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Amendment 53

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

Rebuilding Plan, Catch Level Adjustments, Allocations, and Management Modification for Gag, and Management Modifications for Black Grouper

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

December 2022

South Atlantic Fishery Management Council
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Amendment 53
to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

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Proposed actions: The actions in Amendment 53 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region would modify management of South Atlantic gag and black grouper. Actions would establish a rebuilding plan, revise the overfishing limit, acceptable biological catch, annual catch limits, annual optimum yield, sector allocations, management measures for the commercial and recreational sectors, and accountability measures for the recreational sector. Actions would also modify recreational management measures for black grouper.

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This 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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Why is the South Atlantic Fishery Management Council considering action?

The latest stock assessment (SEDAR 71 2021) indicated the gag stock is undergoing overfishing and is overfished. The Magnuson-Stevens Fishery Conservation and Management Act gives the South Atlantic Fishery Management Council (Council) two years from the time when it receives notification from the National Marine Fisheries Service (NMFS) to prepare and implement a new rebuilding plan. The plan must be implemented by July 2023. In addition, the assessment used revised estimates for recreational catch from the Marine Recreational Information Program (MRIP) based on the Fishing Effort Survey (FES). In 2018, the MRIP fully transitioned its estimation of recreational effort to the mail-based FES. Previous estimates of recreational catch for gag were made using MRIP's Coastal Household Telephone Survey (CHTS) methodology. The latter was not as reliable and robust compared to the new FES survey method (see Section 1.6). Updated projections of catch and data changes incorporated in the assessment provided information to update the overfishing limit (OFL), acceptable biological catch (ABC), annual optimum yield (OY), and annual catch limits (ACL).

The Council's Scientific and Statistical Committee (SSC) has recommended a new OFL and ABC based on results of the stock assessment, and the total ACL and annual OY must be adjusted accordingly. Updated ABC levels recommended by the SSC, based on SEDAR 71 (2021) would result in an approximately 70% reduction in harvest when compared to average total landings from 2015 to 2019. The Council cannot set the ABC and total ACL above their SSC's ABC recommendation. In addition, sector allocations need to be revised because of revisions to recreational landing estimates as explained above. Management measures also need to be adjusted to constrain commercial and recreational harvest to the new fishing levels. Finally, the Council is revising recreational accountability measures (AM) to ensure they are effective at keeping recreational landings from exceeding the recreational ACL and correct for overages when they occur.

In September 2022, the Council added actions to this amendment that modify recreational management measures for black grouper. This was done out of concern for identification issues between gag and black grouper in the recreational sector.

Purpose and Need

Purpose: The *purpose* of this fishery management plan amendment is to establish a rebuilding plan, and revise the acceptable biological catch, annual catch limits and sector allocations for South Atlantic gag based on the results of the most recent stock assessment and make modifications to management measures and accountability measures for South Atlantic gag and black grouper.

Need: The *need* for this fishery management plan amendment is to end overfishing of South Atlantic gag, rebuild the stock, and achieve optimum yield while minimizing, to the extent practicable, adverse social and economic effects.

What actions are being proposed in this plan amendment?

Amendment 53 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region proposes 7 actions. Below are the Council's preferred alternatives for each action.

Action 1: Establish a rebuilding plan for gag

Purpose of Action: A rebuilding plan must be established to end overfishing and rebuild the stock of gag in the South Atlantic as a result of the overfished determination from the SEDAR 712021 stock assessment

Preferred Alternative 3: Establish a rebuilding plan with a rebuilding timeframe to equal T_{max}. This would equal 10 years with the rebuilding period ending in 2032. 2023 would be Year 1.

Action 2: Revise the acceptable biological catch, total annual catch limit, and annual optimum yield for gag

Purpose of Action: New ABC, ACL, and OY levels are needed because the SSC recommended new OFL and ABC values. The current gag ACL does not include recreational landings estimates using the new MRIP FES method.

Preferred Alternative 2. Revise the 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 annual optimum yield for gag and set them equal to the **recommended** acceptable biological catch. The recommended acceptable biological catch is inclusive of recreational estimates from the Marine Recreational Information Program's Fishing Effort Survey.

Action 3: Revise the gag sector allocations and sector annual catch limits

Purpose of Action: The Council's Allocations Trigger Policy (see Appendix J) states the Council will review sector allocations upon completion of a stock assessment. In addition, recreational landings estimates have been revised to adopt the new FES methodology. This action allows the Council to consider how to allocate the total ACL between the commercial and recreational sectors from 2023 onwards under the revised catch levels.

Preferred Alternative 4. Commercial and recreational allocation percentages would change each year from 2023 to 2032 (where they would remain in place until modified) based on:

Preferred Sub-Alternative 4b. Total average commercial and recreational landings from 2015-2019 (5-year average).

Action 4: Modify the commercial management measures for gag

Sub-Action 4a. Reduce the commercial trip limit for gag

Purpose of Sub-Action: The Council is considering reducing the commercial trip limit to allow for reduced harvest of gag during the rebuilding plan. A reduced trip limit will help ensure the commercial sector annual catch limit is not exceeded.

Preferred Alternative 3: Reduce the gag commercial trip limit to 300 pounds gutted weight.

Sub-Action 4b. Modify the seasonal prohibition on commercial harvest and possession of gag

Purpose of Sub-Action: The Council is considering extending the shallow water grouper spawning season closure for gag only to provide an increased opportunity for gag to spawn.

Preferred Alternative 1 (No Action): During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney).

Action 5: Modify recreational management measures for gag

Sub-Action 5a. Establish a recreational vessel limit for gag

Purpose of Action: The Council is considering establishing the recreational vessel limit to achieve the reduction in harvest needed to constrain catch to the updated recreational ACLs, while maintaining recreational access.

Preferred Alternative X:

Sub-Action 5b. Modify the seasonal prohibition on recreational harvest and possession of gag

Purpose of Sub-Action: The Council is considering extending the shallow water grouper spawning season closure for gag only to provide an increased opportunity for gag to spawn.

Preferred Alternative 1 (No Action): During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney).

Sub-Action 5c. Prohibit the retention of gag by captain and crew

Purpose of Sub-Action: The Council is considering prohibiting the retention of gag by captain and crew to limit harvest and contribute to the rebuilding plan.

Preferred Alternative X:

Action 6: Modify gag recreational accountability measures

Purpose of Action: Modifications to gag accountability measures are being considered to prevent landings from exceeding sector ACLs and correct for overages if they occur.

Preferred Alternative 4: Retain the current recreational in-season accountability measures. If recreational landings exceed the recreational annual catch limit, reduce the length of the following year's recreational fishing season by the amount necessary to prevent the recreational annual catch limit from being exceeded in the following year. However, the length of the recreational season will not be reduced if the Regional Administrator determines, using the best scientific information available, that it is not necessary.

Action 7. Modify black grouper recreational management measures

Sub-Action 7a. Establish a recreational vessel limit for black grouper

Purpose of Action: The Council is considering establishing a recreational vessel limit for black grouper to match the proposed regulation for gag because of concerns over identification problems between gag and black grouper in the recreational sector.

Preferred Alternative X:

Sub-Action 7b. Modify the seasonal prohibition on recreational harvest and possession of black grouper

Purpose of Sub-Action: The Council is considering modifying the recreational spawning season closure for black grouper to match the proposed regulation for gag because of concerns over identification between gag and black grouper in the recreational sector.

Preferred Alternative X:

Sub-Action 7c. Prohibit the retention of black grouper by captain and crew

Purpose of Sub-Action: The Council is considering prohibiting the retention of black grouper by captain and crew to match the proposed regulation for gag because of concerns over identification between gag and black grouper in the recreational sector.

Preferred Alternative X:

Chapter 1. Introduction

1.1 What actions are being proposed in this plan amendment?

The actions in Amendment 53 to the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) would modify management of South Atlantic gag and black grouper. Actions for gag include establishing a rebuilding plan, revising annual catch limits (ACL), sector allocations, management measures, and recreational accountability measures (AM). Amendment 53 to the Snapper Grouper FMP (Amendment 53) would also modify recreational management measures for black grouper.

South Atlantic Fishery Management Council

- Responsible for conservation and management of fish stocks in the South Atlantic Region.
- Consists of 13 voting members who are appointed by the Secretary of Commerce, 1 representative from each of the 4 South Atlantic states, the Southeast Regional Administrator of NMFS, and 4 non-voting members.
- 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-Wahoo, which is from Maine to Florida.

1.2 Who is proposing the amendment?

The South Atlantic Fishery Management Council (Council) is responsible for managing snapper grouper species in the South Atlantic region. The Council develops the amendment and submits it to the National Marine Fisheries Service (NMFS) who determines whether to approve the amendment and publish a rule to implement the 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 and other partners to sustainably manage fishery resources in the South Atlantic.

The Council and NMFS are also responsible for making this document available for public comment. The draft environmental assessment (EA) was made available to the public during the scoping process, public hearings, and Council meetings. The EA/amendment will be made available for comment during the rulemaking process.

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). There are 55 species managed by the Council under the Snapper Grouper FMP.

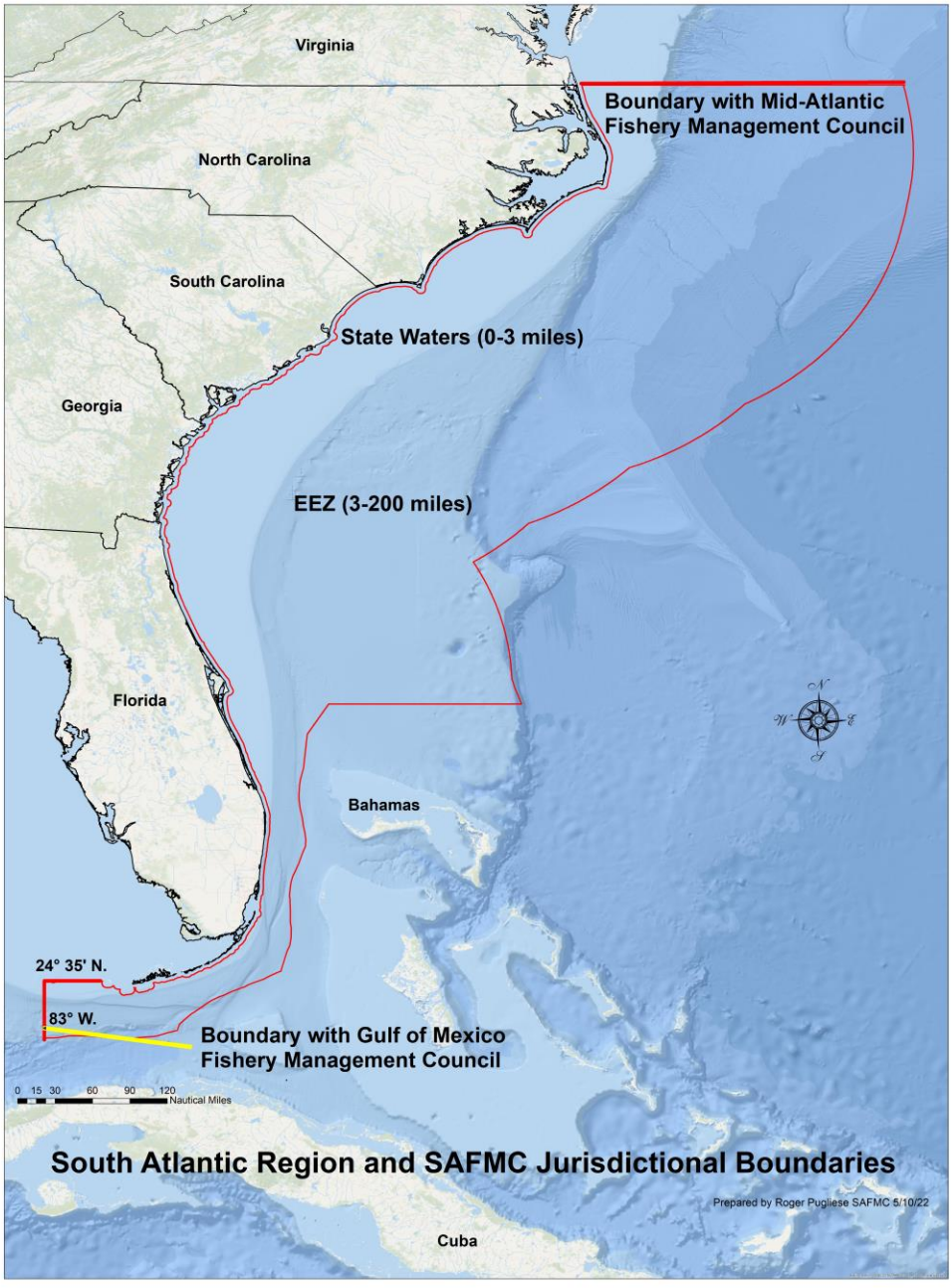

Figure 1.3.1. Jurisdictional boundaries of the Council.

1.4 Why is the Council considering action (Purpose and need statement)?

Purpose: The *purpose* of this fishery management plan amendment is to establish a rebuilding plan, and revise the acceptable biological catch, annual catch limits and sector allocations for South Atlantic gag based on the results of the most recent stock assessment and make modifications to management measures and accountability measures for South Atlantic gag and black grouper.

Need: The *need* for this fishery management plan amendment is to end overfishing of South Atlantic gag, rebuild the stock, and achieve optimum yield while minimizing, to the extent practicable, adverse social and economic effects.

The Council is considering action to respond to the most recent stock assessment for South Atlantic gag (SEDAR 71 2021). The findings of the assessment indicated that the South Atlantic gag stock is overfished and undergoing overfishing. The Council received notification from NMFS (via letter dated July 23, 2021) of the status of the gag stock. Following notification that a stock is undergoing overfishing and overfished, the Magnuson-Stevens Act requires the Council to develop a FMP amendment with actions that end overfishing immediately and rebuild the affected stock.

1.5 What are the acceptable biological catch and overfishing limit recommendations for gag?

The Council's Scientific and Statistical Committee (SSC) reviewed the gag stock assessment (SEDAR 71 2021) at their June 2021 meeting. The assessment followed a standard approach with data through 2019 and incorporated the revised estimates for recreational catch (Fishing Effort Survey). The current overfishing limit (OFL) and acceptable biological catch (ABC) (825,000 lbs gw and 773,000 lbs gw respectively) are inclusive of Coastal Household Telephone Survey (CHTS) units to account for private recreational and charter landings. Through Regulatory Amendment 22 to the FMP the ACL and annual optimum yield (OY) was set at 95% of this ABC (734,350 lbs gw; SAFMC 2015). The updated ABC would be inclusive of Fishing Effort Survey (FES) units for these landings. The SSC found that the assessment 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 Council requested several different rebuilding projections including 50% and 70% probability of rebuilding under different recruitment scenarios, including recent low recruitment and longer-term modeled recruitment based on spawning stock size. At their October 2021 meeting, the SSC recommended OFL and ABC values based on a 70% probability of rebuilding in 10 years and recruitment based on the spawner-recruit relationship from the SEDAR 71 stock assessment (2021). At the December 2021 Council meeting, the Council asked staff to request additional ABC recommendations based on a 60% probability of rebuilding to help minimize social and economic impacts while still preventing overfishing. The SSC met in February 2022 to review this scenario. After discussion, the SSC continued to recommend a 70% probability of

rebuilding in 10 years and recruitment based on the spawner-recruit relationship from the SEDAR 71 stock assessment (2021).

During the March 2022 Council meeting, the Council reviewed the SSC's February 2022 recommendation and accepted the OFL and ABC values based on the 70% probability of rebuilding with a recruitment scenario based on the spawner-recruit relationship from SEDAR 71 (Table 1.5.1).

Table 1.5.1. South Atlantic gag OFL and ABC recommendations (in pounds gutted weight and numbers of fish) based on management starting in 2023.

Year	OFL Landings (lbs gw)	OFL Landings (Numbers)	ABC Landings (lbs gw)	ABC Landings (Numbers)
2023	367,235	35,621	175,632	16,925
2024	494,338	44,843	261,171	23,158
2025	605,227	52,622	348,352	29,077
2026	706,366	60,151	435,081	34,954
2027	808,266	68,072	524,625	41,129
2028	912,033	75,932	617,778	47,415
2029	1,011,133	83,028	711,419	53,422
2030	1,098,379	88,942	800,088	58,772
2031	1,171,120	93,683	879,758	63,304
2032	1,230,363	97,454	948,911	67,043

The Council is not exploring options for adjusting the stock status criteria or formulas for determining the associated stock status values in this FMP amendment. This FMP amendment would adopt the values as determined by the SEDAR 71 assessment and recommended by the SSC (Deterministic values in Table 1.5.2).

Table 1.5.2. Estimated status indicators, benchmarks, and related quantities from the base run of the Beaufort catch-age model, conditional on estimated current selectivities averaged across fleets. Also presented are median values and measures of precision (standard errors, SE) from the Monte Carlo/Bootstrap ensemble analysis. Rate estimates (F) are in units of y−1; status indicators are dimensionless; and biomass estimates are in units of metric tons or pounds, as indicated. Spawning stock biomass (SSB) is measured as total (males and females) mature biomass. The definitions of MSST in this assessment is MSST = 75%SSBMSY.

Quantity	Units	Estimate	Median	SE
F_{MSY}	y^{-1}	0.37	0.35	0.06
B_{MSY}	mt whole	4278.4	4368.7	627.2
SSB_{MSY}	mt whole	1563.9	1659.4	269.7
MSST	mt whole	1172.9	1244.5	202.3
MSY	1000 lb gutted	1455.1	1453.5	41.6
D_{MSY}	1000 fish	17.6	16.7	4.0
R_{MSY}	1000 age-1 fish	521	509	104
$F_{2017\text{-}2019}/F_{MSY}$	-	2.15	2.27	0.38
SSB_{2019}/MSST	-	0.20	0.19	0.04
SSB_{2019}/MSST	-	0.15	0.14	0.03

1.6 How has recreational data collection changed in the southeast?

The Marine Recreational Fisheries Statistics Survey (MRFSS) was created in 1979 by NMFS. The program included the Access Point Angler Intercept Survey (APAIS), which consists of onsite interviews at marinas and other points where recreational anglers fish, to determine catch. MRFSS also included CHTS, which used random-digit dialing of homes in coastal counties to contact anglers to determine fishing effort. In 2000, the For-Hire Survey (FHS) was implemented to incorporate for-hire effort due to lack of coverage of charter boat anglers by the CHTS. The FHS used a directory of all known charter boats and a weekly telephone sample of the charter boat operators to obtain effort information.

MRIP[1] replaced MRFSS in 2013 to meet increasing demand for more precise, accurate, and timely recreational catch estimates. MRIP is a more scientifically sound methodology for estimating catch because it reduces some sources of potential bias as compared to MRFSS resulting in more accurate catch estimates. Specifically, CHTS was improved to better estimate private angling effort. Instead of random telephone calls, MRIP-CHTS used targeted calls to anglers registered with a federal or state saltwater fishing registry. The MRIP also incorporated a new survey design for APAIS in 2013. This new design addressed concerns regarding the validity of the survey approach, specifically that trips recorded during a given time period are representative of trips for a full day (Foster et al. 2018). The more complete temporal coverage with the new survey design provides for consistent increases or decreases in APAIS angler catch rate statistics, which are used in stock assessments and management, for at least some species (NMFS 2021).

[1] https://media.fisheries.noaa.gov/2021-09/MRIP-Survey-Design-and-Statistical-Methods-2021-09-15.pdf/

MRIP also transitioned from the legacy CHTS to a new mail survey (FES) beginning in 2015, and in 2018, the FES replaced the CHTS. Both survey methods collect data needed to estimate marine recreational fishing effort (number of fishing trips) by shore and private/rental boat anglers on the Atlantic and Gulf coasts. The new mail-based FES uses angler license and registration information as one way to identify and contact anglers (supplemented with data from the U.S. Postal Service, which includes virtually all U.S. households). Because the FES and CHTS are so different, NMFS conducted side-by side testing of the two methods from 2015 to 2018 and developed calibration procedures to convert the historical catch estimates (MRFSS, MRIP-CHTS, MRIP-APAIS [collectively MRFSS]) into MRIP-FES. In general, landings estimates are higher using the MRIP-FES as compared to the MRFSS estimates. This is because the FES is designed to more accurately measure fishing activity than the CHTS, not because there was a sudden rise in fishing effort. NMFS developed a calibration model to adjust historic effort estimates so that they can be accurately compared to new estimates from the FES. The new effort estimates alone do not lead to definitive conclusions about stock size or status in the past or at current. NMFS determined that the MRIP-FES data, when fully calibrated to ensure comparability among years and across states, produced the best available data for use in stock assessments and management (NMFS 2021).

1.7 What is the history of management for the gag fishery?

Snapper grouper regulations in the South Atlantic were first implemented in 1983. The reader is referred to Appendix I for the management history of the species in the Snapper Grouper FMP. Below are amendments to the Snapper Grouper FMP addressing gag within the South Atlantic EEZ.

Snapper Grouper FMP (1983)
The 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 (1992)
The amendment established a 20-inch total length minimum size limit for both the commercial and recreational sectors. The amendment also established a recreational bag limit of 5 gag per person per day within the shallow water grouper complex.

Amendment 8 (1992)
The amendment established initial eligibility for two limited entry snapper grouper permits: a non-transferable permit with a 225 pound trip limit and a transferrable unlimited landings permit.

Amendment 9 (1999)
The amendment increased the minimum size for both sectors to 24 in total length. In addition to the modification to the minimum size limit this amendment decreased the recreational bag limit to 2 gag per person per day within the shallow water grouper complex.

Amendment 11 (1999)
The amendment established an overfishing evaluation for gag which indicated that gag was overfished (static spawning potential ratio = 27%). The amendment also determined that for all hermaphroditic groupers, spawning potential ratio the maximum sustainable yield (MSY) proxy would equal 45% static spawning potential ratio.

Amendment 15B (2009)
The amendment prohibited the sale of bag-limit caught snapper grouper species.

Amendment 16 (2009)
The amendment established a shallow water grouper spawning season closure from January 1 to April 30 and the 51% commercial and 49% recreational allocations. It also set a commercial quota for gag that when met, closed the shallow water grouper complex.

Amendment 17A (2011)
The amendment required the use of non-stainless steel circle hooks north of 28 degrees North Latitude when fishing with natural baits for snapper grouper species.

Amendment 17B (2011)
The amendment updated the total ACLs, sector ACLs, established an aggregate ACL for gag, red grouper, and black grouper, and established AMs for gag.

Amendment 24 (2012)
The amendment removed the aggregate ACL for gag, red grouper, and black grouper and established individual ACLs for each species.

Regulatory Amendment 15 (2013)
The amendment reduced the gag commercial quota to account for discard mortality from targeting other shallow water grouper species.

Regulatory Amendment 22 (2015)
The amendment reduced the recreational bag limit to 1 gag per person per day within the shallow water grouper complex as well adjusting the ACL and annual OY.

Amendment 34 (2016)
The amendment modified AMs for snapper grouper species, including gag.

Regulatory Amendment 29 (2020)
The amendment required all vessels fishing for or possessing snapper grouper species in the South Atlantic to possess a descending device readily available for use. The amendment also

required the use of non-offset, non-stainless steel circle hooks north of 28 degrees North Latitude when fishing with natural baits.

Chapter 2. Proposed Actions and Alternatives

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2.1 Action 1. Establish a rebuilding plan for gag

2.1.1 Alternatives

Alternative 1 (No Action). The South Atlantic stock of gag is currently not under a rebuilding plan.

Alternative 2. Establish a rebuilding plan for gag with a rebuilding timeframe to equal the shortest possible time to rebuild in the absence of fishing mortality (T_{min}). This would equal 7 years with the rebuilding period ending in 2029. 2023 would be Year 1.

Preferred Alternative 3. Establish a rebuilding plan for gag with a rebuilding timeframe to equal T_{max}. This would equal 10 years with the rebuilding period ending in 2032. 2023 would be Year 1.

Discussion:
Alternative 1 (No Action) is not a viable alternative as the gag stock is overfished and experiencing overfishing, therefore a rebuilding plan must be established. **Alternative 2** and **Preferred Alternative 3** present different rebuilding timeframes based on requirements in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) National Standards. **Alternative 2** corresponds to the minimum amount of time needed to rebuild (T_{min}) in the absence of fishing mortality (no allowable catch and zero discards). Under this alternative the gag annual catch limit (ACL) would need to be set equal to zero.

Preferred Alternative 3 establishes a rebuilding timeframe of 10 years (T_{max}). National Standard 1 indicates that if the stock is projected to rebuild in 10 years or less, then T_{max} is 10 years (50 CFR §600.310(j)(3)(i)(B)(1)).

2.1.2 Comparison of Alternatives:

In general, prescribing less time to rebuild the stock could result in lower ACLs and more restrictive management measures, but would translate into greater biological benefits for the stock in a shorter timeframe. The rebuilding timeframe under **Alternative 2** is projected to rebuild the gag stock in the least amount of time; therefore, it can be expected that future biological benefits may accrue the soonest, followed by **Preferred Alternative 3**.

A rebuilding plan with a shorter timeframe has the highest implied economic benefit. Therefore **Alternative 2** would have the highest implied economic benefit followed by **Preferred Alternative 3**. Similarly, when considering social effects, the shorter the rebuilding plan the more severe the harvest restrictions. These severe restrictions can lead to negative social effects; therefore **Preferred Alternative 3** is likely to have fewer negative social effects when compared to **Alternative 2**. Administrative burden is not expected to differ amongst the viable alternatives.

2.2 Action 2. Revise the acceptable biological catch, total annual catch limit, and annual optimum yield for gag

2.2.1 Alternatives

Alternative 1 (No Action). The total annual catch limit and annual optimum yield for gag are equal to 95% of the **current** acceptable biological catch. The current acceptable biological catch level is inclusive of recreational estimates from the Marine Recreational Information Program's Coastal Household Telephone Survey.

Year	OFL (lbs gw)	ABC (lbs gw)	Annual OY (lbs gw)	ACL (lbs gw)
2015	782,000	666,000	632,700	632,700
2016	765,000	671,000	637,450	637,450
2017	792,000	713,000	677,350	677,350
2018	813,000	748,000	710,600	710,600
2019	825,000	773,000	734,350	734,350
2020	825,000	773,000	734,350	734,350
2021	825,000	773,000	734,350	734,350
2022	825,000	773,000	734,350	734,350

Preferred Alternative 2. Revise the 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 annual optimum yield for gag and set them equal to the **recommended** acceptable biological catch. The recommended acceptable biological catch is inclusive of recreational estimates from the Marine Recreational Information Program's Fishing Effort Survey.

Year	OFL (lbs gw)	ABC (lbs gw)	Annual OY (lbs gw)	Total ACL (lbs gw)
2023	367,235	175,632	175,632	175,632
2024	494,338	261,171	261,171	261,171
2025	605,227	348,352	348,352	348,352
2026	706,366	435,081	435,081	435,081
2027	808,266	524,625	524,625	524,625
2028	912,033	617,778	617,778	617,778
2029	1,011,133	711,419	711,419	711,419
2030	1,098,379	800,088	800,088	800,088
2031	1,171,120	879,758	879,758	879,758
2032	1,230,363	948,911	948,911	948,911

Alternative 3. Revise the 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 annual optimum yield for gag and set them equal to 95% of the **recommended** acceptable biological catch. The recommended acceptable biological catch is inclusive of recreational estimates from the Marine Recreational Information Program's Fishing Effort Survey.

Year	OFL (lbs gw)	ABC (lbs gw)	Annual OY (lbs gw)	Total ACL (lbs gw)
2023	367,235	175,632	166,850	166,850
2024	494,338	261,171	248,112	248,112
2025	605,227	348,352	330,934	330,934
2026	706,366	435,081	413,327	413,327
2027	808,266	524,625	498,394	498,394
2028	912,033	617,778	586,889	586,889
2029	1,011,133	711,419	675,848	675,848
2030	1,098,379	800,088	760,084	760,084
2031	1,171,120	879,758	835,770	835,770
2032	1,230,363	948,911	901,465	901,465

Alternative 4. Revise the 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 annual optimum yield for gag and set them equal to 90% of the **recommended** acceptable biological catch. The recommended acceptable biological catch is inclusive of recreational estimates from the Marine Recreational Information Program's Fishing Effort Survey.

Year	OFL (lbs gw)	ABC (lbs gw)	Annual OY (lbs gw)	Total ACL (lbs gw)
2023	367,235	175,632	158,069	158,069
2024	494,338	261,171	235,054	235,054
2025	605,227	348,352	313,517	313,517
2026	706,366	435,081	391,573	391,573
2027	808,266	524,625	472,163	472,163
2028	912,033	617,778	556,000	556,000
2029	1,011,133	711,419	640,277	640,277
2030	1,098,379	800,088	720,079	720,079
2031	1,171,120	879,758	791,782	791,782
2032	1,230,363	948,911	854,020	854,020

Discussion:

The updated acceptable biological catch (ABC) recommendations from the Scientific and Statistical Committee (SSC) are based on the results of the SEDAR 71 2021 gag stock assessment. The assessment included updated estimates of recreational fishing effort resulting from the Fishing Effort Survey (FES; Sections 1.5 and 1.6).

Alternative 1 (No Action) would retain the current ABC, total ACL, and annual optimum yield (OY) implemented through Regulatory Amendment 22 to the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP; SAFMC 2015). **Preferred Alternative 2** would implement the ABC recommended by the SSC and would have ABC=ACL=OY. **Alternatives 3** and **4** would also adopt the ABC recommended by the SSC but would add a 5% and 10% buffer, respectively, between the ABC and total ACL and annual OY.

2.2.2 Comparison of Alternatives:

Alternative 1 (No Action) would no longer be based on best scientific information available (BSIA) and, therefore, is not a viable alternative. Relative to **Alternative 1 (No Action)**, **Preferred Alternative 2** through **Alternative 4** would be expected to end overfishing as they do not exceed the SSC recommended ABCs and would be expected to result in positive biological effects to the gag stock. **Preferred Alternative 2** would result in the least biological benefit to the gag stock as there would be no buffer between the ABCs and the total ACLs. Biological benefits resulting from **Alternatives 3** and **4** would increase as the buffer increases. Although **Preferred Alternative 2** would allow the greatest amount of harvest of the action alternatives considered, it is based on the SSC's ABC recommendation and BSIA and represents a catch level that does not result in overfishing.

Alternatives 2 through **4** are all expected to be constraining on harvest and therefore may have negative economic effects for the fishery. Under **Preferred Alternative 2** the potential net economic benefit is expected to be positive starting in 2029 whereas under **Alternative 3** and **Alternative 4** net economic benefits are expected to be positive starting in 2030. While ACLs do not directly affect resource users, higher ACLs generally equate to higher social benefit. With that assumption **Preferred Alternative 2** would provide the highest social benefit when compared to **Alternatives 3** through **4**. Administrative burden is not expected to differ between alternatives.

2.3 Action 3. Revise the gag sector allocations and sector annual catch limits

2.3.1 Alternatives

Note: The revised sector ACLs in Alternative 1 (No Action) through Alternative 4 reflect the revised total ACL in Preferred Alternative 2 of Action 2. The revised total ACL includes recreational landings from the Marine Recreational Information Program (MRIP) using the FES method used in the latest assessment (SEDAR 71 2021).

Alternative 1 (No Action). Retain the current commercial and recreational sector allocations as 51.00% and 49.00%, respectively, of the revised total annual catch limit for gag.

Year	Total ACL (lbs gw)	Commercial ACL (lbs gw) (51%)	Recreational ACL (lbs gw) (49%)
2023	175,632	89,572	86,060
2024	261,171	133,197	127,974
2025	348,352	177,660	170,692
2026	435,081	221,891	213,190
2027	524,625	267,559	257,066
2028	617,778	315,067	302,711
2029	711,419	362,824	348,595
2030	800,088	408,045	392,043
2031	879,758	448,677	431,081
2032	948,911	483,945	464,966

Alternative 2. Allocate 36.37% of the revised total annual catch limit for gag to the commercial sector and 63.63% of the revised total annual catch limit for gag to the recreational sector.

Year	Total ACL (lbs gw)	Commercial ACL (lbs gw) (36.37%)	Recreational ACL (lbs gw) (63.63%)
2023	175,632	63,877	111,755
2024	261,171	94,988	166,183
2025	348,352	126,696	221,656
2026	435,081	158,239	276,842
2027	524,625	190,806	333,819
2028	617,778	224,686	393,092
2029	711,419	258,743	452,676
2030	800,088	290,992	509,096
2031	879,758	319,968	559,790
2032	948,911	345,119	603,792

Alternative 3. Allocate 43.06% of the revised total annual catch limit for gag to the commercial sector and 56.94% of the revised total annual catch limit for gag to the recreational sector.

Year	Total ACL (lbs gw)	Commercial ACL (lbs gw) (43.06%)	Recreational ACL (lbs gw) (56.94%)
2023	175,632	75,627	100,005
2024	261,171	112,460	148,711
2025	348,352	150,000	198,352
2026	435,081	187,346	247,735
2027	524,625	225,904	298,721
2028	617,778	266,015	351,763
2029	711,419	306,337	405,082
2030	800,088	344,518	455,570
2031	879,758	378,824	500,934
2032	948,911	408,601	540,310

Preferred Alternative 4. Commercial and recreational allocations would change each year from 2023 to 2032 (where they would remain in place until modified) based on:

Sub-Alternative 4a. Total average commercial and recreational landings from 2017-2019(3-year average).

Year	Total ACL (lbs gw)	Commercial ACL (lbs gw)	Commercial Allocation %	Recreational ACL (lbs gw)	Recreational Allocation %
2023	175,632	68,281	39%	107,350	61%
2024	261,171	111,051	43%	150,120	57%
2025	348,352	154,641	44%	193,710	56%
2026	435,081	198,006	46%	237,075	54%
2027	524,625	242,778	46%	281,847	54%
2028	617,778	289,354	47%	328,423	53%
2029	711,419	336,175	47%	375,244	53%
2030	800,088	380,509	48%	419,578	52%
2031	879,758	420,344	48%	459,413	52%
2032	948,911	454,921	48%	493,990	52%

*2032 allocations will remain in place until modified.

Preferred Sub-Alternative 4b. Total average commercial and recreational landings from 2015-2019 (5-year average).

Year	Total ACL (lbs gw)	Commercial ACL (lbs gw)	Commercial Allocation %	Recreational ACL (lbs gw)	Recreational Allocation %
2023	85,326	85,326	49%	90,306	51%
2024	261,171	128,096	49%	133,075	51%
2025	348,352	171,687	49%	176,666	51%
2026	435,081	215,051	49%	220,030	51%
2027	524,625	259,823	50%	264,802	50%
2028	617,778	306,400	50%	311,379	50%
2029	711,419	353,220	50%	358,199	50%
2030	800,088	397,555	50%	402,534	50%
2031	879,758	437,390	50%	442,369	50%
2032	948,911	471,966	50%	476,945	50%

*2032 allocations will remain in place until modified.

Discussion:

The South Atlantic Fishery Management Council's (Council) Allocations Trigger Policy (see Appendix J) states the Council will review sector allocations upon completion of a stock assessment. In addition, recreational landings estimates have been revised to adopt the new FES methodology (Section 1.6). This action allows the Council to consider how to allocate the total ACL between the commercial and recreational sectors from 2023 onwards under the revised catch levels.

The current sector allocations for gag were implemented through Amendment 16 to the Snapper Grouper FMP (SAFMC 2008). The Council used the distribution of landings from 1999 through 2003 to determine the existing 51% commercial / 49% recreational allocation (347,301 lbs gw and 358,832 lbs gw respectively). **Alternative 1 (No Action)** would retain the same allocation percentages but apply them to the updated total ACL selected in Action 2. **Alternative 2** would use the distribution of landings from 1999 – 2003 using the updated FES recreational landings information.

Alternative 3 would use the allocations formula adopted by the Council through the Comprehensive ACL Amendment to the Snapper Grouper FMP (SAFMC 2011) for unassessed species. The Council has used this formula to allocate the total ACL for some assessed species such as golden tilefish and red porgy. The formula is as follows:

Sector Allocation Percentage = ((sector's mean landings 2006 to 2008)*0.5) + ((sector's mean landings 1986 to 2008)*0.5)

Preferred Alternative 4 was proposed to the Council in December of 2021. The method would implement the reductions in harvest needed to achieve the new ACL proportionally for each sector, based upon more recent time periods that are closer to the was the fishery is currently

operating (split reduction method). **Sub-Alternative 4a** bases the allocation method on the three-year average commercial and recreational (FES) landings from 2017-2019. **Preferred Sub-Alternative 4b** bases the allocation method on the five-year average of commercial and recreational (FES) landings from 2015-2019. Both **Sub-Alternative 4a** and **Preferred Sub-Alternative 4b** split the reduction needed from total landings to the new ACL in 2023 equally based on the sector's landings from the baseline years. Each year after, throughout the rebuilding plan, as the ACL increases, the ACL poundage increase is split equally between both sectors and added to each sector's ACL from the previous year (See Figure 2.3.1.1 for an example). **Sub-Alternative 4a** would result in allocation percentages shown in Tables 2.3.1.1 – 2.3.1.3 with a 48% commercial and 52% recreational allocation at the end of the rebuilding period in 2032, which would remain in place until modified. **Preferred Sub-Alternative 4b** would result in allocation percentages shown in Tables 2.3.1.4 – 2.3.1.6 with a 50% commercial and 50% recreational allocation in 2032 that would remain in place until modified.

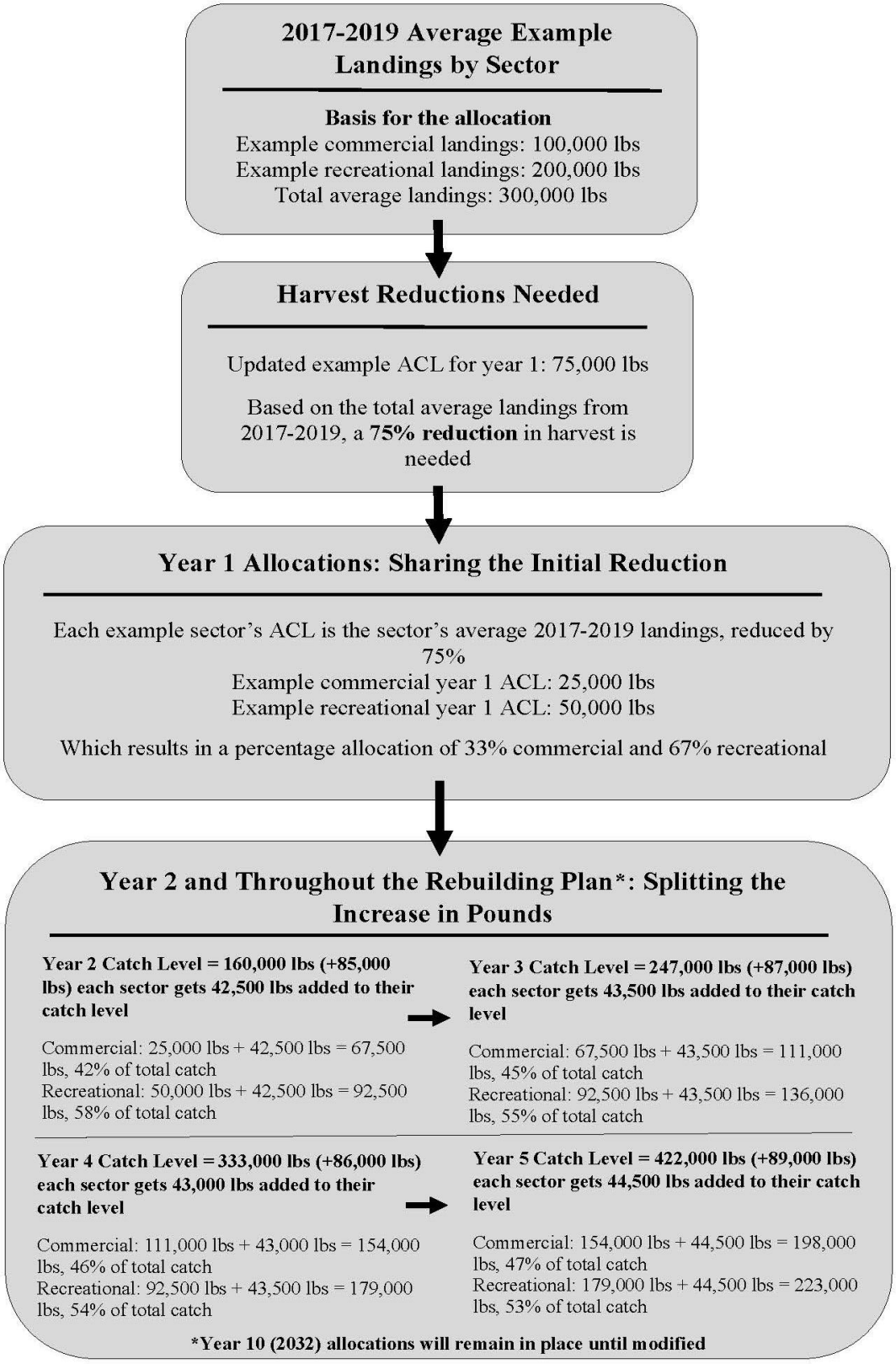

Figure 2.3.1.1. An example demonstrating the split reduction method of allocating between sectors from **Sub-Alternative 4a** and **Preferred Sub-Alternative 4b**.

Table 2.3.1.1. The baseline years and average landings by sector used to determine allocations under **Sub-Alternative 4a** from Action 3.

Allocation Basis Years	Average 2017-2019 Commercial Landings (lbs gw)	Average 2017-2019 Recreational Landings (lbs gw)	Total Average 2017-2019 Landings (lbs gw)
3 Year Average from 2017-2019	231,736	364,331	596,067

Table 2.3.1.2. The resulting sector ACLs and percent allocation from the split reduction method used to determine year 1 allocations under **Sub-Alternative 4a** from Action 3**.**

Year	Total ACL (lbs gw)	Percent Reduction for each Sector Needed to Achieve Updated ACL	Commercial ACL (lbs gw)	Commercial Allocation %	Recreational ACL (lbs gw)	Recreational Allocation %
2023	175,632	71%	68,281	39%	107,350	61%

Table 2.3.1.3. Commercial and recreational allocations in years 2 through 10 that share the increase in poundage each year under **Sub-Alternative 4a** from Action 3.

Year	Total ACL (lbs gw)	Total Increase from Previous Year	Total Increase for each Sector	Commercial ACL (lbs gw)	Commercial Allocation %	Recreational ACL (lbs gw)	Recreational Allocation %
2024	261,171	85,539	42,770	111,051	43%	150,120	57%
2025	348,352	87,181	43,591	154,641	44%	193,710	56%
2026	435,081	86,729	43,365	198,006	46%	237,075	54%
2027	524,625	89,729	44,772	242,778	46%	281,847	54%
2028	617,778	89,544	46,577	289,354	47%	328,423	53%
2029	711,419	93,544	46,821	336,175	47%	375,244	53%
2030	800,088	79,670	44,335	380,509	48%	419,578	52%
2031	879,758	79,670	39,835	420,344	48%	459,413	52%
2032	948,911	69,153	34,576	454,921	48%	493,990	52%

*2032 allocations will remain in place until modified.

Table 2.3.1.4. The baseline years and average landings by sector used to determine allocations under **Preferred Sub-Alternative 4b** from Action 3.

Allocation Basis Years	Average 2015-2019 Commercial Landings (lbs gw)	Average 2015-2019 Recreational Landings (lbs gw)	Total Average 2015-2019 Landings (lbs gw)
5 Year Average from 2015-2019	280,440	296,804	577,244

Table 2.3.1.5. The resulting sector ACLs and percent allocation from the split reduction method used to determine year 1 allocations under **Sub-Alternative 4b** from Action 3.

Year	Total ACL (lbs gw)	Percent Reduction for each Sector Needed to Achieve Updated ACL	Commercial ACL (lbs gw)	Commercial Allocation %	Recreational ACL (lbs gw)	Recreational Allocation %
2023	175,632	70%	85,326	49%	90,306	51%

Table 2.3.1.6. Commercial and recreational allocations in years 2 through 10 that share the increase in poundage each year under **Sub-Alternative 4b** from Action 3.

