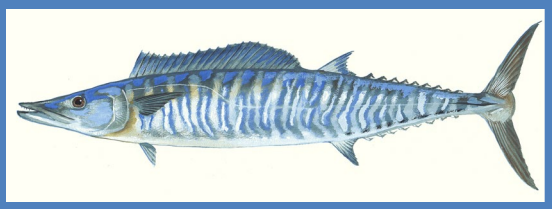

Amendment 10 to the Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic

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

Regulatory Impact Review | Regulatory Flexibility Analysis | Fishery Impact Statement

October 18, 2021

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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 and Wahoo Fishery of the Atlantic

Proposed action(s):	Revise acceptable biological catch, annual catch limits, sector allocations, accountability measures, and management measures for dolphin and wahoo. Management measure changes allow possession of dolphin or wahoo when specified unauthorized gear types are onboard a vessel, remove the operator card requirement, and reduce the recreational vessel limit for dolphin.
Lead agency:	Amendment – South Atlantic Fishery Management Council Environmental Assessment (EA) – National Marine Fisheries Service (NMFS), Southeast Regional Office
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This EA is being prepared using the 1978 CEQ NEPA Regulations. National Environmental Policy Act (NEPA) reviews initiated prior to the effective date of the 2020 CEQ regulations may be conducted using the 1978 version of the regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020. This review began on September 10, 2020, and the agency has decided to proceed under the 1978 regulations.

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Summary

Why is the South Atlantic Fishery Management Council considering action?

The South Atlantic Fishery Management Council (Council) is considering action to respond to new acceptable biological catch (ABC) recommendations from their Scientific and Statistical Committee (SSC) for dolphin and wahoo. The previous ABC recommendation for dolphin was 15,344,846 pounds whole weight (lbs ww) and was based on the third highest landings value during the 1999-2008 time series. The previous ABC recommendation for wahoo was 2,885,303 lbs ww and was based on the third highest landings value during the 1999-2008 time series. 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. This resulted in ABC recommendations of 24,570,764 lbs ww for dolphin and 2,885,303 lbs ww for wahoo. The Council made this request, as they were concerned about using the third highest landings in a four-year time series to set the ABC for dolphin, which by default led to using the second lowest landings value.

The SSC included recreational landings from Monroe County, Florida, in their ABC recommendation. These landings were not included in past catch level recommendations in the South Atlantic for all unassessed species due to issues with determining whether such landings occurred from Gulf of Mexico or South Atlantic waters. The revised methods used to calculate recreational landings allows for better partitioning of recreational landings from Monroe County, Florida, between the Gulf of Mexico and South Atlantic regions and the vast majority of dolphin and wahoo landed in the county are from South Atlantic waters. Through actions in Amendment 10, the Council wants to incorporate best scientific information available and the SSC's catch level recommendations into management of dolphin and wahoo by revising the annual catch limits (ACL) to reflect the updated ABC.

Additionally, the Council is addressing deficiencies in the recreational accountability measures (AM) for dolphin and wahoo. Currently, the AMs for both dolphin and wahoo require that the species be "overfished" for the AM to be triggered. Since there is no stock assessment for either species planned in the foreseeable future, it is unlikely that dolphin or wahoo would be considered overfished. As such, the Council is examining the trigger for recreational AMs as well as the AMs themselves in this amendment. The Council is also considering a change to the recreational possession limits for wahoo to reduce the likelihood of triggering the AM if recreational landings reach the revised recreational ACL.

Finally, the Council is responding to requests from the public for changes to management of dolphin and wahoo. Actions addressing these comments include allowing the possession of commercial quantities of dolphin and wahoo when trap, pot, or buoy gear are on board a vessel, removing the operator card requirements, and reducing the vessel limit for dolphin.

What actions are being proposed in this amendment?

Amendment 10 to the to the Fishery Management Plan (FMP) for the Dolphin and Wahoo Fishery of the Atlantic proposes the following 11 actions for dolphin and wahoo in the Atlantic region.

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

Currently: 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.

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

Currently: 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.

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

Currently: The current recreational sector and commercial sector allocations are 90.00% and 10.00%, respectively, of the revised total annual catch limit for dolphin.

Preferred 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.

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

Currently: The current recreational sector and commercial sector allocations are 96.07% and 3.93%, respectively, of the revised total annual catch limit for wahoo.

Preferred 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 approximately maintaining the current commercial sector annual catch limit and allocating the remaining revised total annual catch limit to the recreational sector.

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

Currently: 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.

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

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

Currently: 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.

Preferred 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.

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

Currently: 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.

Preferred Alternative 2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year mean (*Sub-alternative 2a or 2b*) of landings exceeds the recreational sector annual catch limit. When the recreational sector annual catch limit is changed, use a single year of landings, beginning with

the most recent available year of landings, then a two-year average of landings from that single year and the subsequent year, then a three-year average of landings from those two years and the subsequent year, and thereafter a progressive running three-year average to trigger the recreational accountability measure.

Preferred Sub-alternative 2b. Use the geometric mean to calculate average landings.

Action 8. Revise the post-season recreational accountability measures for <u>wahoo</u>

Currently: 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.

Preferred 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.

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

Currently: 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. A person aboard a vessel in the Atlantic Exclusive Economic Zone that has on board unauthorized 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.

Preferred 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 is authorized to retain dolphin caught by rod and reel while in possession of such gears. Dolphin retained by such a vessel shall not exceed:

Preferred Sub-alternative 2b. 500 pounds gutted weight.

Preferred 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 is authorized to retain wahoo caught by rod and reel while in possession of such gear types. The wahoo commercial trip limit will be 500 pounds.

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

Currently: 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.

Preferred 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.

Preferred 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.

Action 11. Reduce the recreational vessel limit for dolphin

Currently: The recreational daily bag limit is 10 dolphin per person, not to exceed 60 dolphin per vessel, whichever is less.

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

Preferred Sub-alternative 2e. 54 dolphin per vessel, whichever is less.

Chapter 1. Introduction

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

Amendment 10 to the Fishery Management Plan (FMP) for the Dolphin and Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 10) would revise acceptable biological catch (ABC) levels, annual catch limits (ACL), sector allocations, and recreational accountability measures (AM). Additionally, Dolphin Wahoo Amendment 10 would allow possession of dolphin or wahoo when specified unauthorized gear types are onboard a vessel, remove the operator card requirement, and reduce the vessel limit for dolphin.

Management Agencies

- ***South Atlantic Fishery Management Council (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 ***Council staff*** – Develop options based on guidance from the Council and analyze the environmental impacts of those options. If approved by the Secretary of Commerce, NMFS implements the action through rulemaking.

1.2 Who is Proposing the Management Measures?

The Council is proposing these management measures. The Council recommends management measures and sends them to 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.

The 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 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 FMP for the Dolphin and Wahoo Fishery of the Atlantic (Dolphin and Wahoo FMP; SAFMC 2003) (**Figure 1.1**).

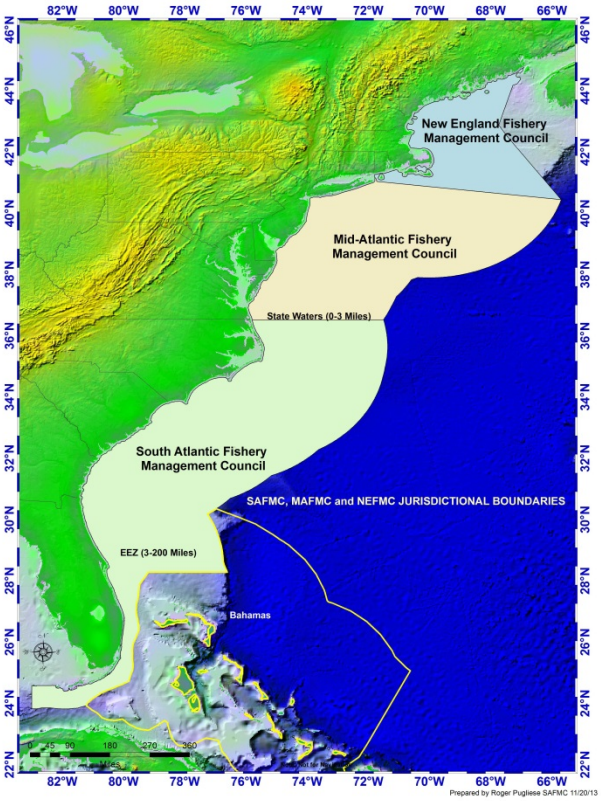

Figure 1.1.3.1 Jurisdictional boundaries of the Dolphin and Wahoo FMP for the Atlantic as managed by the South Atlantic Council.

1.4 Purpose and need statement

Purpose for Action

The *purpose* of Dolphin Wahoo Amendment 10 is to revise the catch levels [acceptable biological catch (ABC) and annual catch limits (ACL)], sector allocations, accountability measures, and management measures for dolphin and wahoo. Management measures address authorized gear and the operator card requirement in the dolphin and wahoo fisheries, as well as the recreational vessel limit in the dolphin fishery.

Need for Action

The *need* for Dolphin Wahoo Amendment 10 is to base conservation and management measures on the best scientific information available and increase net benefits to the Nation, consistent with the Magnuson-Stevens Fishery Conservation and Management Act and its National Standards.

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 FMP for Coastal Pelagic Resources in the Gulf of Mexico and South Atlantic Region (SAFMC 1983b). Under that plan, a control date of May 21, 1999, was established for the commercial dolphin and wahoo fishery in the South Atlantic for possible future limited entry. Regulations were first implemented in 2004 and have been revised multiple times since then. The following summary provides an overview of the history of dolphin and wahoo management in the Atlantic.

Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic (effective 2004)

Dolphin and wahoo regulations were first implemented in 2004 through a separate FMP for the Dolphin and Wahoo Fishery of the Atlantic (SAFMC 2003). The plan established:

- separate management unit for dolphin and wahoo in the U.S. Atlantic,
- a dealer permit,
- for-hire and commercial vessel permits,
- for-hire and commercial operator card requirements,
- reporting requirements,
- both maximum sustainable yield and optimal yield,
- a definition of overfishing,
- a management framework,
- a prohibition on recreational sale of dolphin or wahoo except by for-hire vessels with a commercial permit,
- a 1.5 million pounds (lbs) (or 13% of the total catch) soft cap for the commercial sector,
- a recreational bag limit of 10 dolphin per person, 60 dolphin per vessel maximum,
- a minimum size limit for dolphin of 20 inches fork length off Georgia and Florida,
- a commercial trip limit of 500 lbs of wahoo,
- a recreational bag limit of two wahoo per person per day,
- allowable gear for dolphin and wahoo in the Atlantic EEZ (longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear, including powerheads,
- a prohibition on the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species,
- a fishing year of January 1 to December 31,
- Essential Fish Habitat (EFH) for dolphin and wahoo, and
- EFH-Habitat Areas of Particular Concern (HAPC).

Amendment 1 (effective 2010)

The amendment was included under Comprehensive Ecosystem-Based Amendment 1 and presented spatial information of Council-designated EFH and EFH-HAPCs for the dolphin and wahoo fishery (SAFMC 2009a).

Amendment 2 (effective 2012)

The amendment was included in the Comprehensive Annual Catch Limit Amendment (SAFMC 2011a). This amendment established ABCs, ACLs, AMs, and allocations for both commercial and

recreational sectors; established annual catch targets (ACTs) for the recreational sector; prohibited bag limit sales of dolphin from for-hire vessels; and established a minimum size limit of 20 inches fork length for dolphin caught in the EEZ off South Carolina (SAFMC 2011a).

Amendment 3 (effective 2014)

The Modifications to Federally Permitted Seafood Dealer Reporting Requirements amendment was included under the Joint Generic Dealer amendment in conjunction with the Gulf of Mexico Fishery Management Council (SAFMC 2013a). The amendment required electronic reporting for federal dealers and changed the frequency of reporting.

Amendment 5 (effective 2014)

The amendment addressed the following management measures for the fishery: revisions to ABCs, ACLs (including sector ACLs), recreational ACTs, and AMs implemented through the Comprehensive ACL Amendment; modifications to the sector allocations for dolphin; and revisions to the framework procedure (SAFMC 2013b).

Amendment 6 (effective 2014)

The amendment was included in the Generic charter/headboat reporting amendment, that required electronic logbook reporting for headboat vessels regarding dolphin and wahoo landings (SAFMC 2013c).

Amendment 7 (effective 2016)

The amendment allowed dolphin and wahoo fillets to enter the U.S. EEZ after lawful harvest in The Bahamas; specified the condition of any dolphin, wahoo, and snapper-grouper fillets; described how the recreational bag limit is determined for any fillets; explicitly prohibited the sale or purchase of any dolphin, wahoo, or snapper grouper recreationally harvested in The Bahamas; specified the required documentation to be onboard any vessels with fillets on board; and, specified transit and stowage provisions for any vessels with fillets (SAFMC 2015).

Amendment 8 (effective 2016)

The amendment modified sector allocations for dolphin by increasing the commercial sector allocation from 7.54% to 10% of the total ACL. The action added approximately 377,000 lbs ww to the commercial ACL and set the commercial ACL close to the original "soft" cap of 1.5 million lbs ww that was established in the original Dolphin and Wahoo FMP (SAFMC 2016b).

Regulatory Amendment 1 (effective 2017)

The amendment established a 4,000 lbs ww commercial trip limit for dolphin once 75% of the commercial sector ACL is reached (SAFMC 2016a).

Amendment 9 (effective 2020)

The amendment required weekly electronic reporting for charter vessel operators with a federal for-hire permit in the snapper grouper, dolphin wahoo, or coastal migratory pelagic fisheries; reduced the time allowed for headboat operators to complete their electronic reports; and proposed requiring location reporting by charter vessels with the same detail required for headboat vessels (SAFMC 2017).

Amendment 12 (effective 2021)

The amendment added bullet mackerel and frigate mackerel to the Dolphin and Wahoo FMP and as Ecosystem Component species (SAFMC 2020).

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 optimum yield from a fishery. The tools included ACLs and AMs. An ACL is the level of annual catch of a stock that, if met or exceeded, triggers some corrective action. The total ACL for a stock is often divided between the commercial and recreational sector using sector allocations. The AMs are a corrective action; management controls intended to prevent ACLs from being exceeded. wo examples of AMs include an in-season closure if catch is projected to reach the ACL and reducing the fishing season in the following fishing year due to an overage of the sector ACL 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.

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.

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.

1.7 Why is the Council considering revising the goals and objectives of the Dolphin and Wahoo Fishery Management Plan?

The goals and objectives of the Dolphin and Wahoo FMP were implemented in the original plan[1] that went into place in 2004[2] and have not been revised since then. When the Council was developing the original Dolphin and Wahoo FMP, there was concern over increased overall landings of dolphin and wahoo. The Council was also proactively attempting to address potential commercial long line effort shifts towards dolphin that could have occurred due to consolidation within the Highly Migratory Species fleet.

The Fisheries Allocation Review Policy (NMFS Policy Directive 01-119) issued in July 2016 encourages the use of adaptive management in respect to allocation revisions, which includes "*periodic re-evaluation and updating of the management goals and objectives to ensure they are relevant to current*

[1] The original Dolphin and Wahoo FMP can be accessed at: https://sero.nmfs.noaa.gov/sustainable_fisheries/s_atl/dw/archives/dolphinwahoo_fmp_jan_2003.pdf.

[2] The Federal Register notice implementing the original Dolphin and Wahoo FMP can be found at: https://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/rules/sa/dw/2004/fmp_fr_052704.pdf.

conditions and needs." As part of the Council's process for creating an Allocation Review Trigger Policy, the goals and objectives of all FMPs that include sector allocations will be reviewed and updated as appropriate. The Council is implementing the revised Dolphin and Wahoo FMP goals and objectives through this amendment to respond to this policy and help ensure that the goals and objectives reflect the current fishery. The revised goals and objectives can be found in **Appendix I**.

1.8 Why is the Council considering action?

The Council is considering action to respond to new ABC recommendations from their Scientific and Statistical Committee (SSC) for dolphin and wahoo. The previous ABC recommendation for dolphin was 15,344,846 lbs ww and was based on the third highest landings value during the 1999-2008 time series. The previous ABC recommendation for wahoo was 2,885,303 lbs ww and was based on the third highest landings value during the 1999-2008 time series. These landings did not include recreational landings from Monroe County, Florida, and were based on recreational data from the Marine Recreational Information Program's (MRIP) Coastal Household Telephone Survey (CHTS) method. The current total ACLs and ABCs were implemented by Amendment 5 to the FMP for the Dolphin Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 5) in 2014 (SAFMC 2013b).

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. This resulted in ABC recommendations of 24,570,764 lbs ww for dolphin and 2,885,303 lbs ww for wahoo. The Council made this request, as they were concerned about using the third highest landings in a four-year time series to set the ABC for dolphin, which by default led to using the second lowest landings value.

The SSC included recreational landings from Monroe County, Florida, in their ABC recommendation. These landings were not included in past catch level recommendations in the South Atlantic for all unassessed species due to issues with determining whether such landings occurred from Gulf of Mexico or South Atlantic waters. The revised methods used to calculate recreational landings allows for better partitioning of recreational landings from Monroe County, Florida, between the Gulf of Mexico and South Atlantic regions and the vast majority of dolphin and wahoo landed in the county are from South Atlantic waters. Through actions in Dolphin Wahoo Amendment 10, the Council wants to incorporate best scientific information available and the SSC's catch level recommendations into management of dolphin and wahoo by revising the total ACL to reflect the updated ABC.

The Council is also considering revising sector allocations to reflect the revised total ACLs for dolphin and wahoo. The current sector allocations for dolphin were implemented in 2016 by Amendment 8 to the Dolphin and Wahoo FMP, with 90% of the total ACL to the recreational sector and 10% of the total ACL to the commercial sector. In Amendment 8, the Council set the sector allocations based on the average of the percentages of the total catch by sector for 2008 through 2012. The resulting 10% commercial allocation was expected to prevent commercial harvest from closing as a result of triggering the commercial AM and was close to the 1.5 million pound soft cap implemented in the original Dolphin and Wahoo FMP. The current sector allocations for wahoo were implemented in 2014 by Amendment 5 to the Dolphin and Wahoo FMP, with 96.07% of the total ACL to the recreational sector and 3.93% of the total ACL to the commercial sector. The Council established these allocations by balancing long-term catch history (1999 through 2008) with recent catch history (2006 through 2008) and determined this method as the most fair and equitable way to allocate fishery resources since it considered past and recent

landings. These sector allocations for both dolphin and wahoo were inclusive of MRIP CHTS units for landings from the private and for-hire sector since this was the best available data at the time and none of the sector allocations considered recreational landings from Monroe County, Florida, since these landings were not included when setting the total ABC.

Additionally, the Council is addressing deficiencies in the recreational AMs for dolphin and wahoo. Currently, the AMs for both dolphin and wahoo require that the species be deemed "overfished" for the AM to be triggered. Since there is no stock assessment for either species planned in the foreseeable future, it is unlikely that dolphin or wahoo would be considered overfished. As such, the Council is examining the trigger for recreational AMs as well as the AMs themselves in this amendment.

Finally, the Council is responding to requests from the public for changes to management of dolphin and wahoo. Actions addressing these comments include allowing the possession of commercial quantities of dolphin and wahoo when trap, pot, or buoy gear are on board a vessel, removing the operator card requirements, and reducing the recreational vessel limit for dolphin.

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]) at 15,344,846 lbs ww, 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) Scientific and Statistical Committee's (SSC) ABC recommendation using the third highest landings value during the 1999-2008 times series. These landings did not include recreational landings from Monroe County, Florida, and were based on recreational data from the Marine Recreational Information Program's (MRIP) Coastal Household Telephone Survey (CHTS) method. In April 2020, the Council received a new ABC level recommendation from its SSC for dolphin at 24,570,764 lbs ww (**Table 4.1.1.1**) using the third highest landings value during1994-2007.[3] These landings include recreational landings from Monroe County, Florida, and used MRIP's Fishery Effort Survey (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**).

Preferred Alternative 2 would set the total ACL equal to the ABC and is the most liberal of the alternatives considered. **Alternatives 3** and **4** include a buffer from the ABC, and are thus more conservative. Therefore, biological benefits would be expected to be greatest for **Alternative 4** followed by **Alternative 3**, and **Preferred Alternative 2**. **Alternative 1 (No**

[3] https://safmc.net/download/BB%20Council%20Meeting%20June%202020/SSC_Apr2020Report_FINAL.pdf

Action), which results in the lowest catch level, would be expected to have greater biological benefits compared to other alternatives. However, it is based on CHTS data and is not a viable alternative; hence, it is not included in the comparison of alternatives above. Projections show that none of the total ACLs proposed under **Preferred Alternative 2** through **Alternative 4** would be reached for two of the three scenarios analyzed. Under the maximum landings scenario for 2015-2019, the total ACLs proposed under these alternatives would be reached as late as October 16 and early as September 14 (**Table 4.1.1.4**).

Alternative 1 (No Action) and **Preferred Alternative 2** would both set the total ACL equal to the ABC. The differences between the two alternatives are due to how the ABC is determined and how the non-headboat recreational component of the total ACL would be accounted for moving forward. Therefore, the economic effects of **Alternative 1 (No Action)** and **Preferred Alternative 2** would be assumed to be similar. While none of the ACLs are expected to lead to changes in dolphin harvest or fishing behavior for dolphin based on recent average landings, ACLs that offer a larger buffer between the ACL and observed landings allow for higher potential landings, such as those observed in 2015, and reduce the likelihood of restrictive AMs 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)** and **Preferred Alternative 2** having similar effects. These two alternatives have the highest potential net economic benefits, followed by **Alternative 3**, and **Alternative 4**.

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 social benefits associated with accurate accounting of non-headboat recreational harvest. Higher ACLs may provide opportunity for commercial and recreational fishermen to expand their harvest providing social benefits associated with increased income to fishing businesses within the community and higher trip satisfaction. Among the action alternatives, **Preferred Alternative 2** would be the most beneficial for fishermen, followed by **Alternative 3**, and **Alternative 4**.

Alternative 1 (No Action) is not a viable alternative as explained above. Administrative effects of **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** would be similar. The exception is for the landings scenario with the maximum annual landings during 2015-2019, when the total ACL is projected to be reached earlier in the fishing season under **Preferred Alternative 2**, **Alternative 3,** and **Alternative 4** (**Table 4.1.1.4**). In this scenario, administrative effects would be greater for **Alternative 4**, followed by **Alternative 3**, and **Preferred Alternative 2**. 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.

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) at 1,794,960 lbs ww (**Table 4.2.1.1**), which would not be BSIA. The current total ACL was based on the SSC's ABC recommendation using the third highest landings value during 1999-2008. These landings did not include recreational landings from Monroe County, Florida, and used the older MRIP CHTS method. The current total ACL and ABC was specified by Dolphin Wahoo Amendment 5 in 2014 (SAFMC 2013b). In April 2020, the Council received a new ABC level recommendation from its SSC for wahoo at 2,885,303 lbs ww (**Table 4.2.1.1**) using the third highest landings value during1994-2007. These landings include recreational landings from 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. **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**).

Preferred Alternative 2 would set the total ACL equal to the ABC and is the most liberal of the alternatives. **Alternatives 3** and **4**, which include a buffer from the ABC are thus more conservative. Biological benefits would be expected to be greatest for **Alternative 4** followed by **Alternative 3**, and **Preferred Alternative 2**. **Alternative 1 (No Action)**, which results in the lowest catch level, would be expected to have the greater biological benefits compared to other alternatives. However, it is based on CHTS data and is not a viable alternative; hence, it is not included in the comparison of alternatives above. The ACL would be reached as late as December 24 and as early as November 22 (the fishing year ends on 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 23 and as early as August 29 when compared to maximum annual landings during 2015-2019 (**Table 4.2.1.4**).

Alternative 1 (No Action) and **Preferred Alternative 2** both set the total ACL equal to the ABC, with the difference between the two due to how the ABC has been set and how the non-headboat recreational component of the total ACL would be accounted for moving forward. Therefore, the economic effects of the **Alternative 1 (No Action)** and **Preferred Alternative 2** would be assumed to be similar. ACLs that offer a larger buffer between the ACL and observed

landings allow for higher potential landings, such as those observed from 2015 through 2017, and reduce the likelihood of restrictive AMs being triggered that 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)** and **Preferred Alternative 2** having similar effects. These two alternatives have the lowest potential for negative short-term economic effects, followed by **Alternative 3**, and **Alternative 4** (**Table 4.2.2.1**).

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. 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**. **Alternative 1 (No Action)** is likely to have similar effects as **Preferred Alternative 2**.

Alternative 1 (No Action) is not a viable alternative as explained above. 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 annual landings 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**, and **Preferred Alternative 2**. 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.

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

Note: The revised total annual catch limits in Alternatives 1 (No Action) through 4 reflect Preferred Alternative 2 in Action 1. 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.

Preferred 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

Alternative 1 (No Action) through **Alternative 4** include sector allocations based on the revised total ACL of 24,570,764 lbs ww (based on Preferred Alternative 2 in Action 1, **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. **Alternative 1 (No Action)** would retain the current percentages allocated 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. **Preferred Alternative 3** and **Alternative 4** would result in allocations based on the Council's intent to explore alternatives 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**, 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 being exceeded. 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). The recreational ACL for dolphin would not be reached or exceeded under any of the alternatives in the average 2015-2019 or average 2017-2019 scenarios (**Table 4.3.1.5**). However, the recreational ACL would be reached as early as September 29 under **Alternative 1 (No Action)** and as late as October 11 under **Alternative 2** if the maximum annual landings during 2015-2019 are considered (**Table 4.3.1.5**). Without an effective recreational AM, landings would continue to occur after the ACL had been met and could result in adverse biological effects. Actions 5 and 6 in this amendment include alternatives to revise the trigger for AMs as well as the AM itself.

Alternative 1 (No Action) would continue to allocate 90% of the total ACL to the recreational sector. The resulting allocation (based on Preferred Alternative 2 in Action 1) would be 22,113,688 lbs ww, which is the lowest recreational ACL being considered. **Alternatives 2** through **4** would result in comparatively higher recreational allocations and ACLs. Although none of the recreational ACLs are expected to be constraining based on the average annual landings over the last five years of available data, it is assumed that the recreational sector could fully harvest its ACL, if conditions allowed. Landings of dolphin would potentially be higher under **Alternatives 2** through **4** relative to **Alternative 1 (No Action)**.

Alternative 1 (No Action) would continue to allocate 10% of the total ACL to the commercial sector. The resulting commercial allocation (based on Preferred Alternative 2 in Action 1) would be 2,457,076 lbs ww, which is the highest commercial ACL being considered. **Alternatives 2** through **4** would result in comparatively lower commercial allocations and ACLs. Although none of the commercial ACLs are expected to be constraining based on the average annual landings over the last five years of available data, it is assumed that the commercial sector could fully harvest the ACL if conditions allowed. There would potentially be lower commercial landings of dolphin under **Alternatives 2** through **4** relative to **Alternative 1 (No Action)**.

The alternatives in **Action 3** can be ranked for the recreational sector from a short-term economic perspective with **Alternative 2** having the highest potential economic benefits, followed by **Preferred 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 economic benefits, followed by **Alternative 4**, **Preferred Alternative 3**, and **Alternative 2**. In terms of estimated net economic benefits for the action, the same ranking would apply as stated for the recreational sector.

Sector allocations already exist for the recreational and commercial sectors. **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**, **Preferred 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 due to the decrease in fishing opportunity and concerns about long-term social effects, especially if other actions further decreased harvest opportunities. However, the increase in poundage may result in positive social benefits associated with increased harvest.

Administrative effects would not vary between **Alternative 1 (No Action)** and **Alternatives 2** through **4** for the commercial sector because the commercial ACL would not be reached under

any of the three scenarios considered in the analysis (**Table 4.3.1.5**). For the recreational sector, the recreational ACL would be expected to be reached under the maximum annual landings during 2015-2019 (**Table 4.3.1.5**). **Alternative 4** would result in the recreational ACL being reached earliest compared with **Preferred Alternative 3**, **Alternative 2**, and **Alternative 1 (No Action)** (**Table 4.3.1.5**). Therefore, administrative effects would be greater for **Alternative 4**, followed by **Preferred Alternative 3**, **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 limits in Alternatives 1 (No Action) through 4 reflect Preferred Alternative 2 in Action 2 in Amendment 10. 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.

Preferred 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** include sector allocations based on the revised total ACL of 2,885,303 lbs ww (Preferred Alternative 2 in Action 2, **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. **Alternative 1 (No Action)** would retain the current allocation to the recreational and commercial sectors. **Alternative 2** would allocate percentages based on the total catch between 1994-2007, the time series for catch data used by the SSC when updating the ABC for wahoo. **Preferred 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 being exceeded. The commercial ACL for wahoo would not be reached under **Alternative 1 (No Action)**, **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** for all the scenarios (**Table 4.4.1.5**). The recreational ACL would not be reached

under any alternatives under the average 2017-2019 landings scenario, but it would be reached as early as December 19 and as late as December 24, with **Preferred Alternative 3** reaching the ACL on December 24 under the average 2015-2019 landings scenario (**Table 4.4.1.5**). Under the maximum landings during 2015-2019 scenario, the recreational ACL would be reached as early as September 17 and as late as September 21, with **Preferred Alternative 3** reaching the ACL on September 21 (**Table 4.4.1.5**). Recreational landings for wahoo would continue to occur after the ACL had been met without effective AMs for the recreational sector and could have adverse biological effects. Actions 7 and 8 in this amendment include alternatives to revise the trigger for AMs as well as the AM itself.

Alternative 1 (No Action) would maintain the current recreational allocation of 96.07% of the total ACL. Assuming Preferred Alternative 2 in Action 2, the resulting recreational ACL would be 2,771,911 lbs ww, which is the lowest recreational ACL being considered. **Alternatives 2** through **4** would result in comparatively higher recreational allocations and ACLs. Since all the recreational ACLs are expected to be constraining based on the average annual landings over the last five years of available data, it is anticipated that the additional potential landings of wahoo under **Alternatives 2** through **4** in comparison to **Alternative 1 (No Action)** would be fully harvested by the recreational sector if fishery conditions allow. These additional landings would be expected to comparatively increase total economic benefits for the recreational sector.

Alternative 1 (No Action) would maintain the current commercial allocation of 3.93% of the total ACL. The resulting commercial ACL (based on Preferred Alternative 2 in Action 2) would be 113,392 lbs ww, which is the highest commercial ACL being considered. **Alternatives 2** through **4** would result in comparatively lower commercial allocations and ACLs. Although none of the commercial ACLs are expected to be constraining based on the average annual landings over the last five years of available data (**Table 4.4.1.5**), it is assumed that the commercial sector could fully harvest its ACL if conditions allowed and there would be lower potential landings of wahoo under **Alternatives 2** through **4** relative to **Alternative 1 (No Action)**. These relatively reduced landings would be expected to comparatively decrease economic benefits for the commercial sector.

In general, higher ACLs offer a larger buffer between the sector ACL and observed landings which allows for increased harvest when fishery conditions allow, thereby increasing net economic benefits. Thus, under this notion, the alternatives in **Action 4** can be ranked for the recreational sector from a short-term economic perspective with **Preferred Alternative 3** having the lowest potential for negative economic effects, followed by **Alternative 4**, **Alternative 2**, 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 positive economic effects, followed by **Alternative 2**, **Alternative 4**, and **Preferred Alternative 3**. In terms of estimated net benefits for the action, the same ranking would apply as stated for the recreational sector.

Sector allocations already exist for the recreational and commercial sectors. **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**, **Preferred 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 due to the decrease in fishing opportunity and concerns about long-term social effects, especially if other actions further decreased harvest opportunity. However, the increase in poundage may result in positive social benefits associated with increased harvest.

The commercial sector is not expected to meet its ACL under all three scenarios analyzed for this action (**Table 4.4.1.5**). Therefore, administrative effects for the commercial allocation alternatives would not vary. For the recreational sector, administrative effects would not vary between **Alternative 1 (No Action)** and **Alternatives 2** through **Alternative 4** under the scenario of average landings during 2017-2019 (**Table 4.4.1.5**). However, under the average landings during 2015-2019 and maximum annual landings during 2015-2019 scenarios, administrative effects such as time and costs related to announcing, education, and enforcement would be greater for the alternative reaching the recreational ACL the earliest in the fishing season. As such, administrative effects would be greatest for **Alternative 1 (No Action)**, followed by **Alternative 2**, **Alternative 4**, and **Preferred Alternative 3** (**Table 4.3.1.5**). It is noted that the recreational ACL would be reached as early as September under the maximum annual landings during 2015-2019 scenario, and as late as December under the average landings during 2015-2019 scenario (**Table 4.3.1.5**). Administrative burden depending on 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 **Alternative 1 (No Action)** and **Alternatives 2** through **Alternative 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 mean (*Sub-alternative 2a or 2b*) of landings exceeds the recreational sector annual catch limit. When the recreational sector annual catch limit is changed, use a single year of landings, beginning with the most recent available year of landings, then a two-year average of landings from that single year and the subsequent year, then a three-year average of landings from those two years and the subsequent year, and thereafter a progressive running three-year average to trigger the recreational accountability measure.

Sub-alternative 2a. Use the arithmetic mean to calculate average landings.[4]

Sub-alternative 2b. Use the geometric mean to calculate average landings.[5]

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.

Preferred 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 current recreational AM would never be triggered as there is no stock assessment for dolphin and therefore, stock status

[4] The arithmetic mean is calculated by adding the values of a set of numbers and then dividing the sum by the number of values in the set.

[5] The geometric mean is calculated by multiplying the values of a set of numbers and then taking the n^{th} root of the product, where n is equal to the number of values in the set.

cannot be determined. Therefore, biological benefits would be greater under **Alternatives 2** through **Alternative 6**, which would allow the recreational AM to be triggered, when compared with **Alternative 1 (No Action)**. **Alternative 2** would require the recreational ACL to be constant and the 3-year mean (arithmetic under **Sub-alternative 2a** and geometric under **Sub-alternative 2b**) of landings to exceed the recreational ACL. **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. **Alternative 4** would require recreational landings to exceed the recreational ACL in two of the previous three fishing years or exceed the total ABC in any one year. **Alternatives 2**, **3**, and **4** attempt to smooth out any anomalous years with high or low landings within the past three years. **Preferred 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.

The biological benefits would be expected to be greater under **Alternative 2** through **Alternative 6**, which would enable the recreational AM to be triggered, when compared with **Alternative 1 (No Action)**. Biological effects would depend on the combination of alternative(s) selected in **Action 5** and which post-season AM(s) is (are) selected in **Action 6**. Biological benefits would be greater for the alternative that provides the most timely and realistic trigger for the AM. 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 greater under **Alternative 6**, followed by **Preferred Alternative 5**, **Alternative 4**, **Alternative 3**, and **Alternative 2**.

Alternative 1 (No Action) is not a viable alternative but 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 economic benefits for recreational anglers. In the long-term, if landings increase to the point where the total ACL is exceeded and there is notable 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 if for-hire trips decrease and severely decreased economic benefits 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 as 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. Out of these alternatives, **Alternative 2** would likely have the least likelihood of being triggered, as it uses a three-year mean that would reset when the sector ACL is changed. There is 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. **Sub-alternative 2a** would use an arithmetic mean while **Sub-alternative 2b** would use a geometric mean. Geometric mean provides a lower comparative estimate to arithmetic mean, thus **Sub-alternative 2b** would have a relatively higher threshold if used to trigger the recreational AM, and associated economic effects, compared to **Sub-alternative 2a**. **Alternative 3** likely has similar effects those described for **Alternative 2**. 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 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 slow down landings or prevent the sector or total ACLs from being exceeded, there is the potential that a single year of extremely high recreational landings could influence the three-year summed total (**Alternative 3**), or to a lesser extent the three-year mean (**Alternative 2**), in such a way that AMs would 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.

Alternative 4, **Preferred Alternative 5**, and **Alternative 6** are more stringent than the other alternatives considered in **Action 5**, as they would be triggered from landings exceeding the total or sector ACL in a single year. **Alternative 6** would have the highest probability for the recreational AM to be triggered, 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 ABC would need to be exceeded in a single year or the recreational ACL would need to be exceeded two times in a three-year period. **Preferred Alternative 5** would fall between **Alternatives 6** and **4** in terms of likelihood of being triggered and potential flexibility in allowing some overage of the recreational 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 **Sub-Alternative 2a**, **Sub-alternative 2b**, **Alternative 3**, **Preferred Alternative 5**, **Alternative 4**, and **Alternative 6**.

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. However, dolphin is unassessed and there is not a stock assessment currently planned. As a result, the current AM trigger is not viable and may delay needed management of dolphin. **Sub-alternative 2a** would use the arithmetic mean to calculate average landings over the last three years while **Sub-alternative 2b** uses the geometric mean over the past three years, which could be beneficial if landings in one or more years were artificially estimated to be high or low due to anomalies in harvesting behavior or stock status. Similarly, **Alternative 3** and **Alternative 4** use an extended time frame for triggering the AM, 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.

Preferred Alternative 5 and **Alternative 6** are more conservative triggers, with **Alternative 6** being the most 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.

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **6**, but it is not a viable alternative as explained above. Administrative effects would be greater under **Alternative 2**, followed by **Alternative 3**, **Alternative 4**, **Preferred Alternative 5**, and **Alternative 6**. Administrative burdens include data monitoring, rulemaking, outreach, and enforcement. **Alternative 2** is more complex in that the 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 would start over. **Alternatives 3** through **6** are less complicated, 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.

Preferred 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 by September 1 of each year landings are projected to meet the sector ACL that fishing year, reduce the bag limit to prevent the annual catch limit from being exceeded (*Sub-alternatives 5a through 5e*). If reductions in the bag limit are projected to be insufficient to constrain harvest to the ACL, then also reduce the vessel limit to prevent the annual catch limit from being exceeded (*Sub-alternatives 5f through 5i*). If reductions in the bag limit and vessel limit are not implemented or are projected to be insufficient to constrain harvest to the ACL, then also reduce the length of the recreational fishing season to prevent the annual catch limit from being exceeded.[6] 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.

Bag Limit Sub-Alternatives:

Sub-alternative 5a. Reduce the bag limit by the amount necessary but not below 2 fish per person per day.

Sub-alternative 5b. Reduce the bag limit by the amount necessary but not below 3 fish per person per day.

[6] The intent of this alternative is that NMFS would implement the reduction in bag limit, vessel limit, and/or season length through a single in-season action, but implementation via separate regulations would not be precluded.

Sub-alternative 5c. Reduce the bag limit by the amount necessary but not below 4 fish per person per day.

Sub-alternative 5d. Reduce the bag limit by the amount necessary but not below 5 fish per vessel per day.

Sub-alternative 5e. Do not reduce the bag limit.

Vessel Limit Sub-Alternatives:

Sub-alternative 5f. Reduce the vessel limit by the amount necessary but not below 10 fish per vessel per day.

Sub-alternative 5g. Reduce the vessel limit by the amount necessary but not below 20 fish per vessel per day.

Sub-alternative 5h. Reduce the vessel limit by the amount necessary but not below 30 fish per vessel per day.

Sub-alternative 5i. Do not reduce the vessel limit.

2.6.1 Comparison of Alternatives

Alternative 1 (No Action) is not a viable alternative because the current recreational post-season AM would never be triggered as there is no stock assessment for dolphin and therefore, stock status cannot be determined. **Preferred Alternative 2** would reduce the length of the following recreational fishing season by the amount necessary to prevent the 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 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** through **5e**) and/or the vessel limit would be reduced (**Sub-alternative 5f** through **5i**). If still necessary, the length of the recreational season would be reduced.

Positive biological effects would be greatest under **Preferred Alternative 2**, followed by **Alternatives 4**, **3**, and **5**. Under **Preferred Alternative 2**, the length of the following recreational fishing season would be reduced. This would be the most effective way to ensure recreational landings do not exceed the ACL. **Alternative 3** would reduce the bag limit in the following recreational fishing season; however, as shown in **Section 4.6.1**, most of private recreational and charter vessel trips (MRIP) and all of headboat trips retained 1-5 fish per person. **Alternative 4** would reduce the vessel limit in the following fishing season. Reduction in recreational landings for the private recreational vessels and charter vessels (MRIP) were as high as 12.70% for the entire Atlantic region and nearly zero for east Florida, and South Carolina, Georgia, and east Florida combined (**Section 4.11.1**). Percent reductions between east Florida and South Carolina, Georgia, and east Florida combined are the same because all of the trips in South Carolina and Georgia had less than 30 dolphin on a vessel **Section 4.11.1**). Under **Alternative 5** and its sub-alternatives, the bag and vessel limit reductions may not be enough to reduce the recreational fishing effort when the recreational ACL has already been exceeded (**Section 4.6.1**). By the time the recreational season is shortened, two consecutive years of exceeding the recreational ACL may have occurred.

Alternative 1 (No Action) would implement a payback provision for an overage of the sector ACL that would reduce the sector ACL by the amount of the overage and reduce the fishing season. The economic effects of a reduced fishing season would depend on the severity

of the reduction, the timing, and the availability of other species that could be suitable substitutes for dolphin. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced ACL would result in fewer dolphin harvested, which would result in lower net economic benefits for recreational anglers.

Preferred Alternative 2 also would reduce the fishing season, thus resulting in similar economic effects as those described for **Alternative 1 (No Action)** but to a lesser degree since there is no payback provision for an overage of the sector ACL. A reduced bag limit under **Alternative 3** may reduce the total harvest per angler on trips that meet or exceed the revised bag limit. The individual economic effects of this alternative would be dependent on how many potential fish are removed from the existing bag limit of 10 dolphin per person and the ability of the angler to fully land above the revised bag limit. Consumer surplus on for-hire trips may be less affected than those on private recreational trips since the captain and crew would maintain the ability to retain their bag limit under the existing regulations. In aggregate, the net economic effects would depend on the total harvest reduction that results from the AM being triggered. A reduction in bag limit may also reduce the number of for-hire trips that are taken, thus decreasing net operating revenue for for-hire businesses. The extent to which for-hire trips may be affected will depend on the severity of the bag limit reduction. Based on **Figures 4.6.1.1** through **4.6.1.3** as well as public comments, vessels and anglers fishing in the waters north of South Carolina, particularly those in North Carolina, tend to harvest more dolphin per trip on average, thus reductions in retention limits, such as the bag limit, may incur more severe negative economic effects regionally for vessels in North Carolina and states further north than those in South Carolina, Georgia, or Florida.

The economic effects of a reduced vessel limit in **Alternative 4** would be similar to those described for **Alternative 3** but potentially to a lesser degree, particularly on trips with few anglers onboard. **Alternative 5** would produce similar economic effects to those described in **Alternative 3** and **4**, depending on the sub-alternative that is chosen. Since this alternative would delay and potentially prevent restrictive measures from going into place until there is an indication that the sector ACL would be met or exceeded, this is likely the least restrictive alternative and thus would have the lowest potential negative economic effects that would arise from reduced economic benefits for recreational anglers or reduced net operating revenue for for-hire businesses in the short-term. In terms of potential short-term negative economic effects to the recreational sector, **Alternative 5** would have the lowest potential negative economic effects, followed by **Alternative 4**, **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**.

Alternative 1 (No Action) would require payback by the amount of the previous season's 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. As such, **Alternative 1 (No Action)** will never be implemented and would not result in lost fishing opportunities resulting from payback of a previous season's overage. 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 (**Preferred Alternative 2**, and **Alternative 5**) is anticipated to result in direct negative social effects associated with loss of

access to the resource. **Alternative 5** includes 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.

The social effects of reducing the bag limit (**Alternative 3**) or the vessel limit (**Alternative 4**) 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 would 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. The positive and negative social effects would depend on the likelihood of harvest being open during times of the year when it is easy to access and/or profitable to target dolphin. The timing and importance of different species can vary considerably by state and locations where dolphin is an important species are more likely to experience the direct social effects of reducing the bag or vessel limits. The communities of Mayport, Florida; Hatteras and Wanchese, North Carolina, demonstrate comparatively high landings of dolphin and a reliance upon recreational fishing (**Section 3.2.2**). **Alternative 5** would provide similar social effects as the alternatives described above as it includes bag limit and vessel limit reductions and the option of season length adjustments as needed. The extent to which higher bag limits and long seasons are balanced and the associated social effects would depend on the **Alternative 5** sub-alternative chosen.

Alternative 1 (No Action) would be the least burdensome compared to **Preferred Alternative 2** through **Alternative 5**, but it is not a viable alternative as explained above. Administrative burdens such as data monitoring, rulemaking, outreach, and enforcement would be similar for **Preferred Alternative 2**, **Alternatives 3**, and **4**, because they would involve different post-season AMs (reduced season length, bag limit, and vessel limit, respectively). Administrative effects would be most burdensome under **Alternative 5** because it is complicated and would result in additional time and costs.

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 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.

Preferred Alternative 2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year mean (*Sub-alternative 2a or 2b*) of landings exceeds the recreational sector annual catch limit. When the recreational sector annual catch limit is changed, use a single year of landings, beginning with the most recent available year of landings, then a two-year average of landings from that single year and the subsequent year, then a three-year average of landings from those two years and the subsequent year, and thereafter a progressive running three-year average to trigger the recreational accountability measure.

Sub-alternative 2a. Use the arithmetic mean to calculate average landings.[7]

Preferred Sub-alternative 2b. Use the geometric mean to calculate average landings.[8]

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 current recreational AM would never be triggered as there is no stock assessment for wahoo and therefore, stock status

[7] The arithmetic mean is calculated by adding the values of a set of numbers and then dividing the sum by the number of values in the set.

[8] The geometric mean is calculated by multiplying the values of a set of numbers and then taking the n^{th} root of the product, where n is equal to the number of values in the set.

cannot be determined. **Preferred Alternative 2** through **Alternative 6** would allow the recreational AM to be triggered, when compared with **Alternative 1 (No Action)**. **Preferred Alternative 2** would require the recreational ACL to be constant and the 3-year mean (arithmetic under **Sub-alternative 2a** and geometric under **Preferred Sub-alternative 2b**) of landings to exceed the recreational ACL. **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. **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. **Preferred Alternative 2**, **Alternatives 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 greater for the alternative that is most timely and realistic in triggering the AM. Corrective measures would only occur the following year or years after the recreational ACL is exceeded. Therefore, among the alternatives in **Action 7**, biological effects would be greatest under **Alternatives 6** and **5**, followed by **Alternative 4**, **Alternative 3**, and **Preferred Alternative 2 (Sub-alternative 2a** and **Preferred Sub-alternative 2b)**.

Alternative 1 (No Action) is not a viable alternative but would lead to short-term economic benefits through potential elevated harvest and fishing activity for wahoo, which could result in increased revenue to for-hire vessels and economic benefits for recreational anglers. In the long-term, if landings increase to the point where the total ACL is exceeded and there is notable 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 if for-hire trips decrease and severely decreased economic benefits 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.

Preferred Alternative 2 through **Alternative 6** would implement triggers for the recreational AM that could reasonably be expected to occur since reference to an "overfished" condition would be removed. Out of these alternatives, **Preferred Alternative 2** would be the least likely to be triggered, as it uses a three-year mean that would reset when the sector ACL is changed. There is 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. **Sub-alternative 2a** would use an arithmetic mean while **Preferred Sub-alternative 2b** would use a geometric mean. A geometric mean provides a lower comparative estimate to arithmetic mean, thus **Preferred Sub-alternative 2b** would have a relatively higher threshold if used to trigger the recreational AM, and associated economic effects, compared to **Sub-alternative 2a**. **Alternative 3** likely has similar effects to those described for **Preferred Alternative 2**. Both **Preferred 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 harvest of wahoo to potentially continue to operate 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 to prevent the sector ACL or total ACL from being exceeded, there is the potential that a single year of extremely high recreational landings could influence the three-year summed total (**Alternative 3**), or to a lesser extent, the three-year geometric mean (**Preferred Alternative 2**) 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.

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 or sector ACL in a single year. **Alternative 6** would have the highest probability 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 ABC would need to be exceeded 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 triggered so long as the recreational 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 **Alternatives 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 **Sub-alternative 2a**, **Preferred Sub-alternative 2b**, **Alternative 3**, **Alternative 5**, **Alternative 4**, and **Alternative 6**.

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 landings. **Preferred Alternative 2** proposes using the arithmetic mean to calculate average landings over the past three years (**Sub-alternative 2a**) or the geometric mean over the past three years (**Preferred Sub-alternative 2b**), which could be beneficial from a social perspective if landings in one or more years were artificially estimated to be high or low due to anomalies in harvesting behavior or stock status. Similarly, **Alternative 3** and **Alternative 4** use an extended time frame, 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 most 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.

Alternative 1 (No Action) would be the least burdensome compared to **Preferred Alternative 2** through **Alternative 6**, but it is not a viable alternative as explained above. Administrative effects would be greater under **Preferred Alternative 2** (including **Sub-alternative 2a** and **Preferred Sub-alternative 2b**), followed by **Alternative 3**, **Alternative 4**, **Alternative 5**, and **Alternative 6**. Administrative burdens include data monitoring, rulemaking, outreach, enforcement, time, and associated costs. Under **Preferred Alternative 2** and

Preferred Sub-alternative 2b the 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 would start over. **Alternatives 3** through **6** are less complicated 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 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.

Preferred 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.

2.8.1 Comparison of Alternatives

Alternative 1 (No Action) is not a viable alternative because the current recreational post-season AM would never be triggered as there is no stock assessment for wahoo and therefore, stock status cannot be determined. **Preferred 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.

Preferred Alternative 2 through **Alternative 4** would 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 there are no in-season AMs currently in place, 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 **Preferred Alternative 2**, followed by **Alternative 4**, and **Alternative 3**.

Alternative 1 (No Action) would implement a payback provision for an overage of the sector ACL that would reduce the sector ACL by the amount of the overage and reduce the fishing season only if wahoo is overfished and the total ACL is exceeded. The economic effects of a reduced fishing season would depend on the severity of the reduction, the timing, and the availability of other species that could be suitable substitutes for wahoo. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced ACL would result in fewer wahoo harvested, which would result in lower net economic benefits for recreational anglers.

Preferred Alternative 2 would reduce the fishing season. The economic effects of a reduced fishing season would depend on the severity of the reduction, the timing, and the availability of other species that could be suitable substitutes for wahoo. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced fishing season would result in fewer wahoo harvested, which would result in lower net economic benefits for recreational anglers. A reduced bag limit under **Alternative 3** may reduce the total harvest per angler on trips that meet or exceed the revised bag limit. The individual economic effects of this alternative would be dependent on the ability of the angler to fully land above the revised bag limit. Consumer surplus on for-hire trips may be less affected than those on private recreational trips since the captain and crew would maintain the ability to retain their bag limit under the existing regulations. In aggregate, the net economic effects would depend on the total harvest reduction that results from the AM being triggered. A reduction in bag limit may also reduce the number of for-hire trips that are taken, thus decreasing net operating revenue for for-hire businesses. The economic effects of a vessel limit in **Alternative 4** would be similar to those described for **Alternative 3** but potentially to a lesser degree, particularly on trips with few anglers onboard. In terms of potential short-term negative economic effects to the recreational sector, **Alternative 4** would have the lowest potential negative economic effects, followed by **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**.

Alternative 1 (No Action) would require payback by the amount of the previous season's 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)** includes close monitoring of the landings 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 (**Preferred Alternative 2**) is 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**) or the vessel limit (**Alternative 4**) 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 would 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.

Alternative 1 (No Action) would be the least burdensome compared to **Preferred Alternative 2** through **Alternative 4**, but it is not a viable alternative as explained above. Administrative burdens such as data monitoring, rulemaking, outreach, and enforcement would be similar for **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4**, because they would involve different post-season AMs (reduced season length, bag limit, and vessel limit, respectively).

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.

