Amendment 10 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic

Revise annual catch limits, sector allocations, accountability measures, and management measures for dolphin and wahoo

Regulatory Impact Review | Regulatory Flexibility Analysis | Fishery Impact Statement

November 2020 DRAFT

A publication of the South Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award Number FNA10NMF4410012

Definitions, Abbreviations, and Acronyms Used in the Document

ABC	acceptable biological catch
ACL	annual catch limits
AM	accountability measures
ACT	annual catch target
B	a measure of stock biomass in either weight or other appropriate unit
B_{MSY}	the stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}
B_{OY}	the stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}
B_{CURR}	the current stock biomass
CPUE	catch per unit effort
DEIS	draft environmental impact statement
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
F	a measure of the instantaneous rate of fishing mortality
$F_{30\%SPR}$	fishing mortality that will produce a static SPR = 30%
F_{CURR}	the current instantaneous rate of fishing mortality
F_{MSY}	the rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}
F_{OY}	the rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}
FEIS	final environmental impact statement
FMP	fishery management plan
FMU	fishery management unit
M	natural mortality rate
MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MFMT	maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistics Survey
MRIP	Marine Recreational Information Program
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing limit
OY	optimum yield
PSE	proportional standard error
RIR	regulatory impact review
SAFMC	South Atlantic Fishery Management Council
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SIA	social impact assessment

SPR spawning potential ratio

SSC Scientific and Statistical Committee

Amendment 10 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic

Proposed action(s):	Modify management measures for dolphin and wahoo. Actions include revising annual catch limits, sector allocations, and accountability measures. Additionally actions include allowing possession of dolphin or wahoo when specified unauthorized gears are onboard a vessel, removal of the operator card requirement, reducing the recreational vessel limit, and allowing filleting of dolphin at sea onboard charter or headboat vessels in the waters north of the North Carolina/Virginia boarder.
Lead agency:	Amendment – South Atlantic Fishery Management Council (South Atlantic Council) Categorical Exclusion – National Marine Fisheries Service (NMFS), Southeast Regional Office
For Further Information Contact:	John Hadley South Atlantic Fishery Management Council 4055 Faber Place, Suite 201 North Charleston, SC 29405 843-302-8432 866-SAFMC-10 John.Hadley@safmc.net Nikhil Mehta NMFS, Southeast Region 263 13th Avenue South St. Petersburg, FL 33701 727-551-5098 Nikhil.Mehta@noaa.gov

Table of Contents

List of Appendices

List of Figures

List of Table

SUMMARY

Amendment 10 to the Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic

Chapter 1. Introduction

1.1 What Actions Are Being Proposed in Dolphin Wahoo Amendment 10?

1.2 Who is Proposing the Management Measures?

The South Atlantic Council is proposing these management measures. The South Atlantic Council recommends management measures and sends them to the National Marine Fisheries Service (NMFS) who ultimately approves, disapproves, or partially approves, and implements the actions in the amendment through the development of regulations on behalf of the Secretary of Commerce. NMFS is a line office in the National Oceanic and Atmospheric Administration within the Department of Commerce.

Management Agencies

- ***South Atlantic Fishery Management Council (South Atlantic Council)*** – Engages in a process to determine a range of actions and options and recommends action to the National Marine Fisheries Service (NMFS).
- ***NMFS*** and ***South Atlantic Council staffs*** – Develop options based on guidance from the South Atlantic Council and analyzes the environmental impacts of those options. If approved by the Secretary of Commerce, NMFS implements the action through rulemaking.

The South Atlantic Council made versions of the document available during scoping and public hearings. The final amendment will be made available during the public comment period on the proposed rule. All versions of the document are or will be available on the South Atlantic Council's and NMFS's websites.

1.3 Where is the Project Located?

Management of the federal dolphin wahoo fishery, located off the eastern United States (Atlantic) from Florida to Maine in the 3-200 nautical miles U.S. Exclusive Economic Zone (EEZ), is conducted under the Dolphin Wahoo FMP (SAFMC 2003) (**Figure 1-1**).

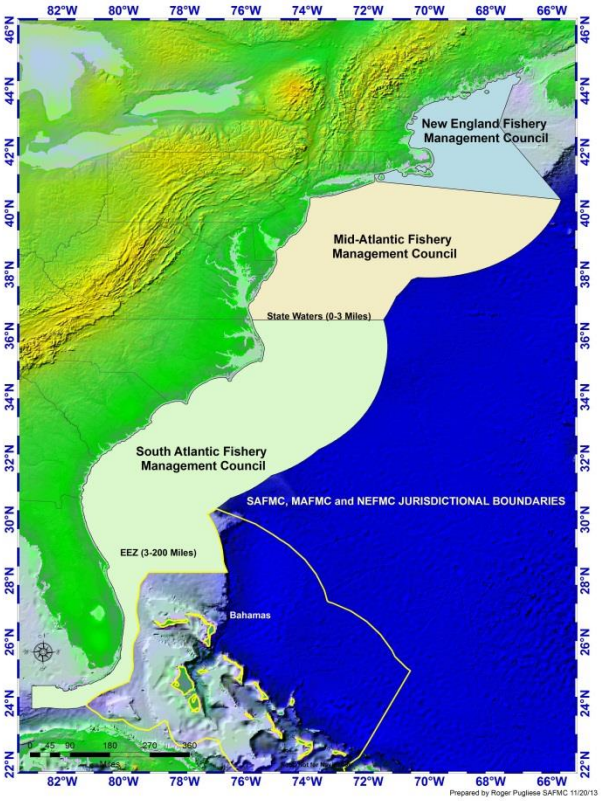

Figure 1-1. Jurisdictional boundaries of the Dolphin and Wahoo Fishery Management Plan for the Atlantic as managed by the South Atlantic Fishery Management Council.

1.4 Why are the South Atlantic Council and NMFS Considering this Action?

The Scientific and Statistical Committee (SSC) provided new acceptable biological catch (ABC) recommendations for dolphin and wahoo at their October 2019 meeting and again at their April 2020 meeting. In doing so, recreational landings were included for Monroe County, Florida for both dolphin and wahoo. These landings were previously left out of past catch level recommendations for all unassessed species due to issues with determining whether such landings occurred from Gulf of Mexico or South Atlantic waters. The new MRIP dataset allows for better partitioning of recreational landings from Monroe County, Florida between regions and the vast majority of dolphin and wahoo landed in the county are caught from South Atlantic waters. At their April 2020 meeting, the SSC revisited the time series used to set the catch level recommendations at the request of the Council and chose the third highest landings from 1994 to 2007 for both dolphin and wahoo to set the ABC instead of a time series of 1994 to 1997 for dolphin and 1999 to 2007 for wahoo. This resulted in ABCs of 24,570,764 lbs ww for dolphin and 2,885,303 lbs ww for wahoo.

Purpose for Action

The *purpose* of Amendment 10 to the Fishery Management Plan for the Dolphin Wahoo Fishery for the Atlantic (Dolphin Wahoo Amendment 10) is to revise the catch levels [acceptable biological catch (ABC), annual catch limits (ACL)], accountability measures, sector allocations, and management measures for dolphin and wahoo. The revisions to the ABC and ACL include recreational landings from Monroe County, Florida, and incorporate recreational data as per the Marine Recreational Information Program using the Fishery Effort Survey method, as well as updates to commercial and for-hire landings. Management measures address authorized gear, operator card requirement, recreational vessel limits, and allow fillets of dolphin at sea onboard for-hire vessels.

Need for Action

The *need* for Dolphin Wahoo Amendment 10 is to base conservation and management measures upon the best scientific information available, and to prevent unnecessary negative social and economic impacts that may otherwise be realized in the dolphin wahoo fishery, in accordance with the provisions set forth in the Magnuson-Stevens Fishery Conservation and Management Act.

1.5 What is the history of management and the Federal regulations for dolphin and wahoo?

Dolphin and wahoo were originally a part of the Fishery Management Plan for Coastal Pelagic Resources in the Gulf of Mexico and South Atlantic Region. Under that plan, a control date of May 21, 1999, for possible future limited entry was established for the commercial dolphin and wahoo fishery in the South Atlantic.

Dolphin and wahoo regulations were first implemented in 2003 through a separate Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic (SAFMC 2003). That plan established:

1. A separate management unit for dolphin and wahoo in the U.S. Atlantic.
2. A dealer permit.
3. For-hire and commercial vessel permits.
4. For-hire and commercial operator permits.
5. Reporting requirements.
6. Maximum Sustainable Yield and Optimal Yield (OY).
7. Defined overfishing.
8. A management framework.
9. Prohibit recreational sale of dolphin or wahoo except by for-hire vessels with a commercial permit.
10. A 1.5 million lb or 13% of the total catch soft cap for the commercial sector.
11. A recreational bag limit of 10 dolphin per person, 60 dolphin per vessel maximum.
12. A minimum size limit of 20 inches fork length off Georgia and Florida.
13. A commercial trip limit of 500 lb of wahoo with no at-sea transfer.
14. A recreational bag limit of 2 wahoo per person, per day.

15. Allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads).
16. A prohibition on the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species.
17. The fishing year of January 1 to December 31 for the dolphin and wahoo fishery.
18. Essential Fish Habitat (EFH) for dolphin and wahoo as the Gulf Stream, Charleston Gyre, and Florida Current.
19. Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPC) for dolphin and wahoo in the Atlantic to include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); the Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; and The "Wall" off of the Florida Keys.

The Fishery Management Plan for Pelagic *Sargassum* Habitat in the South Atlantic Region (SAFMC 2002) and the Comprehensive Ecosystem-Based Amendment 1 (SAFMC 2009a) designated additional EFH and EFH-HAPCs for dolphin and wahoo.

The Comprehensive ACL Amendment (SAFMC 2011) established the ABC control rule, ABC, annual catch limits, OY, and accountability measures (AMs) in the dolphin and wahoo fishery. The Comprehensive ACL Amendment also set an ACT for the recreational sector dolphin and wahoo.

1.6 What are annual catch limits and accountability measures and why are they required?

A reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) in 2007 required implementation of new tools to end and prevent overfishing to achieve the OY from a fishery. The tools ACLs and AMs. An ACL is the level of annual catch of a stock that, if met or exceeded, triggers some corrective action. The AMs are the corrective action, and they are management controls to prevent ACLs from being exceeded and to correct overages of ACLs if they occur. Two examples of AMs include an in-season closure if catch is projected to reach the ACL and reducing the ACL by an overage that occurred the previous fishing year.

Definitions

Annual Catch Limits (ACL)
The level of annual catch (pounds or numbers) that triggers accountability measures to ensure that overfishing is not occurring.

Annual Catch Targets (ACT)
The level of annual catch (pounds or numbers) that is the management target of the fishery, and accounts for management uncertainty in controlling the actual catch at or below the ACL.

Accountability Measures (AM)
Management controls to prevent ACLs, including sector ACLs, from being exceeded, and to correct or mitigate overages of the ACL if they occur.

Sector Annual Catch Limit
The poundage or number of fish that a sector receives (e.g. recreational and commercial) based on the sector allocation and the total ACL.

Sector Allocation
The percentage of the total ACL that a sector receives.

Common Pool Allocation
A percentage of the ACL that can be set aside for use by either sector.

Maximum Sustainable Yield (MSY)
Largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.

Optimum Yield (OY)
The amount of catch that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

Minimum Stock Size Threshold (MSST)
A status determination criterion. If current stock size is below MSST, the stock is overfished.

1.7 How does the South Atlantic Council determine the annual catch limits?

ACLs are derived from the overfishing limit (OFL) and the ABC **(Figure 1.7.1)**. The South Atlantic Council's Scientific and Statistical Committee (SSC) determines the OFL from the stock assessment and the ABC (based on the South Atlantic Council/SSC's ABC control rule), and recommends those to the South Atlantic Council. The OFL is an estimate of the catch level above which overfishing is occurring. The ABC is defined as the level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty.

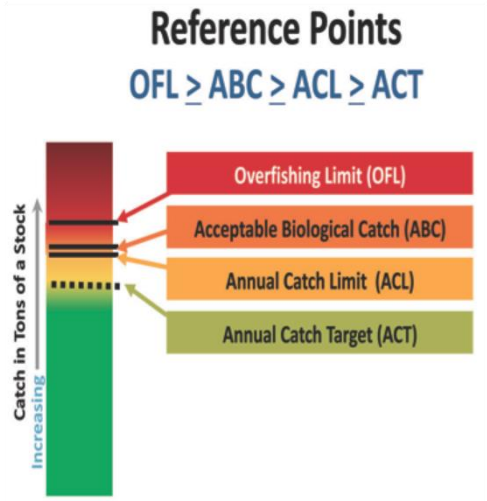

Figure 1.7.1. The relationship of the reference points to each other.

The Magnuson-Stevens Act National Standard 1 (NS 1) guidelines establish the relationship between conservation and management measures, preventing overfishing, and achieving OY from each stock, stock complex, or fishery. The NS 1 guidelines discuss the relationship of the OFL to the maximum sustainable yield (MSY) and ACL to OY. The OFL is an annual amount of catch that corresponds to the estimate of maximum fishing mortality threshold applied to a stock; MSY is the long-term average of such catches. The ACL is the limit that triggers AMs and is the management target for the species. Management measures for a fishery should, on an annual basis, prevent the ACL from being exceeded. The long-term objective is to achieve OY through annual achievement of an ACL. The NS 1 guidelines state that if OY is set close to MSY, the conservation and management measures in the fishery must have very good control of the amount of catch to achieve the OY without overfishing.

The updated framework procedure included in Amendment 17B to the Snapper Grouper FMP (SAFMC 2010b) allows for the timely establishment and adjustment of ACLs if the South Atlantic Council and the NMFS determine they are necessary.

The NS 1 guidelines recommend a performance standard by which the efficacy of any system of ACLs and AMs can be measured and evaluated. According to the guidelines:

> *…if catch exceeds the ACL for a given stock or stock complex more than once in the last four years, the system of ACLs and AMs should be re-evaluated, and modified if necessary, to improve its performance and effectiveness (81 FR 71801).*

If an evaluation concludes that the ACL is chronically exceeded for any one species or species group, and post-season AMs are repeatedly needed to correct for ACL overages, adjustments to management measures would be made. As stated previously, the updated framework procedure implemented through Amendment 17B (SAFMC 2010b) could be utilized to modify management measures such as bag limits, trip limits, seasonal closures, and gear prohibitions in a timely manner. Using the regulatory amendment process to implement such changes, if needed, is the timeliest method of addressing issues associated with repeated ACL overages through permanent regulations.

With vastly improved commercial monitoring mechanisms now in place in the South Atlantic Region, it is unlikely that repeated commercial ACL overages would occur. The NMFS Commercial Landings Monitoring (CLM) system came online in June 2012 and is now being used to track commercial landings of federally managed fish species. The CLM system can track dealer reporting compliance with a direct link to the permits database at the NMFS Southeast Regional Office. Additionally, the Joint Seafood Dealer Reporting Amendment (GMFMC & SAFMC 2013b), which became effective on August 7, 2014, requires electronic reporting, increases required reporting frequency for dealers to once per week, and requires a single dealer permit for all finfish dealers in the Southeast Region. The CLM system and actions in the Joint Generic Dealer Reporting amendment are expected to provide more timely and accurate data reporting and would thus reduce the incidence of quota overages.

Harvest monitoring efforts in the recreational sector are also improving in the South Atlantic Region. On January 27, 2014, regulations became effective requiring headboats to report their landings electronically once per week (Generic Headboat Amendment, GMFMC & SAFMC 2013a). The Gulf of Mexico and South Atlantic Councils have approved amendments that would require electronic reporting for charterboats and headboats with a set reporting frequency.

1.8 How does the South Atlantic Council determine the sector allocations?

Chapter 2. Proposed Actions

2.1 Action 1. Revise the total annual catch limit for dolphin to reflect the updated acceptable biological catch level

Alternative 1 (No Action). The total annual catch limit for dolphin is equal to the current acceptable biological catch level.

Preferred Alternative 2. The total annual catch limit for dolphin is equal to the updated acceptable biological catch level.

Alternative 3. The total annual catch limit for dolphin is equal to 95% of the updated acceptable biological catch level.

Alternative 4. The total annual catch limit for dolphin is equal to 90% of the updated acceptable biological catch level.

2.1.1 Comparison of Alternatives

Alternative 1 (No Action) is not a viable alternative because it would retain the current total annual catch limit (ACL) for dolphin (equal to the current acceptable biological catch (ABC)), which is not based on the best scientific information available (BSIA). The current total ACL is based on the South Atlantic Fishery Management Council's (Council) Statistical and Scientific Committee's (SSC) ABC recommendation using the third highest landings value during the 1999-2008 times series. These landings did not include Monroe County, Florida, and were based on recreational data as per the older Marine Recreational Information Program's (MRIP) Coastal Household Telephone Survey (CHTS) method. **Preferred Alternative 2** through **Alternative 4** would revise the total ACL for dolphin based on the SSC's new ABC recommendation using the third highest landings value during1994-2007 (**Table 4.1.1.1**). These landings include Monroe County, Florida, and are based on recreational data as per MRIP's newer Fishery Effort Survey method (FES) method, which is considered more reliable and robust compared to the CHTS survey method. The new ABC recommendation for dolphin is also based on the new weight estimation procedure from the National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) that uses a 15 fish minimum sample size and represents BSIA.

Preferred Alternative 2 would set the total ACL equal to the ABC and is the most liberal of the alternatives compared to **Alternatives 3** and **4**, which include a buffer from the ABC, and are more conservative. Therefore, biological benefits would be expected to be greater for **Alternative 4** followed by **Alternative 3**, and **Preferred Alternative 2**. Projections show that none of the total ACLs proposed under **Preferred Alternative 2** through **Alternative 4** would be reached when compared with the most recent 5-year (2015-2019) and 3-year (2017-2019) average landings (**Table 4.1.1.4**). The total ACLs proposed under these alternatives would be reached before the end of the fishing year (December 31), when compared with the maximum landings for a single year during 2015-2019, as late as October 16 and early as September 14 (**Table 4.1.1.4**).

Administrative impacts of **Preferred Alternative 2**, **Alternatives 3** and **4** would be similar to **Alternative 1** (**No Action**) because mechanisms for monitoring and documentation of the total ACL for dolphin are already in place. The exception to this is for the landings scenario with the maximum landings for a single year during 2015-2019, when the total ACL is projected to be reached earlier in the fishing season under **Preferred Alternative 2**, **Alternatives 3** and **4**. In this scenario, administrative burdens related to data monitoring, outreach, and enforcement would be greater for **Alternative 4**, followed by **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**.

2.2 Action 2. Revise the total annual catch limit for wahoo to reflect the updated acceptable biological catch level.

Alternative 1 (No Action). The total annual catch limit for wahoo is equal to the acceptable biological catch level.

Preferred Alternative 2. The total annual catch limit for wahoo is equal to the updated acceptable biological catch level.

Alternative 3. The total annual catch limit for wahoo is equal to 95% of the updated acceptable biological catch level.

Alternative 4. The total annual catch limit for wahoo is equal to 90% of the updated acceptable biological catch level.

2.2.1 Comparison of Alternatives

Alternative 1 (No Action) is not a viable alternative because it would retain the current total ACL for wahoo (equal to the current ABC), which is not based on BSIA. The current total ACL is based on the SSC's ABC recommendation using the third highest landings value during the 1999-2008 times series. These landings did not include Monroe County, Florida, and were based on recreational data as per the older MRIP CHTS method. **Preferred Alternative 2** through **Alternative 4** would revise the total ACL for dolphin based on the SSC's new ABC recommendation using the third highest landings value during1994-2007 (**Table 4.2.1.1**). These landings include Monroe County, Florida, and are based on recreational data as per MRIP's newer FES method, which is considered more reliable and robust compared to the CHTS survey method. The new ABC recommendation for dolphin is also based on the new weight estimation procedure from the NMFS SEFSC that uses a 15 fish minimum sample size and represents BSIA.

Preferred Alternative 2 would set the total ACL equal to the ABC and is the most liberal of the alternatives compared to **Alternatives 3** and **4**, which include a buffer from the ABC, and are more conservative. Therefore, biological benefits would be expected to be greater for **Alternative 4** followed by **Alternative 3**, and **Preferred Alternative 2**. The total ACL would be reached as late as December 24 and as early as November 22 before the end of the fishing year (December 31), when compared with the most recent 5 year average (2015-2019) (**Table 4.2.1.4**). The ACL would be reached as late as September 22 and as early as August 29 before the end of the fishing year (December 31), when compared with the maximum landings for a single year during 2015-2019 (**Table 4.2.1.4**). Therefore, a combination of in-season and post-season accountability measures (Actions 9 and 10) that would prevent the sector ACL from being consistently exceeded is essential to preventing the total ACL for wahoo from being exceeded.

Administrative impacts of **Preferred Alternative 2**, **Alternatives 3** and **4** would be similar to **Alternative 1** (**No Action**) because mechanisms for monitoring and documentation of the total ACL for dolphin are already in place. The total ACL is expected to be met earlier in the fishing year for the scenarios considering average landings during 2015-2019 and the maximum landings for a single year during 2015-2019 under **Preferred Alternative 2**, **Alternatives 3** and **4**. **Alternatives 3** and **4** would result in the total ACL being reached earlier than **Preferred**

Alternative 2. Therefore, administrative burdens related to data monitoring, outreach, and enforcement would be greater for **Alternative 4**, followed by **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**.

2.3. Action 3. Revise sector allocations and sector annual catch limits for dolphin

Note: The revised total annual catch limit in Alternatives 1 (No Action) through 4 reflects Preferred Alternative 2 in Action 1 in Amendment 10 to the Fishery Management Plan for Dolphin and Wahoo of the Atlantic. The revised total annual catch limit includes recreational landings from Monroe County, Florida, and incorporates recreational data as per the Marine Recreational Information Program using the Fishery Effort Survey method, as well as updates to commercial and for-hire landings.

Alternative 1 (No Action). Retain the current recreational sector and commercial sector allocations as 90.00% and 10.00%, respectively, of the revised total annual catch limit for dolphin.

Alternative 2. Allocate 93.75% of the revised total annual catch limit for dolphin to the recreational sector. Allocate 6.25% of the revised total annual catch limit for dolphin to the commercial sector. This is based on approximately maintaining the current commercial annual catch limit and allocating the remaining revised total annual catch limit to the recreational sector.

Alternative 3. Allocate 93.00% of the revised total annual catch limit for dolphin to the recreational sector. Allocate 7.00% of the revised total annual catch limit for dolphin to the commercial sector. This is based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of dolphin available to either sector.

Alternative 4. Allocate 92.00% of the revised total annual catch limit for dolphin to the recreational sector. Allocate 8.00% of the revised total annual catch limit for dolphin to the commercial sector. This is based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of dolphin available to either sector.

2.3.1 Comparison of Alternatives

Alternatives 1 (No Action) through **Alternative 4** apply different percentages to the revised total ACL for dolphin of 24,570,764 lbs ww (Preferred Alternative 2 in Action 1 (**Table 4.3.1.1**)) and result in different recreational and commercial sectors ACLs (**Table 4.3.1.2**). The revised total ACL includes recreational landings from Monroe County, Florida, and incorporates recreational data as per the newer MRIP FES method, and updates to commercial and headboat landings. **Alternative 1 (No Action)** would retain the current percentages to the recreational and commercial sectors. **Alternative 2** would allocate percentages that approximately maintain the current commercial ACL and allocate the remaining revised total ACL to the recreational sector. **Alternative 3** would result in allocations based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of dolphin available to either sector. **Alternative 4** would result in allocations based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of dolphin available to either sector.

Biological effects are not expected to vary between **Alternative 1 (No Action)** through **Alternative 4** in **Action 3**, since they do not change the total ACL specified in Action 1. Furthermore, the commercial sector for dolphin has effective in-season and post-season AMs in place to prevent the commercial ACL from exceeding. Analysis shows the recreational sector for dolphin could exceed its ACL under the current AMs and therefore, it is recommended that effective AMs be considered in Actions 5 and 6 in this amendment to avoid possible adverse effects. The commercial ACL for dolphin would not be reached under **Alternative 1 (No Action)** through **Alternative 4** for all the scenarios (**Table 4.3.1.5**). However, the recreational ACL would be reached as early as September 29 and as late as October 11 before the end of the fishing year (December 31) under **Alternative 1 (No Action)** through **Alternative 4** if the maximum annual landings from a single year during 2015-2019 is considered (**Table 4.3.1.5**). Recreational landings would continue to occur without effective AMs for the recreational sector and could have adverse biological effects.

Administrative effects will not vary between **Alternative 1 (No Action)** and **Alternatives 2** through **4** for the commercial sector because the commercial ACL is not expected to be reached under any of the three scenarios considered in the analysis (**Table 4.3.1.5**). For the recreational sector, the recreational ACL is expected to be reached under the maximum landings for a single year during 2015-2019 scenario (**Table 4.3.1.5**). **Alternative 4** would result in the recreational ACL being reached earliest compared with **Alternatives 3**, **2**, and **Alternative 1 (No Action)** (**Table 4.3.1.5**). Therefore, administrative effects would be greater for **Alternative 4**, followed by **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**. Administrative burdens depending on the AM (preferred AM alternatives in Actions 5 and 6 for the recreational sector) would relate to data monitoring, outreach, and enforcement of a short fishing season. Other administrative burdens that may result from revising the values under **Alternative 1 (No Action)** and **Alternatives 2** through **4** would take the form of development and dissemination of outreach and education materials for fishery participants and law enforcement.

2.4 Action 4. Revise sector allocations and sector annual catch limits for wahoo

Note: The revised total annual catch limit in Alternatives 1 (No Action) through 4 reflects Preferred Alternative 2 in Action 2 in Amendment 10 to the Fishery Management Plan for Dolphin and Wahoo of the Atlantic. The revised total annual catch limit includes recreational landings from Monroe County, Florida, and incorporates recreational data as per the Marine Recreational Information Program using the Fishery Effort Survey method, as well as updates to commercial and for-hire landings.

Alternative 1 (No Action). Retain the current recreational sector and commercial sector allocations as 96.07% and 3.93%, respectively, of the revised total annual catch limit for wahoo.

Alternative 2. Allocate 96.35% of the revised total annual catch limit for wahoo to the recreational sector. Allocate 3.65% of the revised total annual catch limit for wahoo to the commercial sector. This is based on the total catch between 1994 and 2007.

Alternative 3. Allocate 97.55% of the revised total annual catch limit for wahoo to the recreational sector. Allocate 2.45% of the revised total annual catch limit for wahoo to the commercial sector. This is based on maintaining the current commercial annual catch limit and allocating the remaining revised total annual catch limit to the recreational sector.

Alternative 4. Allocate 97.00% of the revised total annual catch limit for wahoo to the recreational sector. Allocate 3.00% of the revised total annual catch limit for wahoo to the commercial sector. This is based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of wahoo available to either sector.

2.4.1 Comparison of Alternatives

Alternatives 1 (No Action) through **Alternative 4** apply different percentages to the revised total ACL for wahoo of 2,885,303lbs ww (Preferred Alternative 2 in Action 2 (**Table 4.4.1.1**)) and result in different recreational and commercial sectors ACLs (**Table 4.4.1.2**). The revised total ACL includes recreational landings from Monroe County, Florida, and incorporates recreational data as per the newer MRIP FES method, and updates to commercial and headboat landings. **Alternative 1 (No Action)** would retain the current percentages to the recreational and commercial sectors. **Alternative 2** would allocate percentages based the total catch between 1994-2007, the time series for catch data used by the SSC when updating the ABC for wahoo. **Alternative 3** would result in allocations that approximately maintain the current commercial ACL and allocate the remaining revised total ACL to the recreational sector. **Alternative 4** would revise sector allocations based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of wahoo available to either sector.

Biological effects are not expected to vary between **Alternative 1 (No Action)** through **Alternative 4**, since they do not change the total ACL specified in Action 2. Furthermore, the commercial sector for wahoo has effective in-season and post-season AMs in place to prevent the commercial ACL from exceeding. The recreational sector for wahoo could exceed its ACL under the current AMs and therefore, it is recommended that effective AMs be considered in Actions 7

and 8 in this amendment to avoid possible adverse effects. The commercial ACL for wahoo would not be reached under **Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 4** for all the scenarios analyzed, but, it would be reached under **Alternative 3** and under the maximum landings during 2015-2019 scenario (**Table 4.4.1.5**). The recreational ACL would not be reached under all the alternatives in **Action 4** under the average 2017-2019 landings scenario, but it would be reached as early as December 19 and as late as December 24 under the average 2015-2019 landings scenario, and on different dates in September under the maximum landings during 2015-2019 scenario (**Table 4.4.1.5**). Recreational landings for wahoo would continue to occur without effective AMs for the recreational sector and could have adverse biological effects.

The commercial ACL is expected to be reached earlier in the fishing season under **Alternative 3** under the maximum annual landings during 2015-2019 scenario (**Table 4.4.1.5**), and would result in an in-season closure as per the commercial AM. Therefore, administrative effects for the commercial ACL alternatives would be greater for **Alternative 3** compared with **Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 4**. For the recreational sector, administrative effects will not vary between **Alternative 1 (No Action)** and **Alternatives 2** through **4** for the under the scenario of average landings during 2017-2019 (**Table 4.4.1.5**). However, under the average landings during 2015-2019 and maximum landings for a single year during 2015-2019 scenarios, administrative effects will be greater for the alternative reaching the recreational ACL the earliest in the fishing season, which would be **Alternative 1 (No Action)**, followed by **Alternative 2**, **Alternative 4**, and **Alternative 3** (**Table 4.3.1.5**). It is important to note the recreational ACL would be reached as early as September under the maximum landings for a single year during 2015-2019 scenario and as late as December under the average landings during 2015-2019 scenario (**Table 4.3.1.5**). Administrative burdens depending on the AM (preferred AM alternatives in Actions 7 and 8 for the recreational sector) would relate to data monitoring, outreach, and enforcement of a short fishing season. Other administrative burdens that may result from revising the values under **Alternative 1 (No Action)** and **Alternatives 2** through **4** would take the form of development and dissemination of outreach and education materials for fishery participants and law enforcement.

2.5 Action 5. Revise the trigger for the post-season recreational accountability measures for dolphin

Alternative 1 (No action). If recreational landings exceed the recreational annual catch limit, then during the following fishing year, recreational landings will be monitored for persistence in increased landings. If the recreational annual catch limit is exceeded, it will be reduced by the amount of the recreational overage in the following fishing year and the recreational season will be reduced by the amount necessary to ensure that recreational landings do not exceed the reduced annual catch limit only if the species is overfished and the total annual catch limit is exceeded. However, the recreational annual catch limit and length of the recreational season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year geometric mean of landings exceed the recreational sector annual catch limit. If in any year the recreational sector annual catch limit is changed, the moving multi-year geometric mean of landings will start over.

Alternative 3. Implement post season accountability measures in the following fishing year if the summed total of the most recent past three years of recreational landings exceeds the sum of the past three years recreational sector annual catch limits.

Alternative 4. Implement post season accountability measures in the following fishing year if recreational landings exceed the recreational sector annual catch limit in two of the previous three fishing years or exceeds the total acceptable biological catch in any one year.

Alternative 5. Implement post season accountability measures in the following fishing year if the total (commercial and recreational combined) annual catch limit is exceeded.

Alternative 6. Implement post season accountability measures in the following fishing year if the recreational annual catch limit is exceeded.

2.5.1 Comparison of Alternatives

Alternative 1 (No Action) is not a viable alternative because the recreational AM would never be triggered. There is no in-season closure and the post-season AMs would only occur if dolphin is overfished and the total ACL is exceeded under this alternative. There is no stock assessment for dolphin, therefore, it is unknown if the dolphin stock is overfished. **Alternatives 2** through **6** address this issue. **Alternative 2** would trigger the recreational AM if the 3-year geometric mean of recreational dolphin landings exceed the sector ACL. **Alternative 3** would trigger the recreational AM if the summed recreational landings over 3 years exceeds the summed sector ACL over the same 3 years. **Alternative 4** would trigger the recreational AM if recreational landings exceed the sector ACL two times in a three-year timespan or the total ACL is exceeded. **Alternatives 2**, **3**, and **4** attempt to smooth out any anomalous years with high or low landings within the past three years. **Alternative 5** would trigger the recreational AM if the total ACL is exceeded, and **Alternative 6** would trigger the recreational AM if the recreational ACL is exceeded.

Biological benefits would be expected to be greater under **Alternatives 2** through **Alternative 6** which would enable the recreational AM to be triggered, when compared with **Alternative 1 (No Action)**. Biological effects would be variable depending on the combination of which alternative(s) is (are) selected in **Action 5** and which post-season AM(s) is (are) selected in Action 6. Biological benefits would be expected to be greater for the alternative that provides the most timely and realistic option chosen to trigger an AM. This is pronounced by the fact that no in-season AMs are considered in Dolphin Wahoo Amendment 10 (only post-season AMs are considered in Action 7). Corrective measures would only occur the following year or years after the recreational ACL is exceeded. Therefore, among **Alternatives 2** through **6** in **Action 5**, positive biological effects would be expected to be greater under **Alternative 6**, followed by **Alternative 5**, **Alternative 4**, **Alternative 3**, and **Alternative 2**.

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **6** for administrative reasons, but it is not a viable alternative as explained in **Section 4.5.1**. Administrative effects would be greater under **Alternative 2**, followed by **Alternative 3**, **Alternative 4**, **Alternative 5**, and **Alternative 6**. Administrative burdens include data monitoring, rulemaking, outreach, and enforcement. **Alternative 2** has more moving parts, recreational ACL has to be constant for three years and if in any year the recreational ACL is changed, the moving multi-year geometric mean of landings will start over. **Alternatives 3** through **6** have fewer moving parts that would trigger an AM, and administrative burden would be the least for the simplest trigger option under **Alternative 6**.

2.6 Action 6. Revise the post season recreational accountability measures for dolphin

Alternative 1 (No action). If recreational landings exceed the recreational annual catch limit, then during the following fishing year, recreational landings will be monitored for persistence in increased landings. If the recreational annual catch limit is exceeded, it will be reduced by the amount of the recreational overage in the following fishing year and the recreational season will be reduced by the amount necessary to ensure that recreational landings do not exceed the reduced annual catch limit only if the species is overfished and the total annual catch limit is exceeded. However, the recreational annual catch limit and length of the recreational season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 2. Reduce the length of the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the length of the recreational season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 3. Reduce the bag limit in the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the bag limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 4. Reduce the vessel limit in the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the vessel limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 5. In the following fishing year monitor landings and if landings are projected to meet the sector ACL, reduce the bag limit and/or the vessel limit (*Sub-alternatives 5a and/or 5b*) first and if needed reduce the length of the recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded. However, the vessel limit, bag limit, and/or recreational fishing season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

> **Sub-alternative 5a**. Reduce the bag limit by the amount necessary but not below X fish per person per day (*Council to fill in the number*).
>
> **Sub-alternative 5a**. Reduce the vessel limit by the amount necessary but not below X fish per vessel per day (*Council to fill in the number*).

Alternative 6. In order to prevent the annual catch limit from being exceeded in the following fishing year, reduce the bag limit first, and, if necessary, shorten the length of the recreational fishing season. The bag limit will not be reduced below X fish per person per day (*Council to fill in the number*). However, the bag limit, and/or recreational fishing season, will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 7. In order to prevent the annual catch limit from being exceeded in the following fishing year, reduce the vessel limit first, and, if necessary, shorten the length of the recreational

fishing season. The vessel limit will not be reduced below X fish per vessel per day (*Council to fill in the number*). However, the vessel limit, and/or recreational fishing season, will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

2.6.1 Comparison of Alternatives

Alternative 1 (No Action) is not a viable alternative because there would be no post-season recreational AM. There is no stock assessment for dolphin and it is unknown if the dolphin stock is overfished. The current post-season recreational AM requires the dolphin stock to be overfished and the total ACL to be exceeded before the recreational ACL is reduced by the overage amount and the recreational season reduced. **Alternative 2** would reduce the length of the following recreational fishing season by the amount necessary to prevent the sector ACL from being exceeded. **Alternative 3** would reduce the bag limit the following fishing season by the amount necessary to prevent the ACL from being exceeded. **Alternative 4** would reduce the vessel limit the following fishing season by the amount necessary to prevent the ACL from being exceeded. **Alternative 5** would monitor for persistence in increased landings. Under this alternative, if landings are projected meet the sector ACL, the bag limit or vessel limit would be reduced first and if needed, the length of the recreational fishing season would be reduced by the amount necessary to prevent the ACL from being exceeded.

Positive biological effects would therefore be greatest under **Alternative 2**, followed by **Alternatives 4**, **3**, and **5**. Under **Alternative 2**, the length of the following recreational fishing season will be reduced. This would be the most effective way to ensure recreational landings do not keep occurring. **Alternative 3** would reduce the bag limit in the following recreational fishing season, but, as shown in **Figures 4.6.1.1** and **4.6.1.2**, greater than 99% of the headboat trips and 75%-94% of private recreational and charterboat trips (captured by MRIP) already only retain less than 5 fish per person. Up to 10% of recreational landings are actually over the legal bag limit of 10 fish per person (**Figures 4.6.1.1** and **4.6.1.2**), so further reduction in bag limit may not be the most effective way to protect the stock from further harvest once the recreational ACL is exceeded. **Alternative 4** would reduce the vessel limit in the following fishing season, but, analysis of the alternatives under Action 11 show reduction in recreational landings for the private recreational vessels and charter vessels (captured by MRIP) were as high as 5.71% for the entire Atlantic region and nearly zero for east Florida; with a negligible reduction in headboat landings (**Table 4.6.1.1**). **Alternative 5** would monitor recreational landings in the following year, and if recreational landings are projected to meet the recreational ACL, the bag limit would be reduced (**Sub-alternative 5a**) and/or the vessel limit would be reduced (**Sub-alternative 5b**). If still necessary, the length of the recreational season would be reduced. As mentioned above, the bag and vessel limit reductions may not be enough to reduce the recreational fishing effort when the recreational ACL has already been exceeded. By the time the recreational season is shortened, two years of consecutive exceedance of the recreational ACL may have occurred.

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **5** for administrative reasons, but it is not a viable alternative as explained above. Administrative burdens such as data monitoring, rulemaking, outreach, and enforcement would be similar for **Alternatives 2**, **3**, and **4**, because they would involve different post-season AMs (reduced season length, bag limit, and vessel limit, respectively). Administrative effects would be greatest under **Alternative 5** because there are more moving parts and multiple steps involved (reduced bag/vessel limit first (**Sub-alternative 5a**) and if needed, a reduced season length (**Sub-alternative 5b**).

2.7 Action 7. Revise the trigger for the post-season recreational accountability measures for wahoo

Alternative 1 (No action). If recreational landings exceed the recreational annual catch limit, then during the following fishing year recreational landings will be monitored for persistence in increased landings. If the recreational annual catch limit is exceeded, it will be reduced by the amount of the recreational overage in the following fishing only if the species is overfished and the total annual catch limit is exceeded. However, the recreational annual catch limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year geometric mean of landings exceed the recreational sector annual catch limit. If in any year the recreational sector annual catch limit is changed, the moving multi-year geometric mean of landings will start over.

Alternative 3. Implement post season accountability measures in the following fishing year if the summed total of the most recent past three years of recreational landings exceeds the sum of the past three years recreational sector annual catch limits.

Alternative 4. Implement post season accountability measures in the following fishing year if recreational landings exceed the recreational sector annual catch limit in two of the previous three fishing years or exceeds the total acceptable biological catch in any one year.

Alternative 5. Implement post season accountability measures in the following fishing year if the total (commercial and recreational combined) annual catch limit is exceeded.

Alternative 6. Implement post season accountability measures in the following fishing year if the recreational annual catch limit is exceeded.

2.7.1 Comparison of Alternatives

Alternative 1 (No Action) is not a viable alternative because the recreational AM would never be triggered. There is no in-season closure and the post-season AMs would only occur if wahoo is overfished and the total ACL is exceeded under this alternative. There is no stock assessment for wahoo, therefore, it is unknown if the wahoo stock is overfished. **Alternatives 2** through **6** address this issue. **Alternative 2** would trigger the recreational AM if the 3-year geometric mean of recreational wahoo landings exceed the sector ACL. **Alternative 3** would trigger the recreational AM if the summed recreational landings over 3 years exceeds the summed sector ACL over the same 3 years. **Alternative 4** would trigger the recreational AM if recreational landings exceed the sector ACL two times in a three-year timespan or the total ACL is exceeded. **Alternatives 2**, **3**, and **4** attempt to smooth out any anomalous years with high or low landings within the past three years. **Alternative 5** would trigger the recreational AM if the total ACL is exceeded, and **Alternative 6** would trigger the recreational AM if the recreational ACL is exceeded.

Biological benefits would be expected to be greater under **Alternatives 2** through **Alternative 6** which would enable the recreational AM to be triggered, when compared with

Alternative 1 (No Action). Biological effects would be variable depending on the combination of which alternative(s) is (are) selected in **Action 7** and which post-season AM(s) is (are) selected in Action 8. Biological benefits would be expected to be greater for the alternative that provides the most timely and realistic option chosen to trigger an AM. This is pronounced by the fact that no in-season AMs are considered in Dolphin Wahoo Amendment 10 (post-season AMs are considered in **Action 8**). Corrective measures would only occur the following year or years after the recreational ACL is exceeded. Therefore. among **Alternatives 3** through **6** in **Action 7**, biological effects would be expected to be greater under **Alternatives 6** and **5**, followed by **Alternative 4**, **Alternative 3,** and **Alternative 2**.

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **6** for administrative reasons, but it is not a viable alternative as explained in **Section 4.7.1**. Administrative effects would be greater under **Alternative 2**, followed by **Alternative 3**, **Alternative 4**, **Alternative 5**, and **Alternative 6**. Administrative burdens include data monitoring, rulemaking, outreach, and enforcement. **Alternative 2** has more moving parts, recreational ACL has to be constant for three years and if in any year the recreational ACL is changed, the moving multi-year geometric mean of landings will start over. **Alternatives 3** through **6** have fewer moving parts that would trigger an AM, and administrative burden would be the least for the simplest trigger option under **Alternative 6**.

2.8 Action 8. Revise the post season recreational accountability measures for wahoo

Alternative 1 (No action). If recreational landings exceed the recreational annual catch limit, then during the following fishing year recreational landings will be monitored for persistence in increased landings. If the recreational annual catch limit is exceeded, it will be reduced by the amount of the recreational overage in the following fishing year only if the species is overfished and the total annual catch limit is exceeded. However, the recreational annual catch limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 2. Reduce the length of the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the length of the recreational season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 3. Reduce the bag limit in the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the bag limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 4. Implement a vessel limit in the following recreational fishing season that would prevent the annual catch limit from being exceeded in the following year. However, the vessel limit will not be implemented if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 5. In the following fishing year reduce the bag limit and/or implement a vessel limit (*Sub-alternatives 5a and/or 5b*) at the beginning of the recreational fishing season first while monitoring landings. If landings are projected to meet the sector ACL, reduce the length of that recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded. However, the bag limit will not be reduced, a vessel limit will not be implemented, and/or the recreational fishing season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Sub-alternative 5a. Reduce the bag limit by the amount necessary but not below X fish per person per day (*Council to fill in the number*).

Sub-alternative 5a. Implement a vessel limit by the amount necessary but not below X fish per vessel per day (*Council to fill in the number*).

Alternative 6. In order to prevent the annual catch limit from being exceeded in the following fishing year, reduce the bag limit at the beginning of the recreational fishing season first, and, if necessary, shorten the length of the recreational fishing season. The bag limit will not be reduced below 1 fish per person per day. However, the bag limit, and/or recreational fishing season, will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

Alternative 7. In order to prevent the annual catch limit from being exceeded in the following fishing year, implement a vessel limit at the beginning of the recreational fishing season first, and,

if necessary, shorten the length of the fishing season. The vessel limit will not be below X fish per vessel per day (*Council to fill in the number*). However, the vessel limit, and/or recreational fishing season, will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

2.8.1 Comparison of Alternatives

Alternative 1 (No Action) is not a viable alternative because there would be no post-season recreational AM. There is no stock assessment for wahoo and it is unknown if the wahoo stock is overfished. The current post-season recreational AM requires the wahoo stock to be overfished and the total ACL to be exceeded before the recreational ACL is reduced by the overage amount and the recreational season reduced. **Alternative 2** would reduce the length of the following recreational fishing season by the amount necessary to prevent the sector ACL from being exceeded. **Alternative 3** would reduce the bag limit the following fishing season by the amount necessary to prevent the ACL from being exceeded. **Alternative 4** would reduce the vessel limit the following fishing season by the amount necessary to prevent the ACL from being exceeded. **Alternative 5** would reduce the bag limit or vessel limit at the beginning of the following fishing year and if needed, the length of the recreational fishing season would be reduced by the amount necessary to prevent the ACL from being exceeded.

Alternative 2 through **Alternative 5** would be expected to have greater biological effects compared with **Alternative 1 (No Action)** by reducing the fishing effort for wahoo in the event the recreational ACL is exceeded. Because no in-season AMs are being considered in Dolphin Wahoo Amendment 10, it is imperative that a functional and effective post-season AM is selected to prevent possible adverse biological effects when the recreational ACL is exceeded. It is reasonable to expect biological effects would therefore be greater under **Alternative 2**, followed by **Alternatives 4**, **3**, and **5**.

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **5** for administrative reasons, but it is not a viable alternative as explained above. Administrative burdens such as data monitoring, rulemaking, outreach, and enforcement would be similar for **Alternatives 2**, **3**, and **4**, because they would involve different post-season AMs (reduced season length, bag limit, and vessel limit, respectively). Administrative effects would be greatest under **Alternative 5** because there are more moving parts and multiple steps involved (reduced bag/vessel limit first (**Sub-alternative 5a**) and if needed, a reduced season length (**Sub-alternative 5b**).

2.9 Action 9. Allow properly permitted commercial fishing vessels with trap, pot, or buoy gear on board that are not authorized for use in the dolphin wahoo fishery to possess commercial quantities of dolphin and wahoo

Alternative 1 (No Action). The following are the only authorized commercial gear types in the fisheries for dolphin and wahoo in the Atlantic Exclusive Economic Zone: automatic reel, bandit gear, handline, pelagic longline, rod and reel, and spearfishing gear (including powerheads). A person aboard a vessel in the Atlantic Exclusive Economic Zone that has on board gear types (including trap, pot, or buoy gear) other than authorized gear types may not possess a dolphin or wahoo. The current commercial trip limit for wahoo is 500 pounds. The current trip limit for dolphin is 4,000 pounds once 75 percent of the commercial sector annual catch limit is reached. Prior to reaching 75 percent of the commercial sector annual catch limit, there is no commercial trip limit for dolphin.

Alternative 2. A vessel in the Atlantic Exclusive Economic Zone that possesses both an Atlantic Dolphin/Wahoo Commercial Permit and valid federal commercial permits required to fish trap, pot, or buoy gear or is in compliance with permit requirements specified for the spiny lobster fishery in 50 C.F.R. §622.400 is authorized to retain dolphin caught by rod and reel while in possession of such gears. A vessel in the Atlantic Exclusive Economic Zone that has on board other gear types that are not authorized in the fishery for dolphin may not possess a dolphin. Dolphin retained by such a vessel shall not exceed:

Sub-alternative 2a. 250 pounds gutted weight
Sub-alternative 2b. 500 pounds gutted weight
Sub-alternative 2c. 750 pounds gutted weight
Sub-alternative 2d. 1,000 pounds gutted weight

Alternative 3. A vessel in the Atlantic Exclusive Economic Zone that possesses both an Atlantic Dolphin/Wahoo Commercial Permit and valid federal commercial permits required to fish trap, pot, or buoy gear or is in compliance with permit requirements specified for the spiny lobster fishery in 50 C.F.R. §622.400 is authorized to retain wahoo caught by rod and reel while in possession of such gear types. A vessel in the Atlantic Exclusive Economic Zone that has on board other gear types that are not authorized in the fisheries for wahoo may not possess a wahoo. The wahoo commercial trip limit will be 500 pounds.

2.9.1 Comparison of Alternatives

Currently, a vessel in the Atlantic Exclusive Economic Zone that has on board gear types (including trap, pot, or buoy gear) other than authorized gear types may not possess a dolphin or wahoo (**Alternative 1 No Action**). **Alternative 2** and its **Sub-alternatives 2a** through **2d** would allow various trip limits (250 lbs ww – 1000 lbs ww) of dolphin, and **Alternative 3** would allow a trip limit of 500 lbs ww wahoo to be retained with the above mentioned gear on board. incidental limit in place of 200 pounds of dolphin and wahoo, combined weight, for vessels that do not have a dolphin wahoo commercial permit but do have another federal commercial permit and catch the species north of the 39 degrees north latitude (50 C.F.R. §.622.278).

