SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

SSC Meeting Report

April 28-30, 2020

Meeting via Webinar

VERSION
FINAL
May 19, 2020

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*** Indicates documents not available for the Briefing Book. These will be distributed as they become available.**

SAFMC PUBLIC COMMENT PROCESS

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 was 12:00 pm Tuesday, April 20, 2020. Submit written comments to:

SAFMC – SSC Comments
4055 Faber Place Drive
Suite 201
North Charleston, SC 29405

Verbal comment:

Two opportunities for comment on agenda items were provided at set times during SSC meetings. The first was at the beginning of the meeting, and the second near the conclusion. Those wishing to comment indicated such in the manner requested by the Chair, who then recognized individuals to provide comment.

An opportunity for comment on specific agenda items was also provided as each item came up for discussion. Comments were generally taken after all the initial presentations are given and before the SSC started the discussion of the agenda topic. As before, those wishing to comment indicated such in the manner requested by the Chair, who then recognized individuals to provide comment. All comments are part of the record of the meeting. See meeting minutes.

Meeting Format:

Given the rapidly evolving situation with the outbreak of COVID-19 and potential health risks, this meeting was held as a series of webinars from April 28-30.

1. INTRODUCTION

1.1. Documents

Agenda
Attachment 1. Minutes of the October 2019 meeting

1.2. Action

- Introductions
- Review and Approve Agenda
  - ➢ *Approved by Committee.*
- Approve Minutes
  - ➢ *Approved by Committee.*

2. PUBLIC COMMENT

The public was provided an opportunity to comment on SSC agenda items as they were discussed during the meeting. See meeting minutes.

3. SEDAR ACTIVITIES

3.1. Documents

Attachment 2. Red Snapper ToRs and Schedule
Attachment 3. Black Sea Bass ToRs and Schedule
Attachment 4. Spanish Mackerel ToRs and Schedule

3.2. Overview

SEDAR staff presented the draft TORs and schedules for the upcoming Red Snapper, Black Sea Bass and Spanish Mackerel assessments. SEDAR requested volunteers to participate in these three assessments for 2020 and 2021.

3.3. Public Comment

3.4. Action

- Red Snapper
  - Approve Terms of Reference and schedule.
    - ➢ *The SSC recommends replacing the language in ToR #5 with the proposed language: ToR #5 Convene a panel including SSC representatives to meet via webinar and in-person, as needed, to review model development and provide guidance. Outside of SEDAR, hold a workshop to focus on the selectivity issues regarding the Chevron trap and video indices. A report will be produced and will be reviewed at the SEDAR 73 workshop in December 2020.*
    - ➢ ***SSC Consensus: The SSC approves the ToRs as modified.***

- Request participants.
  - ➢ *Marcel Reichert, Anne Lange, Jeff Buckel, and George Sedberry*

- Black Sea Bass
  - Approve Terms of Reference and schedule.
    - ➢ *The SSC recommends replacing the language in ToR #5 with the proposed language: ToR #5 Convene a panel including SSC representatives to meet via webinar and in-person, as needed, to review model development and provide guidance.*
    - ➢ *Reword ToR #2 Sub-Bullet 4 to include the language regarding the selectivity workshop, as described for Red Snapper TORs (above).*
    - ➢ ***SSC Consensus: The SSC approves the ToRs as modified.***
  - Request participants.
    - ➢ *Fred Serchuk, Chris Dumas, Alexei Sharov*

- Spanish Mackerel
  - Approve Terms of Reference and schedule.
    - ➢ *The SSC recommends replacing the language in ToR #5 with the proposed language: ToR #5 Convene a panel including SSC representatives to meet via webinar and in-person, as needed, to review model development and provide guidance.*
    - ➢ *Reword ToR #1 to avoid confusion over the use of different models and to clarify which models will be used.*
    - ➢ *The SSC is concerned about the long time period that has passed since the previous assessment and the changes/advances in assessment modeling that have occurred in that time period that could potentially be applied to the Spanish Mackerel stock.*
    - ➢ *The SSC recommends removing all references to the assessment being an update.*
    - ➢ ***SSC Consensus: The SSC approves the ToRs as modified.***
  - Request participants.
    - ➢ *Dustin Addis, Wilson Laney, Fred Scharf*

- Request participants for the in-person workshop discussing the selectivity of the camera and Chevron trap gear study conducted by FL FWC.
  - ➢ *Marcel Reichert, Anne Lange, Jared Flowers, Amy Schueller*

- Find replacement for Rob Ahrens on Scamp assessment.
  - ➢ *Churchill Grimes*

Table 1. Current SEDAR projects and those planned but not yet scheduled, with SSC participants where applicable.

Plan Year	SEDAR #: Type	Stock	Terminal Data	Assessment Complete	SSC Participants
2019	64: B	Yellowtail Snapper	2017	Spring 2020	DW: Luiz Barbieri, George Sedberry AW: Anne Lange, Fred Serchuk RW: Amy Schueller, Alexei Sharov
2020	B	Mutton Snapper	2020	Late 2021	TBD
	68: RT	Scamp, Gulf + SA	2017	Summer 2021	DW & AW & RW: Churchill Grimes, Marcel Reichert, Alexei Sharov
	U	Snowy Grouper	2018	Fall 2020	No participants due to this assessment being an update.
	71: OA	Gag	2019	Spring 2021	Wilson Laney, Scott Crosson, Anne Lange
	66: OA	golden Tilefish	2018	Spring 2021	George Sedberry, Genny Nesslage, Churchill Grimes
	OA	Red Snapper	TBD	TBD	Marcel Reichert, Anne Lange, Jeff Buckel, George Sedberry
2021	68: OA	Scamp, Gulf + SA	2020	Early 2022	TBD
	OA	Spanish Mackerel	TBD	Early 2022	Dustin Addis, Wilson Laney, Fred Scharf
	OA	Black Sea Bass	TBD	2022	Fred Serchuk, Chris Dumas, Alexei Sharov

4. NEW SCIENCE CENTER RECREATIONAL WEIGHT ESTIMATION PROCEDURE AND UPDATED ABC'S FOR UNASSESSED SPECIES

4.1. Documents

Attachment 5. New vs. Old Wgt Est Landings & ABCs for Unassessed Species
Attachment 6. SEFSC Wgt Conversion Presentation from MRIP Workshop
Attachment 7. SEFSC Wgt Conversion Background from MRIP Workshop

4.2. Overview

During the August 2019 MRIP Workshop, the Committee was informed of the SEFSC's methodology for converting recreational catch estimates from numbers of fish to weight in pounds. This process involves collapsing across strata in a hierarchical fashion until a minimum sample size of 30 weighed fish is achieved. That average weight is then applied to all landed fish within those strata. The strata hierarchy, from lowest to highest, is area fished, wave, mode, state, year, region, and species.

This described methodology was what was in place when the Committee originally looked at the landings trends for unassessed stocks to make ABC recommendations in October 2019. Since that meeting, the SEFSC has updated this methodology to use a 15 fish minimum sample size rather than the original 30 fish minimum. This update has changed the landings trends seen by the Committee in October 2019 and, therefore, the ABC recommendations. The Committee is asked to look over the trends for the unassessed stocks and decide if the differences, caused only by the updated minimum sample size, are small enough to simply update the original ABC recommendations with the new landings data or if more consideration is needed. The Committee is not being asked to review the entire weight estimation methodology at this time.

At their March 2020 meeting, the Council also took a close look at the Dolphin ABC the SSC recommended, and the Council would like the Committee to take another look at this ABC. The discussion at the Council meeting focused on using the 3rd highest landing value for a time series of only 4 years. That means the SSC set the ABC at the 2nd lowest value in the time series, even though they felt there isn't any concern with the Dolphin stock at this time. The Council is asking the Committee to consider approaches such as a longer time series, a different time series, or the use of the ORCS approach to set the ABC for this stock.

4.3. Public Comment

4.4. Action

- Review new landings time series for all unassessed stocks due to the change in weight estimation methodology by the SEFSC.
    - Consider updating the previous ABC recommendations based on these new landings.
        - ➢ ***SSC Consensus: The SSC has updated their ABC recommendations based on the new weight estimation procedure from the SEFSC that uses a 15 fish minimum sample size (See Table 2 below).***
- Consider the use of ORCS and the use of alternative time series for setting ABCs for Dolphin and Wahoo.
    - ➢ ***SSC Consensus: The SSC recommends using the 3rd highest landings from the years 1994-2007 to set the ABC for Dolphin and Wahoo (See Table 2 below).***
    - ➢ *The SSC recommends reviewing the ORCS methodology as the ABC Control Rule is being developed for Dolphin and Wahoo, as well as for the snapper grouper species. This should include the risk of overexploitation scalar. The new control rule should consider new research on data-limited approaches, given that ORCS does not perform well in the Management Strategy Evaluations conducted to date.*
    - ➢ *The SSC recommends review of the ORCS methodology and its applicability to stocks for which ABC is higher than historical weight-based catches (e.g., Jacks complex).*

Table 2. Revised ABC recommendations based on the new weight estimation procedure developed by the Southeast Fisheries Science Center for all unassessed species.