Preferred 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

Preferred Sub-alternative 2b. 500 pounds gutted weight

Sub-alternative 2c. 750 pounds gutted weight

Sub-alternative 2d. 1,000 pounds gutted weight

Preferred 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**). **Preferred Alternative 2** and its **Sub-alternatives 2a** through **2d** would allow various trip limits (250 lbs ww – 1,000 lbs ww) of dolphin, and **Preferred Alternative 3** would allow a trip limit of 500 lbs ww of wahoo to be retained with the above-mentioned gear on board. There is an incidental limit in place of 200 lbs 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 lbs ww of dolphin and three vessels harvested an average of 59 lbs ww of wahoo during 2015-2019 (**Tables 3.3.1.12** and **3.3.1.13**). **Preferred Alternative 2** (including **Sub-alternatives 2a** through **2d**) and **Preferred Alternative 3** would allow for an increase in landings of dolphin and wahoo, respectively. The biological benefits to dolphin and wahoo would be greatest for the alternatives that allow for the least amount of harvest. However, given that the sector ACLs for dolphin and wahoo would be increased in **Actions 3** and **4**, and the current AM would continue to close the commercial sector if the commercial ACL is reached or projected to be reached, an increase in the trip limit would not be expected to have a negative biological effect on dolphin or wahoo. The biological effects between **Alternative 1 (No Action)**, **Preferred Alternative 2** (including **Sub-alternative 2a** and **Preferred Sub-alternative 2b**), and **Preferred Alternative 3** would be expected to be similar as the trip limits are similar among the alternatives. Higher trip limits considered under **Sub-alternative 2c** (750 lbs ww) and **Sub-alternative 2d** (1,000 lbs ww) could provide an incentive for the current incidental harvest of dolphin to convert to a targeted harvest with more vessels involved and thus have fewer biological benefits than the Council's preferred alternatives. These alternatives could result in a shorter commercial season for dolphin due to an in-season closure and result in regulatory discards. Due to the increase in ACLs proposed for dolphin and wahoo, no changes in bycatch or discards would be expected from this action.

Alternative 1 (No Action) would continue to disallow landings of dolphin or wahoo on trips with trap, pot, or buoy gear on board. This alternative would result in decreased economic benefits for affected commercial vessels through foregone landings of dolphin or wahoo and thus revenue when trap, pot, or buoy gear was on board the vessel. **Preferred Alternative 2** would result in net economic benefits by allowing long-term potential elevated revenue on some commercial trips where trap, pot, and buoy gear that are unauthorized for use in the dolphin and wahoo fishery are on board and dolphin or wahoo landed by rod and reel gear are retained. Higher trip limits would allow for elevated net economic benefits, therefore **Sub-alternative 2d** would have the potential for the highest economic benefits followed by **Sub-alternative 2c**, **2b (Preferred)**, and **2a**. **Preferred Alternative 3** would result in net economic benefits by allowing long-term elevated revenue on some commercial trips where trap, pot, and buoy gear that are unauthorized for use in the dolphin and wahoo fishery are onboard and wahoo landed by rod and reel gear are retained. Economic benefits for commercial vessels would be highest under **Sub-alternative 2d**, followed by **Sub-alternative 2c**, **Preferred Sub-alternative 2b**, **Sub-alternative 2a**, **Preferred Alternative 3**, and **Alternative 1 (No Action)**. In general, dealers are indirectly affected whenever gross revenues to commercial fishing vessels are expected to change (e.g., increases in gross revenues are expected to indirectly benefit dealers and vice versa). Thus, the ranking of economic benefits to dealers would be the same as for commercial fishing vessels.

Allowing harvest of dolphin (**Preferred Alternative 2**) and wahoo (**Preferred Alternative 3**) by rod and reel by vessels with the necessary Atlantic Dolphin/Wahoo Commercial Permit and valid commercial permits required to harvest via fish trap, pot, or buoy gear 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 may not possess 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 fish available to the market or for personal consumption. Under **Preferred Alternative 2** the greater the trip limit for dolphin, the greater opportunity for social benefit (**Sub-alternative 2d**, **Sub-alternative 2c**, **Preferred Sub-alternative 2b**, and **Sub-alternative 2a**). 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 for fishing communities.

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

Preferred 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.

Preferred 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

The intent of including operator cards in the original Dolphin and 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. Because the operator cards are no longer useful and needed, **Preferred 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 and wahoo would be expected under **Preferred Alternatives 2** and **3**, when compared with **Alternative 1 (No Action)**, because this action does not impact the harvest levels for dolphin and wahoo in any manner.

Alternative 1 (No Action) would maintain the operator card requirement for for-hire and commercial participants in the dolphin and wahoo fishery. This requirement results in direct costs to fishery participants through application fees and associated preparation costs incurred including obtaining two passport photos, postage, time to prepared and send the application materials once every three years. Removing the operator card requirement would result in direct economic benefits to captain and crew members that operate for-hire and commercial vessels permitted to fish in the dolphin and wahoo fishery through forgone costs. Removal of these costs would apply to captains or crew members that operate for-hire vessels under **Preferred Alternative 2** and commercial vessels under **Preferred Alternative 3**. In terms of estimated economic benefits, **Preferred Alternative 3** would have the highest estimated economic benefits followed by **Preferred Alternative 2** and **Alternative 1 (No Action)**.

Alternative 1 (No Action) and **Preferred 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 and are burdensome to renew annually. Additionally, law enforcement officials have indicated that operator cards are no longer regularly used to aid in enforcement efforts or gathering data and distributed information. **Preferred 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

Preferred 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.

Administrative effects and burdens related to data collection/monitoring, permitting, law enforcement, etc. would be lower under **Preferred 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. **Preferred 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. This would reduce the current administrative burden/cost on NMFS and free up staff resources to be used for other purposes.

2.11 Action 11. Reduce the recreational vessel limit for dolphin

Note: Alternative 1 (No Action), Alternative 2 and Alternative 3 (including their respective sub-alternatives) do not apply to headboats. The current limit of 10 dolphin per paying passenger onboard a headboat will not change under this action and its alternatives.

Alternative 1 (No Action). The recreational daily bag limit is 10 dolphin per person, not to exceed 60 dolphin per vessel, whichever is less.

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

Sub-alternative 2a. 30 dolphin per vessel, whichever is less.
Sub-alternative 2b. 40 dolphin per vessel, whichever is less.
Sub-alternative 2c. 42 dolphin per vessel, whichever is less.
Sub-alternative 2d. 48 dolphin per vessel, whichever is less.
Preferred Sub-alternative 2e. 54 dolphin per vessel, whichever is less.

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

Sub-alternative 3a. 30 dolphin per vessel, whichever is less.
Sub-alternative 3b. 40 dolphin per vessel, whichever is less.
Sub-alternative 3c. 42 dolphin per vessel, whichever is less.
Sub-alternative 3d. 48 dolphin per vessel, whichever is less.
Sub-alternative 3e. 54 dolphin per vessel, whichever is less.

Alternative 4. In South Carolina, Georgia, and Florida only, the recreational daily bag limit is 10 dolphin per person, not to exceed:

Sub-alternative 4a. 30 dolphin per vessel, whichever is less.
Sub-alternative 4b. 40 dolphin per vessel, whichever is less.
Sub-alternative 4c. 42 dolphin per vessel, whichever is less.
Sub-alternative 4d. 48 dolphin per vessel, whichever is less.
Sub-alternative 4e. 54 dolphin per vessel, whichever is less.

2.11.1 Comparison of Alternatives

Preferred Alternative 2 would reduce the recreational vessel limit for dolphin throughout the jurisdiction in the Atlantic, **Alternative 3** would reduce the recreational vessel limit off Florida, and **Alternative 4** would reduce the recreational vessel limit off South Carolina, Georgia, and Florida. Biological benefits would be expected to be greater under **Preferre**d **Alternative 2**, **Alternatives 3** and **4** (including their respective sub-alternatives) compared with **Alternative 1 (No Action)**, because they consider a reduction in the amount of dolphin that can be retained per trip. Biological benefits would be greater under **Sub-alternative 2a** when compared with **Sub-alternatives 2b**, **2c**, **2d** and **Preferred Sub-alternative 2e**, because only 30 dolphin would be allowed per vessel resulting in a higher reduction in landings under **Sub-alternative 2a** from private recreational and charter vessels **Sub-alternatives 2b**, **2c**, **2d**, and **Preferred Sub-alternative 2e** (**Section 4.11.1**). Under **Alternatives 3** and **4**, off East Florida only and off South Carolina, Georgia, and east Florida, respectively, almost all MRIP and headboat recreational trips harvested less than 10 dolphin per vessel (**Section 4.11.1**). Under

both **Alternatives 3** and **4** (including their respective sub-alternatives), biological effects would be minor and not notably vary between each other, because negligible reductions in recreational landings from private recreational and charter vessels are expected (**Section 4.6.1**). Headboat landings are not expected to be influenced by any reduction under **Alternatives 2, 3,** and **4** (including their respective sub-alternatives) since the existing exemption of headboats from vessel limits would remain. **Preferred Sub-alternative 4e** would reduce the vessel limit from 60 dolphin per vessel to 54 dolphin per vessel and is expected to result in a reduction of 0.69% (114,051 lbs ww) (**Section 4.11.1**). Biological benefits are expected to be greatest under **Sub-alternative 2a**, followed by **Sub-alternatives 2b**, **2c**, **2d, Preferred Sub-alternative 2e**, **Sub-alternatives 3a/4a**, **3b/4b**, **3c/4c**, **3d/4d**, and **3e/4e**, and **Alternative 1 (No Action)**.

The sub-alternatives of **Alternatives 2 (Preferred)**, **3**, and **4** are expected to lower total landings in the short-term, thus economic benefits for the recreational sector are expected to decrease relative to **Alternative 1 (No Action)**. In terms of short-term negative economic effects, the potential reductions in economic benefits would be highest under **Sub-alternative 2a**, followed by **Sub-alternative 2b**, **Sub-alternative 2c**, **Sub-alternative 2d**, **Preferred Sub-alternative 2e, Sub-alternatives 3a**, **3b**, **4a**, and **4b**, **Sub-alternatives 3c** and **4c**, **Sub-alternatives 3d** and **4d**, **Sub-alternatives 3e** and **4e,** and **Alternative 1 (No Action)**.

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 **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** 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. **Alternative 3** and **Alternative 4** are unlikely to result in decreased trip satisfaction as recreational data indicates that majority of private recreational and for-hire/charter trips do not land more than 40 fish per trip. However, **Preferred Alternative 2** may have negative social effects on recreational fishing opportunities in North Carolina as data and public comment indicate that catches from the area regularly exceed 30-fish per vessel. **Sub-alternative 2a** proposes the lowest vessel limit and thus would result in the largest negative short-term social effects followed by **Sub-alternative 2b**, **Sub-alternative 2c**, **Sub-alternative 2d**, and **Preferred Sub-alternative 2e**. Should recreational harvest increase beyond current estimates, **Alternative 2**, **Alternative 3** and **Alternative 4** would help slow harvest and extend the fishing season. **Preferred Alternative 2** and its sub-alternatives would likely slow harvest more than **Alternative 3** and **Alternative 4** and their sub-alternatives which would only restrict harvest along the east coast of Florida and Florida, Georgia, and South Carolina, respectively.

Administrative effects would not vary much between **Alternative 1 (No Action)** and **Preferred Alternative 2, Alternatives 3** and **4** (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.

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.[9] 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)).[10] EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum.*[11]

3.1.2 Habitat Areas of Particular Concern

EFH-habitat of particular concern (HAPC) 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

[9] Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) and incorporated here by reference https://safmc.net/download/Volume-II-Habitats-and-SpeciesApril09Final.pdf.

[10] This EFH definition for dolphin was approved by the Secretary of Commerce on June 3, 1999, as a part of the SAFMC Comprehensive Habitat Amendment (SAFMC 1998), the Fishery Management Plan for Dolphin and Wahoo (2003) and Amendment 2 in Comprehensive Ecosystem Based Amendment 1 (SAFMC 2009) for dolphin and wahoo and presented in the EFH User Guide https://safmc.net/download/SAFMCEFHUsersGuideNov20.pdf .

[11] Note: This EFH-HAPC definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the SAFMC Comprehensive Habitat Amendment (SAFMC 1998)(dolphin was included within the Coastal Migratory Pelagics FMP), the Fishery Management Plan for Dolphin and Wahoo (2003) and Amendment 2 in Comprehensive Ecosystem Based Amendment 1 (SAFMC 2009) for dolphin and wahoo and presented in the EFH User Guide https://safmc.net/download/SAFMCEFHUsersGuideNov20.pdf .

Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*.[12]

Areas that meet the criteria for EFH-HAPCs include habitats required during each life stage (including egg, larval, post larval, juvenile, and adult stages). In addition to protecting habitat from fishing related degradation though fishery management plan regulations, the Council, in cooperation with National Marine Fisheries Service (NMFS), actively comments on non-fishing projects or policies that may impact EFH. With guidance from the Habitat Advisory Panel, the 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 H** 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 3.2.2.1**). Each component is described in detail in Chapter 3 of Amendment 5 to the Dolphin and Wahoo FMP (SAFMC 2013b).

[12] Note: This EFH-HAPC definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the SAFMC Comprehensive Habitat Amendment (SAFMC 1998) (dolphin was included within the Coastal Migratory Pelagics FMP), the Fishery Management Plan for Dolphin and Wahoo (2003) and Amendment 2 in Comprehensive Ecosystem Based Amendment 1 (SAFMC 2009) for dolphin and wahoo and presented in the EFH User Guide https://safmc.net/download/SAFMCEFHUsersGuideNov20.pdf .

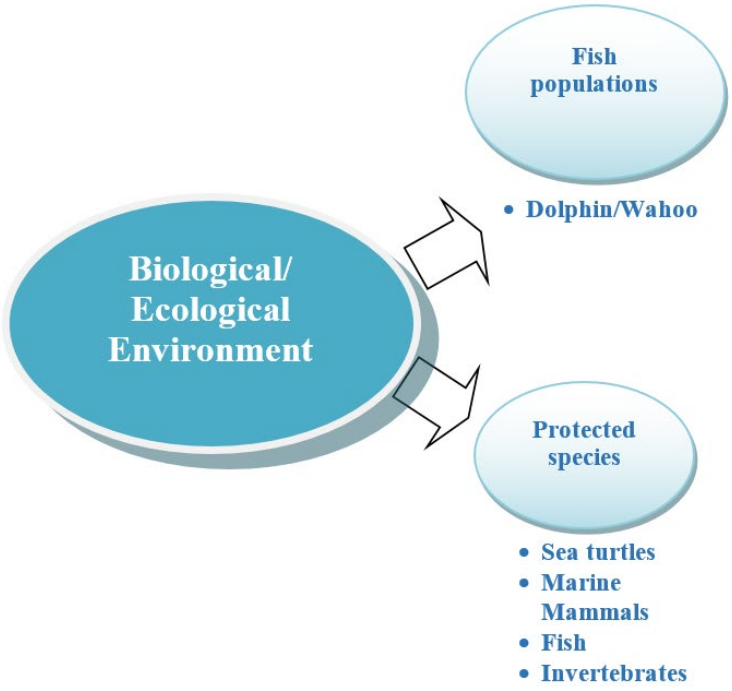

Figure 3.2.1.1. Two components of the biological environment described in this document.

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 and Wahoo FMP (SAFMC 2003).[13]

[13] 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 (Johnson 1978; Palko et al. 1982).

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 three 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 per year.

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)

3.2.3 Wahoo, *Acanthocybium solanderi*

In the western Atlantic, the highly migratory, pelagic wahoo are found from New York through Colombia including Bermuda, the Bahamas, the Gulf of Mexico, and the Caribbean (Collette 2002; Garber et al. 2005; Theisen et al. 2008). 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).

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.

Wahoo Life History
An Overview

- Worldwide distribution; In the western Atlantic wahoo are found from New York through Colombia (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)

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 overfishing and overfished status of wahoo is unknown.[14] 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

[14] (https://media.fisheries.noaa.gov/2021-04/FSSI%20and%20non%20FSSI%20Stock%20Status%20Tables%20Q1%202021.pdf?null).

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 (Oxenford 1999; Prager 2000; McBride et al. 2008; Schwenke and Buckel 2008). 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 (DPS) 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*	T
	Green sea turtle, North Atlantic	*Chelonia mydas*	T
	Green sea turtle, South 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
	Olive ridley sea turtle	*Lepidochelys olivacea*	T
Fish	Atlantic sturgeon, South Atlantic DPS	*Acipenser oxyrinchus*	E
	Atlantic sturgeon, Carolina DPS	*Acipenser oxyrinchus*	E
	Atlantic sturgeon, Chesapeake Bay DPS	*Acipenser oxyrinchus*	E
	Atlantic sturgeon, New York Bight DPS	*Acipenser oxyrinchus*	E
	Atlantic sturgeon, Gulf of Maine DPS	*Acipenser oxyrinchus*	T

Species		Scientific Name	Status
	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, U.S. DPS	*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		

Species descriptions and distributions of species in Table 3.2.5.1 above are available in the Biological Opinions (BiOp) for the Pelagic Longline Fishery for Atlantic Highly Migratory Species (HMS) (PLL BiOp; NMFS 2020b) and the operation of the HMS fisheries (excluding pelagic longline) under the Consolidated Atlantic HMS Fishery Management Plan (Non-PLL BiOp; NMFS 2020a), and are hereby incorporated by reference. Of these species and DPSs, the sea turtles, giant manta ray, Central and Southwest Atlantic DPS scalloped hammerhead shark, and oceanic whitetip shark may be adversely affected by the proposed action through incidental capture in dolphin and wahoo fishing gear. Sea turtle and giant manta rays may also be adversely affected if struck by a vessel in the fishery transiting to or from fishing grounds. All of the other listed species and critical habitat in Table 3.2.5.1 are not likely to be adversely affected because of little overlap with where dolphin and wahoo fishing actually occurs.

The recreational sector for dolphin and wahoo is responsible for majority of the total landings in the Atlantic (Table 4.1.1.2) and uses non-longline hook-and-line gear. Commercial harvest of dolphin and wahoo in the Atlantic using pelagic longline gear does occur, but there are only a few vessels with only ADW permits (**Table 3.2.5.2**). Vessels have to abide by conservation measures to protect listed species (50 C.F.R. § 622.273) and areas closed to longline fishing (50 C.F.R. § 622.274). While commercial harvest of dolphin using longline gear is higher than non-longline gear (Tables 3.3.1.8 and 3.3.1.9), wahoo is mostly harvested using non-longline gear (Tables 3.3.1.10 and 3.3.1.11).

Table 3.2.5.2. Number of vessels with dolphin landings using longline gear and their permit type during 2015-2019. ADW = Atlantic dolphin wahoo permit.

Year	Vessels with ADW+HMS Permits and landings	Vessels with ADW Permits and landings	Vessels with HMS Permits and landings	Total PLL Vessels Landing Dolphin
2015	59	9	3	71
*2016				
2017	51	7	4	62
*2018				
2019	41	4	5	50

*Data for 2016 and 2018 are confidential.
Source: SEFSC.

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 ADW permits.

Table 3.3.1.1. Number of valid ADW 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

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
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
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: 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 0.8% of these vessels' total revenue on an annual basis. The maximum annual gross revenue earned by a single Atlantic wahoo 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

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
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
		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 permit 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

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
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 is 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
		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 3.3.1.0.7. 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

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
		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

Year	Number of Vessels	Statistic	Dolphin Landings (ww)	Dolphin Revenue	Wahoo Revenue	Other Revenue	Total Revenue
		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 3.3.1.0.9. 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
		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 gear 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 0.4% 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
		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

Year	Number of Vessels	Statistic	Wahoo Landings (ww)	Wahoo Revenue	Dolphin Revenue	Other Revenue	Total Revenue
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 gear were on board or used for harvest.

The commercial landings data for dolphin and wahoo from 2015-2019 indicate that gear types 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 gear types 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 gear types 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 gear types or with these gear types on board across all years from 2015-2019, while only three vessels harvested wahoo with these gear types or with these gear types 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 those data are 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 and wahoo fishery.[15] 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 non-longline component of the commercial sector in the dolphin and 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.

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 dolphin wahoo 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 dolphin wahoo 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.

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

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%	
Trips				
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 using gear other than longlines 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 0.5%, respectively, while the economic return on asset value was approximately 0.6% 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%	
Vessels				
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.[16] 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 and 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

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

	2014	2015	2016	2017	Average
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 2015-2016. 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 0.9% of their total seafood purchases on average from 2015-2019.

Information on the purchasing activities of dealers that bought Atlantic wahoo landings from vessels from 2015 through 2019 can be found in **Table 3.3.1.18**. 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.

In addition, federally permitted dealers' ability to change which species they purchase is greater than commercial vessels' ability to change which species they harvest. Unlike commercial vessel permits, dealer permits do not restrict which species dealers can purchase. NMFS does not have estimates of the dealer selling prices for dolphin, wahoo, and other species these dealers buy and sell, and thus also does not have estimates of net cash flow or net revenue from operations for dolphin wahoo dealers comparable to those in the commercial harvesting sector. Thus, while it is possible that the harvest of dolphin and wahoo generates some PS and profit for these dealers, NMFS does not possess the data to estimate PS and profit and, because they are not dependent on purchases of dolphin and wahoo and their ability to switch to purchasing other species, changes to those values as a result of the management measures considered in this amendment are likely to be very small. Similarly, any additional PS and profit generated from dolphin wahoo sales further up the distribution chain to wholesalers/distributors, grocers, and restaurants is likely minimal given the vast number of seafood and other products they handle and their even greater ability to shift to purchasing other products.

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,[17] dolphin are not exported from the U.S. 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 pound (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 lb 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

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

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 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)[18] 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 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.

[18] 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 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 example, 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 component 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 example, 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-August) followed by the 3rd wave (May-June). Target effort by charter vessels was the highest in the 3rd wave. 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 the 1st wave (January-February) and the 6th wave (November-December) 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

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)	Total
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

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)	Total
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-August), with effort being considerably lower in all other waves. Target effort for wahoo was the lowest in the 6th wave (November-December) while catch effort was lowest in the 1st wave (January-February).

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

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)	Total
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 considerably in 2017 (about 36%) and remained at a much lower level through 2019. Headboat effort in North Carolina also declined considerably (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 Atlantic dolphin and wahoo permits (CDW) are open access permits (i.e., access is not restricted). From 2015-2019, the number of CDW 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 CDW permits.

Although the 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 CDW 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 of Mexico and South Atlantic) for-hire vessels determined to be headboats were not actively fishing in 2017.[19] 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 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

[19] 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.

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[20] on an angler trip is approximately $16.07 (2019$), and 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 and 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). Carter (2018) recently estimated that average annual gross revenue for South Atlantic headboats was 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) estimates 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 in the South Atlantic. According to S. Steinback (pers. comm., May 11, 2015), average annual gross revenue for headboats and charter vessels in the Northeast Region are $239,880 and $31,059 in 2019$, respectively.

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 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

[20] 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.

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 dolphin wahoo 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[21]. 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.

[21] A detailed description of the input/output model is provided in Lovell, S., S. Steinback, and J. Hilger (2013).

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

	NC	SC	GA	FL
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

	NY	NJ	DE	MD	VA
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

	ME	NH	MA	RI	CT
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

	NC	SC	GA	FL
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

	NY	NJ	DE	MD	VA
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 and wahoo fishery that follow include these quantitative measures in addition to qualitative information about the communities.

Dolphin and Wahoo Fishery

A description of the social environment of the dolphin and wahoo fishery is contained in Amendment 5 to the Dolphin and Wahoo FMP (SAFMC 2013b) 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 2013b) 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 2013b) 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 Atlantic 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.

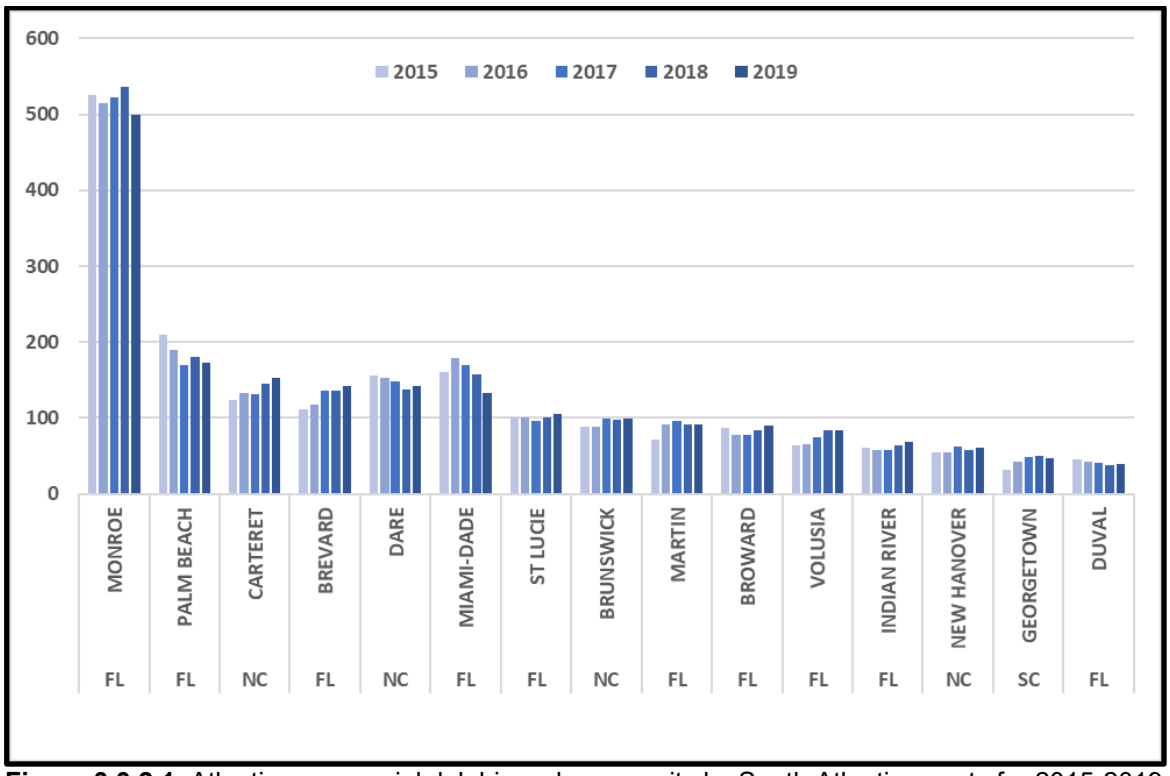

Figure 3.3.2.1. Atlantic commercial dolphin wahoo permits by South Atlantic county for 2015-2019. (Source: SERO Permits database 2020)

Atlantic 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.

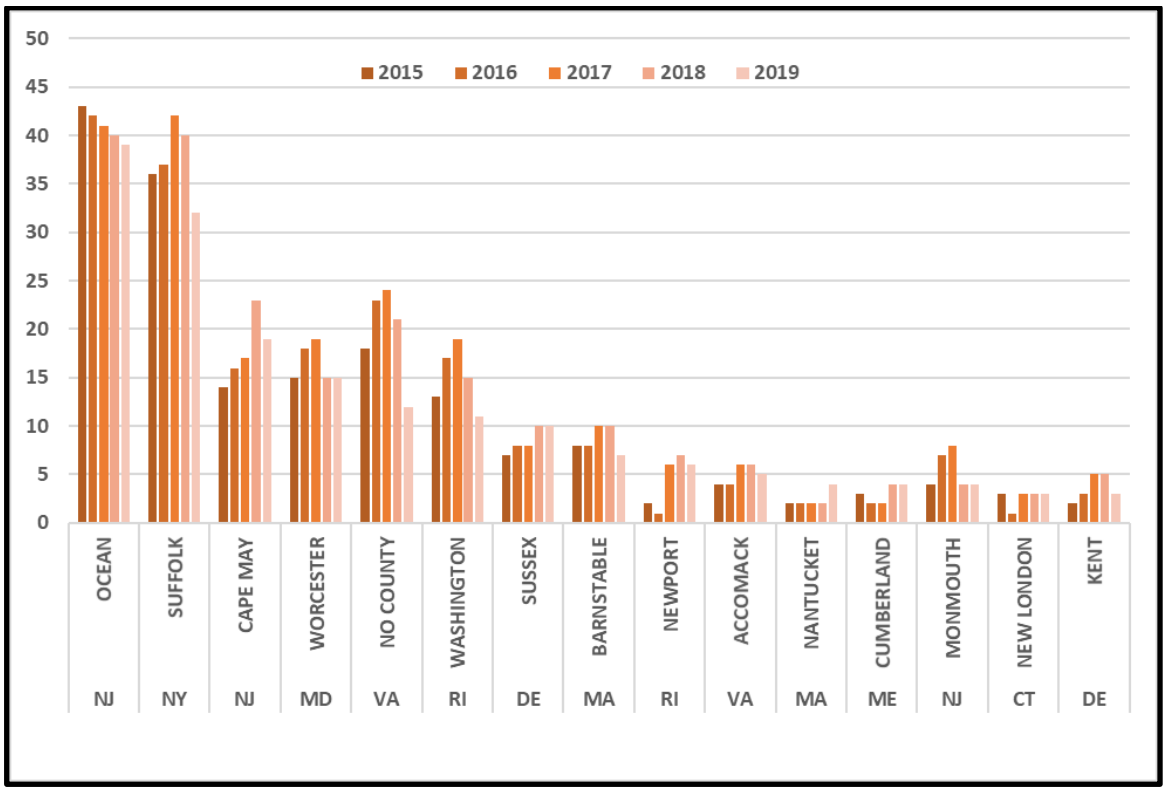

Figure 3.3.2.2. Atlantic commercial dolphin wahoo permits by Northeast county for 2015-2019. (Source: SERO Permits database 2020).

Figure 3.2.1. 1

Monroe County, Florida has far more Atlantic 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.

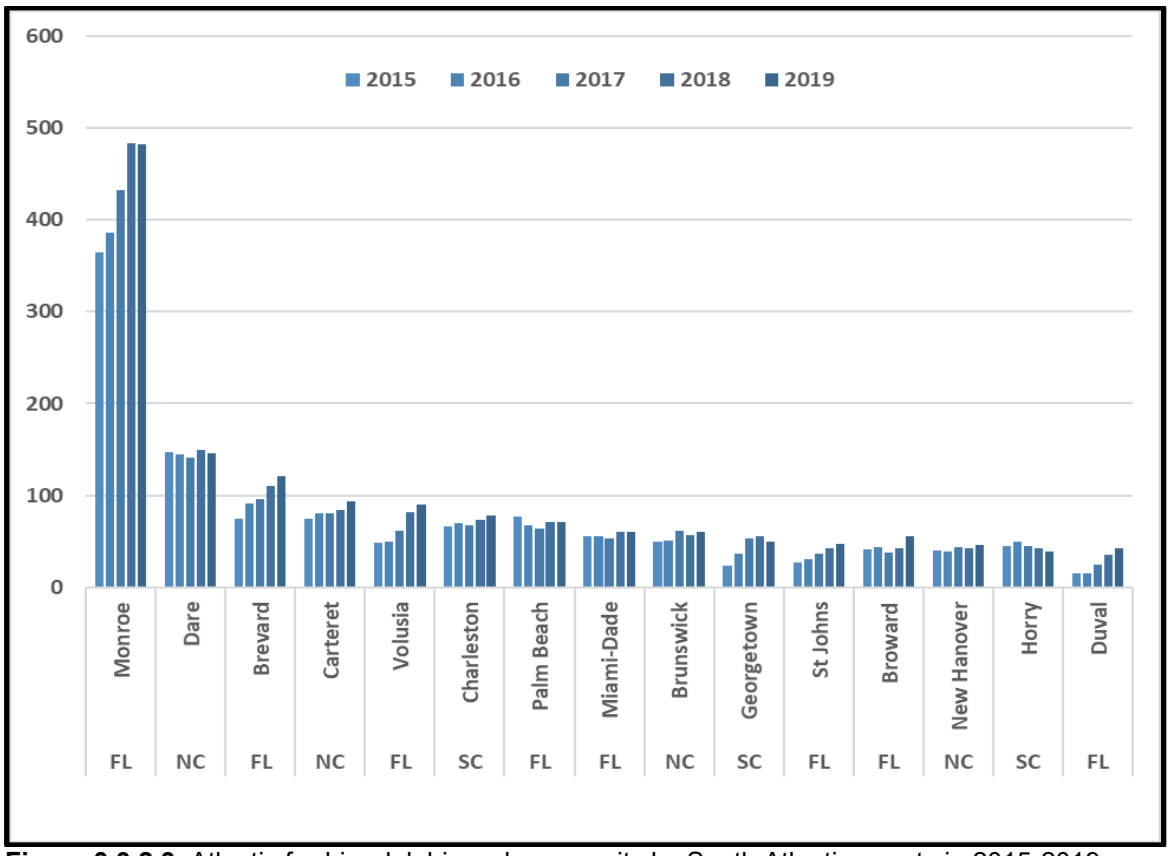

Figure 3.3.2.3. Atlantic for-hire dolphin wahoo permits by South Atlantic county in 2015-2019. (Source: SERO Permits database 2020).

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.

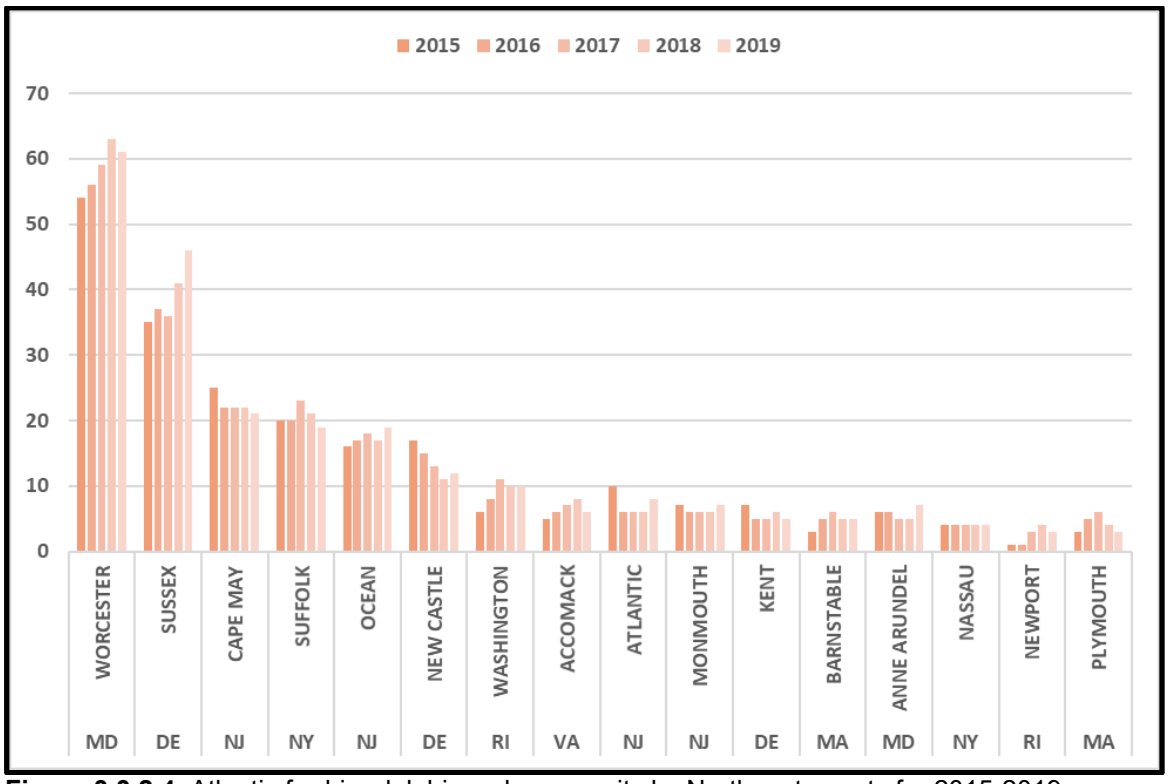

Figure 3.3.2.4. Atlantic for-hire dolphin wahoo permits by Northeast county for 2015-2019. (Source: SERO Permits database 2020).

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.

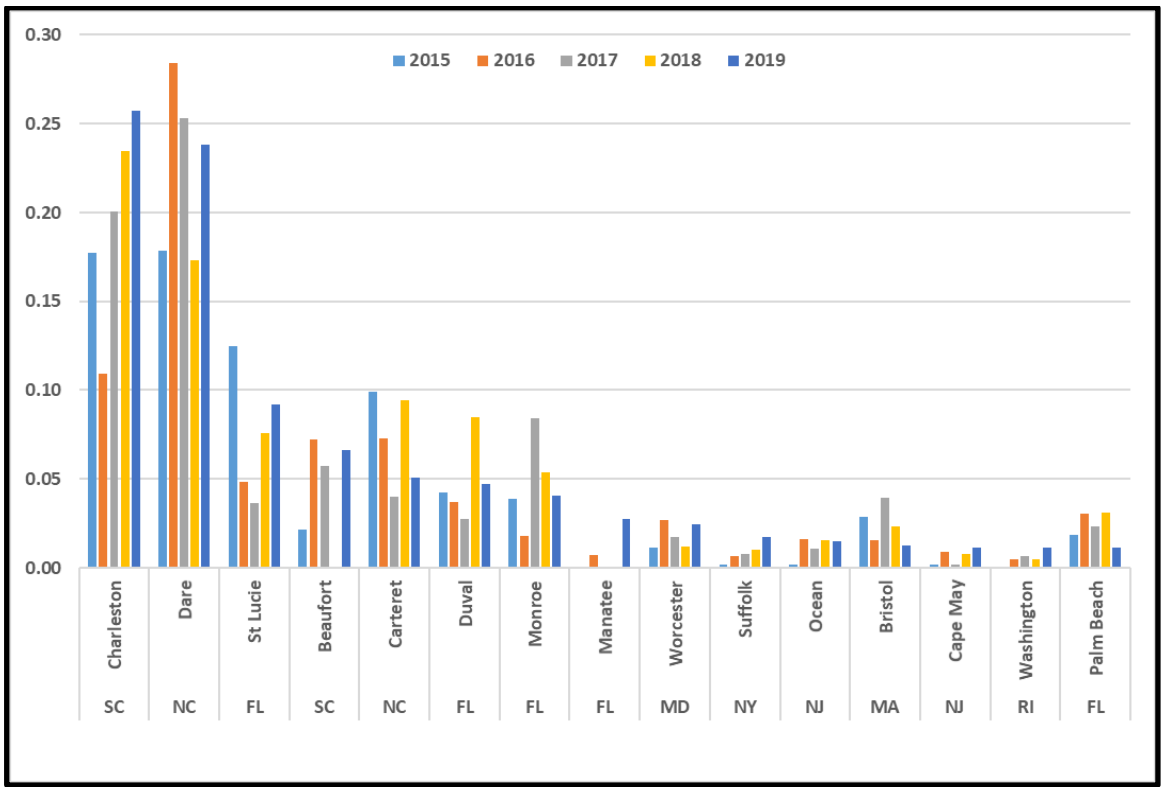

Figure 3.3.2.5. Dolphin regional quotient in pounds by county for 2015-2019. (Source: ACCSP database 2020).

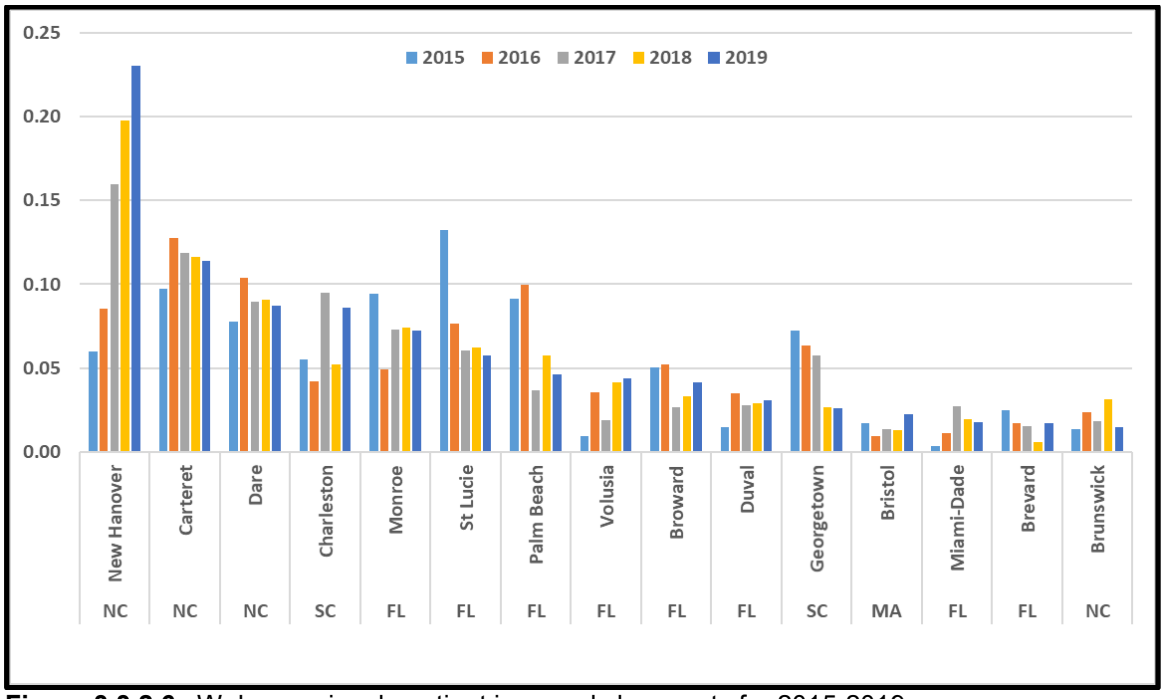

Figure 3.3.2.6. Wahoo regional quotient in pounds by county for 2015-2019. (Source: ACCSP database 2020).

While other data sources have 2019 as the 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 2013b). 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.

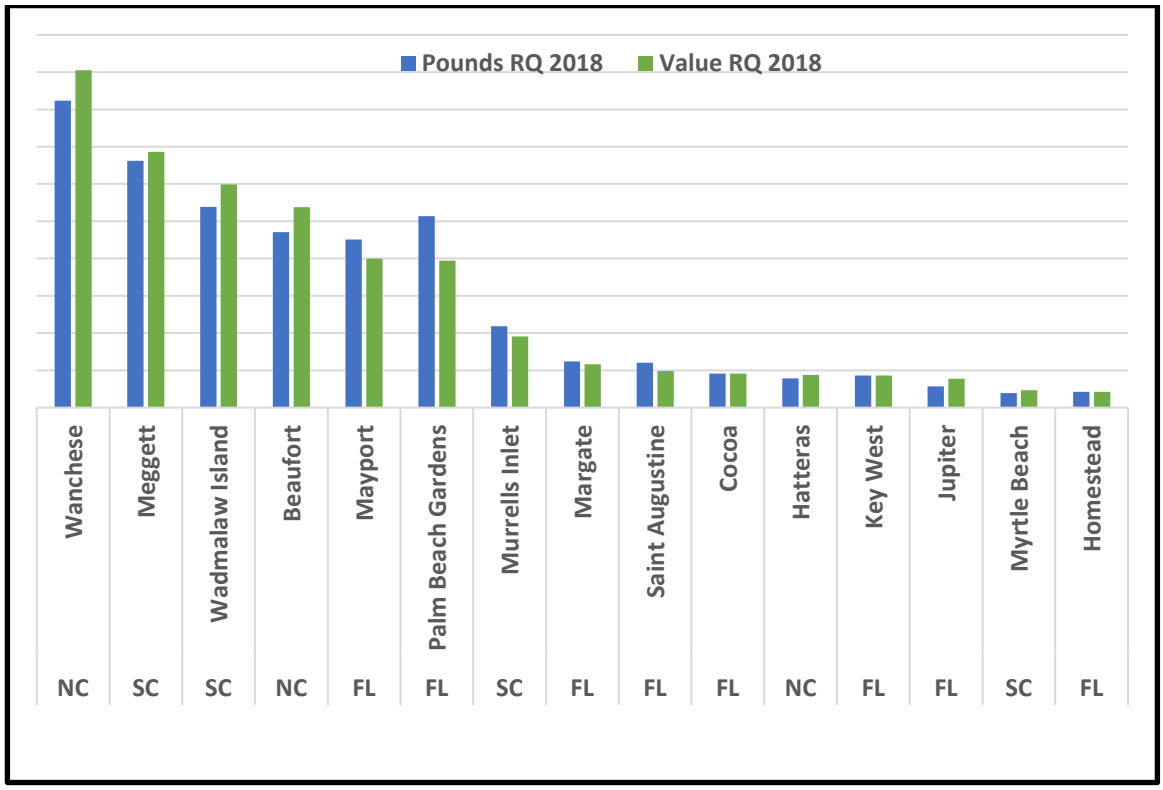

Figure 3.3.2.7. Dolphin pounds and value 2018 Regional Quotient for South Atlantic fishing communities. (Source: SERO Community ALS database 2018).

Again using the regional quotient to identify communities with commercial wahoo landings 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 2013b) 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.

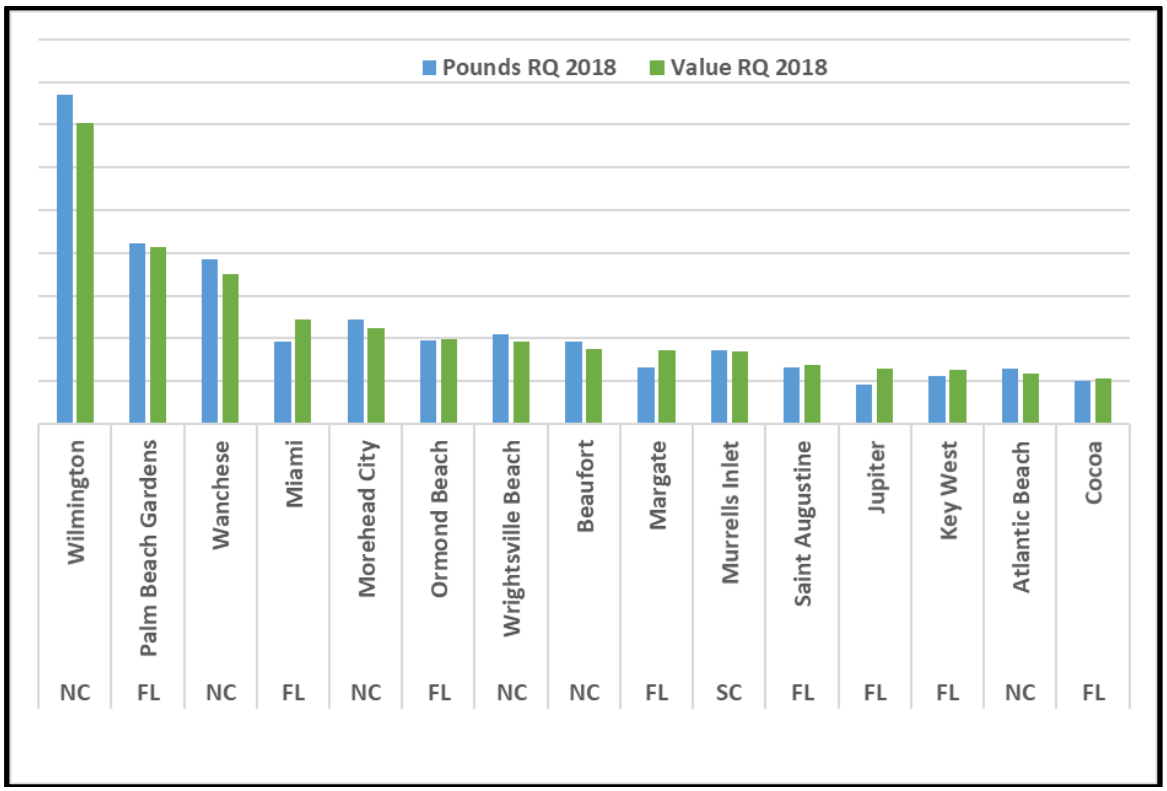

Figure 3.3.2.8. Wahoo pounds and value 2018 Regional Quotient for South Atlantic fishing communities. (Source: SERO Community ALS 2018).

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.

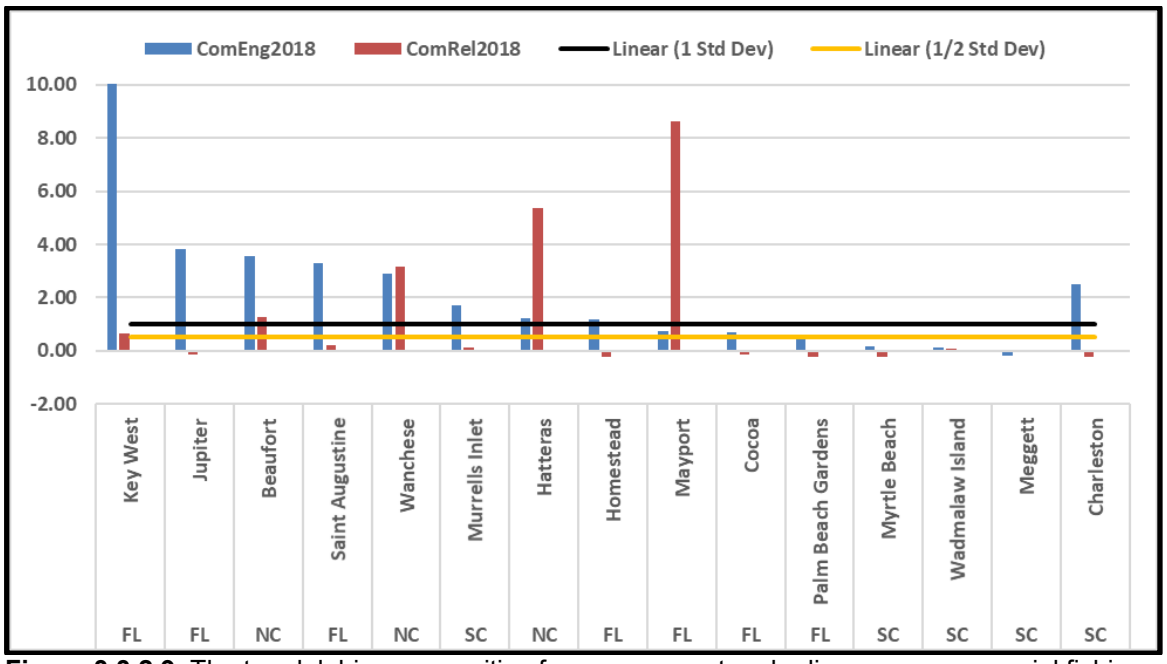

Figure 3.3.2.9. The top dolphin communities for engagement and reliance on commercial fishing. Source: SERO Community ALS 2018.

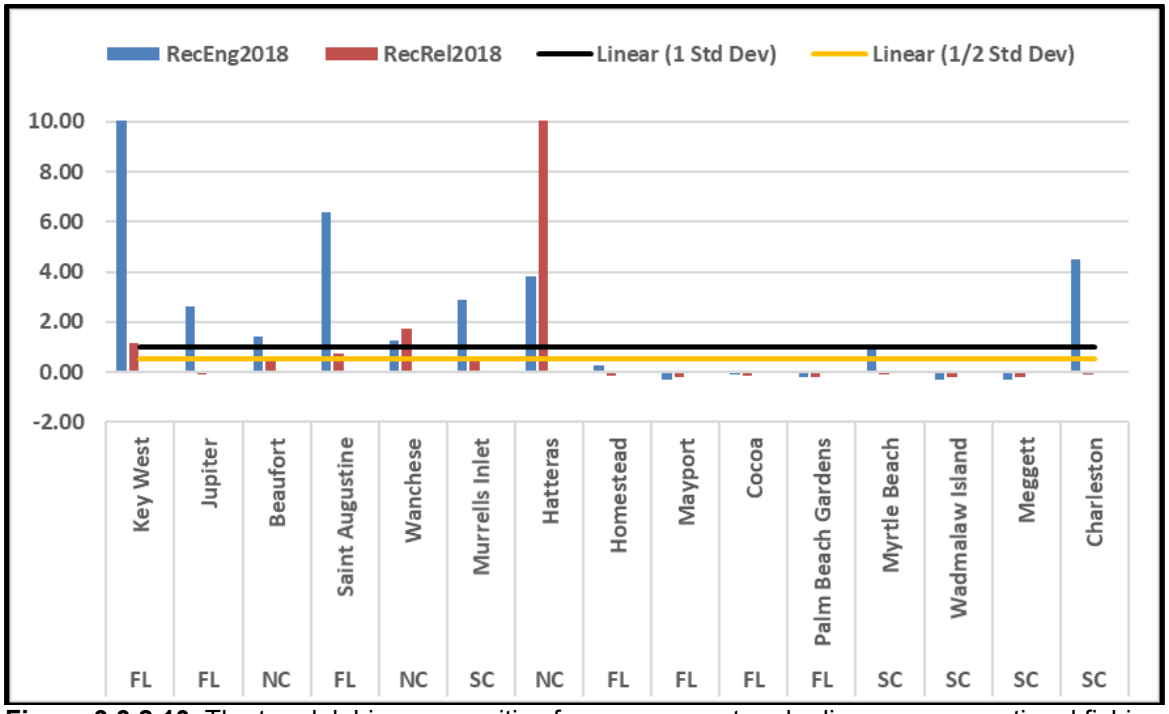

Figure 3.3.2.10. The top dolphin communities for engagement and reliance on recreational fishing. Source: SERO Community ALS 2018.

Mid-Atlantic and New England Regions

The 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 (SAFMC 2013b).