Under **Alternative 1 (No Action)**, 38 vessels harvested an average of 78 lb ww of dolphin and 3 vessels harvested an average of 59 lbs ww of wahoo during 2015-2019 (**Tables 4.9.1.1** and

4.9.1.2). **Alternatives 2** (including sub-alternatives **2a** through **2d**) and **3** would increase these landings for dolphin and wahoo. Given that the total ACLs for dolphin and wahoo are being increased in Actions 1 and 2, and the current AM will continue to have an in-season closure of the commercial sector if the commercial ACL is reached or projected to be reached, biological effects would not be expected to vary between **Alternative 1 (No Action)** and **Alternatives 2** (including sub-alternatives **2a** through **2d**) and **3**. However, higher trip limits such as 750 lbs ww (**Sub-alternative 2c**) and 1000 lbs ww (**Sub-alternative 2d**) could provide an incentive for the current incidental harvest of dolphin to convert to a targeted harvest with more vessels involved. This could result in a shorter season for dolphin due to an in-season closure and result in regulatory discards.

Administrative burdens such as data monitoring, outreach, and enforcement would be greater under **Alternatives 2** (including sub-alternatives **2a** through **2d**) and **3**, when compared with **Alternative 1** (**No Action**). Currently there is very little effort for dolphin and especially for wahoo from vessels with buoy gear, pots, or traps, and this could change due to higher allowances under **Alternatives 2** (including sub-alternatives **2a** through **2d**) and **3**. If the commercial sector closes early in the season due to the commercial ACL being reached early due to higher harvest, administrative burdens will increase related to rulemaking, education, and enforcement.

2.10 Action 10. Remove the requirement of vessel operators or crew to hold an Operator Card in the Dolphin Wahoo Fishery

Alternative 1 (No Action). An Atlantic Charter/Headboat for Dolphin/Wahoo Permit or an Atlantic Dolphin/Wahoo Commercial Permit is not valid unless the vessel operator or a crewmember holds a valid Operator Card issued by either the Southeast Regional Office or by the Greater Atlantic Regional Fisheries Office.

Alternative 2. Neither a vessel operator nor any crewmember is required to have an Operator Card for an Atlantic Charter/Headboat for Dolphin/Wahoo Permit to be valid.

Alternative 3. Neither a vessel operator nor any crewmember is required to have an Operator Card for an Atlantic Dolphin/Wahoo Commercial Permit to be valid.

2.10.1 Comparison of Alternatives

Operator cards were included in the original Dolphin Wahoo FMP (SAFMC 2003) to improve enforcement and aid in data collection of dolphin and wahoo. It was also intended to decrease costs to vessel owners from fisheries violations and make vessel captains more accountable for damaging habitat or violating regulations intended to protect the long-term viability of the stock. Currently, the operator cards are not used for gathering data, distributing information, or enforcement to a large extent. Because, the operator cards are no longer useful and needed, **Alternatives 2** and **3** would remove the requirement to hold an operator card for the vessel operator or crew member for an Atlantic Charter/Headboat for Dolphin/Wahoo Permit and Atlantic Dolphin/Wahoo Commercial Permit, respectively.

No biological effects on dolphin would be expected under **Alternatives 2** and **3**, when compared with **Alternative 1 (No Action)**, because this is an administrative action and does not impact the harvest levels for dolphin and wahoo in any manner.

Administrative effects and burdens related to data collection/monitoring, permitting, law enforcement, etc. would be lower under **Alternatives 2** and **3** compared with **Alternative 1 (No Action)**. Currently, under **Alternative 1 (No Action)**, regulations under 50 C. F. R. §622.270 require operator cards (permits) for an operator of a vessel that has a charter vessel/headboat or commercial permit for dolphin and wahoo. While the NMFS Permit Office in the Northeast does not require a fee for this permit, there is a $50.00 fee for the operator card at the NMFS Southeast Permit Office.

2.11 Action 11. Reduce the recreational vessel limit for dolphin

Alternative 1 (No Action). The recreational daily bag limit is 10 dolphin per person, not to exceed 60 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Alternative 2. The recreational daily bag limit is 10 dolphin per person, not to exceed:

Sub-alternative 2a. 40 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Sub-alternative 2b. 42 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Sub-alternative 2c. 48 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Sub-alternative 2d. 54 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Alternative 3. In Florida only, the recreational daily bag limit is 10 dolphin per person, not to exceed:

Sub-alternative 3a. 40 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Sub-alternative 3b. 42 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Sub-alternative 3c. 48 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Sub-alternative 3d. 54 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

2.11.1 Comparison of Alternatives

Alternatives 2 and **3** would reduce the recreational vessel limit for dolphin throughout the jurisdiction in the Atlantic and just off Florida, respectively, when compared with **Alternative 1 (No Action)**. The sub-alternatives under **Alternatives 2** and **3** are based on the Dolphin Wahoo Committee's guidance from December 2018 to consider alternatives that focuses on vessel limits divisible by 6 but are not below 40 fish, in an attempt to curtail recreational landings for dolphin. In the Atlantic, 93% of headboats and 78% of private recreational/charter vessel trips harvested less than 10 dolphin per vessel, and 2% or less of all recreational trips harvested between 40 to 60 dolphin per vessel (**Figure 4.11.1.1**). As with the recreational bag limits, there was some recreational harvest over the vessel limit in the Atlantic. Off East Florida only, 96% of all recreational trips harvested less than 10 dolphin per vessel with no recreational trips harvesting greater than/equal to 40 fish (**Figure 4.11.1.1**).

Biological benefits would be expected to be greater under **Alternatives 2** and **3** (including their respective sub-alternatives) compared with **Alternative 1 (No Action)**, because they consider a reduction in the vessel limit for dolphin. Under **Alternative 2**, biological benefits would be greater under **Sub-alternative 2a** when compared with **Sub-alternatives 2b**, **2c**, and **2d**, because only 40 dolphin would be allowed per vessel resulting in a reduction of 5.71% in landings under **Sub-alternative 2a** from private recreational and charter vessels (when applied to the entire Atlantic), which is a higher reduction compared to **Sub-alternatives 2b**, **2c**, and **2d** (**Table 4.6.1.1**).

Under **Alternative 3**, biological effects would not notably vary between **Sub-alternatives 3a**, **3b**, **3c**, and **3d**, because negligible reductions in recreational landings from private recreational and charter vessels are expected (**Table 4.6.1.1**). Headboat landings are not expected to influence any reduction under **Alternatives 2** and **3** since the existing exemption of headboats from vessel limits would remain (including their respective sub-alternatives) (**Table 4.6.1.1**). Therefore, biological benefits are expected to be greatest under **Sub-alternative 2a**, followed by **Sub-alternative 2b**, **2c**, **2d**, **3a**, **3b**, **3c** and **3d**, and **Alternative 1 (No Action)**.

Administrative effects would not vary much between **Alternative 1 (No Action)** and **Alternatives 2** and **3** (including their respective sub-alternatives). Recreational bag and vessel limits are already being monitored for dolphin and the various sub-alternatives would modify the current limits to different levels. Minor administrative burdens related to deviating from **Alternative 1 (No Action)** would be related to distributing information, education, and enforcement).

2.12 Action 12. Allow filleting of dolphin at sea on board charter or headboat vessels in the Atlantic Exclusive Economic Zone north of the Virginia/North Carolina border.

Alternative 1 (No Action). Dolphin possessed in the Atlantic Exclusive Economic Zone must be maintained with head and fins intact, with specific exceptions for fish lawfully harvested in the Bahamas. Such fish harvested from the Atlantic Exclusive Economic Zone may be eviscerated, gilled, and scaled, but must otherwise be maintained in a whole condition.

Alternative 2. Exempt dolphin from regulations requiring head and fins be intact on board properly permitted charter and headboat vessels in the Atlantic Exclusive Economic Zone north of the Virginia/North Carolina border where dolphin may be filleted under the following requirement(s):

Sub-alternative 2a. Skin must remain intact on the entire fillet of any dolphin carcass.

Sub-alternative 2b. Two fillets of dolphin, regardless of the length of each fillet, is the equivalent to one dolphin.

2.12.1 Comparison of Alternatives

Alternative 1 (No Action) would not allow fillets of dolphin at sea to be on board in the Atlantic (with the exception of fish from the Bahamas) and is preferable over **Alternative 2** and its **Sub-alternatives** because of concerns expressed by NMFS Office of Law Enforcement and the South Atlantic Law Enforcement Advisory Panel (AP) on the enforceability of allowing fillets of fish in general. **Alternative 2** and its sub-alternatives would only allow fillets of dolphin north of the Virginia/North Carolina border. Even if the skin in intact on the entire fillet of the carcass (**Sub-alternative 2a**), and two fillets of dolphin, regardless of the length of each fillet would count as one fish (**Sub-alternative 2b**), there could be lack of compliance adding to enforcement and identification issues.

No direct biological effect on dolphin would be expected under **Alternative 2** and its **Sub-alternatives 2a** and **2b**, when compared with **Alternative 1 (No Action),** but there could be indirect negative biological effects under **Alternative 2**. The recreational ACL for dolphin is tracked in weight, filleting could reduce size and weight measurements from recreational catches due to fewer measurements being collected dockside by creel surveys. Filleting at sea may encourage harvest, because of availability of more cold storage space and less time/hassle needed at the dock.

Administrative effects and burdens would be higher under **Alternative 2** and its sub-alternatives compared with **Alternative 1 (No Action)**. The Council's Enforcement (LE) AP reviewed the initial request from the Mid-Atlantic Council and unanimously voted against **Alternative 2** and its sub-alternatives. The exception on filleting for fish brought to the U.S. from The Bahamas (**Alternative 1, No Action**) is effective because the fish are caught outside the U.S. EEZ. **Alternative 2** and its sub-alternatives would add considerable burden to law enforcement officers if implemented in U.S. waters (i.e., certain regulations would apply in some areas along the east coast but not in others) resulting in considerably more time required for enforcement and more regulatory complexity. Additionally, allowing fillets of dolphin could negatively affect recreational data collection and monitoring efforts, adding to future administrative burdens.

Chapter 3. Affected Environment

This section describes the affected environment in the proposed project area. The affected environment is divided into four major components:

- **Habitat environment (Section 3.1)**
- **Biological and Ecological environment (Section 3.2)**
- **Economic and Social environment (Sections 3.3)**
- **Administrative environment (Section 3.4)**

3.1 Habitat Environment

Information on the habitat utilized by dolphin and wahoo in the Atlantic is included in Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) and incorporated here by reference. The Fishery Ecosystem Plan can be found at: http://www.safmc.net/ecosystem-management/fishery-ecosystem-plan-1. Dolphin and wahoo are migratory pelagic species occurring in tropical and subtropical waters worldwide. They are found near the surface around natural and artificial floating objects, including *Sargassum* (in the Atlantic).

3.1.1 Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S. C. 1802(10)). EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum.*

Note: This EFH definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Fishery Management Council's (South Atlantic Council) Comprehensive Habitat Amendment (SAFMC 1998). Dolphin was included within the Fishery Management Plan for the Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region (Coastal Migratory Pelagics FMP). This definition does not apply to extra-jurisdictional areas.

3.1.2 Habitat Areas of Particular Concern

EFH-habitat of particular concern (HAPCs) for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*.

Note: This EFH-HAPC definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (SAFMC 1998)(dolphin was included within the Coastal Migratory Pelagics FMP).

Areas that meet the criteria for EFH-HAPCs include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages).

In addition to protecting habitat from fishing related degradation though fishery management plan regulations, the South Atlantic Council, in cooperation with National Marine Fisheries Service (NMFS), actively comments on non-fishing projects or policies that may impact essential fish habitat. With guidance from the Habitat Advisory Panel, the South Atlantic Council has developed and approved policies on: energy exploration, development, transportation and hydropower re-licensing; beach dredging and filling and large-scale coastal engineering; protection and enhancement of submerged aquatic vegetation; alterations to riverine, estuarine and near shore flows; offshore aquaculture; and marine invasive species and estuarine invasive species.

See **Appendix J** for detailed information on EFH and EFH-HAPCs for all Council managed species.

3.2 Biological and Ecological Environment

The marine environment in the Atlantic management area affected by actions in this environmental assessment is defined by two components (**Figure 3-1**). Each component is described in detail in Chapter 3 of Dolphin Wahoo Amendment 5 (SAFMC 2013).

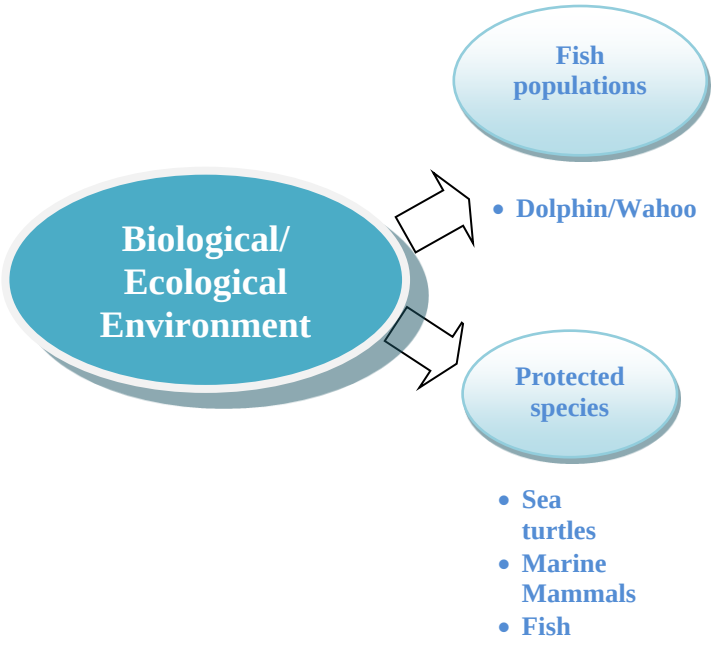

Figure 3-1. Two components of the biological environment described in this document.

3.2.1 Fish Populations

Dolphin and wahoo are highly migratory pelagic species occurring in tropical and subtropical waters worldwide. In the western Atlantic, dolphin and wahoo are distributed from Nova Scotia to Brazil, including Bermuda and the greater Caribbean region, and the Gulf of Mexico. They are found near the surface around natural and artificial floating objects, including *Sargassum* (in the Atlantic).

Dolphin eat a wide variety of species, including small pelagic fish, juvenile tuna, billfish, jacks, and pompano, and pelagic larvae of nearshore, bottom-living species. They also eat invertebrates such as cephalopods, mysids, and jellyfish. Large tuna, rough-toothed dolphin, marlin, sailfish, swordfish, and sharks feed on dolphin, particularly juveniles. Wahoo mainly feed on squid and fish, including frigate mackerel, butterfish, porcupine fish, and round herring. They generally compete with tuna for the same kind of food, but can feed on larger prey. A number of predators such as sharks and large tuna that share their habitat feed on young wahoo. Additional background information regarding the fish populations for dolphin and wahoo can be found in the Dolphin Wahoo FMP (SAFMC 2003) at: https://safmc.net/wp-content/uploads/2016/06/DolphinWahooFMP.pdf.

3.2.2 Dolphin, *Coryphaena hippurus*

In the western Atlantic ocean, dolphin are most common from North Carolina, throughout the Gulf of Mexico and Caribbean, to the northeast coast of Brazil (Oxenford 1999). Dolphin are highly migratory and pelagic with adults found in open water, and juveniles with floating seagrass and marine debris and occasionally found in estuaries and harbors (Palko et al. 1982; Johnson 1978).

Dolphin Life History
An Overview

- Worldwide distribution; In the western Atlantic ocean, from Nova Scotia to Brazil (including Bermuda, The Bahamas, the Gulf of Mexico, and the Caribbean)
- Oceanic, adults in open water and juveniles with floating seagrass and marine debris
- Highly migratory
- Protracted multiple spawning behavior throughout the year, varying with region. Off North Carolina, peak spawning is during April through July
- Maximum age is 4 years (mean <2 years)

In a study by Schwenke and Buckel (2008) off North Carolina, dolphin ranged from 3.5 in (89 mm) fork length (FL) to 57 in (1451 mm) FL. Mean dolphin weight ranged from 14.2 lbs (6.44 kg) for males to 7.6 lbs (3.44 kg) for females. Estimated average growth rate was 0.15 in (3.78 mm)/day during the first six months, and maximum reported age was 3 years. Size at 50% maturity was slightly smaller for female dolphin (18.1 in FL; 460 mm), when compared with males (18.7 in FL; 475 mm); and peak spawning occurred from April through July off North Carolina (Schwenke and Buckel 2008). Prager (2000) estimated natural mortality for dolphin to be between 0.68 and 0.80.

For a more comprehensive record of the literature on the biology and ecology of dolphin, see **Section 3.0** in the Dolphin Wahoo FMP (SAFMC 2003) found at: https://safmc.net/wp-content/uploads/2016/06/DolphinWahooFMP.pdf

3.2.3 Wahoo, *Acanthocybium solanderi*

In the western Atlantic, the highly migratory, pelagic wahoo are found from New York through Columbia including Bermuda, the Bahamas, the Gulf of Mexico, and the Caribbean (Theisen et al. 2008; Garber et al. 2005; Collette 2002). Wahoo typically occur far offshore, inhabit waters around pinnacles, reef edges, and walls, and may be attracted to oceanic frontal zones and temperature discontinuities (Garber et al. 2005).

Wahoo Life History
An Overview

- Worldwide distribution; In the western Atlantic wahoo are found from New York through Columbia (including Bermuda, The Bahamas, the Gulf of Mexico, and the Caribbean)
- Oceanic
- Highly migratory
- The spawning season extends from June through August, with peak spawning in June and July
- Maximum age is 9.3 years (mean 1.8 years)

In studies off Florida and the northern Bahamas, McBride et al. (2008) reported rapid growth to a large size, with sizes ranging from 24.7 in (628 mm) FL to 77 in (1956 mm) FL. Males were smaller than females, with the largest male at 72.3 lbs (32.8 kg) and the largest female was 101.4 lbs (46.0 kg). Maximum age was 9.3 years. Maki Jenkins and McBride (2009) reported size and age at 50% maturity for female wahoo at 36.4 in (925 mm) FL and 0.64 years, respectively, with peak spawning in the summer.

For a more comprehensive record of the literature on the biology and ecology of wahoo, see **Section 3.0** in the Dolphin Wahoo FMP (SAFMC 2003) found at: https://safmc.net/wp-content/uploads/2016/06/DolphinWahooFMP.pdf

3.2.4 Stock Status of Dolphin and Wahoo

The Report to Congress on the Status of U.S. Stocks indicates dolphin is not overfished, and is not undergoing overfishing; while the status of wahoo is unknown (https://s3.amazonaws.com/media.fisheries.noaa.gov/2020-10/FSSI%20and%20non%20FSSI%20Stock%20Status%20Tables%20Q3%202020.pdf?null). Prager (2000) conducted an exploratory assessment of dolphin, but the results were not conclusive. A Southeast Data, Assessment, and Review (SEDAR) stock assessment for dolphin and wahoo may be conducted in the future. The SEDAR process, initiated in 2002, is a cooperative Fishery Management Council process intended to improve the quality, timeliness, and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and U.S. Caribbean. SEDAR is managed by the Caribbean, Gulf of Mexico, and South Atlantic Fishery

Management Councils in coordination with NMFS and the Atlantic and Gulf States Marine Fisheries Commissions.

Oxenford and Hunte (1986) suggested that there were at least two separate unit stocks of dolphin in the northeast and southeast Caribbean Sea. Oxenford (1999) suggested that it was very likely that additional stocks of dolphin existed in the Gulf of Mexico and central/western Caribbean. However, genetic studies conducted by Merten et al. (2015) showed low population differentiation of dolphin throughout the western central Atlantic. Theisen et al. (2008) indicated that a worldwide stock for wahoo consisted of a single globally distributed population. Garber et al. (2005) found no genetic heterogeneity for wahoo in the western central Atlantic. However, Zischke et al. (2012) concluded that despite genetic homogeneity in wahoo, multiple discrete phenotypic stocks existed in the Pacific and eastern Indian oceans.

Life-history characteristics of dolphin such as rapid growth rates, early maturity, batch spawning over an extended season, a short life span, and a varied diet could help sustain fishing pressure (Schwenke and Buckel 2008; McBride et al. 2008; Prager 2000; and Oxenford 1999). Dolphin and wahoo are listed as species of "least concern" under the International Union for Conservation of Nature Red List (https://www.iucnredlist.org/), i.e., species that have a low risk of extinction.

3.2.5 Protected Species

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). ESA-listed species under our purview in the Atlantic include species and Distinct Population Segments (DPSs) of species of marine mammals (whales), sea turtles, and fish. These species and their critical habitat are listed in **Table 3.2.5.1**.

Table 3.2.5.1. Status of Listed Species that May Be Affected in the Action Area (E= endangered, T=threatened)

Species		Scientific Name	Status
Marine Mammals	Sei whale	*Balaenoptera borealis*	E
	Blue whale	*Balaenoptera musculus*	E
	Fin whale	*Balaenoptera physalus*	E
	North Atlantic right whale	*Eubalaena glacialis*	E
	Sperm whale	*Physeter macrocephalus*	E
Sea Turtles	Loggerhead sea turtle, Northwest Atlantic (NWA) Distinct Population Segment (DPS)	*Caretta caretta*	T
	Green sea turtle, North Atlantic DPS	*Chelonia mydas*	T
	Leatherback sea turtle	*Dermochelys coriacea*	E
	Hawksbill sea turtle	*Eretmochelys imbricata*	E
	Kemp's ridley sea turtle	*Lepidochelys kempii*	E

Species		Scientific Name	Status
	Olive ridley sea turtle	*Lepidochelys olivacea*	T
Fish	Atlantic sturgeon, South Atlantic DPS	*Acipenser oxyrinchus oxyrinchus*	E
	Atlantic sturgeon, Carolina DPS	*Acipenser oxyrinchus oxyrinchus*	E
	Atlantic sturgeon, Chesapeake Bay DPS	*Acipenser oxyrinchus oxyrinchus*	E
	Atlantic sturgeon, New York Bight DPS	*Acipenser oxyrinchus oxyrinchus*	E
	Atlantic sturgeon, Gulf of Maine DPS	*Acipenser oxyrinchus oxyrinchus*	T
	Atlantic salmon, Gulf of Maine DPS	*Salmo salar*	E
	Giant manta ray	*Mobula birostris*	T
	Scalloped hammerhead shark, Central and Southwest Atlantic DPS	*Sphyrna lewini*	T
	Smalltooth sawfish	*Pristis pectinata*	E
	Oceanic whitetip shark	*Carcharhinus longimanus*	T
	Nassau grouper	*Epinephelus striatus*	T
Critical Habitat	North Atlantic right whale		
	Loggerhead sea turtle: NWA DPS		

NMFS completed a biological opinion that evaluated the effects of the Atlantic dolphin and wahoo fishery on ESA-listed species on August 27, 2003 (NMFS 2003). The opinion for the dolphin and wahoo fishery concluded the fishery is not likely to jeopardize the continued existence of any listed sea turtle species. NMFS issued an Incidental Take Statement specifying reasonable and prudent measures to minimize the impact of these incidental takes, along with terms and conditions to implement them. NMFS determined the other listed species and critical habitat in the South Atlantic Region (ESA-listed marine mammals, North Atlantic Right whale critical habitat, Atlantic salmon, and smalltooth sawfish) are not likely to be adversely affected by the fishery. Since the 2003 Opinion, NMFS has considered how the continued authorization of the Atlantic dolphin and wahoo fishery would interact with other listed species and designated critical habitat in a series of consultation memoranda.

In December 12, 2016, the Southeast Regional Office requested reinitiation of Section 7 consultation on the continued authorization of the Atlantic dolphin and wahoo fisheries in federal water under the Magnuson-Stevens Act to address the final rule to list green sea turtle distinct population segments (DPS) under the ESA. In the same memorandum, NMFS determined that allowing the dolphin and wahoo fishery to continue during the reinitiation period is not likely to jeopardize any protected species.

Since the initial reinitiation request, NMFS has published two additional final ESA listing rules. On January 22, 2018, NMFS listed the giant manta ray (*Manta birostris*) as threatened under the ESA, effective February 21, 2018. On January 30, 2018, NMFS listed the oceanic whitetip shark (*Cacharhinus longimanus*) as threatened under the ESA, effective March 1, 2018.

Giant manta rays and oceanic whitetip sharks are found in the Atlantic and may be affected by the subject fishery via incidental capture in dolphin wahoo fishing gear.

The listing of the North Atlantic and South Atlantic green sea turtle DPSs and Nassau grouper in 2016 triggered reinitiation of consultation on numerous federal fisheries in the Southeast region, resulting in significant Section 7 workload. In a December 12, 2016, memorandum, it was expected the consultations on the dolphin wahoo fishery would be completed in 2017. However, due to needing to expand the scope of these consultations to address the additional listed species, NMFS now expects the reinitiation period on these fisheries to extend through the end of 2021.

In more recent memoranda, dated June 11, 2018, NMFS requested reinitiation of Section 7 consultation on the continued authorization of the dolphin wahoo fishery in federal waters under the Magnuson-Stevens Act to address the listings of giant manta ray and oceanic whitetip shark under the ESA. In the same memoranda, NMFS also determined that allowing the dolphin wahoo fisheries to continue during the reinitiation period would not violate Sections 7(a)(2) and 7(d) of the ESA. This Section 7(a)(2) determination is only applicable to the proposed action during the re-initiation period and does not address the agency's long-term obligation to ensure its actions are not likely to jeopardize the continued existence of any listed species or destroy or adversely modify critical habitat. A biological assessment is underway, which will be used in the analysis of the next biological opinion for the dolphin wahoo fishery.

3.4 Administrative Environment

3.4.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ, an area extending 200 nm from the seaward boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond the U.S. EEZ.

Responsibility for federal fishery management decision-making is divided between the U.S. 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 collecting and providing the data necessary for the councils to prepare fishery management plans and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws. In most cases, the Secretary has delegated this authority to NMFS.

The Council, in cooperation with the Mid-Atlantic Fishery Management Council and the New England Fishery Management Council, is responsible for conservation and management of dolphin and wahoo in federal waters off the Atlantic states. These waters extend from 3 to 200 mi offshore from the seaward boundary of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and east Florida to Key West. The Council has thirteen

voting members: one from NMFS; one each from the state fishery agencies of North Carolina, South Carolina, Georgia, and Florida; and eight public members appointed by the Secretary. On the Council, there are two public members from each of the four South Atlantic States. Non-voting members include representatives of the U.S. Fish and Wildlife Service, U.S. Coast Guard, State Department, and Atlantic States Marine Fisheries Commission (ASMFC). The Council has adopted procedures whereby the non-voting members serving on the Council Committees have full voting rights at the Committee level but not at the full Council level. Council members serve three-year terms and are recommended by state governors and appointed by the Secretary from lists of nominees submitted by state governors. Appointed members may serve a maximum of three consecutive terms.

Public interests also are involved in the fishery management process through participation on Advisory Panels and through council meetings, which, with few exceptions for discussing personnel and legal matters, are open to the public. The Council uses its Scientific and Statistical Committee (SSC) to review the data and science being used in assessments and fishery management plans/amendments. In addition, the regulatory process is in accordance with the Administrative Procedure Act, in the form of "notice and comment" rulemaking.

3.4.2 State Fishery Management

The state governments of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia North Carolina, South Carolina, Georgia, and Florida have the authority to manage fisheries that occur in waters extending three nautical miles from their respective shorelines. The Department of Marine Fisheries is responsible for marine fisheries in Maine's state waters. In New Hampshire, marine fisheries are managed by the Marine Fisheries Division of the New Hampshire Fish and Game Department. Massachusetts's marine fisheries are managed by the Division of Marine Fisheries of the Massachusetts Department of Fish and Game. Rhode Island's marine fisheries are managed by the Division of Fish and Wildlife of Rhode Island's Department of Environmental Management. Connecticut manages its marine fisheries through the Department of Energy and Environmental Protection. New York's marine fisheries are managed by the Division of Fish, Wildlife and Marine Resources of the Department of Environmental Conservation. New Jersey manages its marine fisheries through the Division of Fish and Wildlife of the Department of Environmental Protection. Pennsylvania manages its fisheries through the Pennsylvania Fish and Boat Commission. Marine fisheries in Delaware are managed by the Fisheries Section of the Division of Fish and Wildlife. Maryland's Department of Natural Resources manages its marine fisheries. Marine fisheries in Virginia are managed by the Virginia Marine Resources Commission. North Carolina's marine fisheries are managed by the Marine Fisheries Division of the North Carolina Department of Environment and Natural Resources. The Marine Resources Division of the South Carolina Department of Natural Resources regulates South Carolina's marine fisheries. Georgia's marine fisheries are managed by the Coastal Resources Division of the Department of Natural Resources. The Marine Fisheries Division of the Florida Fish and Wildlife Conservation Commission is responsible for managing Florida's marine fisheries. Each state fishery management agency has a designated seat on the Council. 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 Atlantic states are also involved through ASMFC in management of marine fisheries. This commission was created to coordinate state regulations and develop management plans for interstate fisheries. It has significant authority, through the Atlantic Striped Bass Conservation Act and the Atlantic Coastal Fisheries Cooperative Management Act, to compel adoption of complementary state regulations to conserve coastal species. The ASFMC is also represented at the Council but does not have voting authority at the Council level.

NMFS's State-Federal Fisheries Division is responsible for building cooperative partnerships to strengthen marine fisheries management and conservation at the state, inter-regional, and national levels. This division implements and oversees the distribution of grants for two national (Inter-jurisdictional Fisheries Act and Anadromous Fish Conservation Act) and two regional (Atlantic Coastal Fisheries Cooperative Management Act and Atlantic Striped Bass Conservation Act) programs. Additionally, it works with the ASMFC to develop and implement cooperative State-Federal fisheries regulations.

3.4.3 Enforcement

Both the NMFS Office for Law Enforcement (NOAA/OLE) and the USCG have the authority and the responsibility to enforce Council regulations. NOAA/OLE agents, who specialize in living marine resource violations, provide fisheries expertise and investigative support for the overall fisheries mission. The USCG is a multi-mission agency, which provides at sea patrol services for the fisheries mission.

Neither NOAA/OLE nor the USCG can provide a continuous law enforcement presence in all areas due to the limited resources of NOAA/OLE and the priority tasking of the USCG. To supplement at sea and dockside inspections of fishing vessels, NOAA entered into Cooperative Enforcement Agreements with all but one of the states in the Southeast Region (North Carolina), which granted authority to state officers to enforce the laws for which NOAA/OLE has jurisdiction. In recent years, the level of involvement by the states has increased through Joint Enforcement Agreements, whereby states conduct patrols that focus on federal priorities and, in some circumstances, prosecute resultant violators through the state when a state violation has occurred.

The NOAA Office of General Counsel Penalty Policy and Penalty Schedule is available online at http://www.gc.noaa.gov/enforce-office3.html.

3.3 Economic and Social Environment

3.3.1 Economic Environment

A description of the dolphin and wahoo stocks affected by the actions considered in this amendment is provided in **Section 3.2**. Additional details on the economic environment of the recreational and commercial sectors of the dolphin and wahoo fishery are provided in the Comprehensive ACL Amendment (SAFMC 2011).

Commercial Sector

Permits

Any fishing vessel that harvests and sells dolphin or wahoo from the Atlantic EEZ must have a valid Atlantic dolphin wahoo commercial permit. Commercial Atlantic dolphin wahoo (ADW) permits are open access permits (i.e., access is not restricted). As shown in **Table 3.3.1.1**, the number of permits that were valid at any point in a given year increased slightly from 2015-2019. The number of permits decreased slightly in 2019 but was still higher than in 2015. As of October 1, 2020, there were 2,072 valid commercial Atlantic dolphin wahoo permits.

Table 3.3.1.1 Number of valid commercial Atlantic dolphin wahoo permits, 2015-2019.

Year	Number of Permits
2015	2,660
2016	2,716
2017	2,785
2018	2,807
2019	2,722

Source: NMFS SERO Sustainable Fisheries (SF) Access permits database.

Vessels

The information in **Table 3.3.1.2** describes the landings and revenue for vessels that harvested Atlantic dolphin in each year from 2015 through 2019, as well as their revenue from Atlantic wahoo and other species. Vessel participation has been highly variable from 2015-2019, peaking at 695 vessels in 2016 and generally decreasing thereafter. Similarly, average annual revenue per vessel from dolphin landings steadily decreased after 2015, declining by about 41% from 2015 through 2019. Average annual revenue per vessel from dolphin was about $3,700 from 2015-2019, while average total revenue per vessel was around $76,000. Thus, Atlantic dolphin vessels are not very dependent on Atlantic dolphin revenue as the latter only represents about 5% of these vessels' total revenue on an annual basis. The maximum annual gross revenue earned by a single Atlantic dolphin vessel during this time was about $1.56 million (2019$) in 2019, though the average gross revenue per vessel was only about $83,800 that year.

Table 3.3.1.2. Landings and revenue statistics for vessels harvesting Atlantic dolphin by year, 2015-2019 (2019$).

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
2015	618	Maximum	97,733	$294,762	$13,413	$1,228,176	$1,249,939
		Total	1,101,476	$3,236,562	$210,267	$44,788,222	$48,235,051
		Mean	1,782	$5,237	$340	$72,473	$78,050
2016	695	Maximum	64,492	$201,536	$9,045	$1,262,136	$1,324,714
		Total	940,696	$3,135,004	$239,148	$45,904,753	$49,278,905
		Mean	1,354	$4,511	$344	$66,050	$70,905
2017	665	Maximum	34,697	$143,602	$14,638	$1,420,514	$1,422,224
		Total	645,792	$2,200,895	$233,330	$51,887,899	$54,322,124
		Mean	971	$3,310	$351	$78,027	$81,687

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
2018	638	Maximum	57,766	$185,590	$14,901	$690,008	$730,071
		Total	511,419	$1,599,455	$173,842	$39,901,133	$41,674,430
		Mean	802	$2,507	$272	$62,541	$65,320
2019	646	Maximum	96,272	$276,949	$14,345	$1,558,540	$1,559,234
		Total	687,559	$1,984,127	$233,283	$51,919,314	$54,136,723
		Mean	1,064	$3,071	$361	$80,370	$83,803

Source: Atlantic Coastal Cooperative Statistics Program (ACCSP), pers. comm., data accessed July 23, 2020.

The information in **Table 3.3.1.3** describes the landings and revenue for vessels that harvested Atlantic wahoo in each year from 2015 through 2019, as well as their revenue from Atlantic dolphin and other species. Vessel participation has been highly variable from 2015-2019, but generally decreased after 2015, with the number of active vessels being about 21% less in 2019 relative to 2015. Average annual revenue per vessel from wahoo landings was also highly variable during this time, but generally increased from 2015 through 2019 in part due to the decline in the number of active vessels. Average annual revenue per vessel from wahoo was about $810 from 2015-2019, while average total revenue per vessel was around $95,800. Thus, Atlantic wahoo vessels are not dependent on Atlantic wahoo revenue as the latter only represents about .8% of these vessels' total revenue on an annual basis. The maximum annual gross revenue earned by a single Atlantic dolphin vessel during this time was about $1.56 million (2019$) in 2019, though the average gross revenue per vessel was only about $104,000 that year.

Table 3.3.1.3. Landings and revenue statistics for vessels harvesting Atlantic wahoo by year, 2015-2019 (2019$).

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
2015	370	Maximum	3,524	$13,413	$294,762	$919,613	$979,201
		Total	64,455	$250,845	$2,899,149	$30,255,573	$33,405,567
		Mean	174	$678	$7,836	$81,772	$90,285
2016	349	Maximum	2,181	$9,045	$201,536	$1,262,136	$1,324,714
		Total	66,868	$272,502	$2,658,451	$27,292,518	$30,223,471
		Mean	192	$781	$7,617	$78,202	$86,600
2017	288	Maximum	3,732	$14,638	$143,602	$1,420,514	$1,422,224
		Total	67,995	$275,965	$1,794,383	$31,499,567	$33,569,915
		Mean	236	$958	$6,230	$109,373	$116,562
2018	273	Maximum	4,050	$14,901	$185,590	$604,212	$730,071
		Total	50,364	$200,338	$1,281,028	$20,774,530	$22,255,896
		Mean	184	$734	$4,692	$76,097	$81,523
2019	292	Maximum	3,726	$14,345	$276,949	$1,558,540	$1,559,234

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
		Total	68,139	$262,896	$1,720,873	$28,404,351	$30,388,120
		Mean	233	$900	$5,893	$97,275	$104,069

Source: ACCSP, pers. comm., data accessed July 23, 2020.

As illustrated in **Table 3.3.1.4** and **Table 3.3.1.5**, although most vessels (about 86%) that have been active in the commercial sector of the Atlantic dolphin fishery possess ADW permits, some vessels (about 14%) do not. Further, vessels with ADW permits are responsible for about 92% of the revenue from dolphin landings, with non-permitted vessels accounting for the other 8%. Active permitted vessels generally have higher average annual dolphin revenue as well as total revenue relative to active vessels that do not possess ADW permits. This result is to be expected since only vessels that harvest dolphin north of 39° N. latitude and have another federal commercial permits are allowed to do so without an ADW permit and those vessels are limited to 200 lbs (ww) per trip. An important difference between permitted and non-permitted vessels that harvest Atlantic dolphin is that the former earn much higher revenue from other fisheries and thus total revenue as well. Specifically, average total revenue for active permitted vessels was almost $82,400 per year while active non-permitted vessels only earned $35,350 on average per year from 2015-2019.

Table 3.3.1.4. Landings and revenue statistics for permitted vessels harvesting Atlantic dolphin by year, 2015-2019 (2019$).

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
2015	545	Maximum	97,733	$294,762	$8,727	$1,228,176	$1,249,939
		Total	1,043,298	$3,056,399	$183,379	$42,539,819	$45,779,597
		Mean	1,914	$5,608	$336	$78,055	$83,999
2016	592	Maximum	64,492	$201,536	$9,045	$1,262,136	$1,324,714
		Total	861,468	$2,852,750	$216,760	$43,060,535	$46,130,044
		Mean	1,455	$4,819	$366	$72,737	$77,922
2017	582	Maximum	34,697	$143,602	$14,638	$1,420,514	$1,422,224
		Total	603,551	$2,057,978	$216,472	$49,861,460	$52,135,910
		Mean	1,037	$3,536	$372	$85,673	$89,581
2018	546	Maximum	57,766	$185,590	$14,901	$690,008	$730,071
		Total	467,592	$1,452,769	$158,560	$36,706,455	$38,317,785
		Mean	856	$2,661	$290	$67,228	$70,179
2019	544	Maximum	96,272	$276,949	$12,369	$1,558,540	$1,559,234
		Total	623,070	$1,776,769	$201,485	$47,087,123	$49,065,377
		Mean	1,145	$3,266	$370	$86,557	$90,194

Source: ACCSP, pers. comm., data accessed July 23, 2020.

Table 3.3.1.5. Landings and revenue statistics for non-permitted and unknown vessels harvesting Atlantic dolphin by year, 2015-2019 (2019$).*

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
2015	73	Maximum	43,045	$136,006	$13,413	$777,111	$777,299
		Total	58,178	$180,163	$26,888	$2,248,403	$2,455,454
		Mean	797	$2,468	$368	$30,800	$33,636
2016	103	Maximum	41,181	$158,363	$4,644	$407,255	$407,368
		Total	79,227	$282,254	$22,388	$2,844,219	$3,148,861
		Mean	769	$2,740	$217	$27,614	$30,571
2017	83	Maximum	21,863	$81,279	$6,849	$276,421	$276,981
		Total	42,241	$142,917	$16,858	$2,026,438	$2,186,213
		Mean	509	$1,722	$203	$24,415	$26,340
2018	92	Maximum	21,298	$76,504	$4,614	$519,843	$520,000
		Total	43,827	$146,685	$15,282	$3,194,678	$3,356,646
		Mean	476	$1,594	$166	$34,725	$36,485
2019	102	Maximum	33,903	$112,711	$14,345	$883,884	$884,571
		Total	64,489	$207,358	$31,798	$4,832,191	$5,071,346
		Mean	632	$2,033	$312	$47,374	$49,719

Source: ACCSP, pers. comm., data accessed July 23, 2020.
*Landings by unknown vessels were consolidated and treated as being landed by a single vessel.

Similarly, as illustrated in **Table 3.3.1.6** and **Table 3.3.1.7**, although most vessels (about 89%) that have been active in the commercial sector of the Atlantic wahoo fishery possess ADW permits, some vessels (about 11%) do not. Further, vessels with ADW permits are responsible for about 89% of the revenue from wahoo landings, with non-permitted vessels accounting for the other 11%. Average annual revenue from wahoo landings are nearly identical for active permitted vessels and active vessels that do not possess ADW permits. Given the aforementioned regulations, this finding suggests that wahoo landings represent incidental catch regardless of whether they are harvested by permitted or non-permitted vessels. The main difference between permitted and non-permitted vessels that harvest Atlantic wahoo is that the former earn much higher revenue from other fisheries and thus total revenue as well. Specifically, average total revenue for active permitted vessels was about $103,000 per year while active non-permitted vessels only earned about $41,300 on average per year from 2015-2019.

Table 3.3.1.6. Landings and revenue statistics for permitted vessels harvesting Atlantic wahoo by year, 2015-2019 (2019$).

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
2015	323	Maximum	2,131	$8,727	$294,762	$919,613	$979,201
		Total	56,004	$217,656	$2,740,423	$28,579,814	$31,537,893

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
		Mean	173	$674	$8,484	$88,482	$97,641
2016	305	Maximum	2,181	$9,045	$201,536	$1,262,136	$1,324,714
		Total	60,163	$245,133	$2,453,131	$26,571,225	$29,269,489
		Mean	197	$804	$8,043	$87,119	$95,966
2017	260	Maximum	3,732	$14,638	$143,602	$1,420,514	$1,422,224
		Total	61,944	$249,806	$1,678,364	$30,314,428	$32,242,598
		Mean	238	$961	$6,455	$116,594	$124,010
2018	248	Maximum	4,050	$14,901	$185,590	$604,212	$730,071
		Total	45,528	$181,716	$1,165,814	$19,617,131	$20,964,662
		Mean	184	$733	$4,701	$79,101	$84,535
2019	252	Maximum	2,917	$12,369	$276,949	$1,558,540	$1,559,234
		Total	57,555	$223,837	$1,561,600	$26,763,923	$28,549,360
		Mean	228	$888	$6,197	$106,206	$113,291

Source: ACCSP, pers. comm., data accessed July 23, 2020.

Table 3.3.1.7. Landings and revenue statistics for non-permitted and unknown vessels harvesting Atlantic wahoo by year, 2015-2019 (2019$).*

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
2015	47	Maximum	3,524	$13,413	$136,006	$517,442	$517,522
		Total	8,451	$33,189	$158,726	$1,675,759	$1,867,674
		Mean	180	$706	$3,377	$35,654	$39,738
2016	44	Maximum	1,112	$4,644	$158,363	$207,850	$208,194
		Total	6,705	$27,369	$205,320	$721,293	$953,982
		Mean	152	$622	$4,666	$16,393	$21,681
2017	28	Maximum	1,719	$6,849	$81,279	$272,822	$273,962
		Total	6,050	$26,159	$116,019	$1,185,139	$1,327,317
		Mean	216	$934	$4,144	$42,326	$47,404
2018	25	Maximum	1,220	$4,614	$76,504	$299,251	$301,720
		Total	4,837	$18,622	$115,215	$1,157,398	$1,291,235
		Mean	193	$745	$4,609	$46,296	$51,649
2019	40	Maximum	3,726	$14,345	$112,711	$302,234	$318,233
		Total	10,584	$39,059	$159,273	$1,640,428	$1,838,759
		Mean	265	$976	$3,982	$41,011	$45,969

Source: ACCSP, pers. comm., data accessed July 23, 2020.
*Landings by unknown vessels were consolidated and treated as being landed by a single vessel.

Similar to permitted and non-permitted commercial vessels, significant differences in landings and revenue exist between vessels that use longline gear and vessels that use other gear types (primarily hook and line) to commercially harvest dolphin. These differences are illustrated in **Table 3.3.1.8** and **Table 3.3.1.9**. Specifically, while many more vessels used non-longline gear (592 vessels) than longline gear (85 vessels) to harvest dolphin on average per year from 2015-2019, the vessels that used longline gear had much higher revenue from dolphin landings (about $22,600) compared to vessels using non-longline gear ($822) as well as much higher total revenue (about $278,000) compared to vessels that used non-longline gear (about $52,200). Based on these estimates, longline vessels were relatively more dependent on revenue from dolphin landings compared to non-longline vessels, as over 8% of the longline vessels' revenue came from dolphin landings while only 1.6% of the non-longline vessels' revenue came from dolphin landings.

Table 3.3.1.8. Landings and revenue statistics for vessels harvesting Atlantic dolphin using longline gear by year, 2015-2019 (2019$).*

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
2015	92	Maximum	97,733	$294,762	$8,727	$1,228,176	$1,249,939
		Total	948,510	$2,805,516	$86,770	$21,118,683	$23,872,497
		Mean	10,310	$30,495	$943	$232,073	$262,335
2016	92	Maximum	64,492	$201,536	$7,738	$1,262,136	$1,324,714
		Total	740,641	$2,464,659	$60,169	$21,495,756	$23,789,227
		Mean	8,050	$26,790	$654	$244,270	$270,332
2017	97	Maximum	34,697	$143,602	$6,063	$1,420,514	$1,422,224
		Total	472,578	$1,676,222	$80,243	$25,236,266	$26,890,001
		Mean	4,872	$17,281	$827	$268,471	$286,064
2018	68	Maximum	57,766	$185,590	$3,887	$604,212	$730,071
		Total	386,833	$1,215,615	$42,992	$14,741,213	$15,935,913
		Mean	5,689	$17,877	$632	$226,788	$245,168
2019	75	Maximum	69,027	$211,561	$7,173	$1,558,540	$1,559,234
		Total	539,699	$1,547,877	$59,701	$22,278,983	$23,773,009
		Mean	7,196	$20,638	$796	$305,192	$325,658

Source: ACCSP, pers. comm., data accessed July 23, 2020.
*Buoy gear is included under longline gear

Table 3.3.1.9. Landings and revenue statistics for vessels harvesting Atlantic dolphin using non-longline gear by year, 2015-2019 (2019$).*

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
2015	554	Maximum	10,549	$37,580	$6,896	$781,131	$781,592
		Total	152,965	$431,046	$123,233	$28,671,656	$29,225,934

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
		Mean	276	$778	$222	$51,754	$52,754
2016	633	Maximum	8,540	$32,499	$7,190	$657,256	$659,513
		Total	200,055	$670,345	$178,799	$28,709,573	$29,558,717
		Mean	316	$1,059	$282	$45,355	$46,696
2017	599	Maximum	6,869	$22,894	$14,638	$888,399	$889,309
		Total	173,214	$524,673	$151,319	$32,667,912	$33,343,905
		Mean	289	$876	$253	$54,537	$55,666
2018	585	Maximum	4,701	$16,423	$14,901	$690,008	$690,013
		Total	124,586	$383,840	$130,366	$27,102,434	$27,616,640
		Mean	213	$656	$223	$46,329	$47,208
2019	590	Maximum	27,245	$65,388	$12,369	$1,081,717	$1,082,393
		Total	147,860	$436,250	$171,238	$34,042,522	$34,650,010
		Mean	251	$739	$290	$57,699	$58,729

Source: ACCSP, pers. comm., data accessed July 23, 2020.
*Includes landings where gear type is unknown and includes landings where pots, traps, and various net-based gears were on board or used for harvest

Similar patterns are seen in the wahoo component of the fishery as illustrated in **Table 3.3.1.10** and **Table 3.3.1.11**. Again, significant differences in landings and revenue exist between vessels that use longline gear and vessels that use other gear types (primarily hook and line) to commercially harvest wahoo. Specifically, while more vessels used non-longline gear (266 vessels) than longline gear (53 vessels) to harvest wahoo on average per year from 2015-2019, the vessels that used longline gear earned more revenue from wahoo landings (about $1,250) compared to vessels using non-longline gear ($700) as well as much higher total revenue (about $353,400) compared to vessels that used non-longline gear (about $46,900). Based on these estimates, neither longline or non-longline vessels were dependent on revenue from wahoo landings as only .4% of the longline vessels' revenue came from wahoo landings while only 1.5% of the non-longline vessels' revenue came from wahoo landings. These estimates further demonstrate that wahoo landings represent incidental harvest for these vessels (i.e., it is not a target species).

