SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

SSC Meeting

FINAL REPORT

April 18-20, 2023

Town and County Inn

Charleston, SC

VERSION
FINAL
5/22/23

CONTENTS

TABLES

DOCUMENTS

** Indicates materials not available for briefing book at time of posting. These materials will be added to the recent materials section when available.*

SAFMC PUBLIC COMMENT PROCESS

Written comment:

Written comment on SSC agenda topics is provided to the Committee through an online form, similar to all other Council briefing materials. Written comment can be submitted at this link. For this meeting, the deadline for submission of written comment is 5:00 p.m., April 19, 2023.

Verbal comment:

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

An opportunity for comment on specific agenda items will also be provided as each item comes up for discussion. Comments will be taken after all the initial presentations are given and questions from the SSC are answered, but before the SSC starts making recommendations to address the action items. As before, those wishing to comment should indicate such in the manner requested by the Chair, who will then recognize individuals to provide comment. All comments are part of the record of the meeting.

Meeting Format:

This meeting will be held in-person at the Town & Country Inn, Charleston, SC. Online registration for the meeting can be found at the Council's website: https://safmc.net/scientific-and-statistical-committee-meeting/

1. INTRODUCTIONS

1.1 Documents

Attachment 1a. SSC April 2023 Agenda
Attachment 1b. Transcript from the January 2023 meeting

1.2 Action

- Introductions and new member appointment.
- Review and approve agenda. – *approved*
- Approve transcript from January meeting. – *approved*

2. PUBLIC COMMENT

The public is provided this comment period for any general comments pertaining to any items on the agenda. There will also be time provided for public comment during each specific agenda item as they are discussed. Those wishing to make comment should indicate their desire to do so to the Committee Chair.

See Transcript for Public Comment

3. REVIEW OF POPULATION PROJECTIONS

3.1 Documents

Attachment 3a. SEFSC presentation: Review of Population Projections

3.2 Presentation

Dr. Erik Williams, SEFSC

3.3 Overview

In the most recent stock assessment for Scamp/Yellowmouth, landings and discards were combined in assessment projections, which is a different approach from how the projections have been modeled in other assessments. Previously, assessment projections for landings and discards had been separated, but the projections imposed a link between the landings and discard exploitation rates so that both responded the same to alternative projected mortality rates. The Council requested the SEFSC provide a presentation on the handling of discards and landings in assessment projections to the SSC that included a review of how projections have been prepared in the past and address the recommendation that estimated discards will be tied to management action in future projections. The SSC should consider how interpretation of P* values and application of the ABC Control rule will be impacted by an alternative approach to projecting future landings and discard values, as well as how management actions, sector allocations, and ACLs in future amendments could be impacted.

3.4 Public Comment

3.5 Action

**Note: The action items below were based on discussions from Council meetings and aftermath of Scamp/Yellowmouth grouper assessment review where landings and dead discards were included as total removals. Future stock assessments for other species will likely not use this approach as the magnitude of discards and their different selectivity warrants separation from the landings.*

- Consider how this change will impact the application of the ABC CR, evaluation of P*, and providing fishing level recommendations for the Council.
    - Discuss how changes in discard assumptions or catch selectivity from management actions will affect the ability to provide updated ABCs.
        - *In the past, combined landings and discards did not change application of ABC-CR.*
        - *New ABC-CR amendment does not treat landings and discards any differently.*
        - *This discussion prompted the SSC to look at ABC recommendations from the past using retrospective analysis. See formation of workgroup below.*
        - *Dead discards comprise substantial portion of total removals for several different species. Need improvement on reporting of actual dead discards; timely data will improve monitoring stock.*
- Discuss how projected stock-level discards and landings can be allocated to fishery sectors to provide ACLs.
        - *There is a need for better discard data.*
- Discuss changes in default projections from SEDAR assessments and adjustments in ABC setting.
        - *The SEFSC indicated that there will be no changes in the default projections for future assessments for most species; that is, projections will continue to have separate landings and discards. Discards were combined with landings in the Scamp complex projections because discards were very low. They have also been combined for some of our deepwater species (Tilefishes, Snowy grouper).*
        - *A research recommendation/projection methodology for discard data: single point estimates of discards are likely not sufficient (high uncertainties). Need to look at distribution around these point estimates and use standard deviations for identifying anomalous points. Bayesian updating techniques to update projections from terminal year moving forward through interim and management years. See Appendix D of: National Academies of Sciences, Engineering, and Medicine 2021. Data*

and Management Strategies for Recreational Fisheries with Annual Catch Limits. Washington, DC: The National Academies Press. https://doi.org/10.17226/26185.

SSC General Comments:

- *Use retrospective analysis as a check of the robustness of projections.*
  - *Workgroup was formed to address this concern.*
  - *Looking at landings/discards/indices for potential signals.*

4. SEDAR 76: BLACK SEA BASS OPERATIONAL ASSESSMENT

4.1 Documents

Attachment 4a. SEDAR 76: Black Sea Bass SAR
Attachment 4b. SEDAR 76: Black Sea Bass Presentation
Attachment 4c. SAFMC ABC Control Rules

4.2 Presentation

Dr. Matthew Vincent, SEFSC

4.3 Overview

This operational assessment evaluated the stock of black sea bass, *Centropristis striata*, off the southeastern United States. The primary objectives were to update and improve the 2018 SEDAR 56 assessment of black sea bass and to conduct new stock projections. Using data through 2016, SEDAR 56 had indicated that the stock was not overfished and not undergoing overfishing though this was only in the recent years. For this assessment, data compilation and assessment methods were guided by methodology of SEDAR 25 and SEDAR 56, as well as by current SEDAR practices. The assessment period is 1978–2021.

Available data on this stock included indices of abundance, landings, discards, and samples of annual length and age compositions from fishery dependent and fishery independent sources. Four indices of abundance were fitted by the model: one from the recreational headboat fleet, one from the commercial lines fleet, one from the MARMAP blackfish/snapper trap survey, and one from the SERFS that combined chevron trap and video sampling. Data on landings and discards were available from recreational and commercial fleets.

The primary model used in the SEDAR 25 benchmark assessment and updated in this operational assessment was the Beaufort Assessment Model (BAM), a statistical catch-age formulation. Results suggest that spawning stock declined until the early 1990s, increased gradually until the late-2000s, with a large increase in 2009 and 2010, and then declined precipitously. The base run estimate of terminal year (2021) spawning stock is below the MSST ($SSB_{2021}/MSST = 0.32$) indicating that the stock is overfished, and the estimated fishing rate is above F_{MSY}. The terminal estimate, which is based on a three-year geometric mean, is above F_{MSY} in the base run ($F_{2019–2021}/F_{MSY} = 2.14$). Thus, this assessment indicates that the stock is overfished and undergoing overfishing.

Projections with $F = 0$ indicate that the stock could recover to its target of SSB_{MSY} within ten years if recruitment returns to its long-term average. If recruitment remains low, the stock abundance will remain low and not achieve SSB_{MSY}.

The SSC is asked to review, discuss, and provide feedback on the SEDAR 76 Black Sea Bass Operational Assessment model configurations, projections, and uncertainties. If the assessment is determined to be suitable for providing management advice, the SSC will apply the ABC Control Rule and make catch level recommendations.

4.4 Public Comment

4.5 Action

- **Review assessment**
  - Does the assessment address the ToRs to the SSCs satisfaction?
    - *Yes, the assessment addresses the ToRs.*
  - Is the assessment consistent with BSIA guidance and practices?
    - *Yes, the assessment is consistent with BSIA.*
  - Does the assessment reliably capture past trends in the fishery and population?
    - *Yes, the assessment captures past trends in the fishery and population.*
    - *However, abundance at age-0 in years 2020-2021 use estimates from 2014-2019 based on average recruitment.*
    - *Abundance at age-1 in 2021 is similarly affected.*
  - Does the assessment provide a reliable, quantitative estimate of current stock status?
    - *Yes, the assessment provides reliable, quantitative estimates of current stock status.*
    - *Typically, Fmsy is calculated from an assessment model using a stock-recruitment relationship with steepness (the level of recruitment compensation) estimated within the assessment model or fixed externally based on comparative information (estimates from species with similar life histories). In this assessment, constant mean recruitment was assumed as the 'stock recruitment relationship'. This implies complete recruitment compensation, i.e., recruitment is assumed not to decline at all even when spawning biomass is reduced to very low levels. In this case, Fmsy equals Fmax (the F at which maximum yield per recruit is achieved) and will represent an overestimate of the true Fmsy if recruitment compensation is anything less than complete (steepness < 1.0). To account for this risk, the SSC recommended to base stock status and projections on $F_{0.1}$, the fishing mortality rate where the slope of*

the yield per recruit curve is 10 percent of the slope of the curve at its origin. This is an accepted approach to reducing the risk of overfishing without foregoing a great deal of yield in situations where the stock-recruitment relationship is not well-defined. The alternative approach of using an SPR-based proxy for Fmsy is not easily implemented for protogynous species when spawner biomass is calculated for females only.

