Amendment 37 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region



DECISION DOCUMENT

Modification to the hogfish fishery management unit, fishing level specifications for the two South Atlantic hogfish stocks, rebuilding plan for the Florida Keys/East Florida stock, and establishment/revision of management measures for both stocks

November 26, 2015

Background

The Florida Fish and Wildlife Conservation Commission completed a stock assessment for hogfish in 2014 (SEDAR 37 2014). The South Atlantic Council's SSC reviewed the assessment and provided fishing level recommendations in October 2014. The Council received the SSC's recommendations at their December 2014 meeting. Based on genetic evidence the SSC supported treating hogfish in the South Atlantic as two stocks: Georgia-North Carolina (GA-NC) and Florida Keys/East Florida (FLK/EFL). Each assessment was then evaluated with regard to fishing level recommendations. The SSC developed catch level recommendations for the GA-NC stock using the Only Reliable Catch Stocks (ORCS) approach, as outlined in Level 4 of the Council's ABC control rule. For the FLK/EFL stock, the SSC considered the benchmark assessment to represent the best available science and recommended it for use in management. The Southeast Fisheries Science Center (SEFSC) concurred with this determination. The assessment results indicated the FLK/EFL stock is undergoing overfishing and is overfished and, therefore, in need of a rebuilding plan.

Amendment 37 would address specifying the boundary between the FLK/EFL stock, managed by the South Atlantic Council, and the Gulf of Mexico stock, managed by the Gulf Council. This demarcation needs to take place to aid in enforcing regulations and for proper tracking of the ACLs for each stock. Amendment 37 also includes actions to specify Acceptable Biological Catch (ABC), Annual Catch Limits (ACLs), and Optimum Yield (OY) for both stocks, establish a rebuilding plan for the FLK/EFL stock, and implement or modify management measures for both stocks to attain the desired level of harvest.

Purpose and Need

Purpose for Actions

The *purpose* of this amendment is to modify the management unit for hogfish, specify fishing levels based on the South Atlantic Fishery Management Council's Scientific and Statistical Committee recommendations for the Georgia-North Carolina and Florida Keys/East Florida stocks of hogfish, and modify or establish management measures. For the Florida Keys/East Florida stock of hogfish, this amendment would establish a rebuilding plan to increase hogfish biomass to sustainable levels within a specified time period based on results of the recent stock assessment conducted with data through 2012.

Need for Actions

The *need* for this amendment is to align the management boundaries for hogfish with the best available science (i.e., genetic information), and end overfishing and rebuild the Florida Keys/East Florida stock of hogfish while minimizing, to the extent practicable, adverse social and economic effects.

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Decision Document

December 2015

Proposed Actions and Alternatives

Action 1. Modify the Fishery Management Unit for hogfish

Alternative 1 (No action). Do not establish separate stocks of hogfish in the South Atlantic. There is a Gulf of Mexico stock and South Atlantic stock of hogfish separated at the jurisdictional boundary between the South Atlantic Fishery Management Council and the Gulf of Mexico Fishery Management Council:

The boundary coincides with the line of demarcation between the Atlantic Ocean and the Gulf of Mexico, which begins at the intersection of the outer boundary of the EEZ, as specified in the Magnuson-Stevens Act, and 83°00' W. long., proceeds northward along that meridian to 24°35' N. lat., (near the Dry Tortugas Islands), thence eastward along that parallel, through Rebecca Shoal and the Quicksand Shoal, to the Marquesas Keys, and then through the Florida Keys to the mainland at the eastern end of Florida Bay, the line so running that the narrow waters within the Dry Tortugas Islands, the Marquesas Keys and the Florida Keys, and between the Florida Keys and the mainland, are within the Gulf of Mexico.

Preferred Alternative 2. Modify the snapper grouper fishery management unit (FMU) to specify two separate stocks of hogfish: (1) a Georgia through North Carolina (GA-NC) stock from the Georgia/Florida state boundary to the North Carolina/Virginia state boundary, and (2) a Florida Keys/East Florida (FLK/EFL) stock from the Florida/Georgia state boundary south to:

Sub-alternative 2a. The South Atlantic/Gulf of Mexico Council boundary. **Sub-alternative 2b.** The Monroe/Collier County line.

Preferred Sub-alternative 2c. A line just south of Cape Sable running due west $(25^{\circ} 09^{\circ}.000 \text{ North Latitude}).$

Biological Effects

Hogfish are currently managed as a single stock within the South Atlantic Council's area of jurisdiction. Recently, however, research on the genetic structure of hogfish (Seyoum et al. 2015) indicated that three genetically distinct population segments are present in the Southeastern U.S.: (1) the eastern Gulf of Mexico, (2) the Florida Keys and the southeast coast of Florida, and (3) the Carolinas. Two of the population segments are within the South Atlantic Council's area of jurisdiction. An amendment to the Snapper Grouper Fishery Management Plan (FMP; SAFMC 1983) is therefore needed to delineate the two stocks of hogfish.

Under Alternative 1 (No Action), hogfish would continue to be managed as s single stock, thus ignoring the latest scientific evidence. As such, management measures might not be as effective because biological parameters such as growth rates, natural mortality, etc. might not accurately be ascribed to at least some portion of the population. Preferred Alternative 2

would specify a GA-NC stock of hogfish north of the GA/FL border and a Florida Keys/East Florida stock south of the GA/FL border according to recommendations in Seyoum et al. (2015). Hence, **Preferred Alternative 2** would result in positive biological benefits since management would be based on the latest scientific research and regulations could be better tailored to address specific management issues pertinent to each stock. **Sub-alternatives 2a-2c (Preferred)** specify the dividing line between the Gulf of Mexico stock (under the jurisdiction of the Gulf of Mexico Fishery Management Council) and the Florida Keys/East Florida stock. Seyoum et al. (2015) state that the two stocks split from each other along the "coastal area west of the Florida Everglades". Thus, from a biological standpoint, **Sub-alternatives 2a-2c (Preferred)** would result in similar biological effects. No changes to how landings are monitored for tracking annual catch limits would result from any of the sub-alternatives considered under this action.

Economic Effects

As described above, modifying the management unit for hogfish is not expected to alter the current harvest or use of the resource. Therefore, **Alternative 1 (No Action)** and **Preferred Alternative 2** (along with its sub-alternatives) are not expected to have any additional economic effects as modifications to the harvest hogfish may be affected by other actions in this amendment.

Social Effects

Changes to management of hogfish and access to the resource could affect fishermen who target hogfish, and associated communities and fishing businesses. Section 3.4 provides detailed information about communities that could be affected by management changes and ACLs, particularly for fishermen and communities in the Florida Keys.

Modifying the hogfish Fishery Management Unit would not be expected to result in direct social effects. However, there may be some indirect effects on fishermen and associated communities associated with aligning management with the most recent stock assessment, and also with any associated management changes due to designation of the two hogfish stocks.

Although additional effects would not usually be expected from retaining the current hogfish FMU under Alternative 1 (No Action), this would be inconsistent with the stock assessment. **Preferred Alternative 2** would align hogfish management with updated scientific information. However, if changes in the quota or other management measures restricted access for fishermen harvesting hogfish in specific areas, there may be some negative social effects due to restricted access to the resource.

Any indirect effects from **Sub-alternatives 2a-2c (Preferred)** would be similar for all fishermen targeting hogfish, except for fishermen in the Florida Keys. Under **Sub-alternatives 2a** and **2b**, management of hogfish in the Florida Keys would be split between the Gulf and South Atlantic Councils' jurisdiction. This would pose problems for the Keys fishermen, as some vessels fish in both jurisdictions and may be subject to separate sets of (present and future)

fishing regulations. Under **Preferred Sub-alternative 2c**, the Florida Keys would be managed exclusively by the South Atlantic Council. Thus, some additional benefits would be expected from **Preferred Sub-alternative 2c**, compared to **Sub-alternatives 2a** and **2b**.

SNAPPER GROUPER AP RECOMMENDATION: None

SSC RECOMMENDATION: None

<u>SCOPING COMMENTS:</u> 5 comments in support of Alternative 2; 2 comments No Action. "Separation of the hogfish stock is a great management decision. The GA-NC hogfish stock is strong with larger fish, more habitat, and a larger population. The southern Florida hogfish stocks are currently overfished. The GA-MC hogfish stock is not overfished."

COMMITTEE ACTION: None at this time.

Action 2. Specify Maximum Sustainable Yield (MSY) for the GA-NC and the Florida Keys/ East Florida (FLK/EFL) stocks of hogfish

Alternative 1 (No Action). Do not define MSY for the GA-NC or the FLK/EFL stocks of hogfish. Currently, MSY equals the yield produced by F_{MSY} . $F_{30\% SPR}$ is used as the F_{MSY} proxy for hogfish in the South Atlantic.

Preferred Alternative 2. MSY equals the yield produced by F_{MSY} or the F_{MSY} proxy ($F_{30\% SPR}$). MSY and F_{MSY} are recommended by the most recent SEDAR/SSC.

Preferred Sub-alternative 2a. GA-NC stock of hogfish. **Preferred Sub-alternative 2b.** FLK/EFL stock of hogfish.

Alternatives	Equation	F _{MSY}	MSY Values (Ibs whole weight)
Alternative 1 (No Action)	MSY is not defined for the GA-NC stock or the FLK/EFL stock	unknown	unknown
Alternative 2 (Preferred)	MSY equals the yield produced by F_{MSY} or the F_{MSY} proxy. MSY and F_{MSY} are recommended by the most recent SEDAR/SSC.	Sub-alt 2a: GA-NC = unknown Sub-alt 2b: FLK/EFL = 0.138	GA-NC = unknown FLK/EFL = 346,095

Biological Effects

MSY is a reference point used by managers to assess fishery performance over the long term. Defining MSY for each of the stocks of hogfish under **Preferred Alternative 2** would not alter the current harvest or use of the resource. Specification of MSY merely establishes a benchmark for resource evaluation on which additional management actions would be based, if necessary. MSY in **Alternative 1 (No Action)** is defined as the yield produced by F_{MSY} where $F_{30\%SPR}$ is used as a proxy for F_{MSY} and represents the overfishing level defined in Amendment 11 (SAFMC 1998b) for a combined hogfish stock. MSY is not defined for the GA-NC stock or the FLK/EFL stock.

In Alternative 1 (No Action), a poundage for MSY is not specified since one was not specified in Amendment 11. Alternative 2 (Preferred) would allow for periodic adjustments of F_{MSY} and MSY values based on estimates from new assessments without the need for a plan

amendment. Because the SEDAR 37 (2014) stock assessment was not considered applicable to the GA-NC stock of hogfish, **Sub-alternative 2a (Preferred)** would essentially maintain the status quo for that stock. However, it differs from **Alternative 1 (No Action)** in that it would allow future adjustments without the need for a plan amendment if a stock assessment were to produce an estimate of MSY for that stock. **Sub-alternative 2b (Preferred)** would redefine MSY for the Florida Keys/East Florida stock based on the recommendation of SEDAR 37 (2014) and the Council's SSC to equal the value associated with the yield at F_{MSY} (346,095 lbs ww). The specification of a MSY equation would have beneficial effects on the Florida Keys/East Florida stock of hogfish as it provides a reference point to monitor the long-term performance of the stock.

As none of the alternatives considered under this action would have direct effects on resource harvest or use, biological effects would be neutral. However, **Alternative 2 (Preferred)**, which is recommended in the most recent SEDAR and by the SSC, has a better scientific basis and thus provides a more solid ground for management actions that have economic and social implications.

Economic Effects

Defining the MSY for hogfish does not alter the current harvest or use of the resource. Specification of this measure establishes a benchmark for fishery and resource evaluation from which additional management actions for the species would be based, should comparison of the fishery and resource with the benchmark indicate that management adjustments are necessary. The impacts of these management adjustments will be evaluated at the time they are proposed. As a benchmark, MSY would not limit how, when, where, or with what frequency participants in the fishery engage in harvesting the resource. This includes participants who directly utilize the resource (principally commercial vessels, for-hire operations, and recreational anglers), as well as participants associated with peripheral and support industries.

Since there would be no direct effects on resource harvest or use, there would be no direct effects on fishery participants, associated industries, or communities. Direct effects only accrue to actions that alter harvest or other use of the resource. Specifying MSY, however, establishes the platform for future management, specifically from the perspective of bounding allowable harvest levels. In this sense, MSY may be considered to have indirect effects on fishery participants.

As a benchmark, MSY sets off the parameters that condition subsequent management actions, and as such, defining MSY takes special significance. Of the alternatives considered in this action, **Alternative 2 (Preferred)**, which is recommended in the most recent SEDAR and by the SSC, has a better scientific basis. Hence, it provides a more solid ground for management actions that have economic implications.

Social Effects

Social effects of management specifications such as MSY for a stock will be associated with both the biological and economic effects of the MSY value in the rebuilding plan. An MSY level that reflects the best available information (**Preferred Alternative 2**) could result in lower F values in the rebuilding plan, and consequentially lower ACLs, which would likely affect fishermen targeting hogfish. However an informed and relevant MSY (**Preferred Alternative 2**) is expected to contribute to the success of the rebuilding strategy, resulting in greater expected long-term benefits to the commercial fleet and recreational fishermen who target hogfish than under **Alternative 1** (No Action).

SNAPPER GROUPER AP RECOMMENDATION: None

SSC RECOMMENDATION: None

SCOPING COMMENTS: 10 comments No Action. "Once separated from the FL stock, the GA-NC hogfish stock will need a stock assessment (SEDAR) to determined MSY."

COMMITTEE ACTION: None at this time

Action 3. Specify Minimum Stock Size Threshold (MSST) for the GA-NC and the Florida Keys/ East Florida (FLK/EFL) stocks of hogfish

Alternative 1 (No Action). Do not define minimum stock size threshold (MSST) for the GA-NC and Florida Keys/East Florida (FLK/EFL) stocks of hogfish. MSST for hogfish in the South Atlantic is equal to SSB_{MSY} ((1-M) or 0.5, whichever is greater).

Alternative 2. Minimum Stock Size Threshold (MSST) = SSB_{MSY} ((1-M) or 0.5, whichever is greater).

Sub-alternative 2a. For the GA-NC stock of hogfish. **Sub-alternative 2b.** For the FLK/EFL stock of hogfish.

- Alternative 3. Minimum Stock Size Threshold (MSST) = 50% of SSB_{MSY}
 Sub-alternative 3a. For the GA-NC stock of hogfish.
 Sub-alternative 3b. For the FLK/EFL stock of hogfish.
- Preferred Alternative 4. Minimum Stock Size Threshold (MSST) = 75% of SSB_{MSY} Preferred Sub-alternative 4a. For the GA-NC stock of hogfish. Preferred Sub-alternative 4b. For the FLK/EFL stock of hogfish.

Alternatives	MSST Equation	Μ	MSST Values (Ibs whole weight)
1 (No Action)	MSST = SSB _{MSY} ((1-M) or 0.5, whichever is greater).	0.25	unknown
2	MSST = SSB _{MSY} ((1-M) or 0.5, whichever is greater).	0.179	GA-NC = unknown FLK/EFL = 1,888,621
3	MSST = 50% of SSB _{MSY}	0.179	GA-NC = unknown FLK/EFL = 1,150,195
4 (Preferred)	MSST = 75% of SSB _{MSY}	0.179	GA-NC = unknown FLK/EFL = 1,725,293

Biological Effects

The Minimum Stock Size Threshold (MSST) corresponds to the level of biomass below which a stock is considered overfished. If it is determined that a stock's biomass is below the

MSST, the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires a rebuilding plan, which could result in harvest reductions.

Alternative 1 (No Action) would retain the MSST definition established in Amendment 11 to the Snapper Grouper FMP (SAFMC 1998b) for the entire stock of hogfish in the South Atlantic. Alternative 2 would impart the same definition of MSST to each of the two stocks of hogfish being defined in this amendment. Hence, in terms of biological effects, Alternatives 1 (No Action) and 2 are identical. The current definition of MSST under Alternatives 1 (No Action) and 2 requires that MSST be at least one half of SSB_{MSY}, but allows for it to be greater than this value if natural mortality (M) is suitably low. If (1-M) is equal to 0.5, then the value obtained from this alternative would be the same as that obtained from Alternative 3, which sets the MSST at 50% of the Spawning Stock Biomass at MSY (SSB_{MSY}). Preferred Alternative 4, which would establish MSST at 75% of SSB_{MSY}.

SEDAR 37 (2014) estimated natural mortality for hogfish at 0.179. However, because the stock assessment was not deemed applicable to the GA-NC stock, this estimate is valid for the Florida Keys/East Florida stock only. For species with such low natural mortality, such as hogfish, the biomass threshold for determining if the stock is overfished (MSST) under the current definition (Alternatives 1 (No Action) & 2) is very close to the biomass level when the stock is not considered overfished (SSB_{MSY}). Since Alternative 1 (No Action) nearly eliminates the buffer between MSST and SSB_{MSY} for stocks with low natural mortality rates, a stock would never be permitted to fall below SSB_{MSY} without triggering an "overfished" determination and mandatory development of a rebuilding plan. The most biologically conservative alternatives are Alternatives 1 (No Action) and 2 because they would ensure that a rebuilding plan is developed for hogfish; however, under these alternatives a rebuilding plan may also be required when it is not biologically necessary. The biological benefits of Alternative 1 (No Action) would take the form of increased harvest restrictions that would be implemented with the intent to rebuild the stock according to the current MSST threshold criterion. Alternative 3 and its sub-alternatives would be the least biologically beneficial since it would allow biomass to decrease by 50% before triggering the rebuilding plan requirement. Preferred Alternative 4 and its subalternatives would still require the development of a rebuilding plan if hogfish was deemed overfished, but would reduce the risk of requiring a rebuilding plan when decreased biomass was due to natural variations in recruitment.

