

Regulatory Amendment 35

to the Fishery Management Plan for the
Snapper Grouper Fishery of the South
Atlantic Region

Red Snapper Catch Limits and Recreational Gear Modifications for the Snapper Grouper Fishery



Environmental Assessment, Regulatory Flexibility Act Analysis, and Regulatory Impact Review

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Regulatory Amendment 35 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Proposed actions:

Reduce the acceptable biological catch and annual catch limits and establish an annual optimum yield for red snapper in the South Atlantic based on the results of the latest stock assessment, and implement management measures to reduce dead discards for the South Atlantic snapper grouper fishery.

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This environmental assessment (EA) is being prepared using the 2020 CEQ NEPA Regulations as modified by the Phase I 2022 revisions. The effective date of the 2022 revisions was May 20, 2022, and reviews begun after this date are required to apply the 2020 regulations as modified by the Phase I revisions unless there is a clear and fundamental conflict with an applicable statute. This EA began on [Date] and accordingly proceeds under the 2020 regulations as modified by the Phase I revisions.

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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 the most recent stock assessment for South Atlantic red snapper (SEDAR 73 2021). The results of SEDAR 73 indicated that South Atlantic red snapper are overfished, overfishing is occurring, and the overfishing is being primarily driven by high numbers of dead discards by the recreational sector. While the number of red snapper dead discards has an especially strong impact on allowable harvest levels for red snapper, as explained in Chapter 1, these dead discards also affect allowable harvests of other stocks managed under the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP). Red snapper co-occurs with other snapper grouper species, many of which are experiencing overfishing. Therefore, actions to adjust red snapper catch levels based on the SEDAR 73 (2021) stock assessment and to reduce dead discards for all species in the snapper grouper fishery management unit are considered in this framework amendment.

The Council received notification from NMFS (via letter dated July 23, 2021) of the status of the red snapper stock in the South Atlantic. Following notification that a stock is undergoing overfishing and is overfished, the Magnuson-Stevens Act requires the Council to develop an FMP amendment with actions that end overfishing immediately and rebuild the affected stock. Because a rebuilding plan is already in place for red snapper and SEDAR 73 (2021) shows that adequate progress towards rebuilding is being made, the Council does not need to revise the existing rebuilding plan but is still required to take action to end overfishing.

This framework amendment is the first of a multi-step approach by the Council to end overfishing of South Atlantic red snapper. This framework amendment would be followed by the completion of a Management Strategy Evaluation (MSE) of the snapper grouper fishery (which is currently in progress) that would provide information to manage this multi-species fishery in a more holistic manner. The MSE will model different combinations of scenarios (what the snapper grouper stocks and fishery could look like currently or in the future) and management strategies (ways that management affects the stocks and fishery) to determine what management actions are most critical to achieve the Council's goals and objectives for the snapper grouper fishery. These scenarios and management strategies can include multiple stocks of snapper grouper species, so resulting management advice can include multi-species actions and impacts, which differs from current management that mostly focuses on single species. The Council intends for the MSE to be followed by an amendment to the Snapper Grouper FMP that would include Council management actions for snapper grouper species based on the MSE and the most current and best scientific information available.

Purpose for Action

The *purpose* of this framework amendment is to reduce the acceptable biological catch and annual catch limits for red snapper in the South Atlantic based on the results of the latest stock

assessment; and specify management measures to reduce dead discards for the South Atlantic snapper grouper fishery.

Need for Action

The *need* for this framework amendment is to ensure red snapper catch limits are based on the best scientific information available and to address overfishing of the South Atlantic red snapper stock by reducing dead discards of snapper grouper species, while minimizing negative social and economic effects to the extent practicable, consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and its National Standards.

What are the Overfishing Limit and Acceptable Biological Catch Recommendations for South Atlantic Red Snapper?

The Council’s Scientific and Statistical Committee (SSC) reviewed the South Atlantic red snapper stock assessment (SEDAR 73 2021) at their April 2021 and July 2021 meetings. The SSC found that the assessment addressed the terms of reference appropriately, was conducted using the best scientific information available, was adequate for determining stock status and supporting fishing level recommendations, and addressed uncertainty consistent with expectations and available information.

The SSC reviewed projections depicting a variety of recruitment, fishing mortality, and discard mortality scenarios. The SSC recommended the overfishing limit (OFL) be based on results of a projection that included recent (last 10 years) average recruitment, a discard mortality rate that accounts for descending device usage based on current and predicted levels of use, a fishing mortality rate of $F_{30\%SPR}$ (the fishing mortality rate when the spawning potential ratio equals 30%; a proxy for F_{MSY}), and no reallocation of fishing mortality from discards to landings. This projection was run out through 2044 to determine if the stock would rebuild within the rebuilding timeframe. The projections indicated the stock would rebuild within the rebuilding timeframe, provided landings, discards, and recruitment remain close to the projected levels. Recommended landings and projected discard levels are provided for the next 5 years (Table S-1).

The current OFL for red snapper is 56,000 fish, and the current acceptable biological catch (ABC) is 53,000 fish, based on the SSC’s recommendation for the 2018 fishing year following the SEDAR 41 stock assessment (2017). The total annual catch limit (ACL) is 42,510 fish (Amendment 43, SAFMC 2017c), with the total ACL allocated between the recreational sector (71.93%) and the commercial sector (28.07%). That allocation results in the current recreational ACL of 29,656 fish and the commercial ACL of 124,815 pounds whole weight (lbs ww).

Table S-1. The OFL and ABC levels recommended for South Atlantic red snapper by the SSC, based on projections from SEDAR 73 (2021) and relative to the current ACL of 42,510 fish. The SSC recommended an ABC equal to the OFL, so values in the table represent the ABC and OFL landings and dead discards in pounds whole weight and numbers of fish.

Year	ABC/OFL Landings (lbs ww)	ABC/OFL Dead Discards (lbs ww)	ABC/OFL Landings (numbers of fish)	ABC/OFL Dead Discards (numbers of fish)	Percent Reduction in ABC/OFL Landings (numbers of fish) from Current Total ACL
2023	327,000	1,036,000	28,000	202,000	34.13%
2024	368,000	1,076,000	31,000	207,000	27.08%
2025	408,000	1,104,000	33,000	210,000	22.37%
2026	446,000	1,122,000	35,000	211,000	17.67%
2027+	480,000	1,133,000	36,000	212,000	15.31%

What Actions are Being Proposed in This Amendment?

Regulatory Amendment 35 to the Snapper Grouper FMP proposes the following:

Action 1. Reduce the South Atlantic red snapper acceptable biological catch, total annual catch limit, and sector annual catch limits, and establish an annual optimum yield

Purpose of Action: The latest stock assessment (SEDAR 73 2021) indicated the stock is overfished and experiencing overfishing. Action is needed because the SSC recommended a new ABC based on results of SEDAR 73, and the ABC, total ACL, and sector ACLs must be adjusted accordingly, and an annual optimum yield (OY) established. The Council cannot set the total ACL above the SSC's recommended ABC.

Preferred Alternative 2: Reduce the red snapper acceptable biological catch and set it equal to the most recent recommendation from the Scientific and Statistical Committee. Revise the total annual catch limit and establish an annual optimum yield for red snapper, and set them **equal to** the recommended acceptable biological catch. Red snapper may only be harvested or possessed in or from the South Atlantic exclusive economic zone during the commercial and recreational fishing seasons. The 2027 total annual catch limit and annual optimum yield would remain in place until modified.

Fishing Year	ABC (numbers of fish)	Annual OY=Total ACL (numbers of fish)	Commercial ACL (lbs ww)	Recreational ACL (numbers of fish)
2023	28,000	28,000	77,016	19,119
2024	31,000	31,000	85,268	21,167
2025	33,000	33,000	90,769	22,533
2026	35,000	35,000	96,270	23,899
2027+	36,000	36,000	99,021	24,581

Action 2. Prohibit the use of more than one hook per line for the snapper grouper recreational sector

Purpose of Action: The latest stock assessment (SEDAR 73 2021) indicated the South Atlantic red snapper stock is experiencing overfishing primarily due to mortality associated with recreational discards. Other snapper grouper species also experience large numbers of dead discards, which limit the Council's ability to prevent overfishing and reduce the number of fish that can be landed by the fishery. Action is needed to reduce bycatch that leads to dead discards in the recreational portion of the snapper grouper fishery, consistent with National Standard 9 of the Magnuson-Stevens Act, and to reduce indiscriminate fishing effort that contributes to the overfishing of several South Atlantic snapper grouper species (including red snapper), consistent with National Standard 1 of the Magnuson-Stevens Act.

Preferred Alternative 2: The recreational sector is required to use one non-offset, non-stainless steel circle hook per line when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits north of 28° N latitude, and no more than one hook per line may be used. The recreational sector is required to use one non-stainless steel hook per line when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits south of 28° N latitude, and no more than one hook per line may be used.

Chapter 1. Introduction

1.1. What Actions are Being Proposed?

The proposed actions in Regulatory Amendment 35 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (Regulatory Amendment 35) would reduce the acceptable biological catch (ABC) and annual catch limits (ACL), and establish an annual optimum yield (OY) for red snapper in the South Atlantic based on the results of the latest stock assessment (Southeast Data, Assessment, and Review; SEDAR 73 2021). Regulatory Amendment 35 would also modify recreational fishing gear configuration when fishing for snapper grouper species to reduce widespread dead discards in the South Atlantic snapper grouper fishery and contribute to ending overfishing of red snapper.

This framework amendment is the first of a multi-step approach to end overfishing of South Atlantic red snapper. This framework amendment will be followed by the completion of a Management Strategy Evaluation (MSE) of the snapper grouper fishery (which is currently in progress) that is expected to provide information to manage this multi-species fishery in a more holistic manner (Section 1.5). Additionally, several scientific projects that are researching topics such as catch and discard areas, spatial abundance, overall distribution and abundance, and effects of alternative management scenarios are also currently underway and expected to be available for use by the conclusion of the MSE. Following the conclusion of the MSE, the South Atlantic Fishery Management Council (Council) intends to develop an amendment to the Snapper Grouper FMP that would include actions for snapper grouper species based on the MSE results and the most current and best scientific information available. The collective actions of Regulatory Amendment 35, expanded outreach and education efforts (see Appendix H), and the plan amendment that would follow the MSE are expected to end overfishing of red snapper.

South Atlantic Fishery Management Council

- Responsible for conservation and management of fish stocks in the South Atlantic Region.
- Consists of 13 voting members and 4 non-voting members; voting members include 1 representative from each of the 4 South Atlantic state fishery management agencies, 8 members appointed by the Secretary of Commerce, and the Southeast Regional Administrator of NMFS.
- Responsible for developing fishery management plans and amendments under the Magnuson-Stevens Act; recommends actions to NMFS for implementation.
- Management area is from 3 to 200 nautical miles off the coasts of North Carolina, South Carolina, Georgia, and east Florida through Key West, except for mackerel which is from New York to Florida, and dolphin and wahoo, which is from Maine to Florida.

Exempted Fishing Permits

Important information is collected during the red snapper seasons, some of which is used for ongoing research projects, including the South Atlantic Red Snapper Research Program (SARSRP). A complete closure (such as that considered under Action 1 – **Alternative 3**) would

eliminate the collection of this information. To ensure that there is no gap in ongoing data collection efforts, the Council and the National Marine Fisheries Service (NMFS) note that NMFS may authorize exempted fishing permits (EFP) under certain circumstances (e.g., limited testing, data collection, etc.). An EFP may authorize a fishing vessel to conduct fishing activities that would otherwise be prohibited under current regulations (e.g. retaining a prohibited species).

The goal of the SARSRP is to better estimate characteristics of the South Atlantic red snapper stock, including population size, distribution, and density. If necessary, it may be possible that an EFP could allow projects to continue sampling for the SARSRP and test innovative management strategies to reduce effort and snapper grouper discards, while providing a way to convert discards into retained catch. Information on EFPs can be found in the Code of Federal Regulations at [50 C.F.R. § 600.745\(b\)](#), and on the NMFS Southeast Regional Office [EFP webpage](#).

1.2. Who is Proposing the Actions?

The Council is responsible for managing fish stocks in the South Atlantic Region. The Council develops the framework amendment and sends it to NMFS, who decides whether the framework amendment is consistent with the Snapper Grouper FMP and all applicable law. NMFS publishes a rule to implement the framework amendment on behalf of the Secretary of Commerce. NMFS is an agency of the National Oceanic and Atmospheric Administration within the Department of Commerce. Guided by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the Council works with NMFS, other partners, and stakeholders to assess the status of fish stocks, specify catch limits, reduce bycatch, and enforce fisheries regulations.

The Council and NMFS are also responsible for making this framework amendment available for public comment. The draft environmental assessment (EA) was combined with the framework amendment and was made available to the public during the scoping process, public hearings, and in Council meeting briefing books. The final EA and framework amendment will be made available for public comment during the proposed rule stage of the rulemaking process. The final EA and framework amendment will be found on the Council's website at <http://www.safmc.net>.

1.3. Where is the Project Located?

Management of the federal snapper grouper fishery located off the southeastern United States (South Atlantic) in the 3-200 nautical miles U.S. exclusive economic zone (EEZ) is conducted under the Snapper Grouper FMP (SAFMC 1983) (Figure 1.3.1). Red snapper is one of fifty-five species managed by the Council under the Snapper Grouper FMP.

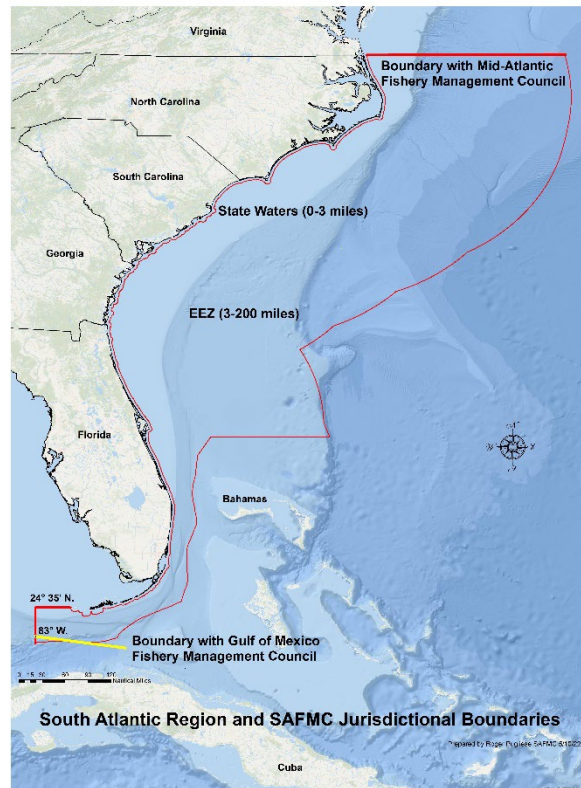


Figure 1.3.1. Jurisdictional boundaries of the Council.

1.4. Why are the Council and NMFS Considering Action? (Purpose and Need)

Purpose: The *purpose* of this framework amendment is to reduce the acceptable biological catch and annual catch limits for red snapper in the South Atlantic based on the results of the latest stock assessment; and implement management measures to reduce dead discards for the South Atlantic snapper grouper fishery.

Need: The *need* for this framework amendment is to ensure red snapper catch limits are based on the best scientific information available and to address overfishing of the South Atlantic red snapper stock by reducing dead discards of snapper grouper species, while minimizing negative social and economic effects to the extent practicable, consistent with the Magnuson-Stevens Fishery Conservation and Management Act and its National Standards.

Background

The Council is considering action to respond to the most recent stock assessment for South Atlantic red snapper (SEDAR 73 2021), address overfishing determined by that assessment, and reduce dead discards in the snapper grouper fishery. SEDAR 73 (2021) included data through 2019 and was conducted using the Beaufort Assessment Model, a statistical catch-at age model. The assessment results indicated that South Atlantic red snapper are overfished and experiencing overfishing (Table 1.4.1). Updated catch and data changes incorporated in the assessment

provided information to update the overfishing level (OFL), ABC, and ACLs, and to establish an annual OY.

Table 1.4.1. South Atlantic red snapper stock status criteria recommendations based on the results of SEDAR 73 (2021), as recommended by the Scientific and Statistical Committee in July 2021. Deterministic projections were used to recommend future catch levels. SSB=spawning stock biomass; MSY = Maximum sustainable yield (MSY); SSB_{MSY} = spawning stock biomass at MSY; MFMT = maximum fishing mortality threshold; F_{MSY} = The fishing mortality rate (F) that, if applied constantly, would result in MSY; MSST = minimum stock size threshold.

Criteria	Deterministic	Probabilistic
Overfished evaluation (SSB/SSB _{MSY})	0.44	0.49
Overfishing evaluation (F/MFMT)	2.20	1.95
MFMT (F _{MSY})	0.21	0.21
SSB _{MSY} (1E8 eggs)	635,426.4	594,630.2
MSST (1E8 eggs)	476,569.8	445,972.6
MSY (1000 lbs)	404.7	407.78

The Council's Scientific and Statistical Committee (SSC) reviewed results of the assessment at their April and July 2021 meetings and recommended new OFL and ABC levels. The SSC's recommendations are summarized in Section 1.6 and were presented to the Council at the September 2021 meeting. Council action is needed because the SSC recommended a new, lower ABC, and the Council cannot set the ABC or total ACL above the SSC's recommended ABC. Therefore, the Council must reduce the ABC, total ACL, and sector ACLs based on SEDAR 73 and the SSC's recommendations. The Council must also establish an OY based on the results of SEDAR 73, which can be set as an annual OY.

The Council received notification from NMFS (via letter dated July 23, 2021) of the status of the red snapper stock in the South Atlantic. Following notification that a stock is undergoing overfishing and is overfished, the Magnuson-Stevens Act requires the Council to develop an FMP amendment with actions that end overfishing immediately and rebuild the affected stock. Because a rebuilding plan is already in place for red snapper and SEDAR 73 (2021) shows that adequate progress towards rebuilding is being made, the Council does not need to revise the existing rebuilding plan but is still required to take action to end overfishing. Red snapper overfishing is being caused by discard mortality incurred largely when the red snapper season is closed and fishermen are targeting snapper grouper species that co-occur with red snapper. Therefore, reducing the harvest of red snapper alone (i.e., lowering the ACL) would be expected to have minimal impact toward ending overfishing.

The vast majority of discard mortality for red snapper (99% of dead discards in numbers of fish from 2017-2019) occurs in the recreational sector (private and for-hire). The recreational season for red snapper occurs in July and the length of the season has ranged from 3-9 days from 2017 to 2021 (Table G.9), with shorter seasons in the most recent years. The commercial season for red snapper begins the second Monday in July and has ranged from 53 to 114 days from 2017 to 2021 (Table F.1). The commercial season has closed before the end of the year due to reaching the commercial ACL in each of those years.

Definitions

Overfished: A stock is considered overfished when the population size is considered too low, whether because of fishing or other causes. If this occurs, a rebuilding plan is needed. For managed stocks, overfished thresholds, also known as minimum stock size thresholds (MSST), are specified so that if the population size falls below the threshold, then the population is considered overfished.

- Overfished is defined as spawning stock biomass (SSB) < MSST

Undergoing Overfishing: A stock is considered to be undergoing overfishing if the (annual catch) rate of removal from the population is too high.

- Overfishing is defined as: full fishing mortality rate (F) > maximum fishing mortality threshold (MFMT)

Discard mortality is a pervasive issue that affects much of the South Atlantic snapper grouper management unit (FMU). The snapper grouper FMU includes 55 bottom- and reef-dwelling fish species, many of which are neither snappers nor groupers (e.g., triggerfish and several jack species). Many of these species have different management regulations and seasons. During a harvest closure for a species, that species must be released even if it is caught when fishing for a different, co-occurring species that can be harvested. For example, in 2021, the recreational sector was allowed to harvest red snapper for three days in July. However, in some areas, red snapper are commonly caught in the same locations as black sea bass and vermilion snapper, which were allowed to be kept and landed throughout 2021. Thus, although a species may not be able to be retained, it still may be caught, released, and be susceptible to release mortality frequently due to effort directed at co-occurring species that can be retained.

Stock assessments estimate the number of fish that can be sustainably removed from a stock annually. These removals can occur as fish that are harvested or fish that are caught, released, and subsequently die due to the catch and release process (i.e., dead discards). If more fish die after being caught and released, fewer of the removals can be projected as harvested fish. Most management regulations pertain to harvested fish because fishermen have more control over what they retain rather than what they catch. Projections of management effects for actions that reduce a species' retention (e.g., lowering ACLs, lowering bag limits, increasing minimum size limits) often estimate similar or higher amounts of removals due to discard mortality (because fewer fish are allowed to be kept, more fish are released, and more fish die following release). Therefore, for stocks with high amounts of dead discards (e.g., South Atlantic red snapper), regulatory changes to allowable harvest (retained fish) have minimal impacts to reducing overall removals and improving stock status. For such stocks, substantial changes to the number of removals must be made by reducing the number of dead discards, either by lowering the discard mortality rate (improving the survival of fish that are released) or by lowering the overall catch (fewer fish released at a given discard mortality rate results in fewer dead discards).

Due to the impacts of discard mortality throughout the multi-species South Atlantic snapper grouper fishery, the Council is considering actions that would affect recreational management of many species in the FMU to reduce dead discards. These actions, along with expanded outreach and education efforts (see Appendix H) and future management actions resulting from the results of the research projects and snapper grouper MSE mentioned above (see Section 1.1), should contribute to ending overfishing of South Atlantic red snapper.

The preferred alternative in Action 1 of Regulatory Amendment 35 would modify the ACL for red snapper to base it on the most recent ABC recommendation from the SSC using information from SEDAR 73 (2021). The SSC's OFL and ABC recommendations assume a commensurate reduction in dead discards to end overfishing. Due to the high proportion of red snapper removals being dead discards, reductions in landings alone, even zero allowable landings, would not end overfishing. Overfishing of red snapper is primarily driven by high numbers of fish caught and released by the recreational sector that do not survive. Dead discards comprise approximately 85% of the projected removals for red snapper while harvesting the ABC (both sectors; see Appendix J). The recreational sector accounts for approximately 99% of the dead discards of red snapper (SEDAR 73 2021). As previously discussed, red snapper co-occur with many other snapper grouper species and are caught out of season (and released) when fishermen target other snapper grouper species. Therefore, to end red snapper overfishing, the Council must also reduce effective effort and dead discards for co-occurring species in the snapper grouper fishery. Dead discards and overfishing are being addressed through Action 2, which is expected to slow the removal rate and reduce catch and discards by limiting recreational anglers to one hook per line while fishing for snapper grouper species with hook-and-line gear and natural bait.

1.5. How is the Council Working to End Overfishing of South Atlantic Red Snapper?

National Standard 1 of the Magnuson-Stevens Act (50 CFR § 600.310(j)(2)(i)) states: *Upon notification that a stock or stock complex is undergoing overfishing, a Council should immediately begin working with its SSC (or agency scientists or peer review processes in the case of Secretariately-managed fisheries) to ensure that the ABC is set appropriately to end overfishing. Councils should evaluate the cause of overfishing, address the issue that caused overfishing, and reevaluate their ACLs and AMs to make sure they are adequate.*

The Council received a letter notifying them of the South Atlantic red snapper stock status of overfished and experiencing overfishing, based on SEDAR 73 (2021), on July 23, 2021.

In September 2021, the Council discussed its response to SEDAR 73 and the catch levels recommended by the SSC based on that stock assessment. The projection used to develop the ABC landings recommendation assumes an approximately 65% reduction in dead discards from recently observed levels. Therefore, only reducing the red snapper ABC and total ACL to the levels recommended by the SSC (Table 1.5.1), without any additional management actions to reduce dead discards, would not be expected to end overfishing. Additionally, prohibiting all harvest of red snapper would not end overfishing either, because the projected fishing mortality rate attributable to dead discards would exceed the maximum fishing mortality threshold. Dead

discards of red snapper come primarily from the recreational sector and are difficult to estimate precisely, as indicated by NMFS' letter to the Council on April 21, 2017, following the SEDAR 41 stock assessment (2017). Furthermore, estimating changes to dead discards that could result from management changes would be more uncertain and take longer to fully evaluate than more typically-evaluated changes in landings. Thus, a multi-pronged, innovative approach was necessary to end overfishing of red snapper. This approach includes development of Regulatory Amendment 35 to fulfill Magnuson-Stevens Act requirements concerning the ABC, OY, and ACLs (the typical response to stock assessments that indicate changes are necessary), conducting an MSE to evaluate alternative management options that will reduce dead discards of red snapper, and development of a plan amendment that will follow the MSE and specify management actions based on the MSE results.

Table 1.5.1. The OFL and ABC levels recommended for South Atlantic red snapper by the SSC, based on projections from SEDAR 73 (2021) and relative to the current ACL of 42,510 fish. The SSC recommended an ABC equal to the OFL, so values in the table represent the ABC and OFL landings and dead discards in pounds whole weight (lbs ww) and numbers of fish.

Year	ABC/OFL Landings (lbs ww)	ABC/OFL Dead Discards (lbs ww)	ABC/OFL Landings (numbers of fish)	ABC/OFL Dead Discards (numbers of fish)	Percent Reduction in ABC/OFL Landings (numbers of fish) from Current Total ACL
2023	327,000	1,036,000	28,000	202,000	34.13%
2024	368,000	1,076,000	31,000	207,000	27.08%
2025	408,000	1,104,000	33,000	210,000	22.37%
2026	446,000	1,122,000	35,000	211,000	17.67%
2027+	480,000	1,133,000	36,000	212,000	15.31%

In September 2021, the Council determined that an MSE was the best analytical method to evaluate ways to reduce dead discards in the snapper grouper fishery to levels that would 1) end overfishing of red snapper and 2) potentially allow for a higher percentage of the projected removals of snapper grouper species to occur as landings rather than dead discards, while balancing the needs for fishery access and resource use. The Southeast Fisheries Science Center advised during the September 2021 meeting that an MSE could take up to five years. In April 2022, the SSC also indicated that solving the issue of dead discards with season or area closures would take longer to develop than the timeline typically needed to implement new catch levels following a stock assessment. Therefore, the Council determined that the MSE and subsequent plan amendment would be a long-term action and additional actions should be taken (through Regulatory Amendment 35) to reduce dead discards in the shorter term. Short-term regulatory actions of Regulatory Amendment 35 would be supplemented by increased Council outreach efforts encouraging the use of Best Fishing Practices that increase survival of fish after being caught and released (see Appendix H). Upon determination of this course of action, the Council directed staff to begin developing the MSE. The Council stated its intention to follow the MSE with a plan amendment that would include management measures based on the MSE results to reduce snapper grouper dead discards (including those of red snapper) and end overfishing of red snapper.

Although the conclusion of work to end overfishing takes time to develop (as noted by the Southeast Fisheries Science Center), in accordance with National Standard 1, the Council immediately began working to end overfishing by directing staff to begin development of the MSE in September 2021. This was followed by a proposed approach presented to the Council at its following meeting in December 2021 and subsequent, continuous steps progressing toward finishing the MSE (Table 1.5.2), which would be followed by an amendment to the Snapper Grouper FMP. The Council identified the issue that caused overfishing as recreational dead discards from the multispecies snapper grouper fishery. While working toward the long-term response to end overfishing of red snapper, the Council identified shorter-term actions to reduce dead discards of snapper grouper species by limiting the allowable number of hooks per line and increasing outreach efforts that encourage Best Fishing Practices. These actions are included in this amendment, along with revising the ABC, annual OY, and ACL to levels recommended by the SSC.

Table 1.5.2. Timeline of Council development of the Snapper Grouper MSE.

Date	Work Completed
July 2021	Council received notification of stock status for South Atlantic red snapper
September 2021	Council received SSC's recommended ABC for red snapper and directed staff to begin work toward: <ol style="list-style-type: none"> 1. A framework amendment that would make short-term management changes to reduce discards. 2. An MSE that will evaluate holistic management measures for the snapper grouper fishery and be used in a subsequent plan amendment to set catch levels for red snapper and adjust management measures for the snapper grouper fishery.
December 2021	Staff presented a discussion document compiling information from Council discussions and including management measures that could affect discard mortality and a proposed work plan for an MSE. The Council directed staff to conduct informal scoping for the framework amendment, evaluate potential measures to reduce dead releases, and to conduct the MSE as proposed (including approval of funds for this project).
February 2022	Request for MSE proposals was released.
March 2022	Council formally initiated Regulatory Amendment 35 and directed inclusion of revising ABC and catch levels according to SSC recommendation.
April 2022	MSE contract with Blue Matter Science approved.
June 2022	Council directed staff to develop Regulatory Amendment 35 to include revision of red snapper catch levels based on the SSC's recommendation and consideration of prohibiting electric reels and rigs with multiple hooks to reduce discards. The Council also directed staff to compile analyses that would inform discussions of time or area closures.
July 2022	Commencement of MSE project.
September 2022	Council revised the timeline of Regulatory Amendment 35 for final Council action in March 2023 and directed for an appendix describing expansion of the Best Fishing Practices outreach and education program to be included in Regulatory Amendment 35.
October 2022	SSC and Snapper Grouper Advisory Panel (AP) introductions to MSE project & initial discussions of operating models, potential management procedures, and performance metrics. SSC and Snapper Grouper AP discussion of actions considered in Regulatory Amendment 35
November 2022	Development of preliminary two-species operating model to demonstrate the multi-species MSE.
December 2022	Regulatory Amendment 35 approved for public hearings; Council directed removal of the action considering prohibition of electric/hydraulically powered reels.
January 2023	Regulatory Amendment 35 Public Hearings.
March 2023	Council introduction to MSE project & initial discussion of operating models, potential management procedures, and performance metrics.
	Future Deadline/Scheduled Work
March 2023-June 2024	Further model development, including interim reports and input opportunities for the Council, SSC, AP, and public.
June 2024	Submission of final MSE Report; subsequent development of a plan amendment to consider changes to the Snapper Grouper FMP that would reduce discards and end overfishing of red snapper.

1.6. Are These Actions Within the Bounds of the Scientific Recommendations?

The Council's SSC provides scientific recommendations on catch levels to the Council, including an OFL and ABC. The OFL is a catch level that corresponds to the stock's MSY. The ABC is a catch limit adjusted downward from the OFL to account for scientific uncertainty and the Council's risk tolerance policy (SAFMC 2023a).

The SSC reviewed the South Atlantic red snapper stock assessment (SEDAR 73 2021) at their April 2021 and July 2021 meetings. The SSC found that the assessment addressed the terms of reference appropriately, was conducted using the best scientific information available, was adequate for determining stock status and supporting fishing level recommendations, and addressed uncertainty consistent with expectations and available information.

The SSC reviewed projections depicting a variety of recruitment, fishing mortality, and discard mortality scenarios. The SSC recommended the OFL be based on results of a projection that included recent (last 10 years) average recruitment (which is higher than the long-term average), a discard mortality rate that assumes descending device usage based on current and predicted levels of use, a fishing mortality rate of $F_{30\%SPR}$ (the fishing mortality rate when the spawning potential ratio equals 30%; a proxy for F_{MSY}), and no reallocation of fishing mortality from discards to landings. This projection was run out through 2044 (the last year of the rebuilding plan) to determine if the stock would rebuild within the rebuilding timeframe. The projections indicated the stock would rebuild within the rebuilding timeframe. Recommended landings and projected discard levels are provided for the next 5 years (Table 1.5.1). The SSC additionally recommended that the ABC equal the recommended OFL (i.e., a buffer between the two amounts was not necessary), because the fishing mortality rate used to project OFL ($F_{30\%SPR}$) was below the fishing mortality rate that would rebuild the stock under the projected conditions ($F_{rebuild}$).

The current OFL for red snapper is 56,000 fish, and the current ABC is 53,000 fish, based on the SSC's recommendation following the SEDAR 41 stock assessment (2017). The total ACL is 42,510 fish (Amendment 43, SAFMC 2017c).

1.7. How Were the ACL Alternatives Determined?

The reauthorization of the Magnuson-Stevens Act in 2007 required the establishment of ACLs and accountability measures (AM) to end and/or prevent overfishing to achieve OY from a fishery. An ACL is the level of annual catch of a stock that, if met or exceeded, triggers some corrective action. The AMs are the corrective actions, and they are management controls to prevent ACLs from being exceeded and to correct for overages of ACLs if they occur. An example of an AM is implementation of an in-season closure if catch is projected to reach the ACL. This framework amendment includes alternatives that would revise the current ACLs for red snapper.

ACL alternatives (Action 1) were developed based on the SSC's recommended ABC. The Council's preferred alternative would set ACL equal to the ABC recommended by the Council's

SSC (**Preferred Alternative 2**) (Table 1.7.1). **Alternative 3** would set ACL equal to 0 fish, which would close all harvest of red snapper for both sectors to further reduce overfishing. The recreational fishing season length is determined each year based on catch rates in the previous years. Based on analyses developed for this amendment (Appendix F), the recreational season length under **Preferred Alternative 2** in each year from initial implementation of Regulatory Amendment 35 through the 2027 fishing year is projected to be 1 day. The Council considered the biological benefit of closing all red snapper harvest under **Alternative 3**, compared to the social and economic benefits of a very short recreational season under **Preferred Alternative 2** (Chapter 4).

Table 1.7.1. Current and proposed (Action 1-**Preferred Alternative 2**) catch limits for South Atlantic red snapper in 2023. Total and recreational catch limits are in numbers of fish (recreational catch estimates are from the Marine Recreational Information Program-Fishing Effort Survey and the Florida State Reef Fish Survey), and the commercial ACL is in pounds whole weight.

Catch Limit Type	Current Limit	Proposed in Regulatory Amendment 35 for 2023
Overfishing Limit	56,000 fish	28,000 fish
Acceptable Biological Catch	53,000 fish	28,000 fish
Total Annual Catch Limit	42,510 fish	28,000 fish
Annual Optimum Yield	N/A	28,000 fish
Commercial Annual Catch Limit	124,815 lbs ww	77,016 lbs ww
Recreational Annual Catch Limit	29,656 fish	19,119 fish

1.8. What is the Management and Stock Assessment History for Red Snapper?

The snapper grouper fishery is highly regulated and regulations have been in place for red snapper since the initial development of the Snapper Grouper FMP in 1983. More information of management for all species in the snapper grouper fishery management unit may be found at <https://safmc.net/fishery-management-plans/snapper-grouper/>. Stock assessment information can be found at www.Sedarweb.org and Section 3.2.1. Below are amendments to the Snapper Grouper FMP and stock assessments addressing red snapper within the South Atlantic EEZ, and emergency and interim rules issued for the species.

Snapper Grouper FMP (SAFMC 1983)

The Snapper Grouper FMP included provisions to prevent growth overfishing in thirteen species in the snapper grouper complex and established a procedure for preventing overfishing in other species; established minimum size limits for red snapper, yellowtail snapper, red grouper, Nassau grouper, and black sea bass; established a 4-inch trawl mesh size to achieve a 12-inch total length (TL) minimum size limit for vermilion snapper; and included additional harvest and gear limitations.

Amendment 4 (SAFMC 1991)

Amendment 4 to the Snapper Grouper FMP prohibited the use of various gear, including fish traps, the use of bottom longlines for wreckfish, and powerheads in special management zones

off South Carolina; established bag limits and minimum size limits for several species (two fish bag limit for red snapper and 20-inch TL minimum size limit) required permits (commercial and for-hire) and specified data collection regulations; and required that all snapper grouper species possessed in the South Atlantic EEZ must have heads and fins intact through landing.

Amendment 11 (SAFMC 1998)

Amendment 11 amended the Snapper Grouper FMP to make definitions of MSY, OY, overfishing, and overfished consistent with National Standard Guidelines. Amendment 11 also identified and defined fishing communities, addressed bycatch management measures, and defined the red snapper F_{MSY} proxy as $F_{30\%SPR}$.

SEDAR 15 (2008, Revised 2009)

The red snapper stock in the South Atlantic was first assessed through the SEDAR process in 2008 and revised in 2009. SEDAR 15 determined the stock to be overfished and undergoing overfishing. In response to SEDAR 15, the Council implemented a moratorium on the harvest of red snapper through Amendment 17A and requested an interim rule to reduce overfishing.

Interim Rule for Red Snapper (NMFS 2009)

The Council received notification from NMFS in a letter dated July 8, 2008, that the South Atlantic red snapper stock was undergoing overfishing and was overfished. In March 2009, the Council requested that the NMFS establish interim measures to reduce overfishing and fishing pressure on the red snapper stock. Interim measures to establish a closure of the commercial and recreational sectors for red snapper in the South Atlantic as requested by the Council became effective on January 4, 2010 (74 FR 63673, 12/04/2009). The interim rule was effective until June 2, 2010, but was extended for an additional 186 days since the Council was developing long-term management measures in Amendment 17A to the Snapper Grouper FMP to end overfishing of red snapper and rebuild the stock (74 FR 27658, 5/18/2010).

Amendment 17A (SAFMC 2010)

Actions in Amendment 17A (SAFMC 2010) specified a 35-year rebuilding schedule with the rebuilding time period ending in 2044, and included a harvest prohibition for red snapper by setting an ACL of zero, and an area closure for all snapper grouper species. The area closure was 4,827 square miles and extended from southern Georgia to northern Florida where harvest and possession of all snapper grouper species would be prohibited (except when fishing with black sea bass pots or spearfishing gear for species other than red snapper). The red snapper prohibition was effective on January 3, 2011; however, NMFS delayed the effective date of the area closure until June 1, 2011, via an emergency rule, to allow time to review the results of a new red snapper stock assessment (SEDAR 24 2010). Amendment 17A also required the use of non-stainless steel circle hooks when fishing for snapper grouper species with hook-and-line gear and natural baits in the South Atlantic EEZ north of 28 degrees North latitude and specified a fishery-independent monitoring program for red snapper.

SEDAR 24 (2010)

Another stock assessment (SEDAR 24) was conducted in 2010, which found the stock to be overfished and undergoing overfishing; however, the rate of overfishing found in SEDAR 24 was less than the rate of overfishing found in the previous stock assessment. Based on the results from SEDAR 24, evidence of decreased effort in the recreational sector, and recommendations

from the SSC, the Council determined that the snapper grouper area closure approved in Amendment 17A, in addition to the harvest prohibition, was more conservative than what was necessary to end overfishing of red snapper.

Comprehensive ACL Amendment (Amendment 25) (SAFMC 2011a)

The Comprehensive ACL Amendment established annual catch limits and sector allocations for many snapper grouper species, including red snapper, using an allocation formula based on historic and recent average landings. The commercial allocation for red snapper was set at 28.07% and the recreational allocation was set at 71.93%.

Regulatory Amendment 10 (SAFMC 2011c)

The action in Regulatory Amendment 10 eliminated the snapper grouper area closure to reduce discard mortality of red snapper that was approved in Amendment 17A. Regulatory Amendment 10 was implemented and became effective on May 31, 2011.

Emergency Rule for Red Snapper (NMFS 2012)

At its June 2012 meeting, the Council received new information regarding discard estimates for red snapper. Using these data, the Council and NMFS determined that a limited season for red snapper would be possible in 2012. Therefore, the Council voted, and NMFS implemented, emergency rulemaking to allow for the limited harvest and possession of red snapper in or from the South Atlantic EEZ in 2012. The rule established red snapper seasons and ACLs for the commercial and recreational sectors in the South Atlantic EEZ in 2012 (77 FR 51939, 8/28/2012). The temporary rule was effective August 28, 2012, through December 31, 2012. The recreational red snapper season opened on September 14, 2012, and closed on September 17, 2012; then reopened on September 21, 2012, and closed on September 24, 2012. The commercial red snapper season opened on September 17, 2012, and closed on September 24, 2012.

Amendment 28 (SAFMC 2013a)

The amendment set the commercial and recreational ACLs and seasons to allow limited harvest of red snapper in 2013. In addition, the amendment established a process to determine whether limited commercial and recreational fishing seasons in the South Atlantic EEZ could occur during a given fishing year if total removals (landings plus dead discards) were less than the ABC in the previous fishing year. Additionally, the Council decided that if limited fishing seasons can occur, the commercial fishing season should begin on the second Monday in July, and the recreational fishing season, which would consist of weekends only (Fridays, Saturdays, and Sundays) would begin on the second Friday in July. The Council also decided that if the projected commercial or recreational fishing season is determined by NMFS to be 3 days or less, then the commercial or recreational fishing season would not open for that fishing year.

Note: Using the process established through Amendment 28, limited harvest of red snapper was allowed in 2013 and 2014. However, because the estimated total removals of red snapper exceeded the ABC in 2014 and 2015 (due to estimates of red snapper discards that were incidentally harvested as bycatch while targeting other species), there was no allowable harvest in 2015 and 2016.

Regulatory Amendment 21 (SAFMC 2014)

The amendment changed the MSST definition for eight snapper grouper species including red snapper from $MSST = [(1-M) \text{ or } 0.5 \text{ whichever is greater}] * SSB_{MSY}$ to $0.75 * SSB_{MSY}$.

SEDAR 41 (2017)

The South Atlantic red snapper stock was assessed again through SEDAR 41 (2017) and found to still be overfished and undergoing overfishing.

Emergency Rule (NMFS 2017)

NMFS allowed limited commercial and recreational harvest of red snapper in 2017 by a temporary rule through emergency action pursuant to the Magnuson-Stevens Act as a result of new scientific information regarding improvements in the red snapper stock. The rule changed the process used to set the ACL, and also announced the opening and closing dates of the 2017 recreational fishing season and the opening date for the 2017 commercial fishing season for red snapper. The emergency rule was effective November 2, 2017, through December 31, 2017. The recreational red snapper season opened on November 3, 2017, and closed on November 6, 2017; then reopened on November 10, 2017, and closed on November 13, 2017; the commercial red snapper season opened November 2, 2017 (82 FR 50839, 11/2/2017).

Amendment 43 (SAFMC 2017c)

In Amendment 43, the Council determined that a limited harvest of red snapper would be allowed by implementing a total ACL of 42,510 fish, based on the landings observed during the limited red snapper season in 2014. That ACL was less than the Council's SSC total ABC recommendation of 53,000 red snapper. Under the total ACL specified in Amendment 43, and based upon the Council's sector allocation (28.07% commercial and 71.93% recreational), the commercial ACL equals 124,815 lbs ww and the recreational ACL equals 29,656 fish. Under Amendment 43 and the final rule, the length of the recreational fishing season serves as the AM for the recreational sector. The length of the recreational red snapper season is projected based on catch rate estimates from previous years, and the projected fishing season end-date would be announced each year in the *Federal Register* before the start of the season. Additionally, the amendment provided notice of the red snapper commercial season opening date and the opening and closing dates for the recreational season in the South Atlantic for the 2018 fishing year.