Table 3.3.1.10. Landings and revenue statistics for vessels harvesting Atlantic wahoo using longline gear by year, 2015-2019 (2019$).*

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
2015	69	Maximum	2,131	$8,727	$294,762	$919,613	$979,201
		Total	24,887	$93,431	$2,649,359	$19,638,267	$22,242,585
		Mean	361	$1,354	$38,397	$288,798	$327,097
2016	52	Maximum	1,950	$7,738	$201,536	$1,262,136	$1,324,714

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
		Total	15,546	$60,169	$2,243,439	$15,176,174	$17,310,003
		Mean	299	$1,157	$43,143	$303,523	$346,200
2017	58	Maximum	1,668	$6,063	$143,602	$1,420,514	$1,422,224
		Total	20,884	$80,243	$1,530,174	$19,411,053	$20,949,306
		Mean	360	$1,384	$26,382	$346,626	$374,095
2018	42	Maximum	931	$3,887	$185,590	$604,212	$730,071
		Total	11,711	$43,243	$1,088,330	$10,733,769	$11,801,864
		Mean	279	$1,030	$25,913	$261,799	$287,850
2019	45	Maximum	2,096	$7,173	$211,561	$1,558,540	$1,559,234
		Total	16,690	$60,327	$1,361,187	$17,694,469	$19,002,502
		Mean	371	$1,341	$30,249	$402,147	$431,875

Source: ACCSP, pers. comm., data accessed July 23, 2020.
*Buoy gear is included under longline gear

Table 3.3.1.11. Landings and revenue statistics for vessels harvesting Atlantic wahoo using non-longline gear by year, 2015-2019 (2019$).*

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
2015	305	Maximum	1,821	$6,896	$37,580	$283,647	$284,281
		Total	39,568	$157,414	$241,585	$11,165,220	$11,564,219
		Mean	130	$516	$792	$36,607	$37,915
2016	303	Maximum	1,784	$7,190	$22,545	$385,931	$386,111
		Total	51,322	$212,333	$387,316	$12,714,810	$13,314,459
		Mean	169	$701	$1,278	$41,963	$43,942
2017	236	Maximum	3,732	$14,638	$22,894	$389,193	$390,820
		Total	47,110	$195,722	$242,937	$13,005,056	$13,443,715
		Mean	200	$829	$1,029	$55,106	$56,965
2018	234	Maximum	4,050	$14,901	$16,423	$299,251	$301,720
		Total	38,654	$157,095	$190,833	$10,275,914	$10,623,841
		Mean	165	$671	$816	$43,914	$45,401
2019	252	Maximum	2,917	$12,369	$22,211	$840,582	$840,661
		Total	51,450	$202,569	$165,918	$12,312,245	$12,680,731
		Mean	204	$804	$658	$48,858	$50,320

Source: ACCSP, pers. comm., data accessed July 23, 2020.
*Includes landings where gear type is unknown and includes landings where pots, traps, and various net-based gears were on board or used for harvest.

The commercial landings data for dolphin and wahoo from 2015-2019 indicate that gears other than those currently authorized for use in the fishery, or allowed to be on board when dolphin and wahoo are harvested, are either being used for harvest or are at least on board when harvest has occurred. These gears include buoy gear, pots, traps, and various net-based gear types, particularly gillnets. Because some states only report the "primary" gear used on a particular trip to ACCSP, it is not possible to determine with complete certainty whether these gears were used to harvest dolphin and wahoo or were simply on board. Regardless, such harvest is currently not allowed under the regulations. One action in this amendment would allow harvest of dolphin and wahoo if buoy gear, pots, or traps are on board the vessel, as long as rod and reel gear (i.e., "handline" gear) is used for harvest. The information in **Table 3.3.1.12** and **Table 3.3.1.13** indicates how many vessels have already likely been engaging in such behavior with respect to dolphin and wahoo, respectively. This information suggests that this behavior is more prevalent for dolphin than for wahoo, as 38 vessels either harvested dolphin with these gears or with these gears on board across all years from 2015-2019, while only 3 vessels harvested wahoo with these gears or with these gears on board across all years from 2015-2019. Additional details, such as providing this information on a yearly basis or by specific gear types, is not possible as that data is confidential.

Table 3.3.1.12. Landings and revenue statistics for vessels harvesting Atlantic dolphin with buoy gear, pots, or traps on board across all years, 2015-2019 (2019$).

Number of Vessels	Statistic	Dolphin Landings (lbs ww)	Dolphin Revenue
38	Total	2,978	$8,691
	Mean	78	$229

Source: ACCSP, pers. comm., data accessed July 23, 2020.

Table 3.3.1.13. Landings and revenue statistics for vessels harvesting Atlantic wahoo with buoy gear, pots, or traps on board across all years, 2015-2019 (2019$).

Number of Vessels	Statistic	Wahoo Landings (lbs ww)	Wahoo Revenue
3	Total	176	$853
	Mean	59	$284

Source: ACCSP, pers. comm., data accessed July 23, 2020.

Estimates of economic returns have not been available historically for the commercial sector of the Atlantic dolphin wahoo fishery.[1] A recent analysis was conducted to provide such estimates for the non-longline component of the commercial sector (Liese, pers. comm, Oct. 22, 2019). These estimates are specific to economic performance in 2014, 2015 and 2016, respectively. The analysis also provides average estimates of economic returns across 2014-2016, which are the most useful for current purposes. Estimates in the analysis are based on a combination of Southeast Coastal logbook data, a supplemental economic add-on survey to the logbooks, and an annual economic survey at the vessel level. The economic surveys collect data on gross revenue, variable costs, fixed costs, as well as some auxiliary economic variables (e.g., market value of the vessel). The analysis provides estimates of critical economic variables for the commercial sector of the dolphin wahoo fishery. In addition, estimates are provided at the trip level and the annual vessel level, of which the latter are most important for current purposes. Findings from the analysis are summarized below.

[1] Separate estimates are not provided for commercial dolphin vessels and wahoo vessels.

From an economic returns perspective, the two most critical results at the trip level are the estimates of trip net cash flow and trip net revenue. Trip net cash flow is trip revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and purchases of annual allocation from other allocation holders. Thus, this estimate represents the amount of cash generated by a typical reef fish trip over and above the cash cost of taking the trip (i.e., variable costs of the trip) and is a proxy for producer surplus (PS) at the trip level. Trip net revenue is trip revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and the opportunity cost of owner's time as captain. By including opportunity cost of the owner's time and excluding purchases of annual allocation, trip net revenue is a measure of the commercial fishing trip's economic profit.

Table 3.3.1.14 illustrates the economic "margins" generated on red grouper trips, i.e., trip net cash flow and trip net revenue as a percentage of trip revenue. As shown in this table, 28% and 32% (or 60% in total) of the average revenues generated on Atlantic dolphin wahoo trips were used to pay for fuel/supplies costs and crew labor costs, while the remaining 40% was net cash flow back to the owner(s). The margin associated with trip net revenue was lower at about 23%, as it accounts for the value of an owner operator's time. Thus, trip cash flow and trip net revenue were both positive on average from 2014 through 2016, generally indicating that Atlantic dolphin wahoo trips were profitable during this time.

Table 3.3.1.14. Economic characteristics of non-longline Atlantic dolphin wahoo trips 2014-2016 (2019$).

	2014	2015	2016	Average
Number of Observations	630	402	537	
Response Rate (%)	82%	79%	95%	
SOI Trip				
Owner-Operated	88%	87%	85%	86.7%
Fuel Used per Day at Sea (gallons/day)	37	43	43	41
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	15.2%	12.9%	12.3%	13.5%
Bait	5%	4.6%	5.2%	4.9%
Ice	1.9%	1.8%	2.3%	2%
Groceries	4%	3.3%	4.8%	4%
Miscellaneous	2.9%	3.2%	3.7%	3.3%
Hired Crew	34%	32.6%	29.8%	32.1%
Owner-Captain Time	17.4%	14.1%	18.8%	16.8%
Trip Net Cash Flow	37.1%	41.7%	41.9%	40.2%
Trip Net Revenue	19.7%	27.6%	23.1%	23.5%
Labor - Hired & Owner	51.4%	46.6%	48.6%	48.9%
Fuel & Supplies	28.9%	25.8%	28.3%	27.7%
Input Prices				
Fuel Price (per gallon)	$4.00	$3.06	$2.27	$3.11
Hire Crew Wage (per crew-day)	$320	$299	$271	$297
Productivity Measures				
Landings/Fuel Use (lbs./gallon)	7.6	7	5.3	7
Landings/Labor Use (lbs./crew-day)	147	152	133	144

Table 3.3.1.15 provides estimates of the important economic variables at the annual level for all vessels that had Atlantic dolphin wahoo landings from 2014 through 2016. Similar to the trip level, the three most important estimates of economic returns are net cash flow, net revenue

from operations, as well as economic return on asset value. Of these measures, net revenue from operations most closely represents economic profits to the owner(s). Net cash flow is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, loan payments, and purchases of annual allocation. Net revenue from operations is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, and the opportunity cost of an owner's time as captain as well as the vessel's depreciation. Economic return on asset value is calculated by dividing the net revenue from operations by the vessel value.

Net cash flow and net revenue from operations at the annual vessel level were both positive from 2014-2016, generally indicating that Atlantic dolphin wahoo vessels in the commercial sector were profitable, though net revenue from operations was only slightly above the break-even level. Specifically, net cash flow and net revenue from operations averaged 17.7% and .5%, respectively, while the economic return on asset value was approximately .6% during this time.

Table 3.3.1.15. Economic characteristics of non-longline Atlantic dolphin wahoo vessels from 2014-2016 (2019$).

	2014	2015	2016	Average
Number of Observations	91	114	103	
Response Rate (%)	59%	80%	80%	
SOI Vessel Owner-Operated	87%	92%	89%	89%
For-Hire Active	32%	19%	14%	22%
Vessel Value	$81,812	$73,414	$92,851	$82,692
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	16.8%	13.9%	13%	14.6%
Other Supplies	11.3%	14.3%	13.8%	13.1%
Hired Crew	22.4%	21.9%	21.2%	21.8%
Vessel Repair & Maintenance	16.3%	16.5%	18.1%	17%
Insurance	2.3%	2%	2.5%	2.3%
Overhead	8.7%	8.9%	10.1%	9.2%
Loan Payment	2.8%	4.7%	5.3%	4.3%
Owner-Captain Time	13.9%	14.6%	15.5%	14.7%
Net Cash Flow	19.4%	17.7%	15.9%	17.7%
Net Revenue for Operations	2.7%	1.4%	-2.7%	0.5%
Depreciation	35.7%	6.5%	8.5%	6.9%
Fixed Costs	27.3%	27.4%	30.8%	28.5%
Labor - Hired & Owner	36.2%	36.5%	36.7%	36.5%
Fuel & Supplies	28.1%	28.2%	26.8%	27.7%
Economic Return (on asset value)	2.4%	1.1%	−1.6%	0.6%

Estimates at this level of detail for longline trips and vessels are not available as these landings are generally reported to the Atlantic HMS logbook program rather than the Southeast Coastal logbook program, and thus have different economic data reporting requirements as determined by the Atlantic HMS Division in the Office of Sustainable Fisheries. However, some of the critical economic return estimates were generated in a recent report reviewing the Atlantic

Bluefin Tuna Individual Bycatch Quota program.[2] These critical estimates are provided in **Table 3.3.1.16**. Although these estimates are not specific to longline vessels harvesting Atlantic dolphin and wahoo, as such estimates do not currently exist, most longline vessels do harvest these species and thus these economic return estimates are considered representative of the longline vessels participating in the Atlantic dolphin wahoo fishery. Because the operating income estimates only account for trip/variable costs, and do not account for annual fixed costs, they are most comparable to the trip net cash flow and annual vessel net cash flow estimates for non-longline vessels.

Table 3.3.1.16. Economic characteristics of Atlantic longline vessels from 2014-2016 (2019$).

	2014	2015	2016	2017	Average
Average Trip Revenue	$26,985	$24,758	$26,370	$26,461	$26,144
Average Trip Operating Income	$8,437	$8,111	$10,619	$11,984	$10,393
Operating Income as % of Trip Revenue	33.9%	35.1%	42.7%	47%	39.7%
Average Annual Vessel Revenue	$316,055	$261,574	$300,730	$307,422	$315,441
Average Annual Vessel Operating Income	$107,068	$91,876	$128,433	$144,351	$125,236
Operating Income as % of Vessel Revenue	33.9%	35.1%	42.7%	47%	39.7%

Dealers

The information in **Table 3.3.1.17** illustrates the purchasing activities of dealers that bought Atlantic dolphin landings from vessels from 2015 through 2019. The number of Atlantic dolphin dealers was relatively stable from 2015-2019. Because of the decline in total Atlantic dolphin purchases per year after 2016, the average annual value of dolphin purchases per dealer was much lower in 2017-2019 compared to 2015-16. Total seafood purchases by Atlantic dolphin dealers were also noticeably lower in 2017-2019 compared to 2015-2016. However, Atlantic dolphin dealers are not dependent on purchases of Atlantic dolphin as average annual purchases of dolphin per dealer were only about $13,900, which only represented about .9% of their total seafood purchases on average from 2015-2019.

The information in and **Table 3.3.1.18** the purchasing activities of dealers that bought Atlantic wahoo landings from vessels from 2015 through 2019. The number of Atlantic wahoo dealers declined by about 15% from 2015 through 2019 even though, with the exception of the decline in 2018, total Atlantic wahoo purchases did not exhibit a strong pattern during this time. The average value of Atlantic wahoo purchases per dealer was unstable from 2015-2019 but did not exhibit a particular pattern. Conversely, total seafood purchases by Atlantic wahoo dealers were noticeably lower in 2018-2019 compared to 2015-2017. Atlantic wahoo dealers are not dependent on purchases of Atlantic wahoo as average annual purchases of wahoo per dealer were only about $2,020, which only represented about .13% of their total seafood purchases on average from 2015-2019.

[2] NOAA Fisheries. 2019. Three-Year Review of the Individual Bluefin Quota Program. 155 pp.

Table 3.3.1.17. Dealer statistics for dealers that purchased Atlantic dolphin landings by year, 2015-2019. All dollar estimates are in 2019$.

Year	Number of Dealers	Statistic	Dolphin Purchases	Wahoo Purchases	Other Purchases	Total Purchases
2015	175	Maximum	$595,303	$29,114	$27,101,701	$27,123,465
		Total	$3,236,562	$240,687	$303,266,508	$306,743,756
		Mean	$18,495	$1,375	$1,732,951	$1,752,821
2016	175	Maximum	$549,715	$18,511	$30,083,561	$30,144,785
		Total	$3,135,004	$264,357	$297,489,990	$300,889,351
		Mean	$17,914	$1,511	$1,699,943	$1,719,368
2017	181	Maximum	$324,347	$15,447	$38,707,221	$38,775,321
		Total	$2,200,895	$267,952	$285,267,223	$287,736,070
		Mean	$12,160	$1,480	$1,576,062	$1,589,702
2018	174	Maximum	$201,860	$12,549	$34,018,354	$34,069,221
		Total	$1,599,455	$194,873	$243,547,460	$245,341,788
		Mean	$9,192	$1,120	$1,399,698	$1,410,010
2019	169	Maximum	$231,178	$16,241	$24,650,138	$24,677,204
		Total	$1,984,127	$252,421	$263,603,875	$265,840,423
		Mean	$11,740	$1,494	$1,559,786	$1,573,020

Source: ACCSP, pers. comm., data accessed July 23, 2020.

Table 3.3.1.18. Dealer statistics for dealers that purchased Atlantic wahoo landings by year, 2015-2019. All dollar estimates are in 2019$.

Year	Number of Dealers	Statistic	Wahoo Purchases	Dolphin Purchases	Other Purchases	Total Purchases
2015	140	Maximum	$29,114	$595,303	$25,805,008	$25,807,336
		Total	$250,845	$3,119,604	$227,960,810	$231,331,259
		Mean	$1,792	$22,283	$1,628,291	$1,652,366
2016	126	Maximum	$18,511	$549,715	$30,083,561	$30,144,785
		Total	$272,502	$3,031,585	$199,857,051	$203,161,138
		Mean	$2,163	$24,060	$1,586,167	$1,612,390
2017	124	Maximum	$15,447	$324,347	$38,707,221	$38,775,321
		Total	$275,965	$2,084,745	$216,569,154	$218,929,864
		Mean	$2,226	$16,812	$1,746,525	$1,765,563
2018	117	Maximum	$12,549	$201,860	$34,018,354	$34,069,221
		Total	$200,338	$1,537,111	$165,628,367	$167,365,816
		Mean	$1,712	$13,138	$1,415,627	$1,430,477
2019	119	Maximum	$16,241	$231,178	$24,650,138	$24,677,204
		Total	$262,896	$1,854,344	$154,468,516	$156,585,756
		Mean	$2,209	$15,583	$1,298,055	$1,315,847

Source: ACCSP, pers. comm., data accessed July 23, 2020.

Foreign Trade

Imports of seafood products compete in the domestic seafood market and have in fact dominated many segments of the seafood market. Imports aid in determining the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports can have downstream effects on the local fish market. At the harvest level, imports can affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to domestic production, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings.

According to NMFS' foreign trade data,[3] dolphin are not exported from the US to other countries. Also, imports and exports of wahoo are not tracked at the individual species level, though it is highly unlikely that any domestic landings of wahoo are exported. Thus, the following describes the imports of dolphin products which directly compete with domestic harvest of dolphin. All monetary estimates are in 2019 dollars.

Total imports of dolphin in volume were highly unstable from 2015 through 2019. Total imports were approximately 57.6 million pounds (mp) product weight (pw) in 2015 and at a similar level in 2018, but fell significantly (by almost 30% relative to 2018) in 2019 to only 40.4 mp pw in 2019. Revenue from dolphin imports followed a somewhat different pattern. Specifically, revenue from dolphin imports was $223.8 million in 2015, but increased to over $255 million in 2017 and almost $270 million (an all-time record) in 2018. However, as with volume, dolphin import revenue fell significantly in 2019 to only around $147 million, a decrease of more than 45% compared to 2018.

The slightly different patterns in volume and revenue were due to changes in the average price per pound during this time. In general, the average price per pound is expected to change inversely with changes in volume. When the volume of dolphin imports decreased from 2015 to 2016, the average price per lb did increase from $3.89 to $4.49. However, the average price increased further, to $5.07 per lb, in 2017 even though the volume of imports increased. When the volume of imports increased in 2017, the average price did decrease somewhat to $4.72 per lb. But when volume decreased significantly in 2019, the average price per lb also decreased significantly to $3.64 (21%), which led to the even more significant decrease in dolphin import revenue.

The average price per pound is sensitive to the product composition of imports. Specifically, imports are either imports in the form of frozen fillets or fresh whole dolphin. The average price per pound for frozen fillets from 2015-2019 was $4.72 while the average price for fresh whole dolphin was only $3.52 per lb. From 2015 through 2018, frozen fillets represented around 79% of the import market, while fresh whole product only represents 21%. However, in 2019, the market share of frozen fillets declined around 66% while the market share for fresh whole fish increased to 34%. This shift in market share between product types largely explains the significant decline in the average price per pound in 2019.

With respect to these imports country of origin, Peru has been the primary source of dolphin imports to the U.S., representing about 31% of the import market from 2015-2019. Ecuador and Taiwan have also controlled significant shares in the dolphin import market during this time, accounting for 25% and 18% of the market, respectively. Together, these countries

[3] https://www.st.nmfs.noaa.gov/apex/f?p=213:3:4130232221294

controlled almost 75% of the dolphin import market from 2015-2019. However, their share of the market did decline during this time, falling from almost 82% in 2016 to only around 70% from 2017 through 2019, as other countries such as Vietnam, Panama, and Costa Rica, increased their imports and share of the import market to the U.S. Also, the decline in Peru's market share in combination with the increase in Ecuador's market share also largely led to the shift in product form from frozen fillets to fresh whole product.

Table 3.3.1.19. Annual pounds and value of dolphin imports and share of imports by country, 2015-2019.

	2015	2016	2017	2018	2019
Pounds of dolphin imports (product weight, million pounds)	57.6	47.2	50.4	57.1	40.4
Value of dolphin imports (millions $, 2019$)	$223.8	$211.7	$255.3	$269.8	$147.1
Average price per lb (2019$)	$3.89	$4.49	$5.07	$4.72	$3.64
Share of Imports by Country					
Peru	33.4	35.3	27.2	34.8	24.4
Ecuador	29.5	21.3	17.4	25.2	31.5
Taiwan	17.6	25.2	26.0	8.9	13.6
All others	19.5	18.2	29.4	31.1	30.5

Source: Pounds of Dolphin Imports (GOM Data Management, pers. comm., Nov. 3, 2020). Values and market share by country (Office of Science and Technology, pers. comm., Nov. 3, 2020).

Economic Impacts

The commercial harvest and subsequent sales and consumption of fish generates business activity as fishermen expend funds to harvest the fish and consumers spend money on goods and services, such as red grouper purchased at a local fish market and served during restaurant visits. These expenditures spur additional business activity in the region(s) where the harvest and purchases are made, such as jobs in local fish markets, grocers, restaurants, and fishing supply establishments. In the absence of the availability of a given species for purchase, consumers would spend their money on substitute goods and services. As a result, the analysis presented below represents a distributional analysis only; that is, it only shows how economic impacts may be distributed through regional markets and should not be interpreted to represent the impacts if these species are not available for harvest or purchase.

In addition to these types of impacts, economic impact models can be used to determine the sources of the impacts. Each impact can be broken down into direct, indirect, and induced economic impacts. "Direct" economic impacts are the results of the money initially spent in the study area (e.g., country, region, state, or community) by the fishery or industry being studied. This includes money spent to pay for labor, supplies, raw materials, and operating expenses. The direct economic impacts from the initial spending create additional activity in the local economy, i.e., "indirect" economic impacts. Indirect economic impacts are the results of business-to-business transactions indirectly caused by the direct impacts. For example, businesses initially benefiting from the direct impacts will subsequently increase spending at other local businesses. The indirect economic impact is a measure of this increase in business-to-business activity, excluding the initial round of spending which is included in the estimate of direct impacts. "Induced" economic impacts are the results of increased personal income caused by the direct

and indirect economic impacts. For example, businesses experiencing increased revenue from the direct and indirect impacts will subsequently increase spending on labor by hiring more employees, increasing work hours, raising salaries/wage rates, etc. In turn, households will increase spending at local businesses. The induced impact is a measure of this increase in household-to-business activity.

Estimates of the U.S. average annual business activity associated with the commercial harvest of Atlantic dolphin and wahoo were derived using the model developed for and applied in NMFS (2018)[4] and are provided in **Table 3.3.1.20** and **Table 3.3.1.21**, respectively. Specifically, these impact estimates reflect the expected impacts from average annual gross revenues generated by landings of Atlantic dolphin and Atlantic wahoo from 2015 through 2019. This business activity is characterized as jobs (full time equivalents), income impacts (wages, salaries, and self-employed income), value-added impacts (the difference between the value of goods and the cost of materials or supplies), and output impacts (gross business sales). Income impacts should not be added to output (sales) impacts because this would result in double counting.

The results provided should be interpreted with caution and demonstrate the limitations of these types of assessments. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species. Separate models specific to individual species such as dolphin and wahoo are not available. For e.g., economic impacts for dolphin and wahoo were estimated using the model for highly migratory species (HMS) as they are most often co-harvested with those species.

Between 2015 and 2019, landings of Atlantic dolphin resulted in approximately $2.43 million (2019$) in gross revenue on average. In turn, this revenue generated employment, income, value-added, and output impacts of 304 jobs, $8.8 million, $12.5 million, and $24.2 million per year, respectively, on average. Between 2015 and 2019, landings of Atlantic wahoo resulted in approximately $252,500 (2019$) in gross revenue on average. In turn, this revenue generated employment, income, value-added, and output impacts of 32 jobs, $.9 million, $1.3 million, and $2.5 million per year, respectively, on average.

[4] A detailed description of the input/output model is provided in NMFS (2011).

Table 3.3.1.20. Average annual economic impacts in the commercial sector of the Atlantic dolphin fishery. All monetary estimates are in thousands of 2019 dollars and employment is measured in full-time equivalent jobs.

Harvesters	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	51	9	11	71
Income impacts	1,256	260	587	2,104
Total value-added impacts	1,339	927	1,007	3,273
Output Impacts	2,431	2,051	1,951	6,433
Primary dealers/processors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	11	4	8	23
Income impacts	428	395	373	1,196
Total value-added impacts	457	504	703	1,663
Output impacts	1,378	1,038	1,374	3,791
Secondary wholesalers/distributors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	5	1	5	11
Income impacts	255	76	268	599
Total value-added impacts	272	127	458	858
Output impacts	683	249	891	1,824
Grocers	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	22	3	5	29
Income impacts	525	174	263	963
Total value-added impacts	559	281	446	1,286
Output impacts	897	456	876	2,229
Restaurants	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	138	9	22	169
Income impacts	2,105	639	1,206	3,950
Total value-added impacts	2,244	1,141	2,032	5,418
Output impacts	4,104	1,786	4,010	9,899
Harvesters and seafood industry	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	227	26	51	304
Income impacts	4,570	1,544	2,699	8,813
Total value-added impacts	4,872	2,981	4,646	12,498
Output impacts	9,494	5,581	9,102	24,176

Table 3.3.1.21. Average annual economic impacts in the commercial sector of the Atlantic wahoo fishery. All monetary estimates are in thousands of 2019 dollars and employment is measured in full-time equivalent jobs.

Harvesters	Direct	Indirect	Induced	Total
Employment impacts	5	1	1	7
Income impacts	130	27	61	218
Total value-added impacts	139	96	104	340
Output Impacts	252	213	202	667
Primary dealers/processors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	1	0	1	2
Income impacts	44	41	39	124
Total value-added impacts	47	52	73	173
Output impacts	143	108	143	393
Secondary wholesalers/distributors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	1	0	1	1
Income impacts	26	8	28	62
Total value-added impacts	28	13	48	89
Output impacts	71	26	92	189
Grocers	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	2	0	1	3
Income impacts	54	18	27	100
Total value-added impacts	58	29	46	133
Output impacts	93	47	91	231
Restaurants	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	14	1	2	18
Income impacts	218	66	125	410
Total value-added impacts	233	118	211	562
Output impacts	426	185	416	1,027
Harvesters and seafood industry	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	24	3	5	32
Income impacts	474	160	280	914
Total value-added impacts	505	309	482	1,297
Output impacts	985	579	944	2,508

Recreational Sector

The recreational sector is comprised of the private and for-hire modes. The private mode includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire mode is composed of charter boats and headboats (also called party boats). Charter boats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person. The type of service, from a vessel- or passenger-size perspective, affects the flexibility to search different fishing locations during the course of a trip and target different species since larger concentrations of fish are required to satisfy larger groups of anglers.

Landings

Recreational dolphin landings peaked in 2015 and declined in subsequent years (**Table 3.3.1.22**). Landings after 2015 were somewhat variable with no discernible trend through 2019. The distribution of landings between modes was relatively stable during this time. Private vessels accounted for the majority of dolphin landings on average from 2015 through 2019, followed by charter vessels. Headboats were responsible for a very small percentage of the landings with no recorded landings from shore.

Table 3.3.1.22. Recreational landings (lbs ww) and percent distribution of dolphin across all states by mode for 2015-2019.

	Landings (pounds ww)				Percent Distribution		
Year	**Charter vessel**	**Headboat**	**Private**	**Total**	**Charter vessel**	**Headboat**	**Private**
2015	3,554,584	28,018	21,793,379	25,375,982	14.0	0.1	85.9
2016	2,688,390	37,653	13,271,300	15,997,343	16.8	0.2	83.0
2017	2,234,758	16,256	10,398,839	12,649,853	17.7	0.1	82.2
2018	2,025,282	19,048	14,760,669	16,805,000	12.1	0.1	87.8
2019	2,593,634	10,652	9,325,011	11,929,298	21.7	0.1	78.2
AVG	**2,619,330**	**22,325**	**13,909,840**	**16,551,495**	**15.8**	**0.1**	**84.0**

Source: Southeast Fisheries Science Center MRIP FES recreational ACL dataset (1/2/2020) and LA Creel.

Recreational wahoo landings were very unstable from 2015 through 2019 (**Table 3.3.1.23**). Landings were at their highest in 2016, but declined significantly in 2017 and particularly 2018, with a slight rebound in 2019. Private vessels accounted for the majority of wahoo landings on average from 2015 through 2019, followed by charter vessels. Headboats were responsible for a very small percentage of the landings with no recorded landings from shore. Although landings declined in all modes in 2017 and 2018, most of the decline was due to lower landings by private vessels, particularly in 2018. As a result, charter vessels made up a greater percentage of the landings in 2018 and, to a lesser degree, in 2019.

Table 3.3.1.23. Recreational landings (lbs ww) and percent distribution of wahoo across all states by mode for 2015-2019.

	Landings (pounds ww)				Percent Distribution		
Year	**Charter vessel**	**Headboat**	**Private**	**Total**	**Charter vessel**	**Headboat**	**Private**
2015	460,621	5,297	2,477,091	2,943,009	15.7	0.2	84.2
2016	513,786	5,502	4,484,157	5,003,444	10.3	0.1	89.6
2017	317,505	2,748	3,265,538	3,585,791	8.9	0.1	91.1
2018	265,529	913	614,518	880,960	30.1	0.1	69.8
2019	369,450	3,131	1,638,234	2,010,815	18.4	0.2	81.5
AVG	**385,378**	**3,518**	**2,495,908**	**2,884,804**	**13.4**	**0.1**	**86.5**

Source: Southeast Fisheries Science Center MRIP FES recreational ACL dataset (1/2/2020) and LA Creel.

Angler Effort

Recreational effort derived from the MRIP database can be characterized in terms of the number of angler trips as follows:

- Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or the second primary target for the trip. The species did not have to be caught.
- Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.
- Total recreational trips - The total estimated number of recreational trips in the Gulf, regardless of target intent or catch success.

Other measures of effort are possible, such as directed trips (the number of individual angler trips that either targeted or caught a particular species). Estimates of dolphin and wahoo target or catch effort for additional years, and other measures of directed effort, are available at https://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index

Private vessels are represent more than 98% of target effort in the recreational sector. The vast majority of target effort by charter vessels occurs in North Carolina and Florida, while most target effort by private vessels occurs in Florida. Private vessels in Florida are responsible for more than 78% of total target effort for dolphin.

The trends in target effort for dolphin from 2015-2019 differ somewhat from the trend in recreational landings. As with charter landings, target effort by charter vessels was also relatively stable during this time, though it did peak in 2015 and dropped off slightly thereafter. The trend in private vessel effort differs from the trend in private vessel landings. For e.g., there was not a noticeable peak in target effort by private vessels in 2015 as with landings, nor was there a noticeable decline in target effort in 2016. Target effort was relatively stable from 2015-2018 and peaked in 2018. However, as with landings, a significant decline occurred in target effort by private vessels in 2019, and this decline was seen across all states/regions, with the exception of South Carolina.

Although private vessels are also responsible for the vast majority of catch effort for dolphin (90%), catch effort by charter vessels represents about 10% of the total catch effort. Similarly, private vessels in Florida account for the majority of catch effort for dolphin (59%). However, relatively significant amounts of catch effort also occur in North Carolina and the Mid-Atlantic region. As expected, the trends in catch effort mimic the trends in landings, with a noticeable peak occurring in 2015, declines thereafter, and a significant decline in 2019. The significant decline in 2019 was most noticeable for private vessels in Florida.

Table 3.3.1.24. Dolphin recreational target trips, by mode and state/region, 2015-2019.

Mode	Year	EFL	GA	MA*	NE**	NC	SC	Total
Shore	2015	0	0	0	0	1,672	0	1,672
	2016	0	0	0	0	0	0	0
	2017	0	0	0	0	0	0	0
	2018	0	0	0	0	0	0	0
	2019	0	0	0	0	2,399	0	2,399
	Average	0	0	0	0	814	0	814
Charter	2015	15,711	44	5,167	0	11,502	7,080	39,504
	2016	9,773	0	1,696	0	21,092	2,718	35,279
	2017	20,915	0	82	0	8,826	1,465	31,288
	2018	12,414	0	789	0	18,282	108	31,593
	2019	9,432	0	2,997	0	20,501	0	32,930
	Average	13,649	9	2,146	0	16,041	2,274	34,119
Private	2015	1,372,503	0	150,821	9,884	193,319	10,211	1,736,738
	2016	1,191,263	0	172,271	1,387	165,699	15,155	1,545,775
	2017	1,458,030	0	46,009	2,166	114,547	116,061	1,736,813
	2018	1,494,387	0	117,625	3,291	165,782	73,207	1,854,292
	2019	899,456	0	77,288	0	98,753	70,876	1,146,373
	Average	1,283,128	0	112,803	3,346	147,620	57,102	1,603,998
All	2015	1,388,214	44	155,988	9,884	206,493	17,291	1,777,913
	2016	1,201,036	0	174,007	1,387	186,790	17,874	1,581,094
	2017	1,478,945	0	46,091	2,166	123,373	117,526	1,768,101
	2018	1,506,801	0	118,414	3,291	184,064	73,315	1,885,884
	2019	908,888	0	80,285	9,884	121,653	70,876	1,181,702
	Average	1,296,777	9	114,957	4,182	164,475	59,376	1,638,939

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.

*MA represents the Mid-Atlantic states of Virginia, Maryland, Delaware, New Jersey, and New York. Total target trips for the MA in 2016 include 40 trips by party boats.

**NE represents the New England states of Connecticut, Rhode Island, and Massachusetts.

Table 3.3.1.25. Dolphin recreational catch trips, by mode and state/region, 2015-2019.

Mode	Year	EFL	GA	MA*	NE**	NC	SC	Total
Charter	2015	41,874	268	8,141	0	46,496	12,535	109,314
	2016	26,236	66	9,505	0	41,853	2,718	80,378
	2017	22,654	47	1,024	0	38,937	0	62,662
	2018	23,096	0	10,161	0	43,752	108	77,117
	2019	22,688	33	6,974	0	44,560	0	74,255
	Average	27,310	83	7,161	0	43,120	3,072	80,745
Private	2015	648,152	0	127,021	8,666	157,014	2,016	942,869
	2016	478,229	0	131,599	1,612	130,932	26,861	769,233
	2017	494,391	1,308	91,852	3,264	67,975	65,287	724,077
	2018	490,081	0	100,526	3,751	78,437	60,376	733,171
	2019	255,001	0	74,423	0	65,220	43,771	438,415
	Average	473,171	262	105,084	3,459	99,916	39,662	721,553
All	2015	690,026	268	135,162	8,666	203,510	14,551	1,052,183
	2016	504,465	66	141,295	1,612	172,785	29,579	849,802
	2017	517,045	1,355	92,878	3,264	106,912	65,287	786,741
	2018	513,177	0	110,687	3,751	122,189	60,484	810,288
	2019	277,689	33	81,401	0	109,780	43,771	512,674
	Average	500,480	344.4	112,285	3,459	143,035	42,734	802,338

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.
*MA represents the Mid-Atlantic states of Virginia, Maryland, Delaware, New Jersey, and New York. Total catch trips includes 191 trips, 2 trips, and 4 trips by party boats in 2016, 2017, and 2019, respectively.
**NE represents the New England states of Connecticut, Rhode Island, and Massachusetts.

Similar to dolphin, private vessels represent the vast majority of target effort for wahoo (97%). Further, private vessels in Florida account for more than 71% of total target effort for wahoo. As with dolphin, the trends in target effort for wahoo do not mimic the trends in landings from 2015-2019. Unlike landings, which peaked in 2016, declined significantly in 2018, and then increased somewhat in 2019, target effort for wahoo was at its highest level in 2018, and then declined significantly in 2019.

As with dolphin, the charter sector accounts for a larger percentage of catch effort for wahoo (18%) compared to target effort. Still, private vessels are responsible for the majority of catch effort for wahoo (82%). Private vessels in Florida represent half of the total catch effort for wahoo, while the combination of charter and private vessels in North Carolina represent about 28% of the total catch effort. The trends in catch effort for wahoo necessarily reflect the trends in landings, at least to some extent, peaking in 2016, declining significantly in 2017 and particularly 2018, and then increasing somewhat in 2019. However, the declines in catch effort in 2017 and 2018 were significantly greater than the declines in landings in those years. For e.g., while landings decreased by about 30% from 2016 to 2017, catch effort decreased by almost 64%.

Table 3.3.1.26. Wahoo recreational target trips, by mode and state/region, 2015-2019.

Mode	Year	EFL	GA	MA*	NC	SC	Total
Charter	2015	2,877	224	0	6,700	0	9,801
	2016	1,435	0	0	5,744	617	7,796
	2017	3,457	0	0	5,182	0	8,639
	2018	0	0	0	2,892	0	2,892
	2019	925	0	225	6,399	0	7,549
	Average	1,739	45	45	5,383	123	7,335
Private	2015	167,739	0	854	55,377	8,744	232,714
	2016	247,741	0	16,608	43,545	14,127	322,021
	2017	201,943	0	1,043	51,675	39,190	293,851
	2018	272,907	0	5,780	33,900	22,306	334,893
	2019	150,033	8,298	11,394	25,172	45,459	240,356
	Average	208,073	1,660	7,136	41,934	25,965	284,767
All	2015	170,616	224	854	62,077	8,744	242,515
	2016	249,176	0	16,608	49,289	14,744	329,817
	2017	205,400	0	1,043	56,857	39,190	302,490
	2018	272,907	0	5,780	36,792	22,306	337,785
	2019	150,958	8,298	11,619	31,571	45,459	247,905
	Average	209,811	1,704	7,181	47,317	26,089	292,102

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.
*MA represents the Mid-Atlantic states of Virginia, Maryland, Delaware, New Jersey, and New York.

Table 3.3.1.27. Wahoo recreational catch trips, by mode and state/region, 2015-2019.

Mode	Year	EFL	MA*	NC	SC	Total
Charter	2015	10,118	812	18,468	0	29,398
	2016	8,339	56	13,169	2,873	24,437
	2017	1,832	0	15,090	0	16,922
	2018	4,576	112	9,067	0	13,755
	2019	2,390	75	12,766	0	15,231
	Average	5,451	211	13,712	575	19,949
Private	2015	35,580	22,412	29,665	1,815	89,472
	2016	189,762	8,916	36,950	0	235,628
	2017	25,430	38,115	13,564	0	77,109
	2018	11,040	859	4,535	6,811	23,245
	2019	22,631	5,531	4,953	8,206	41,321
	Average	56,889	15,167	17,933	3,366	93,355
All	2015	45,698	23,224	48,133	1,815	118,870
	2016	198,101	8,972	50,119	2,873	260,065
	2017	27,262	38,115	28,654	0	94,031
	2018	15,616	971	13,602	6,811	37,000
	2019	25,021	5,606	17,719	8,206	56,552
	Average	62,340	15,378	31,645	3,941	113,304

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.
*MA represents the Mid-Atlantic states of Virginia, Maryland, Delaware, New Jersey, and New York.

As shown in **Tables 3.3.1.28** and **3.3.1.29**, across all modes, target effort for dolphin was the highest in the 4th wave (July-Aug) followed by the 3rd wave (May-June). Target effort by charter vessels was the highest in wave 3. Similarly, catch effort for dolphin was the highest in the 3rd wave followed by the 4th wave across all modes as well as within the charter and private vessel modes. Target and catch effort were the lowest in wave 1 (Jan-Feb) and wave 6 (Nov-Dec) across all modes.

Table 3.3.1.28. Dolphin target trips by wave and mode, 2015–2019.*

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)	Total
	Shore						
2015	0	0	0	0	1,672	0	1,672
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0
2019	0	0	2,399	0	0	0	2,399
Average	0	0	480	0	334	0	814
	Charter						
2015	765	4,053	17,844	7,233	4,995	4,615	39,505

2016	1,967	4,168	16,259	8,684	3,774	428	35,280
2017	390	11,508	8,986	6,689	937	2,778	31,288
2018	691	4,230	17,515	5,342	3,147	666	31,591
2019	1,020	3,758	16,862	8,140	2,862	289	32,931
Average	967	5,543	15,493	7,218	3,143	1,755	34,119
	Private/Rental						
2015	14,200	202,747	605,924	587,489	229,958	96,422	1,736,740
2016	81,532	106,763	617,810	538,926	90,763	109,983	1,545,777
2017	79,394	179,826	614,135	645,010	96,929	121,519	1,736,813
2018	92,025	249,648	495,371	616,274	315,576	85,400	1,854,294
2019	57,875	87,400	376,360	512,208	68,288	44,241	1,146,372
Average	65,005	165,277	541,920	579,981	160,303	91,513	1,603,999
	All						
2015	14,965	206,800	623,768	594,722	236,625	101,037	1,777,917
2016	83,499	110,931	634,069	547,610	94,577	110,411	1,581,097
2017	79,784	191,334	623,121	651,699	97,866	124,297	1,768,101
2018	92,716	253,878	512,886	621,616	318,723	86,066	1,885,885
2019	58,895	91,158	395,621	520,348	71,150	44,530	1,181,702
Average	65,972	170,820	557,893	587,199	163,788	93,268	1,638,940

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads

* Total target trips in 2016 include 40 trips by party boats.

Table 3.3.1.29. Dolphin catch trips by wave and mode, 2015– 2019.*

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)	Total
	Charter						
2015	2,117	12,424	35,899	28,979	19,290	10,605	109,314
2016	5,278	15,801	27,595	22,328	8,281	1,096	80,379
2017	878	7,753	27,534	16,339	8,090	2,068	62,662
2018	2,045	3,804	37,202	22,206	10,276	1,583	77,116
2019	950	5,948	36,144	21,945	7,416	1,851	74,254
Average	2,254	9,146	32,875	22,359	10,671	3,441	80,745
	Private/Rental						
2015	4,673	98,084	340,995	321,988	148,732	28,397	942,869
2016	30,532	63,299	326,145	277,737	60,695	10,826	769,234
2017	15,543	45,278	276,680	291,599	64,627	30,349	724,076
2018	28,786	75,802	242,570	211,435	152,391	22,188	733,172
2019	9,989	45,996	144,041	196,869	37,364	4,155	438,414
Average	17,905	65,692	266,086	259,926	92,762	19,183	721,553

	All						
2015	6,790	110,508	376,894	350,967	168,022	39,002	1,052,183
2016	35,810	79,100	353,740	300,256	68,976	11,922	849,804
2017	16,421	53,031	304,214	307,938	72,719	32,417	786,740
2018	30,831	79,606	279,772	233,641	162,667	23,771	810,288
2019	10,939	51,944	180,185	218,818	44,780	6,006	512,672
Average	20,158	74,838	298,961	282,324	103,433	22,624	802,337

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads

* Total catch trips includes 191 trips, 2 trips, and 4 trips by party boats in 2016, 2017, and 2019, respectively.

As shown in **Tables 3.3.1.30** and **3.3.1.31**, across all modes and within the private and charter vessel modes, target and catch effort for wahoo was the highest in the 4th wave (July-Aug), with effort being considerably lower in all other waves. Target effort for wahoo was the lowest in the 6th wave (Nov/Dec) while catch effort was lowest in the 1st wave (Jan/Feb).

Table 3.3.1.30. Wahoo target trips by wave and mode, 2015–2019.*

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)	Total
	Charter						
2015	279	667	1,677	3,068	3,858	253	9,802
2016	0	522	3,051	2,299	1,706	216	7,794
2017	0	3,426	284	2,753	1,686	490	8,639
2018	0	17	381	1,337	1,098	58	2,891
2019	0	718	1,339	3,901	1,366	225	7,549
Average	56	1,070	1,346	2,672	1,943	248	7,335
	Private/Rental						
2015	18,171	9,112	54,487	109,241	40,152	1,551	232,714
2016	41,997	48,454	40,637	80,115	43,040	67,778	322,021
2017	36,678	59,957	96,777	63,590	14,499	22,349	293,850
2018	75,769	39,272	32,929	87,662	72,351	26,911	334,894
2019	77,267	29,477	20,346	68,551	29,822	14,891	240,354
Average	49,976	37,254	49,035	81,832	39,973	26,696	284,767
	All						
2015	18,450	9,779	56,164	112,309	44,010	1,804	242,516
2016	41,997	48,976	43,688	82,414	44,746	67,994	329,815
2017	36,678	63,383	97,061	66,343	16,185	22,839	302,489
2018	75,769	39,289	33,310	88,999	73,449	26,969	337,785
2019	77,267	30,195	21,685	72,452	31,188	15,116	247,903
Average	50,032	38,324	50,382	84,503	41,916	26,944	292,102

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads

Table 3.3.1.31. Wahoo catch trips by wave and mode, 2015– 2019.*

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)	Total
	Charter						
2015	0	2,569	7,243	12,930	4,568	2,088	29,398
2016	2,832	8,875	3,285	4,308	4,694	444	24,438
2017	0	2,385	596	6,352	6,855	735	16,923
2018	0	891	5,327	3,927	3,453	157	13,755
2019	0	2,026	2,556	5,450	3,932	1,267	15,231
Average	566	3,349	3,801	6,593	4,700	938	19,949
	Private/Rental						
2015	5,354	672	23,199	48,583	11,164	500	89,472
2016	14,070	30,803	17,482	106,481	19,561	47,231	235,628
2017	5,203	3,433	2,228	57,322	3,154	5,770	77,110
2018	5,808	5,886	4,056	2,038	888	4,570	23,246
2019	12,868	8,335	527	3,565	9,554	6,471	41,320
Average	8,661	9,826	9,498	43,598	8,864	12,908	93,355
	All						
2015	5,354	3,241	30,442	61,513	15,732	2,588	118,870
2016	16,902	39,678	20,767	110,789	24,255	47,675	260,066
2017	5,203	5,818	2,824	63,674	10,009	6,505	94,033
2018	5,808	6,777	9,383	5,965	4,341	4,727	37,001
2019	12,868	10,361	3,083	9,015	13,486	7,738	56,551
Average	9,227	13,175	13,300	50,191	13,565	13,847	113,304

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads

Similar analysis of recreational effort is not possible for the headboat mode in the South Atlantic because headboat data are not collected at the angler level. Estimates of effort by the headboat mode are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. The stationary "fishing for demersal (bottom-dwelling) species" nature of headboat fishing, as opposed to trolling, suggests that most, if not all, headboat trips and, hence, angler days, are demersal or snapper grouper trips by intent.

Headboat angler days were highly variable across the South Atlantic states from 2015 through 2019 (**Table 3.3.1.32**). Florida and Georgia were responsible for the vast majority of headboat effort during this time, accounting for about 72% of the total headboat effort. However, headboat effort in Florida and Georgia declined significantly in 2017 (about 36%) and remained at a much lower level through 2019. Headboat effort in North Carolina also declined

somewhat significantly (about 22%), but a year later in 2018. Headboat effort in South Carolina vacillated slightly during this time, but was relatively stable comparatively.

Table 3.3.1.32. South Atlantic headboat angler days and percent distribution by state (2015-2019).

	Angler Days			Percent Distribution		
	EFL/GA*	**NC**	**SC**	**EFL/GA**	**NC**	**SC**
2015	194,979	22,716	39,702	75.8%	8.8%	15.4%
2016	196,660	21,565	42,207	75.5%	8.3%	16.2%
2017	126,126	20,170	36,914	68.8%	11.0%	20.1%
2018	120,560	16,813	37,611	68.9%	9.6%	21.5%
2019	119,712	15,546	41,470	67.7%	8.8%	23.5%
Average	151,607	19,362	39,581	71.3%	9.3%	19.3%

*East Florida and Georgia are combined for confidentiality purposes.
Source: NMFS Southeast Region Headboat Survey (SRHS).

For-hire Permits

There are no specific federal permitting requirements for recreational anglers to fish for or harvest dolphin or wahoo. The same is true of private recreational vessel owners. Instead, private anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. As a result, it is not possible to identify with available data how many individual anglers or private recreational vessels would be expected to be affected by the actions in this amendment.

A federal charter/headboat (for-hire) vessel permit is required for fishing in federal waters for Atlantic dolphin and wahoo. For-hire permits Atlantic dolphin and wahoo are open access permits (i.e., access is not restricted). From 2015-2019, the number of permits that were valid in a given year has continually increased, increasing by more than 21% over this time, as illustrated in **Table 3.3.1.33**. As of October 1, 2020, there were 1,801 valid for-hire Atlantic dolphin wahoo permits.

Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, if a vessel meets the selection criteria used by the SRHS and is selected to report by the Science Research Director of the SEFSC, it is determined to operate primarily as a headboat and is required to submit harvest and effort information to the SRHS.

Table 3.3.1.33. Number of valid for-hire Atlantic dolphin wahoo permits, 2015-2019.

Year	Number of Permits
2015	1,943
2016	2,029
2017	2,150
2018	2,300
2019	2,360

Source: NMFS SERO SF Access Permits Database.

Souza and Liese (2019) estimate that approximately 10% of all permitted Southeast (Gulf and South Atlantic) for-hire vessels determined to be headboats were not actively fishing in 2017.[5] Further, of those that were active, 14% were not active in offshore waters. Thus, approximately 23% of the permitted Southeast headboats were likely not active in the EEZ.

Based on the information in **Table 3.3.1.34**, the number of federally permitted South Atlantic headboats in the SRHS that harvested dolphin varied somewhat from 2015-2019 (K. Fitzpatrick, NMFS SEFSC, pers. comm.), ranging from a high of 60 in 2016 to a low of 36 in 2019 and averaging 50 during this time. The trend in the number of active headboats is consistent with the trend in headboat landings of dolphin as illustrated in **Table 3.3.1.22**.

The number of federally permitted South Atlantic headboats in the SRHS that harvested wahoo also varied somewhat from 2015-2019 (K. Fitzpatrick, NMFS SEFSC, pers. comm.) and generally declined during this time, ranging from a high of 26 in 2015 to a low of 13 in 2018 and averaging 19 during this time. The trend in the number of active headboats is generally consistent with the trend in headboat landings of wahoo as illustrated in **Table 3.3.1.23**.

Table 3.3.1.34. Number of South Atlantic headboats harvesting dolphin and wahoo, 2015-2019.

Year	Number of Dolphin Headboats	Number of Wahoo Headboats
2015	55	26
2016	60	22
2017	48	17
2018	50	13
2019	36	16
Average	50	19

Source: K. Fitzpatrick, NMFS SEFSC, pers. comm.

With respect to permitted South Atlantic charter vessels, Souza and Liese (2019) estimate estimate that 29% were not active in 2017, while 4% of those that were active were not active in offshore waters. Thus, approximately 33% of the permitted South Atlantic charter vessels were likely not active in the EEZ in 2017. Estimates of the number of permitted charter vessels that specifically harvested dolphin or wahoo are not available based on current data.

Economic Value

Participation, effort, and harvest are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The economic value of this satisfaction is referred to as consumer surplus (CS). The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept. These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips. For example, the estimated value of the CS for catching and keeping a second dolphin[6] on an angler trip is approximately $16.07 (2019$), and

[5] Sample sizes were too small to generate reliable estimates for Gulf and South Atlantic headboats separately. Also, Souza and Liese's estimates were not specific to particular fisheries such as dolphin wahoo.

[6] The study only considered trips with at least one fish caught and kept in its experimental design; thus, an estimate for the first caught and kept fish is not available.

decreases thereafter (approximately $10.71 for a third dolphin, $7.89 for a fourth dolphin, $6.22 for a fifth dolphin, and $5.13 for a 6th dolphin) (Carter and Liese 2012). Carter and Liese (2012) did not produce estimates specific to wahoo. Their estimates for dolphin are probably not good proxies for wahoo. Instead, their estimates for king mackerel are likely the best available proxies for wahoo for various reasons. First, wahoo are caught more rarely than dolphin, as they are more of a solitary fish as opposed to a schooling fish like dolphin, and thus are likely more valuable. Further, they are considered a "prize" catch by anglers on trips when they are caught, which suggests they are highly valued in a relative sense. Wahoo are also in the same family (Scombridae) as king mackerel and the bag limit for wahoo is much more similar to the bag limit for king mackerel than for dolphin. According to Carter and Liese (2012), the estimated values of the CS per fish for a second, third, fourth, and fifth king mackerel kept on a trip are approximately $105, $71, $52, and $41 in 2019$.

Estimates of average annual gross revenue for charter vessels are only available from Holland (2012). After adjusting for inflation, the best available estimate of average annual charter vessel revenue is $125,352 (2019$). Holland (2012) also provided an estimate of average annual gross revenue for South Atlantic headboats, which is $221,617 in 2019$. However, a more recent estimate of average annual gross revenue for South Atlantic headboats is available from D. Carter (pers. comm., March 15, 2018). D. Carter (2018) recently estimated that average annual gross revenue for South Atlantic headboats were approximately $304,103 (2019$) in 2017. This estimate is likely the best current estimate of annual gross revenue for South Atlantic headboats as it is based on a relatively large sample and is more recent. The difference in the Holland (2012) and Carter (2018) estimate for headboats suggests that the estimate for charter vessels based on Holland (2012) is likely an underestimate of current average annual revenue for charter vessels.

However, gross revenues overstate the annual economic value and profits generated by for-hire vessels. Economic value for for-hire vessels can be measured by annual PS. In general, PS is the amount of money a vessel owner earns in excess of variable (trip) costs. Economic profit is the amount of money a vessel owner earns in excess of variable and fixed costs, inclusive of all implicit costs, such as the value of a vessel owner's time as captain and as entrepreneur, and the cost of using physical capital (i.e., depreciation of the vessel and gear). Estimates of PS and economic profit for headboats is not available from D. Carter (2018) as that study did not collect cost data. Although Holland (2012) did collect cost data, concerns have been raised about the accuracy of their cost estimates, and thus estimates of average annual vessel PS and profit have not been generated using those estimates.

With regard to for-hire trips, economic value can be measured by PS per angler trip, which represents the amount of money that a vessel owner earns in excess of the cost of providing the trip. Estimates of trip revenue, trip costs, and trip net revenue trips taken by headboats and charter vessels in 2017 are available from Souza and Liese (2019). They also provide estimates of net cash flow per angler trip, which approximate PS per angler trip. As shown in **Table 3.3.1.35**, after accounting for transactions fees, supply costs, and labor costs, net revenue per trip was 42% of revenue for South Atlantic charter vessels and 54% of revenue for Southeast headboats, or $553 and $1,812 (2019$), respectively. Given the respective average number of anglers per trip for each fleet, PS per angler trip is estimated to be $118 for charter vessels and $64 for headboats.

Table 3.3.1.35. Trip economics for offshore trips by South Atlantic charter vessels and Southeast headboats in 2017 (2019$).

	South Atlantic Charter Vessels	Southeast Headboats
Revenue	100%	100%
Transaction Fees (% of revenue)	3%	6%
Supply Costs (% of revenue)	29%	19%
Labor Costs (% of revenue)	28%	22%
Net Revenue per trip including Labor costs (% of revenue)	40%	54%
Net Revenue per Trip	$553	$1,812
Average # of Anglers per Trip	4.7	28.2
Trip Net Cash Flow per Angler Trip	$118	$64

Economic Impacts

The desire for recreational fishing generates economic activity as consumers spend their income on various goods and services needed for recreational fishing. This spurs economic activity in the region where recreational fishing occurs. In the absence of the opportunity to fish, the income would likely be spent on other goods and services and these expenditures would similarly generate economic activity in the region where the expenditure occurs. As such, the analysis below represents a distributional analysis only.

Estimates of the economic impacts resulting from headboat target effort for reef fish are not available. Headboat vessels are not covered in MRIP so, in addition to the absence of estimates of target effort, estimates of the appropriate business activity coefficients for headboat effort have not been generated.

Estimates of the economic impacts (business activity) associated with recreational angling for Atlantic dolphin wahoo were calculated using average trip-level impact coefficients derived from the 2016 Fisheries Economics of the U.S. report (NMFS 2018b) and underlying data provided by the NOAA Office of Science and Technology. Economic impact estimates were adjusted to 2019 dollars using the annual, not seasonally adjusted gross domestic product implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Recreational fishing generates economic impacts (business activity). Business activity for the recreational sector is characterized in the form of jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), value-added impacts (the difference between the value of goods and the cost of materials or supplies), and output impacts (gross business sales).

Addition of the state-level estimates to produce a regional (or national) total may underestimate the actual amount of total business activity because state-level impact multipliers do not account for interstate and interregional trading. National-level multipliers must be used to account for interstate and interregional trading. Estimates of economic impacts from target trips for dolphin in the South Atlantic using national-level multipliers are provided in **Table 3.3.1.36**.

Estimates of average target effort for dolphin by mode and state (2015 through 2019) in the South Atlantic and the associated business activity are provided in **Table 3.3.1.37**. The

estimates provided in **Table 3.3.1.37** use state-level multipliers and thus only apply at the state-level. For example, estimates of business activity in Florida represent business activity in Florida only and not to other states (for e.g., a good purchased in Florida may have been manufactured in a neighboring state) or the nation as a whole. The same holds true for each of the other states. Income impacts should not be added to output (sales) impacts because this would result in double counting. The results provided should be interpreted with caution and demonstrate the limitations of these types of assessments. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species.

Economic impact estimates for dolphin target effort using national multipliers and state multipliers for the Mid-Atlantic states are provided in **Table 3.3.1.38** and **Table 3.3.1.39** and for the New England states in **Table 3.3.1.40** and **Table 3.3.1.41**. Between 2015 and 2019, across all regions and using national-level multipliers, dolphin target effort generated employment, income, value-added, and output (sales) impacts of 1,409 jobs, $71.7 million, $128.5 million, and $226.2 million per year, respectively, on average.

Table 3.3.1.36. Estimated economic impacts from South Atlantic dolphin recreational target trips to U.S., using national multipliers. All monetary estimates are in 2019 dollars.

Mode	Total # of Trips	Value Added Impacts ($ thousands)	Sales Impacts ($ thousands)	Income Impacts ($ thousands)	Employment Impacts (Jobs)
Charter	52,443	$20,779	$36,487	$12,153	288
Private/Rental	1,808,720	$99,265	$174,863	$54,868	1,032
Shore	814	$82	$141	$47	1

Table 3.3.1.37. Estimated economic impacts from average annual South Atlantic dolphin recreational target trips by state and mode (2015-2019), using state-level multipliers. All monetary estimates are in thousands of 2019$ and employment is in full-time equivalent jobs.

	NC	SC	GA	FL
	Charter Mode			
Target Trips	16,041	2,274	9	34,119
Value Added Impacts	$6,759	$554	$2	$7,999
Sales Impacts	$11,741	$963	$3	$13,425
Income Impacts	$3,977	$320	$1	$4,730
Employment (Jobs)	120	11	0	127
	Private/Rental Mode			
Target Trips	147,620	57,102	0	1,603,998
Value Added Impacts	$4,602	$1,331	$0	$44,185
Sales Impacts	$7,609	$2,044	$0	$65,924
Income Impacts	$2,655	$627	$0	$21,829
Employment (Jobs)	73	26	0	637
	Shore			

Target Trips	814	0	0	0
Value Added Impacts	$51	$0	$0	$0
Sales Impacts	$84	$0	$0	$0
Income Impacts	$30	$0	$0	$0
Employment (Jobs)	1	0	0	0
	All Modes			
Target Trips	164,475	59,376	9	1,638,117
Value Added Impacts	$11,412	$1,886	$2	$52,185
Sales Impacts	$19,434	$3,007	$3	$79,349
Income Impacts	$6,661	$947	$1	$26,559
Employment (Jobs)	194	36	0	764

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.

Table 3.3.1.38. Estimated economic impacts from Mid-Atlantic dolphin recreational target trips to U.S., using national multipliers. All monetary estimates are in 2019 dollars.

Mode	Total # of Trips	Value Added Impacts ($ thousands)	Sales Impacts ($ thousands)	Income Impacts ($ thousands)	Employment Impacts (Jobs)
Charter	2,155	$454	$797	$265	6
Private/Rental	112,802	$7,725	$13,608	$4,270	80

Table 3.3.1.39. Estimated economic impacts from average annual Mid-Atlantic dolphin recreational target trips by state and mode (2015-2019), using state-level multipliers. All monetary estimates are in thousands of 2019$ and employment is in full-time equivalent jobs.

	NY	NJ	DE	MD	VA
	For-hire Mode				
Target Trips	177	1,137	26	357	458
Value Added Impacts	$19	$125	$3	$61	$123
Sales Impacts	$30	$199	$6	$99	$207
Income Impacts	$11	$72	$2	$38	$69
Employment (Jobs)	0	2	0	1	2
	Private/Rental Mode				
Target Trips	12,583	38,227	1,627	50,428	9,937
Value Added Impacts	$411	$1,803	$56	$1,363	$314
Sales Impacts	$527	$2,840	$91	$2,156	$486
Income Impacts	$235	$1,124	$28	$795	$171
Employment (Jobs)	6	16	1	21	4
	All Modes				
Target Trips	12,760	39,364	1,653	50,785	0

Value Added Impacts	$430	$1,928	$59	$1,423	$0
Sales Impacts	$557	$3,038	$96	$2,255	$0
Income Impacts	$246	$1,196	$30	$833	$0
Employment (Jobs)	7	18	1	22	0

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.

Table 3.3.1.40. Estimated economic impacts from New England dolphin recreational target trips to U.S., using national multipliers. All monetary estimates are in 2019 dollars.

Mode	Total # of Trips	Value Added Impacts ($ thousands)	Sales Impacts ($ thousands)	Income Impacts ($ thousands)	Employment Impacts (Jobs)
Private/Rental	3,345	$183	$322	$101	2

Table 3.3.1.41. Estimated economic impacts from average annual New England dolphin recreational target trips by state and mode (2015-2019), using state-level multipliers. All monetary estimates are in thousands of 2019$ and employment is in full-time equivalent jobs.

	ME	NH	MA	RI	CT
	For-hire Mode				
Target Trips	0	0	0	0	0
Value Added Impacts	$0	$0	$0	$0	$0
Sales Impacts	$0	$0	$0	$0	$0
Income Impacts	$0	$0	$0	$0	$0
Employment (Jobs)	0	0	0	0	0
	Private/Rental Mode				
Target Trips	0	0	1,312	1,248	785
Value Added Impacts	$0	$0	$38	$24	$21
Sales Impacts	$0	$0	$56	$32	$27
Income Impacts	$0	$0	$28	$17	$11
Employment (Jobs)	0	0	0	0	0
	Shore				
Target Trips	0	0	0	0	0
Value Added Impacts	$0	$0	$0	$0	$0
Sales Impacts	$0	$0	$0	$0	$0
Income Impacts	$0	$0	$0	$0	$0
Employment (Jobs)	0	0	0	0	0
	All Modes				
Target Trips	0	0	1,312	1,248	785
Value Added Impacts	$0	$0	$38	$24	$21

Sales Impacts	$0	$0	$56	$32	$27
Income Impacts	$0	$0	$28	$17	$11
Employment (Jobs)	0	0	0	0	0

Economic impact estimates for wahoo target effort using national multipliers and state multipliers for the South Atlantic states, and Mid-Atlantic states are provided in **Tables 3.3.1.42** and **3.3.1.43** and **Tables 3.3.1.44** and **3.3.1.45**, respectively. Between 2015 and 2019, across all regions and using national-level multipliers, wahoo target effort generated employment, income, value-added, and output (sales) impacts of 132 jobs, $7 million, $12.7 million, and $22.4 million per year, respectively, on average.

Table 3.3.1.42. Estimated economic impacts from South Atlantic wahoo recreational target trips to U.S., using national multipliers. All monetary estimates are in 2019 dollars.

Mode	Total # of Trips	Value Added Impacts ($ thousands)	Sales Impacts ($ thousands)	Income Impacts ($ thousands)	Employment Impacts (Jobs)
Charter	7,290	$3,807	$6,685	$2,227	53
Private/Rental	219,322	$12,171	$21,441	$6,728	127

Table 3.3.1.43. Estimated economic impacts from average annual South Atlantic wahoo recreational target trips by state and mode (2015-2019), using state-level multipliers. All monetary estimates are in thousands of 2019$ and employment is in full-time equivalent jobs.

	NC	SC	GA	FL
	Charter Mode			
Target Trips	5,383	123	45	1,739
Value Added Impacts	$2,268	$30	$8	$408
Sales Impacts	$3,940	$52	$14	$684
Income Impacts	$1,334	$17	$5	$241
Employment (Jobs)	40	1	0	6
	Private/Rental Mode			
Target Trips	41,934	25,695	1,660	150,033
Value Added Impacts	$1,307	$599	$41	$4,133
Sales Impacts	$2,161	$920	$63	$6,166
Income Impacts	$754	$282	$20	$2,042
Employment (Jobs)	21	12	1	60
	Shore			
Target Trips	0	0	0	0
Value Added Impacts	$0	$0	$0	$0
Sales Impacts	$0	$0	$0	$0
Income Impacts	$0	$0	$0	$0
Employment (Jobs)	0	0	0	0

	All Modes			
Target Trips	47,317	25,818	1,705	151,772
Value Added Impacts	$3,575	$629	$50	$4,541
Sales Impacts	$6,102	$972	$77	$6,851
Income Impacts	$2,089	$299	$25	$2,283
Employment (Jobs)	61	12	1	66

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.

Table 3.3.1.44. Estimated economic impacts from Mid-Atlantic wahoo recreational target trips to U.S., using national multipliers. All monetary estimates are in 2019 dollars.

Mode	Total # of Trips	Value Added Impacts ($ thousands)	Sales Impacts ($ thousands)	Income Impacts ($ thousands)	Employment Impacts (Jobs)
Charter	45	$17	$29	$10	0
Private/Rental	7,136	$516	$909	$285	5

Table 3.3.1.45. Estimated economic impacts from average annual Mid-Atlantic wahoo recreational target trips by state and mode (2015-2019), using state-level multipliers. All monetary estimates are in thousands of 2019$ and employment is in full-time equivalent jobs.

	NY	NJ	DE	MD	VA
	For-hire Mode				
Target Trips	0	0	0	0	45
Value Added Impacts	$0	$0	$0	$0	$12
Sales Impacts	$0	$0	$0	$0	$20
Income Impacts	$0	$0	$0	$0	$7
Employment (Jobs)	0	0	0	0	0
	Private/Rental Mode				
Target Trips	0	2,564	467	750	3,355
Value Added Impacts	$0	$121	$16	$20	$106
Sales Impacts	$0	$190	$26	$32	$164
Income Impacts	$0	$75	$8	$12	$58
Employment (Jobs)	0	1	0	0	1
	Shore				
Target Trips	0	0	0	0	0
Value Added Impacts	$0	$0	$0	$0	$0
Sales Impacts	$0	$0	$0	$0	$0
Income Impacts	$0	$0	$0	$0	$0
Employment (Jobs)	0	0	0	0	0
	All Modes				

Target Trips	0	2,564	467	750	3,400
Value Added Impacts	$0	$121	$16	$20	$118
Sales Impacts	$0	$190	$26	$32	$185
Income Impacts	$0	$75	$8	$12	$65
Employment (Jobs)	0	1	0	0	2

Source: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.

3.3.2 Social Environment

Social Importance of Fishing

Socio-cultural values are qualitative in nature making it difficult to measure social valuation of marine resources and fishing activity. The following description includes multiple approaches to examining fishing importance. These spatial approaches focus on the community level (based on the address of dealers or permit holders) and identify importance by "community," defined according to geo-political boundaries (cities). A single county may thus have several communities identified as reliant on fishing and the boundaries of these communities are not discrete in terms of residence, vessel homeport, and dealer address. For example, a fisherman may reside in one community, homeport his vessel in another, and land his catch in yet another.

One approach to identify communities with the greatest engagement utilizes measures called the Regional Quotient (RQ). The RQ is a way to measure the relative importance of a given species across all communities in the region and represents the proportional distribution of commercial landings of a particular species. This proportional measure does not provide the number of pounds or the value of the catch, data which might be confidential at the community level for many places. The RQ is calculated by dividing the total pounds (or value) of a species landed in a given community, by the total pounds (or value) for that species for all communities in the region. For most species, the top fifteen communities are reported as they usually encompass most of the landings. At this time, we do not have a comparable measure for recreational fishing but do have other measures of engagement for that sector.

These measures are an attempt to quantify the importance of the components of a particular fishery to communities along the Atlantic coast and suggest where impacts from management actions are more likely to be experienced. The descriptions of the dolphin wahoo fishery that follow include these quantitative measures in addition to qualitative information about the communities.

Dolphin Wahoo Fishery

A description of the social environment of the dolphin wahoo fishery is contained in Dolphin Wahoo Amendment 5 (SAFMC 2013) and is incorporated herein by reference where appropriate. The South Atlantic, Mid-Atlantic, and New England regions are included in the description of the social environment. The referenced description focuses on available geographic and demographic data to identify communities with strong relationships with dolphin or wahoo fishing (i.e., significant landings and revenue), and positive or negative impacts from regulatory change are expected to occur in places with greater landings of wahoo or dolphin.

The descriptions of South Atlantic communities in Amendment 5 (SAFMC 2013) include information about the top communities based upon permits, regional quotients of commercial landings and value for dolphin and wahoo and fishing engagement and reliance for both commercial and recreational sectors. These top communities are referred to in this document as "dolphin communities" and "wahoo communities" because these are the areas that would be most likely to experience the effects of proposed actions that could change the dolphin or wahoo fisheries and impact the participants and associated businesses and communities within the region. Additionally, the descriptions in Amendment 5 (SAFMC 2013) for all Atlantic regions also include reliance and engagement indices to identify other areas in which dolphin and wahoo fishing is important, and provide information of how a community overall is involved with commercial and recreational fishing and could experience effects from regulatory actions for any species (see Amendment 5 for more details about the reliance and engagement indices). The identified communities in this section are referenced in the social effects analyses in **Section 4** in order to provide information on how the alternatives could affect specific areas. Overall, the dolphin and wahoo fisheries are primarily recreational, and effort and landings predominantly occur in south Florida and the Florida Keys.

Atlantic Dolphin and Wahoo Permits

Monroe County, Florida has more commercial dolphin wahoo permits than any other county depicted in **Figure 3.3.2.1**. Palm Beach County, Florida and Carteret County, North Carolina are next which makes North Carolina and Florida the states with the most concentrated number of commercial dolphin wahoo permits. The trend for most counties is fairly stable from 2015 to 2019 with little increase or decrease in the number of permits.

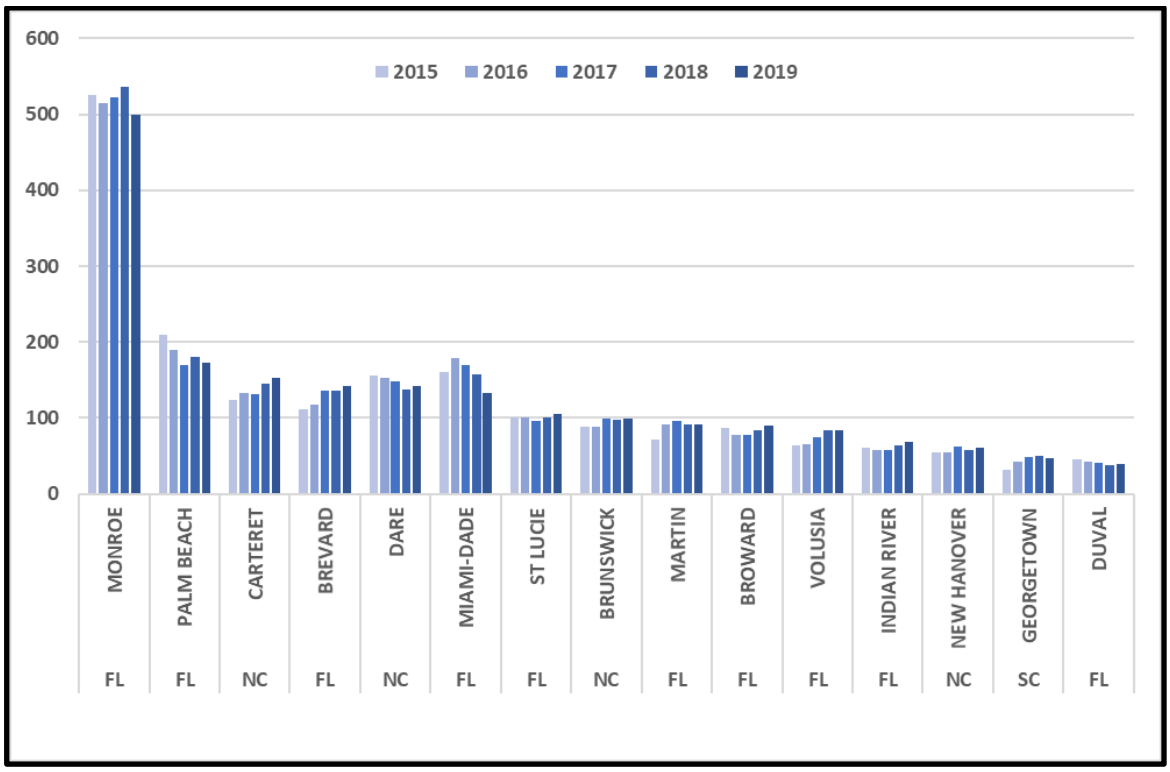

Figure 3.3.2.1. Atlantic commercial dolphin wahoo permits by South Atlantic county for 2015-2019. (Source: SERO Permits database 2020).

Commercial dolphin wahoo permits by county in the Northeast are depicted in **Figure 3.3.2.2** with Ocean County, New Jersey and Suffolk County, New York having the majority of permits. Counties in several Mid-Atlantic states and a few Northeast states are also included in the top 15, but with far fewer permits. For most the trend has been variable but several counties have seen a decrease in the number of permits after seeing an increase from 2015 to 2019.

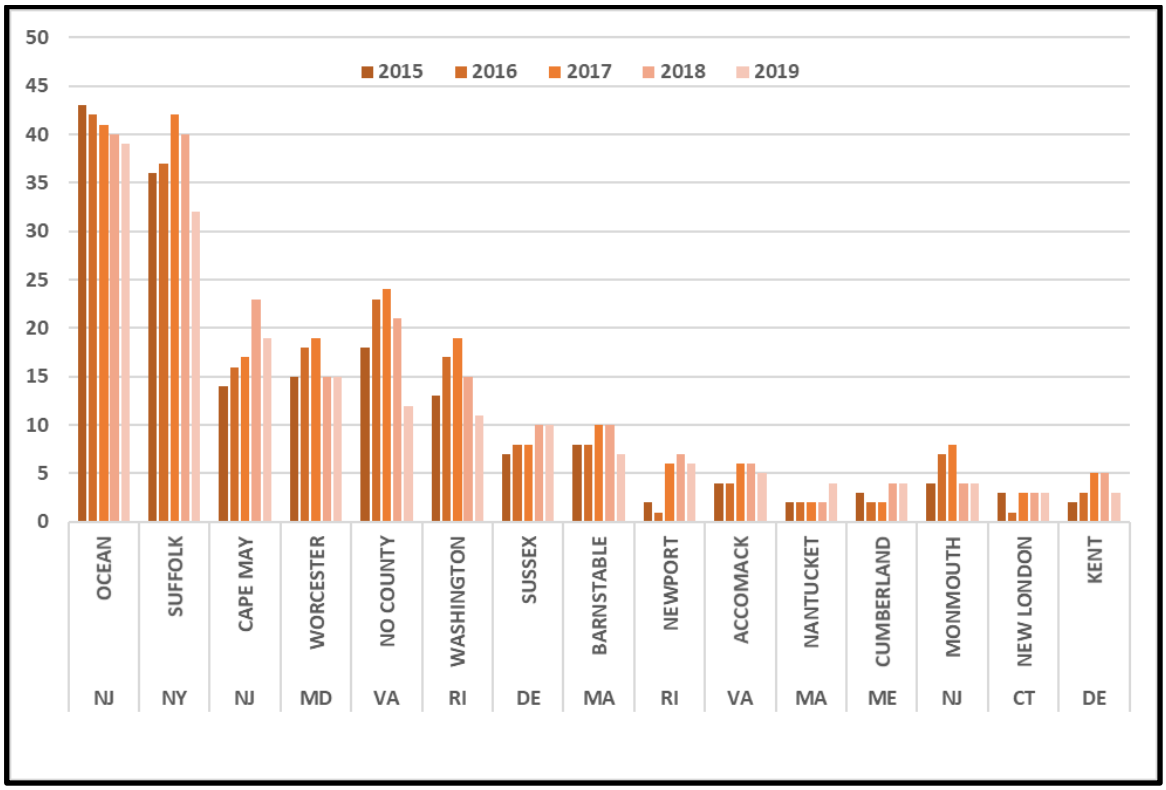

Figure 3.3.2.2. Atlantic commercial dolphin wahoo permits by Northeast county for 2015-2019. (Source: SERO Permits database 2020).

Monroe County, Florida has far more for-hire dolphin wahoo permits than other counties in the South Atlantic region (**Figure 3.3.2.3)** and has seen a substantial increase in recent years. Although other counties in southeast Florida are represented within the top 15, more counties from North Carolina and South Carolina are ranked in the top six than were represented in the commercial sector rankings of dolphin wahoo permits. The for-hire sector seems to have a more even spread of permits throughout the South Atlantic region states than the commercial permits with more counties from both North Carolina and South Carolina.

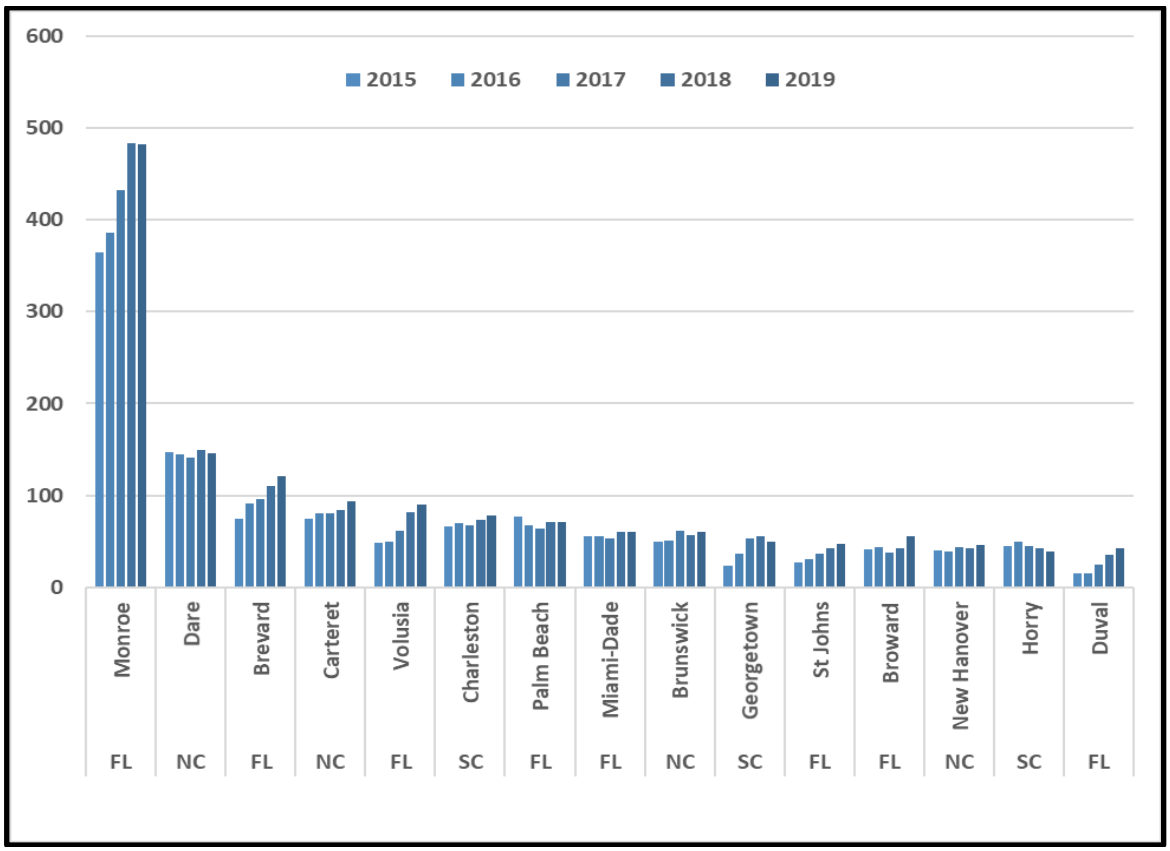

Figure 3.3.2.3. Atlantic for-hire dolphin wahoo permits by South Atlantic county in 2015-2019. (Source: SERO Permits database 2020).

For-hire dolphin wahoo permits in the Northeast are most numerous in Worcester County, Maryland, with Sussex County, Delaware second (**Figure 3.3.2.4**). Counties in New Jersey and New York follow with New Jersey having the most with four counties with permits in the top ten. Trends in the number of permits seem to vary with some counties seeing an increase while others have seen a downward trend, but numbers are fairly stable.

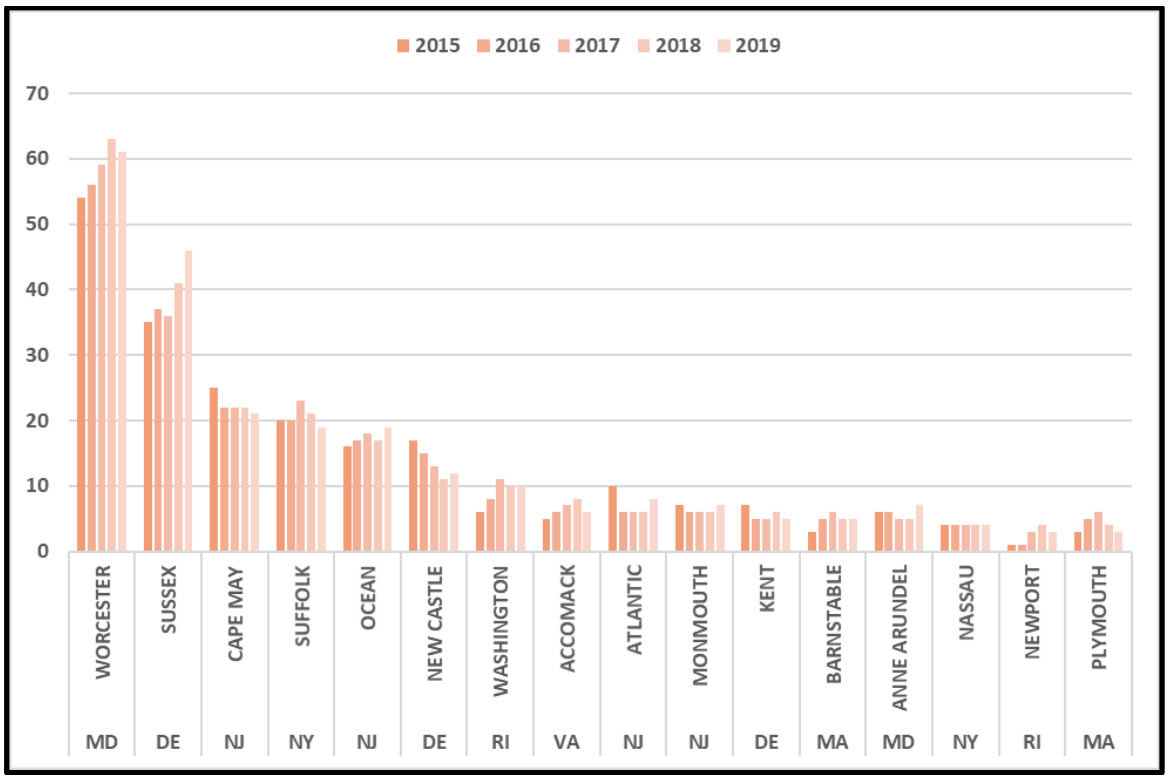

Figure 3.3.2.4. Atlantic for-hire dolphin wahoo permits by Northeast county for 2015-2019. (Source: SERO Permits database 2020).

Commercial Dolphin and Wahoo Communities in the Atlantic

To identify those locations where dolphin and wahoo are an important species a series of figures will identify those places that rank high in terms of Regional Quotient (RQ) for pounds landed. In some cases, the y axis value is hidden to ensure confidentiality. **Figure 3.3.2.5** provides the regional quotient for the top 15 counties for the entire east coast ranked by the 2019 pounds RQ for dolphin. The top ranking counties are Charleston, South Carolina and Dare County, North Carolina, with the majority of counties in Florida. While the top two counties have remained relatively interchangeable over the years, the counties that follow have varied considerably in there rank since 2015. There were four Mid-Atlantic counties that were ranked within the top 15 and a couple from the Northeast, but all have relatively low RQ for dolphin although may have surpassed counties in Florida in the past.

Figure 3.3.2.6 provides the regional quotient for the top 15 counties for the entire east coast ranked by the 2019 pounds RQ for wahoo. The top ranking counties are New Hanover and Carteret County in North Carolina with Dare County close behind, again the majority of counties were in Florida. While the top counties for dolphin remained relatively consist over the years, the top counties for wahoo landings have not. In fact, in 2015 several Florida counties were ranked at the top for RQ for wahoo pounds. Massachusetts was the only state that had a county ranked within the top 15 for wahoo landings from the Northeast.

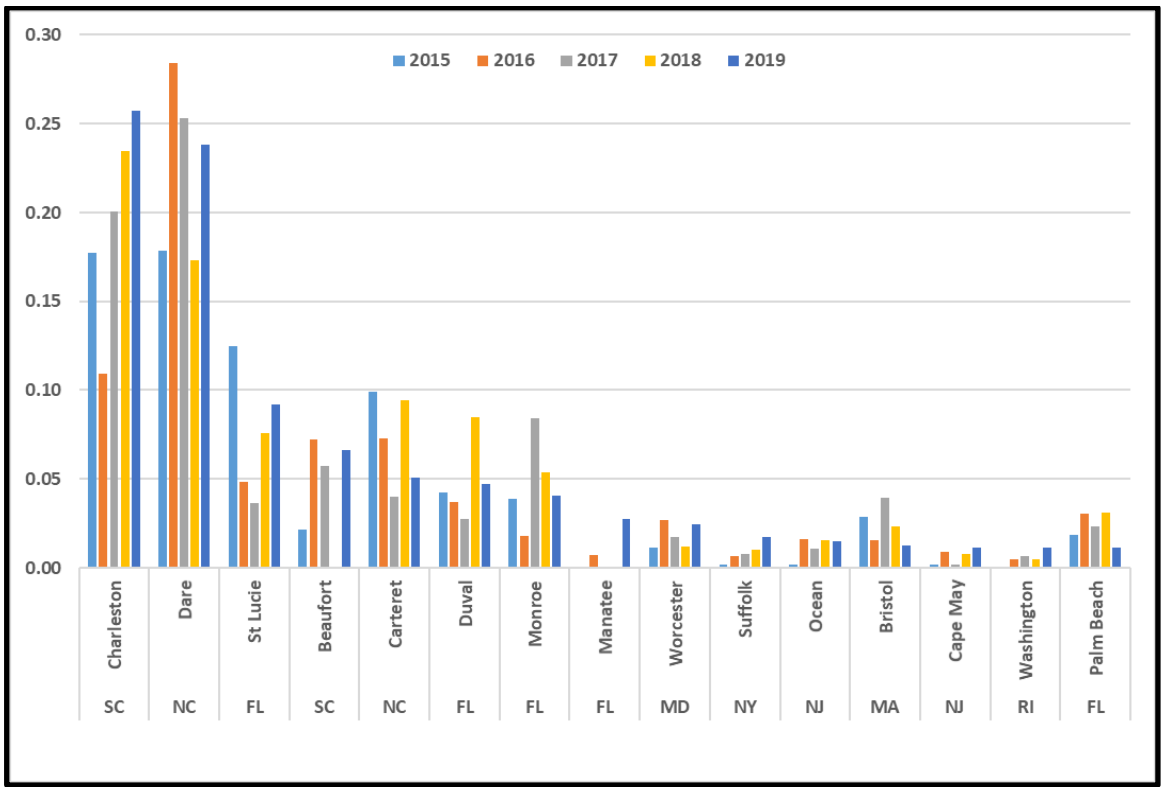

Figure 3.3.2.5. Dolphin regional quotient in pounds by county for 2015-2019. (Source: ACCSP database 2020).

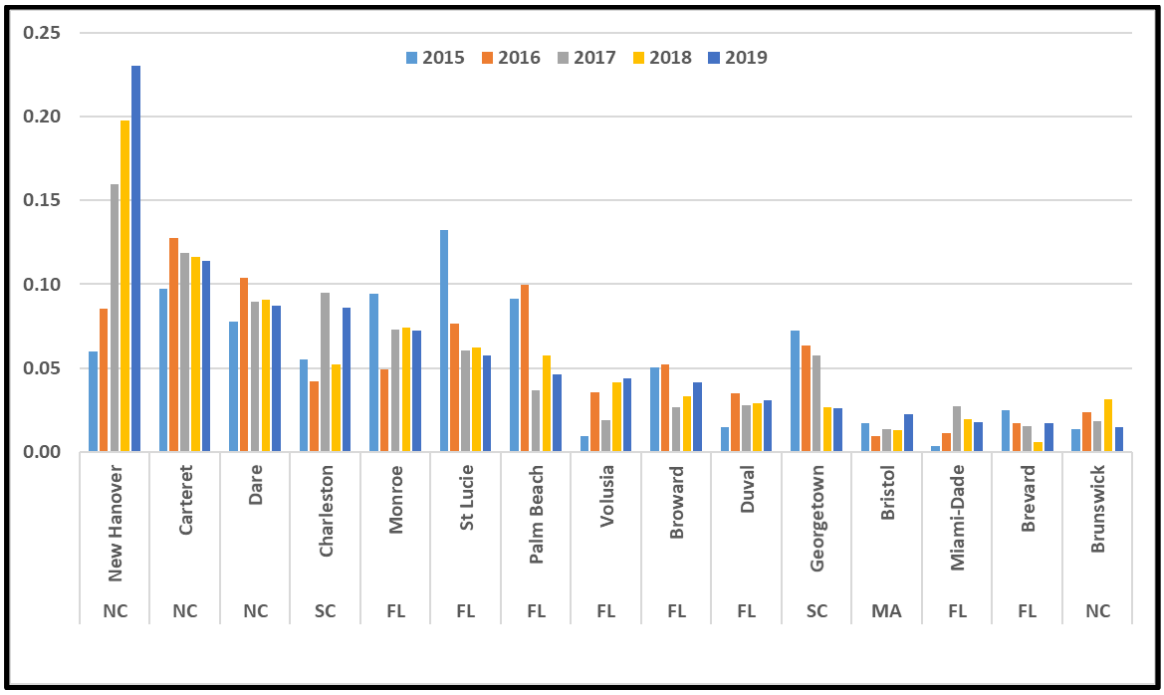

Figure 3.3.2.6. Wahoo regional quotient in pounds by county for 2015-2019. (Source: ACCSP database 2020).

While other data sources have 2019 as terminal year, landings data at the community level was only available with a terminal year of 2018. Wanchese, North Carolina is the top community for total commercial dolphin landings and value RQ in 2018 (**Figure 3.3.2.7**); much

higher than where it was ranked (7th) in Amendment 5 (SAFMC 2013). Several South Carolina communities have gained in RQ for dolphin in recent years with Megget and Murrells Inlet both within the top seven communities since 2011. North Carolina is second to Florida in overall landings of dolphin with South Carolina third. (SAFMC 2013). Florida communities include Palm Beach Gardens, Margate, Mayport, Jupiter, St. Augustine, and Homestead in addition to Key West, but only two in the top five in terms of value. However, Palm Beach Gardens does rank fourth in terms of Pounds RQ. No Georgia communities are identified within the top fifteen communities in terms of dolphin RQ.

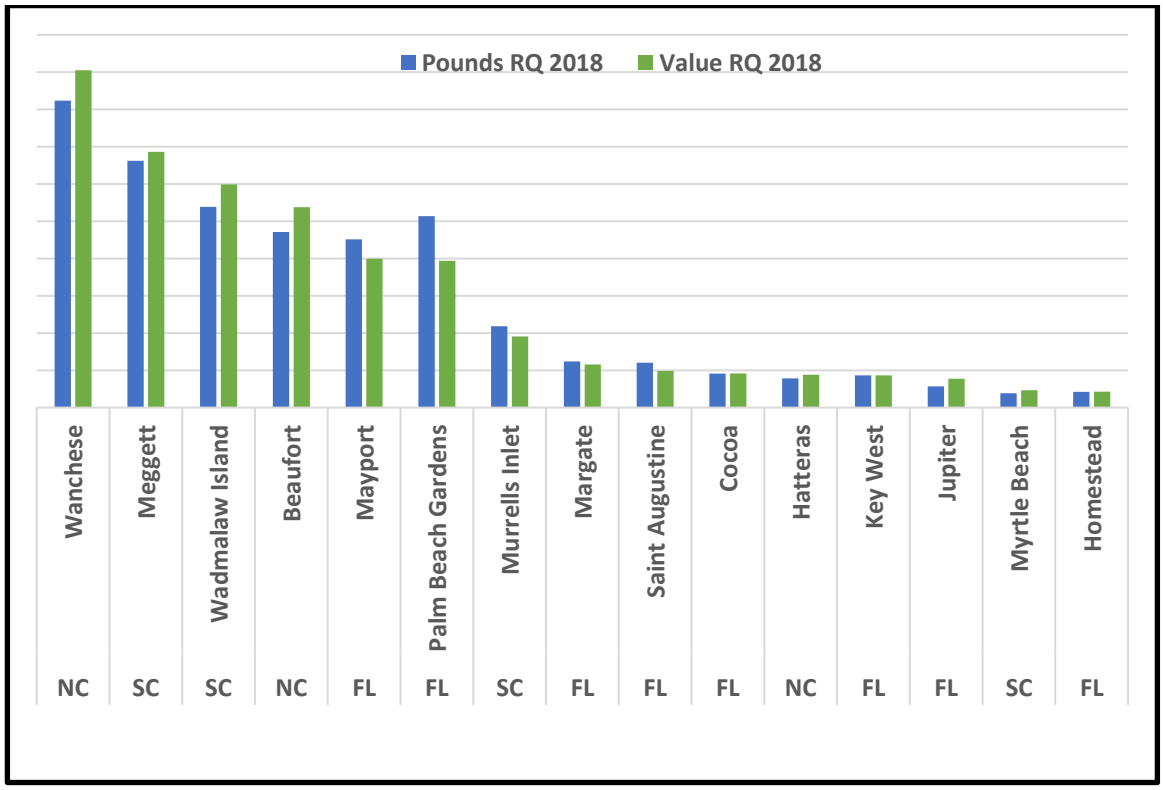

Figure 3.3.2.7. Dolphin pounds and value 2018 Regional Quotient for South Atlantic fishing communities.
(Source: SERO Community ALS database 2018).

Again using the regional quotient to identify wahoo communities in **Figure 3.3.2.8**, Wilmington, North Carolina is the top community for total commercial wahoo landings and value RQ replacing Palm Beach Gardens, Florida which was the top community in Amendment 5 (SAFMC 2013) and now ranks second. As with dolphin, several North Carolina communities have gained in RQ for wahoo in recent years with Beaufort, Morehead City, Wrightsville Beach and Wanchese all within the top ten communities. Most wahoo commercial communities with high RQ are in Florida and include Jupiter, Miami, St. Augustine, Ormond Beach, Cocoa and Margate in addition to Key West in the Florida Keys. The community of Murrells Inlet, South Carolina also has a relatively high regional quotient for wahoo. No Georgia communities are identified within the top 15 wahoo communities in terms of RQ.