Additionally, if the same management measures are used to rebuild a stock under all the alternatives considered, the stock would be expected to rebuild fastest under Alternative 1 (No Action) and Alternative 2 because the overfished threshold (MSST) would be closest to the rebuilt threshold SSB_{MSY} . Therefore, Alternative 1 (No Action) could be considered to have the greatest biological benefit among alternatives considered in this action. The tradeoff associated with the assurance provided by this conservative definition of MSST is that natural variation in recruitment could cause stock biomass to frequently alternate between an overfished and rebuilt condition (biomass at SSB_{MSY}), even if the fishing mortality rate applied to the stock was within the limits specified by the maximum fishing mortality threshold (MFMT). If realized, this situation could result in administrative and socio-economic burdens related to developing and

implementing multiple rebuilding plans that may not be biologically necessary. However, simulations on a wide variety of species by Restrepo et al. (1998) indicated that stocks at biomass levels approximating 75%SSB_{MSY} can rebuild to SSB_{MSY} fairly quickly with little constraint on fishing mortality. Therefore, it is not biologically necessary to have extremely small buffers between overfished and rebuilt thresholds.

Preferred Alternative 4, which would set MSST equal to 75%SSB_{MSY}, is consistent with how the South Atlantic Council has approached defining MSST for other snapper grouper stocks with low natural mortality estimates. The South Atlantic Council changed the MSST definition to 75%SSB_{MSY} for snowy grouper (SAFMC 2008a), golden tilefish (SAFMC 2008b), red grouper (SAFMC 2011d) and, more recently, several other snapper grouper species (red snapper, blueline tilefish, gag, black grouper, yellowtail snapper, vermilion snapper, red porgy, and greater amberjack) (SAFMC 2014). These species have low estimates of natural mortality, and the overfished threshold from the status quo MSST definition is very close to the biomass threshold when stocks are not considered overfished. The biological benefits of **Preferred** Alternative 4, which would trigger a rebuilding plan when biomass is at 75% of SSB_{MSY}, would be expected to be greater than Alternative 3, which would have a lower biomass threshold for an overfished determination (50%SSB_{MSY}) because biomass would not be allowed to decrease as much as it would under Alternative 3 before triggering implementation of a rebuilding plan. At their October 2013 meeting, the South Atlantic Council's Scientific and Statistical Committee acknowledged that the 75%SSB_{MSY} approach is an acceptable choice for MSST, and they voiced no concern regarding the adoption of this management reference point for South Atlantic Council managed species.

Economic Effects

Like MSY, MSST does not alter the current harvest or use of the resource, and thus would have no direct economic effects on fishery participants and associated industries or communities. Unlike MSY, however, MSST is directly related to actions for rebuilding the stock, actions that would have economic implications.

In general, a high MSST level is susceptible to triggering rebuilding actions that could limit harvest or fishing opportunities, thereby affecting the economic status of fishery participants. A low MSST level would be associated with lower probability of enacting rebuilding actions that would alter the economic environment. To the extent that rebuilding actions necessitated by a chosen MSST would tend to have economic effects, it is possible to provide some general implications of the MSST alternatives.

Alternatives 2-4 (Preferred) each have sub-alternatives a and b. Action 3 assumes that Action 1 will result in the decision to create separate management stocks for the Georgia to North Carolina fish and for the Florida Keys/East Florida. The expected economic effects for the sub-alternatives a and b for each alternative is expected to be similar.

Assuming Action 1 results in defining two separate hogfish stocks, Alternative 2 is functionally equivalent to Alternative 1 (No Action) except that Alternative 2 allows MSST to be set to SSB_{MSY} ((1-M) or 0.5, whichever is greater) for each of the stocks separately.

With rebuilding taking place over a number of years, management actions and their economic consequences could change over time depending on a variety of factors, including the status of the stock and fishing conditions. Alternative 3 would appear to be best from an economics standpoint, because it is unlikely to trigger restrictive rebuilding actions in the short term. One possible downside of this alternative is that once the stock is considered overfished, the required rebuilding actions could be very restrictive and potentially remain for quite some time. Alternatives 1 (No Action) and 2 lie on one end of the continuum for potential negative economic effects because they have the highest probability of triggering restrictive rebuilding actions. A possible mitigating factor with Alternatives 1 (No Action) and 2 is the possibility that the required management actions would have adverse economic effects which would not last long. But a frequently varying regulatory regime would tend to de-stabilize business planning and fishing decisions which could have potentially worse economic consequences. The economic implications of the Preferred Alternative 4 may be characterized as falling between Alternatives 1 (No Action)/2 and Alternative 3.

Social Effects

Social effects of revised biological parameters such as MSST for a stock will be associated with both the biological and economic effects of the modified MSST value. The estimated SSB as compared to MSST serves as a proxy for designating a stock as overfished or not. If the proxy is not accurately representing the stock status, the outcomes of the 'overfished' designation when a stock is not overfished can have negative long- and short-term social effects associated with restricted or no access to the fish. Conversely, if an inaccurate proxy results in a stock designated as not overfished when it is overfished, the fishing fleets, associated businesses and communities could be negatively impacted in the long term due to decline in the stock and negative broader biological impacts of overfishing. Lastly, an inaccurate proxy that causes a stock to fluctuate between overfished and not overfished would likely have negative effects on fishermen by requiring changes in regulations on harvest too often. This could negatively affect stability and planning for fishing businesses, in addition to fishing opportunities for recreational anglers, due to inconsistent access to the resource. Although for some fishermen, any access to a stock would be beneficial, the positive effects of consistency in regulations (even if access is restricted) and stability of the fishery would also be expected from a more fixed designation as overfished or not overfished.

Under all alternatives, fishermen could be affected by future restricted access to a specific species due to an overfished designation, which could have negative effects on associated fishing businesses and communities. Although **Preferred Alternative 4** is the more restrictive approach to set the MSST than under **Alternatives 1** (No Action)-3, it would also be the most likely to trigger a rebuilding plan sooner, which may avoid more severe biological impacts to the stock (as noted in Section 4.3.1).

If the FMU were modified in Action 1 to align with the approach used in the stock assessment for the stock boundary, Alternative 1 (No Action) would not be consistent with the most recent scientific information as in Sub-alternatives 2a/b, 3a/b, and 4a/b (Preferred).

SNAPPER GROUPER AP RECOMMENDATION: None

SSC RECOMMENDATION: None

SCOPING COMMENTS: 10 comments No Action

COMMITTEE ACTION: None at this time

Action 4. Establish Annual Catch Limits (ACLs) for the GA-NC stock of hogfish

Alternative 1 (No action). Do not establish ACLs for the GA-NC stock of hogfish. The current ABC for the entire stock of hogfish is 137,824 lbs ww and ACL = OY = ABC. The commercial ACL = 49,469 lbs ww (36.69%) and the recreational ACL = 85,355 lbs ww (63.31%).

Alternative 2. Establish an ACL for the GA-NC stock. Specify commercial and recreational ACLs using re-calculated sector allocations based on proposed modifications to the management unit (81.91% 69.1% commercial and 18.09% 30.9% recreational). The ABC for the GA-NC stock = 28,161-35,716 pounds whole weight (lbs ww). Sub-alternative 2a. ACL = OY = ABC Sub-alternative 2b. ACL = OY = 95% ABC

Sub-alternative 2c. ACL = OY = 90% ABC

Biological Effects

Genetic evidence (Seyoum et al. 2015) indicates that hogfish within the South Atlantic Council's area of jurisdiction belong to two distinct stocks. The SEDAR 37 (2014) assessment, however, was not deemed applicable to the GA-NC stock due to lack of data hence the status of the GA-NC stock is currently unknown. Based on methodology in *Calculating Acceptable Biological Catch for Stocks That Have Reliable Catch Data Only* (Only Reliable Catch Stocks – ORCS) (Berkson et al. 2011), the South Atlantic Council's SSC recommended an approach to compute the Acceptable Biological Catch (ABC) for unassessed stocks with only reliable catch data. The approach involves selection of a "catch statistic", a scalar to denote the risk of overexploitation for the stock, and a scalar to denote the management risk level. The SSC provides the first two criteria for each stock, and the South Atlantic Council specifies their risk tolerance level for each stock.

<u>Catch Statistic:</u> The median was considered inadequate to represent the high fluctuation in landings—i.e., to appropriately capture the range of occasional high landings—therefore, the maximum catch over the period 1999-2007 was chosen instead. This time period was chosen to (1) be consistent with the period of landings used in the South Atlantic Council's Comprehensive ACL Amendment (SAFMC 2011c), and (2) to minimize the impact of recent regulations and the economic downturn on the landings time series. For the GA-NC stock of hogfish, 1999 was the year of highest landings over the 1999-2007 time period and was selected as the "catch statistic."

<u>*Risk of Overexploitation:*</u> Based on SSC consensus and expert judgment each stock was assigned to a final risk of exploitation category based on a suite of attributes used to assess the level of risk. For hogfish, the SSC assigned a risk of overexploitation of 1.25, indicating the species is at moderately high risk of overexploitation.

<u>*Risk Tolerance*</u>: The next step in the process involves multiplying the "catch statistic x scalar" metric by a range of scalar values that reflects the South Atlantic Council's risk tolerance level.

For instance, the South Atlantic Council may choose to be more risk-averse in computing the ABC for a stock that exhibits a moderately high risk of overexploitation. As such, the South Atlantic Council may use a scalar of 0.50 for such stocks to specify a more conservative ABC. On the other hand, stocks with low risk of overexploitation, and thus able to tolerate a higher level of management risk, may be assigned a less conservative scalar, such as 0.90. For hogfish, the South Atlantic Council selected a risk tolerance scalar of 0.7.

Table 4.4.1.1 below summarizes the ORCS approach to arrive at the ABC for the GA-NC stock of hogfish.

Statistic	Value
Risk of Overexploitation	Moderately High
Associated Scalar	1.25
Range of Years	1999-2007
Year of Max Landings	2006
Catch Statistic	40,818 lbs ww
Council Risk Scalar	0.7
(Preferred from Am 29)	0.7
Proposed ABC	35,716 lbs ww

 Table 4.4.1.1.
 The South Atlantic's Scientific and Statistical Committee (SSC) Acceptable Biological

 Catch (ABC) recommendation for the GA-NC stock of hogfish.

The allocation formula from the Comprehensive ACL Amendment (SAFMC 2011) was used to specify commercial and recreational allocations for the GA-NC hogfish stock: (0.5 * catch history) + (0.5 * current trend) where catch history = average landings 1986-2008, current trend = average landings 2006-2008. The formula was applied to SEFSC commercial ACL data, accessed in July 2014, and post-stratified SEFSC recreational data accessed in February 2015). Recreational data were post-stratified to include MRIP landings from Monroe County in the FLK/EFL sub-region, consistent with the SEDAR 37 stock assessment. Commercial and recreational landings used to recalculate sector allocations are shown in **Table 4.4.1.2**.

Year	Rec	Comm	Total
1986	20,625	8,040	28,665
1987	8,733	9,295	18,028
1988	942	10,186	11,128
1989	3,193	15,177	18,370
1990	1,848	27,862	29,710
1991	814	23,886	24,700
1992	3,309	32,274	35,583
1993	6,272	31,739	38,011
1994	688	23,063	23,751
1995	83,580	36,903	120,483
1996	262	17,471	17,733
1997	977	25,394	26,371
1998	1,338	21,959	23,297
1999	1,215	29,186	30,401
2000	2,417	24,104	26,521
2001	1,471	14,193	15,664
2002	11,796	20,557	32,353
2003	2,343	9,307	11,650
2004	3,888	19,295	23,183
2005	15,082	19,255	34,337
2006	17,385	23,433	40,818
2007	8,782	20,754	29,536
2008	9,044	30,437	39,481

Table 4.4.1.2. Commercial and recreational landings (lbs ww) for the GA-NC stock of hogfish, 1986-2008.

Source: NMFS SERO

To set the Annual Catch Limit (ACL) and Optimum Yield (OY) for the GA-NC stock of hogfish, the South Atlantic Council may exercise varying degrees of precaution to account for management uncertainty: **Sub-alternative 2a** would set the ACL and OY at the same level as ABC, whereas **Sub-alternatives 2b** and **2c** would each provide a management uncertainty buffer of 5% and 10%, respectively.

Sub-alternatives 2a-2c would set OY equal to the ACL. National Standard 1 (NS1) establishes the relationship between conservation and management measures, preventing overfishing, and achieving OY from each stock, stock complex, or fishery. The NS1 guidelines discuss the relationship of OFL to the MSY and ACL to OY. The OFL is an annual amount of catch that corresponds to the estimate of maximum fishing mortality threshold applied to a stock; MSY is the long-term average of such catches. The ACL is the limit that triggers AMs and is the management target for the species. Management measures for a fishery should, on an annual basis, prevent the ACL from being exceeded. The long-term objective is to achieve OY through annual achievement of an ACL. The NS1 guidelines state that if OY is set close to MSY, the

conservation and management measures in the fishery must have very good control of the amount of catch in order to achieve the OY without overfishing.

The South Atlantic Council and their SSC have established an ABC control rule that takes into consideration scientific and management uncertainty to ensure catches are maintained below OFL. Setting the ACL equal to the ABC (**Sub-alternative 2a**) leaves no buffer between the two harvest parameters, which may increase risk that harvest could exceed the ABC. The South Atlantic Council considered alternatives in the Comprehensive ACL Amendment (SAFMC 2011a) and Amendment 24 (SAFMC 2011b) that would set the ACL below the ABC but selected ACL=OY=ABC as their preferred alternative. More recently, the South Atlantic Council has frequently set ACLs for snapper grouper species at the same level as the ABC. However, AMs and ACLs are in place to ensure overfishing of hogfish does not occur. The NS1 Guidelines recommend a performance standard by which the system of ACLs and AMs can be measured and evaluated. If the ACL were exceeded more than once over the course of four years, the South Atlantic Council is taking action in Amendment 34 (SAFMC 2015) to enhance the effectiveness of the AMs for hogfish.

Sub-alternatives 2b and **2c** would have a greater positive biological effect than **Sub-alternative 2a** because they would create a buffer between the ACL/OY and ABC, with **Sub-alternative 2c** setting the most conservative ACL at 90% of the ABC (**Table 4.4.1**). Creating a buffer between the ACL/OY and ABC would provide greater assurance that overfishing is prevented, and the long-term average biomass is near or above SSB_{MSY}. However, the South Atlantic Council's ABC control rule takes into account scientific uncertainty. The Magnuson-Stevens Act national standard 1 guidelines indicate an ACL may typically be set very close to the ABC. Setting a buffer between the ACL and ABC would be appropriate in situations where there is uncertainty in whether or not management measures are constraining fishing mortality to target levels. An ACT, which is not required, can also be set below the ACL to account for management uncertainty and provide greater assurance overfishing does not occur.

1	refer from pounds to numbers using an average weight of 10.00 lbs ww per lish.						
	Sub-alternative	Total ACL	Rec ACL (lbs)	Rec ACL (numbers)	Comm ACL (lbs)		
	2a	35,716	11,025	1,040	24,691		
	2b	33,930	10,474	988	23,456		
	2c	32,144	9,923	936	22,222		

Table 4.4.1. Commercial and recreational ACLs provided by Sub-alternatives 2a-2c. Recreational ACL converted from pounds to numbers using an average weight of 10.60 lbs ww per fish.

With vastly improved commercial monitoring mechanisms recently implemented, it is unlikely that repeated commercial ACL overages would occur. The Commercial Landings Monitoring System (CLM) came online in June 2012 and is now being used to track commercial landings of federally managed fish species. This system is able to track individual dealer reports, track compliance with reporting requirements, project harvest closures using five different methods, and analyze why ACLs are exceeded. The CLM performs these tasks by taking into account: (1) spatial boundaries for each stock based on fishing area; (2) variable quota periods such as overlapping years or multiple quota periods in one year; and (3) overlapping species groups for single species as well as aggregated species. Data sources for the CLM system include the Standard Atlantic Fisheries Information System for Georgia and South Carolina, and the Bluefin Data file upload system for Florida and North Carolina. The CLM system is also able to track dealer reporting compliance with a direct link to the permits database in NMFS Southeast Regional Office (SERO).

Additionally, the Southeast Fisheries Science Center (SEFSC) worked with SERO, the Gulf of Mexico Fishery Management Council (Gulf of Mexico Council), and South Atlantic Council to develop a Joint Dealer Reporting Amendment (GMFMC & SAFMC 2013b), which became effective on August 7, 2014. The Joint Dealer Reporting Amendment requires electronic reporting, increases required reporting frequency for dealers to once per week, and requires a single dealer permit for all finfish dealers in the Southeast Region. The CLM and the new dealer reporting requirements constitute major improvements to how commercial fisheries are monitored, and go beyond monitoring efforts that were in place when the NS1 guidelines were developed. The new CLM quota monitoring system and actions in the Joint Generic Dealer Reporting amendment are expected to provide more timely and accurate data reporting and would thus reduce the incidence of quota overages.

Harvest monitoring efforts in the recreational sector have also been improved. On January 27, 2014, regulations became effective requiring headboats to report their landings electronically once per week (Generic Headboat Amendment, GMFMC & SAFMC 2013a). The SEFSC is also developing an electronic reporting system for charter boats operating in the Southeast Region and the Gulf of Mexico and South Atlantic Councils are developing amendments that would require electronic reporting for charterboats with a set reporting frequency. These recreational harvest monitoring efforts could substantially increase the accuracy and timeliness of in-season reporting and reduce the risk of recreational ACL overages, which would be biologically beneficial for hogfish. Therefore, there is a low risk of exceeding the commercial and recreational ACLs and Alternative 2 and its sub-alternatives can be used as part of a successful harvest management system for hogfish with little risk of overfishing.

Economic Effects

Alternative 1 (No Action) is not a viable alternative for this action because establishing an ACL for a stock is a statutory requirement. In general, assuming a sector is able to catch its entire ACL, the higher the ACL, the greater the positive direct economic effects for all sectors, as long as the ACL is not exceeded. Therefore, **Sub-alternative 2a** represents the highest positive direct economic effects, followed by **Sub-alternative 2b** and then **Sub-alternative 2c**.