Regulatory Amendment 33 (SAFMC 2020c)

The framework amendment removed the requirement that if projections indicate the South Atlantic red snapper season (commercial or recreational) would be three days or fewer, the commercial and/or recreational seasons would not open for that fishing year. As the requirement was removed, red snapper harvest could be open for either recreational or commercial harvest for fewer than four days.

Chapter 2. Proposed Actions

2.1. Action 1. Reduce the Acceptable Biological Catch, Total Annual Catch Limit, and Sector Annual Catch Limits, and Establish an Annual Optimum Yield for South Atlantic Red Snapper

2.1.1. Alternatives

Alternative 1 (No Action). The current acceptable biological catch for South Atlantic red snapper is 53,000 fish. The total annual catch limit is 42,510 fish. The commercial sector annual catch limit is 124,815 pounds whole weight. The recreational sector annual catch limit is 29,656 fish. No annual optimum yield is currently specified. Red snapper may only be harvested or possessed in or from the South Atlantic exclusive economic zone during the commercial and recreational fishing seasons.

Preferred Alternative 2. Reduce the red snapper acceptable biological catch and set it equal to the most recent recommendation from the Scientific and Statistical Committee. Reduce the total annual catch limit and establish an annual optimum yield for red snapper and set them **equal to** the recommended acceptable biological catch. Reduce the sector annual catch limits according to the revised total annual catch limit, current allocation method, and average weight estimates from the most recent stock assessment. Red snapper may only be harvested or possessed in or from the South Atlantic exclusive economic zone during the commercial and recreational fishing seasons. The 2027 total annual catch limit and annual optimum yield would remain in place until modified.

Fishing Year	ABC (numbers of fish)	Annual OY=Total ACL (numbers of fish)	Commercial ACL (lbs ww)	Recreational ACL (numbers of fish)
2023	28,000	28,000	77,016	19,119
2024	31,000	31,000	85,268	21,167
2025	33,000	33,000	90,769	22,533
2026	35,000	35,000	96,270	23,899
2027+	36,000	36,000	99,021	24,581

Alternative 3. Reduce the red snapper acceptable biological catch and set it equal to the most recent recommendation from the Scientific and Statistical Committee. Reduce the total annual catch limit, sector annual catch limits, and establish an annual optimum yield for red snapper and set them equal to **0 fish**. Red snapper may not be harvested or possessed in or from the South Atlantic exclusive economic zone. These restrictions also apply in the South Atlantic on board a vessel for which a valid federal commercial or charter vessel/headboat permit for South Atlantic snapper grouper has been issued, regardless of where the fish has been harvested. The 2027 total annual catch limit and annual optimum yield would remain in place until modified.

Fishing Year	ABC (numbers of fish)	Annual OY=Total ACL (numbers of fish)	Commercial ACL (lbs ww)	Recreational ACL (numbers of fish)
2023	28,000	0	0	0
2024	31,000	0	0	0
2025	33,000	0	0	0
2026	35,000	0	0	0
2027+	36,000	0	0	0

Discussion

The current total annual catch limit (ACL) and sector ACLs for red snapper were specified in Amendment 43 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (Amendment 43; SAFMC 2017c). In accordance with the South Atlantic Fishery Management Council's (Council) Allocation Trigger Policy (Appendix I), the Council discussed sector allocations for red snapper at their June 2022 meeting. The Council decided not to consider changes to sector allocations in Regulatory Amendment 35 to the Snapper Grouper FMP, because unlike many other species, the primary recreational data source used in SEDAR 73 was the Florida State Reef Fish Survey, and that survey was not changed by the Marine Recreational Information Program's transition from the Coastal Household Telephone Survey to the mail-based Fishing Effort Survey in 2018. The commercial allocation is 28.07% of the total ACL, and the recreational allocation is 71.93% of the total ACL. The Council determined that this existing allocation remains fair and equitable, is reasonably calculated to promote conservation, and does not allow any entity to acquire an excessive share of fishing privileges. In addition, since the Council intends to consider more holistic management changes to the snapper grouper fishery in a future amendment, the Council may review sector allocations at that time if the Council decides it is necessary.

Under **Alternative 1 (No Action)**, the total ACL would remain 42,510 fish, and be based on the landings observed during the limited red snapper season in 2014, as implemented through Amendment 43. Of that total ACL, the commercial ACL is 124,815 pounds whole weight (lbs ww) and the recreational ACL is 29,656 fish. Based on the recommendations from the Council's Scientific and Statistical Committee (SSC), to calculate the commercial ACL, the total ACL in numbers of fish was converted to weight using the projected average weight of fish caught by both sectors in 2018 (10.46 lbs ww) from SEDAR 41 (2017). As further recommended by the SSC, to calculate the recreational ACL, the commercial ACL in lbs ww was converted to numbers of fish using the average weight of commercially caught red snapper from 2012 to 2014 (9.71 lbs ww) (SEDAR 41, 2017). The recreational ACL is the difference between the total ACL in numbers of fish and the commercial ACL in numbers of fish. In addition, this method was determined to be necessary to ensure that rounding did not result in the sum of the sector ACLs (numbers of fish) exceeding the total ACL (numbers of fish).

The same method as in Amendment 43 was used to determine sector ACLs from the total ACLs considered in Action 1, except the total average weight and commercial average weight were updated to be based on the SEDAR 73 (2021) stock assessment. The updated *total* average weight, calculated as the average of estimated annual average weights of fish landed from 2017-

2019, is 9.80 lbs ww. The updated *commercial* average weight, calculated as the average of estimated annual average weights of fish commercially landed from 2017-2019, is 8.67 lbs ww. These average weights were applied as described above to determine the sector ACLs associated with **Preferred Alternative 2**. Tables 2.1.1.1 and 2.1.1.2 estimate the total number of days the recreational and commercial seasons, respectively, would be open for the various sector ACLs.

Table 2.1.1.1. Estimated number of days the recreational season would be open for the various recreational ACLs. For **Preferred Alternative 2**, the greatest and least proposed recreational ACLs are shown, with the years in between having ACLs and season lengths between these high and low values. The number of days was generated by dividing the recreational ACL by the average catch rate during 2019-2021* (17,031 fish per day).

Alternative	Fishing Year	Recreational ACL (Numbers of Fish)	Total Number of Open Days
Alternative 1	-	29,656	2
Preferred Alternative 2 Low	2023	19,119	1
Preferred Alternative 2 High	2027+	24,581	1
Alternative 3	2023+	0	0

*Note: Landings data for 2022 were considered preliminary at the time this analysis was completed and were not used in the recreational or commercial analyses (Appendix F).

Table 2.1.1.2. Estimated closure dates for the various commercial ACLs. The closure dates were determined from assuming the commercial sector opens on July 10.

Alternative	Fishing year	Commercial ACL (lbs ww)	Estimated Closure Date	Estimated Total Number of Open Days
Alternative 1	-	124,815	11-Sep	63
Preferred Alternative 2 Low	2023	77,016	16-Aug	37
Preferred Alternative 2 High	2027+	99,021	27-Aug	48
Alternative 3	2023-2027	0	0	0

2.1.2. Comparison of Alternatives

Overall, **Alternative 1 (No Action)** is not a viable alternative because it would not be based on the best scientific information available (BSIA) and would exceed the most recent ABC (acceptable biological catch) recommended by the Council's SSC. **Preferred Alternative 2** would allow the greatest amount of harvest compared to **Alternative 3**, and result in the least biological benefit to the red snapper stock as there would be no buffer between the annual ABCs and the total ACLs. When compared to **Alternative 1 (No Action)**, decreasing the total and sector ACLs under **Preferred Alternative 2** and **Alternative 3**-would allow for less overall fishing mortality. Effects of a projected 1-day red snapper season (**Preferred Alternative 2**) on discards of red snapper and overall fishing mortality are unclear, due to likely increased effort that would occur even during short openings for this stock. Notably, this increased effort due to targeting of red snapper during the open season would be a short-term increase (days) that would not necessarily translate to substantial impact on an annual scale. **Alternative 3** could result in

the least fishing mortality and greatest effect of reducing overfishing, because no landings would occur for either sector and the increased effort that typically occurs during the red snapper open season would be expected to be reduced to the normal snapper grouper fishing effort that occurs in July. **Preferred Alternative 2** and **Alternative 3** are both within the SSC's recommended ABC and overfishing limit (OFL) levels and would support the current rebuilding plan. However, the SSC's OFL and ABC recommendations assume a commensurate reduction in dead discards to end overfishing. Due to the high proportion of red snapper removals being dead discards, reductions in landings alone, even zero allowable landings, would not end overfishing.

Since the recent open seasons for both sectors have been relatively short and the commercial sector has a small trip limit of 75 lbs gutted weight, red snapper are not estimated to be a highly targeted species. As a predominately bycatch or catch-and-release fishery already, the considered changes to ACLs under Action 1 are not expected to result in substantial changes in fishing effort or a reduction in discards (noting the small scale of the differences between projected seasons under **Preferred Alternative 2** and **Alternative 3**).

Overall, there are few data to quantify or predict the net biological effects from landings and discards from Action 1. **Preferred Alternative 2** could result in a decrease or an increase in discards and overall fishing-related mortality. **Alternative 3** could reduce the number of recreational open season days that are typically associated with higher effort and discards, which could result in reduced effort and bycatch.

In general, ACLs that allow for fewer fish to be landed can result in decreased net economic benefits if harvest decreases. The revised ACLs being considered in **Preferred Alternative 2** and **Alternative 3** would be constraining on harvest and are projected to reduce landings of red snapper for both the commercial and recreational sectors. As such, a reduction in direct net economic benefits would be expected from each of these alternatives. **Alternative 1 (No Action)** provides the highest ACL and thus the highest potential economic benefits but this alternative is not viable since it is not BSIA resulting from the most recent catch level recommendation from the SSC.

Preferred Alternative 2 would reduce the ACL, and **Alternative 3** would set the ACL for red snapper equal to zero, closing red snapper to commercial and recreational harvest until modified. The reduction or absence of a fishing season for red snapper in past years was highly controversial with negative effects on private recreational fishermen, for-hire businesses, and commercial vessels, especially when compared to the benefits to fishermen during the allowed open seasons. An additional concern with the short seasons likely under **Preferred Alternative 2** is safety at sea. Stakeholders have expressed frustration with crowded boat ramps and reefs during the limited recreational red snapper season, making conditions potentially hazardous for boaters. Additionally, the limited season may result in anglers choosing to fish in dangerous conditions. In general, a higher ACL would lengthen the fishing season and result in the lowest level of negative effects. Among the action alternatives, based on these observed responses to past management decision, **Preferred Alternative 2** would be the most beneficial for fishermen, followed by **Alternative 3**.

Compared to **Alternative 1 (No Action)**, none of the Action 1 alternatives under consideration to modify the ABC and total ACLs would result in significant impacts on the administrative

environment. Reducing the total ACL and sector ACLs for red snapper under **Preferred Alternative 2** and **Alternative 3** would not have substantial effects on the administrative environment, outside of the requisite public notices to announce the season, in-season closures, and potential re-openings.

2.2. Action 2. Prohibit the Use of More Than One Hook Per Line for the Snapper Grouper Recreational Sector

2.2.1. Alternatives

Alternative 1 (No Action). The recreational sector is required to use non-offset, non-stainless steel circle hooks when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits north of 28° N latitude. The recreational sector is required to use non-stainless steel hooks when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits south of 28° N latitude.

Preferred Alternative 2. The recreational sector is required to use one non-offset, non-stainless steel circle hook per line when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits north of 28° N latitude, and no more than one hook per line may be used. The recreational sector is required to use one non-stainless steel hook per line when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits south of 28° N latitude, and no more than one hook per line may be used.

Discussion

Action 2 addresses two main objectives: 1) reduce recreational dead discards in the snapper grouper fishery, and 2) contribute to ending overfishing of red snapper. The South Atlantic snapper grouper fishery contains species that can be caught together when fishing in a single location and time. Therefore, to reduce interactions with red snapper, effort must also be reduced for the other species that are caught in the same area and time. Due to the co-occurrence of snapper grouper species in South Atlantic reef and bottom habitats, reducing the number of hooks per line is expected to reduce the effective effort applied to snapper grouper species.

Preferred Alternative 2 is expected to reduce the number of fish caught per line drop and overall by reducing effort. Fewer fish caught is expected to result in fewer discards and reduced discard mortality due to reduced catches of species, including red snapper.

Reducing the number of dead discards and overall fishing mortality in the snapper grouper fishery would contribute to ending overfishing of South Atlantic red snapper as the primary source of fishing mortality for red snapper is discard mortality from the recreational sector.

During development of Action 2, the Council discussed whether a restriction on the number of hooks per line should apply to both the commercial and recreational sectors. The Council recognized that a large majority of red snapper dead discards occur in the recreational sector (approximately 99%; SEDAR 73 2021). Therefore, including the commercial sector in a restriction on the number of hooks per line would likely result in strong negative economic effects on commercial hook-and-line fishing for snapper grouper species that can be retained, while only providing a relatively small biological benefit by reducing commercial dead discards. Thus, the Council decided that commercial regulations for hook-and-line gear and natural baits would not change under **Preferred Alternative 2**. Additionally, the use of multiple hooks per line while fishing for species that are not included in the Snapper Grouper FMP would not be affected by Action 2. Specifically, the use of rigs with multiple hooks (e.g., sabiki rigs) while

fishing for bait species that are not included in the Snapper Grouper FMP would not be affected by this action.

Different levels of impact are expected among snapper grouper stocks based on differences in species' spatial distributions, depth distributions, rates of recreational releasing (when a fish is caught, how often is it released rather than retained), and discard mortality rates. The Council considered additional alternatives that would implement this measure in specific areas of the region based on latitude, depth, and species distribution. However, recreational discards are responsible for fishing mortality of many snapper grouper species throughout the South Atlantic region and regulatory differences among areas would be confusing. Thus, the Council decided that, if implemented, this regulation should be applied to the entire snapper grouper fishery throughout the South Atlantic region.

Some data comparing catch rates between single hook and double hook rigs have been collected by Florida Fish and Wildlife Commission's Fish and Wildlife Research Institute in the Gulf of Mexico. These data are being supplemented with South Atlantic data being collected by Council staff to develop a more comprehensive analysis that describes differences in catch rates based on gear configurations such as number of hooks, size of hooks, type of rig, angler experience, etc. The Council's SSC reviewed preliminary results of these studies at their October 2022 meeting. A description of preliminary results is provided in Section 4.2.1, but the information available currently indicates potentially lower catch rates for some snapper grouper species, including red snapper, from requiring single hook rigs.

2.2.2. Comparison of Alternatives

Generally, biological benefits are expected to be greater in the short-term for areas and components of the recreational sector that frequently use multi-hook rigs currently and would be required to transition to single hook rigs. Information on current recreational gear usage by area is limited, although information for some areas was provided by the Snapper Grouper Advisory Panel (see Section 5.2.1). Lower than current catch rates would be expected to provide biological benefits by reducing overall catch of snapper grouper species, which would reduce harvest and release mortality, provided that anglers do not make behavioral adjustments that maintain the overall removals (landings plus dead discards). By reducing overall catch of snapper grouper species (including red snapper), this action is expected to contribute to ending overfishing of red snapper by lowering the fishing mortality affecting the stock. Overall, compared to **Alternative 1 (No Action)**, **Preferred Alternative 2** would be expected to provide the greatest overall biological benefits to snapper grouper stocks, with varying levels of benefits (although these cannot be quantified at this time) for individual stocks and in specific areas of the region due to overall reduced catch rates for snapper grouper species throughout the region.

Prohibiting the use of more than one hook on a rig to fish recreationally for snapper grouper species when using natural bait is expected to result in reduced landings in the short-term and thus reduced short-term net economic benefits that would have occurred from these landings. **Preferred Alternative 2** would be restrictive on recreational landings in comparison to **Alternative 1 (No Action)**. Under **Preferred Alternative 2**, recreational landings of many snapper grouper species would likely decrease in the short-term along with the associated net economic benefits derived from these landings. Due to data limitations on the overall use of

single hooks versus multiple hooks when fishing recreationally for snapper grouper species with natural bait, the total change in harvest from **Preferred Alternative 2** cannot be quantified along with the short-term change in net economic benefits.

The decision to fish with single versus multiple hooks would likely depend on a variety of factors including historical and familiar fishing techniques, location of the fishing activity and desired species. As a result, ranking of the alternatives under Action 2 is difficult and likely specific to individual anglers and their preferred fishing practices.

Preferred Alternative 2 would result in an increased administrative burden since it would require extensive coordination between the National Marine Fisheries Service Southeast Regional Office Sustainable Fisheries Division, the Office of Law Enforcement, and the public. Several forms of educational and outreach materials would need to be made available to fishery participants, which would create a relatively short-term impact on the administrative environment.

Chapter 3. Affected Environment

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

- **Habitat Environment** (Section 3.1)
- **Biological and Ecological Environment** (Section 3.2)
- **Economic Environment** (Sections 3.3)
- **Social Environment** (Section 3.4)
- **Administrative Environment** (Section 3.5)

3.1. Habitat Environment

Information on the habitat utilized by species in the snapper grouper fishery management unit (Snapper Grouper FMU) and managed through the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) is included in Volume II of the Fishery Ecosystem Plan (FEP; SAFMC 2009b) and incorporated here by reference. South Atlantic Fishery Management Council (Council) designated essential fish habitat (EFH) and EFH-Habitat Areas of Particular Concern (EFH-HAPC) are presented in the [SAFMC User Guide](#). Web Services and spatial representations of EFH and other habitat related layers are accessible through the [Habitat page](#) of the Council's website.

3.1.1. Inshore/Estuarine Habitat

Many snapper grouper species utilize both pelagic and benthic habitats during several stages of their life histories; larval stages of these species live in the water column and feed on plankton. Most juveniles and adults are demersal (bottom dwellers) and associate with hard structures on the continental shelf that have moderate to high relief (e.g., coral reef systems and artificial reef structures, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings). Juvenile stages of some snapper grouper species also utilize inshore seagrass beds, mangrove estuaries, lagoons, oyster reefs, and embayment systems. In many species, various combinations of these habitats may be utilized during daytime feeding migrations or seasonal shifts in cross-shelf distributions. The life history of red snapper is summarized in Section 3.2.1.

3.1.2. Offshore Habitat

Predominant snapper grouper offshore fishing areas are located in live bottom and shelf-edge habitats where water temperatures range from 11° to 27° C (52° to 81° F) due to the proximity of

the Gulf Stream, with lower shelf habitat temperatures varying from 11° to 14° C (52° to 57° F). Water depths range from 16 to 55 meters (54 to 180 ft) or greater for live-bottom habitats, 55 to 110 meters (180 to 360 ft) for the shelf-edge habitat, and from 110 to 183 meters (360 to 600 ft) for lower-shelf habitat areas.

The exact extent and distribution of productive snapper grouper habitat in South Atlantic continental shelf habitats is unknown. Current data suggest from 3% to 30% of the shelf is suitable habitat for these species. These live-bottom habitats may include low relief areas, supporting sparse to moderate growth of sessile (permanently attached) invertebrates, moderate relief reefs from 0.5 to 2 meters (1.6 to 6.6 ft), or high relief ridges at or near the shelf break consisting of outcrops of rock that are heavily encrusted with sessile invertebrates such as sponges and sea fan species. Live-bottom habitat is scattered irregularly over most of the shelf north of Cape Canaveral but is most abundant offshore from northeastern Florida. South of Cape Canaveral the continental shelf narrows from 56 to 16 kilometers (35 to 10 mi) wide off the southeast coast of Florida and the Florida Keys. The lack of a large shelf area, presence of extensive, rugged living fossil coral reefs, and dominance of a tropical Caribbean fauna are distinctive benthic characteristics of this area.

Rock outcroppings occur throughout the continental shelf from Cape Hatteras, North Carolina to Key West, Florida (MacIntyre and Milliman 1970; Miller and Richards 1979; Parker et al. 1983), which are principally composed of limestone and carbonate sandstone (Newton et al. 1971), and exhibit vertical relief ranging from less than 0.5 to over 10 meters (33 ft). Ledge systems formed by rock outcrops and piles of irregularly sized boulders are also common. Parker et al. (1983) estimated that 24% (9,443 km²) of the area between the 27 and 101 meters (89 and 331 ft) depth contours from Cape Hatteras, North Carolina to Cape Canaveral, Florida is reef habitat. Although the bottom communities found in water depths between 100 and 300 meters (328 and 984 ft) from Cape Hatteras, North Carolina to Key West, Florida is relatively small compared to the whole shelf, this area, based upon landing information of fishers, constitutes prime reef fish habitat and probably significantly contributes to the total amount of reef habitat in this region.

Artificial reef structures are also utilized to attract fish and increase fish harvests; however, research on artificial reefs is limited and opinions differ as to whether or not these structures promote an increase of ecological biomass or merely concentrate fishes by attracting them from nearby, natural un-vegetated areas of little or no relief. There are several notable shipwrecks along the southeast coast in state and federal waters including *Lofthus* (eastern Florida), *SS Copenhagen* (southeast Florida), *Half Moon* (southeast Florida), *Hebe* (Myrtle Beach, South Carolina), *Georgiana* (Charleston, South Carolina), *U.S.S. Monitor* (Cape Hatteras, North Carolina), *Huron* (Nags Head, North Carolina), and *Metropolis* (Corolla, North Carolina).

The distribution of coral and live hard bottom habitat as presented in the Southeast Marine Assessment and Prediction Program (SEAMAP) bottom mapping project is a proxy for the distribution of the species within the snapper grouper complex. Maps are available on the South Atlantic Council's Habitat and Ecosystem Atlas.¹

¹ http://ocean.floridamarine.org/safmc_atlas/

Plots of the spatial distribution of offshore species were generated from the Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP) data. The plots serve as point confirmation of the presence of each species within the scope of the sampling program. These plots, in combination with the hard bottom habitat distributions previously mentioned, can be employed as proxies for offshore snapper grouper complex distributions in the South Atlantic region. Maps of the distribution of snapper grouper species by gear type based on MARMAP data can also be generated through the Council's Internet Mapping System (see the Council's [Habitat webpage](#)).

3.1.3. 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)). Under the Magnuson-Stevens Act, FMPs are required to describe and identify EFH and to minimize the adverse effects of fishing on such habitat to the extent practicable. Specific categories of EFH identified in the South Atlantic Bight, which are utilized by federally managed fish and invertebrate species, include both estuarine/inshore and marine/offshore areas. Specifically, estuarine/inshore EFH includes: estuarine emergent and mangrove wetlands, submerged aquatic vegetation, oyster reefs and shell banks, intertidal flats, palustrine emergent and forested systems, aquatic beds, and estuarine water column. Additionally, marine/offshore EFH includes: live/hard bottom habitats, coral and coral reefs, artificial and manmade reefs, *Sargassum* species, and marine water column.

EFH utilized by snapper grouper species in this region includes coral reefs, live/hard bottom, submerged aquatic vegetation, artificial reefs, and medium to high profile outcroppings on and around the shelf break zone from shore to at least 183 meters [600 ft (but to at least 2,000 ft for wreckfish)] where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical fish complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for survival of larvae and growth up to and including settlement. In addition, the Gulf Stream is also EFH because it provides a mechanism to disperse snapper grouper larvae.

For specific life stages of estuarine-dependent and near shore snapper grouper species, EFH includes areas inshore of the 30 meter (100-ft) contour, such as attached macroalgae; submerged rooted vascular plants (seagrasses); estuarine emergent vegetated wetlands (saltmarshes, brackish marsh); tidal creeks; estuarine scrub/shrub (mangrove fringe); oyster reefs and shell banks; unconsolidated bottom (soft sediments); artificial reefs; and coral reefs and live/hard bottom habitats.

3.1.4. Habitat Areas of Particular Concern

An EFH-HAPC designation adds an additional layer to the EFH designation. Under the Snapper Grouper FMP, EFH-HAPCs are designated based upon ecological importance, susceptibility to human-induced environmental degradation, susceptibility to stress from development, or rarity of

habitat type. EFH-HAPC for species in the Snapper Grouper FMU in the Atlantic include medium to high profile offshore hard bottoms where spawning normally occurs; localities of known or likely periodic spawning aggregations; near shore hard bottom areas; The Point, The Ten Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump (South Carolina); mangrove habitat; seagrass habitat; oyster/shell habitat; all coastal inlets; all state-designated nursery habitats of particular importance to snapper grouper (e.g., primary and secondary nursery areas designated in North Carolina); pelagic and benthic *Sargassum*; Hoyt Hills for wreckfish; the Oculina Bank HAPC; all hermatypic coral habitats and reefs; manganese outcroppings on the Blake Plateau; Council-designated artificial reef special management zones; and deep-water marine protected areas. Areas that meet the criteria for EFH-HAPCs include habitats required during each life stage (including egg, larval, post-larval, juvenile, and adult stages).

The Council established the special management zone (SMZ) designation process in 1983 in the Snapper Grouper FMP, and SMZs have been designated in federal waters off North Carolina, South Carolina, Georgia, and Florida since that time. The purpose of the original SMZ designation, and the subsequent specification of SMZs, was to protect snapper grouper populations at the relatively small, permitted artificial reef sites and “create fishing opportunities that would not otherwise exist.” Thus, the SMZ designation process was centered around protecting the relatively small habitats, which are known to attract desirable snapper grouper species.

In Comprehensive Ecosystem-Based Amendment 1 (CE-BA 1; SAFMC 2009a), the Council designated EFH areas and EFH-HAPCs under the Snapper Grouper FMP. In CE-BA 1, the Council also determined that the designated SMZs met the criteria to be EFH-HAPCs for species included in the Snapper Grouper FMP. Since CE-BA 1, the Council has designated additional SMZs in the Snapper Grouper FMP. The SMZ and EFH-HAPC designations serve similar purposes in pursuit of identifying and protecting valuable and unique habitat for the benefit of fish populations, which are important to both fish and fishers. Therefore, the Council has determined that a designated SMZ meets the criteria for an EFH-HAPC designation, and the Council intends that all SMZs designated under the Snapper Grouper FMP are also designated as EFH-HAPCs under the Snapper Grouper FMP.

The potential impacts the actions in this amendment may have on EFH and EFH-HAPCs are discussed in Chapter 4 of this document.

3.2. Biological and Ecological Environment

The waters off the South Atlantic coast are home to a diverse population of fish. The Snapper Grouper FMU contains 55 species of fish, many of them neither “snappers” nor “groupers.” These species live in depths from a few feet (typically as juveniles) to hundreds of feet. As far as north/south distribution, the more temperate species tend to live in the upper reaches of the South Atlantic management area (e.g., black sea bass, red porgy) while the tropical variety’s core residence is in the waters off south Florida, Caribbean Islands, and northern South America (e.g., black grouper, mutton snapper). These are reef-dwelling species that live amongst each other. These species rely on the reef environment for protection and food. There are several reef tracts that follow the southeastern coast. The fact that these fish populations congregate dictates the

nature of the fishery (multi-species) and further forms the type of management regulations proposed in this document.

3.2.1. Red Snapper, *Lutjanus campechanus*

Life History

The red snapper is found from North Carolina to the Florida Keys and throughout the Gulf of Mexico to the Yucatan Peninsula (Robins and Ray 1986), in depths from 10 to 190 m (33-623 ft). Adults usually occur over rocky bottoms. Juveniles inhabit shallow waters and are common over sandy or muddy bottom habitat (Allen 1985).

Juvenile (Age 0) red snapper are rarely encountered in the U.S. South Atlantic. SEAMAP's fishery-independent trawling survey collected three in 1999, two in 2000, seven in 2013, and four in 2014 in nearshore (<30 ft deep) habitat. A headboat fisherman landed one age-0 red snapper during the 2012 mini-season. One age-0 fish was landed in the commercial sector in 1980. Fishermen have reported observing juvenile red snapper on artificial reefs in shallow water. Estimates of juvenile red snapper mortality have been developed in the Gulf of Mexico; however, little information is available for the U.S.

South Atlantic (Southeast Data, Assessment, and Review (SEDAR) 41 2017).

The maximum size reported for this species is 100 cm (40 in) total length (TL) (Allen 1985; Robins and Ray 1986) and 22.8 kg (50 lbs) (Allen 1985). For samples collected from North Carolina to eastern Florida, maximum reported age is 45 years (White and Palmer 2004). The most recent maximum observed age for red snapper is 51 years. This fish was a 904 mm (36 in) TL female, and was caught in 2003 at 67 meters depth off Florida by a charter boat fisherman (SEDAR 41 2017).

In the U.S. South Atlantic, recent analyses (SEDAR 41 2017) estimate that 50% of female red snapper are mature at 1.3 years old and 325 mm (12.8 in) TL. Fifty percent of male red snapper are mature at 166 mm (6.5 in) TL (SEDAR 41 2017). Grimes (1987) found that the spawning season of this species varies with location, but in most cases occurs nearly year round. Farmer et al. (2017 and references therein) report spawning activity in the South Atlantic occurring from May through October peaking in June through September. According to SEDAR 41 (2017) spawning along the Atlantic coast of the southeastern U.S. generally occurs from April through October and peaks during June through August based on the presence of females with spawning indicators (i.e., the occurrence of hydrated oocytes and/or postovulatory follicles).

Red snapper Life History *An Overview*



- Extend from North Carolina to the Florida Keys, and throughout the Gulf of Mexico to the Yucatan Peninsula
- Waters ranging from 33-623 feet
- Red snapper do not migrate but can move long distances
- The spawning season extends from May to October, peaking in July through September.
- Can live for at least 51 years

Red snapper eat fishes, shrimps, crabs, worms, cephalopods, and some planktonic items (Szedlemayer and Lee 2004).

Stock Status

The SEDAR process is a cooperative Fishery Management Council initiative to improve the quality and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and U.S. Caribbean. The Caribbean, Gulf of Mexico, and South Atlantic Fishery Management Councils manage SEDAR in coordination with the National Marine Fisheries Service (NMFS) and the Atlantic and Gulf States Marine Fisheries Commissions. SEDAR seeks improvements in the scientific quality of stock assessments, constituent and stakeholder participation in assessment development, transparency in the assessment process, and a rigorous and independent scientific review of completed stock assessments.



SEDAR is organized around three workshops. First is the Data Workshop, during which fisheries monitoring and life history data are reviewed and compiled. Second is the Assessment Workshop, which may be conducted via a workshop and several webinars, during which assessment models are developed and population parameters are estimated using the information provided from the Data Workshop. Third and final is the Review Workshop, during which independent experts review the input data, assessment methods, and assessment products. The completed assessment, including the reports of all three workshops and all supporting documentation, are then forwarded to the Council's Scientific and Statistical Committee (SSC). The SSC considers whether the assessment represents the best available science and develops fishing level recommendations for Council consideration.

SEDAR workshops are public meetings organized by SEDAR. Workshop participants appointed by the lead Council are drawn from state and federal agencies, non-government organizations, Council members, Council advisors, and the fishing industry with a goal of including a broad range of disciplines and perspectives. All participants are expected to contribute to this scientific process by preparing working papers, contributing data, providing assessment analyses, evaluating and discussing information presented, and completing the workshop report.

Manooch et al. (1998) conducted the first formal assessment of red snapper in the South Atlantic. The authors concluded that the status of the stock was not ideal but seemed to be responding to management action. Potts and Brennan (2001) revisited the results of that assessment and suggested a broader range of reduction in fishing mortality (F), from 30% to 80%.

South Atlantic Red Snapper Stock Assessments

The red snapper stock in the South Atlantic was assessed through the SEDAR process in 2007-2008, and revised in 2009. That assessment applied a statistical catch-age model using data through 2006 (SEDAR 15 2008, Revised 2009). The assessment found that overfishing had been occurring since the 1960s and the red snapper stock was overfished. Although quantitative results varied, the qualitative results of overfishing a depleted stock were consistent across all catch-age model configurations examined during and after the assessment process (approximately 40 sensitivity runs), as well as with an alternative model formulation (surplus-production model).

In 2010, a benchmark assessment using the Beaufort Assessment Model (BAM) with data through 2009 was completed (SEDAR 24 2010). BAM is a statistical catch-age model developed by the analysts at the Beaufort, North Carolina, NMFS' Southeast Fisheries Science Center (SEFSC) laboratory, and is customizable to the data available. A surplus production model called ASPIC (Prager 1994; Prager 2004) was used as a complement for comparison purposes. Based on the assessment provided from the BAM, the SEDAR Review Panel concluded that the red snapper stock was overfished and overfishing was occurring. Similar to SEDAR 15 (2009), more than 40 sensitivities were run, all of which resulted in the same status determinations.

A benchmark assessment was completed in 2016 (SEDAR 41 2017) with data through 2014. Although the SEDAR Review Panel concluded that the assessment results represented the best scientific information available, the Panel identified several areas of uncertainty including the composition and magnitude of recreational discards, the stock-recruitment relationship, potential changes in Catch Per Unit Effort catchability, and the selectivities for the different fishery fleets. The SSC reviewed the assessment and provided fishing level recommendations at their May 2016 meeting based on $F_{30\%SPR}$ as a proxy for F_{MSY} . The base assessment run suggested that in the terminal year of 2014 the stock remained overfished. The SSC did not have confidence in the terminal fishing mortality estimates; however, they recommended that the assessment results suggested overfishing was likely occurring in the terminal years of the assessment (2012-2014) although the degree to which overfishing was occurring at that time could not be reliably quantified from the assessment results (see May 2016 Final SSC report).

SEDAR 41 (2017) estimated the long-term maximum sustainable yield (MSY) to be about 25% of what it was estimated to be in SEDAR 24 (2010), and projected catch levels from SEDAR 41 at the fishing mortality level predicted to rebuild the stock in the specified timeframe ($F_{Rebuild}$) were approximately 21% of the catch levels projected for 2017 based on SEDAR 24 (2010). Given this, and the various sources of uncertainty in the SEDAR 41 (2017) assessment, the Council sought the SSC's recommendations on additional projection runs and reference point criteria, reliability of Marine Recreational Information Program (MRIP) estimates for red snapper (landings and discards), and the risk associated with using different values of MSY (see Appendix M, Amendment 43 to the Snapper Grouper FMP; SAMFC 2017c). In addition, the Council requested that projections under a discards-only scenario be provided for discussion at their March 2017 meeting. However, the SEFSC indicated (via letter dated February 15, 2017) the projections could not be completed due to the length of time since the completion of the assessment, uncertainty in the landings since most landings were coming from discards, and the change in MRIP methodology for estimating landings and discards. Moreover, the Council received a letter from NMFS (dated March 3, 2017) stating the Council had likely taken sufficient action to address overfishing of red snapper in the South Atlantic and should focus efforts on a methodology to obtain an acceptable biological catch (ABC) for red snapper. SEDAR 41 was updated due to revisions in the headboat index and presented to the SSC in April 2017. Due to the issues laid out by the SEFSC, the Council requested that the SEFSC and the SSC collaborate to explore approaches to arrive at an ABC for red snapper that could be applied to a long-term management approach.

The most recent stock assessment for South Atlantic red snapper, SEDAR 73 (2021) was an operational assessment with data through 2019 and determined the stock to be overfished and undergoing overfishing. However, SEDAR 73 (2021) indicated that the red snapper stock has shown above average recruitment in recent years and substantial progress toward rebuilding. Similar to SEDAR 41 (2017), SEDAR 73 (2021) also indicated that the primary driver of overfishing is recreational discards. The Council's SSC reviewed results of the assessment at their April and July 2021 meetings, and recommended a new overfishing limit and ABC. The Council received notification from NMFS (via letter dated July 23, 2021) of the status of the red snapper stock in the South Atlantic. The SSC's recommendations were presented to the Council at the September 2021 meeting. Following notification that a stock is undergoing overfishing and being overfished, the Magnuson-Stevens Act requires the Council to develop an FMP amendment with actions that end overfishing immediately and rebuild the affected stock. Since a rebuilding plan is already in place and SEDAR 73 (2021) shows progress towards rebuilding is being made, the Council can continue working through its current rebuilding plan but is still required to take action to end overfishing.

Landings, Discards, and Biomass

Visit <https://www.fisheries.noaa.gov/southeast/about-us/south-atlantic-red-snapper> for more details on the commercial and recreational seasons for South Atlantic red snapper since 2017.

Commercial landings and discards

Commercial landings of South Atlantic red snapper are monitored in pounds whole weight (lbs ww) (Table 3.2.1.1). Georgia landings were confidential so they were added to the east Florida landings. During 2015 and 2016, total removals exceeded the ABC, so the annual catch limit (ACL) was set to zero. Since 2017, with 2018 as an exception, the commercial ACL has been met in about two months, resulting in an in-season closure. During 2018 and 2021, the commercial sector was closed in-season as the ACL was predicted to be met, but was reopened later in the season in order to reach the ACL. Since 2016, commercial dead discards have declined as commercial harvest of red snapper was re-opened (Figure 3.2.1.1).

Table 3.2.1.1. Total and state commercial landings (lbs ww) of South Atlantic red snapper from 2017 through 2021 and percentage of the commercial ACL landed each year. Years with in-season closures due to approaching or exceeding the commercial ACL are indicated with the closure date and the total number of days the commercial sector was open.

Year	East FL and GA*	NC	SC	Total landings	ACL	ACL %	In-season closure/reopenings	Number of days open
2017	75,491	9,803	3,980	89,274	124,815	71.5	n/a	60
2018	106,769	11,628	9,756	128,153	124,815	102.7	11/7/2018; reopened 12/5 to 12/15/2018	114
2019	108,513	10,074	7,142	125,729	124,815	100.7	8/30/2019	54
2020	115,880	12,307	6,294	134,480	124,815	107.7	9/5/2020	54
2021	103,696	16,178	8,413	128,287	124,815	102.8	9/14/2021; reopened 11/2 to 11/6/2021	68

Source: SERO Commercial ACL dataset: WH_ACLs_2014-2021_31Aug2022.xlsx.

*Note: Landings data for 2022 were considered preliminary at the time this analysis was completed and were not used in the recreational or commercial analyses (Appendix F).

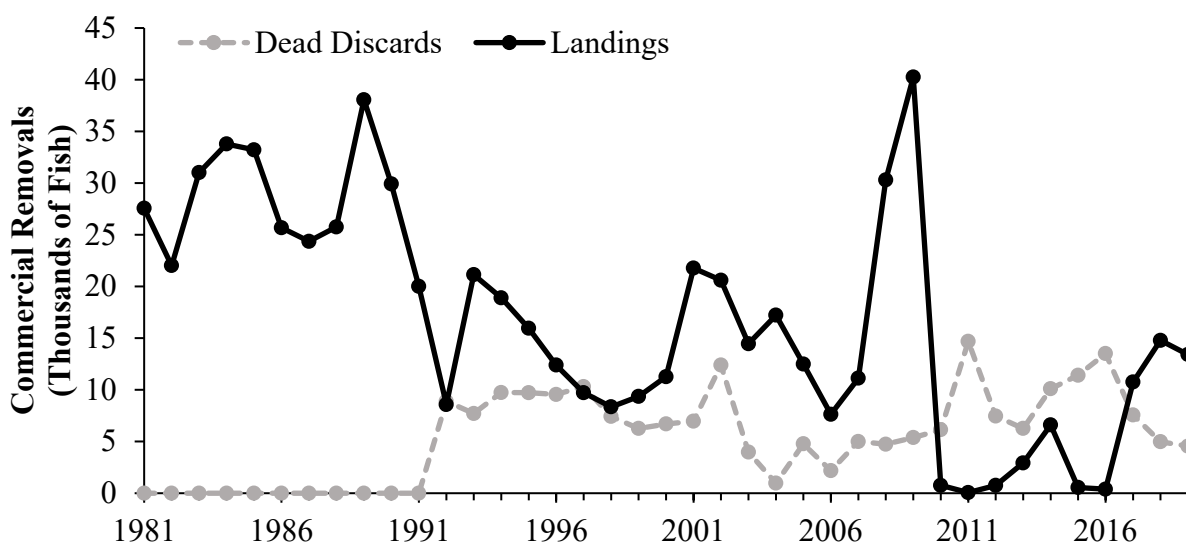


Figure 3.2.1.1. Red snapper commercial landings (black solid) and estimated dead discards (gray dashed) (numbers of fish) from SEDAR 73 (2021) by year from 1981 through 2019.

Recreational landings and discards

Recreational landings of South Atlantic red snapper have been monitored in numbers of fish since 2017 (Table 3.2.1.2). East Florida has landed the majority of red snapper since 2017. The length of the red snapper recreational season has declined from 9 days in 2017, to 6 days in 2018, 5 days in 2019, 4 days in 2020, and 3 days in 2021, as a result of the recreational ACL being projected to be reached sooner each year. Even with the decrease in the number of open days each year, recreational landings of South Atlantic red snapper have exceeded the recreational

ACL since 2018. Figure 3.2.1.2 shows a steep decline in estimated recreational landings since 2010, with a large incline in estimated discards.

Table 3.2.1.2. Total and state recreational landings (numbers of fish) of South Atlantic red snapper from 2017 through 2021 and the total number of days the season was open each year.

Fishing year	Georgia	East Florida	North Carolina	South Carolina	Total landings	Number of Days open
2017	84	13,193	194	1,950	15,421	9
2018	23,087	37,367	472	223	61,149	6
2019	15,564	44,113	150	15,276	75,103	5
2020	14,646	36,363	1,640	23,640	76,289	4
2021	6,807	36,053	7,805	332	50,997	3

Source: MRIP data comes from MRIP_FES_rec81_22wv4_25Oct22w2014to2021LACreel.xlsx

*Note: Landings data for 2022 were considered preliminary at the time this analysis was completed and were not used in the recreational or commercial analyses (Appendix F).

