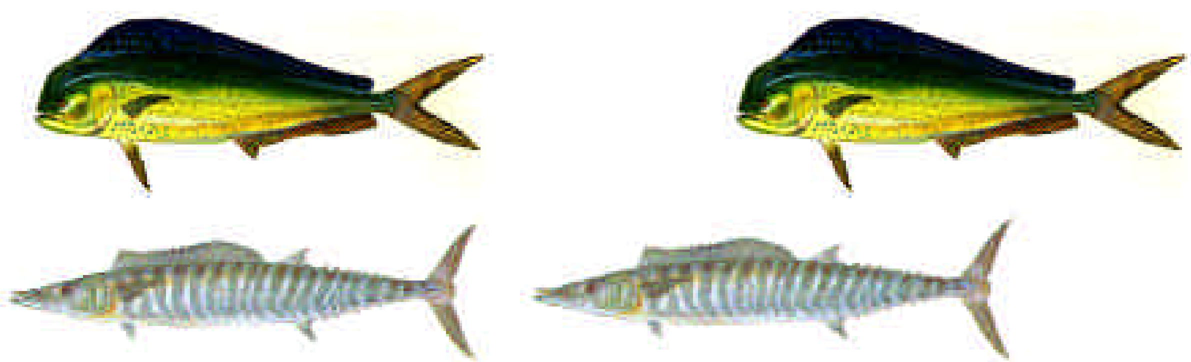
FISHERY MANAGEMENT PLAN FOR THE DOLPHIN AND WAHOO FISHERY OF THE ATLANTIC

INCLUDING A FINAL ENVIRONMENTAL IMPACT STATEMENT, REGULATORY IMPACT REVIEW, INITIAL REGULATORY FLEXIBILITY ANALYSIS, AND SOCIAL IMPACT ASSESSMENT/FISHERY IMPACT STATEMENT



JANUARY 2003

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Mid-Atlantic Fishery Management Council

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LIST OF ACRONYMS/GLOSSARY

ABC (Allowable Biological Catch)- Refers to the range of allowable catch for a species or species group. Usually set each year and used to set the annual Total Allowable Catch, TAC.

ACCSP (Atlantic Coast Cooperative Statistics Program)- A comprehensive data collection program jointly developed by the Atlantic coastal states, regional and federal fishery management agencies.

AP (Advisory Panel)- Members of the public who are appointed by the Council to review information and give advice. Members are familiar with the fishing industry or a particular fishery.

ASMFC (Atlantic States Marine Fisheries Commission)- An interstate commission required to adopt fishery management plans for coastal fisheries. The Commission reviews fishery management actions in each state on the Atlantic coast to see if the states are complying with the measures in the interstate management plans.

Bottom longline means a longline that is deployed with enough weights and/or anchors to maintain contact with the ocean bottom.

BRD (Bycatch Reduction Device)- Any gear or trawl modification to allow finfish to escape (e.g. BRDs in shrimp trawls).

Charleston Bump closed area means the Atlantic Ocean area seaward of the inner boundary of the U.S. EEZ from a point intersecting the inner boundary of the U.S. EEZ at 34°00' N. lat. near Wilmington Beach, NC, and proceeding due east to connect by straight lines the following coordinates in the order stated: 34°00' N. lat., 76°00' W. long.; 31°00' N. lat., 76°00' W. long.; then proceeding due west to intersect the inner boundary of the U.S. EEZ at 31°00' N. lat. near Jekyll Island, GA.

CPUE (Catch Per Unit Effort)- The number or weight of fish caught by an amount of effort. Typically, effort is a combination of gear type, gear size and the length of time the gear is used. CPUE is often used as a measurement of relative abundance for a particular fish.

East Florida Coast closed area means the Atlantic Ocean area seaward of the inner boundary of the U.S. EEZ from a point intersecting the inner boundary of the U.S. EEZ at 31°00min; N. lat. near Jekyll Island, GA, and proceeding due east to connect by straight lines the following coordinates in the order stated: 31°00min; N. lat., 78°00min; W. long.; 28°17min; N. lat., 79°12min; W. long.; then proceeding along the outer boundary of the EEZ to the intersection of the EEZ with 24°00min; N. lat.; then proceeding due west to the following coordinates: 24°00min; N. lat., 81°47min; W. long.; then proceeding due north to intersect the inner boundary of the U.S. EEZ at 81°47min; W. long. near Key West, FL.

EEZ (Exclusive Economic Zone)- All waters from the seaward boundary of coastal states out to 200 miles. For the South Atlantic region, the EEZ ranges from 3 to 200 nautical miles offshore.

EFH (Essential Fish Habitat)- The waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity.

EFH-HAPC (Essential Fish Habitat/Habitat Areas of Particular Concern)- Areas designated as EFH that meet additional criteria specified in the Sustainable Fisheries Act (SFA).

Export means a shipment to a destination outside the customs territory of the United States for which a Shipper's Export Declaration (Customs Form 7525) is required. Atlantic HMS destined from one foreign country to another, which transits the United States and for which a Shipper's Export Declaration is not required to be filed, is not an export under this definition.

FEIS (Final Environmental Impact Statement) and **DEIS** (Draft Environmental Impact Statement)- A requirement of the National Environmental Policy Act (NEPA), an EIS focuses on significant environmental issues, including social and economic concerns, and provides alternatives to the proposed management actions within each Fishery Management Plan.

FAD (Fish Attracting Device)- A man-made object that fish associate with food or prey.

Floatline means a line attached to a buoyant object that is used to support the mainline of a longline at a specific target depth.

FMP (Fishery Management Plan)- A plan to achieve specified management goals for a fishery. It includes data, analyses and management measures for a fishery.

Gangion means a line that serves to attach a hook, suspended at a specific target depth, to the mainline of a longline.

High-flyer means a flag, radar reflector or radio beacon transmitter, suitable for attachment to a longline to facilitate its location and retrieval.

HMS (Highly Migratory Species)- Specified as swordfish, tunas, sharks, and billfish. These fish are managed by the National Marine Fisheries Service’s HMS Division.

ICCAT (International Convention for the Conservation of Atlantic Tunas)- An intergovernmental fishery organization responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and adjacent seas.

IFQ (Individual Fishing Quota)- Established by the Magnuson-Stevens Act, it is the annual catch limit for a person who has a permit to harvest a specific portion of the Total Allowable Catch of a species.

ITQ (Individual Transferable Quota)- A form of limited entry that gives harvest rights to fishermen by assessing a fixed share of the catch to each fisherman.

Longline means fishing gear that is set horizontally, either anchored, floating, or attached to a vessel, and that consists of a mainline or groundline with three or more leaders (gangions) and hooks, whether retrieved by hand or mechanical means.

MSY (Maximum Sustainable Yield)- The largest average catch that can be taken continuously (sustained) from a stock under average environmental conditions. This is used as a management goal.

MRFSS (Marine Recreational Fishing Statistics Survey)- An annual survey by the NMFS to estimate the number, catch, and effort of recreational fishermen.

NMFS (National Marine Fisheries Service)- A federal agency with scientists, research vessels and a data collection system, responsible for managing the nation's saltwater fish. It supports and oversees the actions of fishery managers under the Magnuson Fishery and Conservation Act.

OY (Optimum Yield)- The harvest level for a species that achieves the greatest overall benefits, including economic, social and biological considerations.

Pelagic longline means a longline that is suspended by floats in the water column and that is not fixed to or in contact with the ocean bottom.

SAFE (Stock Assessment and Fishery Evaluation)- A report that provides a summary of the most recent biological condition of a stock of fish and the economic and social condition of the recreational and commercial fishermen and seafood processors who use the fish. The report provides information to determine harvest levels.

SAW/SARC (Stock Assessment Workshop/Stock Assessment Review Committee)- A group of individuals skilled in the study of fish population dynamics and appointed by a federal fishery management council who review the scientific data on the condition of a stock of fish.

SMZ (Special Management Zone)- An area of particular concern, where specific management strategies are in place. These management strategies may include gear restrictions, catch limits, seasonal closures or permit requirements.

SPR (Spawning Potential Ratio)- The number of eggs that could be produced by an average recruit in a fished stock divided by the number of eggs that could be produced by an average recruit in an unfished stock.

SSB (Spawning Stock Biomass)-The total weight of the fish in a stock that are old enough to spawn.

SSBR (Spawning Stock Biomass Per Recruit)- The spawning stock biomass divided by the number of recruits to the stock or how much spawning biomass an average recruit would be expected to produce.

SSC (Scientific and Statistical Committee) – A committee, appointed by the Council, of university, government (state and federal), and private sector professionals knowledgeable in technical areas such as statistics, fishery biology, economics, sociology, etc.

TAC (Total Allowable Catch)- The annual recommended catch for a species group. The Council sets the TAC from the range of the allowable biological catch.

In order to understand and discuss the theory behind fishery management, key biological terms must be defined. Listed below are definitions used by fishery biologists in assessing the condition of a fishery.
Population- A group of individuals of the same species living in a certain area.
Species- A group of similar organisms that can freely interbreed.
Stock- A harvested or managed unit of fish.

It is important to note that often a species may have several populations, and fisheries managers will refer to the group of populations as a stock or manage the populations separately. With migrating species, such as king and Spanish mackerel, this management practice often applies.

In other cases, several species may be included in the same stock because they are harvested together or it may simply be more convenient to manage the species together. The South Atlantic Fishery Management Council employs this practice in the management of snapper and grouper species.

Endangered Species Act (ESA): Section 7 **r**equires a biological evaluation (BE) of the potential effects of a FMP's action(s) on any species or designated critical habitat listed under the ESA.

Marine Mammal Protection Act (MMPA): Enacted in 1972 to protect and manage marine mammals, this act prohibits the taking (harassing, killing, capturing, etc.) with certain exceptions, of marine mammals in U.S. waters and by U.S. citizens on the high seas, and prohibits the importing of marine mammals and marine mammal products.

National Environmental Policy Act (NEPA): In 1969, this federal statute enacted requirements for all federal agencies regarding human impact on the environment. These requirements include interdisciplinary analyses of all environmental effects for any federal action. Such analyses include Environmental Assessments and Environmental Impact Statements.

LIST OF ACTIONS

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DOLPHIN WAHOO FISHERY MANAGEMENT PLAN COVER SHEET

This integrated document contains all elements of the Dolphin and Wahoo Fishery Management Plan, Final Environmental Impact Statement (FEIS), Initial Regulatory Flexibility Analysis (IRFA), Regulatory Impact Review (RIR), and Social Impact Assessment (SIA)/Fishery Impact Statement (FIS). Separate Tables of Contents are provided to assist readers and the NMFS/NOAA/DOC reviewers in referencing corresponding sections of the Plan. Introductory information and/or background for the FEIS, IRFA, RIR, and SIA/FIS are included within the separate table of contents for each of these sections. **General information begins on page 1; information for agency reviewers continues below.**

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NAME OF ACTION

(X) Administrative ( ) Legislative

SUMMARY

The overall goal of the fishery management plan for the South Atlantic, Mid-Atlantic, and New England Councils' areas of jurisdiction is to adopt a precautionary and risk-averse approach to management which in the first instance attempts to maintain the status quo. This will require that current catch levels not be exceeded and that recent conflict between sectors of the fishery (commercial longliners and recreational fishermen) be resolved. Status quo should reflect trends (average catch and effort levels) in the fishery over the five years, 1993 through 1997.

Owing to the significant importance of the dolphin/wahoo fishery to the recreational fishing community in the Atlantic, the goal of this fishery management plan is to maintain the current harvest level of dolphin and insure that no new fisheries develop. With the potential for effort shifts in the historical longline fisheries for sharks, tunas, and swordfish, these shifts or expansions into nearshore coastal waters to target dolphin could compromise the current allocation of the dolphin resource between recreational and commercial user groups. Further, these shifts in effort in the commercial fishery, dependant upon the magnitude (knowing that some dolphin trips may land over 25,000 pounds in a single trip) could result in user conflict and localized depletion in abundance.

Problems and issues identified by the Councils and addressed by this fishery management plan are as follows:

(1) Localized reduction of fish abundance due to high fishing pressure;

(2) Disruption of markets;

(3) Conflict and/or competition between recreational and commercial user groups of dolphin fish;

(4) Reduced social and economic benefits;

(5) Bycatch;

(6) Importance of predator/prey relationships between dolphin and other pelagic species; and

(7) Limited biological, habitat, economic, and social information on dolphin and wahoo stocks and fisheries.

Objectives addressed by this fishery management plan are as follows:

(1) Address localized reduction in fish abundance. The Councils remain concerned over the potential shift of effort by longline vessels to traditional recreational fishing grounds and the resulting reduction in local availability if commercial harvest intensifies;

(2) Minimize market disruption. Commercial markets (mainly local) may be disrupted if large quantities of dolphin are landed from intense commercial harvest or unregulated catch and landing by charter or other components of the recreational sector;

(3) Minimize conflict and/or competition between recreational and commercial user groups. If commercial longlining effort increases, either directing on dolphin and wahoo or targeting these species as a significant bycatch, conflict and/or competition may arise if effort shifts to areas traditionally used by recreational fishermen;

(4) Optimize the social and economic benefits of the dolphin and wahoo fishery. Given the significant importance of dolphin and wahoo to the recreational sector throughout the range of these species and management unit, manage the resources to achieve optimum yield on a continuing basis;

(5) Reduce bycatch of the dolphin fishery. Bycatch is a problem in the pelagic longline fishery for highly migratory species. Any increase in overall effort, and more specifically shifts of effort into nearer shore, non-traditional fishing grounds by swordfish and tuna vessels, may result in increased bycatch of non-target species.

In addition, National Standard 9 requires that: “Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.” Therefore bycatch of the directed dolphin fishery must be addressed;

(6) Direct research to evaluate the role of dolphin and wahoo as predators and prey in the pelagic ecosystem; and

(7) Direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

The Councils are establishing a fishery management plan for dolphin and wahoo and proposing the following actions:

Action 1. The management unit is the population of dolphin (common dolphin- *Coryphaena hippurus* and pompano dolphin- *Coryphaena equiselis*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts;

Action 2. The management unit is the population of wahoo (*Acanthocybium solandri*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts;

Action 3. In the Atlantic any dealer, defined as the person who first receives dolphin or wahoo harvested in or from the EEZ by way of purchase, barter, trade, or transfer in commerce, will be required to possess a valid dealer permit issued by the National Marine Fisheries Service and to report data needed to monitor the dolphin and wahoo fisheries;

Action 4. Require that the owner of a for-hire vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ. Require that the owner of a commercial vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ;

In order to qualify for a commercial vessel permit in the Atlantic, during one of the three calendar years preceding the control date, the vessel owner (1) must have 25 percent of his or her earned income derived from commercial or for-hire fishing, or must have earned at least $10,000 from either commercial or for-hire fishing and (2) must be able to document 250 pounds of landings and sale of dolphin and/or wahoo on or before the control date of May 21, 1999 in the Atlantic. Alternatively individuals may also qualify for a commercial permit if they hold a valid permit in the snapper-grouper, king mackerel, or swordfish fisheries. The commercial permit is transferable (1 for 1) with vessel when sold or replaced. Allow a 200 pound incidental harvest possession limit of dolphin and/or wahoo for vessels with a valid federal commercial permit fishing North of 39° North latitude.

For a person aboard a fishing vessel to fish for dolphin and wahoo in the exclusive economic zone (EEZ), possess dolphin and wahoo in or from the EEZ, off-load dolphin and wahoo from the EEZ, or sell dolphin and wahoo in or from the EEZ, a vessel permit for dolphin and wahoo must be issued to the vessel and be on board.

A fee will be charged to cover the administrative costs of issuing federal vessel permits. There are no requirements to qualify for a for-hire vessel permit;

Action 5. Require that the operator of a commercial or for-hire vessel obtain an operator’s permit issued by the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ. On each federally permitted dolphin/wahoo commercial or for-hire vessel, there must be on board at least one operator who has been issued a federal operator’s permit for the dolphin/wahoo fishery. The federally permitted operator will be held accountable for violations of fishing regulations and also may be subject to a permit sanction. If an operator’s permit has been sanctioned, during the permit sanction period the individual operator may not work in any capacity aboard a federally permitted fishing vessel.

No performance or competency testing will be required to obtain a permit. However, the permit may be revoked for violation of Federal dolphin and wahoo regulations as authorized by 15 C.F.R. 904.

The federal permit program will have the following requirements:

1. Any operator of a vessel fishing for dolphin or wahoo (either commercial or for-hire) must have an operator’s permit issued by the NMFS Regional Administrator.

2. An operator is defined as the master or other individual on board a vessel who is in charge of that vessel (see 50 CFR 620.2).

3. The operator is required to submit an application, supplied by the Regional Administrator, for an Operator’s Permit. The permit will be issued for a period of up to three years.

4. The applicant must provide his/her name, mailing address, telephone number, date of birth, and physical characteristics (height, weight, hair, and eye color) on the application. In addition to this information, the applicant must provide two passport size color photos.

5. The permit is not transferable.

6. Permit holders will be required to carry their permit aboard the fishing vessel during fishing and off-loading operations and must have it available for inspection upon request by an authorized officer.

7. The Regional Administrator may charge an administrative fee for the operator permit consistent with NOAA guidelines;

Action 6. In the Atlantic, require reporting of vessel permit holders (commercial and for-hire) and include reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP). It is the Councils' intent that existing logbook requirements continue until the cooperating partners meet to determine whether these efforts will continue under ACCSP;

Action 7. Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 18.8 and 46.5 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 1.41 and 1.63 million pounds;

Action 8. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and 100% of MSY (between 1.41 and 1.63 million pounds) for wahoo;

Action 9. Overfishing level. Overfishing is defined in terms of the NMFS Guidelines Checklist. A maximum fishing mortality threshold (MFMT) - In the Atlantic, U.S. Caribbean, and Gulf of Mexico overfishing for dolphin and wahoo is defined as a fishing mortality rate (F) in excess of F_{MSY} ($F_{30\% \text{ Static SPR}}$). A minimum stock size threshold (MSST) – In the Atlantic, U.S. Caribbean, and Gulf of Mexico the minimum stock size threshold for dolphin and wahoo is defined as a ratio of current biomass ($B_{current}$) to biomass at MSY or $(1-M)*B_{MSY}$, where 1-M should never be less than 0.5. Using the best available estimates of natural mortality (M = 0.68-0.80) in the formula results in a MSST of 50% B_{MSY}. The stock would be overfished if current biomass ($B_{current}$) was less than MSST and would be recovered when current biomass was equal or greater than the biomass at MSY; and

Action 10. Establish a framework procedure for the Dolphin and Wahoo FMP to provide the South Atlantic Fishery Management Council with a mechanism to independently adjust management measures for their area of responsibility through framework action.

Action 11. Prohibit sale of recreationally caught dolphin or wahoo in or from the Atlantic EEZ except for allowing for-hire vessels that possess the necessary state and Federal commercial permits to sell dolphin harvested under the bag limit in or from the Atlantic EEZ;

Action 12. Establish a cap of 1.5 million pounds or 13% of total landings, whichever is greater, for the commercial fishery for dolphin. Should the catch exceed this level, the Council will review the data and evaluate the need for additional regulations which may be established through the framework;

Action 13. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. Headboats (with a valid certificate of inspection) will be allowed a bag limit of 10 dolphin per paying passenger;

Action 14. Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed;

Action 15. Establish a minimum size limit for dolphin of 20 inches fork length off Florida and Georgia and no minimum size limit north of Georgia;

Action 16. Establish a commercial trip limit for wahoo (landed head and tail intact) of 500 pounds with no transfer at sea allowed;

Action 17. Do not establish a size limit for wahoo in the Atlantic EEZ;

Action 18. Establish a recreational bag limit of 2 wahoo per person per day in the Atlantic EEZ;

Action 19. Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads);

Action 20. Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species;

Action 21. Establish a fishing year of January 1 to December 31 for the dolphin and wahoo fishery in the Atlantic EEZ;

Action 22. Expand the list of Essential Fish Habitat (EFH) definitions that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*;

Action 23. Expand the list of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*; and

Action 24. Assessment of the Impacts of Present Fishing Activities on EFH. No action to implement additional management measures to reduce impacts of fishing on dolphin wahoo EFH. Defer to measures in the *Sargassum* Fishery Management Plan which has been submitted to the Secretary of Commerce for formal review, and incorporate by reference the Comprehensive Habitat Amendment approved by the Secretary on June 3, 1999.

Public hearings were held in the following locations:

<u>Atlantic</u>			
Charleston, South Carolina	May 1, 2000	Savannah, Georgia	May 15, 2000
Atlantic Beach, Florida	May 2, 2000	Key West, Florida	June 8, 2000
Cocoa Beach, Florida	May 3, 2000	Islamorada, Florida	June 12, 2000
Ft. Lauderdale, Florida	May 4, 2000	Ocean City, Maryland	June 26, 2000
Kill Devil Hills, North Carolina	May 9, 2000	Toms River, New Jersey	June 27, 2000
Morehead City, North Carolina	May 10, 2000	Ronkonkoma, New York	June 28, 2000
Wrightsville Beach, North Carolina	May 11, 2000	New London, Connecticut	June 29, 2000
<u>Caribbean</u>			
San Juan, Puerto Rico	May 17, 2000	St. Thomas, U.S.V.I.	May 18, 2000
St. Croix, U.S.V.I.	May 19, 2000		
<u>Gulf of Mexico</u>			
Port Aransas, Texas	July 31, 2000	Galveston, Texas	August 1, 2000
Kenner, Louisiana	August 7, 2000	Biloxi, Mississippi	August 8, 2000
Orange Beach, Alabama	August 9, 2000	Panama City, Florida	August 10, 2000
Ft. Myers, Florida	August 15, 2000	Key West, Florida	August 16, 2000

<u>Public Comment At Council Sessions</u>

St. Thomas, USVI	August 16, 2000
Mobile, Alabama	September 13, 2000
Charleston, South Carolina	September 22, 2000
Biloxi, Mississippi	November 15, 2000
Atlantic Beach, North Carolina	November 30, 2000
St. Thomas, USVI	February 21, 2001
Charleston, South Carolina	September 19, 2002
New Bern, North Carolina	December 5, 2002

FINAL ENVIRONMENTAL IMPACT STATEMENT

This integrated document contains all elements of the Dolphin and Wahoo Fishery Management Plan, Final Environmental Impact Statement (FEIS), Initial Regulatory Flexibility Analysis (IRFA), Regulatory Impact Review (RIR), and Social Impact Assessment (SIA)/Fishery Impact Statement (FIS). Separate Tables of Contents are provided to assist readers and the NMFS/NOAA/DOC reviewers in referencing corresponding sections of the Plan. Introductory information and/or background for the FEIS, IRFA, RIR, and SIA/FIS are included within the separate table of contents for each of these sections. **General information begins on page 1; information for agency reviewers continues below.**

( ) Draft (**X**) Final

SUMMARY

The following problems affect the dolphin wahoo fishery:

1. Localized reduction of fish abundance due to high fishing pressure.
2. Disruption of markets.
3. Conflict and/or competition between recreational and commercial user groups of dolphin fish.
4. Reduced social and economic benefits.
5. Bycatch.
6. Importance of predator/prey relationships between dolphin and other pelagic species.
7. Limited biological, habitat, economic, and social information on dolphin and wahoo stocks and fisheries.

The following objectives are addressed in the dolphin and wahoo fishery management plan:

1. Address localized reduction in fish abundance.
2. Minimize market disruption.
3. Minimize conflict and/or competition between recreational and commercial user groups.
4. Optimize the social and economic benefits of the dolphin and wahoo fishery.
5. Reduce bycatch of the dolphin fishery.
6. Direct research to evaluate the role of dolphin and wahoo as predators and prey in the pelagic ecosystem.
7. Direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

A Final EIS is provided for actions proposed for the dolphin and wahoo fishery management plan. The Councils are establishing a fishery management plan for dolphin and wahoo and proposing actions presented in the List of Actions following the FMP table of contents.

Notice of Intent to Prepare a DEIS Published on: January 17, 2001
Comments on Notice by: February 16, 2001

DEIS to NMFS on: May 24, 2001 DEIS to EPA on: September 14, 2001
Comments on DEIS requested by: November 5, 2001

Three DEIS comments were received from the EPA (Appendix I):

I. United States Department of the Interior, Office of the Secretary, Washington, DC (dated 9/25/02) - "This is to inform you that the Department may have comments, but will be unable to reply within the allotted time. Please consider this letter as a request for an extension of time in which to comment on the document. Our comments, if any, should be available by late October 2001."

Council Response: No additional comments have been received as of 10/2/02.

II. United States Department of State, Bureau of Oceans and International Environmental and Scientific Affairs, Washington, DC (dated 10/12/01) - "As these documents do not contain an international component, we have no comment."

Council Response: None necessary.

III. United States Environmental Protection Agency, Region 4 (dated 11/5/01) - “Overall, EPA supports the proposed dolphin and wahoo FMP. However, we offer the following comments on the NEPA process and have enclosed additional comments on the FMP:

Overall, EPA supports the proposed dolphin and wahoo FMP. However, we offer the following comments on the NEPA process and have enclosed additional comments on the FMP. In summary, EPA conceptually supports the proposed FMP for dolphin and wahoo and will primarily defer to the expertise of the NMFS and the Councils on the bases and assumptions for the proposed actions. However, our NEPA and FMP comments should be considered/clarified by the NMFS/Councils in their development of the pending FEIS as well as future fishery EISs. We rate this DEIS an “EC-1" (Environmental Concerns) due to our NEPA and FMP comments.

1. *NEPA Document* - Compared to previous FMP EISs reviewed by EPA, the present DEIS is more consistent with the NEPA process. We note that background information, management objectives/goals, and options to proposed actions are provided. Moreover, we note that the specific management objectives addressed by individual proposed actions are itemized in the discussion/conclusion sections for those actions. This serves to relate the actions to the FMP objectives.

In addition to such a listing of applicable proposed actions for each management objective, we recommend that a summary table be provided in the FEIS where all actions applicable to each management objective are listed by objective so that the public can readily determine which actions will satisfy each management goal. In the text, NMFS may also wish to more specifically discuss how each proposed action would satisfy specific goals. A summary of how bycatch, for example, would be reduced by the FMP objectives would be of public interest.

Despite NEPA improvements, the DEIS is somewhat cumbersome given that 28 actions are proposed with as many as seven options for these actions. While we support the NEPA concept of reasonable alternatives (options), instances were noted where options could have been lumped into the action and others where the options should have been split into two options since ranges were offered and selections were not yet made. In some cases, the rationale for rejection of options needed further clarification. Some streamlining in the FEIS and future NEPA documents may be possible and should be considered. The summary tables (e.g., Table 3) for the various actions and options are helpful.

Councils’ Response: We agree that the document is somewhat cumbersome given the extremely large number of actions, however, establishing a fishery management plan is a complex and detailed process. All Actions are either required by existing law or are necessary to protect dolphin and wahoo. We have attempted to present the material in a logical and easily comparable format. The idea of listing actions and options by objective will be explored in future EIS documents. Within the Dolphin Wahoo FMP, such a comparison is shown by issue/problem which closely correspond to the objectives. In options with ranges, we have expanded the discussion to talk about the range below and above the point value chosen (see Table 3). We have expanded and clarified the rationale for rejection of options. Council staff are attending NEPA training sessions and the South Atlantic Council now has a full-time NEPA Scientist on staff. We anticipate future documents to be streamlined and improved.

2. *Public Acceptance* - Regarding previous (1989) consideration for managing dolphin and wahoo, page 4 states that "...the Councils decided to forego any management for dolphin due to lack of support for any specific measures at that time." While we understand that public support and involvement is desirable to management success, it is fishery data (landings, stock biomass, etc.) that are key in determining the need for a FMP more so than public receptiveness. Historically, fishery restrictions (bag limits, minimum size, reporting, permits, etc.) are often not welcomed by commercial or recreational fishers, particularly for a previously unregulated fishery such as the present dolphin and wahoo fisheries.

Councils' Response: We agree that fishery data are key in determining the need for a FMP however, for situations like dolphin where the Councils are implementing precautionary management, public support is very helpful. The public now supports implementation of dolphin regulations prior to any negative impacts on the stock.

3. *Role of Federal Lead Agency* - Page 5 states that "[t]he Councils concluded this meets the intent of NEPA." While we understand the important role and expertise of the Councils, they are not federal agencies. Accordingly, we believe that NMFS, as the lead federal agency, should determine NEPA compliance of the federal DEIS. Therefore, the above passage should perhaps read in the FEIS as "NMFS concluded this meets the intent of NEPA," or perhaps as "NMFS and the Councils concluded this meets the intent of NEPA." Other such statements regarding NEPA compliance and the role of the federal lead agency versus the technical role of the Councils should be revisited for the FEIS. Conversely, we are pleased to note that page 178, referring to Action 5, states that "[t]his option is strongly supported by the National Marine Fisheries Service and many vessel owners."

Councils' Response: The reference to page 5 indicates where the Council determined that the structure of the document meets NEPA intent while also meeting the Magnuson-Stevens Act. This determination is appropriate for the Council to make in order to complete the FMP. However, NMFS also makes the same determination when they review any Council document. If the document is approved, then NMFS is concurring with the Council's conclusions. NMFS prepares additional documents during this stage to indicate their conclusions relative to NEPA. We will revise our statements to indicate that the Councils and NMFS concluded….rather than only indicating the Council concluded….

4. *Framework Procedure* - We agree with the use of the framework procedure to quickly modify a FMP where additional information or discussion makes such modification necessary (adaptive management). The NEPA process, however, would still need to be served under framework modifications. We assume that NMFS will ensure NEPA compliance during the framework process.

Councils' Response: We will continue to ensure NEPA compliance during the framework process as we have done in the past. The South Atlantic Council's process involves a public hearing at one Council meeting and then a final review and opportunity for public comment at the following meeting. Once the document is submitted to NMFS there is another opportunity for public comment on the proposed rule.

5. *Options* - As suggested above, some options proposed in the DEIS themselves offer a range of choices. For example, Option 2 for Action 15 (proposing a 20-inch fork length (FL) as a minimum size for dolphin) offers an 18- to 24-inch FL range and suggests that a final FL will be chosen. Options to a proposed action should preferably provide only one FL, i.e., two options should have been presented -- one above 20 inches and one below 20 inches. Since Option 2 offers a range above and below 20 inches, its merits are difficult to comment on by resource agencies and the public. Conversely, other ranges presented in the DEIS such as for the maximum sustainable yield (MSY: Action 7) are appropriate since they present a statistical confidence limit range. However, even in such instances, the need to settle on one MSY value -- such as an average MSY -- seems appropriate.

We also note that Options 2 and 3 for Action 23 seem more consistent with the proposed action than variants to the proposed action. The FEIS should revisit these and revise them as needed, or better identify differences between the options and Action 23.

Councils' Response: We will structure our options to address this concern in future documents. These options were taken to public hearings by the Council and are being retained. Additional discussion has been added to discuss impacts above and below the value chosen. The Council has not specified one MSY given the very limited data available. The Council concluded a range is more appropriate at this stage. As more data become available, the framework procedure can be used to specify a point value for MSY. The EFH options have been expanded and figures added to provide further contrast.

6. *List of Acronyms & Glossary* - Because of the technical nature of fishery science, we recommend that the FEIS include a *List of Acronyms* and a *Glossary* to make the document more user-friendly to the general public (e.g., MSY, SPR, F, OY, FL, RecFIN, ComFIN, fecundity, pelagic, proxy, *Sargassum*, etc.). Although several such terms are defined in the DEIS, their consolidation would facilitate public reviews. Similarly, when listing taxonomic fish families (as was done for the gut analysis for dolphin in Chapter 3: pg. 31), we suggest that the common name also be included with the family name (e.g., Scombridae: mackerels & tunas). In addition, we suggest that the FEIS summarize the concept of Essential Fish Habitat (EFH) in pelagic waters where bottom habitat would not be damaged by fishing gear or most development as it would for EFHs in inshore waters. For example, how would the expansive and meandering Gulf Stream, which is proposed as a dolphin and wahoo EFH in Action 22, be protected as an EFH? Also, we suggest that local terms such as "chicken" dolphin (juvenile dolphin) be further defined as to size (<18-inch FL?) and other characteristics.

Councils' Response: A list of Acronyms & Glossary has been added. Some of the other comments have been addressed or will be addressed in future documents.

In addition to the above NEPA process comments, EPA has provided comments and recommendations on the 28 proposed actions of the FMP and their options in the enclosed *Detailed Comments*. Some of our potential concerns include that similar but nevertheless different species and congeners are lumped into one FMP, that permit fees are required in some regions but not in all regions of the management unit, that operators of for-hire vessels will still be able to sell dolphin and wahoo which may affect the assurance of food quality standards, that the proposed minimum size limit for dolphin would only apply to portions of the Atlantic, the current NMFS position on the harvesting of *Sargassum* weed particularly as it relates to dolphin and wahoo EFH and the status of the *Sargassum* FMP, and the mechanism for the enforcement of the proposed FMP. We suggest additional discussion in the FEIS.

EPA offers the following comments on the FMP actions and their options for the NMFS/Councils consideration in the development of the FEIS:

7. ***Action 1 (Management Unit for Dolphin)*** - We note that the range for the dolphin is broad geographically (Nova Scotia to Brazil) as is the range of the management unit (Atlantic EEZ to the Caribbean EEZ). However, samples within the range indicated no genetic differences and tagging information shows that dolphin move within the range. Accordingly, it seems reasonable that one management plan for dolphin is appropriate for the management unit. It is unclear, however, if both the common dolphin and the pompano dolphin, which are both to be regulated under the same FMP, were examined genetically and via tagging. While differences may not exist within a species, physical and behavioral differences could exist between dolphin congeners. The FEIS should clarify. The DEIS indicates, for example, that pompano dolphin are a smaller-sized species and prefer warmer waters than the common dolphin.

+ *Option 1 for Action 1 (No Action)* - In regard to management of dolphin at a time when the stock appears healthy (pg. 163), we do not disagree with such a proactive NMFS regulation if it is followed by adaptive management of the proposed FMP through the framework process. We note that conflicts between commercial and recreational fishers have occurred, that juvenile “chicken” dolphin are being harvested and that areas of localized reductions have occurred, which suggest that some regulation is already appropriate at this time. As such, we agree with the NMFS rejection of Option 1. However, given the many species being overfished, it is arguable that resources needed for this FMP may be more needed for those species with stocks in greater jeopardy -- unless these species are also already being fully managed. We will defer to the expertise of the NMFS and Councils.

Councils’ Response: Genetic and tagging work did not address the pompano dolphin. Such work is included in the list of research needs.

8. ***Action 2 (Management Unit for Wahoo)*** - The biology and stock status of wahoo is less known than for dolphin. However, the pelagic distribution appears similar and like dolphin, there appears to be movement within the range. Wahoo and dolphin are also harvested by some of the same fishers. It therefore may not be unreasonable to lump wahoo with dolphin in the same FMP and management unit (Atlantic, Caribbean and Gulf of Mexico EEZ). However, given that two different species with different genera are involved and data are limited, separate FMPs may ultimately be more appropriate if a need is identified through the proposed collection of reporting data.

+ *Option 1 for Action 2 (No Action)* - We agree with the NMFS rejection of Option 1 in an effort to compile data to better understand wahoo stocks. Again, adjustment to the proposed FMP appear likely as data become available.

Councils' Response: The Council concluded resources would be better utilized to include both dolphin and wahoo in one FMP given both species are harvested by the same fishermen. It would be duplicative and wasteful to develop a separate FMP for wahoo.

9. ***Action 3 (Dealer Permits for Atlantic and Gulf)*** - EPA agrees with the use of dealer permits in order to better assess dolphin and wahoo landings and changes in landings. In regard to the fee for these permits, NMFS may wish to consider waiving this cost since the information gathered by the dealers is invaluable to the understanding of the two fisheries. The permit fees are also nominal so that revenues would not seem to be a significant gain or loss to the agency. If not waived, however, we suggest that the proposed federal use of the permit fees be disclosed (e.g., fisheries management, enforcement, conservation, permit processing, NMFS policy, etc.) in the FEIS.

+ *Option 1 for Action 3 (No Action)* - We agree with the NMFS rejection of Option 1 so that the two fisheries will be monitored.

+ *Option 2 for Action 3 (Dealer Permits for Caribbean)* - This option proposes a permit and fee for the Caribbean. The Councils have rejected this option since the fees might be an economic burden for Caribbean dealers which may also be fishers and vessel owners, which require additional permits and fees. EPA does not disagree in the sense that we believe that the permit fees might be waived in general, as suggested above. With or without fees, however, we believe that dealer reporting of landings should be required through permits for all subregions of the management unit (Atlantic, Gulf and Caribbean) in order to monitor the two fisheries and for comparisons. It may be argued, however, that if fees are charged in the Atlantic and Gulf but not the Caribbean, some discontent may develop among U.S. dolphin and wahoo fishers.

+ *Option 3 for Action 3 (State vs. Federal Permits for Caribbean)* - For Option 3, EPA defers to the NOAA General Counsel which has "indicated that pursuant to the Magnuson-Stevens Act, it was not feasible to defer to local government permits for harvest and possession of a Federally managed species"(pg. 171).

Councils' Response: We agree that the information being gather is valuable. However, the decision to waive the fee is up to NMFS and not the Council. The FMP states that an administrative fee "may" be charged.

Options addressing the Caribbean and Gulf have been removed from the Dolphin Wahoo FMP. The EPA comments will be addressed by the CFMC and GMFMC as they manage dolphin and wahoo in their areas of jurisdiction.

10. ***Action 4A (Vessel Permits for Atlantic and Gulf)*** - We concur with the action to require the owners of for-hire vessels to obtain a NMFS permit to harvest or possess wahoo or dolphin so that the number of commercial fishing vessels and commercial effort can be determined. A nominal fee would be charged. As indicated above for dealer fees, NMFS may wish to waive this fee considering the value of such a permitting requirement to the understanding of the two species.

Councils' Response: We agree that the information being gather is valuable. However, the decision to waive the fee is up to NMFS and not the Council. The FMP states that an administrative fee "may" be charged.

11. ***Action 4B (Specifics for Vessel Permits for Atlantic)*** - We concur with the presented specifics regarding the need for a vessel permit such as a permit being required if at least 25% of the vessel owner's income was derived from commercial or for-hire fishing. It is unclear, however, as to why a 200-pound wahoo and dolphin bycatch possession limit is allowed for permitted commercial fishers fishing north of 39 degrees North latitude. It is also unclear how such permitting will be enforced. The FEIS should discuss.

+ *Option 1 for Actions 4A and 4B (No Action)* - EPA agrees with the NMFS rejection of this option so that the two fisheries can be further characterized through vessel permitting.

Councils' Response: The 200 pound limit is intended to cover the likely incidental harvest in the area north of 39 degrees North latitude. This would allow this harvest to continue without these fishermen being required to obtain another permit. This trip limit will be enforced along with other fishing regulations as vessels are intercepted and the quantities possessed measured.

12. ***Action 4C (Vessel Permits Without Fees for Caribbean)*** - Due to the economics of the Caribbean subregion, the Councils propose that no permitting fee be charged but that the vessel permitting process be initiated.

As suggested above, we believe that vessel permits should be required for all subregions within the management unit for dolphin and wahoo. With or without fees, the permitting should be consistent within the management unit. It may be argued, however, that if fees are charged in the Atlantic and Gulf but not the Caribbean, some discontent may develop among U.S. dolphin and wahoo fishers.

+ *Option 1 for Action 4C (No Action)* - EPA agrees with the NMFS rejection of this option so that the two fisheries can be further characterized through vessel permitting.

Councils' Response: Options addressing the Caribbean and Gulf have been removed from the Dolphin Wahoo FMP. The EPA comments will be addressed by the CFMC and GMFMC as they manage dolphin and wahoo in their areas of jurisdiction.

13. ***Action 5 (Operator Permits for Atlantic and Gulf)*** - EPA agrees with the requirement of an operator's permit for commercial or for-hire vessels to harvest or possess dolphin or wahoo. We particularly agree that the operator must be onboard, is held accountable for violations of fishery regulations, and that the permit is not transferable and can be revoked and sanctioned.

+ *Option 1 for Action 5 (No Action)* - We concur with the NMFS rejection of this option to minimize onboard violations of the FMP and other fishery regulations.

+ *Option 2 for Action 5 (Operator Permits for Caribbean)* - EPA disagrees with the apparent proposed permit exemption for Carribean operators. The argument that the Caribbean fishery shows no sign of decline can be made for many other areas within the management unit. We suggest that this option be revisited in the FEIS and that Action 5 perhaps be modified to include the Caribbean. This would provide consistency across the management unit, allow comparison against the Atlantic and Gulf, and help ensure FMP compliance in the Caribbean. EPA would not oppose waiving a permit fee, but believes the permitting process and enforcement should be consistent within the management unit.

Councils' Response: Options addressing the Caribbean and Gulf have been removed from the Dolphin Wahoo FMP. The EPA comments will be addressed by the CFMC and GMFMC as they manage dolphin and wahoo in their areas of jurisdiction.

14. ***Action 6: SubAction 6A (Reporting Requirements for Atlantic)*** - EPA will defer to the NMFS expertise regarding data collection techniques and analysis such as the listed ACCSP, RecFIN, ComFIN and the existing logbook requirements. EPA recommends use of standardized methodology and consistency within the management unit to allow regional comparisons.

Councils' Response: We agree and have specified the ACCSP standard for data collection.

15. ***Action 6: SubAction 6B (Reporting Requirements for Gulf and Caribbean)*** - EPA will defer to the NMFS expertise regarding data collection techniques and analysis. Techniques for Gulf and Caribbean will apparently be developed through the framework process. EPA recommends use of standardized methodology and consistency within the management unit to allow regional comparisons.

+ *Option 1 for Action 6 (No Action)* - We concur with the NMFS rejection of this option so that data can be appropriately reduced and interpreted.

Councils' Response: Options addressing the Caribbean and Gulf have been removed from the Dolphin Wahoo FMP. The EPA comments will be addressed by the CFMC and GMFMC as they manage dolphin and wahoo in their areas of jurisdiction.

16. ***Action 7 (Dolphin & Wahoo Maximum Sustainable Yield: MSY)*** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of the MSY for both dolphin and wahoo. We also understand that the MSY is based on the spawning stock size (biomass) preferred by NMFS/Councils. While we understand that the ranges provided represent 80% confidence levels, it would seem that one figure such as the mean be disclosed and used in analysis. The FEIS should discuss.

+ *Option 1 for Action 7 (No Action)* - We concur with the NMFS rejection of this option since the MSY estimate is essential to the management of dolphin stocks and required (or an MSY proxy) by the Magnuson-Stevens Act.

+ *Option 2 for Action 7 (Other MSY Estimates)* - We defer to the NMFS and Councils regarding the preference for biomass-derived MSY estimates as presented in Action 7.

+ *Option 3 for Action 7 (Other MSY Estimates)* - We defer to the NMFS and Councils regarding the preference for biomass-derived MSY estimates as presented in Action 7.

Councils' Response: The MSY represents the production available from the stock and not what is preferred by NMFS/Councils. The law requires that MSY be specified in terms of biomass. The available data are not sufficient for specifying a point value at this time. When sufficient data become available and NMFS provides a point estimate of MSY in the SAFE Report, the Council will adopt such value through the framework procedure.

17. ***Action 8 (Dolphin & Wahoo Optimum Yield: OY)*** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of the OY for both dolphin and wahoo. OY is defined as "the maximum number of fish that can be harvested safely as reduced by social, economic, and ecological features." We are pleased to note that while the OY is often less than MSY it cannot exceed MSY and that ecological features can result in reduced landings. The FEIS should further discuss what specific ecological considerations would be implemented for this FMP.

+ *Option 1 for Action 8 (No Action)* - We concur with the NMFS rejection of this option to prevent overfishing.

+ *Option 2 for Action 8 (Other OY Estimates)* - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8.

+ *Option 3 for Action 8 (Other OY Estimates)* - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8.

+ *Option 4 for Action 8 (Other OY Estimates)* - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8. Also, data presently do not exist to calculate spawning stock size (biomass) by subregions.

Councils' Response: Data are not available to incorporate specific ecological considerations for establishing OY for dolphin and wahoo. This issue will be address when data become available through the annual SAFE Report developed by NMFS.

18. ***Action 9 (Overfishing)*** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of fishing mortality and other components involved in estimating the overfishing estimate for both dolphin and wahoo.

+ *Option 1 for Action 9 (No Action)* - We concur with the NMFS rejection of this option to prevent overfishing.

Councils' Response: No response necessary.

19. ***Action 10 (Framework Procedure)*** - We agree with adjustments to the proposed FMP through the framework procedure to expedite modifications. However, NEPA compliance will still be necessary for such adaptive management.

+ *Option 1 for Action 10 (No Action)* - We concur with the NMFS rejection of this option to allow rapid FMP modifications.

Councils' Response: We will continue to ensure NEPA compliance during the framework process as we have done in the past. The South Atlantic Council's process involves a public hearing at one Council meeting and then a final review and opportunity for public comment at the following meeting. Once the document is submitted to NMFS there is another opportunity for public comment on the proposed rule.

20. ***Action 11 (Sale of Dolphin & Wahoo)*** - We agree that dolphin and wahoo should not be sold by recreational fishers. However, this action exempts for-hire vessels with commercial permits that comply with regulations, which are allowed to sell dolphin and wahoo. EPA can only agree with this exception if the commercial permits for the for-hire vessels require the food quality standards of commercial vessels. It is also unclear as to why Action 11 is only proposed for the Atlantic subregion. The FEIS should discuss.

+ *Option 1 for Action 11 (No Action)* - We concur with the NMFS rejection of this option since recreational fishers can avoid food quality standards that commercial fishers cannot legally avoid.

+ *Option 2 for Action 11 (Phase-Out Period)* - This option proposes to phase out the for-hire vessel exemption in 3-5 years so that only true commercial vessels will eventually be able to sell dolphin and wahoo. We do not disagree with the NMFS rejection of Option 2 if the for-hire vessels indeed are bound by commercial food quality standards.

+ *Option 3 for Action 11 (Prohibit For-Hire Vessels Sales)* - This option would limit the sale of dolphin and wahoo to commercial vessels. Again, we do not disagree with the NMFS rejection of Option 3 if the for-hire vessels indeed are bound by commercial food quality standards. However, EPA favors Option 3 since it provides the best assurance for food quality standards. On the other hand, it does present some societal and economic issues for for-hire vessels.

Councils' Response: Commercial and for-hire vessels selling their catch must abide by all food quality requirements equally. Options addressing the Caribbean and Gulf have been removed from the Dolphin Wahoo FMP. The EPA comments will be addressed by the CFMC and GMFMC as they manage dolphin and wahoo in their areas of jurisdiction.

21. ***Action 12 (Commercial Landings Cap)*** - Although not a rigorous Total Allowable Catch (TAC), this action caps commercial landings at 13% of total landings or 1.5 M pounds, whichever is greater. These caps are based on the average of recent fishery statistics (1994-1997), including the highest (1995) landings (Note - It is unclear why Action 12 (Atlantic EEZ) and Action 27 (Gulf EEZ) used significantly different baseline years; the FEIS should discuss.). Although the NMFS can adjust the caps if exceeded, this non-binding cap offers a target that should perhaps evolve into a TAC as data become available. EPA agrees with capping commercial landings to help resolve commercial/recreational fisher use conflicts.

+ *Option 1 for Action 12 (No Action)* - We concur with the NMFS rejection of this option in order to set a cap, albeit non-binding, and to help resolve fisher use conflicts.

+ *Option 2 for Action 12 (Historical Catch)* - Option 2 bases the cap on historical landings from one of several time periods different from proposed Action 12. We will defer to the NMFS regarding the selection of the appropriate time frame but favor recent landings used in Action 12.

+ *Option 3 for Action 12 (Gear Types)* - Option 2 bases the cap on gear types by different parts of the subregion. We will defer to the NMFS regarding the selection of the appropriate time frame but favor the statistics used in Action 12.

Councils' Response: Options addressing the Caribbean and Gulf have been removed from the Dolphin Wahoo FMP. The EPA comments will be addressed by the CFMC and GMFMC as they manage dolphin and wahoo in their areas of jurisdiction.

22. ***Action 13 (Bag Limit)*** - This action proposes a 10 dolphin per person per day and 60 dolphin per boat per day limit. We conceptually agree with bag limits and will defer to the NMFS regarding the basis of these limits. This action serves to cap recreational fishing.

+ *Option 1 for Action 13 (No Action)* - We concur with the NMFS rejection of this option in order protect dolphin abundance.

+ *Option 2 for Action 13 (Reduced Dolphin Bag Limit Per Boat Per Day)* - We agree with the NMFS rejection of Option 2 regarding dolphin bag limits for for-hire vessels (18-60 per vessel per day) since we will defer to the expertise of the NMFS/Councils proposing Action 13 bag limits. However, the lower bag limit proposed in Option 2 (18 vs. 60) would provide greater protection of stock abundance. From a NEPA standpoint, this option is vague since it provides a wide range rather than a distinct bag limit.

+ *Option 3 for Action 13 (Reduced Dolphin Bag Limit Per Person Per Day)* - We agree with the NMFS rejection of Option 3 regarding dolphin bag limits for fishers (5-10 per person per day) since we will defer to the expertise of the NMFS/Councils proposing Action 13 bag limits. However, the lower bag limit proposed in Option 3 (5 vs. 10) would provide greater protection of stock abundance. From a NEPA standpoint, this option is vague since it provides a wide range rather than a distinct bag limit.

+ *Option 4 for Action 13 (Bag Limit Exemptions)* - We agree with the NMFS rejection of Option 4 proposing Action 13 bag limits with an exemption for headboats fishing in waters north of 39 degrees North Latitude since we will defer to the expertise of the NMFS/Councils proposing Action 13 bag limits. Such exemptions would allow greater landings and therefore reduce dolphin abundance. The basis of such an exemption is also unclear.

Councils' Response: The use of ranges will be addressed in future documents. The public has not indicated that use of ranges is vague or problematical but we will modify to address the NEPA concerns as we prepare new documents.

23. ***Action 14 (Commercial Trip Limits)*** - EPA conceptually agrees with a limit on commercial dolphin landings per trip (3,000 pounds per trip north of 31 degrees North Latitude and 1,000 pounds south) and agrees that no at-sea catch transfers should be allowed. We will defer to the expertise of the NMFS/Councils regarding the basis for these limits. However, the basis for these limits is somewhat unclear (data vs. maintenance of status quo and public opinion). The basis and regional differences should be better discussed in the FEIS.

+ *Option 1 for Action 14 (No Action)* - We concur with the NMFS rejection of this option in order to limit the amount of fishing effort in the dolphin commercial fishery.

+ *Option 2 for Action 14 (1,000-5,000 Pound Trip Limits)* - We agree with the NMFS rejection of Option 2 since we will defer to the expertise of the NMFS/Councils proposing Action 14 trip limits. The increased limits proposed in Option 2 (5,000 vs. 3,000 pounds) would impact abundance.

Councils' Response: The basis for the different trip limits will be expanded.

24. ***Action 15 (Dolphin Size Limits)*** - We conceptually agree with setting a minimum size limit south of Georgia and defer to the expertise of the NMFS/Councils regarding the basis for Action 15 size limits of a 20-inch FL. We understand (pg. 224) that most common dolphin mature at a FL of 18 inches so that it is likely that dolphin will have spawned by the time they have reached the proposed minimum size limit. The size limit would also prevent harvest of juvenile "chicken" dolphin and reduce the harvest of the smaller pompano dolphin species (parenthetically, the FL size range of juvenile "chicken" or "peanut" dolphin should be defined in the FEIS). It would also raise the current limit of an 18-inch FL in Georgia.

The basis for the exemption of a size limit for waters north of Georgia should be further discussed in the FEIS. We note (pg. 228) that the proposal for no size limit in South Carolina is to reduce the number of dolphin regulatory discards which may or may not survive.

+ *Option 1 for Action 15 (No Action)* - We agree with the rejection of this option in order to reduce the taking of young dolphin that become sexually mature at 18-inch FL.

+ *Option 2 for Action 15 (18 to 24-inch FL Size Limit)* - We agree with the NMFS rejection Option 2 since the lower FL range would allow harvesting of young (just sexually-mature) dolphin. From a NEPA perspective, Option 2 is also vague since it provides a range rather than a distinct minimum size limit such as provided in Action 15.

Councils' Response: The discussion on "chicken" size will be added. The use of ranges will be addressed in future documents. The public has not indicated that use of ranges is vague but we will modify to address the NEPA concerns.

25. ***Action 16 (Wahoo Commercial Trip Limit of 500 Pounds)*** - EPA conceptually agrees with a limit on commercial wahoo landings per trip and agrees that no at-sea catch transfers should be allowed. We will defer to the expertise of the NMFS/Councils regarding the basis for this limit.

Although somewhat unclear, we assume that the DEIS did not intent to present 16A and 16B subactions. The FEIS should clarify and may only wish to note that commercial trip limits of 0-2,400 pounds were considered by NMFS/Councils, but that 500 pounds is being proposed. Otherwise, options within the 0-2,400 pound range should be established and considered in the FEIS.

+ *Option 1 for Action 16 (No Action)* - We agree with the NMFS rejection of this option in order to cap commercial trip landings and prevent and minimize localized rapid reductions in abundance due to extended fishing effort or use of efficient gear.

Councils' Response: Action 16 has been modified to remove the suboptions. The use of ranges will be addressed in future documents. The public has not indicated that use of ranges is vague but we will modify to address the NEPA concerns.

26. ***Action 17 (No Size Limit for Wahoo)*** - Since wahoo mature at a 45-inch FL, sexually immature specimens are frequently caught. This affects wahoo spawning potential and the size of subsequent year classes. Since recreational fishing can involve gaffing, the survival rate of discards is low. Accordingly, no size limit is proposed by NMFS/Councils.

EPA can agree with this approach if a recreational bag limit (as proposed in Action 18) and commercial trip limit (as proposed in Action 16) are promulgated since they should similarly serve to allow an adequate number of juveniles to become sexually mature and spawn. Other options might include use of larger lures that might be rejected by juveniles and releasing hooked juveniles without gaffing.

+ *Option 1 for Action 17 (35 to 45-Inch FL Minimum Size for Wahoo)* - EPA agrees with the NMFS rejection of this option since a bag limit and trip limit should serve to preserve a breeding population.

Councils' Response: Bag and trip limits are being proposed. Consideration of additional options would further delay implementation of the Dolphin Wahoo FMP and was rejected by the Councils.

27. ***Action 18 (Wahoo Bag Limit of 2 Per Person Per Day)*** - As discussed above, we conceptually agree with a wahoo bag limit and will defer to the expertise of the NMFS/Councils regarding the basis for the bag limit.

+ *Option 1 for Action 18 (No Action)* - We agree with the NMFS rejection of this option in order to prevent overfishing of adults and juveniles in order to protect the breeding population.

+ *Option 2 for Action 18 (Bag Limit Exemption of For-Hire Captain & Crew)* - We agree with the NMFS rejection of Option 2 to promote the intent of Action 18 and to prevent inconsistent bag limit regulations onboard for-hire vessels.

Councils' Response: No response necessary.

28. ***Action 19 (Allowable Gear for Dolphin and Wahoo)*** - We agree with regulating the gear type and efficiency as a form of fishery management.

+ *Option 1 for Action 19 (No Action)* - We agree with the NMFS rejection of this option in order to regulate the type of gear introduced into the fishery that may result in overfishing.

Councils' Response: No response necessary.

29. ***Action 20 (Prohibit Dolphin & Wahoo Long Lines in HMS Closed Areas)*** - We strongly agree with this approach in order to be consistent with HMS FMP, facilitate management and enforcement, and prevent additional recreational/commercial fisher use conflicts.

+ *Option 1 for Action 20 (No Action)* - We agree with the NMFS rejection of this option in order to be consistent with the HMS FMP.

Councils' Response: No response necessary.

30. ***Action 21 (Fishing Year of Jan 1 to Dec 31)*** - It is unclear as to why establishing a fishing year is proposed since fishing is to be allowed during the whole year with no time closures. Presumably, the intent is to establish the concept as a management tool which can be modified to include closures as needed through framework. As suggested on page 248, this action would initiate a benchmark for data collection and monitoring.

+ *Option 1 for Action 21 (No Action)* - We agree with the NMFS rejection of this option in order to establish this management tool.

Councils' Response: The fishing year is established to provide a timeframe for reporting data and for future use if closures should become necessary.

31. ***Action 22A (EFH for Dolphin and Wahoo)*** - This action proposes to expand the Essential Fish Habitat (EFH) approved for dolphin to also apply to wahoo. Specifically, these EFHs include the Gulf Stream, Charleston Gyre, Florida Current and pelagic *Sargassum*. EPA supports the EFH concept and will defer to the expertise of the NMFS/Councils regarding their selection. We suggest that the FEIS further discuss the EFH as it relates to pelagic waters (as opposed to inshore waters) since no bottom habitat would be damaged through fishing gear or through most development. For example, how would the expansive and meandering Gulf Stream be protected as an EFH?

Councils' Response: The discussion about pelagic waters has been expanded. The Gulf Stream will be protected by its designation as EFH because any activities that may impact EFH would be subject to comment by the Council and NMFS.

32. ***Action 22B (EFH-HAPCs for Dolphin and Wahoo)*** - This action proposes to expand approved EFH-HAPCs (Habitat Areas of Particular Concern) for dolphin to apply to wahoo in the Atlantic. These EFH-HAPCs include the Ten-Fathom Ledge in North Carolina and The "Wall" off the Florida Keys. EPA also supports the EFH-HAPCs concept and will defer to the expertise of the NMFS/Councils regarding their designation. Additional discussion of these pelagic areas relative to the definition of EFH-HAPCs is requested.

+ *Option 1 for Action 22 (No Action)* - We agree with the NMFS rejection of this option in order to expand the designation of EFHs and EFH-HAPCs for dolphin and wahoo.

+ *Option 2 for Action 22 (Expand EFH and EFH-HAPC to Include Sargassum)* - This option would include *Sargassum* weed wherever it occurs in the Atlantic gyre. The NMFS has rejected Option 2 since *Sargassum* extends beyond U.S. EEZ waters where there is no federal jurisdiction.

While EPA does not disagree with this legal definition, the FEIS should consider a hybrid action that includes *Sargassum* in U.S. waters as an EFH-HAPC throughout the range of dolphin and wahoo, since the flotsam is used as open ocean "islands" for food and cover by these pelagic species.

Councils' Response: The discussion about pelagic waters has been expanded. The EPA suggestion about a hybrid action for Option 2 would further delay implementation of the FMP and was rejected by the Council. *Sargassum* is identified as EFH.

33. ***Action 23 (Fishing Impacts on EFH)*** - Consistent with EPA NEPA review comments on the recent *Sargassum* FMP, we agree that *Sargassum* should not be harvested in order to protect this pelagic ecosystem which is used by dolphin and wahoo. If the *Sargassum* FMP is approved by NOAA, no additional action would seem to be needed. If not, we believe EFH protection of *Sargassum* communities would seem appropriate within the presently proposed FMP and should require the return to sea of any *Sargassum* unavoidably brought onboard during fishing. Dolphin and wahoo fishing in other proposed EFH-HAPCs would not seem to degrade these habitats since they are located in deep waters and fishing gear does not involve trawls or dredges that can damage benthic habitats.

+ *Option 1 for Action 23 (No Action)* - We agree with the NMFS rejection of this option in order to protect EFH-HAPCs for dolphin and wahoo against fishing impacts, particularly *Sargassum* communities and the harvesting of *Sargassum* weed.

+ *Option 2 for Action 23 (Prohibit Harvest and Possession of Sargassum)* - This option is unclear since it was rejected by NMFS yet it appears to support proposed Action 23. Page 263 states that Option 1 (no action) was rejected because "[n]ot prohibiting harvest of pelagic *Sargassum* in the South Atlantic EEZ would not meet objectives of the plan or the requirements of the Magnuson-Stevens related to essential fish habitat," yet Option 2 was also rejected because "...NMFS disapproved prohibiting any harvest of pelagic *Sargassum* in their letter rejecting the original [*Sargassum*] FMP..." (pg. 265). The FEIS should discuss this apparent inconsistency and discuss the current NMFS position on the *Sargassum* fishery and the status of the *Sargassum* FMP. EPA supports the prohibition of *Sargassum* harvesting.

It is noted that Options 2 seems more consistent with the proposed Action 23 than an option to Action 23. The FEIS should revisit Option 2 and incorporate it into Action 23 or emphasize the difference between Option 2 and Action 23.

+ *Option 3 for Action 23 (Prohibit Harvest and Possession of Sargassum With Exceptions)* - This option would allow harvesting of *Sargassum* in specified areas. We agree with the NMFS rejection of this option. It is unclear however, if this option was rejected because some harvesting would be allowed in some areas, or if no harvesting would be allowed in some areas. The FEIS should discuss the position of the NMFS regarding *Sargassum* harvesting and protection of EFHs. Again, EPA supports the prohibition of *Sargassum* harvesting and also agrees with the Councils that "...any removal of pelagic Sargassum represents a net loss of EFH..." (pg. 269).

Councils' Response: The Council has been informed by NMFS and NOAA GC that the *Sargassum* FMP must be implemented before the Dolphin Wahoo FMP can be implemented. Therefore, the ultimate outcome of *Sargassum* will be known and if additional action by the Council is necessary, the changes can be made.

34. **<u>Management Measures for U.S. Waters of the Caribbean</u>**

<u>Councils' Response</u>: The Dolphin Wahoo FMP now covers the Atlantic only. The EPA's comments will be addressed by the CFMC as they develop the management program within the Caribbean.

35. **<u>Management Measures for U.S. Waters of the Gulf of Mexico</u>**

<u>Councils' Response</u>: The Dolphin Wahoo FMP now covers the Atlantic only. The EPA's comments will be addressed by the GMFMC as they develop the management program within the Gulf of Mexico.

FEIS to NMFS on: <u>December , 2002</u> FEIS to EPA on: __________
Comments on FEIS requested by: __________________

REGULATORY IMPACT REVIEW (RIR)

This integrated document contains all elements of the Dolphin and Wahoo Fishery Management Plan, Final Environmental Impact Statement (FEIS), Initial Regulatory Flexibility Analysis (IRFA), Regulatory Impact Review (RIR), and Social Impact Assessment (SIA)/Fishery Impact Statement (FIS). Separate Tables of Contents are provided to assist readers and the NMFS/NOAA/DOC reviewers in referencing corresponding sections of the Plan. Introductory information and/or background for the FEIS, IRFA, RIR, and SIA/FIS are included within the separate table of contents for each of these sections. **General information begins on page 1; information for agency reviewers continues below.** The page numbers below refer to the economic discussions.

INTRODUCTION

The Regulatory Impact Review (RIR) is part of the process of developing and reviewing fishery management plans, amendments, and seasonal adjustments, and is prepared by the Regional Fishery Management Councils with assistance from the National Marine Fisheries Service (NMFS), as necessary.

The National Marine Fisheries Service requires a RIR for all regulatory actions that are of public interest. The RIR does three things: 1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action, 2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem, and 3) it ensures the regulatory agency systematically and comprehensively considers all available alternatives so public welfare can be enhanced in the most efficient and cost effective way.

The RIR also serves as the basis for determining whether any proposed actions are a "significant regulatory action" under certain criteria provided in Executive Order 12866. This RIR analyzes the probable impacts of the proposed Fishery Management Plan (FMP) for the Dolphin and Wahoo Fishery of the Atlantic.

In addition, information from the RIR is used to assess the impacts of the proposed actions on small entities. Because of the nature of these proposed actions, an initial regulatory flexibility analysis (IRFA) is prepared in Section 4.8 to provide full disclosure of their impacts on small entities.

PROBLEMS AND OBJECTIVES

The general problems and objectives are found in the FMP (Section 1.0). The FMP proposes to establish a management program for the dolphin and wahoo fishery. Further exposition of these issues is found in discussions under each proposed action.

METHODOLOGY AND FRAMEWORK FOR ANALYSIS

The basic approach adopted in this RIR is an assessment of management measures from the standpoint of determining the resulting changes in costs and benefits to society. The net effects should be stated in terms of producer and consumer surpluses for the harvesting, processing/dealer sectors, and for consumers. Ideally, the expected present values of net yield streams over time associated with the different alternatives should be compared in evaluating the impacts. However, lack of data precludes this type of analysis. The approach taken in analyzing alternative management approaches is to describe and/or quantify the changes in short-term net benefits. A qualitative discussion of the long-term impacts is also attempted. A complete analysis for each measure is contained in Section 4 under "Economic Impacts", and the RIR assessment is summarized in the following table.

Summary of Expected Changes in Net Economic Benefits (Summary of RIR)

The following table summarizes only the economic effects of the proposed fishery managemen actions and alternatives. The detailed economic analyses are contained in Section 4.0 (see RIR Table of Contents for the exact page references). [Note: This table does not include the Council's rationale for choosing among alternatives.] The Council's preferred options are presented in the following table in bold.

Table 1. Summary of Expected Changes in Net Benefits (Summary of Regulatory Impact Review).

Proposed Actions & Rejected Options	Positive Impacts	Negative Impacts	Net Impacts
Proposed Action 1. The management unit is the population of dolphin from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts.	There will be no economic impact from this option since it only establishes a management unit.	There will be no direct economic impact from this option since it only establishes a management unit.	There will be no direct economic impact. However, future actions to improve the dolphin fishery are expected to increase economic benefits to society.
Rejected Options:			
Option 1. No Action.	There would be no direct economic impact from this option.	This option would not allow for development of a comprehensive FMP for dolphin.	There would be no direct economic impact from this option. However, it would not allow FMP development and thus limit future actions to protect the dolphin fishery. This situation would result in reduced net benefits to society.
Option 2. Four other management units were considered: (1) Caribbean as a management unit, with Gulf and Atlantic combined as a management unit; (2) Atlantic as a management unit, with Caribbean and Gulf combined as a management unit; (3) Gulf as a management unit, with Caribbean and Atlantic combined as a management unit; and (4) separate management units for each region: Gulf, Caribbean, and Atlantic.	There would be no direct economic impact from this option since it would only establish a management unit.	There would be no direct economic impact from this option since it only establishes a management unit.	There would be no direct economic impact. However, future actions to improve the dolphin fishery are expected to increase economic benefits to society. Note: The Caribbean and Gulf of Mexico Council jurisdictions are no longer part of this FMP.

Table 1. Summary of Expected Changes in Net Benefits (Continued)

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 2. The management unit is the population of wahoo from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts.	There will be no economic impact from this option since it only establishes a management unit.	There will be no direct economic impact from this option since it only establishes a management unit.	There will be no direct economic impact. However, future actions to improve the wahoo fishery are expected to increase economic benefits to society.
Rejected Options:			
Option 1. No Action.	There would be no direct economic impact from this option.	This option would not allow for development of a comprehensive FMP for wahoo.	There would be no direct economic impact from this option. However, it would not allow FMP development and thus limit future actions to protect the wahoo fishery. This situation would result in reduced net benefits to society.
Option 2. Four other management units were considered: (1) Caribbean as a management unit, with Gulf and Atlantic combined as a management unit; (2) Atlantic as a management unit, with Caribbean and Gulf combined as a management unit; (3) Gulf as a management unit, with Caribbean and Atlantic combined as a management unit; and (4) separate management units for each region: Gulf, Caribbean, and Atlantic.	There would be no direct economic impact from this option since it would only establish a management unit.	There would be no direct economic impact from this option since it only establishes a management unit.	There would be no direct economic impact. However, future actions to improve the wahoo fishery are expected to increase economic benefits to society. Note: The Caribbean and Gulf of Mexico Council jurisdictions are no longer part of this FMP.

Table 1. Summary of Expected Changes in Net Benefits (Continued)

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 3. In the Atlantic any dealer, defined as the person who first receives dolphin or wahoo harvested in or from the EEZ by way of purchase, barter, trade, or transfer in commerce, will be required to possess a valid dealer permit issued by the National Marine Fisheries Service and to report data needed to monitor the dolphin and wahoo fisheries.	This measure should aid enforcement and improve data collection and analyses in the future.	There will be a permit fee for dealers who do not already possess a Federal dealer permit for other species in the Atlantic and Gulf. There will also be a time cost for all dealers completing reports. The public cost of processing these reports is estimated at $12.50 per hour.	If this proposed action is successful in discouraging non-compliance there will be increased benefits from other management measures. Also, management decisions based on additional information is expected to increase net economic benefits.
Rejected Options:			
Option 1. No Action.	There would be no permit fee or time cost for dolphin and wahoo dealers.	This situation would not result in improved compliance with fishery regulations and data collection for management.	This option would not result in the increased benefits to society from improved data collection and analyses for better management of these fisheries.
Option 2. Dealer Permits in the Atlantic, Gulf, and Caribbean.	This measure should aid enforcement and improve data collection and analyses in the future.	There would be similar costs to dealers as stated under the proposed action. Except that this option would also require dealer permits in the Caribbean which is not necessary as most dealers are fishermen and possess vessel permits. Requiring physical facilities would also pose additional unnecessary cost on Caribbean fishermen.	Similar to the proposed action, this option would likely increase future economic benefits to society. However, not to the same extent as the proposed action since there would be an unnecessary cost levied on dealers in the Caribbean. Note: The Caribbean and Gulf of Mexico Council jurisdictions are no longer part of this FMP.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 4. For-Hire and Commercial Vessel Permits.	This measure will improve enforcement and data collection, and could increase economic benefits from the fishery in the long-term resulting from improved management.	A permit fee will increase cost to vessel owners. Estimated at $50 per vessel and $20 for vessels holding multiple permits. Opportunity cost for completing an application is estimated at $5. Also, there will be a loss in revenue to those vessels that do not meet the permit qualification criteria.	This action is likely to increase economic benefits in the future. In comparison to Option 1, it will slow the growth rate of capacity in this fishery.
Rejected Options:			
Option 1. No Action for 4.	There would be no cost for vessel permits.	This option would not provide the basis for identification of vessels in the dolphin and wahoo fishery and subsequent data collection.	This option would not result in improved management or enforcement and hence is likely to result in reduced economic benefits in the future.
Proposed Action 5. For-Hire and Commercial Operator Permits.	This action will improve enforcement and aid in data collection. It should decrease costs to vessel owners from fisheries violations.	Vessel operators will incur a cost of $50 every three years. In addition, the public costs for setting up this system is estimated at $10,000.	This action is likely to increase net benefits in the future.
Rejected Options:			
Option 1. No Action.	There would be no vessel operator's fee. The agency would not incur the cost of setting up and operating this program.	This option would not improve compliance with management regulations and decrease costs to vessel owners from fisheries violations.	This option would not increase future economic benefits.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 6. Reporting Requirements.	This action will provide the data for managing the fishery to increase benefits. Logbook reporting should increase regulatory compliance.	The time cost will be $12.50 per hour. The agency cost will be $11 per logbook and $100 per vessel annually.	The benefits from collecting necessary data and improved compliance should outweigh the time and other costs associated with this additional reporting.
Rejected Options:			
Option 1. No Action.	There would be no time and agency cost associated with this option.	This option would not provide critical information for managing the fishery or improve regulatory compliance.	This option would not provide information to manage the fishery so as to increase economic benefits.
Proposed Action 7. Maximum Sustainable Yield of 18.8-46.5 million pounds for dolphin and proxy of 1.41-1.63 million pounds for wahoo. Note: This FMP no longer applies to the Caribbean and Gulf of Mexico Council jurisdictions, however, the range of MSY for dolphin and wahoo stocks based on available data is still appropriate.	There will be no direct economic impact since defining MSY does not alter current use of the resource.	There will be no direct economic impact since defining MSY does not alter current use of the resource.	Economic effects will stem from the relationship between MSY, OY, and TAC.
Rejected Options:			
Option 1. No Action.	There would be no direct economic impact from this option.	There would be no direct economic impact. However, not setting MSY will not allow for development of the FMP.	As a result of not setting MSY and inability to develop this FMP, this option could result in reduced net economic benefits to society.
Option 2. MSY of 16-18 million pounds for dolphin and SPR proxy for wahoo.	There would be no direct economic impact since defining MSY does not alter current use of the resource.	There would be no direct economic impact since defining MSY does not alter current use of the resource.	Economic effects would stem from the relationship between MSY, OY, and TAC.
Option 3. MSY of 18.8-46.5 million pounds for dolphin and MSY proxy of 1.63-2.176 million pounds for wahoo.	There would be no direct economic impact since defining MSY does not alter current use of the resource.	There would be no direct economic impact since defining MSY does not alter current use of the resource.	Economic effects would stem from the relationship between MSY, OY, and TAC.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 8. Optimum Yield for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and 100% of MSY (between 1.41 and 1.63 million pounds) for wahoo.	There will be no direct economic effects since defining OY does not alter current use of the resource.	There will be no direct economic effects since defining OY does not alter current use of the resource.	Economic effects will stem from the relationship between OY, and TAC.
Rejected Options:			
Option 1. No Action.	There would be no direct economic effect.	There would be no direct economic effect.	However, this option would not allow for management of dolphin and wahoo which could lead to reduced economic benefits.
Option 2. OY tied to SPR.	There would be no direct economic effects since defining OY does not alter current use of the resource.	There would be no direct economic effects since defining OY does not alter current use of the resource.	Economic effects would stem from the relationship between OY, and TAC.
Option 3. OY based on 75% of MSY.	There would be no direct economic effects since defining OY does not alter current use of the resource.	There would be no direct economic effects since defining OY does not alter current use of the resource.	Economic effects would stem from the relationship between OY, and TAC.
Option 4. OY based on biomass.	There would be no direct economic effects since defining OY does not alter current use of the resource.	There would be no direct economic effects since defining OY does not alter current use of the resource.	Economic effects would stem from the relationship between OY, and TAC.
Proposed Action 9. Definition of overfishing for dolphin and wahoo.	There will be no direct economic effect from this measure. Economic benefits would stem from management measures implemented to prevent overfishing.	There will be no direct economic effect from this measure. Economic costs would stem from management measures implemented to prevent overfishing.	Measures taken to prevent overfishing will increase long-term benefits.
Rejected Options:			
Option 1. No Action.	There would be no direct economic effect from this option.	This option would not allow for implementation of the FMP.	This option would not allow for management of dolphin and wahoo and future actions to prevent overfishing, which would decrease economic benefits.
Option 2. Overfishing based on SPR.	There would be no direct economic effect from this measure. Economic benefits would stem from management measures implemented to prevent overfishing.	There would be no direct economic effect from this measure. Economic costs would stem from management measures implemented to prevent overfishing.	Measures taken to prevent overfishing will increase long-term benefits.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 10. Establish a framework procedure for the Dolphin and Wahoo FMP.	This will increase flexibility through more rapid response to changes in the fishery.	There will be agency expenditures for meetings and staff work. .	This action will likely increase economic benefits from a more rapid response to "problems" that arise in the fishery.
Rejected Options:			
Option 1. No Action.	There would be no additional agency cost from this procedure.	This option would not provide the Councils a mechanism to rapidly implement regulations for their area of jurisdiction.	There would be delays in taking action to address problems in the fishery. This situation could lead to a loss of economic benefits.
Proposed Action 11. Prohibit sale of recreationally caught dolphin or wahoo in or from the Atlantic EEZ except for allowing for-hire vessels that possess the necessary state and Federal commercial permits to sell dolphin harvested under the bag limit in or from the Atlantic EEZ.	This action will allow the for-hire sector to continue to earn revenue from the sale of bag limit caught dolphin. There will be some reduction in health risks but not to the same extent as under Option 2 and Option 3.	There will be a loss of revenue to private recreational fishermen who sell their dolphin catch and for hire vessels who sell their wahoo catch. The magnitude of this loss is expected to be lower than under Option 3 and Option 2 (after the phase out period). Allowing sale of dolphin by the for hire sector could pose health risks and increase harvesting demand in the future but not to the same degree as Option 1.	It is not possible to determine the net economic impacts.
Rejected Options:			
Option 1. No Action.	This option would allow the private and for-hire recreational sectors to continue to earn revenue from the sale of fish.	Taking no action could result in increased health risks and increased harvesting pressure by the recreational sector.	It is not possible to determine the net economic impacts.
Option 2. Allow for-hire vessels that possess the necessary commercial permits to continue to sell fish for a 3-5 year phase-out period.	This option would allow for-hire vessels to phase out sale and substitute other revenue earning activities. There would also be reduced health risks.	There would be a loss of revenue to private recreational fishermen who sell their catch. Some for-hire vessels/crew members may not be able to transition to other revenue earning activities.	It is not possible to determine the net economic impacts.
Option 3. Prohibit sale of recreationally caught dolphin and wahoo in the Atlantic EEZ. The intent is to not allow sale from private/rental or for-hire trips and limit sale to vessels with a commercial permit.	This option could reduce health risks from consuming improperly handled fish.	There would be a loss in total revenue to the recreational entities that currently sell bag limit caught dolphin and wahoo. In some areas, such as the Florida Keys, crew members depend on the sale of recreationally caught fish for a large part of their income.	It is not possible to determine the net economic impacts.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 12. Establish a cap of 1.5 million pounds or 13% of total landings, whichever is greater, for the commercial fishery for dolphin. Should the catch exceed this level, the Council will review the data and evaluate the need for additional regulations which may be established through the framework.	There will be no direct economic effects.	There will be no direct economic effects.	However, if the Councils take restrictive action(s) in the future to maintain these allocation shares there will be a change in economic benefits.
Rejected Options:			
Option 1. No Action.	There would be no direct economic effects in the short term.	There would be no direct economic effects in the short term.	However, it is unknown whether future shifts in harvesting levels would occur and thus result in changes in overall benefits to society.
Option 2. Allocate the dolphin resource to both recreational and commercial harvesters in the Atlantic EEZ based on the historical average catch (1984-1997, 1990-1997, or 1994-1997).	There would be no direct economic effects since the shares are not associated with a TAC.	There would be no direct economic effects since the shares are not associated with a TAC.	However, if the Councils take restrictive action(s) in the future to maintain these allocation shares there would be a change in economic benefits.
Option 3. Sub-allocate the resource to commercial harvesters based on a historical split between gear types and average landings between 1994 and 1997.	There would be no direct economic effects since the shares are not associated with a TAC.	There would be no direct economic effects since the shares are not associated with a TAC.	However, if the Councils take restrictive action(s) in the future to maintain these allocation shares there would be a change in economic benefits.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 13. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. Headboats (with a valid certificate of inspection) will be allowed a bag limit of 10 dolphin per paying passenger.	This measure could allow more angler trips for dolphin if "localized depletion" occurs under present conditions.	This measure could decrease benefits for avid anglers constrained by the bag limit or boat limit.	The net economic benefits will depend on the relative changes in these angler benefits.
Rejected Options:			
Option 1. No Action.	There would be no reduction in recreational benefits in the short-term.	This situation would result in loss of future benefits if "localized depletion" occurs.	There would be a reduction in net user benefits in the future if localized depletion occurs and there is overfishing.
Option 2. Establish a recreational boat limit of 18-60 dolphin per boat (including private and for-hire vessels).	This option could allow for more anglers trips to harvest dolphin as compared to the status quo.	There would be a decrease in recreational benefits on those trips where the boat limit constrain harvest.	The net economic benefit would depend on the relative changes in these angler benefits and the boat limit chosen.
Option 3. Establish a recreational bag limit of 5-10 dolphin per person per day, excluding the captain and crew of for-hire vessels in the Atlantic EEZ.	This option could allow for more anglers trips to harvest dolphin as compared to the status quo.	There would be a decrease in recreational benefits on those trips where the bag limit constrain harvest. Also, forgone income to crew from the sale of bag limit caught dolphin.	The net economic benefit would depend on the relative changes in these angler benefits and the bag limit chosen.
Option 4. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. For-hire vessels fishing North of 39° N. Latitude (Delaware Bay, Delaware) would be exempt from the boat limit of 60 dolphin.	This option could allow for more anglers trips to harvest dolphin as compared to the status quo.	There would be a decrease in recreational benefits on those trips where the boat limit and bag limit constrain harvest.	The net economic benefits would depend on the relative changes in these angler benefits.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 14. Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed.	There will be an increase in benefits if this measure prevents growth overfishing and localized depletion.	This measure will decrease net revenue to the commercial harvesters who are constrained by the trip limit.	If this measure is necessary to prevent overfishing, prevent localized depletion, or to regulate market supply throughout the year, then economic benefits will increase.
Rejected Options:			
Option 1. No Action.	This option would not constrain commercial ex-vessel revenue.	This option could result in lower net benefits if the commercial harvesting sector exceeds its allocation, or if unrestrained harvest results in "localized" market flooding.	Economic benefits could decrease if "no action" results in local market flooding and/or the commercial sector exceeds its allocation.
Option 2. Establish a commercial dolphin trip limit of 1,000-5,000 pounds or an equivalent number of fish with no transfer at sea allowed in the Atlantic EEZ.	There would be an increase in benefits if this measure prevents growth overfishing and localized depletion.	This measure would decrease net revenue to the commercial harvesters who are constrained by the trip limit.	If this measure is necessary prevent overfishing, prevent localized depletion, or to regulate market supply throughout the year, then economic benefits would increase.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 15. Establish a minimum size limit for dolphin of 20 inches fork length off Florida and Georgia and no minimum size limit north of Georgia.	There will be no increase in short-term benefits. Long term benefits could increase if present fishing conditions result in growth overfishing or this action is necessary to improve the quality of recreational fishing.	This action will not allow for the harvest of most pompano dolphin. There will be a reduction in short-term net revenue and consumer surplus.	This action will increase long-term net benefits if there are improvements in the yield from the fishery, and improvements in the size structure of the stock.
Rejected Options:			
Option 1. No Action.	There would be no loss of benefits to recreational and commercial fishermen in the short-term.	There would be a loss of economic benefits in the future if current fishing practices result in growth overfishing.	Under this option long-term benefits would decrease if a minimum size limit is needed to “improve” the stock status or to prevent growth overfishing.
Option 2. Establish an 18-24 inch fork length minimum size limit for dolphin.	There would be no increase in short term benefits. Long term benefits could increase if present fishing conditions result in growth overfishing or this action is necessary to improve the quality of recreational fishing.	This action would not allow for the harvest of most pompano dolphin. There will be a reduction in short-term net revenue and consumer surplus.	This action would increase long-term net benefits if there are improvements in the yield from the fishery, and improvements in the size structure of the stock.
Proposed Action 16. Establish a commercial trip limit for wahoo (head and tails intact) of 500 pounds with no transfer at sea allowed.	There will be an increase in benefits if this measure prevents overfishing and localized depletion.	This measure will decrease net revenue to the commercial harvesters who are constrained by the trip limit.	If this measure is necessary to prevent overfishing, prevent localized depletion, or to regulate market supply throughout the year, then economic benefits will increase.
Rejected Options:			
Option 1. No Action.	This option would not constrain commercial ex-vessel revenue.	This option could result in lower net benefits if the commercial harvesting sector exceeds its allocation, or if unrestrained harvest results in “localized” market flooding.	Economic benefits could decrease if “no action” results in local market flooding and/or overfishing occurs in the future.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 17. Do not establish a size limit for wahoo in the Atlantic EEZ.	There will be no loss of benefits to recreational and commercial fishermen in the short-term.	There will be a loss of economic benefits in the future if current fishing practices result in growth overfishing.	Under this option long-term benefits will decrease if a minimum size limit is needed to "improve" the stock status or to prevent growth overfishing.
Rejected Options:			
Option 1. Establish a 35-45 inch fork length minimum size limit for wahoo in the Atlantic EEZ.	There would be no increase in short-term benefits. Long term benefits could increase if present fishing conditions result in growth overfishing or this action is necessary to improve the quality of recreational fishing.	There would be a reduction in short-term net revenue and consumer surplus.	This action would increase long-term net benefits if there are improvements in yield from the fishery, and improvements in the size structure of the stock.
Proposed Action 18. Establish a recreational bag limit of 2 wahoo per person per day in the Atlantic EEZ.	This measure could allow more angler trips for wahoo if "localized depletion" occurs under present fishing conditions.	This measure could decrease benefits for avid anglers constrained by the bag limit.	The net economic benefits will depend on the relative changes in these angler benefits.
Rejected Options:			
Option 1. No Action.	There would be no reduction in recreational benefits in the short-term.	This situation would result in loss of future benefits if "localized depletion" occurs.	There would be a reduction in net user benefits in the future if localized depletion occurs and there is overfishing.
Option 2. Establish a recreational bag limit of 2 wahoo per person per day for the recreational fishery, excluding the captain and crew of for-hire boats in the Atlantic EEZ.	This measure could allow more angler trips for wahoo if "localized depletion" occurs under present conditions.	This measure would decrease benefits for avid anglers constrained by the bag limit. There would also be a loss of expected income from sale of bag limit caught wahoo.	The net economic benefits would depend on the relative changes in these angler benefits.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	**Positive Impacts**	**Negative Impacts**	**Net Impacts**
Proposed Action 19. Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads).	There will be no economic impact from this measure.	There will be no economic impact from this measure.	There will be no economic impact from this measure.
Rejected Options:			
Option 1. No Action.	There would be no economic impact from this option.	There would be no economic impact from this option.	There would be no economic impact from this option.
Proposed Action 20. Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species.	There will be no positive economic impact in the short-term.	This measure will reduce ex-vessel revenue in the long line fleet (estimated range \$96,379 to \$155,942 per year).	This action could increase future benefits to society if it aids in the rebuilding of HMS species.
Rejected Options:			
Option 1. No Action.	There would be no loss of income to the longline sector from prohibition on fishing in the HMS closed areas.	There would be no positive economic impact in the long term from improvements in the HMS stocks.	This option would not provide benefits from the faster recovery of HMS species.
Proposed Action 21. Establish a fishing year of January 1 to December 31 for the dolphin and wahoo fishery in the Atlantic EEZ.	There will be no economic impact from this measure.	There will be no economic impact from this measure.	There will be no economic impact from this measure.
Rejected Options:			
Option 1. No Action.	There would be no economic impact from this option.	There would be no economic impact from this option.	There would be no economic impact from this option.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	Positive Impacts	Negative Impacts	Net Impacts
Proposed Action 22. Expand the list of Essential Fish Habitat (EFH) definitions that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. **EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*.**	There will be no direct economic impact from this measure.	There will be no direct economic impact from this measure.	However, actions implemented to protect habitat could result in increased long-term net benefits but have short-term negative effects on some sectors.
Rejected Options:			
Option 1. No Action.	There would be no direct economic impact from this option.	This option would not allow for development of the Dolphin/Wahoo FMP and subsequent management of these species.	Even though there would be no direct economic effects, this option would not allow the Council to take timely action(s) to protect habitat and critical habitat. This could lead to reduced net economic benefits.
Option 2. Expand the EFH definition to include Sargassum where it occurs in the north Atlantic Gyre in the Sargasso Sea and the EEZ between 20° N. latitude and 40° N. latitude and 30° W. longitude and the western edge of the Gulf Stream.	There would be no direct economic impact from this measure.	There would be no direct economic impact from this measure.	However, actions implemented to protect EFH could result in increased long-term net benefits but have negative effects on some sectors.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	Positive Impacts	Negative Impacts	Net Impacts
Proposed Action 23. Expand the list of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*.	There will be no direct economic impact from this measure.	There will be no direct economic impact from this measure.	However, actions implemented to protect EFH-HAPCs could result in increased long-term net benefits but have negative effects on some sectors.
Rejected Options:			
Option 1. No Action.	There would be no direct economic impact from this option.	This option would not allow for development of the Dolphin/Wahoo FMP and subsequent management of these species.	Even though there would be no direct economic effects, this option would not allow the Council to take timely action(s) to protect habitat and critical habitat. This could lead to reduced net economic benefits.
Option 2. Expand the EFH and EFH-HAPC definitions to include Sargassum where it occurs in the north Atlantic Gyre in the Sargasso Sea and the EEZ between 20° N. latitude and 40° N. latitude and 30° W. longitude and the western edge of the Gulf Stream.	There would be no direct economic impact from this measure.	There would be no direct economic impact from this measure.	However, actions implemented to protect EFH-HAPCs could result in increased long-term net benefits but have negative effects on some sectors.

Table 1. Summary of Expected Changes in Net Benefits (Cont.).

Proposed Actions & Rejected Options	Positive Impacts	Negative Impacts	Net Impacts
Proposed Action 24. Assessment of the Impacts of Present Fishing Activities on EFH. No action to implement additional management measures to reduce impacts of fishing on dolphin wahoo EFH. Defer to measures in the *Sargassum* Fishery Management Plan which has been submitted to the Secretary of Commerce for formal review, and incorporate by reference the Comprehensive Habitat Amendment approved by the Secretary on June 3, 1999.	Economic effects will depend on the measures that are implemented in the SAFMC *Sargassum* Plan.	Economic effects will depend on the measures that are implemented in the SAFMC *Sargassum* Plan.	Net economic effects will depend on the measures that are implemented in the SAFMC *Sargassum* Plan.
Rejected Options:			
Option 1. Prohibit any impacts from current fishing activities on EFH for dolphin and wahoo and oppose future use of fishing gears that are likely to negatively impact such EFH.	There may not be any increase in benefits derived from further action over and above what is expected from implementation of the Council's recommendations in the revised *Sargassum* harvest.	There would be decreased benefits from reduction in sustainable populations of dolphin and wahoo that depend on *Sargassum.*	This option could result in reduced net economic benefits if future harvest of *Sargassum* becomes excessive.

Based on analyses of the proposed actions and other alternatives, the Council has concluded that this action is not likely to result in a rule that may: have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; the President's priorities, or the principles set forth in this Executive Order.

This is a new fishery management plan for the dolphin and wahoo species. Even though these proposed management measures are similar to those adopted for other species managed by the SAFMC, this plan could fit under the criteria of raising novel legal or policy issues arising out of legal mandates and thus this RIR is classified as significant under E.O. 12866. The measures contained in this plan are proposed to address a number of problems in the dolphin/wahoo fishery such as localized depletion, conflict among recreational and commercial user groups, and market disruption in local areas due to unusually large landings of dolphin from intense commercial harvest or unregulated catch and landing by charter or other components of the recreational sector. Please refer to Section 1.0, the purpose and need section of this document, for a more complete description of the objectives and goals of this fishery management plan.

SOCIAL IMPACT ASSESSMENT/FISHERY IMPACT STATEMENT

This integrated document contains all elements of the Dolphin and Wahoo Fishery Management Plan, Final Environmental Impact Statement (FEIS), Initial Regulatory Flexibility Analysis (IRFA), Regulatory Impact Review (RIR), and Social Impact Assessment (SIA)/Fishery Impact Statement (FIS). Separate Tables of Contents are provided to assist readers and the NMFS/NOAA/DOC reviewers in referencing corresponding sections of the Plan. Introductory information and/or background for the FEIS, IRFA, RIR, and SIA/FIS are included within the separate table of contents for each of these sections. **General information begins on page 1; information for agency reviewers continues below.** The page numbers below refer to the social discussion.

INTRODUCTION

Mandates to conduct Social Impact Assessments (SIA) come from both the National Environmental Policy Act (NEPA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). NEPA requires Federal agencies to consider the interactions of natural and human environments by using a "systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences...in planning and decision-making" [NEPA Section 102 (2) (a)]. Under the Council on Environmental Quality's (CEQ, 1986) Regulations for implementing the Procedural Provisions of the National Environmental Policy Act, a clarification of the terms “human environment” expanded the interpretation to include the relationship of people with their natural and physical environment (40 CFR 1508.14). Moreover, agencies need to address the aesthetic, historic, cultural, economic, social, or health effects which may be direct, indirect, or cumulative (Interorganizational Committee on Guidelines and Principles for Social Impact Assessment, 1994).

Under the MSFCMA, fishery management plans (FMPs) must “...achieve and maintain, on a continuing basis, the optimum yield from each fishery” [MSFCMA Section 2 (b) (4)]. Recent amendments to the MSFCMA require that FMPs address the impacts of any management measures on the participants in the affected fishery and those participants in other fisheries that may be affected directly or indirectly through the inclusion of a fishery impact statement (FIS) [MSFCMA Section 303 (a) (9)]. Most recently, with the addition of National Standard 8, FMPs must now consider the impacts upon fishing communities to assure their sustained participation and minimize adverse economic impacts upon those communities [MSFCMA Section 301 (a) (8)]. Consideration of social impacts is a growing concern as fisheries experience increased participation and/or declines in stocks. With an increasing need for management action, the consequences of such changes need to be examined in order to mitigate the negative impacts experienced by the populations concerned.

PROBLEMS AND METHODS

Social impacts are generally the consequences to human populations that follow from some type of public or private action. Those consequences may include alterations to “the ways in which people live, work or play, relate to one another, organize to meet their needs and generally cope as members of a society....” (Interorganizational Committee on Guidelines and Principles for Social Impact Assessment, 1994:1). In addition, cultural impacts that may involve changes in values and beliefs which affect people’s way of identifying themselves within their occupation, communities, and society in general are included under this interpretation. Social impact analyses help determine the consequences of policy action in advance by comparing the status quo with the projected impacts. Therefore, it is extremely important that as much information as possible concerning a fishery and its participants be gathered for an assessment. Although public hearings and scoping meetings do provide input from those concerned with a particular action, they do not constitute a full overview of the fishery.

Without access to relevant information for conducting social impact analyses it is important to identify any foreseeable adverse effects on the human environment. With quantitative data often lacking, qualitative data can be used to provide a rough estimate of some impacts. In addition, when there is a body of empirical findings available from the social science literature, it needs to be summarized and referenced in the analysis.

In attempting to assess the social impacts of the proposed plan, it must be noted that very little data are available for analysis. Social impacts on the harvesters, the processing sector, fishing communities, and society as a whole are not fully addressed due to data limitations. The fishery impact statement consists of the description of the commercial fishery and the social impacts under each action item and options. There is presently no information to define or determine impacts upon fishing communities. A complete analysis for each measure is contained in Section 4 under “Social Impacts”, and the SIA/FIS assessment is summarized in the following table.

Summary of Social Impacts

Table 2. Summary of Social Impacts (SIA/FIS).

ACTION	SOCIAL IMPACTS
ACTION 1. Management Unit for Dolphin.	This action will have an indirect but positive social impact on the fishery. Creating a management unit will lead to better data collection and knowledge of all sectors participating in the dolphin fishery in the U.S. Atlantic.
ACTION 2. Management Unit for Wahoo.	This action will have an indirect but positive social impact on the fishery. Creating a management unit will lead to better data collection and knowledge of all sectors participating in the wahoo fishery in the U.S Atlantic.
ACTION 3. Dealer Permits.	Being able to identify and quantify those directly involved in marketing the fish, the dealers, can only help to attain appropriate management of the fishery. Dealers are in the unique position of being involved on a regular basis with the participants in various fisheries, and they are often the first source of information about changes in landings, prices, and fishing conditions, both natural and social. Dealers can also act to quickly disseminate information from management agencies about proposed or real changes in regulations. While permitting might be seen in the short-term as burdensome paperwork by some of the dealers, the long-term benefits for the fishery in general will outweigh any perceived negative impacts.
ACTION 4. For-Hire and Commercial Vessel Permits.	Permitting vessels will allow for easy identification of those individuals involved in the harvesting of dolphin and wahoo. This information could be used in future social impact assessments to determine the effects of management measures on users.
ACTION 5. For-Hire and Commercial Operator Permit.	Aside from the benefits to be gained from being able to identify who is operating commercial and for-hire vessels, thus enhancing understanding of the fishery, compliance with other fishery regulations may be increased due to the threat of sanctions.
ACTION 6. Reporting Requirements.	Data collection is a crucial part of fisheries management as the numbers of participants in each fishery increases. Industry reporting is required to provide necessary data to manage fisheries. Logbooks are required in a growing number of fisheries to resolve many of the deficiencies in data collection. Most objections to this type of requirement center upon the duplication of reporting and different destination for each report. Once fully implemented, ACCSP will reduce redundancy which will make this option more acceptable to fishery participants.

Table 2. Summary of Social Impacts (Cont.).

ACTION 7. Maximum Sustainable Yield for Dolphin and Wahoo.	The Council must address MSY. Negative impacts for any designation of MSY will stem from how MSY is tied to other management specifications like the overfished level or optimum yield.
ACTION 8. Optimum Yield for Dolphin and Wahoo.	Social impacts from specifying optimum yield are determined from the management actions that stem from each Council's management timeline for reaching OY.
ACTION 9. Definition of Overfishing for Dolphin and Wahoo.	Social impacts from defining overfishing are determined from the management actions that are taken to rebuild a stock if it is in an overfished status.
ACTION 10. Framework Procedure for the Dolphin and Wahoo FMP.	By specifying this framework mechanism for modifying management regulations, a more rapid response to changes in the fishery will be facilitated, thereby enhancing management of the fishery.
ACTION 11. Prohibit sale of recreationally caught dolphin or wahoo in or from the Atlantic EEZ except for allowing for-hire vessels that possess the necessary state and Federal commercial permits to sell dolphin harvested under the bag limit in or from the Atlantic EEZ.	There will be a loss in benefits to the recreational sector, ranging from the fishermen themselves to the restaurants and possibly consumers. Commercial fishermen may experience an increase in benefits.
ACTION 12. Establish a cap of 1.5 million pounds or 13% of total landings, whichever is greater, for the commercial fishery for dolphin. Should the catch exceed this level, the Council will review the data and evaluate the need for additional regulations which may be established through the framework.	Setting commercial and recreational sector allocations at levels that are reflective of historical landings will have no negative social impact on either the commercial or recreational participants. A possible positive social impact is that the potential conflict between the two sectors will be reduced, as this action does not change the status quo.
ACTION 13. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. Headboats (with a valid certificate of inspection) will be allowed a bag limit of 10 dolphin per paying passenger.	Fishers may experience marked decreased satisfaction in the fishing experience when bag limits are set at very low (1-3) numbers. Setting the bag limit at a higher number (5-10) may not decrease fishing satisfaction substantially, however there is no data in this fishery to adequately answer this question.

Table 2. Summary of Social Impacts (Cont.).

ACTION 14. Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed.	The impact of commercial trip limits will depend on the level selected and the area fished. Most trips have an average landing of less than 4,000 pounds, averaging approximately 2,000 pounds. If the commercial trip limit is set at the upper level, it is predicted that there will be few social impacts. If the limit is set at the lower end of the range, it may precipitate a change in the configuration of the commercial sector.
ACTION 15. Establish a minimum size limit for dolphin of 20 inches fork length off Florida and Georgia and no minimum size limit north of Georgia.	Not restricting the size of fish landed will allow more freedom for fishers to catch a variety of species within the management unit. The benefits of this action come from giving the fisher a degree of autonomy and furthermore, the lack of a size limit works well in conjunction with proposed bag limits and boat limits.
ACTION 16. Establish a commercial trip limit for wahoo (landed head and tail intact) of 500 pounds with no transfer at sea allowed.	It is predicted that setting a commercial trip limit for wahoo of 500 pounds will not have a negative impact upon the participants in this fishery.
ACTION 17. Do not establish a size limit for wahoo in the Atlantic EEZ.	There will be no foreseeable negative social impacts from this measure.
ACTION 18. Establish a recreational bag limit of 2 wahoo per person per day in the Atlantic EEZ.	Setting a low bag limit for wahoo may decrease fishing satisfaction for those in the recreational fishing sector. The impact will vary by region.
ACTION 19. Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads).	There will be no impact since this option does not place restrictions on current gear types in the dolphin and wahoo fisheries. Specifying allowable gear will prevent gear from being introduced into the fishery and exacerbating the potential for conflict between recreational and commercial fishermen.

Table 2. Summary of Social Impacts (Cont.).

ACTION 20. Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species.	Social impacts from Action 20 itself are predicted to be minimal; most impacts will result from the general time and area closures for the commercial HMS fishery proposed by NMFS. However, lack of data on commercial longline dolphin fishers makes it difficult to predict outcomes with accuracy.
ACTION 21. Establish a fishing year of January 1 to December 31 for the dolphin and wahoo fishery in the Atlantic EEZ.	There will be no immediate social impacts from establishing a fishing year.
ACTION 22. Expand the list of Essential Fish Habitat (EFH) definitions that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*.	The identification of EFH will have few, if any, social impacts itself. Impacts may result from future management measures.
ACTION 23. Expand the list of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*.	The establishment EFH-HAPCs will have few, if any, social impacts itself. Impacts may result from future management measures.

Table 2. Summary of Social Impacts (Cont.).

ACTION	SOCIAL IMPACTS
ACTION 24. Assessment of the Impacts of Present Fishing Activities on EFH. No action to implement additional management measures to reduce impacts of fishing on dolphin wahoo EFH. Defer to measures in the *Sargassum* Fishery Management Plan which has been submitted to the Secretary for formal review, and incorporate by reference the Comprehensive Habitat Amendment approved by the Secretary, on June 3, 1999.	Public sentiment was overwhelming in favor of a total prohibition. Comments were received from 33 States and Puerto Rico, and from 16 foreign countries. A total of 235 comments were received on the original FMP (175 from individuals and 60 from agencies/organizations). All comments were in favor of the Council's proposed actions except the comment from Mr. William Campbell and one suggestion that additional research was needed. The Council's preferred option is as close to the total prohibition as is feasible, and the many non-use stakeholders would derive social benefits from this action. The protection of this habitat and thus of the dolphin and wahoo habitat is readily accepted by almost all members of the public who hold a stake in this fishery. Hence, there will be both short and long term positive social impacts from this option.

SOCIAL IMPACT ASSESSMENT DATA NEEDS

To provide better assessments, socio-economic data need to be collected on a continuing basis for both the commercial and recreational sectors, including the for-hire sector, on all fisheries. Collecting social and economic information in logbooks will be one manner of providing this information on a continuing basis for the commercial sector. Social and economic add-ons to the MRFSS data collection system can provide this type of data for recreational fishermen. In addition, information on fishing communities in the South Atlantic is virtually non-existent. Fishing communities need to be identified and their dependence upon fishing and fishery resources needs to be established. The following list of data needs is provided as a guideline:

1. Demographic information may include but not necessarily limited to: population; age; gender; ethnic/race; education; language; marital status; children (age and gender); residence; household size; household income (fishing/non-fishing); occupational skills; and association with vessels and firms (role and status).

2. Social structure information may include but is not necessarily limited to: historical participation; description of work patterns; kinship unit, size, and structure; organization and affiliation; patterns of communication and cooperation; competition and conflict; spousal and household processes; and communication and integration.

3. Emic culture information may include but is not necessarily limited to: occupational motivation and satisfaction; attitudes and perceptions concerning management; constituent views of their personal future of fishing; psycho-social well-being; and cultural traditions related to fishing (identity and meaning).

4. Fishing community information might include but is not necessarily limited to: identifying communities; dependence upon fishery resources (this includes recreational use); identifying businesses related to that dependence; and determining the number of employees within these businesses and their status.

This list of data needs is not exhaustive or all-inclusive. Upcoming issues within the South Atlantic will undoubtedly focus upon allocation and the need for reliable and valid information concerning the social environment will become even more necessary for managing fisheries. A further recommendation is for the NMFS to review and implement the “Southeast Social and Cultural Data and Analysis Plan” as this will address many of the current data needs.

The Atlantic Coastal Cooperative Statistics Program (ACCSP) Program Design contains detailed social and economic data needs and draft survey instruments. Social and economic data collection projects should at least collect the minimum data elements.

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1.0 PURPOSE AND NEED

1.1 Issues/Problems

In recent years, landings of dolphin and wahoo from the Atlantic have increased. For example, on the average, between 1994 and 1997, the combined landings from all sectors of the fishery in the Atlantic reached an all time high for the management unit, with the highest landings being reached in 1995. Given that the fishery is historically a recreational fishery, concern was raised when commercial landings in the Atlantic increased, due in part to an increasing number of longliners targeting dolphin or modifying their fishing practices such that dolphin and wahoo constitute a greater portion of their longline trips. While commercial landings have stabilized or decreased in some areas, there still exists the possible redirection of effort from vessels displaced from other directed fisheries. The South Atlantic Council continues to receive correspondence expressing concern over the use of longlines in the fishery, the previous increase in landings of dolphin by longliners, and the possible increase in longline effort that may occur when vessels are displaced from the directed Highly Migratory Species fishery resulting from closures. Even though dolphin grow rapidly and mature early, the Councils are concerned that recent increases in landings could result in localized depletion of stocks and a shift in the historical levels of catch between commercial and recreational fishermen. This increase in landings has resulted from both the commercial longline fishery and the historical recreational fishery, with the most significant increase in harvest of wahoo and dolphin coming from the recreational sector, more specifically the charterboat fishery. Another complicating factor in determining landings by sector is that commercial landings also include fish that were caught by the recreational sector.

Conflict among user groups developed because of the initial redirection of effort by the longline fishery for dolphin and wahoo in the Atlantic. Longliners have indicated their shift in effort in previous years came about due to an early closure in other fisheries such as swordfish and shark. With new regulations within these fisheries, the future of their participation in the dolphin fishery is unknown; however, there could be further effort shifts. There has also been concern over the potential for the increased bycatch of small billfish associated with this effort shift in the Atlantic.

The following problems and issues were identified by the Councils and are addressed by this fishery management plan:

1. Localized reduction of fish abundance due to high fishing pressure. (What is the best approach to maintain a sufficiently high abundance level?)

2. Disruption of markets. (What is the best approach to maintain stable markets for dolphin?)

3. Conflict and/or competition between recreational and commercial user groups of dolphin fish. (What is the best approach to reduce conflict and/or competition that has recently developed between these two sectors of the fishery?)

4. Reduced social and economic benefits. (What is the best approach to optimize social and economic benefits of the dolphin fishery?)

5. Bycatch. (Given the mandate in the Magnuson-Stevens Act to address bycatch in all fishery management plans, what is the best approach to quantify and reduce existing bycatch within the fishery, as well as, prevent an increase in non-target bycatch?)

6. Importance of predator/prey relationships between dolphin and other pelagic species.

7. Limited biological, habitat, economic, and social information on dolphin and wahoo stocks and fisheries.

In addition, it is the Councils' intent to address other required provisions including the identification of Essential Fish Habitat (EFH), establishment of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs), and strategies to minimize or avoid impacts of fishing activity on EFH.

1.2 Management Objectives

The overall goal of the fishery management plan for the South Atlantic, Mid-Atlantic, and New England Councils' areas of jurisdiction is to adopt a precautionary and risk-averse approach to management which in the first instance attempts to maintain the status quo. This will require that current catch levels not be exceeded and that recent conflict between sectors of the fishery (commercial longliners and recreational fishermen) be resolved. Status quo should reflect trends (average catch and effort levels) in the fishery over the last five years 1993 through 1997.

Owing to the significant importance of the dolphin/wahoo fishery to the recreational fishing community in the Atlantic, the goal of this fishery management plan is to maintain the current harvest level of dolphin and insure that no new fisheries develop. With the potential for effort shifts in the historical longline fisheries for sharks, tunas, and swordfish, these shifts or expansions into nearshore coastal waters to target dolphin could compromise the current allocation of the dolphin resource between recreational and commercial user groups. Further, these shifts in effort in the commercial fishery, dependant upon the magnitude (knowing that some dolphin trips may land over 25,000 pounds in a single trip) could result in user conflict and localized depletion in abundance.

Objectives identified by the Councils and addressed by this fishery management plan are as follows:

1. Address localized reduction in fish abundance. The Councils remain concerned over the potential shift of effort by longline vessels to traditional recreational fishing grounds and the resulting reduction in local availability if commercial harvest intensifies.

2. Minimize market disruption. Commercial markets (mainly local) may be disrupted if large quantities of dolphin are landed from intense commercial harvest or unregulated catch and landing by charter or other components of the recreational sector.

3. Minimize conflict and/or competition between recreational and commercial user groups. If commercial longlining effort increases, either directing on dolphin and wahoo or targeting these species as a significant bycatch, conflict and/or competition may arise if effort shifts to areas traditionally used by recreational fishermen.

4. Optimize the social and economic benefits of the dolphin and wahoo fishery. Given the significant importance of dolphin and wahoo to the recreational sector throughout the range of these species and management unit, manage the resources to achieve optimum yield on a continuing basis.

5. Reduce bycatch of the dolphin fishery. Bycatch is a problem in the pelagic longline fishery for highly migratory species. Any increase in overall effort, and more specifically shifts of effort into nearer shore, non-traditional fishing grounds by swordfish and tuna vessels, may result in increased bycatch of non-target species.

In addition, National Standard 9 requires that: "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." Therefore bycatch of the directed dolphin fishery must be addressed.

Appendix C (FSEIS for HMS Regulatory Amendment 1) contains data on dolphin-wahoo pelagic longline fishery analysis. The data presented on page C-66 and in Table C-4 indicate that pelagic longlines targeting dolphin do in fact result in a bycatch of HMS species.

6. Direct research to evaluate the role of dolphin and wahoo as predator and prey in the pelagic ecosystem.

7. Direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

1.3 History of Management

Management of dolphin has been considered previously in the public hearing drafts for Amendment 5 and Amendment 8 to the Fishery Management Plan for Coastal Pelagic Resources in the Gulf of Mexico and South Atlantic Regions. During October of 1989, the Council took to public hearing an action to impose a bag limit for dolphin of 5 fish per person per day for recreational fishermen and a requirement of a coastal pelagics permit to be exempt from the bag limit. In addition, a proposed 18 inch minimum size limit was also included. Public hearings for Amendment 5 were held from Key West, Florida to Norfolk, Virginia in the South Atlantic and to Corpus Christi, Texas in the Gulf. Amendment 8 included several options for management of dolphin, including: 20 inch commercial minimum size limit, 10 fish recreational bag limit, 5 fish per person per day limit (recreational and commercial), 10 fish per person per day limit (recreational and commercial), require coastal pelagics permit for over the bag limit fish, and establish a commercial trip limit of between 1,000 and 12,000 pounds. Public hearings were held on Amendment 8 in the Gulf of Mexico, South Atlantic, and Mid-Atlantic regions. In each case, after reviewing public hearing testimony, the Councils decided to forego any management for dolphin due to lack of public support for any specific measures at that time.

A **control date** of May 21, 1999 for possible future limited entry was established for the commercial dolphin and wahoo fishery in the South Atlantic and endorsed for the entire Atlantic

Pursuant to Section 305(c)(2)(A) of the Magnuson-Stevens Act, the South Atlantic Council requested implementation, through emergency action, of the following measures for the dolphin wahoo fishery in the Atlantic EEZ: 1) Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the

SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed; 2) Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline and hook and line gear including manual, electric, or hydraulic rod and reels, bandit gear, handline, and spearfishing gear (including powerheads); and 3) Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species. The Council approved this request at the November 30, 2000 Council meeting in Atlantic Beach, North Carolina and submitted it in January 2001. On September 12, 2001, NMFS corresponded with the South Atlantic Council indicating they would not be implementing the proposed actions under an Emergency Interim Rule because "Since you submitted your request, several issues arose that had a direct bearing on the EIR, and the relationship of these issues to the EIR had to be considered during the decision-making process. Based on the information provided by the Council, as well as additional information reviewed by our agency, we have determined that there is no current basis for implementing the proposed actions under and EIR." Basically the review process took so long that the summer fishing season was over and NMFS determined that based on the catches during the summer, the emergency interim rule was not required. The did advise that if in the future catches do increase, the would once again consider an emergency request. Note: EIR refers to an emergency interim rule.

In February 2001, under the guidance of NMFS and NOAA General Counsel, the Gulf, Caribbean, and South Atlantic Councils met in joint session and approved the Dolphin Wahoo FMP for submission to the Secretary of Commerce for formal review. However, prior to submission and prompted by litigation, it was determined that the FMP did not meet mandates of SFA relative to Essential Fish Habitat (EFH). The Councils, NMFS and NOAA General Counsel worked to revise the FMP, including additional meetings, public hearings and a DEIS review.

The Councils were scheduled to meet in July 2002 to approve the revised FMP for submission to the Secretary but were advised by NOAA GC that recent litigation would require the Gulf of Mexico and Caribbean Councils to incorporate bycatch measures in the FMP rather than deferring implementation through the framework procedures as proposed in the joint FMP.

Developing new measures for the Gulf and Caribbean will require additional public hearings and an additional DEIS filing and review; a process which could exceed a year, thereby further delaying implementation of management measures for the Atlantic. On July 16, 2002 the South Atlantic Council, after concluding all bycatch and other mandates of SFA are met for the Atlantic, requested the Secretary of Commerce approve the Council's withdrawal from joint preparation of a Dolphin and Wahoo FMP with the Caribbean and Gulf of Mexico while retaining true lead for the Atlantic.

1.4 Proposed Measures

The Councils are establishing a fishery management plan for dolphin and wahoo and proposing actions listed in the List of Actions following the FMP table of contents.

2.0 ALTERNATIVES

National Environmental Policy Act (NEPA) regulations indicate that Section 2.0 should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public. The Councils' documents must also conform to the Magnuson-Stevens Act and "Other Applicable Law" requirements. National Environmental Policy Act regulations are one of the "Other Applicable Laws" referenced. The South Atlantic Council decided to consolidate Magnuson-Stevens Act and "Other Applicable Law" (including NEPA) requirements into one non-duplicative and non-repetitive document. The Council's approach is to present the bulk of the evaluation of alternatives and discussion about the effects on the environment in Section 4.0 Environmental Consequences of Fisheries Activities. Section 2.0 Alternatives, is presented as a summary of Section 4.0. The Council and NMFS concluded this meets the intent of NEPA regulatory requirements.

The Caribbean and Gulf of Mexico Council jurisdictions are no longer part of this FMP. A number of alternatives addressing these areas were removed from this document but are part of the administrative record.

Management measures (proposed actions) are intended to address the management objectives and issues discussed above. Each management measure has a number of alternatives that have been considered by the Councils. The following discussion summarizes the alternatives and how they address the problems/issues identified by the Council.

The proposed action addresses the issues/problems of (1) localized reduction of fish abundance, (2) disruption of markets, (3) conflict and/or competition between recreational and commercial user groups, (4) reduced social and economic benefits, (5) bycatch, (6) predator/prey relationships, and (7) limited data.

The following problems/issues pertaining to the dolphin and wahoo fishery have been identified. In addition, the following problems/issues identified in the Comprehensive Amendment Addressing Essential Fish Habitat (EFH) (SAFMC, 1998c) are also addressed for the dolphin and wahoo fishery. The abbreviated summary title is used in the impact table (Table 3) to identify which problems/issues are addressed by which proposed management measures.

Socio-Economic Problem/Issue	**Summary Title**
· Conflict and/or competition between commercial and recreational user groups.	***Conflicts/Competition***
· Reduced social and economic benefits.	***Benefits***
· Limited statistical, social, and economic information.	***Data***
· Disruption of markets.	***Markets***

Biological Problem/Issue	**Summary Title**
· Localized reduction in fish abundance.	***Overfishing***
· Limited information on production, distribution, and ecology of EFH and dolphin and wahoo use of EFH.	***Data***
· Predator/prey relationships between dolphin and other pelagic species.	***Ecosystem***
· Bycatch.	***Bycatch***
· Mandate to identify EFH-Habitat Areas of Particular Concern.	***Habitat Identification***
· Habitat degradation / loss of Essential Fish Habitat.	***Habitat Protection***
· Mandate to reduce impact of fishing in EEZ on Essential Fish Habitat and recommend measures to reduce impact from non-fishing activities.	***Habitat Protection***

How the alternatives address the problems and issues identified by the Councils is summarized in Table 3. Management alternatives and their consequences are in the rows and issues and problems are in the columns.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems)

Table 3. Summary of Environmental Consequences.

	Issues/Problems	
Alternatives	**Biological: Data**	**Social and Economic: Conflicts/Competition and Data**
Proposed Action 1: The management unit is the population of dolphin (common dolphin - *Coryphaena hippurus* and pompano dolphin - *Coryphaena equiselis)* from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts. Rejected Options:	Establishing a management unit for dolphin will provide the basis for conservation and management of these resources in the EEZ. Research on dolphin, wahoo, and their essential habitat such as pelagic *Sargassum* will be encouraged as a federally managed species.	Will allow the Councils to implement comprehensive management for wahoo throughout the waters of the Atlantic.
Option 1. No Action 2. The Caribbean, with Gulf and Atlantic combined; 3. The Atlantic, with Caribbean and Gulf combined; 4. The Gulf, with Caribbean and Atlantic combined; and 5. Management units for each region: Gulf, Caribbean, and Atlantic.	Would not provide the basis for comprehensive management and protection of dolphin or their essential fish habitat. Establishing a management unit for dolphin would provide the basis for conservation and management of these resources in the EEZ. Research on dolphin, wahoo and their essential habitat such as pelagic *Sargassum* will be encouraged as a federally managed species. However, the segregation of stocks into various geographical combinations would not manage dolphin to the maximum extent practicable throughout their range.	Would not allow for comprehensive management. Would allow the Councils to implement comprehensive management for dolphin throughout the waters of the Atlantic, U.S. Caribbean, and Gulf of Mexico. Note: The Caribbean and Gulf of Mexico Council jurisdictions are no longer part of this FMP.
Proposed Action 2: The management unit is the population of wahoo (*Acanthocybium solandri*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts. Rejected Options:	Establishing a management unit for wahoo will provide the basis for conservation and management of these resources in the EEZ. Research on dolphin, wahoo, and their essential habitat such as pelagic *Sargassum* will be encouraged as a federally managed species.	Would allow the Councils to implement comprehensive management for wahoo throughout the waters of the Atlantic. Would allow for better data collection and knowledge of all sectors in the dolphin and wahoo fishery.
Option 1. No Action. 2. The Caribbean, with Gulf and Atlantic combined; 3. The Atlantic, with Caribbean and Gulf combined; 4. The Gulf, with Caribbean and Atlantic combined; and 5. Management units for each region: Gulf, Caribbean, and Atlantic.	Would not provide the basis for comprehensive management and protection of wahoo or their essential fish habitat. Establishing a management unit for wahoo would provide the basis for conservation and management of these resources in the EEZ. Research on dolphin, wahoo, and their essential habitat such as pelagic Sargassum would be encouraged as a federally managed species. However, the segregation of stocks into various geographical combinations would not manage wahoo to the maximum extent practicable throughout their range.	Would not allow for comprehensive management. Would not allow the Councils to implement comprehensive management for wahoo in the form preferred by the Councils. Note: The Caribbean and Gulf of Mexico Council jurisdictions are no longer part of this FMP.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (Cont.)

Alternatives	Issues/Problems: Biological: Data	Issues/Problems: Social and Economic: Data
Proposed Action 3: Dealer Permits. Rejected Options:	There will not be any direct biological impacts; however, this action would most likely produce positive indirect biological benefits through better data collection in the future. The information obtained from dealers would allow for better stock assessments.	Small cost to sector but will lead to better data collection.
Option 1. No Action. Option 2. Dealer permits in the Atlantic, Gulf of Mexico, and Caribbean.	Would not allow for better data collection. There will not be any direct biological impacts; however, this action would most likely produce positive indirect biological benefits through better data collection in the future. The information obtained from dealers would allow for better stock assessments.	Would not allow for better data collection. Small cost to sector but would lead to better data collection. The additional required dealer permit may create an undue economic burden to the Caribbean fishermen who commonly act as the dealer, owner, and operator of the vessel. In addition, there is a degree of uncertainty associated with the degree of impacts of the dealer permit fee on the fishermen. Note: The Caribbean and Gulf of Mexico Council jurisdictions are no longer part of this FMP.
Proposed Actions 4: For-Hire and Commercial Vessel Permits. Rejected Options:	This action would most likely produce positive indirect biological benefits through better data collection in the future. The information obtained from dealers would allow for better stock assessments.	Small cost to sector but will lead to better data collection.
Option 1. No Action.	Would not allow for better data collection.	Would not allow for better data collection.
Proposed Action 5: For-Hire and Commercial Operator Permits. Rejected Options:	Will make vessel captains more accountable for damaging habitat or violating regulations intended to protect the long-term viability of the stock.	Small cost to sector but will lead to better compliance with fishery management regulations. Omission of the permit requirements in the Caribbean eliminates the potential burden on the artisanal Caribbean fisherman.
Option 1. No Action.	Would not make vessel captains more accountable for damaging habitat or violating regulations intended to protect the long-term viability of the stock.	Would not allow for improved compliance with fishery management regulations.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (Cont.)

	Issues/Problems	
Alternatives	**Biological: Overfishing and Data**	**Social and Economic: Data**
Proposed Action 6: Reporting requirements for dolphin and wahoo. Rejected Options:	Provide information for stock assessment and management.	Small cost to sector but will lead to better data collection.
Option 1. No Action.	Would not provide information for stock assessment and management.	Would not allow for better data collection.
Proposed Action 7: Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 18.8 and 46.5 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 1.41 and 1.63 million pounds. Note: This FMP no longer applies to the Caribbean and Gulf of Mexico Council jurisdictions, however, the range of MSY for dolphin and wahoo based on available data is still appropriate. Rejected Options:	None. Impacts for any designation of MSY will stem from how MSY is tied to other management measures. Lack of adequate information to specify an MSY based on information other than average landings for wahoo will encourage research to quantify distribution and production. Wahoo MSY of 1.41 - 1.63 recommend by NMFS SEFSC as being based on best available data.	No direct impacts. Indirect impacts for any designation of MSY will stem from how MSY is tied to other management measures like the overfished level or optimum yield.
Option 1. No Action.	None. Biological consequences arise from the measures taken to prevent exceeding MSY.	Magnuson-Stevens Act requires the Councils to set MSY or a proxy in development of a FMP. Thus this option would not allow for comprehensive management of dolphin and wahoo in the future.
Option 2. The Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 16 and 18 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is 30% Static SPR.	None. Biological consequences arise from the measures taken to prevent exceeding MSY.	None. Impacts for any designation of MSY would stem from how MSY is tied to other management measures like the overfished level or optimum yield.
Option 3. Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 18.8 and 46.5 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 1.63 and 2.176 million pounds.	None. Biological consequences arise from the measures taken to prevent exceeding MSY.	None. Impacts for any designation of MSY would stem from how MSY is tied to other management measures like the overfished level or optimum yield.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (Cont.)

Alternatives	Issues/Problems Biological: Overfishing and Data	Social and Economic: Data and Benefits
Proposed Action 8: Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and 100% of MSY (between 1.41 and 1.63 million pounds) for wahoo. Rejected Options:	Mandated to specify and achieve optimum yield or a fishery on a continuing basis. Impacts from specifying optimum yield are determined from the management actions taken to achieve optimum yield.	Impacts from specifying optimum yield are determined from the management actions taken to achieve optimum yield.
Option 1. No Action.	None. Biological consequences arise from the measures taken to prevent exceeding OY.	There would be no impacts.
Option 2. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by U.S. fishermen while maintaining the Spawning Potential Ratio (SPR) at or above 40% Static SPR.	None. Biological consequences arise from the measures taken to prevent exceeding OY.	Impacts from specifying optimum yield would be determined from the management actions taken to achieve optimum yield.
Option 3. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and (1.63 and 2.176 million pounds) for wahoo.	None. Biological consequences arise from the measures taken to prevent exceeding OY.	Impacts from specifying optimum yield would be determined from the management actions taken to achieve optimum yield.
Option 4. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while maintaining a total spawning stock size (biomass) as shown below. a. Atlantic Dolphin = __ pounds. b. Atlantic Wahoo = ___ pounds. c. U.S. Caribbean Dolphin = __ pounds. d. U.S. Caribbean Wahoo =__ pounds. e. Gulf of Mexico Dolphin = __ pounds. f. Gulf of Mexico Wahoo = _____ pounds.	None. Biological consequences arise from the measures taken to prevent exceeding OY.	Impacts from specifying optimum yield would be determined from the management actions taken to achieve optimum yield.

Table 3. Summary of Environmental Consequences (Cont.)

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Data
Proposed Action 9: A maximum fishing mortality threshold (MFMT) - In the Atlantic, U.S. Caribbean, and Gulf of Mexico overfishing for dolphin and wahoo is defined as a fishing mortality rate (F) in excess of F_{MSY} ($F_{30\% Static\ SPR}$). A minimum stock size threshold (MSST) – In the Atlantic, U.S. Caribbean, and Gulf of Mexico the minimum stock size threshold for dolphin and wahoo is defined as a ratio of current biomass ($B_{current}$) to biomass at MSY or $(1-M)*B_{MSY,}$ where 1-M should never be less than 0.5. Using the best available estimates of natural mortality (M = 0.68-0.80) in the formula results in a MSST of 50% $B_{MSY.}$ The stock would be overfished if current biomass ($B_{current}$) was less than MSST and would be recovered when current biomass was equal or greater than the biomass at MSY. Rejected Options:	None. Biological consequences arise from the measures taken to prevent exceeding the fishing mortality rate and minimum stock size threshold.	None. Except actions taken to ensure that the fishery does not exceed the fishing mortality rate and the minimum stock size threshold, will have economic and social impacts.
Option 1. No Action.	None. Biological consequences arise from the measures taken to prevent exceeding the fishing mortality rates specified.	None by itself.
Option 2. In the Atlantic and U.S. Caribbean overfishing for dolphin and wahoo is defined as a fishing mortality rate (F) in excess of the fishing mortality rate at 30% Static SPR ($F_{30\% Static\ SPR}$). A threshold level for dolphin and wahoo is defined as 10% Static SPR in the Atlantic. The overfished threshold is based upon a transitional SPR of 30%.	None. Biological consequences arise from the measures taken to prevent exceeding the fishing mortality rates specified.	None by itself.

(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (Cont.)

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Data
Proposed Action 10: Establish a framework procedure for the Dolphin and Wahoo FMP. Rejected Options:	None. The Councils will be able to take action to prevent overfishing and negative impacts on EFH and EFH-HAPCs more quickly through framework rather than plan amendment.	This measure will expedite adoption of fishery management regulations and thus provide higher social and economic benefits.
Option 1. No Action.	None. However, the Council would not be able to take action to prevent overfishing and negative impacts on EFH and EFH-HAPCs through framework.	Could lead to reduced benefits if management measures are not expeditiously implemented.

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Conflicts/Competition and Data
Proposed Action 11: Prohibit sale of recreationally caught dolphin or wahoo in or from the Atlantic EEZ except for allowing for-hire vessels that possess the necessary state and Federal commercial permits to sell dolphin harvested under the bag limit in or from the Atlantic EEZ. Rejected Options:	To the extent prohibition of sale will reduce the number of dolphin and wahoo retained, there will be some positive benefits.	Reduced revenue in the private recreational sector in the short-term from prohibiting sale of dolphin, and the entire recreational sector from the prohibition of wahoo sale. Unable to determine if this option would increase or decrease long-term benefits.
Option 1. No Action.	Without prohibiting sale of recreationally caught dolphin there would be no incentive to stop or limit the practice of catching entire schools of immature small “peanut” or “chicken” dolphin. Over exploitation could lead to localized depletion.	Unable to determine if this option would increase or decrease long-term benefits.
Option 2. Allow for-hire vessels that possess the necessary commercial permits to continue to sell fish for a 3-5 year phase-out period.	To the extent prohibition of sale will reduce the number of dolphin and wahoo retained, there will be some positive benefits. This will have greater biological benefits in 3-5 years over the proposed action and no action.	Reduced revenue in the recreational sector in the short-term. However, the for-hire sector could phase in other revenue generating activities during the allotted 3-5 years. Unable to determine if this option would increase or decrease long-term benefits.
Option 3. Prohibit sale of recreationally caught dolphin and wahoo in the Atlantic EEZ. The intent is to not allow sale from private/rental or for-hire trips and limit sale to vessels with a commercial permit.	This option is identical to the proposed except that all sale of recreationally caught dolphin and wahoo would be prohibited. To the extent prohibition of sale would reduce the number of dolphin retained, there may be some positive benefits. This would provide the greatest biological benefits of all the alternatives.	Reduced economic benefits in the short-term. This option would have the greatest negative social impacts of all the alternatives. Unable to determine if this option would increase or decrease long-term benefits.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (Cont.)

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Conflicts/Competition and Data
Proposed Action 12: Establish a cap of 1.5 million pounds or 13% of total landings, whichever is greater, for the commercial fishery for dolphin. Should the catch exceed this level, the Council will review the data and evaluate the need for additional regulations which may be established through the framework. <u>Rejected Options:</u>	Will prevent the harvest from going unregulated and lessening the possibility of an increase to a level that is not sustainable.	Will allocate the resource on a historical basis to reduce conflict between user groups.
Option 1. No Action.	Would allow the harvest to go unchecked and increase to a level that is not sustainable.	Would not reduce conflict between recreational and commercial sectors.
Option 2. Allocate the dolphin resource to both recreational and commercial harvesters in the Atlantic EEZ based on the historical average catch (1984-1997, 1990-1997, or 1994-1997).	Would prevent the harvest from going unregulated and lessening the possibility of an increase to a level that is not sustainable. However, allocation would not be based on the most recent allocations and reflect the increase in commercial harvest of dolphin.	Would allocate the resource on a historical basis to reduce conflict between user groups. However, allocation would not be based on the most recent allocations and reflect the increase in commercial harvest of dolphin.
Option 3. Sub-allocate the resource to commercial harvesters based on a historical split between gear types and average landings between 1994 and 1997.	Would prevent the harvest from going unregulated and lessening the possibility of an increase to a level that is not sustainable. However, allocation would not be based on the most recent allocations and reflect the increase in commercial harvest of dolphin.	Would allocate the resource on a historical basis to these commercial user groups and ensure that user groups receive their fair share of the resource.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

	Issues/Problems	
Alternatives	**Biological: Overfishing and Data**	**Social and Economic: Conflicts/Competition and Benefits**
Proposed Action 13: Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. Headboats (with a valid certificate of inspection) will be allowed a bag limit of 10 dolphin per paying passenger. Rejected Options:	Prevent waste from excessive catches in excess of the bag limit. There may be some fishing resulting in some release mortality but there would be a greater tendency to stop fishing when the bag limit is filled. This option would reduce the potential for excessive harvest, relay a conservation ethic to fishermen, and prevent the transport of a large catch and subsequent dumping of undesired fish. This action will result in an 8%, 7%, and 7% reduction in recreationally landed weight in New England, Mid-Atlantic, and South Atlantic respectively.	Will reduce economic and social benefits in the short term to anglers constrained by this bag limit. However, if this measure improves the quality of fishing for a larger number of participants then economic benefits will increase.
Option 1. No Action.	Continued waste. This option would not reduce the potential for excessive harvest, relay a conservation ethic to fishermen, or prevent the transport of a large catch and subsequent dumping of undesired fish.	The status quo may not optimize benefits to fishermen due to continued wastage.
Option 2. Establish a recreational boat limit of 18-60 dolphin per boat (including private and for-hire vessels).	Prevent waste from excessive catches in excess of the bag limit. There may be some fishing resulting in some release mortality but there would be a greater tendency to stop fishing when the bag limit is filled. This option would reduce the potential for excessive harvest, relay a conservation ethic to fishermen, and prevent the transport of a large catch and subsequent dumping of undesired fish. The quantity reduced would depend upon the bag limit chosen. Establishing a recreational boat limit of 20 dolphin per boat (including private and for-hire vessels) would result in a 15%, 20%, and 34% reduction in recreationally landed weight in New England, Mid-Atlantic, and South Atlantic respectively. Establishing a recreational boat limit of 60 dolphin per boat (including private and for-hire vessels) would result in a 3%, 2%, and 2% reduction in recreationally landed weight in New England, Mid-Atlantic, and South Atlantic respectively.	Impact would depend on the bag limit chosen. By not designating a per person factor, this option would not spread the waste and resource equally among users.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Conflicts/Competition and Benefits
Option 3. Establish a recreational bag limit of 5-10 dolphin per person per day, excluding the captain and crew of for-hire boats in the Atlantic EEZ.	Prevent waste from excessive catches in excess of the bag limit. There may be some fishing resulting in some release mortality but there would be a greater tendency to stop fishing when the bag limit is filled. This option would reduce the potential for excessive harvest, relay a conservation ethic to fishermen, and prevent the transport of a large catch and subsequent dumping of undesired fish. By excluding the captain and crew, and utilizing a recreational bag limit of less than 10, this option may be more restrictive than the proposed in terms of individual fish quota on charter vessels. However, the absence of a per boat cap may raise the totals above the proposed. Establishing a recreational boat limit of 5 dolphin per person per day would result in a 14%, 17%, and 26% reduction in recreationally landed weight in New England, Mid-Atlantic, and South Atlantic respectively. Establishing a recreational boat limit of 10 dolphin per person per day would result in a 5%, 5%, and 5% reduction in recreationally landed weight in New England, Mid-Atlantic, and South Atlantic respectively.	Impact would depend on the bag limit chosen.
Option 4. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. For-hire vessels fishing North of 39° N. Latitude (Delaware Bay, Delaware) would be exempt from the boat limit of 60 dolphin.	Prevent waste from excessive catches in excess of the bag limit. There may be some fishing resulting in some release mortality but there would be a greater tendency to stop fishing when the bag limit is filled. This option would reduce the potential for excessive harvest, relay a conservation ethic to fishermen, and prevent the transport of a large catch and subsequent dumping of undesired fish. The quantity reduced would be nearly identical to the proposed alternative in terms of restrictions. However, by not restricting fishermen north of Delaware Bay with a 60 fish boat limit, the total harvest for the Atlantic seaboard may be higher.	Would reduce benefits in the short-term. This option accommodates local fishing interest by not restricting fishermen north of Delaware Bay with a 60 fish boat limit, thus possibly producing an additional degree of satisfaction in their fishing experience when north of Delaware Bay.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Conflicts/Competition and Benefits
Proposed Action 14: Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed. Rejected Options:	Will constrain the fishery by preventing unlimited removal and potentially an increase in bycatch. The 3,000 pound commercial trip limit would result in a 0.4%, 1.7%, and 0.4% reduction in commercial trips in New England, Mid-Atlantic, and South Atlantic respectively. The 3,000 pound commercial trip limit would result in a 1.1%, 6.5%, and 5.1% reduction in commercially landed weight in New England, Mid-Atlantic, and South Atlantic respectively. The 1,000 pound commercial trip limit would result in a 1.1% and 12.9% reduction in commercial trips and commercially landed weight off Florida's east coast.	Can reduce the likelihood of sudden declines in the price of dolphin from unusually large quantities on the market at any one time.
Option 1. No Action.	Would not constrain the fishery and allow unlimited removal and potentially an increase in bycatch. There would not be any reduction in trips or weight.	Could increase the likelihood of "market flooding" and not allow for the "optimal" number of fishermen to harvest the resource throughout the year.
Option 2. Establish a commercial dolphin trip limit of 1,000-5,000 pounds or an equivalent number of fish with no transfer at sea allowed in the Atlantic EEZ.	Would constrain the fishery by preventing unlimited removal and potentially an increase in bycatch. A 1,000 pound commercial trip limit would result in a 1.4%, 6%, and 1.4% reduction in commercial trips in New England, Mid-Atlantic, and South Atlantic respectively. A 1,000 pound commercial trip limit would result in a 5.8%, 21.6%, and 16.5% reduction in commercially landed weight in New England, Mid-Atlantic, and South Atlantic respectively. A 4,000 pound commercial trip limit would result in a 0%, 0.8%, and 0.2% reduction in commercial trips in New England, Mid-Atlantic, and South Atlantic respectively. A 4,000 pound commercial trip limit would result in a 0%, 3.4%, and 2.7% reduction in commercially landed weight in New England, Mid-Atlantic, and South Atlantic respectively.	The short-term impact would depend on the actual trip limit chosen. A greater socio-economic impact to the fishermen would be expected from a trip limit of 1,000 pounds, while the designation of a 5,000 pound trip limit would not result in reduced socio-economic impacts.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Conflicts/Competition and Benefits
Proposed Action 15: Establish a minimum size limit for dolphin of 20 inches fork length off Florida and Georgia and no minimum size limit north of Georgia. Rejected Options:	Provides opportunity for all fish to spawn at least once. Eliminates incentive to target school dolphin but makes landing of most pompano dolphin illegal. A minimum size limit of 20 inches fork length would result in a 0% and 33% reduction in the number of recreational landings off the coast of Georgia and Florida respectively. A minimum size limit of 20 inches fork length would result in a 0% and 10% reduction in recreationally landed weight off the coast of Georgia and Florida respectively. A minimum size limit of 20 inches fork length would result in a 16.7% reduction in commercially landed weight in the South Atlantic. This option would have more regulatory discards than the no action alternative, but less regulatory discards than a dolphin minimum size limit greater than 20 inches.	Will not allow fishermen to harvest most pompano dolphin, but could increase long-term net benefits if this measure improves the size distribution of the stock and prevents growth overfishing.
Option 1. No Action.	Does not provide opportunity for all fish to spawn at least once. Does not eliminate incentive to target school dolphin. There would be no increase in regulatory discards.	Would allow fishermen to harvest pompano dolphin, but could reduce long-term benefits if growth overfishing occurs.
Option 2. Establish an 18-24 inch fork length minimum size limit for dolphin.	Provides opportunity for most fish to spawn at least once. Eliminates incentive to target school dolphin but makes landing of most pompano dolphin illegal. A minimum size limit of 18 inches fork length would result in a 0% and 21% reduction in the number of recreational landings off the coast of Georgia and Florida respectively. A minimum size limit of 18 inches fork length would result in a 0% and 6% reduction in recreationally landed weight off the coast of Georgia and Florida respectively. A minimum size limit of 22-24 inches fork length would result in a 6% and 44% reduction in the number of recreational landings off the coast of Georgia and Florida respectively. A minimum size limit of 22-24 inches fork length would result in a 4% and 16% reduction in recreationally landed weight off the coast of Georgia and Florida respectively. The amount of expected regulatory discards would depend upon the size limit. Generally, the smaller the size limit, the more regulatory discards. In turn, an increase in regulatory discards would likely increase the potential for discard mortality.	The impact would depend on the size limit chosen. A greater socio-economic impact to the fishermen would be expected following the establishment of an 18 inch minimum size limit, while the designation of a 24 inch size limit would result in reduced socio-economic impacts.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Conflicts/Competition and Benefits
Proposed Action 16: Establish a commercial trip limit for wahoo (landed head and tails intact) of 500 pounds with no transfer at sea allowed. <u>Rejected Options:</u>	Depending on level established could constrain the fishery and prevents unlimited removal and potentially an increase in bycatch.	Can constrain benefits in the short-term, but could increase long-term benefits if this measure is necessary to improve yield and ensure the distribution of harvest throughout the year and geographic region.
Option 1. No Action.	Would not constrain the fishery and allow unlimited removal and potentially an increase in bycatch.	May not optimize benefits if growth overfishing occurs.
Proposed Action 17: Do not establish a size limit for wahoo in the Atlantic EEZ. <u>Rejected Options:</u>	Will allow harvest prior to maturity.	May not optimize benefits if growth overfishing occurs.
Option 1. Establish a 35-45 inch minimum size limit for wahoo in the Atlantic EEZ.	Allows fish to reach maturity prior to capture and may result in long-term benefits to the population. However, fishermen safety could be sacrificed by requiring the release of wahoo. In addition, the more random nature of harvest does not support the use of size limits in this fishery.	Impacts will depend on the size limit chosen.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

Alternatives	Issues/Problems: Biological: Overfishing and Data	Issues/Problems: Social and Economic: Conflicts/Competition and Benefits
Proposed Action 18: Establish a recreational bag limit of 2 wahoo per person per day in the Atlantic EEZ. Rejected Options:	Prevent waste. This option would reduce the potential for excessive harvest, relay a conservation ethic to fishermen, and prevent the transport of a large catch and subsequent dumping of undesired fish. A recreational bag limit of 2 wahoo per person per day in the Atlantic EEZ would result in a 5.6%, 7.9%, and 13.7% reduction in recreationally landed weights in New England, Mid-Atlantic, and South Atlantic respectively.	Will reduce short-term benefits in the recreational sector, however this can increase overall net user benefits if it ensures the "optimal" level of participation.
Option 1. No Action.	Continue waste. This option would not reduce the potential for excessive harvest, relay a conservation ethic to fishermen, or prevent the transport of a large catch and subsequent dumping of undesired fish. There would be a 0% reduction in recreationally landed weight as a result of this option.	Could decrease recreational satisfaction in the future if status quo does not allow for the "optimal" level of participation.
Option 2. Establish a recreational bag limit of 2 wahoo per person per day for the recreational fishery, excluding the captain and crew of for-hire boats in the Atlantic EEZ.	Prevent waste. This option would reduce the potential for excessive harvest, relay a conservation ethic to fishermen, and prevent the transport of a large catch and subsequent dumping of undesired fish. This option would potentially provide a greater degree of prevention for excessive harvest than the proposed option by excluding the captain and crew of for-hire boats in the bag limits.	Would reduce short-term benefits in the recreational sector, however this can increase overall net user benefits if it ensures the "optimal" level of participation. This option may result in increased dissatisfaction compared to the proposed action for anglers on headboat trips as their catch may be reduced by excluding the captain and crew of for-hire boats in the bag limits.

Alternatives	Issues/Problems: Biological: Data	Issues/Problems: Social and Economic: Conflicts/Competition and Benefits
Proposed Action 19: Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads). Rejected Options:	Could reduce potential bycatch of non-target species and prevent non-traditional, highly efficient gears from entering the fishery.	No impact to vessels currently in the fishery, but could prevent future user conflicts.
Option 1. No Action.	Would not reduce potential bycatch of non-target species and prevent non-traditional, highly efficient gears from entering the fishery.	If present gears are retained no impact to commercial fishery.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

Alternatives	Issues/Problems: Biological: Overfishing, Bycatch and Data	Issues/Problems: Social and Economic: Competition/Conflict and Data
Proposed Action 20. Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species. Rejected Options:	Reduction in pelagic longline bycatch, bycatch mortality, and incidental catch consistent with National Standard 9. Reduce bycatch mortality of threatened loggerhead and endangered leatherback sea turtles. This action also supports the HMS closure for vessels targeting dolphin and wahoo that do not possess an HMS permit.	Will reduce revenue in the longline fleet, but could increase benefits to society if measures result in rebuilding of HMS species and reduced mortality for threatened and endangered sea turtles.
Option 1. No Action.	Would not reduce incidental bycatch mortality and incidental catch consistent with National Standard 9. Would not reduce bycatch mortality of threatened loggerhead and endangered leatherback sea turtles.	Could reduce benefits in the long-term if HMS species fail to recover or there is increased mortality of threatened and endangered sea turtles.
Proposed Action 21: Establish a fishing year of January 1 to December 31 for the dolphin and wahoo fishery in the Atlantic EEZ. Rejected Options:	Establishing a fishing year would present an agreed upon methodology on how data will be organized.	The fishing year is necessary to track the non-binding cap established under Action 12.
Option 1. No Action.	Not establishing a fishing year would not present an agreed upon way to organize data.	This would not allow the non-binding cap to be tracked.

Alternatives	Issues/Problems: Biological: Habitat Identification, Habitat Protection, and Data	Issues/Problems: Social and Economic: Benefits
Proposed Action 22: Expand the list of Essential Fish Habitat (EFH) definitions that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*. Rejected Options:	Identification of EFH is necessary in order to manage dolphin and wahoo stocks. It is also a required provision of fishery management plans under Section 303(a) (7) of the M-SFCMA. Identifying EFH for dolphin and wahoo will provide the basis for management and protection of essential fish habitat.	There will be no impacts from identifying essential fish habitat itself. Measures to minimize damage could have economic impacts.
Option 1. No Action.	Likely loss of essential fish habitat and essential fish habitat - habitat areas of particular concern.	None by itself. Would not allow for actions to protect essential fish habitat, which could result in decreased benefits in the long-term.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

Alternatives	Issues/Problems	
	Biological: Habitat Identification, Habitat Protection, and Data	**Social and Economic: Benefits**
Option 2. Expand the EFH definition to include Sargassum where it occurs in the north Atlantic Gyre in the Sargasso Sea and the EEZ between 20° N. latitude and 40° N. latitude and 30° W. longitude and the western edge of the Gulf Stream.	Identification of EFH is necessary in order to manage dolphin and wahoo stocks. It is also a required provision of fishery management plans under Section 303(a)(7) of the M-SFCMA. Identifying EFH for dolphin and wahoo will provide the basis for management and protection of essential fish habitat. The Councils rejected this option because it includes areas beyond the EEZ.	There will be no impacts from identifying essential fish habitat itself. Measures to minimize damage could have economic impacts.
Proposed Action 23: Expand the list of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and the Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*. <u>Rejected Options:</u>	Establishing EFH-HAPCs for dolphin and wahoo will provide protection of essential fish habitat. Research on *Sargassum* production, distribution, and ecology will be encouraged. In addition, research in EFH-HAPCs including highly dynamic and productive habitats such as "The Point" off NC and "The Charleston Bump" off SC will also be supported. This action is consistent with the Council's designation of pelagic *Sargassum* as essential fish habitat and essential fish habitat - habitat areas of particular concern for coastal migratory pelagics species (SAFMC, 1998b, c.)	Developing a list of EFH-HAPCs will have no economic and social impacts. Impacts may result from future management measures.
Option 1. No Action.	Likely loss of essential fish habitat and essential fish habitat - habitat area of particular concern.	There would be no direct economic or social impacts from this option. Not specifying EFH-HAPCs would limit the Council from taking action in the future to minimize fishing related habitat damage. Degradation of EFH could threaten the long-term economic and social viability of the dolphin/wahoo fishery and thus lead to reduced net economic benefits and reduced social benefits to society.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES
(Effects of Alternatives on the Issues/Problems) (Cont.)

Table 3. Summary of Environmental Consequences (cont.)

Alternatives	Issues/Problems: Biological: Habitat Identification, Habitat Protection, and Data	Issues/Problems: Social and Economic: Benefits
Option 2. Expand the EFH and EFH-HAPC definitions to include *Sargassum* where it occurs in the north Atlantic Gyre in the Sargasso Sea and the EEZ between 20° N. latitude and 40° N. latitude and 30° W. longitude and the western edge of the Gulf Stream.	Establishing EFH-HAPCs for dolphin and wahoo will provide protection of essential fish habitat. Research on *Sargassum* production, distribution, and ecology will be encouraged. This action is consistent with the Council's designation of pelagic *Sargassum* as essential fish habitat and essential fish habitat - habitat areas of particular concern for coastal migratory pelagics species (SAFMC, 1998b, c.) The Council recognizes it is inconsistent with CEQ's regulations (40 CFR 1506.2(d)) to reject an option solely because it is out of an agency's area of authority. However, NMFS and NOAA GC advised the Council to reject this option because the designation is outside the Council's area of jurisdiction.	Developing a list of EFH-HAPCs would have no economic and social impacts. Impacts may result from future management measures.
Proposed Action 24: Assessment of the Impacts of Present Fishing Activities on EFH. Defer to measures in the *Sargassum* Fishery Management Plan which has been submitted to the Secretary for formal review, and incorporate by reference the Comprehensive Habitat Amendment approved by the Secretary, on June 3, 1999. Rejected Options:	Provides mechanism to address impacts of fishing on dolphin wahoo EFH if *Sargassum* FMP is not approved.	Economic and social impacts will depend on whether the measures in the *Sargassum* Plan are adopted.
Option 1. No Action	If the *Sargassum* FMP is not approved and no action is taken there would be a likely a loss of essential fish habitat and essential fish habitat - habitat area of particular concern.	Could reduce net economic benefits if future harvest of *Sargassum* becomes excessive.

STRUCTURE OF TABLE 3 IN FUTURE DOCUMENTS

Council staff is working with NMFS and NOAA GC staff to determine how best to expand the use of tables to better contract differences between options. In addition, use of ranges will be limited to above and below the Council's specified point value. This will address a number of NEPA-related comments that have surfaced. The Council determined the delay to make such changes was not warranted at this time.

3.0 AFFECTED ENVIRONMENT

3.1 Description of the Stock Comprising the Management Unit and the Fishery

The following sections are modified from the proceedings of the dolphin/wahoo workshop (SAFMC, 1998a). Unless otherwise cited, the workshop report is the source for the material in these sections.

3.1.1 Description of Species and their Distribution

3.1.1.1 Dolphin

The common dolphin (*Coryphaena hippurus)* is an oceanic pelagic fish found worldwide in tropical and subtropical waters. The range for dolphin in the western Atlantic is from George's Bank, Nova Scotia to Rio de Janeiro, Brazil. They are also found throughout the Caribbean Sea and the Gulf of Mexico, and they are generally restricted to waters warmer than 20˚C (Oxenford, 1997). They support economically important fisheries from North Carolina through the Gulf of Mexico and within the Caribbean Sea, including the northeast coast of Brazil.

Pompano dolphin *(Coryphaena equiselis),* a more pelagic species, has been recorded off North Carolina, Florida, Bermuda, and in the central Atlantic, Gulf of Mexico, and Caribbean including off Puerto Rico. Pompano dolphin were found in waters which exceed 24˚C (Mather and Day, 1954).

The common dolphin (*Coryphaena hippurus*) and pompano dolphin *(Coryphaena equiselis)* will subsequently be referred to as dolphin. There is pronounced seasonal variation in abundance. Dolphin are caught off North and South Carolina from May through July. Dolphin caught off Florida's East Coast are caught mainly between April and June. February and March are the peak months off Puerto Rico's coast. Dolphin are caught in the Gulf of Mexico from April to September with peak catches in May through August (SAFMC, 1998a).

3.1.1.2 Wahoo

The wahoo (*Acanthocybium solandri*) is an oceanic pelagic fish found worldwide in tropical and subtropical waters. In the western Atlantic wahoo are found from New York through Columbia including Bermuda, the Bahamas, the Gulf of Mexico, and the Caribbean. Wahoo are present throughout the Caribbean area, especially along the north coast of western Cuba where it is abundant during the winter (from FAO species guide; FAO, 1978).

There is pronounced seasonal variation in abundance. They are caught off North and South Carolina primarily during the spring and summer (April-June and July-September), off Florida's east coast year-round, off Puerto Rico and the U.S. Virgin Islands year-round with peak catches between September and March, in the Gulf of Mexico year-round, in the eastern Caribbean between December and June, and in Bermuda between April and September (SAFMC, 1998a).

3.1.2 Reproductive Characteristics

3.1.2.1 Dolphin

Common dolphin are batch spawners and have a protracted spawning season. Size at first maturity ranges from 350 mm fork length (FL) (Florida) to 530 mm FL (Gulf of Mexico) for sexes combined. Males first mature at a larger size than females. Size at full maturity ranges from 550 mm FL (Florida) to 600 mm FL (Puerto Rico) for females (Table 4). Ripe pompano dolphin have been collected in the Atlantic at 205 mm standard length (SL) (Gibbs and Collette, 1959).

Table 4. Summary of reproductive characteristics reported for dolphin (*Coryphaena hippurus*) from the western central Atlantic (Source: Oxenford, 1997; references found in Oxenford, 1997).

Reproductive parameter	Sex	Florida Current			US Virgin Islands	Puerto Rico	Gulf of Mexico	Barbados	
		Beardsley (1967)	Schekter (1982)*[1]	Perez *et al.* (1992)	Perez *et al.* (1992)	Perez & Sadovy (1991), Perez *et al*. (1992)	Bentivoglio (1988)	Oxenford (1985)	Perez *et al.* (1992)
Size at first	M	427	565	-	-	-	528	805	-
maturity (mmFL)	F	350		-	-	400	490-520	667	-
Size class at 100%	M	-	-	-	-	-	-	1178	-
maturity (mmFL)	F	550	-	-	-	600	-	931	-
Approx. age at	M	6-7	6.5	-	-	-	4	4	-
first maturity (mo.)	F	6-7		-	-	-	3-4	4	-
Mature egg size range (mm diam.)	F	1-1.7	-	-	-	0.85-1.56	-	0.86-1.25	-
Mean mature egg size (mm diam.) & sample size (n=no.fish)	F	- -	-	1.03 n=3	1.08 n=2	1.10 n=25	-	0.97 n=69	1.07 n=2
Batch fecundity range & sample size (n=no.fish)	F	85,000-938,000 n=19	-	-	-	219,670-1,548,457 n=25	-	58,000-1,243,770 n=69	-
Batch fecundity-fork length relationship ($Y=aX^b$) Y is no. mature eggs X is mmFL	F	$Y \sim 2.52x10^{-4}X^{3.12}$*[2]	-	-	-	$Y=6.03x10^{-7}X^{3.98}$	-	$Y=2.7x10^{-6}X^{3.67}$	-

*[1] Data are for laboratory reared F_1 generation of Florida broodstock

*[2] Relationship calculated by extrapolation of data from fecundity

The sex ratios in the catch tend to be female-biased although they vary with size of fish captured. The batch-fecundity-length relationship is strongly exponential ranging from 85,000 (approximately 400-600 mm FL) to 1.5 million (approximately 1300-1400 mm FL) eggs per batch.

3.1.2.2 Wahoo

Estimates of size at first maturity from North Carolina are 86 cm FL for males and 101 cm FL for females (Hogarth, 1976). Preliminary estimates from Bermuda are similar (males = 102 cm FL; females = 95 cm FL) (Murray, 1998). Fecundity estimates from North Carolina range from 560,000 eggs (for a 6.13 kg or 13.52 lb wahoo) to 45 million eggs (for a 39.5 kg or 87.10 lb wahoo) (Hogarth 1976).

Hogarth (1976) examined wahoo reproductive tissues and determined that the spawning season extends from June through August with peak spawning in June and July. In addition, wahoo caught off North Carolina in September and October were determined to be post-spawners.

3.1.3 Age and Growth

3.1.3.1 Dolphin

Dolphin grow rapidly and show average first year daily growth rates ranging from 4.2 mm FL (Gulf of Mexico) to 1.6 mm FL (North Carolina). The relationship between fork length and weight is presented in Figure 1. There are a number of estimates of L_∞ from the northern area and a value of 1,400 to 1,500 mm FL appears appropriate for this stock (SAFMC, 1998a). A summary of available length-weight relationships for dolphin from the western central Atlantic is presented in Table 5a (Oxenford, 1997).

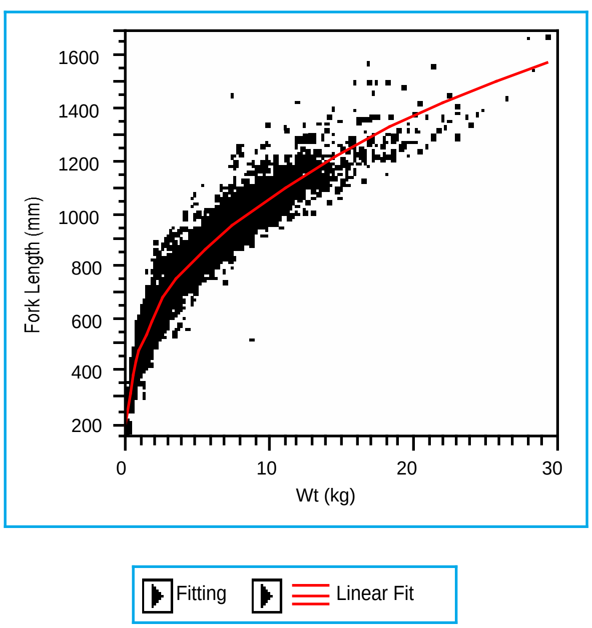


Figure 1. Dolphin length weight relationship (Source: Goodyear, 1999).

Thompson (1999) examined the relationship between dolphin weight and length based on recreational data from MRFSS, the Texas Creel Survey, and the Headboat Survey (N=32,215). The length weight relationship was found to be similar for the Atlantic and Gulf of Mexico and pooling the data provided the resulting relationship: the natural log of the whole weight equals the natural log of the fork length in centimeters minus 10.42 (ln weight = 2.71 ln FL-10.42).

Beardsley (1967) examined 511 dolphin from waters off south Florida ranging in size from 475 to 1,525 mm fork length (FL). Of the 1-year olds, the size range was 475 to 1,175 mm FL. Prager (2000) to provide values for use in empirical estimates of mortality rates for the first stock assessment for dolphin, took a von Bertalanffy growth function and fit it to the grouped length-at-age data of Beardsley (1967). Prager (2000) indicates the following growth function resulting from the analyses describes sizes at age reasonably well:

$L_t = L_\infty(1 - \exp(-K(t - t_0)))$ $\qquad$ $L_t = 1710\ (1- \exp(-0.583[t - 0.7]))$

Table 5a. Summary of length-weight relationships for dolphin (*Coryphaena hippurus*) from the western central Atlantic (Source: Oxenford, 1997; references found in Oxenford, 1997).

Location	Sex	Range in length (mmFL)	Sample size (no.fish)	a	b	kg at 1000 mmFL	Data source
North Carolina	All	672-966	18	$2.00x10^{-9}$	3.22	9.21	Schuck (1951)*[1]
North	Males	275-1350	176	$0.50x10^{-7}$	2.75	8.89	Rose & Hassler (1968)
Carolina	Females	310-1275	325	$1.27x10^{-7}$	2.59	7.76	
Florida	Males	550-1300	19	$1.45x10^{-7}$	2.58	7.97	Beardsley (1967)*[2]
	Females	500-1225	40	$5.75x10^{-8}$	2.71	7.60	
Puerto	All	381-1479	852	$3.80x10^{-8}$	3.49	891?	Perez *et al.*(1992)*[3]
Rico	Males	490-1479	261	$1.78x10^{-8}$	3.62	1289?	
	Females	445-1310	591	$5.75x10^{-8}$	3.36	691?	
	All	358-1323	332	$1.41x10^{-8}$	2.92	8.11	Perez & Sadovy (1991)
	All	381-1479	170	$3.80x10^{-8}$	2.78	8.31	Rivera Betancourt (1994)
Cuba	All	500-1200	56	$3.21x10^{-5}$	2.67	7.02	Garcia-Arteaga *et al.* (1997)*[4]
Barbados	All	160-1365	365	$1.45x10^{-8}$	2.91	7.85	Oxenford (1985)
	Males	239-1365	123	$1.24x10^{-8}$	2.94	8.31	
	Females	160-1240	207	$2.22x10^{-8}$	2.84	7.58	

*[1] Relationship given in original text appears to be in error. Relationship given here was recalculated with data extrapolated from length-weight graph.
*[2] Relationships given in original text were wrong (confirmed by pers. comm. with author on 11.5.84.). Relationships given here are recalculated from extrapolation of data shown in the length-weight graph.
*[3] Relationships given in original text appear to be in error. Authors have been contacted on 9.10.97.
*[4] Relationship is for length in cm.

3.1.3.2 Wahoo

Wahoo appear to be very fast growing in their first year attaining a size of over 39 inches (Hogarth, 1976). The relationship between fork length and weight is presented in Figure 2. Estimates of L_∞ range from 2,210 mm FL (North Carolina) (Hogarth, 1976) to 1,560 mm FL (St. Lucia) (Murray, 1998). Estimates of k (annual) range from 0.152 (North Carolina) to 0.37 (St. Lucia).

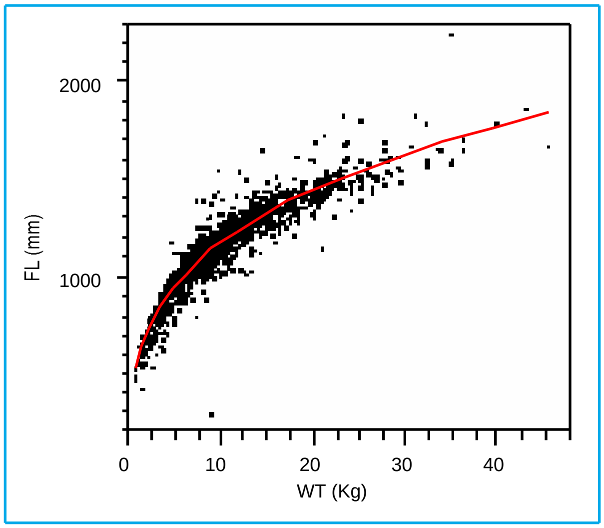


Figure 2. Wahoo length weight relationship (Source: Goodyear, 1999).

3.1.4 Mortality Rates and Longevity

3.1.4.1 Dolphin

Prager (2000) estimated natural mortality (M) for dolphin to be between 0.68 and 0.80. Prior to the exploratory stock assessment (Prager, 2000) one study reported total instantaneous mortality estimates derived from a Robsen-Chapman estimator of approximately 8.2 for dolphin from the Gulf of Mexico (Bentivolglio, 1988). Prager (2000) indicated that the estimate did not seem feasible for the Atlantic where Beardsley (1967) found one 4 year old dolphin in a sample of 511. If one assumes random sampling, then the probability of finding a fish that old in such a small sample was close to zero. Therefore, it is almost certain that the estimate is imprecise or inaccurate, that the vital rates in the Gulf differ greatly from the Atlantic or the vital rates have changed dramatically over time (Prager, 2000).

Absent direct estimates of mortality, two empirical methods of Hoenig (1983) and Pauly (1979) were applied to approximate mortality rates of dolphin in the Atlantic. Tables 5b and 5c present the estimates of total and natural mortality based on these methodologies. For the range of maximum ages reported in the three studies of 3 to 4 years, the Hoenig method provides estimates of total mortality rate Z from 1.42/yr declining to 1.06/yr (Tables 5b). Estimates of M by Pauly’s method are specific to growth parameters and water temperatures. Over the range of mean water temperatures from 20°C to 28°C, M is estimated to be between 0.68/year and 0.80/year (Table 5c).

Table 5b. Estimates of instantaneous rate of total mortality and corresponding annual survival fraction; method Hoenig (1983) (Source: Prager, 2000).

Maximum age (years)	Total Mortality rate (Z)	Survival Fraction (S)
2.50	1.71	0.18
2.75	1.55	0.21
3.00	1.42	0.24
3.25	1.31	0.27
3.50	1.21	0.30
3.75	1.13	0.32
4.00	1.06	0.35
4.25	1.00	0.37
4.50	0.94	0.39
4.75	0.89	0.43
5.00	0.85	0.43

Table 5c. Estimates of instantaneous rate of annual natural mortality M as a function of growth parameters and mean water temperature; method of Pauly (1979) (Source: Prager, 2000).

Mean water temp (C°)	Natural Mortality (M) from Oxenford and Hunte (1983)	M from Beardsley (1967)	M from Rose and Hassler (1968)
20	2.254	0.681	0.262
22	2.355	0.712	0.273
24	2.452	0.741	0.285
26	2.545	0.769	0.295
28	2.634	0.796	0.306
30	2.719	0.822	0.316

3.1.4.2 Wahoo

The only mortality estimates available are from a study conducted in St. Lucia (Murray, 1998). The values are listed below (Table 5d) for five different years.

Table 5d. Estimates of total and annual mortality for wahoo (Source: Murray, 1998).

Mortality Model Used	Total Mortality (Z)	Annual Mortality (A)
Length based catch curve	1.17	68.96%
	1.52	78.13%
	1.45	76.54%
	1.75	82.62%
	2.34	90.37%

Longevity is believed to be at least 5 years based on work from North Carolina (Hogarth, 1976).

3.1.5 Movement Patterns and Stock Structure

3.1.5.1 Dolphin

The best available scientific information indicates there is one stock of common dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico. (However, this FMP only pertains to the Atlantic component of the stock - see Action 1 for more information.) Oxenford (1997) conducted a preliminary investigation of the common dolphin stock structure within the western central Atlantic and suggested that there are at least two separate unit stocks located in the northeast and southeast regions of the western central Atlantic. This hypothesis was based on: observed seasonality, months of peak abundance, and mean size of dolphin from commercial and sport fisheries, which suggested two different migratory circuits; a comparison of life history characteristics of dolphin from North Carolina, Florida, and Barbados, which showed marked differences in average first year growth rates, fecundity-length relationships, size and age at first maturity, and mean mature egg size; and on observed differences in allelic frequencies at the IDH-2 locus determined through electrophoresis.

One conclusion from the Dolphin Wahoo workshop was that the working hypothesis should be a two stock model for the Western Central Atlantic and that the northern stock should include dolphin from the Gulf of Mexico, the U.S. South Atlantic including Puerto Rico, the U.S. Virgin Islands, the Mid-Atlantic, and the New England coasts (SAFMC, 1998a).

A genetic study by Robyn S. Wingrove (pers. comm.) with the University of Charleston was conducted to test the hypothesis of Oxenford (1997) and investigate the possible presence of additional stocks in the Gulf of Mexico and western central Atlantic using Restriction Fragment Length Polymorphism (RFLP) analysis of the ND-1 region of the Mitochondrial DNA (mtDNA). Dolphin DNA samples collected in the western central Atlantic originated from the Carolinas, Georgia, Florida, the Gulf of Mexico, Puerto Rico, Bermuda, the Azores, Martinique, Barbados, Tobago, and Brazil. The ND-1 region of each specimen was amplified by Polymerase Chain Reaction (PCR) and digested with five different restriction endonucleases. The results from the analysis of the frequency distribution of composite mtDNA haplotypes and Analysis of Molecular Variance (AMOVA) found no significant differences between samples collected in the western central Atlantic. These analyses further validate that dolphin in the western central Atlantic comprises a single unit stock and a management unit including common dolphin from the Gulf of Mexico, the U.S. South Atlantic including Puerto Rico, the U.S. Virgin Islands, the Mid-Atlantic, and the New England coasts would be appropriate.

Estimates of biological parameters for dolphin from the northern area were endorsed by participants at the Dolphin Wahoo workshop and are presented in the following sections (SAFMC, 1998a).

3.1.5.2 Wahoo

There have been no investigations of wahoo stock structure. Given this, a working hypothesis could be a single stock model for the western central Atlantic, including the Gulf of Mexico, the U.S. South Atlantic including Puerto Rico, the U.S. Virgin Islands, the Mid-Atlantic, and the New England coasts.

3.1.6 Feeding, Food and Trophic Relationships

3.1.6.1 Dolphin

Dolphin are voracious, surface water, daytime predators. They eat a wide variety of fish species including: small oceanic pelagic species (e.g., flying fish, halfbeaks, man-o-war fish, *Sargassum* fish, and rough triggerfish); juveniles of large oceanic pelagic species (e.g., tunas, billfish, jacks, and dolphin); and pelagic larvae of neritic, benthic species (e.g., flying gurnards, triggerfish, pufferfish, and grunts). They also eat invertebrates (e.g., cephalopods, mysids, and scyphozoans) suggesting that they are essentially non-selective, opportunistic foragers. Rose (1966) examined the stomach contents of 373 dolphin off North Carolina and found the following food items by relative weight: Exocoetidae - 24%, Scombridae - 22%, Carangidae - 12%, Invertebrates - 12%, Miscellaneous Fish Families - 11%, Monacanthidae - 7%, Coryphaenidae - 5%, Unidentified Fish - 4%, and Balistidae - 3%. An analysis of prey ranked as to importance in dolphin diets is presented in Table 6.

Predators (from Oxenford, 1997; references included in Oxenford, 1997)

The diets of other oceanic pelagic species indicate that dolphin, particularly juveniles, serve as prey for many oceanic fish. Their predators include large tuna (Parin, 1968; *Thunnus alalunga*: Murphy, 1914; *T. albacares*: Penrith, 1963, Dragovich and Potthoff, 1972, Takahashi and Mori, 1973, Matthews, *et al.,* 1977), sharks (Parin, 1968; *Hexanchus griseus*: Bigelow and Schroeder, 1948), marlin (Sund and Girigorie, 1966, Parin, 1968: *Makaira nigircans*: Farrington, 1949, Takahashi and Mori, 1942; *Tetrapturus albidus*: Wallace and Wallace, 1942, Nakamura, 1971, Nakamura and Rivas, 1972; *T. audax*: Abitia-Cardenas *et al.,* 1997), sailfish (*Istiophorus platypturus*: Beardsley *et al.,* 1972, Takahashi and Mori, 1973) and swordfish (*Xiphias gladius*: Gorbunova, 1969).

Table 6. Dietary importance (by rank) of the five main prey categories of dolphin (*Coryphaena hippurus*) from the western central Atlantic assessed by numerical abundance (Source: Oxenford, 1997; references found in Oxenford, 1997).

Location		**Southeastern & Gulf states of USA**	**North Carolina**		**Barbados**	
Data source		**Manooch et al. (1984)**	**Gibbs & Collette (1959)**	**Rose & Hassler (1974)**	**Lewis & Axelsen (1967)**	**Oxenford & Hunte**
(this workshop)						
No. dolphin		2219	46	396	70	397
Fish	Ammodytidae	.	3	.	.	.
	Balistidae	1	5	3	4	4
	Carangidae	5	.	2	.	.
	Coryphaenidae	.	.	4	.	.
	Dactylopteridae	.	.	.	1	1
	Exocoetidae	.	.	.	3	3
	Gempylidae	.	1	.	.	.
	Monacanthidae	.	.	.	2	.
	Nomeidae	.	.	.	5	.
	Ostraciidae	.	.	5	.	.
	Scombridae	.	2	.	.	.
	Syngnathidae	3	.	.	.	.
	Tetraodontidae	.	4	.	.	.
Invertebrates	Cephalopoda	.	.	.	.	5
	Decapoda	4	.	1	.	.
	Mysidacea	.	.	.	.	2
	Stomatopoda	2	.	.	.	.

3.1.6.2 Wahoo

Wahoo are essentially piscivorous. Based on work in North Carolina (Hogarth, 1976), fish accounted for 97.4% of all food organisms. These fish included mackerels, butterfishes, porcupine fishes, round herrings, scads, jacks, pompanos, and flying fishes. Invertebrates, squid, and the paper nautilus comprised 2.6% of the total food.

3.1.7 Status of the Stocks

3.1.7.1 Dolphin

Time-series data seems to indicate no decline in stock abundance nor a decrease in mean size of individual fish (SAFMC, 1998a). Some stock analysis was provided by the Mackerel Stock Assessment Panel (MSAP, 1992). Prager (2000) (Appendix B) conducted the first comprehensive exploratory stock assessment for dolphin based on landings from the U.S. Atlantic and Gulf of Mexico. The life history of dolphin and estimates generated by Prager (2000) suggest the species may be able to withstand a relatively high rate of exploitation. The abundance index developed for the assessment indicates an increasing trend in stock size, and the surplus production model based on the index, estimates the recent stock status to be above the biomass at MSY. However, Prager (2000) indicates that the positive indications are balanced by the uncertainty and numerous reasons for caution including: under excessive mortality rates, even a species resistant to exploitation may undergo geographically or temporally localized depletion or be exploited at suboptimal yield per recruit; the current stock structure is only based on limited evidence; and the estimates of vital rates are several decades old.

A preliminary stock assessment (Mahon and Oxenford, 1999) conducted for dolphin from Barbados has key implications for taking a precautionary approach in the management of dolphin and wahoo resources (SAFMC, 1998a):

A. There is a high risk of stock depletion with little warning given that the fishery may remain feasible at low stock levels because of the tendency of the fish to aggregate and the current trends for increasing fishing effort.

B. There is a potential for recruitment overfishing given that fish are economically valuable before size at first maturity and the high interannual variability in abundance apparently driven by environmental factors.

C. That a yield-per-recruit (YPR) approach to selecting a management target is probably inappropriate since even the more conservative $F_{0.1}$ values are likely to lead to a significant reduction in spawning stock biomass.

D. A precautionary approach to management which in the first instance attempts to maintain the status quo of the fishery is recommended. This will require that current catch levels not be exceeded and that recent conflict between sectors of the fishery (commercial longliners and recreational anglers) be resolved. Status quo might reflect trends (average catch and effort levels) in the fishery over the last five years (through 1997).

3.1.7.2 Wahoo

To date there has been no attempt at a comprehensive stock assessment for wahoo. Therefore, the status of the stocks is unknown at this time. Proxy MSY estimates were provided by the NMFS SEFSC and were used to specify the status determination criteria shown in Actions 7, 8, and 9.

3.2 Description of Fishing Activity

The fishery for dolphin and wahoo covered by this plan is prosecuted along the Atlantic coast predominately south of Virginia into the Caribbean Sea and the Gulf of Mexico. The fishery is seasonal with catches from the Atlantic occurring mainly between April and September, catches from the Caribbean primarily occurring January through June, and catches in the Gulf of Mexico mainly occurring between May and October (Table 7).

Table 7. Summary of locations and approximate seasonality of commercial and/or sport fisheries for dolphin (*Coryphaena hippurus*) within the western central Atlantic (Oxenford, 1997). References are found in Oxenford (1997).

Area	Location	Approximate seasonality	Selected References
Southeastern USA	North Carolina South Carolina Georgia East Florida	April-Sept	Ellis 1957 Iversen 1962 Beardsley 1967 Rose & Hassler 1969 Hassler & Hogarth 1977 Gentle 1977 Brusher & Palko 1985 Oxenford & Hunte 1986 Palko *et al.* 1989
Southern USA (Gulf of Mexico)	West Florida Alabama Mississippi Louisiana Texas	May-Oct	Baughman 1941 Springer & Pirson 1958 Fable 1981 Bentivoglio 1988 Palko *et al.* 1989
Central America (Caribbean coast)	Mexico	?	FAO 1996
Northern Caribbean	Bahamas Hispaniola Puerto Rico US Virgin Islands	Jan-June	Erdman 1956 Olsen & Wood 1982 Appeldoorn & Meyers 1993 Perez & Sadovy 1991 Perez *et al.* 1992 Rivera Betancourt 1994
Eastern Caribbean	Guadeloupe Martinique Dominica St. Lucia Barbados St. Vincent Grenada Tobago	Dec-June	Mahon *et al.* 1981 Sacchi *et al.* 1981 Murray 1985 Oxenford & Hunte 1986 Hunte 1987 Mahon *et al.* 1990 Mahon 1993 FAO 1996 Mohammed 1996
Southern Caribbean	Curacao	Dec-July	Zaneveld 1961
South America	Northeast Brazil	?	Monteiro *et al.* 1996
Atlantic	Bermuda	March-Dec	Oxenford & Hunte 1986

Dolphin support economically important fisheries from North Carolina through the Gulf of Mexico, and within the Caribbean Sea, including the northeast coast of Brazil (SAFMC, 1998a). Wahoo are known to support economically important fisheries in the U.S., Bermuda, and through the Caribbean to Tobago (SAFMC, 1998a).

3.2.1 Recreational Fishery
3.2.1.1 Atlantic
3.2.1.1.1 Dolphin

The recreational dolphin fishery in New England has been sporadic with the average landings from 1984-97 at 19,524 pounds (Table 8). The dolphin fishery in the Mid-Atlantic had average landings of 477,655 pounds for the 1984-97 period (Table 8). Recreational landings of dolphin in the South Atlantic have increased over time but have shown wide fluctuation in catches from year to year; landings for the South Atlantic peaked at just over 12 million pounds in 1995; average landings for 1984-1997 were 7,493,268 pounds (Table 8).

Comparing more recent average landings (1997-2000) to the 1994-97 average landings (Table 8) indicates that average recreational landings have increased in the South Atlantic by about 76,000 pounds, decreased in the Mid-Atlantic by about 106,000 pounds, and decreased in New England from 22,747 pounds to 3,020 pounds. Total recreational landings peaked at 13,092,212 pounds in 1995. Total recreational 2000 landings are preliminary but exceed the 1999 landings by about 2.4 million pounds. Average total recreational catch in both the 1994-97 and 1997-2000 periods was 10.3 million pounds.

South Atlantic recreational landings are shown in more detail in Table 9; data only provided through 1997. Florida and North Carolina account for the bulk of landings. Average landings in Florida for 1994-97 were 6,398,917 pounds and declined to 4,731,124 pounds for 1997-99. The trend was reversed in North Carolina with average landings increasing from 3,403,370 pounds to 4,243,769 pounds for the same time periods. Average landings increased in both South Carolina and Georgia for these same time periods (Table 9).

Recreational landings by region and mode within the Atlantic are shown in Tables 10-12; data only provided through 1997. Private/rental accounted for more landings than charter in the Mid-Atlantic and South Atlantic, whereas, charter accounted for more landings in New England. Recreational landings by state in the Mid-Atlantic are shown in Table 13. Landings have been variable and spread amongst the States of Maryland, New Jersey, New York, and Virginia. Over the 1997-99 time period, Virginia and Maryland accounted for the majority of landings. Landings from the recreational sector by state and mode within the Atlantic are presented in Tables 14-25. These tables provide more detail by State but follow the general trends described above.

The overall trend by mode within the South Atlantic is shown in Figures 3 and 4; data only provided through 1997. In North Carolina (Table 22) charter landings exceed private/rental whereas in Florida (Table 25) the private/rental catch greatly exceeds the charter catch. South Carolina’s charter fleet has accounted for more of the recent landings (Table 23), but private/rental had much higher catches in the mid 1980s. The trend in Georgia (Table 24) is similar to South Carolina except that there were no landings recorded from the private/rental mode for 1995-1997.

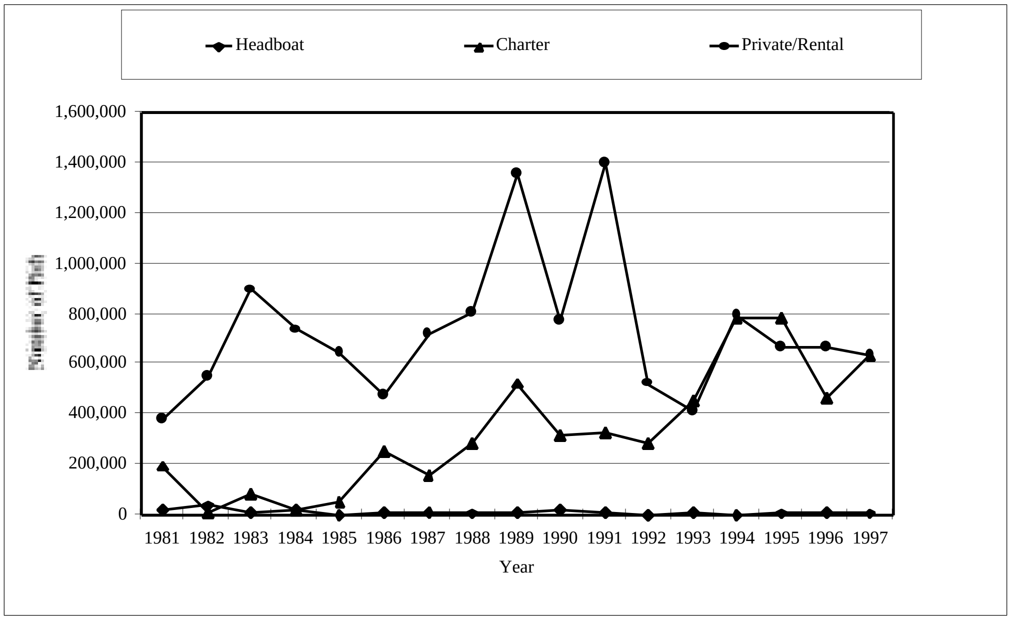


Figure 3. Recreational landings of dolphin in the South Atlantic in numbers by mode for 1981-1997 (Data Source: Goodyear, 1999).

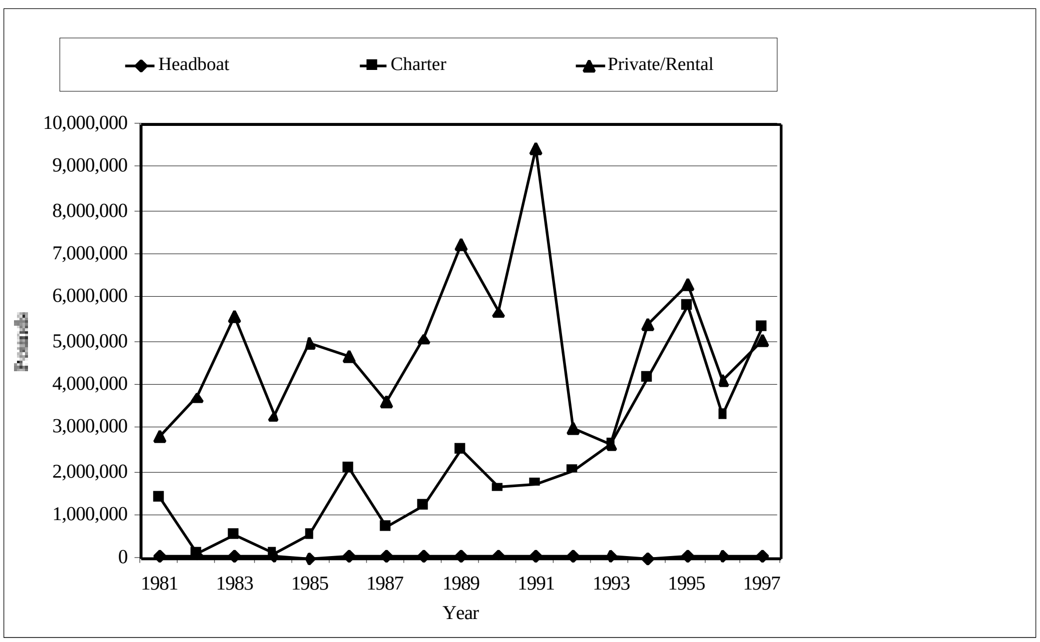


Figure 4. Recreational landings of dolphin (pounds) in the South Atlantic by mode for 1981-1997 (Data Source: Goodyear, 1999).

Table 8. Recreational and commercial landings of dolphin (pounds) from the South Atlantic, Mid-Atlantic, and New England for 1984-2000 (Source: Goodyear (1999) and data provided by NMFS in 2000 & 2002).

Year	South Atlantic		Mid-Atlantic		New England		Totals		
	Recreational	Commercial*	Recreational	Commercial	Recreational	Commercial	Recreational	Commercial	Grand Total
1984	3,475,817	426,960	0	1,700	0	400	3,475,817	429,060	3,904,877
1985	5,569,740	316,102	78,904	5,000	0	4,800	5,648,644	325,902	5,974,546
1986	6,834,766	532,078	193,127	4,200	0	200	7,027,893	536,478	7,564,371
1987	4,395,920	483,681	72,777	13,400	0	1,100	4,468,697	498,181	4,966,878
1988	6,334,041	481,207	166,468	26,600	1,501	17,800	6,502,010	525,607	7,027,617
1989	9,830,209	995,556	806,282	81,700	6,811	15,300	10,643,302	1,092,556	11,735,858
1990	7,430,519	961,088	349,224	69,106	10,101	14,233	7,789,844	1,044,427	8,834,271
1991	11,271,967	1,529,261	554,896	90,722	9,208	9,816	11,836,071	1,629,799	13,465,870
1992	5,192,816	605,072	692,209	72,946	837	8,361	5,885,862	686,379	6,572,241
1993	5,415,304	847,245	1,783,267	97,553	153,885	23,524	7,352,456	968,322	8,320,778
1994	9,100,818	1,114,114	393,450	123,646	6,312	14,793	9,500,580	1,252,553	10,753,133
1995	12,195,526	1,976,776	825,140	238,438	71,546	16,573	13,092,212	2,231,787	15,323,999
1996	7,434,015	1,147,694	563,485	59,341	4,644	9,647	8,002,144	1,216,682	9,218,826
1997	10,424,287	1,475,350	207,940	106,305	8,486	13,265	10,640,713	1,594,920	12,235,633
1998	7,263,852	727,282	429,292	87,545	0	11,813	7,693,144	826,640	8,519,784
1999	9,829,897	944,595	294,479	99,505	3,594	5,990	10,127,970	1,050,090	11,178,060
2000**	11,941,840	928,223	633,110	36,013	0	6,545	12,574,950	970,781	13,545,731
Avg. 84-97	7,493,268	920,870	477,655	70,761	19,524	10,701	7,990,446	1,002,332	8,992,778
Avg. 90-97	8,558,157	1,207,075	671,201	107,257	33,127	13,777	9,262,485	1,328,109	10,590,594
Avg. 94-97	9,788,662	1,428,484	497,504	131,933	22,747	13,570	10,308,912	1,573,986	11,882,898
Avg. 97-2000	9,864,969	1,018,863	391,205	82,342	3,020	9,403	10,259,194	1,110,608	11,369,802

*South Atlantic commercial landings 1984-2000 includes all of Monroe County, FL, landings of dolphin.
**2000 Data are preliminary. Recreational does not include headboat

Table 9. Recreational and commercial landings of dolphin (pounds) North Carolina, Florida, South Carolina and Georgia for 1984-1999 (Source: Goodyear (1999) and data provided by NMFS in 2000 & 2002).

Year	North Carolina		Florida*		South Carolina		Georgia		Total South Atlantic	
	Recreational	Commercial	Recreational	Commercial	Recreational	Commercial	Recreational	Commercial	Recreational	Commercial
1984	6,730	47,144	3,393,058	350,332	76,029	19,878	0	9,606	3,475,817	426,960
1985	446,745	42,348	3,887,256	241,676	1,229,824	17,974	5,915	14,104	5,569,740	316,102
1986	1,451,175	35,923	3,113,305	469,822	2,269,895	11,416	390	14,917	6,834,766	532,078
1987	764,391	70,516	3,617,409	385,698	12,626	19,372	1,493	8,095	4,395,920	483,681
1988	909,643	56,098	5,277,293	386,149	147,104	27,921	0	11,039	6,334,041	481,207
1989	1,905,274	98,899	7,821,178	821,279	103,757	67,463	0	7,915	9,830,209	995,556
1990	1,562,247	96,207	5,800,055	782,171	67,988	70,479	0	12,231	7,430,291	961,088
1991	1,552,804	140,837	9,580,978	1,279,631	130,115	94,604	7,992	14,189	11,271,890	1,529,261
1992	1,004,709	72,119	4,137,917	466,625	47,064	58,064	2,808	8,264	5,192,498	605,072
1993	2,362,142	149,043	2,580,573	594,210	351,549	91,355	120,725	12,637	5,414,984	847,245
1994	2,944,912	160,747	6,597,850	837,294	97,434	107,010	3,401	9,063	9,643,594	1,114,114
1995	3,558,751	355,644	8,552,429	1,306,215	81,019	287,509	2,426	27,408	12,194,620	1,976,776
1996	2,243,169	126,849	5,075,847	868,444	157,219	143,918	3,778	8,843	7,480,014	1,147,694
1997	4,866,647	229,783	5,369,543	949,805	181,840	283,739	1,130	12,023	10,419,160	1,475,350
1998	3,466,778	149,993	3,652,418	526,562	123,473	48,138	606	2,589	7,242,667	727,282
1999	4,397,882	209,860	5,171,410	643,822	193,630	76,827	17,196	9,566	9,780,115	940,075
Avg. 84 - 97	1,827,096	120,154	5,343,192	696,604	353,819	92,907	10,718	12,167	7,534,825	920,870
Avg. 94 - 97	3,403,370	218,256	6,398,917	990,440	129,378	205,544	2,684	14,334	9,934,347	1,428,484
Avg. 97 - 99	4,243,769	196,545	4,731,124	706,730	166,314	136,235	6,311	8,059	9,147,314	1,047,569

*Florida Commercial landings 1988-1999 include all of Monroe County, FL landings.
1997-1999 Recreational data from NMFS MRFSS Web Site. Note: South Atlantic totals from Table 9 are slightly different from South Atlantic totals in Table 8 because MRFSS by state summed versus by South Atlantic total.

Table 10. Recreational landings of dolphin (pounds) in New England by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charter		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	81	359	259	1,142	340	1,501
1989	-	-	1,339	6,811	-	-	1,339	6,811
1990	-	-	81	600	1,275	9,500	1,356	10,101
1991	-	-	156	721	1,833	8,487	1,989	9,208
1992	-	-	111	837	-	-	111	837
1993	-	-	8,709	53,739	7,098	100,146	15,807	153,885
1994	-	-	305	1,772	781	4,540	1,086	6,312
1995	-	-	8,146	71,546	-	-	8,146	71,546
1996	-	-	-	-	614	4,644	614	4,644
1997	-	-	829	8,486	-	-	829	8,486

Table 11. Recreational landings of dolphin (pounds) in Mid-Atlantic by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charter		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
81	-	-	-	-	-	-	-	-
82	-	-	-	-	1,586	1,049	1,586	1,049
83	-	-	2,302	26,904	1,632	23,686	3,935	50,590
84	-	-	-	-	-	-	-	-
85	-	-	12,577	12,697	15,193	66,208	27,770	78,904
86	-	-	2,597	10,521	25,712	182,606	28,309	193,127
87	-	-	2,273	12,765	11,908	60,012	14,181	72,777
88	-	-	3,756	21,928	22,996	144,540	26,752	166,468
89	-	-	30,446	146,264	111,425	660,018	141,871	806,282
90	-	-	11,552	91,693	78,106	257,531	89,658	349,224
91	-	-	20,892	158,678	94,273	396,218	115,166	554,896
92	-	-	35,216	179,332	110,545	512,877	145,761	692,209
93	-	-	150,675	1,358,188	89,742	425,080	240,417	1,783,267
94	-	-	49,296	274,976	30,903	118,475	80,199	393,450
95	-	-	34,248	385,176	36,668	439,964	70,916	825,140
96	-	-	33,705	205,033	56,560	358,452	90,265	563,485
97	-	-	24,456	66,338	19,117	141,602	43,573	207,940

Table 12. Recreational landings of dolphin (pounds) in the South Atlantic by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charter		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	23,056	76,103	197,342	1,392,254	381,410	2,848,551	601,808	4,316,908
1982	39,846	94,722	16,058	110,511	554,631	3,709,001	610,535	3,914,231
1983	10,551	42,136	84,558	568,519	896,783	5,583,383	991,892	6,194,038
1984	17,882	52,727	22,786	135,913	739,500	3,287,178	780,168	3,475,817
1985	5,319	33,587	56,571	580,496	646,186	4,955,658	708,076	5,569,740
1986	11,665	50,324	256,814	2,111,430	476,957	4,673,013	745,436	6,834,766
1987	12,900	49,034	156,330	739,834	717,309	3,607,051	886,539	4,395,920
1988	8,233	35,930	283,695	1,198,525	808,105	5,079,359	1,106,705	6,334,041
1989	13,961	54,751	525,336	2,519,018	1,355,989	7,238,291	1,900,598	9,830,209
1990	17,872	103,072	318,895	1,634,846	773,890	5,680,409	1,113,462	7,430,291
1991	9,949	75,748	330,434	1,752,745	1,403,623	9,443,396	1,744,006	11,271,890
1992	5,450	38,984	285,355	2,068,521	523,503	3,031,715	826,447	5,192,498
1993	10,199	50,742	459,379	2,631,453	413,859	2,664,395	909,841	5,414,984
1994	5,527	24,521	785,113	4,196,392	797,637	5,414,156	1,589,271	9,643,594
1995	6,775	52,000	781,432	5,848,770	667,007	6,291,777	1,456,784	12,194,620
1996	11,893	46,959	468,129	3,315,770	669,066	4,117,283	1,149,088	7,480,014
1997	7,473	39,295	634,597	5,360,610	634,760	5,019,254	1,276,830	10,419,160

Table 13. Recreational landings of dolphin (pounds) in the Mid-Atlantic by state for 1984-1999 (Source: Data provided by NMFS in 2000).