Social Effects

Compared to other snapper grouper species such as black sea bass, vermilion snapper, and gray triggerfish, hogfish is not as economically and socially important in Georgia, South

Carolina, and North Carolina. However, there are some communities that may have fishermen, fishing businesses, and recreational anglers who would be affected by management changes for the GA-NC stock of hogfish. Commercial landings are relatively highest in the South Carolina communities of Little River and Georgetown, and North Carolina communities around the Cape Fear River including Southport, Carolina Beach, and Oak Island (**Figure 3.4.1.3**). These are also communities that have high levels of engagement and reliance on commercial and recreational fishing (**Figures 3.4.1.5** and **3.4.1.7**).

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 fleet, for-hire fleet, and private anglers. AMs can have significant direct and indirect social effects because, when triggered, can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects, such as increased pressure on another species, or fishermen having to stop fishing all together due to regulatory closures. However, restrictions on harvest contribute to sustainable management goals, and are expected to be beneficial to fishermen and communities in the long term.

Under Alternative 2, the ACL for the GA-NC would be based on the most recent stock assessment, but could also set ACLs lower than recent recreational and commercial landings (see **Tables 2.4.1.** and **2.4.3**) in the area. This could result in early closures, paybacks, or other management measures. **Sub-alternative 2c** could result in the most restrictive measures, followed by **Sub-alternative 2b** and **Sub-alternative 2a**. Alternative 1 (No Action), although it is not based on the most recent stock assessment, would allow the most access to the hogfish resource because of the larger ACL, and be the most beneficial to commercial and recreational fishermen in Georgia, South Carolina, and North Carolina.

SNAPPER GROUPER AP RECOMMENDATION:

MOTION: RECOMMEND SUB-ALTERNATIVE 2A UNDER ACTION 4 AS PREFERRED ALTERNATIVE APPROVED BY AP

SSC RECOMMENDATION:

- Regarding the ORCS ABC recommendation for the GA-NC hogfish stock, the SSC consensus is that:
 - This methodology is applicable and appropriate for this stock given that: (1) recreational landings (i.e., the main source of uncertainty) represent a very small proportion of total landings, and (2) the commercial landings are sampled consistently.

- The designation of a Moderately-High risk of overexploitation is still appropriate for this stock. This decision was based mainly on hogfish life history characteristics and vulnerability.
- Regarding catch level recommendations in numbers vs. weight, the SSC recommended that the ABC be set in numbers and converted to weight for the commercial sector.
- The SSC clarified that the OY basis described in the assessment report is not valid. The Council will specify OY in Amendment 37 to the Snapper Grouper FMP.

<u>SCOPING COMMENTS:</u> 12 comments No Action. Stock assessment is needed for this stock. Restrictive management measures are not needed for a stock of unknown status. GA-NC stock is stable.

COMMITTEE ACTION:

- Sector allocations were recalculated using landings provided by NMFS using SEFSC approved weight standardization methodology. The ABC for the GA-NC stock consequently increased from 28,161 lbs ww to 35,716 lbs ww.
- Average weight obtained from pooled recreational samples, 2010-2015.
- Council staff have encountered issues with recreational estimates from the 1980s and, in particular, 1995. A letter was sent to MRIP requesting that MRIP review the intercept data for hogfish off the Carolinas and advise whether the potential outliers Council staff have identified indicate errors.

OPTION 1: ACCEPT THE IPT'S SUGGESTED EDITS FOR ACTION 4

OPTION 2. DO NOT ACCEPT THE IPT'S SUGGESTED EDITS FOR ACTION 4 (COMMITTEE TO SPECIFY CHANGES AND APPROVE)

OPTION 3. SELECT ALTERNATIVE X AS PREFERRED

OTHERS?

Action 5. Establish a rebuilding plan for the Florida Keys/East Florida (FLK/EFL) stock of hogfish

Alternative 1 (No Action). Do not establish a rebuilding plan the Florida Keys/East Florida (FLK/EFL) stock of hogfish. The current ABC for the entire stock of hogfish is 137,824 lbs ww

Alternative 2. Define a rebuilding plan where the rebuilding strategy for the Florida Keys/East Florida (FLK/EFL) stock of hogfish sets <u>ABC equal to the yield at a constant fishing mortality</u> rate and rebuilds the stock in <u>10 years with a 50% probability of rebuilding success</u>. The Overfishing Limit (OFL) is the yield at F_{MSY} . The Spawning Stock Biomass (SSB_{MSY}) is 2,300,391 lbs ww. Year 1 = <u>2016</u>, 2017

Year	F	SSB (lbs)	Probability of SSB > SSB _{MSY}	ABC (lbs)	Discards (lbs)	<mark>Rec ACL</mark> (lbs)	<mark>Ree ACL</mark> (numbers)	<mark>Comm</mark> ACL (lbs)
2017	0.087	466,101	0	48,026	595	<mark>42,599</mark>	<mark>19,906</mark>	<mark>5,427</mark>
2018	0.087	615,078	0	61,994	768	<mark>54,989</mark>	<mark>25,696</mark>	7,005
2019	0.087	780,517	0	77,363	958	<mark>68,621</mark>	<mark>32,066</mark>	<mark>8,742</mark>
2020	0.087	958,225	0.001	93,826	1,162	<mark>83,224</mark>	<mark>38,890</mark>	<mark>10,602</mark>
2021	0.087	1,145,995	0.01	111,135	1,376	<mark>98,577</mark>	<mark>46,064</mark>	<mark>12,558</mark>
2022	0.087	1,341,203	0.049	129,008	1,597	<mark>114,430</mark>	<mark>53,472</mark>	<mark>14,578</mark>
2023	0.087	1,540,211	0.125	147,103	1,821	<mark>130,480</mark>	<mark>60,972</mark>	<mark>16,623</mark>
2024	0.087	1,739,110	0.224	165,076	2,044	<mark>146,422</mark>	<mark>68,422</mark>	<mark>18,654</mark>
2025	0.087	1,934,221	0.327	182,603	2,261	<mark>161,969</mark>	<mark>75,686</mark>	<mark>20,634</mark>
2026	0.087	2,122,134	0.421	199,389	2,469	<mark>176,858</mark>	<mark>82,644</mark>	<mark>22,531</mark>
2027	0.087	2,300,212	0.5	215,211	2,664	<mark>190,892</mark>	<mark>89,202</mark>	<mark>24,319</mark>

Preferred Alternative 3. Define a rebuilding plan where the rebuilding strategy for the Florida Keys/East Florida (FLK/EFL) stock of hogfish sets <u>ABC equal to the yield at a constant fishing</u> <u>mortality rate</u> and rebuilds the stock in <u>10 years with a 72.5% probability of rebuilding success</u>. The Overfishing Limit (OFL) is the yield at F_{MSY} . The Spawning Stock Biomass (SSB_{MSY}) is 2,300,391 lbs ww. Year 1 = <u>2016</u>, 2017

Year	F	SSB (lbs)	Probability of SSB > SSB _{MSY}	ABC (lbs)	Discards (lbs)	<mark>Rec ACL</mark> (lbs)	<mark>Rec ACL</mark> (numbers)	<mark>Comm</mark> ACL (lbs)
2017	0.07	466,101	0	38,367	595	<mark>33,580</mark>	<mark>15,692</mark>	<mark>4,787</mark>
2018	0.069	623,334	0	49,449	777	<mark>43,280</mark>	<mark>20,224</mark>	<mark>6,169</mark>
2019	0.068	801,673	0	61,982	982	<mark>54,249</mark>	<mark>25,350</mark>	<mark>7,733</mark>
2020	0.068	997,357	0.001	75,710	1,206	<mark>66,265</mark>	<mark>30,965</mark>	<mark>9,445</mark>
2021	0.068	1,208,116	0.014	90,469	1,446	<mark>79,182</mark>	<mark>37,001</mark>	<mark>11,287</mark>
2022	0.067	1,430,997	0.067	106,059	1,698	<mark>92,827</mark>	<mark>43,377</mark>	<mark>13,232</mark>
2023	0.067	1,661,827	0.167	122,197	1,957	<mark>106,952</mark>	<mark>49,977</mark>	<mark>15,245</mark>
2024	0.067	1,896,011	0.293	138,566	2,219	<mark>121,279</mark>	<mark>56,672</mark>	<mark>17,287</mark>
2025	0.067	2,129,079	0.417	154,851	2,477	<mark>135,532</mark>	<mark>63,332</mark>	<mark>19,319</mark>
2026	0.068	2,356,761	0.525	170,750	2,728	<mark>149,448</mark>	<mark>69,835</mark>	<mark>21,302</mark>
2027	0.068	2,575,569	0.613	186,018	2,968	<mark>162,811</mark>	<mark>76,079</mark>	<mark>23,207</mark>

Note: Projections for various F scenarios were completed using Stock Synthesis (SS3). Under a constant F scenario, the F values vary over the span of the projection due to changes in the stock's vulnerable biomass and age composition.

Alternative 4. Define a rebuilding plan where the rebuilding strategy for the Florida Keys/East Florida (FLK/EFL) stock of hogfish sets <u>ABC equal to the yield at a constant fishing mortality</u> rate and rebuilds the stock in 7 years with a 50% probability of rebuilding success. The Overfishing Limit (OFL) is the yield at F_{MSY} . The Spawning Stock Biomass (SSB_{MSY}) is 2,300,391 lbs ww. Year 1 = 2016, 2017

Year	F	SSB (pounds)	Probability of SSB > SSB _{MSY}	ABC (lbs)	Discards (lbs)	<mark>Ree ACL</mark> (numbers)	<mark>Ree</mark> <mark>ACL</mark> (lbs)	<mark>Comm</mark> ACL (lbs)
2017	0.027	466,101	0	14,352	595	<mark>12,561</mark>	<mark>5,870</mark>	<mark>1,791</mark>
2018	0.027	643,910	0	19,342	801	<mark>16,929</mark>	7,911	<mark>2,413</mark>
2019	0.027	853,516	0	25,157	1,042	<mark>22,019</mark>	<mark>10,289</mark>	<mark>3,138</mark>
2020	0.027	1,092,682	0.002	31,751	1,315	<mark>27,790</mark>	<mark>12,986</mark>	<mark>3,961</mark>
2021	0.027	1,359,505	0.03	39,049	1,618	<mark>34,177</mark>	<mark>15,971</mark>	<mark>4,872</mark>
2022	0.027	1,650,910	0.133	46,953	1,945	<mark>41,095</mark>	<mark>19,203</mark>	<mark>5,858</mark>
2023	0.027	1,962,295	0.306	55,333	2,293	<mark>48,430</mark>	<mark>22,631</mark>	<mark>6,903</mark>
2024	0.027	2,288,307	0.494	64,049	2,654	<mark>56,058</mark>	<mark>26,195</mark>	<mark>7,991</mark>

Alternative 5. Define a rebuilding plan where the rebuilding strategy for the Florida Keys/East Florida (FLK/EFL) stock of hogfish sets <u>ABC equal to the yield at a constant fishing mortality</u> rate that rebuilds the stock in 7 years with a 72.5% probability of rebuilding success. The Overfishing Limit (OFL) is the yield at F_{MSY} . The Spawning Stock Biomass (SSB_{MSY}) is 2,300,391 lbs ww. Year 1 = 2016, 2017

Year	F	SSB (pounds)	Probability of SSB > SSB _{MSY}	ABC (lbs)	Discards (lbs)	<mark>Rec ACL</mark> (numbers)	<mark>Ree</mark> ACL (lbs)	<mark>Comm</mark> ACL (lbs)
2017	0.022	466,101	0	11,858	595	<mark>10,379</mark>	<mark>4,850</mark>	<mark>1,479</mark>
2018	0.022	646,051	0	15,774	804	<mark>13,806</mark>	<mark>6,451</mark>	<mark>1,968</mark>
2019	0.022	859,315	0	20,469	1,049	<mark>17,915</mark>	<mark>8,372</mark>	<mark>2,554</mark>
2020	0.022	1,103,904	0.002	25,906	1,328	<mark>22,674</mark>	<mark>10,595</mark>	<mark>3,232</mark>
2021	0.022	1,378,000	0.031	32,042	1,639	<mark>28,045</mark>	<mark>13,105</mark>	<mark>3,997</mark>
2022	0.022	1,678,512	0.145	38,810	1,976	<mark>33,968</mark>	<mark>15,873</mark>	<mark>4,842</mark>
2023	0.022	2,000,728	0.329	46,106	2,335	<mark>40,354</mark>	<mark>18,857</mark>	<mark>5,752</mark>
2024	0.022	2,339,124	0.523	53,809	2,710	<mark>47,096</mark>	<mark>22,007</mark>	<mark>6,713</mark>

In the tables above, the terminal Spawning Stock Biomass (SSB) in the rebuilding projections may not equal or exceed the base run estimate of SSB_{MSY} because the SSB estimates in the projections were generated from multiple bootstrap iterations in order to incorporate uncertainty into the projections. Therefore, the actual SSB_{MSY} that the projections are rebuilding to is not the estimate from the base run but the median (or other type of estimate in the case of the 72.5% probability of success runs) from the bootstrap distribution.

Table 2.5.1 below provides a summary of the alternatives for Action 5.

Table 2.5.1.	A summary of t	he various re	building s	scenarios	(Alternatives	1-5) for th	e Florida k	Keys/East
Florida (FLK/E	EFL) stock of ho	ogfish.	-					

Alternatives	F rate strategy	F rate	Year 1 ABC (lbs)	Rebuilt stock (years)	Probability of rebuilt stock
1 (No action)	Do not specify	a rebuilding stock of hogf	plan. The cur ish is 137,824	rrent ABC f 4 lbs ww	for the entire
2	Constant	0.087	48,026	10	50%
3 (Preferred)	Constant	0.070 (year 1)	38,367	10	72.5%
4	Constant	0.027	14,352	7	50%
5	Constant	0.022 (year 1)	11,858	7	72.5%

Biological Effects

The hogfish population in the South Atlantic had not been assessed until SEDAR 37 (2014). The assessment showed the stock of hogfish off Florida is overfished and undergoing overfishing. Hence the South Atlantic Council is mandated to establish a rebuilding plan for that stock within two years of receiving notification of its status. Action 5 presents options for the rebuilding strategy and schedule that would govern the rebuilding plan for the FLK/EFL stock of hogfish and the resulting Acceptable Biological Catch.

Alternatives 2-5 would establish a rebuilding strategy based on the results of the most recent stock assessment (SEDAR 37 2014). The recreational fishery for hogfish was closed in August 2015 due to an increase in landings during Wave 2 of the MRIP survey. As a result, preliminary landings for 2015 were above the landings level assumed in the original set of stock projections from the SEDAR 37 (2014) assessment raising concerns that the projections might no longer represent the Best Scientific Information Available. Hence the Council requested updated projections for the East Florida/Florida Keys Hogfish stock using the most recent landings estimates. The request was for the same suite of scenarios provided in the original projections, modified with the most recent landings estimates and changing year 1 to 2017 to reflect the likely implementation date of the management actions.

The South Atlantic Council's SSC recommended a rebuilding scenario that would set the ABC at the yield under a constant fishing mortality rate that rebuilds the stock in 10 years with a 72.5% probability of rebuilding success. This rebuilding scenario corresponds to **Preferred Alternative 3** (see **Table 4.5.1**). Under **Alternatives 2-5** the total ABC would increase over time until the Spawning Stock Biomass (SSB) reaches the level at which the stock is considered to be rebuilt (~ 2.3 million pounds). Under **Preferred Alternative 3**, this level would be reached in 2027.

Year	Alternative 2 ABC (lbs)	Preferred Alternative 3 ABC (lbs)	Alternative 4 ABC (lbs)	Alternative 5 ABC (lbs)
2017	48,026	38,367	14,352	11,858
2018	61,994	49,449	19,342	15,774
2019	77,363	61,982	25,157	20,469
2020	93,826	75,710	31,751	25,906
2021	111,135	90,469	39,049	32,042
2022	129,008	106,059	46,953	38,810
2023	147,103	122,197	55,333	46,106
2024	165,076	138,566	64,049	53,809
2025	182,603	154,851		
2026	199,389	170,750		
2027	215,211	186,018		

Table 4.5.1. Acceptable Biological Catch (ABC) under rebuilding plan alternatives 2-5.

Alternative 2 yields higher ABCs than Preferred Alternative 3 at a probability of rebuilding of 50%. This level of harvest is higher than that recommended by the South Atlantic Council's Scientific and Statistical Committee. Alternatives 4 and 5 both result in lower ABCs than those under Preferred Alternative 3 and rebuild the FLK/EFL stock of hogfish in 7 years instead of 10. In general, lower levels of harvest and less time to rebuild translate into higher biological benefits for the stock, hence the biological benefits of Alternatives 4 and 5 would be higher than those under Preferred Alternative 3. However, the Scientific and Statistic Committee has indicated that harvest levels proposed under Preferred Alternative 3 are sustainable and would achieve the goal of rebuilding the FLK/EFL stock of hogfish within a reasonable timeframe. Therefore, there is no biological need to constrain harvest below this level. Compared to Alternative 1 (No Action), the biological effects of Alternatives 2-5 would be beneficial since management would be responding to the best scientific information available and results of the SEDAR 37 (2014) stock assessment have indicated that the FLK/EFL stock of hogfish is overfished and undergoing overfishing.

Economic Effects

Rebuilding plans in general impose negative direct economic effects in the short term in favor of more direct positive economic effects in the long term as the stock recovers. The difficulty is in balancing those long term and short-term economic effects. Being overly restrictive in the short term could rebuild the stock faster, but perhaps at the expense of pushing some fishermen out of the fishery because they are unable to survive financially under the restrictions. Being too lenient in the short term could jeopardize the probability of rebuilding the stock as needed.

Alternative 1 (No Action) is not a viable alternative to consider, as there are statutory requirements to rebuild all fishery stocks that are overfished or undergoing overfishing.

Table 4.5.2 estimates the value of hogfish under Alternatives 2 through 5 based on projected ABC values shown in **Table 4.5.1**. The dockside values shown in **Table 4.5.2** assume that the entire ABC will be caught each year of the rebuilding. Under **Alternatives 4** and **5**, the stock is projected to be rebuilt by 2024.