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

New Bedford, Massachusetts is the leading port in terms of commercial 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. Commercial wahoo landings for 2011 were 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 commercial 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.

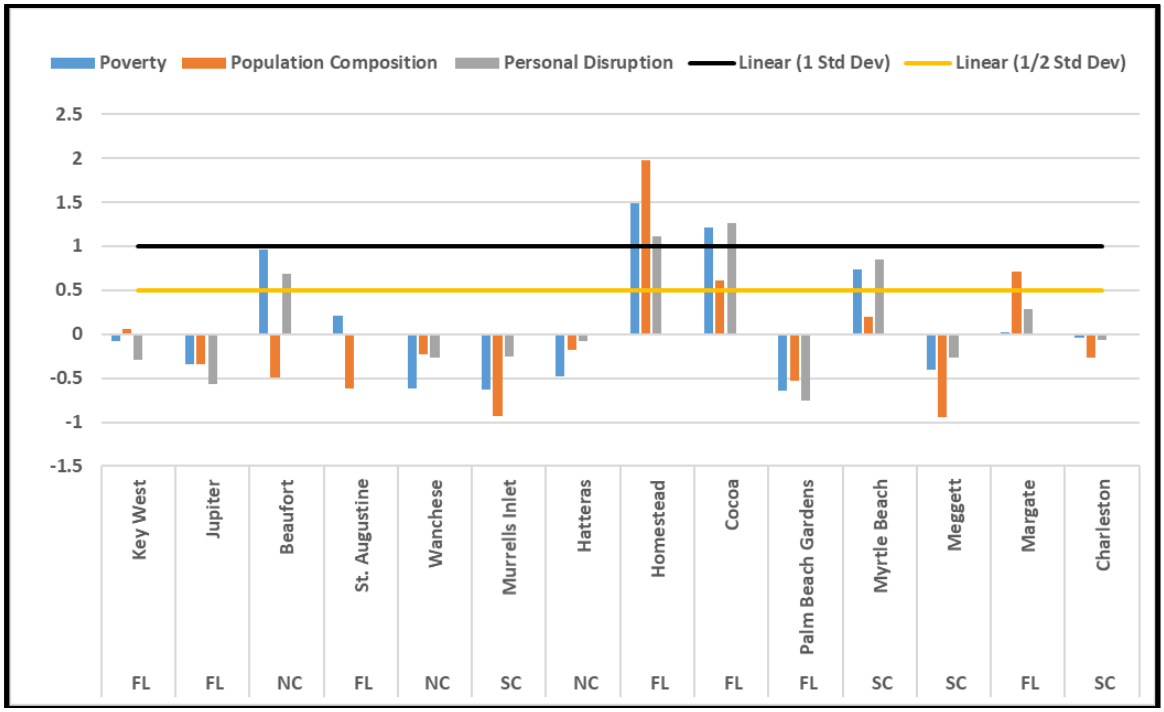

Figure 3.3.3.1. Social vulnerability measures for selected dolphin and wahoo communities. Source: SERO Community CSVIs 2016.

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 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 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 matters and litigation, 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 the 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 Council level, but does not have voting authority at the 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.

3.4.3 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 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). Total ACL for dolphin = current ABC.

2. Total ACL for dolphin = updated ABC.

3. Total ACL for dolphin = 95% updated ABC.

4. Total ACL for dolphin = 90% updated ABC.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated 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 based on Marine Recreational Information Program (MRIP) Coastal Household Telephone Survey (CHTS) data and is not the best scientific information available (BSIA). **Preferred Alternative 2** through **Alternative 4** explore options to revise the total ACL for dolphin based on the Scientific and Statistical Committee's (SSC) new acceptable biological catch (ABC) recommendation that is inclusive of MRIP Fishery Effort Survey (FES) data (which is BSIA), 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.

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	9,047,438	9,583,800
1987	496,478	9,927,475	10,423,953

Year	Commercial Landings (lbs ww)	Recreational Landings (lbs ww)	Total Landings (lbs ww)
1988	524,719	9,313,438	9,838,157
1989	1,063,399	26,607,444	27,670,843
1990	1,015,896	23,769,475	24,785,371
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	15,958,088	17,158,154
1995	2,136,534	23,324,771	25,461,305
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	22,564,554	23,329,930
2002	708,092	20,189,773	20,897,865
2003	723,508	17,214,255	17,937,763
2004	859,703	11,969,367	12,829,070
2005	577,616	12,758,252	13,335,868
2006	650,309	16,232,706	16,883,015
2007	999,163	16,140,525	17,139,688
2008	836,374	13,775,567	14,611,941
2009	1,296,014	17,091,501	18,387,515
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	1,284,976	16,641,747	17,926,723
2015	1,101,476	25,375,982	26,477,458
2016	940,696	15,997,343	16,938,039
2017	645,792	12,649,853	13,295,645
2018	511,419	16,805,000	17,316,419
2019	688,718	11,929,298	12,618,016

Source: SEFSC.

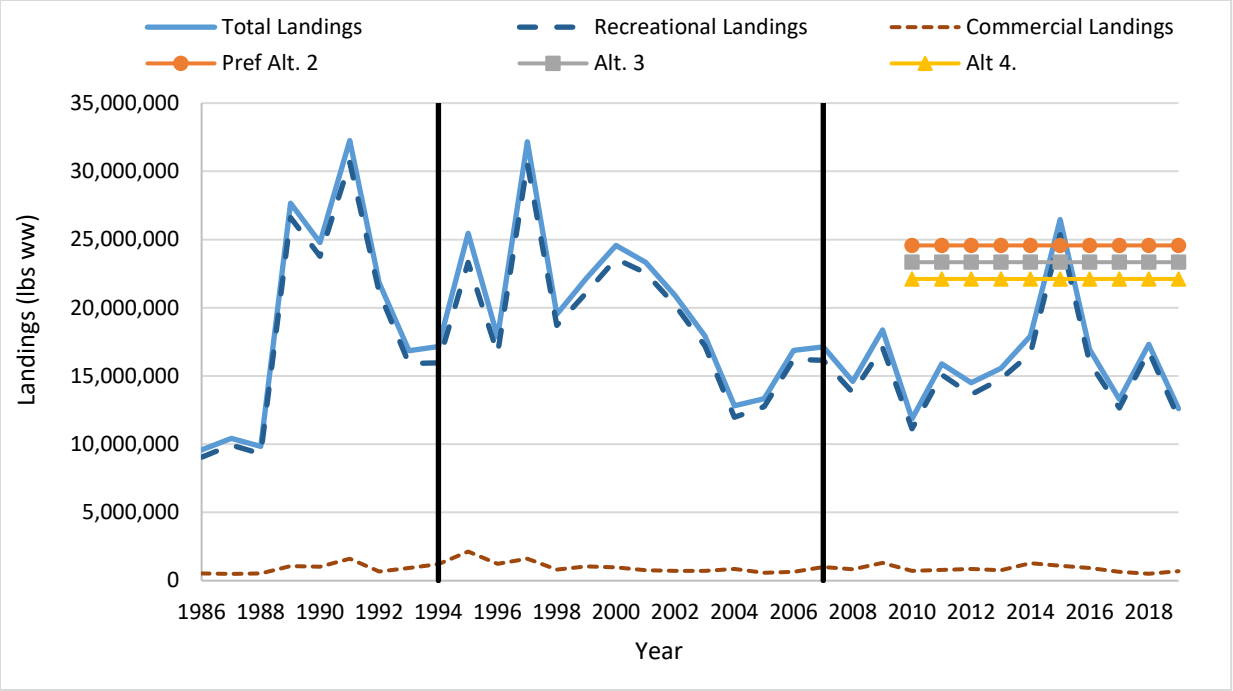

Figure 4.1.1.1. Dolphin landings (pounds whole weight) from 1986-2019 in comparison to the alternatives in Action 1. The solid vertical lines indicate baseline years (1994 to 2007) selected by the SSC for setting the dolphin ABC.

Table 4.1.1.3. 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%

Source: Marine Recreational Information Program.

Preferred Alternative 2, **Alternatives 3**, and **4** would result in a change in the ACL of 60%, 52%, and 44% from the ACL specified in **Alternative 1 (No Action)**, respectively (**Table 4.1.1.1**). **Preferred Alternative 2** would set the total ACL equal to the ABC and would result in the highest ACL of the alternatives considered. **Alternatives 3** and **4** include a buffer from the ABC, and are thus more conservative. Therefore, biological benefits to the dolphin stock would be expected to be greatest for **Alternative 4** followed by **Alternative 3**, and **Preferred Alternative 2**, as long as total landings are below the total ACL. **Alternative 1 (No Action)** represents the lowest total ACL and would be expected to have the greatest biological benefits. However, it is not based on BSIA and is not a viable alternative.

Public comments at recent South Atlantic Fishery Management Council (Council) meetings have expressed concerns over the paucity of large dolphin, especially in the Florida Keys. Lynch et al. (2018) report declining relative abundance of dolphin using longline data from highly migratory species, supporting the reduced dolphin availability mentioned in public comments. Rudershausen et al. (2019) report a dolphin discard mortality rate of 24.8% for the recreational hook-and-line sector in the U.S. South Atlantic, Gulf of Mexico, and Caribbean. High discard mortality rates could negatively affect population sizes. Bycatch and discards are discussed in detail in Appendix D (Bycatch Practicability Analysis (BPA)). Rudershausen et al. (2019) 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.

It is also reasonable to consider that the lack of large dolphin in the Florida Keys may be due to fish moving out of the area or going deeper in search of suitable temperature and food availability. Schlenker et al. (2021) found that the median preferred temperature tagged dolphin throughout the Gulf of Mexico and the western Atlantic was 27.5 °C and 95% of their time was spent between 25-29°C. Spawning events were predicted to occur at nighttime, at a depth distinct from non-spawning periods, primarily between 27.5 and 30 °C, and chiefly at the new moon phase in the lunar cycle (Schlenker et al. 2021). Moreover, throughout their large-scale migrations, dolphin exhibited behavioral thermoregulation to remain largely between 27 and 28 °C and reduced their relative activity at higher temperatures (Schlenker et al. 2021). In the eastern tropical Pacific, a poleward shift in dolphin distribution is expected during this century as a consequence of gradual northern displacement of the sea surface temperature isotherm along the North American coast (Salvadeo et al. 2020). 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. When compared to the most recent 5-year and 3-year average landings, none of the total ACLs proposed under **Preferred Alternative 2** through **Alternative 4** are expected to be reached (**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 annual landings during 2015-2019, as late as October 16 and early as September 14 (**Table 4.1.1.4**).

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).

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[22]	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).

During 2015-2019, only 6% of commercial dolphin wahoo trips reported discards of dolphin and very few species were caught as bycatch (**Table D.2.1.1** in **Appendix D, BPA**). The ratios of recreational discards to landings of dolphin during the same time period were 6% for charter vessels, 13% for headboats, and 37% for private recreational vessels; with higher numbers of species caught as bycatch (**Tables D.2.1.3** and **D.2.1.4** in **Appendix D, BPA**). **Preferred Alternative 2** would increase the total ACL for dolphin thereby allowing more dolphin to be retained which would otherwise have been discarded. However, the primary source of the increase in the total ACL is attributable to the changes to MRIP (i.e., recreational anglers have historically harvested roughly the same proportion, but the data have begun to more accurately estimate that proportion only in relatively recent years), and fishing effort is not expected to substantially change; thus, no changes in bycatch are expected for **Action 1.**

On July 15, 2020, the final rule for Regulatory Amendment 29 to the FMP for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper Regulatory Amendment 29, SAFMC 2020c) 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 final rule for the amendment also required 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 (SAFMC 2020c). Since many recreational fishers targeting dolphin and wahoo using non-longline gear also discard snapper grouper species on the same trip (Table E.2.1.3), the best fishing practices implemented by Snapper Grouper Regulatory Amendment 29 may be

[22] **Alternative 1 (No Action)** of **Action 1** provides an ACL based on recreational landings estimates under the CHTS method rather than recreational landings estimates based on the FES method , 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.

used to fish for dolphin and wahoo. 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 and wahoo fishery management plan.

The proposed alternatives in **Action 1** would not change fishing methods or effort levels substantially for the dolphin and wahoo fishery in the U.S. exclusive economic zone (EEZ), and therefore would perpetuate the existing level of risk for interactions between Endangered Species Act (ESA)-listed species and the fishery. Thus, there are likely to be no additional effects, positive or negative, to protected species from the action alternatives. Previous ESA consultations have assessed the impacts of potential interactions and determined the dolphin and wahoo fishery was not likely to adversely affect marine mammals, Atlantic sturgeon, or *Acropora* species, and was not likely to jeopardize the continued existence or recovery of sea turtles or smalltooth sawfish (Section 3.2.5). These predicted effects on ESA listed species and designated critical habitats are applicable to all actions in this amendment.

Non-longline hook-and-line gear, the gear predominantly used to harvest dolphin by the recreational sector, is the Sustainable Seafood Guide's recommended gear in the U.S. as a "best choice" since this gear has minimal bycatch issues, and does little damage to physical or biogenic habitats (Blue Ocean 2010; Seafood Watch 2016). Therefore, no adverse effects on essential fish habitat (EFH), EFH - habitat areas of particular concern (HAPC), or Coral HAPCs are anticipated. These predicted effects on EFH, EFH HAPCs, and Coral HAPCs are applicable to all actions in this amendment.

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 long-term effects on the health of a stock. The ACL does not directly impact the fishery for a species unless harvest changes, fishing behavior changes, or the ACL is exceeded, thereby potentially triggering accountability measures (AM) such as harvest closures or other restrictive measures. As such, ACLs that are set above observed landings in a fishery for a species and do not change harvest or fishing behavior may not have realized economic effects each year. Nevertheless, ACLs set above observed average harvest levels do create a buffer between the ACL and typical landings that may be utilized in years of exceptional abundance or accessibility of a species, thus providing the opportunity for increased landings and a reduced likelihood of triggering restrictive AMs. As such there are potential economic benefits from ACLs that allow for such a buffer.

As noted in **Section 4.1.1**, **Alternative 1 (No Action)** is not a viable alternative. The ACL is set equal to the ABC in **Alternative 1 (No Action)** and **Preferred Alternative 2**, with the differences between the two largely due to how the ABC has been set and how the non-headboat recreational component of the total ACL would be accounted for moving forward. Therefore, the economic effects of **Alternative 1 (No Action)** and **Preferred Alternative 2** would be assumed to be similar. Methods for estimating harvest have changed for the non-headboat recreational component, which accounts for the majority of dolphin landings (over 95.3% on average from 2015-2019). This accounting of harvest has not changed how many dolphin

recreational anglers are harvesting. Rather, the FES method helps account for total effort and total harvest more accurately. Thus, the increase in the estimated numbers between **Alternative 1 (No Action)** and **Preferred Alternative 2** does not necessarily reflect an actual increase in recreational harvest. Rather the change away from **Alternative 1 (No Action)** to **Preferred Alternative 2** revises how landings will be accounted for moving forward, particularly in regard to recommendations surrounding best available science from the SSC.

The proposed total ACLs for dolphin in **Preferred Alternative 2** through **Alternative 4** are all higher than the observed landings in recent years with the exception of 2015 (**Figure 4.1.1.1**). Assuming long-term landings reflect the average landings over the most recent five years of available data (2015-2019), landings would be expected to continue to be below the potential new ACLs and thus not constraining on harvest for dolphin. As a result, no direct economic effects are anticipated from **Preferred Alternative 2** through **Alternative 4** in the short-term assuming average abundance.

While dolphin harvest or fishing behavior for dolphin are not expected to change, based on recent average landings, a larger buffer between the ACL and observed landings would allow for higher potential landings, such as those observed in 2015, and reduce the likelihood of restrictive AMs being triggered that would lead to short-term negative economic effects. Thus, under this notion, from a short-term economic perspective, **Alternative 1 (No Action)** and **Preferred Alternative 2** would have similar effects (despite the different sized buffers between recent landings and the potential ACL) because the ACL is equal to the ABC in each alternative but the accounting for the non-headboat recreational component of the total ACL would change under **Preferred Alternative 2**). These two alternatives have the highest potential net economic benefits, followed by **Alternative 3**, and **Alternative 4** (**Table 4.1.2.1**).

The estimated economic benefits of **Preferred Alternative 2** through **Alternative 4** are provided in **Table 4.1.2.2** and **Table 4.1.2.3** by sector and in **Table 4.1.2.4** in aggregate for both sectors combined. **Preferred Alternative 2** is estimated to result in an increase in potential net economic benefits of $8,864,745 for the recreational sector, $1,851,508 for the commercial sector, and $10,716,253 for both sectors combined (2019 $). Assumptions used in calculating these estimates include application of the status quo allocation of the total ACL (90% recreational, 10% commercial) to the new ACL for each alternative to estimate economic benefits. This allocation was then compared to 5-year average landings (2015-2019) to determine the difference by sector. To estimate benefits to anglers in the recreational sector, a consumer surplus (CS) estimate of $10.71 (2019 $) per fish was applied to the recreational buffer between the ACL and average annual landings (2015-2019) which is the CS estimate for the third dolphin kept on a recreational trip (**Section 3.3**). CS estimates are available for the second through sixth dolphin kept on a recreational trip. This value was chosen since, on average, there have been approximately three dolphin landed per angler trip in recent years (2015-2019). A weight of 6.72 lbs ww per dolphin was used to convert the recreational portion of the buffer between the ACL and average annual landings (2015-2019) from lbs ww to numbers of fish (Personal Communication, NOAA Southeast Fisheries Science Center SAFE Dataset, December 11, 2019). To estimate economic benefits from the commercial portion of the buffer between landings and the potential ACL, the five-year average breakdown of commercial pelagic longline (PLL) landings compared to all other gear (78% PLL and 22% other gear; **Tables 3.3.1.8** and

3.3.1.9) within the fishery was applied to the commercial portion of the difference. This provided proper application to the appropriate price ($3.17/lbs ww for PLL and $3.05/lbs ww for other gear (2019 $); derived from **Tables 3.3.1.8** and **3.3.1.9**) and net cash flow estimates (39.7% for PLL and 17.7% for other gear; **Section 3.3**) to estimate producer surplus (PS) for the commercial sector.

In the analysis of the action, it was also assumed that changes in the recreational portion of the total ACL would only affect catch per angler trip and not the overall number of trips. This included no change to for-hire fishing activity and thus no change in economic effects for the for-hire component of the recreational sector. As such, there are no estimated changes in PS provided for the recreational sector. There were also no expected changes to CS from the commercial perspective. Although there are not current estimates of demand elasticity for dolphin, domestic harvest in the Atlantic was approximately 778,000 lbs per year based on 2015-2019 landings data (**Table 3.3.1.2**), while domestic harvest in the Pacific was approximately 1.3 million pounds per year on average from 2015-2019[23] and dolphin imports averaged over 50 million pounds per year (**Table 3.3.1.19**). Overall, domestic harvest of dolphin in the Atlantic is relatively low in comparison to U.S. consumption of dolphin, therefore it is assumed that consumer prices are likely driven much more by imports and domestic Pacific landings rather than domestic Atlantic landings.

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 and thus is not applicable to comparison to the other alternatives. **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.

[23] According to NOAA Fisheries Landings Query available at https://www.fisheries.noaa.gov/foss.

Table 4.1.2.2. Estimated change in potential net economic benefits to the recreational sector from **Action 1** (2019 $).

Alternative[1]	Difference between ACL and 2015-2019 average landings (lbs ww)	Estimated economic effects of the difference between the ACL and 2015-2019 average landings
Preferred Alternative 2	**5,562,193**	**$8,864,745**
Alternative 3	4,456,509	$7,102,561
Alternative 4	3,350,825	$5,340,377

[1]**Alternative 1 (No Action)** is tracked in part using CHTS estimates for charter and private recreational landings while **Alternatives 2 (Preferred)** through **4** would be tracked in part using FES estimates for charter and private recreational landings. Charter and private recreational landings make up a large portion of dolphin landings. As such, the economic effects of **Alternative 1 (No Action)** cannot be compared in a quantitative manner to the other alternatives since the accounting methods used to track the CHTS and FES are vastly different and are not comparable. Thus, **Alternative 1 (No Action)** cannot be considered in this analysis.

Table 4.1.2.3. Estimated change in potential net economic benefits to the commercial sector from **Action 1** (2019 $).

Alternative	Difference between ACL and 2015-2019 average landings (lbs ww)	Estimated economic effects of the difference between the ACL and 2015-2019 average landings
Preferred Alternative 2	**1,679,456**	**$1,851,508**
Alternative 3	1,556,603	$1,716,069
Alternative 4	1,433,749	$1,580,629

Table 4.1.2.4. Estimated change in potential net economic benefits (recreation and commercial) from **Action 1** (2019 $).

Alternative[1]	Difference between ACL and 2015-2019 average landings (lbs ww)	Estimated economic effects of the difference between the ACL and 2015-2019 average landings
Preferred Alternative 2	**7,241,649**	**$10,716,253**
Alternative 3	6,013,111	$8,818,629
Alternative 4	4,784,573	$6,921,006

[1]**Alternative 1 (No Action)** is tracked in part using CHTS estimates for charter and private recreational landings while **Alternatives 2 (Preferred)** through **4** would be tracked in part using FES estimates for charter and private recreational landings. Charter and private recreational landings make up a large portion of dolphin landings. As such, the economic effects of **Alternative 1 (No Action)** cannot be compared in a quantitative manner to the other alternatives since the accounting methods used to track the CHTS and FES are vastly different and are not comparable. Thus, **Alternative 1 (No Action)** cannot be considered in this analysis.

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 social benefits associated with accurate accounting of non-headboat recreational harvest.

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 a 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 (**Table 4.1.1.4**). 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. Additionally, higher ACLs may provide opportunity for commercial and recreational fishermen to expand their harvest providing social benefits associated with increased income to fishing businesses within the community and higher trip satisfaction. Among the action alternatives, **Preferred Alternative 2** would be the most beneficial for fishermen, followed by **Alternative 3**, and **Alternative 4**. **Alternative 1 (No Action)** is likely to have similar effects as **Preferred Alternative 2** as the buffer between ACL and ABC remains the same with the accounting of non-headboat recreational harvest would be updated under **Preferred Alternative 2**. As stated in **Section 4.1.1**, **Alternative 1 (No Action)** is not a viable alternative.

4.1.4 Administrative Effects

The mechanism for monitoring and documentation of the total ACL for dolphin are already in place through implementation of Dolphin Wahoo Amendment 5 (SAFMC 2013b) and reflects **Alternative 1** (**No Action**). **Alternative 1 (No Action)** is not a viable alternative as explained in **Section 4.1.1**. Administrative impacts of **Preferred Alternative 2**, **Alternatives 3,** and **4** would be similar. The exception 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 4.1.1.4**). In this scenario, administrative effects would be greater for **Alternative 4**, followed by **Alternative 3**, and **Preferred Alternative 2**. 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). Total ACL for wahoo = current ABC.

2. Total ACL for wahoo = updated ABC.

3. Total ACL for wahoo = 95% updated ABC.

4. Total ACL for wahoo = 90% updated ABC.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

Alternative 1 (No Action) is not a viable alternative because it would retain the current total ACL for wahoo (equal to the current ABC) at 1,794,960 lbs ww (**Table 4.2.1.1**), which is based on MRIP CHTS data and is not based on BSIA. **Preferred Alternative 2** through **Alternative 4** explore options to revise the total ACL for wahoo based on the SSC's new ABC recommendation that is inclusive of MRIP FES data (BSIA) 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	Wahoo 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.

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	2,891,097	2,917,810
1987	51,750	2,210,612	2,262,362
1988	53,164	1,193,703	1,246,867
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	1,664,457	1,771,954
1996	83,451	1,538,442	1,621,893

Year	Commercial Landings (lbs ww)	Recreational Landings (lbs ww)	Total Landings (lbs ww)
1997	93,135	1,119,084	1,212,219
1998	77,964	1,348,802	1,426,766
1999	99,285	1,917,628	2,016,913
2000	65,887	1,790,662	1,856,549
2001	59,175	1,807,268	1,866,443
2002	59,288	2,830,875	2,890,163
2003	58,832	1,997,575	2,056,407
2004	65,942	3,125,371	3,191,313
2005	46,590	1,676,176	1,722,766
2006	40,177	1,061,474	1,101,651
2007	59,144	3,687,038	3,746,182
2008	42,211	1,195,581	1,237,792
2009	45,617	2,303,859	2,349,476
2010	43,806	1,252,120	1,295,926
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	62,299	1,709,854	1,772,153
2015	64,455	2,943,009	3,007,464
2016	66,868	5,003,444	5,070,312
2017	67,995	3,585,791	3,653,786
2018	50,364	880,960	931,324
2019	68,413	2,010,815	2,079,228

Source: SEFSC.

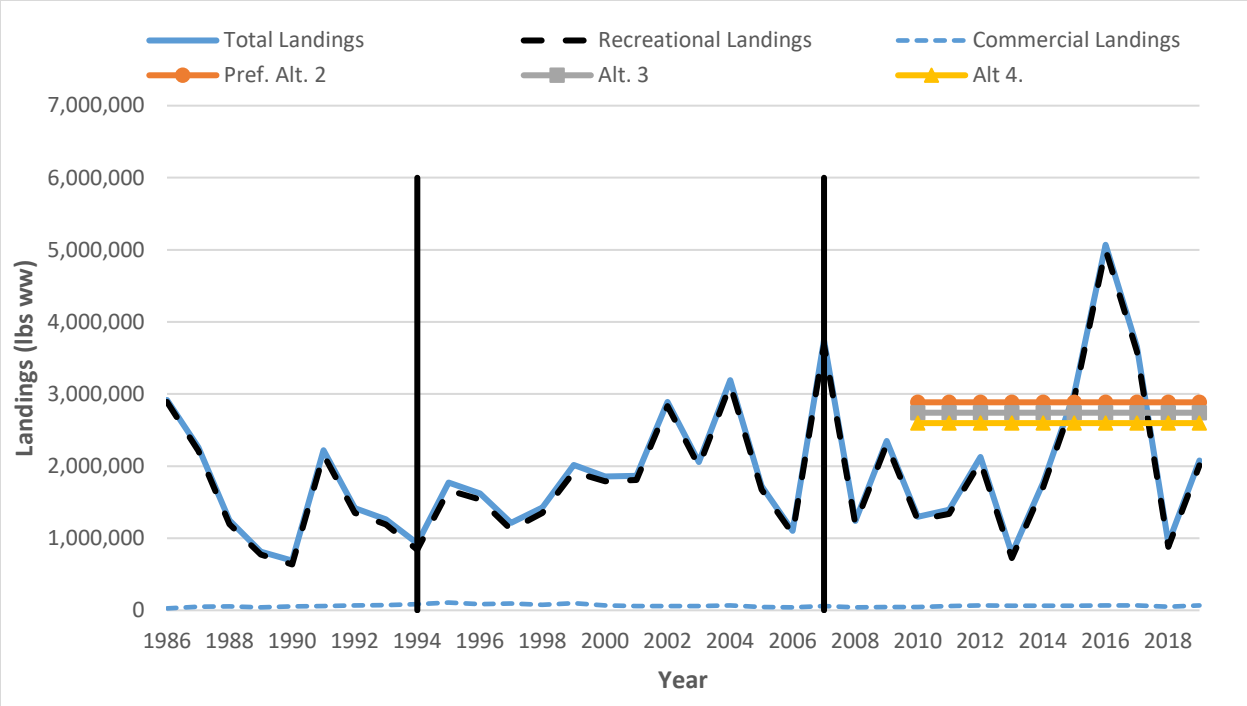

Figure 4.2.1.1. Wahoo landings (lbs ww) from 1986-2019 in comparison to the alternatives in **Action 2**. The solid vertical lines indicate baseline years (1994 to 2007) selected by the SSC for setting the wahoo ABC.

Table 4.2.1.3. 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%
2016	28.8%
2017	40.9%
2018	27.0%
2019	28.8%

Source: Marine Recreational Information Program.

Preferred Alternative 2, **Alternative 3**, and **Alternative 4** would result in an increase in available harvest of 61%, 53%, and 45%, respectively, relative to **Alternative 1 (No Action)** (**Table 4.2.1.1**). **Preferred Alternative 2** would set the total ACL equal to the ABC and would result in the highest ACL of the alternatives considered. **Alternatives 3** and **4** include a buffer from the ABC, and are thus more conservative. Biological benefits would be expected to be greatest for **Alternative 4** followed by **Alternative 3**, and **Preferred Alternative 2**, as long as total landings are below the total ACL. **Alternative 1 (No Action)**, which represents the lowest catch level, would have greater biological benefits over other alternatives considered. However,

it is not based on BSIA and is not a viable alternative. Lynch et al. (2018) found that wahoo did not show a negative decline in relative abundance in recent years, unlike for dolphin. While this does not endorse an increase in the total ACL, it may be less risky compared to dolphin. 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 or as early as November 22 (before the end of the fishing year on 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 23 and as early as August 29 when compared with the maximum annual landings during 2015-2019 (**Table 4.2.1.4**).

During 2015-2019, less than 1% of commercial wahoo trips reported average annual discards of 1 wahoo, with very low numbers of species caught as bycatch (Table D.2.1.1 in Appendix D, BPA). The recreational discards to landings ratio for wahoo during the same time period was less than 1% for charter vessels, 7% for headboats, and 6% for private recreational vessels; with higher numbers of species caught as bycatch (Tables D.2.1.3 and D.2.1.4 in Appendix D, BPA). **Preferred Alternative 2** would increase the total ACL for wahoo; thereby, allowing more wahoo to be retained which would otherwise have been discarded. However, the primary source of the increase in the total ACL is attributable to the change in MRIP's recreational landings estimates from CHTS to FES (i.e., recreational anglers have historically harvested roughly the same proportion, but the data have begun to more accurately estimate that proportion only in relatively recent years). Fishing effort is not expected to substantially change, and the ratio of discards to landings is very low for wahoo; thus, no changes in bycatch are expected for **Action 2** (Appendix D, BPA).

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).

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[24]	Not Applicable	Not Applicable	Not Applicable
Preferred Alternative 2	2,885,303	Yes (24-Dec)	No	Yes (23-Sep)
Alternative 3	2,741,038	Yes (8-Dec)	No	Yes (9-Sep)
Alternative 4	2,596,773	Yes (22-Nov)	No	Yes (29-Aug)

*Current ABC(=ACL).

[24] **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

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 long-term effects on the health of a stock. The ACL does not directly impact the fishery for a species unless harvest changes, fishing behavior changes, or the ACL is exceeded, thereby potentially triggering AMs such as harvest closures or other restrictive measures. As such, ACLs that are set above the observed landings in the fishery for a species and do not change harvest or fishing behavior may not have realized economic effects each year. Nevertheless, ACLs set above observed harvest levels do create a buffer between the ACL and typical landings that may be utilized in years of exceptional abundance or accessibility to a species, thus providing the opportunity for increased landings and a reduced likelihood of triggering restrictive AMs. As such, there are potential economic benefits from ACLs that allow for such a buffer. The opposite is true for ACLs that constrain harvest or fishing effort within a fishery or reduce the previously described buffer between average landings and the ACL.

As noted in **Section 4.2.1**, **Alternative 1 (No Action)** is not a viable alternative. The ACL is set equal to the ABC in **Alternative 1 (No Action)** and **Preferred Alternative 2**, with the differences between the two due to how the ABC has been set and how the non-headboat recreational component of the total ACL would be accounted for moving forward. Therefore, the economic effects of **Alternative 1 (No Action)** and **Preferred Alternative 2** would be assumed to be similar. In regard to the non-headboat recreational component of the total ACL, which accounts for the majority of wahoo landings (96.7% on average from 2015-2019), methods for estimating harvest have changed to measure actual harvest more accurately. This accounting of harvest has not changed how many wahoo recreational anglers are harvesting, rather the FES method helps account for total effort and total harvest more accurately. Thus, the increase in the estimated numbers between **Alternative 1 (No Action)** and **Preferred Alternative 2** does not necessarily reflect an actual increase in recreational harvest. Rather the change away from **Alternative 1 (No Action)** to **Preferred Alternative 2** revises how landings would be accounted for moving forward, particularly regarding recommendations surrounding BSIA from the SSC.

The potential revised total ACLs for wahoo in **Preferred Alternative 2** through **Alternative 4** are less than the observed landings in three out of the past five years of available data (2015-2019) (**Figure 4.2.1.1**). Average landings over the most recent five years have been above the potential new total ACLs, thus these proposed ACLs would potentially constrain harvest. As a result, there would be direct negative economic effects anticipated from **Preferred Alternative 2** through **Alternative 4** in the short-term, assuming average abundance.

Annual catch limits that offer a larger buffer between the ACL and observed landings allow for higher potential landings, such as those observed from 2015 through 2017, and reduce the likelihood of restrictive AMs being triggered that 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)** and **Preferred Alternative 2** having similar effects (despite the different sized buffers between recent catch and the potential ACL because the ACL is equal to the ABC in each alternative but the accounting for the non-headboat recreational component of the total ACL would change under **Preferred Alternative 2**). These two

alternatives have the lowest potential for negative short-term economic effects, followed by **Alternative 3**, and **Alternative 4** (**Table 4.2.2.1**).

The estimated economic benefits of **Preferred Alternative 2** through **Alternative 4** are provided in **Table 4.2.2.2** and **Table 4.2.2.3** by sector and in **Table 4.2.2.4** in aggregate for both sectors combined. **Preferred Alternative 2** is estimated to result in a reduction in potential net economic benefits of $430,106 for the recreational sector, an increase in potential net economic benefits of $46,491 for the commercial sector, and a reduction in potential net economic benefits of $380,333 for both sectors combined. Assumptions used in calculating these estimates include application of the status quo allocation of the total ACL (96.07% recreational, 3.93% commercial) to the new ACL for each alternative to estimate economic benefits. This allocation was then compared to 5-year average landings (2015-2019) to determine the buffer between average annual landings and the ACL by sector. To estimate benefits for the recreational sector, a CS estimate of $105 (2019 $) per fish was applied to the recreational buffer which is the CS estimate for the second wahoo kept on a recreational trip (**Section 3.3**). This value was chosen since the bag limit for wahoo is two fish per person and there is no CS estimate available for the first fish. A weight of 27.56 lbs ww per wahoo was used to convert the recreational portion of the buffer from lbs ww to numbers of fish (Personal Communication, NOAA Southeast Fisheries Science Center SAFE Dataset, December 11, 2019). To estimate economic benefits from the commercial portion of the buffer between landings and the potential ACL, the five-year average breakdown of commercial pelagic longline (PLL) landings compared to all other gear (28% PLL and 72% other gear; **Tables 3.3.1.10** and **3.3.1.11**) within the fishery was applied to the commercial portion of the buffer. This provided proper application to the appropriate price ($3.75/lbs ww for PLL and $4.05/lbs ww for other gear; **Tables 3.3.1.10** and **3.3.1.11**) and net cash flow estimates (39.7% for PLL and 17.7% for other gear; **Section 3.3**) to estimate PS for the commercial sector.

In the analysis of the action, it was also assumed that changes in the recreational portion of the total ACL would only affect catch per angler trip and not the overall number of trips. This included no change to for-hire fishing activity and thus no change in economic effects for the for-hire component of the recreational sector. As such there are no estimated changes in PS provided for the recreational sector. There were also no expected changes to CS from the commercial perspective. Although there are not current estimates of demand elasticity for wahoo, domestic harvest in the Atlantic was approximately 68,000 lbs per year based on 2015-2019 landings data (**Table 3.3.1.3**), while domestic harvest in the Pacific was approximately 1.5 million pounds per year on average from 2015-2019.[25] Overall, domestic harvest of wahoo in the Atlantic is relatively low in comparison to overall U.S. production of wahoo, therefore it is assumed that consumer prices are not likely notably driven by domestic Atlantic landings.

[25] According to NOAA Fisheries Landings Query available at https://www.fisheries.noaa.gov/foss.

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.

Table 4.2.2.2. Estimated change in potential net economic benefits to the recreational sector from **Action 2** (2019 $).

Alternative[1]	Difference between ACL and 2015-2019 average landings (lbs ww)	Estimated economic effects of the difference between the ACL and 2015-2019 average landings
Preferred Alternative 2	**-112,893**	**-$430,106**
Alternative 3	-251,488	-$958,136
Alternative 4	-390,083	-$1,486,167

[1]**Alternative 1 (No Action)** is tracked in part using CHTS estimates for charter and private recreational landings while **Alternatives 2 (Preferred)** through **4** would be tracked in part using FES estimates for charter and private recreational landings. Charter and private recreational landings make up a large portion of wahoo landings. As such, the economic effects of **Alternative 1 (No Action)** cannot be compared in a quantitative manner to the other alternatives since the accounting methods used to track the CHTS and FES are vastly different and are not comparable. Thus, **Alternative 1 (No Action)** cannot be considered in this analysis.

Table 4.2.2.3. Estimated change in potential net economic benefits to the commercial sector from **Action 2** (2019 $).

Alternative	Difference between ACL and 2015-2019 average landings (lbs ww)	Estimated economic effects of the difference between the ACL and 2015-2019 average landings
Preferred Alternative 2	**49,773**	**$46,491**
Alternative 3	44,104	$41,196
Alternative 4	38,434	$35,900

Table 4.2.4.4. Estimated change in potential net economic benefits (recreation and commercial) from **Action 2** (2019 $).

Alternative[1]	Difference between ACL and 2015-2019 average landings (lbs ww)	Estimated economic effects of the difference between the ACL and 2015-2019 average landings
Preferred Alternative 2	**-63,119**	**-$380,333**
Alternative 3	-207,384	-$914,033
Alternative 4	-351,649	-$1,447,732

[1]**Alternative 1 (No Action)** is tracked in part using CHTS estimates for charter and private recreational landings while **Alternatives 2 (Preferred)** through **4** would be tracked in part using FES estimates for charter and private recreational landings. Charter and private recreational landings make up a large portion of wahoo landings. As such, the economic effects of **Alternative 1 (No Action)** cannot be compared in a quantitative manner to the other alternatives since the accounting methods used to track the CHTS and FES are vastly different and are not comparable. Thus, **Alternative 1 (No Action)** cannot be considered in this analysis.

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**. **Alternative 1 (No Action)** is likely to have similar effects as **Preferred Alternative 2** as the buffer between ACL and ABC remains the same with the accounting of non-headboat recreational harvest under **Preferred Alternative 2**. As stated in **Section 4.1.1**, **Alternative 1 (No Action)** is not a viable alternative.

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 2013b) and reflect **Alternative 1** (**No Action**). **Alternative 1 (No Action)** is not a viable alternative as explained in **Section 4.2.1**. 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**, and **Preferred Alternative 2**. 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 among alternatives in **Action 3**, since they do not change the total ACL specified in **Action 1**. Therefore, no biological effects are expected to the dolphin stock. Furthermore, the commercial sector for dolphin has effective in-season and post-season AMs in place to prevent the commercial ACL from being exceeded. **Alternative 1 (No Action)** through **Alternative 4** include sector allocations based on the revised total ACL of 24,570,764 lbs ww (Preferred Alternative 2 in Action 1; **Table 4.3.1.1**). **Table 4.3.1.2** shows the sector allocations resulting from applying the percentages in **Alternative 1 (No Action)** through **Alternative 4**.

Alternatives*

Note: The revised total ACLs in Alternatives 1 (No Action) through 4 reflect Preferred Alternative 2 in Action 1. The revised total ACL includes recreational landings from Monroe County, Florida, and incorporates revised recreational and commercial data.

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

2. Allocate 93.75% of the revised total ACL for dolphin to the recreational sector. Allocate 6.25% of the revised total ACL for dolphin to the commercial sector.

3. Allocate 93.00% of the revised total ACL for dolphin to the recreational sector. Allocate 7.00% of the revised total ACL for dolphin to the commercial sector.

4. Allocate 92.00% of the revised total ACL for dolphin to the recreational sector. Allocate 8.00% of the revised total ACL for dolphin to the commercial sector.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

Table 4.3.1.1. Sector allocations for dolphin in **Action 3** based on the revised total ACL of 24,570,764 lbs ww 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%
Preferred 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
Preferred Alternative 3	**22,850,811**	**1,719,953**
Alternative 4	22,605,103	1,965,661

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**). The commercial sector for dolphin closed in 2015 because the commercial ACL at the time was met. Commercial landings for dolphin also show a seasonal trend, with most of the landings between April and July and a peak in May (**Figure**

4.3.1.3). The largest difference between the current commercial ACL and the proposed commercial ACL would be under **Alternative 1 (No Action)**, followed by **Alternative 4**, **Preferred Alternative 3**, and **Alternative 2** (**Table 4.3.1.3**).

A similar comparison for the recreational sector is not appropriate because of different metrics 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 and a peak in the summer months (**Figure 4.3.1.2**).

An analysis of three scenarios comparing when sector landings would reach the proposed sector ACLs based on total landings per year (2015-2019) with average landings for both commercial and recreational sectors during 2015-2019, 2017-2019, and the maximum annual landings 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**). The recreational ACL for dolphin would not be reached or exceeded under any of the alternatives in the average 2015-2019 or average 2017-2019 scenarios (**Table 4.3.1.5**). However, the recreational ACL would be reached as early as September 29 under **Alternative 1 (No Action)** and as late as October 11 under **Alternative 2** if the maximum annual landings from a single year during 2015-2019 is considered (**Table 4.3.1.5**). Without an effective AM for the recreational sector, recreational landings would continue to occur and could have adverse biological effects on the dolphin stock. The trigger for an AM and the AM itself for dolphin are being considered in Actions 5 and 6.

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
Preferred 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 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

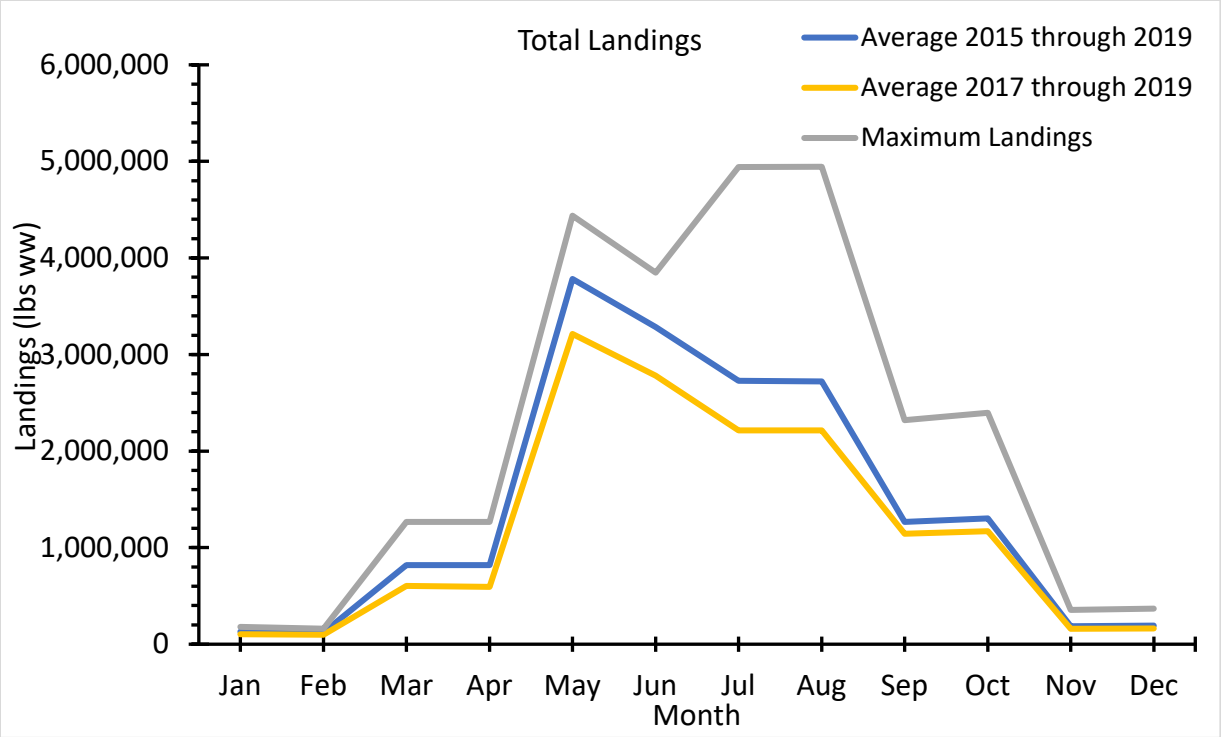

Figure 4.3.1.1. Dolphin total landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum annual landings during 2015-2019. The total landings are both the commercial and recreational landings combined.

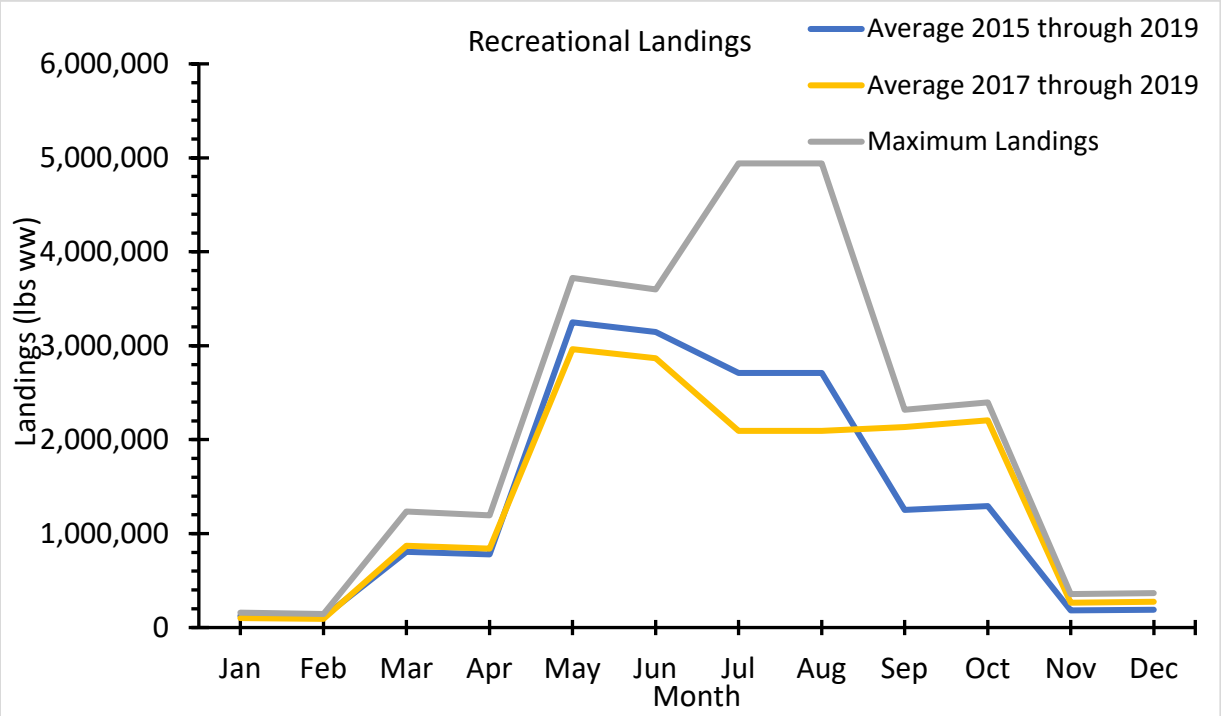

Figure 4.3.1.2. Dolphin recreational landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum annual landings during 2015-2019.

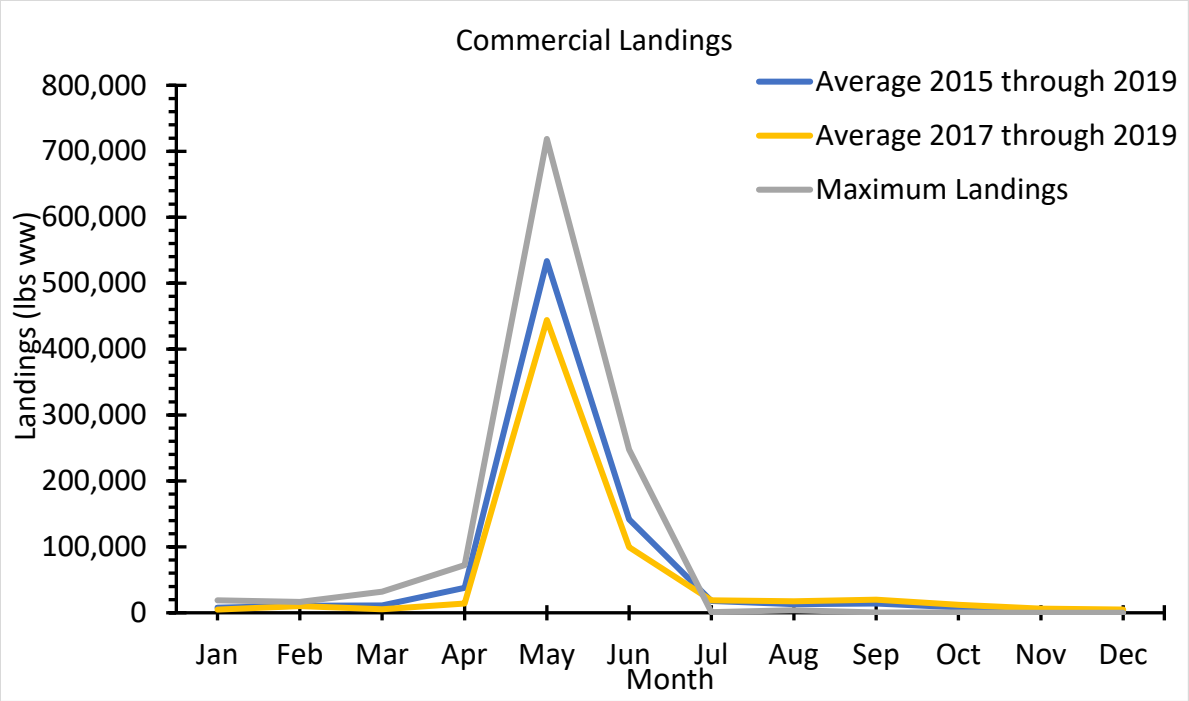

Figure 4.3.1.3. Dolphin commercial landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum landings for a single year during 2015-2019.

Table 4.3.1.5. Predicted date when the recreational and commercial sector ACLs for dolphin would be reached or exceeded under the maximum annual landings during 2015-2019.

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
Preferred 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 1,101,476 lbs ww for the commercial sector.

During 2015-2019, only 6% of commercial dolphin wahoo trips reported discards of dolphin (Table D.2.1.1). Very low numbers of species were caught as bycatch (Table D.2.1.1 in Appendix D, BPA). The ratios of recreational discards to landings of dolphin during the same time period were 6% for charter vessels, 13% for headboats, and 37% for private recreational vessels; with higher numbers of species caught as bycatch (Tables D.2.1.3 and D.2.1.4 in Appendix D, BPA). **Preferred Alternative 3** would increase the commercial and recreational ACLs for dolphin thereby allowing more dolphin to be retained, which would otherwise have been discarded. Given that the allocation changes are based on recent data more accurately estimating recreational harvest that has historically occurred, the proposed allocations are not expected to result in changes to fishing activity or behavior; thus, no changes in bycatch are expected for this action (Appendix D, BPA).

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 long-term effects on the health of a stock. The ACL does not directly impact the fishery for a species unless harvest changes, fishing behavior changes, or the ACL is exceeded, thereby potentially triggering AMs such as harvest closures or other restrictive measures. As such, ACLs that are set above observed landings in a fishery for a species and do not change harvest or fishing behavior may not have realized economic effects each year. Nevertheless, ACLs set above observed average harvest levels do create a buffer between the ACL and typical landings that may be utilized in years of exceptional abundance or accessibility of a species, thus providing the opportunity for increased landings and a reduced likelihood of triggering restrictive AMs. As such there are potential economic benefits from ACLs that allow for such a buffer between average landings and the ACL.

Recreational Sector

Alternative 1 (No Action) would maintain the current 90% of the total ACL allocation to the recreational sector. The resulting allocation under Preferred Alternative 2 in Action 1 would be 22,113,688 lbs ww, which is the lowest recreational ACL being considered in **Action 3** (**Table 4.3.1.2**). **Alternatives 2** through **4** would result in a comparatively higher recreational allocations and ACLs. Although none of the recreational ACLs in **Action 3** are estimated to be constraining based on the average annual landings over the last five years of available data (**Table 4.3.1.5**), it is assumed that the recreational sector could fully harvest its ACL, if conditions allowed, and there would be more potential landings of dolphin under **Alternative 2** through **Alternative 4** relative to **Alternative 1 (No Action)**. These additional landings would be expected to comparatively increase total consumer surplus (CS) for the recreational sector. When compared to **Alternative 1 (No Action)**, **Alternative 2** would result in the largest estimated increase in CS of $1,468,487, followed by **Preferred Alternative 3** and **Alternative 4** with estimated increases in CS of $1,174,791 and $783,193 respectively (2019 $)(**Table 4.3.2.1**).

