DRAFT
AMENDMENT 10 TO THE FISHERY MANGEMENT PLAN FOR SPINY LOBSTER IN THE GULF OF MEXICO AND SOUTH ATLANTIC with Draft Environmental Impact Statement, Initial Regulatory Flexibility Act Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACOE	Army Corps of Engineers
ACT	annual catch target
ADCNR, MRD	Alabama Department of Conservation and Natural Resources, Marine Resources Division
AM	accountability measure
APA	Administrative Procedure Act
AP	advisory panel
ASMFC	Atlantic States Marine Fisheries Commission
B	Biomass
$B_{CURRENT}$	current biomass of stock
B_{MSY}	Biomass at MSY
CEQ	Council on Environmental Quality
CFMC	Caribbean Fishery Management Council
CFR	Code of Federal Regulations
Councils	Gulf of Mexico Fishery and South Atlantic Management Councils
CPUE	catch per unit effort
CL	Carapace Length
CSL	Caribbean Spiny Lobster
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DEIS	draft environmental impact statement
DOC	U. S. Department of Commerce
DOI	Department of Interior
DQA	Data Quality Act
EA	environmental assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFP	exempted fishing permit
EIS	Environmental Impact Statement
ELMR	Estuarine Living Marine Resources
E.O.	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
F	instantaneous fishing mortality rate
FACA	Federal Advisory Committee Act
FAO	Food and Agriculture Organization (United Nations)
FDEP	Florida Department of Environmental Protection
FKNMS	Florida Keys National Marine Sanctuary
FMFC	Florida Marine Fisheries Commission
FMP	fishery management plan
FMRI	Florida Marine Research Institute
F_{MSY}	Fishing Mortality Rate Yielding MSY
FMU	fishery management unit
FWC	Florida Fish and Wildlife Conservation Commission

FWRI	Fish and Wildlife Research Institute
GC	general counsel
GCSE	General Counsel Southeast Region
GMFMC	Gulf of Mexico Fishery Management Council
HAPC	Habitat Areas of Particular Concern
HMS	Highly Migratory Species
IFQ	Individual Fishing Quotas
IRFA	initial regulatory flexibility analysis
ITQ	individual transferable quota
LE	Law Enforcement
LEAP	Law Enforcement Advisory Panel
M	instantaneous natural mortality rate
MARFIN	Marine Fisheries Initiative
MDMR	Mississippi Department of Marine Resources
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act
MP	million pounds
MPA	Marine Protected Area
MRFSS	Marine Recreational Fishery Statistics Survey
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MSST	Minimum Stock Size Threshold
MSY	maximum sustainable yield
NEPA	National Environmental Policy Act
NGO	non-governmental organization
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	Same as NMFS
NOS	National Ocean Service
OFL	overfishing limit
OMB	Office of Management and Budget
OY	optimum yield
PRA	Paperwork Reduction Act
PSA	Productivity Susceptibility Analysis
RA	Regional Administrator of NMFS
RFA	Regulatory Flexibility Act
RIR	regulatory impact review
RSE	restricted species endorsement
SAFMC	South Atlantic Fishery Management Council
SAP	stock assessment panel
SBA	Small Business Administration
SEAMAP	Southeast Area Monitoring and Assessment Program
SEDAR	Southeast Data Assessment Review (stock assessment
SEFSC	Southeast Fisheries Science Center of NMFS
SEIS	supplemental environmental impact statement
SEP	Socioeconomic Panel
SERO	Southeast Regional Office (NMFS)
SFA	Sustainable Fisheries Act

SMZ	special management zone
SPL	saltwater products license (FL)
SPR	spawning potential ratio
SSB	spawning stock biomass
SSBR	spawning stock biomass per recruit
SSC	Scientific and Statistical Committee
TAC	total allowable catch
TCP	trap certification program
TL	Tail Length
TW	Tail Weight
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VPA	virtual population analysis
YPR	yield per recruit
Z	instantaneous total mortality rate

AMENDMENT 10 TO THE FISHERY MANAGEMENT PLAN FOR SPINY LOBSTER IN THE GULF OF MEXICO AND SOUTH ATLANTIC REGIONS

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

Proposed actions:	Specify Magnuson-Stevens Act required values including annual catch limits and accountability measures for species in the Spiny Lobster Fishery Management Plan.
Lead agency:	FMP Amendment – Gulf of Mexico and South Atlantic Fishery Management Councils EIS - NOAA Fisheries Service
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NOI for Amendment 10:	_____
Scoping meetings held:	SAFMC as part of Comp. ACL Amendment (1/26/09 in Charleston, SC; 1/27/09 in New Bern, NC; 2/3/09 in Key Largo, FL; 2/4/09 in Cape Canaveral, FL and 2/5/09 in Pooler, GA) GMFMC (9/21/09 in Key West, FL and 9/22/09 in Marathon, FL)
NOI for EIS:	3/12/10 (75FR48:11843)
Public Hearings held:	_____
DEIS filed:	_____
DEIS notice published:	_____
DEIS Comments received by:	_____
FEIS filed:	_____
FEIS Comments received by:	_____

Abstract
To be added

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EXECUTIVE SUMMARY

To be drafted by Gregg

1.0 INTRODUCTION

This Draft Environmental Impact Statement (DEIS) for Amendment 10 to the Fishery Management Plan for Spiny Lobster in the Gulf of Mexico and South Atlantic (Spiny Lobster FMP) will bring the FMP into compliance with Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requirements. The Spiny Lobster FMP is jointly managed by the Gulf of Mexico and South Atlantic Fishery Management Councils (Councils).

1.1 Background

In 2006, the Magnuson-Stevens Act was re-authorized and included a number of changes to improve conservation of managed fishery resources. The goals require that conservation and management measures "shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry". Included in these changes are requirements that the Regional Councils must establish both a mechanism for specifying annual catch limits (ACLs) at a level such that overfishing does not occur in the fishery, and accountability measures (AMs) to correct if overages occur. Accountability measures are management controls to prevent the ACLs from being exceeded and to correct by either in-season or post-season measures if they do occur.

The ACL is set by the Councils, but begins with specifying an overfishing limit (OFL), which is the yield above which overfishing occurs. Once an OFL is specified, an acceptable biological catch (ABC) is recommended by the Councils Scientific and Statistical Committees. The ABC is based on the OFL and takes into consideration scientific uncertainty. The OFL and ABC are set by scientists, whereas the next two reference points, ACL and annual catch target (ACT) are set by managers. The ACT is not required, but if used should be set at a level that takes into account management uncertainty and provides a low probability of the ACL being exceeded. These measures must be implemented by 2010 for all stocks experiencing overfishing and 2011 for all others.

There are some exceptions for the development of ACLs; for example, when a species can be considered an ecosystem component species and species with annual life cycles. Stocks listed in the Fishery Management Unit are classified as either ''in the fishery'' or as an ''ecosystem component''. By default, stocks are considered to be "in the fishery" unless declared ecosystem component species. Ecosystem component species are exempt from the requirement for ACLs. In addition, ecosystem component species may, but are not required to be included in a Fishery Management Plan for any of the following reasons: data collection purposes; ecosystem considerations related to specification of optimum yield for the associated fishery; as considerations in the development of conservation and management measures for the associated fishery; and/or to address other ecosystem issues.

To be considered for possible classification as an ecosystem component species, the species should:

(A) Be a non-target species or non-target stock;
(B) Not subject to overfishing, approaching overfished, or overfished;
(C) Not likely to become subject to overfishing or overfished, according to the best available information, in the absence of conservation and management measures; and
(D) Not generally be retained for sale or personal use.

The original Spiny Lobster FMP included the Caribbean spiny lobster, *Panulirus argus*, and other incidental species of lobster (spotted spiny lobster, *Panulirus guttatus*; smoothtail spiny lobster, *Panulirus laevicauda*; Spanish slipper lobster, *Scyllarides aequinoctialis*, and ridged slipper lobster, *Scyllarides nodifer*) which inhabit or migrate through coastal waters and the fishery conservation zone now named the exclusive economic zone (EEZ) of the Gulf of Mexico and the South Atlantic (GMFMC and SAFMC 1982). All species of lobster are in the fishery, but only two species, the Caribbean spiny lobster and ridged slipper lobster, are listed under the Fishery Management Unit (GMFMC and SAFMC 1986). The other species in the Spiny Lobster FMP (spotted spiny lobster, smoothtail spiny lobster, and Spanish slipper lobster) may qualify as ecosystem component species.

An ACL for a given stock or stock complex can be established in several ways, either a single ACL for the entire fishery, divided into sector ACLs (i.e., recreational and commercial sectors), divided into sector and gear types (i.e., recreational, commercial diving, bully netting, and commercial trapping), or divided into state-federal ACLs. In any of these cases, the sum of the ACLs cannot exceed the ABC.

Current regulations on the Caribbean spiny lobster, *Panulirus argus*, off the Gulf of Mexico and South Atlantic are summarized in Table 1.1.1 and defined in 50 CFR 640.2. *Scyllarides nodifer* is the other species in the Fishery Management Unit and codified in the regulations in four sections. The common name Slipper (Spanish) lobster as *Scyllarides nodifer* in the regulations (i.e., 50 CFR 640.2) is not the correct common name according to Williams et al. (1988) and FAO Fisheries Synopsis (1991) authorities on the correct common names of invertebrate species; the correct common name is ridged slipper lobster. For the purposes of this document this common name and other listed above will be used throughout the rest of the document. The regulations specified for ridged slipper lobster discuss conservation and management [50 CFR 640.1 (b)], define slipper lobster by genus species [640.2], prohibit harvest of a berried (egg-bearing) lobsters [640.21 9(a)], and prohibit the use of poisons and explosives to take slipper lobster in the exclusive economic zone [(640.22 9a)(3)].

Table 1.1.1. Current commercial and recreational Caribbean spiny lobster regulations for federal waters of the South Atlantic and the Gulf of Mexico.

	Permits required	Size Limits	Bag/Trip Limits	Closed areas	Closed Season	Gear Restrictions	Other Prohibitions
Commercial	Federal spiny lobster vessel permit except if fishing in federal waters off FL. FL commercial harvester permit required in EEZ off FL. Tailing permit if tailing lobster.	Carapace must be more than 3" (measured in the water), separated tails must be at least 5.5"	Off of NC, SC, and GA, 2 per person per day. Off FL and other Gulf states 6 per person per day.	None	FL and other Gulf states: April 1 through August 5 NC, SC, or GA: No closed season.	No spear, hooks, piercing devices, explosives, or poisons. Degradable panel required on non-wooden traps.	No trap tending at night No taking of spiny lobster with eggs.
Recreational	State endorsement required to the fishing license.	Carapace must be more than 3" (measured in the water).	Off of NC, SC, and GA, 2 per person. Off FL and other Gulf states 6 per person per day.	None	FL and other Gulf states: April 1 through August 5 Exception off FL: 2-day non-trap mini-season last Wed and Thurs in July* Other Gulf states: 2-day non-trap mini-season last Sat and Sun in July	No spear, hooks, piercing devices, explosives, or poisons. Degradable panel required on non-wooden traps.	No taking of spiny lobster with eggs.

- During the two-day mini-season off Florida, the bag limit is 12 Caribbean lobsters per person per day, in or from the EEZ, other than off Monroe County. Off Monroe County the bag limit is 6 Caribbean lobsters per person per day.

Explanation of Consultation Under the Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or the habitat designated as critical to their survival and recovery. The ESA requires NOAA Fisheries Service to consult with the appropriate administrative agency (itself for most marine species and the U.S. Fish and Wildlife Service for all remaining species) when proposing an action that may affect threatened or endangered species or adversely modify critical habitat. Consultations are necessary to determine the potential impacts of the proposed action. They are concluded informally when proposed actions may affect but are "not likely to adversely affect" threatened or endangered species or designated critical habitat. Formal consultations, resulting in a biological opinion, are required when proposed

actions may affect and are "likely to adversely affect" threatened or endangered species or adversely modify designated critical habitat.

To satisfy the ESA consultation requirements, NOAA Fisheries Service completed a formal consultation, and resulting biological opinion, on the continued authorization of the Gulf of Mexico and South Atlantic spiny lobster fishery in 2009. When making determinations on FMP actions, not only are the effects of the specific actions proposed analyzed, but also the effects of all discretionary fishing activity under the affected FMPs. Thus, the biological opinion analyzed the potential impacts to ESA-listed species from the continued authorization of the federal spiny lobster fishery. The opinion stated the fishery was not likely to adversely affect ESA-listed marine mammals, Gulf sturgeon or designated critical habitat for elkhorn and staghorn corals. However, the opinion determined that the spiny lobster fishery would adversely affect sea turtles, smalltooth sawfish, and elkhorn and staghorn corals, but would not jeopardize their continued existence. An incidental take statement was issued for green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles, smalltooth sawfish, and both species of coral. Reasonable and prudent measures to minimize the impact of these incidental takes were specified, along with terms and conditions to implement them.

1.2 Purpose Statement

The purpose of this amendment is to bring the Spiny Lobster FMP into compliance with Magnuson-Stevens Act requirements for ACLs and AMs to prevent overfishing; update biological reference points, policies, and procedures; and consider adjustment of management measures to aid law enforcement and comply with measures to protect endangered species established under a biological opinion.

1.3 Need for the Proposed Action

Revisions to the Magnuson-Stevens Act in 2006 require FMPs contain ACLs for all managed species. ACLs must be set at a level that prevents overfishing and does not exceed the recommendations of the respective Councils' Scientific and Statistical Committees for ABC. Fisheries Management Plans are also required to establish AMs, which are management controls that ensure ACLs are not exceeded or provide corrective measures if overages occur. For stocks determined by the Secretary of Commerce to be subject to overfishing, ACLs and AMs must be effective in 2010; for all other stocks managed under an FMP, except species with annual life cycles, ACLs and AMs must be effective in 2011. No species in the Spiny Lobster FMP is undergoing overfishing. The Councils intend to meet the 2011 deadline through Amendment 10 to the Spiny Lobster FMP.

Of the four other lobster species in the Spiny Lobster FMP, only the ridged slipper lobster is specified in the regulations; the other species are in the management unit for data collection purposes only. Landings information is not available on the smoothtail and spotted spiny lobsters. Low numbers of these species may be landed as Caribbean spiny lobster in either the commercial or recreational sector, but no records are available at this

time. Spanish and ridged slipper lobsters also occur in federal waters along the west coast of Florida and are primarily landed as bycatch in shrimp trawls. Because landings information is scarce and incomplete, setting ACLs would be difficult for these species. The Councils could list these four species as ecosystem components or remove them from the FMP; in either case, ACLs and accountability measures would not be required.

Current definitions of maximum sustainable yield, optimum yield, overfishing, and overfished were set for Caribbean spiny lobster in Amendment 6. Currently, the Councils have different definitions for each criterion. The Councils may modify these definitions based on the results of the upcoming stock assessment update and the recommendations of the Scientific and Statistical Committees. A single definition for each biological reference point would simplify management.

An ACL for a given stock can be established as either a single ACL for the entire fishery, separate ACLs for various sectors or gears, or state and federal ACLs. If separate ACLs are set, the ABC must be divided among sectors and/or gears. The State of Florida formed an ad hoc advisory board to develop such allocation plans. Their recommendations will be considered by the Councils for allocation in the federal fishery. A single ACL may be set at or below the ABC, and the sum of separate ACLs cannot exceed the ABC.

The implementation process for a plan amendment can take over a year from initial scoping to final implementation. Framework procedures provide a mechanism for timelier implementation of routine actions such as setting ACLs, and a guideline for implementing such actions in a consistent manner. The framework procedure in the Spiny Lobster FMP was set in Amendment 2 and allows changes to be made to gear and harvest restrictions. Under the reauthorized Magnuson-Stevens Act and the 2008 amended guidelines for National Standard 1 (74 FR 3178), ACLs and, if selected by the Council, ACTs should also be adjusted by framework. Revision of the current framework procedure would allow such adjustments. Further revisions would allow additional action to be implemented through the framework procedure. Amendment 2 also contains a process for the State of Florida to propose modifications to regulations. This process is now outdated and needs to be updated.

Two current federal regulations may be causing detrimental impacts to the resource as well as creating enforcement problems. First, under certain situations and with a federal tailing permit, Caribbean spiny lobster tails may be separated from the body onboard a fishing vessel. This allowance creates difficulties for law enforcement in determining if hooks and spears were used to harvest the resource. Second, up to 50 Caribbean spiny lobsters under the minimum size limit may be retained aboard a vessel provided they are held in a live well aboard a vessel. When in a trap, such juveniles or “short” lobsters are used to attract other lobsters for harvest. This regulation may increase the fishing mortality on juvenile lobsters and could facilitate their illegal trade. The Councils are considering modifying or repealing these two regulations.

On August 27, 2009, the ESA biological opinion evaluating the impacts of the continued authorization of the spiny lobster fishery on ESA-listed species was completed. The opinion concluded the continued authorization of the fishery would not adversely affect ESA-listed marine mammals or elkhorn and staghorn coral designated critical habitat. The opinion also concluded the continued authorization of the fishery may adversely affect, but would not jeopardize the continued existence of elkhorn and staghorn coral, five species of sea turtle (green, hawksbill, Kemp's ridley, leatherback, and loggerheads), and smalltooth sawfish. The opinion authorized a limited amount of incidental take for these species and prescribed non-discretionary reasonable and prudent measures to help minimize the impacts of those takes. Specific terms and conditions required to implement the prescribed reasonable and prudent measures include, but are not limited to: creating new or expanding existing closed areas to protect coral, allowing the public to remove trap-related marine debris, and implementing trap line-marking requirements. The Councils are considering alternatives to meet these requirements.

1.4 Management History

Fishery Management Plan for Spiny Lobster in the Gulf of Mexico and the South Atlantic (1982)
The Spiny Lobster FMP largely extended Florida's rules regulating the fishery to the EEZ throughout the range of the fishery, i.e., North Carolina to Texas. The FMP regulations were effective on July 2, 1982 (47 FR 29203). Major items are as follows:

- MSY is estimated as 12.7 million pounds annually for the maximum yield per recruit size of 3.5 inch carapace length.
- OY is specified to be all lobster more than 3 inch carapace length or not less than 5.5" tail length that can be harvested by commercial and recreational fishermen given existing technology and prevailing economic conditions.
- A minimum harvestable size limit of more than 3 inch carapace length or not less than 5.5 inch tail length shall be established.
- A closed season from April 1 through July 25 shall be established. During this closed season there shall be a five-day "soak period" from July 21-25 and a five-day grace period for removal of traps from April 1-5.
- All spiny lobster traps shall have a degradable surface of sufficient size so as to allow escapement of lobsters from lost traps.
- All spiny lobster taken below the legal size limit shall be immediately returned to the water unharmed except undersized or "short" lobsters which may be carried on the boat/vessel provided they are: for use as lures or attractants in traps and kept in a shaded "bait" box while being transported between traps. No more than three live "shorts" per trap (traps carried on the boat) or 200 live "shorts", whichever is greater, may be carried at any one time.
- A special two-day recreational non-trap season shall be established.
- The retention on boat boats or vessels or possession on land of "berried" female spiny lobsters taken from the FCZ at any time shall be prohibited. Stripping or otherwise molesting female lobsters to remove the eggs shall be prohibited. "Berried" female lobsters taken in traps or with other gear must be immediately returned to the water alive and unharmed.

Table 1.4.1. GMFMC/SAFMC FMP Amendments affecting spiny lobster.

Description of Action	FMP/Amendment	Effective Date
Updated the FMP rules to be more compatible with that of Florida (State). The management measures: limited attractants to 100 per vessel, required live wells, required a commercial vessel permit, provided for a recreational permit, limited recreational fishermen to possession of 6 lobsters, modified the special 2-day recreational season before the commercial season, modified the duration of the closed commercial season (April 1 – August 5 with a preseason soak period beginning August 1), provided a 10-day trap retrieval period, prohibited possession of egg-bearing spiny lobster, specified the minimum size limit for tails [The harvesting of *Panulirus argus* spiny lobsters with a carapace length 3" or less; or if the carapace and tail are separated, with a tail length of less than 5.5" shall be prohibited.], provided for a tail separation permit, and prohibited possession of egg-bearing slipper lobster.	Amendment 1 (1987)	July 15, 1987 (52 FR 22659) with certain rules deferred and implemented on May 16, 1988 (53 FR 17 196) and on July 30, 1990 (55 FR 26448).
Modified the problems/issues and objectives of the fishery management plan; modified the statement of optimum yield [OY is specified to be all spiny lobster more than 3" carapace length or not less than 5.5" tail length that can be legally harvested by commercial and recreational fishermen given existing technology and prevailing economic conditions. OY is estimated at 9.5 million pounds.]; Established a protocol and procedure for an enhanced cooperative state/council management system for instituting future compatible State and federal rules without amending the FMP; and added to the vessel safety and habitat sections of the FMP.	Amendment 2 (1989)	October 27, 1989 (54 FR 48059)

Table 1.4.1. GMFMC/SAFMC FMP Amendments affecting spiny lobster. (continued)

Description of Action	FMP/Amendment	Effective Date
Contained provisions for adding a scientifically measurable definition of overfishing [Overfishing exists when the eggs per recruit ratio of the exploited population to the unexploited population is reduced below 5% and recruitment of small lobsters into the fishery has declined for 3 consecutive fishing years. Overfishing will be avoided when the eggs per recruit ratio of exploited to unexploited populations is maintained above 5%.], an action plan to prevent overfishing, should it occur, as required by the Magnuson Act National Standards (50 CFR Part 602), and the requirement for collection of fees for the administrative cost of issuing permits.	Amendment 3 (1990)	March 25, 199 1 (5 6 FR 12357)
Included extension of the Florida spiny lobster trap certificate system for reducing the number of traps in the commercial fishery to the EEZ off Florida, revision of the FMP commercial permitting requirements; limitation of the number of live undersize lobster used as attractants for baiting traps; specification of gear allowed for commercial fishing in the EEZ off Florida, specification of the possession limit of spiny lobsters by persons diving at night; requirement of lobsters harvested by divers be measured without removing from the water; and specification of uniform trap and buoy numbers for the EEZ off Florida.	Regulatory Amendment 1 (1992)	
Included a change in the days for the special recreational season in the EEZ off Florida; a prohibition on night-time harvest off Monroe County, Florida, during that season; specification of allowable gear during that season; and different bag limits during that season off the Florida Keys and the EEZ off other areas of Florida.	Regulatory Amendment 2 (1993)	

Table 1.4.1. GMFMC/SAFMC FMP Amendments affecting spiny lobster. (continued)

Description of Action	FMP/Amendment	Effective Date
Allowed the harvest of two lobsters per person per day for all fishermen all year long but only north of the Florida/Georgia border. This measure was added to the framework procedure so that future potential changes to the limit do not require a plan amendment. [Developed by the SAFMC]	Amendment 4 (1994)	September 15, 1995 (60 FR 41 828)
Identified Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern for spiny lobster. Areas which meet the criteria for EFH-HAPCs for spiny lobster include Florida Bay, Biscayne Bay, Card Sound, and coral/hard bottom habitat from Jupiter Inlet, Florida through the Dry Tortugas, Florida. [Developed by the SAFMC]	Amendment 5 (1998)	July 14, 2000
Amended the FMP as required to make definitions of MSY, OY, overfishing and overfished consistent with National Standard Guidelines; identified and defined fishing communities and addressed bycatch management measures. MSY for species in the spiny lobster management unit is unknown. The Council reviewed alternatives and concluded the best available data supports using 20% Static SPR as a proxy for MSY. OY for the spiny lobster fishery is the amount of harvest that can be taken by U.S. fishermen while maintaining the SPR at or above 30% Static SPR. Overfishing for species in the Spiny Lobster FMP can only be defined in terms of the fishing mortality component given the data-poor status of these species. Based on the written guidance from NMFS, the Council is setting the overfishing level as a fishing mortality rate (F) in excess of the fishing mortality rate at 20% Static SPR (F20% Static SPR). [Developed by the SAFMC]	Amendment 6 (1998)	December 2, 1999

Table 1.4.1. GMFMC/SAFMC FMP Amendments affecting spiny lobster. (continued)

Description of Action	FMP/Amendment	Effective Date
Identified EFH, described the distribution and relative abundance of juvenile and adult spiny lobster for offshore, near-shore, and estuarine habitats of the Gulf. [Developed by the GMFMC]	Generic Amendment (1998)	Partially approved February 8, 1999 64 FR 13363
The amendment had proposed revision to maximum sustainable yield (MSY), optimum yield (OY), maximum fishing mortality threshold (MFMT), and maximum stock size threshold (MSST) for spiny lobster. MSY, OY, and MSST were disapproved because they were based on transitional spawning stock biomass per recruit (SSBRs). The amendment updated the description of the spiny lobster fisheries and provided fishing community assessment information for Monroe County, Florida. [Developed by the GMFMC]	Generic SFA Amendment (1999)	Partially approved December 2, 1999 64 FR 59126
Created two no-use marine reserves. Tortugas South (60 square nautical miles) was cited in the GMFMC EEZ to encompass a spawning aggregation site for mutton snapper. Tortugas North (120 square nautical miles) included part of the fishery jurisdiction of the FKNMS, Dry Tortugas National Monument, GMFMC, and the state of Florida, and was cooperatively implemented by these agencies. [Developed by the GMFMC]	Generic Amendment 19	August 19,2002 67 FR 47467
Specified that the holder of a valid crawfish license or trap number, lobster trap certificate and state saltwater products license issued by the Florida FWC may harvest and possess, while in the EEZ off Florida, undersized lobster not exceeding 50 per boat and 1 per trap aboard each boat, if used exclusively for luring, decoying or otherwise attracting non-captive lobster into traps.	Regulatory Amendment 3 (2002)	

Table 1.4.1. GMFMC/SAFMC FMP Amendments affecting spiny lobster. (continued)

Description of Action	FMP/Amendment	Effective Date
Set minimum size limit for importation of spiny lobster; and disallowed importation of spiny lobster tail meat which is not in whole tail form with the exoskeleton attached and the importation of spiny lobster with eggs attached or importation of spiny lobster where the eggs, swimmerets, or pleopods have been removed or stripped.	Amendment 8 (2008)	February 11, 2009 (74 FR 1148)
CEBA-1 provides a presentation of spatial information for EFH and EFH-Habitat Areas of Particular Concern designations for species in the Spiny Lobster FMP.	Amendment 9 (2009)	

2.0 Management Alternatives

2.1 Action 1: Other species in the Spiny Lobster FMP

***Note:** More than one alternative may be chosen as a preferred.

Alternative 1: No Action – Retain the following species: smoothtail spiny lobster**,** *Panulirus laevicauda*, spotted spiny lobster, *Panulirus guttatus*, Spanish slipper lobster, *Scyllarides aequinoctialis*, in the Fishery Management Plan for data collection purposes only, but do not add them to the Fishery Management Unit.

Alternative 2: Set ACLs and AMs using historical landings for Spanish slipper lobster *Scyllarides aequinoctialis*, after adding them to the Fishery Management Unit and for ridged slipper lobster, *Scyllarides nodifer*, currently in the Fishery Management Unit.

South Atlantic Preferred Alternative 3: Place any of the following species in the Fishery Management Unit and list them as ecosystem component species.

Gulf Preferred Option a: smoothtail spiny lobster**,** *Panulirus laevicauda*
Gulf Preferred Option b: spotted spiny lobster, *Panulirus guttatus*
Option c: Spanish slipper lobster, *Scyllarides aequinoctialis*
Option d: ridged slipper lobster, *Scyllarides nodifer*

Alternative 4: Remove species from the Joint Spiny Lobster FMP.

Option a: smoothtail spiny lobster**,** *Panulirus laevicauda*
Option b: spotted spiny lobster, *Panulirus guttatus*
Option c: Spanish slipper lobster, *Scyllarides aequinoctialis*
Option d: ridged slipper lobster, *Scyllarides nodifer*

Comparison of Alternatives: The action establishes alternatives for other species currently in Spiny Lobster FMP. Landings and regulations are established for two species of lobster within the fishery management unit, the Caribbean spiny lobster and the ridged slipper lobster (GMFMC and SAFMC 1982). Landings by the recreational sector are not documented by the Marine Recreational Fisheries Statistics Survey (MRFSS), only finfish are collected, but Florida FWC documents recreational catch of Caribbean spiny lobster landings. Florida FWC also documents commercial landings of Caribbean spiny lobster and slipper lobster species by family, meaning that they could be either Spanish or ridged slipper lobster. Even though they are not identified to species level when documented, they are primarily composed of ridged slipper lobster, because it is the only species that commonly occurs in the Florida Keys and attains a size sufficient to be exploited for the industry (Sharp et al. 2007). Additional information on slipper lobsters, identified to the species level is available from the shrimp trawl bycatch fishery report to SEDAR (Scott-Denton 2004). There are no landings or bycatch information documented for smoothtail or spotted spiny lobster species.

In contrast to the total average commercial Caribbean spiny lobsters landings, slipper lobster species are low and constitute less than 1% of the total average landings in both

federal and state waters of the South Atlantic and Gulf of Mexico (Table 2.2.1). The majority of the commercial landings for slipper lobsters, both the Spanish and ridged slipper lobsters occur in federal waters off the Gulf coast (Figure 2.1.1). The gear types used to harvest these species by trips were 56% by trawl, 23% by diving, and 19% by traps, which was fairly consistent over the 10 year period. Low landings of slipper lobsters were also documented in federal South Atlantic waters and Florida state waters for the combined coasts. In the Florida Keys, slipper lobster species are bycatch in traps for Caribbean spiny lobster (Sharp et al. 2007).

Table 2.1.1. Average commercial landings (pounds), number of trips (# trips), and $ value of slipper lobsters (Slipper) in the family Scyllaridae versus Caribbean spiny lobster (Spiny) from 1999 through 2008 for Gulf federal waters, South Atlantic federal waters, and state of Florida landings combined for both coasts. Average pounds landed are live whole animal weight.

Average	Gulf federal		Atlantic federal		Florida state waters	
	Slipper	Spiny	Slipper	Spiny	Slipper	Spiny
Pounds	6,527	164,912	996	998,218	1,594	3,419,293
# Trips	69	413	26	2,976	21	17,805
$ Value	$26,580	$828,149	$4,080	$4,878,155	$6,074	$17,655,979

(Source: Florida FWC, Marine Fisheries Information System 2009) Note: This data is based on the trip ticket program. There is only one space is available for waters fished. Fishers could fish in both state and federal waters within one day, based on the season and other fishing behaviors. This table should be viewed with some caution, because there could be additional unaccounted variability, due to the way the data is recorded and analyzed.

The Gulf States also had some information on slipper lobster landings. Alabama reported total commercial landings of 10,000 pounds or less whole animal weight of slipper lobsters during the 1999-2008 period. Landings records indicate that these species were incidentally caught from shrimp trawls fishing in federal waters off the west coast of Florida (C. Denson, Alabama Marine Resources Division, Alabama Department of Conservation and Natural Resources, personal communication). There were no reported landings for Mississippi, Louisiana, and Texas for slipper lobster species (Source: http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html).

From the South Atlantic states, Georgia had no reported commercial landings of slipper lobster species in either state or federal waters for the years 1999-2008 (J. Califf, Commercial Fisheries Statistics Coordinator, Coastal Resources Division, Georgia Department of Natural Resources, personal communication). In South Carolina, there were no recorded landings of slipper lobster species in state or federal waters (G. Steele, Biological Statistician, South Carolina Department of Natural Resources, personal communication). In the state waters of North Carolina there were no recorded landings of slipper lobsters; however, during the years 1999, 2000, 2002, and 2005 commercial landings for slipper or spiny lobster were not recorded by the North Carolina Division of Marine Fisheries (A. Bianchi, Trip Ticket Coordinator, North Carolina Division of Marine Fisheries, personal communication).

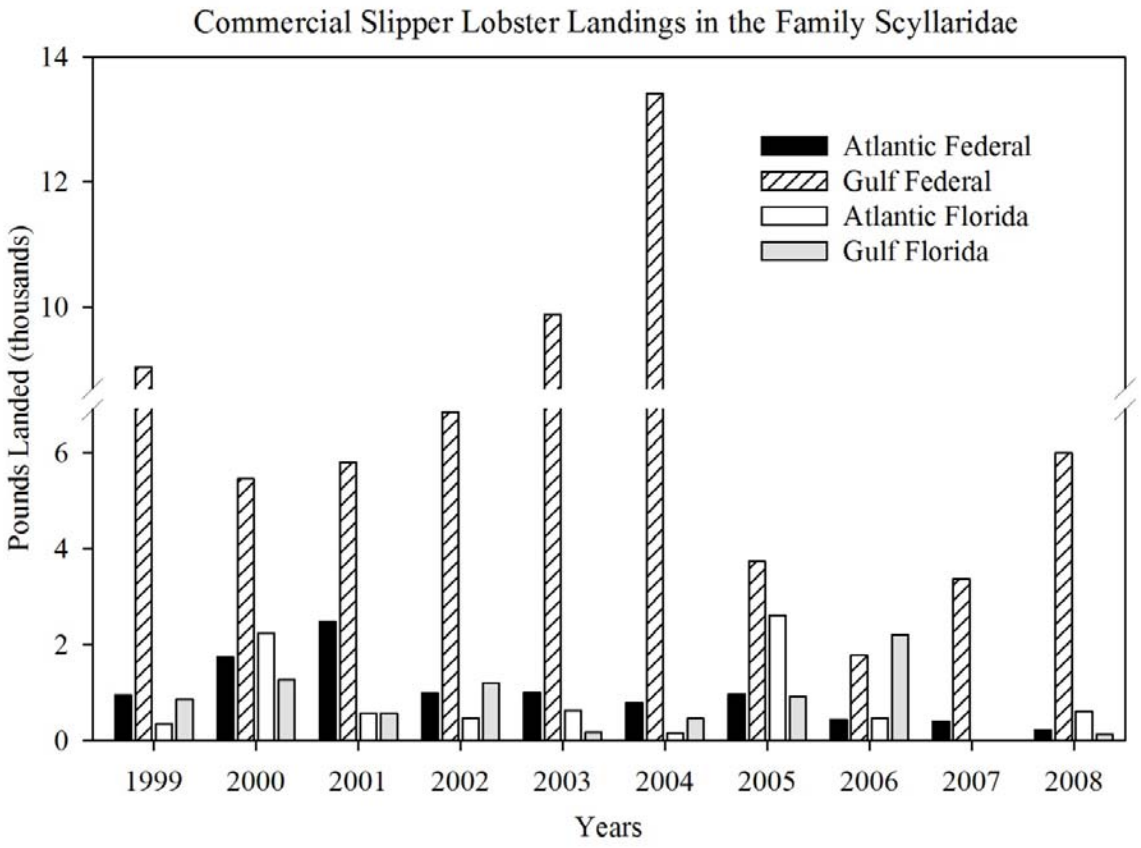


Figure 2.1.1. Commercial slipper lobster landings and other species in the family Scyllaridae from 1999 through 2008 by coast in federal and state of Florida waters. (Source: Florida FWC, Marine Fisheries Information System 2009).

Note: This data is based on the trip ticket program. There is only one space is available for waters fished. Fishers could fish in both state and federal waters within one day, based on the season and other fishing behaviors. This figure should be viewed with some caution, because there could be additional unaccounted variability, due to the way the data is recorded and analyzed.

In addition, to the commercial landings data from the states on the ridged and Spanish slipper lobsters, bycatch information is also available from observer coverage of the U.S. Gulf of Mexico and Southeastern Atlantic Shrimp Fishery (Scott-Denton 2004). The first characterization trip occurred in April 1992 in the Gulf of Mexico, and in June 1992 off the South Atlantic east coast. Bycatch data was collected from one randomly-selected net for each tow. A subsample (approximately 20% of the total catch weight) was processed for species characterization composition. Species weight and number were obtained from the subsample, therefore numbers are for the most part from characterized tows from project "C" and "X" only. During these studies observers did not always specify whether the species was a ridged or Spanish slipper lobster, instead often the family was recorded (i.e., family Scyllaridae). Due to the species being characterized to the family level, one additional species other than the ridged or Spanish slipper lobster was recorded as bycatch, which was the Chace slipper lobster, *Scyllarus chacei*. This species is not currently within the Spiny Lobster FMP and bycatch of this species was the lowest of all three species characterized to the species level. Bycatch of all the species characterized,

within the fishery management plan is low for both the Gulf of Mexico and South Atlantic waters (Table 2.1.2). A majority of the observer data from the family Scyllaridae was documented off the west coast of Florida and some off the Louisiana/Texas coast (Figure 2.1.2). Ridged slipper lobster was documented more often than Spanish slipper lobster in the Gulf of Mexico, paralleling Alabama and Florida documented landings.

There was also low bycatch from the family Scyllaridae documented off the east coast of Florida (Figure 2.1.2). The South Atlantic had no historical bycatch documented for slipper or Caribbean spiny lobsters (1992-1995). Observers documented low numbers of species in the family Scyllaridae from current landings (2001-2007), with no Caribbean spiny lobster documented as bycatch from South Atlantic waters (Table 2.1.2). Based on observer coverage of the shrimp trawl fishery current bycatch has decreased in the Gulf and increased in the Atlantic. However, current landings in the Gulf end in 2002 and are not as updated as the Atlantic current landings ending in 2007.

Table 2.1.2. Current and historical bycatch of lobster species documented by observer coverage of the U.S. Gulf of Mexico and Southeastern Atlantic Shrimp Fishery (Source: E. Scott-Denton, NMFS Galveston Laboratory). Species weight and number are obtained from a subsample of tows, characterized in projects "C" and "X" unless the observer had time and expertise to document to the species level.

Lobster species	Gulf (current) (2001-2002)	Atlantic (current) (2001-2007)	Gulf (historical) (1992-1996)	Atlantic (historical) (1992-1995)
Caribbean spiny lobster (*Panulirus argus)*	19	0	6	0
ridged slipper Lobster (*Scyllarides nodifer*)	101	1	103	0
Spanish slipper lobster (*Scyllarides aequinoctialis*)	16	1	41	0
Family Scyllaridae (slipper lobsters: ridged, Spanish or Chace)	68	45	0	0
Characterized Tows (Sum)	839	649	1,438	301

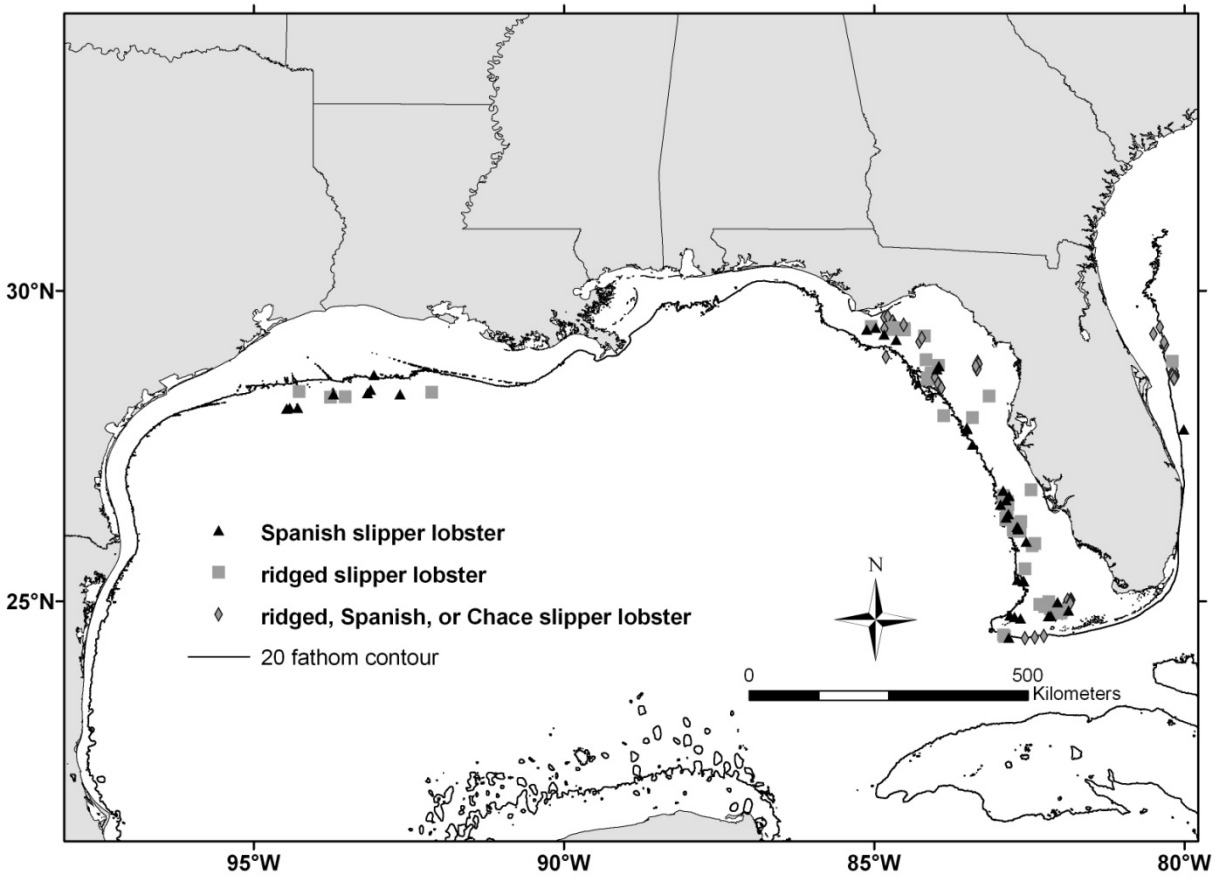


Figure 2.1.2. Location of bycatch documented from the observer shrimp trawl coverage of the U.S. Gulf of Mexico and Southeastern Atlantic coast (Source: E. Scott-Denton, NMFS Galveston Laboratory, personal communication).

Recreational landings for slipper lobsters are not recorded by Florida FWC, only Caribbean spiny lobster landings. However, due to the intense recreational fishery for Caribbean spiny lobster it has been suggested that some fishers will harvest slipper lobster species if observed (Sharp et al. 2007). After inspection of intensive creel surveys, which were conducted for Caribbean spiny lobster during the peak season, there was no indication that slipper lobsters are targeted by recreational fishers in the state of Florida and due to their cryptic nature it is unlikely that a substantial recreational fishery would develop (Sharp et al. 2007). It should also be noted that due to the lack of data on slipper lobster species life history, growth rates, and reproductive biology, conducting an effective stock assessment would be difficult (Sharp et al. 2007).

Alternative 1, no action would retain the following species: smoothtail spiny lobster, spotted spiny lobster, and Spanish slipper lobster in the Fishery Management Plan for data collection purposes only, without adding them to the Fishery Management Unit (FMU). After 28 years, the Councils have not seen the need to add these stocks to the FMU and therefore the need to set ACLs and AMs for these species.

Alternative 2 would set ACLs and AMs using historical commercial landings for Spanish slipper lobster, after adding them to the Fishery Management Unit and for ridged slipper lobster, currently in the Fishery Management Unit. The ACLs and AMs would need to be set for both of these species combined because commercial landings are recorded by family, meaning they could be either Spanish or ridged slipper lobster. Whereas, shrimp trawl bycatch recorded by observers when possible is documented to the species level. Positive biological and physical benefits are expected from setting ACLs and AMs. However, landings of these two species combined are low, from 1999-2008, average commercial landings were 11,120 pounds whole animal weight (Source: Florida FWC, Marine Fisheries Information System 2009). The gear types used to harvest these species by trips were 56% by trawl, 23% by diving, and 19% by traps, which was fairly consistent over the 10 year period. Bycatch of these species is recorded in the number of animals and average size would need to be used to estimate pounds landed. An additional issue is that bycatch estimates in the Gulf were last recorded in 2002 and in the South Atlantic in 2007. Due to monitoring and data collection sources for these two species annual catch limits may be very difficult to track and accountability measures may need to be less restrictive to account for limited landings information and potential large fluctuations.

South Atlantic Preferred Alternative 3 would place any of the following species in the Fishery Management Unit and list them as ecosystem component species (**Options a-d**). The option to use ecosystem component status is intended to encourage the incorporation of ecosystem considerations into fishery management plans, see Figure 2.1.3 as a guide. Species can be placed under ecosystem component species for other reasons such as for ecosystem considerations related to specification of optimum yield for the associated fishery; as considerations in the development of conservation and management measures for the associated fishery; and/or to address other ecosystem issues.

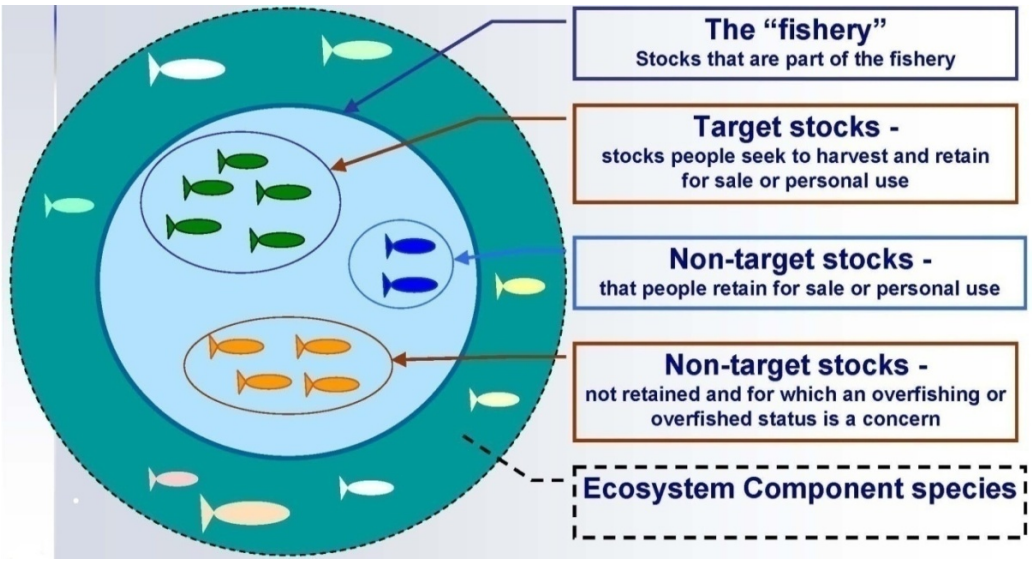


Figure 2.1.3. A conceptual model of stocks in the fishery and ecosystem component stocks. Source: National Standard 1 guidelines.

Whereas, **Gulf Preferred Alternative 3 Options a and b** would place smoothtail and spotted spiny lobsters in the fishery management unit and list them as ecosystem component species. The smoothtail and spotted spiny lobsters meet all of the ecosystem component criteria, because they are non-targeted, not subject to overfishing or overfish, nor likely to become subject to overfishing or overfished. The National Standard final guidelines add new language in § 600.310(d)(5)(i)(D)—''not generally retained for sale or personal use''—in lieu of ''*de minimis* levels of catch'' and clarify that occasional retention of a species would not, in itself, preclude consideration of a species in the Ecosystem Component classification (Table 2.1.3).

Table 2.1.3. Ecosystem component criteria for stocks in the Gulf of Mexico and South Atlantic, average landings were calculated by combining Gulf and South Atlantic commercial landings (Source: Florida FWC, Marine Fisheries Information System 2009). An "X" indicates the National Standard 1 criteria applies to that species.

		National Standard 1 Guidelines Criteria			
Species	**Average Landings (pounds) 1999-2008**	**Non-target**	**Not overfished or overfishing?**	**Not likely to become overfished or overfishing**	**Not generally retained for sale or personal use**
smoothtail spiny lobster	0	X	Unknown	Unknown	X
spotted spiny lobster	0	X	Unknown	Unknown	X
Spanish slipper lobster	11,120	X	Unknown	Unknown	
ridged slipper lobster		X	Unknown	Unknown	

Commercial landings are low average 11,120 pounds whole animal weight of the Spanish and ridged slipper lobsters (**Options c and d**). Bycatch landings from the shrimp trawl fishery are not included in average landings (Table 2.1.3). However, Spanish and ridged slipper lobster are generally retained for sale or personal therefore these species do not meet all the National Standard 1 guidelines.

Florida FWC estimated that in the last nine years, 23% of the landings of slipper lobsters have been due to divers. If the Florida FWC trap limitation program proceeds and the commercial dive fishery increases, it is possible more of these species might be landed. However, little data exists to suggest commercial divers are targeting them, but instead landing them coincidently with Caribbean spiny lobsters. Further Florida FWC completed intensive creel surveys, which were conducted for Caribbean spiny lobster during the peak season, there was no indication that slipper lobsters are targeted by recreational fishers in the state of Florida and due to their cryptic nature it is unlikely that a substantial recreational fishery would develop (Sharp et al. 2007). Placing these species in the ecosystem component classification, would allow them to remain in the fishery management plan for data collection, but not require setting ACLs.

Alternative 4 would remove any of the following species from the Spiny Lobster FMP. Smoothtail and spotted spiny lobsters have no landings information available and if they

do not need to be in the Spiny Lobster FMP for data collection or other management purposes, then it may be appropriate for these species to be removed. If any of the following species are removed from the Spiny Lobster FMP, without another state or federal agency taking over management, there is the potential for negative impacts to the physical and biological environments, if fishing effort for these species increased. However, the two spiny lobster species (**Option a** and **b**) have no landings information available so management by another agency would be difficult. Of the two species of slipper lobster (**Option c** and **d**), the ridged slipper lobster currently has some federal regulations. The regulations specified for ridged slipper lobster discuss conservation and management [50 CFR 640.1 (b)], define slipper lobster by genus species [640.2], prohibit harvest of a berried (egg-bearing) lobsters [640.21 9(a)], and prohibit the use of poisons and explosives to take slipper lobster in the exclusive economic zone [(640.22 9a)(3)]. If these species were removed from the fishery management plan, the federal regulations for ridged slipper lobster would no longer apply.

2.2 Action 2: Modify the current definitions of Maximum Sustainable Yield, Optimum Yield, Overfishing Threshold, and Overfished Threshold for Caribbean spiny lobster

*This action will be modified when the stock assessment update is closer to completion.

2.2.1 Maximum Sustainable Yield (MSY)

Alternative 1: No Action- Use the current definitions of MSY as a proxy. The Gulf of Mexico definition**:** MSY is defined as a harvest strategy that results in at least a 20% transitional SPR (spawning stock biomass per recruit) [Not approved by NOAA Fisheries Service letter received 1999). The South Atlantic definition: MSY is defined as a harvest strategy that results in at least a 20% static SPR (spawning potential ratio).

Alternative 2: Modify the Gulf of Mexico definition to mirror the South Atlantic definition of MSY proxy, defined as 20% static SPR.

Alternative 3: MSY equals the yield produced by fishing mortality at maximum sustainable yield (F_{MSY}) or proxy for F_{MSY}. MSY will be defined by the most recent SEDAR and joint Scientific and Statistical Committee process.

2.2.2 Optimum Yield (OY)

Alternative 1: No Action- Use the current definitions of OY. The Gulf of Mexico definition**:** OY is defined as a harvest strategy that results in at least achieving a 30% transitional SPR (SSBR). The South Atlantic definition: OY is the amount of harvest that can be taken by U.S. fishermen while maintaining the SPR at or above 30% static SPR.

Alternative 2: Modify the Gulf of Mexico definition to mirror the South Atlantic definition of OY: the amount of harvest that can be taken by U.S. fishermen while maintaining the SPR at or above 30% static SPR.

Alternative 3: OY equals the yield produced by F_{OY}. If a stock is overfished, F_{OY} equals the fishing mortality rate specified by the rebuilding plan designed to rebuild the stock to SSB_{MSY} within the approved schedule. After the stock is rebuilt, F_{OY} equals the yield produced by a fraction of F_{MSY} (e.g., 65%, 75% or 85% of F_{MSY}; Joint Councils to specify).

2.2.3 Overfishing Threshold

Alternative 1: No Action - Use the current definitions of overfishing threshold. The Gulf of Mexico definition: overfishing exists when the fishing morality rate (F) results in the transitional SPR being reduced below 20%. The South Atlantic definition: overfishing level as a fishing mortality rate (F) in excess of the fishing mortality rate at 20% static SPR (F20% static SPR).

Alternative 2: Modify the Gulf of Mexico definition to mirror the South Atlantic definition of overfishing threshold: (from transitional to static SPR).

Alternative 3: Specify the Maximum Fishing Mortality Threshold (MFMT) as F_{MSY} or F_{MSY} proxy. The most recent SEDAR and joint Scientific and Statistical Committees will define F_{MSY} or F_{MSY} proxy. This should equal the Overfishing Limit (OFL) provided by the Scientific and Statistical Committees. The Councils will compare the most recent value for the current fishing mortality rate (F) from the SEDAR/SSC process to the level of fishing mortality that would result in overfishing (maximum fishing mortality threshold or MFMT) and if the current F is greater than the MFMT, overfishing is occurring. Comparing these two numbers:

- $F_{CURRENT}$/MFMT = X.XXX

*This comparison is referred to as the **overfishing ratio**. If the ratio is greater than 1, then overfishing is occurring.

2.2.4 Overfished Threshold

Alternative 1: No Action - Use the current definition of overfished threshold. The Gulf of Mexico is the only Council with a current definition: the proxy for MSST is a level of 15% transitional SPR (SSBR). The South Atlantic Council decided to use the framework procedure to add a biomass based component to the overfished definition, due to no biomass levels and/or proxies being available.

Alternative 2: Specify the MSST as XXX million pounds. The MSST is defined by the most recent SEDAR and joint Scientific and Statistical Committees process. The Councils will compare the current spawning stock biomass (SSB) from the SEDAR and Scientific and Statistical Committees process to the level of spawning stock biomass that could be rebuilt to the level to produce the MSY in 10 years. Comparing these two numbers:

- $SSB_{CURRENT}$/MSST = Y.YYY

This comparison is referred to as the **overfished ratio**. If the ratio is less than 1, then the stock is overfished.

Comparison of Alternatives: This action explores various alternatives for establishing biological reference points: MSY, OY, overfishing threshold, and overfished threshold. Currently the Gulf of Mexico and the South Atlantic Councils have different definitions for these biological reference points and the South Atlantic Council does not currently have an overfished threshold definition (GMFMC 1999; SAFMC 1998; SEDAR 8 2005).

Transitional SPR versus static SPR is used for the definitions of MSY, OY, overfishing, and overfished threshold by the Gulf Council. As the name suggests SPR ratio expresses spawning per recruit as a ratio in a fished condition, relative to the maximum theoretical amount of spawning per recruit that occurs when there is no fishing (Slipke and Maceina 2000; MRAG Americas 2001). Due to increased fishing effort reducing the potential reproductive output, the denominator in the spawning potential ratio is always greater

than or equal to the numerator, so the resulting values will range between 0 and 1 (MRAG Americas 2001).

Generally, static SPR is more frequently used than transitional SPR. Static SPR requires minimal data inputs, whereas transitional SPR requires data from a full age-based stock assessment (Parkes 2001). Static SPR is calculated on a per-recruit basis assuming equilibrium conditions of recruitment and mortality throughout their life span. Transitional SPR is computed on a yearly basis and uses actual annual variation in population structure and mortality rates therefore it is considered a dynamic measure (MRAG Americas 2001; Slipke and Maceina 2001). The SEDAR 8 (2005) benchmark assessment terms of reference, suggest that static SPR was used is the assessment based on the South Atlantic Fishery Management Council's Spiny Lobster Amendment 6 (SAFMC 1998).

Alternative 1 under each action would use the current definitions of MSY, OY, overfishing threshold, and overfished threshold, separately for each Council. Due to the spiny lobster fishery being a jointly managed species with a new update assessment taking place in 2010, it might be the best time for the Councils to adopt the same biological reference points in this full amendment.

Alternative 2 under **Actions 2.3.1, 2.3.2, and 2.3.3** would modify the two definitions of maximum sustainable yield, optimum yield, and overfishing threshold to mirror the South Atlantic Council's definitions which use static SPR instead of transitional SPR. Justification for using static SPR is based on projected yield streams at equilibrium, versus the current dynamic measure (transitional SPR), which may change in future years from the current estimate. This could make the projections less reliable than using equilibrium recruitment and morality conditions (static SPR). Since stock assessments are not usually completed on an annual basis, static SPR may be a better index to use for yield projections. Further, static SPR does not require constant recruitment, because it is expressed on a "per recruit" basis and is useful as a measure of overfishing (MRAG Americas 2001). Transitional SPR is often used to monitor overfished populations recovery; however, annual variation in recruitment (i.e., number of animals entering the population each year) could confound the results.

Alternative 2 under each action will modify all biological determination criteria from the current definitions to the most recent SEDAR and joint Scientific and Statistical Committee's process. This alternative would provide the best available science in the update assessment and modify the separate Council definitions into one biological reference point for MSY, OY, overfishing and overfished threshold.

2.3 Action 3: Establish sector allocations for Caribbean spiny lobster in State and Federal waters from North Carolina through Texas

Alternative 1: No action – Do not establish sector allocations.

Alternative 2: Allocate the spiny lobster ACL by the following sector and or gear allocations:

Option a: 75% to the commercial trap fishery, 4% to the commercial dive fishery, 1% to the commercial bully net fishery, and 20% to the recreational fishery.

Option b: 80% commercial and 20% recreational

Alternative 3: Allocate the spiny lobster ACL by the following sector and or gear allocations:

Option a: 70% to the commercial trap fishery, 6% to the commercial dive fishery, 1% to the commercial bully net fishery, and 23% to the recreational fishery.

Option b: 77% commercial 23% recreational

Alternative 4: Allocate the spiny lobster ACL by the following sector and or gear allocations:

Option a: 70% to the commercial trap fishery, 3% to the commercial dive fishery, 1% to the commercial bully net fishery, and 26% to the recreational fishery.

Option b: 74% commercial and 26% recreational

Alternative 5: Allocate the spiny lobster ACL by the following sector and or gear allocations:

Option a: 72% to the commercial trap fishery, 5% to the commercial dive fishery, 1% to the commercial bully net fishery, and 22% to the recreational fishery.

Option b: 78% commercial and 22% recreational

Alternative 6: Allocate the spiny lobster ACL by the following sector and or gear allocations:

Option a: 72% to the commercial trap fishery, 4% to the commercial dive fishery, 1% to the commercial bully net fishery, and 23% to the recreational fishery.

Option b: 77% commercial and 23% recreational

*Note text is not updated to match modified Alternatives and Options

Comparison of Alternatives: The Florida Fish and Wildlife Conservation Commission (FWC) invited representatives of stakeholder groups participating in Florida's Lobster Fishery to serve as members of the Spiny Lobster Ad Hoc Advisory Board (Advisory Board). The Advisory Board was made up of five commercial trappers, three

commercial divers, three recreational fishers, two wholesale dealers, two environmental groups, and one FWC representative on the board.

The Advisory Board was designed to bring together a group of stakeholder representatives from around the state who represent the diversity of the lobster fishery community and included commercial lobster trappers, commercial lobster divers, recreational lobster fishers, a special recreational license holder, wholesale lobster dealers, an environmental group, and a representative from the FWC. The goal was to provide constructive comments and guidance to the FWC in the form of proposed refinements to the management of Florida's spiny lobster fishery. Over a period of sixteen months the Advisory Board met approximately eight times for approximately two days each to focus on reviewing and discussing lobster fishery issues and proposals for refinements to Florida's spiny lobster fishery.

The Advisory Board examined landings records for all sectors of the spiny lobster fishery from fishing seasons 1993/94 through 2003/2004. These data have been updated and are included in detail in Appendix X. The Advisory Board rounded the percentage harvest by bully nets up to a whole percentage and ignored landings from unknown and other gear categories. The alternatives were developed by splitting the landings into four sectors (commercial trap, commercial diving, commercial bully nets, and recreational. During that time, the allocation of the lobster harvest among the different sectors changed. During the initial years of trap reductions, annual landings were generally higher than they had been in a decade. Landings by commercial divers increased, but because landings were so high, the progressive shift in the landings allocation toward that group appeared subtle. However, a period of lower landings beginning with the 2000/01 season underscored this shift toward the commercial dive fishery and the recreational fishery as well. Regulations limiting harvest of commercial divers were enacted beginning with the 2003/04 season. The effects of these rules can be seen by comparing allocations in the 2002/03 and 2003/04 seasons. Landings were essentially the same in both seasons, but the harvest share of commercial divers was reduced because of trip limits and banning harvest from artificial habitat. It appears that in high landing years, trappers have a larger harvest share because lobsters are available to be captured later in the season when there is little diving activity. Harvest from casitas is most effective early in the season. (Note: Harvest by casitas was prohibited during 2003). In low landings years, these early landings make up a larger harvest share than in high landings years. There is a need to understand current allocations in the spiny lobster fishery, how those allocations have shifted over time, and how rule changes have likely impacted allocation.