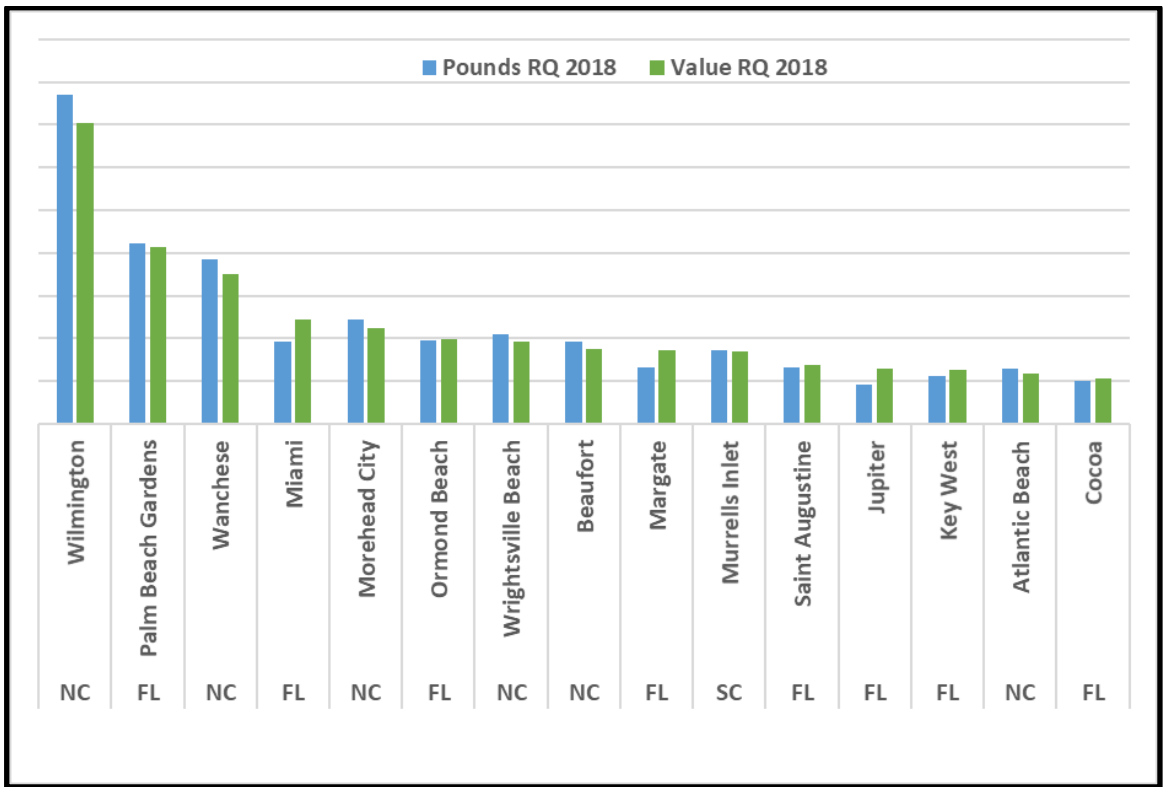

Figure 3.3.2.8. Wahoo pounds and value 2018 Regional Quotient for South Atlantic fishing communities. (Source: SERO).

Reliance on and Engagement with Commercial and Recreational Fishing in the South Atlantic

Reliance and engagement indices identify several communities in the South Atlantic that are substantially engaged in commercial and recreational fishing are shown in **Figure 3.3.2.9 and 3.3.2.10.** The communities of Key West, Jupiter, St. Augustine, and Homestead, Florida; Beaufort, Wanchese, and Hatteras, North Carolina are above the 1 standard deviation threshold for commercial engagement (**Figure 3.3.2.9**). Beaufort, Wanchese, and Hatteras, North Carolina all exceed both the engagement and reliance thresholds of 1 standard deviation demonstrating a higher dependence upon commercial fishing and its supporting businesses. The communities of Key West, St Augustine, and Jupiter, Florida; Beaufort, Hatteras, and Wanchese, North Carolina; and Murrells Inlet, South Carolina are all highly engaged in recreational fishing as shown in **Figure 3.3.2.10**. Only the communities of Mayport, Florida; Hatteras and Wanchese, North Carolina demonstrate reliance upon recreational fishing with scores over 1 standard deviation. These communities would most then most likely have local economies with some dependence upon recreational fishing and its supporting businesses.

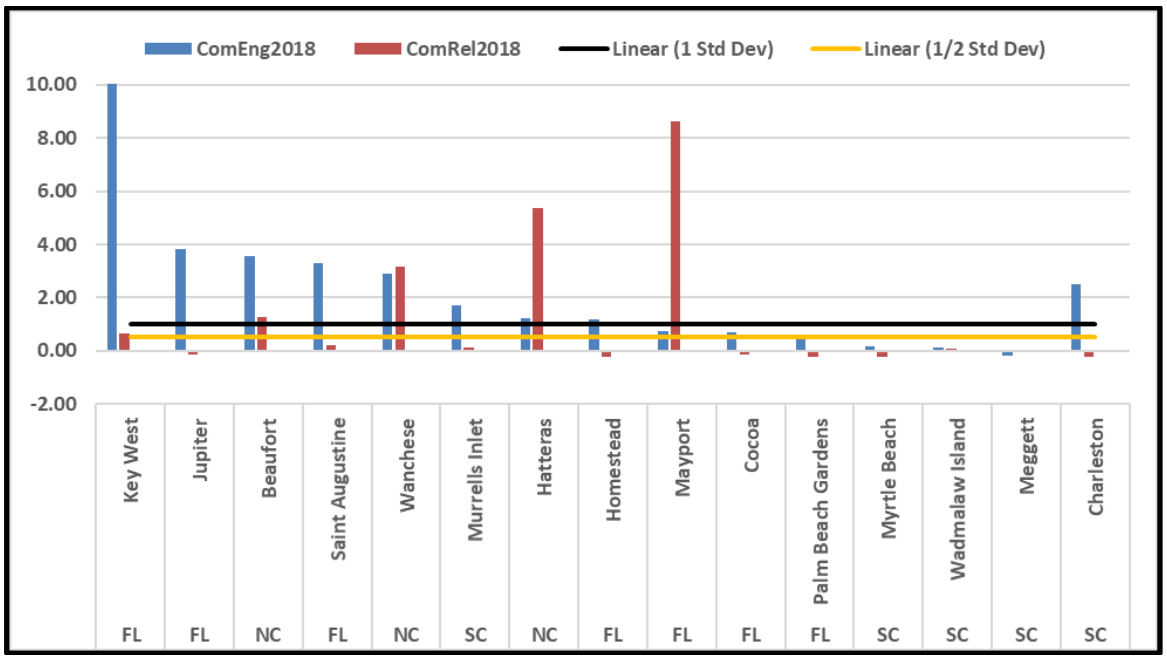

Figure 3.3.2.9. The top dolphin communities for engagement and reliance on commercial fishing. Source: SERO Community ALS 2018.

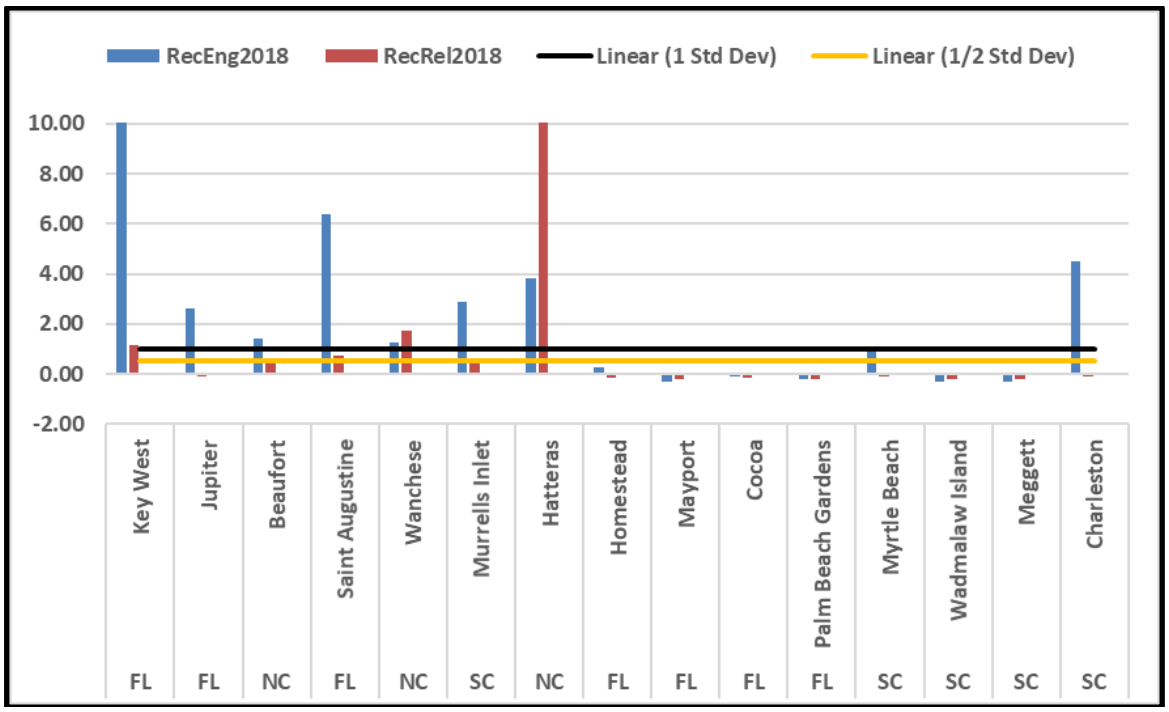

Figure 3.3.2.10. The top dolphin communities for engagement and reliance on recreational fishing. Source: SERO Community ALS 2018.

Mid-Atlantic and New England Regions

The South Atlantic Council manages dolphin and wahoo through the Mid-Atlantic and New England regions. Overall, landings of these species in the Mid-Atlantic and New England regions are very low compared to landings in the South Atlantic. More detailed information about these communities and how they were identified is described in Amendment 5 since we do not have updated landings for those communities (SAFMC 2013).

Commercial Dolphin and Wahoo Communities in the Mid-Atlantic and New England Regions

New Bedford, Massachusetts is the leading port in terms of dolphin landings with Ocean City, Maryland a distant second. Several other communities follow with near comparable amounts of dolphin landed but far less than the leading community. Wahoo landings for 2011were far less than dolphin with only three communities reporting landings: New Bedford, Massachusetts; Hatteras, North Carolina; and Cape May, New Jersey (SAFMC 2013).

Reliance on and Engagement with Commercial and Recreational Fishing in the Mid-Atlantic and New England Regions

Ocean City, Maryland; Belmar, Barnegat Light, Cape May, and Point Pleasant, New Jersey; Montauk, New York; Virginia Beach, and Wachapreague, Virginia; Boston, and New Bedford, Massachusetts; and Point Lookout, New York are all over either the engaged or reliant threshold for commercial fishing or both. In terms of recreational fishing engagement and reliance for Northeast communities with dolphin and wahoo landings, almost every community is over the threshold for either engagement or reliance for recreational fishing (SAFMC 2013).

3.3.3 Environmental Justice Considerations

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. The main focus of Executive Order 12898 is to consider "the 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…" This executive order is generally referred to as environmental justice (EJ).

Commercial fishermen and coastal communities in the South Atlantic, Mid-Atlantic and New England regions may experience some impacts by the proposed action depending upon the alternatives selected and whether they have negative or positive social effects. However, information on the race and income status for many of the individuals involved in fishing is not available. To evaluate where EJ concerns might exist, a suite of social vulnerability indices has been developed; the three indices are poverty, population composition and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and households with children under the age of 5, disruptions such as higher separation rates, higher crime rates and unemployment all are signs of populations experiencing vulnerabilities. These vulnerabilities signify that it may be difficult for someone living in these communities to recover from significant social disruption that might stem from a change in their ability to work or maintain a certain income level.

Because many of the communities included in both the commercial and recreational engagement and reliance figures are the same, a select group most common from each region and sector were included in **Figures 3.3.3.1**

In **Figure 3.3.3.1** there are very few selected communities in Florida that exceed the thresholds for social vulnerability. Homestead and Cocoa are the only two that demonstrate substantial social vulnerabilities with all three indices over 1 or ½ standard deviation thresholds. Beaufort, North Carolina and Myrtle Beach, South Carolina both show some vulnerabilities with both poverty and personal disruption above the ½ standard deviation threshold

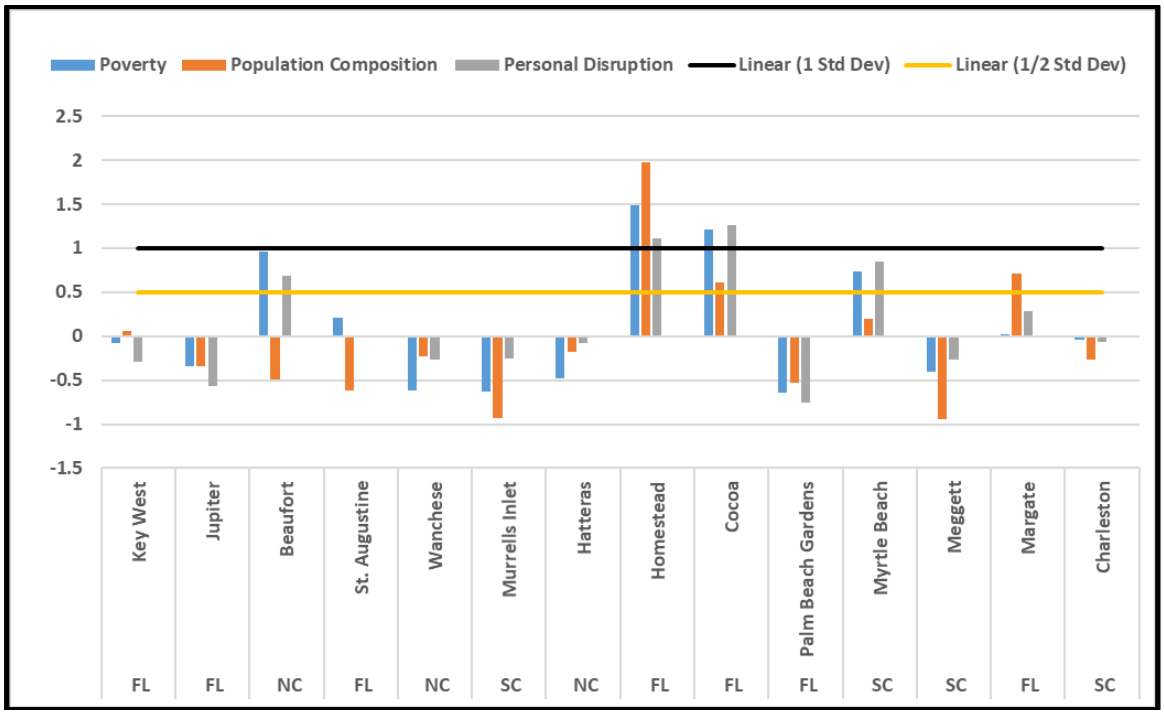

Figure 3.3.3.1 Social vulnerability measures for selected dolphin and wahoo communities. Source: SERO Community CSVIs 2016

While some communities expected to be affected by this proposed amendment may have social vulnerabilities that exceed the EJ thresholds and, therefore, may constitute areas of concern, significant EJ issues are not expected to arise as a result of this proposed amendment. It is anticipated that the impacts from the proposed regulations may impact minorities or the poor, but not through discriminatory application of these regulations.

Finally, the general participatory process used in the development of fishery management measures (e.g., scoping meetings, public hearings, and open South Atlantic Council meetings) is expected to provide sufficient opportunity for meaningful involvement by potentially affected individuals to participate in the development process of this amendment and have their concerns factored into the decision process. Public input from individuals who participate in the fishery has been considered and incorporated into management decisions throughout development of the amendment.

3.4 Administrative Environment

3.4.1 The Fishery Management Process and Applicable Laws

3.4.1.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ, an area extending 200 nm from the seaward boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond the U.S. EEZ.

Responsibility for federal fishery management decision-making is divided between the U.S. 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 collecting and providing the data necessary for the councils to prepare fishery management plans and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws. In most cases, the Secretary has delegated this authority to NMFS.

The South Atlantic Council, in cooperation with the Mid-Atlantic Fishery Management Council and the New England Fishery Management Council, is responsible for conservation and management of dolphin and wahoo in federal waters off the Atlantic states. These waters extend from 3 to 200 mi offshore from the seaward boundary of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and east Florida to Key West. The South Atlantic Council has thirteen voting members: one from NMFS; one each from the state fishery agencies of North Carolina, South Carolina, Georgia, and Florida; and eight public members appointed by the Secretary. On the South Atlantic Council, there are two public members from each of the four South Atlantic States. Non-voting members include representatives of the U.S. Fish and Wildlife Service, U.S. Coast Guard, State Department, and Atlantic States Marine Fisheries Commission (ASMFC). The South Atlantic Council has adopted procedures whereby the non-voting members serving on the South Atlantic Council Committees have full voting rights at the Committee level but not at the full South Atlantic Council level. South Atlantic Council members serve three-year terms and are recommended by state governors and appointed by the Secretary from lists of nominees submitted by state governors. Appointed members may serve a maximum of three consecutive terms.

Public interests also are involved in the fishery management process through participation on Advisory Panels and through council meetings, which, with few exceptions for discussing personnel matters and litigation, are open to the public. The South Atlantic Council uses its Scientific and Statistical Committee (SSC) to review the data and science being used in assessments and fishery management plans/amendments. In addition, the regulatory process is in accordance with the Administrative Procedure Act, in the form of "notice and comment" rulemaking.

3.4.1.2 State Fishery Management

The state governments of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia North Carolina, South Carolina, Georgia, and Florida have the authority to manage fisheries that occur in waters extending three nautical miles from their respective shorelines. The Department of Marine Fisheries is responsible for marine fisheries in Maine's state waters. In New Hampshire, marine fisheries are managed by the Marine Fisheries Division of the New Hampshire Fish and Game Department. Massachusetts's marine fisheries are managed by the Division of Marine Fisheries of the Massachusetts Department of Fish and Game. Rhode Island's marine fisheries are managed by the Division of Fish and Wildlife of Rhode Island's Department of Environmental Management. Connecticut manages its marine fisheries through the Department of Energy and Environmental Protection. New York's marine fisheries are managed by the Division of Fish, Wildlife and Marine Resources of the Department of Environmental Conservation. New Jersey manages its marine fisheries through the Division of Fish and Wildlife of the Department of Environmental Protection. Pennsylvania manages its fisheries through the Pennsylvania Fish and Boat Commission. Marine fisheries in Delaware are managed by the Fisheries Section of the Division of Fish and Wildlife. Maryland's Department of Natural Resources manages its marine fisheries. Marine fisheries in Virginia are managed by the Virginia Marine Resources Commission. North Carolina's marine fisheries are managed by the Marine Fisheries Division of the North Carolina Department of Environment and Natural Resources. The Marine Resources Division of the South Carolina Department of Natural Resources regulates South Carolina's marine fisheries. Georgia's marine fisheries are managed by the Coastal Resources Division of the Department of Natural Resources. The Marine Fisheries Division of the Florida Fish and Wildlife Conservation Commission is responsible for managing Florida's marine fisheries. Each state fishery management agency has a designated seat on the South Atlantic Council. The purpose of state representation at the South Atlantic 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 Atlantic States are also involved through the Atlantic States Marine Fisheries Commission (ASMFC) in management of marine fisheries. This commission was created to coordinate state regulations and develop management plans for interstate fisheries. It has significant authority, through the Atlantic Striped Bass Conservation Act and the Atlantic Coastal Fisheries Cooperative Management Act, to compel adoption of consistent state regulations to conserve coastal species. The ASFMC is also represented at the South Atlantic Council level, but does not have voting authority at the South Atlantic Council level.

NMFS' State-Federal Fisheries Division is responsible for building cooperative partnerships to strengthen marine fisheries management and conservation at the state, inter-regional, and national levels. This division implements and oversees the distribution of grants for two national (Inter-jurisdictional Fisheries Act and Anadromous Fish Conservation Act) and two regional (Atlantic Coastal Fisheries Cooperative Management Act and Atlantic Striped Bass Conservation Act) programs. Additionally, it works with the ASMFC to develop and implement cooperative State-Federal fisheries regulations.

3.4.1.3 Enforcement

Both the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries (NMFS) Office for Law Enforcement (NOAA/OLE) and the United States Coast Guard (USCG) have the authority and the responsibility to enforce South Atlantic Council regulations. NOAA/OLE agents, who specialize in living marine resource violations, provide fisheries expertise and investigative support for the overall fisheries mission. The USCG is a multi-mission agency, which provides at sea patrol services for the fisheries mission.

Neither NOAA/OLE nor the USCG can provide a continuous law enforcement presence in all areas due to the limited resources of NOAA/OLE and the priority tasking of the USCG. To supplement at sea and dockside inspections of fishing vessels, NOAA entered into Cooperative Enforcement Agreements with all but one of the states in the Southeast Region (North Carolina), which granted authority to state officers to enforce the laws for which NOAA/OLE has jurisdiction. In recent years, the level of involvement by the states has increased through Joint Enforcement Agreements, whereby states conduct patrols that focus on federal priorities and, in some circumstances, prosecute resultant violators through the state when a state violation has occurred.

The NOAA Office of General Counsel Penalty Policy and Penalty Schedules can be found at www.gc.noaa.gov/enforce-office3.html.

Chapter 4. Environmental Effects and Comparison of Alternatives

4.1 Action 1. Revise the total annual catch limit for dolphin to reflect the updated acceptable biological catch level

Alternatives

1 (No Action). The total annual catch limit for dolphin is equal to the current acceptable biological catch level.

2. The total annual catch limit for dolphin is equal to the updated acceptable biological catch level.

3. The total annual catch limit for dolphin is equal to 95% of the updated acceptable biological catch level.

4. The total annual catch limit for dolphin is equal to 90% of the updated acceptable biological catch level.

*Preferred alternative is in bold.

4.1.1 Biological Effects

Alternative 1 (No Action) is not a viable alternative because it would retain the current total annual catch limit (ACL) for dolphin (equal to the current acceptable biological catch (ABC)) at 15,344,846 pounds whole weight (lbs ww) (**Table 4.1.1.1**), which is not based on the best scientific information available (BSIA). The current total ACL is based on the South Atlantic Fishery Management Council's (Council) Statistical and Scientific Committee's (SSC) ABC recommendation using the third highest landings value during the 1999-2008 times series. These landings did not include Monroe County, Florida, and were based on recreational data as per the older Marine Recreational Information Program's (MRIP) Coastal Household Telephone Survey (CHTS) method. The current total ACL and ABC was implemented by Amendment 5 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 5) in 2014 (79 FR 32878; SAFMC 2013). In April 2020, the Council recommended a new ABC level for dolphin at 24,570,764 lbs ww (**Table 4.1.1.1**) using the third highest landings value during1994-2007 (https://safmc.net/download/BB%20Council%20Meeting%20June%202020/SSC_Apr2020Report_FINAL.pdf). These landings include Monroe County, Florida, and are based on recreational data as per MRIP's newer Fishery Effort Survey method (FES) method, which is considered more reliable and robust compared to the CHTS survey method. The new ABC recommendation for dolphin is also based on the new weight estimation procedure from the National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) that uses a 15 fish minimum sample size and represents BSIA. **Preferred Alternative 2** through **Alternative 4** explore options to revise the total ACL for dolphin based on the SSC's new ABC recommendation and are viable alternatives for further analysis (**Table 4.1.1.1**). Landings by sector for dolphin are shown in **Table 4.1.1.2** and **Figure 4.1.1.1** during 1986-2019. Percent standard error (PSE) is relatively low for recreational landings (**Table 4.1.1.3**). Total landings for dolphin have not exceeded the new ABC, with the exception of 2015, in over 20 years (**Table 4.1.1.2 and Figure 4.1.1.1**).

Table 4.1.1.1. Total ACL for dolphin under **Alternatives 1 (No Action)** – **4** under **Action 1**.

Alternative	Dolphin Total ACL (lbs ww)	Percent (%) Change
Alternative 1 (No Action)	*15,344,846	0
Preferred Alternative 2	**24,570,764	60
Alternative 3	**23,342,226	52
Alternative 4	**22,113,688	44

*Current ABC=ACL and this represents CHTS estimates.
**FES estimates.

Preferred Alternative 2, **Alternatives 3**, and **4** would result in an increase of 60%, 52%, and 44% from **Alternative 1 (No Action)** respectively (**Table 4.1.1.1**). **Preferred Alternative 2** would set the total ACL equal to the ABC and is the most liberal of the alternatives compared to **Alternatives 3** and **4**, which include a buffer from the ABC, and are more conservative. Therefore, biological benefits would be expected to be greater for **Alternative 4** followed by **Alternative 3**, and **Preferred Alternative 2**.

Public comments at recent Council meetings have expressed concerns over the paucity of large dolphin especially in the Florida Keys area. Lynch et al. (2018) report declining relative abundance of dolphin using longline data from highly migratory species fisheries. Rudershausen et al. (2019) report a discard mortality rate of 24.8% for the recreational hook-and-line fishery in the U.S. South Atlantic, Gulf of Mexico, and Caribbean region, and recommend alternative management strategies (e.g., mandatory retention of hook-traumatized individuals contributing to a bag limit, regardless of size), educating fishers on the use of alternative gear types (e.g., circle hooks), modifying fishing practices (e.g., trolling with heavy drags to reduce fight times and rates of deep hooking), or a combination thereof as more effective solutions than minimum size or bag limits to control the rates of fishing mortality for dolphin. On July 15, 2020, the final rule for Amendment 29 to the Fishery Management Plan for the Snapper Grouper Fishery (Snapper Grouper Amendment 29; 85 FR 36166; SAFMC 2020) required descending devices be on board all commercial, charter vessels and headboats (for-hire), and private recreational vessels while fishing for or possessing snapper grouper species; the use of non-offset, non-stainless steel circle hooks when fishing for snapper-grouper species with hook-and-line gear and natural baits north of 28° N latitude; and all hooks be non-stainless steel when fishing for snapper-grouper species with hook-and-line gear and natural baits throughout South Atlantic Federal waters (). Since a lot of the fishers targeting dolphin and wahoo also target snapper grouper species on the same trip, the best fishing practices implemented by Snapper Grouper Amendment 29 could be expected to flow over to the dolphin wahoo fishery. The Council has also implemented an extensive outreach and public education program, which along with its citizen science initiative is promoting best fishing practices for all the species it manages, including dolphin and wahoo. The Council is expected to consider circle hooks and other gear related actions in a future amendment to the dolphin wahoo fishery. It is also reasonable to consider that the lack of large dolphin in the Florida Keys has to do with the fish moving out of the area in search of suitable temperature and food availability. Studies have shown that seasonal abundance of dolphin along the east coast of the U.S. and Gulf of Mexico is heavily influenced by sea surface temperature and distance to temperature fronts, cholorphyll-*a* concentration, and *Sargassum* mats (Kleisner 2009; Farrell et al. 2014; Merten et al. 2014). Dolphin are also highly fecund, spawn throughout a wide geographical range, have an early age at first maturity, and a short generation time (Palko

et al., 1982; Ditty et al., 1994; Benetti et al., 1995; Oxenford, 1999; McBride et al. 2012). Therefore, dolphin's life-history could support the increase in the ABC (and ACL) as proposed in **Preferred Alternative 2** and endorsed by the Council's SSC. Furthermore, the difference in accounting for recreational landings under the older MRIP CHTS and newer MRIP FES methods is a factor in the increase in the catch limits. As shown in **Table 4.1.1.4**, when compared with the most recent 5-year and 3-year average landings, projections show that none of the total ACLs proposed under **Preferred Alternative 2** through **Alternative 4** would be reached. The total ACLs proposed under these alternatives would be reached before the end of the fishing year (December 31), when compared with the maximum landings for a single year during 2015-2019, as late as October 16 and early as September 14 (**Table 4.1.1.4**).

Table 4.1.1.2. Total landings (lbs ww) of dolphin during 1986-2019.

Year	Commercial Landings (lbs ww)	Recreational Landings (lbs ww)	Total Landings (lbs ww)
1986	536,362	9,047,439	9,583,801
1987	496,478	9,927,475	10,423,953
1988	524,719	9,313,438	9,838,157
1989	1,063,399	26,607,445	27,670,844
1990	1,015,896	23,769,474	24,785,370
1991	1,602,698	30,655,419	32,258,117
1992	667,183	21,151,511	21,818,694
1993	934,393	15,910,599	16,844,992
1994	1,200,066	15,958,087	17,158,153
1995	2,136,534	23,324,770	25,461,304
1996	1,225,669	16,647,149	17,872,818
1997	1,602,801	30,576,000	32,178,801
1998	823,742	18,703,871	19,527,613
1999	1,047,161	21,133,870	22,181,031
2000	987,626	23,583,138	24,570,764
2001	765,376	22,564,553	23,329,929
2002	708,092	20,189,772	20,897,864
2003	723,508	17,214,254	17,937,762
2004	859,703	11,969,367	12,829,070
2005	577,616	12,758,252	13,335,868
2006	650,309	16,232,705	16,883,014
2007	999,163	16,140,525	17,139,688
2008	836,374	13,775,567	14,611,941
2009	1,296,014	17,091,500	18,387,514
2010	715,576	11,137,918	11,853,494
2011	794,863	15,100,020	15,894,883
2012	861,770	13,641,357	14,503,127
2013	757,786	14,801,455	15,559,241
2014	1,303,395	16,641,746	17,945,141

2015	1,111,483	25,375,981	26,487,464
2016	938,477	15,997,342	16,935,819
2017	635,952	12,649,854	13,285,806
2018	535,923	16,805,000	17,340,923
2019*	801,826	11,929,298	12,731,124

*2019 landings are preliminary.

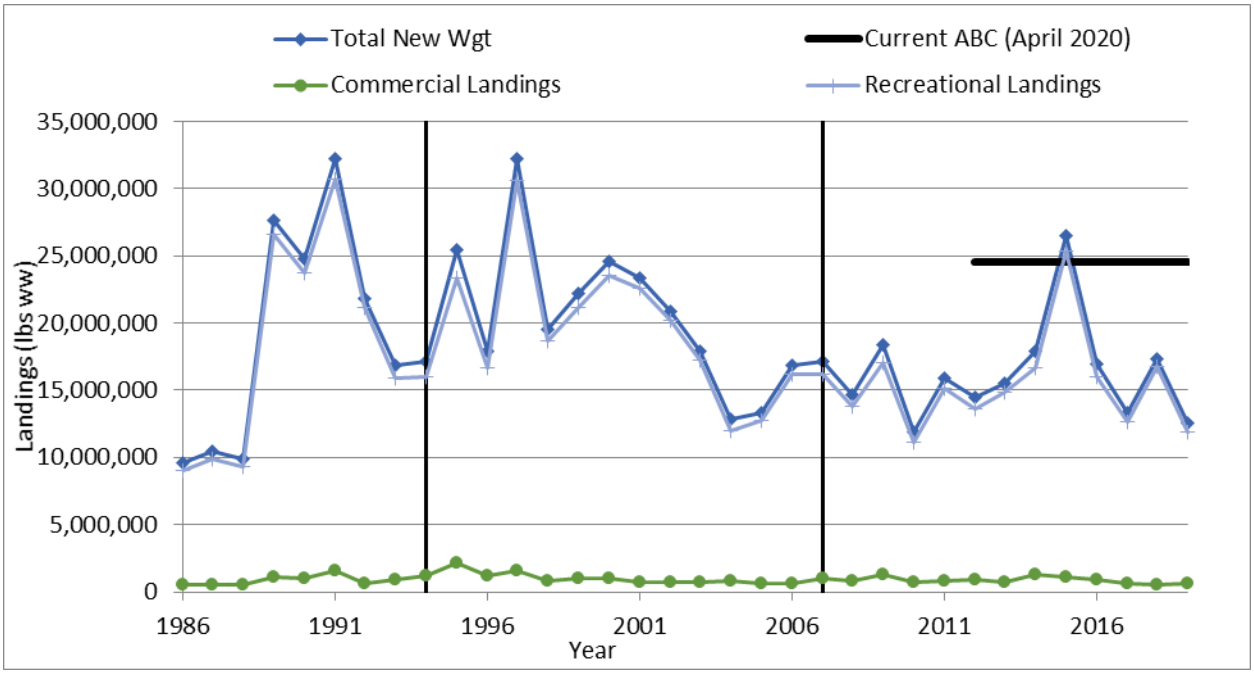

Figure 4.1.1.1. Dolphin landings (pounds whole weight) from 1986-2019 in comparison to the current ABC recommendation from the April 2020 SSC meeting. The solid vertical lines indicate baseline years (1994 to 2007) selected by the SSC for setting the dolphin ABC. Please note that 2019 landings are preliminary.

Table 4.1.1.3. Percent standard errors (PSEs) for recreational dolphin landings (by weight), 2010-2019.

Year	Recreational PSEs for Dolphin
2010	15.2%
2011	13.5%
2012	12.1%
2013	18.9%
2014	15.4%
2015	12.4%
2016	11.2%
2017	14.5%
2018	14.6%
2019	14.4%

Table 4.1.1.4. Projection of total ACL being reached under all the alternatives under **Action 1** when compared with the average landings (lbs ww) during 2015-2019 and 2017-2019, and maximum landings

for a single year during 2015-2019. The new ABC for dolphin = 24,570,764 lbs ww (3rd highest landings from 1994-2007). Please note that 2019 landings are preliminary.

Alternative	Dolphin ACL (lbs ww)	Total ACL Reached (Date) Average Landings 2015-2019	Total ACL Reached (Date) Average Landings 2017-2019	Maximum Landings 2015-2019
Alternative 1 (No Action)	15,344,846[7]	Not Applicable	Not Applicable	Not Applicable
Preferred Alternative 2	**24,570,764**	**No**	**No**	**Yes (16-Oct)**
Alternative 3	23,342,226	No	No	Yes (30-Sep)
Alternative 4	22,113,688	No	No	Yes (14-Sep)

*Current ABC(=ACL).

4.1.2 Economic Effects

In general, ACLs that allow for more fish to be landed can result in increased positive economic effects if harvest increases without notable effects of the stock of a species. The ACL does not directly impact the fishery for a species unless harvest changes or the ACL is exceeded, thereby triggering AMs such as closures or other restrictive measure. As such, ACLs that are set above the observed landings in the fishery for a species do not have realized economic effects.

As noted in **Section 4.1.1**, **Alternative 1 (No Action)** is not a viable alternative, but if the current ACL were to remain in place, it would not be expected to be constraining on the fishery, as observed total harvest (recreational and commercial) has been well below the total ACL. Thus, the fishery would continue to not be constrained by the total ACL and there would be no economic effects. The potential revised total ACLs for dolphin in **Alternatives 2 (Preferred)** through **4** are all higher than the observed landings in recent years except for 2015 (**Figure 4.1.1.1**). Based on the average landings over the most recent five years of available data (2015-2019), landings would continue to be below the potential new ACLs and thus not constraining on the fishery. As a result no economic effects are anticipated from **Alternatives 2 (Preferred)** through **4**.

While none of the ACLs are expected to lead to changes in dolphin harvest or fishing behavior for dolphin, ACLs that offer a larger buffer between the ACL and observed landings reduce the likelihood of a restrictive AM being triggered that would lead to short-term negative economic effects. Thus under this notion, the alternatives in **Action 1** can be ranked from a short-term economic perspective with **Alternative 1 (No Action)** having the lowest potential for negative economic effects, followed by **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4 (Table 4.1.2.1)**.

[7] **Alternative 1 (No Action)** of **Action 1** provides an ACL using CHTS data which had the effort component collected with a phone survey, and did not include recreational landings from Monroe County, Florida. This makes the ACL under **Alternative 1 (No Action)** not applicable to the data provided in **Table 4.1.1.4** because the **Table 4.1.1.4** landings use the FES data and include recreational landings from Monroe County, Florida.

Table 4.1.2.1. Percent difference between the ACLs in **Action 1** compared to 5-year average landings from 2015-2019.

Alternative	Dolphin ACL (lbs ww)	Percent difference between the ACL and average annual landings from 2015-2019*
Alternative 1 (No Action)	15,344,846	59%
Preferred Alternative 2	**24,570,764**	**47%**
Alternative 3	23,342,226	39%
Alternative 4	22,113,688	31%

***Alternative 1 (No Action)** is tracked in part using CHTS estimates for charter and private recreational landings and does not include recreational landings from Monroe County, Florida. **Alternatives 2 (Preferred)** through **4** would be tracked in part using FES estimates for charter and private recreational landings and would include recreational landings from Monroe County, Florida.

4.1.3 Social Effects

The ACL for any stock does not directly affect resource users unless the ACL is met or exceeded, in which case AMs that restrict, or close harvest could negatively impact the commercial, for-hire, and private recreational sectors. AMs can have significant direct and indirect social effects because, when triggered, can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects, such as increased pressure on another species, or fishermen having to stop fishing all together due to regulatory closures. However, restrictions on harvest contribute to sustainable management goals, and are expected to be beneficial to fishermen and communities in the long term. Generally, the higher the ACL the greater the short-term social benefits that would be expected to accrue if harvest is sustainable.

Under **Action 1**, **Preferred Alternative 2** through **Alternative 4**, the ACL for dolphin would be based on the most recent stock assessment and updated MRIP estimates. Adjustments in an ACL based on updated information are necessary to ensure continuous social benefits over time, **Alternative 1 (No Action)** would not update the dolphin ACL based on current information and would not provide the related social benefits.

Commercial and recreational landings are estimated to vary year by year (**Table 4.1.1.2**), but projections show that none of the total ACLs proposed in Action 1 would result in an early closure. However, should landings increase, there could be some years in which recreational and/or commercial landings would exceed their respective ACLs and AMs would be triggered. Depending on the AMs implemented in Action 6 there would likely be some negative effects on recreational fishermen and for-hire and commercial businesses that target dolphin. In general, a higher ACL would lower the chance of triggering a recreational or commercial AM and result in the lowest level of negative effects on the recreational and commercial sectors. Among the action alternatives, **Preferred Alternative 2** would be the most beneficial for fishermen, followed by **Alternative 3**, and **Alternative 4**, and **Alternative 1 (No Action)**.

4.1.4 Administrative Effects

The mechanisms for monitoring and documentation of the total ACL for dolphin are already in place through implementation of Dolphin Wahoo Amendment 5 (SAFMC 2013) and reflects **Alternative 1** (**No Action**). Therefore, administrative impacts of **Preferred Alternative 2**, **Alternatives 3** and **4** would be similar to **Alternative 1** (**No Action**). The exception to this is for the landings scenario with the maximum landings for a single year during 2015-2019, when the total ACL is projected to be reached earlier in the fishing season under **Preferred Alternative 2**, **Alternatives 3** and **4** (**Table 4.2.1.4**). In this scenario, administrative effects would be greater for **Alternative 4**, followed by **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**. Administrative burdens depending on the AM (in-season closure for the commercial sector and the preferred AM alternatives in Actions 5 and 6 for the recreational sector) would relate to data monitoring, outreach, and enforcement of a short fishing season. Other administrative burdens that may result from revising the values under **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** would take the form of development and dissemination of outreach and education materials for fishery participants and law enforcement.

4.2 Action 2. Revise the total annual catch limit for wahoo to reflect the updated acceptable biological catch level

4.2.1 Biological Effects

Alternatives

1 (No Action). The total annual catch limit for wahoo is set equal to the acceptable biological catch level.

2. The total annual catch limit for wahoo is equal to the updated acceptable biological catch level.

3. The total annual catch limit for wahoo is equal to 95% of the updated acceptable biological catch level.

4. The total annual catch limit for wahoo is equal to 90% of the updated acceptable biological catch level.

*Preferred alternative is in bold.

Alternative 1 (No Action) is not a viable alternative because it would retain the current total annual catch limit for wahoo (equal to the current ABC) at 1,794,960 lbs ww (**Table 4.2.1.1**), which is not based on BSIA. The current total ACL is based on the Council SSC's ABC recommendation using the third highest landings value during1999-2008. These landings did not include Monroe County, Florida, and were based on recreational data as per the older MRIP CHTS method. The current total ACL and ABC was implemented by Dolphin Wahoo Amendment 5 in 2014 (79 FR 32878; SAFMC 2013). In April 2020, the Council recommended a new ABC level for wahoo at 2,885,303 lbs ww (**Table 4.2.1.1**) using the third highest landings value during1994-2007 (https://safmc.net/download/BB%20Council%20Meeting%20June%202020/SSC_Apr2020Report_FINAL.pdf). These landings include Monroe County, Florida, and are based on recreational data as per MRIP's newer FES method, which is considered more reliable and robust compared to the CHTS survey method. The new ABC recommendation for wahoo is also based on the new weight estimation procedure from the NMFS SEFSC that uses a 15 fish minimum sample size, and represents BSIA. **Preferred Alternative 2** through **Alternative 4** explore options to revise the total ACL for wahoo based on the SSC's new ABC recommendation and are viable alternatives for further analysis (**Table 4.2.1.1**). Landings by sector for wahoo are shown in **Table 4.2.1.2** and **Figure 4.2.1.1** during 1986-2019. PSE values are relatively low for recreational landings (**Table 4.2.1.3**). Total landings for wahoo have exceeded the new ABC a few times over the past decade, largely due to the recreational landings for wahoo (**Table 4.2.1.2 and Figure 4.2.1.1**).

Table 4.2.1.1. Total ACL for wahoo under **Alternatives 1 (No Action)** – **4** under **Action 2**.

Alternative	Dolphin Total ACL (lbs ww)	Percent (%) Change
Alternative 1 (No Action)	*1,794,960	0
Preferred Alternative 2	**2,885,303	61
Alternative 3	**2,741,038	53
Alternative 4	**2,596,773	45

*Current ABC=ACL and this represents CHTS estimates.
**FES estimates.

Preferred Alternative 2, **Alternatives 3**, and **4** would result in an increase of 61%, 53%, and 45% from **Alternative 1 (No Action)** (**Table 4.2.1.1**). **Preferred Alternative 2** would set the total ACL equal to the ABC and is the most liberal of the alternatives compared to **Alternatives 3** and **4**, which include a buffer from the ABC, and are more conservative.

Therefore, biological benefits would be expected to be greater for **Alternative 4** followed by **Alternative 3**, and **Preferred Alternative 2**. Lynch et al. (2018) found that wahoo did not show a negative decline in relative abundance in recent years, unlike for dolphin. Therefore, increasing the total ACL for wahoo may not have negative biological effects. As shown in **Table 4.2.1.4**, when compared with the most recent 3-year average landings (2017-2019), projections show that none of the total ACLs proposed under **Preferred Alternative 2** through **Alternative 4** would be reached. However, the ACL would be reached as late as December 24 and as early as November 22 before the end of the fishing year (December 31), when compared with the most recent 5 year average (2015-2019) (**Table 4.2.1.4**). The ACL would be reached as late as September 22 and as early as August 29 before the end of the fishing year (December 31), when compared with the maximum landings for a single year during 2015-2019 (**Table 4.2.1.4**). Therefore, a combination of in-season and post-season accountability measures (Actions 9 and 10) that would prevent the sector ACL from being consistently exceeded is essential to preventing the total ACL for wahoo from being exceeded.

Table 4.2.1.2. Total landings (lbs ww) of wahoo during 1986-2019.

Year	Commercial Landings (lbs ww)	Recreational Landings (lbs ww)	Total Landings (lbs ww)
1986	26,713	2,891,096	2,917,809
1987	51,750	2,210,611	2,262,361
1988	53,164	1,193,702	1,246,866
1989	39,028	772,951	811,979
1990	53,829	635,875	689,704
1991	61,126	2,157,817	2,218,943
1992	66,739	1,348,370	1,415,109
1993	71,960	1,190,346	1,262,306
1994	84,966	841,994	926,960
1995	107,497	1,664,458	1,771,955
1996	83,451	1,538,442	1,621,893
1997	93,135	1,119,084	1,212,219
1998	77,964	1,348,800	1,426,764
1999	99,285	1,917,627	2,016,912
2000	65,887	1,790,662	1,856,549
2001	59,175	1,807,269	1,866,444
2002	59,288	2,830,876	2,890,164
2003	58,832	1,997,574	2,056,406
2004	65,942	3,125,371	3,191,313
2005	46,590	1,676,176	1,722,766
2006	40,177	1,061,473	1,101,650
2007	59,144	3,687,038	3,746,182
2008	42,211	1,195,582	1,237,793
2009	45,617	2,303,861	2,349,478
2010	43,806	1,252,121	1,295,927

Year	Commercial Landings (lbs ww)	Recreational Landings (lbs ww)	Total Landings (lbs ww)
2011	61,077	1,335,404	1,396,481
2012	66,208	2,060,316	2,126,524
2013	65,505	723,436	788,941
2014	62,458	1,709,855	1,772,313
2015	63,836	2,943,008	3,006,844
2016	66,745	5,003,444	5,070,189
2017	67,032	3,585,790	3,652,822
2018	50,486	880,959	931,445
2019*	74,449	2,010,815	2,085,264

*2019 landings are preliminary.

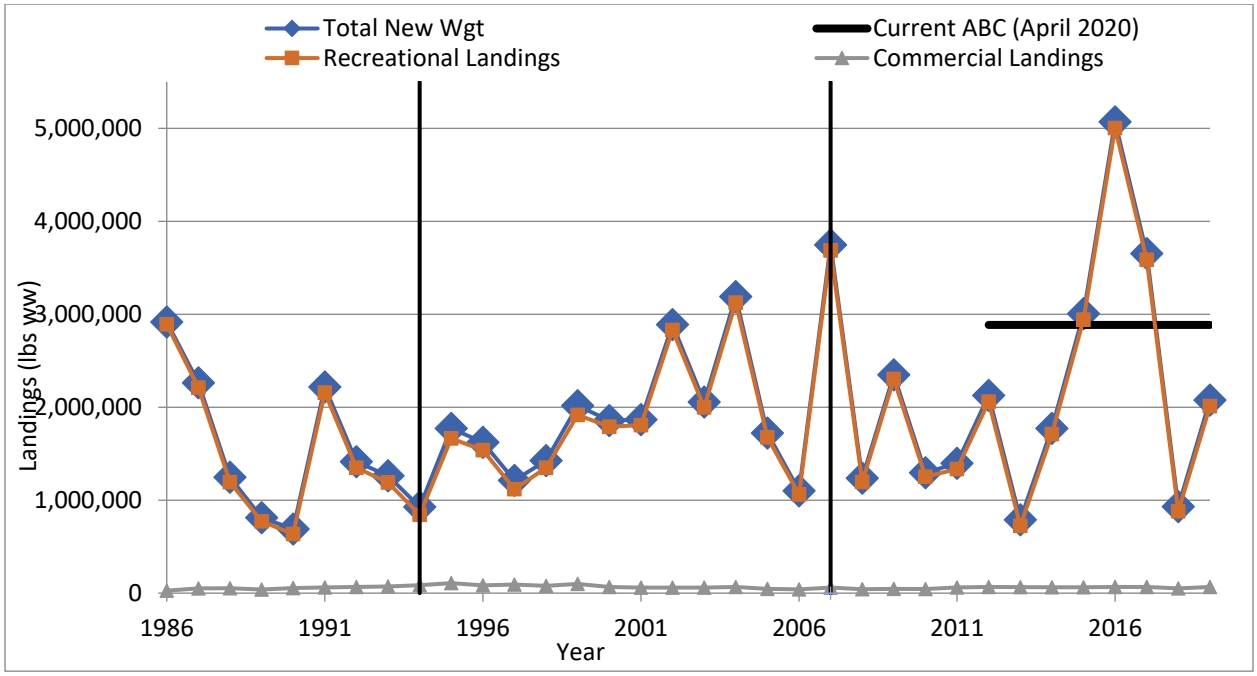

Figure 4.2.1.1. Wahoo landings (pounds whole weight) from 1986-2019 in comparison to the current ABC recommendation from the April 2020 SSC meeting. The solid vertical lines indicate baseline years (1994 to 2007) selected by the SSC for setting the wahoo ABC. Please note that 2019 landings are preliminary.

Table 4.2.1.3. Percent standard errors (PSEs) for recreational wahoo landings (by weight), 2010-2019.

Year	Recreational PSEs for Wahoo
2010	27.2%
2011	25.1%
2012	13.6%
2013	21.5%
2014	21.8%
2015	26.7%

Year	Recreational PSEs for Wahoo
2016	28.8%
2017	40.9%
2018	27.0%
2019	28.8%

Table 4.2.1.4. Projection of total ACL being reached under all the alternatives under Action 2 when compared with the average landings (lbs ww) during 2015-2019 and 2017-2019, and maximum landings for a single year during 2015-2019. The new ABC for wahoo = 2,885,303 lbs ww (3rd highest landings from 1994-2007). Please note that 2019 landings are preliminary.

Alternative	Wahoo ACL (lbs ww)	Total ACL Reached (Date) Average Landings 2015-2019	Total ACL Reached (Date) Average Landings 2017-2019	Maximum Landings 2015-2019
Alternative 1 (No Action)	1,794,960[8]	Not Applicable	Not Applicable	Not Applicable
Preferred Alternative 2	2,885,303	Yes (24-Dec)	No	Yes (22-Sep)
Alternative 3	2,741,038	Yes (8-Dec)	No	Yes (8-Sep)
Alternative 4	2,596,773	Yes (22-Nov)	No	Yes (29-Aug)

*Current ABC(=ACL).