	Delaware	Maryland	New Jersey	New York	Virginia
1984	-	-	-	-	-
1985	-	11,854	18,486	5,964	42,601
1986	-	19,672	23,396	14,243	133,816
1987	-	8,159	-	32,583	32,035
1988	-	152,607	9,490	-	4,371
1989	21,124	125,378	147,952	437,883	73,946
1990	30,423	71,640	74,205	146,813	26,143
1991	28,734	135,346	210,650	34,435	145,731
1992	10,186	158,773	43,928	63,695	415,628
1993	821	1,087,649	77,522	209,476	407,799
1994	29,838	-	24,932	193,659	145,022
1995	90,578	82,547	150,565	37,878	463,572
1996	1,057	224,301	315,071	-	23,057
1997	1,409	54,936	10,619	9,371	131,606
1998	8,347	128,297	50,732	37,851	204,062
1999	-	100,215	9,217	35,853	149,190

Table 14. Recreational landings of dolphin (pounds) in Massachusetts by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	136	1,393	-	-	136	1,393

Table 15. Recreational landings of dolphin (pounds) in Rhode Island by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	81	359	259	1,142	340	1,501
1989	-	-	1,339	6,811	-	-	1,339	6,811
1990	-	-	81	600	1,275	9,500	1,356	10,101
1991	-	-	156	721	1,833	8,487	1,989	9,208
1992	-	-	-	-	-	-	-	-
1993	-	-	5,802	37,555	7,098	100,146	12,900	137,701
1994	-	-	305	1,772	781	4,540	1,086	6,312
1995	-	-	8,146	71,546	-	-	8,146	71,546
1996	-	-	-	-	614	4,644	614	4,644
1997	-	-	693	7,093	-	-	693	7,093

Table 16. Recreational landings of dolphin (pounds) in Connecticut by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	-	-	111	837	-	-	111	837
1993	-	-	2,907	16,184	-	-	2,907	16,184
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-

Table 17. Recreational landings of dolphin (pounds) in New York by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	1,046	5,964	1,046	5,964
1986	-	-	487	2,541	2,243	11,703	2,730	14,243
1987	-	-	1,266	4,606	5,076	27,977	6,342	32,583
1988	-	-	-	-	-	-	-	-
1989	-	-	8,881	45,426	49,053	392,456	57,934	437,883
1990	-	-	207	357	50,588	146,456	50,796	146,813
1991	-	-	-	-	2,135	34,435	2,135	34,435
1992	-	-	1,199	6,088	11,349	57,606	12,548	63,695
1993	-	-	11,852	123,851	8,323	85,625	20,175	209,476
1994	-	-	29,763	169,290	4,334	24,368	34,097	193,659
1995	-	-	-	-	3,002	37,878	3,002	37,878
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	2,796	9,371	2,796	9,371

Table 18. Recreational landings of dolphin (pounds) in New Jersey by Mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	12,079	10,652	7,107	7,834	19,186	18,486
1986	-	-	-	-	4,484	23,396	4,484	23,396
1987	-	-	-	-	-	-	-	-
1988	-	-	1,875	9,490	-	-	1,875	9,490
1989	-	-	6,982	19,171	36,295	128,781	43,277	147,952
1990	-	-	-	-	16,528	74,205	16,528	74,205
1991	-	-	8,368	92,257	10,246	118,393	18,614	210,650
1992	-	-	-	-	11,509	43,928	11,509	43,928
1993	-	-	-	-	4,758	77,522	4,758	77,522
1994	-	-	-	-	18,386	24,932	18,386	24,932
1995	-	-	-	-	11,233	150,565	11,233	150,565
1996	-	-	5,030	12,800	45,560	302,271	50,591	315,071
1997	-	-	-	-	1,150	10,619	1,150	10,619

Table 19. Recreational landings of dolphin (pounds) in Delaware by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	869	9,315	1,068	11,808	1,937	21,124
1990	-	-	6,041	19,696	7,404	10,726	13,445	30,423
1991	-	-	231	3,282	4,798	25,452	5,029	28,734
1992	-	-	4,561	10,186	-	-	4,561	10,186
1993	-	-	209	821	-	-	209	821
1994	-	-	5,416	23,816	1,260	6,022	6,676	29,838
1995	-	-	4,764	90,578	-	-	4,764	90,578
1996	-	-	415	1,057	-	-	415	1,057
1997	-	-	97	898	152	511	250	1,409

Table 20. Recreational landings of dolphin (pounds) in Maryland by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	2,302	26,904	1,632	23,686	3,935	50,590
1984	-	-	-	-	-	-	-	-
1985	-	-	399	1,056	3,265	10,798	3,664	11,854
1986	-	-	-	-	3,499	19,672	3,499	19,672
1987	-	-	1,006	8,159	-	-	1,006	8,159
1988	-	-	1,881	12,438	21,193	140,169	23,074	152,607
1989	-	-	11,874	57,766	15,200	67,612	27,074	125,378
1990	-	-	5,303	71,640	-	-	5,303	71,640
1991	-	-	10,977	48,251	34,390	87,095	45,368	135,346
1992	-	-	24,875	115,465	9,768	43,308	34,643	158,773
1993	-	-	83,525	1,049,607	14,791	38,042	98,316	1,087,649
1994	-	-	-	-	-	-	-	-
1995	-	-	13,215	82,547	-	-	13,215	82,547
1996	-	-	22,118	168,120	11,000	56,181	33,118	224,301
1997	-	-	447	2,885	8,072	52,051	8,519	54,936

Table 21. Recreational landings of dolphin (pounds) in Virginia by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	1,586	1,049	1,586	1,049
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	99	989	3,775	41,612	3,874	42,601
1986	-	-	2,110	7,980	15,486	127,835	17,596	135,816
1987	-	-	-	-	6,832	32,035	6,832	32,035
1988	-	-	-	-	1,802	4,371	1,802	4,371
1989	-	-	1,839	14,586	9,810	59,361	11,649	73,946
1990	-	-	-	-	3,586	26,143	3,586	26,143
1991	-	-	1,316	14,888	42,704	130,843	44,020	145,731
1992	-	-	4,581	47,593	77,919	368,036	82,500	415,628
1993	-	-	55,088	183,909	61,870	223,890	116,959	407,799
1994	-	-	14,117	81,869	6,923	63,153	21,039	145,022
1995	-	-	16,269	212,052	22,433	251,520	38,702	463,572
1996	-	-	6,141	23,057	-	-	6,141	23,057
1997	-	-	23,912	62,555	6,946	69,051	30,858	131,606

Table 22. Recreational landings of dolphin (pounds) in North Carolina by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	219	1,400	195,529	1,379,419	-	-	195,748	1,380,819
1982	423	2,749	11,276	74,578	32,631	289,440	44,330	366,766
1983	136	1,617	44,753	336,120	13,673	226,084	58,563	563,821
1984	495	4,203	1,332	2,527	-	-	1,827	6,730
1985	373	2,386	25,248	308,928	11,961	135,431	37,582	446,745
1986	315	1,872	149,206	1,436,726	2,358	12,577	151,879	1,451,175
1987	504	2,542	81,049	401,389	72,713	360,460	154,266	764,391
1988	435	2,484	107,623	590,879	36,336	296,054	151,065	909,643
1989	1,373	6,610	157,696	1,034,364	94,264	864,300	253,333	1,905,274
1990	2,299	9,132	262,465	1,262,836	59,091	278,315	326,660	1,562,247
1991	3,746	17,049	214,745	996,030	72,948	539,725	291,439	1,552,804
1992	869	7,436	161,923	826,599	29,383	166,108	192,688	1,004,709
1993	3,197	14,043	328,844	1,834,800	105,556	511,514	438,946	2,362,142
1994	1,125	5,296	344,268	2,172,868	100,167	766,748	445,560	2,944,912
1995	1,640	9,888	420,158	2,833,552	77,157	713,234	500,525	3,558,751
1996	547	3,199	274,688	1,790,050	72,515	449,919	347,750	2,243,169
1997	1,053	6,778	419,094	3,914,029	120,185	945,840	540,331	4,866,647

Table 23. Recreational landings of dolphin (pounds) in South Carolina by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	2	31	-	-	-	-	2	31
1983	96	843	-	-	-	-	96	843
1984	607	4,272	2,074	15,921	7,824	55,836	10,505	76,029
1985	443	2,880	4,356	82,567	58,139	1,144,377	62,938	1,229,824
1986	261	910	423	7,521	87,350	2,261,465	88,034	2,269,895
1987	468	2,563	645	10,063	-	-	1,113	12,626
1988	1,125	4,868	8,054	42,097	23,485	100,140	32,664	147,104
1989	985	6,491	4,023	31,943	8,123	65,323	13,131	103,757
1990	1,614	10,988	4,864	29,964	4,269	27,036	10,748	67,988
1991	933	10,937	4,088	43,215	5,890	75,962	10,911	130,115
1992	330	2,519	4,203	35,806	935	8,739	5,469	47,064
1993	826	7,576	21,661	249,998	9,153	93,975	31,640	351,549
1994	686	5,228	6,932	92,205	-	-	7,618	97,434
1995	1,010	9,563	6,582	71,456	-	-	7,592	81,019
1996	753	6,101	12,119	125,207	3,489	25,911	16,361	157,219
1997	1,220	7,378	15,848	171,883	423	2,579	17,490	181,840

Table 24. Recreational landings of dolphin (pounds) in Georgia by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	815	12,852	815	12,852
1983	-	-	135	2,957	1,290	28,300	1,425	31,257
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	602	5,915	602	5,915
1986	-	-	-	-	708	390	708	390
1987	-	-	-	-	307	1,493	307	1,493
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	580	7,992	580	7,992
1992	-	-	-	-	923	2,808	923	2,808
1993	-	-	754	9,028	10,666	111,697	11,420	120,725
1994	2	19	37	302	744	3,081	783	3,401
1995	50	459	348	1,967	-	-	398	2,426
1996	56	500	417	3,278	-	-	473	3,778
1997	103	524	87	606	-	-	190	1,130

Table 25. Recreational landings of dolphin (pounds) on the Florida East Coast by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	22,837	74,703	1,812	12,834	381,410	2,848,551	406,060	2,936,088
1982	39,421	91,942	4,782	35,933	521,185	3,406,709	565,388	3,534,582
1983	10,319	39,676	39,670	229,443	881,819	5,328,999	931,809	5,598,117
1984	16,780	44,252	19,380	117,465	731,676	3,231,342	767,836	3,393,058
1985	4,503	28,321	26,966	189,001	575,484	3,669,935	606,953	3,887,256
1986	11,089	47,542	107,185	667,183	386,541	2,398,581	504,814	3,113,305
1987	11,928	43,929	74,636	328,382	644,289	3,245,098	730,853	3,617,409
1988	6,673	28,579	168,018	565,549	748,284	4,683,165	922,975	5,277,293
1989	11,603	41,650	363,617	1,452,711	1,253,602	6,308,667	1,634,134	7,821,178
1990	13,959	82,951	51,565	342,046	710,530	5,375,059	776,054	5,800,055
1991	5,270	47,761	111,601	713,500	1,324,205	8,819,718	1,441,076	9,580,978
1992	4,251	29,029	119,230	1,206,116	492,262	2,854,061	627,367	4,137,917
1993	6,176	29,123	108,121	537,628	288,484	1,947,209	427,836	2,580,573
1994	3,714	13,978	433,876	1,931,017	696,725	4,644,326	1,135,310	6,597,850
1995	4,075	32,090	354,345	2,941,796	589,850	5,578,543	948,270	8,552,429
1996	10,537	37,158	180,905	1,397,235	593,063	3,641,453	784,505	5,075,847
1997	5,097	24,615	199,569	1,274,092	514,153	4,070,835	718,819	5,369,543

3.2.1.1.2 Wahoo

Wahoo are primarily caught using the same fishing methods as dolphin, i.e., trolling. The recreational fishery for wahoo mainly operates off North Carolina and the east coast of Florida. Annual recreational landings in the South Atlantic ranged from a low of 282,967 pounds in 1990 to a high of 2,470,098 pounds in 1986; landings in 1999 were 1,172,886 pounds and 991,559 in 2000 (Table 26). Average South Atlantic landings for the period 1994-1997 were 866,327 pounds and increased to 992,224 for 1997-2000 (Table 26). In the Mid-Atlantic, for the period 1994-1997, average landings were 16,239 pounds and increased to 76,433 pounds in the 1997-2000 period (Table 26). In New England there were only landings in 1993 (5,738 pounds) and 1998 (5,355 pounds) (Table 26).

Recreational landings by state and mode are shown in Tables 27-35. The charterboat sector in North Carolina landed the largest quantity of wahoo for the period 1994-1997, with an average annual landings of 363,386 pounds during this period (Table 32). Total recreational landings from North Carolina averaged 502,523 pounds for the same time period. The private/rental sector on Florida's East Coast accounted for the next highest average landings of 204,098 pounds during the period 1994-1997 (Table 35), then the private/rental fleet in North Carolina at 138,906 pounds (Table 32), and the charter fleet on the east coast of Florida averaging 132,349 pounds (Table 35) for the same period. Average annual recreational landings of wahoo for the period 1994-1997 for recreational fishermen in South Carolina were 24,844 pounds (Table 33).

Comparing more recent average landings (1997-2000) to the 1984-97 average landings indicates that recreational landings have increased in the South Atlantic by about 200,000 pounds. More recent average landings are also up in the Mid-Atlantic and in New England.

Table 26. Recreational and commercial landings of wahoo (pounds) in the South Atlantic, Mid-Atlantic and New England for 1984-2000 (Source: Goodyear (1999) and data provided by NMFS in 2000 & 2002).

Year	South Atlantic		Mid-Atlantic		New England		Totals		
	Recreational	Commercial*	Recreational	Commercial	Recreational	Commercial	Recreational	Commercial	Grand Total
1984	413,791	25,137	0	100	0	0	413,791	25,237	439,028
1985	423,073	28,426	14,442	200	0	0	437,515	28,626	466,141
1986	2,470,098	26,593	52,313	200	0	0	2,522,411	26,793	2,549,204
1987	797,015	51,403	13,310	400	0	1,200	810,325	53,003	863,328
1988	833,251	52,149	0	1,000	0	0	833,251	53,149	886,400
1989	708,463	43,949	25,026	800	0	0	733,489	44,749	778,238
1990	282,967	58,258	0	1,812	0	0	282,967	60,070	343,037
1991	532,908	62,329	2,198	829	0	103	535,106	63,261	598,367
1992	634,268	64,758	0	1,948	0	1,102	634,268	67,808	702,076
1993	604,996	74,053	0	2,911	5,738	0	610,734	76,964	687,698
1994	772,950	67,503	41,638	3,813	0	16,720	814,588	88,036	902,624
1995	969,818	102,277	11,439	7,119	0	110	981,257	109,506	1,090,763
1996	832,136	79,793	11,878	2,325	0	163	844,014	82,281	926,295
1997	890,402	91,481	0	2,301	0	75	890,402	93,857	984,259
1998	914,049	75,908	29,631	2,518	5,355	51	949,035	78,477	1,027,512
1999	1,172,886	94,655	232,781	4,473	0	0	1,405,667	99,128	1,504,795
2000*	991,559	59,898	43,318	3,125	0	0	1,034,877	63,023	1,097,900
Avg. 84-97	797,581	59,151	12,303	1,840	410	1,391	810,294	62,381	872,676
Avg. 94-97	866,327	85,264	16,239	3,890	0	4,267	882,565	93,420	975,985
Avg. 97-2000	992,224	80,486	76,433	3,104	1,339	32	1,069,995	83,621	1,153,617

*2000 South Atlantic does not include headboat data.

Table 27. Recreational landings of wahoo (pounds) in Rhode Island by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	149	5,738	149	5,738
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-

Table 28. Recreational landings of wahoo (pounds) in New York by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	259	1,772	-	-	259	1,772
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-

Table 29. Recreational landings of wahoo (pounds) in Delaware by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	62	426	-	-	62	426
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	322	8,662	322	8,662
1997	-	-	-	-	-	-	-	-

Table 30. Recreational landings of wahoo (pounds) in Maryland by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	921	35,939	1,004	20,466	1,925	56,405
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-

Table 31. Recreational landings of wahoo (pounds) in Virginia by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	411	14,442	411	14,442
1986	-	-	399	24,162	464	28,151	863	52,313
1987	-	-	-	-	755	13,310	755	13,310
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	1,032	25,026	1,032	25,026
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	306	18,984	897	22,653	1,203	41,638
1995	-	-	635	11,439	-	-	635	11,439
1996	-	-	83	3,216	-	-	83	3,216
1997	-	-	-	-	-	-	-	-

Table 32. Recreational landings of wahoo (pounds) in North Carolina by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	11,614	175,137	2,941	44,351	14,555	219,488
1982	1	37	-	-	-	-	1	37
1983	2	41	3,074	65,405	-	-	3,076	65,446
1984	6	184	-	-	5,464	125,876	5,470	126,060
1985	-	-	1,068	44,838	3,570	138,375	4,637	183,213
1986	-	-	10,604	297,382	2,765	82,985	13,368	380,366
1987	12	584	6,421	208,765	2,581	28,042	9,014	237,392
1988	2	68	5,390	135,996	639	13,375	6,031	149,439
1989	-	-	3,262	99,875	4,914	120,296	8,176	220,171
1990	4	138	6,108	123,409	3,010	51,024	9,123	174,571
1991	-	-	3,825	83,552	1,581	27,320	5,406	110,872
1992	12	452	4,829	118,451	2,497	72,682	7,338	191,585
1993	2	69	7,642	163,903	2,549	66,657	10,193	230,629
1994	2	68	11,447	234,014	7,964	216,008	19,412	450,091
1995	11	382	20,802	417,182	6,523	134,629	27,337	552,193
1996	2	91	12,928	305,571	4,955	132,539	17,885	438,201
1997	18	388	21,320	496,775	3,361	72,446	24,699	569,608

Table 33. Recreational landings of wahoo (pounds) in South Carolina by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	1,827	32,216	1,827	32,216
1983	-	-	-	-	-	-	-	-
1984	2	61	439	19,354	-	-	441	19,415
1985	8	273	1,269	34,771	2,575	70,537	3,852	105,582
1986	1	38	375	17,296	14,150	682,624	14,526	699,957
1987	-	-	431	13,601	-	-	431	13,601
1988	7	239	119	2,419	1,643	33,944	1,769	36,602
1989	-	-	-	-	1,265	52,287	1,265	52,287
1990	3	104	-	-	442	8,665	445	8,769
1991	8	320	1,165	22,390	-	-	1,173	22,710
1992	7	264	1,653	32,422	-	-	1,660	32,685
1993	3	103	1,580	32,291	2,425	50,948	4,008	83,341
1994	4	137	1,947	40,591	-	-	1,951	40,728
1995	11	396	509	10,211	-	-	520	10,607
1996	9	390	814	16,694	-	-	823	17,084
1997	17	363	1,562	30,594	-	-	1,579	30,957

Table 34. Recreational landings of wahoo (pounds) in Georgia by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	2	81	-	-	-	-	2	81
1996	-	-	-	-	-	-	-	-
1997	3	64	-	-	-	-	3	64

Table 35. Recreational landings of wahoo (pounds) on the Florida East Coast by mode for 1981-1997 (Source: Goodyear, 1999).

	Headboat		Charterboat		Private/Rental		Total	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1981	110	3,716	1,175	28,617	-	-	1,285	32,333
1982	129	4,778	-	-	10,968	136,119	11,097	140,897
1983	159	3,273	5,077	178,303	28,069	613,511	33,305	795,087
1984	107	3,309	1,936	55,768	11,434	209,240	13,476	268,316
1985	88	2,902	1,013	32,605	2,548	98,772	3,649	134,279
1986	23,903	900,376	5,611	188,216	12,230	301,183	41,743	1,389,775
1987	58	2,130	10,394	254,178	11,845	289,715	22,297	546,023
1988	446	15,091	13,578	287,079	15,827	345,040	29,851	647,209
1989	77	2,356	3,151	56,790	8,511	376,860	11,739	436,005
1990	4,317	141,979	1,237	21,714	4,110	83,154	9,664	246,847
1991	40	1,056	5,868	127,404	13,547	270,844	19,455	399,304
1992	51	1,873	5,271	123,355	16,207	294,909	21,529	420,137
1993	49	1,504	5,341	94,946	10,824	222,101	16,214	318,551
1994	77	2,222	7,288	141,203	6,924	138,551	14,290	281,976
1995	115	3,316	10,276	127,454	16,603	259,332	28,086	406,653
1996	69	1,795	5,402	115,419	12,451	275,857	17,922	393,070
1997	119	1,420	6,754	145,320	7,712	142,650	14,585	289,391

3.2.2 Commercial Fishery
3.2.2.1 Atlantic
3.2.2.1.1 Dolphin

In the Atlantic, commercial fisheries for dolphin consist primarily of longline and hook and line (which includes hand line, troll, rod and reel and electric reel). The hook and line portion of the commercial fishery is conducted similarly to the recreational hook and line segment, which is described under the recreational fisheries section. The longline component of the fishery consists of longliners that primarily target highly migratory species but may also catch dolphin and longliners that target dolphin directly.

The commercial longline fishery for dolphin in the Atlantic consists of approximately 3 or 4 longline vessels that direct effort on dolphin on a regular basis off the coasts of North and South Carolina (NMFS, 1995 & 1996) and longliners who catch dolphin and wahoo but primarily target highly migratory species, mainly swordfish and shark. In the mid to late 1990s, there was an increase in longline landings of dolphin in the South Atlantic with the participation of swordfish and shark longliners who have been adapting their gear to simultaneously target dolphin. They also focus more effort on dolphin after shark and swordfish quotas have been met. This increased participation by these other longliners may alter the makeup of this fishery as those vessels that participated in the directed fishery for dolphin withdraw for a variety of reasons. According to reports by NMFS (1995 & 1996), there may be as many as 20 longline vessels that currently participate in this fishery.

The directed fishery begins the last part of April and continues for about 3 weeks initially off the coast of South Carolina then north to Morehead City, North Carolina where dolphin become more scattered and difficult to catch near the middle of July. Most fishing occurs on either side of the Gulf Stream where eddies spin-off with early concentrations on the western side (NMFS, 1995 & 1996).

Vessels in the directed longline fishery make sets during the daytime using gear that is from 2 to 6 miles in length. The mainline is often 700 pound monofilament with leaders of 400 pound monofilament. There are ordinarily a total of 75 to 80 hooks per mile with a maximum of 480 hooks total. The standard No. 5 circle hooks that are used for dolphin are smaller than those normally used for conventional longline fishing. Leaders of around 18 inches are also shorter than normal with one hook per leader. No drop lines are used in this fishery and haul back is immediate. Fish are located using hook and line gear along weed lines or temperature breaks. Gear may be set in a circular pattern to facilitate haulback and as many as six sets may be made daily. Trips may average 2 days in length (NMFS, 1995 & 1996).

Longline vessels in the shark and swordfish fisheries target dolphin simultaneously by attaching small leaders to their float buoys. There is usually only one leader per buoy with approximately 100-150 such rigs employed at one time. These dolphin rigs are retrieved at the same time as the main longline which is often set overnight (NMFS, 1995 & 1996).

The commercial dolphin fishery in New England has fluctuated with average landings for 1984-97 of 10,701 pounds (Table 8). Average landings over 1994-97 were up slightly to 13,570 pounds then back down to 9,403 over 1997-2000 (Tables 8 & 36). In the Mid-Atlantic, landings averaged 70,761 pounds for 1984-97, increased to 131,933 over 1994-97, and then decreased to 82,342 pounds over 1997-2000 (Table 8). South Atlantic landings averaged 920,870 pounds over 1984-97, increased to 1,428,484 over 1994-97, and then decreased to 1,018,863 pounds over 1997-2000 (Table 8).

Commercial landings of dolphin by region by gear are shown in Tables 36-38 and Figures 5-7. As mentioned earlier, longlines in the South Atlantic increased over 1994-97 (average = 429,754) but landings by hook and line were roughly double the longline landings at 992,147 pounds (Table 38).

South Atlantic commercial landings are shown by state in Table 9. Average landings were highest in Florida followed by North Carolina, South Carolina, and Georgia. For the most recent time period (1997-99) average landings were 706,730 pounds in Florida, 196,545 pounds in North Carolina, 136,235 pounds South Carolina, and 8,059 pounds in Georgia.

Table 36. Commercial landings of dolphin (pounds) in New England by gear type for 1984-2000 (Source: Goodyear, 1999, NMFS, 2000 & NMFS, 2002).

Year	Hook & Line*	Long Line	Other/Unknown	Combined gear
1984	NA	NA	NA	400
1985	NA	NA	NA	4,800
1986	0	0	0	200
1987	1,100	0	0	1,100
1988	NA	NA	NA	17,800
1989	NA	NA	NA	15,300
1990	NA	NA	NA	14,233
1991	NA	NA	NA	9,816
1992	NA	NA	NA	8,361
1993	NA	NA	NA	23,524
1994	8,771	5,012	1,010	14,793
1995	257	15,852	464	16,573
1996	103	9,198	346	9,647
1997	1,736	12,257	1,925	13,265
1998	NA	NA	NA	11,813
1999	NA	NA	NA	5,990
2000	NA	NA	NA	6,545
Average 94-97	2,717	10,580	936	13,570
Average 97-2000	NA	NA	NA	9,403

*Includes hand line, troll, rod & reel, and electric reel.

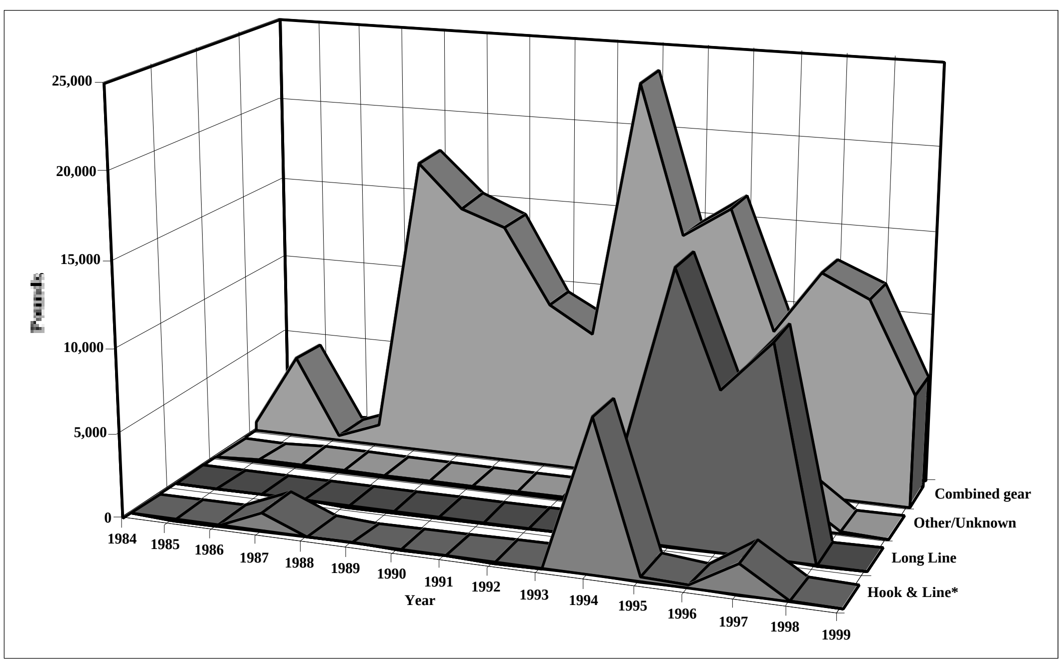


Figure 5. Commercial landings of dolphin (pounds) in New England by gear type for 1984-1999 (Source: Goodyear, 1999 & NMFS, 2000).

Table 37. Commercial landings of dolphin (pounds) in the Mid-Atlantic in pounds by gear type for 1984-2000 (Source: Goodyear, 1999, NMFS, 2000 & NMFS, 2002).

	Hook & Line*	Long Line	Other/Unknown	Combined gear
1984	NA	NA	NA	1,700
1985	NA	NA	NA	5,000
1986	NA	NA	NA	4,200
1987	NA	NA	NA	13,400
1988	NA	NA	NA	26,600
1989	NA	NA	NA	81,700
1990	NA	NA	NA	69,106
1991	NA	NA	NA	90,722
1992	NA	NA	NA	72,946
1993	NA	NA	NA	97,553
1994	2,526	120,245	874	123,646
1995	1,080	231,006	6,368	238,438
1996	248	58,844	248	59,341
1997	671	125,604	1,291	106,305
1998	NA	NA	NA	87,545
1999	1,853	96,599	1,053	99,505
2000	1,592	32,518	1,903	36,013
Avg. 94-97	1,131	133,925	2,195	131,933
Avg. 97-2000	NA	NA	NA	82,342

*Includes hand line, troll, rod & reel and electric reel.

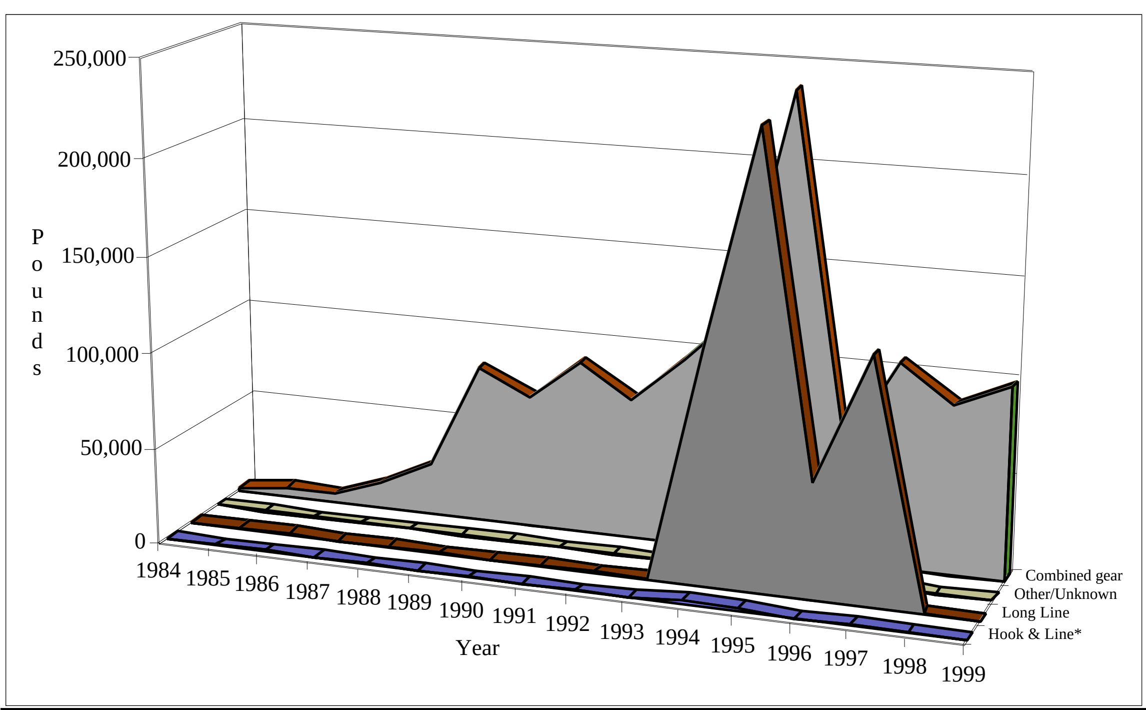


Figure 6. Commercial landings of dolphin (pounds) in the Mid-Atlantic by gear type for 1984-1999 (Source: Goodyear, 1999 & NMFS, 2000).

Table 38. Commercial landings of dolphin (pounds) in the South Atlantic by gear type for 1984-2000 (Source: Goodyear, 1999, NMFS, 2000 & NMFS, 2002).

Year	Hook & Line*	Long Line	Other	Combined gear
1984	NA	NA	NA	426,960
1985	NA	NA	NA	316,102
1986	NA	NA	NA	532,078
1987	NA	NA	NA	483,681
1988	NA	NA	NA	481,207
1989	NA	NA	NA	995,556
1990	NA	NA	NA	961,088
1991	NA	NA	NA	1,529,261
1992	NA	NA	NA	605,072
1993	NA	NA	NA	847,245
1994	848,562	254,240	11,312	1,114,114
1995	1,316,434	650,246	10,096	1,976,776
1996	864,054	275,883	7,757	1,147,694
1997	939,538	538,648	10,274	1,475,350
1998	NA	NA	NA	727,282
1999	647,293	238,903	58,399	944,595
2000	520,590	294,376	113,257	928,223
Average 94-97	992,147	429,754	9,860	1,428,484
Average 97-2000	NA	NA	NA	1,018,863

*Includes hand line, troll, rod & reel, and electric reel.

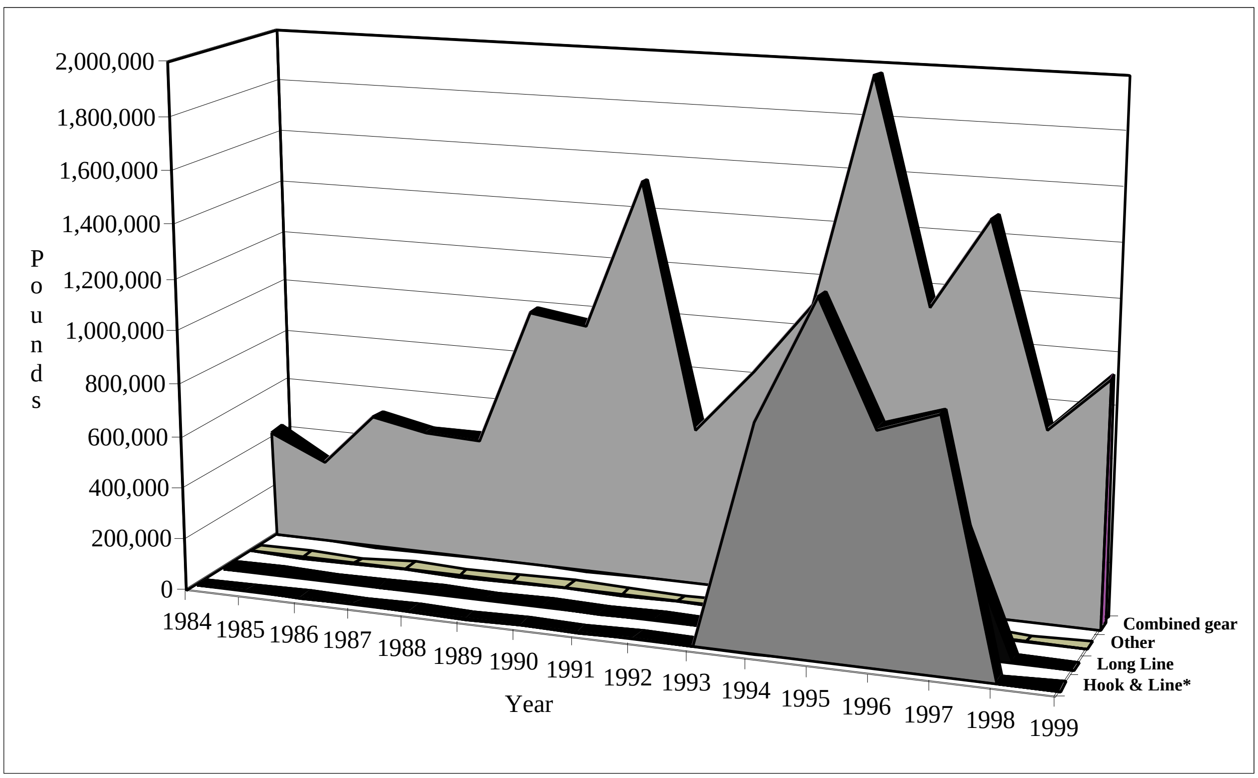


Figure 7. Commercial landings of dolphin (pounds) in the South Atlantic by gear type for 1984-1999 (Source: Goodyear, 1999, NMFS, 2000 & NMFS, 2002).

Mid-Atlantic commercial landings are shown by state in Table 39.

Table 39. Commercial landings of dolphin (pounds) in the Mid-Atlantic by state for 1984-1999 (Source: NMFS and Goodyear, 1999 & NMFS, 2000).

	Maryland	New Jersey	New York	Virginia
1984	600	200	400	500
1985	100	1,700	2,800	400
1986	500	1,200	2,200	300
1987	1,000	3,000	7,400	2,000
1988	1,900	6,200	16,000	2,500
1989	3,700	44,300	25,200	8,500
1990	6,809	30,884	28,645	2,478
1991	6,433	45,023	32,247	7,019
1992	4,204	38,717	25,732	4,293
1993	6,230	40,269	47,920	3,134
1994	10,363	68,542	37,436	7,304
1995	24,824	143,126	68,012	2,493
1996	4,727	34,282	13,321	7,012
1997	3,299	72,620	29,812	574
1998	14,958	40,412	30,972	1,043
1999	7,319	57,937	33,589	1,043

3.2.2.1.2 Wahoo

The commercial fishery for wahoo appears to be incidental to fishing for dolphin or other pelagic species. In New England landings while being sporadic, peaked at 16,720 pounds in 1994 and dropped off to 110 and 163 pounds for 1995 and 1996 respectively (Table 26). Landings for 1997 through 1999 have been 75 pounds or less. In the Mid-Atlantic annual commercial landings from 1984 through 1997 averaged 1,840 pounds. Landings increased to an average of 3,890 pounds in 1994 through 1997 and declined slightly to 3,104 pounds for 1997-2000 (Table 26). In the South Atlantic annual commercial landings ranged from 25,137 pounds in 1984 to 102,277 pounds in 1995 (Table 26). Average landings were 85,264 pounds in 1994-97 and declined slightly to 80,486 pounds in 1997-2000.

3.2.3 Economic Status of the Fishery

3.2.3.1 Commercial Fishery

Prior to the 1970s, most dolphin landings occurred in Florida; however, by the mid-70s there were significant landings in other areas within the South Atlantic region. During the late 1970s, landings increased in the northeast from Maine to Virginia (Thompson, 1999). Commercial landings of dolphin increased from 7% of total harvest in 1985 to about 19% by 1996 (Table 40). In 1995, commercial landings in the Atlantic exceeded 2.2 million pounds. This sector's landings exceeded one million pounds in 1989, and doubled in 1995. During the period 1997 to 1999 the proportion of commercial landings have dropped to around 11% of the total harvested in the Atlantic (Table 40).

Dolphin are caught off North and South Carolina mainly from May through July. Off Florida's east coast the main season occurs between April and June (Thompson, 1999).

Table 40. Proportion of total recreational and commercial dolphin landings by region. Data derived from Table 8.

Year	South Atlantic		Mid-Atlantic		New England	
	Recreational	Commercial*	Recreational	Commercial	Recreational	Commercial
1984	89.01%	10.93%	0.00%	0.04%	0.00%	0.01%
1985	93.22%	5.29%	1.32%	0.08%	0.00%	0.08%
1986	90.35%	7.03%	2.55%	0.06%	0.00%	0.00%
1987	88.50%	9.74%	1.47%	0.27%	0.00%	0.02%
1988	90.13%	6.85%	2.37%	0.38%	0.02%	0.25%
1989	83.76%	8.48%	6.87%	0.70%	0.06%	0.13%
1990	84.11%	10.88%	3.95%	0.78%	0.11%	0.16%
1991	83.71%	11.36%	4.12%	0.67%	0.07%	0.07%
1992	79.01%	9.21%	10.53%	1.11%	0.01%	0.13%
1993	65.08%	10.18%	21.43%	1.17%	1.85%	0.28%
1994	84.63%	10.36%	3.66%	1.15%	0.06%	0.14%
1995	79.58%	12.90%	5.38%	1.56%	0.47%	0.11%
1996	80.64%	12.45%	6.11%	0.64%	0.05%	0.10%
1997	85.20%	12.06%	1.70%	0.87%	0.07%	0.11%
1998	85.26%	8.54%	5.04%	1.03%	0.00%	0.14%
1999	87.94%	8.45%	2.63%	0.89%	0.03%	0.05%
2000	88.16%	6.85%	4.67%	0.27%	0.00%	0.05%
Avg. 84-97	83.33%	10.24%	5.31%	0.79%	0.22%	0.12%
Avg. 90-97	80.81%	11.40%	6.34%	1.01%	0.31%	0.13%
Avg. 94-97	82.38%	12.02%	4.19%	1.11%	0.19%	0.11%
Avg. 97-99	86.17%	9.86%	2.92%	0.92%	0.04%	0.10%

During the period 1994 to 1997, longline and hook and line gears (includes hand line, troll line, rod & reel, and electric reel) accounted for anywhere between 87-90% of the total commercial harvest (Tables 36 to 38). When data from all areas are combined, the longline catch accounted for 37% of the overall dolphin harvest in 1997 (Tables 36 to 38), and the hook and line category accounted for 50% of the total dolphin landings in that year (Tables 36 to 38). The hook and line category not only includes harvest by commercial gear but also bag limit caught fish that are sold by the recreational sector. Based on information from fishermen, the bulk of this recreational sale can be attributed to the for-hire sector.

Price Fluctuations in the Dolphin Fishery

Dolphin prices are similar to that of king mackerel. Price trend in the entire U.S. commercial dolphin fishery is depicted in Table 41a. Even though landings increased significantly during the early and mid 1980s, real prices continued to increase. This trend continued until 1989 when landings doubled from the previous year and prices declined. In the 1990s price reached an all time high in 1994 despite the increase in landings during this period. Rhodes (1998) speculated that this phenomenon was the result of unmet demand for other seafood products that could be substituted with dolphin products such as mahi-mahi steaks. This increasing price trend did not continue when landings reached 2.6 million pounds in 1995. Prices declined in 1995 reaching a seven year low in 1997. Rhodes (1998) also analyzed monthly price data and surmised that in the South Atlantic region, prices are at their lowest in the first half of the year, usually May to June.

It is difficult to determine what factors are responsible for the decrease in price in the years following 1995. Part of this effect may be due to increased landings that peaked in 1995 at 2.57 million pounds. Also, imports may have played a role in this price decline, however import data on dolphin are only available from 1997. Furthermore, The Fisheries Statistics & Economics Division of the National Marine Fisheries Service (NMFS) report only imports of frozen dolphin fillets. A total of 15.75 million pounds of frozen dolphin fillets were imported at a value of $20.23 million dollars in 1997. In 1998 imports were 16.72 million pounds at a value of $23.95 million dollars. However, these figures may be underestimates of dolphin imports. Information from seafood distributors indicate that fresh, de-headed, and gutted dolphin, as well as other product forms, are also imported by U.S. buyers (Rhodes, 1998). Given the lack of historical and complete import data it is difficult to speculate on the influence of imports on domestic prices. A survey of U.S. buyers to collect data on all dolphin product forms imported into the U.S. by country of origin, time of year, and port of entry will provide some of the necessary information for market analysis.

Price Fluctuations in the Wahoo Fishery

In the United States fisheries for wahoo exist off North and South Carolina, primarily from April to September and off Florida's East Coast. The National Marine Fisheries Service first recorded landings of wahoo in the commercial catch in 1974 when they amounted to 1,000 pounds caught primarily off Florida. Landings during the period 1987 to 1993 (Table 41b) ranged between 160,000 to 370,000 pounds (Vondruska, 1999). Recently Louisiana has landed the most. In fact in 1997 more than 50% of total wahoo commercial landings came from Louisiana (Vondruska, 1999). Price per pound was less than $1.00 until 1985 (Table 41b). During the period from 1985 to 1994 real price fluctuated but remained below $1.23 per pound. From 1995 to 1997 the price per pound increased above $1.30 per pound.

Table 41a. Ex-vessel dolphin landings (thousand pounds), value (thousand dollars) and real price (1990 dollars) (Data Source: Vondruska, 1999).

Year	Landings	Real Value	Real Price (1990 dollars)
1979	111	88	0.79
1980	173	133	0.77
1981	132	116	0.88
1982	307	280	0.91
1983	321	298	0.93
1984	444	449	1.01
1985	422	504	1.19
1986	687	801	1.17
1987	648	879	1.36
1988	780	1,031	1.32
1989	1,561	1,766	1.13
1990	1,848	1,949	1.05
1991	2,430	2,771	1.14
1992	1,136	1,250	1.10
1993	1,242	1,505	1.21
1994	1,417	1,971	1.39
1995	2,570	3,214	1.25
1996	1,646	2,158	1.31
1997	1,995	2,086	1.05

Table 41b. Ex-vessel wahoo landings (thousand pounds) and real price (1990 dollars) (Data Source: Vondruska, 1999).

Year	Landings (1,000 pounds)	Real Price (1990 dollars)
1979	15	0.87
1980	23	0.83
1981	26	0.81
1982	30	0.83
1983	34	0.97
1984	30	1.00
1985	39	1.13
1986	52	1.23
1987	160	1.19
1988	312	1.12
1989	300	0.97
1990	203	1.21
1991	252	1.10
1992	365	1.05
1993	335	1.12
1994	249	1.15
1995	264	1.35
1996	231	1.31
1997	256	1.34

3.2.3.2 Recreational Fishery

The preceding section ("Description of Fishing Activity") provides a detailed account of the historical recreational catch of dolphin in the Atlantic by mode of fishing. In summary, the total 1999 recreational harvest accounted for 91% (10,127,970 pounds total recreational harvest and 1,050,090 pounds commercial harvest) of the total U.S. harvest in 1999 (Table 8). Most of this recreational activity occurs in the summer months, and charter boat and private boat modes (Tables 10 to 12) take the majority of the recreational catch of this species.

The size distribution of the catch from the recreational sector differs depending on the mode of fishing (Goodyear, 1999). Headboats harvest smaller fish compared to the other two modes. Just over 55% of the headboat catch are fish below 22 inches (550 mm) fork length. For the most part, the size distribution of fish harvested by private/rental boats and party/charter boats are fairly similar for both groups (Goodyear, 1999). Both size of fish caught and catch success rates are important determinants of the quality of the recreational experience, and thus the value of these recreational trips.

Information on the value of the dolphin recreational fishery in the Atlantic is not yet available. Apart from the economic value (consumer surplus) anglers derive from the resource, they generate significant economic impact through expenditures for recreational fishing which are important to coastal communities in the Atlantic. Data on economic impact of recreational fishing for dolphin are not available.

Like dolphin, the recreational landings of wahoo account for a larger proportion of the total harvest in the Gulf and Atlantic. In 1999 the total commercial harvest amounted to 99,159 pounds, compared to 1.41 million pounds harvested by recreational anglers (Table 26). Information on the value of the wahoo recreational fishery and data on economic impact of recreational fishing for wahoo are not available.

The charterboat sector in the South Atlantic and the Gulf of Mexico depend on dolphin as one of the main attractions for their clientele. Available data indicates that this species is less important to the headboat sector (Holland et al., 1999). Of all charterboat owners surveyed as part of a study to document the characteristics and economics of the for-hire sector in the State of Florida, 26% target dolphin. This species was much more important to the charter fleet operating in the Florida Keys and Florida's Atlantic Coast. Results from this study also revealed that 53% of charterboats in North Carolina and 60% of charterboats in South Carolina target dolphin (Holland et. al., 1999).

In their study Holland et al. (1999) measured capital investment, average annual expenses, and average revenue in the for-hire sector. A summary of this data is contained in Table 41c. On average it appears that investment in equipment is much higher in Florida compared to the rest of the South Atlantic.

In terms of fixed costs, it is unclear as to whether these expenditures were apportioned to charters and other revenue earning activities for the vessel. Some charterboats are full-time operations while others may only operate charters on a seasonal basis and could be commercial harvesters for part of the fishing year. For part-time operations the total annual fixed costs can be attributed to several activities including commercial fishing.

Table 41c. Summary of Capital Investment, Average Annual Expenses, and Average Annual Revenue on Charterboats. Data on Florida includes information for the entire State of Florida (Source: Holland et. al., 1999).

Item	**Florida**	**North Carolina**	**South Carolina**	**Georgia**	**Average for NC, SC, GA**
Average Capital Investment:					
Hull and Superstructure	$90,989				$39,445
Engine	$40,518				$14,586
Electronics	$5,568				$5,900
Other Equipment and Tackle	$5,878				$4,463
Average Annual Expenditures					
Wages and Salaries	$25,810				$17,298
Fuel and Oil	$8,224				$7,575
Engine	$6,334				$2,738
Maintenance and Repair	$5,720				$4,991
Docking Fees	$4,604				
Hull and Superstructure	$3,020				
Insurance	$2,970				
Other Equipment and Tackle	$2,404				
Advertising	$2,041				
Average Total Exp.	**$68,574**	**$46,888**	**$23,235**	**$41,688**	
Average Annual Revenue	**$68,816**	**$60,135**	**$26,304**	**$56,851**	

Crew wages may be underestimates in that they do not reflect the "tips" left by customers. Out of state anglers typically give the fish they catch to the crew members on these charter vessels in lieu of a tip. Crew members, and sometimes vessel owners, sell these fish. The frequency of this practice varies by state within the South Atlantic region and may be more common in Georgia and the Florida Keys. Income derived from bag limit caught fish is not reflected in these revenue estimates or crew salaries. As a result it could be misleading to use this information to determine profitability of the charterboat fleet in each state under current operating procedures. However, these data provide a first step in describing the economic characteristics of this sector.

3.2.4 Social Status of the Fishery

There is little data available that is directly applicable to dolphin and wahoo recreational and commercial fishing communities in the U.S. Atlantic. The data that are available are only partial for some communities and then, in many cases, only some sectors in those communities (commercial, charter, and/or recreational). Until complete and comparative social research is carried out in these regions, the following overview must be considered the best available data on the social characteristics of these fishing communities. However, the community profiles that are included below should be viewed as representative of fishing communities throughout the various geographic regions of the dolphin wahoo fishery. All of the communities profiled count dolphin and wahoo as a fishery that is exploited at least for a portion of the year and at least among one or more user groups.

This lack of complete data should not be seen as necessarily detrimental to the analysis of possible social impacts accruing from this proposed fishery management plan. Rather, the data that are available allows for reasonable predictions of social outcomes due to management measures. What social impacts that occur in one community can then be reasonably expected to occur in other communities that are either somewhat larger or smaller, older or less historical, and with somewhat different demographic, cultural, and economic mixes. This is stated as an acceptable procedure in the CFR Sec.1502.22 when one must proceed with less than complete data.

In order to better understand how a fishing community is defined according to the MSFCMA, the following discussion has been included. **This following section has been drawn directly from the SAFE Report (SAFMC, 1999), Section 3.2 (references are included in the SAFE Report; Table and Figure numbering is from the SAFE Report).**

> *"With the addition of National Standard 8, FMPs must now identify and consider the impacts upon fishing communities to assure their sustainable participation and minimize adverse economic impacts [MSFCMA section 301 (a) (8)].*
>
> *The proposed guidelines for this new standard state: "... fishing communities are considered geographic areas encompassing a specific locale where residents are dependent on fishery resources or are engaged in the harvesting or processing of those resources. The geographic area is not necessarily limited to the boundaries of a particular city or town. No minimum size for a community is specified, and the degree to which the community is 'substantially engaged in' or 'substantially dependent on' the fishery resources must be defined within the context of the geographical area of the FMP. Those residents in the area engaged in the fisheries include not only those actively working in the harvesting or processing sectors, but also "fishery-support services or industries," such as boat yards, ice suppliers, or tackle shops, and other fishery-dependent industries, such as ecotourism, marine education, and recreational diving." [Federal Register Volume 62, Number 149 (August 4, 1997)]*

"The term 'sustained participation' does not mandate maintenance of any particular level or distribution of participation in one or more fisheries or fishing activities. Changes are inevitable in fisheries, whether they relate to species targeted, gear utilized, or the mix of seasonal fisheries during the year. This standard implies the maintenance of continued access to fishery resources in general by the community. As a result, national standard 8 does not ensure that fishermen would be able to continue to use a particular gear type, to target a particular species, or to fish during a particular time of the year." [Federal Register Volume 62, Number 149 (August 4, 1997)]

"The term 'fishing community' means a community that is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew, and fish processors that are based in such communities. A fishing community is a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries-dependent services and industries (for example, boatyards, ice suppliers, tackle shops)." [Federal Register Volume 62, Number 149 (August 4, 1997)]

In order to determine a community's "substantial dependence" or "sustained participation" on fishing, those communities must first be identified. Presently, the NMFS has not identified fishing communities, nor their dependence upon fishing in the South Atlantic. Moreover, there are no ongoing data collection programs to gather the necessary information that would allow for the identification of fishing communities in the South Atlantic or other regions. Also, there are no future plans to implement any such data collection program that would determine dependence upon fishing in order to provide the Councils with important information necessary for social and economic impact analysis of fishing communities. This leaves the councils with existing data collected through other agencies, not always specific to fisheries management, i.e., census data, regional economic census, and previous research on specific fisheries. Although this data can be useful, it is often not specific enough to identify or provide a clear representation of a community and its dependence upon fishing. One reason for this difficulty is that fishermen in a specific fishery often do not reside within one particular municipality that can easily be identified as a fishing community or one that is substantially dependent upon fishing. Also, that information is often not provided at the municipality level, but more often at the county level.

Commercial fishermen may have a domicile (home) in one community and dock their boat in another. They may sell their fish in either place or an entirely different location. Recreational fishermen often do not live on the coast, but drive from inland counties and may launch their boats or fish from several different sites. For these reasons, identifying a "fishing community" becomes problematic in that such a community does not fit the normal geographic boundaries or fall within the metes and bounds that would surround a normal incorporated municipality.

The impacts of fisheries management may be minimal in a single community, but, when taken overall may be substantial to an entire county or several county area. Those same measures may have a small impact on a large metropolitan area, but, to a neighborhood where most fishing families live or most fishing activity originates it could be substantial. Therefore, a "fishing community" may encompass a single municipality, a county, several counties or one neighborhood within a major metropolitan area depending upon a variety of demographic, social, economic and ecological factors that one must consider."

3.2.4.1 Overview of Potentially Impacted Fishing Communities – U.S. Atlantic Region

It is important to note that when discussing fishing communities, a holistic view should be incorporated, that is, all the fishing sectors in the community should be accounted for, as they are interdependent to varying degrees.

The following descriptions of fishing communities are not in any sense complete. In earlier versions of this FMP, a general description of fishing communities in the South Atlantic was included. This section has not been retained in this section because it is out-of-date and not directly applicable to the dolphin wahoo fishery. However, this material can be found in Appendix G. The following are descriptions of fishing communities that at this time best represent the different socioeconomic sectors of recreational (charter, headboat and private vessels) and commercial fishers. When the new Year 2000 Census Bureau figures are released these descriptions will be updated [Note: data are available but have not been analyzed.]. Where possible, after or separately each community description, additional newer information on the different fishery sectors has been added. One additional caveat should be noted: all the following communities in some way harvest dolphin and/or wahoo. Therefore, each of these communities may be impacted positively or negatively by the FMP. What follows does not represent all potentially impacted communities and until more research is done, the extent of the impacts will be unknown.

The communities have been grouped by state in order to allow for more ease in accessing the information.

3.2.4.1.1 Overview of Fishing Communities by State

Until very recently, prior to the publication of New England's Fishing Communities (Hall-Arber et.al., 2002) there had been no readily available information that addressed fishing communities in New England. However, this publication does not address fishing communities as they relate to dolphin or wahoo fishing in New England. This reflects the fact that these fisheries constitute a miniscule percentage of all landings, recreational or commercial.

For the Mid-Atlantic, there are limited data on fishing communities, but it too does not reflect detailed participation in the dolphin wahoo fishery. Only one fishing community in Virginia – Wachapreague – has been studied and noted to register a dolphin wahoo fishery. For this reason the community profile is included in its entirety. The same is true for the communities of Wanchese and Hatteras in North Carolina. What follows is a brief description and/or listing of identified fishing communities of the Mid-Atlantic and South Atlantic. This listing has been included in order to help those who might conduct future social impact assessments identify where potential social impacts may be felt from the implementation of this fishery management plan. It is important to note that the data from the Census is from 1990 (unless otherwise noted), and as of this writing, cannot be updated because the Census Bureau has not released more than general population figures.

NEW YORK

New York's commercial fisheries are concentrated on Long Island, which extends from Brooklyn, a borough of New York City, to the far eastern ports of Montauk and Greenport. There are also small, but historically and culturally important, fisheries for migratory species on the Hudson River and other rivers. The Great Lakes fisheries are entirely recreational and beyond the scope of this report. In 1998, almost 55 million pounds, worth over 84 million dollars ex-vessel, and of course much more when multiplied by values created as seafood is processed, distributed, and sold to consumers, were landed in New York and recorded by the NMFS.

Freeport/Point Lookout	Amagansett,
Oceanside	Shinnecock/Hampton Bays
Montauk	Mt. Sinai
Greenport	
Orient/Orient Point	
Shelter Island	
Fishers Island	
Southold	
Cochogue	
Mattituck	
Three Mile Harbor	

Total commercial landings of dolphin in the state of New York between 1990 and 2000 equaled 341,517 pounds. Total commercial landings of wahoo for the state of New York equaled 11,014 pounds (NMFS personal communication, 2002). Table 13 shows recreational dolphin landings ranging between 0 and 437,883 pounds from 1984 through 1999. Table 28 shows recreational landings of 259 wahoo weighing 1,772 pounds in 1991.

NEW JERSEY

New Jersey is the most densely populated and one of the most industrialized and urbanized states in the nation. Although small in area, it also has a long coastline, about 100 miles, as well as two major tidal rivers, the Hudson and Delaware, and numerous estuaries inside its barrier islands and embayments. Much like New York, its fisheries are found in both urban and rural settings…

…The major fishing ports of New Jersey, from north to south, are Belford, a diversified commercial port with a marketing cooperative; Atlantic Highlands, a charter-boat and party-boat center; Highlands, a small lobstering and clamming port; Shark River (Neptune/Belmar), another small lobstering and recreational fishing port; Brielle, a charter-boat and party-boat recreational fishing center; Point Pleasant Beach, a diversified commercial and recreational port with a marketing cooperative and significant surf clam/ocean quahog activity; Barnegat Light (Long Beach Island), combining recreational and commercial fishing with a strong tradition of deep-water longlining but now diversified; Atlantic City, a surf clam/ocean quahog port; Sea Isle City, a small, diversified port; Wildwood and Cape May, both commercial and recreational, with significant surf clam and ocean quahog, scalloping, finfish dragging, and other fisheries (the largest port in the state and the site of several large seafood packing and processing firms); and Port Norris, once the center of oystering but now mostly the site of crabbing and finfishing plus oyster and clam processing plants. Small-scale clamming, crabbing, and other kinds of fishing take place from numerous other sites around the 100 miles of New Jersey's coast, and substantial seafood processing can be found in various inland communities.

Total commercial landings of dolphin for the state of New Jersey totaled 551,426 pounds from 1990 to 2000. Total commercial landings for the state of New Jersey for wahoo totaled 15,482 pounds from 1990 to 2000 (NMFS, personal communication, 2002). Table 13 shows recreational dolphin landings ranging between 0 and 315,071 pounds from 1984 through 1999. There have been no recorded recreational landings of wahoo.

DELAWARE

The state of Delaware mostly borders on the Delaware Bay and its tributaries. Consequently, its inshore and EEZ ocean fisheries are minor. Its fisheries are "bayman" or "waterman" fisheries. According to a member of the Mid-Atlantic Fishery Management Council and a Sea Grant marine advisory agent in Delaware, gill-netting predominates, and there are no large vessels using gear like otter trawls. According to an official at the state Division of Fish and Wildlife in Dover, there are 120 licensed commercial gill-netters in the state and they all work inshore.

Because of the genuine lack of commercial fishing communities focused on offshore fisheries that would include dolphin and/or wahoo, it will only be noted here that total commercial landings of dolphin for the State of Delaware totaled less than 1000 pounds from 1998 to 2000. No records are given for the State of Delaware for commercial wahoo landings (NMFS, personal communication, 2002).

Recreational fishing predominates in Delaware. A survey has not been done in many years, but the Sea Grant marine advisory agent estimated about 80 recreational marinas in the state. He said that probably 30 to 35 of the ones that are in the coastal bays are community marinas, i.e., open only to residents. A quick search on the Internet produced a listing (but most likely not complete) of current for-hire vessels out of Delaware marinas. Many of the boats listed at the web pages of the Delaware marinas include dolphin and wahoo as targeted fish for offshore charters (see, for example, http://www.oldinlet.com). Table 13 shows dolphin landings ranging between 0 and 90,578 pounds from 1984 through 1999. Table 29 shows landings from 1990 through 1996 ranging between 62 and 322 fish weighing between 426 and 8,662 pounds.

MARYLAND

Maryland has two distinct fishing regions: the seaward coast of the Delmarva Peninsula and the Chesapeake Bay. Ocean City, on the sea coast, is the major port for ocean fisheries of the EEZ and of Mid-Atlantic Fishery Management Council concern.

Recreational fishing for dolphin and wahoo in Maryland does exist, but it is not known to what extent. One event, the White Marlin Open, billed as the largest billfishing tournament in the world, has tournament categories for dolphin and wahoo, indicating not only the presence of these fish in Maryland's recreational fishing profile, but also that they are a valued fish in the recreational repertoire.

Total commercial landings of dolphin for the State of Maryland totaled 86,965 pounds from 1990 to 2000. Total landings for the State of Maryland for wahoo totaled 4,395 pounds of wahoo from 1990 to 2000 (NMFS, personal communication, 2002). Table 13 shows recreational dolphin landings ranging between 0 and 1,087,649 pounds from 1984 through 1999. Table 30 shows recreational landings in only 1983 when 1,925 wahoo weighing 56,405 pounds were landed.

VIRGINIA

Virginia has one of the largest amounts of fish landings in the United States, largely because of the menhaden which are landed and processed in Reedville, Northumberland County, on the western shore of the Chesapeake Bay. Virginia is also known for its waterman fisheries for oysters, blue crabs, etc., mainly in the Chesapeake Bay and its tributaries but also in numerous small bays along the Atlantic coast of the southern Delmarva Peninsula. There are six major ports where large, ocean-going fishing vessels unload their catches: Hampton, Newport News, Virginia Beach, Seaford, and Chincoteague,. In the U.S. census, the first three are largely within the Metropolitan Statistical Area of Norfolk-Virginia Beach-Newport News. These

"Hampton Roads" ports are within a major tourist region, anchored by Chincoteague, Williamsburg, and Virginia Beach. The military is also a large presence, as are numerous heavy and high tech industries. Chincoteague is one of several ports where local seafood businesses depend on migratory fishing vessels from other regions, such as North Carolina or Massachusetts, for landings. The highest value product of the ocean fisheries is the sea scallop; hard clams (quahogs), blue crabs, and oysters are the equivalent in the bays and estuaries. "Shark fishing" for spiny and smooth dogfish and by-catches of angler (monkfish) have emerged in recent years as important fisheries in some ports. Again, a cursory search of the Internet revealed that both dolphin and wahoo are valued recreational fishing targets, both in the for-hire sector and for tournament fishing.

Total commercial landings of dolphin for the State of Virginia totaled 86,965 pounds from 1990 to 1995 (NMFS website does not list landings for other more recent years). Total landings for the state of Virginia for wahoo totaled 1,603 pounds of wahoo from 1990 to 2000 (NMFS, personal communication, 2002). Table 13 shows recreational dolphin landings ranging between 0 and 463,572 pounds from 1984 through 1999. Table 31 shows recreational landings from 1985 through 1997 ranging from 0 wahoo to 1,203 wahoo weighing 41,638 pounds.

The following data on Wachapreague, VA has been excerpted from McCay and Cieri (2000). This community has been included because it is noted that recreational fishermen in this community often target dolphin fish and wahoo.

"Field Observations and Interviews, Wachapreague, VA, July 1999

The one packing house in Wachapreague is owned by a married couple who had a business in another town before coming here 4 to 5 years ago. They have 6 or 7 boats now that go out 20 to 30 miles for croaker, spot, shark (dogfish), conch, and hard and soft crabs. There once was a clam house here as well. The 1998 NMFS landings for Wachapreague were small, mainly gill-netting for horseshoe crabs and pot-fishing for conch and blue crabs.

Captains and crew on the boats are mostly local. In July, 1999 they were fishing for shark (dogfish). Boats come in from North Carolina to Massachusetts. Currently this business wholesales exclusively and sends it product to other wholesalers by common carrier. Plans call for a retail market in the future.

The boats shift from longlining to gillnetting to conch or crab potting. There are usually three crew per boat, all in their 30s and 40s. There are no female fishers in the area.

Other Observations on Wachapreague

In November 1999 Dr. Peter Fricke, of the Sustainable Fisheries Division of the National Marine Fisheries Service, researched the status of Wachapreague as a "fishing community" under the definition of the Magnuson-Stevens Act. His brief study, done by consulting U.S. Census and state and federal fisheries data and making phone calls to port agents and other knowledgeable persons, shows what can and should be done for individual ports when and if they are identified as critical for particular FMPs. With his permission, we reproduce his report on Wachapreague which was prepared in response to review of the spiny dogfish FMP of the New England and Mid-Atlantic Fishery Management Councils. The level of detail provided here was not possible for our study but should be provided in specific FMPs.

Wachapreague, VA is a small rural, non-farming community on the Atlantic Ocean side of the Eastern Shore of the Chesapeake Bay. It lies in Accomack County and is approximately 60 miles North of Norfolk, VA and the same distance South of Salisbury, MD.

Wachapreague provides a sheltered harbor behind a series of barrier islands lying offshore to the East, and is close to U.S 13, a major highway connecting Norfolk and the Carolinas with eastern Maryland, Delaware and Philadelphia. At the time of the 1990 Census, Accomack County had a population of 31,703 and Wachapreague had 313 residents (the 2000 Census gives the county population at 38.305 and Wachapreague's population at 236). The town is incorporated, and has three marinas that provide local moorage. Two of these marinas are privately owned, and in addition to moorings each provides a launching ramp, a bait and tackle shop, and a restaurant. The town owns and operates the third marina, which also has a launching ramp. A fish packing house is located next to the seawall, which provides dockage for four vessels owned by the packinghouse. Other businesses in the community include a grocery and a hotel. Respondents report that employment and commercial activity in the community peak in the summer months. Most businesses are reported to rely on the participants in recreational fisheries for their principal earnings, and the commercial fisheries for a year-round trading base.

Wachapreague, VA at a Glance (1990):

Item	*Number*	*Employment or value*
Population*	313 persons	
Households*	159 households	
Pop. Aged >64*	41%	
Workforce*	106 persons	
Live and work in community*	32 persons	
Household income*		
Transfer income	40 percent	
Earned income	60 percent	
Fishery businesses		
Marinas	3	5 persons FTE**
Bait & tackle	2	4 persons FTE
Boat ramps	3	1 person FTE
Restaurants	3	12 persons FTE
Hotel	1	8 persons FTE
Fish dealers	2	3 persons FTE
Packinghouse	1	8 persons FTE
Grocery	1	3 persons FTE
Commercial boats(all)	25 approx.	(75 persons seasonally)
Homeported	5	15 persons FTE
Transients:		
Other VA.	14	
Out-of -State	6 approx.	
Charter boats (all)	15 approx.	(35 persons seasonally)
Homeported	7	9 persons FTE
Transients	8 approx.	
Recreational boats		
Year-round	40-50 approx.	
Commercial fish landings (all)	362,167 pounds (100%)	$110,104 (100%)
Dogfish	236,000 pounds (65%)	$44,480 (41%)

** 1989 Bureau of Census data. All other information is for 1997.*
*** FTE ~ full time equivalent employees; estimate of year round employment*

Once known as the "flounder capital of the world," Wachapreague continues to be actively involved in recreational fisheries. The marinas provide some 100 slips between them, *with between 40 and 50 private recreational fishing boats moored for the full season. Other transient boats use the marina slips, but the greatest use of the facilities is reported to be by trailerable boats launched from the ramps by fishermen travelling from the Norfolk area, Maryland and Delaware. It was reported that, during the summer flounder season (mid-April to mid-September), parking spaces in the community are non-existent at weekends and on holidays because of street parking by boat trailers and towing vehicles. Seven charter boats were reported to be based in Wachapreague year-round, and another eight to ten charter boats, from as far away as Florida, operated from Wachapreague during the flounder season. The charter and party boats homeported in Wachapreague hold Federal permits for Atlantic tuna angling (5), Atlantic tuna general (1), black sea bass (1), NE Multispecies groundfish (1), scup (1), squid-mackerel-butterfish (1), and summer flounder (1).*

Principal inshore recreational fisheries are for summer flounder (fluke), croaker (hardhead) and spot. Striped bass (rockfish), red drum, black drum and sea trout (weakfish) are also reported to be taken inshore. The offshore recreational fishery (mid-June to mid-September) is for bluefin tuna, yellowfin tuna, dolphin (dorado; mahi-mahi), wahoo, white marlin, blue marlin and sharks. The marinas and local sportfishing organizations sponsored nine recreational fishing tournaments in 1997.

Wachapreague Recreational Fishing Tournaments, 1997

Month	***Tournament***
April	*Wachapreague Marina Spring Flounder Tournament*
April	*Capt. Zed's Wachapreague Spring Flounder Tournament*
June	*MSSA Tuna-ment*
June	*Annual Greater Atlantic Bluefish Tournament*
July	*Eastern Shore Marlin Club Tournament*
August	*"Chick-charter" Ladies Tuna Tournament*
August	*Wachapreague Fall Flounder Tournament*
August	*Fish for Hope Charity Tournament*
September	*Eastern Shore Marlin Club Fall Tournament*

In 1997, spiny dogfish comprised 65.2 percent of commercial landings by weight and 40.7 percent by value, of all reported landings at Wachapreague. Other landings are made, such as conch, which are trucked by fishermen to other ports and sold there to dealers. These landings will appear in the port-of-sale's landing data and will not be attributed to Wachapreague. Moreover, landings from fishing operations within the three-mile territorial sea or for fish, such as conch, for which Federal permits are not required, do not always *appear in the NMFS weighout data. This information is reported to the Commonwealth of Virginia's VMRC as a condition of state permits.*

Two dealers holding Federal permits operate in Wachapreague. One dealer operates the packinghouse, the second offloads from vessels into trucks for direct delivery to retail establishments or processors in other communities. The packinghouse in Wachapreague holds a range of Federal permits for local fisheries that require them, and most reports of landings are provided by this facility to NMFS. In addition to packing the landings of the vessels fishing in the territorial sea and exclusive economic zone, the Wachapreague packing house also is reported to pack finfish and crab landings from Chesapeake Bay fisheries which are trucked to the facility across the peninsula. The packinghouse is family operated and employs 8 to 10 staff on a seasonal basis. The packed products are shipped to seafood processors by tractor-trailer. It is reported that a dedicated tractor-trailer hauls dogfish, during the season, to processing plants in Massachusetts.

Wachapreague is an established community, and recognizes its roots in fisheries and agriculture with an annual community fair and exhibits of old photographs and memorabilia. A preponderance of the County and Wachapreague's residents (79 percent) lived in Accomack County in 1985. However, 70 percent of Wachapreague's residents lived in the same house in 1985 as they did in 1990, in contrast to 60 percent of Accomack County residents. The depth of the roots of the community can be seen in the 1990 Census data.

Wachapreague has an elderly population compared to Accomack county; 41.5 percent of Wachapreague's residents were over the age of 65 years and only 16.2 percent of the residents under 25 years of age in 1990. In Accomack County residents over 65 years of age formed 18.5 percent of the population, while those under 25 years of age comprised 31.7 percent at the time of the 1990 Census. The residents of Wachapreague are white; in 1990 no members of minority groups lived in the community. In contrast, the white residents of Accomack County formed 65 percent of the county's population in 1990.

The gender balance of the populations of Wachapreague and Accomack County was similar; 47.5 percent male and 52.5 percent female. However, household composition differed markedly between Wachapreague and Accomack County in 1990, due to the distinctive population age structures. In Wachapreague most residents lived in two-person households (46.5 percent of 159 households) and 34.6 percent of the households had one resident. In Accomack County, 38.7 percent of the 12,646 households had three or more persons living together, 34.1 percent of the residents lived in two-person households while 27.2 percent lived alone.

Of the 313 persons resident in Wachapreague in 1990, 106 were employed in the work force. Of those employed, 32 persons (30.2 percent) worked in the community. In fact 77.4 percent of Wachapreague's work force were working in Accomack County or Wachapreague itself, while 17 percent worked in Northampton County or the Norfolk/Hampton Roads area to the South. Six persons (5.6 percent of the work force) were employed out of state, in Maryland. In Accomack County as a whole, in contrast, only 13 percent of the work force (13,643 persons) worked in their communities of residence, while 84.5 percent worked within the County. Some 882 persons (6.4 percent of the workforce) commuted south to Northampton County or Norfolk/Hampton Roads, and 1,229 persons (9 percent) worked out of state in Maryland. The employment patterns of commuters in part reflects Wachapreague's location in the southern third of Accomack county and the availability of unskilled and semi-skilled work in the poultry farms and packing houses of the Delmarva Peninsula.

The educational attainments of the residents of Wachapreague and Accomack County as a whole differed. Of the residents over 25 years of age in Wachapreague (n=262), one-

third had not completed high school graduation requirements compared to two-fifths of County residents over 25 years of age (n=21,643). In Wachapreague, 14.1 percent had acquired a tertiary education qualification compared to 13.4 percent of residents of Accomack County over 25 years of age.

While three of Wachapreague's 313 residents lived on farms, no one declared income from farming in 1990. The 1990 census shows that 8 persons were employed in farming, forestry or fishing industries and 5 in farming, forestry or fishing occupations. Employment in transportation was 12 persons. The census also indicates that 58.5 percent of the Wachapreague work force was in the private-for-profit sector and 21.6 percent was self-employed. Information provided by respondents comports with this census data. Since the majority of fishermen are paid on a "share" basis, they are deemed, for tax purposes, to be self-employed. Employment on the four local commercial vessels would be between 12 and 16 persons, and the local charter fleet of seven vessels would provide seasonal employment for between 14 and 18 persons. Year-round employment at the private marinas was estimated to be 8 persons, with seasonal employment up to 15 persons. The packinghouse was estimated to employ 8 to 10 persons year round, with additional staff hired as necessary. Obviously, County residents would fill some of these jobs, since only 32 Wachapreague residents were reported to work in the community.

The median income of Wachapreague households in 1989 was $19, 917, while that of Accomack County households was $20,431. The older population in Wachapreague introduced significant differences in the income patterns between community households and County households. Of the 159 households in Wachapreague 59.1 percent (94 households) reported earned income in 1989, compared to 74.3 percent of Accomack County households. In Wachapreague, 36.4 percent of the households received retirement income and 56 percent of households received Social Security payments. In contrast, only 18 percent of Accomack County households received retirement income while 37.3 percent of County households received Social Security payments.

To summarize, Wachapreague demonstrated in 1990 the profile of a rural town with an older, retired population with some 41 percent of residents receiving income in the form of transfer payments from retirement funds and/or Social Security. Of the employed residents of the town, only one-third works within the community. Thus approximately 70 percent of the working population earned income from sources other than the community's businesses. The businesses of the town are fishery-oriented, with respondents suggesting that direct employment and earnings in the recreational and commercial fishery sectors are split 2:1 between the two sectors. Since the recreational fishery is highly seasonal, peak employment in Wachapreague may exceed 100 jobs at the height of the summer season.

The dependence of some 20 percent of community households for income earned from fishing related activities indicates that this is a fishery dependent community economically. As noted it is estimated that two-thirds of this income is related to recreational fisheries and one-third to commercial fisheries. The proportion of long-term residents, fishing related community events and activities, and the number of retirees, indicate that the social and cultural needs of the population are satisfied by this water-front community and that fishing, both commercial and recreational, is substantially engaged in by the residents of the community.

With regard to the dogfish fishery, the packinghouse and its vessels employ some 20 persons. Any changes in the dogfish fishery would directly impact these persons and this business. Alternative employment might be available in an expansion of the services related to the recreational fishery and in charter-boat operations in the long-term, but more likely *displaced packing house employees would need to find work in the poultry processing and trucking businesses of Accomack County and the Delmarva Peninsula. For the watermen affected by any changes in the dogfish fishery, the future is less bright. Dogfish make up 65.2 percent, by weight, of the catches landed in Wachapreague, and thus a major portion of the local vessels seasonal round of fishing. The recreational fishery is largely a small-boat and trailer fishery, and future opportunities to enter the seasonal charter fisheries would require a significant upward demand in charter boat services. In a worst case scenario of loss of the dogfish fishery due to stock failure or management action, the community would probably lose a significant portion of its community-based winter employment, and would have to rely on seasonal recreational fishery-related employment and businesses.*

NORTH CAROLINA

The following two community profiles describe an example each of a recreational community and a commercial community.

Recreational Fishing

The following section is from McCay and Cieri (2000) and focuses primarily on the recreational harvest of dolphin and wahoo.

Field Observations and Interviews, Dare County, North Carolina
Summer 1998, July 1999

<u>Hatteras</u>

Hatteras and Its Fishery
(Note: This part is based on field research done by Doug Wilson in 1998 for the Highly Migratory Species social impact assessment, Wilson and McCay 1998).

Hatteras Village is a rural community at the southern end of Hatteras Island on North Carolina's Outer Banks, part of Hatteras Township (pop. 2,675 in 1990). Hatteras Island is the "classic example" of a dynamic barrier island, which is bordered by the Atlantic on the east and Pamlico Sound on the west. Noted for it's vast marine resources, the area is also an important point of departure for marine vessels, and has historically been considered a strategic location on the coast of North America during war.

Geographic isolation adds to the local character of Hatteras. Respondents said that it is a place where people feel safe. Some people leave their houses unlocked. It feels safer because it is an isolated island community. A ferry leaves Hatteras to go to neighboring Ocracoke Island. Usage of the ferry is very heavy in the summer when you can bet get cars backed up for a half a mile. The village is quite and insular and "made up of a lot of people who came here to get away from something."

In the 18th century, Hatteras established itself as a seaport community, where activities included whaling and exporting/ importing. However, due to the dynamics of the barrier island geography, Hatteras Inlet was closed in 1764, only to be opened up again during a large storm in 1846. Since World War II the economy of the Hatteras community has depended on charter and commercial fishing as the major sources of local income; tourism also serves as an important economic activity.

Seasonal variation in the local economy of Hatteras is due to the presence of three "seasons". In the spring, revenue begins to pick up during weekend and holiday tourism; it is during this period of time (April to May) that approximately 30 boats from the commercial fleet become active in charter fishing. The second season, approximately June through August, *begins when schools let out for the year and family vacations are frequent. The third "season" is the fall, when fishing, surfing and windsurfing are the dominant activities.*

In Hatteras, 57% of employees are private for profit wage and salary workers. Tourism and recreation are major industries in Hatteras in terms of employment. Commercial fishing is also a major occupation on Hatteras Island, where there are approximately 500 to 600 part and full time commercial fishermen; recreational fishing is a source of seasonal employment. According to the 1990 Census, twenty-one percent of employed persons work for the local (8%), state (7%) or federal (6%) government; these public sector jobs include ferry workers. Self-employed workers make up 16% of the employed work force.

When combined, managerial, professional, technician, and administrative jobs account for nearly half of the occupations reported in the 1990 Census. Farming, forestry and fishing jobs are held by 6% of those employed in Hatteras.

Fishing Related Businesses

In Hatteras there are five seafood wholesalers and one retail market; there are three marinas. Businesses in surrounding communities such as Manteo and Buxton also add to the marine economy. Hatteras Village is almost totally dependent on fishing. While non-fishing tourists, especially windsurfers, are attracted to beaches elsewhere on the island, Hatteras Village's own beaches are less appealing. Tourists come to Hatteras because they want to fish. Our oldest respondent (in 1998) told us that when he was growing up the only thing to do was fish. He remembers one morning, fifty years ago, counting some 260 boats going out of the harbor. They were gillneting for trout and croakers and "caught a lot more fish than is being caught now." The recreational and charter fishing industry's history is just as proud. The wall of one charter boat office is covered with captioned pictures displaying the history of the Albatross Fleet. In 1937, the four sons of a commercial fisherman went into the charter business. Their first sailfish was caught in 1940. Tarpon and dolphin began in 1940. They hired a publicist to spread the word about big game fishing in Hatteras. They caught their first marlin in 1951. In 1952, the first blue marlin was caught by a lady. In 1962, The Albatross III caught a world record, 810 lb blue marlin. The headline on a yellowing copy of a 1958 New York City newspaper article proclaims the shocking news of an "Angler Deliberately Releasing a Blue Marlin!" (Hurley 1958). The angler was Jack Cleveland of Greenwich CT fishing on the Albatross.

Marinas and Charters

As we did for Point Pleasant/Brielle, New Jersey, we offer some detail on the sports-fishing component of Hatteras, which is otherwise not treated in this study. It is based on field research done in 1998 by Douglas Wilson (Wilson and McCay 1998).

A charter boat captain related in 1998 that newcomers are amazed at how good the fishing is. Ditton et al. (1998) did a survey of both private and charter boat anglers in Hatteras in the winter of 1997. Their results support the captain's assertion. They found that of 644 anglers, 46 percent agreed with the statement "I caught more fish than I expected on this trip" and 42 percent agreed that they "could not imaging a better fishing trip." The winter season is bluefin tuna. In early spring they get puppy drum on the beach, and offshore yellowfin tuna, dolphin, wahoo and marlin. Sailfish come in June. In the summer with the warm water they get "all fish": flounder, cobia, speckled trout, drum, wahoo, marlin and sailfish. In the fall are flounders, king mackerel and rockfish.

The marinas are 100 percent fishing related. Over the course of the year most people come to fish with their boats, both trailer boats and over water boats. A marina owner estimates that half of the parties are all men and about half families. The families go to the beach, the shops, and amusements such as go cart tracks. The winter bluefin tuna fishing brings a greater percentage of the trips to the charter fleet In their census of fishing trips during the bulk of the 1997 winter season, Ditton et al. (1998) found only 27 percent of bluefin tuna fishing trips were in private boats and the rest in charter boats. Ditton et al. (1998) found 51 charter boats in Hatteras in January.

Make up charters, where marinas organize the parties, are becoming more and more common. A captain estimated that his marina did 140 make up charters in the past year. The majority of the charter customers are after a good experience with offshore fishing. One captain, who has been chartering for many years, believes that the motivations of the charter customers are changing. He describes the current group as people who want to get way from city jobs and have fun with something really different. A lot of them are outdoorsmen in other areas. The fishing puts them in touch with wild creatures. The "game hogs," meaning those primarily interested in getting a lot of "meat," have dwindled. He sees the customers as will to accept limits when they are imposed. Often they are more willing to accept limits than people who have fished all their lives. Meat, however, is still an important motivation for all anglers except for billfish anglers. In fact, another captain, who does about a quarter of his business on billfish, sees the growing catch and release ethic as having reduced angler interest in marlins.

Captains say it is very hard to find a year round mate. The college students who work in the summer can make more money when they graduate. It's a good lifestyle for a college student, but to find someone year round they have to like to fish. These are more skilled fishers and they want their own boats. One captain said that "of the boats that are fishing year round, you can bet that the mates that they have are looking for a boat to fish in the future." He estimates that about one in five mates are married and supporting a family.

Changes in fishing affect charter bookings almost instantly. Within a couple of weeks after a fish species is gone the marinas will start to get cancellations. Charter customers show little loyalty to North Carolina as a place to fish. Ditton et al. (1998) found that less than a majority of charter boat anglers (44 percent) opposed restricting NC fishing to benefit other parts of the coast, while a majority of the private anglers (57 percent) opposed the measure. They also found that anglers from NC were more likely to oppose the measure.

Because Hatteras attracts top sport fishers from around the world, the issues of minimum sizes and trophy fish take on special significance. One captain, by his account and that of others, attracts people who come specifically to fish for world records. They are interested in setting records by catching smaller bluefin tuna on fly rods. In 1997 fishing for fish between 27" and 73" was closed on March 2nd. Between, March 5th to March 18th, he had four different groups of people coming to fish for bluefin tuna for world records; and they all canceled because they could not keep a world record fish even if they caught it. Few anglers want to release bluefin tuna. Ditton et al. (1998) found that 60 percent opposed catch and release only for bluefin tuna. Keeping trophy fish "means a lot to someone who has paid a thousand dollars to go out fishing" the marina owner said.

The "charter business is not native sons any more" said one respondent. A captain estimated that where the village had 15 charter boats ten years ago there are now 40. These are the charter boats that stay here all year round. Transient charters come for the "cream of the crop," particularly the bluefin season. Ditton et al. (1998) found 51 charter boats in the village during the 1997 bluefin season. There is tension between the local charter boats and *the transient charters because of increased competition for both fish and customers. One new charter boat is a state-of-the-art luxury boat with fish finding electronics, a stereo, a microwave and air conditioning. The locals argue that he could get $1500 a day but instead charges but a little more than the going rate. He has announced that he intends to take business from people. However, they say that the charter fleet has not reached a saturation point and that the customers are still happy. The charter captains say they generally work well together. There is also tension with private recreational fishers who following the charter boats to see where they fish.*

Another long-time, local fisherman is running two party boats. He is finding more and more ways to make the party boat a family excursion. He does pirate trips and other special off shore trips. He also does birding trips.

Tournaments

The Hatteras Village Civic Association holds three tournaments a year. Tournaments attract people for the prize money and the social events that surround them. The biggest in the area is the Big Rock tournament the first week in June. The present tournament is three days and many boats fish out of Hatteras. One marina manager, interviewed just after a tournament in May, reported that the tournament attracted 9 boats. This was an increase of a third over the year round boats. Also in May is a tournament at another marina and one at a private club. Tournaments are in May because it is otherwise a slow month. There is also a king mackerel tournament in the fall,

Recreational billfishing in Hatteras is described by respondents as totally catch and release. The only exception, and it is an important one, is large tournaments. There are seven such tournaments in North Carolina that are too large and if these tournaments were not allowed to kill fish it would have a negative impact on all businesses related to recreational fishing. The biggest tournament directly affecting Hatteras is the Big Rock in Morehead City. Many boats in this tournament fish out of Hatteras. The blue marlins being killed in tournaments are 110 inches. Respondents disagree about the affect of a 113 inch size limit on these tournaments, but 113" inches is tending toward a rare event. It would make it possible that a tournaments would not catch any fish. The tournament at the private club in Hatteras is a total release tournament and has been for five years. However, it is for a trophy only. The organizer says that they lost a few people when they shifted to total release, but they picked up even more. In his estimation, more people don't want to kill than do. The scales at the club are rusted out, they couldn't weigh fish in any case…

Fishing Association and Small-Boat Mixed-Fishery Concerns

The only active commercial fishing organization is the Hatteras-Ocracoke Auxiliary of the North Carolina Fishermen's Association, which has been organized since 1992. In the current Hatteras fleet there are 35 or so small gill net boats dependent on a very diverse fishery. What disturbs them the most is the possibility of limited entry systems. They fish five or six species a year but do not always fish the same ones every year. What scares them is that they will not be fishing sometime when landings are counted for some system based on current participation.

Field Observations and Interviews, Hatteras, NC, July 1999

Commercial fishing in Hatteras is said to be much like that of Ocracoke in terms of the size and number of boats (30' to 45'). They mostly trawl for shrimp in the summer and "drop net in the ocean for trout" in the winter. A distinction of Hatteras is that its crabbers are said *to be more conservative than those on the west banks of North Carolina: Hatteras crabbers have little more than 300 pots apiece whereas on the western banks crabbers do not run less than 1,000 pots apiece. According to one of our informants, the more diversified nature of fishing in the Hatteras area accounts for the difference: "Our diversity allows us to fish fewer pots."*

There are three major sites for fishing boats in Hatteras: two marinas and the docks off Altoona Lane. The docks on Altoona Lane are said to service 20 to 25 crabbers and fishermen, using small boats, up to 35', as well as a couple of larger boats, including a 47' boat used for dogfish by a local fisherman who was fishing up off Massachusetts during our visit. One of the managers of a seafood house here said of the fishermen "They're doing everything they can do to make it. They'll probably be left standing because they do so many different things while inland they only do one or two things." He also said it has been hard to get people to work on the boats or in his fish house because of various regulations.

One of the businesses we interviewed has been in place since 1982. It has experienced a major decline in business from 1994 to 1999, an almost 50% decline. The owner blames this on regulations, in a subtle process: "They take one thing away, then another and another, and finally it all makes a big impact." He says that he's "a believer in the cycle of fish. However, the fishery managers disagree". Still, he insists, "Our fish are coming back now like in '80 and '81. Things like the weather patterns make a big difference in whether there are fish around or not."

He said that he used to go to fisheries meetings all the time but doesn't anymore because "they already have their minds made up." And he has taken to giving money to politicians rather than to fishermen's associations. He feels that the sportsfishermen have more money, and that's why they are winning out. He did say that a state senator from North Carolina has been a champion of the commercial fishermen.

As far as the local community is concerned, he said that it has turned against commercial fishermen in the last 5 or 6 years, primarily because of the ascendancy of tourism. "I'm fighting to stay here, to keep the business viable, what with the mortgage, taxes, all those things." While there obviously have been efforts to preserve wetlands within Hatteras, especially in outlying areas and near the Altoona Lane docks, some large, expensive houses and condominiums have been built on or next to wetland parcels. As he puts it, "There are 20 slips here, and they're probably worth $1,200,000." He sees that pressure is coming to change this area into a residential and/or tourist area. "I don't blame the community. It's changing, but we don't want to change with them," he said.

Another dock in Hatteras is owned by a company based in Wanchese, NC. It is a very small dock, and the dock manager is the major fisherman. He dogfishes in the winter. He leases his boat because, he says, it's too risky to buy it, especially "since we're losin' it" with regards to management of the dogfish fishery. The gillnets they use for dogfish are very expensive. He believes they could have doubled their dogfish catch if they regeared, but won't regear because of the pending regulation. They would have regeared a year ago, but they told them the regulation was coming last year, preventing them from buying new gear then. He said if they had known it wasn't coming until later this year, they would have regeared then, but now it's too late to make it profitable. "They can't put you right out of business, but they'll chisel away at you 'till you can't help but get out of it." "They try to preserve species in the same waters, even when they aren't compatible, even when they eat each other".

This man gillnets for dogfish in the winter. He has 1,300 yards of 4 inch mesh net for croaker. He only sets the small nets twice. He said most fishers in this area do both large and small mesh netting. In the winter they small mesh for croaker and grey trout, but these *species are so plentiful then that the fish houses won't buy from the small time fishers. He said that they aren't getting any trout this year anyway; "trout this year are almost non-existent."*

He says that the way that the inlet has been changing has greatly reduced their ability to catch fish in the inlet. The deep water channel has shifted parallel to the shore, making it unlikely that fish would travel past the sand bars, into the channel. They usually set the pound nets just off the edge of the deep water channel, and a few stop nets in the channel. They have seen fewer fish since the shift.

The weather had been too windy for the past four weeks. The currents are too strong for the bottom fish. No one had packed here for the past two weeks. There is generally a lull this time of the year(July). "But the longhaulers will pick up soon."

The fishermen's hangout, or where they gather when there are more around, tends to be Oden's dock or Sonny's Restaurant

COMMERCIAL FISHING

The following description has been excerpted from the Ecopolicy Center's report that describes communities that exploit the HMS fisheries (1998).

Wanchese Community Profile

Wanchese is located on the southern part of Roanoke Island, located in the northern Outer Banks. This small fishing village is said to have "changed as little as those who have lived here for generations" (Cutchin, 1997). Although ultimately unsuccessful, the first American colony was Roanoke Island; today, a local theater group's re-enactment of this historical event is a popular tourist attraction (CNCSS, 1993). The village actually received its name from a Native American leader named Wanchese who greeted these first English settlers in 1584; Wanchese was officially named when the federal postal system was established in 1886 (Cutchin, 1997).

Throughout the nineteenth century, the commercial fishing industry expanded, due in part to the involvement of the first postmaster (CNCSS, 1993). This postmaster owned or financed most of the commercial fishing boats in Wanchese; he also established a system of credit for the fishermen at his store, which was paid off when they brought in their catches. During that time, almost all of the residents of Wanchese were commercial fishermen. Today the village still revolves around fishing, but has expanded to include processing plants. Though traditionally a commercial fishing community, recent growth in tourism and recreational fishing has sparked competition between the new and the old for a restricted resource.

Wanchese's first fish house was begun in 1936 by the grandfather of the current generation that still runs two fish houses in the community, one of which related this history. His son fished the first trawler in Wanchese in the 1950s. He took a little 65' wooden boat and converted it into a fishing trawler. The grandfather stayed and helped packing boats but he was a gillnetter at heart and would rather be catching fish. In those days they were fishing more in Pamlico and Abermarle Sounds than in the ocean. They beached fished for sea mollusks, trout, croakers, spots, striped bass, and bluefish. In the Sounds they fished croakers, butterfish, Spanish mackerel, spots, and pigfishes. With the trawler they began flounder fishing in the winter. Then they would go offshore and catch some sea bass later in the year. They bought another similar boat and then a WWI converted subchaser. The subchaser was the first boat to try scalloping. The owner of a third fish house built the first flynet in 1971.

Demographic Profile
Population

The 1990 Census population for Wanchese to be 1,374 residents; however, this count is not entirely accurate since the Census includes Nags Head and Roanoke Island with Wanchese (CNCSS, 1993). This population consisted of 51% men and 49% women. Population estimates since 1990 were not readily available for Wanchese.

The relative absence of seasonal change in population for Wanchese departs from the normal pattern of seasonal variation found in the surrounding communities. Since commercial fishing is central to the economy of Wanchese, it does not see the shifts in population that occur due to tourism in the summer months (CNCSS, 1993).

Racial and Ethnic Composition

In 1990, the population of Wanchese primarily consisted of White residents (98%), although a little over 1% of its residents were American Indian. The ethnic composition of Wanchese is primarily European ancestry; nearly 29% of the residents of Wanchese claim United States ancestry.

Age Structure

Forty-six percent of the population of Wanchese are between the ages of 15 and 44 years old. The even age structure is shown by the nearly equal percentage of young and old - 26% below 15 years and 27% above 45 years.

Marriage

In Wanchese, 18% of the population over 15 has never been married. Nearly 69% of the population is currently married. Less than 5% are widowed; approximately 8% are divorced.

Household Composition

According to the 1990 Census, there are 503 households in Wanchese which have an average of 2.69 persons per house. Nearly 63% of these are married couple family households. Of the family households without married couples, three percent are family households with male householders and eleven percent are family households with female householders. The remaining 24% of households are non-family households. Table 5.7 gives additional household information for Wanchese.

Table 5.7. HOUSEHOLD COMPOSITION, WANCHESE, NC (Source: U.S. Bureau of the Census).

Total Number of Households	*503*
Average Number of Persons per Household	*2.69*
Percent of Married-couple Family Households	*62.6*
Percent with own children under	*18 36.0*
Percent of Male Householder Family Households	*2.6*
Percent with own children under	*18 2.6*
Percent of Female Householder Family Households	*10.9*
Percent with own children under	*18 6.0*
Percent of Non-family Households	*23.9*
Percent of Householders Sixty-five or older	*14.3*

There are 583 housing units in Wanchese, of which 88% are occupied. Of the vacant housing units, 14% are vacant due to seasonal usage. Table 5.8 shows additional housing information from the 1990 Census.

TABLE 5.8 HOUSING INFORMATION WANCHESE, NC (Source: U.S. Bureau of the Census).

Total Housing Units	*583*
Owner-occupied Units	*384*
Median Value	*$75,200*
Renter-occupied Units	*129*
Median Contract Rent	*$320*
Vacant Housing Units	*70*
Housing Units Vacant for Seasonal Use	*10*

Educational Trends

In Wanchese, sixty-seven percent of the population 25 and over are high school graduates, according to the 1990 Census. Educational attainment for Wanchese residents is shown in Table 5.9.

The only educational facility located in Wanchese is the private Wanchese Christian Academy, founded by the Wanchese Assembly of God members in the 1970s (CNCSS, 1993). Public schooling is found at the Dare County schools in Manteo; this school system has elementary, middle and high school facilities. The College of Albemarle has a satellite campus in Manteo; secondary education offered by the college at this site includes a boat-building course (CNCSS, 1993).

TABLE 5.9 EDUCATIONAL ATTAINMENT (PERSONS 25 YEARS AND OLDER) WANCHESE, NC (Source: U.S. Bureau of the Census).

	# of Persons 25 years and older	*% of Population*
Less than 9th grade	*85*	*10.8*
9th to 12th grade, no diploma	*172*	*21.8*
High school graduate (includes equivalency)	*259*	*32.9*
Some college, no degree	*170*	*21.6*
Associate degree	*40*	*5.1*
Bachelor's degree	*32*	*4.1*
Graduate or professional degree	*29*	*3.7*

Fishing Associations

Fishing related associations include the Oregon Inlet Users Association and the North Carolina Fisheries Association. The former is involved with supporting the plans for jetties at Oregon Inlet; they are responsible for organizing both the Wanchese Seafood Festival and the Blessing of the Fleet. The latter is a trade organization of seafood dealers and commercial fishermen from the state; two members of the 18 member Board of Directors are from Wanchese (CNCSS, 1993).

Economic Characteristics

Income The 1989 per capita income for Wanchese was $10,830. This is below the state per capita income ($12,885) and the per capita income for Hatteras ($12,796).

Employment Trends Of the 984 Wanchese residents 16 years old and over, 85% participate in the civilian labor force. The unemployment rate is 10.0% of the civilian labor force; of this unemployment rate, 2% consists of male unemployment and 8% is female unemployment. Of the employed work force in Wanchese, approximately 57% are men and 43% are women. The number of working women has been on the rise, due in part to the increase in opportunities for women outside the home created by tourist businesses in the beach communities surrounding Wanchese (CNCSS, 1993).

According to the 1990 Census, 61% of the working population in Wanchese is employed in private for profit jobs. Jobs in the private sector are largely related to the area's commercial fisheries (CNCSS, 1993). Most of these workers are self-employed; the Census figures show that nearly 19% are self-employed workers. Government jobs are considered desirable due to the security and consistency in contrast with the fishing industry (CNCSS,1993); figures from the 1990 Census show that nearly 17% of the workers are employed with the local, state or federal government.

Employment by Industry Nearly 20% of the employed persons over 16 in Wanchese are working in the agriculture, forestry and fisheries industries; this is the highest rating industrial sector for employment. These industries are followed by retail trade (19%) and professional and related services (16%) in terms of employment of Wanchese residents. Farming, forestry and fishing occupations are held by nearly 19% of the Wanchese employed population. Other prevalent occupations are technician and administrators (25%) and managers and professional (17%). Table 5.10 shows the role of industry as an employer in Wanchese. Unlike the surrounding communities, Wanchese has very little seasonal variation in employment resulting from tourism; what seasonal fluctuations do exist are caused by the availability of the fisheries resources and are countered by the flexibility and opportunistic nature of the Wanchese fishermen (CNCSS, 1993). This flexibility is now being threatened; this is addressed below. However, the tourism industries in the surrounding communities do provide seasonal employment opportunities to residents of Wanchese.

TABLE 5.10 EMPLOYMENT BY INDUSTRY (EMPLOYED PERSONS 16 YEARS AND OVER) WANCHESE, NC Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	137	19.7
Mining	0	0
Construction	35	5.0
Manufacturing, nondurable goods	9	1.3
Manufacturing, durable goods	57	8.2
Transportation	17	2.4
Communications and other public utilities	9	1.3
Wholesale trade	46	6.6
Retail trade	133	19.1
Finance, insurance, and real estate	23	3.3
Business and repair services	25	3.6
Personal services	27	3.9
Entertainment and recreation services	20	2.9
Professional and related services	112	16.1
Public administration	46	6.6
Total	696	100

<u>Fishing Related Businesses</u> There are approximately 117 small businesses in Wanchese, 44 of which are commercial or charter fishing businesses (CNCSS, 1993). Some of the more prominent local businesses are described below. Support industries, such as boat builders and seafood packers, are also of great importance to the commercial fisheries.

There are three major fish houses in Wanchese. One, which specializes in scallop and flounder, has fourteen boats which include trawlers, scallop boats and smaller boats for gill netting as well as two scallop boats in Alaska (CNCSS, 1993). They have three packaging and processing houses, a fish-packing house and a processing and freezing operation; These are located in North Carolina, Virginia and Massachusetts. Seafood is distributed locally and nationally by truck and internationally by air freight. The second, which specializes in hooked fish, is an important seafood distributer; this company is the most affected by this FMP. While only operating one boat, this company buys regularly from 35 local and over 70 non-local boats. The third, which specializes in bulk fish, packs the fish from its own two vessels; transportation of their product is set up through an agreement with the Wanchese Fish Company (CNCSS, 1993).

The Wanchese Seafood Industrial Park was constructed in 1980 by the state; it is operated by the North Carolina Department of Commerce. According to the brochure put out by North Carolina Power in 1995, the park has, among other features, "30 acres of leasable land," "a 15-acre deep water harbor," and "1,500 feet of commercial-style concrete docks." There are currently seven seafood related businesses located at the park (CNCSS, 1993).

Part of the Wanchese Seafood Industrial Park project were plans for inlet stabilization. Originally, the seafood park that now takes up half of the newly expanded Wanchese harbor was voted down by the people in the community. The reason they finally put it in was because of the issue of a jetty for Oregon Inlet, which is the most direct route for Wanchese boats to get to open ocean. The state argued that if they were going to spend a hundred million dollars on a jetty the federal government should dredge the harbor, as part of the agreement of the Mateo (Shallowbag) Bay Project (CNCSS, 1993). At that time, the harbor was half as wide as it is now. They dredged it out and piled the spill in the area which is now occupied by the park. They put a cement dock in as well. The state essentially came back to the Wanchese community and said if you want a jetty at Oregon Inlet, you have to have the seafood park first. At first they revolted and then acquiesced because of the importance of the Inlet. They had been trying to get the jetty since the 1950s. Ironically, they still haven't gotten it jetted. The industrial park is also the scene of the annual blessing of the fleet, which is put on by the Oregon Inlet Users Association.

FISHERIES PROFILE

Wanchese as a Multispecies Fishery

A central fact about fishing in Wanches's is the large number of commercially important species that they catch. Many respondents emphasized how they have to be versatile to survive, particularly because they face quick changes in water temperatures. They suggest that Wanchese is much more of a mixed fishery than in the north where people can fish the same species year round. Among the highly migratory species they fish for swordfish, shark, and tuna. Yellowfin tuna is particularly important but they also catch bigeye and bluefin tuna. Because of the weather, summer is the time that they tunas and swordfish are accessible to the medium sized boats that can both gillnet and longline, and late summer is a slow time for everything else. A captain of one of these medium size boats, however, said that he would prefer to stick with shark fishing year round because of the danger of going for tuna and swordfish farther off shore. They gillnet for dogfish, bluefish, Spanish mackerel, trout, and *croakers. The latter two are important in the winter and the Spanish mackerel is important in the spring and fall. They bottom fish for bass and grouper. There are a number of gillnet boats that switch over to charter fishing in the summer. Large trawl boats fish for squid in the summer and a smorgasbord of weakfish, croaker, and flounder in the winter. Squid requires them to travel north. There are now less than fifteen of these trawl boats that stay at Wanchese. The biggest shark months are April to June but their quota is in January and July. Medium sized boats go north to fish for shark. Large longliners fish for swordfish, tuna and dolphin.*

Market considerations are crucial in deciding what to fish. Traditionally, when January comes the larger longliners go shark fishing until the season would close and then try to fish for tuna or swordfish. They use many of these fish to service the restaurants in the local area with a fresh product and they are able to market it better because they pack it fish themselves rather than buying it. Because of this market they would stay fishing for swordfish and mainly tuna until the fall. If the shark season were open at that time, they would want to shark fish September and October. The season, however, is in January and July. Shark trip limits have also made shark fishing less economical for larger boats. Many steam north to fish shark off New York.

The combination of this shifting multispecies fishery and management leads to a complaint voiced by nearly every Wanchese fisher and fish dealer. Wanchese fishers are used to jumping from species to species, but management causes everyone to jumps at the same time. As one respondent put it "this may be good for a specific species at a specific time but it is not good for the whole system." The price of the fish dives when fishers have to shift their effort all to the same species. Some marginal fishers get driven out when these shifts happen. A respondent associated this observation with the fact that there used to be 7-8 Black fishers, and now there are only two. This effect is especially felt when the fishing is good. Another respondent, a fish dealer, said "We had a tremendous amount of fish this winter, one of the busiest winters in a long time. The price of fish was cheaper all winter because everyone was fishing on the same thing. [My] personal trawlers scalloped and floundered. When floundering closed, we had to flynet, fishing for the same fish as gill netters in small boats. We caught a lot, but got nothing for it. I have 350,000 lbs of croakers left, that were caught in March, frozen."

The multispecies nature of the fishery led one respondent to suggest that the loss of the shark quota did not have a major impact in Wanchese because of the number of alternatives. The switch from longlines to gillnets takes a substantial investment at first, but it is then just a day or two to change the gear. Others disagreed, arguing that this initial investment is a hefty one if you are going to do it right. A net reel costs $3000 and will last three or four years. Nets often need to be replaced every year. One gillnet captain spent $6000 on nets last year. A longline tackle supplier explained that shifting between longline gear can also be expensive. Tuna longline gear can be shifted to shark longline gear fairly cheaply, they need different hooks, leads and buoys. This is not true the other way round because shark fishing tends to damage the mainline.

The major fish houses tend to specialize, one of them in hook fisheries. This house reports that shark (including dogfish) is now 40 percent where it was 25 percent in the recent past. Tuna is now 40 percent where it was 50 percent. Swordfish is now 10 percent where it was 15 percent. The remainders are bluefin tuna and dolphin. This house packs between seventy and one hundred different boats through the course of a year. They pack about thirty-five or forty on a full time basis when they are in this area. They develop an ongoing relationship with these boats. When they are in this area, they will come to that dock and their *fish is unloaded even if it is not the species that the house does most of its business in. They also provide dockage fee of charge.*

The fish house owner reported that he is paying between $3.25 and $4.25 for a pound of swordfish that this time of year should be getting $6.00. He attributes the main cause of dropping prices to an increase in imports. The dollar is strong, and the domestic market is the key one for swordfish. The European market is growing but the Japanese eat very little swordfish. Swordfish is caught in Brazil, Argentina, and Africa. The owner says "Just in the last month there has been hundreds of pounds of fish being produced in Africa. We are on a limit, the season was closed 93 the first of April. You would think that the supply of fish would be way down, therefore the price would be way up, but the price is $2-3/lb less than it was ten years ago." The houses have tried to make up for lost business and low prices by expanding overseas themselves and bringing the fish to Wanchese. They try to fly and truck the fish in but it has not worked well. The swordfish boycott is also having a strong effect because the restaurants and retail markets that are complying with the boycott are the upper end market. High quality is the American fleet's key market advantage over the imports.

The closeness of the kinship and other historical networks in the community allows for flexible cooperation that matches the flexibility of the fishery. For example, one fish house provides freight for all the houses on a flexible, contingency basis. Another house has two tractor trailers and if that house has less than 10,000 lbs one day they take their freight on the first house's trucks. Another uses this service when he has under 5,000 lbs, because he has one small truck. The house that provides the freight service used to have seven trucks, however, now they have four.

Issues of Crew and Ownership

Hiring and managing crew is getting increasingly difficult. This is especially true for the larger boats that need people who can stay out longer. There is a lot of turnover in fishing crews, particularly when boats have to shift fisheries and the revenue drops. It used to be that job alternatives, carpentry and building for the tourist industry are common examples, did not pay as well as fishing. This is often no longer the case. Including the captain, gillnet boats take two or three people, smaller longliners take three people, the larger longliners try to have four but sometimes fish with three. Many respondents reported seeing a trend where those people who are available for this work were transients or people who cannot find employment elsewhere. There have been problems with alcohol, drugs dependability and crew creating trouble in the general community. Several respondents reported that they had or knew of boats that were not fishing specifically because they could not find crew to hire. Wanchese is a conservative, rural community where major fishing business decisions have hinged on interpretations of how the Sabbath should best be honored. Some boat owners are very disturbed at the prospect of dealing with drunkenness, drugs and theft in crew. This goes beyond simply management headaches, people in Wanchese want, as they have in the past, to give jobs to people who are going to contribute to stable community that reflects their values. One boat owner said "this is what makes me want to quit. I can handle dealing with regulations, I can't deal with the crew. You have to deal with people you wouldn't want to associate with. The good people are just giving it up and trying to find shore jobs." Successful fishers from prominent fishing families are discouraging their children from going into fishing.

Many captains and boat owners are searching for alternatives. Fishing is an industry that allows people to make a good living based on skills and knowledge that do not come from formal education. As one respondent put it, "a guy who's making $1000 a week fishing with *no education is not going to get a job on land for $1000 a week." Selling boats is difficult. There are few buyers. Searching for buyers and listing the boat for sale makes it even more difficult to find and keep crew. People are leaving fishing for carpentry and building for the tourist industry. Many go into running charter boats.*

Bluefin tuna management has also had an impact. It is very difficult for a Wanchese fisher to legally land and sell bluefin tuna because of the ratios that attach to the incidental permit. This has led to widespread discards (see also the Panama City profile). "There's more put back dead than are brought to the dock - that's a crime against nature" a fish dealer said.

FISHERIES MANAGEMENT ISSUES

Other Comments Offered by Respondents

On the shark rebuilding schedule, one shark fisher commented that he would like to see ITQS or some other form of limited entry place on the shark industry before there is any future increase in the quota. Otherwise he fears a doubling of the fleet to match any doubling of the quota. If limited entry were in place then he could see a benefit of stopping all fishing for two years to rebuild the stock quickly.

Another fisher was very concerned about the effect of management politics, particularly the increased tension between the commercial and recreational communities, on the community and the people in it. "It's getting worse because of the propaganda... I've never wanted to admit it until now, I won't be fishing in a couple years. One, if you really care about what you are doing, it consumes you. Even though you have groups and organizations, everybody don't represent everybody's interests. You can't be at every meeting. When you look at the schedules of the meetings, you've got to do one or the other. This is a community and it is dividing us and it will get worse."

The Charter Boat Industry in North Carolina

There are now some data describing the charter and headboat industry in North Carolina. The estimated number of charter boats in North Carolina in 1999 was 207 (Table 42a). The study (Holland et. al., 1999) used a sample size of 19.3%, or 40 boats. The following tables describe the number of boats by sector and port, ages of operators and educational attainment.

Table 42a. North Carolina charter and headboats (Source: Holland et. al., 1999)

City	Number of Charter Boats *	Number of Headboats
Atlantic Beach	26	2
Carolina Beach	15	2
Hatteras	38	0
Manteo	12	0
Moorhead City	19	2
Ocracoke	11	0
Raleigh	5	0
Swansboro	6	3
Wanchese	6	0
Oregon Inlet	27	0
Pirates Cove	11	0
Other	32	5

NOTE: Only location with three or more charter boats are listed with residuals aggregated into the "Other" category.

The mean age for charter boat operators in North Carolina is 50.3 years (Table 42b) and the mean number of years of education was 13.51 (Table 42c).

Table 42b. North Carolina charter and headboats: age of operators (Source: Holland et. al., 1999).

	N	%
30 or younger	0	0.0
31-40	3	8.6
41-50	18	51.4
51-60	11	31.4
61 and older	3	8.6
Total	35	100

Table 42c. North Carolina charter and headboats: years of education (Source: Holland et. al., 1999).

	N	%
11 or less	2	5.7
12	19	54.3
13-15	6	17.1
16	4	11.4
17 or more	4	11.4
Total	35	100
Mean		13.51

The sample of North Carolina charter boat operators showed no one divorced, 7.5 percent single, and 92.5 were currently married. The great majority of operators shared a household with 2-3 other persons (87.6%). Table 42d. shows the percentage of household income derived from the charter business.

Table 42d. North Carolina charter and headboats: household income from charter boat business (Source: Holland et. al., 1999).

Percent	N	% of Sample
0-9%	7	17.9
10-29%	9	23.1
30-49%	1	2.6
50-69%	6	15.4
70-99%	2	5.1
100%	14	35.9
Total	39	100
Mean		61%

North Carolina's charter boat operators have a an average of 19.6 years in the business, with 58 % having been in the business for 16 years or more. Furthermore, 72% of the North Carolina operators run their business fulltime.

The Charter Boat Industry in South Carolina

There are currently no new fishing community profiles available for South Carolina. Older descriptions of the various fisheries (commercial, recreational) in the state are contained in Appendix G. However, additional and up-to-date information has been collected on charter and headboat operations in the state. These are summarized below from Holland, et al. (1999).

There are an estimated 174 charter boats operating in South Carolina, with Hilton Head, Charleston, Murrells Inlet, Mt. Pleasant, and Little River as the cities of having the most number of boats.

Demographics The majority of charter boat operators in South Carolina are between the ages of 40 and 60, with the mean age being 50 years. The majority have at least 12 years of formal education, with the mean being 15.3 years. 53% are married, and 33 % divorced. According to Holland, et al, "Household size generally corresponded with marital status…in…South Carolina…half of the households consisted of one individual, likely reflecting the proportion of divorced operators in the sample (1999:3-18)."

Almost 40 percent of the operators in South Carolina derive 50% or more of their household income from chartering. South Carolina charter boat operators have less experience in the business than their counterparts in North Carolina or Georgia, with only 14.3% operating their business for 16 years or more. 35.7% have been in the business five or less years, and 30.6% have been in the business six to fifteen years. Furthermore, more South Carolina operators claim to operate part-time (58.6%) than fulltime (41.4%).

The Charter Boat Industry in Georgia

Like South Carolina, there are currently no new fishing community profiles available for Georgia. Older descriptions of the various fisheries (commercial, recreational) in the state are contained in Appendix G. However, additional and up-to-date information has been collected on charter and headboat operations in the state. These are summarized below from Holland, et al. (1999).

There are an estimated 56 charter boats operating in Georgia, with Brunswick, St. Simons Island and Savannah as the cities of having the most number of boats. This relatively low number of boats is due to the geographically smaller coastline of Georgia compared with the other South Atlantic states.

Demographics The majority of charter boat operators in Georgia are between the ages of 41 and 50, with the mean age being 47 years. The majority have at least 12 years of formal education, and 38.5% have at least 16 years. The mean is 14 years. 86.7% are married, and 13% are divorced.

Almost 41.3 percent of the operators in South Carolina derive 50% or more of their household income from chartering. Georgia's charter boat operators have a good deal of experience in the business, with 83.3% operating their business for 16 years or more. Furthermore, 68% of the operators claim to operate fulltime (Holland et al., 1999:3-19).

Headboat Operators in North Carolina, South Carolina and Georgia

There are fewer overall headboat operators in the South Atlantic region than charter boat operators. Their average age is almost 39 years, the majority (60%) have a high school education, and all of those surveyed were married. All but one headboat operator worked fulltime, and all derived the majority of their income from this business.

FLORIDA

Charter Boat Operators in the Florida Atlantic, Keys and Gulf Areas

Florida has the most charter boat operators of all the states in the study by Holland et al. (1999). The estimated populations are as follows: Florida Atlantic – 413 boats; Florida Keys – 230 boats; and Florida Gulf – 615 boats. Table 42e shows a breakdown of charter and headboats in Florida.

The mean age (46 years)for charter boat operators in Florida was comparable to the mean ages in the other states reviewed. More than half (66.5%) of all operators were older than 41 years.

Educational levels are fairly high, with 95% having graduated from high school, and 34% having some college education. 16% of respondents were divorced, 63.4% were married, and 21.5% were single. For all the regions of Florida, 61% indicated that 100 percent of their income comes from chartering.

3.2.4.1.2 Overview of Mixed Commercial and Recreational Fishing Communities

FLORIDA

Florida East Coast

As in most of coastal Florida today, most fishing communities are now mixed, in that there are both recreational and commercial fisheries present. The case of Islamorada is an example of this mixed type of community. The following case has been excerpted from the Ecopolicy Center's report on communities in the HMS fisheries (1998).

> ***"ISLAMORADA COMMUNITY PROFILE***
>
> *Islamorada calls itself the Sportfishing Capital of the World. The name was adopted in the 1950s by this small community because of the simultaneous proximity to the Florida Bay, the Everglades, bonefish flats, coral mountains and the Gulf Stream. One respondent claimed that "at one time or another they get just about every fish in the hemisphere." The history of fishing here dates back to the Large Key Fishing Club and Zane Grey. Presidents Bush, Truman, and Wilson, athletes, such as Ted Williams, and many movie stars have all fished here. Islamorada is famous for light tackle technique and many different rods have been developed. One respondent said "there would be nothing here if it were not for fishing. There are no beaches. There would be no grocery stores, nothing, not even utility companies."*

DEMOGRAPHIC PROFILE

Population

According to the 1990 Census, the population of Islamorada is 1,293. There are more males (54%) than (46%) females.

Racial and Ethnic Composition

The racial composition is 95% White, 0.9% Black, and 3.8% other races. The highest incidence of a single ethnicity is found in residents with German ancestry, which make up 15%of the population.

Age Structure

Forty-four percent of the population are between the ages of 15 and 44 years. The population of those under 15 and those over 44 are approximately the same, suggesting an even age structure.

Marriage

Fifty-nine percent of people 15 years and older are married, 17% never married, and 17% are divorced.

Household Composition

According to the 1990 Census, Islamorada has 672 households, with an average of 1.86 persons per household. Out of this total, 52% are family households, and 48% are non-family households. Table 7.5 shows additional household information for Islamorada from the 1990 Census.

Table 42e. Number of Florida charter and headboats by region and city (Source: Holland et. al., 1999).

Region and City	**Charter Boats N**	**Head Boats N**
Atlantic Coast		
Cape Canaveral	15	2
Daytona Beach	11	1
Fernandina Beach	11	0
Ft. Lauderdale	55	2
Ft. Pierce	11	1
Jacksonville + J. Bch	11	1
Jupiter	11	3
Key Biscayne	11	0
Melbourne + M. Bch	17	0
Miami	55	5
Miami Beach	16	3
New Smyrna + N. S. Bch	13	0
Pompano Bch	22	3
St. Augustine	18	3
Stuart	18	3
Vero + Vero Beach	16	0
Palm Bch + W Palm Bch	14	1
Other	87	14
Florida Keys		
Islamorada	36	5
Key Largo	15	2
Key West	105	4
Marathon	44	4
Other	30	1
Peninsula Gulf		
Boca Grande	14	0
Clearwater	25	7
Ft.Meyers + Ft. Meyers Bch + Lee County	51	8
Madeira Beach	12	0
Marco Island	19	1
Naples	76	1
Palmetto	16	0
Sarasota	42	2
St. Petersburg + St. P. Bch +Tampa	32	2
Other	145	14
Panhandle Gulf		
Destin	73	8
Panama City + Panama City Bch	48	7
Pensacola	36	1
Other	26	2

*Only locations with ten or more charter boats are listed, residuals aggregated in "Other."

TABLE 7.5 HOUSEHOLD COMPOSITION, ISLAMORADA, FL (Source: U.S. Bureau of the Census).

Total Number of Households	*672*
Average Number of Persons per Household	*1.86*
Percent of Married-couple Family Households	*43.8*
Percent with own children under	*18 98*
Percent of Male Householder Family Households	*2.5*
Percent with own children under	*18 0*
Percent of Female Householder Family Households	*5.4*
Percent with own children under	*18 3.3*
Percent of Non-family Households	*48.4*
Percent of Householders Sixty-five or older	*24.3*

In Islamorada there are 966 housing units. Of the 646 occupied housing units, approximately 60% are owner-occupied and 40% are renter-occupied. Seventy-two percent of total vacant units are vacant for seasonal, recreational, or occasional use. Table 7.6 shows additional information for housing units from the 1990 Census.

TABLE 7.6 HOUSEHOLD INFORMATION, ISLAMORADA, FL (Source: U.S. Bureau of the Census).

Total Housing Units	*966*
Owner-occupied Units	*394*
Median Value	*$138,400*
Renter-occupied Units	*252*
Median Contract Rent	*$456*
Vacant Housing Units	*320*
Housing Units Vacant for Seasonal Use	*231*

Education Trends

Twenty-two percent of the 25 years and older population component are high school graduates, with just as many that did not graduate high school. Thirty percent of the population has some college but no college degree. Additional information from the 1990 Census on educational attainment is displayed in Table 7.7. The Florida Keys Chamber of Commerce assert that the educational facilities in the Upper Keys are known for their high standards. There is one elementary schools and one high school in Islamorada.

TABLE 7.7   EDUCATIONAL ATTAINMENT (PERSONS 25 YEARS AND OLDER), ISLAMORADA, FL Source: U.S. Source of Census

	Number of Persons 25 Years and Over	*% of Population*
Less than 9th grade	*104*	*9.6*
9th to 12th grade, no diploma	*137*	*12.6*
High school graduate (includes equivalency)	*222*	*20.4*
Some college, no degree	*322*	*29.6*
Associate degree	*53*	*4.9*
Bachelor's degree	*134*	*12.3*
Graduate or professional degree	*115*	*10.6*

Economic Characteristics

Most of the county's growth since 1950 has been in the unincorporated area. Many people that moved into the region were retirees. By 1980, more people of Hispanic origin moved into the area and commuted throughout the region for jobs. In mid 1970's local effort began to establish a tourist economy. By the 1980's, the tourist economy attracted a service oriented labor force (White, B. 1995).

Employment *Of the residents 16 years and older, approximately 73% participate in the civilian labor force. The unemployment rate for Islamorada is 1.2% of the civilian labor force; this is significantly lower than the state unemployment rate (5.8%). The predominant occupations by employment are technical and administrative occupations (31%) and managerial and professional occupations (26%).*

Employment by Industry *The five most dominant industries in terms of employment for Islamorada are retail trade (39.4%), personal services (12.5%), professional and related services (8.0%), transportation (7.2%), and agriculture, forestry and fisheries (6.8%). Table 7.8 gives additional information from the 1990 Census about employment of Islamorada residents by industry.*

TABLE 7.8 EMPLOYMENT BY INDUSTRY (EMPLOYED PERSONS 16 YEARS AND OVER) ISLAMORADA, FL, (Source: U.S. Bureau of the Census).

Sector	*# Employed*	*% Employed*
Agriculture, forestry, and fisheries	*57*	*6.8*
Mining	*0*	*0*
Construction	*32*	*3.8*
Manufacturing, nondurable goods	*15*	*1.8*
Manufacturing, durable goods	*23*	*2.8*
Transportation	*60*	*7.2*
Communications and other public utilities	*26*	*3.1*
Wholesale trade	*24*	*2.9*
Retail trade	*329*	*39.4*
Finance, insurance, and real estate	*48*	*5.7*
Business and repair services	*18*	*2.2*
Personal services	*104*	*12.5*
Entertainment and recreation services	*27*	*3.2*
Professional and related services	*67*	*8.0*
Public administration	*5*	*0.6*
Total	*835*	*100*

Fishing Related Business

There are a total of eleven marinas in Islamorada. Powerboat rentals are another tourist business with seven in the area. Other water related tourist businesses are boat tours, cruises, kayak, wave runner and sailboat rentals, ten snorkel and dive shops, eight boat dockage, lifts and repair shops, and four fishing supply shops. There are 26 lodgings in Islamorada, consisting of motels, bed and breakfast, resorts and inns, ranging from budget to luxury (Islamorada Chamber of Commerce). Local activities include fishing tournaments, golf and tennis clubs, bowling, museums and galleries, wild bird center and a theater of the sea where tourists can swim with dolphins, Indian Key and Lignumvitae historical and botanical tours, and a fossil reef state geological site. Route U.S. 1 is lined with shops, signs, boutiques, cottages, and multi-million dollar resorts. The islands also offer 18 specialty and general shops (Islamorada Chamber of Commerce).

FISHERIES PROFILE

Recreational Fishing

Recreational activities in the Keys consist of trophy fishing, catch and release, spear fishing, and fishing for food. The traditional past times for the area are reef, shore, and bridge fishing. The recreational fishing industry is increasing. More recently, there has been a growing interest in the guided fishing industry that promotes catch and release. (Bohnsack and Co-worker, 1994).

According to the Florida Bureau of Vessel Titling and Registration, Monroe County has a total of 23,079 registered boats, with 18,731 pleasure and 4,260 commercial boats as of 1996. Respondents reported that fishing for billfish is nearly entirely catch and release. They feel that catch and release, bag and size limits, and other recreational measures are working. Florida's ban on inshore net fishing was also a success, sea trout are plentiful because of the net ban, as are bonefish, pompano, and Spanish mackerel. They are concerned with other commercial fishing activities, particularly drift gill nets and long lining for dolphin. A *respondent said “One commercial person can make a living at the expense of thousands of others.”*

The largest resort in Islamadora began as a fishing marina and sportfishing is a big part of their marketing. Fishing is now just one aspect of the “resort experience” and people come to the resort and discover fishing. While charter captains report that they can see drops in bookings within a month of reports of bad fishing, the resort has never seen droppings in vacancy rates from such reports. The resort has two sets of boats offshore and “back country,” the local term for the Florida Bay area. There are 19 “6 pack boats” which are charter vessels and 1 party boat. The resort arranges pickup charters. Boats that go offshore do fish for marlin, but this is not a big fishery nor do people regularly want to catch them. Charter captains report that marlin were never a big catch, they would get 15-20 in a summer in the early 1980s, now they get one. In the winter they fish for sailfish, black fin tuna, and bonito. Dolphin come in May.

Tournaments are an important marketing device and billfish species are used in the ads. He Holiday Isle Sailfish Tournament is a big one that is specifically marketed to tourists. During tournaments occupancy rates are 100 percent. They advertise in sportfishing magazines, direct mail and through local media. The majority of boats in Islamadora tournaments are Florida boats, but there are some out of state participants. Some of the tournaments generate donations to charity. The Holiday Isle Dolphin Tournament, for example, gave $2500 this year to the American Cancer Society. The Tourist Development Council is a Keys-wide para-statal organization that is supported by a bed tax. They have a large marketing budget and they give grants and sponsorship to tournaments. The will also help with marketing expertise. The Council has three sections: the Fishing Umbrella supports tournaments; the District Advisory Council supports general tourist events; and a third section supports cultural events.

A new, very large, tackle shop is an addition to a national chain. They are surpassing a business plan that they felt was ambitious in the first place. This shop employs 57 people. The shop has a number of local suppliers that includes manufacturers of lures and jewelry as well as local distributors of fishing products. They are going to begin a fishing school next year that will employ 6 teachers and teach 24 people at a time for 3-4 days. They will teach fly casting, different types of fish, how to find fish etc. Their customers are 80 percent tourists.

According to a marine extension agent from the Monroe County Cooperative Extension Service, fishing is doing better as a result of regulations. Despite the marine extension agent’s sentiment, the charter captains are pessimistic about the future. They feel that the overall fishing picture is not good. For 3 years the dolphin have been slow in July and August, four years ago it was very good. Last year they experienced their first loss of customers in the late summer as a result of depressed dolphin catches. Customers read the fishing press and drops in catch will start to have an affect on charter bookings with about a month lag. They are getting a lot of Europeans who want amberjack and sharks. They used to be able to catch hammerhead but these are now “dinosaurs.” They have lost customers to places like Costa Rica because they want to catch marlins. Additionally, good mates are hard to find. There is no “recruitment stock.” Young kids do not grow up thinking they will be charter boat captains. The future looks bleak. They fear that the whole Keys could “become like St. Petersburg, all rich retirees and the marinas all private boats.”

Commercial Fishing

There are only two small longline boats that dock in Islamadora (see the Pompano Beach profile for a description of this fleet). Monroe County commercial landings data for the Islamadora area show 10,647 lbs of dolphin, 4,136 lbs of shark, 711 lbs of tilefish and no swordfish (Center for Economic and Management Research 1995). The Keys overall have important commercial fisheries. Major fisheries are shellfish such as shrimp, stone crab and lobster, having an annual dockside value of about $45 million in the Keys area. Florida Keys National Marine Sanctuary proposed a "no take" zone policy in the next 10 years, which will put many commercial fishermen out of business (Sheldone 1996). King and Spanish mackerel recovered after 15 years of protection by the state and federal regulatory agencies. Finfish fishery consisting of snapper, grouper, and mackerel do about $9 million annually in dockside value. There are also snapper resources such as yellowtail, gray and mutton snapper. (Gregory 1996).

FISHING MANAGEMENT ISSUES

Comments Raised by Respondents

Another local problem is the taxidermy scam (described in the Pompano Beach profile) that is a concern, but the community strongly frowns on landing sailfish. Some people land them and say that they died because they were tail hooked. When this happens people will grumble, especially if they do it 2-3 times a season. People will always start asking questions.

There is a general concern in Islamorada that it would be devastating to the community if the fish stocks are depleted. There are a lot of concerns with habitat such as the loss of grass beds, destruction of mangrove shoreline, water quality, algae blooms, and coral reefs dying from ozone depletion and too much sunlight. Flat fishing depends on knowing the tides because of water pollution, since local water conditions deteriorate when dirty water from the Gulf and Florida Bay comes through the Keys. Twenty years ago, one responded related, there was a lot of clear water with grass, now the grass is not seen due to sewage and pollution. They are concerned with runoff from the lower part of the peninsula including phosphates and exhaust. There is also a concern over loss of fish in the area due to the use of certain gear types, and an increasing number of fishermen.

EAST FLORIDA - POMPANO BEACH COMMUNITY PROFILE

Pompano Beach is small city directly adjacent to Ft. Lauderdale FL. It is very much a part of the dense urban complex which extends along the coast north of Miami. The Ft. Lauderdale area is known as the "Yachting Capital of the World" and the "Venice of America " because of the vast canal system which extends throughout Broward County and create 165 miles of waterfront in the region. Pompano Beach is also a globally important manufacturing center for commercial longlining equipment.

DEMOGRAPHIC CHARACTERISTICS

Population

The 1990 population Pompano Beach was 72,411 and the population estimates for 1993 and 1996 are 74,876, and 74,583 residents, respectively. There are more females (52 %) than males.

Racial and Ethnic Composition

The racial composition of Pompano Beach is approximately 70% White, 29% Black, and less than 1% other races. The highest ethnic group of a single ancestry is Hispanic, which comprises approximately 20% of the population; populations corresponding to all other ethnic groups in the 1990 Census occur at a rate of less than 10% of the population each.

Age Structure

Approximately 40% of the population are between age 15 and 44, according to the 1990 Census. Forty-five percent of the population is over age 44, while only 15% are under age 15; this suggests an aging population.

Marriage

In the 1990 Census, 53% of the population 15 years and older were married. Of those not currently married, 25% were never married, 11% were widowed and 11% divorced.

Household Composition

According to the 1990 Census, Pompano Beach has 31,891 households, with an average of persons per household. There are 58% are family households and 42% are non-family households. Table 7.9 gives additional information on households in Pompano Beach.

TABLE 7.9 HOUSEHOLD COMPOSITION, POMPANO BEACH, FL Source: U.S. Bureau of the Census

Total Number of Households	*31,891*
Average Number of Persons per Household	*2.17*
Percent of Married-couple Family Households	*44.7*
Percent with own children under 18	*10.9*
Percent of Male Householder Family Households	*3.5*
Percent with own children under 18	*1.2*
Percent of Female Householder Family Households	*9.8*
Percent with own children under 18	*4.6*
Percent of Non-family Households	*42.1*
Percent of Householders Sixty-five or older	*37.7*

According to the 1990 Census, there are 42,719 housing units; approximately 25% are vacant. Of the 32,157 occupied housing units, 63% are owner-occupied and 37% are renter-occupied. Seventy-three percent of the vacant housing units are vacant due to seasonal use. Table 7.10 gives additional information regarding housing units.

TABLE 7.10 HOUSING STRUCTURES POMPANO BEACH, FL Source: U.S. Bureau of the Census

Total Housing Units	*42,719*
Owner-occupied Units	*20,343*
Median Value	*$99,300*
Renter-occupied Units	*11,814*
Median Contract Rent	*$470*
Vacant Housing Units	*10,562*
Housing Units Vacant for Seasonal Use	*7,635*

Education Trends

According to the 1990 Census, 73.7% of the residents of Pompano Beach 25 years and older are high school graduates. Table 7.11 gives additional information on educational attainment.

TABLE 7.11EDUCATIONAL ATTAINMENT (PERSONS 25 YEARS AND OLDER), POMPANO BEACH, FL (Source: U.S. Bureau of the Census).

	Persons	*% of Population 25 Years and Over*
Less than 9th grade	*5,331*	*9.8*
9th to 12th grade, no diploma	*9,029*	*16.5*
High school graduate (includes equivalency)	*16,759*	*30.7*
Some college, no degree	*10,115*	*18.5*
Associate degree	*3,380*	*6.2*
Bachelor's degree	*6,855*	*12.5*
Graduate or professional degree	*3,191*	*5.8*

Economic Characteristics

Income

The per capita income for Pompano Beach in 1989 was $17,382; this is higher than the state per capita income ($14,698) but lower than the per capita income for Islamorada ($24,651).

Employment Of the residents 16 years and older, nearly 56% participate in the civilian labor force. The unemployment rate for Pompano Beach is 6.3% of the civilian labor force; this is only slightly higher than the state unemployment rate (5.8%).

Employment by Industry

Of the 15 main industries in Pompano Beach, the five most dominant in terms of employment are: professional and related services (19.8%), retail trade (18.6%), construction (10.4%), finance, insurance, and real estate (9.3%), and business and repair services (6.5%). Agriculture, forestry and fisheries industries employed 3.0% of the population for the 1990 Census. Table 7.12 gives additional information on the industries in Pompano according to the 1990 Census.

TABLE 7.12 EMPLOYMENT BY INDUSTRY (EMPLOYED PERSONS 16 YEARS AND OVER)POMPANO BEACH, FL Source: U.S. Bureau of the Census

Sector	*# Employed*	*% Employed*
Agriculture, forestry, and fisheries	*958*	*3.0*
Mining	*28*	*< 0.1*
Construction	*3,303*	*10.4*
Manufacturing, nondurable goods	*796*	*2.5*
Manufacturing, durable goods	*1,921*	*6.0*
Transportation	*1,260*	*4.0*
Communications and other public utilities	*823*	*2.6*
Wholesale trade	*1,729*	*5.4*
Retail trade	*5,936*	*18.6*
Finance, insurance, and real estate	*2,962*	*9.3*
Business and repair services	*2,067*	*6.5*
Personal services	*1,935*	*6.1*
Entertainment and recreation services	*732*	*2.3*
Professional and related services	*6,305*	*19.8*
Public administration	*1,101*	*3.5*
Total	*31,856*	*100*

FISHERIES PROFILE

Recreational Fishing

The week we visited Pompano Beach they were celebrating the "50 th Year of Yachting" in Ft. Lauderdale. A local yacht manufacturer reported that he sells 58' yachts worth 3,000,000 dollars and he estimates that 85% of the boats he sells are used for fishing. "These people" he says "are very serious about fishing." People in the area have been making boats since the 40s. Recreational fishing is a very important activity in Pompano Beach. According to Florida's Bureau of Vessel Titling and Registry, in 1996-97 Broward County had 44,151 registered boats, with 41,393 pleasure and 2,043 commercial boats. In contrast to many Florida communities, a substantial amount of the recreational industry is supported by local people in addition to tourists. One indicator of this is a large number of small, local fishing tournaments that respondents estimate attract about 75 percent local people and 25 percent tourists. Tournaments generate money for charity, the 1998 Pompano Beach Ladies Tournament raised $33,500 for charity. Many of these tournaments target billfish, but these are sailfish rather than marlin.

Sailfish are very important for promoting tourism in the Pompano Beach area. Tournaments play an important role in attracting tourists, especially in the otherwise "dead" month of May. Local activities include an Annual Sea Food Festival in April, and a Rodeo tournament. In 1996 the Rodeo has increased to 722 angler entrees with 221 boats. The Rodeo tournament, a popular event among the tourists and locals, is held every year. It started in 1965 to encourage tourists to stay in the area longer. Today the Rodeo is known internationally and the non-profit activity supports marine conservation and educational programs. It has grown since 1966 when there were 79 anglers on 47 boats that entered the tournament. By 1994 there were 667 anglers on 261 boats establishing a tournament industry standard. There were 95 winners that year with more than $60,000 cash given out among them (Hardie 1995).

While most tournaments are non-profit, there have been, and are, several attempts to set up for-profit tournaments is a competitive business. The Salt Water Anglers Association tried for four years to have a local tournament circuit in which a series of tournaments would to a set of grand prizes. It was difficult to get sponsors for a 40 boat tournament. Several respondents indicated that the issue of luck versus skill is crucial to a tournaments success. The problem with the local inshore tournaments is that if the fishery requires skill the same people are always going to win. People want to enter tournaments that are more luck-based.

Catch and release of billfish is actively promoted among recreational fishers by such organizations as the Billfish Foundation and the International Game Fish Association, where it has been policy for 15 years. The Miami Billfish Tournament was the first to decide to go with just catch and release. The idea had been that people would cheat when prizes were as high as $10,000. They went to 100 percent release by doing lie detector tests and observers. Several respondents reported that people have begun to accept catch and release as normal practice even in tournaments.

Commercial Fishing

Pompano Beach has a small longline fleet, remnant of a much larger fleet, that mainly targets tuna and swordfish. There is also some shark fishing farther north along the coast. The boats that dock in Pompano Beach are five small (40-50'), short trip year round longline boats, and six or seven seasonal longline boats. There are some larger boats in nearby Dania. December through April is the most intensive local fishing. The resident fleet stay and are joined by many boats from the north come down to fish for the winter. From April through the end of June the larger sized boats found in fish in the South Atlantic bight and land most of their catch at Charleston SC. The smaller boats fish year round in the Gulf of Florida. If swordfish is closed fall is mainly used for maintenance. The longline fleet deals with two fish houses in Pompano Beach and one in Dania.

Commercial fishers in Pompano Beach are proud of the role they have played in the development of the longline industry. They relate that monofilament longline was created and perfected in Pompano Beach. A group of charter boat captains, the "Mosquito Fleet," began experimenting with longlines and various fish attraction devices in the 1970s. Three of these people opened what one respondent claims was the fish house to specialize in pelagic fish. A related company built the first distant water swordfish fleet in the South.

By the early 1980s the fleet was developing and the geographical range of operations was increasing. They sold the smaller boats and the captains were moving into 68' boats that could move north and follow the fish. They moved from short trips to week long trips. By 1983 they were fishing on George's Bank and would be gone for 2-3 weeks. The Pompano Beach longliners began to invest in even larger boats in the mid-80s. This meant, however, that the best captains were gone for longer and longer times. Family problems, divorces and dislocations began to be issues in the fleet.

By the late 1980s, the eight largest boats in the Pompano fleet had been sent to Hawaii. Even with this increased range the fleet was feeling pressure from several sources. The better captains began to get out of the business because they had to travel so much. The mates that took over were less skilled and this increased the amount of time that the home offices had to spend on absentee management. Trade agreements were increasing competition with imported fish. ICCAT restrictions were becoming tighter and, several respondents feel, the US fleet was being restricted more, or at least more effectively, than its foreign competition. With Bahamian independence the fleet lost access to waters near the Bahamas which had been very important for the smaller (~50') longline boats. More recently, the swordfish boycott has depressed prices for the higher quality swordfish that is bread and butter of the smaller boats. A captain told us that they do catch smaller swordfish. The smaller boats catch some swordfish under 30 lb, and a 41 lb size limit would mean throwing back substantial amounts of fish and considerable loss in income. The development of the Pompano Beach area for yachting and recreational fishing has, made dockage and access to the water more expensive. Swordfish closures have reduced income by shifting effort to less valuable species. One fish dealer reports that before the closures his business was 88 percent swordfish and 12 percent tuna, now he does 59 percent swordfish, 12 percent tuna and 29 percent dolphin. Bluefin tuna landings rank third in East Florida ports for 1996 in Pompano Beach, with 835 pounds. There were 5,126 swordfish caught ranking third and 71sharks ranking sixth.

All commercial respondents reported increased difficulty in getting quality crew. The small boats take two crew plus the captain. Owner operators often try to have at least one crew member that they keep with them. Then they try to find anyone they can for particular trips. Respondents reported that as recently as four years ago crew used to line up for work. Now captains have to shop around and the quality is lower. A fish dealer estimates that about half the captains he deals with are married, with an average age of 35, but some are much older. While about half of them are what the dealer describes as "societies poor souls." They are unskilled, recalcitrant individuals who don't want welfare and don't like authority. They go to sea and then get some money and live in a hotel. The other half , who often come from fishing families, want to be captains. There are also some crew who are captains up north and come down and crew for the winter. There is also the occasional college student on winter break.

The end result of all of these factors has been a very substantial reduction of the Pompano Beach longline fleet. For example, the company that sent the eight boats to Hawaii, and owned ten other longliners as well, now owns only two boats. They say that they own these boats only because the grandchildren want to stay attached to the commercial fishery. This company has successfully developed other aspects of their business. Pompano Beach's remaining fleet is considered, both by its owners and suppliers as being in major trouble. Respondents blame both regulations and absence of swordfish from the Straits of Florida. There are few alternative fisheries. Snapper, king mackerel, and red crab are all closed, limited entry fisheries. Dolphin, however, is a profitable alternative during the spring swordfish closure.

Fishers, and other businesses related to commercial longlining in Pompano Beach, are increasingly turning their attention overseas. The best captains are still the ones that go the farthest, but now it is often to work on foreign boats in foreign waters. One longline equipment supplier reported that only 15% of his business is domestic. He has seen sales of longline equipment in Chile double three times since the early 1990s. When he first went to Uruguay in 1990 they had one boat, now they have 10, Brazil's 3-4 longline boats are now 30-40. Another supplier began his business specifically because of the opportunity he saw in the export of longline gear. The East Coast of the US is 30% of his business. He does not see Americans investing in new fixed equipment but people are still replacing equipment when they have to. He describes the East Coast US longline fleet as currently the least technically sophisticated of all the fleets he supplies.

There is a Florida Commercial Fishermen's Association that is not involved very much in pelagic fisheries. Some longliners are members of the Blue Water Fishermen's Association.

FISHERIES MANAGEMENT ISSUES

Additional Comments Offered by Respondents

Several members of the recreational industry expressed concern about a practice of some charter boat captains. When a customer catches a billfish, they ask them if they want to kill it and have it mounted. The idea is that when the customer has already killed the fish he or she is less likely to back out of the deal upon discovering the cost of the mount. When the customer leaves, however, they throw the fish away and the customer gets a fiberglass replica. The contract is written in such a way that this is technically legal and nothing can be done even if the customer finds out.

There is a great deal of tension between the recreational and commercial fishing groups. Both sides acknowledge a problem with over fished stocks but each often blames the other side. Regulatory discards (having to throw saleable fish back dead in order to comply with regulations) are very demoralizing. They are seen by many as an affront to fishing as a way of life.

3.3 Habitat and Environmental Requirements

3.3.1 Description and Status of Essential Fish Habitat for Dolphin and Wahoo in the Atlantic

As required by the Final Rule for Essential Fish Habitat, the Council is designating EFH for dolphin and wahoo. The Council is also designating EFH-HAPCs as encouraged by the final rule. The following builds on material presented in the South Atlantic Council's Habitat Plan (SAFMC, 1998b) to elaborate on the ecological role of dolphin and wahoo (by life stage) in the habitats described. A general description of species and distribution; reproductive characteristics; age and growth; mortality and longevity; movement patterns and stock structure; and feeding, food, and trophic relationships is presented in Section 3.1.

Available information indicates dolphin (common and pompano) and wahoo use basically the same pelagic habitats. Both species are caught using the same gears by the same fisheries and there is very limited information on habitat use by life stage. Therefore, the Council has determined the most appropriate designation of EFH and EFH-HAPCs for all life stages of dolphin and wahoo is to group them together into an assemblage as provided by the EFH Final Rule. Once additional research is conducted to identify habitat preferences, species and habitat distribution, and species abundance by life stage, the present EFH definitions will be refined and additional EFH-HAPCs, if identified, will be considered for designation. In addition, the following describes, where possible, specific geographic locations, boundaries, and locational maps, where definable, for dolphin and wahoo EFH and EFH-HAPCs. These detailed descriptions support the designations of EFH and EFH-HAPCs presented in Actions 22 and 23 in Section 4.0.

Environmental Requirements at Different Life Stages

The following presents known environmental conditions for dolphin and wahoo at different life stages in the Atlantic.

<u>Dolphin</u>

Eggs - Ditty et al. (1994) concluded that in water temperatures between 25º and 30º C, dolphin eggs would hatch in 26 to 38 hours. Ditty et al. (1994) believed that all spawning occurred in oceanic waters over or beyond the continental shelf. The average station depth for capture in their study was 1,198 m.

Larvae - Ditty et al. (1994) found larvae abundant throughout the year in the Gulf of Mexico, but small larvae were found primarily during warm months. Peak abundances were from April to November. They found larvae primarily in water temperatures greater than 24º C and salinities greater than 33 ppt. Few larvae were collected at salinities less than 25 ppt. They also found that the catch of dolphin larvae increased with the increasing concentration of *Sargassum*. Shcherbachev (1973) found larvae to feed on crustaceans, mainly copepods. He noted that larval dolphin start feeding on larval fish when they reach 20 mm standard length.

Juveniles - Juvenile dolphin inhabit the entire Atlantic. Juvenile dolphin are closely associated with floating objects and *Sargassum* (Gibbs and Collette, 1959; Beardsley, 1967; and Rose and Hassler, 1974). Manooch et al. (1984) found fish to make up the largest portion of juvenile dolphin's diet, but invertebrates also were an important part.

Adults - Beardsley (1967) found that female dolphin mature at 350 mm fork length and are mature by 550 mm. Males begin to mature at a larger size around 400 to 450 mm (Beardsley, 1967). Both sexes reach sexual maturity in their first year of life (Beardsley, 1967). In the

Atlantic, Gibbs and Collette (1959) gave the 20º C isotherm as the limit of the dolphin's normal range. Beardsley (1967) found increased numbers of adults in late spring and summer when water temperatures were 26º to 28º C. Adults generally prefer oceanic salinities, although captive dolphins tolerated salinities ranging from 16 to 26 ppt and temperatures from 15º to 29.4º C (Hassler and Hogarth, 1977). The diet of adult dolphin mainly includes fish (Gibbs and Collette, 1959; Shcherbachev, 1973; Rose and Hassler, 1974; Manooch et al., 1984; Massuti et al., 1998), although squid and crustaceans are also taken. Rose and Hassler (1974) found that five fish families accounted for 74% of the prey weight. These were Exocoetidae (26%), Scombridae (22%), Carangidae (12%), Balistidae (9%), and Coryphaenidae (5%). *Sargassum* was also present in 28% of the stomachs examined and occurred most frequently in the stomachs of small female dolphin. *Sargassum* was found in stomach contents by Rose and Hassler (1974) and Manooch et al. (1984). *Sargassum* is ingested incidentally while dolphin are feeding on the fish that make up the *Sargassum* community. Larger males seem to prefer open ocean habitat while females and smaller males remain associated with *Sargassum* and floating debris. Rose and Hassler (1974) postulated that males were more active feeders than females of similar length. They further theorized that since males are substantially heavier than females of similar age, a greater amount of food is required to sustain body metabolism and this requirement for additional food causes more voracious feeding. The open ocean habitat provides larger prey for the larger male dolphin. Rose and Hassler (1974) used catch records from charter boats as the basis for this hypothesis.

Spawning - Adults reach sexual maturity within their first year of life and spawning take place year-round in waters warmer than 24º C in the Atlantic (Beardsley, 1967). Peak spawning seems to take place in the spring and early fall (Beardsley, 1967). Like most fish, fecundity in dolphins increases with increasing size (Beardsley, 1967). Beardsley (1967) estimated that female dolphins produce 240,000 to 3 million eggs annually.

<u>Wahoo</u>

Eggs - No data currently exist on the habitat used by wahoo eggs in the Atlantic. Adult wahoo spawn near Cuba in the Straits of Florida and Straits of Yucatan (Wollam, 1969). Wollam (1969) also found larvae in these same areas. It is therefore postulated that wahoo eggs occupy these same habitats.

Larvae - Wollam (1969) captured twelve larvae ranging from 4.5 to 10.0 mm standard length in the Straits of Yucatan and Florida. All of these larvae were taken in water depths greater than 400 m, except one larvae which was captured in 32 m of water. All larvae were captured between May and October, and none of the larvae were captured in surface waters. The larvae were caught in obliquely towed nets and Wollam (1969) stated that the larvae have a preference for waters below 100 m.

Juveniles - No data exist on the habitat of juvenile wahoo. It is assumed that juveniles inhabit waters with temperatures of 22º to 30º C and are associated with *Sargassum*. Juvenile wahoo are reported to travel in small schools (Hogarth, 1976).

Adults - Adult wahoo in the Atlantic are pelagic in nature and generally associated with *Sargassum* (Manooch and Hogarth, 1983). Rathjen and Squire (1960) recorded wahoo in similar temperature ranges of 22º to 28º C and from May to October off the coast of North Carolina. Adults feed mainly (over 95%) on fish (Hogarth, 1976; Manooch and Hogarth, 1983). Squids and crustaceans make up the remaining portion of their diet. Representative species found by Manooch and Hogarth (1983) were round herring (*Etrumeus teres*), Atlantic flyingfish (*Cypselurus melanurus*), frigate mackerel (*Auxis thazard*), butterfish (*Peprilus triacanthus*), porcupinefish (*Diodon hystrix*), juvenile carangids, and balistids. Round herring, Atlantic flyingfish, and frigate mackerel belong to the fast swimming pelagic community. The others belong to families that are associated with *Sargassum*. Manooch and Hogarth (1983) found that wahoo do not usually eat small food items, nor do they feed readily at the surface. They also found no apparent relationship between size of the wahoo and the size of the prey. They theorized that the wahoo is able to use its sharp teeth to render large fish into consumable sizes.

Spawning - Both females and males mature within the first year of life (Hogarth, 1976). Males spawn when reaching a size of 860 mm total length and females when they reach 1,000 mm total length (Hogarth, 1976). Wollam (1969) stated that wahoo have a long spawning season that lasts from May to October with a peak in June and occurs near Cuba in the Straits of Florida and Straits of Yucatan. Fecundity is size dependent in wahoo and was found by Hogarth (1976) to be 8.7 million eggs in a 1,365 mm total length female. He further estimated that a 1,550 mm female would produce 12.8 million eggs, a 1,645 mm female would produce 33.2 million eggs, and a 1,753 mm female would produce 45.3 million eggs.

3.3.1.1 Sargassum Habitat

3.3.1.1.1 Description of Sargassum Habitat

Within warm waters of the western North Atlantic, pelagic brown algae *Sargassum natans* and *S. fluitans* (Phaeophyta: Phaeophyceae: Fucales: Sargassaceae) form a dynamic structural habitat. These holopelagic species are believed to have evolved from benthic ancestors at least 40 million years ago. Evidence supporting this contention include: 1) lack of sexual reproduction characteristic of benthic species, 2) absence of a basal holdfast, 3) endemic faunal elements (10 invertebrates and 2 vertebrates), 4) greater buoyancy than benthic forms, and 5) late Eocene to early Miocene fossil remains from the Carpathian basin of the Tethys Sea (Winge, 1923; Parr, 1939; Friedrich, 1969; Butler et al., 1983; Stoner and Greening, 1984, Luning, 1990). *Sargassum natans* is much more abundant than *S. fluitans*, comprising up to 90% of the total drift macroalgae in the Sargasso Sea. Limited quantities of several benthic species, including *S. filipendula, S. hystrix, S. polycertium, S. platycarpum* and *S. pteropleuron*, detached from coastal areas during storms, are also frequently encountered adrift. However, the drifting fragments of these benthic species soon perish (Hoyt, 1918; Winge, 1923; Parr, 1939; Butler et al., 1983).

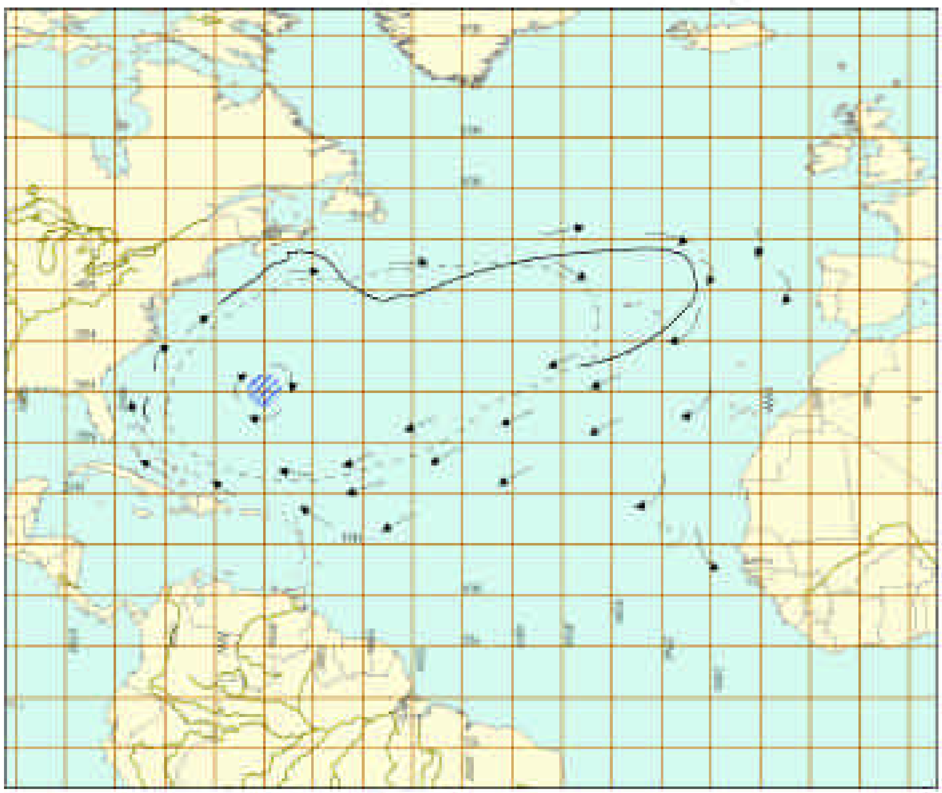
The pelagic species are golden to brownish in color and typically 20 to 80 cm in diameter. Both species are sterile and propagation is by vegetative fragmentation. The plants exhibit complex branching of the thallus, lush foliage of lancolate to linear serrate phylloids and numerous berry-like pneumatocysts. Perhaps the most conspicuous features are the pneumatocysts. These small vesicles function as floats and keep the plants positively buoyant. Gas within these bladders is predominately oxygen with limited amounts of nitrogen and carbon dioxide. The volume of oxygen within the pneumatocysts fluctuates diurnally in response, not to diurnal cycles of photosynthesis, but to changes in the partial pressure of oxygen in the surrounding medium (Woodcock, 1950; Hurka, 1971). There are generally a large number of pneumatocysts on a healthy plant: up to 80% of the bladders can be removed and the plants will remain positively buoyant (Zaitsev, 1971). Under calm sea states the algae are at the surface with less than 0.3% of their total mass exposed above the air - water interface. Experiments indicate that an exposure to dry air of 7-10 minutes will kill phylloids, whereas, pneumatocysts and thallomes can tolerate exposures of 20-30 minutes and 40 minutes, respectively. Wetting of exposed parts with seawater at 1 minute intervals, however, is enough to prevent tissue damage (Zaitsev, 1971). In nature, such stress is likely encountered only during the calmest seas or when the algae is cast ashore. Illustrations and descriptions of *S. natans* and *S. fluitans* are given in Hoyt (1918), Winge (1923), Parr (1939), Taylor (1960), Prescott (1968), Humm (1979), Littler et al. (1989) and Schneider and Searles (1991).

Most pelagic *Sargassum* circulates between 20° N and 40° N latitudes and 30° W longitude and the western edge of the Florida Current/Gulf Stream (Figure 8a). The greatest concentrations are found within the North Atlantic Central Gyre in the Sargasso Sea (Winge, 1923; Parr, 1939; Ryther, 1956; Dooley, 1972; Butler et al., 1983; Butler and Stoner, 1984; Nierman et al., 1986). Total biomass is unknown, but, estimates obtained from net tows range from 800 - 2000 kg wet weight km^{-2}. Within the Sargasso Sea, this translates into a standing crop of 4 to 11 million metric tons (Parr, 1939; Zaitzev, 1971; Peres, 1982; Butler et al., 1983; Butler and Stoner, 1984; Nierman et al., 1986; Luning, 1990). Stoner (1983) suggested that there had been a significant decline in biomass this century, but later recanted (Butler and Stoner, 1984). Nierman et al. (1986) also calculated that no apparent decline had occurred.

Pelagic *Sargassum* contributes a small fraction to total primary production in the North Atlantic. However, within the oligotrophic waters of the Sargasso Sea it may constitute as much as 60% of total production in the upper meter of the water column (Howard and Menzies, 1969; Carpenter and Cox, 1974; Hanson, 1977; Peres, 1982). Estimates of production are typically around 1 mg C m^{-2} d^{-1} with slightly higher values reported from more nutrient rich shelf waters. Production has been shown to double under conditions of nitrogen and phosphorus enrichment (LaPointe, 1986; 1995). Hanisak and Samuel (1984) found *Sargassum* to have low nitrogen and phosphorus requirements, and optimal growth at water temperatures of 24 - 30° C and salinity of 36 ppt. Nitrogen fixation by epiphytic cyanobacteria of the genera *Dichothrix, Trichodesmium,* and *Synechococcus* may enhance production (Carpenter 1972; Carpenter and Cox, 1974; Phlips and Zeman, 1990; Spiller and Shanmugam, 1987). Photosynthesis in both *Sargassum* and the blue-green epiphytes is not inhibited at high light intensities (Hanisak and Samuel, 1984; Phlips et al., 1986): not surprising in view of the neustonic niche they occupy.

Large quantities of *Sargassum* frequently occur on the continental shelf off the southeastern United States. Depending on prevailing surface currents, this material may remain on the shelf for extended periods, be entrained into the Gulf Stream, or be cast ashore (Hoyt, 1918; Humm, 1951; Howard and Menzies, 1969; Carr and Meylen, 1980; Winston, 1982; Haney, 1986; Baugh, 1991). During calm conditions *Sargassum* may form large irregular mats or simply be scattered in small clumps. Langmuir circulations, internal waves, and convergence zones along fronts aggregate the algae along with other flotsam into long linear or meandering rows collectively termed “windrows” (Winge, 1923; Langmuir, 1938; Ewing, 1950, Faller and Woodcock, 1964; Stommel, 1965; Barstow, 1983; Shanks, 1988; Kingsford, 1990). The algae sinks in these convergence zones when downwelling velocities exceed 4.5 cm sec^{-1}. Buoyancy is not lost unless the algae sink below about 100 m or are held under at lesser depths for extended periods (Woodcock, 1950). A time-at-depth relationship exists which affects the critical depth at which bladder failure ensues (Johnson and Richardson, 1977). If buoyancy is lost, plants slowly sink to the sea floor. Schoener and Rowe (1970) indicate that sinking algae can reach 5000 m in about 2 days. Such sinking events contribute to the flux of carbon and other nutrients from the surface to the benthos (Schoener and Rowe, 1970; Pestana, 1985; Fabry and Deuser, 1991). However, the flux of *Sargassum* to the sea floor has not been quantified and there is no information on the fate of this surface export.

Distribution of Pelagic Sargassum in Northwest Atlantic. Adapted from Dooley, 1972.



Solid line refers to the outer boundary of regular occurrence; dashed line refers to the area in which there is a> 5% probability of encounter within 1° square; hatched circle represents possible center of distribution

Figure 8a. Distribution of pelagic *Sargassum* in the Northwest Atlantic (Source: Roger Pugliese Adapted from Dooley, 1972).

3.3.1.1.2 Utilization of Sargassum Habitat

Pelagic *Sargassum* supports a diverse assemblage of marine organisms including fungi (Winge, 1923; Kohlmeyer, 1971), micro-and macro-epiphytes (Carpenter, 1970; Carpenter and Cox, 1974; Mogelberg et al., 1983), at least 145 species of invertebrates (Winge, 1923; Parr, 1939; Adams, 1960; Yeatman, 1962; Weis, 1968; Friedrich, 1969; Fine, 1970; Dooley, 1972; Morris and Mogelberg, 1973; Ryland, 1974; Teal and Teal, 1975; Peres, 1982; Butler et al., 1983; Deason, 1983; Andres and John, 1984; Stoner and Greening, 1984; Morgan et al., 1985; Nierman, 1986; see Table 1 in Coston-Clements et al., 1991), over 100 species of fishes, four species of sea turtles (Smith, 1968; Fletemeyer, 1978; Carr and Meylan, 1980; Redfoot et al., 1985; Ross, 1989; Carr, 1986; 1987a; 1987b; Schwartz, 1988; 1989; Witham, 1988; Manzella and Williams, 1991; Richardson and McGillivary, 1991), and numerous marine birds (Haney, 1986). Many of the organisms most closely associated with *Sargassum* have evolved adaptive coloration or mimic the algae in appearance (Crawford and Powers, 1953; Adams, 1960; Teal and Teal, 1975; Gorelova and Fedoryako, 1986; Hacker and Madin, 1991).

The following points noted in Manooch et al. (1984) and Table 43 developed from information presented in Manooch et al. (1984), further emphasizes the complexity of the *Sargassum* community and the importance of pelagic *Sargassum* habitat to pelagic fishes especially dolphin *(Coryphaena hippurus)*. This material further supports the Councils conclusions.

"One major contribution of this paper is that we have documented the importance of the Sargassum community to dolphin, and therefore to anglers that fish for the species. Traditionally, fishermen seek weed-lines to land dolphin and other pelagic fishes. Seasonal angling success has been associated with the distribution of Sargassum along the southeastern United States. For instance, Rose and Hassler (1974) suggested that diminished landings of dolphin off North Carolina were probably caused by lack of tide-lines (usually caused by floating rows of Sargassum) rather than overfishing in previous years as some believed."

"Much of the material indicated that dolphin frequently feed at the surface and ingest fishes, crustaceans, insects, plants, and inorganic items that are associated with floating Sargassum."

"Sargassum which occurred in 48.6% of the stomachs, was considered to be consumed incidental to normal foods."

Table 43. Percentages occurrence of Sargassum in the stomachs of dolphin *Coryphaena hippurus* and yellowfin tuna (Data Source: Manooch et al., 1984; Rose and Hassler, 1974; and Manooch and Mason, 1983).

	Species	Number	Season or Size (FL)	% Occurrence of Sargassum in stomach
Rose and Hassler (1974)	Dolphin	396	All	28%
Manooch et al. (1984)	Dolphin	2,219	All	48.6%
Manooch et al. (1984)	Dolphin	158	Spring	55.1%
Manooch et al. (1984)	Dolphin	845	Summer	50.9%
Manooch et al. (1984)	Dolphin	61	Fall	29.5%
Manooch et al. (1984)	Dolphin	14	Winter	41.2%
Manooch et al. (1984)	Dolphin	13	≥300 mm	23%
Manooch et al. (1984)	Dolphin	987	≥300-500 mm	49%
Manooch et al. (1984)	Dolphin	686	≥500-700 mm	55%
Manooch et al. (1984)	Dolphin	192	≥700-900 mm	43.8%
Manooch et al. (1984)	Dolphin	189	≥900-1,100 mm	43%
Manooch et al. (1984)	Dolphin	71	≥1,100 mm	38%
Manooch and Mason (1983)	Yellowfin tuna			26.5%
Manooch and Mason (1983)	Blackfin tuna			12.4%

"The relative contribution of the Sargassum community to the diet may be indicative of physiological constraints on the foraging behavior of these pelagic predators. The pursuit and capture of free-swimming prey in the open ocean is energetically expensive, while grazing on relatively sessile animals associated with Sargassum can be accomplished without great energy expenditure. The tunas consume a greater proportion of pelagic, adult fishes and take less prey from the Sargassum community than do dolphin. Although both tunas and dolphin are capable of high speed pursuit, tunas have highly vascularized locomotion muscles enabling sustained aerobic metabolism. Dolphin, with a much smaller portion of red muscle, must rely primarily on anaerobic metabolic pathways (mainly glycolosis), and therefore are limited to short bursts of acceleration. Thus, the energetic strategy for dolphin seems to be forage primarily on smaller prey from the Sargassum community, but also to capture larger prey with short bursts of high speed pursuit if the opportunity arises."

3.3.1.1.3 Measuring Sargassum Distribution and Abundance

Anecdotal information provided by advisory panel members and during the public hearing process indicate abundance of dolphin and success rates seems to be correlated with years when *Sargassum* is abundant and weedlines and windrows are frequently encountered when fishing offshore. However, our current understanding of the seasonal distribution and areal abundance (i.e., biomass per unit area) of pelagic *Sargassum* within the EEZ is poor. Gross estimates of the standing stock for the North Atlantic obtained from towed net samples are highly variable and range between 4 and 11 million metric tons. There is a clear need to improve our understanding of the distribution and abundance of this important habitat. Remote technology could aid to that end. Satellite-based Synthetic Aperture Radar (SAR) offers potential for assessing the distribution of large aggregations over broad swaths of the ocean surface. Coincident ship-based ground-truthing would permit an evaluation of the applicability of routine remote measurements of *Sargassum* distribution and abundance. Understanding the areal distribution and seasonal variability may provide a better indication of dolphin and wahoo abundance or availability in a given year.

3.3.1.2 Description of Water Column Habitats

Specific habitats in the water column can best be defined in terms of gradients and discontinuities in temperature, salinity, density, nutrients, light, etc. These "structural" components of the water column environment (*sensu* Peters and Cross, 1992) are not static but change both in time and space. Therefore, there are numerous potentially distinct water column habitats for a broad array of species and life-stages within species.

The continental shelf off the southeastern U.S., extending from the Dry Tortugas to Cape Hatteras, encompasses an area in excess of 100,000 km^2 (Menzel, 1993). Based on physical oceanography and geomorphology, this environment can be divided into two regions: Dry Tortugas to Cape Canaveral and Cape Canaveral to Cape Hatteras. The break between these two regions is not precise and ranges from West Palm Beach to the Florida-Georgia border depending on the specific data considered. The shelf from the Dry Tortugas to Miami is ~25 km wide and narrows to approximately 5 km off Palm Beach. The shelf then broadens to approximately 120 km off of Georgia and South Carolina before narrowing to 30 km off Cape Hatteras. The Florida Current/Gulf Stream flows along the shelf edge throughout the region. In the southern region, this boundary current dominants the physics of the entire shelf (Lee et al., 1992; 1994). In the northern region, additional physical processes are important and the shelf environment can be subdivided into three oceanographic zones (Atkinson et al., 1985; Menzel, 1993). The outer shelf (40-75 m) is influenced primarily by the Gulf Stream and secondarily by winds and tides. On the mid-shelf (20-40 m), the Gulf Stream, winds, and tides almost equally affect the water column. Freshwater runoff, winds, tides and bottom friction influence inner shelf waters (0-20 m).

Several water masses are present in the region. From the Dry Tortugas to Cape Canaveral, the three water types are: Florida Current Water (FCW), waters originating in Florida Bay, and shelf water. Shelf waters off the Florida Keys are an admixture of FCW and waters from Florida Bay (Lee et al., 1992; 1994). From Cape Canaveral to Cape Hatteras, four water masses are found: Gulf Stream Water (GSW), Carolina Capes Water (CCW), Georgia Water (GW) and Virginia Coastal Water (VCW). Virginia Coastal Water enters the region from north of Cape Hatteras. Carolina Capes Water and GW are admixtures of freshwater runoff and GSW (Pietrafesa et al., 1985;1994).

Spatial and temporal variation in the position of the western boundary current has dramatic affects on water column habitats. Variation in the path of the Florida Current near the Dry Tortugas, induces formation of the Tortugas Gyre (Lee et al., 1992; 1994). This cyclonic eddy has horizontal dimensions on the order of 100 km and may persist in the vicinity of the Florida Keys for several months. The Pourtales Gyre, which has been found to the east, is formed when the Tortugas Gyres moves eastward along the shelf. Upwelling occurs in the center of these gyres, thereby adding nutrients to the near surface (<100 m) water column. Wind and input of Florida Bay water also influence the water column structure on the shelf off the Florida Keys (Smith, 1994; Wang et al., 1994). Similarly, further downstream, the Gulf Stream encounters the Charleston Bump, a topographic rise on the upper Blake Ridge. Here the current is often deflected offshore, again resulting in the formation a cold, quasi-permanent cyclonic gyre, and associated upwelling (Brooks and Bane, 1978). Along the entire length of the Florida Current and Gulf Stream, cold cyclonic eddies are imbedded in meanders along the western front. Three areas of eddy amplification are known: Downstream of Dry Tortugas, downstream of Jupiter Inlet (27° N to 30° N latitude) ("The Point" or "Amberjack Hole"), and downstream of the Charleston Bump (32° N to 34° N latitude) ("The Charleston Gyre"). Meanders propagate northward (i.e., downstream) as waves. The crests and troughs represent the onshore and offshore positions of the Gulf Stream front. Cross-shelf amplitudes of these waves are on the order 10 to 100 km. Upwelling within meander troughs is the dominant source of "new" nutrients to the southeastern U.S. shelf and supports primary, secondary, and ultimately fisheries production (Yoder, 1985; Menzel 1993). Off Cape Hatteras the Gulf Stream turns offshore to the northeast. Here, the confluence of the Gulf Stream, the Western Boundary Under Current (WBUC), Mid-Atlantic Shelf Water (MASW), Slope Sea Water (SSW), CCW, and VCW create a dynamic and highly productive environment, known as the "Hatteras Corner" or "The Point" (Figure 8b).

On the continental shelf, offshore projecting shoals at Cape Fear, Cape Lookout and Cape Hatteras affect longshore coastal currents and interact with Gulf Stream intrusions to produce local upwelling (Blanton et al., 1981; Janowitz and Pietrafesa, 1982). Shoreward of the Gulf Stream, seasonal horizontal temperature and salinity gradients define the mid-shelf and inner-shelf fronts. In coastal waters, river discharge and estuarine tidal plumes contribute to the water column structure.

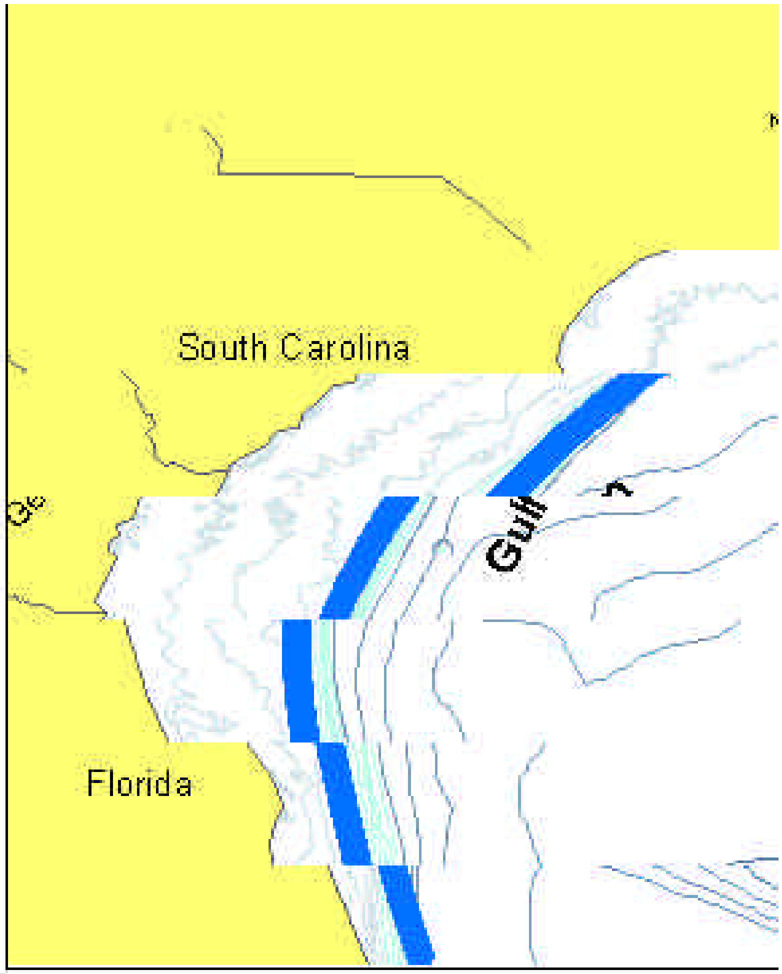


Figure 8b. Water Masses off North Carolina (Source: Roger Pugliese, SAFMC, Adapted from Shepard and Hulbert, 1994).

3.3.1.2.1 Use of Water Column Habitats by Dolphin and Wahoo

Coastal waters off the southeastern U.S. are split into two zoogeographic provinces based on shore fishes and continental shelf invertebrate species. The Caribbean Province includes the Florida Keys and extends northward to approximately the Florida-Georgia border, but its northern boundary is not sharp. The Carolinian Province extends from this border, northwards to Cape Hatteras (Briggs, 1974). A similar faunal break is evident in mesopelagic fish fauna. The boundary between the North Sargasso Sea Province and the South Sargasso Sea Province occurs approximately parallel with Jupiter Inlet, Florida (Backus et al., 1977).

The water column from Dry Tortugas to Cape Hatteras serves as habitat for dolphin and wahoo and a variety of marine fish and shellfish. Dolphin, wahoo, and most marine fish and shellfish broadcast spawn pelagic eggs and thus, most species utilize the water column during some portion of their early life history (e.g., egg, larvae, and juvenile stages). Larvae of shrimp, lobsters, crabs, and larvae of reef, demersal and pelagic fishes are found in the water column (e.g., Fahay, 1975; Powels and Stender, 1976; Leis, 1991; Yeung and McGowan 1991, Criales and McGowan 1994). Problems with species-level identifications prohibits an exact accounting of the number of fishes whose larvae inhabit the water column, but the number of families represented in ichthyoplankton collections ranges from 40 to 91 depending on location, season, and sampling method and includes dolphin and wahoo.

Dolphin and wahoo inhabit the water column as adults. Other pelagic fishes in the region include numerous clupeoids, exocoetids, carangids, *Rachycentron*, *Pomatomus*, coryphaenids, sphyraenids and the scombroids (Schwartz, 1989). Some pelagic species are associated with particular benthic habitats (e.g., *Seriola*, *Sphyraena*), while other species are truly pelagic (e.g., *Thunnus*, *Makaira*). Adult meso- and bathypelagic species inhabit the water column in the Gulf Stream (8c) and adjacent Sargasso Sea (Backus et al., 1977).

Species- and life-stage-specific patterns of water column habitat utilization are not well known for most fishes. Some utilize near-shore fronts as feeding or nursery habitats (e.g., *Anchoa*, *Scomberomorus*); others utilize offshore fronts (e.g., *Coryphaena*, *Xiphius*). Important spawning locations include estuarine fronts (e.g., *Cynoscion*, *Sciaenops*), the mid-shelf front (e.g., *Micropogonias*, *Leiostomus*, *Paralichthys*), and the Gulf Stream front (e.g., *Coryphaena*, *Xiphius*). Recent work has shown an accumulation of fish larvae, including dolphin and wahoo, in these shelf fronts (Govoni, 1993). Movement of the Gulf Stream front also affects the distribution of adult fishes (Magnuson et al., 1981) and hook and line fisherman and longliners target much of their effort for dolphin and other pelagic species in these frontal zones. In addition, the quasi-permanent gyres which impinge upon the shelf near the Florida Keys and downstream from the Charleston Bump probably serve as important spawning/larval retention habitat for a variety of fishes including dolphin and wahoo (Collins and Stender, 1987; Lee et al., 1994). The region known as “The Point” off Cape Hatteras supports an unusually high biomass of dolphin and wahoo and other upper trophic level predators, including many important pelagic fishes. It has been suggested that the area is the most productive sport fishery on the east coast targeting dolphin, wahoo, and other pelagic species including billfish (Ross, 1989).

Due to their important ecological function, areas of the offshore pelagic environments discussed above and the associated benthic habitats represent essential fish habitat-habitat areas of particular concern (EFH-HAPC) and were designated as such though previous Council actions (see SAFMC Comprehensive Habitat Amendment; SAFMC, 1998c). These include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and the Georgetown Hole (South Carolina); for species in the Snapper Grouper complex, Coastal Migratory Pelagic species including dolphin and Coral and Live/Hard Bottom Habitat. Additional EFH-HAPCs were designated for Coastal Migratory Pelagics including: Amberjack Hole (The Point) off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; and The “Wall” off of the Florida Keys. These areas are productive and highly dynamic oceanic areas. A quasi-permanent, cyclonic eddy with attendant upwelling of nutrient-rich, deep water sets-up in the wake of the Charleston Bump. Upwelling results in persistent primary and secondary production that may well result in an important, if not essential feeding environment for the larvae of fishes that congregate to spawn there. The hydrodynamics of the eddy may well serve in the retention of fish propagules that are lost from local populations elsewhere through entrainment into the Gulf Stream. “The Point” off Cape Hatteras is also highly productive due to the confluence of as many as four water masses. Adults of highly migratory species congregate in this area, while the diversity of larval fishes found there is truly astounding (Table 18b of the Habitat Plan (SAFMC, 1998b)). Other water column habitats with high production or dynamic bottom habitats include “Big Rock” and “The Ten Fathon Ledge”. Other areas where water flow is affected by bottom habitat concentrating bait and increasing availability of pelagic habitat like *Sargassum*, include "The Georgetown Hole" off South Carolina.

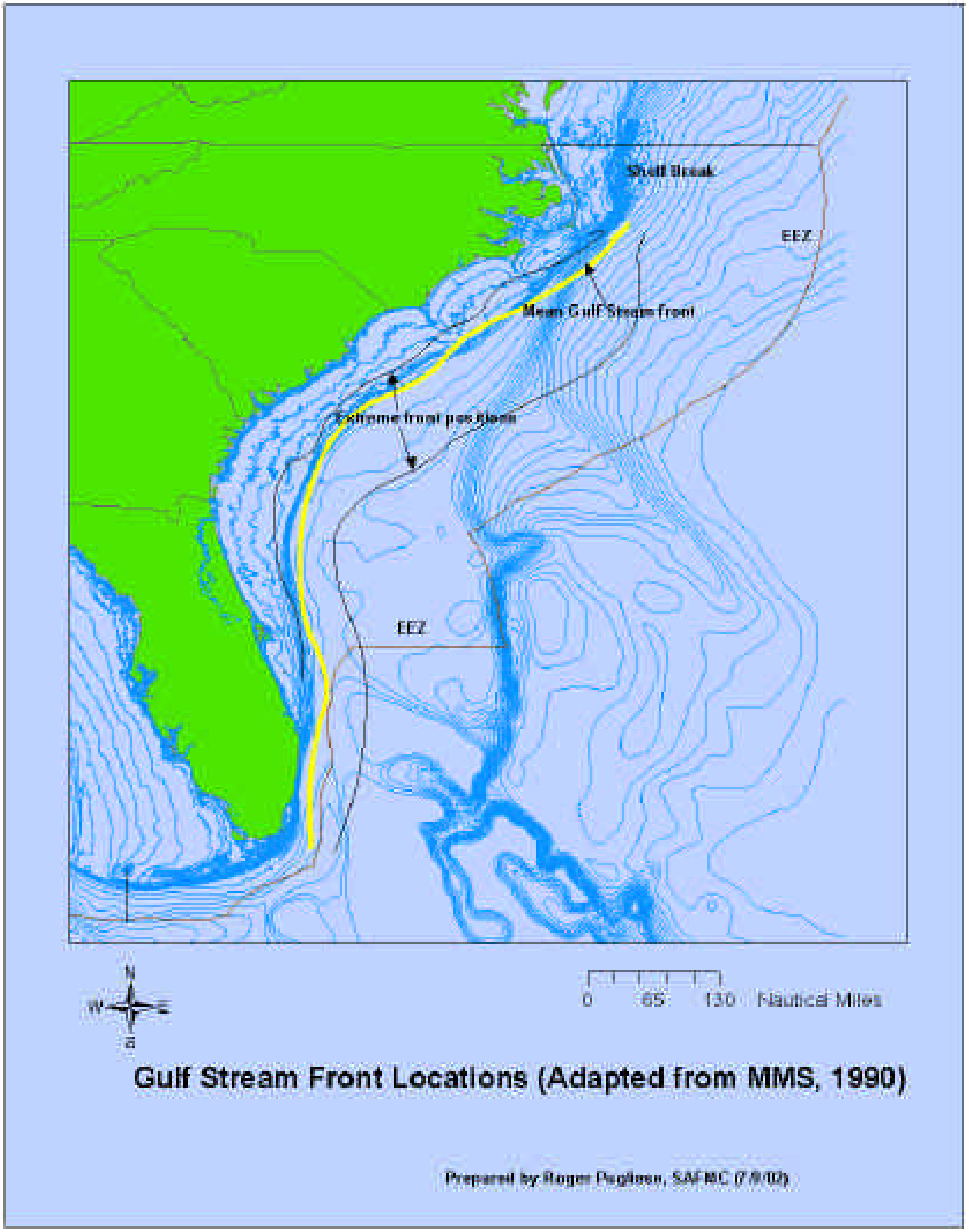


Figure 8c. Gulf Stream front location (Source: MMS 1990).

3.3.1.3 Ecosystem Considerations

The following section is a modification of the South Atlantic Council's SAFE Report for Dolphin and Wahoo (SAFMC, 1999). Tables, Figures, and references are contained in the SAFE Report.

Introduction

As a result of the Sustainable Fisheries Act Amendment to the Magnuson-Stevens Fishery Conservation and Management Act in 1996 the Councils and the NMFS have been mandated to use an ecosystem approach in managing the Nation's Fisheries. The Council has taken the first step with the approval of the Habitat Plan identifying and describing in detail essential fish habitat (EFH) for species managed throughout the South Atlantic and with the approval of the Comprehensive Habitat Amendment amending all existing FMPs to include descriptions of EFH and EFH-habitat areas of particular concern (EFH-HAPCs). By including an Ecosystems Considerations section in the required SAFE reports, existing data regarding the effects of a fishery on the ecosystem will be provided to the Council on a species by species basis while emphasizing the need for a new level of information. This section will also provide a forum in which to express ecosystem concerns for a specific fishery. In addition to receiving information from the National Marine Fisheries Service and Habitat Advisory Panel, anecdotal information concerning ecosystem issues has also been gathered from the Dolphin and Wahoo Advisory Panel, provided both during public hearing and by people familiar with the fishery, and has been included in this section.

While incorporating ecosystem concerns into stock assessment reports is a new approach for this Council, the North Pacific Fishery Management Council has taken this approach for several years. A copy of their ecosystems chapter has been included as Appendix E of the 1999 Wreckfish SAFE report and is an example of the way the ecosystem approach can be used in annual SAFE reports. Another supporting document detailing new ideas and approaches to holistic management is the report to Congress from the Ecosystem Principles Advisory Panel of the NMFS (Appendix F of the 1999 Wreckfish SAFE report), appointed by the National Academy of Sciences. Congress charged NMFS with establishing this panel to assess the extent that ecosystem principles are used in fisheries management and research and to recommend how such principles can be used to improve our Nation's management of living marine resources.

Ecosystem-Based Fishery Management- A Report to Congress by the Ecosystem Principles Advisory Panel as Mandated by the SFA amendments to Magnuson-Stevens Fishery Conservation and Management Act:

Ecosystem-Based Management - *Fishery management actions aimed at conserving the structure and function of marine ecosystems, in addition to conserving the fishery resource. ……… A comprehensive ecosystem-based management approach would require managers to consider all interactions that a target fish stock has with predators, competitors, and prey species; the effects of weather and climate on fisheries biology and ecology; the complex interactions between fishes and their habitat; and the effects of fishing on fish stocks and their habitat.*

Principles, Goals, and Policies recommended by the Ecosystem Principles Advisory Panel include:

Principles -

- The ability to predict ecosystem behavior is limited.
- Ecosystems have real thresholds and limits which, when exceeded, can effect major system restructuring.
- Once thresholds and limits have been exceeded, changes can be irreversible.
- Diversity is important to ecosystem functioning.
- Components of ecosystems are linked.
- Ecosystems are open.
- Ecosystems change with time.

Goals -

- Maintain ecosystem health and sustainability.

Policies -

- Change the burden of proof.
- Apply the precautionary approach.
- Purchase insurance against unforeseen, adverse ecosystem impacts.
- Learn from managed experiences.
- Make local incentives compatible with global goals.
- Promote participation, fairness, and equity in policy and management.

Summary of Recommendations-

Development of a Fishery Ecosystem Plan that will: Delineate the geographical extent of the ecosystem(s) that occur within a Council's authority, including characterization of the biological, chemical, and physical dynamics of the ecosystems, and consider zoning areas for alternative uses; Develop a conceptual model of the food web; Describe the habitat needs of different life history stages; Calculate total removals; Assess uncertainty; Develop indices of ecosystem health; Describe available long-term monitoring; and Assess ecological, human, and institutional elements of the ecosystem.

Ecosystem considerations presented in the final rule to implement the essential fish habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Overview of EFH FMP Amendment Guidelines

The themes of sustainability and risk-averse management are prevalent throughout the Magnuson-Stevens Act, both in the management of fishing practices (e.g., reduction of bycatch and overfishing and consideration of ecological factors in determining optimum yield [OY]) and in the protection of habitats (i.e., prevention of direct and indirect losses of habitats, including EFH). Management of fishing practices and habitat protection are both necessary to ensure long-term productivity of our Nation's fisheries. Mitigation of EFH losses and degradation will supplement the traditional management of marine fisheries. Councils and *managers will be able to address a broader range of impacts that may be contributing to the reduction of fisheries resources. Habitats that have been severely altered or impacted may be unable to support populations adequately to maintain sustainable fisheries. Councils should recognize that fishery resources are dependent on healthy ecosystems; and that actions that alter the ecological structure and/or functions within the system can disturb the health or integrity of an ecosystem. Excess disturbance, including over-harvesting of key components (e.g., managed species) can alter ecosystems and reduce their productive capacity. Even though traditional fishery management and FMPs have been mostly based on yields of single-species or multi-species stocks, these regulations encourage a broader, ecosystem approach to meet the EFH requirements of the Magnuson-Stevens Act. Councils should strive to understand the ecological roles (e.g., prey, competitors, trophic links within food webs, nutrient transfer between ecosystems, etc.) played by managed species within their ecosystems. They should protect, conserve, and enhance adequate quantities of EFH to support a fish population that is capable of fulfilling all of those other contributions that the managed species makes to maintaining a healthy ecosystem as well as supporting a sustainable fishery. Councils must identify in FMPs the habitats used by all life history stages of each managed species in their fishery management units (FMUs). Habitats that are necessary to the species for spawning, breeding, feeding, or growth to maturity will be described and identified as EFH. These habitats must be described in narratives (text and tables) and identified geographically (in text and maps) in the FMP. Mapping of EFH maximizes the ease with which the information can be shared with the public, affected parties, and Federal and state agencies to facilitate conservation and consultation. EFH that is judged to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation, should be identified as "habitat areas of particular concern" (HAPC) to help provide additional focus for conservation efforts. After describing and identifying EFH, Councils must assess the potential adverse effects of all fishing-equipment types on EFH and must include management measures that minimize adverse effects, to the extent practicable, in FMPs. Councils are also directed to examine non-fishing sources of adverse impacts that may affect the quantity or quality of EFH and to consider actions to reduce or eliminate the effects.*

(ii) EFH determination.
(E) Ecological relationships among species and between the species and their habitat require, where possible, that an ecosystem approach be used in determining the EFH of a managed species or species assemblage. The extent of the EFH should be based on the judgment of the Secretary and the appropriate Council(s) regarding the quantity and quality of habitat that is necessary to maintain a sustainable fishery and the managed species' contribution to a healthy ecosystem.

(11) Review and revision of EFH components of FMPs.
This information should be reviewed as part of the annual Stock Assessment and Fishery Evaluation (SAFE) report prepared pursuant to § 600.315(e)."

3.3.1.4 The Effects of Fishing Gear on the Ecosystem and Prior South Atlantic Council Action

The following summarizes the South Atlantic Council's actions to protect essential fish habitat and essential fish habitat - habitat areas of particular concern for dolphin and wahoo. The Council determined the effects of all other fishing activities are minimal and temporary.

The Council, through a revised Fishery Management Plan for Pelagic *Sargassum* Habitat (SAFMC, 2002) is proposing to prohibit all harvest and possession of *Sargassum* from the South Atlantic EEZ south of the 34° N. latitude line and within 100 miles of shore between the 34° N. latitude and the latitude line representing the NC/VA border. The plan caps annual harvest at 5,000 pounds wet weight (determined dockside after being off-loaded). In addition, harvesters will be required to: (a) take onboard observers on each trip, (b) limit harvest to the months of November through June, and (c) use four inch stretch mesh or larger on a frame no larger than four feet by six feet. It is the Council's intent to protect to the maximum extent practicable *Sargassum* as essential fish habitat by immediately prohibiting harvest and possession of *Sargassum* in all areas of the South Atlantic EEZ where harvest has not previously occurred. In addition, the Council is minimizing harvest with no intent to allow an increase because of the value as EFH and EFH-HAPCs to dolphin/wahoo and other managed species including threatened and endangered sea turtles.

The *Sargassum* community represents a highly evolved ecotype with organisms (e.g., *Sargassum* fish, *Sargassum* pipefish, *Sargassum* shrimp, and *Sargassum* crab) which have evolved cryptic coloration and feeding mechanisms to survive and thrive in this habitat. In addition, many organisms (e.g., bryozoans) live attached to the *Sargassum* and feed on phytoplankton in the water column and associated with the habitat. Individuals of these species would be lost in any removal of this habitat. Recent research indicates the essential nature of the fish and other marine organisms using pelagic *Sargassum* in providing the nutrients for growth of the algae. Therefore, the determination that all *Sargassum* is essential fish habitat, as well as an essential fish habitat-habitat area of particular concern, is further supported by this interrelationship between the inhabitants and the growth of *Sargassum*.

The Council concluded the removal of pelagic *Sargassum* habitat constitutes a net loss of essential fish habitat in the South Atlantic region. Also, the Council concluded that the harvest of pelagic *Sargassum* is a violation of Council habitat policies. The harvest of *Sargassum* is contradictory to the goals and objectives of the Habitat Plan (SAFMC, 1998b), the Habitat Comprehensive Amendment (SAFMC, 1998c), and the Revised Pelagic *Sargassum* Habitat Plan (SAFMC, 2002). An experimental fishing provision was considered but dropped because the Council determined this activity constituted a violation of Council habitat policy and goes against the intent of the Magnuson-Stevens Act mandate to address essential fish habitat. This action would meet the directive to identify, describe, and protect essential fish habitat. An acceleration of harvest could degrade the quality of habitat.

Apart from increases in the non-consumptive values discussed below, the Council concluded severe limitations on harvest is likely to increase productivity of marine life in the ecosystem. In particular, dolphin-fish and turtles would be protected to the extent possible from any potential negative impacts and could result in increased abundance depending on additional measures implemented.

The Council concluded maintaining the integrity of the non-consumptive values and the value to other species as habitat greatly outweighs the costs resulting from severely limiting harvest. Like any natural resource, *Sargassum* commands what have been termed non-use values; specifically existence value, bequest value, and option value. Existence value refers to the satisfaction individuals derive from the knowledge that a natural resource exists and will continue to exist in the future even though they may never use or see the resource. Bequest value is the benefit associated with endowing a natural resource to future generations. Option value refers to the benefit individuals obtain from retaining the option to use the resource in the future by conserving it now. These values are undoubtedly difficult to measure, but measurement has been done in a few instances (e.g., Amazonian rainforest and Australian Great Barrier Reef).

In terms of non-consumptive uses, the Council concluded severely limiting harvest would reduce further loss of essential fish habitat; increase the possibility of enhancing ecosystem function and marine productivity; and increase existence, bequest, and option values. After implementation, most of the direct benefits will go to the non-consumptive users. The other values, existence, bequest, and option, are likely to increase at a faster rate. There is no direct method to estimate these benefits. Indirect benefits will accrue to consumptive users to the extent productivity of harvested species (e.g., dolphin-fish) are increased.

3.3.1.5 The Effects of the Proposed Measures on Atlantic Dolphin and Wahoo Habitat

[See South Atlantic Fishery Management Council's Habitat Plan (SAFMC, 1998b).]

Descriptions of Biological Impacts, including impacts on habitat, of proposed measures are included in Section 4.0 Environmental Consequences. No other impacts from fishing were identified during the public hearing process. However, the Council's need to protect *Sargassum* as essential habitat to dolphin and wahoo was the most prevalent comment on habitat received during the public hearing process.

3.3.1.6 The Cumulative Impacts of all Fishing and Non-Fishing Activities on EFH

There are no known impacts from any other recreational or commercial fishing activity on dolphin and wahoo EFH other than the direct removal of pelagic *Sargassum*. Subsequently the harvest off South Atlantic states is being severely curtailed or eliminated through management measures contained in the Sargassum Fishery Management Plan (SAFMC, 2002) designed to protect this habitat to the maximum extent practicable. No other impacts from fishing were identified during the public hearing process. However, the Council's need to protect *Sargassum* as essential habitat to dolphin and wahoo was the most prevalent comment on habitat received during the public hearing process. In addition as described in Section 3.3.1.4 no other fishing gear is known to impact dolphin and wahoo EFH.

In addition, the Council reviewed the information available on non-fishing activities which could effect dolphin and wahoo EFH and has included Action 24 to provide conservation recommendations, adopted habitat policy statements (e.g., ocean disposal and oil and gas exploration, development and transportation), and activity based policies which are intended to protect habitat that is essential to dolphin and wahoo.

3.3.1.7 Summary of Procedure to Update EFH

<u>Habitat Plan</u>

The Council will periodically review and update EFH information and revise the Habitat Plan document (SAFMC, 1998b) as new information becomes available. NMFS should provide some of this information as part of the annual Stock Assessment and Fishery Evaluation (SAFE) report. A complete review of EFH information will also be conducted as recommended in the guidelines in no longer than 5 years.

Workshop Process to Update EFH and EFH-HAPCs and Initiate Development of the South Atlantic Fishery Ecosystem Plan

The first phase of the development of the plan involves the expansion and updating of the existing Habitat Plan (SAFMC, 1998b). This workshop process will build on information and technical expertise drawn on the development process conducted by the South Atlantic Council to address the 1997 proposed rule published by NMFS specifying regional fishery management council guidelines for the description and identification of essential fishery habitat (EFH) in fishery management plans, adverse impacts on EFH, and actions to conserve and enhance EFH. In order to address the original essential fish habitat mandates in the Magnuson-Stevens Act, the Council developed the Habitat Plan to serve as a source document describing EFH and the Comprehensive Habitat Amendment to amend each of the existing fishery management plans to identify and describe EFH and address impacts of fishing gear and/or fishing practices on EFH. In addition, the Council has monitored each fishery management plan and addressed any new impacts from fishing gear and/or fishing practices in an effort to minimize, to the extent practicable, the adverse impacts on EFH. A five-year timeline was established for Council review and update of EFH information through revision of the Habitat Plan. This update was already scheduled for consideration in 2003.

The Council recognizes the scope of the significant task necessary to meet the new essential fish habitat mandates and directive to begin evaluating ecosystem-based management through the development of a Fishery Ecosystem Plan (FEP) and is again calling upon the Habitat Advisory Panel members and other technical experts involved in the previous Habitat Plan development process to serve as or identify appropriate experts to function on a quasi-plan development team for this task. The Habitat and Coral Advisory Panel are scheduled to meet this fall and will provide additional guidance on the workshop process and ecosystem management.

A Final EFH Rule was published on January 17, 2002 replacing the interim Final Rule of December 19, 1997 on which the original EFH and EFH-HAPC designations were made. The Councils have, pursuant to the Final EFH Rule, been directed to update EFH and EFH-HAPC information and designations; in addition, pursuant to revisions to NOAA GC interpretation of the National Environmental Policy Act the Councils will be required to update all Environmental Impact Statements for all Federal Fishery Management Plans under their jurisdiction. Information compiled during this process will further facilitate meeting both the EFH and the NEPA mandate. As was done with the original Habitat Plan, a series of technical workshops will be conducted by Council habitat staff, in cooperation with NMFS/NOS Beaufort Laboratory, NMFS SEFSC Miami Laboratory, NMFS SERO personnel and invited participants. Workshops are intended to build on a review of existing information presented in the Habitat Plan, and focus on updating information pursuant to the new EFH Rule. This effort will begin the integration of comprehensive details of habitat distribution and characterization, the biology of managed species including their biological and the characteristics of the food web they exist in.

3.4 Current Atlantic State Regulations on Dolphin and Wahoo

Dolphin

North Carolina - No minimum size limit; 10 per person per day recreational bag limit; and Charter vessel limit of 60 per trip.

South Carolina - Dolphin must be landed head and tail intact; no transfer at sea; 7 dolphin per person per day recreational bag limit and maximum of 26 dolphin per boat per day; headboats licensed to carry 50 or more passengers could retain up to 50 dolphin per day; 4,500 pound commercial trip limit and 150,000 pound annual commercial landing quota (once the quota is met commercially harvested dolphin will no longer be allowed to be landed in South Carolina); and fishing year would begin April 1 and end the following March 31 or when the quota is reached.

Georgia - 18 inch FL minimum size limit; 15 per person per day recreational bag limit; and commercial closure once a Federal quota (if adopted) is met.

Florida - 20 inch FL commercial size limit and 10 per person per day recreational bag limit.

Wahoo

No Atlantic State has existing regulations or is proposing regulations for wahoo.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This section presents management measures and alternatives considered by the Councils and the environmental consequences of management. The final environmental impact statement (FEIS), regulatory impact review (RIR), initial regulatory flexibility analysis (IRFA), and social impact assessment (SIA)/fishery impact statement (FIS) are incorporated into the discussion under each of the proposed action items.

Actions are followed by four sub-headings: Biological Impacts, Economic Impacts, Social Impacts, and Conclusions. These are self-explanatory with the first three presenting the impacts of each measure considered. The Councils' rationale for taking or rejecting the actions/options are presented under the heading "Conclusions". The Councils' preferred action is listed below the Action number and options considered by the Councils are indicated under the heading "Rejected Options".

4.2 Management Measures

4.2.1 ACTION 1. Management Unit for Dolphin.

The management unit is the population of dolphin (common dolphin - *Coryphaena hippurus* and pompano dolphin - *Coryphaena equiselis)* from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts.

It is the Councils' intent to remove Atlantic dolphin from the Coastal Migratory Pelagics management unit. Under the designation of the South Atlantic Council as lead in development of an Atlantic FMP, management recommendations with respect to the Atlantic group of dolphin will be the responsibility of the South Atlantic Council working with the Mid-Atlantic and New England Councils.

When the plan was being developed jointly for the Atlantic, Gulf, and Caribbean, the management unit under consideration encompassed all three regions with each Council retaining authority for regulations in their area of jurisdiction. Given the multiple and extensive delays in development of the multi-Council FMP, and the need for regulations in the Atlantic, the South Atlantic Council requested they be relieved of their administrative responsibilities to develop a joint plan and they be designated as true lead for development of an Atlantic FMP in cooperation with the New England and Mid-Atlantic Councils. The proposed management unit manages dolphin to the maximum extent practicable throughout their range in the Atlantic.

<u>Biological Impacts</u>

The proposed action will establish a mechanism for management of dolphin in U.S. waters of the Atlantic. This action is consistent with the best available scientific information including recommendations contained in the proceedings of the SAFMC Dolphin and Wahoo workshop (SAFMC, 1998a). These recommendations are based on the discussions and consensus reached at this workshop regarding the biological characteristics and management options most appropriate for management of dolphin and wahoo.

Genetic analysis of dolphin collected through the western north Atlantic was conducted by Robyn Wingrove with the University of Charleston. No significant genetic differences were found in the samples taken from the proposed management unit. See Section 3.1.5 for more details.

In addition to genetic analyses, available tagging information shows movement of dolphin throughout the management unit, especially along the Atlantic coast, which supports selection of the proposed management unit. Northward movement is shown in the following tag-recapture data (Table 44) provided by SCDNR (Kay Davy, pers. comm.).

Table 44. Dolphin tagged and recaptured in the SCDNR Marine Gamefish Tagging Program (Kay Davy, SCDNR, pers.comm.).

