SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

SSC Meeting Report

March 4, 2016

9:00 am – 12:00 pm

MEETING VIA WEBINAR

VERSION
FINAL
March 9, 2016

CONTENTS

DOCUMENTS

SAFMC PUBLIC COMMENT PROCESS

Written comment:

Written comment on SSC agenda topics is to be distributed to the Committee through the Council office, similar to all other Council briefing materials. Written comment to be considered by the SSC shall be provided to the Council office no later than one week prior to an SSC meeting. For this meeting, the deadline for submission of written comment is 12:00 pm Friday, February 26, 2016.

SAFMC

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Verbal comment:

Two opportunities for comment on agenda items will be provided during SSC meetings. The first will be at the beginning of the meeting, and the second near the conclusion, when the SSC reviews its recommendations. Those wishing to comment should indicate such in the manner requested by the Chair, which may be through a show of hands or a written list if the number of interested parties is extensive, who will then recognize individuals to come forward and provide comment. All comments are part of the record of the meeting.

1. INTRODUCTION

1.1. Documents

Agenda

1.2. Action

- Introductions

Vice-Chair Marcel Reichert opened the meeting at 9:05am on March 4, 2016. Chairman Luiz Barbieri sent his regrets to be missing the meeting due to travel, and asked that the Vice-Chair lead the meeting. John Carmichael provided some opening and housekeeping remarks.

- Review and Approve Agenda

The agenda was approved with no changes.

2. PUBLIC COMMENT

The public will be provided two opportunities to comment on SSC agenda items during this meeting. The first at the start of the meeting, and the final will be provided at the end during the review of recommendations. Those wishing to make comment should indicate their desire to do so to the Committee Chair.

No public comments were offered.

2. SPECIFYING THE FLK/EFL HOGFISH RECREATIONAL ACL

The SSC received a brief overview of the issues at hand by John Carmichael, and Vice-Chair Reichert reviewed the action items (see under 3.3 below). Drs. Mike Errigo and Nick Farmer gave a presentation detailing the 2 methods developed to addressing setting the ACL for the FLK/EFL hogfish recreational ACL.

3.1. Documents

Attachment 1. Oct 28-30, 2014 SSC Report

Attachment 2. Hogfish Projection Request Sep 3, 2015

Attachment 3. Updated Hogfish Projections Sep 2015

Attachment 4. Oct 20-22, 2015 SSC Report

Attachment 5. SERO method for specifying hogfish ACL

Attachment 6. SAFMC method for specifying hogfish ACL

Attachment 7. YPR Model Spreadsheet

Attachment 8. Hogfish Decision Tool Description

Attachment 9. FLK/EFL Hogfish Decision Tool Spreadsheet Using SERO Method

Attachment 10. FLK/EFL Hogfish Decision Tool Spreadsheet Using SAFMC Method

3.2. Overview

SEDAR 37 was completed in 2014 by the Florida Fish and Wildlife Conservation Commission (FL FWC), assessing the Florida Keys/East Florida (FLK/EFL) stock of hogfish. The SSC reviewed the assessment at their October 2014 meeting and determined that the FLK/EFL stock was overfished and undergoing overfishing (**Attachment 1**).

The SSC reviewed updated projections for this stock at their October 2015 meeting and determined that these projections represented the BSIA and should be used for management (**Attachments 2 and 3**). In October 2015 the SSC also discussed setting recreational ACLs in numbers vs. weight and concluded it is an appropriate approach for some species, but may not be appropriate for all species managed. The SSC also reviewed Amendment 37, which deals with management for hogfish, and concluded that setting the recreational ACL in numbers of fish is acceptable. The preferred method is to set the ABC and allocate it to sectors in numbers and convert the commercial ACL back to weight (**Attachment 4**). However, this would require recalculating the sector allocations using landings in numbers rather than in weight.

