



SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

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Minutes

System Management Plan Workgroup

Webinar

11/15/2023

1. Introduction of Workgroup Members
 - a. The workgroup members reintroduces themselves due to the time between meetings.
2. Spawning Special Management Zones (SSMZ) Review – (*Attachments 1a and 1b*)
 - a. Chip Collier, Council staff, reviewed the purpose and need from Amendment 36 as well as the goals and objectives for the system management plan for the SSMZs. The SAFMC established five SSMZ that include three areas protecting natural habitats and two artificial reefs areas created by SCDNR intended to be closed areas to protect important spawning areas or areas suspected to be important spawning areas. The three natural area SSMZs have a sunset provision where the SSMZ regulations will be removed in 2027 if the SAFMC does not take action to extend them.
 - b. Since the Workgroup last met, the SAFMC has revamped the [SAFMC protected areas webpage](#). At the bottom of the page is the information on the SSMZs as well as the tutorial developed by the Workgroup on the SSMZs. There has also been two seminar series presentations that discussed managed areas including [larval dispersal from the SSMZs](#) and [deepwater marine protected areas](#).
 - c. The System Management Plan Workgroup is being tasked with developing an evaluation report on the SSMZs. The report should include recommendations on SSMZ regulations as well as other changes for the area including moving the area, changing the size of the area, or removing the protections for an area.
3. Data Collection and Findings in SSMZ – (*Attachment 2*)
 - a. Dr. Will Heyman, LGL Associates, reviewed information describing direct evidence of spawning and indirect evidence of the spawning that could be used to evaluate the effectiveness of the SSMZs. Will and others have conducted cooperative research in the area to collect information on species spawning in the SSMZs.
 - b. All the areas have been mapped to understand the bathymetry of the area.
 - c. Evidence of spawning has been observed in all the natural areas
 - i. South Cape Lookout – Direct Evidence: Scamp and Rock Hind
 - ii. Devils Hole –
 1. Direct evidence: Blackfin Snapper, Greater Amberjack, Scamp, Snowy Grouper, and Warsaw Grouper and

2. Indirect for Gag (blackbelly observations) and Scamp (courtship behavior).
 - iii. Warsaw Hole – Indirect evidence: Warsaw Grouper
- d. Future research – Additional sampling at Georgetown Hole and Warsaw Hole
- e. Workgroup Discussion – Stacey Harter
 - i. What is happening outside of SSMZs versus inside? What is the range for fish in spawning conditions? Not clear for either. It would be good to sample outside of the area. Resources are limited. Tagging would be beneficial to help figure out movements.
 - ii. Staging area may be very important. Fish may move to the spawning area for only a short period of time. Fish in these areas may be as vulnerable as the spawning areas.
 - iii. Large group of Scamp southwest of Riley’s. What is average density to help determine what a significant aggregation is. Large schools of Scamp have been observed but the tiger paw pattern has not been observed. Large schools of Scamp have not been observed throughout the year. FWC is applying for grants to gather more information.
 - iv. Most groupers have shown very little movement based on small sample size. Mutton snapper would move over 100 miles around winter. Making movements in relation to full moon.
 - v. FWC has hydrophones as a potential database of call rates from spawning sites (not SSMZ)
 - vi. Density through time. It would be great to look at density over time. Resources are limited and does not have a dedicated monitoring program.
 - vii. Is poaching occurring? The areas are a type II MPA, which means people can use the area for fishing such as trolling. Some vessels observed in the area appear to be bottom fishing. The size of the area can be an enforcement issue. Staff are going to check with Law Enforcement Advisory Panel as a follow-up.
 - viii. Is non-destructive sampling planned? Yes, cannulation can be used in the 2024 sampling and then descended.
 - ix. Funding to monitor Western Dry Rocks for 7 years. A well designed monitoring and evaluation will be done in the next few years. This information will be useful to understand what is needed to monitor and evaluate the areas.
 - x. Sampling is proposed in Warsaw Hole and Devil’s Hole.
 - xi. Funding sources that might be useful – in situ tagging might be difficult in some areas. Currents may prevent use of hydrophones in Warsaw Hole and Devil’s Hole. Video surveys more doable.
4. Larval Dispersal Models – (*Attachment 3*)
 - a. Roger Brothers, Gulf of Maine Research Institute, gave a presentation on simulated larval dispersal of Gag, Red Grouper, Red Snapper, and Scamp to evaluate the efficacy of the SSMZs. The models used the Connectivity Modeling System (Paris et al. 2013) and combined it with the life history of the selected species and oceanographic conditions at particular sites.
 - b. Background and Goals