- Does the assessment provide reliable predictions of future conditions to support fishing level recommendations?
  - *Projections of discards (Table 24 from sedar 76 stock assessment report) show much higher estimates (~4x) than the last two years (2020-2021) of observed discards (Table 18 from sedar 76). The SSC discussed this concern and one possibility to address this would be to use average F instead of average landings in the interim years. Another would be to incorporate interim year (observed) data into the assessment for use in projections.*

- **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 key factors that affect the reliability of estimates of stock status and fishing level recommendations continue to be uncertainty in recruitment, discard rates and discard mortality, natural mortality, and whether there has been a "regime change" in the fishery. (A "regime change" is a significant shift in the underlying relationships that connect the model variables, something different from the normal variation in the values of the model variables from year to year.) Of these, the estimated recent declines in recruitment appear to be critical to fishing level recommendations and, perhaps, the future long-run viability of the stock, even in the extreme case of F = 0.*
    - *The SSC is concerned about whether or not egg production is the best measure of SSB due to the protogynous nature of this species. The SSC recommends providing male and female spawner biomass in future assessment and projections for this species. The combined male and female spawner biomass may provide information on whether or not decreases in recruitment are a result of decreases in spawner biomass.*
    - *The latter part of the assessment time series relies on a single index of abundance, the SERFS index. This is a similar situation to the scamp complex assessment. The SSC does not*

have a reason to think this index is not robust for the sizes it selects.

- Describe the risks and consequences of the assessment uncertainties with regard to status and fishing level recommendations.
    - *There appears to be much larger uncertainty in estimates of recent relative F (slide 75 in Attachment 4b) compared to uncertainty in recent relative SSB (slides 73-74). Sensitivity analysis indicates that the uncertainty in F appears to be driven by uncertainty in natural mortality (slide 63) and discard mortality (slide 64). Nevertheless, when the model is used (via sensitivity analysis) to assess the effects of alternative values of uncertain model parameters on stock status, there is very high confidence that the stock is currently overfished and high confidence that the stock is currently experiencing overfishing (slide 77). Uncertainty in recruitment in developing catch advice remains a key factor. The estimated recent declines in recruitment appear to be critical to fishing level recommendations and, perhaps, the future long-run viability of the stock, even in the extreme case of F = 0.*
- Are methods of addressing uncertainty consistent with SSC expectations and the available information?
    - *Yes, the methods of addressing uncertainty are consistent with SSC expectations and the available information and reflect the Best Scientific Information Available. Specifically, the staff is to be commended for employing state-of-the-art Monte Carlo / Bootstrap Ensemble (MCBE) methodology. The ability of MCBE models to produce both point estimates and probability distributions for key fishery benchmarks and status indicators is especially useful to the SSC for the purposes of characterizing and visualizing current best estimates (slide 79 in Attachment 4b), trends (slides 73-75) and uncertainty (slides 76-78) in critical management factors. Overall, the MCBE model appears to fit the data well in regard to landings, discards, age/length-comps, and fishery indices, with 98% of 4000 model runs converging on parameter estimates within the bounds of the parameter ranges (a key metric used to assess model fit). The necessary modeling assumptions concerning the prior distributions of natural mortality, discard mortality and index weights are reasonable and consistent with the most recent scientific information. How to best model recruitment, given its highly variable nature and limited information, remains a challenge, but the approach used in this assessment reflects careful consideration of the available information and*

the findings of the recent SSC working group on recruitment modeling. The SSC discussed whether it would be better, in theory, to model recruitment using mean recruitment or a stock-recruitment relationship, but the SSC agreed that it did not make a difference for the results of this particular assessment--either way, there has been a significant decline in recruitment and there is large uncertainty in predicting future recruitment in this assessment. One difference between the model fit of this operational assessment compared to previous assessments is that the most recent assessment finds an increasing trend in F since 2007 compared to a decreasing trend in F since 2007 in previous assessments (slide 67). The SSC agrees that this difference is most likely due to the changes in estimates of recreational fishing effort due to the changes in the FES survey methodology in MRIP.

- 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.
  - *(1) low recruitment--key to determining the long-run viability of the stock, even with F = 0.*
  - *(2) discard mortality--key driver of uncertainty in F*
  - *(3) natural mortality--key driver of uncertainty in F*

- **Provide fishing level recommendations.**
  - Apply the ABC control rule. Discuss and make recommendations on probability of rebuilding projections.
    - *Tier 1. Assessment Information: 2. Reliable measures of exploitation or biomass; no MSY benchmarks, proxy reference points (2.5%)*
    - *Tier 2. Uncertainty Characterization: 2. High – reflects more than just uncertainty in future recruitment (2.5%)*
    - *Tier 3. Stock Status: 4. Stock is both overfished and overfishing (7.5%)*
    - *Tier 4. Productivity and Susceptibility: 2. Medium Risk. Moderate productivity, vulnerability, and susceptibility (as in previous assessment; 5%)*
    - *Total: 17.5%*
    - *P*: 32.5%*
    - *Probability of Rebuilding (1-P*): 67.5%*

- Comment on any difficulties encountered in applying the Control Rule, including any required information that is not available.
  None.

- **Provide advice on monitoring the stock until the next assessment.**
  - What indicators or metrics should be included in the SAFE Report to monitor and evaluate the stock until the next assessment? Current data will be included:
    - Total Landings relative to ABC from the previous assessment until values from SEDAR 76 are adopted.
    - Recreational (CHTS and FES values) and Commercial Landings *and Discards*
    - Trends in abundance included in SEDAR 76: *Compare projections of SERFS index to actual observations.*
    - Economic trends
      - Recreational – MRIP Directed Trips
      - Commercial – Ex-Vessel Value
    - Social trends
      - Observations of Closures
      - *Use of descender devices*
      - Comments from Fishery Performance Report
    - Recent management actions

- **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.
    - *Natural mortality*
    - *Discards and discard mortality, including length information*
    - *How best to measure spawning biomass (females only, females plus males, etc.)*
    - *Biological samples from the recreational fishery to obtain better age comps.*
    - *Research on mechanisms of low recruitment*
    - *Effects of fishing mortality on changes in sex ratios, size at sex transition, and female spawning stock biomass.*
  - Provide any additional research recommendations the SSC believes will improve future stock assessments.
    - *Monitoring annual sex ratios, distribution changes, and sex specific age or length comps*
    - *Investigation into concept of 'regime shifts'*

- *Predation and/or competition with other species (e.g., lionfish, red snapper, etc.)*
- *Collection of other data and types of information from citizen science initiatives, advisory panels, or from other sources the SSC recognizes as reliable.*
- *Development of juvenile index of abundance. Exploration of concept has been started by SCDNR.*
- *The implications of using mean recruitment as a 'stock recruitment relationship' should be thoroughly explored. Even though recruitment may appear independent of stock size over the range observed, this is unlikely to hold for low stock sizes and using mean recruitment is therefore likely to be risk-prone (as well as inconsistent with the basic tenet that a stock recruitment relationship should pass through the origin).*
- *Examine variation of discard mortality with depth.*
- *There appears to be some remaining autocorrelation in the residuals (slides 37 and 38 from attachment 4b) in model fit for the fishery indices that, if leveraged, may improve model fit.*
- *It may be possible to reduce uncertainty in projections by using time series techniques known as vector error correction models (VECM) that combine vector autoregression (VAR) models with error correction models (ECM). In theory, these approaches may help to reduce the uncertainty in predictions, but they are less useful to identifying the factors that affect the predictions (so, for example, "we can predict F better, but we don't know what's driving the predictions"). Nonetheless, it would be an improvement, from a management perspective, to reduce the uncertainty around predictions of say, F, even if we don't know what is driving the predictions.*

- Provide guidance on the next assessment, addressing its timing and type.
  - *Conduct an interim analysis to provide an updated indication of stock health and potential recruitment trajectory.*
  - *Examine CVID index, landings, or discards, to determine if substantial changes have occurred to inform whether a new assessment is warranted (see SAFE report).*
  - *Timing – within 5 years from terminal year of previous assessment or to be adjusted based on results of interim analysis.*
  - *Type – Operational (with flexibility to explore model structure changes).*

- **SSC RECOMMENDATION:**
  - *The SSC is deeply concerned not just with biomass status and low recruitment trends of Black Sea Bass, but also concurrently occurring shallow water snapper and grouper species such as Red Grouper, Red Porgy, Scamp, and Gag.*
  - *The SSC supports the use of increased education to reduce dead discards (e.g., usage of descending devices, best release practices). However, improved release practices that increase survival of discards are not sufficient to reduce overall discard mortality. The Council needs to consider additional strategies to reduce discarding by limiting interactions and thus promote rebuilding through effort reduction.*
  - *Include catch level projections workgroup requests for model output (see bulleted list of items in workgroup report)*
  - *Additional projection recommendations:*
    - *Fixed F for the interim years, with F being the average of the last three years of the time series.*
    - *Projection using $F_{0.1}$ instead of F_{max}*
    - *Allow F from discard fleet to remain constant or increase*
    - *Use both recent average and long-term average recruitment in projections.*
    - *Consider all available information regarding actual landings and discards for 2022*
    - *Exploration of "sine-wave" increase in recruitment scenarios similar to Scamp assessment projections.*
      - *Likely not possible because of lack of uptick in recruitment*
    - *ABC projection using recent (2014-2019) average recruitment and 75%*$F_{0.1}$*

Table 1. Black Sea Bass Catch Level Recommendations

Criteria	Deterministic	Probabilistic
Overfished evaluation ($SSB_{2001}/MSST_{)}$	0.32	0.37
Overfishing evaluation ($F_{2019-2021}/F_{MSY}$)	2.14	2.04
MFMT (F_{MSY})	0.41	0.36
SSB_{MSY} (1E10 eggs)	407.15	481.97
MSST (1E10 eggs)	254.47	283.74
MSY (1000 lbs.)	941.37	893.45
Y at 75% F_{MSY} (1000 lbs.)	918.95	871.45
ABC Control Rule Adjustment	17.5%	
P-Star	32.5%	
SSC recommended $P_{Rebuild}$	67.5%	
M	0.375	
Generation Time	~ 6 years	