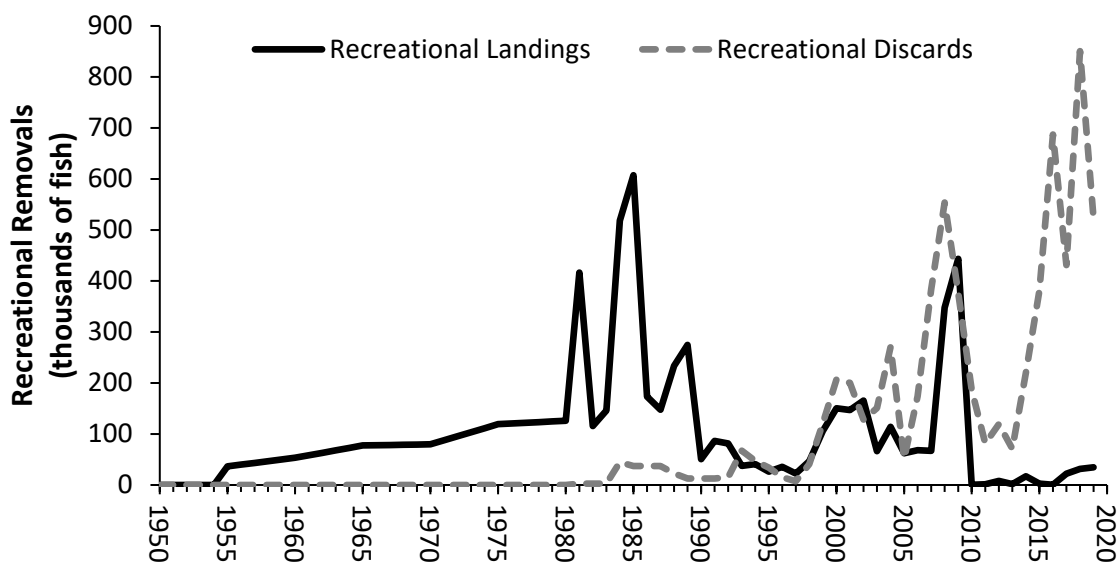


Figure 3.2.1.2. Red snapper recreational landings (black solid) and estimated dead discards (gray dashed) (numbers of fish) from SEDAR 73 (2021) from 1950 through 2019.

Biomass

SEDAR 73 (2021) estimated an evenly distributed initial age structure, with a general decline in biomass until the early-1990s. Since the 1990's until present, there is a relatively stable or increasing pattern of biomass (Figure 3.2.1.3). The terminal year estimates are at levels not seen since around 1980, but with a younger age structure.

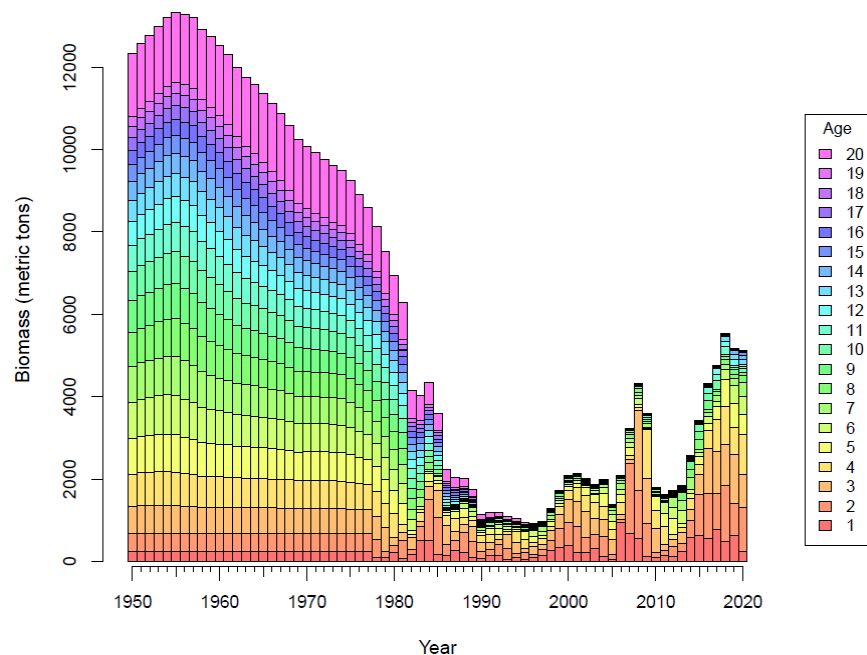


Figure 3.2.1.3. Estimated biomass (metric tons) of South Atlantic red snapper at age at the beginning of each calendar year from 1950-2020 (SEDAR 73 2021).

3.2.2. Bycatch

The implications of bycatch on the red snapper stock and the snapper grouper fishery are discussed in Chapter 4 and Appendix G (Bycatch Practicability Analysis (BPA)). Regulatory Amendment 35 is intended to address overfishing of red snapper and reduce bycatch of snapper grouper species. Both sectors for the snapper grouper fishery likely target a wide range of species other than snapper grouper species during each trip, including dolphin wahoo and coastal migratory pelagic species. This results in a variety of species that may be caught as bycatch on the same South Atlantic fishing trip. Additionally, species caught on the same trip may not have all been caught at a similar time, depth, and location. Thus, catches of multiple species on the same trip may not necessarily indicate co-occurrence of all of those species. The three species most frequently caught on the same commercial trip as red snapper in the South Atlantic region are vermilion snapper, gray triggerfish, and red porgy (Appendix G, Table G.2). The top three species for the recreational sector are black sea bass, vermilion snapper, and gray triggerfish (Appendix G, Table G.11).

3.2.3. Other Species Affected

This amendment indirectly affects other species in the Snapper Grouper FMU that are caught while fishing for red snapper. For summary information on other snapper grouper species that may be affected by the actions in this plan amendment, refer to Appendix G (BPA) and Section 3.2.5 in Vision Blueprint Commercial Regulatory Amendment 27 to the Snapper Grouper FMP (SAFMC 2019c).

3.2.4. Protected Species

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). There are 29 ESA-listed species or distinct population segments (DPS) of marine mammals, sea turtles, fish, and corals managed by NMFS that may occur in federal waters of the South Atlantic or Gulf of Mexico. There are 91 stocks of marine mammals managed within the Southeast region plus the addition of stocks such as North Atlantic right (NARW), humpback, sei, fin, minke, and blue whales that regularly or sometimes occur in Southeast region managed waters for a portion of the year (Hayes et al. 2017). All marine mammals in U.S. waters are protected under the MMPA. The MMPA requires that each commercial fishery be classified by the number of marine mammals they seriously injure or kill. NMFS's List of Fisheries (LOF)² classifies U.S. commercial fisheries into three categories based on the number of incidental mortality or serious injury they cause to marine mammals.

Five of the marine mammal species (sperm, sei, fin, blue, and NARW) protected by the MMPA, are also listed as endangered under the ESA. In addition to those five marine mammals, six species or DPSs of sea turtles [green (the North Atlantic DPS and the South Atlantic DPS), hawksbill, Kemp's ridley, leatherback, and the Northwest Atlantic DPS of loggerhead]; nine species or DPSs of fish (the smalltooth sawfish; five DPSs of Atlantic sturgeon; Nassau grouper; oceanic whitetip shark, and giant manta ray); and seven species of coral (elkhorn coral, staghorn coral, rough cactus coral, pillar coral, lobed star coral, mountainous star coral, and boulder coral) are also protected under the ESA and occur within the action area of the snapper grouper fishery. Portions of designated critical habitat for NARW, the Northwest Atlantic DPS of loggerhead sea turtles, and *Acropora* corals occur within the Council's jurisdiction.

NMFS completed a formal consultation and resulting biological opinion (Bi-Op) on the conservation regulations under the ESA and the authorization of the South Atlantic snapper grouper fishery in federal waters under the Magnuson-Stevens Act, including the fishery managed by the Snapper Grouper FMP, on threatened and endangered species and designated critical habitat dated December 1, 2016. NMFS concluded that the activities addressed in the consultation are not likely to jeopardize the continued existence of any threatened or endangered species, including the North Atlantic right whale, loggerhead sea turtle Northwest Atlantic DPS, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle North Atlantic DPS, green sea turtle South Atlantic DPS, hawksbill sea turtle, smalltooth sawfish U.S. DPS, or Nassau grouper.

Since completing the December 2016 Bi-Op, NMFS published several final rules that listed additional species and designated critical habitat. On January 22, 2018, the giant manta ray (*Manta birostris*) was listed as threatened under the ESA, effective February 21, 2018. On January 30, 2018, the oceanic whitetip shark (*Carcharinus longimanus*) was listed as threatened under the ESA, effective March 1, 2018. Giant manta rays and oceanic whitetip sharks are found in the South Atlantic exclusive economic zone (EEZ) and may be affected by the fishery via incidental capture in snapper grouper fishing gear. NMFS reinitiated formal consultation to address these listings and concluded the authorization of the South Atlantic snapper grouper

² <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries/>

fishery in federal waters during the re-initiation period will not violate ESA Sections 7(a)(2) or 7(d). For summary information on the protected species that may be adversely affected by the snapper grouper fishery and how they are affected refer to Section 3.2.5 in Vision Blueprint Commercial Regulatory Amendment 27 to the Snapper Grouper FMP (SAFMC 2019c).

3.3. Economic Environment

A description of the red snapper stocks affected by the actions considered in this amendment is provided in Section 3.2. Details on red snapper, and the South Atlantic snapper grouper fishery in general, can be found in Amendment 17A (SAFMC 2010), Regulatory Amendment 10 (SAFMC 2011c), the Comprehensive ACL Amendment for the South Atlantic Region (SAFMC 2011a), Amendment 28 (SAFMC 2013a), Amendment 43 (SAFMC 2017c), and Regulatory Amendment 33 (SAFMC 2020c).

3.3.1. Commercial Sector

Permits

Red snapper are one of 55 species managed by the Snapper Grouper FMP. Any fishing vessel that harvests and sells any of the snapper grouper species from the South Atlantic EEZ must have a valid South Atlantic commercial snapper grouper permit, which is a limited access permit. After a permit expires, it can be renewed or transferred up to one year after the date of expiration. As shown in Table 3.3.1.1, the number of permits that were valid at any point in a given year decreased steadily from 2016-2020. There were approximately 6.2% fewer valid permits in 2020, relative to 2016.

Table 3.3.1.1. Number of valid South Atlantic snapper grouper permits, 2016-2020.

Year	Unlimited Permits	225-lb Trip-limited	Total Permits
2016	565	116	681
2017	554	114	668
2018	549	110	659
2019	543	108	651
2020	535	104	639

Source: NMFS Southeast Regional Office (SERO) Sustainable Fisheries (SF) Access permits database. Accessed 10/17/22.

Vessels

The information in Tables 3.3.1.2 and 3.3.1.3 describes the landings and revenue for vessels that harvested South Atlantic red snapper in each year from 2017-2021, as well as their revenue from other species. Vessel participation in the South Atlantic commercial red snapper sector varied over this time period. In 2021 vessel participation increased by 19%, relative to 2017.

Table 3.3.1.2. Number of vessels, trips, and landings (lbs gutted weight [gw]) by year for South Atlantic red snapper.

Year	# of vessels that caught Red Snapper (> 0 lbs gw)	# of trips that caught Red Snapper	Red Snapper landings (lbs gw)	Other species' landings jointly caught w/ Red Snapper	# of SATL trips that only caught other species	Other species' landings on trips w/o Red Snapper	All species landings on Gulf trips (lbs gw)
2017	164	1,154	76,758	267,575	4,535	2,681,772	414,802
2018	201	1,789	111,787	706,877	4,665	2,897,134	309,573
2019	195	1,652	105,378	379,106	4,876	3,031,984	184,234
2020	209	1,723	113,277	410,864	4,825	2,888,757	171,553
2021	195	1,667	106,747	367,442	4,145	2,268,270	151,730
Average	193	1,597	102,789	426,373	4,609	2,753,583	246,378

Source: SEFSC-Social Science Research Group (SSRG) Socioeconomic Panel (Sep. 2022 version)

Table 3.3.1.3. Number of vessels and ex-vessel revenues by year (2021 \$) for South Atlantic red snapper.

Year	# of vessels that caught Red Snapper (> 0 lbs gw)	Dockside revenue from Red Snapper	Dockside revenue from 'other species' jointly caught w/ Red Snapper	Dockside revenue from 'other species' caught on trips w/o Red Snapper	Dockside revenue from 'all species' caught on SATL trips	Total dockside revenue	Average total dockside revenue per vessel
2017	164	\$453,959	\$906,964	\$9,508,423	\$1,177,359	\$12,046,705	\$73,456
2018	201	\$684,305	\$2,657,393	\$9,612,045	\$920,264	\$13,874,007	\$69,025
2019	195	\$662,298	\$1,502,900	\$9,958,564	\$576,732	\$12,700,494	\$65,131
2020	209	\$677,875	\$1,558,664	\$9,663,663	\$645,344	\$12,545,545	\$60,027
2021	195	\$672,628	\$1,343,428	\$7,452,669	\$500,528	\$9,969,253	\$51,124
Average	193	\$630,213	\$1,593,870	\$9,239,073	\$764,045	\$12,227,201	\$63,752

Source: SEFSC-Social Science Research Group (SSRG) Socioeconomic Panel (Sep. 2022 version)

Overall dockside revenue of red snapper varied from year to year in 2017-2021. Red snapper dockside revenue increased by 51% in 2018, relative to 2017 but declined thereafter in 2019 and 2020. Total revenue from red snapper landings in 2021 were 48% greater than 2017, resulting in an overall increase in total revenue during the time period. Revenue from jointly caught species on red snapper trips also varied during this time period. Revenue from jointly caught species tripled in 2018, relative to 2017 but then declined by 43% in 2019. Revenue from jointly caught

species still increased by 48% in 2021 relative to 2017. On average from 2017-2021, red snapper accounted for 5% of total revenue by vessels harvesting South Atlantic red snapper.

Estimates of economic returns are not directly available for the red snapper commercial sector in the South Atlantic. The most recent analysis that calculated estimates of economic returns for South Atlantic commercial fishing vessels was Liese (SEFSC, personal comm. 2022). Liese (SEFSC, personal comm. 2022) calculated economic returns for South Atlantic snapper grouper vessels as well as other segments of interest (SOI). In most cases, these SOIs are at the species or species group level. Liese (SEFSC, personal comm. 2022) produced estimates for a 2018 Snapper Grouper FMP SOI. This SOI consists of all logbook trips by permitted vessels where at least one pound of snapper grouper, including species as defined and managed by the South Atlantic Snapper Grouper FMP, was landed in 2018 using any gear type. This SOI's estimates can be used as a proxy for red snapper estimates. These estimates are specific to economic performance in the years 2014-2018. The analysis also provides average estimates of economic returns across 2014-2018, which are the most useful for current purposes. Estimates in the analysis are based on a combination of Southeast Coastal logbook data, a supplemental economic add-on survey to the logbooks, and an annual economic survey at the vessel level. The economic surveys collect data on gross revenue, variable costs, fixed costs, as well as some auxiliary economic variables (e.g., market value of the vessel). The analysis provides estimates of critical economic variables for the commercial sector in the South Atlantic deepwater portion of the snapper grouper 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 South Atlantic deepwater 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 3.3.1.4 illustrates the economic "margins" generated on South Atlantic snapper grouper trips, i.e., trip net cash flow and trip net revenue as a percentage of trip revenue. As shown in this table, 48.4% of the average revenues generated on South Atlantic snapper grouper trips were used to pay for crew labor costs. Fuel/supplies costs accounted for a further 26% of revenues and 43% of revenue is cash flow back to the owner(s). The margin associated with trip net revenue was lower at about 26%, 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 -2018, generally indicating that South Atlantic snapper grouper trips were profitable during this time.

Table 3.3.1.4. Economic characteristics of South Atlantic snapper grouper fishery trips 2014-2018 (2021 \$).

	2014	2015	2016	2017	2018	Average
Number of Observations	2,964	2,593	2,612	3,527	2,688	-
Response Rate (%)	83%	83%	94%	92%	94%	-
Trips						
Owner-Operated	83%	88%	82%	78%	73%	80.8%
Fuel Used per Day at Sea (gallons/day)	33	38	41	41	39	38
Total Revenue	100%	100%	100%	100%	100%	100%
Costs (% of Revenue)						
Fuel	13.4%	11.5%	9.3%	8.9%	10.8%	10.8%
Bait	6.9%	7.2%	7.2%	8.4%	7.2%	7.4%
Ice	1.9%	1.9%	2.1%	2.2%	1.8%	2%
Groceries	3.2%	2.8%	3.5%	3.1%	3.5%	3.2%
Miscellaneous	2.8%	2.7%	2.8%	2.5%	2.3%	2.6%
Hired Crew	32.6%	32.8%	29.4%	30.4%	29.5%	30.9%
IFQ Purchase	0%	0%	0%	0%	0%	0%
Owner-Captain Time	19.6%	18.0%	17.0%	17.0%	15.9%	17.5%
Trip Net Cash Flow	39%	41.1%	45.7%	44.4%	44.9%	43%
Trip Net Revenue	20%	23.2%	28.7%	27.4%	29%	26%
Labor - Hired & Owner	52%	50.7%	46.4%	47.4%	45.4%	48.4%
Fuel & Supplies	28%	26.1%	24.9%	25.2%	25.6%	26%
Input Prices						
Fuel Price (per gallon)	\$4.36	\$3.37	\$2.60	\$2.75	\$3.11	\$3.24
Hire Crew Wage (per crew-day)	\$317	\$330	\$290	\$312	\$267	\$303
Productivity Measures						
Landings/Fuel Use (lbs./gallon)	8.7	7.7	6.8	8.4	7.3	8
Landings/Labor Use (lbs./crew-day)	150	149	141	172	143	151

Source: Liese (SEFSC, personal comm. 2022).

Table 3.3.1.5 provides estimates of the important economic variables at the annual level for all vessels that had South Atlantic snapper grouper fishery landings from 2014-2018. Similar to the trip level, the three of the 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. As shown in Table 3.3.1.5, net cash flow and net revenue from operations at the annual vessel level were both positive from 2014-2016, generally indicating that South Atlantic snapper grouper vessels in the commercial

sector were profitable. Specifically, net cash flow and net revenue from operations averaged 22 % and 8%, respectively.

Table 3.3.1.5. Economic characteristics of South Atlantic snapper grouper vessels from 2014-2018 (2021 \$).

	2014	2015	2016	2017	2018	Average
Number of Observations	75	101	94	104	98	-
Response Rate (%)	50%	75%	71%	70%	80%	-
Vessels						
Owner-Operated	85%	91%	89%	81%	84%	86%
For-Hire Active	22%	19%	12%	19%	11%	17%
Vessel Value	\$91,800	\$91,051	\$109,451	\$122,846	\$103,622	\$103,754
Total Revenue	100%	100%	100%	100%	100%	100%
Costs (% of Revenue)						
Fuel	15.0%	11.7%	10.1%	10.0%	12.1%	11.8%
Other Supplies	12.1%	12.9%	14.5%	12.0%	12.1%	12.7%
Hired Crew	28.4%	23.9%	27.8%	28.3%	24.4%	26.6%
Vessel Repair & Maintenance	14.7%	15.7%	15.1%	10.6%	15.2%	14.3%
Insurance	1.5%	1.6%	2.1%	1.7%	2.0%	1.8%
Overhead	6.8%	8.4%	10.2%	6.0%	7.2%	7.7%
Loan Payment	2.5%	3.3%	4.6%	2.1%	1.5%	2.8%
IFQ Purchase	0.0%	0.1%	0.0%	0.2%	0.1%	0.1%
Owner-Captain Time	10.6%	12.8%	13.1%	9.5%	10.4%	11.3%
Net Cash Flow	19.0%	22.4%	15.5%	29.2%	25.4%	22.0%
Net Revenue for Operations	6.0%	7.7%	0.2%	16.9%	10.4%	8.0%
Depreciation	5.3%	5.3%	6.7%	5.0%	6.3%	5.7%
Fixed Costs	23.0%	25.7%	27.5%	18.3%	24.4%	24.0%
Labor - Hired & Owner	39.0%	26.7%	40.9%	37.8%	34.7%	38.0%
Fuel & Supplies	27.0%	24.7%	24.6%	21.9%	24.2%	24.0%
Economic Return (on asset value)	5.4%	7.3%	20.0%	16.9%	8.3%	7.6%

Source: Liese (SEFSC, personal comm. 2022).

Dealers

The information in Table 3.3.1.6 illustrates the purchasing activities of dealers that bought red snapper landings from vessels from 2017 through 2021. The total number of dealers purchasing red snapper increased from 2017-2020, but declined slightly in 2021. The total number of dealers increased only by approximately 7% in 2021 relative to 2017. Total value of red snapper purchases by dealers increased in each year overall between 2017 and 2021. Purchases of red snapper landings increased by over 5,000% in 2021, relative to 2017. The average value of red snapper purchases per dealer also increased dramatically from 2017-2021.

The overall value of other species purchases increased by 576% in 2021, relative to 2017. The average value of other species purchase per dealer increased by about 6% in 2021, relative to

2017. Overall, red snapper made up only approximately 2% of total purchases by red snapper dealers, indicating that there is a very low financial dependency on red snapper landings.

Table 3.3.1.6. Dealer statistics for dealers that purchased red snapper landings by year, 2017-2021. All dollar estimates are in 2021 \$.

Year	Number Dealers	Statistic	Red Snapper Purchases	Other Species Purchases	Total Purchases
2017	67	Maximum	\$13,771	\$5,086,825	\$5,086,842
		Total	\$51,556	\$11,665,013	\$11,716,569
		Mean	\$4,687	\$1,060,456	\$1,065,143
2018	70	Maximum	\$167,823	\$10,425,239	\$10,431,269
		Total	\$603,173	\$59,483,987	\$60,087,160
		Mean	\$9,003	\$887,821	\$896,823
2019	73	Maximum	\$111,994	\$8,837,518	\$8,841,052
		Total	\$688,717	\$59,084,351	\$59,773,068
		Mean	\$9,566	\$844,062	\$853,901
2020	74	Maximum	\$155,388	\$11,085,396	\$11,110,164
		Total	\$925,801	\$70,464,449	\$71,390,250
		Mean	\$12,344	\$965,266	\$977,949
2021	72	Maximum	\$1,963,629	\$9,253,789	\$9,473,659
		Total	\$2,862,148	\$78,824,494	\$81,224,057
		Mean	\$39,752	\$1,126,064	\$1,160,344

Source: SERO ALS Data (2022)

Imports

Imports of foreign seafood products compete in the domestic seafood market, and have in fact dominated many segments of the domestic 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. The following describes the imports of fish products that directly compete with domestic harvest of snappers including the species in this amendment.

According to NMFS' foreign trade data,³ snapper species are not exported from the U.S. to other countries. Thus, the following describes the imports of fresh and frozen snapper products, which directly compete with domestic harvest of snapper species. All monetary estimates are in 2021 dollars. As shown in Table 3.3.1.7, imports of fresh snapper products were 31.2 million lbs product weight (pw) in 2017. They peaked at 36.0 million lbs pw in 2021, an increase of 15% relative to 2017. Total revenue from snapper imports increased from \$99.0 million (2021

³ <https://foss.nmfs.noaa.gov/>

dollars) in 2017 to a five-year high of \$148.6 million in 2021. The average price per pound for fresh snapper products was \$3.54 from 2017-2021. Imports of fresh snapper products primarily originated in Mexico or Central America and primarily entered the U.S. through the port of Miami.

Table 3.3.1.7. Annual pounds and value of fresh snapper imports and share of imports by country, 2017-2021.

	2017	2018	2019	2020	2021
Pounds of fresh snapper imports (product weight, million pounds)	31.2	30.5	32.8	32.4	36.0
Value of fresh snapper imports (millions \$, 2021 \$)	99.0	103.5	115.3	113.4	148.6
Average price per lb (2021 \$)	\$3.17	\$3.39	\$3.52	\$3.50	\$4.13
Share of Imports by Country					
Mexico	35.8	32.5	34.9	40.4	32.8
Nicaragua	15.4	17.0	14.6	15.1	13.3
Panama	14.8	16.6	13.9	11.0	14.0
All others	33.9	33.9	36.6	33.5	39.9

Source: NOAA Foreign Trade Query Tool, accessed 11/16/22.

As shown in Table 3.3.1.8, imports of frozen snapper species products were 12.8 million lbs pw in 2017. They peaked at 18.2 million lbs pw in 2021, an increase of 42% relative to 2017. Total revenue from frozen snapper imports increased from \$38.2 million (2021 dollars) in 2017 to a five-year high of \$66.6 million in 2021. The average price per pound for frozen snapper products was \$3.20 from 2017-2021. Imports of frozen snapper products primarily originated in Brazil or South America and primarily entered the U.S. through the port of Miami.

Table 3.3.1.8. Annual pounds and value of frozen snapper imports and share of imports by country, 2017-2021.

	2017	2018	2019	2020	2021
Pounds of frozen snapper imports (product weight, million pounds)	12.8	12.2	11.4	15.9	18.2
Value of frozen snapper imports (millions \$, 2021 \$)	38.2	37.6	36.7	48.4	66.6
Average price per lb (2021 \$)	\$2.98	\$3.08	\$3.22	\$3.05	\$3.65
Share of Imports by Country					
Brazil	61.0	63.8	54.6	55.4	58.6
Indonesia	11.0	11.3	6.8	5.4	3.9
Suriname	7.9	6.9	13.5	10.3	10.5
All others	20.1	17.9	25.0	28.9	27.0

Source: NOAA Foreign Trade Query Tool, accessed 11/16/22

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 snapper 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 South Atlantic red snapper were derived using the model developed for and applied in NMFS (2021) and are provided in Table 3.3.1.9. Specifically, these impact estimates reflect the expected impacts from average annual gross revenues generated by landings of South Atlantic red snapper from 2017 through 2021. 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. 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 red snapper are not available. Between 2017 and 2021, landings of South Atlantic red snapper resulted in approximately \$630,000 (2021 \$) in gross revenue on average. In turn, this revenue generated employment, income, value-added, and output impacts of 75 jobs, \$2.3 million, \$3.2 million, and \$6.3 million per year, respectively, on average.

Table 3.3.1.9. Average annual economic impacts in the commercial sector of the South Atlantic red snapper from 2017-2021. All monetary estimates are in thousands of 2021 dollars and employment is measured in full-time equivalent jobs.

Harvesters	Direct	Indirect	Induced	Total
Employment impacts	13	2	3	18
Income impacts	340	63	153	556
Total value-added impacts	363	227	261	852
Output Impacts	630	513	507	1,650
Primary dealers/processors	Direct	Indirect	Induced	Total
Employment impacts	3	1	2	6
Income impacts	111	102	97	310
Total value-added impacts	118	131	182	431
Output impacts	357	269	356	983
Secondary wholesalers/distributors	Direct	Indirect	Induced	Total
Employment impacts	1	0	1	3
Income impacts	66	20	70	155
Total value-added impacts	71	33	119	222
Output impacts	177	65	231	473
Grocers	Direct	Indirect	Induced	Total
Employment impacts	5	1	1	7
Income impacts	136	45	68	250
Total value-added impacts	145	73	116	333
Output impacts	233	118	227	578
Restaurants	Direct	Indirect	Induced	Total
Employment impacts	34	2	6	42
Income impacts	546	166	313	1,024
Total value-added impacts	582	296	527	1,404
Output impacts	1,064	463	1,039	2,566
Harvesters and seafood industry	Direct	Indirect	Induced	Total
Employment impacts	56	6	13	75
Income impacts	1,199	396	700	2,295
Total value-added impacts	1,278	760	1,205	3,243
Output impacts	2,461	1,428	2,361	6,250

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2021).

*Converted to 2021 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

3.3.2. 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 South Atlantic red snapper landings have been highly variable from 2017-2021 (Table 3.3.2.1). Landings peaked in 2018 at approximately 5.8 million pounds ww, greatly exceeding any other year's landings. Private vessels accounted for the majority of red snapper landings on average from 2017-2021. Private vessels on average from 2017-2021 accounted for 95% of South Atlantic red snapper landings, charter vessels 4%, and headboats making up the remaining 1%. No shore mode landings for South Atlantic red snapper were recorded. The majority of landings on average occurred in Florida/Georgia (96%) (Table 3.3.2.2). Wave 4, which includes the months of July and August, accounted for the majority of landings on average from 2017-2021 (Table 3.3.2.3).

Table 3.3.2.1. Recreational landings (lbs whole weight [ww]) and percent distribution of South Atlantic red snapper across all states by mode for 2017-2021.

	Landings (pounds ww)				Percent Distribution		
	Charter vessel	Headboat	Private	Total	Charter vessel	Headboat	Private
2017	28,991	17,523	1,017,394	1,063,907	3%	2%	96%
2018	27,204	30,126	5,783,748	5,841,077	0%	1%	99%
2019	243,857	26,279	2,055,295	2,325,432	10%	1%	88%
2020	37,060	18,305	4,519,858	4,575,222	1%	0%	99%
2021	53,519	9,308	821,032	883,859	6%	1%	93%
AVG	78,126	20,308	2,839,465	2,937,899	4%	1%	95%

Source: MRIP FES ACL dataset (June22 version).

Table 3.3.2.2. Recreational landings (lbs ww) and percent distribution of South Atlantic red snapper by state* for 2017-2021.

	Landings (pounds ww)				Percent Distribution		
	FL/GA	NC	SC	Total	FL/GA	NC	SC
2017	1,051,273	1,172	11,462	1,063,907	99%	0%	1%
2018	5,835,402	3,904	1,771	5,841,077	100%	0%	0%
2019	2,160,968	1,050	163,413	2,325,432	93%	0%	7%
2020	4,481,704	7,568	85,950	4,575,222	98%	0%	2%
2021	807,918	74,996	945	883,859	91%	8%	0%
AVG	2,867,453	17,738	52,708	2,937,899	96%	2%	2%

Source: MRIP FES ACL dataset (June22 version).

*Florida and Georgia's landings are reported together for confidentiality purposes.

Table 3.3.2.3. Recreational landings (lbs ww) and percent distribution of South Atlantic red snapper by MRIP wave for 2017-2021.

Landings (pounds ww)						
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
2017	7	0	12,816	1,793	104,675	944,615
2018	0	364	26,364	5,814,237	112	0
2019	354	0	3,410	2,321,668	0	0
2020	0	0	1,124	4,574,098	0	0
2021	0	0	7,018	833,015	1,370	42,456
AVG	72	73	10,147	2,708,962	21,231	197,414
Percent Distribution						
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
2017	0%	0%	1%	0%	10%	89%
2018	0%	0%	0%	100%	0%	0%
2019	0%	0%	0%	100%	0%	0%
2020	0%	0%	0%	100%	0%	0%
2021	0%	0%	1%	94%	0%	5%
AVG	0%	0%	1%	79%	2%	19%

Source: MRIP FES ACL dataset (June22 version).

Actions 1 and 2 of this framework amendment are likely to affect recreational harvest for the entire snapper grouper complex in the South Atlantic. Therefore, information on recreational fishing of all South Atlantic snapper grouper species combined are presented in this section as well. Total recreational South Atlantic snapper grouper landings have been highly variable from 2017-2021 (Table 3.3.2.4). Landings peaked in 2020 at approximately 36.2 million pounds ww. Private vessels accounted for the majority of snapper grouper landings on average from 2017-2021. Private vessels on average from 2017-2021 accounted for 54% of South Atlantic snapper grouper landings, shore mode 38%, charter vessels 5%, and headboats the remaining 3%. The

majority of landings on average occurred in Florida/Georgia (86%) (Table 3.3.2.5). Wave 4, which includes the months of July and August, accounted for the majority of landings on average from 2017-2021 (Table 3.3.2.6).

Table 3.3.2.4. Recreational landings in millions of pounds (whole weight [ww]) and percent distribution of South Atlantic snapper grouper across all states by mode for 2017-2021.

	Landings (pounds ww)					Percent Distribution			
	Charter	Headboat	Private	Shore	Total	Charter	Headboat	Private	Shore
2017	1.54	1.01	12.71	12.02	27.28	6%	4%	47%	44%
2018	0.96	0.93	19.08	9.51	30.48	3%	3%	63%	31%
2019	1.47	0.90	13.45	5.32	21.15	7%	4%	64%	25%
2020	1.36	0.70	13.94	20.16	36.16	4%	2%	39%	56%
2021	1.21	0.78	12.64	7.18	21.82	6%	4%	58%	33%
AVG	1.31	0.87	14.36	10.84	27.38	5%	3%	54%	38%

Source: MRIP FES ACL dataset (June 22 version).

Table 3.3.2.5. Recreational landings (lbs ww) and percent distribution of South Atlantic snapper grouper by state for 2017-2021.

	Landings (pounds ww)				Percent Distribution		
	FL/GA	NC	SC	Total	FL/GA	NC	SC
2017	22,263,391	2,607,413	2,410,783	27,281,588	82%	10%	9%
2018	27,582,838	1,847,337	1,049,574	30,479,750	90%	6%	3%
2019	17,808,772	1,593,236	1,745,097	21,147,105	84%	8%	8%
2020	32,191,628	2,416,450	1,550,532	36,158,611	89%	7%	4%
2021	18,694,055	2,038,440	1,086,734	21,819,230	86%	9%	5%
AVG	23,708,137	2,100,575	1,568,544	27,377,257	86%	8%	6%

Source: MRIP FES ACL dataset (June 22 version).

Table 3.3.2.6. Recreational landings (lbs ww) and percent distribution of South Atlantic snapper grouper by MRIP wave for 2017-2021.

Landings (pounds ww)						
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
2017	2,615,837	2,458,858	6,648,124	6,997,684	4,418,404	4,142,681
2018	3,498,157	2,843,908	2,912,870	14,758,749	2,997,640	3,468,427
2019	2,782,073	2,722,135	6,307,992	6,894,244	1,014,026	1,426,634
2020	2,249,341	1,730,458	3,438,747	21,396,427	4,115,974	3,227,663
2021	3,560,321	3,145,618	2,631,837	6,134,520	3,631,422	2,715,510
AVG	2,941,146	2,580,195	4,387,914	11,236,325	3,235,493	2,996,183
Percent Distribution						
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
2017	10%	9%	24%	26%	16%	15%
2018	11%	9%	10%	48%	10%	11%
2019	13%	13%	30%	33%	5%	7%
2020	6%	5%	10%	59%	11%	9%
2021	16%	14%	12%	28%	17%	12%
AVG	11%	10%	17%	39%	12%	11%

Source: MRIP FES ACL dataset (June22 version).

Permits

For-hire Permits

There are no specific federal permitting requirements for recreational anglers to fish for or harvest red snapper. The same is true of private recreational vessel owners. Instead, private anglers are required to either possess 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 also required for fishing in federal waters for South Atlantic snapper grouper. For-hire Atlantic Snapper Grouper permits are open access permits (i.e., access is not restricted). From 2016-2020, the number of For-hire South Atlantic Snapper Grouper permits that were valid in a given year has increased every year until 2019 as illustrated in Table 3.3.2.7. The number of For-hire South Atlantic Snapper Grouper permits that were valid fell by 2% in 2020, relative to 2019.

Table 3.3.2.7. Number of valid For-hire South Atlantic Snapper Grouper permits, 2016-2020.

Year	Number of Permits
2016	1,867
2017	1,982
2018	2,126
2019	2,183
2020	2,136

Source: NMFS SERO SF Access Permits Database
07/08/22.

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).⁴

Tables 3.3.2.8 and 3.3.2.9 describe the recreational target and catch trips for red snapper in the South Atlantic from 2017-2021. There are no catch or target trips by shore mode for red snapper in the South Atlantic. Private vessels represent 97% of red snapper target effort in the recreational sector. The majority of target effort occurs by private vessels in Florida (94%), followed by private vessel target effort occurring in South Carolina and North Carolina (Table 3.3.2.8).

Private vessels are also responsible for the majority of catch effort for red snapper (95%). Catch effort by charter vessels represents the remaining 5% of the total catch effort. Florida accounted for the majority of catch effort for red snapper (92%), with private and charter vessels in Florida accounting for 88% and 5% of the catch effort, respectively. As expected, the trends in catch effort mimic the trends in landings, with the peak occurring in 2018 (Table 3.3.2.9).

⁴ <https://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index>

Table 3.3.2.8. Red snapper recreational target trips, by mode and state, 2017-2021.

Mode	Year	Florida	Georgia	North Carolina	South Carolina	Total
Charter	2017	3,981	0	0	0	0
	2018	2,336	196	380	0	2,912
	2019	15,416	415	0	0	15,831
	2020	3,843	0	0	535	4,378
	2021	3,028	0	22	0	3,050
	Average	5,721	122	80	107	5,234
Private	2017	132,407	0	0	0	132,407
	2018	1,022,123	4,475	0	2,478	1,029,076
	2019	142,558	17,770	1,087	29,000	190,415
	2020	652,654	13,584	491	49,846	716,575
	2021	101,429	7,893	8,119	0	117,441
	Average	410,234	8,744	1,939	20,331	437,183
All	2017	136,388	0	0	0	136,388
	2018	1,024,459	4,671	380	2,478	1,031,988
	2019	157,974	18,185	1,087	29,000	206,246
	2020	656,497	13,584	491	50,381	720,953
	2021	104,457	7,893	8,141	0	120,491
	Average	415,955	8,867	2,020	16,372	443,213

Source: MRIP Survey Data available at:

<https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads>.

Table 3.3.2.9. Red Snapper recreational catch trips, by mode and state, 2017-2021.

Mode	Year	Florida	Georgia	North Carolina	South Carolina	Total
Charter	2017	30,479	76	306	848	31,709
	2018	25,691	1,432	897	1,028	29,048
	2019	41,451	562	212	2,639	44,864
	2020	36,683	314	1,117	1,820	39,934
	2021	36,164	374	1,834	2,622	40,994
	Average	34,094	552	873	1,791	37,310
Private	2017	360,769	23,372	2,200	16,831	403,172
	2018	1,056,090	11,014		2,842	1,069,946
	2019	547,307	28,466	4,871	33,704	614,348
	2020	841,022	29,765	6,999	42,201	919,987
	2021	450,636	22,981	15,598	32,175	521,390
	Average	651,165	23,120	7,417	25,551	705,769
All	2017	391,248	23,448	2,506	17,679	434,881
	2018	1,081,781	12,446	897	3,870	1,098,994
	2019	588,758	29,028	5,083	36,343	659,212
	2020	877,705	30,079	8,116	44,021	959,921
	2021	486,800	23,355	17,432	34,797	562,384
	Average	685,258	23,671	6,807	27,342	743,078

Source: MRIP Survey Data available at:

<https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads>.

Tables 3.3.2.10 and 3.3.2.11 describe the recreational target and catch trips for all snapper grouper species combined in the South Atlantic from 2017-2021. Private vessels represent 61% of snapper grouper target effort in the recreational sector. Shore mode accounted for 38% snapper grouper target effort, and charter vessel the remaining 1%. The majority of target effort occurs by private vessels in Florida (53%), followed by private vessel target effort occurring in South Carolina and North Carolina (Table 3.3.2.10).

Private vessels and shore mode each accounted for 49% of the total catch effort for all snapper grouper species. Catch effort by charter vessels only represents 2% of the total catch effort. Florida accounted for the majority of catch effort for snapper grouper species combined (81%). Shore mode and private vessels in Florida accounted for 42% and 38% of the total South Atlantic snapper grouper recreational target effort. Generally, the trends in catch effort mimic the trends in landings, however, catch effort peaked in 2017 at 10.3 million trips whereas target trips peaked in 2020 at 2.5 million trips (Table 3.3.2.10).

Table 3.3.2.10. South Atlantic snapper grouper recreational target trips, by mode and state, 2017-2021.

Mode	Year	Florida	Georgia	North Carolina	South Carolina	Total
Charter	2017	7,023	1,561	1,320	8,348	18,252
	2018	10,086	238	2,276	1,432	14,032
	2019	29,985	652	3,755	3,125	37,517
	2020	14,659	189	9,154	1,817	25,818
	2021	17,868	581	2,951	4,941	26,341
	Average	15,924	644	3,891	3,933	24,392
Private	2017	713,322	31,807	109,039	76,500	930,668
	2018	1,850,842	52,472	24,964	16,728	1,945,006
	2019	675,967	26,558	36,214	110,780	849,518
	2020	1,261,442	48,657	49,977	105,971	1,466,047
	2021	860,187	25,837	46,522	50,816	983,362
	Average	1,072,352	37,066	53,343	72,159	1,234,920
Shore	2017	526,436	2,195	19,308	1,822	549,761
	2018	362,073	1,235	13,757	534	377,599
	2019	648,635	9,560	40,269	855	699,319
	2020	1,010,864	6,257	4,867	13,641	1,035,629
	2021	1,036,675	2,724	57,117	19,161	1,115,678
	Average	716,937	4,394	27,064	7,203	755,597
All	2017	1,246,781	35,563	129,667	86,670	1,498,681
	2018	2,223,001	53,945	40,997	18,694	2,336,637
	2019	1,354,587	36,770	80,238	114,760	1,586,354
	2020	2,286,965	55,103	63,998	121,429	2,527,494
	2021	1,914,730	29,142	106,590	74,918	2,125,381
	Average	1,805,213	42,105	84,298	83,294	2,014,909

Source: MRIP Survey Data available at:

<https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads>.

Table 3.3.2.11. South Atlantic snapper grouper recreational catch trips, by mode and state, 2017-2021.

Mode	Year	Florida	Georgia	North Carolina	South Carolina	Total
Charter	2017	100,827	3,852	17,040	39,709	161,427
	2018	94,649	2,533	22,676	16,581	136,440
	2019	114,899	1,278	22,488	26,545	165,210
	2020	111,813	1,086	40,976	18,930	172,805
	2021	140,237	3,643	23,583	25,599	193,063
	Average	112,485	2,478	25,353	25,473	165,789
Private	2017	3,274,632	163,839	722,956	537,773	4,699,201
	2018	4,476,137	96,607	363,015	281,485	5,217,245
	2019	3,081,985	159,939	443,487	309,921	3,995,332
	2020	3,404,848	128,138	513,652	306,119	4,352,758
	2021	3,525,401	117,842	488,235	384,568	4,516,046
	Average	3,552,601	133,273	506,269	363,973	4,556,116
Shore	2017	4,642,073	182,447	507,940	112,857	5,445,317
	2018	4,035,392	117,084	219,265	149,712	4,521,453
	2019	3,159,885	67,439	261,482	326,113	3,814,919
	2020	4,385,816	63,736	216,412	188,663	4,854,628
	2021	3,350,958	233,276	297,994	239,431	4,121,659
	Average	3,914,825	132,796	300,619	203,355	4,551,595
All	2017	8,017,532	350,138	1,247,936	690,339	10,305,945
	2018	8,606,178	216,224	604,956	447,778	9,875,138
	2019	6,356,769	228,656	727,457	662,579	7,975,461
	2020	7,902,477	192,960	771,040	513,712	9,380,191
	2021	7,016,596	354,761	809,812	649,598	8,830,768
	Average	7,579,910	268,548	832,240	592,801	9,273,501

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 variable across the South Atlantic states from 2017 through 2021 (Table 3.3.2.12). Florida/Georgia were responsible for the vast majority of headboat effort during this time, accounting for about 67% of the total headboat effort. Headboat effort in Florida/Georgia declined considerably in 2020, about 32% relative to the previous three years. Headboat effort in North Carolina and South Carolina effort vacillated during this time period, but to a much lesser extent than Florida/Georgia.