FMP/ Complex	Stock	ABC Basis	Reference Period	Revised ABC Value
Snapper Grouper FMP	Atlantic Spadefish	ORCS	99-07	1,976,097
	Bar Jack	ORCS	99-07	105,363
	Black Grouper	Decision Tree (3rd Highest)	99-07	784,366
	Gray Triggerfish	ORCS	99-07	1,015,605
	GA-NC Hogfish	ORCS	99-07	28,637
	Scamp	Precautionary Method	10-13, 15-17	314,293
Deepwater Complex	Blackfin Snapper	Decision Tree (3rd Highest)	99-07	3,665
	Misty Grouper	Decision Tree (3rd Highest)	99-07	2,863
	Queen Snapper	Decision Tree (3rd Highest)	99-07	9,448
	Sand Tilefish	Decision Tree (3rd Highest)	99-07	12,910
	Silk Snapper	ORCS	99-07	90,889
	Yellowedge Grouper	ORCS	99-07	113,108
Jacks Complex	Almaco Jack	ORCS	99-07	579,364
	Banded Rudderfish	Decision Tree (3rd Highest)	99-07	162,264
	Lesser Amberjack	Decision Tree (3rd Highest)	99-07	11,032
Snappers Complex	Cubera Snapper	ORCS	99-07	282,397
	Gray Snapper	ORCS	99-07	2,336,791
	Lane Snapper	ORCS	99-07	412,828
Grunts Complex	Margate	ORCS	99-07	255,385
	Sailor's Choice	Decision Tree (3rd Highest)	99-07	97,397
	Tomtate	ORCS	99-07	173,770
	White Grunt	ORCS	99-07	932,872

FMP/ Complex	Stock	ABC Basis	Reference Period	Revised ABC Value
Shallow-Water Complex	Coney	Decision Tree (3rd Highest)	99-07	3,931
	Graysby	Decision Tree (3rd Highest)	99-07	26,086
	Red Hind	ORCS	99-07	45,227
	Rock Hind	ORCS	99-07	53,592
	Yellowfin Grouper	Decision Tree (3rd Highest)	99-07	9,259
	Yellowmouth Grouper	Decision Tree (3rd Highest))	99-07	5,607
Porgy Complex	Jolthead Porgy	Decision Tree (3rd Highest)	99-07	54,789
	Knobbed Porgy	Precautionary Method	15-17	30,573
	Saucereye Porgy	Decision Tree (3rd Highest)	99-07	4,692
	Scup	Decision Tree (Median)	99-07	8,497
	Whitebone Porgy	Decision Tree (3rd Highest)	99-07	50,771
Dolphin Wahoo	Dolphin	Decision Tree (3rd Highest)	94-07	24,570,764
	Wahoo	Decision Tree (3rd Highest)	94-07	2,885,303

5. SEDAR 38 KING MACKEREL ASSESSMENT UPDATE REVIEW

5.1. Documents

Attachment 8. SEDAR 38 Update Assessment Report
Attachment 9. SEDAR 38 Update Assessment Presentation*

5.2. Presentation

SEDAR 38 Update Assessment Overview: Dr. Matt Lauretta, SEFSC

5.3. Overview

The Committee is asked to review the King Mackerel Update assessment prepared through the SEDAR 38 Update and provide fishing level recommendations (Attachment 8). King Mackerel

was last assessed in 2014 during SEDAR 38, where the stock was found to have not been overfished and not undergoing overfishing.

5.4. Public Comment

5.5. Action

- Review assessment
  - Does the assessment address the ToRs to the SSCs satisfaction?
    - ➢ ***The SSC agrees that the assessment appropriately addresses the ToRs.***
  - Does the assessment represent Best Scientific Information Available?
    - ➢ ***The SSC considers this assessment as BSIA given the ToRs.***
  - Does the assessment provide an adequate basis for determining stock status and supporting fishing level recommendations?
    - ➢ ***The SSC considers the assessment an adequate basis for determining stock status and supporting fishing level recommendations.***
- Identify, summarize, and discuss assessment uncertainties
  - Review, summarize, and discuss the factors of this assessment that affect the reliability of estimates of stock status and fishing level recommendations.
    - ➢ *Although the base model converged on a stable solution, the maximum gradient (a standard model performance diagnostic) was 0.015, which is higher than the widely accepted threshold of 0.001. This typically occurs when two or more parameters in the model are very highly correlated (>0.95) and not well estimated.*
    - ➢ *There is uncertainty surrounding how the winter mixing zone landings were assigned to the Gulf and Atlantic stocks, given there is spatial and temporal variability in how mixing actually occurs. In addition, the dynamics of the fishing fleet can vary annually, which contributes to the difficulty in assigning landings in the mixing zone.*
  - Describe the risks and consequences of the assessment uncertainties with regard to status and fishing level recommendations.
    - ➢ *Given diagnostics (max gradient >0.001) indicated that the assessment model is having difficulty estimating all parameters, it is likely that the model configuration is not ideal given the available data. However, modifying the model's configuration was deemed outside the bounds of a SEDAR update assessment. Although the impact could be minor, the SSC cannot be more explicit about the potential risks and consequences of this assessment uncertainty without knowing which parameters are affected. Our research recommendation for addressing this issue can be found below.*

- Are methods of addressing uncertainty consistent with SSC expectations and the available information?
  - ➢ *Methods of addressing uncertainty are consistent with the available information. However, parameter uncertainty was not characterized as fully as in other SEFSC assessments (e.g., using Monte Carlo bootstrap method used by the Beaufort Laboratory); therefore, the Tier II uncertainty score used in setting the ABC was lowered to medium.*
- List (in order of the greatest contribution to risk and overall assessment uncertainty) and comment on the effects of those assessment factors that most contribute to risk and impact status determinations and future yield predictions.
  - ➢ *As mentioned above, the SSC cannot be more explicit about the potential risks and consequences of uncertainty in this assessment without additional information on the cause of model convergence issues. There is also uncertainty surrounding how the winter mixing zone landings were assigned to the Gulf and Atlantic stocks. These issues could not be explored during an update assessment; therefore, the degree to which these factors impact status determination and future yield predictions is unknown at this time.*

- Provide fishing level recommendations
  - Apply the ABC control rule and complete the fishing level recommendations table.
    - ➢ *Tier I: 2 (2.5%)*
    - ➢ *Tier II: 3 (5%)*
    - ➢ *Tier III: 1 (0%)*
    - ➢ *Tier IV: 1 (0%)*
    - ➢ *Adjustment: 7.5%*
    - ➢ *P* = 42.5%*
    - ➢ ***The SSC recommends projections at P*=50% for the OFL and P*=42.5% for the ABC for King Mackerel.***
    - ➢ *Note that the stock is currently well above the biomass target (SPR30%) due in part to unusually high recruitment in recent years (2013-16). Thus, OFL recommendations listed in Table 2 begin at higher than current catches and then decrease over time as SSB declines from well above the target down toward the target.*
  - Comment on any difficulties encountered in applying the Control Rule, including any required information that is not available.
    - ➢ *The SSC does not concur with the MRAG PSA findings that King Mackerel is a high risk stock.*
      - *This stock has never been overfished nor has it undergone overfishing.*

- *There is no evidence of age or size truncation.*
- *This species matures early (fully mature at age 2).*
- *Due to these factors, the Committee recommends a score for Tier IV of Low.*
- *Productivity and Susceptibility considerations are being addressed during the ABC Control Rule Amendment development and the SSC recommends that process continue as expediently as possible.*

- Is adequate rebuilding progress being made? Comment on reasons why progress differs from projections.
  - ➢ *N/A.*

- Provide advice on monitoring the stock until the next assessment
  - What indicators or metrics should the council monitor and could the SSC use to evaluate the stock until the next assessment?
    - ➢ *Identify if sampling of the commercial handline fleet off NC can be brought back to sampling levels that occurred before recent years of frequent hurricanes.*
    - ➢ *If the model is found to be sensitive to the mixing zone composition, monitor the mixing zone for the relative contribution of Atlantic and Gulf of Mexico fish.*
    - ➢ *Monitor the SEAMAP index for future recruitment signals.*
  - Is there a recommended trigger level for these metrics? How should the Council respond if a trigger is activated?
    - ➢ *No recommendation.*
- Provide research recommendations and guidance on the next assessment
  - Review the included research recommendations and indicate those most likely to reduce risk and uncertainty in the next assessment.
    - ➢ *Research aimed at improving the documentation of data series formatting, including index standardization, for SS3 would improve modeling efficiency. This includes statistical coding for consistent database querying and data processing.*
    - ➢ *An evaluation of alternative age references, or age-specific time series, for the SEAMAP fishery independent survey was recommended by the data providers and noted by the analyst for future assessments. Specifically, separate age-0 vs. age-1 indices should be evaluated and compared with an index that pools ages.*
    - ➢ *An analysis of the effect of excluding sublegal fish size observations on the assessment should be undertaken.*

- ➢ *Information on the age-composition of discarded fish from all fleets is needed to validate the assumption of exclusively age-0 discards.*
- ➢ *The conditional age-at-length data had a significant influence on recent recruitment estimates. Future research assessments should evaluate model sensitivity to the age-data and explore alternative parameterizations (such as inverse age-length key), as the fleet coverage was suboptimal with zero information available for several fleets and years.*