OFL RECOMMENDATIONS				
Year	Landed (lbs ww)	Discard (lbs ww)	Landed (number)	Discard (number)
2025	*TBD July 2023*			
2026				
2027				
2028				
2029				

ABC RECOMMENDATIONS				
Year	Landed (lbs ww)	Discard (lbs ww)	Landed (number)	Discard (number)
2025	*TBD July 2023*			
2026				
2027				
2028				
2029				

5. SEDAR 68OA: ATLANTIC SCAMP OPERATIONAL ASSESSMENT

5.1 Documents

Attachment 5a. SEDAR 68OA: SPR, Rebuilding Time Frame, and Forecast Scenarios
Attachment 5b. SEDAR 68OA: Scamp Presentation

Attachment 5c. NOAA-NMFS 10732 SAFMC March 2023 memo

5.2 Presentation

Dr. Kyle Shertzer, SEFSC

5.3 Overview

The SEDAR 68OA: Scamp Operational Assessment was reviewed during the January 2023 SSC meeting where it was determined to be consistent with BSIA, used methods of addressing uncertainty that are consistent with expectations and available information, and is an adequate basis for determining stock status and supporting fishing level recommendations. The estimated spawning stock biomass (SSB) has fluctuated throughout the time series but has been declining since the mid-2000s. The terminal (2021) base-run estimate of spawning stock was near its lowest level of the time series and was well below the minimum stock size threshold (MSST) ($SSB_{2021}/MSST = 0.27$), as was the median estimate ($SSB_{2021}/MSST = 0.29$), indicating that the stock is overfished. The estimated fishing rate has fluctuated around the Maximum Fishing Mortality Threshold (MFMT, represented by $F_{40\%}$) throughout most of the assessment period, but has exceeded it only once since 2010. The terminal estimate, which is based on a three-year geometric mean, is below $F_{40\%}$ in the case of the base run ($F_{2019\text{-}2021}/F_{40\%} = 0.91$) and the median ($F_{2019\text{-}2021}/F_{40\%} = 0.81$). Thus, this assessment indicates that the stock is overfished, but is not experiencing overfishing. The SSC during review determined that the assessment with regard to SSB/SSB_{MSY} is robust and shows clear overfished status (100% of MCBE runs indicated $SSB_{2021}/MSST<1$). Overfishing status (F/F_{MSY}) includes greater uncertainty; the base run indicates overfishing is not occurring in recent years (2019-2021), but approximately 30% of MCBE runs estimate that overfishing was occurring.

The primary reason for the low stock size in terminal years of the assessment is not fishing, but rather low recruitment. Recruitment has been lower than average since the mid-2000s, and the lowest values for the entire time series occur since 2010. The SSC determined that the assessment provides a good basis to predict future conditions and support fishing level recommendations; however, the consistently lower recruitment during the recent period (2010-2019), relative to mean recruitment for the full time series, results in substantial uncertainty in predictions of future recruitment and stock biomass.

The SSC should review the additional rebuilding projections and make catch level recommendations in the table below. They also should provide guidance on setting ABC for the Shallow Water Grouper Complex with Yellowmouth Grouper being removed from the complex. The other unassessed species in this complex will be addressed through the Unassessed Stocks Workgroup process; however, the scamp/yellowmouth stock falls under statutory deadline for rebuilding because of the overfished status.

5.4 Public Comment

5.5 Action

- Review additional requested rebuilding projections and timelines.

- *Tmax unable to be determined because all long-term scenarios had equal merit. If recruitment returns to long-term average, rebuilding within 10 years is possible; however, if recruitment stays low, then rebuilding will never happen. The SSC concerns related to promoting rebuilding of Black Sea Bass through effort reduction also apply to the Scamp complex.*

- Complete the fishing level recommendations table.
  - *ABC = Use Scenario 7 (Table 6), F=75%$F_{40\%}$ with recent average (low) recruitment for setting ABC.*
  - *OFL = F40% with long-term average recruitment.*
- Describe potential methods to develop an ABC for the Shallow Water Grouper Complex that can be developed in the timeline associated with the amendment.
  - *Remove yellowmouth ABC from Shallow Water grouper complex total ABC and retain MRIP-CHTS units for remaining species in the complex until the Unassessed Stocks workgroup convenes to come up with new ABCs using MRIP-FES units.*

- **SSC RECOMMENDATION:**

Table 2. Scamp Catch Level Recommendations

Criteria	Deterministic	Probabilistic
Overfished evaluation ($SSB/MSST_{)}$	0.36	0.38
Overfishing evaluation ($F/F_{MSY\ proxy}$)	0.91	0.81
MFMT ($F_{MSY\ proxy}$)	0.28	0.30
SSB_{MSY} (metric tons)	1503.87	1540.65
MSST (metric tons)	801.60	801.14
MSY (1000 lbs.)	372.28	381.39
Y at 75% F_{MSY} (1000 lbs.)	344.83	353.68
ABC Control Rule Adjustment	20%	
P-Star	30%	
SSC recommended $P_{Rebuild}$	70%	
M	0.155	
Generation Time	~ 10 years	

OFL RECOMMENDATIONS

Year	Total Removals (lbs ww)	Discard (lbs ww)	Total Removals (numbers)	Discard (number)
2025	TBD			
2026				
2027				
2028				
2029				

ABC RECOMMENDATIONS

Year	Total Removals (lbs ww)	Discard (lbs ww)	Total Removals (numbers)	Discard (number)
2025	71,000		12,000	
2026	76,000		12,000	
2027	79,000		13,000	
2028	82,000		13,000	
2029	84,000		14,000	

**Note: Total Removals includes landings plus dead discards*

6. SEDAR 78: SOUTH ATLANTIC SPANISH MACKEREL OPERATIONAL ASSESSMENT

6.1 Documents

Attachment 6a. Spanish Mackerel Summary and Background Presentation
Attachment 6b. SEDAR 78: Spanish Mackerel Revised SAR
Attachment 6c. SEFSC Spanish Mackerel Review April 2023
Attachment 6d. SSC recommended changes for assessment re-run
Attachment 6e. Setting ABCs guidance and ABC Control Rules
Attachment 6f. NOAA Fisheries Procedure 01-101-10
Attachment 6g. NOAA Fisheries Procedure 01-101-11
Attachment 5c. NOAA-NMFS 10732 SAFMC March 2023 memo

6.2 Presentation

Dr. Erik Williams, SEFSC

6.3 Overview

At the January 2023 SSC meeting, the Committee approved the scope of work for the Spanish Mackerel operational assessment re-run, which was then sent to the SEFSC. At the March Council meeting, the SEFSC determined that the SSC's recommendations regarding natural mortality, assumed recruitment and catch estimates should be considered for the next scheduled stock assessment but due to the extensive rework required would not be available for this assessment (see Attachment 5c). The Center recommended that the SSC develop ABC advice based on the current assessment and analysis completed to date. It also determined that the use of data-limited approaches such as DB-SRA or DCAC in place of the current age-structured assessment model would not be consistent with BSIA.

The SSC should determine whether the current SEDAR 78 model is sufficient for providing management advice and provide an ABC for Spanish mackerel during this meeting. Several alternate options to using the assessment projections for generating ABCs were presented in January (Equilibrium OY, yield at 75%F_{MSY}, 3rd highest landings, etc.), and the SSC should discuss the pros/cons of using these alternate methods in lieu of the assessment projections for making catch level recommendations.

6.4 Public Comment

6.5 Action

- Determine whether the current SEDAR 78 stock assessment is sufficient for providing management advice.
  - *S78 is sufficient for providing stock status (not overfished, not overfishing).*
  - *S78 is sufficient for also providing catch level recommendations using model output but not projections.*

- Provide values for OFL and ABC and make catch level recommendations for each proxy.
  - *Set ABC = Yield at 75%Fmsy from base model run (8.024 mp) (Table 22 in SAR)*
  - *Set OFL = Yield at Fmsy from base model run (8.210 mp)*

- **SSC RECOMMENDATION:**

- *In response to the SEFSC letter informing us that the Center was unable to conduct the analyses that were discussed/requested by the SSC and the Spanish Mackerel Working Group, the SSC expresses disappointment in the Center's decision. The SSC felt that the working group carefully considered workload in its discussions and the ultimate request, but appreciated Dr. Williams introduction to his presentation on the SEFSC's response. However, the SSC requests that arrangements for future assessment reviews should continue to provide the SSC the opportunity to request additional analyses or modifications to the assessment, as has been normal practice. Often, such analyses and modifications lead to improved catch advice. Equally as important, they enhance trust in the scientific advice process among Council members and stakeholders. The SSC has enjoyed a long history of working collaboratively and collegially with stock assessment scientists to provide the best possible, mutually agreed advice and hopes to continue to do so going forward.*

- *Concerns, in particular with respect to M, are still significant and were discussed extensively. The SSC discussed that the actual M may be higher than what was used in the assessment, and also refers to discussions on this topic in previous meetings and the working group report.*

- *Given this, the SSC discussed using the sensitivity run with a higher M (0.42) as the base value in the model for determining stock status and for setting ABCs. However, the SSC determined that would require reconfiguration of the model, and per Center workload would not be possible to accomplish.*