Year	Total ACL (lbs gw)	Total Increase from Previous Year	Total Increase for each Sector	Commercial ACL (lbs gw)	Commercial Allocation %	Recreational ACL (lbs gw)	Recreational Allocation %
2024	261,171	85,539	42,770	128,096	49%	133,075	51%
2025	348,352	87,181	43,591	171,687	49%	176,666	51%
2026	435,081	86,729	43,365	215,051	49%	220,030	51%
2027	524,625	89,729	44,772	259,823	50%	264,802	50%
2028	617,778	89,544	46,577	306,400	50%	311,379	50%
2029	711,419	93,544	46,821	353,220	50%	358,199	50%
2030	800,088	88,669	44,335	397,555	50%	402,534	50%
2031	879,758	79,670	39,835	437,390	50%	442,369	50%
2032	948,911	69,153	34,577	471,966	50%	476,945	50%

*2032 allocations will remain in place until modified.

2.3.2 Comparison of Alternatives:

Biological effects have the potential to decrease for any alternatives that provide a sector with historically higher discards more of the total ACL. The recreational sector has had historically higher discards versus landings ratios, therefore **Alternative 2**, **3**, and **Sub-Alternative 4a** could incur negative biological effects since they allocate more to the recreational sector. **Preferred Sub-Alternative 4b** is not expected to significantly differ from **Alternative 1 (No Action)** since the allocation percentages would be very similar.

Economic benefits can be expected to increase for any sector that receives a higher allocation, therefore **Alternatives 2**, **3**, and **Sub Alternative 4a** would causes shifts in economic effects for each sector, either positive or negative depending on the sector. For the commercial sector, when compared to **Alternative 1 (No Action), Preferred Sub-Alternative 4b**, would have the highest economic benefit followed by **Alternative 3**, **Sub-Alternative 4a**, and **Alternative 2.** Conversely, for the recreational sector, when compared to **Alternative 1 (No Action)**, the highest economic benefits would result under **Alternative 2** followed by **Sub-Alternative 4a**, **Alternative 3**, and **Preferred Sub-Alternative 4b**

Social benefits may increase if a sector is allocated more of the total ACL however all alternatives are expected to be constraining for both sectors. For the commercial sector, social benefit is expected to be greatest under **Alternative 1 (No Action)** followed by **Preferred Sub-Alternative 4b**, **Alternative 3**, **Sub-Alternative 4a**, and **Alternative 2.** For the recreational

sector, social benefit is expected to be greatest under **Alternative 2** followed by **Sub-Alternative 4a**, **Alternative 3**, **Alternative 1 (No Action),** and **Preferred Sub-Alternative 4b.** Administrative burden is not expected to differ between alternatives but may accrue as a result of seasonal closures from the reduced catch levels of both sectors.

2.4 Action 4. Modify commercial management measures for gag

2.4.1 Sub-action 4a. Reduce the commercial trip limit for gag

2.4.1.1 Alternatives

Alternative 1 (No Action). The commercial gag trip limit is 1,000 pounds gutted weight until 75% of the commercial annual catch limit is met, at which time the commercial trip limit is reduced to 500 pounds gutted weight for the remainder of the fishing year or until the commercial annual catch limit is met.

Alternative 2. Reduce the gag commercial trip limit to 200 pounds gutted weight.

Preferred Alternative 3. Reduce the gag commercial trip limit to 300 pounds gutted weight.

Alternative 4. Reduce the gag commercial trip limit to 400 pounds gutted weight.

Alternative 5. Reduce the gag commercial trip limit to 500 pounds gutted weight.

Alternative 6. Reduce the gag commercial trip limit to 300 pounds gutted weight in 2023 then increase the commercial trip limit to 500 pounds gutted weight in 2026 and to 1,000 pounds gutted weight in 2027 where the trip limit would remain 1,000 pounds gutted weight until modified.

Discussion:

The current trip limit was established through Regulatory Amendment 14 to the FMP (SAFMC 2014). During the development of Regulatory Amendment 14, the Snapper Grouper Advisory Panel proposed that the Council consider a trip limit "step-down" to help create a bycatch allowance so that commercial fishermen could retain gag when they target other shallow water grouper species.

Alternative 1 (No Action) would retain the current 1,000 lbs gw trip limit with a step down to 500 lbs gw once 75% of the commercial ACL is met. **Alternatives 2** through **5** would reduce the trip limit to 200, 300, 400, or 500 lbs gw respectively without a step down. **Alternative 6** would reduce the commercial trip limit to 300 lbs gw in year one and then increase the trip limit to 500 lbs gw in 2026. The trip limit would increase again to 1,000 lbs gw in 2027. The 1,000 lbs gw trip limit would remain in place thereafter until modified. The year in which the trip limit increases was determined using projected landings. An increase was instituted when the projected landings were not expected to exceed the commercial ACL under the starting trip limit. Projected landings are based on commercial gag landings from 2017-2019 (See Commercial Gag Decision Tool).

2.4.1.2 Comparison of Alternatives:

All alternatives do not pose a risk to overfishing as commercial harvest is limited to the commercial ACL. Smaller commercial trip limits would potentially decrease the commercial landings, helping to constrain harvest to the updated catch levels but could also result in higher

discards. Discard mortality of snowy grouper is considered 100% (SEDAR 36 Update, 2021). When considering discards, **Alternative 1 (No Action)** would have the least potential for negative biological effects followed by **Alternative 5**, **Alternative 4, Preferred Alternative 3, Alternative 6,** and **Alternative 2**. **Alternative 6** would increase the trip limit based on when the projected landings are not expected to exceed the commercial ACL. This alternative has the potential for negative biological effects as it would increase the commercial trip limit regardless of rebuilding progress.

Lower trip limits equate to lower revenue over more trips, potentially decreasing net economic benefit through decreased net revenue. Therefore, **Alternative 1 (No Action)** is expected to result in the highest economic benefit, followed by **Alternative 5, Alternative 4, Alternative 6, Alternative 3,** and **Alternative 2**. When considering social effects, there is a tradeoff between extending the commercial season and the inefficiency/cost of trips. **Alternative 6** would likely result in social benefit as the trip limit starts low, providing access to the resource for a longer period and increasing as the stock rebuilds to increase trip efficiency and cost. Administrative burden is expected to increase with the likelihood of an in-season closure, therefore burden is highest under **Alternative 2,** followed by **Alternative 3, Alternative 6, Alternative 4, Alternative 5.** All alternatives, when compared to **Alternative 1 (No Action)** would reduce administrative burden as they remove the trip limit step down.

2.4.2 Sub-action 4b. Modify the seasonal prohibition on commercial harvest and possession of gag

2.4.2.1 Alternatives

Preferred Alternative 1 (No Action). During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney).

Alternative 2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). For gag only, revise the timing of these restrictions to January 1 through May 31 throughout the exclusive economic zone.

Alternative 3. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). For gag only, revise the timing of these restrictions to December 1 through April 30 throughout the exclusive economic zone.

Alternative 4. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind,

graysby, or coney). For gag only, revise the timing of these restrictions to December 1 through May 31 throughout the exclusive economic zone.

Discussion:

Amendment 16 to the FMP established a commercial shallow-water grouper spawning season closure for the following grouper species: coney, gag, black grouper, graysby, red hind, red grouper, rock hind, scamp, yellowfin grouper, and yellowmouth grouper (SAFMC 2009). The spawning season closure was put in place to allow these grouper species an increased opportunity to spawn before they were targeted by the commercial fishery. Many of the species within this group, including gag, spawn in aggregations that have an increased susceptibility to fishing when aggregated (SEDAR 10 Assessment Report [2006], Coleman et al. 1996).

Preferred Alternative 1 (No Action) would retain the current January 1 through April 30 commercial spawning season closure. **Alternative 2** would extend the spawning season closure an additional month in the spring for gag, closing the commercial season from January 1 through May 31. In 2020, through Regulatory Amendment 30 to the FMP, the annual red grouper spawning season was extended to May 31 in federal waters off North Carolina and South Carolina only (SAFMC 2020). Many fishermen observed fish in spawning condition in May which led to concerns over the efficacy of the spawning season closure for red grouper. Under **Alternative 2** the gag spawning season closure would match the red grouper spawning season closure but would extend throughout the entire South Atlantic. **Alternative 3** would extend the spawning season closure for gag an additional month in the winter, closing the commercial season from December 1 through April 30. **Alternative 4** would extend the spawning season closure an additional month in the spring and winter, closing the commercial season from December 1 through May 31.

2.4.2.2 Comparison of Alternatives:

A longer spawning season closure provides the most biological benefit to the stock, therefore **Alternative 4** has the highest potential for biological benefit, followed by **Alternative 3** and **2**, and **Alternative 1 (No Action).** A longer spawning season closure could result in increased discards as fishermen continue to fish for other shallow-water grouper species, which would reverse the ranking when considering these discards. Because all alternatives encompass peak spawning, there is not expected to be a decrease in biological benefit with regards to spawning opportunities for any alternative.

A shorter commercial season would result in reduced short term economic benefit. Therefore, when considering short-term economic benefit **Preferred Alternative 1 (No Action)** would provide the highest economic benefits followed by **Alternative 3**, **Alternative 2**, and **Alternative 4.** Long-term economic benefit would result from sustainable harvest and the stock continuing to rebuild, therefore the ranking for biological benefits would be expected to provide the most long-term economic benefit as well. Socially, the spawning season closure will be a trade-off between the biological benefits of extending the closure and increased commercial fishing opportunities if it remains unmodified. **Preferred Alternative 1 (No Action)** would cause the least amount of disruption to commercial fishing businesses as fishermen have already adjusted their practices to this closure. Thus, in the short-term, **Preferred Alternative 1 (No Action)** would provide the most access to fishing communities, followed by **Alternative 2**,

Alternative 3, and **Alternative 4**. Because there is already a spawning season closure in place, the administrative burden is not expected to differ between alternatives.

2.5 Action 5. Modify recreational management measures for gag

2.5.1 Sub-action 5a. Establish a recreational vessel limit for gag

2.5.1.1 Alternatives

Alternative 1 (No Action). There is no recreational vessel limit for gag. The recreational bag limit for gag is 1 fish per person per day within the 3 shallow water grouper aggregate (no more than 1 grouper may be gag or black grouper).

Alternative 2. Establish a private recreational vessel limit for gag of:

Sub-Alternative 2a. 2 fish per vessel per day.

Sub-Alternative 2b. 4 fish per vessel per day.

Alternative 3. Establish a for-hire recreational vessel limit for gag of:

Sub-Alternative 3a. 2 fish per vessel per trip.

Sub-Alternative 3b. 4 fish per vessel per trip.

Discussion:

Alternatives 2 and **3** propose gag recreational vessel limits that would help reduce recreational harvest to end overfishing and rebuild the stock. **Alternatives 2** and **3** would not alter the black grouper bag limit, which would remain 1 black grouper per person per day within the 3-grouper aggregate (See Sub-Action 7a for modifications to the black grouper bag limit). **Alternative 2** and associated sub-alternatives would establish a per *day* gag vessel limit for the private recreational component of the recreational sector. **Alternative 3** and associated sub-alternatives would establish a per *trip* gag vessel limit for the for-hire component of the recreational sector. Vessel limits separated by *day* and *trip* are provided as alternatives to constrain harvest for separate components of the recreational sector. Because for-hire vessels may take multiple trips in a day, a per trip limit would ensure equal access for customers on a second trip and would not need to discard a gag if one was caught on the first trip.

2.5.1.2 Comparison of Alternatives:

Biological effects are not expected to differ among alternative in terms of risk to overfishing because harvest will be limited to the recreational ACL. Smaller recreational vessel limits would potentially decrease recreational landings, helping to constrain harvest to the updated catch levels but could also result in higher discards. Discard mortality of snowy grouper is considered 100% (SEDAR 36 Update, 2021). When considering discards, **Alternative 1 (No Action)** would have the least potential for negative biological effects followed by **Sub-Alternative 2b**, **Sub-Alternative 3a, Sub-Alternative 2b,** and **Sub-Alternative 3b**.

Establishing a vessel limit will most likely result in a reduction in harvest and economic benefits, however it would allow longer access to the fishery during the fishing year. With regards to the estimated change in consumer surplus, **Sub-Alternative 2a** is expected to have the largest negative economic effect, followed by **Sub-Alternative 2b**, **Sub-Alternative 3a**, and **Sub-Alternative 3b**. Social impacts will be the tradeoff between longer access to the resource and trip efficiency. Sector components that have a more restrictive vessel limit may have more

negative social effects. .Therefore it can be assumed that **Sub-Alternatives 2a** and **3a** will have potential for higher negative social impacts when compared to **Alternative 1 (No Action)** and **Sub-Alternatives 2b** and **3b**. Administrative burden would increase for all alternatives aside from **Alternative 1 (No Action)** because gag does not currently have a vessel limit.

2.5.2 Sub-action 5b. Modify the seasonal prohibition on recreational harvest and possession of gag

2.5.2.1 Alternatives

Preferred Alternative 1 (No Action). During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney).

Alternative 2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). For gag only, revise the timing of these restrictions to January 1 through May 31 throughout the exclusive economic zone.

Alternative 3. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). For gag only, revise the timing of these restrictions to December 1 through April 30 throughout the exclusive economic zone.

Alternative 4. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). For gag only, revise the timing of these restrictions to December 1 through May 31 throughout the exclusive economic zone.

Discussion: **Preferred Alternative 1(No Action)** would retain the current January 1 through April 30 recreational spawning season closure. **Alternative 2** would extend the spawning season closure an additional month in the spring for gag, closing the recreational season from January 1 through May 31. Under **Alternative 2** the gag spawning season closure would match the red grouper spawning season closure off North Carolina and South Carolina, but would extend throughout the entire South Atlantic. **Alternative 3** would extend the spawning season closure an additional month in the winter, closing the recreational season from December 1 through April 30. **Alternative 4** would extend the spawning season closure an additional month in the spring and winter, closing the recreational season from December 1 through May 31. Alternatives related to black grouper spawning season closure are proposed in Sub-Action 7b.

2.5.2.2 Comparison of Alternatives:

A longer spawning season closure provides the most biological benefit to the stock, therefore **Alternative 4** has the highest potential for biological benefit, followed by **Alternative 3** and **2**, and **Alternative 1 (No Action).** A longer spawning season closure could result in increased discards as fishermen continue to fish for other shallow-water grouper species, which would reverse the ranking when considering these discards. Because all alternatives encompass peak

spawning, there is not expected to be a decrease in biological benefit with regards to spawning opportunities for any alternative.

A shorter recreational season would result in reduced short term economic benefit. Therefore, when considering short-term economic benefit **Preferred Alternative 1 (No Action)** would provide the highest economic benefits followed by **Alternative 3**, **Alternative 2**, and **Alternative 4.** Long-term economic benefit would result from sustainable harvest and the stock continuing to rebuild, therefore the ranking for biological benefits would be expected to provide the most long-term economic benefit as well. Socially, the spawning season closure will be a trade-off between the biological benefits of extending the closure and increased commercial fishing opportunities if it remains unmodified. **Preferred Alternative 1 (No Action)** would cause the least amount of disruption to recreational fishing businesses as fishermen have already adjusted their practices to this closure. Thus, in the short-term, **Preferred Alternative 1 (No Action)** would provide the most access to fishing communities, followed by **Alternative 2**, **Alternative 3**, and **Alternative 4**. Because there is already a spawning season closure in place, the administrative burden is not expected to differ between alternatives.

2.5.3 Sub-action 5c. Prohibit the retention of gag by captain and crew

2.5.3.1 Alternatives

Alternative 1 (No Action). The captain and crew on a for-hire vessel with a Federal for-hire snapper-grouper permit may retain the daily bag limit of gag as allowed for each passenger.

Alternative 2. The gag bag limit for captain and crew on a for-hire vessel with a Federal for-hire snapper-grouper permit is zero.

Discussion:
Alternative 1 (No Action) would allow a captain and crew of a for-hire vessel to continue to retain recreational bag limits of gag on for-hire vessels. If the gag vessel limit is established (see Sub-action 5a), captain and crew could and potentially would supplement the catch of their clients and negate some of the reductions expected from the vessel limit. Continuing to allow captain and crew to retain a daily bag limit of gag may increase the potential harvest by recreational for-hire anglers and prevent necessary reductions in harvest from being achieved. The same modifications to the captain and crew bag limit are being considered for black grouper (See Sub-Action 7c).

2.5.3.2 Comparison of Alternatives:

The prohibition of captain and crew bag limits could provide biological benefits as it has the potential to constrain harvest and result in a longer season, however reductions in landings from captain and crew are hard to quantify because surveys do not provide information on the number of fish retained by captain and crew. Because removing captain and crew would most likely result in a reduction in harvest, there is a potential for decreased economic benefit under **Alternative 2**. Removing the captain and crew bag limits could have negative social effects if captain and crew satisfaction decreases however it could provide long-term social benefits from slowing the rate of harvest. **Alternative 2** would present an initial administrative burden as it would involve the implementation of a new regulation however it would allow for easier enforcement after implementation.

2.6 Action 6. Revise the gag recreational accountability measures

2.6.1 Alternatives

Alternative 1 (No Action). If recreational landings reach or are projected to reach the recreational annual catch limit, recreational harvest of gag is closed for the remainder of the fishing year, regardless of stock status, unless National Marine Fisheries Service determines that no closure is necessary based on the best scientific information available. If recreational landings exceed the recreational annual catch limit, then during the following fishing year recreational landings will be monitored for a persistence in increased landings. If the total annual catch limit is exceeded and gag are overfished, the length of the recreational fishing season and the recreational annual catch limit are reduced by the amount of the recreational annual catch limit overage.

Alternative 2. Remove the current recreational in-season accountability measures. The recreational gag season will start annually on May 1. The National Marine Fisheries Service will annually announce the recreational fishing season end dates in the Federal Register and by other methods, as deemed appropriate. The fishing season will end on the date National Marine Fisheries Service projects the recreational annual catch limit will be met.

Alternative 3. Remove the current recreational in-season accountability measures. If recreational landings exceed the recreational annual catch limit, reduce the length of the following year's recreational fishing season by the amount necessary to prevent the recreational annual catch limit from being exceeded in the following year. However, the length of the recreational season will not be reduced if the Regional Administrator determines, using the best scientific information available, that it is not necessary.

Preferred Alternative 4. Retain the current recreational in-season accountability measures. If recreational landings exceed the recreational annual catch limit, reduce the length of the following year's recreational fishing season by the amount necessary to prevent the recreational annual catch limit from being exceeded in the following year. However, the length of the recreational season will not be reduced if the Regional Administrator determines, using the best scientific information available, that it is not necessary.

Discussion

Alternative 1 (No Action) would retain an in-season closure and a potential payback provision for an overage of the sector ACL, if the total ACL were exceeded, that would reduce the sector ACL by the amount of the overage. Since the recreational AM is likely to be triggered under the proposed reduced catch level, the total ACL may become a "moving target" if payback is triggered in the recreational sector because it would alter the ACL in subsequent fishing years to incorporate the payback. This alternative involves a "double penalty" when the ACL is exceeded by requiring a shortened season and payback provision. The post-season AM is also tied to stock status, and because gag is overfished, it is likely this payback would be triggered if the ACL is exceeded.

Under **Alternative 2**, NMFS would announce the length of the recreational season annually prior to the start date each year, with an end date corresponding to when the recreational ACL is projected to be met for that year.

Alternative 3 would remove the current potential "double penalty" of a reduction in the season length and a payback of the overage if the total ACL was exceeded. Under this alternative, the AM would not be tied to the total ACL, but rather only to the recreational ACL. Since the recreational AM is likely to be triggered under the proposed catch level reductions, the proposed modification would ensure that overages in the recreational sector do not in turn affect the catch level for the commercial sector. The reduced season length would apply to the fishing season following an overage. This alternative would also remove the in-season AM for the recreational season.

Preferred Alternative 4 would also remove the current potential "double penalty" of a reduction in the season length and a payback of the overage if the total ACL was exceeded. Under this alternative, the AM would not be tied to the total ACL, but rather only to the recreational ACL. Since the recreational AM is likely to be triggered under the proposed catch level reductions, the proposed modification would ensure that overages in the recreational sector do not in turn affect the catch level for the commercial sector. The reduced season length would apply to the fishing season following an overage. This alternative would also retain the in-season AMs for the recreational season and would remove the stock status from the post-season trigger.

2.6.2 Comparison of Alternatives:

Biological effects would be expected to be greater for the alternative that provides the most timely and realistic option chosen to trigger and implement an AM. In-season AMs may not be able to be implemented in time for fisheries with short seasons. Considering these factors, biological benefits would be greatest under **Alternative 1 (No Action)**, **Alternative 2**, **Preferred Alternative 4**, and **Alternative 3**. Economic effects can be examined on a short and long-term basis. Negative short-term effects would occur when AMs are put in place that result in more closures and paybacks and less access to the resource, such **Preferred Alternative 4** and **Alternative 1 (No Action)**. These same scenarios would in turn result in long-term benefits because the AM would ensure sustainable harvest and could contribute to rebuilding of the stock.

AMs do not have a direct social effect, but in-season closures and paybacks can have negative social effects when access to the resource is restricted. **Preferred Alternative 4** retains this in-season closure, which, if triggered would have negative social effects but it removes the payback provision which would prevent the direct and indirect negative social effects of a smaller ACL following an overage. Administrative burdens such as data monitoring, rulemaking, outreach, and enforcement would be similar for **Alternative 1 (No Action)**, **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4**. **Alternative 2** would require a season announcement notice in the *Federal Register* annually prior to the season start date. If triggered, **Preferred Alternative 4**, would also require a season announcement notice for a reduced season length.

2.7 Action 7. Modify recreational management measures for black grouper

2.7.1 Sub-action 7a. Establish a recreational vessel limit for black grouper

2.7.1.1 Alternatives

Alternative 1 (No Action). There is no recreational vessel limit for black grouper. The recreational black grouper bag limit is 1 fish per person per day within the 3 shallow water grouper aggregate (no more than 1 grouper may be gag or black grouper).

Alternative 2. Establish a private recreational vessel limit for black grouper of:

Sub-Alternative 2a. 2 fish per vessel per day.

Sub-Alternative 2b. 4 fish per vessel per day.

Alternative 3. Establish a for-hire recreational vessel limit for black grouper of:

Sub-Alternative 3a. 2 fish per vessel per trip.

Sub-Alternative 3b. 4 fish per vessel per trip.

Discussion:

Gag and black grouper are often misidentified in the recreational fishery. Because of this issue, a vessel limit is being considered for black grouper to prevent additional gag to be harvested under the black grouper bag limit if identified improperly. **Alternative 2** and associated sub-alternatives would establish a per *day* black grouper vessel limit for the private recreational component of the recreational sector. **Alternative 3** and associated sub-alternatives would establish a per *trip* black grouper vessel limit for the for-hire component of the recreational sector. Vessel limits separated by *day* and *trip* are provided as alternatives to constrain harvest for separate components of the recreational sector. Because for-hire vessels may take multiple trips in a day, a per trip limit would ensure equal access for customers on a second trip and would not need to discard a black grouper if one was caught on the first trip.

2.7.1.2 Comparison of Alternatives:

It is the goal of the Council to implement black grouper recreational harvest constraints to indirectly benefit the gag fishery and reduce misidentification issues. **Alternatives 2** and **3** and the respective sub-alternatives are expected to constrain harvest compared to **Alternative 1 (No Action)**. Harvest constraint is not needed for the black grouper fishery but assuming gag and black grouper are misidentified, it could indirectly provide greater biological benefits for the gag stock. **Sub-Alternative 2a** is expected to be most constraining on the private recreational sector which could increase discards. **Sub-Alternative 2b** is not expected to constrain black grouper harvest. **Sub-Alternative 3a** is most constraining on the for the for-hire component which could results in increased discards. **Sub-Alternative 3b** is expected to have a very little (7%) reduction in harvest. Since **Alternative 2** and **3** will restrict black grouper harvest, these alternatives would be expected to decrease net economic benefits when compared to **Alternative 1 (No Action)**. With regards to social effects, alternatives with a smaller vessel limit (**Sub-**

Alternative 2a and **Sub-Alternative 3a**) are expected to have a more negative social effects than larger vessel limits. Administrative burden would increase for all alternatives aside from **Alternative 1 (No Action)** because black grouper does not currently have a vessel limit.

2.7.2 Sub-action 7b. Modify the seasonal prohibition on recreational harvest and possession of black grouper

2.7.2.1 Alternatives

Alternative 1 (No Action). During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney).

Alternative 2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). For black grouper only, revise the timing of these restrictions to January 1 through May 31 throughout the exclusive economic zone.

Alternative 3. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). For black grouper only, revise the timing of these restrictions to December 1 through April 30 throughout the exclusive economic zone.

Alternative 4. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). For black grouper only, revise the timing of these restrictions to December 1 through May 31 throughout the exclusive economic zone.

Discussion:

Alternative 1(No Action) would retain the current January 1 through April 30 recreational spawning season closure. **Alternative 2** would extend the spawning season closure an additional month in the spring for black grouper, closing the recreational season from January 1 through May 31. **Alternative 3** would extend the spawning season closure an additional month in the winter, closing the recreational season from December 1 through April 30. **Alternative 4** would extend the spawning season closure an additional month in the spring and winter, closing the recreational season from December 1 through May 31.

2.5.2.2 Comparison of Alternatives:

A longer spawning season closure provides the most biological benefit to the stock, therefore **Alternative 4** has the highest potential for biological benefit, followed by **Alternative 3** and **2**, and **Alternative 1 (No Action).** A longer spawning season closure could result in increased discards as fishermen continue to fish for other shallow-water grouper species, which would reverse the ranking when considering these discards. Because all alternatives encompass peak spawning, there is not expected to be a decrease in biological benefit with regards to spawning opportunities for any alternative.

A shorter recreational season would result in reduced short term economic benefit. Therefore, when considering short-term economic benefit **Preferred Alternative 1 (No Action)** would provide the highest economic benefits followed by **Alternative 3**, **Alternative 2**, and **Alternative 4.** Long-term economic benefit would result from sustainable harvest and the stock continuing to rebuild, therefore the ranking for biological benefits would be expected to provide the most long-term economic benefit as well. Socially, the spawning season closure will be a trade-off between the biological benefits of extending the closure and increased commercial fishing opportunities if it remains unmodified. **Preferred Alternative 1 (No Action)** would cause the least amount of disruption to recreational fishing businesses as fishermen have already adjusted their practices to this closure. Thus, in the short-term, **Preferred Alternative 1 (No Action)** would provide the most access to fishing communities, followed by **Alternative 2**, **Alternative 3**, and **Alternative 4**. Because there is already a spawning season closure in place, the administrative burden is not expected to differ between alternatives.

2.7.3 Sub-action 7c. Prohibit the retention of black grouper by captain and crew

2.7.3.1 Alternatives

Alternative 1 (No Action). The captain and crew on a for-hire vessel with a Federal for-hire snapper-grouper permit may retain the daily bag limit of black grouper as allowed for each passenger.

Alternative 2. The black grouper bag limit for captain and crew on a for-hire vessel with a Federal for-hire snapper-grouper permit is zero.

Discussion:
Alternative 1 (No Action) would allow captains and crew to continue to retain recreational bag limits of black grouper while under charter. If the black grouper vessel limit is established (see Sub-action 7a), captain and crew could and potentially would supplement the catch of their clients and negate some of the reductions expected from the vessel limit. Continuing to allow captain and crew to retain a daily bag limit of black grouper may increase the potential harvest of gag through misidentification and hinder the rebuilding of the gag stock.

2.7.3.2.2 Comparison of Alternatives:

The prohibition of captain and crew bag limits could provide biological benefits as it has the potential to constrain harvest and result in a longer season, however reductions in landings from captain and crew are hard to quantify because surveys do not provide information on the number of fish retained by captain and crew. Because removing captain and crew would most likely result in a reduction in harvest, there is a potential for decreased economic benefit under **Alternative 2**. Removing the captain and crew bag limits could have negative social effects if captain and crew satisfaction decreases however it could provide long-term social benefits from slowing the rate of harvest. **Alternative 2** would present an initial administrative burden as it would involve the implementation of a new regulation however it would allow for easier enforcement after implementation.

Chapter 3. Affected Environment

TO BE COMPLETED

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

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

3.1 Habitat Environment

Information on the habitat utilized by 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 2009) and the FEP Dashboard (under revision) which are incorporated here by reference. South Atlantic Fishery Management Council (Council) designated essential fish habitat (EFH) and EFH-Habitat Areas of Particular Concern (HAPC) are presented in the SAFMC User Guide and spatial representations of these and other habitat related layers are in within the Council's SAFMC Atlas[2].

3.1.1 Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S. C. 1802(10)). EFH for species in the Snapper Grouper FMU 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 600 ft (but to at least 2000 ft for wreckfish) where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for larval survival and growth up to and including settlement. In addition, the Gulf Stream is an EFH because it provides a mechanism to disperse snapper grouper larvae.

[2] https://myfwc.maps.arcgis.com/apps/webappviewer/index.html?id=961f8908250a404ba99fac3aa37ac723

For specific life stages of estuarine dependent and nearshore snapper grouper species, EFH includes areas inshore of the 100-foot 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.

3.1.2 Habitat Areas of Particular Concern

EFH-Habitat Areas of Particular Concern (EFH-HAPCs) for species in the snapper-grouper management unit include medium to high profile offshore hard bottoms where spawning normally occurs; localities of known or likely periodic spawning aggregations; nearshore 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 Habitat Area of Particular Concern; all hermatypic coral habitats and reefs; manganese outcroppings on the Blake Plateau; and Council-designated Artificial Reef Special Management Zones (SMZs). Areas that meet the criteria for EFH-HAPCs include habitats required during each life stage (including egg, larval, post-larval, juvenile, and adult stages).

EFH-HAPCs for golden tilefish includes irregular bottom comprised of troughs and terraces inter-mingled with sand, mud, or shell hash bottom. Mud-clay bottoms in depths of 150-300 meters are HAPC. Golden tilefish are generally found in 80-540 meters, but most commonly found in 200-meter depths.

EFH-HAPC for blueline tilefish includes irregular bottom habitats along the shelf edge in 45-65 meters depth; shelf break; or upper slope along the 100-fathom contour (150-225 meters); hardbottom habitats characterized as rock overhangs, rock outcrops, manganese-phosphorite rock slab formations, or rocky reefs in the South Atlantic Bight; and the Georgetown Hole (Charleston Lumps) off Georgetown, SC.

EFH-HAPCs for the snapper grouper complex include the following deepwater marine protected areas (MPAs) as designated in Snapper Grouper Amendment 14: Snowy Grouper Wreck MPA, Northern South Carolina MPA, Edisto MPA, Charleston Deep Artificial Reef MPA, Georgia MPA, North Florida MPA, St. Lucie Hump MPA, and East Hump MPA.

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 process, 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.

Similarly, in the Comprehensive Ecosystem-Based Amendment 1 (CE-BA 1; SAFMC 2010), the Council designated EFH areas and EFH-HAPCs under the Snapper Grouper FMP. 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. 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. The Council determined in CE-BA 1 that the Council-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 including Spawning SMZs. 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 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 also be designated as EFH-HAPCs under the Snapper Grouper FMP.

3.2 Biological and Ecological Environment

3.2.1 Gag

Life History

Gag occur in the Western Atlantic from North Carolina to the Yucatan Peninsula, and throughout the Gulf of Mexico. Juveniles are sometimes observed as far north as Massachusetts (Heemstra and Randall 1993). Gag commonly occur at depths of 39-152 m (131-498 ft) (Heemstra and Randall 1993) and prefer inshore-reef and shelf-break habitats (Hood and Schlieder 1992). Bullock and Smith (1991) indicated that gag probably do not move seasonally between reefs in the Gulf of Mexico, but show a gradual shift toward deeper water with age. McGovern et al. (2005) reported extensive movement of gag along the Southeast United States. In a tagging study, 23% of the 435 recaptured gag moved distances greater than 185 km. Most of these individuals were tagged off South Carolina and were recaptured off Georgia, Florida, and in the Gulf of Mexico (McGovern et al. 2005).

Gag are considered estuarine dependent (Keener et al. 1988; Ross and Moser 1995; Koenig and Coleman 1998; Strelcheck et al. 2003). Juveniles (age 0) occur in shallow grass beds along Florida's east coast during the late spring and summer (Bullock and Smith 1991). Sea grass is also an important nursery habitat for juvenile gag in North Carolina (Ross and Moser 1995). Post-larval gag enter South Carolina estuaries when they are 13 mm total length (TL) and 40 days old during April and May each year (Keener et al. 1988), and utilize oyster shell rubble as nursery habitat. Juveniles remain in estuarine waters throughout the summer and move offshore as water temperatures cool during September and October.

Huntsman et al. (1999) indicated that gag are vulnerable to overfishing since they are long-lived, change sex, and aggregate to spawn. Maximum reported size for gag is 145 cm (57.5 in) TL and 36.5 kg (81 lbs) (Heemstra and Randall 1993), and maximum reported age is 26 years (Harris and Collins 2000). Most gag are females at lengths less than 87.5 cm (34.7 in) TL. As they

grow, females change to males with 50% of the fish being males at 105 cm (41.6 in) TL and almost 100% males at lengths greater than 120 cm (47.5 in) TL (McGovern et al. 1998).

Along the southeastern United States (1994-1995), size at first maturity is 50.8 cm (20.2 in) TL, and 50% of gag females are sexually mature at 62.2 cm (24.7 in) (McGovern et al. 1998). According to Harris and Collins (2000), age-at-first-maturity is 2 years, and 50% of gag are mature at 3 years. For data that were collected during 1978-1982 off the southeastern United States, McGovern et al. (1998) reported that the smallest mature females were 58 cm (22.9 in) TL and 3 years old. Hood and Schlieder (1992) indicated that most females reach sexual maturity at ages 5-7 in the Gulf of Mexico. Off the southeastern United States, gag spawn from December through May, with a peak in March and April (McGovern et al. 1998). Duration of planktonic larvae is about 42 days (Keener et al. 1988, Koenig and Coleman 1998, Lindeman et al. 2000). McGovern et al. (1998) reported that the percentage of male gag landed by commercial fishermen decreased from 20% during 1979-1981 to 6% during 1995-1996. This coincided with a decrease in the mean length of fish landed. A similar decrease in the percentage of males was reported in the Gulf of Mexico (Hood and Schleider 1992, Coleman et al. 1996).

Adults are sometimes solitary, or can occur in groups of 5 to 50 individuals, especially during the spawning season. They feed primarily on fishes, but also prey on crabs, shrimps, and cephalopods (Heemstra and Randall 1993), and often forage in small groups far from the reef ledge (Bullock and Smith 1991). Juveniles feed primarily on crustaceans, and begin to consume fishes when they reach about 25 mm (1 in) in length (Bullock and Smith 1991, Mullaney 1994).

Stock Status

The Southeast Data, Assessment, and Review (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. 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 public 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.

In 2006, the gag stock was assessed through the SEDAR process as a benchmark assessment (SEDAR 10). The assessment indicated that the stock was not overfished but was undergoing overfishing. The Council and NMFS implemented management measures, including implementing a spawning season closure to end overfishing in Amendment 16 to the FMP (SAFMC 2009).

In 2014, the gag stock was assessed through SEDAR 10 Update as a standard assessment. The assessment indicated that the gag stock was not overfished but was still experiencing overfishing. In response to SEDAR 10 Update, the Council and NMFS modified the annual catch limits and management measures through Regulatory Amendment 22 to the FMP (SAFMC 2015).

The most recent update assessment (SEDAR 71) was finalized in 2021, using data through 2019. The Council's SSC reviewed SEDAR 71 and determined that the assessment is based on the best scientific information available. The assessment's terminal year (2019) base-run estimate of spawning stock biomass (SSB) was below the minimum stock size threshold (MSST) (SSB2019/MSST=0.20), indicating that the stock is overfished (Figure 3.2.1.1). With the exception of a few years in the late 1990s and early 2000s, the estimated fishing rate has exceeded the maximum fishing mortality threshold (MFMT) since the mid-1980s. The estimated terminal year fishing mortality rate (F) based on a three-year geometric mean is above F_{MSY} ($F_{F2017-2019}/F_{MSY}$=2.15), indicating overfishing is occurring (Figure 3.2.1.1). Therefore, NMFS determined the South Atlantic gag stock is undergoing overfishing and remains overfished.

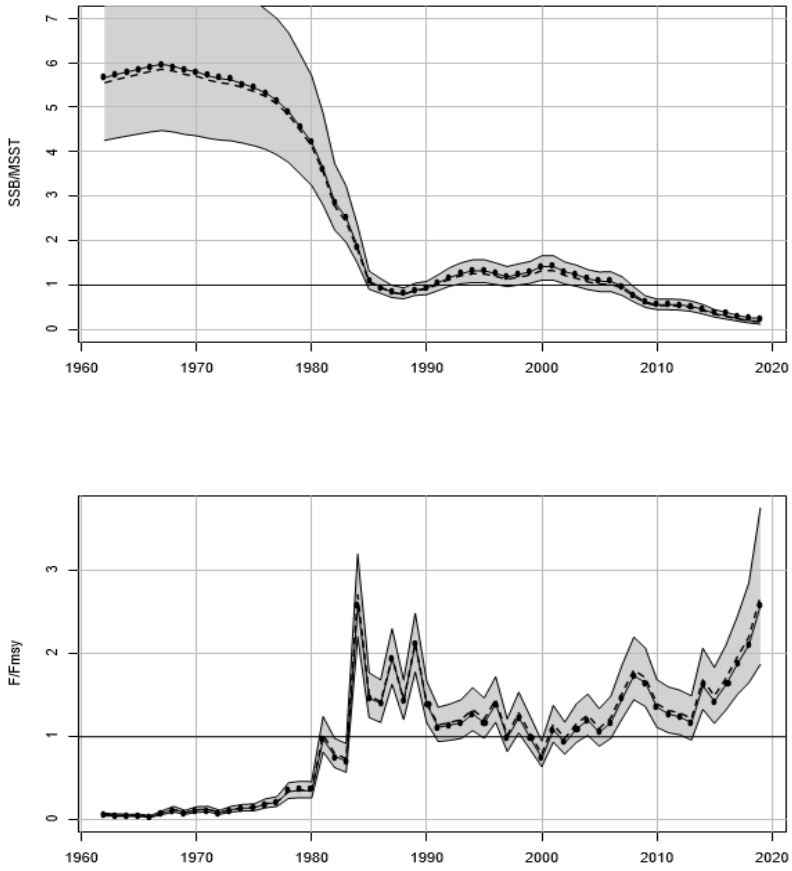

Figure 3.2.1.1. Estimated time series of SSB and F relative to benchmarks. Solid line indicates estimates from base run of the Beaufort Assessment Model; gray error bands indicate 5th and 95th percentiles of the ensemble modeling. Top panel: SSB relative to the MSST; if less than 1, stock is overfished. Bottom panel: F relative to F_{MSY}; if > 1 stock is undergoing overfishing. Source: SEDAR 71 (2021).

Landings

Table 3.2.1.1. South Atlantic gag grouper landings for fishing years 2015 to 2019.

Fishing Year	Commercial landings (lbs gw)	Recreational landings (lbs gw)	Total landings (lbs gw)
2015	284,540	255,211	539,752
2016	234,997	402,941	637,939
2017	196,807	384,331	581,138
2018	239,810	440,410	680,219
2019	258,591	268,251	526,842
5-year average	242,949	350,229	593,178

Source: SEFSC MRIP FES ACL data set (March 2022) for recreational landings and SEFSC Commercial ACL data set (April 2022) for commercial landings.

3.2.2 Black Grouper

Life History

Black grouper (M. bonaci) in the southeastern United States (the northern most part of their range) are found chiefly in southern Florida and the Florida Keys, although specimens have been recorded from Massachusetts to Texas. The range of black grouper extends to southeastern Brazil and east to Bermuda. They are often found associated with rocky ledges and coral reefs from 10-100 m. In the northern hemisphere, black grouper are more often caught in the southeastern Gulf of Mexico, southern Gulf of Mexico, and the Caribbean, spawning aggregations off the coast of Belize. In the southeastern US, black grouper are caught more commonly in the Florida Keys along the reef tract, and are caught along high relief areas in deeper waters off of the west coast of Florida to the Florida Middle Grounds and off of the east coast of Florida. Generally, larger and older individuals are caught more often in deeper waters.

Limited tagging data suggests black groupers only move short distances. Natural mortality is thought to vary by age. Black grouper are protogynous hermaphrodites. The peak spawning season of black grouper based on back-calculated hatching dates of post larval fish from February through April.

Stock Status

The stock assessment history for black grouper in the southeast U.S. waters is brief. Potts and Brennan (2001) presented a summary of the status of snapper grouper species for the Council using commercial as well as recreational fishery data and they found the black grouper stock to be overfished (SPR = 10%, range 0.58-15%) with a fully recruited fishing mortality estimate of 0.60 per year and a natural mortality of 0.15 per year.

In 2010, the Gulf of Mexico and South Atlantic black grouper stocks were assessed through the SEDAR process (SEDAR 19). The assessment indicated that the southeast stock was not overfished but was undergoing overfishing.

Landings

3.2.3 Bycatch

The implications of bycatch on the gag stock and snapper grouper fishery are discussed in Appendix G (Bycatch Practicability Analysis [BPA]).

3.2.4 Other Species Affected

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

3.2.5 Protected Species

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). 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 the stocks such as North Atlantic right whales (NARW), and 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)[3] 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 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.

Since completing the December 2016 Bi-Op, NMFS published several final rules that listed additional species and designated critical habitat. NMFS has reinitiated formal consultation to address these listings and concluded the authorization of the South Atlantic snapper grouper 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 Regulatory Amendment 27 to the FMP (SAFMC 2019a).

[3] https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries/

3.3 Economic Environment

3.3.1 Commercial Sector

Economic information pertaining to the commercial snapper grouper fishery is provided in Amendment 29 (SAFMC 2020), Buck (2018), and Overstreet et al. (2018) and is incorporated herein by reference. Select updates to this information specific to gag grouper are provided below. The major sources of data summarized in this section are the NMFS Southeast Regional Office (SERO) Permits Information Management System (PIMS) and the SEFSC Social Science Research Group (SSRG) Socioeconomic Panel[4] data set. Inflation adjusted values are reported in 2021 dollars.

Permits

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. As of August 26, 2021, there were 579 valid or renewable[5] South Atlantic Snapper Grouper unlimited permits and 112 valid or renewable 225-lb trip-limited permits. Commercial harvest of snapper grouper species in the EEZ may only be sold to dealers with a federal dealer permit. As of August 26, 2021, there were 379 entities with a federal Gulf and South Atlantic Dealers (GSAD) permit.

Landings, Value, and Effort

The number of federally permitted commercial vessels that landed South Atlantic gag was mostly stable from 2015 through 2019 (Table 3.3.1.1). Landings of gag fluctuated modestly during the period, with a 5-year low in 2017. On average (2015 through 2019), vessels that landed gag did so on approximately 23% of their South Atlantic trips and gag accounted for approximately 10% of their annual all species revenue, including revenue from Gulf of Mexico trips (Table 3.3.1.1 and Table 3.3.1.2). Average all species vessel-level revenue for these vessels decreased steadily from 2015 through 2019 by 14% overall (Table 3.3.1.2). The average annual price per pound (lb) gutted weight (gw) for gag during this period was $6.51 (2021 dollars).

C. Liese (NMFS SEFSC, pers. comm. 2022) generated annual vessel-level estimates of costs (as a percentage of revenue) and net revenue from operations for vessels that harvested gag in the South Atlantic. Estimates of producer surplus (PS) can be calculated from the cost information. PS is total annual revenue minus the costs for fuel, other supplies, hired crew, and the opportunity cost of an owner's time as captain. Net revenue from operations, which most closely represents economic profits to the owner(s), is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, and the

[4] This data set is compiled by the SEFSC Social Science Research Group from Federal Logbook System data, supplemented by average prices calculated from the Accumulated Landings System. Because these landings are self-reported, they may diverge slightly from dealer-reported landings presented elsewhere.

