South Atlantic Research and Monitoring Prioritization Plan for 2020-2025

June 14, 2019

I. Short Term research needs for stock assessments to be completed in 2020-2023

- Operational assessment for Spanish Mackerel, mid-2020:
  - Updated maturity data from both sexes for fish below 275mm FL.
  - Evaluate stock structure using updated data and modern techniques, such as genetics. In particular evaluate if there is newer data available on steepness from other analyses of S-R for pelagic stocks with similar reproductive strategies.
- Operational assessment for Gag, mid-2020:
  - Explore larval transport and modeling efforts associated with development of an IOOS to gain insight into larval connectivity and transport.
  - Develop a solution to address species mis-identification with Black Grouper.
- Red Snapper Research Track Assessment, 2021:
  - Improved and updated bycatch mortality estimates
- Gray Triggerfish Research Track Assessment 2022:
  - Address age determination issues for Gray Triggerfish by January 2020 so age structures can be evaluated for a research track assessment tentatively scheduled for 2021, including re-aging of the spines by the start of the RT.
- Black Sea Bass Operational Assessment 2021:
  - Investigate discard mortality due to hooks in shallow waters (<10m).
  - Recommend the use of more direct methods of estimating M, such as Tag-Recapture studies.
- Red Grouper Operational Assessment 2021:
  - Evaluate sample size cutoffs for using age and length compositions. What should be the minimum standards, and how does this interplay with the number of age and length classes modeled in the assessment?
  - Conduct a simulation study to evaluate the performance of the various likelihood formulations that have been used for fitting age and length composition data under sampling conditions realistic in the southeast U.S.
- Mutton Snapper Assessment, 2021:
  - Evaluate the discard mortality estimates for Mutton Snapper and conduct studies to either confirm or refine these estimates.
  - Evaluate the conversion factors used to convert landed weight to whole weight. Preliminary comparisons suggest a lower percentage difference between gutted weight and whole weight at comparable sizes than is currently used.
- White Grunt Research Track Assessment, 2023
  - Conduct stock identification studies for White Grunt.
- Report at the October 2019 SAFMC SSC meeting, for review by the Council in December 2019, on progress to address this research need from the prior plan:

- Develop annual abundance indices for all managed stocks adequately sampled by the expanded Southeast Reef Fish Survey (SERFS), including methods to merge indices encompassing new sampling with those based on pre-SERFS MARMAP efforts, by June 1, 2018 for use in stock assessment and management evaluations.

NOTE THAT DATES OF FUTURE ASSESSMENTS ARE APPROXIMATE, AND SUBJECT TO CHANGE BY THE SEDAR STEERING COMMITTEE.

II. Long Term research needs for stock assessments to be developed within the next 5 years.

- General assessment topics
  - Evaluate assessment projection performance, considering their ability to estimate landings, recruitment, and biomass levels.
    - Research needs for Protogynous stocks, particularly groupers and Black Sea Bass:
      - Investigate possible effects of hermaphroditism on the steepness parameter.
      - Investigate temporal patterns in sexual transition and develop explanations for any patterns identified.
      - Investigate methods for incorporating the dynamics of sexual transition in assessment models.
- Spanish Mackerel
  - Need observer coverage of fisheries that catch Spanish Mackerel (gillnets, castnets, handlines, poundnets, and shrimp trawls) for bycatch estimates.
  - Examine how schooling or migratory dynamics may influence the catchability of the species. In particular, research the assumption of the hyperstability of indices that sample the schooling portion of the stock.
- Gag
  - Evaluate otolith chemistry as an approach to define Gag population structure.
  - Compare genetics of spawning Gag captured by commercial fishermen to juveniles collected in different areas in subsequent months to determine the source of recruits. Consider expanding research to include samples from Mexico to explore gene flow and connectivity.
- Red Snapper
  - Additional acoustic and traditional tagging is needed on known spawning locations to document spawning migrations or aggregations and return of fish to non-spawning areas.
  - Evaluate the effects of environmental variation on the changes in recruitment and survivorship.
  - Investigate possible historical changes in sexual maturity. The current estimate of age of sexual maturity is low and unusual for other Lutjanids.