- *After considerable discussion, the SSC accepted the assessment base run as the basis for stock status determination but recommends that natural mortality (and other raised issues) should be investigated in the next assessment. The SSC concluded that the stock status determination in the Spanish Mackerel assessment base run is likely conservative because of the use of lower M, and the fact that a higher M will result in increased productivity. In addition, the biomass and harvest trends did not raise significant concerns, but the recent increase in F should be monitored.*

- *The SSC considered the above as justification to deviate from its control rule for setting ABC. The options discussed were 3rd highest (has shown poor performance in the literature), Yield at 75%Fmsy, equilibrium OY, and some others. The SSC was most comfortable with using the Yield at 75%Fmsy.*

Table 3. South Atlantic Spanish Mackerel Catch Level Recommendations

Criteria		Deterministic		Probabilistic
Overfished evaluation ($SSB_{2020}/MSST_{)}$		1.40		1.42
Overfishing evaluation ($F_{2018-2020}/F_{MSY}$)		0.77		0.74
MFMT ($F_{MSY\ proxy}$)		0.516		0.523
SSB_{MSY} (metric tons)		6406		6410
MSST (metric tons)		4804		4808
MSY (1000 lbs.)		8210		8351
Y at 75% F_{MSY} (1000 lbs.)		8024		8158
ABC Control Rule Adjustment		10%		
P-Star		40%		
M		0.35		
OFL RECOMMENDATIONS				
Year	Landed (lbs ww)	Discard (lbs ww)	Landed (number)	Discard (number)
2023	8,210,000			
2024	8,210,000			
2025	8,210,000			
2026	8,210,000			
2027	8,210,000			
ABC RECOMMENDATIONS				
Year	Landed (lbs ww)	Discard (lbs ww)	Landed (number)	Discard (number)
2023	8,024,000			
2024	8,024,000			
2025	8,024,000			
2026	8,024,000			
2027	8,024,000			

7. DEEPWATER CORAL DISTRIBUTION MODEL

7.1 Documents

Attachment 7a. Deepwater Coral Distribution Model Presentation
Attachment 7b. Data Synthesis and Predictive Modeling of SEUS Corals

7.2 Presentation

Matthew Poti, NOAA-NCCOS

7.3 Overview

The SAFMC created Coral Habitat Areas of Particular Concern (CHAPCs) in the Coral, Coral Reef, and Live/Hardbottoms (Coral) FMP (1983) and Coral Amendment 6 (2008) and expanded CHAPCs in Coral Amendment 4 (2001) and Coral Amendment 8 (2014) based on observed locations and likely distribution of coral and coral reefs. New observations from remotely operated vehicles have identified coral mounds outside of current CHAPCs and additional mapping data were collected to refine past coral habitat probability models. The methods and data used in coral habitat probability models were reviewed by the SSC in October 2019, where it was recommended that further development of these modeling approaches would be helpful in determining BSIA criteria and use in management. If approved as usable for management, the coral habitat probability models would be considered in development of future amendments.

7.4 Public Comment

7.5 Action

- Review and discuss the methodology, uncertainties, and assumptions associated with the distribution model to describe habitat probability.
  - *The distribution model of deep-sea corals is deemed adequate to describe probability of occurrence.*
  - *The use of occupancy models is likely an improvement over the previous models used.*
- Determine whether this analysis is consistent with BSIA and is appropriate for use in managing fisheries resources.
  - *The SSC deems this analysis consistent with BSIA and appropriate for use in management.*

8. GREATER AMBERJACK ESTIMATION PROJECT UPDATE *(POSTPONED)*

~~8.1 Documents~~

~~Attachment 8a. Presentation of Greater Amberjack Estimation Project~~
~~Attachment 8b. Greater Amberjack project narrative~~

~~8.2 Presentation~~

~~Dr. Sean Powers and Dr. Mark Albins, University of South Alabama, and Dr. John Hoenig, Virginia Institute of Marine Science~~

~~8.3 Overview~~

~~The overarching goal of the proposed research initiative is to provide an independent estimate of Greater Amberjack abundance in the US Gulf GoM and SA in waters out to 150 m in depth. The independent estimate of abundance derived from the proposed research will be compared with the estimates derived from the stock assessment models used by NOAA Fisheries (Stock Synthesis, Beaufort Assessment Model), allowing validation, calibration, and further refinement~~

~~of the model. To accomplish this goal, an expansive sampling program focused on providing a rigorous estimate of Age 1+ Greater Amberjack that can be separated into length bins and stratified by region and habitat type. The sampling design will be informed by a comprehensive data synthesis (fisheries-dependent and independent data, previous habitat mapping and traditional fishermen knowledge). Sampling approaches will be refined through intensive calibration studies. Key assumptions of our sampling design and approaches as well as supportive information will be collected through a series of companion studies. These supportive projects include studies that are designed to examine unresolved issues associated with our understanding of movement and connectivity of Greater Amberjack in the southeastern U.S.~~

~~8.4 Public Comment~~

~~8.5 Action~~

- ~~Comment and provide feedback on the methods and potential uncertainties for the Greater Amberjack research project.~~

9. UPDATE ON THE APPROACH FOR THE VERMILION SNAPPER INTERIM ANALYSIS

9.1 Documents

Attachment 9a. Update on the Approach for the Vermilion Snapper Interim Analysis

9.2 Presentation

Dr. Erik Williams, SEFSC

9.3 Overview

An interim analysis for vermilion snapper by the SEFSC is scheduled for SSC review in October 2023. NOAA staff will discuss the approach for the interim analysis modeling approach and data inputs for vermilion snapper. The overall interim analysis approach was reviewed by the SSC in Oct 2022 and recommendations are included in the final meeting report. The SSC should discuss the approach and data inputs, and how the information could be used for providing catch advice for vermilion snapper.

9.4 Public Comment

9.5 Action

- Discuss the approach and data inputs.
  - *The use of interim analysis can be appropriate in certain circumstances. Please see the discussion of the approach in the October 2022 meeting report.*

- Discuss if the interim approach should be used to develop ABC adjustments (up and down) or serve as a health check on current status.
    - *The interim approach can be used to develop ABC adjustments, both up and down, but will depend on species, situation, magnitude of change in data inputs, the amount of data inputs involved, and the effort to produce the analysis. A basic interim analysis can be utilized as a health check to determine if it triggers further and potentially more complex efforts that can be utilized for ABC adjustments.*
    - *The SSC recommends using Nikolai Klibansky's analysis for determination of which species an interim analysis approach would work best for (see October 2022 SSC report for review of this analysis).*
    - *SEDAR committee should consider which species this approach works well for when determining assessment type during planning and scheduling meetings.*
    - *The parameters for using the interim analysis approach should be set ahead of time. For example, what timing is most appropriate.*
    - *The Center, SEDAR, and SSC need to ensure that interim analyses stay at an appropriate level whereas they are not duplicative of operational assessments.*
    - *Upon a question from the SSC, the SEFSC representative indicated that there is no scheduled BSB interim analysis scheduled at the moment.*

10. SSC WORKGROUPS

10.1 Documents

Attachment 10a. Current membership of SSC workgroups
Attachment 10b. SAFMC SSC Workgroup Approach Document
*Attachment 10c. SADL workgroup scope of work

10.2 Presentation

Dr. Judd Curtis, SAFMC Staff

10.3 Overview

Two new SSC workgroups need to be formed to address recent topics of interest that merit increased focus. The first is examining recent low recruitment issues for a number of stocks and the concept of regime shifts, non-stationarity, and how this would affect stock status determination criteria. The second workgroup would serve as a standing review body for scopes of work for upcoming assessments to increase efficiency of this process. An existing workgroup, the Ecopath with Ecosim (EwE) workgroup, needs additional membership that will review and guide the integration of Ecospace into the existing South Atlantic EwE model. Lastly, SEDAR's 2024 Hogfish Benchmark Assessment planning team has requested that one South Atlantic SSC

member join the planning team. This assessment will be conducted by FWC. SAFMC Staff will review the current membership of SSC workgroups and SEDAR panels and solicit membership for the workgroups. The approved SSC workgroup approach document is attached for reference.

The South Atlantic Deepwater Longline (SADL) survey was developed to survey deep-water species inhabiting the continental shelf and upper slope habitats of the Southeastern US. To incorporate information into SEDAR stock assessments, the SSC has been asked to review a report from the Southeast Fishery Science Center documenting the sampling design and methodology and data generated from this survey. An SSC workgroup comprised of five members was formed that has been tasked with providing comments during the development of a final report that will be presented to the SSC. The SSC will review the survey and ensure the methods are consistent with best scientific information available (BSIA) at their October 2023 meeting. The goal is that, upon review, the SADL survey will be sufficient to incorporate into the stock assessment process without the need for a topical working group for every assessment.