Table 4.3.2.1. Comparison of the estimated change in consumer surplus (CS) for dolphin recreational sector ACLs in **Action 3** (2019 $).

Alternative	Difference between ACL and 5-year average landings (lbs ww)	Estimated change in CS	Comparison to Alternative 1 (No Action)
Alternative 1 (No Action)	5,562,193	$8,864,746	$0
Alternative 2	6,483,596	$10,333,232	$1,468,487
Preferred Alternative 3	**6,299,316**	**$10,039,536**	**$1,174,791**
Alternative 4	6,053,608	$9,647,938	$783,193

Assumptions used in calculating the estimates provided in **Table 4.3.2.1** include a CS estimate of $10.71 (2019 $) per fish was applied to the recreational buffer between average landings and the ACL, which is the CS estimate for the third dolphin kept on a recreational trip (**Section 3.3**). CS estimates are available for the second through sixth dolphin kept on a recreational trip. This value was chosen since on average there are approximately three dolphin landed per angler trip in recent years (2015-2019). A weight of 6.72 lbs ww per dolphin was used to convert the recreational portion of the buffer between the ACL and the five-year average landings from pounds to numbers of fish (Personal Communication, NOAA Southeast Fisheries

Science Center SAFE Dataset, December 11, 2019). In comparing alternatives, **Alternative 1 (No Action**) was used as a baseline, which applied the current allocation of 90% of the total ACL to the recreational sector. The total ACL in this case was based on Preferred Alternative 2 in Action 1 and applied to the alternatives in **Action 3**. All other alternatives considered in **Action 3** (**Alternatives 2** through **4**) would increase the recreational allocation on a percent and thus pound basis, thereby comparatively increasing economic benefits to the recreational sector. In the analysis of the action, it was also assumed that changes in the recreational portion of the total ACL would only affect catch per angler trip and not the overall number of trips. This included no change to for-hire fishing activity and thus no change in economic effects for the for-hire component of the recreational sector. As such there are no estimated changes in producer surplus (PS) provided for the recreational sector.

Commercial Sector

Alternative 1 (No Action) would maintain the current commercial allocation of 10% of the total ACL. The resulting commercial allocation under Preferred Alternative 2 in Action 1 would be 2,457,076 lbs ww, which is the highest commercial ACL being considered in **Action 3** (**Table 4.3.1.2**). **Alternatives 2** through **4** would result in comparatively lower commercial allocations and ACLs. Although none of the commercial ACLs in Action 4 are estimated to be constraining based on the average annual landings over the last five years of available data (**Table 4.3.1.5**), it is assumed that the commercial sector could fully harvest its ACL, if conditions allowed, and there would be fewer potential landings of dolphin under **Alternatives 2** through **4** relative to **Alternative 1 (No Action)**. These relatively reduced landings would be expected to comparatively decrease total PS for the commercial sector. When compared to **Alternative 1 (No Action)**, **Alternative 2** would result in the largest estimated reduction in PS of $1,153,121, followed by **Preferred Alternative 3** and **Alternative 4** with estimated reduction in PS of $813,074 and $542,049 respectively (2019 $) (**Table 4.3.2.2**).

Table 4.3.2.2. Comparison of the estimated change in producer surplus (PS) for dolphin commercial sector ACLs in **Action 3** (2019 $).

Alternative	Difference between ACL and 5-year average landings (lbs ww)	Estimated change in PS [1]	Comparison to Alternative 1 (No Action)
Alternative 1 (No Action)	1,679,456	$1,852,503	$0
Alternative 2	758,053	$836,161	-$1,016,342
Preferred Alternative 3	**942,333**	**$1,039,429**	**-$813,074**
Alternative 4	1,188,041	$1,310,454	-$542,049

Assumptions used in calculating the estimates provided in **Table 4.3.2.2** include application of the five-year average breakdown of commercial pelagic longline (PLL) landings compared to all other gear (78% PLL and 22% other gear; **Tables 3.3.1.8** and **3.3.1.9**) within the fishery was applied to the commercial portion of the buffer. This provided proper application to the appropriate price ($3.17/lbs ww for PLL and $3.05/lbs ww for other gear (2019 $); derived from **Tables 3.3.1.8** and **3.3.1.9**) and net cash flow estimates (39.7% for PLL and 17.7% for other gear; **Section 3.3**) to estimate PS for the commercial sector. In comparing alternatives, **Alternative 1 (No Action**) was used as a baseline which applied the current allocation of 10% of the total ACL to the commercial sector. The total ACL in this case was based on Preferred

Alternative 2 in Action 1 and applied to the alternatives in **Action 3**. All other alternatives considered in **Action 3** (**Alternatives 2** through **4**) would decrease the commercial allocation on a percent and thus pound basis, thereby comparatively decreasing economic benefits to the commercial sector. There were also no expected changes to CS from the commercial perspective. Although there are not current estimates of demand elasticity for dolphin, domestic harvest in the Atlantic was approximately 778,000 lbs ww per year based on 2015-2019 landings data (**Table 3.3.1.2**), while domestic harvest in the Pacific was approximately 1.3 million pounds per year on average from 2015-2019[26] and dolphin imports averaged over 50 million pounds per year (**Table 3.3.1.19**). Overall, domestic harvest of dolphin in the Atlantic is relatively low in comparison to U.S. consumption of dolphin, therefore it is assumed that consumer prices are likely driven much more by imports and domestic Pacific landings rather than domestic Atlantic landings.

Change in Net Economic Benefits

In general, higher ACLs offer a larger buffer between the sector ACL and observed landings, which allows for increased harvest when fishery conditions allow, thereby increase net economic benefits. 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 highest potential economic benefit, followed by **Preferred 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**, **Preferred Alternative 3**, and **Alternative 2**. In terms of estimated net benefits for the action, the same ranking would apply as stated for the recreational sector, with **Preferred Alternative 3** expected to increase net economic benefits by $361,716 (2019 $)(**Table 4.3.2.3**).

Table 4.3.2.3. Estimated change in net economic benefits from the alternatives in **Action 3** in comparison to Alternative 1 (No Action)(2019 $).

Alternative	Estimated change in net economic benefits for the recreational sector	Estimated change in net economic benefits for the commercial sector	Estimated total change in net economic benefits
Alternative 2	$1,468,487	-$1,016,342	$452,145
Preferred Alternative 3	**$1,174,791**	**-$813,074**	**$361,716**
Alternative 4	$783,193	-$542,049	$241,144

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**, **Preferred 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 due to the decrease in fishing

[26] According to NOAA Fisheries Landings Query available at https://www.fisheries.noaa.gov/foss.

opportunity and concerns about long-term social effects, especially if other actions further decreased harvest opportunities. 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 sector's 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 would 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 for **Action 1 – Preferred Alternative 2** 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 could be reached under all the proposed alternatives (**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 would 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 **Preferred Alternative 3**, **Alternative 2**, and **Alternative 1 (No Action)** (**Table 4.3.1.5**). Therefore, administrative effects would be greater for **Alternative 4**, followed by **Preferred Alternative 3**, **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**. Therefore, no biological effects are expected to the wahoo stock. Furthermore, the commercial sector for wahoo has effective in-season and post-season AMs in place to prevent the commercial ACL from being exceeded. **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, **Table 4.4.1.1**). **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 ACLs in Alternatives 1 (No Action) through 4 reflect Preferred Alternative 2 in Action 2. The revised total ACL includes recreational landings from Monroe County, Florida, and incorporates revised recreational and commercial data.

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

2. Allocate 96.35% of the revised total ACL for wahoo to the recreational sector. Allocate 3.65% of the revised total ACL for wahoo to the commercial sector.

3. Allocate 97.55% of the revised total ACL for wahoo to the recreational sector. Allocate 2.45% of the revised total ACL for wahoo to the commercial sector.

4. Allocate 97.00% of the revised total ACL for wahoo to the recreational sector. Allocate 3.00% of the revised total ACL for wahoo to the commercial sector.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

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%
Preferred 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
Preferred 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**). The largest difference between the current commercial ACL and the proposed commercial ACL would be under **Alternative 1 (No Action)**, followed by **Alternative 2**, **Alternative 4**, and **Preferred Alternative 3** (**Table 4.4.1.3**). A similar comparison for the

recreational sector is not appropriate because of 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 comparing when sector landings would reach the proposed sector ACLs based on total landings per year (2015-2019), with average landings for both commercial and recreational sectors during 2015-2019, 2017-2019, and the maximum annual landings 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**, **Preferred Alternative 3**, or **Alternative 4** for all the scenarios (**Table 4.4.1.5**). The recreational ACL would not be reached under any 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, with **Preferred Alternative 3** reaching the ACL on December 24 (**Table 4.4.1.5**). Under the maximum landings during 2015-2019 scenario, the recreational ACL would be reached as early as September 17 and as late as September 21, with **Preferred Alternative 3** reaching the ACL on September 21 (**Table 4.4.1.5**). Recreational landings of wahoo could exceed the recreational ACL without effective AMs for the recreational sector and result in adverse biological effects to the wahoo stock.

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
Preferred 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 during 2015-2019.

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

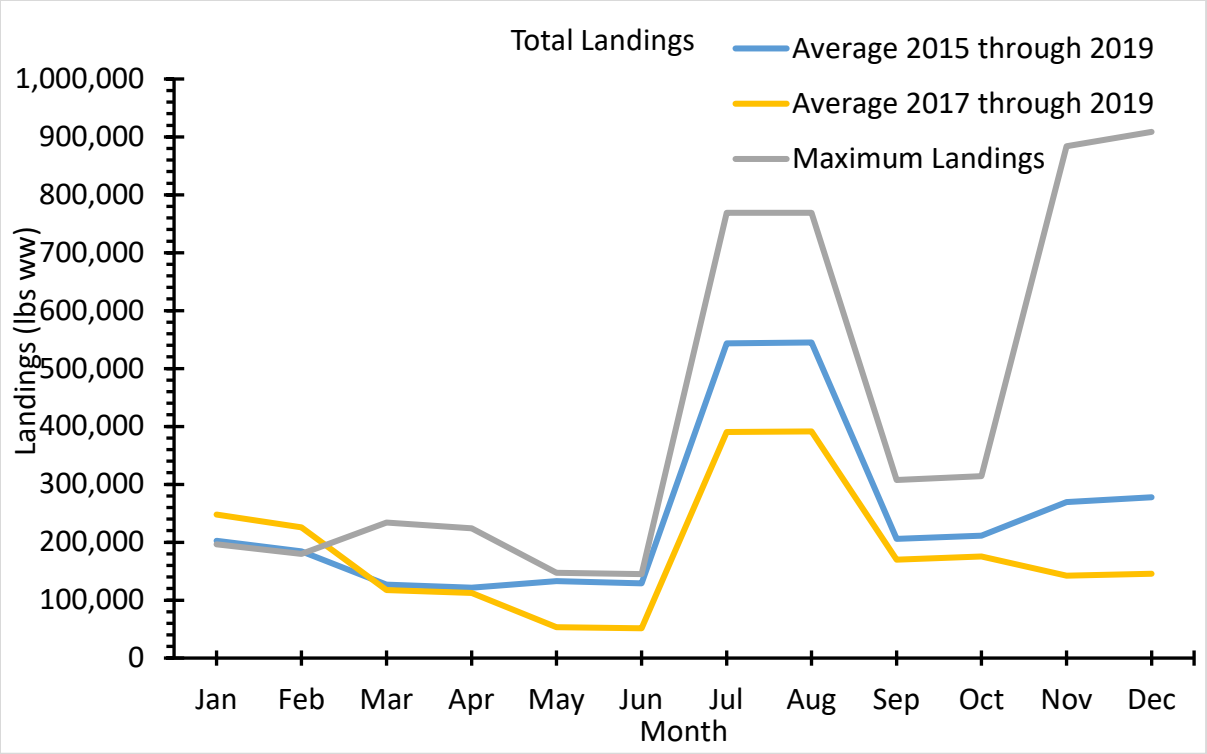

Figure 4.4.1.1. Wahoo total landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum annual landings during 2015-2019. The total landings are both the commercial and recreational landings combined.

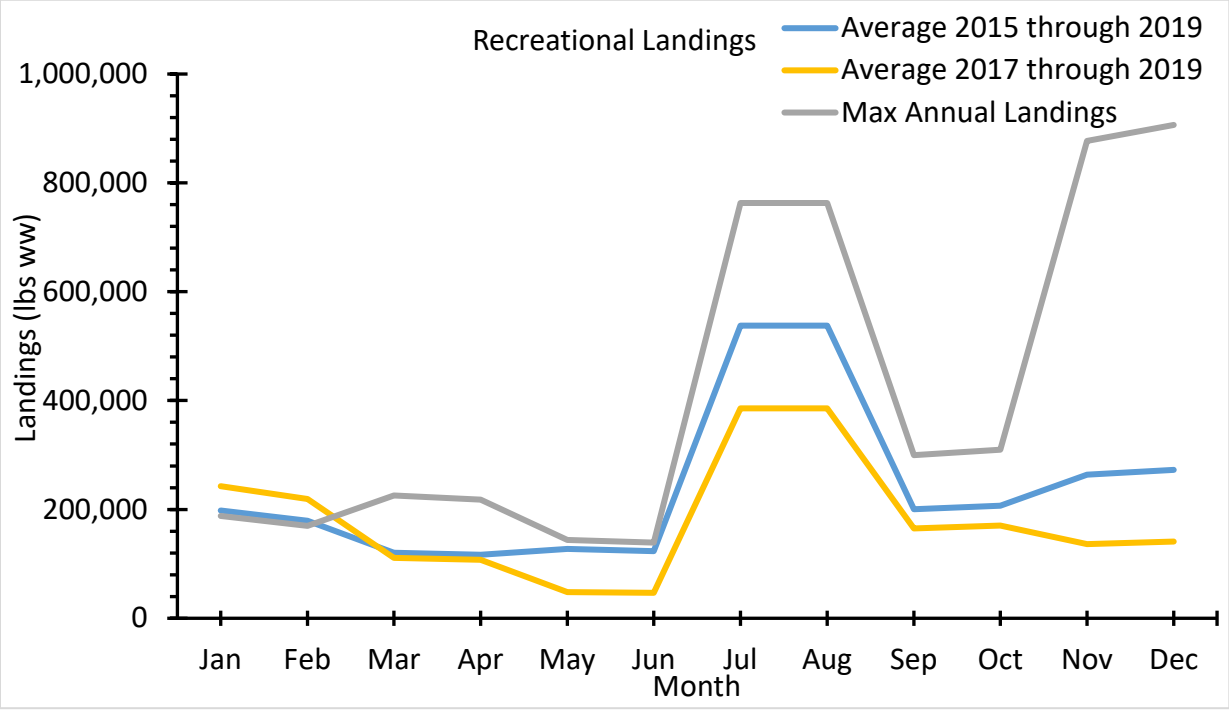

Figure 4.4.1.2. Wahoo recreational landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum annual landings during 2015-2019.

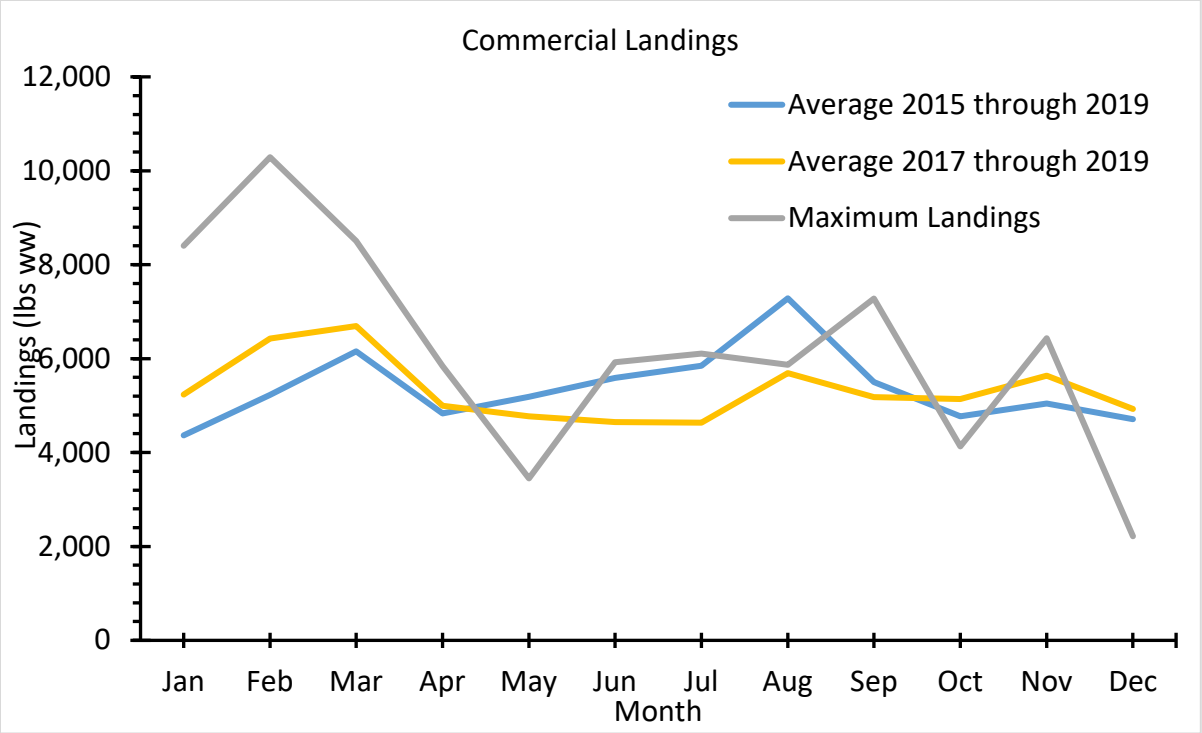

Figure 4.4.1.3. Wahoo commercial landings by month for the three landings scenarios of 1) average during 2015-2019, 2) average during 2017-2019, and 3) the maximum annual landings during 2015-2019.

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 annual landings during 2015-2019.

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
Preferred Alternative 3	**70,690**	**No**	**No**	**No**
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)
Preferred 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.

During 2015-2019, less than 1% of commercial wahoo trips reported average annual discards with very low numbers of species caught as bycatch (Table D.2.1.1 in Appendix D, BPA).

Recreational discards to landings ratio of wahoo during the same time period were less than 1% for charter vessels, 7% for headboats, and 6% for private recreational vessels; with higher numbers of species caught as bycatch (Tables D.2.1.3 and D.2.1.4 in Appendix D, BPA). **Preferred Alternative 3** would increase the commercial and recreational ACLs for wahoo; thereby, allowing more wahoo to be retained which would otherwise have been discarded. Given that the allocation changes are based on recent data more accurately estimating recreational harvest that has historically occurred, there is no anticipated change to fishing activity or behavior and thus, no changes in bycatch are expected from this action (**Appendix D,** BPA)**.**

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 long-term effects on the health of a stock. The ACL does not directly impact the fishery for a species unless harvest changes, fishing behavior changes, or the ACL is exceeded, thereby potentially triggering AMs such as harvest closures or other restrictive measures. As such, ACLs that are set above the observed landings in the fishery for a species and do not change harvest or fishing behavior may not have realized economic effects each year. Nevertheless, ACLs set above observed harvest levels do create a buffer between the ACL and typical landings that may be utilized in years of exceptional abundance or accessibility to a species, thus providing the opportunity for increased landings and a reduced likelihood of triggering restrictive accountability measures. As such there are potential economic benefits from ACLs that allow for such a buffer. The opposite would be true for ACLs that constrain harvest or fishing effort within a fishery or reduce the previously described buffer between average landings and the ACL.

Recreational Sector

Alternative 1 (No Action) would maintain the current sector allocation 96.07% of the total ACL to the recreational sector. Assuming Preferred Alternative 2 in Action 2, the resulting sector ACL 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 comparatively higher sector allocations and sector ACLs 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 if fishery conditions allow. These additional landings would be expected to comparatively increase total CS for the recreational sector. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 3** would result in the largest estimated increase in CS of $162,689, followed by **Alternative 4** and **Alternative 2** with estimated increases in CS of $102,230 and $30,776 respectively (2019 $) (**Table 4.4.2.1**).

Table 4.4.2.1. Comparison of the estimated change in consumer surplus (CS) for wahoo recreational sector ACLs in **Action 4** (2019 $).

Alternative	Difference between ACL and 5-year average landings (lbs ww)	Estimated change in CS	Comparison to Alternative 1 (No Action)
Alternative 1 (No Action)	-112,893	-$430,106	$0
Alternative 2	-104,815	-$399,330	$30,776
Preferred Alternative 3	**-70,191**	**-$267,417**	**$162,689**
Alternative 4	-86,060	-$327,876	$102,230

Assumptions used in calculating the estimates provided in **Table 4.4.2.1** include a consumer surplus (CS) estimate of $105 (2019 $) per fish was applied to the recreational buffer between average recent landings and the sector ACL which is the CS estimate for the second wahoo kept on a recreational trip (Section 3.3). This value was chosen since the bag limit for wahoo is two fish per person and there is no CS estimate available for the first fish. A weight of 27.56 lbs ww per wahoo was used to convert the recreational portion of the buffer from lbs ww to numbers of fish (Personal Communication, NOAA Southeast Fisheries Science Center SAFE Dataset, December 11, 2019). In comparing alternatives, **Alternative 1 (No Action**) was used as a baseline which applied the current allocation of 96.07% of the total ACL to the recreational sector. The total ACL in this case was based on Preferred Alternative 2 in Action 2 and applied to the alternatives in **Action 4**. All other alternatives considered in **Action 4** (**Alternatives 2** through **4**) would increase the recreational allocation on a percent and thus pound basis, thereby comparatively increasing economic benefits to the recreational sector. In the analysis of the action, it was also assumed that changes in the recreational portion of the total ACL would only affect catch per angler trip and not the overall number of trips. This included no change to for-hire fishing activity and thus no change in economic effects for the for-hire component of the recreational sector. As such there are no estimated changes in PS provided for the recreational sector.

Commercial Sector

Alternative 1 (No Action) would maintain the current sector allocation 3.93% of the total ACL to the commercial sector. The resulting sector allocation under Preferred Alternative 2 in Action 2 would be 113,392 lbs ww, which is the highest commercial sector ACL being considered in **Action 4**. **Alternatives 2** through **4** would result in comparatively lower sector allocations and sector ACLs for the commercial sector. Although none of the commercial 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 assumed that the commercial sector could fully harvest the sector ACL if conditions allow and there would be fewer potential landings of wahoo offered by **Alternatives 2** through **4** in comparison to **Alternative 1 (No Action)**. These relatively reduced landings would be expected to comparatively decrease total PS for the commercial sector. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 3** would result in the largest estimated reduction in PS of $39,886, followed by **Alternative 4** and **Alternative 2** with estimated decreases in PS of $25,064 and $7,545 respectively (2019 $) (**Table 4.4.2.2**).

Table 4.4.2.2. Comparison of the estimated change in producer surplus (PS) for wahoo commercial sector ACLs in **Action 4** (2019 $).

Alternative	Difference between ACL and 5-year average landings (lbs ww)	Estimated change in PS	Comparison to Alternative 1 (No Action)
Alternative 1 (No Action)	49,773	$46,491	$0
Alternative 2	41,695	$38,946	-$7,545
Preferred Alternative 3	**7,071**	**$6,605**	**-$39,886**
Alternative 4	22,940	$21,427	-$25,064

Assumptions used in calculating the estimates provided in **Table 4.4.2.2** include application of the five-year average breakdown of commercial PLL landings compared to all other gear (28% PLL and 72% other gear; **Tables 3.3.1.10** and **3.3.1.11**) within the fishery was applied to the commercial portion of the buffer. This provided proper application to the appropriate price ($3.75/lbs ww for PLL and $4.05/lbs ww for other gear; **Tables 3.3.1.10** and **3.3.1.11**) and net cash flow estimates (39.7% for PLL and 17.7% for other gear; **Section 3.3**) to estimate PS for the commercial sector. In comparing alternatives, **Alternative 1 (No Action**) was used as a baseline which applied the current allocation of 3.93% of the total ACL to the commercial sector. The total ACL in this case was based on Preferred Alternative 2 in Action 2 and applied to the alternatives in **Action 4**. All other alternatives considered in **Action 4** (**Alternatives 2** through **4**) would decrease the commercial allocation on a percent and thus pound basis, thereby comparatively decreasing economic benefits to the commercial sector. There were also no expected changes to CS from the commercial perspective. Although there are not current estimates of demand elasticity for wahoo, domestic harvest in the Atlantic was approximately 68,000 lbs per year based on 2015-2019 landings data (**Table 3.3.1.3**), while domestic harvest in the Pacific was approximately 1.5 million pounds per year on average from 2015-2019.[27] Overall, domestic harvest of wahoo in the Atlantic is relatively low in comparison to overall U.S. production of wahoo, therefore it is assumed that consumer prices are not likely notably driven by domestic Atlantic landings.

Change in Net Economic Benefits

In general, higher ACLs offer a larger buffer between the sector ACL and observed landings which allows for increased harvest when fishery conditions allow, thereby increase net economic benefits. Thus under this notion, the alternatives in **Action 4** can be ranked for the recreational sector from a short-term economic perspective with **Preferred Alternative 3** having the lowest potential for negative economic effects, followed by **Alternative 4**, **Alternative 2**, 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 positive economic effects, followed by **Alternative 2**, **Alternative 4**, and **Preferred Alternative 3**. In terms of estimated net benefits for the action, the same ranking would apply as stated for the recreational sector, with **Preferred Alternative 3** expected to increase net economic benefits by $122,803 (**Table 4.4.2.3**).

[27] According to NOAA Fisheries Landings Query available at https://www.fisheries.noaa.gov/foss.

Table 4.4.2.3. Estimated change in net economic benefits from the alternatives in **Action 4** in comparison to Alternative 1 (No Action)(2019 $).

Alternative	Estimated change in net economic benefits for the recreational sector	Estimated change in net economic benefits for the commercial sector	Estimated total change in net economic benefits
Alternative 2	$30,776	-$7,545	$23,231
Preferred Alternative 3	**$162,689**	**-$39,886**	**$122,803**
Alternative 4	$102,230	-$25,064	$77,167

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**, **Preferred 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 due to the decrease in fishing opportunity and concerns about long-term social effects, especially if other actions further decreased harvest opportunity. 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 would 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 for Action 2 – Preferred Alternative 2 indicate that the commercial ACL would not be met under **Alternative 1 (No Action)**, **Alternative 2**, **Preferred Alternative 3,** and **Alternative 4** (**Table 4.4.1.5**). Recreational landings may be met under all the alternatives proposed in **Action 4**. The recreational sector is projected to close between mid-September and late-December, with **Preferred Alternative 3**, offering the longest recreational season (**Table 4.4.1.5**).

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 2013b). The commercial sector is not expected to meet its commercial ACL under all three scenarios analyzed for this action (**Table 4.4.1.5**). Therefore, administrative effects for the commercial ACL alternatives would not vary among the alternatives considered in this action. For the recreational sector, administrative effects would not vary between **Alternative 1 (No Action)** and **Alternatives 2** through **Alternative 4** 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 such as time and costs related to announcing, education, and enforcement. would 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 **Preferred Alternative 3** (**Table 4.3.1.5**). It is noted that 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 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 **Alternative 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 peer-reviewed (for example, SEDAR) stock assessment for dolphin and therefore, it is unlikely to determine the stock status for dolphin as overfished. Biological benefits would be expected to be greater under **Alternative 2** (and its sub-alternatives) through **Alternative 6**, which would allow the recreational AM to be triggered, relative to **Alternative 1 (No Action)**. Biological effects would be variable depending on the combination of alternative(s) 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 to trigger for a post-season AM. Corrective measures (Action 6) would only occur the following year or years after the recreational ACL is exceeded.

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, thus resulting in corrective action the soonest among the alternatives considered. 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.

Alternatives*

1 (No action). If recreational landings exceed the recreational annual catch limit, then recreational landings will be monitored for persistence the following year. 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 only if the species is overfished and the total annual catch limit is exceeded.

2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year mean (Sub-alternative 2a or 2b) of landings exceeds the recreational sector annual catch limit.
   2a. Use the arithmetic mean to calculate average landings.
   2b. Use the geometric mean to calculate average landings.

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.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

Preferred Alternative 5 would require the total (commercial and recreational) ACL to be exceeded before the post-season AM is triggered. The total ACL would only be reached under the maximum landings for a single year during the 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 ABC in any single year. During 2017-2019,

this trigger would have only occurred when the total ACL would have been exceeded because total ABC is set equal to the total ACL.

Alternative 3 would require the summed total of the most recent past three years of recreational landings to exceed the sum of the recreational ACLs for the past three years. During 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 mean (arithmetic under **Sub-alternative 2a** and geometric under **Sub-alternative 2b**) of landings to exceed the recreational ACL. The moving multi-year geometric mean of landings (**Sub-alternative 2b**) would start over if the recreational ACL were changed in any of those 3 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. The geometric mean (the cubic root of the product of three landings estimates in the case being examined) is an averaging technique used to estimate the likely average when data are skewed on the high side of the mean. Because the geometric mean is designed to reduce the influence of high values, it reduces a spike in landings more than the average (arithmetic mean) and is lower than the average observed in the data used in this amendment. This results in the geometric mean having the highest risk of not triggering an AM among the alternatives if the spike in the data is a true observation, but lowest risk of triggering AMs if the spike in the data is due to random error. Using the geometric mean under **Sub-alternative 2b** is a liberal choice among the alternatives considered in this action, with a lower chance of triggering the post-season AM. Therefore, positive biological effects would be greater under **Alternative 6**, followed by **Preferred Alternative 5**, **Alternative 4**, **Alternative 3**, and **Alternative 2** (and its sub-alternatives).

The alternatives in this action would implement criteria that would initiate AMs to reduce the chances that the recreational ACL is exceeded. These alternatives are largely administrative and are not expected to result in changes to bycatch/discards.

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. Thus, the economic effects of the trigger for the AM are indirect rather than direct. These corrective measures typically create short-term negative economic effects by curtailing harvest and fishing activity, thus potentially affecting net revenues of for-hire operations and CS on recreational fishing trips. In the long-term, these measures also help reduce the risk of overfishing a stock to the point of notable reduction, which results in long-term economic benefits through sustained harvest and fishing activity as well as avoiding the 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 5-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 are above the recreational sector ACL specified in Action 3, 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 exceeded and there is notable 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 if for-hire trips decrease 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. Out of these alternatives, **Alternative 2** would be the least likely to be triggered, as it uses a three-year 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, potentially 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. **Sub-alternative 2a** would use an arithmetic mean while **Sub-alternative 2b** would use a geometric mean. Geometric mean provides a lower comparative estimate to arithmetic mean, thus **Sub-alternative 2b** would have a relatively higher threshold if used to trigger the recreational AM compared to **Sub-alternative 2a**. **Alternative 3** likely has similar economic effects those described for **Alternative 2** but is more stringent since the threshold to trigger the AM is lower.

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 harvest to potentially continue 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 summed total (**Alternative 3**) or arithmetic mean (**Alternative 2/Sub-alternative 2a**, or to a lesser extent the three-year geometric mean (**Alternative 2/Sub-alternative 2b**) in such a way that AMs would remain in place for multiple years until these longer-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 (Preferred)**, and **6** that do not solely rely on the use of multi-year metrics for triggering an AM.

Alternative 4 and **Preferred Alternative 5** 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. **Alternative 6** would have the highest probability 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 ABC would need to be exceeded 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 triggered 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. **Preferred Alternative 5** would fall between **Alternatives 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 **Sub-Alternative 2a**, **Sub-Alternative 2b**, **Alternative 3**, **Preferred 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. However, dolphin is unassessed and there is not a stock assessment currently planned. As a result, the current AM trigger is not viable and may delay needed management of dolphin. Proposed alternatives would use various methods to trigger post season AMs based upon landings. **Sub-alternative 2a** would use the arithmetic mean to calculate average landings over the last three years while **Sub-alternative 2b** uses the geometric mean over the past three years, which could be beneficial if landings in one or more years were artificially estimated to be 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.

Preferred Alternative 5 and **Alternative 6** are more conservative triggers, with **Alternative 6** being the most 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.

Alternatives 3 through **6** are less complicated and thus easier for fishery participants to understand, with the simplest trigger option under **Alternative 6**. Simplicity in regulations would be expected to reduce confusion among dolphin fishermen and aid in compliance.

4.5.4 Administrative Effects

Alternative 1 (No Action) would be the least burdensome compared to **Alternatives 2** through **6**, but it is not a viable alternative as explained in **Section 4.5.1**. Administrative effects would be greater under **Alternative 2** (and its sub-alternatives), followed by **Alternative 3**, **Alternative 4**, **Preferred Alternative 5**, and **Alternative 6**. Administrative burdens include data monitoring, rulemaking, outreach, and enforcement. **Alternative 2** (and its sub-alternatives) is more complex in that the 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 would start over. **Alternatives 3** through **6** are less complicated, 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 peer-reviewed (for example, SEDAR) stock assessment for dolphin and therefore, it is unlikely to determine the stock status for dolphin as overfished. **Preferred 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 if the recreational ACL were exceeded.

Alternatives*

1 (No action). If recreational landings exceed the recreational annual catch limit, then recreational landings will be monitored for persistence the following year. 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 only if the species is overfished and the total annual catch limit is exceeded.

2. Reduce the length of the following recreational fishing season.

3. Reduce the bag limit in the following recreational fishing season.

4. Reduce the vessel limit in the following recreational fishing season.

5. In the following fishing year monitor landings, and if by September 1 of each year landings are projected to meet the sector ACL that fishing year, reduce the bag limit (Sub-alternatives 5a through 5e). If reductions in the bag limit are projected to be insufficient also reduce the vessel limit to prevent the annual catch limit from being exceeded (Sub-alternatives 5f through 5i). If reductions in the bag limit and vessel limit are not implemented or are projected to be insufficient to constrain harvest to the ACL, then also reduce the length of the recreational fishing season.

5a. Reduce the bag limit by the amount necessary but not below 2 fish per person per day.

5b. Reduce the bag limit by the amount necessary but not below 3 fish per person per day.

5c. Reduce the bag limit by the amount necessary but not below 4 fish per person per day.

5d. Reduce the bag limit by the amount necessary but not below 5 fish per vessel per day.

5e. Do not reduce the bag limit.

5f. Reduce the vessel limit by the amount necessary but not below 10 fish per vessel per day.

5g. Reduce the vessel limit by the amount necessary but not below 20 fish per vessel per day.

5h. Reduce the vessel limit by the amount necessary but not below 30 fish per vessel per day.

5i. Do not reduce the vessel limit.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

Positive biological effects would be greatest under **Preferred Alternative 2**, followed by **Alternatives 4**, **3**, and **5**. Under **Preferred Alternative 2**, the length of the following recreational fishing season would be reduced. This would be the most effective way to ensure the recreational ACL is not exceeded. **Alternative 3** would reduce the bag limit in the following recreational fishing season, but as shown in **Figures 4.6.1.1**, **4.6.1.2**, and **4.6.1.3**. 90-98% of private recreational and charter vessel trips (MRIP) and 99-100% of headboat trips retained 1-5 fish per person. **Figure 4.6.1.1** does indicate a minor percentage of trips over the bag limit (approximately 3%). However, this does not necessarily represent illegal harvest, but rather is an artifact of analyzing MRIP data, which records the number of anglers on a trip but does not

record captain or crew on a trip. Captain and crew may retain a bag limit of dolphin, provided the vessel limit of 60-dolphin is not exceeded. Of the 3% of trips that exceeded the bag limit, the majority of those trips (92%) came from charter mode. As such, a limited number of trips may appear to have exceeded the bag limit when analyzed for the number of anglers present but in reality the captain and crew may not have been accounted for in the observed data.

Alternative 4 would reduce the vessel limit in the following fishing season. Analysis of the alternatives under Action 11 show reduction in recreational landings for the private recreational vessels and charter vessels (MRIP) were as high as 12.70% for the entire Atlantic region and nearly zero for east Florida, and South Carolina, Georgia, and east Florida combined (**Table 4.11.1.1**). Percent reductions between east Florida and South Carolina, Georgia, and east Florida combined are the same because all of the intercepted trips in South Carolina and Georgia had less than 30 dolphin on a vessel (**Table 4.11.1.1**, **Figures 4.6.1.2** and **4.6.1.3**). **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 consecutive years of exceeding the recreational ACL may have occurred.

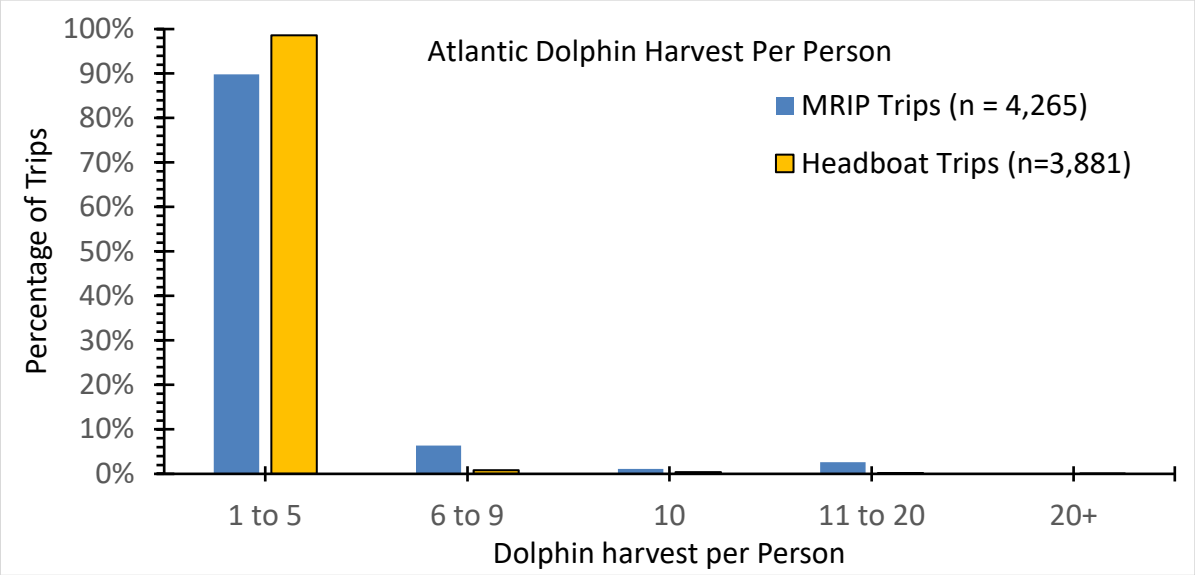

Figure 4.6.1.1. Percentage of trips for dolphin harvested per person. The data are from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and Headboat are provided. The dolphin stock is from Maine to east Florida (including Monroe County, Florida).

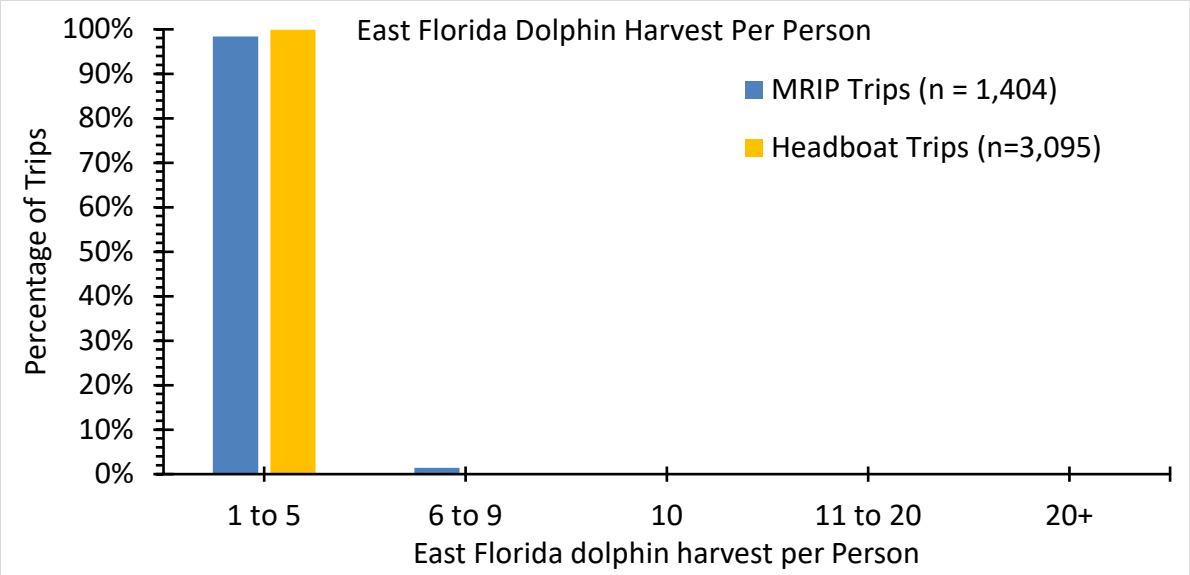

Figure 4.6.1.2. Percentage of trips for a range of east Florida dolphin harvested per person. The data are from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and Headboat are provided. East Florida includes data from Monroe County, Florida.

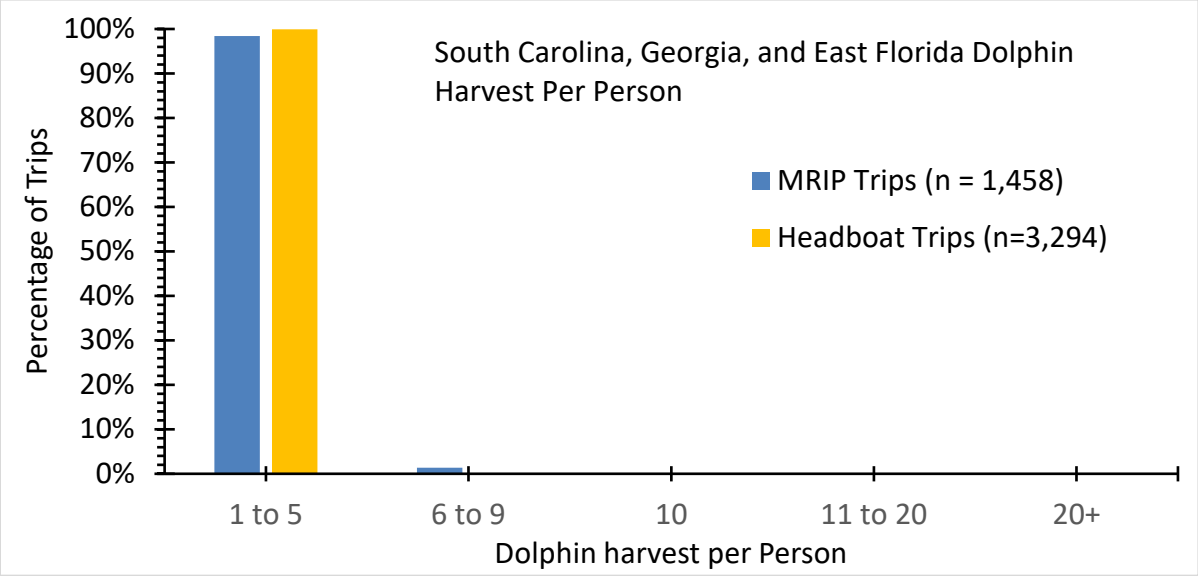

Figure 4.6.1.3. Percentage of trips for a range of South Carolina, Georgia, and east Florida dolphin harvested per person. The data are from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and Headboat are provided. East Florida includes data from Monroe County, Florida.

This action could increase the level of discards/bycatch if regulations force fishermen to return fish to the water. However, when considered in concert with the increased dolphin total and sector ACLs proposed in Actions 1 and 3, and no anticipated change to fishing activity or behavior with the higher ACLs, no changes in bycatch are expected for **Action 6** (Appendix E, BPA).

4.6.2 Economic Effects

In years when a recreational AM is not triggered, there are no economic effects. Thus, there would be no economic effects from **Action 6** 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 6**.

Should the trigger for the recreational AM be met from Action 5, the potential economic effects of **Action 6** would vary depending on the alternative that is examined. **Alternative 1 (No Action)** would implement a payback provision for an overage of the sector ACL that would reduce the sector ACL by the amount of the overage and reduce the fishing season. The economic effects of a reduced fishing season would depend on the severity of the reduction, the timing, and the availability of other species that could be suitable substitutes for dolphin. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced ACL would result in fewer dolphin harvested, which would result in lower CS (i.e., net economic benefits) for recreational anglers.

Preferred Alternative 2 also would reduce the fishing season, thus resulting in similar economic effects as those described for **Alternative 1 (No Action)** but to a lesser degree since there is no payback provision for an overage of the sector ACL. A reduced bag limit under **Alternative 3** may reduce the total harvest per angler on trips that meet or exceed the revised bag limit. The individual economic effects of this alternative would be dependent on how many potential fish are removed from the existing bag limit of 10 dolphin per person and the ability of the angler to fully land above the revised bag limit. Consumer surplus on for-hire trips may be less affected than those on private recreational trips since the captain and crew will maintain the ability to retain their bag limit under the existing regulations. In aggregate, the net economic effects would depend on the total harvest reduction that results from the AM being triggered. A reduction in bag limit may also reduce the demand for and the number of for-hire trips that are taken, thus decreasing net operating revenue for for-hire businesses. The extent to which for-hire trips may be affected would depend on the severity of the bag limit reduction. Based on **Figures 4.6.1.1** through **4.6.1.3** as well as public comments, vessels and anglers fishing in the waters north of South Carolina, particularly those in North Carolina, tend to harvest more dolphin per trip on average, thus reductions in retention limits, such as the bag limit, may incur more severe negative economic effects regionally for vessels in North Carolina and states further north than those in South Carolina, Georgia, or Florida.

The economic effects of a reduced vessel limit in **Alternative 4** would be similar to those described for **Alternative 3** but potentially to a lesser degree, particularly on trips with few anglers onboard. **Alternative 5** would produce similar economic effects to those described in **Alternative 3** and **4**, depending on the sub-alternative that is chosen. Since this alternative would delay and potentially prevent restrictive measures from going into place until there is an indication that the sector ACL will be met or exceeded, this is likely the least restrictive alternative and thus would have the lowest potential negative economic effects that would arise from reduced CS for recreational anglers or reduced net operating revenue for for-hire businesses in the short-term.

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

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. As such, **Alternative 1 (No Action)** would never be implemented and would not result in lost fishing opportunities resulting from payback of a previous season's overage.

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 (**Preferred Alternative 2**, and **Alternative 5**) is anticipated to result in direct negative social effects associated with loss of access to the resource. **Alternative 5** would include close monitoring of landings 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.

The social effects of reducing the bag limit (**Alternative 3**) or the vessel limit (**Alternative 4**) 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 would 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. The positive and negative social effects would depend on the likelihood of harvest being open during times of the year when it is easy to access and/or profitable to target dolphin. The timing and importance of different species can vary considerably by state and locations where dolphin is an important species are more likely to experience the direct social effects of reducing the bag or vessel limits. The communities of Mayport, Florida; Hatteras and Wanchese, North Carolina demonstrate comparatively high landings of dolphin and a reliance upon recreational fishing (Section 3.2.2). These communities would most likely have local economies with some dependence upon recreational fishing and its supporting businesses.

Alternative 5 would provide similar social effects as the alternatives described above as it includes bag limit and vessel limit reductions and the option of season length adjustments as needed. The extent to which higher bag limits and long seasons are balanced and the associated social effects would depend on the sub-alternative chosen. Currently, 90-98% of private recreational and charter vessel trips (MRIP) and 99-100% of headboat trips land 5 fish per person or less (**Figure 4.6.1.1**) and analysis for Action 11 shows that reductions in the 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 **Preferred Alternative 2** through **Alternative 5**, 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 **Preferred Alternative 2**, **Alternatives 3**, and **4**, because they would involve different post-season AMs (reduced season length, bag limit, and vessel limit, respectively). Administrative effects would be most burdensome under **Alternative 5** because it is complicated and would result in additional time and costs.

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 therefore, stock status is unknown. Biological benefits would be expected to be greater under **Preferred Alternative 2** through **Alternative 6**, which would allow the recreational AM to be triggered, when compared with **Alternative 1 (No Action)**. Biological effects would be variable depending on the combination of alternative(s) 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 to trigger an AM. Corrective measures (Action 8) would only occur the following year or years after the recreational ACL is exceeded.

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, thus resulting in corrective action the soonest among the alternatives considered. Table 4.4.1.5 in Action 4 shows that an overage of the recreational ACL could occur under two scenarios: average landings during 2015-2019 and maximum landings for a single year during 2015-2019.

Alternatives*

1 (No action). If recreational landings exceed the recreational annual catch limit, then recreational landings will be monitored for persistence the following year. 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 only if the species is overfished and the total annual catch limit is exceeded.

2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year mean (Sub-alternative 2a or 2b) of landings exceeds the recreational sector annual catch limit.

2a. Use the arithmetic mean to calculate average landings.

2b. Use the geometric mean to calculate average landings.

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.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

Alternative 5 would require the total (commercial and recreational) ACL be exceeded before the post-season AM is triggered. The total ACL would also be reached under the 2 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 ABC in any single year. During 2017-2019,

this trigger would have only occurred when the total ACL would have been exceeded because total ABC is set equal to the total ACL.

Alternative 3 would require the summed total of the most recent past three years of recreational landings to exceed the sum of the recreational ACLs for the past three years. 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. **Alternative 3** would not have triggered post-season AM under status quo as well as under the revised recreational ACL.

Preferred Alternative 2 would require the recreational ACL to be constant and the 3-year mean (arithmetic under **Sub-alternative 2a** and geometric under **Preferred Sub-alternative 2b**) of landings to exceed the recreational ACL. The moving multi-year geometric mean of landings (**Preferred Sub-alternative 2b**) would start over if the recreational ACL were 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. The geometric mean (the cubic root of the product of three landings estimates in the case being examined) is an averaging technique used to estimate the likely average when data are skewed on the high side of the mean. Because the geometric mean is designed to reduce the influence of high values, it reduces a spike in landings more than the average (arithmetic mean) and is lower than the average observed in the data used in this amendment. This results in the geometric mean having the highest risk of not triggering an AM among the alternatives if the spike in the data is a true observation, but lowest risk of triggering AMs if the spike in the data is due to random error. Using the geometric mean under **Preferred Sub-alternative 2b** is a liberal choice among the alternatives considered in this action, with a lower chance of triggering the post-season AM. Therefore, among the alternatives in **Action 7**, biological effects would be expected to be greater under **Alternatives 6** and **5**, followed by **Alternative 4**, **Alternative 3**, and **Preferred Alternative 2 (Sub-alternative 2a** and **Preferred Sub-alternative 2b)**.

The alternatives in this action would implement criteria to initiate AMs to reduce the chances that the recreational ACL is exceeded. These alternatives are not expected to result in changes in daily fishery operations, and therefore, are not expected to result in changes to bycatch/discards.

4.7.2 Economic Effects

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 be 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 wahoo and thus the species would not be expected to be deemed overfished. Under this alternative, the recreational sector could continue to harvest wahoo above the sector ACL unabated by an AM. This would lead to short-term economic benefits through potential elevated harvest and fishing activity for wahoo, 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 exceeded 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 (Preferred) 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, **Preferred Alternative 2** would be the least likely to be triggered, as it uses a three-year 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 of **Preferred Alternative 2** 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. **Sub-alternative 2a** would use an arithmetic mean while **Preferred Sub-alternative 2b** would use a geometric mean. Geometric mean provides a lower comparative estimate to arithmetic mean, thus **Preferred Sub-alternative 2b** would have a relatively higher threshold if used to trigger the recreational AM compared to **Sub-alternative 2a**.