Table 3.3.2.12. South Atlantic headboat angler days and percent distribution by state (2017-2021).

	Angler Days			Percent Distribution		
	EFL/GA*	NC	SC	EFL/GA	NC	SC
2017	126,126	20,170	36,914	68.80%	11.00%	20.10%
2018	120,560	16,813	37,611	68.90%	9.60%	21.50%
2019	119,712	15,546	41,470	67.70%	8.80%	23.50%
2020	84,003	14,152	34,079	63.53%	10.70%	25.77%
2021	120,359	19,715	47,907	64.03%	10.49%	25.49%
Average	114,152	17,279	39,596	66.59%	10.12%	23.27%

Source: NMFS Southeast Region Headboat Survey (SRHS) data 09/20/22.

*Florida and Georgia are combined for confidentiality purposes.

Economic Value

Participation, effort, and harvest are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The economic value of this satisfaction is referred to as consumer surplus (CS). The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept. These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips. Carter and Liese (2012) produced estimates of CS for red snapper South Atlantic. The CS for catching and keeping a second red snapper ⁵ on an angler trip is approximately \$74.54 (2021 \$), and decreases thereafter (approximately \$49.69 for a third red snapper, \$36.62 for a fourth red snapper, and \$28.88 for a fifth grouper (Carter and Liese 2012).

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 \$132,038 (2021 \$). Holland et al. (2012) also provided an estimate of average annual gross revenue for South Atlantic headboats, which is \$233,436 in 2021 \$. However, a more recent estimate of average annual gross revenue for South Atlantic headboats is available from D. Carter (SEFSC, personal comm., March 15, 2018). Carter (SEFSC, personal comm.

⁵ 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.

2018) recently estimated that average annual gross revenue for South Atlantic headboats were approximately \$320,323 (2021 \$) 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 et al. (2012) and Carter (SEFSC, personal comm. 2018) estimate for headboats suggests that the estimate for charter vessels based on Holland (2012) is likely an underestimate of current average annual revenue for charter vessels.

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

With regard to for-hire trips, economic value can be measured by PS per angler trip, which represents the amount of money that a vessel owner earns in excess of the cost of providing the trip. Estimates of trip revenue, trip costs, and trip net revenue trips taken by headboats and charter vessels in 2017 are available from Souza and Liese (2019). They also provide estimates of net cash flow per angler trip, which approximate PS per angler trip. As shown in Table 3.3.2.13, after accounting for transactions fees, supply costs, and labor costs, net revenue per trip was 40% of revenue for South Atlantic charter vessels and 54% of revenue for Southeast headboats, or \$583 and \$1,911 (2021 \$), respectively. Given the respective average number of anglers per trip for each fleet, PS per angler trip is estimated to be \$124 for charter vessels and \$68 for headboats.

Table 3.3.2.13. Trip economics for offshore trips by South Atlantic charter vessels and Southeast headboats in 2017 (2021 \$).

	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	\$583	\$1,911
Average # of Anglers per Trip	4.7	28.2
Trip Net Cash Flow per Angler Trip	\$124	\$68

Source: Souza and Liese (2019).

Business Activity

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. It should be clearly noted that, in the absence of the opportunity to fish, the income would presumably 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 business activity (economic impacts) associated with recreational angling for South Atlantic red snapper and all snapper grouper species combined were calculated using average trip-level impact coefficients derived from the 2017 Fisheries Economics of the U.S. report (NMFS 2021) and underlying data provided by the National Oceanic and Atmospheric Administration (NOAA) Office of Science and Technology. Economic impact estimates in 2018 dollars were adjusted to 2021 dollars using the annual, not seasonally adjusted gross domestic product (GDP) implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Business activity (economic impacts) for the recreational sector is characterized in the form of jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), output impacts (gross business sales), and value-added impacts (contribution to the GDP in a state or region). Estimates of the average annual economic impacts (2017–2021) resulting from red snapper charter and private vessel target trips are provided in Table 3.3.2.14. Estimates of the average annual economic impacts (2017–2021) resulting from all South Atlantic snapper grouper charter, private vessel, and shore mode target trips are provided in Table 3.3.2.15. To calculate the multipliers from Table 3.3.2.14 and Table 3.3.2.15, simply divide the desired impact measure (sales impact, value-added impact, income impact or employment) associated with a given state by the number of target trips for that state.

The estimates provided in Table 3.3.2.14 and Table 3.3.2.15 only apply at the state-level. 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. It is also important to note that these economic impacts estimates are based on trip expenditures only and do not account for durable expenditures. Durable expenditures cannot be reasonably apportioned to individual species. As such, the estimates provided in Table 3.3.2.14 and Table 3.3.2.15 may be considered a lower bound on the economic activity associated with those trips that targeted red snapper or all snapper grouper species combined.

Estimates of the business activity associated with headboat effort are not available. Headboat vessels are not covered in MRIP in the Southeast, so, in addition to the absence of estimates of target effort, estimation of the appropriate business activity coefficients for headboat effort has not been conducted.

Table 3.3.2.14. Estimated average annual economic impacts (2017-2021) from South Atlantic charter and private vessel red snapper target trips, by state, using state-level multipliers. All monetary estimates are in 2021* dollars in thousands.

	NC	SC	GA	FL
Charter Mode				
Target Trips	80	107	122	5,721
Value Added Impacts	\$36	\$27	\$24	\$1,414
Sales Impacts	\$62	\$48	\$41	\$2,373
Income Impacts	\$21	\$16	\$14	\$836
Employment (Jobs)	1	0	0	21
Private/Rental Mode				
Target Trips	1,939	20,331	8,744	410,234
Value Added Impacts	\$64	\$500	\$229	\$11,912
Sales Impacts	\$105	\$767	\$347	\$17,773
Income Impacts	\$37	\$235	\$111	\$5,885
Employment (Jobs)	1	9	4	163
All Modes				
Target Trips	2,019	20,438	8,866	415,955
Value Added Impacts	\$99	\$527	\$253	\$13,326
Sales Impacts	\$167	\$815	\$388	\$20,145
Income Impacts	\$58	\$251	\$125	\$6,721
Employment (Jobs)	2	10	5	184

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

*Converted to 2021 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Table 3.3.2.15. Estimated average annual economic impacts (2017-2021) from South Atlantic snapper grouper target trips, by state and mode, using state-level multipliers. All monetary estimates are in 2021* dollars in thousands.

	NC	SC	GA	FL
Charter Mode				
Target Trips	3,891	3,933	644	15,924
Value Added Impacts	\$1,728	\$1,011	\$128	\$3,935
Sales Impacts	\$3,002	\$1,756	\$216	\$6,605
Income Impacts	\$1,017	\$583	\$73	\$2,327
Employment (Jobs)	29	18	2	59
Private/Rental Mode				
Target Trips	53,343	72,159	37,066	1,072,352
Value Added Impacts	\$1,753	\$1,773	\$970	\$31,138
Sales Impacts	\$2,898	\$2,723	\$1,472	\$46,457
Income Impacts	\$1,011	\$835	\$471	\$15,383
Employment (Jobs)	26	33	18	426
Shore Mode				
Target Trips	27,064	7,203	4,394	716,937
Value Added Impacts	\$1,797	\$366	\$163	\$16,417
Sales Impacts	\$2,956	\$579	\$264	\$24,235
Income Impacts	\$1,040	\$194	\$87	\$8,310
Employment (Jobs)	27	6	3	224
All Modes				
Target Trips	84,298	83,295	42,104	1,805,213
Value Added Impacts	\$5,278	\$3,150	\$1,260	\$51,490
Sales Impacts	\$8,856	\$5,058	\$1,952	\$77,297
Income Impacts	\$3,068	\$1,612	\$631	\$26,021
Employment (Jobs)	83	57	23	709

Source: MRIP Survey Data available at

<https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads>.

*Converted to 2021 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

3.4. Social Environment

This regulatory amendment affects the commercial and recreational management of red snapper and the recreational management of snapper grouper in the South Atlantic. This section provides the background for the proposed actions, which are evaluated in Chapter 4. Commercial and

recreational red snapper landings and snapper grouper permits by state are included to provide information on the geographic distribution of fishing involvement. Descriptions of the top-ranking communities by the number of commercial snapper grouper permits are included, top communities based on commercial landings of red snapper, commercial engagement and reliance for the top communities based on commercial landings of red snapper, top-ranking communities by the number of for-hire snapper grouper permits, and top communities based on recreational engagement and reliance. Community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Act, which requires the consideration of the importance of fishery resources to human communities when changes to fishing regulations are considered. Lastly, social vulnerability data are presented to assess the potential for environmental justice concerns. Additional detailed information about communities in the following analysis can be found on the SERO's Community Snapshots website.⁶

3.4.1. Commercial Sector

Landings by State

The greatest proportion of commercial red snapper landings came from waters adjacent to Florida and Georgia (average of 84.2% from 2017-2021, SEFSC Commercial ACL File), followed by North Carolina (9.9%), and South Carolina (5.9%). The landings for Florida and Georgia are combined to protect confidentiality; however, the proportion of landings attributable to Georgia is minor.

Permits

The majority of snapper grouper unlimited permits are issued to individuals in Florida (67.2%), followed by North Carolina (19.3%), South Carolina (7.9%), and Georgia (1.5%, SERO Permits Office, April 8, 2021). Residents of other states (Illinois Louisiana, Michigan, Minnesota, New Jersey, New York, Ohio, Texas, and West Virginia) also hold snapper grouper unlimited permits, but these states represent a small percentage of the issued permits.

South Atlantic snapper grouper unlimited permits are held by individuals with mailing addresses in 152 communities (SERO Permits Office, April 8, 2021). Communities with the most snapper grouper unlimited permits are located in Florida, South Carolina, North Carolina, and Texas (Table 3.4.1.1). The communities with the most snapper grouper unlimited permits are Key West (9.8% of snapper grouper unlimited permits), Jacksonville (7.9%), and Miami, Florida (3.7%).

⁶ <https://www.fisheries.noaa.gov/southeast/socioeconomics/snapshots-human-communities-and-fisheries-gulf-mexico-and-south-atlantic>

Table 3.4.1.1. Top communities by number of South Atlantic snapper grouper unlimited permits and 225-lb trip-limited permits.

State	Community	Unlimited Permits	State	Community	225-lb Trip-Limited Permits
FL	Key West	51	FL	Key West	9
FL	Jacksonville	41	FL	Marathon	8
FL	Miami	19	FL	Jupiter	6
FL	Rockledge	13	FL	Big Pine Key	5
SC	Little River	12	FL	Miami	5
FL	Marathon	11	FL	Summerland Key	5
NC	Southport	11	FL	Fort Pierce	3
FL	Key Largo	10	FL	Key Largo	3
FL	Summerland Key	10	NC	Wilmington	3
NC	Hampstead	10			
SC	Murrells Inlet	10			
FL	Hialeah	9			
FL	Jupiter	9			
FL	Port Orange	9			
FL	Tavernier	9			
FL	Winter Springs	8			
TX	Corpus Christi	8			

Source: SERO Permits Office, April 8, 2021.

The majority of snapper grouper 225-lb trip-limited permits are issued to individuals in Florida (85.6%), followed by North Carolina (9.3%, SERO Permits Office, April 8, 2021). Residents of other states (New Jersey, South Carolina, Texas, and Virginia) also hold snapper grouper 225-lb trip-limited permits, but these states represent a small percentage of the issued permits.

South Atlantic commercial snapper grouper 225-lb trip-limited permits are held by individuals with mailing addresses in 51 communities (SERO Permits Office, April 8, 2021). Communities with the most commercial snapper grouper 225-lb trip-limited permits are located in Florida and North Carolina (Table 3.4.1.1). The communities with the most snapper grouper 225-lb trip-limited permits are Key West (9.3% of snapper grouper 225-lb trip-limited permits), Marathon (8.2%), and Jupiter, Florida (6.2%).

Regional Quotient

The descriptions of communities include information about the top communities based on a “regional quotient” (RQ) of commercial landings for red snapper. The RQ is the proportion of landings out of the total landings of that species for that region and that year, and is a relative measure. The RQ is reported individually only for the top 10 communities by total landings for the years of 2017 through 2021. All other communities that landed red snapper are grouped as “Other Communities.” Figure 3.4.1.1 shows the RQ in percentage of pounds from 2017 to 2021. A time series is presented because landings of red snapper by community are highly variable by

year, due to a short season and difference in landings per year. The top community of Cocoa, Florida has relatively stable landings by year; however the landings of many communities fluctuate and a few top communities have no landings of red snapper in some years. The top red snapper communities are located in Florida and North Carolina. About 30% of the total red snapper landings from 2017 to 2021 are landed in the top two communities of Sanford and Cocoa Beach, Florida combined.

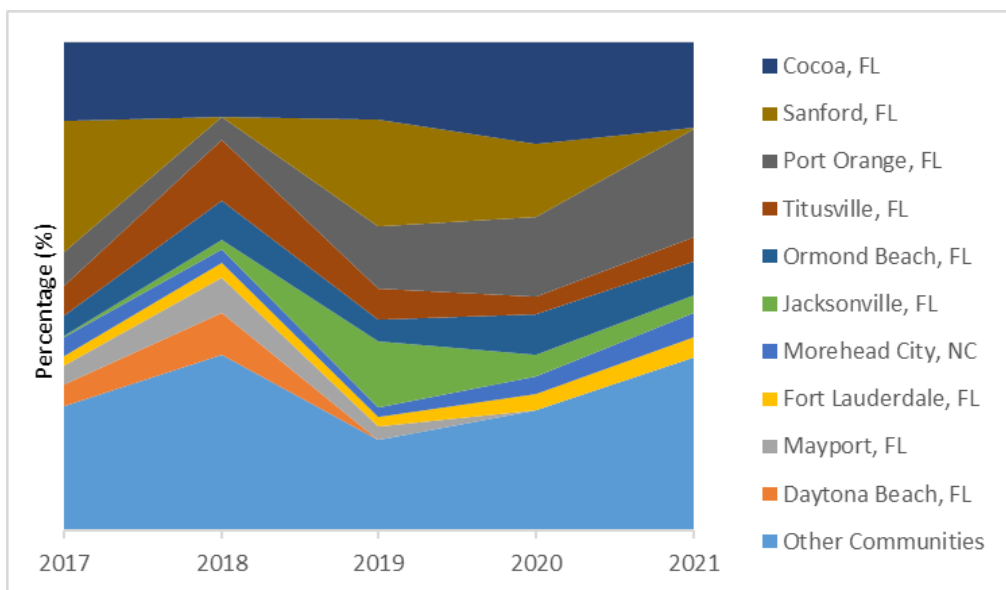


Figure 3.4.1.1. Regional Quotient (pounds) for top South Atlantic communities by red snapper landings from 2017 through 2021. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.

Source: SERO, Community ALS.

Engagement and Reliance

Figure 3.4.1.2 is an overall measure of a community's commercial fishing engagement and reliance and includes the communities with the strongest relationship to the commercial sector for red snapper as depicted in Figure 3.4.1.1. Sanford, Florida is not included because these data are not available for the community. Most communities in Figure 3.4.1.2 would be considered to be highly or moderately engaged in commercial fishing, as several are at or above 1 standard deviation of the mean factor score and most are at or above $\frac{1}{2}$ standard deviation. Titusville, Ormond Beach, and Daytona Beach, Florida, show the least amount of engagement in commercial fishing overall. All of the included communities demonstrate low commercial reliance.

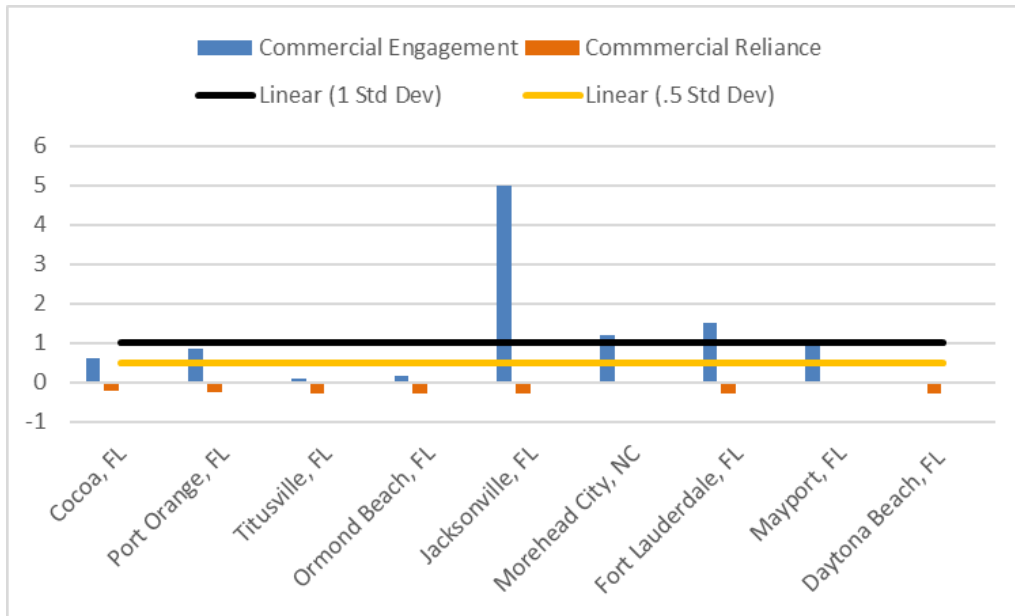


Figure 3.4.1.2. Commercial fishing engagement and reliance for top red snapper communities.
Source: SERO, Community Social Vulnerability Indicators Database 2019.

3.4.2. Recreational Sector

Landings by State

The greatest proportion of recreational snapper grouper landings came from waters adjacent to Florida and Georgia (average of 86% from 2017-2021; Table 3.3.2.5), followed by North Carolina (8%), and South Carolina (6%). Florida and Georgia are combined to maintain confidentiality.

Within Florida and Georgia, the greatest proportion of recreational snapper grouper landings are by private vessels (average of 50.2% from 2017-2021; MRIP-FES Dataset), followed by shore mode (44.4%), charter vessels (.3.3%), and headboats (2.1%). Within North Carolina, the greatest proportion of recreational snapper grouper landings are by private vessels (65.1%), followed by charter vessels (18.2%), shore mode (8.4%), and headboats (8.3%). And within South Carolina, the greatest proportion of recreational snapper grouper landings are by private vessels (69.8%), followed by headboats (12.2%), charter vessels (9.6%), and shore mode (8.5%).

The greatest proportion of recreational red snapper landings came from waters adjacent to Florida and Georgia (average of 96% from 2017-2021; Table 3.3.2.2.), followed by South Carolina (2%), and North Carolina (2%). Florida and Georgia are combined to maintain confidentiality.

Within Florida and Georgia, the greatest proportion of recreational red snapper landings are by private vessels (average of 96.7% from 2017-2021; MRIP-FES Dataset), followed by charter vessels (2.7%), and headboats (0.6%). Within South Carolina, the greatest proportion of recreational red snapper landings are by private vessels (96.6%), followed by headboats (2.6%), and charter vessels (0.8%). And within North Carolina, the greatest proportion of recreational

red snapper landings are by private vessels (88.5%), followed by charter vessels (6.4%), and headboats (5.2%).

Permits

The majority of for-hire snapper grouper permits are issued to individuals in Florida (63.3%), followed by North Carolina (17.2%), South Carolina (8.8%), and Georgia (2.5%, SERO Permits Office, April 8, 2021). Residents of other Gulf states (Alabama, Mississippi, Louisiana, and Texas) also hold a sizable amount of for-hire snapper grouper permits (2.5%). Residents of other states and territories (Arkansas, California, Delaware, Iowa, Illinois, Indiana, Massachusetts, Maryland, Maine, Michigan, Minnesota, Missouri, New Jersey, New York, Ohio, Pennsylvania, Puerto Rico, Rhode Island, and Virginia) also hold for-hire snapper grouper permits.

South Atlantic for-hire snapper grouper permits are held by those with mailing addresses in 429 communities (SERO Permits Office, April 8, 2021). Communities with the most for-hire snapper grouper permits are located in communities in Florida, North Carolina, and South Carolina (Table 3.4.2.1). A large number of communities with the most for-hire snapper grouper permits are located in the Florida Keys (Key West, Marathon, Islamorada, Tavernier, Summerland Key, and Key Largo). The communities with most South Atlantic for-hire snapper grouper permits are Key West (8.4% of for-hire snapper grouper permits), Marathon (3%), and Islamorada, Florida (2.9%).

Table 3.4.2.1. Top communities by number of South Atlantic for-hire snapper grouper permits.

State	Community	Permits
FL	Key West	136
FL	Marathon	49
FL	Islamorada	47
FL	Tavernier	36
FL	St. Augustine	35
FL	Fort Lauderdale	30
FL	Jacksonville	29
FL	Merritt Island	28
FL	Jupiter	23
NC	Wilmington	23
FL	Summerland Key	22
NC	Hatteras	22
FL	Key Largo	21
FL	Port Orange	19
SC	Charleston	19
FL	Miami	18
SC	Mt. Pleasant	18

Source: SERO Permits Office, April 8, 2021.

Engagement and Reliance

Landings for the recreational sector are not available by species at the community level, making it difficult to identify communities as dependent on recreational fishing for red snapper or snapper group in general. Because limited data are available concerning how communities are engaged and reliant on specific species or species groups in the recreational sector, indices were created using secondary data from permit and infrastructure information for the southeast recreational fishing sector at the community level (Jacob et al. 2013; Jepson and Colburn 2013). Recreational fishing engagement is represented by the number of recreational permits and vessels designated as “recreational” by homeport and owner address. Fishing reliance includes the same variables as fishing engagement, divided by population. Factor scores of both engagement and reliance were plotted by community.

Figure 3.4.2.1 identifies the top communities that are engaged and reliant upon recreational fishing in general. All included communities demonstrate high levels of recreational engagement. Four communities (Islamorada, Florida; Hatteras, North Carolina; Tavernier, Florida; and Manteo, North Carolina) demonstrate high levels of recreational reliance.

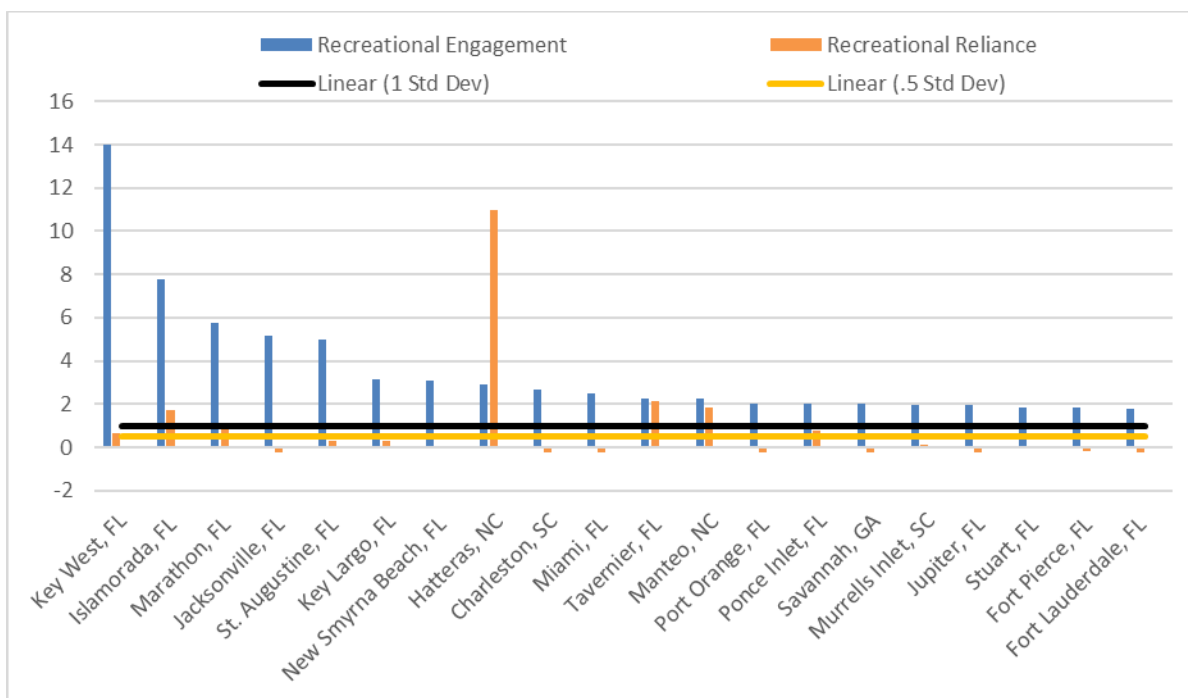


Figure 3.4.2.1. Top 20 communities by recreational fishing engagement and reliance.
Source: SERO, Community Social Vulnerability Indicators Database 2019.

The description of fishing activities presented above highlights which communities may be most involved in South Atlantic red snapper and snapper grouper fishing. It is expected that the impacts from the regulatory action in this regulatory amendment, whether positive or negative, would most likely affect those communities identified above.

3.4.3. Environmental Justice, Equity, and Underserved Communities

Federal agencies are required to consider the impacts and/or address the inequalities of their policies on minority populations, low-income populations, disadvantaged communities, and/or underserved communities. These requirements are outlined in the following Executive Orders (E.O.).

E.O. 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 E.O. 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 E.O. is generally referred to as environmental justice (EJ).

E.O. 13985 requires federal agencies to recognize and work to redress inequalities in their policies and programs that serve as barriers to equal opportunity, including pursuing a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Federal agencies must assess how programs and policies perpetuate systemic barriers to opportunities and benefits to people of color and other underserved groups in order to equip agencies to develop policies and programs that deliver resources and benefits equitably to all.

E.O. 13985 provides definitions for equity and underserved communities, which expand the definition of a community from being geographically situated, or place-based, as defined through the Magnuson-Stevens Act, to also include communities that share a particular characteristic (e.g., crew of commercial fishing vessels). Equity means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. The term “underserved communities” refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list in the preceding definition of “equity.”

E.O. 14008 calls on agencies to make achieving EJ part of their missions “by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.” Census data are available to examine the status of communities with regard to minorities and low-income populations. These data describe geographically based communities (e.g., Key West, Florida)

and are descriptive of the total population, not limited to the fishing components of the community. Information is not available at this time to examine the status of underserved populations engaged in South Atlantic fisheries. To help assess whether EJ concerns may be present within regional place-based communities, a suite of indices were created using census data to examine the social vulnerability of coastal communities within the region. The three indices are poverty, population composition, and personal disruption. 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. Poverty includes poverty rates for different groups; population composition includes more single female-headed households, households with children under the age of five, minority populations, and those that speak English less than well; and personal disruption includes disruptions such as higher separation rates, higher crime rates, and unemployment. Increased rates in the indicators are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figures 3.4.3.1 and 3.4.3.2 provide social vulnerability rankings for place-based communities identified in Section 3.4 as important to commercial and recreational fishing for red snapper specifically or fishing for snapper grouper in general. Several communities exceed the threshold of one standard deviation above the mean for at least one of the indices (Daytona Beach, Fort Pierce, Hialeah, and Miami, Florida). Two of the communities exceed the threshold for all three of the indices (Fort Pierce and Hialeah, Florida). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption resulting from regulatory change.

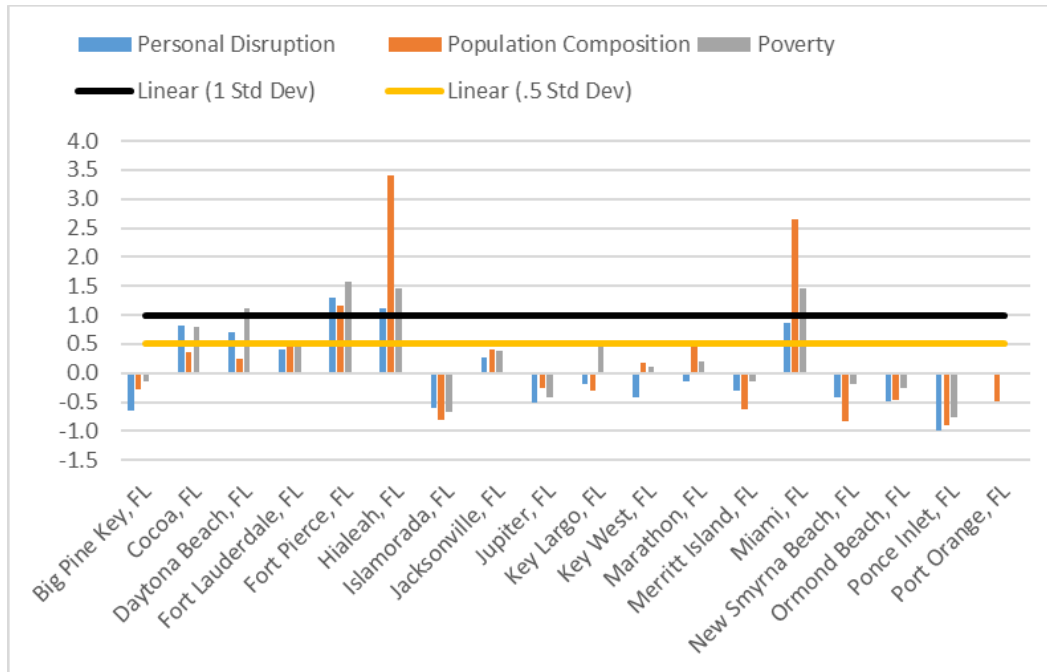


Figure 3.4.3.1. Social vulnerability indices for top commercial and recreational snapper grouper and red snapper communities.

Source: SERO, Community Social Vulnerability Indicators Database 2019.

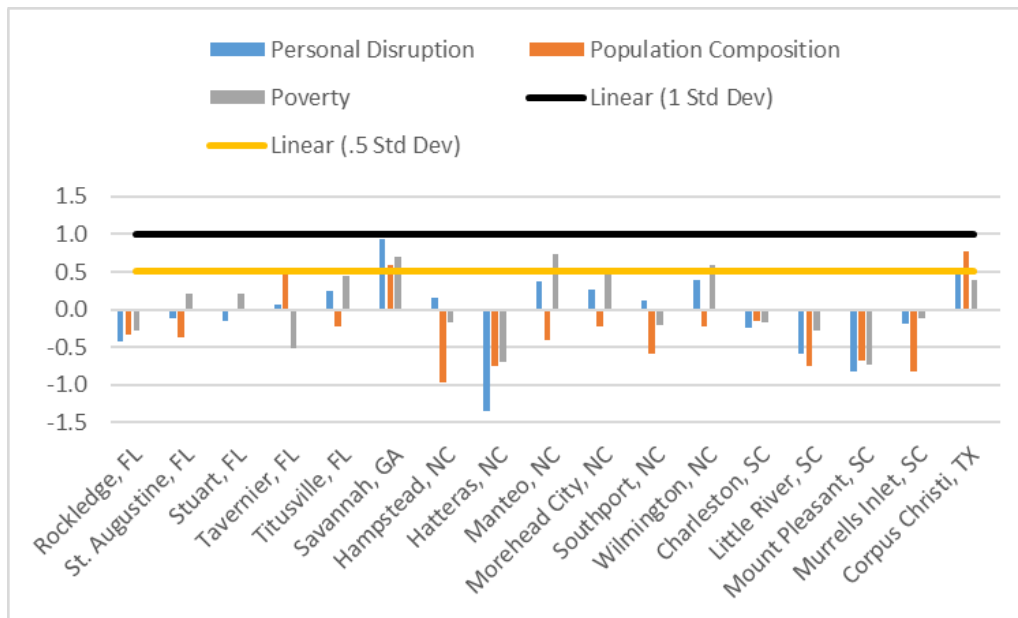


Figure 3.4.3.2. Social vulnerability indices for top commercial and recreational snapper grouper and red snapper communities continued.

Source: SERO, Community Social Vulnerability Indicators Database 2019.

People in these communities may be affected by fishing regulations in two ways: participation and employment. Although the place-based communities identified in Figures 3.4.3.1 and 3.4.3.2 may have the greatest potential for EJ concerns, complete data are not available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on red snapper and snapper grouper specifically (participation). The potential effects of the actions on place-based communities and non-place based communities, such as such as commercial fishermen and recreational stakeholders are discussed in Sections 4.1.3 and 4.2.3. There are no known populations that rely on the consumption of red snapper for subsistence. Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

3.5. Administrative Environment

3.5.1. 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 is responsible for conservation and management of fishery resources in federal waters of the U.S. South Atlantic. These waters extend from 3 to 200 mi offshore from the seaward boundary of 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 (USCG), 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. The Council also established two voting seats for the Mid-Atlantic Council on the South Atlantic Mackerel Committee. Council members serve three-year terms and are recommended by state governors and appointed by the Secretary from lists of nominees submitted by state governors. Appointed members may serve a maximum of three consecutive terms.

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

3.5.2. State Fishery Management

The state governments of 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. North Carolina’s marine fisheries are managed by the Marine Fisheries Division of the North Carolina Department of Environmental Quality. The Marine Resources Division of the South Carolina Department of Natural Resources manages South Carolina’s marine fisheries. Georgia’s marine fisheries are managed by the Coastal Resources Division of the Department of Natural Resources. The Division of Marine Fisheries Management of the Florida Fish and Wildlife Conservation Commission is responsible for managing Florida’s marine fisheries. Each state fishery management agency has a designated seat on the South Atlantic Council. The purpose of state representation at the 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 South Atlantic states are also involved through ASMFC in management of marine fisheries. This commission was created to coordinate state regulations and develop management plans for interstate fisheries. It has significant authority, through the Atlantic Striped Bass Conservation Act and the Atlantic Coastal Fisheries Cooperative Management Act, to compel adoption of complementary state regulations to conserve coastal species. The ASFMC is also represented at the Council but does not have voting authority at the Council level.

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

3.5.3. Enforcement

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

Neither NOAA/OLE nor the USCG can provide a continuous law enforcement presence in all areas due to the limited resources of NOAA/OLE and the priority tasking of the USCG. To supplement at sea and dockside inspections of fishing vessels, NOAA entered into Cooperative

Enforcement Agreements with all but one of the states in the Southeast Region (North Carolina), which granted authority to state officers to enforce the laws for which NOAA/OLE has jurisdiction. In recent years, the level of involvement by the states has increased through Joint Enforcement Agreements, whereby states conduct patrols that focus on federal priorities and, in some circumstances, prosecute resultant violators through the state when a state violation has occurred.

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

Chapter 4. Environmental Effects and Comparison of Alternatives

4.1. Action 1. Reduce the acceptable biological catch, total annual catch limit, and sector annual catch limits, and establish an annual optimum yield for South Atlantic red snapper

4.1.1. Biological Effects

The current overfishing limit (OFL) for South Atlantic red snapper is 56,000 fish and the acceptable biological catch (ABC) is 53,000 fish (SEDAR 41 2017). There is no current annual optimum yield (OY). The current total annual catch limit (ACL) (commercial and recreational ACLs combined) is 42,510 fish (Amendment 43, SAFMC 2017c). The total ACL is based on the South Atlantic Fishery Management Council's (Council) Scientific and Statistical Committee's (SSC) previous ABC recommendation. The red snapper commercial and recreational sectors are managed independently to constrain their harvest to the respective ACLs. Based on the current sector allocation ratio developed by the Council for red snapper of 28.07 % commercial and 71.93 % recreational, the total ACL is separated into a commercial ACL of 124,815 pounds (lbs) whole weight (ww), and a recreational ACL of 29,656 fish (Amendment 43, SAFMC 2017c). In 2021, the SSC recommended new ABC and OFL values (Table 1.5.1) as a result of the latest stock assessment (SEDAR 73 2021).

Alternative 1 (No Action) would retain the total ACL of 42,510 fish that exceeds the most recent ABC and OFL recommendations of the SSC, and would not end overfishing of red snapper. Potential adverse biological impacts from overfishing (fishing mortality too high) include a decrease in the average age and size structure, decline in recruitment, and reduced stock resilience to environmental perturbations. Overall, **Alternative 1 (No Action)** is not a viable alternative because it would not be based on the best scientific information available (BSIA) and would exceed the ABC recommended by the SSC.

Relative to **Alternative 1 (No Action)**, the annual OY and ACLs in **Preferred Alternative 2** and **Alternative 3** are based on the SSC's new OFL and ABC recommendation but like

Alternatives

1. (No Action). The ABC for South Atlantic red snapper is 53,000 fish. The total ACL is 42,510 fish. The commercial sector ACL is 124,815 lbs ww. The recreational sector ACL is 29,656 fish.
2. **Reduce the red snapper ABC and set it equal to the most recent recommendation from the SSC. Revise the total ACL and establish an annual OY for red snapper and set them equal to the recommended ABC.**
3. Reduce the red snapper ABC and set it equal to the most recent recommendation from the ABC. Revise the total ACL and establish an annual OY for red snapper and set them equal to **0 fish**.

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

Alternative 1 (No Action), they do not end overfishing. The SSC's OFL and ABC recommendations assume a commensurate reduction in dead discards to end overfishing.

In general, lower ACLs are expected to result in positive biological effects to the red snapper stock. As a predominately bycatch or catch and release fishery already, the considered changes to ACLs under Action 1 are not expected to result in substantial changes in fishing effort or a reduction in discards (noting the small scale of the differences between projected seasons under **Preferred Alternative 2** and **Alternative 3**). However, **Preferred Alternative 2** and **Alternative 3** are both within the SSC's recommended ABC and OFL levels and would support the current rebuilding plan. Over the long term, reducing harvest of red snapper to help improve the age structure of the population would be expected to allow the stock to be less susceptible to adverse environmental conditions that might affect recruitment success. However, lower catch levels than what is currently specified, would result in a shorter season, as proposed by **Preferred Alternative 2** and **Alternative 3**. Apart from **Alternative 1 (No Action)**, **Preferred Alternative 2** would allow the greatest amount of harvest of the action alternatives considered and result in the less biological benefit to the red snapper stock than **Alternative 3** as there would be no buffer between the ABC and the total ACL. **Alternative 3** would result in the most benefits to the red snapper stock among the alternatives considered because the total ACL would be set to zero and all harvest would be prohibited.

Commercial Sector Landings and Predicting Future Season Length

During 2015 and 2016, total removals (with many of these removals occurring as recreational dead discards) exceeded the ABC in the preceding years (2014 and 2015), so the total ACL was set to zero. From 2017 through 2022 (except for 2018), the commercial ACL has been met in about two months, resulting in an in-season closure each year (Tables 4.1.1.1 and 4.1.1.2).⁷ Georgia landings were confidential so they were added to the east Florida landings. Commercial landings for South Atlantic red snapper were highest in east Florida and Georgia. During 2018 and 2021, commercial harvest was closed in-season as the ACL was predicted to be met, but was reopened later in the season to allow harvest of the entire ACL.

⁷ In 2017, the National Marine Fisheries Service allowed limited commercial (and recreational) harvest of red snapper in 2017 by a temporary rule through emergency action pursuant to the Magnuson-Stevens Fishery Conservation and Management Act ([82 FR 50839](#), November 2, 2017) as a result of new scientific information regarding improvements in the red snapper stock. Amendment 43 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (SAFMC 2017c) revised the red snapper commercial and recreational ACLs and allowed for the harvest of red snapper in South Atlantic federal waters. Additionally, the final rule provided notice of the red snapper commercial season opening date and the opening and closing dates for the recreational season in the South Atlantic for the 2018 fishing year.

Table 4.1.1.1. South Atlantic red snapper commercial landings in lbs ww from 2017 through 2021 and the percentage of the commercial ACL landed each year. 2022 landings are considered preliminary.

Year	East FL and GA*	NC	SC	Total landings	ACL	ACL %
2017	75,491	9,803	3,980	89,274	124,815	71.5
2018	106,769	11,628	9,756	128,153	124,815	102.7
2019	108,513	10,074	7,142	125,729	124,815	100.7
2020	115,880	12,307	6,294	134,480	124,815	107.7
2021	103,696	16,178	8,413	128,287	124,815	102.8
2022	Preliminary					

Source: SERO Commercial ACL dataset: WH_ACLS_2014-2021_31Aug2022.xlsx.

*Georgia.

Table 4.1.1.2. Dates when the South Atlantic red snapper commercial sector was open in the years of 2017 through 2022.

Year	Days Open During Season	Number of Open Days
2017	November 2, 2017, to December 31, 2017	60
2018	July 26, 2018, to November 7, 2018, reopened December 5, 2018, to December 15, 2018	114
2019	July 8, 2019, to August 30, 2019	53
2020	July 13, 2020, to September 5, 2020	54
2021	July 12, 2021, to September 14, 2021, reopened November 2, 2021, to November 6, 2021	68
2022	July 11, 2022, to August 31, 2022	51

Predicted landings for the various commercial ACLs were analyzed using the average catch rates by month (Appendix F). Amendment 28 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (SAFMC 2013a) established that the start of the commercial season begins on the second Monday in July each year. For the range of years considered in the analysis (2023-2027), the second Monday in July could occur from July 8 to July 12. July 10 was used for the analysis because it falls in the middle of July 8 through 12.

Preferred Alternative 2 and **Alternative 3** would specify annual ACLs from 2023 through 2027 until modified. The analysis was simplified by only using the highest and lowest ACL in each of **Preferred Alternative 2** and **Alternative 3**. The estimated closure dates and total number of days that snapper grouper harvest would be open for the proposed commercial ACLs under **Preferred Alternative 2** and **Alternative 3** are shown in Table 4.1.1.3. Since the ACLs start at their lowest value beginning in 2023 for **Preferred Alternative 2**, and increase until 2027, the number of days the fishing season is predicted to be open increases.

Table 4.1.1.3. Estimated closure dates for the various commercial ACLs. The closure dates were determined from assuming the commercial sector opens on July 10.

Alternative	Fishing year	Commercial ACL (lbs ww)	Estimated Closure Date	Estimated Total Number of Open Days
Alternative 1	-	124,815	11-Sep	63
Preferred Alternative 2 (Lowest ACL)	2023	77,016	16-Aug	37
Preferred Alternative 2 (Highest ACL)	2027+	99,021	27-Aug	48
Alternative 3	2023-2027	0	0	0

Recreational Sector Landings and Predicting Future Season Length

Concurrently with the commercial sector, the recreational ACL was set to zero during 2015 and 2016. Since 2017, the majority of red snapper has been landed in east Florida (Table 4.1.1.4). The red snapper recreational sector was open 6 days in November and 3 days in December during 2017, and for 6 days during August in 2018 (Table 4.1.1.5). The length of the red snapper recreational season has continued to decline to 5 days in 2019, 4 days in 2020, and 3 days in 2021, because of the recreational ACL being projected to be reached sooner each year (Table 4.1.1.5). In 2022, the red snapper recreational season was open for 2 days. Recreational landings of South Atlantic red snapper have exceeded the recreational ACL since 2018 (Table 4.1.1.4).