10.4 Public Comment

10.5 Action

- Review SSC rosters of workgroups.
- Review SADL workgroup scope of work.
    - Will this review be sufficient to incorporate the SADL survey into each assessment without the need for a topical working group?
        - *The review scope of work and schedule are sufficient to determine if the survey design is appropriate for exploration of index development and associated length/age compositions. The actual creation of indices of abundance will still need to be reviewed during the assessment process by participants, but not necessarily by the full SSC, unless novel methods are utilized for index creation.*
        - *This assumes the review has a positive outcome (i.e., finds no concern in the design and implementation of sampling method). A topical working group may be needed if concerns arise during the SADL review.*

- Form SSC workgroups for:
    - (1) Regime Shifts
        - *Chris Dumas, George Sedberry, Marcel Reichert*
    - (2) Standing Scope of Work
    - (3) Ecopath with Ecosim
        - *Anne Lange (but not as chair)*
    - (4) Hogfish Planning Team Member
        - *Kai Lorenzen*
    - (5) Discard projections and ABC setting
        - *Scott Crosson*

11. SEP REPORT SUMMARY

11.1 Documents

*Attachment 11a. SEP meeting draft report (when available)

11.2 Presentation

Dr. Scott Crosson, SEP Chair

11.3 Overview

The SSC will receive a summary of topics discussed at the SEP meeting. Particular agenda items include the Socio-economic impacts of COVID, and Portfolio Analysis in Support of EBFM. The SEP meeting summary and report will be added to the final SSC report.

11.4 Public Comment

11.5 Action

- No actions required.

12. USING PORTFOLIO THEORY TO IMPROVE MANAGEMENT OF LIVING MARINE RESOURCES

12.1 Documents

Attachment 12a. Portfolio Analyses of South Atlantic Fisheries Report
*Attachment 12b. Presentation on Portfolio Analyses of South Atlantic Fisheries

12.2 Presentation

Dr. Jason Link, NOAA and Dr. Steve Cadrin, Lauren Brewster, and Fiona Edwards, UMASS

12.3 Overview

Staff from NOAA Fisheries and UMASS Dartmouth are working together to develop an ecosystem-based fishery management (EBFM) approach using portfolio theory to help maximize revenue. The project focuses on the commercial sector for which landings and revenue were available. The frontier analysis of the snapper-grouper commercial fishery indicated that observed revenue could have been achieved with less risk of foregone yield or more revenue could have been obtained with the same risk. This is the first review of the approach for South Atlantic fisheries.

12.4 Public Comment

12.5 Action

- Discuss the findings of the frontier analysis and provide guidance on how to refine the analysis.
  - *Are dead discards included in the analyses of foregone yield and foregone revenue? If not, consider including them given the prevalence of discards for many stocks.*
  - *If recreational fisheries are included in the future, would the value of the fishing experiences themselves (irrespective of the value of the landings in these fisheries) be considered in any way in the portfolio analyses?*
  - *You get more gain/benefit from application of this method if you have strong *negative* correlation among fish spp, between fisheries, between geographic areas, across time periods, etc.*
  - *The method will likely provide fewer benefits within the snapper-grouper fishery, because catches of spp within this fishery are relatively *positively* correlated. (However, you might get benefits in the snapper-grouper fishery if the method is applied to different geographic areas, or to different time periods (seasons, waves) within the snapper-grouper fishery.)*
  - *The method would likely provide more benefits across fisheries for different species, say across some subset of the snapper-grouper, flounder, shrimp, crab, coastal pelagics, HMS fisheries.*
  - *Again, you get more benefit the more ***negatively*** correlated the catch from the various species.*
  - *You get larger benefits if catch is negatively correlated across geographic regions for a given species (or species group).*
  - *You get larger benefits if catch is negatively correlated across seasons or across waves for a given species (or species group).*
  - *For commercial fisheries, benefits of the method would be greater if an individual fisherman can be given greater flexibility to hold a more diverse portfolio of catch permits/quota across different species, geographic locations, or seasons/time periods, where the catches across those categories are ***negatively correlated***. Alternatively, if fishermen could buy shares in each other's businesses/landings, and the landings of the two fishermen are negatively correlated.*
  - *For recreational fisheries, benefits (consumer surplus) of the method would be greater if an individual angler can be given greater flexibility to hold a portfolio of bag limits (or catch tags, etc.) across different species, geographic locations, or seasons/time periods, where the catches across those categories are ***negatively correlated***.*
  - *For Dead Discards, you could run the method as a ***minimization*** and try to minimize mean dead discards for a given variance (rather than running the method as a maximization where you try to maximize mean landings for a given variance). Or, you could run the*

minimization to keep the same mean dead discards but reduce the variance of the discards, which might be important if managers are trying to avoid the extremes of the discard distribution.

- *See SEP report for further guidance on how to refine analysis.*

- Describe how the Council could use this information in the development of ecosystem-based fishery management (EBFM).
  - *Refer to SEP report*

13. SERFS 2022 TRENDS REPORT

13.1 Documents

Attachment 13a. Presentation on SERFS and SEAMAP 2022 trends report

13.2 Presentation

Dr. Tracey Smart, SCDNR

13.3 Overview

The SSC will receive an update on the Southeast Reef Fish Survey (SERFS) and Southeast Area Monitoring and Assessment Program (SEAMAP) sampling efforts and results through 2022.

13.4 Public Comment

13.5 Action

- Review the 2022 trends report from the SERFS and SEAMAP surveys. No actions needed.

14. SAFE REPORTS UPDATE FOR SNAPPER GROUPER

14.1 Documents

*Attachment 14a. SAFE reports update for Snapper Grouper FMP

14.2 Presentation

Dr. Chip Collier, SAFMC Staff

14.3 Overview

Council staff have started to develop Stock Assessment and Fishery Evaluation (SAFE) Reports. These reports are required through National Standard 2 of the Magnuson-Stevens Act. The report should contain the best scientific information available on the condition of the stock, essential fish habitat, marine ecosystems, and fishery. These reports can serve as regular updates to the SSC and Council to aid in discussing the condition of the stock and potential need for adjusting current management measures. The SSC is asked to review and provide feedback on the latest SAFE report for snapper grouper.

14.4 Public Comment

14.5 Action

- Review and comment on the content for the snapper grouper SAFE report.
  - *The SSC was in favor of having SAFE reports developed for the SAFMC FMPs. The SSC recommended adding additional items into the report or modifying the report:*
    - *Add status of stock/fishery perception from fishery performance reports (e.g., sentiment analysis)*
    - *Include a table of catch (landings and discards) relative to projections.*
    - *Add all species into the assessment table.*
    - *Revise the trends to match the longevity of the species (e.g., long-lived fish should have 20-yr trends).*
    - *Increase the size of the icons to make them easier to read – consider using colors that meet 508 compliance criteria.*
    - *Add description for no trend (good and bad).*

15. FWC GEAR TYPE ANALYSIS

15.1 Documents

Attachment 15a. FWC gear type analysis

15.2 Presentation

Dr. Chip Collier, SAFMC Staff

15.3 Overview

The SAFMC has considered single hook rigs to reduce the discard rate for snapper grouper species in Action 2 of Amendment 35: Snapper Grouper Release Mortality Reduction and Red Snapper Catch Levels, to address overfishing for red snapper from the last stock assessment projections. Datasets from FWC and Council Staff were presented and reviewed by the SSC in Oct 2022, and these have been used as justification for Action 2 of the amendment. An additional dataset from FWC in the Gulf of Mexico utilizing single-hook/double-hook data will be reviewed to determine if this information can be considered informative for providing the directionality of discards for red snapper.

15.4 Public Comment

15.5 Action

- Discuss if the FWC gear type study can be considered informative for quantifying discard reductions in the snapper grouper fishery.

- *Yes, the FWC gear type study is informative with caveats, most notably we do not know the universe of anglers using 2 vs 1 hook gears for the region.*
- *Additionally, there is a potential tradeoff for species. For example, there was a reduction in catch of red snapper when using a one-hook rig (benefit for red snapper) but an increase in catch of grouper species (negative for grouper species). All changes in regulations should consider unintended consequences.*
- *The SSC is uncertain how this information will be incorporated into the amendment and could not comment further on the Amendment itself. Because data are missing regarding the proportion of fishers that use 2-hook rigs, the SSC cannot quantify the potential for discard reductions.*

➢ Determine if the information from the three studies on single hook and multi-hook rigs provides evidence that Red Snapper catches would be reduced using single hook rigs.

- *Yes, for Red Snapper, but the catch of grouper species exhibited different results. Again, unintended consequences should be considered.*
- *The FWC gear type study was conducted on the west Florida shelf and potential geographic differences may exist.*

16. SOUTH ATLANTIC RESEARCH AND MONITORING PLAN

16.1 Documents

Attachment 16a: South Atlantic Research and Monitoring Plan 2023-2027

16.2 Presentation

Dr. Judd Curtis and Dr. Chip Collier, SAFMC Staff

16.3 Overview

The Council revises their research and monitoring plan every two years. The research and monitoring plan is used by the Council and NOAA Fisheries staff to identify and prioritize research needs for fisheries in the South Atlantic. These research needs are circulated to funding agencies to be included as research grant priorities and used by researchers during development of research proposals. The Committee is provided an opportunity to review the 2023-2027 South Atlantic Research and Monitoring plan. The Council will consider the plan at its June 2023 meeting.