Voor	Alternative 2	Preferred Alternative 3	Alternative 4	Alternative 5
Icai	ABC (lbs)	ABC (lbs)	ABC (lbs)	ABC (lbs)
2017	\$196,323	\$156,838	\$58,669	\$48,474
2018	\$253,422	\$202,140	\$79,067	\$64,482
2019	\$316,248	\$253,373	\$102,838	\$83,674
2020	\$383,546	\$309,491	\$129,793	\$105,900
2021	\$454,303	\$369,823	\$159,626	\$130,983
2022	\$527,365	\$433,553	\$191,937	\$158,649
2023	\$601,334	\$499,522	\$226,193	\$188,474
2024	\$674,805	\$566,436	\$261,822	\$219,963
2025	\$746,453	\$633,007		
2026	\$815,071	\$698,000		
2027	\$879,749	\$760,413		

 Table 4.5.2. Expected dockside value (in 2014 \$) of hogfish in FLK/EFL under Action 5 alternatives.

In the short term, from most to least direct negative economic effects are Alternative 5, Alternative 4, Preferred Alternative 3, and then Alternative 2. In the long term, from most to least direct positive economic effects are Alternative 2, Preferred Alternative 3, Alternative 4, and then Alternative 5.

Social Effects

Although establishment of a rebuilding strategy for the FLK/EFL stock of hogfish is primarily an administrative action, the selected level of fishing mortality and associated ABCs determine the level of restrictiveness that the management measures need to be in order to rebuild the resource within the specified timeframe. The level to which access to the resource is limited or non-existent will determine the magnitude of the associated social and economic effects expected to accrue during the recovery period. The rebuilding strategies and associated ABCs in this action are trade-offs of long-term and short-term biological benefits, which are directly tied to long-term and short-term social benefits. A more conservative rebuilding strategy would likely result in short-term negative social impacts such as loss of income and decreased fishing opportunities due to lower target fishing mortality. However, the resulting larger sustainable biomass once the hogfish stock is rebuilt is expected to produce long-term social benefits, including stable and sustainable livelihoods for commercial fishermen and the for-hire sector; consistent product for fish houses and restaurants; and private recreational fishing opportunities.

Section 3.4 describes Florida communities that could be affected by changes to the FLK/EFL hogfish rebuilding plan, particularly in the Florida Keys. Additionally, hogfish is an important part of the tourism and culinary scene in the Florida Keys, as a signature dish of the area. Changes to access to hogfish could also affect fish houses and restaurants that depend on a steady supply of hogfish.

Because the recent assessment update determined that FLK/EFL hogfish is overfished and experiencing overfishing, Alternative 1 (No Action) may provide some short-term benefits by not restricting harvest, but would also be expected to result in negative long-term effects on fishermen associated with negative biological effects on the stock. Overall the most benefits to fishermen and communities would come from a rebuilding strategy that limits harvest and access to the resource for fishermen, but would not cause long-term negative biological effects to the stock that could result in negative effects on fishermen in the future.

The short-term direct effects on fishermen and communities under Alternatives 2-4 would depend on the level of reduced access to the hogfish resource, and for how long of a period. Alternative 2 would result in higher ABC levels (and highest possible ACLs) than under Preferred Alternative 3 under a ten-year plan. Alternatives 4 and 5 would result in more restrictive ABC levels but within a shorter period of time.

SNAPPER GROUPER AP RECOMMENDATION: None

<u>SSC RECOMMENDATION</u>: The SSC reviewed the revised and updated hogfish projections provided by FWC-FWRI. The Committee consensus was that these projections represent the best scientific information available and can, therefore, be used for management advice. Specific comments and discussion points brought up during the SSC meeting included:

- The SSC recommends that the very low F rebuilding scenarios (i.e., situations where M is higher than F) be interpreted with caution. In those situations, the driver of population change will be M, not F, and this should be highlighted in these projections. Also, because many of the F values are very low, the actual differences among these low-F projected rebuilding scenarios may not be realized or be detectable statistically. In these cases, there might not be a good way for the Council to objectively choose the best scenario.
- It would also be very helpful if the probability distributions of projected parameters were provided to the SSC for technical review of projections.

SCOPING COMMENTS: 2 comments No Action. 1 comment in support of Alternative 3.

COMMITTEE ACTION:

OPTION 1. ACCEPT THE IPT'S SUGGESTED EDITS FOR ACTION 5

OPTION 2. DO NOT ACCEPT THE IPT'S SUGGESTED EDITS TO ACTION 5 (COMMITTEE TO SPECIFY CHANGES AND APPROVE).

OTHERS?

Action 6. Establish Annual Catch Limits (ACLs) for the Florida Keys/East Florida (FLK/EFL) stock of hogfish

Alternative 1 (No action). Do not establish ACLs for the Florida Keys/East Florida (FLK/EFL) hogfish stock. The current Acceptable Biological Catch (ABC) for the entire stock of hogfish is 137,824 lbs ww and Annual Catch Limit (ACL) = OY = ABC. The commercial annual catch limit (ACL) = 49,469 lbs ww (36.69%) and the recreational annual catch limit (ACL) = 85,355 lbs ww (63.31%).

Preferred Alternative 2. Establish annual catch limits (ACLs) for the Florida Keys/East Florida (FLK/EFL) stock of hogfish. Specify commercial and recreational ACLs for 2017-2025. ACLs will not increase automatically in a subsequent year if present year projected catch has exceeded the total ACL. Specify commercial and recreational ACLs using re-calculated sector allocations based on proposed modifications to the management unit (24.29% 9.6% commercial and 75.71% 90.4% recreational).

Preferred Sub-alternative 2a. ACL = OY = ABC **Sub-alternative 2b.** ACL = OY = 95% ABC **Sub-alternative 2c.** ACL = OY = 90% ABC

Biological Effects

The allocation formula from the Comprehensive ACL Amendment (SAFMC 2011) was used to specify commercial and recreational allocations for the FLK/EFL hogfish stock: (0.5 * catch history) + (0.5 * current trend) where catch history = average landings 1986-2008, current trend = average landings 2006-2008. The formula was applied to SEFSC commercial ACL data, accessed in July 2014, and post-stratified SEFSC recreational data accessed in February 2015). Recreational data were post-stratified to include MRIP landings from Monroe County in the FLK/EFL sub-region, consistent with the SEDAR 37 stock assessment. Commercial and recreational landings data used to re-calculate sector allocations are shown in **Table 2.6.1**.

Year	Recreational	Commercial	Total
1986	173,489	28,878	202,367
1987	340,881	44,300	385,181
1988	247,203	48,362	295,565
1989	151,578	54,155	205,733
1990	307,831	53,914	361,745
1991	196,098	53,590	249,688
1992	309,536	54,495	364,031
1993	266,249	42,646	308,895
1994	224,732	34,716	259,448
1995	285,983	39,433	325,416

Table 2.6.1.	Commercial and	l recreational la	ndings (lbs ww)	used to	re-calculate	hogfish	sector
allocations fo	r Florida Keys/E	ast Florida hogf	ish stock, 1986	-2008.			

1996	159,365	40,136	199,501
1997	168,822	42,573	211,395
1998	57,160	31,211	88,371
1999	115,575	24,155	139,730
2000	40,295	28,015	68,310
2001	79,266	18,455	97,721
2002	99,499	19,525	119,024
2003	123,767	20,623	144,390
2004	190,292	23,299	213,591
2005	189,126	12,380	201,506
2006	120,381	11,337	131,718
2007	271,031	14,402	285,433
2008	361,301	17,882	379,183

Source: NMFS SERO

To set the Annual Catch Limit (ACL) and Optimum Yield (OY) for the FLK/EFL stock of hogfish, the South Atlantic Council may exercise varying degrees of precaution to account for management uncertainty: **Sub-alternative 2a** would set the ACL and OY at the same level as ABC, whereas **Sub-alternatives 2b** and **2c** would each provide a management uncertainty buffer of 5% and 10%, respectively.

Preferred Sub-alternative 2a, **Sub-alternative 2b**, and **Sub-alternative 2c** would set OY equal to the ACL. National Standard 1 (NS1) establishes the relationship between conservation and management measures, preventing overfishing, and achieving OY from each stock, stock complex, or fishery. The NS1 guidelines discuss the relationship of OFL to the MSY and ACL to OY. The OFL is an annual amount of catch that corresponds to the estimate of maximum fishing mortality threshold applied to a stock; MSY is the long-term average of such catches. The ACL is the limit that triggers AMs and is the management target for the species. Management measures for a fishery should, on an annual basis, prevent the ACL from being exceeded. The long-term objective is to achieve OY through annual achievement of an ACL. The NS1 guidelines state that if OY is set close to MSY, the conservation and management measures in the fishery must have very good control of the amount of catch in order to achieve the OY without overfishing.

The South Atlantic Council and their SSC have established an ABC control rule that takes into consideration scientific and management uncertainty to ensure catches are maintained below OFL. Setting the ACL equal to the ABC (**Preferred Sub-alternative 2a**) leaves no buffer between the two harvest parameters, which may increase risk that harvest could exceed the ABC. The South Atlantic Council considered alternatives in the Comprehensive ACL Amendment (SAFMC 2011a) and Amendment 24 (SAFMC 2011b) that would set the ACL below the ABC but selected ACL=OY=ABC as their preferred alternative. More recently, the South Atlantic Council has frequently set ACLs for snapper grouper species at the same level as the ABC. However, AMs and ACLs are in place to ensure overfishing of hogfish does not occur. The NS1 Guidelines recommend a performance standard by which the system of ACLs and AMs can be

measured and evaluated. If the ACL is exceeded more than once over the course of four years, the South Atlantic Council would reassess the system of ACLs and AMs for the species. The South Atlantic Council is taking action in Amendment 34 (SAFMC 2015) to enhance the effectiveness of the AMs for hogfish.

Sub-alternatives 2b and **2c** would have a greater positive biological effect than **Preferred Sub-alternative 2a** because they would create a buffer between the ACL/OY and ABC, with **Sub-alternative 2c** setting the most conservative ACL at 90% of the ABC (**Table 4.6.1**). Creating a buffer between the ACL/OY and ABC would provide greater assurance that overfishing is prevented, and the long-term average biomass is near or above SSB_{MSY}. However, the South Atlantic Council's ABC control rule takes into account scientific uncertainty. The Magnuson-Stevens Act national standard 1 guidelines indicate an ACL may typically be set very close to the ABC. Setting a buffer between the ACL and ABC would be appropriate in situations where there is uncertainty in whether or not management measures are constraining fishing mortality to target levels. An ACT, which is not required, can also be set below the ACL to account for management uncertainty and provide greater assurance overfishing does not occur.

Table 4.6.1. Sector ACLs in pounds and numbers (recreational) for **Sub-alternatives 2a (Preferred)-2c** in **Action 6** and based on ABC projections from **Preferred Alternative 3** in **Action 5** where ABC equal to the yield at a constant fishing mortality rate and rebuilds the stock in 10 years with a 72.5% probability of rebuilding success. Recreational ACL in numbers of fish is based on average weight of **1.76 lbs ww**.

Preferred Sub-alternative 2a: ACL=OY=ABC					
Vear	Total ACL	Rec ACL	Rec ACL	Commercial	
I cui	(lbs)	(lbs)	(numbers)	ACL (lbs)	
2017	38,367	34,670	19,699	3,697	
2018	49,449	44,685	25,389	4,764	
2019	61,982	56,010	31,824	5,972	
2020	75,710	68,415	38,872	7,295	
2021	90,469	81,752	46,450	8,717	
2022	106,059	95,840	54,455	10,219	
2023	122,197	110,423	62,741	11,774	
2024	138,566	125,215	71,145	13,351	
2025	154,851	139,931	79,506	14,920	
2026	170,750	154,298	87,669	16,452	
2027	186,018	168,095	95,509	17,923	
	Sub-alterr	native 2b: ACL=	OY= 95%ABC		
2017	36,449	32,937	18,714	3,512	
2018	46,977	42,450	24,120	4,526	
2019	58,883	53,210	30,233	5,673	
2020	71,925	64,995	36,929	6,930	
2021	85,946	77,665	44,128	8,281	
2022	100,756	91,048	51,732	9,708	
2023	116,087	104,902	59,604	11,185	
2024	131,638	118,954	67,588	12,683	

2025	147,108	132,935	75,531	14,174			
2026	162,213	146,583	83,286	15,629			
2027	176,717	159,690	90,733	17,027			
	Sub-alternative 2c: ACL=OY=90%ABC						
2017	34,530	31,203	17,729	3,327			
2018	44,504	40,216	22,850	4,288			
2019	55,784	50,409	28,642	5,375			
2020	68,139	61,574	34,985	6,565			
2021	81,422	73,577	41,805	7,845			
2022	95,453	86,256	49,009	9,197			
2023	109,977	99,381	56,466	10,596			
2024	124,709	112,694	64,031	12,016			
2025	139,366	125,938	71,556	13,428			
2026	153,675	138,868	78,903	14,807			
2027	167,416	151,286	85,958	16,130			

With vastly improved commercial monitoring mechanisms recently implemented, it is unlikely that repeated commercial ACL overages would occur. The Commercial Landings Monitoring System (CLM) came online in June 2012 and is now being used to track commercial landings of federally managed fish species. This system is able to track individual dealer reports, track compliance with reporting requirements, project harvest closures using five different methods, and analyze why ACLs are exceeded. The CLM performs these tasks by taking into account: (1) spatial boundaries for each stock based on fishing area; (2) variable quota periods such as overlapping years or multiple quota periods in one year; and (3) overlapping species groups for single species as well as aggregated species. Data sources for the CLM system include the Standard Atlantic Fisheries Information System for Georgia and South Carolina, and the Bluefin Data file upload system for Florida and North Carolina. The CLM system is also able to track dealer reporting compliance with a direct link to the permits database in NMFS Southeast Regional Office (SERO).

Additionally, the Southeast Fisheries Science Center (SEFSC) worked with SERO, the Gulf of Mexico Fishery Management Council (Gulf of Mexico Council), and South Atlantic Council to develop a Joint Dealer Reporting Amendment (GMFMC & SAFMC 2013b), which became effective on August 7, 2014. The Joint Dealer Reporting Amendment requires electronic reporting, increases required reporting frequency for dealers to once per week, and requires a single dealer permit for all finfish dealers in the Southeast Region. The CLM and the new dealer reporting requirements constitute major improvements to how commercial fisheries are monitored, and go beyond monitoring efforts that were in place when the NS1 guidelines were developed. The new CLM quota monitoring system and actions in the Joint Generic Dealer Reporting amendment are expected to provide more timely and accurate data reporting and would thus reduce the incidence of quota overages.

Harvest monitoring efforts in the recreational sector have also been improved. On January 27, 2014, regulations became effective requiring headboats to report their landings electronically once per week (Generic Headboat Amendment, GMFMC & SAFMC 2013a). The SEFSC is also developing an electronic reporting system for charter boats operating the Southeast Region and the Gulf of Mexico and South Atlantic Councils are developing a joint amendment that would require electronic reporting for charterboats with a set reporting frequency. These recreational harvest monitoring efforts could substantially increase the accuracy and timeliness of in-season reporting and reduce the risk of recreational ACL overages, which would be biologically beneficial for hogfish. Therefore, there is a low risk of exceeding the commercial and recreational ACLs and **Preferred Alternative 2** and its sub-alternatives can be used as part of a successful harvest management system for hogfish with little risk of overfishing.

Economic Effects

Alternative 1 (No Action) is not a viable alternative for this action because establishing an ACL for a stock is a statutory requirement. In general, assuming a sector is able to catch its entire ACL, the higher the ACL, the greater the positive direct economic effects for all sectors, as long as the ACL is not exceeded. Therefore, **Preferred Sub-alternative 2a** represents the highest positive direct economic effects, followed by **Sub-alternative 2b** and then **Sub-alternative 2c**.

Social Effects

As noted in **Section 4.4.3**, social effects of ACLs are associated with changes to access through associated AMs triggered by reaching the ACL. In general, the higher the ACL, the greater the short-term social and economic benefits that would be expected to accrue, assuming long-term recovery and rebuilding goals are met. Adhering to stock recovery and rebuilding goals is assumed to result in net long-term positive social and economic benefits. Additionally, adjustments in an ACL based on updated information from a stock assessment would be the most beneficial in the long term to fishermen and coastal communities because ACLs would be based on the current conditions, even if the updated information indicates that a lower ACL is appropriate to sustain the stock.

Assuming **Preferred Alternative 3** under **Action 5**, the ACLs under **Preferred Alternative 2** will all have negative effects by restricting access for the commercial and recreational sectors. **Sub-alternative 2c** would be the most restrictive, followed by **Sub-alternative 2b**, and then **Preferred Sub-alternative 2a**. However, the differences in expected social effects between **Sub-alternatives 2a (Preferred)-2c** will likely not matter, because there is such a large difference from the proposed ACLs under **Preferred Alternative 2** and the current conditions of the fishery (**Tables 2.6.1.** and **2.6.2**). However, the restrictions that would result under **Preferred Alternative 2** are expected to result in more long-term benefits than under **Alternative 1 (No Action)** by rebuilding the FLK/EFL hogfish stock.

SNAPPER GROUPER AP RECOMMENDATION: None

SSC RECOMMENDATION:

- Regarding catch level recommendations in numbers vs. weight, the SSC recommended that the ABC be set in numbers and converted to weight for the commercial sector.
- The SSC clarified that the OY basis described in the assessment report is not valid. The Council will specify OY in Amendment 37 to the Snapper Grouper FMP.

SCOPING COMMENTS: 2 comments No Action; 1 comment in support of sub-alternative 2a.

COMMITTEE ACTION:

- Sector allocations were recalculated using landings provided by NMFS using SEFSC approved weight standardization methodology.
- Average weight calculated from recreational samples averaged for each year (2010-2015), then averaged across years.

OPTION 1: ACCEPT THE IPTS' SUGGESTED EDITS FOR ACTION 6.

OPTION 2. DO NOT ACCEPT THE IPT'S SUGGESTED EDITS FOR ACTION 6 (COMMITTEE TO SUGGEST CHANGES AND APPROVE)

OTHERS?

