SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

SSC MRIP Workshop

August 19-21, 2019

Town & Country Inn
Charleston, SC

VERSION
FINAL
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Abbreviations and Acronyms Used in this Document

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
APAIS	Access Point Angler Intercept Survey, The dockside portion of the MRIP survey.
CHTS	Coastal Household Telephone Survey, Old effort portion of MRIP survey.
FES	Fishing Effort Survey, New mail survey for effort in the MRIP survey.
MRIP	Marine Recreational Information Program, Survey that generates recreational catch and effort estimates.
NMFS	National Marine Fisheries Service
OST	Office of Science and Technology, Administers MRIP.
SAFMC	South Atlantic Fishery Management Council
SEDAR	Southeast Data, Assessment, and Review, Program that coordinates stock assessments in the Southeast.
SEFSC	Southeast Fisheries Science Center
SSC	Scientific and Statistical Committee
TORs	Terms of Reference

From 19-21 August 2019, the SAFMC SSC met in Charleston SC with invited experts from the NMFS Office of Science and Technology, the NMFS Southeast Fisheries Science Center, and state agency staff involved in MRIP data collection and processing, to review background information on the development and implementation of the FES calibrated MRIP estimates (including the calibration for the new APAIS design) of recreational fisheries landings. The SAFMC had requested the workshop so that the SSC could better understand and evaluate stock assessments that incorporate the new estimates. At the workshop the SSC heard detailed and informative presentations on the rationale behind the new estimates, the intensive testing and review that went into their development, and improvements that have been made along the way.

Prior to the meeting, the SSC developed, and the SAFMC approved, Terms of Reference that would include the concerns previously expressed by the SSC regarding uncertainties and questions that had prevented the SSC from approving revision assessments that included new MRIP estimates. The TORs were aimed at furthering the knowledge of the SSC regarding the estimates, so that ongoing and future assessments that incorporate the new FES calibrated MRIP estimates could go forward.

The SSC received presentations from OST and SEFSC staff on MRIP that also provided background information needed to address each TOR. The SSC and invitees discussed the presented information and the SSC then agreed on the following conclusions, recommendations and consensus statements, listed below (in italics) in reference to each TOR.

TOR 1. Review and describe the sources of disparity between CHTS and FES estimates of recreational effort for SAFMC managed stocks, considering the impacts of the effort survey change and SEFSC post-processing.

- *The SSC agrees that the CHTS is systematically biased for a number of reasons detailed in the presentations.*
  - *The transition of households from landlines to mobile-only is responsible for the majority of the systematic bias and error present in the CHTS estimates from 2000 to 2017.*
  - *Prior to 2000, factors such as the Gatekeeper effect, the fact that the CHTS is a cold call, the nature of the questions asked, the demographics of landline users, and the mode of the CHTS survey all contributed to the bias and error in the CHTS estimates.*
- *The differences in sampling frame, definition of a fishing trip, and hidden fishing effort (effort from unlicensed anglers and private fishing sites, non-coastal areas) captured by the FES, but not necessarily incorporated into the state observations (which were largely based on saltwater license numbers), can be substantial and account for a large portion of the differences between CHTS and FES estimates.*
- *When comparing the FES estimates to the other effort surveys, it is inappropriate to make direct comparisons due to differences in assumptions, sampling frames, and sampling and expansion methodologies. These need to be accounted for when comparing estimates from disparate survey designs.*

- ***Consensus:*** *The SSC agrees that the FES design is an improvement over the CHTS and considers it Best Scientific Information Available.*
- ***Consensus:*** *The SSC endorses using the FES estimates to track ACLs that will be set using the FES data. Existing ACLs set using CHTS estimates should continue to be tracked using CHTS-like estimates.*
- ***Consensus:*** *The SSC endorses the use of the fully-calibrated estimates (for both FES and APAIS) from 2017 back to the beginning of the time series, and those produced by the FES methodology from 2018 going forward, for use in Stock Assessments in the South Atlantic.*
- ***Consensus:*** *The SSC endorses using the new FES estimates, including the calibrated historical time series as they are, in current assessments--with the understanding that evaluation of "outliers" would still occur.*
- ***Recommendation:*** *SEDAR use its best practices working group to address a systematic way of identifying and dealing with outliers in the data used to inform stock assessments.*
- ***Recommendation:*** *OST prioritize a simulation study testing the sensitivity to the process of estimation of the FES.*
  - *Explore unbiased nature of FES estimates.*
  - *Explore effect of sample size on precision of estimates.*
  - *This could help with stakeholder buy-in.*
- ***Research Recommendations:***
  - *Consider study designs to ground-truth the effort survey, even if conducted over restricted spatial scales.*
  - *Explore the definition of a trip (boat, shore, resident, tourist, etc.) and its effect on effort and catch estimates.*
  - *Look at how exogenous events (hurricanes, red tides) impact effort estimates.*
  - *Use a data-rich species to scale back the data to mimic a data-poor species, to explore effects of sample size by strata.*
  - *Explore a methodology of including seasonal households (which have not been included) and their effect on effort estimates.*

TOR 1a. Describe for a set of SAFMC managed species currently in the SEDAR process how the sources of disparity between CHTS and FES affect the FES catch estimate time series, with attention on trends, uncertainty, and potential outliers.