Table 4.1.1.4. Recreational landings (numbers of fish), annual catch limits (ACL; numbers of fish), and season length (number of open days) for South Atlantic red snapper from 2017 through 2021. 2022 landings are considered preliminary.

Fishing Year	Georgia	East Florida	North Carolina	South Carolina	Total Landings	Recreational ACL	Number of Open Days
2017	84	13,193	194	1,950	15,421	29,656	9
2018	23,087	37,367	472	223	61,149	29,656	6
2019	15,564	44,113	150	15,276	75,103	29,656	5
2020	14,646	36,363	1,640	23,640	76,289	29,656	4
2021	6,807	36,053	7,805	332	50,997	29,656	3
2022	Preliminary					29,656	2

Source: landings come from analysis for Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES), Headboat, and available State Survey data; MRIP data come from MRIP_FES_rec81_22wv4_25Oct22w2014to2021LACreel.xlsx.

Table 4.1.1.5. Dates when the South Atlantic red snapper recreational sector was open in 2017 through 2022.⁸

Year	Days Open During Season	Number of Open Days
2017	November 3, 4, 5, 10, 11, and 12, 2017; reopened December 8, 9, 10, 2017.	9
2018	August 10, 11, 12, 17, 18, and 19, 2018	6
2019	July 12, 13, 14, 19 and 20, 2019	5
2020	July 10, 11, 12, and 17, 2020	4
2021	July 9, 10, and 11, 2021	3
2022	July 8 and 9, 2022	2

Due to potential changes to stock size over time and the limited historical data from July, the season length analysis under proposed recreational catch limits only uses July 2019, 2020, and 2021 data as a proxy⁹ to predict future landings and the recreational season (Appendix F). There is evidence of non-compliance in recent years, with harvest occurring outside of the open red snapper recreational season (Marine Recreational Information Program [MRIP] and National Marine Fisheries Service [NMFS] Southeast Region Headboat Survey). Harvest outside of the open red snapper recreational season is relatively low (<5% of total harvest) compared to harvest during the open season, but still exists. During the closed recreational red snapper season (January through June, August through December) in 2019, 2020, and 2021, there was an average recreational harvest of 600 red snapper each year. To account for the observed non-compliance, this analysis assumed there would be 600 red snapper harvested in the recreational sector during the closed recreational red snapper season, from January through June, and from August through December. Because the red snapper recreational fishing season opens the second Friday in July and NMFS projects the length of the recreational fishing season, future landings were only predicted for July. Future July recreational landings were estimated by calculating the red snapper recreational daily catch rate from the average of 2019 through 2021 (Appendix F, Table F-4), and then applying the catch rate to the number of weekend days (Friday, Saturday, and Sunday) for July. Predicted landings assumed a uniform distribution of landings for each day in July.

The estimated future closure dates and total number of days the recreational red snapper season would be open for the various recreational ACLs are shown in Table 4.1.1.6. The red snapper ACL is predicted to be met in one day under **Preferred Alternative 2** (Table 4.1.1.6). Harvest would be prohibited under **Alternative 3**.

⁸ Since completion of the analyses in this framework amendment, the recreational season for 2023 has been announced to be 2 days, July 14 and 15.

⁹2022 landings were not used because they were still considered preliminary when the analysis was completed.

Table 4.1.1.6. Estimated number of days the recreational red snapper season would be open for the various recreational ACLs. The number of days was generated by dividing the recreational ACL by the average catch rate during 2019-2021 (17,031 fish per day).

Alternative	Fishing Year	Recreational ACL (Numbers of Fish)	Estimated Number of Open Days
Alternative 1		29,656	2
Preferred Alternative 2 (Lowest ACL)	2023	19,119	1
Preferred Alternative 2 (Highest ACL)	2027+	24,581	1
Alternative 3	2023+	0	0

Expected Effects to Bycatch and Discards

Red snapper can be found at depths of 33-623 feet, and release mortality rates for red snapper range from 22-32%,¹⁰ depending on the sector (Appendix G, Table G.10). Release mortality rates for species in the snapper grouper fishery that co-occur with red snapper are also widely variable depending on species and fishing mode, ranging from 6.8% for black sea bass caught in commercial black sea bass pots to 53% for red porgy in the commercial sector, with sector-specific values in between for other species such as gray triggerfish, yellowtail snapper, and vermilion snapper. Red snapper are often harvested incidentally when fishing for other snapper grouper species, such as vermilion snapper, gray triggerfish, red porgy, and black sea bass (Appendix G, Tables G-2 and G-11). Across most of the snapper grouper species, including red snapper, the magnitude of private mode discards is much higher compared to the headboat or charter modes (Appendix G, Table G.4). Recreational discards of several snapper grouper species are higher than the landings for certain modes of fishing (Appendix G, Table G.5). Black sea bass, gag, red snapper, red grouper, and tomtate discards are much higher than their landings across all modes. Red snapper recreational discards to landings ratios are 5,270% in the headboat component, 1,177% in the charter component, and 859% in the private recreational component (Appendix G, Table G.5).

In general, during the short recreational and commercial seasons, a portion of the red snapper catch do not survive after being returned to the water ('dead releases' or 'dead discards'). Of the four discard codes, "out of season" regulations was the most common reason selected for discarded red snapper based on self-reported commercial discards (Appendix G, Table G.3). When compared to **Alternative 1 (No Action)**, decreasing the total and sector ACLs under **Preferred Alternative 2** and **Alternative 3**-would allow for less fish to be harvested. However, high numbers of removals could still occur with shorter seasons from **Preferred Alternative 2** or **Alternative 3** due to high rates of discarding and high numbers of dead discards of red snapper that occur outside of the open season. **Preferred Alternative 2** and **Alternative 3** do

¹⁰ A discard mortality rate of 0.2 implies that, of every five fish released, one fish would die.

have the potential to reduce total removals in both sectors if fewer trips target snapper grouper species that co-occur with red snapper, which could also result in a reduction in discards from the status quo (See Section 4.1.3).

Preferred Alternative 2 would create both beneficial and adverse biological effects. It is unclear whether the net biological effect of reducing the ACL would be positive or negative. Positive biological effects would be expected from reduced landings in both sectors compared to **Alternative 1 (No Action)**. Positive biological effects could also be experienced if reduced catch levels reduce the overall effort applied to the snapper grouper fishery in areas where red snapper are caught. Also, reducing the number of removals by lowering the overall catch (fewer fish released at a given discard mortality rate) could result in fewer dead discards; this is more likely for the commercial sector. Since there is a one-fish bag limit for the recreational sector during the open season, and no minimum size limit for either sector, fishermen have also reported “high grading,” which means discarding of smaller fish as larger fish are caught. Positive biological effects could occur if high-grading and overall catch (landings and discards) is reduced by a shorter season. However, since 2017, red snapper recreational discards per day during open seasons for Florida (where the majority of catch in the region occurs) have increased with shorter seasons (Table G.9; in-season catch estimates for Florida are collected by the Florida State Reef Fish Survey). In 2021, which was the shortest recreational season (included in the analysis (3 days), discards in Florida for the open days were 54,685 fish and the daily discard rate during the recreational season was 18,228 fish per day (Table G.9). This was a close second to the highest number of discards during an open season under this management regime (2019; 5-day season; 56,648 discards) and the highest open season daily rate from 2017 to 2021. Therefore, shortened open recreational seasons for red snapper may have condensed effort rather than reduced effort. This makes biological effects for the recreational sector unclear and potentially strongly impacted by weather during the open days. While additional recreational effort is expected to generally occur during the red snapper season, further increased effort and negative biological effects due to greater catches would be expected during years when the season coincides with favorable weather.

Closure of red snapper harvest for the entire year (ACL=0; **Alternative 3**) is likely to provide the greatest biological benefits of all the alternatives from reduced landings in both sectors. The greatest benefit is likely to occur due to the removal of the derby-like recreational fishery that occurs during the days when red snapper are open. During open recreational days, additional red snapper are discarded, likely due to targeting and additional or increased fishing effort. A closure for the entire year would likely change these days to “normal” fishing days, in which recreational fishers would not target red snapper. Therefore, biological benefits from reductions in landings-related mortality and discard mortality could be expected. Benefits from reduced dead discards may be limited by the small number of days shifted from higher recreational effort to more typical recreational effort (e.g., three days in 2021, one day for the projected **Preferred Alternative 2** catch limits).

The Southeast Fisheries Science Center provided information to the Council during their December 2022 meeting that showed that a large reduction of discard mortalities is needed to

end overfishing of red snapper.¹¹ The alternatives under Action 1 would be unlikely to reduce discards to the level that would be needed to end overfishing. Therefore, **Preferred Alternative 2** and **Alternative 3** could still represent a catch level that would continue to result in overfishing, unless discards are considerably reduced in addition to a reduction to the total ACL. However, reducing the ACL would continue to rebuild the stock under the rebuilding plan. Furthermore, as stated in Chapter 1, this framework amendment including its education and outreach plan (Appendix H), coupled with future amendments based on the results of the snapper grouper management strategy evaluation and other research projects, could be expected to contribute towards ending overfishing of red snapper (Summary Section and Section 1.1).

Overall, there are a lack of data to quantify or predict the net biological effects from landings and discards from Action 1. **Preferred Alternative 2** and **Alternative 3** could result in a decrease or an increase in discards and overall fishing-related mortality. **Alternative 3** could provide the greatest biological benefit due to reduced landings and removal of recreational open season days that are typically associated with higher effort and discards. Since ACLs and accountability measures (AM) are in place for red snapper, and this action would only reduce the ACLs, any changes in fishing effort or behavior or reductions in discards resulting from this action are expected to be limited. Additionally, the proposed reduced ACLs under this action would not be expected to result in significant biological effects, positive or negative, on co-occurring species (refer to Bycatch Practicability Analysis in Appendix G).

Expected Effects to Protected Species and Essential Fish Habitat

No increase in fishing effort is expected from the considered Action 1 alternatives. Therefore, there are likely to be no additional negative effects, to protected species from the action alternatives. Positive effects, if experienced, would be expected to be minimal.

Non-longline hook-and-line gear is predominantly used to harvest red snapper by the recreational sector. This gear type is the Sustainable Seafood Guide's recommended gear in the U.S. as a "best choice" since vertical gear has minimal to no impacts on the seafloor, and does little damage to physical or biogenic habitats (Blue Ocean 2010; Seafood Watch 2023). Therefore, no adverse effects on essential fish habitat (EFH), EFH-Habitat Areas of Particular Concern (HAPC), or Coral HAPCs are anticipated.

4.1.2. Economic Effects

In general, ACLs that allow for fewer fish to be landed can result in decreased net economic benefits if harvest decreases. The ACL does not directly impact the fishery for a species unless harvest changes, fishing behavior changes, or the ACL is met or exceeded, thereby potentially triggering AMs such as harvest closures or other restrictive measures. In the case of red snapper, the revised ACLs being considered in **Preferred Alternative 2** and **Alternative 3** would be constraining on harvest and are projected to reduce landings of red snapper for both the commercial and recreational sectors. As such, a reduction in direct net economic benefits would be expected from each of these alternatives. **Alternative 1 (No Action)** provides the highest

¹¹ <https://safmc.net/events/september-2022-council-meeting/>

ACL and thus the highest potential economic benefits but this alternative is not viable since it does not represent BSIA resulting from the most recent catch level recommendation from the SSC. All of the alternatives being considered would maintain the current sector allocation of the total ACL, which is 28.07% to the commercial sector and 71.93% to the recreational sector.

Alternative 1 (No Action) would contribute the least towards reducing overfishing and rebuilding the stock of red snapper, thus leading to potential long-term negative economic effects through relatively reduced future catch levels and the economic benefits that result from those catch levels. **Preferred Alternative 2** and **Alternative 3** would contribute more towards ending overfishing and rebuilding of the red snapper stock, thus reducing the potential of these long-term negative economic effects occurring or potentially mitigating their magnitude.

Commercial Sector

Alternative 1 (No Action) would maintain the current commercial ACL of 124,815 lbs ww or 112,446 lbs gutted weight (gw) using a ww to gw conversion factor of 1.11. **Preferred Alternative 2** and **Alternative 3** would result in comparatively lower commercial ACLs (Table 4.1.2.1).

The relatively decreased potential landings under **Preferred Alternative 2** and **Alternative 3** occurring from a reduction in the sector ACL would result in reduced revenues and net economic benefits, represented by producer surplus (PS), for commercial vessels. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 2** would result in an estimated decrease in PS of \$263,540 in the 2023 fishing year. This relative reduction in PS would be less each subsequent year thereafter, as the commercial sector ACL increases until the 2027 fishing year, where the ACL would remain constant until modified. **Alternative 3** would result in an estimated decrease in PS of \$688,169 in the 2023 fishing year and remain constant until the ACL is modified (2021 \$; Table 4.1.2.2). These estimated changes in net economic benefits are a total for all vessels combined.

Estimates of net revenues or economic profit are not available for snapper grouper dealers. Therefore, it is not possible to quantitatively estimate the effect of changes in purchases on their profits. However, 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 directionality of economic benefits to dealers would be the same as stated above and would be expected to decrease as a result of **Action 1**. Since red snapper make up approximately 2% of total purchases by dealers, indicating that there is a low financial dependency on red snapper landings, the expected change in net economic benefits to most dealers is expected to be minimal (Section 3.3.1).

Table 4.1.2.1. Difference between the commercial sector ACLs in **Action 1** compared to **Alternative 1 (No Action)**.

Fishing Year	Commercial Sector ACL (lbs gw) ^{1,2}	Difference from Alternative 1 (No Action) (lbs gw) ¹	Difference from Alternative 1 (No Action) (%)
Preferred Alternative 2			
2023	69,384	-43,062	-38%
2024	76,818	-35,628	-32%
2025	81,774	-30,672	-27%
2026	86,730	-25,716	-23%
2027+	89,208	-23,238	-21%
Alternative 3			
2023	0	-112,446	-100%
2024	0	-112,446	-100%
2025	0	-112,446	-100%
2026	0	-112,446	-100%
2027+	0	-112,446	-100%

¹Assumes a 1.11 ww to gw conversion factor.

²Based on sector ACL included in Section 2.1.

Table 4.1.2.2. Estimated change in potential net economic benefits for the commercial sector (PS) from the alternatives in **Action 1** compared to **Alternative 1 (No Action)** (2021 \$).

Fishing Year	Preferred Alternative 2	Alternative 3
2023	-\$263,540	-\$688,169
2024	-\$218,043	-\$688,169
2025	-\$187,713	-\$688,169
2026	-\$157,383	-\$688,169
2027+	-\$142,216	-\$688,169

To estimate the change in potential net economic benefits for the commercial sector, the difference in the current and potential future commercial portion of the total ACL is applied to the appropriate price (\$6.12/lbs gw; Tables 3.3.1.2 and 3.3.1.3) to estimate PS for the commercial sector (Section 3.3.1). A further scaling factor is not applied to gross revenue in this circumstance to estimate PS since red snapper has a relatively low trip limit (75 lbs gw) and makes up a relatively small portion of total revenue for vessels that land the species (Section 3.3.1), thus any incremental change in gross revenue occurring due to a change in landings of red snapper would equate to an equal change in net benefits. It is also assumed that the ex-vessel price would not change as a result of a change in commercial landings due to the relatively low existing landings for red snapper in the South Atlantic Region and notably higher commercial

landings that originate from the Gulf of Mexico Region. Although there are no currently available estimates of the demand elasticity for red snapper in the South Atlantic Region, it is assumed that there would be minimal expected change to consumer surplus (CS) from the commercial perspective since there is likely a high degree of substitutability of red snapper for other species as well as the previously noted commercial red snapper landings from the Gulf of Mexico Region.

Recreational Sector

Alternative 1 (No Action) would maintain the current recreational ACL of 29,656 fish.

Preferred Alternative 2 and **Alternative 3** would result in comparatively lower recreational sector ACLs (Table 4.1.2.3).

The relatively decreased potential landings under **Preferred Alternative 2** and **Alternative 3** occurring from a reduction in the sector ACLs would result in reduced net economic benefits, represented by CS, for recreational anglers. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 2** would result in an estimated decrease in CS of \$785,428 in the 2023 fishing year. This relative reduction in CS would be less each subsequent year thereafter as the recreational sector ACL increases until the 2027 fishing year, where the ACL would remain constant until modified. **Alternative 3** would result in an estimated decrease in CS of \$2,210,558 in the 2023 fishing year and remain constant until the ACL is modified (2021 \$; Table 4.1.2.4).

Table 4.1.2.3. Difference between the recreational sector ACLs in **Action 1** compared to **Alternative 1 (No Action)**.

Fishing Year	Recreational Sector ACL (# of fish)¹	Difference from Alternative 1 (No Action) (# of fish)	Difference from Alternative 1 (No Action) (%)
Preferred Alternative 2			
2023	19,119	-10,537	-36%
2024	22,119	-7,537	-25%
2025	24,119	-5,537	-19%
2026	26,119	-3,537	-12%
2027+	27,119	-2,537	-9%
Alternative 3			
2023	0	-112,446	-100%
2024	0	-112,446	-100%
2025	0	-112,446	-100%
2026	0	-112,446	-100%
2027+	0	-112,446	-100%

¹Based on sector ACL included in Section 2.1.

Table 4.1.2.4. Estimated change in potential net economic benefits for the recreational sector (CS) from the alternatives in **Action 1** compared to **Alternative 1 (No Action)** (2021 \$).

Fishing Year	Preferred Alternative 2	Alternative 3
2023	-\$785,428	-\$2,210,558
2024	-\$561,808	-\$2,210,558
2025	-\$412,728	-\$2,210,558
2026	-\$263,648	-\$2,210,558
2027+	-\$189,108	-\$2,210,558

To estimate the change in net economic benefits for the recreational sector, a CS estimate of \$74.54 for the second red snapper kept on a recreational trip is used (2021 \$; Section 3.3.2). This marginal value estimate is used as it is closest to the current retention limit of one fish per person when the season is open. It is assumed that changes in the recreational portion of the total ACL would mainly affect overall harvest of red snapper and not markedly change overall annual effort (i.e., the number of angler trips taken each year) in the South Atlantic region due to the relatively short existing open harvest season for red snapper and many potential substitute target species that are available in July when the recreational red snapper season would be open.

While it is feasible that there could be some level of reduction in the number of recreational trips, the existing recreational season for red snapper is highly limited and would be reduced by 2 to 3 days, depending on the alternative that is chosen (Table 4.1.1.6). Additionally, there is a great deal of uncertainty in existing recreational effort data targeting red snapper during the short open harvest season. In most recent years, target trip estimates for red snapper as provided by the Marine Recreational Information Program are accompanied by percentage standard error estimates that are above 50, indicating that these estimates are very imprecise.

As such, the economic effects of a potential change in total recreational effort are not quantified. This includes any quantified change in recreational effort onboard for-hire fishing vessels, thus there is no quantified change in PS provided for the for-hire component of the recreational sector. Although there is not an estimate available for a potential change in PS, there is the possibility that angler demand for for-hire trips would somewhat decrease if the open season for red snapper is reduced as a result of a decreased ACL, resulting in lower booking rates and for-hire business net operating revenue. Thus, reducing the ACL for red snapper would likely reduce net economic benefits for the for-hire component of the recreational sector. Any reduction in net economic benefits is expected to be minimal for most for-hire vessels given the short existing season for red snapper under the current ACL in addition to the opportunity for anglers onboard for-hire vessels to target many other species.

Total

Among the viable alternatives being considered in **Action 1**, **Preferred Alternative 2** would allow for comparatively higher potential landings and thus the higher potential net economic benefits than **Alternative 3**. In comparison to **Alternative 1 (No Action)**, **Preferred Alternative 2** would decrease net economic benefits by \$1,048,968 and **Alternative 3** would decrease net economic benefits by \$2,898,727 in the 2023 fishing year (2021 \$; Table 4.1.2.5).

Table 4.1.2.5. Estimated change in potential net economic benefits (recreational and commercial combined) from **Action 1** compared to **Alternative 1 (No Action)** (2021 \$).

Fishing Year	Preferred Alternative 2	Alternative 3
2023	-\$1,048,968	-\$2,898,727
2024	-\$779,851	-\$2,898,727
2025	-\$600,441	-\$2,898,727
2026	-\$421,031	-\$2,898,727
2027+	-\$331,324	-\$2,898,727

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, they can restrict harvest in the current season or subsequent seasons. This can 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 altogether 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.

Under **Preferred Alternative 2** and **Alternative 3**, the ACL for red snapper would be based on the most recent stock assessment. Adjustments in an ACL based on updated information are necessary to ensure harvest remains sustainable and fishermen can continue to have access to the resource over time. **Alternative 1 (No Action)** would not update the red snapper ACL based on current information and would not provide the long-term social benefits associated with sustainable harvest. The most recent stock assessment indicated that red snapper was overfished and undergoing overfishing. **Preferred Alternative 2** and **Alternative 3** would not end overfishing. Not ending overfishing for red snapper would result in long-term negative social effects such as fishermen having to change their behavior and business operations to focus on alternative species. Red snapper is a popular fishery, particularly for the recreational sector, and overfishing and subsequent lower catches, may affect how often private and for-hire anglers choose to go fishing offshore.

Alternative 3 would set the ACL for red snapper equal to zero, closing red snapper to commercial and recreational harvest until modified. The absence of a fishing season for red snapper in past years was highly controversial with negative effects on private recreational fishermen, for-hire businesses, and commercial vessels, especially when compared to the benefits to fishermen during the allowed open seasons.

Commercial and recreational landings are estimated to vary year by year, but projections show that both the commercial and recreational sectors are likely to experience closures and short seasons, respectively, under all proposed alternatives except **Alternative 3**, which would close the red snapper year-round (Appendix F). There would likely be some negative effects on private recreational fishermen and commercial and for-hire businesses that target red snapper.

However, commercial and recreational fishing for red snapper has been heavily restricted due to the stock's overfished status. As a result, fishermen have likely adjusted their businesses to rely on alternative species. An additional concern with the short seasons likely under **Preferred Alternative 2** is safety at sea. Stakeholders have expressed frustration with crowded boat ramps and reefs during the limited recreational red snapper season, making conditions potentially hazardous for boaters. Additionally, the limited season may result in anglers choosing to fish in dangerous conditions. In September 2022, the U.S. Coast Guard expressed concern that, due to the severely limited window for recreational harvest of red snapper, they see a massive influx of boaters on the water, regardless of weather or condition of their vessel. They shared detailed information on the cases and U.S. Coast Guard reactions, including information of multiple distress calls. In general, a higher ACL would lengthen the fishing season and result in the lowest level of negative effects (Tables 4.1.1.3 and 4.1.1.6).

In addition to the social effects associated with restricted access to the red snapper resource for several years, **Alternatives 1 (No Action)** through **3** are expected to result in increased distrust in science and management due to inconsistency in what fishermen see on the water versus the scientific models. Finally, when compared to **Alternative 3**, **Preferred Alternative 2** provides the social benefit of data collection during a fishing season. Improved data collection ultimately leads to more accurate management of the stock and long-term benefits to fishermen in the form of consistent access to the resource.

Social effects on the commercial sector from Action 1 are most likely to be felt in the communities of Sanford, Florida, and Cocoa, Florida, which together account of 30% of red snapper landings (Section 3.4). Jacksonville, Florida, and Morehead City, North Carolina, may also be affected as they also experience comparatively high landings of red snapper and are highly engaged in commercial fishing. Communities in Florida are likely to see the biggest effects from restrictions to the recreational sector as 96% of red snapper landings occur within the state (followed by South Carolina and North Carolina).¹² The Florida Keys sees a high level of recreational engagement and reliance, particularly Islamorada and Tavernier, Florida. The towns of Hatteras and Manteo, North Carolina, also experience a high reliance on recreational fishing and may experience negative social effects because of the decreased ACL for red snapper proposed in **Preferred Alternative 2** through **Alternative 3**.

Among the action alternatives, **Preferred Alternative 2** would be the most beneficial for fishermen, followed by **Alternative 3**. As stated in above, **Alternative 1 (No Action)** is not a viable alternative because it is not based on BSIA.

4.1.4. Administrative Effects

Compared to **Alternative 1 (No Action)**, none of the Action 1 alternatives under consideration to modify the ABC and total ACLs would result in significant impacts on the administrative environment. Since a total ACL and sector ACLs are already in place for red snapper, administrative impacts of this action are likely to be minimal. The commercial red snapper

¹² Florida and Georgia landings are combined to maintain confidentiality with Georgia landings representing a minimal amount of harvest.

season closes when the commercial sector ACL is met or projected to be met. The length of the recreational red snapper season is projected and announced before the start of the recreational season. The NMFS Regional Administrator has the authority to delay the opening of red snapper fishing seasons in the event of a tropical storm or hurricane affecting the Council's area of authority. Reducing the total ACL and sector ACLs for red snapper under **Preferred Alternative 2** and **Alternative 3** would not have substantial effects on the administrative environment, outside of the requisite public notices to announce the season, in-season closures, and potential re-openings. However, in general, the lower the ACL, the more likely it is to be met (if no additional harvest restrictions are implemented), and the more likely an AM would be triggered. Since it is expected that both the commercial and recreational ACLs would be met and an in-season closure is expected to occur under **Preferred Alternative 2**, the administrative effects are likely going to be minimal and the same across these alternatives compared to the status quo. **Alternative 3** would require development and dissemination of outreach and education materials for fishery participants and law enforcement and an in-season announcement of the closed season for both sectors.

4.2. Action 2. Prohibit the Use of More Than One Hook Per Line for the Snapper Grouper Recreational Sector

4.2.1. Biological Effects

Generally, biological benefits are expected to be greater in the short-term for areas and components of the recreational sector that frequently use multi-hook rigs currently and would be required to transition to single hook rigs. Prohibition of more than one hook per line is expected to reduce catch efficiency by requiring more drops to catch a given number of fish. The expectation that reduced efficiency and catch from reducing the number of hooks allowed translates to fewer overall dead discards assumes no adjustments to fishing behavior that would recover that efficiency and catch.

This assumption is supported by constraints that limit offshore hook and line anglers' abilities to adjust behaviors to increase efficiency while complying with current regulations, including: space and number of anglers that can fit (or are allowed) aboard a vessel (which also constrains the number of rods that can be operated), angler fatigue, and time and fuel available for fishing (including time limits set by for-hire trips). Lowering the current catch rates would likely provide biological benefits by reducing overall catch of snapper grouper species, which would reduce harvest and release mortality. By reducing overall catch of snapper grouper species (including red snapper), this action would contribute to addressing overfishing of red snapper by lowering the fishing mortality (the majority of which is discard mortality) applied to the stock, consistent with both National Standards 1 (ending overfishing) and 9 (reduce bycatch).

Similar to other fishery regulations, the efficacy of reducing catch and dead discards by prohibiting multiple hooks per line (resulting in the effects described below) would be heavily dependent on willful angler compliance with the regulations. Law enforcement's role in enforcing compliance is described in Section 4.2.4, and the Law Enforcement Advisory Panel has noted the difficulty in enforcing gear-related regulations (Section 5.2.2). Additionally, compliance will continue to be actively encouraged through the Council's expanded education and outreach efforts, which are described in Appendix H.

Differences in catch efficiency (how quickly fish are caught) have been investigated by the Florida Fish and Wildlife Research Institute (FWRI), which compared catches of red snapper, red grouper, and gag using single hook "Carolina rigs" and multi-hook "chicken rigs" in the Gulf of Mexico (manuscript in preparation). Additional sampling to compare catch efficiencies for single hook and multi-hook chicken rigs in the South Atlantic Region is currently in progress and being conducted by Council staff. Information from both of these studies would be compared and combined as appropriate to develop conclusions about potential changes to catch efficiencies for different hook configurations and sizes, species, areas, etc. that would be expected from

Alternatives

1 (No Action). There is no prohibition on the use of more than one hook per line by the recreational sector while fishing for snapper grouper species.

2. Prohibit the use of more than one hook per line for the recreational sector while fishing for snapper grouper species.

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

changes to gear regulations. Preliminary conclusions from FWRI sampling in the Gulf of Mexico indicate that single hook rigs caught fewer red snapper than double hook rigs, larger hook sizes tended to catch more red snapper, and hook size did not appear to have a significant impact on size of red snapper caught. The FWRI information also indicated that single hook rigs caught more red grouper and gag than double hook rigs. Preliminary results of the Council sampling in the South Atlantic can be found on the [Council website here](#), and indicate that single hook rigs had a lower overall (all species) catch probability than double hook rigs. Results are expected to vary among species, and further analyses and conclusions are expected to be developed following the completion of ongoing sampling. Preliminary information from these studies suggests potentially lower catch rates for some snapper grouper species, including red snapper, from requiring single hook rigs.

Information directly investigating how frequently anglers use more than one hook per line in the South Atlantic snapper grouper recreational sector is lacking. Therefore, usage information must be evaluated qualitatively or indirectly to estimate the potential biological benefits of prohibiting multi-hook rigs. In October 2022, the Snapper Grouper Advisory Panel (Snapper Grouper AP) provided input on the current usage of multiple hooks per line in the snapper grouper recreational sector. Generally, use of more than one hook per line is not uncommon and is most often used in shallower water and when targeting smaller species or a wider variety of species. Biological benefits would be greatest for snapper grouper species that are frequently caught by the components of the recreational sector that use multiple hooks per line. Based on Snapper Grouper AP feedback, this would include the recreational sector off Ponce Inlet, Florida, and off South Carolina when targeting species such as vermilion snapper, black sea bass, or gray triggerfish (Section 5.2.1).

Overall, compared to **Alternative 1 (No Action)**, **Preferred Alternative 2** would be expected to provide the greatest overall biological benefits to snapper grouper stocks, with varying levels of benefits for individual stocks and in specific areas of the region, due to overall reduced catch rates for snapper grouper species throughout the region.

4.2.2. Economic Effects

Prohibiting the use of more than one separate hook to fish recreationally for snapper grouper species when using natural bait would likely result in reduced landings in the short-term and thus reduced short-term net economic benefits that would have occurred from these landings. The magnitude of these reductions would vary based on how prevalent the use of multiple hooks is for a species or area. In the long-term **Alternative 1 (No Action)** would maintain the ability to use multiple separate hooks to fish recreationally for snapper grouper species when using natural bait, thus resulting in no change in short-term net economic benefits.

Preferred Alternative 2 would be restrictive on recreational landings in comparison to **Alternative 1 (No Action)**. Under this alternative, recreational landings of many snapper grouper species would likely decrease in the short-term along with the associated net economic benefits derived from these landings. Due to data limitations on the overall use of single hooks versus multiple hooks when fishing recreationally for snapper grouper species with natural bait is not known, thus the total change in harvest from **Preferred Alternative 2** cannot be quantified along with the short-term change in net economic benefits.

There may be long-term economic benefits from prohibiting the use of more than one separate hook to recreationally fish for snapper grouper species when using natural bait if there are improvements in the condition of stocks of these species resulting from decreased fishing mortality occurring due to lower numbers of fish that are discarded or harvested. Such benefits would be highly variable across species and dependent on the level of reductions in harvest or discards that may occur from **Preferred Alternative 2**. Any such long-term economic benefits would be forgone under **Alternative 1 (No Action)** since the use of multiple separate hooks would be allowed along with the associated relatively increased number of fish discarded or harvested.

4.2.3. Social Effects

Some fishermen prefer to be able to choose the type and number of hooks they use when they fish, preferring the number of hooks that is most efficient. While other fishermen may be comfortable using fewer hooks on a line. If the Council chooses to set standards for the number of hooks per line in the recreational sector, as proposed under **Preferred Alternative 2**, some fishermen may agree that it is in the interest of conserving the species, while others may object to the loss of personal choice, especially if they felt they would experience a reduction in catch rates. However, if the required use one hook per line for the recreational sector lowers the encounter rate of non-target species, as envisioned, it is expected to contribute to the sustainability of harvest and the health of snapper grouper stocks and provide for increased long-term social benefits.

The extent of social effects related to **Preferred Alternative 2** would depend how different regions and different components of the recreational sector execute the snapper grouper fishery. As described in Section 3.4, majority of federal for-hire permits are located on vessels indicating a homeport in the state of Florida, followed by North Carolina, South Carolina, and Georgia. Assuming for-hire fishermen would have to change their fishing practices under **Preferred Alternative 2**, communities in Florida, specifically the Florida Keys, would likely experience the largest social effects as most for-hire permits are found in Key West, Marathon, and Islamorada, Florida. Additionally, communities in the Florida Keys (Islamorada and Tavernier) are highly engaged in and reliant upon recreational fishing activities (for-hire and private). Hatteras and Manteo, North Carolina are also highly engaged in and reliant upon recreational fishing activities and may experience negative effects if private recreational fishermen must change their fishing practices under **Preferred Alternative 2**.

The decision to fish with single versus multiple hooks likely depends on a variety of factors including historical and familiar fishing techniques, location of the fishing activity and desired species. As a result, ranking of the alternatives under Action 2 is difficult and likely specific to individual anglers and their preferred fishing practices.

4.2.4. Administrative Effects

Preferred Alternative 2 would result in an increased administrative burden since it would require extensive coordination between the NMFS Southeast Regional Office Sustainable Fisheries Division, the Office of Law Enforcement, and the public. Several forms of educational and outreach materials would need to be made available to fishery participants, which would

create a relatively short-term impact on the administrative environment. Fishery bulletins and the NMFS web site would be used to notify fishery participants of the new gear requirements. However, there would be increased administrative effects due to enforcement of this action's implementation of regulations in the short and long-term. Administrative effects would occur in the short term as enforcement personnel are trained on requirements. Long term effects would result from these alternatives since it would be difficult to enforce whether anglers are or are not targeting other species that do not prohibit certain gear types.

Chapter 5. Council's Choice for the Preferred Alternative

5.1. Action 1. Reduce the Acceptable Biological Catch, Total Annual Catch Limit, and Sector Annual Catch Limits, and Establish an Annual Optimum Yield for South Atlantic Red Snapper

5.1.1. Snapper Grouper Advisory Panel's Comments and Recommendations

The South Atlantic Fishery Management Council's (Council) Snapper Grouper Advisory Panel (Snapper Grouper AP) discussed Regulatory Amendment 35 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) at their meeting in Charleston, South Carolina, on October 18-20, 2022.

The Snapper Grouper AP passed a motion recommending that the Council select **Preferred Alternative 2** under Action 1. The Snapper Grouper AP had commented on the range of alternatives for this action in several meetings since the conclusion of SEDAR 73 (2021). When providing their formal recommendation on Action 1, the Snapper Grouper AP continued to express disagreement with the stock status and recommended catch levels based on SEDAR 73 and dissatisfaction with needing to reduce harvest of red snapper given the stock's current high and increasing biomass.

Alternatives

1 (No Action). The ABC for South Atlantic red snapper is 53,000 fish. The total ACL is 42,510 fish. The commercial sector ACL is 124,815 lbs ww. The recreational sector ACL is 29,656 fish.

2. Reduce the red snapper ABC and set it equal to the most recent recommendation from the SSC. Revise the total ACL and establish an annual OY for red snapper and set them equal to the recommended ABC.

3. Reduce the red snapper ABC and set it equal to the most recent recommendation from the ABC. Revise the total ACL and establish an annual OY for red snapper and set them equal to **0 fish**.

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

5.1.2. Law Enforcement Advisory Panel Comments and Recommendations

The Law Enforcement Advisory Panel (LE AP) discussed enforceability of several considered management measures to reduce discards in the snapper grouper fishery at their meeting in Charleston, South Carolina, on February 10, 2022. A more recent draft of the amendment was provided via email in January 2023, and any additional comments were requested. The LE AP provided no comments on the enforceability of annual catch limit (ACL) alternatives for red snapper.

5.1.3. Scientific and Statistical Committee Comments and Recommendations

The Council's Scientific and Statistical Committee (SSC) developed recommended overfishing limit (OFL) and acceptable biological catch (ABC) levels at their meeting via webinar on July

28, 2021. Information on the SSC's OFL and ABC recommendations is in Section 1.5. In addition to the recommended OFL and ABC levels, the SSC noted that the projections used to develop their recommendations indicate the stock should rebuild more quickly than by 2044. However, the SSC also cautioned that there is significant uncertainty about projected future recruitment and that setting total ACL equal to ABC and equal to OFL with a 50% probability of rebuilding is the riskiest action the Council can legally take.

5.1.4. Public Comments and Recommendations

Scoping was conducted from January 18 through February 4, 2022. Four comments were received during the scoping period. Additional comments responded to scoping materials were submitted later. All comments responding to scoping materials can be viewed [HERE](#).

Comments on red snapper management or Regulatory Amendment 35 to the Snapper Grouper FMP were also received during public comment periods for the [September 2021](#), [March 2022](#), [June 2022](#), [September 2022](#), and [December 2022](#) Council meetings. Links to online comments are included here and transcripts of verbal public comments are available upon request to Council staff.

The formal public comment period was conducted from January 3, 2023, through February 3, 2023. Two written comments were received during this comment period, and those comments, as well as written comments submitted online after the formal comment period, can be viewed [HERE](#).

In-person public hearings were held in Richmond Hill, Georgia (20 registered attendees); Charleston, South Carolina (6 attendees); Morehead City, North Carolina (10 attendees); Jacksonville, Florida (29 attendees); Cocoa, Florida (25 attendees); and Key Largo, Florida (2 attendees). One additional public hearing was held via webinar (37 attendees).

Comments received during the formal public comment period were summarized for the March 2023 Council Meeting in the [Public Comment Summary Report](#).

Most of the submitted comments did not directly address alternatives considered under Action 1. Those comments that did address Action 1 alternatives were largely in favor of **Alternative 1 (No Action)**.

- Many of the comments expressed desire to increase retainment of red snapper due to the stock's increased abundance.

5.1.5. Council's Conclusion

The Council selected **Preferred Alternative 2** to set total and sector ACLs and annual optimum yield (OY) for red snapper. Under this alternative, the total ACL and OY would equal the ABC values most recently recommended by the SSC. Catch levels under **Preferred Alternative 2** are based on the best scientific information available and recommended by the Council's SSC, in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) National Standard 1 and its associated guidelines and Section 302(g)(1)(B).

Sector ACLs would be updated using the current allocation percentages (28.07% to the commercial sector and 71.93% to the recreational sector) with average weights updated to those estimated in SEDAR 73 (2021). The Council discussed revising the sector allocation percentages but determined that to be unnecessary at this time due to the majority of red snapper landings occurring in Florida, where recreational landings estimates of red snapper are not impacted by the Marine Recreational Information Program's (MRIP) transition from the Coastal Household Telephone Survey to the mail-based Fishing Effort Survey. Florida landings are estimated using Florida's State Reef Fish Survey, which was unaffected by the MRIP transition.

The Council determined that the social and economic benefits of allowing a small amount of red snapper harvest under **Preferred Alternative 2** outweighed potential biological benefits from a full closure of all red snapper harvest (**Alternative 3**). Continued allowance of some harvest maintains a limited commercial fishery for South Atlantic red snapper. For the recreational sector, the shortness of the season is a source of frustration for the red snapper portion of the snapper grouper fishery. However, effort does increase even during the short recreational red snapper season, indicating some desire to target these fish when they can be kept. The Council determined that **Preferred Alternative 2** would best meet the purpose of adjusting catch levels to continue rebuilding the South Atlantic red snapper stock using the best scientific information available while also maximizing social and economic benefits from allowing harvest opportunities as the stock rebuilds. The Council determined that **Preferred Alternative 2** best meets the goals and objectives of the Snapper Grouper FMP (revised through Snapper Grouper Amendment 49 [SAFMC 2023b]), specifically Goal 2 (Management) Objective 3 (maximize social and economic opportunity), while complying with the requirements of the Magnuson-Stevens Act Section (h)(6) and other applicable law.

5.2. Action 2. Prohibit the Use of More Than One Hook Per Line for the Snapper Grouper Recreational Sector

5.2.1. Snapper Grouper Advisory Panel's Comments and Recommendations

At their meeting in Charleston, South Carolina, on October 18-20, 2022, the Snapper Grouper AP passed a motion recommending that the Council prohibit multiple hooks per line for the recreational snapper grouper fishery in waters 150 feet and deeper. Discussion surrounding this recommendation included comments from some Snapper Grouper AP members that supported single hook rigs being required for all depths, some that supported targeting depths where red snapper are most frequently encountered (noting regional differences), some that supported a depth limit that would allow multiple hooks per line to be used beyond 300 feet depth, and some that believed enforcement and compliance difficulties could limit effectiveness of this measure. At the time of this discussion, the Council was considering applying the prohibition of multiple hooks per line to specific areas according to latitude or depth. The Snapper Grouper AP specified 150 feet and deeper primarily to maintain the ability to fish for bait with multi-hook rigs, such as sabiki rigs. This practice typically occurs shallower than 100 feet. However, with the alternatives as currently considered, the prohibition of multiple hooks per line under **Preferred Alternative 2** applies to fishing for snapper grouper species using natural bait, which does not affect the typical use and target (bait fish not in the snapper grouper management unit) of sabiki rigs.

Alternatives

1 (No Action). There is no prohibition on the use of more than one hook per line by the recreational sector while fishing for snapper grouper species.

2. Prohibit the use of more than one hook per line for the recreational sector while fishing for snapper grouper species.

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

The Snapper Grouper AP also provided the following information and comments:

- The Snapper Grouper AP provided input on the current usage of multiple hooks per line in the snapper grouper recreational sector:
 - Lower Florida Keys – Single hooks are used in less than 100 feet; multiple hooks are sometimes used for deep dropping.
 - Ponce Inlet, Florida – 2-hook rigs are frequently used for smaller snapper grouper species, but one hook is typical when targeting larger fish.
 - South Carolina – 2 hooks are often used when targeting smaller species (e.g., vermillion snapper, black sea bass, triggerfish) or a wider variety of species; common for headboats.
 - General impression for most areas was that two hooks are used more commonly in shallower water and when targeting smaller species.
 - Given 1-fish or fewer bag limits for several deeper water and grouper species, a prohibition of multiple hooks per line may be acceptable. With a 1-fish limit, only 1 hook should be used anyway to avoid regulatory discards.

- A catch size frequency shift is possible if prohibition of multiple hooks is implemented. Likely fewer small fish being caught.
- Single hook requirement would likely have impacts on fishing mortality for fish that could be retained as well.
 - For fish with minimum size limits (e.g., black sea bass), a single hook requirement would lower the chance of catching a legal-sized fish and could lower harvest for those species.
- Some snapper grouper species (e.g., vermillion snapper) may be caught in deep water but off the bottom (higher in water column).