So, why does increasing harvest from one sector have the effect of reducing the harvest of another sector? It is because the total lobster harvest each year is largely dependent upon the number of lobster available to be harvested that year and not by the amount of fishing effort expended to catch those lobsters, except in those unusual circumstances where effort is curtailed by extraordinary events such as hurricanes. Across the range of effort in the fishery since approximately 1975, landings and effort have not been related. Good fishing years have occurred with high and low effort, as have poor fishing years. For example, the best year on record for the commercial fishery was 1979 when nearly

7.9 million pounds were landed using ~600,000 traps. In contrast, 1983 was a poor fishing season with a harvest of 4.5 million pounds, again from ~600,000 traps. Similar observations can be made in recent years when landings estimates for all fishing groups were available. During 1999, the fishery (recreational and commercial) harvested 10.1 million pounds from 534,000 traps, 4,377 commercial fishing dive days, and 555,000 recreational fishing days. In contrast, the 2001 harvest of 4.3 million pounds was caught from the same number of traps, 4,538 commercial dive days, and 366,000 recreational fishing days. Furthermore, the size-structure of the lobsters landed by the fishery has remained constant since 1987 as has the average size. The average size has consistently been 3 ¼ inch CL, just barely above the minimum legal size. This indicates that the fishery is heavily reliant on a single year class of lobsters each season – those that have just grown to legal size. Fluctuations in harvest are related to fluctuations in the numbers of new recruits to the fishery and not the number of traps, diver-days or recreational fishing days. Put another way, the size of the 'lobster pie' each year is determined by the number of lobsters attaining legal size. A change in fishing effort by any one sector simply alters that sector's piece of the pie.

The Councils are using the alternatives and the administrative record developed by the FWC as the basis for developing allocation alternatives given that the majority of the harvest occurs off the State of Florida and given that the Councils have delegated much of the management to the State of Florida through a protocol established in Spiny Lobster Amendment 2 in 1989. The consensus recommendations of the Advisory Board, including all options evaluated, are presented in a document dated May 2007 (Appendix X). The alternatives and rational is taken from the Facilitator's Summary Report of the May 23-24, 2006 Meeting (Appendix X). These documents and other materials related to the Spiny Lobster Advisory Committee are available at: http://www.myfwc.com/RULESANDREGS/MarineFisheries_Workshops.htm

Alternative 1 would prevent establishment of sector ACLs and make it more difficult to track total landings to ensure the ACL is not exceeded. In the South Atlantic Council's area, north of Florida, all fishermen are limited to two Caribbean spiny lobsters per person per day year round which effectively allocates 100% to the recreational sector in this area.

Alternative 2 is based on the "better year" which was the 1998/99 fishing season when the trap fishery had the highest proportion of total landings. This alternative was supported by 10 of the 14 members of the Advisory Board present at the May 23-24, 2006. **Alternative 3** is based on a 10-year average (1993/94 – 2002/03) and was supported by 10 of the 14 members of the Advisory Board present. **Alternative 4** is based on using 1993-94 as the first year for baseline allocations and was supported by 3 of the 14 members of the Advisory Board. **Alternative 5** is the average of **Alternatives 2** and **3** and was supported by 11 of the 14 members of the Advisory Board present. This is the consensus recommendation of the Advisory Board for spiny lobster allocations. **Alternative 6** is the average of **Alternatives 2, 3 and 4** and was supported by 5 of the 14 members of the Advisory Board.

2.4 Action 4: Allowable Biological Catch (ABC) Control Rule, ABC Level(s), Annual Catch Limits and Annual Catch Targets for Caribbean Spiny Lobster

2.4.1 Allowable Biological Catch (ABC) Control Rule

ABC is recommended by the Scientific and Statistical Committee (SSC) and specified by the Council. The South Atlantic SSC provided an ABC Control Rule at their April 2010 meeting. The Gulf of Mexico SSC is also developing an ABC Control Rule. These two rules will need to be consolidated and/or modified such that both SSCs agree on one ABC Control Rule for spiny lobster.

Alternative 1. No Action – Do not establish an ABC Control Rule for spiny lobster.

Alternative 2. Establish ABC based on the South Atlantic Council's SSC Data Poor ABC control rule.

Alternative 3. Establish an ABC Control Rule where ABC equals OFL.

Alternative 4. Establish an ABC Control Rule where ABC equals a percentage of yield at MFMT.

Option a. ABC=yield at 65%MFMT
Option b. ABC=yield at 75%MFMT
Option c. ABC=yield at 85%MFMT

Alternative 5. Establish an ABC Control Rule where ABC is a percentage of OFL. The percentage is based upon the level of risk of overfishing (P*).

Option a. ABC=X% of OFL. The X% is based upon P* equals .20.
Option b. ABC=X% of OFL. The X% is based upon P* equals .30.
Option c. ABC=X% of OFL. The X% is based upon P* equals .40.
Option d. ABC=X% of OFL. The X% is based upon P* equals .50.

Comparison of Alternatives: The South Atlantic SSC decided to develop OFL for each species based on median of landings for 1999 to 2008. From there, they will apply the ABC control rule for all the species together for each species grouping to develop the ABC reduction level. The results of the ABC control rule will be multiplied by the OFL to determine the reduction to the OFL for the grouping to each individual species. Each ABC would start at 35% (0% for unknown depletion, 15% because not forage or habitat, % the appropriate Productivity Susceptibility Analysis (PSA) score, 20% out of 25% for certainty of OFL level) of OFL. The variability in the ABC will be that they will have to use the PSA for each species and add the appropriate percent to the ABC that will come up with the appropriate level. The range of ABC for each data poor species will be 35% to 55% of OFL. This approach will be revisited species by species as more data become available. This is considered the "Triage Approach" for the snapper grouper data poor species. Current species exceptions are golden tilefish, yellow tail snapper, wreckfish, and amberjack. Since the Council is following the red porgy rebuilding plan, they won't

be included in this data poor snapper grouper analysis.

Since no estimate of MSY was provided in the last SEDAR assessment due to the lack of a Caribbean-wide assessment, it is expected one will not be available in the update. The SAFMC SSC may decide to develop ABC recommendations based on landings data. If the SEDAR Update finds that overfishing is not occurring, the SSC may decide to bypass the OFL estimate and recommend ABC as the median of landings over the last 10 years.

Table 2.4.1. Spiny lobster landings and potential ABC recommendation from the South Atlantic Scientific and Statistical Committee.

Fishing Season	Com. Total	Rec. Total	Com. & Rec. Total
1991/92	6,836,015	1,815,971	8,651,806
1992/93	5,368,188	1,352,443	6,720,631
1993/94	5,309,790	1,883,114	7,192,104
1994/95	7,181,641	1,905,995	9,087,636
1995/96	7,017,134	1,930,718	8,947,852
1996/97	7,744,104	1,922,596	9,666,700
1997/98	7,640,177	2,304,186	9,944,363
1998/99	5,447,533	1,302,677	6,750,210
1999/00	7,669,207	2,461,981	10,131,188
2000/01	5,568,707	1,957,643	7,526,350
2001/02	3,079,263	1,222,982	4,305,425
2002/03	4,577,392	1,366,743	5,944,135
2003/04	4,161,589	1,300,304	5,461,893
2004/05	5,473,720	341,655	5,815,375
2005/06	2,963,160	947,353	3,910,513
2006/07	4,799,493	1,118,344	5,917,836
2007/08	3,775,835	1,060,095	4,838,132
2008/09	3,250,259	1,036,466	4,285,147
	OFL = Median 10 yrs =		5,638,634
	ABC = Median 10 yrs =		5,638,634
	ABC = 35% of OFL =		1,973,522
	ABC = 55% of OFL =		3,101,249

Source: Landings from Florida Fish & Wildlife Commission; updated 9/29/09.

2.4.2 Set Annual Catch Limits (ACLs) for Caribbean Spiny Lobster

Alternative 1: No Action – Do not set ACLs

Alternative 2: Set an ACL for the entire stock based on the acceptable biological catch (ABC).

Gulf Preferred Option a: ACL = ABC

Option b: ACL = x% of ABC

Alternative 3: Set separate state and federal ACLs based on landings.

Option a: sum of ACLs = ABC

Option b: sum of ACLs = x% of ABC

Alternative 4: Set ACLs for each sector and gear type based on allocations determined in Action 3.

Option a: each ACL = (sector allocation x ABC)

Option b: each ACL = x% of (sector allocation x ABC)

Option c: each ACL = sector allocation x (x% of ABC)

Comparison of Alternatives: ACLs are set by managers and should take into account management uncertainty. Management uncertainty occurs because sufficient catch information is lacking, and may include late catch reporting, misreporting, and underreporting of catches. Management uncertainty is affected by the ability to control actual catch in the fishery. For example, a fishery with in-season catch data and in-season closure authority has better management control than a fishery without these features. ACLs, in coordination with accountability measures, must prevent overfishing. Potential ACL values will be determined after the joint Scientific and Statistical Committees (SSCs) have set an ABC.

The Caribbean spiny lobster stock was last assessed in 2005. A stock assessment update is scheduled for 2010; the results of this updated assessment are expected to be available to the Councils by December 2010 for incorporation into this amendment. The 2005 assessment determined the stock was not undergoing overfishing based on a static spawning potential ratio of 20% (F20%) as set in Amendment 6. However, because the spawning stock includes the entire Caribbean region, spawning biomass at the maximum sustainable yield (Bmsy) or the minimum stock size threshold (MSST) could not be determined; therefore, the assessment could not determine if the stock is overfished.

The Councils' joint SSCs are responsible for recommending an ABC control rule and ABC for each stock to the Councils. The ABC is the level of a stock's annual catch that accounts for the scientific uncertainty in the estimate of the overfishing level and any other scientific uncertainty; in most cases ABC will be reduced from the overfishing limit to reduce the probability overfishing might occur. For the Caribbean spiny lobster fishery, the joint SSCs will recommend an ABC after reviewing the 2010 stock assessment update.

An ACL for a given stock can be established as either a single ACL for the entire fishery, separate ACLs for various sectors or gears, or state and federal ACLs. One ACL for the entire stock (**Alternative 2**) may be appropriate if sector allocations are not set (Action 4). The ACL cannot exceed the ABC. If a Council recommends an ACL which equals ABC (**Option a**), and the ABC is equal to the overfishing limit, the Council must provide sufficient analysis and justification for the approach or the Secretary of Commerce may presume overfishing will not be prevented. The ACL can also be reduced from the ABC to account for management uncertainty (**Option b**).

The Caribbean spiny lobster fishery occurs mainly off the state of Florida. Commercial landings data are available from 1984; starting in this year, commercial fishermen were required to sell their catch to licensed dealers who were required to submit trip tickets. Separate state and federal ACLs (**Alternative 3**) may be appropriate because a large amount of harvest is in state waters. However, distinguishing between landings from these areas is difficult. In addition, federal management would be limited to the portion of the fishery under federal authority. The sum of the state and federal ACLs could equal ABC (**Option a**) or be reduced from the ABC for management uncertainty (**Option b**).

Sector/gear ACLs (**Alternative 4**) may be appropriate if allocations are set, or if based on landings data. Florida commercial landings data are available by gear (trap, diving, and bully net) from the 1991/1992 season through the 2007/2008 season. Recreational landings data in Florida are slightly less complete for the same time period. If more than one ACL is set, the sum of the ACLs can equal (**Option a**), but not exceed, the ABC. The ABC could be separated using the sector/gear allocations chosen in Action 4, then each ACL could be reduced for management uncertainty particular to that sector/gear (**Option b**). Alternately, the ABC could be reduced for overall management uncertainty first, then the resulting amount divided into separate sector/gear ACLs (**Option c**).

2.4.3 Set Annual Catch Targets (ACTs) for Caribbean Spiny Lobster

Gulf Preferred Alternative 1: No Action – Do not set ACTs.

Alternative 2: Set an ACT for the entire stock (If Action 4.2, Alternative 2 chosen).

Alternative 3: Set separate state and federal ACTs (If Action 4.2, Alternative 2 or 3 chosen).

Alternative 4: Set ACTs for each sector and gear type based on allocations from Action 3 (If Action 4.2, Alternative 2 or 4 chosen).

Comparison of Alternatives: The ACT is the amount of annual catch of a stock that is the management target of the fishery, and accounts for further management uncertainty in controlling the actual catch at or below the ACL. An ACT less than the ACL provides a buffer so the risk of exceeding the ACL is reduced and, therefore, the likelihood of triggering accountability measures is reduced. An ACT lowers the allowed catch below

the ACL, but provides stability for fisheries that are apt to fluctuate around a target catch rate. Potential values for ACTs will be determined after the joint SSCs have set an ABC.

Alternative 1 would not set an ACT for Caribbean spiny lobster. The National Standard 1 Guidelines do not require ACTs be established, but provide that ACTs may be used as part of a system of accountability measures. Accountability measures are required regardless of whether ACTs are established. If no ACT is set, the accountability measures would be based on the ACL.

One ACT could be set for the entire Caribbean spiny lobster stock (**Alternative 2**) if a single ACL is set for the stock (Action 4.2 Alternative 2). A single ACT would constrain harvest for all sectors and any accountability measures would be triggered simultaneously. Currently, no quotas constrain harvest of Caribbean spiny lobster. An ACT less than the ACL acts as a quota and creates a buffer which might prevent triggering more severe accountability measures that could disrupt the fishery.

Separate federal/state ACTs (**Alternative 3**) would be appropriate if separate ACLs are set (Action 4.2, Alternative 3), or if a single ACL is set (Action 4.2, Alternative 2). However, the federal government does not have authority to manage harvest of Caribbean spiny lobster in state waters. Unless the states adopt the ACTs as quotas, and institute accountability measures, any ACT set by the Councils could be exceeded without consequence. In an extreme case, landings in state waters could exceed the ABC under these circumstances.

Sector/gear ACTs **(Alternative 4)** could be set if separate sector ACLs are set **(**Action 4.2, Alternative 4**)** or if a single ACL is set for the stock **(**Action 4.2, Alternative 2**)**. In the second case, the accountability measures could be based on the stock ACL allowing one or more of the separate ACTs to be exceeded without severe consequences. This separation might be useful if one group consistently has landings below their allocation and can "absorb" any overage from another group.

2.5 Action 5: Accountability Measures (AMs) by Sector

*Note: More than one alternative, option, sub-option, or combinations thereof, may be chosen as preferred.

Alternative 1: No Action – Do not set AMs.

Alternative 2: Establish in-season AMs.

Option a: Commercial

Sub-option i: quota closure

Sub-option ii: implement a commercial trip limit when 75% of the commercial ACL or ACT is projected to be met.

Option b: Recreational

Sub-option i: quota closure

Sub-option ii: reduce the bag limit when 75% of the recreational ACL or ACT is projected to be met.

Option c: Recreational and commercial combined AM

Sub-option i: prohibit both recreational and commercial harvest when the commercial ACL or ACT, or combined ACL or ACT is projected to be met.

Sub-option ii: reduce the recreational and commercial bag/trip limits when 75% of the commercial ACL or ACT is projected to be met.

Alternative 3: Establish post-season AMs.

Option a: Commercial

Sub-option i: ACL payback in the fishing season following a previous years ACL overage

Sub-option ii: Adjust the length of the fishing season following an ACL overage

Sub-option iii: Implement a trip limit

Option b: Recreational

Sub-option i: ACL payback in the fishing season following an ACL overage. To estimate the overage, compare the recreational ACL with recreational landings over a range of years. For 2011, use only 2011 landings. For 2012, use the average landings of 2011 and 2012. For 2013 and beyond, use the most recent three-year running average.

Sub-option ii: Adjust the length of the fishing season following an ACL overage. To estimate the overage, compare recreational ACL with recreational landings over a range of years. For 2011, use only 2011 landings. For 2012, use the average landings of 2011 and 2012. For 2013 and beyond, use the most recent three-year running average.

Sub-option iii: Adjust bag limit for the fishing season following a previous seasons ACL overage

Option c: Recreational and commercial combined AM

Sub-option i: Adjust season length for both recreational and commercial harvest of spiny lobster in the fishing season following an ACL overage

Sub-option ii: Recreational and commercial ACL payback in the fishing season following a previous years ACL overage (if a combined ACL is chosen).

Comparison of Alternatives: Accountability measures are designed to provoke an action once either the ACL or ACT is reached during the course of a fishing season to reduce the risk overfishing will occur. However, depending on how timely the data are, it might not be realized that either the ACL and/or ACT has been reached until after a season has ended. Such AMs include prohibited retention of species once the sector annual catch target is met, shortening the length of the subsequent fishing season to account for overages of the ACL, and reducing the ACL in the subsequent fishing season to account for overages.

The National Standard 1 guidelines recognize that existing FMPs may use terms and values that are similar to, associated with, or may be equivalent to AMs in many fisheries for which annual specifications are set for different stocks or stock complexes. In these situations the guidelines suggest that, as Councils revise their FMPs they use the same terms as set forth in the National Standard 1 guidelines. Current Caribbean spiny lobster regulations include size limits, a seasonal closure, bag limits, and certain prohibited gear types (Table 2.1.1). There is no previously specified measure that would be considered an AM. Therefore, AMs for the Caribbean spiny lobster fishery in the Gulf and South Atlantic must be specified pursuant to Magnuson-Stevens Act requirements.

There are several types of AMs that may be applied in the Caribbean spiny lobster fishery. In-season AMs are those that are triggered during the fishing season and are typically before an ACL is exceeded. Some examples of in-season AMs include quota closures, trip or bag limit changes, gear restrictions, or catch shares. Post-season AMs would be triggered if the ACL is exceeded and would typically be implemented the following fishing season. Post-season AMs could include seasonal closures, reduced trip or bag limits, or shortening of the fishing season implemented in the subsequent year. National Standard 1 guidelines recommend the use of ACTs in systems of AMs so that an ACL is not exceeded. For fisheries without in-season management control to prevent the ACL from being exceeded, AMs may utilize ACTs that are set below ACLs so that catches do not exceed the ACLs. If an ACT is specified as part of the AMs for spiny lobster, an ACT control rule may be utilized for setting the ACT. The ACT control rule should clearly articulate how management uncertainty in the amount of catch in the fishery is accounted for in setting the ACT. The objective for establishing an ACT and related AMs is that the ACL not be exceeded. Annual catch targets for spiny lobster are being considered by the Councils under Action 2.4.3 of this document. Several AM options that could be applied to the spiny lobster fishery are presented in the alternatives above.

Alternative 1, no action, would not establish AMs for the spiny lobster fishery. The Magnuson-Stevens Act requires that ACLs and AMs be established in 2011; therefore, if **Alternative 1** were chosen as a preferred alternative the Spiny Lobster FMP would not be incompliance with those requirements. Under **Alternative 2,** in-season AMs would be

triggered in order to prevent the ACL from being exceeded. The efficacy of in-season AMs is largely reliant upon in-season monitoring of landings, which may be especially difficult for the recreational sector. The Marine Recreational Fishing Statistics Survey and the newly implemented Marine Recreational Information Program does not collect landings information on crustaceans. Therefore, in-season tracking of Caribbean spiny lobster landings in the recreational sector would be based on the Marine Recreational Fishing Statistics Survey program and state landings reports. An additional obstacle to tracking recreational harvest in-season is that there is a lag time between when the Caribbean spiny lobsters are landed and when those landings are reported in the landings database. This lag time means that projections of when the ACL is expected to be met would need to be employed. Landings projections are not always 100% accurate, thus using such estimates could lead to an in-season AM being triggered prematurely, or not soon enough causing an ACL overage.

The Council may choose one or more post-season AMs under **Alternative 3** to supplement any of the in-season AMs under **Alternative 2**. This would be the most administratively burdensome scenario; however, if an ACL overage were to occur after an in-season AM has been implemented, a post-season AM would be available to the Regional Administrator as a means to correct an overage and prevent overfishing.

Under **Alternative 3**, a post-season AMs would be implemented the fishing season following the season when an ACL is exceeded. Post-season AMs would allow all landings for a particular season to be reported before any harvest restricting measures would take effect. This method of accountability alone may correct for one year's or several year's overages; however, it does little to prevent an overage from occurring again unless it is chosen in conjunction with an in-season AMs.

2.6 Action 6: Develop or Update a Framework Procedure and Protocol for Enhanced Cooperative Management for Spiny Lobster

Alternative 1: No Action – Do not update the Protocol for Enhanced Cooperative Management or the Regulatory Amendment Procedure.

Alternative 2: Update the current Protocol for Enhanced Cooperative Management.

Alternative 3: Update the current Regulatory Amendment Procedures to develop a Framework Procedure to modify ACLs and AMs.

Alternative 4: Revise the current Regulatory Amendment Procedures to create an expanded Framework Procedure.

Option 1: Adopt the base Framework Procedure
Option 2: Adopt the more broad Framework Procedure
Option 3: Adopt the more narrow Framework Procedure

Comparison of Alternatives: The current Protocol for Enhanced Cooperative Management outlines the roles of the federal and State of Florida agencies in managing Caribbean spiny lobster. The current Regulatory Amendment Procedure outlines the actions that can be implemented through framework actions, such as gear and harvest restrictions. The current Protocol and Procedure, developed through Amendment 2 (GMFMC 1989), can be seen in its entirety in Appendix A. This action proposes to modify and update the *protocol* to include relevant agency names and authorities. The framework *procedure* would also be updated to include relevant terms and adjustments to ACLs, ACTs, and accountability measures.

Alternative 1 (No Action) would not modify the current protocols or procedures to include modern terminology and adjustments to ACLs, ACTs, and accountability measures. The Regional Administrator (RA) would maintain his/her current ability to adjust trip limits, bag limits, size limits, seasonal closures, and gear restrictions, but no means would exist of making needed adjustments to the National Standard 1 harvest parameters or management measures in a timely manner.

Alternative 2 would retain the current agreement with the State of Florida, but update the language to be consistent with changes in agency names and terminology since 1989. This alternative could be chosen in conjunction with either **Alternative 3** or **4**.

Proposed Language for the Updated Protocol

Protocol for Roles of Federal and State of Florida Agencies for the Management of Gulf and South Atlantic Spiny Lobster

1. The Gulf of Mexico and South Atlantic Fishery Management Councils (Councils) and NOAA Fisheries Service acknowledge that the fishery is largely a State of Florida (State) fishery, which extends into the exclusive economic zone

(EEZ), in terms of current participants in the directed fishery, major nursery, fishing, and landing areas, historical regulation of the fishery. As such, this fishery requires cooperative state/federal efforts for effective management through the Fishery Management Plan for the Spiny Lobster Fishery of the Gulf of Mexico and South Atlantic (Spiny Lobster FMP).

2. The Councils and NOAA Fisheries Service acknowledge that the State is managing and will continue to manage the resource to protect and increase the long-term yields and prevent depletion of lobster stocks and that the State Administrative Procedure Act and rule implementation procedures, including final approval of the rules by Governor and Cabinet, provide ample and fair opportunity for all persons to participate in the rulemaking procedure.

3. The Florida Fish and Wildlife Conservation Commission (FWC) acknowledges that rules proposed for implementation under any fishery management plan amendment, regulatory or otherwise, must be consistent with the management objectives of the Spiny Lobster FMP, the National Standards, the Magnuson-Stevens Fishery Conservation and Management Act, and other applicable law. Federal rules will be implemented in accordance with the Administrative Procedures Act.

4. The Councils and NOAA Fisheries Service agree that, for any rules defined within an amendment to the Spiny Lobster FMP, the State may propose the rule directly to NOAA Fisheries Service, concurrently informing the Councils of the nature of the rule, and that NOAA Fisheries Service will implement the rule within the EEZ provided it is consistent under paragraph three. If either of the Councils informs NOAA Fisheries Service of their concern over the rule's inconsistency with paragraph three, NOAA Fisheries Service will not implement the rule until the Councils, FWC, and NOAA Fisheries Service resolve the issue.

5. The State will have the responsibility for collecting and developing the information upon which to base the fishing rules, with assistance as needed by NOAA Fisheries Service, and cooperatively share the responsibility for enforcement with federal agencies.

6. Florida FWC will provide to NOAA Fisheries Service and the Councils written explanations of its decisions related to each of the rules; summaries of public comments; biological, economic and social analysis of the impacts of the proposed rule and alternatives; and such other relevant information.

7. The rules will apply to the EEZ for the management area of North Carolina through Texas, unless the Regional Administrator (RA) determines those rules may adversely impact other state and federal fisheries. In that event, the RA may limit the application of the rule, as necessary, to address the problem.

8. NOAA Fisheries Service and the Councils agree that their staffs will prepare the proposed and final rules and the associated National Environmental Policy Act documentation and other documents required to support the rule.

Under **Alternatives 3** and **4**, adjustments to ACLs, ACTs, accountability measures, and other management measures could be made relatively quickly as new fishery and stock abundance information becomes available. Alternatives that would update or revise the current procedure would likely be biologically beneficial for spiny lobster because they would allow periodic adjustments to National Standard 1 guideline harvest parameters, and management measures could be altered in a timely manner in response to stock assessment or survey results.

Alternative 3 and **4** would be expected to increase the efficiency and effectiveness of management change, potentially allowing less severe corrective action when necessary, or the quicker receipt of social and economic benefits associated with less restrictive management. In the long term, positive social and economic effects, relative to the status quo, would be expected from more timely management adjustments.

Alternative 3 would update language and formatting, as well as allow adjustments to ACLs, ACTs, and accountability measures. When the procedure was originally developed, these parameters were not in use. The updates would streamline the process for making these changes if a new stock assessment indicates their necessity. However, the procedure remains fairly restrictive both substantively and procedurally. The changes are summarized in Table 2.6.1. The full text of the framework procedure follows.

Table 2.6.1. Proposed framework modifications under Alternative 3.

Items retained from current framework	Items modified from current framework	Items added to current framework
Adjustments to or implementation of trip limits, bag limits (including zero bag limits), minimum sizes, gear restrictions, and seasonal/area closures	Change the term "Regional Director" to "Regional Administrator"	Use of SEDAR reports or other documentation the Councils or FWC deem appropriate to provide biological analyses
	Change the term "FMFC" to "Florida Fish and Wildlife Conservation Commission (FWC)"	The SSC prepares a written report to the Councils and FWC specifying OFL and a range of ABCs for species in need of catch reductions to achieve OY
		The SEDAR report or SSC will recommend rebuilding periods
Adjustment to or implementation of timeframes for recovery of an overfished species		Adjustments to ABCs, ACLs, and/or sector ACLs
Initial specification and subsequent adjustments of biomass levels and age structured analysis		Adjustment to or implementation of ACTs and AMs
Inclusion of public input in the framework adjustment process		Adjustments to or establishment of MSY
		Adjustments to or implementation of quotas, including closing any commercial fishery when the quota is filled

Proposed Language for Updated Framework Procedure

Joint Fishery Management Plan for the Spiny Lobster Fishery of the Gulf of Mexico (Gulf) and South Atlantic Framework Procedure for Specification of Annual Catch Limits, Annual Catch Targets, Overfishing Limits, Acceptable Biological Catch, Accountability Measures, and annual adjustments:

1. At times determined by NOAA Fisheries Service Southeast Regional Office and Florida Fish and Wildlife Conservation Commission (FWC), the Gulf of Mexico and South Atlantic Councils (Councils), and the Southeast Data, Assessment, and Review (SEDAR) steering committee, stock assessments or assessment updates for spiny lobster in the Gulf and South Atlantic will be

conducted under the SEDAR process. Each SEDAR stock assessment or assessment update will: 1) assess, to the extent possible, the current biomass (B), biomass proxy, or spawning potential ratio (SPR) levels for each stock; 2) estimate fishing mortality (F) in relation to F_{MSY} (maximum fishing mortality threshold [MFMT]) and F_{OY}); 3) determine the overfishing limit (OFL); 4) estimate other population parameters deemed appropriate; 5) summarize statistics on the fishery; 6) specify the geographical variations in stock abundance, mortality, recruitment, and age of entry into the fishery for each stock or stock complex; and 7) develop estimates of B_{MSY}.

2. The Councils and the FWC will consider SEDAR stock assessments, or other documentation deemed appropriate, to provide the biological analysis and data listed above in paragraph 1. Either the Southeast Fisheries Science Center or the stock assessment branch of a State agency may serve as the lead in conducting the analysis, as determined by the SEDAR Steering Committee. The joint Gulf and South Atlantic Scientific and Statistical Committees (SSCs) or some subgroup thereof, will prepare a written report specifying an OFL to the Councils and FWC and may recommend a range of acceptable biological catch (ABC) for attaining or maintaining optimum yield (OY). The OFL is the annual harvest level corresponding to fishing at MFMT (F_{MSY}). The ABC range is intended to provide guidance to the joint SSC subgroup, and is the OFL as reduced due to scientific uncertainty to reduce the probability overfishing will occur in a year. To the extent practicable, the probability overfishing will occur at various levels of ABC and the annual transitional yields (i.e., catch streams) calculated for each level of fishing mortality within the ABC range should be included with the recommended range.

If the spiny lobster stock is determined to be undergoing overfishing or is overfished, the recommended ABC range shall be calculated so as to end overfishing and achieve spiny lobster levels at or above B_{MSY} within the rebuilding periods specified by the Councils and FWC and approved by NOAA Fisheries Service. The SEDAR panel or joint SSC subgroup will recommend rebuilding periods based on the National Standard 1 guidelines, including generation times for the affected stocks. Generation times are to be specified by the stock assessment panel based on the biological characteristics of the individual stocks. The subgroup or panel will recommend a B_{MSY} level and a minimum stock size threshold (MSST) from B_{MSY} to the Councils and FWC. The panel or subgroup may also recommend more appropriate estimates of $F_{MSY,}$ MSY proxy, OY, the overfishing threshold (MFMT), and the overfished threshold (MSST). Where data are inadequate to compute an OFL and recommended ABC range, the subgroup or panel will use other available information as a guide in providing their best estimate of an OFL corresponding to MFMT and ABC range that should result in not exceeding the MFMT.

3. The joint SSC sub-group will examine SEDAR reports or other new information, the OFL determination, and the recommended ABC range. In

addition, the joint SSC sub-group will examine information provided by the social scientists and economists from the Councils' staffs and from the Southeast Regional Office analyzing social and economic impacts of any specification demanding adjustments of allocations, annual catch limits (ACLs), annual catch targets (ACTs), accountability measures (AMs), quotas, bag limits, or other fishing restrictions. The joint SSC sub-group will use the ABC control rule to set ABC at or below the OFL, taking in account scientific uncertainty. If the joint SSC sub-group set ABC equal to OFL, they will provide rational why they believe that level of fishing will not exceed MFMT.

4. The Councils and FWC may conduct a public hearing on the reports and the joint SSCs' ABC recommendation at, or prior to, the time it is considered by the Councils for action. Other public hearings also may be held. The Councils and FWC may convene their Spiny Lobster Advisory Panels, and optionally their socioeconomic experts, to review the report before taking action.

5. If necessary, the Councils and FWC will utilize the following criteria in selecting an ACL, ACT, AM, and a stock restoration time period, in addition to taking into consideration the recommendations and information provided in paragraphs 1-4:

> **a.** Set ACL at or below the ABC specified by the joint SSC sub-group or set a series of annual ACLs at or below the projected ABCs to account for management uncertainty. If the Councils and FWC set the ACL equal to ABC, and ABC has been set equal to OFL, the Councils and FWC will provide rationale why they believe that level of fishing will not exceed MFMT.
> **b.** Optionally, subdivide the ACLs into commercial, for-hire, and private recreational sector ACLs or gear specific ACLs that maximize the net benefits of the fishery to the nation. The sector ACLs will be based on allocations determined by criteria established by the Councils and FWC, and specified by the Councils through a plan amendment. If spiny lobster is overfished, and harvest in any year exceeds the ACL or sector ACL, management measure and catch levels for that sector will be adjusted in accordance with the AMs established for that stock.
> **c.** Optionally, set ACTs or sector ACTs at or below ACLs and in accordance with the provision of the AMs for spiny lobster. The ACT is the management target that accounts for management uncertainty in controlling the actual catch at or below the ACL. If an ACL is exceeded repeatedly, the Councils and FWC have the option to establish an ACT if one does not already exist for a particular stock, and to adjust or establish AMs for that stock as well.

6. The Councils will provide to the RA: 1) the joint SSC sub-group specification of OFL and recommendation of ABCs, ACLs, sector ACLs, ACTs, sector ACTs, AMs, sector AMs; 2) stock restoration target dates for each stock or stock

complex; 3) estimates of B_{MSY} and MSST; 4) estimates of MFMT, and; 5) the quotas, bag limits, trip limits, size limits, closed seasons, and gear restrictions necessary to avoid exceeding the ACL or sector ACLs. The Councils will also provide the joint SSC subgroup reports, a regulatory impact review, proper National Environmental Policy Act documentation, and the proposed regulations within a predetermined time as agreed upon by the Councils, FWC and RA. The Councils and FWC may also recommend new levels or statements for MSY (or proxy) and OY.

7. The RA will review the Councils' recommendations and supporting information; if he/she concurs the recommendations are consistent with the objectives of the Spiny Lobster FMP, the National Standards, and other applicable law, he/she shall prepare a framework action and forward notice of proposed rules to the Assistant Administrator for publication (providing appropriate time for additional public comment). The RA will consider all public comment and information received and will forward a final rule for publication in the Federal Register within 30 days of the close of the public comment, or such other time as agreed upon by the Councils and RA.

8. Appropriate regulatory changes that may be implemented by final rule in the Federal Register include:

a. ACLs or sector ACLs, or a series of annual ACLs or sector ACLs.
b. ACTs or sector ACTs, or a series of annual ACTs or sector ACTs, and establishment of ACTs for stocks which do not have an ACT.
c. AMs, or sector AMs.
d. Bag limits, size limits, vessel trip limits, closed seasons or areas, gear restrictions, and quotas designed to achieve OY and keep harvest levels from exceeding the ACL or sector ACL.
e. New levels or statements of MSY (or proxy) and OY for any stock.
f. Fishing season/year adjustments.

9. The RA is authorized, through notice action, to conduct the following activities.

a. Close the commercial fishery for spiny lobster at such time as projected to be necessary to prevent the commercial sector from exceeding the commercial sector ACL or ACT for the remainder of the fishing year or sub-quota season.
b. Close the recreational fishery for spiny lobster at such time as projected to be necessary to prevent recreational sector ACLs or ACTs from being exceeded.
c. Reopen a commercial or recreational season that had been prematurely closed if needed to assure that a sector ACL or ACT can be reached.

10. If NOAA Fisheries Service decides not to publish the proposed rule of the recommended management measures, or to otherwise hold the measures in abeyance, then the RA must notify the Councils and FWC with the reasons for

concern along with suggested changes to the proposed management measures that would alleviate the concerns. Such notice shall specify: 1) The applicable law with which the amendment is inconsistent; 2) the nature of such inconsistencies; and 3) recommendations concerning the action that could be taken by the Councils to conform the amendment to the requirements of applicable law.

The options in **Alternative 4** would increase the flexibility of the Councils and NOAA Fisheries Service by identifying additional measures that could be changed under the procedure. In addition, these framework options would clarify the appropriate process needed for each type of change. The major differences among the options are highlighted in Table 2.7.2. The full text of the framework procedure for each option follows.

Table 2.6.2. Comparison of Alternative 4 options for a framework procedure.

	Option a (Base)	Option b (Broad)	Option c (Narrow)
Types of framework processes	Open abbreviated Open standard Closed	Open Closed	Open Closed
When open framework can be used	New stock assessment New information or circumstances When changes are required to comply with applicable law or a court order	In response to any new information or changed circumstances	Only when there is a new stock assessment
Actions that can be taken	Abbreviated Open framework can be used for actions that are considered minor and insignificant Standard Open framework used for all others *Representative lists of actions that can be taken under Abbreviated and Standard Open framework are given, but are not exclusive* Closed framework can be used for a specific list of actions	Open framework can be used for a representative list of actions, plus other measures deemed appropriate by the Councils Closed framework can be used for a specific list of actions, plus any other immediate action specified in the regulations	Open framework can only be used for specific listed actions Closed framework can only be used for a specific list of actions
Public input	Requires public discussion at one meeting for each Council	Requires public discussion at one meeting for each Council	Requires public discussion during at least three meetings for each Council, and discussion at separate public hearings within the areas most affected by the proposed measures.
AP/SSC participation	Each Council may convene their SSC, SEP, or AP, as appropriate	Convening the SSC, SEP, or AP, prior to final action is not required	Each Council shall convene their SSC, SEP, and AP
How a request of action is made	Abbreviated requires a letter or memo from the Councils with supporting analyses Standard requires a completed framework document with supporting analyses	Via letter, memo, or the completed framework document with supporting analyses.	Via letter, memo, or completed framework document with supporting analyses.

Option a (Base)
This framework procedure provides standardized procedures for implementing management changes pursuant to the provisions of the Spiny Lobster Fishery Management Plan (FMP) managed jointly between the Gulf of Mexico and South Atlantic Fishery Management Councils (Councils). Two basic processes are included: the open framework process and the closed framework process. The open framework addresses issues where more policy discretion exists in selecting among various management options developed to address an identified management issue, such as changing a size limit to reduce harvest. The closed framework addresses much more specific factual circumstances, where the FMP and implementing regulations identify specific action to be taken in the event of specific facts occurring, such as closing a sector of a fishery when the quota is or is projected to be harvested.

Open Framework:

1. Situations under which the open framework procedure may be used to implement management changes include the following:
    a. A new stock assessment results in changes to the overfishing limit, acceptable biological catch, or other associated management parameters.
    In such instances the Councils may, as part of a proposed framework action, propose an annual catch limit (ACL) or series of ACLs and optionally an annual catch target (ACT) or series of ACTs, as well as any corresponding adjustments to maximum sustainable yield (MSY), optimum yield (OY), and related management parameters.
    b. New information becomes available or circumstances change.
    The Councils will, as part of a proposed framework action, identify the new information and provide rationale why this new information indicates management measures should be changed.
    c. Changes are required to comply with applicable law such as the Magnuson-Stevens Act, Endangered Species Act, Marine Mammal Protection Act, or are required as a result of a court order.
    In such instances the Regional Administrator (RA) will notify the Councils in writing of the issue and that action is required. If there is a legal deadline for taking action, the deadline will be included in the notification.
2. Open framework actions may be implemented in either of two ways: abbreviated documentation or standard documentation process.
    a. Abbreviated documentation process. Regulatory changes that may be categorized as routine or insignificant may be proposed in the form of a letter or memo from the Councils to the RA containing the proposed action, and the relevant biological, social, and economic information to support the action. Either Council may initiate the letter or memo, but both Councils must approve it. If multiple actions are proposed, a finding that the actions are also routine or insignificant must also be included. If the RA concurs with the determination and approves the proposed action, the action will be implemented through publication of

appropriate notification in the Federal Register. Changes that may be viewed as routine or insignificant include, among others:

i. Reporting and monitoring requirements,
ii. Permitting requirements,
iii. Bag and possession limit changes of not more than one lobster,
iv. Size limit changes of not more than 10% of the prior size limit,
v. Vessel trip limit changes of not more than 10% of the prior trip limit,
vi. Closed seasons of not more than 10% of the overall open fishing season,
vii. Restricted areas (seasonal or year-round) affecting no more than a total of 100 nautical square miles,
viii. Respecification of ACL, ACT, or quotas that were previously approved as part of a series of ACLs, ACTs or quotas,
ix. Specification of MSY proxy, OY, and associated management parameters (such as overfished and overfishing definitions) where new values are calculated based on previously approved specifications,
x. Gear restrictions, except those that result in significant changes in the fishery, such as complete prohibitions on gear types,
xi. Quota changes of not more than 10%, or retention of portion of an annual quota in anticipation of future regulatory changes during the same fishing year.

b. Standard documentation process. Regulatory changes that do not qualify as routine or insignificant may be proposed in the form of a framework document with supporting analyses. Non-routine or significant changes that may be implemented under a framework action include, among others:

i. Specification of ACTs or sector ACTs,
ii. Creation of rebuilding plans and revisions to approved rebuilding plans,
iii. Changes specified in section 2(a) that exceed the established thresholds.

3. Either Council may initiate the open framework process to inform the public of the issues and develop potential alternatives to address the issues. The framework process will include the development of documentation and public discussion during at least one meeting for each Council.
4. Prior to taking final action on the proposed framework action, each Council may convene their SSC, SEP, or AP, as appropriate, to provide recommendations on the proposed actions.
5. For all framework actions, the initiating Council will provide the letter, memo, or the completed framework document along with proposed regulations to the RA in a timely manner following final action by both Councils.

6. For all framework action requests, the RA will review the Councils' recommendations and supporting information and notify the Councils of the determinations, in accordance with the Magnuson-Stevens Act (Section 304) and other applicable law.

Closed Framework:

Consistent with existing requirements in the FMP and implementing regulations, the RA is authorized to conduct the following framework actions through appropriate notification in the Federal Register:

a. Close or adjust harvest in any sector of the fishery for a species, sub-species, or species group that has a quota or sub-quota at such time as projected to be necessary to prevent the sector from exceeding its sector-quota for the remainder of the fishing year or sub-quota season,
b. Reopen any sector of the fishery that had been prematurely closed,
c. Implement an in-season accountability measure for a sector that has reached or is projected to reach, or is approaching (e.g., within x %) or is projected to approach its ACL, or implement a post-season accountability measure for a sector that exceeded its ACL in the current year.

Option b (Broad)

This framework procedure provides standardized procedures for implementing management changes pursuant to the provisions of the Spiny Lobster Fishery Management Plan (FMP) managed jointly between the Gulf of Mexico and South Atlantic Fishery Management Councils (Councils). Two basic processes are included: the open framework process and the closed framework process. The open framework addresses issues where more policy discretion exists in selecting among various management options developed to address an identified management issue, such as changing a size limit to reduce harvest. The closed framework addresses much more specific factual circumstances, where the FMP and implementing regulations identify specific action to be taken in the event of specific facts occurring, such as closing a sector of a fishery when the quota is or is projected to be harvested.

Open Framework:

1. The Councils may utilize this framework procedure to implement management changes in response to any additional information or changed circumstances.

   The Councils will, as part of a proposed framework action, identify the new information and provide rationale why this new information requires management measures be adjusted.
2. Open framework actions may be implemented at any time based on information supporting the need for adjustment of management measures or management parameters:

   Changes that may be implemented via the open framework procedure include:

   a. Reporting and monitoring requirements,
   b. Permitting requirements,

c. Bag and possession limits,
d. Size limits,
e. Vessel trip limits,
f. Closed seasons,
g. Restricted areas (seasonal or year-round),
h. Respecification of annual catch limits (ACLs), annual catch targets (ACTs), or quotas that were previously approved as part of a series of ACLs, ACTs or quotas,
i. Specification of maximum sustainable yield (MSY) proxy, optimum yield (OY), and associated management parameters (such as overfished and overfishing definitions) where new values are calculated based on previously approved specifications,
j. Gear restrictions, except those that result in significant changes in the fishery, such as complete prohibitions on gear types,
k. Quota,
l. Specification of ACTs or sector ACTs,
m. Creation of rebuilding plans and revisions to approved rebuilding plans,
n. Any other measures deemed appropriate by the Council.

3. Either Council may initiate the open framework process to inform the public of the issue and develop potential alternatives to address the issue. The framework process will include the development of documentation and public discussion during one meeting for each Council.
4. For all framework actions, the initiating Council will provide the letter, memo, or the completed framework document along with proposed regulations to the Regional Administrator (RA) following final action by both Councils.
5. For all framework action requests, the RA will review the Councils' recommendations and supporting information and notify the Councils of the determinations, in accordance with the Magnuson-Stevens Act (Section 304) and other applicable law.

Closed Framework:

Consistent with existing requirements in the FMP and implementing regulations, the RA is authorized to conduct the following framework actions through appropriate notification in the Federal Register:

a. Close or adjust harvest in any sector of the fishery for a species, sub-species, or species group that has a quota or sub-quota at such time as projected to be necessary to prevent the sector from exceeding its sector-quota for the remainder of the fishing year or sub-quota season,
b. Reopen any sector of the fishery that was prematurely closed,
c. Implement an in-season accountability measure for a sector that has reached or is projected to reach, or is approaching (e.g., within x %) or is projected to approach its ACL, or implement a post-season accountability measure for a sector that exceeded its ACL in the current year,
d. Take any other immediate action specified in the regulations.

Option c (Narrow)
This framework procedure provides standardized procedures for implementing management changes pursuant to the provisions of the Spiny Lobster Fishery Management Plan (FMP) managed jointly between the Gulf of Mexico and South Atlantic Fishery Management Councils (Councils). Two basic processes are included: the open framework process and the closed framework process. The open framework addresses issues where more policy discretion exists in selecting among various management options developed to address an identified management issue, such as changing a size limit to reduce harvest. The closed framework addresses much more specific factual circumstances, where the FMP and implementing regulations identify specific action to be taken in the event of specific facts occurring, such as closing a sector of a fishery when the quota is or is projected to be harvested.

Open Framework:

1. The open framework procedure may be used to implement management changes include only when a new stock assessment results in changes to the overfishing limit, acceptable biological catch, or other associated management parameters. In such instances the Councils may, as part of a proposed framework action, propose an annual catch limit (ACL) or series of ACLs and optionally an annual catch target (ACT) or series of ACTs, as well as any corresponding adjustments to maximum sustainable yield (MSY), optimum yield (OY), and related management parameters.
2. Actions that may be implemented via the framework procedure include:
    a. Reporting and monitoring requirements,
    b. Bag and possession limits,
    c. Size limits,
    d. Closed seasons,
    e. Restricted areas (seasonal or year-round),
    f. Quotas.
3. Either Council may initiate the open framework process to inform the public of the issue and develop potential alternatives to address the issue. The framework process will include the development of documentation and public discussion during at least three meetings for each Council, and shall be discussed at separate public hearings within the areas most affected by the proposed measures.
4. Prior to taking final action on the proposed framework action, each Council shall convene its SSC, SEP, and AP to provide recommendations on the proposed actions.
5. For all framework actions, the initiating Council will provide the letter, memo, or the completed framework document, and all supporting analyses, along with proposed regulations to the RA in a timely manner following final action by both Councils.
6. For all framework action requests, the RA will review the Councils' recommendations and supporting information and notify the Councils of the determinations, in accordance with the Magnuson-Stevens Act

(Section 304) and other applicable law. The RA will provide the Councils weekly updates on the status of the proposed measures.

Closed Framework:

Consistent with existing requirements in the FMP and implementing regulations, the RA is authorized to conduct the following framework actions through appropriate notification in the Federal Register:

a. Close or adjust harvest in any sector of the fishery for a species, sub-species, or species group that has a quota or sub-quota at such time as projected to be necessary to prevent the sector from exceeding its sector-quota for the remainder of the fishing year or sub-quota season,
b. Reopen any sector of the fishery that was prematurely closed,
c. Implement an in-season accountability measure for a sector that has reached or is projected to reach, or is approaching (e.g., within x %) or is projected to approach its ACL, or implement a post-season accountability measure for a sector that exceeded its ACL in the current year.

2.7 Action 7: Modify Regulations Regarding Possession and Handling of Short Caribbean Spiny Lobsters as "Undersized Attractants"

Alternative 1: No Action – Allow the possession of no more than 50 undersized Caribbean spiny lobsters, or one per trap aboard the vessel, whichever is greater, for use as attractants.

Alternative 2: Prohibit the possession and use of undersized Caribbean spiny lobsters as attractants.

Alternative 3: Allow undersized Caribbean spiny lobsters, but modify the number of allowable undersized lobsters, regardless of the number of traps fished.

Option a: allow 50 undersized lobsters

Option b: allow 35 undersized lobsters

Alternative 4: Allow undersized spiny lobster not exceeding 50 per boat and 1 per trap aboard each boat if used exclusively for luring, decoying or otherwise attracting non-captive spiny lobsters into the trap**.**

Comparison of Alternatives: Under the no action **Alternative 1**, the same enforcement and biological concerns would persist. **Alternative 2** would eliminate both the difficulties law enforcement officials currently have in prosecuting undersized spiny lobster cases and any negative biological impacts attributable to undersized lobster as attractants. Prohibiting the use of undersized spiny lobster as attractants may therefore, lead to a reduced risk of exceeding the annual catch limit in any given year and hedge against future overfishing. The enforcement and biological benefits under **Alternative 2** are positive; however, the socioeconomic impacts of prohibiting the use of undersized spiny lobster as attractants could be significant given a significant portion of commercial fishermen fishing for spiny lobster do indeed use undersized lobster as attractants and so very successfully. Amendment 1 to the Spiny Lobster FMP (1987) states as a major issue:

> *The illegal market in undersize lobsters, on board handling and exposure of undersize lobsters and their confinement in traps as attractants are significant sources of undersize lobster mortality that are preventing the fishery from harvesting optimum yield. Although undersize lobsters are an effective attractant, the mortality associated with their use as attractants, in combination with increasing number of traps being fished, are contribution to the fishery's inability to achieve optimum yield…..*

Several of these issues still exist today despite the implementation of the "50 Short" rule. Biological problems related to using undersized lobsters would likely be remedied under **Alternative 2**. **Alternative 3** would not improve law enforcement in the fishery; however, it could potentially reduce the negative biological impacts of using undersized spiny lobster under the status quo without incurring significant socioeconomic impacts. The number of undersized lobster handled, held in live wells, and confined to traps, would decrease under this alternative. Therefore, measureable improvement in stock

abundance may be expected. **Alternative 4** is very similar to **Alternative 1** in that it would allow spiny lobster to be kept onboard for use as attractants ; however, it would change the provision to allow 50 spiny lobster *plus* one per trap, rather than 50 spiny lobster "*or*" one per trap, and it would remove the "whichever is greater" portion of the provision. This alternative is the least biologically beneficial of all the alternatives considered since it would increase the number of spiny lobsters able to be maintained onboard a vessel.

2.8 Action 8: Modify Tailing Requirements for Caribbean Spiny Lobster for Vessels that Obtain a Tailing Permit

*Note: more than one alternative may be chosen as a preferred alternative.

Alternative 1: No Action – Possession of a separated Caribbean spiny lobster tail in or from the EEZ is allowed only when the possession is incidental to fishing exclusively in the EEZ on a trip of 48 hours or more, and a federal tailing permit is issued to and on board the vessel.

Alternative 2: Eliminate the Tail-Separation Permit for all vessels fishing for Caribbean spiny lobster in Gulf and South Atlantic waters of the EEZ.

Alternative 3: Revise the current regulations to clearly state that all vessels must have either a federal spiny lobster permit or a Florida Restricted Species Endorsements associated with a Florida Saltwater Products License in order to obtain a tailing permit.

Alternative 4: Modify the requirements for obtaining a Tail-Separation Permit.

Alternative 5: All Caribbean spiny lobster landed must either be landed all "whole" or all "tailed".

Comparison of Alternatives: Alternative 1 would not modify the current Tail-Separation Permit regulations for Caribbean spiny lobster. A Tail-Separation Permit would still be required in order to land spiny lobsters tailed, and the trips would still be required to be 48 hours or longer in duration. **Alternative 2** would be the most biologically beneficial of all the alternatives being considered under this action. Removing the ability for fishermen to land any Caribbean spiny lobster tailed would increase the probability that most lobster landed would be of legal size since they could easily be measured. **Alternative 3** would address the issue of recreational fishermen obtaining Tail-Separation Permits, but it would not address the issue of commercial fishermen landing undersized lobster by tailing them. **Alternative 3** would provide a minimal biological benefit since it is thought that there are very few recreational fishermen who have in their possession a Tail-Separation Permit.

Alternative 4 would modify the prerequisites needed for obtaining a Tail-Separation Permit in a way that would make them more restrictive and specific. The regulations could be modified in such a way that would address the issue of recreational fishermen obtaining Tail-Separation Permits, as well as the issue of some fishermen landing undersized lobster tailed and legal sized lobster whole. However, **Alternative 4**, unless the modification includes the complete removal of the Tail-Separation Permit, would not be as biologically beneficial as **Alternative 2.**

Alternative 5 would address the issue of some fishermen landing part of their catch whole and part of it tailed; presuming they are tailing select lobsters in order to land sub-legal spiny lobsters for profit. If under **Alternative 5**, most fishermen choose to land the

majority of their Caribbean spiny lobster harvest whole, the action would biologically beneficial. If the majority of fishermen choose to land their harvest tailed, there is a chance this action could be biologically detrimental to the species, since there would be an increased risk that undersized lobster would be taken. Additionally, if **Alternative 3** were chosen in combination with **Alternative 5**, the issue of recreational fishermen obtaining Tail-Separation Permits would be addressed, and could; therefore, result in greater biological benefit than if **Alternative 5** were chosen alone.

2.9 Action 9: Limit Spiny Lobster Fishing in Certain Areas in the EEZ off Florida to Address Endangered Species Act Concerns for Staghorn and Elkhorn Corals

Alternative 1: No Action – Do not limit spiny lobster fishing in certain areas in the EEZ off Florida to address ESA concerns for *Acropora*.

Alternative 2: Prohibit spiny lobster trapping on all known hardbottom in the EEZ off Florida (in areas under the SAFMC's jurisdiction with water depths less than 30 meters).

Alternative 3: Expand existing and/or create new closed areas to prohibit spiny lobster trapping in the EEZ off Florida, with an emphasis on protecting priority conservation areas and areas of *Acropora* colony abundance.

Option a: Expand existing and/or create new closed areas with no buffer zone between the boundary of the closed area and closest *Acropora* colony.

Option b: Expand existing and/or create new closed areas with a minimum buffer zone of at least 15 ft, but less than 100 ft, between the boundary of the closed area and closest *Acropora* colony.

Option c: Expand existing and/or create new closed areas with a minimum buffer zone of at least 100 ft between the boundary of the closed area and closest *Acropora* colony.

Alternative 4: Expand existing and/or create new closed areas to prohibit all spiny lobster fishing in the EEZ off Florida, with an emphasis on protecting priority conservation areas and areas of *Acropora* colony abundance.

Option a: Expand existing and/or create new closed areas with no buffer zone between the boundary of the closed area and closest *Acropora* colony.

Option b: Expand existing and/or create new closed areas with a minimum buffer zone of at least 15 ft, but less than 100 ft, between the boundary of the closed area and closest *Acropora* colony.

Option c: Expand existing and/or create new closed areas with a minimum buffer zone of at least 100 ft between the boundary of the closed area and closest *Acropora* colony.

Comparison of Alternatives: The biological opinion on the spiny lobster fishery requires the Councils protect areas of *Acropora*, by expanding existing or created new closed areas around those areas. These alternatives are being developed to meet those requirements. **Alternative 1** (No Action) would have the least biological benefit to *Acropora*, and would perpetuate the existing level of risk of interaction between these species and the fishery. **Alternative 1** would not meet the requirement established under the biological opinion.

Alternative 2 would provide the greatest biological benefit to *Acropora* and other hardbottom/coral species. Prohibiting trapping on all hardbottom areas would essentially eliminate any the risk to interaction between *Acropora* and spiny lobster traps.

Relative to **Alternative 2**, **Alternatives 3 and 4** will be less biologically beneficial to any *Acropora* colonies located outside the closed areas. **Alternative 3, Option a,** would provide biological benefits to *Acropora* by prohibiting the use of traps within areas of high *Acropora* density, reducing the risk trap gear damage. **Alternative 3, Option b** and **Option c** would provide increasing degrees of protection to *Acropora* corals. Creating buffer zones protects corals from traps moved during storm events. Larger buffer zones provide more protection. As such, **Alternative 3, Option b** would provide a greater biological benefit to *Acropora* than **Option c**. **Alternative 4** would provide slightly more biological benefit to *Acropora* colonies because it would prohibit all fishing for spiny lobster, and would affect all sectors of the commercial fishery equally. The creation of buffer zones with **Alternative 4, Option b** and **Option c** would provide greater biological benefit than not creating buffer zones (**Alternative 4, Option a**), and biological benefits are maximized with larger buffer zones. **Alternatives 2, 3, and 4** with their associated options, would fulfill the requirements of terms and conditions prescribed in the biological opinion.

2.10 Action 10: Require Gear Markings so All Spiny Lobster Trap Lines in the EEZ off Florida are Identifiable

Alternative 1: No Action – Do not require gear marking measures for spiny lobster trap lines.

Alternative 2: Require all spiny lobster trap lines in the EEZ off Florida to be a specific color, not currently in use in other fisheries, along its entire length.

Alternative 3: Require all spiny lobster trap lines in the EEZ off Florida to have easily identifiable patterns/markings, not currently in use in other fisheries, along its entire length.

Alternative 4: Require all spiny lobster trap lines in the EEZ off Florida to be a specific color and have easily identifiable patterns/markings, not currently in use in other fisheries, along its entire length.

Comparison of Alternatives: The biological opinion on the spiny lobster fishery requires the establishment of trap line marking requirements no later than 2014, and that the incidental take of protect species be monitored. The type of line used in the spiny lobster fishery is also used in other fisheries and for other purposes. This makes it extremely difficult to determine if line found in the environment, or entangling protected species, originated from the spiny lobster fishery, particularly if only line is recovered. Trap line marking requirements will allow for greater accuracy in identifying fishery interactions with protected species, leading to more targeted measures to reduce the level and severity of those impacts. **Alternative 1** (No Action) would have no biological benefit for protected species and would not satisfy the line marking requirements of the biological opinion. **Alternatives 2** and **3** will likely have similar biological benefits for protected species. Both alternatives will help improve the accuracy of gear identification. **Alternative 4** may be slightly more biologically beneficial than the other alternatives, because it could allow for an even more accurate determination of the fishing gear found in association with protected species interactions. **Alternatives 2-4** would fulfill the requirements of terms and conditions prescribed in the biological opinion.

2.11 Action 11: Allow the Public to Remove Trap Line, Buoys, or Otherwise make Unfishable, any Spiny Lobster Gear Found in the EEZ off Florida

Alternative 1: No Action – Do not allow public to remove any spiny lobster trap found in the EEZ off Florida

Alternative 2: Allow the public to remove any spiny lobster trap found in the EEZ off Florida following the end of season trap removal period (usually April 5) until the beginning of the next season's trap deployment period (August 1).

Alternative 3: Allow the public to remove any spiny lobster trap found in the EEZ off Florida during the closed season of both the spiny lobster and stone crab fishing seasons (May 20-July 31).

Alternative 4: Allow the public to make any spiny lobster trap unfishable by removing trap line, buoys, and throats if found in the EEZ off Florida from following the end of season trap removal period (usually April 5) until the beginning of the next season's trap deployment period (August 1).

Alternative 5: Allow the public to make any spiny lobster trap unfishable by removing trap line, buoys, and throats if found in the EEZ off Florida during the closed season of both the spiny lobster and stone crab fishing seasons (May 20-July 31).

Comparison of Alternatives: The biological opinion on the spiny lobster fishery requires the Councils explore allowing the public to remove derelict trap fishing gear from the EEZ off Florida. Derelict spiny lobster traps can cause damage to reef and benthic habitat, and entangle *Acropora* corals, sea turtles, smalltooth sawfish, and marine mammals. Allowing the public to remove derelict trap gear would help reduce environmental impacts from lost spiny lobster trap gear. **Alternative 1** would have no biological benefit for protected species and will perpetuate the existing level of risk for interactions between these species and lost trap gear. **Alternative 2** will likely have the greatest biological benefits for protected species. This alternative would allow for the complete removal of all trap debris for the longest period of time, potentially increasing the amount of derelict trap gear removed. Alternative 3 would also allow for the complete removal of derelict trap gear, but for a shorter period. As a result, the biological benefit of **Alternative 3** may be less than **Alternative 2**. **Alternatives 4** and **5** will have less biological benefit than **Alternatives 2** and **3**. Allowing the public to remove trap line, buoys, and throats, will help reduce the potential impacts from ghost fishing and entanglement. However, traps remaining in the environment still have the potential to cause damage to benthic habitat. **Alternative 4** would allow more time for the public to make derelict traps unfishable, potentially increasing the biological benefit to protected species. Compared to **Alternatives 2-4**, **Alternative 5** will have the least biological benefit.