Alternative 3 likely has similar economic effects those described for **Preferred Alternative 2** but is more stringent since the threshold to trigger the AM is lower. Both **Preferred 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 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 slow down landings to prevent the sector ACL or total ACL from being exceeded, there is the potential that a single year of extremely high recreational landings could influence the three-year arithmetic mean (**Sub-alternative 2a**) or geometric mean (**Preferred Sub-alternative 2b**), or the three-

year summed total (**Alternative 3**) in such a way that AMs would remain in place for multiple years until these long-term metrics would revert below the threshold for the AM trigger. In such a scenario, there would be 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 and **5** 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. **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 triggered 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 **Alternatives 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 **Preferred Sub-alternative 2b, Sub-alternative 2a**, **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 landings. **Preferred Alternative 2** proposes using the arithmetic mean to calculate average landings over the past three years (**Sub-alternative 2a**) or the geometric mean over the past three years (**Preferred Sub-alternative 2b**), which could be beneficial if 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 most 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 **Preferred Alternative 2** through **Alternative 6**, but **Alternative 1 (No Action)** is not a viable alternative as explained in **Section 4.7.1**. Administrative effects would be greater under **Preferred Alternative 2** (including **Sub-alternative 2a** and **Preferred Sub-alternative 2b**), followed by **Alternative 3**, **Alternative 4**, **Alternative 5**, and **Alternative 6**. Administrative burdens include data monitoring, rulemaking, outreach, enforcement, time and associated costs. Under **Preferred Alternative 2** and **Preferred Sub-Alternative 2b** the recreational ACL would have to be constant for three years, and if in any year the recreational ACL is changed, the moving multi-year geometric mean of landings would start over. **Alternatives 3** through **6** are less complicated 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 year and the recreational season will be reduced only if the species is overfished and the total annual catch limit is exceeded.

2. Reduce the length of the following recreational fishing season.

3. Reduce the bag limit in the following recreational fishing season.

4. Implement a vessel limit in the following recreational fishing season.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

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 therefore, stock status is unknown. **Preferred Alternative 2** through **Alternative 4** 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 **Preferred Alternative 2**, followed by **Alternatives 4**, and **Alternative 3**.

Under **Preferred Alternative 2**, the length of the following recreational fishing season would 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.

If a recreational fishing season is shortened as proposed under **Preferred Alternative 2**, discard levels of wahoo could increase. However, when considered in concert with the increased total ACL and sector ACLs in **Actions 2** and **4** for wahoo, and no anticipated change to fishing activity or behavior with the higher ACLs, no changes in bycatch are expected for **Action 8 (Appendix D, BPA)**.

4.8.2 Economic Effects

In years when a recreational AM is not triggered, there are no economic effects, thus there would be no economic effects from **Action 8** 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 are potential realized economic effects from the alternatives in **Action 8**.

Should the trigger for the recreational AM be met from Action 7, the potential economic effects of **Action 8**, would vary depending on the alternative that is examined. **Alternative 1 (No Action)** would implement a payback provision for an overage of the sector ACL that would reduce the sector ACL by the amount of the overage and reduce the fishing season, if wahoo is overfished and the total ACL is met. The economic effects of a reduced fishing season would depend on the severity of the reduction, the timing, and the availability of other species that could be suitable substitutes for wahoo. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced ACL would result in fewer wahoo harvested, which would result in lower CS (i.e., net economic benefits) for recreational anglers.

Preferred Alternative 2 would reduce the fishing season. The economic effects of a reduced fishing season would depend on the severity of the reduction, the timing, and the availability of other species that could be suitable substitutes for wahoo. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced fishing season would result in fewer wahoo harvested, which would result in lower CS (i.e., net economic benefits) for recreational anglers. A reduced bag limit under **Alternative 3** may reduce the total harvest per angler on trips that meet or exceed the revised bag limit. The individual economic effects of this alternative would be dependent on the ability of the angler to fully land above the revised bag limit. Consumer surplus on for-hire trips may be less affected than those on private recreational trips since the captain and crew would maintain the ability to retain their bag limit under the existing regulations. In aggregate, the net economic effects would depend on the total harvest reduction that results from the AM being triggered. A reduction in bag limit may also reduce the number of for-hire trips that are taken, thus decreasing net operating revenue for for-hire businesses. The economic effects of a vessel limit in **Alternative 4** would be similar to those described for **Alternative 3** but potentially to a lesser degree, particularly on trips with few anglers onboard.

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

4.8.3 Social Effects

Alternative 1 (No Action) would require payback by the amount of the previous season's 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)** includes close monitoring of the landings 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)**, **Preferred Alternative 2**,) 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**) or the vessel limit (**Alternative 4**) 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 would 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 **Preferred Alternative 2** through **Alternative 4**, 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 **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4**, because they would all involve different post-season AMs (reduced season length, bag limit, and vessel limit, respectively).

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.

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.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

4.9.1 Biological Effects

Under **Alternative 1 (No Action)**, 38 vessels harvested an average of 78 lbs ww of dolphin and three vessels harvested an average of 59 lbs ww of wahoo during 2015-2019 (**Tables 3.3.1.12** and **3.3.1.13**). The biological benefits to dolphin and wahoo would be greatest for the alternatives that allow for the least amount of harvest. However, given that the sector ACLs for dolphin and wahoo would be increased in Actions 3 and 4, and the current AM would continue to close the commercial sector if the commercial ACL is reached or projected to be reached, an increase in the trip limit would not be expected to have a negative biological effect on dolphin and wahoo. The biological effects between **Alternative 1 (No Action)**, **Preferred Alternative 2** (including **Sub-alternative 2a** and **Preferred Sub-alternative 2b**), and **Preferred Alternative 3** would be expected to be similar as the trip limits are similar among the alternatives.

Higher trip limits considered under **Sub-alternative 2c** (750 lbs ww) and **Sub-alternative 2d** (1,000 lbs ww) could provide an incentive for the current incidental harvest of dolphin to convert to a targeted harvest with more vessels involved and thus have fewer biological benefits than the Council's preferred alternateives. These alternatives could result in a shorter commercial season for dolphin due to an in-season closure and result in regulatory discards.

Due to the increase in ACLs proposed for dolphin and wahoo and no expected change in fishing practices, no changes in bycatch or discards would be expected from this action.

4.9.2 Economic Effects

Alternative 1 (No Action) would continue to disallow landings of dolphin or wahoo on trips with trap, pot, or buoy gear on board. While such landings have occurred in the past, presumably these landings would eventually move towards zero as public awareness grew regarding this prohibition as well as awareness of such landings amongst the law enforcement community. As such, this alternative would result in decreased economic benefits for affected commercial vessels through foregone landings of dolphin or wahoo and thus revenue when trap, pot, or buoy gear was on board a vessel.

Preferred Alternative 2 would result in net economic benefits by allowing long-term potential elevated revenue on some commercial trips where trap, pot, and buoy gear that are unauthorized for use in the dolphin and wahoo fishery are on board and dolphin landed by rod and reel gear are retained. The economic effects on individual vessel owners from **Preferred Alternative 2** would depend on each owner's profit maximization strategy, their dependence on dolphin, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Some vessel owners may benefit from additional dolphin landings, while others may not. These types of individual vessel level effects cannot be determined with available models; however, increases in revenues derived from the commercial harvest of dolphin on trips already occurring for other species would result in elevated net revenues and thus increased net economic benefits for the commercial sector. Additionally, higher trip limits would allow for elevated net economic benefits, therefore **Sub-alternative 2d** would have the potential for the highest economic benefits followed by **Sub-alternative 2c**, **2b (Preferred)**, and **2a**.

Preferred Alternative 3 would result in net economic benefits by allowing long-term elevated revenue on some commercial trips where trap, pot, and buoy gear that are unauthorized for use in the dolphin and wahoo fishery are onboard and wahoo landed by rod and reel gear are retained. The economic effects on individual vessel owners from **Preferred Alternative 3** would depend on each owner's profit maximization strategy, their dependence on wahoo, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Some vessel owners may benefit from additional wahoo landings, while others may not. These types of individual vessel level effects cannot be determined with available models; however, increases in revenues derived from the commercial harvest of wahoo on trips already occurring for other species would result in elevated net revenues and thus increased net economic benefits for the commercial sector.

Based on the landings provided in Tables 3.3.1.12 and 3.3.1.13, it is assumed that the economic benefits for **Preferred Alternative 2** would be comparatively higher than **Preferred Alternative 3.** Economic benefits for commercial vessels would be highest under **Sub-alternative 2d**, followed by **Sub-alternative 2c**, **Preferred Sub-alternative 2b**, **Sub-alternative 2a**, **Preferred Alternative 3**, and **Alternative 1 (No Action)**. In general, dealers are indirectly affected whenever gross revenues to commercial fishing vessels are expected to change (e.g., increases in gross revenues are expected to indirectly benefit dealers and vice versa). Thus, the ranking of economic benefits to dealers would be the same as for commercial fishing vessels.

4.9.3 Social Effects

In general, management measures that increase the number of fish a commercial vessel 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. Wahoo is expected to reach its commercial ACL which would trigger the AMs, closing harvest, resulting in negative social effects due to restricted access to the resource.

Allowing harvest of dolphin (**Preferred Alternative 2**) and wahoo (**Preferred 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 may not possess 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 fish available to the market or for personal consumption. Under **Preferred Alternative 2** the greater the trip limit for dolphin, the greater opportunity for social benefit (**Sub-alternative 2d**, **Sub-alternative 2c**, **Preferred Sub-alternative 2b**, **and Sub-alternative 2a**). 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 for fishing communities.

4.9.4 Administrative Effects

Administrative burdens such as data monitoring, outreach, and enforcement would be greater under **Preferred Alternative 2** (including **Sub-alternatives 2a** through **2d**) and **Preferred Alternative 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 **Preferred Alternative 2** (including **Sub-alternatives 2a** through **2d**) and **Preferred Alternative 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

No biological effects on dolphin and wahoo would be expected under **Preferred Alternatives 2** and **3**, when compared with **Alternative 1 (No Action)**, because this action does not impact the harvest levels for dolphin or wahoo in any manner. **Preferred Alternatives 2** and **3** would simply remove the requirement for the vessel operator or crew member to hold an operator card onboard a vessel with an Atlantic Charter/Headboat for Dolphin/Wahoo Permit and Atlantic Dolphin/Wahoo Commercial Permit, respectively, and not have any effect on harvest levels, etc.

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.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

This action deals purely with operator licensing and is not expected to affect fishing activities in any way, and therefore, would not impact bycatch/discards in the dolphin and wahoo fishery.

4.10.2 Economic Effects

Alternative 1 (No Action) would maintain the operator card requirement for for-hire and commercial participants in the dolphin and wahoo fishery. This requirement results in direct costs to fishery participants through application fees and associated preparation costs incurred including obtaining two passport photos, postage, time to prepared and send the application materials once every three years. Removing the operator card requirement would result in direct economic benefits to captain and crew members that operate for-hire and commercial vessels permitted to fish in the dolphin and wahoo fishery through forgone costs. There is a $50 application fee to obtain an operator card from the Southeast Regional Office (SERO), as well as the need to obtain two passport style photographs and the postage required to mail in a completed application (2019$). There is no application fee to obtain an operator card from the Greater Atlantic Regional Fisheries Office (GARFO). The estimated cost of two passport style photographs is $14.99[28] and postage is $0.55[29] per letter (2019$). It is estimated that it takes approximately 1 hour to prepare an operator card application and the necessary materials which would equate to $25.25 based on an applicable assumed hourly wage[30] (2019$). The total

[28] Based on advertised costs at Walgreens and CVS at https://photo.walgreens.com/store/passport-photos#:~:text=%2414.99,listed%20in%20the%20table%20below) and https://www.cvs.com/photo/passport-photos.
[29] Based on advertised costs at the U.S. Postal Service at https://www.usps.com/business/prices.htm.
[30] Based on the May 2019 mean hourly wage for first-line supervisors of farming, fishing, and forestry workers from the U.S. Bureau of Labor Statistics at https://www.bls.gov/oes/current/oes451011.htm.

estimated cost per card holder to obtain an operator card is $90.79 from SERO and $40.79 from GARFO (2019$). Since operator cards are valid for three years, the annualized cost of an operator card per card holder is $30.26 from SERO and $13.60 from GARFO (2019$). Removal of these costs would apply to captains or crew members that operate for-hire vessels under **Preferred Alternative 2** and commercial vessels under **Preferred Alternative 3**.

To estimate the cumulative economic benefits of removing the operator card requirement, an estimate of the number of affected vessels and average benefit per vessel must be determined. Since the number of active dolphin wahoo permits has generally been increasing in most recent years, permit numbers for 2019 (the most recent year of available data) was used for estimating the total number of vessels that may be affected and the economic effects of **Action 10**. In 2019, 2,722 vessels held a valid commercial dolphin wahoo permit (ADW), 2,360 vessels held a valid for-hire dolphin wahoo permit (CDW), and 4,070 vessels had at least one of the federal dolphin wahoo permits (Table 3.3.1.1, Table 3.3.2.12, NMFS SERO SF Access Permits Database). The estimated annual cumulative economic benefits of removing the operator card requirement would be $214,264 under **Preferred Alternative 2**, $247,130 under **Preferred Alternative 3**, and $369,515 under **Preferred Alternatives 2** and **3** combined (2019 $) (**Table 4.10.2.1**). While it is difficult to partition the combined effects of **Preferred Alternatives 2** and **3** by sector due to dually permitted vessels, assuming application of half of the economic effects to the commercial sector and half to the recreational sector (for-hire specifically) for dually permitted vessels, the resulting economic effects would cover 2,266 commercial permit holders and 1,804 for-hire permit holders. Based on this assumption, removal of the operator card requirement would result in annual net economic benefits of $205,730 to the commercial sector and $163,785 to the recreational sector (2019 $).

In terms of estimated economic benefits, **Preferred Alternative 3** would have the highest estimated economic benefits followed by **Preferred Alternative 2** and **Alternative 1 (No Action)**. There are several additional assumptions implicit in these estimates in addition to those previously mentioned. Since operator cards can be used across multiple fisheries, these cards may still be required of the card holder even if the requirement is removed in the dolphin and wahoo fishery, therefore the estimate provided should be viewed as an upper bound estimate of net economic benefits for **Action 10**. Furthermore, as noted an operator card issued by GARFO does not include an application fee, while there is a $50 fee for operator cards issued by the SERO. Because operator cards are issued to an individual rather than a vessel, it is unknown how many operator cards are issued to operators of vessels that also have a dolphin wahoo permit. Since the majority of fishing activity for dolphin and wahoo occurs in the South Atlantic region, it was assumed in the cumulative economic estimates provided in **Table 4.10.2.1** that the application fee applied to all affected individuals.

Table 4.10.2.1. Estimated cumulative economic benefits of **Action 10** (2019$).

Alternative	Number of vessels affected	Estimated cumulative benefits
Alternative 1 (No Action)	0	$0
Preferred Alternative 2	**2,360**	**$214,264**
Preferred Alternative 3	**2,722**	**$247,130**
Preferred Alternatives 2 and 3	**4,070**	**$369,515**

Source: NMFS SERO SF Access Permits Database.

4.10.3 Social Effects

Alternative 1 (No Action) and **Preferred 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 and are burdensome to renew annually. Additionally, law enforcement officials have indicated that operator cards are no longer regularly used to aid in enforcement efforts or gathering data and distributed information. **Preferred 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 **Preferred 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 **Preferred 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[31] :

"(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 and 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, and stated that the operator cards are not used for gathering data, distributing information, or enforcement to a large extent. **Preferred Alternatives 2** and **3** would remove the requirement for the vessel operator or crew member to

[31] https://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_1270

hold an operator card for an Atlantic Charter/Headboat for Dolphin/Wahoo Permit and Atlantic Dolphin/Wahoo Commercial Permit, respectively. This would reduce the current administrative burden/cost on NMFS and free up staff resources to be used for other purposes.

4.11 Action 11. Reduce the recreational vessel limit for dolphin

4.11.1 Biological Effects

Alternatives*

Note: Alternative 1 (No Action), Alternative 2 and Alternative 3 (including their respective sub-alternatives) do not apply to headboats. The current limit of 10 dolphin per paying passenger onboard a headboat will not change under this action and its alternatives.

1 (No Action). The recreational daily bag limit is 10 dolphin per person, not to exceed 60 dolphin per vessel, whichever is less.

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

2a. 30 dolphin per vessel, whichever is less.
2b. 40 dolphin per vessel, whichever is less.
2c. 42 dolphin per vessel, whichever is less.
2d. 48 dolphin per vessel, whichever is less.
2e. 54 dolphin per vessel, whichever is less.

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

3a. 30 dolphin per vessel, whichever is less.
3b. 40 dolphin per vessel, whichever is less.
3c. 42 dolphin per vessel, whichever is less.
3d. 48 dolphin per vessel, whichever is less.
3e. 54 dolphin per vessel, whichever is less.

4. In South Carolina, Georgia, and Florida only, the recreational daily bag limit is 10 dolphin per person, not to exceed:

4a. 30 dolphin per vessel, whichever is less.
4b. 40 dolphin per vessel, whichever is less.
4c. 42 dolphin per vessel, whichever is less.
4d. 48 dolphin per vessel, whichever is less.
4e. 54 dolphin per vessel, whichever is less.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

Biological benefits would be expected to be greater under **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** (including their respective sub-alternatives) compared with **Alternative 1 (No Action)**, because they consider a reduction in the amount of dolphin that can be retained per trip. In the Atlantic, 78% of private recreational/charter vessel (MRIP) trips and 93% of headboat trips harvested less than 10 dolphin per vessel (**Figure 4.11.1.1**). Sixteen percent of MRIP trips and 6% of headboat trips harvested between 10 and 39 dolphin per vessel, and 2% or less of all recreational trips (MRIP and headboats) harvested between 40 to 60 dolphin per vessel (**Figure 4.11.1.1**). There was some recreational harvest (1%) over the 60 dolphin per vessel limit in the Atlantic, but this is not an indication of a problem in the dolphin portion of the dolphin wahoo fishery and is within the margins of sampling error (**Figure 4.11.1.1**). Biological benefits would be expected to be greater under **Sub-alternative 2a** when compared with **Sub-alternatives 2b**, **2c**, **2d**, and **Preferred Sub-alternative 2e**, because only 30 dolphin would be allowed per vessel resulting in a reduction of 12.70% in landings under **Sub-alternative 2a** from private recreational and charter vessels (when applied to the entire Atlantic), which is a higher reduction that the other sub-alternatives considered (**Table 4.11.1.1**). **Preferred Sub-alternative 2e** would reduce the vessel limit from 60 dolphin per vessel to 54 dolphin per vessel and is expected to result in a reduction of 0.69% (114,051 lbs ww) (**Table 4.11.1.1**).

Under **Alternatives 3** and **4**, off East Florida only and off South Carolina, Georgia and east Florida, respectively, 96% of all MRIP and headboat recreational trips harvested less than 10 dolphin per vessel and 4% harvested between 10 and 39 fish per vessel (**Figures 4.11.1.2** and **4.11.1.3**). Under both **Alternatives 3** and **4** (including their respective sub-alternatives), biological effects would not notably vary between each other, 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 be influenced by any reduction under **Preferred Alternative 2, Alternative 3,** and **Alternative 4** (including their respective sub-alternatives) since the existing exemption of headboats from vessel limits would remain. Biological benefits are expected to be greatest under alternatives that may slow down the fishing by offering less incentive to catch 60 dolphin per vessel. Therefore, biological benefits would be greatest under **Sub-alternative 2a**, followed by **Sub-alternatives 2b**, **2c**, **2d**, **Preferred Sub-alternative 2e**, **Sub-alternatives 3a/4a**, **3b/4b**, **3c/4c**, **3d/4d**, and **3e/4e**, and **Alternative 1 (No Action)**.

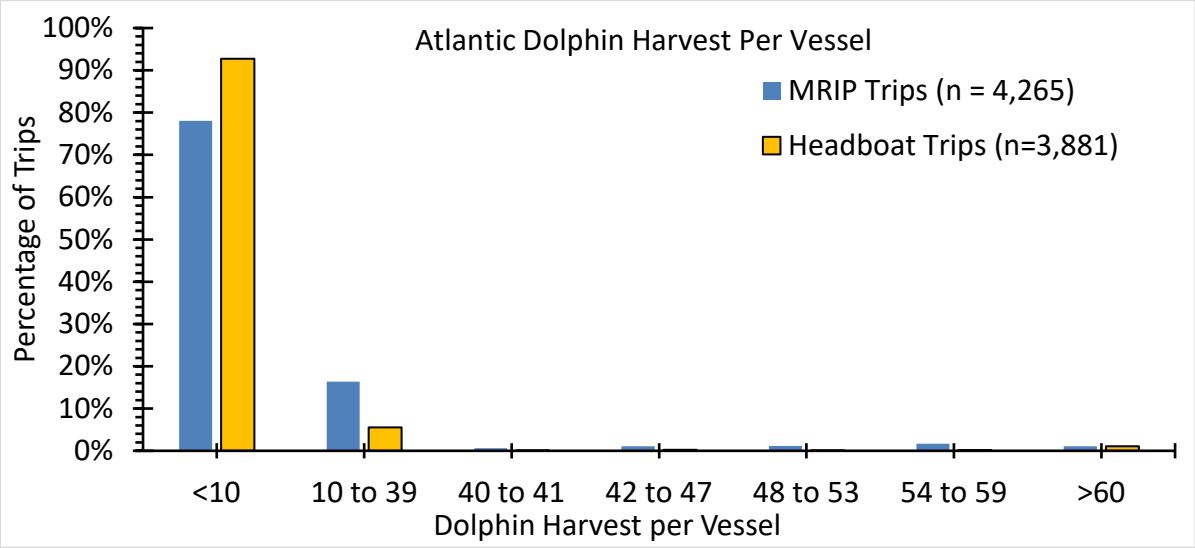

Figure 4.11.1.1. Percentage of trips for a range of dolphin harvested per vessel. The data are from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and the Headboat survey are provided. The dolphin stock is from Maine to east Florida (including Monroe County, Florida).

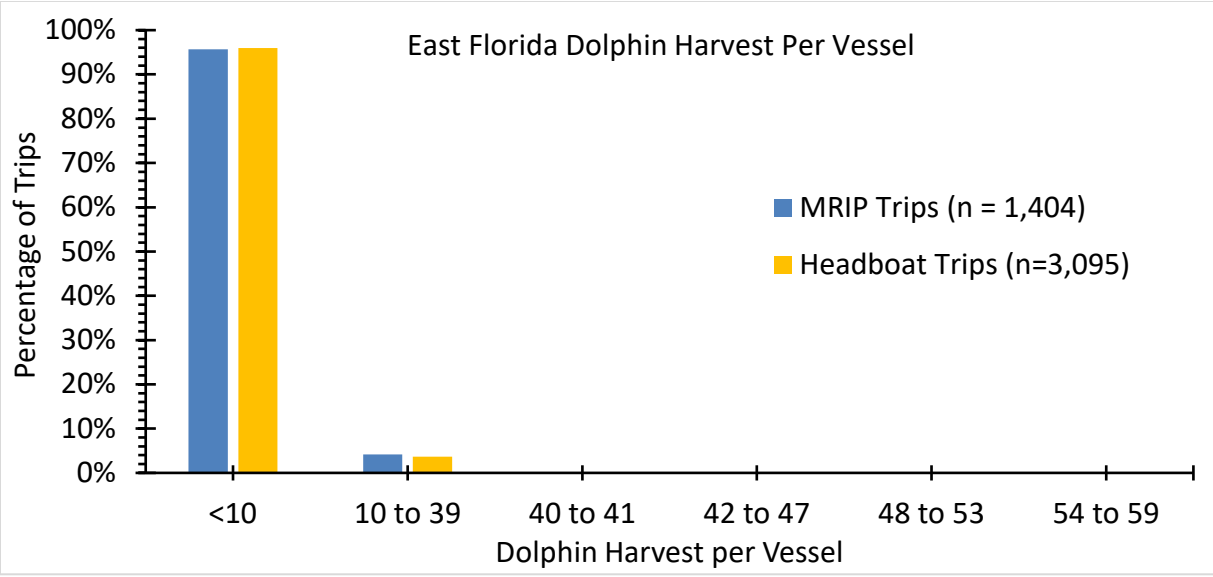

Figure 4.11.1.2. Percentage of trips for a range of east Florida dolphin harvested per vessel. The data are from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and the Headboat survey are provided. East Florida includes data from Monroe County, Florida.

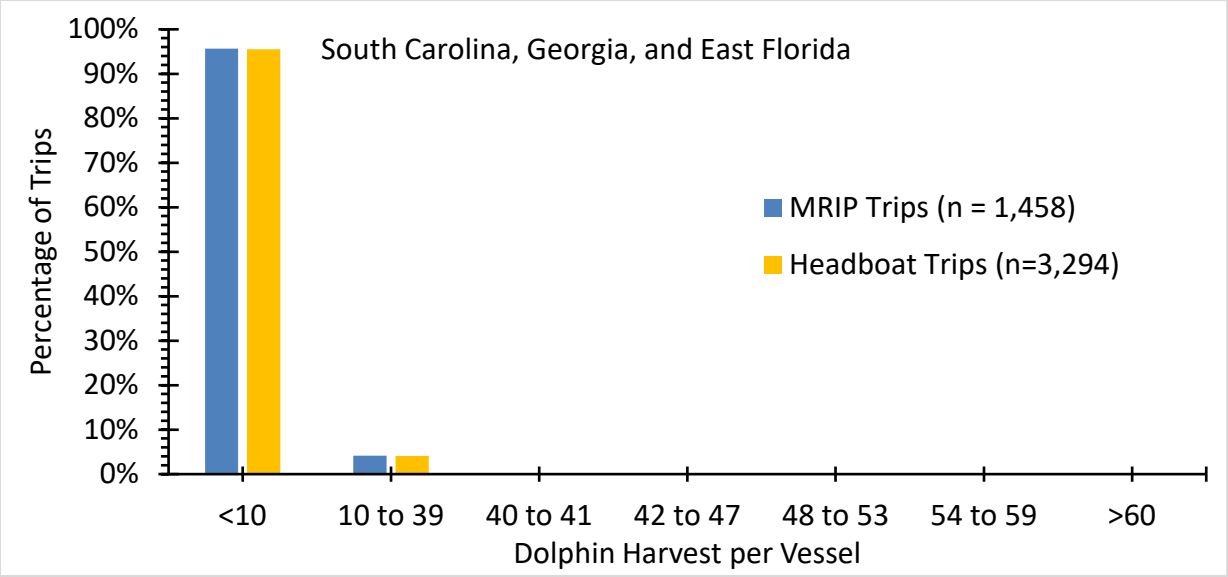

Figure 4.11.1.3. Percentage of trips for South Carolina, Georgia, and east Florida (including Monroe County, Florida). The data are from 2015 through 2019, and data from both MRIP (private rec./charter vessels) and the Headboat survey are provided.

Table 4.11.1.1. Reduction in recreational landings from a range of different vessel limits for dolphin based on private and for-hire recreational dolphin landings from 2015-2019.

Alternative	Vessel Limit	Total recreational landings reduction on a percent basis (private recreational and charter)	Total estimated reduction in landings (lbs ww)
Atlantic Region			
Sub-alt 2a	30 Dolphin	12.70%	2,099,204
Sub-alt 2b	40 Dolphin	5.71%	943,816
Sub-alt 2c	42 Dolphin	4.71%	778,524
Sub-alt 2d	48 Dolphin	2.32%	383,477
Preferred Sub-alt 2e	**54 Dolphin**	**0.69%**	**114,051**
Florida Only			
Sub-alt 3a	30 Dolphin	0.04%	6,612
Sub-alt 3b	40 Dolphin	0.04%	6,612
Sub-alt 3c	42 Dolphin	0.03%	4,959
Sub-alt 3d	48 Dolphin	0.01%	1,653
Sub-alt 3e	54 Dolphin	0.01%	1,653

Alternative	Vessel Limit	Total recreational landings reduction on a percent basis (private recreational and charter)	Total estimated reduction in landings (lbs ww)
South Carolina, Georgia, and Florida Only			
Sub-alt 4a	30 Dolphin	0.04%	6,612
Sub-alt 4b	40 Dolphin	0.04%	6,612
Sub-alt 4c	42 Dolphin	0.03%	4,959
Sub-alt 4d	48 Dolphin	0.01%	1,653
Sub-alt 4e	54 Dolphin	0.01%	1,653

Most of the recreational trips harvested less than 10 dolphin per vessel. Therefore, due to the very small proportion of recreational trips that near or reach the proposed vessel limit of 54 fish per vessel (**Preferred Alternative 2e**), no anticipated change to fishing activity or behavior is expected; thus, no changes in bycatch are expected for **Action 11**.

4.11.2 Economic Effects

Generally, angler satisfaction (which can be measured in CS) increases with the number of fish that can be harvested and the size of the fish. As such, the greater the reduction in a vessel limit the greater, the greater the probability that the satisfaction from a recreational trip could be affected resulting in lower CS.

The sub-alternatives of **Alternatives 2 (Preferred), 3,** and **4** are expected to lower total landings in the short-term, thus total CS for the recreational sector is expected to decrease as well in comparison to **Alternative 1 (No Action)**. Generally, CS would be reduced the most under **Preferred Alternative 2** compared to **Alternatives 3** or **4**, with an estimated change in CS ranging from -$1,602,518 for **Sub-alternative 2a** to -$87,066 for **Preferred Sub-alternative 2e** and an estimated change in CS ranging from -$5,047 for **Sub-alternatives 3a** and **4a** to -$1,262 for **Sub-alternative 3e** and **4e** (2019 $)(**Table 4.11.2.1**).

Table 4.11.2.1. Estimated reduction in recreational landings and CS for **Action 11** in comparison to Alternative 1 (No Action) based on private and for-hire recreational dolphin landings from 2015-2019.

Alternative	Total change in recreational landings on a percent basis	Total estimated change in landings (lbs ww)	Total estimated change in landings (numbers of fish)	Total estimated change in consumer surplus (2019$)
Sub-alternative 2a	-12.70%	-2,099,204	-312,382	-$1,602,518
Sub-alternative 2b	-5.71%	-943,816	-140,449	-$720,502
Sub-alternative 2c	-4.71%	-778,524	-115,852	-$594,320
Sub-alternative 2d	-2.32%	-383,477	-57,065	-$292,743
Pref. Sub-alt. 2e	**-0.69%**	**-114,051**	**-16,972**	**-$87,066**
Sub-alternative 3a	-0.04%	-6,612	-984	-$5,047

Alternative	Total change in recreational landings on a percent basis	Total estimated change in landings (lbs ww)	Total estimated change in landings (numbers of fish)	Total estimated change in consumer surplus (2019$)
Sub-alternative 3b	-0.04%	-6,612	-984	-$5,047
Sub-alternative 3c	-0.03%	-4,959	-738	-$3,785
Sub-alternative 3d	-0.01%	-1,653	-246	-$1,262
Sub-alternative 3e	-0.01%	-1,653	-246	-$1,262
Sub-alternative 4a	-0.04%	-6,612	-984	-$5,047
Sub-alternative 4b	-0.04%	-6,612	-984	-$5,047
Sub-alternative 4c	-0.03%	-4,959	-738	-$3,785
Sub-alternative 4d	-0.01%	-1,653	-246	-$1,262
Sub-alternative 4e	-0.01%	-1,653	-246	-$1,262

Assumptions used in calculating the estimates provided in **Table 4.11.2.1** include a CS estimate of $5.13 (2019 dollars per fish was applied to the projected change in recreational landings provided in **Table 4.11.1.1**. This value is the CS estimate for the sixth dolphin kept on a recreational trip (**Section 3.3**). CS estimates are available for the second through sixth dolphin kept on a recreational trip. This value was chosen since a reduction in the current vessel limit would likely result in a reduction of dolphin kept later in the trip after the vessel limit has been filled. A weight of 6.72 lbs ww per dolphin was used to convert lbs ww to numbers of fish (Personal Communication, NOAA Southeast Fisheries Science Center SAFE Dataset, December 11, 2019). It was also assumed that changes in the recreational portion of the total ACL would only affect catch per angler trip and not the number of trips. This included no change to for-hire fishing activity and thus no change in economic effects for the for-hire component of the recreational sector. As such there are no estimated changes in PS for the recreational sector.

In terms of short-term negative economic effects, the potential reductions in CS would be highest under **Sub-alternative 2a**, followed by **Sub-alternative 2b**, **Sub-alternative 2c**, **Sub-alternative 2d**, **Preferred Sub-alternative 2e, Sub-alternatives 3a**, **3b**, **4a**, and **4b**, **Sub-alternatives 3c** and **4c**, **Sub-alternatives 3d** and **4d**, **Sub-alternatives 3e** and **4e,** 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 **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** 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 AM is triggered) but still maintain harvest limits large enough to have minimal 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 or in regions where productive fishing grounds are farther from shore increasing the length of a trip. 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 3 and **Alternative 4** are unlikely to result in decreased trip satisfaction as recreational data indicate that majority of private recreational and for-hire/charter trips do not land more than 40 fish per trip (**Figure 4.11.1.2** and **Figure 4.11.1.3**). However, **Preferred Alternative 2** may have negative social effects on recreational fishing opportunities in North Carolina as data and public comment indicates that catches from the area do regularly exceed 30-fish per vessel (**Figure 4.11.1.1**). Bag and vessel limits that are too low may make fishing trips inefficient and lower angler satisfaction. **Sub-alternative 2a** proposed the lowest vessel limit and thus would result in the largest negative short-term social effects followed by **Sub-alternative 2b**, **Sub-Alternative 2c**, **Sub-alternative 2d**, and **Preferred Sub-alternative 2e**. Should recreational harvest increase beyond current estimates, **Preferred Alternative 2**, **Alternative 3** and **Alternative 4** would help slow harvest and extend the fishing season. **Preferred Alternative 2** and its sub-alternatives would likely slow harvest more than **Alternative 3** and **Alternative 4** and their sub-alternatives which would only restrict harvest along the east coast of Florida and Florida, Georgia, and South Carolina, respectively.

4.11.4 Administrative Effects

Administrative effects would not vary much between **Alternative 1 (No Action)**, **Preferred Alternative 2,** and **Alternatives 3** and **4** (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).

Chapter 5. South Atlantic Council's Choice for the Preferred Alternative

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

Alternatives*

1 (No Action). Total ACL for dolphin = current ABC.

2. Total ACL for dolphin = updated ABC.

3. Total ACL for dolphin = 95% updated ABC.

4. Total ACL for dolphin = 90% updated ABC.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

5.1.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The Dolphin Wahoo Advisory Panel (DW AP) discussed this action during their October 28, 2020, meeting and offered the following comments:

- Some DW AP members expressed concern over population trends for dolphin noting that abundance is important for the recreational fishery. Dolphin tend to be relatively easy to catch when present, thus making them more susceptible to depletion and a more cautious approach is appropriate to management.

The DW AP approved the following motion:

MOTION: ENDORSE ALTERNATIVE 2 AS THE PREFERRED ALTERNATIVE FOR ACTIONS 1 AND 2.
APPROVED BY AP

5.1.2 Law Enforcement Advisory Panel Comments and Recommendations

The Law Enforcement Advisory Panel (LE AP) received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP had no comments or recommendations on this action.

5.1.3 Scientific and Statistical Committee Comments and Recommendations

The Scientific and Statistical Committee (SSC) convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

5.1.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 1:

- Some comments expressed general support for the South Atlantic Fishery Management Council's (Council) preferred alternative (**Preferred Alternative 2**).
- Consider a five percent buffer between the acceptable biological catch (ABC) and annual catch limit (ACL) if there is a concern over dolphin abundance (**Alternative 3**).

- Support for **Alternative 4** to address uncertainty over dolphin landings, particularly in regard to international commercial fisheries. A precautionary approach is warranted.

5.1.5 Council's Conclusion

An ACL cannot exceed the ABC and may be set annually or on a multiyear plan basis. Annual catch limits in coordination with accountability measures (AMs) must prevent overfishing. The National Standard 1 guidelines specify that fishery management councils can choose to account for management uncertainty by setting the ACL below the ABC but state that ACLs may typically be set close to the ABC.

Revising the total ACL for dolphin to reflect the updated ABC from the Council's SSC incorporates best scientific information available (BSIA) into the management of dolphin. This ABC includes recreational landings from Monroe County, Florida, and uses the Marine Recreational Information Program's (MRIP) Fishing Effort Survey (FES) method, which is considered more reliable and robust compared to the MRIP Coastal Household Telephone Survey (CHTS) 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. Additionally, the revised timeline for setting the ABC for dolphin based on the 1994-2007 landings dataset was determined to incorporate BSIA by the Council's SSC.

In selecting **Preferred Alternative 2**, Council members noted that setting the ACL equal to the ABC follows the precedent that was established with the Comprehensive ACL Amendment (Amendment 2 to the Dolphin and Wahoo Fishery of the Atlantic). Additionally, it was discussed that based on the last twenty years of total landings data, it appears to be unlikely that harvest would consistently exceed the ACL or the ABC, that commercial landings are well tracked through electronic dealer reporting requirements, that there is a commercial trip limit that goes into place once 75 percent of the commercial sector ACL is met, and that recreational landings for dolphin exhibit relatively low percent standard errors (PSE). Council members also noted that setting the ACL equal to the ABC would allow the dolphin portion of the dolphin wahoo fishery to take advantage of years of exceptionally high dolphin abundance.

The Council concluded **Preferred Alternative 2** best meets the purpose and need, the objectives of the Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic (Dolphin Wahoo FMP), as amended, while complying with the requirements of the Magnuson-Stevens Fishery and Conservation and Management Act (Magnuson-Stevens Act) and other applicable law.

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

Alternatives*

1 (No Action). Total ACL for wahoo = current ABC.

2. Total ACL for wahoo = updated ABC.

3. Total ACL for wahoo = 95% updated ABC.

4. Total ACL for wahoo = 90% updated ABC.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

5.2.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- Wahoo tend to be more difficult to target and thus may not be as susceptible to traditional fishing pressure. A less cautious approach to management may be appropriate but DW AP members stated that there is concern over increased fishing pressure, particularly from divers using spearfishing gear. It was noted that some divers seem to be targeting spawning aggregations and that divers were accounting for a notable number of wahoo harvested directly and through delayed mortality due to wahoo being speared but escaping when the spear pulls out of the fish.

The DW AP approved the following motion:
MOTION: ENDORSE ALTERNATIVE 2 AS THE PREFERRED ALTERNATIVE FOR ACTIONS 1 AND 2.
APPROVED BY AP

5.2.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes at their February 1, 2020, meeting. The LE AP had no comments or recommendations on this action.

5.2.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

5.2.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 2:

- Some comments expressed general support for the Council's preferred alternative (**Preferred Alternative 2**).

5.2.5 Council's Conclusion

An ACL cannot exceed the ABC and may be set annually or on a multiyear plan basis. Annual catch limits in coordination with AMs must prevent overfishing. The National Standard 1 guidelines specify that fishery management councils can choose to account for management uncertainty by setting the ACL below the ABC but state that ACLs may typically be set close to the ABC.

Revising the total ACL for wahoo to reflect the updated ABC recommended by the SSC incorporates BSIA into the management of wahoo. This ABC includes recreational landings from Monroe County, Florida, and uses MRIP's FES method, which is considered more reliable and robust compared to the MRIP CHTS 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. Additionally, the revised timeline for setting the ABC for wahoo based on the 1994-2007 landings dataset was determined to incorporate BSIA by the Council's SSC.

In selecting **Preferred Alternative 2**, Council members noted that setting the ACL equal to the ABC follows the precedent that was established with the Comprehensive ACL Amendment (Amendment 2 to the Dolphin and Wahoo Fishery of the Atlantic). Additionally, it was discussed that commercial landings are well tracked through electronic dealer reporting requirements, that there is a commercial trip limit of 500 lbs, and that recreational landings for wahoo exhibit relatively low PSEs. Council members also noted that setting the ACL equal to the ABC would allow the wahoo portion of the dolphin wahoo fishery to take advantage of years of exceptionally high abundance of wahoo.

The Council concluded **Preferred Alternative 2** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

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

5.3.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- The DW AP expressed support for **Alternative 2**, noting that this alternative would not encourage increased harvest of dolphin while also maintaining adequate harvest levels for both sectors.

The DW AP approved the following motion:
MOTION: CHOOSE ALTERNATIVE 2 AS PREFERRED IN ACTION 3. APPROVED BY AP

Alternatives*

Note: The revised total ACLs in Alternatives 1 (No Action) through 4 reflect Preferred Alternative 2 in Action 1. The revised total ACL includes recreational landings from Monroe County, Florida, and incorporates revised recreational and commercial data.

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

2. Allocate 93.75% of the revised total ACL for dolphin to the recreational sector. Allocate 6.25% of the revised total ACL for dolphin to the commercial sector.

3. Allocate 93.00% of the revised total ACL for dolphin to the recreational sector. Allocate 7.00% of the revised total ACL for dolphin to the commercial sector.

4. Allocate 92.00% of the revised total ACL for dolphin to the recreational sector. Allocate 8.00% of the revised total ACL for dolphin to the commercial sector.

**See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

5.3.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP had no comments or recommendations on this action.

5.3.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

5.3.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 3:

- Some comments expressed general support for the Council's preferred alternative (**Preferred Alternative 3**).
- Support for maintaining commercial ACLs on pound basis (**Alternative 2**).
- Support for **Alternative 4** since U.S. commercial fishermen can offer a premium product for dolphin compared to those that are imported and a reduction of 3% in allocation is not necessary at this time.

5.3.5 Council's Conclusion

The Council selected **Preferred Alternative 3** in accordance with their intent to revise sector allocations and ACLs to reflect the revised total ACL for dolphin and needs of the dolphin

portion of the dolphin wahoo fishery. In doing so, the Council wanted to recognize the needs of the recreational sector, which would exhibit higher landings than previously estimated and that there would be a new accounting of recreational landings that is inclusive of the MRIP FES method. At the same time the Council did not want to reduce the sector ACL on a pound basis for the commercial sector and noted that **Preferred Alternative 3** would strike a balance between the needs of both sectors and increase both sector ACLs on a pound basis. Additionally, the revised commercial sector ACL would remain relatively close to the 1.5 million lbs "soft cap" that was originally put in place with the initial adoption of Dolphin Wahoo FMP. Thus this allocation was considered fair and equitable to fishery participants in both the recreational and commercial sectors and would be carried out in such a manner that no particular individual, corporation, or other entity would acquire excessive share. This allocation was also reasonably calculated to promote conservation since it remains within the boundaries of a total ACL that is based upon an ABC recommendation that incorporates BSIA.

The Council concluded **Preferred Alternative 3** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

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

5.4.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- The DW AP expressed support for **Preferred Alternative 3**, noting that this alternative would not encourage increased harvest of wahoo while maintaining adequate harvest levels for both sectors.

The DW AP approved the following motion:
MOTION: CHOOSE ALTERNATIVE 3 AS PREFERRED IN ACTION 4. APPROVED BY AP

Alternatives*

Note: The revised total ACLs in Alternatives 1 (No Action) through 4 reflect Preferred Alternative 2 in Action 2. The revised total ACL includes recreational landings from Monroe County, Florida, and incorporates revised recreational and commercial data.

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

2. Allocate 96.35% of the revised total ACL for wahoo to the recreational sector. Allocate 3.65% of the revised total ACL for wahoo to the commercial sector.

3. Allocate 97.55% of the revised total ACL for wahoo to the recreational sector. Allocate 2.45% of the revised total ACL for wahoo to the commercial sector.

4. Allocate 97.00% of the revised total ACL for wahoo to the recreational sector. Allocate 3.00% of the revised total ACL for wahoo to the commercial sector.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

5.4.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP had no comments or recommendations on this action.

5.4.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

5.4.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 4:

- Some comments expressed general support for the Council's preferred alternative at the time **(Alternative 4)**.
- Support for maintaining commercial ACLs on pound basis (**Preferred Alternative 3)**.

5.4.5 Council's Conclusion

The Council selected **Preferred Alternative 3** in accordance with their intent to revise sector allocations and ACLs to reflect the revised total ACL for wahoo and needs of the wahoo component of the dolphin wahoo fishery. In doing so, the Council wanted to recognize the needs of the recreational sector, which would exhibit higher landings than previously estimated and

that there would be a new accounting of recreational landings that is inclusive of the MRIP FES method. At the same time the Council did not want to reduce the sector ACL on a pound basis for the commercial sector and noted that **Preferred Alternative 3** would strike a balance between the needs of both sectors and increase both sector ACLs on a pound basis. It was also noted that this selection of preferred alternative was consistent with the recommendation from the DW AP. Thus this allocation was considered fair and equitable to fishery participants in both the recreational and commercial sectors and would be carried out in such a manner that no particular individual, corporation, or other entity would acquire excessive share. This allocation was also reasonably calculated to promote conservation since it remains within the boundaries of a total ACL that is based upon an ABC recommendation that incorporates BSIA.

The Council concluded **Preferred Alternative 3** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

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

5.5.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- The DW AP did not choose a single alternative but noted that multi-year triggers that take into account variability in landings are preferred.

5.5.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP had no comments or recommendations on this action.

5.5.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC provided comments and recommendations on this action:

- Smoothing of recreational data might be needed and either the arithmetic mean or geometric mean could be a beneficial tool. The SSC highlighted several properties of the geometric mean that should be considered when using it to trigger AMs:
    - The geometric mean would always be lower than arithmetic mean, and would thus be less likely to trigger AMs, whether the point estimate is accurate or not. The arithmetic mean would always lie between the point estimate and geometric mean.
    - The geometric mean decreases with increases in spread (i.e., how far numbers in the time series are away from the mean); therefore, the geometric mean will be reduced when there is greater variability in the time series.
    - This approach assumes relative stationarity/stability in effort, the fish population, and the environment over 3 years and that high variability is due to random error.

Alternatives*

1 (No action). If recreational landings exceed the recreational annual catch limit, then recreational landings will be monitored for persistence the following year. 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 only if the species is overfished and the total annual catch limit is exceeded.

2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year mean (Sub-alternative 2a or 2b) of landings exceeds the recreational sector annual catch limit.

2a. Use the arithmetic mean to calculate average landings.

2b. Use the geometric mean to calculate average landings.

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.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

- The arithmetic mean is typically used to find the "average" value of numbers that are added together; whereas, the geometric mean is used to find the "average" value of numbers that are multiplied together. Because we would typically add catches (for example, to find cumulative catch over multiple time periods) and not multiply catches, the arithmetic mean might be more appropriate for catch.
- If catch is not normally distributed, the formula used to calculate the arithmetic mean of catch needs to be adjusted. Details on performing this adjustment have been provided to Council staff.
- In contrast, the geometric mean is typically applied to rates, such as growth, mortality, or catch-per-unit effort rates, not levels or point estimates. The geometric mean of growth rates that vary across multiple time periods yields the equivalent "average" growth rate that, if applied to all periods, would yield the same final level. For example, suppose a population increased by 80% in one year and by an additional 25% the next year; this is equivalent to increasing at an average growth rate of 50% per year for both years. The geometric mean of 1.80 and 1.25 is 1.50.
- Any type of mean approach (arithmetic or geometric) has the potential to be carried forward multiple years based on one anomalously high year in the data.

- The SSC suggested exploring alternatives to what was presented, including:
  - Examining a shorter time series of recreational catches might be more appropriate. There are many factors that could contribute to changes in the estimates over time that might not be relevant to consider when determining if an AM should be triggered.
  - Calculating the geometric mean over a longer period than 3 years. Lognormally distributed data typically need a longer time series (e.g., >10 years) to approach a normal distribution.
- In regard to diagnostics that should be reviewed when deciding on an AM trigger, the SSC recommended:
  - An alternative method that may be more appropriate than the geometric mean: characterizing the probability of observing a particular point.
  - Conducting a post-hoc analysis of the recreational data any time the AM would have been triggered (had the point estimate been used but use of the geometric mean prevented it) to collect information on the performance of this approach and highlight stocks for which MRIP estimates might be problematic.
  - Comparing charter boat to recreational data trends when determining if the AM should be triggered.
- In regard to consideration of stock or fishery conditions, the SSC recommended:
  - Exploring the use of order statistics to characterize the probabilities of events such as "the third highest over ten years."
  - Considering life history (e.g., productivity susceptibility analysis [PSA]) of these species. For highly productive, low vulnerability stocks such as dolphin, there would be less concern with using the geometric mean to determine an AM trigger.

5.5.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 5:

- Some comments expressed general support for the Council's preferred alternative (**Preferred Alternative 5**).

5.5.5 Council's Conclusion

In discussing the triggers for the recreational AM, the Council selected **Preferred Alternative 5**. Council members noted that this alternative avoids closing recreational harvest in-season, which is a desired outcome of the Council as it has been expressed as disruptive to the for-hire and private components of the recreational sector. This alternative also provides some flexibility for the recreational sector by implementing a trigger for the recreational AM that is not necessarily met when recreational ACL is fully harvested, provided a portion of the total ACL is unharvested. The trigger would still help ensure sustainable harvest by preventing the total ACL from being exceeded on a consistent basis and addresses the deficiency in the current AM that requires dolphin to be overfished before the recreational AM can be triggered.

The Council concluded **Preferred Alternative 5** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

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

5.6.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- A vessel limit reduction would be slightly preferable compared to the other alternatives being considered, especially compared to a closed season. If dolphin vessel limits are reduced, try to maintain limits that are viable for the for-hire component.

5.6.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP offered the following comments:

- In-season adjustments are generally less desirable than regulation changes that are set towards the beginning of a fishing season from an enforcement standpoint.
- In-season measures are enforceable, but there is a lag time to educate fishermen. Communication is important to get notice of a regulatory change to stakeholders in a timely manner, including law enforcement personnel.

Alternatives*

1 (No action). If recreational landings exceed the recreational annual catch limit, then recreational landings will be monitored for persistence the following year. 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 only if the species is overfished and the total annual catch limit is exceeded.

2. Reduce the length of the following recreational fishing season.

3. Reduce the bag limit in the following recreational fishing season.

4. Reduce the vessel limit in the following recreational fishing season.

5. In the following fishing year monitor landings, and if by September 1 of each year landings are projected to meet the sector ACL that fishing year, reduce the bag limit (Sub-alternatives 5a through 5e). If reductions in the bag limit are projected to be insufficient also reduce the vessel limit to prevent the annual catch limit from being exceeded (Sub-alternatives 5f through 5i). If reductions in the bag limit and vessel limit are not implemented or are projected to be insufficient to constrain harvest to the ACL, then also reduce the length of the recreational fishing season.

5a. Reduce the bag limit by the amount necessary but not below 2 fish per person per day.

5b. Reduce the bag limit by the amount necessary but not below 3 fish per person per day.

5c. Reduce the bag limit by the amount necessary but not below 4 fish per person per day.

5d. Reduce the bag limit by the amount necessary but not below 5 fish per vessel per day.

5e. Do not reduce the bag limit.

5f. Reduce the vessel limit by the amount necessary but not below 10 fish per vessel per day.

5g. Reduce the vessel limit by the amount necessary but not below 20 fish per vessel per day.

5h. Reduce the vessel limit by the amount necessary but not below 30 fish per vessel per day.

5i. Do not reduce the vessel limit.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

5.6.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

5.6.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 6:

- Limited support for **Alternative 5** with a reduced vessel limit.

5.6.5 Council's Conclusion

Council members noted that there appears to be a relatively low likelihood of the AM being triggered, as the ACL is based on the ABC, which is set at a relatively high level of landings that is not often observed for dolphin. Specifying an AM that would shorten the recreational fishing season is less administratively burdensome and relatively simple to implement and communicate should any sort of change in the season be necessary. Additionally, there is a stipulation within **Preferred Alternative 2** that the season would not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary. This specification would allow for the monitoring of landings for the following season to evaluate whether the elevated dolphin landings from the previous year are continuing to persist, which would inform decisions on whether a late season harvest closure would need to occur.

The Council concluded **Preferred Alternative 2** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

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

5.7.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- The DW AP did not choose a single alternative but noted that multi-year triggers that take into account variability in landings are preferred.

5.7.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP had no comments or recommendations on this action.

5.7.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC provided comments or recommendations on this action:

- Smoothing of recreational data might be needed and either the arithmetic mean or geometric mean could be a beneficial tool. The SSC highlighted several properties of the geometric mean that should be considered when using it to trigger AMs:
    - The geometric mean would always be lower than arithmetic mean, and would thus be less likely to trigger AMs, whether the point estimate is accurate or not. The arithmetic mean would always lie between the point estimate and geometric mean.
    - The geometric mean decreases with increases in spread (i.e., how far numbers in the time series are away from the mean); therefore, the geometric mean would be reduced when there is greater variability in the time series.
    - This approach assumes relative stationarity/stability in effort, the fish population, and the environment over 3 years and that high variability is due to random error.

Alternatives*

1 (No action). If recreational landings exceed the recreational annual catch limit, then recreational landings will be monitored for persistence the following year. 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 only if the species is overfished and the total annual catch limit is exceeded.

2. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year mean (Sub-alternative 2a or 2b) of landings exceeds the recreational sector annual catch limit.

2a. Use the arithmetic mean to calculate average landings.

2b. Use the geometric mean to calculate average landings.