- o Provide any additional research recommendations the SSC believes will improve future stock assessments.
  - ➢ *The SSC recommends model sensitivity to the mixing zone catch ratio be investigated.*
  - ➢ *The SSC recommends that the source of poor model convergence (i.e., max gradient >0.001) be identified prior to the next assessment and communicated to the SSC. We suggest examining the .cor file for very highly correlated parameters to help diagnose the problem.*
  - ➢ *Examine sensitivity in start date between current start date when only catch data available versus later start date when multiple data sources are available.*
  - ➢ *Examine sensitivity to the choice of M vs body size schedule (Lorenzen vs Charnov schedule).*
  - ➢ *Examine sensitivity to fitting the indices of abundance better. The fits were not up-weighted during SEDAR 38 or during this update.*
  - ➢ *The SSC recommends that the findings of the South Atlantic Climate Vulnerability Assessment for King Mackerel be taken into consideration during the next assessment, with respect to whether anticipated climate change impacts could affect recruitment, timing of migration, and distribution of all life stages of the species within the South Atlantic and beyond.*
- o Provide guidance on the next assessment, addressing its timing and type.
  - ➢ *The SSC recommends waiting to see the results of the exploration regarding the convergence issue listed above before deciding on the type and timing of the next assessment. Knowing the cause of the problem will help the SSC recommend an appropriate SEDAR track for the next assessment.*

SSC RECOMMENDATION:

Table 3. King Mackerel Recommendations

Criteria		Deterministic		Probabilistic
Overfished evaluation ($SSB/SSB_{30\% SPR}$)		1.7		NA
Overfishing evaluation		0.29		NA
MFMT ($F_{30\% SPR}$)		0.14		NA
SSB_{MSY} (Units)		2,439 (millions of eggs)		NA
MSST (Units)		2,049 (millions of eggs)		NA
MSY (million lbs.)		18.3		NA
Y at 75% $F_{30\% SPR}$ (1000 lbs.)				NA
ABC Control Rule Adjustment		7.5%		NA
P-Star		42.5%		NA
M		0.16		NA
OFL RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2021	34,300,000			
2022	29,500,000			
2023	26,300,000			
2024	24,200,000			
2025	22,700,000			
ABC RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2021	33,300,000			
2022	28,500,000			
2023	25,400,000			
2024	23,300,000			
2025	21,800,000			

6. SEDAR 59 GREATER AMBERJACK ASSESSMENT REVIEW

6.1. Documents

Attachment 10. SEDAR 59 Assessment Report
Attachment 11. SEDAR 59 Assessment Presentation*

6.2. Presentation

SEDAR 59 Assessment Overview: Dr. Kevin Craig, SEFSC

6.3. Overview

The Committee is asked to review the Greater Amberjack Standard assessment prepared through SEDAR 59 and provide fishing level recommendations (Attachment 10). Greater Amberjack was last assessed in 2008 during SEDAR 15, where the stock was found to have not been overfished and not undergoing overfishing. The major reasons for performing a Standard assessment were due to the length of time between the last assessment and this one. There have been many

advances in assessment science since SEDAR 15 was performed, as well as the development of a potential new index in the SERFS video fishery independent index of abundance.

6.4. Public Comment

6.5. Action

- Review assessment
  - Does the assessment address the ToRs to the SSCs satisfaction?
    - ➢ ***The SSC agrees that the assessment appropriately addresses the ToRs.***
  - Does the assessment represent Best Scientific Information Available?
    - ➢ ***The SSC considers this assessment as BSIA.***
  - Does the assessment provide an adequate basis for determining stock status and supporting fishing level recommendations?
    - ➢ ***The SSC considers the assessment an adequate basis for determining stock status and supporting fishing level recommendations.***
- Identify, summarize, and discuss assessment uncertainties
  - Review, summarize, and discuss the factors of this assessment that affect the reliability of estimates of stock status and fishing level recommendations.
    - ➢ *Sensitivity analyses indicated that the model was most sensitive to M.*
    - ➢ *The choice of Charnov M over Lorenzen M had a large impact on the stock status results of the assessment, as was shown by the sensitivity runs.*
  - Describe the risks and consequences of the assessment uncertainties with regard to status and fishing level recommendations.
    - ➢ *The SSC considers the Charnov method an appropriate method for estimating M in this assessment. The likelihood profile over the Charnov M scalar suggests M is likely to be higher than the Lorenzen M and perhaps even higher than the Charnov M.*
      - *The SSC notes that if the Lorenzen method was used, the biomass status and exploitation status would be much closer to or beyond their benchmark limits for much of the time series.*
  - Are methods of addressing uncertainty consistent with SSC expectations and the available information?
    - ➢ *The SSC considers the methods of addressing uncertainty consistent with their expectations and the available information.*
  - List (in order of the greatest contribution to risk and overall assessment uncertainty) and comment on the effects of those assessment factors that most

contribute to risk and impact status determinations and future yield predictions.

- ➢ *The method chosen to estimate M in the assessment has a significant impact on stock status determination and future yield projections.*
- ➢ *Projected catch and ABC values are dependent on the assumption about future recruitment. The projections assumed that the estimated level of recruitment applies in the future. In this assessment, recruitment was above average for most years since the mid-2000s but has declined to near average recruitment in the last three years. If this decline continues to recruitment levels characteristic of the 1990s and early 2000s, then stock projections may be overly optimistic.*

- Provide fishing level recommendations
  - Apply the ABC control rule and complete the fishing level recommendations table.
    - ➢ *Tier I: 2 (2.5%)*
    - ➢ *Tier II: 2 (2.5%)*
    - ➢ *Tier III: 1 (0%)*
    - ➢ *Tier IV: 1 (0%)*
    - ➢ *Adjustment: 5%*
    - ➢ *P* = 45%*
    - ➢ ***The SSC recommends projections at P*=50% for the OFL and P*=45% for the ABC for Greater Amberjack.***
  - Comment on any difficulties encountered in applying the Control Rule, including any required information that is not available.
    - ➢ *Since the MRAG PSA was conducted for the South Atlantic, new life history estimation techniques and additional sampling suggest the productivity of Greater Amberjack is greater than previously thought, warranting a decrease in the PSA risk score. Specifically, the estimate of M used in the assessment has increased and the estimated age at maturity has decreased. Therefore, the stock is likely more productive than the MRAG report reflects and the SSC recommended Tier IV be low risk instead of medium.*
  - Is adequate rebuilding progress being made? Comment on reasons why progress differs from projections.
    - ➢ *N/A.*

- Provide advice on monitoring the stock until the next assessment
  - What indicators or metrics should the council monitor and could the SSC use to evaluate the stock until the next assessment?
    - ➢ *Measure and monitor Greater Amberjack lengths in the SERFS video survey and strengthen support for fishery independent surveys that*

collect data on Greater Amberjack (SERFS video survey, short and long bottom longline surveys).

- Is there a recommended trigger level for these metrics? How should the Council respond if a trigger is activated?
  - ➢ *No recommendation.*

- Provide research recommendations and guidance on the next assessment
  - Review the included research recommendations and indicate those most likely to reduce risk and uncertainty in the next assessment.
    - ➢ *Develop methods to characterize length and age composition of Greater Amberjack observed on videos from the SERFS fishery-independent survey. Trap sampling of Greater Amberjack was limited and potentially biased due to size selectivity of the gear.*
    - ➢ *Implement a systematic age sampling program for both the general recreational and commercial sectors. Age samples were important in this assessment for identifying strong year classes, but sample sizes were relatively small and disparate in time and space.*
    - ➢ *Better characterize reproductive parameters including age at maturity, batch fecundity, spawning seasonality, and spawning frequency. Mature female biomass was the measure of reproductive potential for Greater Amberjack in the assessment but may be biased if reproductive parameters vary significantly with size or age.*
    - ➢ *Age-dependent natural mortality was estimated by indirect methods for this assessment of Greater Amberjack. Telemetry- and conventional-tag programs may be possible for greater amberjack to improve estimates of mortality.*
    - ➢ *Better characterize the migratory dynamics of the stock and the potential for distribution shifts.*
  - Provide any additional research recommendations the SSC believes will improve future stock assessments.
    - ➢ *The SSC recommends the investigation of the use of* Sargassum *spp. by juvenile Greater Amberjack as a nursery habitat and the relationship between the areal extent of* Sargassum *and Greater Amberjack recruitment.*
    - ➢ *The SSC recommends the investigation of the association between Greater Amberjack and reef habitat, whether natural or man-made, with respect to the degree of dependency on such reefs for spawning, shelter, and foraging use.*

- ➢ *Given the progress made in mapping benthic habitats within the South Atlantic, the SSC recommends that the next assessment investigate the potential for developing a habitat/production relationship for Greater Amberjack, should it be determined that the species life history is clearly dependent upon Sargassum spp. for juvenile recruitment, and upon reef habitat for adult shelter, foraging and/or spawning use.*

- ➢ *The SSC recommends that the findings of the South Atlantic Climate Vulnerability Assessment for Greater Amberjack be taken into consideration during the next assessment, with respect to whether anticipated climate change impacts could affect recruitment, timing of migration, and distribution of all life stages of the species within the South Atlantic and beyond.*

- Provide guidance on the next assessment, addressing its timing and type.
  - ➢ *Operational Assessment in 3-5 years.*

SSC RECOMMENDATION:

Table 4. Greater Amberjack Recommendations

Criteria	Deterministic	Probabilistic
Overfished evaluation ($SSB/SSB_{MSY)}$	2.10	2.39
Overfishing evaluation	0.40	0.28
MFMT (F_{MSY})	0.69	1.07
SSB_{MSY} (mt mature female biomass)	3,291	2,642
MSST (mt mature female biomass)	2,468	2,066
MSY (1000 lbs.)	2,342	2,474
Y at 75% F_{MSY} (1000 lbs.)		
ABC Control Rule Adjustment	5%	
P-Star	45%	
M (point estimate)	0.25	

OFL RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2020	5,234,000		403,000	
2021	3,439,000		300,000	
2022	2,890,000		270,000	
2023	2,744,000		263,000	
2024	2,704,000		260,000	

ABC RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2020	4,978,000		382,000	
2021	3,394,000		292,000	
2022	2,871,000		263,000	
2023	2,725,000		257,000	
2024	2,687,000		254,000	

7. SEDAR 60 RED PORGY ASSESSMENT REVIEW

7.1. Documents

Attachment 12. SEDAR 60 Assessment Report
Attachment 13. SEDAR 60 Assessment Presentation*
Attachment 14. MARMAP Supporting Document*

7.2. Presentation

SEDAR 60 Assessment Overview: Dr. Nikolai Klibansky, SEFSC

7.3. Overview

The Committee is asked to review the Red Porgy Standard assessment prepared through SEDAR 60 and provide fishing level recommendations (Attachment 12). Red Porgy was last assessed during the 2012 Update to SEDAR 1, where the stock was found to be overfished but not undergoing overfishing. There had been very little recovery in the stock due to what was thought to be a recruitment failure. The major reasons for performing a Standard assessment were due to the length of time between the last benchmark assessment and this one. There have been many advances in assessment science since SEDAR 1 was performed, as well as the development of a potential new index in the SERFS video fishery independent index of abundance.

7.4. Public Comment

7.5. Action

- Review assessment
  - Does the assessment address the ToRs to the SSCs satisfaction?
    - ➢ ***The SSC agrees that the assessment addresses the ToRs to their satisfaction.***
  - Does the assessment represent Best Scientific Information Available?
    - ➢ ***The SSC agrees that the assessment represents BSIA.***
  - Does the assessment provide an adequate basis for determining stock status and supporting fishing level recommendations?
    - ➢ ***The SSC agrees that the assessment provides an adequate basis for determining stock status and for supporting fishing level recommendations.***
- Identify, summarize, and discuss assessment uncertainties
  - Review, summarize, and discuss the factors of this assessment that affect the reliability of estimates of stock status and fishing level recommendations.
    - ➢ *The recruitment pattern used in the projections has a large effect on the projected catches and rebuilding status.*
    - ➢ *Fishery-dependent and -independent data have shown there to be fluctuations in age/size at maturity and growth rate, which can constrain the ability of the stock to rebuild.*
    - ➢ *The assessment is robust to the uncertainties explored in the sensitivity analyses.*
  - Describe the risks and consequences of the assessment uncertainties with regard to status and fishing level recommendations.
    - ➢ *The status of the terminal recruitment (lowest on record), the terminal SSB (lowest on record), and the current F (above F_{MSY}) from the assessment are robust to all of the uncertainties explored.*

- Are methods of addressing uncertainty consistent with SSC expectations and the available information?

  ➢ ***The SSC agrees that the methods of addressing uncertainty are consistent with their expectations and the available data.***

- List (in order of the greatest contribution to risk and overall assessment uncertainty) and comment on the effects of those assessment factors that most contribute to risk and impact status determinations and future yield predictions.

  ➢ *The greatest contributor to risk for this assessment is recruitment and the uncertainty surrounding future recruitment values. Status determination is unlikely to be affected by this recruitment uncertainty [still likely to be overfished], but the potential for future yield will be impacted by the recruitment time series.*

- Provide fishing level recommendations
  - Apply the ABC control rule and complete the fishing level recommendations table.

    ➢ *The SSC requested additional projections be run using a recruitment level equal to the average recruitment from the last 3 assessment years at F = 0, F = F_{MSY}, and F = 75% F_{MSY}, which the SSC deems to be a possible outcome given the current age composition data supplied by SERFS.*

    - *The F = 0 scenario would allow the SSC to evaluate the extent of rebuilding that can occur under this scenario and should be run until the stock is rebuilt with a 50% probability.*
    - *The SSC recommends the F = F_{MSY} scenario be used to set the OFL and should be run out to 2026.*
    - *The SSC recommends the F = 75% F_{MSY} scenario be used to set the ABC and should be run out to 2026.*

  - Comment on any difficulties encountered in applying the Control Rule, including any required information that is not available.

    ➢ *The SSC had a difficult time implementing the ABC control rule because Red Porgy is under a rebuilding plan, which has made little to no progress given low recruitment in recent years.*

  - Is adequate rebuilding progress being made? Comment on reasons why progress differs from projections.

    ➢ *Rebuilding progress has been stifled by a steady decline in recruitment since the early 1990's.*

    ➢ *Projections provided at the SSC's request using recent (2015-2017) mean recruitment suggest the probability of rebuilding is zero even if fishing mortality is reduced to zero. Although reducing directed fishing*

and minimizing discards may not guarantee rebuilding, it would allow the stock maximum rebuilding potential should conditions improve.

- ➢ *Note that while the SSC recommends an ABC based on F=75%Fmsy to end overfishing, projections indicate this ABC will have only a very minor impact on stock rebuilding.*
- ➢ *If recruitment continues to be low, we will need to reevaluate the productivity of the stock and the benchmark reference points.*

- Provide advice on monitoring the stock until the next assessment
  - What indicators or metrics should the council monitor and could the SSC use to evaluate the stock until the next assessment?
    - ➢ *Monitor the SERFS video/trap survey index and the age comps annually.*
  - Is there a recommended trigger level for these metrics? How should the Council respond if a trigger is activated?
    - ➢ *An indication of a change in recruitment could be a trigger for a new assessment.*
- Provide research recommendations and guidance on the next assessment
  - Review the included research recommendations and indicate those most likely to reduce risk and uncertainty in the next assessment.
    - ➢ *Investigate temporal trends in growth, sex at age, and female maturity at age. In the previous assessments, female maturity at age was estimated for several time blocks and included in the model as a time-varying relationship. During the current assessment process, the basis for modeling only female maturity as time varying was called into question, given that life history parameters are often linked. The decision was made to use only a single female maturity at age relationship. However, the panel judged this to be an important area of future research.*
  - Provide any additional research recommendations the SSC believes will improve future stock assessments.
    - ➢ *Investigate potential factors that may be contributing to the continued low recruitment of Red Porgy, including egg production, egg quality, fertilization rate, juvenile survival, sex ratio, and size/age of sex transition.*
    - ➢ *Investigate whether Red Porgy males establish and maintain territories as part of their spawning behavior (although territorial behavior has not previously been observed, the SSC deemed the question worthy of further investigation).*
    - ➢ *Investigate the potential impact(s) on Red Porgy of increased abundance of Red Lionfish and Red Snapper (or other piscivores found to have recent increased abundance) in the South Atlantic, including:*

- *predation of juvenile Red Porgy by Red Lionfish and Red Snapper and its potential impact on the apparent recruitment failure of Red Porgy*
- *competition for prey between Red Snapper and Red Porgy (e.g., diet composition and size range overlaps)*
- *exploring to what extent the resurgence in the Red Snapper South Atlantic population co-occurred with the decline in the South Atlantic Red Porgy population.*

- Provide guidance on the next assessment, addressing its timing and type.
  - ➢ *The SSC recommends an Operational Assessment within the next 5 years.*

SSC RECOMMENDATION:

Table 5. Red Porgy Recommendations

Criteria		Deterministic		Probabilistic
Overfished evaluation (SSB/SSB_{MSY})		0.271		0.285
Overfishing evaluation		1.730		1.664
MFMT (F_{MSY})		0.18		0.18
SSB_{MSY} (mt)		2,883.7		2,902.6
MSST (mt)		2,162.8		2,177.0
MSY (1000 lbs.)		531.4		538.2
Y at 75% F_{MSY} (1000 lbs.)		515.7		521.9
ABC Control Rule Adjustment		See text above.		
P-Star				
M (Charnov scalar)		0.22		
OFL RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2021	103,000	24,000	64,000	20,000
2022	106,000	25,000	66,000	20,000
2023	109,000	25,000	69,000	21,000
2024	112,000	25,000	70,000	21,000
2025	114,000	26,000	71,000	21,000
2026	116,000	26,000	72,000	21,000
ABC RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2021	78,000	18,000	49,000	15,000
2022	84,000	19,000	52,000	16,000
2023	88,000	20,000	55,000	16,000
2024	92,000	20,000	57,000	16,000
2025	96,000	21,000	59,000	17,000
2026	98,000	21,000	60,000	17,000

8. COUNCIL WORKPLAN UPDATE

8.1. Documents

Attachment 15. SAFMC Work Plan, March 2020
Attachment 16. SAFMC Amendments Overview, March 2020

8.2. Overview

These documents are provided at each meeting to keep the Committee informed of Council activities. Regular detailed reviews of each amendment are no longer requested of the SSC as amendments are developed; instead the Committee is asked to comment on specific technical items that may arise. However, members are welcome to review any ongoing amendments and to

provide comments and suggestions directly to staff. Current versions of each amendment are included in the Council Briefing Books distributed to SSC members. Questions or comments about specific items should be addressed to the staff assigned to each FMP, as summarized below. Items with a question mark next to them do not currently have an assigned staff member in charge of them due to the shuffling around of positions within the office this year. An assignment will be made when the vacant tech staff position is filled.