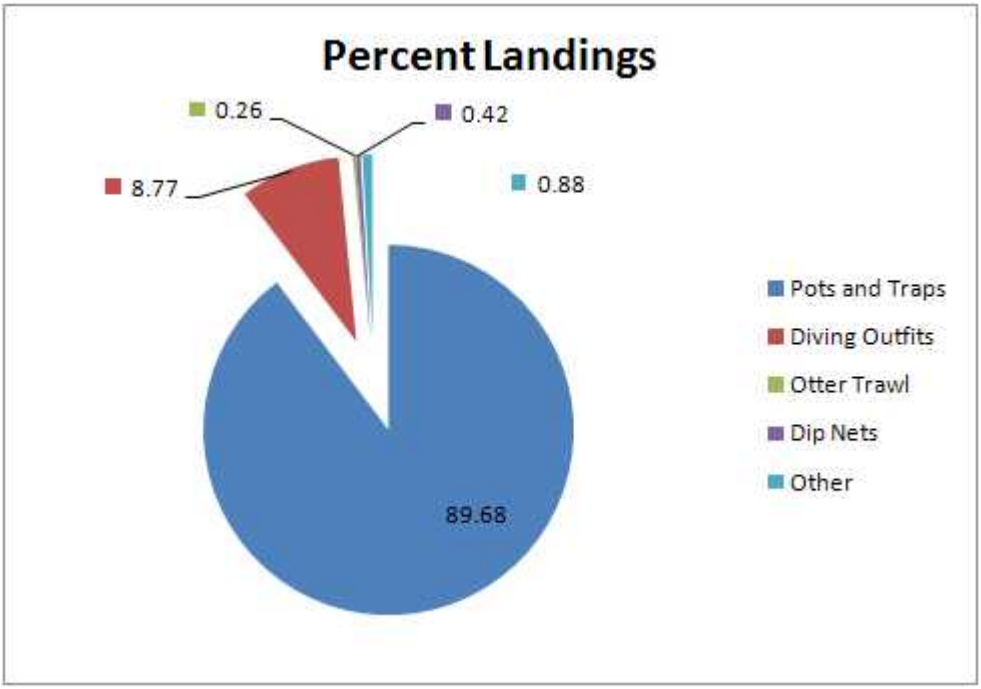
3.0 Affected Environment

3.1 Description of the Fishery

3.1.1 Commercial Fishery

Caribbean spiny lobsters are harvested by both commercial and recreational fishermen. Florida law allows commercial fishermen to harvest spiny lobster by diving or using wooden, plastic or metal traps, or bully or hoop nets (68B-24.006(1)); however, wooden traps are the most popular gear type. These traps are weighted with cement and include a self-deteriorating escape panel that degrades over time. Fishermen commonly string traps along a trap line, with each end of the trap line marked by a buoy. All traps must be removed by April 5 of each year (68B-24.005(4) F.A.C.). Strong coastal storms can damage and destroy the traps.

From 1997 through 2006, about 90 % of annual total state landings have been caught in pots and traps (Figure 3.1.1.1). Diving is the second most popular gear type and takes about 9% of the total pounds landed annually.



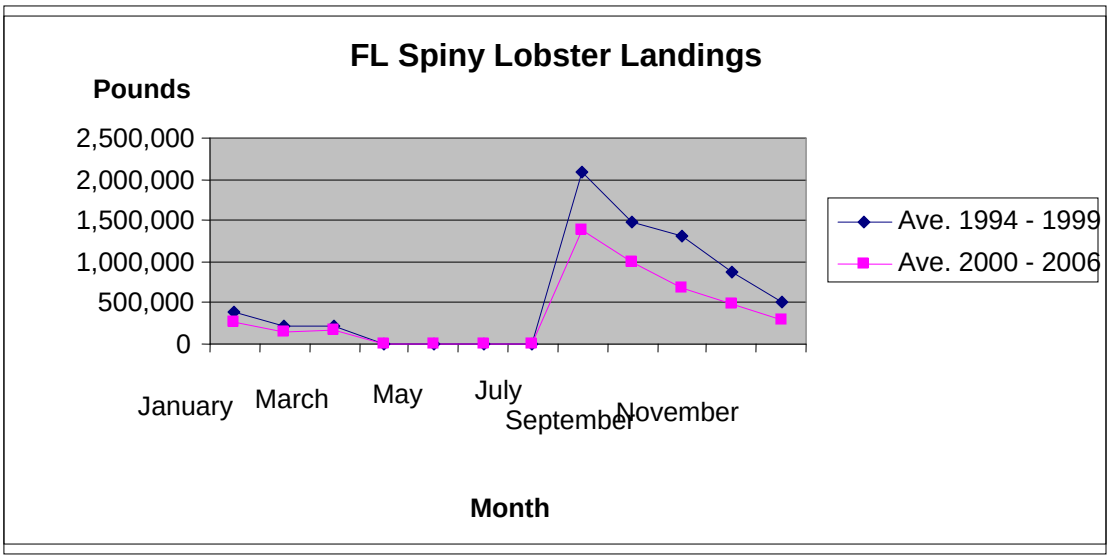
Source: National Marine Fisheries Service, Accumulated Landings System

Figure 3.1.1.1. Average annual percentage of total pounds of Caribbean spiny lobster landed in Florida by gear type, 1997 – 2006.

Commercial fishermen use live undersized lobster, commonly known as “shorts”, instead of cowhide or fish heads as bait to attract legal-sized lobsters into their traps. Florida law allows the holder of a valid Crawfish Endorsement, lobster trap certificates, and valid saltwater products license to harvest and possess, while on the water, undersized spiny

lobster not exceeding 50 per boat or one per trap aboard each boat used exclusively for luring, decoying, or otherwise attracting noncaptive spiny lobster into traps. Such undersized spiny lobster must be kept alive while in possession, in a shaded continuously circulating live well with a pump capacity to totally replace the water at least every 8 minutes and large enough to provide at least 0.75 gallon of seawater per lobster (68B-24.003(3) F.A.C.).

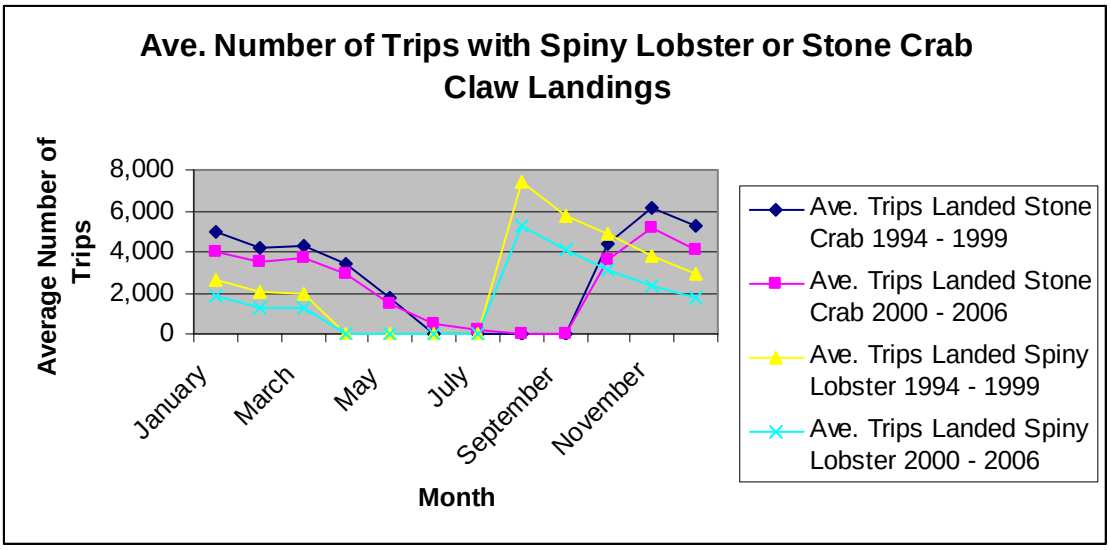
Usually each season's landings peak in August then sharply decrease thereafter (Figure 3.1.1.2). Effort and landings also decrease after the opening of the stone crab claw fishery on October 5 (Figure 3.1.1.3).[1]



Source: Florida Fish and Wildlife Conservation Commission, Marine Fisheries Information System.

Figure 3.1.1.2. Florida landings of Caribbean spiny lobster, 1994 – 2006.

[1] Stone crab was originally a bycatch caught in spiny lobster traps; however, in the 1970s, it became a fishery. Today, many spiny lobster fishermen are also stone crab fishermen as well.



Source: Florida Fish and Wildlife Conservation Commission, Marine Fisheries Information System

Figure 3.1.1.3. Average number of monthly trips that landed either Caribbean spiny lobster or stone crab claws, 1994 – 1999 and 2000 – 2006.

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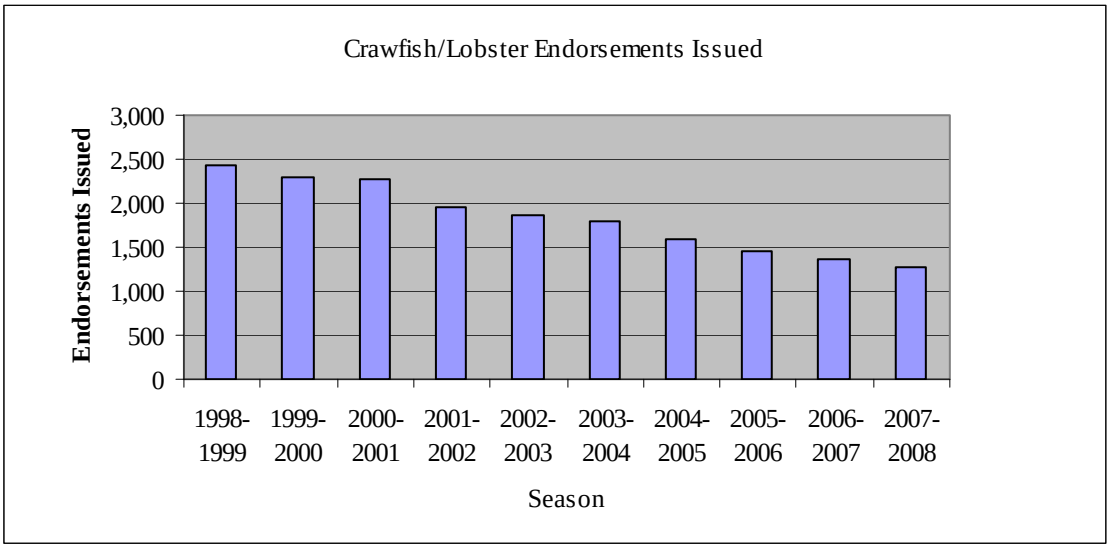
Seven counties account for about 99.5% of Florida's annual commercial landings of Caribbean spiny lobster, with Monroe County dominating by taking about 90% of the landings year after year (Table 3.1.1.1). Both Monroe and Miami-Dade Counties combined account for about 96% of the state's annual commercial landings. According to the FWC (2007), most of the lobsters landed outside Monroe and Dade Counties from 1992 through 2006 were caught in the Keys and sold to wholesale dealers operating in Palm Beach County.

Table 3.1.1.1. Top 7 Counties in Commercial Landings of Caribbean Spiny Lobster, 1994 – 2006.

Florida County	Average Annual Landings	Portion of Average Annual FL Landings	Combined Portions of FL Landings
Monroe	5,070,122	89.658%	89.6584%
Dade	366,385	6.479%	96.1375%
Palm Beach	69,507	1.229%	97.3666%
Broward	46,460	0.822%	98.1882%
Collier	34,981	0.619%	98.8068%
Brevard	20,837	0.368%	99.1753%
Duval	17,067	0.302%	99.4771%

Source: FL Fish and Wildlife Conservation Commission, Marine Fisheries Information System

The number of lobster/crawfish licenses has been in decline in Florida since fiscal year 1998-1999 (Figure 3.1.1.4).[2]



Source: Florida Fish & Wildlife Commission.

Figure 3.1.1.4. Number of Florida Lobster/Crawfish License Endorsements issued.

[2] The fiscal year is from July 30 to June 1.

Monroe County

Monroe County leads the state in landings of Caribbean spiny lobster year after year. From 1994 through 2006 Monroe County led the state in commercial landings of Caribbean spiny lobster, averaging about 90% of the state's commercial landings each year (Table 3.1.1.2).

Table 3.1.1.2. Monroe County commercial landings of Caribbean spiny lobster.

Year	County Landings (lbs)	FL Landings (lbs)	Portion of FL Landings
1994	6,239,090	7,087,357	88.03%
1995	6,245,472	7,001,661	89.20%
1996	7,138,859	7,865,678	90.76%
1997	6,461,282	7,107,684	90.91%
1998	5,268,000	5,831,407	90.34%
1999	6,794,915	7,578,321	89.66%
2000	5,114,237	5,763,470	88.74%
2001	2,904,035	3,405,509	85.27%
2002	4,035,905	4,483,426	90.02%
2003	3,855,401	4,268,277	90.33%
2004	4,500,913	4,983,400	90.32%
2005	3,026,574	3,365,221	89.94%
2006	4,326,907	4,755,048	91.00%
Average	*5,070,122.31*	*5,653,573.77*	*89.58%*

Source: FL Fish and Wildlife Conservation Commission, Marine Fisheries Information System.

Over 78% of the state's trap-tag certificates are held by individuals in Monroe County (Table 3.1.1.3).

Table 3.1.1.3. Monroe County trap tag certificates and endorsement number, as of December 31, 2007.

2006			
	County	State	% State
Endorsement Holders	695	1,402	49.57%
Endorsement Accounts	403	615	65.53%
Endorsements Issued	826	1,638	50.43%
Revenue Collected	$94,300	$182,050	51.80%
Trap Tag Certificates	380,237	485,709	78.28%

2007			
	County	State	% State
Endorsement Holders	632	1,303	48.50%
Endorsement Accounts	365	582	62.71%
Endorsements Issued	751	1,512	49.67%
Revenue Collected	$85,575	$167,700	51.03%
Trap Tag Certificates	369,780	473,943	78.02%

2008			
	County	State	% State
Endorsement Holders	623	1,241	50.20%
Endorsement Accounts	353	550	64.18%
Endorsements Issued	739	1,443	51.21%
Revenue Collected	$84,200	$160,200	52.56%
Trap Tag Certificates	371,780	475,320	78.22%

Source: FL Fish and Wildlife Commission.

The number of crawfish/lobster license holders has declined steadily since the 1998-99 season, and the 651 license holders for the 2006-07 season represents a 43% decline since the 1998-99 season (Table 3.1.1.4). Wholesale seafood dealers in the county have not similarly declined (Table 3.1.1.5).

Table 3.1.1.4. Monroe County Crawfish/Lobster License holders.

Monroe County	
Season	License Holders
1998 - 1999	1,137
1999 - 2000	1,091
2000 - 2001	1,056
2001 - 2002	923
2002 - 2003	883
2003 - 2004	850
2004 - 2005	783
2005 - 2006	703
2006 - 2007	651
2007 - 2008	640

Source: FL Fish and Wildlife Commission.

Table 3.1.1.5 Monroe County wholesale seafood dealers.

Season	Wholesale Dealers
1998 - 1999	104
1999 - 2000	110
2000 - 2001	107
2001 - 2002	107
2002 - 2003	110
2003 - 2004	117
2004 - 2005	116
2005 - 2006	116
2006 - 2007	105
2007 - 2008	106

Source: FL Fish and Wildlife Commission.

Monroe County is the southernmost county in Florida and the United States (Figure 3.1.1.5). It has a total area of 9,679 km^2 (3,737 square miles), with 2,582 km^2 being land and the remaining 7,097 km^2 (about 73 %) being water (U.S. Census Bureau). The County is made up of the Florida Keys and portions of Big Cypress National Preserve and Everglades National Park. The Florida Keys are a series of islands that extend over 220 miles in length and make up the third largest barrier reef ecosystem in the world and the only one of its kind in the country. The State of Florida has designated the Florida Keys as an Area of Critical State Concern to protect the area's ecologically richness, culturally significance, and environmentally sensitive nature (Florida Statute 1986; Florida Administrative Code §28-29, 1975). Over 60% of the Keys land mass is owned by the government and the vast majority of public land has been set aside for conservation. The County has only one highway, U.S. Highway 1, which is also called the Overseas Highway. Commercial activities and residential development are mostly

concentrated along that route (National Research Council, 2002). Among the County's cities are Key West, Key Largo, Big Pine Key, Marathon and Plantation Key.

Figure 3.1.1.5. Monroe County.
Image Source: Wikipedia.

More than 99.9% of the County's population lives on the Florida Keys. According to U.S. Census Bureau estimates, the population of the County fell 6.1% from April 1, 2000, to July 1, 2006, with approximately 74,737 people in 2006. During that period, there was a natural increase in population of 195 (4,642 births less 4,447 deaths) coupled with a net out-migration of 4,668 persons leaving the county (2,612 net international migration less 7,280 net internal out-migration). The number of housing units increased from 51,617 in 2000 to 52,911 in 2005, an increase of 2.5%. Median household income in 2004 was $42,195 and 9.2% of the persons in the county lived below poverty, in comparison to the statewide median household income of $40,900 and poverty rate of 11.9%.

Tourism is the largest sector in the county. There are more establishments in the Retail Trade (NAICS 44) and Accommodation & Food Services (NAICS 72) sectors than any other sectors, and these two sectors employ the most persons. In 2005, 35% of the county's employees were in Accommodation & Food Services and 21% in Retail Trade (Table 3.1.1.6). Of the employer establishments in the Accommodation (NAICS 721) subsector, 164 (or 91%) were in Traveler Accommodation (NAICS 7211) and 14 (or 8%) were in RV Parks & Recreational Camps (NAICS 7212). Similarly, of the nonemployer firms in the Accommodation subsector, 83 (or 87%) were in Traveler Accommodation and 4 (or 4%) were in RV Parks & Recreational Camps.

Table 3.1.1.6. 2005 Nonemployer and employer business statistics, Monroe County.

NAICS Code	Industry Code Description	Non-Employer Firms	Non-Employer Receipts ($1,000)	Employer Establish-ments	No. of Employees	Annual Payroll ($1,000)
11	Forestry, fishing, hunting & ag. support	992	34,476	16	20 - 99	*
21	Mining	5	160	1	0 - 19	*
22	Utilities	9	1,254	2	100 - 249	*
23	Construction	1,177	82,123	359	1,693	55,733
31	Manufac-turing	107	5,337	80	338	9,652
42	Wholesale trade	136	15,495	112	480	18,964
44	Retail trade	601	44,847	723	6,422	145,298
48	Trans. & warehousing	393	19,220	141	942	25,076
51	Information	91	3,781	53	504	21,220
52	Finance & insurance	301	28,942	152	953	38,252
53	Real estate & rental & leasing	1,766	154,010	355	1,031	30,557
54	Professional, sci. & tech. services	1,219	68,691	334	1,320	51,592
55	Management of comps. & enterprises	0	0	6	91	5,136
56	Admin, support, waste mgt, remediation services	895	33,503	192	796	21,627
61	Ed. services	104	2,520	33	222	6,860
62	Health care & social assistance	421	21,970	214	2,373	97,625
71	Arts, entertain-ment & recreation	866	41,944	135	1,103	24,086
72	Accommoda-tion & food	255	41,226	523	10,852	210,466

NAICS Code	Industry Code Description	Non-Employer Firms	Non-Employer Receipts ($1,000)	Employer Establish-ments	No. of Employees	Annual Payroll ($1,000)
	services					
81	Other services (except public adm.)	1,362	43,583	308	1,331	29,204
99	Unclassified establish-ments	0	0	7	0 - 19	*
	TOTAL	10,700	643,082	3,746	30,631	
* : Figure not disclosed.						

Source: U.S. Census, 2005 County Business Patterns and Nonemployer Statistics.

The Monroe County Tourist Development Council estimates more than 3.49 million people visited the County in 2003 and 3.2 million visited the Florida Keys in 2006. Of visitors surveyed from March 2005 through February 2006, 80% were in the Florida Keys for recreation or vacation purposes. Of those surveyed, about 84% reported beach activities, 75% viewing wildlife, 57% diving and snorkeling, and 30% fishing as activities they participated in during their visit (Table 3.1.1.7).

Table 3.1.1.7. Recreational activities of Florida Keys visitors, March 2005 – February 2006.

Recreational Activity	Frequency	% of Responses	% of Cases
Diving	548	3.2	18
Snorkeling	1,171	6.8	38.6
Fishing	913	5.3	30.1
Viewing Wildlife	2,260	13.1	74.5
Boating	1,390	8.1	45.8
Beach Activities	2,547	14.8	83.9
Dine Out/Night Life	2,879	16.7	94.9
Museums/Historic Areas	1,659	9.6	54.7
Sightseeing & Attractions	2,727	15.8	89.9
Cultural Events	1,170	6.8	38.5
Total	17,264	100	

Source: Monroe County Tourist Development Council, Visitor Profile Survey.

In 2002, there were 42 business establishments in the Charter-Fishing and Party-Fishing-Boats subsector (NAICS 4872102) with total annual revenue of about $5.5 million and 73 employees (U.S. Census, 2002 Transportation and Warehousing Subject Series). That

same year there were 23 establishments in the Excursion-and Sightseeing-Boats subsector (NAICS 4872101) with total annual revenue of $17.3 million and 224 employees.

Leeworthy and Wiley (2002) estimate for the time period of June 2000 through May 2001, the general visitor population spent over 12.1 million person days in Monroe County.

From March 2005 to February 2006, 82% of those who visited the Keys arrived by automobile, 16% by air, and 2% by other means (Monroe County Tourist Development Council, Visitor Profile Survey). The Port of Key West is a small port; however, it serves cruise ships with itineraries in the Eastern and Western Caribbean and the Bahamas. The Key West Chamber of Commerce estimates 881,183 cruise passenger arrivals in the Port of Key West in 2006, up from 656,866 in 2000 (**www.keywestchamber.org/cominfo/trends.pdf**). In 2006, imports with a value of $36,283 and exports with a value of $11.7 million transited through the Port of Key West. There are two commercial airports in the Florida Keys: Key West International Airport and Florida Keys Marathon Airport. Key West International Airport had 276,154 arrivals in 2006, up from 275,386 in 2000 and remains the Keys primary airport for commercial activity. At present, only one commercial carrier, Delta Airlines, serves the Marathon Airport, and on July 13, 2007, the airline announced that it was suspending flights to the airport.

Fishing is another sector that is important to the Monroe County economy. In 2005, there were 971 nonemployer firms with annual receipts of $34.5 million in the fishing sector (NAICS 1141), which represent 9.1% of all nonemployer firms and 5.4% of annual receipts for all nonemployer firms in the County that year.

Miami-Dade (Dade) County

Dade County ranks second in the state in commercial landings of Caribbean spiny lobster, averaging over 6% of Florida's annual landings, and the two counties combined produce 96% of the state's commercial landings (Table 3.1.1.8). Over 15% of FL trap-tag certificates are held by individuals in Dade County (Table 3.1.1.9).

Table 3.1.1.8. Dade County Landings of Caribbean Spiny Lobster, 1994 – 2006.

Year	County Landings (lbs)	FL Landings (lbs)	County Portion of FL Landings
1994	611,769	7,087,357	8.63%
1995	511,983	7,001,661	7.31%
1996	456,166	7,865,678	5.80%
1997	429,838	7,107,684	6.05%
1998	377,816	5,831,407	6.48%
1999	512,157	7,578,321	6.76%
2000	328,144	5,763,470	5.69%
2001	215,947	3,405,509	6.34%
2002	242,047	4,483,426	5.40%
2003	273,557	4,268,277	6.41%
2004	329,370	4,983,400	6.61%
2005	197,510	3,365,221	5.87%
2006	276,701	4,755,048	5.82%
Average	*366,385.00*	*5,653,573.77*	*6.40%*

Source: FL Fish and Wildlife Conservation Commission, Marine Fisheries Information System.

Table 3.1.1.9. Dade County Trap Tag Certificates and Endorsements, 2006 – 2008.

2006			
	County	State	% State
Endorsement Holders	217	1,402	15.48%
Endorsement Accounts	112	615	18.21%
Endorsements Issued	255	1,638	15.57%
Revenue Collected	$28,850	$182,050	15.85%
Trap Tag Certificates	71,087	485,709	14.64%

2007			
	County	State	% State
Endorsement Holders	219	1,303	16.81%
Endorsement Accounts	118	582	20.27%
Endorsements Issued	253	1,512	16.73%
Revenue Collected	$28,500	$167,700	16.99%
Trap Tag Certificates	74,166	473,943	15.65%

2008			
	County	State	% State
Endorsement Holders	207	1,241	16.68%
Endorsement Accounts	105	550	19.09%
Endorsements Issued	246	1,443	17.05%
Revenue Collected	$27,525	$160,200	17.18%
Trap Tag Certificates	78,472	475,320	16.51%

Dade County has a total area of 6,297 km^2 (2,431 square miles), with 5,040 km^2 being land and the remaining 1,257 km^2 (about 20 %) being water (U.S. Census Bureau). Most of the area of water is Biscayne Bay, and another significant portion is adjacent waters of the Atlantic Ocean. Among its cities are Miami, Miami Beach, Coral Gables, and Key Biscayne (Figure 3.1.1.6).

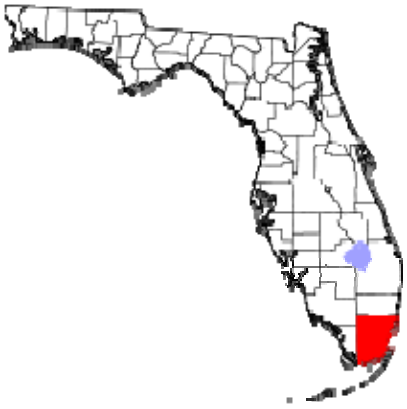


Figure 3.1.1.6. Dade County.
Image Source: Wikipedia.

Dade County is the most populous county in Florida and the 8th most populous county in the nation. According to U.S. Census Bureau estimates, the population of the County grew 6.6% from April 1, 2000 to July 1, 2006, with approximately 2.4 million people in 2006. During that same period, the natural increase in population was 87,668 (204,079 births less 116,411 deaths) and net migration was 66,896 (257,492 net international migration less the 190,596 net internal out-migration). The number of housing units also increased from 852,414 in 2000 to 928,715 in 2005, an increase of about 9%. Median household income in 2004 was $34,682 and 17.1% of the persons in the county lived below poverty, in comparison to the statewide median household income of $40,900 and poverty rate of 11.9%.

Tourism is an important sector to the County economy and is the largest sector of Miami's economy. According to the Greater Miami Convention and Visitors Bureau, in 2007, 12 million overnight visitors spent $17.1 billion, an increase of $1.7 billion since 2005. Overnight visitors generated an economic impact of $13.9 billion. The Dante B. Fascell Port of Miami-Dade ranks as the world's busiest cruise/passenger port in the world. In 2006, over 3.7 million cruise passengers passed through and over 9 million tons of cargo transited through the port (Port of Miami). The combination of cruise and cargo activity supports about 98,000 jobs and generates an economic impact of $12 billion. Miami International Airport (MIA) handled 32.5 million passengers in 2006 (MIA website). Among U.S. airports, MIA ranks first in international freight, third in international passengers, and fourth in total freight.

In 2005, the County had 381 employer establishments in the industry subsector Traveler Accommodation (NAICS 7211) with 25,226 employees; 12 employer establishments in RV (Recreational Vehicle) Parks and Recreational Camps with 39 employees (U.S. Census Bureau, 2005 County Business Patterns). That same year there were 290 non-employer firms in Traveler Accommodation with annual sales of about $27.7 million and 14 non-employer firms in RV Parks & Recreational Parks with annual sales of $284,000 in the County (U.S. Census, 2005 Nonemployer Statistics). The largest sector by number of employees is Retail Trade (NAICS 44), which is followed by Health Care & Social Assistance (NAICS 62), Administrative and Support and Waste Management and Remediative Services (NAICS 56), Professional, Scientific & Technical Services

(NAICS 54), and so on (Table 3.1.1.10). Among nonemployers, the largest sector is Real Estate and Rental and Leasing (NAICS 53), which is followed by Professional, Scientific & Technical Services, Other Services (Except Public Administration), Construction, and so forth (Table 3.1.1.11).

Table 3.1.1.10. 2005 Nonemployer and employer construction statistics, Dade County.

Industry Code	Industry Code Description	Non-Employer Firms	Non-Employer Receipts ($1,000)	Employer Establish-ments	No. of Employees
23	Construction	30,690	1,165,256	4,618	38,417
236	Construction of buildings	5,622	290,129	1,317	10,422
2361	Residential construction	4,601	240,578	1,054	6,278
2362	Nonresiden-tial construc.	1,021	49,551	263	4,124
237	Heavy and civil engineering construction	630	28,338	374	4,800
2371	Utility system construction	121	3,664	65	974
2372	Land subdivision	92	9,868	223	1,017
2373	Highway, street, and bridge construction	85	2,879	58	2,452
2379	Other heavy and civil engineering construction	332	11,927	28	357
23799	Other heavy and civil engineering construction	332	11,927	28	357
238	Specialty trade contractors	24,438	846,789	2,927	23,195

Source: U.S. Census Bureau, 2005 County Business Patterns and Nonemployer Statistics.

Table 3.1.1.11. 2005 Nonemployer and employer business statistics, Miami-Dade County.

NAICS Code	Industry Code Description	Non-Employer Firms	Non-Employer Receipts ($1,000)	Employer Establish-ments	No. of Employees	Annual Payroll ($1,000)
11	Forestry, fishing, hunting & ag. support	1,015	38,961	35	500 - 999	*
21	Mining	38	2,187	29	1,073	62,003
22	Utilities	274	3,944	29	2,500 - 4,999	
23	Construction	30,690	1,165,256	4,618	38,417	1,482,470
31	Manufac-turing	3,669	212,073	2,378	46,621	1,561,117
42	Wholesale trade	7,658	814,973	8,514	67,342	2,884,026
44	Retail trade	16,420	765,506	10,335	118,182	2,870,980
48	Trans. & warehousing	23,596	1,000,767	2,725	51,193	1,936,735
51	Information	3,457	152,330	1,444	21,956	1,283,285
52	Finance & insurance	9,005	561,580	4,728	47,057	2,889,919
53	Real estate & rental & leasing	33,897	2,666,341	4,950	23,462	1,055,582
54	Professional, scientific & tech. serv.	31,153	1,381,648	11,047	60,355	3,488,485
55	Management of comps. & enterprises	*	*	291	17,005	1,311,656
56	Admin, support, waste mgt, remediation services	29,597	550,415	3,489	76,326	2,301,355
61	Ed. services	3,719	63,432	727	28,162	1,019,920
62	Health care & social assistance	26,415	905,533	7,715	114,198	4,439,517
71	Arts, entertain-ment & recreation	8,962	280,307	971	12,553	378,867

NAICS Code	Industry Code Description	Non-Employer Firms	Non-Employer Receipts ($1,000)	Employer Establish-ments	No. of Employees	Annual Payroll ($1,000)
72	Accommoda-tion & food services	3,906	208,302	4,188	89,680	1,506,700
81	Other services (except public adm.)	62,985	1,270,636	5,895	38,989	884,694
99	Unclassified establish-ments	0	0	158	100 - 249	*
	TOTAL	296,456	12,044,191	74,266	858,080	
*:	Figure not disclosed.					

Source: U.S. Census, 2005 County Business Patterns and Nonemployer Statistics.

Palm Beach County

Palm Beach County ranks third in the state's commercial landings of Caribbean spiny lobster, averaging over 1% of FL's landings (Table 3.1.1.12).

Table 3.1.1.12. Palm Beach County commercial landings of Caribbean spiny lobster, 1994 – 2006.

Year	County Landings (lbs)	FL Landings (lbs)	County Portion of FL Landings
1994	73,037	7,087,357	1.03%
1995	72,546	7,001,661	1.04%
1996	77,906	7,865,678	0.99%
1997	61,941	7,107,684	0.87%
1998	66,251	5,831,407	1.14%
1999	94,843	7,578,321	1.25%
2000	115,767	5,763,470	2.01%
2001	64,776	3,405,509	1.90%
2002	51,519	4,483,426	1.15%
2003	51,009	4,268,277	1.20%
2004	56,652	4,983,400	1.14%
2005	54,297	3,365,221	1.61%
2006	63,052	4,755,048	1.33%
Average	*69,507.38*	*5,653,573.77*	*1.28%*

Source: FL Fish and Wildlife Conservation Commission, Marine Fisheries Information System.

Palm Beach County is the largest county in the state by size with a total area of 6,181 km^2 (2,386 square miles), with 5,113 km^2 being land and the remaining 1,068 km^2 (about

17.3%) being water, much of which is in the Atlantic Ocean and Lake Okeechobee (U.S. Census Bureau). It has 47 miles of coastline (Figure 3.1.1.7).

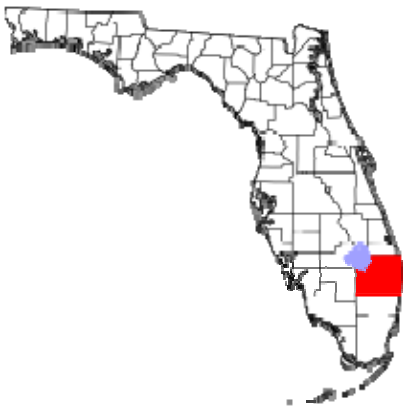


Figure 3.1.1.7. Palm Beach County, Florida.
Image Source: Wikipedia.

The U.S. Census Bureau estimates the population of Palm Beach County grew over 12% from 2000 to 2005, with approximately 1.27 million people in 2005. The County's population growth has been dominated by in-migration from other parts of the country. From April 1, 2000 to July 1, 2006, it is estimated that there was a natural increase in the population of 6,431 (91,093 births less 88,806 deaths) and net migration of 139,754 (50,948 from net international migration plus 88,806 from net internal migration). Much of the population growth is attributable to the County being a popular destination for retirees. About 21% of the County's population was 65 years and over in 2005, as compared to that age group representing about 12% of the U.S. population and approximately 17% of Florida's population that year. Accompanying the increase in population has been an increase in employment. From 2000 to 2004, there was an increase of 77,553 full- and part-time jobs (U.S. Bureau of Economic Analysis). The increases in population and employment have generated increases in demand for homes, commercial and institutional buildings, and infrastructure. Median household income in the county in 2004 was $44,186 and 10.1% lived below poverty, as compared to the statewide median household income of $40,900 and poverty rate of 11.9%.

The three major multi-billion dollar industries in the county are tourism, construction, and agriculture, with tourism being number one (Palm Beach County government website, www.pbc.com/publicaffairs/facts1.htm). In 2004, over 7.2 million people visited the county, which supported $1.51 billion in wages and 7% of the jobs and generated an economic impact of $2.83 billion (Palm Beach County Tourist Development Council).[3]

In 2005, the top three industrial sectors by number of employees were Retail Trade (NAICS 44), Health Care & Social Assistance (NAICS 62), and Accommodation & Food

[3] A hotel visitor survey has found that the climate/weather, beaches/ocean, and beautiful area are what visitors like best about Palm Beach County (Palm Beach County Tourist Development Council).

Services (NAICS 72), the latter being a principal component of tourism (Table 3.1.1.13). In 2005, the County had 154 employer establishments in the industry subsector Traveler Accommodation (NAICS 7211) with 5,000 to 9,999 employees; 14 employer establishments in RV (Recreational Vehicle) Parks and Recreational Camps with 63 employees (U.S. Census Bureau, 2005 County Business Patterns. That same year there were 229 non-employer firms in Traveler Accommodation with annual sales of about $27.3 million and 10 non-employer firms in RV Parks & Recreational Parks with annual sales of over $1 million in the County (U.S. Census, 2005 Nonemployer Statistics). Other important industrial sectors of the County economy include Professional, Scientific & Technical Services (NAICS 54), Retail Trade (NAICS 44), and Health Care and Social Assistance (NAICS 62).

Table 3.1.1.13. 2005 Nonemployer firms and employer establishments, Palm Beach County.

NAICS Code	Industry Code Description	Non-Employer Establish-ments	Non-Employer Receipts ($1,000)	Employer Establish-ments	No. of Employees	Annual Payroll ($1,000)
11	Forestry, fishing, hunting & agricultural support	636	27,851	78	1,398	20,666
21	Mining	18	1,971	24	234	12,828
22	Utilities	48	1,813	30	3,969	412,927
23	Construction	10,593	688,604	4,266	37,576	1,544,242
31	Manufacturing	1,221	74,104	975	15,769	753,088
42	Wholesale trade	2,793	251,624	2,436	19,902	1,052,622
44	Retail trade	7,849	453,732	5,458	73,486	1,831,500
48	Transportation & warehousing	4,172	215,349	773	8,935	326,350
51	Information	1,577	83,540	738	15,530	770,340
52	Finance & insurance	7,523	603,238	3,175	25,748	1,934,633
53	Real estate & rental & leasing	21,153	1,774,645	2,766	14,731	636,205
54	Professional, scientific & technical services	17,586	946,661	6,746	36,406	2,206,725
55	Management of companies & enterprises			217	16,799	1,268,578
56	Admin, support, waste mgt, remediation services	9,542	291,528	3,000	43,417	1,316,027

61	Educational services	2,106	43,080	469	9,864	301,140
62	Health care & social assistance	9,958	367,559	4,511	65,692	2,630,989
71	Arts, entertainment & recreation	4,906	189,810	796	16,627	453,617
72	Accommodation & food services	1,462	121,315	2,478	54,686	853,655
81	Other services (except public adm.)	16,293	554,540	3,625	23,587	564,578
99	Unclassified establishments			87	115	2,561
	TOTAL	119,436	6,690,964	42,648	484,471	18,893,271

Source: U.S. Census Bureau, 2005 County Business Patterns and Nonemployer Statistics.

Broward County

Broward County ranks fourth in annual landings of Caribbean spiny lobster. From 1994 through 2006 its Caribbean spiny lobster landings represented 0.81% of the average annual landings during those years. County landings have dropped since reaching a peak of over 57,000 pounds in 2000 (Table 3.1.1.14).

Table 3.1.1.14. Broward County landings of Caribbean spiny lobster, in pounds, 1994 – 2006.

Year	Spiny Lobster	State Total (lbs)	% of State (lbs)
1994	67,891	7,087,357	0.96%
1995	71,723	7,001,661	1.02%
1996	94,219	7,865,678	1.20%
1997	56,600	7,107,684	0.80%
1998	43,121	5,831,407	0.74%
1999	50,921	7,578,321	0.67%
2000	53,619	5,763,470	0.93%
2001	57,617	3,405,509	1.69%
2002	25,394	4,483,426	0.57%
2003	16,711	4,268,277	0.39%
2004	28,664	4,983,400	0.58%
2005	21,067	3,365,221	0.63%
2006	16,435	4,755,048	0.35%
Average	46,460.15	*5,653,573.77*	*0.81%*

Source: Florida FWC.

Broward County has a total area of 3,418 km^2 (1,320 square miles), with 3,122 km^2 being land and the remaining 296 km^2 (about 9 %) being water (U.S. Census Bureau). Approximately 64% of the county's total area lies within the Everglades conservation area, and development is restricted to 410 square miles (Broward County Planning Services Division). Major Cities include Coral Springs, Fort Lauderdale, Hollywood and Pembroke Pines (Figure 3.1.1.8).

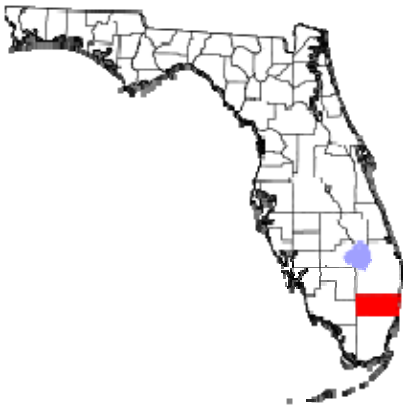


Figure 3.1.1.8. Broward County.
Image Source: Wikipedia.

Broward County is the second most populated county in Florida and is the 15th most populous county in the nation. According to U.S. Census Bureau estimates, the population of Broward County grew 10.1% from April 1, 2000 to July 1, 2006, with

approximately 1.79 million people in 2006. During that same period, the natural increase in population was 43,623 (142,787 births less 99,164 deaths) and net migration was 120,768 (100,986 net international migration plus 19,782 net internal migration), for a total increase of 164,391 people. The increase in population has resulted in increased demand for homes, retail and commercial buildings and infrastructure. Housing units increased from 741,043 in 2000 to 790,308 in 2005, an increase of less than 7% (U.S. Census). Median household income in the county in 2004 was $43,136 in 2004 and 11.6 % of the persons in the county lived below poverty, as compared to the statewide median household income of $40,900 and the poverty rate of 11.9%.

Service industries and retail trade dominate the county's economic environment. In 2005, there were more establishments in the Professional, Scientific & Technical Services sector (NAICS 54) than any other sector, and there were more paid employees in Retail Trade than any other sector (Table 3.1.1.14).

Tourism's contribution is significant. In 2005, the county had a record of over 10 million visitors, a 6.3% increase from 2004 (Broward County Department of Urban Planning and Redevelopment, 2006). Tourism generates more than $8.4 billion and employs more than 112,000 people in the county. In 2005, Fort Lauderdale-Hollywood International Airport's over 22 million passengers broke the previous year's record of travelers passing through the facility.

In 2005, the County had 344 employer establishments in the industry subsector Traveler Accommodation (NAICS 7211) with 10,000 to 24,999 employees; 15 employer establishments in RV Parks and Recreational Camps (NAICS 7212) with 20 to 99 employees (U.S. Census Bureau, 2005 County Business Patterns). That same year there were 318 non-employer firms in Traveler Accommodation with annual sales of about $23.8 million and 17 non-employer firms in RV Parks & Recreational Parks with annual sales of $486,000 in the County (U.S. Census, 2005 Nonemployer Statistics).

Table 3.1.1.14. 2005 Nonemployer and employer business statistics, Broward County.

NAICS Code	Industry Code Description	Non-Employer Firms	Non-Employer Receipts ($1,000)	Employer Establish-ments	No. of Employees	Annual Payroll ($1,000)
11	Forestry, fishing, hunting & agricultural support	467	20,022	50	100 - 249	*
21	Mining	18	2,536	9	133	11,972
22	Utilities	87	4,369	26	500 - 999	*
23	Construction	15,482	824,796	4,729	45,489	1,915,366
31	Manufacturing	1,791	118,443	1,679	29,655	1,160,990
42	Wholesale trade	4,383	439,736	4,710	41,514	1,976,541
44	Retail trade	11,293	579,188	7,374	102,197	2,625,584
48	Transportation & warehousing	7,821	382,114	1,346	21,480	811,196
51	Information	2,504	106,506	1,117	19,503	1,123,875
52	Finance & insurance	7,825	487,869	3,969	40,480	2,335,984
53	Real estate & rental & leasing	25,240	1,843,848	3,670	18,422	704,456
54	Professional, scientific & technical services	22,385	1,035,758	9,187	41,852	2,212,225
55	Management of comps. & enterprises	*	*	273	10,999	983,114
56	Admin, support, waste mgt, remediation services	14,601	386,155	3,869	65,367	1,833,766
61	Ed. services	2,782	55,593	603	15,046	450,758
62	Health care & social assistance	17,572	544,595	5,496	84,111	3,212,404
71	Arts, entertainment & recreation	6,714	222,151	960	9,728	316,824
72	Accommodation & food services	2,312	155,492	3,568	68,512	1,016,954
81	Other services (except public adm.)	27,791	808,376	4,847	30,422	753,542
99	Unclassified establishments	*	*	140	176	4,134
	TOTAL	171,068	8,017,547	57,622	646,067	23,509,177
*	Figure not disclosed.					

***Source*: U.S. Census, 2005 County Business Patterns and Nonemployer Statistics.**

Port Everglades infuses more than $2.4 billion annually to the county's economy (ibid). It handles about 4 million cruise passengers and over 26 million tons of cargo annually, and nearly 6,400 cargo and cruise ships call at the port each year (ibid). According to Broward County Department of Urban Planning and Redevelopment, Port Everglades has been ranked as one of the five fastest growing container ports among the nation's 20 largest seaports. It handles more than 22.1% of the entire state of Florida's waterborne imports and exports.

Fishing is another sector that is important to the Broward County economy, and coral reefs are important habitat for species targeted by commercial and recreational fishermen. In 2002, there were 26 business establishments in the charter-fishing-&-party-fishing-boat subsector (NAICS 4872102) in the County (2002 Economic Census, Transportation and Warehousing Subject Series).

3.1.2 Recreational Fishery

Introduction

Like the commercial fishery, the recreational fishery is concentrated along the Florida Keys. In 2008, for example, approximately 63.5% of the 962,000 lobsters that were harvested during the two-day sport season and first month of the regular season were harvested in the Keys, and approximately 35.9% (345,000) were harvested in the southeast coast of the state. See Figure 3.1.2.1. Less than 1% as harvested elsewhere in the state. Approximately 60% of the statewide effort is located in the Florida Keys (Florida Fish and Wildlife Conservation Commission 2002).

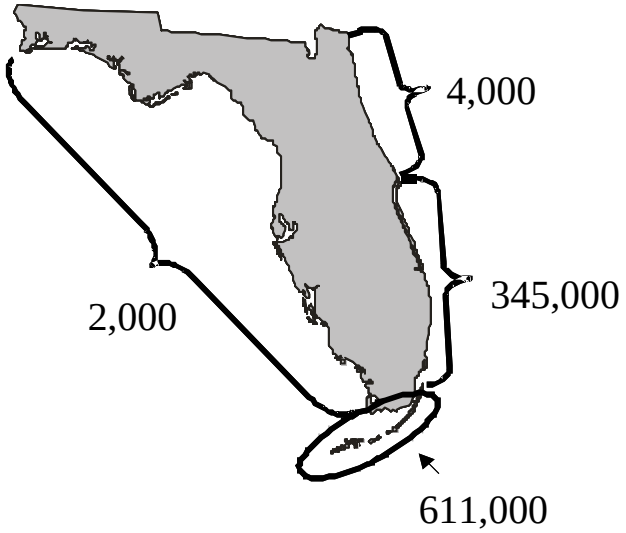


Figure 3.1.2.1. Preliminary estimate of numbers of lobsters landed by recreational lobster fishers during the 2008 Special Two-Day Sport Season and first month of the regular lobster fishing season.
Source: Florida Fish & Wildlife Conservation Commission, Florida Fish & Wildlife Research Institute.

The large majority of recreational landings are taken by divers who tend to target spiny lobster in similar areas as commercial divers. However, recreational lobster divers are more frequently found on the Gulf side of the Florida Keys than their commercial counterparts because the water is shallower and ocean conditions are milder on the Gulf side. Little fishing effort occurs north of Monroe County on the Gulf side. The recreational fishery is largely observed from docks, boats, residential properties, and numerous other places along the Florida Keys and southernmost counties where a diver can get into the water from shore or from boats or platforms where an individual can use a bully or hoop net. The geographic variability has made the inclusion of spiny lobster in the Marine Recreational Fisheries Statistics Survey (MRFSS) cost prohibitive. There has been and continues to be no evidence of subsistence fishing for spiny lobster (SAFMC & GFMC 1982: p. 8-3).

The recreational spiny lobster fishing season has two parts: a two-day sport season that occurs before commercial spiny lobster fishers place their traps in the water and a regular season that coincides with the commercial fishing season. The two-day sport season has been and remains popular as illustrated by a July 28, 1991, article in the *St. Petersburg Times* that concerns "lobstermania" and a July 30, 2009, *Miami Herald* article with the title, "Lobster hunters turn out in droves for Florida mini-season." Recreational spiny lobster fishers individually spend hundreds of dollars for fuel, ramp fees, food, beverages, scuba, snorkeling and hooking equipment and licenses annually. At the same time, however, there have been and continue to be residents and business and commercial interests in the Keys who favor abolishing the sport season. Processors are among those who are critical of the sport season. Shivlani *et al*. (2004) reported that 11% of the processors that they interviewed blamed the sport season for declining commercial landings.

Mail surveys of Florida's recreational lobster permit holders indicate that they fish only a few days each fishing season. Ninety-five percent fish 10 days or less, 59% fish 4 days or less, and 30% fish 1 or 2 days (FFWCC 2006a).

The commercial and regular recreational fishing season for spiny lobster in the EEZ off Florida and the EEZ off the Gulf States, other than Florida, begins on August 6 and ends on March 31 (50 CFR §640.20(b)). No person may possess a Caribbean spiny lobster in or from the Gulf and South Atlantic EEZ with a carapace length of 3.0 inches (7.62 cm) or less or a separated tail with a length less than 5.5 inches (13.97 cm) (50 CFR §640.21(b)).

Brief Relevant Regulatory History

The popularizations of scuba and hookah diving and development of small fiberglass pleasure boats in the 1950s and 1960s increased recreational access to the spiny lobster fishery. Fiberglass boats had many advantages over wooden boats. First, the average retail price of a fiberglass boat was significantly less than the price of a similarly sized wooden boat because fiberglass boats could be constructed faster and cheaper. Second, because the hulls of fiberglass boats were lighter than those of comparably sized wooden boats, fiberglass boats could be powered by smaller engines or outboard motors, which were less costly. Third, the location of outboard motors at the back of the boat increased the rate of speed that a boat could travel because inboard motors were at the middle of the boat giving it a more forward center of gravity that slowed the boat. Fourth, smaller fiberglass boats could be towed on a trailer and didn't require a marina or dock space for storage. Recreational fishers could now trailer their boats, and get to and from fishing areas faster and with less costly boats.

Recreational diving for lobsters and associated tourism increased in the Florida Keys in the 1960s (Labisky *et al*. 1980). By the early 1970s, there were increasing conflicts between Florida's commercial fishers and recreational divers who harvested spiny lobster, so in 1975 the state enacted legislation that created the Special Two-Day Sport Season, which was originally established as July 20 and 21 of each year before the regular season began on July 26. Another purpose of the sport season was to increase

tourism in the Keys, which in the early to mid 1970s was experiencing an economic downturn (Shivlani 2009). By the early 1980s free divers taking lobsters by hand accounted for most of the recreational catch. Divers from the outside of southern Florida generally used charter or party boats. The charter boats were typically hired by diving clubs, while party boats operated out of dive shops along the Florida Keys. Those boats carried from 30 to 50 divers and had a commercial lobster license that allowed for the combined harvests of the divers.

The Gulf and South Atlantic Spiny Lobster FMP was implemented on July 26, 1982 (47 *Federal Register (FR)* 29203). The federal FMP, for the most part, extended Florida's rules of regulating the fishery to the EEZ throughout the range of the fishery. Among the regulations that affected recreational fishers were the minimum size standard; specification of a closed season from April 1 through July 25; prohibition against taking lobsters in the EEZ with spears, hooks or similar devices or gear containing such devices; establishment of a Special Two-Day Sport Season during the first full weekend before the trap-soaking period; prohibition on taking or possessing berried lobsters; and specification of a recreational catch limit during the Special Two-Day Sport Season, but no such limit during the regular season. Recreational fishers could not use traps during the sport season.

A number of the federal FMP's regulations differed from Florida's and resulted in a burden to the recreational fishers and/or hindered management efforts (GFMC and SAFMC 1987). First, the federal and state bag limits differed. The state had a recreational possession limit of 24 lobsters per day per boat during the regular season, while federal regulation had no limit during the regular season. Also, the state had a possession limit of 6 lobsters per person per day during the two-day sport season, while in federal waters the possession limit was 24 lobsters per boat per day during the two-day sport season. The lack of a consistent recreational daily bag limit challenged Florida's enforcement efforts to prevent trap poaching. Those with more than 24 lobsters on the boat during the regular season or with more than 6 lobsters per person per day during the two-day sport season could claim the catch came from federal waters, whether true or not. Without direct observation by a law enforcement official, it was impossible to determine the catch site of a given spiny lobster. Second, the federal two-day sport season did not occur at the same time as Florida's two-day sport season, which also hindered law enforcement efforts. The federal sport season was the weekend before the "soak period," whereas the state sport season was July 20 and 21.

The federal FMP was amended for the first time in 1987 (Amendment 1). A recreational possession limit of 6 lobsters per person per day was established for spiny lobster fishing during the regular and two-day sport seasons. The replacement of the vessel limit during the two-day sport season and with a personal bag limit was expected to benefit charter operations. Also, the timing of the Special Two-Day Sport Season was changed by one to two weeks to the first full weekend prior to August 1 beginning with the 1988-89 fishing season. This change resulted in the federal and state two-day sport seasons being at the same time for the first time. The closed season was delayed and changed to the 5-month period from April 1 to August 5 each year. Also among the changes was the

requirement that recreational fishers, who take spiny lobster in the EEZ, have a Florida recreational fishing license once the state required such a license to fish for spiny lobster in state waters. Amendment 1 noted competition between commercial and recreational fishers had intensified. In 1987, anyone could enter the federal fishery at no cost and the state commercial fishery for a $50 permit fee. During the 1986-87 fishing season, over 4,000 state commercial permits were issued, although only approximately 600 commercial vessels were in the fishery (GFMC and SAFMC 1987). Amendment 1 also established minimum size standards that prohibited taking of spiny lobsters with a carapace of 3.0 inches or less and, if the tail is separated from the carapace, a tail of less than 5.5 inches; however, separation in the EEZ was limited to permitted commercial fishers.

The Florida Marine Fisheries Commission (FMFC) adopted its first fisheries management plan (state FMP) for spiny lobster on July 2, 1987. For the most part, the management plan continued existing practices. A recreational bag limit of six lobsters per person per day was established for both the regular and two-day sport seasons. In 1987, the sport season was switched to the last weekend in July.

The federal FMP was amended a second time in 1989 (Amendment 2) with the purpose of providing a regulatory amendment procedure for instituting compatible Florida and federal rules without amending the FMP. Complementing Florida regulation was and is necessary because the directed spiny lobster fishery occurs entirely within or off Florida waters. Amendment 3 was implemented on March 25, 1991 (56 *FR* 12357) and contained provisions for adding a scientifically measurable definition of overfishing; an action plan to prevent overfishing, should it occur; and the requirement for collection of fees for the administrative cost of issuing permits.

In November 1990, Congress passed the Florida Keys National Marine Sanctuary and Protection Act that established the Florida Keys National Marine Sanctuary (FKNMS) (Pub.L 101-605). The FKNMS is comprised of 9,660 square kilometers (about 2,900 square nautical miles) of coastal waters off the Florida Keys. It extends approximately 220 miles southwest of the southern tip of the Florida peninsula and includes the world's third largest coral barrier reef. Within the Sanctuary are 24 no-take zones. Fifty-eight percent of the Sanctuary resides in Florida waters and 48% is in federal waters. Both NOAA and the State of Florida manage the Sanctuary. The waters of the FKNMS are within the jurisdiction of both the South Atlantic and Gulf of Mexico fishery management councils. Lobster fishing is prohibited in the following no-take areas of the FKNMS: Carysfort Reef, Elbow, Key Largo Dry Rocks, Grecian Rocks, French Reef, Molasses Reef, Conch Reef, Hen and Chicken, Davis Reef, Cheeca Rocks, Alligator Reef, Tennessee Reef Research Only, Coffins Patch, Sombrero Key, Newfound Harbor, Looe Key Research Only, Looe Key, Eastern Sambo, Western Sambo, Eastern Dry Rocks, Rock Key, Sand Key, and Tortugas. See Figure 3.1.2.2. No lobster fishing is allowed in the John Pennekamp Coral Reef State Park during the Special Two-Day Sport Season. During the regular season, no person can harvest lobster from or within any coral formation (patch reef). Lobster fishing is also prohibited in artificial habitat in Florida waters, Biscayne Bay/Card Sound Spiny Lobster Sanctuary, Everglades National

Park, and Dry Tortugas National Park. Biscayne Bay National Park includes approximately 173,000 acres in Miami-Dade County and is about 22 miles long. The park extends from shore to about 14 miles to the 6-foot contour and contains about 72,000 acres of coral reefs.

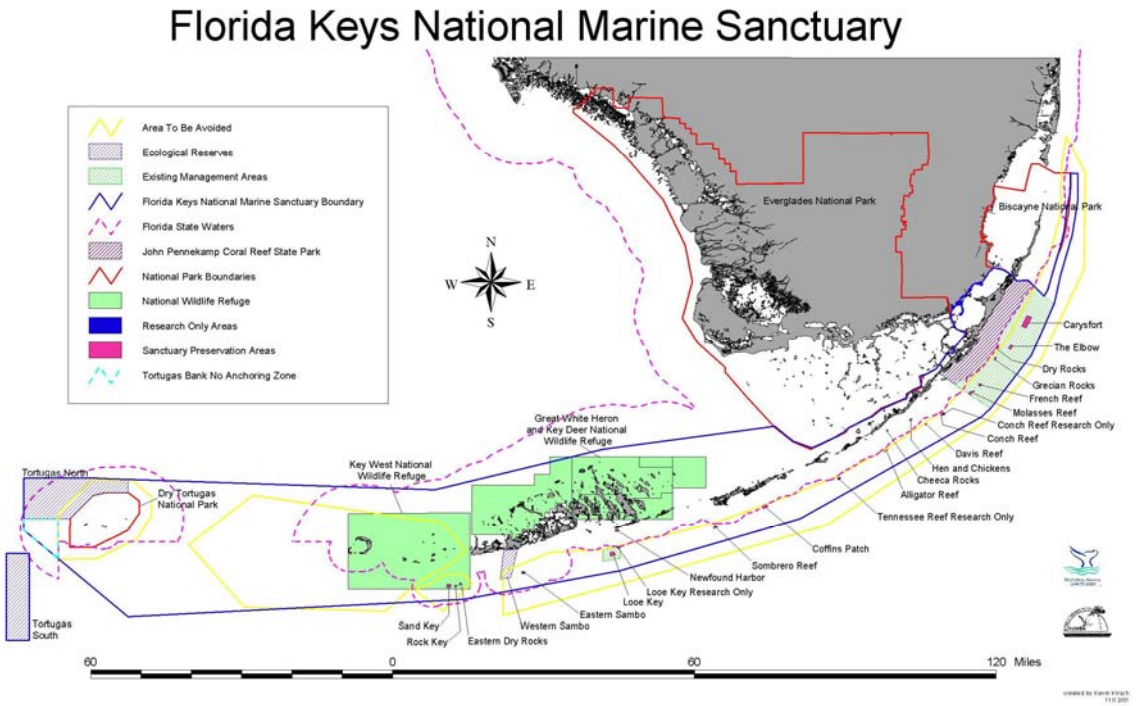


Figure 3.1.2.2. Florida Keys National Marine Sanctuary.

Until 1991, the recreational spiny lobster fishery had been an open-access fishery managed through a personal daily bag limit, a closed season and gear restrictions. There was no institutional mechanism to estimate the number of recreational spiny lobster fishers and their landings.

Florida instituted a recreational spiny lobster permit/license in 1991, which was purchased as an additional endorsement to the state's saltwater fishing license. That same year, the state began to use two annual mail surveys of persons with a recreational lobster permit to estimate the number of persons who harvested lobsters under the permit and their landings of lobsters during the Special Two-Day Sport Season and from opening day to the first Monday in September of the regular fishing season. Reviews of the 1991 survey resulted in several modifications that are seen in the 1992 survey and thereafter.