[5] A renewable permit is an expired limited access permit that cannot be actively fished, but can be renewed for up to one year after expiration.

opportunity cost of an owner's time as captain, as well as the vessel's depreciation. According to C. Liese (NMFS SEFSC, pers. comm. 2022), PS for commercial vessels that harvested South Atlantic gag was approximately 31% of their annual gross revenue, on average, from 2014 through 2018. Net revenue from operations was 1% of their annual gross revenue, on average, during this period. Applying these percentages to the results provided in Table 3.3.1.2 would result in an estimated per vessel average annual PS of $20,994 (2021 dollars) and an average annual net revenue from operations of $677 per year.

Table 3.3.1.1. Number of vessels, number of trips, and landings (lbs gw) by year for South Atlantic gag.

Year	# of vessels that caught gag (> 0 lbs gw)	# of trips that caught gag	gag landings (lbs gw)	Other species' landings jointly caught w/ gag (lbs gw)	# of South Atlantic trips that only caught other species	Other species' landings on South Atlantic trips w/o gag (lbs gw)	All species landings on Gulf trips (lbs gw)
2015	207	1,610	247,080	935,490	5,147	2,963,567	357,386
2016	204	1,452	204,253	873,722	5,261	2,736,730	327,497
2017	201	1,432	177,407	933,461	5,246	2,747,246	291,948
2018	205	1,435	219,043	1,107,202	5,195	2,234,244	188,109
2019	198	1,473	208,316	811,197	4,607	2,247,653	231,833
Average	203	1,480	211,220	932,214	5,091	2,585,888	279,355

Source: SEFSC-SSRG Socioeconomic Panel (January 2022 version).
Note 1: South Atlantic trips refer to trips taken in Council jurisdictional waters and Gulf trips refer to trips taken in Gulf of Mexico Fishery Management Council jurisdictional waters.

Table 3.3.1.2. Number of vessels and ex-vessel revenue by year (2021 dollars) for South Atlantic gag.

Year	# of vessels that caught gag (> 0 lbs gw)	Dockside revenue from gag	Dockside revenue from 'other species' jointly caught w/ gag	Dockside revenue from 'other species' caught on South Atlantic trips w/o gag	Dockside revenue from 'all species' caught on Gulf trips	Total dockside revenue	Average total dockside revenue per vessel
2015	207	$1,571,332	$3,132,516	$9,080,772	$1,284,375	$15,068,994	$72,797
2016	204	$1,301,847	$3,127,392	$8,966,785	$1,014,978	$14,411,002	$70,642
2017	201	$1,161,864	$3,344,335	$8,528,466	$833,228	$13,867,892	$68,994
2018	205	$1,455,858	$3,773,091	$7,114,723	$635,812	$12,979,484	$63,315
2019	198	$1,381,661	$2,925,329	$7,302,755	$837,357	$12,447,102	$62,864
Average	203	$1,374,512	$3,260,532	$8,198,700	$921,150	$13,754,895	$67,722

Source: SEFSC-SSRG Socioeconomic Panel (January 2022 version).

Dealers

The information in Table 3.3.1.3 illustrates the purchasing activities of dealers that bought South Atlantic gag grouper landings from vessels during 2015 through 2019.[6] Like vessels, dealer participation in particular fisheries is fluid, and not all dealers purchased gag grouper in each year during this time. On average, from 2015 through 2019, gag grouper purchases comprised approximately 1.8% of all purchases made by these dealers. The average annual value of total purchases per gag grouper dealer experienced a decreasing trend from 2015 through 2019, with a 5-year low in 2018 (Table 3.3.1.3). Although not shown in the table, the maximum annual value of all purchases made by a single gag grouper dealer from 2015 through 2019 was $11 million (2021 dollars) in 2019.

Table 3.3.1.3. Purchase statistics for dealers that bought South Atlantic gag grouper landings (2021 dollars).

Year	Number of Dealers	Gag Grouper landed lbs gw	Gag Grouper Purchases	Other South Atlantic Purchases	Gulf Purchases	Average purchases value per dealer
2015	101	308,079	$ 1,790,620	$ 77,407,811	$ 17,179,919	$ 954,241
2016	93	257,127	$ 1,488,757	$ 75,873,288	$ 13,036,977	$ 972,032
2017	97	196,528	$ 1,270,099	$ 75,025,385	$ 10,318,927	$ 892,932
2018	99	240,203	$ 1,574,441	$ 68,271,197	$ 14,566,234	$ 852,645
2019	95	257,241	$ 1,677,143	$ 72,966,549	$ 11,976,979	$ 911,797
Average	97	251,836	$ 1,560,212	$ 73,908,846	$ 13,415,807	$ 916,729

Source: SEFSC Fishing Communities Web Query Tool (Version May 29, 2022 Years: 2014-2021).

Imports

Imports of seafood products compete in the domestic seafood market and have in fact dominated many segments of the seafood market. Imports affect the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports have downstream effects on the local fish market. At the harvest level for grouper species, imports affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to the domestic production of grouper species, 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 the domestic harvest of grouper species. Imports data for gag grouper, in particular, are not available.

[6] The estimates in this table are based on Accumulated Landings System data, which tends to produce slightly different estimates of landings and ex-vessel value for gag grouper than the SEFSC-SSRG socio-economic panel database.

Imports of fresh grouper ranged from 10.7 million lbs product weight (pw) to 12.5 million lbs pw from 2015 through 2019. During this time, total revenue from fresh grouper imports ranged from approximately $50.2 million (2021 dollars) to $57.5 million. The average annual price per lb pw for fresh grouper was fairly stable, ranging from $4.53 to $4.70 (2021 dollars). Imports of fresh grouper primarily originated in Mexico, Central America, or South America and entered the U.S. through the ports of Miami, Florida and Tampa, Florida. On average (2015 through 2019), monthly imports of fresh grouper were mostly stable with a peak in July. Imports of frozen grouper ranged from 0.8 million lbs pw to 4.6 million lbs pw during 2015 through 2019. The annual value of these imports ranged from approximately $1.7 million (2021 dollars) to $6.2 million, with a peak in 2018. The average annual price per lb pw for frozen grouper dropped steeply from $2.69 in 2015 to $1.43 in 2017 and then decreased slower through 2019, ending at $1.37 (2021 dollars). Imports of frozen grouper primarily originated in Mexico and India. The majority of frozen grouper imports entered the U.S. through the ports of Miami, Florida, Tampa, Florida, and New York, New York. On average (2015 through 2019), monthly imports of frozen groupers were greatest during the months of January through March and July.

Business Activity

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 seafood 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, such as other finfish or seafood products, and services, such as visits to different food service establishments. As a result, the analysis presented below represents a distributional analysis only; that is, it only shows how economic effects 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.

Estimates of the U.S. average annual business activity associated with the commercial harvest of gag in the South Atlantic were derived using the model developed for and applied in NMFS (2022) and are provided in Table 3.3.1.4.[7] This business activity is characterized as jobs (full- and part-time), output impacts (gross business sales), income impacts (wages, salaries, and self-employed income), and value-added impacts, which represent the contribution made to the U.S. Gross Domestic Product (GDP). These impacts should not be added together because this would result in double counting. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species. Separate models to address individual species are not available. For example, the results provided here apply to a general "reef fish" category, rather than just gag, and a harvester job is "generated" for approximately every $35,237 (2021 dollars) in ex-vessel revenue. These results contrast with the number of harvesters (vessels) with recorded landings of gag presented in Table 3.3.1.1.

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

Table 3.3.1.4. Average annual business activity (2015 through 2019) associated with the commercial harvest of gag in the South Atlantic. All monetary estimates are in 2021 dollars.*

Species	Average Ex-vessel Value ($ thousands)	Total Jobs	Harvester Jobs	Output (Sales) Impacts ($ thousands)	Income Impacts ($ thousands)	Value Added ($ thousands)
gag	$1,375	164	39	$13,631	$5,006	$7,072

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2022).
*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 vessels and headboats. Charter vessels 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 because larger concentrations of fish are required to satisfy larger groups of anglers.

Permits

For anglers to fish for or possess snapper grouper species in or from the South Atlantic EEZ on for-hire vessels, those vessels are required to have an open access South Atlantic Snapper-Grouper Charter/Headboat permit (snapper grouper for-hire permit). As of August 26, 2021, there were 1,930 valid for-hire snapper grouper permits. This sector operates as an open access fishery and not all permitted vessels are necessarily active in the fishery. Some vessel owners may have obtained open access permits as insurance for uncertainties in the fisheries in which they currently operate.

Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, only federally permitted headboats are required to submit harvest and effort information to the NMFS Southeast Region Headboat Survey (SRHS).[8] Participation in the SRHS is based on determination by the Southeast Fisheries Science Center (SEFSC) that the vessel primarily operates as a headboat. As of February 22,

[8] All federal charter/headboat permit holders, including charter vessel owners or operators, are required to comply with the new Southeast For-Hire Electronic Reporting Program as of January 2021. Under this program, all such permit holders must submit logbooks weekly, by 11:59 pm, local time, the Tuesday following a reporting week (Monday-Sunday). Those vessels selected to report to the SRHS (i.e., federally permitted headboats) will continue to submit their reports under the new requirements directly to the SRHS program. For more information, see: https://www.fisheries.noaa.gov/southeast/recreational-fishing-data/southeast-hire-electronic-reporting-program?utm_medium=email&utm_source=govdelivery

2022, 66 South Atlantic headboats were registered in the SRHS (K. Brennan, NMFS SEFSC, pers. comm. 2022). The majority of these headboats were located in Florida/Georgia (41), followed by North Carolina (14) and South Carolina (11). As a result, of the 1,930 vessels with snapper grouper for-hire permits, up to 66 may primarily operate as headboats.[9]

There are no specific permitting requirements for recreational anglers to harvest snapper grouper species. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this proposed amendment.

Angler Effort

Recreational effort derived from the Marine Recreational Information Program (MRIP) database can be characterized in terms of the number of 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 South Atlantic, regardless of target intent or catch success.

Estimates of gag target and catch effort are provided in Table 3.3.2.1 and Table 3.3.2.2, respectively. It is important to note that in 2018, MRIP transitioned from the Coastal Household Telephone Survey (CHTS) to the mail-based fishing effort survey (FES). The estimates presented in Table 3.3.2.1 and Table 3.3.2.2 are calibrated to the MRIP FES and may be greater than estimates that are non-calibrated.[10] As shown in Table 3.3.2.1, there were a minimal number of target trips recorded for gag outside of Florida from 2015 through 2019. In Florida, target trips fluctuated substantially with a 5-year low in 2017. With respect to catch trips, there was a decreasing trend from 2015 through 2019 across all South Atlantic states combined, with the majority of catch trips occurring in Florida (Table 3.3.2.2). North Carolina recorded the second largest number of recreational gag catch trips during the period. For both target and catch trips, the private/rental mode was the dominant mode of fishing (Table 3.3.2.1 and Table 3.3.2.2).

[9] This estimate is based on the SEFSC criteria; however, there may be additional vessels not included in the SRHS that also identify as headboats.

[10] As of August 2018, all directed trip estimate information provided by MRIP (public use survey data and directed trip query results) for the entire time series were updated to account for both the Access Point Angler Intercept Survey (APAIS) design change in 2013, as well as the transition from the CHTS to the FES in 2018. Back-calibrated estimates of directed effort are not available. For more information, see: https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-estimate-updates

Table 3.3.2.1. South Atlantic gag recreational target trips, by mode and state, 2015-2019.*

	FL	GA	NC	SC	Total
	Charter Mode				
2015	1,043	0	25	0	1,068
2016	0	0	0	0	0
2017	0	0	0	0	0
2018	811	0	40	0	851
2019	0	0	0	0	0
Average	371	0	13	0	384
	Private/Rental Mode				
2015	57,113	0	1,897	0	59,010
2016	60,056	0	0	4,852	64,908
2017	19,564	0	0	0	19,564
2018	68,834	0	0	0	68,834
2019	37,667	0	1,750	0	39,416
Average	48,647	0	729	970	50,346
	All Modes				
2015	58,156	0	1,921	0	60,078
2016	60,056	0	0	4,852	64,908
2017	19,564	0	0	0	19,564
2018	69,645	0	40	0	69,685
2019	37,667	0	1,750	0	39,416
Average	49,018	0	742	970	50,730

Source: MRIP database, SERO, NMFS (May 2022).
*Headboat data are unavailable.
Note 1: These estimates are in MRIP FES units.
Note 2: There were no shore mode target trips recorded for gag.
Note 3: Includes post-stratified effort estimates from Monroe County, FL to align with SEDAR estimates.

Table 3.3.2.2. South Atlantic gag recreational catch trips, by mode and state, 2015-2019.*

	FL	GA	NC	SC	Total
	Shore Mode				
2015	0	0	22,810	0	22,810
2016	0	0	0	0	0
2017	0	0	453	0	453
2018	0	0	0	0	0
2019	0	0	887	0	887
Average	0	0	4,830	0	4,830
	Charter Mode				
2015	4,866	722	298	718	6,604
2016	3,919	148	1,283	1,354	6,703
2017	1,966	70	80	1,261	3,377
2018	3,853	310	643	338	5,145
2019	4,714	0	592	322	5,627
Average	3,864	250	579	799	5,491
	Private/Rental Mode				
2015	77,507	0	15,215	2,292	95,014
2016	49,836	0	24,053	6,688	80,577
2017	23,690	18,407	13,366	0	55,462
2018	62,205	1,869	1,059	3,080	68,214
2019	23,530	0	10,032	4,994	38,556
Average	47,354	4,055	12,745	3,411	67,565
	All Modes				
2015	82,373	722	38,324	3,010	124,429
2016	53,755	148	25,335	8,042	87,280
2017	25,656	18,477	13,899	1,261	59,293
2018	66,058	2,179	1,703	3,419	73,359
2019	28,244	0	11,511	5,316	45,071
Average	51,217	4,305	18,154	4,210	77,886

Source: MRIP database, SERO, NMFS (May 2022).
*Headboat data are unavailable.
Note 1: These estimates are in MRIP FES units.
Note 2: Includes post-stratified effort estimates from Monroe County, FL to align with SEDAR estimates.

Estimates of South Atlantic black grouper target and catch effort are provided in Table 3.3.2.3 and Table 3.3.2.4, respectively. These trips, which occurred exclusively in Florida, experienced steep declines from 2015 through 2019.

Table 3.3.2.3. South Atlantic black grouper recreational target trips in Florida*, by mode.

	Shore Mode	Charter Mode	Private/Rental Mode	All Modes
2015	25,672	0	10,705	36,377
2016	0	0	6,021	6,021
2017	0	0	4,898	4,898
2018	0	200	623	823
2019	0	0	2,568	2,568
Average	5,134	40	4,963	10,137

Source: MRIP database, SERO, NMFS (September 2022).
*Florida was the only South Atlantic state with recorded target effort for black grouper.
Note 1: These estimates are in MRIP FES units.
Note 2: Includes post-stratified effort estimates from Monroe County, FL to align with SEDAR estimates.

Table 3.3.2.4. South Atlantic black grouper recreational catch trips in Florida*, by mode.

	Shore Mode	Charter Mode	Private/Rental Mode	All Modes
2015	15,257	9,506	62,057	86,820
2016	0	8,811	41,999	50,810
2017	0	5,912	32,930	38,842
2018	0	3,807	28,920	32,727
2019	0	4,183	17,835	22,018
Average	3,051	6,444	36,748	46,243

Source: MRIP database, SERO, NMFS (September 2022).
*Florida was the only South Atlantic state with recorded catch effort for black grouper.
Note 1: These estimates are in MRIP FES units.
Note 2: Includes post-stratified effort estimates from Monroe County, FL to align with SEDAR estimates.

Similar analysis of recreational angler trips is not possible for the headboat mode 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 total number of standardized full-day angler trips.[11] From 2015 through 2019, headboat effort in the South Atlantic, in terms of angler days, decreased substantially in Florida through Georgia (39% decline) and in North Carolina (32% decline). In South Carolina, there were modest fluctuations in headboat effort during this period (Table 3.3.2.5). Headboat effort was the highest, on average, during the summer months of June through August (Table 3.3.2.6).

[11] Headboat trip categories include half-, three-quarter-, full-, and 2-day trips. A full-day trip equals one angler day, a half-day trip equals .5 angler days, etc. Angler days are not standardized to an hourly measure of effort and actual trip durations may vary within each category.

Table 3.3.2.5. South Atlantic headboat angler days and percent distribution by state (2015 through 2019).

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

*East Florida and Georgia are combined for confidentiality purposes.
Source: NMFS SRHS (March, 2021).

Table 3.3.2.6. South Atlantic headboat angler days and percent distribution by month (2015 through 2019).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Headboat Angler Days											
2015	12,661	11,148	21,842	25,128	25,172	36,907	42,558	30,772	15,649	13,375	9,623	12,562
2016	9,818	12,243	23,872	22,217	27,374	37,454	45,744	29,223	17,061	9,202	12,820	13,404
2017	7,693	10,066	13,382	17,448	19,377	27,050	33,356	21,037	6,684	8,928	8,929	9,260
2018	4,428	9,862	14,080	15,167	13,264	29,038	30,235	26,233	9,715	8,072	7,673	7,217
2019	7,746	8,476	15,186	15,566	19,368	26,587	32,914	20,177	6,716	9,011	8,587	6,394
Avg	8,469	10,359	17,672	19,105	20,911	31,407	36,961	25,488	11,165	9,718	9,526	9,767
	Percent Distribution											
2015	5%	4%	8%	10%	10%	14%	17%	12%	6%	5%	4%	5%
2016	4%	5%	9%	9%	11%	14%	18%	11%	7%	4%	5%	5%
2017	4%	5%	7%	10%	11%	15%	18%	11%	4%	5%	5%	5%
2018	3%	6%	8%	9%	8%	17%	17%	15%	6%	5%	4%	4%
2019	4%	5%	9%	9%	11%	15%	19%	11%	4%	5%	5%	4%
Avg	4%	5%	8%	9%	10%	15%	18%	12%	5%	5%	5%	5%

Source: NMFS SRHS (March, 2021).

Landings

Landings of South Atlantic gag fluctuated from 2015 through 2019 (Figure 3.3.2.1). Landings of South Atlantic black grouper experienced a strong downward trend from 2016 through 2019 (Figure 3.3.2.2). The private mode was the dominant mode of fishing for both species.

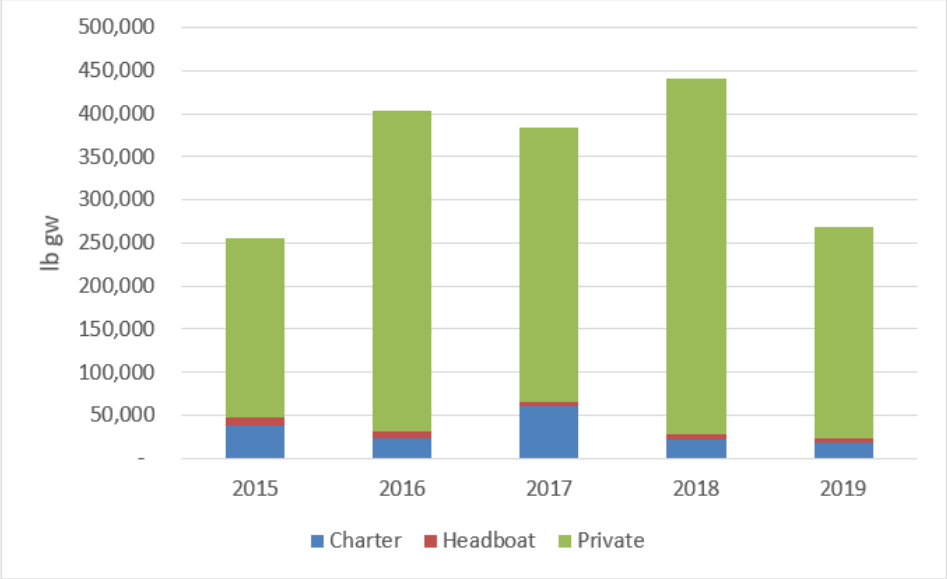

Figure 3.3.2.1. Recreational landings of South Atlantic gag by mode and year.
Source: SEFSC MRIP FES ACL data set (March 2022).
Note1: There were no shore mode landings recorded.
Note2: Includes post-stratified landings estimates from Monroe County, FL to align with SEDAR estimates.

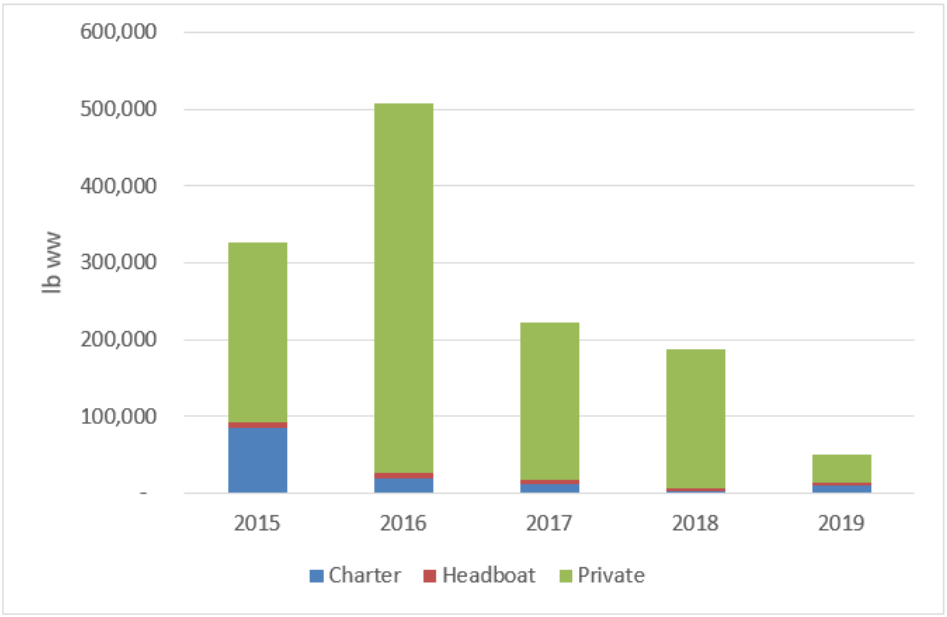

Figure 3.3.2.2. Recreational landings of South Atlantic black grouper by mode and year.
Source: SEFSC MRIP FES ACL data set (March 2022).
Note1: There were no shore more landings recorded.
Note2: Includes post-stratified landings estimates from Monroe County, FL to align with SEDAR estimates.

Seasonal landings patterns were similar on average (2015-2019) for South Atlantic gag and black grouper. There were very low landings in waves 1 and 2, which align with the fixed seasonal closures, followed by a spike in wave 3 (season opening), then a gradual decrease through the remainder of the year (Figure 3.3.2.3 and Figure 3.3.2.4).

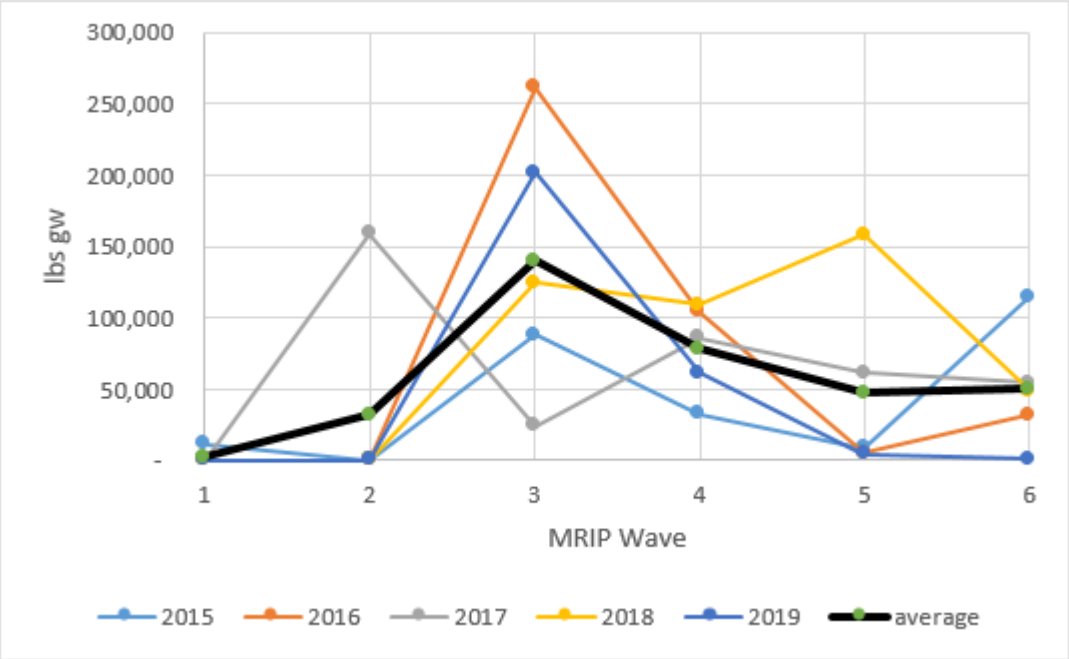

Figure 3.3.2.3. Recreational landings of South Atlantic gag by MRIP wave and year.
Source: SEFSC MRIP FES ACL data set (March 2022).
Note: Includes post-stratified landings estimates from Monroe County, FL to align with SEDAR estimates.

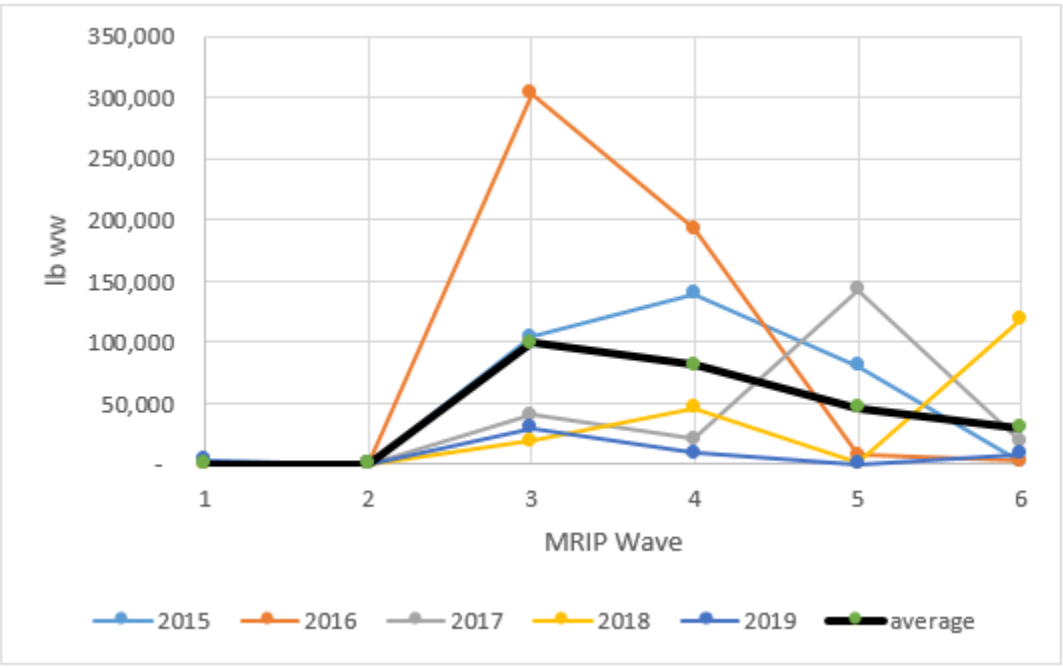

Figure 3.3.2.4. Recreational landings of South Atlantic black grouper by MRIP wave and year.
Source: SEFSC MRIP FES ACL data set (March 2022).
Note: Includes post-stratified landings estimates from Monroe County, FL to align with SEDAR estimates.

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 monetary 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. The estimated values of the CS per fish for a second,[12] third, fourth, and fifth grouper kept on a trip are approximately $115, $77, $57, and $45, respectively (Carter and Liese 2012; values updated to 2021 dollars). [13]

The foregoing estimates of economic value should not be confused with economic impacts associated with recreational fishing expenditures. Although expenditures for a specific good or service may represent a proxy or lower bound of value (a person would not logically pay more for something than it was worth to them), they do not represent the net value (benefits minus cost), nor the change in value associated with a change in the fishing experience.

Estimates of average annual gross revenue for South Atlantic charter vessels and headboats in 2009 are provided in Holland et al. (2012). In 2021 dollars, the average annual gross revenue for a South Atlantic headboat was approximately $234,000, while the average annual gross revenue for a South Atlantic charter vessel was approximately $132,000. However, a more recent estimate of average annual gross revenue for South Atlantic headboats is available from D. Carter (NMFS, pers. comm., 2018). D. Carter (NMFS, pers. comm., 2018) recently estimated that average annual gross revenue for South Atlantic headboats was approximately $320,560 (2021 dollars) 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 D. Carter (NMFS, pers. comm., 2018) estimates for headboats suggests that the estimate for charter vessels based on Holland et al. (2012) is likely an underestimate of current average annual revenue for charter vessels in the South Atlantic. Estimates of annual producer surplus (PS) and economic profit for South Atlantic charter vessels and headboats are not available.

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 revenue, costs, and trip net revenue for trips taken by charter vessels and headboats in 2017 are available from Souza and Liese (2019). They also provide estimates of trip net cash flow per angler trip, which are an approximation of PS per angler trip. According to Table 3.3.2.7, 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 $1,912 (2021 dollars), respectively. Given the average number of anglers

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

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

per trip for each fleet, PS per trip is estimated to be $124 for South Atlantic charter vessels and $72 for Southeast headboats (Table 3.3.2.7).

Table 3.3.2.7. Trip-level economics for offshore trips by South Atlantic charter vessels and Southeast headboats in 2017 (2021 dollars).

	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	$1,912
Average # of Anglers per Trip	4.7	26.6
Trip Net Cash Flow per Angler Trip	$124	$72

Source: Souza and Liese (2019).
*Although Souza and Liese (2019) break headboats out by sub-region, the South Atlantic sample size is small and thus estimates for Southeast headboats in general (Gulf and South Atlantic combined) are presented here.

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 income 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 gag and black grouper were calculated using average trip-level impact coefficients derived from the 2019 Fisheries Economics of the U.S. report (NMFS 2022) and underlying data provided by the National Oceanic and Atmospheric Administration (NOAA) Office of Science and Technology. Economic impact estimates in 2019 dollars were adjusted to 2021 dollars using the annual, not seasonally adjusted 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 value-added impacts (contribution to the GDP in a state or region), output impacts (gross business sales), income impacts (wages, salaries, and self-employed income), and jobs (full- and part-time). Estimates of the average annual economic impacts (2015-2019) resulting from South Atlantic recreational gag target trips and black grouper target trips are provided in Table 3.3.2.8 and Table 3.3.2.9, respectively. The average impact coefficients, or multipliers, used in the

model are invariant to the "type" of effort (e.g., target or catch) and can therefore be directly used to measure the impact of other effort measures such as gag catch trips. To calculate the multipliers from Table 3.3.2.8 or Table 3.3.2.9, simply divide the desired impact measure (value-added impact, sales impact, income impact or employment) associated with a given state and mode by the number of target trips for that state and mode.

The estimates provided in Tables 3.3.2.8 and 3.3.2.9 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. Additionally, some trips may have targeted both gag and black grouper and therefore may be included in both sets of estimates (Tables 3.3.2.8 and 3.3.2.9). 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 or species groups. As such, the estimates provided in Tables 3.3.2.8 and 3.3.2.9 may be considered a lower bound on the economic activity associated with those trips that targeted gag and those that targeted black grouper.

Estimates of the business activity associated with headboat effort are not available. Headboat vessels are not covered in MRIP, 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 3.3.2.8. Estimated annual average economic impacts (2015-2019) from South Atlantic recreational gag 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	13	0	0	371
Value Added Impacts	$6	$0	$0	$92
Sales Impacts	$10	$0	$0	$154
Income Impacts	$3	$0	$0	$54
Employment (Jobs)	0	0	0	1
	Private/Rental Mode			
Target Trips	729	970	0	48,647
Value Added Impacts	$24	$24	$0	$1,413
Sales Impacts	$40	$37	$0	$2,108
Income Impacts	$14	$11	$0	$698
Employment (Jobs)	0	0	0	19
	All Modes			
Target Trips	742	970	0	49,018
Value Added Impacts	$30	$24	$0	$1,504
Sales Impacts	$50	$37	$0	$2,261
Income Impacts	$17	$11	$0	$752
Employment (Jobs)	0	0	0	21

Source: Effort data from MRIP; economic impact results calculated by NMFS SERO using NMFS (2022) and underlying data provided by the NOAA Office of Science and Technology.
Note: There were no shore mode target trips recorded for gag.

Table 3.3.2.9. Estimated economic impacts from South Atlantic black grouper recreational target trips in FL* by mode, using state-level multipliers. All monetary estimates are in 2021 dollars in thousands.

	Charter Mode	Private/Rental Mode	Shore	All Modes
Target Trips	40	4,963	5,134	10,137
Value Added Impacts	$10	$144	$118	$272
Sales Impacts	$17	$215	$174	$405
Income Impacts	$6	$71	$60	$137
Employment (Jobs)	0	2	2	4

Source: Effort data from MRIP; economic impact results calculated by NMFS SERO using NMFS (2022) and underlying data provided by the NOAA Office of Science and Technology.
*Florida was the only South Atlantic state with recorded target effort for black grouper.

3.4 Social Environment

This section of the amendment describes select human dimensions of the gag grouper fishery in the South Atlantic, thereby providing essential background for social effects analysis in Chapter 4. Trends in landings and commercial and recreational permit issuance are emphasized to indicate the extent and geographic distribution of fishing effort, and to aid in identifying communities where fleets are most deeply involved in the pursuit of gag grouper. Description of community-level involvement in the fishery sectors of interest is provided to meet the requirements of National Standard 8 of the Magnuson-Stevens Act, which calls for examination of linkages between fishery resources and human communities when regulatory changes are under consideration. Finally, as prescribed in Executive Orders 12898 and 13985, which address environmental justice concerns, the section identifies vulnerabilities to prospective social change in communities where snapper grouper resources are of known importance to local fleets and businesses.

3.4.1 Gag Grouper Commercial Sector

Gag grouper is a demersal species, with mature individuals exhibiting affinity with rocky ledges and mixed hard bottom and sand environs, typically between ~60 and 250 feet in depth (North Carolina Division of Environmental Quality 2022). Such is the basic nature of ocean areas where the species is commonly pursued by commercial and recreational fleets in the South Atlantic management region. Many commercial captains are highly familiar with such areas and their ecological attributes, along with gag grouper feeding patterns and preferences, and with other factors that enhance the potential for successful harvest. Gag grouper is often accompanied in its preferred ocean habitats by other commercially viable species, including black grouper and scamp, among others (NOAA Fisheries 2022). While some gag-productive areas are widely known, certain areas and forms of knowledge about the species are carefully guarded, although these may be shared or traded with others in a given social network of harvesters. Commercial harvest of gag grouper is currently limited to 1,000 lbs. (gutted weight) per trip (SAFMC 2022).

Buck (2018:63) reports that commercial harvest of gag grouper around the South Atlantic most typically involves use of hook and line gear with electric or hand-cranked reels. Crab, shrimp, and squid are commonly used baits. Based on survey research conducted in 2016, the author further notes that vessels involved in the regional snapper grouper commercial fisheries (including gag grouper) are on average ~31 feet in length overall, utilize some 375 horsepower in total, and have an average fuel capacity of 292 gallons (Buck 2018:47). According to the author, commercial snapper grouper trips typically last between two to three days for vessels departing from ports in North Carolina, northeast South Carolina, and Florida, and up to five days on average for vessels departing from southern South Carolina and Georgia (ibid., pp. 16-22). This difference reflects the longer travel times needed to reach viable snapper grouper grounds along the latter stretch of coastline where the continental shelf is relatively broad.

Landings by State

State-specific landings of gag grouper harvested in federal waters provide an indication of the communities from which commercial captains and crew conduct their operations. During 2019, nearly 49.7% of the year's landings occurred at ports in North Carolina, followed by 25.9% at ports in Florida, and 24.2% at ports in South Carolina. This distribution characterizes the time-series in general. Minimal federally permitted commercial landings of the species were reported along the Georgia coastline during 2019 and the remainder of the time-series (SEFSC Community ALS File).

South Atlantic Commercial Snapper Grouper Permits by State and Community

An unlimited or trip-limited snapper grouper permit must be assigned to commercial fishing vessels in order for captains to legally participate in the gag grouper fishery. A total of 543 unlimited snapper grouper permits were issued in the South Atlantic region during 2019. At 67.2%, most unlimited permits were issued to residents or persons with mailing addresses in Florida that year, followed by 20.9% in North Carolina, 8.8% in South Carolina, and 1.4% in Georgia. Two or fewer unlimited permits were issued to persons in Delaware, New Jersey, New York, and Virginia. Most 225-lb. trip-limited permits were held for use by persons operating from coastal communities in Florida during 2019. A high percentage of both permit types are held by fishery participants active in the Florida Keys (Table 3.4.1). Although a relatively high proportion of snapper grouper permits are held in Florida communities, it should be noted that gag grouper landings accrue most extensively in communities along the southeast North Carolina and northeast South Carolina coastlines (Figure 3.4.1).

Table 3.4.1.1. Distribution of commercial snapper grouper unlimited and 225-lb trip-limited permits among the top 20 permit-holding communities in the South Atlantic during 2019.

Leading Communities: Unlimited Permits	Permits	Leading Communities: 225-lb Trip-Limited Permits	Permits
Key West, Florida	95	Key West, Florida	12
Key Largo, Florida	28	Marathon, Florida	10
Miami, Florida	23	Miami, Florida	9
Marathon, Florida	21	Jupiter, Florida	6
Murrells Inlet, South Carolina	16	Big Pine Key, Florida	5
Southport, North Carolina	14	Key Largo, Florida	4
Little River, South Carolina	14	Hatteras, North Carolina	3
Jacksonville, Florida	14	Wilmington, North Carolina	3
Port Canaveral, Florida	13	West Palm Beach, Florida	3
Jupiter, Florida	13	Middle Torch Key, Florida	2
Beaufort, North Carolina	12	Fort Pierce, Florida	2
Sebastian, Florida	12	St. Augustine, Florida	2
Sneads Ferry, North Carolina	11	Boca Raton, Florida	2
Fort Pierce, Florida	10	Cudjoe Key, Florida	2
Ponce Inlet, Florida	10	Summerland Key, Florida	2
Mayport, Florida	10	Little Torch Key, Florida	2
Fort Pierce, Florida	10	Fort Lauderdale, Florida	2
Holden Beach, North Carolina	9	Sebastian, Florida	2
Islamorada, Florida	9	--	--
Big Pine Key, Florida	9	--	--

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

Community Quotients of Commercial Gag Grouper Landings in the South Atlantic

Figure 3.4.1 depicts the distribution of commercial gag grouper landings among communities in the South Atlantic with the greatest share of such landings in recent years. The distribution expressed in the figure is a regional quotient, or the share of community landings of gag grouper divided by landings of the species across the overall region. Communities are presented in the graphic based on a ranking of average landings over the period of interest.

As can be discerned from the figure, commercial participants based in Murrells Inlet, South Carolina collectively account for the greatest proportion of community-specific gag grouper landings during 2019 and throughout the time-series presented here. Fishery participants resident in or otherwise affiliated with the towns of Atlantic Beach in Florida, Little River in South Carolina, and Morehead City and Supply in North Carolina, further account for the bulk of regional gag grouper landings during the period.

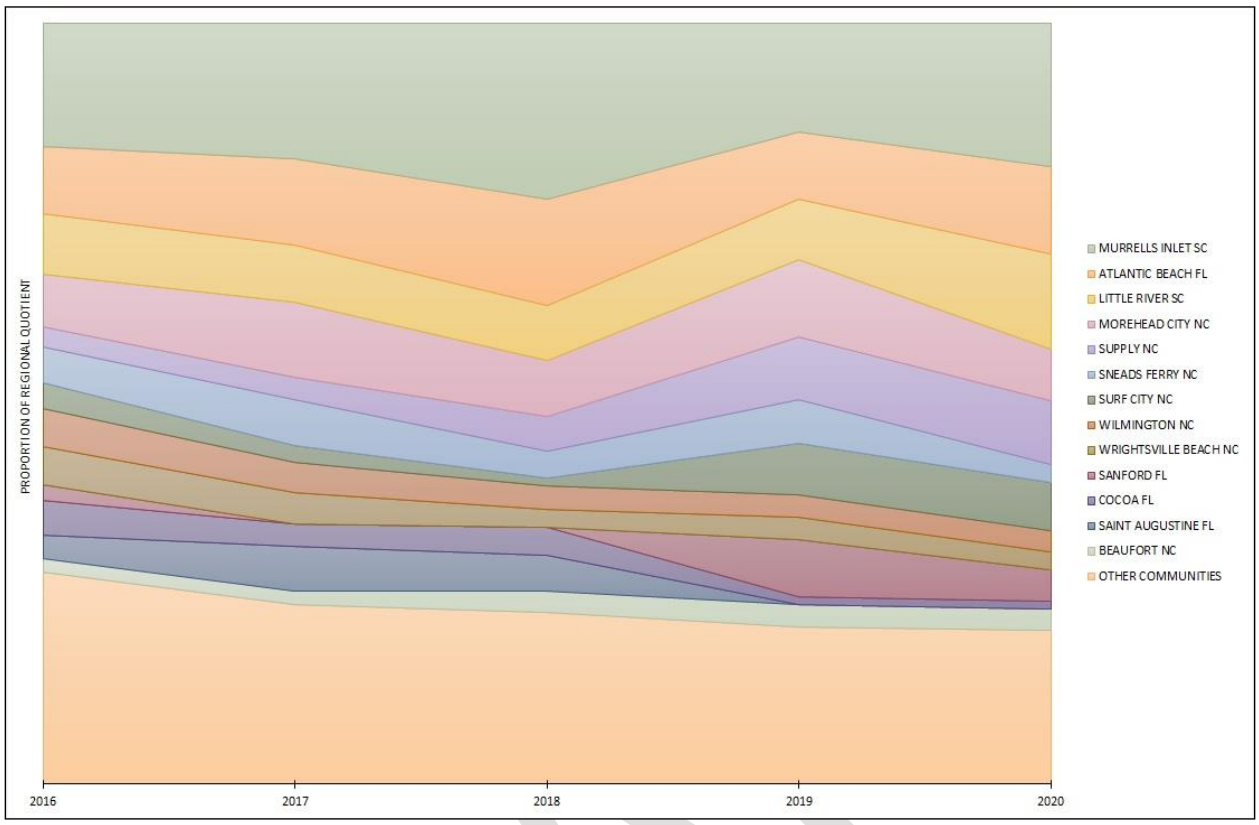

Figure 3.4.1.1. Distribution of regional landings among the top South Atlantic commercial gag grouper landings communities: 2016 through 2020. Source: SEFSC, Community ALS File, July 2022.

Finally, Figure 3.4.2 depicts the local quotient (LQ) of gag grouper landings among communities depicted in the figure above. The LQ metric specifies the proportion of community-specific commercial landings for a given species relative to commercial landings of all species by persons affiliated with that community (y-axis) during a given year or years—in this case for gag grouper during 2019. In certain instances, the LQ value for gag grouper is too low to enable effective visual representation on the graphic. Conversely, certain communities register particularly high LQ values; this is the case for numerous communities in southeast North Carolina and northeast South Carolina.