4.2.2 Economic Effects

In general, ACLs that allow for more fish to be landed can result in increased positive economic effects if harvest increases without notable effects of the stock of a species. The ACL does not directly impact the fishery for a species unless harvest changes or the ACL is exceeded, thereby triggering AMs such as closures or other restrictive measure. As such, ACLs that are set above the observed landings in the fishery for a species do not have realized economic effects.

As noted in **Section 4.1.2**, **Alternative 1 (No Action)** is not a viable alternative, but if the current ACL were to remain in place, it would not be expected to be constraining on the fishery, as observed total harvest (recreational and commercial) has been well below the total ACL. Thus, the fishery would continue to not be constrained by the total ACL and there would be no economic effects. The potential revised total ACLs for wahoo in **Alternatives 2 (Preferred)** through **4** are less than the observed landings in three out of the past five years of available data (2015-2019) (**Figure 4.1.1.1**). Based on the average landings over the most recent five years of available data, landings would be above the potential new total ACLs and thus would constrain the fishery. Based on the historic breakdown of wahoo landings, the commercial fishery would likely go unconstrained as the sector landings would be below the sector ACL set in Action 4. The recreational fishery would likely be constrained by the new total ACL put in place in **Action 2** and sector ACL put in place in Action 4. The economic effects of **Alternatives 2 (Preferred)**

[8] **Alternative 1 (No Action)** of Action 2 provides an ACL using CHTS data which had the effort component collected with a phone survey, and did not include recreational landings from Monroe County, Florida. This makes the ACL under **Alternative 1 (No Action)** not applicable to the data provided in **Table 4.2.1.4** because the **Table 4.2.1.4** landings use the FES data and include recreational landings from Monroe County, Florida

through **4** would be highly dependent on the preferred alternatives chosen in Actions 4, 9, and 10 that address sector allocations and the recreational accountability measure. In general, if the AM is triggered, there would be a lower bag limit, a vessel limit implemented, or the fishing season would be reduced. This could lead to negative short-term economic effects due to decrease revenue and producer surplus for for-hire vessels as well as lower consumer surplus on recreational trips landing wahoo.

In general, ACLs that offer a larger buffer between the ACL and observed landings reduce the likelihood of a restrictive AM being triggered that would lead to short-term negative economic effects. Thus under this notion, the alternatives in **Action 2** can be ranked from a short-term economic perspective with **Alternative 1 (No Action)** having the lowest potential for negative economic effects, followed by **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4 (Table 4.2.2.1)**.

Table 4.2.2.1. Percent difference between the ACLs in **Action 2** compared to 5-year average landings from 2015-2019.

Alternative	Wahoo ACL (lbs ww)	Percent difference between the ACL and average annual landings from 2015-2019*
Alternative 1 (No Action)	1,794,960	43%
Preferred Alternative 2	**2,885,303**	**-4%**
Alternative 3	2,741,038	-12%
Alternative 4	2,596,773	-20%

***Alternative 1 (No Action)** is tracked in part using CHTS estimates for charter and private recreational landings and does not include recreational landings from Monroe County, Florida. **Alternatives 2 (Preferred)** through **4** would be tracked in part using FES estimates for charter and private recreational landings and would include recreational landings from Monroe County, Florida.

4.2.3 Social Effects

The ACL for any stock does not directly affect resource users unless the ACL is met or exceeded, in which case AMs that restrict, or close harvest could negatively impact the commercial, for-hire, and private recreational sectors. AMs can have significant direct and indirect social effects because, when triggered, can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects, such as increased pressure on another species, or fishermen having to stop fishing all together due to regulatory closures. However, restrictions on harvest contribute to sustainable management goals, and are expected to be beneficial to fishermen and communities in the long term. Generally, the higher the ACL the greater the short-term social benefits that would be expected to accrue if harvest is sustainable.

Under **Action 2**, **Preferred Alternative 2** through **Alternative 4**, the ACL for wahoo would be based on the most recent stock assessment and updated MRIP estimates. Adjustments in an ACL based on updated information are necessary to ensure continuous social benefits over time, **Alternative 1 (No Action)** would not update the wahoo ACL based on current information and would not provide the related social benefits.

Commercial and recreational landings are estimated to vary year by year (**Table 4.2.1.2**), and projections indicate that there could be some years in which the total ACL may be met, primarily driven by recreational landings (**Table 4.2.1.4**). Depending on the AMs implemented in Action 8, there would likely be some negative effects on recreational fishermen and for-hire and commercial businesses that target wahoo. In general, a higher ACL would lower the chance of triggering a recreational or commercial AM and result in the lowest level of negative effects on the recreational and commercial sectors. Among the action alternatives, **Preferred Alternative 2** would be the most beneficial for fishermen, followed by **Alternative 3**, and **Alternative 4**, and **Alternative 1 (No Action)**.

4.2.4 Administrative Effects

The mechanisms for monitoring and documentation of the total ACL for wahoo are already in place through implementation of Dolphin Wahoo Amendment 5 (SAFMC 2013) and reflects **Alternative 1** (**No Action**). The total ACL is expected to be met earlier in the fishing year for the scenarios considering average landings during 2015-2019 and the maximum landings for a single year during 2015-2019 under **Preferred Alternative 2**, **Alternatives 3** and **4** (**Table 4.2.1.4**). **Alternatives 3** and **4** would result in the total ACL being reached earlier than **Preferred Alternative 2** (**Table 4.2.1.4**). Therefore, administrative effects would be greater for **Alternative 4**, followed by **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**. Administrative burdens depending on the AM (in-season closure for the commercial sector and the preferred AM alternatives in Actions 7 and 8 for the recreational sector) would relate to data monitoring, outreach, and enforcement of a short fishing season. Other administrative burdens that may result from revising the values under **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** would take the form of development and dissemination of outreach and education materials for fishery participants and law enforcement.

4.3 Action 3. Revise sector allocations and sector annual catch limits for dolphin

4.3.1 Biological Effects

Biological effects are not expected to vary between **Alternative 1 (No Action)** through **Alternative 4** in **Action 3**, since they do not change the total ACL specified in Action 1. Furthermore, the commercial sector for dolphin has effective in-season and post-season AMs in place to prevent the commercial ACL from exceeding. The recreational sector for dolphin could exceed its ACL under the current AMs and therefore, it is recommended that effective AMs be considered in Actions 5 and 6 in this amendment to avoid possible adverse effects. The current sector allocation for dolphin (90% recreational/10% commercial) was implemented by Amendment 8 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 8) in 2016 (81 FR 3731; SAFMC 2015). The current recreational ACL for dolphin is 13,810,361 lbs ww and the current commercial ACL for dolphin is 1,534,485 lbs ww. The current sector ACLs are based on landings which did not include Monroe County, Florida, and were based on recreational data as per the older MRIP CHTS method as well as an older data stream for headboat and commercial landings. **Alternatives 1 (No Action)** through **Alternative 4** include percentages to the recreational and commercial sectors based on the revised total ACL of 24,570,764 lbs ww (Preferred Alternative 2 in Action 1 in Amendment 10 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 10)) (**Table 4.3.1.1**). The revised total ACL includes recreational landings from Monroe County, Florida, and incorporates recreational data as per the newer MRIP FES method, and updates to commercial and headboat landings. **Table 4.3.1.2** shows the sector allocations resulting from applying the percentages in **Alternatives 1 (No Action)** through **Alternative 4**.

Alternatives

Note: The revised total annual catch limit in Alternatives 1 (No Action) through 4 reflects Preferred Alternative 2 in Action 1 in Amendment 10 to the Fishery Management Plan for Dolphin and Wahoo of the Atlantic. The revised total annual catch limit includes recreational landings from Monroe County, Florida, and incorporates recreational data as per the Marine Recreational Information Program using the Fishery Effort Survey method, as well as updates to commercial and for-hire landings.

1 (No Action). Retain the current recreational sector and commercial sector allocations as 90.00% and 10.00%, respectively, of the revised total annual catch limit for dolphin.

2. Allocate 93.75% of the revised total annual catch limit for dolphin to the recreational sector. Allocate 6.25% of the revised total annual catch limit for dolphin to the commercial sector. This is based on approximately maintaining the current commercial annual catch limit and allocating the remaining revised total annual catch limit to the recreational sector.

3. Allocate 93.00% of the revised total annual catch limit for dolphin to the recreational sector. Allocate 7.00% of the revised total annual catch limit for dolphin to the commercial sector. This is based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of dolphin available to either sector.

4. Allocate 92.00% of the revised total annual catch limit for dolphin to the recreational sector. Allocate 8.00% of the revised total annual catch limit for dolphin to the commercial sector. This is based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of dolphin available to either sector.

Table 4.3.1.1. Sector allocations for dolphin in **Action 3** based on the revised total ACL of 24,570,764 lbs ww from Preferred Alternative 2 in Action 1.

Alternative	Percent Recreational allocation	Percent Commercial allocation

Alternative 1 (No action)	90.00%	10.00%
Alternative 2	93.75%	6.25%
Alternative 3	93.00%	7.00%
Alternative 4	92.00%	8.00%

Table 4.3.1.2. Sector ACLs (lbs ww) for dolphin in **Action 3** based on the revised total ACL of 24,570,764 lbs ww from Preferred Alternative 2 in Action 1.

Alternative	Recreational sector ACL (lbs ww)	Commercial sector ACL (lbs ww)
Alternative 1 (No action)	22,113,688	2,457,076
Alternative 2	23,035,091	1,535,673
Alternative 3	22,850,811	1,719,953
Alternative 4	22,605,103	1,965,661

The commercial sector for dolphin closed in 2015 because the commercial ACL was met that year and the Council allocated 10% of the total ACL to the commercial sector through Dolphin Wahoo Amendment 8, which was implemented in 2016 (81 FR 3731; SAFMC 2015). The Council also approved a commercial trip limit of 4,000 lbs ww when 75% of the commercial ACL is met, which was implemented in January 30, 2017 (Regulatory Amendment 1 to the Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic (81 FR 96388, SAFMC 2016). Commercial landings have been well below the current commercial ACL with the exception of 2015 (**Tables 4.1.1.2** and **4.3.1.4**). Commercial landings for dolphin also show a seasonal trend, with most of the landings between April and July, with a peak in May (**Figure 4.3.1.3**). **Table 4.3.1.3** shows the difference from the current commercial ACL for **Alternatives 1 (No Action)** through **Alternative 4**. A similar comparison for the recreational sector is not appropriate because it would be comparing different metrics due to the differences between the old MRIP CHTS and new MRIP FES methods. Recreational landings for dolphin are more spread out during a calendar year, with most of the landings between February and November, with a peak in the summer months (**Figure 4.3.1.2**). An analysis of three scenarios: total landings, average landings for both commercial and recreational sectors during 2015-2019, 2017-2019, and the maximum annual landings from a single year during 2015-2019 (**Table 4.3.1.4**, **Figures 4.3.1.1**, **4.3.1.2**, and **4.3.1.3**) reveals that the commercial ACL for dolphin would not be reached under **Alternative 1 (No Action)** through **Alternative 4** for all the scenarios (**Table 4.3.1.5**). However, the recreational ACL would be reached as early as September 29 and as late as October 11 before the end of the fishing year (December 31) under **Alternative 1 (No Action)** through **Alternative 4** if the maximum annual landings from a single year during 2015-2019 is considered (**Table 4.3.1.5**). Recreational landings would continue to occur without effective AMs for the recreational sector and could have adverse biological effects.

Table 4.3.1.3. Commercial ACLs for dolphin in **Action 3** in comparison to the current commercial ACL.

Alternative	Commercial ACL (lbs ww) *	Difference from current commercial ACL (lbs ww) **
Alternative 1 (No Action)	2,457,076	922,591
Alternative 2	1,535,673	1,188
Alternative 3	1,719,953	185,468
Alternative 4	1,965,661	431,176

* Revised commercial ACL = 2,457,076 lbs ww.

**Current commercial ACL= 1,534,485 lbs ww.

Table 4.3.1.4. Annual landings for dolphin from 2015 to 2019, average landings during 2015-2019, average landings during 2017-2019, and the maximum annual landings from a single year during 2015-2019.

Year	Recreational	Commercial	Total
2015	25,375,981	1,111,483	26,487,464
2016	15,997,342	938,477	16,935,819
2017	12,649,853	635,952	13,285,805
2018	16,804,999	535,923	17,340,922
2019*	11,929,298	801,826	12,731,124
Average 2015-2019	16,551,495	804,732	17,356,227
Average 2017-2019	13,794,717	657,900	14,452,617
Maximum Annual Landings (2015-2019)	25,375,981	1,111,483	26,487,464

*2019 landings are preliminary.

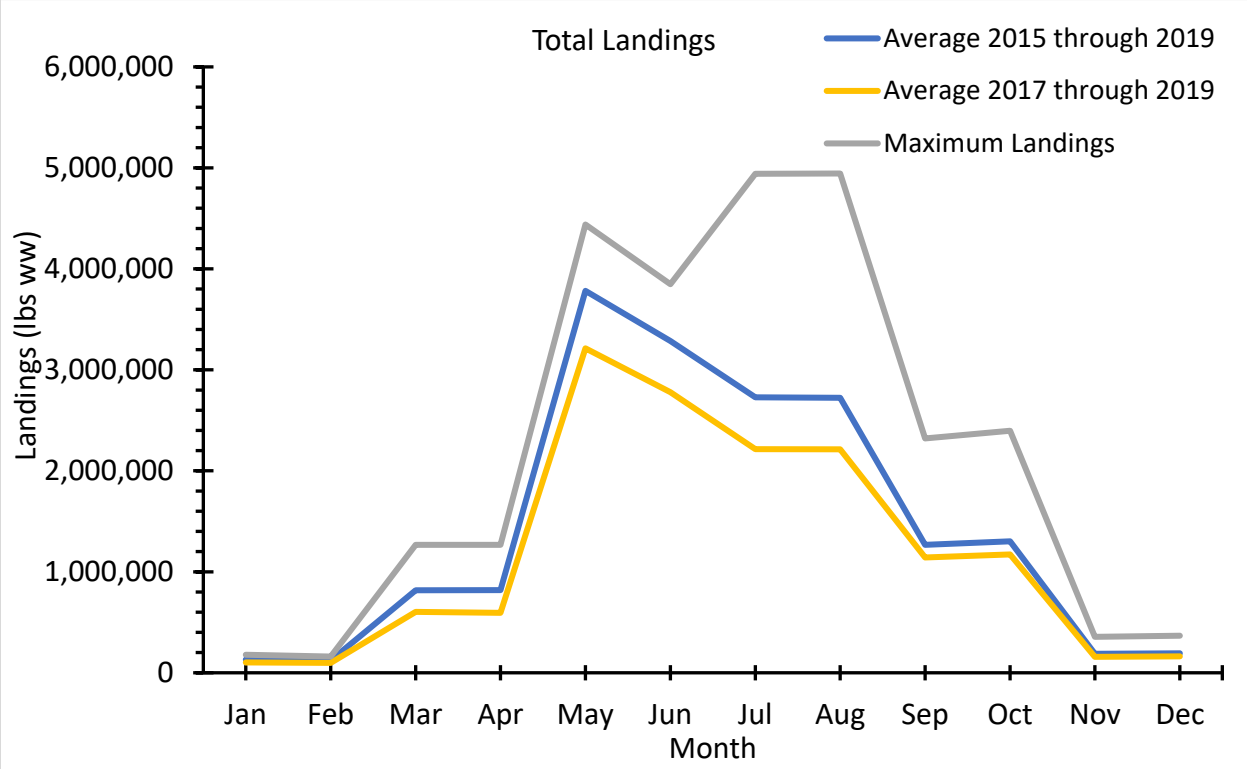

Figure 4.3.1. Dolphin total landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum landings for a single year during 2015-2019. The total landings are both the commercial and recreational landings combined. Please note that 2019 landings are preliminary.

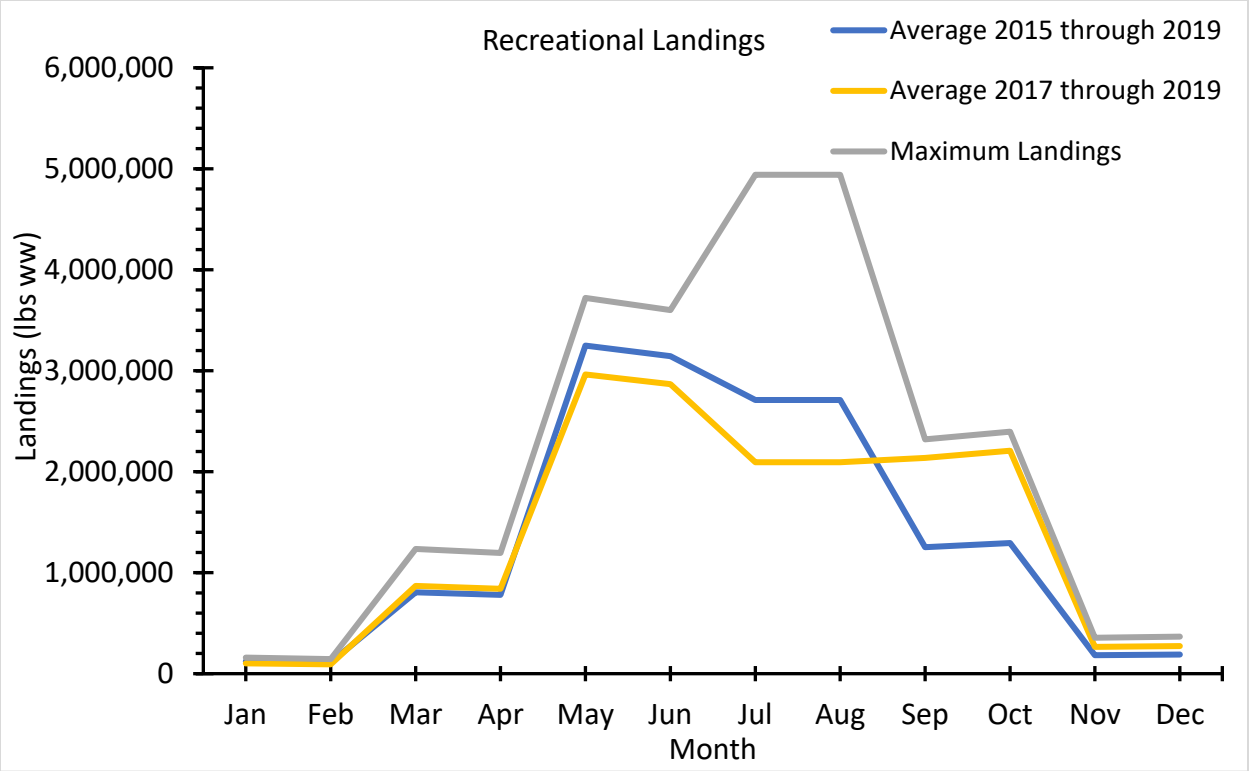

Figure 4.3.2. Dolphin recreational landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum landings for a single year during 2015-2019.

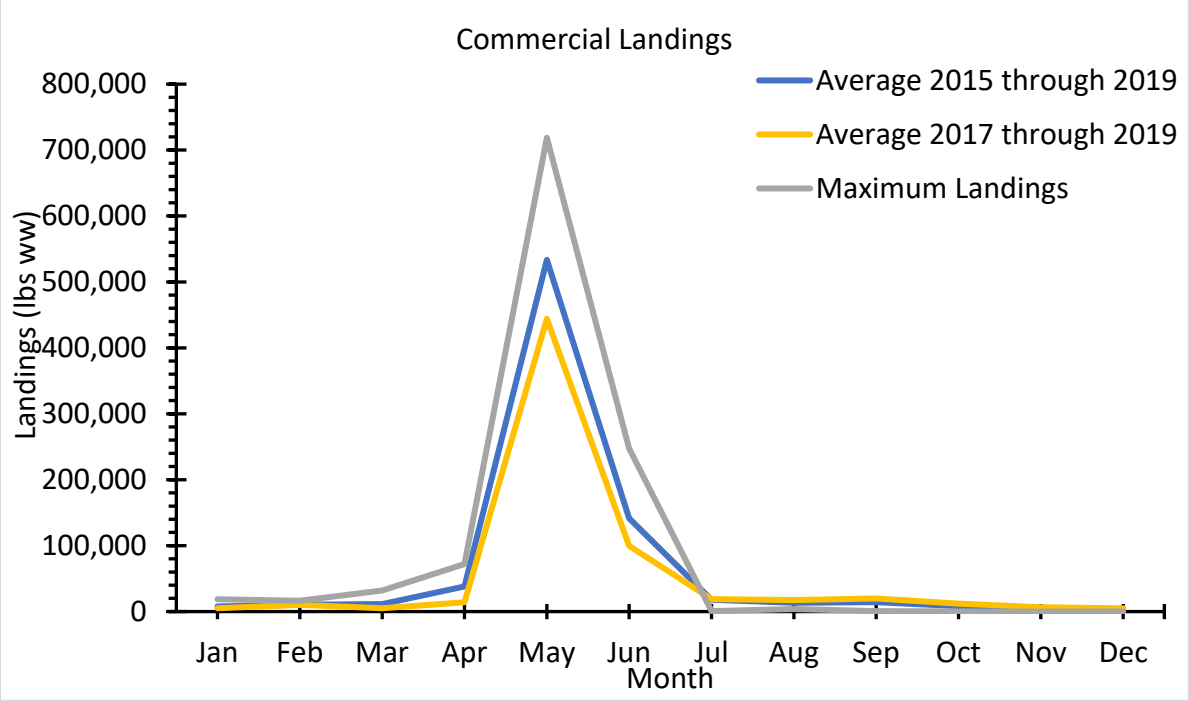

Figure 4.3.3. Dolphin commercial landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum landings for a single year during 2015-2019. Please note that 2019 landings are preliminary.

Table 4.3.1.5. Predicted date when the recreational and commercial sector ACLs for dolphin would be reached or exceeded under the maximum landings for a single year during 2015-2019. The recreational and commercial sector ACLs for dolphin would not be reached or exceeded under the average during 2015-2019 or average during 2017-2019 scenarios. Please note that 2019 landings are preliminary.

Alternative	Recreational Sector ACL (lbs ww)	Recreational ACL reached?	Commercial Sector ACL (lbs ww)	Commercial ACL reached?
Alternative 1 (No Action)	22,113,688	Yes (29-Sep)	2,457,076	No
Alternative 2	23,035,091	Yes (11-Oct)	1,535,673	No
Alternative 3	22,850,811	Yes (8-Oct)	1,719,953	No
Alternative 4	22,605,103	Yes (5-Oct)	1,965,661	No

Note: Maximum annual landings during 2015-2019 were 25,375,981 lbs ww for the recreational sector and 1,111,483 lbs ww for the commercial sector.

4.3.2 Economic Effects

In general, ACLs that allow for more fish to be landed can result in increased positive economic effects if harvest increases without notable effects of the stock of a species. The ACL does not directly impact the fishery for a species unless harvest changes or the ACL is exceeded, thereby triggering AMs such as closures or other restrictive measure. As such, ACLs that are set above the observed landings in the fishery for a species do not have realized economic effects.

All alternatives in **Action 3** would lead to an increase in the sector ACL for the recreational sector, but comparison to the current sector ACL on a pound or number of fish basis is not relevant due to the relatively large shift from CHTS to FES estimates as well as the different geographic range between the existing sector ACL that does not include recreational landings from Monroe County, Florida and new sector ACL that would include these landings. All alternatives in **Action 3** would also lead to an increase in the sector ACL for the commercial sector. Based on the average landings over the most recent five years of available data (2015-2019), landings for both sectors would continue to be below the potential new sector ACLs and thus not constraining on the fishery (**Table 4.3.1.5**). As a result there would be no anticipated change to fishing activity or behavior and thus no economic effects are anticipated from **Alternatives 1 (No Action)** through **4**.

While none of the sector ACLs are expected to lead to changes in dolphin harvest or fishing behavior targeting dolphin, higher ACLs offer a larger buffer between the sector ACL and observed landings which reduces the likelihood of a restrictive AM being triggered that would lead to short-term negative economic effects. Thus under this notion, the alternatives in **Action 3** can be ranked for the recreational sector from a short-term economic perspective with **Alternative 2** having the lowest potential for negative economic effects, followed by **Alternative 3**, **Alternative 4**, and **Alternative 1 (No Action)**. For the commercial sector, the ranking would be the opposite from a short-term economic perspective with **Alternative 1 (No Action)** having the lowest potential for negative economic effects, followed by **Alternative 4**, **Alternative 3**, and **Alternative 2.**

4.3.3 Social Effects

Sector allocations exist for the recreational and commercial sectors already, **Alternative 1 (No Action)** would maintain the current allocation percentages and may have few social effects

as both sectors would see an increase in available poundage. With **Alternative 2**, **Alternative 3**, and **Alternative 4** there would be a decrease in the commercial percentage compared to **Alternative 1 (No Action)**, which could have some negative social effects if commercial fishermen have a negative perception of this change and concerns about long-term social effects, especially if other actions further decreased the harvest thresholds. However, the increase in poundage may result in positive social benefits associated with increased harvest.

As mentioned, there can be many different social effects that result as further allocations are discussed, and perceptions are formed. In the past there has been some resistance to further decreasing a given sectors percentage allocation. Again, it is difficult to predict the social effects with any allocation scheme as it would depend upon other actions in conjunction with this one. A reduction in allocation for one sector may be compounded by a restrictive choice of ABC or ACL (**Action 1**) and may have further effects that could be either negative or positive depending upon the combination of effects. Therefore, the choice of an allocation will need to be assessed with other actions within this amendment to determine the overall social effects and whether short-term losses are offset by any long-term biological gains. Projections indicate that the commercial ACL for dolphin would not be reached under the any of the alternatives proposed in **Action 3**, however the recreational ACL may be reached under **Alternative 1 (No Action)** through **Alternative 4** if maximum landings from recent years are seen in the future (**Table 4.3.1.5**).

4.3.4 Administrative Effects

The mechanisms for monitoring and documentation of the sector ACLs (commercial and recreational) for dolphin are already in place through implementation of Dolphin Wahoo Amendment 8 (SAFMC 2015). Administrative effects will not vary between **Alternative 1 (No Action)** and **Alternatives 2** through **4** for the commercial sector because the commercial ACL is not expected to be reached under any of the three scenarios considered in the analysis (**Table 4.3.1.5**). For the recreational sector, the recreational ACL is expected to be reached under the maximum landings for a single year during 2015-2019 scenario (**Table 4.3.1.5**). **Alternative 4** would result in the recreational ACL being reached earliest compared with **Alternatives 3**, **2**, and **Alternative 1 (No Action)** (**Table 4.3.1.5**). Therefore, administrative effects would be greater for **Alternative 4**, followed by **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**. Administrative burdens depending on the AM (preferred AM alternatives in Actions 5 and 6 for the recreational sector) would relate to data monitoring, outreach, and enforcement of a short fishing season. Other administrative burdens that may result from revising the values under **Alternative 1 (No Action)** and **Alternatives 2** through **4** would take the form of development and dissemination of outreach and education materials for fishery participants and law enforcement.

4.4 Action 4. Revise sector allocations and sector annual catch limits for wahoo

4.4.1 Biological Effects

Biological effects are not expected to vary between **Alternative 1 (No Action)** through **Alternative 4**, since they do not change the total ACL specified in Action 2. Furthermore, the commercial sector for wahoo has effective in-season and post-season AMs in place to prevent the commercial ACL from exceeding. The recreational sector for wahoo could exceed its ACL under the current AMs and therefore, it is recommended that effective AMs be considered in Actions 7 and 8 in this amendment to avoid possible adverse effects. The current sector allocation for wahoo (96.07% recreational/3.93% commercial) was implemented by Amendment 5 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 5) in 2014 (79 FR 32878; SAFMC 2013). The current recreational ACL for wahoo is 1,724,418 lbs ww, and the current commercial ACL for wahoo is 70,542 lbs ww. The current sector ACLs are based on landings which did not include Monroe County, Florida, and were based on recreational data as per the older MRIP CHTS method as well as an older data stream for headboat and commercial landings. **Alternatives 1 (No Action)** through **Alternative 4** include percentages to the recreational and commercial sectors based on the revised total ACL of 2,885,303 lbs ww (Preferred Alternative 2 in Action 2 in Dolphin Wahoo Amendment 10 (**Table 4.4.1.1**). The revised total ACL includes recreational landings from Monroe County, Florida, and incorporates recreational data as per the newer MRIP FES method, and updates to commercial and headboat landings. **Table 4.4.1.2** shows the sector allocations resulting from applying the percentages in **Alternatives 1 (No Action)** through **Alternative 4**.

Alternatives

Note: The revised total annual catch limit in Alternatives 1 (No Action) through 4 reflects Preferred Alternative 2 in Action 2 in Amendment 10 to the Fishery Management Plan for Dolphin and Wahoo of the Atlantic. The revised total annual catch limit includes recreational landings from Monroe County, Florida, and incorporates recreational data as per the Marine Recreational Information Program using the Fishery Effort Survey method, as well as updates to commercial and for-hire landings.

1 (No Action). Retain the current recreational sector and commercial sector allocations as 96.07% and 3.93%, respectively, of the revised total annual catch limit for wahoo.

2. Allocate 96.35% of the revised total annual catch limit for wahoo to the recreational sector. Allocate 3.65% of the revised total annual catch limit for wahoo to the commercial sector. This is based on the total catch between 1994 and 2007.

3. Allocate 97.55% of the revised total annual catch limit for wahoo to the recreational sector. Allocate 2.45% of the revised total annual catch limit for wahoo to the commercial sector. This is based on maintaining the current commercial annual catch limit and allocating the remaining revised total annual catch limit to the recreational sector.

4. Allocate 97.00% of the revised total annual catch limit for wahoo to the recreational sector. Allocate 3.00% of the revised total annual catch limit for wahoo to the commercial sector. This is based on the Council's intent to explore alternatives for sector allocations that would not result in a decrease in the current pounds of wahoo available to either sector.

Table 4.4.1.1. Sector allocations for wahoo in **Action 4** based on the revised total ACL of 2,885,303 lbs ww from Preferred Alternative 2 in Action 2.

Alternative	Percent Recreational allocation	Percent Commercial allocation
Alternative 1 (No action)	96.07%	3.93%

Alternative 2	96.35%	3.65%
Alternative 3	97.55%	2.45%
Alternative 4	97.00%	3.00%

Table 4.4.1.2. Sector ACLs (lbs ww) for wahoo in **Action 4** based on the revised total ACL of 2,885,303 lbs ww from Preferred Alternative 2 in Action 2.

Alternative	Recreational sector ACL (lbs ww)	Commercial sector ACL (lbs ww)
Alternative 1 (No action)	2,771,911	113,392
Alternative 2	2,779,989	105,314
Alternative 3	2,814,613	70,690
Alternative 4	2,798,744	86,559

Commercial landings for wahoo are steady and spread out throughout the year (**Figure 4.4.1.3**). **Table 4.4.1.3** shows the difference from the current commercial ACL for **Alternatives 1 (No Action)** through **Alternative 4**. A similar comparison for the recreational sector is not appropriate because it would be comparing different metrics due to the differences between the old MRIP CHTS and new MRIP FES methods. Most of the recreational landings for wahoo are from June to September, with a peak in July and August (**Figure 4.3.1.2**). An analysis of three scenarios: total landings, average landings for both commercial and recreational sectors during 2015-2019, 2017-2019, and the maximum annual landings from a single year during 2015-2019 (**Table 4.4.1.4**; **Figures 4.4.1.1**, **4.4.1.2**, and **4.4.1.3**) reveals that the commercial ACL for wahoo would not be reached under **Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 4** for all the scenarios, it would be reached under **Alternative 3** and under the maximum landings during 2015-2019 scenario (**Table 4.4.1.5**). The recreational ACL would not be reached under all the alternatives in **Action 4** under the average 2017-2019 landings scenario, but it would be reached as early as December 19 and as late as December 24 under the average 2015-2019 landings scenario, and on different dates in September under the maximum landings during 2015-2019 scenario (**Table 4.4.1.5**). Recreational landings for wahoo would continue to occur without effective AMs for the recreational sector and could have adverse biological effects.

Table 4.4.1.3. Commercial ACLs for wahoo in Action 4 in comparison to the current commercial ACL.

Alternative	Commercial ACL (lbs ww) *	Difference from current commercial ACL (lbs ww) **
Alternative 1 (No Action)	113,392	42,850
Alternative 2	105,314	34,772
Alternative 3	70,690	148
Alternative 4	86,559	16,017

* Revised commercial ACL = 2,885,303 lbs ww.
**Current commercial ACL= 70,542 lbs ww.

Table 4.4.1.4. Annual landings for wahoo from 2015 to 2019, average landings during 2015-2019, average landings during 2017-2019, and the maximum annual landings from a single year during 2015-2019.

Year	Recreational	Commercial	Total
2015	2,943,009	63,836	3,006,845

Year	Recreational	Commercial	Total
2016	5,003,444	66,745	5,070,189
2017	3,585,791	67,032	3,652,823
2018	880,960	50,486	931,446
2019*	2,010,814	74,449	2,085,263
Average 2015-2019	2,884,804	64,510	2,949,313
Average 2017-2019	2,159,188	63,989	2,223,177
Maximum Annual Landings (2015-2019)	5,003,444	74,449	5,077,893

*2019 landings are preliminary.

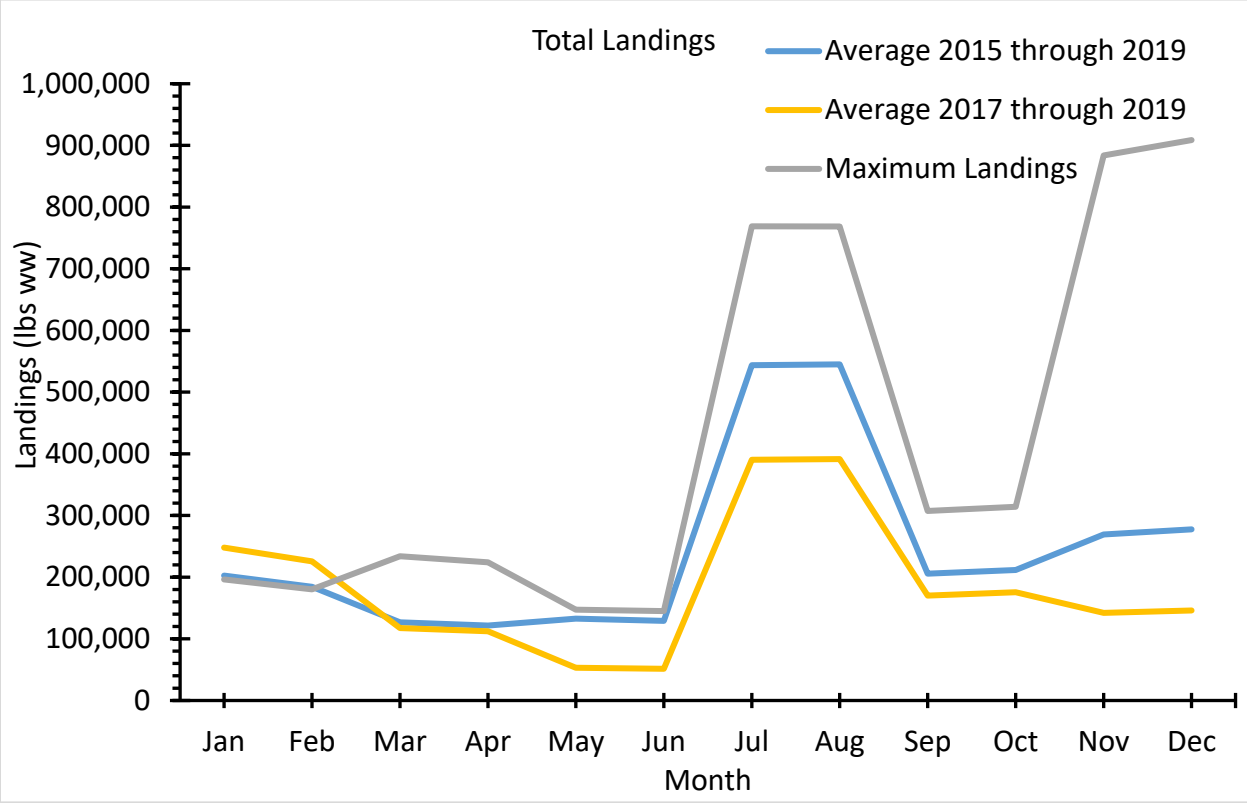

Figure 4.4.1.1. Wahoo total landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum landings for a single year during 2015-2019. The total landings are both the commercial and recreational landings combined. 2019 landings are preliminary.

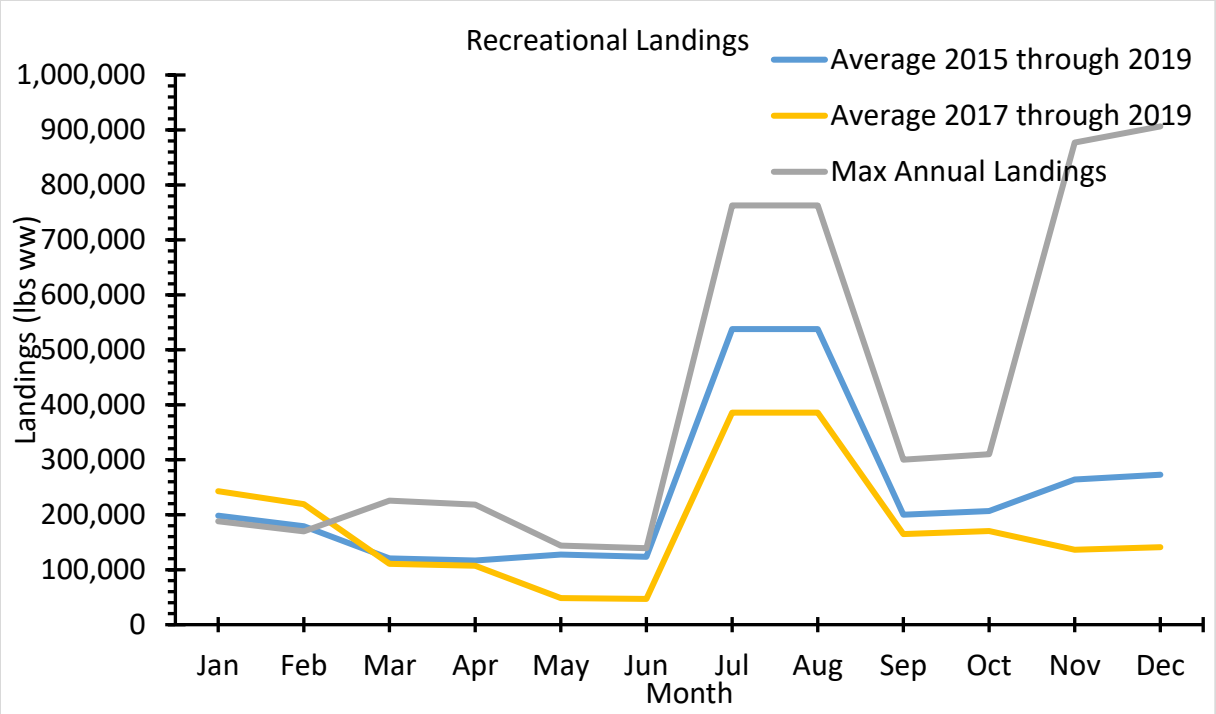

Figure 4.4.1.2. Wahoo recreational landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum landings for a single year during 2015-2019.

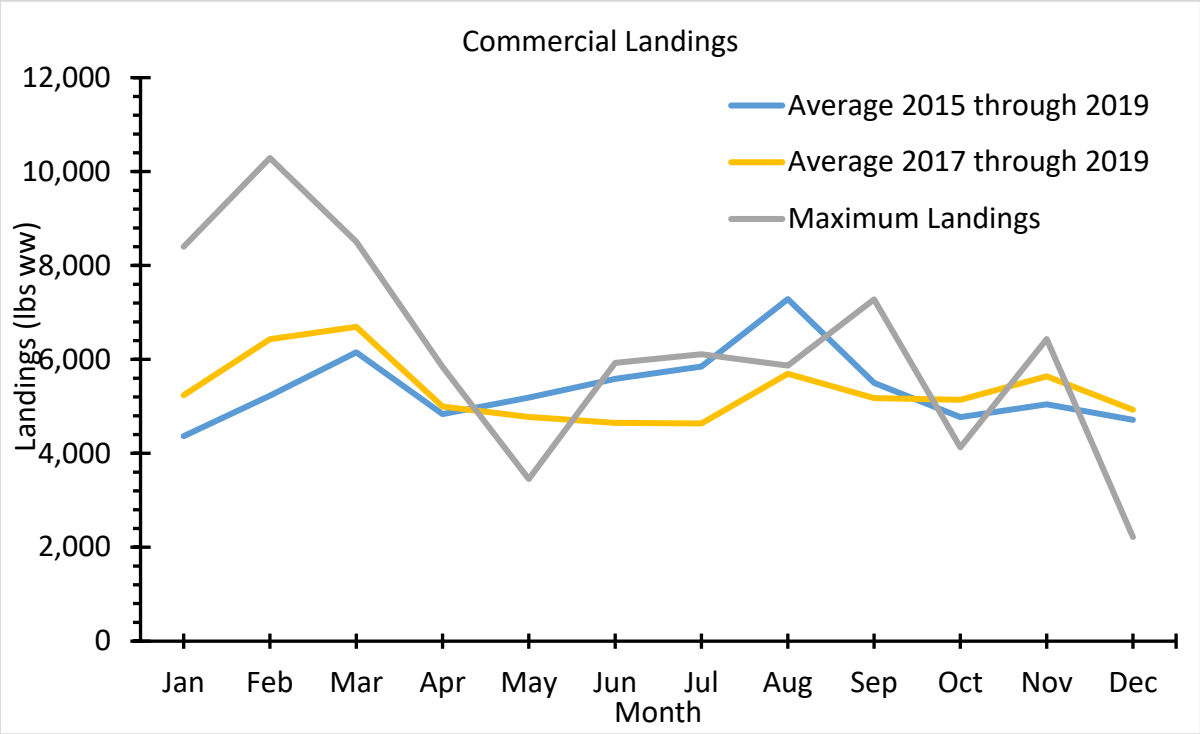

Figure 4.4.1.3. Wahoo commercial landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum landings for a single year during 2015-2019. 2019 landings are preliminary.

Table 4.4.1.5. Predicted date when the recreational and commercial sector ACLs for wahoo would be reached or exceeded under three scenarios: 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum landings for a single year during 2015-2019. 2019 landings are preliminary.

Alternative	Wahoo ACL (lbs ww)	ACL reached? Average 2015-2019 Landings	ACL reached? Average 2017-2019 Landings	ACL reached? Maximum Landings during 2015-2019
Commercial Sector				
Alternative 1 (No Action)	113,392	No	No	No
Alternative 2	105,314	No	No	No
Alternative 3	70,690	No	No	Yes (23-Nov)
Alternative 4	86,559	No	No	No
Recreational Sector				
Alternative 1 (No Action)	2,771,911	Yes (19-Dec)	No	Yes (17-Sep)
Alternative 2	2,779,989	Yes (20-Dec)	No	Yes (18-Sep)
Alternative 3	2,814,613	Yes (24-Dec)	No	Yes (21-Sep)
Alternative 4	2,798,744	Yes (22-Dec)	No	Yes (19-Sep)

Note: Maximum annual landings during 2015-2019 were 5,003,444 lbs ww for the recreational sector and 74,449 lbs ww for the commercial sector.

4.4.2 Economic Effects

In general, ACLs that allow for more fish to be landed can result in increased positive economic effects if harvest increases without notable effects of the stock of a species. The ACL does not directly impact the fishery for a species unless harvest changes or the ACL is exceeded, thereby triggering AMs such as closures or other restrictive measure. As such, ACLs that are set above the observed landings in the fishery for a species do not have realized economic effects.

Alternative 1 (No Action) would maintain the current sector allocation 96.07% of the total ACL to the recreational sector. The resulting sector allocation under Preferred Alternative 2 in Action 2 would be 2,771,911 lbs ww, which is the lowest recreational sector ACL being considered in **Action 4**. **Alternatives 2** through **4** would result in a comparatively higher sector allocation and sector ACL for the recreational sector. Since all of the recreational sector ACLs in **Action 4** are estimated to be constraining based on the average annual landings over the last five years of available data (**Table 4.4.1.5**), it is anticipated that the additional potential landings of wahoo offered by **Alternatives 2** through **4** in comparison to **Alternative 1 (No Action)** would be fully harvested by the recreational sector. These additional landings would be expected to increase total consumer surplus for the recreational sector. **Alternative 3** would result in the largest estimated change in CS of $134,970, followed by **Alternative 4** and **Alternative 2** with estimated increases in CS of $84,812 and $25,533 respectively (2019 dollars)(**Table 4.4.2.1**)[9].

[9] Based on an average weight of 33.22 lbs ww per fish to convert the difference in sector ACLs on a pound basis to numbers of fish. This conversion is based on a MRIP Query accessed on November 17, 2020 at https://www.st.nmfs.noaa.gov/st1/recreational/queries/. A CS estimate of $105 (2019 dollars) per fish was applied as a proxy estimate for wahoo as noted in **Section 3.3.1**. The CS estimate for the second fish harvested on an angler trip was used since the bag limit for wahoo is 2 fish per person.

Table 4.4.2.1. Comparison of the estimated change in consumer surplus (CS) for wahoo recreational sector ACLs in **Action 4**.

Alternative	Estimated wahoo recreational sector ACL (number of fish)	Difference from Alternative 1 (No Action) (numbers of fish)	Difference from Alternative 1 (No Action) (CS in 2019$)
Alternative 1 (No Action)	2,771,911	0	$0
Alternative 2	2,779,989	243	$25,533
Alternative 3	2,814,613	1,285	$134,970
Alternative 4	2,798,744	808	$84,812

All alternatives in **Action 4** would also lead to an increase in the sector ACL for the commercial sector. Based on the average landings over the most recent five years of available data (2015-2019), landings for the commercial sector would continue to be below the potential new sector ACLs and thus not constraining on the commercial fishery (**Table 4.4.1.5**). As a result, there would be no anticipated change to commercial fishing activity or behavior and thus no economic effects are anticipated from **Alternatives 1 (No Action)** through **4** for the commercial sector.

In general, higher ACLs offer a larger buffer between the sector ACL and observed landings which reduces the likelihood of a restrictive AM being triggered that would lead to short-term negative economic effects. Thus under this notion, the alternatives in **Action 4** can be ranked for the recreational sector from a short-term economic perspective with **Alternative 3** having the lowest potential for negative economic effects, followed by **Alternative 4**, **Alternative 2**, and **Alternative 1 (No Action)**. This rank applies to estimated change in net benefits for the action (**Table 4.4.2.1**). For the commercial sector the ranking would be the opposite from a short-term economic perspective with **Alternative 1 (No Action)** having the lowest potential for negative economic effects, followed by **Alternative 2**, **Alternative 4**, and **Alternative 3**.

4.4.3 Social Effects

Sector allocations exist for the recreational and commercial sectors already, **Alternative 1 (No Action)** would maintain the current allocation percentages and may have few social effects as both sectors would see an increase in available poundage. With **Alternative 2**, **Alternative 3**, and **Alternative 4** there would be a decrease in the commercial percentage compared to **Alternative 1 (No Action)**, which could have some negative social effects if commercial fishermen have a negative perception of this change and concerns about long-term social effects, especially if other actions further decreased the harvest thresholds. However, the increase in poundage may result in positive social benefits associated with increased harvest..

As mentioned, there can be many different social effects that result as further allocations are discussed, and perceptions are formed. In the past there has been some resistance to further decreasing a given sectors percentage allocation. Again, it is difficult to predict the social effects with any allocation scheme as it would depend upon other actions in conjunction with this one. A reduction in allocation for one sector may be compounded by a restrictive choice of ABC or ACL (**Action 2**) and may have further effects that could be either negative or positive depending

upon the combination of effects. Therefore, the choice of an allocation will need to be assessed with other actions within this amendment to determine the overall social effects and whether short-term losses are offset by any long-term biological gains. Projections indicate that the commercial ACL would not be met under **Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 4**, however it may be met under **Alternative 3**. Recreational landings may be met under all the alternatives proposed in **Action 4**.