- i. SSMZs were designated as important multi-species spawning areas with the aim to increase recruitment in the U.S. South Atlantic.
 - ii. Uncertainty existed regarding larval fate post-spawning and whether larvae settle in suitable habitats or are swept offshore.
 - iii. The study addressed three main questions:
 - iv. Settlement dynamics of larvae spawned in each SSMZ.
 - v. Comparison of SSMZs with other spawning areas in the Atlantic regarding recruitment.
 - vi. Estimation of recruitment contribution from SSMZs to the Atlantic population.
- c. Species and Modeling Approach
 - i. Four focal species studied: Scamp grouper, Gag grouper, Red Snapper, and Red Grouper.
 - ii. A larval dispersal simulation model (Connectivity Modeling System) was used, combining biological larval behavior with a high-resolution ocean circulation model (Regional Navy Coastal Ocean model).
 - iii. Simulations covered multiple years (four years for some species) to capture average dispersal and recruitment trends.
 - iv. Biological parameters included pelagic larval duration (PLD), vertical larval distribution, settlement criteria (settlement limited to areas less than 30 m depth for groupers), and spawning season timing.
 - v. Larvae were released uniformly on a 10 km grid and from SSMZ centers to analyze dispersal and settlement.
- d. Settlement Dynamics in SSMZs
 - i. Settlement success varied by zone:
 - 1. Area 51 (inshore South Carolina): ~75% settlement success.
 - 2. Area 53 (offshore South Carolina): ~66% settlement.
 - 3. Devil's Hole/Georgetown Hole (South Carolina offshore): ~41% settlement.
 - 4. South Cape Lookout (North Carolina): ~4% settlement.
 - 5. Warsaw Hole (Florida Keys): ~20% settled in Gulf, ~20% in Atlantic, ~60% lost.
 - ii. Grouper species showed generally similar results; red snapper had lower settlement success.
 - iii. Larvae tended to settle near or slightly north/east of release zones.
- e. Comparison with Other Atlantic Spawning Areas
 - i. Simulations released larvae across both the Gulf of Mexico and U.S. South Atlantic.
 - ii. The relative recruitment output by location depicted as a product of:
 - 1. Oceanographic likelihood of settlement.
 - 2. Spatial distribution and intensity of spawning.
 - iii. Some Gulf locations provided significant recruitment to the Atlantic due to oceanographic connectivity.
 - iv. Devil's Hole was a high contributor for scamp and gag species, while South Cape Lookout provided little recruitment due to ocean currents.
 - v. East coast of Florida was a major recruitment source for red snapper.

- vi. For red grouper, most spawning and recruitment originate in the Gulf of Mexico rather than the Atlantic.
- f. Recruitment Contribution from SSMZs
 - i. SSMZs, despite being well-positioned for recruitment, contribute very little (< 0.1%) to total Atlantic recruitment due to their small spatial footprint.
 - ii. Total recruitment contributions by region:
 - 1. Gulf of Mexico: 10-84% depending on species.
 - 2. Atlantic: remainder majority.
 - 3. Among SSMZs, Devil's Hole often contributed the most recruitment.
 - iii. Hypothetical expansion of SSMZ areas 10-fold would still result in minor recruitment contributions (<1%).
 - iv. Suggestion to consider larval settlement in both Atlantic and Gulf for management, especially for Warsaw Hole where larvae settle in both areas.
- g. Uncertainties and Sensitivities
 - i. Uncertainty in biological parameters such as:
 - 1. Vertical distribution of larvae in the water column.
 - 2. Settlement habitat depth limits.
 - ii. Spatial and temporal distribution of spawning.
 - iii. Ocean circulation model choice.
 - iv. Sensitivity analyses on larval traits and oceanographic model choice indicate oceanography has the largest impact on recruitment predictions.
 - v. Data limitations restrict the number of years and resolution of simulations.
 - vi. Expansion of data sets with longer-term hydrodynamic models is ongoing to improve interannual variability analysis.
 - vii. Interannual variability and "boom-bust" recruitment cycles expected to play a significant role and will be studied further.
- h. Model and Data Details
 - i. Spatial modeling used generalized additive models (GAMs) integrating fish abundance and spawning probability.
 - ii. Spawning outputs are scaled by abundance and probability of spawning females.
 - iii. The modeling framework allows post-processing adjustments to test different spawning distributions without rerunning simulations.
 - iv. Plans for forthcoming publication and ongoing collaboration with working groups for further analysis.
- i. Questions and Discussions:
 - i. Asked about the spawning distribution model — it incorporates both abundance and probability of spawning in a probabilistic manner.
 - ii. Discussed the modeling approach and potential to incorporate fecundity or size-based spawning variability in further analyses.
 - iii. Inquired about rationale for species selection and potential for expanding the model to Warsaw Grouper and Speckled Hind.