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.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

- The arithmetic mean is typically used to find the "average" value of numbers that are added together; whereas the geometric mean is used to find the "average" value of numbers that are multiplied together. Because we would typically add catches (for example, to find cumulative catch over multiple time periods) and not multiply catches, the arithmetic mean might be more appropriate for catch.
- If catch is not normally distributed, the formula used to calculate the arithmetic mean of catch needs to be adjusted. Details on performing this adjustment have been provided to Council staff.
- In contrast, the geometric mean is typically applied to rates, such as growth, mortality, or catch-per-unit effort rates, not levels or point estimates. The geometric mean of growth rates that vary across multiple time periods yields the equivalent "average" growth rate that, if applied to all periods, would yield the same final level. For example, suppose a population increased by 80% in one year and by an additional 25% the next year; this is equivalent to increasing at an average growth rate of 50% per year for both years. The geometric mean of 1.80 and 1.25 is 1.50.
- Any type of mean approach (arithmetic or geometric) has the potential to be carried forward multiple years based on one anomalously high year in the data.

- The SSC suggested exploring alternatives to what was presented, including:
  - Examining a shorter time series of recreational catches might be more appropriate. There are many factors that could contribute to changes in the estimates over time that might not be relevant to consider when determining if an AM should be triggered.
  - Calculating the geometric mean over a longer period than 3 years. Lognormally distributed data typically need a longer time series (e.g., >10 years) to approach a normal distribution.
- In regard to diagnostics that should be reviewed when deciding on an accountability measure trigger, the SSC recommended:
  - An alternative method that may be more appropriate than the geometric mean: characterizing the probability of observing a particular point.
  - Conducting a post-hoc analysis of the recreational data any time the AM would have been triggered (had the point estimate been used but use of the geometric mean prevented it) to collect information on the performance of this approach and highlight stocks for which MRIP estimates might be problematic.
  - Comparing charter boat to recreational data trends when determining if the AM should be triggered.
- In regard to consideration of stock or fishery conditions, the SSC recommended:
  - Exploring the use of order statistics to characterize the probabilities of events such as "the third highest over ten years."
  - Considering life history (e.g., PSA) of these species. For highly productive, low vulnerability stocks such as dolphin, there would be less concern with using the geometric mean to determine an AM trigger.

5.7.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 7:

- Some comments expressed general support for the Council's preferred alternative (**Preferred Alternative 2**).

5.7.5 Council's Conclusion

Preferred Alternative 2, Sub-alternative 2b would allow the recreational AM to avoid being triggered due to exceeding the ACL in a single year but would be triggered if the ACL was exceeded on a consistent basis. It was noted that using a three-year geometric mean helps to smooth the landings data and potentially avoid implementing restrictive AMs unnecessarily if there was an anomaly in the landings estimates that was not accurately reflecting an actual increase in the harvest of wahoo. In discussion of this alternative, it was noted that a geometric mean is less sensitive to being affected by abnormally large spikes in landings estimates than the arithmetic mean or using a single year point estimate, and thus would be a better choice for determining the trigger for the recreational AM. The trigger would still help ensure sustainable harvest by preventing the total ACL from being exceeded on a consistent basis and addresses the deficiency in the current AM that requires wahoo to be overfished before the recreational AM can be triggered.

The Council concluded **Preferred Alternative 2, Sub-alternative 2b** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.8 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 year and the recreational season will be reduced only if the species is overfished and the total annual catch limit is exceeded.

2. Reduce the length of the following recreational fishing season.

3. Reduce the bag limit in the following recreational fishing season.

4. Implement a vessel limit in the following recreational fishing season.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

5.8.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- A vessel limit reduction would be slightly preferable compared to the other alternatives being considered, especially compared to a closed season. If vessel limits are reduced, try to maintain limits that are viable for the for-hire component of the wahoo portion of the dolphin wahoo fishery.
    - It was noted that 8 fish per vessel is recommended as a minimum limit for wahoo in an AM.

5.8.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP offered the following comments:

- In-season adjustments are generally less desirable than regulation changes that are set towards the beginning of a fishing season from an enforcement standpoint.
- In-season measures are enforceable, but there is a lag time to educate fishermen. Communication is important to get notice of a regulatory change to stakeholders in a timely manner, including law enforcement personnel.

5.8.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

5.8.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 8:

- For the wahoo recreational AM, consider a reduced vessel limit rather than a harvest closure (**Alternative 4**).
- Also comments in favor of **Alternative 1 (No Action)** and **Preferred Alternative 2**.

5.8.5 Council's Conclusion

Council members noted that specifying an AM that would shorten the recreational fishing season is less administratively burdensome and relatively simple to implement and communicate should any sort of change in the season be necessary. Additionally, there is a stipulation within **Preferred Alternative 2** that the season would not be reduced if the Regional Administrator determines, using the best available science, that it is not necessary. This specification would allow for the monitoring of landings for the following season to evaluate whether the elevated wahoo landings from the previous year are continuing to persist, which would inform decisions on whether a late season harvest closure would need to occur. In choosing this alternative, Council members also noted the relatively equitable nature and equally distributed geographic effects of a shortening of the recreational season, as wahoo are often targeted and caught late in the year throughout the South Atlantic Region.

The Council concluded **Preferred Alternative 2** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.9 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

5.9.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- Consider trip limits of no more than 500 pounds for dolphin. Limits above that tend to go beyond total landings of dolphin on typical rod and reel commercial trips.

The DW AP approved the following motion:
MOTION: ALLOW VESSELS WITH POT, TRAP, OR BUOY GEAR ON BOARD TO POSSESS DOLPHIN OR WAHOO AS LONG AS THEY ARE A PERMITTED VESSEL AND FISH ARE CAUGHT BY ROD AND REEL.
APPROVED BY AP

5.9.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP had no comments or recommendations on this action.

5.9.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

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.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

5.9.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 9:

- Support for allowing 500-pound dolphin trip limit (**Preferred Sub-alternative 2b**) and also including wahoo (**Preferred Alternative 3**).
- Could promote competition and conflict in Mid-Atlantic and New England regions between recreational and commercial vessels fishing pot buoys for dolphin in same area. These buoys operate as fish aggregating devices. Support for a 250-pound dolphin trip limit (**Sub-alternative 2a)** to mitigate these concerns.

5.9.5 Council's Conclusion

In Action 9, the Council was responding to a request from the Atlantic Offshore Lobstermen's Association to modify regulations to allow the historical practice of harvesting dolphin while in the possession of lobster pots to continue. The Council wanted to positively respond to this request but also take a slightly broader approach to allow vessels fishing with trap, pot, or buoy gear to possess dolphin or wahoo as long as the fish were landed with rod and reel gear. In doing so, the Council determined that allowing the retention of constrained amounts of dolphin and wahoo harvested onboard vessels with pot, trap, or buoy gear onboard would have positive economic effects while also limiting the potential for an unforeseen major increase in commercial landings, which could put pressure on the sector ACL and trigger the AM.

The Council concluded **Preferred Alternative 2, Sub-alternative 2b** and **Preferred Alternative 3** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

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

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.

*See Chapter 2 for detailed language of alternatives. Preferred alternative indicated in bold.

5.10.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action and approved the following motion during their April 21, 2017, meeting:

MOTION: SUPPORT ALTERNATIVE 2 AND 3 IN ACTION 8.
APPROVED BY AP
Note: Action 10 was listed as Action 8 in the amendment at the time.

The DW AP discussed this action again and provided the following recommendation during their October 28, 2020, meeting:

- The DW AP endorsed their previous motion to remove the operator card requirements for both the recreational and commercial sectors (**Alternatives 2** and **3**).

5.10.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP offered the following comments on this action:

- In the code of federal regulations, "operator cards" are referred to as "operator permits" so make sure that they are properly referenced in the amendment to avoid confusion when implementing regulation changes.
- Concern was raised by a member of the public over the action, noting that in instances when the operator is not the owner there may not be considerable incentive for that person to report under the new for-hire reporting requirements. The potential to revoke an operator card could provide this incentive and improve reporting compliance.
- The NOAA Office of General Counsel Enforcement Section may have concerns with removal of the operator card requirement as a potential tool.
- While the LE AP initially noted that the operator card requirement could be removed without notable loss to law enforcement capabilities since it has been largely unused for enforcement purposes, it would be an effective tool to help increase compliance with new for-hire reporting requirements particularly if expanded to include other fisheries.
- During Other Business, it was noted that the requirement could be kept for the for-hire fishery but removed for the commercial sector.
- Recommendation: Consider extending the operator card to other fishery management plans to help enforce for-hire reporting requirements.

5.10.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

5.10.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 10:

- Several comments in favor of removing the operator card requirement (**Preferred Alternatives 2** and **3**).
- Maintaining operator card could encourage compliance with the new for-hire reporting requirement, particularly for captains that do not own the vessel (**Alternative 1 (No Action)** or **Preferred Alternative 3**).
- Previously burdensome to apply for and renew. Ability to apply online has streamlined the renewal process. Support for **Alternative 1 (No Action)**.

5.10.5 Council's Conclusion

In discussion of this action, the Council noted that the operator card requirement is only included in two Council-managed fisheries (Dolphin Wahoo and Rock Shrimp). The Council noted that there is potential value for operator cards in aiding law enforcement efforts, but the inconsistent requirement between fisheries greatly diminishes this utility. Public testimony indicated that operator cards are rarely checked and are burdensome to renew. At the March 2016 Council meeting, NMFS Office of Law Enforcement gave a presentation on operator cards, noting that currently the operator cards are not used for gathering data, distributing information, or law enforcement to a large extent. The Council felt that the limited use that operator cards are exhibiting did not outweigh the cost to fishermen to obtain and maintain the card.

The Council concluded **Preferred Alternative 2** and **Preferred Alternative 3** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.11 Action 11. Reduce the recreational vessel limit for dolphin

5.11.1 Dolphin Wahoo Advisory Panel Comments and Recommendations

The DW AP discussed this action during their October 28, 2020, meeting and offered the following comments:

- There was support for **Alternative 1 (No Action)**, particularly in North Carolina, or to take action just in Florida (**Alternative 3**). It was noted that the 60 fish limit is very important to the for-hire fishery in North Carolina, particularly when "slinger" dolphin are abundant.
- If limits are reduced, maintaining limits divisible by 6 is preferred.

The DW AP approved the following motion:
MOTION: SUPPORT ALTERANTIVE 3B OR 3C AS PREFERRED IN ACTION 11. APPROVED BY AP

Alternatives*

Note: Alternative 1 (No Action), Alternative 2 and Alternative 3 (including their respective sub-alternatives) do not apply to headboats. The current limit of 10 dolphin per paying passenger onboard a headboat will not change under this action and its alternatives.

1 (No Action). The recreational daily bag limit is 10 dolphin per person, not to exceed 60 dolphin per vessel, whichever is less.

2. The recreational daily bag limit is 10 dolphin per person, not to exceed:
2a. 30 dolphin per vessel, whichever is less.
2b. 40 dolphin per vessel, whichever is less.
2c. 42 dolphin per vessel, whichever is less.
2d. 48 dolphin per vessel, whichever is less.
2e. 54 dolphin per vessel, whichever is less.

3. In Florida only, the recreational daily bag limit is 10 dolphin per person, not to exceed:
3a. 30 dolphin per vessel, whichever is less.
3b. 40 dolphin per vessel, whichever is less.
3c. 42 dolphin per vessel, whichever is less.
3d. 48 dolphin per vessel, whichever is less.
3e. 54 dolphin per vessel, whichever is less.

4. In South Carolina, Georgia, and Florida only, the recreational daily bag limit is 10 dolphin per person, not to exceed:
4a. 30 dolphin per vessel, whichever is less.
4b. 40 dolphin per vessel, whichever is less.
4c. 42 dolphin per vessel, whichever is less.
4d. 48 dolphin per vessel, whichever is less.
4e. 54 dolphin per vessel, whichever is less.

*Preferred alternative indicated in bold.

5.11.2 Law Enforcement Advisory Panel Comments and Recommendations

The LE AP received a briefing of proposed changes in Amendment 10 at their February 1, 2020, meeting. The LE AP offered the follow comments on this action:

- The LE AP had no issue with enforceability of vessel limit changes; however, it was noted that consistency within the regulation is helpful for compliance.
- Implementing a vessel limit change through this action could mitigate some of the concerns expressed for the accountability measure actions since these measures would be in place year-round and would reduce the likelihood of the accountability measure being triggered.

5.11.3 Scientific and Statistical Committee Comments and Recommendations

The SSC convened on April 27-29, 2021, and received a summary of proposed changes in Amendment 10 in their briefing material. The SSC had no comments or recommendations on this action.

5.11.4 Public Comments and Recommendations

Public hearings for the amendment were held on January 26, 27, and 28, 2021 via webinar. The public comment period was from January 17 through February 5, 2021. Below is a summary of comments on Action 11:

- There was a notable regional theme to many comments. With some exceptions, those in favor of changing retention limits (vessel limits, bag limits, size limits) were largely based in Florida or South Carolina. Those in favor of maintaining the current retention limits were often based in North Carolina.
- Many commenters stressed the importance of maintaining the current vessel limit for dolphin and bag limit (**Alternative 1 (No Action))**, as a reduction would greatly harm the for-hire industry in North Carolina, particularly the Outer Banks (vessels fishing out of Oregon Inlet and Hatteras Inlet) and the southern Outer Banks (vessels fishing out of Beaufort Inlet).
    - Current retention limits are important to "justifying the cost of the trip" for many for-hire as well as some private vessel anglers.
    - Concern over notable economic hardship from reduced retention limits at a time when many in the for-hire industry have already faced challenges due to COVID-19.
    - Reducing vessel limits could lead to more pressure on other species such as those found in the Snapper Grouper complex.
    - If vessel limits are reduced, consider a regional approach rather than the entire Atlantic.
    - Consider holding off on changing vessel limits until several years of data from the for-hire logbook can be used to inform management decisions.
- Several comments in support of a reduced vessel limit for dolphin (**Alternatives 2**, **3**, and **4**). Many expressed support for a 30 fish vessel limit (**Sub-alternatives 2a**, **3a**, and **4a**) and to a lesser extent a 40 fish limit (**Sub-alternatives 2b**, **3b**, and **4b)**. Commenters in support were largely based out of Florida and South Carolina, with some exceptions.
    - Varying opinions on whether reduced vessel limits should cover the entire Atlantic or only apply to certain states.
- Limited and varying opinions on different retention limits between private and for-hire vessels. Most that did comment were in favor of a higher limit onboard for-hire vessels.

5.11.5 Council's Conclusion

In choosing a preferred alternative, it was noted that a goal of the Dolphin Wahoo FMP is to maintain a precautionary approach to management. While there is no stock assessment for dolphin, the Council heard a great deal of public comment, particularly from anglers in Florida, that dolphin abundance appears to be diminishing and that there was concern over the health of the dolphin stock and fishery. The Council chose to implement a coast-wide reduction in the vessel limit to maintain consistency of regulations across regions in the retention limits for dolphin and noted that such a change in retention limits coast-wide would lead to more substantial harvest reductions than a Florida-specific or regional approach.

The Council concluded **Preferred Alternative 2, Sub-alternative 2e** best meets the purpose and need, the objectives of the Dolphin Wahoo FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

Chapter 6. Cumulative Effects

6.1 Affected Area

The South Atlantic Fishery Management Council (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. The immediate impact area would be the federal 200-mile limit of the Atlantic off the coasts 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. Considering the available information, the extent of the boundaries for the affected area would depend upon the degree of fish immigration/emigration and larval transport, whichever has the greatest geographical range. The ranges of affected species are described in Volume II of the Fishery Ecosystem Plan.[32] For the proposed actions found in Amendment 10 to the Fishery Management Plan (FMP) for the Dolphin and Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 10), the cumulative effects analysis includes an analysis of data from 2015 through the present.

6.2 Past, Present, and Reasonably Foreseeable Actions Impacting the Affected Area

Fishery managers implemented the first significant regulations pertaining to dolphin and wahoo in 2004 through the FMP for the Dolphin and Wahoo Fishery of the Atlantic (Dolphin and Wahoo FMP; SAFMC 2003). Listed below are other past, present, and reasonably foreseeable actions occurring in the Atlantic, which, when added to the proposed management measures in Dolphin Wahoo Amendment 10, may result in cumulative effects on the biophysical and social and economic environment. The complete history of management of the dolphin and wahoo fishery can be found in Appendix D (History of Management) of Amendment 7 to the Dolphin and Wahoo FMP (SAFMC 2016b), and is hereby incorporated by reference.

Past Actions

Amendment 2 to the Dolphin and Wahoo FMP (Comprehensive Annual Catch Limit (ACL) Amendment), effective on April 16, 2012, established the acceptable biological catch (ABC) estimate, ACL, recreational annual catch target (ACT), accountability measures (AM), and sector allocations for dolphin and wahoo. Recreational landings did not include Monroe County, Florida, and were based on recreational data from the Marine Recreational Fisheries Statistics Survey (MRFSS).

Amendment 5 to the Dolphin and Wahoo FMP, effective on July 9, 2014, revised the ABC estimates, ACLs (including sector ACLs), recreational ACT, and AMs. Recreational landings did not include Monroe County, Florida, and were based on recreational data from the Marine

[32] http://safmc.net/ecosystem-management/fishery-ecosystem-plan/

Recreational Information Program's (MRIP) Coastal Household Telephone Survey (CHTS) method.

Amendment 7 to the Dolphin and Wahoo FMP, effective on January 27, 2016, allowed dolphin and wahoo fillets to enter the U.S. exclusive economic zone (EEZ) after lawful harvest in The Bahamas, under certain conditions.

Amendment 8 to the Dolphin and Wahoo FMP, effective on February 22, 2016, revised the sector allocations for dolphin.

Regulatory Amendment 1 to the Dolphin and Wahoo FMP, effective on March 21, 2017, established a commercial trip limit of 4000 pounds whole weight once 75 percent of the commercial ACL is reached.

Amendment 9 to the Dolphin and Wahoo FMP (electronic reporting for federally permitted charter vessels and headboats), effective on January 4, 2021, established new, and revised existing, electronic reporting requirements for dolphin and wahoo for-hire vessels to increase and improve fisheries information.

Present Actions

Amendment 12 to the Dolphin and Wahoo FMP proposes adding bullet mackerel and frigate mackerel as ecosystem component species to acknowledge their ecological role as forage fish and achieve ecosystem management objectives (50 C.F.R §600.305(d)(13)). This amendment was submitted for formal review on December 3, 2020. The notice of availability published on January 29, 2021 (86 FR 7524), the proposed rule published on March 2, 2021 (86 FR 12166), and the final rule published on May 10, 2021 (86 FR 24742).

Reasonably Foreseeable Future Actions

Comprehensive Acceptable Biological Catch (ABC) Control Rule Amendment (Amendment 11 to the Dolphin and Wahoo FMP) would modify the ABC control rule, specify an approach for determining the acceptable risk of overfishing and the probability of rebuilding success for overfished stocks, allow phase-in of ABC changes, and allow carry-over of unharvested catch. This amendment will continue development in 2021/2022.

The Council is considering revisiting the subject of longline gear in the dolphin and wahoo fishery, size limits for dolphin, and vessel limits for just the charter boat portion of the recreational sector. Development of these amendments/framework amendments could start in late 2021 and continue through 2022.

Expected Impacts from Past, Present, and Future Actions

The intent of Dolphin Wahoo Amendment 10 is to revise the catch levels, allocations, AMs, and management measures for dolphin and wahoo based on the best scientific information available and increase net benefits to the Nation. The proposed actions in Dolphin Wahoo Amendment 10 are not expected to result in significant cumulative adverse biological or social and economic effects (see Chapter 4). The reader is referred to the Regulatory Impact Review

(Appendix E) reader to the RIR for an assessment of the cumulative economic effects of all the actions in Dolphin Wahoo Amendment 10.

Actions 1 through 4 would increase the total ACLs and sector ACLs for dolphin and wahoo. Lower biological effects could be expected, however, as shown in Chapter 4, landings are not expected be reach the proposed total ACL and sector ACLs in most of the scenarios analyzed. The commercial landings for dolphin and wahoo are not projected to reach the proposed commercial ACL in any of the scenarios analyzed. While the total ACL for wahoo and recreational sectors for dolphin and wahoo are expected to reach the proposed respective ACLs in some of the scenarios analyzed, the reduced seasons specified in the post-season AMs (Actions 6 and 8), and recreational vessel limit reductions (Action 11) would be expected to provide positive biological effects. Increased social benefits are expected from the increased fishing opportunities due to the increased ACLs.

Actions 5 through 8 address the trigger and the post-season AMs for dolphin and wahoo. Biological effects would be variable for dolphin and wahoo for the triggers chosen for recreational AMs (Actions 5 and 7), with positive effects for dolphin and maybe negative effects for wahoo due to the liberal preferred alternative. Social effects could impose short-term negative effects, but conservative approaches may ensure harvest remains sustainable thereby safeguarding social benefits.

No negative biological effects are expected from Action 9, because the current commercial AM includes an in-season closure and this would prevent the commercial landings from exceeding the commercial ACL. Direct positive social benefits would accrue to fishers and fisher communities.

No positive or negative biological effects are expected from Action 10 because the action does not impact the harvest levels for dolphin and wahoo in any manner. Minor social benefits would be expected.

While positive biological effects could be greater among other alternatives considered to reduce the recreational vessel limit for dolphin (Action 11), there would be some reduction in recreational landings in the chosen preferred alternative. Recreational fishing opportunities could be restricted and may have negative social effects (for example, dolphin in North Carolina). Current commercial and recreational landings are below the proposed commercial and recreational ACLs. Fishing behavior is not expected to change as a result of the actions in Dolphin Wahoo Amendment 10, but, if it did and landings increased in the future, the ratio of discards to landings are very low and not expected to negatively affect discards and bycatch (Appendix E, BPA). The proposed actions in Dolphin Wahoo Amendment 10 would not change fishing methods for the dolphin and wahoo fishery in the U.S. exclusive economic zone (EEZ), and therefore would perpetuate the existing level of risk for interactions between Endangered Species Act listed species and the fisheries. Thus, there is likely to be no additional effects, positive or negative, to protected species from the actions.

When combined with the impacts of past, present, and future actions affecting the dolphin and wahoo fishery, minor cumulative impacts are likely to accrue. For example, there could be

beneficial cumulative effects from the actions in this amendment, in addition to future proposed actions to revisit longline gear type, size limits, and other management measures. Also, there may be cumulative social and economic effects by promoting access to the dolphin wahoo fishery, which would improve recreational fishing opportunities and benefits to associated businesses and communities. The actions in this amendment are not expected to result in significant cumulative adverse biological or social and economic effects to the dolphin and wahoo fishery when combined with the impacts of past, present, and future actions (see Chapter 4).

6.3 Consideration of Climate Change and Other Non-Fishery Related Issues

Climate Change

Global climate changes could have significant effects on Atlantic fisheries, though the extent of these effects on the dolphin and wahoo fishery is not known at this time. The Environmental Protection Agency's climate change webpage (https://www.epa.gov/climate-indicators/marine-species-distribution), and NOAA's Office of Science and Technology climate webpage (https://www.fisheries.noaa.gov/topic/climate), provides background information on climate change, including indicators which measure or anticipate effects on oceans, weather and climate, ecosystems, health and society, and greenhouse gases. The United Nations Intergovernmental Panel on Climate Change's Fifth Assessment Report (November 2, 2014) and the U.S. Global Change Research Program (USGCRP)'s Fourth Climate Assessment (2018) also provide a compilation of scientific information on climate change. Those findings are summarized below.

Ocean acidification, or a decrease in surface ocean pH due to absorption of anthropogenic carbon dioxide emissions, affects the chemistry and temperature of the water. Increased thermal stratification alters ocean circulation patterns, and causes a loss of sea ice, sea level rise, increased wave height and frequency, reduced upwelling, and changes in precipitation and wind patterns. Changes in coastal and marine ecosystems can influence organism metabolism and alter ecological processes such as productivity, species interactions, migration, range and distribution, larval and juvenile survival, prey availability, and susceptibility to predators. The "center of biomass," a geographical representation of each species' weight distribution, is being used to identify the shifting of fish populations. Warming sea temperature trends in the southeast have been documented, and animals must migrate to cooler waters, if possible, if water temperatures exceed survivable ranges (Needham et al. 2012). Rising water temperatures, ocean acidification, retreating arctic sea ice, sea level rise, high-tide flooding, coastal erosion, higher storm surge, and heavier precipitation events are projected to continue, putting ocean and marine species at risk, decreasing the productivity of certain fisheries, and threatening communities that rely on marine ecosystems for livelihoods and recreation (USGCRP 2018). Harvesting and habitat changes also cause geographic population shifts. Changes in water temperatures may also affect the distribution of native and exotic species, allowing invasive species to establish communities in areas they may not have been able to survive previously. The combination of warmer water and expansion of salt marshes inland with sea-level rise may increase productivity of estuarine-dependent species in the short term. However, in the long term, this increased productivity may be temporary because of loss of fishery habitats due to wetland loss (Kennedy et al. 2002). The numerous changes to the marine ecosystem may cause an increased risk of disease in marine biota. An increase in the occurrence and intensity of toxic algae blooms will

negatively influence the productivity of keystone animals, such as corals, and critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002; IPCC 2014). Free et al. (2019) investigated the impacts of historical warming on marine fisheries production and found that climate change is altering habitats for marine fishes and invertebrates, but the net effect of these changes on potential food production is unknown.

Climate change may impact dolphin and wahoo in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts will occur. Public comments stating the lack of large dolphin in the Florida Keys may have 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). In the near term, it is unlikely that the management measures contained in Dolphin Wahoo Amendment 10 would compound or exacerbate the ongoing effects of climate change on dolphin and wahoo.

Weather Variables

Hurricane season is from June 1 to November 30, and accounts for 97% of all tropical activity affecting the Atlantic basin. These storms, although unpredictable in their annual occurrence, can devastate areas when they occur. Although these effects may be temporary, those fishing-related businesses whose profitability is marginal may go out of business if a hurricane strikes.

6.4 Overall Impacts Expected from Past, Present, and Future Actions

The proposed actions would designate incorporate best scientific information available to address catch levels, sector allocations, recreational AMs, and management measures for dolphin and wahoo. The actions are expected to increase fishing opportunities while preventing overexploitation and increase net benefits to the Nation, consistent with the Magnuson-Stevens Fishery Conservation and Management Act and its National Standards. The proposed management actions and comparison of alternatives are summarized in Chapter 2 of this document. Detailed discussions of the magnitude and impacts of the alternatives on the human environment appear in Chapter 4 of this document. None of the impacts of the actions in this amendment, in combination with past, present, and future actions have been determined to be significant. Although several other management actions, in addition to this amendment, are expected to affect dolphin and wahoo species, any additive effects, beneficial and adverse, are not expected to result in a significant level of cumulative impacts.

The proposed actions would not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places as these are not in the Atlantic EEZ. These actions are not likely to result in direct, indirect, or cumulative effects to unique areas, such as significant scientific, cultural, or historical resources, park land, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas as the proposed action is not expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort within the Atlantic region. The Stellwagen Bank off the

Northeastern U.S., U.S. Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries are within the boundaries of the Atlantic EEZ. The proposed actions are not likely to cause loss or destruction of these national marine sanctuaries because the actions are not expected to result in appreciable changes to current fishing practices. Additionally, the proposed actions are not likely to change the way in which the dolphin and wahoo fishery is prosecuted; therefore, the actions are not expected to result in adverse impacts on health or human safety beyond the status quo.

6.5 Monitoring and Mitigation

Fishery-independent and fishery-dependent data comprise a significant portion of information used in stock assessments. While there is no stock assessment for dolphin and wahoo, these data aid in allowing sustainable harvest of these species, while monitoring biological, social, and economic parameters. Fishery dependent commercial data are collected through the commercial logbook data and recreational data are collected through the Marine Recreational Information Program, Headboat logbook data, and the For-hire electronic logbook program. Fishery-independent data are collected through the Southeast Fishery Information Survey and the Marine Resources Monitoring Assessment and Prediction Program. The effects of the proposed actions are, and would continue to be, monitored through collection of landings data by the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida. The National Marine Fisheries Service would continue to monitor and collect information on dolphin and wahoo species for life history studies, economic and social analysis, and other scientific observations. The proposed actions relate to the harvest of indigenous species in the Atlantic, and the activities/regulations being altered do not introduce non-indigenous species, and are not reasonably expected to facilitate the spread of such species through depressing the populations of native species. Additionally, these alternatives do not propose any activity, such as increased ballast water discharge from foreign vessels, which is associated with the introduction or spread on non-indigenous species.

Chapter 7. List of Preparers

Table 7.1. List of preparers of the document.

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NMFS = National Marine Fisheries Service, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, PRD = Protected Resources Division, SERO = Southeast Regional Office, HCD = Habitat Conservation Division, GC = General Counsel, OLE = Office of Law Enforcement

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NMFS = National Marine Fisheries Service, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, PRD = Protected Resources Division, SERO = Southeast Regional Office, HCD = Habitat Conservation Division, GC = General Counsel, OLE = Office of Law Enforcement

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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

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Appendix A. Alternatives Considered, but Eliminated from Detailed Analysis

Action. Reduce the recreational bag limit and establish a recreational vessel limit for wahoo

Alternative 1 (No Action). The recreational daily bag limit is 2 wahoo per person. There is no recreational vessel limit for wahoo.

Preferred Alternative 2. The recreational daily bag limit is 1 wahoo per person.

Alternative 3. The recreational vessel limit is:

Sub-alternative 3a. 2 wahoo per vessel.
Sub-alternative 3b. 3 wahoo per vessel.
Sub-alternative 3c. 4 wahoo per vessel.
Sub-alternative 3d. 5 wahoo per vessel.
Sub-alternative 3e. 6 wahoo per vessel.
Sub-alternative 3f. 7 wahoo per vessel.
Sub-alternative 3g. 8 wahoo per vessel.

Discussion: The South Atlantic Fishery Management Council (Council) removed this action in its entirety at their June 2021 meeting. The Council initially considered this action in response to analyses that showed the revised recreational annual catch limit (ACL) for wahoo could be reached or exceeded based on landings in recent years. In doing so, the Council felt that a one fish limit under Preferred Alternative 2 could help ensure that the recreational ACL is not exceeded and the season would not be shortened due to the recreational accountability measure (AM) being triggered. Initial analysis of the action, which was presented at the Council's March 2021 meeting, predicted a 27.1% reduction in recreational wahoo landings, however a corrected and much revised analysis presented at the Council's June 2021 meeting predicted a much smaller estimated recreational landings reduction of 2.9%. The Council concluded that the action should be removed from further consideration after noting the substantial public input received against moving to a one wahoo per person bag limit in addition to the revised analysis showing that the bag limit reduction would not provide the desired reduction in landings to notably change the likelihood of the recreational AM being triggered. Additionally at this meeting, the Council comparatively increased the recreational ACL by changing their preferred alternative in Action 4 from Alternative 4 to Alternative 3 and confirmed the use of geometric mean to trigger the recreational AM which would allow some flexibility in determining whether the AM would go into place if the recreational ACL were to be exceeded.

Action. 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

Preferred 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.

Discussion: The Council removed this action in its entirety at their March 2021 meeting after previously selecting Alternative 1 (No Action) as their preferred alternative at the December 2020 meeting. Council members expressed concern over the action in regard to potentially conflicting with state laws that prevent filleting of fish at sea, reducing catch data collected from dockside intercepts, and noting opposition to the action from the Council's Law Enforcement Advisory Panel (AP) and NOAA's Office of Law Enforcement. The Law Enforcement AP had previously discussed the action and expressed that allowing the filleting of fish at sea would create law enforcement difficulties, fillets are easier to hide than fish kept in a whole condition, and concern that allowing filleting of dolphin at sea would carry over to similar exemptions for other species. The Law Enforcement AP recommended that filleting of dolphin at sea should not be allowed in the Atlantic Exclusive Economic Zone.

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

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.

Discussion: The Council removed these alternatives at their December 2020 meeting. After discussing the workability of these alternatives, the Council captured elements of these alternatives in Alternative 5 of Action 6 in the amendment.

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

Alternative 2. Allocate 93.95% 94.01%of the revised total annual catch limit for dolphin to the recreational sector. Allocate 6.05% 5.99% of the revised total annual catch limit for dolphin to the commercial sector. This is based on the total catch between 2008 and 2012. as reported in 2019 and does incorporate recreational landings from Monroe County, Florida.

Alternative 3. Allocate 94.91% of the revised total annual catch limit for dolphin to the recreational sector. Allocate 5.09% of the revised total annual catch limit for dolphin to the commercial sector. This is based on the total catch between 1994 and 2007.

Discussion: The Council removed these alternatives at their September 2020 meeting. Both of the alternatives would have reduced the commercial sector ACL on a pound basis. The Council stated their intent that they did not want to consider alternatives that would result in a decrease in the pounds of dolphin available to either sector.

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

Alternative 2. Allocate 97.45% of the revised total annual catch limit for wahoo to the recreational sector. Allocate 2.55% of the revised total annual catch limit for wahoo to the commercial sector. This is based on the following formula for each sector using landings data as reported in 2019 and does incorporate recreational landings from Monroe County, Florida.

Sector apportionment = (50% * average of long-term catch (pounds whole weight)) + (50% * average of recent catch (pounds whole weight)).

Long-term catch = 1999 through 2008; Recent catch = 2006 through 2008

Discussion: The Council removed this alternative at their September 2020 meeting. The alternative would have reduced the commercial sector ACL on a pound basis. The Council stated their intent that they did not want to consider alternatives that would result in a decrease in the pounds of wahoo available to either sector.

Action. Revise the commercial accountability measures for dolphin

Alternative 1 (No Action). The current commercial accountability measure includes an in-season closure to take place if the commercial annual catch limit is met or projected to be met. If the commercial annual catch limit is exceeded, it will be reduced by the amount of the commercial overage in the following fishing year only if the species is overfished and the total annual catch limit is exceeded.

Alternative 2. If commercial landings for dolphin reach or are projected to reach the commercial annual catch limit, close the commercial sector for the remainder of the fishing year.

Discussion: The Council removed this action in its entirety at their September 2020 meeting. The Council noted that the commercial accountability measure was operating as intended. While removing the pay back provision may be useful, this portion of the accountability measure would not likely be triggered since it is dolphin will not be assessed for the near-term foreseeable future so the two alternatives are functionally the same.

Action. Revise the optimum yield (OY) definition for dolphin

Alternative 1 (No Action). Optimum yield is equal to the total annual catch limit.

Alternative 2. OY is equal to the sum of the commercial ACL and the recreational ACT.

Alternative 3. OY is equal to 75% MSY.

Alternative 4. OY is the long-term average catch, which is not to exceed the total ACL, and will fall between the total ACL and the sum of the commercial and recreational ACTs.

Discussion: The Council removed this action in its entirety at their June 2020 meeting. It was noted that according to the revised National Standard 1 Guidelines, although the Council can establish an annual optimum yield (OY), it must establish a long-term OY. Annual catch limits (ACLs) are inherently short-term in nature and thus OY cannot be solely set equal to the ACL and or to an annual value. Based on this guidance, the current definition of OY being set equal to the ACL is not adequate. Since this definition of OY (OY=ACL) is used in many of the Council's fishery management plans (FMPs), the Council felt that it would be better to address the issue in a comprehensive amendment that covered many of the Council's FMPs in a single document.

Action. Establish a commercial annual catch target (ACT) for dolphin

Alternative 1 (No Action). There is no annual catch target for the commercial sector.

Alternative 2. The commercial ACT equals 80% of the commercial ACL [commercial ACL *0.8].

Alternative 3. The commercial ACT equals 90% of the commercial ACL [commercial ACL *0.9].

Alternative 4. The commercial ACT equals the commercial ACL.

Discussion: The Council removed this action in its entirety at their June 2020 meeting. The action had originally considered the commercial annual catch target (ACT) as a potential part of the definition of OY for dolphin. Given the removal of the action that revised the definition of OY, the Council felt that this action was no longer necessary.

Action. Modify the recreational annual catch target (ACT) for dolphin

Alternative 1 (No Action). The annual catch target for the recreational sector equals [sector annual catch limit*(1- percent standard error)] or [annual catch limit*0.5], whichever is greater.

Alternative 2. The recreational ACT equals 50% of the recreational ACL [recreational ACL *0.5].

Alternative 3. The recreational ACT equals 60% of the recreational ACL [recreational ACL *0.6].

Alternative 4. The recreational ACT equals 70% of the recreational ACL [recreational ACL *0.7].

Discussion: The Council removed this action in its entirety at their June 2020 meeting. The action had originally considered the recreational ACT as a potential part of the definition of OY for dolphin. Given the removal of the action that revised the definition of OY, the Council felt that this action was no longer necessary.

Action. Allow adaptive management of sector annual catch limits (ACLs) for dolphin

Alternative 1 (No Action). The current allocation for the recreational sector for dolphin is 90% of the total annual catch limit. The current allocation for the commercial sector for dolphin is 10% of the total annual catch limit.

Alternative 2. Set aside a portion of the total annual catch limit ACL that can be used by either sector as a common pool allocation.

Sub-alternative 2a: 1% of the total annual catch limit ACL becomes a common pool allocation. The remaining total annual catch limit ACL is split between the recreational sector and the commercial sector according to the current allocation.

Sub-alternative 2b: 2.5% of the total annual catch limit ACL becomes a common pool allocation. The remaining total annual catch limit ACL is split between the recreational sector and the commercial sector according to the current allocation.

Sub-alternative 2c: 5% of the total annual catch limit ACL becomes a common pool allocation. The remaining total annual catch limit ACL is split between the recreational sector and the commercial sector according to the current allocation.

Sub-alternative 2d: 10% of the total annual catch limit ACL becomes a common pool allocation. The remaining total annual catch limit ACL is split between the recreational sector and the commercial sector according to the current allocation.

Alternative 3. If the commercial annual catch limit ACL is not met in a given fishing year, the unused annual catch limit ACL may be carried forward to the next fishing year only. The carried-forward balance shall not exceed a given percentage (Sub-alternatives 3a-3c) of the commercial sector annual catch limit ACL.

Sub-alternative 3a: The carried forward balance shall not exceed 5% of the total commercial sector annual catch limit ACL.

Sub-alternative 3b: The carried forward balance shall not exceed 10% of the total commercial sector annual catch limit ACL.

Sub-alternative 3c: The carried forward balance shall not exceed 20% of the total commercial sector annual catch limit ACL.

Alternative 4. If the recreational annual catch limit ACL is not met in a given fishing year, the unused annual catch limit ACL may be carried forward to the next fishing year only. The carried-forward balance shall not exceed a given percentage (Sub-alternatives 4a-4c) of the recreational sector annual catch limit ACL.

Sub-alternative 4a: The carried forward balance shall not exceed 1% of the total recreational sector annual catch limit ACL.

Sub-alternative 4b: The carried forward balance shall not exceed 2.5% of the total recreational sector annual catch limit ACL.

Sub-alternative 4c: The carried forward balance shall not exceed 5% of the total recreational sector annual catch limit ACL.

Alternative 5. Conditionally transfer for the next fishing year a certain percentage (Sub-alternatives 5a-5d) of the annual catch limit ACL from a sector that is not landing its annual catch limit ACL to the other sector that is landing at least 90% of its annual catch limit ACL, if the landings of the donating sector are below the minimum landings threshold (Sub-alternatives 5e-5g). The highest landings from the donating

sector, based on available finalized data from the five years prior, will be used as criteria to determine if landings are below the minimum landings threshold for a conditional transfer to occur.

Conditional Quota Transfer (MUST CHOOSE ONE):

Sub-alternative 5a: Conditionally transfer 1% of the unadjusted annual catch limit ACL of one sector to the other sector.

Sub-alternative 5b: Conditionally transfer 2.5% of the unadjusted annual catch limit ACL of one sector to the other sector.

Sub-alternative 5c: Conditionally transfer 5% of the unadjusted annual catch limit ACL of one sector to the other sector.

Sub-alternative 5d: Conditionally transfer 10% of the unadjusted annual catch limit ACL of one sector to the other sector.

Donating sector's annual catch limit ACL Minimum Threshold (MUST CHOOSE ONE), if the donating sector's landings are:

Sub-alternative 5e: less than 50% of its unadjusted annual catch limit ACL

Sub-alternative 5f: less than 65% of its unadjusted annual catch limit ACL.

Sub-alternative 5g: less than 75% of its unadjusted annual catch limit ACL.

Discussion: The Council removed this action in its entirety at their December 2019 meeting. Council members noted that if carry-over of unused sector ACL were to be permitted that it would be better suited to allow this through the ABC Control Rule amendment that the Council is considering. It was also noted that there was not a need for this action, as the commercial sector accountability measure had only been triggered one time since implementation of the Dolphin and Wahoo FMP and that the alternatives being considered would be administratively cumbersome to implement. Additionally, Council members expressed that reallocation of the total ACL for dolphin could be handled in a different action.

Action. Allow bag limit sales of dolphin for dually permitted for-hire and commercial permit holders

Alternative 1 (No Action). Bag limit sales of dolphin landed from a vessel that is issued a federal for-hire dolphin wahoo permit is prohibited if operating on a trip under a for-hire mode. If the vessel is also issued a federal commercial dolphin wahoo permit and necessary state commercial permits, dolphin landed from the vessel may be sold if not operating on a trip under a for-hire or private recreational mode.

Alternative 2. Allow bag limit sales of dolphin landed from a vessel that is issued a federal for hire dolphin wahoo permit, commercial dolphin wahoo permit, and necessary state commercial permits, regardless of whether on a commercial or for-hire trip.

Discussion: The Council removed this action in its entirety at their June 2019 meeting. Council members expressed that the action is inconsistent with the goals and objectives of the Dolphin and Wahoo FMP. Specifically, that the action does not maintain a precautionary approach, access for both sectors, or minimize competition between user groups. Additionally, it was noted that allowing bag limit sales of dolphin would create issues with accounting of sector ACLs and that there were law enforcement concerns over the action directly related to dolphin and the potential for similar exemptions to be granted for other species in the future. Council members also noted that the current regulations do not prevent a properly permitted vessel operator from commercially fishing.

Action. Establish ACLs by gear type for dolphin for the commercial sector.

Alternative 1 (No Action). There is currently one sector ACL for all gear types in the commercial dolphin fishery (10% of the total ACL).

Alternative 2. Allocate 46% (532,220 lbs ww) of the commercial ACL for dolphin to pelagic longline gear. Allocate 54% (624,781 lbs ww) of the commercial ACL for dolphin to hook and line all other commercial fishing gear. (Based on lowest longline % landings by gear type from 2005 through 2014).

Alternative 3. Allocate 50% (578,501 lbs ww) of the commercial ACL for dolphin to pelagic longline gear. Allocate 50% (578,501 lbs ww) of the commercial ACL for dolphin to hook and line and all other commercial fishing gear.

Alternative 4. Allocate 62% (717,341 lbs ww) of the commercial ACL for dolphin to pelagic longline gear. Allocate 38% (439,660 lbs ww) of the commercial ACL for dolphin to hook and line and all other commercial fishing gear. (Based on average landings by gear type from 2005 through 2014).

Alternative 5. Allocate 75% (867,751 lbs ww) of the commercial ACL for dolphin to pelagic longline gear. Allocate 25% (289,250 lbs ww) of the commercial ACL for dolphin to hook and line and all other commercial fishing gear. (Based on highest longline % landings by gear type from 2005 through 2014).

Discussion: The Council removed this action in its entirety at their September 2016 meeting. Council members noted that an increase to the commercial sector ACL for dolphin had recently been approved by the Council via Amendment 8 to the Dolphin and Wahoo FMP and that a 4,000 lbs ww commercial trip limit for dolphin had recently been approved by the Council via Regulatory Amendment 1 to the Dolphin and Wahoo FMP. As such it was unclear what sort of effect the recent change in regulations would have on the commercial sector and Council members felt that an action implementing commercial gear allocations was not needed.

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 B_{MSY} 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

1.1 Administrative Procedure Act (APA)

All federal rulemaking is governed under the provisions of the APA (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Among other things under the APA, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect, with some exceptions. Dolphin Wahoo Amendment 10 to the Fishery Management Plan (FMP) for the Dolphin and Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 10) complies with the provisions of the APA through the South Atlantic Fishery Management Council's (Council) extensive use of public meetings, requests for comments and consideration of comments. The proposed rule associated with this framework amendment will have a request for public comments, which complies with the APA, and upon publication of the final rule, unless the rule falls within an APA exception, there will be a 30-day wait period before the regulations are effective.

1.2 Information Quality Act (IQA)

The IQA (Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-443)) which took effect October 1, 2002, directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidelines to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the IQA. Dolphin Wahoo Amendment 10 uses the best available information and made a broad presentation thereof. The information contained in this document was developed using best available scientific information. Therefore, this document is in compliance with the IQA.

1.3 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the federal CZMA of 1972 requires that all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the Council to have management measures that complement those of the states, federal and state administrative procedures vary and regulatory changes are unlikely to be fully instituted at the same time. The Council believes the actions in this framework amendment are consistent to the maximum extent practicable with the Coastal Zone Management Plans 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. Pursuant to Section 307 of the CZMA, this determination will be submitted to the responsible state agencies who administer the approved Coastal Zone Management Programs in the States 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.

1.4 Executive Order 12612: Federalism

E.O. 12612 requires agencies to be guided by the fundamental federalism principles when formulating and implementing policies that have federalism implications. The purpose of the Order is to guarantee the division of governmental responsibilities between the federal government and the states, as intended by the framers of the Constitution. No federalism issues have been identified relative to the actions proposed in this document and associated regulations. Therefore, preparation of a Federalism assessment under E.O. 12612 is not necessary.

1.5 Executive Order 12962: Recreational Fisheries

E.O. 12962 requires federal agencies, in cooperation with states and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods. Additionally, the Order establishes a seven-member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The National Recreational Fisheries Coordination Council also is responsible for developing, in cooperation with federal agencies, states and tribes, a Recreational Fishery Resource Conservation Plan to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

The alternatives considered in this document are consistent with the directives of E.O. 12962.

1.6 Executive Order 13089: Coral Reef Protection

E.O. 13089, signed by President William Clinton on June 11, 1998, recognizes the ecological, social, and economic values provided by the Nation's coral reefs and ensures that federal agencies are protecting these ecosystems. More specifically, the Order requires federal agencies to identify actions that may harm U.S. coral reef ecosystems, to utilize their program and authorities to protect and enhance the conditions of such ecosystems, and to ensure that their actions do not degrade the condition of the coral reef ecosystem.

The alternatives considered in this document are consistent with the directives of E.O. 13089.

1.7 Executive Order 13158: Marine Protected Areas (MPAs)

E.O. 13158 was signed on May 26, 2000, to strengthen the protection of U.S. ocean and coastal resources through the use of Marine Protected Areas. The E.O. defined MPAs as "any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." It directs federal agencies to work closely with state, local and non-governmental partners to create a comprehensive

network of MPAs "representing diverse U.S. marine ecosystems, and the Nation's natural and cultural resources."

The alternatives considered in this document are consistent with the directives of E.O. 13158.

1.8 National Marine Sanctuaries Act (NMSA)

Under the NMSA (also known as Title III of the Marine Protection, Research and Sanctuaries Act of 1972), as amended, the U.S. Secretary of Commerce is authorized to designate National Marine Sanctuaries to protect distinctive natural and cultural resources whose protection and beneficial use requires comprehensive planning and management. The National Marine Sanctuary Program is administered by the Sanctuaries and Reserves Division of NOAA. The NMSA provides authority for comprehensive and coordinated conservation and management of these marine areas. The National Marine Sanctuary Program currently comprises 13 sanctuaries around the country, including sites in American Samoa and Hawaii. These sites include significant coral reef and kelp forest habitats, and breeding and feeding grounds of whales, sea lions, sharks, and sea turtles. The three sanctuaries in the South Atlantic exclusive economic zone are the USS Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries.

The alternatives considered in this document are not expected to have any adverse impacts on the resources managed by the National Marine Sanctuaries.

1.9 Paperwork Reduction Act (PRA)

The purpose of the PRA is to minimize the burden on the public. The PRA is intended to ensure that the information collected under the proposed action is needed and is collected in an efficient manner (44 U.S.C. 3501 (1)). The authority to manage information collection and record keeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications. The PRA requires NMFS to obtain approval from the OMB before requesting most types of fishery information from the public. Actions in this document are not expected to affect PRA.

1.10 Public Law 99-659: Vessel Safety

Public Law 99-659 amended the Magnuson-Stevens Fishery Conservation and Management Act to require that a FMP or FMP amendment must consider, and may provide for, temporary adjustments (after consultation with the U.S. Coast Guard and persons utilizing the fishery) regarding access to a fishery for vessels that would be otherwise prevented from participating in the fishery because of safety concerns related to weather or to other ocean conditions. No vessel would be forced to participate in Atlantic fisheries under adverse weather or ocean conditions as a result of the imposition of management regulations proposed in this amendment. No concerns have been raised by Atlantic fishermen or by the U.S. Coast Guard that the proposed management measures directly or indirectly pose a hazard to crew or vessel safety under adverse weather or ocean conditions.

Appendix D. Bycatch Practicability Analysis

1. Background

Amendment 10 to the Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic (Dolphin and Wahoo FMP) would modify the catch levels, accountability measures, sector allocations, and management measures for dolphin and wahoo. Management measures address authorized gear, operator card requirement, and recreational vessel limits for dolphin. Development of Amendment 10 is primarily a result of new acceptable biological catch recommendations from the South Atlantic Fishery Management Council's (Council) Science and Statistical Committee (SSC).

Bycatch Reporting Requirements and Methodology

Fishermen with Commercial Atlantic Dolphin Wahoo Permits, who are selected by the Science and Research Director, are required to maintain and submit fishing records though the Southeast Fisheries Science Center (SEFSC) Commercial Logbook. Discard data are collected using the Supplemental Discard Logbook that is sent to a 20% stratified random sample of the active commercial permit holders in the fishery. In addition to the number of self-reported discards per trip and gear, the SEFSC Supplemental Discard Logbook attempts to quantify the reason why discarding occurs using four codes.[33] Fishers can specify multiple reasons for a species discarded on the same trip and gear.

1) Regulation – Not legal size: Animals that would have been sold, however local or federal size limits forbid it.
2) Regulation – Out of season: Animals that would have been sold, however the local or federal fishing season is closed.
3) Regulation – Other: Animals that would have been sold, however a local or federal regulation other than size or season, forbids it (Other than size or season; i.e., protected species, not properly permitted).
4) Market conditions: Animals that have no market value (rotten, damaged).

For the recreational sector, estimates of discards from private recreational and charter fishermen are collected through the Marine Recreational Information Program (MRIP). The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels.

[33] More information on the discard logbook is available here https://www.fisheries.noaa.gov/about/southeast-fisheries-science-center.

2. Population Effects for the Bycatch Species

2.1 Amount and Type of Bycatch and Discards

Commercial Sector

Commercial discards were estimated annually using the SEFSC Commercial Logbook and Supplemental Discard Logbook (accessed May 2020) for all Atlantic trips. A discard rate in numbers of fish per unit of effort was calculated by species and gear, and that rate was expanded to the total effort in the fishery by gear. When discards for dolphin and wahoo are examined for the previous ten years a relatively small number of discards are reported annually (**Figure D.2.1.1**). It is difficult to compare the ratio of commercial landings to discards because commercial landings are reported in weight and discards are reported in numbers of fish. However, based on the information available, very little discarding of dolphin or wahoo was occurring on average. Specifically, 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 majority of discarded dolphin occurred on trips using handline or electric gear and majority of discarded wahoo occurred on trips using trolling gear.