16.4 Public Comment

16.5 Action

- Review and comment on the 2023-2027 South Atlantic Research and Monitoring plan.
    - *Items appearing on previous research and monitoring plans that have been addressed were removed.*
    - *The research and monitoring plan appears comprehensive, appropriate, and long term. Members had the following minor edits/additions:*
        - *Change "Improve biostatistical sampling of Hogfish in all regions from fishery-dependent data sources." to "Improve biological sampling of Hogfish in all regions from fishery-dependent data sources"*
        - *On top of pdf page 3, Add red porgy to bullet that reads: "Research needs for protogynous stocks, particularly groupers,…Black Sea Bass:"*
        - *On pdf page 8, consider deleting the "Funding MARMAP sufficiently to support reinitiating long bottom longline sampling..." given the initiation of the SADL survey.*
        - *On page 9 under reporting requests, change SEFIS to SERFS and change wording that the data will be the most recent for traps (previous year's) and video (two years back)*
        - *For Spanish Mackerel (pg. 4), change text to: Develop a fishery-independent survey for pelagic species to decrease reliance on a fishery-dependent index of abundance that has unexplained trends in residual values in recent years.*

17. OTHER BUSINESS

- New SSC webpage overview
    - *Great job Nick!*
- Role of SSC Chair discussion
- Fishery Management Plan updates
    - *See SEP briefing book*
- SCS8 Theme Options
    - *Regime Shifts and Non-stationarity*
    - *Recruitment projections for use in assessments*
    - *Managing recreational fisheries, recreational OY, and discard issues*
- Take SSC photo

18. PUBLIC COMMENT

The public is provided one final opportunity to comment on SSC recommendations and agenda items.

See Transcript for Public Comment

19. CONSENSUS STATEMENT AND RECOMMENDATIONS

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

The Final SSC report will be provided to the Council by noon on Friday, May 12th, 2023 (approximately 3 weeks from the end of the meeting) for inclusion in the briefing book for the September Council meeting.

20. NEXT MEETINGS

20.1 Scientific and Statistical Committee Meetings

- July Webinar (*as needed*)
- October 24-26, 2023 in Charleston, SC
- April 15-16, 2024 in Charleston, SC (SEP)
- April 16-18, 2024 in Charleston, SC (SSC)

20.2 South Atlantic Fishery Management Council Meetings

- June 12-16, 2023 in St. Augustine, FL
- September 11-15, 2023 in Charleston, SC
- December 4-8, 2023 in Beaufort, NC

ADJOURNED AT 3:48PM

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SOCIO-ECONOMIC PANEL OF THE SCIENTIFIC AND STATISTICAL COMMITTEE

SEP Meeting Overview

April 17-18, 2023

Town and Country Inn
2008 Savannah Highway
Charleston, SC 29407

PURPOSE

This meeting is convened to discuss and provide input to the Scientific and Statistical Committee (SSC) and the South Atlantic Fishery Management Council (Council) on:

- Recent and developing Council actions and amendments,
- The Citizen Science Program,
- Research on using Portfolio Theory to improve the management of living marine resources,
- Research on the socio-economic impacts of COVID,
- Using Portfolio Theory to Improve the Management of Living Marine Resources: a Demonstration for South Atlantic Fisheries,
- Feedback on SAFMC Research Recommendations,
- Mackerel Port Meeting recommendations,
- Socio-economic components of the SAFMC Snapper Grouper Management Strategy Evaluation,
- SEFSC recreational discards of red snapper and other snapper grouper species, and
- Status of and potential improvements to economic analysis of recreational fisheries

CONTENTS

DOCUMENTS

Attachment 1a. Socio-Economic Panel Agenda Overview
Attachment 1b. Minutes from the April 2022 meeting

Attachment 2. Recent and Developing South Atlantic Council Amendments

Attachment 3a. Citizen Science Program update presentation

Attachment 3b. Citizen Science Evaluation Proposal: Decoding the Motivations of Fishers Considering Participation in Citizen Science Projects
Attachment 3c. Citizen Science Evaluation Proposal presentation

Attachment 4a. Marine Fisheries and the COVID-19 Pandemic presentation
Attachment 4b. Marine Fisheries and the COVID-19 Pandemic report

Attachment 5a. Portfolio Analyses of South Atlantic Fisheries
Attachment 5b. Presentation on Portfolio Analyses of South Atlantic Fisheries

Attachment 6. South Atlantic Research and Monitoring Plan 2023-2027: Socio-Economic Panel review

Attachment 7. Mackerel Port Meetings presentation

Attachment 8. SAFMC Management Strategy Evaluation summary for the Socio-Economic Panel

Attachment 9. Presentation slides for SEFSC research on recreational discards of red snapper and other snapper grouper species

Attachment 10. Summary of common economic analyses in SAFMC amendments

1. Introduction

1.1. Documents

- **Attachment 1a**. Socio-Economic Panel Agenda Overview
- **Attachment 1b**. Minutes from the April 2022 meeting

1.2. ACTIONS

- Introductions
- Review and approve the agenda
- Approve April 2022 transcript
- Opportunity for public comment

2. Recent and Developing Council Actions

2.1. Document

- **Attachment 2**. Recent and Developing South Atlantic Council Amendments

2.2. Overview

Council staff will provide a briefing on recent and upcoming amendments and actions (***Attachment 2***). The following amendments may be of particular interest to SEP members.

Amendment 48 (Wreckfish ITQ Program Modernization)

Staff Lead: Christina Wiegand

Purpose of Amendment: The Council finished its second review of the Wreckfish ITQ program in September of 2019. As part of the review there were several recommendations made to modernize the program, which will be addressed in this amendment.

Action Summary: Moving away from a paper coupon-based program to an electronic program; fishing season and spawning closure; cost recovery; wreckfish permit requirement; allocation issues; offloading sites and times; and vessel monitoring system requirements.

Development Level: public hearings complete, consider for formal review in September 2023.

Regulatory Amendment 35 (Discard Mortality Reduction and Red Snapper Catch Levels)

Staff Leads: Mike Schmidtke

Purpose of the Amendment: Respond to the latest stock assessment for Red Snapper (SEDAR 73). Red Snapper are overfished and overfishing is occurring, mainly due to the large number of Red Snapper that die after catch and release. Dead discards are a major issue in the snapper grouper fishery as a whole and affect many species within the complex.

Action Summary: Modify the Red Snapper ABC and ACLs and reduce dead releases in the snapper grouper fishery through prohibiting use of multiple, separate hooks per line by the recreational sector, as well as expansion of best fishing practices outreach and education efforts. These actions are designed to implement Red Snapper catch levels based on the best scientific information available, reduce widespread discarding of snapper grouper species, and address overfishing of red snapper.

Development Level: Final Approval; pending submission to NMFS.

Amendment 46 (Private Recreational Permitting)

Staff Lead: John Hadley

Purpose of the Amendment: Address deficiencies in recreational data through the creation of a permit requirement for private recreational vessels or anglers. Additionally, consider establishing an education component to encourage best fishing practices and reduce discard mortality in the snapper grouper fishery.

Action Summary: This amendment will investigate establishing a permit and education requirement for anglers to participate in the recreational snapper grouper fishery.

Development Level: Scoping conducted and amendment being developed.

Snapper Grouper Management Strategy Evaluation

Staff Lead: Chip Collier and Judd Curtis

Purpose of the Amendment: Dead releases are a major issue in the snapper grouper fishery as a whole and affect many species within the complex. The Council has directed a management strategy evaluation (MSE) project that would consider multispecies effects of potential management changes and be used to develop a more holistic approach to management of the snapper grouper fishery. The amendment will follow the MSE project and consider implementation of management changes evaluated through the MSE.

Action Summary: A future amendment will provide actions intended to incorporate recommendations from the MSE project.

Development Level: MSE in progress, amendment to follow.

Unassessed Snapper Grouper Species ABCs/ACLs/Allocations

Staff Lead: Mike Schmidtke

Purpose of the Amendment: Update the ABCs, ACLs, and sector allocations for unassessed snapper grouper species based on catch level recommendations from the SSC.

Action Summary: Adjust ABCs, ACLs, and sector allocations for unassessed snapper grouper species to incorporate revised recreational landings based on updated MRIP-FES methodology.

Development Level: Scheduled to begin development in December 2023.

Comprehensive ABC Control Rule Amendment

Staff Leads: Mike Schmidtke and Judd Curtis

Purpose of Amendment: To modify the ABC Control Rule to address flexibility allowed under the MSA and revise how uncertainty and risk tolerance are addressed in setting ABCs.

Action Summary: Modify the ABC Control Rule, including specification of scientific uncertainty and management risk components, application of the Control Rule to rebuilding stocks, criteria and procedures for phase-in of ABC changes, criteria and procedures for carry-over of unused portions of the annual catch limit, and establishment a framework procedure to allow carry-overs.

Development Level: Final Approval; pending submission to NMFS.

2.3. Presentation and Discussion

John Hadley and Christina Wiegand, SAFMC staff

2.4. ACTIONS

Discuss and make recommendations as appropriate. In general, this agenda item is meant to brief the SEP on potential Council actions that may be presented to the group for review later in the meeting or at a future SEP meeting.

SEP RECOMMENDATIONS:

- The SEP had no recommendations.

3. Citizen Science Program update

3.1. Document

- **Attachment 3a**. Citizen Science Program update presentation
- **Attachment 3b.** Citizen Science Evaluation Proposal: Decoding the Motivations of Fishers Considering Participation in Citizen Science Projects
- **Attachment 3c**. Citizen Science Evaluation Proposal presentation

3.2. Overview

Julia Byrd, SAFMC staff, will provide an update on program activities and recent efforts of the SAFMC's Citizen Science Program. The presentation will include updates on the SMILE and SAFMC Release projects; share findings from the FISHstory pilot project; and share interview results from initial Program evaluation and stakeholder assessment work. To continue the

evaluation work, the Citizen Science Program will collaborate with Rick Bonney, Dr. Jennifer Sweeney Tookes, and Dr. Tracy Yandle. Dr. Sweeney Tookes will provide an overview of the work she and Dr. Yandle will be doing to gather further information from fishermen as part of these efforts. SEP members will be asked to provide input on this work through the discussion questions below.