Action 7. Establish a recreational Annual Catch Target (ACT) for the GA-NC and the Florida Keys/East Florida (FLK/EFL) stocks of hogfish

Alternative 1 (No Action). Do not establish recreational annual catch targets (ACTs) for the GA-NC and Florida Keys/East Florida (FLK/EFL) stocks of hogfish. The current ACT is 59,390 lbs ww and applies to hogfish throughout the South Atlantic Council's jurisdiction. The ACT = recreational ACL*(1-PSE) or ACL*0.5, whichever is greater, and where Percent Standard Error (PSE) = average PSE 2005-2009.

	J
Year	Hogfish PSE
2005	28.7
2006	34.3
2007	23.9
2008	30.9
2009	29.5
Average	29.5

Source: NMFS Office of Science and Technology MRIP Domain Catch Totals (2015)

Preferred Alternative 2. Establish an annual catch target (ACT) for the GA-NC stock of hogfish for the recreational sector.

Sub-alternative 2a. ACT = recreational ACL*(1-PSE) or ACL*0.5, whichever is greater.

Preferred Sub-alternative 2b. ACT =85% recreational ACL. **Sub-alternative 2c.** ACT = 75% recreational ACL.

Year	Hogfish PSE (GA-NC)
2010	61.9
2011	67.3
2012	63.1
2013	56.1
2014	n/a
Average	62.1%

Source: NMFS Office of Science and Technology MRIP Domain Catch Totals (2015)

Preferred Alternative 3. Establish an annual catch target (ACT) for the Florida Keys/East Florida (FLK/EFL) stock of hogfish for the recreational sector.

Sub-alternative 3a. ACT = recreational ACL*(1-PSE) or ACL*0.5, whichever is greater.

Preferred Sub-alternative 3b. ACT =85% recreational ACL. **Sub-alternative 3c.** ACT = 75% recreational ACL.

Year	Hogfish PSE East FL-FL Keys
2010	30.5
2011	22.0
2012	24.7
2013	14.7
2014	10.7
Average	20.5

Source: NMFS Office of Science and Technology MRIP Domain Catch Totals (2015)

Biological Effects

As explained in **Section 2.7.1**, Annual Catch Targets (ACTs) can be used to prevent ACLs from being exceeded. For species without in-season management control to prevent the ACL from being exceeded, managers may utilize ACTs that are set below ACLs so that catches do not exceed the ACLs. In managing the snapper grouper fishery, however, the South Atlantic Council has chosen not to use ACTs to trigger AMs because it is anticipated that improvements in reporting will significantly reduce management uncertainty.

Since the ACT is typically set lower and would be reached sooner than the ACL, using an ACT rather than the ACL as a trigger for AMs in the recreational sector may prevent an ACL overage. This more conservative approach, would likely help to ensure that recreational data uncertainties do not cause or contribute to excessive ACL overages for vulnerable species. Using recreational ACTs rather than the ACLs to trigger recreational AMs may not eliminate ACL overages completely; however, using such a strategy for the recreational sector may reduce the need to compensate for very large overages. Because the South Atlantic Council has not employed ACTs in its management strategy for the snapper grouper fishery, the biological effects of **Preferred Alternatives 2** and **3** (and their respective sub-alternatives) would be biologically beneficial in that management would be adjusted to apply to two separate stocks of hogfish and, therefore, be responding to the best scientific information available about the target species.

The Percent Standard Error (PSE) for the GA-NC stock of hogfish is above 50%. The South Atlantic Council has consistently chosen to specify recreational ACTs using a formula that incorporates the PSE in order to account for uncertainty in recreational landings estimates. However, recreational landings estimates for the GA-NC stock of hogfish are imprecise (and therefore have high PSEs) due to low MRIP intercepts that may result from low intercept rates of recreational divers. Hogfish are primarily harvested with spearfishing gear. Using the South Atlantic Council's existing ACT formula (Rec ACT = rec ACL*(1-PSE) or 0.5, whichever is greater), would have resulted in setting the recreational ACT at 50% of the recreational ACL. Given that the proposed recreational ACLs for the GA-NC stock of hogfish are low compared to status quo, the South Atlantic Council chose instead to establish the recreational ACT at 85% of the recreational ACL (**Preferred Sub-alternative 2b**). For the FLK/EFL stock of hogfish, the South Atlantic Council selected **Preferred Sub-alternative 3b** to maintain consistency.

Table 4.7.1 shows recreational Annual Catch Targets (ACTs) for the GA-NC stock of hogfish based on the proposed recreational ACL alternatives in **Action 4**.

Table 4.7.2 shows recreational Annual Catch Targets (ACTs) for the Florida Keys/ East Florida (FLK/EFK) stock for the **Alternative 3** sub-alternatives, including **Preferred Sub-alternative 3b**. Recreational ACTs are specified in numbers of fish based on **Preferred Sub-alternative 2a** under **Action 6**.

Table 4.7.1.	Recreational Annual Catch Targets (in pounds and numbers) for the GA-NC s	stock of hogfish
for each of th	ne Recreational ACL sub-alternatives in Action 4.	_

	ACL=ABC		ACL=95%ABC		ACL=90%ABC	
	lbs	num	lbs	num	lbs	num
ACT=rec ACL (1- PSE) or rec ACL*0.5, whichever is greater	5,513	520	5,237	494	4,961	468
ACT=85%rec ACL (Preferred)	9,371	884	8,903	840	8,434	796
ACT=75%recACT	8,269	780	7,855	741	7,442	702

Table 4.7.2. Recreational Annual Catch Targets (ACTs; numbers of fish) under consideration for the Florida Keys/East Florida (FLK/EFL) stock of hogfish based on **Preferred Sub-alternative 2a** under **Action 6**.

			ACT=rec ACL (1-PSE)		ACT=85%recACL (Preferred)		ACT=75%recACL	
Year	Rec ACL (numbers)	Rec ACL (lbs)	numbers	pounds	numbers	pounds	numbers	pounds
2017	19,699	34,670	15,661	27,563	16,744	29,470	14,774	26,003
2018	25,389	44,685	20,184	35,524	21,581	37,982	19,042	33,513
2019	31,824	56,010	25,300	44,528	27,050	47,609	23,868	42,008
2020	38,872	68,415	30,904	54,390	33,042	58,153	29,154	51,312
2021	46,450	81,752	36,928	64,993	39,483	69,489	34,838	61,314
2022	54,455	95,840	43,291	76,193	46,286	81,464	40,841	71,880
2023	62,741	110,423	49,879	87,787	53,329	93,860	47,055	82,818
2024	71,145	125,215	56,560	99,546	60,473	106,433	53,359	93,911
2025	79,506	139,931	63,208	111,245	67,580	118,941	59,630	104,948
2026	87,669	154,298	69,697	122,667	74,519	131,154	65,752	115,724
2027	95,509	168,095	75,929	133,636	81,182	142,881	71,631	126,071

Economic Effects

The purpose of establishing ACTs is to help prevent a sector from exceeding its ACLs due to management uncertainty. Exceeding an ACL would have direct negative economic effects on a

all sectors potentially due to a reduced stock size and to a sector that would have its future ACL reduced by the size of the overage. Without being able to predict exactly how much precaution is needed in setting the ACL, it is difficult to compare alternatives. However, if a fishery is closed too early for a sector based on the ACT, there would be direct negative economic effects as well because the sector was prohibited from harvesting fish.

Alternative 1 (No Action) is not a viable alternative for management as the previous single stock of hogfish has been separated into two separate stocks and the current ACT set for the recreational sector is no longer valid. Preferred Alternative 2, Preferred Sub-alternative 2b and Preferred Alternative 3, Preferred Sub-alternative 3b would allow for this highest catches (and highest positive direct economic effects) before the ACT could be used to trigger a closure for the recreational sector. Preferred Alternative 2, Sub-alternative 2a and Preferred Alternative 3, Sub-alternative 3a which results in the second highest ACL would be expected to result in the next highest amount of positive direct economic effects, followed lastly by Preferred Alternative 2, Sub-alternative 2, Sub-alternative 3, Sub-alternative 3c.

Social Effects

Establishment of a recreational ACT for each stock of hogfish would likely have little effects on recreational fishermen targeting hogfish, unless the Council decides to set the ACT as a trigger for AMs at a later time. A higher ACT could be more beneficial for fishermen, depending on the levels specified in **Preferred Alternative 2** and **Preferred Alternative 3**. Because the ACT is used for monitoring only, it is expected that the social effects of **Alternative 1 (No Action)**, **Preferred Alternative 2**, and **Preferred Alternative 3** would be the similar.

SNAPPER GROUPER AP RECOMMENDATION:

MOTION: SUPPORT THE COUNCIL'S PREFERRED FOR ACTION 7. APPROVED BY AP

SSC RECOMMENDATION: None

SCOPING COMMENTS: 3 comments No Action.

COMMITTEE ACTION: None at this time

Action 8. Increase the commercial and recreational minimum size limit for the GA-NC and the Florida Keys/East Florida (FLK/EFL) stocks of hogfish

Alternative 1 (No Action). Do not increase the commercial and recreational minimum size limit for hogfish. The current minimum size limit for hogfish is 12 inches fork length (FL) for both the commercial and recreational sectors in federal waters of the South Atlantic Region, and state waters of South Carolina, North Carolina, and Florida. There is no minimum size limit for hogfish in state waters of Georgia.

Preferred Alternative 2. Increase the commercial and recreational minimum size limit for the GA-NC stock of hogfish in the South Atlantic Region.

Sub-alternative 2a. 16 inches FL
Sub-alternative 2b. 17 inches FL
Sub-alternative 2c. 18 inches FL
Sub-alternative 2d. 19 inches FL
Preferred Sub-alternative 2e. 20 inches FL
Sub-alternative 2f. Increase the minimum size limit from 12" to 15" in year 1, to 18" in year 2, and to 20" in year 3.

Preferred Alternative 3. Increase the commercial and recreational minimum size limit for the Florida Keys/East Florida (FLK/EFL) stock of hogfish in the South Atlantic Region.

Sub-alternative 3a. 14 inches FL

Preferred Sub-alternative 3b. 15 inches FL

Sub-alternative 3c. 16 inches FL

Sub-alternative 3d. 17 inches FL

Sub-alternative 3e. Increase the minimum size limit from 12" to 14" in year 1 and to 16" in year 3.

Biological Effects

Commercial and recreational hogfish size limit analysis assumed a 10% release mortality rate based on estimates for hook-and-line releases SEDAR 37 (2014). Spearfishing release mortality is estimated to be 100%, but for the purposes of the recreational size limit analysis for hogfish, all landings were treated as hook-and-line. Spearfishing gear is not used on headboats. Although the majority of MRIP landings are likely from spearfishing gear, it is unlikely that all fishermen would spear undersized fish when the size limit is increased. Further, it is unlikely that fishermen who use spearfishing gear would discard many fish. Hence, the assumption of 10% release mortality for size limit analyses is more realistic. A similar rationale was applied to the size limit analysis for the commercial sector; the assignment of a 10% release mortality rate to spearfishing records of fish that would be undersized if the size limit were increased accounts for some level of estimation error by spearfishermen but avoids the unrealistic assumption that 100% of undersized fish between the current and increased size limit would be killed. Projected reductions in recreational hogfish harvest under different minimum size limits for the recreational and commercial sectors are shown in **Tables 4.8.1** and **4.8.2**, respectively.

Hogfish are monandric, protogynous hermaphrodites. Fish mature as females first, and are expected to eventually become male if they live long enough. Research conducted on hogfish that would belong to the Florida Keys/East Florida stock, indicate that a single male maintains harems of 5 to 15 females (Colin 1982, Munoz et al. 2010) during extended spawning seasons that last for months. Hogfish are pair spawners (Davis 1976, Colin 1982), and spawning occurs daily during spawning season (McBride and Johnson 2007, Collins and McBride 2008, Munoz et al. 2010). The size (7.8-28.6 inches FL) and age (1-11 years) range at which sexual transition occurs indicates that transition is socially mediated (Collins and McBride 2011).

Life history studies on hogfish that would belong to the Florida Keys/East Florida stock have estimated female size and age at 50% maturity to occur between 6.0 and 7.6 inches fork length (FL) and 0.9 to 1.6 years (McBride et al. 2008, Collins and McBride 2011). Males may occur as small as 7.8 inches FL, but size at 50% male maturity has been estimated as 16.4 inches FL and 7 years in the Florida Keys (McBride et al. 2008; **Figure 4.8.1**). Sex change in hogfish can take several months (McBride and Johnson 2007), so removal of the dominant male has the potential to significantly affect harem stability and decrease reproductive potential (Munoz et al. 2010). Size limits above 16 inches FL (**Sub-alternatives 3c, 3d** and **3e**) may provide hogfish the opportunity to form harems and transition to males. McBride et al. (2008) state: "...the size of 50% male maturation, approximately 415 to 425 mm (16.3-16.7 inches) FL, is well above the current minimum size limit. Evidently, to reduce disruption to spawning harems and avoid recruitment overfishing, the minimum size limit should be increased."



Figure 4.8.1. Maturation of hogfish (*Lachnolaimus maximus*) from the eastern Gulf of Mexico and south Florida for (A) females by age, (B) females by size, (C) males by age, and (D) males by size (Fig. 4 in McBride et al. 2008).

South Atlantic Snapper Grouper AMENDMENT 37 Decision Document December 2015 For hogfish in the GA-NC stock, the size at transition was calculated based on macroscopic investigation of gonad samples collected in 2013 through 2015 from vessels fishing off North Carolina (Scott Van Sant, SEFSC, unpublished data). The size at which 50% of females transition to males was estimated to be 24 inches fork length (**Figure 4.8.2**) using binary logistic regression implemented in SAS 9.1. The smallest male observed was 15 inches fork length. No female hogfish were observed greater than 30 inches fork length. These data are preliminary and will likely change when a complete historical analysis is completed; however, they provide a general estimate of the transition size for hogfish off North Carolina that can be considered in the management of the GA-NC stock.



Figure 4.8.2. Size at transition (female to male) for hogfish in North Carolina (preliminary data). Source: Scott Van Sant, SEFSC.

						Mod	e of Fishir	ıg					
	Headboat			Cha	rter					Pri	vate		
Size	Annual	1	2	2	4	5	6	1	2	2	4	F	6
12	Annuai	1	2	3	4	3	0	1	2	3	4	3	0
(status													
quo)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13	43%	18%	18%	18%	18%	18%	9%	34%	38%	14%	30%	24%	33%
14	59%	39%	39%	39%	39%	39%	33%	56%	54%	23%	53%	52%	63%
15	72%	79%	79%	79%	79%	79%	70%	63%	63%	66%	53%	52%	68%
16	80%	84%	84%	84%	84%	84%	76%	76%	75%	68%	59%	58%	77%
17	86%	90%	90%	90%	90%	90%	90%	82%	77%	82%	69%	70%	84%
18	86%	90%	90%	90%	90%	90%	90%	87%	80%	90%	87%	87%	90%
19	86%	90%	90%	90%	90%	90%	90%	89%	82%	90%	90%	90%	90%
20	86%	90%	90%	90%	90%	90%	90%	90%	86%	90%	90%	90%	90%

Table 4.8.1. Percent reductions in FLE/FL-Keys recreational landings (in numbers), by mode and wave, at different proposed minimum size limits.

Sources: Headboat CRNF file (mean 2011-2013), MRIP Catch-Effort Files (mean 2012-2014). Note: There were insufficient samples to model monthly impacts of proposed size limits for headboat; headboat catch effort file for 2014 not available.

Table 4.8.2. Percent reductions in GA-NC recreational landings (in numbers), by mode and wave, at different proposed minimum size limits.

		Mode of Fishing											
	Headboat			Cha	rter			Private					
Size	Annual	1	2	2	4	5	6	1	2	2	4	5	6
12	Annuai	1	4		4	3	0	1	4	5	4	3	0
(status													
quo)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13	0%	0%	0%	0%	0%	0%	0%	27%	27%	24%	14%	27%	27%
14	0%	30%	30%	30%	30%	30%	30%	52%	52%	49%	47%	52%	52%
15	0%	30%	30%	30%	30%	30%	30%	66%	66%	62%	66%	66%	66%
16	45%	30%	30%	30%	30%	30%	30%	72%	72%	76%	82%	72%	72%
17	45%	39%	39%	39%	39%	39%	39%	79%	79%	80%	86%	79%	79%
18	45%	39%	39%	39%	39%	39%	39%	81%	81%	82%	86%	81%	81%
19	45%	39%	39%	39%	39%	39%	39%	82%	82%	82%	86%	82%	82%
20	45%	39%	39%	39%	39%	39%	39%	85%	85%	85%	89%	85%	85%

Sources: Headboat CRNF file (mean 2011-2013), MRIP Catch-Effort Files (mean 2012-2014). Note: There were insufficient samples to model monthly impacts of proposed size limits for headboat; headboat catch effort file for 2014 not available.

						Mod	e of Fishir	ıg					
	Headboat			Cha	rter					Pri	vate		
Size Limit	Annual	1	2	3	4	5	6	1	2	3	4	5	6
12	Annual	1	2	5	4	3	U	1	2	5	4	3	0
(status quo)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13	28%	13%	13%	13%	13%	13%	6%	29%	33%	10%	26%	18%	26%
14	42%	32%	32%	32%	32%	32%	28%	46%	45%	18%	45%	40%	54%
15	55%	75%	75%	75%	75%	75%	64%	54%	51%	60%	45%	40%	59%
16	65%	81%	81%	81%	81%	81%	71%	69%	64%	62%	53%	48%	70%
17	73%	90%	90%	90%	90%	90%	90%	77%	68%	78%	65%	64%	79%
18	73%	90%	90%	90%	90%	90%	90%	85%	72%	90%	87%	87%	89%
19	73%	90%	90%	90%	90%	90%	90%	89%	76%	90%	90%	90%	90%
20	73%	90%	90%	90%	90%	90%	90%	89%	82%	90%	90%	90%	90%

Table 4.8.3. Percent reductions in FLE/FL-Keys recreational landings (in pounds whole weight), by mode and wave, at different proposed minimum size limits.