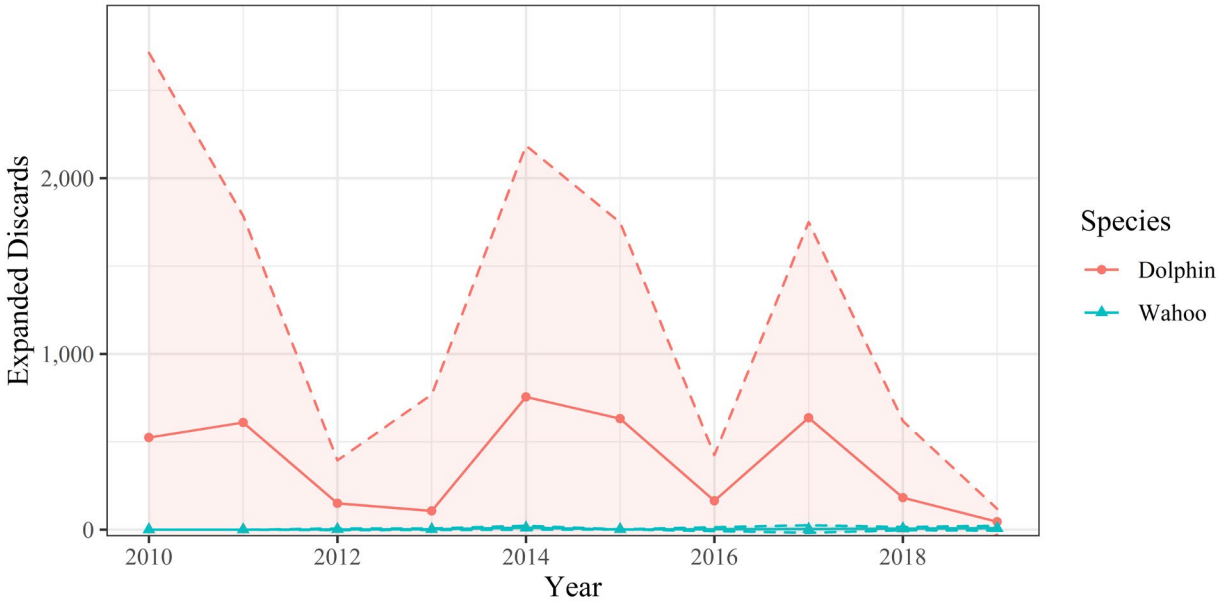

Figure D.2.1.1. Annual expanded discard estimates for dolphin and wahoo (number of fish) by year from 2010 through 2019 with 95% confidence interval (dashed line). Source: SEFSC Supplemental Commercial Discard Logbook (May 2020).

Dolphin wahoo trips were defined as trips with >50% of landings from dolphin and wahoo stocks. From 2015 through 2019, the commercial sector of the dolphin and wahoo fishery in the Atlantic had 3,221 trips for all gear types combined in the SEFSC Commercial Logbook. The dolphin wahoo commercial harvest is characterized by a low amount of discards for all species with discards only occurring on a very small percentage of dolphin wahoo trips (**Table D.2.1.1**).

Table D.2.1.1. From 2015 through 2019, the mean annual number of discards with 95% confidence interval and the percent of dolphin wahoo trips reporting discard by species for dolphin wahoo trips only. Only species with discards reported on dolphin wahoo trips were included and discards represent numbers of fish.

Species	Mean Annual Discards with 95% Confidence Interval	Percent of Dolphin Wahoo Trips Reporting Discards
Dolphin	296 (447-182)	6%
Black Sea Bass	163 (346-26)	1%
Red Snapper	97 (194-24)	1%
Vermilion Snapper	47 (83-20)	1%
King Mackerel	41 (71-19)	1%
Blueline Tilefish	40 (104-0)	<1%
Gray Triggerfish	32 (77-0)	<1%
Yellowtail Snapper	29 (70-0)	<1%
Triggerfishes	23 (60-0)	<1%
Little Tunny	21 (37-8)	<1%
Bank Sea Bass	18 (48-0)	<1%
Banded Rudderfish	16 (41-0)	<1%
Gag	15 (30-4)	1%
Red Porgy	15 (30-4)	<1%
Almaco Jack	9 (22-0)	<1%
Tomtate	7 (19-0)	<1%
Scamp	2 (4-1)	<1%
Goliath Grouper	1 (4-0)	<1%
Rock Hind	1 (3-0)	<1%
Wahoo	1 (1-0)	<1%
Black Grouper	1 (1-0)	<1%

Source: Commercial discard estimates and trips are expanded from the SEFSC Supplemental Commercial Discard Logbook (May 2020).

Of the four discard codes in the logbook, regulations (i.e., not legal size and other) was the most common reason selected for dolphin and wahoo, depending on the species, based on the number of self-reported discards (**Table D.2.1.2**). The 20-inch minimum fork length off Florida, Georgia, and South Carolina appears to be the primary driver of discards for dolphin, but for wahoo it was not determined what regulation was driving discards.

Table D.2.1.2. The percentage of unexpanded discards for each discard reason out of the total number of self-reported discards reported to the Supplemental Discard Logbook in the Atlantic from 2015 through 2019.

Species	Not Legal Size	Out of Season	Other Regulations	Market Conditions
Dolphin	80.1%	0%	16.1%	3.8%
Wahoo	15.4%	0%	61.5%	23.1%

Sources: SEFSC Supplemental Commercial Discard Logbook (May 2020).

Recreational Sector

Recreational discards of dolphin and wahoo are much lower than the landings for all modes of fishing (**Table D.2.1.3**). From 2015 through 2019, the private mode had the highest estimated annual recreational landings and discards of dolphin and wahoo. From 2015 through 2019, the other most discarded species on trips capturing dolphin or wahoo varied by mode, but black sea bass, red snapper, vermilion snapper, and blue runner were in the top ten for all three modes (**Table D.2.1.4**). Recreational discards of other species on trips capturing dolphin or wahoo species are also highest in the private mode.

Rudershausen et al. (2019) report a dolphin discard mortality rate of 24.8% for the recreational hook-and-line sector in the U.S. South Atlantic, Gulf of Mexico, and Caribbean region. Discard mortality rates for wahoo are currently unknown.

Table D.2.1.3. Atlantic dolphin wahoo headboat, charter, and private mean estimates of landings and discards (2015-2019).

Species	HEADBOAT			CHARTER			PRIVATE		
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
Dolphin	3527	416	13%	228,456	14,145	6%	1,865,572	684,060	37%
Wahoo	132	9	7%	12,487	9	<1%	75,258	4,292	6%

Sources: SEFSC Recreational MRIP-FES ACL Dataset (September 2020), SEFSC Headboat Logbook CRNF files (expanded; July 2020).

Table D.2.1.4. From 2015 through 2019, the top ten species with discards reported on trips capturing a dolphin or wahoo by recreational mode. Species are sorted by number of total discards for each mode.

Rank	HEADBOAT		CHARTER		PRIVATE	
	Species	Discards (N)	Species	Discards (N)	Species	Discards (N)
1	Black Sea Bass	59,327	Vermilion Snapper	44,431	Tomtate	963,191
2	Vermilion Snapper	41,519	Black Sea Bass	39,572	Black Sea Bass	733,531
3	Tomtate	27,141	Red Porgy	31,461	Vermilion Snapper	675,379
4	Atlantic Sharpnose Shark	19,784	Red Snapper	19,769	Little Tunny	655,237
5	Blue Runner	13,147	Blue Runner	17,230	Blue Runner	598,930
6	Gray Triggerfish	13,088	Sailfish	14,951	Almaco Jack	595,637
7	Red Snapper	12,722	Gray Triggerfish	13,033	Gray Triggerfish	443,089
8	Red Porgy	9,878	Greater Amberjack	12,023	Red Snapper	403,538
9	Spottail Pinfish	5,339	Little Tunny	11,789	Amberjack Genus	338,552
10	Mutton Snapper	4,854	Jack Genus	9,463	Grunt Family	331,166

Sources: Recreational MRIP-FES survey data, available at https://www.st.nmfs.noaa.gov/st1/recreational/MRIP_Survey_Data/. [Accessed October 2, 2020], SEFSC Headboat Logbook CRNF files (expanded; July 2020).

2.2 Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality

Expected Impacts on Bycatch for the Subject Amendment Actions

Action 1 would revise the total annual catch limit (ACL) for dolphin to reflect the updated acceptable biological catch (ABC) level provided by the Council's SSC. None of the proposed ACLs are expected to lead to changes in dolphin harvest or fishing behavior for dolphin based on recent average landings in the fishery (2015-2019). The Council selected **Alternative 2** as the preferred alternative, which proposes a total ACL that is 47% higher than average landings between 2015-2019. If fishing effort increases in response to higher ACLs, regulatory discards of dolphin could increase, particularly in the recreational sector. However, the primary source of the increase in the total ACL is attributable to the change to MRIP (i.e., recreational anglers have historically harvested roughly the same proportion, but the data have begun to more accurately estimate that proportion only in relatively recent years), and fishing effort is not expected to substantially change; thus, no changes in bycatch are expected for **Action 1**.

Action 2 would revise the total ACL for wahoo to reflect the updated ABC level provided by the Council's SSC. The potential revised total ACLs for wahoo are less than the observed landings in three out of the past five years of available data (2015-2019) and average landings for that timeframe. Based on the historic breakdown of wahoo landings, the commercial sector would likely go unconstrained as the commercial sector landings are predicted to be below the sector ACL set in the proceeding **Action 4**. The recreational sector 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 constrained harvest by the recreational sector could lead to increased regulatory discards. The Council selected **Alternative 2** as the preferred alternative, which proposes a total ACL that is 61% higher than status quo. However, the primary source of the increase in the total ACL is attributable to the change to MRIP (i.e., recreational anglers have historically harvested roughly the same proportion, but the data have begun to more accurately estimate that proportion only in relatively recent years), fishing effort is not expected to substantially change, and the ratio of discards to landings is very low for wahoo; thus, no changes in bycatch are expected for **Action 2**.

Action 3 would revise sector allocations and ACLs for dolphin. The Council selected **Alternative 3** as the preferred alternative, which proposes a 93:7 split between the recreational and commercial sectors, respectively. This allocation scenario modestly increases the commercial ACL, and allocates the remaining quota to the recreational sector. Commercial dolphin landings have been well below the proposed commercial ACL, on average less than 900,000 lbs (2015-2019). The recreational ACL for dolphin would not be reached or exceeded under **Preferred Alternative 3** under the average 2015-2019 or average 2017-2019 scenarios. Given that the allocation changes are based on recent data more accurately estimating recreational harvest that has historically occurred, the proposed allocations are not expected to result in changes to fishing activity or behavior; thus no changes in bycatch are expected for **Action 3**.

Action 4 would revise sector allocations and ACLs for wahoo. The Council selected **Alternative 3** as the preferred alternative, which proposes a 97.55%:2.45% split between the recreational and commercial sectors, respectively. This allocation scenario very modestly increases the commercial ACL, and allocates the remaining quota to the recreational sector. Commercial wahoo landings are predicted to be below the proposed commercial ACL. All of the alternatives predict the recreational sector reaching its ACL prior to the end of the fishing year based on average and maximum landings from 2015-2019. If future landings reach the new ACL, potential management measures such as season closures and reduced

bag or vessel limits would be triggered. These management measures would constrain harvest and could lead to increased regulatory discards. However, very little discarding of wahoo currently occurs by either sector. Given that the allocation changes are based on recent data more accurately estimating recreational harvest that has historically occurred, there is no anticipated change to fishing activity or behavior and thus no changes in bycatch are expected for **Action 4**.

Actions 5 and **7** would revise the trigger for the post-season recreational accountability measures (AM) for dolphin and wahoo, respectively, in the following fishing year. These proposed actions would implement criteria that would initiate AMs to reduce the chances that the respective recreational ACL is exceeded. The Council selected to implement post-season AMs for dolphin if the total (commercial and recreational combined) ACL is exceeded (**Preferred Alternative 5**). For Wahoo, the Council selected to implement post season AMs if the recreational ACLs are constant and the 3-year geometric mean of landings (**Preferred Alternative 2**, **Preferred Sub-alternative 2b**) exceeds the recreational sector ACL. These actions are not expected to alter fishing activity aside from the AM triggered and are not expected to result in changes to bycatch.

Action 6 would revise the post-season recreational AMs for dolphin. The Council selected a reduction in the length of the following recreational fishing season by the amount necessary to prevent the ACL from being exceeded in the following year (**Preferred Alternative 2**) as the preferred option. If a recreational fishing season is shortened, this action could increase regulatory discards in the fishery. However, with the increased dolphin total and sector ACLs in **Actions 1** and **3**, and based on past landings, no anticipated change to fishing activity or behavior are expected with the higher ACLs; thus no changes in bycatch are expected for **Action 6**.

Action 8 would revise the post-season recreational AMs for wahoo. The Council selected a reduction in the length of the following recreational fishing season by the amount necessary to prevent the ACL from being exceeded in the following year (**Preferred Alternative 2**) as the preferred option. If a recreational fishing season is shortened, this action could increase regulatory discards in the fishery. However, with the increased wahoo total and sector ACLs in **Actions 2** and **4**, and based on past landings, no anticipated change to fishing activity or behavior are expected with the higher ACLs; thus, no changes in bycatch are expected for **Action 8**.

Action 9 would allow properly permitted commercial fishing vessels with trap, pot, or buoy gear on board that are not authorized for use in the dolphin and wahoo fishery to possess commercial quantities of dolphin and wahoo. The commercial landings data for dolphin and wahoo from 2015-2019 indicate that gear types 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 include buoy gear, pots, traps, and various net-based gear types, particularly gillnets. This action 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. While current information indicates that this action would affect very few vessels (**Chapter 3**) and vessels would be limited to a small trip limit (500 pounds gutted weight for each species – **Preferred Alternatives 2** (including **Preferred Sub-alternative 2b**) and **3**), this action could convert previously discarded dolphin and wahoo into landed incidental catch. It is unlikely substantial increased targeting of dolphin and wahoo would result from this action, thus very little change in bycatch is expected for **Action 9**.

Action 10 would remove the operator card requirement for for-hire vessels for dolphin and wahoo (**Preferred Alternatives 2** and **3**). This action does not have the potential to impact bycatch in the fishery.

Action 11 would reduce the recreational 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. The Council selected **Alternative 2** as the preferred option (54 dolphin per vessel per trip). **Preferred Sub-alternative 2e** would reduce the vessel limit from 60 dolphin per vessel to 54 dolphin per vessel. For trips that would be expected to catch greater than 54 fish, potentially less undersized fish would be caught and discarded, potentially reducing discards. However, due to the very small proportion of recreational trips that near or reach the proposed vessel limit, no anticipated change to fishing activity or behavior is expected; thus, no changes in bycatch are expected for **Action 11**.

None of the actions and alternatives in Amendment 10 are likely to change the current level of bycatch of target or non-target species in the Atlantic. The biological effects of these actions are outlined in Chapter 4.

Past, Current, and Future Actions to Prevent Bycatch and Improve Monitoring of Harvest, Discards, and Discard Mortality

Action was taken in the Dolphin and Wahoo FMP (SAFMC 2003) to reduce bycatch by prohibiting the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the Council's area of jurisdiction (Atlantic coast) which is closed to the use of pelagic gear for highly migratory pelagic species (HMS). Other actions have been taken in implemented amendments (below) that could reduce bycatch of and bycatch mortality of federally managed species in the South Atlantic.

Amendment 16 to the Snapper Grouper FMP (SAFMC 2009) required the use of dehooking devices, which could help reduce bycatch mortality of non-target species. Dehooking devices can allow fishermen to remove hooks with greater ease and timeliness without removing the fish from the water. If a fish does need to be removed from the water, dehookers could still reduce handling time in removing hooks, thus increasing survival (Cooke et al. 2001).

The Comprehensive ACL Amendment (SAFMC 2011) implemented ACLs and AMs for species not undergoing overfishing in the FMPs for snapper grouper, dolphin and wahoo, golden crab, and *Sargassum*, in addition to other actions such as allocations and establishing annual catch targets for the recreational sector. ACLs and AMs have likely reduced bycatch of target species as well as incidentally caught species.

The Council's Headboat Electronic Reporting Amendment (SAFMC 2013) changed the reporting frequency by headboats from monthly to weekly, and required that reports be submitted electronically. The action is expected to provide more timely information on landings and discards. Improved information on landings would help ensure ACLs are not exceeded. Furthermore, more timely and accurate information would be expected to provide a better understanding of the composition and magnitude of catch and bycatch, enhance the quality of data provided for stock assessments, increase the quality of assessment output, and lead to better decisions regarding additional measures to reduce bycatch.

The Council developed a joint For-Hire Reporting Amendment (SAFMC 2017) with the Gulf of Mexico Fishery Management Council that requires all federally permitted charter vessels report landings information weekly to the SEFSC electronically. Additionally, the Councils will also begin development of a joint amendment to require that all federally permitted commercial fishing vessels in the southeast also report their logbook landings information electronically. These future actions will help to improve estimates on the composition and magnitude of catch and bycatch of species affected by this amendment, as well as all other federally managed species in the southeast region.

Regulatory Amendment 29 to the Snapper Grouper FMP (SAFMC 2020) required descending devices be on board all commercial, 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 many fishermen targeting dolphin and wahoo also use non-longline hook-and-line gear target snapper grouper species on the same trip, the best fishing practices implemented by Regulatory Amendment 29 could be expected to flow over to the dolphin and 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.

Rudershausen et al. (2019) 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. The Council is expected to consider circle hooks and other gear related actions in a future amendment for the dolphin and wahoo fishery.

These past, current, and potential future actions will help to improve estimates on the composition and magnitude of catch and bycatch of federally managed species in the southeast region and minimize discard mortality. Additional information on fishery related actions from the past, present, and future considerations can be found in Chapter 6 (Cumulative Effects) of the amendment.

3. Ecological Effects Due to Changes in Bycatch

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Dolphin and wahoo are pelagic and migratory, interacting with various combinations of species groups at different levels on a seasonal basis. Non-longline hook-and-line gear, the gear predominantly used to harvest dolphin by the recreational sector, is the Sustainable Seafood Guide's recommended gear in the U.S. as a "best choice" since this gear has minimal bycatch issues, and does little damage to physical or biogenic habitats (Blue Ocean 2010; Seafood Watch 2016). Release mortality rates are unknown for most managed species, including dolphin and wahoo, but recent research determined a median mortality rate of 25% for discarded dolphin in the South Atlantic (Rudershausen et al. 2019). It is likely that most mortality is a function of hooking and handling of the fish when the hook is being removed. Better bycatch and discard data would provide a better understanding of the composition and magnitude of catch and bycatch, enhance the quality of data

provided for stock assessments, increase the quality of assessment output, and lead to better decisions regarding additional measures to reduce bycatch.

Because dolphin are not long lived species (up to 4 years), the species is highly productive, and bycatch and discarding is low, bycatch is unlikely to have a significant effect on the health of dolphin. As noted above, the actions contained in this amendment are not expected to result in substantial changes to bycatch in the dolphin and wahoo fishery; thus, ecological effects due to changes in bycatch in this fishery are expected to be negligible. For more details on ecological effects, see Chapters 3 and 4 of this amendment.

4. Changes in the Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects

Amendment 10 is not expected to result in substantial changes in bycatch of other fish species. The dolphin wahoo commercial fishery is characterized by a low amount of discards for all species with discards occurring on a very small percentage of dolphin wahoo trips (Table E.2.1.1). The recreational sector likely targets a wide range of species, including dolphin wahoo, snapper grouper, and coastal migratory pelagic species during each trip. This results in larger and more varied amount and type of bycatch of species other than dolphin and wahoo (Table E.2.1.4). However, the actions in this amendment are not expected to alter fishing activity or behavior; thus no changes in bycatch of other species are expected.

Pelagic longline gear used to harvest dolphin in the Atlantic is associated with bycatch of protected and HMS species. However, the longline component of the Council-managed fishery is small (Chapter 3), and the actions in this amendment are not expected to result in a significant increase in the use of longline gear in the dolphin and wahoo fishery, or associated incidental takes of protected and HMS species. Unless fisherman behavior changes significantly in the near future, no increased risks to species listed under the Endangered Species Act or HMS species beyond the status quo are anticipated as a result of this amendment.

5. Effects on Marine Mammals and Birds

Marine Mammals

Under Section 118 of the Marine Mammal Protection Act (MMPA), the National Marine Fisheries Service (NMFS) must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. The Council managed longline and hook-and-line gear (non-longline) components of the dolphin and wahoo fishery are determined to have remote likelihood of / no known interactions with marine mammals (Category III, LOF, 86 FR 3028; January 14, 2021).

Sea Birds

The Bermuda petrel and roseate tern are the only two ESA-listed seabirds that occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North Carolina and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished US Fish and Wildlife Service data). Interaction with fisheries has not been reported as a concern for either of these species. Although,

the Bermuda petrel and roseate tern occur within the action area, these species are not commonly found and neither has been described as associating with vessels or having had interactions with the dolphin and wahoo fishery. Thus, the fishery is not likely to affect the Bermuda petrel and the roseate tern.

6. Changes in Fishing, Processing, Disposal, and Marketing Costs

The actions proposed in Amendment 10 are not expected to substantially alter fishing practices, processing, disposal, or marketing costs in the near or short term in relation to bycatch or discards in the dolphin and wahoo fishery. As shown in the analyses in Chapter 4 of the preferred alternatives for actions potentially affecting catch, costs are not expected to change. Similarly in the long term, it is more likely that current fishing, processing, disposal, and marketing costs would be maintained at or near their status quo levels, thus leading to no anticipated changes.

7. Changes in Fishing Practices and Behavior of Fishermen

As discussed above, the actions proposed in Amendment 10 are not expected to change fishing practices or fishing behavior, and are likely to have little effect on the overall magnitude of discards. Also, any changes to fishing behavior and subsequent changes in the level of discards or discard mortality that may result from the actions in the amendment are expected to be small, and would not jeopardize the sustainability of any target or non-target species.

8. Changes in Research, Administration, and Enforcement Costs and Management Effectiveness

Research

Research and monitoring is ongoing to understand the effectiveness of implemented management measures and their effect on bycatch. The SEFSC is developing electronic logbooks, which could be used to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Further, a joint Commercial Logbook Reporting Amendment is being developed by the Council and the Gulf of Mexico Fishery Management Council, which would require electronic reporting of landings information by federally permitted commercial vessels to increase the timeliness and accuracy of landings and discard data. The joint For-Hire Reporting Amendment should improve timeliness and quality of data for the charter and headboat components of the recreational sector.

Cooperative research projects between science and industry are available each year in the form of grants from Marine Fisheries Initiative, Saltonstall-Kennedy program, and the Cooperative Research Prom. These programs can provide research funds for observer programs, as well as gear testing and testing of electronic devices. A condition of funding for these projects is that data are made available to the Councils and NMFS upon completion of a study.

Administration

The proposed actions are not expected to significantly impact administrative costs.

Enforcement

The proposed actions are not expected to significantly impact enforcement costs.

9. Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources

Changes in economic, social, or cultural values are discussed in Chapter 4. None of the actions and alternatives in Amendment 10 are likely to change the current level of bycatch of target or non-target species in the Atlantic and thus are unlikely to change the social, economic, or cultural value of fishing activities and non-consumptive uses of the dolphin and wahoo fishery.

10. Changes in the Distribution of Benefits and Costs

The distribution of benefits and costs expected from the proposed actions in Amendment 10 are discussed in the economic and social effects analysis in Chapter 4. These effects are discussed in relation to the baseline economic and social conditions of the fishery and fishing communities outlined in **Chapter 3** of the document. Additionally, the Regulatory Impact Review (Appendix F) and Regulatory Flexibility Act Analysis (Appendix G) provide additional information on changes in the distribution of benefits and costs. Overall, almost no such alterations would be cause by changes to bycatch resulting from this amendment.

11. Social Effects

The baseline social environment and social effects of the proposed actions are described in Chapters 3 and 4 of Amendment 10, respectively. In general, fishermen become frustrated as waste of the resource due to regulatory bycatch of target and non-target species increases. This often results in a distrust of science in that regulations are intended to protect stocks and rebuild overfished stocks by reducing such bycatch. However, none of the actions and alternatives in Amendment 10 are likely to change the current level of bycatch of target or non-target species in the Atlantic and thus are unlikely to result in the negative social effects described.

12. Conclusion

This BPA evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 CFR section 600.350(d)(3)(i). In summary, the proposed actions in Amendment 10 are not likely to significantly contribute or detract from the current level of bycatch in the dolphin and wahoo fishery. The Council, NMFS, and the SEFSC have implemented and plan to implement numerous management measures and reporting requirements that have improved, or are likely to improve monitoring efforts of discards and discard mortality.

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Appendix E. Regulatory Impact Review

Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest to satisfy the obligations under Executive Order (E.O.) 12866, as amended. In conjunction with the analysis of direct and indirect effects in the "Environmental Consequences" section of this Amendment, the RIR: 1) provides a comprehensive review of the level and incidence of impacts associated with a regulatory action; 2) provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives which could be used to solve the problem; and 3) ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way. The RIR also serves as the basis for determining whether any proposed regulations are a "significant regulatory action" under certain criteria provided in Executive Order (E.O.) 12866. In addition, the RIR provides some information that may be used in conducting an analysis of the effects on small entities pursuant to the Regulatory Flexibility Act (RFA). This RIR analyzes the effects this regulatory action would be expected to have on the recreational and commercial sectors of the Atlantic dolphin and wahoo fishery.

Problems and Objectives

The problems and objectives for the proposed actions are presented in Section 1.3 of this amendment and are incorporated herein by reference.

Description of Fisheries

A description of the recreational and commercial sectors of the Atlantic dolphin and wahoo fishery is provided in Section 3.3 of this amendment and is incorporated herein by reference.

Effects of Management Measures

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.1.2. The following discussion summarizes the expected economic effects of the Council preferred alternative relative to the No Action alternative (i.e., the status quo).

The ACL is set equal to the ABC in **Alternative 1 (No Action)** and **Preferred Alternative 2**, with the differences between the two occurring due to how the ABC has been set and how the non-headboat recreational component of the total ACL would be accounted for moving forward. Therefore, the economic effects of the **Alternative 1 (No Action)** and **Preferred Alternative 2**

would be assumed to be similar. Methods for estimating harvest have changed for the non-headboat recreational component, which accounts for the majority of dolphin landings (over 95.3% on average from 2015-2019). This accounting of harvest has not changed how many dolphin recreational anglers are harvesting. Rather, the FES method helps account for total effort and total harvest more accurately. Thus, the increase in the estimated numbers between **Alternative 1 (No Action)** and **Preferred Alternative 2** does not necessarily reflect an actual increase in recreational harvest. Rather the change away from **Alternative 1 (No Action)** to **Preferred Alternative 2** revises how landings will be accounted for moving forward, particularly in regard to recommendations surrounding best available science from the SSC.

The proposed total ACL for dolphin in **Preferred Alternative 2** is higher than the observed landings in recent years, with the exception of 2015. Assuming long-term landings reflect the average landings over the most recent five years of available data (2015-2019), landings would be expected to continue to be below the potential new ACL and thus not constraining on the fishery. As a result, no direct economic effects are anticipated from **Preferred Alternative 2** in the short-term assuming average abundance.

While dolphin harvest or fishing behavior for dolphin are not expected to change, based on recent average landings, a larger buffer between the ACL and observed landings would allow for higher potential landings, such as those observed in 2015, and reduce the likelihood of restrictive AMs being triggered that would lead to short-term negative economic effects. **Preferred Alternative 2** is estimated to result in an increase in potential net economic benefits of $8,864,745 for the recreational sector, $1,851,508 for the commercial sector, and $10,716,253 for both sectors combined (2019 $).

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.2.2. The following discussion summarizes the expected economic effects of the Council preferred alternative relative to the No Action alternative (i.e., the status quo).

The ACL is set equal to the ABC in **Alternative 1 (No Action)** and **Preferred Alternative 2**, with the differences between the two due to how the ABC has been set and how the non-headboat recreational component of the total ACL would be accounted for moving forward. Therefore, the economic effects of **Alternative 1 (No Action)** and **Preferred Alternative 2** would be assumed to be similar. In regard to the non-headboat recreational component of the total ACL, which accounts for the majority of wahoo landings (96.7% on average from 2015-2019), methods for estimating harvest have changed to measure actual harvest more accurately. This accounting of harvest has not changed how many wahoo recreational anglers are harvesting, rather the FES method helps account for total effort and total harvest more accurately. Thus, the increase in the estimated numbers between **Alternative 1 (No Action)** and **Preferred Alternative 2** does not necessarily reflect an actual increase in recreational harvest. Rather the change away from **Alternative 1 (No Action)** to **Preferred Alternative 2** revises how landings will be accounted for moving forward, particularly regarding recommendations surrounding best available science from the SSC.

The potential revised total ACL for wahoo in **Preferred Alternative 2** is less than the observed landings in three out of the past five years of available data (2015-2019). Average landings over the most recent five years have been above the potential new total ACLs, thus these proposed ACLs would potentially constrain harvest. As a result, there would be direct negative economic effects anticipated from **Preferred Alternative 2** in the short-term, assuming average abundance.

Annual catch limits that offer a buffer between the ACL and observed landings allow for higher potential landings, such as those observed from 2015 through 2017, and reduce the likelihood of restrictive AMs being triggered that lead to short-term negative economic effects. **Preferred Alternative 2** is estimated to result in a reduction in potential net economic benefits of $430,106 for the recreational sector, an increase in potential net economic benefits of $46,491 for the commercial sector, and a reduction in potential net economic benefits of $380,333 for both sectors combined (2019 $).

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.3.2. The following discussion summarizes the expected economic effects of the Council preferred alternative relative to the No Action alternative (i.e., the status quo).

Preferred Alternative 3 would result in a comparatively higher recreational allocation and sector ACL. Although the recreational ACL is not estimated to be constraining based on the average annual landings over the last five years of available data (2015-2019), it is assumed that the recreational fishery could fully harvest the sector ACL if conditions allowed, and there would be more potential landings of dolphin under **Preferred Alternative 3** relative to **Alternative 1 (No Action)**. These additional landings would be expected to comparatively increase total consumer surplus (CS) for the recreational sector. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 3** would result in an estimated increase in CS of $1,174,791 (2019 $).

Preferred Alternative 3 would result in a comparatively lower commercial allocation and sector ACL. Although the commercial ACL is not estimated to be constraining based on the average annual landings over the last five years of available data (2015-2019), it is assumed that the commercial fishery could fully harvest the sector ACL if conditions allowed, and there would be fewer potential landings of dolphin under **Preferred Alternative 3** relative to **Alternative 1 (No Action)**. These relatively reduced landings would be expected to comparatively decrease total PS for the commercial sector. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 3** would result in an estimated reduction in PS of $813,074 (2019 $).

In terms of estimated net economic benefits for the action, **Preferred Alternative 3** is expected to increase net economic benefits by $361,716 (2019 $).

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.4.2. The following discussion summarizes the expected economic effects of the Council preferred alternative relative to the No Action alternative (i.e., the status quo).

Preferred Alternative 3 would result in a comparatively higher sector allocation and sector ACL for the recreational sector. Since the recreational sector ACL is estimated to be constraining based on the average annual landings over the last five years of available data (2015-2019), it is anticipated that the additional potential landings of wahoo offered by **Preferred Alternatives 3** would be fully harvested by the recreational sector if fishery conditions allow. These additional landings would be expected to comparatively increase total CS for the recreational sector. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 3** would result in an estimated increase in CS of $162,689 (2019 $).

Preferred Alternative 3 would result in a comparatively lower sector allocation and sector ACL for the commercial sector. Although the commercial sector ACL is not estimated to be constraining based on the average annual landings over the last five years of available data (2015-2019), it is assumed that the commercial sector could fully harvest the sector ACL if conditions allow and there would be fewer potential landings of wahoo offered by **Preferred Alternative 3** in comparison to **Alternative 1 (No Action)**. These relatively reduced landings would be expected to comparatively decrease total PS for the commercial sector. **Preferred Alternative 3** would result in an estimated decrease in PS of $39,886 (2019 $).

In terms of estimated net economic benefits for the action, **Preferred Alternative 3** is expected to increase net economic benefits by $122,803.

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.5.2. The following discussion summarizes the expected economic effects of the Council preferred alternative relative to the No Action alternative (i.e., the status quo).

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 **Preferred Alternative 5** in this scenario. Since the recreational ACL for dolphin is not anticipated to be reached based on the most recent 5-year average recreational landings (2015-2019), there are no anticipated realized economic effects from **Preferred Alternative 5**.

Preferred Alternative 5 is more stringent than **Alternative 1 (No Action)** as it would be triggered from landings exceeding the total ACL in a single year and without dolphin being deemed overfished. **Preferred Alternative 5** would strike a balance between the likelihood of being triggered and potential flexibility in allowing some overage of the recreational sector ACL without the AM being triggered as long as the recreational sector ACL overage was not so large that it surpassed any underage of the commercial sector ACL.

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.6.2. The following discussion summarizes the expected economic effects of the Council preferred alternative relative to the No Action alternative (i.e., the status quo).

In years when the recreational AM is not triggered, there are no economic effects from the AM, thus there would be no economic effects from **Preferred Alternative 2** in this scenario. Since the recreational ACL for dolphin is not anticipated to be reached based on the most recent 5-year average recreational landings (2015-2019), there are no anticipated realized economic effects from **Preferred Alternative 2**.

Preferred Alternative 2 would reduce the fishing season by the amount necessary to prevent the recreational ACL from being exceeded. The economic effects of a reduced fishing season would depend on the severity of the reduction, the timing, and the availability of other species that could be suitable substitutes for dolphin. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues of for-hire businesses. Additionally, a reduced sector ACL would result in fewer dolphin harvested, which would result in lower CS (i.e., net economic benefits) for recreational anglers. Relative to **Alternative 1 (No Action)**, **Preferred Alternative 2** is less stringent in that it does not include a payback provision for an overage of the sector ACL.

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.7.2. The following discussion summarizes the expected economic effects of the Council preferred alternative relative to the No Action alternative (i.e., the status quo).

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 **Preferred Sub-alternative 2b** in this scenario. Since the recreational ACL for wahoo is anticipated to be reached based on the most recent five-year average recreational landings (2015-2019), there would be anticipated realized economic effects from **Preferred Sub-alternative 2b**.

Preferred Sub-alternative 2b uses a three-year geometric mean that would reset when the sector ACL is changed. In summary, **Preferred Sub-alternative 2b** could result in short-term economic benefits for the recreational sector and long-term potential economic costs to fishery participants. 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. The alternative would allow the fishery to potentially continue to operate after a single year of particularly high landings that revert to long-term average levels the following year. There is also no safeguard in place to prevent the total ACL from being exceeded for more than one year. This allows for the potential that a single year of extremely high recreational landings could influence the three-year geometric mean in such a way that AMs would remain in place for multiple years until these long-term metrics would revert below the threshold for the AM trigger. Relative to **Alternative 1 (No Action)**, **Sub-alternative 2b** is more stringent as it would be triggered without wahoo being deemed overfished.

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.8.2. The following discussion summarizes the expected economic effects of the Council preferred alternative relative to the No Action alternative (i.e., the status quo).

In years when a recreational AM is not triggered, there are no economic effects, thus there would be no economic effects from **Preferred Alternative 2** in this scenario. Since the recreational ACL for wahoo is not anticipated to be reached based on the most recent five-year average recreational landings (2015-2019), there are potential realized economic effects from the alternative.

Preferred Alternative 2 would reduce the fishing season by the amount necessary to prevent the recreational ACL from being exceeded. The economic effects of a reduced fishing season would depend on the severity of the reduction, the timing, and the availability of other species that could be suitable substitutes for wahoo. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced ACL would result in fewer wahoo harvested, which would result in lower CS (i.e., net economic benefits) for recreational anglers. Relative to **Alternative 1 (No Action)**, **Preferred Alternative 2** is less stringent in that it does not include a payback provision for an overage of the sector ACL.

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.9.2. The following discussion summarizes the expected economic effects of the Council preferred alternatives relative to the No Action alternative (i.e., the status quo).

Preferred Sub-alternative 2b would result in net economic benefits by allowing long-term potential elevated revenue on some commercial trips where trap, pot, and buoy gear that are unauthorized for use in the dolphin and wahoo fishery are on board and dolphin landed by rod and reel gear are retained. The economic effects on individual vessel owners from **Preferred Sub-alternative 2b** would depend on each owner's profit maximization strategy, their dependence on dolphin, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Some vessel owners may benefit from additional dolphin landings, while others may not. These types of individual vessel level effects cannot be determined with available models; however, increases in revenues derived from the commercial harvest of dolphin on trips already occurring for other species would result in elevated net revenues and thus increased net economic benefits for the commercial sector.

Preferred Alternative 3 would result in net economic benefits by allowing long-term elevated revenue on some commercial trips where trap, pot, and buoy gear that are unauthorized for use in the dolphin and wahoo fishery are onboard and wahoo landed by rod and reel gear are retained. The economic effects on individual vessel owners from **Preferred Alternative 3** would depend on each owner's profit maximization strategy, their dependence on wahoo, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Some vessel owners may benefit from additional wahoo landings, while others may not. These types of individual vessel level effects

cannot be determined with available models; however, increases in revenues derived from the commercial harvest of wahoo on trips already occurring for other species would result in elevated net revenues and thus increased net economic benefits for the commercial sector.

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

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.10.2. The following discussion summarizes the expected economic effects of the Council preferred alternatives relative to the No Action alternative (i.e., the status quo).

Alternative 1 (No Action) would maintain the operator card requirement for for-hire and commercial participants in the dolphin and wahoo fishery. This requirement results in direct costs to fishery participants through application fees and associated preparation costs incurred including obtaining two passport photos, postage, time to prepared and send the application materials once every three years. Removing the operator card requirement would result in direct economic benefits to captain and crew members that operate for-hire and commercial vessels permitted to fish in the dolphin and wahoo fishery through forgone costs. Removal of these costs would apply to captains or crew members that operate for-hire vessels under **Preferred Alternative 2** and commercial vessels under **Preferred Alternative 3**.

In 2019, 2,722 vessels held a valid commercial dolphin wahoo permit (ADW), 2,360 vessels held a valid for-hire dolphin wahoo permit (CDW), and 4,070 vessels had at least one of the federal dolphin wahoo permits. The estimated annual cumulative economic benefits of removing the operator card requirement would be $214,264 under **Preferred Alternative 2**, $247,130 under **Preferred Alternative 3**, and $369,515 under **Preferred Alternatives 2** and **3** combined (2019 $). While it is difficult to partition the combined effects of **Preferred Alternatives 2** and **3** by sector due to dually permitted vessels, assuming application of half of the economic effects to the commercial sector and half to the recreational sector (for-hire specifically) for dually permitted vessels, the resulting economic effects would cover 2,266 commercial permit holders and 1,804 for-hire permit holders. Based on this assumption, removal of the operator card requirement would result in annual net economic benefits of $205,730 to the commercial sector and $163,785 to the recreational sector (2019 $).

Action 11. Reduce the recreational vessel limit for dolphin

A detailed analysis and discussion of the expected economic effects of the proposed action is included in Section 4.11.2. The following discussion summarizes the expected economic effects of the Council preferred alternatives relative to the No Action alternative (i.e., the status quo).

Generally, angler satisfaction (which can be measured in CS) increases with the number of fish that can be harvested and the size of the fish. As such, the greater the reduction in a vessel limit the greater, the greater the probability that the satisfaction from a recreational trip could be affected resulting in lower CS. **Preferred Sub-alternative 2e** is expected to lower total landings in the short-term, thus total CS for the recreational sector is expected to decrease as well in comparison to

Alternative 1 (No Action). **Preferred Sub-alternative 2e** would result in an estimate decrease in CS of $87,066 (2019 $).

Public Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any federal action involves the expenditure of public and private resources, which can be expressed as costs associated with the regulations. Costs to the private sector are discussed in the effects of management measures. Estimated public costs associated with this action include:

South Atlantic Council costs of document preparation, meetings, public hearings, and information dissemination	$98,263
NMFS administrative costs of document preparation, meetings, and review	$114,004
TOTAL[34]	$212,267

The estimate provided above does not include any law enforcement costs. Any enforcement duties associated with this action would be expected to be covered under routine enforcement costs rather than an expenditure of new funds. The South Atlantic Council and NMFS administrative costs directly attributable to this amendment and the rulemaking process would be incurred prior to the effective date of the final rule implementing this amendment.

Net Benefits of Regulatory Action

It is important to specify the time period being considered when evaluating benefits and costs. According to OMB's FAQs regarding Circular A-4,[35] "When choosing the appropriate time horizon for estimating costs and benefits, agencies should consider how long the regulation being analyzed is likely to have resulting effects. The time horizon begins when the regulatory action is implemented and ends when those effects are expected to cease. Ideally, analysis should include all future costs and benefits. Here as elsewhere, however, a 'rule of reason' is appropriate, and the agency should consider for how long it can reasonably predict the future and limit its analysis to this time period. Thus, if a regulation has no predetermined sunset provision, the agency will need to choose the endpoint of its analysis on the basis of a judgment about the foreseeable future."

For current purposes, the reasonably "foreseeable future" is considered to be the next 5 years. There are two primary reasons for considering the next 5 years the appropriate time period for evaluating the benefits and costs of this regulatory action rather than a longer (or shorter) time period.

[34] Calculations are inclusive of the estimated cost of total staff time dedicated to amendment development and applicable meeting costs (Scoping, Public Hearings, South Atlantic Fishery Management Council, Scientific and Statistical Committee, and Advisory Panel meetings). Due to the relatively long time period that the amendment has been considered, an exact estimate of the staff time attributable to the amendment is not available. The provided estimates are based on the total number of meetings that the amendment was reviewed by the Council combined with a scaled average cost per meeting that is based on the RIR sections of other amendments where staff and meeting costs were tracked and calculated.

[35] See p. 4 at https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/OMB/circulars/a004/a-4_FAQ.pdf

First, this regulatory action does not include a predetermined sunset provision. Second, based on the history of management in the dolphin and wahoo fishery in the South Atlantic, regulations such as those considered in this amendment are often revisited within 5 years or so.

The analyses of the changes in economic benefits indicates an annual increase of $9,848,838 in net economic benefits to the recreational sector, $1,251,769 in net economic benefits to the commercial sector, and total net economic benefits of $11,100,607(2019 $). In discounted terms and over a 5-year time period, the total net present value of this change in net economic benefits is $45,514,680 using a 7% discount rate and $50,837,530 using a 3% discount rate (2019 $). These estimates of net economic benefits are likely a lower bound estimate since there are noted unquantifiable benefits from actions in this amendment, such as those described in Action 9. The estimated non-discounted public costs resulting from the regulation are $212,267 (2019 $). The costs resulting from the amendment and the associated rulemaking process should not be discounted as they will be incurred prior to the effective date of the final rule.

Based on the quantified economic effects, this regulatory action is expected to increase net benefits to the Nation. Over a 5-year time period, the quantified net change in economic benefits is expected to be $45,302,414 using a 7% discount rate and $50,625,263 using a 3% discount rate (2019 $).

Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in: 1) an annual effect of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; 2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; 3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or 4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order. Based on the information provided above, these actions have been determined to not be economically significant for the purposes of E.O. 12866. In absolute terms, the expected total costs and benefits of this amendment are $14,051,138.

Appendix F. Regulatory Flexibility Act Analysis

Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure such proposals are given serious consideration. The RFA does not contain any decision criteria; instead the purpose of the RFA is to inform the agency, as well as the public, of the expected economic effects of various alternatives contained in the regulatory action and to ensure the agency considers alternatives that minimize the expected economic effects on small entities while meeting the goals and objectives of the applicable statutes (e.g., the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act)).

With certain exceptions, the RFA requires agencies to conduct an initial regulatory flexibility analysis (IRFA) for each proposed rule. The IRFA is designed to assess the effects various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those effects. An IRFA is primarily conducted to determine whether the proposed regulatory action would have a significant economic effect on a substantial number of small entities. In addition to analyses conducted for the Regulatory Impact Review (RIR), the IRFA provides: 1) a description of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for, the proposed regulatory action; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed regulatory action will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed regulatory action, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule; and 6) a description of any significant alternatives to the proposed regulatory action which accomplish the stated objectives of applicable statutes and would minimize any significant economic effects of the proposed regulatory action on small entities.

In addition to the information provided in this section, additional information on the expected economic effects of the proposed action is included in the RIR.

Statement of the need for, objectives of, and legal basis for the rule

A discussion of the reasons why action by the agency is being considered is provided in Chapter 1.1. The purpose of this proposed regulatory action is to revise the catch levels [acceptable biological catch (ABC) and annual catch limits (ACL)], sector allocations, accountability measures (AMs), and management measures for dolphin and wahoo. Management measures address authorized gear and

the operator permit requirement in the dolphin and wahoo fisheries as well as reduce the recreational vessel limit for dolphin. The objectives of this proposed regulatory action are to base conservation and management measures on the best scientific information available and increase net benefits to the Nation, consistent with the Magnuson-Stevens Act and its National Standards. The Magnuson-Stevens Act serves as the legal basis for the proposed regulatory action.

Description and estimate of the number of small entities to which the proposed action would apply

This proposed regulatory action would set the total ACL for dolphin equal to the new ABC for dolphin that was recommended by the South Atlantic Council's (Council) Scientific and Statistical Committee (SSC). The new total ACL would be equal to 24,570,764 lb gw, where the recreational component of the total ACL is based on Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES) data. The current total ACL is 15,344,846 lb gw, where the recreational component of the total ACL is based on MRIP Coastal Household Telephone Survey (CHTS) data. This proposed regulatory action would also increase the recreational allocation of the total ACL for dolphin from 90% to 93% and decrease the commercial allocation of the total ACL for dolphin from 10% to 7%.

This proposed regulatory action would also set the total ACL for wahoo equal to the new ABC for wahoo that was recommended by the Council's SSC. The new total ACL would be equal to 2,885,303 lb gw, where the recreational component of the total ACL is based on Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES) data. The current total ACL is 1,794,960 lb gw, where the recreational component of the total ACL is based on MRIP Coastal Household Telephone Survey (CHTS) data. This proposed regulatory action would also increase the recreational allocation of the total ACL for wahoo from 96.07% to 97.55% and decrease the commercial allocation of the total ACL for dolphin from 3.93% to 2.45%.

This proposed regulatory action would also revise the trigger for the post-season recreational AM for dolphin and revise the post-season recreational AM for dolphin. Currently, if recreational landings exceed the recreational ACL, then during the following fishing year, recreational landings will be monitored for persistence in increased landings. If the recreational ACL 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 ACL only if the species is overfished and the total ACL is exceeded. Under the proposed regulatory action, post season AMs would be implemented in the following fishing year for the recreational sector if the total ACL is exceeded and the length of the following recreational fishing season would be reduced by the amount necessary to prevent the ACL from being exceeded in the following year. However, the length of the recreational season will not be reduced if the Regional Administrator determines it is not necessary using the best available science.

This proposed regulatory action would also revise the trigger for the post-season recreational AM for wahoo and revise the post-season recreational AM for wahoo. Currently, if recreational landings exceed the recreational ACL, then during the following fishing year, recreational landings will be monitored for persistence in increased landings. If the recreational ACL 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 ACL only if wahoo is overfished and the total ACL is exceeded. Under the proposed regulatory action, if the recreational ACL is constant, post season AMs would be implemented in the following fishing year if the 3-year geometric mean of landings exceeds the recreational ACL and the length of the following recreational fishing season would be reduced by the amount necessary to prevent the ACL from being exceeded in the following year. If the recreational sector ACL is changed, then the most recent one year or 2-year average of landings would be used as the trigger in place of the 3-year geometric mean. However, the length of the recreational season will not be reduced if the Regional Administrator determines it is not necessary using the best available science.

This proposed regulatory action would also allow a vessel that possesses a valid Atlantic Dolphin/Wahoo (ADW) commercial vessel permit, and either possesses a valid federal commercial permit to fish trap, pot, or buoy gear or is in compliance with the federal regulations for spiny lobster permits, to retain up to 500 lb gw of dolphin and 500 lb of wahoo using rod and reel gear with trap, pot, or buoy gear on board. Currently, vessels with trap, pot, or buoy gear on board are not allowed to retain dolphin or wahoo.

This proposed regulatory action would also remove the requirement for a vessel captain or crewmember to possess an operator permit (also known as an "operator card") in order for a vessel's ADW commercial permit or Atlantic Dolphin/Wahoo charter/headboat (CDW) permit to be valid.

This proposed regulatory would also reduce the recreational vessel limit for dolphin from 60 fish to 54 fish per trip for private recreational and charter vessels.

From 2015 through 2019, the average number of vessels that commercially harvested dolphin or wahoo using any type of gear was 721 per year. Many vessels commercially harvest both dolphin and wahoo and some vessels use longline gear as well as other gear to harvest dolphin or wahoo on trips throughout a given year. The direct effects on commercial vessels from the actions to change the total ACLs and sector allocations are expected to vary depending on whether they harvest dolphin or wahoo as well as whether they use longline gear or other gear to harvest dolphin or wahoo. From 2015-2019, the average number of vessels commercially harvesting Atlantic dolphin per year was 677. Of these 677 vessels, an average of 85 vessels used longline gear while an average of 592 vessels used other gear to commercially harvest Atlantic dolphin per year. During this time, the average number of vessels commercially harvesting Atlantic wahoo was 319. Of these 319 vessels, an average of 53 vessels used longline gear and an average of 266 vessels used other gear to commercially harvest Atlantic wahoo.

The proposed action to remove the requirement for a vessel captain or crewmember to possess an operator permit would affect the entire universe of vessels with valid ADW or CDW permits. Some vessels possess both permits. The total number of vessels with either a valid ADW or CDW permit is estimated to be 4,070, of which 2,266 were determined to primarily be commercial fishing vessels while 1,804 vessels were determined to primarily be for-hire fishing vessels.

Although the National Marine Fisheries Service (NMFS) possesses complete ownership data for businesses and vessels that participate in other industries, ownership data regarding businesses that

possess ADW or CDW permits is incomplete. Therefore, it is not currently feasible to accurately determine affiliations between these particular businesses. Because of the incomplete ownership data, for purposes of this analysis, it is assumed each of these vessels is independently owned by a single business, which is expected to result in an overestimate of the actual number of businesses directly regulated by this proposed action. Thus, this proposed regulatory action is estimated to directly regulate 2,266 commercial fishing businesses and 1,804 for-hire fishing businesses in the Atlantic dolphin wahoo fishery.

All monetary estimates in the following analysis are in 2019 dollars. From 2015 through 2019, the average annual gross revenue for a vessel commercially harvesting Atlantic dolphin using longline gear was $268,849 while the average annual gross revenue for a vessel commercially harvesting Atlantic wahoo using longline gear was $244,552. The best available estimate of economic profit for longline vessels is net revenue as a percentage of gross revenue, which is estimated to be 39.7%. This estimate results in an overestimate of actual economic profit as it does not account for implicit costs (e.g., the cost of an owner operator's time) or fixed costs. Nonetheless, annual economic profit for vessels harvesting Atlantic dolphin using longline gear is estimated to be $105,472 per vessel, while annual profit for vessels harvesting Atlantic wahoo using longline gear is estimated to be $136,787. From 2015 through 2019, the average annual gross revenue for a vessel commercially harvesting Atlantic dolphin using other gear was $52,009 while the average annual gross revenue for a vessel commercially harvesting Atlantic wahoo using other gear was $46,336. For vessels using other gear, after accounting for all costs, net operating revenue is estimated to be .5% of gross revenue. Therefore, annual economic profit for vessels harvesting Atlantic dolphin using other gear is estimated to be $261 per vessel, while annual economic profit for vessels harvesting Atlantic wahoo using other gear is estimated to be $232.

On December 29, 2015, NMFS issued a final rule establishing a small business size standard of $11 million in annual gross receipts (revenue) for all businesses primarily engaged in the commercial fishing industry (NAICS code 11411) for RFA compliance purposes only (80 FR 81194, December 29, 2015). In addition to this gross revenue standard, a business primarily involved in commercial fishing is classified as a small business if it is independently owned and operated, and is not dominant in its field of operations (including its affiliates). From 2015 through 2019, the maximum annual gross revenue earned by a single commercial fishing vessel (business) in the Atlantic dolphin wahoo fishery was approximately $1.56 million. Based on the information above, all commercial fishing businesses directly regulated by this proposed regulatory action are determined to be small businesses for the purpose of this analysis.

For other industries, the Small Business Administration (SBA) has established size standards for all major industry sectors in the U.S., including for-hire businesses (NAICS code 487210). A business primarily involved in for-hire fishing is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has annual receipts (revenue) not in excess of $8 million for all its affiliated operations worldwide. Average annual gross revenue for a charter vessel in the South Atlantic is slightly more than $125,000 (Holland et al, 2012), while average annual gross revenue for a headboat in the South Atlantic is more than $304,000 (D. Carter, pers. comm.). Thus, on average, annual gross revenue for headboats is more than double the annual gross revenue for charter vessels, reflecting the fact that businesses that

own charter vessels are typically smaller than businesses that own headboats. Average annual gross revenues for charter vessels and headboats in the Northeast region are less than in the South Atlantic. The maximum annual gross revenue for a single headboat in the South Atlantic was about $.78 million in 2017 (D. Carter, pers. comm.). Based on this information, all for-hire fishing businesses directly regulated by this proposed regulatory action are determined to be small businesses for the purpose of this analysis.

Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records

This proposed regulatory action would not establish any new reporting or record-keeping requirements.

Identification of all relevant federal rules, which may duplicate, overlap or conflict with the proposed rule

No duplicative, overlapping, or conflicting federal rules have been identified.