At the December 7-11, 2015 meeting in Atlantic Beach, NC, the South Atlantic Council gave direction during the Snapper Grouper Committee that they did not want to pursue recalculating allocations until such time as an omnibus amendment can be started that addresses all species with recreational ACLs set in numbers. Therefore, Amendment 37 specifies the FLK/EFL hogfish ABC in pounds, sector allocations in pounds based on the allocation formula approved through the Comp ACL Amendment, and the recreational ACL in numbers using the average weight of a recreationally caught hogfish from 2012 to 2015 Wave 3 (SERO staff). However, this causes a potential issue when other management measures are considered within Amendment 37.

In particular, a proposed change to the minimum size limit causes a potential problem

if the ABC is set in pounds but the recreational ACL is set in numbers. The proposed alternatives increase the minimum size of a hogfish in the FLK/EFL stock from 12" up to 20" in increments of 1". The assumption is that as the minimum size limit is increased, the average weight of a recreationally caught hogfish would also increase. If the average weight of a hogfish increases and the recreational sector is held to the same number of fish as was projected by the model under a 12" size limit, reaching the ACL in numbers may result in exceeding the ACL in pounds. Since the recreational sector in the FLK/EFL area is allocated over 90% of the ABC, there is the possibility that the overall stock ABC in pounds may be exceeded if the average weight of a hogfish increases considerably.

Currently, the fishery is harvesting fish at an average size of 13.9". The Council chose 15" as their preferred minimum size for the recreational FLK/EFL stock during their December 2015 meeting. On average, 70% of the hogfish harvested recreationally are below 15" in the FLK/EFL stock. Therefore, it seems likely that the average weight of recreationally caught hogfish in the FLK/EFL stock will increase if a minimum size of 15" is implemented.

Two methods have been proposed to compensate for the change in minimum size when setting the recreational ACL for the FLK/EFL stock of hogfish in numbers. The first was developed by Southeast Regional Office (SERO) staff and involves adjusting the average weight used for converting the recreational ACL from pounds to numbers based on the Length-Weight (L-W) regression derived during SEDAR 37 (**Attachment 5**). Basically, as the minimum size increases, the average weight used for the conversion is increased based on the L-W relationship from SEDAR 37, accounting for the assumed difference in the average weight of landed hogfish from the proposed minimum size change. SERO staff developed a Decision Tool for Amendment 37 to analyze each of the management alternatives individually and in combination with other proposed management measures (bag limit, trip limit, recreational season). The Decision Tool for recreational FLK/EFL hogfish estimates landings and catch rates under different management alternatives and compares those to the recreational ACL in numbers to determine the approximate season length, landings by month, and dead discards by month for the recreational fishery. A version of the Decision Tool has been included for reference purposes that uses this variable average weight method for determining the recreational ACL of FLK/EFL hogfish for each size limit alternative (**Attachments 8 and 9**).

The method proposed by SERO staff keeps the ABC and total ACL specified in pounds, and limits the fishery to the ABC chosen by the Council, which is based on stock

projections incorporating selectivity from the recent past. In other words, the ABC recommendation does not account for the size limit changes being considered by the Council. If the ABC and ACL are in pounds, then the number of fish harvested would need to be reduced, as the average weight of those fish increases, in order to remain below the ACL in pounds. The underlying assumptions are that conditions input to the model for the projections are still true (certain level of recruitment, selectivity, natural mortality, productivity, etc.), and that if the ABC is exceeded in either pounds or numbers, there is a probability that overfishing could be occurring.

Council staff proposes a second method that would set the ABC and total ACL in numbers of fish instead of pounds. This was in response to the concern that the assumptions inherent in the method proposed by SERO staff may be violated by the proposed minimum size increase. In particular, the assumed selectivity pattern and, therefore, the resulting yield per recruit (YPR) would no longer be valid once the minimum size limit change is implemented. This could result in the fishery being able to harvest a higher yield of hogfish (in pounds) without causing overfishing to occur. Therefore, Council staff developed a modified YPR model to investigate the effects of changes in the minimum size on fishing mortality (F) (**Attachment 6 Appendix** and **Attachment 7**). The results of the modified YPR indicate that the fishery could continue to harvest the same number of fish up to the 20" proposed minimum size alternative with little to no effect on the value of F.