DOLPHIN TAGGED IN THE SC MARINE GAME FISH TAGGING PROGRAM				
DATE TAGGED	**LOCATION TAGGED**	**DAYS OUT**	**LOCATION RECOVERED**	**MIN. DISTANCE (NM)**
12/14/90	STUART, FL	65	ST. LUCIE, FL	
7/1/95	OFF CHARLESTON	24	CAPE HATTERAS, NC	270
8/27/95	OFF CHARLESTON	197	CAPE CANAVERAL,FL	220
5/30/97	OFF CHARLESTON	38	MOREHEAD CITY,NC	160
5/30/97	OFF CHARLESTON	45	OREGON INLET, NC	440
5/17/97	OFF HILTON HEAD	35	CAPE LOOKOUT,NC	245
5/1/98	OFF GEORGETOWN	87	CAPE HATTERAS, NC	210
5/22/98	OFF GEORGETOWN	29	BEAUFORT INLET,NC	150
6/12/98	OFF GEORGETOWN	19	DIAMOND SHOAL, NC	190
5/8/99	OFF GEORGETOWN	98	LONG ISLAND, NY	800
5/21/99	OFF GEORGETOWN	8	OFF GEORGETOWN	0
7/10/99	OFF GEORGETOWN	14	CAPE HATTERAS, NC	210
7/27/99	OFF CHARLESTON	12	CAPE HATTERAS, NC	270

Economic Impacts

Designation of the management unit is required by statute for FMP implementation and establishes a platform for future action and defines the bounds over which such action can apply. In this respect this proposed measure and Option 2 are superior to Option 1 (no action). Defining the management unit for dolphin does not alter current harvest or use of the resource and, therefore has no direct effect on existing fisheries or fishing communities associated with use restrictions. Direct effects only accrue to future actions such as bag limits and trip limits that are promulgated to improve the health of the resource and/or to increase economic benefits to society. These economic benefits would include the non-market benefits anglers derive from improved catch rates or fish size, non-use benefits realized by sectors of society who are not interested in harvest or use of these resources but gain satisfaction from the knowledge that healthy fisheries exist, and increased net revenue to commercial harvesters from improved catch rates.

Social Impacts

Many attendees at the public hearings, particularly from the for-hire and commercial sectors, expressed the belief that a management plan was unnecessary because the fishery was healthy. The Councils recognize that dolphin and wahoo stocks are healthy but wish to be proactive in the management of this fishery, heading off problems before they can occur. The first step in becoming proactive is to declare a management unit. Furthermore, by taking action now, the Council will be helping to lessen the impacts of any conflicts that may arise in the future between different sectors exploiting the resource. However, while managing stocks throughout their geographical range makes good biological sense, it may not be the best option from a social and cultural perspective. Breaking up the management unit may be more beneficial as it will allow for local variances in culture and practice. This increased responsiveness will lead to more realistic management policies and more compliance with the management measures.

Conclusion

Establishment of this management unit complies with the Magnuson-Stevens Act that requires a species be managed to the maximum extent practicable throughout its range. The Councils concluded that defining the management unit is a required part of a fishery management plan and the Councils' action will address the directive to manage a species to the maximum extent practicable throughout its range.

This action allows the Councils to take a risk averse approach and proceed in a timely fashion to develop management measures for the dolphin fisheries of the Atlantic. Although the management unit does not necessarily refer to a biological stock, for the purposes of management of fisheries operating along the U.S. east coast, the management unit definition is appropriate. This is consistent with guidance in 50 CFR 600.320. This action is supported by the best available scientific information and allows the Councils to achieve the stated goals and objectives. The Councils determined this action best achieves the goals of the FMP and the management objectives.

Rejected Options for Action 1:

Option 1. No action.

Biological Impacts

In the South Atlantic and Gulf Councils' areas, dolphin could be managed through the current Coastal Migratory Pelagics FMP of the Gulf and South Atlantic, however this option would not provide for management of dolphin in the New England area of jurisdiction because the species is not included in an existing fishery management plan like Coastal Migratory Pelagics. Lack of management could result in localized depletion.

Economic Impacts

This option would not allow the Councils to manage the Atlantic dolphin fishery throughout its range and to take timely actions when necessary. Without the appropriate management measures, such as bag limits and size limits to ensure healthy fisheries, there could be reduced net economic benefits to society in the future.

Social Impacts

Many attendees at the public hearings, particularly from the for-hire and commercial sectors, expressed the belief that a management plan was unnecessary because the fishery was healthy. If no action is taken, a consistent understanding of the fishery across its geographical range would not be developed, leaving the fishery open to problems such as overfishing and/or the increase of social conflict between fishing sectors. In the short and long-term, not taking any action would lessen the Councils' effectiveness in dealing with and resolving conflict between sectors in the fishery.

Conclusion

This option would not allow the Councils to manage the dolphin fisheries in accordance with the Magnuson-Stevens Act, which directs stocks to be managed to the maximum extent practicable throughout their range. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP. Therefore, the Councils rejected this option.

Option 2. Four other management units considered: (1) Caribbean as a management unit, with Gulf and Atlantic combined as a management unit; (2) Atlantic as a management unit, with Caribbean and Gulf combined as a management unit; (3) Gulf as a management unit, with Caribbean and Atlantic combined as a management unit; and (4) a combined management unit for the Gulf, Caribbean, and Atlantic.

Biological Impacts

While preliminary information indicates that dolphin for the Western North Atlantic may be one stock. Establishing an Atlantic management unit provides the South Atlantic Council with the mechanism to more rapidly implement regulations intended to be risk averse and precautionary for the Atlantic fishery.

Economic Impacts

Establishing a management unit for dolphin should have no economic impact on the recreational and commercial sectors in this fishery, or to other stakeholders who derive benefits from this resource. The choices for setting a geographic range listed under option 2 would meet the technical requirements of defining the management unit and support implementation of an FMP for the resource, thereby providing the platform for subsequent actions that could result in changes in net economic benefits.

Social Impacts

Because the Councils must manage the stocks throughout their range, the most appropriate action is to manage the stocks in a comprehensive geographical range/unit. While this makes biological sense for the fishery, it may not be the best option from a social and cultural perspective. Breaking up the management unit may be more beneficial as it will allow for local variances in culture and practice. This increased responsiveness will lead to more realistic management policies, and hence, more compliance with the policies. Regardless of how the management unit is geographically defined, the action would have an indirect social impact on the fishery. Creating a management unit will be the first step most likely to lead to better data collection and knowledge of all sectors participating in the dolphin and wahoo fishery.

Conclusion

The Councils rejected these options because they were not practicable and they were not the best way to achieve the goals and management objectives of the FMP.

4.2.2 ACTION 2. Management Unit for Wahoo.

The management unit is the population of wahoo (*Acanthocybium solandri*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts.

Under the designation of the South Atlantic Council as lead in development of the FMP, management recommendations with respect to the Atlantic group of wahoo will be the responsibility of the South Atlantic Council working with the Mid-Atlantic and New England Councils.

When the plan was being developed jointly for the Atlantic, Gulf, and Caribbean, the management unit under consideration encompassed all three regions with each Council retaining authority for regulations in their area of jurisdiction. Given the multiple and extensive delays in development of the multi-Council FMP, and the need for regulations in the Atlantic, the South Atlantic Council requested they be relieved of their administrative responsibilities to develop a joint plan and they be designated as true lead for development of an Atlantic FMP in cooperation with the New England and Mid-Atlantic Councils. The proposed management unit manages wahoo to the maximum extent practicable throughout their range in the Atlantic.

Biological Impacts

The proposed action will establish a mechanism for management of wahoo in U.S. waters of the Atlantic. In addition, this action will allow the Councils to manage wahoo in accordance with the Magnuson-Stevens Act which states that stocks are to be managed to the maximum extent practicable throughout their range.

Economic Impacts

Designation of the management unit is required by statute for FMP implementation and establishes a platform for future action and defines the bounds over which such action can apply. In this respect this proposed measure and Option 2 are superior to Option 1 (no action). Defining the management unit does not alter current harvest or use of the wahoo resource and, therefore has no direct economic effect on existing fisheries or fishing communities associated with use restrictions. Direct effects only accrue to future actions such as bag limits and trip limits that are promulgated to improve the health of the resource and/or to increase economic benefits to society. Refer to the discussion under Action 1 for a description of these benefits.

Social Impacts

This action will most likely have an indirect but positive social impact on the fishery. Creating a management unit will lead to better data collection and knowledge of all sectors participating in the wahoo fishery in the U.S Atlantic, U.S. Caribbean, and Gulf of Mexico. Furthermore, by dividing the responsibilities for management between the various councils and regions, the will be a positive social impact on the policy-makers themselves, thus aiding in the ease of management and effecting more efficient relations between the various regions. Another benefit will be an enhanced ability to respond more efficiently to local biological and cultural conditions of the fishery.

Conclusion

The Councils concluded that the proposed management unit is appropriate for the wahoo fishery. Also, defining the management unit is a required part of a fishery management plan and the Councils' action will address the directive to manage a species to the maximum extent practicable throughout its range. The Councils have also adopted this unit because wahoo occupy a similar range and use similar pelagic habitats as dolphin and are pursued and harvested by many of the same fishermen.

This action allows the Councils to take a risk averse approach and proceed in a timely fashion to develop management measures for the wahoo fisheries of the Atlantic. Although the management unit does not necessarily refer to a biological stock, for the purposes of management of fisheries operating along the U.S. east coast, the management unit definition is appropriate. This action is supported by the best available scientific information and allows the Councils to achieve the stated goals and objectives. The Councils determined this action best achieves the goals of the FMP and the management objectives.

Rejected Options for Action 2:

Option 1. No action.

Biological Impacts

This option would not provide for management of wahoo in the Councils' areas of jurisdiction. Lack of management could result in a greater risk of biological problems if increased utilization of wahoo resources occurs in the future. In addition, this option would not allow the Councils to manage wahoo in accordance with the Magnuson-Stevens Act which states that stocks are to be managed to the maximum extent practicable throughout their range.

Economic Impacts

This option would not allow the Councils to manage the wahoo fishery throughout its range and to take timely actions when necessary. Without the appropriate management measures, such as bag limits and size limits to ensure healthy fisheries, there could be reduced net economic benefits to society in the future.

Social Impacts

If no action is taken, no consistent understanding of the fishery will occur, leaving the fishery open to developing problems such as overfishing or the increase of social conflict between fishing sectors. No actions could be taken to resolve such problems in a timely manner.

Conclusion

This option would not allow the Councils to manage the wahoo in accordance with the Magnuson-Stevens Act, which directs stocks to be managed to the maximum extent practicable throughout their range. Therefore, the Councils rejected this option. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 2. Four other management units considered: (1) Caribbean as a management unit, with Gulf and Atlantic combined as a management unit; (2) Atlantic as a management unit, with Caribbean and Gulf combined as a management unit; (3) Gulf as a management unit, with Caribbean and Atlantic combined as a management unit; and (4) separate management units for each region: Gulf, Caribbean, and Atlantic.

Biological Impacts

Establishing an Atlantic management unit provides the South Atlantic Council with the mechanism to more rapidly implement regulations intended to be risk averse and precautionary for the Atlantic wahoo fishery.

Economic Impacts

Establishing a management unit for wahoo should have no economic impact on the recreational and commercial sectors in this fishery, or to other stakeholders who derive benefits from this resource. The choices for setting a geographic range listed under option 2 would meet the technical requirements of defining the management unit and support implementation of an FMP for the resource, thereby providing the platform for subsequent action that could result in changes in net economic benefits.

Social Impacts

Regardless of how the management unit is geographically defined, the action would have an indirect social impact on the fishery. Creating a management unit will most likely lead to better data collection and knowledge of all sectors participating in the wahoo fishery.

Conclusion

The Councils rejected these options because they would not provide for management of wahoo based on the best available biological information. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.3 ACTION 3. In the Atlantic any dealer, defined as the person who first receives dolphin or wahoo harvested in or from the EEZ by way of purchase, barter, trade, or transfer in commerce, will be required to possess a valid dealer permit issued by the National Marine Fisheries Service and to report data needed to monitor the dolphin and wahoo fisheries.

Requirements for a federal dolphin and wahoo permit are that the applicant possesses a state dealer's license and that the applicant must have a physical facility at a fixed location in the state where the dealer has a state license. A fee will be charged to cover the administrative costs of issuing the federal dolphin and wahoo permit. In addition, reporting requirements are specified in Action 6.

It should be noted that dealers who already have federal dealer permits for other species in the Atlantic will not have to obtain separate permits. They will only be required to include dolphin and wahoo in the list of species on their permits. The NMFS Southeast Regional Administrator will issue permits and administer the dealer permit program.

When the plan was being developed jointly with the Gulf and Caribbean Fishery Management Councils, requirements for dealer reporting was proposed for the Gulf region. Given the multiple and extensive delays in development of the multi-Council FMP, and the need for regulations in the Atlantic, the South Atlantic Council requested they be relieved of their administrative responsibilities to develop a joint plan and they be designated as true lead for development of an Atlantic FMP in cooperation with the New England and Mid-Atlantic Councils. The proposed dealer reporting requirements are for the fishery prosecuted in the Atlantic EEZ (New England, Mid-Atlantic, and South Atlantic EEZs).

Biological Impacts

Information obtained from dealers, including but not limited to landings, size distribution, and catch locations, would allow NMFS to better monitor this fishery and thus determine the status of dolphin and wahoo stocks. This information is needed to appropriately manage these stocks in accordance with the Magnuson-Stevens Act.

Economic Impacts

Dealers who want to handle dolphin and wahoo must obtain a federal dealer permit. It should be noted that dealers who already have federal dealer permits for other species in the Atlantic will not have to obtain separate permits. They will only be required to include dolphin and wahoo in the list of species on their permits.

Dealers who handle dolphin and wahoo must fill out monthly dolphin and wahoo reports listing their dolphin and wahoo purchases. This particular option is more comprehensive, in terms of data collection, in that not only wholesalers but also retailers are required to submit data reports.

Dealer permits will increase incentives for dealers to report dolphin and wahoo purchases accurately. The estimated annual cost of dealer permits to the industry is unknown at this time because there is no available count on the number of dolphin and wahoo dealers.

The public cost of dealer reporting is estimated at $12.50 per hour for processing monthly reports. Processing time per report is estimated at 15 minutes based on the level of information collected. Requiring that dealers have physical facilities at fixed locations should not impose any large cost on legitimate dealers because physical facilities are required to offload dolphin and wahoo.

This proposed action should benefit the fishery if it is successful in discouraging non-reporting and other forms of non-compliance, which could significantly reduce the expected benefits from other management measures. This action will impose monetary and time cost to dealers from purchasing a dealer permit and submitting regular data reports to the National Marine Fisheries Service. However dealer information will improve economic analyses, and thus management decisions based on this additional information is expected to increased net economic benefits. In comparison, the no action alternative (Option 1) would not impose these costs on dealers, however, Option 1 would not result in increased benefits to society from improved data collection and analyses for better management of these fisheries. Option 2 and Option 3 would provide some of the same benefits as this measure.

Social Impacts

Being able to identify and quantify those directly involved in marketing the fish, the dealers, can only help to attain appropriate data for management of the fishery. Dealers are in the unique position of being involved on a regular basis with the participants in various fisheries, and they are often the first source of information about changes in landings, prices, and fishing conditions, both natural and social. Dealers can also act to quickly disseminate information from management agencies about proposed or real changes in regulations.

While permitting might be seen in the short-term as burdensome paperwork by some of the dealers, the long-term benefits for the fishery in general will outweigh any perceived negative impacts.

There may be more of a problem in identifying small-scale harvester-dealers that work outside of the formal economy. These are fishermen/dealers that do not have a fixed locality for selling their product. Future social and economic analyses of the fishery should try to account for these undocumented activities so that a better picture of the fishery can be obtained.

Conclusion

The Councils concluded that requiring dealer permits will provide a more accurate and efficient method of determining catch levels and value of dolphin and wahoo. Information obtained from dealers, including but not limited to landings, size distribution, and catch locations, will allow NMFS to better monitor this fishery and thus determine the status of dolphin and wahoo stocks. This information is needed to appropriately manage these stocks in accordance with the Magnuson-Stevens Act. The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Rejected Options for Action 3:

Option 1. No action.

Biological Impacts

This option would not allow determination of the number of dealers in the fishery. If this lack of data precluded the Councils from adequately assessing the status off the dolphin and wahoo stocks, there would be an increased risk of not being able to detect overfishing, should it occur.

Under this option there would be no monetary and time cost to dealers from purchasing a dealer permit and submitting regular data reports. This option would not allow for dealer reporting on dolphin/wahoo landings to better monitor this fishery, and improve data collected for economic analyses and other analyses for management. Also, if a dealer permit is not required the incentive for compliance among dealers and fishermen would decrease and a weak link in the compliance chain could result in reduced economic benefits in the future.

Social Impacts

Not requiring a dealer permit would eliminate any cost to the dealer, thus being of short-term value. However, as noted in the Economic Impacts, not having a dealer permitting structure in place will hamper efforts to effectively obtain data that will assist in managing the fishery. As noted in Section 3.2 in this document, very little social data about the dolphin/wahoo fishery exists. If dealers cannot be identified, then an important potential source of social (as well as biological and economic) data will be lost.

Conclusion

The Councils rejected the no action alternative because it would result in a reduced ability to assess the catch levels and value of dolphin and wahoo resources. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 2. In the Atlantic, U.S. Caribbean, and Gulf of Mexico any dealer, defined as the person who first receives dolphin or wahoo harvested in or from the EEZ by way of purchase, barter, trade, or transfer in commerce, would be required to possess a valid dealer permit issued by the National Marine Fisheries Service and to report data needed to monitor the dolphin and wahoo fisheries.

Requirements for a federal dolphin and wahoo permit are that the applicant possesses a state dealer's license and that the applicant must have a physical facility at a fixed location in the state where the dealer has a state license. A fee will be charged to cover the administrative costs of issuing the federal dolphin and wahoo permit. In addition, reporting requirements are specified in Action 6.

This option would establish a dealer permit in the U.S. Caribbean and Gulf of Mexico as is proposed in Action 3 for the Atlantic.

Biological Impacts

Information obtained from dealers, including but not limited to landings, size distribution, and catch locations, would allow NMFS to better monitor this fishery and thus determine the status of dolphin and wahoo stocks. This information is needed to appropriately manage these stocks in accordance with the Magnuson-Stevens Act.

Economic Impacts

There would be time and monetary investment costs to dealers, or in the case of the U.S. Caribbean to most fishermen, from the purchasing of a dealer's permit from NMFS. There would also be time costs associated with data reporting. The information obtained from the identification of dealers in the Atlantic and Gulf of Mexico may improve the economic analyses in the future. Refer to the economic impact section under Action 3 for a detailed discussion of these benefits.

The administrative costs associated with obtaining a dealer's permit would be levied on the same person. The commercial fishing licenses in Puerto Rico cost U.S. $40.00 for 4 years and in the U.S.V.I. $5.00 per year. A dealer's permit would, in most cases, be obtained by the same commercial fisherman who is already paying for the fishing license. In addition, the Draft Regulations (Law 278) in Puerto Rico will require that commercial fishermen obtain permits for a number of other fisheries at a specified cost per year. All these permits could add up to a significant amount of money for the artisanal commercial fisher in the U.S. Caribbean.

The Draft Regulations (Law 278) include a definition of a non-resident commercial fisherman. Such a non-resident commercial fisherman can obtain, at a cost, a commercial fishing license and the special permits for certain fisheries.

The commercial fishers in the U.S.V.I. sell their day's catch off the back of trucks, where the fish are found in ice boxes, road side, or directly to small restaurants in the area. All catch is sold on the same day that it is caught and landed. In Puerto Rico, there are a number of commercial fishing associations that have certain physical facilities for maintaining fish over a period of time. However, most fish are sold upon landing.

As a result, unlike dealers in the Gulf of Mexico and Atlantic, these Caribbean "dealers" are an identified universe subject to the necessary reporting requirements, and they can be monitored to determine if they are complying with fishery management regulations. Thus, the additional cost for a dealer permit and cost to establish physical facilities in the Caribbean would not provide additional benefits to society.

The administrative costs associated with obtaining a dealer's permit would be levied on the same person. The commercial fishing licenses in Puerto Rico cost U.S. $40.00 for 4 years and in the U.S.V.I. $5.00 per year. A dealer's permit would, in most cases, be obtained by the same commercial fisherman who is already paying for the fishing license. In addition, the Draft Regulations (Law 278) in Puerto Rico will require that commercial fishermen obtain permits for a number of other fisheries at a specified cost per year. All these permits could add up to a significant amount of money for the artisanal commercial fisher in the U.S. Caribbean.

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Social Impacts

Imposing a permit structure on Caribbean harvesters who also act as dealers is seen by some as an action that would likely alter traditional social and cultural configurations among fishing communities. This would occur when the proposed permit structure bypasses long-standing economic ties based on reciprocity and kinship among fishermen and others. This would lead to perhaps severe disruption of social and household relations not only for those directly involved in the fishery, but for those people indirectly involved, such as the consumer.

Furthermore, because in many instances the fishermen is also the vessel owner, operator and the dealer, he will be required to obtain three separate permits, perhaps causing economic hardship. Additionally, in this case, most fishermen/dealers would not have a fixed location to work from as would be required, and hence would be ineligible to sell their product. This is predicted to cause not only immediate negative impacts, but may actually alter the traditional market and kinship structures in communities over the long-run. Because of the unknown social and economic impacts upon fishermen in the Caribbean, the Councils rejected this option while simultaneously recognizing the benefits of permitting dealers.

Conclusion

This option is no longer appropriate because the Dolphin Wahoo FMP now only addresses the Atlantic.

4.2.4 ACTION 4. Require that the owner of a for-hire vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ.

Require that the owner of a commercial vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ.

In order to qualify for a commercial vessel permit in the Atlantic, during one of the three calendar years preceding the control date, the vessel owner (1) must have 25 percent of his or her earned income derived from commercial or for-hire fishing, or must have earned at least $10,000 from either commercial or for-hire fishing and (2) must be able to document 250 pounds of landings and sale of dolphin and/or wahoo on or before the control date of May 21, 1999 in the Atlantic. Alternatively individuals may also qualify for a commercial permit if they hold a valid permit in the snapper-grouper, king mackerel, or swordfish fisheries. The commercial permit is transferable (1 for 1) with vessel when sold or replaced. Allow a 200 pound incidental harvest possession limit of dolphin and/or wahoo for vessels with a valid federal commercial permit fishing North of 39° North latitude.

For a person aboard a fishing vessel to fish for dolphin and wahoo in the exclusive economic zone (EEZ), possess dolphin and wahoo in or from the EEZ, off-load dolphin and wahoo from the EEZ, or sell dolphin and wahoo in or from the EEZ, a vessel permit for dolphin and wahoo must be issued to the vessel and be on board.

A fee will be charged to cover the administrative costs of issuing federal vessel permits. There are no requirements to qualify for a for-hire vessel permit.

The NMFS Southeast Regional Administrator will issue permits and administer the vessel permit program.

When the plan was being developed jointly with the Gulf and Caribbean Fishery Management Councils, requirements for vessel permits was proposed for the Gulf and Caribbean regions. Given the multiple and extensive delays in development of the multi-Council FMP, and the need for regulations in the Atlantic, the South Atlantic Council requested they be relieved of their administrative responsibilities to develop a joint plan and they be designated as true lead for development of an Atlantic FMP in cooperation with the New England and Mid-Atlantic Councils. The proposed vessel permits and reporting requirements are for the fishery prosecuted in the Atlantic EEZ (New England, Mid-Atlantic, and South Atlantic EEZs).

Biological Impacts

This action sets up a limited access system for the fishery pursuant to Section 303(b)(6) of the Magnuson-Stevens Fishery Conservation and Management Act, in order to achieve optimum yield in the fishery. Requiring vessel permits will have biological impacts to the extent that this permit system helps achieve optimum yield (see Action 8). If requiring permits leads to a more accurate determination of the number of vessels in the fishery and their catch, a better understanding of the status of dolphin and wahoo stocks and the OY of the fishery can be attained. The 200-pound incidental harvest limit will allow northern vessels to retain the few dolphin and wahoo they encounter without the burden of obtaining a permit. This allowance will help achieve OY while not having any adverse biological impacts.

Economic Impacts

Vessel permits will enable identification of commercial harvesting and charterboat vessels in the dolphin and wahoo fisheries and to the extent they limit access, cap the participation in the fishery. This could improve the timeliness of obtaining information on these fisheries and allow for effective enforcement. A fee will be charged to cover the cost of administering this permitting process. This fee is currently $50 per application. The opportunity cost (time spent completing the application) is estimated at $5 per application. However, vessel owners holding other federal permits will only pay an additional $20 to receive an endorsement for dolphin and wahoo on their permits. Additional cost to the industry would include the loss in revenue to those vessels that did not meet the permit qualifying criteria and are prohibited from landing dolphin and wahoo.

At this time the number of individuals who will apply for a vessel permit is unknown since the universe of vessels that commercially land dolphin and wahoo cannot be identified. However, these losses could be minor as most vessels in the for-hire and full time commercial harvesting sectors are expected to meet the $10,000 revenue earning criteria that has been the standard used by the Council in determining commercial activity. Also, most vessels that have a “serious interest” in the commercial harvest of dolphin and or wahoo should meet the 250 pound dolphin and wahoo landings requirement. In terms of overall income, 250 pounds of dolphin would have an ex-vessel value of $387.50, using the 2000 average price of $1.55 per pound ($1.55 x 250).

Data from a recently completed study on the for-hire sector indicated that the mean income for South Atlantic charterboat vessels was $51,000 (Holland et al., 1999). Information on the distribution of fishing income was not presented in this report. However, analysis of the data set revealed that among charterboats that targeted dolphin and wahoo only 3.7% reported annual gross fishing income less than $10,000 annually (one observation out of 27). The average length of this category was 23 feet and thus it can be assumed that this vessel was probably a guide boat.

There is no specific information on annual fishing income for vessels commercially harvesting dolphin and wahoo in the Atlantic. An earlier report on vessels in the Southeast with federal fishing permits indicated that the geometric mean income in 1997 was $18,215, and 25% of all vessels reported gross income of less than $9,502 (Vondruska, 1998). Again these figures are not representative of only vessels that commercially harvest dolphin and wahoo.

Analysis of the Florida trip ticket data revealed that 1617 vessels (unique vessel numbers) were found to have landed dolphin and/or wahoo on the Florida Atlantic coast during 1997-2001 (1056 in 1997-1999 only). Among the 1617 vessels, 636 had snapper-grouper, king mackerel and/or swordfish permits. Another 101 had some kind of federal permit for charter fishing during 1997-2001, but only 32 of them had landed 250 pounds or more of dolphin and wahoo on the Florida Atlantic coast in at least one year during 1997-1999. In addition, 100 vessels without any kind of federal fishing permit had met the 250-pound and $10,000 criteria, along with 2 Saltwater Products Licensees that could not be associated with a vessel. Thus, 768 vessels out of the 1617, nearly half, would likely qualify for a permit to fish for dolphin and wahoo (768 = 636 + 32 + 100), plus 2 SPLs for which there is no associated vessel identifier.

However, it cannot be assumed that the remainder of these vessels would not qualify for a dolphin/wahoo permit. Some of these vessels could also operate in the for-hire sector, and charter income would allow the vessel to meet the income requirement. In addition some of the commercial fishing vessels would have landings in other states that are not recorded by the Florida trip ticket system that could enable the vessel to qualify for a dolphin/wahoo commercial vessel permit. In this category there could be “private recreational vessels” that obtain a SPL and sell fish in Florida (there is no income requirement to commercially sell dolphin and wahoo in Florida. They are classified as unrestricted species). This measure was adopted to eliminate this private recreational sale in order to protect the interests of the commercial sector that is dependent on these species.

Vessels with any federal permit that did not qualify for a dolphin/wahoo permit will be allowed an incidental harvest limit of 200 pounds annually when fishing North of the 39° North latitude line. Thus, the short-term forgone revenue of vessels that do not qualify for a permit is not expected to be significant. It is expected that these vessels would make up any minor lost revenue in the future from targeting other species.

The limited access aspect of his measure is only expected to have a minor impact on vessels that do not qualify for a dolphin permit. Vessels that do qualify for a permit would incur an annual out of pocket cost not exceeding $50, and a time cost of $5 for completing the application. It is expected to slow the growth rate of capacity in the future in comparison to the no action alternative (Option 1). In addition, this measure will increase future economic benefits from better management based on data collected from the known universe of participants and better enforcement of fishing regulations.

Social Impacts

Section 303(b)(6) requires that whenever a limited access program is proposed by a federal fishery management body, the Council must take into account present participation in the fishery, historical participation, the economics of the fishery, the capability of fishermen to engage in other fisheries, and the social and cultural framework relevant to the fishery and any affected fishing communities. Although the data available are partial, we can answer these considerations in the majority of cases. While the social and cultural data is limited in the dolphin and wahoo fisheries, there is substantial evidence from other limited entry programs that helps to guide this analysis and make reasonable predictions of social outcomes. Furthermore, enough is known about commercial and for-hire sectors in the fishery that again, one can make reasonable assessments of the social impacts caused by this measure.

Beginning with the for-hire sector, as there are no qualifying criteria to obtain vessel permits, the impacts of this measure should be negligible. Other that the increased burden of paperwork created when applying for a permit, little negative social impact on this sector can be expected (however, with regard to fairness and equity, many fishermen at public hearings questioned why there was no qualifying criteria for the for-hire sector but there was such criteria for commercial vessels). A positive effect from this measure will be the creation of a reliable database that allows for the quantification of the universe of vessels that fish for dolphin and wahoo. Being able to identify this universe will enhance management procedures by increasing management’s efficiency and creating a more reliable database.

The social impacts for the commercial sector of those who harvest and sell dolphin and wahoo will be different than for the “no-sale” for-hire sector. The Council however, has made the qualifying criteria to obtain a permit extremely broad to be as inclusive as possible. Having an income requirement in order to qualify actually serves to protect the commercial fishery from encroachment from those who might only be in the fishery for quick profit. As mentioned under Economic Impacts, the majority of for-hire and commercial vessels are predicted to meet the income requirement for a vessel permit.

Requiring commercial landings of at least 250 pounds of dolphin in any one of the three years prior to the control date is also a very liberal criterion. 250 pounds would be equal to approximately 10 to 20fish, which should not prohibit many fishermen from qualifying. Furthermore, since those fishermen who already hold a snapper-grouper, mackerel, tuna or swordfish permit will be eligible to add dolphin as an endorsement, few impacts are expected to be felt by this group.

One of the only negative social impacts that may occur is that of the cumulative effect of adding one more permitted fishery to the already heavily regulated commercial fisheries in the United States. Each time a permit is created, there is an impact on fisheries in general, and although each impact may be small at the moment of implementation, the cumulative impact over time is predicted to be much greater. Such impacts may be psychological and cultural. They may also be economic, restricting business practices or limiting options. At this time, such impacts can only be suggested, as no work has yet to document these effects has been undertaken in any scientific studies, although it is recommended that such studies be carried out.

It should be noted however, that in public hearing testimony there was some opposition to this measure, citing it was not “fair and equitable” to require permits from some of the fisheries sectors (for hire and commercial) and not others (private recreational fishermen).

One additional social benefit arising from this action will be that this action will be congruent with Action 11 prohibiting the recreational sale of dolphin and wahoo. Whenever measures mirror each other there is less negative social impact upon a user group.

A potential negative impact upon the for-hire sector will be for those who are just entering the chartering sector and have no history in the commercial fishery. They will not be able to document landings or income prior to the control date set for this fishery. If they do not hold other commercial permits such as for snapper grouper or mackerel, they will be effectively barred from selling fish. They could obtain a permit through the purchase of a vessel that already had a permit, but that will be a limited option. This impact will be both negative (for newcomers in the fishery) but positive to those who already hold permits, since their holding in the resource becomes more valuable.

Conclusion

The Councils concluded that requiring vessel permits will more accurately establish the universe of commercial and for-hire vessels in the fishery. This will subsequently improve the timeliness and accuracy of fishery data collected and provide a better opportunity to assess the biological, economic, and social impacts of future management. This action addresses Section 303(b)(6) of the MSFCMA and the Council has determined it will help achieve OY in the fishery.

The 25% and $10,000 income requirements were chosen to track the current requirements for Coastal Migratory Pelagic permits. The 200 pounds was specified as a very low threshold requirement with the intend to include all fishermen that had landed and sold virtually any dolphin and/or wahoo prior to the control date. The 200-pound limit is intended to cover the likely incidental harvest in the area north of 39 degrees North latitude. This would allow this harvest to continue without these fishermen being required to obtain another permit. This trip limit will be enforced along with other fishing regulations as vessels are intercepted and the quantities possessed measured.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, (5) reduce bycatch in the dolphin fishery, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Rejected Options for Action 4:

Option 1. No action.

Biological Impacts

If a vessel permit is not required, the universe of vessels in this fishery would not be known. Not knowing the number of vessels in the fishery could negatively impact our understanding of the fishery and thus result in less accurate stock assessments which increases the risk of overfishing.

Economic Impacts

Compared to the Council's proposed action, there would be no permit fee for vessel owners nor the time cost from completing these applications. If a vessel permit was not required, the universe of vessels in this fishery would not be known which would not improve enforcement of regulations in the dolphin/wahoo fishery. This situation would not facilitate the collection of information on the fishery to improve management. In the long-term, there would likely be a reduction in economic benefits if management measures were not based on accurate information.

Social Impacts

If permits are not required, the Councils and other fishery managers would be unable to determine who fills these two sectors (commercial and for-hire vessels), how they interact in the fishery, and what impacts the regulations might have upon commercial and for-hire fishers. If this sector cannot be identified, then an important potential source of social (as well as biological and economic) data would be lost.

Conclusion

The Councils rejected this option because it would not identify the universe of vessels and would result in a reduced ability to assess catch levels and effort in the dolphin and wahoo fishery. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.5 ACTION 5. Require that the operator of a commercial or for-hire vessel obtain an operator's permit issued by the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ. On each federally permitted dolphin/wahoo commercial or for-hire vessel, there must be on board at least one operator who has been issued a federal operator's permit for the dolphin/wahoo fishery. The federally permitted operator will be held accountable for violations of fishing regulations and also may be subject to a permit sanction. If an operator's permit has been sanctioned, during the permit sanction period the individual operator may not work in any capacity aboard a federally permitted fishing vessel.

No performance or competency testing will be required to obtain a permit. However, the permit may be revoked for violation of Federal dolphin and wahoo regulations as authorized by 15 C.F.R. 904.

The federal permit program will have the following requirements:

1. Any operator of a vessel fishing for dolphin or wahoo (either commercial or for-hire) must have an operator's permit issued by the NMFS Regional Administrator.

2. An operator is defined as the master or other individual on board a vessel who is in charge of that vessel (see 50 CFR 620.2).

3. The operator is required to submit an application, supplied by the Regional Administrator, for an Operator's Permit. The permit will be issued for a period of up to three years.

4. The applicant must provide his/her name, mailing address, telephone number, date of birth, and physical characteristics (height, weight, hair, and eye color) on the application. In addition to this information, the applicant must provide two passport size color photos.

5. The permit is not transferable.

6. Permit holders will be required to carry their permit aboard the fishing vessel during fishing and off-loading operations and must have it available for inspection upon request by an authorized officer.

7. The Regional Administrator may charge an administrative fee for the operator permit consistent with NOAA guidelines.

Possession of any operator permit under another FMP will meet this requirement. The NMFS Southeast Regional Administrator will issue permits and administer the operator permit program.

When the plan was being developed jointly with the Gulf and Caribbean Fishery Management Councils, a requirement for operator permits was proposed for the Gulf region. Subsequently, with the South Atlantic Council requesting they be relieved of their administrative responsibilities in the development of a joint plan while retaining true lead for development of an Atlantic FMP, the proposed operator permits are for the fishery prosecuted in the Atlantic EEZ.

<u>Biological Impacts</u>

There should be no direct biological impacts associated with requiring operator's permits. There will be indirect impacts from having the ability to identify and prosecute operators who continue to violate regulations implemented to protect the long-term viability of the stock or habitat essential to the species managed under this or other Federal fishery management plans.

Economic Impacts

The cost to the agency for setting up this ID card system for operator permits could run up to $10,000 (data provided by the National Marine Fisheries Service). There would also be the cost of issuing and reissuing these permits when they expire. The cost of ID issuance is expected to be similar to that currently charged for most permit categories ($50). Changes or updates to the operator's personal information during the effective period will be accommodated via issuance of a new ID card that would require another fee payment. NMFS recommends that ID cards be issued for a period of three years and thus operators would have to incur the $50 cost every three years.

The proposed action would ensure that vessel operators would be held accountable for federal fishery violations. If there is a permit sanction, that individual may not work in any capacity aboard a federally permitted fishing vessel during the sanction period. Thus, this measure should deter fishery violations. For vessel owners who are not operators this would enhance accountability of the vessel operators they employ and reduce their costs for fishery violations. For owner/operators this measure would ensure that if convicted of a fishery management violation they could not work as an operator aboard another fishing vessel. Thus, the Council's preferred option is likely to effect higher compliance than Option 1.

A reduction in the incidence of fishery management violations is likely to increase net benefits in the future from a reduction in enforcement costs, a reduction in the cost of the penalties (as a result of voluntary compliance), and gains from increased compliance with fishery management regulations. In comparison the "no action" alternative is not likely to provide these benefits but there will be no vessel operator fee from implementing this rejected alternative.

Social Impacts

One of the greatest deterrents to being able to predict accurately the social impacts of a proposed regulations is the lack of knowledge about who is participating in the fishery. While there may be resistance by commercial and for-hire vessel operators to being permitted, the benefits appear to far outweigh the costs. Aside from the benefits to be gained from being able to identify who is operating commercial and for-hire vessels, thus enhancing understanding of the fishery, compliance with other fishery regulations will be enhanced. By not excluding anyone already in the fishery, the Councils sought to be as inclusive as possible.

Comments received during the public hearing process addressed the issue of "fair and equitable treatment" for all sectors of the fishery. In general, commercial and for-hire operators felt that they had been unfairly singled out for sanctions while recreational fishermen will not be held accountable for their actions. Another concern voiced is that the permits protect owners from errant boat captains, but what protects the operators from crew that may not follow regulations? A related point is that while recreational fishers are not counted in the same way as other sectors in the fishery, the data base will not be complete.

An unintended consequence of this proposed action has been to increase tension between the different sectors in the dolphin wahoo fishery.

Since no competency or performance testing will be required, no one currently operating a vessel will be precluded from continuing and new captains entering the fishery will not be affected. The permit program requirements are generally those applied for all permits in the South Atlantic Region.

Conclusion

The Councils concluded that requiring an operator's permit will make vessel captains more responsible for complying with fishery regulations, thus helping to achieve optimum yield. The Councils addressed Advisory Panel member concerns by allowing the possession of any operator permit under any FMP to meet this requirement. This action will especially reduce the impact on all HMS and many Mid-Atlantic and New England fishermen. Many Mid-Atlantic and New England fishermen are already required to have operator permits. This option is strongly supported by the National Marine Fisheries Service and many vessel owners. The Councils determined this action best achieves the goals of the FMP and the management objectives to: (4) optimize the social and economic benefits, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Rejected Options for Action 5:

Option 1. No action.

Biological Impacts

Voluntary compliance could decrease which could lead to negative biological impacts.

Economic Impacts

There would not be an operator's fee or cost to the agency for setting up and managing this ID card system. If a vessel operator's permit is not required the incentive for compliance among vessel operators fishing for dolphin and wahoo would not increase. Thus, there would be no economic gains from improved compliance with fishery management regulations in the future.

Social Impacts

The lack of a permitting structure will have a negative impact on data collection in general and social data collection efforts in particular. Efforts to enhance law enforcement will also suffer. However, by not treating the varying sectors of the fishery differently through different permitting structures, social conflict may decrease in the short and long term between private recreational fishermen and those in the commercial and for-hire sectors.

Conclusion

The Councils rejected this option because it would not provide the number of operators in the fishery or additional incentives to vessel operators to comply with regulations. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.6 ACTION 6. In the Atlantic, require reporting of vessel permit holders (commercial and for-hire) and include the reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP).

It is the Councils' intent that existing logbook requirements continue until the cooperating partners meet to determine whether these efforts will continue under ACCSP.

NMFS is to provide an annual summary of available data and research results for dolphin and wahoo. This Annual SAFE Report is to be written and provided to the South Atlantic Council at least three weeks prior to the Council's annual June meeting.

Bycatch Considerations

National Standard 9 states: "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."

Section 303(a)(11) of the Magnuson Stevens Act states: "Any fishery management plan which is prepared by any Council … with respect to any fishery, may - establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority--

(A) minimize bycatch; and

(B) minimize the mortality of bycatch which cannot be avoided…."

Thus, in order to minimize bycatch, the Council needs to have a way of evaluating whether there is bycatch in the fishery, and if there is bycatch, the amount of that bycatch. That is done through establishing "a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery" as stated in Section 303(a)(11) above. The standardized reporting methodology the Council is choosing to use includes vessel reporting and other aspects of the ACCSP discussed below. The data collection program to quantify finfish discard and release data for headboat fisheries will be an at-se observer program. The data collection program to quantify finfish discard and release data for charterboat fisheries will be the MRFSS intercept survey and at-sea observers, where feasible. Reporting of protected species interactions is required for both headboat and charterboat fisheries.

Bycatch is believed to be minimal in the recreational, charter, and headboat fisheries. Bycatch in the longline fishery is discussed and addressed in Action 20. Once the bycatch information has been collected and assessed, to the extent practicable, the Council will be able to take any action necessary to minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Atlantic Coastal Cooperative Statistics Program or ACCSP

The States of Maine through Florida and the National Marine Fisheries Service presently are collecting statistical information. This information is necessary for the Councils to monitor the fishery. Reporting is mandatory for those selected by the sampling design to ensure a representative subsample of the fishery providing information.

The South Atlantic, Mid-Atlantic, and New England Fishery Management Councils, the ASMFC, NMFS, U.S. Fish and Wildlife Service, all Atlantic Coastal States, District of Columbia, and the Potomac River Fisheries Commission are currently implementing a coastwide fisheries statistics program. A minimum set of reporting requirements (based on a trip-level) for fishermen and dealers have been developed and adopted by each state/agency. These reporting requirements are now the minimum standard for data collection on the Atlantic coast. Nothing in the proposed program will prohibit the state/agency from requiring more detailed information on a trip basis if so desired. The ACCSP has now approved the following modules: (1) Catch and effort; (2) Biological Sampling; (3) Socioeconomic; and (4) Release, Discard, and Protected Species Interactions (see Appendix J for details of the Discard Module). Each of these are hereby incorporated into the reporting requirements for the dolphin and wahoo fishery.

Ongoing efforts of the Atlantic Coastal Cooperative Statistics Program (ACCSP) will result in standardized data collection. Therefore, the Councils urge state and federal agencies to continue collecting this important information:

1. Total Landings By Month By Area
2. Ex-Vessel Value
3. Boats and Vessels:
   General Characteristics
   Number of Crew
   Gear Type and Size
4. Shore Facilities
5. Employment
6. Annual Wholesale Value
7. Imports and Exports

DEFINITION OF AN ACCSP COMMERCIAL DEALER FOR REPORTING PURPOSES: A seafood dealer is defined as any person or entity other than the final consumer, who purchases, ships, consigns, transfers, transports, barters, accepts (maintains), or packs any marine fishery products received from marine resource harvesters or marine aquaculturists. Any marine fishery product landed in any state must be reported by a dealer or a marine resource harvester acting as a dealer in that state. Any marine resource harvester or aquaculturist who sells, consigns, transfers, or barters marine fishery products to anyone other than a dealer would himself be acting as a dealer and would therefore be responsible for reporting as a dealer. This definition is provided for purposes of statistical gathering only.

This definition is being used in the Atlantic in the ACCSP Program.

When the plan was being developed jointly with the Gulf and Caribbean Fishery Management Councils, reporting requirements for the Gulf and Caribbean regions were proposed to be included through a framework action. Subsequently, with the South Atlantic Council requesting they be relieved of their administrative responsibilities in the development of a joint plan while retaining true lead for development of an Atlantic FMP, the reporting requirements are for the fishery prosecuted in the Atlantic EEZ.

BACKGROUND FROM THE ACCSP WEBSITE

Recognizing the need for compatible coastal fishery data, the ACCSP Partners came together to set data collection standards. Because the need for some kinds of data must be balanced against the cost and burden of collecting it, the partners have determined various standards for collecting data from various fishing stakeholders.

Metadata, as defined by the ACCSP are “corollary or descriptive information, both numeric and non-numeric that may qualify or explain primary data.” These data include environmental, economic, social, and regulatory factors affecting commercial, recreational, and for-hire fisheries.

Commercial Fisheries

The ACCSP Partners are at various stages in the implementation of ACCSP-compatible data collection programs for commercial fisheries.

Catch and Effort Data

All marine products that are sold, bartered, or otherwise exchanged for value will be handled through a documented dealer or fisherman responsible for reporting as a dealer in the state where initially landed or produced via aquaculture. This dealer or fisherman will be responsible for reporting each transaction, including price.

The ACCSP commercial data collection program is a mandatory, trip-based system with all fishermen and dealers required to report standardized data elements. All catch and effort data are to be collected at the trip-level with resolution for each gear and area combination. For example, landings and effort data should be recorded separately each time the fisherman changes gear or fishing area within a trip. Either one-ticket or two-ticket reporting systems may be used to collect basic catch and effort at the trip level from both the dealer and the fisherman. In a one-ticket system, both the dealer and fisherman report on one form. In a two-ticket system, a fishermen reports trip data and catch estimates on one form, the dealer reports the trip landing weight and price-per-unit on another form, and both enter data that are required to link the two forms.

Commercial harvesters are required to report all commercial trips regardless of catch. A trip with effort but no catch is still considered a trip; therefore, all data elements other than catch must be reported. Dealers are required to submit monthly negative (no activity) reports in the states where they are licensed. Harvesters with no reported commercial landings during the previous license period are required to certify that fact at the time of license renewal. Commercial fishermen and dealer reports are to be submitted monthly by the 10th of each month after the reporting month, unless more stringent reporting requirements exist (e.g. quota monitoring).

All catch and effort data collection programs for commercial fisheries will follow ACCSP quality control and assurance documentation.

The ACCSP encourages the investigation and use of innovative technologies for commercial data collection in order to reduce the reporting and data entry burdens on all parties.

Quota Monitoring data are a subset of commercial catch and effort data, and involve reports with less detailed data and quicker reporting times. The ACCSP endorsed use of computerized Interactive Voice Response (IVR) systems as the best technology for implementing quota monitoring. Other methods (e.g. Operator Assisted Voice Response System, U.S. mail, voice mail, FAX) may be accepted for reporting commercial quotas if dealers do not have access to touch tone phones. The ACCSP also encourages use of cooperative systems across partners that eliminate duplication and increase efficiency.

Catches of quota monitored species, and negative reports, are required on a weekly and sometimes daily basis. Data should be provided to responsible partners as required under state, ASMFC, or federal fishery management plans or by the following minimum standards:

* 0-75% of quota reached: submitted monthly within 15 days of the end of the month, and
* >75% of quota: submitted weekly by Thursday noon following the end of the reporting week.

Registration Tracking

An ACCSP objective is to link data for each specific fishing trip across the various modules. For example, if a commercial vessel carried an observer, and its crew was interviewed at the dock for socio-economic data, we should be able to link the trip data reported by the vessel captain to dealer data on price-per-pound plus the discard data recorded by the observer and the socio-economic data collected by dockside port agents. This linkage is necessary to model the biological and socio-economic impacts of regulations on fisheries. The ability to link data depends on the development of a unique identifier for various entities. A complete list of all unique identifiers will be maintained in the Registration Tracking module.

Unique identifiers will be required for all commercial dealers and commercial fishermen, and for other commercial entities such as processors. Tracking of permits and fishing vessels by individuals and/or fishing businesses will also be incorporated.

The ACCSP recommends that the hull identification number (HIN) be mandatory on all commercial fishing and for-hire vessels, and that the HIN should be reported on all data collection forms where applicable. The ACCSP recommends that each partner's licensing agency classify each vessel as participating in commercial, recreational and/or for-hire fisheries. The ACCSP specifies baseline data elements that should be collected on all state and federal vessel registration applications.

The current ACCSP standard for the unique identifier for trip data is the trip date plus the vessel identifier plus the trip number when a vessel is involved, and the trip date plus the individual identifier plus the trip number when a vessel is not involved.

Biological Sampling

Dealers should be required to provide port samplers with space and access to landed catch for the collection of biological samples.

Trained field personnel, or port agents, perform biological sampling. Port agents visit docks, unloading sites, and fish houses to collect biological samples by direct observation. Biological sampling includes species identification, length and weight measurements, hard part extraction (e.g., spines, otoliths, scales) for aging purposes, and tissue collection (e.g., gonads, stomach) for life history and stock delineation purposes. The ACCSP Program Design specifies minimum data elements, length frequency measurement methods for specific species, and species-specific aging structures. It also addresses sub-sampling procedures to ensure sampling is representative of the catch.

The ACCSP Biological Review panel recommends annual sampling targets by quarter, area fished, gear/species, and market category. All species managed under Fishery Management Plans are considered priority species. Requests for annual species priorities and target biological sampling levels are sent to NOAA Fisheries Science Center Directors, the ASMFC Director of Research and Statistics, and the Coordinating Council member from each ACCSP Partner. The Biological Review Panel then meets to generate recommendations for sampling. This sampling prioritization is linked closely with the bycatch prioritization process. Recommended priorities and sampling levels are included in the annual ACCSP Request for Proposals.

Filleting of fishes at-sea is a growing issue that may impact the numbers of specimens available for shore-based biological sampling. Partners are urged to consider enacting regulations that require fishes to be landed with head and tail intact, or in a dressed form consistent with Fishery Management Plan requirements (swordfish carcasses, etc.).

ACCSP recommends development of regional aging centers to take advantage of the scientific expertise available coast-wide and to maximize funding available for processing biological samples.

Bycatch, Releases and Protected Species Interactions

The bycatch, releases, and protected species interactions monitoring program (referred to here as bycatch) includes quantitative and qualitative data collection components.

The quantitative component includes:
* mandatory at-sea observers, and
* mandatory and voluntary reporting of releases and discards through the catch and effort trip ticket systems.

Qualitative data collection includes:
* sea turtle and marine mammal stranding and entanglement reporting networks,
* beach bird surveys,
* port sampling to verify reporting on fishermen trip reports, and
* real-time reporting programs (mandatory reports).

Commercial vessels should be required to carry at-sea observers as a condition of permitting in commercial fisheries.

Reporting of protected species interactions and releases and discards of managed species are the highest priorities under this module.
* Reporting of protected species interactions (including threatened species and protected finfish species) is mandatory.
* Reporting of non-protected species releases and discards through the catch and effort reporting system is voluntary.
* Federal statutes require that marine mammal interactions involving incidental injury or mortality must be reported within 48 hours after return from a trip or within 48 hours of occurrence for non-vessel trips.

All partners should develop outreach and training programs to improve reporting accuracy by fishermen.

The ACCSP developed minimum data elements, an extensive set of sampling protocols, and quality control/assurance procedures for at-sea observer programs. The ACCSP and program partners will conduct approved training programs for all new at-sea observers, and will provide certification of qualifications.

Non-verified observer data should be made available for data entry 1-7 days after the trip return date. Finalized data should be provided 45 days after the last day of the month for which data was collected.

Data collected on mandatory trips sampled by At-Sea Observer Programs are not confidential, since the data are observed by an agent of a partner and are not submitted by a person. Observed data on a voluntary trip are confidential.

A Bycatch, Releases, and Protected Species Interactions Committee will recommend priorities for commercial fisheries, using data collected through the monitoring programs and other information. The highest priority for bycatch monitoring of commercial fisheries is fisheries with probable or proven high discards and/or releases. This process will be linked with setting of biological data collection priorities by the Biological Review Panel.

<u>Socioeconomic Data</u>

The ACCSP will collect baseline social and economic data on commercial harvesters using the following voluntary surveys:
* Annual Fixed Cost Survey - data collected from vessel owners/operators,
* Trip Cost Survey (variable costs for a vessel's most recent commercial fishing trip) - data collected from the vessel captain, and
* Annual Owner/Captain/Crew Survey for sociological information.

The surveys will be linked to the ACCSP registration tracking and commercial catch/effort modules. The ACCSP will conduct evaluation studies to determine appropriate survey methodologies (i.e., mode of collection, statistical design) for the commercial harvester surveys.

ACCSP standards include approved survey instruments and quality control and assurance procedures.

All social and economic data at the vessel or individual level are confidential, with access granted only to authorized users as identified in the ACCSP confidentiality protocols…Status

Recreational Fisheries

Data for recreational finfish fisheries on the Atlantic coast are collected primarily through the Marine Recreational Fisheries Statistics Survey (MRFSS), which is conducted by NOAA Fisheries.

Catch and Effort Data

Because of the sheer number of recreational fishermen, it is not practical to require mandatory reporting of all trips and catch, as is done for commercial fishermen. Such an effort would cost tens of millions of dollars to implement and would be impossible to enforce. Therefore recreational data must be collected through surveys that are statistically valid, with levels of precision that allow realistic management decisions.

ACCSP standards for recreational catch and effort data specify that:

* Effort data for the private/rental boat and shore fishing will be collected through a telephone survey with random sampling of households, until a more comprehensive and efficient sampling frame is available, and
* Catch data for the private/rental boat and shore fishing will be collected through an access-site intercept survey of fishermen as they are completing their trips.

ACCSP State Partners are encouraged to increase their involvement in conducting the intercept survey for catch data.

The ACCSP has defined minimum data elements, standard definitions, and quality control/quality assurance procedures for recreational fisheries effort and catch surveys.

The ACCSP will conduct research to evaluate the effects of expanded sampling for improvement of precision and/or accuracy of the estimates of recreational catch and effort data. The ACCSP will implement evaluation studies of alternate methods or sampling frames for effort estimation. A complete list of possible improvements to current surveys that should be evaluated is included in the Program Design.

Quota monitoring data are a subset of recreational catch and effort. The ACCSP is evaluating quota monitoring methods for recreational fisheries.

Registration Tracking

Registration tracking of the for-hire fisheries relies on the same concepts and standards as the commercial and recreational fisheries modules. The commercial standards apply for data collected from the charter and head boat captains and/or operators, and when collecting catch data through the MRFSS intercept interviews (i.e. a vessel identifier will be collected). Unique identifiers for data collected from individual recreational fishermen utilizing for-hire vessels will be the same as for other recreational fishermen.

Biological Sampling

Ideally, when conducting the fishermen intercept interviews for catch data, all fish species in a catch should be measured and weighed unless refused by the fisherman.

Recreational samplers should collect biological data other than lengths and weights (scales, otoliths, tissue, etc.) independently of intercept sampling information in order to minimize possible procedural corruption of the intercept data.

Collection of biological data through tournaments, freezer collections, and scale envelopes offers opportunities for recreational constituencies to participate in the data collection process and should be implemented where feasible.

The ACCSP Program Design specifies minimum data elements, length frequency measurement methods for specific species, and species-specific aging structures. It also addresses sub-sampling procedures to ensure sampling is representative of the catch.

Bycatch, Releases, and Protected Species Interactions

The bycatch, releases, and protected species interactions monitoring program (referred to here as bycatch) includes quantitative and qualitative data collection components.

The quantitative component includes:

* collection of the numbers of released and discarded finfish through existing recreational intercept surveys, and
* collection of release and discard information on protected species through add-ons to existing recreational telephone surveys.

Qualitative data collection includes:

* sea turtle and marine mammal stranding and entanglement reporting networks, and
* additions to existing recreational telephone and intercept surveys for finfish species in high incidence areas and/or the addition of special questions to both surveys.

The ACCSP developed minimum data elements, and quality control/assurance procedures for existing recreational surveys.

Data collected on mandatory trips sampled by At-Sea Observer Programs are not confidential, since the data are observed by an agent of a Partner and are not submitted by a person. Observed data on a voluntary trip are confidential.

A Bycatch, Releases, and Protected Species Interactions Committee will recommend priorities for commercial fisheries, using data collected through the monitoring programs and other information. The highest priority for bycatch monitoring of commercial fisheries is fisheries with probable or proven high discards and/or releases. This process will be linked with setting of biological data collection priorities by the Biological Review Panel.

Socio-Economic Data

The ACCSP will collect baseline social and economic data on the recreational fishery using several voluntary surveys.

The ACCSP will collect social and economic data for finfish recreational fisheries through the addition of data elements to existing MRFSS telephone and intercept surveys. An extensive survey should be conducted every sixth year to allow complete modeling of recreational demand or value (random utility - RUM - or travel-cost models) and expenditures (jobs and dollars spent). Minimum data elements will be added to the intercept or telephone survey every three years to allow for updating the models. The extensive survey will be collected with a brief add-on to the intercept survey, and a lengthier telephone follow-up survey of interviewed fishermen who agree to participate.

Surveys to determine the value of non-consumptive activities involving marine resources (whale-watching, etc.) should be conducted at three and six year intervals. These should be staggered with the consumptive surveys.

Surveys to determine the value and expenditures for recreational shellfish/crustacean fishing need to be developed.

For-hire Fisheries

For-hire fisheries include charter boats, head boats and guide boats. Guide boats are considered a subset of charter boats for sampling purposes. Charter vessels are generally hired on a per-trip basis, while head boats are paid on a per-person basis. Guide boats are generally smaller vessels that are not documented by the Coast Guard and fish inshore.

Catch and Effort Data

ACCSP standards for for-hire fisheries catch and effort data specify that:

* Effort data will be collected through a weekly survey of ten percent of randomly selected charter and head boat captains and/or operators,
* Catch data for charter boats will be collected through an access-site intercept survey of fishermen as they are completing their trips, and
* Catch data for head boats may be collected through both access-site intercepts of fishermen as they are completing their trips and at-sea observers.

This new method for effort data collection was chosen as the most timely, accurate, and reliable method after extensive evaluation of alternate methods for collecting effort and catch data from charter and head boats, including the new method, 100% mandatory logbook reporting, and the current MRFSS random-digit dialing telephone and fishermen intercepts.

The weekly telephone survey of charter and head boat captains and/or operators depends upon compilation and maintenance of a complete list of vessels to use as a for-hire directory frame.

For data collection purposes, charter boats and head boats will be separated, with guide boats included as part of the charter boat component. All charter boat surveys should be designed to allow identification and representative sampling of those trips that may be called guided trips.

The ACCSP has defined minimum data elements, standard definitions, and quality control/quality assurance procedures for the for-hire fisheries effort and catch surveys. The unique identifier for trip data will be the date of return, sampler number, record number, and vessel, individual, and/or interview identifier.

ACCSP State Partners are encouraged to increase their involvement in conducting the intercept survey for catch data.

Quota monitoring data are a subset of for-hire catch and effort. The ACCSP is evaluating quota monitoring methods for the for-hire fisheries.

Registration Tracking

A unique identifier will be required by the ACCSP for all recreational fishermen.

For private/rental boat and shore modes, the unique record identifier for linkage of catch/effort/biological/bycatch, releases and protected species interactions/economic/social trip data will be the date of return, sampler number, record number, and interview identifier. A permit number or a vessel identifier is not necessary as a minimum data element for the private/rental boat or shore modes.

Biological Sampling

Ideally, when conducting the for-hire fishermen intercept interviews for catch data, all fish species in a catch should be measured and weighed unless refused by the fisherman.

Samplers should collect biological data other than lengths and weights (scales, otoliths, tissue, etc.) independently of intercept sampling information in order to minimize possible procedural corruption of the intercept data.

Collection of biological data through tournaments, freezer collections, and scale envelopes offers opportunities for the for-hire constituencies to participate in the data collection process and should be implemented where feasible.

The ACCSP Program Design specifies minimum data elements, length frequency measurement methods for specific species, and species-specific aging structures. It also addresses sub-sampling procedures to ensure sampling is representative of the catch.

Bycatch, Releases, and Protected Species Interactions

The data collection program to quantify finfish discard and release data for head boat fisheries will be an at-sea observer program. The data collection program to quantify finfish discard and release data for charter boat fisheries will be the MRFSS intercept survey and at-sea observers, where feasible. Reporting of protected species interactions is required for both head boat and charter boat fisheries.

Qualitative monitoring for the for-hire fisheries will include the same standards described for the commercial and recreational programs.

Information on finfish bycatch is currently collected for charter and head boats through the MRFSS intercept sampling, and is reported by head boat operators on the Southeast Logbooks. Observer sampling of head boats is expected to be implemented as part of the new MRFSS for-hire methodology in 2003.

Socio-Economic Data

The standards for socio-economic data collection for recreational fishermen who participate in for-hire fisheries are identical to those proscribed for recreational private-boat and shore fishermen.

Socioeconomic data collection for the commercial aspects of for-hire fisheries remain to be developed.

The Councils' evaluation of impacts begins below:

Biological Impacts

Reporting from vessels in the fishery will improve our understanding of the fishery and will improve stock assessments. Biological sampling and data that will be collected through the logbook and by observers are critical to stock assessments. This information is critical for refinement of the dolphin and wahoo management program, determining the type and amount of bycatch, and in preventing overfishing. Ongoing data collection and stock assessments will allow each Council to implement needed modifications in their area of jurisdiction through the comprehensive framework procedure.

Economic Impacts

ACCSP is a comprehensive data collection program that encompasses the recreational and commercial sectors of the fishery. Reporting, making the catch available, and carrying observers are all necessary to monitor and assess the dolphin and wahoo fishery. These analyses will allow identification of management actions that result in increased economic benefits to society. A mandatory logbook reporting system, if implemented, enables the collection of more accurate and complete biological and economic data, increases incentives for regulatory compliance, and aids in enforcement. Estimated cost of logbook reporting to the industry is $12.50 per hour per vessel. This represents the opportunity cost for filling out vessel logbooks.

The public burden costs associated with vessel logbooks include: (a) the cost of logbooks at $8.00 per logbook, (b) mailing cost estimated at $3.00 per logbook, and (c) processing cost estimated at $100 per vessel annually. The benefits from better management of the resource is expected to be greater than any inconvenience to harvesters from requiring mandatory logbook reporting and the public/agency costs from implementing this logbook program. Thus, this measure is superior to the no action alternative (Option 1).

<u>Social Impacts</u>

Data collection is a crucial part of fisheries management, particularly as the numbers of participants in each fishery increases. While each sector may resent the implementation of additional reporting regulations, better data allows for more fair and equitable management decisions for the different sectors participating.

Because the ACCSP has established uniform data collection procedure for the east coast of the United States, fishermen – both recreational and commercial – should feel less burdened.

<u>Conclusion</u>

The Councils concluded the most appropriate method to collect accurate data on dolphin and wahoo in the Atlantic was to include reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP) and to continue existing logbook requirements. Bycatch information is presently collected for the recreational fisheries through the MRFSS program, the Headboat monitoring program of NMFS, and reporting requirements for highly migratory species. Commercial fisheries are monitored for bycatch through logbooks for the snapper grouper fishery, the coastal migratory pelagic fishery, and the highly migratory pelagic species. The ACCSP program provides a baseline and minimum standards and elements so as to provide access to a uniform combined database. Once the bycatch information has been collected and assessed, to the extent practicable, the Council will be able to minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

<u>Rejected Options for Action 6</u>:

Option 1. No action.

<u>Biological Impacts</u>

Not requiring reporting from vessels in the fishery would lessen our understanding of the fishery and would not provide biological sampling and data that are critical for refinement of the dolphin and wahoo management program and in preventing overfishing. The collection of data that may be used in assessing the status of the dolphin and wahoo stocks is necessary to insure that each Council may implement needed modifications to the management of dolphin and wahoo in their area of jurisdiction through the comprehensive framework procedure.

Economic Impacts

Without requiring data collection, the Councils would not have the necessary information to manage the fishery in such a manner so as to increase economic benefits to society. Not maintaining a logbook reporting system would not assist in the collection of more accurate and complete data, and not increase regulatory compliance.

Social Impacts

Not requiring vessels to participate in their respective reporting program (RecFIN, ComFIN, and the ACCSP) or to fill out logbooks would have a negative impact overall on the fisheries in question. If the other actions, such as vessel and operator permits are approved, there will be information about the fishery generated but poorly managed. By not employing existing and proven data collection management methods, data can easily become garbled and of little use to the fishermen, the public or policy-makers and scientists. There would be a great deal of data lost, and this would have a negative impact on the ability to understand, monitor, and assess the fisheries and determine appropriate management measures. This situation would ultimately result in negative social impacts.

Conclusion

The Councils rejected this option because it would lessen our understanding of the fishery and would not provide biological sampling and data that are critical for refinement of the dolphin and wahoo management program. This action would result in lack of adequate information for each Council to implement needed modifications to the management of dolphin and wahoo in their area of jurisdiction through the comprehensive framework procedure. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.7 ACTION 7. Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 18.8 and 46.5 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 1.41 and 1.63 million pounds. Note: This FMP no longer applies to the Caribbean and Gulf of Mexico Council jurisdictions, however, the range of MSY for dolphin and wahoo based on available data is still appropriate.

Biological Impacts

The National Marine Fisheries Service requires that the Councils include biomass-based estimates of MSY in every fishery management plan. This action will meet the requirement for dolphin. This measure by itself will not impact the fishery, and short-term benefits or costs will depend on the management measures adopted to keep the fishery from exceeding MSY.

The draft exploratory assessment for dolphin (Prager, 2000; Appendix B) provides a benchmark estimate for MSY from a production model. The benchmark estimate is 27 million pounds (12,241 metric tons); 80% confidence intervals range from 18.8 million pounds (8,506 metric tons) to 46.5 million pounds (21,110 metric tons).

A proxy MSY of 1.41 to 1.63 million pounds for wahoo was also provided by NMFS SEFSC based on a range of 5 to 10 year median catch history through 1999 (Source: January 8, 2001 letter from Joe Powers (Acting RA) to Kay Williams with an attached memo from Mike Prager to Nancy Thompson dated December 7, 2000).

The Councils have previously proposed using 30% Static SPR as a proxy for MSY but can now specify MSY for dolphin and wahoo based on biomass estimates.

Economic Impacts

The National Marine Fisheries Service requires that the Councils include biomass based estimates of MSY in every fishery management plan. This action will meet the requirements for dolphin and wahoo, and is superior to the no action alternative (option 1) which will not allow for development of this FMP and Option 2 which only provides a biomass based estimate for dolphin.

Defining the MSY does not alter current use of the resource; it merely establishes a benchmark for fishery and resource evaluation from which to base additional management actions, specifically establishing the OY and TAC. OY and TAC should be less than or equal to MSY. Since defining the MSY has no direct effect on resource harvest/use, there would be no direct economic effects associated with harvest changes. Direct effects only accrue to the additional actions that directly alter the use of the resource.

The reference to economic benefits includes consumer surplus to the recreational sector, non-market value to non-consumptive and non-use groups, and net revenue to the for-hire and commercial harvesting sectors of the dolphin/wahoo fisheries.

Social Impact

The National Marine Fisheries Service requires that the Councils include biomass based estimates of MSY in every fishery management plan. This option would meet the requirement for dolphin and wahoo. This option by itself would not impact the fishery and future social benefits or negative social impacts would depend on the management measures adopted to keep the fishery from exceeding MSY. Social benefits/impacts refers to cultural continuity, community cohesion, fishing opportunities, social conflict, stress, etc.

Conclusion

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (4) optimize the social and economic benefits and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Rejected Options for Action 7:

Option 1. No action.

Biological Impacts

The Councils rejected this option because the Magnuson-Stevens Act requires the Councils set MSY or a proxy for MSY. In addition, future stock assessments will be required to address biomass estimates for MSY.

Economic Impact

The Magnuson-Stevens Act requires the Councils set MSY or a proxy for MSY in development of an FMP. Thus, this option would not allow for management of dolphin and wahoo in the future, which could result in reduced net economic benefits to society.

Social Impacts

The Magnuson-Stevens Act requires the Councils set MSY or a proxy for MSY in development of an FMP. Thus, this option would not allow for management of dolphin and wahoo in the future, which could result in reduced social benefits to society.

Conclusion

The Councils rejected this option because the Magnuson-Stevens Act requires the Councils set MSY or a proxy for MSY

Option 2. The Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 16 and 18 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is 30% Static SPR.

Biological Impacts

The National Marine Fisheries Service requires that the Councils include biomass based estimates of MSY in every fishery management plan. This option would meet the requirement for dolphin. This measure by itself would not impact the fishery and short-term benefits or costs would depend on the management measures adopted to keep the fishery from exceeding MSY.

The draft exploratory assessment for dolphin (Prager, 2000) provides a proxy MSY of 15.9 million pounds (7,204 metric tons) based on the average of the last 10 years' catch (1988-1997) or 17.8 million pounds (8,089 metric tons) based on the average of the last 5 years' catch (1993-1997). The Councils previously proposed using 30% Static SPR as a proxy for MSY but can now specify MSY for dolphin and wahoo based on biomass estimates.

Economic Impact

The National Marine Fisheries Service requires that the Councils include biomass based estimates of MSY in every fishery management plan. This option would meet the requirement for dolphin but not wahoo. This option by itself would not impact the fishery and future benefits or costs would depend on the management measures adopted to keep the fishery from exceeding MSY.

Social Impact

The National Marine Fisheries Service requires that the Councils include biomass based estimates of MSY in every fishery management plan. This option would meet the requirement for dolphin but not wahoo. This option by itself would not impact the fishery and future social benefits or negative impacts would depend on the management measures adopted to keep the fishery from exceeding MSY.

Conclusion

The Councils rejected this option in favor of the proposed action because the range for dolphin is based on more data and a biomass proxy for wahoo was provided by NMFS. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 3. The Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 18.8 and 46.5 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 1.63 and 2.176 million pounds.

Biological Impacts

The draft exploratory assessment for dolphin (Prager, 2000) provides a benchmark estimate for MSY from a production model. The benchmark estimate is 27 million pounds (12,241 metric tons); 80% confidence intervals range from 18.8 million pounds (8,506 metric tons) to 46.5 million pounds (21,110 metric tons). A proxy MSY of 1.41 to 1.63 million pounds for wahoo was also provided by NMFS based on catch history.

Economic Impacts

As stated previously, this measure would not have any direct economic effects. Indirect benefits or costs would depend on the management measures adopted to keep the fishery from exceeding MSY.

Social Impact

The National Marine Fisheries Service requires that the Councils include biomass based estimates of MSY in every fishery management plan. This option would meet the requirement for dolphin and wahoo. This option by itself would not impact the fishery and future social benefits or negative impacts would depend on the management measures adopted to keep the fishery from exceeding MSY.

Conclusion

The Councils rejected this option in favor of the proposed action because NMFS recommended using the range for wahoo MSY they provided because it is based on the best available scientific information available. The upper range of MSY for wahoo presented in this option (2.176 million pounds) was derived so that if reduced by 25% to estimate OY the resulting value would be equal to present landings, or approximately 1.63 million pounds. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.8 ACTION 8. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and 100% of MSY (between 1.41 and 1.63 million pounds) for wahoo.

Biological Impacts

The term Optimum Yield is used in the first national standard of the Magnuson Act to achieve the greatest overall benefit to society through the harvest of any species without overfishing. It refers to the maximum number of fish that can be harvested safely as reduced by social, economic, and ecological factors.

Optimum Yield is usually set at a more biologically conservative level than MSY and cannot be set at a level greater than MSY. The difficulty in determining Optimum Yield for dolphin and wahoo comes from the limited information available about the biological, social, economic, and ecological aspects of this fishery. With dolphin and wahoo there is a great deal of uncertainty as to what level of harvest would maximize protection of the resource, ensure economic efficiency, and provide some social security for those involved. Setting Optimum Yield at a low level may be too restrictive for a fishery that operates on a short-lived fish. On the other hand, setting Optimum Yield at a level high enough to allow unlimited harvest could result in less than optimum management.

Economic Impact

Defining the OY does not alter current use of the resource; it merely establishes a benchmark for fishery and resource evaluation from which to base additional management actions, specifically establishing the TAC. Since defining the OY has no direct effect on resource harvest or use, there would be no direct economic effects associated with its specification. Direct economic effects only accrue to the additional management actions that directly alter the use of the resource such as a TAC and other harvest control rules that are implemented to prevent overfishing. This measure is preferred over Option 1 since it would allow for development of the FMP for dolphin and wahoo which would allow for implementation of management measures that could increase economic benefits.

The reference to economic benefits includes consumer surplus to the recreational sector, non-market value to non-consumptive and non-use groups, and net revenue to the for-hire and commercial harvesting sectors of the dolphin/wahoo fisheries.

Social Impacts

This measure by itself will have no impact on the entities in this fishery. Economic and social benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen optimum yield level.

The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing. Social benefits/impacts refers to cultural continuity, community cohesion, fishing opportunities, social conflict, stress, etc.

Conclusion

The Councils concluded the estimate of MSY for dolphin was appropriate; however, the MSY for wahoo probably underestimates the true MSY. This conclusion was based on the level of wahoo landings relative to the MSY estimate and the fact that the fishery is not fully exploited. In addition, the December 7, 2000 memo from Mike Prager to Nancy Thompson includes the following: "Percentage points on the median of five-year catch are suspect. The estimation procedure indicates significant bias, and I am unfamiliar with any procedure likely to correct that. Therefore, I suggest that the median proxy estimate based on 5 years of data not be used, or if used, that only the point estimate be used." This statement was also a factor in the Council's determination that the estimate of MSY probably underestimates the true MSY. Therefore, the Councils specified OY as 100% of MSY. As additional data are collected and the MSY estimate is refined, the Councils will reexamine the appropriateness of setting OY = 100% MSY.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (4) optimize the social and economic benefits, (5) reduce bycatch in the dolphin fishery, (6) direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Rejected Options for Action 8:

Option 1. No action.

Biological Impacts

Not setting an Optimum Yield could lead to overfishing because there would not be a target harvest level.

Economic Impact

There would be no direct economic effect. However, the definition of OY is a necessary benchmark to determine the health of a fishery and whether subsequent action is necessary for stock rebuilding. Such management actions if restrictive would decrease short term economic benefits but with improvements in the fishery could result in increased long term economic benefits. This option would not allow for this monitoring and for subsequent action to avert a decrease in economic benefits.

Social Impacts

This measure by itself would have no impact on the entities in this fishery. Economic and social benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen optimum yield level. The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing.

Conclusion

The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing. Therefore the Councils must establish an optimum yield for managed species, hence, the no action option was rejected. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 2. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by U.S. fishermen while maintaining the Spawning Potential Ratio (SPR) at or above 40% Static SPR.

Biological Impacts

Prior to biomass based Optimum Yield values for dolphin and wahoo being provided to the Councils by NMFS, a proxy Optimum Yield of 40% Static SPR was proposed as the best that could be developed based on the available data.

Economic Impacts

Defining the OY does not alter current use of the resource; it merely establishes a benchmark for fishery and resource evaluation from which to base additional management actions, specifically establishing the TAC. Since defining the OY has no direct effect on resource harvest or use, there would be no direct economic effects associated with its specification. Direct economic effects only accrue to the additional management actions that directly alter the use of the resource such as a TAC and other harvest control rules that are implemented to prevent overfishing. The Councils rejected this option in favor of the proposed action which is biomass based. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Social Impacts

This measure by itself would have no impact on the entities in this fishery. Economic and social benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen optimum yield level. The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing.

Conclusion

Optimum Yield for coastal pelagics is presently defined as 40% Static SPR (for Atlantic migratory group king and Spanish mackerel) and was the South Atlantic Council's preferred definition in the SFA amendment (SAFMC, 1998d). The Councils had previously concluded using this Optimum Yield definition serves as a proxy until NMFS provided additional guidance. The Councils rejected this option in favor of the proposed action which is biomass based. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 3. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and (1.63 and 2.176 million pounds) for wahoo.

Biological Impacts

The impacts would be similar to the proposed Action. The only difference between this option and the proposed action is that the upper range of MSY for wahoo was derived to provide a number, when reduced by 25%, equals the level of present harvest. NMFS provided additional guidance to the Councils indicating the range of wahoo MSY was between 1.41 and 1.63 million pounds which represents the best estimate. Optimum Yield is usually set at a more biologically conservative level and cannot be set at a level greater than MSY. The difficulty in determining Optimum Yield for dolphin and wahoo comes from the limited information available within the social, economic, and ecological realms of this fishery. With dolphin and wahoo there is a great deal of uncertainty as to what level of harvest would maximize protection of the resource, ensure economic efficiency, and provide some social security for those involved. Setting Optimum Yield at a low level may be too restrictive for a fishery that operates on a short-lived fish. On the other hand, setting Optimum Yield at a level high enough to allow unlimited harvest could result in less than optimum management.

Economic Impact

Defining the OY does not alter current use of the resource; it merely establishes a benchmark for fishery and resource evaluation from which to base additional management actions, specifically establishing the TAC. Since defining the OY has no direct effect on resource harvest or use, there would be no direct economic effects associated with its specification. Direct economic effects only accrue to the additional management actions that directly alter the use of the resource such as a TAC and other harvest control rules that are implemented to prevent overfishing.

Social Impacts

This measure by itself would have no impact on the entities in this fishery. Economic and social benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen optimum yield level. The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing.

Conclusion

The Councils rejected this option in favor of the proposed action which is based on the best available data. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 4. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while maintaining a total spawning stock size (biomass) as shown below.

a. Atlantic Dolphin = __________ pounds. b. Atlantic Wahoo =__________pounds.
c. U.S. Caribbean Dolphin = _________pounds. d. U.S. Caribbean Wahoo =_____pounds.
e. Gulf of Mexico Dolphin = _________pounds. f. Gulf of Mexico Wahoo = _____ pounds.

Biological Impacts

The present assessment for both dolphin and for wahoo encompass all regions and does not provide separate estimates.

Economic Impacts

This option by itself would have no impact on the entities in this fishery. Economic benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen optimum yield level.

Social Impacts

This measure by itself would have no impact on the entities in this fishery. Economic and social benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen optimum yield level. The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing.

Conclusion

The Councils rejected this option due to the inability to assess the stock at a level to estimate spawning biomass so harvest could be allocated by region. In addition, the present assessment for both dolphin and for wahoo encompass all regions. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.9 ACTION 9. Overfishing Level. Overfishing is defined in terms of the NMFS Guidelines Checklist.

A maximum fishing mortality threshold (MFMT) - In the Atlantic, U.S. Caribbean, and Gulf of Mexico overfishing for dolphin and wahoo is defined as a fishing mortality rate (F) in excess of F_{MSY} ($F_{30\%Static\ SPR}$).

A minimum stock size threshold (MSST) – In the Atlantic, U.S. Caribbean, and Gulf of Mexico the minimum stock size threshold for dolphin and wahoo is defined as a ratio of current biomass ($B_{current}$) to biomass at MSY or (1-M)*$B_{MSY,}$ where 1-M should never be less than 0.5. Using the best available estimates of natural mortality (M = 0.68-0.80) in the formula results in a MSST of 50% $B_{MSY.}$ The stock would be overfished if current biomass ($B_{current}$) was less than MSST and would be recovered when current biomass was equal or greater than the biomass at MSY.

The natural mortality (M) estimates above are for dolphin; values for wahoo are unknown.

Biological Impacts

The National Standards Guidelines provided the following two definitions: (1) “To overfish means to fish at a rate or level that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis” and (2) “Overfishing occurs whenever a stock or stock complex is subjected to a rate or level of fishing mortality that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis.” The Guidelines go on to indicate that “In all cases, status determination criteria must specify both of the following: (i) A maximum fishing mortality threshold or reasonable proxy thereof, and (ii) A minimum stock size threshold or reasonable proxy thereof.”

Prager (2000) provided a benchmark estimate of F_{MSY} from surplus production modeling for dolphin of 0.51 and estimated the stock status at the start of 1998 as above B_{MSY}. No estimates are available for wahoo.

Economic Impacts

Specifying the overfished and overfishing definitions does not directly affect resource use and, therefore would not have any direct effects on existing fisheries and communities. Direct economic effects associated with resource use would only accrue to subsequent management action in response to an evaluation of the fishery with regards to these benchmarks. If restrictive management actions are implemented there would be increased costs/reduced benefits in the short term. However, it is expected that stock rebuilding will result in increased economic benefits. These definitions are statutory requirements of an FMP and the “no action” alternative (Option 1) would not allow full implementation of the FMP, thereby limiting future opportunity to manage the resource. This situation could lead to reduced economic benefits in the future.

The reference to economic benefits includes consumer surplus to the recreational sector, non-market value to non-consumptive and non-use groups, and net revenue to the for-hire and commercial harvesting sectors of the dolphin/wahoo fisheries.

Social Impacts

This measure by itself would have no impact on the entities in this fishery. Social benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen overfishing level. The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing. Social benefits/impacts refers to cultural continuity, community cohesion, fishing opportunities, social conflict, stress, etc.

Conclusion

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries. This action also meets the Magnuson-Stevens Act requirements to specify MFMT and MSST.

Rejected Options for Action 9:

Option 1. No action.

Biological Impacts

The Councils rejected this option and concluded the proposed action best serves as a proxy until NMFS provides additional guidance regarding setting overfished and overfishing levels for dolphin and wahoo. Specifying MFMT and MSST is a legal requirement and this option would not meet the requirement. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Economic Impacts

This option would not allow for development of the FMP for dolphin and wahoo, since definitions of the overfishing level and overfished levels are required by law. This would limit future opportunity to effectively manage the resource and could result in reduced net economic benefits to society.

Social Impacts

This measure by itself would have no impact on the entities in this fishery. Social benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen overfishing level. The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing.

Conclusion

The Councils are required to define MFMT and MSST for each fishery. Therefore the Councils rejected the no action because it would not define these two parameters as required by the Magnuson-Stevens Act. In addition, the Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 2. In the Atlantic and U.S. Caribbean overfishing for dolphin and wahoo is defined as a fishing mortality rate (F) in excess of the fishing mortality rate at 30% Static SPR ($F_{30\%\ Static\ SPR}$). A threshold level for dolphin and wahoo is defined as 10% Static SPR in the Atlantic. The overfished threshold is based upon a transitional SPR of 30%.

Biological Impacts

There should be no biological impacts from this option because at present the Councils have defined overfishing for all species in the coastal migratory pelagic management unit as a fishing mortality rate (F) in excess of the fishing mortality rate at 30% Static SPR ($F_{30\%\ Static\ SPR}$) with their recent amendments to meet the mandate under the Sustainable Fisheries Act. This is also the coastal migratory pelagic (CMP) MSY proxy, and it is included in the CMP FMP as the standard that should be used when insufficient data are available, as is the case for dolphin and wahoo. A threshold level for all species in the coastal migratory pelagics management unit is defined as 10% Static SPR in the Atlantic. The 30% Transitional SPR definition for overfished is also consistent with the overfished definition that is currently in place. Because dolphin and wahoo are biologically dissimilar from king and Spanish mackerel, there may be other more appropriate definitions of overfishing and overfished.

If the fishery currently operates at or above the SPR levels specified for these criteria, this option would have no impact on the fishery. However, if it is currently operating below these levels there would be some impact depending on what other measures are implemented to get the stock to the specified SPR levels. There are no data on the current SPR level for dolphin and wahoo stocks. It should be noted that the specified SPR levels under these criteria would create a stable fishery and sustained economic benefits in the long-term.

This overfishing level served as a proxy until NMFS provided additional guidance regarding setting overfished and overfishing levels for dolphin and wahoo. As any scientific definition, it can have social impacts if this new level of overfishing is below present harvesting levels. Dolphin and wahoo are relatively short lived and a large proportion of one and two year old fish is harvested annually. By establishing this overfishing level, the Councils can address these concerns and yet continue to allow harvest at levels that are comparable to recent historical catches.

Economic Impacts

Specifying the overfished and overfishing definitions does not directly affect resource use and, therefore would not have any direct effects on existing fisheries and communities. Direct effects associated with resource use would only accrue to subsequent management action in response to an evaluation of the fishery with regards to these benchmarks.

Social Impacts

This measure by itself would have no impact on the entities in this fishery. Social benefits and costs will depend on the management measures adopted to keep the fishery from exceeding the chosen overfishing level. The Councils are required to prevent overfishing and achieve Optimum Yield from each fishery. This requirement directs the Councils to consider overall benefits to society through the harvest of any species without overfishing.

Conclusion

The Councils originally concluded using this overfishing level would serve as a proxy until NMFS provides additional guidance regarding setting overfished and overfishing levels for dolphin and wahoo. The Councils have now rejected this option considering NMFS has provided, and the Councils have adopted, biomass based estimates of MSY as mandated by the

Magnuson-Stevens Act. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.10 ACTION 10. Establish a framework procedure for the Dolphin and Wahoo FMP to provide the South Atlantic Fishery Management Council with a mechanism to independently adjust the following management measures for their area of responsibility through framework action.

The Council is including a framework to respond to changes in the fishery more quickly. Framework actions can be implemented in a shorter period of time than Plan Amendments because the level of review and public participation is not as extensive.

The proposed action is based on other existing frameworks in the southeast, northeast, and Pacific regions. [Note: The Coastal Migratory Pelagics FMP, the Snapper Grouper FMP, and the Golden Crab FMP contain examples of frameworks that were considered in development of the framework for the Dolphin/Wahoo FMP.] The Councils considered expanding and reducing the number of items in these frameworks. Based on NOAA GC advice, the preferred framework is based on removing the following items that were included in the DEIS:

(1) Establishing or modifying a requirement for onboard observers.

(2) Establishing or modifying a requirement for use of a VMS unit that meets standards published by NMFS.

(3) Quotas (including zero quotas).

(4) Moratorium on vessels.

The administrative records contains details of the discussions of various alternatives considered by the Councils. Only the proposed action and no action alternatives are shown to reduce confusion.

When the plan was being developed jointly with the Gulf and Caribbean Fishery Management Councils, this measure established a framework procedure for the Atlantic, Caribbean, and Gulf regions. Subsequently, with the South Atlantic Council requesting they be relieved of their administrative responsibilities in the development of a joint plan while retaining true lead for development of an Atlantic FMP, the proposed framework is for the fishery prosecuted in the Atlantic EEZ.

A. An assessment panel (Panel) appointed by the Councils will reassess the condition of dolphin and wahoo on an annually planned basis. The Panel shall be composed of NMFS scientists, Council staff, Scientific and Statistical Committee members, and other state, university, and private scientists as deemed appropriate by the Councils.

The Panel will address the following items for each stock:

1. Stock identity and distribution. This should include situations where there are groups of fish within a stock which are sufficiently different that they should be managed as separate units. If several possible stock divisions exist, the Panel should describe the likely alternatives.

2. MSY and/or B_{MSY} (or appropriate proxy) for each identified stock. If more than one possible stock division exists, MSY and/or B_{MSY} for each possible combination should be estimated.

3. Condition of the stock(s) or groups of fish within each stock which could be managed separately. For each stock, this should include but not be limited to:
    a. Fishing mortality rate relative to F_{MSY}, $F_{0.1}$, $F_{20\%SPR}$, $F_{30\%SPR}$, $F_{40\%SPR}$, and MFMT.
    b. Spawning potential ratio (SPR).
    c. Abundance relative to an adequate spawning biomass (e.g., MSST).
    d. Trends in recruitment.
    e. Acceptable Biological Catch (ABC) which will result in long-term yield as near MSY as possible.
    f. Maximum Sustainable Yield (MSY).

4. Overfishing and Overfished.
    a. The Councils' target level or Optimum Yield (OY) is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and 100% of MSY (between 1.41 and 1.63 million pounds) for wahoo. ABC is calculated based on the target level or Optimum Yield (75% MSY for dolphin and 100% MSY for wahoo).
    b. Overfishing is defined as a fishing mortality rate (F) in excess of the Maximum Fishing Mortality Threshold (MFMT) which is defined as F_{MSY} ($F_{30\%Static}$ SPR).
    c. Overfished is defined as a biomass below the Minimum Stock Size Threshold (MSST) which is defined as a ratio of current biomass ($B_{current}$) to biomass at MSY or (1-M)*B_{MSY}, where 1-M should never be less than 0.5.
    d. When a stock is overfished, a rebuilding program that makes consistent progress towards restoring stock condition must be implemented and continued until the stock is restored to MSY. The rebuilding program must be designed to achieve recovery within an acceptable time frame consistent with the National Standard Guidelines and as specified by the Councils. The Councils will continue to rebuild the stock until the stock size is restored to the management target (OY) if different from MSY.
    e. When a stock is not overfished, the act of overfishing is defined as a fishing mortality rate (F) in excess of the maximum fishing mortality threshold (MFMT). If overfishing is occurring, a program to reduce fishing mortality rates toward management target levels (OY) will be implemented, even if the stock or group of fish is not in an overfished condition.
    f. The Councils have requested the Assessment Panel (Panel) provide a range of possibilities and options for specifying an absolute biomass level which could be used to represent a depleted condition or state. The Councils will modify biomass based levels through the framework process. Should the biomass be below such a level, the Councils would take appropriate action, including but not limited to, eliminating directed fishing mortality and evaluating measures to eliminate any bycatch mortality in a timely manner through the framework procedure.

5. Management options. The Panel may delineate possible management options based on stock status including effective levels for such actions as:
    a. Bag limits.
    b. Size limits.
    c. Tackle configuration (e.g., minimum hook size).
    d. Season/area closures (including spawning area closures).
    e. Gear restrictions or prohibitions.

f. Permitting restrictions.
g. Trip limits.
h. Overfishing/overfished definitions and related thresholds (e.g., MSST and MFMT) and targets (e.g., OY).
i. Annual specification/quota setting process.
j. Assessment Panel composition and process.
k. Identification, designation, and modification of EFH and EFH-HAPCs.
l. Management measures to reduce or eliminate the impact of fishing gear/activities on EFH or EFH-HAPCs.
m. Specify quota for scientific research.
n. Designation of areas for scientific research.
o. Regulations of longline length if ongoing research with marine mammals documents usefulness.
p. Any other action to minimize the interaction of fishing gear with endangered species or marine mammals.

[When the plan was being developed jointly with the Gulf and Caribbean Fishery Management Councils, this measure established a framework procedure for the Atlantic, Caribbean, and Gulf regions. The preceding list of actions were to be applied variably within each Council jurisdiction at the discretion of each individual Council (Atlantic, U.S. Caribbean, and Gulf of Mexico). Subsequently, with the South Atlantic Council requesting they be relieved of their administrative responsibilities in the development of a joint plan while retaining true lead for development of an Atlantic FMP, the proposed framework is for implementing additional management measures for the fishery prosecuted in the Atlantic EEZ.]

6. The Panel may also recommend more appropriate levels or statements for MSY (or proxy), OY, MFMT, and/or MSST for any stock including their rationale for the proposed changes.

7. Other biological questions as appropriate.

B. The Panel will prepare a written report with its recommendations for submission to the Councils in years assessments are completed in response to annual Operations Plans between NMFS and the Councils by such date as may be specified by the Councils. The report will contain the scientific basis for their recommendations and indicate the degree of reliability which the Council should place on the results and recommendations.

C. The Councils may take action based on the panel report or may take action based on issues/information that surface separate from the assessment panel. The steps for Councils' action are as follows:

1. Assessment panel report: The Councils will consider the report and recommendations of the Panel and such public comments as are relevant to the Panel's report. A public hearing will be held at the time and place where each Council considers the Panel's report. The Councils will consult their Advisory Panels and Scientific and Statistical Committees to review the report and provide advice prior to taking final action. After receiving public input, the Councils will make findings on the need for changes.

2. Information separate from assessment panel report: The Councils will consider information that surfaces separate from the assessment panel. Council staff will compile the information and analyze the impacts of likely alternatives to address the particular situation. The Council staff report will be presented to each Council. A public hearing will be held at the time and place where Councils consider the Council staff report. The Councils will consult their Advisory Panels and Scientific and Statistical Committees to review the report and provide advice prior to taking final action. After receiving public input, the Councils will make findings on the need for changes.

D. If changes are needed in the following*, the Councils will advise the Regional Administrator (RA) of the Southeast Region of the National Marine Fisheries Service in writing of their recommendations, accompanied by the assessment panel or staff report, relevant background material, and public comment:

a. Adjustment of the best estimate of MSY (range and/or best point estimate).
b. Adjustment of the best estimate of OY (range and/or best point estimate).
c. Initial specification of Acceptable Biological Catch (ABC) and subsequent adjustment of the ABC range and/or best estimate when this information becomes available.
d. Setting or modifying Total Allowable Catch (TAC).
e. Reopening of a previously closed area/season, timeframe for recovery of dolphin and wahoo should they become overfished, or fishing year which may not be adjusted by more than two months.
f. Bag limits.
g. Size limits.
h. Tackle configuration (e.g., minimum hook size).
i. Season/area closures (including spawning area closures).
j. Gear restrictions and/or prohibitions.
k. Permitting restrictions.
l. Trip limits.
m. Overfishing/overfished definitions and related thresholds (e.g., MSST and MFMT).
n. Annual specification/quota setting process.
o. Assessment Panel composition and process.
p. Identification, designation, and modification of EFH and EFH-HAPCs.
q. Management measures to reduce or eliminate the impact of fishing gear/activities on EFH or EFH-HAPCs.
r. Specify quota for scientific research.
s. Designation of areas for scientific research.
t. Regulations of longline length if ongoing research with marine mammals documents usefulness.
u. Any other action to minimize the interaction of fishing gear with endangered species or marine mammals.
v. Allocations and modifications to allocations.

***[When the plan was being developed jointly with the Gulf and Caribbean Fishery Management Councils, this measure established a framework procedure for the Atlantic, Caribbean, and Gulf regions. The preceding list of actions with the exception of items a and m, were to be applied variably within each Council**

jurisdiction at the discretion of each individual Council (Atlantic, U.S. Caribbean, and Gulf of Mexico). Subsequently, with the South Atlantic Council requesting they be relieved of their administrative responsibilities in the development of a joint plan while retaining true lead for development of an Atlantic FMP, the proposed framework is for implementing additional management measures for the fishery prosecuted in the Atlantic EEZ.]

Recommendations with respect to the Atlantic group of dolphin and wahoo will be the responsibility of the South Atlantic Council working with the Mid-Atlantic and New England Councils.

E. The RA will review the Council's recommendation, supporting rationale, public comments and other relevant information, and if he/she concurs with the recommendation, he/she will draft regulations in accordance with the recommendation. He/she may also reject the recommendation, providing written reasons for rejection. In the event the RA rejects the recommendation, existing regulations shall remain in effect until resolved.

F. If the RA concurs that the Council's recommendations are consistent with the goals and objectives of the plan, the National Standards, and other applicable law, he/she shall implement the regulations by proposed and final rules in the Federal Register prior to the appropriate fishing year or such dates as may be agreed upon with the Councils. A reasonable period for public comment shall be afforded, consistent with the urgency, if any, of the need to implement the management measure.

Appropriate regulatory changes* recommended by the Council, that may be implemented by the Regional Administrator by proposed and final rules in the Federal Register are:

a. Adjustment of the best estimate of MSY (range and/or best point estimate).
b. Adjustment of the best estimate of OY (range and/or best point estimate).
c. Initial specification of Acceptable Biological Catch (ABC) and subsequent adjustment of the ABC range and/or best estimate when this information becomes available.
d. Setting or modifying Total Allowable Catch (TAC).
e. Reopening of a previously closed area/season, timeframe for recovery of dolphin and wahoo should they become overfished, or fishing year which may not be adjusted by more than two months.
f. Bag limits.
g. Size limits.
h. Tackle configuration (e.g., minimum hook size).
i. Season/area closures (including spawning area closures).
j. Gear restrictions and/or prohibitions.
k. Permitting restrictions.
l. Trip limits.
m. Overfishing/overfished definitions and related thresholds (e.g., MSST and MFMT).
n. Annual specification/quota setting process.
o. Assessment Panel composition and process.
p. Identification, designation, and modification of EFH and EFH-HAPCs.
q. Management measures to reduce or eliminate the impact of fishing gear/activities on EFH or EFH-HAPCs.

r. Specify quota for scientific research.
s. Designation of areas for scientific research.
t. Regulations of longline length if ongoing research with marine mammals documents usefulness.
u. Any other action to minimize the interaction of fishing gear with endangered species or marine mammals.
v. Allocations and modifications to allocations.

***[When the plan was being developed jointly with the Gulf and Caribbean Fishery Management Councils, this measure established a framework procedure for the Atlantic, Caribbean, and Gulf regions. The preceding list of actions with the exception of items a and m, were to be applied variably within each Council jurisdiction at the discretion of each individual Council (Atlantic, U.S. Caribbean, and Gulf of Mexico). Subsequently, with the South Atlantic Council requesting they be relieved of their administrative responsibilities in the development of a joint plan while retaining true lead for development of an Atlantic FMP, the proposed framework is for implementing additional management measures for the fishery prosecuted in the Atlantic EEZ.]**

Authority is granted to the Regional Administrator to close the fishery once a quota has been established through the procedure described above and such quota has been reached or projected to be reached. Authority is also granted to reopen a fishery once a new fishing year begins. When such action is necessary, the Regional Administrator will recommend that the Secretary publish a notice in the Federal Register as soon as possible.

The procedure described above will allow for stock assessments on an annually planned basis and provide for timely adjustments to the management program to prevent overfishing and/or rebuild the stock if overfished. It is the Councils' intent that dolphin and wahoo receive periodic assessments. Initially, assessments would be annual and as sufficient data become available such that the Assessment Panel, the Scientific and Statistical Committee, and the Council feel confident in the results, assessments will be completed every 2-5 years. Council staff and NMFS will specify such assessments in the annual NMFS/Council planning process (called Operations Plans). If overfished, assessments would be done annually.

It is the Councils' intent that Total Allowable Catch (TAC) be limited by the upper end of an Acceptable Biological Catch (ABC) range when and if one is provided; however, no limits should be placed on the lower limit of TAC so that a zero TAC could be specified if deemed necessary to protect the resource.

Biological Impacts

This procedure allows for rapid modification of the management program based on updated stock assessments as well as information separate from the assessment. Providing a mechanism for such modification will allow the Councils to better protect the biological integrity of the dolphin and wahoo resources and achieve optimum yield.

Economic Impacts

The assessments and annual adjustments described above will require some expenditures of public funds for meetings and staff work. An estimate of these costs is not available at this time. Although specific actions may have some economic impacts on fishery participants, the consequences cannot be assessed until such time as the actions are implemented. In principle, this action should allow for additional flexibility in management, which is expected to increase net economic benefits to society from a more rapid response to "problems" that develop in the fishery. In comparison, the "no action" alternative (Option 1) would not provide the benefits of a flexible management system.

Social Impacts

By specifying this framework mechanism for modifying management regulations, a more rapid response to changes in the fishery will be facilitated. This timeliness results from allowing each regional grouping of Councils, or each Council, the ability to act apart from other Councils named in this FMP. However, concern has been expressed through the public hearing process that the proposed framework process will not adequately address issues and impacts on the recreational, for-hire, and commercial sectors. This should not be a concern as analysis of social and economic impacts are required in the framework process. However, for this action to succeed, it is critical that other data collection efforts described in other actions in this proposed plan also be implemented.

Conclusion

The proposed framework procedure allows for rapid modification of the management program and is necessary to allow the Councils to better protect the biological integrity of the dolphin and wahoo resources. This action meets the objectives of the plan while retaining substantial Council and public involvement in management decisions and allows the Councils to rapidly adapt to changes in resource abundance, new scientific information, and changes in fishing pattern among user groups.

Development of future management actions with respect to the Atlantic group of dolphin and wahoo will be the responsibility of the South Atlantic Council working with the Mid-Atlantic and New England Councils.

The Councils determined this action best achieves the goals of the FMP and management objectives: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, (5) reduce bycatch in the dolphin fishery, (6) direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Rejected Options for Action 10:

Option 1. No action.

Biological Impacts

This option would not allow for rapid modification of the management program based on updated stock assessments or other information. Without a mechanism for such modification, the Council could not adequately protect the biological integrity of the dolphin and wahoo resources and would increase the risk of overfishing.

Economic Impacts

This option would not allow the Councils to take timely action if and when needed. Delays in taking action to address problems in the fishery could lead to reduced economic benefits.

Social Impacts

This option would not allow for timely and informed action by the Councils due to the time required for an amendment to the plan to be implemented. Furthermore, when the Councils cannot act in a timely and efficient manner, they lose credibility with the public. Such a loss may lead to declining compliance with regulations.

Conclusion

The Councils rejected this option because adopting a procedure which allows for rapid modification of the management program is necessary to better protect the biological integrity of the dolphin and wahoo resources. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.11 ACTION 11. Prohibit sale of recreationally caught dolphin or wahoo in or from the Atlantic EEZ except for allowing for-hire vessels that possess the necessary state and Federal commercial permits to sell dolphin harvested under the bag limit in or from the Atlantic EEZ.

Biological Impacts

To the extent prohibition of sale will reduce the number of dolphin and wahoo retained, there may be some positive biological benefits. To estimate a range of impacts from prohibiting the sale of recreationally caught dolphin and wahoo in New England, the Mid-Atlantic, and the South Atlantic, one can examine the average commercial hook and line category much of which is believed to be recreational and for-hire harvest that was sold. This category includes dolphin caught by hand line, rod and reel, trolling, and electric reel and, on the average (1994-1997), accounts for 2,717 pounds in New England, 1,328 pounds in the Mid-Atlantic, and 856,079 pounds in the South Atlantic annually (Tables 36-38 and Figures 5-7). In addition, wahoo landings caught by hand line, rod and reel, trolling, and electric reel, on the average (1994-1997), accounts for 71,783 pounds in the Atlantic (Goodyear, 1999).

Economic Impacts

This measure will prohibit all sale of recreationally caught wahoo and restrict private recreational anglers from selling dolphin. In the short-term, this action will reduce benefits to individuals in the private recreational sector who sell bag limit caught dolphin, and individuals in the recreational sector who sell wahoo. There will be a loss of revenue to the recreational sector at least equal to the value of fish sold. Input received during public hearings indicated that a considerable amount of bag limit dolphin is sold.

There is no information on the level of recreational sale for either species, and thus it is not possible to determine the exact magnitude of the expected future revenue losses in the recreational sector. It can be assumed that sale of bag limit caught fish will be recorded in the commercial hook and line category, which includes fish caught by hand line, rod and reel, trolling, and electric reel.

The average wahoo annual landings by hand line, rod and reel, trolling, and electric reel, between 1994 and 2000 for all three regions (New England, the Mid-Atlantic, and the South Atlantic) amounted to 55,783 pounds (Goodyear, 1999; data for 1999 and 2000 were provided by the NMFS, SERO). In order to protect confidential records, information on wahoo landings could not be displayed separately for each region. In the absence of this regulation, the expected ex-vessel value of wahoo landings (whole fish) in this hook and line category is $129,975 per year (using average landings between 1994-2000 and the 2000 average wahoo ex-vessel price of $2.33 per pound for the Atlantic).

The annual ex-vessel value of dolphin in this category is expected to be $1.33 million. This figure was derived from using average landings between 1994-2000 of 860,124 pounds for the Atlantic coast (Tables 36,37,38), and the 2000 average dolphin ex-vessel price of $1.55 per pound for the Atlantic (NMFS web site).

Not all fish in the hook and line category are caught by the recreational sector, as commercial landings from these gear types will also be included. These values are most likely an overestimate of the loss in revenue from restrictions on recreational sale particularly in the case of dolphin, since it is expected that the majority of bag limit caught dolphin will come from the for-hire sector (this measure will not prohibit sale of dolphin by the for-hire sector). There may be some cost to the for-hire sector from having to purchase the necessary permits to be able to sell dolphin.

If recreational trips were not taken as a result of this action there will also be a reduction in consumer surplus benefits in the short-term to these anglers, which could be mitigated in the future from anglers switching to other targets. However, this measure will reduce the risk to public health from improperly handled fish. Given the lack of available information, it is difficult to speculate on the long-term impacts of this proposed measure or whether the economic benefits would outweigh the forgone revenue to the recreational sector.

In comparison to Option 1, this measure would reduce revenue to the recreational sector by a total not expected to exceed $1.46 million. However, the revenue loss in the for-hire recreational sector will be lower than that resulting from implementation of Option 3 since for hire operations will still be allowed to harvest and sell dolphin. During the 3-5 year phase out period, as specified under Option 2, the for hire sector would earn higher revenue compared to the situation under the Councils' proposed measure. However, after the phase out period there would be no difference between Option 2 and Option 3 as there would be a prohibition on all recreational sale. This would also affect crew wages since clients regularly "tip" for-hire crew members with fish caught on these trips. If recreational sale results in "localized reduced prices" Option 3 and Option 2 (after the 3-5 year phase out period) would be more effective at preventing this occurrence than the proposed measure and Option 1.

The effect on private recreational sale would be no different among this action and Options 2 and 3 since sale by the private recreational sector would be immediately prohibited. Compared to the "no action" alternative, it is expected that there will be reduced harvesting demand for dolphin and wahoo under the proposed action and if either Option 2 or Option 3 were to be implemented.

The no action alternative (Option 1) would not address the problem of increased health risks from the sale of recreationally caught fish. The preferred alternative, Option 2 and Option 3 should all result in lowering this risk since they would all restrict recreational sale.

Social Impacts

Comments received in public hearings and other consultations indicate that charter and headboat crews derive a substantial part of their income from the sale of "unwanted" fish landed by their clientele. Given that it is a historical practice to tip the crew with the client's fish so the crew might then sell the fish, prohibiting this act will cause crew and captains economic hardship. Owners and captains claim that without the "fish tip" they will not be able to attract and retain as many well-trained crew in the future, exacerbating what is seen as an already dismal labor market. However, if the for-hire vessel qualifies for the commercial permit to land and sell dolphin, then the impact of this proposed action should be lessened. Some of the objectives of prohibiting recreationally caught fish is that it 1) competes with the commercial market and 2) does not allow for a full accounting of commercial landings. Restricting the sale of dolphin and wahoo to permitted vessels will serve to avoid these problems, and benefit the fishery in the long term.

Prohibiting private recreational sale will have some impact on this sector, but it is impossible to measure the impact as no official records of this activity currently exist. There has been some concern expressed by the commercial sector that fish caught and sold by charter and head boats will be counted against the commercial cap should that ever be implemented. This point of confusion among stakeholders is one source of tension for some in the various sectors in the fishery.

Conclusion

The South Atlantic Council is addressing the sale of recreationally caught fish on a species by species basis. Input received during public hearings indicated that a considerable amount of recreationally caught dolphin is sold mainly by the charter sector. The Councils concluded that dolphin and wahoo are so important to the recreational sector, that prohibiting sale of recreationally caught dolphin and wahoo, except allowing for-hire vessels with appropriate permits to sell dolphin as they historically have, will reduce overexploitation and excessive targeting for sale. In addition, it will eliminate a significant amount of concern that commercial fishermen must adhere to food quality standards and vessel safety requirements that recreational fishermen who sell bag limit fish can avoid. The impact on for-hire vessels will be reduced because, with the appropriate permits, these vessels could still sell dolphin.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, and (4) optimize the social and economic benefits.

Rejected Options for Action 11:

Option 1. No action.

Biological Impacts

Taking no action to prohibit sale would maintain, or allow an increase, in the number of dolphin and wahoo retained for sale. Any biological benefits associated with reducing the incentive of recreational fishermen to sell dolphin or wahoo would be foregone.

Economic Impacts

In the short-term this option would have no impact on the recreational sector. At this time there is a lack of information to determine whether recreational sale is depressing market prices for dolphin. There have been instances where large quantities of recreationally caught dolphin enter local markets and affect “local” prices for a short period of time. Even though recreational sale may account for a large share of domestic landings sold, imports probably have a significant impact on domestic prices. The National Marine Fisheries Service reported that imports of frozen dolphin fillets for 1998 through 2001 averaged 15.1 million pounds (average import price of $1.68 per pound for dolphin fillets), compared to 1.2 million pounds of domestic landings sold in 1999 and 1.1 million pounds sold in 2000. In addition, information from a seafood dealer indicated that imports of other product forms such as whole, gutted dolphin is substantial, and may even exceed local domestic production.

This option would not result in reduced health risks to the public from improperly handled fish. If it is assumed that sale of bag limit caught dolphin and wahoo would pose a higher risk compared to sale through the commercial sector. Given the lack of available information, it is difficult to speculate on the long-term impacts of this option and whether net benefits would exceed the forgone revenue in the recreational sector.

Social Impacts

In the short-term, this would have no negative impacts on the recreational sector. However, there has been some concern that recreationally caught fish are not properly handled and sold and that this may pose a problem for public health. By maintaining the status quo (allowing recreational fishermen to sell their catch), recreational fishers could avoid following food quality standards and vessel safety requirements.

The greatest problem with this option is that it would exacerbate the friction that exists between recreational and commercial fishermen in the United States in general. Particularly in the South Atlantic, much of the ethnographic data collected from commercial fishermen points to the sale of recreationally caught fish as one of the issues that causes the most anger and conflict for that sector. If one of the goals of this plan is to lessen social conflict between the different participating sectors, the no action proposal will fail in achieving that goal.

Conclusion

The Councils concluded that taking no action would not address the potential for overexploitation and excessive targeting for sale. In addition, it would not eliminate the concern that commercial fishermen must adhere to food quality standards and vessel safety requirements that recreational fishermen who sell bag limit fish can avoid. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP. Therefore, the Councils rejected this option.

Option 2. Allow for-hire vessels that possess the necessary commercial permits to continue to sell fish for a 3-5 year phase-out period.

Biological Impacts

To the extent a phase-out and eventual prohibition of sale would reduce the number of dolphin and wahoo retained, there may be some positive biological benefits. To estimate a range of impacts from prohibiting the sale of recreationally caught dolphin and wahoo in New England, the Mid-Atlantic, and the South Atlantic, one can examine the average commercial hook and line category. This category includes dolphin caught by hand line, rod and reel, trolling, and electric reel and, on the average (1994-1997), accounts for 2,717 pounds in New England, 1,131 pounds in the Mid-Atlantic, and 992,147 pounds in the South Atlantic annually (Tables 36-38 and Figures 5-7). In addition, wahoo landings caught by hand line, rod and reel, trolling, and electric reel and, on the average (1994-1997), accounts for 71,783 pounds in the Atlantic (Goodyear, 1999).

Economic Impacts

By providing for-hire vessels the opportunity to sell bag limit fish, the loss in revenue from the sale prohibition would be distributed over a 3 to 5 year time frame. Vessel owners could phase in other revenue earning activities during this period. Some vessel owners may not be able to make up this lost revenue but this number should be lower than that resulting from carrying out Option 3. There would be an immediate loss of ex-vessel revenue to the private recreational anglers who sell dolphin. This option would likely result in decreased health risks from the sale of bag limit caught fish. Given the lack of available information, it is difficult to speculate on the long-term impacts of this option and whether net benefits from reduced health risks would exceed the forgone revenue in the recreational sector.

Social Impacts

Allowing for a 3-5 year phase-out of for-hire sale of fish would lessen the immediate impacts on this sector. It would allow for adjustments to be made in the for-hire sector relative to how the crew is compensated and by those that buy fish from this sector.

The for-hire vessel owners or captains may be forced to rethink how they operate their vessels with regard to the crew they employ. If they can no longer use the income from selling fish caught by clients to supplement their crews' income, they may need to devise other economic and social solutions for paying those wages.

The greatest impact would be on the private recreational fisherman who could no longer sell their bag limit caught fish. However, since there is no reliable data on the frequency or incidence of this practice, it is not now possible to determine what the future impacts might be.

Conclusion

The Councils included this option for public hearing to receive input from the for-hire sector on the level of sale and the importance of that revenue to their overall operations. This option would end sale from the for-hire sector but would provide a time period to phase-out. This option, until the end of the phase-out, would track some state regulations where individuals who have valid state permits may sell up to the bag limit. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP. Therefore, the Councils rejected this option.

Option 3. Prohibit sale of recreationally caught dolphin and wahoo in the Atlantic EEZ. The intent is to not allow sale from private/rental or for-hire trips and limit sale to vessels with a commercial permit.

Biological Impacts

To the extent prohibition of sale would reduce the number of dolphin and wahoo retained, there may be some positive biological benefits. To estimate a range of impacts from prohibiting the sale of recreationally caught dolphin and wahoo in New England, the Mid-Atlantic, and the South Atlantic, one can examine the average commercial hook and line category. This category includes dolphin caught by hand line, rod and reel, trolling, and electric reel and, on the average (1994-1997), accounts for 2,717 pounds in New England, 1,131 pounds in the Mid-Atlantic, and 992,147 pounds in the South Atlantic annually (Tables 36-38 and Figures 5-7). In addition, wahoo landings caught by hand line, rod and reel, trolling, and electric reel and, on the average (1994-1997), accounts for 71,783 pounds in the Atlantic (Goodyear, 1999).

Economic Impacts

If recreational sale was prohibited there would be a loss of revenue to the recreational sector at least equal to the value of fish sold. Input received during public hearings for Amendment 8 to the Coastal Migratory Pelagics (mackerels) Plan suggest that a considerable amount of bag limit dolphin is sold. It is assumed that recreational sale would be recorded in the commercial hook and line category, which includes dolphin caught by hand line, rod and reel, trolling, and electric reel.

The ex-vessel value of dolphin and wahoo landings (whole fish) in this hook and line category amounts to $1.33 million per year, and $129,975 per year respectively (refer to the analysis under Action 11). Not all fish in this category are caught by the recreational sector, as commercial landings would also be reported in this category. These values are most likely overestimates of the loss in revenue from a ban on recreational sale. If recreational trips were not taken as a result of this action there would also be a reduction in consumer surplus benefits in the short-term to these anglers, which could be mitigated in the future from switching to new targets. However, this measure would reduce the risk to public health from improperly handled fish. Given the lack of available information, it is difficult to speculate on the long-term impacts of this option and whether net benefits would exceed the forgone revenue in the recreational sector.

Social Impacts

There would be a loss in benefits to the recreational and for-hire sector if sale of fish were prohibited. Qualitative data points to recreational fishermen selling their catches to coastal restaurants. Prohibiting sales may have a negative impact on those restaurants and their clientele by losing the attractant of freshly caught fish on the menu. Recreational fishermen would also suffer a loss if sales represent some savings to them for the cost of fishing. This may be a moot point if imports are filling the market instead of recreationally caught fish. Commercial fishermen may experience a positive impact from this action by facing less competition and less conflict in the fishery.

Conclusion

The South Atlantic Council is addressing the sale of recreationally caught fish on a species by species basis. Input received during public hearings indicated that a considerable amount of recreationally caught dolphin is sold primarily from charterboats. The Councils concluded that dolphin and wahoo are important to the recreational sector, and that prohibiting sale of recreationally caught dolphin and wahoo would reduce overexploitation and excessive targeting for sale. In addition, it would eliminate the concern that commercial fishermen must adhere to food quality standards and vessel safety requirements that recreational fishermen who sell bag limit fish can avoid. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP. The Councils rejected this option in favor of the proposed action because testimony at public hearing indicated prohibiting all sale would eliminate a significant portion of dolphin and wahoo which historically have provided fresh product to local markets.

4.2.12 ACTION 12. Establish a cap of 1.5 million pounds or 13% of total landings, whichever is greater, for the commercial fishery for dolphin. Should the catch exceed this level, the Council will review the data and evaluate the need for additional regulations which may be established through the framework.

This action establishes a non-binding cap on the commercial harvest in the Atlantic EEZ at 13% of the total commercial and recreational landings from the Atlantic fishery. The Councils' intent is to monitor the fishery and if commercial landings exceed the non-binding allocation, determine if additional regulations are necessary. The Council is establishing this cap now, even though the recreational landings greatly exceed the commercial, to prevent the potential future expansion of the commercial fishery. This is predominantly a recreational fishery and the Council wants to maintain this structure.

Biological Impacts

Provided measures are in place to ensure overfishing is prevented, allocation of the resource between the commercial and recreational sector is not likely to have any impact on the stock.

Table 45. Dolphin harvest (pounds) on the Atlantic Coast from 1994-1999 (Data Source: NMFS, 2000 and Goodyear, 1999).

	Recreational	Commercial	Total	Recreational	Commercial
1994	9,500,580	1,252,553	10,753,133	88%	12%
1995	13,092,212	2,231,787	15,323,999	85%	15%
1996	8,002,144	1,216,682	9,218,826	87%	13%
1997	10,640,713	1,594,920	12,235,633	87%	13%
1998	7,693,144	826,640	8,519,784	90%	10%
1999	10,127,970	1,050,090	11,178,060	91%	9%
2000	12,574,950	970,781	13,545,731	93%	7%
Avg. 94-97	10,308,912	1,573,986	11,882,898	87%	13%
Avg. 97-99	9,487,276	1,157,217	10,644,492	89%	11%
Avg. 97-2000	10,259,194	1,110,608	11,369,802	90%	10%

Economic Impacts

This is a non-binding allocation and this action will not have any direct economic effects on the recreational or commercial sectors. During the period 1994 to 2000, commercial dolphin landings in the Atlantic exceeded 1.5 million pounds in two years (1995 and 1997). Should dolphin landings exceed this level in the future, the Council will consider restrictive action(s) only if the total commercial share of the harvest exceeds 13%. Future restrictive measures will have economic effects on both the recreational and commercial sectors.

There would be no direct economic impacts from the other alternatives considered since no harvest control rules are associated with these measures. Should harvest control rules be implemented in the future to maintain the allocation shares specified by this action, Option 2 and Option 3, there would be a change in economic benefits. At this time it is not possible to ascertain the direction and magnitude of such changes since these effects would depend on the specific harvest control rule(s) adopted.

Social Impacts

The establishment of an allocation scheme for the recreational and commercial sectors participating in the dolphin wahoo fishery is, at this time, non-binding and will only become effective if the Council determines that there is a need for action to limit fishing effort in the future. The Council's goal in this action is to be proactive and preventative in managing the fishery. There are no immediate tangible social impacts from this action, however many commercial fishermen considered this an unnecessary constraint on their ability to harvest dolphin.

Conclusion

Historically the recreational fishery has dominated dolphin harvest. It has been only within the past ten years that regional commercial catches reached one million pounds annually. Recreational and commercial 1994-1997 landings and percentage of total harvest are shown in Table 58; comparisons to the 1997-1999 and 1997-2000 averages are also included. The cap was established based, in part, on the percentage split between commercial and recreational sector harvest for 1997 and the average 1994-1997.

The Councils concluded establishing a non-binding cap on the dolphin harvest at 87% recreational and 13% commercial is appropriate and reflects both the 1997 and the average 1994-1997 harvest between sectors (Table 45). The 1997-99 average was 89% recreational and 11% commercial and the 1997-2000 average was 90% recreational and 10% commercial (2000 landings are preliminary and the final totals may change). This action meets the overall goal of the fishery management plan and the objective to limit the potential conflict between recreational and commercial sectors. Establishment of the framework procedure will allow the Councils to monitor the fishery and, if necessary, implement additional management measures should either sector exceed their non-binding cap.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, and (4) optimize the social and economic benefits.

Rejected Options for Action 12:

Option 1. No action.

Biological Impacts

Provided measures are in place to ensure overfishing is prevented, not allocating the resource between the commercial and recreational sectors is not likely to have any impact on the stock.

Economic Impacts

There should be no change in current short term gross revenue to the commercial and charter sectors and non-market benefits to the recreational sector. However, it is unknown whether the status quo optimizes benefits to society, or whether future shifts in harvesting levels would occur and thus result in changes in economic benefits to society.

Social Impacts

Leaving the fishery open without allocations may only exacerbate any perceived conflict that now exists between commercial and recreational sectors. Conflict between these two sectors is already intense in other fisheries, and steps should be taken to reduce this conflict whenever possible.

Conclusion

The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP. The Councils rejected this option because there is a need to establish a cap on the harvest of dolphin by sector in the Atlantic to take a precautionary and risk-averse approach which maintains management at optimum yield and current allocations among user groups.

Option 2. Allocate the dolphin resource to both recreational and commercial harvesters in the Atlantic EEZ based on the historical average catch (1984-1997, 1990-1997, or 1994-1997).

Biological Impacts

Provided measures are in place to ensure overfishing is prevented, allocation of the resource between the commercial and recreational sector is not likely to have any impact on the stock.

Economic Impacts

This measure would not have an economic impact unless the Councils set a total allowable harvest and take restrictive actions when these landings meet/exceed the non-binding cap.

Social Impacts

Social benefits could be reduced depending on the allocation chosen and whether measures are taken to restrict harvests if allocations are met.

Conclusion

The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP. The Councils rejected this option because capping the harvest of dolphin harvest by sector at 87% recreational and 13% commercial more accurately addresses the goals and objectives of the FMP by reflecting the recent allocation between sectors.

Option 3. Sub-allocate the resource to commercial harvesters based on a historical split between gear types and average landings between 1994 and 1997.

	Hook and Line	Long Line	Other/Unknown
New England	11%	77%	12%
Mid-Atlantic	1%	97%	2%
South Atlantic	69%	30%	1%

Biological Impacts

The historical average catch of dolphin by commercial gear type in New England, Mid-Atlantic and South Atlantic from 1984 to 1997 is provided in Tables 36-38. Average catch by major gear categories (1994-1997) for each Atlantic Region is as shown above (derived from Tables 36-38).

Provided measures are in place to ensure overfishing is prevented, allocation of the resource between the commercial and recreational sector is not likely to have any impact on the stock.

Economic Impacts

The economic impact from these gear allocations would be determined by the total commercial allocation and the expected future harvest for each gear type in each region. The Councils have not decided on the regional allocation in the Atlantic, and at this time it is not possible to calculate the short-term impact on ex-vessel revenue. Since the Councils have not set a binding total allowable harvest, this measure would not have an economic impact on society.

Social Impacts

It should be noted that public hearing comments registered concern that certain subsectors (gear types) of the commercial fishery (e.g., longline vessels) may fill an established allocation more quickly than other subsectors. Concern has also been expressed that because sale of fish by the for-hire sector has not been prohibited, some of this recreational catch and sale might be counted against the commercial allocation. Due to those two problems, this option is more problematic and poses more potential social impacts than the preferred option.

Conclusion

The Councils concluded not to propose sub-allocation of commercial harvest at this time because harvest is only being capped by sector. If this is changed to a hard TAC, such allocation could be considered through the framework provisions of this FMP. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.13 ACTION 13. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. Headboats (with a valid certificate of inspection) will be allowed a bag limit of 10 dolphin per paying passenger.

It should be noted that Headboat is a separate category and is not subjected to the 60 dolphin per boat per day limit. The boat limit discussions below address the party/charter sector which is subject to the boat limit.

Biological Impacts

New England - A recreational bag limit of 10 dolphin will reduce landings from the party/charter boat sector by 11% in numbers of fish and 8% in weight; will not reduce landings from the private/rental sector; and will reduce landings from all recreational sectors by 7% in number and 5% in weight (Table 46).

Table 46. Cumulative reduction in New England recreational dolphin landings from bag limits (Source: Goodyear, 1999).

BAG LIMIT	Headboat		Party/Charter		Private/Rental		Total	
	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight
1	-	-	52	41	38	33	47	38
2	-	-	40	29	21	18	33	25
3	-	-	35	26	12	9	27	20
4	-	-	31	23	6	4	22	16
5	-	-	28	20	4	3	19	14
6	-	-	24	17	3	2	16	12
7	-	-	21	15	1	1	14	10
8	-	-	18	13	0	0	11	8
9	-	-	14	10	0	0	9	6
10	**-**	**-**	**11**	**8**	**0**	**0**	**7**	**5**
11	-	-	8	6	0	0	5	4
12	-	-	6	4	0	0	4	3
13	-	-	4	3	0	0	3	2
14	-	-	3	2	0	0	2	1
15	-	-	2	1	0	0	1	1
20	-	-	0	0	0	0	0	0
25	-	-	0	0	0	0	0	0

Mid-Atlantic - A recreational bag limit of 10 dolphin will reduce landings from the party/charter boat sector, the private/rental sector, and all recreational sectors by 7% in number and 5% in weight (Table 47).

Table 47. Cumulative reduction in Mid-Atlantic recreational dolphin landings from bag limits (Source: Goodyear, 1999).

BAG LIMIT	Headboat		Party/Charter		Private/Rental		Total	
	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight
1	-	-	68	61	58	50	63	55
2	-	-	52	45	42	34	47	39
3	-	-	40	34	32	25	36	29
4	-	-	31	25	25	19	28	22
5	-	-	24	19	20	14	22	17
6	-	-	18	14	16	11	17	13
7	-	-	14	11	13	9	13	10
8	-	-	11	8	10	7	11	8
9	-	-	9	6	9	6	9	6
10	**-**	**-**	**7**	**5**	**7**	**5**	**7**	**5**
11	-	-	5	4	6	4	6	4
12	-	-	4	3	5	3	5	3
13	-	-	4	2	4	3	4	3
14	-	-	3	2	4	2	3	2
15	-	-	2	2	3	2	3	2
20	-	-	1	1	2	1	1	1
25	-	-	0	0	1	0	1	0

South Atlantic - Bag limits are already in place or being considered in South Atlantic states. Florida and North Carolina both have 10 fish recreational bag limits while Georgia has a 15 fish recreational bag limit. South Carolina has recently adopted a 7 fish bag limit. A recreational bag limit of 10 dolphin will reduce landings from the party/charter boat sector by 8% in number and 6% in weight and will reduce landings from the private/rental sector by 6% in number and 3% in weight (Table 48). Establishing a bag limit will reduce the practice of harvesting large quantities or entire schools of small, immature “peanut” or “chicken” dolphin. An increase in yield could be expected, given the rapid growth rate of the species, if fish were caught even only months later.

New England - Establishing a recreational boat limit of 60 dolphin per boat will reduce landings from the party/charter sector by 6% in number and 4% in weight; will not reduce landings from the private/rental sector; and will reduce landings from all recreational sectors by 4% in number and 3% in weight (Table 49).

Table 48. Cumulative reduction in South Atlantic recreational dolphin landings from bag limits (Source: Goodyear, 1999).

BAG LIMIT	Headboat		Party/Charter		Private/Rental		Total	
	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight	Percent Reduction in Number	Percent Reduction in Weight
1	41	32	80	76	55	50	74	69
2	28	20	65	61	35	29	59	53
3	20	14	53	49	24	19	47	41
4	14	10	43	39	18	13	38	33
5	11	7	35	31	15	10	30	26
6	8	5	27	24	12	8	24	20
7	6	4	21	18	10	6	18	15
8	5	3	16	13	8	5	14	11
9	4	2	11	9	7	4	10	8
10	**3**	**2**	**8**	**6**	**6**	**3**	**7**	**5**
11	2	1	6	4	5	3	6	4
12	2	1	4	3	5	3	4	3
13	1	1	3	3	4	2	4	2
14	1	1	3	2	4	2	3	2
15	1	1	2	2	4	2	2	2
20	1	0	1	1	2	1	1	1
25	0	0	1	0	2	1	1	0

Table 49. Cumulative reduction in New England recreational dolphin landings from recreational boat limit (Source: Goodyear, 1999).

Boat	Headboat		Party/Charter		Private/Rental		Total	
Limit	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
0	-	-	100	100	100	100	100	100
5	-	-	52	44	28	24	43	36
10	-	-	39	31	9	7	28	22
20	-	-	29	23	4	3	20	15
30	-	-	21	16	1	1	14	10
40	-	-	14	11	0	0	9	6
50	-	-	9	7	0	0	6	4
60	**-**	**-**	**6**	**4**	**0**	**0**	**4**	**3**
70	-	-	3	2	0	0	2	1
80	-	-	1	1	0	0	1	0
90	-	-	0	0	0	0	0	0
100	-	-	0	0	0	0	0	0

Mid-Atlantic - Establishing a recreational boat limit of 60 dolphin per boat will reduce landings from the party/charter sector by 3% in number and 2% in weight; will reduce landings from the private/rental sector by 3% in number and 2% in weight; and will reduce landings from all recreational sectors by 3% in number and 2% in weight (Table 50).

Table 50. Cumulative reduction in Mid-Atlantic recreational dolphin landings from recreational boat limit (Source: Goodyear, 1999).

Boat	Headboat		Party/Charter		Private/Rental		Total	
Limit	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
0	-	-	100	100	100	100	100	100
5	-	-	67	62	53	46	60	53
10	-	-	51	45	37	31	43	37
20	-	-	30	26	19	15	24	20
30	-	-	18	15	11	8	14	11
40	-	-	10	8	7	5	9	6
50	-	-	6	5	4	3	5	4
60	**-**	**-**	**3**	**2**	**3**	**2**	**3**	**2**
70	-	-	2	1	2	1	2	1
80	-	-	1	1	2	1	1	1
90	-	-	1	1	1	1	1	1
100	-	-	0	0	1	1	1	0

South Atlantic - North Carolina has an overall limit of 60 dolphin fish for charter boats. South Carolina has recently adopted a 26 fish, non-commercial vessel limit and a 50 fish vessel limit for headboats. Establishing a recreational boat limit of 60 dolphin per boat will reduce landings from the headboat sector by 16% in number and 11% in weight; will reduce landings from the party/charter sector by 2% in number and 2% in weight; will reduce landings from the private/rental sector by 1% in number and 1% in weight; and will reduce landings from all recreational sectors by between 2% in number and 2% in weight (Table 51). These are similar to reductions that would occur if similar bag limit measures were applied throughout the management unit (Table 52).

Table 51. Cumulative reduction in South Atlantic recreational dolphin landings from recreational boat limit (Source: Goodyear, 1999).

Boat	Headboat		Party/Charter		Private/Rental		Total	
Limit	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
0	100	100	100	100	100	100	100	100
5	64	55	80	77	32	26	71	65
10	51	41	66	62	19	15	57	51
20	37	29	45	41	10	7	39	34
30	29	22	29	26	6	4	25	21
40	24	17	17	15	3	2	15	12
50	19	14	8	7	2	1	7	6
60	**16**	**11**	**2**	**2**	**1**	**1**	**2**	**2**
70	13	9	1	1	1	0	2	1
80	11	7	1	1	0	0	1	1
90	9	6	0	0	0	0	1	0
100	8	5	0	0	0	0	0	0

Table 52. Cumulative reduction in recreational dolphin landings across all areas (Atlantic, Caribbean, and Gulf of Mexico) from recreational boat limit (Source: Goodyear, 1999).

Boat	Headboat		Party/Charter		Private/Rental		Total	
Limit	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
0	100	100	100	100	100	100	100	100
5	64	55	78	75	35	29	70	64
10	51	41	64	60	21	16	56	50
20	37	29	43	39	10	7	37	32
30	29	21	27	25	6	4	24	20
40	24	17	16	14	3	2	14	12
50	19	14	8	7	2	1	7	6
60	**16**	**11**	**2**	**2**	**1**	**1**	**2**	**2**
70	13	9	1	1	1	0	2	1
80	11	7	1	1	0	0	1	1
90	10	6	0	0	0	0	1	1
100	8	5	0	0	0	0	1	0

Economic Impacts

A bag limit of 10 fish will have more of an impact on total harvest in the for-hire sector than in the private recreational sector (refer to discussion under biological impacts and Tables 46-48). For example, the 10 fish bag limit will reduce the proportion of fish harvested by 11% for the charterboat sector in New England. Boat limits could further constrain harvest on charter and private recreational vessels.

To analyze the impact of a bag limit regulation, it is necessary to examine the number of angler trips that are likely to be affected by this restriction. Data on the proportion of trips that could be impacted by a bag limit regulation are available for the South Atlantic region (Table 53). Assuming the intercept data are representative for the entire recreational sector in the Atlantic, a bag limit of 10 fish per person per day will affect approximately 3% of all recreational dolphin trips. In the South Atlantic, during 1997, the number of recreational trips where dolphin were caught amounted to 469,137 (Holiman, 1999). This estimate does not include headboat trips.

Table 53. South Atlantic recreational dolphin catch and land frequencies, (as a percentage of catch trips), 1997 MRFSS Intercept Data (Holiman, 1999).

	Trips where number of fish were caught		Trips where number of fish were landed	
Number of Fish	%	Cumulative %	%	Cumulative %
0-1	50.83%	50.83%	55.86%	55.86%
2	15.56%	66.39%	14.84%	70.70%
3	7.53%	73.92%	7.20%	77.90%
4	4.61%	78.53%	4.54%	82.44%
5	3.82%	82.35%	3.57%	86.01%
6	3.10%	85.45%	3.06%	89.07%
7	1.91%	87.36%	1.80%	90.87%
8	1.87%	89.23%	1.87%	92.74%
9	1.01%	90.24%	0.90%	93.64%
10	2.92%	93.16%	3.13%	96.77%
11	0.47%	93.63%	0.50%	97.27%
12	4.14%	97.77%	1.08%	98.35%
13	0.50%	98.27%	0.22%	98.57%
14	0.22%	98.49%	0.14%	98.71%
15-32	1.51%	100.00%	1.29%	100.00%

Recreational economic benefits are expected to decline for those affected catch trips/anglers who derive value/pleasure from harvesting dolphin in excess of 10 fish per day and would now be precluded from doing so. Empirical evidence, however, does not exist on which to either document the existence of this additional value or quantify its magnitude. In theory, a decline in recreational value due to a bag or size limit may be sufficient to result in trip cancellation, particularly if the species is a prime target or motivation for taking the trip. Dolphin, however, are a species subject to substantial unsuccessful target effort. Dolphin target trips in 1997 amounted to 684,322 individual angler trips, compared to 469,137 catch trips (trips that caught dolphin regardless of target intent). A straight comparison is not completely correct as the catch trips include anglers who did not target the species. However, assuming a straight comparison were correct, over 31% of target trips would have been unsuccessful. Accounting for the non-target catch trips means that the non-success rate of target trips was even greater than 31%. Thus, given a potentially low success rate and the generous bag limit that would still be allowed, outright cancellation should be minimal. However, again, empirical evidence to support this conclusion is not available, and trip cancellation cannot be ruled out. Further, the more avid and successful anglers for which the new limit would be binding would be expected to place the greater value on the resource. Thus, restricting their behavior may effect a disproportionate loss of economic value.

As described previously there would be some loss of recreational (non market) benefits for those anglers/trips that are constrained by the bag limit. There may be some gain in economic benefits to other anglers if a restriction in the bag limit allows for more angler trips to catch the available resource in a local area. The net economic benefits overall will depend on the relative changes in these angler benefits.

Social Impacts

The only data available about what constitutes a satisfactory fishing experience in the dolphin wahoo fishery is what was heard in public comments. In those comments, many of the for-hire captains and private recreational fishermen claimed that a 10 fish per person, or 60 fish per boat limit was a reasonable limit. Some of those that were not pleased with these limits stated that a lower limit would be more reasonable and conservative. There did not seem to be an overwhelming fear that bag/boat limits would hurt those in the for-hire industry wanting to sell fish left as tips. However, there were not many of those who crew on for-hire vessels who spoke at the public hearings, and no survey has been conducted to determine if these limits would have an impact on them. The measure to allow headboats more freedom by not imposing a boat limit was to reflect the fact that headboats often carry far more passengers than a charter or private vessel and are also less likely to catch/target dolphin. In addition, fishermen responding to an economic add-on question to the NMFS 1999 Marine Recreational Fisheries Statistics Survey (MRFSS) indicated across states and modes of fishing a preference for bag limits as a conservation measure for dolphin (Appendix A.)

Conclusion

The Councils concluded establishing a recreational bag limit for dolphin of 10 and a 60 fish boat limit (excluding headboats) will cap the fishery without excessively reducing the catch. The Councils are allowing the captain and crew to retain a bag limit as well as individuals on headboats because restricting them further was deemed an unnecessary burden on the fishermen. In addition, fishermen responding to an economic add-on question to the NMFS 1999 Marine Recreational Fisheries Statistics Survey (MRFSS) indicated across states and modes of fishing a preference for bag limits as a conservation measure for dolphin (Appendix A.)

This action is intended to reduce wastage but the Councils realize that some fishing with some level of release mortality will occur. However, it is the Councils' opinion that there will be a greater tendency to stop fishing when a bag limit is attained.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, and (4) optimize the social and economic benefits.

Rejected Options for Action 13:

Option 1. No action.

Biological Impacts

Unrestricted bag limits could result in localized depletion. In addition, not limiting recreational catch would allow the practice of catching entire schools of immature "peanut" or "chicken" dolphin to continue.

Economic Impacts

There would be no change to the status quo and thus no change in short-term economic benefits. If unrestricted harvest results in growth overfishing, or localized depletion, economic benefits would decrease in the future.

Social Impacts

There would be no change to the status quo and thus no change in short-term social benefits. If unrestricted harvest results in overfishing, there could be long-term negative impacts.

Conclusion

The Councils rejected not establishing a recreational bag limit for dolphin that is intended to be the primary constraint proposed to cap the recreational fishery. The Councils are also concerned that not adopting a recreational bag limit could make existing and proposed state limits unenforceable. In addition, not proposing a bag limit would ignore the recommendations provided by advisors and representatives of various sectors of the recreational industry. Not adopting a bag limit and not capping recreational catch would be inconsistent with the overall goal and management objectives of the FMP.

Option 2. Establish a recreational boat limit of 18-60 dolphin per boat (including private and for-hire vessels).

Biological Impacts

New England - (Note: 20 fish was used in the analysis on the lower end therefore actual reductions from 18 fish may be greater.) Establishing a recreational boat limit of 18-60 dolphin per boat would reduce landings from the party/charter sector by between 29% and 6% in number and 23% and 4% in weight; would reduce landings from the private/rental sector by between 4% and 0% in number and 3% and 0% in weight; and would reduce landings from all recreational sectors by between 20% and 4% in number and 15% and 3% in weight (Table 49).

Mid-Atlantic - (Note: 20 fish was used in the analysis on the lower end therefore actual reductions from 18 fish may be greater.) Establishing a recreational boat limit of 18-60 dolphin per boat would reduce landings from the party/charter sector by between 30% and 3% in number and 26% and 2% in weight; would reduce landings from the private/rental sector by between 19% and 3% in number and 15% and 2% in weight; and would reduce landings from all recreational sectors by between 24% and 3% in number and 20% and 2% in weight (Table 50).

South Atlantic - (Note: 20 fish was used in the analysis on the lower end therefore actual reductions from 18 fish may be greater.) North Carolina has an overall limit of 60 dolphin fish for charter boats. South Carolina has recently adopted a 26 fish, non-commercial vessel limit and a 50 fish vessel limit for headboats. Establishing a recreational boat limit of 18-60 dolphin per boat would reduce landings from the headboat sector by between 37% and 16% in number and 29% and 11% in weight; would reduce landings from the party/charter sector by between 45% and 2% in number and 41% and 2% in weight; would reduce landings from the private/rental sector by between 10% and 1% in number and 7% and 1% in weight; and would reduce landings from all recreational sectors by between 39% and 2% in number and 34% and 2% in weight (Table 51). These are similar to reductions that would occur if similar bag limit measures were applied throughout the management unit (Table 52).

Economic Impacts

If there is some risk from localized depletion and flooding the market, the choice of the appropriate limit per vessel will result in increased economic benefits to society. However, there could be a reduction in benefits to anglers constrained by the boat limit. It is expected that a limit of 18 fish per boat per day could result in as much as a 39% reduction in landings (number of fish) to the recreational sector in the South Atlantic (Table 51), while a limit of 60 fish per boat would be expected to have a maximum of 4% decrease in numbers of fish harvested in New England (Table 49). A boat limit that constrains the harvest of the recreational angler would also result in lower angler benefits per trip even if the trip is taken.

Social Impacts

There are no social data available (other than public hearing comments and other public comments) to determine what defines a satisfactory recreational experience in the dolphin/wahoo fishery, which makes it difficult to predict what impacts, if any, a boat limit will impose. Setting a lower number for a boat limit may have a negative impact on revenues to for-hire vessels. However, limiting the amount of fish a boat may take will lessen the risk of overfishing, which will have a positive, long-term social impact on all sectors of the fishery.

Conclusion

The Council rejected this option after reconsidering the value and need to meet the overall goal and objectives of the FMP. This option would not provide a mechanism to reduce waste and equitably spread the resource among recreational users. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 3. Establish a recreational bag limit of 5-10 dolphin per person per day, excluding the captain and crew of for-hire boats in the Atlantic EEZ.

Biological Impacts

New England - A recreational bag limit of between 5 and 10 fish would reduce landings from the party/charter boat sector by between 28% and 11% in numbers of fish and 20% and 8% in weight; would reduce landings from the private/rental sector by between 4% and 0% in number and 3% and 0% in weight; and would reduce landings from all recreational sectors by between 19% and 7% in number and 14% and 5% in weight (Table 46).

Mid-Atlantic - A recreational bag limit of between 5 and 10 fish would reduce landings from the party/charter boat sector by between 24% and 7% in number and 19% and 5% in weight; would reduce landings from the private/rental sector by between 20% and 7% in number and 14% and 5% in weight; and would reduce landings from all recreational sectors by between 22% and 7% in number and 17% and 5% in weight (Table 47).

South Atlantic - Bag limits are already in place or being considered in South Atlantic states. Florida and North Carolina both have 10 fish recreational bag limits while Georgia has a 15 fish recreational bag limit. South Carolina has recently adopted a 7 fish bag limit. A recreational bag limit of between 5 and 10 fish would reduce landings from the headboat sector by between 11% and 3% in number and 7% and 2% in weight; would reduce landings from the party/charter boat sector by between 35% and 8% in number and 31% and 6% in weight; would reduce landings from the private/rental sector by between 15% and 6% in number and 10% and 3% in weight; and would reduce landings from all recreational sectors by between 30% and 7% in number and 26% and 5% in weight. Establishing a bag limit would reduce the practice of harvesting large quantities or entire schools of small, immature "peanut" or "chicken" dolphin. An increase in yield could be expected, given the rapid growth rate of the species, if fish were caught even months later.

Economic Impacts

It is expected that a bag limit of 5 fish per person per day could result in as much as a 35% reduction in number of fish harvested (the charterboat sector in the South Atlantic), while a bag limit of 10 fish would be expected to have a moderate impact, reducing the number of fish harvested by at most 11% (the charterboat sector in New England) (Tables 46-48).

To analyze the impact of a bag limit regulation, it is necessary to examine the number of angler trips that are likely to be impacted by the restriction. Data on the proportion of trips that could be impacted by a bag limit regulation are available for the South Atlantic region (Table 53). Assuming the intercept data are representative for the entire recreational sector in the Atlantic, a 5 fish bag limit would affect approximately 4% of all recreational dolphin trips, while a bag limit of 10 fish per person per day would impact approximately 3% of all recreational dolphin trips. In the South Atlantic during 1997, the number of recreational trips where dolphin were caught amounted to 469,137 (Holiman, 1999). This estimate does not include headboat trips.

A bag limit below harvest demand per trip could result in lower angler benefits per trip even if the trip is taken. In addition, reducing the bag limit could also result in fewer recreational trips where dolphin is one of the target(s), and thus reduce economic benefits to the sport fishing sector. For owners of for-hire vessels a reduction in number of angler trips could also result in a loss of revenue. On the other hand, if there is some risk from localized depletion or growth overfishing under current state bag limits, the choice of the appropriate bag limit will result in increased economic benefits to society.

It is a common practice for customers to “tip” the crew of for-hire vessels with fish caught on these trips. These fish are then sold and the revenue received augments the salary of these crew members. Once the vessel qualifies for a commercial permit, this option would not allow the crew to sell bag limit caught dolphin and thus there would be forgone income.

Social Impacts

The only data available about what constitutes a satisfactory fishing experience in the dolphin wahoo fishery is what was heard in public comments. In those comments, many expressed that 10 fish per person per day was certainly a reasonable limit. Fishermen off the coast of Georgia would be the only ones to experience a reduced bag limit if it is set at 5-10 fish per person. However, all the comments indicate that this reduction will probable not decrease satisfaction in any appreciable way.

Conclusion

The Councils adopted a 10 fish bag limit which lies within the range of limits this option presented at public hearing. It was determined that a recreational bag limit of 10 dolphin will cap the fishery without excessively reducing catch. In addition, the Council rejected prohibiting the captain and crew from retaining a bag limit but limited all recreational fishing vessels, except headboats, to a 60 fish boat limit. Headboats would be allowed to have all fishermen on board retain a bag limit of dolphin. The Councils determined this option was not the best way to achieve the goals and management objectives of the FMP.

Option 4. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. For-hire vessels fishing North of 39° N. Latitude (Delaware Bay, Delaware) would be exempt from the boat limit of 60 dolphin.

Biological Impacts

New England - A recreational bag limit of 10 dolphin would reduce landings from the party/charter boat sector by 11% in numbers of fish and 8% in weight; would not reduce landings from the private/rental sector; and would reduce landings from all recreational sectors by 7% in number and 5% in weight (Table 46).

Mid-Atlantic - A recreational bag limit of 10 dolphin would reduce landings from the party/charter boat sector, the private/rental sector, and all recreational sectors by 7% in number and 5% in weight (Table 47).

South Atlantic - Bag limits are already in place or being considered in South Atlantic states. Florida and North Carolina both have 10 fish recreational bag limits while Georgia has a 15 fish recreational bag limit. South Carolina has recently adopted a 7 fish bag limit. A recreational bag limit of 10 dolphin would reduce landings from the headboat sector by 3% in number and 2% in weight; would reduce landings from the party/charter boat sector by 8% in number and 6% in weight; would reduce landings from the private/rental sector by 6% in number and 3% in weight; and would reduce landings from all recreational sectors by 7% in number and 5% in weight (Table 48). Establishing a bag limit would reduce the practice of harvesting large quantities or entire schools of small, immature “peanut” or “chicken” dolphin. An increase in yield could be expected, given the rapid growth rate of the species, if fish were caught even months later.

New England - Establishing a recreational boat limit of 60 dolphin per boat would reduce landings from the party/charter sector by 6% in number and 4% in weight; would not reduce landings from the private/rental sector; and would reduce landings from all recreational sectors by 4% in number and 3% in weight (Table 49). While public testimony indicated a few trips could be impacted from the boat limit, an analysis of the data in Goodyear (1999) shows a 60 fish boat limit would not impact the headboat fishery in New England (the area north of 39°N. latitude)(Table 49).

Mid-Atlantic - Establishing a recreational boat limit of 60 dolphin per boat would reduce landings from the party/charter sector by between 3% in number and 2% in weight; would reduce landings from the private/rental sector by between 3% in number and 2% in weight; and would reduce landings from all recreational sectors by between 3% in number and 2% in weight (Table 50).

South Atlantic - North Carolina has an overall limit of 60 dolphin fish for charter boats. South Carolina has recently adopted a 26 fish, non-commercial vessel limit and a 50 fish vessel limit for headboats. Establishing a recreational boat limit of 60 dolphin per boat would reduce landings from the headboat sector by between 16% in number and 11% in weight; would reduce landings from the party/charter sector by between 2% in number and 2% in weight; would reduce landings from the private/rental sector by 1% in number and 1% in weight; and would reduce landings from all recreational sectors by between 2% in number and 2% in weight (Table 51). These are similar to reductions that would occur if similar bag limit measures were applied throughout the management unit (Table 52).

Economic Impacts

A bag limit of 10 fish would have more of an impact on total harvest in the for-hire sector than in the private recreational sector (see discussion under biological impacts)(Tables 46-48). For example, the 10 fish bag limit could reduce the proportion of fish harvested by 11% for the charterboat sector in New England. A 60 fish boat limit would likely reduce future harvest by 2% overall in the South Atlantic (Table 51).

To analyze the impact of a bag limit regulation, it is necessary to examine the number of angler trips that are likely to be affected by this restriction. Data on the proportion of trips that could be impacted by a bag limit regulation are available for the South Atlantic region (Table 53). Assuming the intercept data are representative for the entire recreational sector in the Atlantic, a bag limit of 10 fish per person per day will affect approximately 3% of all recreational dolphin trips. In the South Atlantic during 1997, the number of recreational trips where dolphin were caught amounted to 469,137 (Holiman, 1999b). This estimate does not include headboat trips.

A bag limit below harvest demand per trip could result in lower angler benefits per trip even if the trip is taken. In addition, reducing the bag limit could also result in fewer recreational trips where dolphin is one of the target(s), and thus reduce economic benefits to the sport fishing sector. For owners of for-hire vessels a reduction in number of angler trips could also result in a loss of revenue. Dolphin, however, are a species subject to substantial unsuccessful target effort. Dolphin target trips in 1997 amounted to 684,322 individual angler trips, compared to 469,137 catch trips (trips that caught dolphin regardless of target intent). A straight comparison is not completely correct as the catch trips include anglers who did not target the species. However, assuming a straight comparison were correct, over 31% of target trips would have been unsuccessful. Accounting for the non-target catch trips means that the non-success rate of target trips was even greater than 31%. Thus, given a potentially low success rate and the generous bag limit that would still be allowed, outright cancellation should be minimal. However, again, empirical evidence to support this conclusion is not available, and trip cancellation cannot be ruled out. Further, the more avid and successful anglers for which the new limit would be binding would be expected to place the greater value on the resource. Thus, restricting their behavior may effect a disproportionate loss of economic value.

Social Impacts

The only data available about what constitutes a satisfactory fishing experience in the dolphin wahoo fishery is what was heard in public comments. In those comments, many of the for-hire captains and private recreational fishermen claimed that a 10 fish per person, or 60 fish per boat limit was a reasonable limit. However, during public comment it was noted that fishermen north of Delaware Bay rarely encounter dolphin, but if they do, a 60 fish per boat limit would be overly restrictive. In order to accommodate different local fishing experiences, this option was created.

Conclusion

The Councils concluded the preferred option establishing a recreational bag limit for dolphin of 10 and a 60 fish boat limit (except that headboats would be limited to 10 dolphin per paying passenger) would cap the fishery without excessively reducing catch. In addition, the Council rejected prohibiting the captain and crew from retaining a bag limit. For-hire vessels fishing North of Delaware Bay would be allowed to have all fishermen on board retain a bag limit of dolphin. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP and rejected this option in favor of the proposed action. This option is very similar to the proposed action except that headboats would be exempt from the boat limit.

4.2.14 ACTION 14. Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed.

It is the Councils intent that vessels landing north of 31° N. latitude abide by the 3,000 pound trip limit and those vessels landing south of 31° N. latitude abide by the 1,000 pound trip limit. This tracks how other trip limits are enforced.

Biological Impacts

New England - Establishing a commercial trip limit of 3,000 will reduce longline trips by <1% and landed weight by 1%; and will reduce all commercial trips by <1% and landed weight by 1% (Table 54). Tables 55-58 present reductions by New England State.

Table 54. Cumulative reduction in commercial dolphin landings in New England from trip Limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	-	-	100	100
100	0	0	60.9	69.9	-	-	60.9	69.9
200	0	0	41.5	51.3	-	-	41.5	51.3
300	0	0	32.5	37.4	-	-	32.5	37.4
400	0	0	27.3	26.2	-	-	27.3	26.2
500	0	0	20.7	17	-	-	20.7	17
600	0	0	9.7	11.1	-	-	9.7	11.1
700	0	0	4.6	8.7	-	-	4.6	8.7
800	0	0	2.5	7.3	-	-	2.5	7.3
900	0	0	2.5	6.4	-	-	2.5	6.4
1000	0	0	1.4	5.8	-	-	1.4	5.8
1500	0	0	0.7	3.8	-	-	0.7	3.8
2000	0	0	0.4	2.6	-	-	0.4	2.6
3000	**0**	**0**	**0.4**	**1.1**	**-**	**-**	**0.4**	**1.1**
3500	0	0	0.4	0.4	-	-	0.4	0.4
≥4000	0	0	0	0	-	-	0	0

Mid-Atlantic - Establishing a commercial trip limit of 3,000 will not reduce hand line rod and reel trips or landed weight; will reduce longline trips by 2% and landed weight by 7%; and will reduce all commercial trips by 2% and landed weight by 7% (Table 59). Tables 60-64 present reductions by Mid-Atlantic State.

South Atlantic - Establishing a commercial trip limit of 3,000 pounds in North Carolina will reduce total landed weight by 4% (Table 53). Establishing a commercial trip limit of 3,000 pounds in South Carolina will reduce trips by 3% and landed weight by 16% (Table 54). Establishing a commercial trip limit in Georgia of 3,000 south of 31° N. Latitude and 1,000 north of 31° N. Latitude will reduce trips by between 0% and 1% and landed weight by between 0% and 2% (Table 68). Establishing a commercial trip limit of 1,000 in Florida east coast will reduce trips by 1% and landed weight by 13% (Table 69).

Table 55. Cumulative reduction in commercial dolphin landings in Maine from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	-	-	100	100	-	-	100	100
100	-	-	85.7	84.7	-	-	85.7	84.7
200	-	-	57.1	73.7	-	-	57.1	73.7
300	-	-	57.1	64.8	-	-	57.1	64.8
400	-	-	42.9	56.7	-	-	42.9	56.7
500	-	-	42.9	50.1	-	-	42.9	50.1
600	-	-	28.6	45.5	-	-	28.6	45.5
700	-	-	28.6	41.1	-	-	28.6	41.1
800	-	-	28.6	36.6	-	-	28.6	36.6
900	-	-	28.6	32.2	-	-	28.6	32.2
1000	-	-	28.6	27.8	-	-	28.6	27.8
1500	-	-	14.3	8.7	-	-	14.3	8.7
2000	-	-	0	0	-	-	0	0
3000	**-**	**-**	**0**	**0**	**-**	**-**	**0**	**0**
3500	-	-	0	0	-	-	0	0
≥4000	-	-	0	0	-	-	0	0

Table 56. Cumulative reduction in commercial dolphin landings in Massachusetts from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	-	-	100	100	-	-	100	100
100	-	-	56.9	65.2	-	-	56.9	65.2
200	-	-	37.4	44.7	-	-	37.4	44.7
300	-	-	27.6	30.3	-	-	27.6	30.3
400	-	-	23.6	18.9	-	-	23.6	18.9
500	-	-	18.7	9.4	-	-	18.7	9.4
600	-	-	7.3	3.1	-	-	7.3	3.1
700	-	-	2.4	1.1	-	-	2.4	1.1
800	-	-	0.8	0.4	-	-	0.8	0.4
900	-	-	0.8	0.1	-	-	0.8	0.1
1000	-	-	0	0	-	-	0	0
1500	-	-	0	0	-	-	0	0
2000	-	-	0	0	-	-	0	0
3000	**-**	**-**	**0**	**0**	**-**	**-**	**0**	**0**
3500	-	-	0	0	-	-	0	0
≥4000	-	-	0	0	-	-	0	0

Table 57. Cumulative reduction in commercial dolphin landings in Rhode Island from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip Limit	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction
0	-	-	100	100	-	-	100	100
100	-	-	75.6	78.6	-	-	75.6	78.6
200	-	-	57.8	63.2	-	-	57.8	63.2
300	-	-	51.1	49.7	-	-	51.1	49.7
400	-	-	42.2	38.2	-	-	42.2	38.2
500	-	-	26.7	29.1	-	-	26.7	29.1
600	-	-	17.8	24	-	-	17.8	24
700	-	-	11.1	21.1	-	-	11.1	21.1
800	-	-	6.7	18.6	-	-	6.7	18.6
900	-	-	6.7	16.9	-	-	6.7	16.9
1000	-	-	4.4	15.7	-	-	4.4	15.7
1500	-	-	2.2	12.3	-	-	2.2	12.3
2000	-	-	2.2	9.5	-	-	2.2	9.5
3000	**-**	**-**	**2.2**	**4.1**	**-**	**-**	**2.2**	**4.1**
3500	-	-	2.2	1.4	-	-	2.2	1.4
≥4000	-	-	0	0	-	-	0	0

Table 58. Cumulative reduction in commercial dolphin landings in Connecticut from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip Limit	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction
0	100	100	-	-	-	-	100	100
100	0	0	-	-	-	-	0	0
200	0	0	-	-	-	-	0	0
300	0	0	-	-	-	-	0	0
400	0	0	-	-	-	-	0	0
500	0	0	-	-	-	-	0	0
600	0	0	-	-	-	-	0	0
700	0	0	-	-	-	-	0	0
800	0	0	-	-	-	-	0	0
900	0	0	-	-	-	-	0	0
1000	0	0	-	-	-	-	0	0
1500	0	0	-	-	-	-	0	0
2000	0	0	-	-	-	-	0	0
3000	**0**	**0**	**-**	**-**	**-**	**-**	**0**	**0**
3500	0	0	-	-	-	-	0	0
≥4000	0	0	-	-	-	-	0	0

Table 59. Cumulative reduction in commercial dolphin landings in the Mid-Atlantic from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip Limit	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction
0	100	100	100	100	-	-	100	100
100	23.4	12.6	64.8	78.9	-	-	64.8	78.9
200	0	0	47.5	64.4	-	-	47.5	64.4
300	0	0	39.4	53.2	-	-	39.4	53.2
400	0	0	31.2	44	-	-	31.2	44
500	0	0	23.7	37.1	-	-	23.7	37.1
600	0	0	17.4	31.7	-	-	17.4	31.7
700	0	0	12.1	28.1	-	-	12.1	28.1
800	0	0	8.1	25.2	-	-	8.1	25.2
900	0	0	7.1	23.3	-	-	7.1	23.3
1000	0	0	6	21.6	-	-	6	21.6
1500	0	0	3.1	15.5	-	-	3.1	15.5
2000	0	0	2.5	12	-	-	2.5	12
3000	**0**	**0**	**1.7**	**6.5**	**-**	**-**	**1.7**	**6.5**
3500	0	0	1.3	4.5	-	-	1.3	4.5
≥4000	0	0	0.8	3.4	-	-	0.8	3.4

Table 60. Cumulative reduction in commercial dolphin landings in New York from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	-	-	100	100
100	0	0	63.4	82.9	-	-	63.4	82.9
200	0	0	47.7	71.3	-	-	47.7	71.3
300	0	0	38.8	62.1	-	-	38.8	62.1
400	0	0	32.6	54.6	-	-	32.6	54.6
500	0	0	26.6	48.3	-	-	26.6	48.3
600	0	0	22.4	43.1	-	-	22.4	43.1
700	0	0	17.6	38.9	-	-	17.6	38.9
800	0	0	11.8	35.5	-	-	11.8	35.5
900	0	0	10.8	33.1	-	-	10.8	33.1
1000	0	0	9.1	31	-	-	9.1	31
1500	0	0	5.4	23.6	-	-	5.4	23.6
2000	0	0	4.6	18.4	-	-	4.6	18.4
3000	**0**	**0**	**3.1**	**10.4**	**-**	**-**	**3.1**	**10.4**
3500	0	0	2.6	7.4	-	-	2.6	7.4
≥4000	0	0	1.5	5.5	-	-	1.5	5.5

Table 61. Cumulative reduction in commercial dolphin landings in New Jersey from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	-	-	100	100	-	-	100	100
100	-	-	67	72.5	-	-	67	72.5
200	-	-	47.8	53.5	-	-	47.8	53.5
300	-	-	41	38.8	-	-	41	38.8
400	-	-	30.4	26.9	-	-	30.4	26.9
500	-	-	21.5	18.7	-	-	21.5	18.7
600	-	-	12.8	12.9	-	-	12.8	12.9
700	-	-	6.7	10.1	-	-	6.7	10.1
800	-	-	4.5	8.2	-	-	4.5	8.2
900	-	-	3.5	6.8	-	-	3.5	6.8
1000	-	-	2.9	5.7	-	-	2.9	5.7
1500	-	-	0.6	1.8	-	-	0.6	1.8
2000	-	-	0.3	1.2	-	-	0.3	1.2
3000	-	-	0.3	0.2	-	-	0.3	0.2
3500	-	-	0	0	-	-	0	0
≥4000	-	-	0	0	-	-	0	0

Table 62. Cumulative reduction in commercial Dolphin Landings in Pennsylvania from Trip Limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	-	-	100	100	-	-	-	-
100	-	-	67.9	86.3	-	-	-	-
200	-	-	50.3	76.7	-	-	-	-
300	-	-	41.2	69.2	-	-	-	-
400	-	-	36.4	62.9	-	-	-	-
500	-	-	31.5	57.2	-	-	-	-
600	-	-	26.1	52.6	-	-	-	-
700	-	-	23	48.6	-	-	-	-
800	-	-	21.2	45	-	-	-	-
900	-	-	19.4	41.7	-	-	-	-
1000	-	-	18.2	38.6	-	-	-	-
1500	-	-	13.9	25.3	-	-	-	-
2000	-	-	7.3	16.7	-	-	-	-
3000	**-**	**-**	**3.6**	**8.4**	**-**	**-**	**-**	**-**
3500	-	-	3.6	5.4	-	-	-	-
≥4000	-	-	2.4	3.3	-	-	-	-

Table 63. Cumulative reduction in commercial dolphin landings in Maryland from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	-	-	100	100
100	0	0	62.2	74.6	-	-	62.2	74.6
200	0	0	45.6	57.5	-	-	45.6	57.5
300	0	0	33.9	44.7	-	-	33.9	44.7
400	0	0	25.8	34.8	-	-	25.8	34.8
500	0	0	17.7	28.1	-	-	17.7	28.1
600	0	0	11	23.9	-	-	11	23.9
700	0	0	6.4	21.2	-	-	6.4	21.2
800	0	0	3.5	19.4	-	-	3.5	19.4
900	0	0	3.5	18.3	-	-	3.5	18.3
1000	0	0	3.5	17.2	-	-	3.5	17.2
1500	0	0	3.2	12	-	-	3.2	12
2000	0	0	1.8	8.3	-	-	1.8	8.3
3000	**0**	**0**	**1.1**	**3.1**	**-**	**-**	**1.1**	**3.1**
3500	0	0	1.1	1.4	-	-	1.1	1.4
≥4000	0	0	0.4	0.7	-	-	0.4	0.7

Table 64. Cumulative reduction in commercial dolphin landings in Virginia from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	-	-	100	100
100	75	19.3	35	66.1	-	-	35.3	65.9
200	0	0	18.3	49.9	-	-	18.2	49.7
300	0	0	15	39.7	-	-	14.9	39.5
400	0	0	8.3	33.3	-	-	8.3	33.2
500	0	0	3.3	29.8	-	-	3.3	29.6
600	0	0	3.3	27.7	-	-	3.3	27.6
700	0	0	3.3	25.7	-	-	3.3	25.6
800	0	0	3.3	23.6	-	-	3.3	23.5
900	0	0	3.3	21.6	-	-	3.3	21.5
1000	0	0	3.3	19.5	-	-	3.3	19.5
1500	0	0	1.7	13.2	-	-	1.7	13.1
2000	0	0	1.7	8.1	-	-	1.7	8
3000	**0**	**0**	**0**	**0**	**-**	**-**	**0**	**0**
3500	0	0	0	0	-	-	0	0
≥4000	0	0	0	0	-	-	0	0

Table 65. Cumulative reduction in commercial dolphin landings in the South Atlantic from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	100	100	100	100
100	19.2	39.3	52	81.1	7.5	65.3	24.6	60.7
200	8.4	21.4	37.9	69.4	7.4	54.7	13.3	46
300	3.8	13.5	31.2	60.3	3.8	48.8	8.4	37.4
400	2.4	9.2	25.7	52.8	3.8	43.4	6.3	31.5
500	1.6	6.4	20.1	46.7	3.7	38	4.7	27.1
600	1.1	4.5	15.6	42	3.7	32.8	3.6	23.7
700	0.8	3.1	12.3	38.3	3.5	27.7	2.7	21.1
800	0.6	2.1	8.5	35.3	3.5	22.7	1.9	19.1
900	0.3	1.5	8	33.2	3.5	17.6	1.6	17.7
1000	**0.2**	**1.2**	**7.5**	**31.1**	**3.5**	**12.6**	**1.4**	**16.5**
1500	0	0.2	5.3	22.7	0	0	0.9	11.7
2000	0	0	3.4	17.1	0	0	0.6	8.8
3000	**0**	**0**	**2.3**	**9.9**	**0**	**0**	**0.4**	**5.1**
3500	0	0	1.8	7.2	0	0	0.3	3.7
≥4000	0	0	1.3	5.3	0	0	0.2	2.7

Table 66. Cumulative reduction in commercial dolphin landings in North Carolina from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	100	100	100	100
100	16	37.7	56	81.7	42.9	71.4	23.4	63.9
200	6.5	21.7	42.2	69.6	28.6	51.7	13.2	50.2
300	3.6	14.1	32.5	60.4	28.6	37.9	9	41.6
400	2	9.9	26.9	53	28.6	24.1	6.6	35.5
500	1.2	7.5	21.7	46.9	14.3	11.7	5	30.9
600	0.8	5.9	18	42	14.3	4.8	4.1	27.3
700	0.7	4.7	15.8	37.8	0	0	3.5	24.4
800	0.6	3.7	10.2	34.2	0	0	2.4	21.8
900	0.4	2.9	10	31.7	0	0	2.2	20
1000	0.4	2.3	9.4	29.2	0	0	2.1	18.3
1500	0.1	0.5	7.5	19.1	0	0	1.5	11.6
2000	0	0	3	13.8	0	0	0.6	8.2
3000	**0**	**0**	**2.7**	**7**	**0**	**0**	**0.5**	**4.1**
3500	0	0	2.2	3.9	0	0	0.4	2.3
≥4000	0	0	1.3	2	0	0	0.2	1.2

Table 67. Cumulative reduction in commercial dolphin landings in South Carolina from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	100	100	100	100
100	27.4	55.3	63.5	87.3	25	29.4	46.1	82.6
200	16.1	37.9	50.5	78.2	0	0	33.9	72.3
300	10.3	26.8	45.2	70.5	0	0	28.4	64.1
400	7.2	19.5	38.1	63.8	0	0	23.2	57.3
500	4.4	14.6	28.5	58.4	0	0	16.9	52
600	3.6	11.1	22.8	54.4	0	0	13.6	48
700	2.8	8.4	17.1	51.2	0	0	10.2	44.9
800	1.9	6.4	15.1	48.6	0	0	8.7	42.3
900	1.5	4.9	13.9	46.3	0	0	7.9	40.1
1000	1	3.8	12.1	44.3	0	0	6.8	38.3
1500	0.3	1.5	10	35.4	0	0	5.3	30.4
2000	0.1	0.7	7.3	28.4	0	0	3.8	24.3
3000	**0.1**	**0**	**5.7**	**18.2**	**0**	**0**	**3**	**15.5**
3500	0	0	3.7	14.4	0	0	1.9	12.3
≥4000	0	0	3	11.9	0	0	1.5	10.2

Table 68. Cumulative reduction in commercial dolphin landings in Georgia from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	-	-	100	100
100	36.6	57.3	60	59.1	-	-	36.6	57.3
200	20.9	37	20	46.1	-	-	20.9	37
300	12.9	24.9	20	36.3	-	-	12.9	24.9
400	8.5	17.2	20	26.5	-	-	8.5	17.2
500	6	11.8	20	16.7	-	-	6	11.8
600	3.7	8.2	20	6.9	-	-	3.7	8.2
700	2.5	6.1	0	0	-	-	2.5	6.1
800	1.7	4.5	0	0	-	-	1.7	4.5
900	1.5	3.3	0	0	-	-	1.5	3.3
1000	**1.2**	**2.3**	**0**	**0**	**-**	**-**	**1.2**	**2.3**
1500	0.2	0.2	0	0	-	-	0.2	0.2
2000	0	0	0	0	-	-	0	0
3000	**0**	**0**	**0**	**0**	**-**	**-**	**0**	**0**
3500	0	0	0	0	-	-	0	0
≥4000	0	0	0	0	-	-	0	0

Table 69. Cumulative reduction in commercial dolphin landings in Florida East Coast from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip Limit	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction
0	100	100	100	100	100	100	100	100
100	19.4	38.7	49.4	79.2	7.1	65.1	23.9	56.8
200	8.5	20.6	35.1	66.8	7.1	54.8	12.4	41.2
300	3.7	12.8	28.7	57.2	3.6	49.1	7.4	32.6
400	2.3	8.7	23.6	49.5	3.6	44	5.4	26.9
500	1.6	6	18.4	43.2	3.6	38.8	4.1	22.6
600	1.1	4.1	14	38.3	3.6	33.6	3	19.4
700	0.8	2.7	10.9	34.6	3.6	28.5	2.3	16.9
800	0.5	1.8	7.2	31.7	3.6	23.3	1.5	15.1
900	0.3	1.2	6.7	29.7	3.6	18.2	1.2	13.9
1000	**0.2**	**0.9**	**6.4**	**27.7**	**3.6**	**13**	**1.1**	**12.9**
1500	0	0.2	4.2	19.7	0	0	0.6	8.9
2000	0	0	2.8	14.6	0	0	0.4	6.5
3000	0	0	1.7	8.2	0	0	0.3	3.7
3500	0	0	1.4	5.8	0	0	0.2	2.6
≥4000	0	0	1	4.1	0	0	0.2	1.8

Economic Impacts

Trip limit impacts presented in Tables 54 to 69 are based on data collected by Dr. Phil Goodyear from several sources that include data supplied by states in the Atlantic. Confidential data (cells with less than three observations) on the distribution of trips by poundage category for the State of North Carolina were not provided to Dr. Goodyear when these tables were originally compiled. Recently, this information was supplied to Council staff and it revealed that there are trips where landings exceed 5,000 pounds in North Carolina (Table 70a). Thus, the data on reduction in harvest from the various trip limits (Table 66) are underestimates for North Carolina.

Data on landings by trip category (1994 to 1999) for North Carolina that were recently supplied to the council, and impacts from various dolphin trip limits based on analysis of each year's data, are presented in Table 70a.

Trip limit impacts for North Carolina are also calculated from a pooled data set spanning 1994 to 1997 instead of each year individually (Table 70b). The pooled data indicate that a 3,000 pound trip limit will reduce revenue by 18% in the North Carolina fishery.

Table 70c presents estimates of the potential loss in ex-vessel revenue to the commercial harvesting sector from the proposed trip limits. Estimates were calculated by assuming that future expected harvests will be at or around the average from 1994 to 1997 (Table 8), and that no additional trips will be taken to earn additional revenue. An ex-vessel price of $1.55 per pound was used in this analysis, the price per pound for dolphin in 2000 (NMFS web site). For the Mid-Atlantic and New England regions the trip limit will be 3,000 pounds.

Reductions in revenue for the South Atlantic were recalculated using the new data for North Carolina (Table 70b) where the trip limit will be 3,000 pounds. A 3,000 pound trip limit will apply to South Carolina, and Georgia North of 31° N. latitude. A 1,000 pound trip limit will apply to Georgia south of 31° N. latitude, and the Florida east coast. There is no further refinement of landings data for Georgia that will allow separation of harvests by the 31° N. latitude line, thus two estimates of the trip limit impact were calculated for Georgia.

Assuming no increase in price, the total expected loss in ex-vessel revenue could vary between $325,053 and $325,563 from the trip limits proposed in this measure (Table 70c). Even if vessels increase the number of trips taken to meet some gross revenue target, net revenue will be lower because of the increased total costs incurred from additional trips. If this measure is necessary to prevent growth overfishing, prevent localized depletion, or to regulate market supply throughout the year, then economic benefits will increase.

Table 70a. Expected decrease in ex-vessel landings to the commercial dolphin fishery in North Carolina from various trip limits (Data Source: The Division of Marine Fisheries, NC Dept. Env., Health, and Nat. Res.)

1994			Reduction in Weight			
Dolphin per Trip	**# of Trips**	**Landings**	**Trip Limit**	**Lb.**	**%**	**Red. In Revenue**
Less than 1000	2,283	125,178	1000	16,564	10%	$25,674
1001-2000	12	15,523	2000	6,041	4%	$9,363
2001-3000	4	9,288	3000	1,753	1%	$2,717
More than 3000 lbs.	3	10,753				
Total Landings	2,302	160,742				
1995			**Reduction in Weight**			
Dolphin per Trip	**# of Trips**	**Landings**	**Trip Limit**	**Lb.**	**%**	**Red. In Revenue**
Less than 1000	2,766	197,404	1000	112,344	31%	$174,134
1001-2000	23	34,738	2000	76,606	21%	$118,739
2001-3000	6	13,653	3000	56,953	16%	$88,277
3001-4000	4	13,785	4000	41,168	12%	$63,810
4001-5000	3	12,914	5000	29,254	8%	$45,343
5000+	11	84,254				
Total Landings	2,813	356,748				
1996			**Reduction in Weight**			
Dolphin per Trip	**# of Trips**	**Landings**	**Trip Limit**	**Lb.**	**%**	**Red. In Revenue**
Less than 1000	1,721	96,315	1000	22,271	17%	$34,520
1001-3000	7	15,976	3000	7,295	6%	$11,308
More than 3000 lbs.	3	16,295				
Total Landings	1,731	128,586				
1997			**Reduction in Weight**			
Dolphin per Trip	**# of Trips**	**Landings**	**Trip Limit**	**Lb.**	**%**	**Red. In Revenue**
Less than 1000	1,814	112,767	1000	103,023	45%	$159,685
1001-2000	7	8,539	2000	94,484	41%	$146,450
More than 2000 lbs.	7	108,484				
Total Landings	1,828	229,790				
1998			**Reduction in Weight**			
Dolphin per Trip	**# of Trips**	**Landings**	**Trip Limit**	**Lb.**	**%**	**Red. In Revenue**
Less than 1000	1,519	91,310	1000	48,680	32%	$75,454
1001-2000	5	7,300	2000	41,380	28%	$64,139
More than 2000 lbs.	5	46,395				
Total Landings	1,529	149,990				
1999			**Reduction in Weight**			
Dolphin per Trip	**# of Trips**	**Landings**	**Trip Limit**	**Lb.**	**%**	**Red. In Revenue**
Less than 1000	1,579	108,735	1000	79,918	38%	$123,873
1001-2000	12	15,491	2000	67,427	32%	$104,512
More than 2000 lbs.	9	85,427				
Total Landings	1,600	209,653				

Table 70b. Expected decrease in ex-vessel revenue in the North Carolina commercial dolphin fishery from trip limits.

Trip Limit	Reduction in Landings (lb.) - NC	Proportional Reduction in Landings - NC	Reduction in Revenue – NC
1000	66,637	29%	$103,287
2000	50,552	22%	$78,356
3000	41,361	18%	$64,110

*Pooled data from 1994-1997 supplied by the NC Div. of Mar. Fisheries are used to calculate proportional reduction from various trip limits

Table 70c. Expected decrease in ex-vessel revenue to the commercial dolphin fishery from the proposed trip limits.

Area	Trip limit	Reduction in landings	Average landings 1994-1997	Reduction in Revenue
New England	3,000 lb.	1.10%	13,570	$231
Mid Atlantic	3,000 lb.	6.50%	131,933	$13,293
North Carolina	3,000 lb. off NC			$64,110
South Carolina	3,000 lb. off SC	15.50%	205,544	$49,382
Georgia	1,000 lb. N 31°N off GA 3,000 lb. S 31°N off GA	2.30% 0.00%	14,334	$511 $0
Florida	1,000 lb. Florida	12.90%	990,440	$198,038
Total				**$325,053** **$325,563**

Social Impacts

The Council discussed various trip limit options before settling on different trip limits for different geographical areas of the South Atlantic. Concern was expressed that a longline fishery exists in North Carolina, and that having a 1,000 pound trip limit will unfairly penalize this fishery. However, commercial catches south of 31° N. latitude have traditionally been taken by hook and line, and rarely exceed 1,000 pounds. In order to better serve the local needs of the fishery's participants, it was decided to split the trip limit to 3,000 pounds north of 31° N. latitude and 1,000 pounds south of that demarcation.

By delineating two trips limits, the social impacts of this measure are somewhat mitigated; the longline fishery off of the North Carolina coast will experience the greatest impact. Their reduction in landings will cause an economic and psychological hardship. Traditional commercial hook and line fisheries south of 31° N. latitude are predicted to experience few social impacts, if any. The longline industries in North Carolina, South Carolina, and Florida will experience the greatest social and economic impacts from this action. The impact will be somewhat mitigated for this industry in North and South Carolina due to a 3000 pound trip limit (although it should be noted that as of this writing in 2002; South Carolina has a 4500 pound commercial trip limit but is prevented from enforcing it due to a court injunction). Long line vessels (estimated to number at approximately 10 vessels) ported along the east coast of Florida will have no such relief given a 1000 pound trip limit. At this amount, the hook and line fishers will experience only a .9 percent reduction in weight of dolphin landed, however, the long line fishery will experience a 27.7 percent reduction in weight of dolphin landed. This reduction is comparable to what would have been lost in the North Carolina long line fishery had the 1000 pound trip been imposed there.

Hook and line fishing (practiced mostly by the private recreational and charter boat sectors) will be allowed to continue on with the ability to sell fish bag limit caught fish with the proper permits. While this action has little negative impact on one allowable gear type (hook and line), it has a negative impact on another (long line). While the recreational sector enjoys a long and well-defined history in the dolphin fishery, there is no indication at this point that this role is being threatened by the commercial sector. It is difficult to predict future human behavior/shift in effort, especially when there is little data about the type of people who make up the different sectors of the dolphin and wahoo fishery.

Significantly, for this action the social impacts are determined to be cumulative – this one action by itself may bring no great damage to the fishery, but when combined with all of the other regulations and declining domestic market conditions, it is reasonable to predict a considerable negative impact on the commercial sector. The long line fishery in the South Atlantic, according to field reports, is not a healthy fishery at the current time.

Conclusion

The Councils concluded establishing a trip limit is an appropriate method to regulate and cap commercial harvest of dolphin, insure highly efficient gear are not employed in the fishery, and prevent a rapid increase in commercial landings which could shift allocation from the recreational sector to the commercial sector. This action is supported by the fact that a longline fishery exists in North Carolina where a 1,000 pound trip limit will unfairly penalize this fishery and commercial catches south of 31° N. latitude have traditionally been taken by hook and line, and rarely exceed 1,000 pounds.

The Councils determined a split trip limit of 3,000/1,000 pounds best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, and (5) reduce bycatch in the dolphin fishery.

Rejected Options for Action 14:

Option 1. No action.

Biological Impacts

Not implementing trip limits could result in additional effort and gear being introduced into the fishery, unrestrained commercial harvest, and the potential for overfishing.

Economic Impacts

This option would not result in a loss of revenue to the commercial harvesting sector constrained by trip limits proposed by Action 14 and Option 2. However, a trip limit could prevent a sector from exceeding its allocation. If this sector exceeds its allocation there could be reduced net economic benefits. In addition, a management measure that restricts harvest per trip could spread harvest of the "available resource" throughout a longer period and among a larger number of fishermen. If current harvesting practices result in localized "market flooding" net benefits would decrease under this no action option.

Social Impacts

The commercial sector would experience few negative social impacts from the lack of a trip limit. However, should they exceed historical catches and cause a shift in the commercial/recreational allocations, there will be negative impacts on all sectors in the fishery. Such impacts would be increased social conflict both on and off the water between recreational and commercial interests and higher management costs due to having to revisit the regulations. It may also lead to more stringent trip and bag limits for both sectors, which would presumably lead to negative social impacts.

Conclusion

The Councils rejected this option because they felt there was a need to establish a trip limit to regulate and cap commercial harvest of dolphin, both to protect the resource and maintain historical harvest levels by recreational and commercial fishermen. In addition, establishing a trip limit would discourage the introduction of highly efficient gear in the fishery and prevent a rapid increase in commercial landings which could shift allocations from the recreational sector to the commercial sector**.** The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 2. Establish a commercial dolphin trip limit of 1,000-5,000 pounds or an equivalent number of fish with no transfer at sea allowed in the Atlantic EEZ.

Note: The analyses from Goodyear (1999) were presented with an upper range of all trips ≥4,000 pounds; above this level, no significant change in impact was observed.

Biological Impacts

New England - Establishing a commercial trip limit of 1,000- ≥4,000 would reduce longline trips by between 1% and 0% and landed weight by between 6% and 0%; and would reduce all commercial trips by between 1% and 0% and landed weight by between 6% and 0% (Table 54). Tables 55-58 present reductions by New England State.

Mid-Atlantic - Establishing a commercial trip limit of 1,000- ≥4,000 would not reduce hand line rod and reel trips or landed weight; would reduce longline trips by between 6% and 1% and landed weight between 22% and 3%; and would reduce all commercial trips by between 6% and 1% and landed weight between 22% and 3% (Table 59). Tables 60-64 present reductions by Mid-Atlantic State.

South Atlantic - An average trip for the directed fishery off North and South Carolina has been reported to be between 1,800 to 2,000 pounds and trips may average two days in length (NMFS, 1997). Establishing a commercial trip limit of 1,000- ≥4,000 would reduce hand line rod and reel landed weight by between 1% and 0%; would reduce longline trips by between 8% and 1% and landed weight between 31% and 5%; and would reduce all commercial trips by between 1% and 0% and landed weight between 17% and 3%. Tables 66-69 present reductions by South Atlantic State.

Economic Impacts

If the chosen trip limit for each region constrains catch per trip and if price does not increase, there would be a loss of revenue to the commercial sector provided vessels do not increase the number of trips taken. Even if vessels increase the number of trips taken to meet some gross revenue target, net revenue would be lower because of the increased total costs incurred from additional trips. Table 70d presents estimates of the potential loss in ex-vessel revenue to the commercial harvesting sector from a 1,000 pound and a 5,000 pound trip limit. Estimates were calculated by assuming that future expected harvests would be at or around the average from 1994 to 1997 (Tables 8 and 9), and that no additional trips would be taken to compensate for the shortfall in revenue. An ex-vessel price of $1.55 per pound was used in this analysis, the price per pound for dolphin in 2000 (NMFS web site). Impacts for North Carolina came from Table 70b based on data from the State of North Carolina. The proportional reduction in harvest from a 5,000 pound trip limit was not presented separately in the analysis conducted by Goodyear (Tables 54-69). The trip frequency by landings category data for North Carolina did not always separate out the number of trips in the 5,000 pound grouping (Table 70a). Thus, it was not possible to calculate the short term expected loss of revenue from a 5,000 pound trip limit (Table 70d).

Table 70d. Expected decrease in ex-vessel revenue to the commercial dolphin fishery from the 1,000 and 5,000 lb. trip limits.

Area	**Average landings 1994-1997**	**Trip Limit = 1,000 LB.**		**Trip Limit = 5,000 LB.**
		Reduction in landings	**Reduction in Revenue**	**Reduction in landings**
New England	13,570	5.8%	1,220	0%
Mid Atlantic	131,933	21.6%	44,171	less than 3.4%
North Carolina		29.0%	103,287	unknown but for some trips landings exceed 5,000 pounds
South Carolina	205,544	38.3%	122,021	less than 10.2%
Georgia	14,334	2.3%	510	0%
Florida	990,440	12.9%	198,038	less than 1.8%
Total			**469,248**	

Assuming no increase in price and that the trip would be taken, the total expected loss in ex-vessel revenue could amount to $469,248 from a 1,000 pound trip limit. Even if vessels increase the number of trips taken to meet some gross revenue target, net revenue would be lower because of the increased total costs incurred from additional trips. If this measure is necessary to prevent localized depletion, or to regulate market supply throughout the year, then benefits will increase.

Social Impacts

This option would present the least impacts to the commercial fishing sector (refer to Table 70d). In particular, North Carolina, South Carolina and Florida would experience fewer social impacts under this more liberal trip limit of 5,000 pounds. However, since it is a range being proposed, it is difficult to know how such a measure would be implemented and/or enforced. If a 1,000 pound trip limit were applied to all of the South Atlantic states the impacts may be severe for the commercial sector; the opposite would be true for the higher, 5,000 pound limit. Social impacts cannot be determined specifically when a range is proposed since the impacts will depend on the final values chosen.

Conclusion

The Councils concluded establishing a trip limit is an appropriate method to regulate and cap commercial harvest of dolphin, insure highly efficient gear are not employed in the fishery and prevent a rapid increase in commercial landings which could shift allocation from the recreational sector to the commercial sector. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP. The Council responded to public comment to maintain the status quo and historical landings, and therefore rejected this option.

4.2.15 ACTION 15. Establish a minimum size limit for dolphin of 20 inches fork length off Florida and Georgia and no minimum size limit north of Georgia.

Biological Impacts

Most dolphin are mature by the time they reach a size of 18 inches (450 mm). All dolphin are mature by the time they reach a size of 24 inches (600 mm). Implementing a size limit will prevent the targeting of small "peanut" or "chicken" dolphin, discourage waste by overharvest and discard, and relay a conservation ethic to both sectors of the fishery. One complicating factor is the presence of pompano dolphin in the catch. These dolphin seldom grow larger than 16 inches, and anecdotal information indicates there is harvest in Florida and North Carolina. A 20 inch size limit could reduce the allowable catch of pompano dolphin.

The impact of size limits, if applied to the entire South Atlantic recreational fishery, are presented in Table 71. However, the size limit is only applicable to the States of Georgia and the east coast of Florida, so the impacts will be reduced. A minimum size limit of 20 inches (508 mm) is not expected to reduce landings from the commercial fishery or recreational sector (Table 72) off Georgia. A recreational minimum size limit of 20 inches will reduce Florida east coast landings from the headboat sector by 34% in number and 13% in weight, the party/charter boat sector by 37% in number and 15% in weight, the private/rental sector by 18% in number and 4% in weight, and from all recreational sectors by 21% in number and 6% in weight (Table 73).

A 20 inch minimum size limit will reduce commercial landings from the hand line fishery off Florida by 2% in weight (Table 74). The fact that slightly more than 3% of the commercial landings in the South Atlantic (Table 75) fall below the proposed size limit confirms testimony at public hearing that the commercial fishery does not depend on small fish. This measure will only minimally impact the hand line fishery.

[Note: Table 74 totals are missing; they were inadvertently not reported in the original work (Goodyear, 1999). The totals in Tables 71-75 are calculated by weighting the percentages by landings for each sector. Given that the longline landings are quite low, the totals only change slightly from the handline numbers (e.g., Table 75).]

Table 71. Reduction in South Atlantic recreational dolphin landings from size limits. (Source: Goodyear, 1999).

Size	Headboat		Party/Charter		Private/Rental		Total	
mm FL	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
< 300	1.3	0.1	0	0	0	0	0	0
301-350	2.6	0.4	0	0	0.2	0	0.1	0
351-400	7.9	1.6	0.9	0.2	3	0.5	1.2	0.2
401-450	17.5	4.9	3.3	0.8	8.5	1.6	4.2	0.9
451-500	**32.7**	**11.8**	**14.4**	**4.4**	**17.2**	**4.1**	**14.9**	**4.4**
501-550	51.8	22.9	37.3	14.2	28.7	8.4	35.9	13.2
551-600	64.4	32.4	51.7	22	38.9	13.2	49.6	20.4
601-650	71	38.7	60.6	28.1	49.5	19.6	58.8	26.5
651-700	76	44.6	65.9	32.5	56.8	24.9	64.4	31.1
701-750	81.5	52.5	69.7	36.4	63.9	31.3	68.8	35.5
751-800	84.4	57.3	74.2	42.1	68.2	35.8	73.2	40.9
801-850	89.2	67.1	78.7	48.7	73	41.9	77.8	47.5
851-900	92	73.6	84	57.7	79	50.9	83.2	56.5
901-1000	96.5	86.3	92.7	76.2	92.9	77.8	92.8	76.5

Table 72. Reduction in recreational dolphin landings in Georgia from size limits (Source: Goodyear, 1999).

Size	Headboat		Party/Charter		Private/Rental		Total	
mm FL	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
< 300	0	0	0	0	0	0	0	0
301-350	0	0	0	0	0	0	0	0
351-400	0	0	0	0	0	0	0	0
401-450	0	0	0	0	0	0	0	0
451-500	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
501-550	0	0	0	0	0	0	0	0
551-600	0	0	14	7	0	0	6	4
601-650	0	0	14	7	100	100	62	45
651-700	0	0	29	17	100	100	68	50
701-750	33	27	29	17	100	100	69	51
751-800	67	55	86	73	100	100	93	84
801-850	67	55	86	73	100	100	93	84
851-900	100	100	86	73	100	100	94	85
901-1000	100	100	100	100	100	100	100	100

Table 73. Reduction in recreational dolphin landings in Florida East Coast from size limits (Source: Goodyear, 1999).

Size	Headboat		Party/Charter		Private/Rental		Total	
mm FL	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
< 300	1	>1	0	0	0	0	0	0
301-350	3	>1	0	0	>1	0	>1	0
351-400	8	2	1	>1	3	1	3	1
401-450	18	5	9	3	9	2	9	2
451-500	**34**	**13**	**37**	**15**	**18**	**4**	**21**	**6**
501-550	53	25	57	26	29	9	33	10
551-600	66	35	69	34	39	14	44	16
601-650	73	42	77	41	50	20	54	23
651-700	78	48	81	46	58	26	61	28
701-750	84	56	85	51	65	33	68	35
751-800	87	61	87	55	69	37	72	39
801-850	91	71	89	58	74	43	76	45
851-900	93	76	91	63	80	52	81	53
901-1000	97	87	95	75	93	79	93	78

Table 74. Reduction in Florida East Coast commercial dolphin landings from size limits (Source: Goodyear, 1999).

	Hand Line		Long Line		Other		Total	
Size	Number	Weight	Number	Weight	Number	Weight	Number	Weight
mm FL	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %
< 500	**7**	**2**	**0**	**0**	**0**	**0**	**-**	**-**
501-600	28	11	4	1	0	0	-	-
601-650	42	19	6	2	0	0	-	-
651-700	49	25	10	3	0	0	-	-
701-750	61	35	17	6	0	0	-	-
751-800	67	43	25	10	0	0	-	-
801-850	77	54	40	20	0	0	-	-
851-900	81	61	54	31	0	0	-	-
901-950	88	73	64	39	0	0	-	-
951-1000	88	73	67	43	100	100	-	-
1001-1050	98	94	69	46	100	100	-	-
1051-1100	100	100	75	53	100	100	-	-
1101-1150	100	100	85	68	100	100	-	-
1151-1200	100	100	87	71	100	100	-	-
1201-1250	100	100	100	71	100	100	-	-
1251-1300	100	100	100	100	100	100	-	-
1301-1350	100	100	100	100	100	100	-	-
1351-1400	100	100	100	100	100	100	-	-
1401-1450	100	100	100	100	100	100	-	-
1451-1500	100	100	100	100	100	100	-	-

Table 75. Reduction in South Atlantic commercial dolphin landings from size limits (Source: Goodyear, 1999).

	Hand Line		Long Line		Other		Total	
Size	Number	Weight	Number	Weight	Number	Weight	Number	Weight
Mm FL	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %
< 500	**11.4**	**3.3**	**0**	**0**	**-**	**-**	**11.4**	**3.3**
501-600	43.4	16.7	21.2	6.3	-	-	43.4	16.7
601-650	50.7	21.1	21.2	6.3	-	-	50.7	21.1
651-700	55.7	25	27.3	9.1	-	-	55.7	24.9
701-750	59.2	28.3	33.3	12.8	-	-	59.2	28.3
751-800	64.8	34.5	39.4	17.4	-	-	64.8	34.5
801-850	71.3	42.8	51.5	28.1	-	-	71.2	42.8
851-900	80.9	57.9	57.6	34.1	-	-	80.9	57.8
901-950	88.3	70.9	63.6	40.8	-	-	88.2	70.9
951-1000	93.3	81.4	75.8	57.1	-	-	93.2	81.4
1001-1050	96.8	89.8	90.9	80.3	-	-	96.8	89.8
1051-1100	98.2	93.7	93.9	85.9	-	-	98.2	93.7
1101-1150	98.5	94.6	93.9	85.9	-	-	98.5	94.6
1151-1200	99.4	97.5	97	92.4	-	-	99.4	97.5
1201-1250	99.7	98.7	100	100	-	-	99.7	98.7
1251-1300	100	100	100	100	-	-	100	100
1301-1350	100	100	100	100	-	-	100	100
1351-1400	100	100	100	100	-	-	100	100
1401-1450	100	100	100	100	-	-	100	100
1451-1500	100	100	100	100	-	-	100	100

Economic Impacts

Based on the size distribution of dolphin catches in the South Atlantic region, a size limit could constrain harvest in both the recreational and commercial fisheries. If both recreational anglers and commercial fishermen respond by increasing effort to meet some harvest goal, then it is likely that there will be increases in cost of fishing for both sectors and a loss in net economic benefits. If fishermen do not increase effort or change standard operating procedures to target larger fish, and total harvest of dolphin is reduced, there will be a loss in short-term gross benefits to both sectors. The subsequent analysis utilizes these assumptions in calculating decreased harvest and economic benefits.

A 20 inch minimum size limit by itself could reduce commercial landings by at least 3% in the South Atlantic (Table 75), and this measure will mostly impact the hand line fishery. In calculating impacts, it is assumed that this percentage reduction will apply to Florida and Georgia, unconstrained expected future harvest will equate to average landings between 1994-1997, and ex-vessel price is set at $1.55 per pound (average price per pound in 2000). Under these assumptions expected short-term reduction in gross revenue from a 20 inch minimum size limit will amount to at least $46,908 (Table 76). This represents the effect of this regulation by itself and not in combination with other proposed actions in this document such as trip limits.

Table 76. Impacts of a 20 inch minimum size limit on the commercial sector in Georgia and Florida*.

Area	Average landings 1994-199	Reduction in Revenue
Georgia	14,334	$668
Florida	990,440	$46,241
	Total	**$46,908**

For the recreational sector the minimum size limit will not be a constraint for the Georgia recreational fishery (Table 72). However, for the east coast of Florida this size limit could reduce numbers and weight of fish harvested by 21% and by 6% respectively (Table 73). This percentage reduction was applied to average numbers and of weight fish harvested during 1994-1997 (896,726 and 6,398,917 pounds respectively) in order to calculate expected reductions in future harvest. Under the stated assumptions a 20 inch minimum size limit could reduce recreational harvest by 188,312 fish (383,935 pounds) (Table 77a), if anglers do not respond by targeting larger fish. If anglers do not respond by increasing effort in this fishery to harvest more fish, there will be a loss in total angler benefits. Even if effort increases, there is likely to be higher costs and thus lower short-term net economic benefits. Long-term benefits could increase if in the future this measure results in higher quality fishing that is sustainable. If this measure is necessary to prevent growth overfishing then long term benefits will increase.

Table 77a. Impacts of a 20 inch dolphin minimum size limit on the recreational sector in Georgia and Florida.

Area	Average landings 1994-1997 (lb.)	Reduction in Weight of Fish (lb.)	Average number of fish landed 1994-1997	Reduction in Numbers of Fish
Georgia	2,684	0	461	0
Florida	6,398,917	383,935	896,726	188,312
Total		**383,935**		**118,312**

Social Impacts

Setting an 20 inch size limit may have a negative impact on both the commercial and recreational sectors, especially when combined with bag and/or trip limits. According to economic analyses, the reduction in landings and income from sales will be considerable, and may precipitate social impacts on the fishery's participants (e.g., a loss of income may increase stress levels for the fisherman; such stress may lead to negative impacts on the household, etc.). Public hearing testimony questions the effectiveness of releasing undersize fish after bringing them to the boat. Many persons commented that it was impossible to measure a fish like a dolphin without injuring the fish. Whether anglers will actually target smaller fish is not known. Not having an allowable incidental bycatch will create regulatory discards. Having size limits for the EEZ that match existing size limits for the States of Georgia and Florida enhances law enforcement efforts and makes for less confusion, hence better compliance by all fishermen.

Conclusion

Establishing a 20 inch size limit off Georgia and the east coast of Florida for dolphin will prevent the targeting of peanut or chicken dolphin, reduce waste, and increase yield in the fishery. This action was adopted in part to establish like regulations off states which already had minimum size limit regulations. In addition, this action will allow harvest only after most female dolphin are sexually mature and have spawned. While the Councils concluded that other proposed measures (i.e., bag limit, trip limit, etc.) will be the primary measures to protect and conserve the resource, implementing a minimum size limit off Georgia and the east coast of Florida will provide additional benefits to the stock and enhance existing state regulations.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (3) minimize conflict and/or competition between recreational and commercial user groups, and (4) optimize the social and economic benefits.

Rejected Options for Action 15:

Option 1. No Action.

Biological Impacts

Dolphin grow rapidly, the benefits of a minimum size limit may not outweigh the costs to the fishery (except for consistent regulations off Georgia and the Florida east coast). In addition, other proposed measures (i.e., bag limit) would prevent the continued targeting of small "peanut" or "chicken" dolphin, prevent waste by overharvest and discards, relay a conservation ethic to the fishery, and reduce loss in yield to the fishery. This action could reduce regulatory discards with certain gear types, such as passive gear (e.g., longlines) where fish remain on the line for extended periods of time and do not survive. Florida presently has a 20 inch commercial size limit in place. Georgia presently has an 18 inch size limit for both recreational and commercial harvest. South Carolina has recently proposed no size limit for dolphin to reduce the amount of regulatory discards.