By 1991, the popularity of the two-day sport season during the last weekend in July was so great that the St. Petersburg Times described it as "lobstermania." The large number of participants in the sport season "created extensive problems that lead to a general consensus by the county commission and Key West Chamber of Commerce that the [sport] season should be abolished or otherwise modified to spread out recreational fishing over a longer period" (GFMC and SAFMC 1993: 2). Significant numbers of

Keys residents and businesses also supported the elimination or modification of the two-day sport season. Among the problems were: 1) the inability of law enforcement to function effectively in the face of overwhelming effort, 2) enormous harvester-related traffic congestion (both on land and in the water) and associated safety problems, and 3) a high incidence of resource violations for lobster and other marine species, including unintentional damage to coral. Among the violations cited by law enforcement were taking of undersized lobsters, no dive flags, exceeding the bag limit, and use of prohibited gear. Unsafe practices included, but were not limited to, poor seamanship and diving in heavily traveled boat lanes. Recreational fishers and dive operations, however, strongly supported retention of the sport season, and argued that it contributed significantly to the economy of Monroe County despite its brevity.

In response to growing criticism of the sport season, the FMFC implemented a series of regulatory changes prior to the 1992-93 season that were designed to reduce the growing numbers of fishers traveling to the Keys during the two-day sport season and their associated negative impacts (Sharp *et al*. 2005). The changes included rescheduling the sport season from the weekend to the last Wednesday and Thursday in July, increasing the daily lobster bag limit outside the Florida Keys from 6 to 12 lobsters per person, and banning night diving in the Keys. The timing of the federal two-day sport season, however, did not change and remained to be during the last weekend in July, resulting in two sport seasons.

The Dry Tortugas National Park was established by Congress in 1992 (Public Law 102-525). Possession of Caribbean spiny lobster is prohibited within boundaries of the park unless the individual took the lobster outside the park waters and the person in possession has proper State/Federal licenses and permits (36 CFR § 7.27(b)(4)(i)). The presence of lobster aboard a vessel in park waters, while one or more persons from such vessel are overboard constitutes prima facie evidence that the lobsters were harvested from park waters in violation of the above regulation.

The first Regulatory Amendment to the federal Spiny Lobster FMP was implemented on December 30, 1992 (Regulatory Amendment 1). Regulatory Amendment 1 directly affected recreational fishers by establishing both the possession limit of spiny lobsters by persons diving at night and the requirement that divers measure lobsters without removing them from the water. All of the changes were implemented through the framework procedure of the federal FMP as established by Amendment 2.

The second Regulatory Amendment (Regulatory Amendment 2) was approved in March 1993 and implemented in August 1993 (58 *FR* 38978). Regulatory Amendment 2 addressed: 1) a change in the days for the Special Two-Day Sport Season in federal waters off Florida, 2) a prohibition on night-time harvest off Monroe County, Florida, during that season, 3) specification of allowable gear during that season, and 4) different bag limits during that season off the Florida Keys and federal waters off other areas of Florida. The special two-day sport season in the EEZ off Monroe County was specified as the last consecutive Wednesday and Thursday in July each year to be consistent with the state's season that was set the previous year. Fishing in federal waters during the

special two-day sport season was restricted to diving and the use of bully nets or hoop nets. Recreational bag limits were specified at no more than 6 lobsters per person per day in federal waters off Monroe County and no more than 12 lobsters per person per day in federal waters off other counties of Florida to be consistent with Florida regulations. In 1993, the Florida Fish and Wildlife Commission (FWC) implemented the Lobster Trap Certificate Program to reduce the number of lobster traps allowed in the commercial fishery. Since the initial allocation of certificates, the FWC decreased the number of certificates four times at 10% reductions: 1994, 1995, 1996, and 1999. In 2001, the FWC set the target number of spiny lobster traps at 400,000 and implemented a 4% annual reduction in traps. The FWC suspended the annual trap reduction in 2003. The program resulted in a significant reduction in the annual numbers of traps set and a redistribution of the combined annual catch from commercial trap fishers to commercial and recreational divers during the 1990s and early 2000s. However, it did not result in a redistribution of landings from the commercial sector to recreational sector overall. Estimated recreational landings represented 26% of total landings in the 1993-94 fishing season and 23% in the 2002-03 fishing season (Spiny Lobster Advisory Board, July 20-21, 2005). During that 10-year period, the share of recreational landings varied from 19% to 28% and showed no definitive trend.

Recreational harvesters have included persons who purchased a commercial permit to exceed the bag limit and to use traps (Regulatory Amendment 2, p. 15). Florida's implementation of the restricted species endorsement (RSE) in 1993 for lobsters meant those recreational harvesters were no longer able to exceed the bag limit because they would not meet the qualifications required of the endorsement. On August 5, 1994, the Special Recreational Crawfish License (SRCL) was issued after the implementation of the commercial spiny lobster trap certificate program. The SRCL was intended to reduce the adverse impact on recreational fishers who were commercially licensed and using traps, but were prohibited from using lobster traps because they did not meet the qualifications that were established from the commercial lobster trap certificate program. Recreational fishers with commercial licenses who used traps with few or no reported landings received ten trap tags pursuant to the trap reduction program. SRCLs are no longer issued and cannot be transferred from the original person it was issued to. Moreover, if the SRCL is not renewed every year, the holder loses the license. The SRCL applies to recreational fishers in state, not federal, waters, and does not permit harvesting lobsters during the 2-day sport season.

Amendment 4 of the federal FMP was implemented on September 13, 1995 (60 *FR* 41828). It provided a bag limit of 2 lobsters per day for all fishers in federal waters off North Carolina, South Carolina, and Georgia (50 *CFR* §640.23).

Amendment 5 of the Spiny Lobster FMP was part of the Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region, which NOAA Fisheries Service approved on June 3, 1999. Amendment 6 was part of the Comprehensive Amendment Addressing Sustainable Fishery Act Definitions and Other Required Provisions in FMPs of the South Atlantic Region. NOAA Fisheries Service approved the Comprehensive Amendment in October 1998 and it was

implemented on December 2, 1999 (64 *FR* 59126). Similarly, the Gulf of Mexico Fishery Management Council developed Generic Amendments to address Essential Fish Habitat and Sustainable Fishery Act. The former described the distribution and relative abundance of juvenile and adult spiny lobster for offshore, near-shore, and estuarine habitats of the Gulf; and the latter updated the description of the spiny lobster fisheries and provided fishing community assessment information for Monroe County, Florida. Amendment 7 was implemented under a Generic Amendment that created the two Tortugas Marine Reserves: Tortugas North (120 square nautical miles) and Tortugas South (60 square nautical miles). This amendment prohibits fishing for or possession of spiny lobster in either of the two reserves. It was implemented on July 19, 2002 (67 *FR* 47467).

Sharp *et al*. (2005) contend Florida's regulatory changes combined with subsequent federal regulatory changes have been successful in reducing the adverse impacts caused by the two-day sport season; however, by 2006 there remained political pressure to either end the sport season or further restrict it (Florida FWC 2006c).

Presently, the sport season is scheduled the last consecutive Wednesday and Thursday of July each year, one week before the start of the commercial season. During the Special Two-Day Sport Season, recreational fishers are allowed up to six lobsters per person per day in Monroe County and Biscayne Bay National Park and up to 12 lobsters per person per day in other areas of the state. The bag limit during the regular recreational lobster-fishing season is six lobsters per person per day. During the sport season diving at night for lobster is not permitted in Monroe County or adjacent federal waters. Bully netting and hoop netting are allowed at night. During the regular season, diving at night for lobster is allowed.

A person does not need a saltwater fishing license or spiny lobster permit if s/he is fishing from a for-hire vessel (guide, charter, party boat) that has a valid vessel license in Florida waters (http://myfwc.com/License/LicPermit_RecreationalHF.htm). Hence, there are persons who harvest spiny lobster who do not have a permit and are not included in the official numbers of recreational fishers.

Number and Description of Recreational Fishers

Prior to 1991, the number of recreational spiny lobster fishers was unknown. That changed with the requirement of the Florida Crawfish Stamp (permit) that began with the 1991-92 season, which was purchased as an additional endorsement to the state's recreational saltwater fishing license. The permit provided the Florida Fish and Wildlife Institute (formerly the Florida Marine Research Institute) with a mechanism by which they could monitor the fishery, specifically, the use of two annual mail surveys sent to persons with a lobster license/permit (FWC 2005). The surveys were and are used to estimate the number and landings of lobsters harvested by recreational fishers who take lobsters during the Special Two-Day Sport Season and from opening day to the first Monday in September of the regular recreational fishing season. The survey of recreational fishers who harvest during the regular fishing season focuses on the first month of the season because the majority of recreational fishing effort occurs during the

first month of the season (Sharp *et al*., 2005). As the season progresses, recreational fishers have to move with the migration of the lobsters from shallower to deeper waters. Eventually, the waters are too deep for non-trap fishing (GFMC and SAFMC 1982). In July 1991, 48,760 permits were issued before the two-day sport season that occurred the last weekend in July, and one month later, another 41,785 permits were issued (Tormalin 1991). In total over 120,000 individuals purchased a permit for the 1991-92 fishing season. The mail surveys of permit holders showed that significant numbers of them did not fish. Bertelsen and Hunt (1991) estimated that 38% of the recreational lobster permit holders participated in both the sport and regular seasons in 1990-91. Approximately 60% of permit holders residing in Monroe County fished, while only approximately 3% of holders from the east coast and 1-2% from the Panhandle and west coast fished (Bertelsen and Hunt 1991). It was estimated that approximately 50,000 people fished for lobsters during the opening month of the 1991-92 fishing season.

The first survey of recreational fishers revealed the average fisher was from the late 20s to early 40s years of age and had completed college (GFMC and SAFMC 1993). Twenty-five percent were novices with less than three years fishing experience, while 33% were highly experienced with over 12 years of experience.

One end-of-the-season mail survey was conducted at the conclusion of the 1994 season to obtain an estimate of fishing effort and landings during the lobster fishing season after the first month (Sharp *et al*. 2005). The data from the survey confirmed the belief that recreational fishing effort is predominantly limited to the sport season and first month of the regular season.

During the 1995-96 fishing season, an estimated 36,126 persons harvested spiny lobster in the two-day sport season and 82,869 harvested lobsters during the first month of the regular season (Florida Department of Environmental Protection 1996). Hunt *et al*. estimate that 10,103 persons participated in the federal two-day sport season and 30,166 participated in the state two-day sport season in 1992.

From the 1990-91 to 1994-95 seasons, an average of 110,000 persons have purchased a crawfish permit. The Florida Marine Research Institute (FMRI) included a socioeconomic component in its 1992 recreational lobster survey. Recreational fishers were asked how much they would be willing to pay to avoid a decrease in the bag limits and how much they would be willing to pay to have an increase in the bag limits. The least they were willing to pay to avoid the bag limits was $0.94 per lobster (in 1992 dollars) and to increase the bag limits was $0.37 per lobster (in 1992 dollars). Sharp *et al*. (2005) estimate that 51,510 permit holders fished during the 1994 two-day sport season and 63,225 fished during the first month of the 1994-95 fishing season. The average fishing group-size during the two-day sport season and first month of the regular season was four people, but, during the sport season, group size was larger in the Florida Keys than in other areas.

The number of crawfish permits rose from about 110,000 in 1993 to almost 140,000 in 1997, and fluctuated around 130,000 from 1998 to 2005 (FWC 2006a). Mail surveys of

recreational lobster license holders indicate that most fish for lobsters only a few days in any particular season, with 30% fishing for 1 to 2 days, 59% for up to 4 days, and 95% fishing for 10 days or less. Approximately, 110,000 recreational divers harvest from 20 to 25% of the combined commercial and recreational catch of spiny lobsters each fishing year (FWC 2006b).

From 1993 to 2002 fishing effort ranged from 60,000 to 112,000 person-days during the two-day sport season and from 261,000 to 514,000 person-days during the regular season (Sharp *et al*. 2005). While there was no discernable trend for the two-day sport season, there was a decreasing trend in fishing effort during the regular season, especially from 1999 to 2002.

Presently, the cost of a resident saltwater fishing license is $17.00, which is valid for one year, and the cost of a resident 5-year lobster (crawfish) permit is $10.00. The recreational lobster permit is required of all fishers 16 years and older, but not Florida residents who are more than 65 years old.

Special Recreational Crawfish Licensed (SRCL) Fishers

In 1993, the Florida legislature created the SRCL, which was implemented with the 1994-95 fishing season. The SRCL was designed for recreational fishers who possessed an SPL but did not qualify for a Restricted Species Endorsement. In the 1994-95 fishing season there were 492 SRCL holders, and approximately 380 of them reported that they fished during the first month of the regular season. During the 2008-09 season there were less than 200.

The number of special recreational crawfish licensed fishers has declined. See Figure 3.1.2.3. Beginning with the 2012-2013 fishing season and every season thereafter, no special recreational crawfish license will be issued or renewed by the FWC (Florida Administrative Code 68B-24.0035). Hence, there will be no SRCL fishers after the 2011-12 fishing season. The SRCL bag limits for the 2010-11 and 2011-12 fishing seasons are 15 and 10 lobsters per person per day, respectively.

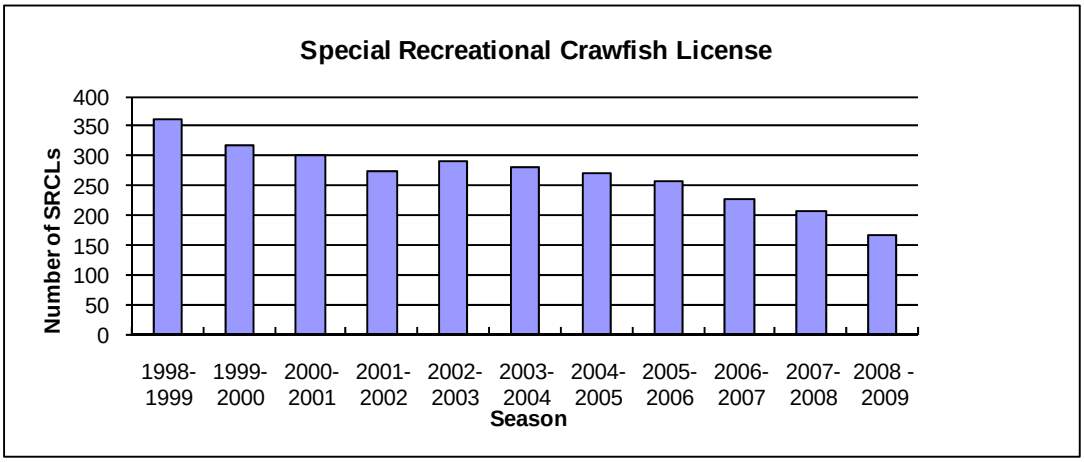


Figure 3.1.2.3. Number of Special Recreational Crawfish Licenses, 1998-99 to 2008-09 Seasons.

Approximately 17% of the SRCL fishers have been from Dade County, followed by approximately 15% from Palm Beach, 13% from Nassau, 12% from Broward, and approximately 8% from Monroe Counties. See Table 3.1.2.1.

Table 3.1.2.1. Average Percent of SRCL Fishers by County, 1998-99 to 2008-09 Fishing Seasons.

County	Ave. Percent of All SRCL Fishers
Dade	16.80
Palm Beach	14.52
Broward	11.69
Brevard	2.86
Charlotte	1.17
Citrus	0.39
Clay	0.36
Collier	2.22
Duval	1.57
Escambia	0.39
Franklin	0.10
Gulf	0.33
Hernando	0.56
Hillsborough	3.95
Indian River	1.31
Jefferson	0.15
Lee	6.22
Levy	0.12
Manatee	1.18
Martin	2.80
Monroe	8.31
Nassau	13.00
Pasco	1.71
Pinellas	5.48
St. Johns	0.39
Sarasota	0.23
St. Lucie	3.13
Volusia	2.77
Inland/Out of State	9.18

Source: FFWC, Marine Fisheries Information System.

Recreational Landings and Catch per Unit Effort

Prior to 1991, there were few estimates of recreational landings. The first estimate of recreational landings was generated from a Delphi exercise that estimated recreational

landings to range from 520,000 to one million pounds or approximately 10% of commercial landings (Zuboy 1980). Davis and Dodrill (1980) suggested the recreational harvest was approximately 9% of the commercial harvest, while Lyons *et al*. (1981) contended it was approximately 10%. Using the first mail surveys, it was first estimated that 403,002 lobsters (435,240 pounds) were harvested during the special two-day sport season, and 1,188,322 lobsters (1,283,388 pounds) were taken during the first month of the 1991-92 regular season (Bertelsen and Hunt 1991, Harper 1993). The Keys accounted for 78% of lobsters taken during the 1991 two-day sport season and 80% of lobsters taken during the first month of the regular season. It is presently estimated that 1,815,971 pounds of spiny lobster were landed by recreational fishers in the 1991-92 fishing season. See Figure 3.1.2.4.

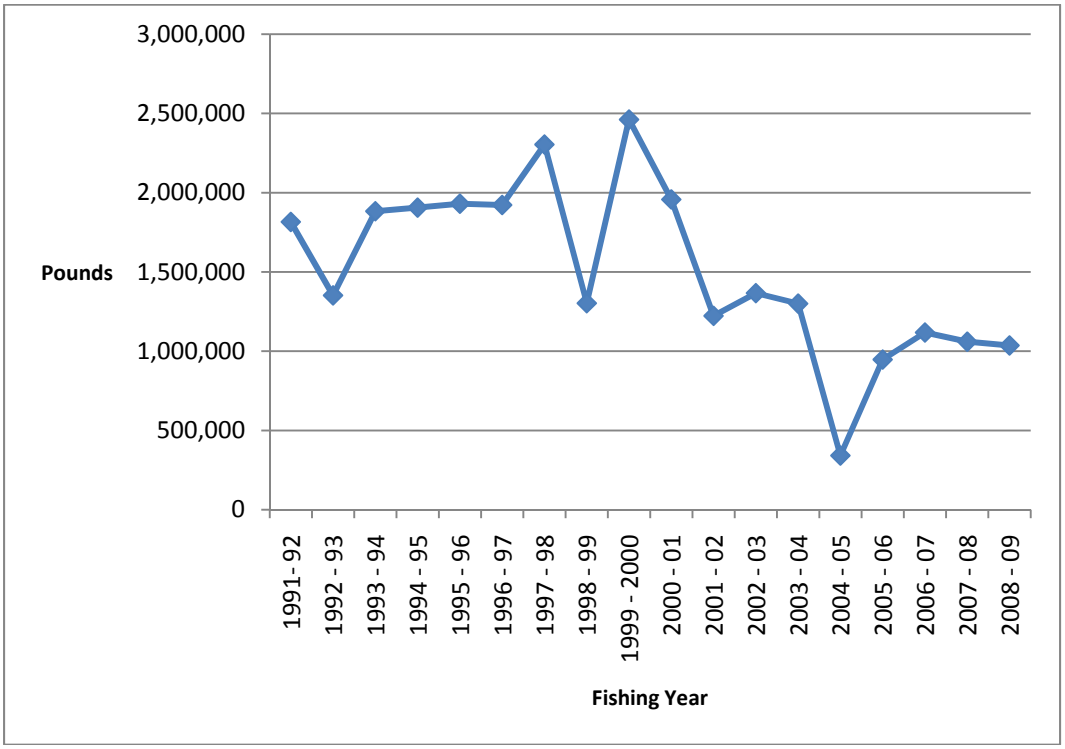


Figure 3.1.2.4. Recreational Landings of Spiny Lobster, 1991-92 to 2008-09. *Source*: Florida Fish & Wildlife Conservation Commission, Updated 9/29/09.

Bertelsen and Hunt (1991) estimated the recreational catch represented 41% of the combined recreational and commercial catches during the first month of the 1991 regular lobster fishing season, and for the year 29% of the statewide commercial harvest. Recreational fishers landed approximately 22% of the state's total lobster landings for the 1991-92 fishing season, which was more than double the previous estimates of 9-10% (Hunt 1994).

Bertelsen and Hunt (1991) estimated that 38% of lobster-permit holders participated in the 1991 sport and regular seasons. Overall 66% of the respondents fished for lobsters in the Keys, 32% along the east coast, and 2% along the Panhandle and west coast.

In 1991, the average group size in the Keys was approximately four persons, while outside the Keys the average group size was slightly less than four during the sport season. The average group sizes were slightly smaller during the first month of the regular season. Bertelsen and Hunt (1991) estimated average individual and group catch rates in the Keys during the two-day sport season to be 7.7 and 19.6 lobsters per day, respectively. Outside the Keys, the average individual and group catch rates were 4.6 and less than 11 lobsters per day during the sport season, respectively. During the first month of the regular season in 1991, the average individual and group catch rates were 8.3 and 16.5 lobsters per day in the Keys, respectively and approximately 4.5 and 10 lobsters per day outside the Keys, respectively. The CPUE tends to be higher during the two-day sport season than the first month of the regular season.

In 1991, a telephone survey on the activity of recreational fishers in each of the eight southeastern states was conducted that included questions concerning directed fishing for shellfish that included lobster. The data from that survey contains only a small number of records in states outside of Florida that identified households as making trips for spiny lobster (Jones 1993). The results of an informal telephone survey of state fisheries personnel conducted by the Southeast Regional Office from late December 1991 through early January 1992 suggested no directed recreational fishery in South Carolina, Alabama, Mississippi, Louisiana and Texas. However, the results also suggested that "[n]umerous catches of exceptionally large lobster (10 to 15 pounds) are periodically reported by private boat-based divers offshore of the Cape Fear area" and a "limited recreational dive fishery exists for spiny lobster involving dive and private recreational boasts operating out of Savannah and Brunswick" (Schmied 1992). The recreational fishery in states outside of Florida was negligible by comparison and that remains to this day.

In 1992, the sport season was switched from a weekend to the last Wednesday and Thursday in July and the bag limit was increased from 6 lobsters per day to 12 lobsters per day outside Monroe County. Together, these changes were intended to reduce fishing pressure and associated conflicts that occurred during the two-day sport season in the Keys. Hurricane Andrew effectively prevented lobster fishing in south Florida during the last two weeks of August 1992 during the regular fishing season when it passed through on August 24. Whereas the first month of the regular season accounted for 75-87% of the combined two-day sport season and first month of the regular season's harvest in 1991 and 1993 to 1995, in 1992, the first month's landings represented approximately 60% of those combined landings. An estimated 1,352,443 pounds of lobsters were harvested during the 1992-93 fishing season, which was a 25% reduction from the previous year.

Recreational harvest rebounded in the 1993-94 season. Hunt *et al*. estimate that over 320,000 pounds were harvested during the 1993 two-day sport season and nearly 1.4 million pounds during the first month of the 1993-94 regular season. For the year, approximately 1.88 million pounds were harvested by recreational fishers. Approximately 67% of the two-day sport harvest and 66% of the first month's harvest during the regular season were taken in the Keys. In 1993, 40% of the persons who

fished during the period from July to Labor Day participated in the sport season and the remaining 60% fished during the first month of the regular season. During the 1993-94 season, the average group size was four persons and, on average, each group spent five to six hours fishing (Hunt *et al*.)

Sharp *et al*. (2004) estimate 362,369 lobsters were landed during the 1994-95 two-day sport season and another 1,320,045 were landed during the first month of the 1994-95 regular season. Approximately 64% of the total lobsters landed during the two survey periods in 1994 were harvested in the Keys, which is less than the 78-80% of the 1991 catch that occurred in the Keys. Approximately 41% of permit holders fished during the sport season and 59% fished in the regular season in 1994, which represented an increase from 1991 when an estimated 38% fished during the sport and regular seasons. Hunt *et al*.'s preliminary estimates of the1993-94 harvest of SRCL holders indicated a total of 51,188 pounds of lobster caught with 80% of the harvest taken in the Keys.

The estimated group catch-per-unit effort increased from 1991 to 1994 in the sport season, particularly in the Keys. Estimated group catch per unit effort (CPUE) in the Keys during the 1991 sport season ranged from 19.3 to 19.9 lobsters per day (Bertelsen and Hunt 1991) and rose to 20.6 lobsters per day in the 1994 sport season (Sharp *et al*. 2005). Group CPUE in the Keys during the first month of the regular season declined, however, from 16.5 lobsters per day in 1991 to 14.2 lobsters per day in 1994. Recreational fishers fishing in the Keys have the highest catch-per-unit-effort in the sport season and tend to have the highest CPUE during the first month of the regular season.

An estimated 216,147 lobsters were harvested during the 1995 two-day sport season and 1,398,989 lobsters were taken during the first month of the 1995-96 regular fishing season (Florida Department of Environmental Protection 1996). Approximately two-thirds of both participating and harvest occurred in the Keys during the sport and regular seasons. From 1991 to 1995, 110,000 permits were issued annually on average and over 1.5 million lobsters were harvested annually on average, with the exception of the 1992 season.

The 1992 regulatory change that changed the two-day sport season from a weekend to a Wednesday and Thursday in July is considered to have reduced the percent of the combined harvest due to the sport season and the number of persons that participated in the sport season. After 1992, the percent of the combined lobster harvest attributable to the sport season fell from 19% in 1993 to 13% in 1995. An estimated 52,015 recreational fishers participated in the two-day sport season in 1993, whereas in 1995, an estimated 36,126 recreational fishers participated in the sport season (Florida Department of Environmental Protection 1996). It was also observed that from 1993 to 1995 there was a decline in the percentage of non-Keys residents traveling to the Keys during the sport season.

An additional survey of the 1994-95 fishing season was conducted by FMRI to assess the extent of the recreational fishery after Labor Day. The data showed that recreational landings after the first month of the regular season are substantially lower than the

amount landed the first month. Approximately 90% of recreational harvest occurred by Labor Day (Sharp *et al*. 2004b), and it continues to be expected that most recreational fishing occurs during the two-day sport season and first month of the regular season.

Recreational fishers who hold a Special Recreational Crawfish License are required to report their landings for the entire season. According to the Florida Department of Environmental Protection (1996), these license holders reported that 75% or more of their fishing effort occurred during the first month of the regular season, and they harvested 80% of their harvest of approximately 63,000 during that first month in the mid 1990s. At the time, SRCL holders were allowed a daily bag limit of 50 lobsters per vessel.

During the 1990's, a shift in the distribution of user group landings from the commercial trap fishery towards the commercial and recreational dive fisheries occurred. This concerned both the state's fisheries managers and those in the commercial trap fishery because the trap fishery was undergoing a progressive decrease in fishing effort via the Lobster Trap Certificate Program (LTP), and it appeared the other fishing sectors were benefiting from the process (FFWCC ad hoc Spiny Lobster Advisory Board Review and Discussion Update No. 2 – November 27, 2006).

Muller *et al*. (1999) estimate recreational harvest in July and August 1998 in the Florida Keys was 837,000 lobsters, which was a sharp decline from the previous 1997-98 fishing season. Recreational lobster harvest fell from approximately 2.3 million pounds in 1997-98 to approximately 1.23 million pounds in 1998-99. See Figure 3.4.2.3. Much of this decline is attributed to the weather. Tropical Storm Charley entered the southeast Gulf of Mexico on August 19, 1998, and was followed by Hurricane Bonnie less than two weeks later. On September 25, 1998, Hurricane Georges struck Florida with reported maximum sustained winds of approximately 95 miles per hour with gusts up to 115 miles per hour and an approximate storm surge of up to seven feet. The storm caused widespread damage within several counties in Florida, including but not limited to Monroe County. The following month lobster fishers, mostly commercial, were also adversely affected by Hurricane Mitch.

Recreational harvest rebounded after the 1998-99 fishing season to approximately 2.46 million pounds, which is the largest annual landings from 1991-92 to 2008-09. See Figure 3.4.2.3. However, it declined substantially again in 2001-02 and weather conditions were a factor. Tropical Storms Barry, Chantel and Dean in August and Hurricane Gabrielle, which made landfall in Venice, Florida, on September 14, 2001, affected the recreational fishery. In 2001, 25% of the annual recreational fishing effort for spiny lobster occurred during the two-day sport season (Leeworthy 2002). Recreational harvest typically accounts for 41% of the total lobster landings in August each year and 22% of the total annual harvest (Hunt 2000).

Statewide recreational fishing effort showed a marginally significant decreasing trend from 1993 to 2002, as did recreational fishing for lobster in the Keys (Sharp *et al*. 2005). However, a statistically significant declining trend did not occur in the southeast region.

From 1999 to 2002, there was a general decline in the number of persons holding a lobster permit and the average number of days a person fished.

In 2004, there were Tropical Storm Bonnie (August), Hurricane Charley (August), Hurricane Francis (September), Hurricane Ivan (September), and Hurricane Jeanne (September), which substantially disrupted recreational lobster fishing. One of the worst hurricane seasons on record was the 2005 season. Of those that hit the coast of Florida, the four of Dennis (July), Katrina (August), Rita (September), and Wilma (October) had a significant adverse impact on spiny lobster fishers, especially commercial trap fishers. Year after year, most of the recreational landings during the two-day sport season occur in the Keys. See Figure 3.1.2.5.

Although recreational landings fell substantially from 1999 to 2005 and sport landings fell similarly during this period, the recreational fishery's share of the total lobster catch did not similarly slide. The recreational share of the total catch rose from 24.5% in the 1999-2000 fishing season to 29.3% in 2001-02, then fell to 22.7% a year later and rose to 23.4% in 2003-04. See Table 3.1.2.2. During this time period, the commercial spiny lobster fishers believed the recreational fishery in general and sport season in particular were "major threats to their survival in the industry" (Shivlani 2009: 90). Processors also blamed the sport season for declining commercial landings.

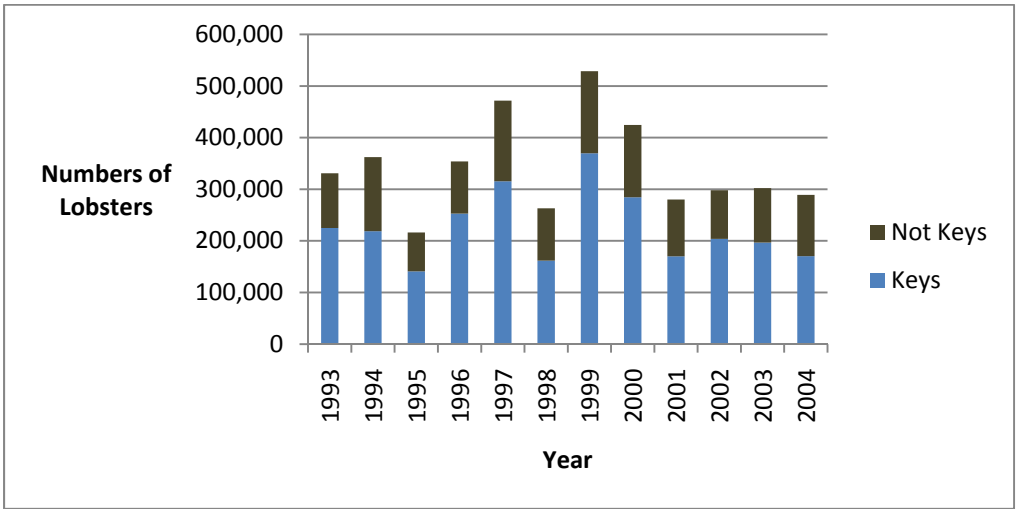


Figure 3.1.2.5. Number of Lobsters Landed During Special Two-Day Sport Season, 1993 – 2004. Source: FFWCC 2006a.

Table 3.1.2.2. Florida Landings of Caribbean Spiny lobster, 1991-92 through 2003-2004 Fishing Seasons.

Fishing Season	Percent Recreational Landings	Percent Commercial Landings	Percent Bait Landings
1991-92	23.59	68.56	7.85
1992-93	19.49	71.64	8.87
1993-94	26.01	67.85	6.15
1994-95	20.67	73.52	5.81
1995-96	21.31	72.16	6.53
1996-97	19.75	73.78	6.48
1997-98	22.76	70.77	6.47
1998-99	19.81	75.58	4.61
1999-00	24.46	70.23	5.32
2000-01	27.42	66.31	6.28
2001-02	29.32	62.00	8.68
2002-03	22.70	70.85	6.45
2003-04	23.36	69.90	6.74

Source: Florida Fish & Wildlife Conservation Commission.

It is estimated that approximately 55,000 recreational fishers harvested approximately 356,000 lobsters statewide during the two-day sport season in 2008. Another approximately 606,000 lobsters were taken from the first day of the regular season (August 6) to September 1 of that year. The sport season accounts for 24.2% of the overall recreational landings from 1994 to 2008 and averages almost 240,000 pounds in Monroe County (Shivlani 2009).

The 2008-09 season began with approximately 356,000 lobsters being caught statewide during the two-day sport season (approximately 230,000 on Wednesday and 126,000 on Thursday). The FFWCC estimates approximately 55,000 licensed lobster fishers participated in the sport season.

Approximately, 606,000 lobsters were taken statewide from opening day of the regular season through Labor Day (August 6 through September 1), and approximately 50,000 licensed lobster fishers fished during this first month of the 2008-09 season. Together, 962,000 lobsters were harvested during the first month of the regular season and the 2-day sport season. From 2006-07 to 2008-09, recreational landings fell from approximately 1.1 million to 1.0 million pounds. See Figure 3.1.2.5.

Average recreational landings from 1991-92 to 2008-09 are approximately 1.5 million pounds. During the three-year period from 1997-98 to 1999-2000, average recreational landings peaked at over 2 million pounds, then fell precipitously to over 0.8 million from 2003-04 to 2005-06. Despite recovering from the 3-year low, the most recent three-year average is significantly less than those three-year averages before the 2003-04 fishing season. See Table 3.1.2.3.

Table 3.1.2.3. Average Recreational Landings (Pounds), 1991-92 to 2008-09, Various Years.

Average, 1991-92 to 2008-09	1,512,848
Average, 1991-92 to 1993-94	1,683,843
Average, 1994-95 to 1996-97	1,919,770
Average, 1997-98 to 1999-2000	2,022,948
Average, 2000-01 to 2002-03	1,515,789
Average, 2003-04 to 2005-06	863,104
Average, 2006-07 to 2008-09	1,071,635

Gears Used

Recreational fishers without a Special Recreational Crawfish License are not allowed to use traps to capture lobster. In the 1980s and prior to the SRCL, those using traps usually fished between five to twelve traps, but some fished as many as 25 traps (Johnson 1987). Bully nets and diving (breath-hold, SCUBA, or hookah) are the only legal recreational fishing methods. Divers must permanently and conspicuously display a 'divers down flag' placard on the vessel and affix the Commercial Dive Permit to the diagonal stripe with 10-inch numbers visible from the air and 4-inch numbers visible from the water. Harvest from artificial habitat is prohibited. Divers must possess a carapace measuring device and measure lobster in the water. The use of bleach or chemical solutions or simultaneous possession of spiny lobster and any plastic container capable of ejecting liquid is prohibited. Most recreational diving occurs in the Florida Keys and in moderately shallow waters.

A survey of recreational divers in the mid 1970s found that 95% of the free divers dove no deeper than 30 feet, while 81% of those who used SCUBA gear dove no deeper than 40 feet. None of the sampled divers reported diving deeper than 80 feet (SAFMC and GFMC 1982: p. 8-16). Some spiny lobsters were caught on shallow flats by recreational fishers using bully nets, but they represented only a small portion of the recreational catch.

Hookah fishing involves diving from a boat for lobster using an air compressor that supplies air for the diver through a long hose. See Figure 3.1.2.4. Multiple divers can be connected to the same compressor. The use of a hookah system has become increasingly popular because one can use it without becoming certified in scuba diving. Anyone can purchase a hookah system, although hookah diving shares many of the same risks as scuba diving such as decompression sickness and air embolism. Novice divers can stay under for longer periods of time than scuba divers, although there is always the risk of the hose breaking or dislodging from the compressor.

According to the FWC (2006a), the large proportion of recreational divers is highly active only at the start of the fishing season when the lobsters are most abundant. As the recreational lobster fishing season continues, the number of dive trips and number of lobsters recreational divers land declines rapidly. Also, there are many divers with a license are not active during the lobster fishing season.

Some divers, generally those from outside southern Florida, will use charter or party boats. Charter boats typically are hired by diving clubs while party boats operate out of dive shops along the Florida Keys (SAFMC & GFMC 1982: p. 8-8). These boats can hold from 30 to 50 divers and have commercial lobster licenses. In Florida, patrons aboard a fishing charter are not required to possess a recreational saltwater fishing permit because they are covered under the fishing license of the charter boat.

Figure 3.1.2.4. Hookah Diving Gear. Source: www.bigbluetech.net/big-blue-tech-news/wp-content/uploads/2009/08/hookah_80175d.jpg.

Those who use bully nets perch on bows of boats at night, shine bright lights into the shallows and use a long-handled net to bag spiny lobsters that move out into the open (Cocking 2009). Recreational fishers are restricted to diving and bully/hoop netting. Spears, wire snares, hooks or any gear/device that could penetrate, puncture or crush the shell of a lobster is prohibited. Divers typically use a "tickle stick" to coerce lobsters from their dens into a hand-held net.

Economic Impacts

The recreational spiny lobster fishery is very important to Monroe County. In 2001, additional socio-economic questions were added on to the annual survey. Almost 230 thousand (229,395) person-days of recreational lobster fishing occurred that year in Monroe County. Of those person-days, approximately 75% (171,127) were during the regular season, and the remaining 58,268 person-days (25 percent) were during the two-day sport season. Approximately 79% of those person-days (180,123) were attributed to visitors of Monroe County and the remaining 21% (49,272 person-days) to residents. See Table 3.1.2.4.

Visitors spend substantially more per person-day than residents of Monroe County, and visitors spend slightly more during the two-day sport season than regular season. See Table 3.1.2.4. Sharp *et al*. (2005) estimate approximately $24 million was spent on recreational lobster fishing in the Florida Keys from the opening of the recreational season through the first Monday in September in 2001. Fishers who resided outside the Keys accounted for about $22 million (92%) of the total monies spent on recreational lobster fishing in the Keys.

Table 3.1.2.4. Average Expenditures per Person-Day in 2001.

Season	Person Days		Ave. Exp. Per Person-Day		Total Expenditures (2001 Dollars)		
	Resident	Visitor	Resident	Visitor	Resident	Visitor	Total
Two-Day	12,306	45,962	$33.99	$129.41	418,281	5,947,942	6,366,223
Regular	36,966	134,161	$42.83	$122.35	1,583,254	16,414,598	17,997,852
Total	49,272	180,123	$40.61	$124.15	2,000,936	22,362,270	24,363,206

Source: Sharp *et al*. 2005.

3.1.3 US Caribbean Fisheries

Puerto Rico

Puerto Rico is an archipelago comprised of the main island (Puerto Rico) and several smaller oceanic islands: Mona, Monito, Desecheo, Caja de Muertos, Vieques, and Culebra, and still smaller islands known as the "Cordillera de Fajardo." Its waters extend 9 nautical miles (10.36 statute miles) off its shore. See Figure 3.1.3.1. About one-third of the population lives around the capitol city of San Juan, and over 11% of the population in San Juan. Other major municipalities are Bayamón, Ponce, Carolina, Arecibo, Guaynabo, and Mayaguez.

Figure 3.1.3.1. **Puerto Rico.**
Image Source: Central Intelligence Agency.

According to the U.S. Census Bureau, the population of Puerto Rico increased about 3 % from April 1, 2000 to July 1, 2006, with approximately 3.93 million people in 2006. The increase in population has been accompanied by a larger percentage increase in housing units. Housing units increased from about 1.26 million in 2000 to approximately 1.44 million in 2005, an increase of about 14.2%. In 2005, median household income in Puerto Rico was $17,184, as compared to $46,242, which was the median household income for the U.S. as a whole.

Manufacturing dominates Puerto Rico's industrial sector. In fiscal year 2002, the Manufacturing sector accounted for approximately 42% of Puerto Rico's Gross Domestic Product. The value of sales, receipts or shipments from manufacturing was approximately $58.6 billion. See Table 3.1.3.1. The chemical industry is the largest component of the manufacturing sector, with about a 64% share (Government Development Bank for Puerto Rico 2003), and that in turn is dominated by the pharmaceutical and medicine-manufacturing sector. Food, electronics, and apparel manufacturing are other major manufacturing industries in the Territory.
Retail Trade and Wholesale Trade follow Manufacturing as key sectors. In 2002, Retail and Wholesale Trade combined accounted for sales, receipts or shipments totaling $46.5 billion. The top three sectors by number of employees are Retail Trade, Health Care & Social Assistance, and Construction.

Table 3.1.3.1. 2002 Economic Census, Summary Statistics, Puerto Rico. *Source:* U.S. Census Bureau.

NAICS Code	Description	Employer Establishments	Sales, Receipts or Shipments ($1,000)	Annual Payroll ($1,000)	Paid Employees
21	Mining	44	107,000	18,834	949
22	Utilities	18	369,932	21,040	503
23	Construction	2,683	5,523,472*	1,009,747	67,288
31-33	Manufacturing	2,196	58,580,060	N	N
42	Wholesale trade	2,313	16,172,710	1,009,360	39,316
44-45	Retail trade	11,465	20,422,975	1,655,584	122,435
48-49	Transportation & warhousing	1,071	2,076,573	253,758	13,137
51	Information	462	3,686,792	633,161	19,696
52	Finance & insurance	1,809	10,233,015	1,152,628	36,059
53	Real estate & rental & leasing	1,783	1,698,631	148,334	8,183
54	Professional, scientific & technical services	3,965	2,836,774	701,485	26,197
55	Management of companies & enterprises	94	511,676	79,091	2,237
56	Administrative & support & waste management & remediation service	1,724	2,336,978	88,063	61,703
61	Educational services	306	242,810	74,829	4,647
62	Health care & social assistance	6,464	4,967,317	1,224,260	68,338
71	Arts, entertainment & recreation	369	278,975	45,393	3,115
72	Accommodation & food services	4,133	3,360,226	732,147	63,810
81	Other services (exceptu public administration)	3,324	1,470,563	281,805	18,417

N = Not available

* value of construction

San Juan Port is one of the world's busiest cruise ship ports and is a central hub for Caribbean cruises. Port of Ponce is the second largest port and Mayaqúez Port, the third. Smaller ports and harbors include Guánica, Guayanilla, Guayana, Fajardo, Culebra, and Vieques.

Puerto Rico's coastline attracts tourists, and tourism, including eco-tourism, is a very important industry; it represents about 6% of the Territory's Gross National Product (Message of the Executive Director of Puerto Rico Tourism Company, February 9-13, 2006). An estimated 5 million tourists visited Puerto Rico in 2004 (Central Intelligence Agency). It is anticipated that recent changes in passport law, which restrict the places where one may travel without a passport, may cause an increase in the number of U.S. citizens who visit the Territory because no U.S. passport is required to travel there.[4]

[4] As stated in the final rule for Documents Required for Travelers Departing From or Arriving in the United States at Air-Ports-of-Entry from Within the Western Hemisphere (71 FR 68411, November 24, 2006),

The eastern coast of Puerto Rico, from Fajardo to Humacao and the offshore nature islands of Vieques and Culebra, have been popular destinations for tourists who snorkel and dive. Another popular snorkeling and diving location is off La Parguera on the southwestern coast, where one can find elkhorn and staghorn corals. Rincón, a municipality on the west coast, is a popular site for coastal tourism, where tourists engage in surfing, tanning, fishing, snorkeling, and SCUBA diving (Pendleton, 2002).

Fishing is another sector that is important to the Puerto Rican economy, and coral reefs are important habitat for species targeted by commercial, recreational and subsistence fishermen. During the period from 1995 through 2002, commercial fishermen caught an average of 1.6 million tons of fish annually, with 87% of the fishermen targeting reef fish and invertebrates, including conch and lobster (NOAA Coral Reef Ecosystem Research Plan). In 2005, domestic landings of shallow water reef fish totaled 771,656 pounds (350,022 kilograms) with a value of $1,766,337. These landings represent approximately 66 % of total pounds of fish landed in Puerto Rico that year. In 2005, 173,445 pounds of spiny lobster were landed with a dockside value of $997,005 and 195,701 pounds of conch were landed with a dockside value of $498,094 (Fisheries of the United States 2005).

U.S. Virgin Islands

The U.S. Virgin Islands consists of the main islands of St. Croix, St. John, and St. Thomas, and 54 smaller islands and keys. Combined it has a land mass of about 134 square miles (346 square kilometers) and territorial waters that encompass approximately 972 square miles (1,564 square kilometers). The U.S. Virgin Islands' waters extend 3 nautical miles (3.45 statute miles) off its shore. See Figure 3.1.3.2.

"Beginning January 23, 2007, all United States citizens and nonimmigrant aliens from Canada, Bermuda and Mexico departing from or entering the United States from within the Western Hemisphere at air-ports-of-entry will be required to present a valid passport."

Figure 3.1.3.2. U.S. Virgin Islands.
Image Source: Central Intelligence Agency.

According to the U.S. Census Bureau, the population of the U.S. Virgin Islands increased from 101,809 in 1990 to 108,612 in 2000, about a 7% increase. From 1990 to 2000, the population of St. Croix increased from 50,139 to 53,234, the population of St. John increased from 3,504 to 4,197 and the population of St. Thomas expanded from 48,166 to 51,181. The population increase was accompanied by an increase in the number of housing units, which rose from 39,290 in 1990 to 50,202 in 2000, an increase of over 27 % in ten years. Median household income of the U.S. Virgin Islands as a whole was $24,704 in 2000, compared to the U.S. median of $41,994 at that time. *The World Factbook* estimates the July 2007 population to be 108,448 (www.cia.gov/library/publications/the-world-factbook/geos/rq.html).

Tourism is the largest contributor to the U.S. Virgin Islands' economy; it accounts for 80% of the Territory's Gross Domestic Product and employment (Central Intelligence Agency). In 1994, the total number of visitor arrivals was approximately 1.9 million and that number increased to over 2.6 million by 2004. It is anticipated that recent changes in U.S. passport laws, which restrict the places a U.S. citizen can travel to without a passport, may cause an increase in the number of U.S. citizens who visit the Territory because no U.S. passport is required to travel there. A survey conducted for the Virgin Islands Department of Planning and Natural Resources found that 100% of hotel industry participants answered that there would be a significant impact on tourist visits to the U.S. Virgin Islands if the coast/beaches were degraded or fisheries and/or coral reefs declined (U.S. Virgin Islands 2003).

Retail Trade is the largest sector by number of establishments, number of employees, annual payroll, and value of sales, receipts or shipments. See Table 3.1.3.2. Accommodation & Food Services is the second largest sector, followed by Construction. In 2002, the value of construction work was about $286 million, an increase of about 55% from 1997, and an increase of about 70% from 1992 (U.S. Census Bureau, Economic Census). Among this construction are new, remodeled, and expanded hotels and resorts. Important industries within manufacturing include petroleum refining, watch assembly, rum distilling, pharmaceuticals, textiles, and electronics.

Table 3.1.3.2. 2002 Economic Census Summary Statistics, U.S. Virgin Islands. ***Source:*** **U.S. Census Bureau.**

NAICS Code	Description	No. Estab.	Sales, Receipts or Shipments ($1,000)	Annual Payroll ($1,000)	Paid Employees
21	Mining	1	D	D	a
22	Utilities	4	D	D	a
23	Construction	190	285,582*	90,662	3,050
31-33	Manufacturing	63	172,830	27,151	1,058
42	Wholesale trade	74	262,932	27,664	1,028
44-45	Retail trade	680	1,217,466	128,444	6,653
48-49	Transportation & warhousing	106	181,965	34,194	1,134
51	Information	45	183,770	30,285	845
52	Finance & insurance	96	248,229	48,040	1,416
53	Real estate & rental & leasing	192	184,904	26,224	1,152
54	Professional, scientific & technical services	228	360,192	50,235	1,238
55	Management of companies & enterprises	23	30,745	2,183	76
56	Administrative & support & waste management & remediation service	155	135,267	35,834	2,050
61	Educational services	19	5,792	1,668	97
62	Health care & social assistance	203	93,289	24,428	1,232
71	Arts, entertainment & recreation	38	110,039	14,271	662
72	Accommodation & food services	313	331,008	92,357	5,639
81	Other services (exceptu public administration)	185	153,703	34,689	1,307

D = Data not disclosed
a = 0 - 19 employees
* Value of construction work

3.1.4 Federal Management of Caribbean Spiny Lobster under the Magnuson-Stevens Act

The Caribbean spiny lobster in the U.S. Exclusive Economic Zone (EEZ) of the Atlantic Ocean and Gulf of Mexico is jointly managed by the South Atlantic and Gulf of Mexico Fishery Management Councils (Councils) through the Fishery Management Plan for Spiny Lobster (Spiny Lobster FMP) in the Gulf of Mexico and South Atlantic. In the

U.S. EEZ of the Caribbean Sea surrounding Puerto Rico and the U.S. Virgin Islands, the resource is managed by the Caribbean Fishery Management Council through a separate FMP. In the Gulf and South Atlantic, the commercial fishery, and to a large extent the recreational fishery, occurs off South Florida, primarily in the Florida Keys. In order to streamline a management process that involves both state and federal jurisdictions, the Spiny Lobster FMP basically extends the Florida FWC rules regulating the state fishery to the southeastern U.S. EEZ from North Carolina to Texas.

Currently, harvest or possession of spiny lobsters in the U.S. South Atlantic EEZ is regulated in the Code of Federal Regulations (CFR). According to 50 CFR 640.4, anyone who sells, trades, or barters or attempts to sell, trade, or barter spiny lobster that was harvested or possessed in the EEZ off Florida, or harvested in the EEZ other than off Florida and landed in Florida must have licenses and certificates specified to be a commercial harvester, as defined in the Florida Administrative Code. Similarly, any person who sells, trades, or barters or attempts to sell, trade, or barter a Caribbean spiny lobster harvest in the U.S. EEZ other than off Florida, a Federal vessel permit must be issued and on board the harvesting vessel (50 CFR §640.4(a)(1)(ii)).

The commercial and recreational fishing season for spiny lobster in the EEZ off Florida and the EEZ off the Gulf States, other than Florida, begins on August 6 and ends on March 31 (50 CFR §640.20(b)). Add mini-season and bag limit information.

No person may possess a Caribbean spiny lobster in or from the Gulf and South Atlantic EEZ with a carapace length of 3.0 inches (7.62 cm) or less or a separated tail with a length less than 5.5 inches (13.97 cm) (50 CFR §640.21(b)). Current regulation prohibits the possession of a spiny lobster or parts thereof in or from the Gulf and South Atlantic EEZ from which the eggs, swimmerettes or pleopods have been removed (50 CFR §640.21(a)); and requires any berried spiny lobster to be returned immediately to the water (50 CFR §640.7(g)).

Add regulations about tailing and use of shorts.

3.1.5 Other Federal Laws and Regulations that Protect Spiny Lobster

Lacey Act

The Lacey Act, as amended in 1981 (16 USC §§ 3372 et seq.) prohibits any person from importing, exporting, transporting, selling, receiving, acquiring, or purchasing in interstate or foreign commerce any fish or wildlife taken, possessed, transported, or sold in violation of any law or regulation of any state or in violation of any foreign law. For example, it is a violation of the Lacey Act to import Caribbean spiny lobster that is in violation of the exporting country's minimum harvest-size standard. Many of the countries that harvest Caribbean spiny lobster have minimum harvest size standards.

Florida Keys National Marine Sanctuary and Protection Act
In November 1990, Congress passed the Florida Keys National Marine Sanctuary and Protection Act that established the Florida Keys National Marine Sanctuary (FKNMS) (Pub.L 101-605).[5] The FKNMS is comprised of 9,660 square kilometers (about 2,900 square nautical miles) of coastal waters off the Florida Keys. It extends approximately 220 miles southwest of the southern tip of the Florida peninsula and includes the world's third largest coral barrier reef. Within the Sanctuary are 24 no-take zones. Fifty-eight percent of the Sanctuary resides in Florida waters and 42% is in federal waters. Both NOAA and the State of Florida manage the Sanctuary. The waters of the FKNMS are within the jurisdiction of both the South Atlantic and Gulf of Mexico fishery management councils.

Biscayne Bay National Park
Originally established as a national monument by Congress in 1968, Biscayne Bay National Park was re-designated as a national park in 1980. The Park's purpose is to preserve and protect its rare combination of terrestrial and aquatic natural resources. The Park includes approximately 173,000 acres in Miami-Dade County, and is about 22 miles long. The park extends from shore about 14 miles to the 60-foot contour and contains about 72,000 acres of coral reefs. Under existing Supervisor's rules for the Park, several areas are closed year-round to public entry to protect sensitive resources and wildlife. This also means not taking Caribbean spiny lobster in those areas.

Dry Tortugas National Park
The Dry Tortugas National Park was established by Congress in 1992 (Public Law 102-525). Possession of Caribbean spiny lobster is prohibited within boundaries of the park unless the individual took the lobster outside the park waters and the person in possession has proper State/Federal licenses and permits (36 CFR § 7.27(b)(4)(i)). The presence of lobster aboard a vessel in park waters, while one or more persons from such vessel are overboard constitutes prima facie evidence that the lobsters were harvested from park waters in violation of the above regulation.

3.1.6 State Spiny Lobster Laws and Fisheries Histories

Up until the twentieth century, landings of spiny lobster were low because the fishery was largely a bait fishery that supported Florida's finfish industry (Labisky et al. 1980). However, at the turn of the century a spiny lobster commercial fishery began to develop due to the construction of the Overseas Railroad in 1912, which allowed dealers to ship spiny lobsters to northern hotels and restaurants (ibid., p. 30). The first legislation enacted by the State of Florida to conserve the supply of spiny lobster in response to the growing commercial retail trade was in 1919 when it implemented a seasonal closure from March 1 to June 1, but which allowed the taking of lobster for research, fish bait, or propagation throughout the year. Two years later the closed season was changed to March 21 to June 21.

[5] The National Marine Sanctuary System was created in 1972. Two areas in the Florida Keys were designated as sanctuaries, the first in 1975 and the second in 1981. These areas were included in the Florida Keys National Marine Sanctuary in November 1990.

In the nineteenth century and up until the early twentieth century, spiny lobsters were typically harvested in shallow waters of Key West with cast nets, gill nets, haul seines, and grains (Labisky et al. 1980). Continuous increases in commercial demand in the early 1900s, however, stimulated expansion of the fishery so that by 1922 the primary fishing grounds extended from the shallow waters surrounding Key West to a "25-mile linear zone that encompassed the southern shores of the lower Florida Keys and the shallow Atlantic reef area both east and west of Key West" (Labisky et al. 1980). The expansion of the fishery into deeper waters necessitated gear changes from cast nets, gill nets, haul seines and grains to increasing use of bully nets and wire traps.

From 1925-26 to 1927-28 total landings increased from 88,000 pounds to 873,000 pounds, an almost 900% increase. The State amended its lobster regulations in 1929 to increase the length of the closed season from three to four months (March 21 to July 21) and set, for the first time, a minimum legal size limit, which was one pound (Labisky *et* al. 1980; Prochaska and Baarda 1975).

Despite declines in landings and prices per pound during the 1930s, the development of deep-freeze processing techniques enabled further expansion of the commercial retail market for spiny lobster in the 1940s. From 1940 to 1949 total commercial landings increased from 0.4 million pounds to 3.58 million pounds and price per pound increased from $0.07 to $0.22. By the 1940s, the most popular commercial fishing gears were wooden slat-traps, bully nets, and ice-can traps in that order. Slat-traps were used primarily in deeper waters "associated with the offshore reef on the Atlantic side of the Keys; bully nets were used in the shallow waters of Florida Bay; and … ice cans were used in shallow inshore waters" (Labisky *et* al. 1980, p. 33). Traps were still pulled by hand, however, which limited their numbers and use in deep waters (Moe 1991). Also in the 1940s, there was an increase in imports of spiny lobster tails from the Caribbean, South Africa, and Australia (Labisky *et* al. 1980).

The south Florida spiny lobster fishery continued to grow in the 1950s. From 1952 to 1959 the number of boats/vessels in the fishery expanded from 102 to 254; the price per pound increased from $0.18 per pound in 1950 to $0.30 per pound in 1959; the number of traps increased from 17,000 in 1951 to approximately 52,000 in 1959; and commercial landings increased from 1.56 million pounds in 1950 to 3.18 million pounds in 1959.[6] With that growth came more State action to protect the supply of spiny lobster. In 1953, the Florida Legislature changed the timing of the closed season from the period of March 21 to July 21 to the period of April 15 to August 15, and redefined the legal size limit from one pound to a minimum tail size of 6 inches; however, in 1955, it reestablished the closed season from March 31 to August 1 (Labisky et al., 1980). In 1954, the State began to require lobster permits and fishers to report the number of traps fished (Florida Marine Fisheries Commission, December 5, 1991).

[6] According to Labisky et al., there were 376 boats/vessels in 1950 and 319 boats/vessels in 1951 that were engaged in spiny lobster fishing. It is unclear why the number of boats/vessels fell to 102 in 1952, or if the 1950 and 1951 figures are questionable estimates. A boat is a watercraft with carrying capacity less than 5 tons, whereas a vessel is a watercraft with a carrying capacity of 5 tons or greater.

Moe (1991) notes three developments in the 1950s that had a significant impact on the spiny lobster fishery. First, the development of skin and SCUBA diving, especially around the Florida Keys, provided easy opportunities to hunt lobster with spear guns, which was legal at that time. Second, the development of hydraulic systems to haul traps eventually eliminated pulling traps in by hand. Third, lobster fishers began to keep 2 or 3 undersized lobsters, known as "shorts", in traps as attractants because the use of shorts increased catches significantly.[7] In a short period of time, "every fisherman used shorts whenever possible as well as the standard cowhide bait" (Moe 1991, p. 385).

According to Labisky *et al*., the south Florida spiny lobster fishery radically changed in the1960s with the influx of thousands of Cubans into the country. Many of the approximately 300,000 Cuban immigrants obtained U.S. government loans and bought boats to fish for lobster in Bahamian waters (Moe 1991; Labisky *et al*. 1980). Most of these immigrants' boats were Miami based. In 1975 when Bahamian waters were closed to foreign fishing, these Miami-based boats began to fish locally.

The first gear restriction occurred in 1965, which specified the types of gear that could be used to harvest lobster (Prochaska and Baarda 1975; Williams 1976). Wood traps could be used, provided that they were not greater than 3 x 2 x 2 feet or the equivalent in cubic feet.[8] Permit numbers had to be placed permanently on each trap or other device used to catch lobsters, as well as on the buoy that was used to mark the traps (Prochaska and Baarda, 1975). Also, traps and buoys had to be color-coded; and up to 20 traps could be attached to a trot-line. That same year the State set the minimum carapace size to 3 inches and minimum tail measurement to 5.5 inches.

In 1968 the minimum carapace length was reduced to 3 inches. About the same time, the fishery in the Florida Keys had expanded from the Key West area to the middle keys (FWRI 2007). A 1969 act allowed a 6-inch minimum on tails separated under special permit.

In 1971, the State changed its regulations to establish a $50 permit fee and allow landings of spiny lobsters harvested from international waters during the State's closed season (Labisky *et al*. 1980). By this time there were increasing conflicts between commercial fishers and recreational divers who harvested spiny lobster, so in 1975 the State enacted legislation that created the special two-day sport season that is scheduled the last consecutive Wednesday and Thursday of July each year, one week before the start of the commercial season. During the special two-day sport season, recreational lobster fishers

[7] Experiments have shown that traps baited with short lobsters catch approximately three times more lobster than traps baited with any other method (Moe, 1991; Heatwole *et al*., 1988).

[8] As stated by Prochaska and Baarda (p. 26): The 1965 law "requires that the constructed traps be of wood slats so that when a trap is lost it will be broken up with time and thus will not continue to catch lobsters which would then be lost for both breeding stock or human consumption. The wood slat traps can be protected on the sides by reinforcement with 16 gauge, one inch poultry wire, though the bottom and top cannot be so reinforced. Partial wire reinforcing is allowed to protect the trap from the 'ravages of turtles'. Ice cans, drums and other similar devices are permitted provided that they are not equipped with grains, spears, grabs, hooks or similar devices."

are allowed up to six lobsters per person per day in the Monroe County and Biscayne Bay National Park and up to 12 lobsters per person per day in other areas of the state. The bag limit during the regular lobster-fishing season is six lobsters per person per day, or 24 per boat per day, whichever is greater.[9]

The Florida Marine Fisheries Commission (FMFC) adopted its first fisheries management plan (FMP) for spiny lobster on July 2, 1987. For the most part, the management plan continued existing practices; however, among the new requirements was the provision of having on board live wells with re-circulating water when transporting short lobsters (FMFC, December 5, 1991). In 1988, a three-year moratorium on the issue of new permits was established in an effort to limit total commercial effort. In July 1990, the FMP was amended, and among its changes was the designation of spiny lobster as a restricted species (RSE) after July 1993. The following year the Florida legislature enacted laws, which prohibited the FMFC from adopting rules that would prohibit the possession of undersized lobsters or require traps to have escape gaps before April 1998.