- Black Sea Bass
  - Investigate the potential for a range shift in the black sea bass population, and the potential causes, such as climate change.
- Red Grouper
  - Evaluate the frequency and magnitude of recruitment coming from the Gulf of Mexico and south.
- Mutton Snapper
  - Design a multi-year study to collect age and gonad samples at spawning sites during the spawning season. This should entail identifying the diurnal usage patterns at spawning sites during the year.
  - Collect more information on commercial and recreational discards, including some validation using at-sea sampling.

III. Short Term Needs for Spawning Special Management Zones to be completed in the next 5 years.

- Document spawning within Spawning SMZs by priority species in the Snapper Grouper complex.
- Collect baseline data for Spawning SMZs.
- Evaluate the sampling program of the Spawning SMZs. The evaluation should review data on compliance, spawning, and determine if current sampling targets are sufficient.
- Develop methods for incorporating the impacts of Spawning SMZs on management actions and stock status.
- Use hydrodynamic modeling to look at connectivity between MPAs and other habitats.

IV. Short Term Needs for MPA monitoring to be completed within the next 5 years.

- Maintain annual monitoring to collect data inside and outside the MPAs to characterize MPAs and enable comparison to reference sites. Identify fish population demographics (e.g. size and age structure, sex ratio, species use of habitat by life stage, spawning activities, etc.) within and adjacent to the MPAs.
- Characterize spawning by managed species within the MPAs.
- Complete multibeam surveys of the MPAs.
- Evaluate the sampling program of the SAFMC MPAs. The evaluation should review data on compliance, species abundance and diversity, and determine if current sampling targets are sufficient.
- Develop methods for incorporating the impacts of MPA on management actions and stock status.
- Use hydrodynamic modeling to look at connectivity between MPAs and other habitats.

V. Long Term Needs to be developed within the next 5 years.

- Consider acoustic tagging projects for addressing area-based management research and monitoring needs as noted in the SSMZ and MPA sections.
- Obtain life history traits for all species listed as either Level 1 or 2 in Table 1, including von Bertalanffy growth parameters, maturity, and reproductive rates.
- Initiate long-term continuous monitoring of age structures in the South Atlantic for all species listed as either Level 1 or 2 in Table 1. Develop models to predict changes to shrimp, shallow water and deepwater coral, Snapper Grouper, Dolphin Wahoo, and Mackerel populations due to climate change, including changes to species' distribution, movements, and reproductive patterns.
- Evaluate the cumulative economic and social impacts of existing regulations on the multi-species Snapper Grouper fishery in the South Atlantic.
- Evaluate management strategies to reduce discard mortality in the multi-species Snapper Grouper fishery.
- Validate age determination for species in the Snapper-Grouper FMP.
- Provide an evaluation of the independent survey and biological sampling information available for all SAFMC managed stocks that are currently unassessed. This evaluation should document past sampling intensity and current sampling targets and provide guidance on the type of stock assessments feasible given currently available data.
- Conduct tagging studies of Snapper Grouper species, including the Mid-Atlantic, Gulf, and SA regions, to evaluate movements and estimate demographic rates between regions.
- Update reproductive biology work on shallow water groupers (Red Grouper), to determine latitudinal variation in spawning periodicity and habits.
- Investigate juvenile habitat and abundance of shallow water groupers (such as Gag and Red Grouper), to evaluate the effectiveness of current regulations in protecting these species, by looking at changes in abundance and frequency of occurrence.
- Develop a program for monitoring/evaluating compliance with the use of descending/venting devices.

VI. Habitat Research and Monitoring Needs

- Map coral distribution in the South Atlantic region.
- Monitor health of coral reef systems.

VII. Specific Monitoring Priorities

- Increase funding for fisheries independent monitoring in the South Atlantic. Specific needs include:
  - Restoring MARMAP funding to a minimum of $850,000 annually.
  - Funding MARMAP sufficiently to support reinitiating long bottom longline sampling that provides the only abundance information for deepwater stocks such as Tilefish.