Economic Impacts

There would be no short-term economic losses from this option, however long-term benefits may not be optimized if a minimum size limit is needed to "improve" the stock status or to prevent growth overfishing.

Social Impacts

Not restricting the size of fish landed would allow more freedom for fishers to harvest the dolphin resource. The benefits of this action come from giving the fishermen a degree of autonomy and furthermore, the lack of a size limit would have worked well in conjunction with proposed bag limits and boat limits.

Conclusion

The Councils rejected taking no action and concluded establishing a size limit for dolphin was necessary to complement state regulations and other actions including a bag limit to prevent the targeting of "peanut" or "chicken" dolphin, reduce waste, and increase yield in the fishery. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 2. Establish an 18-24 inch fork length minimum size limit for dolphin.

Biological Impacts

Most dolphin are mature by the time they reach a size of 18 inches (450 mm). All dolphin are mature by the time they reach a size of 24 inches (600 mm). Implementing a size limit would prevent the targeting of small "peanut" or "chicken" dolphin, discourage waste by overharvest and discard, and relay a conservation ethic to both sectors of the fishery.

New England - A recreational minimum size limit of between 18 and 24 inches (450 and 600 mm) would not reduce landings from the headboat sector; would reduce landings from the party/charter boat sector by between 30% and 53% in number and 8% and 21% in weight; would reduce landings from the private/rental sector by between 0% and 53% in number and 0% and 17% in weight; and would reduce landings from all recreational sectors by between 22% and 53% in number and 5% and 20% in weight (Table 77b).

Table 77b. Reduction in New England recreational dolphin landings (pounds) from size limits (Source: Goodyear, 1999).

Size	Headboat		Party/Charter		Private/Rental		Total	
mm FL	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
< 300	-	-	2.6	0.2	0	0	1.9	0.1
301-350	-	-	7.8	1	0	0	5.8	0.6
351-400	-	-	10.4	1.6	0	0	7.7	1
401-450	**-**	**-**	**29.6**	**7.8**	**0**	**0**	**21.9**	**5**
451-500	-	-	34.8	9.8	15.8	4.1	29.9	7.8
501-550	-	-	43.1	14.2	52.6	17.1	45.6	15.2
551-600	**-**	**-**	**52.8**	**21.2**	**52.6**	**17.1**	**52.8**	**19.7**
601-650	-	-	67.8	34.2	57.9	19.9	65.2	29.1
651-700	-	-	67.8	34.2	57.9	19.9	65.2	29.1
701-750	-	-	78.7	48.8	63.2	24.6	74.6	40.2
751-800	-	-	83.9	57.4	68.4	30	79.8	47.7
801-850	-	-	86.5	62.5	73.7	36.4	83.1	53.2
851-900	-	-	86.5	62.5	94.7	67	88.6	64.1
901-1000	-	-	99.5	96.6	94.7	67	98.3	86

Mid-Atlantic - A recreational minimum size limit of between 18 and 24 inches would not reduce landings from headboats; would reduce landings from the party/charter boat sector by between 15% and 62% in number and 4% and 29% in weight; would reduce landings from the private/rental sector by between 19% and 56% in number and between 5% and 22% in weight; and would reduce landings from all recreational sectors by between 17% and 60% in number and 4% and 26% in weight (Table 77c).

Table 77c. Reduction in Mid-Atlantic recreational dolphin landings (pounds) from size limits (Source: Goodyear, 1999).

Size	Headboat		Party/Charter		Private/Rental		Total	
mm FL	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
< 300	-	-	0	0	0.3	0	0.1	0
301-350	-	-	1.4	0.2	0.9	0.1	1.2	0.1
351-400	-	-	3.5	0.7	4.2	0.8	3.8	0.7
401-450	**-**	**-**	**14.7**	**4.1**	**19.4**	**4.8**	**16.5**	**4.4**
451-500	-	-	31.9	11.5	32	9.4	32	10.6
501-550	-	-	51.3	21.9	49.2	17.4	50.5	20
551-600	**-**	**-**	**61.7**	**29.2**	**56.3**	**21.6**	**59.6**	**26**
601-650	-	-	70.6	36.8	64.3	27.6	68.1	32.9
651-700	-	-	75.9	42.4	68.8	31.9	73.1	38
701-750	-	-	80.3	48.1	72.1	35.7	77.1	42.8
751-800	-	-	84.3	54.4	75.8	40.6	80.9	48.6
801-850	-	-	88	61.3	82.5	51.5	85.8	57.1
851-900	-	-	91.7	69.4	86.8	59.9	89.8	65.4
901-1000	-	-	96.3	81.6	94.1	76.8	95.4	79.6

South Atlantic - A recreational minimum size limit of between 18 and 24 inches would reduce landings from the headboat sector by between 18% and 64% in number and 5% and 32% in weight; would reduce landings from the party/charter boat sector by between 3% and 52% in number and 1% and 22% in weight; would reduce landings from the private/rental sector by between 9% and 39% in number and 2% and 13% in weight; and would reduce landings from all recreational sectors by between 4% and 50% in number and 1% and 20% in weight (Table 71).

A commercial minimum size limit between 18 and 24 inches would reduce landings from the hook and line sector by between 11% and 43% in number and 3% and 17% in weight; would reduce landings from the longline sector by between 0% and 21% in number and 0% and 6% in weight; would reduce landings from all commercial sectors in the South Atlantic by between 11% and 43% in number and 3% and 17% in weight (Table 71).

Since a separate size limit analysis is not available for New England and the Mid-Atlantic, results from all areas were utilized for these regions (Table 77d). A commercial minimum size limit between 18 and 24 inches would reduce landings from the hook and line sector by between 7% and 10% in number and 1% in weight; would reduce landings from the longline sector by between 2% and 5% in number and less than 1% in weight; would reduce landings from all commercial sectors in the Mid-Atlantic and New England by between 7% and 10% in number and 1% in weight.

One complicating factor is the presence of pompano dolphin in the catch. These dolphin seldom grow larger than 16 inches and anecdotal information indicates there is harvest in Florida and North Carolina and an 18 to 24 inch size limit could significantly reduce the allowable catch.

Table 77d. Reduction in commercial dolphin landings (pounds) across all areas (Atlantic, Caribbean and Gulf of Mexico) from size limits (Source: Goodyear, 1999).

	Hand Line		Long Line		Other		Total	
Size	Number	Weight	Number	Weight	Number	Weight	Number	Weight
mm FL	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %
< 500	**7.3**	**0.8**	**2.3**	**0.2**	**-**	**-**	**7.3**	**0.8**
501-600	**10.3**	**1.4**	**5.1**	**0.7**	**-**	**-**	**10.3**	**1.4**
601-650	11.6	1.7	6.1	0.9	-	-	11.6	1.7
651-700	14.1	2.6	7.1	1.2	-	-	14.1	2.6
701-750	15.8	3.3	8.3	1.7	-	-	15.8	3.3
751-800	19.1	5	13.6	4	-	-	19.1	5
801-850	23.2	7.5	14.2	4.3	-	-	23.2	7.5
851-900	26	9.5	14.6	4.5	-	-	26	9.5
901-950	30.3	13.1	25.1	12.1	-	-	30.3	13.1
951-1000	38.4	20.9	31.7	17.2	-	-	38.4	20.9
1001-1050	59.7	44.2	45.9	30.3	-	-	59.7	44.2
1051-1100	79.3	68.7	62.5	47.8	-	-	79.3	68.7
1101-1150	92.4	86.9	69	55.4	-	-	92.3	86.9
1151-1200	95.9	92.5	89.5	83.1	-	-	95.9	92.5
1201-1250	99.4	98.8	94.7	90.7	-	-	99.4	98.8
1251-1300	100	100	99.7	99.3	-	-	100	100
1301-1350	100	100	99.8	99.6	-	-	100	100
1351-1400	100	100	99.8	99.6	-	-	100	100
1401-1450	100	100	99.9	99.8	-	-	100	100
1451-1500	100	100	99.9	99.8	-	-	100	100

Economic Impacts

Based on the size distribution of dolphin catches in each region, a size limit could constrain harvest in both the recreational and commercial fisheries. The expected reduction in harvest from this measure would depend on the actual limit chosen, and would vary depending on the gear used and mode of fishing. Refer to the biological impacts section for data on the proportional reduction in landings by mode, region, and gear in the Atlantic.

If both recreational anglers and commercial fishermen respond by increasing effort to meet some harvest goal, then it is likely that there will be increases in the cost of fishing for both sectors and a loss in net economic benefits. If fishermen do not increase effort or change standard operating procedures to target larger fish, and total harvest of dolphin is reduced, there will be a loss in short-term gross benefits to both sectors (except in the case where a price increase is high enough to avoid this situation in the commercial fishery). The subsequent analysis utilizes this assumption in calculating decreased harvest and economic benefits.

Estimates of potential decreases in the weight of fish harvested by the recreational sector was calculated assuming that expected future harvest would amount to the average harvest from 1994-1997 in the absence of this regulation. In addition, to determine the effects of an 18" minimum size limit the results of the 401-450 size category was used in this calculation and the results from the 501-600 category was used to estimate the effect of the 24 inch size category. Under these assumptions expected short-term reduction in weight of fish harvested could vary as shown in Table 77e depending on the size limit chosen.

Table 77e. Impacts of an 18 inch and 24 inch dolphin minimum size limit on the recreational sector.

Area	Average landings 1994-1997 (lb.)	Reduction from an 18" min. size limit		Reduction from a 24" min. size limit	
		%	Weight (lb.)	%	Weight (lb.)
New England	22,747	5.0%	1,137	19.7%	4,481
Mid Atlantic	497,504	4.4%	21,890	26.0%	129,351
South Atlantic	9,788,662	0.9%	88,098	20.4%	1,996,887
Total			**111,125**		**2,130,719**

Estimates of potential decreases in ex-vessel value of commercial landings were calculated assuming that expected future harvest would amount to the average harvest from 1994-1997 in the absence of this regulation, and ex-vessel price is set at $1.55 per pound (price per pound in 1998; NMFS, 1998 and 1999a). In addition, to determine the effects of an 18" minimum size limit the results of the <500mm size category was used in this calculation and the results from the 501-600 category was used to estimate the effect of the 24 inch size category. Data on the impact of minimum size limits were available for the South Atlantic region but not separately for the Mid-Atlantic and New England. The proportional reduction in landings for these two regions was calculated by using the impact of size limits across all areas (Table 77d). Under these assumptions and using data described, the expected short term reduction in gross revenue could vary between $74,872 and $372,921 depending on the size limit chosen (Table 77f).

Table 77f. Impacts of an 18 inch and 24 inch dolphin minimum size limit on the commercial sector.

Area	Average landings 1994-1997 (lb.)	Reduction in Weight of Fish (lb.) from an 18" min. size limit		Reduction in Weight of Fish (lb.) from a 24" min. size limit	
New England	13,570	0.80%	$169	1.40%	$294
Mid Atlantic	131,933	0.80%	$1,636	1.40%	$2,863
South Atlantic	1,428,484	3.30%	$73,067	16.70%	$369,763
Total			**$74,872**		**$372,921**

Refer to the economic impact section under Action 15 for further discussion on the potential short-term and long-term economic effects of establishing a minimum size limit.

Social Impacts

Setting an 18-24 inch (fork length) minimum size limit on the catch of dolphin may have a negative impact on both the commercial and recreational sectors, especially if combined with bag and/or trip limits. According to economic analyses, the reduction in landings and income from sales would be considerable, and may precipitate social impacts on the fishery's participants (e.g., a loss of income may increase stress levels for the fisherman; such stress may lead to negative impacts on the household, etc.). One of the most important reasons the Council came to consider size limits for dolphin was that the public had widely requested these limits at public hearings.

Conclusion

Establishing an 18-24 inch minimum size limit for dolphin would prevent the targeting of "peanut" or "chicken dolphin", reduce waste, and increase yield in the fishery. In addition, this action would allow harvest only after most female dolphin are sexually mature and have spawned. The Councils determined the 20 inch limit is most appropriate at this time, and the other sizes considered are not the best way to achieve the goals and management objectives of the FMP.

4.2.16 ACTION 16. Establish a commercial trip limit for wahoo (landed head and tail intact) of 500 pounds with no transfer at sea allowed.

The Councils considered trip limits ranging from 0 to 2,400 pounds as shown in Tables 78-80. In order to reduce repetition only the proposed action and no action options are included. The administrative record contains discussion of the full range considered.

Biological Impacts

New England - Establishing a commercial trip limit of 500 pounds will not reduce any commercial trips; reductions do not begin to occur until a 200 pound trip limit is considered (Table 78).

Mid-Atlantic - Establishing a commercial trip limit of 500 pounds will reduce longline trips by 1% and landed weight by 3% (Table 79).

South Atlantic - Establishing a commercial trip limit of 500 pounds will reduce hand line/rod and reel trips by <1% in number and landed weight by <1%; (Table 80); will reduce longline trips by 1% in number and landed weight by 9%; will reduce landings from the total commercial sector by <1% in number and by 2% in weight (Table 80).

Economic Impacts

If this trip limit reduces catch per trip and if price remains constant there will be a loss of revenue to the commercial sector, provided vessels do not increase the number of trips taken. A 500 pound trip limit could reduce commercial landings in the South Atlantic by 1.7% and in the Mid-Atlantic by 2.9%. The average annual harvest of wahoo from 1994 to 1997 in the South Atlantic region amounted to 85,264 pounds and 3,890 pounds in the Mid-Atlantic. Assuming future expected harvest without this regulation will amount to the average harvest between 1994 and 1997, it is expected that this measure will reduce total commercial harvest by 1,450 pounds (85,264 x .017) in the South Atlantic, and 113 pounds (3,890 x 0.029) in the Mid-Atlantic. The total reduction in landings could amount to 1,563 pounds and total revenue will be $3,641 annually (using an average price of $2.33/pound; the average price of wahoo in 2000). If this measure is necessary to prevent overfishing, prevent localized depletion, or to regulate market supply throughout the year, then economic benefits will increase.

Social Impacts

It is predicted that setting a commercial trip limit for wahoo of 500 pounds will not have a negative impact upon the participants in this fishery.

Conclusion

The Council adopted a 500 pound trip limit to cap the fishery and prevent expansion. Considering total landings will be reduced by 2% or less, little impact on present harvest is expected. The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, and (4) optimize the social and economic benefits.

Rejected Options for Action 16:

Option 1. No action.

Biological Impacts

Not establishing a commercial trip limit would leave the fishery unrestrained and a significant increase in harvest could occur if fishermen targeted wahoo with some type of highly efficient gear.

Economic Impacts

There would be no reduction in commercial ex-vessel revenue from this option. It is difficult to speculate on long term benefits without information on the sustainability of current levels of harvest. Economic benefits could decrease if "no action" results in local market flooding and/or overfishing occurs in the future.

Social Impacts

There would be no social impacts from this option.

Conclusion

The Councils concluded taking no action would not provide a cap or limitation on commercial wahoo harvest possibly allowing unchecked expansion of the fishery and redirection of effort toward wahoo. The Councils rejected this option in order to limit the fishery and prevent expansion. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Table 78. Reduction in commercial wahoo landings in New England from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip Limit	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction	Trips % Reduction	Weight % Reduction
0	-	-	100	100	-	-	100	100
50	-	-	55.1	30.2	-	-	55.1	30.2
100	-	-	6.9	7.2	-	-	6.9	7.2
150	-	-	3.4	3.4	-	-	3.4	3.4
200	-	-	3.4	0.4	-	-	3.4	0.4
250	-	-	0	0	-	-	0	0
300	-	-	0	0	-	-	0	0
350	-	-	0	0	-	-	0	0
400	-	-	0	0	-	-	0	0
450	-	-	0	0	-	-	0	0
500	**-**	**-**	**0**	**0**	**-**	**-**	**0**	**0**
750	-	-	0	0	-	-	0	0
1000	-	-	0	0	-	-	0	0
1500	-	-	0	0	-	-	0	0
2000	-	-	0	0	-	-	0	0
2500	-	-	0	0	-	-	0	0

Table 79. Reduction in commercial wahoo landings in the Mid-Atlantic from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	-	-	100	100	-	-	100	100
50	-	-	45	47.4	-	-	45	47.4
100	-	-	19.8	28	-	-	19.8	28
150	-	-	9.9	19.1	-	-	9.9	19.1
200	-	-	6.2	13.5	-	-	6.2	13.5
250	-	-	4.2	10.1	-	-	4.2	10.1
300	-	-	2.5	8	-	-	2.5	8
350	-	-	2.2	6.3	-	-	2.2	6.3
400	-	-	1.9	5	-	-	1.9	5
450	-	-	1.5	3.8	-	-	1.5	3.8
500	**-**	**-**	**1.4**	**2.9**	**-**	**-**	**1.4**	**2.9**
750	-	-	0	0	-	-	0	0
1000	-	-	0	0	-	-	0	0
1500	-	-	0	0	-	-	0	0
2000	-	-	0	0	-	-	0	0
2500	-	-	0	0	-	-	0	0

Table 80. Reduction in commercial wahoo landings in the South Atlantic from trip limits (Source: Goodyear, 1999).

	Hand Line/Rod& Reel		Long Line		Other		Total	
Trip	Trips	Weight	Trips	Weight	Trips	Weight	Trips	Weight
Limit	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction	% Reduction
0	100	100	100	100	100	100	100	100
50	27	23.8	41.9	47	10.5	6.7	28.7	27.9
100	5.1	8.9	17.6	27.6	0	0	6.6	12.2
150	2.2	5.3	7.7	18.9	0	0	2.8	7.7
200	1.5	3.3	4.2	14.7	0	0	1.8	5.3
250	0.6	2.1	2.3	12.5	0	0	0.8	3.9
300	0.5	1.5	1.4	11.2	0	0	0.6	3.2
350	0.4	1	1.3	10.2	0	0	0.5	2.6
400	0.2	0.7	0.9	9.6	0	0	0.3	2.2
450	0.2	0.4	0.8	9	0	0	0.3	1.9
500	**0.2**	**0.2**	**0.5**	**8.5**	**0**	**0**	**0.2**	**1.7**
750	0	0	0.4	6.9	0	0	0	1.2
1000	0	0	0.1	6	0	0	0	1.1
1500	0	0	0.1	5.5	0	0	0	1
2000	0	0	0.1	5	0	0	0	0.9
2500	0	0	0.1	4.5	0	0	0	0.8

4.2.17 ACTION 17. Do not establish a size limit for wahoo in the Atlantic EEZ.

Biological Impacts

Most wahoo are mature by the time they reach a size of 45 inches (1,125 mm). Not implementing a size limit will allow the harvest of fish prior to spawning. However, the majority of testimony at public hearings indicated there will be a problem with releasing wahoo safely and the associated hooking/gaffing mortality may outweigh the intended benefit.

Economic Impacts

There will be no short-term economic impact from this measure. Size limits can create regulatory discards with certain gear types, such as passive gear (e.g., longlines) where fish remain on the line for extended periods of time and do not survive. However, long-term benefits will decrease if this situation results in growth overfishing.

Social Impacts

By regulating the catch of wahoo with commercial trip limits and a recreational bag limit, the utility of further restricting catches with a size limit provides no substantial social benefit. This action will not burden either the recreational or commercial sector.

Conclusion

The Council considered a size limit to allow wahoo to grow to maturity prior to harvest however, the benefit from this action was outweighed by the more random nature of harvest and the potential safety problem fishermen encounter in releasing wahoo due to the potential for being cut by the large number of teeth. In addition, the harvest of wahoo will be managed through the recreational bag limit and the commercial trip limit.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial groups, and (4) optimize the social and economic benefits.

Rejected Options for Action 17:

Option 1. Establish a 35-45 inch minimum size limit for wahoo in the Atlantic EEZ.

Biological Impacts

Most wahoo are mature by the time they reach a size of 45 inches (1,125 mm). Implementing a size limit could prevent the harvest of fish prior to spawning and relay a conservation ethic to both sectors of the fishery.

New England - A recreational minimum size limit of between 35 and 45 inches (875 - 1,125 mm) would not reduce landings from any recreational sector.

Mid-Atlantic - A recreational minimum size limit of between 35 and 45 inches would reduce landings from the party/charter boat sector by between 0% and 33% in number and 0% and 19% in weight; would reduce landings from the private/rental sector by between 0% and 92% in number and 0% and 81% in weight; and would reduce landings from all recreational sectors by between 0% and 61% in number and 0% and 33% in weight (Table 81).

South Atlantic - A recreational minimum size limit of between 35 and 45 inches would reduce landings from the headboat sector by between 36% and 91% in number and 20% and 82% in weight; would reduce landings from the party/charter boat sector by between 7% and 47% in number and 2% and 31% in weight; would reduce landings from the private/rental sector by between 2% and 50% in number and 1% and 31% in weight; and would reduce landings from all recreational sectors by between 7% and 48% in number and 2% and 31% in weight (Table 82).

A commercial minimum size limit of between 35 and 45 inches would reduce South Atlantic landings from the handline sector between 0% and 39% in number and between 0% and 25% in weight; would reduce landings from the longline sector by between 0% and 31% in number and between 0% and 16% in weight; and would reduce landings from all sectors by between 0% and 39% in number and between 0% and 25% in weight (Table 83).

Table 81. Reduction in Mid-Atlantic recreational wahoo landings from size limits (Source: Goodyear, 1999).

Size	Headboat		Party/Charter		Private/Rental		Total	
Mm FL	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
< 601	-	-	-	-	-	-	-	-
601-800	-	-	-	-	-	-	-	-
801-900	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
901-1000	-	-	-	-	91.7	80.8	43.7	18.9
1001-1050	-	-	-	-	91.7	80.8	43.7	18.9
1051-1100	-	-	-	-	91.7	80.8	43.7	18.9
1101-1150	**-**	**-**	**33.3**	**18.9**	**91.7**	**80.8**	**61.1**	**33.4**
1151-1200	-	-	33.3	18.9	91.7	80.8	61.1	33.4
1201-1250	-	-	33.3	18.9	91.7	80.8	61.1	33.4
1251-1300	-	-	33.3	18.9	100	100	65.1	37.8
1301-1350	-	-	33.3	18.9	100	100	65.1	37.8
1351-1400	-	-	66.7	50	100	100	82.5	61.7
> 1400	-	-	100	100	100	100	100	100

Table 82. Reduction in South Atlantic recreational wahoo landings from size limits (Source: Goodyear, 1999).

Size	Headboat		Party/Charter		Private/Rental		Total	
Mm FL	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
< 601	-	-	0.1	0	0.5	0.1	0.1	0
601-800	27.2	12.9	2.8	0.7	0.5	0.1	2.7	0.7
801-900	**36.3**	**19.9**	**7.1**	**2.4**	**2.2**	**0.7**	**6.8**	**2.3**
901-1000	72.6	58	16.2	7.4	19.6	9.4	16.6	7.5
1001-1050	90.8	82	25.4	13.5	27.5	14.2	25.7	13.6
1051-1100	90.9	82.1	36.3	21.8	39.3	22.4	36.6	21.9
1101-1150	**90.9**	**82.1**	**47.2**	**31.2**	**50.3**	**31.1**	**47.5**	**31.2**
1151-1200	99.9	99.6	60	43.7	57.3	37.4	59.9	43.3
1201-1250	99.9	99.6	70.5	55.2	65	45.1	70.2	54.5
1251-1300	99.9	99.6	81.2	68.5	75.3	56.7	80.9	67.7
1301-1350	99.9	99.6	86.8	76.1	78.4	60.8	86.3	75
1351-1400	99.9	99.6	90.1	81.2	82.3	66.2	89.6	80.2
> 1400	100	100	100	100	100	100	100	100

Table 83. Reduction in South Atlantic commercial wahoo landings from size limits (Source: Goodyear, 1999).

	Hand Line		Long Line		Other		Total	
Size	Number	Weight	Number	Weight	Number	Weight	Number	Weight
Mm FL	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %	Cumulative %
< 600	0	0	0	0	-	-	0	0
601-800	0	0	0	0	-	-	0	0
801-900	**0**	**0**	**0**	**0**	**-**	**-**	**0**	**0**
901-1000	4.9	2.5	7.7	3.3	-	-	5.1	2.6
1001-1050	20.3	11.7	23.1	11.8	-	-	20.4	11.7
1051-1100	27.8	16.4	30.8	16.3	-	-	27.9	16.4
1101-1150	**39.3**	**25**	**30.8**	**16.3**	**-**	**-**	**38.8**	**24.5**
1151-1200	45.7	30.4	30.8	16.3	-	-	45	29.7
1201-1250	53.2	37.4	44.9	28.4	-	-	52.8	37
1251-1300	70	55.1	52.6	35.6	-	-	69.1	54.1
1301-1350	75	60.8	68.1	51.9	-	-	74.7	60.3
1351-1400	75.2	61	78.2	64.5	-	-	75.3	61.2
1401-1450	87.6	78.6	84.6	72.9	-	-	87.4	78.3
1451-1500	90.1	82.5	84.6	72.9	-	-	89.8	82

Economic Impacts

Based on the size distribution from catches of wahoo in each region, a size limit could reduce harvest in both the recreational and commercial fisheries provided fishermen do not respond by targeting larger fish. If both recreational anglers and commercial fishermen respond by increasing effort to meet some harvest goal, then it is likely that there will be increases in cost of fishing for both sectors and no change in total harvest. In both cases short-term net benefits will decrease.

If fishermen do not increase effort then total harvest will be reduced from 3.8% to 33.5% in the commercial sector and 3.1% to 31.1% in the recreational sector, as a result of a minimum size regulation (Table 84). The extent of this reduced harvest and reduced economic benefits depends on the size limit chosen. For the commercial wahoo fishery in the Atlantic, size limit restrictions in the range from 35” to 45” could lower ex-vessel revenue from $8,272 to $72,920 per year (using a price per pound of $2.33) and assuming that future expected landings in the absence of a regulation would amount to the average landings from 1994 to 1997 = 93,421 pounds) (Table 26). A size limit regulation could reduce landings by 27,360 pounds to 274,478 pounds annually in the recreational sector catching wahoo in the Atlantic (based on future expected harvest of 882,566 pounds per year in the absence of a size limit regulation; average harvest between 1994 and 1997).

Table 84. Proportional reduction in total harvest from various minimum size limits.

Minimum Size Limit		**Commercial**		**Recreational**		
Inches	**Reporting Interval**	**South Atlantic**	**All Areas**	**South Atlantic**	**Mid Atlantic**	**All Areas**
35	**801-900**	**0%**	**3.8%**	**2.3%**	**0%**	**3.1%**
40	901-1000	2.6%	10.8%	7.5%	18.9%	8.2%
42	1001-1050	11.7%	17.5%	13.6%	18.9%	14.1%
45	**1101-1150**	**24.5%**	**33.5%**	**31.2%**	**33.4%**	**31.1%**

Note: The percentage reductions for all areas are from Goodyear (1999).

Under the stated assumptions a minimum size limit could reduce recreational and commercial harvest if fishermen do not respond by targeting larger fish (Table 84). Even if effort increases, there is likely to be higher costs and thus lower short-term net economic benefits. Long-term benefits could increase if in the future this measure results in higher quality fishing that is sustainable. If this measure is necessary to prevent growth overfishing then long term benefits would increase from implementation of the "optimal" minimum size limit.

Social Impacts

Based on comments received in public hearings from all sectors of the fishing public, the Council decided to not impose size limits on wahoo. Fishermen commenting claimed that it is almost impossible to release a hooked wahoo without killing it, and thus it would constitute waste in the fishery. It was also noted that it was rare to catch an undersized wahoo, so it was not much of a problem to begin with. There would be no social impacts from this action.

Conclusion

The Councils rejected this option because the recreational bag limit and commercial trip limit will meet the overall goal and objectives of the FMP.

4.2.18 ACTION 18. Establish a recreational bag limit of 2 wahoo per person per day in the Atlantic EEZ.

Biological Impacts

Implementing a 2 fish bag limit will reduce the potential for excessive harvest and relay a conservation ethic to fishermen.

New England - A recreational bag limit of 2 fish will not reduce landings from the headboat sector; will reduce landings from the party/charter boat sector 9% in number and 7% in weight; will reduce landings from the private/rental sector 6% in number and 5% in weight; and will reduce landings from all recreational sectors 7% in number and 6% in weight (Table 85).

Mid-Atlantic - A recreational bag limit of 2 fish will not reduce landings from the headboat or party/charter boat sectors; will reduce landings from the private/rental sector 10% in number and 8% in weight; and will reduce landings from all recreational sectors 10% in number and 8% in weight (Table 86).

South Atlantic - A recreational bag limit of 2 fish will reduce landings from the headboat sector 35% in number and 27% in weight; will reduce landings from the party/charter boat sector by 9% in number and 6% in weight; will reduce landings from the private/rental sector by 14% in number and 9% in weight; and will reduce landings from all recreational sectors by 20% in number and 14% in weight (Table 87).

Table 85. Reduction in New England recreational wahoo landings from bag limits (Source: Goodyear, 1999).

Bag	Headboat		Party/Charter		Private/Rental		Total	
Limit	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
0	-	-	100	100	100	100	100	100
1	-	-	22.3	18.9	21.1	17.9	21.5	18.2
2	**-**	**-**	**8.7**	**6.9**	**6.4**	**5**	**7.1**	**5.6**
3	-	-	3.3	2.5	2.6	1.9	2.8	2.1
4	-	-	1	0.8	1.2	0.8	1.1	0.8
5	-	-	0.4	0.3	0.5	0.4	0.5	0.3
6	-	-	0.2	0.1	0.4	0.2	0.3	0.2
7	-	-	0.1	0	0.2	0.2	0.2	0.1
8	-	-	0	0	0.1	0.1	0.1	0.1
9	-	-	0	0	0	0	0	0
10	-	-	0	0	0	0	0	0
11	-	-	0	0	0	0	0	0
12	-	-	0	0	0	0	0	0
13	-	-	0	0	0	0	0	0
14	-	-	0	0	0	0	0	0
15	-	-	0	0	0	0	0	0
20	-	-	0	0	0	0	0	0
25	-	-	0	0	0	0	0	0

Table 86. Reduction in Mid-Atlantic recreational wahoo landings from bag limits (Source: Goodyear, 1999).

Bag	Headboat		Party/Charter		Private/Rental		Total	
Limit	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
0	-	-	-	-	100	100	100	100
1	-	-	-	-	23.6	19.5	23.6	19.5
2	**-**	**-**	**-**	**-**	**10.3**	**7.9**	**10.3**	**7.9**
3	-	-	-	-	5.3	3.9	5.3	3.9
4	-	-	-	-	3.3	2.3	3.3	2.3
5	-	-	-	-	1.6	1.1	1.6	1.1
6	-	-	-	-	1	0.7	1	0.7
7	-	-	-	-	0.7	0.5	0.7	0.5
8	-	-	-	-	0.3	0.2	0.3	0.2
9	-	-	-	-	0	0	0	0
10	-	-	-	-	0	0	0	0
11	-	-	-	-	0	0	0	0
12	-	-	-	-	0	0	0	0
13	-	-	-	-	0	0	0	0
14	-	-	-	-	0	0	0	0
15	-	-	-	-	0	0	0	0
20	-	-	-	-	0	0	0	0
25	-	-	-	-	0	0	0	0

Table 87. Reduction in South Atlantic recreational wahoo landings from bag limits (Source: Goodyear, 1999).

Bag	Headboat		Party/Charter		Private/Rental		Total	
Limit	Number	Weight	Number	Weight	Number	Weight	Number	Weight
	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction	%Reduction
0	100	100	100	100	100	100	100	100
1	56.2	48.6	19.5	14.5	21.5	15.9	34.9	27.3
2	**34.5**	**26.8**	**9.3**	**5.7**	**13.7**	**8.8**	**20**	**13.7**
3	23.7	16.7	7.1	3.9	11	6.7	14.2	8.8
4	17.2	11	6.3	3.4	10.1	6.2	11	6.4
5	13	7.4	5.8	3.1	9.2	5.6	9	4.8
6	10.2	5	5.3	2.9	8.3	5	7.5	3.8
7	8.2	3.4	4.9	2.7	7.4	4.4	6.4	3
8	7.3	2.7	4.6	2.5	6.6	4	5.8	2.6
9	7.1	2.6	4.2	2.2	5.8	3.5	5.5	2.4
10	6.9	2.5	3.8	2	5	3	5.2	2.3
11	6.9	2.5	3.4	1.8	4.2	2.5	4.9	2.1
12	6.8	2.5	3	1.6	3.4	2.1	4.6	1.9
13	6.7	2.4	2.6	1.4	2.6	1.6	4.3	1.8
14	6.6	2.4	2.2	1.2	1.8	1.1	4	1.6
15	6.6	2.4	1.8	1	1.1	0.6	3.8	1.5
20	6.2	2.2	0	0	1.2	2.6	0.6	0.8
25	5.8	2.1	0	0	0.2	2.4	0.1	0.8

Economic Impacts

A bag limit of 2 fish will result in an overall 14% reduction in recreational landings of wahoo, provided anglers do not increase the number of trips targeting wahoo in the Atlantic (Table 88). The average wahoo recreational harvest in the Atlantic between 1994-1997 was 882,566 pounds (Table 88). Thus, it is expected that a 2 fish bag limit could reduce recreational landings by 119,970 pounds annually, and thus also reduce short-term net recreational benefits (consumer surplus).

Data on catch and landings trip frequency distribution in the South Atlantic Region, taken from the MRFSS intercept survey in 1997, indicate that on 99% of all trips where wahoo were caught, two or fewer fish were landed (Holiman, 1999a). This information does not capture data from other regions in the Atlantic nor the headboat sector in the South Atlantic region.

Table 88. Reduction in recreational wahoo landings (pounds) from a two fish bag limit (Data Source: Goodyear, 1999).

Region	Average Harvest 1994-1997 (lb.)	% Reduction in Landings from a 2 Fish Bag Limit	Reduction in Harvest (lb.)
New England	0	5.60%	-
Mid Atlantic	16,239	7.90%	1,283
South Atlantic	866,327	13.70%	118,687
Total	**882,566**		**119,970**

As described previously there would be some loss of recreational (non market) benefits for those anglers/trips that are constrained by this two fish bag limit. There may be some gain in economic benefits to other anglers if a restriction in the bag limit allows for more angler trips to catch the available resource in a local area. In comparison to Option 2 this measure would not allow the captain and crew of for hire vessels to land in excess of the bag limit unless they had a commercial permit for sale of these species. The net economic benefits overall will depend on the relative changes in these angler benefits.

Social Impacts

Setting a low bag limit for wahoo may decrease fishing satisfaction for those in the recreational fishing sector. The impact will vary by region. However, public testimony and landings data suggest that catching more than two wahoo per recreational trip is uncommon, therefore, the impact is predicted to be minimal, at least in the South Atlantic region.

Setting a low bag limit for wahoo may decrease fishing satisfaction for those in the recreational fishing sector. As reflected in Table 88, this change in satisfaction will vary by region, and leads to the prediction that greater dissatisfaction would be held in the South Atlantic than other regions (as landings would decrease by a greater percentage). However, public testimony tended to support the two fish bag limit, indicating that catching more than two wahoo is a fairly uncommon event. It is predicted that this action will have few negative social impacts.

Conclusion

The Councils concluded establishing a recreational bag limit for wahoo will establish conservation measures in the fishery and distribute the resource among various recreational sectors.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (3) minimize conflict and/or competition between recreational and commercial user groups, and (4) optimize the social and economic benefits.

Rejected Options for Action 18:

Option 1. No action.

Biological Impacts

No bag limit could result in overfishing if there is no cap on total allowable catch and effort were to expand.

Economic Impacts

There will be no change to the status quo and thus no change in short-term economic benefits. If unrestricted harvest results in overfishing, there could be long-term negative impacts.

Social Impacts

There will be no change to the status quo and thus no change in short-term social benefits.

Conclusion

The Councils rejected no action and are establishing conservation measures for the recreational fishery which equitably distribute the resource among various recreational sectors. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

Option 2. Establish a recreational bag limit of 2 wahoo per person per day for the recreational fishery, excluding the captain and crew of for-hire boats in the Atlantic EEZ.

Biological Impacts

See the Biological Impacts of the proposed action. Under this option there would be an additional reduction in catches from excluding the captain and crew of for-hire boats in the Atlantic EEZ.

Economic Impacts

The effect of a 2 wahoo bag limit was described under the economic impact of Action 18. The difference here is that the captain and crew of for-hire vessels would forgo benefits from not being included in the bag limit catch. It is a common practice for customers to "tip" the crew of for-hire vessels with fish caught on these trips. These fish are then sold and the revenue received augments the salary of these crew members. Once the vessel qualifies for a commercial permit, this option would not allow the crew to sell bag limit caught wahoo and thus there would be forgone income.

Social Impacts

Setting a low bag limit for wahoo may decrease fishing satisfaction for those in the recreational fishing sector. Excluding the captain and crew may impact the total number of wahoo landed on charter vessels thus lowering the satisfaction of the anglers purchasing the trip. The impact would vary by region.

Conclusion

The Councils concluded prohibiting the captain and crew from retaining the bag limit was an unnecessary burden and this option is not the best way to achieve the goals and management objectives of the FMP. Therefore, the Councils rejected this option.

4.2.19 ACTION 19. Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads).

This option was presented at hearing to receive public input and allow the Council to chose any combination (other options) of the listed gears. The Council considered but rejected including additional gears authorized in other fisheries (e.g., trawls) and considered and rejected restricting (in any way) the allowable gear identified in the preferred alternative. All gear currently allowed in the dolphin fishery under the Coastal Migratory Pelagics FMP were included as allowable gear and spearfishing gear was added.

Biological Impacts

Specifying allowable gear will prevent new gear from being introduced into the fishery and exacerbating the potential for localized depletion, increased bycatch, and problems associated with conflict/competition between gear types.

Economic Impacts

There will be no immediate economic impact since this option does not place restrictions on current gear types in the dolphin and wahoo fisheries.

Social Impacts

There will be no impact since this option does not place restrictions on current gear types in the dolphin and wahoo fisheries. Specifying allowable gear will prevent gear from being introduced into the fishery and exacerbating the potential for conflict between recreational and commercial fishermen.

Conclusion

The Councils concluded establishing allowable gear will limit the fishery to existing gear, prevent the expansion of the commercial fishery and shift in harvest patterns between sectors through use of new highly efficient gear. In addition, the Councils, pursuant to the Magnuson-Stevens Act, are required to specify allowable gear for managed species.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, and (5) reduce bycatch in the dolphin fishery.

Rejected Options for Action 19:

Option 1. No action.

Biological Impacts

Taking no action to specify allowable gear would not prevent gear from being introduced into the fishery and would provide the potential for overfishing to occur.

Economic Impacts

There would be no economic impact since this option would not place restrictions on gear types to be used in the dolphin and wahoo fisheries.

Social Impacts

There would be no impact since this option would not place restrictions on current gear types in the dolphin and wahoo fisheries.

Conclusion

The Councils rejected this option because specifying gear is a required provision of the Magnuson-Stevens Act and taking this action would be effective in preventing redirection of effort from other fisheries, using new highly efficient gear. The Councils are also concerned that a shift in allocation from the recreational sector to the commercial sector could occur if new fisheries began using highly efficient gear. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.20 ACTION 20. Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species.

The proposed action tracks the HMS regulations as requested by NMFS. The Council considered but rejected an even broader restriction on the use of longlines to fish for dolphin and wahoo. However, the Council determined that implementation of any different alternatives would complicate management for the HMS species.

Biological Impacts

Observer data and vessel logbooks indicate that pelagic longline fishing for Atlantic swordfish and tunas results in catch of non-target finfish species such as bluefin tuna, billfish, and undersized swordfish, and of protected species, including threatened and endangered sea turtles. Also, this fishing gear incidentally hooks marine mammals and sea birds during tuna and swordfish operations. The bycatch of animals that are hooked but not retained due to economic or regulatory factors contributes to overall fishing mortality. Such bycatch mortality may significantly impair rebuilding of overfished finfish stocks or the recovery of protected species. Atlantic blue marlin, white marlin, sailfish, bluefin tuna, and swordfish are overfished. The concurrent closure in this FMP was deemed necessary by NMFS to reduce bycatch and incidental catch of overfished and protected species by pelagic longline fishermen who target highly migratory pelagic species (HMS).

Appendix C (FSEIS for HMS Regulatory Amendment 1) contains data on dolphin-wahoo pelagic longline fishery analysis. The data presented on page C-66 and in Table C-4 indicate that pelagic longlines targeting dolphin do in fact result in a bycatch of HMS species.

Prohibiting the use of pelagic longlines for dolphin and wahoo within any "time or area closure" in the Atlantic for harvest of Highly Migratory Pelagic Species (HMS) will protect the integrity of the management measures implemented to reduce bycatch and regulatory discards in the HMS fishery. It will also prevent directed and potential increases in dolphin and wahoo fishing from causing additional bycatch mortality of non-target and undersized HMS species. In addition, a prohibition may prevent a shift in the present ages harvested by sector.

Pelagic longlines are classified as a Category I fishery under the Marine Mammals Protection Act indicating the gear used in this fishery is associated with frequent serious injury or mortality of marine mammals. In addition, under the endangered species consultation process a Biological Opinion prepared by NMFS for the HMS plan identified significant interaction between pelagic longlines and threatened and endangered sea turtles and recommended measures to reduce bycatch. Goodyear (1998) indicated the majority of fishing mortality on billfish results from bycatch in the pelagic longline fishery and that fishing mortality on blue marlin is 3.19 times higher than that which will produce MSY and 1.88 times greater than that which will produce MSY for white marlin. The assessment was updated (NMFS, 2000) and fishing mortality in blue marlin is now 4 times higher than that which will produce MSY and greater than 7 times that which will produce MSY for white marlin.

Economic Impacts

Regulatory Amendment 1 to the Atlantic Tunas, Swordfish, and Shark Fishery Management Plan established time/area closures for pelagic longline fishing targeting HMS species in the South Atlantic and Gulf of Mexico (HMS closed areas). The HMS closed areas in the South Atlantic region are the Florida Straits (Area between 31^{o} N and 24^{o} N latitude, and 79^{o} W longitude) year round and the Charleston Bump (the area between 31^{o} N and 34^{o} N latitude, and 76^o W longitude) from February 1 to April 30 (Map on page 44 and page 165 of Appendix D). The economic effect of a prohibition on the use of longlines for dolphin and wahoo in these closed areas will depend on whether effort is redistributed to other areas where dolphin are caught during the closure period (NMFS, 2000).

Estimates on the expected proportional reductions in dolphin longline harvests were taken from the NMFS Final Environmental Impact Statement, which were calculated from the HMS logbook data. Table 89 presents an analysis for the case where effort is displaced to other “open” fishing areas during the closure period and estimates for the situation where there is no displacement of effort.

The average annual longline harvest in the South Atlantic region from 1994-2000 of 375,383 pounds (Table 38) was used to calculate the reduction in annual longline landings from the proposed closed areas. Also, an average price of $1.55 per pound was applied to harvest reductions to determine the change in annual gross revenue (NMFS, 1998 & 1999b). Thus, this action could result in a short-term reduction of $95,655 to $154,770 (Table 89). These estimates only represent the expected losses from reduction in dolphin harvests and not the total reduction in ex-vessel revenue from all species.

Table 89. Impact of potential closed areas in the South Atlantic region on dolphin longline harvests.

ITEM	No Displacement of Effort	Displacement of Effort to Other Areas
% Reduction in Dolphin Harvest*	26.60%	16.44%
Reduction In Longline Landings (lb.)	99,852	61,713
Reduction In Revenue	$154,770	$95,655
% Reduction in Total Dolphin Commercial Landings (Average of 1994-2000)	6%	4%

*NMFS (2000)

In the future the affected longline vessels could respond by increasing effort to target dolphin and other species outside of the closed area in an effort to make up this lost revenue. This action could result in higher net benefits in the future only if these measures reduce the rebuilding time of the depleted HMS populations such that the future benefits outweigh these costs to the longline industry.

Social Impacts

This action will present the most potentially significant social impacts to the commercial dolphin and wahoo fishing sector. While there are no specific data on the commercial dolphin/wahoo longline fishery or communities, there is a report entitled “Social and Cultural Impact Assessment of the Highly Migratory Species Fisheries Management Plan and the Amendment to the Atlantic Billfish Fisheries Management Plan,” (Wilson and McCay, 1998) which examines impacts of the proposed closure of federal waters to the longline fishing and its associated communities. These data overlap with dolphin and wahoo commercial fishing and related longlining communities in the South Atlantic, Gulf of Mexico, and the U.S. Caribbean.

In speaking about the pelagic longline fleet and related businesses, the report's authors write:

> *"Five sources of pressure on this fleet are apparent. We list them in no particular order. The first is imports. Increasing power of foreign fishing fleets in combination with increased political emphasis on free trade have placed downward pressure on the prices of most of this fleet's products. The second is land values. As recreational fishing and other coastal activities become more popular the cost of dockage and coastal community land climbs. The third is personnel. Every fishing community reports ever increasing problems with finding and holding quality employees. The magnitude of this problem, and its accompanying social dislocations, is such that if any one of these pressures is to be selected as the most ominous for the future of these communities it will be this one. The fourth is increasing distances that boats have to steam to find fish. The last is increasing regulation. While this latter category is very important, and almost always gets the most ire from fishers, many admit that it is not the worst of the problems. One of the most prominent fishers in this fleet told us, and we agree with his assessment, that if no regulations were promulgated by these fisheries management plans the relative decline of the longline fleet in comparison with its foreign competitors would continue. Only government subsidies, which many competing fleets enjoy, would make a difference.*
>
> *The central message is that the most stringent regulations of the longline fleet being considered in these plans would substantially accelerate the U.S. fleet's current decline and the movement offshore of its assets. In communities where the longline fleet is the main commercial fishery, the changes described above, particularly the inability of the fishing communities to recruit future fishers, are undermining these communities' sustained access to the resource."*

Because most of the commercial fishermen that longline for dolphin do so as an alternative to fishing for other species such as tuna, Action 20 will have some impacts on the fishermen and communities that support them. In effect, it closes the one alternative that would have been left to longliners that depended on HMS and used dolphin as a back-up fishery. But, for those boats and businesses already operating in a marginal manner, the proposed time and area closures for HMS longlining will have the most substantial impacts, perhaps forcing them out of business. Those boats that remain will supposedly have enough alternative resources to not be substantially impacted by closing them off to longlining for dolphin. However, due to the lack of data on those who longline for dolphin, it is difficult to predict what specific social impacts might follow this action. Much depends on how the closure is mitigated by alternative employment strategies and/or any federal "buyback" program for HMS boats.

Finally, consideration in this case should be given to social impacts that are harder to quantify but are nonetheless real. By closing the longline dolphin fishery in conjunction with the proposed HMS closure, fishers may suffer a heightened loss of identity and loss of self-esteem as their way of life is altered or ended. Psychological stress on the fishers, their related families, crews, and communities may also increase, having unpredictable consequences. There will most likely be an increase in tension between fishers and fishery managers, effecting a strain on political relationships in the management sector.

<u>Conclusions</u>

The Councils concluded tracking HMS area/season closures will enhance the enforceability and the intended long-term benefits for non-target, as well as, HMS species. In addition, it will prevent a shift in commercial effort targeting dolphin and wahoo.

This action was taken because a "time or area closure" affecting the use of pelagic longline gear for Highly Migratory Pelagic Species (HMS) in the Atlantic has been implemented. Impacts on HMS species from proposed closures are presented in the NMFS Final Supplemental Environmental Impact Statement (NMFS, 2000). The Councils could have chosen to only adopt a closure in the South Atlantic EEZ but determined closing it in all HMS closure areas where they have jurisdiction for dolphin and wahoo was more appropriate.

Effective March 1, 2001, areas were to be closed to use of pelagic gear for highly migratory pelagic species; the 2001 closures became effective on March 1 and were not extended into May (other than the Florida closure that is year round). For subsequent years, the closure will be February 1 through April 30. The East Florida Coast year round closed area means the Atlantic Ocean area seaward of the inner boundary of the U.S. EEZ from a point intersecting the inner boundary of the U.S. EEZ at 31°00' N. lat. near Jekyll Island, GA, and proceeding due east to connect by straight lines the following coordinates in the order stated: 31°00' N. lat., 78°00' W. long.; 28°17' N. lat., 79°12' W. long.; then proceeding along the outer boundary of the EEZ to the intersection of the EEZ with 24°00' N. lat.; then proceeding due west to the following coordinates: 24°00' N. lat., 81°47' W. long.; then proceeding due north to intersect the inner boundary of the U.S. EEZ at 81°47' W. long. near Key West, FL, year round. The Charleston Bump closed area is the area between 31° N and 34° N lat., and 76°W long. from February 1 to April 30 (Map on page 7-16 in Appendix D; Appendix E presents the HMS Final Rule and a Technical Amendment to that rule).

Another alternative the Councils considered and subsequently approved was to request emergency action to implement some measures. This could be considered an additional SubOption. Pursuant to Section 305(c)(2)(A) of the Magnuson-Stevens Act, the South Atlantic Council requested implementation through emergency action of the following measures for the dolphin wahoo fishery in the Atlantic EEZ: 1) Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed; 2) Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline and hook and line gear including manual, electric, or hydraulic rod and reels, bandit gear, handline, and spearfishing gear (including powerheads); and 3) Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species. The Councils' rationale is shown below:

> *"In December 1999, NMFS requested the Councils consider a complimentary action to enhance the bycatch reduction afforded by the HMS rule (Appendix D). The South Atlantic Council concurred with the NMFS findings that if longline vessels redirect effort to dolphin and wahoo in the HMS closed areas, it may compromise the biological basis and enforceability of the regulations established to reduce by-catch of juvenile highly migratory species.*
>
> *The Council is concerned that sufficient latent effort exists in the longline fishery to: (1) disrupt the traditional commercial and recreational fisheries for dolphin and wahoo in the HMS closed areas, (2) impede efforts to reduce the bycatch of juvenile HMS species, and (3) cause other management problems. This latent effort consists of three categories of vessels:*

(1) longline vessels forced to or willing to give up the HMS permit (e.g., that can no longer economically fish for HMS species and/or find it more economically beneficial to fish in the closed HMS areas for dolphin and wahoo), (2) longline or other vessels that did not meet the qualifying criteria for obtaining the limited access HMS permit, and (3) vessels capable of gearing up to longline for dolphin and wahoo.

It is difficult to determine an exact number of vessels included in these three categories, however, the Final Supplemental Environmental Impact Statement of Regulatory Amendment 1 to the Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan (FSEIS) and the Federal Register HMS final regulations provide a rough estimate of vessels in the first category. The revised final regulatory flexibility analysis (FRFA) indicates that the final time/area closure actions will cause approximately 14% of HMS permitted longline vessels (based on 208 vessels reporting landings in 1998) to be forced out of business. Table 8-2 in the FSEIS shows that 9 percent or 19 of these vessels will be forced out of business by the South Atlantic closures. These 19 vessels would represent the low-end number for the latent longline effort that could target dolphin and wahoo in the southern HMS closed areas. The FRFA states that as of March 23, 2000 there were 450 HMS limited access longline permits. There is no break down as to how these permit holders will be affected by the various time/area closures, however, by extrapolating the 450 permits in 2000 with the 208 permits in 1998 an approximate number of vessels that may be forced out of the HMS fishery by the South Atlantic closures can be calculated. Nine percent of the 450 permits or 40 vessels would represent the high-end number for the latent longline effort in the South Atlantic.

From this it can be inferred that for the first category of vessels mentioned above, some 19 to 40 vessels could potentially target dolphin and wahoo off of the Carolinas, Georgia and Florida.

Accurately determining the potential number of vessels in the second category becomes more difficult. According to information provided by the NMFS's HMS staff, there were approximately 1440 swordfish and shark permits issued to vessels in Florida over the period 1998 - May 1999 (prior to the limited access program). Currently there are 413 vessels with swordfish and shark limited access permits in Florida, of which about 215 (52%) are on the east coast. How many of the 1440 previously permitted vessels in Florida that did not receive HMS limited access permits could or would target dolphin and wahoo in the South Atlantic is unknown. However, if the ratio between the east and west coast limited access permit holders that exists today is applied to those 1440 vessels, the upper limit of the number of vessels in the second category is about 749 (1440 x .52). If as few as 10% of these vessels decided to direct part of their fishing effort to longline for dolphin and wahoo it would have a significant adverse impact on the fishery as it now exists.

Numbers are not available for the third category of vessels. Many of the commercial vessels fishing in the South Atlantic participate in a number of different fisheries. Some of these vessels have the capability of gearing up to longline for dolphin and wahoo. If economic incentives were sufficient, an unknown, but potentiality large number of vessels could enter the fishery.

Senate Bill 1911 identifies 68 vessels in the voluntary buyout program, many of which are located in South Atlantic ports. It is our understanding Bill 1911 may be dead in its present form. However, if this legislation is resurrected and the buyout occurs, a number of these vessels could enter the dolphin and wahoo fisheries if allowed for in the legislative language. This Bill does identify 68 longline vessels that are prepared to get out of the HMS fishery. If the buyout does not occur, some of these vessels could potentially redirect their fishing effort to dolphin and wahoo.

In addition, the Council is concerned that without the proposed trip limits and allowable gear regulations an uncontrolled redirection of effort toward dolphin and wahoo and HMS species by displaced HMS vessels in areas not covered by the HMS closure (e.g., the areas north of Florida) could result in localized reduction in fish abundance, market disruption, increased conflict between recreational and commercial sectors, increased bycatch and a shift in historic allocations between commercial and recreational user groups. On page 9-5 of the FSEIS it is stated "NMFS received a number of comments that indicated communities in the mid-Atlantic Bight, particularly recreational communities, would also be negatively impacted and may experience increased user conflicts if all the vessels from the Charleston Bump and East Coast areas move north". It is further stated that 52 of the 78 permit holders that reported landings from these areas might move north."

The Council approved this request at the November 30, 2000 Council meeting in Atlantic Beach, North Carolina and submitted the request to NMFS on January 11, 2001. NMFS rejected the request on September 12, 2001.

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, and (5) reduce bycatch in the dolphin fishery.

Rejected Options for Action 20:

Option 1. No action.

Biological Impacts

Not prohibiting the use of pelagic longlines in areas closed to Highly Migratory Pelagic Species (HMS) would not protect the integrity of the management measures implemented to reduce bycatch and regulatory discards in the HMS fishery. It would also not prevent new commercial effort shifting to target dolphin and wahoo and additional bycatch mortality of non-target and undersized HMS species.

Economic Impacts

There could be economic consequences from not prohibiting the use of longlines for dolphin and wahoo in time/area closures for highly migratory species (HMS). If longline vessels redirect effort to dolphin and wahoo in the HMS closed area, there would not be a reduction in the bycatch of juvenile highly migratory species. In addition, this situation could result in excessive harvest of dolphin and wahoo. Both situations may not optimize benefits to society. Keeping the HMS closed areas open to longlining for dolphin and wahoo could lead to increased enforcement costs from monitoring the activities of these vessels to ensure that they are not harvesting HMS in these areas.

Social Impacts

As noted above, the longline fleet is already under substantial pressure from other factors besides increasing government regulation. Even if the status quo is maintained, many boats and associated businesses may close down shortly because other economic and social pressures.

Conclusions

The Councils concluded not tracking HMS area/season closures would compromise the enforceability and the intended long-term benefits for non-target, as well as, HMS species. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP.

4.2.21 ACTION 21. Establish a fishing year of January 1 to December 31 for the dolphin and wahoo fishery in the Atlantic EEZ.

The Council considered but rejected other fishing years such as April 1 - March 31 (the current fishing year for dolphin under the Coastal Migratory Pelagics FMP) and other possible combinations because where feasible the Council is trying to have the fishing year coincide with the calendar year.

Biological Impacts

There will be no biological impacts from establishing a fishing year.

Economic Impacts

There will be no economic impacts from establishing a fishing year since it will not have a direct or indirect effect on fishing activity or harvest.

Social Impacts

There will be no social impacts from establishing a fishing year.

Conclusion

Establishing a fishing year will provide the basis for collection of necessary biological, economic, and social data. In addition, specifying a fishing year of January 1 to December 31 will be useful in future stock assessments. A fishing year would be necessary in the future if allocations or quotas were established in the fishery.

The Councils determined this action best achieves the goals of the FMP and the management objectives to (4) optimize the social and economic benefits, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Rejected Options for Action 21:

Option 1. No action.

Biological Impacts

There would be no biological impacts from not establishing a fishing year.

Economic Impacts

There would be no economic impacts from not establishing a fishing year. Establishing a fishing year would not have a direct or indirect effect on fishing activity or harvest.

Social Impacts

There would be no social impacts from not establishing a fishing year.

Conclusion

The Councils concluded not establishing a fishing year would prevent the creation of a benchmark for use in collection of data, assessment of the resources, and in tracking quotas if implemented in the future. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP and rejected this option.

4.2.22 ACTION 22. Expand the list of Essential Fish Habitat (EFH) definitions that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic.

EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*.

Note: This EFH definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (SAFMC, 1998b) (dolphin was included within the Coastal Migratory Pelagics FMP). This definition does not apply to extra-jurisdictional areas. A detailed description of the pelagic habitats used by dolphin and wahoo is presented in Section 3.0 Affected Environment.

Biological Impacts

The identification of essential habitat for dolphin and wahoo will enable the Council to protect essential fish habitat effectively and take timely actions when necessary. This could prevent further decreases in biological productivity and may lead to possible increases in yield in fish stocks.

As required by the Magnuson-Stevens Act and Final Rule for Essential Fish Habitat, the Council is defining EFH for dolphin and wahoo. The following builds on material presented in the South Atlantic Council's Habitat Plan (SAFMC, 1998b) to elaborate on the ecological role of dolphin and wahoo (by life stage) in the habitats described. A general description of species and distribution; reproductive characteristics; age and growth; mortality and longevity; movement patterns and stock structure; and feeding, food, and trophic relationships is presented in Section 3.1.

Available information indicates dolphin (common and pompano) and wahoo use basically the same pelagic habitats, both species are caught using the same gears by the same fisheries and there is very limited information on habitat use by life stage. Therefore, the Council has determined the most appropriate definition of EFH for all life stages of dolphin and wahoo is to group them together as provided by the EFH Final Rule, into an assemblage. Once additional research is conducted to identify habitat preferences, species and habitat distribution and species abundance by life stage, the present EFH definitions will be refined. In addition, the following describes where possible specific geographic locations and boundaries and locational maps where definable for dolphin and wahoo EFH.

The Gulf Stream (see Figure 9) and Florida Current (see Figure 11)

The Gulf Stream and associated gyres and eddies occurring in the Atlantic EEZ are EFH for all life stages of dolphin and wahoo. The Florida Current and associated gyres and eddies are EFH for all life stages of dolphin and wahoo as shown in Figure 11. The geographic extent encompasses the EEZ from the southern most tip of the Florida Keys along the east coast to approximately Biscayne Bay where it converges with the Gulf Stream. Along the entire length of the Gulf Stream and Florida Current, cold cyclonic eddies are imbedded in meanders along the western front. Three areas of eddy amplification are known: Downstream of Dry Tortugas and downstream of Jupiter Inlet (27°N to 30°N latitude) ("The Point" or "Amberjack Hole"). Similarly, further downstream, the Gulf Stream encounters the "Charleston Bump" (32°N to 34°N latitude), a topographic rise on the upper Blake Ridge. Here the current is often deflected offshore, again resulting in the formation a cold, quasi-permanent cyclonic gyre "The Charleston Gyre", and associated upwelling (Brooks and Bane, 1978). Meanders propagate northward (i.e., downstream) as waves. The crests and troughs represent the onshore and offshore positions of the Gulf Stream front. Cross-shelf amplitudes of these waves are on the order 10 to 100 km.

Upwelling within meander troughs is the dominant source of 'new' nutrients to the southeastern U.S. shelf and supports primary, secondary and ultimately fisheries production (Yoder, 1985; Menzel 1993). Off Cape Hatteras the Gulf Stream turns offshore to the northeast. Here, the confluence of the Gulf Stream, the Western Boundary Under Current (WBUC), Mid-Atlantic Shelf Water (MASW), Slope Sea Water (SSW) , CCW and VCW create a dynamic and highly productive environment, known as the "Hatteras Corner" or "The Point".

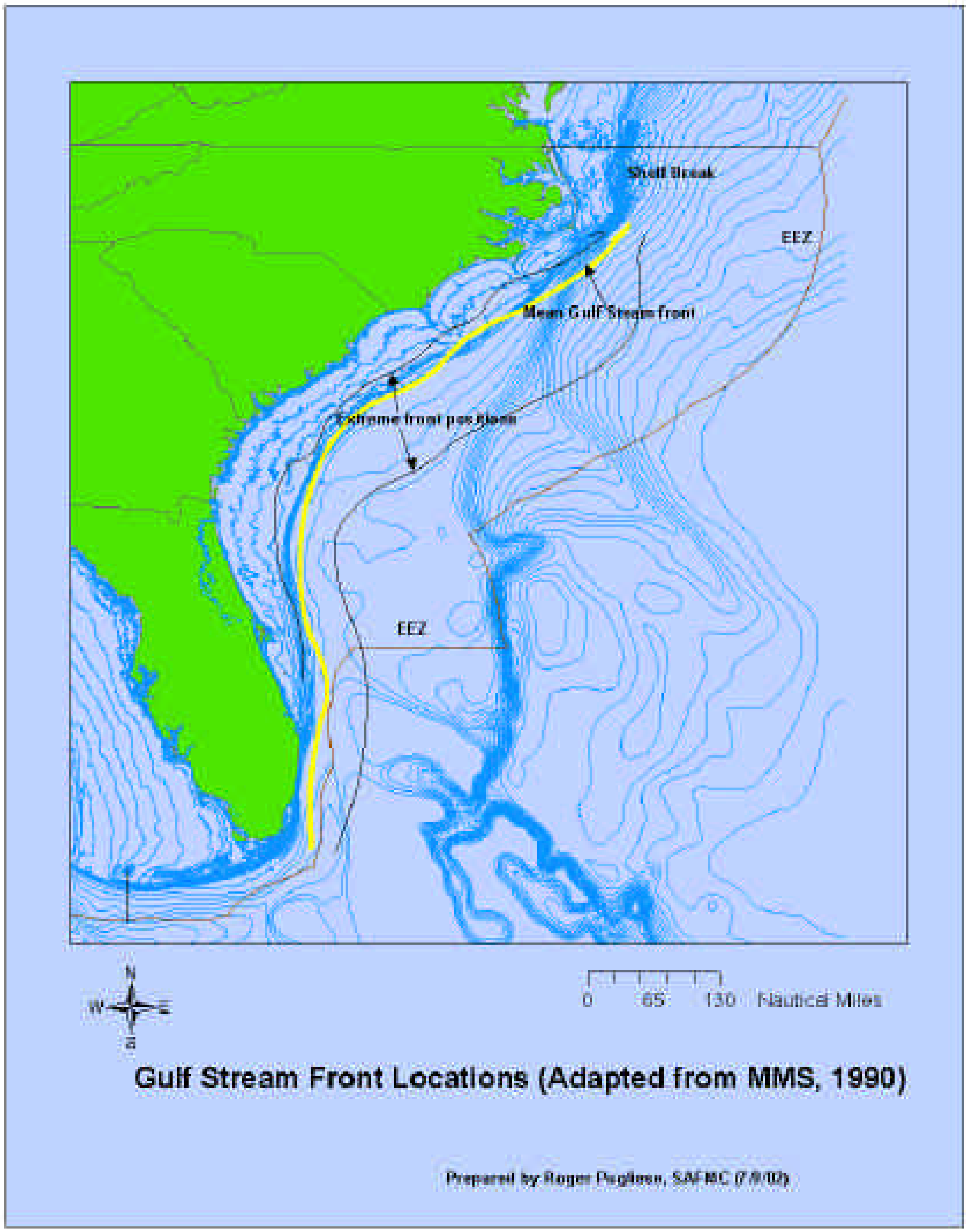
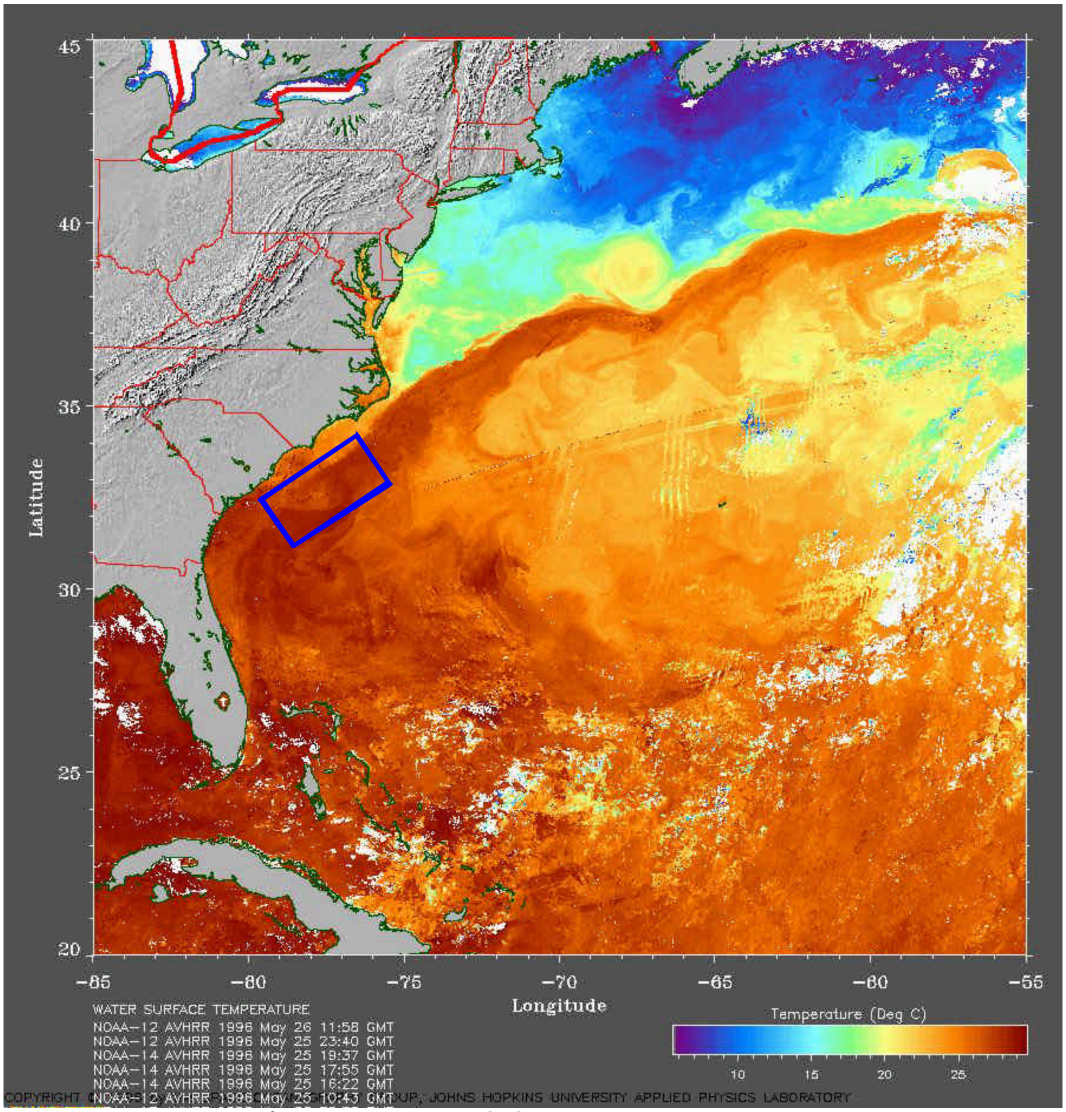


Figure 9. Gulf Stream Front Locations (Adapted from MMS, 1990).

The Charleston Gyre as EFH for Dolphin and Wahoo (see Figure 10)

The Charleston Gyre is a quasi-permanent, cyclonic eddy with attendant upwelling of nutrient-rich deepwater sets-up in the wake of the Charleston Bump (Sedberry et al., 2000). Upwelling results in persistent primary and secondary production that may well result in an important, if not essential feeding environment for the larvae of fishes that congregate to spawn there. The hydrodynamics of the eddy may well serve in the retention of fish propagules that are lost from local populations elsewhere through entrainment into the Gulf Stream. A description of the pelagic habitats including the Gyre that make up the South Atlantic ecosystem is presented in Section 3.3.1.



Approximate Corner Points of - Area Encompassing Charleston Gyre Occurrence

NW 79° 30' W	32° 30' N	NE 77° W	34°20' N
SW 78° 45' W	31° 20' N	SE 75° 30' W	33° N

Figure 10. Composite sea surface temperature image (3 day image, ending May 26, 2002). Deflection of the Gulf Stream offshore and downstream of the Charleston Bump creates the "The Charleston Gyre". The Gyre is visible at 32°N latitude (Source: Johns Hopkins University / Applied Physics Laboratory, Ocean Remote Sensing Group recording Advanced High Resolution Radiometer (AVHRR) on the NOAA polar-orbiting satellite).

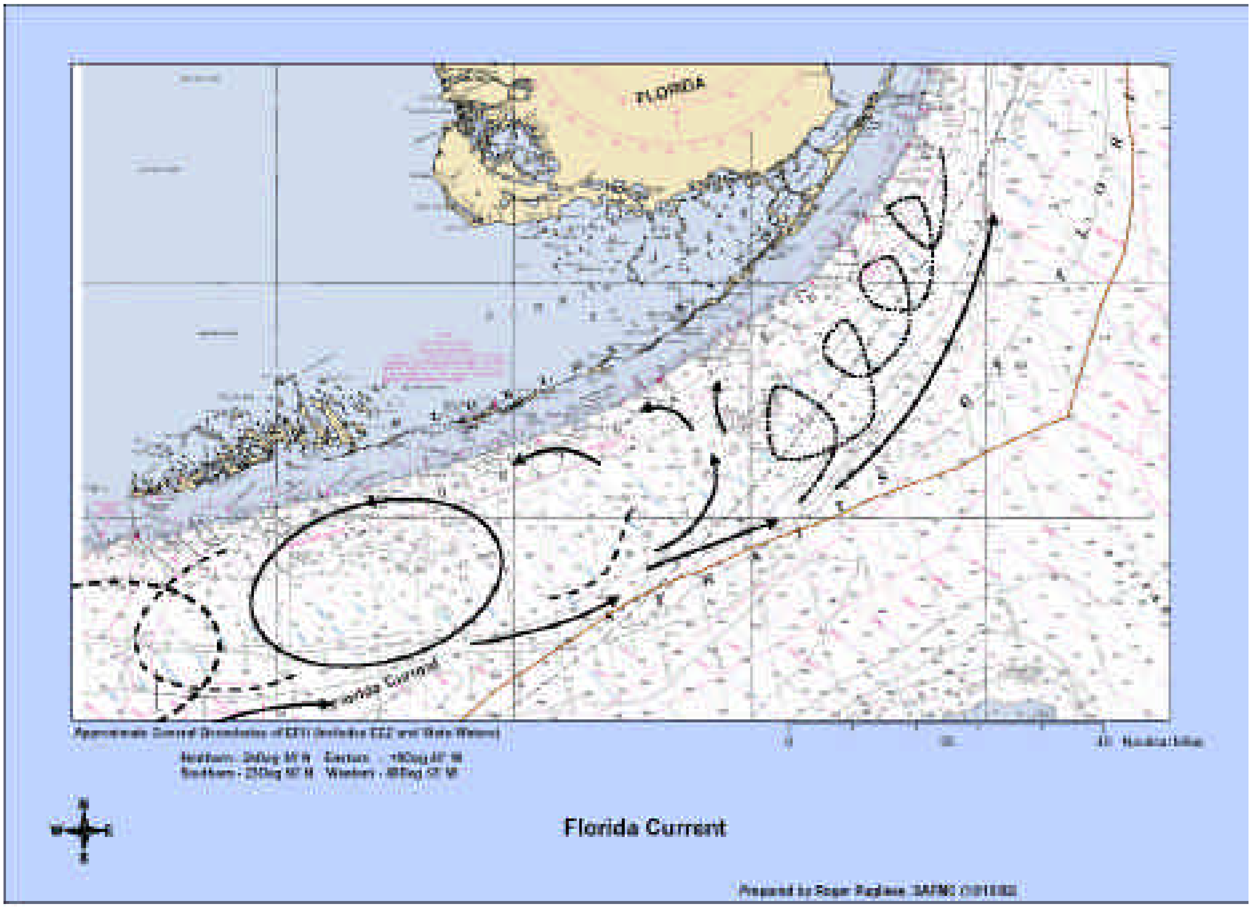


Figure 11. The Florida Current.

Pelagic *Sargassum* as EFH for Dolphin and Wahoo (see Figure 12)

The geographic extent of pelagic Sargassum as EFH and EFH-HAPC for all life stages of dolphin and wahoo is presented in Figure 12. Dolphin and wahoo and other fishes associated with pelagic *Sargassum* in the western North Atlantic have been studied by a number of investigators (Adams, 1960; Parin, 1970; Zaitzev, 1971; Dooley, 1972; Bortone et al., 1977; Fedoryako, 1980, 1989; Gorelova and Fedoryako, 1986; Settle, 1993; Moser et al., in press). Similar research has also addressed the ichthyofauna of drift algae in the Pacific (Uchida and Shojima, 1958; Besednov, 1960; Hirosaki, 1960b; Shojima and Ueki, 1964; Anraku and Azeta, 1965; Kingsford and Choat, 1985; Kingsford and Milicich, 1987; Nakata et al., 1988). In all cases, juvenile fishes were numerically dominant. Sampling designs and gear avoidance have no doubt contributed to the poorly described adult fish fauna. However, studies by Gibbs and Collette (1959), Beardsley (1967), Parin (1970), Manooch and Hogarth (1983), Manooch and Mason (1983), Manooch et al. (1984; 1985), and Fedoryako (1989) clearly indicate that large pelagic adult fishes including dolphin and wahoo utilize *Sargassum*. This is supported by the practice of recreational fishermen targeting dolphin, wahoo and other pelagic species by fishing "weedlines".

Dolphin and wahoo and other pelagic fish found in association with *Sargassum* are not restricted to that habitat and are known to frequent various types of drift material and fish aggregating devices (Besednov, 1960; Mansueti, 1963; Hunter and Mitchell, 1967; Kojima, 1966;

Kulczycki et al., 1981; Lenanton et al., 1982; Robertson, 1982; Nakata et al., 1988; Fedoryako, 1989; Rountree, 1989; 1990). Sargassum provides dolphin and wahoo and other pelagic species protection, feeding opportunity, shade, structural affinity, visual reference, tactile stimulation, historical accident, passive drift and is used as a spawning substrate for at least one prey species, flying fish have all (Hirosaki, 1960a; Hunter and Mitchell, 1968; Senta, 1966a; 1966b; 1966c; Dooley, 1972; Helfman, 1981).

The surface residence time, season and geographic location of *Sargassum* affect the species composition and abundance of fishes associated with it. Most of the young fishes that associate with the algae are surface forms (Fahay, 1975; Powles and Stender, 1976) and it is not known if they remain near the alga when it is submerged. Research determining the associations of fish and *Sargassum* at various depths is needed. Recruitment of dolphin and other pelagic fish to drift algae and flotsam is initially rapid and continues to increase over time (Senta, 1966a; Hunter and Mitchell; 1968; Kingsford and Choat, 1985; Kingsford, 1992). The abundance of larval and juvenile dolphin and other species of fishes varies seasonally and regionally, both in terms of numbers of fish and fish biomass (Dooley, 1972; Settle, 1993). The invertebrate fauna which may serve as important prey for early life stages of dolphin is similarly variable (Weis, 1968; Fine, 1970; Stoner and Greening, 1984). Regional trends in the mean abundance and biomass of young fish including dolphin and wahoo show decrease in abundance across the continental shelf and into the Gulf Stream and Sargasso Sea, and a decrease from spring through winter (Settle, 1993). Species richness is generally highest on the outer shelf during spring and summer and further offshore during the fall and winter. Overall, diversity is greatest in offshore waters (Bortone et al., 1977; Fedoryako, 1980; 1989; Settle, 1993).

The types of *Sargassum* habitats (e.g., individual clumps, small patches, large rafts, and weedlines) and the "age" (i.e., growth stage and degree of epibiont colonization) also affect the distribution and abundance of associated fishes. Ida et al. (1967a & 1967b), Fedoryako (1980), Gorelova and Fedoryako (1986) and Moser et al. (in press) described the spatial distribution of fishes in and around clumps and rafts of *Sargassum*. Juvenile dolphin (*Coryphaena), Diodon, Lobotes* and the exocoetids occupy the outer periphery, whereas *Canthidermis, Balistes, Kyphosus, Abudefduf, Caranx* and *Seriola* are distributed below the algae. Other species such as *Histrio* and *Syngnathus* are typically hidden within the foliage. Larger juvenile dolphin and adult dolphin and wahoo and other species associated with this habitat occupy nearby waters out to several 10's of meters from the patches. With regard to algal age, Conover and Sieburth (1964) and Sieburth and Conover (1965) suggest that the community could be significantly controlled by the effects of exogenous metabolites on algal epibionts. These substances, which are released during periods of new algal growth, inhibit epibiotic colonization, and could alter the trophic resources available to associated macrofauna, including fish (Gorelova and Fedoryako, 1986). Stoner and Greening (1984) concluded that algal age did affect the macrofaunal composition, but the abundance of carnivores remained stable. However, since their study dealt primarily with the invertebrate fauna, the effects of these substances on other trophic links remains unknown, although similar compounds are known to deter some herbivores (Paul, 1987; Hay and Fenical, 1988; Hay et al., 1988; Steinberg, 1988).

Fish abundance of which dolphin constitutes a significant portion, has been found to be positively correlated with *Sargassum* biomass. Correlations were significant over the middle shelf throughout the year. Fish biomass was also positively correlated over the outer shelf during the fall (Settle, 1993). No correlation was observed in the Gulf Stream or Sargasso Sea (Dooley, 1972; Fedoryako, 1980; Settle, 1993). The abundance of motile macrofauna (mostly invertebrates) has also been shown to be related to *Sargassum* biomass (Stoner and Greening, 1984).

Dolphin and wahoo are among the over 100 species of fishes collected or observed associated with the *Sargassum* habitat (Table 17- Appendix E). The carangids and balistids are the most conspicuous, being represented by 21 and 15 species respectively. Many species serve as prey for various life stages of dolphin including the planehead filefish, *Monacanthus hispidus*, which is clearly the most abundant species in shelf waters off the southeastern U.S. (Dooley, 1972; Bortone et al., 1977; Settle, 1993; Moser et al., in press).

Seasonal abundance of other species including *Caranx* spp., *Elagatis bipinnulata*, *Seriola* spp., *Pagrus pagrus*, *Mugil* spp., *Peprilus triacanthus*, and *Balistes capriscus* illustrates the ecological importance of the habitat to the early-life-stages of many species. The intraspecies relationships between dolphin, wahoo other fishes and *Sargassum* habitat have not been quantified. As with many other of these fishes dolphin and wahoo are found in convergence zones even in the absence of *Sargassum*.

Economic Impacts

This action will not have a direct economic impact as it only identifies EFH. However, other actions that protect habitat should result in increased net economic benefits to society in the long-term but may have some negative short term economic consequences for the sectors that are affected.

Social Impacts

There will be few social impacts from identifying essential fish habitat itself. The social impacts will most likely come from future actions that are associated with such a definition. The assumption is that such definition will provide protection for dolphin and wahoo and eventually improve stocks through protection of habitat. In that case, the social impacts will be positive in the long run. Harvesting restrictions may impose short-term, negative social impacts on these fishermen. However, in the long run, the restrictions should bring about increased biological productivity, which will be of benefit to not only the participants in this fishery, but many others as well. This could conceivably impose negative, short-term impacts that may be mitigated in the long-term if productivity is increased.

Outside the fishery management arena, there is another area where social impacts will occur and that is the permitting process. Defining essential fish habitat will likely alter the process by which permits for activities that impact essential fish habitat are issued. The potential for increased restrictions, mitigation and permitting requirements may have impacts upon the behavior of individuals and agencies seeking permits. The nature and extent of those impacts are unknown and will undoubtedly vary depending upon the individual and/or agency.

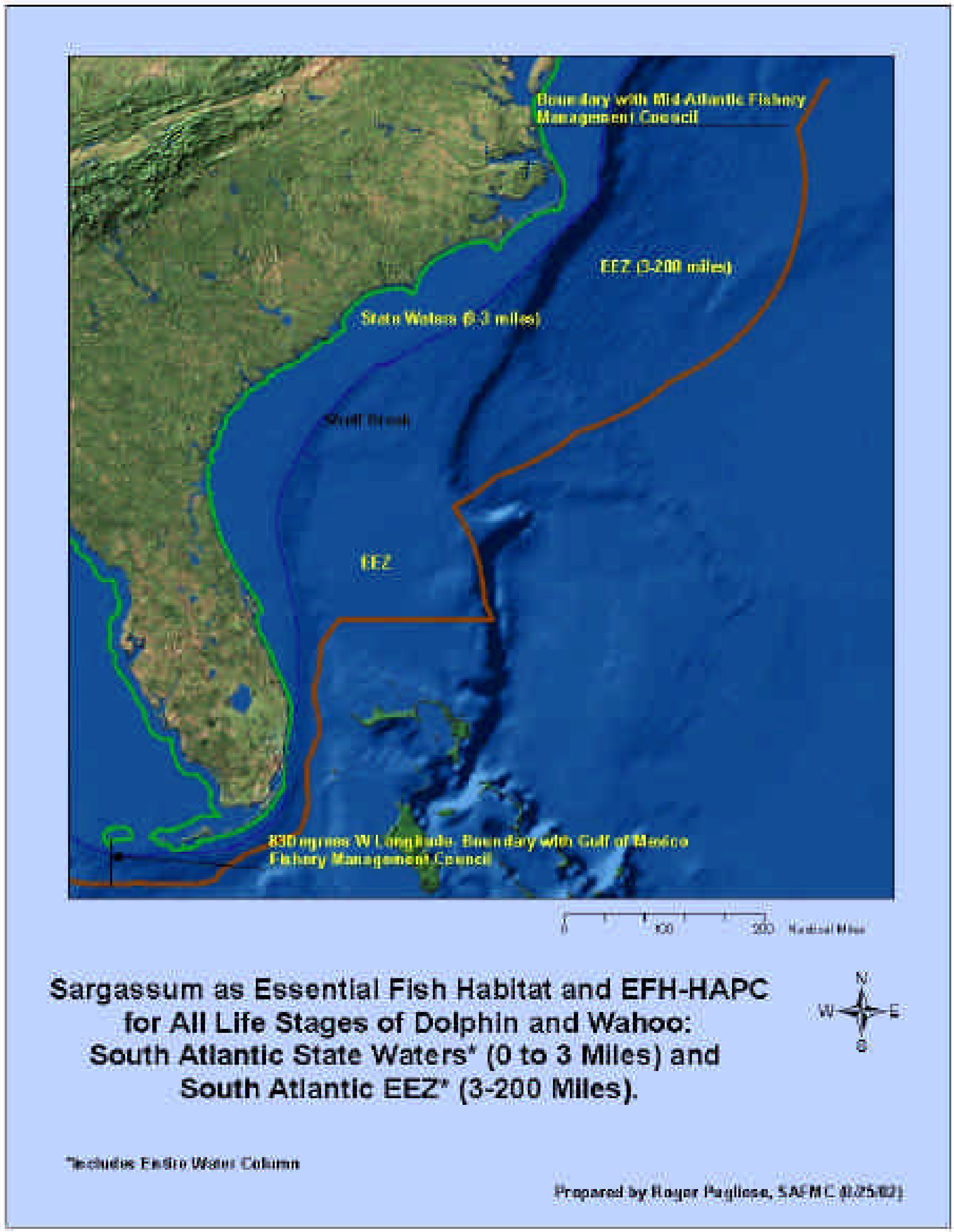


Figure 12. Pelagic *Sargassum* as EFH and EFH-HAPC for all life stages of dolphin and wahoo.

Conclusion

Amendments to the Magnuson-Stevens Act (1996) and the EFH Final rule published January 2002 requires the Councils identify essential fish habitat. This action meets that mandate. Any activities impacting essential fish habitat will come under the review process described by the Councils. This process (identification and commenting) will allow the Councils to provide additional protection for habitat important to species for which the Council has management authority.

The identification of essential fish habitat for dolphin and wahoo will enable the Councils to protect their essential fish habitat effectively and take timely actions when necessary. This will prevent further decreases in biological productivity and could lead to possible increases in the abundance of species dependent upon the habitat being protected.

The Councils concluded establishing EFH for dolphin and wahoo best achieves the goals of the FMP and management objectives to: (4) optimize the social and economic benefits, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries. This action will also protect habitat essential to the survival and growth to maturity of dolphin and wahoo.

Rejected Options for Action 22:

Option 1. No action.

Biological Impacts

The Councils would be limited in the future in terms of protecting the long-term biological productivity of the dolphin and wahoo fisheries and minimizing gear related habitat damage from occurring in these fisheries. Currently, dolphin in the South Atlantic Council's area of jurisdiction is covered under the EFH definitions of the Coastal Migratory Pelagics FMP. This Dolphin Wahoo FMP contains the directive to remove dolphin in the Atlantic from the Coastal Migratory Pelagics FMP. If no action were taken dolphin would continue to be managed under the Coastal Migratory Pelagics FMP within the South Atlantic Council's area of jurisdiction.

Economic Impacts

There would be no direct economic impacts from this option. However, the Magnuson-Stevens Act stipulates that EFH must be specified as a component of any fishery management plan (FMP) and this option would not allow for development of this FMP and future management of the dolphin and wahoo fisheries. Also, not specifying EFH would limit the Council from taking action in the future to minimize fishing related habitat damage. Degradation of essential fish habitat could threaten the long-term economic viability of the dolphin and wahoo fishery and thus lead to reduced net economic benefits to society.

Social Impacts

Adopting the no action alternative would not comply with Magnuson-Stevens mandates to identify essential fish habitat. Although there would be few social impacts from no action, it is in the best interest of the Councils and fishermen to identify this habitat. Defining essential fish habitat can facilitate expeditious action by the Councils in the future to protect habitat for dolphin and wahoo.

Conclusion

The Councils are directed by the Magnuson-Stevens Act to identify, describe, and protect EFH for all managed species or species proposed for management. Therefore, the Councils are using the information compiled during development of the Habitat Plan (SAFMC, 1998b) that pertains to dolphin and wahoo. This option is not available because the Councils must describe EFH. The Councils determined this option does not meet the requirements of the Act and is not the best way to achieve the goals and management objectives of the FMP and rejected this option.

Option 2. Expand the EFH definitions to include *Sargassum* where it may occur in the north Atlantic GYRE in the Sargasso Sea and the EEZ between 20° N. latitude and 40° N. latitude and 30° W. longitude and the western edge of the Gulf Stream.

Biological Impacts

The identification of EFH will enable the Councils to protect essential fish habitat effectively and take timely actions when necessary. This could prevent further decreases in biological productivity and may lead to possible increases.

Economic Impacts

This action by itself will not have an economic impact as it only identifies EFH. Other actions taken to protect EFH will have associated economic effects to entities involved in harvest of Sargassum but should result in increased net economic benefits to society in the long-term.

Social Impacts

Presumably there would be few social impacts from identifying EFH. The social impacts would most likely come from the actions that were associated with such a definition. The assumption would be that such definition would provide protection for habitat. In that case, the social impacts would be positive in the long-term. However, in some cases, protection of habitat may mean harvesting restrictions in areas where harvesting presently takes place or other actions which may impose constraints on those who harvest habitat. This would certainly impose negative short-term impacts that may be mitigated in the long term if productivity is increased.

Conclusion

The Councils rejected this option because it includes *Sargassum* that is beyond the outer limit of the EEZ. NMFS and NOAA GC have advised that the Councils do not have authority beyond the EEZ. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP and rejected this option.

4.2.23 ACTION 23. Expand the list of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic.

EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*.

Note: This EFH-HAPC definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (dolphin was included within the Coastal Migratory Pelagics FMP).

Biological Impacts

The Council is designating EFH-HAPCs for dolphin and wahoo as is encouraged by the Final Rule for Essential Fish Habitat, the Council is designating EFH-HAPCs for dolphin and wahoo. The following builds on material presented in the South Atlantic Council's Habitat Plan (SAFMC, 1998b) to elaborate on the ecological role of dolphin and wahoo (by life stage) in the habitats described. A general description of species and distribution; reproductive characteristics; age and growth; mortality and longevity; movement patterns and stock structure; and feeding, food, and trophic relationships is presented in Section 3.3.1.

Available information indicate that the various life stages of dolphin (common and pompano) and wahoo use basically the same pelagic habitats, both species are caught using the same gears by the same fisheries but there is very limited information on habitat use by life stage. Therefore, the Council has determined the most appropriate designation of EFH-HAPCs for dolphin and wahoo is to group them together as provided by the EFH Final Rule, into an assemblage. Once additional research is conducted to identify habitat preferences, species and habitat distribution and species abundance by life stage, the present EFH-HAPCs definitions will be refined. In addition, the following describes where possible specific geographic locations and boundaries and locational maps where definable for dolphin and wahoo EFH-HAPCs.

Due to their important ecological function, areas of the offshore pelagic environments represent essential fish habitat-habitat areas of particular concern (EFH-HAPC) for dolphin (common and pompano) and wahoo; these include The Point (Figure 13), The Ten-Fathom Ledge (Figure 14), and Big Rock (Figure 14) (North Carolina); The Charleston Bump (Figure 15a) and the Georgetown Hole (Figure 15b)(South Carolina); Amberjack Hole (The Point) (Figure 16) off Jupiter Inlet (Florida); The Hump off Islamorada (Figure 17), Florida; The Marathon Hump (Figure 18)off Marathon, Florida; "The Wall" off of the Florida Keys (located along the shelf break between 81° 54' W and 81° 48' longitude). These areas are productive and highly dynamic oceanic areas.

Other water column habitats with high production or dynamic bottom habitats include "Big Rock" and "The Ten Fathom Ledge". Other areas where water flow is affected by bottom habitat concentrating bait and increasing availability of pelagic habitat like Sargassum, include "The Georgetown Hole" off South Carolina.

Section 600.815 (a) (8) of the final rule on essential fish habitat determinations recognizes that subunits of EFH may be of particular concern. Such areas, termed Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs), can be identified using *Identification of habitat areas of particular concern*. FMPs should identify specific types or areas of habitat within EFH as habitat areas of particular concern based on one or more of the following considerations: (i) The importance of the ecological function provided by the habitat; (ii) The extent to which the habitat is sensitive to human-induced environmental degradation; (iii) Whether, and to what extent, development activities are, or will be, stressing the habitat type; and (iv) The rarity of the habitat type. The following is a summary evaluation of the EFH-HAPC as it relates to the criteria:

EFH-HAPC and Criteria Evaluation	Ecological Function	Sensitivity to Environmental Degradation	Threat from Development Activities	Rarity of Habitat
The Point	High	Medium	Medium	High
The Ten Fathom Ledge	High	Medium	Low	Medium
Big Rock	High	Medium	Medium	High
The Charleston Bump	High	Low	Medium	High
The Georgetown Hole	High	Low	Low	High
The Point off Jupiter Inlet	High	Medium	Low	High
The Hump off Islamorada	High	Low	Low	High
The Marathon Hump	High	Medium	Low	High
The Wall off of the Florida Keys	Medium	Medium	Low	Medium
Pelagic *Sargassum*	High	Medium	Low	High

The proposed EFH-HAPCs for dolphin and wahoo all meet at least one or more of the above criteria. This action enables the Councils to protect these EFH-HAPCs effectively and take timely actions when necessary. This could prevent further decreases in biological productivity and may lead to possible increases in yield of fish stocks.

This evaluation is based in part on information presented in this Action and Section 3.3.1.2.1 describing the general characteristics of the unique habitat type and where available specific descriptions of the habitat associated with the area proposed for designation as an EFH-HAPC. In addition, supporting rationale for designation including identified threats from fishing and non-fishing activities is presented in Habitat Plan (SAFMC, 1998b), the Comprehensive Habitat Amendment (SAFMC, 1998c) and the *Sargassum* Fishery Management Plan (SAFMC 2002) and included by reference. The *Sargassum* FMP is under Secretarial Review for approval and implementation.

The following figures present locational maps for areas which for dolphin and wahoo ranked high in terms of ecological function, sensitivity, probability of stressor introduction, and/or (criteria established for designation of EFH-HAPCs). Based on the criteria in Section 600.815 (a) (9), it is concluded that they represent Essential Fish Habitat-Habitat Areas of Particular Concern for species managed under the Fishery Management Plan for Dolphin Wahoo of the Atlantic Region.

The Point

"The Point" off Cape Hatteras is also highly productive due to the confluence of as many as four water masses. Adults of highly migratory species congregate in this area, while the diversity of larval fishes found there is truly astounding (Table 18b of the Habitat Plan (SAFMC, 1998b).

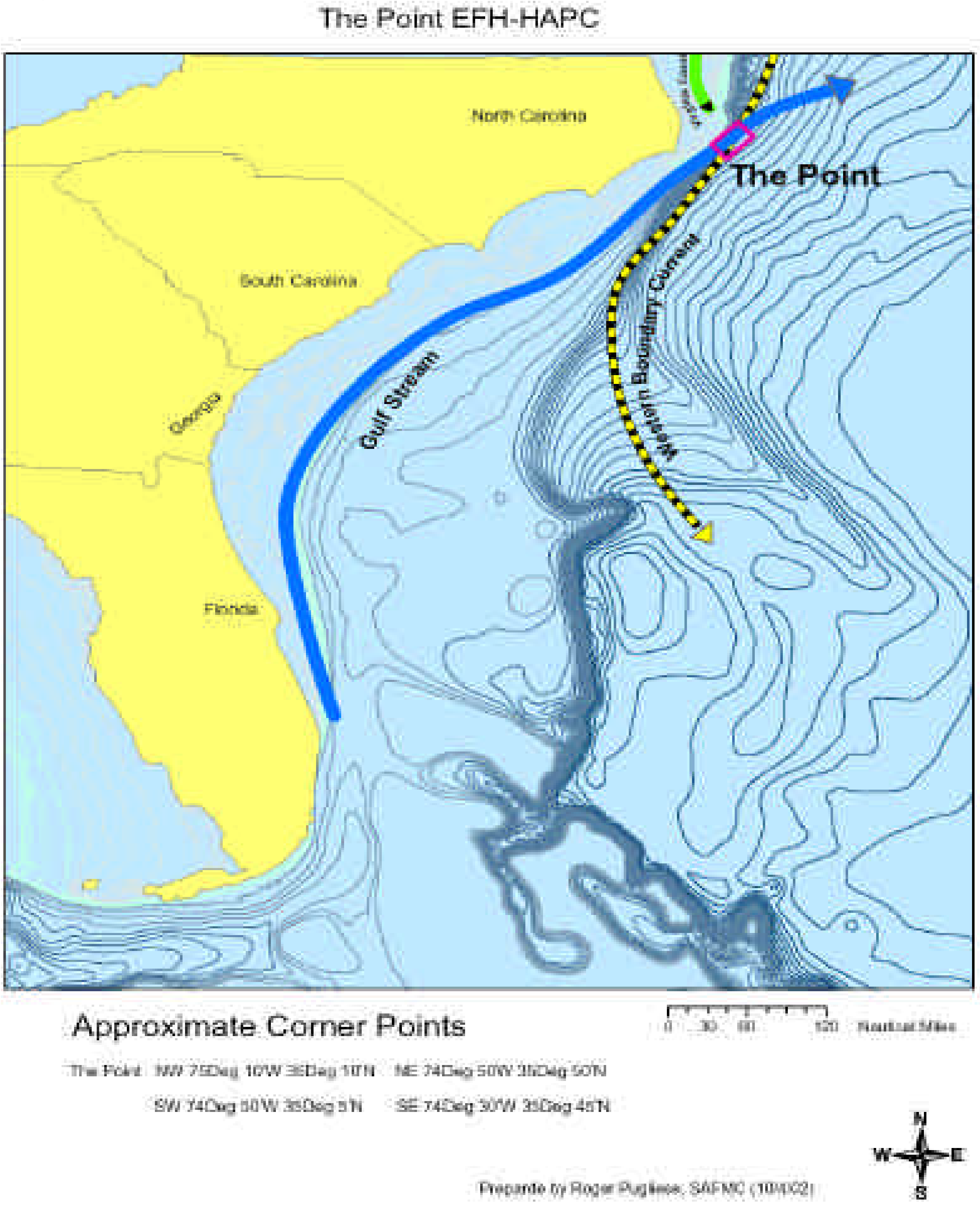


Figure 13. "The Point" Essential Fish Habitat-Habitat Area of Particular Concern.

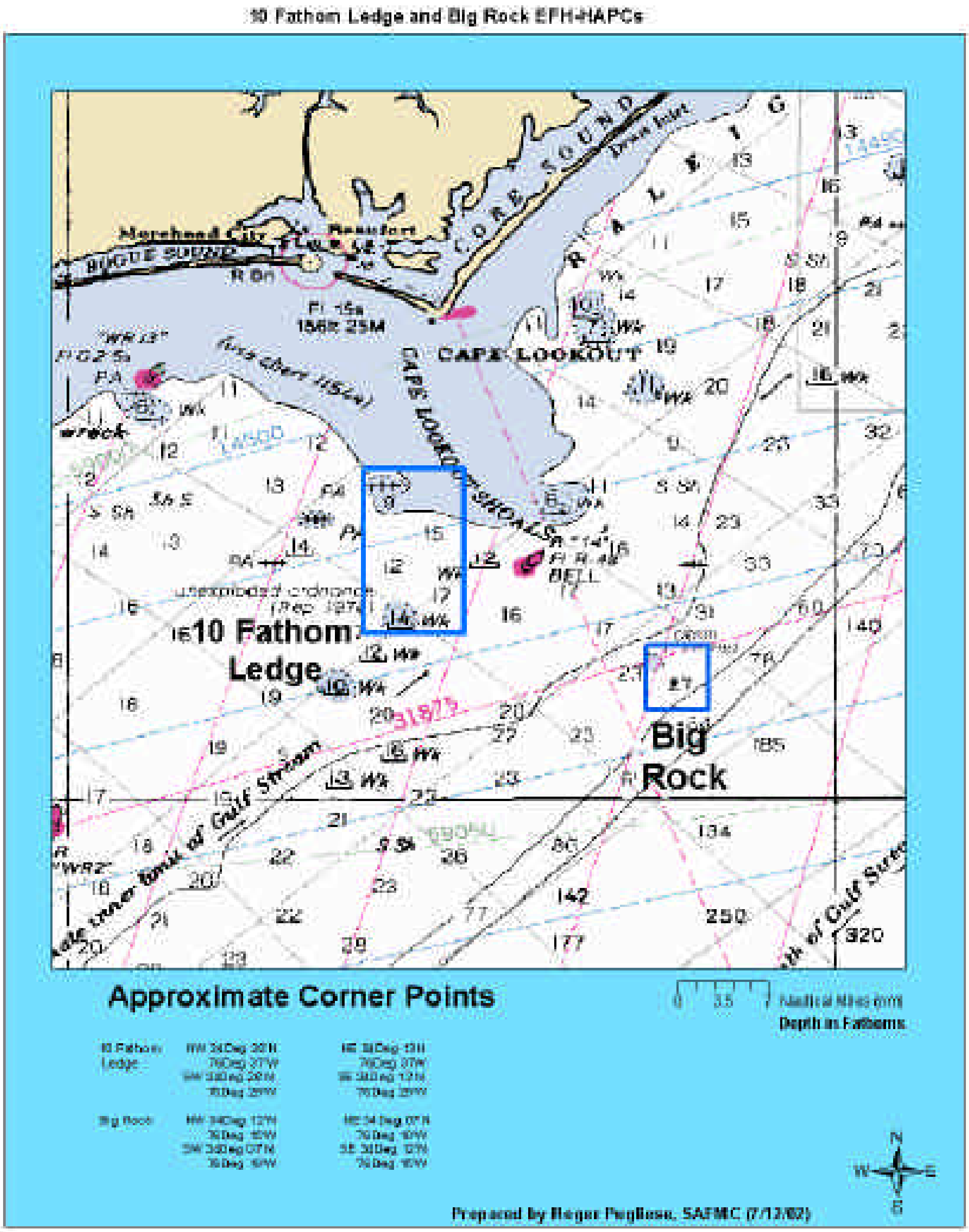


Figure 14. The 10 Fathom Ledge and Big Rock EFH-HAPCs. Note: The 10-Fathom Ledge is within the bounds of extreme front locations and eddies from the Gulf Stream as presented in Figure 8c.

The Charleston Bump Complex

The Charleston Bump is a bottom feature of great topographic relief located southeast of Charleston South Carolina (Sedberry et al., 2000) The Bump complex includes a quasi-permanent, cyclonic eddy the “Charleston Gyre” with attendant upwelling of nutrient-rich deep water sets-up in the wake of the “Charleston Bump”. Upwelling results in persistent primary and secondary production that results in an important, if not essential feeding environment for larvae of fishes and the adults that congregate to spawn there. The hydrodynamics of the eddy, thermal fronts associated with the Gulf Stream and the benthic habitat contribute to attract pelagic fish and retain and concentrate larvae, juvenile, prey for larger fish (Sedberry et al., 2000) and pelagic *Sargassum*. Therefore this area is an EFH-HAPC for all life stages of dolphin and wahoo.

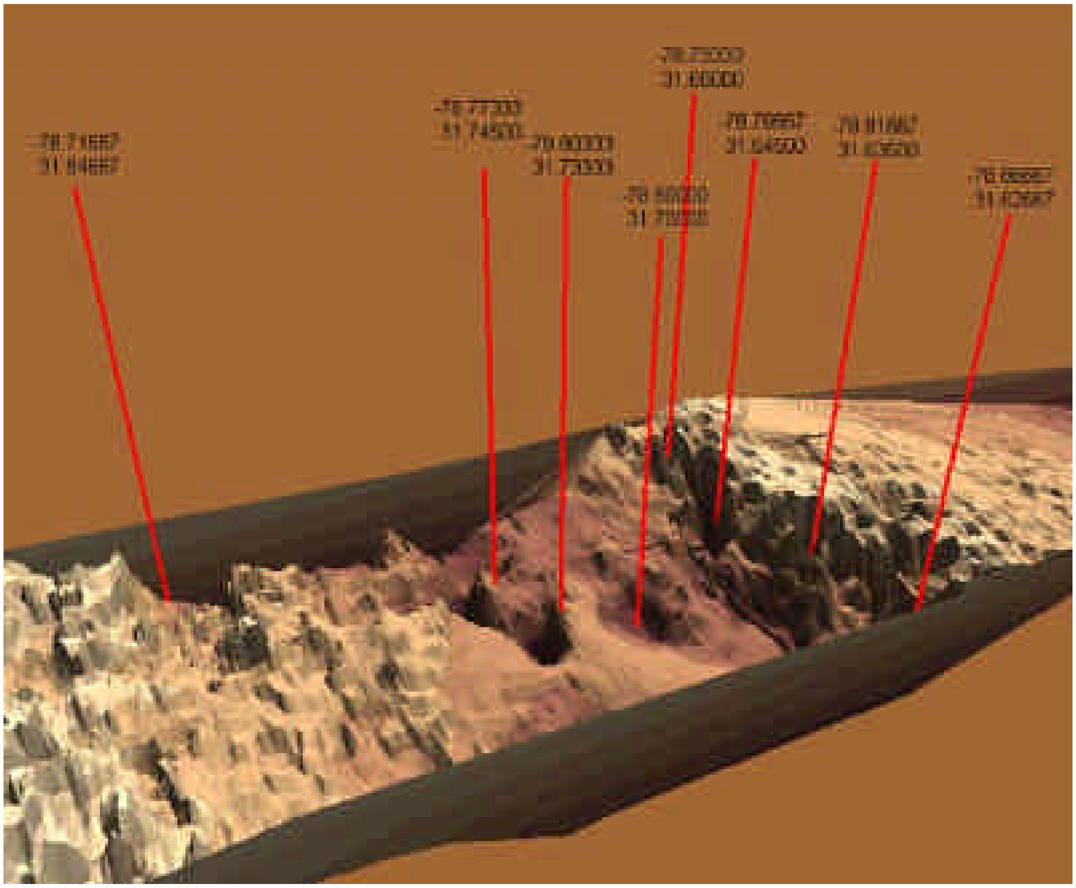


Figure 15a. Three-Dimensional Multibeam Map of a section of the Charleston Bump derived from a survey conducted by the NOAA shipWhiting during research cruises conducted in 1999 and 2000 (Source: NOAA, 2002).

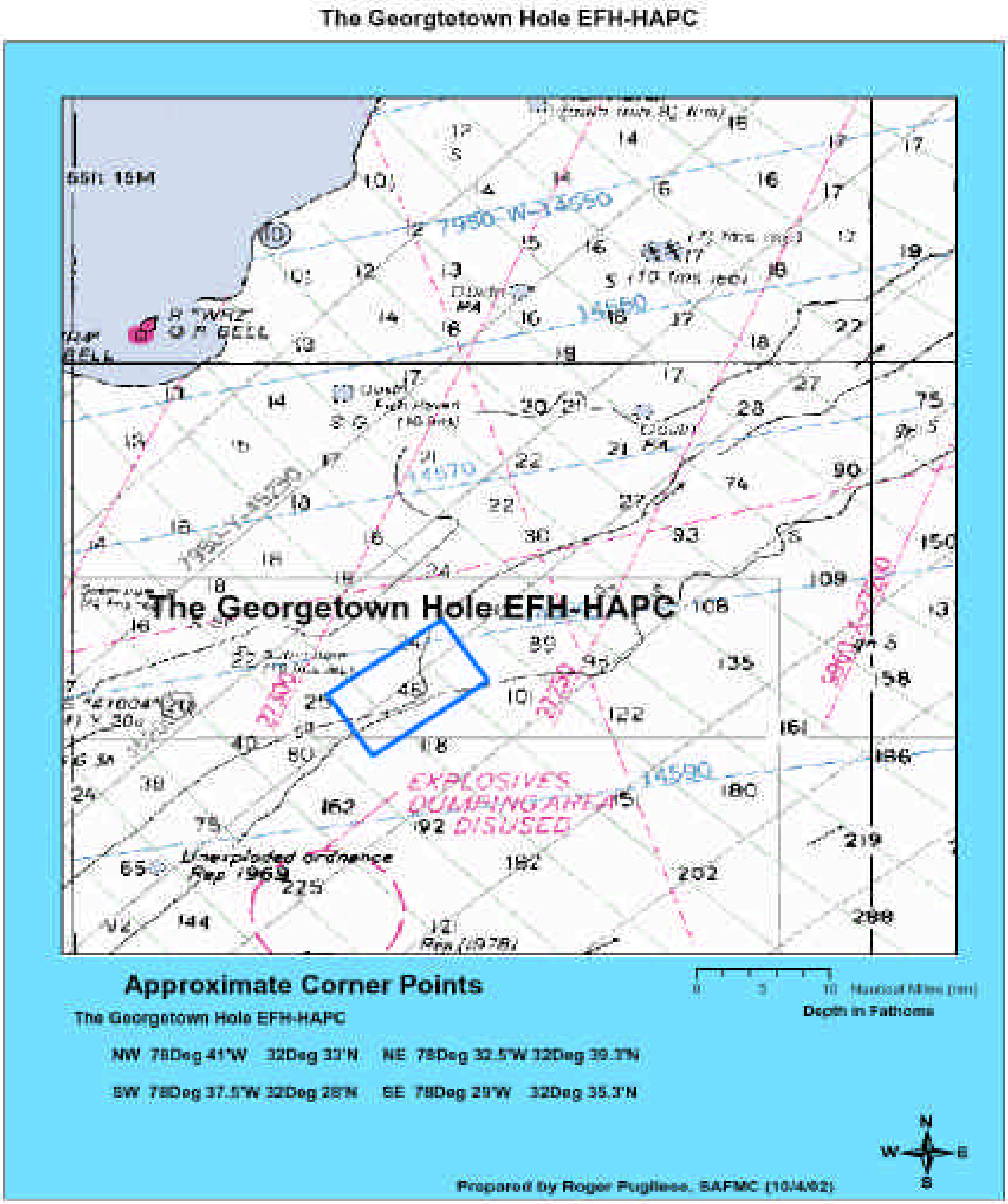


Figure 15b. The Georgetown Hole Essential Fish Habitat Habitat Area of Particular Concern.

The Point off Jupiter Inlet / Amberjack Lump EFH-HAPC

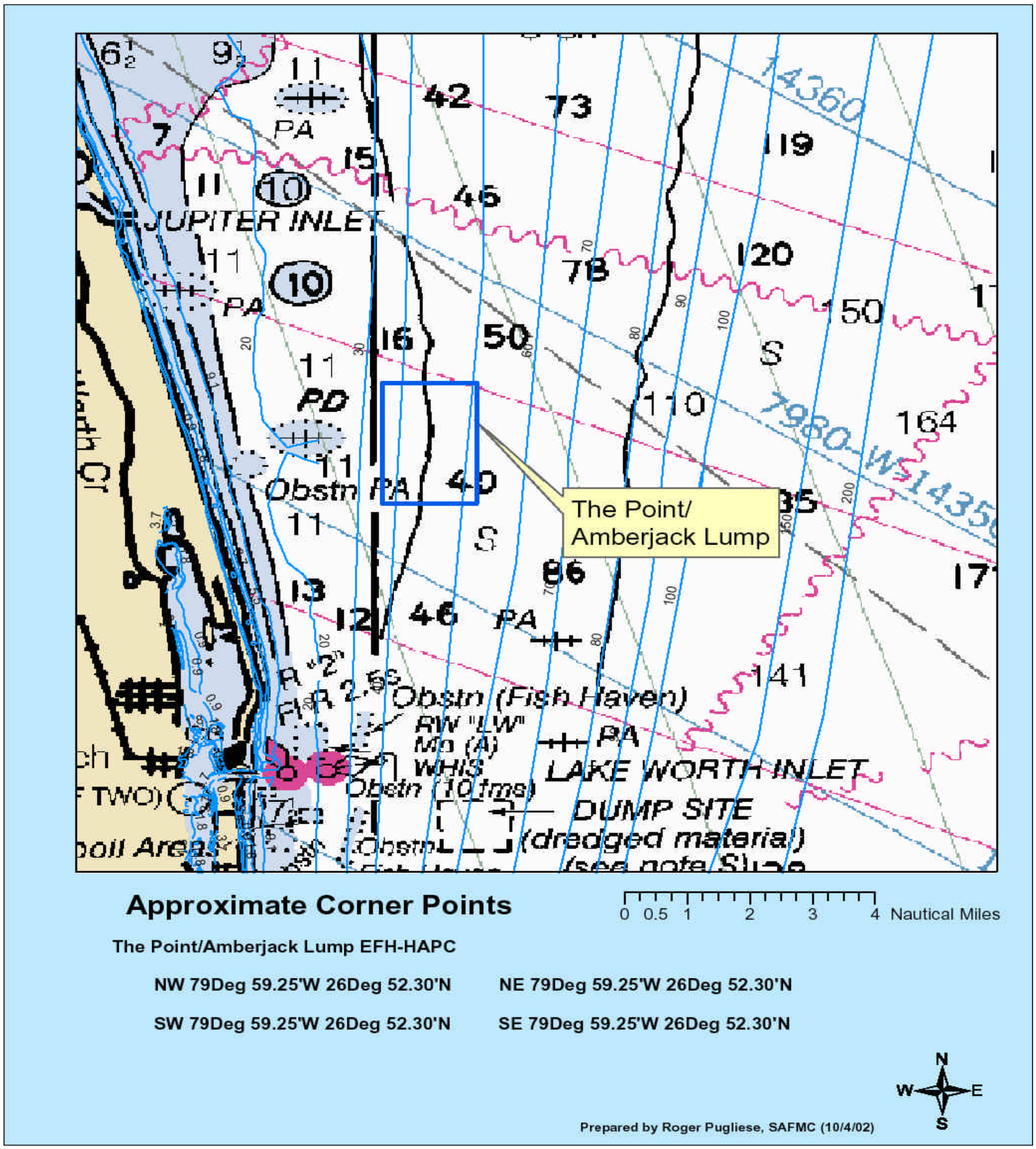


Figure 16. The Amberjack Lump (The Point) Essential Fish Habitat-Habitat Area of Particular Concern.

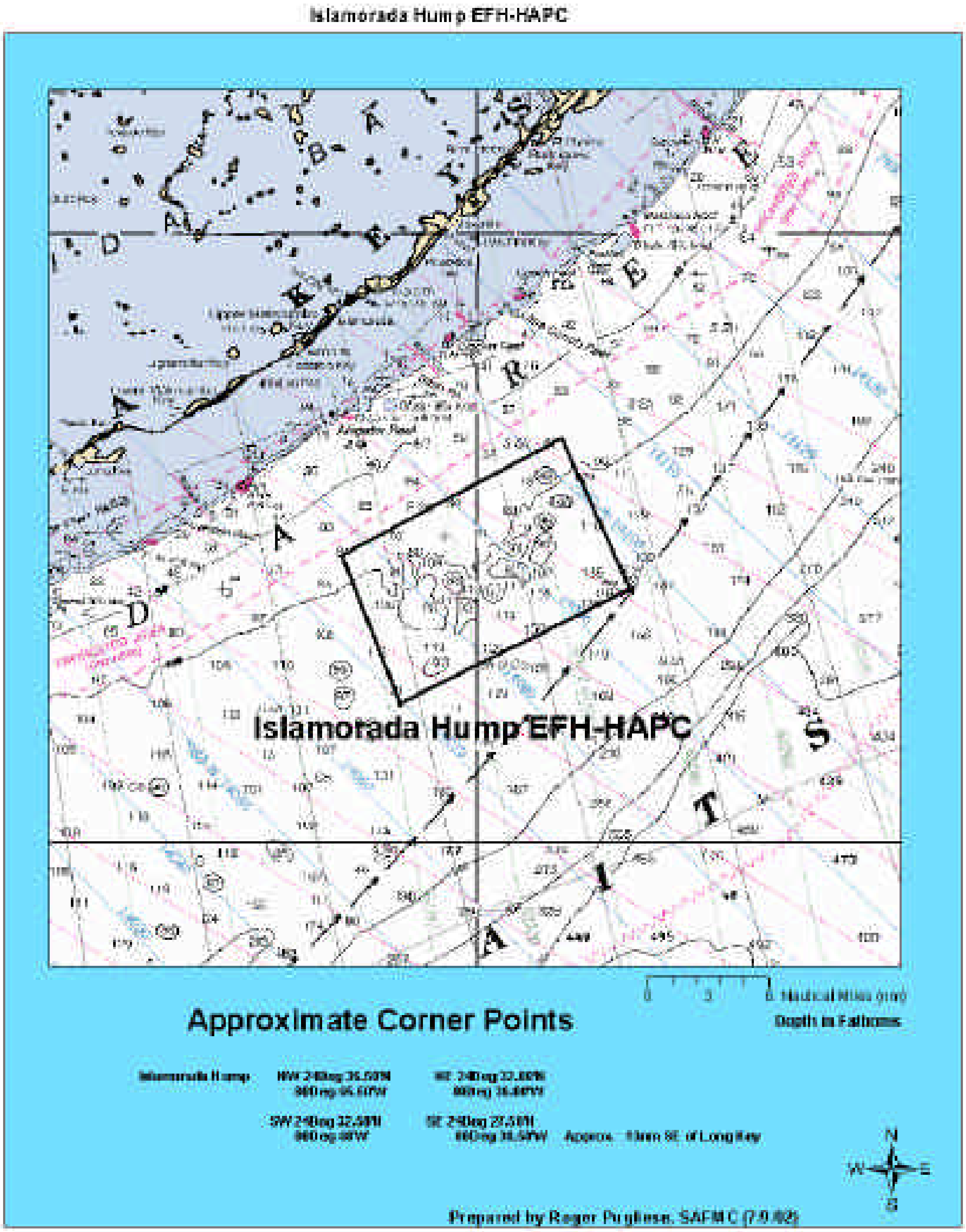


Figure 17. The Islamorada Hump Essential Fish Habitat-Habitat Area of Particular Concern.

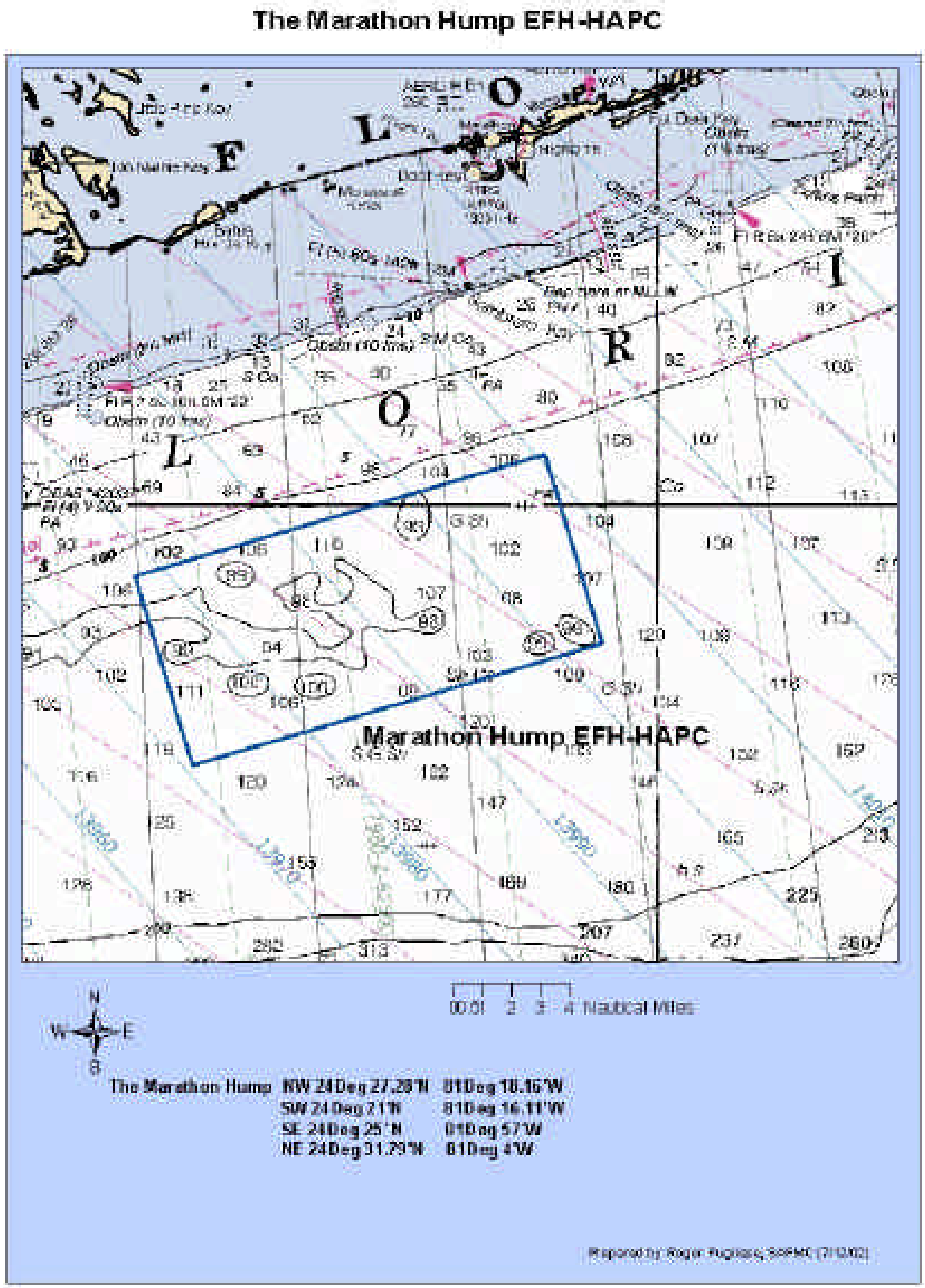


Figure 18. The Marathon Hump Essential Fish Habitat-Habitat Area of Particular Concern.

Economic Impacts

This action by itself will not have an economic impact as it only identifies EFH-HAPCs. Other actions taken to protect EFH-HAPCs will have associated economic effects but should result in increased net economic benefits to society in the long-term.

Social Impacts

The identification of EFH-HAPCs will have few, if any, social impacts itself. Impacts may result from future management measures.

Conclusion

Recent amendments to the Magnuson-Stevens Act (1996) require the Councils identify essential fish habitat and allow the Councils to designate portions of EFH as being particularly important (EFH-HAPCs). This action meets that provision. Any activities impacting the EFH-HAPCs will come under the review process described by the Councils. This process (establishment of EFH-HAPCs and commenting) will allow the Councils to provide additional protection for habitat important to species for which the Councils have management authority.

The establishment of EFH-HAPCs will enable the Councils to protect essential fish habitat effectively and take timely actions when necessary. This will prevent further decreases in biological productivity and could lead to possible increases in the abundance of species dependent upon the habitat being protected.

The Councils concluded establishing EFH-HAPCs for dolphin and wahoo will enhance protection of vital components of essential fish habitat which are especially important to various life stages of these pelagic species. The Councils determined this action best achieves the goals of the FMP and the management objectives to: (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, (5) reduce bycatch in the dolphin fishery, (6) direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Rejected Options for Action 23:

Option 1. No action.

Biological Impacts

The Councils would be limited in the future in terms of protecting the long-term biological productivity of the dolphin and wahoo fisheries and minimizing gear related habitat damage from occurring in these fisheries.

Economic Impacts

There would be no direct economic impacts from this option. Also, not specifying EFH-HAPCs would limit the Council from taking action in the future to minimize fishing related habitat damage. Degradation of essential fish habitat could threaten the long-term economic viability of the dolphin and wahoo fishery and thus lead to reduced net economic benefits to society.

Social Impacts

Although there would be few social impacts from no action, it is in the best interest of the Councils and fishermen to identify this habitat. Designation of EFH-HAPCs can facilitate expeditious action by the Councils in the future to protect habitat for dolphin and wahoo.

Conclusion

The Councils are directed by the Magnuson-Stevens Act to identify, describe, and protect EFH and encouraged to designate, describe, and protect EFH-HAPCs for all managed species or species proposed for management. Therefore, the Councils are using the information compiled during development of the Habitat Plan (SAFMC, 1998b) that pertains to dolphin and wahoo. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP and rejected this option.

Option 2. Expand the EFH-HAPC definitions to include *Sargassum* where it occurs in the north Atlantic GYRE in the Sargasso Sea and the EEZ between 20° N. latitude and 40° N. latitude and 30° W. longitude and the western edge of the Gulf Stream.

Biological Impacts

The identification of EFH-HAPC's will enable the Councils to protect essential fish habitat effectively and take timely actions when necessary. This could prevent further decreases in biological productivity and may lead to possible increases.

Economic Impacts

This action by itself will not have an economic impact as it only identifies EFH-HAPCs. Other actions taken to protect EFH-HAPCs will have associated economic effects to entities involved in harvest of Sargassum but should result in increased net economic benefits to society in the long-term.

Social Impacts

Presumably there would be few social impacts from identifying EFH-HAPC's. The social impacts would most likely come from the actions that were associated with such a designation. The assumption would be that such designation would provide protection for habitat. In that case, the social impacts would be positive in the long-term. However, in some cases, protection of habitat may mean harvesting restrictions in areas where harvesting presently takes place or other actions which may impose constraints on those who harvest habitat. This would certainly impose negative short-term impacts that may be mitigated in the long term if productivity is increased.

Conclusion

The Councils rejected this option because it includes *Sargassum* that is beyond the outer limit of the EEZ. NMFS and NOAA GC have advised that the Councils do not have authority beyond the EEZ. The Councils determined this option is not the best way to achieve the goals and management objectives of the FMP and rejected this option.

4.2.24 ACTION 24. Assessment of the Impacts of Present Fishing Activities on EFH. No action to implement additional management measures to reduce impacts of fishing on dolphin wahoo EFH. Defer to measures in the *Sargassum* Fishery Management Plan (presented below) which has been submitted to the Secretary of Commerce for formal review, and incorporate by reference the Comprehensive Habitat Amendment approved by the Secretary of Commerce on June 3, 1999.

The Council determined that all other fishing impacts would be temporary and/or minimal.

Biological Impacts

After an extensive fishery management plan development and public hearing process, the Councils have determined no other fishing activities significantly impact dolphin wahoo habitat (EFH) and essential fish habitat - habitat areas of particular concern (EFH-HAPC) and no additional action is necessary to protect dolphin and wahoo essential fish habitat. The fishing gear used for dolphin and wahoo (hand line, rod and reel, longlines) do not significantly impact the EFH of dolphin and wahoo because dragging hooks through the water does not damage the water molecules. Further, any *Sargassum* inadvertently “caught” on hooks can be immediately released with little to no release mortality. Pelagic fishing gear is fished in the water column and as such does not contact or impact the sea bed.

Traps (used in other fisheries), when being hauled to the surface have been seen to tangle *Sargassum* on the top face of the trap, these strands of *Sargassum* being returned to the Ocean to prevent accidents on board the fishing vessels because of the slippery nature of their texture.

Strong support for protecting dolphin and wahoo habitat and more specifically *Sargassum* as the Council has proposed in the Fishery Management Plan for Pelagic *Sargassum* Habitat, was provided during the hearing process. The following summarizes the South Atlantic Council’s actions to address fishing gear impacts on *Sargassum* and to protect EFH and EFH-HAPCs for dolphin and wahoo.

The Council, through a revised Fishery Management Plan for Pelagic *Sargassum* Habitat (SAFMC, 2002) will prohibit all harvest and possession of *Sargassum* from the South Atlantic EEZ south of the 34° N. latitude line and within 100 miles of shore between the 34°N. latitude and the latitude line representing the NC/VA border. The plan caps annual harvest at 5,000 pounds wet weight (determined dockside after being off-loaded). In addition, harvesters will be required to: (a) take onboard observers on each trip, (b) limit harvest to the months of November through June, and (c) use of four inch stretch mesh or larger on a frame no larger than four feet by six feet. It is the Council’s intent to protect to the maximum extent practicable *Sargassum* as essential fish habitat by immediately prohibiting harvest and possession of *Sargassum* in all areas of the South Atlantic EEZ where harvest has not previously occurred. In addition, the Council is minimizing harvest with no intent to allow an increase because of the value as EFH and EFH-HAPCs to dolphin/wahoo and other managed species including threatened and endangered sea turtles.

The *Sargassum* community represents a highly evolved ecotype with organisms (e.g., *Sargassum* fish, *Sargassum* pipefish, *Sargassum* shrimp, and *Sargassum* crab) which have evolved cryptic coloration and feeding mechanisms to survive and thrive in this habitat. In addition, many organisms (e.g., bryozoans) live attached to the *Sargassum* and feed on phytoplankton in the water column and associated with the habitat. These species will be lost in any removal of this habitat. Recent research indicates the essential nature of the fish and other marine organisms using pelagic *Sargassum* in providing the nutrients for growth of the algae. Therefore, the determination that all *Sargassum* is essential fish habitat, as well as an essential fish habitat area of particular concern, is further supported by this interrelationship between the inhabitants and the growth of *Sargassum*.

The Council concluded the removal of pelagic *Sargassum* habitat constitutes a net loss of essential fish habitat in the South Atlantic region. Also, the Council concluded that the harvest of pelagic *Sargassum* is a violation of Council, NMFS, and NOAA habitat policies. The harvest of *Sargassum* is contradictory to the goals and objectives of the Habitat Plan (SAFMC, 1998b), the Habitat Comprehensive Amendment (SAFMC, 1998c), and the Revised Pelagic *Sargassum* Habitat Plan (SAFMC, 2002). An experimental fishing provision was considered but dropped because the Council determined this activity constituted a violation of Council habitat policy and goes against the intent of the Magnuson-Stevens Act mandate to address essential fish habitat. This action will meet the directive to identify, describe, and protect essential fish habitat. An acceleration of harvest could degrade the quality of habitat.

Apart from increases in the non-consumptive values discussed below, the Council concluded severe limitations on harvest are likely to increase productivity of marine life in the ecosystem. In particular, dolphin-fish and turtles will be protected to the extent possible from any potential negative impacts and could result in increased abundance depending on additional measures implemented.

No additional measures have been identified as necessary to reduce the impact of any Atlantic fishery on dolphin and wahoo EFH. Therefore no biological impacts will result from taking no action at this time. The Council will monitor the fishery and take additional action to reduce fishing impacts if deemed necessary through framework provisions established in this plan.

Economic Impacts

The Council revised and submitted a Fishery Management Plan for Pelagic *Sargassum* Habitat to the Secretary of Commerce that will address the direct harvest of the *Sargassum* resource (a more detailed discussion of this plan is contained under the biological impacts section). At this time the Council does not require additional action be taken to protect EFH for dolphin and wahoo in this FMP.

In the *Sargassum* FMP the Council's recommended action will result in increased direct and indirect benefits to society not only through protection of dolphin and wahoo populations but benefits will accrue from protection of other species. Society derives benefit from the ecosystem services provided by *Sargassum* that translates into use value to sport fishing and commercial fishing sectors, non-consumptive use value, and non-use benefits (existence value). Concurrently, implementation of this plan will also result in reduced revenue for the firm harvesting *Sargassum*.

Social Impacts

By deferring to measures listed in the *Sargassum* Fishery Management Plan, there is more consistency across all Fishery Management Plans of the SAFMC.

Public hearing testimony and written testimony received by the Council overwhelmingly supported the measures set out in the *Sargassum* FMP. Comments were received from 33 States and Puerto Rico, and from 16 foreign countries. A total of 235 comments were received on the original FMP (175 from individuals and 60 from agencies/organizations). All comments were in favor of the Council's proposed actions except for two. The Council's preferred option is as close to the total prohibition as is feasible, and the many non-use stakeholders would derive social benefits from this action.

The protection of this habitat and thus of the dolphin and wahoo habitat is readily accepted by almost all members of the public who hold a stake in this fishery. Hence, there will be both short and long term positive social impacts from this option.

Conclusion

The Councils determined this action best achieves the goals of the FMP and the management objectives to: (4) optimize the social and economic benefits, (6) direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

The original *Sargassum* FMP was sent to the Secretary of Commerce for formal review and implementation on December 14, 1998. The Secretary of Commerce disapproved the original *Sargassum* FMP on November 24, 1999 because there was insufficient justification for setting the Optimum Yield (OY) at zero harvest and because no Maximum Sustainable Yield (MSY) was included. The Council modified their plan to allow limited harvest and added a MSY. The Revised *Sargassum* FMP (SAFMC, 2002) was sent to the Secretary of Commerce in 2002. Management measures in the Sargassum FMP reduce the impact of the only fishery known to impact EFH or EFH-HAPCs for dolphin and wahoo. The Council will monitor the fishery and take additional action to reduce fishing impacts if deemed necessary, through framework provisions established in this plan.

Rejected Options for Action 24:

Option 1. Prohibit any impacts from current fishing activities on EFH for dolphin and wahoo and oppose future use of fishing gears that are likely to negatively impact such EFH.

Biological Impacts

The fishing gear used for dolphin and wahoo do not significantly impact EFH or EFH-HAPCs for dolphin and wahoo. There are no biological impacts from this option at this time. If the Council deemed it necessary to take additional action to reduce fishing impacts on EFH through the framework provisions established in this plan, the biological impacts of such action would have to be determined.

Economic Impacts

At this time the direct harvest of *Sargassum* was identified as the only additional action the Council needs to take in protecting dolphin/wahoo EFH from the effects of fishing. There may not be any increase in benefits derived from further action over and above what is expected from implementation of the Council's recommendations in the revised Sargassum FMP. Additional actions that restrict activities of other fisheries could result in reduced overall net economic benefits.

Social Impacts

There are no social impacts from this option at this time. If the Council after monitoring the fishery, deemed it necessary to take additional action to reduce fishing impacts on EFH through the framework provisions established in this plan would have to determine the social impacts of such action.

Conclusion

The Council rejected this option upon determine establishing additional management measures to reduce the effect of fishing on EFH was not deemed necessary at this time.

4.2.25 Existing SAFMC Habitat Policies & Procedures

Atlantic Essential Fish Habitat Conservation Recommendations

This material indicates previous actions/positions the South Atlantic Council has taken to protect essential fish habitat:

Established policies and procedures of the SAFMC and the NMFS (Appendix N - Comprehensive Habitat Amendment (SAFMC, 1998c) provide the framework for conserving and enhancing essential fish habitat for dolphin and wahoo. Integral components of this framework include adverse impact avoidance and minimization; provision of compensatory mitigation whenever the impact is significant and unavoidable; and incorporation of enhancement as a fundamental component of fishery resource recovery. New and expanded responsibilities contained in the MSFCMA will be met through appropriate application of these policies and principles. In assessing the potential impacts of proposed projects, the Councils, the NMFS, and USFWS are guided by the following general considerations:

• The extent to which the activity would directly and indirectly affect the occurrence, abundance, health, and continued existence of fishery resources;

• The extent to which the goal of "no net-loss of wetlands" would be attained;

• The extent to which an unacceptable precedent may be established or potential for a significant cumulative impact exists;

• The extent to which adverse impacts can be avoided through project modification or other safeguards;

• The availability of alternative sites and actions that would reduce project impacts;

• The extent to which the activity is water dependent if loss or degradation of EFH is involved; and

• The extent to which mitigation may be used to offset unavoidable loss of wetland habitat functions and values.

SAFMC Essential Fish Habitat and Environmental Protection Policy

In recognizing that dolphin and wahoo are dependent on the quantity and quality of their essential habitats, it is the policy of the SAFMC to protect, restore, and develop habitats upon which the dolphin and wahoo fisheries depend; to increase the extent of their distribution and abundance; and to improve their productive capacity for the benefit of present and future generations. For purposes of this policy, "habitat" is defined as the physical, chemical, and biological parameters that are necessary for continued productivity of the species that is being managed. The objectives of the SAFMC policy will be accomplished through the recommendation of no net loss or significant environmental degradation of existing habitat. A long-term objective is to support and promote a net-gain of fisheries habitat through the restoration and rehabilitation of the productive capacity of habitats that have been degraded, and the creation and development of productive habitats where increased fishery production is probable. The SAFMC will pursue these goals at state, Federal, and local levels. The Council shall assume an aggressive role in the protection and enhancement of habitats important to species, and shall actively enter Federal, decision-making processes where proposed actions may otherwise compromise the productivity of fishery resources of concern to the Council.

SAFMC Essential Fish Habitat Policy Statements Affecting Dolphin and Wahoo

These are policies previously adopted by the South Atlantic Council which affect dolphin and wahoo. Action 24 addressees gear impacts.

<u>SAFMC Policy Statement Concerning Dredging and Dredge Material Disposal Activities Ocean Dredged Material Disposal Sites (ODMDS) and SAFMC Policies</u>

The shortage of adequate upland disposal sites for dredged materials has forced dredging operations to look offshore for sites where dredged materials may be disposed. These Ocean Dredged Material Disposal Sites (ODMDSs) have been designated by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE) as suitable sites for disposal of dredged materials associated with berthing and navigation channel maintenance activities. The South Atlantic Fishery Management Council (SAFMC; the Council) is moving to establish its presence in regulating disposal activities at these ODMDSs. Pursuant to the Magnuson Fishery Conservation and Management Act of 1976 (the Magnuson Act), the regional fishery management Councils are charged with management of living marine resources and their habitat within the 200 mile Exclusive Economic Zone (EEZ) of the United States. Insofar as dredging and disposal activities at the various ODMDSs can impact fishery resources or essential habitat under Council jurisdiction, the following policies address the Council's role in the designation, operation, maintenance, and enforcement of activities in the ODMDSs:

The Council acknowledges that living marine resources under its jurisdiction and their essential habitat may be impacted by the designation, operation, and maintenance of ODMDSs in the South Atlantic. The Council may review the activities of EPA, COE, the state Ports Authorities, private dredging contractors, and any other entity engaged in activities which impact, directly or indirectly, living marine resources within the EEZ.

The Council may review plans and offer comments on the designation, maintenance, and enforcement of disposal activities at the ODMDSs.

ODMDSs should be designated or redesignated so as to avoid the loss of live or hard bottom habitat and minimize impacts to all living marine resources.

Notwithstanding the fluid nature of the marine environment, all impacts from the disposal activities should be contained within the designated perimeter of the ODMDSs.

The final designation of ODMDSs should be contingent upon the development of suitable management plans and a demonstrated ability to implement and enforce that plan. The Council encourages EPA to press for the implementation of such management plans for all designated ODMDSs.

All activities within the ODMDSs are required to be consistent with the approved management plan for the site.

The Council's Habitat and Environmental Protection Advisory Panel, when requested by the Council, will review such management plans and forward comment to the Council. The Council may review the plans and recommendations received from the advisory sub-panel and comment to the appropriate agency. All federal agencies and entities receiving a comment or recommendation from the Council will provide a detailed written response to the Council regarding the matter pursuant to 16 U.S.C. 1852 (i). All other agencies and entities receiving a comment or recommendation from the Council should provide a detailed written response to the

Council regarding the matter, such as is required for federal agencies pursuant to 16 U.S.C. 1852 (i).

ODMDSs management plans should indicate appropriate users of the site. These plans should specify those entities/agencies which may use the ODMDSs, such as port authorities, the U.S. Navy, the Corps of Engineers, etc. Other potential users of the ODMDSs should be acknowledged and the feasibility of their using the ODMDSs site should be assessed in the management plan.

Feasibility studies of dredge disposal options should acknowledge and incorporate ODMDSs in the larger analysis of dredge disposal sites within an entire basin or project. For example, Corps of Engineers analyses of existing and potential dredge disposal sites for harbor maintenance projects should incorporate the ODMDSs as part of the overall analysis of dredge disposal sites.

The Council recognizes that EPA and other relevant agencies are involved in managing and/or regulating the disposal of all dredged material. The Council recognizes that disposal activities regulated under the Ocean Dumping Act and dredging/filling carried out under the Clean Water Act have similar impacts to living marine resources and their habitats. Therefore, the Council urges these agencies apply the same strict policies to disposal activities at the ODMDSs. These policies apply to activities including, but not limited to, the disposal of contaminated sediments and the disposal of large volumes of fine-grained sediments. The Council will encourage strict enforcement of these policies for disposal activities in the EEZ. Insofar as these activities are relevant to disposal activities in the EEZ, the Council will offer comments on the further development of policies regarding the disposal/deposition of dredged materials.

The Ocean Dumping Act requires that contaminated materials not be placed in an approved ODMDS. Therefore, the Council encourages relevant agencies to address the problem of disposal of contaminated materials. Although the Ocean Dumping Act does not specifically address inshore disposal activities, the Council encourages EPA and other relevant agencies to evaluate sites for the suitability of disposal and containment of contaminated dredged material. The Council further encourages those agencies to draft management plans for the disposal of contaminated dredge materials. A consideration for total removal from the basin should also be considered should the material be contaminated to a level that it would have to be relocated away from the coastal zone.

Offshore and Nearshore Underwater Berm Creation

The use of underwater berms in the South Atlantic region has recently been proposed as a disposal technique that may aid in managing sand budgets on inlet and beachfront areas. Two types of berms have been proposed to date, one involving the creation of a long offshore berm and the second involving the placement of underwater berms along beachfronts bordering an inlet. These berms would theoretically reduce wave energy reaching the beaches and/or resupply sand to the system.

The Council recognizes offshore berm construction as a disposal activity. As such, all policies regarding disposal of dredged materials shall apply to offshore berm construction. Research should be conducted to quantify larval fish and crustacean transport and use of the inlets prior to any consideration of placement of underwater berms. Until the impacts of berm creation in inlet areas on larval fish and crustacean transport is determined, the Council recommends that disposal activities should be confined to approved ODMDSs. Further, new offshore and near shore underwater berm creation activities should be reviewed under the most rigorous criteria, on a case-by-case basis.

Maintenance Dredging and Sand Mining for Beach Renourishment

The Council recognizes that construction and maintenance dredging of the seaward portions of entrance channels and dredging borrow areas for beach re-nourishment occur in the EEZ. These activities should be done in an appropriate manner in accordance with the policies adopted by the Council.

The Council acknowledges that endangered and threatened species mortalities have occurred as a result of dredging operations. Considering the stringent regulations placed on commercial fisherman, dredging or disposal activities should not be designed or conducted so as to adversely impact rare, threatened, or endangered species. NMFS Protected Species Division should work with state and federal agencies to modify proposals to minimize potential impacts on threatened and endangered sea turtles and marine mammals.

The Council has and will continue to coordinate with Minerals Management Service (MMS) in their activities involving exploration, identification, and dredging/mining of sand resources for beach renourishment. This will be accomplished through membership on state task forces or directly with MMS. The Council recommends that live bottom/hard bottom habitat and historic fishing grounds be identified for areas in the South Atlantic region to provide for the location and protection of these areas while facilitating the identification of sand sources for beach renourishment projects.

Open Water Disposal

The SAFMC is opposed to the open water disposal of dredged material into aquatic systems which may adversely impact habitat that fisheries under Council jurisdiction are dependent upon. The Council urges state and federal agencies, when reviewing permits considering open water disposal, to identify the direct and indirect impacts such projects could have on fisheries habitat.

The SAFMC concludes that the conversion of one naturally functioning aquatic system at the expense of creating another (marsh creation through open water disposal) must be justified given best available information.

SAFMC Policy on Oil and Gas Exploration, Development, and Transportation

The SAFMC urged the Secretary of Commerce to uphold the 1988 coastal zone inconsistency determination of the State of Florida for the respective plans of exploration filed with Minerals Management Service (MMS) by Mobil Exploration and Producing North America, Inc. for Lease OCS-G6520 (Pulley Ridge Block 799) and by Union Oil Company of California for Lease OCS-G6491/6492 (Pulley Ridge Blocks 629 & 630). Both plans of exploration involve lease blocks lying within the lease area comprising the offshore area encompassed by Part 2 of Lease Sale 116, and south of 26° North latitude. The Council's objection to the proposed exploration activities was based on the potential degradation or loss of extensive live bottom and other habitat essential to fisheries under Council jurisdiction.

The SAFMC also supported North Carolina's determination that the plans of exploration filed with MMS by Mobil Exploration and Producing North America, Inc. for Lease OCS Manteo Unit are not consistent with North Carolina's Coastal Zone Management program. The Council has expressed concern to the Outer Continental Shelf Leasing and Development Task Force about the proposed area and recommends that no further exploration or production activity be allowed in the areas subject to Presidential Task Force Review (the section of Sale 116 south of 26° N. latitude).

The SAFMC recommends the following to the MMS when considering proposals for oil and gas activities for previously leased areas under Council jurisdiction:
1) That oil or gas drilling for exploration or development on or closely associated with live bottom habitat, or other special biological resources essential to commercial and recreational fisheries under Council jurisdiction, be prohibited.
2) That all facilities associated with oil and gas exploration, development, and transportation be designed to avoid impacts on coastal wetlands and sand sharing systems.
3) That adequate spill containment and cleanup equipment be maintained for all development and transportation facilities and, that the equipment be available on site within the trajectory time to land, and have industry post a bond to assure labor or other needed reserves.
4) That exploration and development activities should be scheduled to avoid northern right whales in coastal waters off Georgia and Florida as well as migrations of that species and other marine mammals off South Atlantic states.
5) That the EIS for lease Sale 56 be updated to address impacts from activities related to specifically natural gas production, safety precautions which must be developed in the event of a discovery of a "sour gas" or hydrogen sulfide reserve, the potential for southerly transport of hydrocarbons to near shore and inshore estuarine habitats resulting from the cross-shelf transport by Gulf Stream spin-off eddies, the development of contingency plans to be implemented if problems arise due to the very dynamic oceanographic conditions and the extremely rugged bottom, and the need for and availability of onshore support facilities in coastal North and South Carolina, and an analysis of existing facilities and community services in light of existing major coastal developments.

The SAFMC recommended the following concerns and issues be addressed by the MMS prior to approval of any application for a permit to drill any exploratory wells in Lease Sale 56 and that these concerns and issues also be included in the Environmental Impact Statement for the Outer Continental Shelf (OCS) Leasing Plan for 1992-1997:
1) Identification of the on-site fisheries resources, including both pelagic and benthic communities, that inhabit, spawn, or migrate through the lease sites with special focus on those specific lease blocks where industry has expressed specific interest in the pre-lease phases of the leasing process. Particular attention should be given to critical life history stages. Eggs and larvae are most sensitive to oil spills, and seismic exploration has been documented to cause mortality of eggs and larvae in close proximity.
2) Identification of on-site species designated as endangered, threatened, or of special concern, such as shortnose sturgeon, striped bass, blueback herring, American shad, sea turtles, marine mammals, pelagic birds, and all species regulated under federal Fishery Management Plans.
3) Determination of impacts of all exploratory and development activities on the fisheries resources prior to MMS approval of any applications for permits to drill in the Exploratory Unit area, including effects of seismic survey signals on fish behavior, eggs, and larvae; temporary preclusion from fishing grounds by exploratory drilling; and permanent preclusion from fishing grounds by production and transportation.
4) Identification of commercial and recreational fishing activities in the vicinity of the lease or Exploratory Unit area, their season of occurrence, and intensity.
5) Determination of the physical oceanography of the area through field studies by MMS or the applicant, including on-site direction and velocity of currents and tides, sea states, temperature, salinity, water quality, wind storms frequencies and intensities, and icing conditions. Such studies must be required prior to approval of any exploration plan submitted in

order to have an adequate informational database upon which to base subsequent decision making on site-specific proposed activities.

6) Description of required existing and planned monitoring activities intended to measure environmental conditions, and provide data and information on the impacts of exploration activities in the lease area or the Exploratory Unit area.

7) Identification of the quantity, composition, and method of disposal of solid and liquid wastes and pollutants likely to be generated by offshore, onshore, and transportation operations associated with oil and gas exploration development and transportation.

8) Development of an oil spill contingency plan which includes oil spill trajectory analyses specific to the area of operations, dispersant-use plan including a summary of toxicity data for each dispersant, identification of response equipment and strategies, establishment of procedures for early detection and timely notification of an oil spill including a current list of persons and regulatory agencies to be notified when an oil spill is discovered, and well defined and specific actions to be taken after discovery of an oil spill.

9) Studies should include detailing seasonal surface currents and likely spill trajectories.

10) Mapping of environmentally sensitive areas (e.g., spawning aggregations of snappers and groupers); coral resources and other significant benthic habitats (e.g., tilefish mudflats) along the edge of the continental shelf (including the upper slope); the calico scallop, royal red shrimp, and other productive benthic fishing grounds; other special biological resources; and northern right whale calving grounds and migratory routes, and subsequent deletion from inclusion in the respective lease block(s).

11) Planning for oil and gas product transport should be done to determine methods of transport, pipeline corridors, and onshore facilities. Siting and design of these facilities as well as onshore receiving, holding, and transport facilities could have impacts on wetlands and endangered species habitats if they are not properly located.

12) Develop understanding of community dynamics, pathways, and flows of energy to ascertain accumulation of toxins and impacts on community by first order toxicity.

13) Determine shelf-edge, down-slope dynamics and resource assessments to determine fates of contaminants due to the critical nature of canyons and steep relief to important fisheries (e.g., swordfish, billfish, and tuna).

14) Discussion of the potential adverse impacts upon fisheries resources of the discharges of all drill cuttings that may result from activities in, and all drilling muds that may be approved for use in the lease area or the Exploration Unit area including: physical and chemical effects upon pelagic and benthic species and communities including their spawning behaviors and effects on eggs and larval stages; effects upon sight feeding species of fish; and analysis of methods and assumptions underlying the model used to predict the dispersion and discharged muds and cuttings from exploration activities.

15) Discussion of secondary impacts affecting fishery resources associated with on-shore oil and gas related development such as storage and processing facilities, dredging and dredged material disposal, roads and rail lines, fuel and electrical transmission line routes, waste disposal, and others.

The following section addresses the recommendations, concerns and issues expressed by the South Atlantic Council (Source: Memorandum to Regional Director, U.S. Fish and Wildlife Service, Atlanta, Georgia from Regional Director, Gulf of Mexico OCS Region dated October 27, 1995):

"The MMS, North Carolina, and Mobil entered into an innovative Memorandum of Understanding on July 12, 1990, in which the MMS agreed to prepare an Environmental Report (ER) on proposed drilling offshore North Carolina. The scope of the ER prepared by the MMS was more comprehensive than an EIS would be. The normal scoping process used in preparation of a NEPA-type document would not only "identify significant environmental issues deserving of study" but also "deemphasize insignificant issues, narrowing the scope" (40 CFR 1500.4) by scoping out issues not ripe for decisions.

Of particular interest to North Carolina are not the transient effects of exploration, but rather the downstream and potentially broader, long-term effects of production and development. The potential effects associated with production and development would normally be "scoped out" of the (EIS-type) document and would be the subject of extensive NEPA analysis only after the exploration phase proves successful, and the submittal of a full-scale production and development program has been received for review and analysis. The ER addressed three alternatives: the proposed Mobil plan to drill a single exploratory well; the no-action alternative; and the alternative that the MMS approve the Mobil plan with specific restrictions (monitoring programs and restrictions on discharges). The ER also analyzes possible future activities, such as development and production, and the long-term environmental and socioeconomic effects associated with such activities. The MMS assured North Carolina that all of the State's comments and concerns would be addressed in the Final ER (USDOI MMS, 1990).

The MMS also funded a Literature Synthesis study (USDOI MMS, 1993a) and a Physical Oceanography study (USDOI MMS, 1994), both recommended by the Physical Oceanography Panel and the Environmental Sciences Review Panel (ESRP). Mobil also submitted a draft report to the MMS titled, Characterization of Currents at Manteo Block 467 off Cape Hatteras, North Carolina. The MMS also had a Cooperative Agreement with the Virginia Institute of Marine Science to fund a study titled, Seafloor Survey in the Vicinity of the Manteo Prospect Offshore North Carolina (USDOI MMS, 1993b). The MMS had a Cooperative Agreement with East Carolina University to conduct a study titled, Coastal North Carolina Socioeconomic Study (USDOI MMS, 1993c). The above-mentioned studies were responsive to the ESRP's recommendations as well as those of the SAFMC and the State of North Carolina.

Citations:

USDOI, MMS. 1990. Atlantic Outer Continental Shelf, Final Environmental Report on Proposed Exploratory Drilling Offshore North Carolina, Vols. I-III.

USDOI, MMS. 1993a. North Carolina Physical Oceanography Literature Study. Contract No. 14-35- 0001-30594.

USDOI, MMS. 1993b. Benthic Study of the Continental Slope Off Cape Hatteras, North Carolina. Vols. I-III. MMS 93-0014, -0015, -0016.

USDOI, MMS. 1993c. Coastal North Carolina Socioeconomic Study. Vols. I-V. MMS 93-0052, -0053, -0054, -0055, and -0056.

USDOI, MMS. 1994. North Carolina Physical Oceanographic Field Study. MMS 94-0047.

Copies of these studies can be acquired from the address below:

Minerals Management Service, Technical Communication Services, MS 4530, 381 Elden Street; Herndon, VA 22070-4897; (703) 787-1080

<u>SAFMC Policy Statement on Ocean Dumping</u>

The SAFMC is opposed to ocean dumping of industrial waste, sewage sludge, and other harmful materials. Until ocean dumping of these materials ceases, the SAFMC strongly urges State and Federal agencies to control the amount of industrial waste, sludge, and other harmful materials discharged into rivers and the marine environment, and these agencies should increase their monitoring and research of waste discharge. The SAFMC requests that the Environmental Protection Agency continue to implement and enforce all legislation, rules, and regulations with increased emphasis on the best available technology requirements and pretreatment standards. The SAFMC requests that EPA require each permitted ocean dumping vessel (carrying the above described material) to furnish detailed information concerning each trip to the dump site. This might be monitored with transponders, locked Loran C recorder plots of trips to and from dump sites, phone calls to the EPA when a vessel leaves and returns to port, or other appropriate methods. Also the EPA should take legal action to enforce illegal (short or improper) dumping. The SAFMC requests that fishermen and other members of the public report to the EPA, Coast Guard, and the Councils any vessels dumping other than in approved dump sites. The SAFMC supports the phase out of ocean dumping of the above described materials.

Activity Based Policies

<u>Oil and Gas Exploration and Production</u>

Exploration and production of oil and gas resources in wetlands usually have adverse impacts since excavation and filling are generally required to accommodate access and production needs. In open marine waters, dredging and filling is usually not necessary, but special stipulations are required to minimize adverse impacts to living marine resources. In addition to the above recommendations for navigation channels, access canals, and pipeline installation, the following apply:

A. In coastal wetlands:

a. Activities should avoid wetland use to the extent practicable. Alternatively, the use of uplands, existing drilling sites and roads, canals, and naturally deep waters should be encouraged. When wetland use is unavoidable, work in unvegetated and disturbed wetlands is generally preferable to work in high quality and undisturbed wetlands;

b. Temporary roadbeds (preferably plank roads) generally should be used instead of canals for access to well sites;

c. Water crossings should be bridged or culverted to prevent alteration of natural drainage patterns;

d. Culverts or similar structures should be installed and maintained at sufficient intervals (never more than 500 feet apart) to prevent blockage of surface drainage or tidal flow;

e. Petroleum products, drilling muds, drill cuttings, produced water, and other toxic substances should not be placed in wetlands;

f. If the well is productive, the drill pad and levees should be reduced to the minimum size necessary to conduct production activities; and

g. Defunct wells and associated equipment should be removed and the area restored to the extent practicable. Upon abandonment of wells in coastal wetlands, the well site, various pits, levees, roads, and work areas should be restored to preproject conditions by restoring natural elevations and planting indigenous vegetation whenever practicable. Abandoned well access canals should generally be plugged at their origin (mouths) to minimize bank erosion and saltwater intrusion, and spoil banks should be graded back into borrow areas or breached at regular intervals to establish hydrological connections.

B. In open estuarine waters: Activities in estuarine waters should be conducted as follows:

a. Existing navigable waters already having sufficient width and depth for access to mineral extraction sites should be used to the extent practicable;

b. Petroleum products, drilling muds, drill cuttings, produced water, and other toxic substances should not be placed in wetlands; and

c. Defunct equipment and structures should be removed.

C. On the continental shelf: Activities should be conducted so that petroleum-based substances such as drilling mud, oil residues, produced waters, or other toxic substances are not released into the water or onto the sea floor. The following measures may be recommended with exploration and production activities located close to hard banks and banks containing reef building coral:

a. Drill cuttings should be shunted through a conduit and discharged near the sea floor, or transported ashore or to less sensitive, NMFS-approved offshore locations. Usually, shunting is effective only when the discharge point is deeper than the site that is to be protected;

b. Drilling and production structures, including pipelines, generally should not be located within one mile of the base of a live reef;

c. All pipelines placed in waters less than 300 feet deep should be buried to a minimum of three feet beneath the sea floor, where possible. Where this is not possible, and in deeper waters where user conflicts are likely, pipelines should be marked by lighted buoys and/or lighted ranges on platforms to reduce the risk of damage to fishing gear and the pipelines. Pipeline alignments should be located along routes that minimize damage to marine and estuarine habitat. Buried pipelines should be examined periodically for maintenance of adequate earthen cover.

Other Mineral Mining/Extraction

Proposals for mining mineral resources (sand, gravel, shell, phosphate, etc.) from or within 1,500 feet of exposed shell reefs and vegetated wetlands, and within 1,500 feet of shorelines are unacceptable except when the material is to be used for oyster cultch. All other proposals will be considered on a case-by-case basis.

SAFMC Recommendation for International Protection of *Sargassum* and the Sargasso Sea

Because of the importance of *Sargassum* as essential fish habitat and as an essential fish habitat area of particular concern for dolphin and wahoo, the extra-jurisdictional pelagic *Sargassum* occurring in the Sargasso Sea outside the EEZ should be protected. Therefore, the United States should pursue all other options under the Magnuson-Stevens Act and other laws to protect *Sargassum* in international waters.

4.3 Unavoidable Adverse Effects

Action 1. The management unit is the population of dolphin (common dolphin- *Coryphaena hippurus* and pompano dolphin- *Coryphaena equiselis*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts;

Action 2. The management unit is the population of wahoo (*Acanthocybium solandri*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts;

Action 3. In the Atlantic any dealer, defined as the person who first receives dolphin or wahoo harvested in or from the EEZ by way of purchase, barter, trade, or transfer in commerce, will be required to possess a valid dealer permit issued by the National Marine Fisheries Service and to report data needed to monitor the dolphin and wahoo fisheries; Require that the owner of a for-hire vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ;

Action 4. Require that the owner of a commercial vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ;

In order to qualify for a commercial vessel permit in the Atlantic, during one of the three calendar years preceding the control date, the vessel owner (1) must have 25 percent of his or her earned income derived from commercial or for-hire fishing, or must have earned at least $10,000 from either commercial or for-hire fishing and (2) must be able to document 250 pounds of landings and sale of dolphin and/or wahoo on or before the control date of May 21, 1999 in the Atlantic. Alternatively individuals may also qualify for a commercial permit if they hold a valid permit in the snapper-grouper, king mackerel, or swordfish fisheries. The commercial permit is transferable (1 for 1) with vessel when sold or replaced. Allow a 200 pound incidental harvest possession limit of dolphin and/or wahoo for vessels with a valid federal commercial permit fishing North of 39° North latitude.

For a person aboard a fishing vessel to fish for dolphin and wahoo in the exclusive economic zone (EEZ), possess dolphin and wahoo in or from the EEZ, off-load dolphin and wahoo from the EEZ, or sell dolphin and wahoo in or from the EEZ, a vessel permit for dolphin and wahoo must be issued to the vessel and be on board.

A fee will be charged to cover the administrative costs of issuing federal vessel permits. There are no requirements to qualify for a for-hire vessel permit;

Action 5. Require that the operator of a commercial or for-hire vessel obtain an operator's permit issued by the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ. On each federally permitted dolphin/wahoo commercial or for-hire vessel, there must be on board at least one operator who has been issued a federal operator's permit for the dolphin/wahoo fishery. The federally permitted operator will be held accountable for violations of fishing regulations and also may be subject to a permit sanction. If an operator's permit has been sanctioned, during the permit sanction period the individual operator may not work in any capacity aboard a federally permitted fishing vessel. No performance or competency testing will be required to obtain a permit. However, the permit may be revoked for violation of Federal dolphin and wahoo regulations as authorized by 15 C.F.R. 904.

The federal permit program will have the following requirements:

1. Any operator of a vessel fishing for dolphin or wahoo (either commercial or for-hire) must have an operator's permit issued by the NMFS Regional Administrator.

2. An operator is defined as the master or other individual on board a vessel who is in charge of that vessel (see 50 CFR 620.2).

3. The operator is required to submit an application, supplied by the Regional Administrator, for an Operator's Permit. The permit will be issued for a period of up to three years.

4. The applicant must provide his/her name, mailing address, telephone number, date of birth, and physical characteristics (height, weight, hair, and eye color) on the application. In addition to this information, the applicant must provide two passport size color photos.

5. The permit is not transferable.

6. Permit holders would be required to carry their permit aboard the fishing vessel during fishing and off-loading operations and must have it available for inspection upon request by an authorized officer.

7. The Regional Administrator may charge an administrative fee for the operator permit consistent with NOAA guidelines;

Action 6. In the Atlantic, require reporting of vessel permit holders (commercial and for-hire) and include reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP). Also continue existing logbook requirements;

Action 7. Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 18.8 and 46.5 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 1.41 and 1.63 million pounds;

Action 8. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and 100% of MSY (between 1.41 and 1.63 million pounds) for wahoo;

Action 9. Overfishing level. Overfishing is defined in terms of the NMFS Guidelines Checklist. A maximum fishing mortality threshold (MFMT) - In the Atlantic, U.S. Caribbean, and Gulf of Mexico overfishing for dolphin and wahoo is defined as a fishing mortality rate (F) in excess of F_{MSY} ($F_{30\%\ Static\ SPR}$). A minimum stock size threshold (MSST) – In the Atlantic, U.S. Caribbean, and Gulf of Mexico the minimum stock size threshold for dolphin and wahoo is defined as a ratio of current biomass ($B_{current}$) to biomass at MSY or $(1-M)*B_{MSY}$, where 1-M should never be less than 0.5. Using the best available estimates of natural mortality (M = 0.68-0.80) in the formula results in a MSST of 50% B_{MSY}. The stock would be overfished if current biomass ($B_{current}$) was less than MSST and would be recovered when current biomass was equal or greater than the biomass at MSY; and

Action 10. Establish a framework procedure for the Dolphin and Wahoo FMP to provide the South Atlantic Fishery Management Council with a mechanism to independently adjust management measures for their area of responsibility through framework action.

Action 11. Prohibit sale of recreationally caught dolphin or wahoo in or from the Atlantic EEZ except for allowing for-hire vessels that possess the necessary state and Federal commercial permits to sell dolphin harvested under the bag limit in or from the Atlantic EEZ;

Action 12. Establish a cap of 1.5 million pounds or 13% of total landings, whichever is greater, for the commercial fishery for dolphin. Should the catch exceed this level, the Council will review the data and evaluate the need for additional regulations which may be established through the framework;

Action 13. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. Headboats (with a valid certificate of inspection) will be allowed a bag limit of 10 dolphin per paying passenger;

Action 14. Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed;

Action 15. Establish a minimum size limit for dolphin of 20 inches fork length off Florida and Georgia and no minimum size limit north of Georgia;

Action 16. Establish a commercial trip limit for wahoo (landed head and tail intact) of 500 pounds with no transfer at sea allowed;

Action 17. Do not establish a size limit for wahoo in the Atlantic EEZ;

Action 18. Establish a recreational bag limit of 2 wahoo per person per day in the Atlantic EEZ;

Action 19. Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads);

Action 20. Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species;

Action 21. Establish a fishing year of January 1 to December 31 for the dolphin and wahoo fishery in the Atlantic EEZ;

Action 22. Expand the list of Essential Fish Habitat (EFH) definitions that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*;

Action 23. Expand the list of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic. EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*; and

Action 24. Assessment of the Impacts of Present Fishing Activities on EFH. No action to implement additional management measures to reduce impacts of fishing on dolphin wahoo EFH. Defer to measures in the *Sargassum* Fishery Management Plan which has been submitted to the Secretary for formal review, and incorporate by reference the Comprehensive Habitat Amendment approved by the Secretary on June 3, 1999.

The following summarizes the separate effects from those actions that are likely to result in adverse impacts. A more detailed discussion of the impacts of each action is contained in Section 4.

Actions 3, 4, and 5 will result in a small increase in operating costs for dealers, vessel owners, and operators in the dolphin/wahoo fishery. Action 4 could result in revenue loss to those vessels not able to qualify for a dolphin wahoo permit. It is estimated that Action 6 will result in a time cost equivalent to $12.50 per hour for respondents required to complete logbooks.

Action 11 that proposes to prohibit the sale of recreationally caught dolphin by the private recreational sector, and wahoo by the entire recreational sector will most likely result in decreased revenue and consumer surplus. Action 13 would establish a 10 fish recreational bag limit/60 fish boat limit, which will reduce benefits to recreational anglers. The 3,000 pound/1,000 pound trip limit for dolphin in the Atlantic EEZ (Action 14) could reduce annual revenue in the commercial sector by $312,961. A 20 inch minimum size limit for dolphin could reduce consumer surplus benefits in the recreational fishery, and revenue in the commercial fishery by at least $45,092 (Action 15). Action 16 proposes a 500 pound trip limit on the wahoo fishery in the Atlantic EEZ, which could reduce commercial ex-vessel revenue by $2,360 annually.

Action 18 establishes a bag limit of 2 wahoo per person per day, which would reduce benefits to anglers since there would be a reduction in landings. This measure may well reduce short term recreational landings by 119,970 pounds. A prohibition on the use of pelagic longline gear for dolphin and wahoo in the HMS closed areas (Action 20) could reduce revenue in the commercial fishery anywhere from $105,271 to $170,329.

4.4 Relationship of Short-term and Long-term Productivity

The measures proposed are necessary to take a precautionary, risk adverse approach to cap harvest in the dolphin and wahoo fishery to protect the long-term viability of the fishery.

4.5 Irreversible and Irretrievable Commitments of Resources

There are no irreversible or irretrievable commitments of resources associated with the proposed actions. If the Councils do not take action to regulate the dolphin/wahoo fisheries, there could be a reduction in yield.

4.6 Effects of the Fishery on the Environment

See also Section 9.6 National Environmental Policy Act for additional discussion.

4.6.1 Damage to Ocean and Coastal Habitat

The proposed actions, and their alternatives, are not expected to have any adverse effect on the ocean and coastal habitats.

4.6.2 Physical Environment

The proposed actions in this plan will have a positive impact on the physical environment by identifying and describing Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern (EFH-HAPCs) so impacts from fishing and non-fishing activities can be minimized.

4.6.3 Effects on Wetlands

The proposed plan will have no effect on any flood plains, wetlands, or rivers.

4.6.4 Fishery Resource

The proposed actions take a precautionary, risk averse management approach by managing dolphin and wahoo throughout their range in the Atlantic, Gulf of Mexico, and U.S. Caribbean EEZ.

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4.6.5 Human Environment

The Council concluded the long-term benefits are expected to exceed the short-term loss.

4.6.6 Public Health and Safety

The proposed actions, and their alternatives, are not expected to have any substantial adverse impact on public health or safety.

4.6.7 Endangered Species and Marine Mammals

The proposed actions, and their alternatives, are not expected to adversely affect any endangered or threatened species or marine mammal population (see bycatch discussion below). The proposed actions would ensure that overfishing does not occur. Therefore, the proposed actions would likely reduce the future likelihood of potential entanglements, serious injuries, and mortality's of listed or protected species, as compared to the Status Quo. Appendix F contains a Biological Evaluation (BE) prepared by the Councils. The Biological Evaluation contains the Councils' detailed rationale.

4.6.8 Bycatch

Observer data and vessel logbooks indicate that pelagic longline fishing for Atlantic swordfish and tunas results in catch of non-target finfish species such as bluefin tuna, billfish, and undersized swordfish, and of protected species, including threatened and endangered sea turtles. Also, this fishing gear incidentally hooks marine mammals and sea birds during tuna and swordfish operations. The bycatch of animals that are hooked but not retained due to economic or regulatory factors contributes to overall fishing mortality. Such bycatch mortality may significantly impair rebuilding of overfished finfish stocks or the recovery of protected species. Atlantic blue marlin, white marlin, sailfish, bluefin tuna, and swordfish are overfished. The concurrent closure in this FMP was deemed necessary by NMFS to reduce bycatch and incidental catch of overfished and protected species by pelagic longline fishermen who target highly migratory pelagic species (HMS).

Appendix C (FSEIS for HMS Regulatory Amendment 1) contains data on dolphin-wahoo pelagic longline fishery analysis. The data presented on page C-66 and in Table C-4 indicate that pelagic longlines targeting dolphin do in fact result in a bycatch of HMS species.

Implementation of regulations proposed in this plan will address the Magnuson-Stevens Act requirements to reduce bycatch and the mortality of bycatch. Additional detailed data on bycatch in the directed dolphin/wahoo fisheries will be provided through full implementation of ACCSP (which includes observer coverage) as required under Action 6.

4.6.9 Cumulative Effects

The proposed actions, and their alternatives, are not expected to result in cumulative adverse effects that could have a substantial effect on dolphin and wahoo or any related stocks, including endangered and threatened species, such as turtles. Appendix F contains a Biological Evaluation (BE) prepared by the Councils. The Biological Evaluation contains the Councils' detailed rationale. In fact, the proposed measures provide the basis from which essential fish habitat and essential fish habitat - habitat areas of particular concern for dolphin and wahoo can be protected from fishing and non-fishing impacts. These habitats are also important as habitat for threatened and endangered sea turtles. See Section 3.4 and 4.3 of the Habitat Plan (SAFMC, 1998b).

Economic Considerations

It is not possible to quantify the overall cumulative economic impacts of the management actions in this plan, the effect of other fishing regulations, and other factors such as coastal development and imports. The relevant data and econometric models are not available to conduct analyses of the past, current, and future cumulative effects of the proposed regulations, other fishery regulations, and other factors not related to fishery management that affect participants in this fishery. For example, recreational and commercial entities in the dolphin and wahoo fishery who participate in other fisheries would be affected by state and federal fishery management actions including those implemented in the SAFMC snapper/grouper and mackerel fisheries. It is expected that dolphin imports have a major influence on the domestic dolphin price based on the fact that large quantities of product (in the frozen fillet category and the flash/frozen category) enters U.S. markets annually. A complete market demand model is required to quantify this effect; however, such a model is not currently available.

The permitting and data collection requirements proposed in this FMP (i.e., full implementation of ACCSP) would provide some of the necessary information for future analyses of the management actions in the dolphin and wahoo fisheries. However, collection of all information to quantify all effects will be expensive. The estimated cost for full implementation of ACCSP (catch/effort, biological sampling, discards and protected resources, and socioeconomic modules) along the entire Atlantic coast is approximately $50 million. Analysis of this data and development of the required economic, social, and biological models could easily equal this estimate.

The following is a qualitative summary of the direct economic impacts of the measures on the private recreational sector, for-hire recreational sector, and commercial harvesting sector. Detailed analysis of these effects are contained in Section 4. Also, refer to Table 1 for a summary of the economic impacts. While some of the measures proposed would directly reduce the economic benefits for some participants in the dolphin/wahoo fishery, economic benefits could accrue to other individuals. For example, the prohibition on recreational sale will result in reduced revenue to the private recreational sector. However, this measure will reduce health risks for seafood consumers (recreationally harvested fish are generally not handled according to HAACP to the same degree as commercially harvested fish).

Proposed measures in the SAFMC dolphin/wahoo FMP will reduce net consumer surplus in the recreational sector from the bag limits and the minimum size regulations. There will also be reductions in revenue from the prohibition on recreational sale. Some private recreational anglers sell all or a portion of their catch to offset their trip costs and this prohibition of sale will also reduce the overall net consumer surplus benefits on these recreational fishing trips. This sector would benefit in the future if these precautionary measures reduce the incidence of localized depletion which could allow for improved fishing quality and possibly additional angler benefits.

There could be a reduction in trips and/or overall harvest in the for-hire sector as a result of the size limit, boat limits, and bag limits proposed for dolphin and wahoo which would result in loss of net income. In addition, there will be some loss of revenue from the prohibition on recreational sale of wahoo. For-hire vessels that sold dolphin in the past but do not qualify for a Federal commercial dolphin permit will experience a loss of revenue.

There will be a minor increase in the overall vessel operating costs in the commercial harvesting sector from the permit requirement. Also, there will be reduced short-term revenue from the trip limits and the dolphin minimum size limit. Regulatory Amendment 1 to the Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan established areas that are closed to longlining (Appendix D). The longline sub-sector will experience losses in revenue from the prohibition on fishing in these HMS closed areas from a reduction in all landings (HMS species as well as dolphin and wahoo). Some of these vessels could shift fishing effort into other areas during the closure periods and/or target other fisheries to recoup some of the forgone revenue.

The measures proposed for dolphin and wahoo in this plan will have some short-term negative impacts on participants in these fisheries. Also other state and federal fishery management regulations previously implemented in the Atlantic affected some participants in this fishery. It must be noted that these regulations were enacted to improve stock status and/or to reconcile conflicts in these fisheries, which could increase long-term economic benefits to society.

<u>Social Considerations</u>

Like the economic impacts to the human environment, it is not possible at the present time to conduct a full cumulative effects analysis for the social and cultural impacts resulting from the proposed implementation of this Dolphin/Wahoo Fishery Management Plan.
In order to aptly conduct a cumulative impact analysis for any proposed action, whether it is in fisheries, forestry, rural development, etc. there should be available a set of baseline social, cultural, and demographic data from which one can draw comparisons and determine past, present, and future impacts. The analyses should include a determination of which factors have impacted the community or social group in question. In order to be comprehensive, the analyses need to recognize the interactions and interlinkages among such supposedly disparate spheres such as natural entities or conditions (e.g., climate change, shifts in ocean current patterns) along with economic factors (e.g., variations in labor force composition, price fluctuations, or even the political economy of the nation and world). Other factors closer to the sociocultural sphere effecting outcomes of sociocultural cumulative change include, for example, events such as coastal development and its associated gentrification process, the growing acceptance of concepts concerning environmental preservation/protection, and demographic shifts among ethnic groupings. Other than in a very qualitative way, these types of impacts cannot be sufficiently evaluated until further data collection and analyses are implemented (cost estimates provided above in the economic discussion). Both the proposed data collection efforts of the ACCSP and the hiring of social scientists by NOAA Fisheries should facilitate this task.

Specifically relevant to this FMP, any identified cumulative social impacts have been discussed in Section 4 under each action and the alternatives.

4.7 Public and Private Costs

Preparation, implementation, enforcement, and monitoring of this and any federal action involves expenditure of public and private resources which can be expressed as costs associated with the regulation. Costs associated with the development of the dolphin and wahoo fishery management plan include:

Councils costs of document preparation, meetings, data synthesis/analysis, scoping meetings, workshops, public hearings, and information dissemination =	$248,000
NMFS administrative costs of document preparation, meetings, and review =	$50,000
NMFS law enforcement and monitoring costs =	$90,000
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Total	$388,000+

4.8 Effects on Small Businesses: Initial Regulatory Flexibility Analysis (IRFA)

The Regulatory Flexibility Act requires an assessment of the economic impacts of proposed actions on small entities. It provides for certifying that a proposed rule would not have a significant economic impact on a substantial number of small entities if the factual basis for the certification is provided. If a certification cannot be made, an initial regulatory flexibility analysis (IRFA) must be prepared. The IRFA, using information from the analysis of the economic impacts of the various alternatives contained in the document should demonstrate that:

- Reasonable alternatives from among which to select a proposal are identified.
- The proposal selected reflects a wise choice from among reasonable alternatives.
- Managers have fair warning whether their proposal will generate loud complaint.
- The proposal competes well against other social goals, regardless of legislative mandates, in light of other administration priorities.
- The proposal will move rapidly through the regulatory process at OMB and SBA's Office of Advocacy.
- The proposal is likely to withstand legal challenge.

The definition of a "small entity" is taken from Part 121 of Title 13, Code of Federal Regulation (CFR), which classifies businesses by SIC code as small or large. The established size standards are as follows:

- Any fish harvesting business is a small entity if it is independently owned and operated and not dominant in its field of operation and if it has annual gross receipts not in excess of $3.5 million.
- A business entity in the for-hire sector is classified as small if annual gross receipts do not exceed $6.0 million annually.

It was not possible to identify all firms or vessels in this fishery since there is no federal permit or national database that tracks the operation of fishing vessels in the Atlantic. However, it is assumed that all entities fall in the small category based on information from industry sources and data on gross revenue from federally permitted vessels in the south Atlantic that engage in the harvest of dolphin and wahoo. These firms affected by the proposed management actions will qualify as small business entities because their gross revenues are less than $3.5 million annually. Hence, it is clear that the criterion of a substantial number of small business entities comprising the dolphin/wahoo harvesting industry being affected by the proposed rule will be met. Evaluation of whether a proposed rule will result in a "significant impact" is less clear. Recent guidelines provided by the National Marine Fisheries Service recommends that the criteria of profitability and disproportionality be used in this determination (NMFS, 2000):

1. Disproportionality. A comparison must be made of the effect of the proposed rule on small and large entities.
2. Profitability. The analysis should focus on the short and medium-term effect on profits of small entities.

Disproportionality

The industry is composed entirely of small businesses (harvesters and fish houses). Since no large businesses are involved, there are no disproportional small versus large business effects. However, among the small entities in this fishery there is a degree of heterogeneity in terms of gear used and type of operation (recreational for-hire, commercial harvester, or a combination of both activities).

Profitability

For purposes of the Regulatory Flexibility Act, this management plan would impact small business entities. The subsequent paragraphs summarize the separate effects from only those actions that are likely to have a direct impact on entities in the dolphin and wahoo fisheries in the Atlantic.

Action 3 (the requirement for dealer permits) will impose a time cost and a small increase in operating costs (the permit fee). This action is unlikely to substantially reduce firm level profitability.

The requirement for a vessel permit is likely to reduce the number of vessels that sell dolphin and wahoo. Most affected, will be firms that sell small quantities of dolphin/wahoo and/or entities that do not depend on the commercial or for-hire fisheries in the Atlantic for a large portion of their overall income. The Council set these criteria so as to protect the firms that have traditionally sold dolphin/wahoo and depend on these fisheries for a significant part of their income. Also, the Council's intent was to reduce the level of private recreational sale and protect the public from improperly handled fish.

There is little information to determine how many vessels will likely be affected by this measure in the Atlantic. Analysis of the Florida trip ticket data revealed that 1617 vessels (unique vessel numbers) were found to have landed dolphin and/or wahoo on the Florida Atlantic coast during 1997-2001 (1056 in 1997-1999 only). The Council set several qualifying criteria so that vessels that depend on commercial fishing or vessels that land and sell more than a minimal quantity each year would qualify for a commercial permit. A vessel owner would have to earn more than 25% of gross annual income or earn at least $10,000 gross revenue annually from a combination of commercial sale of any species and for-hire fishing, and also document 250 pounds of dolphin/wahoo landings in any one year during the period 1997-1999. If vessels did not qualify under these criteria but held a Federal permit in either the snapper/grouper, king mackerel, or swordfish fisheries they would automatically qualify for a commercial dolphin/wahoo permit. In this data set about 50% of all identified vessels would meet these criteria. However, it cannot be assumed that the remainder of these vessels would not qualify for a dolphin/wahoo permit. Some of these vessels could also operate in the for-hire sector, and charter income would allow the vessel to meet the income requirement. Data from a recently completed study on the for-hire sector indicated that the mean income for South Atlantic charterboat vessels was $51,000 (Holland et. al., 1999). Information on the distribution of fishing income was not presented in this report. However, analysis of the data set revealed that among charterboats that targeted dolphin and wahoo only 3.7% reported annual gross fishing income less than $10,000 annually.

In addition some of the commercial fishing vessels would have landings in other states that are not recorded by the Florida trip ticket system that could enable the vessel to qualify for a dolphin/wahoo commercial vessel permit. In this category there could be "private recreational vessels" that obtain a Saltwater Products License (SPL) and sell fish in Florida. There is no income requirement to commercially sell dolphin and wahoo in Florida. They are classified as unrestricted species. This measure was adopted to eliminate this private recreational sale in order to protect the interests of the commercial sector that is dependent on these species.

For commercial vessel owners that did not meet the income requirement, their combined overall annual income from any commercial or for-hire activity would have to be less than $10,000 or less than 25% of overall annual income. For those vessels that were in the fishery prior to May 31, 1999 meeting the income requirement but not the landings requirement, their forgone income would not exceed $387.50. Vessels that entered the fishery after May 31, 1999 will not be eligible to fish for dolphin/wahoo unless they hold one of the “closed access” commercial permits. Furthermore, vessels with any federal permit that did not qualify for a dolphin/wahoo permit will be allowed an incidental harvest limit of 200 pounds annually when fishing North of the 39° North latitude line.

However, it is expected that vessels not meeting these qualifying criteria could recoup some of their forgone revenue by participating in other fisheries. At this time it is not possible to calculate the impact on vessel profitability of this proposed measure since information is not available regarding the economic dependence of these vessels on the dolphin/wahoo fishery nor is there available information on the operating cost of these vessels.

The requirement for operator permits (Action 5) would increase the costs to vessel owners only if the owner is the operator. This cost is expected to be around $50, and permits should be valid for three years. Action 4 will also increase the annual cost to vessel owners who qualify for a commercial dolphin/wahoo permit. A fee will be charged to cover the cost of administering this permitting process. This fee is currently $50 per application. The opportunity cost (time spent completing the application) is estimated at $5 per application. However, vessel owners holding other federal permits will only pay an additional $20 to receive an endorsement for dolphin and wahoo on their permits. For vessels that qualify for the dolphin/wahoo fishery these actions are unlikely to substantially reduce firm level profitability.

Action 11 that proposes to prohibit the sale of recreationally caught dolphin by the private recreational sector, and wahoo by the entire recreational sector will result in decreased revenue within the for-hire sector and the private recreational sector. It was not possible to estimate this loss with a great degree of accuracy, however it is expected that this short-term loss should not exceed $1.46 million in the first year. The 3,000 pound/1,000 pound trip limit for dolphin in the Atlantic EEZ (Action 14) could reduce annual revenue in the commercial sector by $312,961. A 20 inch minimum size limit for dolphin could reduce revenue in the commercial fishery by at least $45,092 (Action 15). Action 16 proposes a 500 pound trip limit on the wahoo fishery in the Atlantic EEZ, which could reduce commercial ex-vessel revenue by $2,360 annually. However, it is expected that some of these vessels will mitigate this loss by participating in other fisheries. A prohibition on the use of pelagic longline gear for dolphin and wahoo in the HMS closed areas (Action 20) could reduce revenue in the commercial fishery anywhere from $105,271 to $170,329. However, it is expected that some of these vessels will mitigate this loss by participating in other fisheries. It is not possible to estimate the average impact per vessel since there is no information to specifically determine the number of vessels in the fishery nor in each sector of this fishery. Also, at this time it is not possible to calculate the impact on vessel profitability of these proposed measures since information is not available regarding the economic dependence of these vessels on the dolphin/wahoo fishery nor is there available information on the operating cost of these vessels.

In summary, there could be some impact on the short-term profits of commercial and for-hire vessels that do not qualify for a commercial permit and increased costs for vessels that fish for these species from the requirements for operator permits and vessel permits, reduced revenue from trip limits and the dolphin size limit, and the impact on the pelagic longline fleet from the proposed closed areas. It is uncertain as to whether this proposed rule will have a significant impact on a substantial number of small business entities, therefore, and Initial Regulatory Flexibility Analysis (IRFA) is required.

The full details of the economic analyses conducted for the proposed rule are contained in the RIR under the heading “Economic Impacts” in Section 4. Some of the relevant results are summarized for the purposes of the IRFA.

Description of the reasons why action by the agency is being considered: Refer to Section 1.0, Purpose and Need. This fishery management plan includes the following measures:
(1) Establish a management unit for dolphin and (2) Establish a management unit for wahoo to allow the Councils to manage these fisheries for sustainable benefits; (3) Require dealer permits, (4) Require for-hire and commercial vessel permits, (5) Require operator permits, and
(6) Establish data reporting requirements to provide data on this fishery for better management and enable better enforcement of fisheries regulations. The requirement for vessel permits will also protect the vessels that have traditionally sold dolphin/wahoo and obtain a larger share of their income from commercial sale of these species; (7) Set Maximum Sustainable Yield (MSY), (8) Set Optimum Yield (OY), and (9) Define Overfishing to allow the Councils to monitor the status of the fishery and determine if actions are needed to prevent overfishing; (10) Establish a framework procedure for the dolphin and wahoo FMP to allow for a more flexible management system; (11) Prohibit sale of recreationally caught dolphin by the private recreational sector, and prohibit all sale of wahoo in the Atlantic EEZ to reduce the harvesting pressure on the resource and the health risks from sale of improperly handled fish; (12) Establish a cap on the commercial dolphin harvest in the Atlantic EEZ by sector at 87% for the recreational fishery and 13% for the commercial fishery to reduce future conflicts between user groups; (13) Establish a 10 fish recreational bag limit for dolphin in the Atlantic EEZ and (14) Establish commercial dolphin trip limits in the Atlantic EEZ to improve management of the stock, avoid future excessive harvest and market disruptions, and reduce the likelihood of localized depletion at certain times of the year; (15) Establish a minimum size limit for dolphin off Florida and Georgia to reduce potential enforcement problems; (16) Establish a 500 pound commercial wahoo trip limit in the Atlantic EEZ to improve management of the stock, avoid future excessive harvest and market disruptions, and reduce the likelihood of localized depletion at certain times of the year; (18) Specify a two fish bag limit for wahoo in the Atlantic EEZ to avoid excessive recreational harvest and reduce conflict with the commercial sector; (19) Specify allowable gear for dolphin and wahoo in the Atlantic EEZ to control entry into the commercial fishery, to reduce competition with entities currently in the fishery, and to avoid the potential for localized overfishing and increased by-catch; (20) Prohibit the use of pelagic longline gear within any time or area closure in the South Atlantic Council’s area of jurisdiction for dolphin and wahoo (Atlantic Coast), which is closed to the use of such gear for highly migratory pelagic species, that would complement and facilitate the intended reduction of HMS bycatch and regulatory discards as well as enhance enforceability of the closure; (21) Specify a January 1-December 31 fishing year to aid in reporting requirements; (22) Specify Essential Fish Habitat for dolphin and wahoo in the Atlantic and (23) Habitat Areas of Particular Concern for Dolphin and Wahoo in the Atlantic to be able to enact measures that protect habitat that these species depend upon;

Statement of the objectives of, and legal basis for, the proposed rule: The following objectives are a part of these actions:
(1) **Address localized reduction in fish abundance**. The Councils remain concerned over the potential shift of effort by longline vessels to traditional recreational fishing grounds and the resulting reduction in local availability if commercial harvest intensifies; (2) **Minimize market disruption.** Commercial markets (mainly local) may be disrupted if large quantities of dolphin are landed from intense commercial harvest or unregulated catch and landings by charter or other

components of the recreational sector; (3) **Minimize conflict and/or competition between recreational and commercial user groups**. If commercial longlining effort increases, either directing on dolphin and wahoo or targeting these species as a significant incidental catch, conflict and/or competition may arise if effort shifts to areas traditionally used by recreational fishermen; (4) **Optimize the social and economic benefits of the dolphin and wahoo fishery.** Given the significant importance of dolphin and wahoo to the recreational sector throughout the range of these species and management unit, it is important to manage the resources to achieve optimum yield on a continuing basis; (5) **Reduce bycatch of the dolphin fishery.** Bycatch is a problem in the pelagic longline fishery. Any increase in overall effort, and more specifically shifts of effort into nearer shore, non-traditional fishing grounds by swordfish and tuna vessels, may result in increased bycatch of non-target species; (6) **Direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem**; and (7) **Direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries**.
The Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265) as amended through October 11, 1996 provides the legal basis for the rule.

Description and estimate of the number of small entities to which the proposed rule will apply:

The proposed rule will apply to all dealers, and vessels in the commercial and recreational sectors engaged in the harvest of dolphin and wahoo in the U.S. Atlantic. In the Atlantic, commercial fisheries for dolphin consist primarily of longline and hook and line (which includes hand line, troll, rod and reel and electric reel). The hook and line portion of the commercial fishery is conducted similarly to the recreational hook and line segment, which is described under the recreational fisheries section. The longline component of the fishery consists of longliners that primarily target highly migratory species but may also catch dolphin and longliners that target dolphin directly.

At this time it is not possible to identify the entire universe engaged in these fisheries. An attempt was made to identify vessels landing dolphin and wahoo along the Atlantic coast of Florida. Analysis of the Florida trip ticket data indicated that 1617 vessels (unique vessel numbers) were found to have landed dolphin and/or wahoo on the Florida Atlantic coast during 1997-2001 (1056 in 1997-1999 only).

The measures in this proposed rule could have an impact on all entities or a subset of vessels. The fishery can be divided into: 1) Vessels that are in the for-hire sector that wi1l not qualify for a commercial vessel permit. These entities will be able to operate in the for-hire dolphin/wahoo fishery but will not be able to receive income from the commercial sale of dolphin; 2) Dealers in the dolphin/wahoo fishery who will bear the cost of the dealer permit and who will be required to submit reports on these fisheries; 3) For-hire vessels qualifying for a commercial permit that will be impacted by regulations on recreational fishing and commercial fishing. 4) Commercial vessels that qualify for a vessel permit that will be subject to the commercial fishing restrictions and the commercial fishing reporting requirements; 5) Commercial fishing vessels not qualifying for a permit that would bear the cost of forgone income from dolphin/wahoo sales.

The rule is likely to result in reduced income earned by these vessels to varying degrees. At this time it is not possible to identify the universe of affected entities nor estimate the size of these categories with any degree of accuracy.

Description of the projected reporting, record keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records: There will be some time costs associated with completing the permit applications for vessel permits, dealer permits, and operator permits. The time burden for completing the vessel permit application has been estimated at $5 per application. The proposed rule will require dealer reporting and a logbook reporting system for vessels commercially harvesting dolphin. In addition, further data needs as specified under the ACCSP will be required. All commercial harvesting entities and entities in the for-hire sector will have to meet these reporting requirements. The approximate burden cost for dealer reporting has been estimated at $12.50 per hour. The professional skills necessary to meet these requirements will not change relative to the level that all fishermen are familiar with and have previously used. Compliance will be monitored through existing systems established by the National Marine Fisheries Service and the U.S. Coast Guard.

Identification of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule: No duplicative, overlapping, or conflicting Federal rules have been identified.

Description of significant alternatives to the proposed rule and discussion of how the alternatives attempt to minimize economic impacts on small entities: In Section 4, for each proposed action there is a section on the rejected options. The economic impacts are calculated and/or described for each alternative, and where possible an assessment of the economic impact on small entities is included. The only actions that are likely to result in direct impact on these entities in the dolphin/wahoo fishery are addressed below. The following discussion provides the rationale for the Council's choice of each proposed action in comparison to the alternatives considered for that action item:

1. **Preferred Action 3** should discourage non–reporting and other forms of non-compliance with regulations which will not reduce the expected benefits from other management measures. This action will impose monetary and time cost to dealers from purchasing a dealer permit and submitting regular data reports to the National Marine Fisheries Service. However dealer information will improve economic analyses, and thus management decisions based on this additional information is expected to increased net economic benefits. In comparison, the no action alternative (Option 1) would not impose these costs on dealers. However, Option 1 would not result in increased benefits to society from improved data collection and analyses for better management of these fisheries.

2. **Preferred Action 4** is only expected to have a minor impact on vessels that do not qualify for a dolphin permit. Vessels that do qualify for a permit would incur an annual out of pocket cost not exceeding $50, and a time cost of $5 for completing the application. This measure is expected to slow the growth rate of capacity in the future in comparison to the no action alternative (Option 1). In addition, this measure will increase future economic benefits from better management based on data collected from the known universe of participants and better enforcement of fishing regulations. The Council set these criteria so as to protect the firms that have traditionally sold dolphin/wahoo and depend on these fisheries for a significant part of their income. Furthermore, the Council's intent was to reduce the level of private recreational sale and protect the public from improperly handled fish.

3. **Preferred Action 5** would ensure that vessel operators would be held accountable for federal fishery violations. If there is a permit sanction, that individual may not work in any capacity aboard a federally permitted fishing vessel during the sanction period. Thus, this measure should deter fishery violations. For vessel owners who are not operators this would enhance accountability of the vessel operators they employ and reduce their costs for fishery violations. For owner/operators this action will ensure that if convicted of a fishery management violation they could not work as an operator aboard another fishing vessel. Thus, the Council's preferred option is likely to effect higher compliance than Option 1. A reduction in the incidence of fishery management violations is likely to increase net benefits in the future from a reduction in enforcement costs, a reduction in the cost of the penalties (as a result of voluntary compliance), and gains from increased compliance with fishery management regulations. In comparison, the "no action" alternative is not likely to provide these benefits but there will be no vessel operator fee from implementing this rejected alternative.

4. **Preferred Action 11 i**n comparison to Option 1 will reduce revenue to the recreational sector by a total not expected to exceed $1.46 million. However, the revenue loss in the for-hire recreational sector will be lower than that resulting from implementation of Option 3 since for-hire operations will still be allowed to harvest and sell dolphin. During the 3-5 year phase out period, as specified under Option 2, the for-hire sector would earn higher revenue compared to the situation under the Councils' proposed measure. However, after the phase out period there would be no difference between Option 2 and Option 3 as there would be a prohibition on all recreational sale. If recreational sale results in "localized reduced prices" Option 3 and Option 2 (after the 3-5 year phase out period) would be more effective at preventing this occurrence than the proposed measure and Option 1. The effect on private recreational sale would be no different among this action and Options 2 and 3, since sale by the private recreational sector would be immediately prohibited. Compared to the "no action" alternative, it is expected that there will be reduced harvesting demand for dolphin and wahoo under the proposed action and if either Option 2 or Option 3 were to be implemented. The no action alternative (Option 1) would not address the problem of increased health risks from the sale of recreationally caught fish. The preferred alternative, Option 2 and Option 3 should all result in lowering this risk since they would all restrict recreational sale.

5. **Preferred Action 14** would result in decreased net revenue to those commercial vessels constrained by the trip limit. Option 2 does not specify a trip limit and thus could be more or less restrictive depending on the specific trip limit chosen. However, a trip limit could prevent a sector from exceeding its allocation. If this sector exceeds its allocation there could be reduced net economic benefits. In addition, a management measure that restricts harvest per trip could spread harvest of the "available resource" throughout a longer period and among a larger number of fishermen. If current harvesting practices result in localized "market flooding" net benefits would decrease under the no action option (Option 1).

6. **Preferred Action 15** could constrain harvest in both the recreational and commercial fisheries. This measure would reduce short-term net economic benefits to both recreational anglers and commercial fishermen. Long-term benefits could increase if in the future this measure results in higher quality fishing that is sustainable. If this measure is necessary to prevent growth overfishing then long term benefits will increase. In contrast, Option 1, "no action", would not result in short-term economic losses, however long-term benefits may not

be optimized if a minimum size limit is needed to “improve” the stock status or to prevent growth overfishing.

7. **Preferred Action 16** could reduce total revenue by $3,641 annually assuming there are no price changes. If this measure is necessary to prevent overfishing, prevent localized depletion, or to regulate market supply throughout the year, then economic benefits will increase. In contrast there would be no reduction in commercial ex-vessel revenue from the “no action” alternative (Option 1). Economic benefits could decrease if “no action” results in local market flooding and/or overfishing occurs in the future.

8. **Preferred Action 20** could result in a short-term reduction of $95,655 to $154,770 in revenue for those longline vessels that fish in the HMS proposed closed areas. These estimates only represent the expected losses from reduction in dolphin harvests and not the total reduction in ex-vessel revenue from all species. Regulatory Amendment 1 to the Atlantic Tunas, Swordfish, and Shark Fishery Management Plan established time/area closures for pelagic longline fishing targeting HMS species in the South Atlantic and Gulf of Mexico (HMS closed areas). The HMS closed areas in the South Atlantic region are the Florida Straits (Area between 31^{o} N and 24^{o} N latitude, and 79^{o} W longitude) year round and the Charleston Bump (the area between 31^{o} N and 34^{o} N latitude, and 76^{o} W longitude) from February 1 to April 30 (Map on page 44 and page 165 of Appendix D). In the future the affected longline vessels could respond by increasing effort to target dolphin and other species outside of the closed area in an effort to make up this lost revenue. This action could result in higher net benefits in the future only if these measures reduce the rebuilding time of the depleted HMS populations such that the future benefits outweigh these costs to the longline industry. Not taking action (Option 1) could have economic consequences if longline vessels redirect effort to dolphin and wahoo in the HMS closed areas. There would be no reduction in the bycatch of juvenile highly migratory species, and this situation could result in excessive harvest of dolphin and wahoo. Both effects may not optimize benefits to society. Keeping the HMS closed areas open to longlining for dolphin and wahoo could lead to increased enforcement costs from monitoring the activities of these vessels to ensure that they are not harvesting HMS in these areas.