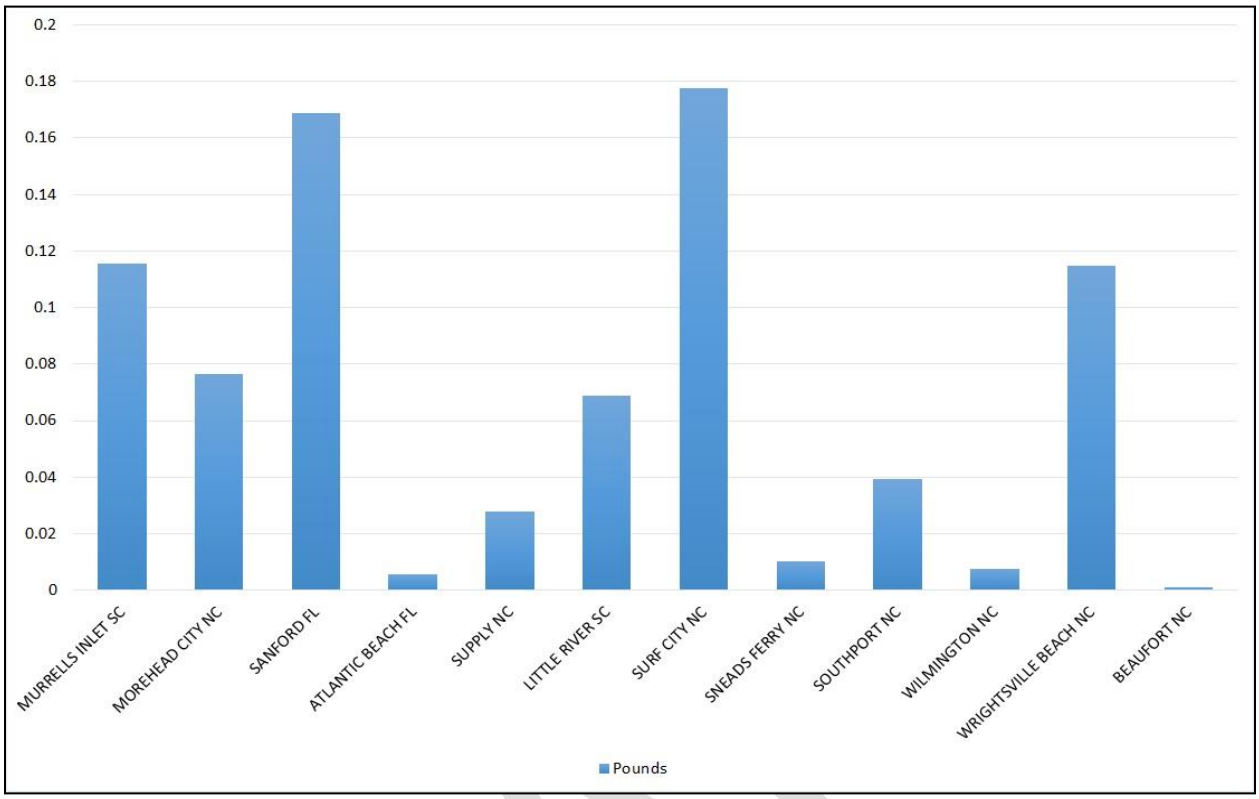

Figure 3.4.1.2. Local quotient of commercial gag grouper landings among communities with the highest percentage of gag landings in 2019. Source: SEFSC, Community ALS Data File, September 2022.

Community Engagement & Reliance: Commercial Gag Grouper Sector

As depicted in Figure 3.4.3 below, the North Carolina communities of Morehead City, Supply, Sneads Ferry, Beaufort, and especially Wilmington score above the one standard deviation threshold for relative extent of *engagement* in the commercial sector of the South Atlantic gag grouper fishery. The Florida community of Atlantic Beach also scores highly in terms of relative extent of engagement in the sector. Meanwhile, the communities of Sneads Ferry and Beaufort in central North Carolina score above the .5 standard deviation threshold for *reliance* on the gag grouper resource. The measure of engagement provided here is a generalizable composite indicator based on: (a) gag grouper landings reported among the region's commercial fleets—in this case, pounds averaged over the time series, (b) ex-vessel revenue associated with those landings, and (c) the number of commercial fishery participants and seafood dealers present in a given community. The measure of reliance incorporates the same variables as above, divided by the total local population figure. Both measures are useful means for indicating where any prospective effects of management actions for gag grouper are likely to be experienced. Readers are referred to Jacob et al. (2013), Jepson and Colburn (2013), and Hospital and Leong (2021) for discussion of the rationale and approach for using indicators to assess local engagement in and reliance on regional marine fisheries.

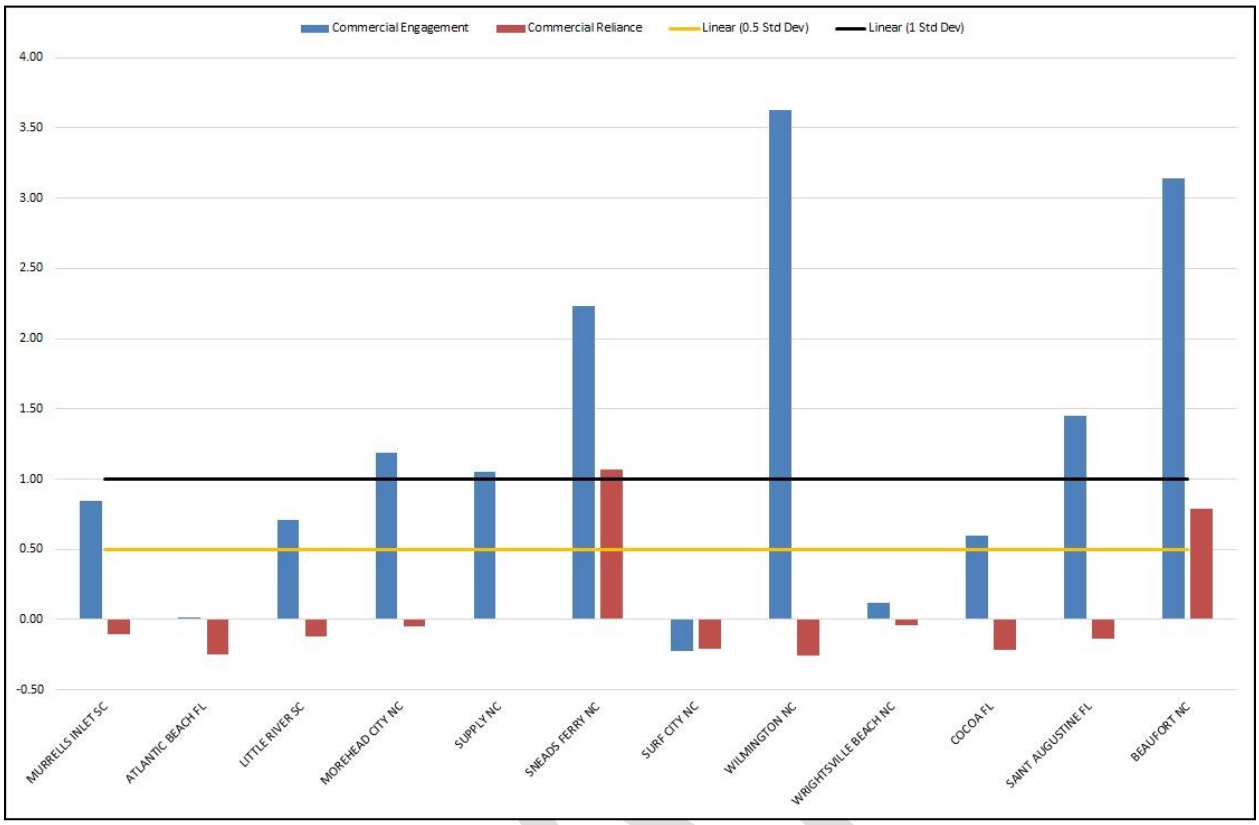

Figure 3.4.1.3. Measures of engagement and reliance among the leading commercial gag grouper landings communities in the South Atlantic during 2019. Source: SERO, Community Social Vulnerability Indicators Database.

3.4.2 Gag and Black Grouper Recreational Sector

Participants active in the South Atlantic gag and black grouper recreational sectors generally use gear and techniques suited to the species' feeding behaviors and its affinity with the aforementioned offshore rocky and mixed bottom habitats. Vertical hook-and-line gear with live or cut bait are commonly deployed by operators of charter and private vessels alike. Given a common tendency among recreational anglers in southern portions of the South Atlantic fishery management region to confuse gag grouper with black grouper and vice-versa, the federal waters recreational bag limit is one fish of either species per person per day (SAFMC 2022). Of note, juvenile gag grouper can be found at times in shallow estuaries (Ross and Moser 1995) where it is occasionally pursued or captured incidentally by inshore anglers.

Pursuit of gag and black grouper and other snapper grouper species by charter captains and crew operating in the offshore zone is said to be on the increase in recent years (see South Atlantic Fishery Management Council 2020). This relates in part to heightened efficiency of access to the fishing grounds, which is in turn, facilitated by increasingly proficient fish-finding and geo-positioning technologies, and by ever-evolving vessel and engine technologies (see Cooke et al. 2022). As a result, charter and private vessel trips focusing on gag and adjacent species very typically last for one day and often less, depending on distance to the fishing grounds, motivations for fishing, time needed to achieve success (or cease effort), and so forth. Although

motivations to fish on a recreational basis in the South Atlantic are many and various, an increasing emphasis on formally and informally organized local and regional fishing competitions is readily observable in coastal communities around the region.

Distribution of Recreational Gag and Black Grouper Landings by State

Based on data generated through the NMFS Marine Recreational Information Program Fishing Effort Survey (MRIP-FES), nearly 58% of gag grouper landings were documented along Florida's east coast during 2019, followed by 31.8% in North Carolina, and 10% in South Carolina. Gag grouper landings resulting from bottom fishing activities along the coast of Georgia were minimal during 2019 and other recent years. With regard to black grouper, over 95% of MRIP-FES landings were documented along Florida's east coast during 2019, with minimal landings documented in South Carolina and Georgia, and none in North Carolina.

For-Hire Permits

For-hire charter and headboat captains who wish to pursue gag and/or black grouper with their clients must possess a South Atlantic snapper grouper charter/headboat permit. In total, 2,183 such permits were issued during 2019, with the vast majority issued to residents or persons with mailing addresses in the South Atlantic states. The total number of permits issued increased steadily during the 2015 through 2019 time-series, with 1,779 permits issued in 2015, 1,867 in 2016, 1,982 in 2017, and 2,126 in 2018.

Table 3.4.2.1. Distribution of South Atlantic for-hire/headboat snapper grouper permits among the top 20 permit-holding communities in the region: 2019.

State	Leading Communities	Number of Permits in 2019
Florida	Key West	198
Florida	Islamorada	97
Florida	Marathon	82
Florida	Port Canaveral	76
South Carolina	Charleston	60
Florida	Miami	45
North Carolina	Hatteras	44
Florida	St. Augustine	40
Florida	Ponce Inlet	36
North Carolina	Beaufort/Morehead City	36
South Carolina	Murrells Inlet	33
Florida	Key Largo	32
Florida	Jupiter	32
Florida	Jacksonville	30
Florida	Naples	29
Florida	Cape Canaveral	28
North Carolina	Manteo	26
Florida	Port Orange	25
South Carolina	Hilton Head Island	24
South Carolina	Little River	24
North Carolina	Atlantic Beach	21

Source: SERO Sustainable Fisheries (SF) Access permits database

Community Engagement & Reliance: South Atlantic Recreational Gag and Black Grouper Sector

The full range of data indicative of the manner and extent of involvement in the South Atlantic gag grouper recreational sector is not readily available at the community level of analysis. For this reason, it is not possible with available information to identify communities that are specifically engaged in and/or reliant on recreational fishing for gag grouper. Given that information regarding community-specific interaction with any given species is limited, NOAA Fisheries social scientists developed indices for identifying communities where recreational fishing is an important component of the local economy in general (see Jacob et al. 2013; Jepson and Colburn 2013; Hospital and Leong 2021).

Based on the available indices, the communities depicted in Figure 3.4.4 are those in the South Atlantic region where residents are most clearly involved in the recreational fishing industry in general. Further specificity is enabled in that the communities represented in the figure are those with the greatest number of for-hire snapper grouper permits in the South Atlantic fishery management region.

The measure of engagement depicted in the figure derives from the number of for-hire permitted vessels and recreational fishing infrastructure actively used by residents or persons otherwise connected to a given community. The measure of reliance derives from the same variables divided by the total local population figure.

All communities depicted here demonstrate particularly extensive engagement in South Atlantic recreational fisheries. However, particularly high levels of involvement are noted among participants in Jacksonville, Key West, Melbourne Beach, and Islamorada in Florida, and Hatteras and Nags Head in North Carolina.

Notably, Nags Head is the only community that meets the one standard deviation threshold for *reliance* on the recreational fishing industry, indicating the importance of for-hire and private recreational fishing and related services and opportunities in this small Outer Banks community. As of the 2020 U.S. Census, the year-round population of Nags Head was approximately 3,168 persons (U.S. Census Bureau 2020). It should be noted, however, that the population of Nags Head and that of the North Carolina Outer Banks region as a whole expands dramatically during the summer months, with positive business implications for local for-hire fishing fleets and associated support sector businesses.

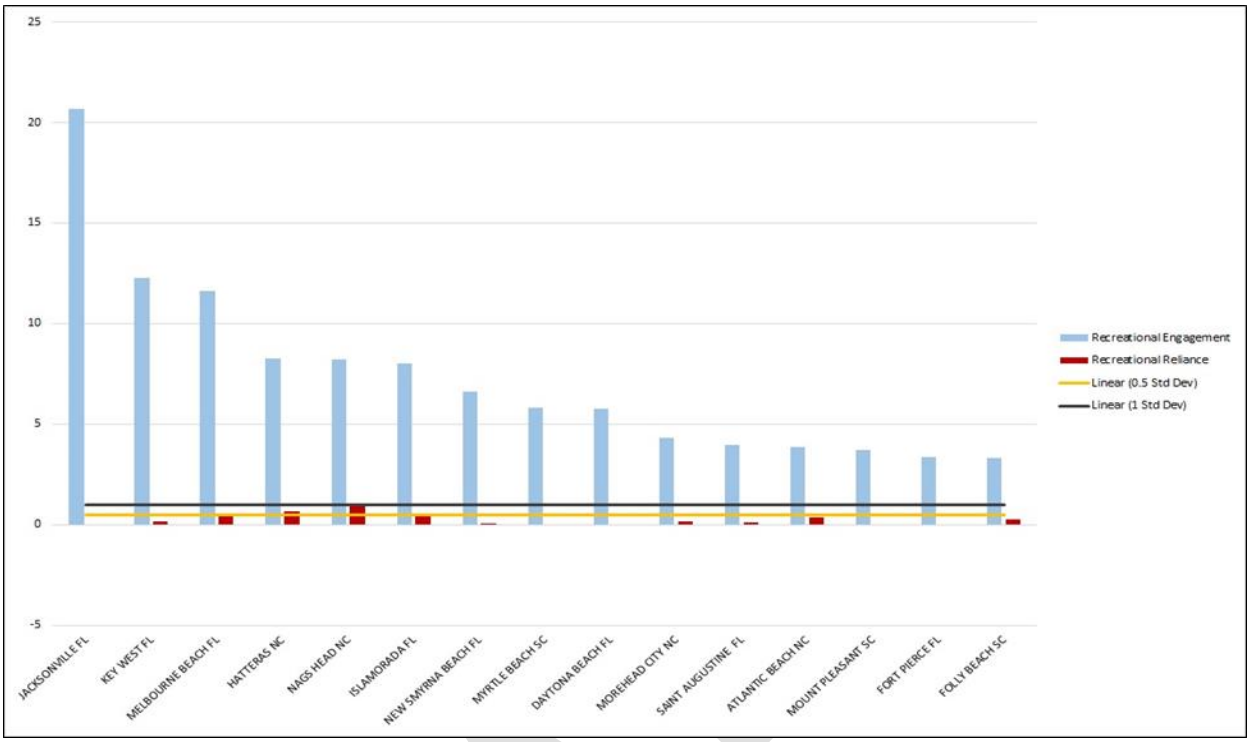

Figure 3.4.2.1. Measures of community involvement in the South Atlantic recreational fishing sector: 2019. Source: SERO, Community Social Vulnerability Indicators Database.

3.4.3 Environmental Justice

Executive Order 12898 was established in 1994 to require that personnel working in federal agencies examine the human health and socioeconomic implications of federal regulatory actions among low-income and minority groups and populations around the nation. The order requires that such agencies conduct programs, policies, and activities in a manner that ensures no individuals or populations are excluded, denied the benefits of, or subjected to discrimination due to race, color, or nation of origin. Of particular relevance in the context of marine fisheries, federal agencies are further required to collect, maintain, and analyze data regarding patterns of consumption of fish and wildlife among persons who rely on such foods for purposes of subsistence. In sum, the principal intent of the order is to require assessment and due consideration of any "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."

Established in 2021, Executive Order 13985 also calls for social equity in the context of federal decision-making and policy actions. Titled "Advancing Racial Equity and Support for Underserved Communities through the Federal Government," this order requires that federal policies and programs are designed and undertaken in a manner that delivers resources and benefits equitably to all citizens, including those who are members of historically underserved communities. Here, the phrase "underserved communities" refers to populations and persons that have been systematically denied full and equitable opportunity to participate in economic, social, and civic aspects of life in the nation.

Various data are available to indicate environmental justice issues among minority and low-income populations and/or indigenous communities potentially affected by federal regulatory and other actions. With the intent of enhancing capacity to determine whether environmental justice issues may be affecting communities around the U.S. where fishing-related industry is an important aspect of the local economy, NMFS social scientists undertook an extensive series of deliberations and review of pertinent data and literature. The scientists ultimately selected key social, economic, and demographic variables that could function to identify social vulnerabilities at the community level of analysis (see Jacob et al. 2013; Jepson and Colburn 2013). Census data such as community-specific rates of poverty, number of households maintained by single females, number of households with children under the age of five, rates of crime, and rates of unemployment exemplify the types of information chosen to aid in community analysis. Pertinent variables were subsequently used to develop composite indices that could be applied to assess vulnerability to environmental, regulatory, and other sources of change among the communities where fishing and related activities are important aspects of the local economy and society.

As provided in the following figures, three composite indices—termed here as poverty, population composition, and personal disruption—are applied to indicate relative degrees of socioeconomic vulnerability among those communities with the greatest percentages of gag grouper landings in the South Atlantic region. Mean standardized scores for each community are provided along the y-axis, with means for the vulnerability measures and threshold standard deviations depicted along the x-axis. Scores exceeding the .5 standard deviation level indicate local social vulnerability to regulatory and other sources of change. As can be discerned from Figure 3.4.5 below, five of the principal gag grouper landings communities exceed the designated vulnerability thresholds for one or more indices. These are Morehead City, Sneads Ferry, and Wilmington in North Carolina; and Cocoa Beach in Florida.

Finally, Figure 3.4.6 depicts social vulnerability measures for communities most extensively involved in the South Atlantic recreational fishing industry. The data presented here indicate the presence of such issues especially in the Florida communities of Miami and Key Largo, and in the North Carolina communities of Hatteras, Morehead City, and Manteo. Both figures derive from data available in the SERO Community Social Vulnerability Indicators (CSVI) Database.

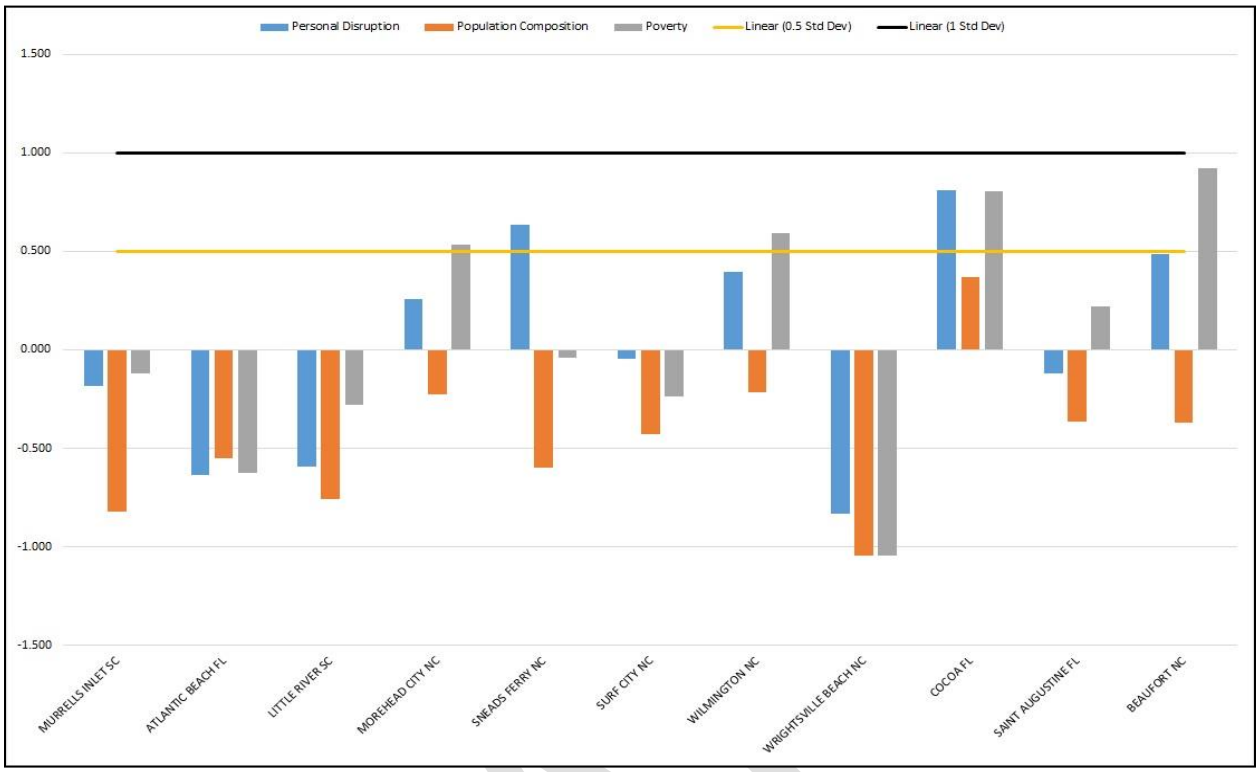

Figure 3.4.4.1. Socioeconomic vulnerability measures for South Atlantic communities with the highest absolute percentages of commercial gag grouper landings. Source: SERO CSVI Database.

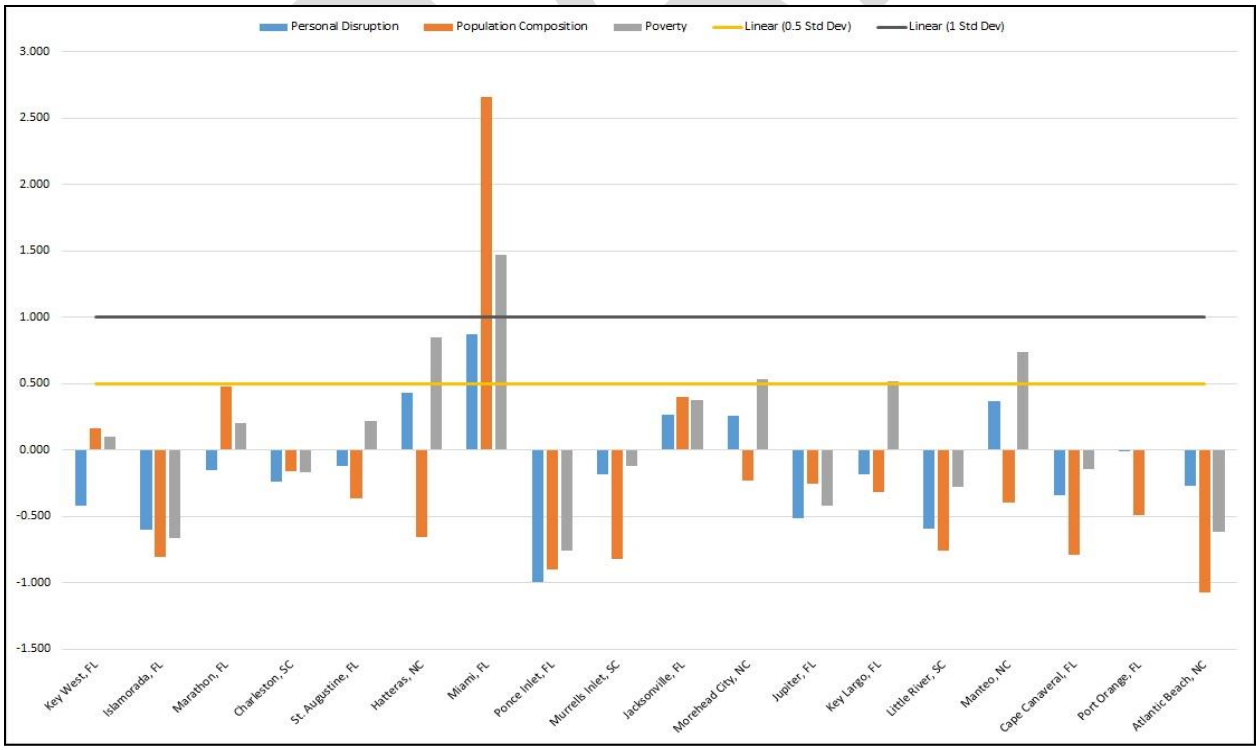

Figure 3.4.4.2. Socioeconomic vulnerability measures for communities most extensively involved in the recreational sector of the South Atlantic snapper grouper fishery. Source: SERO CSVI Database.

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

TO BE COMPLETED

4.1 Action 1. Establish a rebuilding plan for gag

Alternatives*

1. (No Action). The South Atlantic stock of gag is currently not under a rebuilding plan.

2. Establish the rebuilding plan to equal the shortest possible time to rebuild in the absence of fishing mortality (T_{min}). This would equal 7 years.

3. Establish the rebuilding plan to equal the longest possible time to rebuild (T_{max}). This would equal 10 years.

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

4.1.1 Biological Effects

Expected effects to gag grouper, co-occurring species, and essential fish habitat

The National Marine Fisheries Service (NMFS) previously determined that the gag stock was not overfished nor subject to overfishing based on SEDAR 10 (2014). However, NMFS has determined that the stock is now undergoing overfishing and is overfished based on the recent SEDAR 71 (2021). **Alternative 1 (No Action)** would have adverse effects on the stock as gag grouper is overfished and currently without a rebuilding plan. A rebuilding plan allows fishery managers to gauge the progress, success, and shortcomings of a rebuilding program. The absence of an updated rebuilding plan may compromise the ability to set proper annual catch limits (ACL) and management measures to benefit the stock and ensure overfishing does not occur. Moreover, **Alternative 1 (No Action)** is not based upon the best scientific information available (BSIA) as it would not address the results of the latest stock assessment and it would not meet the requirements of the Magnuson-Stevens Fishery Conservation and Management Act.

The alternatives to establish a rebuilding plan (**Alternative 2** and **Preferred Alternative 3**), in contrast, are based on the BSIA and would likely have beneficial effects to the gag grouper stock as they would establish a timeframe for rebuilding the stock. In general, prescribing less time to rebuild the stock could result in lower ACLs and more restrictive management measures, but would translate into greater biological benefits for the stock in a shorter timeframe. The rebuilding timeframe under **Alternative 2** is projected to rebuild the gag grouper stock in the least amount of time; therefore, it can be expected that future biological benefits may accrue soonest, followed by **Preferred Alternative 3**.

Establishing a rebuilding plan does not directly affect bycatch; thus the alternatives proposed under Action 1 would not result in any biological effects, positive or negative, on co-occurring species (refer to Bycatch Practicability Analysis [BPA; Appendix G]).

Defining the Range of Alternatives

Guidance on how to define the upper and lower bounds of a rebuilding timeframe are specified in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) National Standard 1 (NS 1) Guidelines (https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-guidelines).

In regard to the determining the minimum time for rebuilding a stock (T_{min}), NS 1 specifies that *"T_{min} means the amount of time the stock or stock complex is expected to take to rebuild to its maximum sustainable yield (MSY) biomass level in the absence of any fishing mortality. In this context, the term "expected" means to have at least a 50 percent probability of attaining the B_{msy}, where such probabilities can be calculated. The starting year for the T_{min} calculation should be the first year that the rebuilding plan is expected to be implemented."*

For gag grouper, according to projections originating from SEDAR 71 2021, the minimum predicted time for gag grouper to rebuild in the absence of any fishing is 7 years, thus T_{min} is specified as being 7 years (**Alternative 2**).

With T_{min} corresponding to less than 10 years, NS 1 provides guidance to define the maximum time for rebuilding a stock (T_{max}) as follows; *"If T_{min} for the stock or stock complex is 10 years or less, then T_{max} is 10 years* (**Preferred Alternative 3**)*."*

The actions in this amendment are not expected to negatively impact snapper grouper essential fish habitat (EFH). Fishing effort is not expected to significantly increase as a result of this action, nor are changes in fishing techniques or behavior expected that would affect EFH. The predicted effects on EFH are applicable to all actions in this plan amendment.

Expected effects to protected species

The actions in this plan amendment would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types. Therefore, there are no additional impacts on Endangered Species Act (ESA)-listed species or designated critical habitats anticipated as a result of this action (see Section 3.2.5 for a more detailed description of ESA-listed species and critical habitat in the action area). The predicted effects on ESA-listed species and designated critical habitats are applicable to all actions in this plan amendment.

4.1.2 Economic Effects

A rebuilding timeframe does not impose direct economic effects, as it does not directly constrain harvest or fishing effort. There are potential indirect economic effects that can occur due to a rebuilding timeframe, as the length of the rebuilding period selected can determine how future, long term economic benefits from an improved stock, such as improved catch rates and increased ACLs; with shorter rebuilding periods potentially accruing benefits sooner than longer rebuilding periods.

Alternative 1 (No Action) would incur the lowest implied long-term economic benefits, as there would be no rebuilding timeframe, which presumably would not aid in the gag stock rebuilding. This alternative is not viable as it does not comply with the Magnuson-Stevens Act to set a

rebuilding timeframe for a species that is determined to be overfished. **Alternative 2** would provide the shortest viable rebuilding period of 7 years, which would be accompanied by the highest implied long-term economic benefits. **Preferred Alternative 3** would provide the longest rebuilding period of 10 years; hence, it has the lowest implied long-term economic benefits amongst the viable alternatives. In summary, it can be expected that implied long-term economic benefits would be highest under **Alternative 2**, followed in turn by **Preferred Alternative 3**, and **Alternative 1 (No Action)**, which is not a viable alternative.

4.1.3 Social Effects

Although defining a rebuilding schedule is an administrative action, the schedule will determine the severity of the management measures necessary to rebuild the gag grouper resource within the allotted timeframe. The severity of these measures will determine the magnitude of the associated social effects that are expected to accrue during the rebuilding period. Generally, the shorter the rebuilding schedule, the more severe the harvest restrictions. The more severe the harvest restrictions, the greater the short-term negative effects on fishing communities. Commercial and recreational fishermen may be able to adjust to the restrictions by switching to other species and/or seeking other employment or recreational pursuits, thereby mitigating any potential negative social effects. However, if other species are also depleted, regulations may prevent switching to another fishery and net negative social effects are potentially more severe. If current resource users choose or are economically forced, to exit the fishery due to measures implemented to achieve rebuilding, long-term benefits associated with recovery may be realized by a different set of users. Ultimately, establishing a rebuilding plan provides for the sustained participation of fishing communities in the gag fishery (Section 3.4) by ensuring the sustainability of the gag grouper resource, providing long-term positive social effects throughout the fishery in the form of consistent access to the resource.

Because the current gag grouper assessment indicated the stock was overfished and undergoing overfishing, a rebuilding schedule must be set, as proposed in **Alternative 2** and **Preferred Alternative 3**. Therefore, **Alternative 1 (No Action)**, which would not establish a rebuilding schedule, would not be based upon the best scientific information available. **Preferred Alternative 3** is likely to have fewer short-term negative social effects as it establishes a longer rebuilding schedule than **Alternative 2**.

4.1.4 Administrative Effects

Alternative 1 (No Action) would not establish a rebuilding timeframe for the gag grouper stock and would, therefore, not comply with Magnuson-Stevens Act requirements. **Alternative 2** would rebuild the gag grouper stock in the least amount of time (7 years) followed by **Preferred Alternative 3** (10 years). The shorter the amount of time required to rebuild the stock would likely require more restrictive harvest regulations for gag. **Alternative 1 (No Action)**, which would not establish a rebuilding timeframe, would require subsequent additional management action to adopt a legally compliant rebuilding timeframe. Therefore, it would have the greatest imposed administrative burden on NMFS. **Alternative 2** and **Preferred Alternative 3** would also likely impact the administrative environment for NMFS in the form of developing, implementing, and monitoring more restrictive harvest regulations for gag, in addition to annually reviewing rebuilding progress.

4.2 Action 2. Revise the acceptable biological catch, total annual catch limit, and annual optimum yield for gag

4.2.1 Biological Effects

Expected effects to gag and co-occurring species

Alternatives*

1. (No Action). Current ACL and annual OY are equal to the current ABC.

2. Revise the ABC. The total ACL and annual OY are set equal to the updated ABC. The 2032 ACL and annual OY would remain in place until modified.

3. Revise the ABC. The total ACL and annual OY are set at 95% of the updated ABC. The 2032 ACL and annual OY would remain in place until modified.

4. Revise the ABC. The total ACL and annual OY are set at 90% of the updated ABC. The 2032 ACL and annual OY would remain in place until modified.

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

Alternative 1 (No Action) would retain a total ACL that exceeds the most recent acceptable biological catch (ABC) recommendations of the Scientific and Statistical Committee (SSC); and would not end overfishing of gag. **Alternative 1 (No Action)** would no longer be based on BSIA and, therefore, is not a viable alternative. **Alternative 1 (No Action)** would be expected to result in adverse biological effects to the gag stock as it would not end overfishing and would not rebuild the stock. Potential adverse 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.

Relative to **Alternative 1 (No Action)**, **Preferred Alternative 2** through **Alternative 4** would be expected to end overfishing as they do not exceed the SSC recommended ABCs and OFLs and would be expected to result in positive biological effects to the gag stock. However lower catch levels than what is currently allowed, as proposed by **Preferred Alternative 2**, **Alternative 3** and **Alternative 4**, could result in increased discards of gag if fishermen catch gag during closed seasons while targeting other species. Over the long term, reducing harvest of gag 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. **Preferred Alternative 2** would result in the least biological benefit to the gag stock as there would be no buffer between the ABCs and the total ACLs. Biological benefits resulting from **Alternatives 3** and **4** would increase as the buffer increases. Although **Preferred Alternative 2** would allow the greatest amount of harvest of the action alternatives considered, it is based on the SSC's ABC recommendation and BSIA, and represents a catch level that does not result in overfishing.

Biological benefits to the gag stock would be greatest under **Alternative 4**, followed by **Alternative 3**, **Preferred Alternative 2**, and **Alternative 1 (No Action)**.

Gag are often harvested incidentally when fishing for other snapper grouper species, such as other shallow-water grouper, red snapper, and black sea bass. Substantial changes in fishing effort or behavior are not expected as a result of this action, thus the proposed ACLs under this

action would not be expected to result in any biological effects, positive or negative, on co-occurring species (refer to BPA in Appendix G).

4.2.2 Economic Effects

In general, ACLs that allow for more fish to be landed can result in increased positive economic effects if harvest increases without notable effects on the stock of a species. The ACL does not directly impact the fishery for a species unless harvest changes, fishing behavior changes, or the ACL is exceeded, thereby potentially triggering accountability measures (AM) such as harvest closures or other restrictive measure. In the case of gag grouper, the revised ACLs being considered in **Preferred Alternative 2** through **Alternative 4** would be constraining on harvest when initially implemented and are projected to reduce landings of gag grouper for both the commercial and recreational sectors.

As noted in Section 4.2.1, **Alternative 1 (No Action)** is not a viable alternative. Although not viable since it does not implement BSIA, **Alternative 1 (No Action)** would be expected to be constraining on harvest when compared to recent 5-year average landings. The ACL is set equal to the ABC in **Alternative 1 (No Action)** and **Preferred Alternative 2**, with the differences between the two in part occurring due to the current versus updated ABC and how the non-headboat recreational component of the total ACL would be accounted for moving forward. Specifically, the current ABC is inclusive of Coastal Household Telephone Survey (CHTS) measurements to account for private recreational and charter landings while the updated ABC would be inclusive of Fishing Effort Survey (FES) measurements for these landings. Projections that allow for conversion between both measurements for the recreational sector are not available, as there is no forward-looking conversion between the two. As such, a direct comparison of **Alternative 1 (No Action)** to **Preferred Alternative 2** is not possible. This applies to comparisons of **Alternative 1 (No Action)** to **Alternatives 3** and **4** as well since these two alternatives also incorporate the updated ABC and thus FES measurements. As a proxy for the status quo (**Alternative 1 (No Action)**), the five-year (2015- 2019) average landings of gag grouper are compared to **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** to estimate the economic effects of each alternative.

The potential revised total ACLs for gag grouper in **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** would be constraining on harvest when implemented (Table 4.2.2.1; Table 4.2.2.2). **Alternative 4** would provide the lowest total ACL, thus would be expected to most severely limit harvest and there would be elevated negative economic effects anticipated from this alternative. **Alternative 3** offers a comparatively higher ACL and **Preferred Alternative 2** would provide the highest ACL. From an economic benefits perspective, **Preferred Alternative 2** would provide the highest potential economic benefits of the viable alternatives being considered followed by **Alternative 3** and **Alternative 4** (Table 4.2.2.2).

Table 4.2.2.1. South Atlantic gag grouper landings for fishing years 2015 to 2019.

Fishing Year	Commercial landings (lbs gw)	Recreational landings (lbs gw)	Total landings (lbs gw)
2015	284,540	255,211	539,752
2016	234,997	402,941	637,939
2017	196,807	384,331	581,138
2018	239,810	440,410	680,219
2019	258,591	268,251	526,842
5-year average	242,949	350,229	593,178

Source: SEFSC MRIP FES ACL data set (March 2022) for recreational landings and SEFSC Commercial ACL data set (April 2022) for commercial landings.

Table 4.2.2.2. Percent difference between the total ACLs in Action 2 compared to 5-year average landings from fishing years 2015 to 2019[a].

Fishing Year	Percent difference between the ACL and 5-year average annual landings for Preferred Alternative 2	Percent difference between the ACL and 5-year average annual landings for Alternative 3	Percent difference between the ACL and 5-year average annual landings for Alternative 4
2023	**-70%**	-72%	-73%
2024	**-56%**	-58%	-60%
2025	**-41%**	-44%	-47%
2026	**-27%**	-30%	-34%
2027	**-12%**	-16%	-20%
2028	**4%**	-1%	-6%
2029	**20%**	14%	8%
2030	**35%**	28%	21%
2031	**48%**	41%	33%
2032+	**60%**	52%	44%

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

The estimated change in potential landings by sector under **Preferred Alternative 2** through **Alternative 4** are provided in Table 4.2.2.3 and Table 4.2.2.5. Table 4.2.2.4 and Table 4.2.2.6 show the resulting estimated change in net economic benefits by sector and Table 4.2.2.7 shows the estimated change in net economic benefits for **Action 2** in aggregate for both sectors combined. In the 2023 fishing year, **Preferred Alternative 2** is estimated to result in a decrease in potential net economic benefits of $520,122 for the commercial sector (as measured in producer surplus or PS), a decrease in potential net economic benefits of $2,140,163 for the recreational sector (as measured in consumer surplus or CS), and a decrease in potential net economic benefits of $2,660,285 for both sectors combined (2021 $). The change in net economic benefits would relatively increase in subsequent years as the total ACL increases and thus so do the allowable landings along with the associated benefits of these landings.

Table 4.2.2.3. Estimated change in potential landings (lbs gw) to the commercial sector from Action 2.

Fishing Year	Preferred Alternative 2	Alternative 3	Alternative 4
2023	**-257,729**	-262,208	-266,686
2024	**-214,104**	-220,764	-227,423
2025	**-169,641**	-178,525	-187,407
2026	**-125,410**	-136,504	-147,599
2027	**-79,742**	-93,120	-106,498
2028	**-32,234**	-47,988	-63,741
2029	**15,523**	-2,619	-20,760
2030	**60,744**	40,342	19,939
2031	**101,376**	78,942	56,508
2032+	**136,644**	112,446	88,249

Table 4.2.2.4. Estimated change in potential net economic benefits to the commercial sector (PS) from Action 2 (2021 $).

Fishing Year	Preferred Alternative 2	Alternative 3	Alternative 4
2023	**-$520,122**	-$529,161	-$538,199
2024	**-$432,083**	-$445,524	-$458,963
2025	**-$342,353**	-$360,281	-$378,207
2026	**-$253,089**	-$275,479	-$297,869
2027	**-$160,928**	-$187,926	-$214,923
2028	**-$65,052**	-$96,844	-$128,636
2029	**$31,326**	-$5,284	-$41,895
2030	**$122,587**	$81,414	$40,239
2031	**$204,586**	$159,312	$114,038
2032+	**$275,760**	$226,928	$178,096

Table 4.2.2.5. Estimated change in potential landings (numbers of fish) to the recreational sector from Action 2.

Fishing Year	Preferred Alternative 2	Alternative 3	Alternative 4
2023	**-18,610**	-18,916	-19,222
2024	**-15,629**	-16,084	-16,539
2025	**-12,591**	-13,198	-13,805
2026	**-9,568**	-10,326	-11,084
2027	**-6,447**	-7,362	-8,276
2028	**-3,201**	-4,278	-5,354
2029	**62**	-1,177	-2,417
2030	**3,153**	1,758	364
2031	**5,929**	4,396	2,863
2032+	**8,339**	6,686	5,032

Table 4.2.2.6. Estimated change in potential net economic benefits to the recreational sector (CS) from Action 2 (2021 $).

Fishing Year	Preferred Alternative 2	Alternative 3	Alternative 4
2023	**-$2,140,163**	-$2,175,360	-$2,210,552
2024	**-$1,797,338**	-$1,849,676	-$1,902,010
2025	**-$1,447,932**	-$1,517,740	-$1,587,544
2026	**-$1,100,337**	-$1,187,523	-$1,274,709
2027	**-$741,461**	-$846,590	-$951,719
2028	**-$368,120**	-$491,917	-$615,715
2029	**$7,177**	-$135,385	-$277,948
2030	**$362,547**	$202,218	$41,885
2031	**$681,850**	$505,554	$329,258
2032+	**$959,003**	$768,848	$578,697

Table 4.2.2.7. Estimated change in potential net economic benefits (recreational and commercial combined) from Action 2 (2021 $)[a].

Fishing Year	Preferred Alternative 2	Alternative 3	Alternative 4
2023	**-$2,660,285**	-$2,704,521	-$2,748,751
2024	**-$2,229,421**	-$2,295,199	-$2,360,973
2025	**-$1,790,285**	-$1,878,021	-$1,965,751
2026	**-$1,353,426**	-$1,463,002	-$1,572,579
2027	**-$902,388**	-$1,034,515	-$1,166,642
2028	**-$433,172**	-$588,761	-$744,351
2029	**$38,503**	-$140,670	-$319,843
2030	**$485,134**	$283,631	$82,124
2031	**$886,436**	$664,866	$443,296
2032+	**$1,234,763**	$995,775	$756,792

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

Assumptions used in calculating these estimates include application of the status quo allocation of the total ACL (51% commercial, 49% recreational) to the new ACL for each alternative to estimate economic benefits. This allocation is then compared to the baseline scenario (i.e. a proxy for **Alternative 1 (No Action)**) to determine the gap between the baseline scenario and the ACL by sector under the assumption that both sectors would fully harvest their respective ACLs. For the commercial sector, the current sector ACL of 347,301 pound gutted weight (lbs gw) is used as the baseline scenario since the units measuring this portion of the total ACL are not changing due to this action. For the recreational sector, 5-year average landings from 2015-2019 (24,731 fish; source is SEFSC MRIP FES ACL data set (March 2022)) in FES terms are used as the baseline scenario since a forward looking conversion of CHTS and FES measurements is not available that would allow direct comparison of the current recreational sector ACL under

Alternative 1 (No Action), which is in CHTS terms, to the resulting new recreational sector ACL under **Preferred Alternative 2** through **Alternative 4**.