5.2.2. Law Enforcement Advisory Panel Comments and Recommendations

At their meeting in Charleston, South Carolina, on February 10, 2022, the LE AP commented that gear regulations tend to be hard to enforce and consequently need to be kept simple. No additional comments were provided following the request for comments via email in January 2023.

5.2.3. Scientific and Statistical Committee Comments and Recommendations

At their October 2022 meeting in Charleston, South Carolina, the SSC provided the following comments on the utility of prohibiting multiple separate hooks per line to reduce discards in the snapper grouper fishery:

- Issue is complex due to a variety of single- and multiple-hook rigs used on trips targeting multiple species managed under different plans (e.g., snapper grouper and coastal migratory pelagics).
- Preliminary data suggest that there would be a small reduction in catch of red snapper when using a single hook relative to a double hook rig.
- Observer data summary of for-hire (charter/headboat) anglers on east coast of Florida found that the majority of anglers used a single hook rig and only 8.5% use separate double hooks. Thus, a change to a single hook rig for this stakeholder group would not have a substantial effect on catch reductions.
- Total number of double hook versus single hook rigs used in the private recreational sector is unknown and is a critical piece of information to assess the overall impact of single versus separate double hook rigs.
 - The majority of fishing effort and landings is from the private recreational sector, emphasizing the need for information on gear use for that component of the recreational sector.

5.2.4. Public Comments and Recommendations

Most of the comments that addressed Action 2 supported **Alternative 1 (No Action)**.

- Commenters stated that **Alternative 2** would likely have little, if any, biological benefit to red snapper and would hinder fishing effort directed at other species that could be retained.

- Commenters stated that **Alternative 2** would especially have negative impacts on the deep drop fishery, noting that bottom fishing for species like deepwater grouper and tilefish at 300 feet and deeper requires substantial effort to reel lines in.
 - The potential for losing bait on the only hook being used to fish may discourage anglers from fishing in that way or booking charter or headboat trips that fish in that way.

5.2.5. Council's Conclusion

Preferred Alternative 2 is an initial step that is expected to reduce fishing mortality for South Atlantic red snapper, as well as other species in the snapper grouper fishery management unit, by slowing catch rates, reducing overall catch, reducing the number of fish that are caught and released, and reducing the number of fish that die after being caught and released. Because this action is intended to reduce mortality primarily of bycatch species rather than those targeted to be retained, the Council determined this requirement should be applied to the entire snapper grouper fishery throughout the South Atlantic region. **Preferred Alternative 2** is expected to reduce bycatch, consistent with National Standard 9 of the Magnuson-Stevens Act and the goals and objectives of the Snapper Grouper FMP (SAFMC 2023b), specifically Goal 2 (Management) Objective 4 (reduce and mitigate discards). **Preferred Alternative 2** and other ongoing Council projects are expected to have a cumulative effect to end overfishing of South Atlantic red snapper, in accordance with National Standard 1 of the Magnuson-Stevens Act. **Preferred Alternative 2** is also expected to contribute to ending overfishing and rebuilding of other South Atlantic snapper grouper species by reducing fishing mortality for those species, as well.

Chapter 6. Cumulative Effects

6.1. Affected Area

The immediate impact area would be the federal 200-mile limit of the Atlantic off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West (South Atlantic exclusive economic zone [EEZ]), which is also the South Atlantic Fishery Management Council's (Council) area of jurisdiction. In light of the available information, the extent of the boundaries 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 (SAFMC 2009b). For the proposed actions found in Regulatory Amendment 35 to the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP), the cumulative effects analysis includes an analysis of data from 2017 through the present.

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

Past Actions

Amendment 36 to the Snapper Grouper FMP (SAFMC 2016a), effective on July 31, 2017, was implemented to establish new spawning special management zones to protect spawning areas for snapper grouper species.

Amendment 37 to the Snapper Grouper FMP (SAFMC 2016b), effective on August 24, 2017, modified the hogfish fishery management unit in response to genetically different stocks along the South Atlantic, specified fishing levels for the two stocks, established a rebuilding plan for the Florida Keys/East Florida stock, and established or revised management measures for both hogfish stocks such as size limits, recreational bag limits, and commercial trip limits.

Amendment 43 to the Snapper Grouper FMP (SAFMC 2017c), effective on July 26, 2018, specified recreational and commercial annual catch limits (ACL) for red snapper beginning in 2018.

Abbreviated Framework 1 to the Snapper Grouper FMP (SAFMC 2017b), effective on August 27, 2018, was implemented to address overfishing of red grouper, and reduced the commercial and recreational ACLs for red grouper in the South Atlantic EEZ.

Abbreviated Framework 2 to the Snapper Grouper FMP (SAFMC 2018), effective on May 9, 2019, revised fishing levels for black sea bass and vermilion snapper in response to the latest stock assessments for those species in the South Atlantic.

Amendment 42 to the Snapper Grouper FMP (SAFMC 2019a), effective on January 8, 2020, added three newly approved sea turtle release devices and updated the regulations to simplify and clarify the specifications for other release gear requirements. The new devices and updates provide more options to fulfill the requirements for sea turtle release gear on board vessels with commercial and charter/for-hire snapper grouper permits in the South Atlantic. The amendment

also streamlines the procedure to implement newly approved devices and handling procedures in the future.

Vision Blueprint Commercial Regulatory Amendment 27 (Regulatory Amendment 27) to the Snapper Grouper FMP (SAFMC 2019c), effective on February 26, 2020, addresses specific action items in the 2016-2020 Vision Blueprint for the commercial sector of the snapper grouper fishery. The framework amendment revised commercial regulations for blueline tilefish, snowy grouper, greater amberjack, red porgy, vermilion snapper, almaco jack, Other Jacks Complex (lesser amberjack, almaco jack, and banded rudderfish), queen snapper, silk snapper, blackfin snapper, and gray triggerfish. Actions include modifying fishing seasons, trip limits, and minimum size limits.

Regulatory Amendment 30 to the Snapper Grouper FMP (SAFMC 2019b), effective on March 9, 2020, revised the rebuilding plan for red grouper, extended the annual spawning closure for that species off North and South Carolina, and established a commercial trip limit.

Vision Blueprint Recreational Regulatory Amendment 26 (Regulatory Amendment 26) to the Snapper Grouper FMP (SAFMC 2019d), effective on March 30, 2020, addresses specific action items in the 2016-2020 Vision Blueprint for the recreational sector of the snapper grouper fishery. The framework amendment modified the 20-fish aggregate bag limits, and minimum size limits for certain species.

Regulatory Amendment 29 to the Snapper Grouper FMP (SAFMC 2020b), effective July 15, 2020, modified gear requirements for South Atlantic snapper grouper species. Actions included requirements for descending and venting devices, and modifications to requirements for circle hooks and powerheads, in order to improve survivorship of released fish.

Abbreviated Framework 3 to the Snapper Grouper FMP (SAFMC 2020a), effective August 17, 2020, revised fishing levels for blueline tilefish in the South Atlantic region.

Regulatory Amendment 33 to the Snapper Grouper FMP (SAFMC 2020c), effective August 17, 2020, removed the requirement that if projections indicate the South Atlantic red snapper season (commercial or recreational) would be three days or fewer, the commercial and/or recreational seasons would not open for that fishing year. If this requirement is removed, red snapper harvest could be open for either recreational or commercial harvest for fewer than four days.

Amendment 39 to the Snapper Grouper FMP (Modifications to Charter Vessel and Headboat Reporting Amendment), effective September 1, 2020 (corrected January 4, 2021) (SAFMC 2017a), modified reporting requirements for federally-permitted charter vessels and headboats in the snapper grouper, dolphin wahoo, and coastal migratory pelagics (mackerel and cobia) fisheries.

Regulatory Amendment 34 to the Snapper Grouper FMP (SAFMC 2020d), effective May 3, 2021, created 34 special management zones around artificial reefs off North Carolina and South Carolina.

Amendment 50 to the Snapper Grouper FMP (SAFMC 2022), effective January 19, 2023, addressed the results of the latest stock assessment for the red porgy stock in the South Atlantic region. Red porgy are overfished and overfishing is occurring. The Council was required to establish a rebuilding plan by June 2022 and adjust catch levels and management measures to end overfishing.

Present Actions

Amendment 44 to the Snapper Grouper FMP would address the results of the latest stock assessment for the yellowtail snapper stock in the southeast.

Comprehensive Acceptable Biological Catch (ABC) Control Rule Amendment (Amendment 45 to the Snapper Grouper 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. The Council approved the Amendment 45 at their December 2022 meeting.

Amendment 51 to the Snapper Grouper FMP would address the results of the latest stock assessment for the snowy grouper stock in the South Atlantic region. Snowy grouper was determined to be overfished and undergoing overfishing. The Council approved Amendment 51 at their December 2022 meeting.

Amendment 52 to the Snapper Grouper FMP would respond to the latest stock assessment for golden tilefish (SEDAR 66). Golden tilefish are not overfished and overfishing is not occurring. The amendment would also respond to increased recreational effort on blueline tilefish by adjusting the recreational bag limit for blueline tilefish and modifying recreational accountability measures. The Council approved Amendment 52 at their December 2022 meeting.

Amendment 53 to the Snapper Grouper FMP would address the results of the latest stock assessment for the gag stock in the South Atlantic region. Gag was determined to be overfished and undergoing overfishing. The Council approved Amendment 53 at their March 2023 meeting.

Reasonably Foreseeable Future Actions

Amendment 46 to the Snapper Grouper FMP proposes actions to focus on private recreational permit requirements.

Expected Impacts from Past, Present, and Future Actions

The intent of Regulatory Amendment 35 is to modify management of South Atlantic red snapper. Actions include revising ACLs, and gear modifications for the recreational sector. Development of Regulatory Amendment 35 is a response to the most recent stock assessment for South Atlantic red snapper (SEDAR 73 2021). The proposed actions are not expected to result in significant cumulative adverse biological or socio-economic effects (see Chapter 4). In recent years, participants in the snapper grouper fishery and associated businesses have experienced some negative economic and social impacts due to changes in ACLs and early closures during the fishing years. Factors such as distance to fishing grounds, weather, and water temperature affect availability of species to the recreational fleets in different parts of the Council's jurisdiction. The proposed actions would address overfishing and support the current rebuilding

plan in place. Furthermore, over the long term, reducing harvest of red snapper to help improve the age structure of the population would be expected to allow the stock to be less susceptible to adverse environmental conditions that might affect recruitment success.

When combined with the impacts of past, present, and future actions affecting the snapper grouper 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 reduce overfishing of snapper grouper species, require the use of descending devices, and reducing bycatch. Also, there may be cumulative socio-economic effects by promoting access to the fishery which would improve recreational fishing opportunities and benefits to associated businesses and communities; however, the actions in this amendment are not expected to result in significant cumulative adverse biological or socio-economic effects to the snapper grouper 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 snapper grouper 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>) provide 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 (IPCC) Sixth Assessment Report (February 28, 2022), U.S. Global Change Research Program (USGCRP)'s Fourth Climate Assessment (2018), and the Ecosystem Status Report for the U.S. South Atlantic Region (Craig et al. 2021) 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 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 2022). 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 driven movement of fish stocks is causing commercial, small-scale, artisanal, and recreational fishing activities to shift poleward and diversify harvests (IPCC 2022). In the South Atlantic Region, species richness and abundance of offshore hard bottom reef fishes have generally declined over time while richness and abundance of demersal fishes in soft sediment habitats on the nearshore shelf have increased. Potential explanations for these patterns include changes in harvest (directed and bycatch), trophic interactions, and environment effects on recruitment (Craig et al. 2021). Climate change may impact snapper grouper species 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.

Patterns from stock assessments in the South Atlantic Region indicate biomass of most assessed species generally show declines from the 1970s through the 1990s with some species showing signs of recovery beginning in the early to mid-2000s. Recruitment of a number of snapper-grouper species has declined since the early 2010s; whereas, recruitment of red snapper and some pelagic species has increased in recent years (Craig et al. 2021). In the near term, it is unlikely that the actions in Regulatory Amendment 35 would compound or exacerbate the ongoing effects of climate change on snapper grouper species.

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 management actions are summarized in Chapter 2 of this document. Detailed discussions of the magnitude and significance of the impacts of the alternatives on the human environment appear in Chapter 4 of this document. None of the impacts of the actions in this framework amendment, in combination with past, present, and future actions have been determined to be significant. Although several other management actions, in addition to this framework amendment, are expected to affect snapper grouper 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 South 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 South Atlantic region. The U.S.S. Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries are within the boundaries of the South 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 snapper grouper 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. Fishery-independent data are being collected through the Southeast Fishery-Independent 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 recreational landings data by all the four states in the South Atlantic Region (Florida, Georgia, South Carolina, and North Carolina). The National Marine Fisheries Service would continue to monitor and collect information on snapper grouper species for stock assessments and stock assessment updates, life history studies, economic and social analyses, 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

Name	Agency/Division	Title
Mike Schmidtke	SAFMC	IPT Lead/Fishery Scientist
Myra Brouwer	SAFMC	Deputy Director for Management
Chip Collier	SAFMC	Deputy Director for Science and Statistics
John Hadley	SAFMC	Economist
Christina Wiegand	SAFMC	Social Scientist
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Mary Vara	SERO/SF	IPT Lead/Fishery Biologist
Rick DeVactor	SERO/SF	South Atlantic Branch Chief
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Mike Travis	SERO/SF	Socio-economic Branch Chief
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Manny Antonaras	SERO/OLE	Assistant Director
Matt Walia	SERO/OLE	Compliance Liaison
Kyle Shertzer	SEFSC	Biologist
Scott Crosson	SEFSC	Economist

IPT = Interdisciplinary Planning Team, SAFMC = South Atlantic Fishery Management Council, SERO = Southeast Regional Office, SF = Sustainable Fisheries Division, PR = Protected Resources Division, HC = Habitat Conservation Division, NOAA=National Oceanic and Atmospheric Administration, GC = General Counsel, OLE = Office of Law Enforcement, SEFSC = Southeast Fisheries Science Center.

Chapter 8. Agencies and Persons Consulted

Responsible Agencies

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List of Agencies, Organizations, and Persons Consulted

SAFMC Law Enforcement Advisory Panel

SAFMC Snapper Grouper Advisory Panel

SAFMC Scientific and Statistical Committee

North Carolina Coastal Zone Management Program

South Carolina Coastal Zone Management Program

Georgia Coastal Zone Management Program

Florida Coastal Zone Management Program

Florida Fish and Wildlife Conservation Commission

Georgia Department of Natural Resources

South Carolina Department of Natural Resources

North Carolina Division of Marine Fisheries

North Carolina Sea Grant

South Carolina Sea Grant

Georgia Sea Grant

Florida Sea Grant

Atlantic States Marine Fisheries Commission

National Marine Fisheries Service

- Washington Office

- Office of Ecology and Conservation

- Southeast Regional Office

- Southeast Fisheries Science Center

Chapter 9. References

- Alsop, III, F.J. 2001. Smithsonian Handbooks: Birds of North America eastern region. DK Publishing, Inc. New York, NY.
- Allen, G.R. 1985. FAO species catalogue. Vol. 6. Snappers of the world. An annotated and illustrated catalogue of lutjanid species known to date. FAO Fish. Synop. 6(125): 208 pp.
- Blue Ocean Institute. 2010. The blue ocean institute guide to ocean friendly seafood. http://www.blueocean.org/files/Seafood_Guide.pdf.
- Campbell, M.D., W.B. Driggers, B. Sauls, and J.F. Walter. 2014. Release mortality in the red snapper fishery: a meta-analysis of three decades of research. Fishery Bulletin. 112:283-296.
- Carter, D. W. and C. Liese. 2012. The Economic Value of Catching and Keeping or Releasing Saltwater Sport Fish in the Southeast USA. North American Journal of Fisheries Management, 32:4, 613-625. <http://dx.doi.org/10.1080/02755947.2012.675943>.
- Cooke, S.J., D.P. Philipp, K.M. Dunmall, and J.F. Schreer. 2001. The influence of terminal tackle on injury, handling time, and cardiac disturbance of rock bass. North American Journal of Fisheries Management. Vol. 21, no. 2, pp. 333-342.
- Craig, J.K., G.T. Kellison, S.M. Binion-Rock, S.D. Regan, M. Karnauskas, S.-K. Lee, R. He, D.M. Allen, N.M. Bacheler, H. Blondin, J.A. Buckel, M.L. Burton, S.L. Cross, A. Freitag, S.H. Groves, C.A. Hayes, M.E. Kimball, J.W. Morley, R.C. Muñoz, G.D. Murray, J.J. Reimer, K.W. Shertzer, T.A. Shropshire, K.I. Siegfried, J.C. Taylor, and D.L. Volkov. 2021. Ecosystem Status Report for the U.S. South Atlantic Region. NOAA Technical Memorandum, NMFS-SEFSC-753, 145 p. <https://doi.org/10.25923/qmgr-pr03>.
- Farmer, N.A., W.D. Heyman, M. Karnauskas, S. Kobara, T.I. Smart, J.C. Ballenger, M. Reichert, D.M. Wyanski, M.S. Tishler, K.C. Lindeman, S.K. Lowerre-Barbieri, T.S. Switzer, J.J. Solomon, K. McCain, M. Marhefka, and G.R. Sedberry. 2017. Timing and locations of reef fish spawning off the southeastern United States. PLoS ONE 12(3): e0172968. <https://doi.org/10.1371/journal.pone.0172968>.
- Free, C. M., J. T. Thorson, M. L. Pinsky, K. L. Oken, J. Wiedenmann, and O. P. Jensen. 2019. Impacts of historical warming on marine fisheries production. Science. 363: 979-983 pp. U.S. Global Change Research Program 2018. Fourth National Climate Assessment. Volume II: Impacts, Risks, and Adaptation in the United States. <https://nca2018.globalchange.gov/>
- Grimes, C.B. 1987. Reproductive biology of the Lutjanidae: a review. Pages 239-294 In J.J. Polovina and S. Ralston (eds.). Tropical snappers and groupers: biology and fisheries management. Westview Press. Boulder, Colorado.
- Hayes, S., E. Josephson, K. Maze-Foley, and P.E. Rosel. 2017. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2016. NOAA Technical Memorandum NMFS – NE-241. U.S. Department of Commerce – Woods Hole, MA.

Holland, S. M., Oh, C., Larkin, S. L., Hodges, A. W. 2012. The operations and economics of the for-hire fishing fleets of the South Atlantic states and the Atlantic coast of Florida. University of Florida. Available: <https://fred.ifas.ufl.edu/pdf/Holland.pdf>.

IPCC, 2022: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844.

Jacob, S., P. Weeks, B. Blount, and M. Jepson. 2013. Development and evaluation of social indicators of vulnerability and resiliency for fishing communities in the Gulf of Mexico. *Marine Policy* 37:86-95.

Jepson, M. and L. L. Colburn. 2013. Development of social indicators of fishing community vulnerability and resilience in the U.S. Southeast and Northeast Regions. U.S. Dept. of Commerce, NOAA Technical Memorandum NMFS-F/SPO-129, 64 p.

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

MacIntyre, I.G. and J.D. Milliman. 1970. Physiographic features on the outer shelf and upper slope, Atlantic Continental Margin, southeastern United States. *Geological Society of America Bulletin* 81:2577-2598.

Manooch, C.S., III, J.C. Potts, D.S. Vaughan, and M.L. Burton. 1998. Population assessment of the red snapper from the southeastern United States. *Fisheries Research* 38:19-32.

Miller, G.C. and W.J. Richards. 1979. Reef fish habitat, faunal assemblages and factors determining distributions in the South Atlantic Bight. *Proceedings of the Gulf and Caribbean Fisheries Institute* 32:114-130.

Needham, H., D. Brown, and L. Carter. 2012. Impacts and adaptation options in the Gulf coast. Report prepared for the Center for Climate and Energy Solutions. 38 pp.
<http://www.c2es.org/docUploads/gulf-coast-impacts-adaptation.pdf>.

Newton J.G., O.H. Pilkey, and J.O. Blanton. 1971. An Oceanographic Atlas of the Carolina and continental margin. North Carolina Dept. of Conservation and Development. 57 p.

NMFS. 2009. Interim Rule to Address Overfishing of Red Snapper in the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. National Marine Fisheries Service, Southeast Region, 263 13th Ave S., St. Petersburg, FL, 33701.

NMFS. 2012. Measures to Allow Limited Harvest of Red Snapper (*Lutjanus campechanus*) in the South Atlantic in 2012, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. National Marine Fisheries Service, Southeast Region, 263 13th Ave S., St. Petersburg, FL, 33701.

NMFS. 2017. Specification of Annual Catch Limits for Red Snapper (*Lutjanus campechanus*) in the South Atlantic Region, Final Environmental Assessment, Regulatory Impact Review, and Fishery Impact Statement, National Marine Fisheries Service, Southeast Region, 263 13th Ave S., St. Petersburg, FL, 33701.

NMFS. 2021. Fisheries Economics of the United States, 2017. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-219, 246 p.

Parker, R.O., D.R. Colby, and T.D. Willis. 1983. Estimated amount of reef habitat on a portion of the U.S. South Atlantic and Gulf of Mexico Continental Shelf. Bulletin of Marine Science 33:935-940.

Potts, J.C. and K. Brennan. 2001. Trends in catch data and estimated static SPR values for fifteen species of reef fish landed along the southeastern United States. Report prepared for SAFMC.

Prager, M. H. 1994. A suite of extensions to a non-equilibrium surplus-production model. Fishery Bulletin 92: 374-389.

Prager, M. H. 2004. User's Manual for ASPIC: A Stock-Production Model Incorporating Covariates (ver.5) And Auxiliary Programs. National Marine Fisheries Service Beaufort Laboratory Document BL-2004-01, 1-25.

Pulver, J. R., H. Liu, and E. Scott-Denton. 2016. Modelling community structure and species co-occurrence using fishery observer data. ICES Journal of Marine Science 73(7):1750-1763.

Pulver, J. R. 2017. Sink or swim? Factors affecting immediate discard mortality for the Gulf of Mexico commercial reef fish fishery. Fisheries Research, 188:166-172.

Robins, C.R. and G.C. Ray. 1986. A field guide to Atlantic coast fishes of North America. Houghton Mifflin Company, Boston, U.S.A. 354 pp.

Rudershausen, P. J., J. A. Buckel, and J. E. Hightower. 2014. Estimating reef fish discard mortality using surface and bottom tagging: effects of hook injury and barotrauma. Canadian Journal of Fisheries and Aquatic Sciences 71:514-520.

SAFMC. 1983. Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Impact Statement, and Regulatory Impact Review. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699.

SAFMC. 1991. Amendment 4 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699.

SAFMC. 1998. Comprehensive Sustainable Fisheries Act Amendment to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 11), Final Environmental Assessment, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699.

SAFMC. 2008a. Amendment 15B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2008b. Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2009a. Comprehensive Ecosystem-Based Amendment 1 for the South Atlantic Region, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201; North Charleston, SC 29405.

SAFMC. 2009b. Fishery Ecosystem Plan II for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2010. Amendment 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2011a. Comprehensive Annual Catch Limit Amendment (Amendment 25 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region), Final Environmental Impact Statement, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2011b. Comprehensive Ecosystem-Based Amendment 2 for the South Atlantic Region, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201; North Charleston, SC 29405.

SAFMC. 2011c. Regulatory Amendment 10 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review, and Social Impact Assessment/Fishery

Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2013a. Amendment 28 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2013b. Joint South Atlantic/Gulf of Mexico Generic Charter/Headboat Reporting in the South Atlantic Region, Final Environmental Assessment, Initial Regulatory Flexibility Act Analysis, and Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405, and Gulf of Mexico Fishery Management Council, 4107 W Spruce St, #200, Tampa, FL 33607.

SAFMC. 2014. Regulatory Amendment 21 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Act Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2016a. Amendment 36 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2016b. Amendment 37 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Impact Statement, Regulatory Impact Review, Regulatory Flexibility Analysis, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405

SAFMC. 2017a. Modifications to Charter Vessel and Headboat Reporting Amendment for the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2017b. Abbreviated Framework 1 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Regulatory Impact Review and Regulatory Flexibility Act Analysis. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2017c. Amendment 43 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2018. Abbreviated Framework 2 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic, Regulatory Flexibility Analysis and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2019a. Amendment 42 to the FMP for the Snapper Grouper Fishery of the South Atlantic Region, Regulatory Flexibility Analysis and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2019b. Regulatory Amendment 30 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2019c. Vision Blueprint Commercial Regulatory Amendment 27 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2019d. Vision Blueprint Regulatory Amendment 26 for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2020a. Abbreviated Framework 3 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2020b. Regulatory Amendment 29 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2020c. Regulatory Amendment 33 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment and Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC. 2020d. Regulatory Amendment 34 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2022. Amendment 50 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic, Final Environmental Assessment, Regulatory Flexibility Analysis,

and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2023a. Comprehensive Acceptable Biological Catch Control Rule Amendment (Amendment 45 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic), Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC. 2023b. Amendment 49 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic, Final Environmental Assessment, Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

Seafood Watch Program. 2023 Monterey Bay Aquarium. <http://www.seafoodwatch.org>.

SEDAR. 2008, Revised 2009. SEDAR 15 Stock assessment report (SAR 1) South Atlantic Red Snapper. SEDAR, 4055 Faber Place Drive, North Charleston, SC 29405. 511 p. Available at www.sedarweb.org

SEDAR. 2010. SEDAR 24 Stock assessment report South Atlantic Red Snapper. SEDAR, 4055 Faber Place Drive, North Charleston, SC 29405. 524 p. Available at www.sedarweb.org

SEDAR. 2017. SEDAR 41 Stock assessment report - Revision 1 South Atlantic Red Snapper. SEDAR, 4055 Faber Place Drive, North Charleston, SC 29405. 805 pp. Available at www.sedarweb.org.

SEDAR. 2021. SEDAR 73 South Atlantic Red Snapper Stock Assessment Report. SEDAR, North Charleston SC. 194 pp. Available at <http://sedarweb.org/sedar-73>.

Souza, Philip M., Jr. and Christopher Liese. 2019. Economics of the Federal For-Hire Fleet in the Southeast - 2017. NOAA Technical Memorandum NMFS-SEFSC-740, 42 p.

Stephen, J. A., and P. J. Harris. 2010. Commercial catch composition with discard and immediate release mortality proportions off the southeastern coast of the United States. Fisheries Research 103:18-24.

Szedlmayer, S., and J. D. Lee. 2004. Diet shifts of juvenile red snapper (*Lutjanus campechanus*) with changes in habitat and fish size. Fishery Bulletin 102: 366-375.

USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

White, D.B. and S.M. Palmer. 2004. Age, growth and reproduction of the red snapper, *Lutjanus campechanus*, from the Atlantic waters of the southeastern United States. Bulletin of Marine Science 75: 335-360.

Wilson, R.R. and K.M. Burns. 1996. Potential survival of released groupers caught deeper than 40 m based on shipboard and in-situ observations, and tag-recapture data. *Bulletin of Marine Science*. 58(1): 234-247.

Appendix A. Other Applicable Law

A.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. Regulatory Amendment 35 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 35) 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 regulatory 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.

A.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. Regulatory Amendment 35 uses the best scientific information available and made a broad presentation thereof. Therefore, this document is in compliance with the IQA.

A.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 plan amendment are consistent to the maximum extent practicable with the Coastal Zone Management Plans of Florida, Georgia, South Carolina, and North Carolina. 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 Florida, South Carolina, Georgia, and North Carolina.

A.4. Executive Order 12612: Federalism

Executive Order (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.

A.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.

A.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.

A.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 MPAs. 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.

A.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.

A.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.

A.10. Small Business Act (SBA)

Enacted in 1953, the SBA requires that agencies assist and protect small-business interests to the extent possible to preserve free competitive enterprise. The objectives of the SBA are to foster business ownership by individuals who are both socially and economically disadvantaged; and to promote the competitive viability of such firms by providing business development assistance including, but not limited to, management and technical assistance, access to capital and other forms of financial assistance, business training, and counseling, and access to sole source and limited competition federal contract opportunities, to help firms achieve competitive viability. Because most businesses associated with fishing are considered small businesses, NMFS, in

implementing regulations, must make an assessment of how those regulations will affect small businesses.

A.11.Public Law 99-659: Vessel Safety

Public Law 99-659 amended the Magnuson-Stevens Fishery Conservation and Management Act to require that an 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 South Atlantic fisheries under adverse weather or ocean conditions as a result of the imposition of management regulations proposed in this amendment. If the Regional Administrator (RA) determines tropical storm or hurricane conditions exist, or are projected to exist, in the South Atlantic, during a commercial or recreational fishing season, the RA may modify the opening and closing dates of the fishing season by filing a notification to that effect with the Office of the Federal Register, and announcing via NOAA Weather Radio and a Fishery Bulletin any change in the dates of the red snapper commercial or recreational fishing season.

In September 2022 (post Regulatory Amendment 33), the U.S. Coast Guard expressed concern to NMFS SERO that, due to the severely limited window for recreational harvest of red snapper, they see a massive influx of boaters on the water, regardless of weather or condition of their vessel. They shared detailed information on the cases and U.S. Coast Guard reactions, including information of multiple distress calls. The U.S. Coast Guard asked NMFS who to speak with to increase the duration of the red snapper season in order to limit hazards on the water. NMFS relayed this information to the Council in December 2022 and June 2023.

Appendix B. Regulatory Impact Review

B.1. 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 red snapper fishery.

B.2. Problems and Objectives

The problems and objectives for the proposed actions are presented in Section 1.4 of this amendment and are incorporated herein by reference.

B.3. Description of Fisheries

A description of the commercial and recreational sectors of the red snapper fishery is provided in Section 3.3 of this amendment and is incorporated herein by reference.

B.4. Effects of Management Measures

Action 1. Reduce the acceptable biological catch, total annual catch limit, and sector annual catch limits, and establish an annual optimum yield for South Atlantic red snapper

A detailed analysis and discussion of the expected economic effects of the proposed action are 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).

In general, annual catch limits (ACL) that allow for fewer fish to be landed can result in decreased net economic benefits if harvest decreases. The ACL does not directly impact the fishery for a species unless harvest changes, fishing behavior changes, or the ACL is met or exceeded, thereby potentially triggering accountability measures such as harvest closures or other restrictive measures. In the case of red snapper, the revised ACL being considered in **Preferred Alternative 2** would be constraining on harvest and is projected to reduce landings of red snapper for both the commercial and recreational sectors. As such, a reduction in direct net

economic benefits would be expected from this alternative. This alternative would maintain the current sector allocation of the total ACL, which is 28.07% to the commercial sector and 71.93% to the recreational sector. **Preferred Alternative 2** would contribute more towards ending overfishing and rebuilding of the red snapper stock, thus reducing the potential long-term negative economic effects of relatively reduced future catch levels from occurring or potentially mitigating the magnitude.

Commercial Sector

Preferred Alternative 2 would result in a comparatively lower commercial ACL. The relatively decreased potential landings under **Preferred Alternative 2** occurring from a reduction in the sector ACL would result in reduced revenues and net economic benefits, represented by producer surplus (PS), for commercial vessels. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 2** would result in an estimated decrease in PS of \$263,540 in the 2023 fishing year (2021 \$). This relative reduction in PS would be less each subsequent year thereafter as the commercial sector ACL increases until the 2027 fishing year, where the ACL would remain constant until modified.

Estimates of net revenues or economic profit are not available for snapper grouper dealers. Therefore, it is not possible to quantitatively estimate the effect of changes in purchases on their profits. However, 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 directionality of economic benefits to dealers would be the same as stated above and would be expected to decrease as a result of **Preferred Alternative 2**. Since red snapper make up approximately 2% of total purchases by dealers, indicating that there is a low financial dependency on red snapper landings, the expected change in net economic benefits to most dealers is expected to be minimal.

Recreational Sector

Preferred Alternative 2 would result in comparatively lower recreational sector ACL. The relatively decreased potential landings under **Preferred Alternative 2** occurring from a reduction in the sector ACL would result in reduced net economic benefits, represented by consumer surplus (CS), for recreational anglers. When compared to **Alternative 1 (No Action)**, **Preferred Alternative 2** would result in an estimated decrease in CS of \$785,428 in the 2023 fishing year (2021 \$). This relative reduction in CS would be less each subsequent year thereafter as the recreational sector ACL increases until the 2027 fishing year, where the ACL would remain constant until modified.

Total

In comparison to **Alternative 1 (No Action)**, **Preferred Alternative 2** would decrease net economic benefits by \$1,048,968 in the 2023 fishing year (2021 \$). This relative reduction in net economic benefits would be less each subsequent year thereafter as the total ACL increases until the 2027 fishing year, where the ACL would remain constant until modified.

Action 2. Prohibit the use of more than one hook per line for the snapper grouper recreational sector

A detailed analysis and discussion of the expected economic effects of the proposed action are 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).

Prohibiting the use of more than one separate hook to fish recreationally for snapper grouper species when using natural bait would likely result in reduced landings in the short-term and thus reduced short-term net economic benefits that would have occurred from these landings. The magnitude of these reductions would vary based on how prevalent the use of multiple hooks is for a species or area. In the long-term **Alternative 1 (No Action)** would maintain the ability to use multiple separate hooks to fish recreationally for snapper grouper species when using natural bait, thus resulting in no change in short-term net economic benefits.

Preferred Alternative 2 would be restrictive on recreational landings in comparison to **Alternative 1 (No Action)**. Under this alternative, recreational landings of many snapper grouper species would likely decrease in the short-term along with the associated net economic benefits derived from these landings. Due to data limitations on the overall use of single hooks versus multiple hooks when fishing recreationally for snapper grouper species with natural bait is not known, thus the total change in harvest from **Preferred Alternative 2** cannot be quantified along with the short-term change in net economic benefits.

There may be long-term economic benefits from prohibiting the use of more than one separate hook to recreationally fish for snapper grouper species when using natural bait if there are improvements in the condition of stocks of these species resulting from decreased fishing mortality occurring due to lower numbers of fish that are discarded or harvested. Such benefits would be highly variable across species and dependent on the level of reductions in harvest or discards that may occur from **Preferred Alternative 2**. Any such long-term economic benefits would be forgone under **Alternative 1 (No Action)** since the use of multiple separate hooks would be allowed along with the associated relatively increased number of fish discarded or harvested.

B.5. 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 are in 2021 dollars and include:

South Atlantic Council costs of document preparation, meetings, public hearings, and information dissemination	\$57,458
NMFS administrative costs of document preparation, meetings, and review	\$68,234
TOTAL	\$125,692

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 estimated 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.

B.6. Net Benefits of Regulatory Action

It is important to specify the time period being considered when evaluating benefits and costs. According to the Office of Management and Budget's frequently asked questions regarding Circular A-4,¹³ "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. First, this regulatory action does not include a predetermined sunset provision. Second, based on the history of management in the snapper grouper 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 a decrease of \$785,428 in net economic benefits to the recreational sector, a decrease of \$263,540 in net economic benefits to the commercial sector, and a decrease in total net economic benefits of \$1,048,968 (2021 \$) in the first year of implementation. These net benefits change in subsequent years largely due to the increasing annual catch limit for red snapper. In discounted terms and over a 5-year time period using the analyses provided in this amendment, the total net present value of the change in net economic benefits is -\$2,709,067 using a 7% discount rate and -\$2,962,872 using a 3% discount rate (2021 \$). On an average annual basis over a 5-year time period, the total net present value of the change in net economic benefits is -\$541,813 using a 7% discount rate and -\$592,574 using a 3% discount rate (2021 \$).

The estimated non-discounted public costs resulting from the regulation are \$125,692 (2021 \$). 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 decrease net economic benefits to the Nation. Over a 5-year time period, the quantified change in net economic benefits is expected to be -\$2,834,759 using a 7% discount rate and -\$3,088,563 using a 3% discount rate (2021 \$). On an average annual basis over a 5-year time period, the total net present value of the

¹³ See p. 4 at https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/OMB/circulars/a004/a-4_FAQ.pdf

change in net economic benefits is -\$566,952 using a 7% discount rate and -\$617,713 using a 3% discount rate (2021 \$).

B.7. 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 \$1,174,660 by the first year of implementation (2021 \$).

Appendix C. Initial Regulatory Flexibility Act Analysis

C.1. 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.

C.2. 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 Section 1.4. The purpose of this proposed regulatory action is to revise the acceptable biological catch (ABC) and annual catch limits (ACLs) for red snapper in the South Atlantic based on the results of the latest stock assessment, and implement management measures to reduce dead discards for the South Atlantic snapper grouper fishery. The objectives of this proposed regulatory action are to ensure red snapper ACLs are based on the best scientific information available and address overfishing of the South Atlantic red snapper stock by reducing dead discards of snapper grouper species, while minimizing negative social and economic effects to the extent practicable, consistent with the Magnuson-Stevens Act and its National Standards. The Magnuson-Stevens Act serves as the legal basis for the proposed regulatory action. All monetary estimates in the following analysis are in 2021 dollars.

C.3. Description and estimate of the number of small entities to which the proposed action would apply

For red snapper, this proposed regulatory action would: reduce and set the South Atlantic red snapper ABC equal to the most recent ABC recommended by the Scientific and Statistical Committee (SSC); reduce the total ACL and establish an annual optimum yield (OY) equal to the proposed ABC; and reduce the sector ACLs based on the revised total ACL, current sector allocation method, and the average weight per fish estimates in the commercial and recreational sectors from the most recent stock assessment. The proposed values are in Table C.1.

Table C.1. Proposed South Atlantic red snapper ABC, total ACL/annual OY, commercial ACL, and recreational ACL for 2023 through 2027 until modified.

Fishing Year	ABC (numbers of fish)	Annual OY=Total ACL (numbers of fish)	Commercial ACL (lbs ww)	Recreational ACL (numbers of fish)
2023	28,000	28,000	77,016	19,119
2024	31,000	31,000	85,268	21,167
2025	33,000	33,000	90,769	22,533
2026	35,000	35,000	96,270	23,899
2027+	36,000	36,000	99,021	24,581

This proposed action would regulate, and is expected to directly affect, commercial fishing businesses that commercially harvest South Atlantic red snapper. Commercial fishing vessels are required to possess either an unlimited or 225-lb trip limit South Atlantic snapper grouper

commercial vessel permit. From 2016 through 2020, an average of 660 commercial vessels possessed one of these permits each year. However, the average number of commercial fishing vessels that actually harvested South Atlantic red snapper between 2017 and 2021 was only 193 vessels per year. The National Marine Fisheries Service (NMFS) does not possess complete ownership data regarding businesses that harvest South Atlantic red snapper. Therefore, it is not currently feasible to accurately determine affiliations between commercial fishing vessels and the businesses that own them. As a result, for purposes of this analysis, it is assumed each commercial fishing vessel is independently owned by a single business, which is expected to result in an overestimate of the actual number of commercial fishing businesses regulated by this proposed regulatory action. Thus, this analysis assumes that 193 commercial fishing businesses would be regulated by this proposed action.

This proposed action would also regulate and directly affect recreational anglers and for-hire fishing businesses. However, recreational anglers are not considered entities under the RFA, and thus the effects of this action on recreational anglers are not germane to this analysis. With respect to for-hire fishing businesses, a federal charter-headboat (for-hire) South Atlantic snapper grouper vessel permit is required to harvest red snapper from federal waters in the South Atlantic. The National Marine Fisheries Service (NMFS) does not possess complete ownership data regarding businesses that hold charter-headboat (for-hire) South Atlantic snapper grouper vessel permits. Therefore, it is not currently feasible to accurately determine affiliations between vessels and the businesses that own them. As a result, for purposes of this analysis, it is assumed each for-hire vessel is independently owned by a single business, which is expected to result in an overestimate of the actual number of for-hire fishing businesses regulated by this proposed regulatory action. Further, NMFS also does not currently possess data on the number of for-hire fishing vessels that harvest or target South Atlantic red snapper. However, from 2016 through 2020, the average number of for-hire fishing vessels with charter-headboat South Atlantic snapper grouper vessel permits was 2,059. Because these permits are open access and thus not limited, this analysis assumes that as many as 2,059 for-hire fishing businesses could be regulated by this proposed action.

Although recreational fishermen are required to use non-offset, non-stainless steel circle hooks when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits north of 28° N latitude, there is currently no limit on the number of hooks they can use per line. This proposed regulatory action would restrict recreational fishermen to using only one non-offset, non-stainless steel circle hook per line when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits north of 28° N latitude. Similarly, recreational fishermen are already required to use non-stainless steel hooks when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits south of 28° N latitude. This proposed regulatory action would also restrict recreational fishermen to using only one non-stainless steel hook when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits south of 28° N latitude. This action to restrict the number of hooks used by recreational fishermen in the snapper grouper fishery would regulate the behavior of recreational anglers, but not the behavior of for-hire fishing businesses. Recreational anglers are not considered entities under the RFA, and thus the effects of this action are not germane to this analysis.

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 2017 through 2021, the maximum annual gross revenue earned by a single commercial fishing vessel harvesting snapper grouper species was about \$587,000. Based on this information, all commercial fishing businesses regulated by this proposed regulatory action are determined to be small entities for the purpose of this analysis.

For other industries, the Small Business Administration 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 \$12.5 million for all its affiliated operations worldwide. The maximum annual gross revenue for a single headboat in the South Atlantic was about \$320,300 in 2017 (D. Carter, pers. comm.). According to Holland et al. (2012), average annual charter vessel revenue is slightly more than \$132,000. Based on this information, all for-hire fishing businesses regulated by this proposed regulatory action are determined to be small businesses for the purpose of this analysis.

C.4. 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.

C.5. 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.