In 1991, Florida instituted a recreational spiny lobster license (also known as a crawfish permit), which was purchased as an additional endorsement to the state's recreational saltwater fishing license. Also that year the State began to use two annual mail surveys of persons with a lobster license/permit to estimate the number and landings of lobsters harvested by recreational fishers who take lobsters during the special two-day sport season and from opening day to the first Monday in September of the regular fishing season.[10]

The number of traps increased greatly from the mid 1970s through the 1980s, rising from 219,100 in 1970 to 979,766 in 1991 (Figure 3.1.6.1). This rapid growth resulted in increased user conflicts on the water, excessive mortality of shorts, declining yield per trap, and concerns about trap debris (FWC 2007)

[9] Recreational fishers are not allowed to use traps to capture lobster. Bully nets and diving (breath-hold, SCUBA, or hookah) are the only legal recreational fishing methods.

[10] The survey of recreational fishers who harvest during the regular fishing season focuses on the first month of the season because the majority of fishing effort occurs during the first month of the season (Sharp *et al*., 2005).

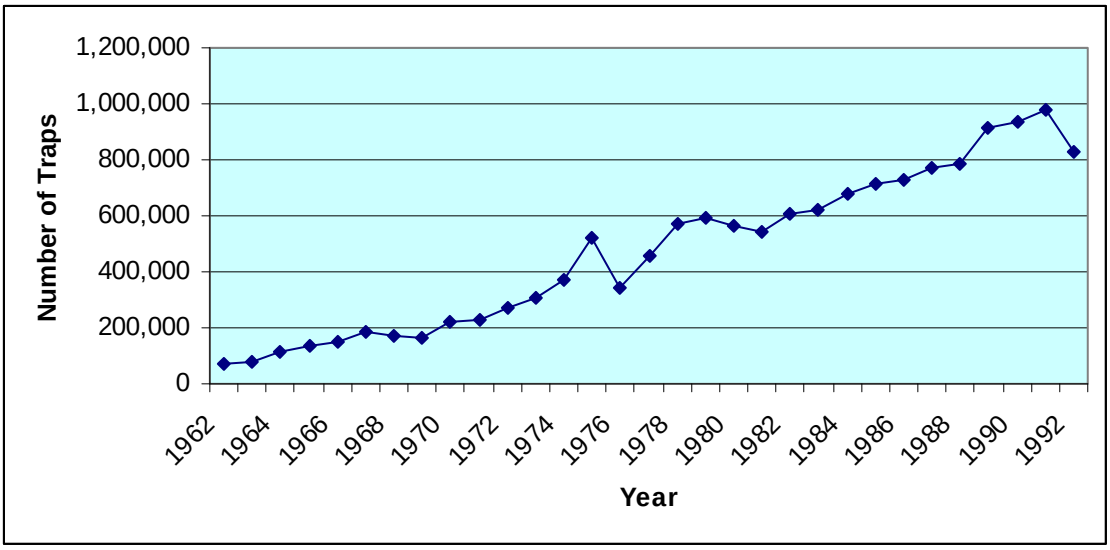


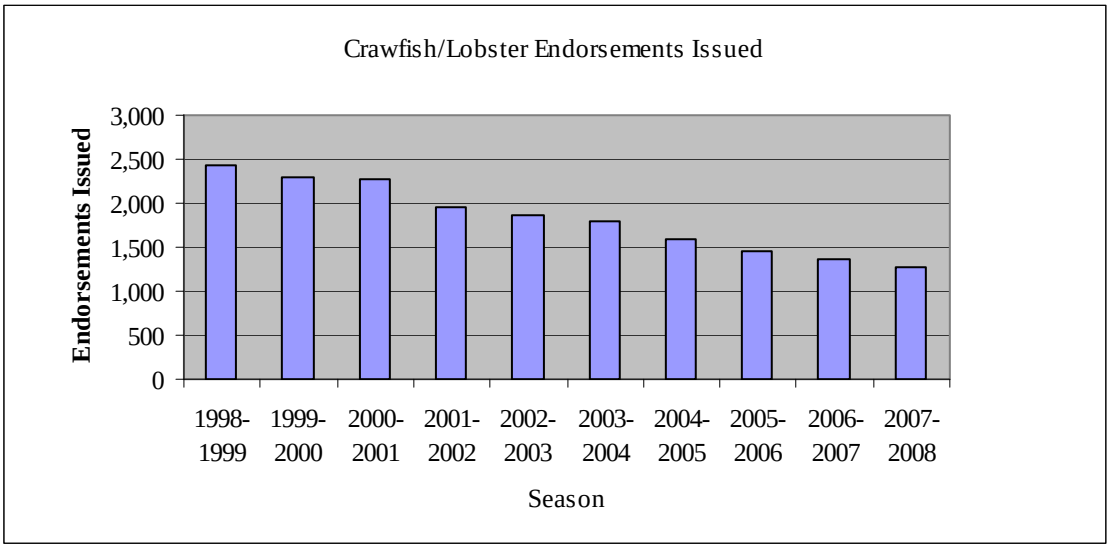
Figure 3.1.6.1. Annual numbers of lobster traps, 1962 – 1993.

In 1992, Florida implemented the spiny lobster Trap Certificate Program (TCP), which regulated the total number of traps by requiring a certificate for each trap and setting a limit on the number of certificates. When first implemented, the initial certificate allocation was based on the trap use that had been reported for the three preceding years (Larkin and Milon ?).

The Florida FWC is authorized to reduce the total number of certificates by decreasing the number of each individual's traps by no more than 10% annually. In 1993, Caribbean spiny lobster fishermen set 704,234 traps. That same year, the Florida FWC implemented the TCP to reduce the number of lobster traps allowed in the fishery. Since the initial allocation of certificates, the Florida FWC has decreased the number of certificates four times at 10% reductions: 1994, 1995, 1996, and 1999. In 2001, the Florida FWC set the target number of spiny lobster traps at 400,000 and implemented a 4% annual reduction in traps. The Florida FWC suspended the annual trap reduction in 2003; nonetheless, the program has resulted in a significant reduction in the annual numbers of traps set. During the 2005 - 2006 season, 497,042 trap tag certificates were issued; followed by 473,943 for the 2006 - 2007 season and as of December 21, 2007, there were a total of 475,320 trap tag certificates for the 2007 - 2008 season.

No one who owns one or more lobster trap certificates can be issued a commercial dive permit (68B-24.0055(2)(b)). As of January 1, 2005, and until January 1, 2010, no new commercial dive permits will be issued and no commercial dive permit will be renewed or replaced except those that were active during the 2004 – 2006 fishing season. Existing permits may only be issued to a single saltwater products license with a valid crawfish endorsement and a valid restricted species endorsement (68B-24.005(2)(c)). Failure to renew the commercial dive permit by September 30 of each year results in forfeiture of the permit.

A crawfish endorsement or crawfish license, also known as a trap number, is required for any person to use traps to harvest spiny lobster or take spiny lobster in commercial quantities (68B-24.0055(1)). The number of Crawfish Endorsements issued has declined since the 1998 -1999 season (Figure 3.1.6.2). The number of individuals holding Crawfish Endorsements has also declined. During the 2005 – 2006 season, there were 1,402 endorsement holders, followed by 1,303 for 2006 – 2007, and as of December 1, 2007, there were 1,241 endorsement holders for the 2007 – 2008 season.



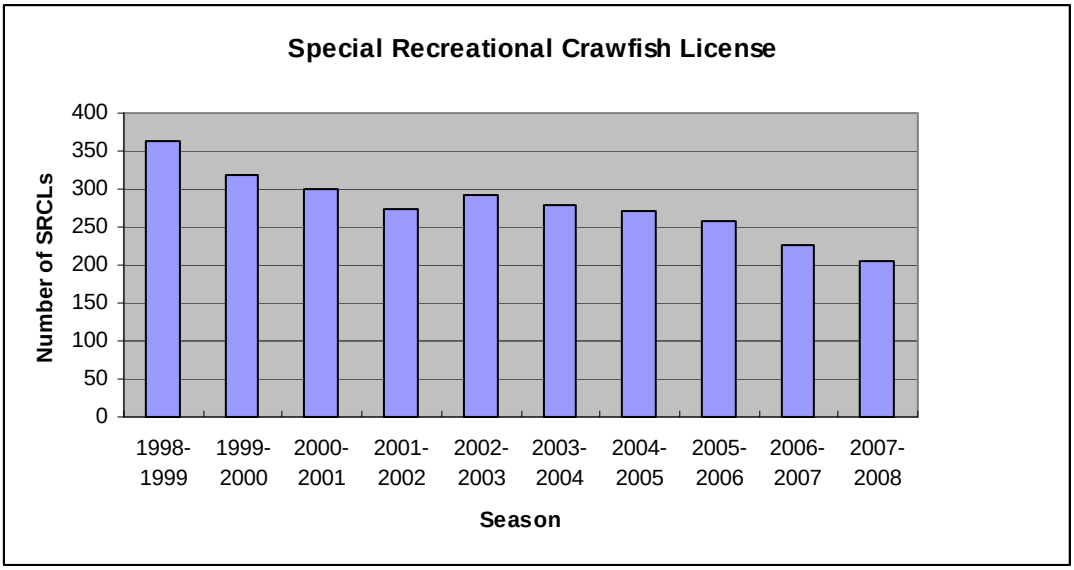
Source: Florida Fish and Wildlife Conservation Commission, Marine Fisheries Information System.

Figure 3.1.6.2. Number of crawfish/lobster endorsements issued by Florida FWC.

On August 5, 1994, the SRCL was issued after the implementation of the commercial spiny lobster trap certificate program (68B-24.0035, Florida Administrative Code). The SRCL was intended to reduce the adverse impact on recreational fishers who were commercially licensed and using traps, but were prohibited from using lobster traps because they did not meet the qualifications that were established from the commercial lobster trap certificate program.[11] SRCLs are not issued to persons who did not possess a crawfish trap number (Crawfish Endorsement) and a Saltwater Products License during the 1993 – 1994 license year (68B-24.0035(2)(b), F.A.C.). No person issued a SRCL may also possess a Crawfish Endorsement. An SRCL is not valid unless the holder also possesses a valid Recreational Crawfish Permit required by Section 372.57(8)(d), Florida Statutes. Moreover, if the SRCL is not renewed every year, the holder loses the license. The SRCL applies to recreational fishers in state, not federal, waters, and does not permit harvesting lobsters during the two-day sport season. License holders are required to file quarterly reports with the Florida FWC detailing the amount of spiny lobster harvested in the previous quarter together with the amount harvested by other recreational harvesters aboard the license holder's vessel (68B-24.0035(2)(e), F.A.C.).

[11] A commercial license was/is required because traps were/are not legally acceptable gear in the recreational spiny lobster fishery.

The number of SRCLs has declined since the 1998 – 1999 season (Figure 3.1.6.3). Beginning with the 2012 – 2013 license year and every year thereafter, no SRCL will be issued or renewed (68B-24.0035(2)(g), F.A.C.).



Source: Florida Fish and Wildlife Conservation Commission, Marine Fisheries Information System.

Figure 3.1.6.3. Number of special recreational crawfish licenses, 1998/1999 to 2007/2008 season.

Current Florida Regulations

Currently, Florida law requires anyone who commercially harvests or sells spiny lobster to have a Saltwater Products License (SPL). An SPL may be issued in the name of an individual or a valid vessel registration number issued in the name of the licensed applicant. The State also requires anyone who sells spiny lobster to have an RSE and Crawfish Endorsement.

Spiny lobster harvested in Florida waters must remain in a whole condition while on or below state waters and the practice of separating the tail from the body is prohibited (68B-24.003(4)). Possession of spiny lobster tails that have been separated on or below state waters is prohibited unless the spiny lobster is being imported pursuant to 68B-24.0045, F.A.C., or were harvested outside state waters and the separation was pursuant to a federal permit allowing such separation. If tails are separated from the body, tails must be at least 5.5 inches in length,[12] otherwise, if whole, the carapace must be greater than 3 inches long (68B-24.003(1), F.A.C.).

In Florida, the harvest or possession of egg-bearing spiny lobster is prohibited and any egg-bearing lobster found in traps must be immediately returned to the water free, alive and unharmed (68B-24.007 *F.A.C.*). The practice of stripping or otherwise molesting egg-bearing spiny lobster in order to remove the eggs is prohibited and the possession of

[12] No less than 5.5 inches not including any protruding muscle tissue.

spiny lobster or spiny lobster tails from which the eggs, swimmerets or pleopods have been removed or stripped is prohibited (68B-24.007 *F.A.C.*).

Possession of undersized lobster is prohibited, except in the spiny lobster trap fishery, where fishermen use undersized lobsters to attract legally sized ones. Allowable gears are traps, hand-held net, hoop net (diameter no larger than 10 feet), bully net (diameter no larger than 3 feet), and by diving. The vessel limit for harvest with a bully net is 250 lobsters per vessel per day, for the trap fishery there is no bag or trip limit, and limits for the dive fishery are regional. Additional restrictions and requirements depend on the method of harvest.

For those in the spiny lobster trap fishery, trap certificates and tags are required for all traps. A tag must be securely attached to each trap; spiny lobster trap specifications and trap, buoy, and vessel marking requirements apply; and traps, buoys, and vessels must display the Crawfish endorsement. Traps must be constructed of wood or plastic and be no larger than 3 feet by 2 feet or the volumetric equivalent (12 cubic feet) with the entrance located on top of the trap. Each plastic trap must have a degradable panel. Traps may be baited and placed in the water beginning August 1. Traps may be worked during daylight hours only. Traps may not be placed within 100 feet of the intracoastal waterway or any bridge or seawall. Traps must be removed from the water by April 5 each year. Harvest is prohibited in designated areas of John Pennekamp Coral Reef State Park. Florida law authorizes Florida FWC to retrieve traps left in the water after the close of the season and fines the traps' owners to cover the costs of retrieving the traps.
All vessels used by persons commercially harvesting lobster by diving, scuba, or snorkel must display the Commercial Dive Permit on the vessel SPL. A person with a Commercial Dive Permit cannot have a trap certificate. After January 1, 2005, no diver permits were issued, renewed or replaced except those that were active in 2004-05. Dive permits that are not renewed by September 30 of each year are forfeited. A 250-lobster daily vessel limit applies in Broward, Dade, Monroe, Collier, and Lee counties and adjoining federal waters.

The commercial and regular recreational Caribbean spiny lobster seasons start on August 6 and end on March 31 (68B-24.005(1). No person can harvest, attempt to harvest, or have in his possession, regardless of where taken, any spiny lobster during the closed season of April 1 through August 5 of each year, except during the two-day sport season, for storage and distribution of lawfully possessed inventory stocks or by special permit issued by the Florida FWC (68B-24.005(1)). During the two-day sport season no person can harvest spiny lobster by any means other than by diving or with the use of a bully net or hoop net.

A Wholesale Dealer License is required for any person, firm or corporation that sells spiny lobster to any person, firm, or corporation except to the consumer and who may buy spiny lobster from any person pursuant to section 370.06(2) of the Florida Statutes or any licensed wholesale dealer.

Zoning laws have indirectly affected the spiny lobster fishery in south Florida. In August 1986, Monroe County changed its zoning laws by implementing the Monroe County Land Use Plan (Plan). Under the Plan, commercial fishers must store, build, repair, and dip traps in industrial or commercially zoned areas, within areas designated as commercial fishing villages or in areas termed specific fishing districts (Johnson & Orbach, 1990).[13] Prior to the zoning change, fishers could store and work on traps on residential property. Under Article V, Section 9.5 – 143(f) of the Monroe County Ordinances, where a nonconforming use of land or structure is discontinued or abandoned for 6 months or 1 year in the case of stored lobster traps, then such use may not be reestablished or resumed, and subsequent use must conform to provisions detailed in the chapter of the ordinances.

3.2 Physical Environment

To be filled in by Gregg

3.3 Biological Environment

3.3.1 Lobster

Family Palinuridae (Figure 3.3.1.1)

Figure 3.3.1.1. From left to right the following species are: Caribbean spiny lobster, smoothtail spiny lobster, spotted spiny lobster.
Source: Photograph from Florida FWC website.

[13] Traps used to be dipped in recycled oil to protect them from the marine environment. However, that practice was prohibited beginning in 1995. Now fishermen soak traps in a brine solution to extend the life of their traps.

Caribbean spiny lobster

Panulirus argus, is widely distributed throughout the western Atlantic Ocean as far north as North Carolina to as far south as Brazil including Bermuda, the Bahamas, Caribbean, and Central America (Herrnkind 1980; Figure 3.3.1.2). Analyses of DNA indicate a single stock structure for the Caribbean spiny lobster throughout its range (Lipcius and Cobb 1994; Silberman and Walsh 1994). This species inhabits shallow waters, occasionally as deep as 295 ft (90 m), possibly even deeper. Caribbean spiny lobster can be found among rocks, on reefs, in grass beds or in any habitat that provides protection. The species is gregarious and migratory. Maximum total body length recorded is 18 inches (45 cm), but the average total body length for this species is 8 inches (20 cm; FAO Fisheries Synopsis 1991).

Figure 3.3.1.2. Distribution of Caribbean spiny lobster.
Source: FAO Fisheries Synopsis 1991;Joint CFMC-GMFMC-SAFMC Amendment 8, 2008.

Distribution and dispersal of Caribbean spiny lobster is determined by the long planktonic larval phase, called the puerulus, during which time the infant lobsters are carried by the currents until they become large enough to settle to the bottom (Davis and Dodrill 1989). As the lobsters begin metamorphosis from puerulus to the juvenile form, the ability to swim increases and they move into shallow, near shore environments to grow and develop.

Young benthic stages of Caribbean spiny lobster will typically inhabit branched clumps of red algae (*Laurencia sp*.), mangrove roots, seagrass banks, or sponges where they feed on invertebrates found within the microhabitat. In contrast to the social behavior of their older counterparts, the juvenile lobsters are solitary and show aggressive behavior to ensure they remain solitary. The inhabitation of macroalgae by the juvenile lobsters provides protection to the vulnerable individuals from predators while providing easy access to food sources (Marx and Hernkind 1985).

Individuals two to four years show nomadic behavior emigrating out of the shallows and moving to deeper, offshore reef environments. Once in the adult phase, Caribbean spiny lobsters are thigmotactic and tend to enter social living arrangements aggregating in enclosed dens. Shelter environments may include natural holes in a reef, rocky outcrops, or artificially created environments (Lipcius and Cobb 1994).

As adults in the offshore environment, Caribbean spiny lobsters support commercial, recreational, and artisanal fisheries throughout their geographic range (Davis and Dodrill 1989). Given the wide distribution of this species from Bermuda down to Brazil, it is hard to determine a definitive stock structure for this species. There are a multitude of currents and other factors that influence the movement of water throughout their range. The long duration that lobsters spend in the larval stage, traveling by the currents severely impairs the ability of scientists to determine a stock structure. More recent work with DNA may be useful in determining some sort of stock structure for the Caribbean spiny lobster (Lipcius and Cobb, 1994); however, the extensive larval phase may also limit this tool as it takes few successful migrants to homogenize the gene pool (Silberman and Walsh 1994). Studies have also shown that the presence of local gyres or loop currents in certain locations could influence the retention of locally spawned larvae. In addition, benthic structures such as coral reef may disturb the flow of water and lead to the settlement of larvae in a particular location (Lee et. al. 1994).

The general anatomy of Caribbean spiny lobster conforms to the typical decapod body plan consisting of five cephalic and eight thoracic segments fused together to form the cephalothorax (Figure 3.3.1.3). The carapace, a hard shield-like structure, protects this portion of the body and is often the part of the lobster measured and used as a standard to determine organism length. All the segments bear paired appendages that serve in locomotion, sensory, or both (Phillips et al. 1980). From the head of the lobster, the appendages are ordered starting with the first antennae, second antennae, mandibles, first maxillae, and second maxillae. There are five pairs of walking legs called pereiopods (walking legs) and a six-segmented tail. The antennae function primarily to obtain sensory information by chemoreception, as do the dactyls of the walking legs and the mouthparts involved in handling food. Lobsters have great visual ability, achieved through the use of their paired, lateral compound eyes. In addition, highly distributed superficial hairs detect water movements (Ache and Macmillan 1980).

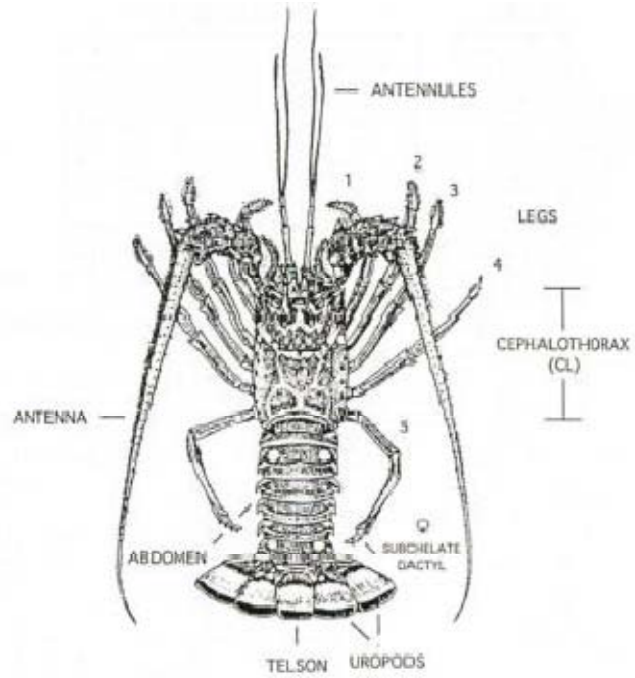


Figure 3.3.1.3. Morphology of Caribbean spiny lobster, *Panulirus argus*. Source: Lipcius and Cobb (1994).

Gills are the main organs used by lobsters for respiration. The rate of oxygen consumption in *P. argus* is dependent upon the temperature, the degree of crowding within the den, feeding and size of the lobster; oxygen consumption is not determined by the concentration of the oxygen in the water as some studies show that oxygen uptake remained the same in both hypoxic and aerated water (Phillips et al. 1980).

Food Habits

After Caribbean spiny lobster settle from the planktonic phase to the benthic habitat they enter seagrass and macroalgae nursery habitat. Their diet consists of small gastropod mollusks, isopods, amphipods and ostracods, most of which can be found in or within close proximity to the lobster's algal shelter. Studies suggest that as the abundance of food declines in and around their algae habitat, lobsters forage more frequently and thus have more frequent contact with conspecifics. Aggressive behavior in the juvenile lobsters, which at this time live solitarily, has been observed as a means of enforcing territoriality. The consequence of increased aggressive interactions as well as a declining food source is thought to induce the nomadic emigration from the algal nursery environment to off shore reef environments (Marx and Herrnkind, 1985).

During the adult and juvenile phases, the Caribbean spiny lobster will rest in shelters during daylight hours and emerge in the evening to forage for food. Adult lobsters are key predators in many benthic habitats with their diets consisting of slow-moving or stationary bottom-dwelling invertebrates including sea urchins, mussels, gastropods, clams and snails (Lipcius and Cobb 1994). Juvenile lobsters also forage at night and will eat a similar diet of invertebrates, only smaller individual prey. During feeding, prey organisms are seized and maneuvered using the anterior periopods or maxillipeds, while

the mandibles carry out mechanical digestion and are capable of crushing hard mollusk shell (Herrnkind et. al. 1975). Little is known about the dietary requirements of the larval phase, plankton sized lobsters.

Larger animals such as sharks and finfish frequently prey upon adult Caribbean spiny lobsters. Studies indicate that Caribbean spiny lobsters are highly selective of the dens they choose to live in and the location of these crevices. Their evening movements away from and subsequent return to their dens illustrates the spatial orientation they have to their immediate habitats (Herrnkind, 1980).

Reproduction

Reproduction in the Caribbean spiny lobster occurs almost exclusively in the deep reef environment once mature individuals have made the permanent transition from the shallow seagrass nursery to the ocean coral reef system. Spawning season is in the spring and summer; however, autumnal reproduction has been known to occur in some situations (Kanciruk and Herrnkind 1976). The gestation period for eggs is about a month. Eggs are orange when they are fresh and brown when they are close to hatching. Studies have found that the initiation of spawning is related to water temperature with an optimal water temperature for mating of 24 degrees centigrade (Lyons et. al. 1981).

Reproductive fecundity is dependent upon the size of the individual as well as the geographic area in which the lobster lives. Reproductive efficiency for a given size in a given area can be determined using the relationship between fecundity and carapace length. A study conducted in South Florida found that differences exist between the fecundity/carapace length relationships of individuals living in the Dry Tortugas from individuals living in the Upper and Middle Florida Keys. Based on data provided from each location, an Index of Reproductive Potential was calculated using the model developed by Kanciruk and Herrnkind (1976):

Index = (A x B x C)/D
Where:

A = number of females in size class/total females
B = propensity of size class to carry eggs
C = egg carrying capacity of size class female
D = constant (31.27) – present to set the 76-80 mm size class index to 100 as the standard.

Choice of mate is determined by the female as well as inter-male aggression, where larger males will prevent a smaller male from courting a female (Lipcius and Cobb1994). Females mate only once during a season, while males can fertilize multiple females. During mating, the male will flick his antennules over the anterior of the female and scrape at her with the third walking legs. The male follows the female around continually trying to lift the female up and embrace her. This pattern continues until the female acquiesces and they each stand on their walking legs while the male deposits the spermatophore mass on the female sternum (Atema and Cobb 1980). Females bearing eggs will usually live in solitary dens and infrequently forage for food (Lyons, et. al.

1981). Large adult females will produce more broods, as well as spawn eggs earlier in the reproductive period than younger females since younger individuals molt earlier in the reproductive period.

Growth and Molting

The life cycle of the Caribbean spiny lobster provides larvae with the potential to travel long distances for periods ranging from a few months to almost two years (Figure 3.3.1.4). During this time, the larval lobsters remain near the surface of the water. Maximum potential dispersal distances differ from one region to another and are primarily dependent on the currents in the area. A gyre in an area where lobster eggs have hatched may keep the larva in the same geographic area, however most of the time the larva are transported out of the area, sometimes hundreds of miles (Lee et. al. 1994). Once the planktonic lobsters reach about 1.4 inches (35 mm) they are large enough to settle down as post larval pueruli in shallow benthic environments to grow. Growth in juveniles is rapid with most reaching a carapace length of 2.4-2.8 inches (60-70 mm) within about two years (Hernkind 1980). Once the lobsters reach about 2.8 inches (70 mm) and begin to sexually mature, the young Caribbean spiny lobster emigrate from the nursery to deeper offshore reef environments.

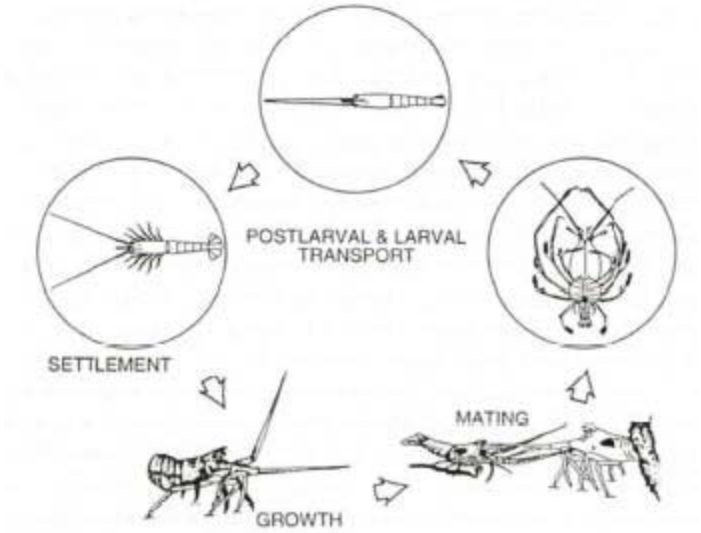


Figure 3.3.1.4. The Life Cycle of the Caribbean spiny lobster *Panulirus argus*.
Source: Lipcius and Cobb (1994).

Physical growth of lobsters is achieved through molting (Figure 3.3.1.4). A thorough understanding of the molt cycle of the Caribbean spiny lobster is an important component to the management of this fishery because the catchability and captive behavior of crustaceans is directly related to the animal's proximity to molting. The molt cycle begins with the inter-molt period, the time when a new cuticle is being created, tissue growth is rapid and the lobster actively forages. This period of time culminates in ecdysis, which is shedding the old cuticle or molting (Lipcius and Hernkind 1982).

Molting occurs primarily at night. Possible reasons for nocturnal ecdysis include decreasing the risk of cannibalism by other members of this gregarious species, and

decreasing diurnal predation risks. The first action to occur during molting is the rupture of the thoracoabdominal membrane followed by a rising of the dorsal part of the cephalothorax; this action frees the eyes, bases of antennae and antennules. A series of peristaltic contractions causes the removal of the abdomen from the old cuticle, while writhing motions free the cephalothorax and attached structures. A few final wriggles and contractions terminating in a tail flip completely segregates the lobster from its old cuticle. Once molted, the lobster seeks immediate shelter, as they are especially vulnerable until their new cuticle becomes hardened (Lipcius and Hernkind 1982). For adult lobsters, molts average about two and a half times each year. The entire molting event takes approximately ten minutes. The new exoskeleton will take about 12 days from the start of the molt to harden such that it cannot be dented; however the shell is not completely formed until the 28^{th} day (Williams 1984).

Studies found that feeding rates significantly increase in the time preceding a molt to accommodate the increasing metabolic needs associated with new cuticle formation. About a week before ecdysis, daily food intake for the Caribbean spiny lobster decreases rapidly, in correlation with a reduction in demanding activities such as locomotion and foraging. In the few days before and the time during ecdysis, feeding ceases altogether and the lobster becomes socially reclusive. Within a week of the molting event Caribbean spiny lobster will display maximal feeding, foraging and locomotor activity rates to accommodate for the active tissue growth that occurs (Lipcius and Hernkind 1982). The dramatic swings in feeding and foraging behavior associated with the molting cycle influences the success of fishermen when capturing this species. The highest catchability of spiny lobster is expected immediately following molting because lobsters are actively foraging at this time and are therefore more likely to accept bait. Conversely, the lowest catchability of spiny lobster is expected before molting when foraging decreases and the lobster becomes less mobile (Lipcius and Hernkind 1982).

Growth and Mortality Rates

Despite the wide body of literature on this species, limited information is available on the growth and aging of the Caribbean spiny lobster due in part to the molting habits of lobsters interfering with tagging efforts. Consequently, length data, which is substantially easier and less costly to collect, has been the dominant source of information used to estimate growth in Caribbean spiny lobster. The limited quantitative information that exists on growth for this species at various locations has been compiled in a doctoral thesis by Jaime Manuel Gonzalez-Cano (1991) and was graphed below using the von Bertalanffy growth model.

$$L = Linf\ [1-e(-k(t-to))]$$

Where:

L = length of the organism at time t

Linf = asymptotic average length achieved

K = growth rate with units 1/time

T_o = time when the length of the organism would be zero

As with any fished population, especially one with poor aging information, natural mortality rates for Caribbean spiny lobster populations have been difficult to isolate from fished rates of mortality.

Locomotion and Migration

The Caribbean spiny lobster achieves locomotion by using the five pairs of walking legs attached to the cephalothorax and can swim (backward) for brief periods using its tail for propulsion (Lipcius and Cobb 1994). Caribbean spiny lobster patterns of movement fall into the following categories: homing, nomadism and migration. Throughout most of their life, Caribbean spiny lobster is a shelter dweller during the day and forages at night. Evening movements within the home range are directed; lobsters are aware of their location and can find the way back to the den of origin even if detours are caused by predators or divers. Nomadism is the movement that occurs in juvenile lobsters away from the nursery habitat and to the offshore reefs. Migration is the direct movement of an entire population or sub-population over a long distance for a given period of time (Herrnkind 1980).

Mass movements (2-60 individuals) of Caribbean spiny lobsters occur annually throughout the geographic range of the species and are dependent on latitude and climactic factors. Observed locations for the migration include Bermuda in October, the Bahamas and Florida in late October and early November, and the Yucatan and Belize in December (Herrnkind 1985). This mass migratory behavior is thought to have evolved in response to deteriorating conditions that resulted from the periods of glaciations that occurred over the past several 100,000 years. Thus, the migration and queuing behavior became specialized by the natural selection on individuals of the harsh winters during periods of glaciations. Gonads during the migration in the fall are inactive, as they don't begin to mature until the late winter (Herrnkind 1985).

The first autumn storm in the tropics usually brings a severe drop in water temperature of about five degrees centigrade, as well as high northerly winds of up to 40 km/h and large sea swells. The shallow regions that the lobsters exploit during the summer months become turbid and cold, initiating the diurnal migration of thousands of lobsters to evade these conditions. The Caribbean spiny lobster is highly susceptible to severe winter cooling and will exhibit reduced feeding and locomotion at temperatures 54-57 ºF (12-14 ºC); molting individuals usually perish under these conditions. According to Herrnkind (1985), the behavioral changes observed in Caribbean spiny lobster as well as the known biological information about the species lends credence to the idea that individuals migrate to evade the stresses of the cold and turbidity in the winter.

Caribbean spiny lobster initiate the migratory behavior by queuing, the single file formation of migrating individuals initiated by visual or tactile stimuli. Queuing is maintained by establishing contact between the antennules of one individual and anterior walking legs of another. Biologically, the queuing behavior is an important hydrodynamic drag reduction technique for the migration of individuals over long distances (Bill and Herrnkind 1976). Studies done by tagging individuals found that

during the migration, individuals tended to move distances of 19-31 statute miles (30-50 km; Herrnkind 1985).

Migratory movement lasts for variable periods of time and is believed to be dependent on the total number of migratory lobsters. One study in the Bahamas in 1971 found the migration to take six hours while another study in the same location in 1969 found the migration to take five days. It is thought that the more lobsters present, the longer the migration will last in order to avoid overcrowding of shelters at their final destination (Kanciruk and Herrnkind 1978). Once individuals reach sheltered habitats located in deeper water, such as a deep reef site, the migratory queuing behavior ends and the lobsters disperse.

Other Species in the Family Palinuridae

Spotted spiny lobster, *Panulirus guttatus*, range includes the western Atlantic, Bermuda, Bahamas, South Florida, Belize, Panama, and Venezuela, as well as the Caribbean from Cuba to Trinidad, Curacao, and Bonaire (Figure 3.3.1.5). This species prefers shallow water and inhabits rocky areas, mainly in crevices. Maximum total body length recorded is 8 in (20 cm), but the average total body length for this species is 6 in (15 cm; FAO Fisheries Synopsis 1991). This species is occasionally caught in traps, typically set for other species, such as the Caribbean spiny lobster (FAO Fisheries Synopsis 1991).

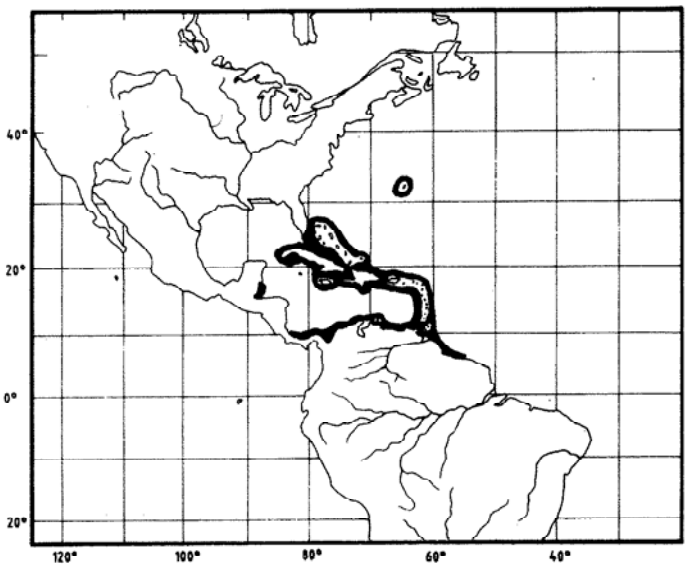


Figure 3.3.1.5. Distribution of spotted spiny lobster, *Panulirus guttatus*.
Source: FAO Fisheries Synopsis (1991).

Smoothtail spiny lobster, *Panulirus laevicauda*, range includes the western Atlantic, Bermuda, South Florida, down into Brazil, as well as Central America, and the Caribbean (Figure 3.3.1.6). This species is found in coastal waters, as deep as 164 ft (50 m) and prefers rock or coral reef substrate as habitat. Maximum total body length recorded is 12 inches (31 cm), but the average total body length for this species is 8 in (20 cm).

Sometimes smoothtail spiny lobsters are taken together with Caribbean spiny lobster. The largest yield for this species is in Brazil (FAO Fisheries Synopsis 1991).

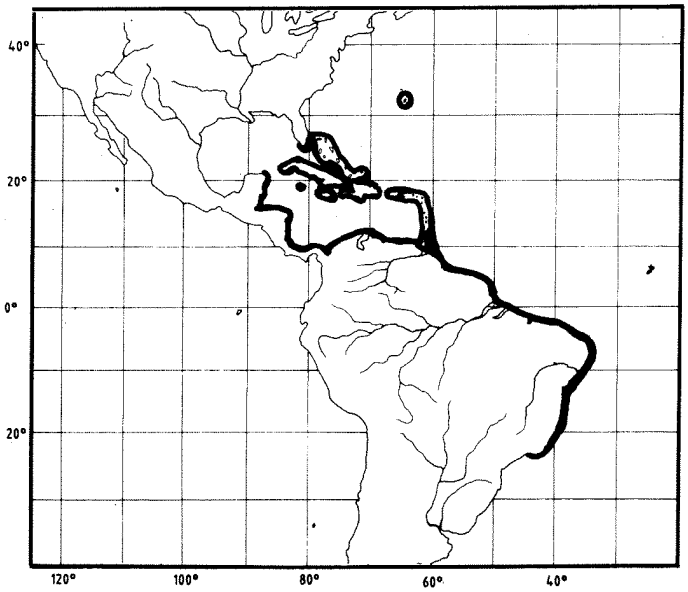


Figure 3.3.1.6. Distribution of smoothtail spiny lobster, *Panulirus laevicauda*.
Source: FAO Fisheries Synopsis (1991).

Family Scyllaridae

Spanish slipper lobsters, *Scyllarides aequinoctialis*, are distributed in the western Atlantic Ocean, as far north as South Carolina down to Brazil including Bermuda, the Gulf of Mexico, and the Caribbean (Figure 3.3.1.7). This species depth distribution ranges from 2 to 591 ft (0.6 to 180 m), usually between 2 to 210 ft (0.6 and 64 m). This species preferred habitat is sand or rocks, often on high-relief coral reefs in crevices (FAO Fisheries Synopsis 1991; Sharp et al. 2007). The animals are sluggish and nocturnal and feed on algae and detritus. They bury themselves in the sand. Maximum total body length recorded is 12 inches (31 cm), but average carapace length is 5 inches (12 cm; FAO Fisheries Synopsis 1991; Sharp et al. 2007).

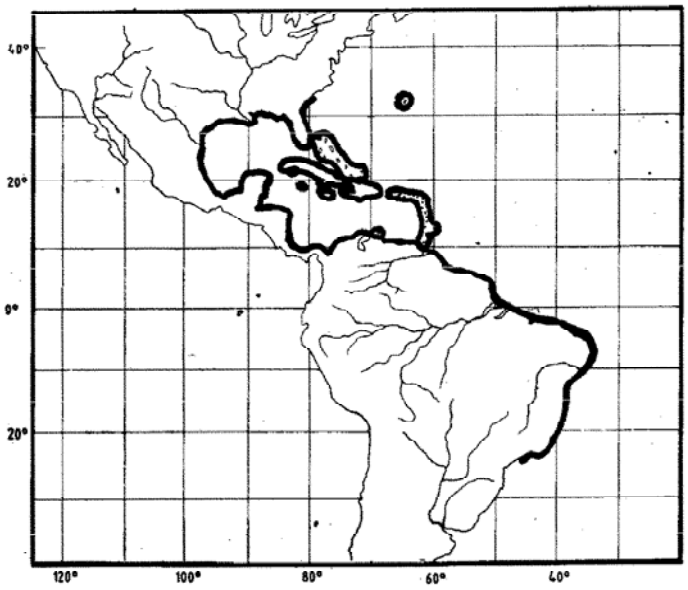


Figure 3.3.1.7. Distribution and photograph of Spanish slipper lobster, *Scyllarides aequinoctialis*.
Source: FAO Fisheries Synopsis (1991); Photograph by J. Hunt (2009).

Ridged slipper lobster, *Scyllarides nodifer*, are distributed throughout the western Atlantic Ocean, south of Cape Lookout, North Carolina, Bermuda, and the entire Gulf of Mexico (Figure 3.3.1.8). This species is typically found in the Florida Keys and Dry Tortugas (FAO Fisheries Synopsis 1991). Ridged slipper lobster depth distribution

ranges between 6.5 to 299 ft (2 and 91 m) and prefer sandy substrate, sometimes mixed with mud, shell, or corals. They are often found on low-relief coral reefs and bury themselves in sediments during daylight hours (Sharp et al. 2007). Maximum total body length recorded is 14 in (35 cm), but average carapace length is 4.3 in (11 cm; FAO Fisheries Synopsis 1991; Sharp et al. 2007).

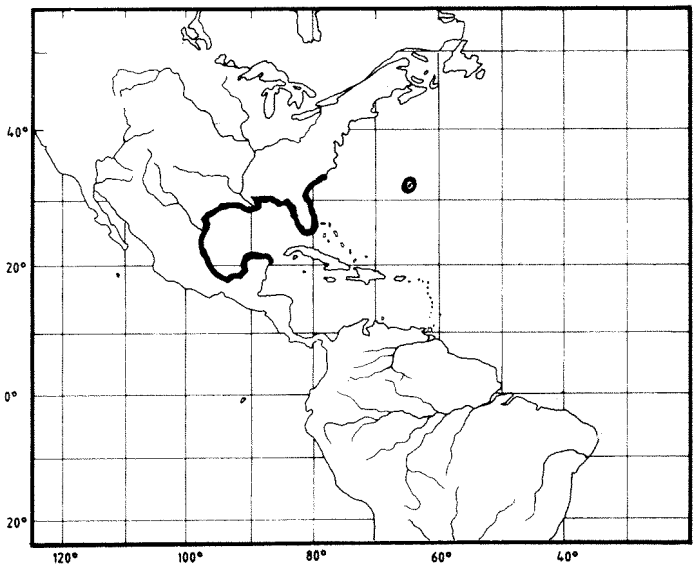


Figure 3.3.1.8. Distribution and photograph of ridged slipper lobster. Source: FAO Fisheries Synopsis (1991); Photograph by J. Hunt (2009).

3.3.2 Protected Species

There are 32 different species of marine mammals that may occur in the EEZ of the Gulf of Mexico, South Atlantic, and Caribbean. All 32 species are protected under the Marine Mammals Protection Act (MMPA) and six are also listed as endangered under the Endangered Species Act (ESA) (i.e., sperm, sei, fin, blue, humpback and North Atlantic right whales). There are no known interactions between spiny lobster fisheries and marine mammals. Other species protected under the ESA occurring in the Gulf of Mexico, South Atlantic, and Caribbean include five species of sea turtle (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish, and two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]). A discussion of these species is below. Designated critical habitat for the North Atlantic right whale also occurs within the South Atlantic region.

ESA-Listed Sea Turtles
The following sections are a brief overview of the general life history characteristics of the sea turtles found in the Gulf of Mexico and South Atlantic region. Several volumes exist that cover more thoroughly the biology and ecology of these species (i.e., Lutz and Musick (eds.) 1997, Lutz et al. (eds.) 2002).

Green sea turtle hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr 1987, Walker 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick 1976, Hughes 1974). At approximately 20 to 25 cm carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also know to consume jellyfish, salps, and sponges (Bjornal 1980, 1997; Paredes 1969; Mortimer 1981, 1982). The diving abilities of all sea turtles species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 m (360 ft) (Frick 1976), but they are most frequently making dives of less than 20 m (65 ft.) (Walker 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes with most dives lasting from 9 to 23 minutes (Walker 1994).

The hawksbill's pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan 1988, Meylan and Donnelly 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal waters. Little is known about the diet of pelagic stage hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (van Dam and Diéz 1998). The hawksbill's diet is highly specialized and consists primarily of sponges (Meylan 1988). Gravid females have been noted ingesting coralline substrate (Meylan 1984) and calcerous algae (Anderes Alvarez and Uchida 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are

not known, but the maximum length of dives is estimated at 73.5 minutes. More routinely dives last about 56 minutes (Hughes 1974).

Kemp's ridley hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr 1987, Ogren 1989). Once the juveniles reach approximately 20 cm carapace length they move to relatively shallow (less than 50m) benthic foraging habitat over unconsolidated substrates (Márquez-M. 1994). They have also been observed transiting long distances between foraging habitats (Ogren 1989). Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or from discarded bait (Shaver 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50 m or less (Soma 1985; Byles 1988). Their maximum diving range is unknown. Depending on the life stage a Kemp's ridleys may be able to stay submerged anywhere from 167 minutes to 300 minutes, though dives of 12.7 minutes to 16.7 minutes are much more common (Soma 1985; Mendonca and Pritchard 1986; Byles 1988). Kemp's ridleys may also spend as much as 96% of their time underwater (Soma 1985; Byles 1988).

Leatherbacks are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. However, they will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1000 m (Eckert et al. 1989) but more frequently dive to depths of 50 m to 84 m (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5 minutes (Standora et al. 1984, Eckert et al. 1986, Eckert et al. 1989, Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora et al. 1984).

Loggerhead hatchlings forage in the open ocean and are often associated with Sargassum rafts (Hughes 1974, Carr 1987, Walker 1994, Bolten and Balazs 1995). The pelagic stage of these sea turtles are known to eat a wide range of things including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma 1972). Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm straight-line carapace length they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell 2002). Here they forage over hard- and soft-bottom habitats (Carr 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke et al. 1993). Estimates of the maximum diving depths of loggerheads ranges from 692-764ft (211 to 233 m; Thayer et al. 1984; Limpus and Nichols 1988). The lengths of loggerhead dives are frequently between 17 and 30 minutes (Thayer et al. 1984; Limpus and Nichols 1988;

Limpus and Nichols 1994; Lanyan et al. 1989) and they may spend anywhere from 80 to 94% of their time submerged (Limpus and Nichols 1994; Lanyan et al. 1989).

ESA-Listed Marine Fish

The historical range of the smalltooth sawfish in the U.S. ranged from New York to the Mexico border. Their current range is poorly understood but believed to have contracted from these historical areas. In the South Atlantic region, they are most commonly found in Florida, primarily off the Florida Keys (Simpfendorfer and Wiley 2004). Only two smalltooth sawfish have been recorded north of Florida since 1963 (the first was captured off of North Carolina in 1999 (Schwartz 2003) and the other off Georgia 2002 [Burgess unpublished data]). Historical accounts and recent encounter data suggest that immature individuals are most common in shallow coastal waters less than 25 m (Bigelow and Schroeder 1953, Adams and Wilson 1995), while mature animals occur in waters in excess of 100 meters (Simpfendorfer pers comm. 2006). Smalltooth sawfish feed primarily on fish. Mullet, jacks, and ladyfish are believed to be their primary food resources (Simpfendorfer 2001). Smalltooth sawfish also prey on crustaceans (mostly shrimp and crabs) by disturbing bottom sediment with their saw (Norman and Fraser 1937, Bigelow and Schroeder 1953).

ESA-Listed Marine Invertebrates

Elkhorn (*Acropora palmata*)(Figure X) and staghorn (*A. cervicornis*) (Figures 3.3.2.1 and 3.3.2.2) coral were listed as threatened under the ESA on May 9, 2006. The Atlantic *Acropora* Status Review (*Acropora* Biological Review Team 2005) presents a summary of published literature and other currently available scientific information regarding the biology and status of both these species.

Elkhorn and staghorn corals are two of the major reef-building corals in the wider Caribbean. In the Gulf of Mexico, South Atlantic, and Caribbean they are found most commonly in the Florida Keys and U.S. Virgin Islands, though colonies exist in Puerto Rico and Flower Gardens National Marine Sanctuary in the Gulf of Mexico. The depth range for these species ranges from <1 m to 60 m. The optimal depth range for elkhorn is considered to be 1 to 5 m depth (Goreau and Wells 1967), while staghorn corals are found slightly deeper, 5 to 15 m (Goreau and Goreau 1973).

All Atlantic *Acropora* species (including elkhorn and staghorn coral) are considered to be environmentally sensitive, requiring relatively clear, well-circulated water (Jaap et al. 1989). Optimal water temperatures for elkhorn and staghorn coral range from 25° to 29°C (Ghiold and Smith 1990, Williams and Bunkley-Williams 1990). Both species are almost entirely dependent upon sunlight for nourishment, contrasting the massive, boulder-shaped species in the region (Porter 1976, Lewis 1977) that are more dependent on zooplankton. Thus, Atlantic *Acropora* species are much more susceptible to increases in water turbidity than some other coral species.

Fertilization and development of elkhorn and staghorn corals is exclusively external. Embryonic development culminates with the development of planktonic larvae called planulae (Bak et al. 1977, Sammarco 1980, Rylaarsdam 1983). Unlike most other coral

larvae, elkhorn and staghorn planulae appear to prefer to settle on upper, exposed surfaces, rather than in dark or cryptic ones (Szmant and Miller 2006), at least in a laboratory setting. Studies of elkhorn and staghorn corals indicated that larger colonies of both species[14] had higher fertility rates than smaller colonies (Soong and Lang 1992).

Figure 3.3.2.1 Elkhorn Coral (*Acropora palmata*) Photo Credit: W. Jaap

Figure 3.3.2.2 Staghorn Coral (*A. cervicornis*) Photo Credit: W. Jaap

[14] As measured by surface area of the live colony

3.4 Economic and Social Environment

3.4.1 Global Commercial Production of Caribbean Spiny Lobster

According to the Food and Agriculture Organization of the United Nations (FAO), world capture of Caribbean spiny lobster has greatly increased from 1950 through 2005, starting at a low of 2,957 metric tons in 1950 to 35,540 metric tons in 2005 (Table 3.4.1.1, http://www.fao.org/fishery/species/3445). Among the countries that harvested Caribbean spiny lobster from 1996 through 2005 and reported those landings to the FAO, the Bahamas had the largest average annual landings, followed by Cuba, Brazil, Nicaragua, and the United States. U.S. imports of frozen spiny lobster represented an average of 87% of reported annual Caribbean spiny lobster landings from countries other than the U.S. and Cuba. Annual global production of Caribbean spiny lobster averages about 54% of all spiny lobster production (*Panulirus* spp. and *Palinurus* spp.) and about 17% of global production of all lobster. Since 1962, average annual global harvest of Caribbean spiny lobster has been less than such harvest for American and rock lobster (*Jasus* spp.).

Table 3.4.1.1. Global production of lobster, including Caribbean spiny lobster, 1962 through 2003.

	Metric Tons Landed		
Year	Caribbean Spiny Lobster	Total Lobster	% CSL of Total Lobster
1962	16,324	122,638	13.31%
1963	15,426	123,324	12.51%
1964	15,347	129,765	11.83%
1965	18,658	129,195	14.44%
1966	17,827	131,749	13.53%
1967	16,502	124,935	13.21%
1968	19,497	138,694	14.06%
1969	25,239	142,392	17.73%
1970	25,400	141,138	18.00%
1971	24,500	139,484	17.56%
1972	25,600	145,008	17.65%
1973	25,500	141,820	17.98%
1974	28,759	138,846	20.71%
1975	26,184	143,107	18.30%
1976	24,573	146,555	16.77%
1977	24,449	148,724	16.44%
1978	30,020	157,399	19.07%
1979	32,855	164,539	19.97%
1980	29,165	156,797	18.60%
1981	29,353	161,591	18.16%
1982	29,655	163,420	18.15%
1983	28,704	175,553	16.35%
1984	34,820	183,056	19.02%
1985	36,994	200,846	18.42%
1986	34,637	202,523	17.10%
1987	33,303	205,057	16.24%
1988	32,535	209,884	15.50%

	Metric Tons Landed		
Year	Caribbean Spiny Lobster	Total Lobster	% CSL of Total Lobster
1989	34,340	208,655	16.46%
1990	32,881	211,600	15.54%
1991	40,240	216,486	18.59%
1992	36,805	205,882	17.88%
1993	36,206	206,618	17.52%
1994	39,066	217,288	17.98%
1995	39,833	219,874	18.12%
1996	38,468	212,951	18.06%
1997	36,756	233,381	15.75%
1998	34,165	217,126	15.74%
1999	38,098	228,602	16.67%
2000	37,631	227,596	16.53%
2001	31,863	221,749	14.37%
2002	38,344	224,883	17.05%
2003	33,327	224,074	14.87%
Average	*29,758*	*177,257*	*16.71%*

Source: FAO Fishstats, reported landings.

Five species of lobster are both commercially and recreationally harvested in U.S. waters. These species are: American lobster (*Homarus americanus*), California spiny lobster (*Panulirus interruptus*), Caribbean spiny lobster (*Panulirus argus*), banded or Hawaiian spiny lobster (*Panulirus marginatus*), and Spanish slipper lobster (*Scyllarides aequinoctialis*). The American lobster is a "true" lobster, whereas the others are members of the spiny/rock lobster group. In the southeast, spotted lobster (*Panulirus guttatus*), ridged slipper lobster (*Scyllarides nodifer*), and smooth tail lobster (*Panulirus laevicauda*) are taken by recreational fishermen only. Since 2000, commercial landings of Hawaiian spiny lobster, which is also known as banded spiny lobster (*Panulirus marginatus*), have declined from 10,394 pounds in 2000 to 4,870 pounds in 2004.

From 1962 through 2003, continental U.S. commercial landings of Caribbean spiny lobster have ranged from a low of 1,424 metric tons in 1962 to a high of 5,358 metric tons in 1972 (Table 3.4.1.2). Since 1992, an average of 2,626 metric tons has been landed in the continental U.S. annually. Puerto Rico had no reported commercial landings of Caribbean spiny lobster from 1962 through 1998 and the U.S. Virgin Islands had no such landings from 1962 through 1974. Prior to 1999, over 95% of commercial landings occurred in the contiguous U.S.; however, since 1999 landings in Puerto Rico have increased resulting in its productive share rising from zero up to a high of over 10% in 2001.

Table 3.4.1.2. U.S., U.S. Virgin Islands and Puerto Rico commercial production of Caribbean spiny lobster, 1962 – 2003. *Source*: FAO Fishstats.

Year	Metric Tons			Pounds			% of Landings		
	US	USVI	PR	US	USVI	PR	US	USVI	PR
1962	1,424	0	0	3,139,383	0	0	100.00%	0.00%	0.00%
1963	1,626	0	0	3,584,717	0	0	100.00%	0.00%	0.00%
1964	1,647	0	0	3,631,014	0	0	100.00%	0.00%	0.00%
1965	2,608	0	0	5,749,657	0	0	100.00%	0.00%	0.00%
1966	2,427	0	0	5,350,620	0	0	100.00%	0.00%	0.00%
1967	2,002	0	0	4,413,655	0	0	100.00%	0.00%	0.00%
1968	3,247	0	0	7,158,411	0	0	100.00%	0.00%	0.00%
1969	3,839	0	0	8,463,548	0	0	100.00%	0.00%	0.00%
1970	4,600	0	0	10,141,266	0	0	100.00%	0.00%	0.00%
1971	3,900	0	0	8,598,030	0	0	100.00%	0.00%	0.00%
1972	5,400	0	0	11,904,964	0	0	100.00%	0.00%	0.00%
1973	5,100	0	0	11,243,577	0	0	100.00%	0.00%	0.00%
1974	4,938	0	0	10,886,428	0	0	100.00%	0.00%	0.00%
1975	3,363	22	0	7,414,147	48,502	0	99.35%	0.65%	0.00%
1976	2,430	39	0	5,357,234	85,980	0	98.42%	1.58%	0.00%
1977	2,318	59	0	5,110,316	130,073	0	97.52%	2.48%	0.00%
1978	2,080	71	0	4,585,616	156,528	0	96.70%	3.30%	0.00%
1979	2,699	74	0	5,950,277	163,142	0	97.33%	2.67%	0.00%
1980	2,959	49	0	6,523,479	108,027	0	98.37%	1.63%	0.00%
1981	2,463	42	0	5,429,986	92,594	0	98.32%	1.68%	0.00%
1982	2,649	58	0	5,840,046	127,868	0	97.86%	2.14%	0.00%
1983	2,053	29	0	4,526,091	63,934	0	98.61%	1.39%	0.00%
1984	2,369	35	0	5,222,752	77,162	0	98.54%	1.46%	0.00%
1985	1,667	35	0	3,675,107	77,162	0	97.94%	2.06%	0.00%
1986	2,362	54	0	5,207,320	119,050	0	97.76%	2.24%	0.00%
1987	2,169	30	0	4,781,827	66,139	0	98.64%	1.36%	0.00%
1988	2,438	48	0	5,374,871	105,822	0	98.07%	1.93%	0.00%
1989	2,438	57	0	5,374,871	125,664	0	97.72%	2.28%	0.00%
1990	2,606	60	0	5,745,248	132,277	0	97.75%	2.25%	0.00%
1991	2,878	74	0	6,344,905	163,142	0	97.49%	2.51%	0.00%
1992	1,792	*70*	0	3,950,684	154,324	0	96.24%	3.76%	0.00%
1993	2,548	*70*	0	5,617,379	154,324	0	97.33%	2.67%	0.00%
1994	3,420	*70*	0	7,539,811	154,324	0	97.99%	2.01%	0.00%
1995	2,934	*80*	0	6,468,364	176,370	0	97.35%	2.65%	0.00%
1996	3,373	*80*	0	7,436,193	176,370	0	97.68%	2.32%	0.00%
1997	2,783	*80*	0	6,135,466	176,370	0	97.21%	2.79%	0.00%
1998	2,343	*90*	0	5,165,432	198,416	0	96.30%	3.70%	0.00%
1999	2,749	*94*	209	6,060,509	207,235	460,766	90.07%	3.08%	6.85%
2000	2,571	*100*	212	5,668,086	220,462	467,380	89.18%	3.47%	7.35%
2001	1,527	*110*	190	3,366,459	242,509	418,878	83.58%	6.02%	10.40%
2002	2,047	*120*	158	4,512,863	264,555	348,330	88.04%	5.16%	6.80%
2003	1,887	130	196	4,160,124	286,601	432,106	85.27%	5.87%	8.86%

Commercial landings of Caribbean spiny lobster in the contiguous United States have been reported in Alabama, Georgia, Florida, Mississippi, South Carolina, and Texas since 1962; however, Florida dominates (Table 3.4.1.3). In 35 of the 45 years from 1962 through 2006, Florida landings accounted for all of the annual commercial landings; and in each of the other 10 years, annual landings in Florida represented at least 94% of the total pounds commercially landed that year. This explains why the species is also called the Florida spiny lobster.

Table 3.4.1.3. Commercial landings of Caribbean spiny lobster by state, 1962 – 2006, in pounds.