There is also a table below (Table 5) which lists all the active SSC workgroups and their members. There is currently only the Ecopath Model Review Workgroup that is active (Table 5). We anticipate a change in chairmanship this summer as Rob Ahrens transitions off the SSC and the group prepares to report back to the SSC this fall.

- Corals Amendment 10/Golden Crab Amendment 10/Shrimp Amendment 11 (Access Areas) – Chip Collier
- Fishery Ecosystem Plan – Roger Pugliese
- SG Amendments 43 & 46 (Red Snapper & Recreational Reporting) – Chip Collier
- SG Regulatory Amendment 31 (Recreational AMs) – Brian Cheuvront
- SG Regulatory Amendment 34 (SMZs off NC and SC) – Myra Brouwer
- DW Amendment 10 (Management measures for Dolphin and Wahoo) – John Hadley
- DW Amendment 12 (Bullet and Frigate Mackerel as EC species) – John Hadley
- Spiny Lob Regulatory Amendment 5 (Comm trip limits for SG1 and LT permits off GA-NC) – Christina Wiegand
- Bycatch Reporting Amendment – Chip Collier
- Comprehensive ABC Control Rule Amendment – TBD

Table 6. Currently active SSC workgroups and their membership.

Workgroup	Members
Ecopath Model Review Workgroup	Rob Ahrens (Chair)
	Yan Li
	Eric Johnson
	Marcel Reichert
	Alexei Sharov
	Fred Scharf

8.3. Public Comment

8.4. Action

- No specific actions required
  - ➢ *The SSC would like to encourage that the Council more highly prioritize the ABC Control Rule Amendment due to the complications the SSC has been having with the current ABC Control Rule when attempting to implement it. Reasons for updating the amendment include:*

- *The use of ORCS in the control rule needs to be reevaluated given that ORCS does not perform well in the Management Strategy Evaluations conducted to date.*
- *The SSC often disagrees with the MRAG scores provided for the PSA part of the control rule (e.g., see King Mackerel and Greater Amberjack above).*
- *The SSC recommended removal of some aspects of the control rule given that they are the purview of the Council.*
- *Lastly, the SSC often deviates from the control rule and would like the amendment updated in order to maintain consistency and to improve the control rule provided the new science that has been done since the implementation of the current control rule.*

9. OTHER BUSINESS

- National SSC Meeting Update
  - ➢ *The National SSC meeting has been postponed until 2021.*

10. PUBLIC COMMENT

The public was provided an additional opportunity to comment on SSC recommendations and agenda items. See meeting minutes.

11. CONSENSUS STATEMENTS AND RECOMMENDATIONS REVIEW

The Committee is provided an opportunity to review its report, final consensus statements, and final recommendations.

The Final SSC report will be provided to the Council by 9 am on Tuesday, May 19, 2020 (approximately 2.5 weeks from the end of the meeting) for inclusion in the briefing book for the June Council meeting.

12. ELECTIONS

- ➢ *Chair: Genny Nesslage*
- ➢ *Vice Chair: Jeff Buckel*

13. NEXT MEETINGS

13.1. SAFMC SSC MEETINGS

2020 Meeting Dates

- October 13-15, 2020 in Charleston, SC
  - Preferred week
  - NEFMC SSC has not scheduled their Oct meeting yet.
    - ➢ *The SSC recommends this date for their October meeting.*
    - ➢ *Staff will send a note to the staff member in charge of the SSC at the New England Council (Chris Kellogg) letting them know of when our SSC meeting is scheduled to avoid scheduling conflicts, if possible.*
- October 20-22, 2020 in Charleston, SC
  - ➢ Some SSC members indicated these dates were not good.
- Joint SA and Gulf SSC review meeting for Yellowtail Snapper will be held July 21-23 via webinar.

13.2. SAFMC Meetings

2020 Council Meetings

June 8-12, 2020 via webinar
September 14-18, 2020 in Charleston, SC
December 7-11, 2020 in Wrightsville Beach, NC

ADJOURN

Appendix I SEP Report

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SOCIO-ECONOMIC PANEL OF THE SCIENTIFIC AND STATISTICAL COMMITTEE

SEP Meeting Overview

April 8-9, 2020

Webinar

PURPOSE

This meeting is convened to discuss and provide input to the SSC and Council on:

- Recent and developing Council actions
- Citizen Science and FISHstory
- SEFSC technical memorandum on the economics of the commercial king and Spanish mackerel fishery
- Best fishing practices outreach and persuasion
- Allocations

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2. Recent and Developing Council Actions I-3
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4. SEFSC technical memorandum on the economics of the King Mackerel and Spanish Mackerel fisheries. I-7
5. Discussion on best fishing practices and persuasion I-8
6. Discussion on allocations I-10
7. Other Business I-17
8. Opportunity for Public Comment I-17
9. Report and Recommendations Review I-17
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DOCUMENTS

Attachment 1a. Socio-Economic Panel Agenda
Attachment 1b. Minutes from the April 2019 meeting

Attachment 2. Recent and Developing SAFMC Amendments

Attachment 3. Citizen Science update presentation

Attachment 4a. NOAA Technical Memorandum: Economics of the U.S. South Atlantic and Gulf of Mexico King Mackerel and Spanish Mackerel Fisheries - 2016
Attachment 4b. Presentation slides for SEP discussion of technical memorandum on the economics of the commercial King and Spanish Mackerel fisheries

Attachment 5. Best fishing practices outreach presentation

Attachment 6a. StoryMap focusing on allocations (link only, *https://arcg.is/19ybGG*)
Attachment 6b. Allocations discussion presentation slides

Attachment 6c. NMFS Recommended Practices and Factors to Consider When Reviewing and Making Allocations Decisions

1. Introduction

1.1. Documents

Attachment 1a. Socio-Economic Panel Agenda
Attachment 1b. Minutes from the April 2019 meeting

1.2. ACTIONS

- Review and approve the agenda
- Approve the April 2019 Minutes
- Introductions
- Opportunity for public comment

2. Recent and Developing Council Actions

2.1. Document

Attachment 2. Recent and Developing SAFMC Amendments

2.2. Overview

Council staff will provide a briefing on recent and upcoming amendments and actions (***Attachment 2***). The briefing will go into details on Snapper Grouper Vision Blueprint Amendment 26 (Recreational), Snapper Grouper Vision Blueprint Amendment 27 (Commercial), Snapper Grouper Amendment 29 (Best Fishing Practices and Powerhead Regulations), Dolphin Wahoo Amendment 10 (Revise Dolphin and Wahoo Management Measures), and CMP Framework Amendment 8 (King mackerel trip limits, Season 2).

Vision Blueprint Regulatory Amendment 26 (Recreational)
The Council initiated development of this amendment in June 2016 to address short-term recreational management measures identified in the Vision Blueprint. Actions in the amendment include modification to the composition and limits of the recreational aggregates and measures to reduce discards. The final rule published on February 27, 2020 and regulations will become effective on March 30, 2020.

Vision Blueprint Regulatory Amendment 27 (Commercial)
In June 2016, the Council directed staff to begin development of an amendment to address items identified in the Vision Blueprint addressing commercial management measures. Actions include commercial split seasons and/or trip limit adjustments for several species/complexes and size limit changes. The final rule published on January 27, 2020 and regulations became effective on February 26, 2020.

Regulatory Amendment 29 (Best Fishing Practices and Powerhead Regulations)
At their March 2018 meeting, the Council removed actions pertaining to best fishing practices and powerhead regulations from Amendment 46 and requested that staff begin

development of a framework amendment. The Council was concerned that other actions in Amendment 46 (recreational permitting and reporting) would take significant time to be developed and did not want to delay action on other issues. The Council reviewed an options paper at their June 2018 meeting and approved the amendment for scoping with actions addressing venting and descending devices, circle hooks, allowable rigs, and powerheads. The Council reviewed scoping comments at their September 2018 meeting. Actions and alternatives addressing venting and descending devices, circle hooks, and powerheads were approved for analysis. The action pertaining to allowable rigs was removed. The Council reviewed a draft public hearing document at their March 2019 meeting. Preferred alternatives were selected that would require a descending device be on board vessels fishing for or possessing snapper grouper species, require vessels fishing for or possessing snapper grouper species to use non-offset circles north of 28 degrees north latitude, and would allow the use of powerheads to harvest snapper grouper species in federal waters off South Carolina. The amendment was submitted to NMFS on January 13, 2020.