Significance of economic effects on small entities

Substantial number criterion

This proposed regulatory action, if implemented, would be expected to directly regulate all 4,070 vessels with either a valid ADW or CDW permit, of which 2,266 were determined to be commercial fishing businesses while 1,804 were determined to be for-hire fishing businesses. All directly regulated businesses have been determined, for the purpose of this analysis, to be small entities. Based on this information, the proposed regulatory action is expected to affect a substantial number of small businesses.

Significant economic effects

The outcome of "significant economic impact" can be ascertained by examining two factors: disproportionality and profitability.

Disproportionality: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

All entities directly regulated by this regulatory action have been determined to be small entities. Thus, the issue of disproportionality does not arise in the present case.

Profitability: Do the regulations significantly reduce profits for a substantial number of small entities?

The proposed actions to increase the total ACLs for dolphin and wahoo are not expected to directly affect for-hire fishing vessels. Harvest for the non-headboat components of the recreational

sector, including for charter vessels, will now be based on MRIP-FES data rather than MRIP-CHTS data. Non-headboat landings accounted for 99.9% of dolphin and wahoo recreational landings from 2015 through 2019. This change in the estimation method does not change how many dolphin or wahoo are actually being harvested by for-hire vessels. Rather, the FES method generates more accurate estimates of effort (trips) and harvest. Thus, the increase in the recreational component of the new ACLs does not necessarily reflect an actual increase in what the recreational sector, including for-hire fishing vessels, can potentially harvest.

With respect to the proposed actions to increase the recreational sector allocations for dolphin and wahoo, assuming the new ACLs discussed above, the recreational ACL for dolphin is expected to increase by 737,123 lb gw (or 3.3%) and the recreational ACL for wahoo is expected to increase by 42,702 lb gw (or 1.5%). The underlying analysis assumed that changes in the recreational ACLs due to these proposed actions would only affect catch per angler trip and not the total number of trips harvesting dolphin or wahoo (i.e., catch effort). It is even more likely that target trips for dolphin and wahoo are unlikely to change as a result of these proposed actions, which is important as target trips are assumed to be the source of profits for for-hire fishing vessels. The recreational fishing season for dolphin and wahoo are currently year-round and that is not expected to change because of these actions. Thus, target trips for dolphin or wahoo would not be expected to change as a result of a change in the fishing season length. Headboats only accounted for .1% of dolphin and wahoo landings from 2015 through 2019. If that continues in the future, their landings would only potentially increase by 7,371 lb gw of dolphin and 43 lb gw of wahoo. It is highly unlikely that headboats would increase their target effort for dolphin or wahoo as a result of such small increases. Charter vessels accounted for 15.8% of dolphin landings and 13.4% of wahoo landings from 2015 through 2019. If that continues in the future, their landings could potentially increase by 116,465 lb gw for dolphin and 5,722 lb gw for wahoo. As with headboats, this minor increase in their potential landings for wahoo would not be expected to change their target effort for wahoo. However, the potential increase in dolphin landings by charter vessels is not insignificant and it is possible that the number of trips harvesting and even targeting dolphin could increase. But the increase in the supply of dolphin available for harvest by charter vessels will only lead to an increase in the number of target trips for dolphin if it is accompanied by an increase in the demand for trips targeting dolphin by charter vessels. As the proposed action by itself is not expected to induce a higher demand for target trips, the assumption that target trips for dolphin by charter vessels will not change seems reasonable. Because the number of for-hire fishing trips targeting dolphin or wahoo is not expected to change, no change in economic profits to for-hire fishing vessels is expected due to these actions. However, if target trips for dolphin by charter vessels were to increase, their profits would be expected to increase as well.

Conversely, the proposed actions to increase the total ACL and decrease the commercial sector's allocation of the total ACL for dolphin are expected to directly affect vessels commercially harvesting dolphin. The magnitude of these effects are expected to vary depending on whether vessels use longline gear or other gear to commercially harvest dolphin, in part because longline vessels are responsible for harvesting 78% of the commercial Atlantic dolphin landings while vessels using other gear only harvest 22%. Further, dolphin landed by longline gear sell for $3.17/lb gw while dolphin landed by other gear only sell for $3.05/lb gw.

Compared to average annual landings from 2015 through 2019, for longline vessels, the increase in the total ACL for dolphin could result in an increase of 1,309,456 lb gw in landings of dolphin. This would be expected to increase their gross revenue by approximately $4,150,976, or $48,835 per vessel. This potential increase in gross revenue would be expected to increase economic profit for longline vessels by approximately $1,647,937, or $19,387 per vessel, which represents an 18.4% increase in their economic profits. Compared to average annual landings from 2015 through 2019, for vessels using other gear, the increase in the total ACL could result in an increase of 369,480 lb gw in landings of dolphin. This would be expected to increase their gross revenue by approximately $1,126,914, or $1,904 per vessel. This potential increase in gross revenue would be expected to increase economic profit by approximately $5,634, or about $10 per vessel, which represents a 3.6% increase in their economic profits.

However, the decrease in the commercial sector's allocation from 10% to 7% would partially offset some of these potential gains in landings, revenue and economic profits. Specifically, for longline vessels, the decrease in the commercial sector's allocation for dolphin would reduce the potential landings, revenue, and economic profits of dolphin by 574,956 lb gw, $1,822,611, and $723,577, respectively. On a per vessel basis, revenue and economic profit would decrease by approximately $21,442 and $8,513, respectively. Thus, for longline vessels, the combined effects of the higher ACL and reduced commercial sector allocation for dolphin would potentially lead to an increase in landings, revenue, and economic profits for dolphin of 734,500 lb gw, $2,328,365, and $924,360, respectively. On a per vessel basis, revenue and economic profit would increase by approximately $27,393 and $10,875, respectively, or by about 10.3%.

For vessels using other gear, the decrease in the commercial sector's allocation for dolphin would reduce the potential landings, revenue, and economic profits of dolphin by 162,176 lb gw, $494,610, and $2,473, respectively. On a per vessel basis, revenue and economic profit would decrease by approximately $36 and $4, respectively. Thus, for vessels using other gear, the combined effects of the higher ACL and reduced commercial sector allocation for dolphin would potentially lead to an increase in landings, revenue, and economic profits for dolphin of 207,313 lb gw, $632,304, and $3,161, respectively. On a per vessel basis, revenue and economic profit would increase by approximately $1,068 and $5, respectively, or by about 2%.

Similarly, the proposed actions to increase the total ACL and decrease the commercial sector's allocation of the total ACL for wahoo are expected to directly affect vessels commercially harvesting wahoo. The magnitude of these effects are expected to vary depending on whether vessels use longline gear or other gear to commercially harvest wahoo, in part because longline vessels are responsible for harvesting 28% of the commercial Atlantic wahoo landings while vessels using other gear harvest 72%. Further, wahoo landed by longline gear sell for $3.75/lb gw while wahoo landed by other gear sell for $4.05/lb gw.

Compared to average annual landings from 2015 through 2019, for longline vessels, the increase in the total ACL for wahoo could result in an increase of 13,936 lb gw in landings of wahoo. This would be expected to increase their gross revenue by approximately $52,260, or $986 per vessel. This potential increase in gross revenue would be expected to increase economic profit for longline vessels by approximately $20,747, or $391 per vessel, which represents a .3% increase in their

economic profits. Compared to average annual landings from 2015 through 2019, for vessels using other gear, the increase in the total ACL could result in an increase of 38,837 lb gw in landings of wahoo. This would be expected to increase their gross revenue by approximately $157,290, or $591 per vessel. This potential increase in gross revenue would be expected to increase economic profit by approximately $786, or about $3 per vessel, which represents a 1.3% increase in their economic profits.

However, the decrease in the commercial sector's allocation from 3.93% to 2.45% would mostly offset some of these potential gains in landings, revenue and economic profits. Specifically, for longline vessels, the decrease in the commercial sector's allocation for wahoo would reduce the potential landings, revenue, and economic profits of wahoo by 11,957 lb gw, $44,839, and $17,800, respectively. On a per vessel basis, revenue and economic profit would decrease by approximately $846 and $336, respectively. Thus, for longline vessels, the combined effects of the higher ACL and reduced commercial sector allocation for wahoo would potentially lead to an increase in landings, revenue, and economic profits for wahoo of 1,979 lb gw, $7,421, and $2,947, respectively. On a per vessel basis, revenue and economic profit would increase by approximately $140 and $55, respectively, or by less than .1%.

For vessels using other gear, the decrease in the commercial sector's allocation for wahoo would reduce the potential landings, revenue, and economic profits of wahoo by 30,745 lb gw, $124,519, and $623, respectively. On a per vessel basis, revenue and economic profit would decrease by approximately $468 and slightly more than $2, respectively. Thus, for vessels using other gear, the combined effects of the higher ACL and reduced commercial sector allocation for wahoo would potentially lead to an increase in landings, revenue, and economic profits for wahoo of 8.092 lb gw, $32,771, and $163, respectively. On a per vessel basis, revenue and economic profit would increase by approximately $123 and less than $2, respectively, or by about .2%.

The proposed actions to revise the triggers for the post-season recreational AMs for dolphin wahoo and revise the post-season recreational AMs for dolphin and wahoo do not directly regulate any for-hire fishing businesses and are not expected to directly affect for-hire fishing vessels. These actions revise existing administrative procedures that could affect management measures in the future if various criteria are met. Thus, these actions may only cause indirect economic effects in the future and neither the direction nor magnitude of those effects are foreseeable at this time.

An increase in profit is expected as a result of the proposed action to allow a vessel that possesses a valid Atlantic Dolphin/Wahoo (ADW) commercial vessel permit, and either possesses a valid federal commercial permit to fish trap, pot, or buoy gear or is in compliance with the federal regulations for spiny lobster permits, to retain up to 500 lb gw of dolphin and 500 lb of wahoo using rod and reel gear with trap, pot, or buoy gear on board. Under the current regulations, vessels with trap, pot, or buoy gear on board were not allowed to retain dolphin or wahoo, and thus were forced to discard any dolphin or wahoo they may have incidentally harvested. Because these vessels may now retain and sell these fish, their gross revenue from fishing would be expected to increase without any increase in costs. Because retention has not been previously allowed and discard data are limited, it is not possible to determine how many commercial fishing vessels may benefit from this proposed action.

The proposed action to remove the requirement for a vessel captain or crewmember to possess an operator permit is expected to reduce costs for 2,266 commercial fishing businesses and 1,804 for-hire fishing businesses. The current requirement results in direct costs to vessels that possess ADW or CDW permits. These costs include application fees and associated preparation costs incurred in the permit application process, including the need to obtain two passport photos, postage, and the time to prepare and send the application materials once every three years. The total reduction in costs associated with removing this requirement is estimated to be $369,515, of which $205,730 would accrue to fishing vessels determined to primarily be commercial fishing businesses and $163,785 would accrue vessels determined to primarily be for-hire fishing businesses. The reduction to both types of businesses is approximately $91 per vessel/business, which represents less than .1% of a commercial longline vessel's annual economic profit but as much as 39% of the annual economic profit for a commercial vessel using other gear. Profit estimates are not available for for-hire vessels, but this cost reduction represents less than .1% of the annual average gross revenue for both charter vessels and headboats in the South Atlantic and headboats in the Northeast Region, and about .3% of the annual average gross revenue for charter vessels in the Northeast Region.

The proposed action to reduce the recreational vessel limit for dolphin from 60 fish to 48 fish per trip for private recreational and charter vessels does not apply to headboats. Further, private recreational vessels are not businesses or entities under the Regulatory Flexibility Act and therefore are not germane to this analysis. In addition, this proposed action is not expected to directly affect charter vessels for reasons similar to why the proposed actions to change the total ACLs and sector allocations for dolphin are not expected to directly affect charter vessels. Specifically, the recreational fishing season for dolphin is currently year-round and that is not expected to change because of this action. Further, the underlying analysis assumed that a change in the vessel limit would only affect catch per angler on charter vessel trips and not the total number of charter vessel trips. Because the number of for-hire fishing trips is not expected to change, no change in economic profits to charter vessels is expected due to this action.

As a result of the information above, a significant reduction in profits for a substantial number of small entities is not expected as a result of the proposed regulatory action.

Description of significant alternatives to the proposed action and discussion of how the alternatives attempt to minimize economic impacts on small entities

This proposed regulatory action, if implemented, is not expected to reduce the profits of any small businesses directly regulated by this action. As a result, the issue of significant alternatives is not relevant.

Appendix G. Fishery Impact Statement

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires a FIS be prepared for all amendments to Fishery Management Plans (FMPs). The FIS contains an assessment of the likely biological, social, and economic effects of the conservation and management measures on: 1) fishery participants and their communities; 2) participants in the fisheries conducted in adjacent areas under the authority of another Council; and 3) the safety of human life at sea.

Actions Contained in Amendment 10 to the Fishery Management Plan for the Dolphin Wahoo Fishery of the Atlantic (Dolphin Wahoo Amendment 10)

Dolphin Wahoo Amendment 10 proposes 11 actions to incorporate best scientific information available to address catch levels, sector allocations, recreational accountability measures (AM), and management measures for dolphin and wahoo. The actions and their preferred alternatives are:

<u>Actions that accommodate revised recreational data and catch level recommendations:</u>

- **Action 1.** Revise the total annual catch limit for dolphin to reflect the updated acceptable biological catch level.
    - **Preferred Alternative 2.** The total annual catch limit for dolphin is equal to the updated acceptable biological catch level.
- **Action 2.** Revise the total annual catch limit for wahoo to reflect the updated acceptable biological catch level.
    - **Preferred Alternative 2.** The total annual catch limit for wahoo is equal to the updated acceptable biological catch level.
- **Action 3.** Revise sector allocations and sector annual catch limits for dolphin.
    - **Preferred 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.
- **Action 4.** Revise sector allocations and sector annual catch limits for wahoo.
    - **Preferred 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 approximately maintaining the current commercial sector annual catch limit and allocating the remaining revised total annual catch limit to the recreational sector.

<u>Actions that change recreational accountability measures:</u>

- **Action 5.** Revise the trigger for the post-season recreational accountability measures for dolphin.
    - **Preferred Alternative 5.** Implement post season accountability measures in the following fishing year if the total (commercial and recreational combined) annual catch limit is exceeded.
- **Action 6.** Revise the post-season recreational accountability measures for dolphin.

- **Preferred 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.

- **Action 7.** Revise the trigger for the post-season recreational accountability measures for wahoo.
  - **Preferred Alternative 2**. Implement post season accountability measures in the following fishing year if the recreational annual catch limits are constant and the 3-year mean (Sub-alternative 2a or 2b) of landings exceeds the recreational sector annual catch limit. When the recreational sector annual catch limit is changed, use a single year of landings, beginning with the most recent available year of landings, then a two-year average of landings from that single year and the subsequent year, then a three-year average of landings from those two years and the subsequent year, and thereafter a progressive running three-year average to trigger the recreational accountability measure.
  - **Preferred Sub-alternative 2b**. Use the geometric mean to calculate average landings.
- **Action 8.** Revise the post-season recreational accountability measures for wahoo.
  - **Preferred 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.

<u>Actions that implement various management revisions:</u>

- **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.
  - **Preferred 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:
  - **Preferred Sub-alternative 2b**. 500 pounds gutted weight
  - **Preferred 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 is authorized to retain wahoo caught by rod and reel while in possession of such gear types. The wahoo commercial trip limit will be 500 pounds.
- **Action 10.** Remove the requirement of vessel operators or crew to hold an Operator Card in the Dolphin Wahoo Fishery.
  - **Preferred 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.

- **Preferred 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.

- **Action 11.** Reduce the recreational vessel limit for dolphin.
  - **Preferred Alternative 2**. The recreational daily bag limit is 10 dolphin per person, not to exceed:
  - **Preferred Sub-alternative 2e**. 54 dolphin per vessel, whichever is less.

Assessment of Biological Effects

The total ACLs and sector ACLs will be increased for dolphin and wahoo (Actions 1 through 4) and would be expected to yield lower biological effects, however, as shown in Chapter 4, landings are not expected be reach the proposed total annual catch limits (ACL) and sector ACLs in most of the three scenarios analyzed. The commercial landings for dolphin and wahoo are not projected to reach the proposed commercial ACL in any of the three scenarios analyzed (Sections 4.3 and 4.4). In the event that total landings and recreational landings for dolphin and wahoo approach/exceed their respective ACLs, reduced seasons as per the post-season AMs (Actions 6 and 8) and reduction in vessel limit for dolphin (Action 11), could provide additional reductions in harvest and resulting landings that could provide positive biological effects. Biological effects would be variable for dolphin and wahoo for the triggers chosen for recreational AMs (Actions 5 and 7), with positive effects for dolphin and maybe negative effects for wahoo due to the liberal preferred alternative. No negative biological effects are expected from Action 9, because the current commercial AM includes an in-season closure and this would prevent the commercial landings from exceeding the commercial ACL. No positive or negative biological effects are expected from Action 10 because the action does not impact the harvest levels for dolphin and wahoo in any manner. While positive biological effects could be greater among other alternatives considered to reduce the recreational bag limit for dolphin (Action 11), there would be some reduction in recreational landings in the chosen preferred alternatives. Current commercial and recreational landings are below the proposed commercial and recreational ACLs. Fishing behavior is not expected to change as a result of the actions in Dolphin Wahoo Amendment 10, but, if it did and landings increased in the future, the ratio of discards to landings are very low and not expected to negatively affect discards and bycatch (Appendix E, BPA). The proposed actions in Dolphin Wahoo Amendment 10 would not change fishing methods for the dolphin and wahoo fishery in the U.S. exclusive economic zone, and therefore would perpetuate the existing level of risk for interactions between Endangered Species Act listed species and the fisheries. Thus, there is likely to be no additional effects, positive or negative, to protected species from the actions.

Assessment of 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 on the stock of a species. Also, ACLs that offer a larger buffer between the ACL and observed landings allow for higher potential landings and reduce the likelihood of restrictive AMs being triggered that would lead to short-term negative economic effects (Action 1 through 4). The revised total ACL for dolphin (Action 1) would result in increased potential net economic benefits while the revised total ACL for wahoo (Action 2) would result in decreased potential net economic benefits. When examining sector allocations of the revised total

ACL, the revised sector allocations for dolphin and wahoo would result in increased net economic benefits for the recreational sector, decreased net economic benefits for the commercial sector, and an overall increase in net economic benefits (Actions 3 and 4).

The trigger for a recreational AM (Actions 5 and 7) does not directly affect the actions taken under the AM (Actions 6 and 8) but does affect whether corrective measures may be put in place. Thus, the economic effects of the trigger for the AM are indirect rather than direct. These corrective measures typically create short-term negative economic effects by curtailing harvest and fishing activity, thus potentially affecting net revenues of for-hire operations and CS on recreational fishing trips. In the long-term, these measures also help reduce the risk of overfishing a stock to the point of notable reduction, which would be expected to result in long-term net economic benefits through sustained harvest and fishing activity as well as avoiding the need for more stringent management measures that may be needed to rebuild a depleted stock.

The AM trigger for dolphin in Action 5 would have a comparatively high probability for the recreational AM in Action 6 to be implemented. Thus, Action 5 has a relatively high likelihood of generating short-term negative economic effects. In years when a recreational AM is not triggered, there are no economic effects, 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, there are no anticipated direct economic effects from any of the alternatives in Action 6. Should the trigger for the recreational AM be met from Action 5 and a post season harvest reduction be implemented via the AM chosen in Action 6, the potential economic effects would depend on the severity of the harvest season reduction, the timing, and the availability of other species that could be suitable substitutes for dolphin. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced ACL would result in fewer dolphin harvested, which would result in lower CS (i.e. net economic benefits) for recreational anglers.

The AM trigger for wahoo in Action 7 would likely have a relatively low likelihood of being triggered relative to alternatives that consider a single year of landings, 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 trigger 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 positive short-term net economic benefits for the recreational sector but negative net economic benefits to fishery participants in the long-term. Should the trigger for the recreational AM be met from Action 7 and a post season harvest reduction be implemented via the AM chosen in Action 8, the potential economic effects would depend on the severity of the harvest season reduction, the timing, and the availability of other species that could be suitable substitutes for wahoo. Generally, a reduced fishing season may reduce the number of for-hire trips that are taken, which would negatively affect net operating revenues for for-hire businesses. Additionally, a reduced ACL would result in fewer wahoo harvested, which would result in lower CS (i.e. net economic benefits) for recreational anglers.

Action 9 would result in net economic benefits by allowing long-term potential elevated revenue on some commercial trips where trap, pot, and buoy gear that are unauthorized for use in the dolphin and wahoo fishery are on board and dolphin or wahoo landed by rod and reel gear are retained. Action 10 would remove costs related to obtaining and maintaining an operator card for for-hire and commercial participants in the dolphin and wahoo fishery, thereby increasing net economic benefits.

Generally, angler satisfaction (which can be measured in CS) increases with the number of fish that can be harvested and the size of the fish. As such, the greater the reduction in a vessel limit or bag limit, the greater the probability that the satisfaction from a recreational trip could be affected resulting in lower CS. Action 11 is expected to reduce dolphin harvest, which is expected to result in reduced short-term net economic benefits and negative economic effects.

Assessment of Social Effects

The ACL for any stock does not directly affect resource users unless the sector ACL is met or exceeded, in which case sector AMs that restrict, or close harvest could negatively impact the commercial, for-hire, and private recreational sectors (Actions 1 through 8). 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. Additionally, higher ACLs may provide opportunity for commercial and recreational fishermen to expand their harvest providing social benefits associated with increased income to fishing businesses within the community and higher trip satisfaction. The proposed stock ACLs for dolphin and wahoo (Action 1 and Action 2, respectively) will be increased and positive social effects are anticipated. There can be many different social effects that result as sector allocations (Actions 3 and 4) are discussed, and perceptions are formed. In the past there has been some resistance to further decreasing a given sector's percentage allocation. It is difficult to predict the social effects with any allocation scheme as it would depend upon other actions in conjunction with this one. Projections in Chapter 4 indicate that the commercial ACL for dolphin and wahoo would not be reached, however, the recreational ACL for both species could be reached under all the proposed triggering AMs (Actions 5 through 8).

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. The proposed dolphin AM trigger (Action 5) is a more conservative triggers 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. The AM trigger for wahoo (Action 7) proposes using 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. 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 as a post-season AM for dolphin and wahoo (Action 6 and Action 8) is anticipated to result in direct negative social effects associated with loss of access to the resource.

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. Allowing properly permitted commercial fishing vessels with trap, pot, or buoy gear on board to harvest dolphin and wahoo via rod and reel (Action 9) 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 fish available to the market or for personal consumption. Removing the requirement of vessel operators or crew to hold an Operator Card in the Dolphin and Wahoo Fishery (Action 10) is expected to have minimal effects on coastal communities as public testimony indicates that operator cards are rarely checked by law enforcement and are burdensome to renew annually. Reducing the recreational vessel limit for dolphin (Action 11) could restrict recreational fishing opportunities for dolphin, however the harvest limits may help to extend the recreational fishing season by slowing the rate of harvest. Generally, slowing the rate of harvest and ensuring sustainable of harvest of the dolphin stock would provide for long-term social benefits to coastal communities.

Assessment of Effects on Safety as Sea

Dolphin Wahoo Amendment 10 is not expected to result in direct impacts to safety at sea.

Appendix H. Essential Fish Habitat and Move to Ecosystem Based Management

EFH and EFH-HAPC Designations and Cooperative Habitat Policy Development and Protection

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires federal fishery management Councils and the National Marine Fisheries Service (NMFS) to designate Essential Fish Habitat (EFH) for species managed under federal fishery management plans (FMP). Federal regulations that implement the EFH program encourage fishery management Councils and NMFS also to designate subsets of EFH as a way to highlight priority areas within EFH for conservation and management. These subsets of EFH are called EFH-Habitat Areas of Particular Concern (EFH-HAPCs or HAPCs) and are designated based on ecological importance, susceptibility to human-induced environmental degradation, susceptibility to stress from development, or rarity of the habitat type. Information supporting EFH and EFH-HAPC designations was updated (pursuant to the EFH Final Rule) in FEP II.

SAFMC EFH User Guide (https://safmc.net/download/SAFMCEFHUsersGuideNov20.pdf)

The EFH Users Guide developed during the FEP II development process is available through the FEP II Dashboard (see following sections) and provides a comprehensive list of the designations of EFH and EFH-HAPCs for all species managed by the Council and the clarifications identified during FEP II development. As noted above, additional detailed information supporting the EFH designations appears in FEP, FEP II and in individual FMPs, and general information on the EFH provisions of the Magnuson-Stevens Act and its implementing regulations (50 CFR 900 Subparts J and K) can be found at https://sero.nmfs.noaa.gov/habitat_conservation/index.html. These sources should be reviewed for information on the components of EFH assessments, steps to EFH consultations, and other aspects of EFH program operation.

SAFMC EFH Policy and EFH Policy Statements

Policy for Protection and Restoration of Essential Fish Habitat
SAFMC Habitat and Environmental Protection Policy

In recognizing that species are dependent on the quantity and quality of their essential habitats, it is the policy of the Council to protect, restore, and develop habitats upon which fisheries species depend; to increase the extent of their distribution and abundance; and to improve their productive capacity for the benefit of present and future generations. For purposes of this policy, "habitat" is defined as the physical, chemical, and biological parameters that are necessary for continued productivity of the species that is being managed. The objectives of the SAFMC policy will be accomplished through the recommendation of no net loss or significant environmental degradation of existing habitat. A long-term objective is to support and promote a net-gain of fisheries habitat through the restoration and rehabilitation of the productive capacity of habitats that have been degraded, and the creation and development of productive habitats where increased fishery production is probable. The Council will pursue these goals at state, Federal, and local levels. The Council shall assume an aggressive role in the protection and enhancement of habitats important to fishery species, and shall actively enter Federal, decision making processes where

proposed actions may otherwise compromise the productivity of fishery resources of concern to the Council.

SAFMC Essential Fish Habitat Policy Statements
Considerations to Reduce or Eliminate the Impacts of Non-Fishing Activities on EFH

In addition to implementing regulations to protect habitat from degradation due to fishing activities, the Council in cooperation with NOAA Fisheries, actively comments on non-fishing projects or policies that may impact fish habitat. The Council established a Habitat Protection and Ecosystem Based Management Advisory Panel and adopted a comment and policy development process. Members of the Advisory Panel serve as the Council's habitat contacts and professionals in the field and have guided the Council's development of the following Policy Statements:

- EFH Policy Statement on South Atlantic Climate Variability and Fisheries (December 2016)
- EFH Policy Statement on South Atlantic Food Webs and Connectivity (December 2016)
- Protection and Restoration of EFH from Marine Aquaculture (June 2014)
- Protection and Enhancement of Marine Submerged Aquatic Vegetation (June 2014)
- Protection and Restoration of EFH from Beach Dredging and Filling, Beach Re-nourishment and Large Scale Coastal Engineering (March 2015)
- Protection and Restoration of EFH from Energy Exploration, Development, Transportation and Hydropower Re-Licensing (December 2015)
- Protection and Restoration of EFH from Alterations to Riverine, Estuarine and Nearshore Flows (June 2014)
- Policies for the Protection of South Atlantic Marine & Estuarine Ecosystems from Non-Native and Invasive Species (June 2014)
- Policy Considerations for Development of Artificial Reefs in the South Atlantic Region and Protection of Essential Fish Habitat (September 2017)

Habitat Conservation and Fishery Ecosystem Plans

The Council, views habitat conservation as the foundation in the move to Ecosystem Based Fishery Management (EBFM) in the region. The Council has been proactive in advancing habitat conservation through extensive gear restrictions in all Council FMPs and by directly managing habitat and fisheries affecting those habitats through two FMPs, the Fishery Management Plan for Coral, Coral Reefs and Live/Hard Bottom Habitat of the South Atlantic Region (Coral FMP) and the Pelagic Sargassum Habitat FMP. In addition, the Dolphin and Wahoo FMP represents a proactive FMP which established fishery measures and identified EFH in advance of overfishing or habitat impacts from the fisheries.

Building on the long-term conservation approach, the Council facilitated the evolution of the Habitat Plan into the first FEP to provide a clear description and understanding of the fundamental physical, biological, and human/institutional context of ecosystems within which fisheries are managed and identify information needed and how that information should be used in the context of FMPs. Developing a South Atlantic FEP required a greater understanding of the South Atlantic ecosystem, including both the complex relationships among humans, marine life, the environment and essential fish habitat and a more comprehensive understanding of the biological, social, and economic impacts of management necessary to initiate the transition from single species management to EBFM in the region. To support the move towards EBFM, the Council adopted broad goals: (1) maintaining or improving ecosystem structure and function; (2) maintaining or improving economic, (3) social, and cultural benefits from resources; and (4) maintaining or improving biological, economic, and cultural diversity.

Ecosystem Approach to Conservation and Management of Deep-water Ecosystems

The Council's Habitat and Environmental Protection Advisory Panel and Coral Advisory Panel supported an ecosystem approach and proactive efforts to identify and protect deep-water coral ecosystems in the South Atlantic region. Through Comprehensive Ecosystem-Based Amendment 1, Comprehensive Ecosystem-Based Amendment 2, and Coral Amendment 8, the Council established and expanded deep-water coral HAPCs (CHAPCs) and co-designated them as EFH-HAPCs to protect the largest continuous distribution (>23,000 square miles) of pristine deep-water coral ecosystems in the world from fishing and non-fishing activities.

Fishery Ecosystem Plan II Development

The Council developed FEP II, in cooperation with NOAA Fisheries, as a mechanism to incorporate ecosystem principles, goals, and policies into the fishery management process, including consideration of potential indirect effects of fisheries on food web linkages when developing harvest strategies and management plans. Council policies developed through the process support data collection, model and supporting tool development, and implementation of FEP II. FEP II and the FEP II Implementation Plan provide a system to incorporate of ecosystem considerations into the management process.

FEP II was developed employing writing and review teams established from the Council's Habitat Protection and Ecosystem Based Management Advisory Panel, and experts from state, federal, NGOs, academia and other regional organizations and associations. Unlike the original Plan, FEP II is a living continually developing online information system presenting core sections and sections with links to documents or other online systems with detailed updated information on species, habitat, fisheries and research. For example, FEP II provides both concise summaries of Council managed species with links to detailed information served through the South Atlantic Ecospecies online species information system cooperatively developed with Florida Fish and Wildlife Research Institute (FWRI). The system provides online access to detailed information on habitat, life history, the fishery and management. A core part of the FEP II development process involved engaging the Council's Habitat Protection and Ecosystem Based Management Advisory Panel and regional experts in developing new sections and ecosystem- specific policy statements to address South Atlantic food webs and connectivity and South Atlantic climate variability and fisheries. In addition, standing essential fish habitat policy statements were updated and a new artificial reef habitat policy statement was approved. In combination, these statements advance habitat conservation and the move to EBFM in the region. They also serve as the basis for further policy development, consideration in habitat and fish stock assessments and future management of fisheries and habitat. They also support a more comprehensive view of conservation and management in the South Atlantic and identify long-term information needs, available models, tools, and capabilities that will advance EBFM in the region.

Fishery Ecosystem Plan II Dashboard

The FEP II Dashboard and associated online tools provide a clear description of the fundamental physical, biological, human, and institutional context of South Atlantic ecosystems within which fisheries are managed. The FEP II Digital Dashboard layout and online links follow are below:

- Introduction
- South Atlantic Ecosystem
- South Atlantic Habitats
- Managed Species

- Social and Economic
- Essential Fish Habitat
- SAFMC Managed Areas
- Research & Monitoring
- SAFMC Tools

NOAA Ecosystem Based Fishery Management Activities Supporting FEP II

NOAA EBFM Policy and Road Map

To support the move to EBFM, NOAA Fisheries developed an agency-wide EBFM Policy and Road Map (available through Ecosystem page of the FEP II Dashboard http://safmc.net/fishery-ecosystem-plan-ii-south-atlantic-ecosystem/) that outlines a set of principles to guide actions and decisions over the long-term to: implement ecosystem-level planning; advance our understanding of ecosystem processes; prioritize vulnerabilities and risks of ecosystems and their components; explore and address trade-offs within an ecosystem; incorporate ecosystem considerations into management advice; and maintain resilient ecosystems.

FEP II Implementation Plan Structure and Framework

The Implementation Plan (http://safmc.net/download/SAFMC-FEP-II-Implementation-Plan-March-2018.pdf) is structured to translate approved policy statements of the Council into actionable items. The plan encompasses chapters beginning with an introduction to the policy statement, a link to the complete policy statement, and a table which translates policies and policy components into potential action items. The actions within the plan are recommendations for activities that could support the Council's FEP II policies and objectives.

FEP II Two Year Roadmap

The FEP II Two Year Roadmap (http://safmc.net/download/SAFMC-FEP-II-Two-Year-Roadmap-March-2018.pdf) draws from the Implementation Plan and presents three to five priority actions for each of the nine approved policy statements of the Council which would be initiated or completed over the next two years. The Roadmap provides "Potential Partners" and other potential regional collaborators, a focused list of priority actions they could cooperate with the Council on to advance policies supporting the move to EBFM in the South Atlantic region.

Monitoring/Revisions to FEP II Implementation Plan

FEP II and this supporting Implementation Plan are considered active and living documents. The Implementation Plan will be reviewed and updated periodically. During their spring meeting in 2021 and every three years following, the Habitat Protection and Ecosystem Based Management Advisory Panel will engage regional experts as needed, to determine whether additional actions addressing council policies should be added to the implementation plan. The Council's Habitat Protection and Ecosystem Based Management Committee will review, revise and refine those recommendations for Council consideration and approval for inclusion into the implementation plan.

Regional Habitat and Ecosystem Partners

The Council, with the Habitat Protection and Environmental Based Management Advisory Panel as the foundation, collaborates with regional partners to create a comprehensive habitat and ecosystem network in the region to enhance habitat conservation and EBFM.

Integrated Ocean Observing System (IOOS) and Southeast Coastal and Ocean Observing Regional Association (SECOORA)

The Integrated Ocean Observing System (IOOS®) is a partnership among federal, regional, academic, and private sector parties that works to provide new tools and forecasts to improve safety, enhance the economy, and protect our environment. IOOS supplies critical information about our Nation's oceans, coasts, and Great Lakes. Scientists working to understand climate change, governments adapting to changes in the Arctic, municipalities monitoring local water quality, and industries affected by coastal and marine spatial planning all have the same need: reliable, timely, and sustained access to data and information that inform decision-making. Improving access to key marine data and information supports several purposes. IOOS data sustain national defense, marine commerce, and navigation safety. Scientists use these data to issue weather, climate, and marine forecasts. IOOS data are also used to make decisions for energy siting and production, economic development, and ecosystem-based resource management. Emergency managers and health officials need IOOS information to make decisions about public safety. Teachers and government officials rely on IOOS data for public outreach, training, and education.

Southeast Coastal and Ocean Observing Regional Association (SECOORA)

The Southeast Coastal Ocean Observing Regional Association (SECOORA) is the coastal ocean observing system for the Southeast U.S. SECOORA is one of 11 regional coastal observing systems that comprise the NOAA-led United States Integrated Ocean Observing System (U.S. IOOS®). SECOORA's mission is to observe, understand, and increase awareness of our coastal ocean; promoting knowledge, economic, and environmental health through strong regional partnerships. Guided by their members, users, regional ocean experts, managers, and other stakeholders, SECOORA collects data and creates tools that support human populations, coastal economies and a healthy, sustainable environment. The SECOORA observing system is comprised of multiple data products, moored and coastal stations, high-frequency radars, and a glider observatory. The SECOORA footprint spans the eastern side of Gulf of Mexico to South Atlantic Bight and is connected by the Loop Current-Florida Current-Gulf Stream continuum. The SECOORA Strategic Plan (2016-2020) was developed by the Board in 2015 and guides tasks for the next 4 years. SECOORA supports projects that are important to stakeholders in the southeast. SECOORA talks to users and produces oceanographic observations, models, web tools, applications, and products based on their needs. Data are available on the portal http://secoora.org/data/. Each project SECOORA supports is linked to one of four focus areas: Marine Operations, Coastal Hazards, Ecosystems, and Climate Variability.

The Council is a voting member and Council staff serves on the Board of Directors to guide and direct priority needs for observation and modeling to support fisheries oceanography and integration into stock assessments through SEDAR.

Collaboration facilitates SECOORAs ability to: refine current or water column designations of EFH and EFH-HAPCs (e.g., Gulf Stream and Florida Current); provide oceanographic models linking benthic, pelagic habitats, and food webs; provide oceanographic input parameters for ecosystem mode; integrate OOS information into SEDAR process in the South Atlantic; facilitate OOS system collection of data and other research necessary to support the Council's conservation of habitat and use of area-based management tools in the South Atlantic Region including designation of EFH and EFH-HAPC and

establishment of Marine Protected Areas, Deepwater C-HAPCs, Special Management Zones, Spawning Special Management Zones and Allowable Gear Areas; characterize connectivity of habitats and managed areas; highlight the OOS program in the South Atlantic FEP II Dashboard; and provide access to OOS products to facilitate model and tool development and provide researchers access to data or products including those collected/developed by South Atlantic OOS partners. The Council is also collaborating with SECOORA to advance the coordination, techniques and data integration for biodiversity and environmental observations in support of region-specific decision making and implement a sustainable National Marine Biodiversity Observation Network (Marine Biodiversity Observation Network).

National Fish Habitat Plan and Southeast Aquatic Resource Partnership (SARP)

The Councils serve on the National Habitat Board http://www.fishhabitat.org/ and, as a member of the Southeast Aquatic Resource Partnership (SARP) https://southeastaquatics.net/, has highlighted this collaboration by including the Southeast Aquatic Habitat Plan (SAHP) and associated watershed conservation restoration targets into the original FEP. Many of the habitat, water quality, and water quantity conservation needs identified in the threats and recommendations Volume of the original FEP are directly addressed by on-the-ground projects supported by SARP. This cooperation results in funding fish habitat restoration and conservation intended to increase the viability of fish populations and fishing opportunity, which also meets the needs to conserve and manage EFH for Council-managed species or habitat important to their prey. This work supports conservation objectives identified in the SAHP to improve, establish, or maintain riparian zones, water quality, watershed connectivity, sediment flows, bottoms and shorelines, and fish passage, and addresses other key factors associated with the loss and degradation of fish habitats. SARP also developed the Southern Instream Flow Network (SIFN) https://southeastaquatics.net/sarps-programs/sifn to address the impacts of flow alterations in the Southeastern US aquatic ecosystems which leverages policy, technical experience, and scientific resources among partners based in 15 states. Maintaining appropriate flow into South Atlantic estuarine systems to support healthy inshore habitats essential to Council managed species is a major regional concern and efforts of SARP through SIFN are envisioned to enhance state and local partners ability to maintain appropriate flow rates.

South Atlantic Landscape Conservation Cooperative

The Council participates as Steering Committee member for the South Atlantic Landscape Conservation Cooperative (SALCC), an applied conservation science partnership focused on the South Atlantic region that informs on-the-ground strategic conservation efforts at landscape scales. LCC partners included Department of Interior (DOI) agencies, other federal agencies, states, tribes, non-governmental organizations, universities, and others. The DOI Southeast Climate Services Center (CSC) had the LCCs in the region as their primary clients. One of the initial charges of the CSCs is to downscale climate models for use at finer scales.

The SALCC developed a Strategic Plan and a regional blueprint to address the rapid changes in the South Atlantic including climate change, urban growth, and increasing human demands on resources which are reshaping the landscape. Integration of connectivity, function, and threats to river, estuarine and marine systems supporting Council-managed species is supported by the SALCC and enhanced by the Council being a voting member of its Steering Committee. In addition, the Council's Webservices present spatial representations of EFH, managed areas, regional fish and fish habitat distribution, and fishery operation information which was drawn on as a critical part of the collaboration with the SALCC Conservation Planning Atlas and the Regional Conservation Blueprint. While the LCCs are no longer

funded, the South Atlantic Conservation Blueprint continues to be refined and serves as the technical foundation for the Southeast Conservation Adaptation Strategy (SECAS).

Southeast Conservation Adaptation Strategy: http://secassoutheast.org/

SECAS unites the conservation community around a shared, long-term vision for the future to consider dramatic changes sweeping the Southeastern United States including urbanization, competition for water resources, extreme weather events, sea-level rise, and climate change which pose unprecedented challenges for sustaining our natural and cultural resources. Through SECAS, diverse partners are working together to design and achieve a connected network of lands and waters that supports thriving fish and wildlife populations and improved quality of life for people across the Southeastern United States and the Caribbean. The primary product of SECAS is the Southeast Conservation Blueprint SECAS Blueprint. http://secassoutheast.org/blueprint.html. The Blueprint stitches together smaller sub-regional plans into one unifying map that identifies important areas for conservation and restoration.

Regional Ecosystem Modeling in the South Atlantic

South Atlantic Ecopath with Ecosim Model

The Council worked cooperatively with the University of British Columbia and the Sea Around Us project to develop a straw-man and preliminary food web models (Ecopath with Ecosim) to characterize the ecological relationships of South Atlantic species, including those managed by the Council. This effort helped the Council and cooperators identify available information and data gaps while providing insight into ecosystem function. More importantly, the model development process provided a vehicle to identify research necessary to better define populations, fisheries, and their interrelationships. While individual efforts were underway in the South Atlantic, only with significant investment of resources through other programs was a comprehensive regional model further developed.

A subsequent collaboration building on the previous Ecopath model developed through the Sea Around Us project for the South Atlantic Bight focused on simulating forage fish population changes that could result from environmental or oceanographic variation associated with climate change effect and how it could potentially affect managed species.

As part of the FEP II development process a new generation South Atlantic ecosystem modeling effort funded by the SALCC, was conducted to engage a broader scope of regional partners. This effort facilitated development of a new generation Ecopath with Ecosim (EwE) model which will ultimately provide evaluation tools for the SSC and Council and inform other regional conservation planning efforts.

The new South Atlantic EwE model provides a more complete view of the system and supports potential future evaluations that may be possible with the model. With the model complete and tuned to the available data it can be used to address broad strategic issues, and explore "what if" scenarios that could then be used to address tactical decision-making questions such as provide ecosystem context for single species management, address species assemblage questions, and address spatial questions using Ecospace.

A modeling team comprised of FWRI staff, Council staff and other technical experts as needed, will coordinate with members of the original Ecosystem Modeling Workgroup to maintain and further refine the South Atlantic Model. The SAFMC Ecospecies online species information system will be the long-term repository for the processed inputs and outputs associated with the South Atlantic model. Online

access to the EcoSpecies system is available through the FEP II Dashboard through individual links under Managed Species Section http://safmc.net/uncategorized/safmc-managed-species/ and through the Tools Section http://safmc.net/fishery-ecosystem-plan-ii-tools/ The direct link to the system is http://saecospecies.azurewebsites.net/.

Tools to support EBFM in the South Atlantic Region

The Council developed a Habitat Conservation and Ecosystem Management Section of the website http://safmc.net/fishery-ecosystem-plan-ii-introduction/which provides access to the FEP II Digital Dashboard and associated tools. Florida's FWRI maintains and distributes GIS data, imagery, and documents relevant to habitat conservation and ecosystem-based fishery management in their jurisdiction. Over the last several years, FWRI has created web services and applications using the ArcGIS for Server (AGS) software. AGS enables collaboration among various federal, state and local agencies to evaluate and analyze fisheries-related information in a new way. By transitioning to the AGS platform, the Council enhanced their online suite of tools to support fisheries management in their region. The Council has continued its collaboration with FWRI in the evolution to Web Services provided through the regional SAFMC Habitat and Ecosystem Atlas (http://ocean.floridamarine.org/safmc_atlas/) and the SAFMC Digital Dashboard (http://ocean.floridamarine.org/safmc_dashboard/). The online systems provide access to the following Services:

SAFMC Fisheries Webservice: (http://ocean.floridamarine.org/SA_Fisheries/)

The service provides access to species distribution and spatial presentation of regional fishery independent data from the Southeast Area Monitoring and Assessment Program (South Atlantic) SEAMAP-SA, the Marine Resources Monitoring, Assessment, and Prediction program (MARMAP), and NOAA Southeast Fishery-Independent Survey (SEFIS).

SAFMC EFH Webservice: (http://ocean.floridamarine.org/sa_efh/)

The EFH service provides access to spatial representation of EFH and EFH-HAPCs for Council managed species and Highly Migratory Species.

SAFMC Managed Areas Service: (http://ocean.floridamarine.org/safmc_managedareas/).

The Managed Area service provides access to spatial presentations of Council and other managed areas in the region. A new data layer of gear restrictions to include in the Managed Areas map service. Restrictions for black sea bass pots, fish traps, roller rigs, octocoral harvest, spiny lobster closed areas, golden crab closed areas, pelagic sargassum harvest, and longline prohibited areas are provided.

SAFMC EcoSpecies Online Species Information System: (http://saecospecies.azurewebsites.net/)

FWRI works with the Council to provide support relevant to habitat conservation and ecosystem-based fishery management in the Council's jurisdiction. The system provides species life history and habitat information to flexibly fill the needs of the Council and other regional users. The updated and refined system provides the Council with the foundation from which to attain a more comprehensive understanding of habitat and biology of species, fisheries information, social and economic impacts of management, and ecological consequences of conservation and management. The system was further refined with information supporting EFH designations, Annual Catch Limits (ACLs), and Accountability Measures (AMs) associated with all Council-managed species, added and additional refinement of structure and function further enhancing the systems capabilities and utility. In addition, new habitat information based on life history stage was imported into the database and a link to a User's Guide (http://safmc.net/download/EcoSpecies-WebUser-Manual-3-17.pdf) was added. The project in 2019 will

continue to update and refine the online data system. Updates included in this phase of the project address the need by the Council to refine and update species information for future 5-year EFH reviews and to highlight and expand accessibility and availability of detailed species, habitat, and fishery information for FEP II to further support the move to Ecosystem-Based Fishery Management.

South Atlantic Artificial Reefs Web Application:

(http://myfwc.maps.arcgis.com/apps/webappviewer/index.html?id=f3c6ac59ee5f49e59f1ae5c96c5bc76b). This application provides a regional view of artificial reefs locations, contents and eventually imagery associated with programs in the southeastern U.S. overseen by individual states (Florida, Georgia, South Carolina, North Carolina).

South Atlantic ACCSP Web Map and Application:

A new ArcGIS Online web map displays Atlantic Coastal Cooperative Statistics Program (ACCSP) Statistical Areas with related ACCSP non-spatial tables of non-confidential data binned into 5-year time steps to better represent catch and values of Council-managed species across time. The web map provides an easy interface to view landings of a statistical area over time. FWRI also created an ACCSP web application for users to query by species for each time step or query by ACCSP Statistical Areas. The ACCSP web application is powered by the web map to display charts of landings and values for ACCSP Statistical Areas. The related table widgets summarize the fields for "live_pounds" and "dollar_values" by species and time step.

SAFMC Habitat and Ecosystem Digital Dashboard Enhancements:

To further enhance the Councils Digital Dashboard and enhance linkages with regional partners mapping and characterizing habitats and documenting species use of habitats in the South Atlantic Region, a live link to the *Okeanos Explorer* while on cruise was added to the Projects page and a link to the Atlantic Coastal Fish Habitat Partnership (ACFHP) was added to the Partners page.

Ecosystem-Based Action, Future Challenges and Needs

The Council has implemented ecosystem-based principles through several existing fishery management actions including establishment of deep-water Marine Protected Areas for the Snapper Grouper fishery, proactive harvest control rules on species (e.g., dolphin and wahoo) which are not overfished, implementing extensive gear area closures which in most cases eliminate the impact of fishing gear on EFH, and use of other spatial management tools including Special Management Zones and Spawning Special Management Zones. Through development of the Comprehensive Ecosystem-Based Amendments, the Council has taken an ecosystem approach to protecting deep-water ecosystems while providing for traditional fisheries for the Golden Crab and Royal Red shrimp in areas where they do not impact deep-water coral habitat. The stakeholder-based process tapped into an extensive regional Habitat and Ecosystem network. Support tools facilitate Council deliberations and with the help of regional partners, are being refined to address long-term habitat conservation and EBFM needs.

One of the greatest challenges to enhance habitat conservation and EBFM in the region is funding high priority research, including comprehensive benthic mapping and ecosystem model and management tool development. In addition, collecting detailed information on fishing fleet dynamics including defining fishing operation areas by species, species complex, and season, as well as catch relative to habitat is critical for assessment of fishery, community, and habitat impacts and for Council use in place-based management measures. Additional resources need to be dedicated to expanding regional coordination of modeling, mapping, characterization of species use of habitats, and full funding of

regional fishery independent surveys (e.g., MARMAP, SEAMAP, and SEFIS) which are linking directly to addressing high priority management needs. The FEP II Implementation Plan includes Appendix A to highlight research and data needs excerpted from the SEAMAP 5 Year Plan because they represent short and long-term research and data needs that support EBFM and habitat conservation in the South Atlantic Region.

Development of ecosystem information systems to support Council management should build on existing tools (e.g., Regional Habitat and Ecosystem GIS and Arc Services) and provide resources to regional cooperating partners for expansion to address long-term Council needs. NOAA should support and build on the regional coordination efforts of the Council as it transitions to a broader management approach. Resources need to be provided to collect information necessary to update information supporting FEP II, which support refinement of EFH designations and spatial representations and future EBFM actions. These are the highest priority needs to support habitat conservation and EBFM, the completion of mapping of near-shore, mid-shelf, shelf edge, and deep-water habitats in the South Atlantic region and refinement in the characterization of species use of habitats.

Appendix I. Revised Goals and Objectives of the Dolphin and Wahoo Fishery Management Plan

Preamble: The original and ongoing intent of the Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic is to sustainably manage the stocks of dolphin and wahoo for the long-term benefit of all participants. Owing to the substantial importance of the fisheries for dolphin and wahoo, particularly to the recreational sector, this fishery management plan seeks to manage these fisheries using a precautionary approach that maintains access, minimizes competition, preserves the social and economic importance of the fisheries, as well as promotes research and incorporation of ecosystem considerations where practicable.

Goal 1 (Precautionary Approach): Management of the dolphin and wahoo fisheries is precautionary, risk-averse, and maintains historic catch levels while preventing overfishing.	
Objective 1	Maintain catch levels that do not exceed catch level recommendations for dolphin or wahoo and do not directly change the balance of landings in comparison to the historic fishery to the extent that conflict is created between the recreational and commercial sectors.
Objective 2	Minimize bycatch of dolphin and wahoo in non-directed fisheries.
Goal 2 (Access): The recreational and commercial sectors retain access to the dolphin and wahoo resource.	
Objective 1	For the recreational sector, adopt management measures that ensure consistent and predictable access to dolphin and wahoo when they are regionally available as well as maintain abundant stock levels that lead to high encounter rates and elevated trip satisfaction.
Objective 2	For the commercial sector, adopt management measures that ensure consistent and predictable access to dolphin and wahoo when they are regionally available.
Objective 3	Address concerns as practicable over localized reduction in fish abundance and the resulting perceived decline in local availability of dolphin and wahoo.
Goal 3 (Minimize Competition Between User Groups): Competition between user groups is minimized.	
Objective 1	Ensure effort and catch levels of dolphin and wahoo by distinct user groups does not notably expand beyond their traditional share of the fishery.
Objective 2	Exercise caution in allowing development of new fisheries or expansion of existing fisheries that may increase competition between user groups.
Goal 4 (Economic and Social Importance): Management of the dolphin and wahoo fisheries recognizes and preserves their economic and social importance to both the recreational and commercial sectors.	
Objective 1	Manage the dolphin and wahoo resources to achieve optimum yield on a continuing basis in order to maximize the economic and social net benefits of the fishery.

Objective 2	Minimize market disruption. In the short-term, commercial markets (mainly local) may be disrupted if large quantities of dolphin are landed from intense commercial harvest or unregulated catch.
Objective 3	Encourage research that improves knowledge about the social and economic elements of the dolphin and wahoo fishery.
Objective 4	Improve awareness and understanding of how social and economic issues are linked to dolphin and wahoo fishery management measures.
Goal 5 (Ecosystem Based Management and Research Priorities): Management of the dolphin and wahoo fisheries recognizes the importance of biologic information and incorporating ecosystem considerations.	
Objective 1	Support improved and expanded monitoring and reporting programs for the dolphin and wahoo fishery. Promote collection of quality data to support management plans and programs considered by the Council.
Objective 2	Support measures that incorporate ecosystem considerations for the management of dolphin and wahoo where practicable.
Objective 3	Promote research aimed at developing ecosystem based management of dolphin and wahoo.
Objective 4	Promote research that enhances collection of biologic and habitat data on dolphin and wahoo stocks and fisheries.