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 ($6.51/lbs gw; Tables 3.3.1.2 and 3.3.1.3) along with a scaling factor of 31% of gross revenue (Section 3.3.1; NMFS SEFSC, pers. comm. 2022) to estimate PS for the commercial sector. It is assumed that the ex-vessel price will not change due to the change in commercial landings. Although there are no currently available estimates of the demand elasticity for gag grouper, it is assumed that there would be no expected change to CS from the commercial perspective since there is likely a high degree of substitutability of gag grouper for other species. 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, economic benefits to dealers would be directionally the same as stated above for commercial vessels.

To estimate net economic benefits for the recreational sector, a CS estimate of $115 for the second grouper 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. An average weight of 14.06 lbs gw per gag grouper (SEFSC MRIP FES ACL data set (March 2022)) is used to convert the recreational portion of the ACL from lbs gw to numbers of fish. It is assumed that changes in the recreational portion of the total ACL would only affect catch per trip and not the overall number of trips taken due to the low retention limit for gag grouper and a large number of potential substitute target species. This assumption includes no direct change to for-hire fishing activity and thus no change in direct economic effects for the for-hire component of the recreational sector. As such, there are no estimated changes in PS provided for the recreational sector.

4.2.3 Social Effects

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

Under **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** the total ACL for gag grouper would be based on the most recent stock assessment and updated MRIP estimates. Adjustments in an ACL based on updated information are necessary to ensure continuous social benefits over

time, **Alternative 1 (No Action)** would not update the gag grouper total ACL based on current information and would not provide the social benefits associated with up-to-date scientific information.

In general, a higher ACL would lower the chance of triggering a recreational or commercial AM and result in the lowest level of negative effects on the recreational and commercial sectors. Additionally, higher ACLs may provide opportunity for commercial and recreational fishermen to expand their harvest providing social benefits associated with increased income to fishing businesses within the community and higher trip satisfaction. Among the action alternatives, **Preferred Alternative 2** would be the most beneficial for fishermen, followed by **Alternative 3**, and **Alternative 4**.

4.2.4 Administrative Effects

Reducing the total ACL and annual OY for gag through **Preferred Alternative 2** through **Alternative 4** would not have effects on the administrative environment, outside of the requisite public notices. 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 ACL would be met and an in-season closure is expected to occur under each of the alternatives, the administrative effects are likely going to be minimal and the same across the viable alternatives.

4.3 Action 3. Revise the gag sector allocations and sector annual catch limits

4.3.1 Biological Effects

Alternatives*

1 (No Action). Apply the current allocation percentages to the revised total ACL. Total ACL is allocated 51% to the commercial sector and 49% to the recreational sector.

2. Allocate 36.37% of the gag grouper total ACL to the commercial sector and 63.63% the recreational sector.

3. Allocate 43.06% of the gag grouper total ACL to the commercial sector and 56.94% the recreational sector.

4. Allocate by splitting the percent decrease from previous total landings to each sector proportionally in Year 1. Split the poundage increase in the remaining years and add to each sectors annual catch limit

4a. Base the allocation method on a 3-year average from 2017-2019.

4b. Base the allocation method on a 5-year average from 2015-2019.

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

Expected effects to gag and co-occurring species

Biological effects are not expected to be substantially different between **Alternative 1 (No Action)** and **Preferred Sub-Alternative 4b**, since the allocation percentages would be similar and do not affect the total ACL specified in Action 2. However, **Alternative 2** through **Sub-Alternative 4a** shift allocation from the commercial sector to the recreational sector by varied amounts. Because the commercial sector has effective in-season and post-season AMs in place to prevent the commercial ACL from being exceeded, the shift in allocation to the recreational sector in **Alternative 2** through **Preferred Alternative 4**, **Sub-Alternative 4a** could incur negative biological effects on the gag stock relative to **Alternative 1 (No Action)**.

Shifting allocation from the commercial to recreational sector (**Alternatives 2** and **3**) could lead to increased discards of gag. Gag discards in the commercial sector are attributed to "not of legal size" and "out of season" (Table G.1.1.2). Reducing the commercial allocation would likely result in shorter commercial fishing seasons. Additionally, gag discards vs. landings ratios for all components of the recreational sector are high (Table 4.3.1.1). **Preferred Sub-Alternative 4b** would result in similar allocations to **Alternative 1 (No Action)** in 2023-2026 and equal allocations in 2027 and beyond.

Table 4.3.1.1. South Atlantic headboat, charter, and private mean annual estimates of landings and discards (2015-2019) for gag. Headboat and MRIP (charter and private) landings and discards are in numbers of fish.

HEADBOAT			CHARTER			PRIVATE		
Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
679	805	118%	2,387	2,257	95%	21,664	57,088	264%

Gag are often harvested incidentally when fishing for other snapper grouper species, such as other shallow-water grouper, red snapper, and black sea bass. **Preferred Sub-Alternative 4b** does not result in substantial change allocations between sectors so substantial changes in fishing

effort or behavior are not expected as a result of this action, thus the proposed ACLs under this action would not be expected to result in any biological effects, positive or negative, on co-occurring species (refer to BPA in Appendix G).

4.3.2 Economic Effects

In general, sector ACLs that allow for more fish to be landed can result in increased positive economic effects if harvest increases without notable effects on the stock of a species. The ACL does not directly impact the fishery for a species unless harvest changes, fishing behavior changes, or the ACL is exceeded, thereby potentially triggering AMs such as harvest closures or other restrictive measure. In the case of gag grouper, the revised sector allocations and resulting ACLs being considered in **Alternatives 1 (No Action)** through **Preferred Alternative 4** would be constraining on harvest for both sectors when initially implemented and shifts between sectors would create distributional economic effects by sector, depending on the allocation.

Commercial Sector

Alternative 1 (No Action) would maintain the current commercial allocation of 51% of the total ACL. **Alternative 2** and **Alternative 3** would result in a comparatively lower commercial sector allocation (36.37% and 43.06% of the total ACL respectively). **Preferred Alternative 4**, **Sub-alternative 4a** and **Preferred Alternative 4**, **Preferred Sub-alternative 4b** would result in a comparatively lower commercial sector allocation as well (initially 39% and 49% of the total ACL respectively) but would shift over time, with an increasingly higher sector allocation each year into the rebuilding period. All of the commercial ACL alternatives in Action 3 are estimated to be constraining when initially implemented in 2023 based on the average annual landings over the last five years of available data (Table 4.2.2.1 and Table 4.3.2.1), therefore it is assumed that the commercial sector could fully harvest its ACL if conditions allowed, and there would be fewer potential landings of gag grouper under **Alternative 2**, **Alternative 3,** and **Preferred Alternative 4** relative to **Alternative 1 (No Action)**. These relatively decreased landings would be expected to comparatively decrease total potential PS for the commercial sector. When compared to **Alternative 1 (No Action)**, **Preferred Sub-Alternative 4b** would result in an estimated decrease in PS of $8,569 in fishing year 2023 (2021 $)(Table 4.3.2.2). Estimates of net revenues or economic profit are not available for snapper grouper dealers. Therefore, it is not possible to 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.

Table 4.3.2.1. Percent difference between the commercial sector ACLs in Action 3 compared to 5-year average landings of gag grouper from 2015-2019 and comparison of sector ACLs.

Fishing Year	Commercial sector ACL (lbs gw)[a]	Percent difference between 5-year average landings and the sector ACL	Difference from Alternative 1 (No Action) sector ACL (lbs gw)
Alternative 1 (No Action)			
2023	89,572	-63%	-
2024	133,197	-45%	-
2025	177,660	-27%	-
2026	221,891	-9%	-
2027	267,559	10%	-
2028	315,067	30%	-
2029	362,824	49%	-
2030	408,045	68%	-
2031	448,677	85%	-
2032+	483,945	99%	-
Alternative 2			
2023	63,877	-74%	-25,695
2024	94,988	-61%	-38,209
2025	126,696	-48%	-50,964
2026	158,239	-35%	-63,652
2027	190,806	-21%	-76,753
2028	224,686	-8%	-90,381
2029	258,743	7%	-104,081
2030	290,992	20%	-117,053
2031	319,968	32%	-128,709
2032+	345,119	42%	-138,826
Alternative 3			
2023	75,627	-69%	-13,945
2024	112,460	-54%	-20,737
2025	150,000	-38%	-27,660
2026	187,346	-23%	-34,545
2027	225,904	-7%	-41,655
2028	266,015	9%	-49,052
2029	306,337	26%	-56,487
2030	344,518	42%	-63,527
2031	378,824	56%	-69,853
2032+	408,601	68%	-75,344
Preferred Alternative 4, Sub-alternative 4a			
2023	68,281	-72%	-21,291
2024	111,051	-54%	-22,146

2025	154,641	-36%	-23,019
2026	198,006	-18%	-23,885
2027	242,778	0%	-24,781
2028	289,354	19%	-25,713
2029	336,175	38%	-26,649
2030	380,509	57%	-27,536
2031	420,344	73%	-28,333
2032+	454,921	87%	-29,024
Preferred Alternative 4, Sub-alternative 4b			
2023	**85,326**	**-65%**	**-4,246**
2024	**128,096**	**-47%**	**-5,101**
2025	**171,687**	**-29%**	**-5,973**
2026	**215,051**	**-11%**	**-6,840**
2027	**259,823**	**7%**	**-7,736**
2028	**306,400**	**26%**	**-8,667**
2029	**353,220**	**45%**	**-9,604**
2030	**397,555**	**64%**	**-10,490**
2031	**437,390**	**80%**	**-11,287**
2032+	**471,966**	**94%**	**-11,979**

[a]Assumes the total ACL in Preferred Alternative 2 of Action 2 to determine the sector ACL.

Table 4.3.2.2. Estimated change in potential net economic benefits for the commercial sector (PS) from the alternatives in Action 3 compared to **Alternative 1 (No Action)**(2021 $).

Fishing Year	Alternative 2	Alternative 3	Pref. Alternative 4, Sub Alt. 4a	Pref. Alternative 4, Pref. Sub Alt. 4b
2023	-$51,855	-$28,142	-$42,967	**-$8,569**
2024	-$77,110	-$41,849	-$44,693	**-$10,294**
2025	-$102,850	-$55,821	-$46,455	**-$12,054**
2026	-$128,456	-$69,715	-$48,202	**-$13,804**
2027	-$154,895	-$84,064	-$50,011	**-$15,612**
2028	-$182,398	-$98,992	-$51,891	**-$17,491**
2029	-$210,046	-$113,996	-$53,780	**-$19,382**
2030	-$236,225	-$128,204	-$55,570	**-$21,170**
2031	-$259,748	-$140,970	-$57,179	**-$22,778**
2032+	-$280,165	-$152,052	-$58,573	**-$24,175**

Assumptions used in calculating the estimates in Table 4.2.2.2 include a comparison of the sector ACL in **Alternative 1 (No Action)** to the appropriate sector ACL resulting from the other alternatives. An appropriate ex-vessel price ($6.51/lbs gw; Tables 3.3.1.2 and 3.3.1.3) along with a scaling factor of 31% of gross revenue (Section 3.3.1; NMFS SEFSC, pers. comm. 2022) is applied to estimate PS for the commercial sector. It is assumed that the ex-vessel price will not change due to the change in commercial landings. Although there are no currently available

estimates of the demand elasticity for gag grouper, it is assumed that there would be no expected change to consumer surplus from the commercial perspective since there is likely a high degree of substitutability of gag grouper for other species. The total ACL for which the sector ACLs are based upon is derived from Preferred Alternative 2 in Action 2.

Recreational Sector

Alternative 1 (No Action) would maintain the current recreational allocation of 49% of the total ACL. **Alternative 2** and **Alternative 3** would result in a comparatively higher recreational sector allocation (63.63% and 56.94% of the total ACL respectively). **Preferred Alternative 4**, **Sub-alternative 4a** and **Preferred Alternative 4**, **Preferred Sub-alternative 4b** would result in a comparatively higher recreational sector allocation as well (initially 61% and 51% of the total ACL respectively) but would shift over time, with a decreasing sector allocation over the rebuilding period. All of the recreational ACL alternatives in Action 3 are estimated to be constraining when initially implemented in 2023 based on the average annual landings over the last five years of available data (Table 4.2.2.1 and Table 4.3.2.3), therefore it is assumed that the recreational sector could fully harvest its ACL if conditions allowed, and there would be higher potential landings of gag grouper under **Alternative 2, Alternative 3,** and **Preferred Alternative 4** relative to **Alternative 1 (No Action)**. These relatively increased landings would be expected to comparatively increase total potential CS for the recreational sector. When compared to **Alternative 1 (No Action)**, **Preferred Sub-Alternative 4b** would result in an estimated increase in CS of $37,083 in fishing year 2023 (2021 $)(Table 4.3.2.4).

Table 4.3.2.3. Percent difference between the recreational sector ACLs in Action 3 compared to 5-year average landings of snowy grouper from 2015-2019 and comparison of sector ACLs.

Fishing Year	Recreational sector ACL (lbs gw)	Percent difference between 5-year average landings and the sector ACL	Difference from Alternative 1 (No Action) sector ACL (lbs gw)
Alternative 1 (No Action)			
2023	86,060	-75%	-
2024	127,974	-63%	-
2025	170,692	-51%	-
2026	213,190	-39%	-
2027	257,066	-27%	-
2028	302,711	-14%	-
2029	348,595	0%	-
2030	392,043	12%	-
2031	431,081	23%	-
2032+	464,966	33%	-
Alternative 2			
2023	111,755	-68%	25,695
2024	166,183	-53%	38,209
2025	221,656	-37%	50,964
2026	276,842	-21%	63,652
2027	333,819	-5%	76,753

2028	393,092	12%	90,381
2029	452,676	29%	104,081
2030	509,096	45%	117,053
2031	559,790	60%	128,709
2032+	603,792	72%	138,826
Alternative 3			
2023	100,005	-71%	13,945
2024	148,711	-58%	20,737
2025	198,352	-43%	27,660
2026	247,735	-29%	34,545
2027	298,721	-15%	41,655
2028	351,763	0%	49,052
2029	405,082	16%	56,487
2030	455,570	30%	63,527
2031	500,934	43%	69,853
2032+	540,310	54%	75,344
Preferred Alternative 4, Sub-alternative 4a			
2023	107,350	-69%	21,290
2024	150,120	-57%	22,146
2025	193,710	-45%	23,018
2026	237,075	-32%	23,885
2027	281,847	-20%	24,781
2028	328,423	-6%	25,712
2029	375,244	7%	26,649
2030	419,578	20%	27,535
2031	459,413	31%	28,332
2032+	493,990	41%	29,024
Preferred Alternative 4, Sub-alternative 4b			
2023	**90,306**	**-74%**	**4,246**
2024	**133,057**	**-62%**	**5,083**
2025	**176,666**	**-50%**	**5,974**
2026	**220,030**	**-37%**	**6,840**
2027	**264,802**	**-24%**	**7,736**
2028	**311,379**	**-11%**	**8,668**
2029	**358,199**	**2%**	**9,604**
2030	**402,534**	**15%**	**10,491**
2031	**442,369**	**26%**	**11,288**
2032+	**476,945**	**36%**	**11,979**

[a]Assumes the total ACL in Preferred Alternative 2 of Action 1 to determine the sector ACL.

Table 4.3.2.4. Estimated change in potential net economic benefits for the recreational sector (CS) from the alternatives in Action 3 compared to **Alternative 1 (No Action)** (2021 $).

Fishing Year	Alternative 2	Alternative 3	Pref. Alternative 4, Sub Alt. 4a	Pref. Alternative 4, Pref. Sub Alt. 4b
2023	$210,165	$114,059	$174,136	**$34,729**
2024	$312,520	$169,613	$181,137	**$41,575**
2025	$416,846	$226,238	$188,270	**$48,863**
2026	$520,624	$282,552	$195,361	**$55,946**
2027	$627,781	$340,706	$202,690	**$63,275**
2028	$739,247	$401,208	$210,304	**$70,898**
2029	$851,303	$462,020	$217,968	**$78,553**
2030	$957,404	$519,602	$225,215	**$85,808**
2031	$1,052,741	$571,344	$231,734	**$92,327**
2032+	$1,135,490	$616,256	$237,394	**$97,979**

Assumptions used in calculating the estimates in Table 4.3.2.4 include a comparison of the sector ACL in **Alternative 1 (No Action)** to the appropriate sector ACL resulting from the other alternatives. To estimate net economic benefits for the recreational sector, a CS estimate of $115 for the second grouper 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. A weight of 14.06 lbs gw per gag grouper (SEFSC MRIP FES ACL data set (March 2022)) is used to convert the recreational portion of the ACL from lbs gw to numbers of fish. It is assumed that changes in the recreational sector ACL would only affect catch per trip and not the overall number of trips taken due to the low retention limit for gag grouper and a large number of potential substitute target species. This includes no direct change to for-hire fishing activity and thus no change in direct economic effects for the for-hire component of the recreational sector. As such, there are no estimated changes in producer surplus (PS) provided for the recreational sector. The total ACL for which the sector ACLs are based upon is derived from Preferred Alternative 2 in Action 2.

Total

In general, higher ACLs allow for increased harvest when fishery conditions allow, thereby increase net economic benefits. Thus, under this notion, the alternatives in Action 3 can be ranked for the commercial sector from a short-term economic perspective with **Alternative 1 (No Action)** resulting in the highest potential benefits followed by **Preferred Sub-Alternative 4b**, **Alternative 3**, **Sub-Alternative 4a**, and **Alternative 2**. For the recreational sector, the ranking would be the opposite with **Alternative 2** resulting in the highest potential benefits followed by **Sub-Alternative 4a, Alternative** 3, **Preferred Sub-Alternative 4b**, and **Alternative 1 (No Action)**. In terms of total estimated net economic benefits for the action, the same ranking would apply as stated for the recreational sector. In comparison to **Alternative 1 (No Action)**, **Preferred Sub-Alternative 4b** would increase net economic benefits by $26,160 in the 2023 fishing year (Table 4.3.2.5)(2021 $).

Table 4.3.2.5. Estimated change in potential net economic benefits from the alternatives in Action 2 compared to **Alternative 1 (No Action)** (2021 $).

Fishing Year	Alternative 2	Alternative 3	Pref. Alternative 4, Sub Alt. 4a	Pref. Alternative 4, Pref. Sub Alt. 4b
2023	$158,310	$85,917	$131,168	$26,160
2024	$235,411	$127,763	$136,444	$31,281
2025	$313,996	$170,417	$141,815	$36,809
2026	$392,168	$212,836	$147,159	$42,142
2027	$472,885	$256,642	$152,679	$47,663
2028	$556,849	$302,216	$158,413	$53,407
2029	$641,257	$348,024	$164,188	$59,172
2030	$721,179	$391,398	$169,645	$64,638
2031	$792,993	$430,374	$174,555	$69,549
2032+	$855,325	$464,204	$178,821	$73,804

4.3.3 Social Effects

Sector allocations exist for the recreational and commercial sectors already, **Alternative 1 (No Action)** would maintain the current allocation percentages. Under **Alternative 2**, **Alternative 3**, **Sub-alternative 4a** and **Preferred Sub-alternative 4b** there would be a decrease in the commercial percentage compared to **Alternative 1 (No Action)**. These alternatives could have some negative social effects if commercial fishermen, have a negative perception of this change due to the decrease in fishing opportunity and concerns about long-term social effects, especially if other actions further decreased harvest opportunities.

As mentioned above, there can be many different social effects that result as allocations are discussed further, and perceptions are formed. In the past there has been some resistance to further decreasing a given sector's percentage allocation. It is difficult to predict the social effects with any allocation scheme as it would depend upon other actions in conjunction with this one. A reduction in allocation for one sector may be compounded by a restrictive choice of ABC or ACL (Action 2) and may have further effects that could be either negative or positive depending upon the combination of management actions. Therefore, the choice of an allocation would need to be assessed with other actions within this amendment to determine the overall social effects and whether short-term losses are offset by any long-term biological gains.

Based on Action 2-Preferred Alternative 2 and recent commercial and recreational landings, all of the proposed commercial or recreational ACLs are expected to be met, resulting in triggering of the AMs (Action 6). Modifications to commercial management measures (Action 4) and recreational management measures (Action 5) are anticipated to decrease landings and length the season, but not to the extent that would prevent closures.

4.3.4 Administrative Effects

Administrative effects would not vary between **Alternative 1 (No Action)** through **Preferred Alternative 4** because an in-season closure is predicted for both sectors. Administrative burdens

depending on the commercial AM and recreational AM (Action 6) would relate to data monitoring, outreach, and enforcement of a shortened fishing season. Other administrative burdens that may result would take the form of development and dissemination of outreach and education materials for fishery participants and law enforcement.

4.4 Action 4. Modify commercial management measures for gag

4.4.1 Sub-action 4a. Reduce the commercial trip limit for gag

4.4.1.1 Biological Effects

Alternatives*
1 (No Action). The commercial gag trip limit is 1,000 lbs gw until 75% of the commercial ACL is met, at which time the commercial trip limit is reduced to 500 lbs gw for the remainder of the fishing year or until the commercial ACL is met.
2. Reduce the gag commercial trip limit to 200 lbs gw.
3. Reduce the gag commercial trip limit to 300 lbs gw.
4. Reduce the gag commercial trip limit to 400 lbs gw.
5. Reduce the gag commercial trip limit to 500 lbs gw.
6. Reduce the gag commercial trip limit to 300 lbs gw in 2023 then increase the commercial trip limit to 500 lbs gw in 2026 and to 1,000 lbs gw in 2027 where the trip limit would remain 1,000 lbs gw until modified.
*See Chapter 2 for detailed language of alternatives. Preferred indicated in bold.

Expected effects to gag and co-occurring species

The biological effects of **Alternatives 2** through **Alternative 5** would not differ from **Alternative 1 (No Action)** in terms of risk of overfishing as overall harvest would be limited to the commercial ACL, and AMs would be triggered if the ACL was reached. Under **Alternative 6**, harvest would still be limited to the commercial ACL and AMs would still be triggered if the ACL was reached but there is potential for projected landings to differ from how the fishery operates. The increase in commercial trip limit under this alternative would occur regardless of whether adequate rebuilding occurs, which could have negative effects on the stock.

Reducing commercial trip limits in combination with a reduction in the commercial ACL under Action 3 could extend the length of the respective commercial fishing seasons relative to **Alternative 1 (No Action)**. Under the reduced commercial ACL proposed in Action 3, **Alternative 1 (No Action)** would result in the shortest commercial fishing seasons, the largest number of discards over the long-term, and thus the highest adverse effects to the gag stock among the alternatives considered. A commercial trip limit of 200 pounds gutted weight (lbs gw), as proposed under **Alternative 2** would result in the longest predicted commercial seasons among the alternatives considered, thus allowing some retention of gag over the longest time and minimizing discards to the largest extent. However, in general, reductions in commercial trip limits could increase the number of discards, as fish that would normally be retained would have to be discarded under a lower trip limit. Predicted season closure dates based on trip limit alternatives under this action can be explored using the Gag Commercial Decision Tool which provides projected landings based on 2017 to 2019 landings under various action and alternative combinations. The majority of commercial trips with a least one pound of gag would fall below or at the preferred alternative (Figure 4.4.1.1.1). **Alternatives 2** through **6** are not expected to result in a substantial increase in gag discards.

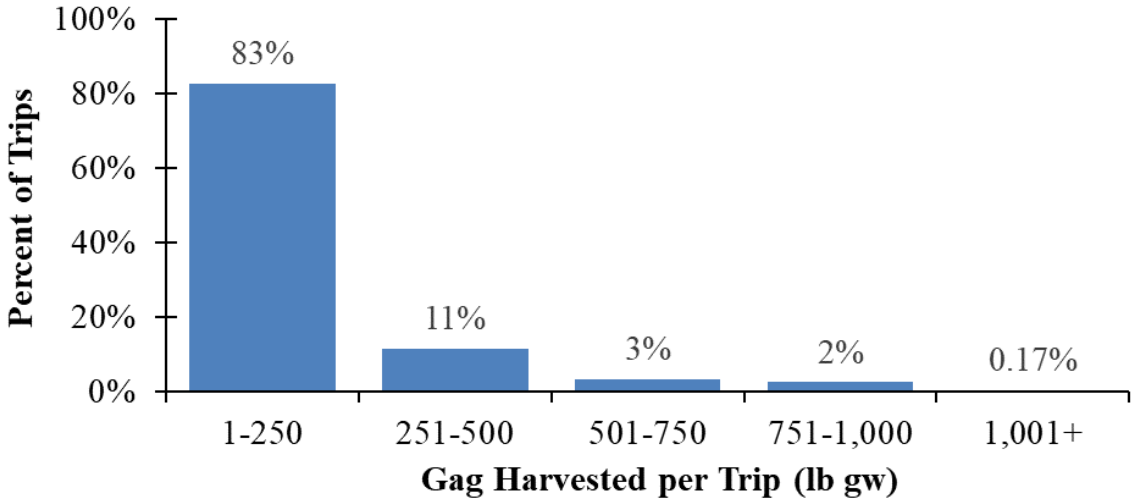

Figure 4.4.1.1.1. The percent of commercial trips (n=8,607) harvesting gag by bin from 2017 through 2019. Source: SEFSC commercial logbook (May 6, 2021).

Biological benefits to the gag stock would be greatest under **Alternative 2**, followed by **Preferred Alternative 3**, **Alternative 4**, **Alternative 5**, **Alternative 6**, and **Alternative 1 (No Action)**.

Gag are often harvested incidentally when fishing for other snapper grouper species, such as other shallow-water species, red snapper, and black sea bass. Substantial changes in fishing effort or behavior are not expected as a result of this action, thus the proposed commercial trip limits under this action would not be expected to result in any biological effects, positive or negative, on co-occurring species (refer to BPA in Appendix G).

4.4.1.2 Economic Effects

Generally, commercial trip limits are not considered to be economically efficient because they require an increase in the number of trips and associated trip costs to land the same amount of fish. However, the negative economic effects of this inefficiency can be offset by price support resulting from the supply limitations and the lengthening of seasons. Given the ACL for gag grouper that restricts maximum harvest to sustainable levels, the alternative with the fewest number of trips that have to stop retaining gag grouper because the trip limit has been reached would result in the least amount of direct negative economic effects on a trip level.

Decreasing trip limits would allow for decreased potential revenue on trips that land gag grouper, thereby resulting in a decrease in economic benefits to commercial vessels participating in the fishery through potentially reduced revenue. Lower trip limits would allow for lower levels of revenue over more trips, thus potentially decreasing net economic benefits through decreased net revenue. With the exception of **Alternative 6**, all of the alternatives would remain in place until further modified. **Alternative 6** would allow for an increase in the trip limit in 2026 and again in 2027, and thus would provide an expected increase in economic benefits in future fishing years. In terms of potential net economic benefits, **Alternative 1 (No Action)** would provide the

highest expected benefits followed by **Alternative 5**, **Alternative 4**, **Alternative 6**, **Preferred Alternative 3**, and **Alternative 2**.

The initial quantitative economic effects of this sub-action are largely captured in the economic effects described in Action 2 and Action 3 for the commercial sector since harvest would be constrained due to the revised total and commercial sector ACL for gag grouper regardless of the trip limit imposed. Thus, the quantitative effects in Table 4.4.1.2.1 are not necessarily additive to the effects shown in Action 2 and 3, but rather show the estimated economic effects of Sub-Action 4a with all other conditions remaining the same and represent the estimated economic effects in the 2023 fishing year. The estimated change in landings are based on 3-year average commercial landings and are based on the outcomes of the commercial analysis section in Appendix F that shows the expected decrease in commercial landings under the various trip limit scenarios. The resulting estimated change in landings is paired with the appropriate price and PS estimate ($6.51/lbs gw; 31% of gross revenue; Section 3.3) to estimate the change in net economic benefits to the commercial sector.

Table 4.4.1.2.1. Comparison of the estimated change in commercial landings of gag grouper and associated net economic benefits (PS) for Sub-Action 4a in the 2023 fishing year (2021 $).

Alternative	Estimated change in landings (lbs gw)	Change in PS (2021 $)
Alternative 1 (No Action)	0	-
Alternative 2	-74,133	-$149,608
Pref. Alternative 3	**-46,333**	**-$93,505**
Alternative 4	-30,116	-$60,777
Alternative 5	-18,533	-$37,401
Alternative 6	-46,333	-$93,505

4.4.1.3 Social Effects

Commercial fishermen in the communities identified in Section 3.4 would likely be those affected by a change in the gag grouper commercial trip limit. However, it is likely that fishermen who have targeted gag grouper in recent years also target other species and would be able to adjust their businesses to adapt to regulatory changes. In general, a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Additionally, if the trip limit is too low, the commercial ACL may not be met.

Commercial landings of gag grouper in the South Atlantic have been decreasing and the commercial ACL has not been met since the 2014 fishing year (Appendix F). **Alternative 2** proposes the lowest trip limit and would likely result in the largest reduction in landings, while **Alternative 5** and **Alternative 6** propose the highest trip limits and would likely result in the lowest reduction in landings when compared to **Alternative 1 (No Action)**. Given recent commercial landings of gag grouper, and assuming Action 2 – Preferred Alternative 2 and Action 3 – Preferred Sub-alternative 4b, all proposed alternatives are anticipated to result in a commercial closure during 2023 and 2024 fishing seasons. **Alternative 1 (No Action)**, **Preferred Alternative 3**, **Alternative 4**, **Alternative 5**, and **Alternative 6** are anticipated to

result in a season closure during the 2025 fishing season. **Alternative 1 (No Action)** is anticipated to result in a closure 2026 season. None of the proposed alternatives are anticipated to result in landings that would exceed the ACL and result in a shorter season from 2027 onward. While **Alternative 6** is likely to result in some closures early on in the rebuilding plan, it would allow the trip limit to increase as the stock biomass increases, which would provide social benefits to fishermen in the form of increased access to the resource.

While shorter seasons can result in negative social effects as described above, slowing the rate of harvest, and contributing to rebuilding goals for gag grouper would be expected to contribute to the sustainability of harvest and the health of the gag grouper stock and provide for long-term social benefits.

4.4.1.4 Administrative Effects

Alternative 1 (No Action) through **Alternative 6** would not substantially change the administrative environment from its current state because commercial trip limits are already in place, however **Alternatives 2** through **6** would lower administrative burden due to the removal of the trip limit step down. Currently, there is a commercial quota monitoring system in place for gag that is utilized to monitor landings against the commercial ACL. The probability of an in-season closure increases with increasing trip limits, therefore, **Alternative 1 (No Action)** would impose the most administrative burden, followed by **Alternative 5**, **Alternative 4**, and **Preferred Alternative 3**. **Alternative 2** would impose the least administrative burden of the proposed alternatives. **Alternative 6** would have the same amount of administrative burden as **Preferred Alternative 3** until the trip limit is increased in 2028. At this time, the commercial sector would be more likely to meet their ACL so the administrative burden would increase as NMFS would send closure notices.

4.4.2 Sub-action 4b. Modify the commercial spawning season closure for gag

4.4.2.1 Biological Effects

Alternatives*

1 (No Action). The annual commercial gag spawning season closure is from January 1 through April 30.

2. Extend the annual commercial gag spawning season closure to January 1 through May 31.

3. Extend the annual commercial gag spawning season closure to December 1 through April 30.

4. Extend the annual commercial gag spawning season closure to December 1 through May 31.

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

Expected effects to gag and co-occurring species

Gag grouper are protogynous hermaphrodites, meaning they are born female and transition to male later in life. Gag are also aggregate spawners which tend to have increased susceptibility to fishing during spawning events (Coleman et al. 1996).

Most sources note that gag spawning occurs from January through April with some sources indicating that gag spawning continues into May and the summer months as well as the fall months (Table 4.4.2.1.1). **Preferred Alternative 1 (No Action)** provides a spawning season closure which encompasses peak spawning. **Alternative 2** and **3** would provide extended biological benefit as it would provide and additional month of spawning when some source note that gag are continuing to spawn (Table 4.4.2.1.1). **Alternative 4** would be expected to provide the greatest biological benefit as it provides the longest spawning season closure.

Biological benefits to the gag stock would be greatest under **Alternative 4**, followed by **Alternative 2**, **Alternative 3,** and **Preferred Alternative 1 (No Action)**.

Table 4.4.2.1.1. A comparison of the gag spawning season from the Gulf of Mexico and South Atlantic region reported by source. Gray squares indicate spawning and black indicate peak spawning activity.

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Farmer et al. 2017												
Brule et al. 2018												
Biggs et al. 2017												
Gruss et al. 2017												
Binder et al. 2017												
Coleman et al. 1996												
SEDAR 10, 2006												

Gag are often harvested incidentally when fishing for other snapper grouper species, such as other shallow-water grouper, red snapper, and black sea bass. Extending the spawning season closure in this sub-action could result in shifts in fishing effort to other snapper grouper species. However, because this is a multi-species fishery, substantial changes in fishing effort or behavior are not expected as a result of this action, thus the proposed commercial trip limits under this

action would not be expected to result in any additional biological effects on co-occurring species (refer to BPA in Appendix G).

4.4.2.2 Economic Effects

In general, providing increased protection for spawning gag would be expected to result in improvements in stock abundance and biomass and create indirect, long-term, positive economic effects presumably through the availability of increased numbers of fish in the future. However, there can be some direct, short-term negative economic effects as fewer fish could be available to harvest until the biomass of harvestable fish increases due to the decrease in the amount of time the species if open to harvest.

Implementing a spawning season closure and harvest prohibition for the commercial sector would be expected to reduce landings of gag in the short-term and, consequently, producer surplus (PS) as well under **Alternatives 2**, **3**, and **4** in comparison to **Preferred Alternative 1 (No Action)**. From a short-term economic benefits perspective, **Preferred Alternative 1 (No Action)** would provide the highest economic benefits followed by **Alternative 3**, **Alternative 2**, and **Alternative 4**.

The initial quantitative economic effects of this sub-action are largely captured in the economic effects described in Action 2 and Action 3 for the commercial sector since harvest would already be constrained by the revised total and commercial sector ACL for gag grouper regardless of a potential change in the spawning season closure. Thus, the quantitative effects in Table 4.4.2.2.1 are not necessarily additive to the effects shown in Action 2 and 3, but rather show the estimated economic effects of Sub-Action 4b with all other conditions remaining the same. The estimated change in landings are based on 3-year average commercial landings and the outcomes of the commercial analysis section in Appendix F that shows the expected decrease in commercial landings under the various spawning season closure scenarios. The resulting estimated change in landings is paired with the appropriate price and PS estimate ($6.51/lbs gw; 31% of gross revenue; Section 3.3) to estimate the change in net economic benefits to the commercial sector.

Table 4.4.2.2.1. Comparison of the estimated change in commercial landings of gag grouper and associated net economic benefits (PS) for Sub-Action 4b in the 2023 fishing year (2021 $).

Alternative	Estimated change in landings (lbs gw)	Change in PS (2021 $)
Pref. Alternative 1 (No Action)	**0**	-
Alternative 2	-51,791	-$104,519
Alternative 3	-18,059	-$36,445
Alternative 4	-69,851	-$140,966

4.4.2.3 Social Effects

The potential effects on commercial fishing businesses and coastal communities of modifying the gag grouper spawning closure will be a trade-off between the biological benefits of the seasonal closure and the increased commercial fishing opportunities if the closure is shortened. In general, a longer seasonal closure may be biologically beneficial to the stock and contribute to sustainable fishing opportunities in the future if the closure appropriately lines up with spawning,

but a longer closure would be more likely to restrict access to gag grouper. **Alternative 4**, which would close the commercial gag grouper fishery for six months, is likely to result in the largest reduction in landings when compared to **Preferred Alternative 1 (No Action)**, followed **Alternative 2**, and **Alternative 3**. Ultimately, the direct social effect of modifying the commercial spawning season closure depends on the likelihood of commercial harvest being open during times of the year when it is profitable for communities to target gag grouper. Historically, commercial gag grouper landings have been highest during the month of May, decreasing as the year progresses (See Appendix F for Decision Tool Information). **Preferred Alternative 1 (No Action)** would cause the least amount of disruption to commercial fishing businesses as fishermen have already adjusted their practices to this closure. Thus, in the short-term, **Preferred Alternative 1 (No Action)** would provide the most access to fishing communities, followed by **Alternative 2**, **Alternative 3**, and **Alternative 4**.

4.4.2.4 Administrative Effects

Administrative effects would not vary between **Preferred Alternative 1 (No Action)**, **Alternative 2**, **Alternative 3**, and **Alternative 4**. Administrative burdens associated with a commercial spawning season closure would be related to distributing information, education, and enforcement.

4.5 Action 5. Modify recreational management measures for gag

4.5.1 Sub-action 5a. Establish a recreational vessel limit for gag

Alternatives*

1 (No Action). The recreational gag bag limit is 1 fish per person per day within the 3 shallow water grouper aggregate (no more than 1 grouper may be gag or black grouper).

2. Establish a private recreational vessel limit for gag of:
   2a. 2 fish per vessel per day.
   2b. 4 fish per vessel per day.

3. Establish a for-hire vessel limit for gag of:
   3a. 2 fish per vessel per trip.
   3b. 4 fish per vessel per trip.

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

4.5.1.1 Biological Effects

Expected effects to gag and co-occurring species

The biological effects of **Alternatives 2** and **3** would not differ from **Alternative 1 (No Action)** in terms of risk of overfishing as overall harvest would be limited to the recreational ACL and AMs would be triggered if the ACL was reached.

Establishing a recreational vessel limit in combination with a reduction in the recreational ACL under Action 3 could extend the length of the respective recreational fishing seasons relative to **Alternative 1 (No Action)**. Under the reduced recreational ACL proposed in Action 3, **Sub-Alternatives 2b** and **3b** would result in the shortest recreational fishing season, the largest number of discards over the long-term, and thus the highest adverse effects to the gag stock among the alternatives considered. A recreational vessel limit of 2 fish per vessel per day, as proposed under **Sub-alternative 2a** would result in the longest predicted recreational season among the alternatives considered, thus allowing some retention of gag over the longest time and minimizing discards to the largest extent. However, approximately 45% of private and charter vessels harvested only 1 gag per vessel trip and approximately 75% harvested 1 or less gag per vessel trip from 2017-2019 (Figure 4.5.1.1.1). Also, approximately 60% of headboats harvested only 1 gag per vessel trip and approximately 80% harvested 2 or less gag per vessel trip from 2017-2019 (Figure 4.5.1.1.1). These data suggest a vessel limit would not have a large impact on reducing recreational harvest of gag. Predicted season closure dates from combinations of sub-alternatives under this action can be explored using the Gag Recreational Decision Tool.

A recreational vessel limit is also being considered for black grouper due to identification issues within the recreational sector only (Sub-Action 7a). Juvenile gag and black grouper tend to be more distinguishable with gag displaying a mottled pattern of light and dark patches while black grouper show dark, rectangular blocks separated by pale space (Ross and Moser 1995). As both species age and move to deeper water, identification becomes more challenging. Misidentified gag and black grouper are prevalent in South Florida and the Florida Keys (SEDAR10-DW-18, 2006).

When a season closes, discards of gag may increase as fishermen target other snapper grouper species, particularly other shallow water grouper species. However, in general, increase in recreational vessel limits could increase the number of discards, as fish that would normally be retained would have to be discarded under a lower vessel limit.

Biological benefits to the gag stock would be greatest under **Sub-Alternative 2a** and **3a**, followed by **Sub-Alternative 2b** and **3b**, and **Preferred Alternative 1 (No Action)**.

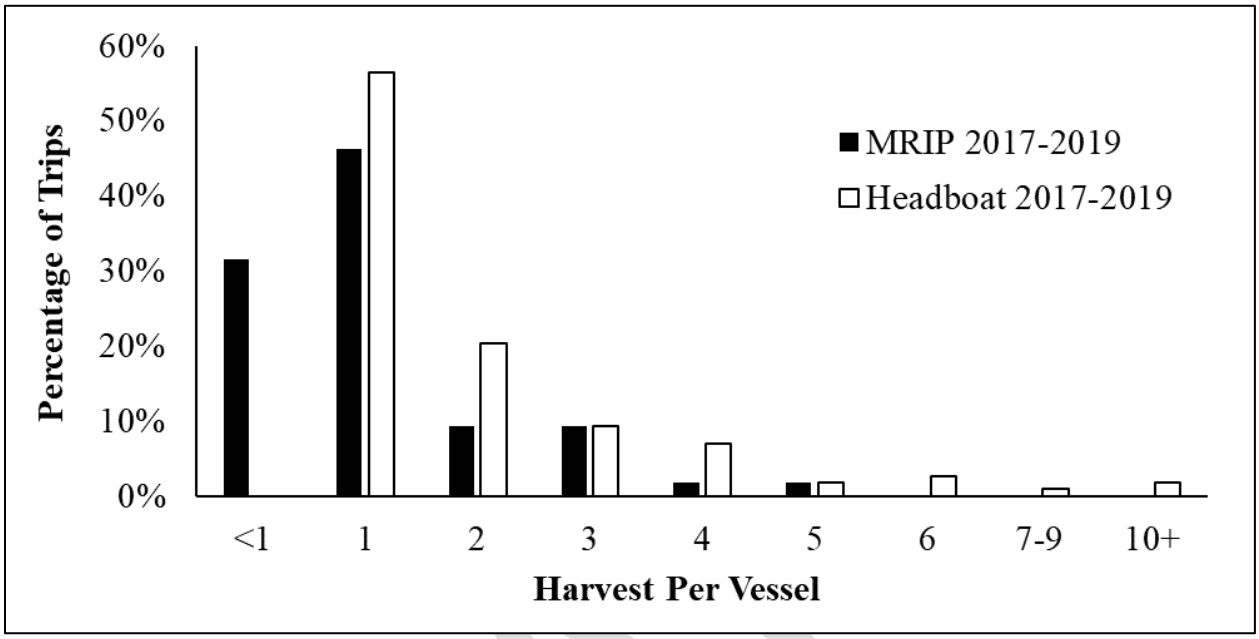

Figure 4.5.1.1.1. Distribution of South Atlantic gag harvested per vessel trip from the two recreational datasets: MRIP FES (n = 54 trips), and headboat (n= 897 trips).

Gag are often harvested incidentally when fishing for other snapper grouper species, such as other shallow-water grouper, red snapper, and black sea bass. Substantial changes in fishing effort or behavior are not expected as a result of this action, thus the proposed vessel limits under this action would not be expected to result in any additional biological effects on co-occurring species (refer to BPA in Appendix G).

4.5.1.2 Economic Effects

Implementing a vessel limit for gag would likely result in a reduction in harvest and economic benefits associated with that harvest. As such **Alternatives 2** and **3** would be expected to reduce CS on some fishing trips, with **Alternative 2** affecting anglers on private recreational trips and **Alternative 3** affecting anglers on for-hire trips. Since the revised recreational sector ACL is expected to be fully harvested when initially implemented in 2023 and many subsequent years, total CS in the recreational gag fishery is expected to be the similar across the alternatives. Vessel limits may lead to a longer fishing season when harvest of gag is allowed, thereby leading to comparatively more fishing trips and associated economic benefits from such trips. If the economic benefits from a longer fishing season offset the reductions in harvest on a trip level, the implementation of vessel limits (**Alternatives 2** and **3**) would increase economic benefits compared to **Alternative 1 (No Action)**. Under this assumption, presumably lower vessel limits could lead to longer fishing seasons and thus higher potential economic benefits as long as the sector ACL is being met.

Conversely, while there may be some benefit from implementing a vessel limit aboard for-hire vessels stemming from a prolonged season, such a limitation could affect the marketability of for-hire trips if limits are set too low. Thus, a lower for-hire vessel limit, such as **Sub-alternative 3a**, may lead to a decrease in economic benefits for for-hire vessels due to decreased for-hire trips being booked by customers. These potential effects cannot be quantified with current data due to lack of available data.