  - Maintaining funding for SEAMAP at levels sufficient to support long-term fishery independent survey operations.
  - Maintaining funding for SEFIS to support video survey work.
  - Increasing funding for SEFIS to support the use of stereo cameras, or other such technology, to measure fish length during the video survey.
  - Providing funding for the MPA/SMZ monitoring needs noted above.

- Monitor the mixing rates of Gulf and South Atlantic King Mackerel. Mixing rates may change over time and should therefore be regularly evaluated, although annual monitoring may not be necessary.

- Implement a monitoring and research program to address issues relevant to ecosystem management. Topics include trophic interactions, food preferences, predator-prey relationships, and ecosystem connectivity.

- Develop monitoring programs for Dolphin and Golden Crab that can support future quantitative stock assessments for these stocks.

- Develop and implement new methods for decreasing uncertainty of recreational catch estimates for federally managed offshore species, including but not limited to enhancements to the MRIP survey, add-on surveys, and new methods for collecting recreational catch data.

- Maintain/improve the ability to document commercial and recreational landings and discards.

VIII. SPECIFIC ANNUAL REPORTING REQUESTS

- Provide by June 1 annually, SAFE reports that provide stock status including OFL and MSY, an evaluation of the management program including whether ACLs were met or AMs triggered and addressing reasons for such, results of independent fisheries monitoring, complete landings and discard losses in weight and numbers of fish, fishery dependent monitoring statistics, and measures of effort and economic value for all managed stocks.

- Provide by October 1 annually, a report on the SEFIS program that addresses survey sampling effort, biological sampling intensity, and survey findings for assessed species. This should include updated abundance index trends for all stocks sampled

- Provide annual progress reports, by the SEFSC at the June Council meeting, detailing efforts to implement the research recommendations noted in Council Research and Monitoring Plans.

Table 1. SAFMC Assessment Priorities

Stock	Level**	Next Assessment Status. Scheduled assessment in **Bold**.
Black Grouper	1 (2)	Not scheduled at this time
Black Sea Bass	1	2021 Operational
Blueline Tilefish	1	2017 Benchmark
Dolphin	1/3	Not scheduled at this time
FLK/EFL Hogfish	1	**2022 (Type TBD)**
Gag	1	**2020 Operational**
GA-NC Hogfish	1 (2)	Not scheduled at this time
golden Tilefish	1	**2020 Operational**
Gray Triggerfish	1 (2)	2022/23 Research Track
Greater Amberjack	1	**2019 Standard**
King Mackerel	1	**2019 Update**
Mutton Snapper	1	**2021 Benchmark**
Red Grouper	1	2021 Operational
Red Porgy	1	**2019 Standard**
Red Snapper	1/3	**2021/22 Research Track**
Scamp	1	**2020/21 Research Track**
Snowy Grouper	1	**2019 Update**
Spanish Mackerel	1	**2021 Operational**
Spiny Lobster	1/3	not scheduled at this time
Vermilion Snapper	1	2017 Standard
White Grunt	1	2023/24 Research Track
Yellowtail Snapper	1	**2019 Benchmark**
Almaco Jack	2	not scheduled at this time
Atlantic Spadefish	2	not scheduled at this time
Banded Rudderfish	2	not scheduled at this time
Bar Jack	2	not scheduled at this time
Knobbed Porgy	2	not scheduled at this time
Lane Snapper	2	not scheduled at this time
Red Hind	2	not scheduled at this time
Silk Snapper	2	not scheduled at this time
Tomtate	2	not scheduled at this time
Wahoo	2	not scheduled at this time
Penaeid Shrimp	2	not scheduled at this time
Golden Crab	3	not scheduled at this time
Goliath Grouper	3	not scheduled at this time
Nassau Grouper	3	not scheduled at this time
Speckled Hind	3	not scheduled at this time
Warsaw Grouper	3	not scheduled at this time
Wreckfish	3	not scheduled at this time

Level 1: High data collection priority, age-based assessment goal
Level 2: High data collection priority, data limited or non age-based assessment goal
Level 3: Management actions or biological traits impede typical assessment approaches