Presentation and Discussion

Julia Byrd and Meg Withers, SAFMC staff

3.3. ACTIONS

Provide feedback and guidance for the Citizen Science Program evaluation based on the discussion questions below.

Discussion Questions:

1. Does the SEP have recommendations on alternative configurations for the geographic zones for the study? Other resources to determine where most King Mackerel and snapper grouper are currently being landed? (See Figure 1 and Table 2)

2. Regarding the angler sector:
   - Suggestions for enhancing randomization in sampling, especially considering the fundamental characteristics of the population are unknown?
   - Suggestions for additional strategies for recruiting in this sector?
   - Suggestions for contacts in fishing clubs or other fishing organizations?

3. Thoughts on likely preferences of participants for phone vs video vs in person by sector?

4. We plan for the interview guides to address themes of:
   - Attitudes to and willingness to work with management
   - Fishery conditions
   - Trust & well-being (social and economic)
   - Social networks

5. If time allows, are there any additional themes you would recommend be addressed?

SEP RECOMMENDATIONS:

- RE: FishStory:
  - The SEP expressed enthusiasm for this project, and made suggestions that could possibly improve the accuracy rates of volunteer identifications and reduce the numbers of "expert" validations needed: reduce the number of photos each volunteer can review each session (to reduce fatigue-induced inaccuracy); reduce access from less-accurate volunteers (though staff noted that Zooniverse is not set up in a manner that allows exclusion of any volunteers); or reducing the number of species each volunteer is identifying in each session (e.g. "in this session you will be searching for and marking only vermillion snapper, gag grouper, and tilefish").
- RE: Fisher Perspectives on Citizen Science:
  - The SEP agreed with the geographic zones and the separating out of the Keys from the Carolinas and GA/the rest of Florida. Staff should consider ways to include anglers

who may not live in a region but may actively fish there (e.g., non-coastal resident saltwater anglers). The SEP suggested looking at recent FMP amendments sections written by Christina Weigand about fishing communities to identify match or dissonance with the communities identified using NOAA Community Snapshots. Geographic sections for anglers will reflect the same geographic boundaries.

- The SEP suggested that the researchers need to think about how to separate/include/handle the long-term vs. occasional anglers to identify those who might even be interested in participating in Citizen Science. Staff should consider if they have an in-state annual fishing license, which they can only get if they are a resident of that state. By working primarily through the fishing organizations the researchers are selectively biasing towards people who can afford the clubs – and these may not be active anglers, just people who are interested in the magazines or stickers that membership provides. Consider employing snowball sampling from participants to minimize this exclusion.
- SEP argues that response rates to different survey modes will likely be generational, with younger people not ever answering a call from a new or unknown number, and older people not being interested in video calls. They stress that the researchers should mention convenience of participation (e.g. in person, online, how can we make it easiest for you?). Consider incorporating a text warning/invite and/or a chat-based interview tool, and/or a link to a website where people can learn more about a project.
- Additional Topics suggested by the SEP included "From where do you get information about your fishery?" and " What would you do to make management better?"

4. The COVID-19 Pandemic and South Atlantic Fisheries – Findings to Date

4.1. Document

- **Attachment 4a.** The COVID-19 Pandemic and South Atlantic Fisheries presentation
- **Attachment 4b.** Marine Fisheries and the COVID-19 Pandemic report

4.2. Overview

Marine Fisheries and the COVID-19 Pandemic: Calendar Year 2020 Survey Data and Analysis describes elements of a large-scale survey program implemented by NOAA Fisheries to examine domestic fishery impacts associated with the COVID-19 pandemic at the year-one mark of the pandemic in the United States. The origins of this project relate to NOAA's need for information regarding the impact of COVID-19 on the fishing industry and fishing dependent businesses across the United States, knowing that the novel coronavirus COVID-19 would generate profound challenges across the various domestic fishing and seafood distribution sectors.

4.3. Presentation

Ed Glazier, NOAA Southeast Regional Office
Matt McPherson, NOAA Southeast Fisheries Science Center

4.4. ACTIONS

Discuss and provide recommendations for how impacts associated with the COVID-19 pandemic should be considered in the management process.

Discussion Questions

1. Given the unusual fishing behavior exhibited during the pandemic, does the SEP have recommendations for how staff should consider data from 2020/2021 when conducting analysis for the purposes of management?
    a. Commercial data?
    b. Recreational data?

2. Based on the study, what aspects of pandemic impacts are likely to continue to persist into the future (such as participation rates, loss of infrastructure, movement of commercial landings to online sales or "dock to dish", etc.)?

SEP RECOMMENDATIONS:

- The SEP's discussion focused on two relevant topics related to both commercial and recreational fisheries. There was acknowledgement that the data were atypical, but it was unknown how long the effects of the pandemic were going to affect fisheries datasets or how they were going to affect the data. Based on the discussions, the SEP's recommendation was to use the 2020/2021 for now, but to monitor it in the future for long term trends to see whether the topic ought to be revisited as the effects of the COVID-19 Pandemic are still affecting fisheries. Similar issues occurred in the aftermath of the Great Recession/Financial Crisis of the late 2000s.
- The SEP is unable to forecast future trends.

5. Using Portfolio Theory to Improve the Management of Living Marine Resources: A Demonstration for South Atlantic Fisheries

5.1. Documents

- **Attachment 5a.** Portfolio Analyses of South Atlantic Fisheries
- **Attachment 5b.** Presentation on Portfolio Analyses of South Atlantic Fisheries

5.2. Overview

Staff from NOAA Fisheries and UMASS Dartmouth are working together to develop an ecosystem-based fishery management approach using portfolio theory to help maximize commercial revenue. The project focuses on the commercial sector for which landings and revenue were available. The frontier analysis of the snapper grouper commercial fishery indicated that observed revenue could have been achieved with less risk of foregone yield or more revenue could have been obtained with the same risk. This is the first review of the approach for South Atlantic Fisheries.

5.3. Presentation

Jason Link, NOAA Northeast Fisheries Science Center

Steve Cadrin, Lauren Brewster, and Fiona Edwards, University of Massachusetts Dartmouth

5.4. ACTIONS

Discuss and make recommendations on how to refine the frontier analysis and determine the sensitivity to the approach.

Discussion Questions:

1. Does the treatment of the data seem appropriate for the analysis?

2. Are the methods to analyze the frontier gap appropriate?

3. Describe how the revenue and risk change in the frontier approach.

4. Provide recommendations on how to improve the optimizer tolerance and precision.

5. How could the Council use this information in management?

SEP RECOMMENDATIONS:

- The research found that a multi-species management approach could lead to improved performance over single-species management. Results indicated that annual fishing portfolios were not on the efficient frontier indicating that revenues could be increased without increasing risk or the same revenues could be achieved with less risk.
- The SEP noted concerns related to the use of dollars of species (or species group) revenue as a measure of return associated with portfolio analysis applied to the South Atlantic commercial snapper-grouper fishery. It was mentioned that portfolio theory applied more traditionally to questions of percentage returns associated with investments. The use of percentage returns directly accounts for the cost of the investment in the calculation. Certain SEP members felt that the application to the snapper-grouper fishery using dollars of revenue as the return measure did not account for the investment in fishing that led to the fishing revenues. Potential changes mentioned including measuring returns using fishing trip net income or revenue per unit effort. The presenters noted that this information was not available in the data set they used.
- The SEP asked about potential issues related to using species/species group-specific revenues and how they covaried across years for different species groups. The main issue raised was with regards to the idea that these revenues are impacted by past management decisions and do not represent how species revenues might naturally covary.
- The SEP questioned the role of a fishermen's ability to effectively target species on fishing trips and the potential role that co-catching of species and/or how to account for species that, while harvested by South Atlantic snapper-grouper fishermen, are not actively targeted by those fishermen. It was unclear to some SEP members as to how this would impact prescriptive optimal portfolios developed using this technique. SEP members questioned whether the efficient frontier prescribed actively measured a target portfolio similar to what investors would purchase based on application of modern portfolio theory to investment decisions.
- There were data gaps and some other issues, but treatment of the data seemed appropriate for the analysis. The SEP recommended that where data issues were encountered the researchers conduct sensitivity analysis and consider conducting the analysis with a focus on species without data gaps only. The lack of recreational data is particularly troubling in the southeast.

- SEP members had reservations about the SAFMC making management decisions based on portfolio theory analysis. One issue noted was the reliance on historical landings/revenue data being the basis for decisions about future behavior and landings. SEP members also noted general concerns about the applicability of portfolio theory to fisheries management decisions.

6. Feedback on SAFMC Research Recommendations

6.1. Document

- **Attachment 6.** South Atlantic Research and Monitoring Plan 2023-2027: Socio-Economic Review

6.2. Overview

The Council revises their research and monitoring plan every two years. The research and monitoring plan is used by Council and NOAA Fisheries staff to develop research concepts that are intended for use in management, provided to NOAA Fisheries for potential inclusion in research grants as priorities, and used by other researchers during development of research proposals. The Panel is provided an opportunity to review the 2023-2027 South Atlantic Research and Monitoring plan. The Council will consider the plan at its June 2023 meeting.

6.3. Presentation

Chip Collier, SAFMC Staff

6.4. ACTIONS

Discuss and make recommendations as appropriate.
Discussion Questions:

1. Do the social and economic priorities in the South Atlantic Research and Monitoring Prioritization Plan accurately reflect the needs in this region?