Dolphin Wahoo Amendment 10 (Dolphin and Wahoo Management Measures)
In March 2016, the Council directed staff to begin development of a joint dolphin wahoo and snapper grouper amendment to examine different ways to allocate or share quota between the commercial and recreational sectors for dolphin and yellowtail snapper. Options included a common pool allocation, a reserve category, temporary or permanent shifts in allocation, combined annual catch limits, and creating gear allocations in the commercial dolphin fishery. Over multiple meetings, the Council has considerably revised the amendment to now include actions that would:

- Revise ACLs for dolphin and wahoo
- Revise section allocations for dolphin and wahoo
- Revise the definition of optimum yield in the dolphin fishery
- Revise accountability measures for dolphin and wahoo
- Allow the possession of dolphin and wahoo when unauthorized gears for use in the Dolphin Wahoo fishery are onboard properly permitted vessels
- Remove the operator card requirement in the Dolphin Wahoo fishery
- Modify the recreational limit of dolphin
- Modify gear, bait, and training requirements in the longline fishery for dolphin and wahoo to align with Highly Migratory Species requirements
- Allow filleting of dolphin at sea onboard for-hire vessels in the waters north of the Virginia/North Carolina border

The Council will review revised ABC recommendations from the SSC for dolphin and wahoo at the June 2020 meeting and provide guidance on further development of Amendment 10.

Framework Amendment 8 (King mackerel trip limits, Season 2)
At the March 2019 meeting the Council reviewed Mackerel Cobia Advisory Panel concerns regarding low commercial trip limits in the Atlantic southern zone during season two (October to the end of February). During the winter months, fishermen are only able to fish a small number of days due to the weather. Additionally, due to changes

in the fishery, more fish are on the market during this time of the year, resulting in lower prices. When the weather is decent, AP members felt it would be helpful if fishermen had access to a higher trip limit to make trips worthwhile. The Council directed staff to begin work on a framework amendment to address season two trip limits for Atlantic king mackerel. At the June 2019 meeting the Council approved actions and alternatives to be included in Framework Amendment 8. The Council also requested emergency action to raise the season two trip limit south of the Flagler/Volusia County line from 50-fish to 75-fish for the 2019/2020 season. This amendment is intended to make a permanent change to the season two trip limit. At the September 2019 meeting the Council reviewed the analysis and added an additional alternative which they subsequently selected as their preferred (100-fish during season 2 with no step up in February). The amendment was submitted to NMFS on February 19, 2020. A proposed rule is currently under development.

2.3. Presentation and Discussion

John Hadley, SAFMC staff

2.4. ACTIONS

Discuss and make recommendations as appropriate. In general, this agenda item is meant to brief the SEP on Council actions that were largely driven by social or economic concerns or may be presented to the group for review later in the meeting.

The SEP had no specific recommendations.

3. Citizen Science update and FISHstory Walkthrough

3.1. Documents

Attachment 3. Citizen Science update presentation

3.2. Overview

Staff will present a brief update on the Council's Citizen Science Program, highlighting activities that have occurred since the Spring 2019 SEP meeting. Additionally, staff will provide an overview and demonstration of the FISHstory pilot project that will launched in early 2020. The FISHstory project will document historic catch and length estimates from the 1940s-1970s from a headboat fleet in Daytona Beach, FL. The project uses an online crowdsourcing platform, Zooniverse, to build an interface that will allow members of the public (e.g. citizens) to be trained to identify and count species in the photos. A team of species ID experts, comprised of fishermen and scientists, will help validate the species identified by citizens. Once species are verified, one key species will be selected for length analysis. A project design team - comprised of scientists, fishermen, and

outreach experts – have been developing the FISHstory project interface and training materials in Zooniverse. Staff will provide a demonstration of the FISHstory test project.

3.3. Presentation and Discussion

Julia Byrd and Allie Iberle, SAFMC staff

3.4. ACTIONS

The SEP will have an opportunity to discuss and make recommendations as appropriate.

Discussion Questions:

1. Are there any additional data fields that could be collected from the historic photos that would be helpful for management?
2. Are the training materials in the project adequate for non-fish experts to contribute to data collection?
3. Are there any supporting materials that would be helpful to develop to assist in bringing this project into classrooms?
4. If additional funding is obtained for the project to expand geographically, are you aware of other individuals or organizations with archives of similar historic photos we should potentially contact?

The SEP was impressed by the progress that has been made in a year, and the many projects in various stages of development. The following comments were noted. These are primarily related to the FISHistory project. Follow-up questions clarified that fish size measurement, vessel name, date, captain name are all being collected in house.

Oral history could be an important addition to Fishstory. Not only are the oral histories important, but also they can be an opening to people being willing to share photos they might not otherwise. The NOAA Oral History project has extremely useful resources for gathering oral histories and uploading, and the regional office has good expertise. Collection and digitization of photos is important, as we are hearing stories of 50-70 years of photos being lost in hurricanes.

Fishstory data has the potential of being used for artificial intelligence (AI) training, which then could be used for AI species identification if the project was to be scaled up. UNCW has students in the Data Science program who would love to use this for a masters or Ph.D. project. Fishstory could also be a great lab/extra credit assignment for students in a variety of related disciplines.

RE: slide #4 (base info of # and condition of infrastructure, etc). Jen and Tracy are wrapping up a Sea Grant funded project in Georgia that is directly related, and should have results within a year.

Julia Byrd mentioned that more bottom habitat mapping is desired. UNCW, Dept of Environmental Sciences, has recently hired Joni Backstrom, a new professor whose research specialty is bottom mapping. He has bottom mapping equipment, prior industry

experience, etc. He's been mapping areas from Morehead City, NC, to the South Carolina line, and he could potentially map other areas of interest.

4. SEFSC technical memorandum on the economics of the King Mackerel and Spanish Mackerel fisheries.

4.1. Document

Attachment 4a. NOAA Technical Memorandum: Economics of the U.S. South Atlantic and Gulf of Mexico King Mackerel and Spanish Mackerel Fisheries - 2016
Attachment 4b. Presentation slides for SEP discussion of technical memorandum on the economics of the commercial King and Spanish mackerel fisheries

4.2. Overview

In the spring of 2019, the Southeast Fisheries Science Center (SEFSC) released the technical memorandum *Economics of the U.S. South Atlantic and Gulf of Mexico King Mackerel and Spanish Mackerel Fisheries – 2016* (***Attachment 4a***). The tech memo provides summary information and economic estimates for the King and Spanish mackerel fishery as a whole and for specific Segments of Interest (SOI) that consist of areas or groups of gear types used within the king and Spanish mackerel fisheries. The Committee will receive a summary presentation from the SEFSC on the methods and major findings from the tech memo (***Attachment 4b***).

4.3. Presentation and Discussion

Dr. Christopher Liese, SEFSC staff

4.4. ACTIONS

Review the analysis, discuss the uncertainties, and determine if it is the best scientific information available.

Discussion Questions:

1. Among the findings in the tech memo are estimates of net revenue and net cash flow that are potentially useful for better analyzing the economic effects of fishery management actions on the commercial sector. These results are intended to be incorporated into amendments to the Coastal Migratory Pelagics Fishery Management Plan either by reference or direct application to estimate net economic effects to commercial participants and net costs or benefits. In doing so, it is assumed that this tech memo represents best scientific information available.
    a. Does the SEP agree that the tech memo should be considered best scientific information available?

2. Does the SEP have any additional recommendations?

The SEP endorsed this tech memo as best available science for use on economic analysis in Fishery Management Plans. The economics reports produced by Chris Liese are outstanding in their level of detail and consistency across fisheries. They quickly convey complex information in an easy to understand format. The automated data cleaning, data analysis, and report generation software and procedures that have been developed greatly increase the efficiency of the economic analysis process, reduce the time between data collection and availability of summary reports, and allow more frequent updating of economic information.

Where possible, the production of similar reports for other fisheries would be very valuable for assessing the economic health of the fisheries, the economic impacts ("multiplier effects) of fishery activity on other sectors of the economy, and the impacts of regulatory changes on the fisheries themselves.

Although the estimates of net revenue were described as "low," around 2%-5%, many industries that sell a commodity product (where each seller is selling a very similar product), such as the grocery industry, have similar margins. So, these margins may not be "low," but rather simply representative of an industry where there are many sellers (i.e., fishermen) selling a very similar product (mackerel).

It is important to note that while estimates of average net revenue per fisherman are very useful for assessing the effects of regulatory changes on an SOI as a whole, the variation in net revenue across fishermen is also important. Some fishermen are "highliners" who will have net revenue higher than the average, while others may have very low net revenue or even negative net revenue (at least in the short-run). A given regulatory change will have different effects on these different types of fishermen. The information provided in the report that gives the percentage distribution of net revenue across fishermen for a given SOI is very useful for understanding the distribution of impacts of a given regulation across the various types of fishermen in an SOI; this is a large improvement over simply having an estimate of the impact on the "average" fisherman.

5. Discussion on best fishing practices and persuasion

5.1. Document

Attachment 5. Best fishing practices outreach presentation

5.2. Overview

Recently the Council approved Snapper Grouper Regulatory Amendment 29 which includes actions related to best fishing practices (i.e. descending devices and circle hooks) intended to improve the survivorship of released snapper grouper species. The Council has expressed an interest in implementing an outreach campaign to support the amendment and educate stakeholders on the new requirements related to descending

devices including device options and proper use. Staff will update the SEP on current and future outreach efforts and give a brief overview of relevant literature on persuasion.