Year	Pounds Landed by State						TOTAL
	FL	GA	MS	AL	SC	TX	
1962	3,107,000	32,200	0	0	0	0	3,139,200
1963	3,585,200	0	0	0	0	0	3,585,200
1964	3,631,100	0	0	0	0	0	3,631,100
1965	5,714,100	35,000	0	0	0	0	5,749,100
1966	5,350,200	0	0	0	0	0	5,350,200
1967	4,413,600	0	0	0	0	0	4,413,600
1968	6,154,900	1,004,200	0	0	0	0	7,159,100
1969	7,581,200	882,200	0	0	0	0	8,463,400
1970	9,869,500	0	212,700	0	33,000	0	10,115,200
1971	8,206,000	0	373,500	132,600	0	0	8,712,100
1972	11,416,800	0	191,000	39,000	165,100	0	11,811,900
1973	11,171,700	0	21,000	1,500	0	0	11,194,200
1974	10,882,600	0	0	800	0	0	10,883,400
1975	7,408,400	0	0	100	0	0	7,408,500
1976	5,345,600	0	0	0	0	0	5,345,600
1977	6,344,100	0	0	0	0	0	6,344,100
1978	5,601,903	0	0	0	0	0	5,601,903
1979	7,828,269	0	0	0	0	0	7,828,269
1980	6,694,842	0	0	0	0	0	6,694,842
1981	5,894,005	0	0	0	0	0	5,894,005
1982	6,496,804	0	0	0	0	0	6,496,804
1983	4,317,000	0	0	0	0	0	4,317,000
1984	6,251,917	0	0	0	0	0	6,251,917
1985	5,739,393	0	0	0	0	0	5,739,393
1986	5,006,704	0	0	0	0	0	5,006,704
1987	6,082,439	0	0	1,141	0	67	6,083,647
1988	6,308,430	0	0	0	0	0	6,308,430
1989	7,673,159	0	0	0	0	0	7,673,159
1990	5,986,170	0	0	0	0	0	5,986,170
1991	7,022,809	0	0	0	0	0	7,022,809
1992	4,486,421	0	0	0	0	0	4,486,421
1993	5,378,807	0	0	0	0	0	5,378,807
1994	7,104,204	0	0	0	0	0	7,104,204

Year	Pounds Landed by State						TOTAL
	FL	GA	MS	AL	SC	TX	
1995	7,023,938	0	0	0	0	0	7,023,938
1996	7,868,547	0	0	0	0	0	7,868,547
1997	7,107,518	0	0	0	0	0	7,107,518
1998	5,829,132	0	0	0	0	0	5,829,132
1999	7,529,605	0	0	0	0	0	7,529,605
2000	5,772,670	0	0	0	0	0	5,772,670
2001	3,411,253	0	0	0	0	0	3,411,253
2002	4,484,598	0	0	0	0	0	4,484,598
2003	4,269,831	0	0	0	0	0	4,269,831
2004	5,006,383	0	0	0	0	0	5,006,383
2005	3,369,856	0	0	0	0	0	3,369,856
2006	4,773,995	0	0	0	0	0	4,773,995

Source: NMFS Accumulated Landings System.

3.4.2 Hurricanes

Hurricanes can have both positive and negative economic impacts on spiny lobster fishermen, especially those that use traps. The beneficial impact is that a hurricane can cause lobsters to move and go into traps and nets, which increases landings. However, the negative impacts include damages to and losses of traps, other gear, and vessels and associated losses of landings and revenues.[15]

On September 25, 1998, Hurricane Georges struck Florida with reported maximum sustained winds of approximately 95 miles per hour with gusts up to 115 miles per hour and an approximate storm surge of up to seven (7) feet. Several counties had widespread damage, including Monroe County (Wetherell). One of the worst hurricane seasons on record was the 2005 season. Of those that hit the coast of Florida, the four of Dennis (July), Katrina (August), Rita (September), and Wilma (October) had a significant adverse impact on spiny lobster trap fishers. According to a May 1, 2006, article at *keysnews.com*, Florida Keys lobster trap fishermen "reported losing up to 70 % of their traps in the four hurricanes that skirted the Keys in 2005. Officials have estimated that the hurricanes cost lobster fishermen $35 million in lost traps and catch" (O'Hara, May 1, 2006). In April 2006, the Florida Hurricane Relief Fund, which was established in 2004, gave $0.5 million to the Florida Keys Commercial Fishermen's Association (Association) to help lobster and stone crab fishers in Monroe and Miami-Dade counties replace traps lost to the 2005 hurricane season. According to the Association's executive director, the money will be equally distributed among the fishermen who apply for aid (ibid).[16]

3.5 Administrative Environment

3.5.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et

[15] Traps are not insurable.

[16] To prove eligibility, a commercial lobster and stone crab fishermen "must show tax receipts for the past several years and documents showing their landings" (O'Hara, May 1, 2006).

seq.), originally enacted in 1976. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ, an area extending 200 nautical miles from the seaward boundary of each of the coastal states, and authority over US anadromous species and continental shelf resources that occur beyond the EEZ.

Responsibility for federal fishery management decision-making is divided between the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in Section 10. In most cases, the Secretary has delegated this authority to NOAA Fisheries Service.

The Councils are responsible for fishery resources in federal waters of their respective regions. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the states of Florida Texas and the territory of Puerto Rico, and the three-mile seaward boundary of the Atlantic side of Florida and the states of Alabama, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and the territory of the USVI.

The Councils consist of voting members: public members appointed by the Secretary; one each from the fishery agencies of the state or territory, and one from NOAA Fisheries Service. The public is also involved in the fishery management process through participation on advisory panels and through council meetings that, with few exceptions for discussing personnel matters and litigation, are open to the public. The regulatory process is also in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

Regulations contained within FMPs are enforced through actions of the NOAA's Office for Law Enforcement, the U.S. Coast Guard, and various state authorities. To better coordinate enforcement activities, federal and state enforcement agencies have developed cooperative agreements to enforce the Magnuson-Stevens Act.

3.5.2 State Fishery Management

The purpose of state representation at the council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments have the authority to manage their respective state fisheries. Each of the states exercises legislative and regulatory authority over their states' natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the states' natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Action 1: Other species in the Spiny Lobster FMP

4.1.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

Alternative 1 would not meet the National Standard 1 guidelines and is not likely to have any positive impacts to the physical environment. Leaving the four of species of lobster under the Fishery Management Plan without setting ACLs, designating these species as ecosystem component species, or removing them from the fishery management plan without another agency taking over management could negatively impact the physical and biological environments.

Alternative 2 would set ACLs and AMs for each species. This alternative is expected to have positive impacts to the physical and biological environments. However, setting an ACL for the smoothtail and spotted spiny lobster (**Option a** and **b**) would be difficult, because there are no historical landings available for these species. However, the other two species of slipper lobsters, Spanish and ridged (**Option c** and **d**) have commercial landings information, but are considered species landed as bycatch in the shrimp trawl and the Caribbean lobster trap fishery. Positive physical, ecological, and biological impacts expected including better monitoring and record keeping of the resource, implementing accountability measures, when and if the ACLs are exceeded. There may be additional administrative burdens involved with setting and maintaining ACLs and AMs for other lobster species.

If **Alternative 3** was selected as preferred, it is unknown what impacts to the physical and biological environment may occur. Leaving the species in the fishery management plan may offer the benefit of collecting data that could be used later. If any or all of the other lobster species were left in the fishery management plan, data collected from implementation on could be used in the development of conservation and management measures. Positive impacts to the physical and biological environments are expected at a later date. There may also be additional administrative burdens involved at a later time, by maintaining any or all of the species as ecosystem component species.

Alternative 4 would remove any or all of the other lobster species from the fishery management plan. If another agency took over management, positive physical and biological impacts are expected. However, the two spiny lobster species (**Option a** and **b**) have no landings information available so management by another agency would be difficult. Whereas, the two species of slipper lobster (**Option c** and **d**) currently have some federal regulations. If the two slipper lobsters were removed from the fishery management plan and another agency took over management, positive impacts to the physical and biological environments are expected. If another agency did not take over management of other lobster species and overfishing or detriment to the resource occurred without our knowledge, negative physical and biological impacts are expected. However, presently due to the lack of landings data on all of the other species of spiny and slipper lobster presently in the Spiny Lobster FMP completing a stock assessment

would probably not be possible even for the ridged slipper lobster (**Option d**; Sharp et al. 2007).

4.1.2 Direct and Indirect Effect on the Economic Environment

4.1.3 Direct and Indirect Effect on the Social Environment

4.1.4 Direct and Indirect Effect on the Administrative Environment

4.1.5 Council Conclusions

4.2 Action 2: Modify the current definitions of Maximum Sustainable Yield, Optimum Yield, Overfishing Threshold, and Overfished Threshold for Caribbean spiny lobster

4.2.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

This action explores various alternatives for establishing biological reference points: MSY, OY, overfishing threshold, and overfished threshold. **Alternatives 2** and **3** under all actions are expected to have positive impacts to the physical and biological environments. **Alternative 1,** no action under all actions could have negative impacts to the physical and biological/ecological environment, due to the biological reference points being inconsistent between the two Councils. There could be additional administrative burdens, if these biological reference points are not modified for consistency. In addition to that issue, the Gulf Council's current definitions for the biological reference points use transitional SPR, which is more appropriate for stocks that are overfished. The best case scenario suggests that when transitional SPR is used, proxies should be estimated on an annual basis (MRAG Americas 2001). Caribbean spiny lobster were not overfished or undergoing overfishing based on the SEDAR 8 (2005) benchmark assessment, therefore static SPR for yield projections are suggested as a better proxy to use based on the current information available about the stock. The South Atlantic Council currently uses static SPR as a proxy and **Alternative 2**, under **Actions 3.3.1, 3.3.2 and 3.3.3,** would modify the Gulf Council's definition to static SPR. **Alternative 2** under **Action 3.3.4** would modify the overfished threshold to the current Gulf Council definition 15% transitional SPR, but use static SPR instead. This would make the overfished definitions consistent between the Councils and used static SPR which is better proxy for yield projects, because it uses equilibrium changes in recruitment and mortality. Consistency between Councils when establishing biological reference points would be more beneficial for the physical and biological environments. Using the same proxies reduces confusion for assessments and provides guidance for analysts. Further, based on the information available on Caribbean spiny lobster, static SPR is a more appropriate proxy to use. Transitional SPR proxies should be estimated on an annual basis and are not beneficial

for long term yield projections (MRAG Americas 2001). **Alternative 3** under all actions would modify the current definitions to the biological reference points established during the SEDAR and joint Scientific and Statistical Committee process. **Alternative 3** would be based on the best available science and reviewed by experts; therefore, this alternative if selected as preferred could provide the best benefits to the physical and biological environments. The biological reference points would be consistent between Councils and based on the most recent data.

4.2.2 Direct and Indirect Effect on the Economic Environment

4.2.3 Direct and Indirect Effect on the Social Environment

4.2.4 Direct and Indirect Effect on the Administrative Environment

4.2.5 Council Conclusions

4.3 Action 3: Establish sector allocations for Caribbean spiny lobster in State and Federal waters from North Carolina through Texas

Table 4.3.1 Florida statewide spiny lobster landings by fishing year.

Fishing Season	Com. Trap	% Com. Trap	Com. Dive	% Com Dive	Com. Bully	% Com. Bully	Com. Other	Com. Unknown	Com. Total	Rec. Total	% Rec.	Com. & Rec. Total
1991/92	3,370,669	39.0%	92,587	1.1%	2,715	0.0%	5,537	3,364,507	6,836,015	1,815,971	21.0%	8,651,806
1992/93	3,934,923	58.5%	148,752	2.2%	1,855	0.0%	6,044	1,276,614	5,368,188	1,352,443	20.1%	6,720,631
1993/94	4,982,625	69.3%	169,545	2.4%	5,967	0.1%	8,423	143,230	5,309,790	1,883,114	26.2%	7,192,104
1994/95	6,808,250	74.9%	253,961	2.8%	18,892	0.2%	4,924	95,614	7,181,641	1,905,995	21.0%	9,087,636
1995/96	6,637,721	74.2%	307,717	3.4%	18,333	0.2%	2,784	50,579	7,017,134	1,930,718	21.6%	8,947,852
1996/97	7,318,618	75.7%	337,971	3.5%	28,206	0.3%	3,292	56,017	7,744,104	1,922,596	19.9%	9,666,700
1997/98	7,147,561	71.9%	397,068	4.0%	25,494	0.3%	13,473	56,581	7,640,177	2,304,186	23.2%	9,944,363
1998/99	5,037,323	74.6%	352,283	5.2%	11,582	0.2%	3,627	42,718	5,447,533	1,302,677	19.3%	6,750,210
1999/00	6,995,609	69.1%	588,461	5.8%	16,765	0.2%	8,192	60,180	7,669,207	2,461,981	24.3%	10,131,188
2000/01	4,856,259	64.5%	635,394	8.4%	12,193	0.2%	5,308	59,553	5,568,707	1,957,643	26.0%	7,526,350
2001/02	2,610,086	60.6%	447,484	10.4%	8,527	0.2%	12,854	312	3,079,263	1,222,982	28.4%	4,305,425
2002/03	3,992,322	67.2%	559,839	9.4%	19,575	0.3%	4,948	708	4,577,392	1,366,743	23.0%	5,944,135
2003/04	3,730,675	68.3%	406,694	7.4%	21,581	0.4%	1,560	1,079	4,161,589	1,300,304	23.8%	5,461,893
2004/05	5,126,178	88.1%	311,438	5.4%	34,167	0.6%	565	1,372	5,473,720	341,655	5.9%	5,815,375
2005/06	2,679,606	68.5%	266,565	6.8%	14,593	0.4%	1,161	1,235	2,963,160	947,353	24.2%	3,910,513
2006/07	4,516,784	76.3%	251,522	4.3%	27,875	0.5%	2,573	739	4,799,493	1,118,344	18.9%	5,917,836
2007/08	3,465,602	71.6%	289,525	6.0%	18,919	0.4%	539	1,250	3,775,835	1,060,095	21.9%	4,838,132
2008/09	2,987,334	69.7%	243,292	5.7%	17,034	0.4%	450	2,144	3,250,259	1,036,466	24.2%	4,285,147

Source: Florida Fish & Wildlife Commission. Updated 9/29/09.

4.3.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

4.3.2 Direct and Indirect Effect on the Economic Environment

4.3.3 Direct and Indirect Effect on the Social Environment

4.3.4 Direct and Indirect Effect on the Administrative Environment

4.3.5 Council Conclusions

4.4 Action 4: Allowable Biological Catch (ABC) Control Rule, ABC Level(s), Annual Catch Limits and Annual Catch Targets for Caribbean Spiny Lobster

4.4.1 Direct and Indirect Effects on the Physical and Biological/Ecological Environments

ABC is recommended by the Scientific and Statistical Committee (SSC) and specified by the Council. The South Atlantic SSC provided an ABC Control Rule at their April 2010 meeting. The Gulf of Mexico SSC is also developing an ABC Control Rule. These two rules will need to be consolidated and/or modified such that both SSCs agree on one ABC Control Rule for spiny lobster.

Setting an ACL or ACT could affect the physical environment if harvest changes from current levels. Lobster fishing, particularly when traps are used, can have negative impacts on the bottom as described in section x. Commercial trap fishing for Caribbean spiny lobster is not managed by landings but by restricting the number of trap tags issued by the State of Florida. Therefore, unless the state increases the number of trap tags it distributes, the number of traps could not increase even if more landings were allowed. If harvest is restricted under an ACL or ACT, fishing effort could be reduced through accountability measures such as a shortened season, and negative impacts might be decreased.

Setting an ACL or ACT potentially will have an impact on the biological environment if harvest changes from current levels, and AMs are triggered when they are met or exceeded. The ABC level will be determined by the SSC pending results of the stock assessment update. An ACL equal to the ABC would allow a higher level of landings than an ACL lower than the ABC. Likewise, not setting an ACT would allow a higher level of landings than setting an ACT.

Traps impact species besides lobsters. Fish, crabs, and other invertebrates may be captured as bycatch. Marine mammals and sea turtles can become entangled in trap line. These negative impacts could increase or decrease if effort changes; however, even if ACLs or ACTs are set higher than current harvest levels, effort would not be expected to increase. Current effort is limited by the number of trap tags issued by the State of Florida, commercial and recreational bag limits, and the length of the fishing season. Although fishers could fish more often and fish during a longer part of the season to increase effort, they presumably are already fishing at the level they desire because regulations do not prohibit such increased effort.

The more divided the ACL is, the more accountability each division will have. With a single ACL for the stock, one sector or gear type could exceed its allocation without triggering accountability measures, as long as the stock ACL is not exceeded. If the ACL is separated by sectors or gear, accountability measures would be triggered as each sector or gear reaches its limit. This level of control would be expected to result in greater positive impacts on the biological environment because catch would be more restricted.

Further, with separate ACLs or ACTs, different types of accountability measures could be triggered that are more suited to the particular sector/gear, and therefore, be more effective in constraining harvest within the ACL. Conversely, separate federal and state ACLs or ACTs would provide less control of harvest because NOAA Fisheries Service has no authority to regulate harvest in state waters.

4.4.2 Direct and Indirect Effect on the Economic Environment

4.4.3 Direct and Indirect Effect on the Social Environment

4.4.4 Direct and Indirect Effects on the Administrative Environment

Harvest of Caribbean spiny lobster is currently managed by closed seasons, restrictions on the number of traps, and bag limits. Commercial fishermen report their catch through state trip tickets, which are compiled over several months before totals are available for federal management. Recreational catch is estimated based on telephone and dockside surveys. With establishment of an ACL or ACT, commercial landings may need to be included in the Southeast Fisheries Science Center's Quota Monitoring System. This system requires dealers to report landings, usually on a biweekly basis. If ACLs or ACTs are set by sector or gear, separate entries would be needed in the system. Additional changes would be needed if separate ACLs are set for state and federal waters. The Florida commercial trip ticket system does not allow entry of more than one area fished. Lobster fishermen often fish in both state and federal waters on the same trip (W. Sharp, personal communication), so landings currently are difficult to distinguish between the two areas.

4.4.5 Council Conclusions

4.5 Action 5: Accountability Measures (AMs) by Sector

4.5.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

Alternative 1 is not considered a viable option since it would specify no AM and therefore, would not limit harvest to the ACL or correct for an ACL overage. The Magnuson-Stevens Act requires that mechanisms of accountability be established for all federally managed species. **Alternative 1** would not comply with this mandate, and would provide no biological benefit to the species. **Alternative 2** would attempt to limit harvest to levels at or below the ACL or ACT by reducing and/or closing harvest once a particular landings threshold is met. The most biologically beneficial in-season AM would include a combination of **Sub-options i** and **ii** where a trip limit and/or bag limit reduction would be triggered once 75% of the ACL is projected to be landed. Then the fishery (commercial and/or recreational) would be closed once the ACL or ACT is projected to be met. Using the ACT as the triggering harvest parameter would be more biologically beneficial than using the ACL since ACT is typically set at a lower level than the ACL to reduce the chance that an ACL overage would occur.

Option b under **Alternative 2** would provide the least biological benefit of all the in-season AMs considered because it would not account for landings in the commercial fishery, which is larger component of the fishery than the recreational sector. Furthermore, it should be noted that the efficacy of in-season AMs is largely reliant upon in-season monitoring of landings, which may be especially difficult in the recreational sector. The newly implemented Marine Recreational Information Program does not collect landings information on crustaceans. Therefore, in-season tracking of Caribbean spiny lobster in the recreational sector would be based on the Marine Recreational Fishing Statistics Survey and state landings reports. An additional obstacle to tracking recreational harvest in-season is that there is a lag time between when the Caribbean spiny lobsters are landed and when those landings are reported in the landings database. This lag time means that projections of when the ACL is expected to be met would need to be employed. Landings projections are not always 100% accurate, thus using such estimates could lead to in-season AMs being triggered prematurely, or not soon enough causing an ACL overage.

Currently, the state of Florida, where the majority of recreational fishing for spiny lobster takes place, tracks recreational landings through two separate annual surveys sent to fishermen holding recreational lobster permits. The surveys are distributed via e-mail to collect landings information on harvest during the Special Two-Day Season, and to collect landings information from the opening day of the regular season through the first Monday in September (when the majority of spiny lobster fishing effort occurs) (Sharp 2005). Since Florida is the only state to track recreational landings of spiny lobster and no recreational landings data are collected by NOAA Fisheries Service, a new quota-monitoring program that would incorporate a mechanism to collect recreational and commercial landings information to track combined or separate ACLS may be needed. A quota monitoring program for spiny lobster could potentially be dealer-based through the establishment of dealer permit and reporting program specifically designed for spiny lobster. Additionally, spiny lobster could be added to the list of species for which recreational landings data is captured through MRIP, though doing so may not address the issue of time lags between the time of harvest and the time when the data are available to fisheries managers. Any supplemental or improved data collection efforts for spiny lobster would likely yield greater biological benefit over the long-term.

Option c under the in-season AMs would likely yield similar biological benefit when compared to the combination of **Options a** and **b**. If the ACT were used as the AM trigger harvest level, biological benefits would like be more than those under a combination of **Options a** and **b**. **Option c** would use commercial landings data to measure harvest levels compared to the ACT or ACL, and would not rely on any recreational landings data which can be highly variable. In this respect, **Option c** would likely provide the greatest assurance, of all the options considered, that t in-season AMs would be triggered for the commercial and recreational fishery combined when they are most appropriate. However, **Option c**., **Sub-option i**. may prove to be too conservative since the recreational fishery could be closed unnecessarily due to the commercial fishery reaching their ACT or ACL when the recreational fishery has not yet done so (if sector ACLs are chosen under Action 5 of this amendment). A different combination of in-

season AM options and sub-options could be implemented to reduce the risk that the recreational fishery would be closed prematurely while ensuring the maximum biological benefit for the species is achieved. Such a combination could include **Sub-options i** and **ii**. under **Option a**, and **Sub-option ii**. under **Option c**. This combination of options would incorporate the benefits of using commercial landings data, with a reduced risk of unnecessarily impacting the recreational sector.

Alternative 3 includes a large suite of possible post-season AMs that would be triggered in the event of an ACL overage. The post-season AM options are designed to compensate or correct for the magnitude of the overage during the following fishing year. In doing so, harvest levels would return to their baseline ACL over the course of two fishing years, the year of the overage and the year of the overage correction. Biologically, the ideal scenario is not allow the ACL to be exceeded to begin with, then no post-season AM would be required and stock would realize the biological benefits of sustainable harvest conditions into perpetuity. Unfortunately, management and scientific uncertainty, and numerous other variables including economic and unforeseen biologic and weather events, play a major role in annual spiny lobster landings, which may fall above or below any number of harvest parameters. The advantage of implementing post-season AMs is that the landings data for any given year can be examined in totality before the AM is actually triggered, as opposed to in-season AMs that would rely largely on projections of harvest that may or may not have a high degree of uncertainty. Using actual landings data to calculate the precise magnitude of an overage is biologically beneficial in that it ensures an adequate level of payback is implemented.

As is the case under **Alternative 2**. a combination of the separate recreational and commercial AMs (**Options a** and **b**), would yield similar biological benefits when compared to **Option c**, which builds in a combination sector AMs. **Option b** alone would be the least biologically beneficial post-season AM because it does not compensate for any overages created by the commercial fishery. The variability in recreational landings data should be taken into account when considering **Option B** under **Alternative 3**. Because recreational landings data are known to be highly variable and MRIP does not currently collect information on spiny lobster harvest, using a three year running average of estimated recreational landings compared to the recreational ACL could reduce, to some extent, variability caused by anomalous spikes or declines in landings. Sudden spikes or reductions in harvest could greatly influence post season AMs in the recreational sector if they are only considered on a year-by-year basis. Averaging recreational spiny lobster harvest over several years would minimize the influence any one exceptionally poor or exceptionally good year could have on the magnitude of the pay-back or season length reduction. **Option a** would yield greater biological benefit than **Option b** because the commercial component of the fishery is larger than the recreational component; however, it does not account for any overages in the recreational sector. The most biologically beneficial post-season AM is **Option c**, which includes AMs for the commercial and recreational sectors, which would therefore be expected to adequately compensate for overages in one or both sectors.

Reducing the length of the fishing season by the amount needed to pay back the overage in addition shortening the season length to prevent a future overage would likely have a greater biological benefit than only reducing the length of fishing season.

The most biologically beneficial AM for Caribbean spiny lobster is most likely some combination of in-season AMs and post-season AMs for both sectors of the fishery. Under this scenario, if the in-season AM failed at preventing an ACL overage, the Regional Administrator would still have the option to implementing a post-season AM in order to compensate for the overage.

Alternative 1 would perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. Establishing AMs is unlikely to alter fishing behavior in a way that would cause new adverse effects to *Acropora*. The impacts from **Alternatives 2** and **3,** and the associated sub-alternatives**,** on sea turtles and smalltooth sawfish are unclear. If they perpetuate the existing amount of fishing effort, but causes effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If these alternatives reduce the overall amount of fishing effort in the fishery, the risk of interaction between sea turtles and smalltooth sawfish will likely decrease.

4.5.2 Direct and Indirect Effect on the Economic Environment

4.5.3 Direct and Indirect Effect on the Social Environment

4.5.4 Direct and Indirect Effect on the Administrative Environment

Alternative 1 would not produce near-term administrative impacts. However, this alternative would not comply with Magnuson-Stevens Act requirements and therefore, may trigger some type of legal action for not doing so. If this scenario were to occur, the burden on the administrative environment would be great in the future. **Alternatives 2** and **3** would produce a small negative impact on the administrative environment regardless of the choice of options and sub-options. Under each of the sub-options a notice would need to be drafted and disseminated to fishery participants notifying them of the previous year's overages, and how much the next year's catch limit and/or bag limit would be reduced, or season shortened.

4.5.5 Council Conclusions

4.6 Action 6: Develop or Update a Framework Procedure and Protocol for Enhanced Cooperative Management for Spiny Lobster

4.6.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

Alternative 1 would maintain the Regional Administrator's current ability to adjust total allowable catch, quotas, trip limits, bag limits, size limits, seasonal closures, and area closures; however, no means would exist to make needed adjustments to the National Standard 1 harvest parameters in a timely manner. Often, when a harvest reduction is needed, corrective action is required quickly. Not allowing ACLs, ACTs, and AMs to be adjusted through framework would most likely lead to extended delays in implementing harvest reductions and/or associated AMs. Such a scenario could be biologically detrimental because excessive levels of fishing mortality, or even overfishing, would persist until the appropriate harvest limitations could be put in place through amendment action. Alternately, if new data shows a stock is doing better than previous assessments indicated, unnecessary restrictions could prevent the fishery from harvesting its optimum yield. The impacts on the physical environment would not change under this alternative.

Alternative 2 would have no impact on the physical or biological environment because its only purpose is to update the protocol, which defines the roles of federal and State of Florida agencies in managing spiny lobster. The updates would include relevant agency names and authorities. Regardless of how the current framework procedures or protocols are modified, those changes will have no immediate effect because those changes will not cause immediate changes in harvest objectives.

Alternatives 3 and 4 would likely be biologically beneficial for spiny lobster. Under **Alternative 3,** adjustments to ACLs, ACTs, and AMs could be made relatively quickly as new fishery and stock abundance information becomes available. Under **Alternative 4**, adjustments to other management measures would also be simplified. By changing the current framework procedure to allow for periodic adjustments to National Standard 1 harvest parameters, management measures could be altered in a timely manner to implement harvest level changes or AMs in response to stock assessment or survey results. Allowing ACL and other adjustments to be made through framework actions could eliminate the need to prepare and analyze individual amendments or amendment actions for each adjustment needed. Framework actions are initiated by the Councils and implemented by the Regional Administrator, and require less time when compared to the lengthy amendment process. The majority of public participation and comment on framework issues typically takes place when the framework procedure is initially drafted during the regular amendment process, as in this action. Eliminating these time-consuming factors would enable harvest modifications to be expedited when they are most needed. The physical environment would be indirectly impacted because changes in harvest levels would change effort levels, either increasing or decreasing the impact of traps on the bottom. A quicker change to the regulations would result in a quicker change in the physical impacts of the fishery.

4.6.2 Direct and Indirect Effect on the Economic Environment

4.6.3 Direct and Indirect Effect on the Social Environment

4.6.4 Direct and Indirect Effect on the Administrative Environment

Alternative 1 would be the most administratively burdensome of the alternatives being considered, because all modifications to ACLs, ACTs, and AMs would need to be implemented through an FMP amendment, which is a more laborious and time consuming process than a framework action. **Alternative 2** would have no impact on the administrative environment. **Alternatives 3** would incur less of an administrative burden than **Alternative 1** because several steps in the lengthy amendment process would be eliminated if the Regional Administrator were given the latitude to adjust ACLs, ACTs, and AMs through framework actions. **Alternative 4** would incur even less of an administrative burden because other management measures could also be adjusted through framework actions. **Alternative 4 Option b** would be the least burdensome because it would allow the widest range of actions to take place under the framework procedure.

The Gulf Council is considering alternatives to the framework procedures of all Gulf FMPs that are similar to the options in **Alternative 4**. If the Councils choose the same basic framework for the Spiny Lobster FMP as for other Gulf FMPs, the process of implementing framework actions may be more streamlined.

4.6.5 Council Conclusions

4.7 Action 7: Modify Regulations Regarding Possession and Handling of Short Caribbean Spiny Lobsters as "Undersized Attractants"

4.7.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

This action is being considered in order to address law enforcement concerns related to allowing vessels to maintain undersized spiny lobster onboard fishing vessels. The number and storage requirements for undersize spiny lobster allowed to be retained have been modified several times since the original Spiny Lobster FMP was implemented. In 1982 the Spiny Lobster FMP included the first provisions for keeping undersized spiny lobster for use as attractants. At that time no more than three live undersize lobsters could be placed in each trap or no more than 200 undersize lobsters could be maintained on board a vessel, whichever was greater. The July 1987 final rule implementing Amendment 1 changed the number of undersize lobster that could be kept on board to 100. In May 1988, a second final rule implementing Amendment 1 was published and included a requirement that all undersize lobster are to be maintained in a live well. A regulatory amendment was developed in 1992, which further revised the provisions regarding keeping undersize spiny lobster for use as attractants. The final rule for this regulatory amendment was published in November 1992, and reduced the number of undersize lobster allowed to be kept from 100 to 50, and maintained the live well requirement. The 1992 regulations are still in place today.

Currently, regulations at 50 CFR 640.21(c) state:

> *A live spiny lobster under the minimum size limit specified in paragraph (b)(1) of this section that is harvested in the EEZ by a trap may be retained aboard the harvesting vessel for future use as an attractant in a trap provided it is held in alive well aboard the vessel. No more than fifty undersized spiny lobsters, or one per trap aboard the vessel, whichever is greater, may be retained aboard for use as attractants. The live well must provide a minimum of ¾ gallons (1.7 liters) of seawater per spiny lobster. An undersized spiny lobster so retained must be released alive and unharmed immediately upon leaving the trap lines and prior to one hour after official sunset each day.*

Therefore, each vessel is not necessarily limited to only 50 undersize lobsters, but one lobster per trap. In the commercial spiny lobster fishery, it is common for a vessel to carry more than 100 traps on any one trip. This allowance may contribute to the magnitude of negative biological impacts and positive socioeconomic impacts. Traditionally, fishermen have realized great success using live lobster as bait in lobster traps. Experiments have shown that traps baited with short lobsters catch approximately three times more lobster than traps baited with any other method (Moe 1991; Heatwole et al. 1988).

Allowing possession of undersized lobster on board any permitted spiny lobster vessel within the EEZ makes it difficult for law enforcement officials to discern whether those

undersized lobsters are truly being maintained for use as attractants, or for illegal purposes. If a vessel is stopped by a law enforcement official with undersized lobster onboard in transit toward port with the intention to sell or keep those lobsters, prosecution is made more difficult by the fact that regulations allow undersized spiny lobster to be kept under certain conditions.

In addition to law enforcement concerns, there may also be negative biological impacts of allowing 50 or more undersized spiny lobster to be maintained in a live well. If undersized spiny lobster continue to be sold illegally, and transported under the guise of being used as attractants, those lobster are not returned to the water as they should be and they are not able to reproductively contribute to the population. Secondly, trauma incurred during holding in live wells, caused by crowding, duration of confinement during transport, or relocation to a different environment, and may also contribute to undersized spiny lobster mortality, which may negatively impact the population. It should be noted that some undersize lobster are able to escape from the trap; however, the magnitude of such occurrences is unknown. Lyons (1987) indicated live wells eliminated most exposure mortality and reduced seasonal mortality by 37 to 49 %. However he indicated that 28.5% of the undersize lobster would still die from confinement mortality during the season. Therefore, even though live wells reduce the risk of mortality do to air exposure some lobsters may perish as a result of predation when confined to a trap.

Alternative 1 would be the most negative impact on the biological environment of the three alternatives under consideration. Under **Alternative 1**, there would be no change from the current regulatory requirement to have no more than 50 undersized lobsters, or one per trap aboard the vessel, whichever is greater, for use as attractants. **Alternative 1** produces the highest rate of spiny lobster mortality associated with use as attractants relative to **Alternatives 2** and **3**. Additionally, **Alternative 1** does not address the enforcement concerns referenced in Section 2.8 of this document. If undersized spiny lobster continue to be sold illegally, and transported under the guise of being used as attractants, those lobster are not returned to the water as they should be they are, therefore, not able reproductively contribute to the population. Secondly, trauma incurred during holding in live wells, caused by crowding, duration of confinement during transport or relocation to a different environment, may also contribute to undersized spiny lobster mortality, which may negatively impact the population.

Through time, the Caribbean spiny lobster population has fluctuated substantially (Figure 4.7.1.1). The total biomass ranged from 15,000 mt in 1985-86 to 20,200 mt in 1995-96 and was 19,200 mt at the beginning of 2003-04. Spawning biomass increased from 3,300 mt in 1985-86 to 5,700 mt in 2003-04 (SEDAR 8 2005). According to Lyons (1987), there is an approximate 28.5% confinement mortality rate for those undersized Caribbean spiny lobster used as attractants. It is difficult to know the precise number of undersize Caribbean spiny lobster used as attractants in any given year; however, it is understood to be a very common practice in the commercial sector and SEDAR 8, 2005 indicates the total fishing mortality rate in 2003-04 fishing year was 0.85 per year with the bait mortality portion of that fishing mortality rate being 0.05 per year. Figure 4-3 illustrates

fishing related mortality attributable to each sector and use of undersized lobster as attractants through history.

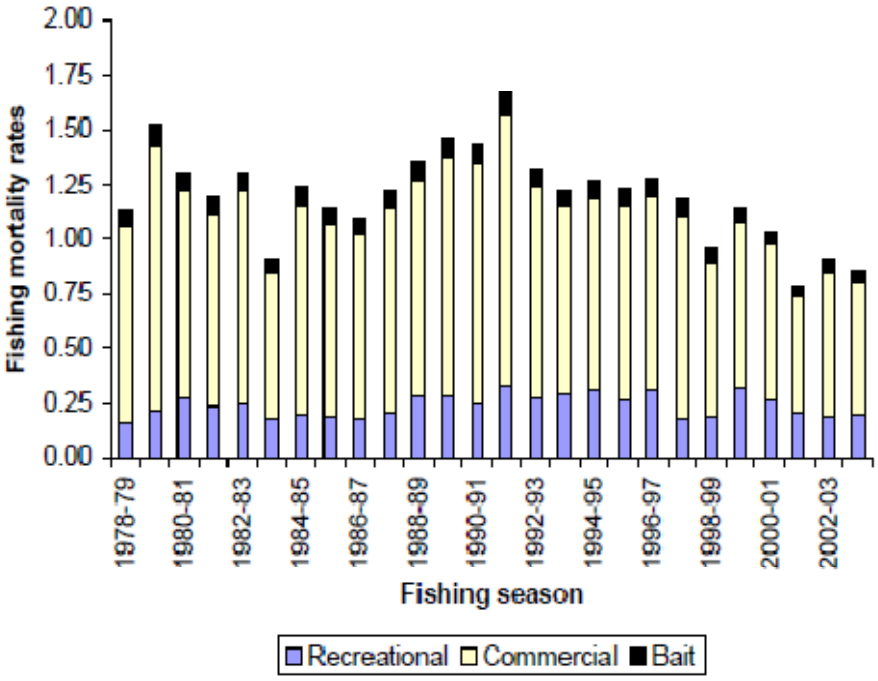


Figure 4.7.1.1. Fishing mortality per year by fishing year for the recreational fishery (purple bars), commercial fishery (yellow bars), and bait fishery (black bars). Source SEDAR 8, 2005

Alternative 2 would be the most biologically beneficial alternative under this action since, theoretically, all mortality associated with using undersized lobsters as attractants would cease. Under **Alternative 2** there would be an approximate decrease in confinement mortality of 28.5% (Lyons, 1987). Prohibiting the use of undersize Caribbean spiny lobsters as attractants may also reduce the risk of potential ACL overages and hedge against future overfishing. Additionally, **Alternative 2** would solve enforcement problems related to undersized Caribbean spiny lobster since there would no longer be a legal reason for any vessel to have undersize Caribbean spiny lobster onboard.

Alternative 3 would not address the issues raised by the Office of Law Enforcement; however, it could help to reduce fishing mortality attributable to use of undersized lobsters for baiting purposes. **Alternative 3** would not benefit the biological environment to the extent **Alternative 2** would, and depending upon the option chosen, may only yield negligible biological benefits over the status quo. Limiting the number of undersized lobster that could be used as attractants to 35 (**Option b.**) could potentially reduce the current level of confinement mortality by about half, which would likely contribute to some improvement in stock abundance. Additionally, allowing only 35 undersized lobster to be used as bait, and removing the provision that allows one undersized lobster per trap (whichever is greater), could hedge against overfishing, but

not to the same degree as **Alternative 2**. **Option a.** would provide the least biological benefit of all the alternatives and options under consideration since it deviates the least from the status quo. **Option a.** would retain the allowance for 50 undersized Caribbean spiny lobster, but would remove the one lobster per trap provision. In doing so, vessels would be limited to 50 undersized lobsters regardless of the number of traps they are carrying onboard. There may be some biological benefit realized under this option; however, the degree to which those benefits would impact the environment would depend on the number of fishermen who traditionally carry more than 50 traps and keep more than 50 undersized lobsters for use as attractants.

Alternative 4 is very similar to **Alternative 1** in that it would allow spiny lobster to be kept onboard for use as attractants ; however, it would change the provision to allow 50 spiny lobster *plus* one per trap, rather than 50 spiny lobster "*or*" one per trap, and it would remove the "whichever is greater" portion of the provision. This alternative is the least biologically beneficial of all the alternatives considered since it would increase the number of spiny lobsters able to be maintained onboard a vessel. Changing this provision under **Alternative 4** would make the federal regulations compatible with Florida's state regulations. The purpose of keeping 50 spiny lobsters onboard is ensure there is an adequate supply of attractants during the baiting process for each trap, i.e., some traps will be onboard being baited while others would be in the water with baits already in them.

There is concern that allowing spiny lobsters to be kept onboard, even at the status-quo level, could perpetuate the spread of the PaV1 virus, which typically affects juvenile spiny lobsters and causes general lethargy. The virus can be transmitted via prolonged contact, and ingestion. Spiny lobsters infected with the PaV1 virus are typically avoided by healthy, normally social, conspecifics (Behringer, 2008). A study conducted by Behringer (2010), found that healthy spiny lobsters were less likely to cohabitate with infected with PaV1, which could leave them vulnerable to predation if they were to choose a less safe shelter in order to avoid contact with the infected lobster. Therefore, the higher the number of spiny lobsters allowed to be maintained in lives wells the higher the risk of perpetuating the spread of the PaV1 virus, especially amongst young spiny lobsters that are more susceptible to acquiring the virus.

Alternative 1 would perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. Modifying or removing the 50-shorts rule is unlikely to alter fishing behavior in a way that would cause new adverse effects to *Acropora*. The impacts from **Alternatives 2**, **3, and 4,** and the associated options**,** on sea turtles and smalltooth sawfish are unclear. If they perpetuate the existing amount of fishing effort, but causes effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If these alternatives reduce the overall amount of fishing effort in the fishery, the risk of interaction between sea turtles and smalltooth sawfish will likely decrease.

4.7.2 Direct and Indirect Effect on the Economic Environment

4.7.3 Direct and Indirect Effect on the Social Environment

4.7.4 Direct and Indirect Effect on the Administrative Environment

Alternative 2 would create the lowest impact on the administrative environment since it would remove the need for enforcement personnel to check vessels for specific numbers of undersized Caribbean spiny lobsters. Enforcement officers would simply check for the absence or presence of undersized lobsters. Additionally, the job of gathering prosecutorial evidence to prove a violation would be made simpler because the vessel operator would not be able to circumvent the undersized lobster prohibition by claiming they were in transit, or had several more traps in the water. **Options a** and **b** under **Alternative 3** would not increase the administrative burden over the status quo since numbers of undersized lobsters would still need to be documented, just at a lower number. However, **Alternative 1** and **Alternative 3** would not address the current enforcement concerns regarding the use of undersized Caribbean spiny lobster, and difficulty in prosecuting related violations would persist.

4.7.5 Council Conclusions

4.8 Action 8: Modify Tailing Requirements for Caribbean Spiny Lobster for Vessels that Obtain a Tailing Permit

4.8.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

Currently, a Tail-Separation Permit is required for any vessel that wishes to land spiny lobster with tails detached for storage purposes on trips longer than 48 hours in duration. As of January 2010, there are 334 vessels with active Tail-Separation Permits. Regulations at 50 CFR 640.21(d) do not require that a vessel fishing for spiny lobster in the EEZ first have a federal or state permit/license/endorsement before they may obtain a federal Tail-Separation Permit. Vessels wishing to obtain a Tail-Separation Permit only have to meet the qualifying criteria of certifying that at least 10% of their earned income is derived from commercial fishing, and be on a trip for 48 hours or more. However, any vessel owner wishing to legally sell Caribbean spiny lobster must have the requisite permit/license/endorsement. The regulations do not explicitly state that a vessel must be associated with either a Florida Restricted Species Endorsement, or a federal Spiny Lobster Permit, leaving open the possibility of a non-commercially permitted vessel to obtain a tailing permit, which may affect enforcement of the minimum size requirements, the spear fishing prohibition, and illegal sales. Action 11 of Amendment 1 to the Spiny Lobster FMP (1987) clearly states the Council's initial intent for issuance of tailing permits:

> *The separation of lobster carapace and tail at sea shall be prohibited except by species permit. To be eligible for a tail separation permit,*

> *the fishing craft must have been assigned a commercial lobster permit, and must be operated for lobster fishing in the EEZ for two or more days from port. Furthermore, a signed statement that his fishing activity necessitates a tail separation permit.*

However, regulations regarding tailing permit requirements have changed several times since the inception of the permit. In 1990 a final rule implementing Amendment 1 was published in the *Federal Register*. This rule prohibited tailing of spiny lobster harvested from the EEZ except by special permit, and required that a vessel must be associated with a federal commercial spiny lobster permit in order to obtain a Tail-Separation Permit. In 1992 the Council opted to make the Tail-Separation Permit an endorsement to the federal Spiny Lobster Permit through a regulatory amendment. At that time, it was also determined that federal Spiny Lobster Permit issuance would discontinue when Florida's trap certificate and identification program was implemented and when Florida designated spiny lobster as a restricted species, thus limiting the sellers of Caribbean spiny lobster to individuals who have Restricted Species Endorsements on their Florida Saltwater Products License. The Florida trap certificate and identification program was implemented through a final rule published in 1993. Therefore, as stated in the 1992 regulatory amendment, a federal Spiny Lobster Permit was no longer required for vessels fishing for spiny lobster in state or federal waters off Florida. However, the regulations stated that only vessels with federal Spiny Lobster Permits could obtain a Tail-Separation Endorsement. In order to allow vessels participating in Florida's trap certificate program without a federal Spiny Lobster Permit, to obtain a Tail-Separation Endorsement, the regulations were modified to change the "Tail-Separation Endorsement" to a "Tail-Separation Permit", and removed the requirement for a federal Spiny Lobster Permit, as outlined in the 1992 regulatory amendment. The regulations currently state:

> *The possession aboard a fishing vessel of a separated spiny lobster tail in or from the EEZ is authorized only when the possession is incidental to fishing exclusively in the EEZ on a trip of 48 hours or more and a federal Tail-Separation Permit specified in 50 CFR 640.4(a)(2).*

50 CFR 640.4(a)(2) states:

> *For a person to possess aboard a fishing vessel a separated spiny lobster tail in or from the EEZ, a Tail-Separation Permit must be issued to the vessel and must be on board.*

The intent of allowing fishermen to tail Caribbean spiny lobster was to promote ease of storage and transport of the harvested lobster on long commercial trips. Tail-Separation Permits were not initially intended for use by non-commercially permitted vessels. However, because the regulations do not explicitly state that a federal Spiny Lobster Permit, or a Florida Saltwater Products License with a Restricted Species Endorsement are required in order to obtain a Tail-Separation Permit some recreational fishermen have obtained Tail-Separation Permits for their own purposes. Tail-Separation Permits, even

if restricted to the commercial sector, are not biologically advantageous, since commercial vessels with tailing permits are able to fish more efficiently for spiny lobster than those vessels without the permit. Because whole lobsters utilize more storage space than tails, vessels that are associated with a Tail-Separation Permit are able to store much more product than vessels that have to store the lobster whole. Greater efficiency means those vessels with Tail-Separation Permits are also able to take more spiny lobster from the population at a faster rate, which could be detrimental in the long term for overall stock abundance. Therefore, eliminating the Tail-Separation Permit requirements could potentially benefit the biological environment in addition to complimenting law enforcement efforts.

Alternately, a revision to the regulations may clarify that non-commercially permitted fishermen may not obtain a Tail-Separation Permit regardless of how long a trip is or how much of their earned income is derived from other types of commercial fishing. Revising the regulations in this way would not require an amendment action. The Council would have the option to approve or disapprove the change in regulations when they deem the proposed rule. Currently there are 334 active Tail-Separation Permits. If the Council were to choose to change the requirements for obtaining a tailing permit, it would have the option of changing the trip duration requirement, or change the earned income requirement. Modifying one or both of those parameters could change the universe of vessels eligible to obtain a Tail-Separation Permit. However, changing the earned income requirement is associated with eligibility for the federal Spiny Lobster Permit not just the Tail-Separation Permit, and would therefore affect the universe of vessels able to apply for the federal Spiny Lobster Permit.

Several fishery participants that attended the scoping meetings were in favor of requiring all Caribbean spiny lobster be either landed all whole or landed all tailed. The rationale for proposing this alternative is that requiring spiny lobster to be landed all whole or all tailed would prevent the abuse of having a short carapace but a long tail. Requiring that all lobster be landed tailed or whole would prevent the practice of only tailing undersized lobster, and would close the loophole for those who attempt circumvent the three inch carapace length minimum size requirement.

Alternative 1 would not modify the current Tail-Separation Permit regulations for Caribbean spiny lobster. A Tail-Separation Permit would still be required in order to land spiny lobsters tailed, and the trips would still be required to be 48 hours or longer in duration. Under **Alternative 1** the problem of some recreational fishermen obtaining Tail-Separation Permits, and some fishermen tailing only undersized lobster and keeping the legal sized lobster whole for landing would persist. There would be no biological benefit realized under **Alternative 1**. **Alternative 2** would be the most biologically beneficial of all the alternatives being considered under this action. Removing the ability for fishermen to land any Caribbean spiny lobster tailed would increase the probability that most lobster landed would be of legal size since they could easily be measured. Legal sized lobsters have reached their reproductive potential and are able to contribute to the overall stock abundance. Therefore, ensuring that spiny lobsters are able to mature enough to reproductively contribute to the population by making it more difficult for

fishermen to profit off of undersized harvest would remove the incentive for the practice to continue.

Alternative 3 would address the issue of recreational fishermen obtaining Tail-Separation Permits, but it would not address the issue of commercial fishermen landing undersized lobster by tailing them. **Alternative 3** would provide a minimal biological benefit since it is thought that there are very few recreational fishermen who have in their possession a Tail-Separation Permit. However, clarifying the regulations now would prevent even more recreational fishermen from trying to obtain the Tail-Separation Permit in the future, which would be biologically beneficial since it would reduce the risk that undersized lobster could be kept onboard in a tailed condition.

Alternative 4 would modify the prerequisites needed for obtaining a Tail-Separation Permit in a way that would make them more restrictive and specific. The regulations could be modified in such a way that would address the issue of recreational fishermen obtaining Tail-Separation Permits, as well as the issue of some fishermen landing undersized lobster tailed and legal sized lobster whole. Addressing both concerns would be biologically beneficial since modifying the regulation could result in a reduced occurrence of harvest of sub-legal Caribbean spiny lobster. The more spiny lobsters allowed to grow and reproduce, the more stable the overall population will be. However, **Alternative 4**, unless the modification includes the complete removal of the Tail-Separation Permit, would not be as biologically beneficial as **Alternative 2. Alternative 4** could yield greater biological benefits than **Alternative 5**, which may allow some level of undersized harvest to persist, and it would provide greater biological benefits than **Alternative 3** as well since **Alternative 3** does not address the issue of commercial fishermen tailing spiny lobsters with the intent to land undersized harvest.

Alternative 5 would address the issue of some fishermen landing part of their catch whole and part of it tailed; presuming they are tailing select lobsters in order to land sub-legal spiny lobsters for profit. If vessels were to consistently land all Caribbean spiny lobster tailed rather than whole the chance that a portion of that harvest is sub-legal is higher than if fishermen chose to land their entire harvest whole. However, whole lobster may be more desirable in the market, and therefore, this measure may reduce the incentive to land all spiny lobster tailed even though it may result in storage issues on long trips. If under **Alternative 5**, most fishermen choose to land the majority of their Caribbean spiny lobster harvest whole, the action would biologically beneficial. If the majority of fishermen choose to land their harvest tailed, there is a chance this action could be biologically detrimental to the species, since there would be an increased risk that undersized lobster would be taken. Additionally, this alternative alone does not address the issue of recreational fishermen obtaining Tail-Separation Permits. However, if **Alternative 3** were chosen in combination with **Alternative 5**, the issue of recreational fishermen obtaining Tail-Separation Permits would be addressed, and could; therefore, result in greater biological benefit than if **Alternative 5** were chosen alone.

Alternative 1 would perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. Requiring that all Caribbean spiny lobster be landed whole or all spiny lobster be landed tailed is unlikely to alter fishing behavior in a way that would cause new adverse effects to *Acropora*. The impacts from **Alternatives 2** through **5,** on sea turtles and smalltooth sawfish are unclear. If they perpetuate the existing amount of fishing effort, but causes effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If these alternatives reduce the overall amount of fishing effort in the fishery, the risk of interaction between sea turtles and smalltooth sawfish will likely decrease.

4.8.2 Direct and Indirect Effect on the Economic Environment

4.8.3 Direct and Indirect Effect on the Social Environment

4.8.4 Direct and Indirect Effect on the Administrative Environment

Alternative 2 would have a positive impact on the administrative and law enforcement environments since the Tail-Separation Permit would no longer exist and the practice of tailing Caribbean spiny lobsters would be prohibited. **Alternative 3** would create a very small administrative burden when compared to the status quo because some updates to the current regulatory text would be necessary. **Alternative 4** would likely produce the greatest administrative impact since it would require the regulatory text be updated, and some notice given to fishery participants regarding the changes. Determining how the Tail-Separation Permit requirement would be modified may require additional meetings or deliberations among Council and NOAA Fisheries staff, which could entail some utilization of time and recourses. **Alternative 5** would also require a modification to the regulations; however, the administrative burden would be very low. If the majority of fishermen chose to land their harvest whole the burden on law enforcement officers would be reduced for those trips. Law enforcement issues may still exist for those fishermen who may choose to land their entire harvest tailed under **Alternative 5**.

4.8.5 Council Conclusions

4.9 Action 9: Limit Spiny Lobster Fishing in Certain Areas in the EEZ off Florida to Address Endangered Species Act Concerns for Staghorn and Elkhorn Corals

4.9.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

Acropora colony size and location data have been collected during successive surveys of benthic habitat. These surveys are conducted as part of a larger program dating back to 1999 (Miller et al. 2008). The maps in Appendix D show known locations of *Acropora* colonies and conservation priorities.

Colonial size data was used to establish three conservation priority categories for elkhorn and staghorn colonies. The largest "super colonies" have been designated as conservation priority 1 because of their importance to sexual reproduction. Other smaller, but still sexually mature, colonies have designated as conservation priority 2, and non-sexually mature colonies have been designated conservation priority 3.

Gamete production by *Acropora* colonies increases with size. Elkhorn and staghorn corals are generally considered sexually mature when the surface area of live tissue exceeds 100 cm^2. Elkhorn corals with a living tissue surface area of 1000 cm^2 are rare, and could be considered "super colonies." A similar distinction could be made for staghorn corals with a living tissue surface area of 500 cm^2. Colonies of this size have exponentially higher reproductive potential compared to other sexually mature colonies, and represent essential sources of gamete production. Colonies of this size are also exceedingly rare. Sampling at over 1,000 locations throughout the Florida Keys and the Dry Tortugas where data was collected on colonial size identified only 17 super colonies (6 staghorn colonies and 9 elkhorn colonies). These colonies have been designated as conservation priority 1. The same level of sampling has also identified 62 sexually mature colonies (32 staghorn colonies and 30 elkhorn colonies) designated as conservation priority 2, and 61 non-sexually mature colonies (58 staghorn colonies and 3 elkhorn colonies) designated as conservation priority 3.

Additional data indicating the location of *Acropora* colonies are also used. These data points simply reflect whether *Acropora* colonies were present at the time of sampling and do not include colonial size information. Since no size information is available for these colonies conservation priorities could not be assigned. It is important to remember that locations without assigned conservation priorities are not of low conservation value; rather they only areas with minimal data. In all likelihood, areas of high *Acropora* occurrence provide significant conservation benefits and should be viewed as areas requiring special attention and protection.

Because of *Acropora*'s branching morphology, colonies of any size are susceptible to fragmentation/breakage and abrasion from traps and trap lines. Traps are generally not deployed on coral or hardbottom (Lewis et al. 2009). Most fishers appear to drop traps on seagrass, rubble, or sandy habitats because these areas are less likely to cause damage

(Hill et al. 2003) and traps move less on these substrates (Uhrin et al. 2005). However, the relatively poor water quality in the Lower and Middle Keys may cause fishers to accidentally deploy traps on habitats that could support *Acropora*. The ESA biological opinion that evaluated the impacts of the spiny lobster fishery determined that the deployment and retrieval of traps during normal fishing operations had little impact to *Acropora* relative to traps moved from their original locations during storms.

Lewis et al. (2009) analyzed the impacts to benthic habitat in the Florida Keys of trap movement during storms. The study revealed that traps move during non-tropical storm events.[17] Buoyed traps moved an average of 15 ft during each storm and as much as 98 ft from their original location (Lewis et al. 2009). The movement of buoyed spiny lobster traps following a tropical storm or hurricane has never been measured during trap impact studies, largely because those traps are rarely, if ever, recovered after such events. However, anecdotal evidence indicates that fishermen have found traps several miles from their original location after tropical storms and/or hurricanes (FFWCC unpublished data).

The movement of traps during storms that the poses the greatest threat to *Acropora.* Even traps initially placed by fishermen in locations devoid of *Acropora* colonies can be moved during storms into reef habitats causing damage. Creating buffer zones between closed area boundaries and the closest *Acropora* colonies, will reduce the likelihood of traps contacting colonies even if they are moved by storms. A buffer zone of 15 ft would likely protect *Acropora* colonies from the average movement of a trap during a storm. A buffer zone of this size would protect colonies from % of typical storms (i.e., non-tropical) impacting the fishing grounds during the season. Expanding the buffer zone to 100 ft would likely to protect *Acropora* colonies from % of typical storms (i.e., non-tropical) impacting the fishing grounds during the season.

The Florida Keys National Marine Sanctuary (FKNMS) has designated 15 special use or sanctuary preservation areas in federal waters where trap fishing is prohibit [15 CFR 922.164(d)(iii)]. *Acropora* density occur in many of these areas. However, other areas of high *Acropora* density exist outside these closed areas. Creating new closed areas or expanding existing closed to include these areas of high *Acropora* density, will help reduce the likelihood of interactions between spiny lobster traps and coral colonies.

Alternative 1 would have the least biological benefit to *Acropora,* and would perpetuate the existing level of risk of interaction between these species and the fishery. **Alternative 1** would not meet the requirement established under the biological opinion. **Alternative 2** would provide the greatest biological benefit to *Acropora* and other hardbottom/coral species. Prohibiting trapping on all hardbottom areas would essentially eliminate any the risk to interaction between *Acropora* and spiny lobster traps. Relative to **Alternative 2**, **Alternatives 3** and **4** will be less biologically beneficial to any *Acropora* colonies located outside the closed areas. A**lternative 3, Option a,** would provide biological benefits to *Acropora* by prohibiting the use of traps within areas of

[17] Storm events were defined as sustained winds greater than 15 knots, last two days or more (Lewis et al. 2009).

high *Acropora* density, reducing the risk of trap gear damage. **Alternative 3, Option b** and **Option c** would provide increasing degrees of protection to *Acropora* corals. Creating buffer zones protects corals from traps moved during storm events. Larger buffer zones provide more protection. As such, **Alternative 3, Option b** would provide a greater biological benefit to *Acropora* than **Option c**. **Alternative 4** would provide slightly more biological benefit to *Acropora* colonies because it would prohibit all fishing for spiny lobster, and would affect all sectors of the commercial fishery equally. The creation of buffer zones with **Alternative 4, Option b** and **Option c** would provide greater biological benefit than not creating buffer zones (**Alternative 4, Option a**), and biological benefits are maximized with larger buffer zones. **Alternatives 2, 3, and 4** with their associated options, would fulfill the requirements of terms and conditions prescribed in the biological opinion.

Alternative 1 will perpetuate the existing level of risk for interactions between other ESA-listed species and the fishery. The impacts from **Alternatives 2-4** and their associated options on sea turtles and smalltooth sawfish are unclear. If these closed areas perpetuate the existing amount of fishing effort, but cause effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If these alternatives reduce the overall amount of fishing effort in the fishery, the risk of interaction between sea turtles and smalltooth sawfish will likely decrease.

4.9.2 Direct and Indirect Effect on the Economic Environment

4.9.3 Direct and Indirect Effect on the Social Environment

4.9.4 Direct and Indirect Effect on the Administrative Environment

4.9.5 Council Conclusions

4.10 Action 10: Require Gear Markings so All Spiny Lobster Trap Lines in the EEZ off Florida are Identifiable

4.10.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

The biological opinion on the fishery requires the establishment of buoy lines marking requirements no later than 2014, and that the incidental take of protect species be monitored. These alternatives are being developed to meet those requirements. Currently, all spiny lobster traps fished in the EEZ off Florida must follow the gear marking requirements established by the State of Florida at 68B-24 in the Florida Administrative Code (F.A.C). Those regulations require a buoy or a time-release buoy to be attached to each spiny lobster trap or at each end of a weighted trap trotline. Each buoy must be a minimum of six inches in diameter and constructed of Styrofoam, cork, molded polyvinyl chloride, or molded polystyrene [F.A.C. 68B-24.006(3)]. Additionally, each trap and buoy used must have the fishers' current lobster license or trap number permanently affixed in legible figures. On each buoy, the affixed lobster license or trap number shall be at least two inches high [F.A.C. 68B-24.006(4)].

Lines are consistently found as marine debris and most frequently without buoys or traps still attached. Miller et al. (2008) found lost pot/trap gear to be the second most prevalent type of marine debris in the Florida Keys and the most damaging to benthic habitat. In all cases, lines were without buoys. Current gear marking requirements for the fishery only require buoys and traps be marked. However, buoys are frequently dislodged from lines and the type of line used in the spiny lobster fishery is also used in other fisheries and for other purposes. These conditions make it extremely difficult to determine if line found in the environment, or entangling protected species, originated from the spiny lobster fishery. A lack of uniquely identifiable markings also makes monitoring incidental take by the fishery difficult. Without uniquely identifiable trap line markings, erroneously attributing the incidental take of a protected species to the spiny lobster fishery is possible.