4.4.4 Administrative Effects

The mechanisms for monitoring and documentation of the sector ACLs (commercial and recreational) for wahoo are already in place through implementation of Dolphin Wahoo Amendment 5 (SAFMC 2013). The commercial sector is not expected to meet its commercial ACL under two of the three scenarios analyzed for this action. The commercial ACL is expected to be reached earlier in the fishing season under **Alternative 3** under the maximum annual landings during 2015-2019 scenario (**Table 4.4.1.5**), and would result in an in-season closure as per the commercial AM. Therefore, administrative effects for the commercial ACL alternatives would be greater for **Alternative 3** compared with **Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 4**. For the recreational sector, administrative effects will not vary between **Alternative 1 (No Action)** and **Alternatives 2** through **4** for the under the scenario of average landings during 2017-2019 (**Table 4.4.1.5**). However, under the average landings during 2015-2019 and maximum landings for a single year during 2015-2019 scenarios, administrative effects will be greater for the alternative reaching the recreational ACL the earliest in the fishing season, which would be **Alternative 1 (No Action)**, followed by **Alternative 2**, **Alternative 4**, and **Alternative 3** (**Table 4.3.1.5**). It is important to note the recreational ACL would be reached as early as September under the maximum landings for a single year during 2015-2019 scenario and as late as December under the average landings during 2015-2019 scenario (**Table 4.3.1.5**). Administrative burdens depending on the AM (preferred AM alternatives in Actions 7 and 8 for the recreational sector) would relate to data monitoring, outreach, and enforcement of a short fishing season. Other administrative burdens that may result from revising the values under **Alternative 1 (No Action)** and **Alternatives 2** through **4** would take the form of development and dissemination of outreach and education materials for fishery participants and law enforcement.

4.5 Action 5. Revise the trigger for the post-season recreational accountability measure for dolphin

4.5.1 Biological Effects

Alternative 1 (No Action) is not a viable alternative because the current recreational AM would never be triggered as there is no stock assessment for dolphin and there would be no way to determine its overfished status. Therefore, biological benefits would be expected to be greater under **Alternatives 2** through **Alternative 6** which would enable the recreational AM to be triggered, when compared with **Alternative 1 (No Action)**. Biological effects would be variable depending on the combination of which alternative(s) is (are) selected in **Action 5** and which post-season AM(s) is (are) selected in Action 6.

Biological benefits would be expected to be greater for the alternative that provides the most timely and realistic option chosen to trigger an AM. This is pronounced by the fact that no in-season AMs are considered in Dolphin Wahoo Amendment 10 (only post-season AMs are considered in Action 7). Corrective measures would only occur the following year or years after the recreational ACL is exceeded. Therefore, among **Alternatives 2** through **6** in **Action 5**, positive biological effects would be expected to be greater under **Alternative 6**, followed by **Alternative 5**, **Alternative 4**, **Alternative 3**, and **Alternative 2**. **Alternative 6** is the simplest and most conservative trigger and would allow post-season AMs to occur in the year following an overage of the recreational ACL. **Table 4.3.1.5** in Action 3 shows that this would only occur under the maximum landings for a single year during 2015-2019 scenario. **Alternative 5** would require the total (commercial and recreational) ACL to be exceeded before the post-season AM is triggered. The total ACL would also only be reached under the maximum landings for a single year during 2015-2019 scenario (**Table 4.1.1.4** in **Action 1**). **Alternative 4** would require recreational landings to exceed the recreational ACL in two of the previous three fishing years or exceed the total ACL in any one year. During 2017-2019, this trigger would only occur when the total ACL is exceeded as described under **Alternative 5**. **Alternative 3** would require the summed total of the most recent past three years of recreational landings to exceed the sum of the past three years recreational ACLs. During

Alternatives

1 (No action). If recreational landings exceed the recreational annual catch limit, then during the following fishing year, recreational landings will be monitored for persistence in increased landings. If the recreational annual catch limit is exceeded, it will be reduced by the amount of the recreational overage in the following fishing year and the recreational season will be reduced by the amount necessary to ensure that recreational landings do not exceed the reduced annual catch limit only if the species is overfished and the total annual catch limit is exceeded. However, the recreational annual catch limit and length of the recreational season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year geometric mean of landings exceed the recreational sector annual catch limit. If in any year the recreational sector annual catch limit is changed, the moving multi-year geometric mean of landings will start over.

3. Implement post season accountability measures in the following fishing year if the summed total of the most recent past three years of recreational landings exceeds the sum of the past three years recreational sector annual catch limits.

4. Implement post season accountability measures in the following fishing year if recreational landings exceed the recreational sector annual catch limit in two of the previous three fishing years or exceeds the total acceptable biological catch in any one year.

5. Implement post season accountability measures in the following fishing year if the total (commercial and recreational combined) annual catch limit is exceeded.

6. Implement post season accountability measures in the following fishing year if the recreational annual catch limit is exceeded.

2017-2019, recreational landings reached a total of 41,384,152 lbs ww (**Table 4.1.1.2**) and the sum of the recreational ACL during these years was 41,431,083 lbs ww (under the older MRIP CHTS method) and would have been 66,341,064 lbs ww under Preferred Alternative 2 in Action 1. Therefore, the post-season AMs would not have been triggered under **Alternative 3**. **Alternative 2** would require the recreational ACL to be constant and the 3-year geometric mean of landings to exceed the recreational ACL. The moving multi-year geometric mean of landings would start over if the recreational ACL was changed in any of those three years. This alternative is difficult to analyze since there are many assumptions and recreational landings would vary every year. Additionally, the recreational ACL may be revised within the 3-year time frame and the calculations would start over. This adds uncertainty to when the post-season AM would be triggered.

4.5.2 Economic Effects

The trigger for a recreational AM does not directly affect the actions taken under the AM but does affect whether corrective measures are put in place. These corrective measures typically create short-term negative economic effects by curtaining harvest and fishing activity, thus potentially affecting net revenues of for-hire operations and consumer surplus (CS) on recreational fishing trips. In the long-term, these measures also help reduce the risk of overfishing a stock to the point of depletion, which results long-term economic benefits through sustained harvest and fishing activity as well as the for-gone need for more stringent management measures that may be needed to rebuild a depleted stock.

In years when the recreational AM is not triggered, there are no economic effects from the trigger for the AM, thus there would be no economic effects from **Action 5** in this scenario. Since the recreational ACL for dolphin is not anticipated to be reached based on the most recent five-year average recreational landings (**Section 4.3.1**), there are no anticipated realized economic effects from any of the alternatives in **Action 5**.

If landings were to notably increase beyond recent observed landings and fall above the recreational sector ACL specified in Action 3, the following economic effects would be expected. As noted in **Section 4.5.1**, **Alternative 1 (No Action)** is not a viable alternative, but if the current AM trigger were to remain, the AM would not go into place since there is no stock assessment planned for dolphin and thus the species would not be expected to be deemed overfished. Under this alternative, the recreational sector could continue to harvest dolphin above the sector ACL unabated by an AM. This would lead to short-term economic benefits through potential elevated harvest and fishing activity for dolphin, which could result in increased revenue to for-hire vessels and CS for recreational anglers. The near-term net outcome of these potential economic effects is difficult to determine, but in the long-term if landings increase to the point where the total ACL is exceed and there is depletion of the stock due to unsustainable harvest, there would be severe negative economic effects for the recreational sector through notable lost revenue to for-hire vessels and severely decreased CS for recreational anglers. Additionally, depletion of the stock due to unsustainable harvest levels would also result in notable negative economic effects for the commercial sector as well through decreased revenue to commercial vessels and seafood dealers.

Alternatives 2 through **6** would implement triggers for the recreational AM that could reasonably be expected to occur since reference to an "overfished" condition would be removed. The specific economic effects of these alternatives would be highly dependent on the post-season recreational AM that is specified in Action 6. Out of these alternatives, **Alternative 2** would likely have the least likelihood of being trigger, as it uses a three-year geometric mean that would reset when the sector ACL is changed. Depending on landings and whether a change to the sector ACL is put in place, this alternative could delay the AM from being implemented for several years, allowing the recreational sector to exceed its ACL. There is also no safeguard in place to prevent the total ACL from being exceeded for more than one year. This could result in short-term economic benefits for the recreational sector and long-term potential economic costs to fishery participants. The economic effects would be similar but to a lesser degree as those outlined for **Alternative 1 (No Action)** since the recreational AM would eventually be triggered under an elevated landings scenario and prolonged unsustainable harvest would be unlikely. **Alternative 3** likely has similar economic effects those described for **Alternative 2** but is more stringent since there is not a mechanism to reset the AM trigger if the sector ACL is changed. Both **Alternative 2** and **Alternative 3** use three-year timelines for triggering an AM which could help mitigate the likelihood of a restrictive AM being put in place due to anomalies from the recreational data and would also allow the fishery to potentially continue to operate in after a single year of particularly high landings that revert to long-term average levels the following year. Given the "pulse" nature of recreational landings for dolphin, where landings rarely remain elevated for more than a single year, using a multi-year timeline for the AM trigger may be beneficial for the recreational sector. Conversely, since there is no in-season AM to prevent or slow down landings in excess of the sector ACL or total ACL, there is the potential that a single year of extremely high recreational landings could influence the three-year geometric mean (**Alternative 2**) or the three-year summed total (**Alternative 3**) in such a way that AMs would be remain in place for multiple years until these long-term metrics would revert below the threshold for the AM trigger. In such a scenario, this would lead to negative economic effects for the recreational sector in comparison to **Alternatives 4**, **5**, and **6** that do not solely rely on the use of multi-year metrics for triggering an AM.

Alternatives 4, **5**, and **6** are more stringent than the other alternatives considered in **Action 5**, as they would be triggered from landings exceeding the total ACL in a single year. **Alternatives 4** and **5** explicit include this and **Alternative 6** does so since by default given the combination of the current commercial AM and the potential recreational AM under this alternative. **Alternative 6** would have the lowest threshold for the recreational AM to be implemented, thus this alternative has the highest likelihood of short-term negative economic effects. **Alternative 4** would have a comparatively higher threshold for the recreational AM going into place, as the total ACL would need to be exceed in a single year or the recreational ACL would need to be exceeded two times in a three-year period. This would allow some flexibility of the recreational sector to exceed the sector ACL without an AM being trigger so long as the recreational sector ACL overage was not so large that it surpassed any underage of the commercial sector ACL or occurred multiple times in a three-year timespan. **Alternative 5** would fall between Alternative 6 and 4 in terms of likelihood of being triggered and potential flexibility in allowing some overage of the recreational sector ACL without the AM being triggered.

In terms of for-gone potential short-term negative economic effects to the recreational sector, **Alternative 1 (No Action)** would have the lowest potential negative economic effects, followed by **Alternative 2**, **Alternative 3**, **Alternative 5**, **Alternative 4**, and **Alternative 6**.

4.5.3 Social Effects

The AM trigger itself should not have any negative social effects but could impose negative effects indirectly if the trigger initiates management action that is unnecessary at the time or delays management action when it is necessary. **Alternative 1 (No Action)** would not revise the trigger for post-season recreational AMs, which requires payback of any recreational overage and a reduction in the season length to ensure the ACL is not exceeded if the stock is overfished and the total ACL is exceeded. Proposed alternatives would use various methods to trigger post season AMs based upon landing. **Alternative 2** uses the geometric mean over the past three years, which could be beneficial if for some reason landings in one or more years were artificially high or low due to anomalies in harvesting behavior or stock status. Similarly, **Alternative 3** and **Alternative 4** use an extended time frame for which may also be beneficial if landings are especially volatile. Alternatively, less conservative triggers may indirectly result in negative long-term social effects if they delay necessary management action.

Alternative 5 and **Alternative 6** are more conservative triggers, with **Alternative 6** being the more conservative, which could impose negative short-term social effects if AMs are triggered due to volatile landings in a single year. Alternatively, if management action is necessary, conservative triggers many ensure that harvest remains sustainable safeguarding long-term social benefits.

4.5.4 Administrative Effects

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **6** for administrative reasons, but it is not a viable alternative as explained in **Section 4.5.1**. Administrative effects would be greater under **Alternative 2**, followed by **Alternative 3**, **Alternative 4**, **Alternative 5**, and **Alternative 6**. Administrative burdens include data monitoring, rulemaking, outreach, and enforcement. **Alternative 2** has more moving parts, recreational ACL has to be constant for three years and if in any year the recreational ACL is changed, the moving multi-year geometric mean of landings will start over. **Alternatives 3** through **6** have fewer moving parts that would trigger an AM, and administrative burden would be the least for the simplest trigger option under **Alternative 6**.

4.6 Action 6. Revise the post season recreational accountability measure for dolphin

4.6.1 Biological Effects

Alternative 1 (No Action) is not a viable alternative because the current recreational AM would never be triggered as there is no stock assessment for dolphin and there would be no way to determine its overfished status. Therefore, **Alternative 2** through **Alternative 5** would be expected to have greater positive biological effects compared with **Alternative 1 (No Action)** by reducing the fishing effort for dolphin in the event the recreational ACL is exceeded. Because no in-season AMs are being considered in Dolphin Wahoo Amendment 10, it is imperative that a functional and effective post-season AM is selected to prevent possible adverse biological effects when the recreational ACL is exceeded. Positive biological effects would therefore be greatest under **Alternative 2**, followed by **Alternatives 4**, **3**, and **5**. Under **Alternative 2**, the length of the following recreational fishing season will be reduced. This would be the most effective way to ensure recreational landings do not keep occurring. **Alternative 3** would reduce the bag limit in the following recreational fishing season, but, as shown in **Figures 4.6.1.1** and **4.6.1.2**, greater than 99% of the headboat trips and 75%-94% of private recreational and charterboat trips (captured by MRIP) already only retain less than 5 fish per person. Up to 10% of recreational landings are actually over the legal bag limit of 10 fish per person (**Figures 4.6.1.1** and **4.6.1.2**), so further reduction in bag limit may not be the most effective way to protect the stock from further harvest once the recreational ACL is exceeded. **Alternative 4** would reduce the vessel limit in the following fishing season, but, analysis of the alternatives under Action 11 show reduction in recreational landings for the private recreational vessels and charter vessels (captured by MRIP)

Alternatives

1 (No action). If recreational landings exceed the recreational annual catch limit, then during the following fishing year, recreational landings will be monitored for persistence in increased landings. If the recreational annual catch limit is exceeded, it will be reduced by the amount of the recreational overage in the following fishing year and the recreational season will be reduced by the amount necessary to ensure that recreational landings do not exceed the reduced annual catch limit only if the species is overfished and the total annual catch limit is exceeded. However, the recreational annual catch limit and length of the recreational season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

2. Reduce the length of the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the length of the recreational season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

3. Reduce the bag limit in the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the bag limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

4. Reduce the vessel limit in the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the vessel limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

5. If landings are projected to meet the sector ACL, reduce (*Sub-alternatives 5a and/or 5b*) first and if needed reduce the length of the recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded. However, the vessel limit, bag limit, and/or recreational fishing season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

5a. The bag limit

5b. The vessel limit

were as high as 5.71% for the entire Atlantic region and nearly zero for east Florida; with a negligible reduction in headboat landings (**Table 4.6.1.1**). **Alternative 5** would monitor recreational landings in the following year, and if recreational landings are projected to meet the recreational ACL, the bag limit would be reduced (**Sub-alternative 5a**) and/or the vessel limit would be reduced (**Sub-alternative 5b**). If still necessary, the length of the recreational season would be reduced. As mentioned above, the bag and vessel limit reductions may not be enough to reduce the recreational fishing effort when the recreational ACL has already been exceeded. By the time the recreational season is shortened, two years of consecutive exceedance of the recreational ACL may have occurred.

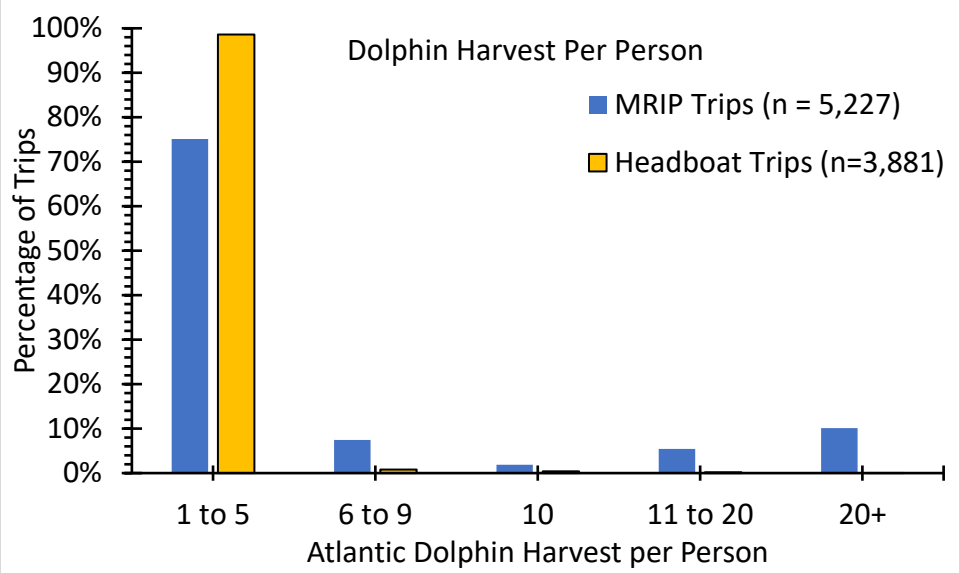

Figure 4.6.1.1. Percentage of trips for dolphin harvested per person. The data is from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and Headboat are provided. The dolphin stock is from Maine to east Florida (including Monroe County, Florida).

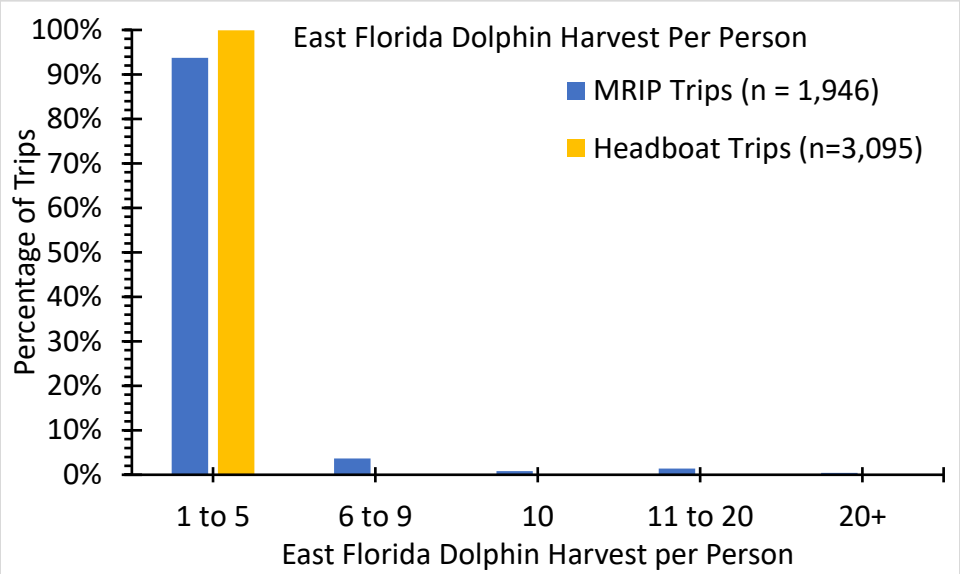

Figure 4.6.1.2. Percentage of trips for a range of east Florida dolphin harvested per person. The data is from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and Headboat are provided. East Florida includes data from Monroe County, Florida.

Table 4.6.1.1. Percent reduction in recreational landings from a range of different vessel limits for dolphin. Recreational data from MRIP (private/charter) and Headboat during 2015-2019.

Vessel Limit	MRIP Reduction (Private Rec. & Charter)	Total Recreational Landings Reduction (Private, Rec., Charter, & Headboat)
Atlantic Region		
40 Dolphin per Vessel	5.71%	5.70%
42 Dolphin per Vessel	4.71%	4.70%
48 Dolphin per Vessel	2.32%	2.31%
54 Dolphin per Vessel	0.69%	0.69%
Only East Florida		
40 Dolphin per Vessel	0.04%	0.04%
42 Dolphin per Vessel	0.03%	0.03%
48 Dolphin per Vessel	0.01%	0.01%
54 Dolphin per Vessel	0.01%	0.01%

4.6.2 Economic Effects

In general, AMs help ensure that ACLs are not exceeded, particularly on a consistent basis. Exceeding an ACL on a consistent basis presents a high likelihood of overfishing which could possibly derail a rebuilding strategy adopted for an overfished stock or even drive an otherwise healthy stock to being overfished. Once overfishing occurs, or a stock becomes overfished, and more restrictive regulations are adopted, affected fishery participants could redirect their effort to other species that could also experience overfishing or be overfished over time. This could eventually trigger untoward repercussions on the ecological environment for a stock and other associated species.

4.6.3 Social Effects

Alternative 1 (No Action) would require payback by the amount of the previous seasons overage and would shorten the next season. Payback would reduce the next year's ACL and could have negative social effects depending upon the amount of payback. However, over time such payback may be necessary to sustain the stock. However, the payback is only triggered if the stock is determined to be overfished and dolphin is currently unassessed. **Alternative 1 (No Action)** and **Alternative 5** include close monitoring of the fishery and may have social benefits if management is able to respond in a timely manner to keep the fishing season open for as long as possible, maintaining access for participants.

Overall, longer seasons result in increased fishing opportunities for the recreational sector and increased revenue opportunities for the for-hire sector. Reducing the season length (**Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 5**) are anticipated to result in direct negative social effects associated with loss of access to the resource.

The social effects of reducing the bag limit (**Alternative 3** and **Alternative 5a**) or the vessel limit (**Alternative 4** and **Alternative 5b**) depend upon how fishermen are affected by either higher bag/vessel limits and shorter seasons, or lower bag limits and longer seasons. Reducing the bag limit and/or vessel limit may have beneficial social effects as the season may be extended. Fishermen will likely prefer the longest fishing season with the highest bag limit and the subsequent trade-offs between shorter seasons or lower bag limits may depend upon the area fished. Currently, majority of recreational and for-hire/charter trips land than 5 fish per person (**Figure 4.6.1.1**) and analysis for **Action 11** show that reductions in bag limit and vessel limit result in minimal reductions in harvest and may not be an effective means of ensuring recreational harvest remains below the ACL.

4.6.4 Administrative Effects

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **5** for administrative reasons, but it is not a viable alternative as explained in **Section 4.6.1**. Administrative burdens such as data monitoring, rulemaking, outreach, and enforcement would be similar for **Alternatives 2**, **3**, and **4**, because they would involve different post-season AMs (reduced season length, bag limit, and vessel limit, respectively). Administrative effects would be greatest under **Alternative 5** because there are more moving parts and multiple steps involved (reduced bag/vessel limit first (**Sub-alternative 5a**) and if needed, a reduced season length (**Sub-alternative 5b**).

4.7 Action 7. Revise the trigger for the post-season recreational accountability measure for wahoo

4.7.1 Biological Effects

Alternative 1 (No Action) is not a viable alternative because the current recreational AM would never be triggered as there is no stock assessment for wahoo and there would be way to determine its overfished status. Therefore, biological benefits would be expected to be greater under **Alternatives 2** through **Alternative 6** which would enable the recreational AM to be triggered, when compared with **Alternative 1 (No Action)**. Biological effects would be variable depending on the combination of which alternative(s) is (are) selected in **Action 7** and which post-season AM(s) is (are) selected in Action 8.

Alternatives

1 (No action). If recreational landings exceed the recreational annual catch limit, then during the following fishing year recreational landings will be monitored for persistence in increased landings. If the recreational annual catch limit is exceeded, it will be reduced by the amount of the recreational overage in the following fishing only if the species is overfished and the total annual catch limit is exceeded. However, the recreational annual catch limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year geometric mean of landings exceed the recreational sector annual catch limit. If in any year the recreational sector annual catch limit is changed, the moving multi-year geometric mean of landings will start over.

3. Implement post season accountability measures in the following fishing year if the summed total of the most recent past three years of recreational landings exceeds the sum of the past three years recreational sector annual catch limits.

4. Implement post season accountability measures in the following fishing year if recreational landings exceed the recreational sector annual catch limit in two of the previous three fishing years or exceeds the total acceptable biological catch in any one year.

5. Implement post season accountability measures in the following fishing year if the total (commercial and recreational combined) annual catch limit is exceeded.

6. Implement post season accountability measures in the following fishing year if the recreational annual catch limit is exceeded.

Biological benefits would be expected to be greater for the alternative that provides the most timely and realistic option chosen to trigger an AM. This is pronounced by the fact that no in-season AMs are considered in Dolphin Wahoo Amendment 10 (post-season AMs are considered in **Action 8**). Corrective measures would only occur the following year or years after the recreational ACL is exceeded. Therefore. among **Alternatives 3** through **6** in **Action 5**, biological effects would be expected to be greater under **Alternatives 6** and **5**, followed by **Alternative 4**, **Alternative 3,** and **Alternative 2**. **Alternative 6** is the simplest and most conservative trigger and would allow post-season AMs to occur in the year following an overage of the recreational ACL. **Table 4.4.1.5** in **Action 4** shows that this could occur under two scenarios: average landings during 2015-2019 and maximum landings for a single year during 2015-2019. **Alternative 5** would require the total (commercial and recreational) ACL to be exceeded before the post-season AM is triggered. The total ACL would also be reached under the two scenarios mentioned in **Alternative 6** (**Table 4.2.1.4** in **Action 2**). **Alternative 4** would require recreational landings to exceed the recreational ACL in two of the previous three fishing years or exceed the total ACL in any one year. During 2017-2019, this trigger would only occur when the total ACL is exceeded as described under **Alternative 5**.

Alternative 3 would require the summed total of the most recent past three years of recreational landings to exceed the sum of the past three years recreational ACLs. During 2017-2019, recreational landings reached a total of 6,477,564 lbs ww (**Table 4.2.1.2**) and the sum of the recreational ACL during these years was 5,173.254 lbs ww (under the older MRIP CHTS method), and would have been 8,315,733 lbs ww under **Preferred Alternative 2** in **Action 2**. Because the current AM under **Alternative 1 (No Action)** requires the wahoo stock to be overfished before AMs can occur, **Alternative 3** would not have triggered post-season AM under status quo as well as under the revised recreational ACL. **Alternative 2** would require the recreational ACL to be constant and the 3-year geometric mean of landings to exceed the recreational ACL. The moving multi-year geometric mean of landings would start over if the recreational ACL was changed in any of those three years. This alternative is difficult to analyze since there are many assumptions and recreational landings would vary every year. Additionally, the recreational ACL may be revised within the 3-year time frame and the calculations would start over. This adds uncertainty to when the post-season AM would be triggered.

4.7.2 Economic Effects

The trigger for a recreational AM does not directly affect the actions taken under the AM but does affect whether corrective measures are put in place. These corrective measures typically create short-term negative economic effects by curtaining harvest and fishing activity, thus potentially affecting net revenues of for-hire operations and consumer surplus (CS) on recreational fishing trips. In the long-term, these measures also help reduce the risk of overfishing a stock to the point of depletion, which results long-term economic benefits through sustained harvest and fishing activity as well as the for-gone need for more stringent management measures that may be needed to rebuild a depleted stock.

In years when the recreational AM is not triggered, there are no economic effects from the trigger for the AM, thus there would be no economic effects from **Action 7** in this scenario. Since the recreational ACL for wahoo is anticipated to be reached based on the most recent five-year average recreational landings (**Section 4.4.1**), there would anticipated realized economic effects from the alternatives in **Action 7**.

If landings were to notably increase beyond recent observed landings and fall above the recreational sector ACL specified in Action 4, the following economic effects would be expected. As noted in **Section 4.7.1**, **Alternative 1 (No Action)** is not a viable alternative, but if the current AM trigger were to remain, the AM would not go into place since there is no stock assessment planned for dolphin and thus the species would not be expected to be deemed overfished. Under this alternative, the recreational sector could continue to harvest dolphin above the sector ACL unabated by an AM. This would lead to short-term economic benefits through potential elevated harvest and fishing activity for dolphin, which could result in increased revenue to for-hire vessels and CS for recreational anglers. The near-term net outcome of these potential economic effects is difficult to determine, but in the long-term if landings increase to the point where the total ACL is exceed and there is depletion of the stock due to unsustainable harvest, there would be severe negative economic effects for the recreational sector through notable lost revenue to for-hire vessels and severely decreased CS for recreational anglers. Additionally, depletion of the stock due to unsustainable harvest levels would also

result in notable negative economic effects for the commercial sector as well through decreased revenue to commercial vessels and seafood dealers.

Alternatives 2 through **6** would implement triggers for the recreational AM that could reasonably be expected to occur since reference to an "overfished" condition would be removed. The specific economic effects of these alternatives would be highly dependent on the post-season recreational AM that is specified in Action 8. Out of these alternatives, **Alternative 2** would likely have the least likelihood of being trigger, as it uses a three-year geometric mean that would reset when the sector ACL is changed. Depending on landings and whether a change to the sector ACL is put in place, this alternative could delay the AM from being implemented for several years, allowing the recreational sector to exceed its ACL. There is also no safeguard in place to prevent the total ACL from being exceeded for more than one year. This could result in short-term economic benefits for the recreational sector and long-term potential economic costs to fishery participants. The economic effects would be similar but to a lesser degree as those outlined for **Alternative 1 (No Action)** since the recreational AM would eventually be triggered under an elevated landings scenario and prolonged unsustainable harvest would be unlikely. **Alternative 3** likely has similar economic effects those described for **Alternative 2** but is more stringent since there is not a mechanism to reset the AM trigger if the sector ACL is changed. Both **Alternative 2** and **Alternative 3** use three-year timelines for triggering an AM which could help mitigate the likelihood of a restrictive AM being put in place due to anomalies from the recreational data and would also allow the fishery to potentially continue to operate in after a single year of particularly high landings that revert to long-term average levels the following year. Given the "pulse" nature of recreational landings for wahoo, where landings rarely remain elevated for more than a single year, using a multi-year timeline for the AM trigger may be beneficial for the recreational sector. Conversely, since there is no in-season AM to prevent or slow down landings in excess of the sector ACL or total ACL, there is the potential that a single year of extremely high recreational landings could influence the three-year geometric mean (**Alternative 2**) or the three-year summed total (**Alternative 3**) in such a way that AMs would be remain in place for multiple years until these long-term metrics would revert below the threshold for the AM trigger. In such a scenario, this would lead to negative economic effects for the recreational sector in comparison to **Alternatives 4**, **5**, and **6** that do not solely rely on the use of multi-year metrics for triggering an AM.

Alternatives 4, **5**, and **6** are more stringent than the other alternatives considered in **Action 7**, as they would be triggered from landings exceeding the total ACL in a single year. **Alternatives 4** and **5** explicit include this and **Alternative 6** does so since by default given the combination of the current commercial AM and the potential recreational AM under this alternative. **Alternative 6** would have the lowest threshold for the recreational AM to be implemented, thus this alternative has the highest likelihood of short-term negative economic effects. **Alternative 4** would have a comparatively higher threshold for the recreational AM going into place, as the total ACL would need to be exceed in a single year or the recreational ACL would need to be exceeded two times in a three-year period. This would allow some flexibility of the recreational sector to exceed the sector ACL without an AM being trigger so long as the recreational sector ACL overage was not so large that it surpassed any underage of the commercial sector ACL or occurred multiple times in a three-year timespan. **Alternative 5** would fall between Alternative 6 and 4 in terms of likelihood of being triggered and potential

flexibility in allowing some overage of the recreational sector ACL without the AM being triggered.

In terms of for-gone potential short-term negative economic effects to the recreational sector, **Alternative 1 (No Action)** would have the lowest potential negative economic effects, followed by **Alternative 2**, **Alternative 3**, **Alternative 5**, **Alternative 4**, and **Alternative 6**.

4.7.3 Social Effects

The AM trigger itself should not have any negative social effects but could impose negative effects indirectly if the trigger initiates management action that is unnecessary at the time or delays management action when it is necessary. **Alternative 1 (No Action)** would not revise the trigger for post-season recreational AMs, which requires payback of any recreational overage and a reduction in the season length to ensure the ACL is not exceeded if the stock is overfished and the total ACL is exceeded. Proposed alternatives would use various methods to trigger post season AMs based upon landing. **Alternative 2** uses the geometric mean over the past three years, which could be beneficial if for some reason landings in one or more years were artificially high or low due to anomalies in harvesting behavior or stock status. Similarly, **Alternative 3** and **Alternative 4** use an extended time frame for which may also be beneficial if landings are especially volatile. Alternatively, less conservative triggers may indirectly result in negative long-term social effects if they delay necessary management action.

Alternative 5 and **Alternative 6** are more conservative triggers, with **Alternative 6** being the more conservative, which could impose negative short-term social effects if AMs are triggered due to volatile landings in a single year. Alternatively, if management action is necessary, conservative triggers many ensure that harvest remains sustainable safeguarding long term social benefits.

4.7.4 Administrative Effects

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **6** for administrative reasons, but it is not a viable alternative as explained in **Section 4.7.1**. Administrative effects would be greater under **Alternative 2**, followed by **Alternative 3**, **Alternative 4**, **Alternative 5**, and **Alternative 6**. Administrative burdens include data monitoring, rulemaking, outreach, and enforcement. **Alternative 2** has more moving parts, recreational ACL has to be constant for three years and if in any year the recreational ACL is changed, the moving multi-year geometric mean of landings will start over. **Alternatives 3** through **6** have fewer moving parts that would trigger an AM, and administrative burden would be the least for the simplest trigger option under **Alternative 6**.

4.8 Action 8. Revise the post season recreational accountability measures for wahoo

Alternatives

1 (No action). If recreational landings exceed the recreational annual catch limit, then during the following fishing year recreational landings will be monitored for persistence in increased landings. If the recreational annual catch limit is exceeded, it will be reduced by the amount of the recreational overage in the following fishing only if the species is overfished and the total annual catch limit is exceeded. However, the recreational annual catch limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

2. Reduce the length of the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the length of the recreational season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

3. Reduce the bag limit in the following recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded in the following year. However, the bag limit will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

4. Implement a vessel limit in the following recreational fishing season that would prevent the annual catch limit from being exceeded in the following year. However, the vessel limit will not be implemented if the Regional Administrator determines, using the best available science, that it is not necessary.

5. Reduce the bag limit or implement a vessel limit (*Sub-alternatives 5a and/or 5b*) at the beginning of the following fishing year. If landings are projected to meet the sector ACL, reduce the length of that recreational fishing season by the amount necessary to prevent the annual catch limit from being exceeded. However, the bag limit will not be reduced, a vessel limit implemented, and/or the recreational fishing season will not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary.

5a. Reduce the bag limit

5b. Implement a vessel limit

4.8.1 Biological Effects

Alternative 1 (No Action) is not a viable alternative because the current recreational AM would never be triggered as there is no stock assessment for wahoo and there would be way to determine its overfished status. Therefore, **Alternative 2** through **Alternative 5** would be expected to have greater biological effects compared with **Alternative 1 (No Action)** by reducing the fishing effort for wahoo in the event the recreational ACL is exceeded. Because no in-season AMs are being considered in Dolphin Wahoo Amendment 10, it is imperative that a functional and effective post-season AM is selected to prevent possible adverse biological effects when the recreational ACL is exceeded. It is reasonable to expect biological effects would therefore be greater under **Alternative 2**, followed by **Alternatives 4**, **3**, and **5**. Under **Alternative 2**, the length of the following recreational fishing season will be reduced. This would be the most effective way to ensure recreational landings do not keep occurring. As discussed in Action 4, the recreational ACL for wahoo would be reached as early as December 19 and as late as December 24 under the average 2015-2019 landings scenario, and on different dates in September under the maximum landings during 2015-2019 scenario (**Table 4.4.1.5**). **Alternatives 3** and **4** would reduce the bag limit and vessel limit, respectively, in the following recreational fishing season. **Alternative 5** would implement a bag limit reduction (**Sub-alternative 5a**) and/or the vessel limit reduction (**Sub-alternative 5b**) at the beginning of the recreational fishing year while monitoring landings. The recreational fishing season would also be reduced by the amount necessary to prevent the recreational ACL from being exceeded again. While **Alternative 5** in this action is slightly more proactive and

timely than **Alternative 5** in **Action 6** for dolphin, by the time the recreational season is shortened, two years of consecutive exceedance of the recreational ACL may have occurred.

4.8.2 Economic Effects

In general, AMs help ensure that ACLs are not exceeded, particularly on a consistent basis. Exceeding an ACL on a consistent basis presents a high likelihood of overfishing which could possibly derail a rebuilding strategy adopted for an overfished stock or even drive an otherwise healthy stock to being overfished. Once overfishing occurs, or a stock becomes overfished, and more restrictive regulations are adopted, affected fishery participants could redirect their effort to other species that could also experience overfishing or be overfished over time. This could eventually trigger untoward repercussions on the ecological environment for a stock and other associated species.

4.8.3 Social Effects

Alternative 1 (No Action) would require payback by the amount of the previous seasons overage and would shorten the next season. Payback would reduce the next year's ACL and could have negative social effects depending upon the amount of payback. However, over time such payback may be necessary to sustain the stock. However, the payback is only triggered if the stock is determined to be overfished and wahoo is currently unassessed. **Alternative 1 (No Action)** and **Alternative 5** include close monitoring of the fishery and may have social benefits if management is able to respond in a timely manner to keep the fishing season open for as long as possible, maintaining access for participants.

Overall, longer seasons result in increased fishing opportunities for the recreational sector and increased revenue opportunities for the for-hire sector. Reducing the season length (**Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 5**) are anticipated to result in direct negative social effects associated with loss of access to the resource.

The social effects of reducing the bag limit (**Alternative 3** and **Alternative 5a**) or the vessel limit (**Alternative 4** and **Alternative 5b**) depend upon how fishermen are affected by either higher bag/vessel limits and shorter seasons, or lower bag limits and longer seasons. Reducing the bag limit and/or vessel limit may have beneficial social effects as the season may be extended. Fishermen will likely prefer the longest fishing season with the highest bag limit and the subsequent trade-offs between shorter seasons or lower bag limits may depend upon the area fished.

4.8.4 Administrative Effects

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **5** for administrative reasons, but it is not a viable alternative as explained in **Section 4.8.1**. Administrative burdens such as data monitoring, rulemaking, outreach, and enforcement would be similar for **Alternatives 2**, **3**, and **4**, because they would involve different post-season AMs (reduced season length, bag limit, and vessel limit, respectively). Administrative effects would be greatest under **Alternative 5** because there are more moving parts and multiple steps involved (reduced bag/vessel limit first (**Sub-alternative 5a**) and if needed, a reduced season length (**Sub-alternative 5b**).

4.9 Action 9. Allow properly permitted commercial fishing vessels with trap, pot, or buoy gear on board that are not authorized for use in the dolphin wahoo fishery to possess commercial quantities of dolphin and wahoo

Alternatives

1 (No Action). The following are the only authorized commercial gear types in the fisheries for dolphin and wahoo in the Atlantic Exclusive Economic Zone: automatic reel, bandit gear, handline, pelagic longline, rod and reel, and spearfishing gear (including powerheads). A vessel in the Atlantic Exclusive Economic Zone that has on board gear types (including trap, pot, or buoy gear) other than authorized gear types may not possess a dolphin or wahoo. The current commercial trip limit for wahoo is 500 pounds. The current trip limit for dolphin is 4,000 pounds once 75 percent of the commercial sector annual catch limit is reached. Prior to reaching 75 percent of the commercial sector annual catch limit, there is no commercial trip limit for dolphin.

2. A vessel in the Atlantic Exclusive Economic Zone that possesses both an Atlantic Dolphin/Wahoo Commercial Permit and valid federal commercial permits required to fish trap, pot, or buoy gear or is in compliance with permit requirements specified for the spiny lobster fishery in 50 C.F.R. §622.400 is authorized to retain dolphin caught by rod and reel while in possession of such gear types. A vessel in the Atlantic Exclusive Economic Zone that has on board other gear types that are not authorized in the fishery may not possess a dolphin. Dolphin retained by such a vessel shall not exceed:

- 2a. 250 pounds gutted weight
- 2b. 500 pounds gutted weight
- 2c. 750 pounds gutted weight
- 2d. 1,000 pounds gutted weight

3. A vessel in the Atlantic Exclusive Economic Zone that possesses both an Atlantic Dolphin/Wahoo Commercial Permit and valid federal commercial permits required to fish trap, pot, or buoy gear or is in compliance with permit requirements specified for the spiny lobster fishery in 50 C.F.R. §622.400 is authorized to retain wahoo caught by rod and reel while in possession of such gear types. A vessel in the Atlantic Exclusive Economic Zone that has on board other gear types that are not authorized in the fisheries for wahoo may not possess a wahoo. The wahoo commercial trip limit will be 500 pounds.

4.9.1 Biological Effects

Under **Alternative 1 (No Action)**, 38 vessels harvested an average of 78 lb ww of dolphin and 3 vessels harvested an average of 59 lbs ww of wahoo during 2015-2019 (**Tables 4.9.1.1** and **4.9.1.2**). **Alternatives 2** (including sub-alternatives **2a** through **2d**) and **3** would increase these landings for dolphin and wahoo. Given that the total ACLs for dolphin and wahoo are being increased in Actions 1 and 2, and the current AM will continue to have an in-season closure of the commercial sector if the commercial ACL is reached or projected to be reached, biological effects would not be expected to vary between **Alternative 1 (No Action)** and **Alternatives 2** (including sub-alternatives **2a** through **2d**) and **3**. However, higher trip limits such as 750 lbs ww (**Sub-alternative 2c**) and 1000 lbs ww (**Sub-alternative 2d**) could provide an incentive for the current incidental harvest of dolphin to convert to a targeted harvest with more vessels involved. This could result in a shorter season for dolphin due to an in-season closure and result in regulatory discards.

Table 4.9.1.1. Landings for vessels harvesting dolphin with buoy gear, pots, or traps on board during 2015-2019.

Number of Vessels	Statistic	Dolphin Landings (lbs ww)
38	Total	2,978
	Mean	78

Table 4.9.1.2. Landings for vessels harvesting wahoo with buoy gear, pots, or traps on board during 2015-2019.

Number of Vessels	Statistic	Wahoo Landings (lbs ww)
3	Total	176
	Mean	59

4.9.2 Economic Effects

4.9.3 Social Effects

In general, management measures that increase the number of fish an angler can land are expected to be more beneficial to fishermen and fishing communities by increasing access to the resource, so long as overharvest is not occurring to negatively affect the stock in the long term. Once the ACL is met or exceeded, triggering AMs that restrict, or close harvest could negatively affect the commercial fleet, for-hire fleet, and private anglers.

Allowing harvest of dolphin (**Alternative 2**) and wahoo (**Alternative 3**) by vessels with the necessary Atlantic Dolphin/Wahoo Commercial Permit and valid commercial permits required to harvest via fish trap, pot, or buoy gear by rod and reel is anticipated to result in direct positive social effects to fishermen and communities. Under **Alternative 1 (No Action)** fishermen with non-authorized gear on board their vessels are unable to harvest dolphin or wahoo despite encountering these species while tending their gear. Allowing harvest via rod and reel would increase their access to the fishery and is anticipated to result in direct social benefits to commercial fishing business in the form of increased revenue and indirect social benefits to fishing communities in the form of increased job opportunities and fish available to the market. Alternatively, if the additional landings result in the dolphin or wahoo ACL being met or exceeded, triggering AMs, all dolphin and wahoo commercial fishermen would experience negative social effects associated with loss of access to the resource.

4.9.4 Administrative Effects

Administrative burdens such as data monitoring, outreach, and enforcement would be greater under **Alternatives 2** (including sub-alternatives **2a** through **2d**) and **3**, when compared with **Alternative 1** (**No Action**). As discussed in **Section 4.9.1**, currently there is very little effort for dolphin and especially for wahoo from vessels with buoy gear, pots, or traps, and this could change due to higher allowances under **Alternatives 2** (including sub-alternatives **2a** through **2d**) and **3**. If the commercial sector closes early in the season due to the commercial

ACL being reached early due to higher harvest, administrative burdens will increase related to rulemaking, education, and enforcement.

4.10 Action 10. Remove the requirement of vessel operators or crew to hold an Operator Card in the Dolphin Wahoo Fishery

4.10.1 Biological Effects

Alternatives

1 (No Action). An Atlantic Charter/Headboat for Dolphin/Wahoo Permit or an Atlantic Dolphin/Wahoo Commercial Permit is not valid unless the vessel operator or a crewmember holds a valid Operator Card issued by either the Southeast Regional Office or by the Greater Atlantic Regional Fisheries Office.

2. Neither a vessel operator nor any crewmember is required to have an Operator Card for an Atlantic Charter/Headboat for Dolphin/Wahoo Permit to be valid.

3. Neither a vessel operator nor any crewmember is required to have an Operator Card for an Atlantic Dolphin/Wahoo Commercial Permit to be valid.

No biological effects on dolphin would be expected under **Alternatives 2** and **3**, when compared with **Alternative 1 (No Action)**, because this is an administrative action and does not impact the harvest levels for dolphin and wahoo in any manner**.** The intent of including operator cards in the original Dolphin Wahoo FMP (SAFMC 2003) was to improve enforcement and aid in data collection of dolphin and wahoo. It was also intended to decrease costs to vessel owners from fisheries violations and make vessel captains more accountable for damaging habitat or violating regulations intended to protect the long-term viability of the stock. At the March 2016 Council meeting, NMFS Office of Law Enforcement gave a presentation on operator cards, mentioning that currently the operator cards are not used for gathering data, distributing information, or enforcement to a large extent. Because, the operator cards are no longer useful and needed, **Alternatives 2** and **3** would remove the requirement to hold an operator card for the vessel operator or crew member for an Atlantic Charter/Headboat for Dolphin/Wahoo Permit and Atlantic Dolphin/Wahoo Commercial Permit, respectively.

4.10.2 Economic Effects

4.10.3 Social Effects

Alternative 1 (No Action) and **Alternatives 2** and **3** are expected to have minimal effects on coastal communities. Public testimony from dolphin and wahoo fishermen has indicated that operator cards are rarely checked by law enforcement tool and are burdensome to renew annually. Additionally, law enforcement officials have indicated that operators are no longer regularly used to aid in enforcement efforts or gathering data and distributed information. **Alternative 2** would remove the burden of obtaining and renewing an operator card for the holders of the Atlantic Charter/Headboat for Dolphin/Wahoo Permit and **Alternative 3** would remove the burden from Atlantic Dolphin/Wahoo Commercial Permit holders resulting in minor social benefits. Additionally, consistency in regulations between dolphin/wahoo permits and other federal permits that do not require an operator card would be expected to reduce confusion among fishermen and aid in compliance.

4.10.4 Administrative Effects

Administrative effects and burdens related to data collection/monitoring, permitting, law enforcement, etc. would be lower under **Alternatives 2** and **3** compared with **Alternative 1 (No**

Action). Currently, under **Alternative 1 (No Action)**, regulations under 50 C. F. R. §622.270 require (https://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_1270):

"(c) *Operator permits.* (1) An operator of a vessel that has or is required to have a charter vessel/headboat or commercial permit for Atlantic dolphin and wahoo issued under this section is required to have an operator permit.

(2) A person required to have an operator permit under paragraph (c)(1) of this section must carry on board such permit and one other form of personal identification that includes a picture (driver's license, passport, etc.).

(3) An owner of a vessel that is required to have a permitted operator under paragraph (c)(1) of this section must ensure that at least one person with a valid operator permit is aboard while the vessel is at sea or offloading.

(4) An owner of a vessel that is required to have a permitted operator under paragraph (c)(1) of this section and the operator of such vessel are responsible for ensuring that a person whose operator permit is suspended, revoked, or modified pursuant to subpart D of 15 CFR part 904 is not aboard that vessel."

As mentioned in **Section 4.10.1**, the intent of including operator cards in the Dolphin Wahoo FMP was to improve enforcement and aid in data collection. It was also intended to decrease costs to vessel owners from fisheries violations and make vessel captains more accountable for damaging habitat or violating regulations intended to protect the long-term viability of the stock. At the March 2016 Council meeting, NMFS Office of Law Enforcement gave a presentation on operator cards, mentioning that currently the operator cards are not used for gathering data, distributing information, or enforcement to a large extent. **Alternatives 2** and **3** would remove the requirement for the vessel operator or crew member to hold an operator card for an Atlantic Charter/Headboat for Dolphin/Wahoo Permit and Atlantic Dolphin/Wahoo Commercial Permit, respectively.