The reason for this is that F is based on the numbers killed, so alternatives with the same number of fish killed have similar F values when you consider F over the same range of ages. Therefore, the recreational fishery can harvest a higher poundage of hogfish without causing the stock to undergo overfishing. By increasing the minimum size of hogfish the fishery can harvest, the Council can alter the selectivity. The expected selectivity under the preferred minimum size limit (15 inches) is different than the current selectivity of the fishery. The Amendment 37 IPT agreed on their Jan 15, 2016 conference call that the preferred method for dealing with this situation was to rerun the projections under different selectivity assumptions. However, conversations with FL FWC staff made it clear that this exercise would take a significant amount of time and effort to complete due to complications with the SS3 model coding and the fact that there is no one with the necessary expertise to make these types of coding changes to SS3 in a reasonable time frame. Currently, Amendment 37 is under a statutory deadline to be implemented by Feb of 2017 due to the FLK/EFL hogfish stock being declared overfished and the rerunning of these projections cannot be completed within the allowable timeline.

Therefore, Council staff proposed an alternative method which maintains an equivalent value of F as projected by the assessment model, but allows the yield of the ACL to vary based on changes in the expected selectivity at different minimum size limits. As mentioned previously, this method initially sets the ABC and total ACL in numbers of fish instead of pounds. Although the ABC and total ACL are in numbers, conversions to pounds must be done in order to apply the sector allocation formula in pounds and to track the commercial landings in pounds (the native units for the commercial sector). However, the proposed minimum size change would have little to no effect on the commercial sector because they are currently harvesting hogfish right at the proposed 15" minimum size, on average (**Attachment 3**). This method sets the total ACL in numbers, converts it to pounds using the model calculated average weight, and then uses the commercial allocation in pounds to determine the commercial ACL in pounds. The commercial ACL in pounds is converted to numbers using the commercial average weight, which is equivalent to a fish an inch and a half greater than the preferred 15" minimum size (avoiding the same problem faced in the recreational sector). Once the commercial ACL is in numbers, it can be subtracted from the total ACL in numbers to determine the recreational ACL in numbers. In this method, all AMs could be tracked in numbers rather than in pounds (or the commercial sector can be tracked in pounds if the Council prefers). A version of the Decision Tool created by SERO staff that utilizes this alternative method for determining the recreational ACL of FLK/EFL hogfish is included for reference (**Attachment 10**).

3.3. Action

- Review the two proposed methods for specifying the recreational ACL for the FLK/EFL stock of hogfish.
    - Identify uncertainties in each method and discuss their impact on fishing level recommendations and management.
    - Compare and contrast the approaches with regard to risk of overfishing and progress toward rebuilding goals.
    - Discuss whether the implementation of a minimum size limit violates the projection selectivity assumptions for recreationally caught hogfish in the FLK/EFL stock and the potential effects on fishing level recommendations.
    - Discuss whether each method represents Best Scientific Information Available, and provide guidance on their use in setting fishing level recommendations for this stock in Amendment 37.

3.4. SSC Recommendations

Identify uncertainties in each method and discuss their impact on fishing level recommendations and management.

Fishing levels can be specified in numbers or pounds. Converting recommendations, initially made in pounds, to numbers may require assumptions and caveats, but these can be evaluated and addressed.

Size limit changes will likely shift selectivity and therefore change the portion of the population that is exploited. This will have consequences for average exploitation rates, yield, and spawning biomass. In the case of a hermaphroditic species like hogfish it can be difficult to predict how a size and selectivity change will impact reproductive potential. Raising the limit as proposed could shift exploitation from small, low-fecundity females to larger, more fecund females. Changes to the minimum size limit could also impact the SSB per recruit.

The SSC notes that both scientific and management uncertainties are high for this stock, whether considering the assessment, yield predictions, or these size limit effects. A major concern that has come to the forefront through these analyses is the very poor sampling of weights of fish caught in this predominantly recreational fishery. The SSC also recognized that these uncertainties affect both presented methods.