5.3. Presentation and Discussion

Cameron Rhodes, Christina Wiegand, and Dr. Brian Cheuvront, SAFMC staff

5.4. ACTIONS

Provide direction on the most effective ways to move forward with a best fishing practices outreach campaign and language to be used in outreach materials.

Discussion Questions:

1. What methods/tools should be used to communicate information on Regulatory Amendment 29 and proper descending device use? Social media, website, infographics, brochures, press releases?
2. What strategies should be used to make the material engaging for fishermen who might utilize these devices?
3. Which attitudes are most important to target during creation of outreach materials?
4. What language should be used when conducting outreach to ensure both cognitive and peripheral routes of persuasion are being addressed?
5. How can the Council encourage leaders in the fishing industry to participate in outreach and work with other fishermen to use descending devices as part of being experienced and successful anglers?
6. How can staff evaluate whether outreach efforts are achieving all six steps necessary for effective influence?
7. Some research shows that the link between attitudes and behavior is not as strong as originally predicted. Should Council outreach efforts move from attitudes to behavior change?

The SEP offered suggestions to take into consideration, including:

1. *The need to acknowledge/handle different fisher audiences differently (e.g. what works for rec anglers or charter/headboats probably won't be similarly appealing to commercial fishers).*
2. *The need to overcome commercial fisher attitudes that some SEP members have encountered, such as a doubt that snapper populations need this special treatment, and doubt that the devices truly work. Be positive, don't try to convince them that "good fishers" care for the ecosystem by doing this (very likely to backfire).*
3. *The potential generational differences—what works for the older generations may not be relevant for Millennials or Gen Z--means different outreach strategies may be needed to be effective. There are a huge variety of ways fishers get information, ranging from NMFS fisheries bulletins to forwarded emails.*

The SEP suggested looking to the Public Health literature for contemporary best practices on encouraging behavior modification (e.g. "how to get people with diabetes to change their eating habits" or "how to encourage more condom use in high HIV areas")

as this field is based on changing how people act. Jennifer Sweeney Tookes and Tracy Yandle volunteered to look over any materials before they are deployed to communities or focus groups. The SEP liked some of the kitschy ideas like the "west coast descender rap" and endorsed a cartoon of a fish being sent below a boat on a descender, who swims off, then back with a beer and a thank you note for saving his life, both of which he attaches to the rising descender.

6. Discussion on allocations

6.1. Document

Attachment 6a. StoryMap focusing on allocations (link only, see below)
Attachment 6b. Allocations discussion presentation slides

Additional background material:
Attachment 6c. NMFS Recommended Practices and Factors to Consider When Reviewing and Making Allocations Decisions

6.2. Overview

Due to revisions based on revised MRIP estimates (i.e. recreational data) and new ABCs expected from the SSC, the Council will be continuing to discuss sector allocation revisions for many fish species that the Council manages. Prior to the March 2020 meeting, the Council last discussed how to make sector allocations for most fish species ahead of the development of the Comprehensive ACL Amendment that went into effect in 2012. At the March 2020 meeting, Council staff presented information on sector allocation policy history and led a discussion on ways the Council can look at future sector allocations. The staff-led portion of the discussion included review of a StoryMap broadly covering the topic of allocations (*https://arcg.is/19ybGG*), and a presentation reviewing current allocation methods used in the Council's fishery management plans and potential alternative methods. The Council discussed methods they would like to consider for determining sector allocations in the future. Staff will review past actions on sector allocations and recent Council discussions from their March 2020 meeting with the SEP (***Attachment 6b***).

6.3. Presentation and Discussion

John Hadley and Christina Wiegand, SAFMC staff

6.4. ACTIONS

Review past actions on allocations and recent Council discussions, consider available data and approaches, including "out of the box" options, and recommend ways to incorporate social and economic considerations in future allocation discussions.

Discussion Questions:

1. Does the SEP recommend an approach or approaches that should be used when conducting economic analyses of allocations?
2. Does the SEP recommend an approach or approaches that should be used when conducting social analyses of allocations?
3. What social and economic data sources are available for conducting analyses related to allocations?
4. What factors should the Council take into account when considering whether to reallocate?
5. How should social and economic information related to allocations be best presented to the Council for consideration?

The SEP offered many recommendations on allocation.

1. Does the SEP recommend an approach or approaches that should be used when conducting economic analyses of allocations?

A traditional economic analysis would use the equimarginal principle to compare the desirability of alternative fishery section allocations. Under this principle, each additional unit of a resource (here, pounds of fish) is allocated to the sector where it is most highly valued, with declining marginal returns for each sector as they receive each additional unit allocated. Economic theory suggests that the marginal value per pound declines as more quota is allocated to either the commercial sector or the recreational sector. At a minimum, implementing the equimarginal principle requires estimates of the marginal value per unit (i.e., per pound) of landings for each sector (commercial, recreational, charter etc).

In the commercial sector, we need at least an estimate of the commercial harvesters' producer surplus including opportunity costs. We have some of those estimates from the Liese reports noted above. Ideally, we would also have those estimates further down the product chain on the commercial side, so we could review the impacts on processors, wholesalers, retailers, and final consumers for the commercial sector. The producer surplus for the commercial sector as a whole is thus the sum of the producer surpluses from the harvest, processing, wholesale, distribution and retail sectors. To this is added the consumer surplus of the final consumers of commercially-landed seafood to obtain the overall surplus for the commercial sector. In the commercial sector, marginal value declines due to declining profit (i.e., "producer surplus") per fish as catch increases. With constant ex-vessel price per pound, profit is declining due to the increasing marginal costs of fishing effort.

In the recreational sector, the marginal value of quota is downward sloping due to the diminishing returns to the enjoyment (i.e., "consumer surplus") of catching additional fish within a given time period. Consumer surplus per pound of fish is the difference between angler willingness to pay to catch (and keep) a pound of fish and the amount

that they must actually pay (i.e., the cost of the recreational fishing trip to the angler). Consumer surplus for the recreational sector is the sum of the consumer surpluses of the customers of the for-hire (i.e., charter and party boat modes) sector and the private (e.g., boat and shore modes) recreational sectors. The owners of the for-hire fleet also generate some producer surplus since they are engaged in a commercial enterprise, which should be added to the consumer surplus estimates.

The most efficient sector allocation occurs when the marginal value of competing uses of a scarce resource are equalized across sectors (Carter, Agar and Waters 2008, Gentner et al. 2010). For example, if fishery quota is allocated so that the marginal value of commercial harvest is greater than the marginal value of recreational harvest, then society is better off with a reallocation away from the recreational sector and towards the commercial sector. The most efficient allocation is the quota allocation that results in the same marginal value in each sector.

For the commercial harvest sector, the marginal value of catch for a multispecies fishing firm is estimated from a profit function that depends on the quantity of catch, ex-vessel prices for the catch, opportunity cost of the captain/crew, and the prices and quantities of production inputs. Trip cost data are used to estimate fleet trip costs using regression models. Estimated trip costs are then used to develop estimates of input compensated supply curves for harvesters. The input compensated supply curves are used to develop estimates of the marginal and non-marginal values of landings in the commercial fishery across a range of potential allocations. Profit functions could also be developed for seafood processors, wholesalers, distributers and retailers. Estimates of the consumer surplus enjoyed by the final consumers of commercially-caught seafood can be obtained from estimates of consumer demand for seafood based on surveys of seafood consumers.

For the recreational sector, revealed and stated preference methods have been used to estimate the marginal value of recreational catch. The travel cost method is a revealed preference approach to estimating the consumer surplus of recreational activities, such as recreational fishing, in which many of the benefits and costs occur outside normal market transactions (Haab et al. 2012). With the travel cost method an implicit price of the recreation experience is constructed, including the costs of travel and for-hire fishing fees. Recreation behavior such as fishing site choice and frequency tends to negatively correlate with travel costs. Anglers tend to choose sites with low travel costs and when they choose sites further away, tend to visit those less often. This behavior can be used to construct anglers' demand curve for recreational fishing, as can models of boat fuel consumption (Carter et al 2016). Consumer surplus can then be calculated from the demand curve. Stated preference approaches use hypothetical behavior questions in angler surveys to estimate the value of the catch (Carter and Liese 2012). Stated preference surveys mimic the logic of the travel cost method and are particularly useful in management situations where the travel cost method is difficult to implement. Combinations of the revealed and stated preference approaches can be used to account for biases and limitations of each approach (Hindsley et al. 2018).

References:

Carter, David W., Juan J. Agar and James R. Waters, "Economic Framework for Fishery Allocation Decisions with an Application to Gulf of Mexico Red Grouper, NOAA Technical Memorandum NMFS-SEFSC-576, September 2008.

Carter, David W., and Christopher Liese. "The economic value of catching and keeping or releasing saltwater sport fish in the Southeast USA." North American Journal of Fisheries Management 32, no. 4 (2012): 613-625.

Carter, David W., Akbar Marvasti, Christopher Liese, and Scott Crosson. "Valuing Sportfishing Harvest with the Demand for Boat Fuel" Marine Resource Economics (2016) 31:3, 323-338

Gentner, Brad, James Kirkley, Paul R. Hindsley and Scott Steinback, Summer Flounder Allocation Analysis, NOAA Technical Memorandum NMFS-F/SPO-111. October 2010.