5.0 ESSENTIAL FISH HABITAT CONSERVATION RECOMMENDATIONS

Established policies and procedures of the SAFMC and the NMFS (Appendix N - Comprehensive Habitat Amendment (SAFMC, 1998c) provide the framework for conserving and enhancing essential fish habitat for dolphin and wahoo. Other Council essential fish habitat policies and procedures are included in their respective EFH documents. Integral components of this framework include adverse impact avoidance and minimization; provision of compensatory mitigation whenever the impact is significant and unavoidable; and incorporation of enhancement as a fundamental component of fishery resource recovery. New and expanded responsibilities contained in the MSFCMA will be met through appropriate application of these policies and principles. In assessing the potential impacts of proposed projects, the Councils, the NMFS, and USFWS are guided by the following general considerations:

- The extent to which the activity would directly and indirectly affect the occurrence, abundance, health, and continued existence of fishery resources;

- The extent to which the goal of “no net-loss of wetlands” would be attained;

- The extent to which an unacceptable precedent may be established or potential for a significant cumulative impact exists;

- The extent to which adverse impacts can be avoided through project modification or other safeguards;

- The availability of alternative sites and actions that would reduce project impacts;

- The extent to which the activity is water dependent if loss or degradation of EFH is involved; and

- The extent to which mitigation may be used to offset unavoidable loss of wetland habitat functions and values.

6.0 DOLPHIN AND WAHOO RESEARCH NEEDS

6.1 Essential Fish Habitat Research Needs

The following constitutes the basic structure of the Council's essential fish habitat (EFH) research and monitoring program contained in the Habitat Plan (SAFMC, 1998b). This general structure provides research recommendations the Council, the National Marine Fisheries Service (NMFS), and other habitat partners in the South Atlantic region view as necessary for carrying out the EFH management mandate.

The Council has determined that the NMFS, in cooperation with other Federal, State and regional habitat partners in the south Atlantic region, will develop the necessary understanding, using basic and applied research and literature syntheses, to help conserve, protect, and restore EFH of living marine resources managed by the Council. Statutes and international conventions and treaties which authorize the NMFS to conserve and restore marine habitat include but are not limited to the Magnuson-Stevens Fishery Conservation and Management Act, the Endangered Species Act, the Fish and Wildlife Coordination Act, the National Marine Sanctuaries Act, the Clean Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund"), and Oil Pollution Act (OPA).

Additional research is necessary to insure sufficient information is collected to support a higher level of description and identification of dolphin and wahoo habitat. In addition, research is needed to identify and evaluate existing and potential adverse effect on dolphin and wahoo habitat, including but not limited to, direct physical loss or alteration; impaired habitat quality or function; cumulative impacts from fishing; and non-gear related fishery impacts.

The Council recommends NMFS apply their adopted Habitat Research Plan to direct and conduct research and transfer results to management components within NMFS. The Council coordinates with NMFS management components to provide information on permit and policy activities and fishery and EFH information for fishery management plans. The NMFS plan is designed to develop the necessary expertise to accomplish or oversee the restoration, creation, or acquisition of habitat to benefit living marine resources. The plan provides guidance in four areas: ecosystem structure and function, effects of alterations on habitat, development of habitat restoration methods, and development of indicators of impact and recovery of habitat. A fifth area is the need for synthesizing and providing timely scientific information to managers.

The Council worked with NMFS and other NOAA programs, including the Office of Ocean and Coastal Resource Management, Coastal Ocean Program, Center for Coastal Ecosystem Health (Charleston, SC), and National Sea Grant Program to meet the goals of NOAA. NMFS will work closely with other federal agencies to increase cooperation and partnerships, maximize research information, and reduce potential duplication of research efforts. The Council has adopted the same general structure for the research and monitoring program. In addition, a list of research needs for dolphin and wahoo is included.

6.1.1 Ecosystem Structure and Function

Understanding the structure and function of natural ecosystems, their linkages to one another, and the role they play in supporting and sustaining living marine resources, their abundance, distribution, and health is critical. Knowing when and how systems are affected, assessing the cause and degree of impact, and providing the basis for restoring and maintaining these systems are integral to this research area and must be evaluated in terms of landscape ecology. Research on ecosystem structure and function will provide the necessary foundation for linking all areas to provide the basis for making fundamentally sound management decisions. Thus, assessment of habitat impacts, development of restoration methods and evaluation of restoration effectiveness, development of indicators of impact and recovery, and synthesis and transfer of information for the development of management policy and regulations all are dependent on a comprehensive understanding of ecosystem structure and functioning.

Research in this area will include studies on the relationship between habitat and yield of living marine resources including seasonality and annual variabilities and the influence of chemical and physical fluxes on these relationships. These research efforts will be dependent upon knowledge of basic life histories, habitat structural integrity and limiting factors, and must be evaluated within the context of habitat mosaics or habitat heterogeneity. Therefore, data on habitat location are integral to this research area. Information on essential fish habitat, variability in yield of fishery resources as a function of material fluxes, habitat type, location and scale should be generated. This research area provides the foundation for understanding cause and effect relationships and development and evaluation of protection and restoration strategies.

6.1.2 Effect of Habitat Alterations

Knowledge of the causes of damage to ecosystems is critical to restoring past losses and preventing future degradation and loss of habitats essential for maintaining and enhancing living marine resources. Therefore, quantification of the response of habitats and living marine resources to natural and anthropogenic alterations is not only a prerequisite to determining the degree of impact, predicting the rate of recovery, and recommending the most effective restoration procedures, but it also is a requisite to establishing effective protective measures.

The basis for determining cause and effect relationships depends on an understanding of the natural structure and function of an ecosystem, individual living marine resource requirements, and population characteristics. The Council is interested in both maintaining sustainable living marine resource populations and protecting the essential fish habitat they depend upon. Habitat partners should conduct research to relate non-fishing impacts observed at the individual level to effects at the population level which would link habitat impacts ultimately to living marine resource populations. Studies should include cause and effect research designed to evaluate responses of living marine resource and habitats to physical and chemical modifications of coastal and estuarine systems. Research is encouraged that considers downstream responses to upland modification, the role of buffers zones, as well as living marine resource and habitat responses to physical and waterflow alterations and water quality modifications. Information should be generated on responses to both individual and cumulative impacts so as to provide the basis for policy statements, guidelines, and regulations to protect habitats. These cause and effect databases will furnish information pertinent not only to permit-related activities, but also to NMFS mandated responsibilities in restoration planning and implementation.

6.1.3 Habitat Restoration Methods

Not applicable.

6.1.4 Indicators of Habitat and Living Marine Resources Impacts and Recovery

Increasing and extensive exploitation of coastal resources demands that indicators be used to simplify the process of determining whether an ecosystem, habitat, or living marine resource is healthy, degraded, or is recovering. The development of indicators of habitat/living marine resource impacts and recovery is critical for managers judging the status of essential fish habitat or fishery resources and determining the need for corrective actions.

The development of habitat or resource indicators must be based on information derived from comparative research on the structure and function of disturbed, natural, and/or restored habitats of different ages and geographical locations for a suite of biological, chemical, and physical parameters; time-dependent biotic population analyses; and contaminant level follow-up evaluations for sediment, biota, and water. This type of research will help managers identify essential fish habitat status; standardize indicators for specific habitats through comparisons across geographic gradients and scales; and develop recommendations on chemical "cleanup" techniques and most appropriate measures to assess success. The Council encourages NMFS, in cooperation with the other habitat partners in the Southeast, to utilize such guideposts to develop and improve best management practice approaches.

6.1.5 Synthesis and Information Transfer

The synthesis and timely transfer of information derived from research findings and the existing literature is a key element of the essential fish habitat research and monitoring program and this program. Decisions on permitting, regulation, enforcement, redirection of research efforts, and development and implementation of restoration plans must be made with the best available information. Scientists must step back from their research long enough to provide timely information syntheses to habitat managers. Likewise, it is imperative that State and Federal habitat managers recognize that generic information generated by the scientific community does have powerful application to their site-specific problems.

Technology and information transfer will be expedited through the use of all available information sources and the application of "user-friendly" information bases. Geographical Information Systems (GIS) provide the opportunity to amass and array large quantities of complex data, thereby, providing potential for relational observations by decision-makers; such use is strongly encouraged. Many areas of synthesis and transfer have been indicated in the earlier four research areas and will not be repeated here. Additional examples include information syntheses on essential fish habitat and essential fish habitat-habitat areas of particular concern and modes of protection and restoration, and synthesis of available information on landscape approaches to basin-wide management including permitting and restoration. Such collations of current and evolving information bases are important to the Council and those charged with the conservation and management of fishery resources as well as to State and Federal habitat managers concerned about developing and implementing policy. These syntheses could be done within NMFS, through partnerships with other agencies, and by contract. It is important, however, that syntheses be provided in a useable format and even published in outlets available to both scientific and management communities. The scientific community must participate in the synthesis and transfer process.

6.1.6 Implementation

The five interlinked areas provide a framework for the type of research and continuity needed to effectively manage EFH. In some instances this linkage between research areas may be hierarchical. Research on ecosystem structure and function provides the foundation for linking all areas. For example, knowledge of the structure and function of the ecosystem must be known before one can actually determine the effects of habitat alterations, develop restoration methods, or develop indicators of impact and recovery. Elements shown for each research area depict the stages and continuity of information required to develop a comprehensive database for making important resource decisions. Research founded on this approach will provide State and Federal habitat managers with a broad information base that is scientifically and ecologically credible, and responsive to management needs. The Council will coordinate with and support NMFS Southeast Regional Office and Fisheries Science Centers in their effort to determine habitat research and management priorities. Research conducted to address the EFH mandate in the Southeast Region should: address regional management and research needs pertinent to the Council, NMFS or other habitat partner responsible for conservation or management of EFH or species which depend on EFH; be consistent with the Council's, NMFS's, and other habitat partner's long-term goals or habitat policies; and provide information about the benefit of protecting EFH or living marine resources.

Cooperative efforts between NMFS research and management staffs, and with other federal/state agencies, industry, and academia, are encouraged. This approach will create greater and improved partnerships, which will be required if we are to meet the Council's, NOAA's, and NMFS's goal to protect, conserve, and restore essential fish habitat through sound habitat research. In addition, the Council will support programmatic EFH research proposals when requested from and developed by NMFS SEFSC.

Habitat and species specific research needs identified in Council Fishery Management Plans are presented below for pelagic *Sargassum* habitat.

6.1.7 Prioritized EFH Research Needs for Dolphin and Wahoo

This determination was developed based on research needs identified through the Pelagic Water Column Workshop, Research and Monitoring Workshop, Settle (1997) and the NMFS Biological Opinion for the Sargassum FMP (SAFMC, 2002) as they apply to dolphin and wahoo.

1. What is the areal and seasonal abundance of pelagic *Sargassum* off the southeast U.S.?
2. Develop methodologies to assess remotely assess *Sargassum* using aerial or satellite technologies (e.g., Synthetic Aperture Radar)?
4. What is the relative importance of pelagic *Sargassum* weedlines and oceanic fronts for early life stages of dolphin and wahoo?
5. Are there differences in abundance, growth rate, and mortality?
6. What is the age structure of all fishes that utilize pelagic *Sargassum* habitat as a nursery and how does it compare to the age structure of recruits to pelagic and benthic habitats?
7. Is pelagic *Sargassum* mariculture feasible?
8. Determine the species composition and age structure of species associated with pelagic *Sargassum* when it occurs deeper in the water column?
9. Additional research on the dependencies of pelagic *Sargassum* productivity on the marine species using it as habitat.
10. Quantify the contribution of nutrients to deepwater benthic habitat by pelagic *Sargassum*.
11. Studies should be performed on the abundance, seasonality, life cycle, and reproductive strategies of Sargassum and the role this species plays in the marine environment, not only as an essential fish habitat, but as a unique pelagic algae.
12. Research to determine impacts on the *Sargassum* community, as well as the individual species of this community that are associated with, and/or dependent on, pelagic *Sargassum*. Human-induced (tanker oil discharge; trash) and natural threats (storm events) to *Sargassum* need to be researched for the purpose of protecting and conserving this natural resource.
13. Develop cooperative research partnerships between the Council, NMFS Protected Resources Division, and state agencies since many of the needs to a) research pelagic *Sargassum*, and b) protect and conserve pelagic *Sargassum* habitat, are the same for both managed fish species and listed sea turtles.
14. Direct specific research to further address the association between pelagic *Sargassum* habitat and post-hatchling sea turtles

6.2 Prioritized Research Needs for Dolphin and Wahoo.

The determination is based on Prager, 2000 and SAFMC, 1998a research workshop recommendations.

Research needs include but are not limited to the following:

1. In the short-term effort should be directed at examining all existing seasonality (effort and landings), mean size, and life history data for dolphin from the northern area.
2. Additional data are needed to develop and/or improve estimates of growth, fecundity, etc. Research in this area is encouraged.
3. There are limited social and economic data available. Additional data need to be obtained and evaluated to better understand the implications of fishery management options.
4. Trophic data should be considered in support of an ecosystem management approach.
5. Essential fish habitats for dolphin and wahoo need to be identified.
6. An overall design should be developed for future tagging work. This could be done by the Working Group. In addition, existing tagging databases should be examined.
7. Long-term work should continue and expand on current research investigating genetic variability of dolphin populations in the western central Atlantic.
8. Observer programs should place observers on longline trips directed on dolphin. Catch and bycatch characterization, condition released (alive or dead), etc. should be collected. Observers could also be used to collect bioprofile data (size, sex, hard parts for aging, etc.).
9. High levels of uncertainty in inter-annual variation in abundance of dolphin should be investigated through an examination of oceanographic and other environmental factors.
10. Release mortality should be investigated as a part of the evaluation of the effectiveness of current minimum size limits in the dolphin fishery.
11. Establish a list serve for dolphin and wahoo which would facilitate research and the exchange of information.

Note: An additional recommendation of the workshop was to establish a regional working group to develop and implement a coordinated research program for dolphin and wahoo.

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SAFMC Dolphin Wahoo Workshop Report:
Dr. Hazel A. Oxenford, MAREMP, University of the West Indies, Barbados; Dr. Brian Luckhurst, Division of Fisheries, Bermuda; and Mr. Peter A. Murray, OECS, St. Lucia, West Indies served as editors of this report. South Atlantic Council Staff provided administrative support by serving as moderators, recording the workshop, transcribing summary minutes, typing the report, and providing funding for the three invited researchers. The proceedings were prepared by Gregg Waugh, Mike Jepson, and Kerry O'Malley.

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The following individuals were involved in workshops or on writing teams which developed essential fish habitat information presented in the SAFMC Habitat Plan (SAFMC, 1998b) which has been incorporated into this fishery management plan.

SAFMC Habitat Sub-Group Workshop (Pelagic Habitat - *Sargassum* and Water Column): Workshop #9 October 7-8, 1997

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Illustrations
Dolphin and wahoo illustrations presented in the Habitat Plan are by Duane Raver in Manooch,III, C.S. and D. Raver, Jr. 1984. “Fisherman’s guide: Fishes of the Southeastern United States.”

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SAFMC Habitat Advisory Panel
SAFMC Scientific and Statistical Committee
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New Hampshire Coastal Zone Management Program
Rhode Island Coastal Zone Management Program
Massachusetts Coastal Zone Management Program
Connecticut Coastal Zone Management Program
New York Coastal Zone Management Program
New Jersey Coastal Zone Management Program
Delaware Coastal Zone Management Program
Pennsylvania Coastal Zone Management Program
Maryland Coastal Zone Management Program
Virginia Coastal Zone Management Program
North Carolina Coastal Zone Management Program
South Carolina Coastal Zone Management Program
Georgia Coastal Zone Management Program
Florida Coastal Zone Management Program
Florida State Clearing House, Department of Community Affairs
Florida Department of Environmental Protection
Florida Marine Fisheries Commission
Georgia Department of Natural Resources
South Carolina Department of Natural Resources
North Carolina Department of Environment, Health, and Natural Resources

South Carolina Department of Health and Environmental Control
Maine Department of Marine Resources
New Hampshire Fish and Game Department
Rhode Island Division of Fish and Wildlife
Massachusetts Division of Marine Fisheries
Connecticut Department of Environmental Protection
New York State Department of Environmental Conservation
New Jersey Division of Fish, Game and Wildlife Department of Environmental Protection
Delaware Department of Natural Resources and Environmental Control
Pennsylvania Fish and Boat Commission
Maryland Department of Natural Resources
Virginia Marine Resources Commission
Gulf and South Atlantic Fisheries Development Foundation
MAFMC & NEFMC
National Marine Fisheries Service

- Washington Office
- Office of Ecology and Conservation
- Southeast Region
- Northeast Region
- Beaufort Lab
- Charleston Lab
- Southeast Fisheries Science Center
- Northeast Fisheries Science Center

National Oceanic and Atmospheric Administration

- General Counsel
- SEA Division/ORCA
- Coastal Services Center

United States Fish and Wildlife Service
United States Coast Guard
United States Environmental Protection Agency, Region IV
National Coalition for Marine Conservation
Coastal Conservation Association of Florida
Center for Marine Conservation
National Fisheries Institute
Bluewater Fishermen
Florida Sea Grant
Atlantic States Marine Fisheries Commission
North Carolina Fisheries Association
Organized Fishermen of Florida
The Georgia Conservancy
Reefkeeper International
Harbor Branch Institute
Monroe County Commercial Fishermen, Inc.
Audubon Living Oceans Campaign

9.0 OTHER APPLICABLE LAW

9.1 Vessel Safety

PL. 99-659 amended the Magnuson-Stevens Act to require that a fishery management plan or amendment must consider, and may provide for, temporary adjustments (after consultation with the U.S. Coast Guard and persons utilizing the fishery) regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safety of the vessels.

No vessel will be forced to participate in the fishery under adverse weather or ocean conditions as a result of the imposition of management regulations set forth in this amendment. Therefore, no management adjustments for fishery access will be provided.

There are no fishery conditions, management measures, or regulations contained in this amendment which would result in the loss of harvesting opportunity because of crew and vessel safety effects of adverse weather or ocean conditions. No concerns have been raised by people engaged in the fishery or the Coast Guard that the proposed management measures directly or indirectly pose a hazard to crew or vessel safety under adverse weather or ocean conditions.

Therefore, there are no procedures for making management adjustments in this amendment due to vessel safety problems because no person will be precluded from a fair or equitable harvesting opportunity by the management measures set forth.

There are no procedures proposed to monitor, evaluate, and report on the effects of management measures on vessel or crew safety under adverse weather or ocean conditions.

9.2 Coastal Zone Consistency

Section 307(c)(1) of the federal Coastal Zone Management Act of 1972 requires that all federal activities which directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the Councils to have complementary management measures with those of the states, federal and state administrative procedures vary and regulatory changes are unlikely to be fully instituted at the same time. Based upon the assessment of this plan's impacts in previous sections, the Councils have concluded this plan is an improvement to the federal management measures for dolphin and wahoo. The Councils have determined the plan to be consistent with existing state Coastal Zone Management Plans to the maximum extent practicable.

This determination was submitted and deemed to consistent with the Atlantic responsible state agencies under Section 307 of the Coastal Zone Management Act administering approved Coastal Zone Management Programs in the states. The determination was submitted to state agencies in the Gulf of Mexico under Section 307 of the Coastal Zone Management Act administering approved Coastal Zone Management Programs in these states.

9.3 Endangered Species and Marine Mammal Acts

The Sustainable Fisheries Act of 1996 established certain requirements and standards the Councils and the Secretary must meet in managing fisheries under the Magnuson-Stevens Act. Implementing the provisions in this fishery management plan will not likely adversely affect any listed and protected species under the Endangered Species Act (ESA) and Marine Mammals Protection Act (MMPA) in the action area including [Note: See Appendix F for the Councils detailed rationale.]:

Whales:	Date Listed
(1) Northern right whale- *Eubalaena glacialis* (ENDANGERED) (Critical Habitat Designated)	12/2/70
(2) Humpback whale- *Magaptera novaeangliae* (ENDANGERED)	12/2/70
(3) Fin whale- *Balaenoptera physalus* (ENDANGERED)	12/2/70
(4) Sei whale- *Balaenoptera borealis* (ENDANGERED)	12/2/70
(5) Sperm whale- *Physeter macrocephalus* (ENDANGERED)	12/2/70
(6) Blue whale- *Balaenoptera musculus* (ENDANGERED)	12/2/70

Sea Turtles:	Date Listed
(1) Kemp's ridley turtle- *Lepidochelys kempii* (ENDANGERED)	12/2/70
(2) Leatherback turtle- *Dermochelys coriacea* (ENDANGERED)	6/2/70
(3) Hawksbill turtle- *Eretmochelys imbricata* (ENDANGERED)	6/2/70
(4) Green turtle- *Chelonia mydas* (THREATENED/ENDANGERED)	7/28/78
(5) Loggerhead turtle- *Caretta caretta* (THREATENED)	7/28/78

Fish:	
(1) Shortnose sturgeon- *Acipenser brevirostrum* (ENDANGERED)	3/11/67

Seagrasses:	
(1) Johnson's seagrass- *Halophilia johnsonii* (THREATENED) (Critical Habitat Designated)	9/14/98

Species Proposed for Listing
None

Designated Critical Habitat
Right Whale: Between 31°15' N. Latitude (approximately the mouth of the Altamaha River, Georgia) and 30°15' N. Latitude (approximately Jacksonville Beach, Florida) from the coast out to 15 nautical miles offshore; the coastal waters between 30°15' N. Latitude and 28°00' N. (approximately Sebastain Inlet, Florida) from the coast out to 5 miles.

Proposed Critical Habitat
None

Candidate Species- Fish
Dusky shark *Carachahinus obscrurus*
Sand Tiger Shark *Odontaspis taurus*
Night Tiger Carachahinus signatus
Speckled hind *Epinephelus drummondhayi*
Atlantic sturgeon *Acipenser oxyrhynchus oxyrhynchus*
Mangrove rivulus *Rivulus mamoratus*
Opposum pipefish *Microphis barchyurus lineatus*
Key silverside *Menidia conchorum*
Golith Grouper (formerly Jewfish) *Epinephelus itajara*
Warsaw grouper *Epinephelus nigritus*
Nassau grouper *Epinephelus striatus*

Other Species Under U.S. Fish and Wildlife Service Jurisdiction:	Date Listed
(1) West Indian manatee- *Trichechus manatus* (ENDANGERED)	3/67
(Critical Habitat Designated)	1976
(2) American crocodile - *Crocodulus acutus* (ENDANGERED)	9/75
(Critical Habitat Designated)	12/79

Research efforts identifying use of *Sargassum* habitat by juvenile sea turtles is summarized in the *Sargassum* Fishery Management Plan (SAFMC, 2002).

9.4 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to control paperwork requirements imposed on the public by the federal government. The authority to manage information collection and record keeping requirements is vested with the Director of the Office of Management and Budget. This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

The Council is proposing measures under this plan to require reporting, a vessel permit, operator's permit, and dealer permit.

9.5 Federalism

No federalism issues have been identified relative to the actions proposed in this amendment and associated regulations. The affected states have been closely involved in developing the proposed management measures and the principal state officials responsible for fisheries management in their respective states have not expressed federalism related opposition to adoption of this plan.

9.6 National Environmental Policy Act

The discussion of the need for this amendment, proposed actions and alternatives, and their environmental impacts are contained in Sections 1.0 and 2.0 of this plan and the environmental impact statement. A description of the affected environment is contained in Section 3.0 and Council recommendations for protection of essential fish habitat and are contained in Section 5.0.

The proposed plan is a major action having a significant positive impact on the quality of the marine and human environment of Atlantic, Caribbean and Gulf of Mexico. The proposed action will have a significant positive impact by taking a precautionary, risk averse approach in managing the dolphin and wahoo resources and their essential fish habitat and essential fish habitat-habitat areas of particular concern.

Mitigating measures related to proposed actions are unnecessary. No unavoidable adverse impacts on protected species, wetlands, or the marine environment are expected to result from the proposed management measures in this plan.

Overall, the benefits to the nation resulting from implementation of this fishery management plan are greater than management costs.

Environmental Significance and Impact of the Fishery, Proposed Action, and Alternatives

Section 4.0 describes the Council's management measures in detail. Section 1508.27 of the CEQ Regulations list 10 points to be considered in determining whether or not impacts are significant. The analyses presented below are based on the detailed information contained in Section 4.0 Environmental Consequences including the Regulatory Impact Review, Regulatory Flexibility Determination, and Social Impact Assessment.

Beneficial and Adverse Impacts

There are beneficial and adverse impacts from the proposed actions. The impacts are described for each action in Section 4.0 and summarized in Section 2.0.

Summary of Adverse Impacts: For a detailed discussion of the biological, social, and economic adverse impacts of the proposed measures refer to the biological, social, and economic impact discussions under each Action in Section 4.2.

Summary of Beneficial Impacts: For a detailed discussion of the biological, social, and economic beneficial impacts of the proposed measures refer to the biological, social, and economic impact discussions under each Action in Section 4.2.

Public Health or Safety

The proposed actions, and their alternatives, are not expected to have any substantial adverse impact on public health or safety.

Unique Characteristics

The proposed actions have no impacts on characteristics of the area such as proximity to historic or cultural resources, park lands, wetlands, or ecologically critical areas.

Controversial Effects

The proposed actions are expected to have significant controversial effects with prohibition of longlining in HMS closed areas and prohibition on the sale of recreationally caught fish. The Councils provided extensive opportunity for input by holding public hearings, receiving public comment at Council meetings, and by providing the opportunity for interested persons to provide written and email comments. During development of this plan, the Councils incorporated suggestions from the public and their advisory panels. Additionally, states incorporate public input into their management measures which the Council is requesting track federal measures.

Uncertainty or Unique/Unknown Risks

The proposed actions are not expected to have any significant effects on the human environment that are highly uncertain or involve unique or unknown risks. Benefits from management cannot be quantified but the direction and relative magnitude are known and are positive. If the proposed actions were not implemented there would be a high level of uncertainty as to the future status of dolphin and wahoo resources and their essential fish habitat.

Precedent/Principle Setting

The proposed actions are not expected to have any significant effects by establishing precedent and do not include actions which would represent a decision in principle about a future consideration.

Relationship/Cumulative Impact

The proposed actions are not expected to have any significant cumulative negative impacts that could have a substantial effect on resources or any related stocks, including sea turtles. See Appendix F for the Councils detailed rationale.

Historical/Cultural Impacts

The proposed actions are not expected to have any significant effects on historical sites listed in the National Register of Historic Places and will not result in any significant impacts on significant scientific, cultural, or historical resources.

Endangered/Threatened Species Impacts

The proposed actions are not expected to have any negative effects on any endangered or threatened species or marine mammal population. See Appendix F for the Councils detailed rationale. Critical habitats, established under ESA, have been designated in the South Atlantic for the Northern Right Whale and Johnson's Seagrass. Therefore, the Councils concluded the proposed management measures will not adversely affect the recovery of endangered or threatened species or their critical habitat.

Interaction With Existing Laws for Habitat Protection

The proposed actions are expected to have a positive interaction with existing Federal requirements imposed for the protection of the environment. The proposed actions will enhance existing federal regulations protecting fisheries under the jurisdiction of the Councils and coordinate with State, Federal, regional, and international efforts to protect their essential fish habitat.

Effects of the Fishery on the Environment

Section 4.2 of the Habitat Plan contains a discussion on threats to essential habitat from fishing activities in the Atlantic. The Councils evaluated the effects of fisheries under their jurisdiction on the environment and concluded no other fishing activity impacts EFH for dolphin and wahoo except for the harvest of pelagic *Sargassum* in the Atlantic which the SAFMC considers to be a direct removal of dolphin and wahoo EFH and EFH-HAPCs. Implementation of the management measures to reduce, to the maximum extent practicable, the impact of fisheries on essential fish habitat for dolphin and wahoo is necessary under the *Sargassum* FMP or, if not through the *Sargassum* FMP, then implemented pursuant to action under the framework of this FMP.

Bycatch

Bycatch from the longline fishery has been recognized as a problem. Any increase in total effort redirected from swordfish, shark, and tuna fisheries on dolphin and wahoo or into nearshore areas to increase their catch of dolphin and wahoo, may increase overall bycatch.

Effort Directed at or From Other Fisheries

Measures proposed in this plan are intended to minimize the shift of vessels from other fisheries into the dolphin and wahoo fishery.

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Appendix F. .

11.0 APPENDICES

Appendix A. MRFSS Economic Add-On Question for Dolphin Management (Source: MRFSS 1999).

Management for Dolphins

For the species you listed as target species (in this case dolphin), indicate which of the following conservation measures you prefer?

Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	1,737	26.7	1,737	26.7
Maximum Size	427	6.6	2,164	33.3
Bag Limit	2,148	33.0	4,312	66.3
Diff Seasonal Limit	344	5.3	4,656	71.6
Areal Restriction	131	2.0	4,787	73.6
Limit Who Can Fish	169	2.6	4,956	76.2
No Preference	1,073	16.5	6,029	92.8
DK	438	6.7	6,467	99.5
R	33	0.5	6,500	100.0

Frequency Missing = 1

Management for Dolphins

State of Intercept = Florida

Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	1,033	27.0	1,033	27.0
Maximum Size	280	7.3	1,313	34.3
Bag Limit	1,275	33.3	2,588	67.6
Diff Seasonal Limit	215	5.6	2,803	73.2
Areal Restriction	71	1.9	2,874	75.1
Limit Who Can Fish	96	2.5	2,970	77.6
No Preference	591	15.4	3,561	93.0
DK	243	6.3	3,804	99.4
R	24	0.6	3,828	100.0

Frequency Missing = 1

Management for Dolphins

State of Intercept = Georgia Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	61	22.9	61	22.9
Maximum Size	23	8.6	84	31.6
Bag Limit	68	25.6	152	57.1
Diff Seasonal Limit	12	4.5	164	61.7
Areal Restriction	11	4.1	175	65.8
Limit Who Can Fish	7	2.6	182	68.4
No Preference	53	19.9	235	88.3
DK	31	11.7	266	100.0

Management for Dolphins

State of Intercept = South Carolina Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	217	27.0	217	27.0
Maximum Size	47	5.9	264	32.9
Bag Limit	251	31.3	515	64.1
Diff Seasonal Limit	36	4.5	551	68.6
Areal Restriction	19	2.4	570	71.0
Limit Who Can Fish	24	3.0	594	74.0
No Preference	160	19.9	754	93.9
DK	46	5.7	800	99.6
R	3	0.4	803	100.0

Management for Dolphins

State of Intercept = North Carolina

Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	426	26.6	426	26.6
Maximum Size	77	4.8	503	31.4
Bag Limit	554	34.6	1,057	65.9
Diff Seasonal Limit	81	5.1	1,138	71.0
Areal Restriction	30	1.9	1,168	72.9
Limit Who Can Fish	42	2.6	1,210	75.5
No Preference	269	16.8	1,479	92.3
DK	118	7.4	1,597	99.6
R	6	0.4	1,603	100.0

Management for Dolphins

Mode = Shore

Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	538	24.0	538	24.0
Maximum Size	164	7.3	702	31.3
Bag Limit	681	30.3	1,383	61.6
Diff Seasonal Limit	140	6.2	1,523	67.8
Areal Restriction	78	3.5	1,601	71.3
Limit Who Can Fish	58	2.6	1,659	73.9
No Preference	404	18.0	2,063	91.9
DK	172	7.7	2,235	99.6
R	10	0.4	2,245	100.0

Management for Dolphins

Mode = Charter

Management Measure	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
Minimum Size	333	29.3	333	29.3
Maximum Size	71	6.2	404	35.5
Bag Limit	406	35.7	810	71.2
Diff Seasonal Limit	66	5.8	876	77.0
Areal Restriction	18	1.6	894	78.6
Limit Who Can Fish	29	2.6	923	81.2
No Preference	146	12.8	1,069	94.0
DK	65	5.7	1,134	99.7
R	3	0.3	1,137	100.0

Management for Dolphins

Mode = Private/Rental

Management Measure	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
Minimum Size	866	27.8	866	27.8
Maximum Size	192	6.2	1,058	33.9
Bag Limit	1,061	34.0	2,119	68.0
Diff Seasonal Limit	138	4.4	2,257	72.4
Areal Restriction	35	1.1	2,292	73.5
Limit Who Can Fish	82	2.6	2,374	76.1
No Preference	523	16.8	2,897	92.9
DK	201	6.4	3,098	99.4
R	20	0.6	3,118	100.0

Frequency Missing = 1

Appendix B. Exploratory Dolphin Stock Assessment (Prager, 2000).

Exploratory Assessment of Dolphinfish, *Coryphaena hippurus*, based on U.S. Landings from the Atlantic Ocean and Gulf of Mexico

DRAFT

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Abstract

The dolphinfish *Coryphaena hippurus* is a large, fast-swimming fish found worldwide in tropical and subtropical ocean waters. Dolphinfish are top-level predators that grow rapidly and mature in less than one year. The species supports both commercial and recreational fisheries in U. S. waters and in other national and international waters of at least 20°C. The current stock hypothesis, of one stock in the Gulf of Mexico and South Atlantic, plus a second stock ranging south in the Caribbean Sea from the Virgin Islands, was provisionally accepted for this report.

Through reanalysis of growth data and application of empirical methods, the annual rate of natural mortality M was estimated as about 0.68 to 0.80 per year. Such values are similar to those accepted for yellowfin tuna, another wide-ranging, fast-growing, predatory species found in warm ocean waters.

An index of relative abundance was developed on data from the U.S. longline fishery, and the index was used to fit a surplus production model. Model results include estimated MSY of about 12,000 mt/yr; estimated F_{MSY} of about 0.5/yr; and estimated stock status at the start of 1998 as above B_{MSY}. These results are plausible but uncertain; the uncertainty being due primarily to the abundance index, whose accuracy is unknown. A more fundamental source of uncertainty is the scarcity of information on stock structure.

For comparison, proxies for reference points were also computed. Based on the above estimates of M, the proxy estimate of F_{MSY} is about 0.5 to 0.8 per year. Based on an average of recent landings, a proxy estimate of MSY is about 7,200 to 8,100 mt/yr. It is not known whether the production-model estimates or these proxies are more accurate.

The benchmark and proxy estimates and the life history of dolphinfish suggest that it might be able to withstand a relatively high rate of exploitation. However, results are exploratory and uncertain, and no good index of relative abundance yet exists. In addition, U.S. data are unlikely to encompass the entire hypothesized stock.

The most important research needed to improve assessment includes studies of stock structure, studies of current vital rates, and modeling studies on abundance indices. A fishery-independent source of relative abundance information would be extremely valuable. International cooperation could potentially leverage U.S. efforts and improve data coverage of this transnational stock. With added research to rely on, future assessments of this resource could be more definitive.

1 Introduction

The dolphinfish[1] *Coryphaena hippurus* is a large, fast-swimming fish found worldwide in tropical and subtropical ocean waters. The species supports commercial and recreational fisheries in North Atlantic waters off the United States and in the Gulf of Mexico; those fisheries have been described by Thompson (1999). A synopsis of available biological information is provided by Palko et al. (1982), who describe the species thus: "dolphins are top-level predators, very agile, and capable of taking fast-moving prey."

The species is considered highly desirable for food, and it is widely sought by fishermen for food and recreation. Distribution is limited to the warm side of the 20°C isotherm, and dolphinfish are caught in suitable waters across the Atlantic basin, in the Gulf of Mexico, and in the Mediterranean Sea.

Accurate assessment of dolphinfish in U.S. waters is hindered by several factors. There is no statistics program in place specifically aimed at sampling the species, although records of dolphinfish appear in NMFS longline logbook, weighout, and MRFSS databases, and in data from other programs as well. However, the geographical sampling extents of those databases are not ideal for dolphinfish. Most (about 80% to 90%) of the landings are in recreational fisheries, which are usually more difficult to sample than commercial fisheries. The degree of dead discarding and live-release mortality is not well known. Stock structure is still uncertain, as discussed below. Most vital rates have not been reliably estimated, or the applicability of existing estimates is uncertain because of doubts about stock structure. Thus, it is doubtful that a meaningful catch-at-age matrix could be constructed. Recognizing this limitation, in this report a non-age-structured assessment model (surplus production model) is used for assessment purposes.

2 Stock Structure

Based on seasonal patterns in catch and on genetic observations, Oxenford and Hunte (1986) postulated a two-stock structure for dolphin in the western Atlantic. Under this hypothesis, a southern stock is found east and north of South America and extending northward to the Virgin Islands. Above the Virgin Islands, starting roughly at Puerto

[1]The common name preferred by AFS (1980) is dolphin; others include mahi-mahi, dorado, and dolphinfish. The last is used here to avoid potential confusion with marine mammals,

Rico and extending north to North Carolina and north along the U.S. Atlantic coastline, the northern stock is found. Analyses in this report are made under this two-stock hypothesis and are concerned only with the northern stock.

Because the distribution of dolphin is basin-wide (given suitable temperatures), an analysis of fish caught off the United States is probably not sufficient to accurately characterize population dynamics of even this northern stock. At the least, data from Caribbean nations such as Cuba and Jamaica will be missing; if the stock extends to the eastern Atlantic, data from the eastern side of the basin will be missing. Furthermore, it is not known whether dolphinfish in the Gulf of Mexico should be considered part of the northern stock. In this report, they are so considered, but this assumption is made in the absence of data and so is an important source of uncertainty.

3 Vital Rates

The vital rates (growth, maturity, fecundity, mortality) of a stock offer insights into the degree of exploitation that it might endure without undue stock decline. As well as being used directly in data-intensive analyses such as spawning-stock biomass per recruit analysis, yield per recruit analysis, and sequential population analysis (VPA and similar analyses), information on vital rates and other life-history characteristics can be helpful in judging the permissible degree of exploitation in information-poor situations. From maturity, fecundity and growth patterns, one can form at least a qualitative impression of the likely response of a stock to exploitation. In addition one can compare a species to other species of similar life history about which more is known, or at least experience of which is more extensive.

In such a life-history approach, one generally expects that a relatively infecund, slow-maturing species can sustain a lesser degree of exploitation than a relatively fecund, early-maturing species. Examples of the former group would be most shark species; of the latter, species such as tropical tunas and menhadens. A notable exception to this general picture is that small, fast-growing, planktiverous species in coastal upwelling zones have been prone to drastic population crashes: a conspicuous example is the California sardine *Sardinops sagax* (MacCall 1979). However, fast-growing, early-maturing, predatory species that are more oceanic in distribution have not experienced such crashes, despite many decades of at least moderately intensive exploitation. This does not preclude the possibility of a crash under some excessive level of exploitation

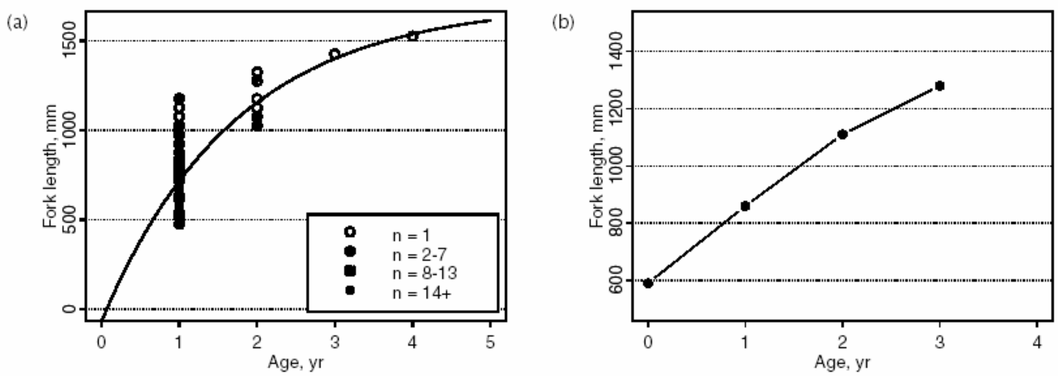

Figure 1. Data from published growth studies on dolphinfish with newly fitted von Bertalanffy growth functions. (a) Beardsley (1967); (b) Rose and Hassler (1968).

that might be reached in future.

3.1 Growth

Growth of dolphinfish is rapid. Beardsley (1967) examined 511 dolphin from waters off south Florida ranging in size from 475 to 1,525 mm fork length (FL). Of the 1-year-olds, the size range was 475 to 1,175 mm FL. No growth model was fitted in that study. In the present study, to provide values for use in empirical estimates of mortality rates (described in §3.3 below), a von Bertalanffy growth function

$$L_t = L_\infty \left(1 - \exp\left(-K(t - t_0)\right)\right) \tag{1}$$

was fit to the grouped length-at-age data of Beardsley (1967) as read from his Fig. 5. The resulting growth function is

$$L_t = 1710 \left(1 - \exp(-0.583[t - 0.07])\right), \tag{2}$$

and it appears to describe the sizes at age of those specimens reasonably well (Fig. 1a). Some of the dispersion apparent in Fig. 1a stems from the practice of reporting fish ages as integers, thus not accounting for growth increments less than one year; the scatter would presumably be less if ages were recorded to the nearest month or sizes were back-calculated to size at the time of formation of the last annulus.

A second relevant growth study was based on samples from the recreational charter-boat fishery off Hatteras, North Carolina. Rose and Hassler (1968) examined 738 specimens during the 1961 through 1963 fishing seasons. Age determination was by scale reading; the oldest fish observed was 3 yr old (more precisely, under 4 yr old, as 3 but not 4 annuli were observed). Rose and Hassler (1968) fitted several models, including a length–weight model and a model relating body length to scale length, but they did not fit a standard growth model. As part of the present study, the grouped size-at-age data were read from their Fig. 3 and a von Bertalanffy model was fit. The resulting estimated growth function (Fig. 1b) is

$$L_t = 2459\left(1 - \exp(-0.158(t + 1.74))\right). \tag{3}$$

Statistical details for reanalysis of the two data sets were similar. Distribution of size at age was discernible from Beardsley (1967), but not from Rose and Hassler (1968), so for reanalysis of that study's data, a single size (the reported mean) was used for each age. In each reanalysis, recorded sizes were statistically weighted by sample sizes reported by the original authors.

Both reports truncated all ages to integer, without any attempt to estimate true age by examining growth since the last annulus or by considering month of collection. The effect of such truncation is loss of precision in the estimates of the von Bertalanffy growth parameters and likely bias in the estimate of t_0. The truncation would not be expected to bias estimates of K or L_∞ directly.

The growth curves corresponding to the two studies are somewhat different (Fig. 1. Because fish examined by Rose and Hassler (1968) were on average younger than those examined by Beardsley (1967), the former study may not describe size of older fish as well, and its estimate of asymptotic length L_∞ may not as closely reflect the overall maximum length of older fish in the stock.

The growth curves estimated here describe slower patterns of growth than that reported by Oxenford and Hunte (1983) from Barbados. That is not surprising, because fish in North Carolina and Florida waters are part of the presumed northern, rather than southern, stock, and they live in colder waters. For purposes of this report, the two sets of growth parameters estimated from U.S. waters seem more relevant.

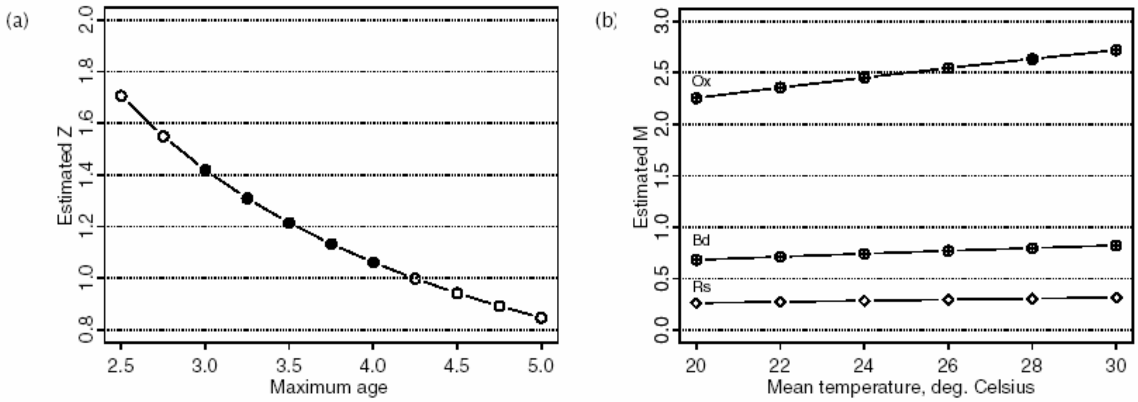

Figure 2. Empirical estimates of mortality rates for dolphinfish. (a) Estimates of total mortality rate Z from maximum observed age t_∞ by method of Hoenig (1983). Filled circles reflect range of t_∞ reported in literature. (b) Estimates of natural mortality rate M from growth parameters and average water temperature. Curve Ox is based on Oxenford and Hunte's estimates from Barbados; curve Be is based on growth data from Florida waters (Beardsley 1967) and reanalyzed here; curve Rs is based on growth data from NC waters, (Rose and Hassler 1968) and reanalyzed here.

3.2 Maturity and Fecundity

No analysis of reproductive biology was made for this report. Nonetheless, in considering the species' overall life history, a few key points from Beardsley (1967) will be summarized. In Florida waters, both sexes reach sexual maturity in the first year of life. The spawning season is extended, and multiple spawning may be common in both sexes. Total egg production per female is 240,000 to nearly 3 million eggs per year for a range of sizes from 500 mm to 1,100 mm FL. Rose and Hassler (1968) found that, of those they examined, few of the 2-year-old fish and none of the 3-year-old fish were females, but they attributed this sexual differential to "differential feeding habits of the sexes," leading to biased sampling (towards males) in their study, which used hook-and-line gear, rather than a population sex ratio different from unity. Other studies of reproductive biology are summarized in Palko et al. (1982).

3.3 Mortality Rates

Only one direct estimate of mortality rate was located in the literature. Bentivoglio (1988) used a Robson–Chapman estimator to estimate total mortality in the Gulf of Mexico Z at about 8.2/yr. That value does not seem feasible for dolphinfish in the Atlantic, where Beardsley (1967) found one 4-yr-old fish in a sample of 511. Assuming random

Table 1. Estimates of instantaneous rate of total mortality and corresponding annual survival fraction; method of Hoenig (1983).

Maximum age, yr	Total mortality rate Z	Survival fraction S
2.50	1.71	0.18
2.75	1.55	0.21
3.00	1.42	0.24
3.25	1.31	0.27
3.50	1.21	0.30
3.75	1.13	0.32
4.00	1.06	0.35
4.25	1.00	0.37
4.50	0.94	0.39
4.75	0.89	0.41
5.00	0.85	0.43

sampling, the probability of finding so old a fish in a sample of 511 is approximately $511e^{-8.2 \cdot 4} = 2.9 \times 10^{-12}$, which can be considered very close to zero. The probability of finding a fish even 3 yr old would be about 1.1×10^{-8}. Thus, it is almost certain that either the estimate $\hat{Z} = 8.2$ is imprecise or inaccurate, that fish in the Gulf of Mexico have quite different vital rates from fish in the Atlantic, or that vital rates have changed dramatically through time. The following conclusion was reached by Bentivoglio (1988): "From all growth studies done in the Atlantic, the Gulf of Mexico dolphin population would seem to resemble the southern population as determined by Oxenford and Hunte (1986) [in having faster growth rates than fish in U.S. Atlantic waters.]."

Absent direct estimates, mortality rates are often estimated from other information using two empirical methods. The method of Pauly (1979) estimates natural mortality rate M from parameters L_∞ and K of the von Bertalanffy growth model and mean prevailing water temperature. The method of Hoenig (1983) estimates total mortality rate Z from the oldest age observed in a large sample, and is sometimes used to estimate M under the assumption that the sample comes from an unfished stock.

The two empirical methods were applied to approximate mortality rates of dolphinfish in the Atlantic (the northern stock). For the range of maximum ages reported in Beardsley (1967), Rose and Hassler (1968), and Oxenford and Hunte (1983) of 3 yr

Table 2. Estimates of instantaneous rate of annual natural mortality M as a function of growth parameters and mean water temperature; method of Pauly (1979). For key to study appreviations, see caption to Fig. 2.

Mean water temp, °C	M from study Ox	M from study Be	M from study Ro
20	2.254	0.681	0.262
22	2.355	0.712	0.273
24	2.452	0.741	0.285
26	2.545	0.769	0.295
28	2.634	0.796	0.306
30	2.719	0.822	0.316

to 4 yr, the Hoenig (1983) method provides estimates of total mortality rate Z from 1.42/yr declining to 1.06/yr as the maximum observed age increases (Fig. 2a, Table 1). If the maximum age of 4 yr is interpreted to mean a fish from age class 4, i. e., a fish on average slightly older than 4 yr, the estimate of Z would be less than 1.06/yr (Table 1). These are estimates of Z at the time the oldest ages were observed, i. e., at the time of the studies cited.

Estimates of M by Pauly's method are specific to growth parameters and water temperature assumed. Estimates were made for a a range of temperatures and three sets of von Bertalanffy growth parameters (Fig. 2b). The estimates based on the growth parameters of Oxenford and Hunte (1983) are presumably descriptive of the southern stock and are shown for comparison only. The two sets of estimates derived from growth parameters for the northern stock vary somewhat. Because the data of Beardsley (1967) included a wider range of sizes, a more even sex distribution, and resulted from more varied sampling techniques than the data of Rose and Hassler (1968), estimates from those data seem better suited to the purposes of this assessment.

Estimates of M based on the data of Beardsley (1967) are relatively high for such a large fish, but within the range of plausibility, given its high growth rate and early maturity. Over a range of mean water temperatures from 20° to 28°, corresponding estimates of M range from 0.68/yr to 0.80/yr (Fig. 2b; Table 2). For comparative purposes, this range of values is similar to accepted estimates of M for yellowfin tuna, another large, warm-water, wide-ranging, predatory fish. For that species, the values commonly used are $M = 0.8$ for ages 0 and 1 and $M = 0.6$ for older fish (ICCAT 1991).

4 Abundance Index

An index of relative abundance was estimated from the weighout database maintained at the NMFS Southeast Fisheries Science Center in Miami. This database contains records of fishing effort (number of hooks set) and landings in weight for numerous species caught in the U. S. longline fishery. That data base was selected because of its wide data coverage and because the relative lack of targeting on dolphinfish might result in approximately random sampling, which in turn would provide an unbiased index of relative abundance. (By comparison, using data from a fishery in which dolphinfish are strongly targeted might tend to underestimate changes in relative abundance, because targeting, especially on a schooling species, can cause catchability to increase with declining abundance.)

To construct the abundance index, the weighout data compiled by Goodyear (1999) for the South Atlantic Fishery Management Council were used; those data include years 1986 through 1997. In a data screening step, the following records were removed:

- Records with gear other than longline, as such records could not be used in generating a standardized abundance index
- Records from NMFS areas 10, 11, 12, and 13, which are south of the area occupied by the hypothesized northern stock of dolphinfish
- Records showing no hooks set, as being typographic errors or simply incomplete information
- Records believed to be from sets targeting dolphinfish, as being nonrepresentative of overall abundance trends; such records are few and mainly in the last few years

Following screening, data were accumulated on a trip basis (defined by unique combinations of vessel ID, number of hooks set, location and logbook date),[2] with total weight of dolphin landed and total number of hooks set as the major variables compiled for analysis.

[2]Present practice is to apply a unique trip identifier in the weighout database. Because that practice was instituted only recently, other data were used here to define unique fishing trips.

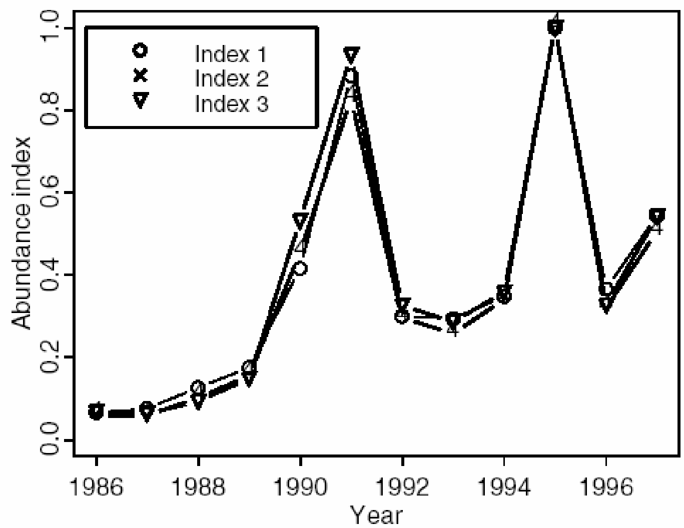

Figure 3. Preliminary indices of relative abundance of dolphinfish in U.S. waters. Indices vary by specific factors included in models. (See text for details.)

The abundance index itself was estimated through a statistical procedure similar to a linear model, but based on a delta-lognormal model (Lo et al. 1992; Zhou and Tu 1999). This procedure has been adopted in fisheries work for data sets with many cells with CPUE values of zero (Ortiz et al. 1999). Because the longline fishery is primarily directed at swordfish, not at dolphinfish, that was the case here.

Three indices were constructed, differing only in the effects estimated. Index #1 estimated effects only for year and general location of the catch (NMFS location code). Index #2 also estimated effects for an assigned *operation code* that classifies vessels into general groups by style and power of fishing. Index #3 omitted that operation code but added a seasonal effect (quarter of the year). The relative abundances (year effects) estimated by the three analyses were nearly identical (Fig. 3). Year effects from Index #1 were used in surplus production modeling (§5) and are given in the second column of Table 3.

Whether the estimated indices truly represent patterns of relative abundance is open to question: this analyst has limited confidence that they do. Inspection of Fig. 3 demonstrates that the estimated ratio between largest and smallest abundances within each index is about 15:1 and that the range of estimated abundances in recent years (1994–1997) is nearly 4:1. It is questionable whether dolphinfish have undergone such

Table 3. Data used in production model of dolphinfish *Coryphaena hippurus*. Relative abundance is in arbitrary units and derived from a delta-lognormal model; catch is the sum of commercial and recreational landings.

Year	CPUE	Catch, mt
1985	—	4,576.85
1986	0.06655	4,576.85
1987	0.07546	3,302.52
1988	0.12668	3,480.16
1989	0.17511	6,166.56
1990	0.41530	5,854.16
1991	0.88276	7,875.63
1992	0.30023	4,526.29
1993	0.29382	5,199.09
1994	0.34805	5,801.06
1995	1.00000	9,036.78
1996	0.36632	5,817.63
1997	0.54344	10,232.91

large and sudden changes in abundance; however the possibility cannot be dismissed. Moreover, the indices could be accurate (unbiased) but imprecise (noisy) because of poor representation of dolphinfish in the catch or for other reasons. With no corroborating evidence of population abundance patterns, one must say that uncertainty in the abundance indices is high.

5 Surplus Production Model

A surplus production model was fit to abundance index #1 and total landings as compiled by Goodyear (1999). Data used in modeling are given in Table 3. The model was fit with the computer program ASPIC (Prager 1995), which implements a non-equilibrium version of the logistic surplus production model of Lotka (1924) and Schaefer (1954, 1957) as revised by Pella (1967) and Prager (1994). Fits were also made with abundance indices #2 and #3, and because results were essentially the same, they are not presented here. The objective of fitting this model was to obtain estimates of stock status and reference points for management.

The surplus production model seems to fit the data reasonably well (Fig. 4a): it cap-

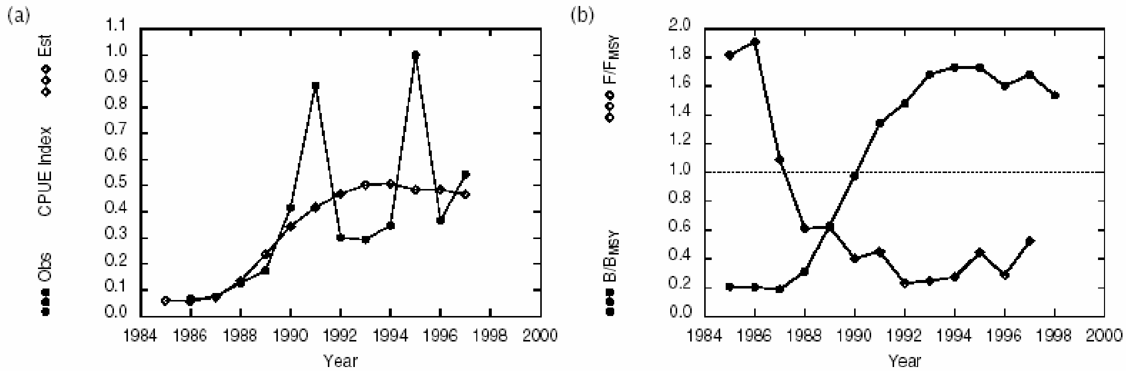

Figure 4. Surplus production model of dolphinfish, based on U.S. landings and long-line CPUE. (a) Fit of model to CPUE index. (b) Estimates of relative benchmarks B/B_{MSY} and F/F_{MSY} over time.

Table 4. Benchmark estimates from production model of dolphinfish in north Atlantic Ocean. Bias-corrected (BC) estimates shown, along with upper and lower bounds of nonparametric 80% confidence interval; all derived from bootstrapping.

Benchmark	BC estimate	80% LCB	80% UCB
MSY, mt/yr	12,241	8,506	21,110
F_{MSY}, proportion/yr	0.49	0.34	0.85
B_{1998}/B_{MSY}	1.56	1.22	1.77
F_{1997}/F_{MSY}	0.51	0.26	0.92

tures the overall pattern of change in the abundance index, though not the recent large fluctuations. Estimates from the model (Table 4) are plausible given the life history and catch record of the species. The confidence intervals in Table 4 should be regarded as minimum estimates; actual bounds of uncertainty are probably greater. Concern about uncertainty in these estimates springs from two related sources. First, as mentioned immediately above, the underlying abundance index is itself uncertain, and estimates from the production model can be no more certain than the data on which they are based. It is also notable that the model estimates low stock abundance at the start of the period (about 20% of B_{MSY} in 1985), followed by an increase of about 8×, to about 168% of B_{MSY} in 1997 (Fig. 4b). This pattern reflects that of the abundance index, although the model smoothes the variation somewhat. With no independent evidence at hand for comparison, it is difficult to know whether the estimate of low relative abundance in the mid

1980's is meaningful or an artifact. To judge sensitivity of the production model, additional runs were attempted with the first-year biomass fixed at higher fractions of B_{MSY} (fractions ranging from 0.2 to 0.6), but it was not possible to obtain estimates under that constraint. In summary, estimates from the production model seem plausible given the species' life history and recent landings, but can be considered no more certain than the estimated abundance indices upon which they are based.

6 Reference Points and Proxies

It has been recommended that limit reference points be specified as part of the information supplied for fishery management (FAO 1995; Restrepo et al 1998), and this approach has become increasingly important. The production model estimates above provide one set of estimates of limit reference points: MSY = 12,241 mt/yr and F_{MSY} = 0.49/yr (Table 4). Because of uncertainty in those estimates, it seems desirable to seek another set of reference points for comparative purposes.

In data-limited situations, the use of proxies for MSY and F_{MSY} has been suggested, along with the necessity of "bringing the knowledge base at least up to data-moderate standards" (Restrepo et al 1998). The same document suggests that suitable proxies for F_{MSY} can lie between $F = 0.75M$ and $F = M$. Given the range of estimates of M developed in §3.3 ($0.68 \le \hat{M} \le .80$), the corresponding range of proxies would be be $0.51 \le F \le 0.80$.

Restrepo et al (1998) also suggest that "if there is no reliable information to estimate fishing mortality or biomass reference points, it may be reasonable to use the historical average catch as a proxy for MSY, taking care to select a period when there is no evidence that abundance was declining." Using that approach, one could take an average of the last ten years' catch and arrive at a proxy for MSY of Y = 7,204 mt/yr. The choice of ten years is somewhat arbitrary, but the suggestion is to use a recent time period. If the last five years' catch are averaged, the proxy for MSY becomes Y = 8,089 mt/yr.

The benchmark estimates from the surplus production model and their proxy counterparts are comparable, but the production model estimates that a larger sustainable yield might be possible through application of a lower rate of fishing mortality. Unfortunately, current knowledge does not allow a scientific statement about which set of benchmarks is closer to the truth.

7 Summary of Stock Status

The life history of dolphinfish and the estimates generated here suggest that this species may be able to withstand a relatively high rate of exploitation. The abundance index indicates an increasing trend in stock size, and the surplus production model based on that index estimates that recent (start of 1998) stock status is above B_{MSY}. These positive indications are balanced by abundant uncertainty and reasons for caution:

1. Under excessive mortality rates, even a species resistent to exploitation may undergo geographically or temporally localized depletion or be exploited at suboptimal yield per recruit.

2. The current stock hypothesis is supported by only limited evidence.

3. The stock status of fish in the Gulf of Mexico is unknown. Here, they have been assumed to belong to the northern stock. Based on vital rates estimated for the two areas, that assumption may be incorrect.

4. Under the current stock hypothesis, extent of the stock include waters of other nations, so that international cooperation in research, monitoring, and assessment appears necessary to obtain more complete catch records and to delineate stock boundaries.

5. Estimates of vital rates are several decades old.

6. The abundance index is quite uncertain and lacks corroboration.

8 Research Needs

Assessment of dolphinfish is limited by lack of information. Critical areas for futher investigation are

- Better definition of stock structure

- More research on vital rates

- Further research on appropriate indices of abundance

While research on these items can be conducted in parallel, it is a fundamental tenet that scientific assessment depends on proper definition of stock structure (Pitcher and Hart 1982). It is exceedingly difficult to interpret apparent changes in abundance when the fish under study may represent an unknown number of stocks, each of unknown extent.

All methods of assessment depend to some degree on estimates of vital rates. At the very least, yield per recruit cannot be estimated accurately without good estimates of growth and M; these are also needed for age-structured methods. Estimates of spawning potential and proxy estimates of F_{MSY} depend on knowledge of vital rates. Finally, even when they are not used directly in assessment models, comparison to current vital rates provides perspective to benchmark estimates.

Development of abundance indices for widely dispersed and poorly sampled species is not a simple endeavor. Development so far has been limited by time and manpower. More fundamentally, it is not certain whether the available data, which are mostly fishery dependent, are unbiased (for the population, not the catch) and have sufficient coverage. A fishery-independent measure of abundance would be a valuable tool, especially for a species such as dolphinfish, which tends to aggregate in surface waters and so is subject to targeting.

9 Acknowledgments

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Appendix C. Purpose and Need (Section 1.0), Affected Environment (Section 5), Description of the Pelagic Longline Fishery for HMS (Section 6.0), and HMS Action to reduce bycatch and incidental catch in the Final Supplemental Environmental Impact Statement for the Regulatory Amendment to the Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan to Address Reduction of Bycatch and Incidental Catch in the Atlantic Pelagic Longline Fishery (NMFS, 1999b).

FINAL
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

REGULATORY AMENDMENT 1 TO THE ATLANTIC TUNAS, SWORDFISH, AND SHARKS FISHERY MANAGEMENT PLAN

REDUCTION OF BYCATCH, BYCATCH MORTALITY, AND INCIDENTAL CATCH IN THE ATLANTIC PELAGIC LONGLINE FISHERY

(Includes Final Supplemental Environmental Impact Statement, Regulatory Impact Review, and Final Regulatory Flexibility Analysis)

Revised
June 14, 2000

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Sustainable Fisheries
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Reduction of Bycatch, Bycatch Mortality, and Incidental Catch in the Atlantic Pelagic Longline Fishery

Final Action: Implement time/area closures in the Gulf of Mexico and South Atlantic Bight/East Florida Coast and prohibit use of live bait in the Gulf of Mexico by pelagic longline fishermen who hold federal highly migratory species permits. The final rule will be published by August 1, 2000.

Type of statement: Final Documents: Supplemental Environmental Impact Statement, Social Impact Assessment, Regulatory Impact Review, and Regulatory Flexibility Analysis

Lead Agency: National Marine Fisheries Service: Office of Sustainable Fisheries

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Abstract: The intent of these final actions is to reduce the occurrence of bycatch and incidental catch by U.S. commercial fishermen who hold Federal highly migratory species permits and use pelagic longline gear in the Atlantic Ocean. The final action would amend the Highly Migratory Species Fishery Management Plan by establishing time and area closures and gear restrictions to pelagic longline fishing to reduce the bycatch and bycatch mortality of highly migratory species, threatened or endangered turtle species, and the incidental catch of marine mammals and sea birds. This action minimizes the reduction in target catches of tuna, swordfish, and other commercially-viable species. The final action prohibits the use of pelagic longline gear year-round in an area of the northeastern Gulf of Mexico (DeSoto Canyon) and an area along the east coast of Florida (East Florida Coast). A third area located off Georgia, South Carolina and a portion of North Carolina (Charleston Bump) is closed to pelagic longline gear during February through April. In addition, this final action prohibits the use of live bait on pelagic longline gear used in the Gulf of Mexico. These measures address objectives in the Highly Migratory Species Fishery Management Plan and Amendment One of the Atlantic Billfish Fishery Management Plan, consistent with National Standard 9 of the Magnuson-Stevens Fishery Conservation and Management Act.

Alternatives considered for managing bycatch and incidental catch from pelagic longlines ranged from no action to a total prohibition of the use of pelagic longline gear. In addition to time/area closures, alternatives examined include limiting the gear soak time, requiring circle hooks, and other gear-based actions.

1.0 PURPOSE AND NEED FOR ACTION

1.1 General

This final rule implements time/area closures and gear restrictions for pelagic longline gear deployed by U.S.-flagged vessels in the Atlantic Ocean to reduce pelagic longline bycatch, bycatch mortality, and incidental catch, consistent with National Standard 9 (NS9). Pelagic longline gear is the dominant commercial fishing gear used by U.S. fishermen in the Atlantic Ocean to target highly migratory species (HMS). Further, it is a common commercial fishing gear used by vessels from many other nations in the Western Atlantic Ocean. Pelagic longline fishing by U.S. commercial fishermen is conducted offshore of the Atlantic and Gulf Coasts, in the Caribbean basin and South Atlantic Ocean, with a significant proportion of fishing effort occurring within the U.S. Exclusive Economic Zone (EEZ). Management of the U.S. pelagic longline fishery in the Atlantic Ocean and surrounding waters has historically relied upon a catch or landing quota and/or a minimum size limits. The National Marine Fisheries Service (NMFS) closely monitors the United States pelagic longline fleet through observer and logbook programs; a vessel monitoring program (VMS) is scheduled for implementation in the pelagic longline fishery on September 1, 2000.

Pelagic longline gear can be modified (gear type and configuration, timing of sets, etc.) to target yellowfin tuna, bigeye tuna, sharks, or swordfish. However, this gear also catches other species (or sizes) of fish (e.g., marlin, sailfish, undersized swordfish), mammals (porpoises or whales) that are either hooked or entangled, sea birds, and sea turtles that are not the gear's targets. Many of the species are not kept because they cannot be legally retained due to species prohibitions, minimum size limits, quotas, or other regulations (i.e., *regulatory discards*), and in these cases, animals must be released in a manner intended to maximize survival. However, there can be significant mortality of the bycatch as a result of the interaction with pelagic longline gear. In other instances, species are not kept *by choice*, due to market value, hold capacity, or for a myriad of other reasons.

Bycatch and bycatch mortality of billfish, undersized swordfish, and sea turtles has been a particular concern for many years because of its impact on the stocks of these species. In September 1997, NMFS released the first report entitled "A Report to Congress: Status of Fisheries in the United States." This report designated North Atlantic swordfish, Atlantic blue marlin, Atlantic white marlin, bluefin tuna, and the large coastal shark (LCS) complex as overfished; west Atlantic sailfish and bigeye tuna were added to the overfished stocks list in 1998 and northern albacore tuna was added in 1999. Further, several sea turtle stocks are listed as either endangered or threatened (see Section 5).

1.2 What is Bycatch and Incidental Catch?

Bycatch has become a central concern of fishing industries, environmentalists, resource managers, scientists, and the public, both nationally and globally. A 1994 report of the Food and Agriculture Organization (FAO) of the United Nations estimated that nearly one-quarter (27 million metric tons (mt)) of the total world catch by commercial fishing operations was discarded (Alverson *et al.*, 1994). Bycatch precludes other more productive uses of fishery resources; it is important to minimize the waste associated with bycatch when so many of the world's fisheries are either fully exploited or overexploited. As a source of fishing mortality, excessive bycatch in commercial fisheries can slow rebuilding of overfished stocks (if most of the bycatch dies) and imposes direct and indirect costs on commercial fishing operations by increasing sorting time, and decreasing the amount of gear available to catch target species. Bycatch concerns also apply to populations of marine mammals, sea turtles, seabirds and other components of ecosystems for which there are no commercial or recreational uses.

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) defines bycatch as:

> *fish that are harvested in a fishery, but are not sold or kept for personal use, and includes economic discards and regulatory discards. [Bycatch] does not include fish released alive under a recreational catch and release fishery management program.*

Some relevant examples of fish that are included in the Magnuson-Stevens Act's definition of bycatch are Atlantic billfish caught and discarded by commercial fishing gear (even if tagged and released); undersized swordfish; and bigeye and yellowfin tunas caught and discarded by commercial fishermen; species for which there is little or no market and which are therefore discarded, such as blue sharks; and other highly migratory species that are not landed for various reasons (including fish hooked and lost, or fish released at the boat - whether or not the fish was tagged). Bycatch also includes the release of prohibited shark species and LCS caught by pelagic longline gear during a closure of that fishery. The recreational fishery can also have bycatch, including both regulatory discards (fish caught below minimum size limits or in excess of bag limits, e.g., 27 inch minimum size for yellowfin tuna with a three-fish per person per trip bag limit), and selective discards of fish that could legally be retained. However, bycatch does not include Atlantic HMS harvested in a commercial fishery that are *not* regulatory discards and that are tagged and released alive under a scientific tag-and-release program. Recreationally caught billfish and white sharks are now part of a catch-and-release program under the Fishery Management Plan for Atlantic Tunas, Sharks, and Swordfish (HMS FMP) and Amendment One to the Atlantic Billfish Fishery Management Plan (Billfish FMP Amendment) and as such, are not considered bycatch.

Incidental catch is the catch of those animals that are caught incidental to fishing operations that may or may not be discarded, e.g., bluefin tuna caught on a pelagic longline gear. Incidental catch also includes marine mammals and sea birds which are discarded but are not included in the Magnuson-Stevens Act definition of bycatch. NMFS focuses this rulemaking not only on bycatch as defined by the Magnuson-Stevens Act but on all discarded animals.

NMFS initiated efforts to address the issue of bycatch of finfish and turtles and incidental catch of marine mammals in 1997 through the development and publication of the HMS FMP and

Billfish FMP Amendment. These documents provide detailed discussions of bycatch and incidental catch issues associated with the various HMS commercial and recreational fisheries. The HMS FMP and its associated consolidated rule include several measures to reduce bycatch, including a time/area closure for pelagic longline fisheries to reduce discards of bluefin tuna, limited access for swordfish and shark fisheries, proposed quota reductions that serve as part of the foundation for international negotiations, gear restrictions (e.g., the ban on drift gillnets for tuna fishing as a result of frequent encounters with marine mammals and other protected species), and outreach programs (e.g., providing information on the impacts of circle hooks, live vs. dead bait, etc.). Further, the Billfish FMP Amendment defers management of billfish bycatch in commercial HMS fisheries to the plan that manages the directed fisheries in which billfish bycatch occurs; namely the HMS FMP.

The HMS FMP indicated that time and area closures could be a useful tool to reduce bycatch and bycatch mortality in the pelagic longline fishery in the short term. The HMS FMP included a time/area closure for pelagic longline fishermen to address bluefin tuna incidental catch. Although the draft HMS FMP proposed a time/area closure in the Florida Straits aimed at reducing undersized swordfish bycatch, public comment indicated that the closure was likely too small to be effective, and was not comprehensive with respect to the incidental catch of other species. NMFS agreed with the comments and did not finalize the Florida Straits closure, instead opting to develop a more effective closure, together with pelagic longline gear restrictions, to address bycatch issues, which is the purpose of this final rule.

1.3 Objectives of the Final Action

The following objectives were developed to guide agency action, to the extent practicable, to reduce bycatch, bycatch mortality, and incidental catch of undersize swordfish, billfish, and other overfished and protected species from the U.S. pelagic longline fishery operating in the Atlantic Ocean:

(1) Maximize the reduction in finfish bycatch;
(2) Minimize the reduction in the target catch of swordfish and other species;
(3) Consider impacts on the incidental catch of other species to minimize or reduce incidental catch levels; and
(4) Optimize survival of bycatch and incidental catch species.

This rulemaking is also consistent with the objectives of the HMS FMP and the Billfish FMP Amendment. It particularly addresses the objective of the HMS FMP "to minimize, to the extent practicable, bycatch of living marine resources and the mortality of such bycatch that cannot be avoided in the fisheries for Atlantic tuna, swordfish, and sharks." Although the Billfish FMP Amendment defers management of commercial fishing bycatch to the HMS FMP, it does state an objective of that plan is to "...minimize to the extent practicable, bycatch and discard mortality of billfish on gears..." Further, to the extent that these actions reduce mortality levels of overfished resources, particularly of pre-reproductive fish and spawning populations, these objectives will augment rebuilding efforts initiated in the HMS FMP and Billfish FMP Amendment.

1.4 Endangered Species Act and Marine Mammal Protection Act

The Endangered Species Act (ESA) is the primary Federal legislation governing interactions between fisheries and species whose continued existence is threatened or endangered. Through a consultative process, this law requires Federal agencies to evaluate proposed actions in light of the impacts they could have on these ESA-listed species. In the case of marine fisheries, NMFS' Office of Sustainable Fisheries (OSF) consults with the NMFS Office of Protected Resources (OPR) and the U.S. Fish and Wildlife Service to determine what impacts major fishery management actions will have on threatened and endangered populations of marine species and what actions can be taken to reduce or eliminate negative impacts. Under the formal consultative process, NMFS issues a Biological Opinion (BO) which outlines expected impacts of the proposed action and specifies the reasonable and prudent alternatives to avoid jeopardy or, if the action does not jeopardize threatened or endangered species, specifies reasonable and prudent measures to minimize impacts of any incidental take of the endangered or threatened species (see Section 5.8).

The Marine Mammal Protection Act (MMPA) of 1972 is the principal Federal legislation that guides marine mammal species protection and conservation policy. Under requirements of the MMPA, NMFS produces an annual List of Fisheries that classifies domestic commercial fisheries by gear type relative to their rates of incidental mortality or serious injury of marine mammals. The Atlantic pelagic longline fishery for HMS is considered a Category I fishery, which indicates that this gear is associated with frequent serious injury or mortality to marine mammals. Fishermen participating in Category I fisheries are required to be registered under the MMPA and, if selected, to accommodate an observer aboard their vessels. Vessel owners or operators in Category I fisheries must report to NMFS all incidental mortalities and injuries of marine mammals during the course of commercial fishing operations.

1.5 Advisory Panel Deliberation and Public Comment

As a result of the re-authorization of the Magnuson-Stevens Act, an HMS Advisory Panel (AP) and an Atlantic Billfish AP were formed during 1997. These panels consist of members from recreational, commercial, environmental, and scientific communities, as well as from state fisheries agencies, the five Atlantic Fishery Management Councils, and the International Commission for the Conservation of Atlantic Tuna (ICCAT) Advisory Committee. NMFS held a joint HMS-Atlantic Billfish AP meeting during the development of the FMPs in July 1997 to expressly evaluate bycatch issues and options. The discussion focused on possible time/area closures and gear restrictions and/or gear modifications. The draft HMS FMP and draft Billfish FMP Amendment issued in October 1998 included a time/area closure in the Florida Straits to pelagic longline fishing activity during the months of July, August, and September as part of a management strategy to reduce bycatch of undersized swordfish and Atlantic billfish. NMFS received numerous comments concerning the use of time/area closures for the pelagic longline fishery. A range of comments supported the proposed Florida Straits closure, other nursery areas (for swordfish in particular) such as the Charleston Bump and areas in the Gulf of Mexico, and a year-round ban of pelagic longline gear. Comments also opposed any time/area closure that would have unpredictable results due to redistributed effort. Specific to the proposed area in the Florida Straits, many comments indicated that the area was too small to have the desired conservation effect because fishermen would redistribute their effort along the fringe of the closed areas.

After considering these comments, NMFS agreed and deferred the implementation of a time/area closure for protection of undersized swordfish and billfish pending further analyses of the impacts of effort redistribution, and increased effectiveness with temporal and/or spatial expansion of the time/area management window. Further rationale for the delay was based on the potential magnitude of the economic and social impacts that would likely result from a more extensive time/area closure. Consistent with the delay in the implementation of additional time/area closures in the pelagic longline fishery, NMFS delayed until September 1, 2000, the requirement for all commercial vessels with pelagic longline gear on board to have a NMFS-approved vessel monitoring system.

In June 1999 and again in February 2000, NMFS met with the HMS and Atlantic Billfish APs on various time/area strategies. The latter meeting was to solicit comments on the proposed rule (published December 15, 1999). NMFS considered comments by the APs in the development of this document and the accompanying final rule. Further, NMFS held 13 public hearings on the proposed rule and received several hundred written and verbal comments through March 1, 2000. On April 26, 2000, NMFS published an additional notice to request comments on the expanded Initial Regulatory Flexibility Analysis (IRFA) summary, on an additional closed area alternative (DeSoto Canyon) in the eastern Gulf of Mexico, and on the applicability of delayed implementation strategies for time/area closures for the pelagic longline fishery. The comment period on the additional notice closed on May 12, 2000, with approximately 200 written comments and 2000 form letters received on the additional notice alone. Summaries of the comments submitted and NMFS' response can be found in Appendix B and will also be included in the preamble to the final rule.

1.6 Background Research and Supplemental Analyses

The original Swordfish FMP, approved on August 22, 1985, included measures to reduce the number of small swordfish (defined as swordfish under 50 pounds dressed weight (dw)) taken along the Atlantic coast. The primary regulatory mechanism in the plan to reduce the catch of these fish was the Variable Season Closure (VSC). In essence this was a time/area closure in which each fishing area (New England/Mid-Atlantic, South Atlantic, East Florida Coast, Gulf of Mexico, and Caribbean) was to be closed a sufficient amount of time to reduce its catch of small fish. Each area's reduction was determined by first calculating the difference between the total number of fish under 50 pounds dw in the most recent year and the number caught in 1980 and dividing by the number caught in the most recent year (for all areas combined). This fraction was multiplied by each area's catch of small fish in the most recent year resulting in the number of small fish by which that area had to reduce its catch. For each area, monthly landings of small fish were determined for the most recent year and divided by the number of days in the month. The number of closure days necessary to achieve the requisite reduction was then determined.

Closures were to be during September, October, November or December. Each Council then was to select the starting date for closure, but the duration of the closure was set by the requisite reduction and the monthly landings pattern for the previous year. Although the VSC provision was approved by the Secretary of Commerce (Secretary), it was not implemented.

In 1997, NMFS examined billfish catch information from pelagic longline gear during 1986-1996. Catches were plotted, by quarter, year, and species, with copies of these plots provided to the HMS and Billfish APs. Results of these qualitative plots of catch frequency indicated that billfish are encountered throughout the range of the pelagic longline fisheries, with areas of high billfish catch generally reflecting areas of high pelagic longline effort (P. Mace, pers. comm.). However, some notable differences in the distribution of the various billfish species were identified relative to the range of fishing effort (NMFS, unpublished), including, for example, a relatively higher occurrence of blue and white marlin discards in the western Gulf of Mexico, relative to the level of pelagic longline fishing effort.

Goodyear (1998) examined pelagic logbook data from U.S. commercial fishermen to determine the distribution of relative monthly catch rates of billfish and target species by one, two and five degree areas to identify potential time/area strata that could reduce billfish bycatch. The areas examined were limited to the operational areas of the U.S. pelagic longline fleet, which includes a large area outside the U.S. EEZ. Although the results of Goodyear's study demonstrate that time/area closures could be effective in reducing billfish bycatch in commercial fishing gear, his study did not account for redistribution of pelagic longline effort to other open time/area cells. Billfish are sparsely distributed over vast ocean areas; therefore shifting commercial efforts could result in similar, or perhaps even higher billfish encounter rates elsewhere. Another point to consider is the spatial distribution of the closed areas considered in Goodyear's study, which ranged from the Grand Banks, along the east U.S. coast, Gulf of Mexico and Caribbean. Some of the areas identified by Goodyear (1998) are outside the U.S. EEZ where other countries also operate commercial longline fleets. Although ATCA provides authority to close these areas to U.S. pelagic longline vessels, the time/area portion of the final rule focuses on the U.S. EEZ to maximize the effectiveness of the closures, because most effort and catch by U.S.-flagged pelagic longline vessels is within this area.

Cramer and Scott (1998) examined pelagic logbook records for 1987 through 1996 to determine the effect of closures on swordfish and discards from the U.S. pelagic longline fishery. They used two analytical techniques (perfect hindsight analysis and five-year average analysis) to identify spatial patterns in the reduction of bycatch and target catches resulting from quarterly closures of two degree squares (latitude X longitude). The perfect hindsight analysis indicated that 50 percent reduction of reported swordfish discards could be achieved with a loss of approximately 15 percent of target catch. The overwhelming majority of the two degree square closures selected by the five-year average analysis were below 35ºN latitude. Cramer and Scott ranked the two degree square areas on a quarterly basis and calculated the expected reduction in discards and target catch. If all effort was removed from those areas, reductions ranged from 15 to 27 percent for swordfish discards, 6 to 14 percent for billfish discards, 7 to 12 percent for swordfish landings, 4 to 6 percent in dolphin landings and 1 to 2 percent in bigeye, albacore, yellowfin, and skipjack (BAYS) tunas landings. Estimates were also made of the number of landed and discarded fish that would not have been caught if all the effort from the closed areas was distributed among the remaining two degree squares in proportion to the reported effort in those squares. Under this scenario, swordfish discards would decrease by 7 to 23 percent, billfish discards be reduced by 2 to 8 percent, swordfish landings could increase by 0 to 4 percent, and BAYS landing could also increase by 4 to 9 percent.

NMFS published a draft technical memorandum which outlined analyses of various areas for closure to longline fishing (Appendix C of the Draft Supplementary Environmental Impact Statement (DSEIS)). Those analyses were purely biological and focused on areas of high bycatch rates. Refer to Section 7.0 and Appendix C of this document for more information on the analytical procedures used in the time/area analysis.

A recent manuscript from the NMFS Southeast Fisheries Science Center (Scott *et al.*, 2000; Appendix D) provides an analysis of available logbook and observer data sets to evaluate the relationships of U.S. pelagic longline catch rates of billfish in the Gulf of Mexico relative to use of live and dead bait. Blue marlin, white marlin and sailfish discards are combined for this analysis; observer sets with unidentified billfish species, which could include swordfish, are also included in the analysis. Predicted reduction in total billfish bycatch ranges from 2 percent to approximately 30 percent depending upon the source of information (logbook and observer) and assumptions about effort levels following conversion from live to dead bait.

1.7 The Fishery Management Plan and the Framework Process

NMFS published the HMS FMP and Billfish FMP Amendment in April 1999. These documents included rebuilding plans to comply with provisions of the Magnuson-Stevens Act for fisheries identified as overfished, and also contained fishery conservation and management measures to address bycatch and bycatch mortality concerns associated with HMS fisheries. This Final Supplemental Environmental Impact Statement (FSEIS) and the final rule serve as a regulatory amendment to the HMS FMP. Therefore, the final actions apply to those fishermen holding permits for highly migratory species and who use pelagic longline gear. Those pelagic longline fishermen who may target dolphin and wahoo in the South Atlantic Bight but do not hold permits for HMS are required to discard all HMS. The Secretary of Commerce sought the help of the South Atlantic, Gulf of Mexico, and Caribbean Fishery Management Councils (FMC) to develop complementary regulations, as appropriate. The South Atlantic FMC (SAFMC) published a draft FMP (April 2000) for the dolphin and wahoo fishery of the Atlantic, Caribbean and Gulf of Mexico. The draft FMP includes a preferred action to prohibit the use of pelagic longline gear for dolphin and wahoo within "any time or area closure in the SAFMC's area of jurisdiction (Atlantic Coast) which is closed to the use of such gear for highly migratory species." The Gulf of Mexico FMC in its comments on the proposed rule and Draft Supplementary Environmental Impact Statement supported a total closure of the Gulf of Mexico to pelagic longline gear during March through September.

Under the HMS FMP, the activities involved in continuing fishery management include monitoring, evaluation, adjustment, and revision. There are two primary methods that can be used to change management measures included in an FMP: FMP amendment and framework regulatory adjustment. The HMS FMP included time/area restrictions, gear use restrictions, and gear modifications as management options under the framework procedures. Framework regulatory adjustment procedures provide for timely changes to the management measures in the regulations in response to new information about the fishery. Framework adjustment lends flexibility and efficiency to the regulatory process by allowing NMFS to make time-critical changes in the regulations without engaging in the longer process of amending the FMP. Framework adjustment is not intended to circumvent the FMP amendment process that must take place when circumstances in the fishery change substantially or when a different management philosophy or objectives are adopted, triggering significant changes in the management system. Rather, framework adjustment is intended to make it possible to manage fisheries and meet the objectives of the FMP more responsively under conditions requiring timely management actions. As with an FMP amendment, framework adjustments must go through extensive public and analytical review. This includes a proposed rule, a public comment period, at least one public hearing, and a final rule. AP meetings will be held for a rulemaking if the agency deems it necessary for purposes of consultation or AP review. The AP and public comment processes for this final action on bycatch reduction under the framework process are summarized above in Section 1.4.

1.8 Summary

The purpose of this document is to consider a full range of fishery management alternatives that minimize, to the extent practicable, bycatch, bycatch mortality, and incidental catches of undersized swordfish, billfish, and other non-target HMS, as well as protected species taken by U.S. commercial pelagic longline fishermen operating in the Atlantic Ocean. NMFS considered alternatives that enhance the survival of bycatch and incidental catches of these species that are captured on pelagic longline gear. In this document, NMFS considers the biological, social and economic impacts of these potential management actions. This document supports rulemaking by providing the required analyses of the impacts of the final regulations. This FSEIS serves as a supplement to the environmental impact statement that accompanied the regulations that implemented the HMS FMP . That document can be requested from NMFS, Highly Migratory Species Division, 1315 East-West Highway, Silver Spring, MD 20910, or accessed from the following Internet address: http://www.nmfs.gov/sfa/hmspg.html.

SECTION 2 THROUGH SECTION 4 INTENTIONALLY OMMITTED

5.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

Pelagic longline fishermen encounter many species of fish; some of those captured are marketable and thus are retained, others are discarded for economic or regulatory reasons. Species frequently encountered are swordfish, tunas, and sharks, as well as billfish, dolphin, wahoo, king mackerel, and other finfish species. Sometimes pelagic longline fishermen also hook sea turtles, marine mammals, and sea birds, known collectively as "protected" species. All of these species are federally managed, and NMFS seeks to control the mortality that results from fishing effort. Detailed descriptions of the life histories and population status of those species are given in the HMS FMP and are not provided here. Management of declining fish populations requires reductions in fishing mortality from both directed and incidental fishing. The status of the stocks of concern is summarized below.

5.1 Swordfish

Atlantic swordfish (*Xiphias gladius*), also known as broadbill, are large migratory predators that range from Canada to Argentina in the West Atlantic Ocean. Swordfish live to be more than 25 years old, and reach a maximum size of about 902 lb dw. Females mature between ages 2 and 8 with 50 percent mature at age 5 at a weight of about 113 lb dw. Males mature between ages 2 and 6 with 50 percent mature at age 3 at a weight of about 53 lb dw (Arocha, 1997). Large swordfish are usually females; males seldom exceed 150 lb dw. Swordfish are distributed globally in tropical and subtropical marine waters. Their broad distribution, large spawning area, and prolific nature have contributed to the resilience of the species in spite of the heavy fishing pressure being exerted on it by many nations. During their annual migration, North Atlantic swordfish follow the major currents which circle the North Atlantic Ocean (including the Gulf Stream, Canary and North Equatorial Currents) and the currents of the Caribbean Sea and Gulf of Mexico. The primary habitat in the western North Atlantic is the Gulf Stream, which flows northeasterly along the U.S. coast, then turns eastward across the Grand Banks. In U.S. waters, young swordfish predominate year-round in pelagic longline catches off Florida's "panhandle" (Apalachicola Bay) and off the south and east coasts of Florida.

In 1999, scientists of the International Commission for the Conservation of Atlantic Tunas (ICCAT) conducted a stock assessment on North Atlantic swordfish. The biomass of the North Atlantic stock is estimated to be 65 percent of the level needed to produce maximum sustainable yield (SCRS, 1999). It appears as though quota decreases and possibly minimum size restrictions, may have protected undersized swordfish over the last three years. In 1999, ICCAT nations agreed to a ten-year rebuilding program. Quotas must be strictly monitored, as overages can result in penalties, including quota reductions and trade sanctions, under ICCAT's compliance recommendations.

5.2 Atlantic Billfish

Blue marlin (*Makaira nigricans*), white marlin (*Tetrapturus albidus*) and sailfish (*Istiophorus platypterus*) are highly migratory billfish that are widely distributed over the Atlantic Ocean (including the Caribbean Sea and Gulf of Mexico). They are opportunistic feeders, feeding primarily on fish and squid. Marlins, in addition to sailfish and longbill spearfish, are bycatch in the Atlantic pelagic longline fishery. Billfish FMP Amendment provides more detailed background regarding the life history strategies of Atlantic billfish, including, age and growth, reproduction, movement pattern, influences of physical oceanographic features, essential fish habitat and other information.

Results of the most recent stock assessment for Atlantic blue marlin and Atlantic white marlin (SCRS, 1996) indicate that Atlantic-wide biomass levels have been below the level necessary to produce maximum sustainable yield (B_{MSY}) for about three decades under both total Atlantic and north Atlantic stock hypotheses (SCRS, 1998). The Atlantic Billfish FMP amendment includes a 10-year rebuilding plan for blue and white marlin as a foundation for the negotiations at the 2000 ICCAT meetings.

5.3 Atlantic Tunas

Tunas are highly migratory fish found in many of the world's tropical, subtropical, and temperate ocean regions. Bluefin (*Thunnus thynnus*), bigeye (*Thunnus obesus*), and albacore (*Thunnus alalunga*) tunas are widely distributed throughout the Atlantic, while yellowfin tuna are considered to be a subtropical species. Bluefin tuna mature at approximately age 8 or later (60 inches CFL), while yellowfin, bigeye, and albacore tunas mature at a smaller size (40 inches CFL). Smaller yellowfin tuna form mixed schools with skipjack tuna and juvenile bigeye tuna and are mainly limited to surface waters, while larger yellowfin tuna are found in surface and sub-surface waters. Bigeye tuna inhabit waters deeper than those of any other tuna species and undertake extensive vertical movements. Albacore tuna tend to inhabit deeper waters, except when young. Many of these tunas are opportunistic feeders, eating mainly fish and squid (SCRS, 1999b). Commercial and recreational fishermen from numerous countries participate in fisheries for several species of Atlantic tuna.

5.4 Large Coastal and Pelagic Sharks

Large coastal sharks (LCS) are comprised of several species. Many of these species make extensive migrations along the U.S. Atlantic coast. Several LCS are caught by pelagic longline gear, including silky, dusky, sandbar, and hammerhead sharks. Pelagic sharks commonly taken in the pelagic longline fishery include shortfin mako, porbeagle, common thresher, and blue; longfin mako, sixgill, bigeye sixgill, and sevengill are occasionally or rarely taken. Trans-Atlantic migrations of these pelagic sharks are common; they are taken in several international fisheries outside the U.S. EEZ.

Compared to other finfish, sharks have low reproductive rates which make them especially vulnerable to overfishing. Because LCS are overfished and the status of pelagic sharks is unknown at this time (but in 1993 were found to be fully fished), NMFS seeks to minimize interactions between these species and pelagic longline gear.

5.5 Other Finfish

Dolphin (*Coryphaena hippurus*) are fast-swimming, pelagic, migratory, and predatory fish found in tropical and subtropical waters throughout the world. They are short-lived and fast growing, traits that allow the stock to support high fishing mortality rates. Also referred to as mahi-mahi, these fish are sold by commercial fishermen (driftnet and pelagic longline) and are targeted by recreational fishermen along the U.S. southeastern Atlantic and Gulf of Mexico coasts. Dolphin was one of the top ten recreationally harvested species in 1998 (NMFS, 1999a).

Wahoo (*Acanthocybium solanderia*) are large pelagic fish found throughout the tropical and subtropical waters of the Atlantic Ocean. The life history of wahoo is largely unknown, although they are a fast-growing species similar to dolphin. These fish are also landed both recreationally and commercially, although encounter rates are generally lower than those for dolphin.

5.6 Status of the Stocks

A summary of the status of the major highly migratory species stocks caught on pelagic longlines is provided in Table 5.1. SCRS conducted a stock assessment for North and South Atlantic swordfish in 1999 based on international catch and catch per unit effort data through 1998. Tuna and billfish assessments took place in 1997, using data through 1996. These SCRS assessments are based on international catch and effort data that are submitted to ICCAT. Shark status is evaluated through a group of scientists convened by NMFS using U.S. catch and effort data only (in 1998, estimates of Mexican landings of blacktip sharks were provided). The group of pelagic sharks is comprised of less than 10 species and currently the status of this group is unknown. In 1993, this species group was identified as fully fished. Available information on catch, landings, and catch rates is insufficient to accurately determine the status of this species grouping, although there is concern particularly regarding porbeagle sharks, and the level of blue shark discards from pelagic longline fisheries. NMFS has listed north Atlantic swordfish, bluefin tuna, bigeye tuna, northern albacore, blue and white marlin, sailfish, and large coastal sharks as overfished, because the fishing mortality rate is higher than that required to keep a population at maximum sustainable yield (MSY) or because biomass is below the level that would support MSY (or both). Further details about stock status, minimum biomass thresholds, and maximum fishing mortality levels can be found in the HMS FMP and the Billfish FMP amendment.

Table 5.1. Status of Highly Migratory Species Stocks in the Atlantic Ocean. Source: SCRS,1999; NMFS 1999b, c.

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Fishing Mortality Rate (Threshold is F_{MSY})	Outlook
N. Atlantic Swordfish	B_{1999}/B_{MSY}= 0.65 (0.5 to 1.05)	$0.8B_{MSY}$	F_{1998}/F_{MSY}= 1.34 (0.84 to 2.05)	Overfished; rebuilding plan in place
S. Atlantic Swordfish	B_{1999}/B_{MSY}= 0.1.10 (0.84to 1.40)	$0.8B_{MSY}$	F_{1998}/F_{MSY}= 1.34 (0.81 to 2.54)	Overfishing may be occurring

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Fishing Mortality Rate (Threshold is F_{MSY})	Outlook
W. Atlantic Bluefin Tuna	SSB_{1997}/SSB_{MSY} (two line)=0.48 SSB_{1997}/SSB_{MSY} (Beverton-Holt) =0.071 SSB_{1997}/SSB_{75} =0.14-0.17	$0.86B_{MSY}$	F_{1997}/F_{MSY} (two-line) = 1.73 F_{1997}/F_{MSY} (Beverton-Holt) = 4.10	Overfished; rebuilding plan in place
Atlantic Bigeye Tuna	SSB_{1998}/B_{MSY}= 0.57 to 0.63	$0.6B_{MSY}$ (age 2+)	F_{1998}/F_{MSY}= 1.5 to 1.82	Borderline overfished; Overfishing is occurring
Atlantic Yellowfin Tuna	B_{1997}/B_{MSY}= 0.92 to 1.35	$0.5B_{MSY}$ (age 2+)	F_{1997}/F_{MSY}= variable > 1.0	Stock not overfished; Fishing mortality is probably greater than what would produce MSY
N. Atlantic Albacore Tuna	B_{1997}/B_{MSY}= 0.47 (0.34 to 0.63) $B_{90\text{-}94}/B_{75\text{-}80}$= 0.72	$0.7B_{MSY}$	F_{1997}/F_{MSY}= 1.39 (uncertain) F_{1997}/F_{MAX}= 0.91 $F_{1997}/F_{0.1}$= 1.60	Overfished; Overfishing is occurring; SCRS notes stock stock is at or above full exploitation
W. Atlantic Skipjack Tuna	unknown	unknown	unknown	unknown
Atlantic Blue Marlin	B_{1996}/B_{MSY}= 0.236	$0.9B_{MSY}$	F_{1995}/F_{MSY}= 2.87 (1.45 to 3.41)	Overfished; overfishing is occurring
Atlantic White Marlin	B_{1996}/B_{MSY}= 0.226	$0.85B_{MSY}$	F_{1995}/F_{MSY}= 1.96 (1.33 to 2.91)	Overfished; overfishing is occurring
West Atlantic Sailfish	$B_{1992\text{-}96}/B_{MSY}$= 0.62	$0.75B_{MSY}$	$F_{91\text{-}95}/F_{MSY}$= 1.4	Overfished; overfishing is occurring
Large Coastal Sharks (all species)	N_{1998}/N_{MSY}= 0.30 (baseline) N_{1998}/N_{MSY}= 0.36 (alternative)	$0.9B_{MSY}$	F_{1997}/F_{MSY}= 6.34 (baseline) F_{1997}/F_{MSY}= 6.03 (alternative)	Overfished; overfishing is occurring
Small Coastal Sharks	B_{1991}/B_{MSY}= 1.12	$0.9B_{MSY}$	$F_{86\text{-}91}/F_{MSY}$= 0.89	Fully fished; Overfishing is not occuring
Pelagic Sharks	unknown	unknown	unknown	unknown

5.7 Marine Mammals

Pelagic longline fishermen have been observed over the period from 1993 through 1997 to encounter short and long-finned pilot whales, spotted and bottlenose dolphins, Risso's dolphin, a Clymene dolphin, and a killer whale. The most recent annual estimate indicates that the U.S. Atlantic pelagic longline fleet caught 39 marine mammals in 1997; all were released alive. Most of the marine mammals were encountered in the U.S. EEZ between South Carolina and Cape Cod.

NMFS is most concerned about the impact of pelagic longline fishing on the pilot whales that prey on longline-hooked tunas. Two species of pilot whales (*Globicephala melas* and *G.*

macrorhynchus) are distributed principally along the continental shelf edge in the winter and spring off the northeast U.S. coast. In late spring, pilot whales move onto Georges Bank and into the Gulf of Maine and more northern waters. They remain there through the autumn. In general, pilot whales tend to occupy habitats with complex bottom structure. The stock structure of the North Atlantic population is currently unknown, however several genetic studies are underway. Sightings of these animals in U.S. waters occur primarily within the Gulf Stream, and primarily along the continental shelf and slope in the northern Gulf of Mexico.

5.8 Sea Turtles

Loggerhead and leatherback turtles are the species predominantly caught in the Atlantic pelagic longline fishery. Turtles are caught throughout the range of the fishery (Gulf of Mexico, Caribbean, Florida to Maine) but the sets with the most turtles occur in the Northeast Distant area (see Figure 6.2). Many sea turtle populations are especially slow to recover from increased fishing mortality because their reproductive potential is low (late sexual maturation, low juvenile survival). General information about the biology and status of sea turtles can be found in the Recovery Plans for each species (available through the Office of Protected Resources, NMFS); the status of sea turtle populations is provided in Table 5.2. Most turtles are released alive from pelagic longline entanglements. However, NMFS is concerned about serious injury and mortality of turtles once they are released.

Table 5.2. Status of Atlantic sea turtle populations: Species taken in the pelagic longline fishery 1992-1997. Source: NMFS, 1999d.

Species/Stock	Status: trend in U.S. nesting population
Loggerhead: Northern Sub-population	Threatened: declining through mid-1980s, no trend detected since that time
Leatherback	Endangered: loss of some nesting populations, otherwise stable
Green	Endangered: increasing
Kemp's Ridley	Endangered: thought to be increasing
Hawksbill	Endangered: unknown if there is a recent trend

5.8.1 Background Information for Biological Opinion for the Atlantic Pelagic Longline Fishery

The Office of Sustainable Fisheries (OSF) requested a re-initiation of consultation under section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*), on November 19, 1999, based on preliminary reports that observed incidental take of loggerhead sea turtles by the Atlantic pelagic longline fishery during 1999 had exceeded levels anticipated in the April 23, 1999, Biological Opinion (BO) for the pelagic longline component of HMS fisheries. Specifically, the Incidental Take Statement (ITS) of the April 23, 1999, BO allowed the following levels of incidental take:

(a) 690 leatherback sea turtles (*Dermochelys coriacea*), entangled or hooked (annual estimated number) of which no more than 11 are observed hooked by ingestion or moribund when released.

(b) 1541 loggerhead sea turtles (*Caretta caretta*) entangled or hooked (annual estimated number); of which no more than 23 may be hooked by ingestion or observed moribund when released.

A draft BO was provided to OSF in early June 2000; a final BO is scheduled to be completed by late June 2000. It is not anticipated that the final BO will differ significantly from the draft BO in regard to the Reasonable and Prudent Alternatives (RPAs), Reasonable and Prudent Measures (RPMs), and Terms and Conditions (TCs) of the draft BO. The draft BO also addressed the shark drift gillnet fishery and HMS purse seine fisheries; however, the following discussion addresses only issues in the BO that apply specifically to the pelagic longline fishery.

In recent years, NMFS has undertaken several ESA section 7 consultations to address the effects of vessel operations and gear associated with Federally-permitted fisheries on threatened and endangered species in the action area. Each of those consultations sought to develop ways of reducing the probability of adverse effects of the action on large whales and sea turtles. Similarly, NMFS has undertaken recovery actions under both MMPA and ESA to address the problem of take of whales in the fishing and shipping industries. Incidental take levels anticipated under the ITSs associated with these existing BOs, not including those for the pelagic longline fishery, are summarized in Table 5.3 below, followed by a brief discussion of each action on which there is consultation.

Table 5.3. Summary of incidental take levels anticipated under the incidental take statements associated with NMFS existing BOs in the US Atlantic and Gulf of Mexico. Note: This table does not including the anticipated takes for the Atlantic pelagic longline fishery. Source: NMFS, 2000b.

Federal Action	Anticipated Incidental Take Level (lethal or non)				
	Loggerhead	Leatherback	Green	Kemp's	Hawksbill
Coast Guard Vessel Operation	1[1]	1[1]	1[1]	1[1]	1[1]
Navy – SE Ops Area	84	12	12[1]	12[1]	0
Shipshock – Seawolf	50	6	4[1]	4[1]	4[1]
COE Dredging – S. Atlantic	35	0	7	7	2
COE Dredging - N & W Gulf of Mexico	30	0	8	14	2
COE Dredging - E Gulf of Mexico	2 + 8[2]	0 + 5[2]	1 + 5[2]	1 + 5[2]	1 + 5[2]
COE Rig Removal, Gulf of Mexico	1[1]	1[1]	1[1]	1[1]	1[1]
MMS Rig Removal, Gulf of Mexico	10[3]	5[3]	5[3]	5[3]	5[3]
NE Multispecies Sink Gillnet Fishery	100[4]	10[4]	10[4]	10[4]	10[4]
ASMFC Lobster Plan	0[5]	0[5]	0[5]	0[5]	0[5]
Monkfish Fishery	6	1	1	1	0
Dogfish Fishery	6	1	1	1	0
Summer Flounder, Scup & Black Sea Bass	15	3[1]	3[1]	3[1]	3[1]

Federal Action	Anticipated Incidental Take Level (lethal or non)				
	Loggerhead	Leatherback	Green	Kemp's	Hawksbill
Shrimp Fishery	3550[1]	650	3550[1]	3550[1]	3550[1]
NRC – St. Lucie, FL	5	1	10	1	1
NRC – Brunswick, NC	50[1] (6)	50[1] (0)	50[1] (3)	50[1] (2)	50[1] (0)
NRC – Crystal River, FL	55[1] (1)	55[1] (1)	55[1] (1)	55[1] (1)	55[1] (1)
Total (maximum anticipated[6])	**4008**	**801**	**3724**	**3721**	**3690**

[1]Up to this amount for these species, in combination. In most cases, it is expected that takes of turtle species other than loggerheads will be minimal. Parentheses indicate expected mortalities, where provided in the BO. Other numbers represent "takes", including non-lethal captures.
[2]Up to 8 turtles total, of which, no more than 5 may be leatherbacks, greens, Kemp's or hawksbill, in combination.
[3]Not to exceed 25 turtles, in total.
[4]As part of the 1989 BO on the Issuance of Exemptions for Commercial Fishing Operations under MMPA Section 114.
[5]Included in totals noted above.
[6]Maximum values given for non-loggerhead hardshell turtles are extreme, due to lumping of anticipated takes across species under ITS s.

Sea turtle bycatch estimates based on observations of takes in the pelagic longline component of the swordfish/tuna/shark fishery number in the thousands. The incidental take estimates anticipated in Scott and Brown (1997), used in the April 23, 1999, BO, were revised and updated by estimates provided in Johnson *et al.* (1999) and Yeung (1999). The estimated numbers for all species of sea turtles caught on pelagic longline gear are provided in Table 5.4. below. These estimates are similar to those used in developing the April 23, 1999, BO, and are provided as background in understanding the magnitude of take occurring in the fishery. However, subsequent to the analyses noted above, the Southeast Fisheries Science Center (SEFSC) developed an improved method (Brown *et al*., 2000) for estimating swordfish catch which pooled across quarters, years and areas rather than the previously used method (also followed for protected species bycatch estimation) that assumed zero catch in areas not sampled. The SEFSC then followed with revised estimates of protected species bycatch (Yeung and Epperly, in prep.) following the Brown *et al*. (2000) method but with pooling priorities selected as appropriate for these species. Although peer review and refinement of the manuscript is not yet complete, NMFS believes this methodology is more accurate and appropriate than that used in previous analyses of these data, as the failure to account effort in unobserved areas would result in negative bias in the estimates. The Yeung and Epperly (in prep.) data, although preliminary, are reported below (see Table 5.5).

Table 5.4. **Estimated Sea Turtle Takes Recorded in the U.S. Atlantic and Gulf of Mexico Pelagic Longline Fishery for Swordfish, Tuna and Sharks, 1992 - 1998.** Source: Johnson *et al.*, 1999, Yeung, 1999b, NMFS, 2000b.

Species	Loggerhead		Leatherback		Green		Hawksbill		Kemp's		Sum Total**
Year	Total	Dead*	Total	Dead*	Total	Dead*	Total	Dead*	Total	Dead*	
1992	247	18	871	87	129	18	30	0	0	0	1295
1993	374	9	889	12	25	0	0	0	0	0	1315

1994	1279	12	700	12	24	0	0	0	15	0	2047
1995	2169	0	925	0	31	0	0	0	0	0	3290
1996	410	0	674	0	0	0	0	0	0	0	1084
1997	329	0	357	0	0	0	13	0	23	0	765
1998	472	0	169	0	0	0	77	0	0	0	718

* Does not account for death that may occur after release, which several studies have shown to be 29-33 percent
**Totals include unidentified turtles not listed in the table.

The previous estimated take for all species combined (pooled within areas) was 728 (337-1824, 95 percent CI) in 1998, with a high of 3,136 (2,325-4,260, 95 percent CI) in 1995. Of these, the estimated number in the bycatch that were released dead ranged from 0 in 1995-1997 to 60 (11-307, 95 percent CI) in 1992 (note: this does not account for death that may occur after the release). These totals include unidentified turtles not listed in the table. Most marine turtles were caught from the Grand Banks (NED) fishing area, outside of the US EEZ. These estimates include the loggerhead, leatherback, Kemp's ridley, hawksbill and green sea turtles (see Appendix III). However, the records of the Kemp's ridley and green captures may have been misidentifications and should be re-evaluated (see Hoey, 1998; Witzell 1999).

For 1998, Yeung (1999) provided estimates for the number of sea turtles "seriously injured" *(i.e.*, those not expected to survive). Pooling across species but stratified by area, an estimated total of 730 sea turtles were taken. Of these, Yeung (1999) estimates that all but 10 were seriously injured. This is a much greater predicted mortality rate than that reported by Aguilar *et al.* (1992). Yeung's (1999) criteria for determining serious injury were based on criteria developed for marine mammals (Angliss and DeMaster,1998) and may be overly conservative for sea turtles. These values still use the "old" methods of estimation (*i.e.,* data were not pooled across quarters, years or areas).

Table 5.5. **Comparison of the estimates of total bycatch by species and year among the pooling treatment of zero observer effort strata using two different pooling orders.** Note: qyn and yqn stand for q=quarter, y=year, n= NAREA (the order from left to right represents the pooling priority) and two different minimums for observed sets: 5 and 30 (qyn5 is used in the Yeung and Epperly (in prep.) as it requires less pooling from more distantly related samples). Estimates using the omission treatment (omit, *i.e.*, estimate assigns zero values to areas not sampled) used in Johnson *et al.* (1999) Table 10 and in Yeung (1999) Table 5 are also listed. Source: NMFS, 2000b.

Species	Year	qyn5	qyn30	yqn5	yqn30	Omit
Unid. turtle	92	30	30	37	34	
	93	27	30	27	27	28
	94	33	20	33	21	19
	95	135	79	135	80	
	96	7	25	7	26	
	97	41	58	41	62	19
	98	4	23	2	30	
	Total	**277**	**265**	**282**	**280**	**66**

Species	Year	qyn5	qyn30	yqn5	yqn30	Omit
Green	92	90	67	78	56	37
	93	29	38	29	48	32
	94	29	36	27	51	25
	95	35	8	34	23	
	96	19	27	27	35	
	97	4	10	1	5	
	98	14	23	12	18	
	Total	**220**	**209**	**208**	**236**	**94**
Hawksbill	92	26	23	20	20	15
	93					
	94				3	
	95		2		1	
	96	3	8	1	3	
	97	13	4	13	5	13
	98	13	4	13	7	13
	Total	**55**	**41**	**47**	**39**	**41**
Kemp's ridley	92	1	4	1	4	
	93					
	94	23	24	23	24	19
	95		3			
	96	3	6	1	6	
	97	18	20	18	18	17
	98	1	3		2	
	Total	**46**	**60**	**43**	**54**	**36**
Leatherback	92	941	811	764	925	350
	93	992	945	993	880	876
	94	763	755	774	693	477
	95	874	953	877	959	880
	96	726	747	782	815	36
	97	313	405	319	453	51
	98	394	532	435	609	181
	Total	**5003**	**5148**	**4944**	**5334**	**2851**
Loggerhead	92	215	790	188	932	88
	93	392	635	389	483	388
	94	1299	1460	1274	1296	346
	95	2233	2124	2231	2005	1418
	96	957	933	986	965	118
	97	461	534	417	500	201
	98	987	902	1018	954	516
	Total	**6544**	**7378**	**6503**	**7135**	**3075**

Preliminary information from observer data for 1999 indicates that 45 leatherbacks, 64 loggerheads and 3 unidentified turtles were observed taken; 1 of the loggerheads was dead when boated (NMFS, unpublished data). The location of the hook was not always recorded (N=60) and thus it is assumed that all animals for which this information was not recorded were seriously injured. Thus, 19 of 45 (42 percent) leatherbacks, 50 of 64 (78 percent) loggerheads and 1 of 3 (33 percent) unidentified turtles were assumed to have ingested the hook and were seriously injured or dead. In addition, many animals were released with line still attached, which may also contribute to subsequent mortality.

Observed take levels documented in 1999 indicate that, of all the turtles taken, up to 50 loggerheads and 19 leatherbacks were observed "hooked by ingestion" or moribund upon release (Table 5.6). However, only about 3 percent observer coverage was obtained (G. Scott, pers.

comm.). The anticipated take levels were based on 5 percent observer coverage. Thus, the observed levels of take would have been considerably higher had the required 5 percent coverage level been achieved (as represented by the higher numbers). If the 5 percent observer coverage had been acheived, NMFS preliminarily expects that up to 83 loggerheads and 32 leatherbacks would have been observed "hooked by ingestion" or moribund in 1999.

Table 5.6. Observed Levels of Loggerhead and Leatherback Sea Turtles Taken Incidental to Commercial Pelagic Longlining for Swordfish and Tuna in the U.S. Atlantic Fleet in 1999. Source: NMFS, 2000b.

Species	Total Observed Takes	Anticipated Take by Hook or Ingestion	Actual no. Observed Dead or Taken by Hook or Ingestion[1]	No. taken if Scaled[2] to 5% Effort Level	Estimated[3] no. Taken by Hook or Ingestion, Extrapolated[2] to 5% Coverage Level	Amount ITS Exceeded Actual and (Estimated)
Loggerhead	64	23	50	83	32	60 (9)
Leatherback	45	11	19	32	22	13 (11)

[1]Observer logs in most cases were not detailed enough to determine whether or not a mouth hooked animal was "hooked by ingestion"; thus to be conservative, cases which were unclear were considered as "hooked by ingestion."
[2]Number observed * 5 percent level desired/3 percent achieved.
[3]Based on 29 percent of Total Observed Takes (per post-release mortality estimates provided by Aguilar *et al.*, 1992)

While a determination of whether an animal meets the criteria of "hooked by ingestion or moribund when released" is in some cases somewhat subjective due to the limited detail regarding entanglements provided on observer forms, in most cases the animal's status is very clear (e.g. comments indicating "hooked in gullet") or would be clear if a higher level of detail is provided by the observer. Additionally, where enough detail is not provided, NMFS takes the risk averse approach and assumes the injury may be serious enough to eventually incur death.

For the loggerhead turtle and for all sea turtle species, juvenile survivorship to maturity and adult longevity are critical to population growth. For the loggerhead turtle with an especially long pelagic stage, a reduction in mortality over the 7-12 years of the pelagic stage, during which it is vulnerable to incidental take by this fishery, is especially critical (Heppell *et al.*, in prep).

Witzell (1999) summarized turtle catch from logbook data (1992 - 1995) for sets targeting swordfish and tuna, or both. The Northeast Distant Area accounted for 70 percent of the loggerhead and 47 percent of the leatherback captures that were reported north of the mid-Atlantic Bight. June through November were the peak months for reported captures. A review of observer reports for sets targeting all species between 1990 - 1996 yielded similar results (Hoey, 1998). The Northeast Distant accounted for 75 percent of the loggerhead and 40 percent of the leatherback captures for all sampling areas. The Northeast Distant Area also was the only area where interactions of four or more turtles occurred on a single set. July through November were the predominant months for turtle captures (Hoey, 1998).

It has been suggested that the use of lightsticks is associated with the incidental take of sea turtles in pelagic longline fisheries (Witzell and Cramer, 1995; Price, 1995). Examination of logbook data indicated that CPUE for leatherbacks and loggerheads doubled with the use of lightsticks

(Witzell and Cramer, 1995). However, Hoey's 1998 analysis of Atlantic pelagic longline observer data from 1990 - 1996 indicated that lightstick use had little bearing on levels of sea turtle bycatch. For the Hawaii longline fishery, Skillman and Kleiber (1998) were unable to predict turtle capture based on lightstick use. The use of lightsticks was associated with a number of other more significant predictor variables (e.g. latitude and fishing for swordfish) (Skillman and Kleiber, 1998). Preliminary results of a study on the response of post-hatchling loggerheads to lightsticks indicate that the turtles were strongly attracted to glowing green lightsticks and were weakly attracted to glowing yellow Coghlan lightsticks; methodology developed for testing these animals needs to be applied to older animals (Wang *et al.*, 2000).

NMFS held a workshop in Miami on August 31- September 1, 1999, to discuss monitoring the number of turtles taken and killed in the pelagic longline fisheries and to discuss steps that could be taken to reduce the takes. The report (Kleiber *et al.*, in prep.) lists recommendations for data collection. The Atlantic recommendations were: 1) the color of the lightsticks should be recorded; 2) the position of takes in relation to floats and lightsticks must be recorded; and 3) an estimate of the length of line remaining on the turtle when released should be made. To date only the third recommendation has been implemented in the Atlantic pelagic longline fishery. The report further recommends prioritized avenues of research to both reduce turtle takes in the longline fisheries and improve the survival of turtles taken. Recommendations to reduce takes included targeted closures to selectively achieve a reduction in effort where takes were particularly high, setting hooks deeper in the water column, restrictions on time of day that the lines soaked and were fished, experiments/analyses to determine takes relative to floats or lightsticks and to determine vulnerability relative to time of day, some hook testing, and research on turtle deterrents (*e.g.*, dyed bait). Recommendations to improve survival included changes in the hooks used (circle vs. J and highly corrodible), increase in gangion line length, removal of all line from turtle before release, shortened soak times, and improved handling guidelines.

There are few sources of information on the level of mortality caused by pelagic longlines. In the Spanish pelagic longline fishery, the minimum mortality due to ingestion/internal hooking (84 percent of the loggerheads captured had ingested the hook) was estimated to be 29 percent (Aguilar *et al.*, 1992) in addition to the mortality associated with drowning while hooked (4 of 1098 animals). Post-hooking mortality studies in both the Atlantic and Pacific, based on satellite-tag transmissions of deeply (ingested) and lightly (mouth or foul hooked) hooked turtles of all species (mostly loggerheads), indicate that 29 percent (11 of 38) died (Balazs, pers. comm.; Polovina *et al.*, in press; Bjorndal *et al.*, 1999); 11 of 25 (44 percent) deeply hooked animals failed to transmit signals from their satellite transmitters after being released; the assumption is that they died and remained submerged. The deeply hooked animals tracked by Balaz had all lines removed and were dehooked where possible prior to released; thus 44 percent is likely an underestimate of mortality for deeply hooked animals. The transmissions of the remaining 14 were no different from the transmissions of 13 lightly hooked (in mouth, beak, or flipper) and thus it is assumed that all lived. Sea turtle mortality reported due to drowning in the Mexican tuna longline fishery in the Gulf of Mexico was 33 percent (Ulloa Ramirez and Gonzáles Ania, in press) and there is no estimate of post-hooking mortality in that fishery. Therefore, based on the total estimated catch and a 29 percent mortality rate, 593 and 954 turtles may have died in 1994 and 1995, respectively in the pelagic longline fishery. This is likely a low estimate.

The numbers under the "actual number observed dead or hooked by ingestion" column in Table 5.6 above, minus the one mortality (*i.e.* the deeply hooked animals) represent 62.5 percent of the total observed takes. Multiplying this by the 44 percent mortality estimate observed by Balaz (pers. comm.) for deeply hooked animals yields an overall estimate of 27.5 percent mortality for this fishery, thus reinforcing the 29 percent figure reported by Aguilar *et al.* (1992) as a solid, conservative estimate of minimum mortality.

Requiring fishermen to move after an interaction with not only a marine mammal, as recommended by the AOCTRT, but following an interaction with a sea turtle as well (as now required in the HMS FMP), is intended to mitigate against the contagious distribution of marine mammal and sea turtle takes noted in the observer data set. If fishermen comply with this provision, according to industry representatives familiar with the observer data set, there could be up to a 40 percent reduction in levels of serious injury and mortality of strategic stocks of marine mammals. Hoey (1998) noted that for the Northeast Distant fishing area, 68.1 percent of all loggerheads observed entangled in pelagic longline gear were caught on sets with other loggerheads. For leatherbacks, 31.7 percent were caught on sets with other leatherbacks. Thus, HMS' adoption of this measure in the April 1999 HMS FMP could substantially decrease incidental take levels of both marine mammals and sea turtles. However, as OSF notes in the HMS FMP, this measure is extremely difficult, if not impossible to enforce. Given this difficultly, NMFS is hopeful that, provided with education, fishermen will comply. NMFS also hopes that with the continued promotion of protected species conservation affected via the educational outreach/workshop efforts discussed below, an increased level of compliance with this requirement may be achieved. However, without having an observer onboard there is no way to fully ascertain that fishermen will comply with this provision.

5.8.2 Conclusion of Biological Opinion

After reviewing the current status of the northern right whale, the humpback, fin and sperm whales, and leatherback, loggerhead, green, hawksbill, and Kemp's ridley sea turtles, the environmental baseline for the action area, the effects of implementation of the proposed Amendment to the Atlantic HMS FMP, the record of compliance with requirements of previous BOs on HMS fisheries, and probable cumulative effects, it is NMFS' BO that continued operation of the Atlantic pelagic longline fishery is likely to jeopardize the continued existence of loggerhead sea turtles. It is possible, pending additional analysis, that the final BO will also include a jeopardy finding for the pelagic longline fishery for leatherback sea turtles. If this happens, NMFS expects that similar RPAs would be required.

5.8.3 Reasonable and Prudent Alternatives (RPAs)

Regulations (50 CFR §402.02) implementing section 7 of the ESA define RPAs as alternative actions, identified during formal consultation, that: 1) can be implemented in a manner consistent with the intended purpose of the action; 2) can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; 3) are economically and technologically feasible; and 4) would, NMFS believes, avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

The draft BO concluded that the Atlantic pelagic longline fisheries for swordfish, tunas, and sharks are likely to jeopardize the continued existence of loggerhead sea turtles. The clause "jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (CFR §402.02).

Federal fisheries threaten loggerhead sea turtles primarily by capturing them in differing types of gear, injuring turtles caught in fishing gear, harming turtles that manage to escape by leaving gear trailing from their mouths or body parts, drowning turtles that are caught in gear, or some combination of these effects. According to the draft BO, to avoid the likelihood of jeopardizing the continued existence of loggerhead sea turtles, OSF must implement fishery management measures to reduce the number of loggerhead sea turtles that are incidentally captured, injured, killed by gear associated federally-managed fisheries by at least 75 percent from current (that is, a reduction in the number of loggerhead sea turtles captured, injured, or killed compared with a running average of the number captured, injured, or killed during the period 1993 to 1999) levels.

The draft BO requires OSF to lessen the impact of the pelagic longline fishery upon loggerhead and leatherback sea turtles, and ensure takes decrease in future years because:

(1) of the current status of the loggerhead population;
(2) the levels of incidental take of the April 28, 1999, BO were exceeded for this species;
(3) the SEFSC's revised estimates of incidental take levels for sea turtles indicates that takes in this fishery over the years have actually been much higher than previously believed;
(4) the time/area closures included in the final actions this document could increase incidental take levels for sea turtles; and,
(5) the largely unquantifiable nature of most of these potential changes.

As more information becomes available regarding the status of these populations, it may be necessary to implement additional restrictions to further reduce incidental takes.

Under the terms of the draft BO, the reduction in the number of loggerhead sea turtles that are incidentally captured, injured, or killed in gear can be accomplished directly by gear modifications or it can be accomplished indirectly by changing the method by which gear is deployed. Indirect modifications can include:

(a) Managing fisheries that use harmful gear over time and space to eliminate the likelihood of interactions between loggerhead sea turtles and gear (proportional to the threat posed by specific gear);

(b) Managing fisheries to eliminate the likelihood that loggerhead sea turtles captured by gear would drown before they can be released (such as keeping soak times to less than 30 to 45 minutes);
(c) Excluding gear from areas that, based on available data, appear to be important for loggerhead sea turtles; or,
(d) Any combination of these changes that reduce the number of loggerhead sea turtles that are incidentally captured, injured, and killed by gear associated with federally-managed fisheries by at least 75 percent from current levels.

According to the draft BO, if OSF cannot develop and implement management measures that reduce the number of loggerhead sea turtles that are incidentally captured, injured, and killed by gear associated federally-managed fisheries by at least 75 percent from current levels, OSF must implement the following RPAs, which has three elements:

(1a) Modifications in Fishing Method (e.g. limiting fishing activity to certain temperatures and time regimes); **or,**
(1b) Gear Modifications (e.g. allowing the use of only corrodible hooks);
(2) Exclusion Zones (e.g. temporally and spatially restricting pelagic longline effort in the Grand Banks area); and,
(3) Enhanced Monitoring.

If the final BO includes a jeopardy finding for leatherback sea turtles, similar or the same RPAs could also apply to this species.

5.8.4 Incidental Take Statement

Section 9 of ESA and Federal regulation pursuant to section 4(d) of ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not a prohibited taking under ESA, provided that such taking is in compliance with the RPMs and TCs of the ITS.

Section 7(b)(4)(c) of the ESA specifies that in order to provide an ITS for an endangered or threatened species of marine mammal, the taking must be authorized under section 101(a)(5) of the Marine Mammal Protection Act of 1972 (MMPA). Since no incidental take has been authorized under section 101(a)(5) of the MMPA, no statement on incidental take of endangered whales is provided and no take is authorized. Nevertheless, OSF must immediately (within 24 hours) notify the nearest NMFS Office of Protected Resources should a take occur.

Regarding anticipated incidental take for the pelagic longline fishery for swordfish, tunas, and sharks, it is hoped that the final actions to reduce bycatch in the pelagic longline fishery, which may slightly increase take levels of sea turtles, will be more than offset by additional requirements to reduce take and that estimates of incidental takes of sea turtles in this fishery, which are approximately double previously available estimates, will be substantially minimized by the RPAs and RPMs required under the draft BO.

5.8.5 Reasonable and Prudent Measures

Section 7(b)(4) of the ESA requires that when an agency action is found to comply with section 7(a)(2) of the ESA and the proposed action may incidentally take individuals of listed species, NMFS will issue a statement specifying the impact of any incidental taking. It also states that RPMs necessary to minimize impacts, and TCs to implement those measures must be provided and followed to minimize those impacts. Only incidental taking by the Federal agency that complies with the specified TCs is authorized.

The RPMs and TCs are specified as required by 50 CFR § 402.14 (i)(1)(ii) and (iv) to document the incidental take by HMS fisheries and to minimize the impact of that take on sea turtles. These measures and TCs are non-discretionary, and must be implemented by OSF, in order for the protection of section 7(o)(2) to apply. OSF has a continuing duty to regulate the activity covered by this ITS. If the agency fails to require OSF to adhere to the TCs of the ITS through enforceable terms, and/or fails to retain oversight to ensure compliance with these TCs, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of the incidental take, OSF must report the progress of the action and its impact on the species to NMFS as specified in the ITS [50 CFR 402.14(i)(3)].

The draft BO states that the RPMs that are necessary and appropriate to minimize take of listed species include an effective monitoring and reporting system to document take, educating fishermen to reduce the potential for serious injury or mortality of hooked turtles, and assessments of current data to look for trends that may indicate management measures to reduce the number of protected species interactions.

Terms and Conditions

In order to be exempt from the take prohibitions of section 9 of ESA, the early June 2000 draft BO requires OSF to comply with the following TCs, which implement the RPMs described above and outline required reporting/monitoring requirements. These TCs would be non-discretionary:

1) Observer coverage;
2) Record information on the condition of sea turtles and marine mammals when released;
3) Require the presence and use of dipnets and cutting devices on all longline vessels;
4) Review the Azore's study when it is completed and review other related studies;
5) Provide financial support to genetic research with the ultimate goal of quantifying the various segments of the sea turtle populations;
6) Determine and report on the level of reduction that lightsticks could achieve while

allowing the fishery to continue;

7) As an alternative to the observed experimental fishery to modify gear and fishing techniques to reduce sea turtle takes, investigate use of these options via other means (*e.g.* providing support to various studies, performing data analyses, conducting follow-up activities on various information, etc.); and,

8) Analyze the effects on marine mammal and sea turtle bycatch of limiting the length of pelagic longline gear in the Mid-Atlantic Bight area to 24 nm.

5.9. Sea Birds

Sea bird species hooked by Atlantic pelagic longlines include gannets, gulls, and storm petrels. Sea birds are protected under the Migratory Bird Treaty Act; endangered sea birds are further protected under the Endangered Species Act. The United States is developing a National Plan of Action in response to the FAO Plan of Action to reduce incidental seabird takes. Many seabird populations are especially slow to recover from mortality because their reproductive potential is low (one egg per year and late sexual maturation). They forage on the surface but also pursue prey fish at shallow depths making them somewhat susceptible to driftnet and pelagic longline gear. They are possibly at the highest risk during the process of setting and hauling while the gear is at or near the surface.

Incidental take data for seabirds observed entangled in pelagic longlines are summarized in Appendix B. In 1990-1997, 34 seabirds were hooked by pelagic longlines; 9 were released alive. Seabirds are more often hooked on pelagic longlines as the gear is being set. The birds eat the bait and then become hooked on the line. The line sinks and the birds are subsequently drowned. Anecdotal information suggests that other fisherman also encounter sea birds while fishing for Atlantic HMS.

NMFS has not identified a need to implement gear modifications to reduce takes of sea birds in the pelagic longline fisheries; takes of sea birds are minimal in this fishery in the Atlantic, probably due to night setting of the longlines or fishing in areas where there are not significant numbers of birds. Alexander *et al.* (1997) provides a for additional possibilities of mitigating measures for sea bird mortality in longline fisheries.

6.0 DESCRIPTION OF THE PELAGIC LONGLINE FISHERY FOR ATLANTIC HMS

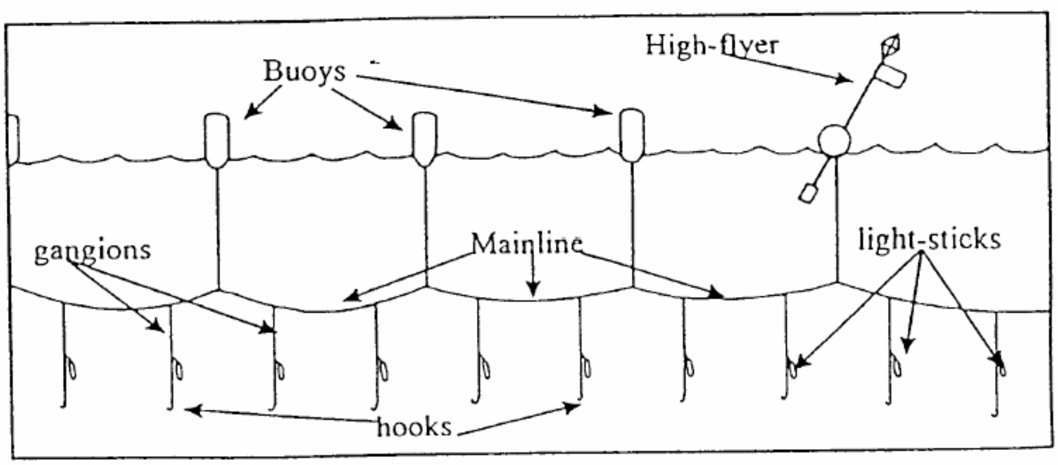
The HMS FMP provides a thorough description of the U.S. fisheries for Atlantic HMS, including sectors of the pelagic longline fishery. Below is specific information regarding the catch of pelagic longline fishermen in the Gulf of Mexico and off the Southeast coast of the United States. For more detailed information on the fishery, please refer to the HMS FMP.

6.1 Pelagic Longline Gear

The U.S. pelagic longline fishery for Atlantic HMS primarily targets swordfish, yellowfin tuna, or bigeye tuna in various areas and seasons. Secondary target species include dolphin, albacore tuna, pelagic sharks including mako, thresher, and porbeagle sharks, as well as several species of large coastal sharks. Although this gear can be modified (i.e., depth of set, hook type, etc.) to target either swordfish, tunas, or sharks, like other hook and line fisheries, it is a multispecies fishery. These fisheries are opportunistic, switching gear style and making subtle changes to the fishing configuration to target the best available economic opportunity of each individual trip. Longline gear sometimes attracts and hooks non-target finfish with no commercial value, as well as species that cannot be retained by commercial fishermen, such as billfish.

Pelagic longline gear is composed of several parts. See Figure 6.1.

Figure 6.1. Typical U.S. pelagic longline gear. Source: Arocha, 1997.



When targeting swordfish, the lines generally are deployed at sunset and hauled in at sunrise to take advantage of the nocturnal near-surface feeding habits of swordfish. In general, longlines targeting tunas are set in the morning, deeper in the water column, and hauled in the evening. Fishing vessels preferentially target swordfish during periods when the moon is full to take advantage of increased densities of pelagic species near the surface, although vessels of the distant water fleet undertake extended trips include other phases of the lunar cycle. The number of hooks per set varies with line configuration and target catch (Table 6.1).

Table 6.1. Average Number of Hooks per set, 1995 through 1998.

Target Species	1995	1996	1997	1998
Swordfish	500	497	500	485
Bigeye Tuna	831	804	725	732
Yellowfin Tuna	753	750	717	717
Shark	666	662	669	746
Mix	705	724	710	719

6.2 Pelagic Longline Catch and Discard Patterns

The pelagic longline fishery is comprised of five relatively distinct segments/fisheries with different fishing practices and strategies, including the Gulf of Mexico yellowfin tuna fishery, the south Atlantic-Florida east coast to Cape Hatteras swordfish fishery, the mid-Atlantic and New England swordfish and bigeye tuna fishery, the U.S. distant water swordfish fishery, and the Caribbean Islands tuna and swordfish fishery. Each vessel type has different range capabilities due to fuel capacity, hold capacity, size, and construction. In addition to geographical area, segments differ by percentage of various target and non-target species, gear characteristics, bait, and deployment techniques. Some vessels fish in more than one fishery segment during the course of the year. Pelagic longline catch (including bycatch, incidental catch, and target catch) is largely related to these vessel and gear characteristics but is summarized for the whole fishery in Table 6.2, based on information provided through the mandatory pelagic logbooks submitted to the SEFSC.

Table 6.2. Reported total annual catch of species caught by U.S. Atlantic pelagic longlines, in number of fish 1995 through 1998.

Species	1995	1996	1997	1998
Swordfish Kept	72,773	73,169	68,253	67,937
Swordfish Discarded	29,176	23,808	20,483	22,536
Blue Marlin Discarded	2,924	3,280	2,605	1,274
White Marlin Discarded	3,283	2,822	2,776	1,485
Sailfish Discarded	1,124	1,430	1,714	810
Spearfish Discarded	368	549	379	103
Bluefin Tuna Kept	240	208	180	204
Bluefin Tuna Discarded	2,848	1,706	679	1,304
BAYS Kept	119,259	84,977	102,123	74,412
Yellowfin Tuna Kept	82,297	62,869	73,987	48,938
Bigeye Tuna Kept	22,338	17,271	21,328	18,181

Species	1995	1996	1997	1998
Pelagic Sharks Kept	5,871	5,279	5,136	3,607
Pelagic Sharks Discarded	90,193	84,590	82,235	43,998
LCS Kept	58,567	36,047	21,741	11,756
LCS Discarded	11,033	11,486	8,026	5,891
Dolphin Kept	71,541	37,007	63,056	21,678
Wahoo Kept	4,930	3,468	4,569	4,180
Turtles Discarded	1,142	498	267	885
Number of Hooks (X 1,000)	*11,036*	*10,617*	*9,873*	*7,617*

In the United States, sale of billfish from the Atlantic Ocean is prohibited. The relative magnitude and frequency of encounters of billfish with pelagic longline gear (responsible for most of the commercial bycatch of billfish) affect the approach necessary to reduce this bycatch. The percent of the U.S. longline catch comprised of billfish and estimates of subsequent live releases from pelagic longline gear are shown in Table 6.3.

Table 6.3. Annual Proportion of Billfish in the U.S. Pelagic Longline Catch in 1995, by number.
Source: Cramer, 1996.

Species	Proportion of Catch (*percent*)	Percent Released Alive
Atlantic blue marlin	0.49	74.4
Atlantic white marlin	0.49	68.8
West Atlantic sailfish	0.20	58.0
Longbill spearfish	0.07	64.7
All species combined	1.26	69.2

6.2.1 U.S. Catch in Relation to International Catch of Atlantic Highly Migratory Species

The United States harvests only a portion of the Atlantic-wide catch of highly migratory species (Table 6.4). In 1998, U.S. fishermen (commercial dead discards and recreational landings) accounted for only 1-3 percent of the Atlantic billfish fishing mortality (depending on species). For tunas, the U. S. fishery accounts for variable proportions of the Atlantic-wide mortality: 47 percent for West Atlantic bluefin tuna, almost 4 percent for yellowfin tuna, and a much smaller proportion of skipjack, bigeye tuna, and albacore tuna mortality. The United States accounted for 25 percent of the north Atlantic swordfish catch. Because curbing U.S. fishing alone would not be effective, the United States seeks to work in the international arena to reduce bycatch and bycatch mortality. In some cases, such as marlins, the mortality by U.S. commercial fishermen has only a small impact on the stocks.

Table 6.4. Percentage of U.S. pelagic longline catches (landings + discards) as a proportion of the total annual reported ICCAT catches. Calculations are based on information provided by the 1999 SCRS report. Source: SCRS, 1999.

Species	Stock	1996	1997	1998
Yellowfin Tuna	Atlantic	2.1	2.7	1.7
Bigeye Tuna	Atlantic	0.6	0.8	0.7
Skipjack Tuna	West Atlantic	0.001	0.01	0.004
Albacore Tuna	North Atlantic	0.4	0.6	0.7
Bluefin Tuna	West Atlantic	5.9	3.9	4.3
Blue Marlin	Atlantic	4.4	3.4	1.6
White Marlin	Atlantic	4.4	7.7	2.9
Sailfish	West Atlantic	7.9	14.2	1.8
Swordfish	North Atlantic	27.2	26.3	28.2

Note: Shark catches are reported as bycatch but are insufficient to determine relative proportions.

6.2.2 Marine Mammals

Of the marine mammals that are hooked by pelagic longline fishermen, many are released alive, although some animals suffer serious injuries and may die after being released. Mammals are caught primarily from June through December in the Mid-Atlantic Bight and Northeast Coastal areas. In the past, the incidental catch rate was highest, on average, in the third quarter (July - September) in the Mid-Atlantic Bight. Incidental catch of pilot whales in pelagic longlines is thought to result from pilot whales preying on tuna that have been caught on the gear.

6.2.3 Sea Turtles

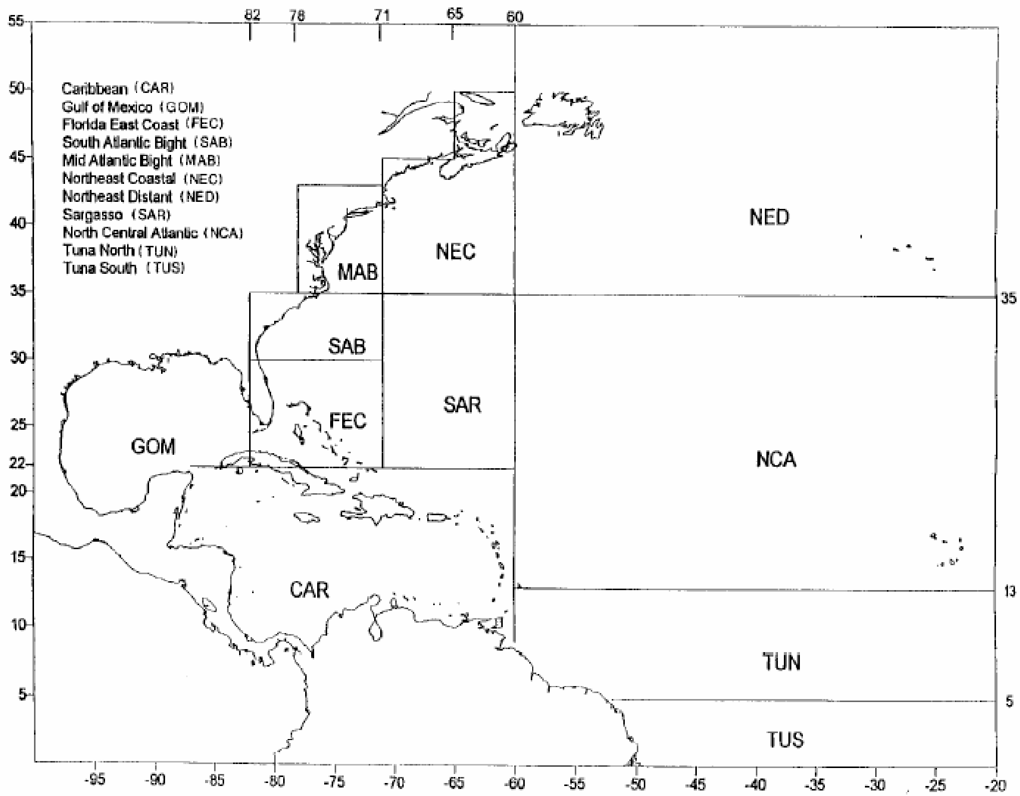
A summary of reported turtle takes from the pelagic logbook from 1995-1998 is provided in Table 6.2. Many of these turtles were taken in the Northeast Coastal (NEC) and Northeast Distant (NED) areas (Figure 6.2) and were released alive. In the past, the bycatch rate was highest in the third and fourth quarters. Loggerhead and leatherback turtles dominate the catch of turtles. In general, sea turtle captures are rare, but takes appear to be clustered (Hoey and Moore, 1999). Further information on sea turtle takes is provided in Section 5.8.

6.3 Regional U.S. Pelagic Longline Fisheries Description

Pelagic longline catch composition varies among the various areas of the operational range of the U.S. commercial fleet in the Atlantic Ocean. Hoey and Moore (1999) summarized historical observer data to describe catch composition of pelagic longline sets made during 1990 to 1997 in the statistical areas shown in Figure 6.2, including: Tropical (TUN, TUS); Caribbean (CAR); Western North Central Atlantic (SAR, NCA); Gulf of Mexico (GOM); Florida East Coast (FEC); South Atlantic Bight (SAB); Mid-Atlantic Bight (MAB); Northeast Coastal (NEC); and

Northeast Distant.

Figure 6.2. Geographic areas used in summaries of pelagic logbook data from 1992 - 1998. Source: Cramer and Adams, 2000.



6.3.1 The Gulf of Mexico Yellowfin Tuna Fishery

These vessels primarily target yellowfin tuna year-round; however, each port has one to three vessels that direct on swordfish either seasonally or year-round. Longline fishing vessels that target yellowfin tuna in the Gulf of Mexico also catch and sell dolphin, swordfish, and other tunas and sharks. During yellowfin tuna fishing, few swordfish are captured incidentally. Many of these vessels participate in other Gulf of Mexico fisheries (targeting shrimp, shark, and snapper/grouper) during allowed seasons. Major home ports for this fishery include Panama City, FL; Destin, FL; Dulac, LA; and Venice, LA.

6.3.2 The South Atlantic ~ Florida East Coast to Cape Hatteras Swordfish Fishery

These pelagic longline vessels primarily target swordfish year-round. Yellowfin tuna and dolphin are other important marketable components of the catch. Smaller vessels fish shorter trips from the Florida Straits north to the bend in the Gulf Stream off Charleston, South Carolina (Charleston Bump). Mid-sized and larger vessels migrate seasonally on longer trips from the Yucatan Peninsula throughout the West Indies and Caribbean Sea and some trips range as far north as the mid-Atlantic coast of the United States to target bigeye tuna and swordfish during the late summer and fall. Fishing trips in this fishery average nine sets over 12 days. Major home ports (including seasonal ports) for this fishery include Georgetown, SC; Cherry Point, SC; Charleston, SC; Fort Pierce, FL; Pompano Beach, FL; Dania, FL; and Key West, FL. This sector of the fishery consists of small to mid-size vessels which typically sell fresh swordfish to local high-quality markets.

6.3.3 The Mid-Atlantic and New England Swordfish and Bigeye Tuna Fishery

This fishery has evolved during recent years to become an almost year-round fishery based on directed tuna trips, with substantial numbers of swordfish trips as well. Some vessels participate in the directed bigeye/yellowfin tuna fishery during the summer and fall months and then switch to bottom longline fisheries and/or shark fishing during the winter when the large coastal shark season is open. Fishing trips in this fishery sector average 12 sets over 18 days. During the season, vessels primarily offload in the major ports of Fairhaven, MA; Montauk, NY; Barnegat Light, NJ; Ocean City, MD; and Wanchese, NC. Some of these vessels follow the swordfish along the mid-Atlantic coast, then fish off the coast of the southeast United States during the winter months.

6.3.4 The U.S. Atlantic Distant Water Swordfish Fishery

This fleet's fishing grounds range virtually the entire span of the western North Atlantic to as far east as the Azores and the mid-Atlantic Ridge. About ten larger vessels operate out of mid-Atlantic and New England ports during the summer and fall months, and move to Caribbean ports during the winter and spring months. Many of the current distant water operations were among the early participants in the U.S. directed Atlantic commercial swordfish fishery. These larger vessels, with greater ranges and capacities than the coastal fishing vessels, enabled the United States to become a significant player in the north Atlantic fishery. They also fish for swordfish in the south Atlantic. The distant water vessels traditionally have been larger than their Southeast counterparts because of the distances required to travel to the fishing grounds. Fishing trips in this fishery tend to be longer than in other fisheries, averaging 30 days and 16 sets. Principal ports for this fishery range from San Juan, Puerto Rico through Portland, ME, and include Fairhaven, MA, and Barnegat Light, NJ.

6.3.5 The Caribbean Tuna and Swordfish Fishery

This fleet is similar to the southeast coastal fishing fleet in that both are comprised primarily of smaller vessels that make short trips relatively near-shore, producing high quality fresh product. Both fleets also encounter relatively high numbers of undersized swordfish at certain times of the year. Longline vessels targeting HMS in the Caribbean set fewer hooks per set, on average, fishing deeper in the water column than the distant water fleet off New England, the northeast coastal fleet, and the Gulf of Mexico yellowfin tuna fleet. This fishery is typical of most pelagic fisheries, being truly a multispecies fishery, with swordfish as a substantial portion of the total catch. Yellowfin tuna, dolphin and, to a lesser extent, bigeye tuna, are other important components of the landed catch. Principal ports are St. Croix, U.S. Virgin Island; and San Juan, Puerto Rico. Many of these high quality fresh fish are sold to local markets to support the tourist trade in the Caribbean.

6.3.6 Regional Pelagic Longline Catches

As expected, swordfish dominates the catch in weight along the southeast coast and northeast areas (Table 6.5). Tuna catch dominates in the Gulf of Mexico and in the Mid-Atlantic Bight (Table 6.6). Blue marlin and sailfish are taken most frequently in the Caribbean and Gulf of Mexico; white marlin are also taken in these areas, as well as the northeast coastal area (Tables 6.7 and 6.8). Pelagic sharks and LCS (Table 6.9) are taken most frequently along the Atlantic coast. Further information on the distributional patterns of these species is provided in the HMS FMP and Billfish FMP Amendment.

Table 6.5. Regional Swordfish Pelagic Longline Catch: 1997 and 1998 (reported in pelagic longline ; areas defined as shown in Figure 6.2). Source: Cramer and Adams, 2000.

Area	Number Swordfish Caught	Percent Kept	Percent Discarded Dead	Percent Discarded Alive	Number Swordfish Caught	Percent Kept	Percent Discarded Dead	Percent Discarded Alive
	1997				1998			
CAR	8,029	84	7	7	5114	81	11	7
GOM	16,260	68	18	13	11306	74	13	11
FEC	13,200	66	20	13	13954	65	19	14
SAB	11,438	72	16	10	20008	71	15	12
MAB	4,240	53	24	21	7894	62	17	19
NEC	5,360	69	15	14	5877	68	16	14
NED	14,200	88	7	4	15621	84	7	7
SAR	336	91	4	4	25	100	0	0
NCA	2,931	94	2	3	4381	93	3	3
TUN	1,519	85	7	7	1117	79	11	9
TUS	9,114	92	4	3	4410	91	4	3
Total	**86,627**	**76**	**13**	**10**	**89707**	**75**	**13**	**11**

Table 6.6. Regional Pelagic longline catches of tunas (mt whole weight), by year and area, by U.S. pelagic longline fleet. Source: NMFS, 1999c.

Area	Tuna Species	1995	1996	1997	1998
NW Atlantic (areas MAB, NEC, FEC, NED)	Yellowfin	1277.6	728.3	838.9	464.9
	Skipjack	0.1	0.1	1.0	0.7
	Bigeye	669.4	333.0	476.3	544.3
	Bluefin	171.9	101.9	56.7	85.3
	Albacore	240.0	63.6	140.0	155.4
Gulf of Mexico (area GOM)	Yellowfin	1934.4	2164.8	2571.3	1864.5
	Skipjack	0.6	0.2	1.3	0.6
	Bigeye	71.4	30.9	33.9	25.6
	Bluefin	42.3	39.5	30.2	25.7
	Albacore	10.3	5.7	16.9	3.9
Caribbean (Areas SAR, NCA, CAR, TUN)	Yellowfin	351	34.2	135.4	58.6
	Skipjack	0.1	0	1.2	0
	Bigeye	109.4	32.8	50.0	48.5
	Bluefin	0	0	0	0
	Albacore	80.3	6.6	16.1	17.8
NC Area 94a	Yellowfin	18.6	319.3	6.1	4.6
	Skipjack	0	0	0	0
	Bigeye	135.3	228.9	91.8	48.4
	Bluefin	0	0	0	1.7
	Albacore	6.2	32.4	11.4	1.6
SW Atlantic (area TUS)	Yellowfin	0	38.4	221.9	55.3
	Skipjack	0	0	0	0
	Bigeye	0	34.9	142.8	28.5
	Bluefin	0	0	0	0
	Albacore	0	1.1	4.7	1.4

Table 6.7. **Number of blue marlin, white marlin and sailfish discarded (dead and alive), by area, from U.S. commercial longline vessels, based on pelagic logbook reports .** Source: Cramer and Adams, 2000.

Area	Blue Marlin Discards			White Marlin Discards			Sailfish Discards		
	96	97	98	96	97	98	96	97	98
CAR	463	295	156	171	154	118	44	40	38
GOM	646	512	558	490	392	418	586	623	434
FEC	204	171	246	109	100	210	303	192	183
SAB	386	156	130	290	142	126	248	121	108
MAB	53	38	25	315	224	166	20	3	8
NEC	262	54	44	459	419	146	10	3	4
NED	3	3	33	12	8	18	0	1	1
SAR	6	1	0	33	16	0	2	0	0
NCA	137	70	46	160	105	112	21	7	3
TUN	819	605	58	423	251	138	188	222	30
TUS	120	398	29	37	589	42	44	550	26
Total	3,099	2,303	1,295	2,501	2,450	1,494	1,466	1,762	835

Table 6.8. **U.S. commercial dead discards (mt ww) and recreational landing estimates (mt) of Atlantic Marlins for 1994, 1995 and 1996.** Source: NMFS, 1999c.

	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Atlantic Blue Marlin			**Atlantic White Marlin**			**Atlantic Sailfish**		
Northwest Atlantic									
Longline Discards	37.3	18.7	23.3	25.3	11.2	15.3	19.2	9.2	6.4
Rod & Reel	18	25	34.1	2.7	0.9	2.4	0.2	0	0.1
Unclassified			0.62			0.7			0.06
Gulf of Mexico									
Longline Discards	24.7	51	18.5	11.6	15.4	11.8	42.1	13.3	17.0
Rod & Reel	8.3	11.5	4.5	0.6	0.9	0.2	0.8	0.4	1.0
Caribbean									
Longline Discards	124.7	24.6	2.3	26.6	6.6	1.3	8.2	3.3	0.2
Rod & Reel	9.6	8.6	10.6	0	0	0.02	0.2	0.2	0.05
Other	0	0	0	0	0	0	0	0	0
Unknown									
Longline Discards	8.6	2.3	6.1	3.9	0.5	2.8	1.9	0	0.8
Southwest Atlantic									
Longline Discards	1.24	41.5	1.6	0.2	37.1	0.9	0.2	31.9	2.7
All Gear Totals	231.4	183.2	101.6	70.9	72.6	35.4	72.8	58.3	28.3
Rod & Reel Totals	34.9	45.1	49.2	3.3	1.8	2.6	1.2	0.6	1.15
Percent U.S. Reported Mortality Attributed to Pelagic longline gear	84.9	75.4	51.6	95.3	97.5	92.7	98.3	99.0	95.9

Table 6.9. **Regional U.S. Atlantic Pelagic Longline Catches of Sharks in 1998.** Source:(Task I data submitted to ICCAT, 1999, not a complete set of shark landings)

Region	**Pelagic Sharks**		**Coastal Sharks**	
	Dead Discards (number of fish)	**Landings (number of fish)**	**Dead Discards (number of fish)**	**Landings (number of fish)**
Gulf of Mexico	288	393	458	653
Atlantic Coast	3259	2832	2604	6203
Caribbean	129	58	5	0
Atlantic-Distant	2651	662	1	5
South Atlantic	113	17	49	0

6.3.7 Pelagic Longline Vessel Characteristics

An important component to consider in the evaluation of possible impacts of various management alternatives (Section 7) are the physical characteristics of the U.S. pelagic longline fleet, including where vessels are homeported (Figure 6.3). The size of the vessel limits the range within which a pelagic longline vessel can safely operate (distance from home port and from shore). In a recent study of the pelagic longline fleet, Larkin *et al.* (1998) found that the average length of Atlantic pelagic longline vessels in 1996 was 57 feet (range 30-95 feet). The distribution of pelagic longline vessel lengths (by increments of 10 feet) with either a directed or incidental permit that would allow landings of swordfish, tuna and/or sharks are shown in Figure 6.4. Pelagic longline vessels were divided into three groups: vessels with home ports north of 36° N. latitude, those south of 36° N. latitude, and vessels homeported in the Gulf of Mexico. Vessels fishing out of the east coast of Florida to North Carolina are smaller than other areas, with lengths generally 50 feet or less. This is indicative of vessels that make short trips to the swordfish and tuna fishing grounds along the southeastern U.S. coast that are relatively close to shore. Vessels homeported out of the northeastern United States are larger (most over 50 feet), reflecting the distance these vessels must travel to the productive fishing areas. The vessels in the Gulf of Mexico are intermediate in size relative to those along the U.S. Atlantic coast, with the modal group in the 60 foot range.

Figure 6.3. Frequency distribution, by homeport state, of pelagic longline vessels with directed or incidental limited access HMS permits. Source: NMFS permit database, October 1999.

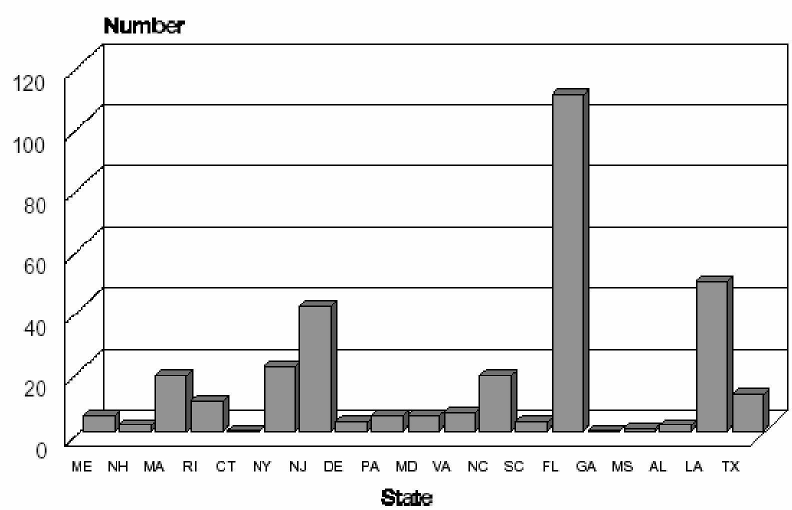
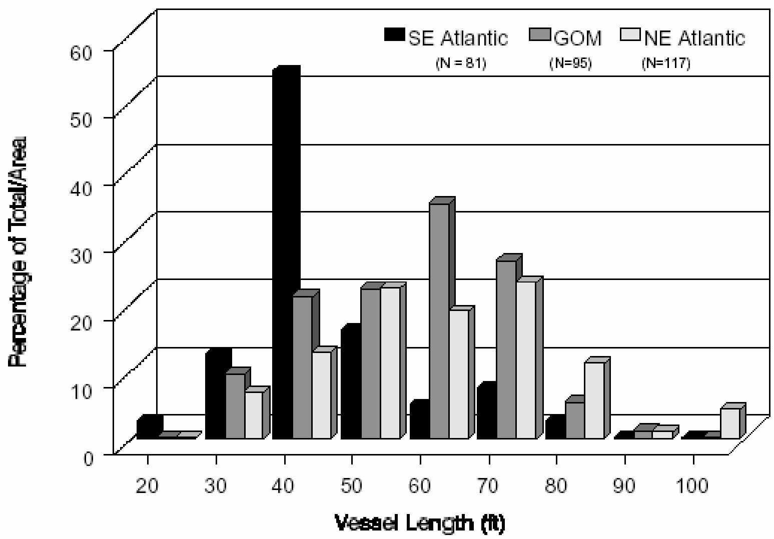


Figure 6.4. **Distribution of vessel lengths with home ports from the Gulf of Mexico, the southeastern U.S. Atlantic coast (south of 36º N latitude) and northeastern U.S. Atlantic coast (north of 36º N latitude).** Source: NMFS Permit database, October 1999.



6.4 Economics of Pelagic Longline Fishing

6.4.1 Costs

The average cost of a pelagic longline trip was estimated from a description of the voluntary 1996 trip summary report data (Larkin *et al.*, 1998). The data requested on the trip summary forms include cost data for fuel, bait, groceries, light sticks, and miscellaneous expenses (including docking and unloading fees). In addition, the form requested the amounts paid to the crew, captain, and vessel owner per trip. The average costs per trip are summarized in Table 6.10, based on reports from 95 vessels that submitted the voluntary economic information for 488 trips taken during 1996. Ward and Hanson (1999) also examined the pelagic logbook voluntary form. They used data from 1996 through 1998 and found the total average cost per pelagic longline trip to be $5,284 with a standard deviation of $6,406 (1,932 trips); these average cost estimates are somewhat lower than the Larkin *et al*. (1998) study that examined only 488 trip (vs 1,932 trips) from 1996 (vs 1996 to 1998 average). They also found in 1996 and 1997 (Table 6.11) that the average trip cost was $2,965 with a standard deviation of $4277 (1,583 trips), not including payments to the captain and crew. Additional data may reduce some of the variability found in the database.

Strand and Mistiean (1999) found that Gulf of Mexico vessels use more fuel and light sticks per set, and capture more tuna and swordfish per set than Atlantic vessels (Table 6.12). Note that this study did not consider the distant water fleet in their calculations because they do not represent the majority of the vessels fishing in the Atlantic. Fuel costs are considerably lower in the Gulf but the seasonal economics of the longline fishery (in both the Atlantic and the Gulf) may be largely dependent on the migrations of tunas and swordfish. Large variation in costs, up to $200 per set, were found to exist depending on the time of year and the area of operation.

Table 6.10. **Average variable cost per pelagic longline trip for 1996.** Source: Larkin *et al.*, 1998.

Cost Category	Average Cost
Light Sticks	$801
Fuel	$1,400
Bait	$1,506
Ice	$384
Groceries	$617
Miscellaneous	$2,623
TOTAL	**$7,331**

Table 6.11. **Average percent and value of the cost components of pelagic longline trips: 1996-1997.** Source: Ward and Hanson, 1999.

Cost Category	**Average Cost**
Fuel	$876
Bait	$646
Ice	$350
Freight/Handling	$350
Groceries	$441
Light Sticks	$302
Total	**$2,965**

Table 6.12. **Average characteristics of trips and sets, by region and season.** Source: Strand and Mistiean, 1999.

Characteristics	**Sample of Atlantic Vessels**		**Sample of Gulf of Mexico Vessels**		**Entire Sample**
	January-March	April-December	January-March	April-December	January-December
Fuel/trip (gals)	451	715	1660	1684	990
Number of Lightsticks/trip	726	577	1749	755	929

Characteristics	Sample of Atlantic Vessels		Sample of Gulf of Mexico Vessels		Entire Sample
Price of fuel ($/gal)	1.02	0.99	0.74	0.77	0.91
Price of light sticks ($/light stick)	0.50	0.52	0.51	0.53	0.52
Swordfish Harvest/set	8.9	11.8	32.8	13.1	14.1
Tuna harvest/set	2.9	13.4	14.0	18.9	13.3
Sets per trip	2.9	3.5	6.0	5.7	4.2

6.4.2 Revenues

Many consumers consider swordfish to be a premier seafood product. Swordfish that bring $3.00 per pound to the vessel may sell in some restaurants at prices of over $20.00 for a six-ounce steak. Swordfish prices are affected by a number of demand and supply factors, including the method of harvest, either by distant-water or inshore vessels, and by gear type (harpoon vs. pelagic longline). Generally, prices for fresh swordfish can be expected to vary during the month due to the heavier fishing effort around the period of the full moon. Swordfish prices also vary by size and quality, with prices first increasing with size, up to about 250 lbs, then decreasing due to higher handling costs for larger fish. "Marker" swordfish weighing 100 to 275 lbs are preferred by restaurants because uniform-sized dinner portions can be cut with a minimum of waste. "Pups" weighing 50 to 99 lbs dw are less expensive than markers but the yield of uniformly sized portions is smaller. "Rats" (33 to 49 lbs dw) are the least expensive but are generally not used by food service or retail buyers who require large portions of uniform size. Larger tunas are also more desirable than smaller ones with prices for tunas ranging from $1.00-1.50 for 0-29 pound yellowfin tuna to $1.50-3.00 for 50+ pound yellowfin tuna (Strand and Mistiean, 1999). Size of fish harvested can be a substantial factor in management because regulations might have the effect of reducing catch but might raise the average size per fish caught and therefore, raise the price.

However, just as costs can vary seasonally and depending on region, prices also might exhibit patterns at different ports and during different times of the year. Demand for swordfish was shown to be stronger during the second and third quarters of the year (Thunberg and Seale, 1992), reflecting the popularity of swordfish steaks during the barbecue and seaside tourist seasons. There is evidence of regional differences in price. The eastern Gulf of Mexico, for example, receives relatively low prices for swordfish and near average prices for tuna (Strand and Mistiean, 1999).

ICCAT quotas for Atlantic swordfish have decreased. Although studies (Gauvin 1990; Thunberg and Seale, 1992) demonstrate that ex-vessel gross revenues may rise as supply decreases and as U.S. consumer income rises, U.S. prices have declined over the past four years (Table 6.13). The combination of decreased prices and decreased quota indicates that total gross revenues for the fleet as a whole have probably declined as well. Declining prices for swordfish may be the result of substitution with imports which occur during critical months of the year; imports of swordfish have increased dramatically in recent years. The relatively strong U.S. dollar and weak Japanese Yen may be drawing fish that were formerly marketed in Asia to the domestic market, including swordfish and steak-grade tuna that compete with U.S. domestic swordfish.

Table 6.13. **Index of ex-vessel prices for swordfish and tunas, 1989 - 1998.** Base year is 1982. Source: NMFS, 1999a.

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Swordfish	119	108	102	111	92	107	104	103	91	70
Tunas	108	112	126	97	117	181	212	105	118	96

6.4.3 Imports

NMFS has identified 69 swordfish importers who have imported swordfish since the swordfish import permitting, reporting and small fish restrictions were implemented in June 1999. Recent import data collected from the importer activity reports (part of dealer bi-weekly reports) and the Certificates of Eligibility are summarized in Table 6.14. These data are limited because the program was not implemented until mid-year 1999.

Dealers submit reports to NMFS on swordfish sales that include the weight and price of the fish. The processing and wholesale sectors are an integral part of the U.S. swordfish industry and are described in detail in the HMS FMP. The sector that might be most affected by this rulemaking is the primary processing sector, notably those firms that purchase the raw product from fishermen or importers and transform it into a consumer product. Secondary processors provide restaurants and food service distributors with loins or "wheels" (large bone-in sections cut through the body).

Other participants involved in the commercial trade sector of the Atlantic swordfish fishery include brokers, freight forwarders, carriers (primarily commercial airlines), and consignees. Brokers are private individuals or companies who are hired by importers and exporters to help move their merchandise through U.S. Customs with the proper paperwork and payments. The broker must possess thorough knowledge of tariff schedules and U.S. Customs regulations and keep abreast of changes in the law and administrative regulations. Freight forwarders often arrange for land transportation and storage facilities for the incoming shipment. The nominal or an ultimate consignee is the person who "owns" the shipment of swordfish.

Table 6.14. Swordfish Import Data Collected under the Swordfish Import Monitoring Program (lbs). June - September 1999 totals. Based on data received through November 15, 1999.

Flag Country of Vessel	Ocean of Harvest				Total
	Atlantic	Pacific	Indian	Unknown	
Australia	0	394060.3	72900.7	6938.8	473899.8
Brazil	796966.8	0	0	0	796966.8
Canada	565248	0	0	0	565248
Chile	0	901326.5	0	0	901326.5
Columbia	0	192.5	0	0	192.5
Costa Rica	0	257504.3	0	0	257504.3
Ecuador	0	52658.3	0	0	52658.3
El Salvador	0	8768	0	0	8768
Fiji Islands	0	52017.6	0	0	52017.6
Grenada	2607	0	0	0	2607
Guam	0	1905	0	0	1905
Indonesia	0	0	74854.3	0	74854.3
Japan	0	163100	0	0	163100
Mexico	0	101845.4	0	0	101845.4
Micronesia	0	542	0	0	542
Namibia	0	0	0	0	0
Netherlands	1597	0	0	0	1597
New Zealand	0	177731.9	0	0	177731.9
Panama	0	243.9	0	0	243.9
Peru	929.4	2374	0	0	3303.4
Philippines	0	30568	0	0	30568
Samoa	0	1204	0	0	1204
South Africa	1262258	0	0	0	1262258
Taiwan	100348	29400	2537219	0	2666967
Trinidad	837	0	0	0	837
Uruguay	156845.1	0	0	0	156845.1
Vietnam	0	5044.1	0	0	5044.1
Unknown	0	0	0	332113.7	332113.7
Totals	2887636.2	2180485.8	2684974.1	339052.5	8092148.6

6.5 Management of the U.S. Atlantic Pelagic Longline Fishery

The U.S. Atlantic pelagic longline fishery is subject to numerous management measures designed to meet conservation goals, as well as provide scientific information for optimal management of these resources. The pelagic longline fishery is restricted to catching a limited swordfish quota, divided between the North and South Atlantic (separated at 5° N. latitude). Other regulations include minimum sizes for swordfish, yellowfin, bigeye, and bluefin tuna, limited access permitting, reporting requirements (including logbooks and vessel monitoring systems), and gear requirements (temporary restrictions on length of line). The pelagic longline fishery is subject to a high level of management, and as such, is strictly monitored to avoid overharvest of the swordfish quota and to monitor bycatch.

Pelagic longline fishermen and the dealers who purchase highly migratory species from them are also subject to reporting requirements. NMFS has extended dealer permitting and reporting requirements to all swordfish importers as well as dealers who buy domestic swordfish from the Atlantic. These data are used to evaluate the impacts of harvesting on the stock and the impacts of regulations on affected entities.

Current billfish regulations prohibit the retention of billfish by commercial longline vessels, and the sale of billfish from the Atlantic Ocean. As a result, all billfish hooked on longlines must be released, and are considered bycatch.

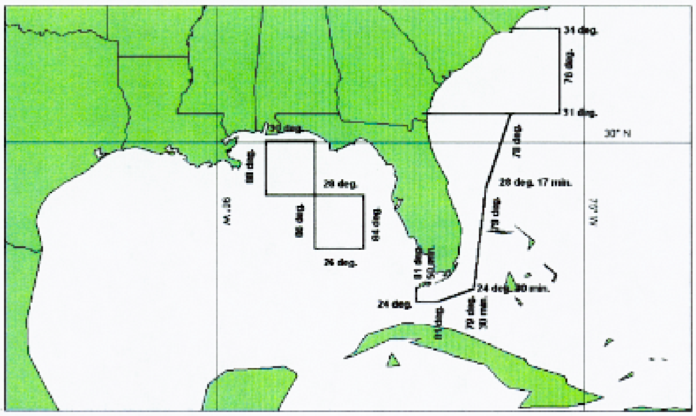
Pelagic longlines were not historically part of the bluefin tuna fishery in the United States. For this reason, their catch is considered incidental and NMFS has implemented regulations to discourage longline fishermen from targeting bluefin tuna and to limit the incidental catch of this species. As a result of these regulations, bluefin tuna are often discarded.

In 1997, NMFS convened the Longline Advisory Panel which investigated strategies for comprehensive management of this fishery, because of its multispecies nature. The meetings of that group with NMFS staff resulted in a report to Congress which outlined possible changes in management to address fishermen's concerns. NMFS will continue to use this document to guide management in an effort to move towards ecosystem management of Federal fisheries. That report supported limited access, which is currently in place for pelagic longline fishermen targeting Atlantic highly migratory species. Limited access imparts a greater vested interest in the future of the fishery, and provides incentive for stock rebuilding and bycatch reduction. Further, the HMS and Atlantic Billfish APs have considered numerous pelagic longline issues in the development of the HMS FMP, Billfish FMP Amendment, and this final rule.

PAGES 7-1 THROUGH 7-15 INTENTIONALLY OMMITTED

Final Action: Closure of the DeSoto Canyon area and the East Florida Coast area year-round; Closure of the Charleston Bump area February 1-April 30.

Figure 7.2. Geographic boundaries for DeSoto Canyon, East Florida Coast and Charleston Bump.



Background and Summary of Additional Analytical Procedures

During the comment period for the proposed HMS bycatch rule, NMFS received many comments indicating that the DeSoto Canyon area located in the eastern Gulf of Mexico should be closed to pelagic longline effort due to the historically high occurrence of undersized swordfish in that location. Although NMFS had analyzed closures in the Gulf of Mexico in the November 1999 Draft Technical Memorandum which encompassed the DeSoto Canyon sub-region, NMFS responded to this comment by preparing an April 26, 2000, federal register notice (65 FR 24440), including a summary of biological, economic, and social impacts associated with closure of this area. Briefly, procedural methods involved examining logbook information dating back to 1993 (1995 was used in the previous analysis) through 1998 (which was unavailable at the time the proposed rule was prepared) for the area bounded by 84°W to 90°W longitude and 26°N to 30°N latitude. This large area in the northeastern Gulf of Mexico was then subset into 2° X 2° (latitude X longitude) blocks, noting inter-annual and intra-annual changes of target and discard catch-per-unit-effort and ratios of target catch to discards, where appropriate (e.g., swordfish kept vs. swordfish discarded). Following this procedure, two blocks were identified for potential year-round closure: 86°W to 88°W longitude and 28°N to 30°N latitude; and 84°W to 86°W longitude and 26°N to 28°N latitude. A summary of pelagic longline catch and discards of swordfish in these areas between 1993 and 1998 is provided in Table 7.2. The northwest block of the DeSoto Canyon area falls within the GulfC closure. The lower, southeastern block of the DeSoto Canyon is located within the GulfD area, which was examined in the Draft

Technical Memorandum, which was made available to the general public in November 1999, and was included as an attachment to the DSEIS.

Table 7.2. Summary of the annual (1993 through 1998) number of swordfish kept and discarded, number of hooks used, and annual ratio of swordfish kept to swordfish discarded from the two blocks identified for closure in the northeastern Gulf of Mexico (DeSoto Canyon).

Year	Swordfish Kept	Swordfish Discarded	Ratio Kept/Discarded	Number of Hooks
1993	1,685	2,370	0.71	482,881
1994	1,630	3,816	0.43	464,803
1995	1,125	1,195	0.94	312,172
1996	2,769	1,983	1.40	354,307
1997	182	1,188	1.50	272,737
1998	968	476	2.03	233,495
Total	9,959	11,028	0.90	211,395

Comments on the proposed rule and DSEIS also indicated that the proposed closures along the U.S. southeast Atlantic coast would have a significant economic and social impact on pelagic longline vessels and on shore-side businesses that operate in the area. There was also concern voiced regarding the biological, social and economic impacts of vessels that displace effort into areas open to fishing. The level of turtle takes by the pelagic longline fishery, particularly from the Northeast Distant area also provided further rationale for examining strategies that would reduce the level of effort redistribution, particularly in the fall months. To respond to these concerns, an evaluation was made of the catch patterns within the SAtlE to determine if changes could be made to the temporal and/or spatial components of this closure that would address the four over-arching objectives of the FSEIS, *but at the same time*, minimize economic and social impacts related to effort redistribution.

After a qualitative review of the logbook information from pelagic longline sets made in SAtlE over the four year period between 1995 through 1998, the area was sub-divided into two smaller areas separated at the 31°N latitude line (slightly north of the Florida/Georgia border). The U.S. coastline remains as the western border of the closures; the eastern boundaries of SAtlE also remain unchanged. For ease in reference, the northern area of SAtlE between 31°N and 34°N will be designated as the "Charleston Bump" area and the area south of 31°N will be referred to as the "East Florida Coast" closure. Monthly patterns of effort (number of hooks), swordfish kept, swordfish discarded, catch-per-unit-effort, ratio of swordfish kept to swordfish discarded, and monthly total discards as a percent of the total annual discards were summarized for the two areas to assist in the process of identifying any patterns that could be used to reduce the time an area is closed, while still achieving the objectives of the agency action (Table 7.3 and Table 7.4).

Table 7.3. **Summary of monthly catch and discards of swordfish between 1995 through 1998 in the Charleston Bump area.**

Month	Number of Hooks	Swd Kept	Swd Discarded	Swd Kept CPUE x 1000 hooks	Swd Discard CPUE x 1000 hooks	Ratio Kept/Discard	Percent of Area Annual Discards
Jan	226,459	566	329	2.50	1.45	1.72	5.1
Feb	293,918	1842	1079	6.27	3.67	1.71	16.7
Mar	471,423	3850	2634	8.17	5.59	1.46	40.7
Apr	325,295	1532	989	4.71	3.04	1.55	15.3
May	345,522	1384	506	4.00	1.46	2.73	7.8
June	233,423	1160	312	5.00	1.34	3.72	4.8
July	60,043	316	124	5.26	2.06	2.55	1.9
Aug	20,712	185	44	8.93	2.12	4.20	0.7
Sept	16,603	145	15	8.73	0.90	9.67	0.2
Oct	28,464	289	205	10.15	7.20	1.41	3.2
Nov	15,340	164	116	10.69	7.56	1.41	1.8
Dec	20,335	156	113	7.67	5.56	1.38	1.7
Total	2,057,537	11,589	6466	5.63	3.14	1.79	

Table 7.4. **Summary of monthly catch and discards of swordfish between 1995 through 1998 in the East Florida Coast area.**

Month	Hooks x 1000	Swd Kept	Swd Discarded	Swd Kept CPUE x 1000 hooks	Swd Discard CPUE x 1000 hooks	Ratio Kept/Discard	Percent of Area Annual Discards
Jan	215,874	2859	2337	13.24	10.83	1.22	7.8
Feb	201,966	1805	1485	8.94	7.35	1.22	4.9
Mar	243,922	3266	2441	13.39	10.01	1.34	8.1
Apr	366,192	4183	2232	11.42	6.09	1.87	7.4
May	452,945	4115	2070	9.08	4.57	1.99	6.9
June	355,864	5518	2410	15.51	6.77	2.29	8.0
July	315,727	4923	2148	15.59	6.80	2.29	7.1
Aug	297,399	5296	3060	17.81	10.30	1.73	10.2
Sept	258,314	6490	3104	26.87	12.02	2.24	10.3
Oct	337,472	8063	4057	23.89	12.02	1.99	13.5
Nov	203,898	4097	2284	20.09	11.20	1.79	7.6
Dec	229,280	4124	2421	18.00	10.56	1.70	8.0
Total	3,478,853	55,189	30,049	15.87	8.64	1.84	

The information provided in Tables 7.3 and 7.4 was examined to determine the number of swordfish landed and discarded, both in terms of numerical dominance and in catch-per-unit-effort. Temporal variations in the ratio of swordfish kept to swordfish discarded were also evaluated to identify times of the year when more swordfish are discarded relative to the number kept. A total of six temporal and spatial alternatives to the SAtlE closure were identified from this evaluation process (Table 7.5).

Table 7.5. Closure alternatives for the Charleston Bump and East Florida Coast sub-areas of SAtlE. Months open to fishing are shaded and designated with a "O"; months closed to pelagic longline fishing are designated with a "C."

Closure Options		J	F	M	A	M	J	J	A	S	O	N	D
Alternative 1: SAtlE Jan to Dec *Closed 12 months*		C	C	C	C	C	C	C	C	C	C	C	C
Alternative 2: SAtlE Nov to April *Closed 6 months*		C	C	C	C	O	O	O	O	O	O	C	C
Alternative 3: N of 31 N: Open	N	O	O	O	O	O	O	O	O	O	O	O	O
S: of 31 N: Closed *Some area open all year*	S	C	C	C	C	C	C	C	C	C	C	C	C
Alternative 4: N of 31 N: Feb-May	N	O	C	C	C	C	O	O	O	O	O	O	O
S: of 31 N: Nov - Apr *Closed 3 months*	S	C	C	C	C	O	O	O	O	O	O	C	C
Alternative 5: N of 31 N: Feb-July	N	O	C	C	C	C	C	C	O	O	O	O	O
S: of 31 N: Aug-Jan *Some area open all year*	S	C	O	O	O	O	O	O	C	C	C	C	C
Alternative 6: N of 31 N: Feb-Apr	N	O	C	C	C	O	O	O	O	O	O	O	O
S: of 31 N: All year *Closed 3 months*	S	C	C	C	C	C	C	C	C	C	C	C	C

The next step in identifying a subset alternative to the SAtlE area was to apply the no effort redistribution and effort redistribution models to each of the five alternatives to determine if any of the subsets provided similar bycatch and incidental catch reductions (Objective 1), minimally impacted target catch (Objective 2), and altered incidental catches of other species (Objective 3). The results of the two models are presented in Table 7.6. For each species, the "best" alternative to the SAtlE closure, in terms of meeting the objectives of the FSEIS, is shaded.

Following this iterative process, Alternative 6 (Closure of Charleston Bump during February through April, and East Florida Coast year-round) provided results most similar to SAtlE in terms of reducing swordfish discards and maintaining catch of target species of swordfish and

BAYS tunas. Under the effort redistribution model, the final action was better than the preferred southeastern Atlantic closure identified in the DSEIS (SAtlE) in reducing sailfish discards, and did not increase bycatch of blue marlin, white marlin, and turtles to the degree expected under the preferred alternative of the proposed rule. Target catch of dolphin and large coastal sharks were also less impacted by final action than by the preferred alternative in the DSEIS.

Table 7.6. **Comparison of time-area options under no effort redistribution and effort redistribution models.**

Area/ Alternatives	Portion of Catch Attempting to Reduce								Minimize Impacts on this Portion of Catch				
	Swd discard	BUM discard	WHM discard	SAI discard	BFT discard	Turtle caught	P.sharks discard	LCS discard	Swd kept	BAYS kept	Dolphin kept	P. sharks kept	LCS kept
No Displacement Model: 1995 through 1998													
1) SAtlE closed all year	-38.03	-11.36	-5.94	-25.82	-0.93	-1.86	-2.29	-45.81	-23.67	-4.00	-50.86	-9.03	-36.61
2) SAtlE closed Nov - April	-19.23	-3.15	-2.03	-5.22	-0.41	-0.72	-1.65	-22.71	-10.08	-2.33	-7.24	-5.44	-26.98
3) N: open all year S: Closed all year	-31.30	-10.20	-3.80	-23.94	-0.67	-1.46	-1.13	-29.96	-19.56	-1.36	-23.56	-5.24	-19.56
4)N: closed Feb-May S: closed Nov-Apr	-19.17	-3.39	-2.59	-5.59	-0.27	-0.68	-1.43	-20.00	-7.40	-2.54	-22.39	-4.93	-21.76
5)N: closed Feb-July S: closed Aug to Jan	-14.70	-6.01	-3.10	-11.36	-0.37	-0.82	-1.34	-23.25	-14.70	-3.13	-28.56	-4.51	-12.59
6) N: closed Feb-Apr S: Closed all year	-36.20	-10.56	-4.54	-24.38	-0.70	-1.65	-1.83	-36.55	-22.02	-3.21	-26.60	-7.10	-26.50
Displacement Model 1995 through 1998													
1) SAtlE closed all year	-27.69	7.74	11.40	-11.30	17.31	8.41	10.18	-35.53	-10.76	10.42	-42.56	7.00	-22.05

Area/ Alternatives	Portion of Catch Attempting to Reduce								Minimize Impacts on this Portion of Catch				
	Swd discard	BUM discard	WHM discard	SAI discard	BFT discard	Turtle caught	P.sharks discard	LCS discard	Swd kept	BAYS kept	Dolphin kept	P. sharks kept	LCS kept
2) SAtlE closed Nov - April	-13.21	8.67	6.75	1.11	**2.16**	1.12	**2.47**	-18.04	**-2.44**	3.46	**-5.33**	2.46	**-17.91**
3) N: open all year S: Closed all year	-24.69	**-0.64**	5.85	**-16.08**	9.56	6.49	8.17	-22.56	-12.02	8.31	-15.01	4.23	-11.73
4)N: closed Feb-May S: closed Nov-Apr	-13.04	9.12	6.95	2.24	2.73	**1.09**	2.60	-14.18	-2.73	3.56	-18.57	3.66	-12.02
5)N: closed Feb-July S: closed Aug to Jan	-16.36	3.63	**5.70**	-3.70	6.71	5.24	6.92	-15.82	-6.61	5.36	-22.79	4.12	-3.97
6) N: closed Feb-Apr S: Closed all year	**-27.32**	5.36	9.71	-13.20	10.75	7.13	8.45	**-27.86**	-11.29	**8.33**	-16.44	**5.89**	-14.74

Population Effects on Bycatch Species

The DeSoto Canyon area would eliminate approximately 32,860 nm^2 miles of ocean to the use of pelagic longline gear by U.S. commercial fishermen (Figure 7.2). The DeSoto Canyon portion of this final action would result in the following changes in bycatch under the **no effort redistribution** model: swordfish discards reduced by 5%, blue and white marlin discards reduced by 1 and 2% , respectively, and sailfish discards reduced by 5%. This closed area has virtually no effect, positive or negative on sea turtle populations if fishing effort is not redistributed. Target catch of swordfish, BAYS tunas, and pelagic sharks would all be reduced by approximately 2%. Under the **effort redistribution** model, the DeSoto Canyon portion of this final action would have the following results: swordfish discards reduced by 4%, blue and white marlin increased by 1% each, and sailfish discards reduced by 1%. This closed area would not have any population effects on sea turtles if it is assumed that fishing effort is redistributed throughout the Gulf of Mexico. Target catch of swordfish, dolphin and pelagic sharks would all be reduced by less than 2%, while catches of yellowfin tuna would increase by nearly 2%.

The DeSoto Canyon closure will be implemented on November 1, 2000, or approximately 90 days after the target date for publication of the final rule on August 1, 2000. The three month delay in implementing the year-round closure in this area to allow affected businesses to move their base of operation will potentially result in additional discards of approximately 140 swordfish, 10 blue marlin, 8 sailfish, and 15 white marlin, based on average annual discards of these species for August through October. Delay of the closure will also allow additional retention of target catches of swordfish (260 fish) and yellowfin tuna (550 fish), again based on average landings for this three month period.

The Charleston Bump area is approximately 49,090 nm^2 of ocean and the East Florida Coast area is approximately 50,720 nm^2 of ocean (Figure 7.2). Collectively, the year-round closure of the East Florida Coast and the February through April closure of the Charleston Bump areas of this final action would result in the following changes in bycatch under the **no effort redistribution** model: swordfish discards reduced by 36%, blue and white marlin discards reduced by 11 and 5%, respectively, and sailfish discards reduced by 24%. This closed area could decrease turtle interactions by 2% if we assume that fishing effort is not redistributed. Under the **effort redistribution model**, the combined Charleston Bump and East Florida Coast closures, the following results would be predicted: swordfish discards *reduced* by 27%, blue and white marlin *increased* by 5 and 10%, respectively, and sailfish discards *reduced* by 13%. This closed area could *increase* sea turtle interactions by 7% if we assume that fishing effort is redistributed throughout the Gulf of Mexico or the Atlantic Ocean, including the Caribbean Sea. Target catch would be *reduced* for swordfish (11%) and dolphin (16%), while catches of yellowfin tuna (8%), bigeye tuna (10%) and pelagic sharks (5%) would *increase*.

The Charleston Bump and East Florida Coast closures will be implemented on February 1, 2001, or approximately 180 days after the target date for publication of the final rule on August 1, 2000. The six month delay in implementing the year-round closure in this area to allow affected businesses to move their base of operation will have no impact on the Charleston Bump area, which will be closed only during February through April of each year. However, the 180-day delay in closing the East Florida Coast area could potentially result in additional discards of approximately 4300 swordfish, 125 blue marlin, 122 sailfish, and 26 white marlin, based on average annual discards of these species for the period between August through January. Delay of the closure will also allow additional retention of target catches of swordfish (7800 fish) and yellowfin tuna (300 fish), again based on average landings for this six month period.

Combined, the areas of this final action encompass approximately 132,670 nm^2 of ocean which would be closed to Atlantic pelagic longline fishermen on a seasonal basis. For the combined Gulf of Mexico (DeSoto Canyon) and southeast Atlantic coast (Charleston Bump and East Florida Coast) areas, the **no effort redistribution** model from the 1995 through 1998 pelagic logbook database resulted in the following percent reductions of incidental catch and bycatch (Figure 7.3): swordfish discards, 42%; blue marlin discards, 12%; white marlin discards, 6%; sailfish discards, 30%; bluefin tuna discards, 1% (when combined with the June closure, the net effect on bluefin tuna discards is a 54% reduction)[1]; and sea turtles, 2%. Under the no effort redistribution model, target and incidental landings are also reduced, including: swordfish, 25%; BAYS tunas, 5% (yellowfin tuna, 6%; bigeye tuna, 1%); dolphin, 30%, pelagic sharks (kept and discarded), 9% and 2%, respectively; and large coastal sharks (kept and discarded), 32% and 43%, respectively.

Under the **redistribution of effort** model for the combined Gulf of Mexico and southeast U.S. Atlantic coast areas, the final action *reduced* swordfish discards by 31% and sailfish discards by 14%. The discards of blue marlin and white marlin *increased* by 7% and 11%, respectively, when effort was redistributed from the closed areas. Bluefin tuna discards also increased by 11% when pelagic longline effort was randomly redistributed throughout the operational range of the U.S. Atlantic pelagic longline fishery; however when combined with the June closure, the *net effect* on bluefin tuna is a 39% *reduction* in discards. Target landings of swordfish were *reduced* under this closure alternative (13%), as were dolphin (18%), but landings of several target species *increased* when pelagic longline effort was redistributed, including BAYS tunas (10%) , and pelagic sharks (4%). The incidental catch of sea turtles also increased (7%) with pelagic longline effort redistribution. However, the effort redistribution model will tend to over-estimate changes in catch for species with non-random distributions (e.g., turtles in the Grand Banks area) as previously explained. Comments received on the proposed rule concur with NMFS that many of the displaced vessels are too small to fish with pelagic longline gear in areas of high turtle concentrations (e.g., the Grand Banks). Therefore, a 7% increase in turtle takes is expected to be the *maximum* increase.

Blue marlin, white marlin and sailfish discard rates generally increase when effort is redistributed from the closed areas along the SE U.S. Atlantic coast to the remaining open areas of the Atlantic and Gulf of Mexico, including locations of relatively high CPUE for billfish. Blue marlin bycatch

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[1]In the draft SEIS, the reduction in bluefin tuna discards was inflated because the analysis included the existing time/area closure off the Mid-Atlantic coast, as discussed above. This analysis separates out that closed area in order for the reader to differentiate the results of each closed area/combination.

rates may be over-estimated by the effort redistribution model because calculation of CPUE in the *remaining open areas assumes the species distribution is constant. If the species is concentrated in* one area, rather than evenly distributed over the entire open area, results could be skewed. Pelagic longline effort in the Caribbean (fishing areas below 22°N latitude) represents approximately 14.7 percent of the total U.S. Atlantic-wide fishing effort, but accounts for 50% of the total blue marlin discards. These areas were not considered for closure since they are generally located outside U.S. EEZ waters. Closures were limited to the U.S. EEZ to maximize the impact of the closure on all sources of fishing mortality (i.e., both domestic and foreign). Therefore, it is likely that the no *effort redistribution model would be more applicable for blue marlin (12 percent reduction in* discards). Although white marlin discards were less concentrated in the Caribbean (32% of total Atlantic-wide levels), it is likely that the effort redistribution model also overestimated the impact of shifting pelagic longline effort, particularly in consideration of the size of vessel affected. Pelagic longline vessels fishing from the east coast of Florida to North Carolina are generally smaller than in other areas along the eastern seaboard, with vessel lengths generally 50 feet or smaller (Figure 6.4). Due to the distance of these areas from the continental United States and the size of many of the vessels operating off Florida, Georgia and South Carolina, it seems unlikely that much effort from the SE U.S. would be redistributed into the open Caribbean or southwest Atlantic Ocean. Therefore, the impact of effort redistribution on Atlantic billfish discards may be lower than that predicted by the effort redistribution model. Table 7.7 shows the estimated change in total weight (lbs) of target catch estimated by the model from reported levels for 1995 through 1998 through the pelagic logbook system.

Figure 7.3 **Percent change in catch resulting from DeSoto Canyon, Charleston Bump and East Florida Coast closures, 1995 through 1998.** Swd-swordfish, BFT-bluefin tuna, BUM-blue marlin, WHM-white marlin, SAI-sailfish, Psh-Pelagic sharks, LCS-large coastal sharks, Turt-turtles, YFT-yellowfin tuna, BET-bigeye tuna, Dol-dolphin, D indicates discards, K indicates fish kept.

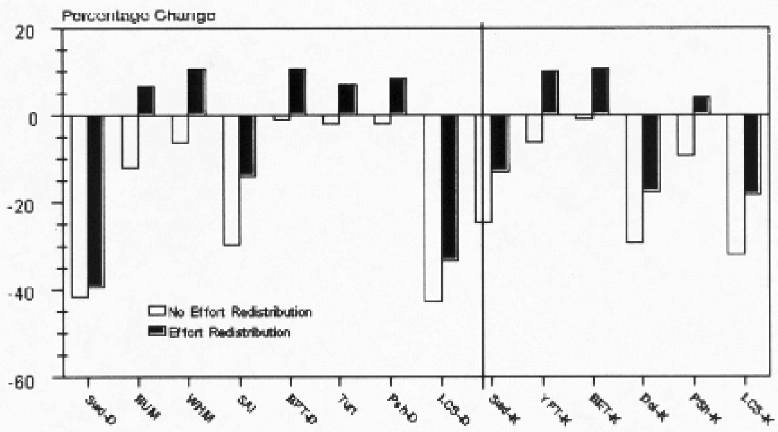

Table 7.7. **Impact of the DeSoto Canyon, Charleston Bump and East Florida Coast closures, 1995 through 1998, on the estimated weight of target catch (x 100,000 lbs) "with" and "without" redistribution of effort.**

Species	1995		1996		1997		1998	
	Without	With	Without	With	Without	With	Without	With
Swordfish	-9.65	-3.28	-14.38	-6.31	-12.77	-6.73	-16.03	-11.34
BAYS tunas	-13.08	17.10	-13.55	21.11	-9.49	22.62	-7.52	16.97
Bluefin tuna	-0.02	0.07	-0.02	0.07	-0.01	0.04	-0.01	0.05
Pelagic sharks	-1.44	0.63	-1.44	0.62	-1.19	0.62	-0.75	0.32
LCS	-11.92	-5.91	-10.56	-7.07	-3.45	-1.49	-3.48	-2.77
Dolphin	-3.08	-2.19	-1.53	-0.92	-2.38	-1.36	-0.56	-0.19
Wahoo	-0.29	0.10	-0.18	0.11	-0.21	0.15	-0.24	0.17

Effects on Bycatch of Other Species and Resulting Population and Ecosystem Effects

Under the no effort redistribution model, discards of swordfish would be reduced similar to levels noted for the preferred alternative identified in the DSEIS (SAtlE+GulfB). The final action closure is about half as effective in reducing the discards of blue and white marlin. However, analysis on the impact of use of live bait in the Gulf of Mexico (see final action under Section 7.2) indicates that the relatively higher incidence of billfish discards in GulfB may be a function of fishing practice (i.e., using live bait), rather than an actual reflection of higher frequency of occurrence. Prohibiting live bait may equalize much of the benefits between the GulfB and DeSoto Canyon closures, particularly for sailfish. The reduction in discards of pelagic sharks and large coastal sharks are similar between the proposed and final action closures. When effort redistribution is modeled, the DeSoto Canyon-Charleston Bump/East Florida Coast closures are more effective in reducing the discards of swordfish than the SAtlE+GulfB closure, and slightly more effective in reducing discards of sailfish. Discards of pelagic sharks and large coastal sharks will be lower under the final action that noted in the preferred alternative in the proposed rule.

The Charleston Bump/East Florida Coast closure will increase sea turtle interaction with redistribution of effort, but to a lesser degree than the year-round closure of SAtlE selected as a preferred alternative in the DSEIS. As noted in Section 5.8, NMFS reinitiated consultation under Section 7 of the ESA due to exceeding sea turtle take levels for the pelagic longline fishery in 1999. The June 2000 draft BO indicated that the continued operation of the Atlantic pelagic longline fleet is likely to jeopardize the continued existence of loggerhead turtles. It is possible, pending additional analysis, that the final BO will also include a jeopardy finding for leatherback sea turtles. Therefore, any increase in turtle takes as a result of effort redistribution must be carefully considered. NMFS has initiated efforts to address the BO, including possible regulatory and non-regulatory actions.

The "turtles caught" component analyzed under both the no effort redistribution and effort redistribution models, is a combination of all species of turtles reported by pelagic longline fishermen in the logbooks and identified as either released uninjured, injured or killed. To further refine the effects of the final action, the two effort models were applied to logbook information for 1995 through 1998 for loggerhead and leatherback sea turtles reported as either release uninjured, injured or killed (Table 7.8 A and B). Of the 2792 turtles interacting with pelagic longline gear between 1995 through 1998, 2504 were either leatherbacks (n=719) or loggerheads (n=1785) turtles that were reported caught but not injured. The 7.13% increase in turtle interactions predicted by the effort redistribution model (Figure 7.3) would result in an increase of 190 leatherbacks and loggerhead released unharmed, with the remainder of the impact resulting in an increase of 4 turtles injured and only 1 turtle killed, at least based on logbook reports.

Table 7.8. **Impact of final time/area closures on the number of loggerhead and leatherback turtles caught and release unharmed, injured or killed on pelagic longline sets made during 1995 through 1998.**

A. Charleston Bump (February through April) and East Florida Coast (year-round)

		Turtles Caught But NOT Injured		Turtles Injured		Turtles Killed	
	Turtles Caught[2]	Leather-backs	Logger-heads	Leather-backs	Logger-heads	Leather-backs	Logger-heads
Total Atlantic	2792	719	1785	3	35	10	3
No Effort Redistribution	-1.64%	-1.67%	-0.78%	0.0%	0.0%	0.0%	0.0%
Expected Change[1]	2746	707	1771	3	35	10	3
Effort Redistribution	7.13%	8.09%	7.43%	7.01%	10.78%	8.07%	17.15%
Expected Change	2991	777.2	1917.7	3.2	38.8	10.8	3.5

[1]Expected Change means the predicted change in catch (takes) based on the no effort redistribution model or effort redistribution model. Positive values for the models indicate a predicted INCREASE in catch, while negative values are indicative of a predicted DECREASE in catch. All changes are based on Atlantic-wide levels.
[2]Turtles Caught correspond to values provided Figure 7.3.

B. De Soto Canyon, closed all year.

		Turtles Caught But NOT Injured		Turtles Injured		Turtles Killed	
	Turtles Caught[2]	Leather-backs	Logger-heads	Leather-backs	Logger-heads	Leather-backs	Logger-heads
Total Atlantic	2792	719	1785	3	35	10	3
Total Gulf of Mexico	66	27	9	0	1	1	0
No Effort Redistribution	-0.29%	-0.56%	-0.06%	0.0%	-2.9%	0.0%	0.0%
Expected Change[1]	2784	715	1784	3	34	10	3
Effort Redistribution	0.0%	-0.1%	0.0%	0.0%	-2.8%	0.5%	0.0%
Expected Change	2784	718.3	1785	3	34	10	3

[1]Expected Change means the predicted change in catch (takes) based on the no effort redistribution model or effort redistribution model. Positive values for the models indicate a predicted INCREASE in catch, while negative values are indicative of a predicted DECREASE in catch. All changes are based on Atlantic-wide levels.
[2]Turtles Caught correspond to values provided Figure 7.3.

Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources

The ex-vessel gross revenues of the pelagic longline fishery as a whole might decrease by over $7.5 million if all the effort is not redistributed (Table 7.9), which is about half the effect anticipated under similar conditions for the preferred DSEIS alternative closure of areas GulfB+SAtlE. However, if the redistribution does occur, the ex-vessel gross revenues of the fishery might increase by nearly $3 million. The actual impact of this closure is probably somewhere between these two values. In general, businesses and communities in the center of any closed area are likely to suffer the greatest loss in gross revenues while those businesses and communities along the edges of the closed area might not notice any differences. Businesses and communities outside the closed area might notice increased benefits as effort is moved to the open areas. A more complete evaluation of the economic and social impacts of the final action is provided in Sections 8.0 and 9.0, respectively, of this document based on the most conservative assumption, from an economic standpoint, of no effort redistribution.

Table 7.9. **Impact on fishermen that results from the projected change in ex-vessel gross revenue based on change in number of target species caught in 1997 (in millions of dollars) for closing the Charleston Bump and East Florida Coast areas.**

Species	Change in Ex-Vessel Gross Revenues (millions of $)	
	No Redistribution Model	Redistributed Effort Model
Swordfish	-4.64	-2.44
BAYS tunas	-2.35	5.61
Bluefin tuna	-0.01	0.02
Pelagic sharks	-0.09	0.05
Large Coastal Sharks	-0.19	-0.08
Dolphin	-0.35	-0.20
Wahoo	-0.04	0.03
Total	**-7.67**	**2.97**

Changes in the Distribution of Benefits and Costs

The economic impact of the final action closure on pelagic longline target species was estimated by multiplying the percent change in target catch predicted by the no redistribution and redistribution models by the total Atlantic annual catch of each species. The resultant values are summarized in Table 7.7. Negative numbers indicate fewer fish would be caught under this closure scenario, while positive numbers indicate more fish caught. Dealers outside closed areas are likely to benefit due to increased effort close to their locations. In contrast, dealers in close proximity to closed areas may be directly negatively impacted.

The dollar values in Table 7.9 represent the change in gross revenue only to fishermen. Under the redistribution model, it is likely that fishing costs would increase as well, thereby exacerbating any decrease in gross revenues. Localized increases in recreational success for billfish, tunas and swordfish are likely following reduction of pelagic longline effort in the closed areas. The analytical approach used in the FSEIS does not quantify the possible increase in recreational opportunities; therefore any potential increase in angler consumer surplus and net economic benefit cannot accurately be estimated. However, it is possible that concomitant increases in vessel manufacture and purchase, dock and fuel services, tackle and gear supplies, charters, as well as other businesses in support of the recreational fishing industry, could be experienced.

Summary

This alternative is the final action because it is effective at reducing undersized swordfish and sailfish bycatch while minimizing economic, social and community impacts, particularly on Gulf of Mexico fishermen, but also for fishermen and businesses located along the southeast U.S. Atlantic coast (because the Charleston Bump area will be open for nine months of the year). NMFS' objective is to optimize target catch while reducing bycatch and incidental catch. Under the effort redistribution model, the proposed rule would decrease discards of swordfish by 24% and sailfish by 13 %, while potentially increasing blue marlin discards by 1% and white marlin discards by 4%. The final time/area closures, in conjunction with the live bait prohibition (Section 7.2) would reduce swordfish discards by 31% and sailfish discards by 29%; blue marlin and white marlin discards could increase by 3% and 7% respectively. Target catches under the proposed agency action would reduce the number of swordfish kept by 10% and dolphin kept by 36%; landings of BAYS tunas would increase by 9%. The final action time/area closures in the DeSoto Canyon, East Florida Coast and Charleston Bump could reduce number of swordfish kept by 13% and dolphin kept by 18%, while BAYS tunas landings would increase by nearly 10%.

During the comment period for the proposed agency action, many comments were received regarding environmental justice issues, particularly for the Vietnamese American community in the Gulf of Mexico and the impact on the yellowfin tuna fishery with closure of the western Gulf. Comments from residents of SC noted a similar issue with minority workers in commercial industries that support the pelagic longline fishery in that area. NMFS has minimized the economic effects of the proposed western Gulf of Mexico closure that was specifically established to reduce billfish bycatch, by prohibiting use of live bait by pelagic longline vessels instead. Application of this gear restriction appears to be as effective in reducing sailfish discards as the western Gulf closure, and is approximately half as effective in reducing marlin discards. In consideration of the magnitude of U.S. billfish discards relative to Atlantic-wide levels and the extent of the economic impacts associated with the proposed Gulf closure, modifying fishing practices is a viable alternative that effectively addresses the objectives of the agency actions by reducing billfish bycatch, to the extent practicable, while allowing fishing to continue in the western Gulf of Mexico (see Section 7.2).

The final action also resulted in the smallest predicted increase in sea turtle interactions (7 percent) when effort is redistributed, of all the time/area alternatives considered. It should be noted, however, that turtle bycatch rates may be over-estimated by the effort redistribution model because estimation of catch-per-unit-effort assumes species are randomly distributed in the remaining open areas. The results could be skewed if species are concentrated in one area such sea turtles in the Grand Banks, rather than randomly distributed over the entire open area. Further, nearly 90 percent of all sea turtle interactions with pelagic longline gear result in release of the animal with no damage, based on information provided in the pelagic logbooks.

SECTION 8 THROUGH SECTION 11 AND APPENDICES A THROUGH C-4
AND APPENDICES D AND E OMMITTED INTENTIONALLY

Dolphin-Wahoo Pelagic Longline Fishery Analysis

In the proposed rule on reducing bycatch mortality in the pelagic longline fishery, NMFS indicated a concern that the pelagic longline fishery targeting dolphin may have similar bycatch rates to those sets targeting swordfish and BAYS tunas. Consequently, NMFS proposed that HMS-permitted vessels be prohibited from setting pelagic longline gear in the closed area, regardless of target species. Given the jurisdictional issues, NMFS requested that the respective Fishery Management Councils consider the potential bycatch issues presented by pelagic longlines set in the closed area to target species managed under Council FMPs.

NMFS examined logbook reports from 1998 for all sets made in the area proposed for year round closure (SAtlE: Key West, FL to Wilmington Beach, NC). Because logbook reports do not specifically indicate which sets targeted dolphin, NMFS separated all sets into those targeting swordfish/tunas/sharks and those listing a target as "other". It was presumed that sets listing a target as "other" are predominantly targeting dolphin and this was reflected in the nearly 10 fold higher catch per set of dolphin: 1.7 vs 15.1 dolphin kept per set. Preliminary information from the pelagic logbook database that addresses bycatch by pelagic longline gear set to target dolphin (mahi) off the southeast U.S. is presented in Table C-4.

Note that sets listing "other" as a target represent about 13% of the total effort in the area. All else equal, catch and bycatch rates would be approximately the same share of the totals as that of effort (i.e., 13%). This expectation is generally reflected in the data with respect to swordfish kept (~8/set), BAYS tunas kept (~0.5/set), and billfish discards (~0.2/set). However, swordfish and bluefin tuna discards are lower than would otherwise be expected, while dolphin and wahoo kept and BAYS tunas discards are higher than would be expected. These differences in catch rates may be related to fishing area, time of day/season, and/or gear modifications. Nonetheless, given the pelagic logbook reports, bycatch of billfish, sharks and BAYS tunas seems to be a concern in the dolphin fishery.

Further specific information on catch occurring when pelagic longlines are set to target dolphin would be needed to confirm or refute the bycatch concerns. In the interim, to facilitate enforcement and to take a precautionary approach, NMFS has decided that HMS- permitted vessels should be prohibited from setting all pelagic longline gear in the closed areas, regardless of target species. It is possible that an operator of an HMS-permitted vessel who wishes to target dolphin could apply for an exempted fishing permit (EFP). If EFPs are issued, the data collected (e.g., logbook or observer reports) could be used to determine if a dolphin fishery could be undertaken that would be consistent with the bycatch reduction objectives of the HMS FMP. However, such authorization for EFPs would have to be considered in consultation with the Councils having management authority for dolphin.

Table C-4. Pelagic logbook reports of effort, catch and bycatch in SAtlE closed area during 1998.

	Target				Percent
	Sword/Tunas/Shark		Other Species		Targeting
	Number	# / sets	Number	# / sets	Other Species
Sets	2,140		320		13.0%
Hooks	841,981	393.4	153,426	479.5	15.4%
Swordfish kept	18,757	8.8	2,678	8.4	12.5%
Swordfish discarded	9,105	4.3	470	1.5	4.9%
Bluefin tuna kept	5	0.0	0		
Bluefin tuna discarded	3	0.0	0		
BAYS tunas kept	1,132	0.5	182	0.6	13.9%
BAYS tunas discarded	91	0.0	52	0.2	36.4%
Blue marlin discarded	174	0.1	13	0.0	7.0%
Sailfish discarded	207	0.1	28	0.1	11.9%
Spearfish discarded	21	0.0	4	0.0	16.0%
White marlin discarded	90	0.0	15	0.0	14.3%
Pelagic sharks kept	296	0.1	62	0.2	17.3%
Pelagic Sharks discarded	1,038	0.5	288	0.9	21.7%
Lg coastal sharks kept	5,825	2.7	194	0.6	3.2%
Lg coastal sharks discarded	2,649	1.2	614	1.9	18.8%
Turtles caught	9	0.0	0		
Turtles injured	0	0			
Turtles killed	0	0			
Dolphin kept	3,636	1.7	4,834	15.1	57.1%
Dolphin discarded	20	0.0	7	0.0	25.9%
Wahoo kept	124	0.1	109	0.3	46.8%
Wahoo discarded	2	0.0	0		

* Data are preliminary and subject to change. Logbook database queried on January 27, 2000.

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Appendix D. HMS Final Rule for the Regulatory Amendment to the Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan to Address Reduction of Bycatch and Incidental Catch in the Atlantic Pelagic Longline Fishery (NMFS, 2000) and Technical Amendment to the Final Rule (NMFS, 2001).

Federal Register

Tuesday,
August 1, 2000

Part III

Department of Commerce

National Oceanic and Atmospheric Administration

50 CFR Part 635

Atlantic Highly Migratory Species; Pelagic Longline Management; Final Rule

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 635

[Docket No. 991210332-0212-02; I.D. 110499B]

RIN 0648–AM79

Atlantic Highly Migratory Species; Pelagic Longline Management

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS issues final regulations to prohibit pelagic longline fishing at certain times and in certain areas within the Exclusive Economic Zone of the Atlantic Ocean off the coast of the Southeastern United States and in the Gulf of Mexico, and to prohibit the use of live bait when deploying pelagic longline gear in the Gulf of Mexico. This action is necessary to reduce bycatch and incidental catch of overfished and protected species by pelagic longline fishermen who target highly migratory species (HMS).

DATES: This final rule is effective September 1, 2000.

ADDRESSES: For copies of the Final Supplemental Environmental Impact Statement/Regulatory Impact Review/ Final Regulatory Flexibility Analysis (FSEIS/RIR/FRFA), contact Steve Meyers at 301–713–2347 or write to Rebecca Lent, Chief, HMS Division (SF/ 1), Office of Sustainable Fisheries, NMFS, 1315 East-West Highway, Silver Spring, MD 20910.

FOR FURTHER INFORMATION CONTACT: Steve Meyers at 301–713–2347, fax 301–713–1917, e-mail steve.meyers@noaa.gov; or Buck Sutter at 727–570–5447, fax 727–570–5364, e-mail buck.sutter@noaa.gov.

SUPPLEMENTARY INFORMATION: The Atlantic swordfish and tuna fisheries are managed under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the Atlantic Tunas Convention Act (ATCA). The Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (HMS FMP) is implemented by regulations at 50 CFR part 635.

Pelagic Longline Fishery

Pelagic longline gear is the dominant commercial fishing gear used by U.S. fishermen in the Atlantic Ocean to target highly migratory species. The gear consists of a mainline, often many miles in length, suspended in the water column by floats and from which baited hooks are attached on leaders (gangions). Though not completely selective, longline gear can be modified (e.g., gear configuration, hook depth, timing of sets) to target preferentially yellowfin tuna, bigeye tuna, or swordfish.

Observer data and vessel logbooks indicate that pelagic longline fishing for Atlantic swordfish and tunas results in catch of non-target finfish species such as bluefin tuna, billfish, and undersized swordfish, and of protected species, including threatened and endangered sea turtles. Also, this fishing gear incidentally hooks marine mammals and sea birds during tuna and swordfish operations. The bycatch of animals that are hooked but not retained due to economic or regulatory factors contributes to overall fishing mortality. Such bycatch mortality may significantly impair rebuilding of overfished finfish stocks or the recovery of protected species.

Proposed Bycatch Reduction Strategy

Atlantic blue marlin, white marlin, sailfish, bluefin tuna, and swordfish are overfished. In the HMS FMP and Amendment 1 to the Atlantic Billfish FMP (Billfish FMP Amendment), NMFS adopted a strategy for rebuilding these stocks through international cooperation at the International Commission for the Conservation of Atlantic Tunas (ICCAT). This strategy primarily involves reducing fishing mortality through the negotiation of country-specific catch quotas according to rebuilding schedules. However, the contribution of bycatch to total fishing mortality and the fact that ICCAT catch quotas for some species require that countries account for dead discards must be considered in the HMS fisheries. The swordfish rebuilding plan that was adopted by ICCAT at its 1999 meeting provides added incentive for the United States to reduce swordfish discards.

In addition to ICCAT stock rebuilding efforts, several other applicable laws require that NMFS address bycatch issues in the HMS fisheries. These include the Magnuson-Stevens Act, the Marine Mammal Protection Act (MMPA), and the Endangered Species Act (ESA). Magnuson-Stevens Act national standard 9 for fishery management plans requires U.S. action to minimize bycatch and bycatch mortality to the extent practicable.

Under the MMPA, the Atlantic pelagic longline fishery has been listed as a Category I fishery due to the frequency of incidental mortality and serious injury to marine mammals. The Atlantic Offshore Cetacean Take Reduction Team was formed in May 1996 to address protected species bycatch in the Atlantic pelagic fisheries. A take reduction plan, submitted to NMFS in November, 1996, that contained measures to address the bycatch of strategic stocks of marine mammals, noted that additional reductions in takes of marine mammals could occur with closures of certain fishing areas during times of high interaction rates.

Finally, under the ESA, NMFS is required to address fishery-related take of sea turtles that are considered threatened or endangered. Although most turtles are released alive, NMFS remains concerned about serious injuries of turtles hooked on pelagic longline gear. To the extent that turtle interactions occur at higher rates in certain fishing areas at particular times, time-area closures for pelagic longline fishing could affect turtle takes. An area closure to address swordfish discards could also help reduce sea turtle interactions if these animals tend to occur in the same ocean areas at the same time. Conversely, if sea turtle interactions are relatively higher in areas that remain open, fishing effort displaced from areas closed to protect juvenile swordfish could lead to increased turtle takes.

In the final HMS FMP and Billfish FMP Amendment, NMFS stated that a comprehensive approach to time-area closures would be undertaken as part of a bycatch reduction strategy after further analysis of the data and consultation with the HMS and Billfish Advisory Panels (APs). NMFS held a combined meeting of the HMS and Billfish APs on June 10–11, 1999, to discuss possible alternatives for a proposed rule under the framework provisions of the HMS FMP. The AP members were generally supportive of the time-area management strategy, provided several comments on temporal and/or spatial components that NMFS should consider further in its analyses, and requested that NMFS develop a written document outlining all analytical methods and results of the time-area evaluation. The APs' comments and suggestions were included in the development of a draft Technical Memorandum, which was made available to the public on November 2, 1999 (64 FR 59162).

Subsequent to the release of the Technical Memorandum, NMFS considered three alternative actions to reduce bycatch and/or bycatch mortality in the Atlantic HMS pelagic longline fishery: status quo, gear modifications that would decrease hook-ups and/or increase survival of bycatch species, and the prohibition of longline fishing in areas where rates of bycatch or incidental catch are higher. NMFS considered gear modifications beyond those examined previously during development of the HMS FMP. NMFS also considered a broad range of closures, both in terms of area and time. A proposed rule was published December 15, 1999 (64 FR 69982), for which alternatives were identified and analyzed in a draft Supplemental Environmental Impact Statement (64 FR 73550, December 30, 1999). The proposed rule included closed areas for pelagic longline gear in the western Gulf of Mexico and off the southeast coast of the United States.

During the comment period on the proposed rule, NMFS received comment on many issues related to the proposed time/area closures. In particular, commenters noted that the proposed closure in the western Gulf of Mexico would not adequately address juvenile swordfish bycatch in the DeSoto Canyon area of the eastern portion of the Gulf. Additionally, commenters noted the significant economic impacts associated with large scale area closures in that vessel operators and shoreside support services would need considerable time for adjustment and relocation. Given these comments, NMFS analyzed the potential impacts of an additional closed area in the DeSoto Canyon. Subsequently, NMFS published supplementary information regarding the potential impacts of closing the DeSoto Canyon Area together with a revised summary of the IRFA prepared for the proposed rule (65 FR 24440, April 26, 2000). The comment period for the proposed rule was reopened through May 12, 2000, and NMFS specifically requested comments on the extent to which delayed effectiveness could mitigate the economic impacts of area closures.

ESA Consultation

On November 19, 1999, NMFS reinitiated consultation under section 7 of the ESA based on preliminary reports that observed incidental take of loggerhead sea turtles by the Atlantic pelagic longline fishery during 1999 had exceeded levels anticipated in the Incidental Take Statement (ITS) previously issued for the HMS FMP. Additionally, the consultation included the pelagic longline management rulemaking that was in preparation, as it was recognized that the time/area closures, if implemented, could affect the overall interaction rates with sea turtles. In a Biological Opinion issued on June 30, 2000 (BO), NMFS concluded that operation of the pelagic longline fishery was likely to jeopardize the continued existence of loggerhead and leatherback sea turtles. The BO identified the Reasonable and Prudent Alternatives (RPAs) necessary to avoid jeopardy and listed the Reasonable and Prudent Measures (RPMs) and Terms and Conditions (TCs) necessary to authorize continued take as part of a revised ITS. While the implications of the BO are discussed in this final rule, NMFS will undertake additional rulemaking and non-regulatory actions as required to implement the additional management measures required under the BO.

Response to Comments

NMFS received several hundred comments and several thousand form letters during the 2 comment periods, 13 public hearings, and 2 joint AP meetings of this rulemaking. Following are summaries of the comments together with NMFS' responses.

General

Comment 1: There is no conservation benefit from the proposed closures except for small swordfish; therefore, the proposed time/area closures will probably have an imperceptible effect on rebuilding overfished HMS.

Response: NMFS disagrees. Depending on the amount of redistribution of effort under the proposed closed areas, other species, such as sailfish and large coastal sharks, may benefit from these closures. Under the no-effort redistribution model, billfish discards are reduced by 19 to 43 percent, although, as discussed in the FSEIS, the actual benefit of these time/area closures is likely somewhere between the extremes predicted by the effort redistribution models. Further, prohibiting the use of live bait will provide a 10- to 46-percent reduction in billfish discards in the Gulf of Mexico. National standard 9 of the Magnuson-Stevens Act requires that FMPs reduce bycatch to the extent practicable. Although it was not a stated objective of the final rule to rebuild overfished stocks through time/area closures or gear modifications, some benefit to rebuilding may also be experienced to the degree that mortality rates will be reduced for juveniles, pre-adults, and reproductive fish. Also, to the extent that the United States can use the domestic bycatch reduction program, including time/area closures and gear modifications, to convince other ICCAT member nations that bycatch should be minimized, these actions may have a significant impact on Atlantic-wide rebuilding of overfished HMS stocks.

Comment 2: NMFS is already past the deadline for a rebuilding program for overfished HMS that includes bycatch reduction measures.

Response: NMFS disagrees. The HMS FMP and the Billfish FMP Amendment include rebuilding plans that meet Magnuson-Stevens Act guidelines. The swordfish rebuilding program recently adopted by ICCAT is based in large part on the rebuilding plan outlined in the HMS FMP. Similarly, the rebuilding plans for blue and white marlin emphasize the importance of international efforts to reduce bycatch and bycatch mortality. NMFS implemented bycatch reduction measures in the HMS FMP, including limited access for swordfish and shark fisheries, time/area closure for pelagic longline gear to reduce bluefin tuna dead discards, limiting the length of mainline for longline fishermen, and other measures summarized in the HMS FMP. The Billfish FMP Amendment also outlined a bycatch reduction strategy. NMFS expects that additional measures will continue to be implemented for all HMS fisheries, including educational workshops that share results of recent research on gear modifications. Finally, as a result of the jeopardy finding in the BO, NMFS will initiate implementation of the requirements of the BO via additional rulemaking and other non-regulatory means.

Comment 3: NMFS should extend the VMS implementation deadline past June 1, 2000.

Response: NMFS agrees. On April 19, 2000 (65 FR 20918), NMFS extended the effective date until September 1, 2000. This will provide adequate time (2 months) to ensure that all systems are fully functional prior to the implementation of the time/area closures. Also, implementation of the measures in the BO may require a time/area closure and/or gear setting restrictions to be enforced by VMS.

Comment 4: As the swordfish stocks continue to rebuild, the United States may need more U.S. boats to harvest the swordfish quota.

Response: NMFS disagrees. The final regulations implementing the HMS FMP (May 28, 1999; 64 FR 29090), NMFS established a limited access program for Atlantic swordfish, Atlantic shark, and the pelagic longline sector of the Atlantic tuna fisheries. A description of the qualifying requirements for a directed or incidental limited access permit is contained in Chapter 4 of the HMS FMP. Using a multi-tiered process based on participation, approximately 450 limited access swordfish permits (directed and incidental) were awarded.

Subsequent examination of fishing activity by these vessels in preparation of the proposed and final rule indicates that a significant portion did not report any HMS landings in either 1997 (331 vessels reported HMS landings) or 1998 (208 vessels reported HMS landings). Currently, the North Atlantic swordfish stock is estimated to be at 65 percent of the level needed to support maximum sustainable yield (MSY). When the stock attains the level consistent with MSY, it is likely that the number of U.S.-flagged vessels with directed or incidental swordfish permits will be sufficient to handle any potential increase in the U.S. swordfish quota.

Comment 5: NMFS should be concerned about small sources of mortality that may exacerbate overfishing and slow rebuilding.

Response: NMFS agrees and is concerned about all sources of mortality on HMS stocks. NMFS is committed to work through available international fora to rebuild overfished HMS stocks, even when U.S. fishing is responsible for only a small source of the total Atlantic-wide mortality. The rebuilding plans provided in the Billfish FMP Amendment are indicative of this commitment. Further, the Agency is required by the Magnuson-Stevens Act to take appropriate conservation actions, while considering the social and economic impacts on fishermen and fishing communities, and as such must consider management actions that meet the national standard guidelines.

Comment 6: NMFS should increase outreach efforts to inform the public of the need for management of HMS resources.

Response: NMFS agrees but is currently restricted from increasing outreach efforts by competing demands for funding (e.g., funds for observers, science). Note that the NMFS Highly Migratory Species Management Division posts current events and useful documents on the website www.nmfs.noaa.gov/sfa/hmspg.html. NMFS also produces informational brochures on current fishing regulations and mailouts, and NMFS uses a fax network for distribution of information. NMFS scientists are also participating in periodic outreach programs to share information on life history of billfish, sharks and tunas, as well as sharing information on methods that will enhance survival of released fish. An information hotline has also been established that summarizes current fisheries regulations as they apply to HMS. The hotline can be accessed by calling toll-free at 1–800–894–5528. Additional outreach efforts will be implemented as funding becomes available.

Comment 7: The proposed closed areas will result in an increase in swordfish imports into the United States; this would deny U.S. seafood consumers access to fresh, quality-controlled fish.

Response: NMFS does not anticipate that the U.S. fleet will be unable to meet its quota as a result of this final rule. Therefore, it is unlikely that imports will increase as a result of closed areas, although imports may increase for other unrelated reasons. NMFS does regulate the swordfish market other than to prohibit the import of undersized Atlantic swordfish into the U.S., which is monitored through the Certificate of Eligibility program. NMFS does not anticipate that this rule would affect the availability of high-quality, inspected seafood products provided to citizens of the United States by U.S. commercial fishermen. Imports of fishery products into the United States are also subject to the same hazard analysis and critical control point (HACCP) guidelines as are domestic landings.

Comment 8: The proposed closed areas are not equitable for constituents in different states.

Response: As required by national standard 2 of the Magnuson-Stevens Act, NMFS utilized the best available scientific information to develop the proposed rule and the final action. NMFS used logbooks, observer programs, and various scientific studies to identify distributional patterns of seasonal abundance, by species, and areas of overlap between various HMS, protected and endangered species, as defined by concentrations of bycatch and incidental catch from pelagic longline gear in the U.S. EEZ. Therefore, in large part, the biology of the species dictated the locations of the closures. In the selection of the final actions, international obligations and the national standards were considered, including the issue of equity, as required by national standard 4. While the final closed areas may have larger impacts on fishermen who fish in those areas, such impacts are not inconsistent with national standard 4.

Comment 9: NMFS is ignoring sea bird bycatch by the recreational fishermen who troll for HMS.

Response: NMFS disagrees that it is ignoring sea bird bycatch. NMFS has no data indicating that sea birds are caught and discarded in the recreational fishery for HMS. NMFS is currently implementing a logbook and a voluntary observer program for charter/headboats involved with HMS fisheries. This program will provide additional information on recreational fishing, including any possible interactions with seabirds or other protected or endangered species. If the data collected indicate that a sea bird bycatch problem exists in the U.S. recreational troll fisheries, NMFS will take appropriate action.

Comment 10: NMFS should quantify bycatch and bycatch mortality in the recreational fishery.

Response: NMFS agrees that quantifying bycatch and bycatch mortality in recreational fisheries is important and has collected data used to quantify bycatch of large pelagics in the recreational fishery. Such data are reported in the U.S. National Report prepared each year by NMFS for submission to ICCAT. The Billfish FMP Amendment established a catch-and-release fishery management program for the recreational Atlantic billfish fishery; therefore, all billfish released alive, regardless of size, by recreational anglers are not considered as bycatch. However, the mortality associated with the capture-and-release event is an important component to quantify for population assessment. NMFS currently collects data on the number of billfish retained and released at selected tournaments. NMFS has funded studies to quantify the bycatch mortality in bluefin tuna and billfish recreational fisheries, and NMFS scientists have recently reported on the use of circle hooks to reduce release mortality for the recreational billfish fishery. NMFS encourages fishermen to handle and release HMS in a manner that maximizes their chances of survival.

Comment 11: NMFS should re-establish the Second Harvest Program for swordfish whereby undersized swordfish are fed to the hungry instead of being discarded as bycatch.

Response: The specific regulations for the swordfish donation program were eliminated when the HMS regulations were consolidated in implementing the final HMS FMP and Billfish FMP Amendment (May 29, 1999; 64 FR 29090). During the consolidation process, the swordfish donation program regulations were evaluated under the President's Regulatory Reinvention Initiative. Given the low level of participation in the program at the time and the anticipated reduction in dead discards of undersized swordfish as the U.S. moved to adopt the alternative minimum size, it was determined that potential scale of operations did not require extensive regulatory text. However, under the current consolidated regulations, a fishermen could apply for an Exempted Fishing Permit (EFP) to authorize the donation of certain fish that could not otherwise be retained (e.g., swordfish in excess of the bycatch limits in effect for the particular vessel). Thus, the regulations still provide a mechanism for a donation program.

Comment 12: NMFS regulations force pelagic longline fishermen to discard swordfish, thus increasing bycatch in this fishery. NMFS should have a higher minimum size with a tolerance for undersized fish to reduce bycatch.

Response: Swordfish caught below the minimum size are regulatory discards and, as such, are considered bycatch. The minimum size limit was established to create an incentive for fishermen to avoid areas of undersized swordfish, though this was found to be less successful than anticipated. NMFS discontinued the use of a higher minimum size with a 15-percent tolerance for smaller fish because of concerns about the difficulty in enforcing such a measure. NMFS proposed a lower minimum size with no tolerance, and industry participants largely supported this decrease, stating that most of the fish landed under the tolerance provisions were just under the higher minimum size. In the Spring of 1999, the ICCAT Advisory Committee recommended that NMFS evaluate the efficacy of the swordfish minimum size limit and reconsider eliminating that size limit if warranted. Pending the outcome of that evaluation, ICCAT is expressly considering discards in the swordfish catch allocation scheme. Under the 1999 ICCAT recommendation, total North Atlantic discards of undersized swordfish are subject to an allowance of 400 mt Atlantic-wide for the 2000 fishing season; the U.S. receives 80 percent of this dead discard allowance (320 mt). The United States is obligated by international agreement to address swordfish discards. The time/area closures defined in the final rule will significantly reduce swordfish discards by U.S. pelagic longline vessels. Although some small swordfish will still be encountered under time/area management, the overall proportion of the catch that is discarded will be reduced and may, in fact, provide an opportunity to consider alternatives to minimum sizes in the international management of Atlantic swordfish.

Comment 13: The proposed closed areas are expected to increase the catch of mako, thresher, and blue sharks. The pelagic shark stocks will not be able to withstand the possible increase in pelagic shark mortality (landings and discards) associated with pelagic longline effort redistribution.

Response: Although the status of the pelagic sharks stock is currently designated as unknown, NMFS disagrees that the final rule will have a significant adverse impact on pelagic shark mortality. However, this does not mean that NMFS is not concerned about the status of these stocks. In fact, the HMS FMP established a blue shark quota, including dead discards from pelagic longline gear, that effectively sets an upper limit to the magnitude of impacts from displaced effort. In analyzing the impacts of the final closed areas, NMFS predicts only a 4-percent increase in pelagic shark landings and estimated discard rates increase by 8 percent under the effort redistribution model, which may overestimate impacts on bycatch and target catch. NMFS will closely monitor all pelagic shark landings through logbook and observer programs to follow changes in landing patterns resulting from effort redistribution.

Comment 14: The proposed time/area closures will reduce gear conflicts between the growing recreational HMS fisheries and commercial fishing communities, but in some areas, particularly the eastern Gulf of Mexico and Mid-Atlantic Bight, conflicts could potentially increase.

Response: NMFS previously identified gear conflicts between recreational and commercial entities in the 1988 Atlantic Billfish FMP and in the 1999 Amendment to that FMP. NMFS agrees that conflicts between recreational and commercial fishing groups could escalate in areas that remain open as a result of pelagic longline effort redistribution. Mitigating possible user conflicts was one of several reasons that temporal and spatial components of the proposed action were refined in the final action and, in the case of the western Gulf of Mexico, replaced by a live bait prohibition. Any management measure leading to a reduction in bycatch of billfish from commercial fishing gear may lead to localized increases in angler success and resultant economic benefits to associated U.S. recreational industries.

Comment 15: NMFS should consider implementing Individual Transferable Quotas (ITQs) in the future as a bycatch reduction measure, particularly for bluefin tuna in the longline fishery.

Response: Implementation of an ITQ scheme, with the sole or even partial purpose of reducing discards, could be considered and would require extensive detailed analysis before proceeding. However, NMFS is prohibited by the Magnuson-Stevens Act from implementing new ITQ programs at this time. The HMS FMP specifically addressed the bycatch of bluefin tuna by the pelagic longline fishery through implementation of a time/area closure during June off the Mid-Atlantic Bight. Initial results of the efficacy of the first closure (June 1999) are preliminary and do not indicate that the anticipated reductions were fully achieved. NMFS is currently reviewing whether the results are due to (1) a limited time frame for outreach (the final rule was published on May 28, 1999, with an effective date of June 1, 1999, for the bluefin tuna pelagic longline closure); (2) enforcement issues (VMS implementation was delayed until September 1, 2000); or, (3) inter-annual variation in the areas of BFT interaction (increased discards occurred outside of the closed area).

Comment 16: Large closed areas will pose significant enforcement challenges to U.S. Coast Guard (USCG) since the areas identified for closure in the proposed rule are not routinely patrolled by cutters. (This comment received from the USCG was followed up by a comment that supports the use of VMS to enforce closed areas.)

Response: NMFS recognizes the need for effective enforcement of these closed areas and, as such, supports the use of VMS, which will become effective for all pelagic longline vessels on September 1, 2000 (65 FR 20918; April 19, 2000). USCG resources will continue to be utilized, as that Agency is capable of confirming a vessel's location and whether it is fishing in the closed area. NMFS has entered into a cooperative agreement with the USCG to assist in the monitoring of fishing vessels at USCG locations.

Comment 17: NMFS should define the closed area by latitude and longitude in the regulatory text, including the designation for the U.S. EEZ.

Response: Except for a small portion of the East Florida Coast area, NMFS provides latitude and longitude coordinates for the boundaries to the closed areas in the regulatory text of this final rule. Given the curvature of the EEZ boundary between the U.S. and the Bahamas, it would be too complicated to express that segment of the boundary in latitude and longitude coordinates. NMFS notes that the EEZ boundary is plotted on most NOAA nautical charts and that vessel operators fishing that area must be familiar with the EEZ boundary in any case, as they are not authorized to fish commercially in the Bahamas.

Comment 18: NMFS should take these proposed closed areas to ICCAT and encourage international closed areas.

Response: NMFS supports consideration of closed areas and gear modifications to reduce undersized swordfish catch and fishing mortality and to protect spawning and/or nursery areas for swordfish and billfish on an Atlantic-wide basis, as discussed in the HMS FMP and Billfish FMP Amendment. In 1999, ICCAT adopted a U.S.-sponsored resolution for the development of possible international time/area closures (and gear modifications), and the Standing Committee for Research and Statistics (SCRS) is scheduled to provide a report on this topic at the ICCAT meeting in 2002. The final rule will be included in the U.S. National Report that will be submitted to ICCAT in October, 2000.

Comment 19: NMFS should ban pelagic longline gear or, at least, ban the use of this gear inside the U.S. EEZ.

Response: NMFS disagrees. Banning pelagic longline gear in the U.S. EEZ is not necessary to protect highly migratory species. Bycatch can be addressed through time/area closures, education, and gear modifications. Requiring all vessels using pelagic longline gear to fish only outside the 200 mile limit may also be inconsistent with consideration of safety issues as required under national standard 10.

Comment 20: Closures are not necessary; swordfish are rebuilding.

Response: NMFS agrees that the North Atlantic swordfish stock may have stabilized and that an international rebuilding program is in place. To the extent that the time/area closures will reduce bycatch and bycatch mortality of undersized swordfish, pre-adults, and spawning fish, the closures will enhance stock rebuilding. Furthermore, NMFS is required by an ICCAT recommendation and under national standard 9 to minimize bycatch, to the extent practicable. Providing protection of small swordfish and reproducing fish though time/area closures is particularly critical as stocks begin to rebuild. The United States is allocated 29 percent of the north Atlantic swordfish quota (1997 through 1999), and approximately 80 percent of the reported dead discards. Under the 1999 ICCAT recommendation, the total North Atlantic dead discard allowance for the 2000 fishing season is 400 mt; the U.S. receives 80 percent of the North Atlantic dead discard allowance (320 mt). The dead discard allowance for the United States is reduced to 240 mt in 2001, 160 mt in 2002, and will be phased out by 2004, with any overage of the discard allowance coming off the following year's quota. A total of 443 mt of swordfish were reported discarded by U.S. fishermen in the North Atlantic during 1998. Under the time/area strategy of the final rule, the no effort redistribution model predicts a 41.5-percent reduction in discards; under the effort redistribution model, discards are reduced by 31.4 percent. The closures could potentially reduce discards from 1998 levels to 259 mt under the no-effort redistribution model and to 304 mt under the effort redistribution model, thereby meeting at least the year 2000 discard allocation levels without affecting the subsequent year's quota.

Comment 21: NMFS should increase observer coverage of all components of HMS fisheries, including the pelagic longline fishery.

Response: NMFS agrees that it would be beneficial to increase observer coverage to document bycatch in all HMS fishing sectors. Observer coverage of the pelagic longline averaged between 4 and 5 percent between 1992 through 1998; a total of 2.9 percent of pelagic longline sets were observed during 1998. However, given current fiscal constraints, NMFS will not likely be able to significantly increase observer coverage in the pelagic longline fishery. NMFS will investigate additional funding mechanisms. Depending on funding, NMFS may implement an initial phase of the HMS charter/headboat and voluntary observer program in the summer of 2000 that will provide additional bycatch information from recreational fisheries.

Comment 22: NMFS should develop a comprehensive bycatch strategy, including specific targets for bycatch reduction.

Response: NMFS disagrees that setting fixed bycatch targets is necessary; in fact, such targets may be counterproductive. The multi-species approach followed in the development of the proposed and final action to reduce bycatch, bycatch mortality, and incidental catch precludes setting target reduction for specific species without considering the impact on the remaining portion of the catch composition. For example, if the time/area closures were simply based on reducing swordfish discards by a set percentage, a concomitant increase in bycatch of other species could occur, or target catches could be reduced more than necessary to achieve national standard 9 mandates. NMFS agrees that a comprehensive bycatch strategy is necessary and has outlined a plan that incorporates data collection, analysis, and measures that minimize bycatch, to the extent practicable. This strategy is outlined in the HMS FMP and the Billfish FMP Amendment.

Comment 23: NMFS should conduct educational workshops.

Response: NMFS supports the use of educational workshops to disseminate information on current research regarding bycatch reduction and to provide a forum through which fishermen can share bycatch reduction techniques with each other. NMFS scientists periodically hold seminars for fishermen to discuss the benefits of circle hooks and other handling techniques in the recreational billfish fishery. NMFS will seek input from representatives of fishing organizations and from the AP members regarding opportunities for workshops. Depending upon available funding and staff, NMFS will hold educational workshops to examine bycatch reduction activities in HMS fisheries, both for recreational and commercial fishermen.

Comment 24: NMFS needs to be able to respond quickly to results of monitoring and evaluation of closed areas. NMFS should develop a framework process for adjusting closed areas, if necessary, in a timely manner.

Response: NMFS agrees that a quick response to shifting fishing effort patterns is necessary. NMFS is currently able to adjust or develop new closed areas through the framework process (proposed and final rules, including public comment period) without amending the HMS FMP in the event that closed areas need to be altered to maximize the benefits to the nation. However, it will take time to collect and analyze the appropriate information, including data from the mandatory logbooks, observer program, and VMS.

Comment 25: NMFS should reduce effort in the longline fishery, not just reduce bycatch.

Response: The intent of this rulemaking is not to reduce effort in the fishery, but to reduce bycatch while minimizing the reduction of target catch by shifting effort away from areas with high bycatch and incidental catch. NMFS agrees that under a quota system, a time/area closure scheme will not necessarily reduce effort, although some vessel operators may choose to discontinue fishing due to economic or social factors. The use of time/area closures and gear restrictions (prohibition of live bait) was deemed by NMFS to be the best available management tool to reduce current levels of bycatch by the pelagic longline fishery, as required by national standard 9.

Comment 26: NMFS should consider additional actions to address the impact of the increase in sea turtle interactions resulting from pelagic longline effort redistribution.

Response: NMFS agrees that sea turtle interactions with pelagic longline gear must be minimized as required by the ESA for listed species. On November 19, 1999, NMFS reinitiated consultation with NMFS' Office of Protected Resources based on preliminary information on the 1999 take levels by the pelagic longline fishery. The BO issued on June 30, 2000 concluded that the continuation of the pelagic longline fishery could jeopardize the continued existence of loggerhead and leatherback sea turtles. The final time/area closures along the southeastern U.S. Atlantic coast were temporally and spatially reconfigured to mitigate, to the extent practicable, the impact of effort redistribution on sea turtle interactions. Bycatch rates, particularly for sea turtles, may be over-estimated by the effort redistribution model because the model estimated bycatch rates by assuming random or constant catch-per-unit-effort in all remaining open areas. This estimation procedure could skew results for certain species if those species are concentrated in certain areas (such as sea turtles in the Grand Banks), instead of being randomly distributed over the entire open area. Fishing activities will be monitored using VMS, as well as through logbooks and on-board observers, to determine impacts of actual effort redistribution, which may require further Agency action to address increased turtle takes. NMFS is initiating efforts to address the requirements of the BO, including possible regulatory and non-regulatory actions.

Comment 27: NMFS is proceeding with the use of time/area management strategies only because of litigation filed against NMFS by various environmental groups following publication of the final rules implementing the HMS FMP.

Response: NMFS disagrees. During public hearings held during the Fall of 1998 as part of the scoping process used to develop management alternatives for the draft HMS FMP and the Billfish FMP Amendment, NMFS received many comments regarding the utility of time/area closures to reduce bycatch in various HMS fisheries, including pelagic longline gear, and their use in protecting essential fish habitat (e.g., spawning and nursery grounds). The draft HMS FMP included a closure of a portion of the Florida Straits to reduce swordfish discards. Comments on the proposed action indicated that the area was spatially and temporally too limited to accomplish any significant reduction in bycatch, and, consequently, the area was not included as part of the final action. However, the HMS FMP clearly stated that, following publication of a final rule, an evaluation of wide-ranging time/area closures would be completed and implemented, if warranted. NMFS honored that commitment through the preparation of the Draft Technical Memorandum and the proposed and final rules, establishing both time/area and gear modifications to reduce bycatch by the U.S. Atlantic HMS pelagic longline fishery.

Comment 28: The comment period for the DeSoto Canyon area closure alternative is too short. Additional time must be provided to allow those in the affected area to adequately respond to this potentially devastating closure.

Response: NMFS disagrees that additional time was warranted for public comment on the DeSoto Canyon closure alternative. During the public hearing period for the proposed rule (December 15, 1999, to March 1, 2000), NMFS received many comments indicating that an additional closure was needed in the northeastern Gulf of Mexico because of the historically high swordfish discard rate in the area. In response to this comment, NMFS conducted additional analysis and identified an area generally around the DeSoto Canyon that in fact did have high incidence of discards of swordfish relative to swordfish kept. Although the DeSoto Canyon is included within areas that were analyzed in the DSEIS and draft Technical Memorandum (made available November 1999), NMFS decided that an additional comment period was needed specifically on the potential utility of this closure because pelagic longline effort has declined by greater than 50 percent in this area over the past 5 years. NMFS notified the public of its intentions to consider a sub-area of previously analyzed areas in the Gulf of Mexico (i.e., DeSoto Canyon) through the HMS fax network, which is sent to thousands of permit holders, seafood dealers and fish houses throughout the eastern United States. In addition, NMFS mailed the **Federal Register** notice with supplementary information summarizing the biological, economic, and social analysis of the DeSoto Canyon closure, and the VMS materials to all HMS pelagic longline permitees. As a result of the April 26, 2000, **Federal Register** notice (65 FR 24440) soliciting comment on this alternative, NMFS received hundreds of responses, indicating that adequate time was provided for comment.

Comment 29: Fish farming is the only answer to providing fish as a food for our population.

Response: NMFS agrees that aquaculture and mariculture play and have an important role to play in providing fishery products, but disagrees that they are the only answer.

Use of Time/Area Closures to Reduce Bycatch

Comment 1: NMFS should use time/area closures to reduce bycatch.

Response: NMFS agrees that closed areas can be an effective way to reduce bycatch, both in the U.S. and international pelagic longline fisheries, and this final rule implements time/area closures for the pelagic longline fisheries in the Gulf of Mexico and along the southeastern U.S. Atlantic coast. Due to efforts of the United States, ICCAT has asked its scientific committee to explore the use of closed areas throughout the management unit. Swordfish, marlin, sailfish, and other HMS are considered overfished and are currently experiencing overfishing Atlantic-wide. The rebuilding plans established in the HMS FMP and the Billfish FMP Amendment will be enhanced to the extent that reduction of bycatch will decrease mortality of juveniles and reproductive fish. Further, a reduction in swordfish discards is now critical for the U.S. pelagic longline fishery as a result of the 1999 ICCAT recommendation setting an North Atlantic discard allowance that is incrementally reduced to a zero tolerance level by 2004.

Comment 2: NMFS should change the size and/or shape of the proposed western Gulf of Mexico closed area.

Response: NMFS agrees and is closing the DeSoto Canyon area year-round to pelagic longline fishing to address undersized swordfish discards and to prevent further increases in swordfish discards as a result of possible effort displacement to this area in response to the southeastern U.S. Atlantic coastal closures. Further, NMFS has attempted to mitigate the economic effects of the actions specifically aimed at reducing billfish bycatch, by eliminating the proposed western Gulf closure and by prohibiting use of live bait by pelagic longline vessels in the Gulf of Mexico instead. This gear modification is potentially as effective in reducing sailfish discards as the western Gulf closure and is approximately half as effective in reducing marlin discards. However, in consideration of the magnitude of U.S. billfish discards relative to Atlantic-wide levels and the extent of the economic impacts associated with the proposed western Gulf closure, modifying fishing practices is a viable alternative that effectively accomplishes the objectives of reducing billfish bycatch while allowing fishing to continue in the western Gulf of Mexico.

Comment 3: Several commenters supported a closure of the Charleston

Bump area. Conversely, other commenters stated that the level of fishing activity in the Charleston Bump area does not warrant closure of this area.

Response: Although pelagic longline activity in the Charleston Bump area results in bycatch of small swordfish throughout the year, over 70 percent of the swordfish bycatch takes place during February through April. Therefore, NMFS is closing the Charleston Bump area for this 3-month time frame of the highest discard rates. This partial year closure addresses the bulk of swordfish discards while minimizing social and economic impacts of the rule by allowing fishing for 9 months, rather than the year-round closure included in the proposed Agency action. Minimizing the temporal component of the Charleston Bump closure also reduces the magnitude of potential increases in sea turtles interactions and white marlin discards predicted by the displaced effort model for the proposed rule. Nevertheless, NMFS is aware of the overall concerns regarding this area relative to potential increases in effort and concomitant effects on bycatch and incidental catch and will monitor fishing activity to determine whether a larger/longer closure is necessary in the Charleston Bump area. If necessary, NMFS would pursue further action through the FMP framework process.

Comment 4: NMFS should consider additional pelagic longline closed areas in a future rulemaking.

Response: NMFS agrees that additional closed areas may be necessary to address bycatch, bycatch mortality, and incidental catch, particularly to address sea turtle takes as discussed in section 5.8 of the FSEIS. Shifts in fishing effort patterns may also warrant future rulemaking to close affected areas. NMFS will continue to monitor the pelagic longline fleet throughout its range.

Comment 5: NMFS should change the shape, size, and/or timing of the South Atlantic proposed closed area.

Response: NMFS agrees. NMFS is closing the southern part of the proposed Southeast area below 31°N latitude (East Florida Coast) year-round in order to maximize the bycatch reduction benefits. The northern portion of the proposed closed area (Charleston Bump) is closed for the period of highest swordfish discards during February through April. NMFS may consider a larger closure in the Charleston Bump area if effort increases significantly in this area, resulting in increased incidental catches or discards of overfished HMS or protected species. NMFS would pursue this action through the FMP framework process.

Comment 6: NMFS should include a closure of the Mid-Atlantic Bight and/or a Northeast area to pelagic longline gear.

Response: NMFS disagrees that this rule should close the Mid-Atlantic Bight and/or Northeast coastal statistical areas. The areas closed by this rule are considered temporal and spatial "hot spots" for HMS bycatch from U.S. pelagic longline effort within the U.S. EEZ, as evaluated by the frequency of occurrence and the relationship between total catch and discard rates. NMFS has included a closure in the mid-Atlantic area as part of the final HMS FMP to reduce bluefin tuna discards from pelagic longline gear. Nevertheless, NMFS recognizes that pelagic longline effort will likely increase in areas that remain open (as analyzed in the redistribution of effort model in FSEIS). By minimizing the size of the closure in the Gulf of Mexico and shortening the closed season for the Charleston Bump area, NMFS expects that the effects of effort redistribution would be lessened from those evaluated in the DSEIS and proposed rule. Considering HMS bycatch, closures of the Mid-Atlantic Bight, beyond the June pelagic longline closure for bluefin tuna discards, or in the offshore waters in the Atlantic Ocean off the northeastern United States are not warranted at this time. NMFS will continue to monitor the pelagic longline fleet throughout its range and will take appropriate action if necessary through the proposed and final rule process to reconfigure closures. In addition, as required by the BO, NMFS will consider measures to reduce and monitor interactions with sea turtles, particularly in the pelagic longline fishing grounds on the Grand Banks. Such measures may include area closures.

Comment 7: NMFS should close areas to both commercial and recreational pelagic fishing. NMFS should consider closing areas to recreational rod and reel fishermen, particularly to protect small bluefin tuna.

Response: NMFS disagrees. The closures included in the final rule address the requirements of national standard 9, while minimizing, to the extent practicable, the significant economic impacts that will be experienced by this fishery, as required by national standard 8. Monitoring programs in place do not identify the recreational fishery as a source of excessive bycatch. In fact, NMFS established a catch-and-release fishery management program in the Billfish Amendment in recognition of the operational patterns of the recreational fishery to encourage further catch and release of Atlantic billfish. However, NMFS continues to address both monitoring of the recreational fishery and any bycatch mortality that does occur. At this time, NMFS encourages recreational fishermen to increase survival of released fish through the use of dehooking devices, circle hooks, and other gear modifications that may reduce stress on the hooked fish. Further, depending upon the availability of funding, NMFS will offer educational workshops in order to reduce bycatch in the recreational fishery.

Comment 8: NMFS should consider "rolling closures" to spread the impacts throughout the region.

Response: NMFS considered and rejected rolling closures. The HMS and Billfish APs advised NMFS that rolling closures may not be effective. MFS conducted analyses to consider closures with varying spatial limitations on a seasonal basis along the southeastern U.S. Atlantic coast; however, none were as effective as the final action (see section 7 of the FSEIS). Economic impacts of the closures were minimized, to the extent practicable, in light of the objectives of the conservation measures.

Comment 9: NMFS should use oceanographic conditions to define the size, shape, and timing of area closures.

Response: NMFS agrees that many life history characteristics of HMS are driven by oceanographic conditions, including the strength of the Gulf Stream in the Atlantic, the loop current in the Gulf, and the eddies that spin off these structures. By following long-term distributional patterns in establishing the temporal and spatial components of the closures, oceanographic conditions were indirectly utilized in defining and evaluating the effectiveness of the time/area closures. The sizes of the closures around the Charleston Bump and DeSoto Canyon are examples of how NMFS accounted for variations in the current patterns to establish the closed area boundaries.

Comment 10: NMFS should alter the closed areas to be consistent with Congressional proposals.

Response: NMFS disagrees. The objectives of the legislative proposals are not identical with those of this action. This final rule reflects the four objectives stated in the proposed rule: (1) maximize the reduction of finfish bycatch; (2) minimize the reduction in target catch of swordfish and other species; (3) consider impacts on the incidental catch of other species to minimize or reduce incidental catch levels; and (4) optimize survival of bycatch and incidental catch species.

NMFS has reviewed the various legislative proposals and provided, in testimony before Congress, an analysis of the relative effectiveness of the closures following the methods outlined in the FSEIS. In addition to bycatch reduction, the legislative actions also consider gear interactions and economic mitigation through a buyout program, which are beyond the scope of this rulemaking.

Comment 11: The closures proposed by NMFS ignore an historically high area of swordfish discards and nursery grounds in the DeSoto Canyon in the northeastern Gulf of Mexico.

Response: NMFS agrees and is closing an area in the northeastern Gulf of Mexico that includes the DeSoto Canyon. In the draft Technical Memorandum issued with the proposed rule, NMFS had evaluated the closure of a larger area in the Gulf of Mexico (area Bill D) that included the DeSoto Canyon. However, the primary objective for closures in the Gulf of Mexico in the proposed rule was to reduce billfish discards in the western Gulf of Mexico. In responding to comments on the use of live bait, NMFS noted in the FSEIS (see section 7.2) that the higher discards in the western Gulf were a likely result of fishing practices rather than a reflection of relatively higher abundance. Historically, catches of small swordfish were high in the DeSoto Canyon area; however there has been considerably less effort in this area in recent years, which is likely a reflection of the stricter minimum size limit for swordfish with no tolerance. Further rationale for the northeastern Gulf of Mexico closure is to prevent additional effort in this area by pelagic longline fishermen displaced from the southeastern U.S. Atlantic coast closures, which could negate the effectiveness of East Florida Coast and Charleston Bump closures in reducing swordfish discards.

Comment 12: NMFS should reconsider the proposed closed areas because the increase in the bycatch of blue marlin, white marlin, and large coastal sharks is not "worth" the decrease in swordfish bycatch expected to result from the proposed closed areas.

Response: The effort redistribution model used in the DSEIS and FSEIS is based on the assumption that all effort in the closed areas is randomly distributed throughout the remaining open areas and, as such, offers an estimation of the "worst-case scenario" from a biological perspective. This model estimates that discards of blue marlin could increase by 6.6 percent and white marlin by 10.8 percent. Blue marlin bycatch rates may be over-estimated by the effort redistribution model because the model estimated bycatch rates by assuming random or constant catch-per-unit-effort in all remaining open areas. This estimation procedure could skew results for certain species if those species are concentrated in certain areas, instead of being randomly distributed over the entire open area (see section 7 and appendix C of the FSEIS for full description of analytical procedures). Pelagic longline effort in the Caribbean (fishing areas below 22° N. latitude) represents approximately 14 percent of the total U.S. Atlantic-wide fishing effort, but accounts for over half of the total blue marlin discards by U.S. pelagic longline vessels. These areas were not considered for closure since they are generally located outside U.S. EEZ waters. Therefore, it is likely that the no-effort redistribution model would be more applicable for blue marlin (12 percent reduction in discards). White marlin discards were less concentrated in the Caribbean (32 percent of total Atlantic-wide levels) and did not show any identifiable patterns, particularly after the live bait effects were removed from the catch patterns. Therefore, the effort redistribution model (11 percent increase in white marlin discards) is probably more applicable in this case, indicating that white marlin discards are problematic and will need to be closely monitored. The prohibition of live bait in the Gulf will potentially further reduce Atlantic-wide discard levels of blue marlin and white marlin by approximately 3 percent and sailfish by 15 percent. Because large coastal sharks are overfished, management efforts that reduce discards (33.3 percent under the effort redistribution model) are likely to be beneficial to stock recovery and, in that regard, meet the objectives of the final rule.

Comment 13: The closures included in the proposed rule will not be effective in rebuilding overfished HMS stocks unless huge areas of the Atlantic Ocean outside the U.S. EEZ are also closed.

Response: National standard 9 requires FMPs to take actions to minimize bycatch to the extent practicable. The management actions included in the final rule have been formulated to meet the bycatch reduction directive of national standard 9, consistent with the requirements of other national standards for FMPs. To the extent that reducing bycatch and bycatch mortality impacts juvenile and reproductive HMS populations, the final actions may augment rebuilding programs for the overfished HMS stocks. While NMFS agrees that unilateral management action by the United States cannot rebuild overfished HMS stocks, the United States has been a leader in conservation of HMS resources and has taken many management actions (e.g., the time/area closures) to show the international forum our willingness to take the critical steps necessary to conserve these stocks. U.S. leadership has been used as a primary negotiation tool at ICCAT. The swordfish rebuilding program adopted by ICCAT in 1999 was based in large part on the rebuilding plan outlined in the HMS FMP. To the extent that the United States can use time/area closures and other bycatch reduction management strategies to convince other ICCAT member entities that bycatch can be minimized, the actions contained in the final rule may have a significant impact on Atlantic-wide rebuilding of overfished HMS stocks.

Comment 14: The entire Gulf of Mexico should be closed to pelagic longline fishing.

Response: NMFS disagrees that closure of the entire Gulf of Mexico to pelagic longline fishing is warranted. The proposed closure of the western Gulf of Mexico was predicated on the relatively higher billfish discards associated with the pelagic longline fishery operating in that area. Additional information and analyses obtained by NMFS subsequent to the publication of the DSEIS and proposed rule on December 15, 1999, indicate that prohibition of live bait could reduce blue and white marlin discards in the Gulf of Mexico by approximately 10 to 20 percent, and sailfish discards by 45 percent, depending upon the analytical procedure used. Closure of the DeSoto Canyon area in the northeastern Gulf of Mexico, although only a third the size of the western Gulf of Mexico closure (32,800 square miles versus 96,500 square miles), will provide a greater benefit in the reduction of swordfish discards (4 percent reduction Atlantic-wide versus a 3.1-percent increase under the effort redistribution model) and will prevent vessels displaced from the southeastern U.S. Atlantic coastal closures from fishing in an area with an historically high rate of swordfish discards. The cumulative benefits of the northeastern Gulf closure and live bait prohibition meet the objectives of the final rule by providing a reasonable alternative to reduce bycatch rates, while minimizing economic and social impacts throughout the Gulf of Mexico.

Comment 15: NMFS has already closed too many areas to commercial fishing. The proposed closures will eventually lead to total closure of the entire Atlantic region to commercial fishing.

Response: NMFS disagrees that the final rule closures will lead to elimination of the commercial pelagic longline fishery. However, NMFS agrees that use of time/area closures as a fishery management tool must involve careful consideration of the impact of Agency action on all components of both the commercial and recreational fisheries. Implementation of practicable conservation measures that meet Magnuson-Stevens Act directives is the overarching objective of the Agency. To that end, NMFS has reduced the spatial and temporal constraints of the proposed closures and included a gear modification (prohibition of live bait) to help mitigate the economic and social concerns expected to result from the actions originally proposed.

Comment 16: Closure of the DeSoto Canyon area, in addition to the western Gulf closure, will displace vessels into the Atlantic and/or Caribbean, which will negate the conservation measures associated with the closures.

Response: NMFS disagrees because the effort redistribution model assumes that effort is displaced randomly throughout the remaining open areas. Therefore, the conservation benefits associated with the final action closures account for movement of effort into the Caribbean, Mid-Atlantic Bight, or any other open area. Further, since the final rule does not close the western Gulf of Mexico, it is likely that the limited fishing effort currently expended within the DeSoto Canyon closure area (approximately one-third the size of the proposed Gulf closure) will be dispersed largely within the Gulf of Mexico.

Comment 17: The proposed time/area closures are unjust, unnecessary, and inequitable and, as such, will result in further lawsuits against NMFS.

Response: National standard 9 of the Magnuson-Stevens Act requires that NMFS take action to reduce bycatch to the extent practicable. The use of time/area closures is a practicable means of reducing bycatch of HMS resources while considering the economic concerns of participants in the pelagic longline fishery who target these overfished, international fishery resources. The IRFA, RIR, and other components of the DSEIS clearly identified the significant economic, social, and community impacts associated with the proposed time/area closures. NMFS selected conservation measures in the final rule that meet the directives of the Magnuson-Stevens Act, while being mindful of the requirements of national standard 8 to minimize negative economic, social, and community impacts, to the extent practicable.

Comment 18: The DeSoto Canyon closure is needed to protect a swordfish nursery area, but it needs to be larger to be more effective.

Response: NMFS agrees that the DeSoto Canyon area is an area with an historically high ratio of swordfish discarded to swordfish kept. NMFS does not agree that additional closed areas are warranted at this time. The analysis undertaken for the FSEIS included catch history from the entire northeastern Gulf of Mexico, east of the Mississippi River, and north of 26° N. latitude (general location of the U.S. EEZ). Although effort has been declining around DeSoto Canyon in recent years, NMFS has selected this area for a closure to prevent further effort from being expended in this area, either by displaced effort from the Atlantic or by vessels shifting operations from other areas of the Gulf of Mexico.

Comment 19: NMFS should have considered closures in the Caribbean, including the EEZ around Puerto Rico and the U.S. Virgin Islands, to protect spawning populations of swordfish and billfish.

Response: Closed areas in the Caribbean were considered. However, as discussed in the DSEIS and FSEIS, closures were generally limited to U.S. EEZ waters where they would have maximum impact on all pelagic longline fishing effort. NMFS agrees that the Caribbean waters support important HMS spawning and nursery areas as identified in the essential fish habitat components of the HMS FMP and the Billfish FMP Amendment. Pelagic longline effort in the Caribbean (fishing areas below 22° N. latitude) by U.S. flagged vessels is very effective in targeting swordfish with relatively low discard rates (approximately 6.7 fish kept to 1 discarded, as compared to an average 0.9 swordfish kept to 1 discarded in the DeSoto Canyon area). Conversely, the U.S. pelagic longline effort in the Caribbean represents approximately 14 percent of the total U.S. Atlantic-wide fishing effort, but accounts for over half of the total blue marlin discards by U.S. pelagic longline vessels. NMFS did not select a closure in the Caribbean area because of the extensive range of the fishing effort in the Caribbean, which occurs mainly in international waters. In addition, the configuration of the EEZ around both Puerto Rico and the U.S. Virgin Islands would make closures relatively ineffective.

Comment 20: NMFS should close the DeSoto Canyon area in addition to, not in place of, the proposed western Gulf of Mexico closure.

Response: NMFS agrees that the DeSoto Canyon should be closed year-round to reduce swordfish discards and prevent an increase in fishing pressure in this area as a result of displaced effort from the East Florida Coast closure. However, NMFS does not agree that the proposed western Gulf of Mexico closure (March to September) is also warranted at this time. The final rule includes a prohibition on the use of live bait on pelagic longline gear in the Gulf of Mexico. Analysis of this alternative indicates that prohibiting the use of live bait is likely to be as effective in reducing sailfish discards as the western Gulf closure, and about half as effective in reducing marlin discards. However, in consideration of the magnitude of U.S. billfish discards relative to Atlantic-wide levels and the extent of the economic, social, and community impacts associated with the proposed western Gulf closure, modifying fishing practices is a reasonable alternative that effectively accomplishes the objective of reducing billfish bycatch, to the extent practicable, while allowing fishing to continue in the western Gulf of Mexico.

Comment 21: There is no reason for NMFS to close the DeSoto Canyon area to pelagic longline gear.

Response: NMFS disagrees. The rationale for closing the DeSoto Canyon area year-round to pelagic longline fishing is twofold. The first is to prohibit fishing in an area with an historically low ratio of swordfish kept to number of undersized swordfish discarded, which over the period of 1993 to 1998 has averaged less than one swordfish kept to one swordfish discarded. The second is to prevent further increases in swordfish discards as a result of effort displacement into this area from the Florida East Coast year-round closure.

Comment 22: The closures included in the proposed rule are more effective than the measures contained in various bills being considered in Congress.

Response: There are several bills currently before Congress. It is difficult at this time to predict whether any of the bills will be enacted and, if a bill is enacted, what measures it will contain. The objectives of the legislative proposals are also different in some respects from those of NMFS' final action.

Comment 23: Although the original proposed rule and the additional DeSoto Canyon closed area may not be contrary to ICCAT recommendations, they violate sections of the Magnuson-Stevens and Atlantic Tunas Convention

Acts. The action is not being taken to comply with ICCAT recommendations.

Response: NMFS disagrees that the proposed and final rules violate the Magnuson-Stevens Act and ATCA. In fact, if NMFS failed to address the issues developed in the final action, the Agency would be in violation of Magnuson-Stevens Act directives related to national standard 9. Further, the 1999 ICCAT recommendation established a dead discard allowance that will require the United States to reduce swordfish discards by 25 percent from 1998 levels (i.e., 443 mt to 320 mt) during the 2000 fishing year; any discards in excess of the dead discard allowance will be taken off the following year's quota. The dead discard allowance is subsequently reduced to 240 mt in 2001, 160 mt in 2002, and 0 mt by 2004. Thus, consistent with the ICCAT recommendation, NMFS must take action to reduce swordfish dead discards.

Gear Modifications

Comment 1: NMFS needs to do gear research specifically for the Atlantic pelagic longline HMS fishery. Results from gear modification research on other fisheries may not have the same effectiveness when applied to the Atlantic pelagic longline fishery.

Response: NMFS agrees that research on gear modifications would be most helpful if conducted in the Atlantic pelagic longline fishery. In fact, several gear-based data collection and research programs have been specifically directed on the Atlantic HMS pelagic longline fisheries. One study is looking at whether gear modifications, such as circle hooks, can reduce bycatch mortality and whether they are cost-effective. Results are either inconclusive or too preliminary for application in this final rule. Funding is very limited at this time, so research results from other study areas are often applied to similar fisheries (e.g., western Pacific tuna longline and Gulf of Mexico tuna longline fishery).

Comment 2: NMFS should provide exempted fishing permits (EFPs) to research vessels in closed areas to investigate the effectiveness of gear modifications and fishing practices to reduce bycatch and incidental catch interaction with pelagic longline gear.

Response: NMFS agrees. Researchers must obtain a Scientific Research Permit (SRP) or EFP from NMFS to conduct research in a closed area with pelagic longline gear. A mechanism exists whereby NMFS can grant an SRP/EFP in order to obtain data (50 CFR 600.745). If a research team submits the required information, including a research plan, NMFS would consider granting an SRP/EFP subject to the terms and requirements of the existing regulations.

Comment 3: NMFS received comments both supporting and opposing a regulation requiring the use of circle hooks in HMS fisheries. Comments include the following: Require them on commercial and/or recreational HMS vessels; do not require them; they are safer than regular hooks, and better, cheaper, and more effective than the DSEIS indicated.

Response: NMFS agrees that circle hooks are a promising tool that can be used in many hook and line fisheries to improve survival of hooked fish and turtles that must be released. NMFS has funded a study, now underway in the Azores, to evaluate the effectiveness of circle hooks on sea turtle interactions and survival. If analyses indicate that circle hooks are a cost-effective way to increase turtle survival, NMFS may issue regulations requiring the use of such gear. NMFS seeks the cooperation of all fishermen to explore the use of circle hooks as a means to reduce bycatch mortality, which is less expensive and may have less economic impact than other measures (e.g., more extensive time/area closures). Many recreational anglers have already switched to circle hooks, particularly when fishing with dead bait, with several recent articles in sportfishing magazines reporting on the value of using circle hooks to reduce hooking-related mortality levels. In certain fisheries, commercial fishermen have already adopted circle hooks as well, as there is evidence of increased catch rates for some target species (e.g., yellowfin tuna).

Comment 4: Some commenters noted that NMFS should prohibit the use of live bait in the pelagic longline fishery. Conversely, other commenters noted that, if NMFS prohibits live bait, fishermen will switch from targeting tuna to targeting swordfish. Since many pelagic longline fishermen operating in the Gulf of Mexico have incidental swordfish permits, this might result in increased discards of swordfish.

Response: NMFS agrees that live bait should be prohibited. Live bait is used for 13 percent (logbook data) to 21 percent (observer data) of all pelagic longline sets in the Gulf of Mexico. Logbook and observer data indicate that blue and white marlin discards occur approximately twice as frequently on hooks with live bait; sailfish are discarded four to five times more frequently when live bait is used. Live bait is generally used to target yellowfin tuna, although dead bait is used on the majority of pelagic longline sets. Prohibiting live bait may lead to additional use of squid or other dead bait, which may be less effective than live bait in catching yellowfin tuna, but is a reasonable alternative to a closure of the western Gulf of Mexico as a means of reducing billfish bycatch. Some fishermen may switch from targeting tuna (daytime fishery) to targeting swordfish with dead bait, thereby increasing swordfish discards. However, fishing for swordfish with pelagic longline gear generally takes place during night-time hours and has an added expense and complexity with the use of light sticks. In anticipation of fishermen targeting swordfish in the Gulf of Mexico in reaction to this prohibition, NMFS has implemented a time/area closure in a known swordfish nursery area in the eastern Gulf of Mexico (DeSoto Canyon) in an attempt to avoid the increased catch rates of small swordfish there. Further, if longline fishermen holding an Incidental category swordfish permit experience increased swordfish catch rates, NMFS may need to reconsider the incidental catch limit and the allocation of swordfish quota to the directed fishery. Prohibiting the use of live bait could be just as effective in reducing sailfish discards (approximately 15 percent reduction from the Atlantic-wide U.S. totals during 1995 through 1998) as the western Gulf closure. Although the live bait prohibition would be somewhat less effective in reducing marlin bycatch discards than the March to September area closure (e.g., blue marlin: 3.3 percent vs. a 7.2-percent reduction under the displaced effort model), it is less costly and is a practical alternative to the western Gulf closure.

Comment 5: NMFS should implement other gear modifications (e.g., decreasing length of longline, decreasing soak time, and timing of sets).

Response: NMFS agrees that gear modifications could be effective at reducing bycatch. However, many of these measures are difficult to enforce or could be circumvented by altering fishing patterns (e.g., additional sets made or increased soak time to offset a shorter mainline), resulting in no bycatch reduction. NMFS continues to support research projects regarding effectiveness of gear modifications.

Comment 6: NMFS should allow the U.S. Atlantic pelagic longline fishery 1 year to voluntarily reduce bycatch with the use of self-imposed gear modifications.

Response: As a result of a 1999 ICCAT recommendation setting Atlantic-wide discard quotas, the United States must immediately reduce swordfish discards during the 2000 fishing year to 320 mt. This will have to be a significant reduction from 1998, when a total of 443 mt of swordfish discards from the North Atlantic were reported by the United States. The ICCAT recommendation also incrementally reduces the dead discard allowance to zero by the 2004 fishing year. Any dead discards over the annual allowance will be taken off the following year's quota. Therefore, NMFS has determined that it is necessary to initiate mandatory bycatch reduction measures at this time.

Comment 7: NMFS should limit the soak times of pelagic longline gear to reduce the number of dead discards.

Response: NMFS evaluated an alternative in the FSEIS that would reduce pelagic longline soak time to 6 hours. The strategy would reduce the amount of time that pelagic longline gear could be deployed and thus reduce fishing effort (hours/hook) for each longline set. The current range of soak time for pelagic longline gear is 5 to 13 hours. This alternative was rejected based on the practicality of enforcement and the likelihood that fishermen would make two sets during a day, or otherwise extend a fishing trip to execute a similar level of effort/trip. Since most billfish hit a longline hook during setting or retrieving, requiring a measure that forced a greater frequency of hooks moving through the water column could increase billfish discards. However, limiting soak to reduce sea turtle takes will likely be considered in developing alternatives to address concerns raised in the BO.

Environmental Justice

Comment 1: The proposed closed areas would disproportionately affect African-Americans in South Carolina, Vietnamese-Americans in the states bordering the Gulf of Mexico, and low-income crew members.

Response: NMFS considered environmental justice concerns as required by E.O. 12898 in selecting the preferred actions of the final rule. By minimizing the size of the closure in the Gulf of Mexico through prohibiting the use of live bait and by shortening the closed season for the Charleston Bump area, NMFS expects that the economic and social effects of the closures on minority groups and all other components of the pelagic longline fishing community will be minimized to the extent practicable.

Protected Species

Comment 1: NMFS should re-designate the longline fishery from a Category I to a Category II fishery under the MMPA because the fishery bycatch meets the criteria for a Category II designation.

Response: NMFS classifies fisheries on an annual basis. Classification criteria consist of a two-tiered, stock-specific approach that first addresses the total impact of all fisheries on each marine mammal stock, and then addresses the impact of individual fisheries on each stock. NMFS bases its classification of commercial fisheries on a variety of different types of information. The best source of information concerning the level of fishery-specific marine mammal incidental serious injury and mortality is the fishery observer program. If observer data are not available, NMFS may use fishermen's reports submitted per the requirements of the Marine Mammal Authorization Program since 1996 (or the Marine Mammal Exemption Program from 1989 to 1995), stranding data, data from other monitoring programs, and other sources of information. The Atlantic pelagic longline fishery has been monitored with about 2 to 5 percent observer coverage, in terms of sets observed, since 1992. The 1992–1997 estimated take was based on an analysis of the observed incidental take and self-reported incidental take and effort data. The 1998 stock assessment reports, which were used for the 1999 List of Fisheries, included data which placed the pelagic longline fishery into Category I. NMFS will reevaluate categories in developing the 2001 List of Fisheries. However, NMFS anticipates using serious injury data, which would likely cause the pelagic longline fishery to remain in Category I.

Comment 2: NMFS should be more concerned about fishermen than about sea turtles.

Response: NMFS is concerned about achieving conservation benefits of the final rule while at the same time minimizing expected economic impacts on fishermen and related businesses, to the extent practicable. However, NMFS also must be in compliance with the Endangered Species Act, which requires NMFS to take appropriate actions to protect endangered or threatened species (e.g., sea turtles). The final rule includes reasonable actions that meet requirements of the Magnuson-Stevens Act and ATCA (as it applies to swordfish discards) to reduce bycatch and seek long-term rebuilding of overfished HMS stocks, while balancing economic and social impacts. Even so, it is clear that the final actions will have significant social and economic impacts on various components of the pelagic longline communities. NMFS recognizes those impacts and has noted possible sources of economic relief (see section 8.0 of FSEIS).

Comment 3: The projected increase in turtle takes as a result of the proposed closures (under the redistribution of effort model) is not likely because many boats are not capable of redistributing their longline effort to the Grand Banks.

Response: NMFS agrees that turtle bycatch rates may be over-estimated by the effort redistribution model because estimation of catch-per-unit-effort in the remaining open areas could be skewed if species are concentrated in one area (such as sea turtles in the Grand Banks or blue marlin in the Caribbean; see FSEIS for further information), rather than randomly distributed over the entire open area. Although fishing in the Grand Banks area requires a relatively larger vessel than currently utilized in some of the closed areas (e.g., east Florida coast) for practical and safety reasons, it is possible that some boats could commence fishing on the Grand Banks or increase current effort in this area due to the closures in other areas, resulting in potential increases in turtle interactions. It is not known at this time how many vessels are expected to redistribute their effort to areas and times where turtle interactions are highest, but fishing activities will be continually monitored through the VMS program, as well as through logbooks and on-board observers. The anticipated takes for loggerheads and leatherback sea turtles for pelagic longline gear established by the incidental take statement were exceeded during 1999, as discussed in section 5.8 of the FSEIS. The June 30, 2000 BO contained jeopardy findings for both loggerhead and leatherback sea turtles. NMFS is initiating efforts to address this issue, including possible regulatory and non-regulatory actions.

Dolphin/Wahoo Issue

Comment 1: Comments were received that the mahi ''loophole'' undermines the effectiveness of the HMS time/area rule; Vessels using longline gear to target dolphin (mahi) should be prohibited from the HMS pelagic longline closed areas; NMFS should continue to work with the Councils to coordinate closed areas to reduce bycatch; If an exception is made for the closed area, HMS longline fishermen may move into the dolphin fishery.

Response: NMFS has notified the respective fishery management councils of the jurisdictional issues presented by vessels fishing with pelagic longline gear for species that are not directly managed by the Secretary of Commerce (e.g., dolphin). The South Atlantic

Fishery Management Council has prepared a Draft Dolphin and Wahoo Fishery Management Plan with a preferred alternative that would prohibit the use of pelagic longline gear for dolphin and wahoo in areas closed to such gear under HMS regulations. NMFS cannot predict whether HMS longline fishermen will move into the dolphin fishery, but it is unlikely that there would be a major shift in effort. Vessel operators may not fish with pelagic longline gear in closed areas if they hold an HMS permit; therefore, they would have to relinquish all HMS permits in order to do so. NMFS does not expect that longline fishermen would sell their swordfish and tuna permits in order to target dolphin for a seasonal fishery of limited size and duration.

Comment 2: NMFS should implement emergency regulations until the respective Councils can close the potential loophole posed by the longline fishery for dolphin.

Response: If the level of fishing effort targeting dolphin increases, it will most likely be due to factors other than the time/area closures implemented for bycatch reduction in the tuna/swordfish longline fisheries. It is unlikely that vessels affected by the HMS closures would give up HMS permits specifically to conduct a dolphin fishery. NMFS and the respective Councils can monitor effort, catch, and bycatch of non-HMS permitted longline fishermen targeting dolphin in the HMS closed areas and determine whether further action is required. The South Atlantic Fishery Management Council has already undertaken preliminary steps in preparing a proposed Dolphin and Wahoo FMP that includes parallel closures.

Comment 3: No billfish or swordfish are caught in the mahi fishery; NMFS should not shut down the mahi longline fishery; it has virtually no discards and the stock is healthy; NMFS needs to analyze the dolphin fishery more closely in evaluating the impacts of the pelagic longline time/area closure.

Response: Recognizing the jurisdictional issues, NMFS has asked the appropriate fishery management councils to examine management options guiding the use of pelagic longline gear to target dolphin. In the FSEIS, NMFS has included a more detailed discussion of the potential bycatch issues in the pelagic longline fishery for dolphin. Logbook reports from 1998 were examined for all sets made in the area from Key West, FL, to Wilmington Beach, NC. It was not possible to identify effort in the dolphin fishery with certainty, but sets were separated into those targeting swordfish/tunas/sharks and those listing a target as ''other.'' It was presumed that sets listing a target as ''other'' are predominantly targeting dolphin, and this was reflected in the nearly tenfold higher catch per set of dolphin. While swordfish and bluefin tuna discards were generally lower for the presumed dolphin sets, bycatch of billfish, sharks and bigeye, albacore, yellowfin, and skipjack (BAYS) tunas seems to be a concern. More specific information on catch occurring when pelagic longlines are set to target dolphin would be needed to confirm or refute the bycatch concerns. In the interim, to facilitate enforcement and to take a precautionary approach, NMFS has decided that HMS-permitted vessels should be prohibited from setting all pelagic longline gear in the closed areas, regardless of target species. It is possible that an operator of an HMS-permitted vessel who wishes to target dolphin could apply for an exempted fishing permit (EFP). If EFPs are issued, the data collected (e.g., logbook or observer reports) can be used to determine whether a dolphin fishery could be undertaken that would be consistent with the bycatch reduction objectives of the HMS FMP. However, such authorization for EFPs would have to be considered in consultation with the councils having management authority for dolphin.

Redistribution of Effort

Comment 1: More pelagic longline fishermen will relocate to open fishing areas than exit the fishery as a result of the time/area closures.

Response: To estimate the range of potential ecological impacts of the time/area closures, NMFS examined two scenarios for effort reallocation: (1) all effort in the closed area is removed from the system (worst-case alternative from the economic, social and community standpoint) and (2) all effort is randomly moved to available open areas (which may overestimate impact of effort if a species is not relatively uniformly distributed throughout the area—see discussion of sea turtle and blue marlin distribution in the FSEIS). Available information is insufficient for NMFS to estimate the number of vessels that may decide to discontinue fishing or to determine where the remaining vessels will relocate. However, if total U.S. pelagic longline effort is reduced by vessels leaving this fishery, the estimates of the effectiveness of the time/area closures will be underestimated.

Comment 2: The NMFS western Gulf of Mexico proposed closure would force displacement of pelagic longline effort into known bycatch areas, particularly the DeSoto Canyon area in the eastern Gulf of Mexico, resulting in net losses in conservation effectiveness of the time/area closures.

Response: NMFS agrees that this is a possibility. The areas selected in the proposed rule were based on areas and times when discard rates were relatively higher than those in other temporal/spatial alternatives (''hot spots''). The overriding objective for the proposed closure in the Gulf of Mexico was to reduce billfish discards. A relatively higher discard-per-unit-effort was noted for marlin and sailfish in the western Gulf of Mexico. In conducting the analyses for the proposed rule, NMFS also recognized that there were discards of swordfish in the eastern Gulf; however, there was a relatively lower occurrence of billfish discards, particularly blue and white marlin, in this eastern area. Therefore, in consideration of the fact that the western Gulf area also had discards of undersized swordfish, NMFS selected this area for closure in the proposed rule. Information that became available subsequent to the preparation of the proposed rule and consistent with public comments received has provided additional insight into the differential bycatch of billfish from pelagic longline sets using live bait, a fishing practice which has occurred mainly in the western Gulf of Mexico. NMFS anticipated that this fishing technique would be moved to the eastern Gulf of Mexico if the proposed closure were implemented, resulting in an increase in billfish bycatch in this area. The final rule incorporates a prohibition on the use of live bait on pelagic longline gear which will reduce billfish bycatch without the need for a closure in the western Gulf of Mexico. As a result, NMFS re-examined other areas in the Gulf of Mexico and is closing the DeSoto Canyon and a portion of the west Florida shelf based on the historically high ratio of swordfish discards to swordfish kept in these areas. Further, this action will prevent an expansion of displaced fishing effort into this area following closures along the southeastern U.S. Atlantic coast.

Comment 3: Displaced boats will re-flag to another country or sell their vessel and gear to ICCAT non-member countries in the Caribbean, or other areas, which will negate any gain in the reduction of billfish and undersized swordfish discards by U.S. commercial pelagic longline effort.

Response: It is possible that U.S. owners will decide to sell their vessel(s) to citizens of one of the Caribbean countries. NMFS has information that indicates that many Caribbean nations (some which may not be members of ICCAT) are interested in expanding their fishing fleets for HMS. NMFS is involved with many United States initiatives regarding issues of illegal, unregulated and unreported (IUU) fishing, including those developed through ICCAT and FAO. The recent ICCAT restrictions on swordfish imports from Honduras and Belize are evidence of this international effort. ICCAT also continues to work with Caribbean nations to discuss allocation criteria for these nations, as well as adherence to ICCAT recommendations, which has been a source of concern.

Comment 4: The time/area closures will increase competition in the shark fishery because pelagic longline vessels will re-rig to undertake bottom longline fishing.

Response: NMFS disagrees. The shark fishery operates under a limited access permit system. Most pelagic longline vessels have qualified for limited access shark permits. The level of retention allowable under an incidental permit is not sufficient to support profitable operations focusing on shark resources. While some pelagic longliners have directed permits and it is possible that some fishermen could purchase a directed shark permit, the total number of directed permits is capped, and the shark fishery operates under a quota system; therefore total effort and relative competition between vessels should remain unchanged.

Comment 5: NMFS will force pelagic longline fishermen with small vessels to fish farther from shore, which could be unsafe during inclement weather. NMFS should consider safety-at-sea implications of the proposed closed areas.

Response: NMFS agrees that vessel safety is an important component to be considered in developing reasonable management measures, as required by national standard 10 of the Magnuson-Stevens Act. Some pelagic longline vessels historically operating in the areas being closed are not capable of safely fishing farther out to sea in the open areas due to their size. However, the vast majority of pelagic longline effort targeting swordfish and tuna occurs in deep waters, generally in waters with depths in excess of 500 fathoms (3000 feet), requiring a vessel of sufficient size to safely handle open ocean conditions. The final rule closures should not adversely impact most of these vessels in regard to sea-worthiness, particularly with the removal of the western Gulf of Mexico closure and reducing the temporal restrictions of the Charleston Bump closure. However, there is a fleet of small pelagic longline vessels that fish the deep waters found relatively close to shore along the east Florida coast. This area will be closed year-round because of the magnitude of reported swordfish and billfish discards. If these vessels are moved to open areas that require fishing at a greater distance from shore, NMFS encourages vessel operators to follow U.S. Coast Guard-approved operating procedures and to exercise caution in determining the safe operating range for their sizes and types of vessels.

Comment 6: Directed shark fishermen should be allowed to catch more sharks since bycatch of large coastal sharks in the pelagic longline fishery would be reduced with the time/area closures.

Response: NMFS disagrees. Shark resources in the United States are either overfished (large coastal sharks), fully fished (small coastal) or unknown (pelagic sharks). Each shark category has a set harvest level that encompasses catch from all fishing sources. Time/area closures may result in an increase in pelagic shark discards and landings of approximately 8 and 4 percent, respectively, under complete effort redistribution. Conversely, the number of large coastal sharks discarded and landed from pelagic longline gear will likely decrease by 33 and 18 percent, respectively, which may increase the duration of the large coastal shark fishing season. However, further increases in shark quotas are not warranted at this time.

Comment 7: The effort redistribution model included in the DSEIS predicts an increase in BAYS tuna landings, but the United States has agreed to limit effort in the yellowfin tuna fishery under an ICCAT agreement.

Response: While NMFS agrees that, under the effort redistribution model, BAYS tuna landings may increase (mainly as a result of increased yellowfin tuna catches), the ICCAT agreement limits U.S. yellowfin effort to 1993 levels. The catch levels predicted by the effort redistribution model are based on total effort redistribution and, as such, are likely to be an over-estimation of actual effort and catches under the final rule time/area closures. As a result of the HMS FMP, a limited access system is now in place for the tuna pelagic longline fishery, and a recreational limit of three yellowfin tuna per person per trip was also implemented. Commercial yellowfin tuna landings in 1993 were 4,386 mt, while more recently (1996 to 1998), landings have averaged approximately 3,525 mt. The nearly 10 percent increase in BAYS landings predicted by the displaced effort model would increase average annual landings to only 3,700 to 3,800 mt, without an overall increase in effort.

Comment 8: Fishermen can and will fish in closed areas with other types of fishing gear.

Response: In the FSEIS, NMFS analyzed the potential impacts of fishermen changing target species through redistributing effort to other fisheries in which the vessel already may be active, or pursuing new fisheries by purchasing permits, as necessary. The South Atlantic Fishery Management Council is currently holding public hearings on a proposed dolphin/wahoo FMP that includes a preferred alternative that would prohibit pelagic longline fishing for dolphin and wahoo within the spatial and temporal constraints of closures for the HMS pelagic longline fishery. This could reduce effort redistribution from HMS to the dolphin and wahoo fisheries.

Comment 9: If Agency actions force fishermen to fish in areas with high turtle interactions, then the Agency is responsible for any increase in take, not fishermen.

Response: NMFS disagrees. The final time/area closures along the southeastern U.S. Atlantic coast were temporally and spatially reconfigured to mitigate, to the extent practicable, the impact of effort redistribution on sea turtle interactions. Turtle bycatch rates may be over-estimated by the effort redistribution model because estimation of catch-per-unit-effort in the remaining open areas could be skewed if species are concentrated more in one area (like sea turtles in the Grand Banks) rather than randomly distributed over the entire open area. NMFS will continue to monitor the fishery after implementation of the final rule. As a result of the jeopardy findings for loggerhead and leatherback sea turtles, NMFS will issue additional regulations that may include further modifications to gear and/or fishing methods, closed or limited fishing areas, and expanded monitoring (see section 5.8 of the FSEIS).

Comment 10: The majority of directed swordfish and tuna pelagic longline fishermen are not active in other commercial fisheries.

Response: NMFS disagrees. Of the 329 fishermen with swordfish limited access permits who held valid permits as of May 9, 2000, approximately half held only HMS limited access permits. The other fishermen held a range of permits including king mackerel, Spanish mackerel, golden crab, reef fish, red snapper (both Class 1 and Class 2 licences), rock shrimp, snapper-grouper, and spiny lobster. In addition, some of the vessel permit holders held permits in fisheries that are managed by the Northeast Regional Office.

Comment 11: The closure will have unknown benefits because reallocation of effort will change the catch composition.

Response: NMFS examined a range of impacts of effort reallocation, including removal of all effort from closed areas to redistributing all effort to available open areas. While the models used by NMFS provide estimates of potential increases or decreases in catch and discards, NMFS agrees that a full, quantitative assessment of effort reallocation cannot be made until the closures are implemented and fishermen develop new fishing patterns. However, the closures implemented through the final rule will significantly reduce impacts on the level of discards from the U.S. pelagic longline fishery in the U.S. EEZ, which was the goal of the action. NMFS will monitor vessel activity through the use of VMS, observers, logbooks, and dealer reports.

Comment 12: The time/area closures will force vessels to increase effort and/or move into other South Atlantic fisheries for which they hold permits. Boats will move into the bottom longline fishery and catch grouper, snapper, and tilefish or shift to other pelagic longline fisheries, like dolphin and wahoo, in either the impacted closed areas or other locations along the Atlantic coast.

Response: NMFS agrees that some vessels will likely expend effort in other fisheries. Although some pelagic longline fishermen who homeport their vessels in the closed areas have other permits (e.g., coastal migratory pelagics, snapper-grouper, charter vessels), many have only directed or incidental swordfish, shark and tuna permits. Most of the southeastern fisheries require Federal permits, some of which are issued under limited access programs. Limited access permits may not be available, which may limit the ability of displaced pelagic longline fishermen to target other species. Other vessels may move into other activities consistent with their fishing experience (e.g., recreational charter fishing). The dolphin and wahoo fishery resources are not under the direct management jurisdiction of the Secretary of Commerce. However, the Agency agrees that some pelagic longline effort may be directed toward dolphin and wahoo. The South Atlantic Fishery Management Council has prepared a proposed dolphin/wahoo FMP that includes a preferred alternative prohibiting pelagic longline fishing for dolphin and wahoo within the spatial and temporal constraints of closures for the HMS pelagic longline fishery. The FSEIS provides an analysis of potential impacts of alternative fishing activity by displaced HMS pelagic longline vessels.

Analysis of Ecological Benefits of Closures

Comment 1: The DSEIS indicated that the proposed time/area closures would have a huge reduction in bluefin tuna discards, but reducing bluefin tuna bycatch is not listed as an objective of the Agency action.

Response: NMFS disagrees that reduction of bluefin tuna discards was not included as an objective of the proposed Agency action, which had four clear objectives: Maximize the reduction of finfish bycatch (which includes bluefin tuna); minimize the reduction in the target catch of swordfish and other species; ensure the incidental catch of other species remains unchanged or is reduced; and optimize the survival of released animals. Analysis of time/area closure effectiveness used for the proposed rule encompassed all closures for HMS, including the annual northeastern U.S. pelagic longline closure during June developed specifically to reduce bluefin tuna discards that was part of the final rule implementing the HMS FMP. Closures included in the final rule are listed by species and area to clarify the cumulative impacts for each spatial component. Bluefin tuna discards increased by 11 percent when pelagic longline effort was randomly redistributed throughout the operational range of the U.S. Atlantic pelagic longline fishery as a result of the East Florida Coast and Charleston Bump closures; however, when combined with the June closure already in place, the net effect on bluefin tuna is a 39-percent reduction in discards.

Comment 2: The Agency should have considered a more expansive scientific information baseline for evaluation of potential closures, including scientifically peer-reviewed literature prior to the 1995 to 1997 information included in the DSEIS, as well as more updated and/or near real-time data sources (e.g., satellite data).

Response: In preparing the FSEIS, the Agency expanded the data analyses to include logbook information from 1993 to 1998. These data provide further support for the temporal and spatial components of the time/area closures of the final rule. Historical scientific studies describing movement behavior of HMS, as well as oceanographic studies of current and water mass patterns were also reviewed in preparing the FSEIS. Setting closures or other fishing activities based on near real-time satellite information on water or current patterns may be considered in future management actions, particularly in conjunction with the communication capabilities of the VMS systems required for all pelagic longline fishing vessels beginning September 1, 2000. Recent scientific studies on the relationship between billfish discard rates relative to use of live and dead bait on pelagic longline gear were also used.

Comment 3: The evaluation of closed areas should be based on the ratio of catch to bycatch instead of absolute numbers of bycatch.

Response: NMFS agrees that the ratio of catch to bycatch should be used in evaluating which areas to close, but disagrees that the absolute numbers of bycatch should not be considered. In developing the final area closures, NMFS examined, where appropriate, the temporal and spatial variations of the ratio of bycatch to target catch, the absolute numbers of bycatch and target catch, and relative fishing effort. For example, an area that has a high discard to number kept ratio may be indicative of a problem area, depending upon the relative volume of fishing effort that is currently or historically conducted in the area. Conversely, an area that has a relatively high absolute number of discards but a low ratio of discards to number of fish kept would be evaluated based on the relative fishing effort in the area. The analytical methods are fully described in the DSEIS, and clarified, where appropriate, in the FSEIS.

Comment 4: A target bycatch threshold should be developed to allow for a tracking of the success of Agency actions.

Response: NMFS disagrees. The development of the proposed and final rules clearly follows a multispecies management approach, and' as such, it is inappropriate to set target reductions for specific species without considering the impact on the remaining portion of the catch composition. For example, if the time/area closures were simply based on reducing swordfish discards by a set percentage, this could disproportionally increase the level of bycatch, bycatch mortality, and/or incidental catch of other species. The four overarching objectives discussed in the DSEIS and FSEIS guided the Agency throughout the development of the proposed and final actions.

Comment 5: NMFS should investigate the effectiveness of the pelagic longline closure in the Pacific Ocean to evaluate potential impacts of closures along the U.S. Atlantic coast.

Response: NMFS agrees that all similar closures should be evaluated to determine potential biological, social, and economic impacts of final Agency actions. The closure of nearly 1 million square miles of Pacific Ocean near Hawaii to pelagic longline fishing vessels has been in effect since December 23, 1999; therefore, information on the impacts is limited at this time.

Comment 6: Observer data should be used to evaluate accuracy of the logbook reports used in the NMFS time/area analyses.

Response: NMFS agrees that observer coverage is needed to ground-truth information provided in the mandatory logbook program. The Draft Technical Memorandum, included as part of the DSEIS, provides a discussion of the limitations of logbook data and explains the rationale for using these data. The Atlantic pelagic longline fishery has been monitored with about 2 to 5 percent observer coverage, in terms of sets observed since 1992, and is used to ground-truth the mandatory logbook data, and to provide specific biological information (e.g., tagging, obtaining tissue samples for genetic work). The observer information was used in developing the prohibition on the use of live bait.

Comment 7: The analyses of the time/area closures are flawed because of the dependence upon mis-reported information in the mandatory logbooks.

Response: NMFS disagrees that the analyses are flawed. While NMFS recognizes that there are limitations and constraints in the use of logbook information as discussed in the Draft Technical Memorandum and HMS FMP, these data undergo thorough review by NMFS scientists and can be used to identify catch trends and patterns over time. Also, if logbooks under-report bycatch as indicated in public comment, then the benefits of the time/area closures are even greater than predicted in the FSEIS.

Comment 8: Use of percentages in the analyses make it difficult to assess benefits of the time/area closures.

Response: To allow for valid analysis of temporal and spatial variations in closure effectiveness on a suite of target species and bycatch, it was necessary to have a common denominator for all comparisons. The total U.S. Atlantic catch, by year and species, was used for this purpose, and was provided in tabular form in the DSEIS. The percentages provided in the analyses can easily be converted to number by multiplying the percentage value by the appropriate annual total (landings and discards were considered as separate groups). In the FSEIS, NMFS further clarifies the use of percentages, numerical values, and ratios of numbers caught to numbers discarded.

Comment 9: NMFS should not lump all BAYS together in the analysis of the time/area closures. Each tuna species should be separately analyzed, particularly for yellowfin tuna.

Response: NMFS agrees that it is important to separate out the impact of the time/area closures on the various species of the BAYS tuna complex. Atlantic-wide, yellowfin tuna and bigeye tuna represent over 91 percent of the U.S. pelagic longline fleet catch of BAYS tunas (YFT—70.4 percent and bigeye tuna—20.8 percent). In the Gulf of Mexico, the 99.1 percent of the BAYS harvested from the proposed western Gulf closed area consisted of yellowfin tuna; in the final rule closure of DeSoto Canyon, yellowfin make up 98.4 percent of the BAYS complex. The BAYS tunas in the closure of the southeastern U.S. Atlantic coast consist of 89.5 percent yellowfin tuna and 7.5 percent bigeye tuna. The potential changes in landings of yellowfin tuna, bigeye tuna, the aggregate BAYS complex, and bluefin tuna are summarized for each final action under the effort redistribution and no effort redistribution models described in the FSEIS.

Comment 10: NMFS should summarize the impacts of the time/area closures separately for the Gulf of Mexico and southeastern U.S. Atlantic coastal closures.

Response: NMFS agrees. Ecological and economic impacts may be better understood if summarized both separately and in combination, and, to that end, this presentation approach is taken in the FSEIS. Although the DSEIS combined the ecological impacts for the Gulf of Mexico and southeastern U.S. Atlantic coastal closures under the discussion of each alternative, the draft Technical Memorandum provided results of the no effort redistribution and effort redistribution models separately for each closure area.

Comment 11: NMFS should consider incorporating tagging data into the time/area analysis procedures.

Response: NMFS agrees that information from tagging studies of billfish, tunas, sharks, and other species released by recreational and commercial fishermen provides valuable data on the range and movement patterns of these species and, as such were included in the qualitative procedures used to identify general areas for potential closure.

Comment 12: The proposed Agency action is focused only on reducing swordfish discards, and does not consider the impacts on vessels.

Response: NMFS disagrees. The evaluation of the time/area closure fishery management strategy in the DSEIS and FSEIS followed a multi-species approach. Consistent with the objectives, patterns in the discards, bycatch and incidental catches of billfish, sea turtles, bluefin tuna, pelagic and large coastal sharks, and other overfished HMS were used to define time/area closures. The areas selected for closure in the final rule also seek to minimize the target catch of swordfish, tuna, dolphin, and other species and, thus, minimize the economic impacts on vessel owners. The evaluation of the impacts of the closures included all components of the pelagic longline catch, as well as those of dealers within the time/area closure locations.

Mitigation of Economic Impacts

Comment 1: NMFS should provide economic compensation for the displaced vessels and dealers who are negatively impacted from the closed areas (various vessel buyout schemes were suggested ranging from recreational permit fees to having the remaining commercial fishermen compensate those who go out of business; other schemes included employing all displaced longline fishermen in fish hatcheries). While vessel owners can sell their permits and receive some compensation, dealers cannot. NMFS should provide resources for retraining or education of displaced longline fishermen.

Response: NMFS recognizes that the time/area closures will adversely affect many vessels and dealers, and that the ripple effects of the closures will go beyond the immediate community of fishermen, and affect fishing families, associated businesses, and the larger coastal economy. NMFS also recognizes that the Magnuson-Stevens Act requirements to rebuild overfished fisheries and reduce bycatch are going to result in economic hardships—even closure of some businesses. Once the stocks are rebuilt, it may still not be possible for all the affected individuals to make a living because many fisheries are currently overcapitalized. NMFS has made a concerted effort to identify possible sources of economic relief for individuals and businesses affected by the regulatory measures in this rule. Some government agencies, such as the Small Business Administration, the Economic Development Administration, the Farm Credit System, the U.S. Department of Labor's Economic Dislocation and Worker Adjustment Assistance Act, may provide fishing industry participants with loans, training for new jobs, and/or grants for economically stressed communities, and the Fisheries Finance Program could support an industry-sponsored vessel buyback. A summary of the types of buyback programs, loans, and government agencies that may be able to help are listed in section 3 of the FSEIS.

Comment 2: NMFS needs to consider other alternatives that might have fewer and lesser adverse economic impacts.

Response: In developing this final rule, NMFS considered and adopted a variety of options that minimize bycatch and bycatch mortality, achieve the same conservation goals, and mitigate the rule's economic impact. These option's include smaller closed areas and/or shorter closed periods than were proposed. In addition, the final rule substitutes a prohibition on the use of live bait in the Gulf of Mexico for the proposed closed area in the western Gulf. These alternatives are likely to have less of an adverse economic impact on fishermen and communities than the alternatives in the proposed rule.

Comment 3: NMFS received a number of comments regarding permit buyouts, including the following: NMFS should buy out displaced longline vessels; NMFS should not buy out displaced longline vessels; thousands of businesses fail every day and those businesses do not ask tax payers to buy them out; NMFS should destroy any longline vessels that are bought out; and, without a buyout, many companies will go out of business.

Response: This rule does not include a fishing capacity reduction program (buyback program); however, NMFS may implement a buyback program for this fishery if circumstances warrant. Any buyback program will be implemented in accordance with the Magnuson-Stevens Act, NMFS fishing capacity reduction regulations, and other applicable law. Under section 312 of the Magnuson-Stevens Act, NMFS may implement buyback programs that purchase fishing permits from permit holders or, alternatively, it may implement buyback programs that restrict vessels from participating in other fisheries by requiring that they be scrapped or be subject to title restrictions. The buyback method selected will depend on particular circumstances present when such buyback program, if any, is implemented. Furthermore, NMFS has concluded that it does have the authority to initiate and implement buyback programs for fisheries under the direct management authority of the Secretary of Commerce. Regulations implementing section 312, published May 18, 2000 (65 FR 31444), provide that "for a fishery under the direct management authority of the Secretary, NMFS may conduct a program on NMFS' own motion by fulfilling the requirements * * * that reasonably apply to a program not initiated by a request." Because of the significant negative economic impacts expected with this final rule, NMFS has made a concerted effort to identify possible sources of economic relief for individuals and businesses affected by regulatory measures in fishery management. A summary of the types of buyback programs, loans, and government agencies that may be able to help are listed in Section 3 of the FSEIS.

Comment 4: This proposed rule may cause Congress to abandon the legislative buyout that has been under consideration.

Response: NMFS announced in the 1999 HMS FMP that the Agency was committed to reducing bycatch and bycatch mortality, as required in the Magnuson-Stevens Act, and would proceed with rulemaking to address bycatch concerns. NMFS cannot predict what this rulemaking may have on Congressional action.

Comment 5: NMFS should recognize that there are economic and competitive disadvantages to businesses geographically close to the proposed closed areas.

Response: NMFS agrees and is aware of the potentially significant economic impacts to related businesses, not just to fishermen. However, these areas were not chosen with respect to the impacts on a specific region but rather to target "hot spots" for pelagic longline bycatch. Because of the anticipated significant economic impacts, NMFS has selected alternatives that minimize those impacts while still maintaining conservation benefits similar to those in the proposed rule. In the Gulf of Mexico, NMFS chose to prohibit live bait in lieu of the large Western Gulf closure and has also implemented a smaller closed area that focuses on swordfish bycatch reduction. Although this area has a year-round closure, it is also located offshore so that smaller fishing vessels may still be able to fish. Thus, businesses near this closure may not be affected to the same extent as they would be if the area extended to the coast. In addition, as discussed earlier, NMFS has made a concerted effort to identify possible sources of economic relief for individuals and businesses affected by regulatory measures in fishery management.

Comment 6: NMFS should reconsider limiting the capacity of the Atlantic pelagic longline fleet. NMFS should not implement further regulations and instead should monitor the fishery while giving the limited access program a chance to "settle." Limited access was an important first step that has not been given a chance to provide benefits.

Response: NMFS agrees that limiting access to the fishery is an important step. In July 1999, NMFS implemented limited access in the pelagic longline fleet. While it is true that limiting access to this fishery could provide an incentive for fishermen to reduce bycatch because they have an investment in the future of the fishery, NMFS has a mandate under the Magnuson-Stevens Act to minimize bycatch, to the extent practicable. In addition, the limited access program in place now was designed to reduce latent effort, not to reduce fishing effort. As a result, there is still excess capacity in this fishery. For example, of the 450 permit holders who qualified for a directed or incidental swordfish limited access permit, only 208 reported landings in the pelagic logbook in 1998. While other permit holders may be reporting landings in other logbooks, NMFS believes that many permit holders who do not fish regularly can still be bought out by fishermen who may be more active. Therefore, as announced in the HMS FMP and the 2000 SAFE report and in addition to this rule to reduce bycatch and bycatch mortality in the pelagic longline fishery, NMFS continues to monitor the status of this fishery and, if necessary, will work with the APs to consider additional steps to reduce fishing effort.

Comment 7: NMFS should make fishermen pay for an observer instead of VMS.

Response: NMFS agrees that a user fee system for funding observer coverage could be beneficial. However, a VMS program to track vessels in areas where bycatch is a concern has some advantages in that it costs less, is less intrusive, and has some vessel safety benefits. NMFS will continue to examine means of applying user fees in fisheries subject to observer coverage. In the interim, the Atlantic pelagic longline fishery VMS requirement is effective beginning September 1, 2000.

Comment 8: Minimizing bycatch through large area closures will result in greater overall economic benefits for all fishing industry sectors.

Response: NMFS agrees that minimizing bycatch enhances rebuilding of overfished stocks and, over the long term, should increase the economic benefits for all fishing sectors. However, in the short term, large area closures will force many small entities, such as fishermen and dealers, out of business. NMFS has chosen to close the areas that will provide the greatest conservation and economic benefits in both the short and long terms. Because of the jeopardy finding for loggerhead and leatherback sea turtles, NMFS will propose additional measures to reduce the level of turtle takes. This could include a closure of the Grand Banks for the months of September through December, modifications in fishing methods, gear modifications, and increased monitoring activities.

Comment 9: Every effort should be made to mitigate the economic loss to commercial fishermen; however, given the current strong economy, there is ample opportunity for those disadvantaged by the closures to make a financial recovery.

Response: NMFS agrees that the economic loss to the commercial fishermen must be minimized as long as the conservation goals can still be achieved. Fishermen and others who lose their job or go out of business as a result of this rule may be able to relocate to either a different job altogether, or to a different job within the fishing industry. To aid displaced individuals, NMFS identified possible sources of economic relief for individuals and businesses affected by regulatory measures in fishery management. A summary of the types of loans and government agencies that may be able to help are listed in 3 of the FSEIS.

Comment 10: NMFS needs to consider actions to minimize economic impacts associated with moving families to areas that remain open to pelagic longline fishing.

Response: NMFS is aware that some families will need to move as a result of these regulations and that the cost of moving may be high. To examine more fully these impacts, NMFS published a **Federal Register** document (65 FR 24440) on April 26, 2000, asking specifically for comments on the impact of delaying the effective date to provide sufficient time to relocate. The comments received are discussed here. Also, as a result of these concerns, NMFS is delaying implementation of some of these regulations for different lengths of time.

Comment 11: The DeSoto Canyon closure is keyed to reducing swordfish discards and the analysis focuses on the social and economic impacts on the swordfish longline fishermen and their associated fishing communities. Other fisheries and fishing communities are likely to be affected by this closures and should be considered in the analysis.

Response: NMFS agrees that a variety of fisheries and fishing communities should be considered in undertaking efforts to minimize bycatch and bycatch mortality. As this final rule is directed at the activities of only pelagic longline fishermen, the analyses focus on the impacts to the pelagic longline fishery and communities. As NMFS collects additional information on other fisheries (e.g., recreational, bottom longline), NMFS may determine that additional rulemakings are needed to reduce bycatch and bycatch mortality in those fisheries. If NMFS undertakes such rulemakings, it will conduct analyses to determine the impact of those rules.

Comment 12: Many comments were received about the effective date. These comments included the following: NMFS should do the right thing and insist that the closures not be reduced and that they be implemented no later than 30 days after publication of the final rule expected on August 1; The closures must be enacted immediately without any delay; Fishermen and related businesses would need at least one full year prior to implementation to move and resettle into other regions; If NMFS is not going to provide compensation, NMFS needs to delay implementation by at least 6 months to relocate entire businesses, find a new docking facility, relocate staff, find a new church, find new schools for children, and find a new house; The swordfish rebuilding measures implemented last November at ICCAT are risk-prone and have less than a 50-percent chance of rebuilding in 10 years. Given this, NMFS needs to implement these closures immediately to reduce pressure on the stock and increase the chance of sticking to the rebuilding schedule.

Response: NMFS agrees that fishermen and related businesses will need time to relocate in response to the closures in this final rule. NMFS disagrees that even a short delay of these regulations would hinder rebuilding or cause irreparable harm to the resource. Any dead swordfish discards that happen between the publication of the final rule and implementation will be taken off the U.S. swordfish dead discard allowance included in the rebuilding plan. Thus, NMFS has decided to delay the implementation of the closures: 90 days for the DeSoto Canyon area (November 1, 2000) and 180 days (February 1, 2001) for the East Florida Coast closure, which coincides with the annual date that the seasonal Charleston Bump closure begins. Thus, the closures in the Southeast Atlantic would begin at the same time, making the regulations less confusing and allow fishermen and related businesses approximately 6 months to relocate if they so decide. The implementation of the DeSoto Canyon closure is not delayed for as long, because this closure is not as large an area as is the one the Atlantic and it is further offshore. Thus, fishermen who have fished pelagic longlines in the DeSoto Canyon area may be able to find alternative fishing sites within the Gulf of Mexico without having to relocate the home port of the vessel, and less time is necessary to prepare.

Comment 13: Unless NMFS undertook a detailed analysis of the behavior of longline fishermen and processing industry to investigate the impacts of delaying the effective date (costs, vessel's choice, etc.), any decision to delay implementation would be essentially arbitrary.

Response: NMFS disagrees. NMFS believes that commercial fishermen, dealers, and processors provided enough information in their comments on how long and why delayed implementation is needed for NMFS to make an informed decision.

Comment 14: NMFS asked the wrong question in regard to delayed implementation. The correct question is what approach would produce the highest net economic benefits, not what are the short-term gains.

Response: NMFS believes that asking the commercial fishing industry why they need delayed implementation and how long a delay it should be provides information needed for NMFS to decide the optimal approach. NMFS does not believe the highest net economic benefit would be achieved if all of the commercial fishermen were asked to move within 30 days. Instead, NMFS believes it could be more beneficial to the fishermen and the consumer if commercial industries were given time to relocate while still giving them time to fish during this season.

Comment 15: NMFS' entire approach on this rulemaking is fundamentally flawed because the Agency does not have the ability nor the authority to initiate an effort buyout program for Atlantic HMS.

Response: NMFS disagrees. NMFS announced in the HMS FMP that it was committed to reducing bycatch and bycatch mortality and would initiate rulemaking for time/area closures based on comments received during that rulemaking. NMFS has previously concluded (65 FR 31444, May 18, 2000) that section 312 of the Magnuson-Stevens Act provides authorization for the Atlantic HMS buyout "on NMFS' own motion by fulfilling the requirements * * * that reasonably apply to a program not initiated by a request." While NMFS recognizes that a buyout program may provide some compensation for vessel owners, a buyout program would not provide any compensation for other business owners. Instead, NMFS has explored other ways of minimizing economic impacts including smaller time/area closures, a prohibition on live bait, and delayed implementation.

Comment 16: Closing the DeSoto Canyon in addition to the western Gulf of Mexico would only increase any social and economic impacts to vessels and their support and supplier community-based infrastructures.

Response: NMFS agrees that closing both the proposed Gulf B area and the DeSoto Canyon would have even greater economic impacts than closing either one alone. In addition, preliminary analyses indicate that prohibiting live bait may have similar conservation benefits for billfish as closing the western Gulf of Mexico. For this reason, NMFS decided to close the DeSoto Canyon to minimize bycatch, particularly small swordfish, and prohibit live bait to minimize billfish bycatch.

Comment 17: The Vietnamese Americans who have settled in states bordering the Gulf of Mexico are especially vulnerable to social and cultural disruption since they are dependent upon commercial fishing as a traditional livelihood that provides stability.

Response: NMFS agrees that the Vietnamese American fishermen may be affected by the social and economic impacts of these regulations. However, NMFS mitigated impacts to the fishermen in these final regulations by deciding against closing the Western Gulf of Mexico and choosing to prohibit live bait. Thus, although these fishermen may need to alter the current method of fishing, they should not need to relocate.

Comment 18: NMFS failed to factor in the economic benefits from decreased swordfish discards which would be added to the United States' total allowable landings under the ICCAT swordfish rebuilding program if swordfish discards are reduced below ICCAT targets.

Response: NMFS disagrees that the Agency failed to factor in the economic benefits from decreased swordfish discards in relation to the 1999 ICCAT swordfish rebuilding program. NMFS recognizes that reducing dead discards is crucial in order for U.S. fishermen to continue to land the full swordfish quota allocated to the United States (see section 7 of the FSEIS). For a full analysis of the social, economic, and conservation benefits of the 1999 swordfish rebuilding program, see the preamble to the proposed rule (64 FR 33519, December 15, 1999).

Comment 19: Adding the DeSoto Canyon area closure to the Western Gulf of Mexico closure still would not save that many blue and white marlins. NMFS must weigh that against the economic devastation the closures will cause.

Response: NMFS agrees that economic impacts must be considered. However, NMFS does not believe that Agency needs to "balance" the economic impacts against the conservation benefits. The Magnuson-Stevens Act mandates NMFS to rebuild overfished stocks, prevent overfishing, and minimize bycatch and bycatch mortality for all stocks, not just billfish. Recently, the U.S. Court of Appeals for the District of Columbia Circuit ruled that the Magnuson-Stevens Act requires NMFS to give priority to conservation benefits and to consider adverse economic impacts if two alternatives achieve the same conservation benefits. NMFS recognizes that some regulations that meet this mandate will cause economic harm and has provided a summary of alternatives that may help affected fishermen and communities in Section 3 of the FSEIS. In addition, NMFS has analyzed many different areas and seasons in order to determine whether time/area closures will be effective at meeting the goals of this FSEIS, which time/area closures are the most effective, and which time/area closures are effective but have the least economic impacts. NMFS believes that the management measures chosen will meet all of the goals of this action and minimize the economic impacts, to the extent practicable.

Social and Economic Analyses

Comment 1: NMFS received comments on the extent of the impacts of the proposed closed areas on the fishing fleet, including: One-third of the fleet would go out of business; hundreds of coastal communities would be negatively impacted; many fishermen would need to relocate; and the closures fall disproportionately on minority and low-income communities.

Response: Comments received on the proposed rule helped NMFS to develop final regulations that would minimize the impacts of the potential closed areas while yielding similar (or better) conservation benefits. For example, many comments suggested that NMFS consider the DeSoto Canyon area both instead of and in addition to the proposed western Gulf closure (area Gulf B). NMFS found that the proposed Gulf B closure could reduce the total gross revenues from the entire pelagic longline fleet by 6.4 percent while the DeSoto Canyon closure might reduce the total gross revenues from the entire fleet by 2.2 percent. In addition, while analyses indicate the Gulf B closure could increase swordfish discards by 3.9 percent, the DeSoto Canyon closure could decrease swordfish discards by 4.1 percent. In the South Atlantic, the proposed closure could reduce swordfish discards by 27.7 percent and reduce total gross revenues to the fleet by 19.2 percent while the final closure could reduce swordfish discards by 27.3 percent and reduce total gross revenues for the fleet by only 9.0 percent.

Comment 2: The closures will have almost no adverse impact on any group including commercial longline fishermen, as shown by NMFS' analyses. The economic and biological benefits of these zone closures far outstrip any commercial interests.

Response: NMFS disagrees that this rule will not have any adverse impacts. NMFS' analyses, as supported by numerous comments received, indicate that many fishermen, dealers, and related industries could go out of business as a result of this rule. In addition, this rule will have ripple effects throughout the entire fishing community, commercial and recreational, and into other jobs and industries such as mechanics, engineers, and fishing supply markets. The analyses conducted for this rule indicate that the closed areas and times will have positive biological impacts and significant negative economic impacts for some businesses. NMFS has tried to achieve the conservation goal of minimizing bycatch while minimizing the economic impacts.

Comment 3: Restrictions on commercial fishermen have economic impact not just on dealers and wholesalers but also on local grocery stores, welders, truckers, electrical technicians, mechanics, food banks, and other people in all communities.

Response: NMFS agrees that this rule will have indirect impacts beyond the immediate fishing industry. However, non-fishing industries are already dependent on a range of businesses and industries. Although some initial adverse impacts may occur, these indirectly affected industries should be able to adjust through increased business in other non-fishing sectors.

Comment 4: The economics of the pelagic longline fishery are integrated with other fisheries from a dealer's perspective.

Response: NMFS agrees. In both the initial and final regulatory flexibility analyses and the regulatory impact review, NMFS analyzed the impact of this rule on dealers. NMFS stated that, as a result of this rule, some dealers may lose a substantial amount of fish previously supplied from fishermen who have been issued a directed or incidental swordfish permit. However, the actual amount of gross revenues dealers lose will depend on the type of fish and the amount of fish dealers can obtain from other fishermen and other fisheries. Although NMFS believes this regulation will have a significant economic impact on HMS dealers who are located in coastal ports adjacent to the closed areas, most dealers are not as specialized as fishermen are, and they may be in a position to develop alternative business opportunities (e.g., purchases of other domestic fish products, import/export, value-added processing).

Comment 5: Closing the DeSoto canyon area will force some businesses to close.

Response: NMFS agrees; assuming no effort redistribution, the economic analyses for the DeSoto Canyon closure indicate that approximately eight vessels (4 percent) would lose half of their gross revenues and seven dealers who received fish from limited access permit holders (5.6 percent) would lose business volume equal to about half of the fish now handled. However, the economic impacts of the DeSoto Canyon are smaller than the anticipated economic impacts of the proposed Gulf B closure (12 vessels and 3 dealers losing half of their business). In addition, the closure of the DeSoto Canyon area has greater biological benefits for undersized swordfish than the proposed Gulf B closure. Thus, although some vessels may still go out of business as a result of this closure, the DeSoto Canyon area closure minimizes the economic impacts for most individuals. Also, the DeSoto Canyon area is located offshore, so smaller fishing vessels may still be able to fish adjacent open areas without relocating. This is not true of the Gulf B closure, which would have forced small vessels owners who wished to continue to fish to relocate.

Comment 6: With the closures, pelagic longline fishermen are likely to move into other areas. Many existing fishermen and countless others working in those areas will be devastated by the concentration of boats. NMFS has failed to analyze the impact of displaced fishermen on communities in the open areas.

Response: NMFS agrees that with this rule, many pelagic longline fishermen are likely to move into other areas. While this rule may increase user conflicts in some areas, NMFS feels that this relocation will increase the social and economic benefits in many communities by increasing the level of economic activity in the area, including employment. It is likely that some dealers and marinas in the open areas or along the edges of the closed areas will see an increase in business as fishermen move. Other support businesses near the open areas will likely be similarly influenced. Also, communities in the closed areas may have some economic relief if they transfer effort from commercial fishing to recreational fishing. This may have the added benefits of lessening user conflicts in other areas and enhancing the recreational experience. In addition, due to the shorter Charleston Bump closure and the smaller DeSoto Canyon closure further off the coast, some fishermen in those areas may decide not to relocate.

Comment 7: Even though the quantity of swordfish available to consumers may not decrease due to imports, the quality of fresh swordfish will. Fresh fish should be available to everyone, not just to those who have the economic means to get it themselves or live across a line on a map. Even with a buyout, the level of economic activity will be diminished and consumers will lose access to the freshest product.

Response: NMFS agrees that it is advantageous when fresh fish is available to everyone, and future generations are considered in efforts to develop sustainable fisheries. For that reason, NMFS is working to rebuild overfished fisheries and to reduce bycatch and bycatch mortality while minimizing the economic impacts with methods such as time/area closures and gear modifications, without banning pelagic longline gear. These methods will allow the fishery to continue to provide as much fresh fish as possible.

Comment 8: This proposed rule should be considered as significant under Executive Order (E.O.) 12866.

Response: Both NMFS and the Office of Management and Budget(OMB) concluded that this rule does not meet the criteria for classification as "significant" for purposes of E.O. 12866 review. However, NMFS has prepared initial and final regulatory flexibility analyses as required by the Regulatory Flexibility Act (RFA). It should be noted that a rule could have a significant economic impact for purposes of the RFA without the rule being considered significant under the criteria of E.O. 12866.

Comment 9: The costs of the time/area closures have been overestimated while the benefits have been underestimated. NMFS has overestimated the man-hour cost of circle hooks. Many economic benefits have been underestimated or omitted from the analysis of the economic impact of the proposed closures.

Response: NMFS agrees that some of the costs have been overestimated and some of the benefits have been underestimated. In both the initial and final regulatory flexibility analyses and the regulatory impact review, NMFS estimated the maximum economic impact of each alternative and understated many of the benefits. This is different than the analyses NMFS conducted to analyze the conservation impacts. Those analyses estimated the conservation impacts under no effort redistribution and effort redistribution models. The no effort redistribution model allowed NMFS to estimate the maximum biological benefits. The effort redistribution model allowed NMFS to estimate the minimum biological benefits. For the economic analyses, NMFS assumed no effort redistribution. This model allowed NMFS to estimate the maximum economic impact of the final regulations. If NMFS had assumed effort redistribution, the economic analyses would have indicated no change from the status quo or, perhaps, an increase in gross revenues (see section 7 of the FSEIS). While NMFS believes that the actual costs and benefits of the regulations will be somewhere between status quo and the costs described in the analyses, NMFS used the estimates from the most conservative models to make its decisions. This means that, for the biological estimates, NMFS used the effort redistribution model, and for the economic estimates, NMFS used the no-effort redistribution model. However, NMFS believes that many fishermen and related industries will adapt to the regulations and will continue to work in either the HMS fisheries or in others. However, because NMFS cannot predict the behavior of individuals, NMFS cannot estimate the exact cost or benefit any regulation will have. In addition, NMFS recognizes that the ripple effect of the closures will impact other business that provide goods and services to the pelagic longline fishery (e.g., tackle manufactures and suppliers; dock-side services, including ice, bait, fuel, dockage, labor; and vessel manufacture and repair). Although the final regulatory flexibility analysis and regulatory impact review provide a more thorough discussion of economic factors associated with the final Agency actions, NMFS does not have the necessary detailed economic information to make a quantitative proposed rule and supplemental information meet all the requirements of the RFA. NMFS recognizes that the final regulations will have large impacts on many fishing families and communities but notes that the RFA does not preclude an Agency from implementing regulations having such impacts. NMFS chose final actions that meet the conservation goals and minimized the economic impacts, to the extent practicable.

Comment 18: Regional market gluts, especially associated with bad weather events and/or quota closures, should be expected to reduce ex-vessel prices.

Response: NMFS agrees that the time/area closures may have some impact on ex-vessel price particularly if closures or bad weather keep commercial fishermen from fishing in the open areas. However, given the extent of the remaining open areas in the Gulf and along the Atlantic coast, NMFS does not believe that the time/area closures would change the ex-vessel price significantly or cause significant market gluts.

Comment 19: NMFS should omit dealers who only import foreign fish from the analysis; in reality, domestic dealers who primarily offload and purchase ''trip-fish'' are few and far between and those in the closed areas will be impacted far greater than NMFS has analyzed.

Response: NMFS agrees that dealers who purchase most of their fish from vessels that now fish the designated closed areas will be greatly affected by these regulations. However, neither the IRFA nor FRFA considered imported fish. Instead, these analyses only considered fish sold to dealers by swordfish limited access permit holders.

Comment 20: Pelagic longline vessels need to gross at least $500,000 year to be profitable; NMFS' estimate for gross ex-vessel revenues is too low.

Response: NMFS disagrees that the estimate for average ex-vessel gross revenues used in the IRFA and FRFA is too low. A number of studies performed on the voluntary economic add-on of the pelagic logbook indicate that many fishermen are operating on the margin and are not profitable. One study found that the average gross revenue per vessel was $118,804. This is similar to the average of $113,173 used in the IRFA and $137,126 used in the FRFA. Thus, while some vessels may gross over $500,000, the majority of vessels do not.

Changes From the Proposed Rule

For reasons explained in the responses to comments listed in the preceding text, NMFS has modified the proposed rule to balance bycatch reduction objectives with the need to mitigate economic impacts. The proposed western Gulf of Mexico closure has been changed to a Gulf-wide prohibition on the use of live bait with pelagic longline gear. Also, the year-round DeSoto Canyon closed area has been added to further reduce dead discards of small swordfish. The proposed southeastern United States closed area has been split into northern and southern components: a seasonal (February 1– April 30) closure for the Charleston Bump area and a year-round closure for the Florida East Coast area.

To facilitate enforcement, several new definitions and prohibitions were added, and the proposed descriptions of fishing gear and the conditions for transit of the closed areas were revised. These revisions prohibit fishing activity of any type, regardless of gear actually deployed or target species, when a vessel issued an HMS permit is in a closed area with pelagic longline gear on board. Additionally, this final rule establishes a rebuttable presumption that fish on board a vessel in a closed area were taken in the closed area with a pelagic longline if that gear is on board. This imposes a burden on the vessel operator to demonstrate that such fish were taken outside the closed area (e.g., logbook entries, VMS signature).

Conclusions

In this final rule, NMFS prohibits pelagic longline fishing in areas with relatively higher bycatch rates because this alternative would best address the conservation and management objectives embodied in the FMP as required by the Magnuson-Stevens Act and ICCAT recommendations. Under the effort redistribution model, the final time/area closures, in conjunction with the live bait prohibition, are expected to reduce swordfish discards by 31 percent and sailfish discards by 29 percent; blue marlin and white marlin discards could increase by 3 percent and 7 percent, respectively. The final action time/area closures in the DeSoto Canyon, East Florida Coast and Charleston Bump could reduce the number of swordfish kept by 13 percent and the number of dolphin kept by 18 percent, while BAYS tunas landings would increase by nearly 10 percent.

The final area closures, together with the ban on live bait longlining in the Gulf of Mexico, appropriately meet the objectives of the Billfish and HMS FMPs and have the greatest likelihood of reducing bycatch while minimizing, to the extent possible, adverse impacts on fishing revenues and costs. Should future research indicate that practicable gear modifications could further reduce bycatch of managed HMS and/or protected resources, NMFS will consider those gear modifications in conjunction with, or as an alternative to, time-area closures. In addition, NMFS will address turtle bycatch in the pelagic longline fishery in a separate rulemaking (see the following ESA discussion). Future regulatory measures to reduce sea turtle bycatch may involve additional area closures and/or further modifications to fishing gear and methods in defined areas of high interaction rates.

NMFS notes that there are similarities and differences between the time-area closures for pelagic longline gear contained in this final rule and those contained in legislation pending before Congress. Should any of the Congressional bills become law, NMFS will modify the measures contained in this final rule as necessary.

Compliance Guide

Under the Small Business Regulatory Enforcement Fairness Act of 1996, Federal Agencies are required to provide small business entities with a plain-language summary of how to comply with new regulations. Copies of the compliance guide for this final rule are available from Rebecca Lent (see **ADDRESSES**). To facilitate distribution, the compliance guide is also included in this document:

Q1: I am a recreational fisherman. Will these regulations affect me?

A: No. These regulations only affect commercial fishermen who use pelagic longline gear in the Atlantic ocean and have a Federal permit for Atlantic HMS.

Q2: I use pelagic longline gear. Will these regulations affect me?

A: Yes, if you have a Federal permit for Atlantic HMS. These regulations will prohibit you from fishing with pelagic longline gear in certain areas and times and from using live bait in the Gulf of Mexico. The Gulf of Mexico is the area of the U.S. EEZ west of 83° W. longitude as defined in 50 CFR 600.105 (c).

Q3: What is longline gear?

A: A longline is fishing gear that is set horizontally, either anchored, floating, or attached to a vessel, and that consists of a mainline with three or more leaders (gangions) and hooks, whether retrieved by hand or mechanical means.

Q4: What is pelagic longline gear?

A: Pelagic longline gear is defined as a longline that is suspended by floats in the water column and that is not fixed to or in contact with the ocean bottom. Your vessel has pelagic longline on board when:

1. A power-operated longline hauler,
2. A mainline,
3. High-flyers,

4. Floats capable of supporting the mainline, and

5. Leaders (gangions) with hooks are on board. Removal from the vessel of any one of these five elements constitutes removal of pelagic longline gear.

Q5: What are the areas where I can't fish using pelagic longline gear?

A: As of November 1, 2000, you will not be able to fish at any time using pelagic longline gear in the DeSoto Canyon area. This area, composed of two squares offshore of the west coast of Florida, is defined as the area within the following coordinates: 30°00' N. lat., 88°00' W. long.; 30°00' N. lat., 86°00' W. long.; 28°00' N. lat., 86°00' W. long.; 28°00' N. lat., 84°00' W. long.; 26°00' N. lat., 84°00' W. long.; 26°00' N. lat., 86°00' W. long.; 28°00' N. lat., 86°00' W. long.; 28°00' N. lat., 88°00' W. long.; 30°00' N. lat., 88°00' W. long.

As of February 1, 2001, you will not be able to fish at any time using pelagic longline gear in the East Florida Coast area. This area, located along the east coast of Florida through Georgia, is defined as the seaward area within the following coordinates: starting at 31°00' N. lat. near Jekyll Island, Georgia, and proceeding due east to 31°00' N. lat., 78°00' W. long.; 28°17' N. lat., 79°00' W. long.; then proceeding along the boundary of the Economic Exclusive Zone (EEZ) to 24°00' N. lat., 79°30' W. long.; then connecting by straight lines the following coordinates in the order stated: 24°00' N. lat., 79°30' W. long.; 24°00' N. lat., 81°00' W. long.; 24°00' N. lat., 81°47' W. long.; then proceeding due north to intersect the coast at 81°47' W. long. near Key West, Florida.

Also, as of February 1, 2001, you will not be able to fish using pelagic longline gear from February through April each year in the Charleston Bump area. This area, located off of North Carolina, is defined as 34°00' N. lat. near Wilmington Beach, North Carolina, and proceeding due east to connect by straight lines the following coordinates: 34°00' N. lat., 76°00' W. long.; 31°00' N. lat., 76°00' W. long.; then proceeding due west to intersect the coast at 31°00' N. lat. near Jekyll Island, Georgia.

Q6: Are all three areas closed year-round?

A: No. The Charleston Bump area is closed only February 1 through April 30 of each year. The other two areas, DeSoto Canyon and East Florida Coast, are closed year-round.

Q7: Are there any gear or fishing method restrictions in this rule?

A: Yes. As of September 1, 2000, in the Gulf of Mexico, pelagic longline fishermen are not allowed to use live bait. Setting up a live well or maintaining live baitfish on board is prohibited. You may not have a tank or well attached to an aeration or water circulation device or have live baitfish if a pelagic longline is on board.

Q8: I am a recreational fisherman. Can I use live bait?

A: Yes. These regulations do not affect recreational fishermen.

Q9: I am a commercial fisherman but I don't use pelagic longline. Will these regulations affect me?

A: As long as you do not have a pelagic longline on board your vessel, you will be able to fish in the closed areas. See question number 4 above for an explanation of the five elements of pelagic longline gear.

Q10: I use pelagic longline gear but do not have a limited access permit to fish for highly migratory species. Will these regulations affect me?

A: These closed areas and gear restrictions apply only to commercial fishermen who hold Federal permits for Atlantic HMS. While unpermitted vessels may fish for other species with pelagic longline gear in these areas, no tunas, swordfish, billfish, or sharks may be retained on board those vessels. However, NMFS is working with the Regional Councils to ensure consistency between regulations for all pelagic longline fisheries.

Q11: Will I need to buy a vessel monitoring system (VMS)?

A: If you are a commercial fisherman with Federal permits for Atlantic HMS and you have pelagic longline gear on board, you will need to have a VMS operational by September 1, 2000.

Q12: Can I transit the closed areas or will I need to go around them?

A: If you have pelagic longline gear on board and possess a Federal Atlantic HMS permit, you will be allowed to transit the area if your vessel has a working VMS unit, but you will not be allowed to fish with any gear type. If you have pelagic longline gear on board, it is assumed that any fish on board were caught with pelagic longline in the closed area and you will have to demonstrate that the fish were harvested outside the closed area. If you do not have pelagic longline on board, you may fish in the area.

Q13: Is there a vessel buyback program associated with this rule?

A: No. This rule does not have a buyback program associated with it. Legislation pending before Congress may address vessel buybacks.

Q14: I have the Federal swordfish, shark, and tuna limited access permits. If I decide to leave the pelagic longline fishery, can I sell my permits?

A: Yes. You can sell your limited access permits individually, as a group, with the vessel, or without the vessel. If you have directed permits, upgrading restrictions for horsepower, length overall, and net and gross tonnage apply. For more information on transferring or renewing limited access permits, please contact the NOAA Fisheries Southeast region permit office in St. Petersburg, FL, at (727) 570–5326.

Classification

This final rule is published under the authority of the Magnuson-Stevens Act, 16 U.S.C. 1801 *et seq.*, and ATCA, 16 U.S.C. 971 *et seq.*

NMFS prepared an initial regulatory flexibility analysis for the proposed rule. Based on comments received on the proposed rule and on the IRFA (see Comments and Responses section), NMFS has amended the final actions and has revised the regulatory flexibility analysis accordingly. The final regulatory flexibility analysis FRFA assumes that fishermen, during the time they would otherwise be pelagic longline fishing in the designated areas would instead (1) make longline sets in other areas, (2) participate in other commercial fisheries, or (3) exit commercial fishing. As of March 23, 2000, 450 vessel owners had been issued for limited access permits for swordfish, sharks, and the Atlantic tunas Longline category. With these three permits, these 450 fishermen may use a pelagic longline to target Atlantic swordfish (if they have a directed swordfish permit), Atlantic tunas, or Atlantic sharks (if they have a directed shark permit). If they have an incidental swordfish or incidental shark permit, these fishermen could still target Atlantic tunas. Thus, the number of small entities directly affected by this regulation consists of at least these 450 fishermen. In addition, other sectors of the commercial fishery might be affected by this regulation, including dealers, processors, bait houses, and hook manufacturers. Using the weighout slips submitted by fishermen reporting in the pelagic longline logbook, NMFS estimates that 125 dealers received fish in 1998 from the 450 fishermen who qualified under the limited access program. NMFS also received comments that the businesses associated with the recreational and charter/headboat sectors of the HMS fisheries may also experience economic impacts as a result of the commercial fishing effort displacement which would result from the time/area closures. On balance, though, these impacts are likely to be positive as gear conflicts will be reduced in some areas and the availability of target species will increase for the recreational sector.

Under this final action, a decrease in gross revenues will result for some proportion of the affected small entities in the commercial fishing sector. Under the final time/area closure actions, NMFS estimates that, assuming the worst case scenario, the average annual gross revenues per permit holder could decrease by nearly 5 percent to about $130,000. Additionally, NMFS estimates that under the final closure actions approximately 43 percent of the vessels that reported landings in 1998 will experience at least a 5-percent decrease in gross revenues and approximately 14 percent of the vessels will experience at least a 50-percent decrease in gross revenues (i.e., be forced out of business). The final rule closures will also have an economic impact on dealers. About 15 percent of the permitted dealers could experience at least a 5-percent reduction in the amount of fish handled due to the DeSoto Canyon area closure, while 28 percent could experience at least five percent reduction in the amount of fish handled due to the Charleston Bump and East Florida Coast closures. However, to the extent that landings of HMS are likely to increase in other areas, gains will accrue to certain other vessel operators and dealers.

Based on comments received on the proposed rule and the IRFA, NMFS has adopted a ban on live bait sets in lieu of the western Gulf of Mexico closed area. While a prohibition on live bait may reduce the landings of some pelagic longline fishermen, particularly yellowfin tuna landings, it is not likely that this final action will have a large impact on the gross revenues of any permit holder. More likely, this final action may have an impact on the net revenues of some permit holders since it will change the method of fishing. Requiring the use of frozen bait might increase costs by up to 22 percent for fishermen who currently use live bait. However, the use of dead bait might decrease the time at sea (since a number of days are used up fishing for live bait) and a decrease in the time spent at sea might decrease the cost of fuel, groceries, or the costs associated with catching the bait and keeping it alive. Thus, even though fishermen might need to spend additional money up front in order to leave for a fishing trip, this alternative might be beneficial if more sea time is available to fish for target species. In any event, the economic impacts of a live bait prohibition are expected to be less significant than under the proposed closure.

The alternatives considered include the status quo, gear modifications, and a ban on pelagic longline fishing by U.S. vessels in the Atlantic Ocean. Although the status quo and gear modification alternatives might have lesser economic impacts on participants in the pelagic longline fishery, those alternatives either do not reduce bycatch to the extent that NMFS expects to be achieved by the time-area closures or present enforcement difficulties. While a complete ban on longline fishing would reduce bycatch to a greater extent than the time-area closures, the lost value of commercial seafood products and the adverse impacts on fishery participants and fishing communities would impose greater costs than the final action.

In addition to changes from the proposed rule, NMFS has decided to delay implementation of some of the final regulations to help mitigate some of the economic impacts fishermen may experience as a result of the time/area closures and to give fishermen and related industries a chance to relocate both business interests and families. The RIR/FRFA provides further discussion of the economic effects of the final actions and all the alternatives considered.

This final action will not impose any additional reporting or recordkeeping requirements on vessel operators or dealers. Vessel logbooks, dealer reports, observer notification, and VMS requirements applicable to the HMS fisheries are all currently approved by the Office of Management and Budget under existing regulations.

In preparing the draft HMS FMP and Billfish Amendment, NMFS reinitiated formal consultation for all Highly Migratory Species commercial fisheries on May 12, 1998, under section 7 of the ESA. In a BO issued on April 23, 1999, NMFS concluded that operation of the Atlantic pelagic longline fishery may adversely affect, but is not likely to jeopardize, the continued existence of any endangered or threatened species under NMFS' jurisdiction. Certain provisions of the BO were incorporated into the final rule that implemented the FMPs and consolidated the HMS regulations (e.g., moving after encounters and limiting the mainline length). Other provisions of the BO required non-regulatory programmatic actions (e.g., research and monitoring).

The Incidental Take Statement (ITS) of the April 23, 1999, BO authorized the following levels of incidental take in the pelagic longline fisheries: 690 leatherback sea turtles (*Dermochelys coriacea*), entangled or hooked (annual estimated number) of which no more than 11 are observed hooked by ingestion or moribund when released; 1541 loggerhead sea turtles (*Caretta caretta*) entangled or hooked (annual estimated number) of which no more than 23 may be hooked by ingestion or observed moribund when released.

Observed take levels documented in 1999 indicate that, of all the turtles taken, up to 50 loggerheads and 19 leatherbacks were observed "hooked by ingestion" or moribund upon release. However, only about 3 percent observer coverage was obtained and the anticipated take levels were based on 5 percent observer coverage. Thus, the observed levels of take would likely have been considerably higher had the required 5 percent coverage level been achieved. If the target observer coverage level had been achieved, NMFS preliminarily projects that up to 83 loggerheads and 32 leatherbacks would have been observed "hooked by ingestion" or moribund in 1999.

On November 19, 1999, NMFS reinitiated consultation under Section 7 of the ESA because observed take of loggerhead sea turtles by the Atlantic pelagic longline fishery had exceeded levels anticipated in the ITS. The consultation included this pelagic longline management rulemaking because the time/area closures, if implemented, could affect the overall interaction rates with sea turtles depending on fishermen's responses in terms of shifting pelagic longline effort or fishing for other species with other gear. The consultation also addressed the shark drift gillnet fishery and the Atlantic tunas purse seine fisheries; however, the following discussion addresses only issues in the BO that apply specifically to the pelagic longline fishery which is the subject of this final rule.

After reviewing the current status of the northern right whale, the humpback, fin and sperm whales, and leatherback, loggerhead, green, hawksbill, and Kemp's ridley sea turtles, the environmental baseline for the action area, the effects of implementation of the proposed Amendment to the Atlantic HMS FMP, the record of compliance with requirements of previous BOs on HMS fisheries, and probable cumulative effects, it is NMFS' BO that continued operation of the Atlantic pelagic longline fishery is likely to jeopardize the continued existence of loggerhead and leatherback sea turtles.

According to the BO, to avoid the likelihood of jeopardizing the continued existence of loggerhead and leatherback sea turtles, NMFS must implement fishery management measures to reduce the number of these turtles that are incidentally captured, injured, killed by gear associated with federally-managed fisheries by at least 75 percent from current levels; that is, a reduction in the number of loggerhead and leatherback sea turtles captured, injured, or killed compared with a running average of the number captured, injured, or killed during the period 1993 to 1999. The reduction can be accomplished directly by gear modifications or it can be accomplished indirectly by changing the method by which gear is deployed.

Indirect modifications could include managing fisheries that use harmful gear over time and space to eliminate the likelihood of interactions between loggerhead sea turtles and gear (proportional to the threat posed by specific gear); managing fisheries to eliminate the likelihood that loggerhead sea turtles captured by gear would drown before they can be released (such as keeping soak times to less than 30 to 45 minutes); excluding gear from areas that, based on available data, appear to be important for loggerhead sea turtles; or, any combination of these changes that reduce the number of loggerhead sea turtles that are incidentally captured, injured, and killed by gear associated with federally-managed fisheries by at least 75 percent from current levels.

The BO identified the Reasonable and Prudent Alternatives (RPAs) necessary to avoid jeopardy, and listed the Reasonable and Prudent Measures (RPMs) and Terms and Conditions (TCs) necessary to authorized continued takes. According to the BO, if NMFS cannot develop and implement direct or indirect management measures that reduce the number of loggerhead sea turtles that are incidentally captured, injured, and killed by gear associated with federally managed fisheries by at least 75 percent from current levels, the following RPAs must be implemented: modifications in fishing gear or method (e.g., requirement for corrodible hooks or limiting fishing activity to certain temperature and time of day regimes); or exclusion zones (e.g., temporally and spatially restricting pelagic longline effort in the Grand Banks area); and enhanced monitoring.

Section 9 of ESA and Federal regulations issued pursuant to section 4(d) of ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under sections 7(b)(4) and 7(o)(2) of the ESA, taking that is incidental to and not intended as part of the Agency action is not a prohibited taking, provided that such taking is in compliance with the RPMs and TCs of the ITS. Section 7(b)(4)(c) of the ESA specifies that in order to provide an ITS for an endangered or threatened species of marine mammal, the taking must be authorized under section 101(a)(5) of the Marine Mammal Protection Act of 1972 (MMPA). Since no incidental take has been authorized under section 101(a)(5) of the MMPA, no statement on incidental take of endangered whales is provided and no take is authorized.

Regarding anticipated incidental take of sea turtles in the pelagic longline fishery for swordfish, tunas, and sharks, it is hoped that this final rule to reduce bycatch in the pelagic longline fishery, which may slightly increase take levels of sea turtles, will be more than offset by the additional requirements to implement the RPMs according to the terms and conditions of the ITS. The BO states that the RPMs that are necessary and appropriate to minimize take of listed species include an effective monitoring and reporting system to document take, educating fishermen to reduce the potential for serious injury or mortality of hooked turtles, and assessments of current data to look for trends that may indicate management measures to reduce the number of protected species interactions.

In order to be exempt from the take prohibitions of section 9 of ESA, the June 30, 2000, BO requires NMFS to comply with certain terms and conditions which would implement the RPMs described earlier and outline required reporting/monitoring requirements. The terms and conditions are non-discretionary and require: at-sea observer coverage; information collection on the condition of sea turtles and marine mammals when released; the presence and use of dipnets and cutting devices on all longline vessels; review of turtle bycatch and release mortality studies; financial support for genetic research to identify sea turtle subpopulations; examination of the influence of gear and fishing technique modifications such as light sticks and length of mainline on protected species interaction rates.

NMFS will address the requirements of the BO in a subsequent rulemaking and by certain non-regulatory actions. In the interim, this final rule will not result in any irreversible and irretrievable commitment of resources that will have the effect of foreclosing the formulation or implementation of any RPAs necessary to reduce impacts on protected species.

This final rule has been determined to be not significant for purposes of E.O. 12866.

List of Subjects in 50 CFR Part 635

Fisheries, Fishing, Fishing vessels, Foreign relations, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Statistics, Treaties.

Dated: July 26, 2000.

Penelope D. Dalton,

Assistant Administrator for Fisheries, National Marine Fisheries Service.

For the reasons set out in the preamble, 50 CFR part 635, is amended as follows:

PART 635—ATLANTIC HIGHLY MIGRATORY SPECIES

1. The authority citation for part 635 continues to read as follows:

Authority: 16 U.S.C. 971 *et seq.*; 16 U.S.C. 1801 *et seq.*

2. In § 635.2, the definition of "High-flyer" is revised and new definitions for "Charleston Bump closed area," "DeSoto Canyon closed area," "East Florida Coast closed area," "Handline," "Longline," and "Pelagic longline" are added in alphabetical order to read as follows:

§ 635.2 Definitions.

* * * * *

Charleston Bump closed area means the Atlantic Ocean area seaward of the baseline from which the territorial sea is measured from a point intersecting the U.S. coast at 34°00' N. lat. near Wilmington Beach, North Carolina, and proceeding due east to connect by straight lines the following coordinates in the order stated: 34°00' N. lat., 76°00' W. long.; 31°00' N. lat., 76°00' W. long.; then proceeding due west to intersect the coast at 31°00' N. lat. near Jekyll Island, Georgia.

* * * * *

DeSoto Canyon closed area means the area within the Gulf of Mexico bounded by straight lines connecting the following coordinates in the order stated: 30°00' N. lat., 88°00' W. long.; 30°00' N. lat., 86°00' W. long.; 28°00' N. lat., 86°00' W. long.; 28°00' N. lat., 84°00' W. long.; 26°00' N. lat., 84°00' W. long.; 26°00' N. lat., 86°00' W. long.; 28°00' N. lat., 86°00' W. long.; 28°00' N. lat., 88°00' W. long.; 30°00' N. lat., 88°00' W. long.

* * * * *

East Florida Coast closed area means the Atlantic Ocean area seaward of the baseline from which the territorial sea is measured from a point intersecting the U.S. coast at 31°00' N. lat. near Jekyll Island, Georgia, and proceeding due east to connect by straight lines the following coordinates in the order stated: 31°00' N. lat., 78°00' W. long.; 28°17' N. lat., 79°00' W. long.; then proceeding along the boundary of the EEZ to 24°00' N. lat., 79°30' W. long.; then connecting by straight lines the following coordinates in the order stated: 24°00' N. lat., 79°30' W. long.; 24°00' N. lat., 81°00' W. long.; 24°00' N. lat., 81°47' W. long.; then proceeding due north to intersect the coast at 81°47' W. long. near Key West, Florida.

* * * * *

Handline means fishing gear that consists of a mainline to which no more than two leaders (gangions) with hooks are attached, and that is released and retrieved by hand, rather than by mechanical means.

High-flyer means a flag, radar reflector or radio beacon transmitter, suitable for attachment to a longline to facilitate its location and retrieval.

* * * * *

Longline means fishing gear that is set horizontally, either anchored, floating, or attached to a vessel, and that consists of a mainline or groundline with three or more leaders (gangions) and hooks, whether retrieved by hand or mechanical means.

* * * * *

Pelagic longline means a longline that is suspended by floats in the water column and that is not fixed to or in contact with the ocean bottom.

* * * * *

3. In § 635.4, paragraph (a)(10) is added, and paragraph (e)(4) is removed, to read as follows:

§ 635.4 Permits and fees.

* * * * *

(a) * * *

(10) *Permit condition.* An owner issued a swordfish or shark permit pursuant to this part must agree, as a condition of such permit, that the vessel's swordfish or shark fishing, catch and gear are subject to the requirements of this part during the period of validity of the permit, without regard to whether such fishing occurs in the EEZ, or outside the EEZ, and without regard to where such swordfish or shark, or gear are possessed, taken or landed. However, when a vessel fishes within the waters of a state that has more restrictive regulations on swordfish or shark fishing, persons aboard the vessel must abide by the state's more restrictive regulations.

* * * * *

4. In § 635.21, paragraph (c) introductory paragraph and paragraph (c)(2) are revised, and paragraph (c)(4) is added to read as follows:

§ 635.21 Gear operation and deployment restrictions.

* * * * *

(c) *Pelagic longlines.* For purposes of this part, a vessel is considered to have pelagic longline gear on board when a power-operated longline hauler, a mainline, high-flyers, floats capable of supporting the mainline, and leaders (gangions) with hooks are on board. Removal of any one of these elements constitutes removal of pelagic longline gear. If a vessel issued a permit under this part is in a closed area designated under paragraph (c)(2) of this section with pelagic longline gear on board, it is a rebuttable presumption that fish on board such vessel were taken with pelagic longline gear in the closed area.

* * * * *

(2) If pelagic longline gear is on board a vessel issued a permit under this part, persons aboard that vessel may not fish or deploy any type of fishing gear in:

(i) The Northeastern United States closed area from June 1 through June 30 each calendar year;

(ii) In the Charleston Bump closed area from February 1 through April 30 each calendar year;

(iii) In the Florida East Coast closed area at any time beginning at 12:01 a.m. on February 1, 2001; and,

(iv) In the DeSoto Canyon closed area at any time beginning at 12:01 a.m. on November 1, 2000.

* * * * *

(4) In the Gulf of Mexico: pelagic longline gear may not be fished or deployed from a vessel issued a permit under this part with live bait affixed to the hooks; and, a person aboard a vessel issued a permit under this part that has pelagic longline gear on board shall not maintain live baitfish in any tank or well on board the vessel and shall not possess live baitfish, and shall not set up or attach an aeration or water circulation device in or to any such tank or well. For the purposes of this section, the Gulf of Mexico includes all waters of the U.S. EEZ west and north of the boundary stipulated at 50 CFR 600.105(c).

* * * * *

5. In § 635.69, paragraph (a) is revised by adding a second sentence to read as follows:

§ 635.69 Vessel monitoring systems.

(a) *Applicability.* * * * A vessel is considered to have pelagic longline gear on board for the purposes of this section, when gear as specified at § 635.21(c) is on board.

* * * * *

6. In § 635.71, paragraphs (a)(30), (31), and (32) are added to read as follows:

§ 635.71 Prohibitions.

* * * * *

(a) * * *

(30) Deploy or fish with a pelagic longline greater than the maximum length authorized for any area specified at § 635.21(c)(1).

(31) Deploy or fish with any fishing gear from a vessel with a pelagic longline on board in any closed area during the time periods specified at § 635.21(c)(2).

(32) In the Gulf of Mexico, deploy or fish a pelagic longline with live bait affixed to the hooks or to possess live bait, or set up a well or tank to maintain live bait, aboard a vessel with pelagic longline gear on board as specified at § 635.21(c)(4).

* * * * *

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coordinator. However, in the event that the interference contour of a proposed station would overlap the service contour of an existing station licensed on one of these previously shared frequencies, the written concurrence of the coordinator associated with the industry for which the existing station license was issued, or the written concurrence of the licensee of the existing station, shall be obtained. For the purposes of this § 90.35, the service contour for UHF stations is the 39 dBu contour; and the interference contour for UHF stations is the 21 dBu contour; the service contour for VHF stations is the 37 dBu contour; and the interference contour for VHF stations is the 19 dBu contour.

* * * * *

3. Section 90.175 is amended by revising paragraphs (b)(1), (b)(2), and (b)(3) to read as follows:

§ 90.175 Frequency coordination requirements.

* * * * *

(b) * * *

(1) A statement is required from the applicable frequency coordinator as specified in §§ 90.20(c)(2) and 90.35(b) recommending the most appropriate frequency. In addition, if the interference contour of a proposed station would overlap the service contour of a station on a frequency formerly shared prior to radio service consolidation by licensees in the Manufacturers Radio Service, the Forest Products Radio Service, the Power Radio Service, the Petroleum Radio Service, the Motor Carrier Radio Service, the Railroad Radio Service or the Automobile Emergency Radio Service, the written concurrence of the coordinator for the industry-specific service, or the written concurrence of the licensee itself, must be obtained. Requests for concurrence must be responded to within 20 days of receipt of the request. The written request for concurrence shall advise the receiving party of the maximum 20 day response period. The coordinator's recommendation may include comments on technical factors such as power, antenna height and gain, terrain and other factors which may serve to minimize potential interference. In addition:

(2) On frequencies designated for coordination or concurrence by a specific frequency coordinator as specified in §§ 90.20(c)(3) and 90.35(b), the applicable frequency coordinator shall provide a written supporting statement in instances in which coordination or concurrence is denied. The supporting statement shall contain sufficient detail to permit discernment of the technical basis for the denial of concurrence. Concurrence may be denied only when a grant of the underlying application would have a demonstrable, material, adverse effect on safety.

(3) In instances in which a frequency coordinator determines that an applicant's requested frequency or the most appropriate frequency is one designated for coordination or concurrence by a specific frequency coordinator as specified in §§ 90.20(c)(3) or 90.35(b), that frequency coordinator may forward the application directly to the appropriate frequency coordinator. A frequency coordinator may only forward an application as specified above if consent is received from the applicant.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 635

[Docket No. 991210332–0212–02; I.D. 122700B]

RIN 0648–AO95

Atlantic Highly Migratory Species (HMS) Fisheries; Regulatory Adjustments

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule; technical amendment.

SUMMARY: NMFS amends the final regulations governing the Atlantic HMS fisheries to clarify the annual quota for blue sharks, to revise a cross-reference for shark size limits, and to revise the specifications for the East Florida Coast and Charleston Bump closed areas as intended by the recent final rule to minimize bycatch and incidental catch in the pelagic longline fishery.

DATES: Effective January 31, 2001.

FOR FURTHER INFORMATION CONTACT: Karyl Brewster-Geisz at 301-713-2347, FAX: 301–713–1917.

SUPPLEMENTARY INFORMATION: On May 28, 1999, NMFS published a final rule (64 FR 29090) that implemented, among other things, the Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan (HMS FMP), which was adopted by the agency in April 1999. The final consolidated rule included language specifying the semiannual blue shark quota but inadvertently omitted language specifying the annual blue shark quota. The final consolidated rule also incorrectly cross-referenced the shark minimum size limit that is specified in the HMS FMP.

Additionally, on August 1, 2000, NMFS published a final rule (65 FR 47214) that prohibited pelagic longline fishing at certain times and in certain areas within the Exclusive Economic Zone (EEZ) of the Atlantic Ocean off the coast of the Southeastern United States and in the Gulf of Mexico. In that final rule, the definitions for the East Florida Coast and Charleston Bump closed areas inadvertently specified parts of the Atlantic Ocean outside the U.S. EEZ. As noted throughout the record for the final rule, the agency intended the restrictions to apply only in the U.S. EEZ. This technical amendment corrects these errors in the regulatory text and does not change the intent of the final rule. Due to the respecification of the referenced closed areas and the need for NMFS to distribute this information to affected fishermen and State and Federal enforcement personnel, NMFS postpones initiation of those time/area closures until March 1, 2001.

Classification

The Assistant Administrator for Fisheries (AA), under 5 U.S.C. 553(b)(B), finds that providing prior notice and opportunity for public comment on this final rule is unnecessary and contrary to the public interest. This final rule corrects earlier rules by clarifying regulatory text inconsistent with the final HMS FMP and the Final Supplemental Environmental Impact Statement for the regulatory amendment reducing bycatch, bycatch mortality, and incidental catch in the Atlantic pelagic longline fishery. These corrections and clarifications are necessary to avoid adverse impacts on fishery participants that would result from inconsistent interpretations of the regulations relative to these regulations and/or the inability of NMFS to enforce regulations due to lack of clarity. For similar reasons, the AA, under 5 U.S.C. 553(d)(3), finds that delaying the effective date of this final rule for 30 days is unnecessary and contrary to the public interest.

Because prior notice and opportunity for public comment are not required for this rule by 5 U.S.C. 553, or by any other law, the analytical requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, are inapplicable. This action is not significant under the meaning of Executive Order 12866.

List of Subjects in 50 CFR Part 635

Fisheries, Fishing, Fishing vessels, Foreign relations, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Statistics, Treaties.

Dated: January 30, 2001

William T. Hogarth,

Acting Assistant Administrator for Fisheries, National Marine Fisheries Service.

For the reasons set out in the preamble, 50 CFR part 635 is amended as follows:

PART 635—ATLANTIC HIGHLY MIGRATORY SPECIES

1. The authority citation for part 635 continues to read as follows:

Authority: 16 U.S.C. 971 *et seq.*; 16 U.S.C. 1801 *et seq.*

2. In § 635.2, the definitions of ''Charleston Bump closed area'' and ''East Florida Coast closed area'' are revised to read as follows:

§ 635.2 Definitions.

* * * * *

Charleston Bump closed area means the Atlantic Ocean area seaward of the inner boundary of the U.S. EEZ from a point intersecting the inner boundary of the U.S. EEZ at 34°00' N. lat. near Wilmington Beach, NC, and proceeding due east to connect by straight lines the following coordinates in the order stated: 34°00' N. lat., 76°00' W. long.; 31°00' N. lat., 76°00' W. long.; then proceeding due west to intersect the inner boundary of the U.S. EEZ at 31°00' N. lat. near Jekyll Island, GA.

* * * * *

East Florida Coast closed area means the Atlantic Ocean area seaward of the inner boundary of the U.S. EEZ from a point intersecting the inner boundary of the U.S. EEZ at 31°00' N. lat. near Jekyll Island, GA, and proceeding due east to connect by straight lines the following coordinates in the order stated: 31°00' N. lat., 78°00' W. long.; 28°17' N. lat., 79°12' W. long.; then proceeding along the outer boundary of the EEZ to the intersection of the EEZ with 24°00' N. lat.; then proceeding due west to the following coordinates: 24°00' N. lat., 81°47' W. long.; then proceeding due north to intersect the inner boundary of the U.S. EEZ at 81°47' W. long. near Key West, FL.

* * * * *

3. In § 635.21, paragraphs (c)(2)(ii) and (iii) are revised to read as follows:

§ 635.21 Gear operation and deployment restrictions.

* * * * *

(c) * * *

(2) * * *

(ii) In the Charleston Bump closed area from March 1 through April 30, 2001, and from February 1 through April 30 each calendar year thereafter;

(iii) In the East Florida Coast closed area at any time beginning at 12:01 a.m. on March 1, 2001; and

* * * * *

4. In § 635.22, the first sentence of paragraph (c) is revised to read as follows:

§ 635.22 Recreational retention limits.

* * * * *

(c) *Sharks.* One shark from either the large coastal, small coastal or pelagic group may be retained per vessel per trip, subject to the size limits described in §635.20(e), and, in addition, one Atlantic sharpnose shark may be retained per person per trip. * * *

* * * * *

5. In § 635.27, paragraph (b)(1)(iii) is revised to read as follows:

§ 6355.27 Quotas.

* * * * *

(b) * * *

(1) * * *

(iii) *Pelagic sharks.* The annual commercial quotas for pelagic sharks are 92 mt dw for porbeagle sharks, 273 mt dw for blue sharks, and 488 mt dw for pelagic sharks other than porbeagle or blue sharks (unless otherwise specified in the **Federal Register** as provided in paragraph (b)(1)(iv) of this section). These quotas are divided between two semiannual periods, January 1 through June 30, and July 1 through December 31. The quotas for each semiannual period are as follows:

(A) Porbeagle shark–46 mt dw.

(B) Blue sharks–136.5 mt dw.

(C) Pelagic sharks, other than porbeagle or blue sharks–244 mt dw.

* * * * *

[FR Doc. 01–2957 Filed 1–31–01; 3:33 pm]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

[Docket No. 991228355-0370-04; I.D. 101200F]

RIN 0648-AM50

Fisheries of the Northeastern United States; 2001 Fishing Quotas for Atlantic Surf Clams, Ocean Quahogs, and Maine Mahogany Ocean Quahogs

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule; 2001 fishing quotas for Atlantic surf clams, ocean quahogs, and Maine mahogany ocean quahogs.

SUMMARY: NMFS issues final quotas for the Atlantic surf clam, ocean quahog, and Maine mahogany ocean quahog fisheries for 2001. The intent of this action is to specify allowable harvest levels of Atlantic surf clams and ocean quahogs from the exclusive economic zone and an allowable harvest level of Maine mahogany ocean quahogs from the waters north of 43°50'N. lat. in 2001.

DATES: Effective from February 5, 2001, through December 31, 2001.

ADDRESSES: Send comments on any ambiguity or unnecessary complexity arising from the language used in this final rule to Patricia A. Kurkul, Regional Administrator, Northeast Region, National Marine Fisheries Service, One Blackburn Drive, Gloucester, MA 01930-2298. Copies of supporting documents, including the Environmental Assessment, Regulatory Impact Review, Final Regulatory Flexibility Analysis (EA/RIR/FRFA), and the Essential Fish Habitat Assessment, are available from the Regional Administrator, Northeast Region. The EA/RIR/FRFA is accessible via the Internet at *http:/www.nero.gov/ro/doc/nr.htm.*

FOR FURTHER INFORMATION CONTACT: Jennifer L. Anderson, Fishery Management Specialist, 978-281-9226.

SUPPLEMENTARY INFORMATION: The Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fisheries (FMP) directs NMFS, in consultation with the Mid-Atlantic Fishery Management Council (Council), to specify quotas for surf clams and ocean quahogs on an annual basis from a range that represents the optimum yield (OY) for each fishery. It is the policy of the Council that the levels selected allow fishing to continue at that level for at least 10 years for surf clams

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Appendix E. List of fishes collected or observed in association with pelagic *Sargassum* in the North Atlantic Ocean including the Gulf of Mexico and Caribbean Sea. Life-stages are E=egg, L=larva, J=juvenile and A=adult. Nomenclature follows Robins et al. (1991) (Source: NMFS 1997).).

Family Genus and species	Common name	Life-stage(s)
Carcharhinidae	requiem sharks	
Carcharhinus falciformis	silky shark	A
C. limbatus	blacktip shark	A
C. longimanus	oceanic whitetip shark	A
Muraenidae	morays	
Unidentified	moray	L
Clupeidae	herrings	
Sardinella aurita	Spanish sardine	J
Gonostomatidae	lightfishes	
Unidentified	lightfish	L
Myctophidae	lanternfishes	
Unidentified	lanternfish	L
Gadidae	cods	
Urophycis chuss	red hake	L, J
U. earlli	Carolina hake	L, J
U. floridana	southern hake	L, J
U. regia	spotted hake	L, J
Antennariidae	frogfishes	
Histrio histrio	sargassumfish	L, J, A
Exocoetidae	flyingfishes	
Cypselurus furcatus	spotfin flyingfish	E, L, J, A
C. melanurus	Atlantic flyingfish	E, L, J, A
Exocoetus obtusirostris	oceanic two-wing flyingfish	J
Hemirhamphus balao	balao	J
H. brasiliensis	ballyhoo	J
Hirundichthys affinis	fourwing flyingfish	E, L, J, A
Hyporhamphus unifasciatus	silverstripe halfbeak	L, J
Paraexocoetus brachypterus	sailfin flyingfish	E, L, J, A
Prognichthys gibbifrons	bluntnose flyingfish	E, L, J, A
Belonidae	needlefishes	
Tylosurus acus	agujon	L, J
Fistulariidae	cornetfishes	
Fistularia tabacaria	bluespotted cornetfish	J
Centriscidae	snipefishes	
Macroramphosus scolopax	longspine snipefish	J
Syngnathidae	pipefishes	
Hippocampus erectus	lined seahorse	J
H. reidi	longsnout seahorse	J
Microphis brachurus	opossum pipefish	J
Syngnathus caribbaeus	Caribbean pipefish	J
S. floridae	dusky pipefish	J
S. fuscus	northern pipefish	J
S. louisianae	chain pipefish	J
S. pelagicus	sargassum pipefish	E, L, J, A
S. scovelli	gulf pipefish	J
S. springeri	bull pipefish	J

Table 17(Cont.). List of fishes collected or observed in association with pelagic *Sargassum* in the North Atlantic Ocean including the Gulf of Mexico and Caribbean Sea.

Family Genus and species	Common name	Life-stage(s)
Dactylopteridae	flying gurnards	
Dactylopterus volitans	flying gurnard	L, J
Scorpaenidae	scorpionfishes	
Unidentified	scorpionfish	L
Serranidae	sea basses	
Epinephelus inermis	marbled grouper	J
Priacanthidae	bigeyes	
Priacanthus arenatus	bigeye	J
Pristigenys alta	short bigeye	L, J
Apogonidae	cardinalfishes	
Apogon maculatus	flamefish	L
Pomatomidae	bluefish	
Pomatomus saltatrix	bluefish	L
Rachycentridae	cobias	
Rachycentron canadum	cobia	E, L, J, A
Echeneidae	remoras	
Phtheirichthys lineatus	slender suckerfish	J
Carangidae	jacks	
Caranx bartholomaei	yellow jack	L, J
C. crysos	blue runner	L, J
C. dentex	white trevally	J
C. hippos	crevalle jack	J
C. latus	horse-eye jack	J
C. ruber	bar jack	L, J
Chloroscombrus chrysurus	Atlantic bumper	L, J
Decapterus macerellus	mackerek scad	J
D. punctatus	round scad	J
D. tabl	redtail scad	J
Elagatis bipinnulata	rainbow runner	L, J, A
Naucrates ductor	pilotfish	J
Selar crumenophthalmus	bigeye scad	L, J
Selene vomer	lookdown	J
Seriola dumerili	greater amberjack	L, J
S. fasciata	lesser amberjack	J
S. rivoliana	almaco jack	L, J, A
S. zonata	banded rudderfish	J
Trachinotus falcatus	permit	L, J
T. goodei	palometa	J
Trachurus lathami	rough scad	L, J
Coryphaenidae	dophins	
Coryphaena equisetis	pompano dolphin	L, J, A
C. hippurus	dolphin	L, J, A
Lutjanidae	snappers	
Lutjanus sp.	snapper	L
Rhomboplites aurorubens	vermillion snapper	L, J
Lobotidae	tripletails	
Lobotes surinamensis	tripletail	L, J, A
Gerreidae	mojarras	
Eucinostomus sp.	mojarra	L

Table 17(Cont.). List of fishes collected or observed in association with pelagic *Sargassum* in the North Atlantic Ocean including the Gulf of Mexico and Caribbean Sea.

Family Genus and species	Common name	Life-stage(s)
Sparidae	porgies	
Pagrus pagrus	red porgy	L, J
Mullidae	goatfishes	
Mullus auratus	red goatfish	L, J
Unidentified	goatfish	L
Kyphosidae	sea chubs	
Kyphosus incisor	yellow chub	L, J
K. sectatrix	Bermuda chub	L, J
Chaetodontidae	butterflyfishes	
Chaetodon ocellatus	spotfin butterflyfish	J
C. striatus	banded butterflyfish	J
Pomacentridae	damselfishes	
Abudefduf saxatilis	sergeant major	L, J
Mugilidae	mullets	
Mugil cephalus	striped mullet	L
M. curema	white mullet	L
Sphyraenidae	barracudas	
Sphyraena barracuda	great barracuda	A
S. borealis	northern sennet	L, J
Polynemidae	threadfins	
Polydactylus virginicus	barbu	J
Labridae	wrasses	
Bodianus pulchellus	spotfin hogfish	J
Thalassoma bifasciatum	bluehead	J
Scaridae	parrotfishes	
Unidentified	parrotfish	L
Uranoscopidae	stargazers	
Unidentified	stargazer	L
Blenniidae	combtooth blennies	
Hypsoblennius hentzi	feather blenny	L
Parablennius marmoreus	seaweed blenny	L
Gobiidae	gobies	
Microgobius sp.	goby	L
Acanthuridae	surgeonfishes	
Acanthurus randalli	gulf surgeonfish	J
Acanthurus sp.	surgeonfish	L
Trichiuridae	snake mackerels	
Unidentified	snake mackerel	L
Scombridae	mackerels	
Acanthocybium solandri	wahoo	J, A
Auxis thazard	frigate mackerel	J, A
Euthynnus alletteratus	little tunny	A
Katsuwonus pelamis	skipjack tuna	A
Scomber japonicus	chub mackerel	J
Scomberomorus cavalla	king mackerel	A
Thunnus albacares	yellowfin tuna	J, A
T. atlanticus	blackfin tuna	A
Xiphiidae	swordfishes	
Xiphius gladius	swordfish	L, J

Table 17 (Cont.). List of fishes collected or observed in association with pelagic *Sargassum* in the North Atlantic Ocean including the Gulf of Mexico and Caribbean Sea.

Family Genus and species	Common name	Life-stage(s)
Istiophoidae	billfishes	
Istiophorus platypterus	sailfish	L, J
Makaira nigricans	blue marlin	L, J, A
Tetrapturus albidus	white marlin	L, J, A
Stromateidae	butterfishes	
Ariomma sp.	driftfish	L
Centrolophus sp.	ruff	J
Cubiceps pauciradiatus	bigeye cigarfish	J
Hyperoglyphe bythites	black driftfish	J
H. perciformis	barrelfish	J
Peprilus triacanthus	butterfish	L, J
Psenes cyanophrys	freckled driftfish	J
Bothidae	lefteye flounders	
Bothus sp.	flounder	L
Cyclopsetta fimbriata	spotfin flounder	L
Balistidae	leatherjackets	
Aluterus heudeloti	dotterel filefish	L, J
A. monoceros	unicorn filefish	L, J
A. schoepfi	orange filefish	L, J
A. scriptus	scrawled filefish	L, J
Balistes capriscus	gray triggerfish	J, A
B. vetula	queen triggerfish	J
Cantherhines macrocerus	whitespotted filefish	J
C. pullus	orangespotted filefish	J, A
Canthidermis maculata	rough triggerfish	J
C. sufflamen	ocean triggerfish	J
Monacanthus ciliatus	fringed filefish	J
M. hispidus	planehead filefish	J
M. setifer	pygmy filefish	J
M. tuckeri	slender filefish	J
Xanthichthys ringens	sargassum triggerfish	J
Ostraciidae	boxfishes	
Lactophrys sp.	cowfish	L
Tetraodontidae	puffers	
Chilomycterus antennatus	bridled burrfish	J
C. schoepfi	striped burrfish	J
Diodon holocanthus	ballonfish	J
D. hystrix	porcupinefish	J
Sphoeroides maculatus	northern puffer	L
S. spengleri	bandtail puffer	L
Unidentified	puffer	L
Molidae	molas	
Mola sp.	mola	J

Appendix F. Biological Evaluation for Actions Proposed to Conserve and Manage Dolphin and Wahoo in the United States Atlantic Exclusive Economic Zone (EEZ).

Biological Evaluation

Proposed actions to conserve and manage common dolphin, *Coryphaena hippurus*, pompano dolphin, *Coryphaena equiselis*, and wahoo, *Acanthocybium solandri*, in the United States Atlantic Exclusive Economic Zone (EEZ).

In recent years, landings of dolphin and wahoo from the Atlantic EEZ have increased. This increase is thought to have resulted from the commercial longline fishery redirecting a portion of their effort from other directed fisheries due to closures and from the recreational fishery, particularly the charterboat sector. Though both dolphin and wahoo grow rapidly and mature early, the New England, Mid-Atlantic and South Atlantic Fishery Management Councils are concerned that these recent increases in landings could result in localized depletion of stocks and a shift in the historical levels of catch between commercial and recreational fishermen.

Historically, dolphin/wahoo has been considered a recreational fishery, so concerns were raised when commercial landings in the Atlantic began to increase. Traditional longliners, originally targeting species such as shark, tuna and swordfish, were known to be modifying their fishing practices to include dolphin/wahoo as a greater portion of their longline trips. Longliners have indicated that their shift in effort was due to early closures in those other fisheries. Considering further regulations within the highly migratory species (HMS) fishery, the future of the longliners participation in the dolphin fishery is unknown though it may mean continued shifts in effort. With this increase in landings and the potential for effort expansion into nearshore coastal waters to target dolphin, conflicts over the allocation of resources between recreational and commercial fishermen may continue to occur. Further, these shifts in effort in the commercial fishery, dependant upon the magnitude, could result in localized depletion in abundance.

To address these issues of concern, the Atlantic Fishery Councils jointly developed a fishery management plan (FMP) for dolphin/wahoo. Due to the importance of the dolphin/wahoo fishery to the recreational fishing community in the Atlantic, the overall goal of the South Atlantic, Mid-Atlantic, and New England Councils is to initially adopt precautionary management strategies that attempt to maintain the current harvest level and historical allocations of dolphin and ensure that no new fisheries develop. This will require that current catch levels not be exceeded and that existing conflicts between sectors of the fishery (i.e. commercial longliners and recreational fishermen) be resolved. The status quo is intended to reflect trends in the fishery (average catch and effort levels) observed over recent years.

Currently, there are no federal regulations in place to manage this fishery however, several states have implemented size and bag limits for the dolphin fishery. North Carolina has implemented a daily bag limit of 10 per person with no minimum size and limits charter vessels to 60 per trip. South Carolina has a daily bag limit of 7 per person or 26 per boat, whichever is less, and a commercial trip limit of 4,500 pounds. The commercial quota for South Carolina is 180,000 pounds. Georgia has a 20-inch fork length minimum and a 10 per person daily recreational bag limit that is not to exceed 60 per boat except for headboats certified to allow 10 fish per paying customer. Florida has a 10 per person daily recreational bag limit with a 20-inch fork length minimum size for the commercial fishery only.

In this evaluation, the term dolphin includes both the common and pompano species.

Objectives

Listed below are the objectives addressed by this FMP.

(1) Address localized reduction in fish abundance. The Councils remain concerned over the potential shift of effort by longline vessels to traditional recreational fishing grounds and the resulting reduction in local availability if commercial harvest intensifies.

(2) Minimize market disruption. Commercial markets (mainly local) may be disrupted if large quantities of dolphin are landed from intense commercial harvest or unregulated catch and landings by components of the recreational sector.

(3) Minimize conflict and/or competition between recreational and commercial user groups. If commercial longlining effort increases either directing on dolphin and wahoo or targeting these species as a significant bycatch, conflict and/or competition may arise if effort shifts to areas traditionally used by recreational fishermen.

(4) Optimize the social and economic benefits of the dolphin fishery. Given the significant importance of dolphin and wahoo to the recreational sector throughout the range of these species, and management unit, manage the resources to achieve optimum yield on a continuing basis is necessary.

(5) Reduce bycatch of the dolphin fishery. Bycatch is a problem in the pelagic longline fishery. Any increase in overall effort, and more specifically shifts of effort into nearer shore, non-traditional fishing grounds by swordfish and tuna vessels, may result in increased bycatch of non-target species. In addition, National Standard 9 requires that: "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." Therefore bycatch of the directed dolphin fishery must be addressed. Appendix C (FSEIS for HMS Regulatory Amendment 1) contains data on dolphin-wahoo pelagic longline fishery analysis. The data presented on page C-66 and in Table C-4 indicate that pelagic longlines targeting dolphin do in fact result in a bycatch of HMS species.

(6) Direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem.

(7) Direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Action Area

The area of concern is the U.S. EEZ of the Atlantic. State waters, though not regulated by the Councils, may undergo indirect effects by the Federal fishery though what impacts transiting vessels may have most likely would not dissipate if the Federal fishery were non-existent.

Current Fisheries

The fishery for dolphin and wahoo covered by this plan is conducted along the Atlantic coast, predominantly south of Virginia into southern Florida. Wahoo are caught off North and South Carolina primarily during the spring and summer and off Florida's east coast year-round.

Commercial-Dolphin

In the Atlantic, commercial fisheries for dolphin consist primarily of longline and hook and line (which includes hand line, troll, rod and reel and electric reel). The hook and line portion of the commercial fishery is conducted similarly to the recreational hook and line segment, which is described under the recreational fisheries section. The longline component of the fishery consists of longliners that primarily target highly migratory species but may also catch dolphin and longliners that target dolphin directly.

In the mid- to late 1990s, there was an increase in longline landings of dolphin in the South Atlantic due to the participation of swordfish and shark longliners who had adapted their gear to simultaneously target dolphin. Longline vessels targeting highly migratory species have been known to catch dolphin simultaneously by attaching small leaders to their float buoys with usually only one leader per buoy with approximately 100-150 such rigs employed at one time. These rigs are retrieved at the same time as the main longline which is often set overnight (NMFS 1997 as cited in SAFMC 2001). However, based on information from the Hawaii longline fleet indicating that hooks set beneath or adjacent to floatlines have a much higher incidental take of sea turtles than hooks one or more positions away from the floatline, the following gear modifications have been required by the National Marine Fishery Service (NMFS) Emergency Rule (50 CFR Part 635). All Atlantic vessels that use longline gear and have Federal HMS limited access permits are prohibited from setting gangions within two gangion lengths of the floatline. While gear is deployed, gangions may not be attached to floatlines or to the mainline except at a distance from the attachment point of the floatline to the mainline of at least twice the length of the average gangion length in the set. In addition, to deploy gear during shallow sets the length of the gangion must be greater than the length of the floatline to ensure that a hooked or entangled turtle has sufficient slack to reach the surface and avoid drowning.

Pelagic longliners are currently prohibited from harvesting highly migratory species in the East Florida Coast Area at all times. They are also seasonally prohibited from utilizing the Charleston Bump Area from February 1 through April 30 of each year. In addition, a portion of the Northeastern Area off New Jersey is closed during June and the Northeast Distant Statistical Reporting Area (NED) closure has been extended through July 8, 2002 under NMFS Emergency Rule (50 CFR Part 635).

The directed commercial longline fishery for dolphin consists of only a few longline vessels off the coast of the Carolinas (NMFS 1997 as cited in SAFMC 2001). Approximately 8 to 12 trips per year are conducted May through July with most trips occurring during June. Vessels in the directed longline fishery for dolphin make sets during the daytime using gear that is two to six miles in length. The mainline is often 700-pound monofilament with 400-pound monofilament leaders. Typically, there are a total of 75-80 hooks per mile with a maximum of 480 hooks. The standard circle hook used for dolphin is smaller than those used for conventional longline fishing. One hook per leader is used with leaders being approximately 18 inches in length. No drop lines are used in this fishery and haul back is immediate. Gear may be set in a circular pattern to facilitate haul back and as many as six sets may be made daily with trips averaging two days in length (NMFS 1997 as cited in SAFMC 2001). Fish are located using hook and line gear along weed lines or temperature breaks.

The 1994 through 1997 commercial landings of dolphin indicate that in the South Atlantic, hook and line accounts for the majority of catches whereas in New England and the Mid-Atlantic it is longlines (Table 1). Commercial landings data of dolphin for 1999 and 2000 are presented in Table 2 and show a similar breakdown.

Table 1. Average commercial landings of dolphin (pounds) by gear type for New England, Mid-Atlantic and South Atlantic, 1994-1997.
(Source: Goodyear 1999 as cited in SAFMC 2001)

	Hook and Line	Longline	Other/Unknown
New England	2,717	10,580	936
Mid-Atlantic	1,131	133,925	2,195
South Atlantic	992,147	429,754	9,860

Table 2. Commercial landings of dolphin (pounds) by gear type for New England, Mid-Atlantic and South Atlantic, 1999 and 2000. (Source: J. Poffenburger, NMFS pers. comm.).

	Hook and Line	Longline	Other/Unknown
New England, 1999	NA	NA	NA
New England, 2000	NA	NA	NA
Mid-Atlantic, 1999	1,853	96,599	1,053
Mid-Atlantic, 2000	1,592	32,518	1,903
S. Atlantic, 1999	647,293	238,903	58,399
S. Atlantic, 2000	520,590	294,376	113,257

Commercial-Wahoo

In the Atlantic, the commercial fishery for wahoo appears to be incidental to fishing for dolphin or other pelagic species. Averaged landings of wahoo from 1984 through 1999 for the Atlantic EEZs are presented in Table 3. Commercial landings data for wahoo by gear type for 1999 and 2000 are presented in Table 4, and show a similar breakdown to dolphin catches. The longline fishery accounts for the majority of catches in the Mid-Atlantic while hook and line account for the majority in the South Atlantic.

Table 3. Commercial landings of wahoo (pounds) averaged over 1984-1997 and 1997-1999 by region. (Source: NMFS 2000, Goodyear 1999 as cited in SAFMC 2001).

Years	South Atlantic	Mid-Atlantic	New England
Ave 1984-1997	59,151	1,840	1,391
Ave 1997-1999	87,244	3,097	52

Table 4. Commercial landings of wahoo (pounds) by gear type for New England, Mid-Atlantic and South Atlantic, 1999 and 2000. (Source: J. Poffenburger, NMFS pers. comm.).

	Hook and Line	Longline	Other/Unknown
New England, 1999	NA	NA	NA
New England, 2000	NA	NA	NA
Mid-Atlantic, 1999	159	4,248	66
Mid-Atlantic, 2000	397	1,902	826
S. Atlantic, 1999	62,652	13,190	18,813
S. Atlantic, 2000	32,359	9,925	17,614

Recreational-Dolphin

The recreational fishery in the Atlantic lands the majority of the total U.S. dolphin catch (SAMFC 1999). Much of this fishery occurs during the summer with most of the catch taken by offshore charter and private/rental vessels (SAFMC 2001). In general, private/rental vessels accounted for most recreational landings of dolphin for the Mid-Atlantic and South Atlantic regions whereas charter vessels landed more in New England (Table 5). More current data from 1998 through 2000 show a similar pattern (Table 6). Though data are scant describing the details of the recreational fishery, in general, dolphin are primarily caught by trolling live or artificial bait often near a floating object or floating material such as grass or a weedline. A common practice is to troll near a floating object and, if a fish is caught, to leave it on the line in the water to attract other dolphin. Chunks of bait are then tossed into the school and dolphin are hooked as the school comes up after the bait. Fishermen on charter vessels generally troll at a vessel speed of approximately 4.5 to 6 knots.

Table 5. Average annual recreational landings of dolphin (pounds) by mode from New England, Mid-Atlantic and South Atlantic between 1981 and 1997.
(Source: Goodyear 1999 as cited in SAFMC 2001)

	Charter	Private/Rental	Headboat
New England	8,522	7,556	NA
Mid-Atlantic	173,558	222,842	NA
South Atlantic	2,127,389	4,861,402	54,155

Table 6. Recreational landings of dolphin (pounds) by mode for New England, Mid-Atlantic and South Atlantic, 1999 and 2000. (Source: J. Poffenburger, NMFS pers. comm.).

	Charter	Private/Rental	Headboat
New England, 1998	NA	NA	NA
New England, 1999	NA	1,443	NA
New England, 2000	NA	NA	NA
Mid-Atlantic, 1998	151,145	278,147	NA
Mid-Atlantic, 1999	78,632	215,847	NA
Mid-Atlantic, 2000	401	632,709	NA
S. Atlantic, 1998	4,675,713	2,567,029	21,110
S. Atlantic, 1999	3,840,009	5,940,207	49,681
S. Atlantic, 2000	4,388,095	7,553,745	NA

Recreational-wahoo

Wahoo are caught primarily by trolling. The recreational fishery for wahoo in the Atlantic mainly operates off North Carolina and the east coast of Florida (SAFMC 2001). The charter boat sector in North Carolina was responsible for landing the largest quantity of wahoo for 1994-1997 with annual average landing of 363,386 pounds (Table 32 in SAFMC 2001). The private/rental sector accounted for the majority of landings off eastern Florida during that same period with an average landing of 204,098 pounds (Table 35 in SAFMC 2001). More recent recreational landings for wahoo caught in the Atlantic are presented in Table 7.

Table 7. Recreational landings of wahoo (pounds) combined for New England, Mid-Atlantic and South Atlantic, 1998, 1999 and 2000.
(Source: J. Poffenburger, NMFS pers. comm.).

	Combined Pounds
New England, 1998	5,355
New England, 1999	NA
New England, 2000	NA
Mid-Atlantic, 1998	29,631
Mid-Atlantic, 1999	232,781
Mid-Atlantic, 2000	43,318
S. Atlantic, 1998	914,049
S. Atlantic, 1999	1,172,886
S. Atlantic, 2000*	991,559

*Does not include landings from the headboat survey.

List of Actions

Management measures for the Atlantic EEZ include:

Action 1. The management unit is the population of dolphin (common dolphin- *Coryphaena hippurus* and pompano dolphin- *Coryphaena equiselis*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts.

Action 2. The management unit is the population of wahoo (*Acanthocybium solandri*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts.

Action 3. In the Atlantic any dealer, defined as the person who first receives dolphin or wahoo harvested in or from the EEZ by way of purchase, barter, trade, or transfer in commerce, would be required to possess a valid dealer permit issued by the National Marine Fisheries Service and to report data needed to monitor the dolphin and wahoo fisheries.

Requirements for a federal dolphin and wahoo permit are that the applicant possesses a state dealer's license and that the applicant must have a physical facility at a fixed location in the state where the dealer has a state license. A fee will be charged to cover the administrative costs of issuing the federal dolphin and wahoo permit. In addition, reporting requirements are specified in Action 6.

Action 4. Require that the owner of a for-hire vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ.

Require that the owner of a commercial vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ.

In order to qualify for a commercial vessel permit in the Atlantic, during one of the three calendar years preceding the control date, the vessel owner (1) must have 25 percent of his or her earned income derived from commercial or for-hire fishing, or must have earned at least $10,000 from either commercial or for-hire fishing and (2) must be able to document 250 pounds of landings and sale of dolphin and/or wahoo on or before the control date of May 21, 1999 in the Atlantic. Alternatively individuals may also qualify for a commercial permit if they hold a valid permit in the snapper-grouper, king mackerel, or swordfish fisheries. The commercial permit is transferable (1 for 1) with the vessel when sold or replaced. Allow a 200 pound incidental harvest possession limit of dolphin and/or wahoo for vessels with a valid federal commercial permit fishing North of 39° North latitude.

For a person aboard a fishing vessel to fish for dolphin and wahoo in the exclusive economic zone (EEZ), possess dolphin and wahoo in or from the EEZ, off-load dolphin and wahoo from the EEZ, or sell dolphin and wahoo in or from the EEZ, a vessel permit for dolphin and wahoo must be issued to the vessel and be on board.

A fee will be charged to cover the administrative costs of issuing federal vessel permits. There are no requirements to qualify for a for-hire vessel permit.

Action 5. Require that the operator of a commercial or for-hire vessel obtain an operator's permit issued by the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ. On each federally permitted dolphin/wahoo commercial or for-hire vessel, there must be on board at least one operator who has been issued a federal operator's permit for the dolphin/wahoo fishery. The federally permitted operator will be held accountable for violations of fishing regulations and also may be subject to a permit sanction. If an operator's permit has been sanctioned, during the permit sanction period the individual operator may not work in any capacity aboard a federally permitted fishing vessel.

No performance or competency testing will be required to obtain a permit. However, the permit may be revoked for violation of Federal dolphin and wahoo regulations as authorized by 15 C.F.R. 904.

The federal permit program will have the following requirements:

1. Any operator of a vessel fishing for dolphin or wahoo (either commercial or for-hire) must have an operator's permit issued by the NMFS Regional Administrator.
2. An operator is defined as the master or other individual on board a vessel who is in charge of that vessel (see 50 CFR 620.2).

3. The operator is required to submit an application, supplied by the Regional Administrator, for an Operator's Permit. The permit will be issued for a period of up to three years.
4. The applicant must provide his/her name, mailing address, telephone number, date of birth, and physical characteristics (height, weight, hair, and eye color) on the application. In addition to this information, the applicant must provide two passport size color photos.
5. The permit is not transferable.
6. Permit holders would be required to carry their permit aboard the fishing vessel during fishing and off-loading operations and must have it available for inspection upon request by an authorized officer.
7. The Regional Administrator may charge an administrative fee for the operator permit consistent with NOAA guidelines.

Action 6. In the Atlantic, require reporting of vessel permit holders (commercial and for-hire) and include reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP). It is the Councils' intent that existing logbook requirements continue until the cooperating partners meet to determine whether these efforts will continue under ACCSP.

Action 7. The Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 18.8 and 46.5 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 1.41 and 1.63 million pounds.

Action 8. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and 100% of MSY (between 1.41 and 1.63 million pounds) for wahoo.

Action 9. Overfishing Level. Overfishing is defined in terms of the NMFS Guidelines Checklist.

A maximum fishing mortality threshold (MFMT) - In the Atlantic, U.S. Caribbean, and Gulf of Mexico overfishing for dolphin and wahoo is defined as a fishing mortality rate (F) in excess of F_{MSY} ($F_{30\%Static\ SPR}$).

A minimum stock size threshold (MSST) – In the Atlantic, U.S. Caribbean, and Gulf of Mexico the minimum stock size threshold for dolphin and wahoo is defined as a ratio of current biomass ($B_{current}$) to biomass at MSY or $(1\text{-}M)*B_{MSY}$, where 1-M should never be less than 0.5. Using the best available estimates of natural mortality (M = 0.68-0.80) in the formula results in a MSST of 50% B_{MSY}. The stock would be overfished if current biomass ($B_{current}$) was less than MSST and would be recovered when current biomass was equal or greater than the biomass at MSY.

Action10. Establish a framework procedure for the Dolphin and Wahoo FMP to provide the South Atlantic Fishery Management Council with a mechanism to independently adjust management measures for their area of responsibility through framework action.

Action 11. Prohibit sale of recreationally caught dolphin or wahoo in or from the Atlantic EEZ except for allowing for-hire vessels that possess the necessary state and Federal commercial permits to sell dolphin harvested under the bag limit in or from the Atlantic EEZ.

Action 12. Establish a cap of 1.5 million pounds or 13% of total landings, whichever is greater, for the commercial fishery for dolphin. Should the catch exceed this level, the Council will review the data and evaluate the need for additional regulations which may be established through the framework.

Action 13. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. Headboats (with a valid certificate of inspection) would be allowed a bag limit of 10 dolphin per paying passenger.

Action 14. Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed.

Action 15. Establish a minimum size limit for dolphin of 20 inches fork length off Florida and Georgia and no minimum size limit north of Georgia.

Action 16. Establish a commercial trip limit for wahoo (landed head and tail intact) of 500 pounds with no transfer at sea allowed.

Action 17. Do not establish a size limit for wahoo in the Atlantic EEZ.

Action 18. Establish a recreational bag limit of 2 wahoo per person per day.

Action 19. Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads).

Action 20. Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species.

Action 21. Establish a fishing year of January 1 to December 31 for the dolphin and wahoo fishery in the Atlantic EEZ.

Action 22. Expand the list of Essential Fish Habitat (EFH) definitions that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic.

EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*.

Action 23. Expand the list of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic.

EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*.

Action 24. Assessment of the Impacts of Present Fishing Activities on EFH. No action to implement additional management measures to reduce impacts of fishing on dolphin wahoo EFH. Defer to measures in the *Sargassum* Fishery Management Plan, which has been submitted to the Secretary for formal review, and incorporate by reference the Comprehensive Habitat Amendment approved by the Secretary, on June 3, 1999.

Description of Listed Species and Critical Habitats Known to Occur in the Action Area

Under Section 7 of the Endangered Species Act of 1973, as amended, a review of listed species and designated critical habitat(s) known to occur in the area of proposed action(s) and potential impacts to these species and habitat(s) is required.

Marine listed species and critical habitat designations in the eastern U. S.

Endangered

Blue whale	*Balaenoptera musculus*
Humpback whale	*Megaptera novaeangliae*
Fin whale	*Balaenoptera physalus*
Northern right whale (Critical Habitat Designated)	*Eubalaena glacialis*
Sei whale	*Balaenoptera borealis*
Sperm whale	*Physeter macrocephalus*
Leatherback sea turtle	*Dermochelys coriacea*
Hawksbill sea turtle	*Eretmochelys imbricata*
Kemp 's Ridley turtle	*Lepidochelys kempii*
Green turtle	*Chelonia mydas*
Shortnose sturgeon	*Acipenser brevirostrum*
Atlantic salmon	*Salmo salar*

Note: Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. Atlantic waters.

Threatened

Loggerhead turtle	*Caretta caretta*
Johnson's seagrass (Critical Habitat Designated)	*Halophilia johnsonii*

Proposed Species

Smalltooth sawfish	*Pristis pectinata*

Proposed Critical Habitat

None

Candidate Species

Dusky shark	*Carcharhinus obscrurus*
Sand Tiger Shark	*Odontaspis taurus*
Night Tiger	*Carachahinus signatus*
Atlantic sturgeon	*Acipenser oxyrhynchus oxyrhynchus*
Mangrove rivulus	*Rivulus mamoratus*
Opposum pipefish	*Microphis barchyurus lineatus*
Key silverside	*Menidia conchorum*
Goliath grouper	*Epinephelus itajara*
Speckled hind	*Epinephelus drummondhayi*
Warsaw grouper	*Epinephelus nigritus*
Nassau grouper	*Epinephelus striatus*

Species Under U.S. Fish and Wildlife Service (USFWS) Jurisdiction:

West Indian manatee (Critical Habitat Designated)	*Trichechus manatus*
American crocodile (Critical Habitat Designated)	*Crocodylus acutus*

Species that may be affected by the Dolphin/Wahoo fishery

Dolphin and wahoo fisheries within the action area are considered unlikely to adversely impact the following listed species due to their limited geographical range, which occur primarily or only along the coast or due to their absence from the principal area of concern: Johnson's seagrass, Shortnose sturgeon, Atlantic salmon, Smalltooth sawfish, American crocodile and the West Indian Manatee. Thus, these species will not be discussed further and the rest of the analysis will only pertain to the remaining listed species.

Sperm Whale, *Physeter macrocephalus*

Sperm whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). The primary reason for this specie's decline was commercial whaling. The International Whaling Commission (IWC) prohibited commercial hunting of sperm whales in 1981 (Reeves and Whitehead 1997 as cited in NMFS 2001).

For management purposes, the IWC recognizes four stocks of sperm whales: the North Pacific, The North Atlantic, the Northern Indian Ocean and Southern Hemisphere. However, to date, the worldwide stock structure of sperm whales remains unclear (Dufault *et al*. 1999, as cited in NMFS 2001). In the western North Atlantic, sperm whales range from Greenland to the Gulf of Mexico and the Caribbean. Their occurrence in the waters of the United States EEZ appears to be seasonal. Based on sightings data, during the winter, concentrations of sperm whales are found east and northeast of Cape Hatteras. In the spring, this concentration shifts northward to east of Delaware and Virginia as well as throughout the central portion of the mid-Atlantic Bight and southern portion of

Georges Bank. Their distribution is similar during the summer, except sperm whales are also sighted east and north of Georges Bank as well as on the continental shelf south of New England. During the fall, sperm whales continue to be abundant on the continental shelf south of New England and are found along the edge of the continental shelf in the Mid-Atlantic Bight (see CeTAP 1982; Scott and Sadove 1997). The best considered abundance estimate for sperm whales in the western North Atlantic comes from surveys covering the Gulf of St. Lawrence to Florida suggesting a population of 4,072 (CV=0.36) (Waring *et al*. 2001). Currently, the population trend for this species is undeterminable due to insufficient data.

Although it is not known for certain, sperm whales are believed to live at least 60 years (Rice 1989). Males sexually mature between the ages of 12 and 20 though they may not physically mature until about age 40. Females attain sexual maturity generally around age 9 and are regarded as physically mature at 30 (Würsig *et al*. 2000). Females birth a single calf approximately every four to seven years (Würsig *et al*. 2000). In general, females and immature whales form pods that are almost exclusively confined to warmer waters whereas the adult males can be found traveling to higher latitudes (Reeves and Whitehead 1997 as cited in NMFS 2001). Mature males return to lower latitudes during the winter to breed. Currently it is unknown whether the sperm whales found in the Gulf of Mexico undergo similar seasonal movements. Sperm whales typically prefer deep-water habitats, however, are periodically found in coastal waters (Scott and Sadove 1997). Their occurrence closer to shore is usually associated with the presence of food. Sperm whales prey primarily on large sized squid but also occasionally take octopus and a variety of fish including shark and skate (Leatherwood and Reeves 1983).

Sperm whales were hunted in America from the 17th century through the early 20th century though specific numbers of animals taken are unknown (Townsend 1935 as cited in NMFS 2001). The IWC has estimated nearly a quarter-million sperm whales were killed worldwide from commercial whaling during the 19th century alone and another 700,000 taken from the early 1900's through the early 1980's (NMFS 2001 and references therein). Since the IWC ban on commercial harvesting of sperm whales, human-induced mortality or injury does not appear to be a significant factor impacting the recovery of the species (Perry *et al*. 1999 as cited in NMFS 2001). Due to their more offshore distribution and benthic feeding habits, sperm whales seem less subject to entanglement in fishing gear than some cetacean species. Documented interactions have primarily involved offshore fisheries such as pelagic drift gillnets and longling fisheries, though no interactions between sperm whales and longlines have been recorded in the U.S. Atlantic. (In January 1999, NMFS issued a Final Rule to prohibit the use of driftnets in the North Atlantic swordfish fishery, 50 CFR Part 630). Overall, the fishery-related mortality or serious injury for the western North Atlantic stock is considered to be less than 10% of the Potential Biological Removal level (PBR). PBR is a calculation required under the MMPA which estimates the number of animals that can be removed annually from the population or stock (in addition to natural mortality) while allowing that stock to remain at an optimum sustainable population level (OSP). The estimated PBR for the western North Atlantic sperm whale is 7.0 and 0.8 for the Gulf of Mexico stock (Waring *et al*. 2001). Other impacts known to kill or injury sperm whales include ship strikes and ingestion of foreign material (i.e. fishing line, plastics).

Blue Whale, *Balaenoptera musculus*

Blue whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected by the Marine Mammal Protection Act of 1972 (MMPA). Modern whaling severely depleted the world's stocks of blue whales decreasing their population to only a small fraction of what it was thought to be in the early 20th century. Blue whales were given complete protection in the North Atlantic in 1955 under the International Convention for the Regulation of Whaling though Iceland did not recognize their protected status until 1960 (Sigurjónsson 1988).