Gear marking techniques are used in other areas and other regions. Specific gear marking requirements have been implemented in the Northeast to address entanglement concerns with large whales. Three methods that were tested and found to work satisfactorily in the Northeast under normal conditions are shown in Figure 4-4. At the top, colored twine is seized around the line and woven between the strands. In the center, the line was spray-painted; this method requires that the line be dry. At the bottom, colored electrical tape was wrapped in one direction and then back over itself to form two layers. The particular color/pattern required for the spiny lobster fishery could be similar to those in Figure 4.10.1.1. Requiring a specific color trap line would also fulfill the intent of the requirements in the biological opinion.

Figure 4.10.1.1. Examples of satisfactory gear markings used in Northeast trap fisheries.

The trap lines used in the spiny lobster fishery are ubiquitous in the marine environment. Because of the many fisheries and gears that utilize this type of trap rope, it is often difficult to ascertain which fishery or gear type actually interacted with a protected species when trap rope is the only portion of the gear recovered. Trap line marking requirements will allow for greater accuracy in identifying fishery interactions with protected species, leading to more targeted measures to reduce the level and severity of those impacts. **Alternative 1** would have no biological benefit for protected species and would not satisfy the line marking requirements of the biological opinion. **Alternatives 2** and **3** will likely have similar biological benefits for protected species. Both alternatives will help improve the accuracy of gear identification. **Alternative 4** may be slightly more biologically beneficial than the other alternatives, because it could allow for an even more accurate determination of the fishing gear found in association with protected species interactions. **Alternatives 2-4** would fulfill the requirements of terms and conditions prescribed in the biological opinion.

Alternative 1 would have the least biological benefit to sea turtles and smalltooth sawfish and will perpetuate the existing level of risk for interactions between these species and the fishery. The creation of trap marking requirements under **Alternatives 2, 3,** and **4** would provide indirect benefits to sea turtles and smalltooth sawfish. Trap marking requirements will provide better understanding of the frequency of interactions between these species and the fishery. By better understanding of which fisheries are interacting with sea turtles and smalltooth sawfish, ways to reduce those interactions can be developed.

4.10.2 Direct and Indirect Effect on the Economic Environment

4.10.3 Direct and Indirect Effect on the Social Environment

4.10.4 Direct and Indirect Effect on the Administrative Environment

4.10.5 Council Conclusions

4.11 Action 11: Allow the Public to Remove Trap Line, Buoys, or Otherwise make Unfishable, any Spiny Lobster Gear Found in the EEZ off Florida

4.11.1 Direct and Indirect Effect on the Physical and Biological/Ecological Environments

The biological opinion on the spiny lobster fishery requires the Councils explore allowing the public to remove derelict trap fishing gear from the EEZ off Florida. Florida regulations allow traps to be deployed beginning August 1 of each year and require all traps be removed from the water by April 5 (with the opportunity for an extension under certain circumstances). Current federal regulations state that any trap, buoy, or rope found in the EEZ of Florida and any other Gulf state outside of the authorized period is considered unclaimed or abandoned property and may be disposed of in any manner considered appropriate by the Assistant Administrator or authorized officer [50 CFR 640.20(b)(3)(iii)]. Those regulations also state that pulling or tending another person's spiny lobster trap, without prior authorization is prohibited.

The State of Florida also has regulations addressing the retrieval of derelict traps[18] and trap debris.[19] Trap debris may be removed at any time from shoreline areas landward of mean low water, and from mangroves or other shoreline vegetation by nonprofit nongovernmental organizations, fishery participant organizations[20], or other community or citizens groups when they organize, promote, and participate in coastal cleanup events for the purpose of removing marine debris. However, prior authorization from Florida FWC is required for any coastal clean-up events that remove trap debris occurring in state waters seaward of mean low water (F.A.C. 68B-55.002).

During the spiny lobster season, derelict traps may be retrieved at any time deemed appropriate by FWC. However, only FWC employees, local, state, or federal personnel, or members of a fishery participant organization may retrieve derelict traps, during the open season. Members of a fishery participant organization must have a FWC-approved plan to authorize trap retrieval. During the closed season for spiny lobster, and after any authorized trap retrieval period together with any extensions, traps are considered to be derelict and may be retrieved as part of coastal cleanup events authorized by FWC (F.A.C. 68B-55.004).

At any time, local, state, or federal government personnel may remove trap debris and derelict traps from areas permanently closed to trapping without prior authorization from FWC (F.A.C. 68B-55.002 and 68B-55.004).

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[18] "Derelict traps" are defined as traps in the water during the closed season for a species (including spiny lobster), or a trap in the water during the appropriate fishing season but lacking more than two of the following: a buoy, line, trap tag (if required) or a current license ([F.A.C. 68B-55.001(3)]

[19] "Trap debris" is defined as to any piece of a trap, or any combination of such pieces not constituting a fishable trap [F.A.C. 68B-55.001(2)]).

[20] "Fishery participant organization" is a a group of commercial fishermen all of whom possess a current saltwater products license and a blue crab, stone crab or spiny lobster endorsement [F.A.C. 68B-55.001(5)]).

Trap losses in the spiny lobster fishery range from 10 to 20% of all traps fished, or 50,000 to 100,000 traps, annually (Lewis et al. 2009). Years with strong or frequent tropical storms/hurricanes can increase the number. For example, during the 2005–06 lobster seasons approximately 60% of registered traps were lost because of hurricanes Katrina, Rita, and Wilma (Lewis et al. 2009). Of the traps lost, only a small percent is ever recovered.

Lost traps pose multiple threats to the environment and protected species. Lost traps can "ghost" fish for a year or more (FWC unpubl. data, Lewis et al. 2009). Trailing trap-lines can become entangled in the reef, damaging corals and sponges (Chiappone et al. 2005). Marine mammals and ESA-listed sea turtles and marine fish can become entangled in trailing ropes (Guillroy et al. 2005, Seitz and Poulakis 2006; Lewis et al. 2009). Wooden traps eventually degrade after many months, but plastic trap throats and polystyrene buoys persist indefinitely in the marine environment. Seagrass meadows can be damaged when traps are lost or left for periods longer than six weeks (Uhrin et al. 2005). Thousands of lost and abandoned traps can have a significant effect on the reef environment over an extended period of time.

Unlike nearshore areas where traps can be located during aerial surveys or by boats during low tides, traps lost in federal waters are much more difficult to identify. Traps identified in the nearshore environment are also more conducive to trap clean-up events because of their proximity to boat ramps and areas where recovered derelict traps can be off loaded. Organized clean ups for the sole purpose of removing derelict trap gear in federal waters is generally expensive and difficult to conduct. Allowing the public to remove derelict trap gear would promote many individual contributions, which could have a large cumulative effect.

Many arguments presented by industry members against trap removal cited concerns that legally fishing traps may be removed by someone other than themselves, either intentionally or by accident. However, they did recognize the potential environmental impacts of lost traps and suggested their own alternative that would allow the public to make traps unfishable. Specifically, they recommended authorizing the removal of buoys, trap lines, and throats from derelict spiny lobster traps in the EEZ. They stated that these actions would render the trap unlikely to ghost fish, and would reduce a traps likelihood of moving during storm events. This proposal also ensured that no one other than the owner of the trap would be authorized to remove the trap from the water.

Another argument against allowing the public to pull derelict traps is a concern over confusion between similar looking traps (i.e., spiny lobster and stone crab traps). For example, some industry members voiced concerns that legally fishing stone crab traps would be confused for derelict spiny lobster traps by the public and pulled. Two of the alternatives being considered by the Councils would only allow the public to remove derelict traps during the closed seasons for spiny lobster and stone crabs. By limiting the removal of traps during the closed seasons for both species, it ensures that only truly derelict traps are removed.

Derelict spiny lobster traps can cause damage to reef and benthic habitat, and entangle sea turtles, smalltooth sawfish, and marine mammals. Allowing the public to remove derelict trap gear would help reduce environmental impacts from lost spiny lobster trap gear. **Alternative 1** would have no biological benefit for protected species and will perpetuate the existing level of risk for interactions between these species and lost trap gear. **Alternative 2** will likely have the greatest biological benefits for protected species. This alternative would allow for the complete removal of all trap debris for the longest period of time, potentially increasing the amount of derelict trap gear removed. **Alternative 3** would also allow for the complete removal of derelict trap gear, but for a shorter period. As a result, the biological benefit of **Alternative 3** may be less than **Alternative 2**. **Alternatives 4** and **5** will have less biological benefit than **Alternatives 2** and **3**. Allowing the public to remove trap line, buoys, and throats, will help reduce the potential impacts from ghost fishing and entanglement. However, traps remaining in the environment still have the potential to cause damage to benthic habitat. **Alternative 4** would allow more time for the public to make derelict traps unfishable, potentially increasing the biological benefit to protected species. Compared to **Alternatives 2-4**, **Alternative 5** will have the least biological benefit.

4.11.2 Direct and Indirect Effect on the Economic Environment

4.11.3 Direct and Indirect Effect on the Social Environment

4.11.4 Direct and Indirect Effect on the Administrative Environment

4.11.5 Council Conclusions

4.12 Cumulative Effects Analysis

As directed by NEPA, federal agencies are mandated to assess not only the indirect and direct impacts, but the cumulative impacts as well. NEPA defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 C.F.R. 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect is when the combined effects are greater than the sum of the individual effects.

This section uses an approach for assessing cumulative effects that is based upon guidance offered by the CEQ publication "Considering Cumulative Effects" (1997). The report outlines 11 items for consideration in drafting a CEA for a proposed action.

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.
2. Establish the geographic scope of the analysis.
3. Establish the timeframe for the analysis.
4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.
6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.
8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative effects.
10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
11. Monitor the cumulative effects of the selected alternative and adapt management.

The CEA for the biophysical environment will follow these 11 steps. Cumulative effects on the biophysical environment and the socio-economic environment will be analyzed separately.

4.13 Other Effects

4.13.1 Unavoidable Adverse Effects

Environmental impacts identified in Section 4 did not identify any adverse effects.

4.13.2 Relationship Between Short-Term Uses and Long-Term Productivity

4.13.3 Irreversible and Irretrievable Commitments of Resources

There are no irreversible or irretrievable commitments of agency resources proposed herein. The actions to set ACLs, AMs, and other management measures in the spiny lobster fishery are readily changeable by the Councils in the future. There may be some loss of immediate income (irretrievable in the context of an individual not being able to benefit from compounded value over time) to some sectors from the potential limitation of harvest due to accountability measures.

4.14 Any Other Disclosures

CEQ guidance on environmental consequences (40 CFR §1502.16) indicates the following elements should be considered for the scientific and analytic basis for comparisons of alternatives. These are:

a) Direct effects and their significance.
b) Indirect effects and their significance.
c) Possible conflicts between the proposed action and the objectives of federal, regional, state, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.
d) The environmental effects of alternatives including the proposed action.
e) Energy requirements and conservation potential of various alternatives and mitigation measures.
f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.
g) Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.
h) Means to mitigate adverse environmental impacts.

4.14 Environmental Justice

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6.0 List of Agencies, Organizations and Persons to Whom Copies of the Statement are Sent

Department of Commerce Office of General Counsel
Environmental Defense
Florida Fish and Wildlife Conservation Commission
Florida Keys Commercial Fishermen's Association
National Fisheries Institute
National Marine Fisheries Service Office of General Counsel
National Marine Fisheries Service Office of General Counsel Southeast Region
National Marine Fisheries Service Southeast Regional Office
National Marine Fisheries Service Southeast Fisheries Science Center
National Marine Fisheries Service Silver Spring Office
National Marine Fisheries Service Office of Law Enforcement
United States Coast Guard
United States Fish and Wildlife Services

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8.0 Index

Appendix A. Alternatives considered but eliminated from detailed analyses

2.1 Action 1: Delegate management of the Spiny Lobster FMP to Florida FWC

Alternative 1: No Action – Continue the current state and federal management system

Alternative 2: Delegate all management to Florida FWC, except establishment of an annual catch limit (ACL)

Alternative 3: Delegate certain management criteria to Florida FWC, except establishment of an ACL

Management criteria to delegate include:

Options a: Numerical specification of ACL and breakdown into sector-specific ACLs based on the definitions later in document

Options b: Commercial quotas and recreational allocations based on the allocations specified later in this document

Options c: Size limits

Options d: Recreational bag limits

Options e: Commercial trip limits

Options f: Permit endorsements

Options g: Fishing seasons

Options h: Application of the accountability measures, including closing the fishery when a sector reaches its quota and/or allocation

Options i: Rules and regulations for traps, including gear marking, tagging, etc.

Options j: Data collection and reporting requirements

Options k: Closed areas

Comparison of Alternatives: The Fishery Management Plan for Spiny Lobster in the Gulf of Mexico and South Atlantic (Spiny Lobster FMP) has been jointly managed by the Gulf of Mexico and South Atlantic Fishery Management Councils (Councils) since 1982. In 1989, the Spiny Lobster FMP was amended to establish compatible regulations between the federal and state fisheries. Thereafter, the Florida Fish and Wildlife Conservation Commission (FWC) has taken the lead in Caribbean spiny lobster fishery management, with NOAA Fisheries Service establishing compatible regulations when applicable. The commercial fishery is currently managed with a trap limitation and permitting program, minimum size limits, closed fishing seasons, gear restrictions, and other prohibitions. The recreational fishery is currently managed with minimum size limits, bag limits, closed fishing seasons, gear restrictions, and other prohibitions (Table 2.1.1).

The joint jurisdiction of the two Councils extends from the North Carolina/Virginia border in the South Atlantic to the Texas/Mexico border in the Gulf of Mexico. A majority of the commercial and recreational landings for Caribbean spiny lobster occurs in the waters off Florida (Table 2.1.1). Caribbean spiny lobster are also found in waters off other states within the Councils' jurisdiction, but in these areas, low abundance results in low levels of harvest. For example in the Gulf of Mexico, Alabama reported no commercial landings of spiny lobster species (C. Denson, Alabama Marine Resources Division, Alabama Department of Conservation and Natural Resources, personal

communication). There were no reported commercial landings for spiny lobster in Mississippi, Louisiana, and Texas and no program currently in place to document recreational landings in any of the states but Florida (Source: http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html).

Off Georgia there were no commercial landings of Caribbean spiny lobster species from state or federal waters for the years 1999-2008 (J. Califf, Commercial Fisheries Statistics Coordinator, Coastal Resources Division, Georgia Department of Natural Resources, personal communication). Similarly, in the state waters off South Carolina there were no recorded landings of spiny lobster species. In federal waters off South Carolina, commercial landings by divers between 1991 and 2003 included 6 pounds landed one year, and between 2004 and 2008, 15 pounds was landed in one year (G. Steele, Biological Statistician, South Carolina Department of Natural Resources, personal communication).

In state waters off North Carolina, there were no recorded landings of Caribbean spiny lobster. However, in federal waters off North Carolina there were low landings for Caribbean spiny lobster in 2001, 2003, 2004, 2006, 2007, and 2008. The average landings were 100 pounds or less live whole animal weight by commercial divers. The ex-vessel value for Caribbean spiny lobster species during this time period (1999-2008) ranged from $50 to $3,500 (A. Bianchi, Trip Ticket Coordinator, North Carolina Division of Marine Fisheries, personal communication). In 1999, 2000, 2002, and 2005 commercial landings for those species were not recorded by the North Carolina Division of Marine Fisheries.

Because of the low landings from states other than Florida, the federal fishery is currently managed through regulations affecting the EEZ off states in three areas: the South Atlantic states not including Florida (North Carolina, South Carolina, and Georgia), the State of Florida, and the Gulf of Mexico states not including Florida (Texas, Louisiana, Mississippi, and Alabama). This division of regulations reflects differences in Caribbean spiny lobster abundance and fishing effort in these regions (Table 2.1.2).

Table 2.1.2. Average commercial landings of Caribbean spiny lobsters 1999-2008 for Gulf federal waters, South Atlantic federal waters, and state of Florida waters (both coasts). Average pounds landed are live whole animal weight.

Caribbean Spiny Lobster	Gulf federal	Atlantic federal	Florida state waters
Average Pounds	164,912	998,218	1,709,646
Average # Trips	413	2,976	8,903
Average $ Value	$828,149	$4,878,155	$8,827,990

Source: Florida FWC, Marine Fisheries Information System 2009.

Note: This data is based on the trip ticket program. There is only one space available for waters fished. Fishers could fish in both state and federal waters within one day, based on the season and other fishing behaviors. This table should be viewed with some caution, because there could be additional unaccounted variability, due to the way the data is recorded and analyzed.

Alternative 1, no action, would continue the current state and federal management system and set an ACL and accountability measures as determined in actions later in this

amendment for Caribbean spiny lobster. If this alternative was selected as the preferred alternative, the National Standard 1 guideline would still need to be met in 2011. **Alternative 2** or **3** would set an ACL and accountability measures (AMs), but delegate all or certain management measures, respectively. Delegation to Florida would require agreement from Florida FWC to accept the responsibility of Caribbean spiny lobster management. **Alternative 2**, would delegate all management of Caribbean spiny lobster to Florida FWC, but still set an ACL (see Action 4). If **Alternative 2** was selected as a preferred alternative, Florida FWC could use various management criteria to maintain the ACL. This method of management is similar to what is occurring presently; Florida FWC has taken the lead in Caribbean spiny lobster fishery management, with NOAA Fisheries Service establishing compatible regulations when applicable through the Council's processes. One modification from the current management process in addition to setting an ACL is establishing AMs. If the ACL was exceeded Florida FWC would need to apply AMs, compatible in federal waters to account for these overages, under the National Standard 1 guidelines.

Alternative 3 would also set an ACL, but delegate certain management criteria to Florida FWC, such as size limits, bag limits, fishing seasons, and trip limits. This alternative could be become more complicated; if and when the ACL was exceeded NOAA Fisheries Service would need to implement the previously established AMs. If Florida FWC only has certain management criteria or vice versa, then the appropriate criteria for management may be split between the Councils and NOAA Fisheries Service and Florida FWC, making it more difficult to prevent the ACL from being exceeded or by initiating AMs, if and when they were exceeded. The public could also become confused, by management changes coming from NOAA Fisheries Service instead of Florida FWC and compatibility with these regulations. The benefit of delegating all or certain management criteria to Florida FWC is that the state can move faster than the federal system when and if, accountability measures need to be implemented. **Alternatives 2** and **3** would still allow the Councils to maintain their joint Amendment 4 and 8 with the Caribbean Council (73 FR 1148). This newly implemented amendment prohibits importation of undersized Caribbean spiny lobsters into the U.S.

This action is primarily administrative and alternatives in this action are expected to have little impact on the biological or physical environments. **Alternative 2** may be more streamlined than **Alternative 3** or **Alternative 1** simply due to all management criteria being delegated to Florida FWC. This may create more of an administrative burden for Florida FWC working jointly with NOAA Fisheries Service and the Councils, but be less burdensome to the public keeping up with regulatory changes. If **Alternative 3** is selected as preferred, there may be more of an administrative burden for all parties involved, Florida FWC, NOAA Fisheries Service, and the Councils. In addition, by delegating only certain management criteria the process, meant to be streamlined, may become more burdensome for all parties involved. Further, members of the public following regulations for Caribbean spiny lobster may become confused if various management criteria are implemented from different agencies.

4.1.1. Direct and Indirect Effect on the Physical and Biological/Ecological Environment

This action is administrative in nature and explores delegating all or certain management criteria to Florida FWC. Florida FWC has taken the lead in management of Caribbean spiny lobster with federal agencies adopting compatible regulations. **Alternative 1** would continue the current state and federal management system of Caribbean spiny lobster. Various gear types used by the commercial lobster fishery can have negative impacts on the physical environment and could have indirect impacts on the biological or ecological environment. **Alternative 1** would not meet the National Standard 1 guidelines, because annual catch limits (ACLs) and accountability measure (AMs) would not be established by 2011, possibly causing negative impacts to the physical and biological environments. In order to meet the National Standard 1 guidelines, ACLs and AMs must be established by 2011 for species that are not overfished. At the SEDAR 8 benchmark assessment for Caribbean spiny lobster, this species was not found to be overfished or undergoing overfishing (SEDAR 8 2005). The Councils and NOAA Fisheries Service would work jointly with Florida FWC to establish ACLs and AMs based on the previous work they have completed on Caribbean spiny lobster.

Alternative 2 and **Alternative 3** would delegate all management or certain management criteria of Caribbean spiny lobster to Florida FWC, respectively. **Alternative 2** is the streamlined option, because the state can likely move faster than the federal system, when and if, AMs need to be implemented. AMs would already be established jointly with Florida FWC, the Councils, and NOAA Fisheries Service. When or if, the ACL was exceeded, Florida FWC could implement in-season or post-season AMs quickly, reducing any negative impacts to the physical environment. This could also have positive benefits to the biological and ecological environment, whereas **Alternative 1** and **3** may be less streamline because more than one management agency is involved. If **Alternative 3** is selected as preferred, AMs may take longer to implement, based on which management criteria are delegated and when and if, the ACL is exceeded. If AMs take longer to implement under **Alternative 3** there could be indirect impacts on the physical environment. A significantly longer time to implement AMs could allow Caribbean spiny lobster to be overharvested causing negative impacts to the biological or ecological environment.

4.1.2. Direct and Indirect Effect on the Economic Environment

4.1.3. Direct and Indirect Effect on the Social Environment

4.1.4. Direct and Indirect Effect on the Administrative Environment

Action 2: Other species in the Spiny Lobster FMP

Alternative 2: Set ACLs and AMs for each species using historical landings
Option a: smoothtail spiny lobster**,** *Panulirus laevicauda*
Option b: spotted spiny lobster, *Panulirus guttatus*

2.3 Action 3: Modify the current definitions of Maximum Sustainable Yield, Optimum Yield, Overfishing Threshold, and Overfished Threshold for Caribbean spiny lobster

2.3.4 Overfished Threshold

Alternative 2: Adopt the Gulf Council overfished threshold definition for the South Atlantic. The Gulf of Mexico definition: proxy for MSST of 15% transitional SPR, with the additional modification to static SPR.

Appendix B. Social Impact Assessment (SIA)/Fishery Impact Statement (FIS)

INTRODUCTION

Mandates to conduct Social Impact Assessments come from both the National Environmental Policy Act (NEPA) and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). 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).

Recent amendments to the Magnuson-Stevens Act require 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 [Magnuson-Stevens Act section 303 (a) (9)]. Most recently, with the addition of National Standard 8, FMPs must now consider the impacts upon fishing communities to the extent practicable to assure their sustained participation and minimize adverse economic impacts upon those communities [Magnuson-Stevens Act 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 to minimize the negative impacts experienced by the populations concerned to the extent practicable.

DATA LIMITATIONS 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, included under this interpretation are cultural impacts that may involve changes in values and beliefs, which affect the way people identify themselves within their occupation, communities and society in general. Social impacts analyses help determine the consequences of policy action in advance by comparing the status quo with the projected impacts. Therefore, it is important that as much information as possible concerning a fishery and its participants be gathered for an assessment.

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 of the impacts based on the best available science. 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 analyses.

SUMMARY OF SOCIAL IMPACT ASSESSMENT

Descriptions of the affected communities and expected effects of the alternatives considered in this amendment are provided in sections 5 and 6, respectively.

Appendix C. Regulatory Impact Review (RIR, economic impacts of preferred alternatives)

Appendix D. Regulatory Flexibility Analysis (RFA, economic impacts of proposed regulatory actions)

Appendix E. Bycatch Practicability Analysis

Appendix F. Other Applicable Laws

The MSFCMA (16 U.S.C. 1801 et seq.) provides the authority for U.S. fishery management. But fishery management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems within which those fisheries are conducted. Major laws affecting federal fishery management decision making are summarized below.

Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NOAA Fisheries is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451 et seq.) encourages state and federal cooperation in the development of plans that manage the use of natural coastal habitats, as well as the fish and wildlife those habitats support. When proposing an action determined to directly affect coastal resources managed under an approved coastal zone management program, NOAA Fisheries is required to provide the relevant state agency with a determination that the proposed action is consistent with the enforceable policies of the approved program to the maximum extent practicable at least 90 days before taking final action.

Information Quality Act

The Data Quality Act (DQA) (Public Law 106-443), which took effect October 1, 2002, requires the government for the first time to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the Act directs the Office of Management and Budget (OMB) to issue government wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." Such guidelines have been issued, directing all federal agencies to create and issue agency-specific standards to 1) ensure Information Quality and develop a pre-dissemination review process; 2) establish administrative mechanisms allowing affected persons to seek and obtain correction of information; and 3) report periodically to OMB on the number and nature of complaints received.

Scientific information and data are key components of FMPs and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the Act, FMPs and amendments must be based on the best information available, properly reference all supporting materials and data, and should be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data should also undergo quality control prior to being used by the agency.

Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies use their authorities to conserve endangered and threatened species, and that they ensure actions they authorize, fund, or carry out are not likely to harm the continued existence of those species or the habitat designated to be critical to their survival and recovery. The ESA requires NOAA Fisheries, when proposing a fishery action that "may affect" critical habitat or endangered or threatened species, to consult with the appropriate administrative agency (itself for most marine species, the U.S. Fish and Wildlife Service for all remaining species) to determine the potential impacts of the proposed action. Consultations are concluded informally when proposed actions "may affect but are not likely to adversely affect" endangered or threatened species or designated critical habitat. Formal consultations, resulting in a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" endangered or threatened species or designated critical habitat. If jeopardy or adverse modification is found, the consulting agency is required to suggest reasonable and prudent alternatives.

On April 28, 1989, NOAA Fisheries Southeast Region (SERO) completed a formal consultation, including a Biological Opinion (Opinion), on the effects of commercial fishing activities in the Southeast Region on threatened and endangered species. The Opinion concluded that the Gulf of Mexico and South Atlantic spiny lobster fishery was likely to adversely affect, but not jeopardize the continued existence of ESA-listed sea turtles. Subsequent, informal consultations on the continued authorization of the fishery determined it was not likely to adversely affect ESA-listed species. The impacts of the Caribbean spiny lobster fishery on ESA-listed species were last evaluated in a formal consultation, concluded on May 19, 2005. The opinion concluded that Caribbean spiny lobster fishing was likely to adversely affect, but not jeopardize the continued existence of ESA-listed sea turtles.

As provided in 50 CFR 402.16, reinitiation of formal consultation is required when discretionary involvement or control over the action has been retained (or is authorized by law) and: 1) the amount or extent of the incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical

habitat not previously considered; or 4) if a new species is listed or critical habitat designated that may be affected by the identified action.

Since the completion of the most recent formal consultations on these fisheries, two species of *Acropora* coral have been listed under the ESA, and may be affected by spiny lobster fishing. Additionally, new information is available revealing effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered. Accordingly, NOAA Fisheries Office of Sustainable Fisheries has requested initiation of a Section 7 consultation with the SERO's Protected Resources Division for this amendment. NOAA Fisheries anticipates completion of the consultations on the Gulf of Mexico/South Atlantic and Caribbean spiny lobster fisheries prior to Secretarial review and approval of the fishery plan amendments for the spiny lobster fisheries.

Rivers and Harbors Act of 1899

The Rivers and Harbors Act was created in 1899 to prevent navigable waters of the United States from being obstructed. Section 10 of the Act requires that anyone wishing to dredge, fill, or build a structure in any navigable water and associated wetlands obtain a permit from the ACOE. An activity affecting wetlands may require a Section 404 and Section 10 permit, thus both sections are often included together in a permit notice. When these activities are permitted, and there is direct loss of submerged habitat, such as seagrasses, then mitigation is often required to compensate for this loss.

Clean Water Act

In 1972, Congress passed the Clean Water Act (CWA) - also known as the Water Pollution Prevention and Control Act - to protect the quality of the nation's waterways including oceans, lakes, rivers and streams, aquifers, coastal areas, and aquatic resources. The law sets out broad rules for protecting the waters of the United States; Sections 404 and 401 apply directly to waters and aquatic resources protection.

Section 404 of the CWA (often referred to as "Section 404" or simply "404") forbids the unpermitted "discharge of dredge or fill material" into waters of the United States. Section 404 does not regulate every activity in aquatic resources or coastal areas, but requires anyone seeking to fill any area to first obtain a permit from the Army Corps of Engineers (ACOE). Constructing bridges, causeways, piers, port expansion, or any other construction or development activity along a waterway or in aquatic resources generally requires a 404 permit. When a fill project is permitted, there may be mitigation required to replace lost aquatic resources.

Section 401 of the Clean Water Act requires that an applicant for a Section 404 permit obtain a certificate from their state's environmental regulatory agency (if the state has delegated such authority to the agency) that the activity will not negatively impact water quality. This permit process is supposed to prevent the discharge of pollutants (pesticides, heavy metals, hydrocarbons) or sediments into waters, which may be above acceptable levels, because decreased water quality may endanger the health of the people, fish, and wildlife. However, acceptable pollutant levels have not been established for many aquatic

resources, which make it difficult for state agencies to fully assess a project's impact on water quality.

National Marine Sanctuaries Act

Under the National Marine Sanctuaries Act (NMSA) (also known as Title III of the Marine Protection, Research and Sanctuaries Act of 1972), as amended, the Secretary of Commerce is authorized to designate National Marine Sanctuaries to protect distinctive natural and cultural resources whose protection and beneficial use requires comprehensive planning and management. The National Marine Sanctuaries are administered by NOAA's National Ocean Service. The Act provides authority for comprehensive and coordinated conservation and management of these marine areas. The National Marine Sanctuary System currently comprises 13 sanctuaries around the country, including sites in American Samoa and Hawaii. These sites include significant coral reef and kelp forest habitats, and breeding and feeding grounds of whales, sea lions, sharks, and sea turtles. A complete listing of the current sanctuaries and information about their location, size, characteristics, and affected fisheries can be found at http://www.sanctuaries.nos.noaa.gov/oms/oms.html.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act protects the quality of the aquatic environment needed for fish and wildlife resources. The Act requires consultation with the Fish and Wildlife Service and the fish and wildlife agencies of States where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency (except TVA) under a Federal permit or license. NOAA Fisheries was brought into the process later, as these responsibilities were carried over, during the reorganization process that created NOAA. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources", and to ensure that the environmental value of a body of water or wetland is taken into account in the decision-making process during permit application reviews. Consultation is most often (but not exclusively) initiated when water resource agencies send the FWS or NOAA Fisheries a public notice of a Section 404 permit. FWS or NOAA Fisheries may file comments on the permit stating concerns about the negative impact the activity will have on the environment, and suggest measures to reduce the impact.

Executive Orders

E.O. 12114: Environmental Assessment of Actions Abroad

The purpose of this Executive Order is to enable responsible officials of Federal agencies having ultimate responsibility for authorizing and approving actions encompassed by this Order to be informed of pertinent environmental considerations and to take such considerations into account, with other pertinent considerations of national policy, in making decisions regarding such actions. While based on independent authority, this Order furthers the purpose of the National Environmental Policy Act and the Marine Protection Research and Sanctuaries Act and the Deepwater Port Act consistent with the foreign policy and national security policy of the United States, and represents the United

States government's exclusive and complete determination of the procedural and other actions to be taken by Federal agencies to further the purpose of the National Environmental Policy Act, with respect to the environment outside the United States, its territories and possessions.

Agencies in their procedures shall establish procedures by which their officers having ultimate responsibility for authority and approving actions in one of the following categories encompassed by this Order, take into consideration in making decisions concerning such actions, a document described in Section 2-4(a):
(a) major Federal actions significantly affecting the environment of the global commons outside the jurisdiction of any nation (e.g., the oceans or Antarctica);
(b) major Federal actions significantly affecting the environment of a foreign nation not participating with the United States and not otherwise involved in the action;
(c) major Federal actions significantly affecting the environment of a foreign nation which provide to that nation:

(1) a product, or physical project producing a principal product or an emission or effluent, which is prohibited or strictly regulated by Federal law in the United States because its toxic effects on the environment create a serious public health risk; or

(2) a physical project which in the United States is prohibited or strictly regulated by Federal law to protect the environment against radioactive substances.

(d) major Federal actions outside the United States, its territories and possessions which significantly affect natural or ecological resources of global importance designated for protection under this subsection by the President, or, in the case of such a resource protected by international agreement binding on the United States, by the Secretary of State. Recommendations to the President under this subsection shall be accompanied by the views of the Council on Environmental Quality and the Secretary of State.

The purpose of this amendment/EIS is to increase the spawning biomass of the spiny lobster population in the waters of the Caribbean and tropical western Atlantic (the oceans). It has been determined in section 6 there will be significant biological affects in a positive form; and as indicated numerous times throughout the document, the restrictions considered in this document were developed in accordance with a number of international agreements and accords passed by foreign nations.

E.O. 12866: Regulatory Planning and Review

Executive Order 12866: Regulatory Planning and Review, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NOAA Fisheries prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that either implement a new fishery management plan or significantly amend an existing plan. RIRs provide a comprehensive analysis of the costs and benefits to society associated with proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action"

under the criteria provided in E.O. 12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the RFA. A regulation is significant if it is likely to result in an annual effect on the economy of at least $100,000,000 or has other major economic effects.

E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights, which became effective March 18, 1988, requires that each federal agency prepare a Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings Implication Assessment. Management measures limiting fishing seasons, areas, quotas, fish size limits, and bag limits do not appear to have any taking implications. There is a takings implication if a fishing gear is prohibited, because fishermen who desire to leave a fishery might be unable to sell their investment, or if a fisherman is prohibited by federal action from exercising property rights granted by a state.

E.O. 13089: Coral Reef Protection

The Executive Order on Coral Reef Protection (June 11, 1998) requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and, to the extent permitted by law, ensure that actions they authorize, fund or carry out not degrade the condition of that ecosystem. By definition, a U.S. coral reef ecosystem means those species, habitats, and other national resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., federal, state, territorial, or commonwealth waters).

E.O. 13112: Invasive Species

The Executive Order requires agencies to use authorities to prevent introduction of invasive species, respond to and control invasions in a cost effective and environmentally sound manner, and to provide for restoration of native species and habitat conditions in ecosystems that have been invaded. Further, agencies shall not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere unless a determination is made that the benefits of such actions clearly outweigh the potential harm; and that all feasible and prudent measures to minimize the risk of harm will be taken in conjunction with the actions. The actions undertaken in this amendment will not introduce, authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere.

E.O. 13132: Federalism

The Executive Order on federalism requires agencies in formulating and implementing policies that have federalism implications, to be guided by the fundamental federalism principles. The Order serves to guarantee the division of governmental responsibilities between the national government and the states that was intended by the framers of the

Constitution. Federalism is rooted in the belief that issues that are not national in scope or significance are most appropriately addressed by the level of government closest to the people. This Order is relevant to FMPs and amendment given the overlapping authorities of NOAA Fisheries, the states, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate state, tribes and local entities (international too). The proposed management measures in this Amendment to the Spiny Lobster FMPs of the Caribbean and the South Atlantic/Gulf of Mexico have been developed with the local, federal and international officials.

E.O. 13141: Environmental Review of Trade Agreements

This Executive Order requires the U.S. Trade Representative, through the interagency Trade Policy Staff to conduct environmental reviews of three of the most common agreements: comprehensive multilateral trade rounds, bilateral or multilateral free-trade agreements, and major new trade liberalization agreements in natural resource sectors. Although the procedures for environmental impact assessment in Executive Order 13141 are not subject to NEPA, they follow similar guidelines. Understanding the importance of this E.O. in relation to this Amendment/EIS, NOAA Fisheries Service has made a concerted effort to involve the USTR and other agencies involved with trade negotiations to inform them of the intention of the actions being undertaken by the Councils and NOAA Fisheries Service.

E.O. 13158: Marine Protected Areas

Executive Order 13158 (May 26, 2000) requires federal agencies to consider whether their proposed action(s) will affect any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resource within the protected area.

E.O. 12898: Environmental Justice

This Executive Order mandates that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions. Federal agency responsibilities under this Executive Order include conducting their programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons from participation in, denying persons the benefit of, or subjecting persons to discrimination under, such, programs policies, and activities, because of their race, color, or national origin. Furthermore, each federal agency responsibility set forth under this Executive Order shall apply equally to Native American programs.

Specifically, federal agencies shall, to the maximum extent practicable; conduct human health and environmental research and analysis; collect human health and environmental data; collect, maintain and analyze information on the consumption patterns of those who

principally rely on fish and/or wildlife for subsistence; allow for public participation and access to information relating to the incorporation of environmental justice principals in Federal agency programs or policies; and share information and eliminate unnecessary duplication of efforts through the use of existing data systems and cooperative agreements among Federal agencies and with State, local, and tribal governments. The proposed actions would be applied to all participants in the fishery, regardless of their race, color, national origin, or income level, and as a result are not considered discriminatory. Additionally, none of the proposed actions are expected to affect any existing subsistence consumption patterns. Therefore, no environmental justice issues are anticipated and no modifications to any proposed actions have been made to address environmental justice issues.

Marine Mammal Protection Act

The MMPA established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NOAA Fisheries) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries; and studies of pinniped-fishery interactions. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. To legally fish in a Category I and/or II fishery, a fisherman must obtain a marine mammal authorization certificate by registering with the Marine Mammal Authorization Program (50 CFR 229.4) and accommodate an observer if requested (50 CFR 229.7(c)) and they must comply with any applicable take reduction plans.

The Caribbean spiny lobster trap/pot and Florida spiny lobster trap/pot fisheries are listed as part of a Category III fishery (72 FR 66048; November 27, 2007) because there has only been one documented interaction between these gears and marine mammals.

Paperwork Reduction Act

The Paperwork Reduction Act (PRA) of 1995 (44 U.S.C. 3501 et seq.) regulates the collection of public information by federal agencies to ensure that the public is not overburdened with information requests, that the federal government's information collection procedures are efficient, and that federal agencies adhere to appropriate rules governing the confidentiality of such information. The PRA requires NOAA Fisheries to obtain approval from the Office of Management and Budget before requesting most types of fishery information from the public. This action contains no PRA requirements.

Small Business Act

The Small Business Act of 1953, as amended, Section 8(a), 15 U.S.C. 634(b)(6), 636(j), 637(a) and (d); Public Laws 95-507 and 99-661, Section 1207; and Public Laws 100-656 and 101-37 are administered by the SBA. The objectives of the act are to foster business ownership by individuals who are both socially and economically disadvantaged; and to promote the competitive viability of such firms by providing business development assistance including, but not limited to, management and technical assistance, access to capital and other forms of financial assistance, business training and counseling, and access to sole source and limited competition federal contract opportunities, to help the firms to achieve competitive viability. Because most businesses associated with fishing are considered small businesses, NMFS, in implementing regulations, must make an assessment of how those regulations will affect small businesses. Implications to small businesses are discussed in the RIR herein (Section 7).

Magnuson-Stevens Act Essential Fish Habitat Provisions

The Magnuson-Stevens Act includes EFH requirements, and as such, each existing, and any new, FMPs must describe and identify EFH for the fishery, minimize to the extent practicable adverse effects on that EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of that EFH. The Council and NMFS have determined there are no adverse effects to EFH in this amendment as discussed in the Environmental Consequences section (Section 6).

Migratory Bird Treaty Act

Under the Migratory Bird Treaty Act (MBTA), it is unlawful to pursue, hunt, take, capture, kill, possess, trade, or transport any migratory bird, or any part, nest, or egg of a migratory bird, included in treaties between the United States and Great Britain, Mexico, Japan, or the former Union of Soviet Socialists Republics, except as permitted by regulations issued by the Department of the Interior (16 U.S.C. 703-712). Violations of the MBTA carry criminal penalties; any equipment and means of transportation used in activities in violation of the MBTA may be seized by the United States government and, upon conviction, must be forfeited to it. To date, the MBTA has been applied to the territory of the United States and coastal waters extending three miles from shore. Furthermore, Executive Order 13186 (see Section 9.5.9) was issued in 2001, which directs federal agencies, including NOAA Fisheries, to take certain actions to further implement the MBTA.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.) requires federal agencies to consider the environmental and social consequences of proposed major actions, as well as alternatives to those actions, and to provide this information for public consideration and comment before selecting a final course of action. Because NOAA Fisheries Service is proposing a major fishery action that may significantly affect the quality of the human environment, NOAA Fisheries Service has prepared this EIS to comply with NEPA and its implementing regulations.

Regulatory Flexibility Act

The purpose of the Regulatory Flexibility Act (RFA 1980, 5 U.S.C. 601 et seq.) is to ensure that federal agencies consider the economic impact of their regulatory proposals on small entities, analyze effective alternatives that minimize the economic impacts on small entities, and make their analyses available for public comment. The RFA does not seek preferential treatment for small entities, require agencies to adopt regulations that impose the least burden on small entities, or mandate exemptions for small entities. Rather, it requires agencies to examine public policy issues using an analytical process that identifies, among other things, barriers to small business competitiveness and seeks a level playing field for small entities, not an unfair advantage.

After an agency determines that the RFA applies, it must decide whether to conduct a full regulatory flexibility analysis (IRFA or Final Regulatory Flexibility Analysis) or to certify that the proposed rule will not "have a significant economic impact on a substantial number of small entities. In order to make this determination, the agency conducts a threshold analysis, which has the following 5 parts: 1) Description of small entities regulated by proposed action, which includes the SBA size standard(s), or those approved by the Office of Advocacy, for purposes of the analysis and size variations among these small entities; 2) Descriptions and estimates of the economic impacts of compliance requirements on the small entities, which include reporting and recordkeeping burdens and variations of impacts among size groupings of small entities; 3) Criteria used to determine if the economic impact is significant or not; 4) Criteria used to determine if the number of small entities that experience a significant economic impact is substantial or not; and 5) Descriptions of assumptions and uncertainties, including data used in the analysis. If the threshold analysis indicates that there will not be a significant economic impact on a substantial number of small entities, the agency can so certify.

Public Law 99-659: Vessel Safety

Public Law 99-659 amended the Magnuson-Stevens Act to require that a FMP or FMP 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 a fishery for vessels that would be otherwise prevented from participating in the fishery because of safety concerns related to weather or to other ocean conditions.

Appendix G. Scoping Summary

SUMMARY MINUTES
PUBLIC HEARING – MARATHON, FL
SPINY LOBSTER AMENDMENT 10
JOINT AMENDMENT FOR THE GULF OF MEXICO AND
SOUTH ATLANTIC FISHERY MANAGEMENT COUNCILS

September 22, 2009

Attendance:
Bob Gill, Gulf Council
Dr. Gregg Waugh, SAFMC
Dr. Carrie Simmons, Gulf Council Staff
Phyllis Miranda, Gulf Council Staff

36 Members of the Public

The public hearing was convened by Chairman Bob Gill at 6:00 p.m. Dr. Carrie Simmons reviewed the PowerPoint presentation with the public. The public was then invited to provide their comments.

Karl Lessard, Florida Keys Commercial Fishermen's Association. He read into the record from two written letters which had previously been provided to the Council at the June Council meeting and which are attached. In summary, these letters stated that they do not want the Councils to repeal the Spiny Lobster FMP, because it is felt that the state is not able to do a stock assessment alone. In addition, the size limit requirements on imports are crucial to maintain an economically viable fishery. The FKCFA is in support of the following allocation: 72% commercial trap fishery, 22% recreational divers, 5% commercial divers, and 1% bully net fishing. He requested that the Council set the ACL using a quota instead of using landing records. He added that they are mainly concerned about spiny lobster and the Council should do what they think is appropriate for the other lesser landed species in the FMP. He stated that mortality of short lobsters is estimated to be low, 8-10%; which is lower than fishing mortality on most other species.

Tim Daniels, Marathon, FL. He stated that the fishermen are scared that the catch limit on the lobster would be limited because of the data resulting from hurricanes and illegal fishing. The population has been reduced due to the hurricanes and this has caused them to not be able to catch as many lobsters. He stated that he would like to see the historical data to go back 20-30 years and that data be considered when setting an ACL. He felt that management of spiny lobster or stone crab should not be turned over to the state of Florida. He was in agreement with the previous allocation for Monroe County that Karl Lessard stated. He noted that the recreational diver mini-season is difficult to measure and control. He added that the use of shorts as an attractant is a necessary component of

lobster fishing. He added that economic and social impact studies should be done on all the fisheries that are mandated under the MSA.

Hal Osburn, Florida Keys Commercial Fishermen's Association. He stated that sociological cultural information needs to be a focus of the studies and that ACLs and AMs should be based on the current stock assessment, not a future stock assessment as it is the best available data. He felt that the spiny lobster FMP should remain under the joint jurisdiction of the GMFMC, the SAFMC, and the FFWC. He added that the state cannot keep up with the requirements of managing the spiny lobster fishery and that the restriction on the importation of illegal size spiny lobster is very important and would not exist anymore under state management. He was of the opinion that all Caribbean spiny lobster landed should be landed either all whole or all tailed, and that having that regulation would prevent the abuse of having a short carapace but a long tail.

Gary Nichols, Nichols Seafood, Islamorada, FL and Organized Fishermen of Florida. He stated that lobster catch can historically be sustained to 6 million pounds. He would like to see an allocation that is closest to the 6 million pounds. He felt that the ACL should be based on the current stock assessment. He believed that the Councils should retain management of the spiny lobster. He stated that he is in favor of modifying the tailing permit to all tailed or all whole lobster landed. He added that the coral needs to be protected and that the coral working group and the Sanctuary were trying to identify more areas that needed to be closed to achieve that goal. He noted that he lobsters in deeper water and catches ridged slipper lobster, and he felt that whatever is appropriate to protect the spawning stock, such as egg bearing females, is important.

Jeff Cramer, Organized Fishermen of Florida. He stated that the current stock assessment should be used instead of using an updated assessment that may not reflect the true condition of the spiny lobster stock because of the hurricanes and other issues. He added that about a dozen fishermen in the coral workgroup were working with NOAA's Protected Species Division to identify areas that the corals are located. He said that the fishermen were willing to do anything to protect the corals and that the lobsters are not typically located near the corals. He felt that the Councils should maintain control over the FMP. He felt that the trip ticket system was flawed because on any given day he may fish in three areas, but only records one on the trip ticket. In general, he felt that fishing in federal waters was underreported and traps were moved between federal and state waters based on season and movement of the lobster. He stated that undersized lobsters imported from other countries were a big problem for local fishers. He indicated that he uses shorts as an attractant and that they were kept in good condition before going into the trap. He added that often the shorts escape the trap indicating that they could leave the trap at any time.

Richard Stiglitz, commercial fisherman, Monroe County, FL. He indicated that he has used shorts for 40 years. He stated that he takes care of the lobsters on his boat that he uses for shorts and that there is next to no short mortality on their boats. He felt that the ACLs need to be set high on the spiny lobster because a number set too low would be devastating to the Keys communities. He also stated that in the northern Gulf (Naples to

Tampa) is a population of large spawning females and it should always be protected. He did not think any fishers were currently targeting this area, but it should be protected. He was in agreement with other speakers, that federal management should stay involved.

Additional attendees who chose not to speak on Spiny Lobster:
Chris Johnson, charter boat captain, Marathon, FL
Christy Johnson, Seasquared Charters
John Bartus, Marathon Chamber of Commerce
Rick Turner, charter boat captain, Marathon, FL
Don Moll, charter boat captain
Michelle Owen, Environmental Defense Fund
David McKinney, Environmental Defense Fund
Elizabeth Prieto, Marathon, FL
Edwin Prieto, Marathon, FL
Barbara Maddox, Captain Pip's Marina & Hideaway, Marathon, FL
Leda Dunmire, Pew Environmental Group
Dawn Ward, University of Florida, Gainesville, FL
Toby Kight, Marathon, FL
John Harrison, Marathon, FL
Gigi Harrison, Marathon, FL
Donald Beechum, Marathon, FL
Paul Lebo, Marathon, FL
Gene Trag, Marathon, FL
Capt. Don Muller
Richard Turner, Marathon, FL

SUMMARY MINUTES
PUBLIC HEARING – KEY WEST, FL
SPINY LOBSTER AMENDMENT 10
JOINT AMENDMENT FOR THE GULF OF MEXICO AND
SOUTH ATLANTIC FISHERY MANAGEMENT COUNCILS

September 21, 2009

Attendance:
Bob Gill, Gulf Council
Dr. Gregg Waugh, SAFMC
Dr. Carrie Simmons, Gulf Council Staff
Phyllis Miranda, Gulf Council Staff

43 Members of the Public

The public hearing was convened by Chairman Bob Gill at 6:00 p.m. Dr. Carrie Simmons reviewed the PowerPoint presentation with the public. The public was then invited to provide their comments.

John Coffin, Big Pine Key, FL. He read into the record a written statement, which is attached. In summary, he said the spiny lobster fishery should be left to Florida FWC. They are vested in dealing with allocation issues and knowledgeable of the history of the fishery as well as the diverse groups of people competing in the fishery. He listed several positive and negative reasons for the Florida FWC to take over management of the fishery. He noted that the federal management system would have a lot do deal with as far as allocation issues in the fishery if management was not given to Florida FWC.

Jim Sharpe, Jr., Big Pine Key, FL. He read into the record a written statement which is attached. In summary, he felt that Florida FWC should have full and unrestricted management of the spiny lobster fishery, because 95% of the lobster fishery occurs in state waters. He added that the state has been studying and managing the lobster fishery for years and should continue managing the fishery. He noted that the state had received money to study casitas to see if it can be used as a viable commercial gear in a portion of the commercial fishery. He indicated that the state is also studying new trap designs to decrease wind driven trap movement.

George Niles, Florida Keys Commercial Fishermen's Association. He stated that he felt that the ACL for lobster should be set using the data from SEDAR. He added that the federal government should retain management of lobster, because the resources they had access to were of more value to the fishery than those that the state government had.

Bobby Pillar, Summerland Key, FL. He stated that he supported Mr. Niles' position with regard to lobster being federally managed as opposed to state managed. He felt that something needed to be done about lobster being imported from other countries into the

states before lobster season actually opens. He noted that in agreement with spiny lobsters being landed all tailed or all whole, the tailing permit could be modified.

Peter Bacle, Stock Island Lobster Co. He stated that neither state nor federal would do a good job of managing spiny lobster. He recommended no action on splitting the recreational and charterboat sectors. He felt that the ACL should be set for the fisheries in which there is an identifiable catch, i.e. the commercial industry. He added that there was no way to identify amounts of recreational catch. He was in agreement that short mortality was not a problem, because shorts really have lower mortality inside the traps because it is safer than outside the traps. He believes that the tailing permit should be kept, and that it was not an issue because his fish house handles very few tailed lobsters.

Lee Starling, commercial diver and spear fisherman, Key West, FL. He felt that the Gulf Council should retain management of spiny lobster. He stated that he was against the use of casitas, because he felt that they do impact migration patterns. He wanted to note that all types of fisheries have bycatch or potentially unintended consequences on other species, even divers. He felt that short lobsters used as attractants can get out of the traps and that mortality is not a problem.

<u>Additional attendees who chose not to speak on Spiny Lobster</u>:
Billy Wickers III, Big Coppit Key, FL
Capt. Bill Wickers, Key West Charter Boat Assoc.
Richard Gomez, Capt. Conch, Key West, FL
Robert Nevius, charter boat captain
Daniel Padron, Key West, FL
Craig Jiovani, C&J Ent. Co. Inc. d/b/a Charter Boat Grand Slam
Brice Barr, Double Down Sportfishing
Mimi Stafford, Key West, FL
Rob Harris, Conchy Joe's Marine & Tackle
Steven Lamp, Dream Catcher Charters
Gennifer Lamp, Key West, FL
Ron Meyers, Little Torch Key, FL
David McKinney, Environmental Defense Fund
Michelle Owen, Environmental Defense Fund
Kari MacLauchlin, University of Florida
Marlin Scott, Keys Radio Group
Chuck Coleman, Key West, FL
Josh Nicklaus, Key West, FL
Juan Blanco, Key West, FL

Appendix H. Public Hearing Summary

Appendix I. Responses to Comments on Draft Environmental Impact Statement (DEIS)

Appendix J. Maps showing known locations and conservation priorities of *Acropora* colonies in the Florida Keys

This appendix includes 17 charts; 1 index chart, and 16 additional charts. These maps provide two types of data on *Acropora* colonies. The first, *Acropora* conservation priorities, were developed using on colonial size and location data. The largest "super colonies" have been designated as conservation priority 1 because of their importance to sexual reproduction. Other smaller, but still sexually mature, colonies have designated as conservation priority 2, and non-sexually mature colonies have been designated conservation priority 3. The second dataset, *Acropora* presence, simply indicates where *Acropora* colonies were identified during sampling, and does not necessarily indicate the absence of *Acropora* elsewhere. Since no colonial size data were recorded at these sites, a conservation priority could not be assigned to these colonies. *Acropora* colonies, especially those occurring in high abundance, likely provide great conservation benefit to the species and should not be considered less important because they have not been assigned a conservation priority. In all likelihood, these areas provide significant conservation benefits and should be viewed as areas requiring special attention and protection.

All data have been transposed on top of NOAA nautical charts 11463, 11464, 11449, 11453, 11445, 11446, 11439, and 11438; here, the charts are arranged east to west (Upper Keys to the Dry Tortugas). To ease the use and transmission of these charts during the development of the amendment, the bathymetric data has been removed. To enhance viewing of data points, each chart has been subdivided into four quadrants (NE, SE, NW, and SW) and the depth contours have been removed. Since *Acropora* are only known to occur on hardbottom habitat and south of U.S. Highway 1, only the quadrants with hardbottom habitat and/or *Acropora* presence data are included here. Some overlap exists between charts and the orientation of north may be different on each chart. These maps are being used as reference to address requirements in the biological opinion to create new or expand existing closed areas to protect *Acropora* corals from spiny lobster fishing.

Included on each chart are the identified locations of *Acropora* from 1996-2009; *Acropora* conservation priorities; the 30-meter bathymetric contour; the boundary between state and federal waters; known areas of hardbottom habitat; any areas currently closed to trapping for spiny lobster; and any existing Florida Keys National Marine Sanctuary (FKNMS) Management Areas. "*Acropora* Priority Sites" also appear on these maps. These areas represent locations requiring high priority response from individuals responding to an environmentally damaging event, such as an oil spill because of the nature of the natural resources occurring there. These priority sites are included here only for reference and do not have any regulatory impact of fishing. *Acropora* are not found in waters deeper than 30 meter; the 30-meter depth contour has been included to identify the deepest extent at which *Acropora* is expected to occur. The charts also show hardbottom areas that may support *Acropora,* even if the presence of *Acropora* has not been confirmed there. *Acropora* is not anticipated in non-hardbottom habitat.