C.6. Significance of economic effects on small entities

Substantial number criterion

If implemented, this proposed regulatory action is expected to directly affect 193 of the 660 commercial fishing businesses with South Atlantic snapper grouper permits, or approximately 29% of those commercial fishing businesses. Further, this proposed regulatory action will potentially affect all of the approximately 2,059 for-hire fishing businesses with valid charter-headboat permits in the South Atlantic snapper grouper fishery. All regulated commercial and

for-hire fishing 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 average commercial fishing business harvesting South Atlantic red snapper generates an average of \$63,752 per year in gross revenue from commercial fishing. Approximately 8% of this average annual gross revenue represents economic profits, or about \$5,100 per vessel per year. Given a conversion factor of 1.11 to convert commercial landings and the commercial ACL in gutted weight (gw) to whole weight (ww), the proposed action that reduces the commercial ACL for South Atlantic red snapper is expected to reduce commercial landings of South Atlantic red snapper by an average of 31,663 lbs gw per year from 2023 through 2027. Using an average of \$6.12 per lbs/gw, this expected reduction in commercial landings is also expected to reduce gross revenue from the commercial harvest of South Atlantic red snapper by \$193,779 per year on average from 2023 through 2027. Given that there are approximately 193 commercial fishing businesses harvesting South Atlantic red snapper each year, the average reduction in annual gross revenue per business is about \$1,004. Because the commercial trip limit for South Atlantic red snapper is so low (75 lbs gw), it would not be profitable to target red snapper on a commercial trip, and thus it is assumed that red snapper are harvested incidentally rather than targeted in the commercial sector. As such, effort and costs are not expected to change as a result of the reduction in the commercial ACL. Rather, red snapper will be retained while taking commercial trips targeting other species when the commercial season for red snapper is open, which will generate revenue, and discarded when the commercial season for red snapper is closed, which would not generate revenue. In other words, the reduced commercial ACL simply eliminates red snapper revenue from trips taken when the commercial season is closed. Because the number of trips and costs are not expected to change, the expected reduction in gross revenue represents an equivalent expected reduction in economic profits. Given the estimates above, the expected reduction in economic profits per commercial fishing business is also \$1,004, or about 19.7% of their average economic profits per year.

For for-hire fishing businesses, it is assumed that the proposed reduction in the recreational ACL would mainly reduce the number of red snapper that could be retained on recreational trips rather than markedly change effort (i.e., the number angler trips taken each year), particularly not target effort. If the number of charter trips targeting red snapper is not expected to change because of the proposed action, then economic profits for for-hire fishing businesses would also not be expected to change. The rationale for this assumption is that the recreational season for red snapper is already highly limited and, under the proposed action, would only be reduced from 2 days to 1 day, or by 1 day. Additionally, there is considerable uncertainty in the target effort estimates for red snapper because of the very short recreational open season. The Marine Recreational Information Program (MRIP) generates effort estimates by wave, which is a two-month time period, not by day. In recent years, target trip estimates for red snapper from MRIP have percentage standard error estimates that are above 50, indicating that these estimates are very imprecise. So, even though charter vessels were estimated to target South Atlantic red snapper on more than 5,200 trips per year from 2017 through 2021 based on MRIP data, it is likely that many of those trips either occurred outside of the very short recreational open season or the number of target trips is overestimated. Further, many potential substitute target species are available in July when the recreational red snapper season would be open. Based on this information, it is unlikely that for-hire fishing businesses would experience a reduction in economic profits because of the proposed action and, if any reduction were to occur, it would be small and not quantifiable based on available data.

C.7. Description of significant alternatives to the proposed action and discussion of how the alternatives attempt to minimize economic impacts on small entities

Two alternatives, including the status quo, were considered for the proposed action to: reduce and set the South Atlantic red snapper ABC equal to the most recent ABC recommended by the SSC; reduce the total ACL and establish an annual OY equal to the proposed ABC; and reduce the sector ACLs based on the revised total ACL, current sector allocation method, and the average weight per fish estimates in the commercial and recreational sectors from the most recent stock assessment. The status quo alternative would have retained the current ABC, total ACL, and sector ACLs, and left annual OY unspecified. This alternative was not selected because the Magnuson-Stevens Act requires OY to be specified for each species and requires that an ACL cannot exceed the ABC recommended by the SSC. Further, the various catch limits under this alternative would not be based on the SSC's most recent ABC recommendation for South Atlantic red snapper, and therefore would not be based on the best scientific information available. In addition, this alternative would not be expected to help reduce overfishing, contrary to the requirements of the Magnuson-Stevens Act.

Like the proposed action, the second alternative would have reduced the ABC to the level recommended by the SSC. However, it also would have set the total ACL, annual OY, and sector ACLs equal to zero, thereby prohibiting retention of South Atlantic red snapper in 2023 and future years until the South Atlantic Fishery Management Council (Council) took further action. This alternative was not selected because it would have had greater adverse economic effects on commercial and recreational harvesters which the Council did not consider to be justified by the additional biological benefits to the South Atlantic red snapper stock.

One alternative, the status quo, was considered for the proposed action to restrict recreational fishermen to using only one non-offset, non-stainless steel circle hook per line when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits north of 28° N latitude and only one non-stainless steel hook when fishing for South Atlantic snapper grouper species with hook-and-line gear and natural baits south of 28° N latitude. This alternative was not selected because it was not expected to reduce fishing mortality for South Atlantic red snapper, as well as other species in the snapper grouper fishery, and therefore would not reduce overfishing of red snapper or reduce dead discards of red snapper and other snapper grouper species, contrary to the Council's objectives.

Appendix D. Essential Fish Habitat and Move to Ecosystem Based Management

D.1. 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 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 Fishery Ecosystem Plan (FEP) II.

D.1.1. South Atlantic Council EFH User Guide

The [EFH Users Guide](#) developed during the FEP II development process is available through the FEP II Dashboard and provides a comprehensive list of the designations of EFH and EFH-HAPCs for all species managed by the South Atlantic Fishery Management Council (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). These sources should be reviewed for information on the components of EFH assessments, steps to EFH consultations, and other aspects of EFH program operation.

D.1.2. South Atlantic Council EFH Policy and EFH Policy Statements Policy for Protection and Restoration of EFH South Atlantic Council 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 Council 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.

D.1.3. South Atlantic Council EFH 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 NMFS, 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 (Habitat AP) and adopted a comment and policy development process. Members of the Habitat AP 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 \(September 2017\)](#)

D.2. 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 [FMP for Coral, Coral Reefs and Live/Hard Bottom Habitat of the South Atlantic Region](#) (Coral FMP) and the [FMP for the Sargassum Fishery of the South Atlantic Region](#). The FMP for the Dolphin and Wahoo Fishery in the Atlantic 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 South Atlantic Council adopted broad goals: (1) maintaining or improving ecosystem structure and function; (2) maintaining or improving economic, social, and cultural benefits from resources; and (3) maintaining or improving biological, economic, and cultural diversity.

D.3. Ecosystem Approach to Conservation and Management of Deep-water Ecosystems

Through [Comprehensive Ecosystem-Based Amendment 1](#), [Comprehensive Ecosystem-Based Amendment 2](#), and [Coral Amendment 8](#), the South Atlantic 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.

D.4. FEP II Development

The Council developed FEP II in cooperation with NMFS, 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. South Atlantic 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 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 AP, and experts from state, federal, non-governmental organizations (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. A core part of the FEP II development process involved engaging the Council's Habitat Protection and Ecosystem Based Management AP 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.

D.4.1.FEP II Dashboard (In Transition to New Habitat and Ecosystem Page)

The FEP II Dashboard and associated online tools provided a clear description of the fundamental physical, biological, human, and institutional context of South Atlantic ecosystems within which fisheries are managed. Developing webpages on the Council’s website will integrate the following FEP II components:

- Introduction
- South Atlantic Ecosystem
- South Atlantic Habitats
- Managed Species
- Social and Economic
- Essential Fish Habitat
- SAFMC Managed Areas
- Research & Monitoring
- SAFMC Tools

D.5. NOAA EBFM Activities Supporting FEP II

D.5.1.NOAA EBFM Policy and Road Map

To support the move to EBFM, NMFS developed an agency-wide EBFM Policy and Road Map available through Ecosystem page (under revision) of the FEP II Dashboard 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 to ecosystems and their components; explore and address trade-offs within an ecosystem; incorporate ecosystem considerations into management advice; and maintain resilient ecosystems.

D.5.2.FEP II Implementation Plan Structure and Framework

The Implementation Plan 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.

D.5.3.FEP II Two Year Roadmap

The FEP II Two Year Roadmap draws from the Implementation Plan and presents three to five priority actions for each of the nine approved policy statements of the Council. 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.

D.5.4. 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. 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.

D.6. Regional Habitat and Ecosystem Partners

The Council, with the Habitat Protection and Ecosystem Based Management AP as the foundation, collaborates with regional partners to create a comprehensive habitat and ecosystem network in the region to enhance habitat conservation and EBFM.

Detailed information and links to partners are highlighted online:

https://ocean.floridamarine.org/safmc_dashboard/partners.html.

D.7. Regional Ecosystem Modeling in the South Atlantic

D.7.1. 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.

The current South Atlantic Ecopath with Ecosim (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 the Florida Fish and Wildlife Research Institute (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 Council convened a working group to provide guidance on application of the Ecopath with Ecosim model framework to investigate potential impacts of increased red snapper recruitment on other species in the snapper grouper complex broader South Atlantic Ecosystem. The Working group met in August 2021 to review the model and provide guidance on further

development and in September 2021 to review findings and prepare a report for Scientific and Statistical Committee (SSC) consideration. Results were presented to the SSC in October 2021.

D.8. Tools supporting Habitat Conservation and EBFM in the South Atlantic Region

The Council developed a Habitat Conservation and Ecosystem Management Section which provided access to the FEP II Digital Dashboard and associated tools which is under development with the new website. Florida's FWRI maintains and distributes GIS data, imagery, and documents relevant to habitat conservation and ecosystem-based fishery management in their jurisdiction. Web Services and spatial representations of EFH and other habitat related layers are accessible through the Council's [SAFMC Atlas](#), a platform for searching and visualizing GIS data relevant to the Council's mission and download of GIS layers and information on regional partners is available through the [SAFMC Digital Dashboard](#). The online systems provide access to the following Services:

- i. [South Atlantic Fisheries Webservice](#): 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).
- ii. [South Atlantic EFH Webservice](#): Provides access to spatial representation of EFH and EFH-HAPCs for South Atlantic Council-managed species and Highly Migratory Species.
- iii. [South Atlantic Managed Areas Service](#): Provides access to spatial presentations of South Atlantic Council and other managed areas in the region.
- iv. [South Atlantic Artificial Reefs Web Application](#): Provides a regional view of artificial reefs locations, contents and imagery associated with programs in the southeastern U.S. overseen by individual states (Florida, Georgia, South Carolina, North Carolina).
- v. South Atlantic [ACCSP Web Map](#) and [Application](#): The web map displays Atlantic Coastal Cooperative Statistics Program (ACCSP) Statistical Areas representing catch and values of Council-managed species across time with the application displaying charts of landings and values for ACCSP Statistical Areas.

D.9. Ecosystem-Based Action, Future Challenges and 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 linked 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 South Atlantic 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 E. Alternatives Considered but Eliminated

In addition to alternatives considering allowance of electrically or hydraulically-powered reels throughout the South Atlantic recreational snapper grouper fishery, the South Atlantic Fishery Management Council (Council) directed exploration of other alternatives with considering regulations that would be specific to areas based on geography, depth, and species/catch distributions. Draft alternatives and sub-alternatives (noted below as DRAFT) were developed for consideration at the December 2022 Council meeting.

At their December 2022 meeting, the Council decided to remove an action (previously, Action 2) considering a prohibition of electrically or hydraulically-powered reels. The Council decided that the complications of enforcing this type of restriction and potential difficulties for disabled individuals outweighed the potential benefit of reducing a relatively small number of dead discards.

Action 2. Prohibit the use of electrically or hydraulically-powered reels to fish recreationally for snapper grouper species

Alternative 1 (No Action). There is no prohibition on the use of electrically or hydraulically powered reels by the recreational sector to fish for snapper grouper species in the South Atlantic exclusive economic zone.

Alternative 2. Prohibit the use of electrically or hydraulically-powered reels by the recreational sector to fish for snapper grouper species, in the South Atlantic exclusive economic zone.

DRAFT Alternative 3. Prohibit the use of electrically or hydraulically-powered reels by the recreational sector to fish for snapper grouper species in the South Atlantic Exclusive Economic Zone off:

Sub-Alternative 3a. North Carolina

Sub-Alternative 3b. South Carolina

Sub-Alternative 3c. Georgia

Sub-Alternative 3d. North Florida (counties include Nassau, Duval, Saint Johns, Flagler, Volusia)

Sub-Alternative 3e. Central Florida (counties include Brevard, Indian River, St Lucie)

Sub-Alternative 3f. South Florida (counties include Martin, Palm Beach, Broward, Miami-Dade, Monroe)

DRAFT Alternative 4. Prohibit the use of electrically or hydraulically-powered reels by the recreational sector while fishing for snapper grouper species in the South Atlantic Exclusive Economic Zone in an area associated with the following depths:

Sub-Alternative 4a. Less than 100 feet

Sub-Alternative 4b. 100 feet to 200 feet

Sub-Alternative 4c. 200 feet to 300 feet

Sub-Alternative 4d. Greater than 300 feet

**ADDITIONAL SUB-ALTERNATIVE DERIVED FROM AP
RECOMMENDATION ON ACTION 3 (SINGLE HOOK RIGS):**

Sub-Alternative 4e. Greater than 150 feet

The Council considered the addition of sub-alternatives to (Old) Action 3 (Currently Action 2) prohibition of more than one hook per line) that would specify the prohibition of multiple hooks to only apply in areas based on latitude or depth. The Council determined that simplicity was needed to maximize compliance with this regulation and potential benefits to snapper grouper stocks strongly affected by dead discards, such as red snapper. Therefore, the Council did not add the draft sub-alternatives shown below to Action 2 for final consideration.

Action 3. Prohibit the use of more than one hook per line for the snapper grouper recreational sector

DRAFT Alternative 3. Prohibit the use of more than one hook per line for the recreational sector to fish for snapper grouper species in the South Atlantic Exclusive Economic Zone off:

Sub-Alternative 3a. North Carolina

Sub-Alternative 3b. South Carolina

Sub-Alternative 3c. Georgia

Sub-Alternative 3d. North Florida (counties include Nassau, Duval, Saint Johns, Flagler, Volusia)

Sub-Alternative 3e. Central Florida (counties include Brevard, Indian River, St Lucie)

Sub-Alternative 3f. South Florida (counties include Martin, Palm Beach, Broward, Miami-Dade, Monroe)

DRAFT Alternative 4. Prohibit the use of more than one hook per line for the recreational sector to fish for snapper grouper species in the South Atlantic Exclusive Economic Zone in an area associated with depth:

Sub-Alternative 4a. Less than 100 feet

Sub-Alternative 4b. 100 feet to 200 feet

Sub-Alternative 4c. 200 feet to 300 feet

Sub-Alternative 4d. Greater than 300 feet

**ADDITIONAL SUB-ALTERNATIVE DERIVED FROM AP
RECOMMENDATION:**

Sub-Alternative 4e. Greater than 150 feet

Appendix F. Data Analyses

Red Snapper Closure Prediction Analysis

Regulatory Amendment 35 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) is considering reducing both the commercial and recreational red snapper annual catch limits (ACL). An analysis was needed to determine the impact of the reduction of the total and sector ACLs. The first step is predicting future landings for both the commercial and recreational sectors.

F.1. Commercial Sector

The commercial ACL is 124,815 pounds whole weight (lbs ww)¹⁴, and the commercial season begins on the second Monday in July each year. The commercial ACL is monitored during the season and the sector is closed when the ACL is reached or projected to be reached. Since 2017, the commercial sector has had various open fishing periods each year (Table F.1). From 2017 through 2021, except for 2018, the red snapper commercial sector was open for about two months (Table F.1). The commercial season was reopened during late 2018 and 2021 because the ACL was not met when the season was first open. Therefore, predicted landings came from determining the catch rate per day for each month when the commercial sector was open from 2017 through 2021. Data before 2017 was not used because the South Atlantic red snapper fishery was closed in 2015 and 2016 due to estimated high mortality of discarded red snapper. Also, landings before 2015 were not used because it was assumed the recent landings (2017 to 2021) would better reflect future landings more than older landings (before 2015). Commercial landings data for 2022 were considered preliminary at the time this analysis was completed and were not used in this analysis. Figure F.1 displays the catch rate per day for each year from the recent time periods when the commercial sector was open (2017 through 2021), and also the average catch rate for each month when data were available.

¹⁴Based on the current sector allocation ratio developed by the Council for red snapper of 28.07 percent commercial and 71.93 percent recreational, the total ACL is separated into a commercial ACL of 124,815 lbs ww, and a recreational ACL of 29,656 fish. The commercial sector's ACL is set in pounds of fish because the commercial sector reports landings in weight. Therefore, weight is a more accurate representation of commercial landings. In Regulatory Amendment 35, for the commercial sector, one red snapper is equivalent to 8.67 lbs ww. ACLs for the recreational sector are specified in numbers of fish because the Council determined that numbers of fish are a more reliable estimate for that sector than specifying the ACL in weight of fish. Because surveys that estimate recreational landings collect information on numbers of fish and convert those numbers to weights using biological samples that are sometimes limited, the Council believes that there can be uncertainty in estimates of recreational landings by weight.

Table F.1. Dates when the South Atlantic red snapper commercial sector was open in the years of 2017 through 2021.

Year	Days Open During Season	Number of Open Days
2017	November 2, 2017 to December 31, 2017	60
2018	July 26, 2018 to November 7, 2018, reopened December 5, 2018 to December 15, 2018	114
2019	July 8, 2019 to August 30, 2019	53
2020	July 13, 2020 to September 5, 2020	54
2021	July 12, 2021, to September 14, 2021, reopened November 2, 2021, to November 6, 2021	68

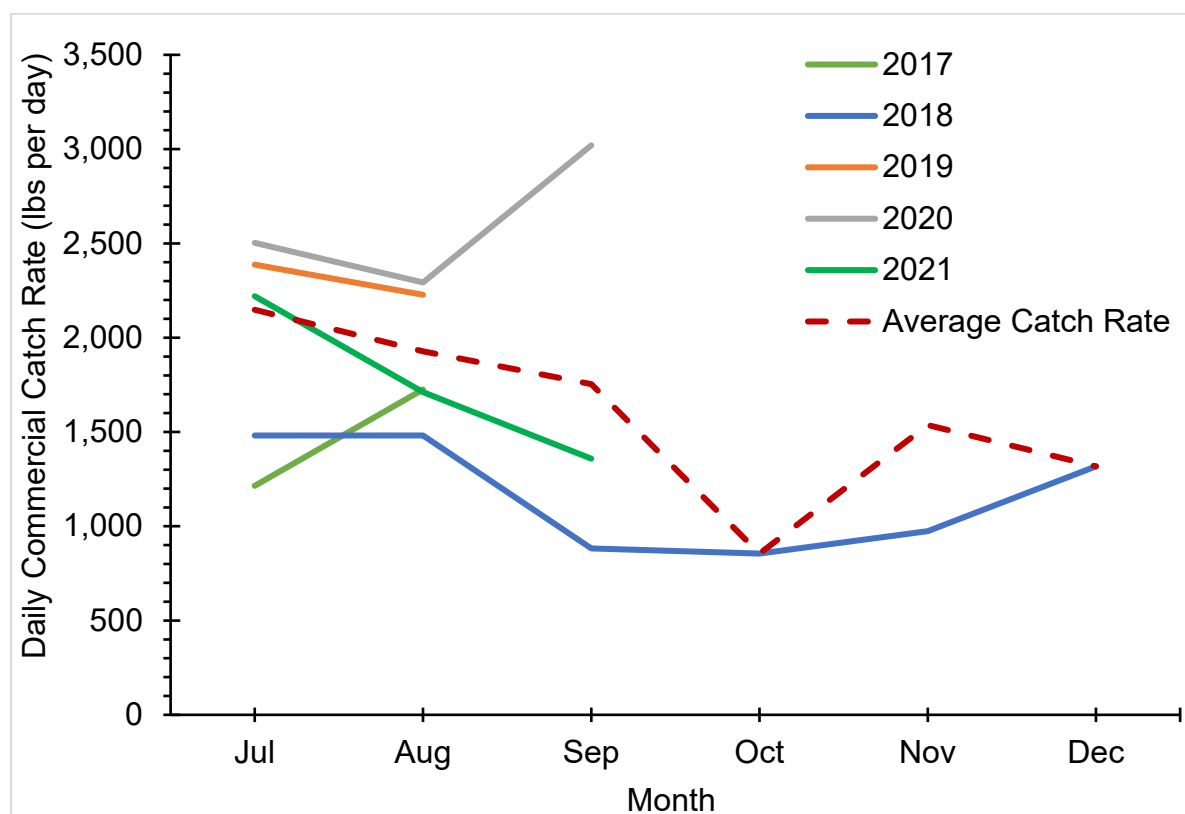


Figure F.1. South Atlantic red snapper commercial catch per day for months when the commercial sector was open in the years of 2017 through 2021. Also, an average catch rate for each month when the commercial sector was open is shown with the red dashed line. The catch rate is in lbs ww.

Predicted landings for the various commercial ACLs in Action 1 of Regulatory Amendment 35 were analyzed by using the average catch rates by month. As stated earlier, Amendment 28 to the Snapper Grouper FMP (SAFMC 2013a) set the start of the commercial sector to be the second Monday in July. The second Monday in July could occur on the range of dates from as

early as July 8 to as late as July 12. Since the start date could change from year to year a start date of July 10 was chosen since it falls in the middle of July 8 through 12. Alternative 2 of Action 1 has five different ACLs from 2023 through 2027 until modified. The analysis was simplified by only using the high and low ACL of Alternative 2. Alternative 3 of Action 1 sets the ACL at zero beginning in 2023 through 2027 until modified, and Alternative 3 was not analyzed because the fishery would be closed under the ACL of zero. The estimated closure dates for the various commercial ACLs are shown in Table F.2. The commercial ACLs are in lbs ww.

Table F.2. Estimated closure dates for the various commercial ACLs being considered in Action 1 in Regulatory Amendment 35. The closure dates were determined from assuming the commercial sector opens on July 10.

Alternative	Fishing year	Commercial ACL (lbs ww)	Estimated Closure Date	Estimated Total Number of Open Days
Alternative 1	-	124,815	11-Sep	63
Alternative 2 Low	2023	77,016	16-Aug	37
Alternative 2 High	2027+	99,021	27-Aug	48
Alternative 3	2023+	0	n/a	0

F.2. Recreational Sector

The first step in analyzing the impact from the various ACLs in Regulatory Amendment 35 to the Snapper Grouper FMP is an analysis of past landings. The red snapper recreational sector was open for six days in November and three days in December during 2017, and for six days during August in 2018. In 2019, 2020, and 2021, the recreational season was open in July for five days, four days, and three days, respectively (Table F.3). Due to potential changes to stock size over time and the limited historical data from July, this analysis only uses July 2019, 2020, and 2021 data as a proxy to predict future landings and the recreational season. Recreational landings data for 2022 were considered preliminary at the time this analysis was completed and were not used in this analysis.

Table F.3. Dates when the South Atlantic red snapper recreational sector was open in the years of 2017 through 2021.

Year	Days Open During Season	Number of Open Days
2017	November 3, 4, 5, 10, 11, and 12, 2017; reopened December 8, 9, 10, 2017.	9
2018	August 10, 11, 12, 17, 18, and 19, 2018	6
2019	July 12, 13, 14, 19 and 20, 2019	5
2020	July 10, 11, 12, and 17, 2020	4
2021	July 9, 10, and 11, 2021	3

Application of data obtained from the Marine Recreational Information Program (MRIP) for analysis is limited because the MRIP survey provides two-month (rather than daily or monthly) estimates of recreational landings, and is therefore not set up to generate landings estimates for such short red snapper recreational fishing seasons. To overcome this MRIP survey limitation, the South Atlantic states (North Carolina, South Carolina, Georgia, and Florida) conducted their own state specific red snapper surveys during the South Atlantic red snapper recreational season in 2019, 2020, and 2021. A red snapper mini-season ad-hoc group consisting of National Marine Fisheries Service (NMFS) and state employees who were involved with the MRIP and individual state red snapper surveys was formed. The group met in 2020 to review the 2019 MRIP and state survey red snapper data (SEDAR 73-WP10) to determine the best estimates to use to characterize the South Atlantic red snapper recreational landings for the stock assessment. The data sources (MRIP and state surveys) for the 2019 data used in this analysis were chosen following the ad-hoc group's guidance and recommendations used in the stock assessment. The Southeast Region Headboat Survey (SRHS) is the only survey that collects recreational landings from headboats, and the SRHS red snapper landings were also included for this analysis.

At the present time (October 2022), complete and final MRIP and SRHS landings are available for 2021. All of the individual state specific red snapper surveys of 2021 are also available at this time. The red snapper mini-season ad-hoc group did not meet to discuss the 2020 and 2021 red snapper recreational landings, because the group only met to review the red snapper landings that were needed for the latest stock assessment and the last year of data used for SEDAR 73 was 2019. However, this analysis applies the ad-hoc group's recommendations to the review of the 2020 and 2021 recreational landings data.

The red snapper mini-season ad-hoc group method of choosing the recreational landings data by each state and mode is defined below. This method was followed to determine the best scientific information available to be used to determine the 2020 and 2021 recreational landings.

Method 1: Use state survey numbers if no MRIP numbers are available

Method 2: Use MRIP numbers if no state survey numbers are available

Method 3: Use the estimate/number (MRIP or state survey) that is more reliable (taking into account sample sizes, variability, and/or biases associated with the survey) when both MRIP and state survey numbers were available.

The method defined above was used to determine the 2019, 2020, and 2021 landings by state and mode. The landings and the catch rate (fish per day) are shown in Table F.4.

Table F.4. Summary of the 2019, 2020, 2021, and average of 2019 through 2021 South Atlantic red snapper recreational landings, in numbers of fish. The catch rate was determined by dividing the July harvest by the number of days the season was open in July for that fishing year. In 2019, the recreational season was 5 days, the 2020 recreational season was 4 days, and the 2021 recreational season was 3 days.

State	2019 Landings	2020 Landings	2021 Landings	Average 2019, 2020, and 2021 Landings
NC	150	1,640	7,805	3,198
SC	15,276	23,640	332	13,083
GA	15,564	14,646	6,807	12,339
East FL	44,113	36,363	36,053	38,843
Total	75,103	76,289	50,997	67,463
Catch Rates (Fish per Day)				
NC	30	410	2,602	1,014
SC	3,055	5,910	111	3,025
GA	3,113	3,662	2,269	3,014
East FL	8,823	9,091	12,018	9,977
Total	15,021	19,072	16,999	17,031

*The landings are a combination of state surveys and MRIP that were chosen following the guidance and recommendations set by SEDAR 70's ad-hoc landings review group (SEDAR 73-WP10).

There is evidence of non-compliance in recent years, with harvest occurring outside of the open red snapper recreational season (MRIP and SRHS). Harvest outside of the open red snapper recreational season is relatively low (<5% of total harvest) compared to harvest during the open season, but still exists. During the closed recreational red snapper season (January through June, August through December) in 2019, 2020, and 2021, there was an average recreational harvest of 600 red snapper each year. To account for the observed non-compliance, this analysis assumed there would be 600 red snapper harvested in the recreational sector during the closed recreational red snapper season, from January through June, and from August through December.

Because the red snapper recreational fishing season opens in July and NMFS projects the length of the recreational fishing season, future landings were only predicted for July. Future July recreational landings were estimated by calculating the red snapper recreational daily catch rate from the average of 2019 through 2021 (Table F.4), and then applying the catch rate to the number of weekend days (Friday, Saturday, and Sunday) for July. Predicted landings assumed a uniform distribution of landings for each day in July. Based on the information and analyses described above, the recreational red snapper sector is predicted to meet the various ACLs under **Alternatives 1 (No Action)** and **Alternative 2** in one to two days, and closed to harvest under **Alternative 3** (Table F.5).

Table F.5. Estimated number of days the recreational season would be open for the various recreational ACLs being considered in Action 1 in Regulatory Amendment 35. The number of days was generated by dividing the recreational ACL by the average catch rate (17,031 fish per day).

Alternative	Fishing Year	Recreational ACL (Numbers of Fish)	Estimated Number of Open Days
Alternative 1 (No Action)		29,656	2
Alternative 2 Low	2023	19,119	1
Alternative 2 High	2027+	24,581	1
Alternative 3	2023+	0	0

Appendix G. Bycatch Practicability Analysis (BPA)

G.1. Background

National Standard 9 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) states that “Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.” The Magnuson-Stevens Act defines “bycatch”, in part, as fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. The National Marine Fisheries Service (NMFS) outlines, at 50 C.F.R. §600.350(d) (3) (i), ten factors that should be considered in determining whether a management measure minimizes bycatch or bycatch mortality to the extent practicable.

1. Population effects for the bycatch species.
2. Ecological effects due to changes in the bycatch of that species (effects on other species in the ecosystem).
3. Changes in the bycatch of other species of fish and the resulting population and ecosystem effects.
4. Effects on marine mammals and birds.
5. Changes in fishing, processing, disposal, and marketing costs.
6. Changes in fishing practices and behavior of fishermen.
7. Changes in research, administration, and enforcement costs and management effectiveness.
8. Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources.
9. Changes in the distribution of benefits and costs.
10. Social effects.

The Fishery Management Councils are encouraged to adhere to the precautionary approach outlined in Article 6.5 of the Food and Agriculture Organization of the United Nations Code of Conduct for Responsible Fisheries when uncertain about these factors.

Bycatch Reporting Requirements and Methodology

For the commercial sector, the vessel reporting requirement is achieved through logbooks. Fishermen with Commercial South Atlantic Unlimited Snapper Grouper or 225-lb Trip Limit Snapper Grouper Permits, who are selected by the Science and Research Director, are required to maintain and submit fishing records through the NMFS 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.¹⁵ Fishermen 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)/Fishing Effort Survey (FES). The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels. Red snapper discards are also collected from a red snapper specific survey run by the Florida Fish and Wildlife Conservation Commission (FWC). The FWC only operates their red snapper specific survey when the red snapper recreational season is open. Therefore, if there is only a three-day recreational season for red snapper then the FWC survey will only collect discards during those three days. In addition, in January 2021, NMFS implemented the Southeast For-Hire Electronic Reporting Program, which implemented mandatory electronic reporting of for-hire vessel catch data for over 3,000 vessels in the Gulf of Mexico and South Atlantic. The purpose of this program is to provide more accurate and reliable fisheries information about for-hire catch, effort, and discards.

G.2. Population Effects for the Bycatch Species

The South Atlantic Fishery Management Council (Council) manages snapper grouper stocks in federal waters from the Florida Keys to the Virginia/North Carolina border. Regulatory Amendment 35 to the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (Regulatory Amendment 35) would modify management of South Atlantic red snapper. Actions include revising annual catch limits (ACL) and gear modifications for the recreational sector. Development of Regulatory Amendment 35 is a response to the most recent stock assessment for South Atlantic red snapper (SEDAR 73 2021).

Commercial Sector

Commercial discards in the South Atlantic snapper grouper fishery are shown in Table G.1 and Figure G.1, including red snapper, vermilion snapper, black sea bass, and red porgy. Most discards originate from handline/electric rig and trap gear, with some discards from trolling gear and relatively low discards from longline and diving gear. Trap/pot gear show high levels of discarded black sea bass, which is the targeted species of this gear type, but low levels of bycatch for other species. It is possible that trip-level reporting leads to the relatively high discard

¹⁵ More information on the discard logbook is available here <https://www.fisheries.noaa.gov/about/southeast-fisheries-science-center>.

estimates from trolling gear; these may be sets using another gear type (i.e., handline/electric rig) on a trip declared as a trolling gear trip. The ratio of commercial landings to commercial discards is not compared because commercial landings are reported in lbs and discards are reported in numbers of fish.

Table G.1. Top ten species with mean estimated South Atlantic commercial discards (number of fish) during snapper grouper trips (defined as trips with >50% of landings from snapper grouper stocks), sorted from largest to smallest, by gear, for 2019 to 2021. Data for some gear types and for some species were not included in the table to protect confidentiality.

Stock	Handline/ Electric	Stock	Longline	Stock	Trap / Pot	Stock	Troll
Vermilion Snapper	4,636	Blueline Tilefish	155	Black Sea Bass	4,731	Red Snapper	56
Red Snapper	3,551	Snowy Grouper	73	Gray Triggerfish	101	King Mackerel	17
Red Porgy	2,568	Greater Amberjack	10	Triggerfishes	74	Yellowtail Snapper	9
Yellowtail Snapper	1,864	Confidential Data		Gag	16	Greater Amberjack	8
Black Sea Bass	1,131			Red Snapper	14	Little Tunny	6
Gray Triggerfish	891			Red Porgy	12	Confidential Data	
Triggerfishes	771			Confidential Data			
Almaco Jack	770						
Greater Amberjack	304						
Gray Snapper	251						

Source: SEFSC Coastal Logbook (accessed September 2022) and Discard Logbook (accessed November 2022).

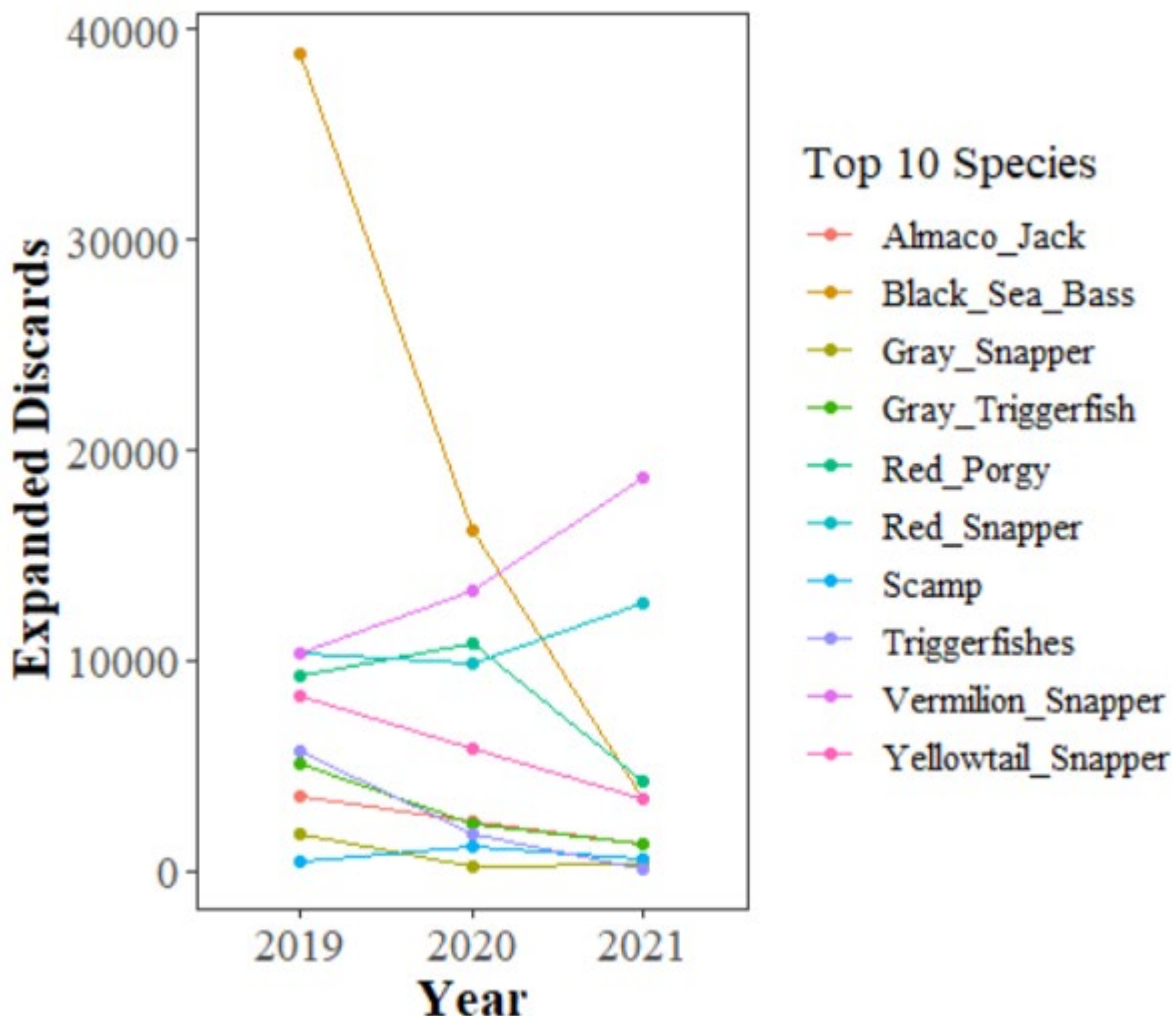


Figure G.1. Expanded self-reported commercial discards (numbers of fish) for the top ten species discarded during snapper grouper trips (defined as trips with >50% of landings from snapper grouper stocks) from 2019-2021 for all gear types.

Source: SEFSC Coastal Logbook (accessed September 2022) and Discard Logbook (accessed November 2022).

Table G.2 lists the top ten species harvested on the same trips that harvested South Atlantic red snapper. The data for Table G.2 was generated from SEFSC commercial logbook data. The analysis was done by isolating all commercial logbook trips that reported any harvest of red snapper using data from 2019 through 2021 in the South Atlantic, and then summarizing the other species caught on these same trips. The most common species being landed with red snapper in the South Atlantic were vermilion snapper and gray triggerfish. These analyses are limited to co-occurrence of landings and do not contain any information on species that were discarded at-sea. Other studies have incorporated data from the Reef Fish Observer Program in the Gulf of Mexico and an independent sampling program that may provide more comprehensive analyses, but these are focused on the Gulf of Mexico and not the South Atlantic (Pulver et al. 2016).

Table G.2. The top ten species harvested on a commercial trip that harvested South Atlantic red snapper from 2019 through 2021.

Species Landed	Percent of Trips
Vermilion Snapper	20.2
Gray Triggerfish	18.6
Red Porgy	13.4
King Mackerel	12.2
Black Sea Bass	11.7
Greater Amberjack	11.3
Gag Grouper	10.3
Scamp	10.1
Mangrove Snapper	8.2
Almaco Jack	7.7

Source: Southeast Fisheries Science Center Commercial Logbook (September 2022).

Of the four discard codes, out of season was the most common reason selected for discarded red snapper based on self-reported discards (82%) (Table G.3). Out of season was also the primary driver of discards for almaco jack, red porgy, red snapper, and vermilion snapper. Not legal size was the primary driver of commercial discards for black sea bass, gag, gray snapper, gray triggerfish, greater amberjack, yellowtail snapper, and vermilion snapper.

Table G.3. The percentage of unexpanded discards for each discard reason out of the total number of self-reported discards reported to the Supplemental Discard Logbook for the top ten snapper grouper species discarded in the South Atlantic from 2019 through 2021. Some percentages may not sum to 100% due to rounding.

Species	Not Legal Size	Out of Season	Other Regulations	Market Conditions
Almaco Jack	42%	45%	7%	5%
Black Sea Bass	99%	0%	0%	0%
Blueline Tilefish	0%	9%	90%	1%
Gag	51%	45%	1%	3%
Gray Triggerfish	53%	46%	2%	0%
Greater Amberjack	93%	4%	1%	2%
Red Porgy	43%	49%	5%	3%
Red Snapper	3%	82%	15%	0%
Snowy Grouper	2%	5%	86%	6%
Vermilion Snapper	92%	1%	7%	0%
Yellowtail Snapper	96%	1%	1%	3%

Source: SEFSC Supplemental Commercial Discard Logbook (September 2022).

Recreational Sector

From 2019 through 2021, the most discarded species on trips capturing a snapper grouper species was black sea bass for two of the three modes (Table G.4). Gray snapper had greatest amount of discards for the private mode as other snapper grouper species. Black sea bass, red snapper, vermilion snapper, tomtate, blue runner, and grunt species were in the top ten for all modes.

Table G.4. Top ten species with discards reported on trips capturing a snapper grouper species in the South Atlantic by recreational mode from 2019 through 2021. Species are sorted by number of total discards for each mode from 2019-2021.

Rank	Headboat Species	Headboat Discards (N)	Charter Species	Charter Discards (N)	Private Species	Private Discards (N)
1	Black Sea Bass	1,031,872	Black Sea Bass	674,459	Gray Snapper	32,774,950
2	Red Snapper	516,330	Red Snapper	364,669	Black Sea Bass	19,107,665
3	Vermilion Snapper	347,736	Gray Snapper	288,851	Blue Runner	11,887,718
4	Gray Triggerfish	336,539	Tomtate	225,833	Red Snapper	7,203,918
5	White Grunt	331,753	Vermilion Snapper	185,268	Grunt family	5,655,851
6	Tomtate	246,859	Grunt Family	176,259	Tomtate	3,798,129
7	Yellowtail Snapper	158,153	Mutton Snapper	67,736	Atlantic Spadefish	3,373,111
8	Red Grouper	139,832	Blue Runner	60,844	Vermilion Snapper	2,377,021
9	Lane Snapper	69,361	Greater Amberjack	57,094	Yellowtail Snapper	2,025,943
10	Blue Runner	56,688	Gray Triggerfish	44,429	Mutton Snapper	1,992,303

Sources: MRIP FES data from SEFSC Recreational ACL Dataset (September 2021); Headboat data from SEFSC Headboat Logbook files (October 2020).

Recreational discards of several snapper grouper species are higher than the landings for certain modes of fishing (Table G.5). Black sea bass, gag, red snapper, red grouper, and tomtate discards are much higher than their landings across all modes. Across most of the snapper grouper species, the magnitude of private mode discards is much higher compared to the headboat or charter modes. Red snapper recreational discards to landings ratios are 5,270% in the headboat component, 1,177% in the charter component, and 859% in the private recreational component (Table G.5).

Table G.5. South Atlantic snapper grouper headboat, charter, and private mean annual estimates of landings and discards (2019-2021). Headboat and MRIP (charter and private) landings and discards are in numbers of fish.