Sources: Headboat CRNF file (mean 2011-2013), MRIP Catch-Effort Files (mean 2012-2014). Note: There were insufficient samples to model monthly impacts of proposed size limits for headboat; headboat catch effort file for 2014 not available.

Table 4.8.4. Percent reductions in GA-NC recreational landings (in pounds whole weight), by mode and
wave, at different proposed minimum size limits.

		Mode of Fishing											
	Headboat			Cha	rter			Private					
Size Limit	Annual	1	2	3	4	5	6	1	2	3	4	5	6
12	2 initial	-	-	U	•	5	0	-	-	U	•	0	Ŭ
(status													
quo)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13	0%	0%	0%	0%	0%	0%	0%	17%	17%	14%	11%	17%	17%
14	0%	30%	30%	30%	30%	30%	30%	37%	37%	35%	36%	37%	37%
15	0%	30%	30%	30%	30%	30%	30%	50%	50%	45%	53%	50%	50%
16	45%	30%	30%	30%	30%	30%	30%	55%	55%	61%	71%	55%	55%
17	45%	34%	34%	34%	34%	34%	34%	65%	65%	65%	78%	65%	65%
18	45%	34%	34%	34%	34%	34%	34%	67%	67%	67%	78%	67%	67%
19	45%	34%	34%	34%	34%	34%	34%	69%	69%	67%	78%	69%	69%
20	45%	34%	34%	34%	34%	34%	34%	75%	75%	72%	85%	75%	75%

Sources: Headboat CRNF file (mean 2011-2013), MRIP Catch-Effort Files (mean 2012-2014). Note: There were insufficient samples to model monthly impacts of proposed size limits for headboat; headboat catch effort file for 2014 not available. **Figure 4.8.3** shows the length composition of recreationally caught hogfish from 1995 to 2012. The solid black line represents the 12-inch (fork length) minimum size limit. The average length in the time series was 14.07 inches.



Figure 4.8.3. Length composition (inches fork length) of recreationally caught hogfish, 1995-2012. N=682. Source: SEDAR 37 (2014).

Figure 4.8.4 shows the size distribution (inches fork length) of commercially harvested hogfish in the South Atlantic. The majority of hogfish in the GA-NC portion of the stock are harvested at 25 inches and greater. In Florida, the majority of commercially harvested hogfish



are at the 12-inch minimum size limit.



(B)

Figure 4.8.4. Size distribution in inches fork length (FL) of hogfish landed commercially in two areas: (A) GA-NC and (B) Florida Keys/East Florida, 2012-2014. Source: NMFS SERO. Commercial TIP data (L. Beerkircher, SEFSC, pers. comm.)

Figure 4.8.5 shows the size distribution (inches fork length) of hogfish harvested recreationally in the South Atlantic. For the GA-NC stock, the size distribution of recreationally caught hogfish (based on MRIP) in 2012-2014 shows shows a peak at 12 inches, the current minimum size limit. Similarly, headboat landings (for South Atlantic hogfish overall), also show a peak at 12 inches.



Figure 4.8.5. Size distribution in inches fork length (FL) of hogfish landed recreationally in 2011-2014: (A) GA-NC and FLK/EFL based on Marine Recreational Information Program (MRIP) estimates; and (B) entire South Atlantic based on Southeast Headboat Survey.

Sources: NMFS SERO. MRIP (NMFS OST, accessed May 2015) and Southeast Headboat Survey (HBS bp72_13 file).

Preferred Sub-alternative 2e would increase the minimum size limit for the GA-NC stock (both sectors) to 20 inches fork length (FL). Off North Carolina, 50% of hogfish transition to males at 24.5 inches FL (**Figure 4.8.2**) and the majority of commercial harvested hogfish are 25 inches or larger (**Figure 4.8.4**, **A**). Hence the proposed minimum size limit would continue to allow removal of the most reproductively successful individuals with potentially negative biological effects on the population. On average, **Preferred Sub-alternative 2e** would result in a 45% reduction in harvest from mean landings from 2012 through 2014 for the headboat sector and 39% and 86% for the charter and private sectors, respectively (**Table 4.8.2**). **Sub-alternatives 2a-2d** would also result in reductions in harvest but not to the same level as **Preferred Sub-alternative 2e**. Hence the latter would be the most biological benefit. However, ACLs and AMs are in place to constrain harvest. Compared to **Alternative 1 (No Action)** all of the sub-alternatives under **Alternative 2** would be expected to benefit the GA-NC stock of hogfish, although all of them would continue to allow the most fecund individuals to be removed from the population. (*Need to add discussion for Sub-alt 2f...*)

As mentioned previously, studies on reproductive biology of hogfish in Florida suggest that minimum size limits above 16 inches would allow more females to transition to males thus promoting spawning harems and benefiting the hogfish population. Hence, Sub-alternatives 3c, 3d and 3e would increase the minimum size limit for the FLK/EFL stock of hogfish to a level that would impart the most biological benefits to the stock. Of these, Sub-alternative 3d would be the most biologically beneficial, followed by Sub-alternative 3c and 3e. Preferred Subalternative 3b, however, would not be expected to impart biological benefits to the FLK/EFL hogfish stock because it would continue to allow removal of the most reproductively productive individuals and possibly disrupt formation of harems since individuals would be harvested before transition from female to male could take place. Similarly, Sub-alternative 3a would result in negative biological effects compared to the other alternatives considered. Compared to Alternative 1 (No Action), Sub-alternatives 3a-3e would be expected to benefit the FLK/EFL stock of hogfish to varying degrees. On average, Preferred Sub-alternative 3b would reduce harvest from mean 2012-2014 landings by 72% for the headboat sector, and by 78% and 61% for the charter and private sectors, respectively (Table 4.8.1). Sub-alternatives 3c-3e would result in greater potential reductions in harvest and presumably be more biologically beneficial. However, ACLs and AMs are in place to constrain harvest.

Economic Effects

In general, increasing the size limit for a species has little long-term economic effect unless the larger size limit results in greater numbers of fish reaching spawning size and/or fish have higher fecundity prior to being harvested. Size limits that result in more spawning and/or higher fecundity would result on more direct, long-term, positive economic effects presumably through the availability of increased numbers of fish in the future. However, there could be some direct, short-term, negative economic effects as fewer fish would be available to harvest until the current population grows into the new minimum size and/or the biomass of harvestable fish increases. The greater the increase in size limit from **Alternative 1 (No Action)**, the higher the probability for longer short-term negative economic effects. However, this could also eventually result in greater long-term positive economic effects from a larger spawning biomass.

Preferred Sub-alternative 2e affords the highest probability of long-term positive economic effects, as well as the highest probability of greater short-term direct negative economic effects. In terms of least to most long-term, direct, positive economic effects, the sub-alternatives for **Preferred Alternative 2** would be **2a**, **2b**, **2c**, **2d**, and **Preferred Sub-alternative 2e**. Until further biological effects are provided, it is not clear where **Sub-alternative 2f** fits into the ranking. Nonetheless, **Sub-alternative 2f** would provide fewer long-term, direct, positive economic effects than **Preferred Sub-alternative 2e**.

Preferred Sub-alternative 3d affords the highest probability of long-term positive economic effects, as well as the highest probability of greater short-term direct negative economic effects. In terms of least to most long-term, direct, positive economic effects, the sub-alternatives for **Preferred Alternative 3** would be **3a**, **Preferred 3b**, **3c**, and **3d**. Until further biological effects are provided, it is not clear where **Sub-alternative 3e** fits into the ranking. Nonetheless, **Sub-alternative 3e** would provide greater long-term, direct, positive economic effects than **Preferred Sub-alternative 3b**.

Social Effects

As discussed in **Section 4.5.3**, hogfish is an important commercial and recreational species in the Florida Keys. Additionally, as discussed in **Section 4.4.3**, there are communities in South Carolina and North Carolina that may be affected by management changes for GA-NC hogfish.

Some social effects of minimum size limits would be associated with the positive and negative biological effects of minimum size limits on the hogfish stocks (Section 4.8.1). Positive effects of allowing only fish of a certain size that are caught in the South Atlantic EEZ to be landed could help maintain sustainability of harvest and the health of each hogfish stock, which would be beneficial to recreational and commercial fishermen in the long term. Negative effects of potential increase in discard mortality due to higher minimum size limit could affect the stock and in turn, commercial and recreational fishing opportunities.

Because recreational harvest would be reduced as the minimum size limit increases (see **Table 4.8.2**), there would be expected negative short-term effects on recreational fishermen targeting hogfish in North Carolina, South Carolina, and Georgia under an increased minimum size limit for the GA-NC stock (**Preferred Alternative 2**). However, there would be more expected negative effects on private recreational anglers than on recreational fishermen on forhire vessels. Recreational fishing opportunities would likely be the most affected by the largest minimum size limit under **Preferred Sub-alternative 2e**, but there would be minimal or no expected effects on the commercial sector by any minimum size limit in **Sub-alternatives 2a-2f** (**Figure 4.8.4**). Short-term effects on recreational fishermen and associated businesses and communities would be the least under **Alternative 1 (No Action)**. However, it should be noted that there may be long-term benefits of reducing the rate of harvest to extend the fishing season and to contribute to rebuilding the stock when the minimum size limit is increased (**Preferred Alternative 2**).

Under **Preferred Alternative 3**, an increase in the minimum size limit for FLK/EFL hogfish would be expected to result in a higher level of harvest reduction for the recreational sector (**Table 4.8.1**), particularly under the highest proposed minimum size limit (**Sub-alternative 3d**). **Preferred Sub-alternative 3b** would have less negative effects on recreational harvest and on commercial harvest, but even a small reduction in the minimum size limit will likely have negative effects on commercial and recreational fishing opportunities.

SNAPPER GROUPER AP RECOMMENDATION:

MOTION: RECOMMEND SUB-ALTERNATIVE 2B AS PREFERRED FOR ACTION 8. Sub-alternative 2b. 17 inches FL APPROVED BY AP (6 TO 5)

MOTION: RECOMMEND SUB-ALTERNATIVE 3E AS PREFERRED FOR ACTION 8. Sub-alternative 3e. Increase the minimum size limit from 12" to 14" in year 1 and to 16" in year 3. APPROVED BY AP

****RECOMMENDATION TO LOOK AT SLOT LIMIT FOR HOGFISH (12 TO 16 INCHES) FOR FLORIDA HOGFISH.***

****RECOMMENDATION: FOR THE NC-GA STOCK, THE COUNCIL SHOULD CONSIDER REGULATING COMMERCIAL AND RECREATIONAL HOGFISH BASED ON TWO SEPARATE GEARS (HOOK-AND-LINE AND SPEAR). MAINTAINING SEPARATE ACLs FOR COMMERCIAL AND RECREATIONAL BUT NOT BASED ON GEAR. INTENT IS TO BETTER MANAGE USING DIFFERENT SIZE LIMITS, ETC.***

SSC RECOMMENDATION: None

SCOPING COMMENTS:

8 comments – support sub-alternative 2c (15" FL for GA-NC stock)

- 1 comment support sub-alternative 2d (16" FL for GA-NC stock)
- 2 comment support sub-alternative 3c (15" FL for FLK/EFL)
- 1 comment support sub-alternative 2f (18" FL for GA-NC stock)
- 1 comment support sub-alternatives 3d or 3f (16" or 18" for FLK/EFL stock)

COMMITTEE ACTION:

OPTION 1. CONSIDER PUBLIC COMMENT AND CHANGE PREFERRED ALTERNATIVE(S)

OPTION 2. MAKE NO CHANGES AT THIS TIME

OTHERS?

Action 9. Establish a commercial trip limit for the GA-NC and the Florida Keys/East Florida (FLK/EFL) stocks of hogfish

Alternative 1 (No Action). Do not establish a commercial trip limit for the GA-NC and Florida Keys/East Florida (FLK/EFL) stocks of hogfish in the South Atlantic Region. Currently there is no commercial trip limit for hogfish in the South Atlantic Region.

Alternative 2. Establish a commercial trip limit for the GA-NC stock of hogfish in the South Atlantic Region.

Sub-alternative 2a. 100 lbs per trip. Sub-alternative 2b. 250 lbs per trip. Sub-alternative 2c. 500 lbs per trip. Sub-alternative 2d. 750 lbs per trip.

Alternative 3. Establish a commercial trip limit for the Florida Keys/East Florida stock of hogfish in the South Atlantic Region.

Sub-alternative 3a. 25 lbs per trip. Sub-alternative 3b. 50 lbs per trip. Sub-alternative 3c. 100 lbs per trip. Sub-alternative 3d. 150 lbs per trip. Sub-alternative 3e. 200 lbs per trip.

NOTE: The commercial ACL for the GA-NC stock ranges from 24,691 to 22,222 lbs ww. The preferred commercial ACL for 2017 for the FLK/EFL stock is 3,697 lbs ww.

Biological Effects

Alternative 1 (No Action) would not establish a commercial trip limit for the GA-NC and FLK/EFL stocks of hogfish. Alternatives 2 and 3 (including their respective sub-alternatives) would establish a commercial trip limit for the GA-NC and FLK/EFL stocks of hogfish, respectively.

Commercial logbook data were explored to determine harvest of hogfish per trip and to analyze trip limit options. During 2012-2014 (the most recent years of complete data), 2,008 commercial trips landed hogfish in the South Atlantic (**Figure 4.9.1**). During 2012-2014, 64% of the commercial trips landed 25 lbs ww or less, 14% landed 50 lbs ww, 9% landed 75 lbs ww, 5% landed 200 lbs ww, 2% landed 300 lbs ww, 1% landed 400 lbs ww, and <1% landed 500 lbs ww or more (**Figure 4.9.1**).

Hogfish are commercially harvested primarily by spear and hook-and-line gear. **Figure 4.9.2** shows the distribution of hogfish landings per trip by gear type. The majority of the trips that landed hogfish during 2012-2014 used spear (47%, 950 trips) and hook and line gear (42%, 842 trips). **Figure 4.9.3** shows hogfish harvested commercially per trip (lbs ww) in two areas of the South Atlantic, GA-NC and FLK/EFL, during 2012-2014.



Figure 4.9.1. Distribution of commercially harvested hogfish per trip (lbs ww) by year, from 2012 through 2014, in the South Atlantic. Source: Commercial logbook dataset accessed April 2, 2015.



Figure 4.9.2. Distribution of commercially harvested hogfish per trip (lbs ww) by gear, from 2012 through 2014, in the South Atlantic. Note: The "Other" gear type consists of hogfish landings from gill nets, traps, and if the gear type was not provided in the commercial logbook dataset. Source: Commercial logbook dataset accessed April 2, 2015.



Figure 4.9.3. Distribution of commercially harvested hogfish per trip (lbs ww) by area, from 2012 through 2014, in the the South Atlantic. The areas were defined as GA-NC and FLK/EFL. Source: Commercial logbook dataset accessed April 2, 2015.

More commercial trips (1,238) were observed for the Florida Keys/east Florida stock than in GA-NC (770) during 2012-2014, but GA-NC had higher pounds per trip (**Figure 4.9.3**). In the FLK/EFL area, 72% of the commercial trips landed 25 lbs ww or less per trip, 15% landed 50 lbs ww, 7% landed 75 lbs ww, 3% (each) landed 100 and 200 lbs ww, <1% landed 300 lbs ww or more (Figure 4.9.3). For GA-NC, 53% of the commercial trips landed 25 lbs ww or less per trip, 13% landed 50 lbs ww, 11% landed 75 lbs ww, 6% landed 100 lbs ww, 9% landed 200 lbs ww, 3% each landed 300 and 400 lbs ww, and 1% landed 500 lbs ww or more (**Figure 4.9.3**).

Percent decrease in landings by gear and for all gears were calculated for the different trip limits considered by the sub-alternatives under **Alternatives 2** and **3**. The results for GA-NC are shown in **Table 4.9.1** and the results for FLK/EFL are shown in **Table 4.9.2**.

Table 4.9.1. Percent decrease in landings by gear and for all gears, for various commercial hogfish trip limits for GA-NC.

Alternative 2; Trip Limit (lbs ww)	Hook and Line	Spear	All Gears (incl. hook-and-line, spear, gill nets, traps, etc.)
Sub-alternative 2a - 100	1.7%	38.5%	40.8%
Sub-alternative 2b - 250	0.1%	17.0%	17.4%
Sub-alternative 2c - 500	0.0%	5.0%	5.0%
Sub-alternative 2d - 750	0.0%	2.3%	2.3%

Source: South Atlantic commercial logbook data, 2012-2014.

Alternative 3; Trip Limit (lbs ww)	Hook-and- Line	Spear	All Gears (incl. hook-and-line, spear, gill nets, traps, etc.)
Sub-alternative 3a - 25	7.7%	27.1%	42.1%
Sub-alternative 3b - 50	4.3%	13.1%	21.9%
Sub-alternative 3c - 100	2.0%	3.8%	8.1%
Sub-alternative 3d - 150	1.4%	1.6%	4.3%
Sub-alternative 3e - 200	0.8%	1.1%	2.6%

Source: South Atlantic commercial logbook data, 2012-2014.

Alternative 2, Sub-alternative 2a (100 lbs ww trip limit) would have the largest percent decrease in commercial landings for GA-NC stock of hogfish, followed by Sub-alternatives 2b (250 lbs ww trip limit), and 2c (500 lbs ww trip limit) (Table 4.9.1). This is logical, given that only 6% of the commercial trips during 2012-2014 landed 100 lbs ww, 9% landed 200 lbs ww, and only 1% landed 500 lbs ww or more (Figure 4.9.3).

Alternative 3, Sub-alternative 3a (25 lbs ww trip limit) would have the largest percent decrease in commercial landings for the FLK-EFL stock of hogfish, followed by Subalternatives 3b (50 lbs ww trip limit), 3c (100 lbs ww trip limit), 3d (150 lbs ww trip limit) and 3e (200 lbs ww trip limit) (Table 4.9.2). This reflects the data shown in Figure 4.9.3, which shows that most (72%) of the commercial trips landed 25 lbs ww or less per trip, 15% landed 50 lbs ww, and 3% (each) landed 100 and 200 lbs ww.