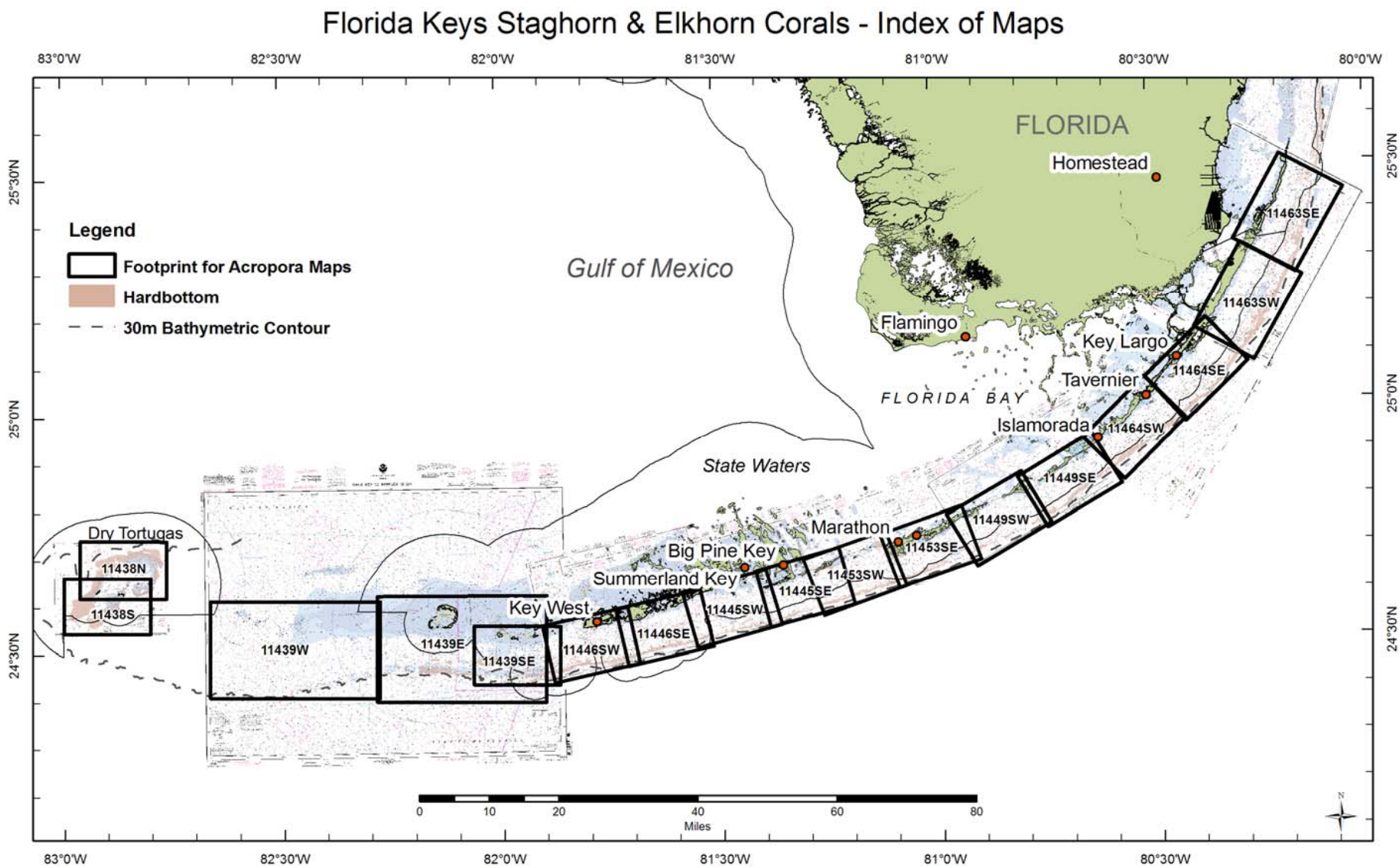

Figure 1 Index of maps showing known *Acropora* colony locations and conservation priorities in the Florida Keys

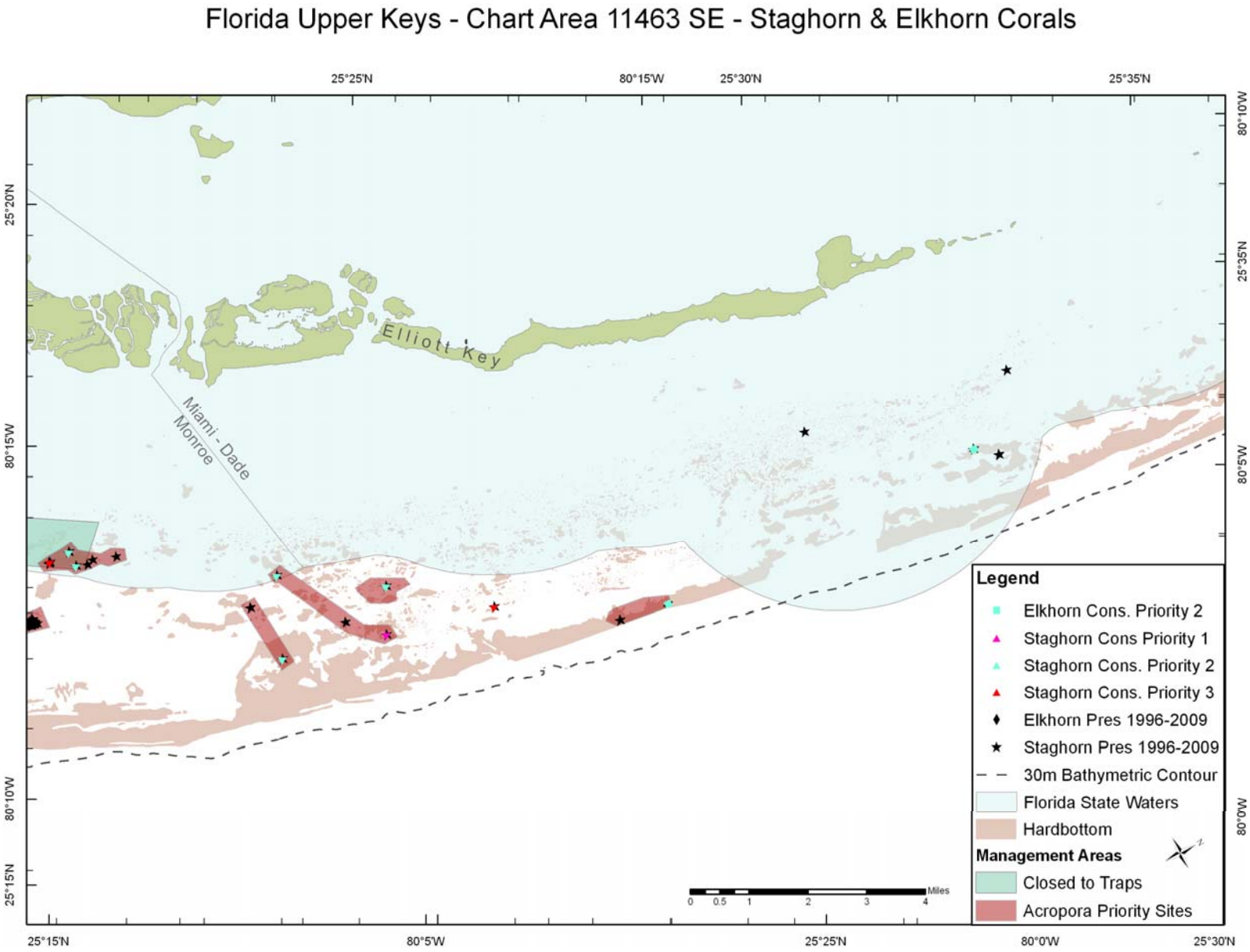

Figure 2 Map of known *Acropora* colony locations and conservation priorities in the Upper Florida Keys

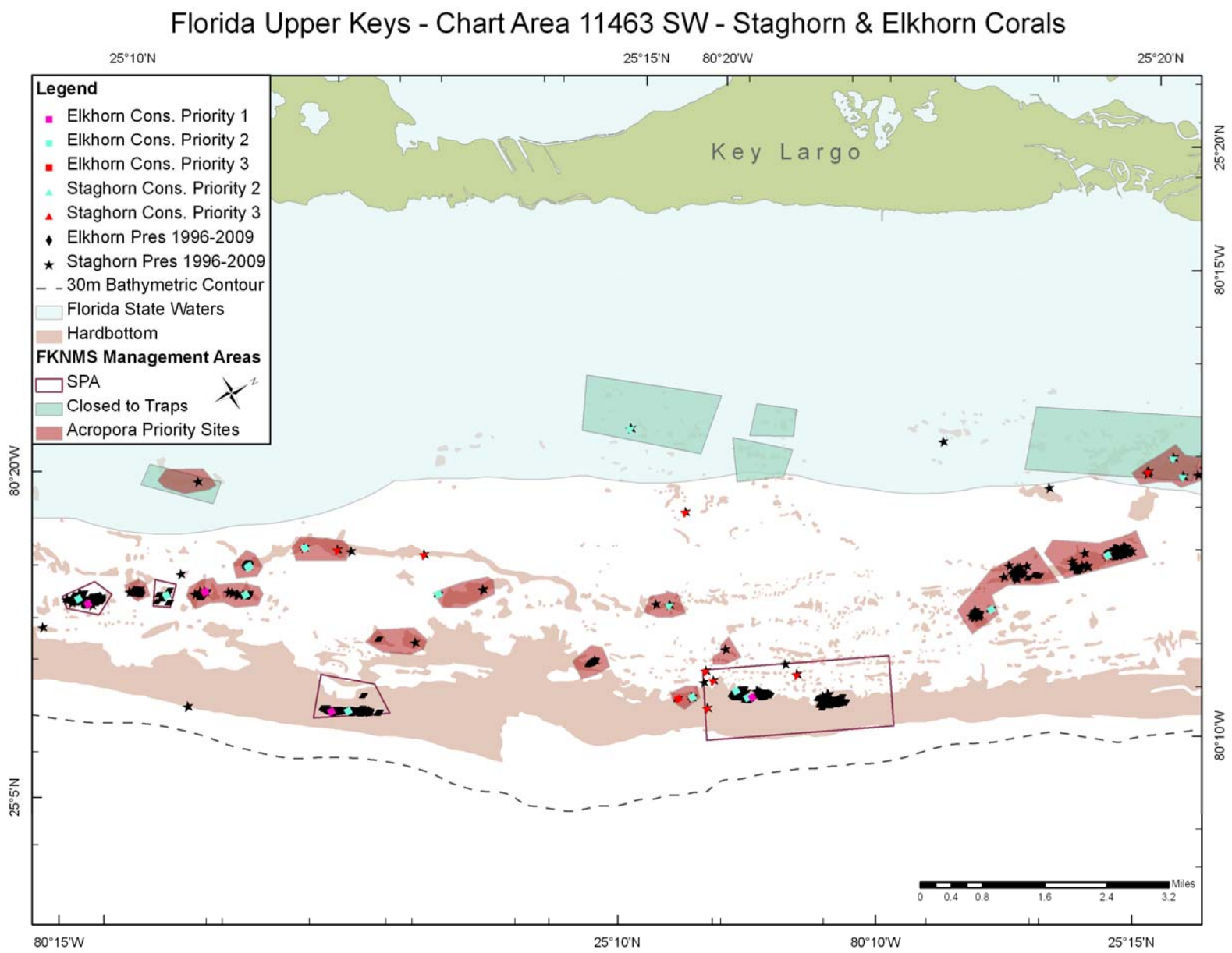

Figure 3 Map of known *Acropora* colony locations and conservation priorities in the Upper Florida Keys (cont'd)

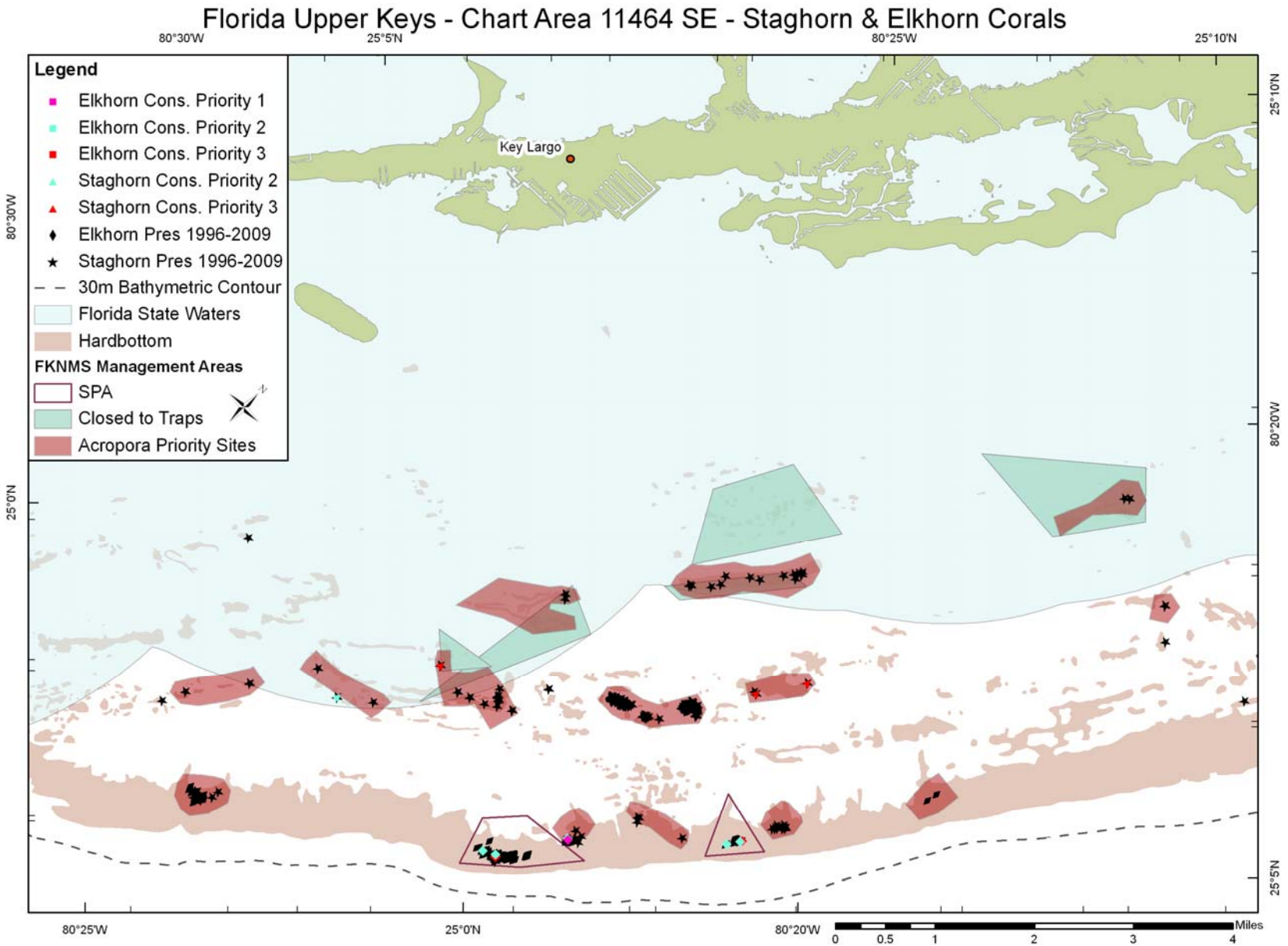

Figure 4 Map of known *Acropora* colony locations and conservation priorities in the Upper Florida Keys (cont'd)

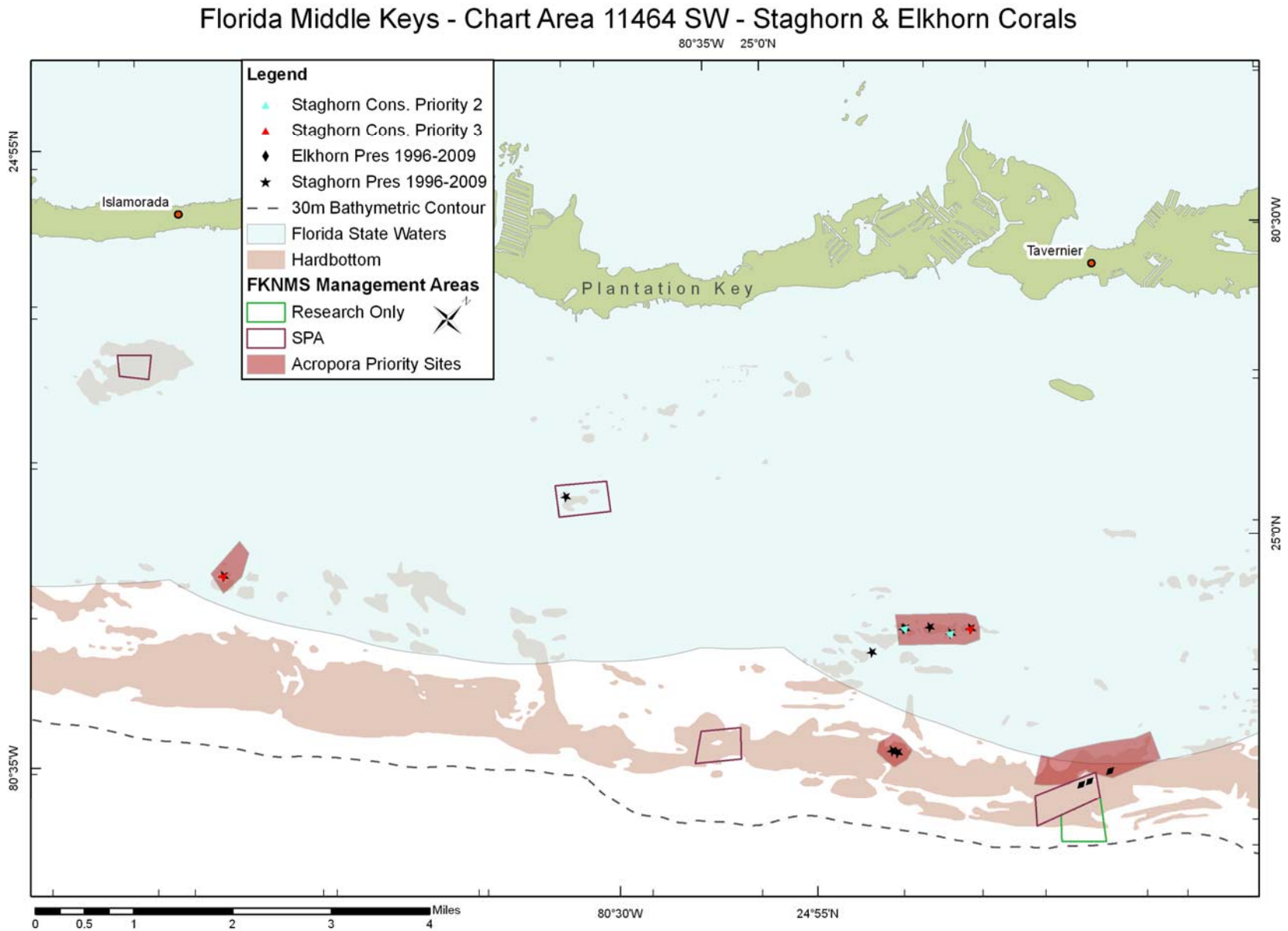

Figure 5 Map of known *Acropora* colony locations and conservation priorities in the Middle Florida Keys

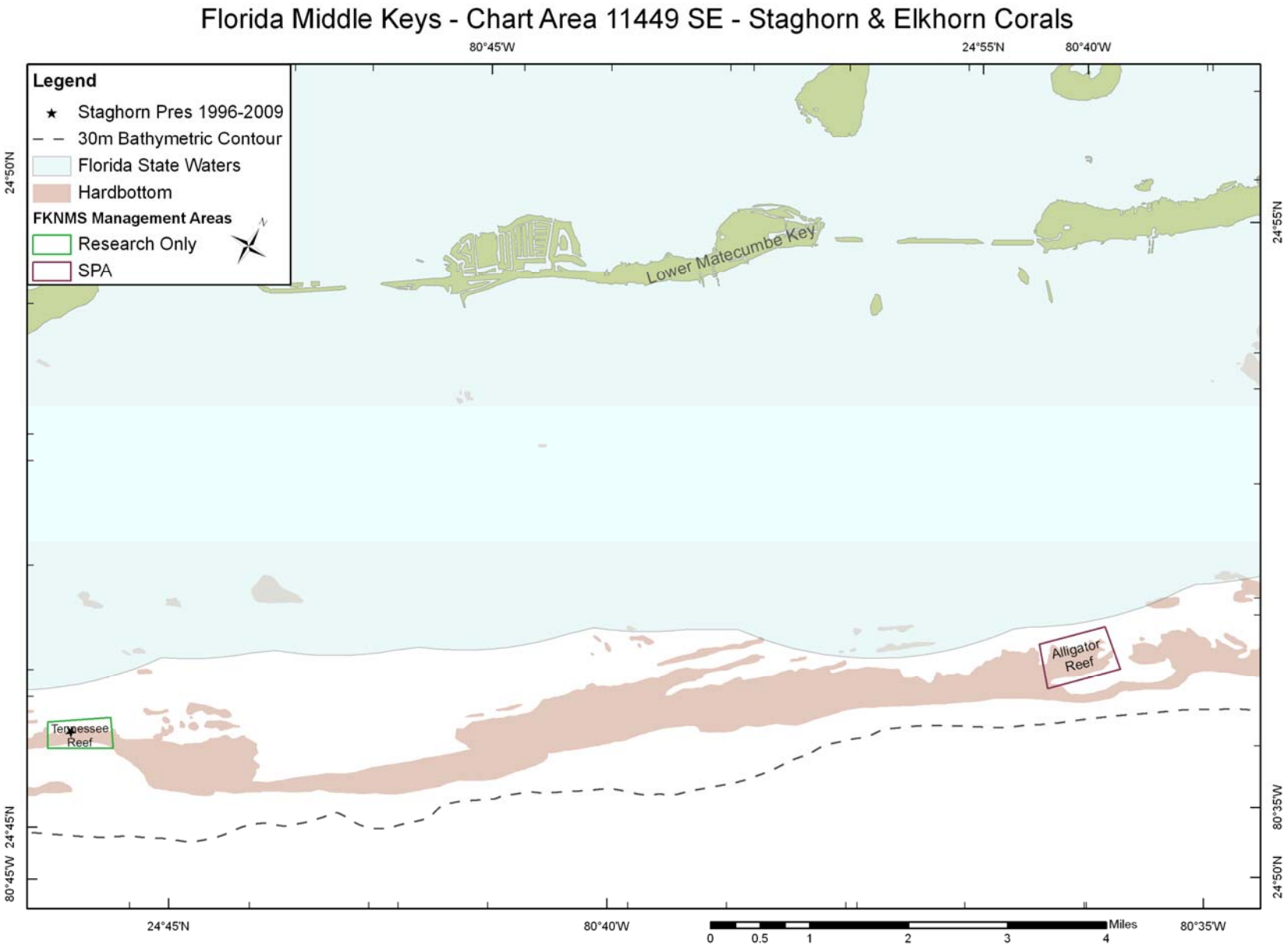

Figure 6 Map of known *Acropora* colony locations and conservation priorities in the Middle Florida Keys (cont'd)

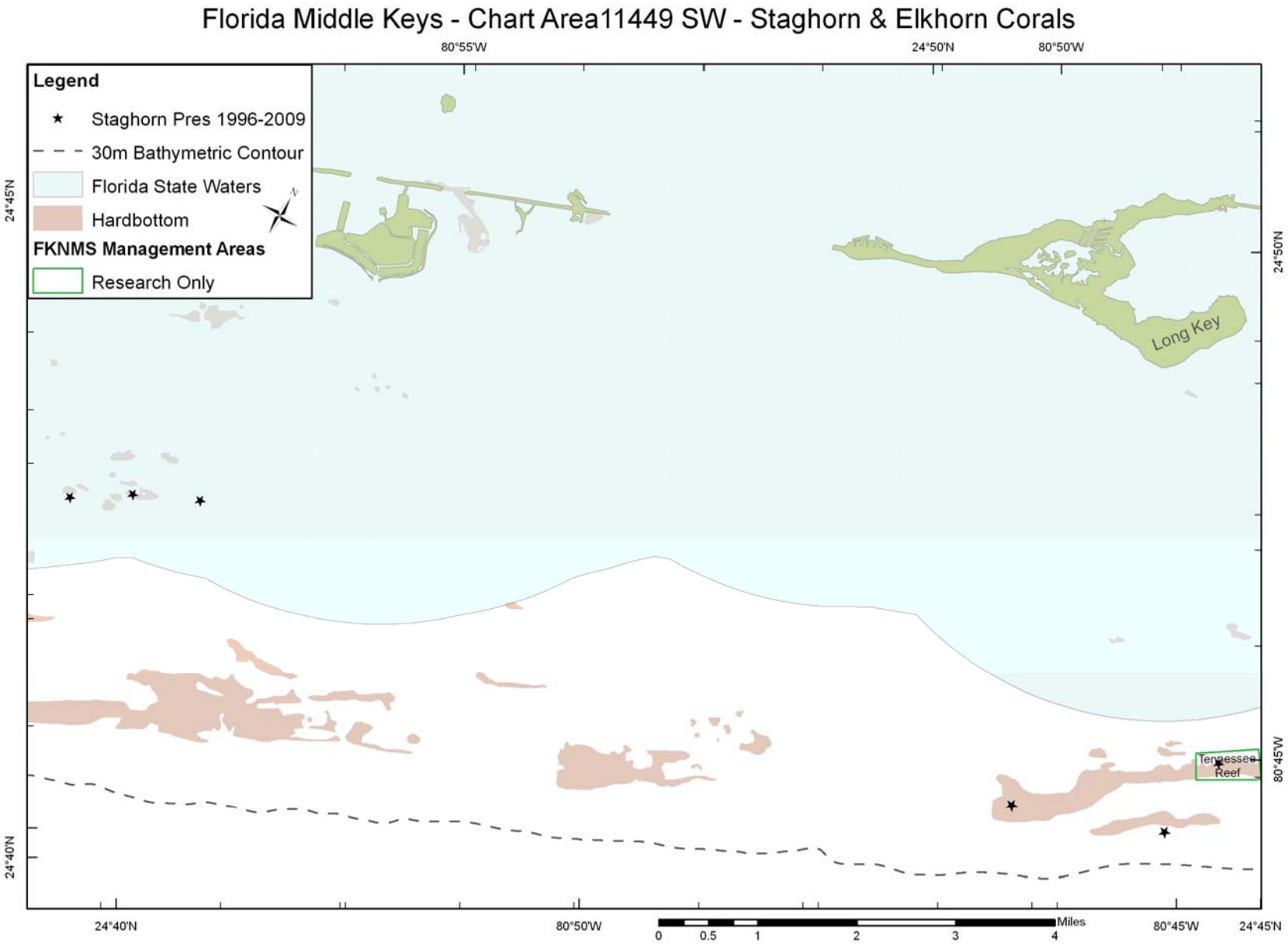

Figure 7 Map of known *Acropora* colony locations and conservation priorities in the Middle Florida Keys (cont'd)

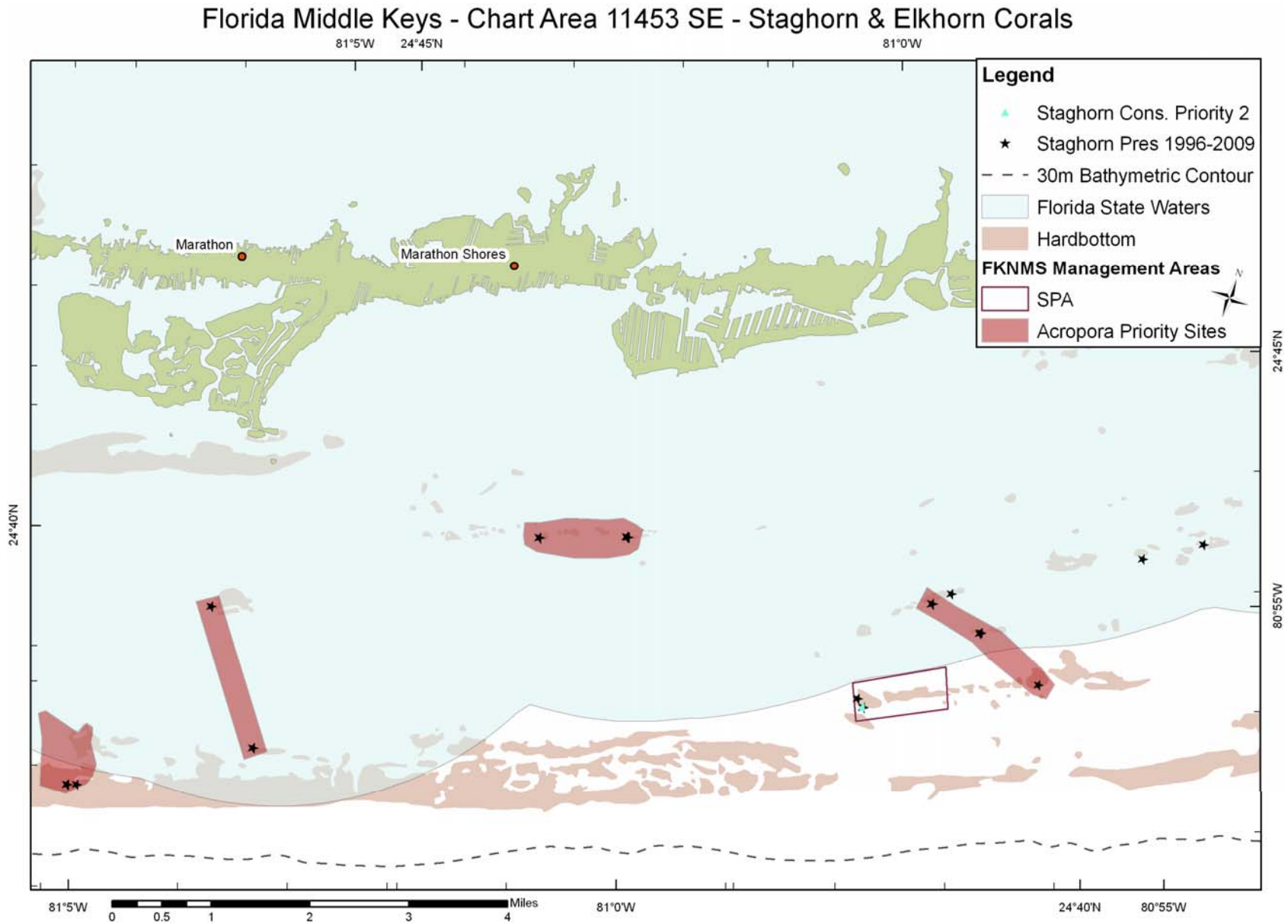

Figure 8 Map of known *Acropora* colony locations and conservation priorities in the Middle Florida Keys (cont'd)

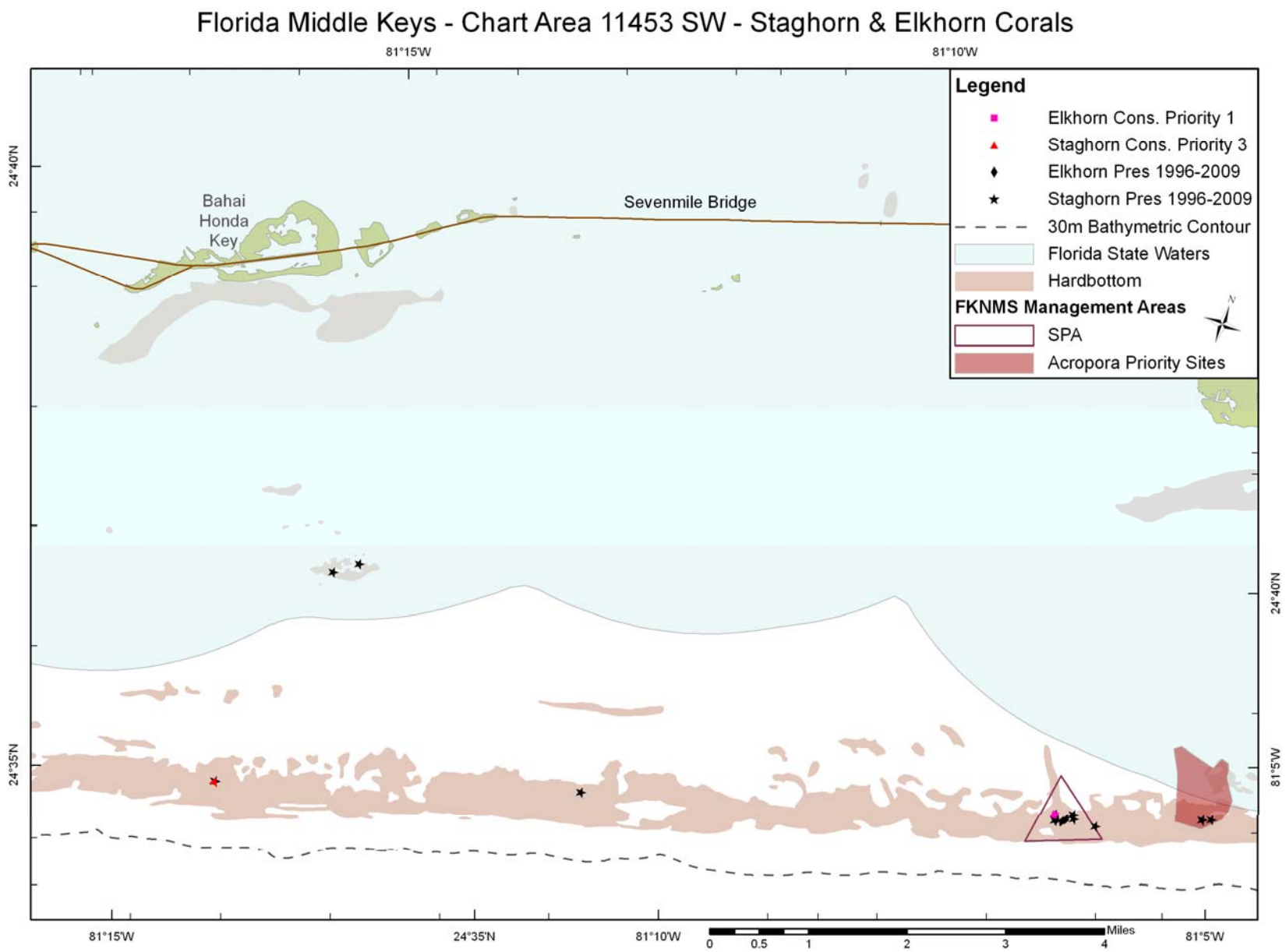

Figure 9 Map of known *Acropora* colony locations and conservation priorities in the Middle Florida Keys (cont'd)

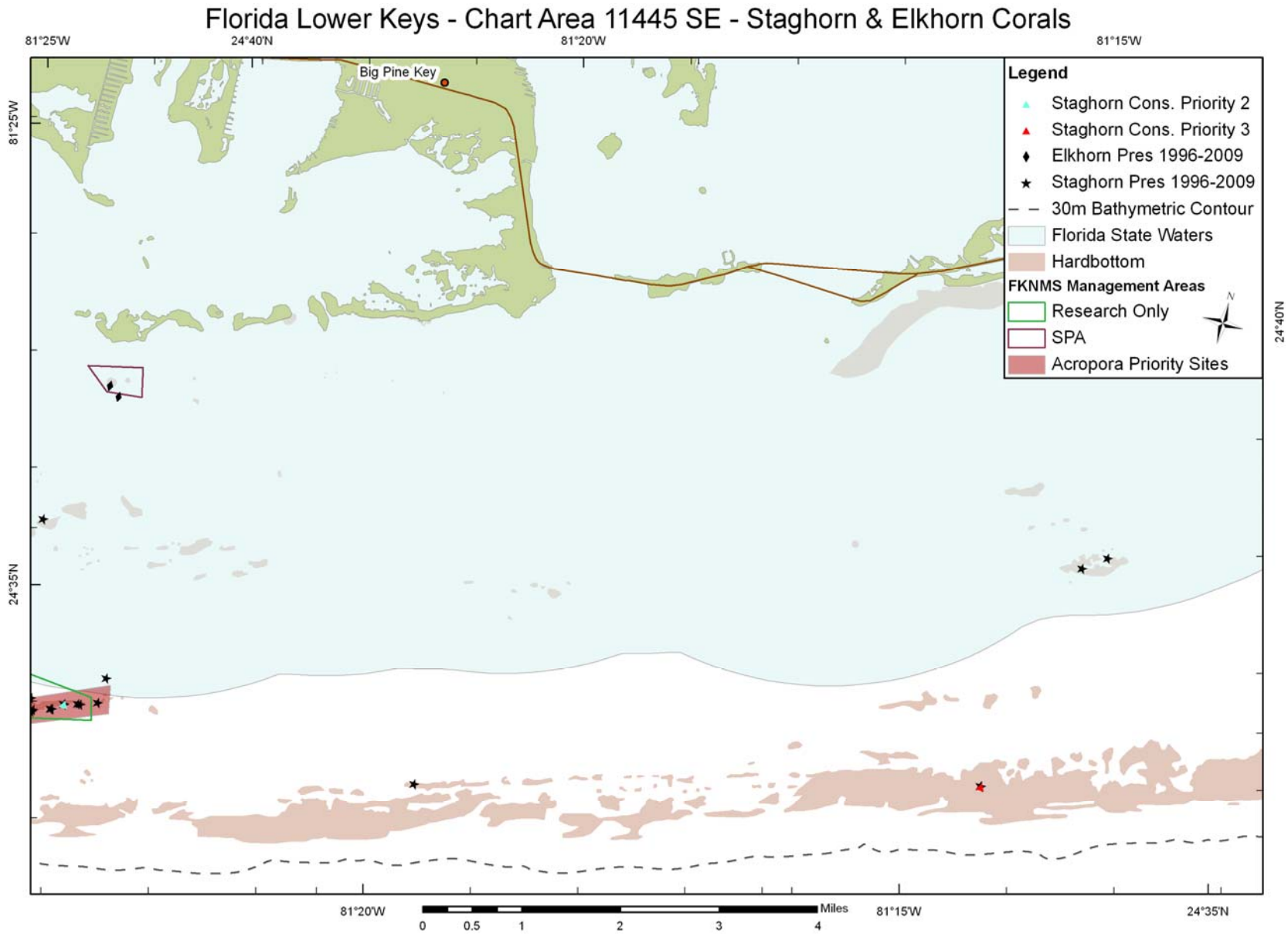

Figure 10 Map of known *Acropora* colony locations and conservation priorities in the Lower Florida Keys

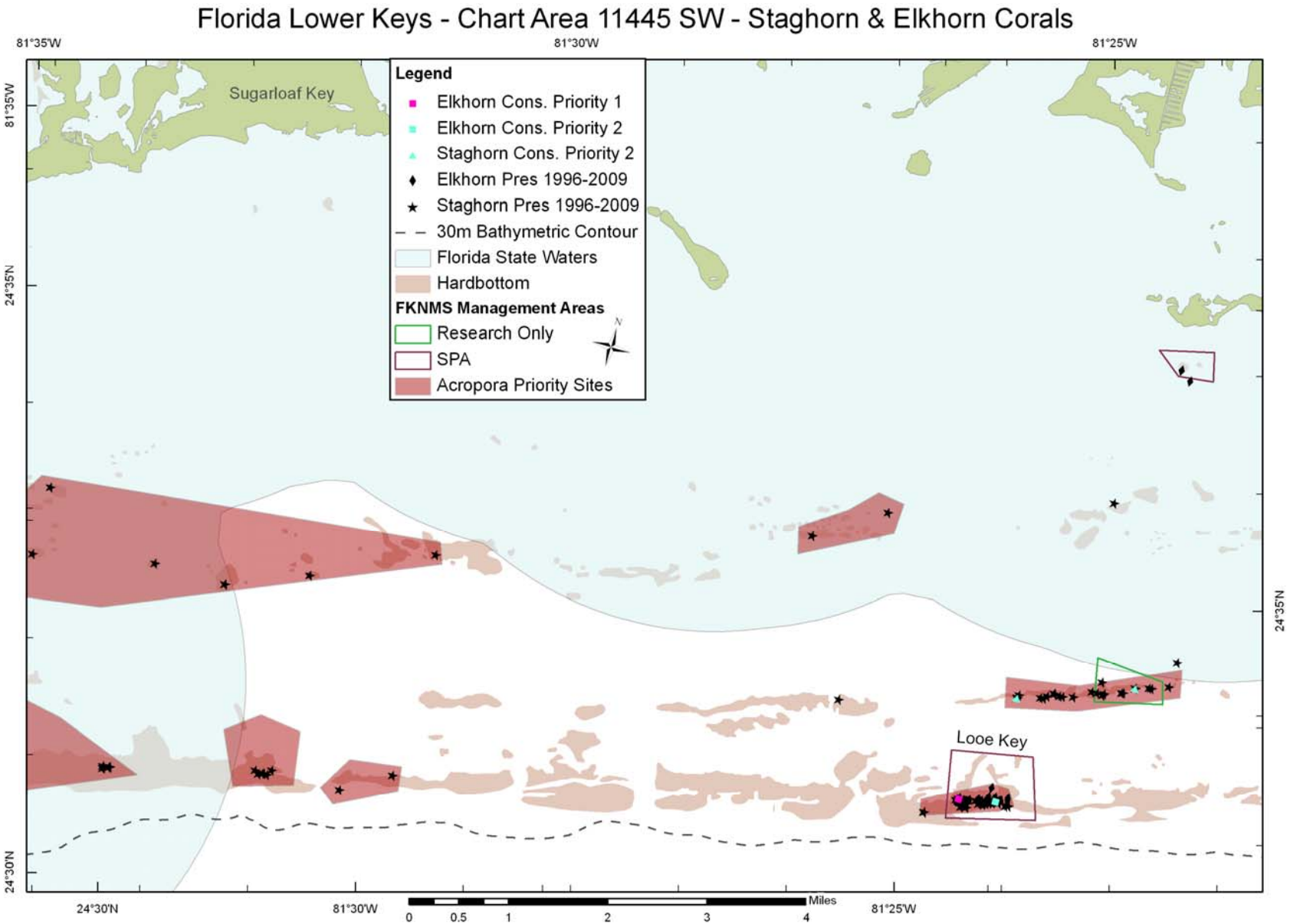

Figure 11 Map of known *Acropora* colony locations and conservation priorities in the Lower Florida Keys (cont'd)

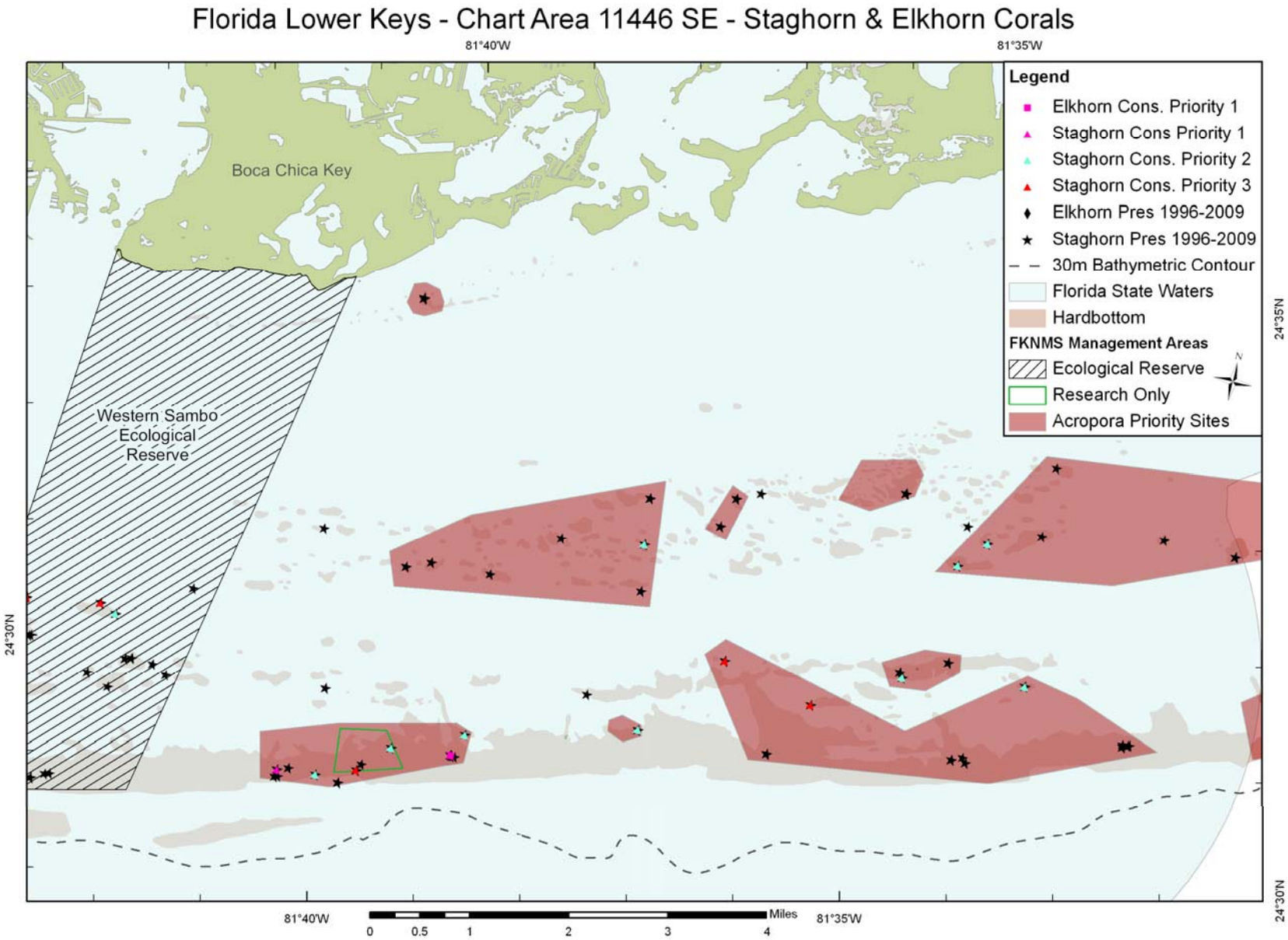

Figure 12 Map of known *Acropora* colony locations and conservation priorities in the Lower Florida Keys (cont'd)

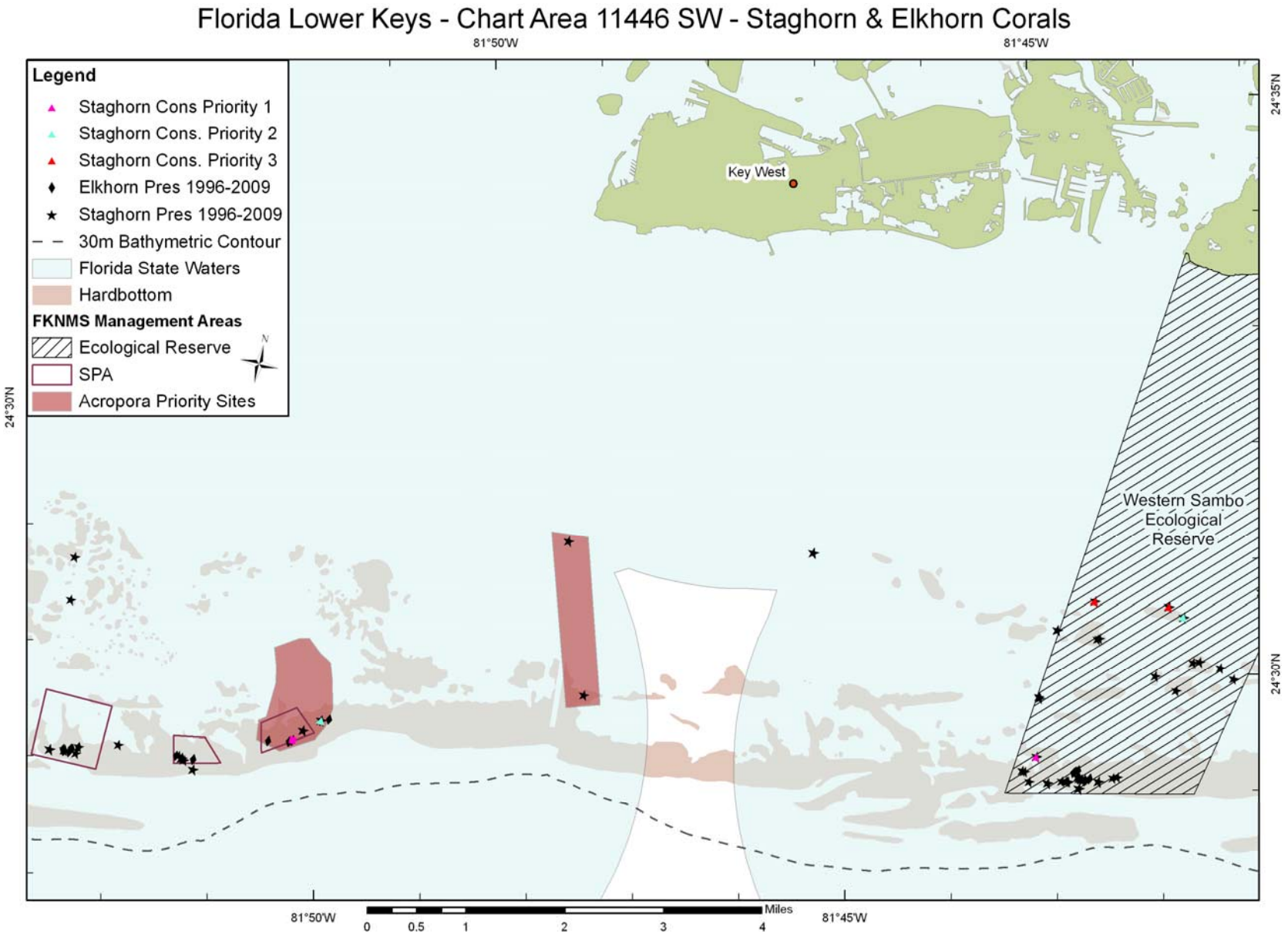

Figure 13 Map of known *Acropora* colony locations and conservation priorities in the Lower Florida Keys (cont'd)

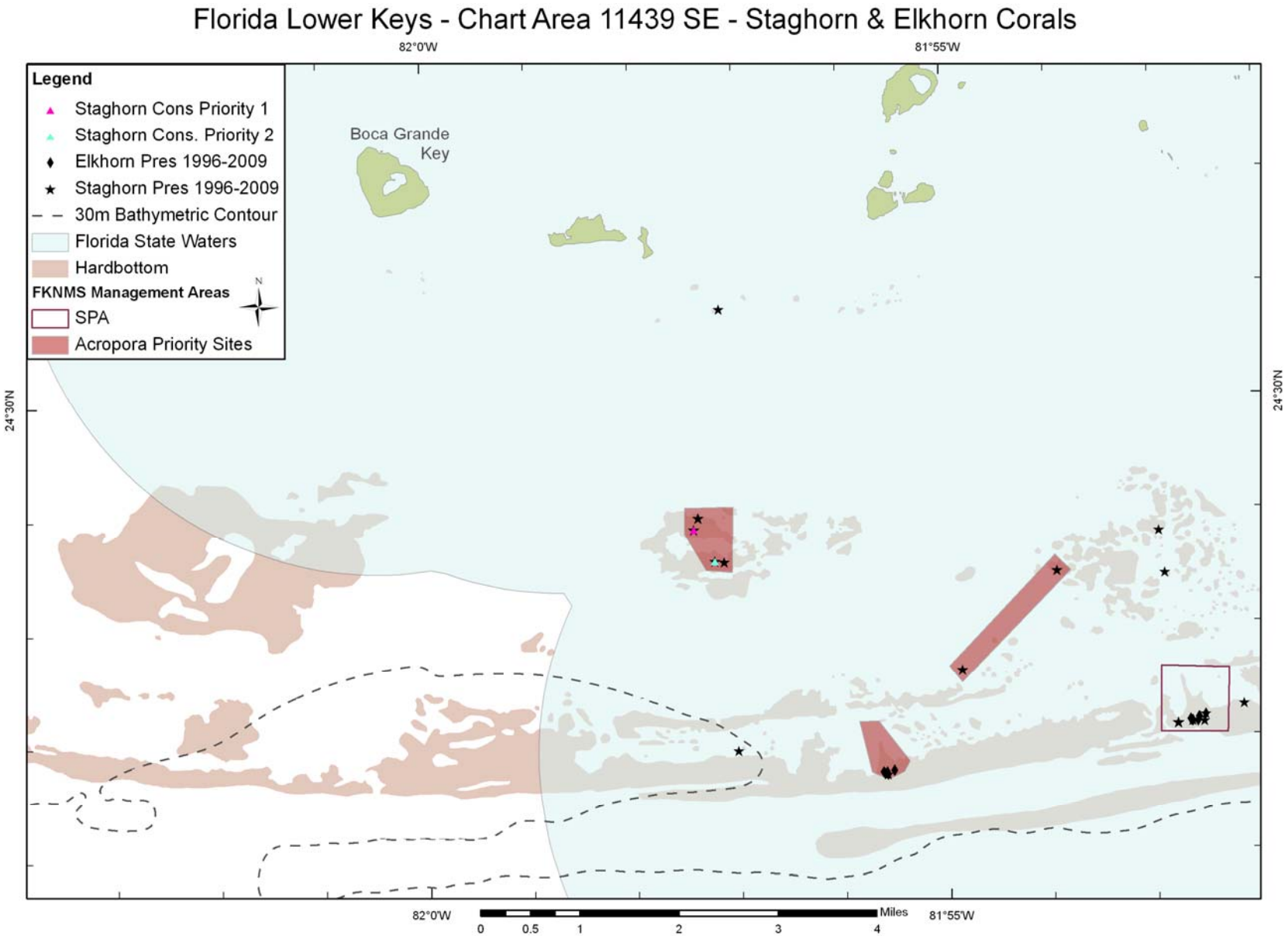

Figure 14 Map of known *Acropora* colony locations and conservation priorities west of Key West, Florida

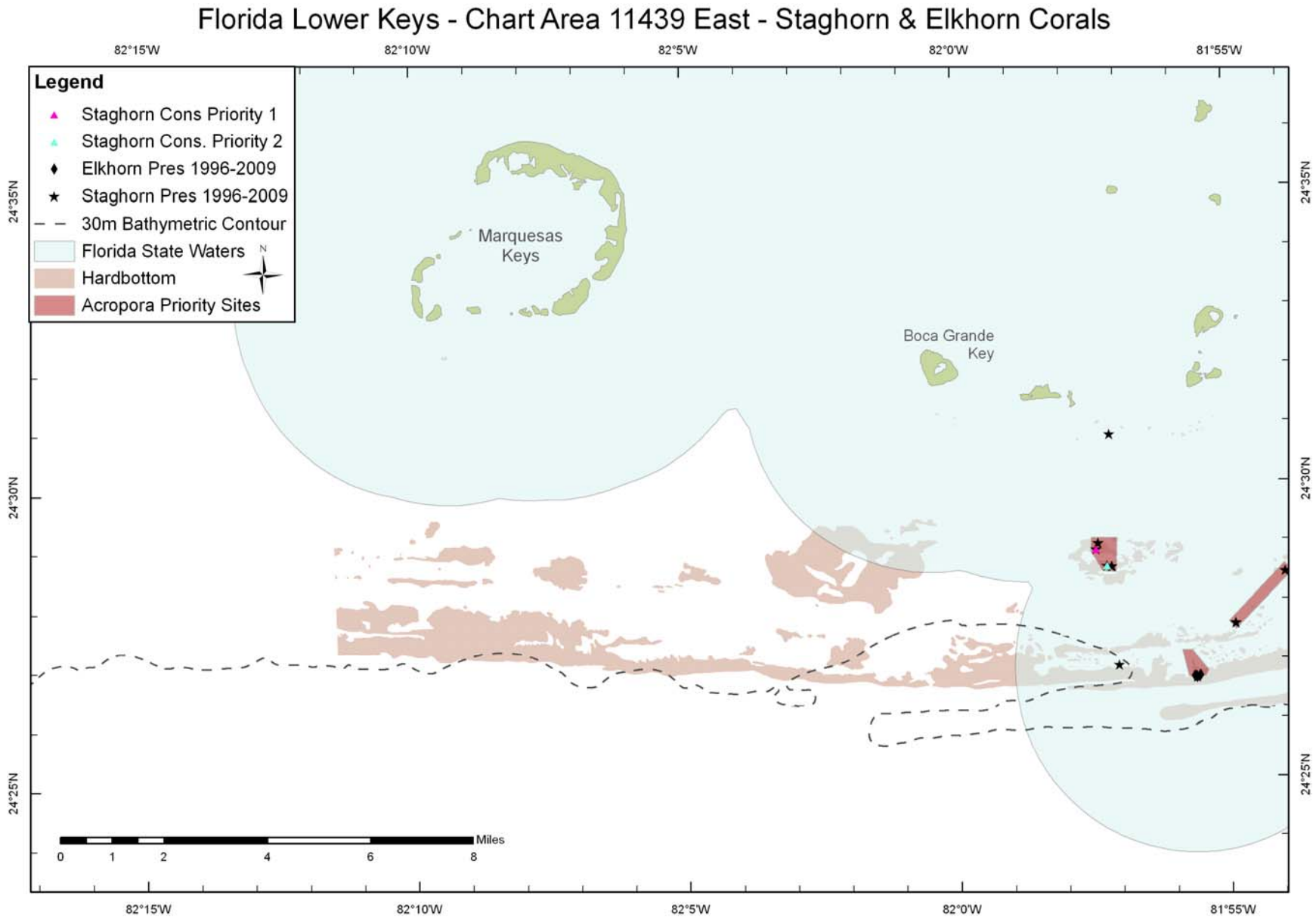

Figure 15 Map of known *Acropora* colonies and conservation priorities near the Marquesas Keys

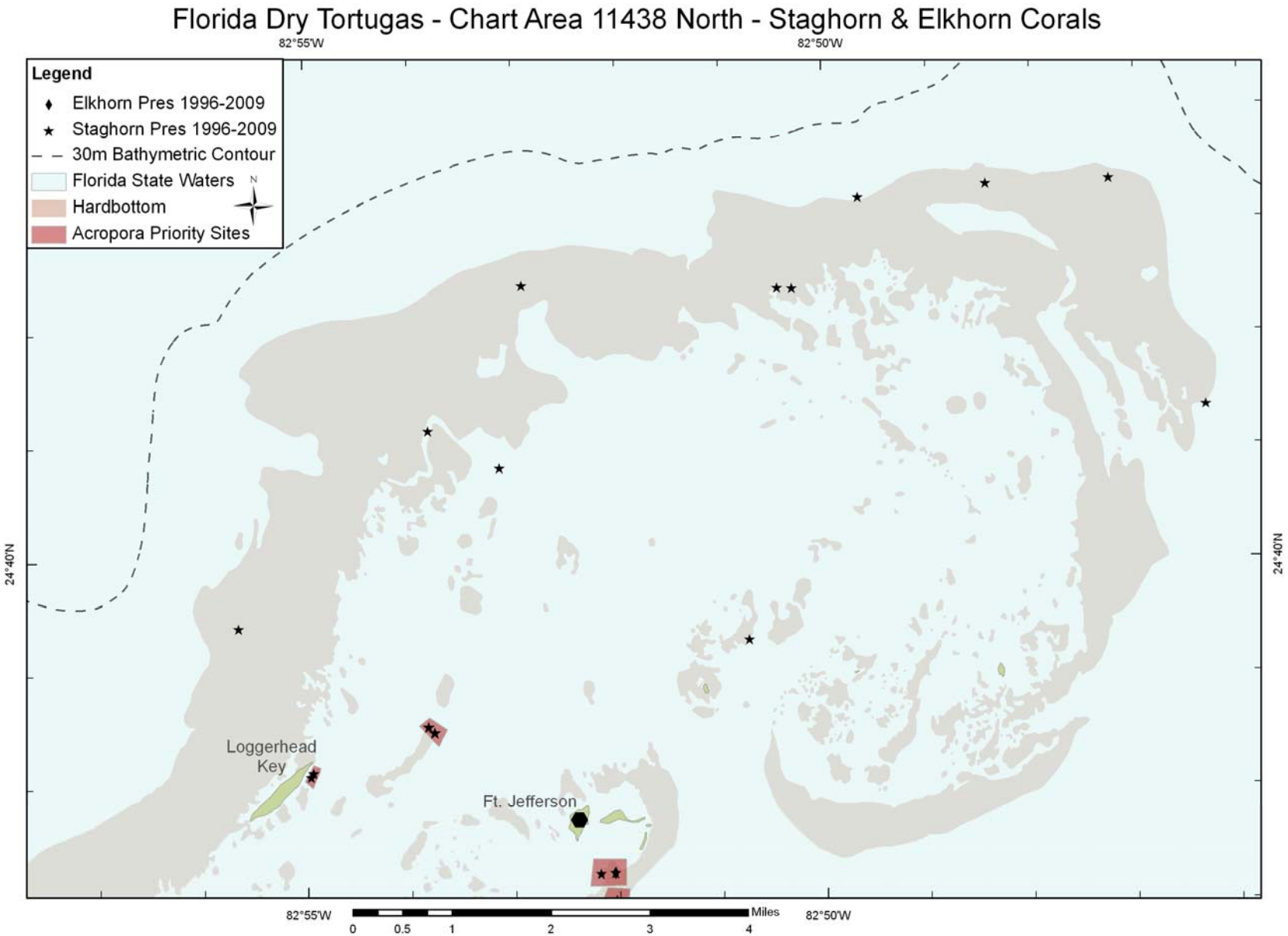

Figure 16 Map of known *Acropora* colonies north of Ft. Jefferson in the Dry Tortugas

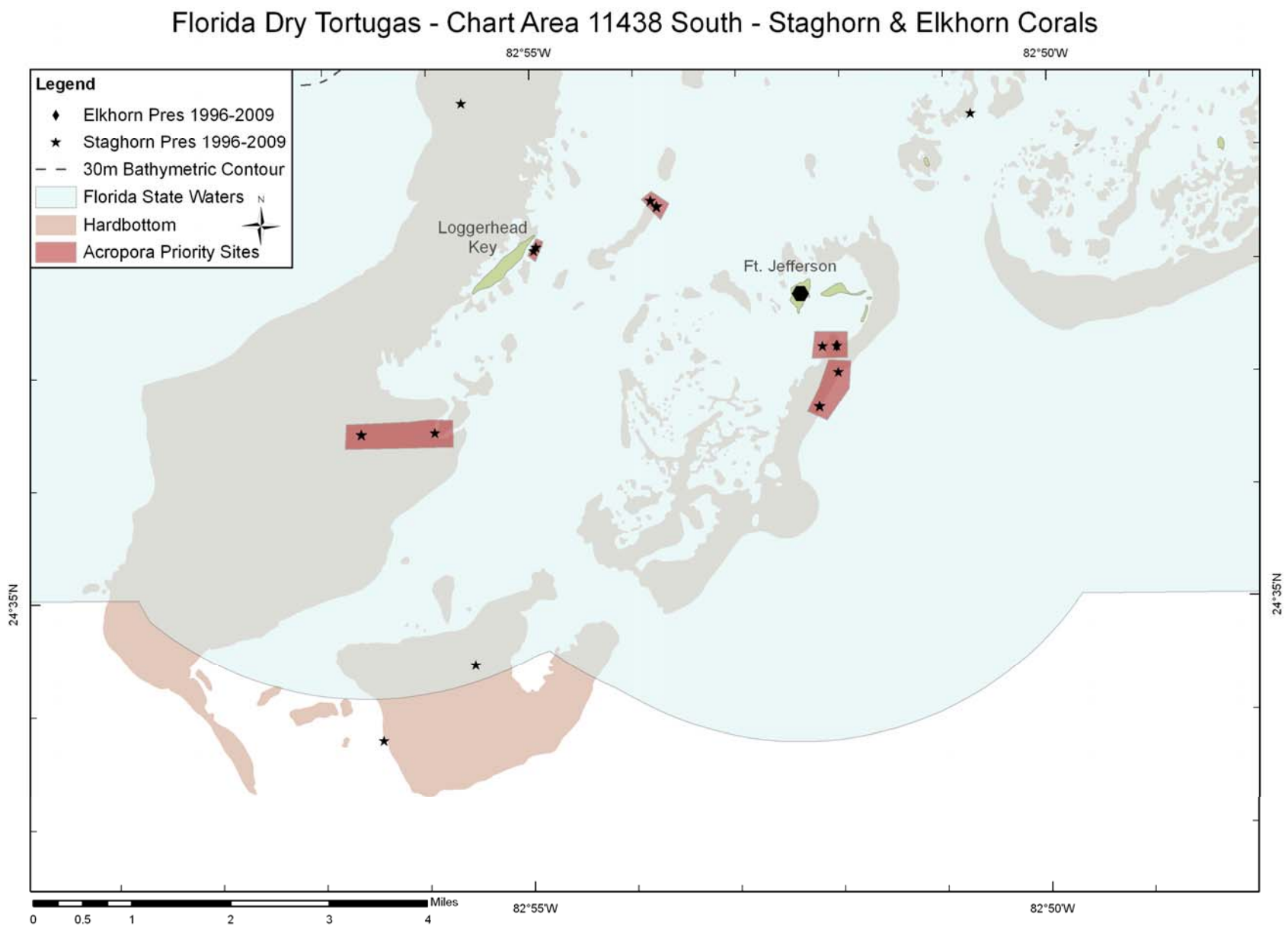

Figure 17 Map of known *Acropora* colonies south of Ft. Jefferson in the Dry Tortugas