2. Are there any additional priorities that should be added to the current list? Consider general needs as well as recent nation-wide initiatives such as "30 for 30" or increased integration of Equity and Environmental Justice.

SEP RECOMMENDATIONS:

- The SEP noted that the request to "Evaluate the cumulative economic and social implications of existing regulations on the multi-species Snapper Grouper fishery in the South Atlantic" needs a standard. What time periods should be suggested as the alternative to the present? It was noted that Chris Liese's presentation to the SEP, SSC, and Council covers the commercial fishery's lack of economic profits and resource rents, and that a manuscript based on that is under journal review.
- The SEP agrees with the need for regularly updated estimates of recreational economic value for Council managed species.

7. Mackerel Port Meeting recommendations

7.1. Document

- **Attachment 7.** Mackerel Port Meetings Presentation

7.2. Overview

Based on recommendations from the Mackerel Cobia Advisory Panel, the Council directed staff to begin work on a plan to conduct port meetings for king and Spanish mackerel. The purpose of these port meetings will be to gain a comprehensive understanding of the mackerel fisheries to improve management efforts. Port meetings will *tentatively* be conducted in key communities throughout the Gulf of Mexico and along the Atlantic up to the southern end of Massachusetts in cooperation with other councils, the Atlantic States Marine Fisheries Commission, and state agencies. After port meetings have been conducted, staff will develop a final report that includes notes from all conducted port meetings and a thematic analysis identifying patterns and themes among the different meetings.

7.3. Presentation

Christina Wiegand, SAFMC staff

7.4. ACTIONS

Discuss and provide feedback on port meeting structure and outcomes.

Discussion Questions:

1. What types of facilitation methods should be considered? Sticky wall/dot exercises; break out groups; group consensus exercise, etc.
    a. How might items identified by the Council be organized and prioritized for port meeting discussions?
    b. What is the best way to gather thoughts on short and long-term management solutions?

2. How should staff identify the key communities to hold port meetings?

3. How can port meetings be distinguished from other stakeholder meetings such as MSE discussions and public comment opportunities?

4. Are there other analysis/products that may be helpful to include in the final report?

5. Does the SEP have any comments for the Council on the current objectives for the CMP FMP?

SEP RECOMMENDATIONS:

- SEP suggested strongly clarifying that these Port Meetings are NOT intended to be similar in format to normal Public Comment sessions, and that they will require more interaction and input in a different manner. The SEP noted that people would likely still come to the meetings with a set of prepared comments and ideas they would like to share, so perhaps inviting them to do so at

the beginning and ending of each meeting would help alleviate that desire while still keeping the meeting focused on the necessary tasks and materials. They should NOT be called Visioning Sessions.

- Methods could incorporate sticky walls, break out groups, four corners, etc.
- The SEP suggested returning to the permit-holders who suggested these meetings to determine their thoughts on this structure. They suggest reviewing some of the consensus-building techniques used by the Mid-Atlantic Council in the Climate Change Scenario Planning Workshops of 2021 to assist in building out hypothetical management solutions. Specifically addressing the Objectives given, the SEP questions the relevance of the time frame foundation in Objective 5, and whether this is impacting the ability of management to address Objective 8.
- The SEP suggested thinking broadly about where recreational anglers may be located and acknowledge that this may not be in close proximity to the coast.

8. Socio-economic components of the SAFMC Snapper Grouper Management Strategy Evaluation

8.1. Documents

- **Attachment 8.** SAFMC Management Strategy Evaluation summary for the Socio-Economic Panel

8.2. Overview

In 2021, the Council directed a management strategy evaluation (MSE) to be conducted for the South Atlantic snapper grouper fishery to develop management strategies that will consider addressing the number of released fish to improve yield throughout the snapper grouper fishery, balancing the needs for fishery access and resource use while preventing overfishing and rebuilding overfished stocks. During the development of the MSE, angler welfare and angler well-being were mentioned as objectives for evaluating outcomes of the MSE. Staff are requesting guidance on available data and methods that can be used to evaluate angler welfare and angler well-being.

8.3. Presentation

Chip Collier, SAFMC Staff

8.4. ACTIONS

Discuss and make recommendations as appropriate.

Discussion Questions:

1. How can angler welfare and angler well-being be incorporated into the current MSE process for the snapper grouper fishery?

2. What social or economic methods, data, or tools could be used to evaluate these two topics?

3. Does the SEP have recommendations on potential concepts, objectives, and strategies to address angler well-being and angler welfare that would be appropriate for the snapper grouper fishery?
    a. An example from concept to strategy for an MSE would be concept: stakeholders identifying the lack of trophy fish being available, objective: increase the number of trophy fish in the population, and strategy: increase the minimum size limit to allow for a higher percentage of fish reaching trophy fish.

SEP RECOMMENDATIONS:

- Importantly, the SEP asked for clarification on angler welfare and angler well-being. It has not been defined and the SEP was asked for information on potentially defining those terms. To economists, welfare and well-being are synonymous. To social scientists, the two terms could have a number of different meanings, including health-related measures. A comment from an SAFMC council member indicated that one of the concerns is angler safety in the recreational red snapper derby fishery.
- The economic definition of angler welfare is captured by the consumer surplus, or net willingness to pay, of recreational trips and harvest/catch. There are a number of studies that estimate these values for snapper-grouper in the South Atlantic.
- There are several methods that could be used to estimate economic values for the snapper-grouper fishery. There is existing MRIP data that can be used to develop revealed preference models of angler behavior. A stated preference survey could be developed to provide value estimates but this is costly and time-consuming. Given that there are usable value estimates for this fishery in the peer-reviewed literature, the SEP recommends that benefit transfer methods be used to support the MSE.
- Other measurable outcomes to capture angler welfare include trip satisfaction scales, length of season, species encounter rates, retained fish relative to dead discards, and catch per unit effort. These data could be captured in angler surveys.
- The SEP did not address question number 3 for two reasons. First, there was much discussion about definitions of angler welfare and well-being. Second, the management question may be beyond the expertise of the SEP.

9. SEFSC research on recreational discards of red snapper and other snapper grouper species

9.1. Documents

- **Attachment 9.** Presentation slides for SEFSC research on recreational discards of red snapper and other snapper grouper species

9.2. Overview

Mortality stemming from large numbers of fish being caught and released by recreational anglers has posed an ongoing challenge for the management of red snapper and other stocks of snapper grouper species in the South Atlantic region. Research is currently being conducted to compute improved discard estimates for the South Atlantic snapper grouper fishery. Additionally, the

research includes efforts to model the economic and biological effects of certain regulatory regimes that would minimize discards while potentially increasing retained catch.

9.3. Presentation

Scott Crosson, NOAA Southeast Fisheries Science Center

9.4. ACTIONS

Evaluate the information presented, provide feedback on the nature of research, and make recommendations on the project. In general, this agenda item is meant to update the SEP on research relevant to fisheries in the Southeast.

SEP RECOMMENDATIONS:

- Dr. Scott Crosson presented an overview of his and others work on the discards regulations project currently underway in the South Atlantic. Dr. Crosson informed the SEP that there exists a need to improve and sync up recreational discard estimates of snapper-grouper species, specifically red snapper. The SEP agreed on the merit of the discards regulations project, and further recommended that the SSC and SAFMC Council also consider supporting a RFP for this project. Enforcement concerns were raised on the individuals that would be selected for the hypothetical EFP, and how fishing effort would truly be directed under such a management regime. However, the benefits of collecting information on angler behavior under a tag-based vs seasonal fishing regulations as well as catch composition in high abundancy areas far exceeds the SEP's concerns. SEP agreed on the general methodology and spatial delineation areas of the project.

10. Discussion on the status of and potential improvements to economic analysis of recreational fisheries

10.1. Documents

Attachment 10. Summary of common economic analyses in SAFMC amendments

10.2. Overview

NOAA Fisheries will be hosting a Recreational Economics Constituents Workshop from April 25-26th, 2023 in Tampa, Florida. The workshop is intended to engage the recreational fishing community to increase understanding of how economics plays a role in recreational fisheries management decisions, understand constituents' perceptions, identify ways to that constituents can contribute to economic data collection and analysis, and identify avenues to collaborate on the communication of recreational fisheries economic data and analysis as well as support future information sharing.

As part of the workshop, there will be a panel discussion on understanding economic analysis needed for a regulatory review. The panel will discuss what analyses economists conduct that contribute to the regulatory process and how decisions are made with imperfect information. The panel will include Scott Crosson providing a Council SSC member's perspective on potential improvements to economic analysis.

10.3. Presentation

Scott Crosson, NOAA Southeast Fisheries Science Center
John Hadley, SAFMC staff

10.4. ACTIONS

Discuss and make recommendations as appropriate. The SEP may want to incorporate topics and points brought forth earlier in the meeting into this discussion.

Discussion Questions:

1) Focusing on economic analysis of recreational fisheries, what type of analyses does the SEP feel are particularly strong? What types of analyses are not as strong or have the potential for notable improvements?

2) What upcoming initiatives or research excite you? Where should future research priorities be directed for economic analyses of recreational fisheries? What sort of improvements could be made?

SEP RECOMMENDATIONS:

- The SEP found the NOAA's regularly scheduled expenditure surveys to be a reliable source of information, and would like to see more regular and scheduled updates to the per-fish valuations for both retained and discarded fish.

11. Other Business

12. Opportunity for Public Comment

13. Report and Recommendations Review

14. Next SEP Meeting

- Spring 2024 Annual Meeting in Charleston, SC