Compare and contrast the approaches with regard to risk of overfishing and progress toward rebuilding goals.

The alternatives put forth by the Southeast Regional office (Method 1) are consistent with past practices. They are developed to prevent a fishery exceeding an initial ABC recommendation (typically provided in pounds) regardless of size limit or other regulatory changes taken by the Council that are known to impact selectivity and thus yield. In this case, they adjust the ACL downward to account for higher average weights expected of fish landed under higher size limits.

The analysis put forth by SAFMC staff (Method 2) takes a different approach, and attempts to address the higher yield per recruit that typically results from raising size limits, and to hold the fishery to the numbers of fish associated with the initial ABC recommendation while allowing the poundage associated with that number of fish to vary.

SAMFC staff performed a Yield per Recruit analysis to support the notion that overfishing can be prevented despite higher yield in pounds. Since it was based on equilibrium conditions,

rather than abundance at age as estimated in the stock assessment, the YPR exploitation rates are not directly comparable to the assessment benchmark values. Moreover, after considerable review into calculations and reporting basis for the fishing mortality values from the assessment, the SSC determined that the units are not the same. However, the YPR analysis does have value as an illustration of how yield in pounds can increase as size of exploitation increases. It was also noted that the exploitation rate changes very little between current conditions and predicted conditions under a 15" size limit.

The SSC suggested revising the YPR analysis to incorporate actual abundance at age estimates from the SS3 model to provide a short-term projection, rather than a long-term expectation. Staff agreed to make these changes immediately, with the goal of having them completed and available for SSC consideration before the SSC report to the Council on Tuesday, March 8, 2016. Moreover, after considerable review of the calculations and reporting basis for the fishing mortality values from the assessment, the SSC determined that the units are not the same. As currently configured, the YPR model proposed for determining ACL in numbers is based on an instantaneous fishing mortality rate. However, the stock assessment report (on page 235 of the pdf document) indicates that an annual exploitation rate based on biomass for ages 1-20 was used to determine stock status with respect to the F-based reference point. Therefore, in order for the YPR model to produce results that are comparable to the stock assessment and resultant stock status definition, the YPR would need to calculate the exploitation rate for biomass of ages 1-20. If this is not done, the values for the ACL are not appropriate because the two F based metrics are not equitable

The results (provided) shortly after the SSC meeting are summarized in table 1. The exploitation rate was calculated using the biomass of ages 1 to 20 (as was done in the stock assessment) in order to use the same overfishing variable to evaluate whether there was a change in exploitation between the two minimum sizes when harvesting a constant number of fish. The results indicate that although yield increases when fishing at a 15 inch minimum size versus a 12 inch minimum size, the exploitation rate actually decreases. Therefore, the modified YPR analysis conducted by SAFMC staff indicates that overfishing is not more likely to occur under a 15 inch minimum size than a 12 inch minimum size, despite the higher yield in pounds available at the 15 inch minimum size.

Table 1. Exploitation rates (E) and Yield predicted from the YPR model under a 12 inch and 15 inch size limit. Population E is exploitation rate based on the entire population from ages 1 to 20, Total E is the same as Population E but also includes dead discards.

Size Limit (in)	Population E	Total E	Landings (num)	Yield (lbs.)
12	0.12	0.12	16,514	71,900
15	0.11	0.11	16,514	93,121

Discuss whether the implementation of a minimum size limit violates the projection selectivity assumptions for recreationally caught hogfish in the FLK/EFL stock and the potential effects on fishing level recommendations.

Changes in size regulations will affect selectivity within a fishery, and such changes will impact management benchmarks and fishing level recommendations. Updating projection analyses to include selectivity parameters consistent with the size limit changes is the preferred approach to evaluate proposed size limit changes and to support fishing level recommendations that are consistent with the changes in selectivity. The SSC therefore recommends revising the hogfish projections once the Council has chosen a minimum size limit.

While in this case differences in yield associated with the various alternatives may appear small, it is still necessary and important to address these issues and devote attention to the stock.