i. Red Porgy, Greater Amberjack, King Mackerel, Golden Tilefish, and Gag.
   - *Information addressing this TOR is available in the briefing materials for this workshop in extensive detail.*
   - *Overall, the SSC did not identify any one factor that contributed to the disparity in the estimates between the two surveys. Several factors working in concert (differently for each species or even each data point) contributed to the disparities.*

- *As an example, the panel had an extended discussion of Red Porgy outliers in the estimated catch time series, particularly the estimated landings in 2016. Based on the discussion, we learned that while the FES calibration was responsible for most of the difference from the previous survey estimates, the weighting approach used in the APAIS sampling methodology up-weighted samples landed in the afternoon. Since most Red Porgy were landed in the afternoon in 2016, this led to a large estimate of Red Porgy catch in 2016. For other species examined during the workshop (e.g., Greater Amberjack), the FES calibration was also responsible for most of the difference between the new survey design and the CHTS design, but the APAIS weighting methodology also contributed to some degree in most cases. The large effects of the FES calibration were often driven by a single state, fishing mode, or temporal wave, while the APAIS effects were most often driven by fishing pressure at a specific site and also by day type (weekend, holiday, etc.).*
- *In summary, the sources of outliers were species-dependent and often caused by higher estimates of effort and/or catch in unique combinations of location, time of year, or fishing mode.*

TOR 1b. Review SEFSC post-survey processing and determine what portion of the difference in catch estimates is due to (1) the change from CHTS to FES vs. (2) the post-survey processing of the data by the SEFSC.

i. Does this post-survey processing have a larger effect in certain circumstances?
   - *The effect depends on the number of samples in a stratum.*
   - ***Consensus:*** *The SSC did not identify any circumstances where the SEFSC post-survey processing methods caused larger effects in the catch estimates than others.*

ii. Are there any patterns in post-survey processing that might affect the disparity between the CHTS and FES estimates?
   - *There may be differences in the weight estimates, but there is no pattern or systematic bias to these differences.*
   - ***Consensus:*** *The post-survey processing of the MRIP data has no effect on estimates of numbers of fish between the CHTS and FES methods, which are used in assessments.*

TOR 1c. Identify a set of critical factors (e.g. spatial/temporal coverage of the data that were used in analysis for extrapolation, decision to exclude outlier/abnormal data points, error structures/statistical distributions used in analyses, etc.) most likely to contribute to CHTS/FES disparities for species managed by the South Atlantic Council.

i. Describe how the sources of disparity and data issues identified for the 5 species examined above may affect estimates for other SAFMC species.

ii. Review recreational catch estimates for species currently being assessed (Golden Tilefish, Greater Amberjack, Red Porgy).

- *From 2000 to 2017, the factor contributing most to the trend in the disparity between the CHTS and FES estimates is the increase in the proportion of wireless-only households.*
- *Factors affecting the overall disparity between the FES and CHTS estimates prior to 2000, and to a lesser effect from 2000 to 2017, include:*
  - *The Gatekeeper effect,*
  - *The fact that the CHTS is a cold call,*
  - *The nature of the questions asked in the CHTS vs. the FES surveys,*
  - *The difference in survey mode (phone vs. mail) between the CHTS and FES surveys,*
  - *Differences in coverage,*
  - *Different rates of non-response.*

TOR 2. Establish approaches for the use of FES estimates for unassessed species

- *The SSC ABC Workgroup will meet before the October SSC meeting to go over the landings trends and new ABCs for unassessed stocks and develop recommendations for the full SSC to consider at their October meeting.*
- *The ABC Workgroup members:*
  - *Marcel Reichert*
  - *Carolyn Belcher*
  - *Jeff Buckel*
  - *Eric Johnson*

TOR 2a. Compare current ABC values to updated values based on the revised estimates and determine if any further information or analysis is needed for the SSC to provide updated ABC recommendations for unassessed stocks using the revised MRIP estimates.

i. This could include a re-evaluation of the time series used as a time of stable effort for the ORCS methodology.

- *The ABC Workgroup will meet to address this.*

TOR 2b. Consider whether the current ABC control rule is adequate for developing ABC estimates using the revised MRIP estimates. If it is not adequate, recommend specific changes the Council should consider.

i. This could include different approaches for incorporating large amounts of uncertainty into the estimation of the ABC using differing statistical methods, such as a Bayesian statistical framework with noninformative / uninformative priors.

- *The ABC Workgroup will meet to address this.*

Summary Comments

The workshop was a valuable contribution to the SSC understanding of, and ability to make recommendations involving, the new FES calibrated MRIP estimates. The SSC appreciates the contributions of OST, SEFSC and state representatives to the workshop. Comments from SSC members included the following:

> *"I was really impressed with the presentations and am much more confident in the MRIP numbers."*
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> *"Overall, I think we accomplished a great deal and most people felt good about where we ended up with this."*
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> *"This has been a very informative day and a half and a very good use of SSC time."*
>
> *"…very important discussion"*
>
> *"…this is a complicated and difficult issue, and I appreciate everyone's effort to make it move forward."*
>
> *"…this was a very informative workshop…"*