The initial quantitative economic effects of this sub-action are largely captured in the economic effects described in Action 2 and Action 3 for the recreational sector since harvest would already be constrained by the revised total and recreational sector ACL for gag grouper regardless of the vessel limit imposed. Thus, the quantitative effects in Table 4.5.2.1.1 are not necessarily additive to the effects shown in Action 2 and 3, but rather show the estimated economic effects of Sub-Action 5a with all other conditions remaining the same. The estimated change in landings is based on 3-year average recreational landings and the outcomes of the recreational analysis section in Appendix F that shows the expected decrease in recreational landings under various vessel limit scenarios. The estimated change in landings is paired with an average weight of 14.06 lbs gw per gag grouper (SEFSC MRIP FES ACL data set (March 2022)) to convert recreational landings from lbs gw to numbers of fish. A CS estimate of $115 for the second grouper kept on a recreational trip (2021 $; Section 3.3.2) is then applied to estimate the total change in CS.

Table 4.5.2.1.1. Comparison of the estimated change in recreational landings of gag grouper and associated net economic benefits (CS) for Sub-Action 5a in the 2023 fishing year (2021 $).

Alternative	Estimated change in landings (lbs gw)	Change in CS (2021 $)
Alternative 1 (No Action)	**0**	-
Alternative 2, Sub-Alt 2a	-54,449	-$445,351
Alternative 2, Sub-Alt 2b	-8,409	-$68,779
Alternative 3, Sub-Alt 3a	-6,918	-$56,584
Alternative 3, Sub-Alt 3b	-663	-$5,423

4.5.1.3 Social Effects

In general, establishing a vessel limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded. However, limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Establishing a vessel limit would restrict recreational fishing opportunities for gag grouper and change the recreational fishing experience. By restricting the number of gag grouper that can be kept, the season would also likely be longer because the rate of harvest would be slower. It is also likely that fishermen who have targeted gag grouper in recent years also target other species and may be able to adjust their businesses to adapt to regulatory changes.

Under the recreational ACL proposed in Action 3, recreational landings of gag grouper are anticipated to result in triggering of recreational AMs (Action 6) in the short-term (2023 through 2028 fishing seasons). Establishing a recreational vessel limit (**Alternative 2**) and a for-hire per trip limit (**Alternative 3**) may work to extend the season for gag grouper.

Sub-Alternative 2a would set the most restrictive vessel per day limit for the private component of the recreational sector and would likely result in the largest reduction in landings, followed by **Sub-**A**lternative 2b**. This reduction in landings is likely to have negative social effects on the recreational sector in the form of decreased access to the resource. However, the proposed vessel limit may work to extend the fishing season providing access to the gag grouper fishery for the largest portion of the year. Similarly, **Sub-Alternative 3a** would set the most restrictive vessel per trip limit for the for-hire component of the recreational sector and would likely result in the largest reduction in landings, followed by **Sub-**A**lternative 2b**. This switch from a per person limit (**Alternative 1 (No Action)**) to a vessel limit may have negative social effects on the for-hire component in the form of decreased access to the resource, especially on trips where the number of paying passengers exceeds the number of gag grouper that may be retained.

Ultimately, slowing the rate of harvest and ending overfishing of gag groper would be expected to contribute to the sustainability of harvest and the health of the gag grouper stock and provide for long-term social benefits to South Atlantic fishing communities.

4.5.1.4 Administrative Effects

Administrative effects would increase when compared to the status quo [**Alternative 1 (No Action)**] since no vessel limits are in place for gag. Recreational vessel limits would need to be monitored for enforcement and compliance. Minor administrative burdens related to deviating from **Alternative 1 (No Action)** would be related to distributing information, education, and enforcement.

4.5.2 Sub-action 5b. Modify the recreational spawning season closure for gag

4.5.2.1 Biological Effects

Expected effects to gag and co-occurring species

Alternatives*

1 (No Action). The annual recreational gag spawning season closure is from January 1 through April 30.

2. Extend the annual recreational gag spawning season closure to January 1 through May 31.

3. Extend the annual recreational gag spawning season closure to December 1 through April 30.

4. Extend the annual recreational gag spawning season closure to December 1 through May 31.

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

Gag are protogynous hermaphrodites, meaning they are born female and transition to male later in life. Gag are also aggregate spawners which tend to have increased susceptibility to fishing during spawning events (Coleman et al. 1996).

Most sources note that gag spawning occurs from January through April with some sources indicating that gag spawning continues into May and the summer months as well as the fall months (Table 4.5.2.1.1). **Preferred Alternative 1 (No Action)** provides a spawning season closure which encompasses peak spawning. **Alternative 2** and **3** would provide extended biological benefit as it would provide and additional month of spawning when some source note that gag are continuing to spawn (Table 4.5.2.1.1). **Alternative 4** would be expected to provide the greatest biological benefit as it provides the longest spawning season closure.

Biological benefits to the gag stock would be greatest under **Alternative 4**, followed by **Alternative 2**, **Alternative 3**, and **Preferred Alternative 1 (No Action)**.

Table 4.5.2.1.1. A comparison of the gag spawning season from the Gulf of Mexico and South Atlantic region reported by source. Gray squares indicate spawning and black indicate peak spawning activity.

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Farmer et al., 2017												
Brule et al., 2018												
Biggs et al., 2017												
Gruss et al., 2017												
Binder et al., 2017												
Coleman et al., 1996												
SEDAR 10, 2006												

Gag are often harvested incidentally when fishing for other snapper grouper species, such as other shallow-water grouper, red snapper, and black sea bass. Extending the spawning season closure in this sub-action could result in shifts in fishing effort to other snapper grouper species. However, because this is a multi-species fishery, substantial changes in fishing effort or behavior

are not expected as a result of this action, thus the proposed commercial trip limits under this action would not be expected to result in any additional biological effects on co-occurring species (refer to BPA in Appendix G).

4.5.2.2 Economic Effects

In general, providing increased protection for spawning gag would be expected to result in improvements in stock abundance and biomass and create indirect, long-term, positive economic effects presumably through the availability of increased numbers of fish in the future. However, there can be some direct, short-term negative economic effects as fewer fish could be available to harvest until the biomass of harvestable fish increases due to the decrease in the amount of time the species if open to harvest.

Implementing a spawning season closure and harvest prohibition for the recreational sector would be expected to reduce landings of gag in the short-term and, consequently, CS as well under **Alternatives 2**, **3**, and **4** in comparison to **Preferred Alternative 1 (No Action)**. From a short-term economic benefits perspective, **Preferred Alternative 1 (No Action)** would provide the highest economic benefits followed by **Alternative 3**, **Alternative 2**, and **Alternative 4**.

The initial quantitative economic effects of this sub-action are largely captured in the economic effects described in Action 2 and Action 3 for the recreational sector since harvest would already be constrained by the revised total and recreational sector ACL for gag grouper regardless of the vessel limit imposed. Thus, the quantitative effects in Table 4.5.2.2.1 are not necessarily additive to the effects shown in Action 2 and 3, but rather show the estimated economic effects of Sub-Action 5b with all other conditions remaining the same. The estimated change in landings are based on 3-year average recreational landings and the outcomes of the recreational analysis section in Appendix F that shows the expected decrease in recreational landings under the various spawning season closure scenarios. The estimated change in landings is paired with an average weight of 14.06 lbs gw per gag grouper (SEFSC MRIP FES ACL data set (March 2022)) to convert recreational landings from lbs gw to numbers of fish. A CS estimate of $115 for the second grouper kept on a recreational trip (2021 $; Section 3.3.2) is then applied to estimate the total change in CS.

Table 4.5.2.2.1. Comparison of the estimated change in recreational landings of gag grouper and associated net economic benefits (CS) for Sub-Action 5b in the 2023 fishing year (2021 $).

Alternative	Estimated change in landings (lbs gw)	Change in CS (2021 $)
Pref. Alternative 1 (No Action)	**0**	**-**
Alternative 2	-62,443	-$462,166
Alternative 3	-17,581	-$130,124
Alternative 4	-80,024	-$592,290

4.5.2.3 Social Effects

The potential effects on recreational fishing and coastal communities of modifying the gag grouper closure will be a trade-off between the biological benefits of the seasonal closure and resulting long-term social benefits from a heathier stock, and the increased recreational fishing

opportunities if the closure is shortened. In general, a longer seasonal closure may be biologically beneficial to the stock and contribute to sustainable fishing opportunities in the future if the closure appropriately lines up with spawning, but a longer closure would be more likely to restrict access to gag grouper. **Alternative 4**, which would close the recreational gag grouper fishery for six months, is likely to result in the largest reduction in landings, followed by **Alternative 2**, **Alternative 3** and **Preferred Alternative 1 (No Action)**. Ultimately, the direct social effect of modifying the recreational seasonal prohibition will be driven by the level of access to gag grouper during periods when participation is highest.

4.5.2.4 Administrative Effects

Administrative effects would not vary between **Preferred Alternative 1 (No Action)**, **Alternative 2**, **Alternative 3**, and **Alternative 4**. Administrative burdens associated with a recreational spawning season closure would be related to distributing information, education, and enforcement.

4.5.3 Sub-action 5c. Prohibit the retention of gag by captain and crew

4.5.3.1 Biological Effects

Alternatives*

1 (No Action). The captain(s) and crew of a for-hire vessel may retain the same daily bag limit of gag as allowed for each passenger.

2. The gag bag limit for captain(s) and crew of for-hire vessels is zero.

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

Expected effects to gag and co-occurring species

Reductions in landings resulting from restrictions on captain and crew retention limits are difficult to quantify because surveys used to collect recreational fishing data do not provide information on the number of captains or crew on the vessel, or whether or not the captain and crew contribute to the catch. **Alternative 1 (No Action)** would maintain status quo regulations and continue to allow captain and crew to retain the same daily gag bag limit as allowed for each passenger. **Alternative 2** would reduce the daily bag limit of gag for captain and crew to zero while under charter. Since the primary intent of eliminating the captain and crew bag limit is to extend the fishing season, **Alternative 1 (No Action)** would result in shorter open recreational seasons. Additionally, **Alternative 1 (No Action)** would result in higher bycatch and fishing mortality during the open season when compared to **Alternative 2** because of greater fishing effort. Prohibiting captain and crew from retaining bag limits of gag would extend the fishing season and prevent captains and crew from supplementing their client's catch once their client's daily bag limits or vessel limit (Sub-action 5a) have been met. Reductions in landings resulting from a zero captain and crew bag limit in combination with other management alternatives considered in Action 5 would directly benefit the biological environment by reducing gag directed fishery landings to levels necessary to rebuild the stock.

Biological benefits to the gag stock would be greatest under **Alternative 2**, followed by **Alternative 1 (No Action)**.

Gag are often harvested incidentally when fishing for other snapper grouper species, such as other shallow-water grouper, red snapper, and black sea bass. Substantial changes in fishing effort or behavior are not expected as a result of this sub-action, thus the prohibition of the bag limit retention for captain and crew under this action would not be expected to result in any additional biological effects on co-occurring species (refer to BPA in Appendix G).

4.5.3.2 Economic Effects

Removing the captain and crew bag limit for gag would likely result in a reduction in harvest and economic benefits associated with that harvest. As such **Alternative 2** would be expected to reduce CS on some fishing trips. Since the revised recreational sector ACL is expected to be fully harvested when initially implemented in 2023 and many subsequent years, total CS in the recreational gag fishery is expected to be the similar between the alternatives. While there may be some benefit from reducing captain and crew bag limits due to a slightly prolonged season, such a limitation may affect the marketability of for-hire trips if this harvest restriction limits the ability to market and sell trips. Thus, **Alternative 2** may lead to a decrease in PS for for-hire

vessels due to decreased for-hire trips being booked by customers. **Alternative 1 (No Action)** would alleviate these potential negative economic effects on the for-hire sector and thus lead to higher expected net economic benefits. These potential effects cannot be quantified with current data.

4.5.3.3 Social Effects

In general, prohibiting retention of fish by captain and crew (**Alternative 2**) may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded. However, not being able to retain the gag bag limit lower captain and crew satisfaction and potentially lower overall trip satisfaction because captain and crew would not be able to supplement their client's catch. The captain and crew bag limit under **Alternative 1 (No Action)** would likely have little effect on recreational fishermen in the short-term but could result in negative effects in the future if the recreational ACL is regularly exceeded. Slowing the rate of harvest and ensuring sustainable of harvest of the gag stock would provide for long-term social benefits. If slowing the rate of harvest and lengthening the season provides additional fishing opportunities to the recreational fishing communities, **Alternative 2** would be the most beneficial, followed by **Alternative 1 (No Action)**.

4.5.3.4 Administrative Effect

Alternative 1 (No Action) would maintain status quo regulations, which allow captain and crew to retain daily bag limits of gag while under charter. **Alternative 2** would result in an additional regulation to enforce, but could reduce the burden on enforcement by making it easier and faster to determine compliance with regulations (less fish to count and measure). **Alternative 2** would also eliminate issues of identification between black grouper and gag.

4.6 Action 6. Modify the gag recreational accountability measures

4.6.1. Biological Effects

Alternatives*

1 (No Action). In-season closure if recreational landings reach or are projected to reach the recreational ACL. If landings exceed the recreational ACL, then monitor landings the following year. If the total ACL is exceeded and gag are overfished, reduce the length of the recreational fishing season and the recreational ACL by the amount of the overage.

2. The recreational season will open annually after the annual spawning season closure ends. NMFS will annually announce the end date as deemed appropriate.

3. Remove the recreational in-season closure. If the recreational ACL is exceeded and the total ACL is exceeded, reduce the length of the following year's recreational fishing season by the amount necessary to prevent the recreational ACL from being exceeded in the following year.

4. Retain the recreational in-season closure. If the recreational ACL is exceeded and the total ACL is exceeded, reduce the length of the following year's recreational fishing season by the amount necessary to prevent the recreational ACL from being exceeded in the following year.

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

Expected effects to gag and co-occurring species
Biological benefits would be expected to be greater for the alternative that provides the most timely and realistic option chosen to trigger and implement an AM.

Under **Alternative 1 (No Action)**, an in-season closure would likely be triggered due to the proposed reduction in the recreational ACL. In addition, because gag are overfished, an overage of the total ACL would trigger a reduction in the length of the recreational season and a payback of the overage in the subsequent fishing year.

A similar AM to that proposed under **Alternative 2** is currently in place in the South Atlantic for black sea bass. The gag recreational fishing season would begin on May 1, when the spawning season closure ends. NMFS would determine the length of the recreational season each year. Analyses show the recreational ACL would likely be met in June for 2023. **Alternative 2** would result in biological benefit to the stock in that it is likely to prevent overages of the recreational ACL. However, this alternative would not correct for an overage if it were to occur due to an unforeseen increase in recreational effort.

Alternative 3 would correct for recreational overages of the ACL but would not implement a mechanism to prevent the ACL from being exceeded since it would remove the current in-season AM. As such, **Alternative 3** could have negative biological effects to the gag stock.

Preferred Alternative 4 would correct for recreational overages of the ACL and would keep the current in-season AM. Keeping the current in-season AM in place would reduce the risk of allowing substantial overages of the recreational ACL.

Biological benefits to the gag stock would be greatest under **Alternative 1 (No Action)**, followed by **Alternative 2**, **Preferred Alternative 4**, and **Alternative 3**.

4.6.2 Economic Effects

Alternative 1 (No Action) would retain an in-season closure and a potential payback provision for an overage of the sector ACL that would reduce the sector ACL by the amount of the overage while gag are overfished. This alternative is the most stringent of the AMs being considered, thus it would likely result in the greatest potential for short-term negative economic effects but long-term economic benefits.

Alternative 2 would result in a fishing season that is announced annually. This AM would limit overall long-term harvest of gag but could result in economic benefits that mitigate the short-term cost of the AM itself by allowing more time to adjust to the changing harvest regulations. There would also be no safeguard in place to prevent the total ACL from being exceeded with the removal of an in-season closure. This could result in short-term economic benefits for the recreational sector due to increased harvest and long-term potential economic costs to fishery participants. Additionally, this alternative does not have a payback provision for an overage of the sector ACL, making the potential for short-term negative economic effects lower in comparison to **Alternative 1 (No Action)**.

The economic effects of **Alternative 3** would likely be similar to those of **Alternative 2**, but the AM for this alternative would be triggered with a single year of landings rather than be in place every year. There would be no safeguard in place to prevent the total ACL from being exceeded with the removal of an in-season closure. Additionally, there would be no further restricted fishing season annually, thus potential harvest is likely higher under **Alternative 3** in comparison to **Alternative 1 (No Action)** and **Alternative 2**. This could result in short-term economic benefits for the recreational sector due to increased harvest and long-term potential economic costs to fishery participants. The economic effects of **Preferred Alternative 4** would likely be similar to those of **Alternative 3**, but there would be lower potential short-term benefits and long-term costs since the in-season closure to harvest would still remain.

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

4.6.3 Social Effects

AMs can have direct and indirect social effects because, when triggered, they can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects. Some of those effects are similar to other thresholds being met and may involve switching to other species or discontinuing fishing altogether. Those restrictions usually translate into reduced opportunity for harvest, which in turn can change fishing behaviors. Those behaviors can increase pressure on other stocks or amplify conflict. While these negative effects are usually short term, they may at times induce other indirect effects that can have a lasting effect on a community.

Alternative 1 (No Action) would not modify the current recreational AMs for gag grouper (in-season closure, post-season season length reduction and ACL payback if overfished and stock ACL is exceeded). Inconsistent closure dates may make it challenging for for-hire businesses to

plan their fishing activities. Overall, longer seasons result in increased fishing opportunities for the recreational sector and increased revenue opportunities for the for-hire sector. Reducing the season length is anticipated to result in direct negative social effects associated with loss of access to the resource.

Alternatively, **Alternative 2** would have NMFS announce the length of the recreational season after the spawning season closure is complete, with an end date corresponding to when the recreational ACL is projected to be met for that year. While the end date for the gag grouper season may shift each year, announcing at the beginning of the open season would allow private anglers and for-hire businesses to plan their activities around the closure in advance. Alternatively, this process does not provide for a reopening should landings fall below the recreational ACL which may result in foregone fishing opportunities if landings occur at a slower rate than projected.

Alternative 3 would remove the in-season closure for gag grouper. Removing the in-season closure would prevent the direct and indirect negative social effects associated with restricted harvest during a current season. Additionally, **Alternative 3** would remove the ACL payback provision which would prevent the direct and indirect negative social effects of a smaller ACL following an overage, reducing access to the fishery during the subsequent season. However, the post-season season length reduction if overfished and stock ACL is exceeded would remain. Longer seasons result in increased fishing opportunities for the recreational sector and increased revenue opportunities for the for-hire sector. Reducing the season length is anticipated to result in direct negative social effects associated with loss of access to the resource.

Preferred Alternative 4 would retain the in-season closure for gag grouper. However, it would remove the ACL payback provision which would prevent the direct and indirect negative social effects of a smaller ACL following an overage, as detailed above, reducing access to the fishery during the subsequent season.

4.6.4 Administrative Effects

Administrative burdens such as data monitoring, rulemaking, outreach, and enforcement would be similar for **Alternative 1 (No Action)**, **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4**. **Alternative 2** would require a season announcement notice in the *Federal Register* annually prior to the season start date. If triggered, **Preferred Alternative 4**, would also require a season announcement notice for a reduced season length.

4.7 Action 7. Modify recreational management measures for black grouper

4.7.1 Sub-action 7a. Establish a recreational vessel limit for black grouper

Alternatives*

1 (No Action). The recreational black grouper bag limit is 1 fish per person per day within the 3 shallow water grouper aggregate (no more than 1 grouper may be gag or black grouper).

2. Establish a private recreational vessel limit for black grouper of:
- 2a. 2 fish per vessel per day.
- 2b. 4 fish per vessel per day.

3. Establish a for-hire vessel limit for black grouper of:
- 3a. 2 fish per vessel per trip.
- 3b. 4 fish per vessel per trip.

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

4.7.1.1 Biological Effects

Expected effects to black grouper and co-occurring species

A recreational vessel limit for black grouper is being considered due to identification issues within the recreational sector only. Juvenile gag and black grouper tend to be more distinguishable with gag displaying a mottled pattern of light and dark patches while black grouper show dark, rectangular blocks separated by pale space (Ross and Moser, 1995). As both species age and move to deeper water, identification becomes more challenging. Misidentified gag and black grouper are prevalent in South Florida and the Florida Keys (SEDAR10-DW-18, 2006). Both gag and black grouper are protogynous hermaphrodites that spawn in aggregates and rely on estuaries for early life stages (Ross and Moser, 1995). Because of these identification issues and similar life history, modifications to black grouper recreational management measures are being considered to ensure gag grouper are rebuilt within the rebuilding plan and constrain harvest to updated catch levels.

Alternatives 2 and **3** and the respective sub-alternatives would constrain harvest when compared to **Alternative 1 (No Action)**. **Sub-Alternative 2a** is expected to be the most constraining alternative for the private recreational component, therefore discards could increase and have negative effects on the black grouper stock (Table 4.7.1.1.1). **Sub-Alternative 2b** is not expected to constrain black grouper harvest and therefore is not expected to have negative effects on the stock (Table 4.7.1.1.1). **Sub-Alternative 3a** is the most constraining on harvest for the for-hire component, resulting in an approximately 24% decrease in landings (Table 4.7.1.1.1). As a result, discards would be expected to increase and could have a negative effect on the stock. **Sub-Alternative 3b** is less constraining on the for-hire component, however a 7% reduction is still expected. Since 2019, black grouper landings have consistently been at 50% and less of the ACL, and therefore any reduction in landings as a result of a vessel or bag limit would make it even less likely that black grouper landings meet or exceed the ACL.

Table 4.7.1.1.1. The predicted percent change in landings per trip for black grouper from the current 1 fish per person per day (pp/day) limit for each of the vessel limit alternatives.

Sub-Action 7a Alternatives	Potential Vessel Limit (# of fish)	MRIP Private Predicted Change in Landings	For-hire Predicted Change in Landings
Alternative 1 (No Action)	1 fish pp/day	0%	0%
Alternative 2	2 per vessel	-6%	-24%
Alternative 3	4 per vessel	0%	-7%

Black grouper are often harvested incidentally when fishing for other snapper grouper species, such as other shallow water grouper, red snapper, and black sea bass. Substantial changes in fishing effort or behavior are not expected as a result of this action, thus the proposed vessel limits under this action would not be expected to result in any additional biological effects on co-occurring species (refer to BPA in Appendix G).

4.7.1.2 Economic Effects

Implementing a vessel limit for black grouper would likely result in a reduction in harvest and economic benefits associated with that harvest. As such **Alternatives 2** and **3** would be expected to reduce CS on some fishing trips, with **Alternative 2** affecting private recreational trips and **Alternative 3** affecting for-hire trips. Since the current recreational sector ACL for black grouper has not been met in recent years, it is assumed that implementing a vessel limit will restrict overall harvest and the associate economic benefits of such harvest (CS), thus there would be an expected decrease in net economic benefits from **Alternatives 2** and **3**, including their sub-alternatives, in comparison to **Alternative 1 (No Action)**.

While there may be some benefit from implementing a vessel limit aboard for-hire vessels stemming from a prolonged season or increased availability of the species, such a limitation may affect the marketability of for-hire trips if limits are set too low. Thus, a lower for-hire vessel limit, such as **Sub-alternative 3a**, may lead to a decrease in PS for for-hire vessels due to decreased for-hire trips being booked by customers. These potential effects cannot be quantified with current data.

4.7.1.3 Social Effects

In general, establishing a vessel limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded. However, limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Establishing a vessel limit would restrict recreational fishing opportunities for black grouper and change the recreational fishing experience. Misidentification of black grouper and gag grouper is an identified issue in the fishery. By mirroring recreational management measures for gag grouper, it ensures that gag grouper, which is currently under a rebuilding plan, is sustainably harvested even when misidentified as a black grouper.

Sub-Alternative 2a would set the most restrictive vessel per day limit for the private component of the recreational sector and would likely result in the largest reduction in landings, followed by **Sub-Alternative 2b**. This reduction in landings is likely to have negative social effects on the recreational sector in the form of decreased access to the resource. Similarly, **Sub-Alternative 3a** would set the most restrictive vessel per trip limit for the for-hire component of the recreational sector and would likely result in the largest reduction in landings, followed by **Sub-Alternative 2b**. This switch from a per person limit (**Alternative 1 (No Action)**) to a vessel limit may have negative social effects on the for-hire component in the form of decreased access to the resource, especially on trips where the number of paying passengers exceeds the number of black grouper that may be retained. However, the proposed private recreational and for-hire limits would ensure that gag grouper, which are often misidentified as black grouper, are sustainably harvested.

4.7.1.4 Administrative Effects

Administrative effects would increase when compared to the status quo [**Alternative 1 (No Action)**] since no vessel limits are in place for black grouper. Recreational vessel limits would need to be monitored for enforcement and compliance. Minor administrative burdens related to deviating from **Alternative 1 (No Action)** would be related to distributing information, education, and enforcement.

4.7.2 Sub-action 7b. Modify the recreational spawning season closure for black grouper

4.7.2.1 Biological Effects

Alternatives*

1 (No Action). The annual recreational black grouper spawning season closure is from January 1 through April 30.

2. Extend the annual recreational black grouper spawning season closure to January 1 through May 31.

3. Extend the annual recreational black grouper spawning season closure to December 1 through April 30.

4. Extend the annual recreational black grouper spawning season closure to December 1 through May 31.

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

Expected effects to black grouper and co-occurring species

Black grouper are protogynous hermaphrodites, meaning they are born female and transition to male later in life. Black grouper are also aggregate spawners which tend to have increased susceptibility to fishing during spawning events (SEDAR 48, 2017).

Most sources note that black grouper spawning occurs from January through April with some sources indicating that black grouper spawn in the winter months as well (Table 4.7.2.1.1). **Alternative 1 (No Action)** provides a spawning season closure which encompasses peak spawning. **Alternative 2** would not be expected to provide a substantial biological benefit for black grouper since most sources note that spawning does not occur in May, however matching the spawning season with gag grouper could help to avoid the harvest of spawning gag from misidentification. **Alternative 3** would provide increased opportunity for black grouper spawning since most sources indicate black grouper are spawning in the winter. **Alternative 4** would be expected to provide the greatest biological benefit as it provides the longest spawning season closure.

Black grouper landings have been variable in recent years with increases in September through October and the winter months. Projected black grouper landings are expected to be highest during November and December, which could result in increased discards is under **Alternatives 3** and **4**. Increased discards would have a negative impact on the stock (Figure 4.7.2.1.1).

Biological benefits to the black grouper stock would be greatest under **Alternative 4**, followed by **Alternative 2**, **Alternative 3,** and **Alternative 1 (No Action)**.

Table 4.7.2.1.1. A comparison of the black grouper spawning season from the Gulf of Mexico and South Atlantic region reported by source. Gray squares indicate spawning and black indicate peak spawning activity.

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SEDAR 48, 2017												
Brule et al., 2018												
Biggs et al., 2017												
Gruss et al., 2017												

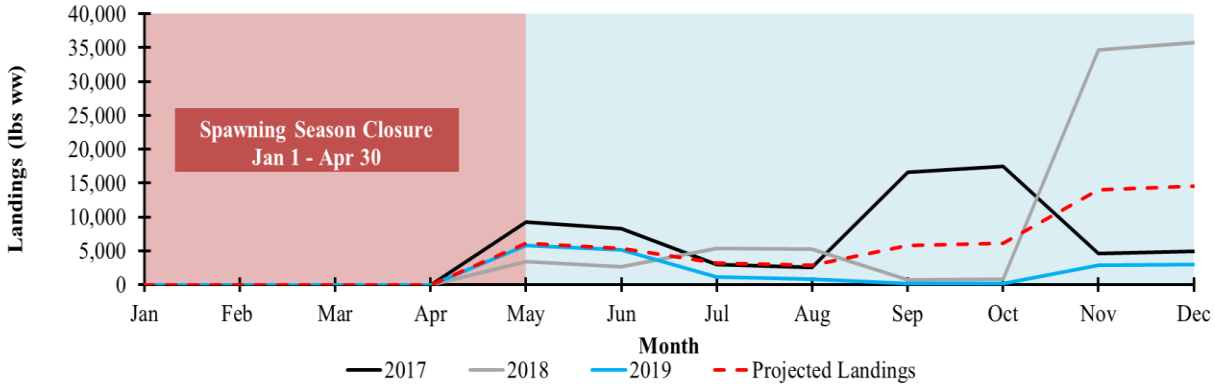

Figure 4.7.2.1.1. South Atlantic black grouper recreational landings by month from 2017-2019 and predicted 2023 landings.

4.7.2.2 Economic Effects

In general, providing increased protection for spawning black grouper would be expected to result in improvements in stock abundance and biomass and create indirect, long-term, positive economic effects presumably through the availability of increased numbers of fish in the future. However, there can be some direct, short-term negative economic effects as fewer fish could be available to harvest until the biomass of harvestable fish increases due to the decrease in the amount of time the species if open to harvest.

Implementing an increased spawning season closure and harvest prohibition for the recreational sector would be expected to reduce landings of black grouper in the short-term and consequently CS under **Alternatives 2**, **3**, and **4** in comparison to **Alternative 1 (No Action)**. From a short-term economic benefits perspective, **Alternative 1 (No Action)** would provide the highest economic benefits followed by **Alternative 3**, **Alternative 2**, and **Alternative 4**.

4.7.2.3 Social Effects

The potential effects on recreational fishing and coastal communities of modifying the black grouper closure will be a trade-off between the biological benefits of the seasonal closure and resulting long-term social benefits from a heathier stock, and the increased recreational fishing opportunities if the closure is shortened. In general, a longer seasonal closure may be biologically beneficial to the stock and contribute to sustainable fishing opportunities in the future if the closure appropriately lines up with spawning, but a longer closure would be more

likely to restrict access to black grouper. **Alternative 4**, which would close the recreational black grouper fishery for six months, is likely to result in the largest reduction in landings, followed by **Alternative 2**, **Alternative 3**, and **Alternative 1 (No Action)**. Ultimately, the direct social effect of modifying the recreational seasonal prohibition will be driven by the level of access to black grouper during periods when participation is highest. Misidentification of black grouper and gag grouper is an identified issue in the fishery. By mirroring recreational management measures for gag grouper, it ensures that gag grouper, which is currently under a rebuilding plan, is sustainably harvested even when misidentified as a black grouper.

4.7.2.4 Administrative Effect

Administrative effects would not vary between **Alternative 1 (No Action)**, **Alternative 2**, **Alternative 3**, and **Alternative 4**. Administrative burdens associated with a recreational spawning season closure would be related to distributing information, education, and enforcement.

4.7.3 Sub-action 7c. Prohibit the retention of black grouper by captain and crew

4.7.3.1 Biological Effects

Alternatives*

1 (No Action). The captain(s) and crew of a for-hire vessel may retain the same daily bag limit of black grouper as allowed for each passenger.

2. The black grouper bag limit for captain(s) and crew of for-hire vessels is zero.

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

Expected effects to black grouper and co-occurring species

Reductions in landings resulting from restrictions on captain and crew retention limits are difficult to quantify because surveys used to collect recreational fishing data do not provide information on the number of captains or crew on the vessel, or whether or not the captain and crew contribute to the catch. **Alternative 1 (No Action)** would maintain status quo regulations and continue to allow captain and crew to retain the same daily black grouper bag limit as allowed for each passenger. **Alternative 2** would reduce the daily bag limit of black grouper for captain and crew to zero while under charter. **Alternative 1 (No Action)** would result in higher bycatch and fishing mortality during the open season when compared to **Alternative 2** because of greater fishing effort. Prohibiting captain and crew from retaining bag limits of black grouper would prevent captains and crew from supplementing their client's catch once their client's daily bag limits or vessel limit (Sub-action 7a) have been met.

Biological benefits to the black grouper stock would be greatest under **Alternative 2**, followed by **Alternative 1 (No Action)**.

Black grouper are often harvested incidentally when fishing for other snapper grouper species, such as other shallow water grouper, red snapper, and black sea bass. Substantial changes in fishing effort or behavior are not expected as a result of this sub-action, thus the prohibition of the bag limit retention for captain and crew under this action would not be expected to result in any additional biological effects on co-occurring species (refer to BPA in Appendix G).

4.7.3.2 Economic Effects

Removing the captain and crew bag limit for black grouper would likely result in a reduction in harvest and economic benefits associated with that harvest. As such **Alternative 2** would be expected to reduce CS on some fishing trips. Since the current recreational sector ACL for black grouper has not been met in recent years, it is assumed that removing the captain and crew bag limit would restrict overall harvest and the associate economic benefits of such harvest (CS), thus there would be an expected decrease in net economic benefits from **Alternatives 2** in comparison to **Alternative 1 (No Action)**.

While there may be some benefit from reducing captain and crew bag limits from a slightly prolonged season, such a limitation may affect the marketability of for-hire trips if this harvest restriction limits the ability to market and sell trips. Thus **Alternative 2** may lead to a decrease

in PS for for-hire vessels due to decreased for-hire trips being booked by customers. **Alternative 1 (No Action)** would alleviate these potential negative economic effects on the for-hire sector and thus lead to higher expected net economic benefits. These potential effects cannot be quantified with current data.

4.7.3.3 Social Effects

In general, prohibiting retention of fish by captain and crew (**Alternative 2**) may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded. However, not being able to retain the black grouper bag limit may lower captain and crew satisfaction and potentially lower overall trip satisfaction because captain and crew would not be able to supplement their client's catch. The captain and crew bag limit under **Alternative 1 (No Action)** would likely have little effect on recreational fishermen in the short-term but could result in negative effects in the future if the recreational ACL is regularly exceeded. Slowing the rate of harvest and ensuring sustainable of harvest of the black grouper and the commonly misidentified gag grouper stock, which is under a rebuilding plan, would provide for long-term social benefits. If slowing the rate of harvest and mirroring gag grouper regulations provides additional fishing opportunities to the recreational fishing communities, **Alternative 2** would be the most beneficial, followed by **Alternative 1 (No Action)**.

4.7.3.4 Administrative Effect

Alternative 1 (No Action) would maintain status quo regulations, which allow captain and crew to retain daily bag limits of black grouper while under charter. **Alternative 2** would result in an additional regulation to enforce, but could reduce the burden on enforcement by making it easier and faster to determine compliance with regulations (less fish to count and measure). **Alternative 2** would also eliminate issues of identification between black grouper and gag.

Chapter 5. DRAFT Council's Rationale for the Preferred Alternatives

TO BE COMPLETED

5.1 Action 1. Establish a rebuilding plan for gag

5.1.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

The South Atlantic Fishery Management Council (Council) Snapper Grouper Advisory Panel (AP) met October 2021 and April 2022 and were given a briefing on the amendment at each meeting. In April 2022, the AP noted concerns with the success of a rebuilding plan if the private recreational sector is not identified through a tag or endorsement. The AP suggested the implementation of a tag or stamp to better understand the amount of gag landings from the private recreational sector.

5.1.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP convened on February 10, 2022. The AP received a briefing on the amendment and had no comments or recommendations pertaining to establishing a rebuilding plan for gag.

5.1.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

TO BE COMPLETED

5.1.4 Public Comments and Recommendations

Scoping meetings were held via webinar in February 2022. No comments were received pertaining to Action 1.

5.1.5 Council's Rationale

TO BE COMPLETED

5.1.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

This action does not directly respond to objectives in the Vision Blueprint as rebuilding overfished stocks is a mandate under the Magnuson-Stevens Conservation and Management Act (Magnuson-Stevens Act).

5.2 Action 2. Revise the acceptable biological catch, total annual catch limit, and annual optimum yield for gag

5.2.1 Snapper Grouper AP Comments and Recommendations

The Council Snapper Grouper AP met October 2021 and April 2022 and were given a briefing on the amendment at each meeting. At both meetings, the AP did not have any recommendations regarding the annual catch limit (ACL) or optimum yield (OY).

5.2.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP convened on February 10, 2022. The AP received a briefing on the amendment and had no comments or recommendations pertaining to the ACL or OY.

5.2.3 SSC Comments and Recommendations

TO BE COMPLETED

5.2.4 Public Comments and Recommendations

Scoping meetings were held via webinar in February 2022. No comments were received pertaining to Action 2.

5.2.5 South Atlantic Council's Rationale

TO BE COMPLETED

5.2.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

This action does not directly respond to objectives in the Vision Blueprint as adjusting catch levels to end overfishing is a mandate under the Magnuson-Stevens Act.

5.3 Action 3. Revise the gag sector allocations and sector annual catch limits

5.3.1 Snapper Grouper AP Comments and Recommendations

The Council Snapper Grouper AP met October 2021 and April 2022 and were given a briefing on the amendment at each meeting. At both meetings, the AP did not have any recommendations regarding sector allocations and sector ACLs.

5.3.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP convened on February 10, 2022. The AP received a briefing on the amendment and had no comments or recommendations pertaining to sector allocations and sector ACLs.

5.3.3 SSC Comments and Recommendations

TO BE COMPLETED

5.3.4 Public Comments and Recommendations

Scoping meetings were held via webinar in February 2022. No comments were received pertaining to Action 3.

5.3.5 South Atlantic Council's Rationale

The Council selected **Preferred Sub-Alternative 4b** in accordance with their intent to revise sector allocations and ACLs to reflect the revised total ACL for gag and the needs of the gag portion of the snapper grouper fishery. In doing so, the Council wanted to recognize the need for balance between the commercial and recreational sector. The Council noted that **Preferred Sub-Alternative 4b** would strike a balance between the needs of both sectors and increase both sector ACLs on a pound basis throughout the rebuilding plan. Thus, this allocation method was considered fair and equitable to fishery participants in both the recreational and commercial sectors and would be carried out in such a manner that no particular individual, corporation, or other entity would acquire excessive shares. This allocation method was also reasonably calculated to promote conservation since it remains within the boundaries of a total ACL that is based upon an ABC recommendation that incorporates BSIA.

The Council concluded **Preferred Sub-Alternative 4b** best meets the purpose and need, the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.3.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

This action addresses actions under Strategy 6.1: *Support management approaches that consider the mechanics of designing allocation strategies* under *Objective 6 – Develop management measures that support optimal sector allocations for the Snapper Grouper Fishery.*

5.4 Action 4. Modify commercial management measures for gag

5.4.1 Sub-action 4a. Reduce the commercial trip limit for gag

5.4.1.1 Snapper Grouper AP Comments and Recommendations

The Council Snapper Grouper AP met October 2021 and April 2022 and were given a briefing on the amendment at each meeting. In April 2021, the AP noted that they preferred either the 300- or 400-pound (lb) gutted weight (gw) trip limit alternative (**Preferred Alternative 3** and **Alternative 4**). The AP also noted that most commercial fishermen would prefer a longer commercial season versus a larger trip limit.

5.4.1.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP convened on February 10, 2022. The AP received a briefing on the amendment and had no comments or recommendations pertaining to the reduction of the commercial trip limit.

5.4.1.3 SSC Comments and Recommendations

TO BE COMPLETED

5.4.1.4 Public Comments and Recommendations

Scoping meetings were held via webinar in February 2022. Several commenters suggested tightening regulations on or prohibiting commercial gag harvest versus the recreational sector during the rebuilding plan. Other commenters suggested a commercial trip limit of 100 and 500 lbs.

5.4.1.5 South Atlantic Council's Rationale

TO BE COMPLETED

5.4.1.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The use of trip limits for the commercial sector is addressed under the Vision Blueprint's Strategy 2.1 - *Support development of management approaches that address retention of snapper grouper species*. The first priority action under this strategy is to consider trip limit adjustments for the commercial sector to lengthen seasons and better utilize ACLs.

5.4.2 Sub-action 4b. Modify the commercial spawning season closure for gag

5.4.2.1 Snapper Grouper AP Comments and Recommendations

The Council Snapper Grouper AP met October 2021 and April 2022 and were given a briefing on the amendment at each meeting. In April 2021, the AP noted that they preferred a commercial spawning season with an additional month in the spring (January 1 – May 31, **Alternative 2**).

5.4.2.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP convened on February 10, 2022. The AP received a briefing on the amendment and had no comments or recommendations pertaining to the commercial spawning season closure.

5.4.2.3 SSC Comments and Recommendations

TO BE COMPLETED

5.4.2.4 Public Comments and Recommendations

Scoping meetings were held via webinar in February 2022. Commenters suggested that prior to modifying the current spawning season closure, it should be evaluated for its effectiveness. With regards to modification suggestions, one commenter suggested extending the closure while another suggested implementing spatial spawning closures from January through June.

5.4.2.5 South Atlantic Council's Rationale

TO BE COMPLETED

5.4.2.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The use of spawning season closures is addressed under the Vision Blueprint's Strategy 2.3 - *Support development of management approaches that account for the seasonality of the snapper grouper fishery.*

5.5 Action 5. Modify recreational management measures for gag

5.5.1 Sub-action 5a. Establish a recreational vessel limit for gag

5.5.1.1 Snapper Grouper AP Comments and Recommendations

The Council Snapper Grouper AP met October 2021 and April 2022 and were given a briefing on the amendment at each meeting. In April 2021, the AP noted that they preferred a vessel limit of either 4 or 6 fish per vessel (**Alternative 3** or **4**).

5.5.1.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP convened on February 10, 2022. The AP received a briefing on the amendment and had no comments or recommendations pertaining to the recreational vessel limit.

5.5.1.3 SSC Comments and Recommendations

TO BE COMPLETED

5.5.1.4 Public Comments and Recommendations

Scoping meetings were held via webinar in February 2022. Several commenters were opposed to a vessel limit for gag. One commenter was in favor of a vessel limit for gag and suggested a 1 fish per vessel per day limit with a tag lottery system for headboats.

5.5.1.5 South Atlantic Council's Rationale

TO BE COMPLETED

5.5.1.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

This action addresses Strategy 2.1– Support development of management approaches that address retention of snapper grouper species under Objective 2 - Develop innovative management measures that allow consistent access to the fishery for all sectors.

5.5.2 Sub-action 5b. Modify the recreational spawning season closure for gag

5.5.2.1 Snapper Grouper AP Comments and Recommendations

The Council Snapper Grouper AP met October 2021 and April 2022 and were given a briefing on the amendment at each meeting. In April 2021, some AP noted that they preferred a recreational spawning season with an additional month in the spring (January 1 – May 31, **Alternative 2**) while others noted that May is a crucial month for the charter component.

5.5.2.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP convened on February 10, 2022. The AP received a briefing on the amendment and had no comments or recommendations pertaining to the recreational spawning season closure.

5.5.2.3 SSC Comments and Recommendations

TO BE COMPLETED

5.5.2.4 Public Comments and Recommendations

Scoping meetings were held via webinar in February 2022. Commenters suggested that prior to modifying the current spawning season closure, it should be evaluated for its effectiveness. With regards to modification suggestions, one commenter suggested extending the closure while another suggested implementing spatial spawning closures from January through June.

5.5.2.5 South Atlantic Council's Rationale

TO BE COMPLETED

5.5.2.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The use of spawning season closures is addressed under the Vision Blueprint's Strategy 2.3 - *Support development of management approaches that account for the seasonality of the snapper grouper fishery.*

5.5.3 Sub-action 5c. Prohibit the retention of gag by captain and crew

5.5.3.1 Snapper Grouper AP Comments and Recommendations

5.5.3.2 Law Enforcement AP Comments and Recommendations

5.5.3.3 SSC Comments and Recommendations

5.5.3.4 Public Comments and Recommendations

5.5.3.5 South Atlantic Council's Rationale

5.5.3.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

5.6 Action 6. Revise the gag recreational accountability measures

5.6.1 Snapper Grouper AP Comments and Recommendations

The Council Snapper Grouper AP met October 2021 and April 2022 and were given a briefing on the amendment at each meeting. At both meetings, the AP did not have any recommendations regarding the recreational accountability measures (AM).

5.6.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP convened on February 10, 2022. The AP received a briefing on the amendment and had no comments or recommendations pertaining to the recreational AMs.