Blue whales are the largest of the baleen whales, which instead of teeth, use a series of plates rooted in the upper jaw (made of material similar to that of finger-nails) to strain food from the water. As with most baleen whales, it is thought that blue whales undertake seasonal north/south movements, with summers spent in higher latitudes feeding and winters in lower latitudes, possibly breeding or calving. In the western North Atlantic, blue whales range from the Arctic to the mid-latitudes with only occasional sightings observed in the U.S. Atlantic EEZ during the late summer (CeTAP 1982; Wenzel *et al*. 1988). Records also exist of this species occurring off Florida and in the Gulf of Mexico though their distribution in southern waters remains largely unknown (Yochem and Leatherwood 1985 as cited Waring *et al*. 2001). It has generally been accepted that the North Atlantic consists of two stocks of blue whales (western and eastern) however, stock structure has not been examined through molecular or other appropriate analyses. The U.S. Navy has acoustically tracked blue whales in much of the North Atlantic including subtropical waters north of the West Indies and in deep water east of the U.S. EEZ (Clark 1995 as cited in Waring *et al*. 2001). Evidence from acoustic work has suggested that individual blue whales may range over the entire ocean basin leading some to speculate that they form a single population that breeds at random (NMFS 1998 and references therein). The few population estimates that currently exist for blue whales in the western North Atlantic tend to be specific to particular areas (see NMFS 1998). Mitchell (1974) estimated the entire western North Atlantic population to number in the low hundreds during the late 1960s and 1970s. It's thought that since their protection from commercial hunting, some populations of blue whales have shown signs of recovery while others have not been monitored to the extent of being able to determine their status.

Blue whales are the largest of the cetaceans reaching lengths of over 80 feet in the North Atlantic. Females give birth approximately every two to three years bearing a single calf. Assumed to be a long-lived species, they are thought to attain sexual maturity between 5 and 15 years of age (Mizroch *et al*. 1984; Yochem and Leatherwood 1985 as cited in NMFS 1998). Their diet consists primarily of krill.

Though commercial whaling has had a severe effect on the status of blue whales worldwide, the western North Atlantic population has not been subjected to legal hunting since the 1960s. Today, potential threats are more likely to occur from collisions with vessels, entanglement in fishing gear and habitat degradation in the forms of both noise and chemical pollution. Currently, there are no confirmed records of mortalities or serious injuries from fishery interactions occurring in the U.S. Atlantic EEZ. It is unclear as to whether blue whales are just less prone to becoming entangled or if their large size allows them to break through nets or carry gear away with them. If the latter is the case, there may be undiscovered mortalities resulting from gear-related injuries. The total level of human-caused mortality and serious injury is unknown but believed to be insignificant (Waring *et al*. 2001). The estimated PBR for the western North Atlantic blue whale is 0.6. NMFS has put into effect a Recovery Plan for blue whales that was published in 1998.

Fin whale, *Balaenoptera physalus*

Fin whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). Modern whaling depleted most stocks of fin whales. Commercial hunting in the North Atlantic ended in 1987 though Greenland still conducts an "aboriginal subsistence" hunt allowed under the International Whaling Commission.

The overall distribution pattern of fin whales is complex. They appear to display a less obvious north/south pattern of migration exhibited by other baleen whales. Based on acoustic studies, a general southward "flow pattern" from the Labrador/Newfoundland region south past Bermuda and into the West Indies occurs in the fall (Clark 1995 as cited in NMFS 1998a).

Fin whales are known to occur from the Gulf of Mexico northward to the arctic pack ice (NMFS 1998a and references therein). They are common in the waters of the U.S. Atlantic EEZ primarily from Cape Hatteras northward (Waring *et al*. 2001). For management purposes, NMFS recognizes only a single stock of fin whales in the U.S. waters of the western North Atlantic, though genetic data support the idea of several subpopulations (see Bérubé *et al*. 1998). A survey conducted in 1999 from Georges Bank northward to the Gulf of St. Lawrence, led to an estimate of 2,814 (CV=0.21) individuals for the western North Atlantic population. This however, is considered a conservative estimate due to the extensive range of the fin whale throughout the entire North Atlantic and the uncertainties regarding population structure and exchange between surveyed and un-surveyed areas. To date, there is insufficient information in order to determine population trends.

Fin whales are thought to attain sexual maturity at around 10 years of age or older though it appears that exploited populations can mature as early as age 6 or 7 (Gambell 1985 as cited in NMFS 1998a). The calving interval is estimated to be about 2 years but may be longer in unexploited populations (Agler *et al*. 1993 as cited in NMFS 1998a). Regional distribution of fin whales is most likely influenced by prey availability with krill and small schooling fish such as capelin, *Mallotus villosus*, herring, *Clupea harengus*, and sand lance, *Ammodytes* spp., believed to be their main prey items (NMFS 1998a and references therein).

Aside from the threat of illegal whaling or increased legal whaling, potential threats affecting fin whales include collisions with vessels, entanglement in fishing gear and habitat degradation from chemical and noise pollution. Fin whales are known to have been killed or seriously injured by inshore fishing gear (gillnets and lobster lines) off eastern Canada and the United States (NMFS 1998a). The total level of human-caused mortality or serious injury is unknown, but is considered to be less than 10% of the calculated PBR (4.7) and thus not significant (Waring *et al*. 2001). A draft recovery plan for fin whales is available but the plan has not yet been finalized.

Sei whale, *Balaenoptera borealis*

Sei whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). Sei whales began to be regularly hunted by modern whalers after the populations of larger, more easily taken species (i.e. humpbacks, right whales and gray whales, *Eschrichtius robustus*) had declined. Most stocks of sei whales were also reduced, in some cases drastically, by whaling efforts throughout the 1950's into the early 1970's. International protection for the sei whale began in the 1970's though populations in the North Atlantic continued to be harvested by Iceland until 1986 when the International Whaling Commission's moratorium on commercial hunting in the Northern Hemisphere came into effect.

The sei whale is one of the least well studied of the "great whales". Hence little is known about the distribution and current status for most stocks. They are believed to undertake seasonal north/south movements, with summers spent in higher latitudes feeding and winters in lower latitudes. In the western North Atlantic, it is thought that a large segment of the population is centered in northerly waters, perhaps the Scotian Shelf during the summer feeding season (Mitchell and Chapman 1977 as cited in Waring *et al*. 1999). Their southern range during the spring and summer includes the northern areas of the U.S. Atlantic EEZ (i.e. Gulf of Maine and Georges Bank). Strandings along the northern Gulf of Mexico and in the Greater Antilles, indicate those areas to be the southernmost range for this population (Mead 1977 as cited in Waring *et al*. 1999). The sei whale is generally found in deeper waters though they are known for periodic excursions into more shallow and inshore waters when food is abundant (Payne *et al*. 1990).

Sei whales are not known to be common anywhere in U. S. Atlantic waters (NMFS 1998a). Stock identification in the western North Atlantic remains unclear however, there is some evidence of two stocks consisting of a Nova Scotia stock and a Labrador Sea stock (Mitchell and Chapman 1977 as cited in Waring *et al*. 1999). The Nova Scotia stock is thought to extend along the U. S. coast to at least North Carolina. The total number of sei whales in the U. S. Atlantic EEZ is not known and there are no recent abundance estimates.

Sei whales attain sexual maturity at approximately 8-10 years of age and females are thought to calve every two years or so (Lockyer and Martin 1983 as cited in NMFS 1998a). Their primary food are calanoid copepods and euphausiids (NMFS 1998a and references therein).

Since the cessation of commercial whaling, threats to sei whales in the western North Atlantic appear to be few although do include ship collisions and entanglement in fishing gear. Because of their offshore distribution and overall scarcity in U. S. Atlantic waters, reports of entrapments and entanglements tend to be low. It is unknown whether sei whales are less prone to interact with fishing gear or if they break through or carry the gear away with them causing mortalities that go largely unrecorded. There were no reported fishery-related mortalities or serious injuries observed by NMFS during 1991-1997 however, the total level of human-caused impacts is unknown but thought to be insignificant (Waring *et al*. 1999). PBR for the western North Atlantic sei whale is unknown since there is no minimum estimate of population size however, any fishery-related mortality would be unlawful as there is no recovery plan currently in place.

Humpback whale, *Megaptera noveangliae*

Humpback whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). Because of their nature to aggregate on both summer and winter grounds, often near coasts, humpbacks were relatively easy prey for shore-based whalers. As a result, their populations were severely depleted by the time they achieved protection from commercial hunting in 1966.

Humpback whales utilize the northwestern Atlantic as a feeding ground during the summer with most then migrating to calving and breeding areas in the Caribbean during the winter (Clapham *et al*. 1993; Katona and Beard 1990). A significant number of animals however, are observed in mid- and high-latitude regions in the winter (Swingle *et al*. 1993). Based on sighting and stranding information, it appears that young humpbacks in particular have increased in occurrence along the coasts of Virginia and North Carolina during the winter (Wiley *et al*. 1995). There have also been increased wintertime sightings off the coastal waters further southeast (Waring *et al*. 1999a and references therein). Photographic mark-recapture analyses from the Years of the North Atlantic Humpback (YONAH) project conducted in 1992/1993, gave an ocean-basin-wide estimate of 10,600 individuals (CV=0.067) which to date is regarded as the best available estimate for the North Atlantic. It appears that the humpback whale population is increasing though it is unclear whether this increase is ocean-wide or confined to specific feeding grounds.

Female humpbacks are thought to reach sexual maturity between 4 and 6 years of age whereas males tend to be older attaining sexual maturity between 7 and 15 years (as cited in NMFS 2001). Calving intervals observed for the western North Atlantic are approximately every 2 to 3 years (Clapham and Mayo 1990). Humpback whales are described as opportunistic feeders, foraging on a variety of food items including euphausiids and small schooling fish such as herring, sand lance and mackerel (Paquet *et al*. 1997, Payne *et al*. 1990). In the mid-latitudes during the winter, juvenile humpbacks are also known to eat bay anchovies and menhaden, *Brevoortia tyrannus*.

Although habitat degradation, such as chemical and noise pollution, may be adversely affecting the recovery of humpbacks, the major threats appear to be vessel collisions and entanglements with fishing gear (see Waring *et al*. 2001 for synopsis of mortality/injury). Wiley *et al*. (1995) examining stranding data obtained principally from the mid-Atlantic, found that in the 20 cases where evidence of human impact was discernable, 30% had major injuries possibly caused by a vessel collision and 25% had injuries consistent with entanglement in fishing gear. Presently, there is insufficient information on the North Atlantic population overall to reliably determine population trends. Even though the total level of human-caused mortality or serious injury is not actually known, the total fishery-related mortality and serious injury for this stock is not less than 10% of the calculated PBR (33) and is therefore considered to be significant (Waring *et al*. 1999a). A Recovery Plan is in effect (NMFS 1991).

Northern right whale, *Eubalaena glacialis*

Northern right whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). Hunting is the major reason the western North Atlantic right whale population has declined to less than 300 individuals. Presently, the North Atlantic right whale is considered one of the most critically endangered populations of large whales in the world (Clapham *et al*. 1999 as cited in Waring *et al*. 2001). The species was continually hunted off the east coast of the United States for three centuries possibly reducing its numbers to less than 100 individuals by the time international protection from the League of Nations came into effect in 1935 (see Waring *et al*. 2001 and reference therein). Right whales have been protected from commercial whaling under legislation of the International Whaling Commission since 1949 (NMFS 1991a).

Western North Atlantic right whales occur in the waters off New England and northward to the Bay of Fundy and the Scotian Shelf during the summer (Waring *et al*. 2001). During the winter, a segment of the population, consisting mainly of pregnant females, migrates southward to calving grounds off the coastal waters of the southeastern United States. Right whales use mid-Atlantic waters as a migratory pathway between their summer feeding grounds and winter calving grounds. During the winters of 1999/2000 and 2000/2001, considerable numbers of right whales were recorded in the Charleston, South Carolina area (NMFS 2001). Currently, it remains unclear whether this is typical or reflects a northern expansion of the normal winter range.

Based on photo-identification techniques, the western North Atlantic population size was estimated to be 291 individuals in 1998 (Kraus *et al*. 2000 as cited in Waring *et al*. 2001). This estimate may be low if animals were not photographed and identified or if animals were incorrectly presumed dead due to not being seen for an extended period of time. The population growth rate estimated for the western North Atlantic population during the late 1980's through early 1990's suggested that the stock was slowly recovering (Knowlton *et al*. 1994). However, a review of work conducted in 1999 indicated that the survival rate of the northern right whale had declined during the 1990's (as cited in Waring *et al*. 2001). One factor currently under review for this decline is the apparent increase in the calving interval. The mean calving interval pre-1992 was estimated at 3.67 years. An updated analysis considering data through the 1997/98 season indicated that the mean calving interval had increased to more than 5 years (Kraus *et al*. 2000 as cited in Waring *et al*. 2001). Reasons under consideration for this shift include contaminants, biotoxins, nutrition/food limitation, disease and inbreeding problems.

The primary sources of human-caused mortality and injury of right whales include ship strikes and entanglement in fishing gear. A recent study estimated that 61.6% of right whales show injuries consistent with entanglement in gear while 6.4% exhibited signs of injury from vessel strikes (Hamilton *et al*. 1998). With the small population size and low annual reproductive rate, human-caused mortalities have a greater impact on this species relative to other species. As such, due to the overall decline in the western North Atlantic right whale population, the PBR is set at zero (Waring *et al*. 2001).

Three right whale critical habitats were designated by NMFS (59 FR 28793; June 3, 1994). Two are off New England, Cape Cod/Massachusetts Bay and Great South Channel. The third is off the southeastern coast of the United States [between 31°15' N. latitude (approximately the mouth of the Altamaha River, Georgia) and 30°15' N. latitude (approximately Jacksonville Beach, Florida) extending from the coast out to 15 nautical miles offshore and the coastal waters between 30°15' N. latitude and 28°00' N. (approximately Sebastain Inlet, Florida) from the coast out to 5 miles]. Programs to foster both awareness and mitigate potential problems of anthropogenic injury and mortality to right whales have been implemented in both the northeast and southeast areas. One such program is the Mandatory Ship Reporting System requiring vessels over 300 tons to report information on their location, speed and direction once in a critical habitat. In return they receive information on right whale occurrence and recommendations on measures to avoid collisions with whales. A Recovery Plan was published in 1991 by NMFS and is in effect. A revised plan is due out presently.

Kemp's ridley turtle, *Lepidochelys kempii*

Kemp's ridley turtles are listed as Endangered under the Endangered Species Act of 1973, as amended. Their population has declined since 1947 with the primary cause being attributed to human activities such as egg collection, fishing for juveniles and adults and hunting adults for meat consumption and other products. In addition, Kemp's ridleys have been adversely impacted by high levels of incidental capture by shrimp trawlers (NMFS 2001a). Of all the species of marine turtles, this species has declined to the lowest population level.

Kemp's ridleys occur mainly in coastal areas of the Gulf of Mexico and along the east coast of the U.S. with sightings extending as far north as Cape Cod Bay, Massachusetts NMFS 2001b). Post-hatchlings appear to inhabit pelagic waters of the Gulf and north Atlantic Ocean where they feed on *Sargassum* and associated fauna. Ridleys then move into shallow, nearshore waters after one or two years and forage primarily on crabs. The principal nesting beaches are found in Mexico though a few nest each year in south Texas. The nearshore waters of the Gulf and Atlantic provide important habitat for juveniles. It is believed that the Gulf coast from Port Aransas, Texas through Cedar Key, Florida is primary habitat for subadult ridleys in the northern Gulf of Mexico (Ogren 1988 as cited in NMFS 2001). Preliminary analysis of tagging studies conducted by Texas A&M University, suggests that subadult ridleys remain in warm, shallow, nearshore waters in the northern Gulf until cooler waters push them offshore or south along the Florida coast (NMFS 2001). Sexual maturity is thought to occur between 7-15 years indicating that this species is probably long lived.

In 1995, NMFS established the Turtle Expert Working Group (TEWG) consisting of population biologists, sea turtles scientists and managers. Charged with conducting an assessment of the Kemp's ridley population, the group suggested that the population was in the early stages of recovery, though strandings in some years have increased at rates higher than the estimated rate of population increase (TEWG 1998 as cited in NMFS 2001). Of particular concern was the relatively high numbers of Kemp's ridley carcasses occurring on Texas and Louisiana beaches in recent years. These strandings tended to occur during periods of high levels of shrimping and are believed to have been incidentally taken by the shrimp fishery though other sources of mortality for this species exists in these waters. Overall, the TEWG indicates that the population appears to be increasing through the efforts of nest protection programs implemented by both the U.S.FWS and Mexico's Instituto Nacional de Pesca and the use of Turtle Excluder Devices (TEDs) by the shrimp fishery.

Even though the recovery of this population appears to have begun, caution is still necessary due to a variety of factors. Major threats still exist in the form of incidental capture in both commercial and recreational fisheries. Fishing gear known to have captured turtles includes bottom trawls, gillnets, longline, pound nets, traps used to harvest crabs, whelk, lobster and reef fish, dredge and hook and line (NMFS 2001b). Ingestion of marine debris, dredging and coastal construction, beach development and artificial lighting on nesting beaches are also known to negatively impact turtles. In the Gulf of Mexico, oil spills are also a concern. To further the recovery of the Kemp's ridley turtle population, NMFS joined the cooperative conservation effort at Rancho Nuevo in 1996 whose objective is to protect area nesting females, ensure high hatchling production and facilitate research efforts. Moreover, NMFS has implemented regulations to help reduce incidental capture in the shrimp and summer flounder trawl fishery, longline fisheries, pound net fishery in Chesapeake Bay, Virginia and gillnet fisheries in Pamlico Sound, North Carolina. A Recovery Plan is in effect for the Kemp's ridley turtle (USFWS and NMFS 1992)

Hawksbill turtle, *Eretmochelys imbricata*

Hawksbill turtles are listed as Endangered under the Endangered Species Act of 1973, as amended. Most populations appear to be declining (as much as 80% during the last 100 years) or depleted (Meylan 2001).

Hawksbill turtles occur in tropical and subtropical seas in the Atlantic, Pacific and Indian Oceans. They are widely distributed throughout the Caribbean Sea and western North Atlantic with sightings occasionally occurring as far north as Massachusetts. Hawksbills utilize different habitats during various stages of their life cycle (NMFS 2001c). Post-hatchlings inhabit the pelagic environment, using weedlines that accumulate at convergence points as shelter. After several years at sea, hawksbills head toward coastal waters. Coral reefs are considered the resident foraging habitat for juveniles, sub-adults and adults as they feed primarily on sponges. Ledges and caves are used for resting. Nesting tends to occur on small pocket beaches. A single female may nest 3 to 5 times each season with clutch sizes of up to 250 eggs (Meylan 2001). Females exhibit a high degree of fidelity to their nest sites and genetic studies suggest that nesting populations be treated as separate stocks whereas feeding grounds typically include turtles from multiple nesting populations (Meylan 2001). Age at which hawksbills attain sexual maturity is unknown however, they are slow growing indicating it occurs at a later age.

The following distributional information is from Meylan (2001). The Atlantic coast of Florida is the only area in the U.S. where hawksbill turtles nest on a regular basis however, four nests have been the maximum counted in any year from 1979-2000. Strandings occur along the entire Atlantic coast although the majority are found south of Cape Canaveral. Most strandings involve pelagic-staged turtles that are perhaps dispersing from nesting beaches in the Gulf and Caribbean. Juvenile and adults are also observed along Florida's Atlantic coast but not in large numbers.

Most hawksbill turtles in U. S. waters occur in Puerto Rico and the U.S.V.I. Mona Island. Puerto Rico has the largest known nesting aggregation in the Caribbean Basin with over 500 nests recorded annually during 1997-2000. As such, Mona Island has been designated as a critical habitat for hawksbill turtles and is protected under the administration of the Puerto Rico Department of Natural Resources and Environment. Nesting also occurs in other areas in Puerto Rico though many sites have not been systematically surveyed over a significant period of time. In the U.S.V.I., important nesting sites occur as well. A small, but seemingly static, nesting population has been surveyed since 1987 at Buck Island Reef National Monument off St. Croix. Nesting is also observed elsewhere on St. Croix and the Islands of St. John and St. Thomas. Juvenile and adult hawksbills are commonly found in the waters of the U.S.V.I. Tagging studies have indicated that immature turtles remain resident in these waters for extended periods.

Primary threats to the hawksbill turtle populations along the Atlantic coast include fouling from petroleum products, ingestion of marine debris, loss or degradation of habitat (i. e. beach development and artificial lighting on nesting beaches), boat strikes and capture on hooks or entanglement in fishing gear or other marine debris. In the Gulf, marine pollution (particularly oil) as well as entanglement, habitat loss and boat-related injuries are also issues. The Caribbean populations face similar threats along with incidences of poaching and illegal trade for tortoiseshell and stuffed juvenile hawksbills (NMFS 2001b).

Regulations are in effect to help reduce incidental capture in the shrimp and summer flounder trawl fisheries, longline fisheries, pound net fishery in Chesapeake Bay, Virginia and gillnet fisheries in Pamlico Sound, North Carolina. A recovery plan is in effect (NMFS and USFWS 1993).

Green turtle, *Chelonia mydas*

Green turtles are listed under the Endangered Species Act of 1973, as amended, as threatened throughout its range except for the Florida and Pacific Mexico breeding populations, which are listed as endangered. The greatest cause of this species' decline is attributed to commercial harvest for food as well as products such as jewelry. Incidental catches in commercial shrimp trawlers are also considered to have had an adverse effect of its recovery.

Green turtles are observed in waters extending from Texas to Massachusetts as well as around the U.S.V.I. and Puerto Rico (NMFS 2001b). Important feeding grounds have been identified off both the southwest and southeast coastlines of Florida as well as the Florida Keys. The eastern coast of Florida is also thought to contain primary nesting sites (Ehrhart 1979 as cited in NMFS 2001).

Additional nesting sites are found in the U.S.V.I., Puerto Rico, South and North Carolinas. Hatchlings inhabit the pelagic environment where they are believed to associate with communities of *Sargassum*. After several years, the turtles head to coastal habitats where they forage on sea grasses and macroalgae in shallow bays, lagoons and reefs (Rebel 1974 as cited in NMFS 2001).

Green turtles are slow growing and delay sexual maturity until approximately 25-60 years of age (NMFS 2001b). Their total population size is unknown and determining population trends is difficult due to wide year-to-year fluctuations in numbers of nesting females. Current estimates of females nesting annually on Florida are approximately 700 on average (NMFS2001b).

Major threats affecting this species are similar to threats faced by other marine turtle species and include incidental capture in both commercial and recreational fisheries, ingestion of marine debris, artificial lighting on nesting beaches and coastal development or habitat loss. As with other species, NMFS has implemented regulations to help reduce incidental capture in the shrimp and summer flounder trawl fisheries, longline fisheries, pound net fishery in Chesapeake Bay, Virginia and gillnet fisheries in Pamlico Sound, North Carolina. In the Caribbean, the coastal waters of Culebra Island, Puerto Rico were designated as critical habitat in 1998. NMFS and USFWS have published a Recovery Plan for the Green turtle, which is in effect (NMFS and USFWS 1991).

Loggerhead turtle, *Caretta caretta*

Loggerhead turtles were listed as threatened under the Endangered Species Act of 1973, as amended in July of 1978.

Loggerheads are found in bays, estuaries, lagoons and along continental shelves in temperate, subtropical and tropical waters of the Atlantic, Pacific and Indian Oceans. In the Atlantic, their range includes waters from Newfoundland southward to Argentina. They are considered the most abundant species of sea turtle occurring off U.S. shores.

Loggerhead turtles attain sexual maturity between the ages of 20 and 38 (NMFS 2001b). Females reproduce approximately every 2.5 years and eggs are laid throughout the summer (Richardson and Richardson 1982 as cited in NMFS, SEFSC 2001). The largest known nesting concentrations in the U.S. are along the east coast of Florida. Additional nesting sites occur in Georgia, the Carolinas and the Gulf Coast of Florida. Five nesting subpopulations have been identified in the western North Atlantic through genetic analyses (NMFS 2001b). A northern subpopulation occurs from North Carolina to northeast Florida. South Florida has a second nesting subpopulation, the Florida Panhandle a third and a fourth occurs on the eastern Yucatán Peninsula. The fifth nesting subpopulation occurs on the islands of the Dry Tortugas near Key West Florida. Nesting trends are available for the northern and south Florida subpopulations. Nesting females in Georgia and the Carolinas appear to be stable at best if not declining while numbers for south Florida are thought to be increasing though the most recent evidence indicates that their rate of increase may be slowing (NMFS, SEFSC 2001). These trends are of adult nesting females and may not reflect growth rates for the overall population.

Each nesting assemblage is considered a distinct reproductive population. The sex of loggerhead hatchlings is environmentally determined by the temperature of the nest during incubation (NMFS, SEFSC 2001). In general, warmer temperatures as found in nesting sites near Cape Canaveral, Florida produce more females whereas the cooler temperatures affecting nesting sites in the northern subpopulation produce predominantly males. Since males appear not to exhibit the same degree of site fidelity as nesting females, it is thought that the high proportion of males produced in the northern subpopulation are an important source of males throughout the southeast U.S., making that small subpopulation very important with regard to management decisions.

In the Atlantic, hatchlings head directly offshore and are found associating with *Sargassum* in pelagic driftlines (NMFS 2001b). Loggerheads spend 7 to 13 years in the pelagic environment until reaching a size of approximately 16-20 inches when they move to near-shore and estuarine waters. Once inshore, they inhabit benthic habitats where they feed primarily on invertebrates. Their foraging grounds contain individuals from various nesting colonies from throughout the western North Atlantic (TEWG 2000 as cited in NMFS, SEFSC 2001).

One primary threat to the loggerhead population is incidental capture in fishing gear. Gear known to impact this species includes trawl, gill nets, longline, hook and line, pound nets, long haul seine, channel nets and lobster pots. Conservation efforts on both the state and federal levels have been helpful in mitigating fishery and sea turtle interactions. The requirement to use TEDs by commercial shrimpers in the U.S. Atlantic and Gulf of Mexico, has greatly reduced the mortality of this species in that fishery. Concerns remain however, as evidence suggests that large subadults and adults may not be able to escape through the TEDs currently authorized for use. NMFS has recently proposed modifying the size of the escape opening on TEDs used by shrimp trawlers to allow for larger, benthic immature and adult loggerheads to escape. On the state level, Georgia now requires the use of TEDs in their whelk trawl fishery in state waters and almost all gill netting in the state waters of South Carolina, Georgia, Florida, Louisiana and Texas is prohibited. Entanglement nets are also prohibited in most fisheries managed by the South Atlantic Fishery Management Council. Other management actions have been implemented by NMFS to help reduce incidental takes in pelagic longline fisheries, pound net fishery in Chesapeake Bay, Virginia and gillnet fisheries in Pamlico Sound, North Carolina. Other factors adversely impacting this species include habitat degradation, particularly of nesting habitats as well as ingestion of marine debris and biotoxins. In 1991, NMFS and USFWS have published a Recovery Plan for the loggerhead and it is in effect.

Leatherback turtle, *Dermochelys coriacea*

Leatherback turtles were listed as endangered throughout its range in June of 1970 under the Endangered Species Act of 1973, as amended.

Leatherbacks are largely pelagic and inhabit the open ocean as hatchlings and remain through adulthood. They do, however, move into coastal waters to feed and reproduce. In the Atlantic Ocean, leatherbacks have been observed as far north as Labrador, Canada and as far south as Argentina and South Africa (NMFS, SEFSC 2001 and references therein). Pelagic coelentrates are their major prey items and the movements of leatherbacks appear to be closely associated with their search for food.

Aerial surveys conducted along the western North Atlantic have provided information regarding the seasonal movements of leatherbacks. Large juveniles and adults from the southeastern coast appear to move to the mid-Atlantic in the spring with some individuals continuing further north up to Canadian waters in the summer. During the fall and winter, leatherbacks travel southward or perhaps farther offshore. Movements of smaller juvenile leatherbacks remain unclear, as aerial surveys are limited to observations of larger individuals.

Little is known about the population structure of leatherbacks. The sex ratio for leatherbacks appears to vary with location, season and year (Leslie *et al*. 1996 as cited in NMFS, SEFSC 2001). Males tend to be produced more during wetter, cooler months while females tend to predominate during drier, warmer months. Estimates of the population are done through surveys of nesting females. Despite being a long-lived species, generally living over 30 years, female leatherbacks, in some cases, are thought to attain sexually maturity as early as 3-6 years to 13-14 years (Rhodin 1985; Zug and Porham 1996 as cited in NMFS 2001). They nest approximately every 2-3 years producing 100 or more eggs per clutch. Three primary nesting beaches are known to occur in the U.S. St. Croix, U.S.V.I., Culebra Island, Puerto Rico and along the southeast Florida coast (NMFS 2001b). Nesting females have increased from 20 per year to over 100 in St. Croix (NMFS 2001b). Increases have also been recorded in Florida and Puerto Rico, however, overall nesting populations worldwide have declined (NMFS, SEFSC 2001).

In 1978, the USFWS established a critical habitat for this species in the U.S.V.I. at Sandy Point, St. Croix. A year later, NMFS extended this designation to include the waters around Sandy Point (Bell and Spotila 2001 as cited in NMFS, SEFSC 2001).

As with loggerhead turtles, a variety of fisheries use gear that impacts leatherbacks. Gillnets, longlines, trawls and pot gear are of the most concern. Currently, TEDs authorized for use in the U.S. shrimp industry are generally not capable of excluding adult leatherbacks. Hence, NMFS has recently proposed modifying the size of the escape opening on TEDs used by shrimp trawlers to allow for leatherbacks to escape. In 1995, NMFS in cooperation with several southeastern states implemented the Leatherback Contingency Plan. This plan was developed to help reduce leatherback mortality in shrimp trawls by enabling NMFS to establish leatherback conservation zone regulations which stipulate using weekly aerial surveys to assess turtle concentrations along the coast from Cape Canaveral, Florida to the North Carolina/Virginia border. If concentrations were high (10 turtles/50 nm), then the area was closed to shrimp trawlers not using TEDs modified with the leatherback escape opening. NMFS can also impose emergency measures to further protect the turtles when warranted. In addition, many of the state fishery conservation efforts in place to reduce incidental capture of other sea turtles also have beneficial effects for the leatherback. Other factors impacting this species include illegal harvesting of nesting females and/or their eggs, destruction of nesting habitat and ingesting marine debris. In 1992, NMFS and USFWS published a Recovery Plan for leatherback turtles, which is in effect.

Seabirds

To address on-going concerns regarding seabird and fisheries interactions, the National Marine Fishery Service recently initiated an Interagency Seabird Working Group (ISWG). The group is comprised of representatives from NMFS, USFWS., regional Councils and Department of State. The first meeting of the ISWG was held via video/teleconference January 15, 2002. The new initiative is looking to find practicable and effective solutions to seabird/fishery interactions. The immediate focus is to address issues through the implementation of the *National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries*, however, it is recognized that potential interactions of seabirds and fisheries other than longlines also need to be addressed.

To date, no specific seabird/gear interaction assessments have been conducted for the fisheries managed by the South Atlantic, New England and Mid-Atlantic Councils though incidental takes of seabirds have been recorded by both the Southeast Fisheries Science Center (SEFSC) Pelagic Longline and New England and Mid-Atlantic Gillnet Fisheries Observer Programs.

Due to relatively high incidental takes of seabirds, including the endangered short-tailed Albatross, off the Alaskan coast, the North Pacific Fishery Management Council has taken the lead by instituting seabird regulations for vessels using hook and line gear in groundfish and halibut fisheries off Alaska. At its December 2001 meeting in Anchorage, Alaska, the North Pacific Fishery Management Council recommended changes to the existing regulations for seabird avoidance measures endorsing seabird avoidance measures on all vessels greater than 26 ft LOA using hook and line gear: large vessels (> 55 ft LOA) and also on smaller vessels that were not specifically addressed in the experimental regime of the Washington Sea Grant Program (WSGP) research. The proposed changes were based on results from a cooperative research effort that included fishery scientists from the WSGP, the University of Washington, NOAA Fisheries, US FWS, and the North Pacific Fishery Management Council.

Effects of Actions on Listed Species and Designated Critical Habitats in Action Area

Effects on Large Whales

The FMP specifies allowable gear for dolphin and wahoo in the Atlantic EEZ as longline and hook and line which includes manual, electric or hydraulic rod and reels, bandit gear, handline and spearfishing gear. Pelagic longlines are classified as a Category I fishery under the Marine Mammal Protection Act (MMPA) indicating that the gear is associated with frequent serious injury or mortality of marine mammals. While large whales could become entangled in longlines, federal observers in the Atlantic fishery have not recorded such incidents. As reviewed within the Biological Opinion for the HMS FMP prepared by NMFS (2001), the Atlantic pelagic longline fishery may affect but is not likely to jeopardize the continued existence of the sperm, blue, fin, sei, humpback or northern right whale. Under the HMS final rule (FR 00-19272), effective August 1, 2000, specific actions prohibit pelagic longline fishing in certain areas including the Charleston Bump and the southeastern coast of Florida. The South Atlantic Fishery Management Council understands that if longline vessels redirect their effort to dolphin and wahoo in the HMS closed areas, it may compromise the biological basis and enforceability of the regulations established to reduce bycatch of juvenile highly migratory species. As such, Action 20 of the Dolphin Wahoo FMP prohibits the use of surface and pelagic longline gear for dolphin/wahoo within any “time or area closure” in the South Atlantic Fishery Management Council’s area of jurisdiction that is closed to pelagic gear under the HMS FMP (Florida's east coast and Charleston Bump). These area closures encompass right whale critical habitat as well as surrounding waters where right whales have been sighted during their calving season. This action, therefore, further decreases potential risk of interaction with longline gear to calving/nursing right whales or overwintering humpbacks.

The handline/rod and reel gear fisheries are listed as Category III fisheries under the MMPA due to their low risk of interacting with marine mammals. NMFS has received a few reports of whale entanglements in handline gear, but on further examination of these events, the whales appeared not to have been injured or were able to disentangle themselves. Available information regarding marine mammal interactions with hook and line gear is often anecdotal. Specimens commonly are of stranded animals and consist of individuals with only fragments of gear or line marks on the body thus making it difficult to attribute the gear to a particular fishery. Mortalities of bottlenose dolphins due to ingestion of hooks and/or line have been documented (see Gorzelany 1998; Well *et al* 1998), though, again, particular fisheries could not be determined and the gear most likely had been discarded or was consumed via a fish that had been hooked and broke away with the gear.

Effects on Sea Turtles

To evaluate the effects of the proposed actions on sea turtles, each fishery and specific fishing techniques will be addressed individually.

Longline Fishery

As mentioned earlier, the longline component of the fishery consists of longliners that primarily target highly migratory species but may also catch dolphin and longliners that target dolphin directly. Longline fisheries generally affect sea turtles by entangling or hooking them. Turtles that become entangled risk drowning when they are forcibly submerged or they may incur injuries from the entangling lines. Turtles that are hooked can be injured or killed depending on whether they are hooked externally - generally in the flippers, head or beak - or internally, where the animal has ingested the hook. Because of a turtle's digestive structure, deeply ingested hooks are difficult to remove from a turtle's mouth without seriously injuring it (NMFS 2001). In addition to the immediate effects, entanglement in longline gear can have long-term effects on a turtle's ability to swim, forage, migrate and breed, though these effects are much more difficult to monitor or measure (NMFS 2001).

Sea turtles appear to be attracted to the floats used on longline gear. They may be responding to gelatinous organisms or algae that collects on buoys and buoy lines at or near the surface. An analysis of observer data from the Hawaii based pelagic longline fishery indicated that the proximity of the gangion to a floatline had a strong, significant effect on turtle catch rates (Kleiber 2000, unpublished). For hauls that captured loggerheads, 45% were caught on the hooks nearest a floatline even though those hooks represented only 20% of the total hooks set. The remaining 80% of the gangions set farther from the floatlines accounted for 55% of the loggerhead incidental captures. Results were similar for leatherbacks. It is also possible that this reflects a depth effect, as hooks closest to floatlines are shallower than hooks set farther away and thus first to be encountered.

HMS Longline Fishery

The pelagic longline fishery targeting highly migratory species has been addressed in the Biological Opinion prepared by NMFS (2001) for the HMS FMP. Thus this fishery will not be considered further in this analysis except to summarize the conclusions stated in the Biological Opinion. It was concluded that 1) the Atlantic pelagic longline fishery may adversely affect but is not likely to jeopardize the continued existence of Kemp's ridley, green or hawksbill sea turtles, and 2) continued operation of the Atlantic pelagic longline fishery is likely to jeopardize the continued existence of the leatherback and loggerhead sea turtles. Pelagic longline gear most commonly catches loggerhead and leatherback turtles. Loggerheads are most vulnerable to pelagic longlines during their pelagic, immature stage, which may last from 7 to 13 years whereas leatherbacks are exposed to the pelagic fishery throughout their life cycle (NMFS 2001).

Directed Longline Fishery

The directed longline fishery, though a small component of the dolphin/wahoo fishery, is of concern due to the practice of setting hooks near the surface, which may increase the likelihood of capturing leatherback and loggerhead turtles. Sea turtle mortality associated with the pelagic longline fishery along with the estimated amount of reductions necessary to allow for long-term population increases have been accounted for in population models presented in the HMS FMP (see NMFS 2001). However, mortalities associated with the directed longline fishery have not been incorporated into these models. Any additional mortalities associated with directed longline sets for dolphin need to be fully assessed to ensure this fishery does not pose a significant threat to the northern nesting subpopulation of loggerheads and to leatherbacks. Although the practice of this fishery to haul back immediately increases the chance of caught turtles being released alive, post-release survival estimates are not sufficiently known.

With current restrictions in place regarding time/area closures and the proposed action to establish a 3,000 pound trip limit for dolphin north of 31° N. latitude and a 1,000 pound trip limit for dolphin south of 31° N. in the EEZ southward through the South Atlantic Fishery Management Council's area of jurisdiction, it is unlikely that this fishery will expand. The directed longline fishery has, at times, harvested upwards of 25,000 pounds or more per trip. It is thought that a 3,000 or 1,000 pound trip limit may either drastically reduce or, perhaps, even eliminate this directed effort. An effort reduction along with gear modifications required by NMFS will most likely further reduce the directed longline fishery's impacts on sea turtles.

With regard to management decisions when considering allowable gear types, a study conducted in the Azores longline fishery examined the effects of different styles of hooks on sea turtle captures. Overall, it was shown that gear type and placement could effect the number of incidental captures. One example was the comparison of Standard "J" hooks, Offset "J" hooks and circle hooks with the percentage of turtles hooked in the throat. Circle hooks, which is already fairly standard gear with longliners fishing for dolphin, were correlated with the least amount of turtles hooked in the throat (see NMFS, SEFSC 2001). This study also showed a tendency for more turtles to be caught on hooks closest to buoys; however, there was no significant effect of hook position along the mainline on turtle bycatch.

Hook and Line Fishery

Hook and line gear constitutes the majority of the dolphin and wahoo fishery. Information from observer comments, reports from the public and stranding data from the Atlantic, shows that all species of sea turtles have been impacted by hook and line fisheries (STSSN unpublished data and NMFS public sighting database, Beaufort, North Carolina). Since these data sources are descriptive in nature, consistent information regarding the type of hook and line fishery or targeted species is lacking. Although they do indicate that incidental capture is not uncommon with hook and line gear. As with longlines, sea turtles can interact with hook and line gear by becoming entangled and/or hooked. Turtles that ingest hooks often face the additional risk of needing to be moved to a facility that can surgically remove the hook. There have been recorded instances of turtles not surviving surgery (STSSN unpublished data). With turtles that are too large to be lifted on board a vessel, removal of gear may be difficult if not impossible. Gear left on, such as trailing line from an ingested hook, may pose serious risks to turtle. Researchers from the Mediterranean have described an "accordion effect" which can occur if a turtle swallows monofilament that is still attached to an embedded hook. The intestines, as it attempts to pass the unmoving monofilament line, coils and wraps upon itself usually killing the turtle (as reported in NMFS 2001). Trailing line may also snag on floating or fixed objects further entangling the turtle. Fishermen and observers are generally instructed to clip the line as close to the hook as possible when removal of the hook is not feasible. It appears that many turtles caught in hook and line fisheries are released alive though the condition and status of these turtles after their release remains unknown.

Trolling

Much of the hook and line fishery for dolphin and wahoo throughout the action area is executed by trolling near or through weedlines. The lines are pulled behind both recreational and commercial vessels at speeds varying between 4 to 10 knots. To date, there has not been a report of an incidental capture of a turtle while trolling. Though a potential may exist, the risk is considered to be low due to the speed at which the bait is pulled through the water making it difficult for a turtle to catch.

Casting

The technique of casting into a school of dolphin amid chunks of bait in the water as well as drifting over a school and casting lines directly on to the fish, may present more of a risk for sea turtle captures as the turtle would be more capable of biting the bait. However, since this type of fishing occurs near the surface, a turtle may be more visible and thus avoided. Unfortunately, as mentioned earlier, data sources on hook and line gear and turtle interactions are descriptive in nature making it difficult to quantify the rate of interactions with this or other particular types of hook and line fishing techniques.

Effects on Habitat

Pelagic longlines are thought to have negligible impact on habitat due to the lack of interaction with the benthic environment. The effects of hook and line are currently unknown due to lack of information (Barnette 2001). A minimal impact from these fisheries may occur during the pelagic-stage of sea turtles when they are known to associate with weedlines or rafts of macroalgae such as *Sargassum*. Dolphin are also known to forage on fauna associated with these rafts and weedlines often prompting fishermen to troll through them. In general, the bait used on trolling hooks is thought to be too large for the small turtles to pursue; however, the temporary disturbance of the floating habitat caused by fishermen deploying or retrieving gear, may break or remove cover used by the turtles; thus leaving them vulnerable to predation.

Located within the action area are three right whale critical habitats, which were designated by NMFS on June 3, 1994 (59 FR 28793). Two areas were designated in the northeast off Massachusetts and include portions of Cape Cod and Massachusetts Bays and the Great South Channel. The third area is off the coasts of southern Georgia and northern Florida. Actions that may adversely affect the value of designated critical habitat for the northern right whale are evaluated regardless of whether right whales are present within the critical habitat when adverse effects might occur. Concerns of how proposed actions may diminish the value of the critical habitats include 1) the distribution and relative abundance of gear associated with the fisheries as they pertain to the potential of increasing the risk of entanglements and mortalities, and 2) whether the fishery may diminish the value of the habitat by reducing the availability of right whale prey within the habitat. Since right whales feed primarily on copepods, the latter of the two concerns is highly unlikely. With regard to the former concern, as mentioned earlier, though large whales could become entangled in longlines it is unlikely. In addition, the Biological Opinion prepared for the HMS FMP indicates that the participants in the HMS fisheries, including longliners, generally do not co-occur in time and space with right whales while in these critical habitat areas. This along with the longline closures off the southeastern U. S. further lessen the potential for entanglement risk of longline gear to right whales.

Beneficial Effects

Several actions proposed by the Dolphin Wahoo FMP may prove beneficial in assessing fisheries and their interactions with protected species. Due to the scant information describing the effort and fishing practices of the hook and line fishery and components of the longline fishery, Actions 1-5, which create management units as well as require dealer and/or vessel permits, will allow for the collection of much needed data on the fisheries. In addition, Action 6, which requires fishery information from the Atlantic EEZ be reported to the Atlantic Coastal Cooperative Statistics Program (ACCSP), Recreational Fisheries Information Network and the Commercial Fisheries Information Network, will allow for better analyses and dissemination of data. The ACCSP Coordination Council has recently approved a module that deals with discard bycatch and protected species interactions. This module will be built into the ACCSP statistical system, which will improve reporting. Both quantitative and qualitative data will be collected for commercial and for-hire fisheries. Quantitative data will be collected through a coastwide, at-sea observer program as well as through a voluntary fishermen-reporting system. Recreational fisheries data will be collected through add-ons to existing recreational telephone surveys. Qualitative data will be collected through a number of different sources including sea turtle and marine mammal stranding networks, port agent interviewing and call-in reports.

Cumulative Effects

The event of incidental capture of the listed cetaceans found in the action area is considered rare for longline or hook and line fisheries. Although, other impacts such as disease, vessel strikes, entanglement in other fisheries and habitat degradation due to chemical and noise pollution as well as marine debris may cause adverse impacts on their populations' recovery. This is particularly true for the critically endangered northern right whale (see NMFS 2001for details on cumulative impacts).

To fully assess the recovery of sea turtles, the full range of human and natural phenomena also need to be considered. Hurricanes may have potentially negative effects on the survival of eggs or on nesting habitat itself if the beach is greatly reduced. Human-related activities pose multiple threats. Entanglement in fishing gear other than longlines and hook and line (see NMFS 2001; NMFS, SEFSC 2001 for details). Loss of nesting habitat due to coastal development and impacts on orientation of nesting females as well as just hatched young due to artificial lighting on nesting beaches. Degradation of the marine habitat by chemical pollution and marine debris with the latter being a particular problem for sea turtles, as many types of plastics are perceived as food items. Direct taking of eggs or individual turtles whether legal or illegal. The impacts of many of these activities are under-monitored, particularly on the international level. NMFS has estimated that thousands of sea turtles of all species are incidentally or intentionally caught or killed annually by international activities (NMFS 2001).

Some anthropogenic mortality that contributed to the decline of sea turtles has been mitigated since sea turtles were listed under the ESA. Examples of such include the use of TEDs in shrimp trawlers, reduction or closure of certain fisheries using entangling nets and the prohibition of harvesting eggs and nesting females in the U.S. as well as other areas (for further information of sea turtle impacts see NMFS 2001; NMFS, SEFSC 2001).

Determinations

After reviewing the current status of the listed species known to occur in the action area of the Dolphin Wahoo FMP, and the effects of the continued operation of the fisheries involved as well as the probable cumulative effects, the following conclusions have been formed:

1) certain proposed actions may affect - is not likely to adversely affect - the collection of needed data on the operation and effort of the directed longline and the hook and line fisheries for use in future assessments;

2) continued operation of the directed longline and the hook and line fisheries in the action area may affect - is not likely to adversely affect -the continued existence of Johnson's Seagrass, Shortnose sturgeon, Atlantic salmon, Smalltooth sawfish, American Crocodile and the West Indian Manatee;

3) continued operation of the directed longline and the hook and line fisheries in the action area may affect - is not likely to adversely affect - the continued existence of sperm, blue, fin, sei, humpback, and northern right whales, or Kemp's ridley, Green, Hawksbill turtles;

4) continued operations of the directed longline and the hook and line fisheries in the action area may affect - is likely to adversely affect - the continued existence of the leatherback and loggerhead sea turtles; and

5) continued operations of the directed longline and the hook and line fisheries in the action area are not likely to destroy or adversely modify critical habitat designated for the northern right whale.

Recommendations

1) Based on current data evaluations indicating that specific modifications to fishing methods may reduce the threat of incidental capture to turtles (i. e. modifying the practice of deploying hooks nearer the surface or near floatlines to decrease sea turtle captures in longline gear), provisions should be provided for in future FMPs and any framework to provide flexibility for such modifications.

2) Create provisions to collect information that describes fishing practices, fishing effort as well as bycatch and incidental capture data to better assess potential impacts with protected species.

3) Collect the necessary data to assess the magnitude of recreational fisheries on sea turtles including post-release survival estimates. Sea turtle capture rates by hook and line type gear are qualitative and do not provide a basis for meaningful management recommendations thus reporting requirements for sea turtle interactions should be mandated through existing programs such as ACCSP. On-board observers should be placed on a proportion of trips to confirm reporting rates.

4) Provide public outreach for both commercial and recreational fishermen with regard to protected species and fisheries. Specifically, provide information pertaining to procedures to follow if they have an interaction with a protected species as well as guidelines to release and, if necessary, resuscitate sea turtles.

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Appendix G. Fishing Communities in the South Atlantic Region. (Source: SAFMC Dolphin Wahoo 1999 SAFE).

"4.3.3 Fishing Communities - Identify and define fishing communities

Identifying fishing communities provides a basis for analyzing impacts of management measures on fishing communities rather than on a fishery-wide basis. This would be more relevant in situations where impacts are differential because of the location, level of activity and dependency on fishing, availability of alternative job opportunities, etc. in different fishing communities. This measure would allow fishery managers to obtain information on the impacts of future management measures on different fishing communities. It could make for the formulation of management measures that would minimize impacts on fishing communities that have fewer opportunities to adapt to changes imposed by the measures.

Identification and definition of fishing communities would normally have a positive impact, except that, for the South Atlantic, there are no data collected on fishing communities. National Standard 8 imposes requirements on the council and the fishery management regulatory process that cannot be satisfied given existing data. Current data available do not allow for a meaningful definition of fishing community, moreover, do not provide a measure of dependence upon fishing and will not contribute to useful impact analysis.

At its March meeting, the Gulf of Mexico Fishery Management Council's Socio-economic Panel recommended that further research be initiated and funded by National Marine Fisheries Service as soon as possible to aid in the identification and definition of fishing communities in the Southeast. The panel also recommended the scope of this problem be addressed at a national level, such that impacts upon fishing communities can be analyzed across regions as well as within. A key area for expanded research is ethnographic and survey research to identify, not only communities, but also those who provide supporting services to the economy and culture of fishing communities. Especially important in the Southeast is the need to provide a realistic portrayal of recreational fishing, diving, and eco-tourism and their importance to a fishing community.

The Council concluded incorporating all available information at this time would meet the mandates of the recent Magnuson-Stevens Act amendments relative to fishing communities.

With the addition of National Standard 8, FMPs must now identify and consider the impacts upon fishing communities to assure their sustainable participation and minimize adverse economic impacts [MSFCMA section 301 (a) (8)].

The proposed guidelines for this new standard state: *"... fishing communities are considered geographic areas encompassing a specific locale where residents are dependent on fishery resources or are engaged in the harvesting or processing of those resources. The geographic area is not necessarily limited to the boundaries of a particular city or town. No minimum size for a community is specified, and the degree to which the community is 'substantially engaged in' or 'substantially dependent on' the fishery resources must be defined within the context of the geographical area of the FMP. Those residents in the area engaged in the fisheries include not only those actively working in the harvesting or processing sectors, but also ``fishery-support services or industries,'' such as boat yards, ice suppliers, or tackle shops, and other fishery-dependent industries, such as ecotourism, marine education, and recreational diving."* [Federal Register Volume 62, Number 149 (August 4, 1997)]

"*The term 'sustained participation' does not mandate maintenance of any particular level or distribution of participation in one or more fisheries or fishing activities. Changes are inevitable in fisheries, whether they relate to species targeted, gear utilized, or the mix of seasonal fisheries during the year. This standard implies the maintenance of continued access to fishery resources in general by the community. As a result, national standard 8 does not ensure that fishermen would be* *able to continue to use a particular gear type, to target a particular species, or to fish during a particular time of the year."* [Federal Register Volume 62, Number 149 (August 4, 1997)]

"*The term 'fishing community' means a community that is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew, and fish processors that are based in such communities. A fishing community is a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries-dependent services and industries (for example, boatyards, ice suppliers, tackle shops)."* [Federal Register Volume 62, Number 149 (August 4, 1997)]

In order to determine a community's "substantial dependence" or "sustained participation" on fishing, those communities must first be identified. Presently, the NMFS has not identified fishing communities, nor their dependence upon fishing in the South Atlantic. Moreover, there are no ongoing data collection programs to gather the necessary information that would allow for the identification of fishing communities in the South Atlantic or other regions. Also, there are no future plans to implement any such data collection program that would determine dependence upon fishing in order to provide the Councils with important information necessary for social and economic impact analysis of fishing communities. This leaves the councils with existing data collected through other agencies, not always specific to fisheries management, i.e., census data, regional economic census, and previous research on specific fisheries. Although this data can be useful, it is often not specific enough to identify or provide a clear representation of a community and its dependence upon fishing. One reason for this difficulty is that fishermen in a specific fishery often do not reside within one particular municipality that can easily be identified as a fishing community or one that is substantially dependent upon fishing. Also, that information is often not provided at the municipality level, but more often at the county level.

Commercial fishermen may have a domicile (home) in one community and dock their boat in another. They may sell their fish in either place or an entirely different location. Recreational fishermen often do not live on the coast, but drive from inland counties and may launch their boats or fish from several different sites. For these reasons, identifying a "fishing community" becomes problematic in that such a community does not fit the normal geographic boundaries or fall within the metes and bounds that would surround a normal incorporated municipality.

The impacts of fisheries management may be minimal in a single community, but, when taken overall may be substantial to an entire county or several county area. Those same measures may have a small impact on a large metropolitan area, but, to a neighborhood where most fishing families live or most fishing activity originates it could be substantial. Therefore, a "fishing community" may encompass a single municipality, a county, several counties or one neighborhood within a major metropolitan area depending upon a variety of demographic, social, economic and ecological factors that one must consider.

One important circumstance to consider when assessing the impacts upon fishing communities is the difference between rural and urban areas, as many fishing communities exist in rural areas on the Southeast coast. There are several ways in which rural areas differ from the more urban or metropolitan as illustrated in *Understanding Rural America* (ERS-USDA, 1993). Rural areas have consistently lagged behind urban areas with respect to real earnings per job and education levels. Rural areas have also seen a rise in subgroups who are prone to economic disadvantage--families headed by single mothers and minorities. However, these differences vary across the country and are influenced by several factors, one of which is the availability of natural resources. In order to explain and examine some of these differences, counties within the U.S. have been classified as either metropolitan or non-metropolitan. A further subdivision of non-metro counties provides a more clear understanding into each subtype's dependence upon certain economic specialization and the importance of those differences to the residents of those counties (ERS-USDA, 1993). The following classification system may also suggest a possible method for defining an area's dependence upon fishing using the appropriate criteria.

Six types of non-metro counties have been classified, three of which are based upon economic specialization - farming, manufacturing and services. The other three county classifications are based upon their relevance to policy -- retirement-destination; Federal lands; and persistent poverty. Using earned income as a measure of dependence, the classification for counties based upon economic specialization is as follows:

Farming counties - 20% or more earned income from farming
Manufacturing - 30% or more earned income from manufacturing
Services - 50% or more earned income from services industries

Those counties whose classification is based upon economic specialization are mutually exclusive; the other three classification types are not mutually exclusive (ERS-USDA, 1993).

This type of classification system, based upon a percentage of earned income or other measure, might be used to determine a community, county or region's dependence upon fishing. However, like farming counties, those dependent upon fishing have likely seen a decline in the dependence upon fishing over time. This is probably due to significant increases in the population of coastal areas since the 1970's. Much of the population growth has been in the form of immigration of people 60 and older who seek coastal areas for retirement destinations. The increase in this population sector, in turn, brings a greater dependence upon service industries. Choosing such a measure of dependence is not possible at this time and would have to be developed through further analysis and/or research.

Griffith and Dyer developed a typology of fishing community dependence for the Northeast Multi-species Groundfish Fishery (MGF) (Aguirre, 1996). In that typology, they identified critical indicators of dependence which included specific physical-cultural and general social-geographic indicators, i.e., number of repair/supply facilities; number of fish dealers/processors; presence of religious art/architecture dedicated to fishing; presence of secular art/architecture dedicated to fishing; number of MGF permits; and number of MGF vessels. Using previous results and supplemental research of their own, they were able to develop a fishery dependence index score for the five primary ports in the MGF.

From their research Griffith and Dyer were able to document five variables which best predicted dependence upon the MGF:

1. Relative isolation or integration of fishers into alternative economic sectors, including political participation. To what extent have the fleets involved in the MGF enclaved themselves from other parts of the local political economy or other fisheries? How much have the MGF fleets become, similar to an ethnic enclave, closed communities?

2. Vessel types within the port's fishery. Is there a predominance of large vessels or small vessels, or a mix of small, medium, and large?

3. Degree of specialization. To what extent do fishers move among different fisheries? Clearly, those fishers who would have difficulty moving into alternative fisheries or modifying their vessels with alternative gears are more dependent on the MGF than those who have histories of moving among several fisheries in an opportunistic fashion.

4. Percentage of population involved in fishery or fishery-related industries. Those communities where between five and ten percent of the population are directly employed in MGF fishing or fishing-related industries are more dependent on the MGF than those where fewer than five percent are so employed.

5. Competition and conflict within the port, between different components of the MGF. Extensive competition and conflict between fishers within the same port--as well as between different actors in the MGF, such as boat owners and captains--seem to be associated with intensive fishing effort and consequent high levels of dependence on the MGF. In this case, dependence may have a strong perceptual dimension, with fishers perceiving the resources they are harvesting to be scarce and that one fleet's gain is another fleet's loss.

It is important to understand that these factors are appropriate for the MGF and are not necessarily the best predictors for all fishing communities. Fisheries in the Southeast will differ markedly from those in other regions of the country, especially with regard to their integration into other economies and notably the tourist economy. Recreational fishing is an integral part of the tourism and service economy that has developed for coastal communities in the South Atlantic. For these communities, dependence upon fishing will undoubtedly be tied to commercial and recreational fishing and their associated businesses. Therefore, it is important for fishery dependence models to be developed specifically for the South Atlantic.

Griffith and Dyer (Aguirre 1996) also discuss their description of fishing communities as it relates to the term Natural Resource Community (NRC). Dyer et. al define a NRC as "a population of individuals living within a bounded area whose primary cultural existence is based upon the utilization of renewable natural resources" (1992:106). Natural Resource Communities possess an elementary connection between biological cycles within the physical environment and socio-economic interactions within the community. An adaptation to working on the water by fishermen has important implications for the community as a whole because of the necessary support activities that take place on land, i.e., net hanging & mending; fish handling & preparation; boat building & repair. This important tie to the physical environment not only dictates occupational participation, but structures community interaction and defines social values for those living in Natural Resource Communities. While fishing communities in the MGF are not bounded or set apart from the larger community in which they reside, they still manifest certain recognizable features that would classify them as NRCs (Aguirre 1996). Fishing communities in the South Atlantic will also show signs of being integrated into the larger economy, but may still maintain certain vestiges of an NRC. Fishermen in the South Atlantic, like those in the Northeast MGF, will not likely see their ecological systems being closed, but affected by a host of other forces, both globally and locally. Far more detailed research will need to be conducted among South Atlantic fishing communities to determine changes in integration of the larger economy. One of the most likely changes will be an increasing dependence upon the service sectors as recreational fishing and other recreational activities play an increasing role in the economies of coastal communities. While there will continue to be a connection between the social and physical environments, the nature of that interaction will undoubtedly change.

At this time there is insufficient data to completely identify and define fishing communities in the South Atlantic. The following description of fishing communities provides information to explore ways of defining fishing communities that range from geographical regions to a well bounded municipality. With varied levels of research or data available for each state, descriptions of fishing communities will depend upon the amount of data available and the specific nature and timeliness of that data. In some cases, it may be possible to find a municipality that will clearly fit a definition of fishing community and meet a criterion for dependence upon fishing. In others, it may be a series of communities or counties designated a "fishing community" or possibly a particular sector of a large metropolitan area.

Readily available data will be discussed to allow for public input on the best way to identify fishing communities and determine their dependence upon fishing. Following the discussion of fishing communities in the South Atlantic a discussion of data needs and format will provide possible directions for data collection and analysis. The Council welcomes comments on all aspects of incorporating this new national standard, in order to devise a classification system which will assist in assessing the impacts of fishery management upon fishing communities.

4.3.3.1.1 South Atlantic Fishing Communities

According to NMFS, South Atlantic commercial fishermen have harvested well over 250,000 pounds of seafood in each of the years 1995 and 1996 (Table 1). Those landings have represented over $200,000,000 in harvest value. The value of those landings can become even greater once it diffuses throughout South Atlantic fishing communities as it provides employment and other benefits to other sectors within each community's economic base.

Table 1. U.S. Domestic Commercial Fishing Landings by Region, 1995 and 1996. Source Fisheries of the United States, 1996.

	1995		1996	
Region	**Thousand pounds**	**Thousand dollars**	**Thousand pounds**	**Thousand dollars**
New England	592,665	580,957	641,821	564,169
Middle Atlantic	240,413	179,747	241,936	181,869
Chesapeake	845,632	174,229	728,830	158,736
South Atlantic	**277,035**	**238,112**	**268,990**	**209,407**
Gulf of Mexico	1,464,718	724,619	1,496,875	680,304

Commercial seafood landings also represent other forms of expenditure which have an impact upon fishing communities, such as: fuel, gear, groceries, etc. Support industries like, gas stations, tackle shops, grocery stores all have an investment in the harvesting capability of the local fishing fleet.

As with commercial fishing, recreational fishing activity will also contribute to the economic base of a fishing community as fishermen buy fuel, bait, tackle and food & beverage for fishing trips. Figure 1 demonstrates an increasing trend in recreational fishing trips for most South Atlantic states, but, also substantial variation in the number of trips over time. Such variation can mean significant economic impacts for those communities that rely upon recreational fishing.

South Atlantic fishing communities will depend upon both recreational fishing and commercial fishing for determining the importance of fishing to their economic base. The supporting role of associated businesses will also need to be incorporated into any measure of dependence. Such businesses as: seafood dealers and processors, marinas, gas stations, bait and tackle shops, dive shops, trucking firms, restaurants and many others, all have some role in determining dependence upon fishing. Unfortunately, data that is robust and/or specific enough does not exist to include in such a determination.

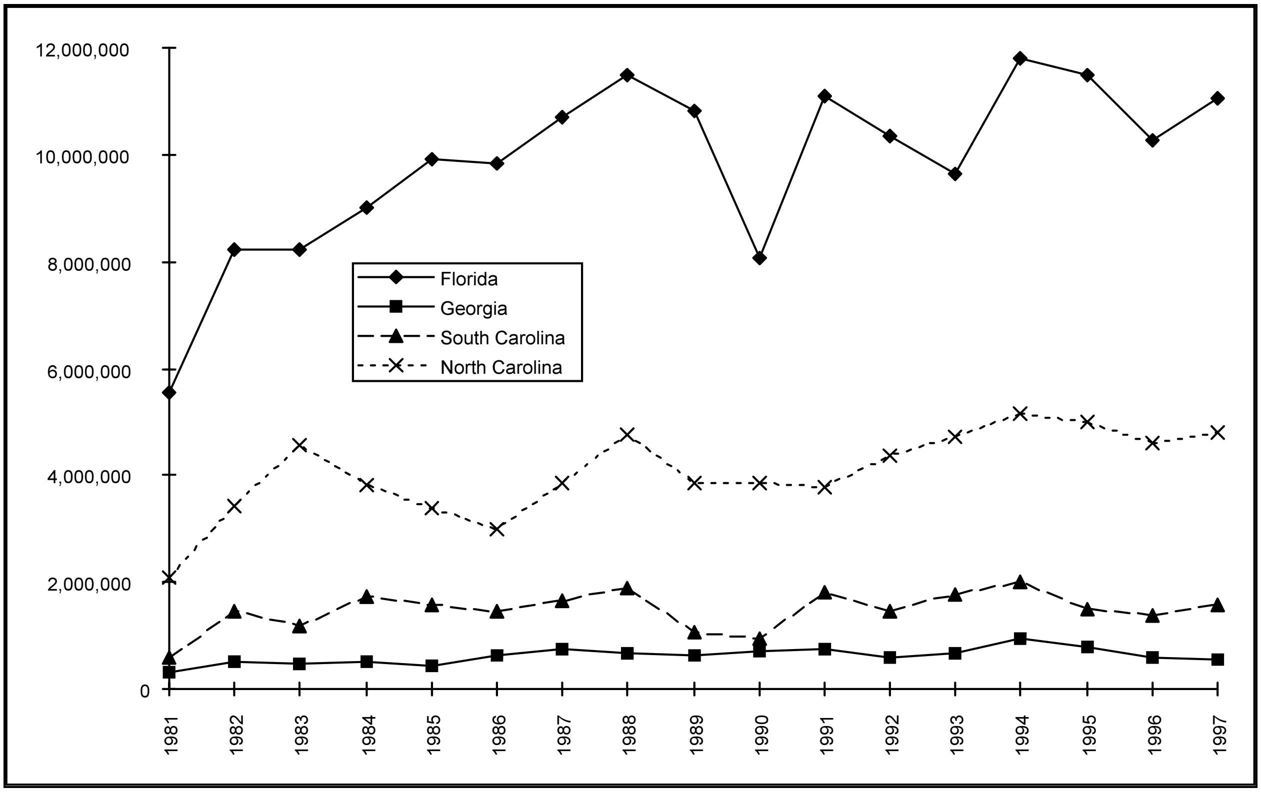

Figure 1. Estimated Number of Marine Recreational Fishing Trips by State and Year for the South Atlantic. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics and Economics Division.

To identify fishing communities in the South Atlantic one might begin with the National Oceanic and Atmospheric Administrations publication *Fisheries of the United States* (1996). Among the various statistics listed are commercial landings of major U.S. ports. These ports could be considered to be substantially dependent upon fishing. Table 2 lists the major ports for the South Atlantic in 1996 and 1995 for quantity and value of landings. Some ports are listed as individual communities while others are a combination of several communities over a limited geographical range. This characterization may be useful as we attempt to further delineate fishing communities in each state. Other sources of information helpful in defining fishing communities include the United States Census and Bureau of Economic Research, which include economic information for many areas of the U.S.

Table 2. Quantity, Value and Rank of Commercial Landings for South Atlantic Ports among Major U.S. Ports Source: Fisheries of the United States, 1996.

Port	1995 Quantity*	1995 Rank	1995 Value*	1995 Rank	1996 Quantity*	1996 Rank	1996 Value*	1996 Rank
Key West	23.4	32	66.7	5	23.7	37	62.8	4
Beaufort-Morehead City, NC	87.0	16	35.0	15	75.4	18	20.3	34
Wanchese-Stumpy Point, NC	39.0	25	25.0	24	43.4	24	24.6	27
Charleston-Mt.Pleasant, SC	11.0	58	19.0	32	- - -	- -	- - -	- -
Cape Canaveral, FL	10.1	- -	16.9	35	21.2	43	17.7	42
Darien-Bellville, GA	- - -	- -	11.0	50	- - -	- -	- - -	- -
Beaufort, SC	- - -	- -	11.0	51	- - -	- -	- - -	- -
Englehard-Swanquarter, NC	11.0	58	- - -	- -	15.0	50	- - -	- -
Oriental-Vandemere, NC	9.0	- -	10.0	- -	14.0	53	13.3	50
Bellhaven-Washington, NC	- - -	- -	6.0	- -	- - -	- -	11.5	58

*Value and quantity are in millions of dollars and pounds respectively.

4.3.3.1.2 North Carolina

The 1990 Census of Population and Housing provides the following information for North Carolina regarding individuals who reported their occupation as fisher in Table 3. This data will likely include those individuals who commercially fish fresh water areas and others who are not impacted by fisheries management of marine fisheries at the council level. This information does provide data for comparison and could help set parameters for a measure of dependency upon fishing. It is not recommended that these figures be used to determine dependency upon fishing, however. The 1990 Census classifies year-round full-time workers as all persons 16 years old and over who usually worked 35 hours or more per week for 50 to 52 weeks in 1989.

Table 3. Number of Fishers and Mean Annual Income for North Carolina in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of fishers			
Male	989	1,271	2,260
Female	47	105	152
Total	1,036	1,376	2,412
Mean Annual Income ($)			
Male	16,315	13,069	14,489
Female	11,518	4,489	6,662
Total	16,097	12,414	13,996

The 1990 Census also provides the following information for North Carolina regarding individuals who reported their occupation as captain of a fishing vessel in Table 4. It is interesting to note that there were no females listed as captain of fishing vessels. This concurs with the much of the research on the occupation of fishing which finds very few women in this role. Although women often play an important role in the fishing operation, they are rarely in the position of captain of fishing vessels.

Table 4. Number of Captains of Fishing Vessels and other officers and Mean Annual Income for North Carolina in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of Captains			
Male	102	141	243
Female	0	0	0
Total	102	141	243
Mean Annual Income ($)			
Male	26,917	33,640	30,818
Female	0	0	0
Total	26,917	33,640	30,818

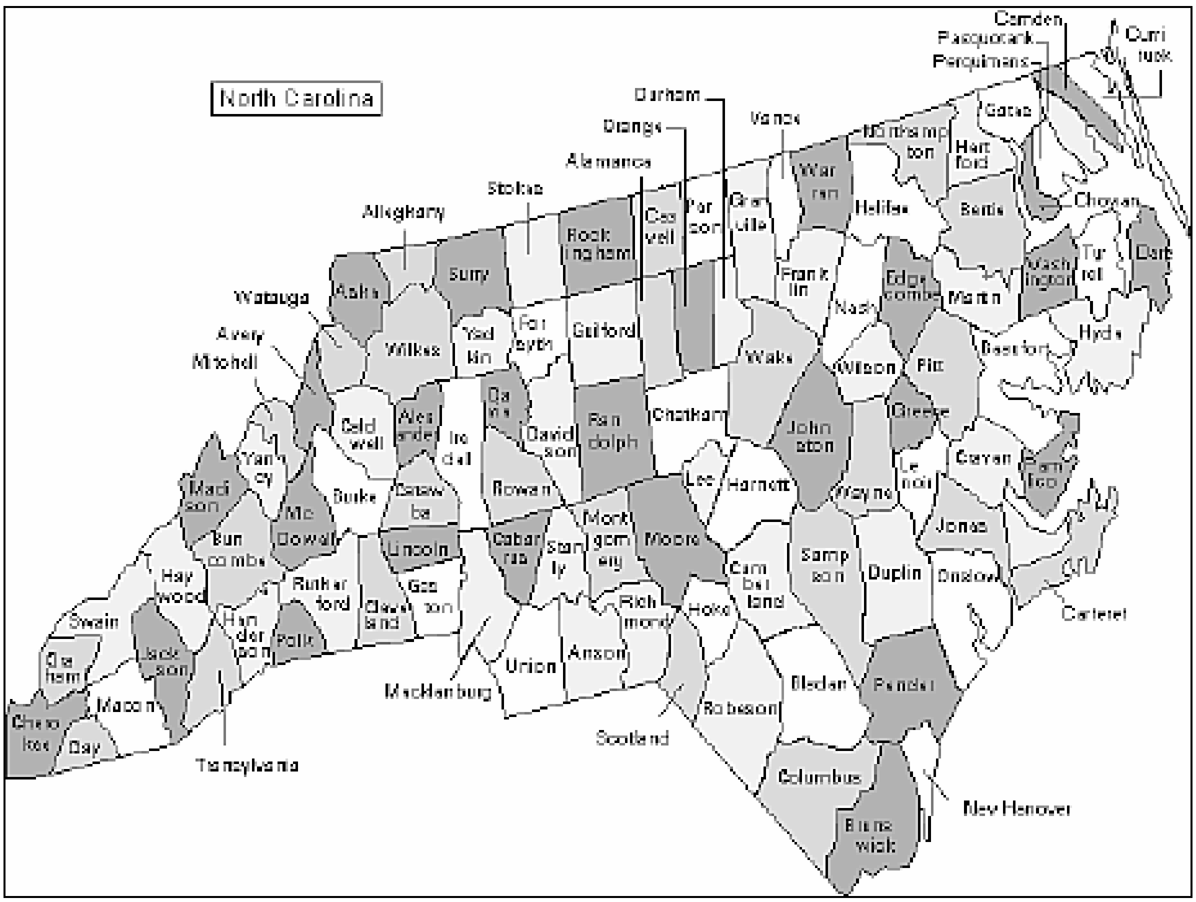

Figure 2. North Carolina Counties. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Johnson and Orbach (1996) have divided North Carolina into six areas for their research on effort management of North Carolina commercial fisheries. Those areas were determined to be distinct with regard to species/gear combinations in addition to sociological, ecological and environmental differences. The areas defined are as follows:

Area 1: Albermarle Area - Currituck, Camden, Pasquotank, Perquimans, Chowan, Bertie, Washington, and Tyrell Counties.

Area 2: Dare County

Area 3: Southern Area - Brunswick, Pender, New Hanover, and Onslow Counties
Area 4: Pamlico Area - Craven, Pamlico, Beaufort, and Hyde Counties.
Area 5: Carteret County
Area 6: Inland Counties.

Area 1: Albermarle Area

The Albermarle area includes the following counties: Currituck, Camden, Pasquotank, Perquimans, Chowan, Bertie, Washington and Tyrell. Johnson and Orbach (1997) found that commercial fishermen in this area had two primary gear types, pots and gill nets. They also concluded that fishermen here move in and out of gill netting on an annual basis.

Table 5. Population and Economic Information for Counties included in Area 1. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 1-County		1993	1994	1995
Bertie	Population	20,631	20,665	20,745
	Personal Income (Thousands of $)	291,226	303,292	328,227
	Per Capita Pers Income ($)	14,116	14,677	15,822
	Personal Income Fishing (Thousands of $)	71	75	84
Camden	Population	6,211	6,370	6,399
	Personal Income (Thousands of $)	92,875	100,012	105,636
	Per Capita Pers Income ($)	14,953	15,700	16,508
	Personal Income Fishing (Thousands of $)	0	0	0
Chowan	Population	13,815	13,909	13,958
	Personal Income (Thousands of $)	226,563	234,453	247,428
	Per Capita Pers Income ($)	16,400	16,856	17,727
	Personal Income Fishing (Thousands of $)	128	134	151
Currituck	Population	15,215	15,831	16,285
	Personal Income (Thousands of $)	251,885	269,871	291,055
	Per Capita Pers Income ($)	16,555	17,047	17,873
	Personal Income Fishing (Thousands of $)	358	376	423
Pasquotank	Population	33,220	33,488	33,759
	Personal Income (Thousands of $)	510,623	534,860	574,433
	Per Capita Pers Income ($)	15,371	15,972	17,016
	Personal Income Fishing (Thousands of $)	- - - -	- - - -	- - - -
Perquimans	Population	10,644	10,692	10,737
	Personal Income (Thousands of $)	148,365	162,627	160,912
	Per Capita Pers Income ($)	13,939	15,210	14,987
	Personal Income Fishing (Thousands of $)	- - - -	0	- - - -
Tyrell	Population	3,918	3,875	3,846
	Personal Income (Thousands of $)	56,056	58,138	52,738
	Per Capita Pers Income ($)	14,307	15,003	13,712
	Personal Income Fishing (Thousands of $)	476	500	562
Washington	Population	14,136	14,276	14,138
	Personal Income (Thousands of $)	220,429	229,038	238,124
	Per Capita Pers Income ($)	15,593	16,044	16,843
	Personal Income Fishing (Thousands of $)	225	236	266

Using multidimensional scaling, Johnson and Orbach were able to examine the spatial relationship of various types of fishing in each area. For Area 1, crab potting was the most central fishery. In other words most fishermen in the area do some crab potting. Referring to cliques, they found that for this area fishermen who peeler pot, eel pot, crab pot and gill net flounder differ from those that long haul. Fishermen that long haul will crab pot and gill net flounder but do not engage in peeler pots or eel pots.

In examining the categories which would include fishermen for Area 1 (Table 6) there seems to be no trend regarding either those in Farm/Fish/Forest occupations or the Agriculture, Fishing, Mining Industries. There are both increases and decreases in the number of those within each categories from 1970 to 1990 which varies by county.

Table 6. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for North Carolina Coastal Counties included in Area 1 for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	**Occupation/Industry**	**1970**	**1980**	**1990**
Bertie County	Farm/Fish/Forest	923	1035	839
	Agri.,Fishing,Mining	1050	1038	884
Camden County	Farm/Fish/Forest	203	220	114
	Agri.,Fishing,Mining	220	181	137
Chatham County	Farm/Fish/Forest	740	904	832
	Agri.,Fishing,Mining	927	934	1286
Currituck County	Farm/Fish/Forest	194	247	316
	Agri.,Fishing,Mining	215	296	309
Pasquotank County	Farm/Fish/Forest	444	491	469
	Agri.,Fishing,Mining	552	478	508
Perquimans County	Farm/Fish/Forest	417	513	299
	Agri.,Fishing,Mining	445	524	316
Tyrrell County	Farm/Fish/Forest	197	249	208
	Agri.,Fishing,Mining	225	273	233
Washington County	Farm/Fish/Forest	408	511	551
	Agri.,Fishing,Mining	462	557	526

Area 2 : Dare County

Within Dare county the following communities have been described through recent research of the snapper grouper fishery and might be considered fishing communities: Manns Harbor, Manteo, Wanchese, Hatteras, Stumpy Point (Iverson 1997). Johnson and Orbach (1997) found that commercial fishermen in this area had two primary gear types, pots and gill nets. In their analysis of fishery networks for Area 2 they again found crab pots to be central. Another interesting difference revealed was that fishermen who shrimp trawl in this area will gillnet for sharks but do not engage in crab potting.

Dare County shows a higher personal income from fishing over the three years listed (Table 7) than most other coastal counties in North Carolina.

Table 7. Population and Economic Information for Counties included in Area 2. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 2				
County		**1993**	**1994**	**1995**
Dare				
	Population	24,300	25,106	26,074
	Personal Income (Thousands of $)	429,564	465,011	502,474
	Per Capita Pers Income ($)	17,678	18,522	19,271
	Personal Income Fishing (Thousands of $)	5,426	5,688	6,392

Dare County (Table 8) shows a general increase in the number of individuals in the listed occupations and industries over the twenty years from 1970 to 1990.

Table 8. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for Dare County (Area 2) for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Dare County	Farm/Fish/Forest	11	376	637
	Agri.,Fishing,Mining	181	446	655

Snapper Grouper Fishing

Most of the snapper grouper permit holders in Area 2 work out of Hatteras and only a small portion of their annual commercial fishing activity is devoted to targeting snapper grouper species. Black sea bass, snowy grouper, and blueline tilefish are the most frequently targeted species by commercial snapper grouper fishermen from this area. Surface longlining for tuna and swordfish is apparently the most productive and profitable style of commercial fishing in the area, and the small towns of Manteo and Wanchese serve as refuge for a large number of both local and non-local longlining boats (Iverson, 1997).

Area 3: Southern Area

The Southern Area includes the following counties and communities (in parenthesis): Brunswick (Southport). Pender, New Hanover, Onslow (Sneads Ferry). Johnson and Orbach (1997) found that commercial fishermen in this area had four primary gear types: hook-and-line, gill net, hand harvest of shellfish, and trawling. Pot fishing was classified as secondary gear but they report that increasing usage over time could possibly make it a primary gear. It is interesting to note that they also reported that pot fishing showed an increase in all five areas over time. Area 3 showed much more complexity in annual rounds of fishing than Areas 1 or 2 with shrimp trawling, hand clamming and crab potting all central to the network (Johnson and Orbach 1997).

Table 9. Population and Economic Information for Counties included in Area 3. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 3				
County		**1993**	**1994**	**1995**
Brunswick	Population	56,350	58,386	60,697
	Personal Income (Thousands of $)	878,453	941,247	1,024,954
	Per Capita Pers Income ($)	15,589	16,121	16,886
	Personal Income Fishing (Thousands of $)	1,595	1,674	1,885
Pender	Population	32,554	33,894	33,759
	Personal Income (Thousands of $)	510,623	534,860	574,433
	Per Capita Pers Income ($)	15,681	16,341	17,253
	Personal Income Fishing (Thousands of $)	- - - -	- - - -	- - - -
New Hanover	Population	131,091	135,317	139,906
	Personal Income (Thousands of $)	2,620,539	2,800,024	3,036,665
	Per Capita Pers Income ($)	19,990	20,692	21,705
	Personal Income Fishing (Thousands of $)	- - - -	- - - -	693
Onslow	Population	145,638	144,951	144,259
	Personal Income (Thousands of $)	1,962,312	2,030,075	2,149,074
	Per Capita Pers Income ($)	13,474	14,005	14,897
	Personal Income Fishing (Thousands of $)	667	700	787

Counties included in Area 3 (Table 10.) show a general increase in numbers of individuals within the selected occupations and industries, with the exception of Pender County which shows a decline from 1970-1990.

Table 10. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for North Carolina Coastal Counties included in Area 3 for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database.

County	Occupation/Industry	1970	1980	1990
Brunswick County	Farm/Fish/Forest	370	668	1028
	Agri.,Fishing,Mining	505	645	971
Pender County	Farm/Fish/Forest	772	562	627
	Agri.,Fishing,Mining	892	669	690
New Hanover County	Farm/Fish/Forest	289	550	782
	Agri.,Fishing,Mining	564	615	984
Onslow County	Farm/Fish/Forest	754	869	996
	Agri.,Fishing,Mining	906	800	987

Snapper Grouper Fishing

For Area 3, the small community of Sneads Ferry, is unique in that the majority of the commercial reef fishermen fish with sea bass pots. According to the 1993 federal permit list for the South Atlantic region, there were 58 permit holders who indicated that sea bass pots were their primary gear type. Of those, 13 permit holders worked out of Sneads Ferry (Iverson, 1997). Overall, 72% of fishermen using sea bass pots as their primary gear work out of home ports in North Carolina.

Area 4: Pamlico Area.

The Pamlico area includes these counties and communities (in parenthesis): Craven, Pamlico (Vandemere, Oriental), Beaufort (Bellhaven, Washington), Hyde (Ocracoke, Swanquarter, Englehard). Johnson and Orbach (1997) found that commercial fishermen in this area had three primary gear types, pots, gill nets, and trawls. In terms of annual fishing rounds Area 4 is the simplest to understand where two strategies are employed: gill netting and crab potting or trawling and crab potting. They go on to note that this simple strategy may signify few choices for fishermen in this area in the case of environmental or regulatory change (Johnson and Orbach 1997). Possible fishing communities within Area 4 might be: Vandemere and Oriental.

Pamlico county had the highest personal income from fishing for Area 4 from 1993 to 1995 with a steady increase over those three years (Table 11). Hyde county followed with Beaufort next; both showing an increase over time. For most counties in Area 4 (Table 12) the general trend seems to be an increase from 1970 to 1980 and then a decrease from 1980 to 1990 within these occupation and industry categories. Beaufort County shows an overall decrease from 1970-1990.

Table 11. Population and Economic Information for Counties included in Area 4. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 4				
County		**1993**	**1994**	**1995**
Craven				
	Population	83,595	83,851	85,163
	Personal Income (Thousands of $)	1,450,296	1,508,353	1,626,657
	Per Capita Pers Income ($)	17,349	17,988	19,101
	Personal Income Fishing (Thousands of $)	386	405	- - - -
Pamlico				
	Population	11,772	11,948	12,064
	Personal Income (Thousands of $)	179,384	186,131	199,576
	Per Capita Pers Income ($)	15,238	15,578	16,543
	Personal Income Fishing (Thousands of $)	2,714	2,851	3,211
Beaufort				
	Population	43,446	43,815	43,998
	Personal Income (Thousands of $)	674,788	711,961	756,048
	Per Capita Pers Income ($)	15,532	16,249	17,184
	Personal Income Fishing (Thousands of $)	1,339	1,406	1,580
Hyde				
	Population	5,374	5,339	5,362
	Personal Income (Thousands of $)	80,982	90,101	80,300
	Per Capita Pers Income ($)	15,069	16,876	14,976
	Personal Income Fishing (Thousands of $)	1,860	1,973	2,215

Table 12. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for North Carolina Coastal Counties included in Area 4 for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	**Occupation/Industry**	**1970**	**1980**	**1990**
Craven County	Farm/Fish/Forest	873	1136	832
	Agri.,Fishing,Mining	1129	1222	860
Pamlico County	Farm/Fish/Forest	245	498	442
	Agri.,Fishing,Mining	502	662	477
Beaufort County	Farm/Fish/Forest	1452	1393	1024
	Agri.,Fishing,Mining	2169	2123	1190
Hyde County	Farm/Fish/Forest	295	509	454
	Agri.,Fishing,Mining	442	579	511

Area 5: Carteret County

In Area 5 Johnson and Orbach (1997) found that commercial fishermen had three primary gear types, gill nets, trawls and hand harvest of shell fish. In terms of annual fishing rounds Area 5 did not show the clear gear stratification found in other areas. Shrimp trawling is the most central fishery, but pound netting, crab potting, and mechanized clamming also occur with shrimp trawling. (Johnson and Orbach 1997). Possible fishing communities within Area 5: Morehead City and Beaufort.

Table 13. Population and Economic Information for Counties included in Area 5. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 5				
County		**1993**	**1994**	**1995**
Carteret				
	Population	55,747	56,381	57,690
	Personal Income (Thousands of $)	935,032	985,484	1,076,753
	Per Capita Pers Income ($)	16,773	17,479	18,664
	Personal Income Fishing (Thousands of $)	2,783	2,871	3,207

Among North Carolina's coastal counties, Carteret county was second to Dare county (Table 13) in terms of personal income from fishing. In addition, Carteret County (Table 14) shows an marked increase from 1970 to 1980, then a decrease from 1980 to 1990, within the occupations of Farm/Fish/Forest and an overall increase in the number of Agriculture, Fishing and Mining industries.

Table 14. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for Carteret County (Area 5) for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database.

County	**Occupation/Industry**	**1970**	**1980**	**1990**
Carteret County	Farm/Fish/Forest	225	1200	1158
	Agri.,Fishing,Mining	731	1234	1260

In a recent report on the importance of commercial fishing in Carteret county, Diaby (1997) found that Carteret county ranked first in poundage (96,652,314 lb) and second in dockside value ($20,618,486) in terms of commercial landings for North Carolina coastal counties. Finfish represented the 91% of total landings and 46% of total ex-vessel value. The most important species of finfish were: menhaden, flounder, croaker, weakfish and spot. Shellfish and crustaceans accounted for only 9% of all commercial landings but, represented over half of the value of landings during the period from 1974-1994. Employment by the commercial fishing industry, both full and part time for Carteret county was estimated to be 3,232 people for 1994 (Diaby, 1997). This number varies from those reported in the census data and emphasizes the problems in comparing these types of data. Since 1981 there have been about 105 to 140 licensed seafood dealers in Carteret county. The value of processed seafood peaked for the county in 1981 when scallops accounted for almost half of the value with a total value of $19,737,126. Since that time there has been a general decline in total value of processed seafood attributable to a decline in scallop landings. Menhaden was the most important single processed product over a fifteen year period from 1980 to 1994 (Diaby, 1997).

In estimating the economic impact of Carteret county commercial harvesting sector Diaby (1997) estimated $27 million in sales of goods and services and $11.66 million in value added. Total employment from commercial harvesting activities was estimated to be 3,371.

Sales of goods and services for the wholesaling and processing sector were estimated at $19 million, with $11 million n value added. There were an estimated 1,563 full and part time jobs created earning $6.55 million in wages (Diaby, 1997).

Overall, the activities of the commercial fishing industry created $46 million in sales of goods and services and $24 million in value added. There were 4,934 full and part time jobs which earned $14 million in wages (Diaby, 1997).

The recreational fishery spent approximately $70 million on fishing trips in Carteret county with $25.23 million in employ compensation and $47.61 in value added. There were 1,821 full and part time jobs associated with the recreational fishing industry in Carteret County.

The total impact of the coastal fishing industry on the economy of Carteret County was estimated to be $120.74 million with $71.32 million in value added. The total number of full and part time jobs was estimated at 6,755 with earnings of $38.94 (Diaby, 1997).

Snapper Grouper Fishing

The Morehead City/Beaufort area is located approximately 50 miles south of Ocracoke in Carteret County. This area is known for its sportfishing activity including several major tournaments each year. There is a small population of full time commercial reef fishermen in Morehead, however the majority of fishermen holding commercial permits are primarily part timers. Many of these fishermen divide their time between charter fishing during the peak tourist season (April through September) and commercial fishing in the winter months. Full time fishermen in this area reported fishing approximately 50 miles straight offshore and fishing from Hatteras to as far south as the South Carolina/Georgia line. Trip lengths vary with the size of the vessel, but the average trip length is 7 days and the larger boats carried up to 3 crew members (Iverson, 1997).

King Mackerel Fishery

The king mackerel fishery in North Carolina has grown steadily since 1980 and has leveled with catches repeatedly around one million pounds in recent years. From 1986 to 1990 the number of permits for Atlantic group king mackerel issued in North Carolina ranged from a low of 325 in 1987/88 to a high of 533 in 1989/90. Again, the majority of those permits were granted to hook and line fishermen. Present data indicates there were 448 commercial vessels permitted for king and Spanish mackerel in North Carolina (Vondruska, 1997).

4.3.3.1.3 South Carolina

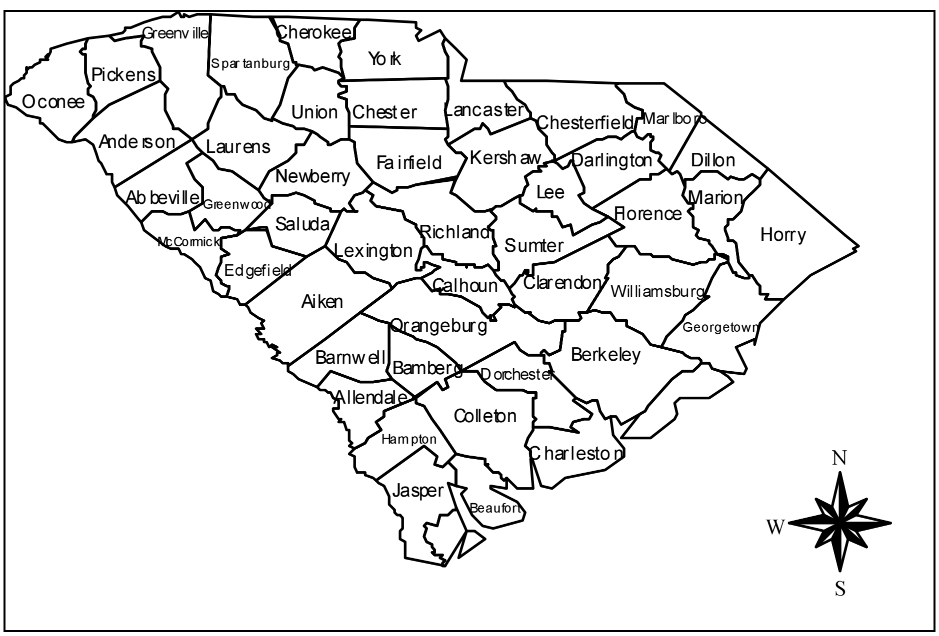

Figure 3. South Carolina Counties Source: Roger Pugliese, SAFMC Staff.

The 1990 Census of Population and Housing provides the following information for South Carolina regarding individuals who reported their occupation as fisher in Table 15. A total of 401 individuals claimed Fisher as their occupational title with less than half indicating it was a year round full time employment. There were few females who indicated such and they had a far lower mean annual income than males in this occupation.

Table 15. Number of Fishers and Mean Annual Income for South Carolina Fishers in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of fishers			
Male	188	193	381
Female	6	14	20
Total	194	207	401
Mean Annual Income ($)			
Male	28,842	14,489	18,946
Female	750	5,000	2,403
Total	23,710	14,269	18,390

There were a total of 69 individuals who indicated their occupation as captain of a fishing vessel in the 1990 census of population and housing. and 7 of them were female according to Table 16 Again, females had a much lower mean annual income when compared to males.

Table 16. Number of Captains of Fishing Vessels and other officers and Mean Annual Income for South Carolina in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of Captains			
Male	17	45	62
Female	7	0	7
Total	24	45	69
Mean Annual Income ($)			
Male	18,765	15,022	16,048
Female	9,000	0	9,000
Total	15,917	15,022	15,333

Horry County

The following descriptions for fishing communities in South Carolina are notes from Kim Iverson of South Carolina Department of Natural Resources. Kim has spent many months interviewing both commercial and recreational fishermen in South Carolina and other parts of the South Atlantic region as part of several research projects. Although the research was not intended to identify fishing communities, her notes represent the best available information on fishing communities for South Carolina.

Little River has a long history of fishing activity, both commercial and recreationally. The headboat operations date back to the 1940's. As of 1996, there were headboats operating in Little River. There are approximately 4 vessels that actively run charters and also commercial fish. Several full time snapper/grouper vessels operate out of the area. Little River also hosts an annual Blue Crab Festival each spring (Kim Iverson, SCDNR pers. comm., 1998).

Murrells Inlet has a large fleet of charter and headboats, with one marina hosting one of the Governor's Cup Billfishing Tournaments. There are several smaller fishing tournaments held in the area. There are fish houses in the community that deal primarily with finfish. There are no shrimp dealers. This area is also noted for it's large number of seafood restaurants that target the tourist market from Myrtle Beach (Kim Iverson, SCDNR pers. comm., 1998).

Major fishing tournaments held in Murrells Inlet are: March of Dimes Annual Flounder Tournament - Voyagers View Marina. Registration was by angler with approximately 200 anglers participating. Local tournament with many family participants. Primarily smaller boats < 25' participating. Tournament date May 17.; and the Marlin Quay Governor's Cup Billfish Tournament - Marlin Quay Marina. The last in the series of SC Gov. Cup. Total of 31 boats registered. July 23-26 (Kim Iverson, SCDNR pers. comm., 1998).

Major tournaments in North Myrtle Beach: Dock Holidays Governor's Cup Billfish Tournament - Dock Holiday's Marina. The first tournament in a series of 6 for the SC Governor's Cup. April 30 - May 3. Total of 25 boats entered; Frantic Atlantic King Mackerel Tournaments - North Myrtle Beach - Blue Marlin Yacht & Fishing Club. A two tournament series consisting of the Spring and Fall Classics. Total purse of $250,000 for the series. Total of 392 paid boat entries with an average of 4.09 anglers per boat. Tournament dates May 9-11, September 26-28; Evinrude Outboard King Mackerel Tournament - Oct. 11-12, Weigh-in stations at Dock Holidays Marina, Marlin Quay Marina and Georgetown Landing. 147 boats were registered; Yamaha Contender King Mackerel Classic - Weigh in stations at Dock Holidays Marina, Marlin Quay Marina and Georgetown Landing. 125 boats registered; Fall Pier King Tournament - September 19-21 (Kim Iverson, SCDNR pers. comm., 1998).

One of the largest concentration of snapper grouper vessels is located in Murrells Inlet, SC. Most of the reef fishermen in this area are full time commercial fishermen and consider bandit reels to be the most effective way of catching snapper grouper. There is a wide variety of snapper grouper species off of Murrells Inlet, with gag grouper, scamp grouper and vermilion snapper being highly targeted. The average trip length is 5 days with some of the larger boats (>40 ft.) fishing up to 10 days. A few smaller bandit boats may stay out for 2-3- days. The Gulf Stream is approximately 62 miles offshore from Murrells Inlet. Most bandit boats fish between the 20-50 fathom line, concentrating on the 25 fathom curve. Winter weather dictates that fishermen fish shallow, in waters 60-90' deep. Several fishermen switch to sea bass trapping during the winter months (Iverson, 1997).

Horry County has shown a small increase in personal income from fishing that follows the general increase in personal income overall (Table 17).

Table 17. Population and Economic Information for Horry County, South Carolina. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		**1993**	**1994**	**1995**
Horry				
	Population	148,385	152,435	157,834
	Personal Income (Thousands of $)	2,543,793	2,744,260	3,013,059
	Per Capita Pers Income ($)	17,143	18,177	19,220
	Personal Income Fishing (Thousands of $)	81	129	169

Vessels in Murrells Inlet will fish an area from Frying Pan Shoals off southern NC, south to Savannah. The average boat has two crew members. It is interesting to note that fishermen stated a crew of 3 plus the captain was ideal for this area, but decreasing catches and increased costs have made it necessary to cut back on crew members (Iverson, 1997).

Georgetown County

The community of Georgetown has shrimp dealers who also deal in finfish and shellfish. Georgetown is host to the one of the SC Governor's Cup Billfish Tournaments along with several other smaller fishing tournaments. There are no headboats operating from the area and charter activity is limited. Georgetown is known for it's historic waterfront district (Kim Iverson, SCDNR pers. comm., 1998).

Major fishing tournaments in Georgetown County: Georgetown Landing Governor's Cup Billfishing Tournament - May 21-24, Georgetown Landing Marina. The oldest of the series tournaments with 45 boats participating.

Georgetown County shows an increasing personal income from fishing like Horry County in Table 18 but, personal income from fishing tends to be a larger percentage of overall personal income than in Horry County.

Table 18. Population and Economic Information for Georgetown County, South Carolina. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		**1993**	**1994**	**1995**
Georgetown				
	Population	49,371	49,966	50,835
	Personal Income (Thousands of $)	822,317	885,024	946,898
	Per Capita Pers Income ($)	16,656	17,713	18,627
	Personal Income Fishing (Thousands of $)	246	388	399

Charleston County

McClellanville is a small community with a long history of commercial shrimping. McClellanville has a large shrimp fleet. At any given time (dependent upon the season) there can be as many as 20 shrimp boats at the docks. Shrimp wholesale dealers are also present within the community. McClellanville hosts an annual Blessing of the Fleet Festival each spring. Shem Creek (Mt. Pleasant) hosts a mixture of commercial and recreational fishing activity along with a number of seafood restaurants, a retail seafood market and a waterfront hotel. There are also headboats operating out of Shem Creek along with charter operations. There is a large permanent shrimp fleet and many shrimp boats visit seasonally. At any give time there are an average of 30 shrimp boats along the creek. Shrimp dealers along the creek also buy and sell finfish from the trawlers. There are several offshore fishing boats including longline and snapper/grouper boats. Several shellfishermen and crabbers do business along the creek. Each spring, Mt. Pleasant hosts an Annual Blessing of the Fleet for the shrimp boats.

In Folly Beach there is a concentration of commercial fishing vessels and several fish houses who handle offshore finfish, shellfish, shrimp and crabs. Rockville is a historical small community located at the south end of Wadmalaw Island. There are commercial dealers who handle shrimp, inshore fish, offshore finfish and some shellfish. On Edisto Island there are several commercial seafood dealers. There are approximately 10 shrimp boats that operate there, fluctuating with the season. The dealers handle primarily shrimp and in-shore species along with shellfish and blue crabs. There is also a large "harvest" of horseshoe crabs. These crabs are "bled" for their blood that is used in cancer research and returned to the water. Edisto Island is also host to the annual SC Governor's Cup Billfish Tournament. Charter activity here is limited. Bennett's Point is a small community south of Edisto with shrimping operations in the community. There are 10-15 small boat shrimpers that live in Walterboro and fish out of Bennett's Point (Kim Iverson, SCDNR pers. comm., 1998).

Table 19. Population and Economic Information for Charleston County, South Carolina.
Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Charleston	Population	297,888	287,139	281,068
	Personal Income (Thousands of $)	5,653,489	5,879,506	6,083,636
	Per Capita Pers Income ($)	18,979	20,476	21,645
	Personal Income Fishing (Thousands of $)	3,188	3,809	- - - -

Charleston County (Table 19) has a higher personal income from fishing than the previous two counties, but has a much larger overall dollar value for personal income overall.

Major fishing tournaments in the Charleston County area: SCSSA (South Carolina Saltwater Sportfishing Assoc.) Early Bird - Ashley Marina. Approximately 25 registered boats. April 19. Multi-species tournament; James Island King Mackerel Tournament - James Island Yacht Club, May 24; Wild Dunes Governor's Cup Billfish - June 11-14. Total of 46 registered boats; Bohicket Invitational Governor's Cup Billfish - June 25-28. Total of 48 registered boats. Bohicket Marina on John's Island; Lowcountry Angler's Inshore Tournament - June 28. Multi-species tournament held at the East Cooper Outboard Motor Club on Gold Bug Island in Mt. Pleasant. Registration by angler, with approximately 200 anglers registered; SCSSA Sailfish XV - Ashley Marina in Charleston. Club sponsored tournament with approximately 25 boats registered. Sailfish, tuna, dolphin & wahoo. August 8-10; Fishing For Miracles King Mackerel Tournament - Ripley's Light Marina. Large King tournament with over 200 boats entered. August 14-16; Alison Oswald, Sr. Memorial Tournament - James Island Yacht Club. Local tournament with approximately 75 boats participating. Multi-species. Aug. 23; Edisto Marina Governor's Cup Billfish Tournament - July 16-19. One of the oldest and largest of the Billfish Series. 46 Boats registered. Edisto Island (Kim Iverson, SCDNR pers. comm., 1998).

Beaufort County

In Frogmore there are 8 commercial dealers which are home to over 50 shrimpers. This does not include the many individuals with shrimp boats in their back yards. The dealers primarily handle shrimp but others may also handle crabs and shellfish. There is a large blue crab industry on nearby Lady's Island. There are several commercial seafood dealers in the Port Royal area with over 30 shrimp boats. There are also commercial crabbers, shad fishermen and offshore finfishermen here. There are a small number of charter vessels operating out of this area also. Hilton Head Island primarily caters to the tourist trade. There are several headboats operating on Hilton Head. These boats make half-day trips and night trips for shark fishing. There are four major marinas that offer charter fishing. Commercially, Hilton Head had 4 seafood dealers and approximately 12-15 shrimp boats (Kim Iverson, SCDNR pers. comm., 1998).

Data on personal income from fishing in Table 20 for Beaufort County may have been excluded due to confidentiality issues.

Major fishing tournaments in Beaufort County: 42nd Annual Beaufort County Water Festival Fishing Tournament - June 28. Held in conjunction with the annual Beaufort Water Festival; Hilton Head Kingfish Classic - Schillings Marina, Hilton Head Island. July 10-12. Registration by angler with a total of 49 registered; Dottie Dunbar Women's Tournament - Palmetto Bay Marina, Hilton Head. Women's only multi-species inshore tournament. Total of 49 anglers registered. October 4 (Kim Iverson, SCDNR pers. comm., 1998).

Table 20. Population and Economic Information for Beaufort County, South Carolina.
Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Beaufort				
	Population	94,375	97,293	100,017
	Personal Income (Thousands of $)	2,057,250	2,194,774	2,373,921
	Per Capita Pers Income ($)	21,799	22,558	23,774
	Personal Income Fishing (Thousands of $)	----	----	----

Possible fishing communities in South Carolina: Charleston, Mt. Pleasant, Hilton Head, Port Royal, Frogmore (St. Helena), Bennett's Point, Edisto Beach, Rockville, Folly Beach, Shem Creek, McClellanville, Georgetown Waterfront, Murrell's Inlet, Little River (most of these locations are designated ports of landing)

Counties in South Carolina have seen a general increase in these occupations and industries over the past three decades (Table 21), with the exception of Horry County which has seen a slight decreasing trend.

Table 21. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for South Carolina Coastal Counties for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Horry County	Farm/Fish/Forest	2627	2542	2310
	Agri.,Fishing,Mining	2843	2653	2110
Georgetown County	Farm/Fish/Forest	403	558	597
	Agri.,Fishing,Mining	552	856	690
Charleston County	Farm/Fish/Forest	810	1697	2056
	Agri.,Fishing,Mining	1256	1938	2316
Beaufort County	Farm/Fish/Forest	436	938	966
	Agri.,Fishing,Mining	698	1087	1111
Colleton County	Farm/Fish/Forest	532	614	730
	Agri.,Fishing,Mining	787	705	782

For the Charleston, South Carolina MSA (Table 22) there are 113 individuals who indicated fishing as their year round occupation . Another 102 individuals indicated that it is a part time or seasonal occupation for them. This represents over half of those individuals in South Carolina who indicated the occupation as fishing from Table 15. The Charleston, SC MSA includes Berkely, Charleston and Dorchester counties.

Table 22. Number of Individuals in Occupation of Fishing By Work Status and Gender for the Charleston, SC MSA in 1989. Source: 1990 Census Of Population And Housing.

	Year Round Full Time	Other	Total
Male	102	102	204
Female	11	0	11
Total	113	102	215

4.3.3.1.4 Georgia

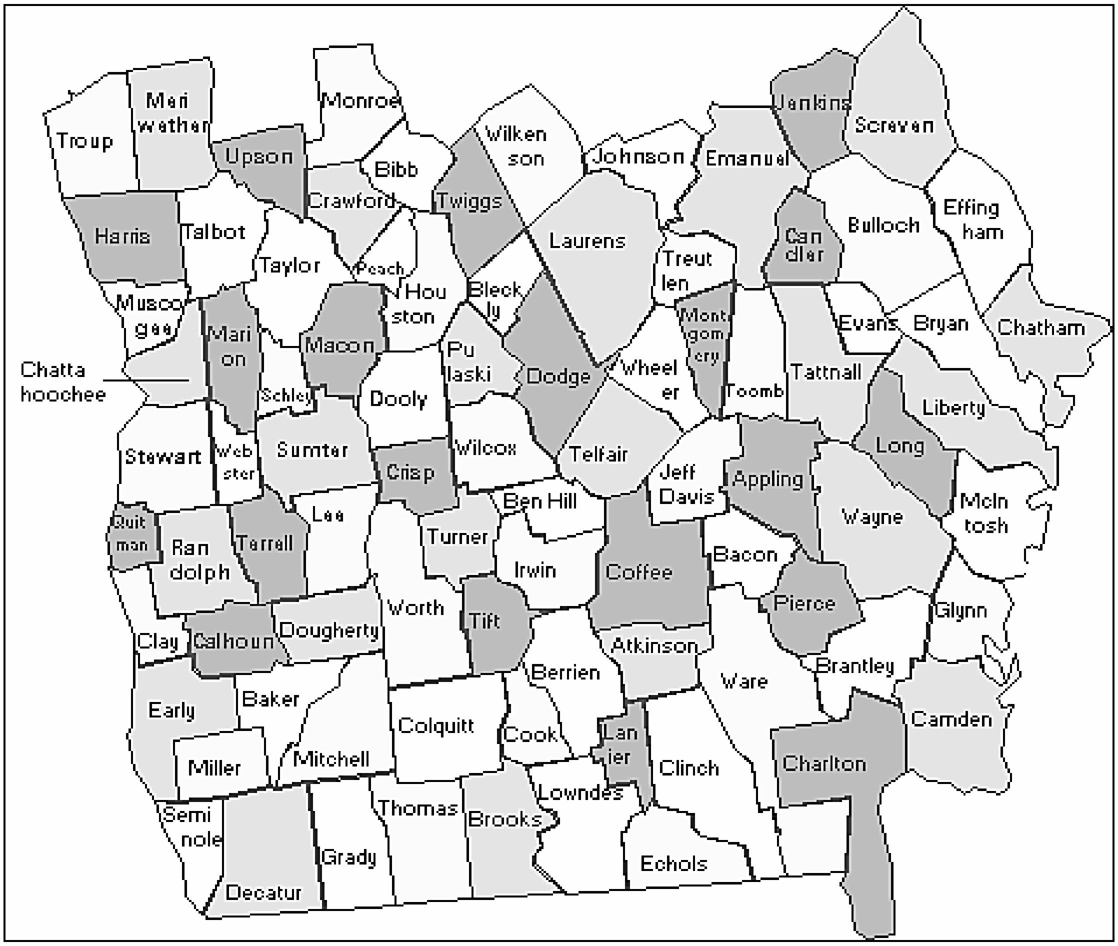

Figure 4. Georgia Coastal Counties. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

The 1990 Census of Population and Housing provides the following information for Georgia regarding individuals who reported their occupation as fisher in Table 23. A total of 536 individuals claimed Fisher as their occupational title with less than half indicating it was a year round full time employment. There were few females who indicated such and they had a far lower mean annual income than males who indicated it was a full time occupation. However, females who indicated it was other than full time had a much higher mean income than any other category. This may be due to a low sample size, however.

Table 23. Number of Fishers and Mean Annual Income for Georgia in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of fishers			
Male	222	295	518
Female	11	7	18
Total	234	302	536
Mean Annual Income ($)			
Male	19,139	11,082	15,058
Female	8,600	25,000	20,080
Total	18,813	12,024	15,308

Shrimping

In their 1975 report, Nix et. al., found a total of 32 commercial docks in six Georgia coastal counties. Those docks and shrimp trawlers were distributed as follows: Camden Co. - 5 docks and 33 trawlers; Glynn Co. - 5 docks and 74 trawlers; McIntosh Co. - 12 docks and 111 trawlers; Liberty Co. - 1 dock and 18 trawlers; Bryan Co. - 1 dock and 2 trawlers; and finally Chatham Co. - 8 docks and 69 trawlers. This information is outdated and certainly does not represent the current status and location of shrimp trawlers in Georgia. However, the report does represent the kinds of information that can be extremely helpful in identifying fishing communities.

Snapper Grouper Fishing

The coast of Georgia contains a small concentration of full-time reef fishermen that fish primarily with bandit reels. Their fishing patterns are similar to those found in SC with vessels fishing from northern Florida north to the SC/NC line (Iverson, 1997).

Possible fishing communities in Georgia: Savannah, Brunswick, St. Marys, Jekyll Island, and Darien.

Table 24. Number of Captains of Fishing Vessels and other officers and Mean Annual Income for Georgia in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of Captains			
Male	17	21	38
Female	0	0	0
Total	17	21	38
Mean Annual Income ($)			
Male	25,706	1,976	12,592
Female	0	0	0
Total	25,706	1,976	12,592

Table 25. Population and Economic Information for Chatham County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Chatham	Population (number of persons)	224,050	225,779	226,554
	Personal income (thousands of dollar	4,569,113	4,810,530	5,087,638
	Per capita personal income (dollars)	20,393	21,306	22,457
	Personal Income Fishing (Thousands of $)	650	(D)	25

Table 26. Population and Economic Information for Bryan County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Bryan				
	Population	18,827	20,008	21,212
	Personal Income (Thousands of $)	274,738	307,258	342,128
	Per Capita Pers Income ($)	14,593	15,357	16,129
	Personal Income Fishing (Thousands of $)	251	359	- - - -

Table 27. Population and Economic Information for Liberty County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Liberty				
	Population	56,625	58,827	58,571
	Personal Income (Thousands of $)	636,042	669,454	709,468
	Per Capita Pers Income ($)	11,233	11,380	12,113
	Personal Income Fishing (Thousands of $)	- - - -	90	97

Table 28. Population and Economic Information for McIntosh County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
McIntosh				
	Population	8,985	9,153	9,372
	Personal Income (Thousands of $)	110,187	116,171	125,645
	Per Capita Pers Income ($)	12,263	12,692	13,406
	Personal Income Fishing (Thousands of $)	3,619	4,486	- - - -

Table 29. Population and Economic Information for Glynn County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Glynn				
	Population	64,759	64,956	65,450
	Personal Income (Thousands of $)	1,322,745	1,400,544	1,505,337
	Per Capita Pers Income ($)	20,426	21,558	23,000
	Personal Income Fishing (Thousands of $)	328	343	351

Table 30. Population and Economic Information for Camden County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Camden				
	Population	39,712	41,262	40,819
	Personal Income (Thousands of $)	502,639	542,385	556,622
	Per Capita Pers Income ($)	12,657	13,145	13,636
	Personal Income Fishing (Thousands of $)	1,889	2,431	2,484

Georgia coastal counties have seen a general increase in these occupations and industries with the exception of Liberty County which has shown a decrease from 1970-1990.

Table 31. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for Georgia Coastal Counties for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Bryan County	Agri.,Fishing,Mining	161	100	200
	Farm/Fish/Forest	121	135	136
Chatham County	Agri.,Fishing,Mining	558	686	1103
	Farm/Fish/Forest	228	704	1062
Liberty County	Agri.,Fishing,Mining	332	146	152
	Farm/Fish/Forest	242	205	157
McIntosh County	Agri.,Fishing,Mining	233	266	169
	Farm/Fish/Forest	27	260	193
Glynn County	Agri.,Fishing,Mining	261	482	593
	Farm/Fish/Forest	84	581	712
Camden County	Agri.,Fishing,Mining	209	126	176
	Farm/Fish/Forest	106	110	205

4.3.3.1.5 Florida

Florida's eastern coastline is made up largely of metropolitan counties. This is primarily due to the increases in population for Florida's coastal counties over the past 50 years. Florida's coastline has become a very popular retirement destination and tourist attraction. Because they are largely metropolitan, fishing communities here may be subsumed into these larger metropolitan areas and difficult to identify. Data presented from the most recent Census will also show that in relation to the larger economy, fishing will contribute very little at the county level for most coastal counties. Over the years, with the demographic changes following the inmigration of retirees and tourists and the subsequent economic transition, few fishing communities will have survived as distinct communities.

The data presented in Table 32 shows Florida as having almost 6,000 individuals claiming fisher as their occupation in the 1990 census; 381 of those individuals were female. Mean annual income is highest for those reporting fishing as a full time occupation with women reporting a lower mean annual income in all categories.

Table 32. Number of Fishers and Mean Annual Income for Florida in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of fishers			
Male	2,698	2,844	5,544
Female	111	270	381
Total	2,809	3,116	5,925
Mean Annual Income ($)			
Male	23,288	11,794	17,388
Female	17,285	11,511	13,193
Total	23,051	11,770	17,118

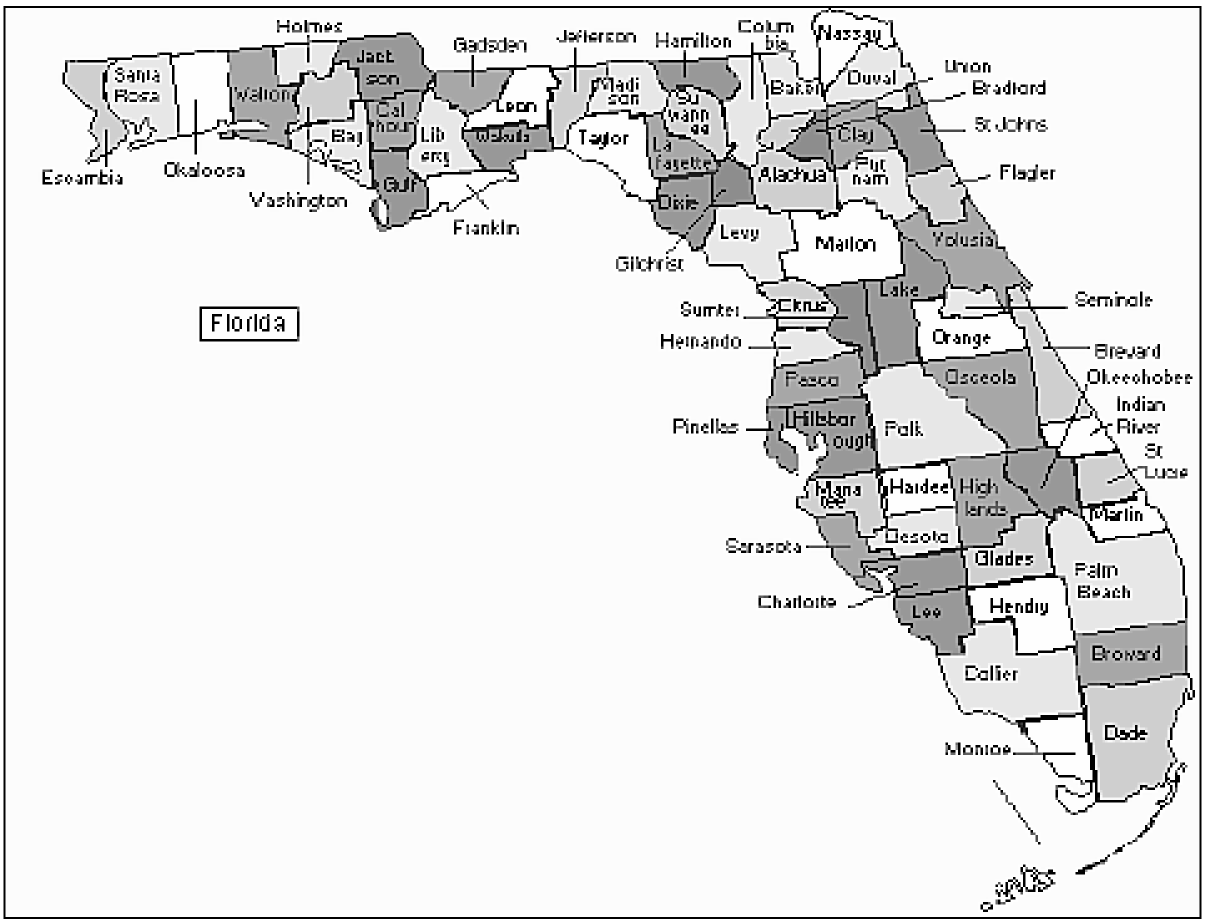

Figure 5. Florida Coastal Counties. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

There were over 1100 individuals from Florida who reported their occupation as captain of a fishing vessel during the 1990 census, with 51 of them being female (Table 33). Again, mean annual income was highest for full time workers and females reported lower mean annual income for both full time and other work.

Table 33. Number of Captains of Fishing Vessels and other officers and Mean Annual Income for Florida in 1990 Source: U.S. Bureau of the Census.

	Year Round/Full Time	**Other**	**Total**
Number of Captains			
Male	430	633	1,063
Female	26	25	51
Total	456	658	1,114
Mean Annual Income ($)			
Male	25,993	21,274	23,183
Female	8,487	15,420	11,885
Total	24,995	21,052	22,666

Nassau County (Table 34) showed an increase in personal income from fishing over the time period from 1993 to 1995 which reflects the general increase in population and personal income overall for the county.

Table 34. Population and Economic Information for Nassau County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		**1993**	**1994**	**1995**
Nassau				
	Population	48,355	49,565	50,717
	Personal Income (Thousands of $)	954,342	1,003,920	1,089,793
	Per Capita Pers Income ($)	19,736	20,255	21,488
	Personal Income Fishing (Thousands of $)	1,540	1,918	2,068

Duval County (Table 35) shows slow growth in population over the three years listed, but does show growth in personal income from fishing from 1993 to 1994. There was a slight decrease in personal income from fishing reported from 1994 to 1995.

Table 35. Population and Economic Information for Duval County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		**1993**	**1994**	**1995**
Duval				
	Population	701,267	703,152	705,014
	Personal Income (Thousands of $)	14,111,822	14,724,897	15,748,121
	Per Capita Pers Income ($)	20,123	20,941	22,337
	Personal Income Fishing (Thousands of $)	2,272	3,658	3,335

St John's County (Table 36) had some growth in personal income from fishing from 1993 to 1994 but no data were available for 1995 to indicate whether that trend continued.

Table 36. Population and Economic Information for St. John's County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
St. Johns				
	Population	94,480	98,377	101,966
	Personal Income (Thousands of $)	2,394,764	2,612,557	2,869,300
	Per Capita Pers Income ($)	25,347	26,557	28,140
	Personal Income Fishing (Thousands of $)	432	502	- - - -

According to Table 37, Flagler County had no individuals reporting personal income from fishing for the time period 1993 to 1995. Volusia County also has no personal income from fishing listed in Table 38, but data were not included due to confidentiality issues.

Table 37. Population and Economic Information for Flagler County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Flagler				
	Population	35,868	37,894	40,260
	Personal Income (Thousands of $)	571,528	631,959	692,269
	Per Capita Pers Income ($)	15,934	16,677	17,195
	Personal Income Fishing (Thousands of $)	0	0	0

Table 38. Population and Economic Information for Volusia County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Volusia				
	Population	397,372	405,515	410,115
	Personal Income (Thousands of $)	6,845,402	7,235,060	7,772,063
	Per Capita Pers Income ($)	17,227	17,842	18,951
	Personal Income Fishing (Thousands of $)	- - - -	- - - -	- - - -

Indian River County saw an increase in personal income from fishing from 1993 to 1994 according to Table 39, but saw a decrease from 1994 to 1995. St. Lucie County (Table 40) may have had a similar trend although data from 1993 are missing and the trend is not clear.

Table 39. Population and Economic Information for Indian River County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Indian River				
	Population	94,184	95,374	96,263
	Personal Income (Thousands of $)	2,686,514	2,827,427	3,065,533
	Per Capita Pers Income ($)	28,524	29,646	31,845
	Personal Income Fishing (Thousands of $)	1,340	1,826	1,707

Table 40. Population and Economic Information for St. Lucie County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
St. Lucie				
	Population	165,120	169,284	171,914
	Personal Income (Thousands of $)	2,719,602	2,840,752	3,051,018
	Per Capita Pers Income ($)	16,470	16,781	17,747
	Personal Income Fishing (Thousands of $)	- - - -	1,855	1,303

Table 41. Population and Economic Information for Broward County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Broward				
	Population	1,353,279	1,358,585	1,412,942
	Personal Income (Thousands of $)	32,716,045	34,273,950	37,007,667
	Per Capita Pers Income ($)	24,175	24,736	26,192
	Personal Income Fishing (Thousands of $)	658	816	- - - -

The trend in personal income from fishing for Broward County is not clear as data from 1995 are missing from Table 41 because of confidentiality. Brevard County (Table 42) shows a decrease in personal income from fishing during 1994 to 1995, but overall shows a much larger percentage of personal income coming from fishing than most counties previous.

Table 42. Population and Economic Information for Brevard County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Brevard				
	Population	435,546	443,337	450,238
	Personal Income (Thousands of $)	8,564,204	8,938,218	9,341,030
	Per Capita Pers Income ($)	19,663	20,161	20,747
	Personal Income Fishing (Thousands of $)	3,600	4,690	3,797

Martin County has one of the highest per capita incomes reported over the three year period according to Table 43. There was also a significant increase in personal income from fishing from 1993 to 1994 which decreased in 1995. Palm Beach County, with an even higher per capita income, showed an increase in personal income from fishing from 1993 to 1994 with no data available for 1995 (Table 44).

Table 43. Population and Economic Information for Martin County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Martin				
	Population	107,238	109,194	110,495
	Personal Income (Thousands of $)	3,406,064	3,521,665	3,815,294
	Per Capita Pers Income ($)	31,762	32,251	34,529
	Personal Income Fishing (Thousands of $)	270	1,658	819

Table 44. Population and Economic Information for Palm Beach County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Palm Beach				
	Population	933,644	957,522	976,358
	Personal Income (Thousands of $)	30,994,531	32,423,719	35,204,121
	Per Capita Pers Income ($)	33,197	33,862	36,057
	Personal Income Fishing (Thousands of $)	1,464	1,902	- - - -

Dade County shows a steady growth in personal income from fishing for the time period listed in Table 45. Monroe County shows, by far, the highest personal income from fishing for any Florida county and most likely any county in the South Atlantic according to Table 46.

Table 45. Population and Economic Information for Dade County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Dade				
	Population	1,985,373	2,011,571	2,046,078
	Personal Income (Thousands of $)	39,110,301	40,344,476	43,087,320
	Per Capita Pers Income ($)	19,699	20,056	21,058
	Personal Income Fishing (Thousands of $)	1,247	1,479	1,897

Table 46. Population and Economic Information for Monroe County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Monroe				
	Population	81,737	81,461	81,152
	Personal Income (Thousands of $)	1,982,209	2,054,326	2,208,152
	Per Capita Pers Income ($)	24,251	25,219	27,210
	Personal Income Fishing (Thousands of $)	13,506	15,558	16,723

Recently, data were compiled from the last three census and placed into a user friendly interface through a MARFIN grant by the Louisiana Population Data Center, Louisiana State University (C. M. Tolbert, et al. 1998). Those data provide a time series of information from the last three census with the ability to compare several variables at the state,. county and place level. Census places are incorporated and Census designated places of 2500 or more persons. The tables presented below incorporate the data included in the MARFIN SocioDemographic Database for the coastal counties outlined above with a focus on the occupational classification of Farm/Fish/Forest and the industry classification of Agriculture, Fishing, and Mining. These classifications are inclusive of those within the occupation and industry of fishing, but not exclusive of others, therefore it is difficult to know the exact number of individuals who have indicated their occupation or business is fishing. We can only assume that whatever trend appears over the time corresponds to the occupation of fishing as well as the others.

Data covering Metropolitan Statistical Areas are provided because it includes a more detailed occupational breakdown, but unfortunately geographic boundaries expand as most MSAs encompass more than one county. In some cases, MSAs were not used because the area covered did not correspond with the coastal areas within the South Atlantic region. As mentioned earlier, these data are what is currently available. Further analysis is constrained by variety of issues relating to data computability and availability at each place level of analysis. As mentioned before more research on fishing communities will be required before a more complete definition and identification can be accomplished.

Examining census data at the level of Metropolitan Statistical area reveals greater detail for occupation, but the scale changes as MSAs often times encompass more than one county. Metropolitan area (MA) is a large population nucleus, together with adjacent communities that have a high degree of economic and social integration with that nucleus. Metropolitan Areas must contain either a place with a minimum population of 50,000 or a Census Bureau-defined urbanized area and a total MA population of at least 100,000. An MA comprises one or more central counties and also may include one or more outlying counties that have close economic and social relationships with the central county. Metropolitan statistical areas (MSA's) are relatively freestanding MA's and are not closely associated with other MA's. These areas typically are surrounded by nonmetropolitan counties. See Appendix ?? for details on the parameters for the coastal MSAs included in this discussion.

When you look at the occupations of farming, fishing and forestry for Florida coastal counties in Table 47, over the past 20 years there is, in general, a steady increase in the number of individuals within these occupations and industries.

Table 47. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for East Florida Coastal Counties from 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Nassau County	Farm/Fish/Forest	371	427	559
	Agri.,Fishing,Mining	501	462	606
Duval County	Farm/Fish/Forest	1237	2782	3729
	Agri.,Fishing,Mining	2536	2959	4324
St.Johns County	Farm/Fish/Forest	794	813	1002
	Agri.,Fishing,Mining	1012	883	976
Flagler County	Farm/Fish/Forest	145	314	408
	Agri.,Fishing,Mining	186	298	403
Volusia County	Farm/Fish/Forest	1308	3150	4917
	Agri.,Fishing,Mining	2511	3407	5606
Indian River County	Farm/Fish/Forest	991	1907	2042
	Agri.,Fishing,Mining	1454	2361	2217
St. Lucie County	Farm/Fish/Forest	2602	2710	3147
	Agri.,Fishing,Mining	3253	3252	3342
Broward County	Farm/Fish/Forest	1982	7358	9425
	Agri.,Fishing,Mining	5354	7756	10317
Brevard County	Farm/Fish/Forest	764	1772	3369
	Agri.,Fishing,Mining	1394	2279	3585
Martin County	Farm/Fish/Forest	964	1838	1983
	Agri.,Fishing,Mining	1268	2032	2086
Palm Beach County	Farm/Fish/Forest	6552	9676	13261
	Agri.,Fishing,Mining	9791	11780	15155
Dade County	Farm/Fish/Forest	4804	11257	14894
	Agri.,Fishing,Mining	9682	13708	16926
Monroe County	Farm/Fish/Forest	163	1769	1729
	Agri.,Fishing,Mining	920	1932	1860

The following table includes only those individuals who reported their occupation as fishing for the following Metropolitan Statistical Areas (MSA) within Florida.

Table 48. Number of Individuals in Occupation of Fishing By Work Status and Gender for Florida MSA in 1989. Source: 1990 Census Of Population And Housing.

Jacksonville		Year Round Full Time	Other	Total
	Male	151	210	361
	Female	15	49	64
	Total	166	259	425
West Palm Beach		Year Round Full Time	Other	Total
	Male	94	47	141
	Female	0	0	0
	Total	94	47	141
Miami		Year Round Full Time	Other	Total
	Male	254	254	508
	Female	0	30	0
	Total	254	284	538

Snapper Grouper Fishery Profile

Concentrations of reef fishermen can be found in the communities of Mayport, Port Orange and New Smyrna, north of Cape Canaveral. Bandit reels are the primary gear used for reef fishing in these areas, although a few bottom longline vessels are present. In northern Florida, bandit fishermen report trips lasting 5-6 days and fish 30-50 miles offshore. They average between 2 to 3 crew members depending on vessel size and gear. Vessels from the Mayport area reported fishing from the Georgia line south to the Daytona area. The larger longline vessels are required by regulations to fish past the 50 fathom line and reported trip lengths of up to 10 days, fishing as far as 100 miles from shore. These bottom long line vessels fish for deep water species such as tilefish in water 600 - 900' deep (Iverson, 1997).

King Mackerel Fishery Profile

McKenna (1994) identified the number of fishermen in Florida reporting landings of king mackerel (based on Saltwater Products Licenses) from 1987 to 1993 as varying from 1,500 to 2,222. From 1986 to 1990 the number of commercial permits for Atlantic migratory group king mackerel ranged from a high of 888 in 1989/90 fishing season to low of 785 in the 1987/88 fishing year. The percentage of those permits which were hook and line fishermen for those years ranged from 89% in 86/87 to 78% in 1990. There were 1654 vessels permitted for commercial king mackerel and Spanish mackerel in Florida for the 1993-94 fishing year. The number of permitted vessels was divided with 846 and 808 allocated to the East and West coasts respectively. How many of those vessels landed king mackerel is unknown at this time. Catch per unit of effort data seems fairly consistent for the southeastern region of the Atlantic group king mackerel with an average CPUE of between 200-300 lbs/trip (McKenna, 1994). Most of the commercial landings of Atlantic group king mackerel are made by hook and line fishermen. In addition, because most landings of Atlantic group king mackerel are in Florida and the most information that exists is on the Florida fishery, the following description will focus primarily on the Florida fishery unless noted otherwise.

King Mackerel Hook and Line Fleet

There were approximately 203 full and part time vessels in the hook and line mackerel fleet in 1980. Vessel size ranged from 22-44 feet in length. Today, the Florida South Atlantic troll fishery is composed of about 100 full-time and 100 part-time operations, about 150 of them are dependent upon king mackerel. Full-time fishermen operate primarily out of Jupiter, Port Salerno, Fort Pierce, Sebastian, and Rivera Beach. Normally, there is one fisherman to a boat. Part-time fishermen operate mostly out of Palm Beach, frequently two or three fishermen per boat. Approximately 40 percent of the full time trollers switch to bottom fishing for various reef fish after the Gulf king mackerel season. The remainder of these full time trollers tie up their boats when the Gulf king mackerel season ends. Some engage in various non-fishing jobs, while the majority reportedly wait for the opening of the Atlantic king mackerel season (GMFMC & SAFMC, 1994).

During the peak season about 75 to 100 troll vessels and 16 to 20 net vessels target king mackerel in the Keys. Net vessels usually start fishing late December, although some of these vessels troll for mackerel before net fishing becomes more practicable. Most king mackerel fishermen in the Keys target other species such as stone crab, spiny lobster, and reef fish throughout the year.

King Mackerel Net Fishing Fleet

There were approximately 89 large gill net vessels in Florida including full and part time in 1980. The vessels ranged in size from 30-65 feet. These vessels fished Spanish and king mackerel during the winter, but also targeted lobster, swordfish and bait fish during other times of the year. Vessels over 40 feet usually employed a power roller to haul nets. The large gill net fleet was primarily located from Florida's central east coast in Ft. Pierce, throughout the Florida Keys to the central west coast as far north as Cortez. There were also a few large boats in the Panhandle area of Port St. Joseph (Centaur Associates, 1981).

Approximately 87% of captains in the large gill net fleet at that time depended entirely upon fishing for their income. Net fishermen, then as they do today, have the options of participating in the Spanish mackerel fishery, trolling for king mackerel, and fishing with nets or hook and line for Atlantic group king mackerel after March (Centaur Associates 1981).

Today, there are twelve large net boats located in the Keys that may fish Atlantic group king mackerel occasionally. These vessels have a capacity of up to 40,000 pounds per trip and have had large catches of king mackerel in the past. There does not seem to be a small gill net boat sector for Atlantic king mackerel. In Monroe County there are 16 to 20 large net boats currently participating in the king mackerel fishery, some with capacity to land up to 50,000 pounds. There are another 6 to 12 small net boats in south-west Florida ready to enter the fishery when the opportunity arises. These vessels are 30 to 40 feet in length with capacities of 5,000 to 10,000 pounds.

There has been a general decline in net catches along the Florida east coast. This may be attributed to regulations like the prohibition of drift nets and purse seines, but also stems from the recent net ban in Florida state waters.

King Mackerel Dealers

McKenna (1994) identified over 200 dealers in Florida who had handled king mackerel since 1987. In 1992 there were 240 who reported landings of king mackerel. Most of those dealers purchased king mackerel ten or fewer times per season and handled less than 5000 pounds. There were over twenty dealers who handled 100,000 pounds or more during the 1992 season (McKenna, 1994) .

Possible fishing communities in Florida: Mayport, Port Orange, New Smyrna, Sebastian, Port Salerno, Rivera Beach, Ft. Pierce, Jupiter, West Palm Beach, Boyton Beaches, The Keys -- Upper Keys: Key Largo, Tavernier; Middle Keys - Islamorada, Marathon; Lower Keys; and Key West.

4.3.3.1.6 Other Community related Analysis

In a recent survey of snapper grouper fishermen in the South Atlantic questions were posed concerning a fishermen's tenure within a community and attitudes towards community change. The results in Table 49 show that the majority of fishermen feel their community has stayed the same or has changed for the better. A larger percentage of inactive than active snapper grouper fishermen feel that their community has changed for the worse. Well over half of fishermen interviewed had been in their present community for twenty years or more. Over sixty percent of inactive fishermen have lived in their community for twenty years or more, while over fifty percent of active fishermen have lived in their communities for 19 years or less. The mean number of years a fishermen had resided in their present community was twenty years or more for North Carolina, South Carolina and Florida. In comparison Georgia snapper grouper fishermen had an average tenure in their communities of 6.5 years. This may be an artifact of the small sample size in Georgia as only seven fishermen from that state were interviewed, but could also be reflective of the nature of snapper grouper fishing in Georgia (Rhodes et al., 1997).

Table 49. Snapper Grouper Fishermen's Tenure and Attitude toward Change in their Present Community. Source: Socio-demographic Assessment of Commercial Reef Fishermen in the South Atlantic Region. 1997.

	Active (%)	Inactive (%)
Feel Your Community has changed?	(N=201)	(N=26)
For the better	41.8	30.8
For the worse	32.1	46.2
Stayed the same	25.9	23.1
	Active (Yrs)	Inactive (Yrs)
Number of Years in Present Community?	(N=201)	(N=26)
2-12	27.6	25.9
13-19	32.0	11.1
20-35	19.5	33.4
36 <	20.9	29.6

These perspectives on an individual's feelings toward a community become important when that person must face significant changes regarding his/her occupation, as is often the case when limited entry or some other form of fisheries management is implemented. An individual's commitment toward their community and sense of belonging will influence decisions on whether to stay in fishing or within a particular community. The impacts become important for the community if many individuals face the same decision. When active fishermen were asked what is the likelihood of moving to a new town in the next 2-3 years most responded that it is was unlikely, however, over 27% indicated they were not sure or it was likely. When both inactive and active fishermen were asked the likelihood of leaving commercial fishing altogether 46% of inactive fishermen said it was likely or very likely, while only 11% of active fishermen indicated such a likelihood. (Rhodes et al., 1997). These type of data at the community level would contribute much to the understanding of possible impacts of future fisheries management.

4.3.3.1.7 Data Needs

As mentioned earlier, the data presented here is what is currently available and readily accessible. It is very limiting and does not provide a sufficient amount of detail needed to define and identify fishing communities. Therefore, the likelihood of realistic impact assessment of future fishing regulations on fishing communities is not good.

At the present the NMFS does not collect data on fishing communities. Therefore, it is impossible to realistically identify fishing communities in this amendment. There is a tremendous need for research to be conducted on a continuous basis to collect this information. Both state and federal government agencies have access to current information which can inform the process of identifying fishing communities. Permit databases for fishing licenses, wholesale and retail licenses, boat registrations, marina permits, boat landing locations, and many others exist now. Putting that information into one database is a monumental task, but should be undertaken soon. Geographic Information System software is now available and being used to compile much of the data regarding habitat. The same type of databases need to be created regarding fishing communities. Spatial analysis of the variables that help identify and define fishing communities can give useful insight into the changes that affect these coastal communities.

It is unlikely that Council Staff would be able to gather these data. Council staff have in the past, with the cooperation of industry, been able to gather important information about a particular fishery, but were criticized for not following OMB guidelines. The difficulty with following OMB guidelines is that approval of data gathering tools is too time consuming. Councils are often on a timeline to develop FMPs which does not allow for a lengthy approval process. The South Atlantic Council staff has sufficient expertise with this type of data collection that design, implementation and analysis can often take place during an extremely short time period with little burden upon the public. In fact, industry is often eager to provide these type of data for consideration during development of an FMP, but don't have the expertise to offer data a form that can be used by Council staff.

Data collection is critical to the future of impact assessment of fishing communities. Standards must be set and data need to be collected. At present, the ACCSP is attempting to set those standards and has included social and economic data in that program. The ACCSP Technical Source Document IV contains detailed social and economic data needs and draft survey instruments. Social and economic data collection projects should at least collect the minimum data elements. Support of ACCSP can be an important step in meeting the future needs of the councils with regard to fishing communities. In addition, another guideline for the types of data needed can be found in the Southeast Social and Cultural Data Analysis Plan (NMFS, 1994). The plan was designed to address many of the current social and cultural information needs for the three councils in the Southeast. "

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Appendix H. Trends in Dolphin and Wahoo Commercial and Recreational Catch Rates: A Study for The South Atlantic Fishery Management Council (Source: Goodyear, 1999).

Trends in Dolphin and Wahoo Commercial and Recreational Catch Rates: A Study for The South Atlantic Fishery Management Council

C. Phillip Goodyear
415 Ridgewood Road
Key Biscayne, FL 33149
Phil_Goodyear@email.msn.com

March 2, 1999

Data Sources Available for the Analyses

Data Source	Requested	Have	Imported	Extracted	Processed
Recreational					
MRFSS catch	X	X	X	X	X
MRFSS size	X	X	X	X	X
MRFSS cpue	X	X	X	X	X
TPWD catch	X	X	X	X	X
TPWD length	X	X	X	X	X
TPWD trips	X	X	X	X	X
TPWD fish	X	X	X	X	X
TPWD party	X	X	X	X	X
Headboat catch	X	X	X	X	X
Headboat bioprofile	X	X	X	X	X
Headboat effort	X	X	X	X	X
Headboat vessel	X	X	X	X	X
Large Pelagic catch	X	X	X	X	X
Large Pelagic size	X	X	X	X	X
Large Pelagic cpue	X	X	X	X	X
NMFS Charterboat Master	X	X	X	X	X
NMFS Charterboat Vessels	X	X	X	X	X
SC Charterboat survey	X	X	X	X	X
AL Charterboat size	X	X	X	X	X
NC Survey	X (Data incorporated into MRFSS intercept files)				
Commercial					
NMFS Commercial Catches	X	X	X	X	X
FL Commercial Catches	X	X	X	X	X
GOM Reef fish logbook	X	X	X	X	X
SA Reef fish logbook	X	X	X	X	X
Pelagic longline logbook	X	X	X	X	X
Pelagic longline weigh out	X	X	X	X	X
Pelagic longline observers	X	X	X	X	X
Trip Interview Program	X	X	X	X	X

Dolphin Recreational Landings

Dolphin Annual Totals

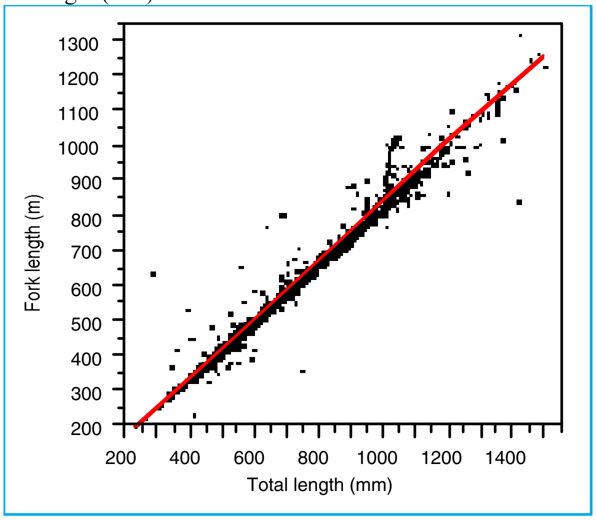
YR	Headboat Number	Headboat Pounds	Charter Number	Charter Pounds	Private/Rental Number	Private/Rental Pounds	Total Number	Total Pounds
81	23,056	76,103	228,038	1,606,560	408,715	2,969,018	659,809	4,651,681
82	39,977	95,021	467,180	2,528,861	816,955	4,456,811	1,324,112	7,080,691
83	13,714	53,692	146,907	847,827	1,009,223	6,072,043	1,169,844	6,973,563
84	18,896	55,842	135,424	861,529	833,706	3,576,840	988,025	4,494,210
85	5,348	33,686	149,895	927,970	1,008,560	6,038,049	1,163,803	6,999,705
86	18,396	70,347	424,240	3,195,089	1,014,289	6,620,998	1,495,387	10,088,250
87	17,797	63,876	537,243	3,008,939	917,785	4,205,998	1,472,825	7,278,815
88	12,191	45,540	448,513	1,672,217	1,054,986	5,932,472	1,522,362	7,670,456
89	19,369	63,501	769,175	3,925,113	1,899,695	9,586,182	2,693,550	13,592,950
90	30,387	141,218	378,658	2,202,994	1,099,335	7,767,084	1,761,093	12,904,230
91	18,508	93,120	673,100	4,466,616	1,966,721	12,801,070	2,658,329	17,360,800
92	8,601	45,619	475,690	4,062,992	834,232	5,814,886	1,330,661	9,976,774
93	14,234	63,656	1,142,284	6,493,442	831,451	4,825,101	2,019,027	11,460,040
94	10,897	39,113	1,158,643	6,310,622	1,036,197	6,428,897	2,206,731	12,787,150
95	12,720	70,943	1,254,486	10,873,300	1,003,538	8,974,380	2,272,314	19,920,700
96	14,668	54,172	800,878	6,699,763	891,306	6,069,741	1,706,852	12,823,680
97	11,639	48,348	1,273,035	13,765,780	931,847	8,743,603	2,216,521	22,557,710

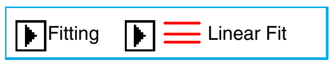
Dolphin Recreational Size Limits

Dolphin All Areas

Size Mm FL	Headboat Number Int %	Headboat Number Cum %	Headboat Weight Int %	Headboat Weight Cum %	Party/Charter Number Int %	Party/Charter Number Cum %	Party/Charter Weight Int %	Party/Charter Weight Cum %	Private/Rental Number Int %	Private/Rental Number Cum %	Private/Rental Weight Int %	Private/Rental Weight Cum %	Total Number Int %	Total Number Cum %	Total Weight Int %	Total Weight Cum %
< 300	1.5	1.5	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
301-350	2.1	3.6	0.4	0.5	0.1	0.1	0.0	0.0	0.4	0.5	0.0	0.1	0.1	0.1	0.0	0.0
351-400	8.2	11.8	2.1	2.6	0.9	0.9	0.2	0.2	3.3	3.8	0.5	0.6	1.3	1.5	0.2	0.2
401-450	12.0	23.8	4.2	6.9	2.5	3.5	0.6	0.8	6.1	9.9	1.3	1.8	3.2	4.6	0.7	1.0
451-500	14.6	38.4	7.0	13.9	10.8	14.3	3.5	4.3	9.0	18.9	2.5	4.4	10.5	15.1	3.3	4.3
501-550	17.3	55.7	10.7	24.6	21.8	36.1	9.1	13.4	11.4	30.3	4.2	8.6	20.0	35.1	8.2	12.5
551-600	11.5	67.2	9.1	33.7	14.1	50.2	7.5	20.9	10.8	41.1	5.1	13.8	13.5	48.6	7.0	19.5
601-650	6.1	73.3	6.1	39.8	9.2	59.5	6.1	27.0	9.9	50.9	5.9	19.6	9.3	58.0	6.0	25.6
651-700	4.8	78.0	5.9	45.8	5.7	65.1	4.7	31.7	7.0	57.9	5.1	24.7	5.9	63.9	4.8	30.3
701-750	4.9	83.0	7.4	53.2	3.8	68.9	3.8	35.4	6.5	64.4	5.8	30.6	4.2	68.1	4.2	34.5
751-800	2.7	85.7	4.8	58.0	4.6	73.4	5.6	41.0	3.9	68.3	4.1	34.7	4.4	72.5	5.3	39.8
801-850	4.4	90.1	9.4	67.4	4.6	78.0	6.6	47.6	4.6	72.9	5.7	40.4	4.6	77.1	6.4	46.2
851-900	2.5	92.6	6.3	73.7	5.3	83.3	8.9	56.5	5.5	78.3	8.2	48.6	5.3	82.5	8.7	55.0
901-1000	4.0	96.6	12.1	85.7	8.9	92.2	18.4	74.9	12.8	91.1	24.7	73.3	9.6	92.0	19.6	74.6

Dolphin Fork Length (mm) By Total length (mm)





Linear Fit

Fork length (m) = 1.59779 + 0.83677 Total length (mm)

Summary of Fit

RSquare	0.980438
RSquare Adj	0.980431
Root Mean Square Error	24.51826
Mean of Response	541.8344
Observations (or Sum Wgts)	2899

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	87284973	87284973	145197.8
Error	2897	1741518	601.1452	Prob>F
C Total	2898	89026491		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.5977865	1.4891	1.07	0.2834
Total length (mm)	0.8367711	0.002196	381.05	0.0000

Nonlinear Fitting Control Panel

_ Second Deriv. Method
_ Continuous Update
_ Iteration Log
_ Loss is -LogLikelihood
PLCI iter=1 Converged g=0.00469
Converged in the Gradient

	Current	Limit	Alpha
Iteration	1	60	0.050
Shortening	0	15	
O Criterion	2.458692e-12	0.0000001	
D Criterion	8.934562e-11	0.0000001	
G Criterion	2.576568e-16	0.000001	
CL Criterion	?	0.00001	

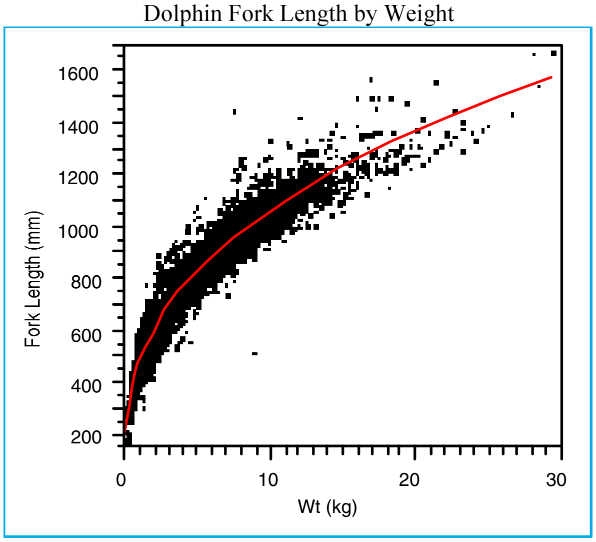
Parameter	Current Value	Lock	SSE
p1	470.40733804	_	48728678.461
p2	0.3563859561	_	48733983.89

Solution

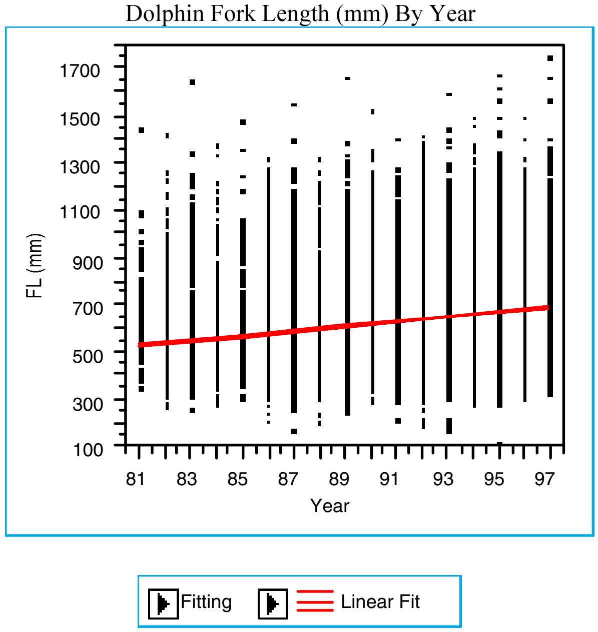
SSE	DFE	MSE	RMSE
48728678.461	35285	1381.0026	37.161844

Parameter	Estimate	ApproxStdErr	Lower CL	Upper CL
p1	470.40733804	0.24986684	469.917591	470.897085
p2	0.3563859561	0.00036833	0.35566401	0.3571079

Dolphin Fork Length by Weight



Dolphin Fork Length (mm) By Year



Linear Fit

FL (mm) = -284.82 + 10.0443 Year

Summary of Fit

RSquare	0.036284
RSquare Adj	0.036258
Root Mean Square Error	187.8641
Mean of Response	643.1458
Observations (or Sum Wgts)	37645

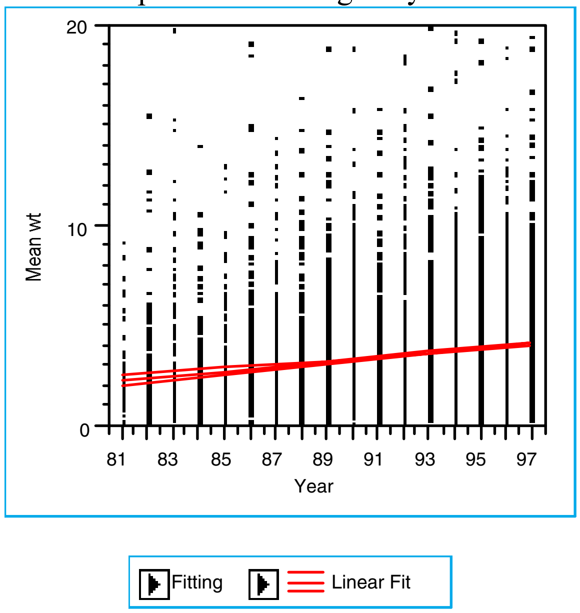
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	50019232.3	50019232	1417.259
Error	37643	1328531947	35292.93	Prob>F
C Total	37644	1378551180		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-284.8169	24.66839	-11.55	<.0001
Year	10.044267	0.266805	37.65	<.0001

Dolphin Mean Weight By Year



Linear Fit

Mean wt = -6.9656 + 0.1152 Year

Summary of Fit

RSquare	0.025844
RSquare Adj	0.025715
Root Mean Square Error	2.82595
Mean of Response	3.584954
Observations (or Sum Wgts)	7591

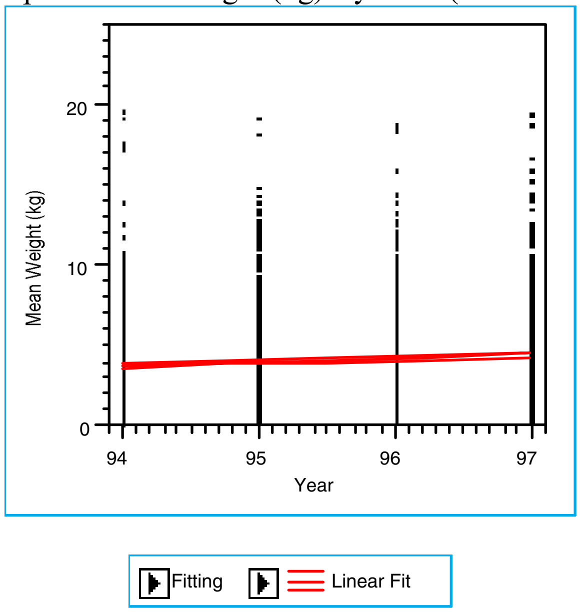
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1607.835	1607.84	201.3319
Error	7589	60605.714	7.99	Prob>F
C Total	7590	62213.550		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-6.965575	0.74427	-9.36	<.0001
Year	0.1151981	0.008119	14.19	<.0001

Dolphin Mean Weight (kg) By Year (1994-1997)



Linear Fit

Mean Weight (kg) = -18.338 + 0.2355 Year

Summary of Fit

RSquare	0.008351
RSquare Adj	0.00803
Root Mean Square Error	2.913549
Mean of Response	4.137488
Observations (or Sum Wgts)	3093

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	220.954	220.954	26.0290
Error	3091	26238.783	8.489	Prob>F
C Total	3092	26459.736		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-18.33767	4.4056	-4.16	<.0001
Year	0.2355042	0.04616	5.10	<.0001

Dolphin Recreational Bag and Trip Limits

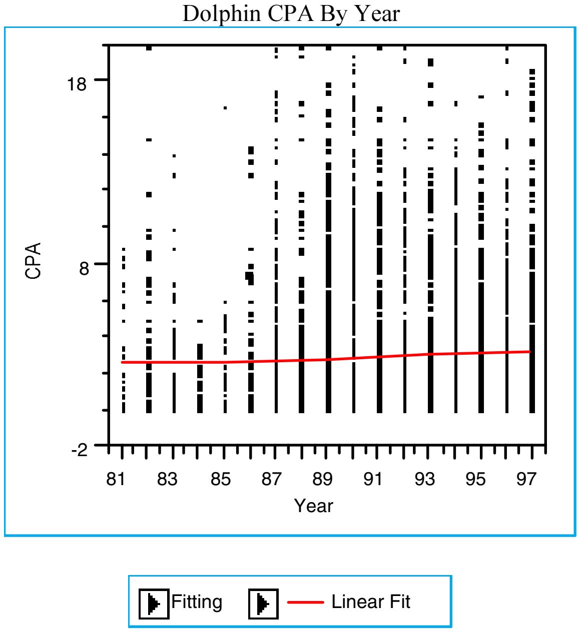
Dolphin Bag Limit All Areas

Bag Limit	Headboat Number Int %	Headboat Number % Red	Headboat Weight Int %	Headboat Weight % Red	Party/Charter Number Int %	Party/Charter Number % Red	Party/Charter Weight Int %	Party/Charter Weight % Red	Private/Rental Number Int %	Private/Rental Number % Red	Private/Rental Weight Int %	Private/Rental Weight % Red	Total Number Int %	Total Number % Red	Total Weight Int %	Total Weight % Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
1	59.8	40.2	69.1	30.9	21.2	78.8	25.0	75.0	43.7	56.3	49.6	50.4	26.8	73.2	32.2	67.8
2	13.2	27.0	11.4	19.6	14.7	64.0	15.6	59.4	20.1	36.2	20.5	29.9	15.7	57.5	16.3	51.4
3	7.7	19.3	6.2	13.4	11.8	52.2	11.9	47.5	10.6	25.5	10.0	19.8	11.5	46.0	11.2	40.2
4	5.2	14.1	3.9	9.5	9.9	42.3	9.6	37.9	6.2	19.3	5.5	14.3	9.0	37.0	8.5	31.7
5	3.6	10.5	2.6	6.9	8.5	33.8	8.1	29.8	4.2	15.2	3.5	10.7	7.5	29.5	6.9	24.8
6	2.6	7.9	1.8	5.0	7.2	26.6	6.7	23.1	2.9	12.3	2.4	8.4	6.2	23.2	5.6	19.2
7	1.9	6.0	1.3	3.7	6.2	20.4	5.7	17.4	2.2	10.1	1.7	6.6	5.3	17.9	4.7	14.6
8	1.4	4.6	1.0	2.7	5.2	15.2	4.7	12.7	1.7	8.4	1.3	5.3	4.4	13.5	3.8	10.7
9	1.0	3.6	0.6	2.1	4.3	10.9	3.8	8.9	1.4	7.0	1.0	4.3	3.6	9.9	3.1	7.7
10	0.7	2.8	0.5	1.6	3.5	7.4	3.1	5.8	1.2	5.9	0.9	3.4	3.0	6.9	2.5	5.1
11	0.5	2.3	0.3	1.3	1.7	5.6	1.5	4.4	0.6	5.3	0.4	3.0	1.5	5.4	1.2	3.9
12	0.5	1.8	0.3	1.0	1.4	4.2	1.2	3.2	0.6	4.7	0.4	2.6	1.2	4.2	1.0	2.9
13	0.4	1.4	0.2	0.8	0.8	3.3	0.7	2.5	0.5	4.2	0.3	2.3	0.8	3.4	0.6	2.4
14	0.3	1.2	0.2	0.6	0.7	2.6	0.6	1.9	0.4	3.8	0.3	2.0	0.6	2.8	0.5	1.9
15	0.2	1.0	0.1	0.5	0.6	2.1	0.5	1.5	0.3	3.5	0.2	1.8	0.5	2.3	0.4	1.5
20	0.5	0.5	0.3	0.2	1.2	0.9	0.9	0.6	1.2	2.2	0.8	1.0	1.2	1.1	0.8	0.6
25	0.2	0.3	0.1	0.1	0.4	0.4	0.3	0.3	0.5	1.7	0.3	0.7	0.4	0.7	0.3	0.4

Dolphin Trip Limit All Areas

Trip Limit	Headboat Number Int %	Headboat Number % Red	Headboat Weight Int %	Headboat Weight % Red	Party/Charter Number Int %	Party/Charter Number % Red	Party/Charter Weight Int %	Party/Charter Weight % Red	Private/Rental Number Int %	Private/Rental Number % Red	Private/Rental Weight Int %	Private/Rental Weight % Red	Total Number Int %	Total Number % Red	Total Weight Int %	Total Weight % Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
5	36.1	63.9	45.2	54.8	21.6	78.4	25.0	75.0	65.3	34.7	71.4	28.6	30.1	69.9	36.0	64.0
10	12.9	51.0	13.4	41.4	14.3	64.1	14.9	60.1	13.8	20.9	12.4	16.2	14.2	55.7	14.3	49.7
20	13.7	37.2	13.0	28.5	21.0	43.1	20.6	39.4	10.7	10.2	8.9	7.4	18.8	36.9	17.7	31.9
30	8.1	29.1	7.1	21.4	15.6	27.4	14.8	24.7	4.4	5.8	3.3	4.0	13.3	23.6	11.9	20.0
40	5.6	23.6	4.6	16.8	11.6	15.9	10.6	14.1	2.4	3.4	1.7	2.3	9.7	13.9	8.4	11.6
50	4.2	19.4	3.3	13.5	8.3	7.5	7.5	6.6	1.4	2.0	1.0	1.3	6.9	7.0	5.9	5.7
60	3.4	16.0	2.6	10.9	5.6	1.9	5.0	1.6	1.0	1.0	0.7	0.6	4.7	2.3	3.9	1.7
70	2.6	13.3	2.0	8.9	0.9	1.1	0.7	0.9	0.3	0.7	0.2	0.4	0.9	1.5	0.7	1.1
80	2.1	11.2	1.5	7.3	0.4	0.6	0.4	0.5	0.2	0.4	0.1	0.3	0.5	1.0	0.4	0.7
90	1.7	9.6	1.2	6.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.7	0.3	0.5
100	1.4	8.2	1.0	5.2	0.2	0.1	0.2	0.1	0.1	0.2	0.0	0.1	0.2	0.5	0.2	0.3

Dolphin CPA By Year



Linear Fit

CPA = -0.1354 + 0.03366 Year

Summary of Fit

RSquare	0.001128
RSquare Adj	0.000996
Root Mean Square Error	4.002495
Mean of Response	2.947139
Observations (or Sum Wgts)	7591

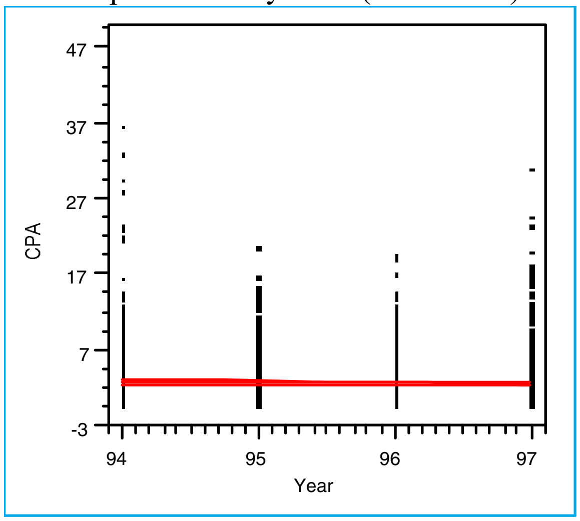
Analysis of Variance

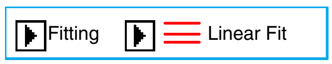
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	137.25	137.254	8.5677
Error	7589	121575.54	16.020	Prob>F
C Total	7590	121712.79		0.0034

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-0.13545	1.054137	-0.13	0.8978
Year	0.0336579	0.011499	2.93	0.0034

Dolphin CPA By Year (1994-1997)





Linear Fit

CPA = 11.8375   0.09327 Year

Summary of Fit

RSquare	0.000705
RSquare Adj	0.000382
Root Mean Square Error	3.985751
Mean of Response	2.935976
Observations (or Sum Wgts)	3093

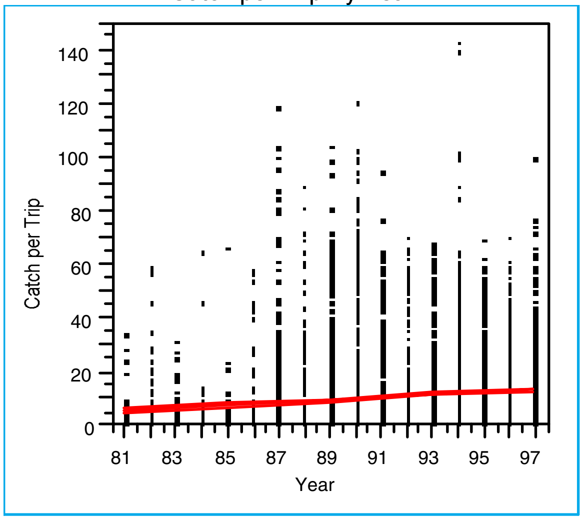
Analysis of Variance

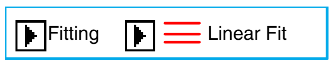
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	34.659	34.6593	2.1817
Error	3091	49104.275	15.8862	Prob>F
C Total	3092	49138.934		0.1398

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.83745	6.026884	1.96	0.0496
Year	-0.093273	0.063148	-1.48	0.1398

Catch per Trip By Year





Linear Fit

Catch per Trip = -34.32 + 0.49285 Year

Summary of Fit

RSquare	0.012755
RSquare Adj	0.012624
Root Mean Square Error	17.3252
Mean of Response	10.81821
Observations (or Sum Wgts)	7591

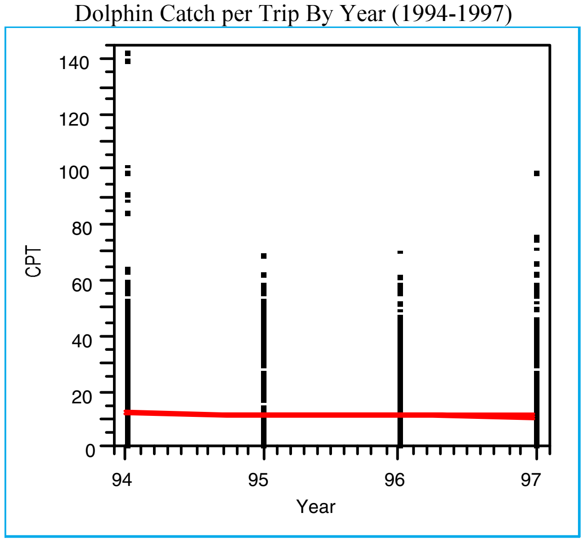
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	29429.4	29429.4	98.0449
Error	7589	2277933.7	300.2	Prob>F
C Total	7590	2307363.1		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-34.31998	4.562937	-7.52	<.0001
Year	0.4928505	0.049774	9.90	<.0001

Dolphin Catch per Trip By Year (1994-1997)



Fitting Linear Fit

Linear Fit

CPT = 55.591   0.45859 Year

Summary of Fit

RSquare	0.000933
RSquare Adj	0.00061
Root Mean Square Error	17.03551
Mean of Response	11.82574
Observations (or Sum Wgts)	3093

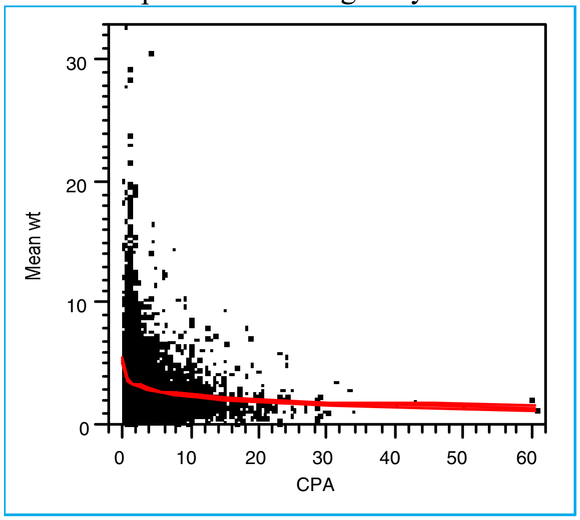
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	837.83	837.829	2.8870
Error	3091	897035.24	290.209	Prob>F
C Total	3092	897873.07		0.0894

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	55.591004	25.75953	2.16	0.0310
Year	-0.458591	0.2699	-1.70	0.0894

Dolphin Mean Weight By CPA



Fitting   Transformed Fit to Log

Transformed Fit to Log

Mean wt = 3.86429   0.58417 Log(CPA)

Summary of Fit

RSquare	0.048237
RSquare Adj	0.048111
Root Mean Square Error	2.793282
Mean of Response	3.584954
Observations (or Sum Wgts)	7591

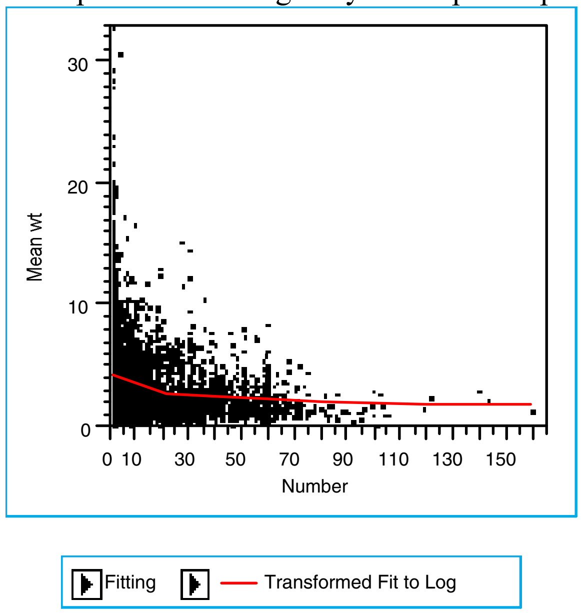
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	3000.971	3000.97	384.6205
Error	7589	59212.578	7.80	Prob>F
C Total	7590	62213.550		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	3.8642881	0.035082	110.15	0.0000
Log(CPA)	-0.58417	0.029787	-19.61	<.0001

Dolphin Mean Weight By Catch per Trip



Transformed Fit to Log

Mean wt = 4.19247   0.45221 Log(Number)

Summary of Fit

RSquare	0.047877
RSquare Adj	0.047751
Root Mean Square Error	2.79381
Mean of Response	3.584954
Observations (or Sum Wgts)	7591

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2978.584	2978.58	381.6069
Error	7589	59234.966	7.81	Prob>F
C Total	7590	62213.550		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	4.1924652	0.04467	93.85	0.0000
Log(Number)	-0.452208	0.023149	-19.53	<.0001

Dolphin Commercial Landings

Dolphin Commercial Totals by Gear (1950-1997)

Gear	N Rows	Pounds	% total
Combined Gears	50	11844787	56.30
Lines Long Set With Hooks	124	3117906	14.82
Lines Troll Other	98	2611375	12.41
Lines Hand Other	152	2104716	10.00
Not Coded	7	1070966	5.09
Rod and Reel	16	97571	0.46
Lines Long Reef Fish	11	61710	0.29
Reel Electric or Hydraulic	7	49047	0.23
Lines Troll Salmon	2	20600	0.10
Trawl Midwater Paired	6	15730	0.07
Troll & Hand Lines Cmb	3	10424	0.05
Otter Trawl Bottom Fish	21	8952	0.04
Lines Troll Tuna	9	4626	0.02
Lines Long Shark	3	4487	0.02
Gill Nets Drift Runaround	3	3600	0.02
Haul Seines Beach	2	3417	0.02
Gill Nets Other	3	1850	0.01
Gill Nets Drift Other	5	1824	0.01
Gill Nets Drift Large Pelagic	5	1084	0.01
Pots And Traps Eel	1	1004	0.00
Gill Nets Sink/Anchor Other	3	592	0.00
Floating Traps (Shallow)	2	500	0.00
Stop Seines	1	400	0.00
Dredge Scallop Sea	2	221	0.00
Harpoons Other	1	152	0.00
Pots And Traps Fish	1	102	0.00
Lines Power Troll Tuna	1	85	0.00
Harpoons Swordfish	2	66	0.00
Pots And Traps Lobster Ofshore	1	15	0.00
Pots And Traps Lobster Inshore	1	10	0.00

Dolphin Commercial Totals by State All Years

State	N Rows	Pounds	Percent
Florida West Coast	47	9376129	44.36
Florida East Coast	48	4229386	20.01
Louisiana	14	2862699	13.55
North Carolina	19	1786685	8.45
South Carolina	21	1360478	6.44
New Jersey	15	489272	2.32
New York	17	317928	1.50
Texas	9	300314	1.42
Georgia	16	149593	0.71
Rhode Island	18	90605	0.43
Maryland	16	68537	0.32
Virginia	15	39601	0.19
Massachusetts	11	35908	0.17
Maine	9	10966	0.05
Alabama	5	9439	0.04
Connecticut	6	6648	0.03
Florida	4	3.9	0.00

Dolphin Commercial Totals by State 94-97

State	N Rows	Pounds	Percent
Florida West Coast	4	2911777	38.51
Florida East Coast	4	1445035	19.11
Louisiana	4	919431	12.16
North Carolina	4	873023	11.55
South Carolina	4	822176	10.87
New Jersey	4	277579	3.67
New York	4	128784	1.70
Texas	4	48356	0.64
Georgia	3	44954	0.59
Maryland	4	36561	0.48
Rhode Island	4	21171	0.28
Massachusetts	4	17436	0.23
Maine	4	8202	0.11
Virginia	1	6087	0.08
Connecticut	2	584	0.01
Alabama	1	219	0.00

Dolphin All Areas

Gear	1994	1995	1996	1997
Hook & Line	929,351	1,493,093	988,692	1,104,947
Longline	453,232	1,025,654	507,506	812,059
Other	16,545	24,314	15,284	14,752
Unknown	129,922	284,210	304,326	270,856
Total	1,528,768	2,826,985	1,815,520	2,202,323

Dolphin Commercial Size Limits

Dolphin All Areas

Size Mm FL	Hand Line Number Int %	Hand Line Number Cum %	Hand Line Weight Int %	Hand Line Weight Cum %	Long Line Number Int %	Long Line Number Cum %	Long Line Weight Int %	Long Line Weight Cum %	Other Number Int %	Other Number Cum %	Other Weight Int %	Other Weight Cum %	Total Number Int %	Total Number Cum %	Total Weight Int %	Total Weight Cum %
< 500	7.3	7.3	0.8	0.8	2.3	2.3	0.2	0.2	-	-	-	-	7.3	7.3	0.8	0.8
501-600	3.0	10.3	0.6	1.4	2.8	5.1	0.5	0.7	-	-	-	-	3.0	10.3	0.6	1.4
601-650	1.3	11.6	0.4	1.7	1.0	6.1	0.2	0.9	-	-	-	-	1.3	11.6	0.4	1.7
651-700	2.5	14.1	0.9	2.6	1.0	7.1	0.3	1.2	-	-	-	-	2.5	14.1	0.9	2.6
701-750	1.7	15.8	0.7	3.3	1.2	8.3	0.4	1.7	-	-	-	-	1.7	15.8	0.7	3.3
751-800	3.3	19.1	1.7	5.0	5.3	13.6	2.3	4.0	-	-	-	-	3.3	19.1	1.7	5.0
801-850	4.2	23.2	2.5	7.5	0.6	14.2	0.3	4.3	-	-	-	-	4.2	23.2	2.5	7.5
851-900	2.7	26.0	1.9	9.5	0.4	14.6	0.2	4.5	-	-	-	-	2.7	26.0	1.9	9.5
901-950	4.4	30.3	3.6	13.1	10.5	25.1	7.6	12.1	-	-	-	-	4.4	30.3	3.6	13.1
951-1000	8.1	38.4	7.7	20.9	6.6	31.7	5.1	17.2	-	-	-	-	8.1	38.4	7.7	20.9
1001-1050	21.3	59.7	23.3	44.2	14.2	45.9	13.0	30.3	-	-	-	-	21.3	59.7	23.3	44.2
1051-1100	19.6	79.3	24.5	68.7	16.6	62.5	17.6	47.8	-	-	-	-	19.6	79.3	24.5	68.7
1101-1150	13.0	92.4	18.2	86.9	6.5	69.0	7.6	55.4	-	-	-	-	13.0	92.3	18.2	86.9
1151-1200	3.5	95.9	5.6	92.5	20.4	89.5	27.7	83.1	-	-	-	-	3.5	95.9	5.6	92.5
1201-1250	3.5	99.4	6.3	98.8	5.2	94.7	7.6	90.7	-	-	-	-	3.5	99.4	6.3	98.8
1251-1300	0.6	100.0	1.2	100.0	5.0	99.7	8.6	99.3	-	-	-	-	0.6	100.0	1.2	100.0
1301-1350	-	100.0	-	100.0	0.2	99.8	0.3	99.6	-	-	-	-	0.0	100.0	0.0	100.0
1351-1400	-	100.0	-	100.0	-	99.8	-	99.6	-	-	-	-	-	100.0	-	100.0
1401-1450	-	100.0	-	100.0	0.1	99.9	0.2	99.8	-	-	-	-	0.0	100.0	0.0	100.0
1451-1500	-	100.0	-	100.0	-	99.9	-	99.8	-	-	-	-	-	100.0	-	100.0

Dolphin Commercial Trip Limits

Dolphin All Areas

Trip Limit	Hand Line/R&R Trips Int %	Hand Line/R&R Trips % Red	Hand Line/R&R Weight Int %	Hand Line/R&R Weight % Red	Long Line Trips Int %	Long Line Trips % Red	Long Line Weight Int %	Long Line Weight % Red	Other Trips Int %	Other Trips % Red	Other Weight Int %	Other Weight % Red	Total Trips Int %	Total Trips % Red	Total Weight Int %	Total Weight % Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
100	80.5	19.5	59.5	40.5	49.3	50.7	20.8	79.2	91.6	8.4	37.0	63.0	73.2	26.8	36.9	63.1
200	10.9	8.6	17.7	22.8	14.6	36.1	12.5	66.7	1.3	7.0	11.8	51.2	11.8	15.0	14.7	48.4
300	4.6	4.0	8.0	14.9	6.8	29.3	9.6	57.1	3.5	3.6	5.9	45.3	5.1	9.9	8.9	39.5
400	1.5	2.5	4.4	10.5	5.5	23.8	7.8	49.3	-	3.6	5.2	40.0	2.4	7.5	6.4	33.1
500	0.8	1.7	2.9	7.6	5.0	18.8	6.3	43.1	0.3	3.3	5.0	35.0	1.8	5.7	4.8	28.3
600	0.5	1.2	2.0	5.6	4.4	14.5	4.9	38.1	-	3.3	4.8	30.2	1.4	4.3	3.7	24.6
700	0.3	0.9	1.4	4.2	3.4	11.0	3.7	34.4	0.1	3.1	4.7	25.5	1.0	3.3	2.8	21.8
800	0.3	0.6	1.1	3.1	3.2	7.8	3.0	31.5	-	3.1	4.6	20.9	1.0	2.3	2.2	19.6
900	0.3	0.4	0.7	2.4	0.7	7.1	2.2	29.3	-	3.1	4.6	16.2	0.3	2.0	1.6	18.1
1000	0.1	0.3	0.4	2.0	0.5	6.6	2.0	27.3	-	3.1	4.6	11.6	0.2	1.8	1.3	16.7
1500	0.2	0.1	1.3	0.7	2.2	4.4	8.1	19.2	3.1	0.0	11.6	0.0	0.7	1.1	5.2	11.5
2000	0.1	0.0	0.5	0.3	1.6	2.8	5.1	14.2	-	0.0	-	0.0	0.4	0.7	3.1	8.4
3000	0.0	0.0	0.2	0.1	1.1	1.7	6.3	7.8	-	0.0	-	0.0	0.3	0.4	3.8	4.6
3500	0.0	0.0	0.0	0.0	0.5	1.3	2.3	5.6	-	0.0	-	0.0	0.1	0.3	1.3	3.3
4000	0.0	0.0	0.0	0.0	0.4	0.9	1.5	4.0	-	0.0	-	0.0	0.1	0.2	0.9	2.4

Wahoo Recreational Harvest

Wahoo Annual Totals

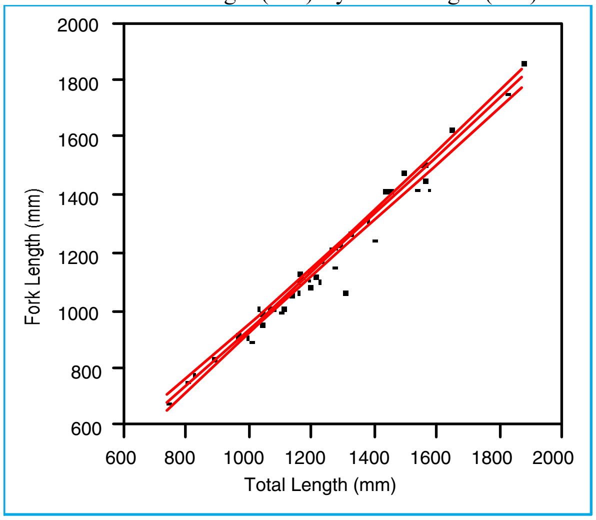
YR	Headboat Number	Headboat Pounds	Charter Number	Charter Pounds	Private/Rental Number	Private/Rental Pounds	Total Number	Total Pounds
81	110	3,716	106,022	1,615,215	14,386	213,540	120,518	1,832,471
82	130	4,815	627	8,741	21,113	300,914	21,870	314,470
83	161	3,314	10,561	314,696	34,126	749,487	44,848	1,067,497
84	119	3,676	3,347	94,929	16,911	335,281	20,377	433,886
85	96	3,175	3,350	112,214	12,392	443,292	15,838	558,680
86	23,912	900,775	18,370	569,890	36,326	1,254,674	78,608	2,725,338
87	115	4,068	32,202	711,809	23,220	467,049	55,537	1,182,926
88	618	20,173	23,140	513,462	30,707	737,052	54,465	1,270,686
89	95	3,521	8,013	209,285	16,048	586,909	24,156	799,715
90	4,335	142,615	10,021	208,078	11,465	228,561	25,821	579,254
91	125	3,989	20,984	426,385	24,212	560,891	45,321	991,266
92	181	6,643	17,913	390,873	32,753	594,113	50,847	991,629
93	153	4,689	24,789	505,692	28,608	694,614	53,550	1,204,994
94	219	5,385	28,041	550,670	19,822	392,952	48,082	949,007
95	278	8,901	45,669	847,456	30,170	520,836	77,210	1,393,745
96	149	4,366	23,371	564,068	23,875	619,467	47,394	1,187,901
97	258	3,394	52,022	1,068,091	15,669	288,341	67,949	1,359,826

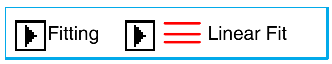
Wahoo Recreational Size Limits

Wahoo All Areas

Size	Headboat				Party/Charter				Private/Rental				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
Mm FL	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %
< 601	-	-	-	-	0.4	0.4	0.0	0.0	0.4	0.4	0.1	0.1	0.4	0.4	0.0	0.0
601-800	26.8	26.8	12.6	12.6	3.2	3.7	0.8	0.9	1.7	2.2	0.5	0.5	3.2	3.6	0.8	0.9
801-900	9.1	35.9	6.9	19.5	5.6	9.2	2.3	3.2	3.7	5.9	1.3	1.8	5.5	9.1	2.2	3.1
901-1000	36.0	71.9	37.2	56.7	8.9	18.2	4.8	8.0	15.6	21.5	8.0	9.9	9.4	18.5	5.1	8.2
1001-1050	18.2	90.1	23.7	80.5	8.9	27.0	6.0	14.0	8.2	29.7	5.0	14.9	8.8	27.3	5.9	14.1
1051-1100	0.1	90.2	0.2	80.7	10.4	37.4	8.0	22.0	11.6	41.3	8.3	23.2	10.5	37.8	8.0	22.1
1101-1150	0.3	90.5	0.5	81.2	10.4	47.8	9.1	31.0	9.9	51.2	8.0	31.2	10.3	48.1	9.0	31.1
1151-1200	9.1	99.6	17.2	98.5	12.1	59.9	12.0	43.0	6.6	57.9	6.1	37.2	11.7	59.8	11.5	42.6
1201-1250	0.1	99.7	0.3	98.7	10.8	70.7	12.0	55.0	6.7	64.6	6.9	44.1	10.5	70.4	11.6	54.2
1251-1300	-	99.7	-	98.7	10.5	81.2	13.1	68.1	10.4	75.0	11.9	56.0	10.5	80.8	13.0	67.2
1301-1350	-	99.7	-	98.7	5.5	86.7	7.6	75.7	3.7	78.6	4.8	60.8	5.3	86.2	7.4	74.6
1351-1400	-	99.7	-	98.7	3.6	90.3	5.6	81.3	4.3	82.9	6.2	67.0	3.6	89.8	5.6	80.2
> 1400	0.3	100.0	1.3	100.0	9.7	100.0	18.7	100.0	17.1	100.0	33.0	100.0	10.2	100.0	19.8	100.0

Wahoo Fork Length (mm) By Total Length (mm)





Linear Fit

Fork Length (mm) = -54.153 + 0.99104 Total Length (mm)

Summary of Fit

RSquare	0.971017
RSquare Adj	0.970413
Root Mean Square Error	42.61702
Mean of Response	1163.64
Observations (or Sum Wgts)	50

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2920681.4	2920681	1608.118
Error	48	87178.1	1816	Prob>F
C Total	49	3007859.5		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-54.15281	30.96017	-1.75	0.0867
Total Length (mm)	0.9910423	0.024713	40.10	<.0001

Nonlinear Fitting Control Panel

_ Second Deriv. Method
_ Continuous Update
_ Iteration Log
_ Loss is -LogLikelihood
PLCI iter=2 Converged g=9.47e-6
Converged in the Gradient

	Current	Limit	Alpha
Iteration	2	60	0.050
Shortening	0	15	
O Criterion	5.587935e-14	0.0000001	
D Criterion	0.0000029098	0.0000001	
G Criterion	0.0000000036	0.000001	
CL Criterion	?	0.00001	

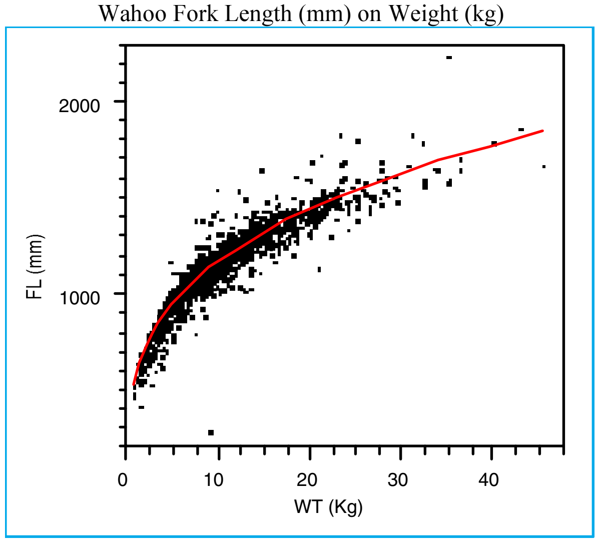
Parameter	Current Value	Lock	SSE
p1	589.06590181	_	9744995.5861
p2	0.3004449317	_	9761113.438

Solution

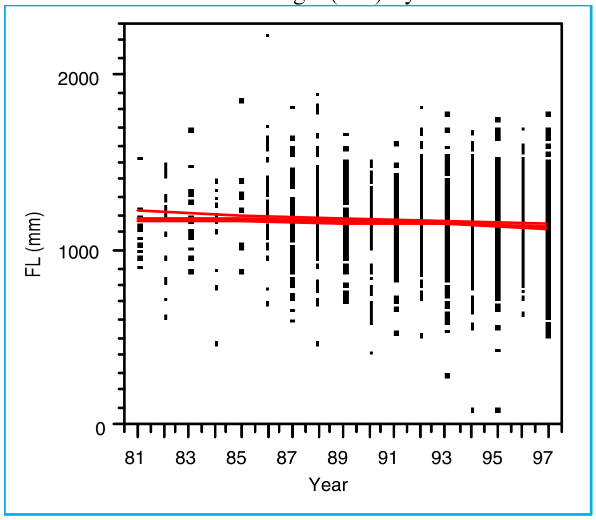
SSE	DFE	MSE	RMSE
9744995.5861	2325	4191.396	64.740991

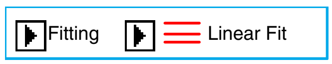
Parameter	Estimate	ApproxStdErr	Lower CL	Upper CL
p1	589.06590181	3.22517103	582.809605	595.390413
p2	0.3004449317	0.00228632	0.29599309	0.30489937

Wahoo Fork Length (mm) on Weight (kg)



Wahoo Fork Length (mm) By Year





Linear Fit

FL (mm) = 1449.64   3.12172 Year

Summary of Fit

RSquare	0.003002
RSquare Adj	0.002636
Root Mean Square Error	199.036
Mean of Response	1159.642
Observations (or Sum Wgts)	2728

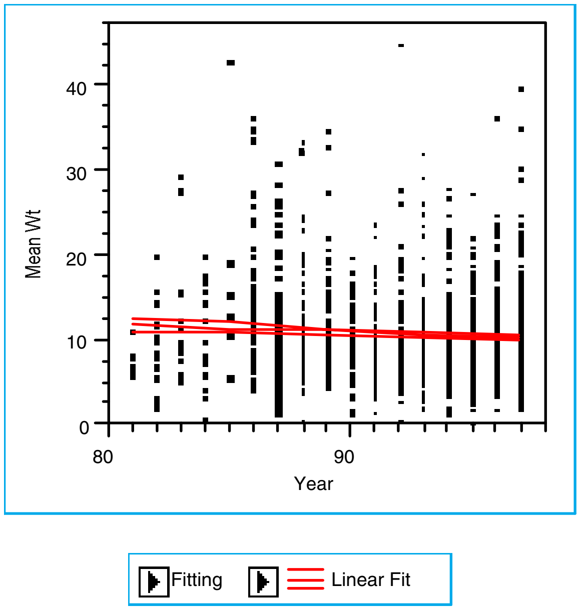
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	325141	325141	8.2075
Error	2726	107991389	39615	Prob>F
C Total	2727	108316530		0.0042

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1449.6371	101.2964	14.31	<.0001
Year	-3.12172	1.089657	-2.86	0.0042

Wahoo Mean Weight By Year



Linear Fit

Mean Wt = 19.2759   0.09255 Year

Summary of Fit

RSquare	0.003729
RSquare Adj	0.003078
Root Mean Square Error	5.579437
Mean of Response	10.71417
Observations (or Sum Wgts)	1532

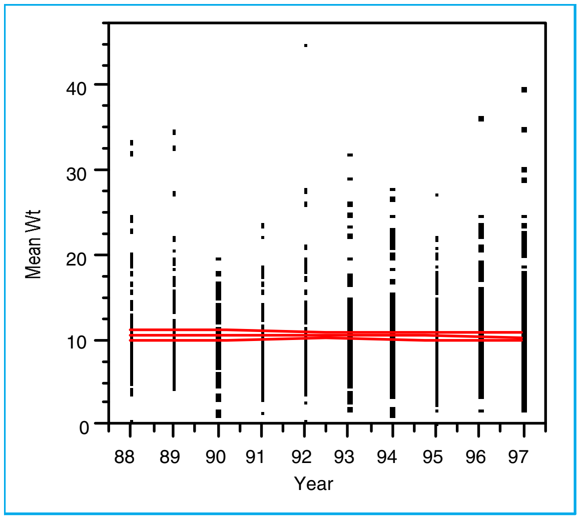
Analysis of Variance

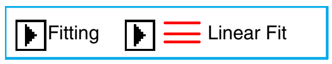
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	178.274	178.274	5.7267
Error	1530	47629.080	31.130	Prob>F
C Total	1531	47807.354		0.0168

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	19.275858	3.580554	5.38	<.0001
Year	-0.09255	0.038674	-2.39	0.0168

Wahoo Mean Weight By Year 1988-1997





Linear Fit

Mean Wt = 13.1362   0.02778 Year

Summary of Fit

RSquare	0.000205
RSquare Adj	-0.00054
Root Mean Square Error	5.281206
Mean of Response	10.53934
Observations (or Sum Wgts)	1344

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	7.677	7.6773	0.2753
Error	1342	37429.912	27.8911	Prob>F
C Total	1343	37437.590		0.5999

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	13.136238	4.951842	2.65	0.0081
Year	-0.027781	0.052952	-0.52	0.5999

Wahoo Recreational Bag and Trip Limits

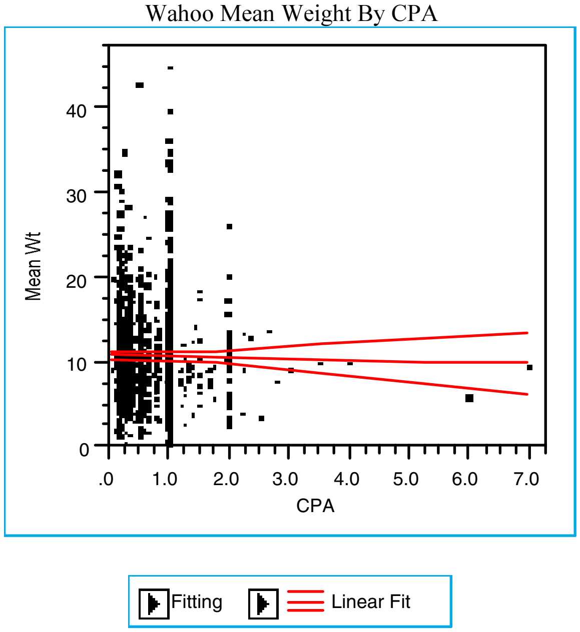
Wahoo Bag Limitr\ All Areas

Bag Limit	Headboat				Party/Charter				Private/Rental				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
1	43.8	56.2	51.5	48.5	80.4	19.6	85.3	14.7	80.0	20.0	84.8	15.2	65.9	34.1	73.4	26.6
2	21.7	34.5	21.8	26.7	10.4	9.2	9.0	5.7	8.8	11.2	7.8	7.3	14.8	19.3	13.4	13.2
3	10.8	23.7	10.1	16.7	2.4	6.8	1.8	3.8	2.7	8.5	2.1	5.2	5.7	13.6	4.7	8.4
4	6.5	17.2	5.7	10.9	0.8	6.0	0.5	3.3	0.9	7.6	0.6	4.6	3.1	10.5	2.4	6.1
5	4.2	13.0	3.6	7.4	0.6	5.4	0.3	3.0	0.8	6.8	0.5	4.1	2.0	8.5	1.5	4.6
6	2.9	10.2	2.4	5.0	0.5	5.0	0.3	2.7	0.7	6.1	0.4	3.6	1.4	7.1	1.0	3.6
7	1.9	8.2	1.6	3.4	0.4	4.6	0.2	2.5	0.7	5.4	0.4	3.2	1.0	6.1	0.7	2.9
8	0.9	7.3	0.7	2.7	0.4	4.2	0.2	2.3	0.6	4.8	0.4	2.9	0.6	5.5	0.4	2.5
9	0.2	7.1	0.1	2.6	0.4	3.9	0.2	2.1	0.6	4.2	0.4	2.5	0.3	5.2	0.2	2.3
10	0.2	7.0	0.1	2.5	0.4	3.5	0.2	1.9	0.6	3.6	0.3	2.2	0.3	4.9	0.2	2.1
11	0.1	6.9	0.0	2.5	0.4	3.1	0.2	1.7	0.6	3.1	0.3	1.8	0.3	4.6	0.1	2.0
12	0.1	6.8	0.0	2.5	0.4	2.8	0.2	1.5	0.6	2.5	0.3	1.5	0.3	4.3	0.1	1.8
13	0.1	6.7	0.0	2.4	0.4	2.4	0.2	1.3	0.6	1.9	0.3	1.1	0.3	4.1	0.1	1.7
14	0.1	6.6	0.0	2.4	0.4	2.0	0.2	1.1	0.6	1.3	0.3	0.8	0.3	3.8	0.1	1.5
15	0.1	6.6	0.0	2.4	0.4	1.7	0.2	0.9	0.6	0.8	0.3	0.5	0.3	3.6	0.1	1.4
20	0.4	6.2	0.1	2.2	1.7	0.0	0.9	0.0	0.8	0.0	0.5	0.0	1.1	2.4	0.6	0.8
25	0.4	5.8	0.1	2.1	-	0.0	-	0.0	-	0.0	-	0.0	0.2	2.3	0.0	0.7

Wahoo Trip Limit All Areas

Trip Limit	Headboat Number Int %	Headboat Number % Red	Headboat Weight Int %	Headboat Weight % Red	Party/Charter Number Int %	Party/Charter Number % Red	Party/Charter Weight Int %	Party/Charter Weight % Red	Private/Rental Number Int %	Private/Rental Number % Red	Private/Rental Weight Int %	Private/Rental Weight % Red	Total Number Int %	Total Number % Red	Total Weight Int %	Total Weight % Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
1	6.4	93.6	11.2	88.8	41.7	58.3	46.4	53.6	60.1	39.9	65.9	34.1	28.9	71.1	37.8	62.2
2	1.9	91.7	2.5	86.3	18.0	40.3	18.5	35.2	12.7	27.2	12.6	21.5	11.3	59.8	13.5	48.7
3	1.7	90.0	2.1	84.2	10.3	30.0	10.1	25.1	6.2	20.9	5.9	15.6	6.7	53.2	7.5	41.1
5	3.1	86.8	3.8	80.4	11.1	18.9	10.4	14.6	6.5	14.4	5.8	9.8	7.7	45.5	8.2	32.9
10	7.0	79.9	8.1	72.3	9.8	9.1	8.6	6.0	5.3	9.1	4.4	5.4	8.4	37.0	8.2	24.8
15	6.0	73.9	6.7	65.6	2.5	6.6	2.0	4.0	1.1	8.0	0.8	4.6	3.8	33.2	3.3	21.5
20	5.3	68.5	5.8	59.8	0.8	5.8	0.6	3.4	0.6	7.5	0.3	4.3	2.6	30.6	2.0	19.5
25	4.6	63.9	4.9	54.9	0.4	5.3	0.3	3.2	0.5	7.0	0.3	4.0	2.1	28.6	1.6	17.9
30	4.2	59.6	4.4	50.6	0.4	5.0	0.2	3.0	0.5	6.5	0.3	3.7	1.9	26.6	1.4	16.5
40	7.8	51.8	7.9	42.6	0.7	4.2	0.4	2.5	1.0	5.5	0.6	3.2	3.5	23.1	2.6	13.9
50	6.6	45.2	6.5	36.2	0.7	3.5	0.4	2.1	1.0	4.6	0.5	2.6	3.1	20.0	2.2	11.8
75	12.7	32.6	12.0	24.1	1.8	1.7	1.1	1.0	2.4	2.2	1.4	1.3	6.1	13.9	4.2	7.6
100	7.8	24.8	7.0	17.2	1.7	0.0	1.0	0.0	2.2	0.0	1.3	0.0	4.1	9.8	2.7	4.9

Wahoo Mean Weight By CPA



Linear Fit

Mean Wt = 10.7859 0.12574 CPA

Summary of Fit

RSquare	0.000121
RSquare Adj	-0.00053
Root Mean Square Error	5.58953
Mean of Response	10.71417
Observations (or Sum Wgts)	1532

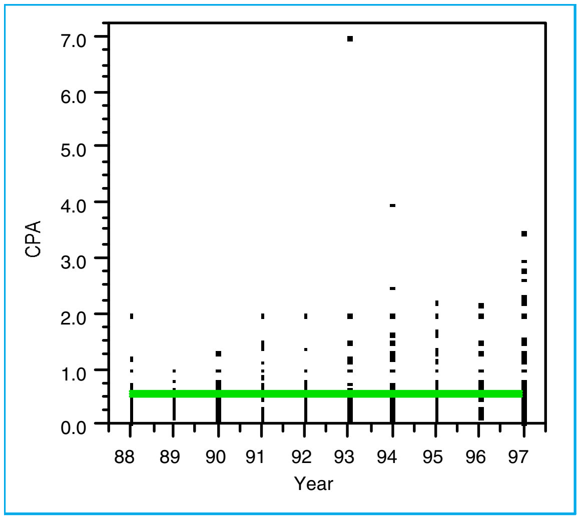
Analysis of Variance

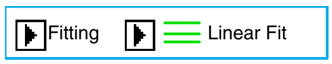
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	5.808	5.8084	0.1859
Error	1530	47801.546	31.2428	Prob>F
C Total	1531	47807.354		0.6664

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.785931	0.219302	49.18	0.0000
CPA	-0.125743	0.291631	-0.43	0.6664

Wahoo CPA By Year 1988-1997





Linear Fit

CPA = 0.77166   0.00236 Year

Summary of Fit

RSquare	0.000181
RSquare Adj	-0.00056
Root Mean Square Error	0.478131
Mean of Response	0.550983
Observations (or Sum Wgts)	1344

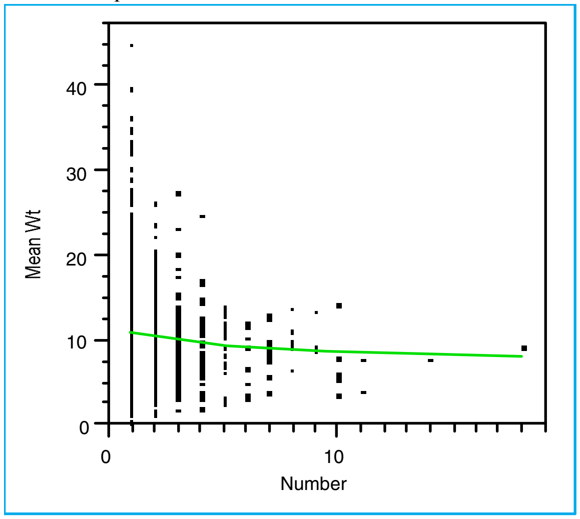
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.05544	0.055441	0.2425
Error	1342	306.79337	0.228609	Prob>F
C Total	1343	306.84881		0.6225

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.7716632	0.448312	1.72	0.0854
Year	-0.002361	0.004794	-0.49	0.6225

Wahoo Mean Weight (kg) By Catch Per Trip



Transformed Fit to Log

Mean Wt = 10.8536   0.94241 Log(Number)

Summary of Fit

RSquare	0.009649
RSquare Adj	0.008911
Root Mean Square Error	5.256204
Mean of Response	10.53934
Observations (or Sum Wgts)	1344

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	361.239	361.239	13.0753
Error	1342	37076.350	27.628	Prob>F
C Total	1343	37437.590		0.0003

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.853575	0.167655	64.74	0.0000
Log(Number)	-0.94241	0.260624	-3.62	0.0003

Wahoo Commercial Landings

Wahoo Commercial Totals by Gear-All years

Gear	N Rows	Pounds	% Pounds
Combined Gears	45	1278379	42.50
Not Coded	4	656797	21.83
Lines Long Set With Hooks	80	586741	19.51
Lines Troll Other	29	244463	8.13
Lines Hand Other	56	186817	6.21
Floating Traps (Shallow)	1	15882	0.53
Lines Long Reef Fish	4	10120	0.34
Reel Electric or Hydraulic	5	8465	0.28
Rod and Reel	8	8441	0.28
Gill Nets Drift Runaround	5	7200	0.24
Trawl Midwater Paired	2	3445	0.11
Gill Nets Sink/Anchor Other	2	1019	0.03
Lines Long Shark	1	221	0.01
Gill Nets Drift Other	2	63	0.00
Lines Troll Tuna	2	37	0.00
Gill Nets Drift Large Pelagic	1	16	0.00
Dredge Scallop Sea	1	14	0.00

Wahoo Commercial Totals by State All years

State	N Rows	Pounds	% Pounds
Louisiana	13	1572783	52.08
Florida West Coast	24	527182	17.46
Florida East Coast	24	330205	10.93
North Carolina	19	266503	8.82
Texas	9	132063	4.37
South Carolina	17	130089	4.31
Rhode Island	4	16252	0.54
New Jersey	10	11565	0.38
New York	14	8361	0.28
Georgia	6	7175	0.24
Alabama	3	6743	0.22
Maryland	8	2941	0.10
Virginia	14	2750	0.09
Mississippi	1	2718	0.09
Massachusetts	4	1327	0.04
Connecticut	2	1241	0.04

Wahoo Commercial Totals by State 94-97

State	N Rows	Pounds	% Pounds
Louisiana	4	513534	51.76
Florida West Coast	4	183631	18.51
North Carolina	4	107871	10.87
Florida East Coast	4	88069	8.88
South Carolina	4	41719	4.20
Texas	4	22466	2.26
Rhode Island	4	16252	1.64
New Jersey	4	6990	0.70
New York	4	5616	0.57
Georgia	2	3775	0.38
Maryland	3	2002	0.20
Massachusetts	2	122	0.01
Virginia	2	109	0.01
Connecticut	1	41	0.00

Wahoo All Areas

Gear	1994	1995	1996	1997
Hook & Line	63,778	95,177	73,275	95,280
Longline	26,840	30,590	31,878	34,809
Other	19,391	4,257	555	1,718
Unknown	140,677	135,576	127,369	133,162
Total	250,404	265,314	232,789	264,678

Wahoo Commercial Size Limits

Wahoo All Areas

Size Mm FL	Hand Line Number Int %	Hand Line Number Cum %	Hand Line Weight Int %	Hand Line Weight Cum %	Long Line Number Int %	Long Line Number Cum %	Long Line Weight Int %	Long Line Weight Cum %	Other Number Int %	Other Number Cum %	Other Weight Int %	Other Weight Cum %	Total Number Int %	Total Number Cum %	Total Weight Int %	Total Weight Cum %
< 600	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
601-800	2.5	2.5	0.8	0.8	0.9	0.9	0.2	0.2	-	-	-	-	2.3	2.3	0.7	0.7
801-900	7.3	9.8	2.9	3.7	12.3	13.2	4.2	4.4	-	-	-	-	7.7	10.0	3.0	3.8
901-1000	12.7	22.5	7.1	10.7	12.5	25.7	6.7	11.1	-	-	-	-	12.7	22.8	7.0	10.8
1001-1050	9.8	32.4	6.6	17.3	12.5	38.2	7.8	18.9	-	-	-	-	10.0	32.8	6.7	17.5
1051-1100	13.0	45.4	9.7	27.1	5.3	43.6	3.6	22.5	-	-	-	-	12.4	45.2	9.2	26.7
1101-1150	8.3	53.7	7.1	34.2	4.0	47.6	3.2	25.7	-	-	-	-	8.0	53.2	6.8	33.5
1151-1200	6.8	60.5	6.7	40.9	3.7	51.3	3.1	28.9	-	-	-	-	6.6	59.8	6.4	39.9
1201-1250	5.9	66.4	6.2	47.1	3.8	55.1	3.8	32.6	-	-	-	-	5.7	65.5	6.0	45.9
1251-1300	8.0	74.4	9.5	56.6	10.3	65.4	11.5	44.1	-	-	-	-	8.2	73.8	9.7	55.6
1301-1350	5.8	80.2	7.7	64.3	12.5	78.0	15.2	59.3	-	-	-	-	6.3	80.0	8.3	63.9
1351-1400	6.5	86.7	9.5	73.8	8.2	86.2	11.3	70.6	-	-	-	-	6.6	86.6	9.6	73.5
1401-1450	3.9	90.6	6.4	80.2	2.2	88.4	3.4	73.9	-	-	-	-	3.8	90.5	6.1	79.7
1451-1500	2.8	93.4	5.1	85.2	4.0	92.4	6.6	80.5	-	-	-	-	2.9	93.3	5.2	84.9

Wahoo Commercial Trip Limits

Wahoo All Areas

Trip Limit	Hand Line/R&R Trips Int %	Hand Line/R&R Trips % Red	Hand Line/R&R Weight Int %	Hand Line/R&R Weight % Red	Long Line Trips Int %	Long Line Trips % Red	Long Line Weight Int %	Long Line Weight % Red	Other Trips Int %	Other Trips % Red	Other Weight Int %	Other Weight % Red	Total Trips Int %	Total Trips % Red	Total Weight Int %	Total Weight % Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
50	64.8	35.2	54.7	45.3	36.3	63.7	28.6	71.4	87.3	12.7	92.1	7.9	50.1	49.9	36.2	63.8
100	24.1	11.1	15.3	29.9	22.5	41.2	17.1	54.3	12.7	0.0	7.9	0.0	23.3	26.6	16.6	47.2
150	4.2	7.0	6.5	23.4	11.9	29.2	11.6	42.8	-	0.0	-	0.0	8.2	18.5	10.1	37.1
200	2.6	4.4	4.2	19.2	6.7	22.6	8.6	34.2	-	0.0	-	0.0	4.7	13.8	7.3	29.8
250	2.0	2.3	2.5	16.7	4.8	17.7	6.7	27.5	-	0.0	-	0.0	3.5	10.3	5.4	24.3
300	0.4	2.0	1.6	15.1	3.5	14.2	5.2	22.2	-	0.0	-	0.0	2.0	8.3	4.2	20.2
350	0.3	1.7	1.4	13.8	2.4	11.8	4.4	17.9	-	0.0	-	0.0	1.4	6.9	3.5	16.7
400	0.3	1.4	1.2	12.6	2.5	9.3	3.5	14.4	-	0.0	-	0.0	1.4	5.5	2.8	13.9
450	0.1	1.3	1.0	11.6	1.7	7.7	2.8	11.6	-	0.0	-	0.0	0.9	4.6	2.3	11.6
500	0.1	1.2	1.0	10.7	1.5	6.2	2.3	9.3	-	0.0	-	0.0	0.8	3.8	1.9	9.7
750	0.7	0.4	3.1	7.5	4.2	2.0	6.1	3.2	-	0.0	-	0.0	2.5	1.3	5.2	4.4
1000	0.2	0.2	1.3	6.3	1.5	0.5	2.2	1.0	-	0.0	-	0.0	0.9	0.4	1.9	2.5
1500	0.1	0.1	1.3	5.0	0.4	0.1	0.7	0.3	-	0.0	-	0.0	0.3	0.1	0.8	1.7
2000	-	0.1	0.8	4.2	0.1	0.0	0.2	0.1	-	0.0	-	0.0	0.0	0.1	0.4	1.3
2500	-	0.1	0.8	3.4	0.0	0.0	0.0	0.1	-	0.0	-	0.0	0.0	0.1	0.3	1.1

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Appendix I. Comments on the Draft Environmental Impact Statement

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

November 5, 2001

Dr. Joseph E. Powers
National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702

SUBJ: **EPA NEPA Review of NMFS DEIS for "Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic, Caribbean, and Gulf of Mexico"; CEQ Number 010350**

Dear Dr. Powers:

Pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed the subject National Marine Fisheries Service (NMFS) Draft Environmental Impact Statement (DEIS) prepared by the South Atlantic Fishery Management Council (Council) in cooperation with the New England Fishery Management Council, Caribbean Fishery Management Council and Gulf of Mexico Fishery Management Council (Councils) for the Fishery Management Plan (FMP) for dolphin (common dolphin - *Coryphaena equisetis* and pompano dolphin - *C. hippurus*) and wahoo (*Acanthocybium solandri*) fisheries.