None of the alternatives under consideration for this action are expected to adversely impact species or critical habitat listed under the Endangered Species Act (ESA). Establishing commercial trip limits for hogfish as addressed in this action would not alter the way in which the snapper grouper fishery is prosecuted in terms of gear types used or areas fished; nor would

any of the alternatives substantially increase or decrease fishing effort. Therefore, no impacts on ESA-listed species or designated critical habitat thereof are anticipated as a result of this action (see **Section 3.2.4** for a detailed description of ESA-listed species and critical habitat in the action area).

The proposed alternatives under this action would not alter the way the commercial portion of the snapper grouper fishery for hogfish is prosecuted. Furthermore, the gears predominantly used by hogfish commercial fishermen (spear and hook-and-line gear) are known to have minimal to no bycatch issues, and do little damage to physical or biogenic habitats (Blue Ocean 2010; Seafood Watch 2010). Therefore, no adverse effects on EFH, EFH-HAPCs, or Coral HAPCs are anticipated (see **Section 3.1** and **Appendix H** for a detailed description of EFH in the South Atlantic Region).

Economic Effects

Generally, trip limits are not considered to be economically efficient because they require an increase in trips and associated trip costs to land the same amount of fish. The fewer the number of trips that have to stop targeting hogfish because the trip limit has been reached would result in the least amount of direct negative economic effect. Alternative 2 applies to the GA-NC stock, while Alternative 3 applies to the FLK/EFL stock. Alternatives 2 and 3 each have different trip limits. There are no specific trip costs available for average trip costs associated with either stock, therefore specific values associated with trip costs cannot be estimated.

Table 4.9.1 shows the percent of trips that would be expected to be affected by the subalternatives of Alternative 2 (GA-NC stock). The ranking of sub-alternatives from least direct negative economic effect to the greatest is Alternative 1 (No Action), Sub-alternative 2d, Subalternative 2c, Sub-alternative 2b, and Sub-alternative 2a.

Likewise, **Table 4.9.2** shows the percent of trips that would be expected to be affected by the sub-alternatives of **Alternative 3** (FLK/EFL stock). The ranking of sub-alternatives from least direct negative economic effect to the greatest is **Alternative 1** (No Action), **Sub-alternative 3e**, **Sub-alternative 3d**, **Sub-alternative 3c**, **Sub-alternative 3b**, and **Sub-alternative 3a**.

Social Effects

Commercial fishermen in the communities identified in **Section 4.3** would likely be those affected by a change in the hogfish commercial trip limit. However, it is likely that fishermen who have targeted hogfish in recent years also target other species, and will 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.

However, in general hogfish are not harvested commercially at high levels in the South Atlantic (**Figure 4.9.3**), with most trips landing 25 lbs or less. While a trip limit may help to slow the rate of harvest by restricting landings for larger vessels, it is likely that establishing a trip limit under **Alternative 2** and **3** would have minimal effects on commercial fishermen and associated communities. The social benefits of extending the fishing season by slowing the rate of harvest would be most likely under the lower trip limits (**Sub-alternatives 2a** and **3a**).

SNAPPER GROUPER AP RECOMMENDATION:

MOTION: RECOMMEND THAT THE COUNCIL CONSIDER ADDITIONAL SUB-ALTERNATIVES FOR 150 AND 200 POUND COMMERCIAL TRIP LIMIT FOR GA-NC (ACTION 9). APPROVED BY AP (1 OPPOSED)

SSC RECOMMENDATION: None

SCOPING COMMENTS: 3 comments – No action.

9 comments – support sub-alternative 2a (250 lbs ww commercial trip limit for GA-NC stock)

The FLA hogfish stocks are overfished and currently experiencing overfishing. When proposed regulation to rebuild stocks, commercial fishermen will travel north to fish. This will increase take on the GA-NC stock. This scenario has already happened in NC where the North Carolina Dept. of Marine Fisheries (NCDMF) has issued a proclamation restricting hogfish catches for both recreation and commercial interest. It is also noted that NCDMF regulations should be used in determining stock status until a stock assessment can be completed for the GA-NC hogfish stock.

It doesn't look like a lot of Hogfish are caught on commercial trips as it is. So in my opinion I don't believe they need to be limited by trip limits. If there were to be a trip limit I believe all the options are way to small to be commercially viable with the cost of owning and operating a commercial vessel these days.

For the south Florida area a commercial trip limit of anything less than 200 lbs would not be economically viable.

COMMITTEE ACTION:

OPTION 1. CONSIDER PUBLIC COMMENT AND CHANGE RANGE OF ALTERNATIVE(S)

OPTION 2. SELECT ALTERNATIVES X AND X AS PREFERREDS.

OTHERS?

Action 10. Modify and/or establish recreational bag limits for the GA-NC and the Florida Keys/East Florida (FLK/EFL) stocks of hogfish

Alternative 1 (No Action). Do not modify and/or establish recreational bag limits for the GA-NC and Florida Keys/East Florida (FLK/EFL) stocks of hogfish in the South Atlantic Region. Currently the recreational bag limit is 5 fish per person per day off Florida and there is no recreational bag limit off Georgia, South Carolina, and North Carolina.

Alternative 2. Establish a recreational bag limit for the GA-NC stock of hogfish in the South Atlantic Region.

Sub-alternative 2a. 2 fish per person per day. **Sub-alternative 2b.** 1 fish per person per day. **Sub-alternative 2c.** 1 fish per vessel per day.

Alternative 3. Modify the recreational bag limit for the Florida Keys/East Florida (FLK/EFL) stock of hogfish in the South Atlantic Region.

Sub-alternative 3a. 3 fish per person per day.
Sub-alternative 3b. 2 fish per person per day.
Sub-alternative 3c. 1 fish per person per day.
Sub-alternative 3d. 1 fish per vessel per day.

Alternative 4. Establish a season for the GA-NC stock of hogfish in the South Atlantic region. Sub-alternative 4a. May-August Sub-alternative 4b. July-August Sub-alternative 4c. May-June

Alternative 5. Establish a season for the Florida Keys/East Florida (FLK/EFL) stock of hogfish in the South Atlantic region.

<mark>Sub-alternative 5a. May-June</mark> Sub-alternative 5b. July-August

NOTE: The recreational ACL for the GA-NC stock ranges from 1,040 to 936 fish. The preferred recreational ACL for the FLK/EFL stock for 2017 is 20,576 fish.

Biological Effects

During 2012-2014, recreational landings (lbs ww) of hogfish were predominantly from Monroe County, Florida and East Florida, followed by North Carolina, Georgia/East Florida, and South Carolina (**Table 4.10.1**).

Alternative 1 (No Action) would maintain the 5 fish per person per day recreational bag limit for hogfish off Florida, with no recreational bag limit off Georgia, South Carolina, and North Carolina. Under Alternative 2, for the GA-NC stock of hogfish, Sub-alternatives 2a and

2b would consider a 2 fish per person per day and 1 fish per person per day recreational bag limit, respectively. **Sub-alternative 2c** would consider a 1 fish per vessel per day recreational bag limit. Under **Alternative 3**, for the FLK/EFL stock of hogfish, **Sub-alternatives 3a**, **3b**, and **3c** would consider 3, 2, and 1 fish per person per day recreational bag limits, respectively. **Sub-alternative 3d** would consider a 1 fish per vessel per day recreational bag limit.

Year	North Carolina	South Carolina	Georgia/East FL	East Florida	Monroe County	Total
2012	4,178	3	178	84,042	281,172	369,573
2013	825	5	255	63,998	92,768	157,852
2014	8	16	368	111,410	154,087	265,889
Average 2012- 2014	1,670	8	267	86,483	176,009	264,438

Table 4.10.1. Recreational landings (lbs ww) of hogfish by state in the South Atlantic during 2012-2014.

Source: MRIP ACL dataset generated from the SEFSC on July 20, 2015.

Marine Recreational Information Program (MRIP) catch and effort files from 2012 to 2014 were explored to determine recreational trips that harvested hogfish in the South Atlantic. Five hundred fifty-five recreational trips (194 MRIP and 361 Headboat trips) from North Carolina through Monroe County, Florida harvested hogfish. None of the headboat trips harvested more than 1 hogfish per person. The MRIP private and charter trips had 78% of the trips harvest 2 hogfish per person or less, 14% of the trips harvested 3-4 hogfish per person, and 8% of the trips harvested 5 hogfish or more per person (**Figure 4.10.1**).



Figure 4.10.1. Distribution of hogfish harvested per person from two recreational datasets (MRIP and Headboat) during 2012-2014, in the South Atlantic.

Decision Document December 2015 **Figure 4.10.2** shows the distribution of hogfish harvested per vessel during 2012-2014. Among headboats trips, 87% harvested 1 hogfish per vessel, 10% harvested 2 hogfish, 1% harvested 3 hogfish, and 2% harvested more than 5 hogfish per vessel. For the MRIP private and charter recreational trips, 19% harvested 1 hogfish per vessel, 34% harvested 2 hogfish per vessel, 19% harvested 4 hogfish per vessel, and 28% harvested more than 5 hogfish per vessel (**Figure 4.10.2**).



Figure 4.10.2. Distribution of hogfish harvested per vessel from two recreational datasets (MRIP and Headboat) during 2012-2014, in the South Atlantic.

Reductions in landings from the proposed bag limits in **Alternatives 2** and **3** (and their subalternatives) were calculated. A discard mortality of 10% (SEDAR 37 2014) was applied to the bag limit analysis. The majority of the MRIP trips from 2012-2014 harvested hogfish were with spearfishing gear (56%, n=109 trips). Discard mortality for spearfishing trips was assumed to be zero because spearfishing is very selective and any reduction in bag limit will result in the spearing of fewer fish. For example, if the bag limit is reduced from five to three fish then spear fishermen would focus their efforts to only spear three fish, and it's assumed the spear fishermen would not spear five fish and then release two in the water.

The calculated percent decrease in landings for the bag limits under consideration are shown by mode in **Table 4.10.2**. There were no calculated reductions in landings for headboat bag limits per person because there were no trips in 2012 to 2014 that harvested more than one hogfish per person. The percent decrease in landings from the bag limits per person from North Carolina to Georgia was very small, because only 5% (n=9 trips) of the MRIP trips occurred from North Carolina to Georgia from 2012 to 2014. In both regions the bag limits per vessel had higher reductions because this would restrict the catch to only one hogfish per trip for the entire vessel.

South Atlantic Snapper Grouper AMENDMENT 37 **Table 4.10.2.** Percent decrease in recreational landings from decreasing the bag limit in the South Atlantic. Percent decrease in landings were calculated by mode, and applied the bag limit reduction to 3 areas: 1) All of South Atlantic region; 2) Only North Carolina to Georgia; and 3) only east Florida and the Florida Keys. Data used for this analysis were from 2012 through 2014.

Dec Limit	MR	Headboat							
Bag Limit	Charter	Private	HeadDoat						
All of South Atlantic Region									
3 per Person	3.1	12.9	0.0						
2 per Person	7.8	25.4	0.0						
1 per Person	20.3	49.3	0.0						
1 per Vessel	93.3	99.1	39.5						
	Only North Carolina to Georgia								
	Altern	ative 2							
2 per Person (Sub- alternative 2a)	0.0	0.0	0.0						
1 per Person (Sub- alternative 2b)	0.0	0.4	0.0						
1 per Vessel (Sub- alternative 2c)	33.3	75.0	41.1						
	Only east Florida	and Florida Keys							
	Altern	ative 3							
3 per Person (Sub- alternative 3a)	3.1	12.9	0.0						
2 per Person (Sub- alternative 3b)	7.8	25.4	0.0						
1 per Person (Sub- alternative 3c)	20.3	48.9	0.0						
1 per Vessel (Sub- alternative 3d)	92.4	99.7	25.0						

Source: NMFS SERO

For GA-NC, there would be smaller percent decrease in recreational landings under Alternative 2 and its sub-alternatives for private, charterboat, and headboat (Table 4.10.2), because most of the hogfish are harvested in FLK/EFL (Table 4.10.1). For FLK/EFL, there would be no percent decrease for headboats under Alternative 3 bag limits per person but a 25% decrease in landings for a 1 hogfish per vessel limit (Table 4.10.2). For charter and private modes, Sub-alternative 3d would have the largest percent decrease, followed by Subalternative 3c, 3b, and 3a (Table 4.10.2). The percent reductions in landings are higher for the private mode then the charter mode calculations. This is an expected outcome because private recreational anglers harvest more hogfish per vessel compared to headboats (Figure 4.10.2).

Alternatives 4 and 5 (including their sub-alternatives) consider two-month fishing seasons for GA-NC and FLK/EFL, respectively. **Sub-alternative 4a** would allow recreational harvest of hogfish during May-June, **Sub-alternative 4b** during July-August, and **Sub-alternative 4c**

during August-September. **Sub-alternative 5a** would allow recreational harvest of hogfish during May-June, and **Sub-alternative 5b** would allow recreational harvest during July-August.

Recreational landings are reported in two-month waves, with wave 1 covering January/February and wave 6 covering November/December. Average recreational landings during 2012-2014 show steady landings from January to April, a drop during May and June, a substantial increase in July and August and a drop off from September through December (**Figure 4.10.3**).



Figure 4.10.3. Recreational landings (lbs ww) by two month waves during 2012-2014 for the South Atlantic Region, including Monroe County, Florida.

Economic Effects

There are no reliable consumer surplus or net operating revenue estimates available that specifically address the value of recreationally caught hogfish (see Section 3.3.2). Therefore, the analysis for this action is qualitative. The more restrictive the sub-alternative, the increased probability that there will be increased direct negative economic effects to recreational fishers and businesses such as the for-hire industry. All the sub-alternatives of Alternative 2 and Alternative 3 are more restrictive than Alternative 1 (No Action).

The sub-alternatives of **Alternative 2** (GA-NC stock) would establish a recreational trip limit where there had not been one in the past. Sub-Alternatives 2a and 2b are expected to have little to no economic effect on the fishery as very few anglers as shown in **Table 4.10.2** have landed more than 1 fish as reported in MRIP landings. However, the MRIP estimates were based on very few trips having been sampled and may not capture recreational spearfishing landings. In

terms of least to greatest negative direct economic effects would be Alternative 1 (No Action), Alternative 2a (2 fish per person/day), Alternative 2b (1 fish per person/day), and lastly Alternative 2c (1 fish per vessel/day).

The sub-alternatives of Alternative 3 (FLK/EFL stock) would establish a recreational trip limit that would be more restrictive than the current five fish per person limit (Alternative 1 – No Action). Historically, most recreational hogfish trips in FLK/EFL stock would be affected by the sub-alternatives of Alternative 3 as shown in Table 4.10.2. In terms of least to greatest negative direct economic effects would be Alternative 1 (No Action), Sub-alternative 3a (3 fish per person/day), Sub-alternative 3b (2 fish per person/day), Alternative 3c (1 fish per person/day), and lastly Sub-alternative 3d (1 fish per vessel/day).

Social Effects

In general, the social effects of modifying the recreational bag or vessel limit would be associated with the biological costs of each alternative (see Section 4.10.1), as well as the effects on current recreational fishing opportunities. While Alternatives 2 and 3 would limit recreational fishing opportunities for hogfish, Alternative 3 would also be expected to contribute to successful rebuilding of the FLK/EFL.

Different levels of recreational fishing opportunities under each alternative could affect recreational anglers and for-hire businesses targeting hogfish. The social effects of bag limits can be associated with how many and at what times of year the recreational catch may be retained. Additionally, any long-term negative biological effects on the stock due to recreational landings from higher bag limits, or dead discards due to lower bag limits, would also likely result in negative effects of recreational fishing opportunities in future years.

In general, social benefits from improved recreational fishing opportunities will result from a bag limit that has the largest portion of the year open to recreational harvest, with the highest number of fish per person, as long as the recreational ACL is not exceeded and there is no inseason closure or post-season payback. Alternative 1 (No Action) would be the most beneficial to recreational fishermen in the short-term but could detract from measures to rebuild the FLK/EFL stock and sustain the GA-NC stock. For the GA-NC stock, Sub-alternative 2c would be the most restrictive by designating a vessel limit of one fish, and would in particular be expected to negatively affect private recreational anglers (Table 4.10.2). Sub-alternatives 2a and 2b would be expected to have little or no effects on recreational fishing opportunities, similar to Alternative 1 (No Action).

For the FLK/EFL stock, the most restrictive recreational limit (**Sub-alternative 3d**) may eliminate recreational fishing opportunities for charter and private recreational anglers (**Table 4.10.2**). Less restrictive recreational limits in **Sub-alternatives 3a-3c** and **Alternative 1** (**No Action**) would improve benefits to the recreational sector and associated businesses, but may also shorten the fishing season under the recreational ACL specified in **Action 6**.

SNAPPER GROUPER AP RECOMMENDATION:

MOTION: RECOMMEND THE COUNCIL CONSIDER A RECREATIONAL BAG LIMIT FOR THE GA-NC STOCK OF 2 FISH PER PERSON PER DAY (SUB-ALTERNATIVE 2A). **Sub-alternative 2a.** 2 fish per person per day. APPROVED BY AP

MOTION: RECOMMEND THE COUNCIL CONSIDER SUB-ALTERNATIVE 3B (2 FISH PER PERSON PER DAY) FOR THE FLK/EFL STOCK OF HOGFISH

Sub-alternative 3b. 2 fish per person per day.

APPROVED BY AP

SSC RECOMMENDATION: None

SCOPING COMMENTS:

10 comments – support sub-alternative 2a (4 fish bag limit for GA-NC stock)
2 comment – No action
1 comment – support sub-alternative 2c (3 per person per day for GA-NC stock)

COMMITTEE ACTION:

OPTION 1. CONSIDER PUBLIC COMMENT AND CHANGE/DO NOT CHANGE RANGE OF ALTERNATIVES

OPTION 2. SELECT ALTERANTIVES X AND X AS PREFERREDS.