5.6.3 SSC Comments and Recommendations

TO BE COMPLETED

5.6.4 Public Comments and Recommendations

Scoping meetings were held via webinar in February 2022. No comments were received pertaining to Action 6.

5.6.5 South Atlantic Council's Rationale

TO BE COMPLETED

5.6.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

This action does not directly address management objectives in the Vision Blueprint. Establishing AMs to prevent overfishing is a mandate under the Magnuson-Stevens Act.

5.7 Action 7. Modify recreational management measures for black grouper

5.7.1 Sub-action 7a. Establish a recreational vessel limit for black grouper

5.7.1.1 Snapper Grouper AP Comments and Recommendations

5.7.1.2 Law Enforcement AP Comments and Recommendations

5.7.1.3 SSC Comments and Recommendations

5.7.1.4 Public Comments and Recommendations

5.7.1.5 South Atlantic Council's Rationale

5.7.1.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

5.7.2 Sub-action 7b. Modify the recreational spawning season closure for black grouper

5.7.2.1 Snapper Grouper AP Comments and Recommendations

5.7.2.2 Law Enforcement AP Comments and Recommendations

5.7.2.3 SSC Comments and Recommendations

5.7.2.4 Public Comments and Recommendations

5.7.2.5 South Atlantic Council's Rationale

5.7.2.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

5.7.3 Sub-action 7c. Prohibit the retention of black grouper by captain and crew

5.7.3.1 Snapper Grouper AP Comments and Recommendations

5.7.3.2 Law Enforcement AP Comments and Recommendations

5.7.3.3 SSC Comments and Recommendations

5.7.3.4 Public Comments and Recommendations

5.7.3.5 South Atlantic Council's Rationale

5.7.3.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

Chapter 6. Cumulative Effects

TO BE COMPLETED

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, 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.[14] For the proposed actions found in Amendment 53 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

Fishery managers implemented the first significant regulations pertaining to snapper grouper species in 1983 through the Snapper Grouper FMP (SAFMC 1983). Listed below are other past, present, and reasonably foreseeable actions occurring in the South Atlantic Region. These actions, when added to the proposed management measures, may result in cumulative effects on the biophysical and socio-economic environment. The complete history of management of the snapper grouper fishery can be found in Appendix I (History of Management).

Past Actions

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

Amendment 37 to the Snapper Grouper FMP, 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, effective on July 26, 2017, specified recreational and commercial annual catch limits (ACL) for red snapper beginning in 2018.

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

Abbreviated Framework 1 to the Snapper Grouper FMP, 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 exclusive economic zone (EEZ).

Abbreviated Framework 2 to the Snapper Grouper FMP, 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, 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.

Regulatory Amendment 27 (Vision Blueprint Regulatory Amendment 27) to the Snapper Grouper FMP, 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, 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.

Regulatory Amendment 26 (Vision Blueprint Regulatory Amendment 26) to the Snapper Grouper FMP, 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, 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.

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

Regulatory Amendment 33 to the Snapper Grouper FMP, 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.

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

Present Actions

Amendment 44 to the Snapper Grouper FMP will 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.

Amendment 49 to the Snapper Grouper FMP would address the results of the latest stock assessment for the greater amberjack stock in the South Atlantic region.

Amendment 50 to the Snapper Grouper FMP would address the results of the latest stock assessment for the red porgy stock in the South Atlantic region. Red porgy was determined to be overfished and undergoing overfishing. The Council submitted Amendment 50 for review by the Secretary of Commerce on May 3, 2022.

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.

Regulatory Amendment 35 to the Snapper Grouper FMP would modify management of South Atlantic red snapper. Actions include revising annual catch limits (ACL), and gear modifications for the recreational sector.

Reasonably Foreseeable Future Actions

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

Regulatory Amendment 31 to the Snapper Grouper FMP could include actions to revise recreational accountability measures to allow more flexibility in managing recreational fisheries. Development of this framework amendment is currently on hold.

Expected Impacts from Past, Present, and Future Actions

The intent of Amendment 53 is to modify management of South Atlantic gag. Actions include establishing a rebuilding plan, and revising annual catch limits (ACL), sector allocations, recreational accountability measures (AM), and management measures for the commercial and recreational sectors. Development of Amendment 53 is a response to the most recent stock assessment for South Atlantic gag (SEDAR 71 2021). The proposed actions in Amendment 53 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 could result in increased regulatory discards of gag. However, the proposed actions would end overfishing and establish a plan to rebuild the stock.

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 dolphin and wahoo, snapper grouper, and golden crab fisheries is not known at this time. The Environmental Protection Agency's climate change webpage (https://www.epa.gov/climate-indicators/marine-species-distribution), and NOAA's Office of Science and Technology climate webpage (https://www.fisheries.noaa.gov/topic/climate), provides background information on climate change, including indicators which measure or anticipate effects on oceans, weather and climate, ecosystems, health and society, and greenhouse gases. The United Nations Intergovernmental Panel on Climate Change's 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 Amendment 53 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 amendment, in combination with past, present, and future actions have been determined to be significant. Although several other management actions, in addition to this amendment, are

expected to affect 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. 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 Information Survey and the Marine Resources Monitoring Assessment and Prediction Program. The effects of the proposed actions are, and would continue to be, monitored through collection of 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 Interdisciplinary Plan Team (IPT) Members

Name	Agency/Division	Title
Manny Antoneras	SERO/OLE	Criminal Investigator
Myra Brouwer	SAFMC	Deputy Director for Management
Kevin Craig	NMFS/SEFSC	Fishery Biologist
Scott Crosson	SERO/SF	Economist
Judd Curtis	SAFMC	Quantitative Fishery Scientist
Rick DeVictor	SERO/SF	South Atlantic Branch Chief
Ed Glazier	SERO/SF	Social Scientist
Alisha Gray	SERO/SF	Data Analyst
John Hadley	SAFMC	Economist
Frank Helies	SERO/SF	Fishery Scientist/IPT Lead
Allie Iberle	SAFMC	Fishery Scientist/IPT Lead
Jennifer Lee	SERO/PR	Fishery Biologist
Roger Pugliese	SAFMC	Senior Fishery Biologist
David Records	SERO/SF	Economist
Scott Sandorf	SERO/SF	Technical Writer & Editor
Mike Schmidtke	SAFMC	Fishery Biologist
Monica Smit-Brunello	NOAA GC	General Counsel
Sara Stephenson	SERO/SF	Fishery Biologist
Mike Travis	SERO/SF	Data Analyst
Matthew Walia	SERO/OLE	Compliance Liaison Analyst
Christina Wiegand	SAFMC	Social Scientist

NOAA=National Oceanic and Atmospheric Administration, NMFS = National Marine Fisheries Service, SERO = Southeast Regional Office, SF = Sustainable Fisheries Division, PR = Protected Resources Division, HC = Habitat Conservation Division, SEFSC=Southeast Fisheries Science Center, GC = General Counsel

Chapter 8. Agencies and Persons Consulted

Responsible Agencies

South Atlantic Fishery Management Council (Administrative Lead)
4055 Faber Place Drive, Suite 201
N. Charleston, South Carolina 29405
843-571-4366/ 866-SAFMC-10 (TEL)
843-769-4520 (FAX)
www.safmc.net

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

List of Agencies, Organizations, and Persons Consulted

SAFMC Law Enforcement Advisory Panel
SAFMC 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

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Appendix A. Other Applicable Laws

1.1 Administrative Procedure Act (APA)

All federal rulemaking is governed under the provisions of the APA (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Among other things under the APA, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect, with some exceptions. Amendment 53 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 53) 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 plan amendment will have a request for public comments, which complies with the APA, and upon publication of the final rule, unless the rule falls within an APA exception, there will be a 30-day wait period before the regulations are effective.

1.2 Information Quality Act (IQA)

The IQA (Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-443)) which took effect October 1, 2002, directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidelines to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the IQA. Amendment 53 uses the best available information and made a broad presentation thereof. The information contained in this document was developed using best available scientific information. Therefore, this document is in compliance with the IQA.

1.3 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the federal CZMA of 1972 requires that all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the Council to have management measures that complement those of the states, federal and state administrative procedures vary and regulatory changes are unlikely to be fully instituted at the same time. The Council believes the actions in this 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.

1.4 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.

1.5 Executive Order 12962: Recreational Fisheries

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

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

1.6 Executive Order 13089: Coral Reef Protection

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

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

1.7 Executive Order 13158: Marine Protected Areas (MPAs)

E.O. 13158 was signed on May 26, 2000, to strengthen the protection of U.S. ocean and coastal resources through the use of 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.

1.8 National Marine Sanctuaries Act (NMSA)

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

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

1.9 Paperwork Reduction Act (PRA)

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

1.10 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.

1.11 Public Law 99-659: Vessel Safety

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

Appendix B. Regulatory Impact Review

TO BE COMPLETED

Appendix C. Regulatory Flexibility Analysis

TO BE COMPLETED

Appendix D. Essential Fish Habitat and Ecosystem Based Fishery Management

I. 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.

a. 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 (South Atlantic 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.

b. 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 South Atlantic 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 South Atlantic 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 South Atlantic Council will pursue these goals at state, Federal, and local levels. The South Atlantic 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 South Atlantic Council.

c. 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 South Atlantic Council in cooperation with NMFS, actively comments on non- fishing projects or policies that may impact fish habitat. The South Atlantic Council established a Habitat Protection and Ecosystem Based Management Advisory Panel (AP) and adopted a comment and policy development process. Members of the AP serve as the South Atlantic Council's habitat contacts and professionals in the field and have guided the South Atlantic 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)

II. Habitat Conservation and Fishery Ecosystem Plans

The South Atlantic Council, views habitat conservation as the foundation in the move to Ecosystem Based Fishery Management (EBFM) in the region. The South Atlantic Council has been proactive in advancing habitat conservation through extensive gear restrictions in all South Atlantic 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 South Atlantic 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, (3) social, and cultural benefits from resources; and (4) maintaining or improving biological, economic, and cultural diversity.

III. 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.

IV. FEP II Development

The South Atlantic 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 of ecosystem considerations into the management process.

FEP II was developed employing writing and review teams established from the South Atlantic Council's Habitat Protection and Ecosystem Based Management AP, and experts from state, federal, NGOs, academia and other regional organizations and associations. Unlike the original Plan, FEP II is a living continually developing online information system presenting core sections and sections with links to documents or other online systems with detailed updated

information on species, habitat, fisheries and research. A core part of the FEP II development process involved engaging the South Atlantic 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.

V. 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. The Council's new website (under development) will include a new Habitat and Ecosystem page where the FEP II Dashboard layout shown below will be refined and integrated.

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

VI. NOAA EBFM Activities Supporting FEP II

a. 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 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 of ecosystems and their components; explore and address trade-offs within an ecosystem; incorporate ecosystem considerations into management advice; and maintain resilient ecosystems.

b. FEP II Implementation Plan Structure and Framework

The Implementation Plan is structured to translate approved policy statements of the South Atlantic 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 South Atlantic Council's FEP II policies and objectives.

c. 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 South Atlantic Council which would be initiated or completed over the next two years (2019-2020). The Roadmap provides "Potential Partners" and other potential regional collaborators, a focused list of priority actions they could cooperate with the South Atlantic Council on to advance policies supporting the move to EBFM in the South Atlantic region.

d. Monitoring/Revisions to FEP II Implementation Plan

FEP II and this supporting Implementation Plan are considered active and living documents. The Implementation Plan will be reviewed and updated periodically. During their spring meeting in 2021 and every three years following, the Habitat Protection and Ecosystem Based

Management AP will engage regional experts as needed, to determine whether additional actions addressing council policies should be added to the implementation plan. The South Atlantic Council's Habitat Protection and Ecosystem Based Management Committee will review, revise and refine those recommendations for South Atlantic Council consideration and approval for inclusion into the implementation plan.

VII. Regional Habitat and Ecosystem Partners

The South Atlantic 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

VIII. Regional Ecosystem Modeling in the South Atlantic

a. South Atlantic Ecopath with Ecosim Model

The South Atlantic 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 South Atlantic Council. This effort helped the South Atlantic 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 EwE model provides a more complete view of the system and supports potential future evaluations that may be possible with the model. With the model complete and tuned to the available data it can be used to address broad strategic issues and explore "what if" scenarios that could then be used to address tactical decision-making questions such as provide ecosystem context for single species management, address species assemblage questions, and address spatial questions using Ecospace.

A modeling team comprised of FWRI staff, South Atlantic 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.

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

The South Atlantic 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.

IX. 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 South Atlantic Council use in place-based management measures. Additional resources need to be dedicated to expanding regional coordination of modeling, mapping, characterization of species use of habitats, and full funding of regional fishery independent surveys (e.g., MARMAP, SEAMAP, and SEFIS) which are linking directly to addressing high priority management needs. The FEP II Implementation Plan includes Appendix A to highlight research and data needs excerpted from the SEAMAP 5 Year Plan because they represent short and long-term research and data needs that support EBFM and habitat conservation in the South Atlantic Region.

Development of ecosystem information systems to support South Atlantic 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 South Atlantic 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. Actions and Alternatives Removed from Consideration

TO BE COMPLETED

Action. Increase the gag minimum size limit.

Alternative 1 (No Action). The gag minimum size limit is 24 inches total length.

Alternative 2. The gag minimum size limit is 28 inches total length.

Alternative 3. The gag slot limit is 24 inches total length to 30 inches total length.

Discussion: The revision of the current minimum size limit was discussed because of concerns of a lack of large, mature, male gag. The Council discussed the merits of increasing the size limit or creating a slot limit but there were concerns of increased discards with both options. Ultimately the Council felt that increased discards would be detrimental to the stock and that the current size limit is sufficient to allow gag a chance to spawn before being prosecuted by the fishery.

Action. Restrict dive gear (including bang sticks) during the gag rebuilding plan.

Alternative 1 (No Action). There are no restrictions to spearfishing gear for gag grouper.

Alternative 2. Spearfishing gear (including bang sticks) is not allowed during the rebuilding plan for gag.

Alternative 3. Spearfishing gear (including bang sticks) is not allowed during certain months of the year.

Discussion: After the assessment review, the Council was concerned about the lack of larger, male gag in the population and this gear type's ability to remove these individuals from the population. During the scoping sessions an overwhelming number of commenters opposed to the restriction or removal of spearfishing gear for gag. Commenters noted that removing this gear type for gag would be detrimental to spearfishing operations. Commenters also noted that spearfishermen have the ability to be selective when fishing and that if a slot limit was created, they could correctly judge size underwater, but that they rarely remove large males because of limitations in depth and dive time. Spearfishermen also pointed out to the Council that spearfishing involves very little to no discard, which is a major issue in the snapper grouper fishery. Considering the comments submitted, the Council felt that relying on other management measures that limit effort would help contribute to rebuilding success while still ensuring fair and equitable access to the resource.

Action. Modify the commercial accountability measures for gag grouper

Alternative 1 (No Action). If commercial landings reach or are projected to reach the commercial annual catch limit, commercial harvest of gag is closed for the remainder of the fishing year, regardless of stock status, unless National Marine Fisheries Service determines that no closure is necessary based on the best scientific information available. If commercial landings exceed the commercial annual catch limit, then during the following fishing year commercial landings will be monitored for a persistence in increased landings. If the total annual catch limit is exceeded and gag are overfished, the length of the commercial fishing season and the commercial annual catch limit are reduced by the amount of the commercial annual catch limit overage.

Alternative 2. The commercial gag season will start annually on May 1. National Marine Fisheries Service will annually announce the commercial fishing season end dates in the Federal Register and by other methods, as deemed appropriate. The fishing season will end on the date National Marine Fisheries Service projects the commercial annual catch limit will be met.

Alternative 3. Remove the current in-season accountability measures. If commercial landings exceed the commercial annual catch limit, reduce the length of the following year's commercial fishing season by the amount necessary to prevent the commercial annual catch limit from being exceeded in the following year. However, the length of the commercial season will not be reduced if the Regional Administrator determines, using the best scientific information available, that it is not necessary.

Alternative 4. Retain the current in-season accountability measures. If commercial landings exceed the commercial annual catch limit, reduce the length of the following year's commercial fishing season by the amount necessary to prevent the commercial annual catch limit from being exceeded in the following year. However, the length of the commercial season will not be reduced if the Regional Administrator determines, using the best scientific information available, that it is not necessary.

Alternative 5. Remove the current in-season accountability measures. If commercial landings exceed the commercial annual catch limit OR landings exceed the total annual catch limit, reduce the length of the following year's commercial fishing season by the amount necessary to prevent the commercial sector's annual catch limit from being exceeded in the following year. However, the length of the commercial season will not be reduced if the Regional Administrator determines, using the best scientific information available, that it is not necessary.

Discussion: The Council felt that the current commercial accountability measure functions appropriately for the commercial sector. The current accountability measure uses both an in-season and post-season accountability measure the Council felt is effective at helping to prevent overages and pay back any overages that occur in the following fishing year.

Appendix F. Data Analyses

TO BE COMPLETED

1.1 Gag Analysis

Modeling the Seasonal Closures for the South Atlantic Gag Recreational and Commercial Sectors

LAPP/DM Branch
NOAA Fisheries Service
Southeast Regional Office
May 2022

Introduction

Gag (*Mycteroperca microlepis*) are one of 55 species in the South Atlantic Snapper-Grouper Fishery Management Plan (FMP). The FMP provides management for snapper and grouper species in the federal waters of the South Atlantic.

In 2021, a stock assessment was conducted for the South Atlantic gag (SEDAR 71). Results from the assessment showed the gag stock is overfished and experiencing overfishing. An amendment to the Snapper-Grouper FMP is currently being drafted and its purpose is to establish management measures that will rebuild the stock. The current management measures of the recreational sector include a spawning season closure from January 1 – April 30, a minimum size of 24 inches total length, and a recreational bag limit of 1 fish per person per day. The current management measures of the commercial sector include a spawning season closure from January 1 – April 30, a minimum size of 24 inches total length, and a commercial trip limit of 1,000 pounds gutted weight (lbs gw) until 75% of the annual catch limit (ACL) is met or is projected to be met, at which point a 500 lbs gw trip limit would apply. The FMP amendment proposes to establish a rebuilding plan, set an acceptable biological catch, consider adjusting sector allocations, spawning season closures, recreational bag limits and commercial trip limits, and finally, setting new ACLs that incorporate the updated Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES) data for the South Atlantic gag fishery.

Data Sources

Commercial landings data for South Atlantic gag were obtained from the Southeast Fisheries Science Center (SEFSC) on April 5, 2022. The SEFSC commercial logbook data (5/6/21) was also obtained for trip level data.

Recreational landings data for South Atlantic gag were obtained from the Southeast Fisheries Science Center (SEFSC) on March 17, 2022. This data set includes landings from the Southeast Region Headboat Survey (SRHS), the Texas Parks and Wildlife Department (TPWD) Creel

survey, the Louisiana Creel survey (LA Creel) and the Marine Recreational Information Program (MRIP) Access Point Angler Intercept Survey (APAIS) and Fishing Effort Survey (FES). The current recreational survey has been the MRIP FES since 2015 when the MRIP Coastal Household Telephone Survey (CHTS) was discontinued. Conversion factors were used on the MRIP FES data to provide the MRIP CHTS survey equivalent landings to match the landings that were used to set the current ACL and ACT for South Atlantic gag. The MRIP survey file also included imputed MRIP catch estimates for 2020 to account for disruptions in dockside sampling due to COVID. MRIP, TPWD, and LA Creel conduct dockside intercepts to collect information on the size and number of gag caught by mode (charter, private, shore). SRHS surveys collect size and number of gag through logbooks completed by headboat operators.

Methods

Reductions in landings are necessary to achieve the FMP amendment's need to end overfishing of South Atlantic gag, rebuild the stock, and achieve optimum yield while minimizing, to the extent practicable, adverse social and economic effects. Several management measures were explored as tools to reduce harvest. Such measures included investigating different spawning season closures, reducing recreational vessel limits and commercial trip limits, and considering various rebuilding plans with reduced ACLs set using the updated MRIP FES. All calculations were done using SAS (SAS Institute, Cary, NC).

Predicted Future Landings

The FMP amendment will impose new and reduced ACLs for both the recreational and commercial sectors and use updated MRIP FES data for the recreational sector. Monthly predicted landings are required to explore how the reduced ACLs and spawning season closure options will impact the fishing season length. Predicted landings are estimated by taking a three-year monthly average of the three most recent years of complete data, as those are believed to be the best approximation of future harvest patterns. Since 2020 and 2021 landings data are not considered representative landings due to the global pandemic, years 2017-2019 were used to estimate predicted landings. Commercial landings data are provided as monthly estimates. For recreational landings, the SRHS provides monthly landings estimates, however, MRIP data is provided in two-month waves (e.g., January and February = wave 1, March and April = wave 2, etc.). To estimate monthly recreational landings, MRIP waves were first used to generate monthly landings by assuming equal daily catch rates for months within a wave, and then monthly SRHS landings were added back in. Predicted landings, and the landings used to generate those predicted landings, are shown in Figures F.1.1.1 and F.1.1.2.

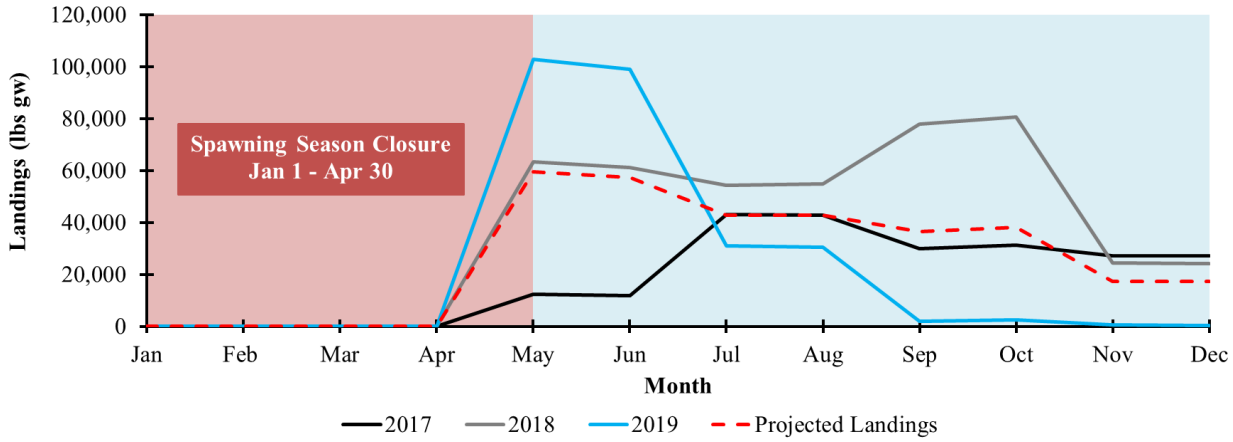

Figure F.1.1.1. South Atlantic gag recreational landings by month from 2017-2019 and predicted 2023 landings. All of the landing projections assume no landings between January 1 and April 30 for the spawning season closure.

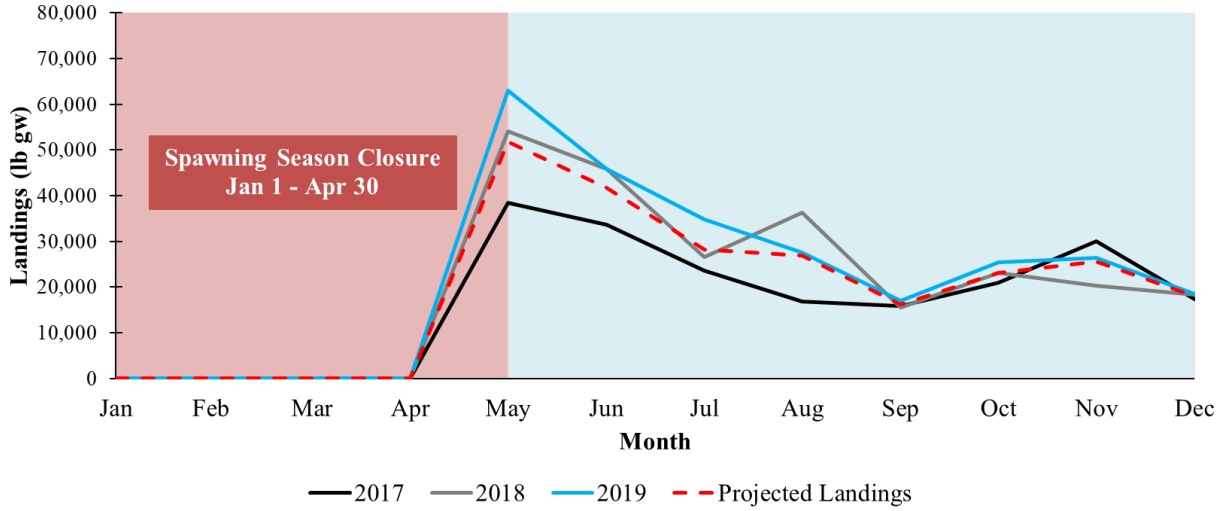

Figure F.1.1.2. South Atlantic gag commercial landings by month from 2017-2019 and predicted 2023 landings. All of the landing projections assume no landings between January and April 30 for the spawning season closure.

Season Projections with Reduced Annual Catch Limits

All predicted landings were used to produce daily recreational and commercial landing estimates by assuming equal landing rates for each day within a month. Cumulative daily landings for the fishing year were compared against a range of the ACLs proposed in the FMP amendment to project closure dates. The proposed ACLs compared against predicted landings assume the preferred rebuilding plan of a maximum of 10 years. The proposed recreational ACL for Action 2, Alternative 1 uses MRIP CHTS data since that is what the fishery is currently managed under. All other proposed recreational ACLs incorporate the updated MRIP FES data.

Closed Season Analyses

The majority of landings of South Atlantic gag occur at the start of the fishing season in May, and typically decline through the remainder of the year. The amendment to the FMP includes options to adjust the spawning season closure for both the recreational and commercial sectors to reduce harvest. The impact of a seasonal closure was modeled by converting the number of days closed into a percentage of days closed for a given month. The projected landings during that month were then reduced by the percentage of the month that was closed.

Commercial Trip Limit Analysis

The SEFSC commercial logbook data (5/6/21) were used to examine trip limits in the South Atlantic gag commercial sector. Currently, the fishery has a 1,000 lbs gw trip limit that is reduced to 500 lbs gw when 75% of the ACL is met or projected to be met. From 2017 through 2019, the commercial logbook had 8,607 trips recorded that harvested gag in the South Atlantic. A majority (78%) of trips harvesting gag landed less than 200 lbs gw, and most landed less than 500 (94%; Figure F-3). Landing reductions for each trip limit option were estimated by normalizing all trips that harvested greater than the allowable limit to the maximum allowable landings. For example, to determine the percent reduction in landings if a 200 lbs gw trip limit were imposed, trips estimated to have harvested greater than 200 lbs gw were normalized to have harvested only 200 lbs gw and new total landings was calculated to compare with landings under current limits. Estimated reductions from projected landings for potential trip limits are shown in Table F.1.1.1.

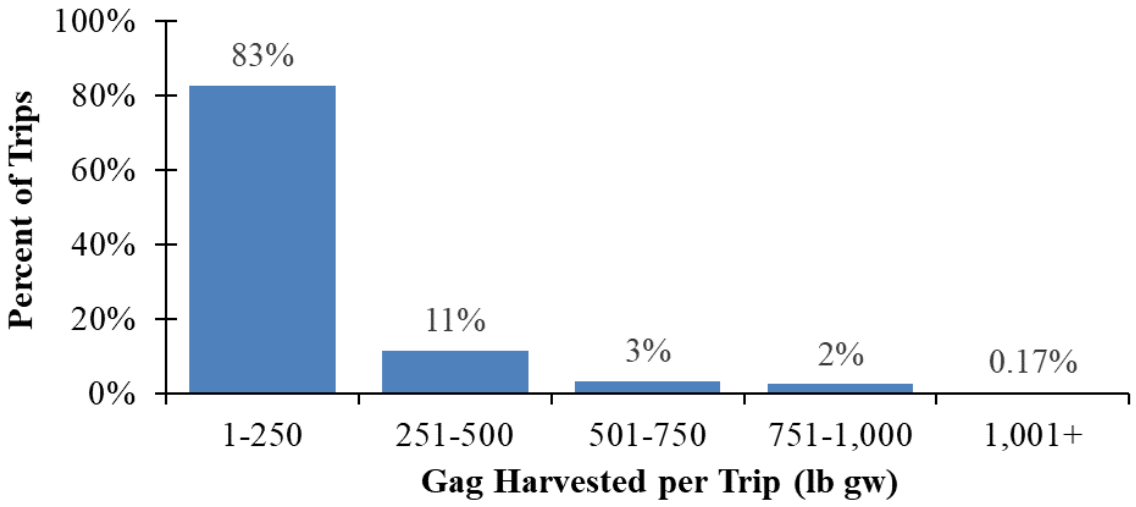

Figure F.1.1.3. The percent of commercial trips (n=8,607) harvesting gag by bin from 2017 through 2019. Source: SEFSC commercial logbook (May 6, 2021).

Table F.1.1.1. The predicted percent change in landings per trip from the current 1,000 lbs gw trip limit.

Current Trip Limit (lbs gw)	Potential Trip Limit (lbs gw)	Predicted Change in Landings
1,000	500	-8%
1,000	400	-13%
1,000	300	-20%
1,000	200	-32%

Recreational Vessel Limit Analysis

Recent recreational catch-effort data from the MRIP FES and the SRHS were used to examine vessel limits in the South Atlantic gag recreational fishery. Currently, the fishery has a 1 fish per person per day limit. From 2017 through 2019, there were 54 trips in the MRIP FES and 897 trips in the SRHS that reported harvesting gag in the South Atlantic. All trips reported landing one gag or fewer per person per day. Additionally, a majority of trips (78%) in the MRIP FES and over half (57%) in the SRHS reported harvesting one gag or fewer per trip (**Figure F.1.1.4**). Landing reductions for each vessel limit option were estimated by normalizing all trips that harvested greater than the allowable limit to the maximum allowable landings. For example, to determine the percent reduction in landings if a 2 fish vessel limit were imposed, trips estimated to have harvested greater than 2 fish per vessel were normalized to have harvested only 2 fish and new total landings was calculated to compare with landings under current limits. Estimated reductions from projected landings for potential trip limits are shown in **Table F.1.1.2**.

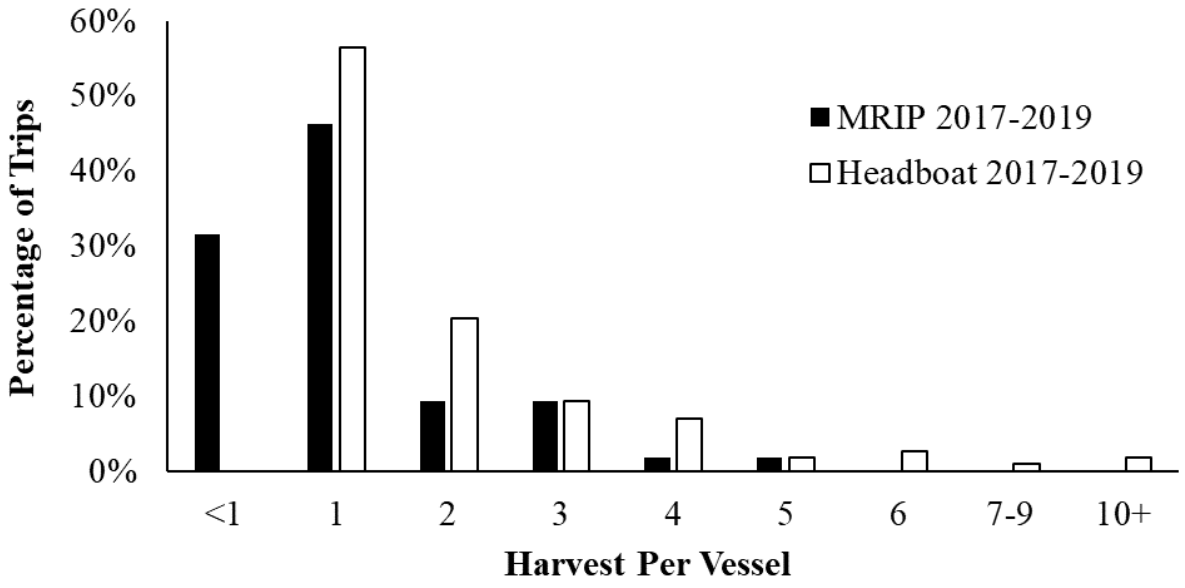

Figure F.1.1.4. Distribution of South Atlantic gag harvested per vessel trip from the two recreational datasets: MRIP FES (n = 54 trips), and headboat (n= 897 trips).

Table F.1.1.2. The predicted percent change in landings per trip from the current 1 fish per person per day limit.

Current Vessel Limit (# of fish)	Potential Vessel Limit (# of fish)	MRIP Predicted Change in Landings	SRHS Predicted Change in Landings
1 pp/day	6 per vessel	0%	-5%
1 pp/day	4 per vessel	-1%	-11%
1 pp/day	2 per vessel	-16%	-30%

Decision Tool

Two separate decision tools were developed to explore all management options being considered in Amendment 53 to the Snapper-Grouper FMP. A recreational decision tool (RDT) was developed to explore recreational sector specific management options, and a commercial decision tool (CDT) to explore commercial sector specific management options.

Percent reductions calculated from changes in spawning season closures were applied to predicted future landings to determine how much harvest would be reduced and incorporated into both decision tools. If month (*m*) was 100% closed, landings were set to zero pounds for all sectors. If a month was partially or fully open, the predicted monthly landings were computed as follows:

$$L_{sector,m} = PL_{sector,m} * O_m$$

where PL is the projected future landings and O is the percent of month open to fishing. Percent reductions calculated from changes in recreational vessel limits were applied to future projected recreational landings to determine how much recreational harvest could be further impacted. These reductions were incorporated into the RDT. The impacts of a recreational vessel limit on predicted monthly landings were computed as follows:

$$L_{sector,m} = PL_{sector,m} * VLR_m$$

where PL is the projected future landings and VLR is the percent reduction expected based on the recreational vessel limit option being considered.

Percent reductions calculated from changes in commercial trip limits were applied to future projected commercial landings to determine how much commercial harvest could be further impacted. These reductions were incorporated into the CDT. The impacts of a commercial trip limit on predicted monthly landings were computed as follows:

$$L_{sector,m} = PL_{sector,m} * CTR_m$$

where PL is the projected future landings and CTR is the percent reduction expected based on the commercial trip limit option being considered.

Both the RDT and CDT were implemented in Microsoft Excel using drop-down menus for inputting desired management measures and exploring different combinations of management options (**Figures F.1.1.5 and F.1.1.6**). Excel was chosen because it is widely available for constituent use.

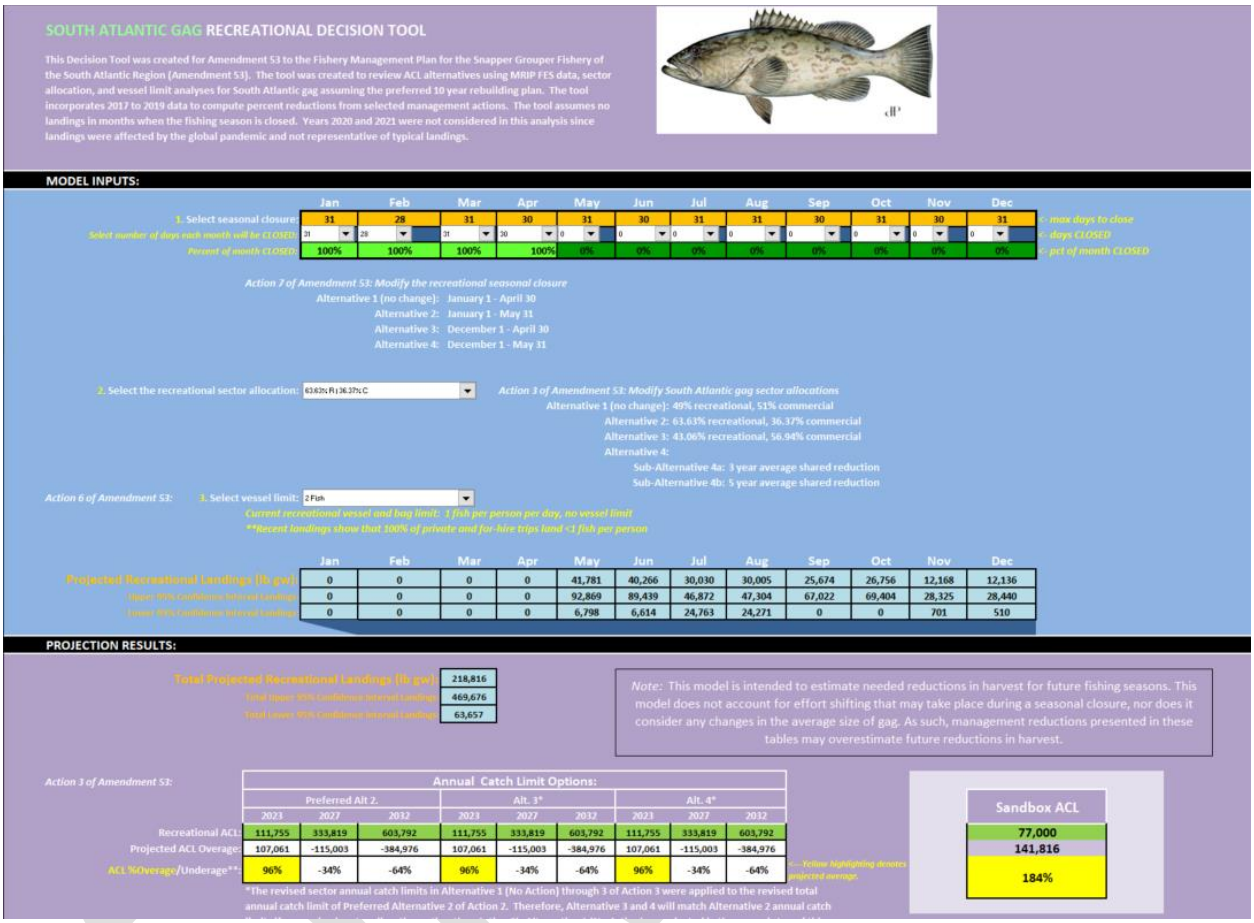

Figure F.1.1.5. Screenshot for the recreational decision tool.

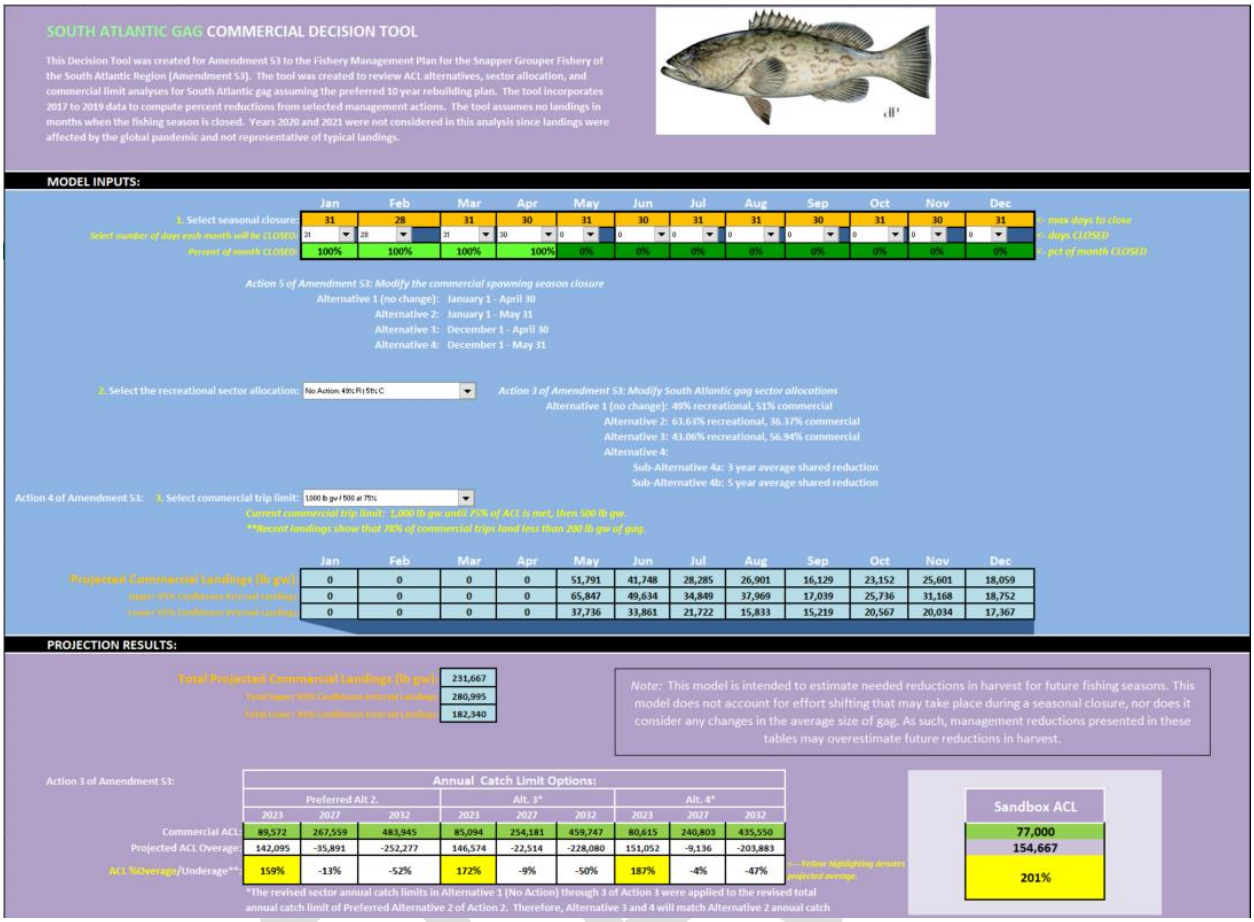

Figure F.1.1.6. Screenshot for the commercial decision tool.

Results

Projected recreational and commercial landings and days open in the season if Alternative 1 of Action 2 were selected are presented in **Table F.1.1.3**. This alternative maintains current management regulations and sets the total ACL and annual optimum yield for gag equal to 95% of the current acceptable biological catch (ABC; 734,350 pounds gutted weight). The current ABC level is inclusive of recreational estimates from the MRIP CHTS. Projected recreational and commercial landings and days open in the season for all management alternatives in Action 2 (**Table F.1.1.4)** and all management alternatives in Action 3 (**Table F.1.1.5**) are also presented. All alternatives in **Tables F.1.1.4 and F.1.1.5** are inclusive of the MRIP FES and may be explored in the RDT and CDT.

The RDT and CDT allow a range of closed seasons, and respectively, vessel and trip limits. Each management option selected within the decision tool (or combination thereof) produces predicted landings that can be compared to several of the proposed ACLs. Selecting various combinations of the management options can further impact the predicted landings and influence whether the ACL is reached or expected to be reached. Finally, the decision tools also provide a Sandbox ACL in which any ACL can be supplied to have the decision tool generate an expected

closure date and days open in the season. All results assume no effort shifting and that no landings occur during spawning season closures.

Table F.1.1.3. The projected South Atlantic gag commercial and recreational landings (lbs gw) and closure dates expected if **Alternative 1** of **Action 2** is selected, which maintains current management regulations.

Action 2, Alternative 1 (No Action): 734,350 lbs gw combined ACL			
Sector	ACL (lbs gw)	Closure Date	Days Open
Recreational	359,832*	None (80,532 lbs gw)	245
Commercial	374,519	None (231,667 lbs gw)	245

* The ACL for Alternative 1 is inclusive of recreational landings tracked using the MRIP Coastal Household Telephone Survey.

Table F.1.1.4. The projected South Atlantic gag commercial and recreational landings (lbs gw) and closure dates expected with each proposed annual catch limit alternative for **Alternatives 2** through **4** of **Action 2**.