Discuss whether each method represents Best Scientific Information Available, and provide guidance on their use in setting fishing level recommendations for this stock in Amendment 37.

The SSC considers the SAFMC proposed 'Method 2' to be Best Scientific Information available at this time to address the related issues of specifying the recreational ACL in numbers and addressing the proposed minimum size limit change. The SSC recommends that the ABC values shown for Method 2, and reported in Table 2 below, are likely sufficient to prevent overfishing. Addressing the impact of size limit change on fishery yield is appropriate and necessary, and Method 2 is the more appropriate approach to use at this time. Nonetheless, several caveats are provided with this recommendation:

- *This recommendation is temporary, intended only to serve until the revised projections incorporating the size limit changes are available. The SSC requests that revised projections are completed and available for review at its October 2016 meeting.*
- *This recommendation is based on the assumption that results from the*

revised YPR analyses will support Method 2 as the better method for preventing overfishing.

Table 2. ABC and sector ACL values resulting from Method 2.

Year	ABC (numbers)	Comm ACL (pounds)	Comm ACL (number)	Rec ACL (number)
2017	17,930	3,695	1,416	16,514
2018	21,421	4,762	1,824	19,597
2019	24,996	5,969	2,287	22,709
2020	29,200	7,291	2,793	26,407
2021	33,965	8,712	3,338	30,627
2022	39,027	10,213	3,913	35,114
2023	44,162	11,768	4,509	39,653
2024	49,254	13,344	5,113	44,141
2025	54,183	14,912	5,713	48,470
2026	58,878	16,443	6,300	52,578
2027	63,295	17,914	6,863	56,432

Additional Recommendations and Comments

Updated projections for the hogfish stock are needed, and are requested for SSC consideration in October 2016. These projections should address the selectivity changes associated with the size limit selected by the Council, provide details on SSB for both males and females, provide updated reference points (MFMT, MSST) and provide values for yield and population conditions through the rebuilding period. The SSC will review these analyses, consider any changes required in fishing levels, and consider the number of years over which reliable fishing level recommendations can be made.

The SSC recommends that the hogfish stock assessment for the Florida Keys stock be updated once the 2018 data are available. This is consistent with the SSC's earlier recommendation as to the timing of an update of the assessment (see SSC report October, 2014). In addition to previously offered recommendations, the SSC provided the following recommendations to reduce uncertainty in the next assessment:

- *Increased sampling of the recreational fishery, including diving effort;*
- *Increased sampling of catch weights;*
- *Develop internal consistency between the hogfish assessment model (SS3) and projections that address proposed changes in selectivity to reduce scientific uncertainty, as well as consistency among projections, allocations and ACL monitoring to reduce management uncertainty; and*

- *Thoroughly document the basis for fishing mortality estimates and reference points provided by the assessment, particularly how reported F values are calculated, and consider details such as whether it is weighted and what ages are included in the calculations.*

The SSC recommends that, after minimum legal size changes are implemented, a retrospective evaluation of the expected fishing mortality and realized fishing mortality for the observed catch would be informative to evaluate performance of the method. This is relevant to hogfish as well as other stocks where the Council has made similar management changes.

Over the long term, hogfish management will benefit from improved population monitoring that will enable future evaluation of how the selectivity change may affect the population (maturity, sex ratios, sex change).

3. OTHER BUSINESS

There was no other business.

5. PUBLIC COMMENT

The public is provided an additional opportunity to comment on SSC recommendations and agenda items.

Council Chair Dr. Duval thanked the SSC for their efforts in discussing this complex matter at such short notice.

6. REPORT AND RECOMMENDATIONS REVIEW

The Committee reviewed the recommendations and consensus statements, and added a few comments and clarification. Council requested that SSC recommendations addressing the TORs be provided by the SSC Chair or Vice-Chair at the Snapper Grouper Committee meeting on March 8, 2016. Recognizing the short time between this SSC meeting and the March Council meeting report, the Vice-Chair requested any comments and review to be provided no later than COB, Monday March 7.

7. ADJOURN

The meeting was adjourned at 11:45am on March 4, 2016.