Species	Headboat Landings (N)	Headboat Discards (N)	Headboat Ratio (D:L)	Charter Landings (N)	Charter Discards (N)	Charter Ratio (D:L)	Private Landings (N)	Private Discards (N)	Private Ratio (D:L)
Almaco Jack	37,387	7,980	21%	59,999	10,802	18%	255,107	755,521	296%
Black Sea Bass	92,199	1,031,872	1,119%	87,046	674,459	775%	795,935	19,107,665	2,401%
Gag	1,525	47,442	3,111%	4,867	7,333	151%	45,778	201,114	439%
Gray Triggerfish	90,099	331,753	368%	187,049	44,429	24%	906,238	1,198,325	132%
Greater Amberjack	7,635	15,000	196%	56,509	57,094	101%	104,767	224,289	214%
Mutton Snapper	31,135	36,512	117%	14,280	67,736	474%	348,690	1,992,303	571%
Red Grouper	7,580	139,832	1845%	1,201	1,877	156%	48,821	160,300	328%
Red Porgy	19,978	17,002	85%	17,134	5,169	30%	141,612	131,775	93%
Red Snapper	9,798	516,330	5,270%	30,972	364,669	1,177%	839,033	7,203,918	859%
Scamp	2,519	8,057	320%	3,991	970	24%	6,484	7,681	118%
Snowy Grouper	588	4	1%	2,471	210	8%	0	474	0
Tomtate	111,173	246,859	222%	57,409	225,833	393%	966,711	3,798,021	393%
Vermilion Snapper	388,429	347,736	90%	330,554	185,268	56%	1,577,348	2,377,021	151%
White Grunt	380,602	331,753	87%	67,536	14,536	22%	863,855	1,756,613	203%
Whitebone Porgy	13,801	1,170	8%	5,060	195	4%	94,895	11,412	12%
Yellowtail Snapper	283,872	158,153	56%	47,380	24,168	51%	1,436,119	2,025,943	141%

Sources: MRIP FES data from SEFSC Recreational ACL Dataset (September 2022); Headboat data from SEFSC Headboat Logbook files (October 2022)

Current Discards

Currently, commercial discard data are collected using a supplemental form that is sent to a 20% stratified random sample of the active permit holders in the snapper grouper fishery. However, in the absence of any observer data, there are concerns about the accuracy of logbook data in collecting bycatch information. Biases associated with logbooks primarily result from inaccuracy in reporting of species that are caught in large numbers or are of little economic interest (particularly of bycatch species), and from low compliance rates. Commercial discards were estimated by month using the SEFSC Commercial Logbook and Supplemental Discard Logbook (accessed May 2021) to develop a discard rate in numbers of fish per unit of effort, by species, gear, and region, and expand that rate to the total effort in the fishery by gear and region. Note that a randomly selected comprehensive observer program is not available in the South Atlantic, thus estimation of commercial discards is reliant upon self-reported data.

Red snapper contributed to a significant number of discards in the South Atlantic region. From 2019 through 2021, the commercial sector of the South Atlantic snapper grouper fishery had red snapper listed as the second most commonly discarded species (Table G.6). An examination of the recreational sector provided the South Atlantic red snapper discards by state with most of the red snapper discards occurring off Florida (Table G.7). An examination of the discards by wave has the July/August wave having the highest number of discards (Table G.8). Annual discards during the recreational open season in Florida (where the majority of catch occurs) have increased from 2017 to 2021 as season length has decreased within that same timeframe (Table G.9). Therefore, the average number of red snapper discards per open day has increased over time.

Table G.6. Mean annual South Atlantic commercial discards for top ten snapper grouper species from 2019 through 2021. Discards represent numbers of fish (n).

Species	Mean Discards (n)
Vermilion Snapper	23,408
Red Snapper	18,781
Gray Triggerfish	14,944
Yellowtail Snapper	11,089
Almaco Jack	7,899
Greater Amberjack	3,175
Gag	2,067
Gray Snapper	1,909
Scamp	1,243
Mutton Snapper	377

Sources: Discard estimates expanded from the SEFSC Supplemental Commercial Discard Logbook (September 2022).

Table G.7. South Atlantic red snapper total and average recreational discards (numbers of fish) by state from 2019 through 2021.

State	Total Discards	Average Discards per Year
North Carolina	46,687	15,562
South Carolina	322,196	107,399
Georgia	233,760	77,920
East Florida	6,965,944	2,321,981

Source: MRIP FES data from recreational landings provided from the SEFSC in September 2022.

Table G.8. South Atlantic red snapper total and average recreational discards (numbers of fish) by two-month wave from 2019 through 2021. The data are in numbers of red snapper discards and a cumulative total from 2019 through 2021 for each wave.

	Jan/Feb	Mar/Apr	May/Jun	Jul/Aug	Sep/Oct	Nov/Dec
Total Discards	983,577	810,041	1,905,451	2,492,263	634,934	742,321
Average Discards per Year	327,859	270,014	635,150	830,754	211,645	247,440

Source: MRIP FES data from recreational landings provided from the SEFSC on September 2022.

Table G.9. Number of recreational red snapper discards (numbers of fish) collected from the Florida Fish and Wildlife red snapper mini-season survey, and the length (in days) of the South Atlantic red snapper recreational season.

Year	Discards	Season Length
2017	4,331	9
2018	41,660	6
2019	56,648	5
2020	Not Available*	4
2021	54,685	3

Source: Data from Florida Fish and Wildlife Atlantic red snapper mini-season recreational survey.

*The survey did not collect discards in 2020 due to COVID concerns.

G.3. 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 acceptable biological catch (ABC), total ACL, and establish an annual optimum yield (OY) for red snapper. The regulation ‘out of season’ was the most common reason selected for commercial release of red snapper (Table G.3). **Preferred Alternative 2** would allow for less fish to be harvested compared to **Alternative 1 (No Action)**, and increase the likelihood of an in-season closure. The season would be closed to red snapper harvest for both sectors under **Alternative 3**. Therefore, Action 1 could result in an increase in bycatch

because more fish would need to be returned to the water rather than kept, which has indirect adverse effects to the red snapper stock. However, if there are less trips targeting snapper grouper species that co-occur with red snapper during the closed seasons, then discards could decrease. Changes to fishing effort or behavior is expected to be minimal for the overall snapper grouper fishery; thus, minimal to no changes in bycatch of co-occurring species are expected as a result of Action 1.

Action 2 (**Preferred Alternative 2**) would prohibit the use of more than one hook per line for the snapper grouper recreational sectors. Reduced catch rates would be expected to provide biological benefits compared to **Alternative 1 (No Action)** by reducing overall catch of snapper grouper fishes, which would reduce harvest and release mortality. By reducing overall catch of snapper grouper species (including red snapper) and discards, this action will contribute to ending overfishing of red snapper by lowering the fishing mortality applied to the stock.

Past, Current, and Future Actions to Prevent Bycatch and Improve Monitoring of Harvest, Discards, and Discard Mortality

Actions taken in the Snapper Grouper FMP related to management of red snapper, including actions that could reduce bycatch and bycatch mortality of red snapper and other snapper grouper species, are outlined in Section 1.8 of this regulatory amendment. Other past, current, and future actions that could prevent bycatch and/or improve monitoring of harvest, discards, and discard mortality are included below.

Amendment 16 to the Snapper Grouper FMP (SAFMC 2008b) required the use of dehooking devices, which could help reduce bycatch mortality of snapper grouper species. Dehooking devices can allow fishermen to remove hooks with greater ease and more quickly without removing the fish from the water. If a fish does need to be removed from the water, de-hookers reduce handling time thus increasing survival (Cooke et al. 2001).

Amendment 17A to the Snapper Grouper FMP (SAFMC 2010) required circle hooks for snapper grouper species north of 28 degrees latitude, which has likely reduced bycatch mortality of some snapper grouper species.

The Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2; SAFMC 2011b) included actions that modified management of special management zones (SMZ) off South Carolina; revised sea turtle release gear requirements for the snapper grouper fishery that were established in Amendment 15B to the Snapper Grouper FMP (SAFMC 2008a); and designated new essential fish habitat (EFH) and EFH-Habitat Areas of Particular Concern in the South Atlantic. CE-BA 2 also included an action that limited harvest and possession of snapper grouper and coastal migratory pelagic (CMP) species to the bag limit in the special management zone (SMZ) off South Carolina. This action likely reduced bycatch around SMZs by restricting commercial harvest in the area, but has probably had limited effect on the magnitude of overall bycatch of snapper grouper species in the South Atlantic.

The Comprehensive ACL Amendment (SAFMC 2011a) 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 Joint South Atlantic/Gulf of Mexico Generic Charter/Headboat Reporting Amendment (Amendment 31 to the Snapper Grouper FMP; SAFMC 2013b) 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.

Amendment 36 to the Snapper Grouper FMP (SAFMC 2016a) established spawning SMZs and is expected to reduce bycatch of many snapper grouper species, especially speckled hind and Warsaw grouper.

The Council developed the Modifications to Charter Vessel and Headboat Reporting Amendment (Amendment 39 to the Snapper Grouper FMP; SAFMC 2017a) 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 are developing 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.

Amendment 42 to the Snapper Grouper FMP (SAFMC 2019a) modified sea turtle release gear regulations for the commercial snapper grouper fishery and modified the snapper grouper framework so the Council may more quickly modify sea turtle and other protected resources release gear and handling requirements in the future.

Regulatory Amendment 29 to the Snapper Grouper FMP (SAFMC 2020b) required descending devices be on board all commercial, for-hire, and private recreational vessels while fishing for or possessing snapper grouper in order to reduce discard mortality of 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. 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.

Amendment 46 to the Snapper Grouper FMP proposes actions to focus on a private recreational permit.

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.

G.4. Ecological Effects Due to Changes in Bycatch

Release mortality rates for the snapper grouper fishery are widely variable species to species and sector to sector, and are dependent on fishing mode (Table G.10). For instance, recreational discards of red snapper in the South Atlantic are a main driver in the overfishing determination for the stock (SEDAR 41 2017 and SEDAR 73 2021). However, discard mortality estimates for snapper grouper species are variable and highly uncertain. Generally, release mortality is highly correlated with depth for snapper grouper species, with highest mortality among fish captured in deep water (Campbell et al. 2014; Pulver 2017; Rudershausen et al. 2014; Stephen and Harris 2010; Wilson and Burns 1996). Red snapper can be found in 33-623 feet of water. A range of release mortality rates were used in the latest assessment of South Atlantic red snapper. In SEDAR 73 (2021), the release mortalities varied by sector, gear, and time period. The release mortality rates ranged from 0.22 to 0.32 (Table G.10).

Table G.10. Release mortality rates of select recreationally and commercially important snapper-grouper species from recent stock assessments.

Species	Fishery	Release mortality	Data Source
Black Sea Bass	Recreational	13.7%	SEDAR 56 (2018)
Black Sea Bass	Commercial Trap/Pot (2007- present)	6.8%	SEDAR 56 (2018)
Black Sea Bass	Commercial Vertical Line	19%	SEDAR 56 (2018)
Gag	Recreational	25%	SEDAR 10 Update (2014)
Gag	Commercial	40%	SEDAR 10 Update (2014)
Gray Triggerfish	Recreational & Commercial	12.5%	SEDAR 41 (2016)
Greater Amberjack	Recreational & Commercial	20%	SEDAR 59 (2020)
Red Porgy	Recreational	41%	SEDAR 60 (2020)
Red Porgy	Commercial	53%	SEDAR 60 (2020)
Red Snapper	Recreational - Private	23%	SEDAR 73 (2021)
Red Snapper	Recreational - Charter & Headboat	22%	SEDAR 73 (2021)
Red Snapper	Commercial	32%	SEDAR 73 (2021)
Vermilion snapper	Recreational	38%	SEDAR 55 (2018)
Vermilion snapper	Commercial	41%	SEDAR 55 (2018)
Yellowtail snapper	Recreational	15%	SEDAR 64 (2020)
Yellowtail snapper	Commercial	12.5%	SEDAR 64 (2020)

It is likely that most mortality is a function of hooking and handling of the fish when the hook is being removed. Regulatory Amendment 29 to the Snapper Grouper FMP (SAFMC 2020b) 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. The Council 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. The goal of these regulations is to reduce discard mortality for snapper grouper species.

The actions contained in this regulatory amendment are intended to reduce bycatch in the snapper grouper fishery; thus, adverse 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.

G.5. Changes in the Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects

Regulatory Amendment 35 is intended to reduce bycatch of snapper grouper species. Both sectors for the snapper grouper fishery likely target a wide range of species other than snapper

grouper species during each trip, including dolphin wahoo and coastal migratory pelagic species. This results in a varied amount, and type of, bycatch of species. The top three species caught with red snapper on a commercial trip in the South Atlantic region are vermilion snapper, gray triggerfish and red porgy (Table G.2). For the recreational sector, it is black sea bass, vermilion snapper, and gray triggerfish (Table G.11).

Table G.11. The top ten species that are commonly caught on recreational trips that caught red snapper in the South Atlantic region. MRIP recreational landings from 2019 to 2021.

Species Landed	Percent of Trips
Black Sea Bass	26.1%
Vermilion Snapper	25.1%
Gray Triggerfish	16.4%
Tomtate	13.3%
King Mackerel	9.7%
Greater Amberjack	7.9%
Almaco Jack	7.2%
Gag	6.3%
White Grunt	5.5%
Cobia	5.3%

Source: MRIP FES data from recreational landings provided from the SEFSC in September 2022.

G.6. Effects on Marine Mammals and Birds

Marine Mammals

Under Section 118 of the Marine Mammal Protection Act (MMPA), the 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 gear types used to catch red snapper are nets, spear, traps, longline and hook-and-line. The longline and hook-and-line gear components of the snapper grouper fishery, which are primarily the gears used to catch red snapper, are determined to have remote likelihood of/no known interactions with marine mammals (Category III, LOF, 88 FR 16899; March 21, 2023).

Sea Birds

The Bermuda petrel and roseate tern 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 snapper grouper fishery. Thus, the fishery is not likely to adversely affect the Bermuda petrel and the roseate tern.

G.7. Changes in Fishing, Processing, Disposal, and Marketing Costs

The actions proposed in Regulatory Amendment 35 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 snapper grouper 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.

G.8. Changes in Fishing Practices and Behavior of Fishermen

The actions proposed in Regulatory Amendment 35 are intended to address overfishing of red snapper and reduce bycatch of snapper grouper species. The reduction of the ABC and total and sector ACLs has the potential to decrease catch and landings. The potential net effect of reduced ABCs and ACLs on discards is unclear and dependent on how the new catch limits and resultant seasons for red snapper affect snapper grouper catch and fishing effort. However, the gear modifications proposed in Regulatory 35 would reduce catch by prohibiting multiple hooks per line, which could result in reduced 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 intended to be an overall reduction from the current amount of discards in the fishery.

G.9. 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 For-Hire Reporting Amendment requirements 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 Program. 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.

Although commercial and recreational harvest of red snapper would be prohibited under Action 1, **Alternative 3**, and reduced under **Preferred Alternative 2**, NMFS may authorize exempted fishing permits (EFP) under certain circumstances (e.g. limited testing, data collection, etc.). An EFP may authorize a fishing vessel to conduct fishing activities that would otherwise be prohibited under current regulations. It may be possible that an EFP project would be able to test innovative management strategies to reduce effort and snapper grouper discards, while providing a way to transfer discards into retained catch. Information on EFPs can be found in the Code of Federal Regulations at [50 C.F.R. § 600.745\(b\)](#), and on the [SERO EFP webpage](#).

Administration

The proposed actions are not expected to significantly impact administrative costs.

Enforcement

The proposed actions are not expected to significantly impact enforcement costs.

G.10. 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. The gear modifications proposed in Regulatory Amendment 35 have the potential to decrease 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 a reduction from the current amount of discards in the fishery. This potential reduction in discards may lead to improvements to the social, economic, or cultural value of fishing activities and if fishermen must modify the way they have fished historically to comply with the proposed gear modifications.

G.11. Changes in the Distribution of Benefits and Costs

The distribution of benefits and costs expected from the proposed actions in Regulatory Amendment 35 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 B) and Regulatory Flexibility Act Analysis (Appendix C) provide additional information on changes in the distribution of benefits and costs. Overall, this amendment is not expected to increase bycatch in a way that would change the distribution of benefits and costs.

G.12. Social Effects

The baseline social environment and social effects of the proposed actions are described in Chapters 3 and 4 of Regulatory Amendment 35, respectively. In general, fishermen become frustrated as waste of the resource increases due to regulatory bycatch of target and non-target species. This often results in a distrust of science because regulations are intended to protect stocks and rebuild overfished stocks by reducing such bycatch. However, none of the actions and alternatives in Regulatory Amendment 35 are likely to increase the current level of bycatch

of target or non-target species in the South Atlantic and thus are unlikely to result in the negative social effects described.

G.13. Conclusion

This BPA evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 C.F.R. § 600.350(d)(3)(i). In summary, the proposed actions in Regulatory Amendment 35 are intended to reduce the current level of bycatch in the snapper grouper 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 the monitoring efforts of discards and discard mortality.

Appendix H. Best Fishing Practices Outreach Campaign

Release Survivorship in the Snapper Grouper Fishery

Regulatory measures combined with growing fishing effort in the South Atlantic snapper grouper fishery, particularly from the recreational sector, have led to a drastic increase in the number of non-target snapper and grouper that must be released. Due to the multispecies nature of the snapper grouper fishery, it is common for non-target species to be caught and released due to regulatory or other reasons, while fishing for other species. The increase in releases has led to an increase in the number of fish that die after being caught and released. This problem is illustrated by red snapper where the number of dead releases far outnumbers fish removed from the population by harvest (SEDAR 73 2021). Large numbers of released fish limit the South Atlantic Fishery Management Council's (Council) ability to prevent overfishing and reduce the number of fish that can be sustainably landed by the snapper grouper fishery. While there are management and fishermen efforts in place aimed at improving survival after release through best fishing practices (BFP) and the use of descending devices, more outreach and education are needed to ensure these practices become ubiquitous throughout the fishery.

Outreach and Education Goals and Objectives

- Increase knowledge of fishing methods that will improve survivorship of released snapper grouper species, including:
 - Understanding of barotrauma
 - Signs of barotrauma
 - Types of descending devices
 - Proper use of descending devices
 - Proper handling techniques
 - Avoidance of non-target species
 - Stock benefits from increased use of BFP
- Encourage the active use of BFP when fishing for snapper grouper species.
- Improve knowledge of Council regulations related to BFP, including descending devices and circle hooks.
- Gather information on the utilization of descending devices and other BFP.
- Increase knowledge of and participation in Council activities.
 - Citizen Science Program including SAFMC Release project.
 - Opportunities to serve on advisory panels or make public comments.
- Build and maintain relationships with fishing communities.
 - Periodic contact both in-person and via email.
 - Consistent distribution of BFP and Citizen Science outreach materials.

Current Outreach and Education Efforts

Important Note: This level of outreach would *not* be possible without the help of our stakeholders and government partners. The South Atlantic Sea Grant offices involved in the multi-year, multi-state reef fish extension grant are collaborating with the Council to provide a South Atlantic Reef Fish Extension/Communication Fellow to address the communication and outreach needs of the snapper grouper fishery and BFP. While housed at the Council office, the fellow is financially supported through Sea Grant. Additionally, state agencies, local community

leaders, and advisory panel members have been instrumental in helping staff find opportunities to share BFP information.

Moreover, the BFP and citizen science outreach campaign for SAFMC Release have become close partners due to their overlapping goals and messages. Both projects encourage the use of BFP and the SAFMC Release project provides an opportunity to gather information on descending device usage, a key research recommendation from recent SEDAR assessments. This partnership has allowed staff to leverage limited resources with both projects optimizing time and funding to increase the potential impact of both initiatives.

South Atlantic Reef Fish Extension/Communication Fellow

The South Atlantic Reef Fish Extension/Communication Fellowship is responsible for engaging in extension programming and communication projects that work to advance stakeholder understanding of snapper grouper issues and management, BFP, and advances in research related to snapper grouper species. The following outreach strategies are employed by the fellow:

- Tackle Shop Tours
 - Traveling to tackle shops, marinas, and fishing clubs to chat, engage, and inform stakeholders and distribute educational materials.
 - Developing a tackle shop database to help guide outreach efforts (i.e., which tackle shops cater to offshore anglers, have descending devices in stock, etc.)
 - Such tackle shops have and will continue to be revisited in the future to build relationships and further education.
- Fishing Seminars
 - Working with fishing community leaders and local businesses to hold seminars where staff can demonstrate BFP and provide information on the Citizen Science Program.
- Charter Trips
 - Take charter trips with outdoor writers and social media influencers in the South Atlantic region to demonstrate BFP and citizen science efforts and share how stakeholders can contribute to sustainable management and scientific data collection.
- Industry Events
 - Attending various fishing industry events, such as the International Convention of Allied Sportfishing Trades (ICAST) to spread awareness of BFP, Citizen Science, and Council management.

Activities Completed in 2022:

- Tackle shops in the following areas were visited:
 - Outer Banks North Carolina (Hatteras, Manteo, Kitty Hawk),
 - Northern South Carolina (Myrtle Beach, Murrells Inlet, Georgetown),
 - Central South Carolina (Charleston),
 - Southern South Carolina (Beaufort, Hilton Head),
 - Northern Georgia (Savannah),
 - Southern Georgia (Darien, Brunswick),
 - Florida Keys (Miami, Key Largo, Marathon, Key West).

- “Responsible and Effective Bottom Fishing” seminar with local charter captains, Mark Phelps, and Chuck Griffin, at Haddrell’s Point Tackle on 4/27 in Mt. Pleasant, South Carolina.
 - Approximately fifty people attended exhibiting interest in BFP and SAFMC Release,
 - BFP and SAFMC Release information provided as part of seminar and outreach materials distributed.
- Outreach at the Governor’s Cup Billfishing Series tournament in Georgetown, South Carolina.
 - Web analytics showed a large spike in traffic to the Council’s BFP webpage following this outreach effort.
- ICAST 2022
 - ICAST is the world’s largest sportfishing trade show held annually in Orlando, Florida,
 - Council 10 X 20’ educational exhibit focusing on BFP and SAFMC Release as part of the show's Conservation Corner,
 - Unique opportunity to talk with leaders in the industry, make contacts, and further develop partnerships,
 - Encouraged attendees to carry descending devices and Council informational materials in their store.
- Charter trip with Good Times Sportfishing and local writers in Hatteras, North Carolina.
- Charter Guide Summit with SC Department of Natural Resources (Charleston, Murrells Inlet, and Lemon Island, South Carolina).
 - Provided information on BFP and SAFMC Release to charter captains as part of the summits conducted by SCDNR.

Outreach Activities through 2022:

- Tackle shop outreach in southern North Carolina (Wilmington).
- Charter trip with Miss Judy Charters and local writers in Savannah, Georgia.
- Content creation trip to gather photo and video footage of descending device use and SAFMC Release for use in outreach materials.

SAFMC Release

SAFMC Release, a project developed through the Council’s Citizen Science Program, partners with recreational, for-hire, and commercial fishermen to collect information about their released shallow water grouper and red snapper using the free mobile app, SciFish. Data collected through the app include fish length, depth caught, hook type, use of descending devices or venting, and occurrence of shark depredation. This information provides valuable insight into the age and survivorship of released fish which addresses a Council citizen science research priority and SEDAR research recommendations.

Current Education & Outreach Activities

Current SAFMC Release outreach activities are listed below. These activities are being led by the Citizen Science Project Coordinator (contractor) with the support and oversight of the Citizen Science Program Manager (full time staff member). Activities in italics were conducted in direct collaboration with the BFP campaign and were highlighted above. Communications with project participants (newsletters, social media, etc.) regularly highlight BFP messages.

- Partnerships with agencies in their outreach
 - Examples of partnerships:
 - North Carolina Division of Marine Fisheries: Mailing sent to 10,000 licensed recreational saltwater anglers with information about the project; laminated flyers with QR code for SAFMC Release placed at approximately 100 boat ramps
 - South Carolina Department of Natural Resources: Presented at charter summits held in Charleston, Murrells Inlet, and Beaufort, South Carolina
- Hosting of educational seminars about BFP and SAFMC Release
- Attending industry events
 - ICAST in July 2022
- Tackle shop visits throughout the region
- Charter trips for content creation
- Regular email and phone communication with participants.
 - Thank you emails following submissions
 - Answering questions about the project
 - Follow-up emails with new participants approximately one month after they join the project
- Monthly newsletters for participants
- Weekly social media posts
- Annual data summaries, which are shared with participants

Descending Device Outreach Coordination Team

Organized by staff at the Florida Fish and Wildlife Conservation Commission, the Descending Device Outreach Coordination Team provides a venue for state agencies, federal agencies, and non-profits working on BFP outreach to share strategies and collaborate on initiatives. The Reef Fish Extension/Communication Fellow, Citizen Science Project Coordinator, and other Council staff participate as members of this team. During ICAST 2022, the Descending Device Outreach Coordination Team hosted a “Donuts and Descending” event that brought ICAST attendees to the Conservation Corner to learn about barotrauma in snapper grouper species and methods to improve survival of released fish, including BFP and use of descending devices. The event was well attended, and the Coordination Team is currently working on hosting a larger event during ICAST 2023.

Proposed Expansion of Best Fishing Practices Outreach and Education

Goal: Increase the overall use of BFP, including descending devices, in the South Atlantic snapper grouper fishery by increasing stakeholder awareness of the need to improve survival of released fish and BFP regulations currently in place.

Overview: The Citizen Science Project Coordinator, who is leading SAFMC Release outreach efforts, is currently funded through the end of 2023. Funding for the Reef Fish Extension/Communication Fellowship is available through 2024. Current BFP outreach activities are limited by available funding and staff. To maintain and increase BFP outreach efforts, additional staff will be required. To maintain the SAFMC Release project's outreach and expand their capacity to implement new engagement strategies, the Citizen Science Project Coordinator position needs to be extended beyond 2023. As such, an additional full-time best fishing practices outreach position and funds to extend the current Citizen Science Project Coordinator position are recommended. These positions are necessary to maintain the connections and relationships built with participants and stakeholders throughout the region.

The BFP and SAFMC Release campaigns are focused on behavior change within the snapper grouper fishery. Fostering change within the fishery is a long-term goal that requires regular interaction with stakeholders over a significant period to achieve. These outreach initiatives are crucial to the development and maintenance of relationships with fishing communities. This work not only contributes to the continued use of BFP and the long-term retention of SAFMC Release users and increased data submission, but also provides the opportunity for regular, two-way communication with constituents. Staff and fishermen can discuss signs of barotrauma, descending device use, Council regulations related to BFP, Council activities, opportunities to get involved, and what fishermen are seeing on the water. It is important that the individuals conducting this engagement be long-term, full-time staff members with health benefits to avoid the loss of these connections at the end of short contract periods.

The chosen best fishing practices candidate will supplement the work currently being done by the Reef Fish Extension/Communication fellow, including organizing fishing seminars, attending industry events, and fishing tournament, but will also focus on reaching a broader group of snapper grouper stakeholders by creating a marketing and promotion strategy for BFP throughout the South Atlantic region.

As detailed in the above section, logging information on released fish through the SAFMC Release project is considered a best fishing practice. Therefore, expansion of BFP outreach extends to the Citizen Science Program. Expanding the outreach and engagement capabilities of the Citizen Science Program by funding an additional year of the Citizen Science Project Coordinator will allow staff to increase recruitment and retention efforts for the SAFMC Release project, further providing fishermen with the opportunity to gather data on released fish and on their descending device usage. These efforts will contribute to the data available to manage the snapper grouper fishery.

Best Fishing Practices Outreach Specialist Position Description:
Complement current Reef Fish Extension/Communication Fellow and Citizen Science Program efforts:

Current efforts by the Reef Fish Extension/Communication Fellow and Citizen Science Project Coordinator, as detailed above, are limited due to funding and available staff. To increase the reach and efficacy of this work, the BFP Outreach Specialist would support these efforts once funding ends for the Communications Fellow and Citizen Science Project Coordinator.

- **Organizing fishing seminars:** seminars have been valuable opportunities for education regarding BFP and SAFMC Release as well as relationship-building with members of the fishing community.
- **Attending fishing tournaments and other industry events:** while there are few reef fish tournaments, often snapper grouper anglers will participate in a wide variety of fishing tournaments.
 - Example tournaments:
 - [Governor's Cup](#) - South Carolina
 - [Carolina Sportsman](#) - lists monthly various species tournaments (King mackerel, Spanish mackerel, red drum etc.) in North Carolina
 - [Marlin Magazine](#) - lists monthly billfish tournaments in Florida
 - Example industry events:
 - [ICAST](#)
 - [ASA's Sportfishing Summit](#)
- **Additional mailings to potential SAFMC Release participants** about the project, as well as BFP, either solely by SAFMC or in partnership with other agencies performing outreach.
- **Additional personal communication with SAFMC Release participants** via phone and email. Most participants who submit data are fishermen with whom we have built a strong relationship, making this a critically important communication effort.
- More **tackle shop visits** throughout the Southeast region (both initial and repeat visits).
- Assist in organizing and conducting **content creation and media charter trips**.

New efforts to be led by the Best Fishing Practices Outreach Specialist:

- **Marketing and advertising**
 - Produce videos, ads, and physical materials such as, but not limited to, billboards, targeted social media, push notifications on various weather applications focusing on various best fishing practice subjects.
 - General information about the South Atlantic Council, current issues in the snapper grouper fishery, and the importance of BFP
 - SAFMC Release (what is it, how to use it, and why to use it)
 - How to use a descending device
 - How to make your own descending device
 - Regulatory BFP requirements in the South Atlantic
 - How to properly vent a fish

- Best handling practices, non-target species avoidance, and other Council regulations pertaining to BFP
- Create an optional interactive outreach tool to test users on their knowledge of BFP. To make it engaging, ideas include adding short videos, pictures, and a game.
 - Housed on BFP webpage. Depending on the platform, it may be possible to gather information on what users get correct and incorrect.
 - Example questions:
 - “What signs of barotrauma are being exhibited by this gag grouper?”
 - “What best fishing practice is being done incorrectly in this video?”
 - “How much weight should be attached to a descending device?”
 - After playing a short video about SAFMC Release: “Would you like to help inform managers on what you are seeing on the water?”
- Create a “Best Fishing Practice Master Volunteer Program” (become a BFP MVP!) that trains volunteers to become experts in all things Best Fishing Practices and encourages them to train others in their fishing community.
 - In person workshops in the region to share best fishing practice information, learn from BFP MVPs on their thoughts on effectively sharing this information with their communities, and create a network of other attendees.
 - Target audiences:
 - Port samplers
 - Marine Resources Education Program (MREP) graduates
 - Federal for-hire permit holders
 - State and federal agencies (North Carolina Division of Marine Fisheries, South Carolina Department of Natural Resources, Georgia Department of Natural Resources, Florida Fish and Wildlife Conservation Commission, U.S. Coastguard, NOAA (National Oceanic and Atmospheric Administration) Office of Law Enforcement)
 - Council Advisory Panel members
 - SAFMC Release participants
 - Campaign by mailings, seminars, tackle shop outreach, advertisements, partnerships
 - BFP MVPs to receive a certificate once completed, giving attendees an opportunity to market their “MVP” status and encourage others to become a BFP MVP

New efforts to be led by the Citizen Science Project Coordinator:

- **Explore organizing periodic short fishing “tournaments” to facilitate discussions about BFP and increased SAFMC Release submissions.**
 - Such tournaments are envisioned to be virtual in nature. Potentially held in partnership with other agencies or companies, participants would be encouraged to log their releases within a given period but would not be attending an in-person event.
 - The tournament prizes and sampling design will be adjusted to encourage submission of the specific data needed. Such specificity will not only enhance the effectiveness of this effort but will also avoid an increase in the pressure placed on closed species.
- **Develop and implement additional points of contact with SAFMC Release participants**
 - Push notifications and/or text notifications
 - Additional email check-ins
 - Gathering and sharing participant testimonials
- **Establish a SAFMC Release participant recognition program**
 - Encourage long-term retention and continued release submissions by recognizing participants’ contributions in a more formalized manner (currently, we send thank you emails).
 - Such a program could feature those who excel in certain categories, such as:
 - The most fish logged
 - The most fish descended
 - The longest fish logged of a particular species
 - The shortest fish logged of a particular species
 - Participants and their achievements in the above categories could be featured in the SAFMC Release newsletter and highlighted on the Council’s social media.

The Best Fishing Practices Outreach Specialist and Citizen Science Project Coordinator would also attend various workshops, advisory panel, and Council meetings within the South Atlantic, as appropriate.

Evaluation of Current and Future Outreach and Education Campaigns

Evaluation of the outreach efforts proposed in this appendix will be key in ensuring that the goal of increasing the use of BFP in the South Atlantic snapper grouper fishery is achieved. Yet, it can be challenging for Council staff to complete this work due to time and funding constraints as well as policy constraints due to the Paperwork Reduction Act. However, in recent years, there has become increased interest in exploring stakeholder perception and usage of BFP, namely barotrauma mitigation tools like descending devices. Several survey-based studies have been

completed throughout the South Atlantic and Gulf of Mexico region (described below).¹⁶ However, they all ask slightly different questions, focus on different areas, or are not longitudinal in nature, making it challenging to determine changes in fishing behavior throughout the South Atlantic region.

To help aid the Council, researchers conducting work on BFP perceptions, outreach, and usage would be invited to a workshop to present their work and discuss how it may benefit the Council's BFP program. Specific goals and objectives will be developed as the workshop is organized, but broadly the purpose would be to:

- 1) Learn more about current research efforts underway in the South Atlantic region.
- 2) Discuss how past research efforts can be used to create a baseline for BFP use in the snapper grouper fishery.
- 3) How future research can be used to help determine the effectiveness of different BFP.
- 4) How future research can help quantify changes in fishermen behavior over time, as it relates to BFP usage.

Examples of recent BFP studies conducted in the South Atlantic and Gulf of Mexico regions:

Southeast Florida and South Carolina Anglers' Release Practices and Their Attitudes Toward Descending Devices (The Nature Conservancy)

- In 2022, the Nature Conservancy conducted a survey of anglers who fished in Southeast Florida or South Carolina for several species of fish that are included in the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. The survey found that a slight majority of anglers had noticed signs of barotrauma and were familiar with the term. Additionally, most surveyed anglers in both states were familiar with descending devices. However, only a quarter to a third have used descending devices. The baseline data collected in this study can be compared to future surveys to examine trends in attitudes, behavior, and the effectiveness of outreach campaigns.

Awareness, Attitudes, Perceptions, and Use of Best Fishing Practices by Recreational Reef Anglers in the Gulf of Mexico (The Gulf States Marine Fisheries Commission)

- The purpose of this study was to gather baseline information on recreational angler behavior and knowledge of best fishing practices in the Gulf of Mexico. A follow-up study will be conducted in 2024 to measure changes in angler knowledge of best fishing practices. This initial survey found that anglers want to help release fish survive, however there is a lack of knowledge around descending devices and their benefits. The full report can be found here:
<https://www.gsmfc.org/publications/GSMFC%20Number%20312.pdf>.

¹⁶ This is not an exhaustive list of research conducted in the southeast region on angler attitudes and behaviors relative to best fishing practices. The initiatives listed here include efforts to gather baseline information *and* to conduct future surveys to estimate changes in angler knowledge because of outreach efforts.

Reef Fish Extension Program Surveys

- As part of the broader Reef Fish Extension Project, Sea Grant fisheries extension specialists and university scientists are conducting annual surveys of reef fish stakeholders to identify pressing research needs as well as stakeholder attitudes, perceptions, and beliefs regarding the management of snapper grouper species in the Gulf of Mexico and South Atlantic regions.

SAFMC Release

- Data collected through the SAFMC Release project, including use of descending devices, will be summarized, and considered for use in upcoming stock assessments and relevant management actions. Additionally, SAFMC Release has developed goals and objectives to help evaluate and make improvements to the project over time.

Appendix I. Allocation Review Trigger Policy

In a letter to the NOAA Assistant Administrator dated July 16, 2019, the South Atlantic Fishery Management Council (Council) responded to NOAA's Fisheries Allocation Review Policy (NMFS Policy Directive 01-119) and the associated Procedural Directive on allocation review triggers (NMFS Procedural Directive 01-119-01). The Policy established the responsibility for the Regional Fishery Management Councils to set allocation review triggers and consider three types of trigger criteria: indicator, public interest, and time. Councils were directed to establish triggers for consideration of allocation reviews by August 2019. The Council's response follows:

The Council has reviewed species allocations on numerous occasions in the past. However, these reviews may not have been formally documented in a fishery management plan amendment if a decision was made not to modify sector allocations. This new policy will ensure all species currently having sector allocations will be reviewed on a regular basis and will formalize the allocation review process so the Council's consideration of allocations will be documented.

The Council reviewed their current sector allocations and began discussions on the Policy and Procedural Directives and criteria for considering fishery allocation reviews at their December 2018 meeting. At their June 2019 meeting, the Council adopted two types of criteria for triggering consideration of an allocation review: indicator and time.

The Council chose several indicator-based criteria as triggers:

- Either sector exceeds its ACL or closes prior to the end of its fishing year three out of five consecutive years,
- Either sector under harvests its ACL or OY by at least 50% three out of five consecutive years,
- After a stock assessment is approved by the SSC and presented to the Council, and
- After the Council reviews a species Fishery Performance Report.

The Council chose a time-based trigger to ensure allocation reviews are regularly considered. Each species will have its sector allocations reviewed not less than every seven years. Table 1 shows by species when the next sector allocation review will be considered by the Council should an indicator-based criterion not be triggered. Regardless of whether consideration of an allocation review is triggered by an indicator or time criterion once it occurs the next one will automatically be scheduled for consideration seven years later. For species which are jointly managed with the Gulf of Mexico Fishery Management Council, the timing for consideration of allocation reviews was coordinated with that council.

A public interest-based criterion was not selected because the Council currently receives substantial and regular comment from the public through scoping and public hearing sessions, general public comment periods held at every Council meeting, the public comment form on the Council's website, and through other more informal channels. Thus, the Council decided the existing Council process provides sufficient opportunity for public input on allocation.

Table I.1. Next year for allocation reviews (as of 2019) for SAFMC-managed species.

Assessed Species	Review Year	Unassessed Species	Review Year	Grunts Complex	Review Year
Black grouper	2026	Atlantic spadefish	2022	White grunt	2024
Black sea bass	2023	Bar jack	2022	Sailor's choice grunt	2024
Blueline Tilefish	2020	Scamp	2022	Tomtate	2024
Gag	2022	Speckled hind	*	Margate	2024
Golden tilefish	2021	Warsaw grouper	*	Shallow-Water Groupers Complex	Review Year
Gray triggerfish	2023	Deepwater Species	Review Year	Red hind	2026
Greater amberjack	2021	Yellowedge grouper	2024	Rock hind	2026
GA-NC Hogfish	2023	Silk snapper	2024	Yellowmouth grouper	2026
FLK/EFL Hogfish	2023	Misty grouper	2024	Yellowfin grouper	2026
Mutton napper	2023	Sand tilefish	2024	Coney	2026
Red grouper	2023	Queen Snapper	2024	Graysby	2026
Red porgy	2021	Blackfin snapper	2024	Porgy Complex	Review Year
Red snapper	2024	Jacks Complex	Review Year	Jolthead porgy	2027
Snowy grouper	2021	Almaco jack	2025	Knobbed porgy	2027
Vermilion snapper	2021	Banded rudderfish	2025	Saucereye porgy	2027
Wreckfish	2019	Lesser amberjack	2025	Scup	2027
Yellowtail snapper	2021	Snappers Complex	Review Year	Whitebone porgy	2027
Atlantic Group King mackerel	2021	Gray snapper	2025	Dolphin/Wahoo	Review Year
Atlantic Group Spanish mackerel	2022	Lane snapper	2025	Dolphin	2019
Gulf Group Cobia FL East Coast zone	2021	Cubera snapper	2025	Wahoo	2019

*ACL=0 for this species. If ACL>0 in the future, allocations will be reviewed when the ACL is increased.

Appendix J. SEDAR 73 (2021) Red Snapper Projection Table

Table J.1. Scientific and Statistical Committee’s recommended projection for South Atlantic red snapper acceptable biological catch, based on SEDAR 73 (2021) with F= F30 starting in 2022 and recent average recruitment. Benchmarks are based on Block 3 and discard mortality on Block 4 with no reallocation of F toward landings. R = number of age-1 recruits (in 1000s), F = fishing mortality rate (per year), S = spawning stock (1e8 eggs), L = landings expressed in numbers (n, in 1000s) or whole weight (w, in 1000 lb), D = dead discards expressed in numbers (n, in 1000s) or whole weight (w, in 1000 lb), and pr.reb = proportion of stochastic projection replicates with $SSB \geq SSBF30$. The extension “b” indicates expected values (deterministic) from the base run; the extension “m” indicates median values from the stochastic projections.

Year	R.b	R.m	F.b	F.m	S.b	S.m	L.b(n)	L.m(n)	L.b(w)	L.m(w)	D.b(n)	D.m(n)	D.b(w)	D.m(w)	pr.reb
2020	718	628	0.39	0.34	307585	325212	40	39	416	409	443	407	2019	1910	0.053
2021	718	629	0.35	0.31	347034	372325	39	38	420	413	332	288	1626	1473	0.117
2022	718	629	0.21	0.21	401322	430186	25	28	284	319	195	189	983	996	0.206
2023	718	629	0.21	0.21	465178	491225	28	31	327	363	202	191	1036	1016	0.307
2024	718	629	0.21	0.21	529917	551037	31	33	368	403	207	194	1076	1034	0.415
2025	718	630	0.21	0.21	593360	608291	33	35	408	441	210	196	1104	1050	0.526
2026	718	623	0.21	0.21	653509	662653	35	36	446	475	211	196	1122	1062	0.637
2027	718	630	0.21	0.21	710246	712268	36	38	480	506	212	197	1133	1067	0.733
2028	718	629	0.21	0.21	762093	757711	38	39	511	533	212	197	1138	1072	0.81
2029	718	630	0.21	0.21	809274	799286	39	40	538	559	212	197	1143	1076	0.871
2030	718	624	0.21	0.21	851779	835646	40	41	562	581	212	198	1146	1080	0.915
2031	718	625	0.21	0.21	889553	868429	41	42	584	602	212	198	1148	1083	0.946
2032	718	628	0.21	0.21	923163	896936	42	43	603	619	213	198	1151	1086	0.968
2033	718	627	0.21	0.21	952682	921751	42	44	620	635	213	198	1153	1092	0.98
2034	718	631	0.21	0.21	978473	944097	43	44	634	649	213	199	1154	1093	0.988
2035	718	629	0.21	0.21	1001094	963960	44	45	647	662	213	199	1156	1096	0.993
2036	718	626	0.21	0.21	1020799	981064	44	45	658	673	213	199	1157	1097	0.996
2037	718	630	0.21	0.21	1037826	995602	44	45	668	683	213	199	1158	1099	0.998
2038	718	629	0.21	0.21	1052612	1008953	45	46	676	692	213	199	1159	1103	0.999
2039	718	629	0.21	0.21	1065380	1019871	45	46	683	698	213	199	1160	1103	0.999
2040	718	630	0.21	0.21	1076422	1030010	45	46	689	704	213	198	1161	1102	1
2041	718	634	0.21	0.21	1085957	1038653	45	47	695	710	213	199	1161	1105	1
2042	718	627	0.21	0.21	1094186	1046759	46	47	699	715	213	199	1162	1102	1
2043	718	631	0.21	0.21	1101288	1053572	46	47	703	719	213	199	1162	1103	1
2044	718	627	0.21	0.21	1107417	1059173	46	47	707	722	213	199	1163	1104	1