Action 2, Preferred Alternative 2: Recommended ABC								
Year	Rec. ACL*	Predicted Rec. Landings	Rec. Closure Date	Days Open in Rec. Season	Comm. ACL	Predicted Comm. Landings	Comm. Closure Date	Days Open in Comm. Season
2023	86,060	311,339	**Jun 14**	44	89,572	231,667	**Jun 28**	58
2027	257,066		**Oct 15**	167	267,559		None	245
2032	464,966		None	245	483,945		None	245
Action 2, Alternative 3: 95% of the recommended ABC								
Year	Rec. ACL*	Predicted Rec. Landings	Rec. Closure Date	Days Open in Rec. Season	Comm. ACL	Predicted Comm. Landings	Comm. Closure Date	Days Open in Comm. Season
2023	81,757	311,339	**Jun 12**	42	85,094	231,667	**Jun 24**	54
2027	244,213		**Oct 5**	157	254,181		None	245
2032	441,718		None	245	459,747		None	245
Action 2, Alternative 4: 90% of the recommended ABC								
Year	Rec. ACL*	Predicted Rec. Landings	Rec. Closure Date	Days Open in Rec. Season	Comm. ACL	Predicted Comm. Landings	Comm. Closure Date	Days Open in Comm. Season
2023	77,454	311,339	**Jun 10**	40	80,615	231,667	**Jun 21**	51
2027	231,360		**Sep 24**	146	240,803		None	245
2032	418,470		None	245	435,550		None	245

Note: All alternatives to Action 2 assume current sector allocations of 49% recreational and 51% commercial. All ACLs and projected landings are in pounds gutted weight.

*The recreational ACLs presented are inclusive of recreational landings tracked using the MRIP Fishing Effort Survey.

Table F.1.1.5. The projected South Atlantic gag commercial and recreational landings (lbs gw) and closure dates expected with each proposed annual catch limit alternative for **Action 3**. **Alternative 1 (No Action)** of **Action 3** is omitted since it is identical to **Action 2 Alternatives**.

Action 3, Alternative 2: 63.63% recreational and 36.37% commercial								
Year	Rec. ACL*	Predicted Rec. Landings	Rec. Closure Date	Days Open in Rec. Season	Comm. ACL	Predicted Comm. Landings	Comm. Closure Date	Days Open in Comm. Season
2023	111,755	311,339	**Jun 28**	58	63,877	231,667	**Jun 9**	39
2027	333,819		None	245	190,806		**Nov 4**	187
2032	603,792		None	245	345,119		None	245
Action 3, Alternative 3: 43.06% recreational and 56.94% commercial								
Year	Rec. ACL*	Predicted Rec. Landings	Rec. Closure Date	Days Open in Rec. Season	Comm. ACL	Predicted Comm. Landings	Comm. Closure Date	Days Open in Comm. Season
2023	100,005	311,339	**Jun 22**	52	75,627	231,667	**Jun 18**	48
2027	298,721		**Dec 9**	222	225,904		**Dec 22**	235
2032	540,310		None	245	408,601		None	245
Action 3, Alternative 4a: 3-year average shared reduction								
Year	Rec. ACL*	Predicted Rec. Landings	Rec. Closure Date	Days Open in Rec. Season	Comm. ACL	Predicted Comm. Landings	Comm. Closure Date	Days Open in Comm. Season
2023	107,350	311,339	**Jun 26**	56	68,281	231,667	**Jun 12**	42
2027	281,847		**Nov 9**	192	242,778		None	245
2032	493,990		None	245	454,921		None	245
Action 3, Alternative 4b: 5-year average shared reduction								
Year	Rec. ACL*	Predicted Rec. Landings	Rec. Closure Date	Days Open in Rec. Season	Comm. ACL	Predicted Comm. Landings	Comm. Closure Date	Days Open in Comm. Season
2023	90,306	311,339	**Jun 17**	47	85,327	231,667	**Jun 25**	55
2027	264,802		**Oct 22**	174	259,823		None	245
2032	476,945		None	245	471,966		None	245

Note: All sector allocation options considered in alternatives 2-3 were applied to the revised total ACL of preferred Alternative 2 of Action 2. All ACLs and projected landings are in pounds gutted weight.
*The recreational ACLs presented are inclusive of recreational landings tracked using the MRIP Fishing Effort Survey.

Discussion

As with most projection models, the reliability of either of the RDT or CDT results are dependent upon the accuracy of the underlying data and input assumptions. We have attempted to create a realistic baseline as a foundation for comparisons, under the assumption that projected future landings will accurately reflect actual future landings. These closure dates are our best estimate, but uncertainty still exists as economic conditions, weather events, changes in catch-per-unit effort, fisher response to management regulations, and a variety of other factors may cause departures from any assumption.

The RDT and CDT also do not incorporate any changes in the average size of South Atlantic gag during rebuilding. As the stock rebuilds, it is likely that the average size will increase. An increased average size would lead to fishermen capturing their quota more rapidly relative to previous years under similar effort levels. All of these factors would result in more pessimistic projections. As such, management reductions may be overestimates, and caution should be taken in their interpretation and use. By contrast, continued adverse economic conditions and rising fuel prices may reduce effort, which would counter these other trends.

References

SEDAR. 2021. SEDAR 71 South Atlantic Gag Stock Assessment Report. SEDAR, North Charleston SC. 164 pp. available online at: http://sedarweb.org/sedar-71

1.2 Black Grouper Analysis

Recreational Vessel Limit Analysis for the South Atlantic Black Grouper Recreational Sector

LAPP/DM Branch
NOAA Fisheries Service
Southeast Regional Office
October 2022

Background

Black grouper (*Mycteroperca bonaci*) are one of 55 species in the South Atlantic Snapper-Grouper Fishery Management Plan (FMP). The FMP provides management for snapper and grouper species in the federal waters of the South Atlantic. The current management measures of the recreational sector include a spawning season closure from January 1 – April 30, a minimum size of 24 inches total length, and a recreational bag limit of 1 fish per person per day. This report explores recreational vessel limits as a method to reduce harvest of the species until a rebuilding plan can be set in place.

Data Sources

Recreational landings data for South Atlantic gag were obtained from the Southeast Fisheries Science Center (SEFSC) on March 17, 2022. This data set includes landings from the Southeast

Region Headboat Survey (SRHS) and the Marine Recreational Information Program (MRIP) Access Point Angler Intercept Survey (APAIS) and Fishing Effort Survey (FES). The current recreational survey has been the MRIP FES since 2015 when the MRIP Coastal Household Telephone Survey (CHTS) was discontinued. MRIP conducts dockside intercepts to collect information on the size and number of back grouper caught by mode (charter, private, shore). SRHS surveys collect size and number of black grouper through logbooks completed by headboat operators.

Recreational Vessel Limit Analysis

Recent recreational catch-effort data from the MRIP FES and the SRHS were used to examine vessel limits in the South Atlantic black grouper recreational fishery. Currently, the fishery has a 1 fish per person per day limit. From 2017 through 2019, there were 9 charter trips and 28 private trips in the MRIP FES and 144 trips in the SRHS that reported harvesting black grouper in the South Atlantic. All trips reported landing one black grouper or fewer per person per day. Additionally, a majority of for-hire trips (100% charter and 54% headboat) and private trips (93%) reported harvesting one black grouper or fewer per trip (**Figure F.1.2.1**).

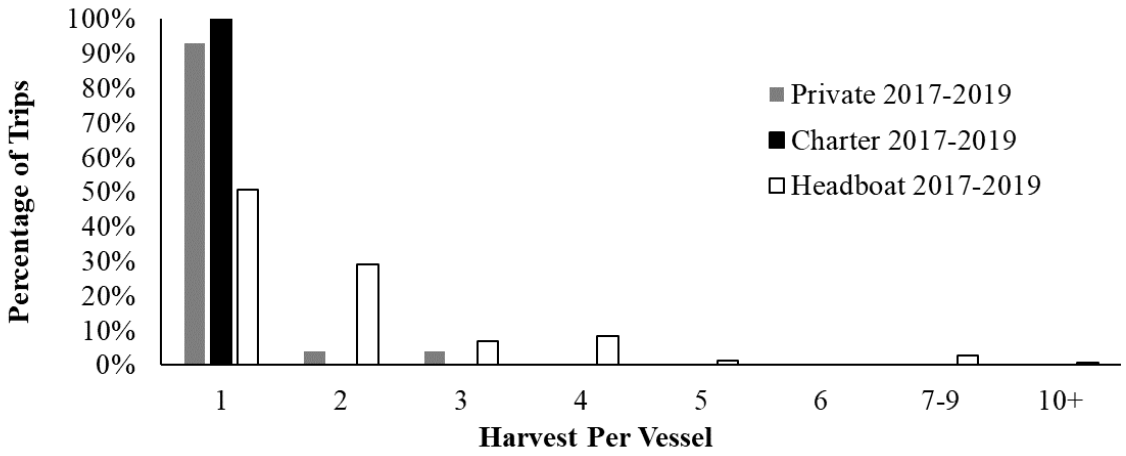

Figure F.1.2.1 Distribution of South Atlantic black grouper harvested per vessel trip from the two recreational datasets: MRIP FES (n = 27 private trips and 9 charter trips), and SRHS (n= 144 headboat trips).

Landing reductions for each vessel limit option were estimated by normalizing all trips that harvested greater than the allowable limit to the maximum allowable landings. For example, to determine the percent reduction in landings if a 2 fish vessel limit were imposed, trips estimated to have harvested greater than 2 fish per vessel were normalized to have harvested only 2 fish and a new total landings was calculated to compare with landings under current limits. Estimated reductions from projected landings for potential trip limits are shown in **Table F.1.2.1**.

Landing reductions estimated from this analysis may be used to produce predicted landings that can be compared to several of the proposed ACLs. Selecting various combinations of the management options can further impact the predicted landings and influence whether the ACL is

reached or expected to be reached. All results assume no effort shifting and that no landings occur during spawning season closures. Black grouper landings have consistently been at 50% and less of the ACL, and therefore any reduction in landings as a result of a vessel or bag limit will make it even less likely that black grouper landings meet or exceed the ACL.

Table F.1.2.1. The predicted percent change in landings per trip from the current 1 fish per person per day (pp/day) limit. Each Action 7 Alternative specifies that a vessel limit or a 1 fish pp/day limit will be imposed, depending on whichever is more restrictive. Since current regulations already specify 1 fish pp/day, there is no predicted percent change in landings per trip should the bag limit of 1 fish pp/day be more restrictive.

Action 7 Alternatives	Potential Vessel Limit (# of fish)	MRIP Private Predicted Change in Landings	For-hire Predicted Change in Landings
Alternative 1 (No Action)	1 fish pp/day	0%	0%
Alternative 2	2 per vessel	-6%	-24%
Alternative 3	4 per vessel	0%	-7%

Appendix G. Bycatch Practicability Analysis

TO BE COMPLETED

Background

Amendment 53 to the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) would modify management of South Atlantic gag. Actions include establishing a rebuilding plan, and revising annual catch limits (ACL), sector allocations, recreational accountability measures (AM), and management measures for the commercial and recreational sectors. Development of Amendment 53 is a response to the most recent stock assessment for South Atlantic gag (SEDAR 71 2021). National Marine Fisheries Service (NMFS) outlines at 50 CFR § 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.

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.

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

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). MRIP/FES replaced the Marine Recreational Fishery Statistics Survey. The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels. 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.

1. Population Effects for the Bycatch Species

1.1 Amount and Type of Bycatch and Discards

Commercial Sector

Commercial discards in the South Atlantic snapper grouper fishery are shown in Table G.1.1.1 and Figure G.1.1.1. 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 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 pounds and discards are reported in numbers of fish.

Table G.1.1.1. 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 the 2015-2019 period.

Stock	Diver	Stock	Handline / Electric	Stock	Longline	Stock	Trap / Pot	Stock	Troll
Gray Snapper	133	Vermilion Snapper	23,324	Red Grouper	176	Black Sea Bass	25,581	Black Sea Bass	1,114
Hogfish	57	Red Porgy	20,337	Snowy Grouper	157	Trigger-fishes	1,507	Grunts	66
Black Grouper	28	Red Snapper	16,805	Blueline Tilefish	32	Vermilion Snapper	662	King Mackerel	34
Ocean Triggerfish	10	Black Sea Bass	7,797	Greater Amberjack	26	Gray Triggerfish	407	White Grunt	24
Mutton Snapper	8	Yellowtail Snapper	7,278	Red Snapper	20	White Grunt	207	**Gag**	**19**
Red Grouper	5	Gray Triggerfish	3,966	Red Porgy	18	Grunts	161	Dolphin	16
Yellow Jack	2	Trigger-fishes	2,652	Trigger-fishes	5	Red Porgy	94	Black Grouper	13
Yellowtail Snapper	2	Almaco Jack	2,004	Golden Tilefish	2	Red Snapper	65	Rock Sea Bass	6
Groupers	1	Blue Runner	1,956	Amberjacks	1	**Gag**	**23**	Trigger-fishes	5
King Mackerel	1	Greater Amberjack	1,510	Blackfin Snapper	1	Red Grouper	6	Greater Amberjack	3

Source: SEFSC Coastal Logbook (accessed May 2020) and Discard Logbook (accessed May 2020). Note: Commercial gray triggerfish includes the "triggerfishes, unclassified" category.

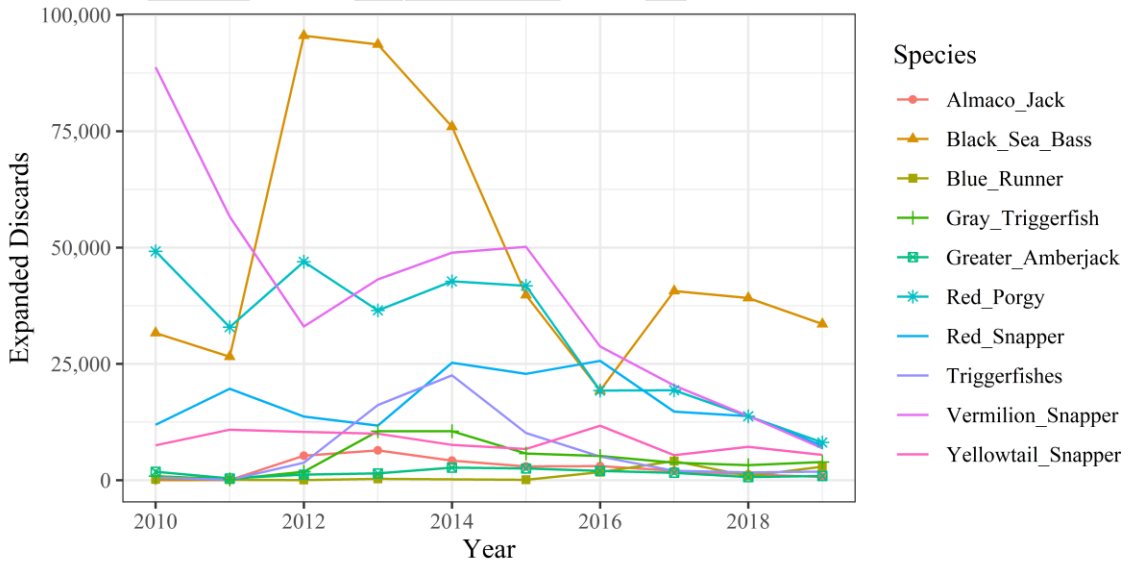

Figure G.1.1.1. Expanded self-reported commercial discards (numbers of fish) for the top ten species discarded during snapper grouper trips (defined as trips with >50% of landings from snapper grouper stocks) from 2010-2019 for all gear types.

Source: SEFSC Coastal Logbook (accessed May 2020) and Discard Logbook (accessed May 2020).

Of the four discard codes, regulations (i.e., not legal size and out of season) was the most common reason selected for the most commonly discarded snapper grouper species based on self-reported discards (Table G.1.1.2). The minimum size limit appears to be the primary driver of commercial discards for gag, followed by out of season.

Table G.1.1.2. The percentage of unexpanded discards for each discard reason out of the total number of self-reported discards reported to the Supplemental Discard Logbook for the top ten snapper grouper species discarded in the South Atlantic from 2015 through 2019. Some percentages may not sum to 100% due to rounding.

Species	Not Legal Size	Out of Season	Other Regulations	Market Conditions
Almaco Jack	4%	72%	7%	17%
Black Sea Bass	99%	0%	0%	0%
Gag	**78%**	**20%**	**0%**	**2%**
Gray Snapper	91%	0%	0%	8%
Gray Triggerfish	59%	39%	1%	0%
Greater Amberjack	77%	20%	3%	1%
Red Porgy	19%	78%	2%	0%
Red Snapper	2%	78%	20%	0%
Vermilion Snapper	43%	50%	7%	0%
Yellowtail Snapper	92%	6%	2%	0%

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

Recreational Sector

From 2015 through 2019, the most discarded species on trips capturing a snapper grouper species was black sea bass for all three modes (Table G.1.1.3). Red snapper, tomtate, yellowtail snapper, and grunt species were in the top ten for all modes.

Table G.1.1.3. 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		CHARTER		PRIVATE	
	Species	Discards (N)	Species	Discards (N)	Species	Discards (N)
1	Black Sea Bass	2,362,007	Black Sea Bass	1,464,909	Black Sea Bass	40,129,026
2	Vermilion Snapper	461,562	Red Snapper	601,973	Gray Snapper	21,989,786
3	Tomtate	327,379	Yellowtail Snapper	529,770	Pinfish	10,632,466
4	White Grunt	294,025	Tomtate	472,005	Red Snapper	9,907,110
5	Yellowtail Snapper	278,821	Vermilion Snapper	416,724	Yellowtail Snapper	6,926,752
6	Red Snapper	258,627	Gray Snapper	275,171	Tomtate	6,619,263
7	Gray Triggerfish	183,024	Mutton Snapper	149,472	Hardhead Catfish	5,036,604
8	Blue Runner	121,476	Blue Runner	133,872	Grunt (family)	4,961,629
9	Grunts (unidentified)	99,496	Grunt (family)	128,757	Atlantic Croaker	4,675,997
10	Atlantic Sharpnose Shark	90,504	Greater Amberjack	112,017	Gray Triggerfish	3,828,858

Sources: MRIP FES data from SEFSC Recreational ACL Dataset (September 2020); Headboat data from SEFSC Headboat Logbook CRNF files (expanded; July 2020).

Recreational discards of several snapper grouper species are higher than the landings for certain modes of fishing (Table G.1.1.4). Red snapper, black sea bass, 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. Gag recreational discards to landings ratios are high (Table G.1.1.4).

Table G.1.1.4. South Atlantic snapper grouper headboat, charter, and private mean annual estimates of landings and discards (2015-2019). Headboat and MRIP (charter and private) landings and discards are in numbers of fish.

Species	HEADBOAT			CHARTER			PRIVATE		
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
Almaco Jack	8,345	1,683	20%	12,752	2,921	23%	70,012	237,235	339%
Black Sea Bass	48,095	472,401	982%	37,817	288,186	762%	484,547	7,953,343	1,641%
Gag	**679**	**805**	**118%**	**2,387**	**2,257**	**95%**	**21,664**	**57,088**	**264%**
Gray Triggerfish	39,606	36,605	92%	53,395	19,237	36%	306,482	765,772	250%
Greater Amberjack	3,757	3,555	95%	24,570	22,404	91%	69,007	128,035	186%
Mutton Snapper	15,939	15,516	97%	24,579	29,894	122%	208,691	576,812	276%
Red Grouper	2,577	8,675	337%	3,282	8,902	271%	53,718	142,866	266%
Red Porgy	12,095	12,765	106%	14,248	8,922	63%	109,050	83,622	77%
Red Snapper	2,461	51,725	2,102%	6,033	120,395	1,996%	211,833	1,981,423	935%
Scamp	1,554	1,044	67%	3,174	193	6%	2,775	1,458	53%
Snowy Grouper	501	4	1%	1,936	165	9%	2,536	599	24%
Tomtate	44,536	65,476	147%	13,456	94,401	702%	439,869	1,323,853	301%
Vermilion Snapper	128,029	92,312	72%	73,407	83,345	114%	435,534	661,292	152%
White Grunt	149,852	58,805	39%	26,450	8,944	34%	517,265	350,516	68%
Whitebone Porgy	5,083	1,720	34%	3,475	325	9%	25,948	3,740	14%
Yellowtail Snapper	134,139	55,764	42%	239,421	105,954	44%	1,002,876	1,385,351	138%

Sources: MRIP FES data from SEFSC Recreational ACL Dataset (September 2020); Headboat data from SEFSC Headboat Logbook CRNF files (expanded; July 2020).

1.2 Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality

Expected Impacts on Bycatch for the Subject Amendment Actions

Action 1 would establish a rebuilding plan for South Atlantic gag. The Council selected **Alternative 3** as the preferred alternative, which proposes a rebuilding timeframe that would end in 2032. Establishing a rebuilding plan does not directly affect bycatch; thus, no changes in bycatch are expected for Action 1.

Action 2 would revise the acceptable biological catch (ABC), total annual catch limit (ACL), and annual optimum yield (OY) for gag. All of the proposed ABCs, ACLs, and OYs would lead to a reduction in harvest of gag. The Council selected **Alternative 2** as the preferred alternative, which proposes an ABC, total ACL, and annual OY that are equal to the ABC level recommended by the Council's SSC. Lower catch levels than what are currently allowed, as proposed by **Preferred Alternative 2**, could result in increased regulatory discards of gag because season lengths would likely be shorter. Because the lower proposed catch levels are expected to be beneficial for the gag stock, and more than 60% of discarded fish are expected to survive (Table G.2.1), additional adjustments of the total ACL are not practicable to reduce gag discards at this time. Fishing effort or behavior is not expected to change for the overall snapper grouper fishery; thus, no changes in bycatch of co-occurring species are expected as a result of Action 2.

Action 3 would revise the sector allocations for gag and sector ACLs to reflect the updated ABC level recommended by the Council's SSC and chosen by the Council. The Council selected **Alternative 4**, **Sub-alternative 4b** as the preferred alternative, which proposes a starting allocation of 49% commercial / 51% recreational for 2023 to 2026. In 2027 and until modified, the sector allocations would be an equal 50/50 split. This allocation scenario modestly increases the recreational sector allocation from the status quo for the first three years of the rebuilding timeframe. Because the recreational sector tends to discard greater numbers of gag than the commercial sector, it is possible that **Preferred Sub-Alternative 4b** could slightly increase overall discards of gag. The proposed allocations are not expected to result in changes to fishing activity or behavior in the snapper grouper fishery; thus, no changes in bycatch of co-occurring species are expected as a result of Action 3.

Action 4 would modify commercial management measures for gag. For Sub-action 4a the Council selected **Alternative 3** as the preferred alternative, which proposes a 300 pound gutted weight trip limit. Reducing commercial trip limits in combination with a reduction in the commercial ACL under Action 3 could extend the length of commercial fishing. However, in general, reductions in commercial trip limits could increase the number of discards, as fish that would normally be retained would have to be discarded under a lower trip limit. According to trip level landings data, the majority of commercial trips with a least one pound of gag would fall below or at the preferred alternative (Figure 4.1.1.1). **Preferred Alternative 3** is not expected to result in a substantial increase in gag discards. For Sub-action 4b the Council selected

Alternative 1 (No Action) as the preferred alternative, so no changes in bycatch are expected from this sub-action. While increased discards of gag are expected, there is no anticipated change to fishing activity or behavior in the snapper grouper commercial sector and thus no changes in bycatch of co-occurring species are expected as a result of Action 4.

Action 5 would modify recreational management measures for gag. Sub-action 5a would establish vessel limits for the recreational sector. The Council has not selected a preferred option for this sub-action. Establishing a vessel limit for gag could result in increased regulatory discards; however, the majority of recreational fishing trips land one or less gag per trip. For Sub-action 5b the Council selected **Alternative 1 (No Action)** as the preferred alternative, so no changes in bycatch are expected from this sub-action. Sub-action 5c would prohibit bag limit retention for captain and crew for the for-hire component of the recreational sector. The Council has also not selected a preferred option for this sub-action. Fishing activity or behavior in the snapper grouper recreational sector is not expected to substantially change, thus no changes in bycatch of co-occurring species are expected as a result of Action 5.

Action 6 would revise the recreational AMs for gag. The proposed AMs range from implementing an in-season closure to announcing the length of the season. If a recreational fishing season is shortened as a result of a triggered AM, this action could increase regulatory discards in the fishery. The Council selected **Alternative 4** as the preferred option. **Preferred Alternative 4** would retain the in-season AMs and reduce the length of the following year's recreational fishing season by the amount necessary to prevent the recreational ACL from being exceeded in the following year. No substantial changes to fishing activity or behavior are expected; thus, no changes in bycatch are expected for Action 6.

Action 7 would modify recreational management measures for black grouper. Sub-action 7a would establish vessel limits for the recreational sector. The Council has not selected a preferred option for this sub-action. Establishing a vessel limit for black grouper could result in increased regulatory discards. For Sub-action 5b the Council selected **Alternative 1 (No Action)** as the preferred alternative, so no changes in bycatch are expected from this sub-action. Sub-action 5c would prohibit bag limit retention for captain and crew for the for-hire component of the recreational sector. The Council has also not selected a preferred option for this sub-action. Fishing activity or behavior in the snapper grouper recreational sector is not expected to substantially change, thus no changes in bycatch of co-occurring species are expected as a result of Action 7.

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 gag, including actions that could reduce bycatch and bycatch mortality of gag and other snapper grouper species, are outlined in Section 1.7 of this 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 2009) 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 2011a) 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 2008); 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 SMZs 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 2011b) implemented ACLs and AMs for species not undergoing overfishing in the FMPs for snapper grouper, dolphin and wahoo, golden crab, and Sargassum, in addition to other actions such as allocations and establishing annual catch targets for the recreational sector. ACLs and AMs have likely reduced bycatch of target species as well as incidentally caught species.

The Council's Headboat Electronic Reporting Amendment (SAFMC 2013) changed the reporting frequency by headboats from monthly to weekly, and required that reports be submitted electronically. The action is expected to provide more timely information on landings and discards. Improved information on landings would help ensure ACLs are not exceeded. Furthermore, more timely and accurate information would be expected to provide a better understanding of the composition and magnitude of catch and bycatch, enhance the quality of data provided for stock assessments, increase the quality of assessment output, and lead to better decisions regarding additional measures to reduce bycatch.

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

The Council developed a joint For-Hire Reporting Amendment (SAFMC 2017) with the Gulf of Mexico Fishery Management Council that requires all federally permitted charter vessels report landings information weekly to the SEFSC electronically. Additionally, the Councils will also begin development of a joint amendment to require that all federally permitted commercial fishing vessels in the southeast also report their logbook landings information electronically.

These future actions will help to improve estimates on the composition and magnitude of catch and bycatch of species affected by this amendment, as well as all other federally managed species in the southeast region.

Amendment 42 to the Snapper Grouper FMP (SAFMC 2019c) 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 2020) required descending devices be on board all commercial, for-hire, and private recreational vessels while fishing for or possessing snapper grouper species; the use of non-offset, non-stainless steel circle hooks when fishing for snapper grouper species with hook-and-line gear and natural baits north of 28° N latitude; and all hooks be non-stainless steel when fishing for snapper grouper species with hook-and-line gear and natural baits throughout South Atlantic federal waters. 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.

Regulatory Amendment 31 to the Snapper Grouper FMP (included in the Comprehensive Recreational AMs Amendment) could include actions to revise recreational AMs to allow more flexibility in managing recreational fisheries.

Regulatory Amendment 35 to the Snapper Grouper FMP proposes actions to prohibit the use of certain gear types (electric reels, multi-hook rigs) for the recreational sector while fishing for snapper grouper species.

Amendment 46 to the Snapper Grouper FMP proposes actions to focus on private recreational permit and reporting. Work on this amendment is currently on hold.

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.

2. 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.2.1). For instance, recreational discards of red snapper in the South Atlantic are a main driver in the overfishing determination for the stock (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). Gag can be captured over a broad depth range or transition to different depth zones throughout their life history, so release mortality rates can be variable.

Table G.2.1. 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 71 (2021)**
Gag	**Commercial**	**40%**	**SEDAR 71 (2021)**
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 2020) required descending devices be on board all commercial, for-hire, and private recreational vessels while fishing for or possessing snapper grouper species; the use of non-offset, non-stainless steel circle hooks when fishing for snapper grouper species with hook-and-line gear and natural baits north of 28° N latitude; and all hooks be non-stainless steel when fishing for snapper grouper species with hook-and-line gear and natural baits throughout South Atlantic federal waters. 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 amendment are not expected to result in substantial changes to bycatch in the snapper grouper fishery; thus, ecological effects due to changes in bycatch in this fishery are expected to be negligible. For more details on ecological effects, see Chapters 3 and 4 of this amendment.

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

Amendment 53 is not expected to result in changes in bycatch of other fish species. The snapper grouper fishery is characterized by a high number of discards for all species and sectors (Table G.1.1.1 and G.1.1.3). Both sectors likely target a wide range of species, including dolphin wahoo, snapper grouper, and coastal migratory pelagic species during each trip. This results in a varied amount and type of bycatch of species. However, the actions in this amendment are not expected to alter overall fishing activity or behavior in the fishery; thus, no changes in bycatch of other species are expected.

4. 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 longline and hook-and-line gear components of the snapper grouper fishery are determined to have remote likelihood of / no known interactions with marine mammals (Category III, LOF, 87 FR 23122; April 19, 2022).

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 dolphin wahoo fishery. Thus, the fishery is not likely to adversely affect the Bermuda petrel and the roseate tern.

5. Changes in Fishing, Processing, Disposal, and Marketing Costs

The actions proposed in Amendment 53 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.

6. Changes in Fishing Practices and Behavior of Fishermen

As discussed above, the actions proposed in Amendment 53 are not expected to change fishing practices or fishing behavior, and are likely to have little effect on the overall magnitude of discards. Also, any changes to fishing behavior and subsequent changes in the level of discards or discard mortality that may result from the actions in the amendment are expected to be small, and would not jeopardize the sustainability of any target or non-target species.

7. 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 should improve timeliness and quality of data for the charter and headboat components of the recreational sector.

Cooperative research projects between science and industry are available each year in the form of grants from Marine Fisheries Initiative, Saltonstall-Kennedy program, and the Cooperative Research Prom. These programs can provide research funds for observer programs, as well as gear testing and testing of electronic devices. A condition of funding for these projects is that data are made available to the Councils and NMFS upon completion of a study.

Administration

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

Enforcement

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

8. Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources

NEED

9. Changes in the Distribution of Benefits and Costs

NEED

10. Social Effects

NEED

11. Conclusion

NEED

12. References

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Appendix H. Fishery Impact Statement

The Magnuson-Stevens Fishery Conservation and Management Act requires a Fishery Impact Statement (FIS) be prepared for all amendments to fishery management plans (FMP). The FIS contains an assessment of the expected and potential biological, economic, and social effects of the conservation and management measures on: 1) fishery participants and their communities; 2) participants in the fisheries conducted in adjacent areas under the authority of another Council; and 3) the safety of human life at sea. Detailed discussion of the expected effects for all proposed changes is provided in Chapters 1 and 2. The FIS provides a summary of these effects.

Actions Contained in Amendment 53 to the FMP for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 53)

Amendment 53 would modify management of South Atlantic gag grouper. Actions include establishing a rebuilding plan, revising the acceptable biological catch (ABC), annual catch limits (ACL), annual optimum yield (OY), sector allocations, accountability measures (AM), and management measures for the commercial and recreational sectors. The actions and their preferred alternatives are:

Assessment of Biological Effects

Assessment of Economic Effects

Assessment of the Social Effects

Assessment of Effects on Safety at Sea
Amendment 53 is not expected to result in direct impacts to safety at sea.

Appendix I. History of Management

The snapper grouper fishery is highly regulated; some of the species included in this amendment have been regulated since 1983. The following webpage includes a summary of the amendments to the original Snapper Grouper Fishery Management Plan (FMP), as well as some events not covered in amendment actions:

https://safmc.net/fishery-management-plans/snapper-grouper/

Appendix J. Allocations 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 J-1. Next year for allocation reviews (as of 2019) for SAFMC managed species.

Assessed Species	Review Year
Black grouper	2026
Black sea bass	2023
Blueline Tilefish	2020
Gag	2022
Golden tilefish	2021
Gray Triggerfish	2023
Greater amberjack	2021
GA-NC Hogfish	2023
FLK/EFL Hogfish	2023
Mutton Snapper	2023
Red grouper	2023
Red porgy	2021
Red snapper	2024
Snowy grouper	2021
Vermilion snapper	2021
Wreckfish	2019
Yellowtail Snapper	2021
Atlantic Group KingMackerel	2021
Atlantic Group Spanish Mackerel	2022
Gulf Group Cobia- FL East Coast Zone	2021
Unassessed Species	
Atlantic Spadefish	2022
Bar Jack	2022
Scamp	2022
Speckled hind*	*
Warsaw grouper*	*
DeepwaterComplex	
Yellowedge Grouper	2024
Silk Snapper	2024
Misty Grouper	2024
Sand Tilefish	2024
Queen Snapper	2024

Blackfin Snapper	2024
Jacks Complex	
Almaco Jack	2025
Banded Rudderfish	2025
Lesser Amberjack	2025
Snappers Complex	
Gray Snapper	2025
Lane Snapper	2025
Cubera Snapper	2025
Grunts Complex	
White Grunt	2024
Sailor's Choice	2024
Tomtate	2024
Margate	2024
Shallow-Water Groupers Complex	
Red Hind	2026
Rock Hind	2026
YellowmouthGrouper	2026
Yellowfin Grouper	2026
Coney	2026
Graysby	2026
Porgy Complex	
Jolthead Porgy	2027
Knobbed Porgy	2027
Saucereye Porgy	2027
Scup	2027
Whitebone Porgy	2027
Dolphin/Wahoo	
Dolphin	2019
Wahoo	2019

*ACL=0 for this species. If ACL>0 in the future, allocations will be reviewed when the ACL is increased.

Appendix K. Stock Projections

In addition to the projections provided in the SEDAR 71 (2021) assessment, the Council requested additional projections. The full list of projections are as follows:

1. OFL (Fmsy), recruitment conditioned on the spawner-recruit model, and management starting in 2023 (previously provided in the October SSC 2021 report)

2. ABC with a Prebuild = 70% in 10 years, recruitment conditioned on the spawner-recruit model, and management starting in 2023 (previously provided in the October SSC 2021 report)

3. ABC with a Prebuild = 60% in 10 years, recruitment conditioned on the spawner-recruit model, and management starting in 2023 (new projection)

All projections were conducted with the standard methodology reported in the SEDAR 71 assessment report. All MSY-related benchmarks are unchanged and come from the SEDAR 71 stock assessment report, which are based on a freely estimated Beverton-Holt stock-recruit curve (steepness = 0.898 and R0 = 526,309 fish). The SEDAR 71 stock assessment estimated that overfishing in 2017 – 2019 was more than twice the Fmsy value (F/Fmsy = 2.15) and the Gag Grouper stock was at 15% of its SSBmsy level in 2019. Landings during each of the interim years (2020-2022) were assumed to be the average landings during the last three years of the assessment (2017-2019). Management was assumed to start in 2023 and projections were run 10 years after that point (until 2032).

Results for the previously provided Fmsy projection (number 1 above) are shown in Table K-1. There is a 14.2% probability of recovery in 10 years under Fmsy. Results for the previously provided projection with a 70% probability of rebuilding in 10 years and recruitment conditioned on the stock-recruitment curve (number 2 above) are shown in Table K-2. The fishing rate leading to recovery under this scenario is F = 0.165. Results for rebuilding in 10 years with a 60% probability and recruitment conditioned on the stock-recruitment curve (number 3 above) are shown in Table K-3. The fishing rate leading to recovery under this scenario is F = 0.212.

Table K-1. Projection results with fishing mortality rate fixed at F = Fmsy, management starting in 2023, and recruitment conditioned on the stock recruitment curve. R = number of age-1 recruits (in 1000s), F = fishing mortality rate (per year), S = spawning stock (mt), L = landings, and D = dead discards expressed in numbers (n, in 1000s) and in gutted weight (gutted, in 1000 lb). The extension 'base' indicates expected values (deterministic) from the base run. The extension 'med' indicates median values from the stochastic projections.

Year	R.base (1000)	R.med (1000)	F.base	F.med	S.base (mt)	S.med (mt)	L.base (1000)	L.med (1000)	L.base (1000 lbs gutted)	L.med (1000 lbs gutted)	D.base (1000)	D.med (1000)	D.base (1000 lbs gutted)	D.med (1000 lbs gutted)	pr.recover
2020	301.18	263.851	1.01	0.98	225.39	223.37	49.313	49.187	539.102	538.888	25.234	22.211	103.89	91.978	0
2021	296.442	254.319	0.95	0.96	211.9	208.41	55.544	54.916	539.102	538.888	24.425	22.735	103.915	97.437	0
2022	287.234	240.482	0.75	0.79	241.1	228.51	55.62	55.697	539.102	538.888	19.07	18.449	82.344	80.336	0
2023	306.491	243.895	0.36	0.35	333.45	304.45	35.621	31.301	367.235	321.842	9.862	8.133	42.474	35.465	0
2024	354.216	275.332	0.36	0.35	472.81	437.19	44.843	40.114	494.338	441.192	11.156	8.99	47.624	39.022	0.003
2025	402.431	314.71	0.36	0.35	602.76	564.43	52.622	47.347	605.227	547.542	12.702	10.283	54.154	44.264	0.007
2026	432.824	342.051	0.36	0.35	715.94	677.47	60.151	54.174	706.366	641.138	13.94	11.3	59.91	49.077	0.016
2027	452.481	359.91	0.36	0.35	822.33	778.93	68.072	61.337	808.266	735.304	14.785	12.032	64.044	52.799	0.027
2028	467.096	375.328	0.36	0.35	930.93	877.11	75.932	68.284	912.033	828.544	15.379	12.598	66.962	55.324	0.046
2029	479.248	387.993	0.36	0.35	1039.41	972.99	83.028	75.175	1011.133	923.094	15.84	13.022	69.172	57.387	0.069
2030	489.309	400.295	0.36	0.35	1138.99	1059.48	88.942	80.622	1098.379	1003.829	16.216	13.378	70.944	59.021	0.092
2031	497.138	412.176	0.36	0.35	1224.3	1134.51	93.683	85.062	1171.12	1072.22	16.516	13.718	72.362	60.479	0.118
2032	502.992	420.363	0.36	0.35	1294.88	1197.59	97.454	88.599	1230.363	1126.44	16.746	14.122	73.46	62.346	0.142

Table K-2. Projection results with Prebuild = 70% in 10 years, recruitment conditioned on the stock-recruitment curve, and management starting in 2023. R = number of age-1 recruits (in 1000s), F = fishing mortality rate (per year), S = spawning stock (mt), L = landings, and D = dead discards expressed in numbers (n, in 1000s) and in gutted weight (gutted, in 1000 lb). The extension 'base' indicates expected values (deterministic) from the base run. The extension 'med' indicates median values from the stochastic projections.

Year	R.base (1000)	R.med (1000)	F.base	F.med	S.base (mt)	S.med (mt)	L.base (1000)	L.med (1000)	L.base (1000 lbs gutted)	L.med (1000 lbs gutted)	D.base (1000)	D.med (1000)	D.base (1000 lbs gutted)	D.med (1000 lbs gutted)	pr.recover
2020	301.18	263.779	1.01	0.98	225.39	224.39	49.313	49.156	539.102	538.9	25.234	21.922	103.89	91.036	0
2021	296.442	256.188	0.95	0.96	211.9	209.63	55.544	54.863	539.102	538.9	24.425	22.628	103.915	96.657	0
2022	287.234	242.554	0.75	0.79	241.1	229.66	55.62	55.611	175.632	538.855	19.07	18.4173	82.344	80.024	0
2023	306.491	247.035	0.16	0.16	346.3	318.03	16.925	15.765	175.632	163.358	4.505	3.885	19.45	16.991	0.001
2024	359.64	277.292	0.16	0.16	545.55	501.69	23.158	21.688	261.171	244.306	5.179	4.308	22.202	18.787	0.014
2025	420.701	328.196	0.16	0.16	765.23	707.54	29.077	27.192	348.352	326.123	6.042	5.003	25.826	21.681	0.069
2026	459.641	360.882	0.16	0.16	984.01	913.66	34.954	32.588	435.081	406.069	6.763	5.638	29.176	24.554	0.168
2027	484.396	386.694	0.16	0.16	1203.36	1115.8	41.129	38.369	524.625	490.171	7.258	6.087	31.627	26.77	0.273
2028	501.62	407.898	0.16	0.16	1432.4	1332.63	47.415	44.367	617.778	578.332	7.596	6.438	33.333	28.5	0.373
2029	514.749	419.62	0.16	0.16	1670.67	1559.54	53.422	50.002	711.419	667.376	7.841	6.728	34.557	29.86	0.465
2030	525.047	435.112	0.16	0.16	1904.94	1779.41	58.772	55.083	800.088	752.284	8.027	6.93	35.475	30.851	0.551
2031	532.929	449.995	0.16	0.16	2122.35	1993.02	63.304	59.391	879.758	829.754	8.17	7.169	36.177	31.953	0.631
2032	538.838	458.191	0.16	0.16	2316.29	2180.5	67.043	62.972	948.911	897.005	8.278	7.324	36.71	32.745	0.704

Table K-3. Projection results with Prebuild = 60% in 10 years, recruitment conditioned on the stock-recruitment curve, and management starting in 2023. R = number of age-1 recruits (in 1000s), F = fishing mortality rate (per year), S = spawning stock (mt), L = landings, and D = dead discards expressed in numbers (n, in 1000s) and in gutted weight (gutted, in 1000 lb). The extension 'base' indicates expected values (deterministic) from the base run. The extension 'med' indicates median values from the stochastic projections.

Year	R.base (1000)	R.med (1000)	F.base	F.med	S.base (mt)	S.med (mt)	L.base (1000)	L.med (1000)	L.base (1000 lbs gutted)	L.med (1000 lbs gutted)	D.base (1000)	D.med (1000)	D.base (1000 lbs gutted)	D.med (1000 lbs gutted)	pr.recover
2020	301.18	263.851	1.01	0.98	225.39	223.37	49.313	49.187	539.102	538.888	25.234	22.211	103.89	91.978	0
2021	296.442	254.319	0.95	0.96	211.9	208.41	55.544	54.916	539.102	538.888	24.425	22.735	103.915	97.437	0
2022	287.234	240.482	0.75	0.76	241.1	228.51	55.62	55.697	539.102	538.888	19.07	18.449	82.344	80.336	0
2023	306.491	243.895	0.21	0.21	343.23	312.59	21.494	19.975	222.694	206.542	5.775	4.956	24.919	21.685	0.001
2024	358.363	277.912	0.21	0.21	527.22	482.64	28.824	26.951	323.318	300.478	6.614	5.531	28.325	24.027	0.011
2025	416.428	322.975	0.21	0.21	722.34	665.12	35.583	33.413	422.183	395.235	7.673	6.382	32.775	27.666	0.049
2026	453.451	355	0.21	0.21	910.28	847.45	42.219	39.559	518.155	485.822	8.551	7.101	36.853	30.969	0.127
2027	477.116	376.688	0.21	0.21	1094.92	1021.6	49.169	45.941	616.153	578.9	9.155	7.644	39.83	33.525	0.219
2028	493.818	394.464	0.21	0.21	1285.75	1194.74	56.199	52.344	717.299	670.778	9.569	8.048	41.908	35.56	0.303
2029	506.801	408.63	0.21	0.21	1482.03	1380.08	62.827	58.675	817.68	766.825	9.874	8.376	43.416	37.14	0.387
2030	517.131	421.421	0.21	0.21	1671.74	1561.5	68.631	63.94	911.028	855.24	10.11	8.66	44.566	38.395	0.465
2031	525.087	434.523	0.21	0.21	1844.22	1723.17	73.469	68.402	993.235	933.087	10.293	8.907	45.455	39.46	0.537
2032	531.057	442.799	0.21	0.21	1994.87	1867.09	77.404	72.115	1063.22	998.598	10.432	9.138	46.135	40.608	0.599