- iv. Suggested overlaying deepwater MPA boundaries with the maps to assess additional contributions.
 - v. Asked about including variability in larval traits (e.g., swimming speed, settling time) and which parameters contributed most to model uncertainty.
 - vi. Responses indicated oceanographic model choice has the greatest impact; larval biological parameters affect results but less so.
 - vii. Highlighted data availability challenges especially for multi-year hydrodynamic velocity fields.
 - viii. Emphasized importance of vertical migration behavior of larvae and improved understanding of water column dynamics for better modeling.
 - ix. Debated including larval settlement in the Gulf area for Warsaw Hole due to management boundary issues and potential cross-jurisdictional larval movement.
 - 1. Participants agreed that larvae settling in the Gulf could contribute back to the South Atlantic fisheries population.
 - x. Noted limitations due to management boundaries versus oceanographic realities.
 - xi. Discussed low relative spawning abundance and recruitment of red grouper in Atlantic compared to Gulf.
 - xii. Discussed potential impact of regional variations in spawning season timing and plans to incorporate those.
- j. Next Steps / Action Items:
- i. Continue developing and refining model, especially incorporating interannual variability with longer hydrodynamic data sets.
 - ii. Evaluate expanding analysis to additional species of interest (e.g., Warsaw Grouper, Speckled Hind).
 - iii. Conduct sensitivity analyses on spawning season timing and larval biological parameters as new data becomes available.
 - iv. Plan publication of modeling results and integrate feedback from management workgroups.
 - v. Consider management implications of larval settlement crossing boundaries between Gulf of Mexico and U.S. South Atlantic.
 - vi. Potential future inclusion of deepwater MPA boundaries in spatial recruitment maps.
5. Evaluation Tools for the SSMZs – (*Attachments 4a and 4b*)
- a. Chip Collier, Council Staff, reviewed two different options to evaluate the tools that could be used for evaluation of the SSMZs the Marine Effectiveness Tracking Tool (Attachment) and Specific Questions for the SSMZ developed by staff (Attachment) . .
 - b. Workgroup Discussion – Stacey Harter
 - i. The targeted draft SAFMC seemed to be the better option as long as we could get the dashboard that came out of the METT. Staff indicated this could be done so that the questions were targeted for the SSMZs while having some of the visualization tools available.

- ii. Should do them as a whole or do separately? Recommend doing the SSMZs individually.
- iii. Further develop the social and economic questions. Reach out to FWC staff on questions and methods for evaluating Western Dry Rocks.
- iv. Dashboard should include 1, 2, 4, 5, 6, and 7.
- v. Include questions to describe threats in the region
- vi. Process. First, develop the questions, then the SMP Workgroup would individually score the questions. Finally, regroup and evaluate what the final score should be as a group. A report would be developed and given to different advisory panels and listen to their input. Based on other Advisory Panel input, the SMP workgroup would develop a final recommendation.
- vii. How tailored. It might be good to have it so that it could be used for other management areas. Compliance, enforcement, and outreach could be set up to be used for evaluation in other areas. Biological should try to address the purpose and need for the protected areas.
- viii. Staff will create a google doc for the metrics.
- ix. Need more information to complete the form. Particularly for enforcement. Law enforcement panel is meeting in February 2024 to provide additional information.
- x. Discussion on structuring the evaluation for monitoring the five Spawning SMZs: whether to evaluate all together for efficiency or individually for detailed site-specific insights.
- xi. Introduction of a draft evaluation framework with metrics categorized into:
 - xii. Planning inputs (objectives development, management evaluation setup, size/shape/location appropriateness)
 - xiii. Process (outreach, communication, enforcement, monitoring)
 - xiv. Outcomes (biological evidence, comparison with nearby areas, social and economic impacts)
 - xv. Outputs (emerging threats, condition trends, compliance trends)
- xvi. Emphasis on the need for a clear communication plan and better outreach beyond reliance on law enforcement officers.
- xvii. Consideration of social and economic metrics was noted as an area requiring further development.
- xviii. 3. Discussion on Evaluation Methodology**
- xix. Proposal to adapt the existing Management Effectiveness Tool (MET) framework incorporating targeted questions related to spawning SMZs.
- xx. Suggested grading scale from A (decreasing concern) to D (improving status) based on the condition and trend assessments.
- xxi. Work group consensus favored evaluating each SMZ individually due to differing characteristics and purposes.
- xxii. Discussion on potentially tailoring the tool for applicability to other marine protected areas, balanced against the need for specificity.
- xxiii. 4. Data Needs and Stakeholder Engagement**

- xxiv. Recognition that some work group members require additional data, particularly from enforcement agencies and monitoring programs.
- xxv. Plans to engage the Law Enforcement Advisory Panel, Snapper Grouper Advisory Panel, and Scientific and Statistical Committee (SSC), including the socioeconomic panel, to provide broader input and expert review.
- xxvi. Mention of upcoming opportunities for gathering additional data, including the Law Enforcement Advisory Panel meeting and outreach to South Carolina DNR regarding Area 51 and 53 monitoring.
- xxvii. 5. Collaborative Development Process**
- xxviii. Decision to create a Google Document and Word version of the draft evaluation tool to allow group comments and collaborative development.
- xxix. Plan to develop a dashboard tool to visualize evaluation results.
- xxx. Proposal to use a Delphi approach: individual scoring with supporting comments, followed by group discussion to finalize scores.
- xxxi.

6. Election of Co-Chair – Elected Chris Taylor as Co-Chair