The dolphin and wahoo fisheries are primarily recreational, particularly the dolphin fishery. The proposed FMP is somewhat proactive since both fisheries are currently healthy and not overfished. However, there are areas of localized reductions and some areas of use conflicts now exist between recreational and commercial (long line) fishers. In general, the FMP proposes to regulate a large fishery management unit (U.S. waters of the Atlantic, Gulf of Mexico and Caribbean EEZ) and promulgate dealer, vessel, and operator permits to gather fishery data to better understand the two fisheries; provide non-binding caps on both recreational and commercial landings to allocate the resource and reduce fisher use conflicts; and set bag and size limits to protect fish abundance and the harvesting of juveniles (e.g., "chicken" dolphin). Specifically, the DEIS lists (pg. xviii) the following management objectives of the FMP: "(1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, (5) reduce bycatch in the dolphin fishery, (6) direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries."

Overall, EPA supports the proposed dolphin and wahoo FMP. However, we offer the following comments on the NEPA process and have enclosed additional comments on the FMP:

* *NEPA Document* - Compared to previous FMP EISs reviewed by EPA, the present DEIS is more consistent with the NEPA process. We note that background information, management objectives/goals, and options to proposed actions are provided. Moreover, we note that the specific management objectives addressed by individual proposed actions are itemized in the discussion/conclusion sections for those actions. This serves to relate the actions to the FMP objectives.

In addition to such a listing of applicable proposed actions for each management objective, we recommend that a summary table be provided in the FEIS where all actions applicable to each management objective are listed by objective so that the public can readily determine which actions will satisfy each management goal. In the text, NMPS may also wish to more specifically discuss how each proposed action would satisfy specific goals. A summary of how bycatch, for example, would be reduced by the FMP objectives would be of public interest.

Despite NEPA improvements, the DEIS is somewhat cumbersome given that 28 actions are proposed with as many as seven options for these actions. While we support the NEPA concept of reasonable alternatives (options), instances were noted where options could have been lumped into the action and others where the options should have been split into two options since ranges were offered and selections were not yet made. In some cases, the rationale for rejection of options needed further clarification. Some streamlining in the FEIS and future NEPA documents may be possible and should be considered. The summary tables (e.g., Table 3) for the various actions and options are helpful.

* *Public Acceptance* - Regarding previous (1989) consideration for managing dolphin and wahoo, page 4 states that "...the Councils decided to forego any management for dolphin due to lack of support for any specific measures at that time." While we understand that public support and involvement is desirable to management success, it is fishery data (landings, stock biomass, etc.) that are key in determining the need for a FMP more so than public receptiveness. Historically, fishery restrictions (bag limits, minimum size, reporting, permits, etc.) are often not welcomed by commercial or recreational fishers, particularly for a previously unregulated fishery such as the present dolphin and wahoo fisheries.

* *Role of Federal Lead Agency* - Page 5 states that "[t]he Councils concluded this meets the intent of NEPA." While we understand the important role and expertise of the Councils, they are not federal agencies. Accordingly, we believe that NMFS, as the lead federal agency, should determine NEPA compliance of the federal DEIS. Therefore, the above passage should perhaps read in the FEIS as "NMFS concluded this meets the intent of NEPA," or perhaps as "NMFS and the Councils concluded this meets the intent of NEPA." Other such statements regarding NEPA compliance and the role of the federal lead agency versus the technical role of the Councils should be revisited for the FEIS. Conversely, we are pleased to note that page 178, referring to

Action 5, states that "[t]his option is strongly supported by the National Marine Fisheries Service and many vessel owners."

* *Framework Procedure* - We agree with the use of the framework procedure to quickly modify a FMP where additional information or discussion makes such modification necessary (adaptive management). The NEPA process, however, would still need to be served under framework management. We assume that NMFS will ensure NEPA compliance during the framework process.

* *Options* - As suggested above, some options proposed in the DEIS themselves offer a range of choices. For example, Option 2 for Action 15 (proposing a 20-inch fork length (FL) as a minimum size for dolphin) offers an 18- to 24-inch FL range and suggests that a final FL will be chosen. Options to a proposed action should preferably provide only one FL, i.e., two options should have been presented -- one above 20 inches and one below 20 inches. Since Option 2 offers a range above and below 20 inches, its merits are difficult to comment on by resource agencies and the public. Conversely, other ranges presented in the DEIS such as for the maximum sustainable yield (MSY: Action 7) are appropriate since they present a statistical confidence limit range. However, even in such instances, the need to settle on one MSY value -- such as an average MSY -- seems appropriate.

We also note that Options 2 and 3 for Action 23 seem more consistent with the proposed action than variants to the proposed action. The FEIS should revisit these and revise them as needed, or better identify differences between the options and Action 23.

* *List of Acronyms & Glossary* - Because of the technical nature of fishery science, we recommend that the FEIS include a *List of Acronyms* and a *Glossary* to make the document more user-friendly to the general public (e.g., MSY, SPR, F, OY, FL, RecFIN, ComFIN, fecundity, pelagic, proxy, *Sargassum*, etc.). Although several such terms are defined in the DEIS, their consolidation would facilitate public reviews. Similarly, when listing taxonomic fish families (as was done for the gut analysis for dolphin in Chapter 3: pg. 31), we suggest that the common name also be included with the family name (e.g., Scombridae: mackerels & tunas). In addition, we suggest that the FEIS summarize the concept of Essential Fish Habitat (EFH) in pelagic waters where bottom habitat would not be damaged by fishing gear or most development as it would for EFHs in inshore waters. For example, how would the expansive and meandering Gulf Stream, which is proposed as a dolphin and wahoo EFH in Action 22, be protected as an EFH? Also, we suggest that local terms such as "chicken" dolphin (juvenile dolphin) be further defined as to size (<18-inch FL?) and other characteristics.

In addition to the above NEPA process comments, EPA has provided comments and recommendations on the 28 proposed actions of the FMP and their options in the enclosed *Detailed Comments*. Some of our potential concerns include that similar but nevertheless different species and congeners are lumped into one FMP, that permit fees are required in some regions but not in all regions of the management unit, that operators of for-hire vessels will still be able to sell dolphin and wahoo which may affect the assurance of food quality standards, that the proposed minimum size limit for dolphin would only apply to portions of the Atlantic, the current NMFS position on the harvesting of *Sargassum* weed particularly as it relates to dolphin and wahoo EFH and the status of the *Sargassum* FMP, and the mechanism for the enforcement of the proposed FMP. We suggest additional discussion in the FEIS.

In summary, EPA conceptually supports the proposed FMP for dolphin and wahoo and will primarily defer to the expertise of the NMFS and the Councils on the bases and assumptions for the proposed actions. However, our NEPA and FMP comments should be considered/clarified by the NMFS/Councils in their development of the pending FEIS as well as future fishery EISs. We rate this DEIS an "EC-1" (Environmental Concerns) due to our NEPA and FMP comments.

Should you have questions regarding these comments, you may wish to contact Chris Hoberg of my staff at 404/562-9619.

Sincerely,

Heinz J. Mueller, Chief
Office of Environmental Assessment
Environmental Accountability Division

Enclosure

DETAILED COMMENTS

EPA offers the following comments on the FMP actions and their options for the NMFS/Councils consideration in the development of the FEIS:

o **Management Measures for U.S. Waters of the Atlantic, Caribbean and Gulf of Mexico**

Action 1 (Management Unit for Dolphin) - We note that the range for the dolphin is broad geographically (Nova Scotia to Brazil) as is the range of the management unit (Atlantic EEZ to the Caribbean EEZ). However, samples within the range indicated no genetic differences and tagging information shows that dolphin move within the range. Accordingly, it seems reasonable that one management plan for dolphin is appropriate for the management unit. It is unclear, however, if both the common dolphin and the pompano dolphin, which are both to be regulated under the same FMP, were examined genetically and via tagging. While differences may not exist within a species, physical and behavioral differences could exist between dolphin congeners. The FEIS should clarify. The DEIS indicates, for example, that pompano dolphin are a smaller-sized species and prefer warmer waters than the common dolphin.

+ *Option 1 for Action 1 (No Action)* - In regard to management of dolphin at a time when the stock appears healthy (pg. 163), we do not disagree with such a proactive NMFS regulation if it is followed by adaptive management of the proposed FMP through the framework process. We note that conflicts between commercial and recreational fishers have occurred, that juvenile "chicken" dolphin are being harvested and that areas of localized reductions have occurred, which suggest that some regulation is already appropriate at this time. As such, we agree with the NMFS rejection of Option 1. However, given the many species being overfished, it is arguable that resources needed for this FMP may be more needed for those species with stocks in greater jeopardy -- unless these species are also already being fully managed. We will defer to the expertise of the NMFS and Councils.

* ***Action 2 (Management Unit for Wahoo)*** - The biology and stock status of wahoo is less known than for dolphin. However, the pelagic distribution appears similar and like dolphin, there appears to be movement within the range. Wahoo and dolphin are also harvested by some of the same fishers. It therefore may not be unreasonable to lump wahoo with dolphin in the same FMP and management unit (Atlantic, Caribbean and Gulf of Mexico EEZ). However, given that two different species with different genera are involved and data are limited, separate FMPs may ultimately be more appropriate if a need is identified through the proposed collection of reporting data.

+ *Option 1 for Action 2 (No Action)* - We agree with the NMFS rejection of Option 1 in an effort to compile data to better understand wahoo stocks. Again, adjustment to the proposed FMP appear likely as data become available.

* ***Action 3 (Dealer Permits for Atlantic and Gulf)*** - EPA agrees with the use of dealer permits in order to better assess dolphin and wahoo landings and changes in landings. In regard to the fee for these permits, NMFS may wish to consider waiving this cost since the information gathered by the dealers is invaluable to the understanding of the two fisheries. The permit fees are also nominal so that revenues would not seem to be a significant gain or loss to the agency. If not waived, however, we suggest that the proposed federal use of the permit fees be disclosed (e.g., fisheries management, enforcement, conservation, permit processing, NMFS policy, etc.) in the FEIS.

\+ <u>*Option 1 for Action 3 (No Action)*</u> - We agree with the NMFS rejection of Option 1 so that the two fisheries will be monitored.

\+ <u>*Option 2 for Action 3 (Dealer Permits for Caribbean)*</u> - This option proposes a permit and fee for the Caribbean. The Councils have rejected this option since the fees might be an economic burden for Caribbean dealers which may also be fishers and vessel owners, which require additional permits and fees. EPA does not disagree in the sense that we believe that the permit fees might be waived in general, as suggested above. With or without fees, however, we believe that dealer reporting of landings should be required through permits for all subregions of the management unit (Atlantic, Gulf and Caribbean) in order to monitor the two fisheries and for comparisons. It may be argued, however, that if fees are charged in the Atlantic and Gulf but not the Caribbean, some discontent may develop among U.S. dolphin and wahoo fishers.

\+ <u>*Option 3 for Action 3 (State vs. Federal Permits for Caribbean)*</u> - For Option 3, EPA defers to the NOAA General Counsel which has "indicated that pursuant to the Magnuson-Stevens Act, it was not feasible to defer to local government permits for harvest and possession of a Federally managed species"(pg. 171).

* ***Action 4A (Vessel Permits for Atlantic and Gulf)*** - We concur with the action to require the owners of for-hire vessels to obtain a NMFS permit to harvest or possess wahoo or dolphin so that the number of commercial fishing vessels and commercial effort can be determined. A nominal fee would be charged. As indicated above for dealer fees, NMFS may wish to waive this fee considering the value of such a permitting requirement to the understanding of the two species.

Action 4B (Specifics for Vessel Permits for Atlantic) - We concur with the presented specifics regarding the need for a vessel permit such as a permit being required if at least 25% of the vessel owner's income was derived from commercial or for-hire fishing. It is unclear, however, as to why a 200-pound wahoo and dolphin bycatch possession limit is allowed for permitted commercial fishers fishing north of 39 degrees North latitude. It is also unclear how such permitting will be enforced. The FEIS should discuss.

\+ <u>*Option 1 for Actions 4A and 4B (No Action)*</u> - EPA agrees with the NMFS rejection of this option so that the two fisheries can be further characterized through vessel permitting.

* ***Action 4C (Vessel Permits Without Fees for Caribbean)*** - Due to the economics of the Caribbean subregion, the Councils propose that no permitting fee be charged but that the vessel permitting process be initiated.

As suggested above, we believe that vessel permits should be required for all subregions within the management unit for dolphin and wahoo. With or without fees, the permitting should be consistent within the management unit. It may be argued, however, that if fees are charged in the Atlantic and Gulf but not the Caribbean, some discontent may develop among U.S. dolphin and wahoo fishers.

+ *Option 1 for Action 4C (No Action)* - EPA agrees with the NMFS rejection of this option so that the two fisheries can be further characterized through vessel permitting.

Action 5 (Operator Permits for Atlantic and Gulf) - EPA agrees with the requirement of an operator's permit for commercial or for-hire vessels to harvest or possess dolphin or wahoo. We particularly agree that the operator must be onboard, is held accountable for violations of fishery regulations, and that the permit is not transferable and can be revoked and sanctioned.

+ *Option 1 for Action 5 (No Action)* - We concur with the NMFS rejection of this option to minimize onboard violations of the FMP and other fishery regulations.

+ *Option 2 for Action 5 (Operator Permits for Caribbean)* - EPA disagrees with the apparent proposed permit exemption for Carribean operators. The argument that the Caribbean fishery shows no sign of decline can be made for many other areas within the management unit. We suggest that this option be revisited in the FEIS and that Action 5 perhaps be modified to include the Caribbean. This would provide consistency across the management unit, allow comparison against the Atlantic and Gulf, and help ensure FMP compliance in the Caribbean. EPA would not oppose waiving a permit fee, but believes the permitting process and enforcement should be consistent within the management unit.

Action 6: SubAction 6A (Reporting Requirements for Atlantic) - EPA will defer to the NMFS expertise regarding data collection techniques and analysis such as the listed ACCSP, RecFIN, ComFIN and the existing logbook requirements. EPA recommends use of standardized methodology and consistency within the management unit to allow regional comparisons

* ***Action 6: SubAction 6B (Reporting Requirements for Gulf and Caribbean)*** - EPA will defer to the NMFS expertise regarding data collection techniques and analysis. Techniques for Gulf and Caribbean will apparently be developed through the framework process. EPA recommends use of standardized methodology and consistency within the management unit to allow regional comparisons.

+ <u>*Option 1 for Action 6 (No Action)*</u> - We concur with the NMFS rejection of this option so that data can be appropriately reduced and interpreted.

* ***Action 7 (Dolphin & Wahoo Maximum Sustainable Yield: MSY)*** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of the MSY for both dolphin and wahoo. We also understand that the MSY is based on the spawning stock size (biomass) preferred by NMFS/Councils. While we understand that the ranges provided represent 80% confidence levels, it would seem that one figure such as the mean be disclosed and used in analysis. The FEIS should discuss.

+ <u>*Option 1 for Action 7 (No Action)*</u> - We concur with the NMFS rejection of this option since the MSY estimate is essential to the management of dolphin stocks and required (or an MSY proxy) by the Magnuson-Stevens Act.

+ <u>*Option 2 for Action 7 (Other MSY Estimates)*</u> - We defer to the NMFS and Councils regarding the preference for biomass-derived MSY estimates as presented in Action 7.

+ <u>*Option 3 for Action 7 (Other MSY Estimates)*</u> - We defer to the NMFS and Councils regarding the preference for biomass-derived MSY estimates as presented in Action 7.

* ***Action 8 (Dolphin & Wahoo Optimum Yield: OY)*** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of the OY for both dolphin and wahoo. OY is defined as "the maximum number of fish that can be harvested safely as reduced by social, economic, and ecological features." We are pleased to note that while the OY is often less than MSY it cannot exceed MSY and that ecological features can result in reduced landings. The FEIS should further discuss what specific ecological considerations would be implemented for this FMP.

+ <u>*Option 1 for Action 8 (No Action)*</u> - We concur with the NMFS rejection of this option to prevent overfishing.

+ <u>*Option 2 for Action 8 (Other OY Estimates)*</u> - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8.

+ <u>*Option 3 for Action 8 (Other OY Estimates)*</u> - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8.

+ <u>*Option 4 for Action 8 (Other OY Estimates)*</u> - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8. Also, data presently do not exist to calculate spawning stock size (biomass) by subregions.

* ***Action 9 (Overfishing)*** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of fishing mortality and other components involved in estimating the

overfishing estimate for both dolphin and wahoo.

+ _Option 1 for Action 9 (No Action)_ - We concur with the NMFS rejection of this option to prevent overfishing.

* ***Action 10 (Framework Procedure)*** - We agree with adjustments to the proposed FMP through the framework procedure to expedite modifications. However, NEPA compliance will still be necessary for such adaptive management.

+ _Option 1 for Action 10 (No Action)_ - We concur with the NMFS rejection of this option to allow rapid FMP modifications.

o Management Measures for U.S. Waters of the Atlantic

Action 11 (Sale of Dolphin & Wahoo) - We agree that dolphin and wahoo should not be sold by recreational fishers. However, this action exempts for-hire vessels with commercial permits that comply with regulations, which are allowed to sell dolphin and wahoo. EPA can only agree with this exception if the commercial permits for the for-hire vessels require the food quality standards of commercial vessels. It is also unclear as to why Action 11 is only proposed for the Atlantic subregion. The FEIS should discuss.

+ _Option 1 for Action 11 (No Action)_ - We concur with the NMFS rejection of this option since recreational fishers can avoid food quality standards that commercial fishers cannot legally avoid.

+ _Option 2 for Action 11 (Phase-Out Period)_ - This option proposes to phase out the for-hire vessel exemption in 3-5 years so that only true commercial vessels will eventually be able to sell dolphin and wahoo. We do not disagree with the NMFS rejection of Option 2 if the for-hire vessels indeed are bound by commercial food quality standards.

+ _Option 3 for Action 11 (Prohibit For-Hire Vessels Sales)_ - This option would limit the sale of dolphin and wahoo to commercial vessels. Again, we do not disagree with the NMFS rejection of Option 3 if the for-hire vessels indeed are bound by commercial food quality standards. However, EPA favors Option 3 since it provides the best assurance for food quality standards. On the other hand, it does present some societal and economic issues for for-hire vessels.

Action 12 (Commercial Landings Cap) - Although not a rigorous Total Allowable Catch (TAC), this action caps commercial landings at 13% of total landings or 1.5 M pounds, whichever is greater. These caps are based on the average of recent fishery statistics (1994-1997), including the highest (1995) landings (Note - It is unclear why Action 12 (Atlantic EEZ) and Action 27 (Gulf EEZ) used significantly different baseline years; the FEIS should discuss.).

Although the NMFS can adjust the caps if exceeded, this non-binding cap offers a target that should perhaps evolve into a TAC as data become available. EPA agrees with capping commercial landings to help resolve commercial/recreational fisher use conflicts.

+ _Option 1 for Action 12 (No Action)_ - We concur with the NMFS rejection of this option in order to set a cap, albeit non-binding, and to help resolve fisher use conflicts.

+ _Option 2 for Action 12 (Historical Catch)_ - Option 2 bases the cap on historical landings from one of several time periods different from proposed Action 12. We will defer to the NMFS regarding the selection of the appropriate time frame but favor recent landings used in Action 12.

+ _Option 3 for Action 12 (Gear Types)_ - Option 2 bases the cap on gear types by different parts of the subregion. We will defer to the NMFS regarding the selection of the appropriate time frame but favor the statistics used in Action 12.

Action 13 (Bag Limit) - This action proposes a 10 dolphin per person per day and 60 dolphin per boat per day limit. We conceptually agree with bag limits and will defer to the NMFS regarding the basis of these limits. This action serves to cap recreational fishing.

+ _Option 1 for Action 13 (No Action)_ - We concur with the NMFS rejection of this option in order protect dolphin abundance.

+ _Option 2 for Action 13 (Reduced Dolphin Bag Limit Per Boat Per Day)_ - We agree with the NMFS rejection of Option 2 regarding dolphin bag limits for for-hire vessels (18-60 per vessel per day) since we will defer to the expertise of the NMFS/Councils proposing Action 13 bag limits. However, the lower bag limit proposed in Option 2 (18 vs. 60) would provide greater protection of stock abundance. From a NEPA standpoint, this option is vague since it provides a wide range rather than a distinct bag limit.

+ _Option 3 for Action 13 (Reduced Dolphin Bag Limit Per Person Per Day)_ - We agree with the NMFS rejection of Option 3 regarding dolphin bag limits for fishers (5-10 per person per day) since we will defer to the expertise of the NMFS/Councils proposing Action 13 bag limits. However, the lower bag limit proposed in Option 3 (5 vs. 10) would provide greater protection of stock abundance. From a NEPA standpoint, this option is vague since it provides a wide range rather than a distinct bag limit.

+ _Option 4 for Action 13 (Bag Limit Exemptions)_ - We agree with the NMFS rejection of Option 4 proposing Action 13 bag limits with an exemption for headboats fishing in waters north of 39 degrees North Latitude since we will defer to the expertise of the NMFS/ Councils proposing Action 13 bag limits. Such exemptions would allow greater landings and therefore reduce dolphin abundance. The basis of such an exemption is also unclear.

**** Action 14 (Commercial Trip Limits)*** - EPA conceptually agrees with a limit on commercial dolphin landings per trip (3,000 pounds per trip north of 31 degrees North Latitude and 1,000 pounds south) and agrees that no at-sea catch transfers should be allowed. We will defer to the expertise of the NMFS/Councils regarding the basis for these limits. However, the basis for these limits is somewhat unclear (data vs. maintenance of status quo and public opinion). The basis and regional differences should be better discussed in the FEIS.

+ *Option 1 for Action 14 (No Action)* - We concur with the NMFS rejection of this option in order to limit the amount of fishing effort in the dolphin commercial fishery.

+ *Option 2 for Action 14 (1,000-5,000 Pound Trip Limits)* - We agree with the NMFS rejection of Option 2 since we will defer to the expertise of the NMFS/Councils proposing Action 14 trip limits. The increased limits proposed in Option 2 (5,000 vs. 3,000 pounds) would impact abundance.

Action 15 (Dolphin Size Limits) - We conceptually agree with setting a minimum size limit south of Georgia and defer to the expertise of the NMFS/Councils regarding the basis for Action 15 size limits of a 20-inch FL. We understand (pg. 224) that most common dolphin mature at a FL of 18 inches so that it is likely that dolphin will have spawned by the time they have reached the proposed minimum size limit. The size limit would also prevent harvest of juvenile "chicken" dolphin and reduce the harvest of the smaller pompano dolphin species (parenthetically, the FL size range of juvenile "chicken" or "peanut" dolphin should be defined in the FEIS). It would also raise the current limit of an 18-inch FL in Georgia.

The basis for the exemption of a size limit for waters north of Georgia should be further discussed in the FEIS. We note (pg. 228) that the proposal for no size limit in South Carolina is to reduce the number of dolphin regulatory discards which may or may not survive.

+ *Option 1 for Action 15 (No Action)* - We agree with the rejection of this option in order to reduce the taking of young dolphin that become sexually mature at 18-inch FL.

+ *Option 2 for Action 15 (18 to 24-inch FL Size Limit)* - We agree with the NMFS rejection Option 2 since the lower FL range would allow harvesting of young (just sexually-mature) dolphin. From a NEPA perspective, Option 2 is also vague since it provides a range rather than a distinct minimum size limit such as provided in Action 15.

Action 16 (Wahoo Commercial Trip Limit of 500 Pounds) - EPA conceptually agrees with a limit on commercial wahoo landings per trip and agrees that no at-sea catch transfers should be allowed. We will defer to the expertise of the NMFS/Councils regarding the basis for this limit.

Although somewhat unclear, we assume that the DEIS did not intent to present 16A and 16B subactions. The FEIS should clarify and may only wish to note that commercial trip limits of

0-2,400 pounds were considered by NMFS/Councils, but that 500 pounds is being proposed. Otherwise, options within the 0-2,400 pound range should be established and considered in the FEIS.

+ _Option 1 for Action 16 (No Action)_ - We agree with the NMFS rejection of this option in order to cap commercial trip landings and prevent and minimize localized rapid reductions in abundance due to extended fishing effort or use of efficient gear.

* ***Action 17 (No Size Limit for Wahoo)*** - Since wahoo mature at a 45-inch FL, sexually immature specimens are frequently caught. This affects wahoo spawning potential and the size of subsequent year classes. Since recreational fishing can involve gaffing, the survival rate of discards is low. Accordingly, no size limit is proposed by NMFS/Councils.

EPA can agree with this approach if a recreational bag limit (as proposed in Action 18) and commercial trip limit (as proposed in Action 16) are promulgated since they should similarly serve to allow an adequate number of juveniles to become sexually mature and spawn. Other options might include use of larger lures that might be rejected by juveniles and releasing hooked juveniles without gaffing.

+ _Option 1 for Action 17 (35 to 45-Inch FL Minimum Size for Wahoo)_ - EPA agrees with the NMFS rejection of this option since a bag limit and trip limit should serve to preserve a breeding population.

* ***Action 18 (Wahoo Bag Limit of 2 Per Person Per Day)*** - As discussed above, we conceptually agree with a wahoo bag limit and will defer to the expertise of the NMFS/Councils regarding the basis for the bag limit.

+ _Option 1 for Action 18 (No Action)_ - We agree with the NMFS rejection of this option in order to prevent overfishing of adults and juveniles in order to protect the breeding population.

+ _Option 2 for Action 18 (Bag Limit Exemption of For-Hire Captain & Crew)_ - We agree with the NMFS rejection of Option 2 to promote the intent of Action 18 and to prevent inconsistent bag limit regulations onboard for-hire vessels.

Action 19 (Allowable Gear for Dolphin and Wahoo) - We agree with regulating the gear type and efficiency as a form of fishery management.

+ _Option 1 for Action 19 (No Action)_ - We agree with the NMFS rejection of this option in order to regulate the type of gear introduced into the fishery that may result in overfishing.

* ***Action 20 (Prohibit Dolphin & Wahoo Long Lines in HMS Closed Areas)*** - We strongly agree with this approach in order to be consistent with HMS FMP, facilitate management and enforcement, and prevent additional recreational/commercial fisher use conflicts.

+ _Option 1 for Action 20 (No Action)_ - We agree with the NMFS rejection of this option in order to be consistent with the HMS FMP.

* ***Action 21 (Fishing Year of Jan 1 to Dec 31)*** - It is unclear as to why establishing a fishing year is proposed since fishing is to be allowed during the whole year with no time closures. Presumably, the intent is to establish the concept as a management tool which can be modified to include closures as needed through framework. As suggested on page 248, this action would initiate a benchmark for data collection and monitoring.

+ _Option 1 for Action 21 (No Action)_ - We agree with the NMFS rejection of this option in order to establish this management tool.

Action 22A (EFH for Dolphin and Wahoo) - This action proposes to expand the Essential Fish Habitat (EFH) approved for dolphin to also apply to wahoo. Specifically, these EFHs include the Gulf Stream, Charleston Gyre, Florida Current and pelagic *Sargassum*. EPA supports the EFH concept and will defer to the expertise of the NMFS/Councils regarding their selection. We suggest that the FEIS further discuss the EFH as it relates to pelagic waters (as opposed to inshore waters) since no bottom habitat would be damaged through fishing gear or through most development. For example, how would the expansive and meandering Gulf Stream be protected as an EFH?

* ***Action 22B (EFH-HAPCs for Dolphin and Wahoo)*** - This action proposes to expand approved EFH-HAPCs (Habitat Areas of Particular Concern) for dolphin to apply to wahoo in the Atlantic. These EFH-HAPCs include the Ten-Fathom Ledge in North Carolina and The "Wall" off the Florida Keys. EPA also supports the EFH-HAPCs concept and will defer to the expertise of the NMFS/Councils regarding their designation. Additional discussion of these pelagic areas relative to the definition of EFH-HAPCs is requested.

+ _Option 1 for Action 22 (No Action)_ - We agree with the NMFS rejection of this option in order to expand the designation of EFHs and EFH-HAPCs for dolphin and wahoo.

+ _Option 2 for Action 22 (Expand EFH and EFH-HAPC to Include Sargassum)_ - This option would include *Sargassum* weed wherever it occurs in the Atlantic gyre. The NMFS has rejected Option 2 since *Sargassum* extends beyond U.S. EEZ waters where there is no federal jurisdiction.

While EPA does not disagree with this legal definition, the FEIS should consider a hybrid action that includes *Sargassum* in U.S. waters as an EFH-HAPC throughout the range of dolphin and wahoo, since the flotsam is used as open ocean "islands" for food and cover by these pelagic species.

* ***Action 23 (Fishing Impacts on EFH)*** - Consistent with EPA NEPA review comments on the recent *Sargassum* FMP, we agree that *Sargassum* should not be harvested in order to protect this pelagic ecosystem which is used by dolphin and wahoo. If the *Sargassum* FMP is approved by NOAA, no additional action would seem to be needed. If not, we believe EFH protection of *Sargassum* communities would seem appropriate within the presently proposed FMP and should require the return to sea of any *Sargassum* unavoidably brought onboard during fishing. Dolphin and wahoo fishing in other proposed EFH-HAPCs would not seem to degrade these habitats since they are located in deep waters and fishing gear does not involve trawls or dredges that can damage benthic habitats.

+ *Option 1 for Action 23 (No Action)* - We agree with the NMFS rejection of this option in order to protect EFH-HAPCs for dolphin and wahoo against fishing impacts, particularly *Sargassum* communities and the harvesting of *Sargassum* weed.

+ *Option 2 for Action 23 (Prohibit Harvest and Possession of Sargassum)* - This option is unclear since it was rejected by NMFS yet it appears to support proposed Action 23. Page 263 states that Option 1 (no action) was rejected because "[n]ot prohibiting harvest of pelagic *Sargassum* in the South Atlantic EEZ would not meet objectives of the plan or the requirements of the Magnuson-Stevens related to essential fish habitat," yet Option 2 was also rejected because "...NMFS disapproved prohibiting any harvest of pelagic *Sargassum* in their letter rejecting the original [*Sargassum*] FMP..." (pg. 265). The FEIS should discuss this apparent inconsistency and discuss the current NMFS position on the *Sargassum* fishery and the status of the *Sargassum* FMP. EPA supports the prohibition of *Sargassum* harvesting.

It is noted that Options 2 seems more consistent with the proposed Action 23 than an option to Action 23. The FEIS should revisit Option 2 and incorporate it into Action 23 or emphasize the difference between Option 2 and Action 23.

+ *Option 3 for Action 23 (Prohibit Harvest and Possession of Sargassum With Exceptions)* - This option would allow harvesting of *Sargassum* in specified areas. We agree with the NMFS rejection of this option. It is unclear however, if this option was rejected because someharvesting would be allowed in some areas, or if no harvesting would be allowed in some areas. The FEIS should discuss the position of the NMFS regarding *Sargassum* harvesting and protection of EFHs. Again, EPA supports the prohibition of *Sargassum* harvesting and also agrees with the Councils that "...any removal of pelagic Sargassum represents a net loss of EFH..." (pg. 269).

o **Management Measures for U.S. Waters of the Caribbean**

Action 24 (Natural Flotsom as EFH) - This action identifies natural objects such as

Sargassum weed, floating algae and other plants in the water column and their accumulation along ocean fronts as an EFH for dolphin and wahoo. However, it excludes manmade fish attracting devices (FADs) and lost nets. In principal, EPA does not disagree with the proposed action, but believes that FADs could be part of the EFH despite being manmade (we request that a hybrid option (or amending Action 24) that includes FADs be considered for the FEIS). However, lost nets and other manmade marine debris should not be included in the EFH definition in order to discourage marine disposal of refuse (despite the fact that such debris probably has flotsom value much like natural objects).

+ *Option 1 for Action 24 (No Action)* - We agree with the NMFS rejection of this option in order to establish EFHs for dolphin and wahoo.

+ *Option 2 for Action 24 (Natural & Manmade Flotsom as EFH)* - Option 2 defines the EFH as natural flotsom (*Sargassum*, algae, etc. in water column and along ocean fronts) and manmade items such as FADs, refuse and lost nets. We agree with the NMFS rejection of Option 2 because we believe refuse and lost nets should not be included as EFH. However, as indicated above, we believe FADs could be part of the EFH definition.

+ *Option 3 for Action 24 (All Waters From Shoreline to EEZ as EFH)* - This option encompasses all waters from the shoreline to the EEZ boundary as the EFH. We agree with the NMFS rejection of Option 3 since this area is too broad and difficult to enforce. It is also questionable if this entire area is truly *essential* habitat for dolphin and wahoo.

+ *Option 4 for Action 24 (EFH as HAPC)* - The NMFS rejected Option 4 to consider dolphin and wahoo HAPCs the same as EFHs since HAPCs are not yet defined for these species. We will defer to the NMFS/Councils for such designations but would expect that one or more HAPCs could be within an EFH, but would not be equated to an EFH.

+ *Option 5 for Action 24 (Prohibit Fishing Impacts in EFH)* - It is unclear how Option 5 differs from Action 23. The NMFS rejected Option 5 but proposes Action 23. The FEIS should clarify this apparent inconsistency.

+ *Option 6 for Action 24 (Oppose Man-Induced Activities Potentially Harmful to EFH)* - The NMFS rejected Option 6 in the sense that no such man-induced activities that are harmful to EFHs have been documented. Nevertheless, such activities could occur and should be opposed. Therefore, we suggest that this concept should proactively be included in Action 24 rather than rejected (unless this protection is already part of the definition of an EFH). The FEIS should consider.

+ *Option 7 for Action 24 (Enhance Quality of EFH)* - The NMFS rejected Option 7 in the sense that such issues should be addressed as they arise. As in the case of Option 6, we believe that this concept to support and enhance EFHs should be included in Action 24 rather than rejected (unless this is already part of the definition of an EFH). The

FEIS should consider.

o Management Measures for U.S. Waters of the Gulf of Mexico

*** Action 25 (Establish a Fishing Year of January 1 to December 31)** - This action for the Gulf EEZ would complement proposed Action 21 for the Atlantic EEZ. We agree with establishing a fishing year as a management tool (also see above EPA comments for Action 21).

+ *Option 1 for Action 25 (No Action)* - We agree with the NMFS rejection of this option (also see above EPA comments for Action 21).

+ *Option 2 for Action 25 (Other Fishing Years)* - Option 2 would establish a commercial fishing year from July 1 to June 30 and a recreational year from January 1 to December 31. Although rejected by the NMFS, it is unclear as to why Option 2 was rejected. The significance of the designated dates for the commercial fishery is also unclear. The FEIS should discuss.

*** Action 26 (Prohibit Sale of Recreational Dolphin)** - EPA agrees with this proposed action in the Gulf EEZ as discussed above for Action 11 in the Atlantic EEZ. We believe that recreational fishers should not be allowed to sell their catch in order to assure fish food quality. We further believe that for-hire vessels, even if they should hold a commercial permit, should also not be allowed to sell dolphin and wahoo unless fish quality can be assured.

+ *Option 1 for Action 26 (No Action)* - We agree with the NMFS rejection as discussed above for Action 11 for recreational vessels in order to help assure food quality standards and prevent double counting of fish landings as both recreational and commercial.

+ *Option 2 for Action 26 (Endorsement to Commercial King Mackerel Permit)* - Option 2 would require a commercial dolphin and wahoo endorsement to the commercial king mackerel permit to sell dolphin and wahoo. This option was rejected by the NMFS. We will defer to the NMFS.

+ *Option 3 for Action 26 (Prohibit Sale from all Vessels Without Commercial Permit)* - We agree with the NMFS rejection to promote food quality standards required for commercial fishers.

*** Action 27 (Fisher Allocation for Dolphin and Wahoo Based on 1984-1997 Landings)** - Action 27 would allocate dolphin (Action 27A) and wahoo (Action 27B) resources for recreational versus commercial fishing and would be based on an average of landings for 1984 to 1997. It is unclear as to why allocations in the Atlantic (Action 12 for dolphin) was based on significantly different baseline (1994-1997), unless this was an inadvertent typographical error (1984 vs. 1994). We agree with averaging of several years of landings but prefer that a more recent data set be used as proposed for Action 12.

+ _Option 1 for Action 27 (No Action)_ - We agree with the NMFS rejection of this option in order to establish a cap on commercial and recreational fishing consistent with historically distributed landings, but prefer the use of more recent data.

+ _Option 2 for Action 27A (Allocate Dolphin Based on 1990-1997 or 1994-1997 Timeframes)_ - We disagree with the rejection of Option 2 since EPA prefer the use of 1994-1997 data set, which is also consistent with Action 12. However, from a NEPA standpoint, Option 2 is vague since it provides two timeframe options instead of one.

+ _Option 3 for Action 27B (Allocate Wahoo Based on 1990-1997 or 1994-1997 Timeframes)_ - We disagree with the rejection of Option 3 since EPA prefer the use of 1994-1997 data set, which is also consistent with Action 12 for dolphin. However, from a NEPA standpoint, Option 3 is vague since it provides two timeframe options instead of one.

*** Action 28 (EFH)*** - This proposed action discusses EFH under two actions, 28A and 28B. From a NEPA standpoint, Action 28A and 28B contradict each other and cannot both be proposed. Accordingly, Action 28B should probably have been an option to Action 28A, or vice-versa. The FEIS should consider.

Action 28A (EFH Based on Subhabitats & Conditions at Various Life Stages) - Action 28A proposes that the EFH be based on collected data that document conditions or subhabitats necessary to various life stages of dolphin and wahoo in the Gulf EEZ. We agree with such documentation if there is reason to believe that certain subhabitats that are not already part of the EFHs are critical to certain life stages of dolphin and wahoo. EPA will defer to the expertise of the NMFS/Councils.

Action 28B (EFH Without Subhabitats - Status Quo) - Action 28B does not propose documentation of subhabitats as EFH since they are not necessary, would not likely affect EFH, and there is uncertainty as to what constitutes EFH. We agree with such documentation if there is reason to believe that certain subhabitats that are not already part of the EFHs are critical to certain life stages of dolphin and wahoo. EPA will defer to the expertise of the NMFS/Councils.

+ _Option 1 for Action 28 (No Action)_ - We agree with the NMFS rejection of this option since EFHs must be designated for each FMP.

+ _Option 2 for Action 28 (EFH as All Waters Outside of 5 Fathoms Under Different Water Quality Conditions)_ - Option 2 proposes to identify the EFH as all waters outside of five fathoms as modified by natural conditions such as temperature, currents, salinity, etc. Option 2 was rejected by the NMFS since "a full identification of EFH for dolphin and wahoo is needed in order to fully understand the importance of individual components and to assess management strategies to maintain, protect, and improve EFH." (pg. 294). This rationale is unclear and should be clarified in the FEIS, i.e., it is unclear if such full identification is infeasible, unwarranted, not cost-effective, unavailable, etc. EPA believes that such identifications should be made and considered part of the EFH if there is reason to believe that conditions are critical to one or both species. If so, this option should not be rejected but rather incorporated, to the extent feasible, into Action 28.

+ *Option 3 for Action 28 (EFH as Natural Flotsom Areas)* - Option 3 was also rejected by NMFS using a rationale similar to Option 2. This rationale should be clarified in the FEIS. EPA believes that natural and possibly manmade structures (FADs) could be defined as EFH and should not be rejected but instead incorporated into Action 28 (see EPA above comments on Action 24).

+ *Option 4 for Action 28 (Establish HAPCs)* - Option 4 proposes to establish several HAPCs in the Gulf including Steamboat Lumps, the Flower Gardens, and DeSoto Canyon (pg. 295). This option was rejected by NMFS since "...HAPCs are not likely to provide additional protection..." We will defer to the expertise of the NMFS/Councils in this regard.

+ *Option 5 for Action 28 (Prohibit Any Current Fishing Impacts on EFH)* - Option 5 was rejected by NMFS since "...existing fishing activities are not known to negatively affect EFH..." (pg.297). It is further noted that no *Sargassum* fishery currently exists in the Gulf and that means to detect such fishing impacts have been established. As such, EPA agrees with the rejection of Option 5 as being duplicative.

+ *Option 6 for Action 28 (Support and Enhance EFH)* - Option 6 proposes to enhance dolphin and wahoo EFHs. The NMFS rejected this option since little is known about dolphin and wahoo habitat so enhancement is difficult at this time. EPA does not disagree, but favors inclusion of "enhancement" language in Action 28 (rather than rejection of the concept) which can be modified as habitat information becomes available and the framework process.

United States Department of State

Bureau of Oceans and International Environmental and Scientific Affairs

Washington, D.C. 20520

October 12, 2001

Valerie L. Chambers
Chief, Domestic Fisheries Division
National Marine Fisheries Service, NOAA
1335 East-West Highway
Silver Spring, MD 20910

Dear Ms. Chambers:

Thank you for your letter of September 19, 2001, in which you provided for our review a copy of the Fishery Management Plan and the Draft Environmental Impact Statement for the Dolphin and Wahoo Fishery Management Plan submitted by the South Atlantic Fishery Management Council. As these documents do not contain an international component, we have no comment.

Sincerely,

for

Bill Gibbons-Fly
Acting Director, Office of Marine Conservation

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

SEP 25 2001

OPTIONAL FORM 99 (7-90)
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Roger

In Reply Refer To:
ER 01/881

~~Valerie L. Chambers~~
Chief, Domestic Fisheries Division
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Silver Spring, MD 20910

Dear Ms. Chambers:

This is in regard to the request for the Department of the Interior's comments on the Draft Fishery Management Plan and Draft Environmental Impact Statement for the Dolphin and Wahoo Fishery of the Atlantic, Caribbean, and Gulf of Mexico.

This is to inform you that the Department may have comments, but will be unable to reply within the allotted time. Please consider this letter as a request for an extension of time in which to comment on the document.

Our comments, if any, should be available by late October 2001.

Sincerely,

Terence N. Martin

Terence N. Martin
Team Leader, Natural Resources Management
Office of Environmental Policy
and Compliance

Appendix J. ACCSP Release, Discard, and Protected Species Interactions Monitoring Program

ATLANTIC COASTAL COOPERATIVE STATISTICS PROGRAM (ACCSP)
www.accsp.org

The ACCSP is a State-Federal cooperative initiative to improve the collection and management of Atlantic coast commercial, recreational, and for-hire fisheries data. The program began in November 1995 with the signing of a Memorandum of Understanding (MOU) by 23 Atlantic coast fisheries management agencies, signifying their intent to develop and implement this program.

The ACCSP Program Design, approved by the Coordinating Council on December 14, 1998, provides detailed information on ACCSP standards and policies, reporting requirements and sampling programs, quality control and assurance documentation, and processes necessary for adjustments and modification. This document should be followed by all ACCSP partner agencies as fully as possible to ensure effective implementation of the ACCSP data collection and data management models.

The Program Design document and subsequent module documents are all written in the future tense. This may result in some confusion about whether or not the program "is implemented" or "will be implemented at some point in the future". The Program Design is the plan for a coast-wide data collection program. Minimum data elements that must be collected are identified, however, individual partners may collect additional data. It is up to the National Marine Fisheries Service and the other State/Federal Partners to implement this plan.

The Councils are adopting all approved modules, including the following Release/Discard & Protected Species Module, for the Dolphin Wahoo Fishery Management Plan (FMP). When the Secretary of Commerce approves the Dolphin Wahoo FMP, it will then be the responsibility of the NMFS (in cooperation with the other partner agencies) to implement the minimum data elements in the dolphin/wahoo fisheries.

Section 8. ACCSP Release, Discard, and Protected Species Interactions Monitoring Program

The ACCSP release, discard, and protected species interactions monitoring program will be a coastwide program (Maine through Florida) to include all living marine resources in estuarine, inshore, and offshore waters. Data should be collected from all U.S. fishing vessels leaving from and landing at east coast ports, including shore-based fishing operations. The program should be conducted throughout the year and will include commercial, recreational, and the for-hire fisheries.

The release, discard, and protected species interactions monitoring program will include quantitative and qualitative data collection components. The quantitative component includes an at-sea observer program and collection of release/discard data through the fishermen reporting system. The qualitative release, discard, and protected species interactions monitoring program will include sea turtle and marine mammal stranding networks and beach bird surveys, trend analysis, and add-ons to existing recreational and for-hire intercept and telephone surveys.

Release/discard data collected through the qualitative release/discard monitoring program and the fishermen reporting system will be used to identify and prioritize fisheries requiring collection of additional release, discard and gear configuration data through quantitative methods.

Reporting of protected species interactions and managed species data currently are the highest priorities under the ACCSP release, discard, and protected species interactions monitoring program. A Discard and Release Prioritization Committee will recommend priorities for the commercial, recreational, and the for-hire fisheries on an annual basis.

Required reporting of protected species interactions information is mandatory for the ACCSP commercial reporting system and is mandatory for the for-hire vessels which fall under the Marine Mammal Protection Act (MMPA) requirements. Reporting of protected species interactions is voluntary for recreational fishermen. Under federal statutes, incidental injury or mortality to a marine mammal during commercial fishing activities, including charter boat fisheries, must be reported within 48 hours of the end of a fishing trip, or for non-vessel fisheries, within 48 hours of occurrence.

Reporting of discards or releases through the catch and effort reporting system is strongly encouraged, although voluntary for non-protected discards or releases of other marine organisms. Any ACCSP partner may require mandatory reporting of any marine organism discard and release data, based on jurisdictional assessments or management requirements. All partners should develop outreach and fishermen training programs to improve reporting accuracy by fishermen. The ACCSP should evaluate the quality of the data and any voluntary, mandatory, and at-sea observer collection programs, at least annually.

Overview of the ACCSP release, discard, and protected species interactions monitoring program for commercial, for-hire, and recreational fisheries. See details on these programs in Sections 8.a through 8.c.

Figure 4. Overview of the ACCSP release, discard and protected species interactions monitoring program for commercial, for-hire, and recreational fisheries. See details on these programs in sections 8.a through 8.c.

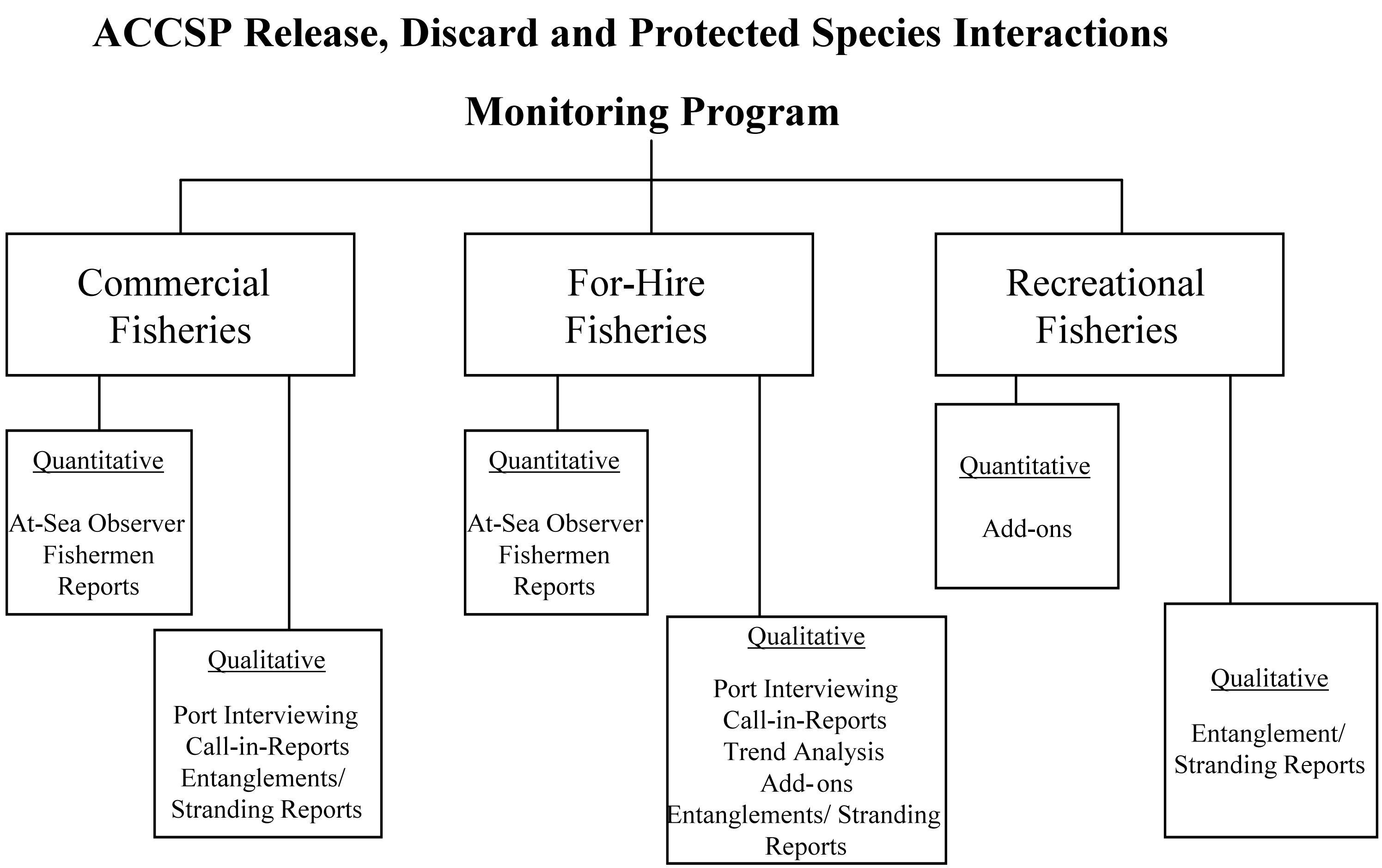
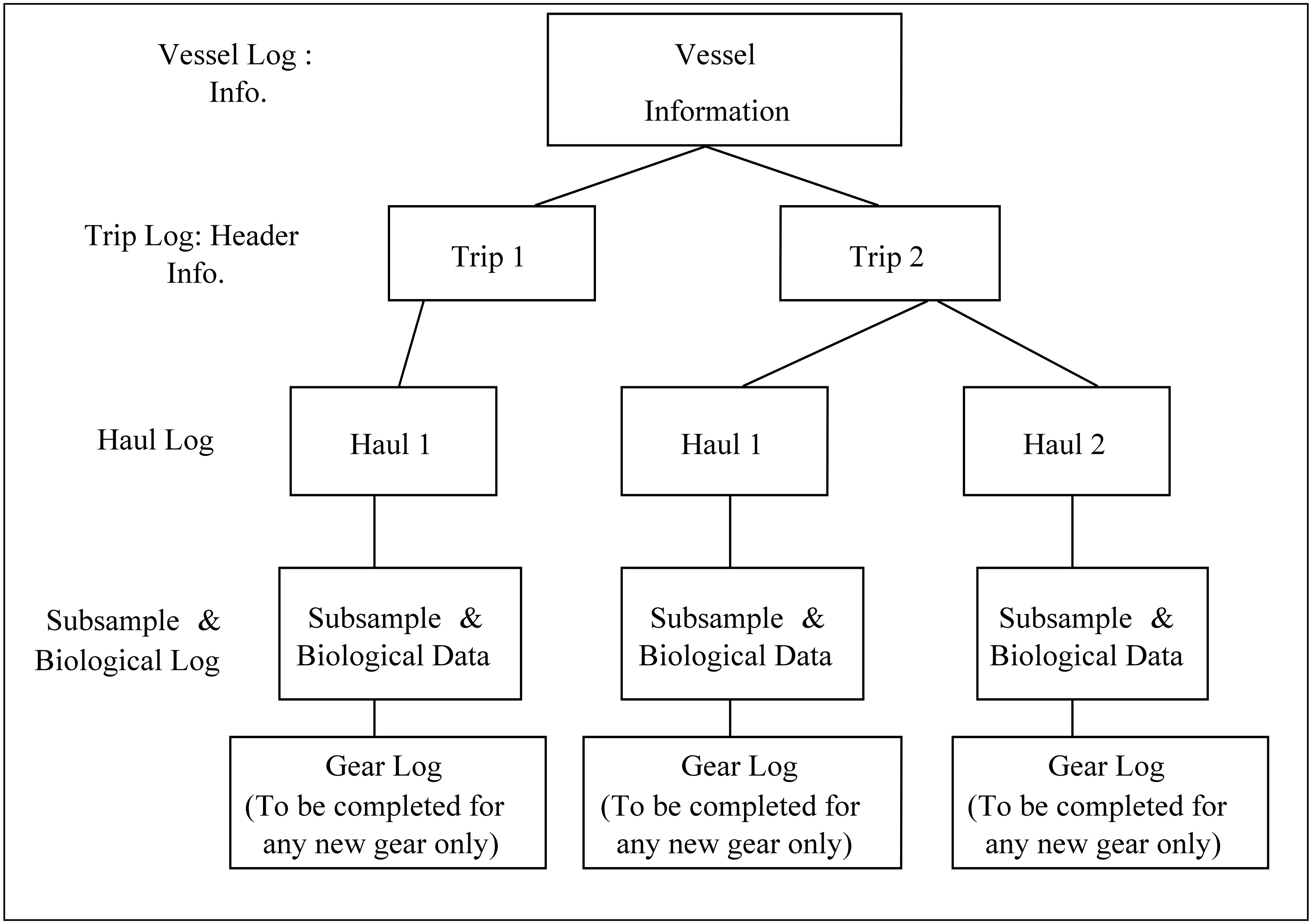


FIGURE 8.2. Flow of data collection forms for At-Sea Observer Program



Section 8.a Release, Discard, and Protected Species Interactions

The ACCSP quantitative release, discard, and protected species interactions monitoring program for commercial fisheries will include an at-sea observer program and commercial fishermen reporting.

The ACCSP qualitative release, discard, and protected species interactions monitoring program for commercial fisheries will include port interviewing to verify finfish reporting in the fishermen trip report and strandings and entanglements data.

Section 8.b. Release, Discard, and Protected Species Interactions Monitoring Program for the For-Hire Fisheries

The ACCSP quantitative release, discard, and protected species interactions monitoring program for the for-hire fisheries will include an at-sea observer program and fishermen reporting, through the appropriate methodology as determined by the Discard Prioritization Committee.

The ACCSP qualitative release, discard, and protected species interactions monitoring program for the for-hire fisheries will include port interviewing to verify finfish reporting in the fishermen logbook (if determined appropriate), call-in reporting, trend information provided through the fishermen trip report, and strandings and entanglements data, and an add-on to existing recreational telephone surveys for protected species data.

Development of sampling methodologies specific to collection of observer data from the for-hire fisheries will be accomplished once the catch/effort collection methodology has been determined for that mode.

Section 8.c. Release, Discard, and Protected Species Interactions Monitoring Program for Recreational Fisheries (Private/Rental and Shore Modes)

The ACCSP will continue to collect quantitative data on the number of released and discarded finfish species through existing recreational intercept surveys. The ACCSP will collect qualitative release/discard information on protected species for recreational fisheries (private/rental and shore modes) through an add-on to existing recreational telephone surveys, strandings, and entanglements data.

Section 8.d. Qualitative Release, Discard, and Protected Species Interactions Monitoring Program

The qualitative component of the release, discard, and protected species interactions monitoring program should include a combination of the following methods: 1) strandings and entanglements programs, 2) addition of questions and/or samples to existing recreational and for-hire telephone and intercept surveys, 3) commercial fisherman reporting systems, 4) port interviewing programs, and 5) real-time reporting programs.

Add-ons to existing recreational and for-hire surveys should be as follows: 1) additional questions added to telephone surveys for protected species interactions, and 2) additional sampling in the telephone and intercept surveys for finfish species in high incidence areas and/or the addition of special questions to both surveys.

For the purposes of this Module, entanglements are defined as a human interaction between marine species and fishing gear.

The National Stranding Network will serve as the ACCSP standard for the collection of strandings data. As the Stranding Network forms are modified, they should be reviewed by the Discard Prioritization Committee for inclusion in the Program Design.

Stranding and entanglement data collection programs should collect the approved minimum data elements listed in **Tables 8.E. and 8.F.** (pp. 8-26 to 8-37), including formats, descriptions, and reporting forms.

Stranding/entanglements data will include an assessment of human interaction: 1) physical contact between marine species and fishing gear (i.e., entanglements); 2) vessel/boat strikes; or 3) other human-related causes (e.g., ingestion of marine debris, gunshot). Strandings with evidence of an entanglement will be used to qualify interactions between commercial, for-hire, and recreational fisheries when possible.

Protected species interactions, releases, and discards of other marine organisms data collected through the commercial reporting system should be evaluated for trend information, especially for identification of high incidence areas for additional quantitative sampling.

Data collected through port interviewing programs should be used to verify data collected through real-time reporting and anecdotal information. Real-time reporting (i.e., 1-800 call-in systems) should be used for reporting of unusual events (interactions with protected species and possible finfish species).

The data collected through the ACCSP qualitative release, discard, and protected species interactions monitoring program will be used by the Discard, Prioritization Committee to prioritize and modify the quantitative release, discard, and protected species interactions data collection programs. The release/discard prioritization process should be linked closely with the setting of biological data collection priorities by the Biological Review Panel.

The ACCSP At-Sea Observer Program is mandatory for the for-hire vessels under the MMPA and vessels participating in commercial fisheries (dependent on their classification category under MMPA). As a condition of permitting, vessels should be required to carry at-sea observers.

Note: The ACCSP Coordinating Council approved the ACCSP observer program as mandatory, at Jekyll Island (October 19, 1998).

Specific fisheries priorities will be determined through the discard prioritization process to be developed by the Discard Prioritization Committee.

All ACCSP at-sea observer programs should be conducted following the sampling protocols in **Table 8.G.** (p. 8-38) The ACCSP At-Sea Observer Program should collect minimum standard data elements at the haul level for commercial fisheries and at the drop level (each time gear is set) in the for-hire fisheries, utilizing adopted ACCSP standards and quality control/assurance procedures. Data on gear configuration should be collected when major changes in gear are made during a trip. Please see **Tables 8.G - 8-S** (pp.8-38 to 8-83) for the reference tables and data elements associated with the quantitative observer program.

All ACCSP at-sea observer programs should be conducted under the overall program goals with regards to protected species interactions, releases, and discards of other marine organisms as follows. The Program should develop and document specific program objectives to meet these goals.

1. To quantify protected species interactions, releases, and discards of other marine organisms from all U.S. commercial and for-hire recreational fishing vessels leaving from or landing at east coast ports.

3 To obtain accurate and representative fisheries release/discard data that may be used for required state and federal programs that:

5. Support the goals and objectives of the Magnuson-Stevens Fishery Conservation and Management Act, Atlantic Coastal Fisheries Cooperative Management Act, Marine Mammal Protection Act, Endangered Species Act, Migratory Bird Treaty Act, Atlantic Striped Bass Conservation Act such as minimizing releases and discards, release and discard mortality, and for marine mammals, reducing interactions to insignificant levels approaching zero mortality;
6. identify and evaluate fishing gear and practices that minimize or eliminate protected species interactions, releases and discards of other marine organisms;
7. provide fishermen with fishing opportunities without impacting the objectives of fishery management plans for species that are fully exploited or overfished;
8. improve contributions to regional fishery management councils and the Atlantic States Marine Fisheries Commission (ASMFC) through a better understanding of the amount and nature of releases and discards, especially economic and regulatory releases and discards;

9. assess abundance of marine resources -- assessments used by the National Marine Fisheries Service, the councils, states, and ASMFC for development and amendment of fisheries regulations/management plans and for conservation and management of marine mammals and protected species; and
10. monitor the effectiveness of regulations, gear modifications, fishing practices, and fishery management plans in achieving conservation objectives.

To provide a verification tool for fishermen logbook reporting or other qualitative data collection methods;

4. To provide all state and federal fisheries agencies with a template for a comprehensive, long-term at-sea observer program, including standardized data elements and program design, sampling strategies, priorities, and data management; and,

5. To strengthen and verify the flow of information to fishery managers and scientists. The ACCSP and program partners will conduct an approved training program for all new at-sea observers, and will provide certification of qualifications through this program.

Non-verified observer data should be made available for data entry 1-7 days after the trip return date. Finalized data should be provided 45 days after the last day of the month for which data was collected.

The data collected through the ACCSP At-Sea Observer Program for commercial fisheries should be linked to the commercial fishermen reporting system by the unique identifier (trip start date, vessel/participant identifier, and trip number).

Given that longitude and latitude are collected at the haul level, it is not possible to provide this information at the trip level. Therefore, primary area fished will need to be determined by the observer after the completion of the trip. As recommended in **Table 8.H.** (p. 8-39), Area Fished is defined as the statistical area and distance from shore where most fishing occurs.

Pilot surveys will be conducted on a fishery-by-fishery basis to determine the appropriate level of observer coverage required to meet relevant management objectives.

Observer data vessel or individual identifiers will be disguised and the data will be aggregated before release from the ACCSP data management system. Authorized users will have access to individual identifiers. Non-authorized users requesting individual identifiers will be referred to the agency that originally collected the data.

NOTE: Under current NMFS rulings, observed data on a mandatory trip are not considered confidential since the data are observed by an agent of NMFS and not submitted by a reporting entity. Observed data on a voluntary trip is confidential.

Section 8.f. Annual Prioritization Process for the ACCSP Release, Discard, and Protected Species Interactions Monitoring Program

The ACCSP will utilize an annual prioritization process to determine fisheries to be targeted for observer coverage the following year. The process timeline will closely follow the ACCSP's Funding Decision Guidelines and the annual meeting of the ACCSP's Biological Review Panel. It is imperative that all Committee members attend these prioritization meetings. The prioritization process will be enhanced with diversity of opinion..

The evaluation matrix variables (**Table 8.A.**) will utilized to prioritize Atlantic coast fisheries for observer coverage. Fisheries with the highest point totals after the evaluation should be considered high priority fisheries. The ACCESS fisheries database developed by ASMFC staff should be updated regularly and utilized to identify the fisheries to be evaluated in the matrix.

All available catch/effort data should be utilized to evaluate the Fishery Information variables. The ACCSP data management system should sum the number of records by gear/area strata to calculate the total number of trips.

Observer effort should be allocated across the fishing season for a particular species or group.

Table 8.A. Fishery Evaluation Matrix Variables

Fishery Information
Management Agency (for information only)

Total dollar value of the fishery (for information only)

Is the fishery managed? (national, regional, or inter-jurisdictional fishery management plan?)
- Yes = 1
- No = 0

Number of trips (general indication of the total number of trips from the prior year)
- 1 = 1 - 100
- 2 = 101 - 1000
- 3 = 1001 - 10,000
- 4 = 10,001 - 50,000
- 5 = 50,001 - 100,000

Total Landings (general indication of the total landings of that species by that gear type)
- 1 = < 33% of the total species landings
- 2 = > 34% but < 66% of the total species landings
- 3 = > 67% of the total species landings

Change in Prior Year's Landings
- 0 = < 50% change
- 3 = > 50% change

Discard Information
Amount of regulatory discards (dead) of target species (percent total weight of targeted species)
- 0 = none
- 1 = low (< 5%)
- 2 = medium (5-20%)
- 3 = high (> 20%), or unknown

Protected species interactions (general indication of protected species interactions in the targeted fishery) (MMPA Rating Scale)
- 0 = does not affect / no interactions
- 3 = low - interactions not likely to harm protected species stocks
- 6 = medium - interactions could affect or interactions are unknown but could affect recovery of protected species stocks
- 9 = high - interactions adversely affect recovery of protected species stocks

Table 8.A. (cont'd)

Amount of regulated species discards (general indication of the weight of discards of other regulated species, relative to total landings)

0 = none
1 = low < 5%
2 = medium 5-20%
3 = high > 20%, or unknown

Impact of discards on other regulated species stocks (general indication of the condition and biomass of the regulated species being discarded)

0 = no impact
1 = low
2 = medium
3 = high, or unknown

Amount of non-regulated species discards (general indication of the weight of discards of other non-regulated species, relative to total landings)

0 = none
1 = low < 5%
2 = medium 5-20%
3 = high > 20%, or unknown

Impact of discards on non-regulated species stocks (general indication of the condition and biomass of the non-regulated species being discarded)

0 = none
1 = low
2 = medium
3 = high, or unknown

Fishery							Species						
Fishery	**$ Value of Fishery**	**Management Agency?**	**Fishery managed (y=1/n=0)**	**# Trips**	**Total Landings**	**Change in Prior Year's Landings or Effort**	**Regulatory discards of target species (dead)**	**Protected spp interaction**	**Amount of regulated spp discards**	**Impact of discards to other regulated spp stock**	**Amount of non-reg spp discards**	**Impact of discards on non-reg spp stock**	**Total points**
	no	no											
	points	points;					0, 1, 2, 3	0, 3, 6, 9	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	0,1, 2, 3	
	info only	info only											
					1= <33%	0 = <50%	0 = none	0 = none	0 = none	0 = none	0 = none	0 = none	
					2= 34-66%	3 = > 50%	1 = < 5%	3 = low	1 = < 5%	1 = low	1 = < 5%	1 = low	
					3= >67%		2 = 5-20%	6 = med,	2 = 5-20%	2 = med	2 = 5-20%	2 = med	
				1-5 points			3 = > 20%	9 = high	3 = >20%	3 = high	3 = > 20%	3 = high	
							or unknown	or unknown	or unknown	or unknown	or unknown	or unknown	

The following target sampling levels are the ACCSP standards for the commercial fisheries portion of the Release, Discard, and Protected Species Interactions Monitoring Program:

A target of 5% of total trips, or achieving a 20-30% PSE for high priority fisheries.

A target of 2% of total trips for all other fisheries.
(in order to begin baseline data collection from non-priority fisheries)

These target sampling levels must be evaluated annually on a fishery by fishery basis to determine where the variance stabilizes and to meet desired goals.

Section 8.h. Recreational Fisheries Priorities

Recreational fisheries priorities should be compiled and evaluated as a portion of the ACCSP fishery prioritization process outlined in Section 8.f.

Until the ACCSP catch/effort and at-sea observer methodologies are determined, no observer targets be established for the for-hire fishery. However, finalization of the for-hire catch-effort protocols should not preclude a Partner proposing an observer pilot study for the for-hire sector.

Section 8.i. Observer Data Tracking System

The ACCSP will utilize a target tracking system, to track the number of observed trips so that observer effort may be reallocated as targets are met. ACCSP Partners should upload the following minimum data elements to the ACCSP tracking system before the 10th of the month following collection. The submission timeline will allow two effort reallocations per calendar quarter.

Partners are encouraged to monitor the tracking system as required to complete targets. The tracking system should reset to zero at the end of each quarter.

Table 8.B. Data Elements Required for the ACCSP Observer Tracking System

State Landed
Port Landed
Target Species (all three, if noted) (**Table 8.H.** p. 8-39)
Primary Area Fished
Primary Gear Used
Number of Protected Species Interactions

Section 8.j. Quality Assurance/Quality Control

Quality assurance/quality control standards for the Discard, Release, and Protected Species Interactions module may be found in **Appendix F-3** of the ACCSP Program Design.

Examples of per Sample Requirements and Annual Sample Targets Northeast Sampling Requirements, per Sample, by Species, 2001

SPECIES	LENGTHS	SCALES	OTOLITHS
Alewife	100	20	--
Winter flounder	100	25	--
small	50	10	--
Black Sea Bass	100	25	
Blueback herring	100	--	20
Bluefish	100	25	--
Butterfish	100	--	25 or freeze 25+ fish
Cod Scrod	50	--	10
Market	100	--	20
Large or whale	100	--	20
Cusk	100	--	20
American plaice (dab)	100	--	25
small	50	10 or	10
Spiny dogfish	100 sexed	No age	
Summer flounder (fluke)	100	25	
small	50	10	
Witch flounder (grey sole)	100	--	25
small	50	10	
Haddock	100		50
Scrod (only)	50		25
Lobster	100 sexed	no age	
Mackerel	100		freeze 25+ fish
Monkfish	100	no age	
Ocean Quahog	30	no age	
Pollock	100		20
Redfish	100 sexed		10 male & 10 female
Red Crab	100 sexed	no age	
Rock Crab	100 sexed	no age	
Scup	100	25	
Surf Clams	30	no age	
Sea Herring			freeze 50+ fish
Sea Scallops	200	no age	
Shad	100	25	--
Shrimp	--	--	freeze 1 qt.
Silver hake	100	--	
Juvenile (only)	30	--	
Squid *Loligo*	100	–	
Illex	100	--	
Striped Bass	100	25	
Tilefish	100	--	20
Weakfish	100	25	--
White hake	100	--	25
Windowpane	100	25	--
Small	50	10	--
Yellowtail flounder	100 sexed	15 males & 15 females	–
Industrial Species	1-3 bushels	–	

BIOLOGICAL SAMPLING REQUIREMENTS by SPECIES/REGION - FY2000									
Region	***Species***	***Mkt Cat***	***Gear***	***Statistical Area***	***Oct-Dec***	***Jan-Mar***	***Apr-Jun***	***Jul-Sep***	***TOT***
ME	ATL HALIBUT	UNC	ALL	51	0	0	1	0	1
MA-N	ATL HALIBUT	UNC	ALL	51	0	0	1	0	1
				TOTAL	0	0	2	0	2
NJ	BLACK SEA BASS	JUMBO/LRG	ALL	6	1	1	2	0	4
RI	BLACK SEA BASS	JUMBO/LRG	OT	53-63	1	1	1	0	3
VA/MD	BLACK SEA BASS	JUMBO/LRG	ALL	62	0	0	2	2	4
VA/MD	BLACK SEA BASS	JUMBO/LRG	OT	61-63	0	4	2	0	6
NJ	BLACK SEA BASS	MED	ALL	6	1	1	2	0	4
RI	BLACK SEA BASS	MED	OT	53-63	1	1	1	0	3
VA/MD	BLACK SEA BASS	MED	ALL	62	0	0	2	2	4
VA/MD	BLACK SEA BASS	MED	OT	61-63	0	4	2	0	6
NJ	BLACK SEA BASS	SM	ALL	6	1	2	2	1	6
RI	BLACK SEA BASS	SM	OT	53-63	1	1	1	0	3

VA/MD	BLACK SEA BASS	SM	ALL	62	0	0	2	2	4
VA/MD	BLACK SEA BASS	SM	OT	61-63	0	4	2	0	6
				TOTAL	6	19	21	7	53
MA-S/CC	BLACKBACK	LMNSL	OT	522,56,525	1	1	1	1	4
MA-N	BLACKBACK	LRG	OT	51	2	1	2	1	6
MA-N	BLACKBACK	LRG	OT	522,56,525	0	1	1	0	2
MA-S/CC	BLACKBACK	LRG	OT	51	0	0	1	0	1
MA-S/CC	BLACKBACK	LRG	OT	521,526,53	1	1	1	2	5
MA-S/CC	BLACKBACK	LRG	OT	522,56,525	1	1	2	2	6
RI	BLACKBACK	LRG	OT	521,526,53,61	0	1	1	1	3
RI	BLACKBACK	LRG	OT	62,63	0	0	1	0	1
MA-N	BLACKBACK	MED	OT	51	0	1	0	0	1
MA-N	BLACKBACK	MED	OT	522,56,525	0	1	1	0	2
MA-S/CC	BLACKBACK	MED	OT	51	0	0	1	1	2
RI	BLACKBACK	MED	OT	521,526,53,61	0	1	2	1	4
RI	BLACKBACK	MED	OT	62,63	0	1	1	0	2
MA-S/CC	BLACKBACK	PW	OT	51	0	1	0	0	1
MA-S/CC	BLACKBACK	PW	OT	521,526,53	1	0	1	1	3
MA-S/CC	BLACKBACK	PW	OT	522,56,525	1	1	1	1	4
MA-S/CC	BLACKBACK	PW	OT	61-63	0	1	0	0	1
MA-S/CC	BLACKBACK	SM	OT	51	0	1	1	0	2
MA-S/CC	BLACKBACK	SM	OT	521,526,53	1	1	2	3	7
MA-S/CC	BLACKBACK	SM	OT	522,56,525	1	1	2	2	6
RI	BLACKBACK	SM	OT	521,526,53,61	0	0	1	1	2
MA-N	BLACKBACK	UNC	OT	522,56,525	0	1	1	0	2
NY/LI	BLACKBACK	UNC	OT	61-63	0	2	2	2	6
				TOTAL	9	19	26	19	73
MA-N	BLUEFISH	UNC	ALL	52,53	0	0	0	1	1

MA-S/CC	BLUEFISH	UNC	ALL	52,53	1	0	0	1	2
ME/NH	BLUEFISH	UNC	ALL	52,51	0	0	0	1	1
NJ	BLUEFISH	UNC	ALL	53,6	1	0	3	3	7
NY/LI	BLUEFISH	UNC	ALL	52,53,56,6	3	0	3	3	9
RI	BLUEFISH	UNC	ALL	52,53,56,6	1	0	0	1	2
VA/MD	BLUEFISH	UNC	ALL	6	2	0	1	1	4
				TOTAL	8	0	7	11	26
RI	BUTTERFISH	LRG	OT	52,53,56,6	2	2	0	0	4
RI	BUTTERFISH	MED	OT	52,53,56,6	1	1	0	0	2
RI	BUTTERFISH	SM	OT	52,53,56,6	2	2	0	0	4
NJ	BUTTERFISH	UNC	OT	53,6	1	1	1	1	4
NY/LI	BUTTERFISH	UNC	OT	51-53,6	0	1	0	0	1
RI	BUTTERFISH	UNC	OT	5	2	3	2	0	7
				TOTAL	8	10	3	1	22
MA-N	COD	LRG	GN	51	1	1	1	1	4
MA-N	COD	LRG	GN	52,53,56	1	1	1	1	4
MA-S/CC	COD	LRG	GN	51	1	1	1	1	4
ME/NH	COD	LRG	GN	51	1	1	1	1	4
ME/NH	COD	LRG	GN	52,53,56	1	1	1	1	4
MA-S/CC	COD	LRG	LL	51	1	1	1	1	4
MA-N	COD	LRG	OT	51	2	3	3	2	10
MA-N	COD	LRG	OT	52,53,56	2	2	2	2	8
MA-S/CC	COD	LRG	OT	52,53,56	2	2	3	2	9
ME/NH	COD	LRG	OT	51	1	1	1	1	4
ME/NH	COD	LRG	OT	52,53,56	1	1	2	1	5
MA-N	COD	MKT	GN	51	1	1	1	1	4
MA-N	COD	MKT	GN	52,53,56	2	2	2	2	8
MA-S/CC	COD	MKT	GN	51	1	1	1	1	4
ME/NH	COD	MKT	GN	51	1	1	1	1	4
ME/NH	COD	MKT	GN	52,53,56	1	2	2	2	7

MA-S/CC	COD	MKT	LL	51	1	1	1	1	4
MA-N	COD	MKT	OT	51	1	3	3	1	8
MA-N	COD	MKT	OT	52,53,56	2	2	3	3	10
MA-S/CC	COD	MKT	OT	52,53,56	2	2	4	3	11
ME/NH	COD	MKT	OT	51	1	1	1	1	4
ME/NH	COD	MKT	OT	52,53,56	2	2	2	2	8
MA-N	COD	SCROD	GN	51	1	1	1	1	4
MA-N	COD	SCROD	GN	52,53,56	1	1	1	1	4
MA-S/CC	COD	SCROD	GN	51	1	1	1	1	4
ME/NH	COD	SCROD	GN	51	0	0	1	1	2
ME/NH	COD	SCROD	GN	52,53,56	1	0	1	1	3
MA-S/CC	COD	SCROD	LL	51	1	1	1	1	4
MA-N	COD	SCROD	OT	51	2	2	1	1	6
MA-N	COD	SCROD	OT	52,53,56	2	2	2	3	9
MA-S/CC	COD	SCROD	OT	52,53,56	2	1	2	3	8
ME/NH	COD	SCROD	OT	51	1	1	1	1	4
ME/NH	COD	SCROD	OT	52,53,56	1	1	2	1	5
MA-S/CC	COD	UNC	GN	52,53,56	3	3	3	3	12
MA-S/CC	COD	UNC	LL	52,53,56	3	3	3	3	12
				TOTAL	48	50	58	53	209
MA-N	CUSK	UNC	OT	5	1	1	1	1	4
ME/NH	CUSK	UNC	OT	5	1	2	1	1	5
MA-N	CUSK	UNC	LL	5	1	1	1	1	4
ME/NH	CUSK	UNC	LL	5	1	1	1	1	4
				TOTAL	4	5	4	4	17
MA-N	DAB	LRG	OT	51,52,56	1	1	2	2	6
MA-S/CC	DAB	LRG	OT	52,53,56	0	0	1	1	2
ME/NH	DAB	LRG	OT	51,52,56	2	2	2	2	8
RI	DAB	LRG	ALL	5,6	0	0	1	0	1
MA-N	DAB	MED	OT	51,52,56	2	1	2	2	7

MA-S/CC	DAB	MED	OT	52,53,56	0	0	1	1	2
ME/NH	DAB	MED	OT	51,52,56	1	1	2	2	6
MA-N	DAB	SM	OT	51,52,56	2	2	2	1	7
MA-S/CC	DAB	SM	OT	52,53,56	1	2	2	1	6
ME/NH	DAB	SM	OT	51,52,56	1	1	2	2	6
				TOTAL	10	10	17	14	51
MA-N	DOGFISH	UNC	GN	51,52,56	0	0	2	2	4
MA-N	DOGFISH	UNC	OT	51,52	1	0	1	1	3
MA-N	DOGFISH	UNC	LL/LT	5,6	0	0	1	1	2
MA-S/CC	DOGFISH	UNC	GN	51,52,56	1	0	1	1	3
MA-S/CC	DOGFISH	UNC	LL/LT	5,6	2	0	2	2	6
ME/NH	DOGFISH	UNC	GN	51,52,56,6	2	2	2	2	8
ME/NH	DOGFISH	UNC	OT	51,52,56,6	2	2	2	2	8
VA/MD	DOGFISH	UNC	ALL	6	2	2	1	0	5
				TOTAL	10	6	12	11	39
MA-S/CC	FLUKE	JUMBO	OT	52,53,56,6	0	1	1	1	3
NJ	FLUKE	JUMBO	OT	53,6	1	2	1	1	5
NY/LI	FLUKE	JUMBO	OT	53,6	1	2	1	1	5
RI	FLUKE	JUMBO	OT	52,53,56,6	1	2	1	1	5
VA/MD	FLUKE	JUMBO	OT	62,63	2	4	1	1	8
MA-S/CC	FLUKE	LRG	OT	52,53,56,6	0	1	2	2	5
NJ	FLUKE	LRG	OT	53,6	1	4	1	2	8
NY/LI	FLUKE	LRG	OT	53,6	1	2	1	1	5
RI	FLUKE	LRG	OT	52,53,56,6	2	4	2	2	10
VA/MD	FLUKE	LRG	OT	53,6	3	6	1	1	11
MA-N	FLUKE	MED	OT	52,53,56,6	0	0	0	1	1
MA-S/CC	FLUKE	MED	OT	52,53,56,6	0	1	1	1	3
NJ	FLUKE	MED	OT	53,6	1	4	1	2	8
NY/LI	FLUKE	MED	OT	53,6	1	2	2	1	6
RI	FLUKE	MED	OT	52,53,56,6	2	4	2	2	10

VA/MD	FLUKE	MED	OT	53,6	3	6	1	1	11
NJ	FLUKE	SM	OT	53,6	1	1	1	1	4
NY/LI	FLUKE	SM	OT	53,6	1	1	1	1	4
RI	FLUKE	SM	OT	52,53,56,6	1	1	1	1	4
VA/MD	FLUKE	SM	OT	53,6	1	1	0	0	2
				TOTAL	23	49	22	24	118
MA-N	GOOSEFISH	LRG	ALL	5,6	1	4	3	1	9
MA-S/CC	GOOSEFISH	LRG	OT	5,6	6	8	6	4	24
MA-S/CC	GOOSEFISH	LRG	SD	5,6	7	3	5	6	21
ME/NH	GOOSEFISH	LRG	ALL	5,6	3	4	4	3	14
NJ	GOOSEFISH	LRG	GN	5,6	0	3	1	0	4
NJ	GOOSEFISH	LRG	SD	5,6	1	1	1	1	4
NY/LI	GOOSEFISH	LRG	GN	5,6	1	0	1	0	2
RI	GOOSEFISH	LRG	GN	5,6	1	0	1	0	2
RI	GOOSEFISH	LRG	OT	5,6	2	2	3	2	9
RI	GOOSEFISH	LRG	SD	5,6	0	0	0	1	1
VA/MD	GOOSEFISH	LRG	SD	5,6	0	1	2	1	4
MA-N	GOOSEFISH	PW	ALL	5,6	1	1	1	1	4
MA-S/CC	GOOSEFISH	PW	ALL	5,6	1	1	1	1	4
ME/NH	GOOSEFISH	PW	ALL	5,6	0	1	1	0	2
NJ	GOOSEFISH	PW	ALL	5,6	0	1	0	0	1
RI	GOOSEFISH	PW	ALL	5,6	1	1	1	1	4
VA/MD	GOOSEFISH	PW	ALL	5,6	0	1	1	1	3
MA-N	GOOSEFISH	SM	ALL	5,6	1	2	1	1	5
MA-S/CC	GOOSEFISH	SM	OT	5,6	8	10	8	4	30
MA-S/CC	GOOSEFISH	SM	SD	5,6	5	2	5	7	19
ME/NH	GOOSEFISH	SM	ALL	5,6	2	3	3	3	11
NJ	GOOSEFISH	SM	ALL	5,6	1	1	1	1	4
RI	GOOSEFISH	SM	OT	5,6	3	2	2	5	12
VA/MD	GOOSEFISH	SM	ALL	5,6	0	1	1	0	2
MA-N	GOOSEFISH	UNC	ALL	5,6	1	0	0	0	1

MA-S/CC	GOOSEFISH	UNC	ALL	5,6	1	0	1	0	2
NJ	GOOSEFISH	UNC	ALL	5,6	9	2	5	1	17
NJ	GOOSEFISH	UNC	ALL	5,6	9	2	5	1	17
NY/LI	GOOSEFISH	UNC	OT	5,6	1	1	1	0	3
NY/LI	GOOSEFISH	UNC	GN	5,6	1	0	2	0	3
VA/MD	GOOSEFISH	UNC	ALL	5,6	0	0	2	0	2
				TOTAL	67	58	69	46	240
MA-N	GREY SOLE	LRG	OT	51,52,56	1	1	1	1	4
MA-S/CC	GREY SOLE	LRG	OT	51,52,56	1	1	1	1	4
ME/NH	GREY SOLE	LRG	OT	51,52,56	3	3	3	3	12
MA-N	GREY SOLE	MED	OT	51,52,56	1	1	1	1	4
ME/NH	GREY SOLE	MED	OT	51,52,56	2	2	2	2	8
MA-N	GREY SOLE	SM/PW	OT	51,52,56	1	1	1	1	4
MA-S/CC	GREY SOLE	SM/PW	OT	51,52,56	1	1	1	1	4
ME/NH	GREY SOLE	SM/PW	OT	51,52,56	2	2	2	2	8
				TOTAL	12	12	12	12	48
MA-N	HADDOCK	LRG	OT	51	1	1	1	1	4
MA-N	HADDOCK	LRG	OT	52,56	2	1	2	1	6
MA-S/CC	HADDOCK	LRG	OT	52,56	2	2	2	2	8
ME/NH	HADDOCK	LRG	OT	51	1	1	1	1	4
ME/NH	HADDOCK	LRG	OT	52,56	1	1	1	1	4
RI	HADDOCK	LRG	OT	5,6	0	0	1	0	1
MA-N	HADDOCK	SCROD	OT	51	1	1	1	1	4
MA-N	HADDOCK	SCROD	OT	52,56	2	1	2	1	6
MA-S/CC	HADDOCK	SCROD	OT	52,56	2	2	2	2	8
ME/NH	HADDOCK	SCROD	OT	51	1	1	1	1	4
ME/NH	HADDOCK	SCROD	OT	52,56	1	1	1	1	4
RI	HADDOCK	SM	OT	5	0	0	1	0	1
				TOTAL	14	12	16	12	54

MA-N	HERRING	UNC	ALL	51,52,56	10	20	10	10	50
ME/NH	HERRING	UNC	OT	51	25	0	20	35	80
NJ	HERRING	UNC	ALL	6	0	5	0	0	5
RI	HERRING	UNC	ALL	5,6	0	15	0	0	15
				TOTAL	35	40	30	45	150
RI	*Illex*	FT	UNC	5,6	6	3	8	12	29
NJ	*Illex*	FT	UNC	62	6	4	6	9	25
NJ	*Illex*	FT	LG	61-63	0	0	4	6	10
VA/MD	*Illex*	OT	UNC	61-63	0	3	3	5	11
	*** See monthly sampling plan*				12	10	21	32	75
MA-N	LOBSTER	UNC	LP	52	1	0	1	1	3
MA-S/CC	LOBSTER	UNC	LP	5	3	2	4	4	13
ME/NH	LOBSTER	UNC	LP	515	1	1	1	1	4
RI	LOBSTER	UNC	LP	52,53,56,6	4	4	4	4	16
				TOTAL	9	7	10	10	36
MA-S/CC	*Loligo*	OT	UNC	5	0	0	2	0	2
MA-S/CC	*Loligo*	PN	UNC	5	0	0	5	2	7
RI	*Loligo*	OT	UNC	5,6	5	9	4	3	21
RI	*Loligo*	FT	UNC	5,6	6	11	5	4	26
NY/LI	*Loligo*	OT	UNC	5,6	3	3	3	6	15
NJ	*Loligo*	OT	UNC	6	9	12	5	2	28
VA/MD	*Loligo*	OT	UNC	6	0	1	0	0	1
	*** See monthly sampling plan*				23	36	24	17	100
ME/NH	MACKEREL	UNC	OT	51	0	1	1	0	2
NJ	MACKEREL	UNC	OT	5,6	4	4	4	0	12
RI	MACKEREL	UNC	OT	5,6	4	4	4	0	12
VA/MD	MACKEREL	UNC	OT	5,6	0	1	0	0	1
				TOTAL	8	10	9	0	27

MA-S/CC	OCEAN POUT	UNC	OT	51,52,53	0	2	2	0	4
RI	OCEAN POUT	UNC	OT	52,53,6	0	2	2	0	4
NY/LI	OCEAN POUT	UNC	OT	53,6	0	3	3	0	6
				TOTAL	0	7	7	0	14
MA-S/CC	OCEAN QUAHOG	UNC	CD	53,61	7	7	7	7	28
ME/NH	OCEAN QUAHOG	UNC	CD	51	5	5	5	5	20
NJ	OCEAN QUAHOG	UNC	CD	61,62	5	10	10	10	35
NY/LI	OCEAN QUAHOG	UNC	CD	53, 61	5	5	5	5	20
RI	OCEAN QUAHOG	UNC	CD	52,53,56	10	10	8	8	36
VA/MD	OCEAN QUAHOG	UNC	CD	62,63	5	5	5	5	20
				TOTAL	37	42	40	40	159
NJ	OFFSHORE HAKE	UNC	OT	53,61	0	0	1	0	1
RI	OFFSHORE HAKE	UNC	OT	53,61	0	0	1	0	1
				TOTAL	0	0	2	0	2
MA-N	POLLOCK	LRG	GN	51,52,56	1	1	1	1	4
MA-N	POLLOCK	LRG	OT	51,52,56	3	3	3	3	12
ME/NH	POLLOCK	LRG	GN	51,52,56	2	2	2	2	8
ME/NH	POLLOCK	LRG	OT	51,52,56	2	2	2	2	8
MA-N	POLLOCK	MED	OT	51,52,56	2	2	2	2	8
ME/NH	POLLOCK	MED	GN	51,52,56	2	2	2	2	8
ME/NH	POLLOCK	SM	GN	51,52,56	2	2	2	2	8
ME/NH	POLLOCK	SM	OT	51,52,56	2	2	2	2	8
				TOTAL	16	16	16	16	64
MA-N	RED HAKE	UNC	OT	51,52,56	1	0	1	1	3
NJ	RED HAKE	UNC	OT	52,53,56,6	1	1	1	1	4

NY/LI	RED HAKE	UNC	OT	52,53,56,6	3	3	1	1	8
RI	RED HAKE	UNC	OT	52,53,56,6	1	1	2	1	5
				TOTAL	6	5	5	4	20
MA-N	REDFISH	UNC	OT	51,52,56	2	2	2	2	8
ME/NH	REDFISH	UNC	OT	51,52,56	1	1	2	1	5
				TOTAL	3	3	4	3	13
MA-S/CC	SCUP	JUM	ALL	52,53,56	0	0	1	1	2
NJ	SCUP	JUM	ALL	6	0	2	0	0	2
RI	SCUP	JUM	ALL	53,6	0	0	1	1	2
MA-S/CC	SCUP	LRG	ALL	52,53,56	1	0	1	1	3
NJ	SCUP	LRG	OT	53,6	1	4	1	1	7
NY/LI	SCUP	LRG	ALL	53,6	1	1	1	0	3
RI	SCUP	LRG	ALL	52,53,56,6	2	1	1	1	5
VA/MD	SCUP	LRG	OT	6	0	1	0	0	1
NJ	SCUP	LRG MIX	OT	52,53,6	0	2	0	0	2
MA-S/CC	SCUP	MED	ALL	52,53,56	1	0	1	1	3
NJ	SCUP	MED	OT	53,6	0	1	1	0	2
NY/LI	SCUP	MED	ALL	53,6	1	1	1	0	3
RI	SCUP	MED	ALL	52,53,56,6	2	1	1	1	5
VA/MD	SCUP	MED	OT	6	0	1	0	0	1
NJ	SCUP	PIN	ALL	6	0	1	0	0	1
NY/LI	SCUP	PIN	ALL	6	1	0	0	0	1
MA-S/CC	SCUP	SM	ALL	52,53,56	1	0	0	0	1
NJ	SCUP	SM	OT	53,6	1	1	1	1	4
NY/LI	SCUP	SM	ALL	53,6	1	0	0	0	1
RI	SCUP	SM	OT	52,53,56,6	1	1	1	1	4
VA/MD	SCUP	SM	OT	6	0	1	1	0	2
NY/LI	SCUP	UNC	ALL	53,6	2	1	1	1	5
				TOTAL	16	20	14	10	60

MA-N	SEA SCALLOP	UNC	SD	ANY	0	0	1	1	2
MA-S/CC	SEA SCALLOP	UNC	SD	5	9	10	28	21	68
MA-S/CC	SEA SCALLOP	UNC	SD	6	5	7	19	13	44
ME/NH	SEA SCALLOP	UNC	SD	ANY	9	7	1	0	17
NJ	SEA SCALLOP	UNC	SD	ANY	3	6	17	11	37
RI	SEA SCALLOP	UNC	SD	ANY	0	0	0	1	1
VA/MD	SEA SCALLOP	UNC	SD	ANY	6	13	29	19	67
VA/MD	SEA SCALLOP	UNC	TRA WL	ANY	1	3	7	5	16
				TOTAL	33	46	102	71	252
MA-N	SHRIMP	UNC	OT	51	0	4	2	0	6
ME/NH	SHRIMP	UNC	OT	51	0	16	6	0	22
				TOTAL	0	20	8	0	28
NJ	SILVER HAKE	JUV	OT	ANY	2	2	2	2	8
NY/LI	SILVER HAKE	JUV	OT	ANY	8	8	6	6	28
RI	SILVER HAKE	JUV	OT	ANY	2	3	4	2	11
MA-N	SILVER HAKE	UNC	OT	5	4	1	1	4	10
MA-S/CC	SILVER HAKE	UNC	OT	5	4	1	1	4	10
NJ	SILVER HAKE	UNC	OT	6	2	3	3	2	10
NY/LI	SILVER HAKE	UNC	OT	52,53,6	10	14	8	8	40
RI	SILVER HAKE	UNC	OT	52	5	3	2	0	10
RI	SILVER HAKE	UNC	OT	53,6	3	5	10	0	18
				TOTAL	40	40	37	28	145
NJ	SURFCLAM	UNC	CD	6	10	10	10	10	40
NY/LI	SURFCLAM	UNC	CD	61,53	10	10	10	10	40
VA/MD	SURFCLAM	UNC	CD	6	10	10	10	10	40
				TOTAL	30	30	30	30	120
ME/NH	TILEFISH	LRG	LL	52-63	0	1	1	0	2

NJ	TILEFISH	LRG	LL	52-63	0	2	2	0	4
NY/LI	TILEFISH	LRG	LL	52-63	1	1	1	1	4
ME/NH	TILEFISH	MED	LL	52-63	0	1	1	0	2
RI	TILEFISH	MED	ALL	52-63	1	0	1	1	3
NY/LI	TILEFISH	MED	LL	52-63	3	3	2	2	10
NJ	TILEFISH	MED	LL	52-63	0	2	2	0	4
RI	TILEFISH	SM/KIT	ALL	52-63	1	1	0	0	2
NY/LI	TILEFISH	SM/KIT	LL	52-63	3	2	1	1	7
NJ	TILEFISH	SM/KIT	LL	52-63	1	1	1	0	3
				TOTAL	10	14	12	5	41
MA-N	WHITE HAKE	LRG	GN	5	1	1	1	1	4
MA-N	WHITE HAKE	LRG	OT	51,52,56	1	1	1	1	4
MA-N	WHITE HAKE	LRG	OT	52,53,56	1	1	1	1	4
ME/NH	WHITE HAKE	LRG	GN	51,52,56	1	1	2	2	6
ME/NH	WHITE HAKE	LRG	LL/LT	5,6	1	1	1	1	4
ME/NH	WHITE HAKE	LRG	OT	5	2	1	1	3	7
ME/NH	WHITE HAKE	LRG	OT	51,52,6	1	1	1	1	4
MA-N	WHITE HAKE	MED	OT	52,53,56	1	1	2	2	6
ME/NH	WHITE HAKE	MED	GN	5	1	1	2	2	6
ME/NH	WHITE HAKE	MED	LL/LT	5	1	1	1	1	4
ME/NH	WHITE HAKE	MED	OT	5	1	1	1	1	4
MA-N	WHITE HAKE	SM	OT	51,52,56	1	1	1	1	4
MA-N	WHITE HAKE	SM	OT	52,53,56	1	1	1	1	4
ME/NH	WHITE HAKE	SM	GN	51,52,56	1	1	1	1	4
ME/NH	WHITE HAKE	SM	OT	5	1	1	1	1	4
MA-S/CC	WHITE HAKE	UNC	OT	5	1	1	1	1	4
ME/NH	WHITE HAKE	UNC	LL/LT	5	1	1	1	1	4
ME/NH	WHITE HAKE	UNC	OT	5	1	1	1	1	4
				TOTAL	19	18	21	23	81
MA-S/CC	WINDOWPANE	UNC	OT	52,56	5	4	3	5	17

NY/LI	WINDOWPANE	UNC	OT	53,61	2	1	1	1	5
RI	WINDOWPANE	UNC	OT	52,53,61	2	0	0	0	2
				TOTAL	9	5	4	6	24
MA-N	YELLOWTAIL	LRG	OT	514,521	2	2	2	2	8
MA-S/CC	YELLOWTAIL	LRG	OT	514,521	2	2	2	2	8
MA-S/CC	YELLOWTAIL	LRG	OT	522,56,525	2	2	2	2	8
MA-S/CC	YELLOWTAIL	LRG	OT	526,53	2	2	2	2	8
RI	YELLOWTAIL	LRG	OT	526,537,539	2	2	2	2	8
RI	YELLOWTAIL	LRG	OT	522,525,56	2	2	2	2	8
RI	YELLOWTAIL	LRG	OT	526,53	2	2	2	2	8
MA-N	YELLOWTAIL	SM	OT	514,521	2	2	2	2	8
MA-S/CC	YELLOWTAIL	SM	OT	514,521	2	2	2	2	8
MA-S/CC	YELLOWTAIL	SM	OT	522,56,525	2	2	2	2	8
MA-S/CC	YELLOWTAIL	SM	OT	526,53	2	2	2	2	8
RI	YELLOWTAIL	SM	OT	526,537,539	2	2	2	2	8
RI	YELLOWTAIL	SM	OT	522,525,56	2	2	2	2	8
RI	YELLOWTAIL	SM	OT	526,53	2	2	2	2	8
				TOTAL	28	28	28	28	112
				OVERALL TOTAL	553	647	693	582	2475

Samplers should attempt to obtain at least 30 length frequencies of a single species/market category, but no more than 50, from each sampled trip.

Please Note: Non-rounded target numbers are a three-year average of lengths or biological samples taken for that species from that state. Rounded target numbers are state-apportioned portions of the entire South Atlantic target.

SPECIES	STATE	Lengths	Otoliths	Gonads
Black Grouper	FL	1200		960
		GA		
		NC	3	
		SC	21	
Black Sea Bass	FL	136	34	
		GA	600	240
		NC	1200	480
		SC	600	240
Gag Grouper	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240
Golden Tilefish	FL	1200	480	
		GA	1200	480
		NC	79	
		SC	1200	480
Grey Snapper	FL	1200	960	1200
		GA	7	
		NC	1	
		SC	16	
Gray Triggerfish	FL	1200	480	
		GA	600	240
		NC	600	240
		SC	600	240
Greater Amberjack	FL	1200	480	1200
		GA	600	240
		NC	600	240
		SC	600	240
Hogfish	FL		1200	7
		GA		
		NC	36	
		SC	241	

SPECIES	STATE	Lengths	Otoliths	Gonads
Jolthead Porgy	FL	600	240	600
		GA		
		NC	6	
		SC		
King Mackerel	FL	1800	804	
		GA	15	
		NC	900	
		SC	900	204
Spanish Mackerel	FL	1404	1080	
		GA	60	
		NC	696	
		SC	1	60
Lane Snapper	FL	1200	960	
		GA		
		NC		
		SC	2	
Lesser Amberjack	FL	960		
		GA	480	
		NC	480	
		SC	480	
Littlehead Porgy	FL	600	240	600
		GA		
		NC		
		SC		
Margate	FL	600	240	600
		GA		
		NC	6	
		SC		
Mutton Snapper	FL	1800	1440	1800
		GA	7	
		NC	6	
		SC	18	
Red Porgy	FL	600	52	
		GA	600	240
		NC	600	240
		SC	600	240
Red Snapper	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240

SPECIES	STATE	Lengths	Otoliths	Gonads
Scamp		FL	600	43
		GA	600	240
		NC	600	240
		SC	600	240
Snowy Grouper	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240
Vermilion Snapper	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240
White Grunt	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240
Wreckfish	FL	1200	480	
		GA	1200	480
		NC		
		SC	1200	480
Yellowtail Snapper	FL	2400	960	
		GA	13	
		NC	4	
		SC	10	

NO TARGETS IDENTIFIED FOR THESE SPECIES - 2000-2001

Tautog
Atlantic sturgeon
Atlantic croaker
Red drum
American eel
Horseshoe crab
Northern shrimp
Atlantic menhaden
River herring/Hickory shad
Spot
Spotted seatrout
Winter flounder
Spiny dogfish

Table 8.D. Overview of the ACCSP qualitative release, discard, and protected species interactions monitoring program.

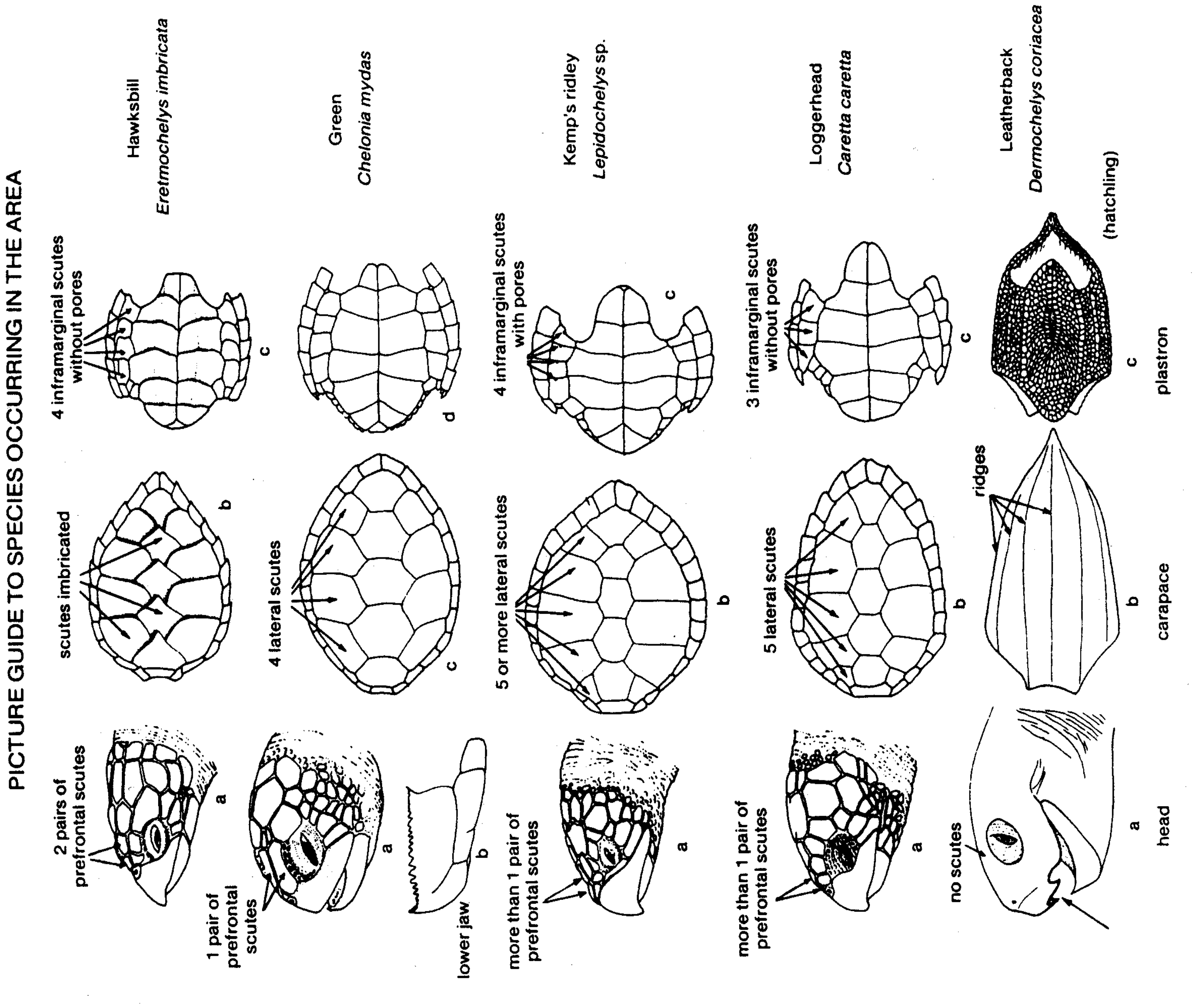
Program Activity	Description / Criteria
Stranding/Entanglement Programs	11. Use existing infrastructure and framework, including standard forms. 12. Provide funding to implement procedures for a coordinated coastwide stranding/entanglement network. 13. Provide stranding/entanglement data to the ACCSP. 14. Gear taken from stranding/entanglement programs should be retained and stored for future analysis.
Add-on to Existing Recreational and for-hire Telephone and Intercept Surveys	15. Continue collection of release/discard data through existing catch surveys for recreational and for-hire fisheries. 16. Increase sample size in areas of high incidence of releases and discards. 17. Add additional questions to the telephone and intercept surveys for protected species interactions.
Commercial Reporting System	18. Evaluate release/discard data collected through commercial catch/effort data collection programs for trend information to identify release/discard problem areas. 19. If for-hire logbooks are implemented through the ACCSP, evaluate release/discard data for trend information.
Port Interviewing	20. Use of interview data from port interviewing programs to verify information collected through real-time reporting and other anecdotal information. 21. Use port interviewing programs for dissemination of ACCSP information and materials. 22. Data elements should include time, area, date, fishery type, release/discard information.
Real-Time Reporting	23. 1-800 call-in system for real-time reporting of rescue needs or unusual event taking of protected species and possible finfish species. The system should accept anonymous information. 24. Data to be collected should include area, date, time, fishery type (if applicable), releases, and discards. 25. One number should be provided and maintained by one ACCSP program partner. 26. All relevant information should be forwarded in a timely manner to the appropriate organization/office for action. 27. Verification of reports should be made through port interviewing, the commercial fishermen logbook reporting system, U.S. Coast Guard boardings, and the at-sea observer program.

Table 8.E. Minimum standard data elements to be collected through the sea turtle strandings and salvage network for providing information to the ACCSP qualitative release, discard, and protected species interactions data collection program.

Data Element	Description / Criteria	Format
Observer Name	Initials of the person who handled the turtle in the field.	3 digit character
Stranding Date	The date the turtle was first reported or encountered.	MM:DD:YYYY
Observer Address/Affiliation	Address where observer can be reached.	50 digit character
Observer Phone Number	Phone number, including area code, where observer can be reached.	10 digit numeric
Species	The species of sea turtle observed. (NOTE: Committee recommends addition of an ITIS Unknown Turtle Species code and delete Reliability of ID field below)	ITIS 11 digit character (Table A.8 Program Design)
Turtle Number By Day	Sequential number indicating the number of turtles observed during each day. This data element will default to one when only one turtle was observed.	2 digit numeric
Indication of Verification of Identification	Indication of whether the species identification was verified by a state coordinator (0=no, 1=yes).	1 digit character
Sex	Sex of the sea turtle (1=male, 2=female, 9=undetermined).	1 digit character
Sex Determined	Indication of how sex was determined (1=necropsy; 2=tail length beyond carapace in adults)	1 digit numeric
State	The state in which the sea turtle was stranded.	2 digit character postal alpha abbreviation (Table A.3, Program Design)
County	The county in which the sea turtle was stranded.	3 digit character FIPS code (Table A.9 Program Design)
Latitude	The specific latitude of the stranding. If latitude cannot be provided specific reference information should be provided on the stranding location in the Notes field.	6 digit numeric, 2 decimal minutes

Data Element	Description / Criteria	Format
Longitude	The specific longitude of the stranding. If longitude cannot be provided specific reference information should be provided on the stranding location in the Notes field.	7 digit numeric, 2 decimal minutes
Condition	An indication of the general condition of the turtle (0=alive, 1=fresh dead, 2=moderately decomposed, 3=severely decomposed, 4=dried carcass, 5=skeletons/bones only).	1 digit numeric
Final Disposition	The final disposition in which the observer left the turtle (1=painted, left on beach; 2= buried, on beach/off beach; 3=salvaged specimen, all/part; 4=pulled up on beach or dune; 5=unpainted, left on beach; 6=released alive, 7=taken alive to holding facility, 9=unknown).	1 digit numeric
Tag Numbers	List of tag numbers and indication of location of tag.	12 digit character
Carapace Length	Length of the carapace over curve.	5 digit numeric
Length Type	Straight length - SCL Curve length - CLL	3 digit character
Units of Measurement (Carapace Length and Width)	Units of length measurement (CM=centimeters, IN=inches).	2 digit character (Table A.3 Program Design)
Carapace Width	Width of the carapace over curve (curved length).	5 digit numeric
Width Method	Straight width - SCW Curve width - CLW	3 digit character
Weight	Weight of turtle	5 digit numeric
Units of Measurement (Weight)	Units of weight measurement (KG=kilograms, LB=pounds).	2 digit character (Table A.3 Program Design)
Notes	General remarks of the observer (i.e., whether turtle was involved with tar or oil, gear or debris entanglement, wounds or mutilations, propeller damage, papillomas, epizoa).	See Table A.12 Program Design, for note codes.

SEA TURTLE STRANDING AND SALVAGE NETWORK – STRANDING REPORT



BACK OF FORM

Minimum standard data elements to be collected through the marine mammal stranding network providing information to the ACCSP qualitative release, discard, and protected species interactions monitoring program.

Data Element	Description / Criteria	Format
Field Number	Assigned by responding organization - used to identify individual stranded animals.	Character
NMFS Registration Number	Assigned by NMFS. Used to identify individual stranded animals.	Character
National Database Number	Assigned by NMFS. Used to identify individual stranded animals.	Character
Common Name	The common name of the marine mammal observed.	25 digit character
Species	The species of the marine mammal observed.	ITIS11 digit character (Table A.8 Program Design)
Observer Name	Initials of the person who handled the marine mammal in the field.	3 digit character
Observer Affiliation	Agency/group observer is associated with.	50 digit character
Observer Address	Address where observer can be reached.	50 digit character
Observer Phone Number	Phone number, including area code, where observer can be reached.	10 digit numeric
Sighting Only	0 = No 1 = Yes - note if a sighting only	1 digit character
Location Found	1 = beach 2 = floating 3 - swimming 4 = other	1 digit character
State	The state in which the marine mammal was observed.	2 digit character FIPS (postal code) (Table A.9, Program Design)
County	The county in which the marine mammal was observed.	3 digit character FIPS (Table A.9, Program Design)
City	The city in which the marine mammal was observed.	10 digit character
Locality Details	Details on the specific locality where the marine mammal was observed.	50 digit character
Latitude	The specific latitude of the marine mammal observation.	6 digit numeric, 2 decimal minutes
Longitude	The specific longitude of the marine mammal observation.	7 digit numeric, 2 decimal minutes
Mass Stranding	Indication of whether the observation was a mass stranding of marine mammals (0=no, 1=yes).	1 digit numeric

Table 8.F. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Number of Animals	# of animals involved in the stranding event	3 digit numeric
Human Interaction	Indication of whether a human interaction occurred (0=no, 1=yes, 2= cannot be determined).	1 digit numeric
Type of Human Interaction	Type of human interaction, if applicable (1=boat collision, 2=shot, 3=fishery interaction, 4=other).	1 digit numeric
Determination of Human Interaction	1 = external exam, 2 = internal exam, 3 = not examined	3 digit character
Other Causes	0 = no, 1 = yes, 2 = CTBD	1 digit character
Description of Other Causes	Circumstances surrounding the stranding other than, or in addition to, evidence of human interaction.	50 digit character
Date of Initial Observation	Initial observation date of the marine mammal.	MM:DD:YYYY
Condition at Initial Observation	An indication of the general condition of the marine mammal at the initial observation (1=alive, 2=fresh dead, 3=moderately decomposed, 4=advanced decomposition, 5=mummified, 9=unknown).	1 digit numeric
Date of Examination	Date of examination of the marine mammal.	MM:DD:YYYY
Status	1 = alive, 2 = dead, 3 = unknown	1 digit character
Condition at Examination	An indication of the general condition of the marine mammal at the time of examination (1=alive, 2=fresh dead, 3=moderately decomposed, 4=advanced decomposition, 5=mummified/skeletal, 9=dead/unknown).	1 digit numeric
Live Animal Condition/Disposition	The final disposition of the marine mammal (1=left at site, 2=immediate release at site, 3=relocated, 4=euthanized at site, 5=died at site, 6=transferred to rehabilitation, 7=died during transport).	1 digit numeric
Transport	Information on where the marine mammal was transported to.	25 digit character

Table 8.F. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Final Disposition After Transport	Indication of whether the mammal died or was released during or after transport (0=died, 1=released)	1 digit numeric
Date of Final Disposition	Date that marine mammal died or was released on or after transport.	MM:DD:YYYY
Tag(s) Applied	Were tags applied/attached to marine mammal, for identification (0=no, 1=yes)	1 digit character
Tag(s) Present	Were tags present on the marine mammal upon initial identification (0=no, 1=yes)	1 digit character
Tag Number(s) and Description	List tag number(s), description of tag type(s), and tag location(s).	50 digit character
Tag Placement	Location where tag was placed (1=front, 2-rear).	1 digit numeric
Carcass Disposition	The disposition of the carcass (1=left at site, 2=buried, 3=towed, 4=scientific collection, 5=educational collection, 6=other, 9=unknown).	1 digit numeric
Necropsy	Indication of whether the marine mammal was necropsied (0=no, 1=yes).	1 digit numeric
Sex	Sex of the marine mammal (1=male, 2=female, 9=unknown).	1 digit numeric
Length	Straight length of the marine mammal, per standard protocols.	10 digit numeric
Reliability of Length	Indication of whether length was measured or estimated (ME=measured, ES=estimate).	2 digit character (Table A.3, Program Design)
Units of Length Measurement	Units of length measurement (CM=centimeters, IN=inches).	2 digit character (Table A.3, Program Design)
Weight	Weight of marine mammal.	10 digit numeric
Reliability of Weight	Indication of whether weight was measured or estimated (ME=measured, ES=estimate).	2 digit character (Table A.3, Program Design)
Units of Weight Measurement	Units of weight measurement (KG=kilograms, LB=pounds)	2 digit character (Table A.3, Program Design)
Remarks	General remarks.	50 digit character
Tissue/Skeletal Material Taken	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Disposition of Tissue/Skeletal Material	List of any samples collected and their disposition.	50 digit character

MARINE MAMMAL, SEA TURTLE, AND DEBRIS SIGHTING LOG

The purpose of this log is to record all marine mammal, sea turtle, and debris sightings. Also, the observer records sighting effort (time spent looking) for transit watches, including time when no sightings are made. his information is critical in determining the temporal and spatial distribution of these animals and debris, and the relative abundance and behavior of animals in the vicinity of fishing operations. Sea bird sightings are not recorded here.

The types of sightings and watches, and the proper procedures for conducting each type of watch are described in the Marine Mammal, Sea Turtle and Debris Watches section of the NEFSC Observer Program Training Manual.

Each time a transit watch is conducted, this effort must be recorded on the log with a "begin" watch and "end" watch record (see EVENT TYPE codes, #3). Begin and end watch times must be at least one minute apart. A sighting of a marine mammal, sea turtle or debris may NOT be recorded in the same record as a "begin" or "end" watch record. For gillnet fisheries, do not record begin and end haul watch information as this information is already recorded on the Gillnet Haul Log.

An animal must not be recorded on both the Marine Mammal, Sea Turtle, and Debris Sighting Log and the Marine Mammal, Sea Turtle, and Sea Bird Incidental Take Log. See the Marine Mammal, Sea Turtle, and Sea Bird Incidental Take Log in the NEFSC Observer Program Manual for more detailed instructions on deciding when an animal is a sighting versus an incidental take. An animal determined to be an incidental take is recorded on the Marine Mammal, Sea Turtle, and Sea Bird Incidental Take Log.

Any debris caught during a haul is recorded on the Haul Log (or the Individual Animal Log in pelagic fisheries) and not on this log.

INSTRUCTIONS

For instructions on completing fields A-C refer to the Common Haul Data section of the NEFSC Observer Program Manual.

1. TODAY'S DATE: Record the month, day, and year that the event being described occurred. Example: 03/20/01.

EVENT INFORMATION

TIME: Record the local time using the 24 hour clock (0000-2359) that the event being described occurred. Example: 20:32.

3. TYPE CODE: Indicate the type of event that occurred by recording the most appropriate two digit code:

For Watches Only - When a marine mammal, sea turtle, and debris watch is conducted, record one of the following begin/end watch event type codes:

01= Begin transit watch. 02 = End transit watch.
05= Begin haul watch. 06 = End haul watch.

NOTE: For gill net fisheries, do not record begin and end haul watch information as this information is already recorded on the Gillnet Haul Log.

For Sightings Only - When a marine mammal, sea turtle, or debris sighting is made, record one of the following sighting event type codes to indicate whether the observer is on- or off-effort, and to best describe the vessel activity at the time the sighting was made:

08 = On-effort, during dedicated watch.
11 = Off-effort, vessel stop/anchor/drift.
13 = Off-effort, transiting or searching.
15 = Off-effort, hauling in gear.
17 = Off-effort, waiting for J/V transfer.

00 = Unknown.

NOTE: If the sighting is made during a watch, the sighting event code is always "On-effort, during dedicated watch" (08).
NOTE: Use code 99 to describe dedicated sighting activity outside of the specified watches.

4. POSITION CODE: Indicate the location and position of the observer on the vessel at the time of this event by recording the most appropriate one digit code:
00 = Unknown.
02 = Wheelhouse, facing forward.
04 = Work deck, facing backward.
06 = Starboard side, facing net.
99 = Other, describe the position in COMMENTS.
NOTE: If the sighting is not seen by the observer, record "Other" (99), and describe in COMMENTS.

5. HAUL NUMBER: Record the haul number assigned to the haul in which any on-effort events or off-effort sightings occurred between the beginning and end of a haul. This number must agree with the number recorded for this haul on the corresponding Haul Log.
NOTE: If the event does not occur during a haul, record a dash (-).

6. LATITUDE/LONGITUDE OR LORAN: Record the latitude and longitude location, to the tenth of a minute, where the event occurred. If the latitude and longitude location is given in seconds, convert them to tenths of minutes If latitude and longitude positions are not available, record the LORAN stations and bearings.
NOTE: See Appendix Q. Conversion Tables for a list of second ranges and corresponding conversions to tenths of minutes.
NOTE: If neither latitude/longitude or LORAN positions are available, record the statistical area as listed in Appendix E.1. Map of Statistical Areas of the Northeast U.S. or Appendix E.2. Map of Statistical Areas of the Southeast U.S.

ACCSP STATISTICAL AREA MAPS ARE IN DEVELOPMENT.
Example: 35 23.4 75 16.7 or 9960X 27054 9960Y 41824
NOTE: While 9960- loran chains are the most frequently used chains within this program's jurisdiction, in extreme northern and southern areas other chains may be used, such as:
Southern North Carolina: 7980-

7. WEATHER CODE: Indicate the weather at the time the event occurred by recording the appropriate two digit code:
00 = Unknown 01 = Clear
03 = Layers of Clouds 04 = Drizzle
06 = Showers 07 = Thunderstorms 08 = Rain and Fog
09 = Fog/thick haze 10 = Snow, or rain/snow mix
11 = Blowing snow 99 = other (describe in Comments)

8. WAVE HEIGHT: Record, in whole feet, the wave height at the time the event occurred. If the wave height is less than six inches, record "0". NOTE: This is not a range.

9. COMMENTS?: Indicate whether there is a comment associated with this event by recording the appropriate code:
0 = No. 1 = Yes.

IF THE EVENT RECORDED IS A MARINE MAMMAL, SEA TURTLE, OR DEBRIS SIGHTING, COMMENTS MUST BE INCLUDED. COMMENTS are recorded on the Marine Mammal, Sea Turtle, and Debris Sighting Comments Log. Each event has an unique EVENT TIME per day. Care should be taken to correctly record the matching EVENT TIME on both logs.

Sighting comments should include all field characteristics actually seen by the observer and used to make an identification of the animal. Any unusual marks, scars or coloration on the animal(s) should be noted. Size of animal(s) should be included if an estimation is possible. Record ranges of the number of animals sighted, including the number of calves. Behaviors of the animal(s) sighted should be included, such as swim speed and direction and any other activities noted while the animal(s) was (were) observed.

Observed associations with other vessels, marine life or oceanographic phenomena (i.e. wind rows, current lines, flotsam, jetsam or a dramatic change of water color in the immediate area) should also be included. If photographs were taken, record the ROLL NUMBER and FRAME NUMBERS.

It is important to document any marine debris, whether in the area of animals or not. The debris and its approximate size(s) should be described in general terms, e.g., plastic sheeting 1 meter square, trawl webbing 0.5(m) X 3.0(m), etc. If derelict gear is picked up on purpose to be disposed of properly, take photographs and record in COMMENTS any marine life that may be entangled. Debris entanglement and ingestion have been documented as sources of mortality for marine mammals, sea turtles, sea birds, fish, and shellfish (Shomura and Yoshida 1985). Sea turtles often utilize large pieces of debris for shelter.

SIGHTING INFORMATION

NOTE: If the record or event being recorded is not a sighting, leave the following fields (#10-#15) blank.

10. **SPECIES NAME:** Record the complete common name of each marine mammal, sea turtle, or debris sighted, as listed in **ACCSP Table A.8, Program Design**.
NOTE: If it is not possible to make a positive species identification, identify the animal to the most specific generic group of which you are positive, i.e. baleen whale, unidentified dolphin, seal, sea turtle, etc. DO NOT GUESS AT SPECIES IDENTIFICATION.
Examples: Unidentified Whale Harbor Porpoise.

11. **SPECIES CODE:** Leave this field blank.

12. **NUMBER OF ANIMALS:** Record the number of animals sighted. Do not record a range.
NOTE: If the sighting is debris, record a dash (-) in this field.

13. **SIGHT CUE CODE:** Indicate how the sighting was first detected by recording the appropriate code:
0 = Unknown.
1 = Sighted with naked eye.
2 = Sighted with binoculars.
3 = First sighted by captain or crew, then by observer.
4 = Sighted by captain or crew ONLY.
9 = Other, describe the sight cue in COMMENTS.

14. **ANIMAL CONDITION CODE:** Indicate the condition of the animal(s) sighted by recording the appropriate two digit code:
00 = Unknown, explain why you can not identify the animal condition in COMMENTS.
01 = Alive, condition unknown.
02 = Alive, not injured.
03 = Alive, injured, describe how the animal is injured in COMMENTS.

04 = Alive, hook/gear in/around mouth, attempt to determine where in the mouth the hook is, etc. and describe in COMMENTS.
05 = Alive, hook/gear in/around flipper, i.e. hook in the flipper or gear around the flipper.
06 = Alive, hook/gear in/around another single body part, i.e. hook in the neck or plastron; specify which in COMMENTS.
07 = Alive, hook/gear in/around several body parts, describe more fully in COMMENTS.
08 = Alive, seen by captain and/or crew ONLY.
10 = Dead, condition unknown.
11 = Dead, fresh.
12 = Dead, moderately decomposed.
13 = Dead, severely decomposed.
14 = Dead, seen by captain and/or crew ONLY.
NOTE: Codes 04-07 exist primarily to improve descriptions of sea turtles. However, these codes may be used, as appropriate, for other animals.
NOTE: If the sighting is debris, leave this field blank.

4 **ANIMAL BEHAVIOR CODE:** Indicate the initial behavior of the animal(s) when first sighted by recording the most appropriate two digit code:
00 = Unknown.
01 = Near gear, physical contact.
02 = Near gear, within 50 meters.
03 = Near gear, within 51 to 150 meters.
04 = Feeding on catch.
05 = Porpoising: the animal(s) is (are) splashing along at the surface, breaking the surface regularly, showing most of the body.
06 = Bow riding: the animal(s) is (are) observed keeping pace with vessel on the bow wave.
07 = Breaching: the animal(s) emerge(s) from the water and crash(es) down on a flank, back or belly.
08 = Swimming at surface: the animal(s) is (are) observed several times surfacing 'normally', each surfacing at some irregular distance from the previous one; it (they) appear(s) to be just moving along.
09 = Milling: the animal(s) is (are) rolling at the surface with no direction, making short dives without moving along. Often a group activity.
10 = Motionless at surface (or dead).
11 = Vessel avoidance: the animal(s) abruptly change(s) its (their) swimming direction or behavior to avoid the vessel; a startling, alarming, fleeing reaction.
12 = Vessel attraction: the animal(s) change(s) its (their) swimming direction to approach the vessel, such as a pod of dolphins purposefully heading toward the vessel to bowride.
99 = Other, describe the animal behavior in COMMENTS.
NOTE: If the animal(s) exhibit(s) multiple behaviors, record the code for the initial behavior only, and describe all subsequent behaviors in COMMENTS. If multiple initial animal behaviors exist for one sighting, record the lowest numerical code which applies, and record the other behaviors in COMMENTS.
NOTE: If the sighting is debris, leave this field blank.

Table 8.G. Overview of the ACCSP at-sea observer program for collection of quantitative release, discard, and protected species interactions data.

Reporting Requirement	Description / Criteria
Sampling Strategies	All release/discard data should be collected at the haul level for commercial fisheries and at the drop level (each time gear is wet) for the for-hire fisheries. All release, discard, and protected species interactions monitoring programs should develop stratified random sampling procedures and a target sampling frame. Sampling strata should be determined on an issue-specific basis, as determined by the release/discard prioritization process (see Table 34). The generated sampling frame should include additional vessels to replace vessels that are not utilized. The general criteria to be used for not selecting a vessel should be when that particular vessel has participated in the program at least four times in one month or once per quarter for longer trips. All programs should indicate in the database the procedure used to select vessels, including reasoning for non-random selection. All ACCSP at-sea observer programs should provide documentation for those vessels that are not included in the sampling frame. Pilot surveys will be conducted to determine the appropriate level of observer coverage on a fishery-by-fishery basis to meet relevant management objectives of all fisheries based upon days at sea or fishing days (trip level for headboats) until such time as data are available for estimation of PSE (percent standard error) values. Recommended PSE values for both protected species and finfish is 20-30% Use of proportional sampling across all gear types and fisheries, recognizing some prioritization as need (statutory requirements) and data (high release/discard areas) dictate.
Data Management and Submission	Data submission should be on a trip basis. All release/discard data from commercial fisheries should be linked by the unique identifier to data collected through the commercial fishermen reporting system (Section 5.a.). Non-verified observer data should be made available for data entry 1-7 days after the trip return date, while finalized data should be provided 45 days after the last day of the month for which data was collected.
Subsampling Protocols	Subsampling priorities are as follows: 1) collect complete data on every haul; 2) collect partial data on every haul; and 3) collect partial data as often as possible. Specific subsampling procedures should be developed and documented by each collecting agency on a fisheries-specific basis (see the ACCSP Quality Control/Assurance Document and general subsampling guidance). Basic data elements to be collected on all unobserved hauls include: vessel/trip header information, haul number, time set, time retrieved, estimated kept catch, gear number, lat/long begin, and lat/long end.

Minimum standard data elements to be collected through the ACCSP at-sea observer program for collection of quantitative release, discard, and protected species interactions data for commercial fisheries.

Data Element	**Description / Criteria**	**Format**
Vessel Information		
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number) These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel (if applicable)	20 digit character
Individual Identifier	An identifier unique to an individual (i.e. operator license number), traceable through time and space	11 digit character
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	***To Be Developed***
Trip Information		
Reporting Form Series Number	Individual number for each reporting form, to be assigned by the collecting agency (i.e., trip ticket number). This data element may be blank in the dual reporting system.	12 digit alphanumeric
Form Type/Version Number	Version identification number for the ACCSP reporting form.	12 digit alphanumeric
Trip start	Date the trip started (this is unique to each trip and can be used to tie multiple unloadings into a trip record). A trip is shore to shore by gear/area combination, or in the case of transfers at sea, an off-loading at sea is a trip. This information should include trips with effort but no catch.	MM/DD/YYYY
Target Species or Species Group 1	The first target species or species group for that trip/haul.	ITIS 11 digit character (Table A.8 Program Design)
Target Species or Species Group 2	The second target species or species group for that trip.	ITIS 11 digit character (Table A.8 Program Design)
Target Species or Species Group 3	The third target species or species group for that trip.	ITIS 11 digit character (Table A.8 Program Design)
State Landed	The state where the product was landed or unloaded.	2 digit character postal code (Table A.9 Program Design)
Port Landed	The location within a state where the product was landed/unloaded.	5-digit FIPS code (Table A.9 Program Design)

Table 8.H. (cont'd)		
Trip Number	Sequential number representing the number of trips taken in a single day by either a vessel or individual. The trip number will default to "one" when only a single trip is conducted.	2 digit numeric
Data Element	**Description / Criteria**	**Format**
Primary Gear	The primary gear used to catch the landed species.	3-digit numeric (Table A.4 Program Design)
Primary Area Fished	Statistical area and distance from shore where most hauls occurred. The distance from shore where fishing occurred [inland (less than 0 nautical miles...nm), nearshore (0-3 nm on Atlantic coast, 0-9 nm on Florida and Texas Gulf coast), EEZ (3-200 nm on Atlantic coast, 9-200 nm on Florida and Texas Gulf coast), territorial seas (in the USVI and Puerto Rico (12 nm), and international (>200 nm)] is embedded in this code.	3-digit numeric plus 2 decimals (Table A.3 and Tables A1 - A.10 Program Design) and area figures when revised
Number of Hauls	Total number of hauls of gear during a trip.	3 digit numeric (Table A.2, Program Design)
Haul Information		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character
Gear(s)	The type(s) of gear used to catch the landed species.	3 digit character (Table A.4, Program Design)
Quantity of Gear	The amount of gear employed.	4-digit numeric (Table 22, Program Design)
Haul Number	Sequential number for unique locations where gear was hauled, representing the number of hauls taken in a single trip by either a vessel or individual.	3 digit numeric
Haul Observed	Indication of whether the haul was actually observed (0=haul not observed,, 1=complete catch data collected, 2=complete release/discard data only, 3=partial release/discard data, 4=observed kept portion, not release/discard data).	1 digit character
Target Species or Species Group 1	The first target species or species group for that haul.	ITIS 11 digit character (Table A.8, Program Design)
Target Species or Species Group 2	The second target species or species group for that haul.	ITIS 11 digit character (Table A.8, Program Design)

Table 8.H. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Target Species or Species Group 3	The third target species or species group for that haul.	ITIS 11 digit character (Table A.8, Program Design)
Lat Begin	The latitude at the beginning of the haul.	6 digit numeric plus 1 character (2 decimal minutes)
Long Begin	The longitude at the beginning of the haul.	7digit numeric plus 1 character (2 decimal minutes)
Lat End	The latitude at the end of the haul.	6 digit numeric plus 1 character (2 decimal minutes)
Long End	The longitude at the end of the haul.	7digit numeric plus 1 character (2 decimal minutes)
Time Set	The time the gear was set. Used with time hauled to derive fishing time	MO:DD:HH:MM
Time Retrieved	The time the gear was hauled. Used with time set to derive fishing time	MO:DD:HH:MM
Depth Fished	Depth in fathom at which the gear is fished.	4 digit numeric plus 1 decimal
Minimum Bottom Depth	Minimum depth of bottom in fathoms.	4 digit numeric plus 1 decimal
Maximum Bottom Depth	Maximum depth of bottom in fathoms.	4 digit numeric plus 1 decimal
Deterrent Devices Operational	Indication of whether deterrent devices were operational during the haul	1 digit character (Y/N)
Deterrent Device	Indication of whether deterrent devices were used during the haul (0= pinger, 1= tory lines, 2 = deflectors, 3= other).	1 digit character
Deterrent Device 2	Indication of whether deterrent devices were used during the haul (0= pinger, 1= tory lines, 2 = deflectors, 3= other).	1 digit character
Deterrent Device 3	Indication of whether deterrent devices were used during the haul (0= pinger, 1= tory lines, 2 = deflectors, 3= other).	1 digit character
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit numeric

Table 8.H.(cont'd)		

Data Element	**Description / Criteria**	**Format**
Subsample Log **- SEE TABLE 20 FOR PRIORITIES**		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character
Haul Number	Sequential number for unique locations where gear was hauled, representing the number of hauls taken in a single trip by either a vessel or individual.	3 digit numeric
Subsample Amount or Weight	The total amount, in whole pounds, numbers, or other appropriate unit of measurement of each marine species that is landed, sold, released, discarded, etc. Quantity of protected species should be measured in numbers. This data element is linked to the units of measurement and disposition code for exact characterization of the quantity. For some species, especially protected species, these data are needed on a set basis.	8 digit numeric plus two decimals
Units of Measurement for Subsample Weight	Units of measurement for subsample weight (i.e., each, pounds, numbers, etc.)	2 digit character (Table A.3, Program Design)
Species	The species for each species of marine resources landed, sold, released, discarded, etc. Each species is to be identified separately. Use of market or generalized categories is to be avoided within species code fields or variables.	ITIS 11 digit character (Table A.8, Program Design)
Disposition	Fate of the product (i.e. releases, discards, bait, industrial use, personal consumption, marine mammal interactions, etc.). Disposition of releases and discards should be recorded (i.e. regulatory versus other releases and discards, dead or alive).	3 digit character (Table A.5, Program Design)
Grade	Any grade categories that affect price, usually size related.	2 digit numeric (Table A.7, Program Design)
Subsample Quantity	The amount, in whole pounds, numbers, or some other appropriate unit of measurement of each marine species that is landed, sold, released, discarded, etc. Quantity of protected species should be measured in numbers. This data element is linked to the units of measurement and disposition code for exact characterization of the quantity. For some species, especially protected species, these data are needed on a set basis.	8 digit numeric plus two decimals
Units of Measurement	Units of measurement for quantity (i.e. each, pounds, bushels, etc).	2 digit character (Table A.3, Program Design)
Estimated or Actual	How was quantity collected (0=actual, 1=estimated).	1 digit character

Table 8.H.		

(cont'd)		
Data Element	**Description / Criteria**	**Format**
Biological Sample Weight	Weight of subsample for biological sampling	8 digit numeric plus two decimals
Minimum Data Required for Observed Entanglements		
Field Number	Assigned by responding organization. Used to identify individual stranded animals.	
Haul Number	Sequential number for unique locations where gear was hauled, representing the number of hauls taken in a single trip by a vessel or individual.	3 digit numeric
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit numeric
Entanglement Situation Code	MUST BE ADDED TO APPENDIX A.5, ACCSP PROGRAM DESIGN 00 - unknown 01 - fell from gear, point unknown 02 - fell from gear before exiting water 03 - fell from gear once out of water 04 - fell from gear due to force of roller 05 - removal requires cutting gear or animal 06 - removal does not require cutting gear/animal 99 - other Longline Gear Only 07 - foul hooked, cut from gear 08 - foul hooked, removed from gear 10 - bird caught - gangion attached to line 11 - bird caught - gangion not attached to line	2 digit character
Net Number (gillnet only)	Consecutive number assigned to that net where the animal is entangled.	2 digit numeric
Number of Floats (gillnet only)	Number of floats counted from where the animal is entangled to the nearest endline	3 digit numeric
Meters Below Floatline	Indication of where in the gear the animal was captured.	3 digit numeric
Taken on Set or Retrieval	Indication of when the animal was captured (1=set; 2=haul)	1 digit character

Table 8.H.		

(cont'd)		
Data Element	**Description / Criteria**	**Format**
Condition of Animal	Indication of the condition of the animal when released; record most appropriate code (0=unknown; 1=alive, condition unknown; 2=alive, not injured; 3=alive, injured; 4=alive, gear in/around mouth; 5=alive, gear in/around flipper; 6=alive, gear in/around another single body part; 7=alive, gear in/around multiple body parts; 8=alive, seen by captain/crew only; 10=dead, condition unknown; 11=dead, fresh; 12=dead, moderately decomposed; 13=dead, severely decomposed; 14=dead, seen by captain/crew; 99=other	2 digit numeric
Comments	Include information on where gear is on the animal and what part of the gear entangled the animal	50 digit character
Biological Information		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character
Haul Number	Sequential number for unique locations where gear was hauled representing the number of hauls taken in a single trip by either a vessel or individual.	3 digit numeric
Species	The species for each species of marine resources landed, sold, released, discarded, etc. Each species is to be identified separately. Use of market or generalized categories is to be avoided within species code fields or variables.	ITIS 11 digit character (Table A.8, Program Design)
Disposition	Fate of the product (i.e. releases, discards, bait, industrial use, personal consumption, marine mammal interactions, etc.). Disposition of releases and discards should be recorded (i.e. regulatory versus other releases and discards, dead or alive).	3 digit character (Table A.5, Program Design)
Minimum Data for Marine Mammals		
Species	Species of each marine mammal observed	ITIS 11 digit character (Table A.8, Program Design)
Photo(s)	Were photos taken? (0=no; 1=yes) – Photo should include the tag number and trip identifier, where applicable.	1 digit numeric
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied. (0=unknown; 1=taken without tag, then tagged; 2=taken without tag, and not tagged; 3=taken with a tag, and retagged; 4=taken with a tag, and not retagged).	1 digit character

Table 8.H.		

(cont'd)		
Data Element	**Description / Criteria**	**Format**
Length	Straight measurement as per protocols.	10 digit numeric
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Indicate whether length was measured or estimated (0=actual; 1=estimated)	1 digit character
Gender	1=male, 2=female, 3=unknown	1 digit character
Biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text
Tag ID Number(s)	Tag number from pre-existing or newly applied tags.	12 digit character
Minimum Data for Sea Turtles		
Species	Species of each sea turtle observed	ITIS 11 digit character (Table A.8, Program Design)
Photo(s)	Were photos taken? (0=no; 1=yes) – Photo should include the tag number and trip identifier, where applicable.	1 digit character
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied. (0=unknown; 1=taken without tag, then tagged; 2=taken without tag, and not tagged; 3=taken with a tag, and re-tagged; 4=taken with a tag, and not re-tagged).	1 digit character
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Indicate whether length was measured or estimated (0=actual; 1=estimated)	1 digit numeric
Straight Carapace Length	Straight length of carapace from notch to notch (requires use of calipers)	5 digit numeric
Curved Carapace Length	Curved length of carapace from notch to notch (requires use of flexible measuring tape).	5 digit numeric

Table 8.H. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Straight Carapace Width	Straight width of carapace from notch to notch (requires use of calipers)	5 digit numeric
Curved Carapace Width	Curved width of carapace from notch to notch (requires use of flexible measuring tape)	5 digit numeric
Width Type	Indicate whether width was measured or estimated (0=actual; 1=estimated)	1 digit numeric
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit numeric
Text Field	Comments or uncoded data	Text Field
Minimum Data for Fish and Crustaceans		
Species	Species of fishes and crustaceans observed	ITIS 11 digit character (Table A.8,Program Design)
Photo	Were photos taken? (0=no; 1=yes) – Photo should include the tag number and trip identifier, where applicable.	1 digit character
Length	Length measurement as per protocols.	10 digit numeric
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Type of length measurement (centerline, standard, total, etc).	2 digit character (Table A.3, Program Design)
Gender	1=male, 2=female, 3=unknown.	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Minimum Data for Birds		
Species	Species of observed birds	ITIS 11 digit character (Table A.8, Program Design)
Photo	Were photos taken? (0=no; 1=yes) – Photo should include the tag number and trip identifier, where applicable.	1 digit character
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied.	1 digit character

Table 8.H.		

(cont'd)		
Gender	1=male, 2=female, 3=unknown.	1 digit character
Age Class	Indication of age class (1=immature, 2=mature, 3=unknown).	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text Field

Gear Log	See Tables 8.I. - 8.R. for specific data elements to be collected on each gear type and linked back to the haul log.

Standard measurements of quantity of gear, fishing time, number of sets, time set and retrieved, and depth fished for specific gear types. These measurements must be used in the at-sea observer release/discard monitoring program to ensure consistency between programs.

Type of Gear	Quantity	Fishing Time	Number of Sets	Time Set/retrieved	Depth Fished (REVIEW)
Traps and Pots	Number traps pulled	Mean soak time		Set: when first pot goes over Retrieved: from the moment buoy line is retrieved	Bottom depth
Trawls	Number of nets towed	Total tow time	Number of tows	Set: when winch stops Retrieved: when winch starts	Bottom of net
Gill Nets Entangleme nt	Total Net Length, number of sets to number of hauls	Soak time	Number of string (net) hauls	Set: when first buoy goes over Retrieved: when last buoy comes on board	Depth of floatline
Longlines	Number gangions/hooks	Soak time	Number of hauls	Set: start of set Retrieved: retrieval of set	Depth of set
Dredges	Number pulled	Total tow time	Number of tows	Set: when winch stops Retrieved: when winch starts	Bottom depth
Nets	Number of pieces of apparatus	Soak time		Set: when first net goes over Retrieved: from the moment buoy line is retrieved	Bottom of net
Hook and Line	Number of lines (Number of hooks is secondary)	Soak time (not including transit time)	N/A	Set: when first lines are lowered Retrieved: when last lines are pulled up	Bottom fishing - bottom depth Trolling - average depth fished between set and retrieval
Purse Seines	Length of floatline	Soak time	Number of sets	Search Start: When nets placed in Search Stop: nets removed	Bottom depth
By Hand	N/A	Actively Fishing	N/A	N/A	Bottom depth
Spear and Gig	Number	Search time	N/A	N/A	N/A
Haul Seines	Length of net	Soak Time		Set: seine in Retrieved: seine out	

NOTE: Quantifiers must be assigned for each specific gear

Specific gear data elements for gill net fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	**Description / Criteria**	**Format**
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit numeric (Table A.4 Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit numeric
Gear Characteristics		
Number of Net Panels	Total number of net panels used in the gear.	2 digit numeric
Length of Net Panels	Average horizontal distance in feet of the net panel on the gear as measured along the floatline.	3 digit numeric
Mesh Count, Vertical	Average number of vertical meshes for this gear type.	2 digit numeric
Net Height	Average height of net measured in feet at the endline.	2 digit numeric plus 1 decimal
Net Color	Color or combination of colors that best describe individual net panels (00=unknown, 01=clear, 02=white, 03=pink, 04=black, 05=green, 06=blue, 07=multicolor, 08=red, 09=orange, 10=purple, 98=combination, 99=other)	2 digit character

Table 8.I. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Hanging Ratio	Average ratio of the number of meshes to the length of the floatline they are attached to.	1 digit numeric plus 2 decimals
Minimum Mesh Size	Minimum mesh size of the net panels. To be collected only if panel mesh size is not recorded.	2 digit numeric plus 2 decimals
Maximum Mesh Size	Maximum mesh size of the net panels. To be collected only if panel mesh size is not recorded.	2 digit numeric plus 2 decimals
Minimum Twine Size	Minimum twine size of the net panels. To be collected only if panel twine size is not recorded.	2 digit numeric (Table A.11 Program Design for conversions)
Maximum Twine Size	Maximum twine size the net panels. To be collected only if panel twine size is not recorded.	2 digit numeric (Table A.11 Program Design for conversions)
Net Material	Type of material used to construct the majority of the net (0=unknown, 1=mono, 2=multi-mono, 3=multistrand, 9=other)	1 digit character
Floatline Material	Type of material used to construct the majority of the floatline (0=unknown, 1=floating with foam core, 2=twisted poly, 9=other)	1 digit character
Float Distance	Average distance in inches between floats; measured from center to center.	2 digit numeric
Float Type	The material used to construct the majority of floats (0=unknown, 1=plastic, 2=styrofoam, 9=other)	1 digit character
Float Diameter	Average float diameter measured in centimeters.	2 digit numeric
Leadline Weight	Weight of leadline measured in pounds per 100 fathoms.	3 digit numeric
Additional Leadline Weight	Total weight in pounds of additional weights added to leadline, not including the leadline weight.	3 digit numeric
Length of Tiedowns	Average length of tiedown measured in feet	1 digit numeric plus 1 decimal

Table 8.I. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Distance Between Tiedowns	Average distance between tiedowns measured in feet	2 digit numeric plus 1 decimal
Length of Buoyline	Average length of buoyline in feet, measured from the floats at the water surface	2 digit numeric
Anchor Weight	Total weight of anchor(s) in pounds holding gear in place	3 digit numeric
# Nets at each Mesh Size	Number of nets and corresponding mesh size (next element), to the nearest 1/10 inch	2 digit numeric
Mesh Size	Mesh size corresponding to # nets element	2 digit numeric plus 1 decimal
Floatline Length	Length of floatline, in feet	5 digit numeric
# Floats	Number of floats used	5 digit numeric
Leadline Length	Length of leadline, in feet	5 digit numeric
Space between Net Panels	Number of spaces used between nets	3 digit numeric
Weighted Width of Spaces between Net Panels	To the nearest foot, the weighted average width of space(s) used between nets	2 digit numeric
Number of Spaces	Total number of spaces between nets	3 digit numeric
Anchor Method	Type of method used to anchor the gear (0=unknown, 1=tied to vessel only, 2=anchored only, 3=tied to vessel and anchored, 9=other).	1 digit character
Net Information		
Mesh Size	The distance between knot to knot of stretched mesh.	2 digit numeric plus 2 decimals
Twine Size	Twine size derived from the diameter of the net webbing.	2 digit numeric (Table A.11 Program Design for conversions)
Text Field	Comments or uncoded data	Text

Specific gear data elements for trawl fisheries (to be collected through a gear log and linked to the haul log - Table 8.H).

Data Element	**Description / Criteria**	**Format**
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit numeric (Table A.4 Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit numeric
Gear Characteristics		
Net Name	Common name for net - if no common name, indicate net manufacturer and other relevant information.	25 digit character
Net Position	Net position relative to vessel and other nets (1=out/port, 2=in/port, 3=in/stbd, 4=out/stbd, 5=trytrawl (comments on gear config sheet where fished), 6=stern trawl).	1 digit numeric
Door Type	Common name of door type, include construction material	25 digit character
Door Length	Length of the sled edge in feet	4 digit numeric plus 2 decimals
Door Height	Height of door in feet.	4 digit numeric plus 2 decimals
Door Weight	Weight of door in pounds.	4 digit numeric
Net Construction Material Type	Primary construction material of net body (00=unknown, 01=nylon, 02=poly, 99=other).	2 digit character

Table 8.J. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Headrope Length	Length of headrope in feet.	3 digit numeric plus 2 decimals
Footrope/Sweep Length	Length of footrope/sweep in feet.	3 digit numeric plus 2 decimals
Ground Cable Length	Length of ground cable in feet.	3 digit numeric plus 2 decimals
Top Bridle Length	Length of top bridle in feet.	3 digit numeric plus 2 decimals
Bottom Bridle Length	Length of bottom bridle in feet.	3 digit numeric plus 2 decimals
Number of Meshes in the Fishing Circle	Number of meshes at the area of largest opening in the net	4 digit numeric
Mesh Size in the Fishing Circle	Size of mesh opening	3 digit numeric plus 1 decimal
Mesh Type in the Fishing Circle	Type of mesh used in fishing circle (1=square, 2=diamond).	1 digit character
Measurement Type in the Fishing Circle	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Codend Hung	Hanging configuration of codend (1=diamond, 2=square, 3= square wrapped, 4=combination, 5=other, 6=unknown).	1 digit character
Codend Twine Type	Twine type (number of strands) in codend of net (1=single, 2=double).	1 digit character
Codend Twine Material	Material used to construct codend (00=unknown, 01=nylon, 02=poly, 99=other).	2 digit character
Codend Twine Diameter	Diameter of twine used in codend in millimeters.	2 digit numeric
Codend Mesh Size	Size of mesh opening in codend.	3 digit numeric plus 1 decimal
Liner Used	Is a liner used in codend? (0=no, 1=yes)	1 digit character
Liner Mesh Size	Size of liner mesh opening.	3 digit numeric plus 1 decimal
Liner Mesh Type	Mesh type used in liner (1=square, 2=diamond).	1 digit character
Codend Strengthener Used	Is a strengthener used on codend? (0=no, 1=yes)	1 digit character

Table 8.J (cont'd)		

(cont'd)		
Data Element	**Description / Criteria**	**Format**
Codend Chaffing Gear Used	Is chaffing gear used on codend? (0=none, 1=bottom half, 2=all the way around)	1 digit character
Codend Length	Number of meshes in length of codend.	3 digit numeric
Codend Circumference	Number of meshes in widest circumference in codend.	3 digit numeric
Codend Mesh Size	Size of mesh opening in the codend.	3 digit numeric plus 1 decimal
Codend Mesh Type	Mesh type used in codend (1=square, 2=diamond).	1 digit character
Codend Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Graduated Mesh in Net Body	Is the mesh size used in the body of the net the same size throughout? (0=no, 1=yes)	1 digit character
Minimum Mesh Size in Net Body	Size of opening of smallest mesh.	3 digit numeric plus 1 decimal
Maximum Mesh in Net Body	Size of opening of largest mesh.	3 digit numeric plus 1 decimal
Net Body Mesh Type	Mesh type used in net body (1=square, 2=diamond).	1 digit character
Net Body Mesh Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Cable Type	Type of ground gear used on ground cable (0=none, 1=chain, 2=cable, 3=wrapped cable, 4=rock hopper, 5=roller, 6=rubber cookie, 7=bobbin, 9=other, 10=unknown).	2 digit character
Cable Diameter	Maximum diameter in centimeters of ground gear.	3 digit numeric plus 2 decimals
Leg/Bridle Type	Type of ground gear used on leg/bridle (0=none, 1=chain, 2=cable, 3=wrapped cable, 4=rock hopper, 5=roller, 6=rubber cookie, 7=bobbin, 9=other, 10=unknown).	2 digit character
Leg/Bridle Diameter	Maximum diameter of leg/bridle in millimeters.	3 digit numeric plus 2 decimals
Footrope Type	Type of ground gear used on footrope (0=none, 1=chain, 2=cable, 3=wrapped cable, 4=rock hopper, 5=roller, 6=rubber cookie, 7=bobbin, 9=other, 10=unknown).	2 digit character

Table 8.J (cont'd) Table 24 (cont'd).		
Data Element	**Description / Criteria**	**Format**
Footrope Diameter	Maximum diameter of footrope in millimeters.	3 digit numeric plus 2 decimals
Trawl Extension Mesh Size	Size of mesh opening in the trawl extension.	3 digit numeric plus 1 decimal
Trawl Extension Mesh Type	Mesh type used in the trawl extension (1=square, 2=diamond).	1 digit character
Trawl Extension Mesh Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Tickler Chain Length	Length of chain in feet.	3 digit numeric plus 2 decimals (0.0 = not used)
Tickler Chain Size	Stock size of the chain.	2 digit numeric plus 2 decimals
Number of Floats on Headrope	Number of floats on headrope.	2 digit numeric
Floatation Diameter	Maximum diameter of most common float size in centimeters.	3 digit numeric plus 2 decimals
Loop Chain Length	Length of chain in feet.	3 digit numeric plus 2 decimals (0.0=not used)
Data Element	**Description / Criteria**	**Format**
# of Links Per Loop	Number of chain links between two attachments to the footrope.	2 digit numeric
# of Loops Per Net	Number of chain links between two attachments to the footrope.	2 digit numeric
Type of Release/discard Reduction Device	The type of release/discard reduction device used in the trawl (0=none, 1=TED, 2=finfish excluder 3=finfish deflector, 4=combination 5=other, 6=unknown).	1 digit character
Additional Gear Characteristics for Skimmer Trawls		
Frame Material	Primary construction material of frame (1=aluminum, 2=steel, 9=unknown).	1 digit character
Frame Width	Width of frame in feet.	2 digit numeric plus 1 decimal
Shoe Length	Length of shoe in inches, which is attached to the outer, lower part of the frame.	2 digit numeric plus 1 decimal
Loop Chain Size	Stock size of chain.	2 digit numeric plus 2 decimal points

Table 8.J. (cont'd) (cont'd)**Table 8.I. (cont'd)**Ta		
Data Element	**Description / Criteria**	**Format**
Weight of Bullet	Weight of bullet in pounds, which is attached to the inner, lower part o the frame and acts as a counterweight.	3 digit numeric
Attachment Point of Tickler Chain	Distance from the footrope to the point of attachment of the tickler chain in inches.	3 digit numeric
Net Body Material	Primary construction material of net body (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Codend Material	Primary construction material of codend (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Codend Twine Size	Twine size of codend in millimeters.	2 digit numeric (Table A.11, Program Design for conversions)
Additional Gear Characteristics for Raised Footrope Trawls		
Dropper Chain Size	Stock size of dropper chain.	2 digit numeric plus 2 decimals
Dropper Chain Sweep Length	Sweep length of dropper chain in feet.	3 digit numeric
Number of Vertical Dropper Chains	Number of vertical dropper chains.	2 digit numeric
Length of Vertical Dropper Chains	Length of vertical dropper chains in feet.	3 digit numeric plus 2 decimals
Gear Characteristics of Beam Trawls		
Construction Material of Fishing Circle	Primary construction material of fishing circle (00=unknown, 01=nylon, 02=poly, 99=other).	1 digit character
Number of Meshes in the Fishing Circle	Number of meshes at the area of largest opening in the net	4 digit numeric
Mesh Size in the Fishing Circle	Size of mesh opening	3 digit numeric plus 1 decimal
Mesh Type in the Fishing Circle	Type of mesh used in fishing circle (1=square, 2=diamond).	1 digit character
Measurement Type in the Fishing Circle	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character

Table 8.J. (cont'd)		

Data Element	**Description / Criteria**	**Format**
Codend Material	Primary construction material of codend (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Codend Chaffing Gear Used	Is chaffing gear used on codend? (0=none, 1=bottom half, 2=all the way around)	1 digit character
Codend Length	Number of meshes in length of codend.	3 digit numeric
Codend Circumference	Number of meshes in widest circumference in codend.	3 digit numeric
Codend Mesh Size	Size of mesh opening in the codend.	3 digit numeric plus 1 decimal
Codend Mesh Type	Mesh type used in codend (1=square, 2=diamond).	1 digit character
Codend Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Codend Twine Material	Material used to construct codend (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	2 digit character
Codend Twine Diameter	Diameter of twine used in codend in millimeters.	2 digit numeric
Codend Liner Mesh Size	Size of mesh opening in codend (0=none used).	3 digit numeric plus 1 decimal
Codend Liner Mesh Type	Mesh type used in codend (1=square, 2=diamond).	1 digit character
Codend Liner Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Footrope Length	Length of footrope in feet.	3 digit numeric plus 2 decimals
Footrope Type	Type of ground gear used on footrope (0=none, 1=chain, 2=cable, 3=wrapped cable, 4=rock hopper, 5=roller, 6=rubber cookie, 7=bobbin, 9=other, 10=unknown).	2 digit character
Footrope Diameter	Maximum diameter of footrope in millimeters.	3 digit numeric plus 2 decimals

Table 8.J. (cont'd)		

Data Element	**Description / Criteria**	**Format**
Headrope Length	Length of headrope in feet.	3 digit numeric plus 2 decimals
Headrope Attachment Points	Points of attachment of headrope (1=all along length of beam, 2=outside edges of beam, 3=other, 9=unknown).	1 digit character
Number of Floats on Headrope	Number of floats on headrope.	2 digit numeric
Number of Bridles	Number of bridles per beam.	2 digit numeric
Bridle Length	Length of bridle in feet.	3 digit numeric plus 2 decimals
Bridle Attachment Points	Points of attachment of bridle (1=all along length of beam, 2=outside edges of beam, 3=other, 9=unknown).	1 digit character
Location of Additional Weights	Location of additional weights.	1 digit character
Weight of Additional Weights	Total weight of additional weights in pounds.	3 digit numeric plus 2 decimals
Loop Chain Length	Length of chain in feet.	3 digit numeric plus 2 decimals (0.0=not used)
Loop Chain Size	Stock size of chain.	2 digit numeric plus 2 decimals
# of Links Per Loop	Number of chain links between two attachments to the footrope.	2 digit numeric
# of Loops Per Net	Number of chain links between two attachments to the footrope.	2 digit numeric
Type of Release/discard Reduction Device	The type of release/discard reduction device used in the trawl (0=none, 1=TED, 2=finfish excluder 3=finfish deflector, 4=combination 5=other, 6=unknown).	1 digit character
Beam Weight	Weight of beam in pounds.	3 digit numeric plus 2 decimals
Beam Shoe Width	Width of beam shoe in inches.	2 digit numeric plus 1 decimal
Beam Width	Width of beam in feet.	2 digit numeric plus 1 decimal
Beam Maximum Diameter	Maximum diameter of beam in centimeters.	3 digit numeric plus 2 decimals
Beam Height	Height of beam in feet.	2 digit numeric plus 1 decimal

Table 8.J. (cont'd) **Table 24 (cont'd).**		
Data Element	**Description / Criteria**	**Format**
Beam Fishing Opening Height	Height of beam fishing opening in feet.	2 digit numeric plus 1 decimal
Beam Fishing Opening Width	Width of beam fishing opening in feet.	2 digit numeric plus 1 decimal
Beam Material	Primary construction material of beam (0=unknown, 1=steel, 2=wood, 3=fiberglass, 9=other).	1 digit character
Number of Rock Chains	Number of rock chains used (0=none used).	2 digit numeric
Number of Tickler Chains	Number of tickler chains (0=none used).	2 digit numeric
Chain Bag Used	Indication of whether a chain bag was used (0=no, 1=yes).	1 digit character
Chaffing Gear Used on Chain	Indication of whether chaffing gear was used (0=no, 1=yes).	1 digit character
Average Number of Links Between Rings in Chain	Number of links between rings.	1 digit numeric
Inside Chain Ring Size (top of bag)	Inside diameter of rings in inches.	2 digit numeric plus 2 decimal points
Inside Chain Ring Size (bottom of bag)	Inside diameter of rings in inches.	2 digit numeric plus 2 decimal points
Chain Length	Number of rings from club, stick or terminal end of dredge to dredge frame.	3 digit numeric
Text Field	Comments or uncoded data	Text

Specific gear data elements for longline fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	**Description / Criteria**	**Format**
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit numeric (Table A.4 Program Design)
Gear Characteristics		
Number of Hooks	Average hooks per set (round to nearest whole number) over the entire trip.	4 digit numeric
Mainline Diameter	Diameter of mainline in millimeters.	3 digit numeric plus 1 decimal
Mainline Test	Strength of line in pound strength.	4 digit numeric
Mainline Material	Primary construction material of mainline (1=nylon, 2=cotton, 3=steel wire, 9=other).	1 digit character
Number of Strands in Mainline	Number of strands in mainline.	2 digit numeric
Mainline Color	Predominant colors used in the mainline (1=clear, 2=white, 3=pink, 4=black, 5=green, 6=blue, 7=multi-color, 8=red, 9=other).	2 digit character
Dropline Minimum Length	Shortest dropline length in feet (rounded to nearest whole number).	3 digit numeric
Dropline Maximum Length	Longest dropline length in feet (rounded to nearest whole number).	3 digit numeric
Gangions Diameter	Diameter of gangions in millimeters.	3 digit numeric plus 1 decimal
Gangions Test	Strength of line in pound strength.	3 digit numeric

Table 8.K. (cont'd) Table 25 (cont'd)		
Data Element	**Description / Criteria**	**Format**
Gangions Material	Primary construction material of gangions (1=nylon, 2=cotton, 3=steel wire, 9=other).	1 digit character
Distance Between Gangions	Distance between hooks (round in whole feet).	4 digit numeric
Gangions Color	Predominant colors of gangions (1=clear, 2=white, 3=pink, 4=black, 5=green, 6=blue, 7=multi-color, 8=red, 9=other).	2 digit character
Gangion Minimum Length	Shortest dropline length used in feet (rounded to nearest whole number).	3 digit numeric
Gangion Maximum Length	Longest dropline length used in feet (rounded to nearest whole number).	3 digit numeric
Leader Length	Average total length of leader (rounded to whole inches) (0=none used).	4 digit numeric
Leader Test	Strength of line in pound strength.	3 digit numeric
Leader Material	Type of leader material (1=nylon, 2=cotton, 3=steel wire, 9=other).	1 digit character
Hook Brand	Manufacturer brand name.	10 digit character
Hook Model/Pattern Number	Hook number assigned by manufacturer.	10 digit character
Hook Size	Manufacturer hook size with slash included.	4 digit character
Number of Light Sticks	Average total count of light sticks, calculated based on light sticks per set during trip (0=none used).	4 digit numeric
Light Stick Color(s)	Predominant color of light sticks (1=clear, 2=white, 3=pink, 4=black, 5=green, 6=blue, 7=multi-color, 8=red, 9=other, 10=yellow, 11=purple).	2 digit character
Number of Floats	Average total count of polyballs and/or dobs used per set for the trip (0=none used)	3 digit numeric
Number of Hooks Between Floats	Total count of hooks (round to whole numbers) between floats.	4 digit numeric
Anchor Weight	Total anchor weight in whole pounds (0=none used).	3 digit numeric
Anchor Weight/Actual or Estimated	Indication of how weight was measured (1=actual, 2=estimated).	1 digit numeric
Bait	Predominant species used as bait.	ITIS 11 digit character (Table A.8 Program Design)
Text Field	Comments or uncoded data	Limited to Text

Table 8.L. Specific gear data elements for dredge fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	**Description / Criteria**	**Format**
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4 Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics		
Dredge weight	Estimated weight of dredge frame and bag in pounds.	5 digit numeric
Width of dredge shoe	Width of dredge shoe in inches at widest point.	3 digit numeric plus 2 decimals
Number of Digby/Rock Buckets per dredge	Number of buckets on Digby dredge.	2 digit numeric
Bucket Width	Width of bucket opening in inches.	3 digit numeric plus 2 decimals
Bucket Height	Height of bucket opening in inches.	3 digit numeric plus 2 decimals
Frame Height	Height of dredge frame in inches - bottom of cutting bar to top of pressure plate or top of frame.	3 digit numeric plus 2 decimal points
Frame Width	Width of frame at the widest point in inches.	3 digit numeric plus 2 decimal points
Fishing Opening Height	Height of fishing opening from bottom of cutting bar or shoe to bottom of upper frame in inches.	3 digit numeric plus 2 decimal points

Table 8.L. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Fishing Opening Width	Inside measure of the widest point in dredge frame in feet.	3 digit numeric plus 2 decimals
Cutting Bar Used	Type of cutting bar used (0=none, 1= bar only, 2 = bar with teeth, 8 = other, 9 = unknown).	1 digit character
Angle of cutting bar/teeth	Angle of teeth or cutting bar in relation to horizontal in degrees.	2 digit numeric
Depth of cutting bar/teeth	Maximum depth bar/teeth cut into sediment in inches.	2 digit numeric plus 2 decimals
Teeth spacing	Space between teeth in inches.	2 digit numeric plus 2 decimals
Pressure Plate Used	Indication of whether a pressure plate was used (0=no, 1=yes).	1 digit character
Club Stick Used	Indication of whether a club stick was used (0=no, 1=yes).	1 digit character
Twine Top Mesh Size	Size of mesh opening (0=no twine top used).	3 digit numeric plus 1 decimal
Twine Top Mesh Type	Type of mesh used in the twine top (1=square, 2=diamond).	1 digit character
Twine Top Measurement Type	Type of mesh measurement (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Twine Top Height in Meshes	Number of meshes in length.	2 digit numeric
Twine Top Width in Meshes	Number of meshes in width.	2 digit numeric
Twine Top Height in Rings	Number of rings in length.	2 digit numeric
Twine Top Width in Rings	Number of rings in width	2 digit numeric
Number of Rock Chains	Number of rock chains used (0=none used).	2 digit numeric
Number of Tickler Chains	Number of tickler chains (0=none used).	2 digit numeric
Chain Bag Used	Indication of whether a chain bag was used (0=no, 1=yes).	1 digit character
Chaffing Gear Used on Chain	Indication of whether chaffing gear was used (0 = no, 1=yes).	1 digit character
Average Number of Links Between Rings in Chain	Number of links between rings.	1 digit numeric
Inside Chain Ring Size (top of bag)	Inside diameter of rings in inches.	2 digit numeric plus 2 decimals

Table 8.L. (cont'd) Table 26(cont'd).tab		
Data Element	**Description / Criteria**	**Format**
Inside Chain Ring Size (bottom of bag)	Inside diameter of rings in inches.	2 digit numeric plus 2 decimals
Chain Length	Number of rings from clubstick or terminal end of dredge to dredge frame.	3 digit numeric
Mesh Bag Chaffing gear used	Indication of whether chaffing gear was used (0=no, 1=yes).	1 digit character
Mesh Bag Mesh Size	Size of mesh (0=no mesh bag used).	3 digit numeric plus 2 decimals
Mesh Bag Mesh Type	Type of mesh used in the mesh bag (1=square, 2=diamond).	1 digit character
Mesh Bag Measurement Type	Type of mesh measurement (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Mesh Bag Length	Number of meshes in length.	2 digit numeric
Mesh Bag Circumference	Number of meshes in fishing circle.	3 digit numeric
Gear Characteristics for Hydraulic Escalator Dredge		
Pump Capacity	Horsepower of pump.	3 digit numeric
Intake or Suction Hose	Inside diameter of intake or suction hose in millimeters.	2 digit numeric plus 1 decimal
Pressure Hose	Inside diameter of pressure hose in millimeters.	2 digit numeric plus 1 decimal
Pressure Manifold or Head	Width between inside edge of sled runners in inches.	3 digit numeric
Number of Nozzles on Manifold	Number of nozzles on manifold.	2 digit numeric
Diameter of Nozzles	Inside diameter of nozzles in millimeters.	2 digit numeric plus 1 decimal
Length of Nozzles	Length of nozzles in feet from point of attachment on manifold to opening of nozzle.	2 digit numeric plus 1 decimal
Angle of Nozzle Attachment	Angle of nozzle measured from horizontal.	2 digit numeric
Overall Length of Conveyor	Overall length of conveyor in feet measured from manifold to other end of conveyor belt where it reverses direction.	2 digit numeric plus 1 decimal
Text Field	Comments or uncoded data	Text

Specific gear data elements for cast net fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics		
Mesh size	Size of opening of largest mesh.	4 digit numeric
Mesh Type	Type of mesh used in net (1=square, 2=diamond).	1 digit character
Mesh Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Number of weights	Number of weights on the net.	2 digit numeric
Individual Weight	Individual weight of lead line weights in ounces.	2 digit numeric plus 2 decimals

Table 8.M. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Twine material	Type of twine material (1=mono, 2=multi).	1 digit character
Breaking strength	Pound test of twine.	2 digit numeric plus 2 decimals
Radius of gear	Radius of gear in feet.	2 digit numeric plus 2 decimals
Modification	Are any modifications made to gear (strengtheners, etc) (0=no, 1=yes).	1 digit character
Description	Description of modifications.	50 character text
Text Field	Comments or uncoded data	Text

Table 8.N. Specific gear data elements for fixed net (pound nets, weirs, etc.) fisheries (to be collected through a gear log and linked to the haul log - Table 8.H).

Data Element	**Description / Criteria**	**Format**
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics-Bottom Staked Pound/Fyke & Hoop Nets (including floating trap nets)		
Pound/Bowl Shape	Geometric shape of pound/bowl (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	1 digit character
Length/Diameter of Pound/Bowl	Length/diameter of gear in feet.	2 digit numeric
Width	Width of gear in feet.	2 digit numeric
Mesh Size	Predominant mesh size.	3 digit numeric plus 1 decimal
Twine Size	Predominant twine size.	3 digit numeric (Table A.11, Program Design for conversions)

Table 8.N. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Pound/Bowl Material	Predominant construction material (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Height of Pound	Height of pound in feet.	3 digit numeric
Number of Pounds	Number of pounds, hoops etc.	1 digit numeric
Bait Used (if applicable)	Bait used in the pound (i.e hoop nets used for shrimp).	ITIS11 digit character (Table A.8, Program Design)
Anchoring Method	Method of anchoring the net (1=stakes, 2=anchors) .	1 digit character
Number of Pound Escape Vents	Total number of escape vents.	2 digit numeric
Geometric Shape of Pound Escape Vent	Geometric shape of pound escape vent (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	1 digit character
Pound Escape Vent Length	Total length of pound escape vent in feet.	2 digit numeric
Pound Escape Vent Width	Total width of pound escape vent in feet.	2 digit numeric
Location of Pound Escape Vent	Location of pound escape vent.	2 digit character
Pound Biodegradable Panel Attachment Type	Predominant type of degradable material used (0=none used, 1=iron hogrings, 2=degradable plastic, 3=softwood lathe, 4=uncoated wire).	1 digit character
Leader Inshore Mesh Size	Predominant mesh size at nearshore end of net.	3 digit numeric plus 1 decimal
Leader Trap Mesh Size	Predominant mesh size at trap entrance.	3 digit numeric plus 1 decimal
Leader Inshore Twine Size	Predominant twine size at nearshore end.	3 digit numeric (Table A.11, Program Design for conversions)
Leader Trap Twine Size	Predominant twine size at trap entrance.	3 digit numeric (Table A.11, Program Design for conversions)
Leader Material	Predominant construction material of leader (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Leader Length	Total length of leader in feet.	4 digit numeric

Table 8.N. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Leader Inshore Depth	Depth of leader at nearshore end, in feet.	2 digit numeric
Leader Trap Depth	Depth of leader at trap entrance in feet (also end of leader).	2 digit numeric
Leader Anchoring Material	Method of anchoring the net.	1 digit character
Heart Length/Diameter	Length/diameter of heart in feet.	2 digit numeric
Heart Width	Width of heart in feet.	2 digit numeric
Heart Mesh Size	Predominant mesh size in heart.	3 digit numeric plus 1 decimal
Heart Twine Size	Predominant twine size in heart.	3 digit numeric (Table A.11, Program Design for conversions)
Heart Material	Predominant construction material of heart.	1 digit character
Heart Anchoring Method	Method of anchoring heart.	2 digit character
Wing Inshore Mesh Size	Predominant mesh size at nearshore end of net.	3 digit numeric plus 1 decimal
Wing Trap Mesh Size	Predominant mesh size at trap entrance.	3 digit numeric plus 1 decimal
Wing Inshore Twine Size	Predominant twine size at nearshore end.	3 digit numeric (Table A.11, Program Design for conversions)
Wing Trap Twine Size	Predominant twine size at trap entrance.	3 digit numeric (Table A.11, Program Design for conversions)
Wing Material	Predominant construction material of leader (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Wing Length	Total length of wing in feet.	4 digit numeric
Wing Inshore Depth	Depth of leader at nearshore end of net in feet.	2 digit numeric
Wing Trap Depth	Depth of leader at trap entrance in feet (also end of leader).	2 digit numeric
Number of Wings	Total number of wings in the net.	2 digit numeric
Wing Anchoring Material	Method of anchoring the wings.	1 digit character
Text Field	Comments or uncoded data	Text

Table 8.O. Specific gear data elements for haul seine fisheries (to be collected through a gear log and linked to the haul log - Table 8.H).

Data Element	**Description / Criteria**	**Format**
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics- Haul nets		
Net Far End Mesh Size	Predominant mesh size at the far end of the net.	3 digit numeric plus 1 decimal
Net Pocket Mesh Size	Predominant mesh size at the pocket.	3 digit numeric plus 1 decimal
Net Far End Twine Size	Predominant twine size at the far end of the net.	3 digit numeric (Table A.11, Program Design for conversions)
Net Pocket Twine Size	Predominant twine size at the pocket.	3 digit numeric (Table A.11, Program Design for conversions)

Table 8.O. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Net Material	Predominant construction material of the net (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Net Length	Total length of the leader in feet.	4 digit numeric
Net Depth	Depth at the ends of the wings in feet.	2 digit numeric
Pocket Shape	Geometric shape of pound/bowl (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other). .	1 digit character
Pocket Length/Diameter	Length/diameter of the pocket in feet.	4 digit numeric
Pocket Width	Width of the pocket in feet.	2 digit numeric
Pocket Depth	Depth of the pocket in feet.	2 digit numeric
Pocket Mesh Size	Predominant mesh size of the pocket.	3 digit numeric plus 1 decimal
Pocket Twine Size	Predominant twine size of the pocket.	3 digit numeric (Table A.11, Program Design for conversions)
Text Field	Comments or uncoded data	Text

Table 8.P. Specific gear data elements for pot and trap fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	**Description / Criteria**	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit
Gear Characteristics		
Number of Pots	Number of pots per haul.	3 digit numeric
Geometric Shape	Geometric shape of pots (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	2 digit character
Frame Primary Construction Material	Primary material (1=wood, 2=wire, 3=plastic, 9=other).	2 digit character
Mesh Size	Mesh size of the pot or trap.	2 digit numeric plus 2 decimals
Top Length	Length of the top of the predominant pot in whole inches.	2 digit numeric
Top Width	Width of the top of the predominant pots in whole inches.	2 digit numeric
Bottom Length	Length of the bottom of the predominant pot in whole inches.	2 digit numeric
Bottom Width	Width of the bottom of the predominant pots in whole inches.	2 digit numeric

Table 8.P. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Height	Height of the predominant pots in whole inches.	2 digit numeric
Distance Between Pots	Average distance between pots in feet.	2 digit numeric
Number of Entrances	Number of entrances to the pot or trap.	1 digit numeric
Geometric Shape of Entrance	Geometric shape of the entrance (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	2 digit character
Length of Entrance	Length of the entrance in inches.	2 digit numeric
Width of Entrance	Width of the entrance in inches.	2 digit numeric
Location of Entrance	Location of the entrance.	2 digit character
Number of Escape Vents	Number of escape vents.	1 digit numeric
Geometric Shape of Escape Vents	Geometric shape of escape vents (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	2 digit character
Length/Diameter of Escape Vents	Length of escape vents in inches.	2 digit numeric
Width of Escape Vents	Width of escape vents in inches.	2 digit numeric
Location of Escape Vents	Location of escape vents.	2 digit character
Use of Biodegradable Panel	Is a biodegradable panel used (0=no, 1=yes).	1 digit character
Attachment Type	Type of attachment of biodegradable panel.	1 digit character
Bait	Predominant type of bait used.	ITIS11 digit character (Table A.8, Program Design)
Buoy Line Material	Predominant type of line material (need to develop list of materials).	2 digit numeric
Buoy Line Diameter	Predominant line diameter in millimeters.	1 digit numeric plus 2 decimals
Trot Line Material	Predominant type of line material (need to develop list of materials).	2 digit character
Trot Line Diameter	Predominant line diameter in millimeters.	1 digit numeric plus 2 decimals
Text Field	Comments or uncoded data	Text

Specific gear data elements for purse seine fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.)

Data Element	**Description / Criteria**	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics		
Float Line Length	Length of floatline in feet.	4 digit numeric
Float Line Diameter	Diameter of floatline in millimeters.	2 digit numeric plus 2 decimals
Lead Line Length	Length of lead line in feet.	4 digit numeric
Lead Line Diameter	Diameter of lead line in millimeters.	2 digit numeric plus 2 decimals
Lead Line Weight	Total estimated weight of lead line in pounds.	4 digit numeric plus 2 decimals
Type of Hauling Device	Device used to haul the net in (1=power block, 2=triplex, 3=drum, 9=other, 8-unknown).	1 digit numeric

Table 8.Q. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Ring type	Type of ring used to hold purse line (1=round, 2=snap, 3=combo, 9=other).	1 digit character
Ring Material	Material from which rings are constructed (1=steel, 2=iron, 3=alloy, 4=stainless, 5=combo, 9=other).	1 digit character
Net Material	Material used in net, excluding bunt (1=nylon, 2=poly, 3=Kevlar, 4=Spectra, 9=other).	1 digit character
Net Length	Total length of net in feet.	4 digit numeric
Net Depth	Depth of net in feet.	3 digit numeric
Net Twine Size	Diameter of twine in millimeters.	2 digit numeric plus 1 decimal (Table A.11, Program Design for conversions)
Tom Weight	Additional total weight on the purse line in pounds used to control the depth of the purse line.	4 digit numeric (0=none)
Net Mesh Size	Size of mesh in the net.	3 digit numeric plus 2 decimals
Net Mesh Type	Type of mesh used in the net (1=square, 2=diamond).	1 digit character
Net Mesh Measurement Type	Type of mesh measurement (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Sack/Bunt Material	Material used in net, excluding bunt (1=nylon, 2=poly, 3=Kevlar, 4=Spectra, 9=other).	1 digit character
Sack/Bunt Length	Total length of sack/bunt in feet.	4 digit numeric
Sack/Bunt Depth	Depth of sack/bunt in feet.	3 digit numeric
Sack/Bunt Mesh Size	Size of mesh in the sack/bunt.	3 digit numeric plus 2 decimals
Sack/Bunt Mesh Type	Type of mesh used in the sack/bunt (1=square, 2=diamond).	1 digit character

Table 8.Q. (cont'd) Table 31 (cont'd).		
Data Element	**Description / Criteria**	**Format**
Sack/Bunt Mesh Measurement Type	Type of mesh measurement (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Sack/Bunt Twine Size	Diameter of twine in sack/bunt in millimeters.	2 digit numeric plus 1 decimal (Table A.11, Program Design for conversions)
Chase Boat Horsepower	Total horsepower of the boat.	3 digit numeric
Chase Boat Gross Tonnage	Gross tonnage of the boat.	3 digit numeric
Chase Boat Length	Total length of the chase boat in feet.	2 digit numeric
Text Field	Comments or uncoded data	Text

Specific gear data elements for rake/hoe/tong fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	**Description / Criteria**	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics- Rakes/Tongs/Hoes		
Operating Mechanism	Method of operation (1=mechanical, 2=hand, 3=hydraulic, 4 = sail).	2 digit character
Shaft Length	Length of shaft/handle in feet.	2 digit numeric
Width	Width of entire tongs, rakes, hoes in inches.	2 digit numeric
Length of Tines/Teeth	Length of tines/teeth in inches.	2 digit numeric plus 2 decimals
Spacing of Tines/Teeth	Spacing of tines/teeth in inches.	2 digit numeric plus 2 decimals
Bar Spacing	Bar spacing in inches.	2 digit numeric plus 2 decimals
Weight of Tongs	Total weight of tongs in pounds.	2 digit numeric
Text Field	Comments or uncoded data	Text

Minimum standard data elements to be collected through the ACCSP at-sea observer program for collection of quantitative release, discard, and protected species interactions data for the for-hire fisheries.

Data Element	**Description / Criteria**	**Format**
Vessel Information		
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Fishing Party Size	Number of fishermen in the party.	3 digit numeric
Actual Number of Anglers Fishing	Number of anglers actually fishing on the vessel.	3 digit numeric
Individual Identifier	An identifier unique to an individual (i.e. operator license number) traceable through time and space.	11 digit character
Individual Operator	Name of vessel owner/operator	30 digit character
Trip Information		
Form Type/Version Number	Version identification number for the ACCSP reporting form.	12 digit alphanumeric
Trip start	Date the trip started (this is unique to each trip and can be used to tie multiple unloadings into a trip record). A trip is shore to shore by gear/area combination, or in the case of transfers at sea, an off-loading at sea is a trip. This information should include trips with effort but no catch.	MM/DD/YYYY
Trip Number	Sequential number representing the number of trips taken in a single day by either a vessel or individual. The trip number will default to "one" when only a single trip is conducted.	2 digit character
Time left dock	The time the vessel left the dock	MO:DD:HH:MM
Time returned	The time the vessel returned to the dock.	MO:DD:HH:MM
Drop Information		
Trip Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information)	21 digit character
Drop Number	Sequential number for unique location / gear taken in a single trip.	3 digit character
Drop Observed	Indication of whether the drop was actually observed (0=no, 1=yes).	1 digit character
Lat Begin	The latitude at the beginning of the drop.	6 digit numeric plus 1 character (2 decimal minutes)

Table 8.S. (cont'd)		

Table 33 (cont'd).Table		
Data Element	**Description / Criteria**	**Format**
Long Begin	The longitude at the beginning of the drop.	7 digit numeric plus 1 character (2 decimal minutes)
Lat End	The latitude at the end of the drop.	6 digit numeric plus 1 character (2 decimal minutes)
Long End	The longitude at the end of the drop.	7 digit numeric plus 1 character (2 decimal minutes)
Fishing Method	Type of fishing method used (i.e., bottom, troll, surface, fly, drift, chumming, midwater).	3 digit character
Distance from Shore	The distance from shore where fishing occurred [inland (less than 0 nautical miles...nm), nearshore (0-3 nm on Atlantic coast, 0-9 nm on Florida and Texas Gulf coast), EEZ (3-200 nm on Atlantic coast, 9-200 nm on Florida and Texas Gulf coast), territorial seas (in the USVI and Puerto Rico (12 nm), and international (>200 nm)] is embedded in this code. (See Table A.3. and area figures when revised).	1 digit character (Table A.3,Program Design.)
Start Time	The time the captain indicates that fishing can begin. Used with time gear retrieved to derive fishing time.	MO:DD:HH:MM
Stop Time	The time that the captain indicates to haul in fishing lines. Used with time set to derive fishing time.	MO:DD:HH:MM
Depth Fished	Depth at which the gear is fished (fathoms) (1 = surface, 2 = midwater, 3 = bottom).	1 digit character
Minimum Bottom Depth	Minimum depth of bottom in fathoms.	4 digit numeric plus 1 decimal point
Maximum Bottom Depth	Maximum depth of bottom in fathoms.	4 digit numeric plus 1 decimal point
Subsample Log		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character

Table 8.S. (cont'd)		
Data Element	**Description / Criteria**	**Format**
Drop Number	Sequential number for unique location / gear taken in a single trip.	3 digit character
Species	The species for each species of marine resources landed, sold, released, discarded, etc. Each species is to be identified separately. Use of market or generalized categories is to be avoided within species code fields or variables.	ITIS11 digit character (Table A.8,Program Design)
Disposition	Fate of the catch (i.e. releases, discards, bait, industrial use, personal consumption, protected species interactions, etc.). Disposition of releases and discards should be recorded (i.e. regulatory versus other releases and discards, dead or alive).	3 digit character (Table A.5, Program Design)
Quantity Observed (Replaces Quantity Kept)	The amount, in numbers, of each marine species recorded by a trained observer.	4-digit numeric
Quantity Reported (Replaces Quantity Kept)	The amount, in numbers, of each marine species reported by fishermen	4 digit numeric
Estimated or Actual	How was quantity collected (1=actual, 2=estimated).	1 digit character
Biological Data Information		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character
Drop Number	Sequential number for unique location / gear taken in a single trip.	3 digit character
Species	The species for each species of marine resources landed, sold, released, discarded, protected species, etc. Each species is to be identified separately. Use of market or generalized categories is to be avoided within species code fields or variables.	ITIS11 digit character (Table A.8,Program Design)
Minimum Data for Marine Mammals		
Species	Species of marine mammals observed	ITIS 11 digit character (Table A.8, Program Design)
Photo(s)	Were photos taken? (0=no; 1=yes) Photo should include the tag number and trip identifier, where applicable.	1 character numeric

Table 8.S. (cont'd) Table 33 (cont'd).		
Data Element	**Description / Criteria**	**Format**
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied. (0=unknown; 1=taken without tag, then tagged; 2=taken without tag, and not tagged; 3=taken with a tag, and retagged; 4=taken with a tag, and not retagged).	1 digit character
Length	Straight measurement as per protocols.	10 digit numeric
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program design)
Length Type	Indicate whether length was measured or estimated (0=actual; 1=estimated)	1 digit character
Gender	Gender of the species (1=male, 2=female, 3=unknown).	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text
Minimum Data for Sea Turtles		
Species	Species of sea turtles observed	ITIS 11 digit character (Table A.8, Program Design)
Photo(s)	Were photos taken? (0=no; 1=yes) Photo should include the tag number and trip identifier, where applicable.	1 digit character
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Indicate whether length was measured or estimated (0=actual; 1=estimated)	1 digit character
Width Type	Indicate whether width was measured or estimated (0=actual; 1=estimated)	1 digit character

Table 8.S. (cont'd) Table 33 (cont'd).Tfsfe		
Data Element	**Description / Criteria**	**Format**
Straight Carapace Length	Straight length of carapace from notch to notch (requires use of calipers)	5 digit numeric
Curved Carapace Length	Curved length of carapace from notch to notch (requires use of flexible measuring tape)	5 digit numeric
Straight Carapace Width	Straight width of carapace from notch to notch (requires use of calipers)	5 digit numeric
Curved Carapace Width	Curved width of carapace from notch to notch (requires use of flexible measuring tape)	5 digit numeric
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text
Minimum Data for Fish and Crustaceans		
Species	Species of fish/crustaceans observed	ITIS 11 digit character (Table A.8, Program Design)
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information).	21 digit character
Photo	Were photos taken? (0=no; 1=yes) Photo should include the tag number and trip identifier, where applicable.	1 digit character
Length	Length measurement in millimeters as per protocols.	10 digit numeric
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Type of length measurement (standard, total, etc).	2 digit character Table A.3, Program Design)
Gender	Gender of the species (1=male, 2=female, 3=unknown).	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Trip Identifier	Trip start, vessel, or individual identifier and trip number (see vessel and trip information)	21 digit character
Species	Bird species observed	ITIS 11 digit character (Table A.8, Program Design)
Photo	Were photos taken? (0=no; 1=yes) Photo should include the tag number and trip identifier, where applicable.	1 digit character
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied.	1 digit character

Table 8.S. (cont'd) Table 33 (cont'd).Tfsfe		
Minimum Data for Birds		
Data Element	**Description / Criteria**	**Format**
Gender	Gender of the species (1=male, 2=female, 3=unknown).	1 digit character
Age Class	Indication of age class (1=immature, 2=mature, 3=unknown).	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text

TABLE 8.T. ACCSP release/discard prioritization process for identifying Atlantic coast commercial, recreational and for-hire fisheries requiring collection of more detailed gear configuration data or collection of release/discard data at a more detailed level of resolution.

Activity	**Specific Task**
Characterize Atlantic coast fisheries	Compile information on commercial and fisheries, including release/discard activities. Annually update information.
Annually review documentation	Fisheries characterization information qualitative and quantitative data obtained through the at-sea observer, strandings, entanglements, fishermen reporting, and port interviewing programs target sampling levels for biological sampling based on recommendations from the Biological Review Panel
Identify problem areas and make recommendations	Based on annual data review, develop recommendations and modifications which may include: increase sampling levels collection of more detailed gear configuration information collection of data at a more detailed level of resolution (set/tow) collection of intensive biological samples
Implementation	Implement recommended modifications to existing at-sea observer programs and other quantitative release/discard monitoring programs.