OTHERS?

2.11 Action 11. Establish a recreational fishing season for the GA-NC and Florida Keys/East Florida (FLK/EFL) stocks of hogfish

Alternative 1 (No Action). There is no recreational fishing season for hogfish in the South Atlantic. Currently, the recreational fishing year for hogfish is January 1 through December 31.

Alternative 2. Establish a recreational fishing season for the GA-NC stock of hogfish in the South Atlantic region.

Sub-alternative 2a. May-August Sub-alternative 2b. July-August Sub-alternative 2c. May-June

Alternative 3. Establish a recreational fishing season for the Florida Keys/East Florida (FLK/EFL) stock of hogfish in the South Atlantic region. Sub-alternative 3a. May-June Sub-alternative 3b. July-August

Biological Effects

(to be completed)

Economic Effects

The economic effects of establishing a set recreational season for hogfish would depend on several factors. The factors would include whether or not the season was restrictive enough to keep the recreational ACL from being exceeded or if the season was too restrictive and unnecessarily restricting access to the resource.

In each case, the sub-alternatives of Alternatives 2 and 3 are more restrictive than Alternative 1 (No Action). However, depending on how quickly the recreational sector ACL is expected to be caught, it is impossible to know whether setting an exact season is more beneficial to the recreational sector because of the delay related to processing MRIP landings estimates. Too long of a delay in closing the recreational sector could result in very large overages and shortened future seasons. Until there is analysis of the sub-alternatives of Alternatives 2 and 3, it will not be known whether setting a fixed season, or which fixed season is most appropriate for either the GA-NC or FLK/EFL hogfish stocks.

Social Effects

Hogfish is an important recreational species in some areas of the South Atlantic, particularly in South Florida and the Florida Keys (see **Section 3.4**). Changes to the fishing year for each stock could change the level of access to hogfish during periods when hogfish are available and

when participation in the fishery is highest. However, long-term biological benefits of maintaining a healthy stock would contribute to future fishing opportunities for both the commercial and recreational sectors.

The social effects of Alternatives 2 and 3 compared to Alternative 1 (No Action) will depend on when recreational effort is the highest, and how the proposed recreational limits in Action 10 will work under the proposed ACLs in Actions 4 and 6.

SNAPPER GROUPER AP RECOMMENDATION:

MOTION: RECOMMEND THAT THE COUNCIL CONSIDER A SPAWNING SEASON CLOSURE FOR GA-NC (MAY-JUNE) AND KEEP THE CALENDAR YEAR AS THE FISHING YEAR FOR THE RECREATIONAL SECTOR. APPROVED BY AP

NOTE: Under "Other Business", the AP approved the following motion regarding the fishing year for hogfish. After the meeting, the AP Chair corroborated the AP's preference for a July 1 start date for both sector. MOTION: RECOMMEND THE COUNCIL START THE HOGFISH COMMERCIAL AND RECREATIONAL FISHING YEAR ON JULY 1.

APPROVED BY AP

MOTION: RECOMMEND AN ADDITIONAL SUB-ALTERNATIVE 3C UNDER ACTION 11 FOR A RECREATIONAL SEASON FOR FL HOGFISH MAY 1 THROUGH SEPTEMBER 30. APPROVED BY AP

SSC RECOMMENDATION: None

SCOPING COMMENTS: None. This action has not been approved for inclusion in the amendment.

COMMITTEE ACTION:

OPTION 1. APPROVE INCLUDION OF ACTION 11 FOR A RECREATIONAL SEASON AND APPROVE/MODIFY RANGE OF ALTERNATIVES.

OPTION 2. DO NOT INCLUDE ACTION 11 FOR A RECREATIONAL SEASON.

OPTION 3. SELECT ALTERNATIVE(S) X AS PREFERRED.

OTHERS?

Action 12. Establish commercial and recreational accountability measures (AMs) for the GA-NC and the Florida Keys/East Florida (FLK/EFL) stocks of hogfish

Alternative 1 (No Action). Do not establish AMs for the GA-NC and Florida Keys/East Florida (FLK/EFL) stocks of hogfish. Current commercial and recreational AMs apply to hogfish throughout the South Atlantic Council's area of jurisdiction.

Preferred Alternative 2. If commercial landings reach or are projected to reach the commercial annual catch limit (ACL), NMFS would close the commercial sector for the remainder of the fishing year. On and after the effective date of such a notification, all sale or purchase is prohibited and harvest or possession of hogfish in or from the EEZ would be limited to the recreational bag and possession limit. Additionally, if the commercial ACL is exceeded, NMFS would reduce the commercial ACL in the following fishing year by the amount of the commercial overage, only if hogfish is overfished **and** the total ACL (commercial ACL and recreational ACL) of the respective stock is exceeded.

Preferred Sub-alternative 2a: For the GA-NC stock of hogfish. **Preferred Sub-alternative 2b:** For the Florida Keys/East Florida (FLK/EFL) stock of hogfish.

Preferred Alternative 3. If recreational landings reach or are projected to reach the recreational ACL, NMFS would close the recreational sector for the remainder of the fishing year, unless, using the best scientific information available, NMFS determines that a closure is unnecessary.

Sub-alternative 3a. For the GA-NC stock of hogfish <u>if the stock is overfished</u>. **Preferred Sub-alternative 3b.** For the GA-NC stock of hogfish <u>regardless of stock</u> <u>status</u>.

Sub-alternative 3c. For the Florida Keys/East Florida (FLK/EFL) stock of hogfish <u>if the</u> stock is overfished.

Preferred Sub-alternative 3d. For the Florida Keys/East Florida (FLK/EFL) stock of hogfish regardless of stock status.

Preferred Alternative 4. If recreational landings exceed the recreational annual catch limit (ACL), then during the following fishing year, recreational landings will be monitored for a persistence in increased landings. If necessary, NMFS would reduce the length of fishing season and the recreational ACL in the following fishing year by the amount of the recreational overage, only if the species is overfished and the total ACL (commercial ACL and recreational ACL) of the respective stock is exceeded. The length of the recreational season and recreational ACL will not be reduced if NMFS determines, using the best scientific information available, that a reduction is unnecessary.

Preferred Sub-alternative 4a. For the GA-NC stock of hogfish.

Preferred Sub-alternative 4b. For the Florida Keys/East Florida (FLK/EFL) stock of hogfish.

Biological Effects

Accountability Measures (AMs) for hogfish are being revised through Amendment 34 to the Snapper Grouper Fishery Management Plan (FMP; under review). A revision to the AMs for hogfish and many other snapper grouper species was necessary to create a consistent regulatory environment while preventing unnecessary negative socio-economic impacts, and prevent overfishing. Subsequent to the reauthorization of the Magnuson-Stevens Act in 2007, the South Atlantic Council established AMs for managed species over the next several years through various amendments to the Snapper Grouper FMP. Consequently, inconsistencies in the regulatory language arose creating some confusion. Through implementation of Amendment 34 (under review), however, the South Atlantic Council has brought consistency in the management response to meeting or exceeding established Annual Catch Limits (ACLs) for snapper grouper species.

As Amendment 34 was being developed, however, work was underway to determine the stock structure of hogfish (Seyoum et al. 2015). Since a splitting of the hogfish stock within the South Atlantic Council's area of jurisdiction is being proposed in this amendment (Action 1), action must be also taken to specify AMs for each of the two hogfish stocks.

For the commercial sector, the payback provision under **Preferred Alternative 2** would be triggered infrequently, because the payback would only be required if two criteria are met: (1) hogfish is overfished *and* the total ACL has been exceeded. At this time, the likelihood of both of these scenarios taking place at the same time for the GA-NC stock of hogfish is zero, since the status of the stock is unknown. As such, **Preferred Sub-alternative 2a** is the least biologically advantageous alternative for the GA-NC stock of hogfish because a commercial payback would never be triggered, even when it was biologically needed. For the FLK/EFL stock of hogfish, while the likelihood of both of these scenarios taking place at the same time is small, one of the two criteria to trigger a commercial payback has already been met as the stock is overfished. Hence, **Preferred Sub-alternative 2b** may impart biological benefits to the FLK/EFL stock. However, since **Preferred Alternative 2** would prohibit harvest in-season if the commercial ACLs for the respective hogfish stock was met or was projected to be met, overages of the total ACL (commercial and recreational combined) would be unlikely.

Preferred Alternatives 3 and 4 would apply to the recreational sector. **Preferred Subalternatives 3b** and **3d** would trigger an in-season closure for the GA-NC stock and the FLK/EFL stock, respectively, regardless of stock status. These sub-alternatives have the potential to impart biological benefits to both stocks compared to **Sub-alternatives 3a** and **3c** since an overfished determination would not be needed to trigger a closure and thus ACL overages would be avoided. Under **Preferred Alternative 4**, if the recreational ACL is exceeded, recreational landings during the following year would be monitored for persistence in increased landings. If necessary, the recreational season *and* the recreational ACL would be reduced the following fishing year but only if the respective hogfish stock is overfished and the total ACL (commercial + recreational) is exceeded. In this respect, **Preferred Alternative 4** is almost identical **Preferred Alternative 2** for the commercial sector; however, the Regional Administrator would determine, based upon the best scientific information available, whether a payback is actually needed. The Regional Administrator may determine that a payback is not needed in a case where the combined total ACL has been met and the species is overfished, but an ongoing stock assessment indicates the species, or a species in a species group, is no longer overfished; or if ACL overages are shown to be caused by increased rates of harvest due to increasing stock abundance rather than increased fishing effort. Thus, **Preferred Alternative 4** would maintain the ability of the Regional Administrator to interpret landings data to determine whether a payback is needed. However, these sub-alternatives would all allow the payback to take the form of a recreational ACL reduction *and* a season length reduction, compared to **Alternative 1** (**No Action**), which only allows for a season length reduction as a form of payback. However, **Preferred Alternative 3** would allow the Regional Administrator to close the recreational sector when the recreational ACL for the respective hogfish stock is met or projected to be met. Therefore, if in-season closures are implemented when needed to prevent recreational ACLs from being exceeded, the need to initiate an ACL payback the following year would be greatly reduced.

Since **Preferred Alternatives 2** and **3** would prohibit commercial and recreational harvest in-season if the sector ACLs were met or were projected to be met and since overages of the total ACL (commercial and recreational combined) would be unlikely to occur, significant biological impacts, beneficial or adverse, on the GA-NC and FLK/EFL stocks of hogfish are not expected.

None of the alternatives considered under this action would significantly alter the way in which the hogfish portion of the snapper grouper fishery is prosecuted in the South Atlantic EEZ. No adverse impacts on endangered or threatened species are anticipated because of this action; nor are any adverse impacts on essential fish habitats or habitat areas of particular concern including corals, sea grasses, or other habitat types expected because of this action.

Economic Effects

In general, AMs help ensure that ACLs are not exceeded, particularly on a consistent basis. Exceeding an ACL on a consistent basis presents a high likelihood of overfishing which could possibly derail a rebuilding strategy adopted for an overfished stock or even drive an otherwise healthy stock to being overfished. Once overfishing occurs, or a stock become overfished, and more restrictive regulations are adopted, affected fishers could redirect their effort to other species that could also experience overfishing or be overfished over time. This could eventually trigger untoward repercussions on the ecological environment for a stock and other associated species. Incorporating paybacks in AMs may not eliminate the occurrence of overages but it does decrease the likelihood that overages (and overfishing) would occur over time.

Action 12 considers alternatives that would modify AMs for hogfish which had recently been modified in Snapper Grouper Amendment 34 (2015). Under Alternative 1 (No Action), the current AMs in place for these species would not be modified. Preferred Alternative 2 specifies the same conditions that would require paybacks of overages in the commercial sector, which are the same as Alternative 1 (No Action). Preferred Sub-alternatives 2a and 2b

specify that the commercial AMs for both the GA-NC and Florida Keys/East Florida Sectors. **Preferred Alternative 4** considers an in-season closure for the recreational sector.

Preferred Alternative 3 specifies the same conditions that would require closure of the recreational sector. **Sub-alternatives 3a** and **3c** would close the recreational sector for the rest of the fishing year only if the GA-NC or FLK/EFL stocks are overfished. **Preferred Sub-alternatives 3b** and **3d** would close the recreational sector for the rest of the fishing year regardless of the stock status.

Preferred Alternative 4 and **Preferred Sub-alternatives 4a** and **4b** are analogous to **Alternative 1 (No Action)**, but for the recreational sector. **Preferred Sub-alternatives 4a** and **4b** would require NMFS to monitor the recreational sector for a persistence in increased landings and if necessary reduce the recreational ACL the following fishing year for the amount of the recreational overage.

The selection of any of the sub-alternatives of **Preferred Alternative 2** through **Preferred Alternative 4** does not change the basic premise of **Alternative 1** (No Action) that commercial fishing would be stopped when the commercial ACL has been met or projected to be met or the following recreational fishing season shortened when recreational ACL is exceeded. Thus, only when overages occur would the various alternatives have possibly differing economic effects. The relative magnitude of short-term economic effects of the various alternatives would depend on the likelihood of triggering AMs, particularly those that have a payback proviso. The alternatives' long-term economic effects would depend on their effects on the sustainability of the stock to support continued fishing opportunities for the commercial and recreational fishing participants, overall the potential economic impacts of **Preferred Alternatives 2** through **Preferred Alternative 4** are not expected to be significant.

There is no expected difference in economic effects among Alternative 1 (No Action), Preferred Alternative 2 (Preferred Sub-Alternatives 2a and 2b) and Preferred Alternative 4 (Preferred Sub-Alternatives 4a and 4b).

Preferred Alternative 3 is designed to help prevent recreational fishing for hogfish from continuing when it is known through MRIP landings that the recreational ACL has been or will soon be exceeded. Allowing fishing to continue under these conditions would only exacerbate the magnitude of ACL paybacks, shorten future seasons even more, or depending on the size of the overage, eliminate a recreational fishing season altogether for one or more years. While it is not possible to determine the specific economic effects without knowing the potential extent of the impact of the hogfish AM, minimizing recreational overages would reduce the longer term direct negative economic impacts. **Sub-alternatives 3a** and **3c** would allow the Regional Administrator to close a recreational sector during a season only if the stock is overfished. **Preferred Sub-alternatives 3b** and **3c** would give the Regional Administrator more flexibility to close a recreational sector during a season regardless of the status of the stock. **Subalternatives 3a** and **3c** would be less likely to cause short-term direct economic effects compared to **Preferred Sub-alternatives 3b** and **3d** because fewer species potentially would be affected. However, **Preferred Sub- alternatives 3b** and **3d** would be more likely to prevent long term, direct economic effects compared to **Sub- alternatives 3a** and **3c**. In summary, regardless of which alternatives are chosen under **Action 12**, none of the potential direct or indirect economic effects are expected to be significant when compared to the status quo.

Social Effects

Accountability measures can have significant direct and indirect social effects because, when triggered, can restrict harvest in the current season or subsequent seasons. However, AMs are critical in keeping landings from exceeding the recommended catch levels, which is crucial under a rebuilding plan.

Alternative 1 (No Action) would maintain the current AMs, which would provide some protection to keep the ACLs from being exceeded and negative effects on the rebuilding plan. **Preferred Alternative 2** and **Preferred Sub-alternatives 2a** and **2b** would have similar effects on commercial fishermen and businesses as Alternative 1 (No Action), except that there may be more flexibility in the payback provision because the total ACL must be exceeded and the stock be overfished. Additionally, **Preferred Alternative 2** will make the commercial AMs for the hogfish stocks consistent with AMs for several other snapper grouper species.

Because there is no in-season closure for the recreational sector in place (Alternative 1 (No Action)), there is no additional means to reduce the risk of an overage, particularly for the FLK/EFL stock. Preferred Alternative 3/ Preferred Sub-alternatives 3b and 3d would require an in-season closure regardless of stock status, which would be expected to be more beneficial than Sub-alternatives 3a and 3c for fishermen by contributing to success in the rebuilding plan for the FLK/EFL stock, and sustaining harvest for the GA-NC stock.

Similar to Alternative 1 (No Action), Preferred Alternative 4/ Preferred Sub-alternatives 4a and 4b would maintain the same post-season recreational AM but make the AMs consistent with other snapper grouper species.

SNAPPER GROUPER AP RECOMMENDATION: None

SSC RECOMMENDATION: None

<u>SCOPING COMMENTS</u>: 3 comments no action. AM for the GA-NC stock should be determined after a hogfish stock assessment (SEDAR). Imposing an AM for an unknown fish stock would be arbitrary at best.

COMMITTEE ACTION: None at this time.

Timing

Hearings – weeks of Jan 25-29, 2016 and Feb 1-5, 2016 Public Hearings and Scoping Meetings: Held from 4-7 pm; except Morehead City that begins at 5 pm

Week 1	
January 25, 2016	January 26, 2016
Richmond Hill, GA	Charleston, SC
January 27, 2016	January 28, 2016
Murrells Inlet, SC	Morehead City, NC

Week 2*	
February 1, 2016	February 2, 2016
Ft. Lauderdale, FL	Key Colony Beach, FL
February 3, 2016	February 3, 2016
Key West, FL	Cocoa Beach, FL
-	

*Florida is holding a number of workshops on mutton snapper and requested that we conduct our hearings at the same time/location as much as possible. The Ft. Lauderdale, Key Colony, and Key West hearings will be joint and FWC will present their proposed measures and SAFMC will present ours (hopefully should include all the FWC suggestions). FWC staff agreed to distribute our public hearing summary (mutton snapper and hogfish) at their remaining meetings in Key Largo on 2/4, Naples on 2/15, and Stuart on 2/16.

COMMITTEE ACTION:

OPTION 1. APPROVE AMENDMENT 37 FOR PUBLIC HEARINGS WITH TIMING PRESENTED ABOVE

OPTION 2. APPROVE AMENDMENT 37 FOR PUBLIC HEARINGS AND DIFFERENT TIMING (COMMITTEE TO SUGGEST CHANGE AND APPROVE).

OPTION 3. DO NOT APPROVE AMENDMENT 37 FOR PUBLIC HEARINGS.

OTHERS?