Haab, Timothy, Robert Hicks, Kurt Schnier, and John C. Whitehead. "Angler heterogeneity and the species-specific demand for marine recreational fishing." Marine Resource Economics 27, no. 3 (2012): 229-251.

Hindsley, Paul, Craig E. Landry, Kurt Schnier, John C. Whitehead, Mohammadreza Zarei, "Joint Estimation of Revealed and Stated Preference Recreational Data for Evaluation of the Economic Effects of the Allocation of Fishery Harvests," Final Report to the National Marine Fisheries Service, December 2018.

2. Does the SEP recommend an approach or approaches that should be used when conducting social analyses of allocations?

Beyond the existing Coburn/Jepson community measures of commercial and recreational engagement that are already incorporated into FMP Amendments, the SEP suggested that advisory panel reports and oral histories be consulted, with the latter particularly useful for looking at social impacts in communities where fishing for some species may have ceased because of regulatory changes. There is also a literature on job satisfaction on commercial fisheries, although much of that work by Pollnac and company has concentrated on northeastern US fisheries. One exception is Crosson (2015), which found that family history was an important indicator of fisheries engagement in North Carolina.

A recurring problem in fisheries allocation is how to address the "fairness" of alternative allocations for the stakeholders involved. One new approach comes from the "fair division" literature, a branch of "social choice" theory, which is a part of political science. This literature typically focuses on how to allocate resources efficiently and fairly using various voting or auction procedures (Moulin 2003, Brams 2008). Much of the work to date is theoretical; however, Haake, Raith and Su (2002) present a procedural algorithm that attempts to make the idea practical for management purposes.

The algorithm is used in a participatory setting (a meeting with the various stakeholders together; the meeting could be in-person or online) to allocate a resource (such as a fishery resource, an ACL) in a way that achieves both efficiency (maximum value for society from the resource) and fairness (no stakeholder would want to trade his allocation for any other stakeholder's allocation). Haake, Raith and Su describe the assumptions that must hold in order to (1) guarantee that the algorithm will find a solution and (2) ensure that that process scales to accommodate any number of stakeholders. Importantly, the resource can be sub-divided into various differentiated "segments" (such as different fishing areas, different depths, different target species, different seasons, etc.), and the algorithm can be used to find the allocation of the differentiated segments that is both efficient and fair. Further, the stakeholders can also be differentiated in terms of their preferences, costs, skills, experience, etc.--the algorithm will still find the allocation that is efficient and fair. Perhaps even more surprising is that the algorithm doesn't need to know how the characteristics of the segments vary across segments, nor how the characteristics of the stakeholders vary across stakeholders, in order to arrive at the efficient and fair allocation. To the SEP's knowledge, there has been no application of such "fair division" methods in fisheries. It might be worth doing some research to adapt the Haake, Raith and Su method to a fisheries context and then attempting a "dry run" of the method with some real stakeholders, but for a hypothetical fishery, to test the method, discover and iron out any kinks, and gauge acceptability to stakeholders.

References:

Brams, S.J. 2008. Mathematics and Democracy: Designing Better Voting and Fair-Division Procedures. Princeton University Press. Princeton, NJ.

Crosson, Scott. "Anticipating Exit from North Carolina's Commercial Fisheries" Society & Natural Resources (2015), 28:7, 797-806.

Moulin, H.J. 2003. Fair Division and Collective Welfare. MIT Press. Cambridge, MA.

Haake, C.-J., M.G. Raith and F.E. Su. 2002. Bidding for envy-freeness: A procedural approach to n-player fair-division problems. Social Choice and Welfare. 19:723-749.

3. What social and economic data sources are available for conducting analyses related to allocations?

Several sources of economic data were mentioned that may be suitable for an analysis of allocation. The SEFSC collects and reports on trip-level and annual landings, revenues and costs for various commercial fisheries in the Southeast. Earlier in this meeting, the SEP reviewed Christopher Liese's report about the economics of the commercial king mackerel and Spanish mackerel fisheries, and in last year's meeting reviewed a similar report about the economics of the snapper-grouper fishery. For recreational fisheries,

there are a number of existing WTP estimates as noted in the literature mentioned under Part 1 of this section.

When conducting an analysis, economists should check to make sure that the data exhibit diminishing marginal value per pound as sector allocation increases and increasing marginal value per pound as sector allocation decreases. If marginal values per pound are constant, then the policy implication is that total economic benefits would be maximized by allocating 100% of allowable catches to only one sector. This outcome is not realistic and suggests that there probably is a deficiency in data and that the quantitative analysis should be discounted in favor of a qualitative description of potential gains and losses due to reallocation.

The SEP does not recommend the use of Input/Output (I/O) models to determine sector allocations. Structurally, the I/O models used in the Southeast do not include non-linearities or constraints that would limit the growth of economic impacts per pound as sector allocation increases. Thus, the same sector would always generate larger economic impacts per pound regardless of the size of quota to be allocated. The policy implication is an all or nothing outcome. One sector would receive 100% of the allocation and all other sectors would receive 0% allocations, which is not a realistic outcome. An alternative class of model, called Computable General Equilibrium (CGE) models, includes non-linearities and constraints, but has not been developed for fisheries in the Southeast. Sherman Robinson is the "father" of CGE models:

https://www.ifpri.org/profile/sherman-robinson

More recently: Dixon, Peter and Dale W. Jorgenson, ed. (2013). Handbook of Computable General Equilibrium Modeling, Vols. 1A and 1B, North Holland

On the general issue of how to best collect data and construct the datasets needed to run stock assessment, allocation, or any other type of model, this recent paper by Robinson might also be helpful:

"A Bayesian methodology for building consistent datasets for structural modeling"

https://www.ifpri.org/publication/bayesian-methodology-building-consistent-datasets-structural-modeling

4. What factors should the Council take into account when considering whether to reallocate?

In theory, a sector's allocation represents a constraint on its ability to land fish in an aggregate sense. Mathematically, there is an implied shadow price that represents the marginal value of an additional pound of quota for each sector with an allocation. Re-allocation is suggested for fisheries for which there are relatively large and sustained

differences in the implied shadow prices by sector. For example, if one sector consistently fails to harvest its allocation, then the Council could reasonably conclude that the marginal value of quota is zero for this sector and that some of its total allowable catch could be re-allocated to another sector with a binding allocation. However, keep in mind that any reallocation of currently unused quota that results in a lower encounter rate for fishermen with the species may inflict unintended costs. The recreational sector, in particular, may prefer to fish a stock below MSY because other aspects of the experience produce important value.

Usually, however, all sectors face binding allocations. Are there indicators that suggest disparities in their implied shadow prices? One possible indicator is the hypothetical length of season that would result without other management actions, such as trip limits or bag limits, designed to slow each sector's harvest. Under this reasoning, longer seasons imply less restrictive allocations and smaller shadow prices for season length. In this case, shadow price is interpreted as the marginal value of an additional day of fishing and is a derivative of marginal value per pound of quota. Re-allocation would be justified to equalize marginal values of an additional day of fishing across sectors. The problem is to determine the length of each hypothetical season that would equalize these shadow prices. It is tempting to assume that re-allocation to equalize hypothetical season length would approximately equalize marginal value of an additional day of fishing, but this assumption probably is not valid. Nevertheless, economic efficiency probably would be enhanced if quota were re-allocated to sectors with consistently short hypothetical fishing seasons from those sectors with consistently long hypothetical seasons. Traditional management actions such as trip limits and bag limits can continue to be used to slow each sector's rate of harvest and lengthen actual fishing seasons.

5. How should social and economic information related to allocations be best presented to the Council for consideration?

The Council is familiar with efficiency. But they should also be presented with concepts such as:

- *Pareto efficiency and improvements*
- *shadow values and prices*
- *equity and fairness (see discussion of "fair division" in section 2 above)*
- *local vs. regional vs. national impacts of alternative allocations*
- *consumer and producer surplus*
- *impacts on sales, jobs, labor income, tax revenues*

- *economic "multiplier" effects throughout the supply chain and distribution chain*

7. Other Business

The SEP received initial information from Scott Crosson about NOAA actions on the Covid-19 crisis. NOAA economists nationwide gathered initial qualitative information about the status of regional fisheries in mid-March, which were compiled into a report for Congress by NOAA headquarters. The CARES Act includes $300M for US fisheries aid, and NOAA is now compiling state-by-state summaries of the different fisheries' landings by group over the past half decade. This is being done from existing data sources such as trip tickets, not from any ongoing surveys, although those will likely follow at some point in the near future. NOAA information on Covid-19 and its effects on fisheries can be accessed at https://www.fisheries.noaa.gov/national/noaa-fisheries-coronavirus-covid-19-update.

Council staff briefed the SEP on the desire to help fishermen and fishing businesses where possible and on plans to potentially engage the Council's advisory panels to gather information that agencies or academia could use going forward to supplement economic relief efforts. Within this context, staff explained that they do not want to do more harm than good when it comes to survey fatigue or overly burdening fishermen since there likely will be multiple organizations reaching out to them at a later date. The SEP recommended that staff consider compiling resources and information on where fishermen could turn to for potential economic relief while the COVID 19 crisis is ongoing.

8. Opportunity for Public Comment

There was no public comment received.

9. Report and Recommendations Review

10. Next SEP Meeting

- Spring 2020, Charleston SC