4.11 Action 11. Reduce the recreational vessel limit for dolphin

4.11.1 Biological Effects

Alternatives

1 (No Action). The recreational daily bag limit is 10 dolphin per person, not to exceed 60 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

2. The recreational daily bag limit is 10 dolphin per person, not to exceed:
- Sub-alternative 2a. 40 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.
- Sub-alternative 2b. 42 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.
- Sub-alternative 2c. 48 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.
- Sub-alternative 2d. 54 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

3. In Florida only, the recreational daily bag limit is 10 dolphin per person, not to exceed:
- Sub-alternative 3a. 40 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.
- Sub-alternative 3b. 42 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.
- Sub-alternative 3c. 48 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.
- Sub-alternative 3d. 54 dolphin per vessel, whichever is less, except on board a headboat where the limit is 10 dolphin per paying passenger.

Biological effects are expected to be greater for the alternative that results in the least amount of dolphin allowed to be harvested and least for the alternative that allows more dolphin to be harvested. Therefore, biological benefits would be expected to be greater under **Alternatives 2** and **3** (including their respective sub-alternatives) compared with **Alternative 1 (No Action)**, because they consider a reduction in the vessel limit for dolphin. In the Atlantic, 93% of headboats and 78% of private recreational/charter vessel trips harvested less than 10 dolphin per vessel, and 2% or less of all recreational trips harvested between 40 to 60 dolphin per vessel (**Figure 4.11.1.1**). As with the recreational bag limits (**Figure 4.6.1.1**), there was some recreational harvest over the vessel limit in the Atlantic (**Figure 4.11.1.1**). Off East Florida only, 96% of all recreational trips harvested less than 10 dolphin per vessel with no recreational trips harvesting greater than/equal to 40 fish (**Figure 4.11.1.1**). Under **Alternative 2**, biological benefits would be greater under **Sub-alternative 2a** when compared with **Sub-alternatives 2b**, **2c**, and **2d**, because only 40 dolphin would be allowed per vessel resulting in a reduction of 5.71% in landings under **Sub-alternative 2a** from private recreational and charter vessels (when applied to the entire Atlantic), which is a higher reduction compared to **Sub-alternatives 2b**, **2c**, and **2d** (**Table 4.6.1.1**). Under **Alternative 3**, biological effects would not notably vary between **Sub-alternatives 3a**, **3b**, **3c**, and **3d**, because negligible reductions in recreational landings from private recreational and charter vessels are expected (**Table 4.6.1.1**). Headboat landings are not expected to influence any reduction under **Alternatives 2** and **3** since the existing exemption of headboats from vessel limits would remain (including their respective sub-alternatives) (**Table 4.6.1.1**). Therefore, biological benefits are expected to be greatest under **Sub-alternative 2a**, followed by **Sub-alternative 2b**, **2c**, **2d**, **3a**, **3b**, **3c** and **3d**, and **Alternative 1 (No Action)**.

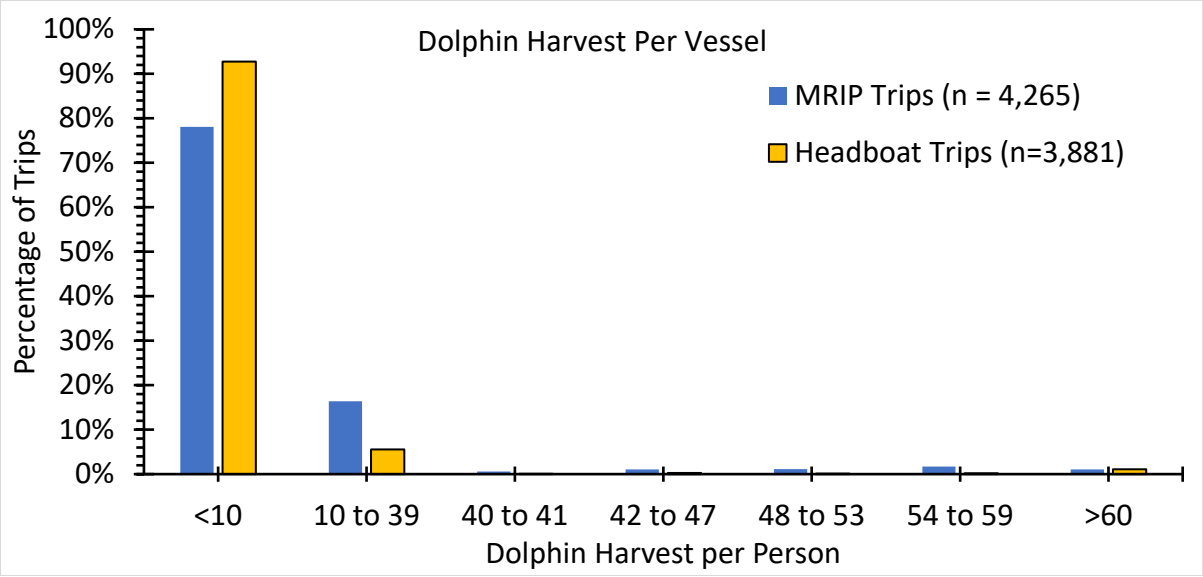

Figure 4.11.1.1. Percentage of trips for a range of dolphin harvested per vessel. The data is from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and Headboat are provided. The dolphin stock is from Maine to east Florida (including Monroe County, Florida).

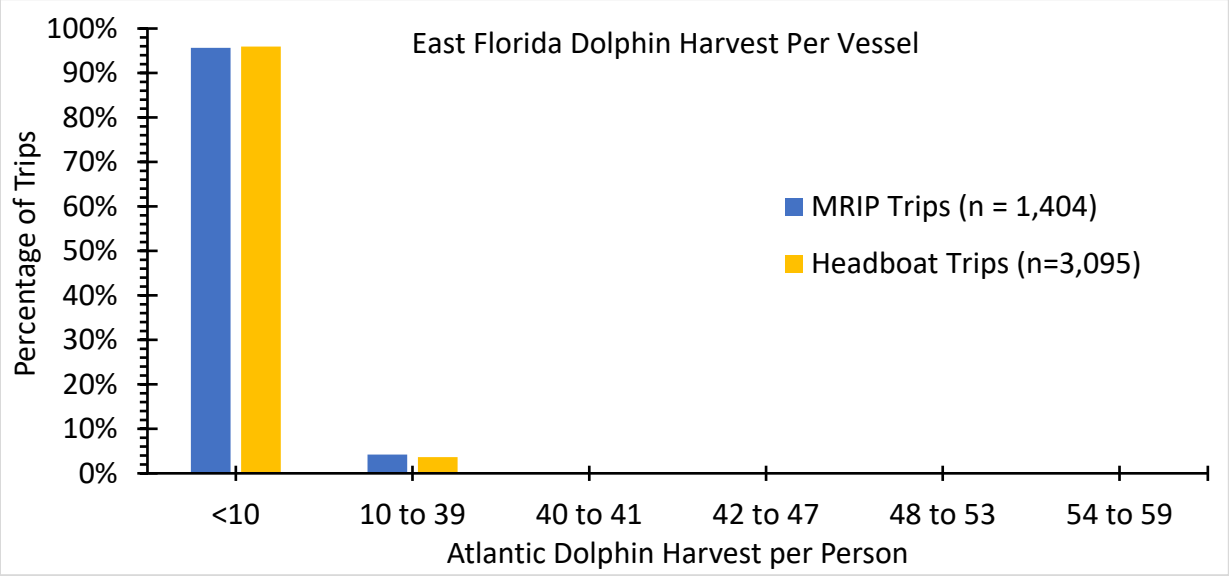

Figure 4.11.1.2. Percentage of trips for a range of east Florida dolphin harvested per vessel. The data is from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and Headboat are provided. East Florida includes data from Monroe County, Florida.

4.11.2 Economic Effects

Generally, angler satisfaction (which can be measured in consumer surplus) increases with the number of fish that can be harvested and the size of the fish. The smaller the bag limit the greater the probability that the satisfaction from an angler trip could be affected. Additionally, for-hire captains have indicated that higher bag limits for dolphin encourages some anglers to book trips, thereby potentially increasing annual revenue for these vessels. Given the larger

scope of **Alternative 2**, this alternative is expected to have the largest potential short-term negative economic effects followed by **Alternative 3**, and **Alternative 1 (No Action)**.

4.11.3 Social Effects

In general, the social effects of modifying the recreational harvest limits would be associated with the biological costs of each alternative, as well as the effects on current recreational fishing opportunities. While **Alternatives 2** and **3** could restrict recreational fishing opportunities for dolphin, the harvest limits may help to extend the recreational fishing season by slowing the rate of harvest if landings were to increase. Different levels of recreational fishing opportunities under each alternative could affect recreational anglers and for-hire businesses targeting dolphin. In general, benefits to the recreational sector would result from harvest limits that do not result in restricted access to dolphin (i.e., because an accountability measure (AM) is triggered) but still maintain harvest limits large enough to have minimum effect on recreational trip satisfaction. The social effects of the potential harvest limits would depend on the trade-off between restrictive measures that may affect trip satisfaction or triggering the AMs because harvest exceeds the ACL in a short period of time and would depend on if recreational effort and landings in that year are higher than the average landings in recent years.

In general, measures that reduce the number of fish that a recreational angler can keep may negatively affect trip satisfaction. As measures are more restrictive there could be more expected negative effects on trip satisfaction for recreational fishermen. Additionally, lower vessel limits would have more negative effects on boats and trips with more fishermen on board, such as on headboat trips. However, more restrictive measures are also expected to benefit participants in the recreational sector by slowing harvest to not reach the ACL until later in the year. Benefits would be particularly apparent in years with high recreational effort and catch.

Alternative 2 and **Alternative 3** are unlikely to result in decreased trip satisfaction as recreational data indicates that less than 2% of private recreational and for-hire/charter trips land more than 40 fish per trip (**Figure 4.11.1.1**). However, should recreational harvest increase beyond current estimates, **Alternative 2** and **Alternative 3** would help slow harvest and extend the fishing season. **Alternative 2** and its sub-alternatives would likely slow harvest more than **Alternative 3** and its sub-alternatives which would only restrict harvest along the east coast of Florida.

4.11.4 Administrative Effects

Administrative effects would not vary much between **Alternative 1 (No Action)** and **Alternatives 2** and **3** (including their respective sub-alternatives). Recreational bag and vessel limits are already being monitored for dolphin and the various sub-alternatives would modify the current limits to different levels. Minor administrative burdens related to deviating from **Alternative 1 (No Action)** would be related to distributing information, education, and enforcement). Analysis in **Section 4.11.1** and Action 6 shows that this action would not affect headboat landings and only small reductions in recreational landings from private recreational and charter vessels (when applied to the entire Atlantic) are expected under some of the sub-alternatives in **Alternative 2** (**Table 4.6.1.1**).

4.12 Action 12. Allow filleting of dolphin at sea on board charter or headboat vessels in the Atlantic Exclusive Economic Zone north of the Virginia/North Carolina border.

4.12.1 Biological Effects

Alternatives

1 (No Action). Dolphin possessed in the Atlantic Exclusive Economic Zone must be maintained with head and fins intact, with specific exceptions for fish lawfully harvested in the Bahamas. Such fish harvested from the Atlantic Exclusive Economic Zone may be eviscerated, gilled, and scaled, but must otherwise be maintained in a whole condition.

2. Exempt dolphin from regulations requiring head and fins be intact on board properly permitted charter and headboat vessels in the Atlantic Exclusive Economic Zone north of the Virginia/North Carolina border where dolphin may be filleted under the following requirement(s):

2a. Skin must remain intact on the entire fillet of any dolphin carcass.

2b. Two fillets of dolphin, regardless of the length of each fillet, is the equivalent to one dolphin.

No direct biological effect on dolphin would be expected under **Alternative 2** and its **Sub-alternatives 2a** and **2b**, when compared with **Alternative 1 (No Action),** but there could be indirect negative biological effects under **Alternative 2**. **Alternative 1 (No Action)** would not allow fillets of dolphin at sea to be on board in the Atlantic (with the exception of fish from the Bahamas) and is preferable over **Alternative 2** and its **Sub-alternatives** because of concerns expressed by NMFS Office of Law Enforcement and the South Atlantic Law Enforcement Advisory Panel (AP) on the enforceability of allowing fillets of fish in general. **Alternative 2** and its sub-alternatives would only allow fillets of dolphin north of the Virginia/North Carolina border. Law enforcement would need guidance to address the possible scenario where a fish is caught and filleted north of the Virginia/North Carolina border, but landed south of that line where the exception on filleting at sea would not apply. Filleting at sea is allowed for some federally regulated groundfish and flounder species in the Mid-Atlantic and New England regions, but it is not allowed for golden tilefish, blueline tilefish, or HMS species such as federally regulated tunas, sharks, and swordfish, adding complexity to both enforcement and fishers. **Figures 4.6.1.1** and **4.6.1.2** show that up to 10% of recreational landings for dolphin are over the legal bag limit of 10 fish per person in the Atlantic. Allowing fillets could add to this problem. Even if the skin in intact on the entire fillet of the carcass (**Sub-alternative 2a**), and two fillets of dolphin, regardless of the length of each fillet would count as one fish (**Sub-alternative 2b**), there could be lack of compliance and identification issues. Furthermore, since the recreational ACL for dolphin is tracked in weight, filleting could reduce size and weight measurements from recreational catches due to fewer measurements being collected dockside by creel surveys. Filleting at sea may encourage harvest, because of availability of more cold storage space and less time/hassle needed at the dock. Finally, allowing fillets of dolphin would encourage fillets be allowed for other species under other FMPs compounding the negative indirect effects mentioned above.

4.12.2 Economic Effects

4.12.3 Social Effects

The social effects of the proposed action on the fishing fleets, and associated businesses and communities are expected to be positive. Allowing fillets to be brought back by properly permitted charter and headboat vessels north of the Virginia/North Carolina line could contribute to improved quality of dolphin caught on these trips since whole fish would not have to be stored with head and fins intact. This management measure could be beneficial to Mid-Atlantic fishermen who must travel farther to productive fishing grounds when harvesting dolphin. Requiring the skin to be intact on fillets of dolphin (**Sub-alternative 2a**) and counting two fillets as one dolphin for trip limit purposes (**Sub-alternative 2b**) would be expected to enhance the ability of law enforcement officers to identify species and enforce regulations, which would be expected to result in long-term broad social benefits.

4.12.4 Administrative Effects

Administrative effects and burdens would be higher under **Alternative 2** and its sub-alternatives compared with **Alternative 1 (No Action)**. The Council's Enforcement (LE) AP reviewed the initial request from the Mid-Atlantic Council and unanimously voted against **Alternative 2** and its sub-alternatives. Some of their rationale was:

• Law enforcement officers would need to count and match racks and fillets. This would be burdensome to boarding officers and would be redundant.

• The exception on filleting for fish brought to the U.S. from The Bahamas (**Alternative 1, No Action**) is effective because the fish are caught outside the U.S. EEZ. **Alternative 2** and its sub-alternatives would add considerable burden to law enforcement officers if implemented in U.S. waters (i.e., certain regulations would apply in some areas along the east coast but not in others) resulting in considerably more time required for enforcement and more regulatory complexity.

• Law enforcement would need guidance to address the possible scenario where a fish is caught and filleted north of Cape Hatteras but landed south of that line where the exception on filleting at sea would not apply.

Additionally, as explained in **Section 4.12.1**, allowing fillets of dolphin could negatively affect recreational data collection and monitoring efforts, adding to future administrative burdens.

Chapter 5. Council's Choice for the Preferred Alternative

Chapter 6. Cumulative Effects

Chapter 7. List of Preparers

Table 7-1. List of preparers of the document.

Name	SAFMC	Title
Brian Cheuvront	SAFMC	IPT Lead/Deputy Executive Director for Management
John Hadley	SAFMC	IPT Lead/Economist
Nikhil Mehta	NMFS/SF	IPT Lead/Fishery Biologist
David Dale	NMFS/HC	EFH Specialist
Mike Errigo	SAFMC	Data Analyst
Chip Collier	SAFMC	Fishery Biologist
Mike Travis	NMFS/SF	Economist
Noah Silverman	NMFS/SER	Regional NEPA Coordinator
Mike Jepson	NMFS/SF	Fishery Social Scientist
Mike Larkin	NMFS/SF	Data Analyst
Jennifer Lee	NMFS/PR	Fishery Biologist (Protected Resources)
Scott Crosson	NMFS/SEFSC	Economist
Jack McGovern	NMFS/SF	Fishery Biologist
Roger Pugliese	SAFMC	Senior Biologist
Monica Smit-Brunello	NMFS/GC	Attorney
Kari MacLauchlin	SAFMC	Social Scientist
Scott Sandorf	NMFS/SF	Technical Writer & Editor
Rick DeVictor	NMFS/SF	Fishery Biologist

NMFS = National Marine Fisheries Service, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, PR = Protected Resources Division, SERO = Southeast Regional Office, HC = Habitat Conservation Division, GC = General Counsel, Eco=Economics

Table 7-2. List of interdisciplinary plan team members for the document.

Name	Organization	Title
John Hadley	SAFMC	IPT Lead/Economist
Brian Cheuvront	SAFMC	IPT Lead/ Deputy Executive Director for Management
Nikhil Mehta	NMFS/SF	IPT Lead/Fishery Biologist
Scott Sandorf	NMFS/SF	Technical Writer & Editor
Scott Crosson	NMFS/SEFSC	Economist
Mike Travis	NMFS/SF	Economist
David Dale	NMFS/HC	EFH Specialist
Rick DeVictor	NMFS/SF	Fishery Biologist
Mike Larkin	NMFS/SF	Data Analyst
Tracy Dunn/Manny Antonaras	NMFS/LE	Special Agent(s)
Jennifer Lee	NMFS/PR	Fishery Biologist (Protected Resources)
Noah Silverman	NMFS/SER	Regional NEPA Coordinator
Roger Pugliese	SAFMC	Senior Biologist
Myra Brouwer	SAFMC	Fishery Biologist
Mike Errigo	SAFMC	Data Analyst
Chip Collier	SAFMC	Fishery Biologist
Mike Jepson	NMFS/SF	Fishery Social Scientist
Kari MacLauchlin	SAFMC	Fishery Social Scientist
Monica Smit-Brunello	NOAA/GC	Attorney
Jack McGovern	NMFS/SF	Fishery Biologist
Kyle Shertzer	NMFS/SEFSC	Fishery Biologist

NMFS = National Marine Fisheries Service, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, PR = Protected Resources Division, SERO = Southeast Regional Office, HC = Habitat Conservation Division, GC = General Counsel, Eco=Economics

Chapter 8. Agencies and Persons Consulted

Responsible Agency for CE
NMFS, Southeast Region
263 13th Avenue South
St. Petersburg, Florida 33701
(727) 824-5301 (TEL)
(727) 824-5320 (FAX)

List of Agencies, Organizations, and Persons Consulted
SAFMC Law Enforcement Advisory Panel
SAFMC Dolphin Wahoo Advisory Panel
SAFMC Scientific and Statistical Committee
SAFMC Information and Education Advisory Panel
Florida Fish and Wildlife Conservation Commission
Georgia Department of Natural Resources
South Carolina Department of Natural Resources
North Carolina Division of Marine Fisheries
Atlantic States Marine Fisheries Commission
Gulf of Mexico Fishery Management Council
Mid Atlantic Fishery Management Council
New England Fishery Management Council
National Marine Fisheries Service
- Washington Office
- Office of Ecology and Conservation
- Southeast Regional Office
- Southeast Fisheries Science Center

Chapter 9. References

Adams, W.F., and C. Wilson. 1995. The status of the smalltooth sawfish, *Pristis pectinata* Latham 1794 (Pristiformes: Pristidae) in the United States. Chondros 6(4):1-5.

Anderes Alvarez, B. L., and I. Uchida. 1994. Study of hawksbill turtle (*Eretmochelys imbricata*) stomach content in Cuban waters. Pages 27-40 *in* Study of the Hawksbill Turtle in Cuba (I). Ministry of Fishing Industry, CUBA. Ministry of Fishing Industry, Cuba.

Benetti, D. D., R. W. Brill, and S. A. Kraul Jr. 1995. The standard metabolic rate of dolphinfish. J. Fish. Biol. 46:987–996.

Bigelow, H.B., and W.C. Schroeder. 1953. Sawfishes, guitarfishes, skates and rays, pp. 1-514. *In:* Tee-Van, J., C.M Breder, A.E. Parr, W.C. Schroeder and L.P. Schultz (eds). Fishes of the Western North Atlantic, Part Two. Mem. Sears Found. Mar. Res. I.

Bjorndal, K. A. 1997. Foraging ecology and nutrition of sea turtles. P. L. Lutz, and J. A. Musick, editors. The Biology of Sea Turtles. CRC Press, Boca Raton.

Bjorndal, K. A. 1980. Nutrition and grazing behavior of the green turtle, *Chelonia mydas*. Marine Biology 56:147-154.

Blue Ocean Institute. 2010. The blue ocean institute guide to ocean friendly seafood. http://www.blueocean.org/files/Seafood_Guide.pdf

Bolten, A. B., and G. H. Balazs. 1995. Biology of the early pelagic stage - the 'lost year'. Pages 579-581 *in* K. A. Bjorndal, editor. Biology and Conservation of Sea Turtles. Smithsonian Institution Press, Washington, DC.

Brongersma, L. D. 1972. European Atlantic turtles. Zoologische Verhandelingen (121):1-318.

Burke, V. J., S. J. Morreale, and A. G. J. Rhodin. 1993. *Lepidochelys kempii* (Kemp's ridley sea turtle) and *Caretta caretta* (loggerhead sea turtle): diet. Herpetological Review 24(1):31-32.

Byles, R. 1988. Satellite Telemetry of Kemp's Ridley Sea Turtle, *Lepidochelys kempi*, in the Gulf of Mexico. Report to the National Fish and Wildlife Foundation:40 pp.

Carr, A. F. 1986. RIPS, FADS, and little loggerheads. BioScience 36(2):92-100.

Carr, A. 1987. New perspectives on the pelagic stage of sea turtle development. Conservation Biology 1(2):103-121.

CEQ (Council on Environmental Quality). 1997. Considering Cumulative Effects Under the National Environmental Policy Act. U.S. Council on Environmental Quality, Washington, DC. 64 pp.

Collette, B. B. 2002. Scombridae. In: 'The Living Marine Resources of the Western Central Atlantic. Volume 2: Bony Fishes Part 2 (*Opistognathidae* to *Molidae*), Sea Turtles and Marine Mammals. FAO Species Identification Guide for Fishery Purposes and American Society of Ichthyologists and Herpetologists, Special Publication No. 5'. (Ed. K. E. Carpenter.) pp. 1701–1722. Food Agricultural Organization, Rome.

Ditty, J. G., R. F. Shaw, C. B. Grimes, and J. S. Cope. 1994. Larval development, distribution, and abundance of common dolphin, *Coryphaena hippurus*, and pompano dolphin, *C. equiselis* (family: Coryphaenidae), in the northern Gulf of Mexico. Fish. Bull. 92:275–291.

Eckert, S. A., K. L. Eckert, P. Ponganis, and G. L. Kooyman. 1989. Diving and foraging behavior of leatherback sea turtles (*Dermochelys coriacea*). Canadian Journal of Zoology 67(11):2834-2840.

Eckert, S. A., D. W. Nellis, K. L. Eckert, and G. L. Kooyman. 1986. Diving patterns of two leatherback sea turtles (*Dermochelys coriacea*) during internesting intervals at Sandy Point, St. Croix, U.S. Virgin Islands. Herpetologica 42(3):381-388.

EPA. 1999. EPA Region 4: Interim Policy to Identify and Address Potential Environmental Justice Areas. EPA-904-R-99-004.

Farrell, E. R., A. M. Boustany, P. N. Halpin, and D. L. Hammond. 2014. Dolphinfish (*Coryphaena hippurus*) distribution in relation to biophysical ocean conditions in the northwest Atlantic. Fisheries Research. 151:177-190.

Frick, J. 1976. Orientation and behavior of hatchling green turtles *Chelonia mydas* in the sea. Animal Behavior 24(4):849-857.

Garber, A. F., M. D. Tringali, and J. S. Franks. 2005. Population genetic and phylogeographic structure of wahoo, *Acanthocybium solandri*, from the western Atlantic and central Pacific Oceans. Marine Biology (Berlin) 147: 205–214. doi:10.1007/S00227-004-1533-1

GMFMC (Gulf of Mexico Fishery Management Council)/SAFMC (South Atlantic Fishery Management Council). 2013. Amendment 20A to the fishery management plan for coastal migratory pelagic resources in the Gulf of Mexico and Atlantic regions including environmental assessment, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida, and South Atlantic Fishery Management Council, North Charleston, South Carolina. Available at: http://www.gulfcouncil.org/docs/amendments/CMP%20Amendment%2020A.pdf

Haab, T. C., J. C. Whitehead, and T. McConnell. 2001. The Economic Value of Marine Recreational Fishing in the Southeast United States. NOAA Technical Memorandum NMFS-SEFSC-466.

Haab, T.C., R. Hicks, K. Schnier, and J.C. Whitehead. 2009. Angler Heterogeneity and the Species-Specific Demand for Recreational Fishing in the Southeastern United States. Draft Final Report Submitted for MARFIN Grant #NA06NMF4330055.

Hughes, G. R. 1974. Is a sea turtle no more than an armored stomach? Bulletin of the South African Association for Marine Biological Research 11:12-14.

IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

Johnson, G. D. 1978. Development of fishes of the Mid-Atlantic Bight. An atlas of egg, larval, and juvenile stages. Vol. IV Carangidae through Epruppidae. U.S. Dep. Inter., Fish Wildl. Serv., BioI. Serv. Prog. *FWS/OBS-78!12,* Jan. 1978: 123-128.

Keinath, J. A., and J. A. Musick. 1993. Movements and diving behavior of leatherback turtle. Copeia 1993(4):1010-1017.

Kennedy, V. S., R. R. Twilley, J. A. Kleypas, J. H. Cowan, Jr., and S. R. Hare. 2002. Coastal and Marine Ecosystems & Global Climate Change: Potential Effects on U.S. Resources. Pew Center on Global Climate Change. 52 p.

Kleisner, K.M., 2009. A Spatio-Temporal Analysis of Dolphinfish, *Coryphaena hippurus*, Abundance in the Western Atlantic: Implications for Stock Assessment of a Data-Limited Pelagic Resource. University of Miami, PhD thesis.

Lanyon, J.M., C.J. Limpus, and H. Marsh. 1989. Dugongs and turtles: grazers in the seagrass system. *In:* Larkum, A.W.D, A.J. McComb, and S.A. Shepard (eds.) Biology of Seagrasses. Elsevier, Amsterdam, 610.

Limpus, C.J. and N. Nichols. 1988. The southern oscillation regulates the annual numbers of green turtles (*Chelonia mydas*) breeding around northern Australia. Australian Journal of Wildlife Research 15:157.

Limpus, C.J. and N. Nichols. 1994. Progress report on the study of the interaction of El Niño Southern Oscillation on annual *Chelonia mydas* numbers at the southern Great Barrier Reef rookeries. *In:* Proceedings of the Australian Marine Turtle Conservation Workshop, Queensland Australia.

Lutz, P. L. and J. A. Musick, editors. 1997. The biology of sea turtles. CRC Press, Boca Raton, Florida.

Lutz, P. L., J. A. Musick, and J. Wyneken. 2003. The Biology of Sea Turtles. Volume II. CRC Press, Inc., Washington, D.C.

Lynch, P. D., K. W. Shertzer, E. Cortés, and R. J. Latour. 2018. Abundance trends of highly migratory species in the Atlantic Ocean: accounting for water temperature profiles. ICES Journal of Marine Science 75:1427–1438.

Maki Jenkins, K.L. and R.S. McBride. 2009. Reproductive biology of wahoo, *Acanthocybium solandri*, from the Atlantic coast of Florida and the Bahamas. Marine and Freshwater Research. 60:893-897.

Márquez M. R. 1994. Synopsis of biological data on the Kemp's ridley turtle, *Lepidochelys kempii* (Garman 1880). U. S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, Miami, Florida.

McBride, R. S., A. K. Richardson, and K. L. Maki. 2008. Age, growth, and mortality of wahoo, *Acanthocybium solandri*, from the Atlantic coast of Florida and the Bahamas. Marine and Freshwater Research 59, 799–807. doi:10.1071/MF08021

McBride, R. S., Snodgrass, D. J. G., Adams, D. H., Rider, S. J., and Colvocoresses, J. A. 2012. Bull. Mar. Sci. 88(2):283-303.

Mendonca, M. T. and P. C. H. Pritchard. 1986. Offshore movements of post-nesting Kemp's ridley sea turtles (*Lepidochelys kempii*). Herpetologica 42:373-380.

Merten, W., Appeldoorn, R., and D. Hammond. 2014. Movements of dolphinfish (*Coryphaena hippurus*) along the U.S. east coast as determined through mark and recapture data. Fisheries Research. 151:114-121.

Merten, W. B., Schizas, N. V., Craig, M. T., Appeldoorn, R. S., and D. L. Hammond. 2015. Genetic structure and dispersal capabilities of dolphinfish (*Coryphaena hippurus*) in the western central Atlantic. Fish. Bull. 113:419–429.

Meylan, A. 1984. Feeding ecology of the hawksbill turtle (*Eretmochelys imbricata*) spongivory as a feeding niche in the coral reef community. University of Florida.

Meylan, A. 1988. Spongivory in hawksbill turtles: a diet of glass. Science 239:393-395.

Meylan, A. B. and M. Donnelly. 1999. Status justification for listing the hawksbill turtle (*Eretmochelys imbricata*) as critically endangered on the 1996 IUCN Red List of Threatened Animals. Chelonian Conservation and Biology 3(2):200-204.

Mortimer, J. A. 1981. The feeding ecology of the west Caribbean green turtle (*Chelonia mydas*) in Nicaragua. Biotropica 13(1):49-58.

Mortimer, J. A. 1982. Feeding ecology of sea turtles. Pages 103-109 *in* K. A. Bjorndal, editor. Biology and Conservation of Sea Turtles. Smithsonian Institution Press, Washington D.C.

NMFS (National Marine Fisheries Service). 2009c. "Economic Value of Angler Catch and Keep in the Southeast United States: Evidence from a Choice Experiment." NOAA SEFSC SSRG.

Norman, J. R., and F. C.. Fraser. 1938. Giant Fishes, Whales and Dolphins. W. W. Norton and Company, Inc, New York, NY. 361 pp.

Ogren, L. H. 1989. Distribution of juvenile and subadult Kemp's ridley sea turtles: preliminary results from 1984-1987 surveys. Pages 116-123 *in* C. W. Caillouet Jr., and J. A.M. Landry, editors. Proceedings of the First International Symposium on Kemp's Ridley Sea Turtle Biology, Conservation, and Management. Texas A&M University Sea Grant College, Galveston, Texas.

O'Hop, J., M. Murphy, and D. Chagaris 2012. The 2012 Stock Assessment Report for Yellowtail Snapper in the South Atlantic and Gulf of Mexico. Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute 100 Eighth Ave Southeast St. Petersburg, Florida 33701-5020.

Oxenford, H. A. 1999. Biology of the dolphinfish (*Coryphaena hippurus*) in the western central Atlantic: a review. Scientia Marina 63 (3-4): 277-301.

Oxenford, H. A. and W. Hunte. 1986. A preliminary investigation of the stock structure of the dolphin, *Coryphaena hippurus*, in the western central Atlantic. U.S. Fishery Bulletin 84: 451-460.

Palko, B. J., G. L. Beardsley, and W. J. Richards. 1982. Synopsis of the biological data on dolphin fishes, *Coryphaena hippurus* Linnaeus and *Coryphaena equiselis* Linnaeus. U.S. Dept. Commer., NOAA Tech. Rept. NMFS Circ. 443, 28 p.

Paredes, R.P. 1969. Introduccion al Estudio Biologico de *Chelonia mydas agassizi* en el Perfil de Pisco, Master's thesis, Universidad Nacional Federico Villareal, Lima, Peru.

Prager, M. H. 2000. Exploratory Assessment of Dolphinfish, *Coryphaena hippurus*, based on U.S. landings from the Atlantic Ocean and Gulf of Mexico. NMFS, SEFSC 18pp.

Rothschild, B.J. 1986. Dynamics of Marine Fish Populations. Harvard University Press. Cambridge, Massachusetts. 277pp.

Rudershausen, P. J., Poland, S. J., Merten, W., and Buckel, J. A. 2019. North American Journal of Fisheries Management. 39:1143–1154.

SAFMC (South Atlantic Fishery Management Council). 1983. Fishery Management Plan, Regulatory Impact Review and Final Environmental Impact Statement for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Circle, Suite 306, Charleston, South Carolina, 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1997. Amendment 8 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Circle, Suite 306, Charleston, South Carolina, 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2002. Fishery Management Plan for Pelagic *Sargassum* Habitat of the South Atlantic Region Including a Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, & Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 1 Southpark Circle, Suite 306, Charleston, South Carolina, 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2003. Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic, Including a Final Environmental Impact Statement, Regulatory Impact Review, Initial Flexibility Analysis, & Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 1 Southpark Circle, Suite 306, Charleston, South Carolina, 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2006. Amendment 13C to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 631 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2008a. Amendment 15A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 325 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2008b. Amendment 15B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 324 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2009a. Comprehensive Ecosystem-Based Amendment 1 for the South Atlantic Region (Including a FEIS, IRFA, FRIR & FSIA/FIS). South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2009b. Fishery Ecosystem Plan for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2009c. Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 608 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011a. Comprehensive Annual Catch Limit Amendment for the South Atlantic Region with Final Environmental Impact Statement, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 755 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011b. Regulatory Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013. Amendment 5 to the Fishery Management Plan for the Dolphin and Wahoo Fishery for the Atlantic with Final Environmental Assessment,

Regulatory Flexibility Analysis, Regulatory Impact Review, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014a. Amendment 27 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region . South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014b. Regulatory Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region . South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC 2015. Amendment 34 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Amendment 9 to the Fishery Management Plan for the Golden Crab of the South Atlantic Region, and Amendment 8 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic with Final Environmental Assessment, Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC 2016. Regulatory Amendment 1 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic with Final Environmental Assessment, Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2020. Amendment 29 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. Final Environmental Assessment, Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

Schwenke, K. L. and J.A. Buckel. 2008. Age, growth, and reproduction of dolphinfish (*Coryphaena hippurus*) caught off the coast of North Carolina. Fishery Bulletin 106: 82–92.

Seafood Watch Program. 2010. Monterey Bay Aquarium. http://www.seafoodwatch.org.

Shaver, D. J. 1991. Feeding Ecology of Wild and Head-Started Kemp's Ridley Sea Turtles in South Texas Waters. Journal of Herpetology 25(3):327-334.

Simpfendorfer, CA. 2001. Essential habitat of the smalltooth sawfish, *Pristis pectinata*. Report to the National Fisheries Service‘s Protected Resources Division. Mote Marine Laboratory, Technical Report (786) 21pp.

Simpfendorfer, C.A. and T.R. Wiley. 2004. Determination of the distribution of Florida‘s remnant sawfish population, and identification of areas critical to their conservation. Mote Marine Laboratory, Technical Report July 2, 2004, 37 pp.

Soma, M. 1985. Radio biotelemetry system applied to migratory study of turtle. Journal of the Faculty of Marine Science and Technology, Tokai University, Japan, 21:47.

Standora, E. A., J. R. Spotila, J. A. Keinath, and C. R. Shoop. 1984. Body temperatures, diving cycles, and movement of a subadult leatherback turtle, *Dermochelys coriacea*. Herpetologica 40:169-176.

Thayer, G.W., K.A. Bjorndal, J.C. Ogden, S.L. Williams, and J.C. Zieman. 1984. Role of large herbivores in seagrass communities. Estuaries 7:351.

Theisen, T. C., B.W. Bowen, W. Lanier, and J.D. Baldwin. 2008. High connectivity on a global scale in the pelagic wahoo, *Acanthocybium solandri* (tuna family Scombridae). Molecular Ecology 17, 4233–4247.

van Dam, R. P. and C. E. Díez. 1998. Home range of immature hawksbill turtles (*Eretmochelys imbricata* (Linnaeus) at two Caribbean islands. Journal of Experimental Marine Biology and Ecology 220(1):15-24.

Walker, T. 1994. Post-hatchling dispersal of sea turtles. Proceedings of the Australian Marine Turtle Conservation Workshop 1994:79-94.

Whitehead, J.C. and T. C. Haab. 2001. Analysis of Contingent Valuation data from the 1997-98 Southeast Economic Add-on Survey Data. NOAA Technical Memorandum NMFS SEFSC-465.

Witzell, W. N. 2002. Immature Atlantic loggerhead turtles (*Caretta caretta*): suggested changes to the life history model. Herpetological Review 33(4):266-269.

Zischke, M. T., S. P. Griffiths, I. R. Tibbetts, and R. J. G. Lester. 2012. Stock identification of wahoo (*Acanthocybium solandri*) in the Pacific and Indian Oceans using morphometrics and parasites. ICES Journal of Marine Science 10.1093/icesjms/fss164.

Appendix A. Alternatives Considered, but Eliminated from Detailed Analysis

Appendix B. Glossary

Acceptable Biological Catch (ABC Acceptable Biological Catch (ABC): Maximum amount of fish stock than can be harvested without adversely affecting recruitment of other components of the stock. The ABC level is typically higher than the total allowable catch, leaving a buffer between the two.

Accountability measure (AM): AMs are fishery management rules that prevent annual catch limits from being exceeded (i.e. prevent overfishing) and make corrections when fishing goes over the annual catch limit.

ALS: Accumulative Landings System. NMFS database which contains commercial landings reported by dealers.

Annual Catch Limit (ACL): The amount of a particular fish species, stock or stock complex that can be caught in a given year.

Annual Catch Target (ACT): An annual catch target is an amount of annual catch that serves as the management target, set below the annual catch limit to account for management uncertainty.

Biomass: Amount or mass of some organism, such as fish.

B_{MSY}: Biomass of population achieved in long-term by fishing at F_{MSY}.

Bycatch: Fish harvested in a fishery, but not sold or kept for personal use. Bycatch includes economic discards and regulatory discards, but not fish released alive under a recreational catch and release fishery management program.

Caribbean Fishery Management Council (CFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The CFMC develops fishery management plans for fisheries off the coast of the U.S. Virgin Islands and the Commonwealth of Puerto Rico.

Catch Per Unit Effort (CPUE): The amount of fish captured with an amount of effort. CPUE can be expressed as weight of fish captured per fishing trip, per hour spent at sea, or through other standardized measures.

Charter Boat: A fishing boat available for hire by recreational anglers, normally by a group of anglers for a short time period.

Cohort: Fish born in a given year. (See year class.)

Control Date: Date established for defining the pool of potential participants in a given management program. Control dates can establish a range of years during which a potential participant must have been active in a fishery to qualify for a quota share.

Constant Catch Rebuilding Strategy: A rebuilding strategy where the allowable biological catch of an overfished species is held constant until stock biomass reaches B_{MSY} at the end of the rebuilding period.

Constant F Rebuilding Strategy: A rebuilding strategy where the fishing mortality of an overfished species is held constant until stock biomass reached BMSY at the end of the rebuilding period.

Directed Fishery: Fishing directed at a certain species or species group.

Discards: Fish captured, but released at sea.

Discard Mortality Rate: The percent of total fish discarded that do not survive being captured and released at sea.

Derby: Fishery in which the TAC is fixed and participants in the fishery do not have individual quotas. The fishery is closed once the TAC is reached, and participants attempt to maximize their harvests as quickly as possible. Derby fisheries can result in capital stuffing and a race for fish.

Effort: The amount of time and fishing power (i.e., gear size, boat size, horsepower) used to harvest fish.

Exclusive Economic Zone (EEZ): Zone extending from the shoreline out to 200 nautical miles in which the country owning the shoreline has the exclusive right to conduct certain activities such as fishing. In the United States, the EEZ is split into state waters (typically from the shoreline out to 3 nautical miles) and federal waters (typically from 3 to 200 nautical miles).

Exploitation Rate: **Amount of fish harvested from a stock relative to the size of the stock, often expressed as a percentage.**

F: **Fishing mortality.**

Fecundity: A measurement of the egg-producing ability of fish at certain sizes and ages.

Fishery Dependent Data: Fishery data collected and reported by fishermen and dealers.

Fishery Independent Data: Fishery data collected and reported by scientists who catch the fish themselves.

Fishery Management Plan: **Management plan for fisheries operating in federal waters. Produced by regional fishery management councils and submitted to the Secretary of Commerce for approval.**

Fishing Effort: **Usually refers to the amount of fishing. May refer to the number of fishing vessels, amount of fishing gear (nets, traps, hooks), or total amount of time vessels and gear are actively engaged in fishing.**

Fishing Mortality: A measurement of the rate at which fish are removed from a population by fishing. Fishing mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Fishing Power: Measure of the relative ability of a fishing vessel, its gear, and its crew to catch fishes, in reference to some standard vessel, given both vessels are under identical conditions.

$F_{30\%SPR}$: Fishing mortality that will produce a static SPR = 30%.

$F_{45\%SPR}$: Fishing mortality that will produce a static SPR = 45%.

F_{OY}: Fishing mortality that will produce OY under equilibrium conditions and a corresponding biomass of B_{OY}. Usually expressed as the yield at 85% of F_{MSY}, yield at 75% of F_{MSY}, or yield at 65% of F_{MSY}.

F_{MSY}: Fishing mortality that if applied constantly, would achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}

Fork Length (FL): The length of a fish as measured from the tip of its snout to the fork in its tail.

Gear restrictions: **Limits placed on the type, amount, number, or techniques allowed for a given type of fishing gear.**

Growth Overfishing: When fishing pressure on small fish prevents the fishery from producing the maximum poundage. Condition in which the total weight of the harvest from a fishery is improved when fishing effort is reduced, due to an increase in the average weight of fishes.

Gulf of Mexico Fishery Management Council (GFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The GFMC develops fishery management plans for fisheries off the coast of Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida.

Head Boat: A fishing boat that charges individual fees per recreational angler onboard.

Highgrading: Form of selective sorting of fishes in which higher value, more marketable fishes are retained, and less marketable fishes, which could legally be retained are discarded.

Individual Fishing Quota (IFQ): Fishery management tool that allocates a certain portion of the TAC to individual vessels, fishermen, or other eligible recipients.

Longline: Fishing method using a horizontal mainline to which weights and baited hooks are attached at regular intervals. Gear is either fished on the bottom or in the water column.

Magnuson-Stevens Fishery Conservation and Management Act: Federal legislation responsible for establishing the fishery management councils and the mandatory and discretionary guidelines for federal fishery management plans.

Marine Recreational Fisheries Statistics Survey (MRFSS): Survey operated by NMFS in cooperation with states that collects marine recreational fisheries data.

Marine Recreational Information Program (MRIP): Survey operated by NMFS in cooperation with states that collects marine recreational fisheries data.

Maximum Fishing Mortality Threshold (MFMT): The rate of fishing mortality above which a stock's capacity to produce MSY would be jeopardized.

Maximum Sustainable Yield (MSY): The largest long-term average catch that can be taken continuously (sustained) from a stock or stock complex under average environmental conditions.

Minimum Stock Size Threshold (MSST): The biomass level below which a stock would be considered overfished.

Modified F Rebuilding Strategy: A rebuilding strategy where fishing mortality is changed as stock biomass increases during the rebuilding period.

Multispecies fishery: Fishery in which more than one species is caught at the same time and location with a particular gear type.

National Marine Fisheries Service (NMFS): Federal agency within NOAA responsible for overseeing fisheries science and regulation.

National Oceanic and Atmospheric Administration: Agency within the Department of Commerce responsible for ocean and coastal management.

Natural Mortality (M): A measurement of the rate at which fish are removed from a population by natural causes. Natural mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Optimum Yield (OY): The amount of catch that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

Overfished: A stock or stock complex is considered overfished when stock biomass falls below the minimum stock size threshold (MSST) (e.g., current biomass < MSST = overfished).

Overfishing: Overfishing occurs when a stock or stock complex is subjected to a rate of fishing mortality that exceeds the maximum fishing mortality threshold (e.g., current fishing mortality rate > MFMT = overfishing).

Quota: Percent or annual amount of fish that can be harvested.

Recruitment (R): Number or percentage of fish that survives from hatching to a specific size or age.

Recruitment Overfishing: The rate of fishing above which the recruitment to the exploitable stock becomes significantly reduced. This is characterized by a greatly reduced spawning stock, a decreasing proportion of older fish in the catch, and generally very low recruitment year after year.

Scientific and Statistical Committee (SSC): Fishery management advisory body composed of federal, state, and academic scientists, which provides scientific advice to a fishery management council.

Selectivity: The ability of a type of gear to catch a certain size or species of fish.

South Atlantic Fisheries Management Council (SAFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The SAFMC develops fishery management plans for fisheries off North Carolina, South Carolina, Georgia, and the east coast of Florida.

Spawning Potential Ratio (Transitional SPR): Formerly used in overfished definition. The number of eggs that could be produced by an average recruit in a fished stock divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR) of a fished stock divided by the SSBR of the stock before it was fished.

% Spawning Per Recruit (Static SPR): Formerly used in overfishing determination. The maximum spawning per recruit produced in a fished stock divided by the maximum spawning per recruit, which occurs under the conditions of no fishing. Commonly abbreviated as %SPR.

Spawning Stock Biomass (SSB): The total weight of those fish in a stock which are old enough to spawn.

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

Total Allowable Catch (TAC): The total amount of fish to be taken annually from a stock or stock complex. This may be a portion of the Allowable Biological Catch (ABC) that takes into consideration factors such as bycatch.

Total Length (TL): The length of a fish as measured from the tip of the snout to the tip of the tail.

Appendix C. Other Applicable Law

Appendix D. History of Management

History of Management of the Atlantic Dolphin and Wahoo Fisheries

The dolphin and wahoo fisheries are highly regulated and have been regulated since 2004. The following table summarizes actions in each of the amendments to the original FMP.

Time period/dates	Cause	Observed and/or Expected Effects
Effective June 28, 2004	Fishery Management Plan for the Dolphin Wahoo Fishery off the Atlantic states (Dolphin Wahoo FMP).	1) A 20-inch fork length minimum size limit for dolphin off the coasts of Georgia and Florida with no size restrictions elsewhere; (2) prohibition of longline fishing for dolphin and wahoo in areas closed to the use of such gear for highly migratory pelagic species; and (3) allowable gear to be used in the fishery (hook-and-line gear including manual, electric, and hydraulic rods and reels; bandit gear; handlines; longlines; and spearfishing (including powerheads) gear. In addition, other approved portions of the FMP were also effective on this date, including (1) the management unit and designations of stock status criteria for the unit; (2) a fishing year of January 1 through December 31; (3) a 1.5 million pound (or 13% of the total harvest) cap on commercial landings; (4) establishment of a framework procedure by which the SAFMC may modify its management measures; and (5) designations of Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern (HAPC).
Effective September 24, 2004	Dolphin Wahoo FMP	1) owners of commercial vessels and/or charter vessels/headboats must have vessel permits and, if selected, submit reports; (2) dealers must have permits and, if selected, submit reports; (3) longline vessels must comply with sea turtle protection measures; (4) a recreational bag limit of 10 dolphin and 2 wahoo per person per day, with a limit of 60 dolphin per boat per day (headboats are excluded from the boat limit); (5) prohibition on recreational sale of dolphin and wahoo caught under a bag limit unless the seller holds the necessary commercial permits; and (6) a commercial trip limit of 500 pounds for wahoo.

Time period/dates	Cause	Observed and/or Expected Effects
Effective November 23, 2004	Dolphin Wahoo FMP	Operators of commercial vessels, charter vessels and headboats that are required to have a federal vessel permit for dolphin and wahoo must display operator permits.
Effective Date July 22, 2010	Amendment 1 to the Dolphin Wahoo FMP (Comprehensive Ecosystem Based Amendment (CE-BA) 1)	Updated spatial information of Council-designated EFH and EFH-HAPCS.
Effective Date April 16, 2012	Amendment 2 to the Dolphin Wahoo FMP (Comprehensive ACL Amendment SAFMC 2011C)	Set ABC, ACL, ACT and AMs
Target 2014	Amendment 5 to the Dolphin Wahoo FMP	Revisions to acceptable biological catch estimates (ABCs), annual catch limits (ACLs) (including sector ACLs), recreational annual catch targets (ACTs), and accountability measures (AMs) implemented through the Comprehensive ACL Amendment; modifications to the sector allocations for dolphin; and revisions to the framework procedure in the Dolphin Wahoo FMP.

Appendix E. Bycatch Practicability Analysis

Appendix F. Regulatory Impact Review

Appendix G. Regulatory Flexibility Act Analysis

Appendix H. *Fishery Impact Statement*

Appendix I. Essential Fish Habitat and Move to Ecosystem Based Management