

# **Management Strategy Evaluation for the South Atlantic Snapper Grouper Fishery**

September 2025

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## **Executive Summary**

This document accompanies the Council presentation on the Snapper Grouper Management Strategy Evaluation (MSE). It summarizes the purpose, design, and early insights from the MSE and frames four decisions requested from the Council:

1. Prioritize management scenarios to test in the next phase.
2. Provide further guidance for aggregate bag limits, if included.
3. Confirm the species set for modeling in this phase.
4. Confirm the performance objectives to evaluate trade-offs consistently across species (maximum 6 to 7 tradeoffs).

The MSE is a quantitative approach that compares candidate management procedures under uncertainty and reports performance relative to stakeholder-chosen objectives. It is not a single deterministic prediction. Instead, it reveals trade-offs (e.g., rebuilding probability vs. near-term landings vs. number of discards) so that management choices can be evidence-based and robust to uncertainties identified for the fishery.

## **Purpose and Rationale**

The Snapper Grouper fishery presents complex challenges: multiple rebuilding plans, high discard levels (especially for Black Sea Bass, Gray Snapper, and Red Snapper), sectoral and spatial complexity, and changing data streams. Traditional single-species analyses do not fully describe the variety trade-offs or the behavioral responses of fishermen to new rules. The MSE provides an approach to evaluate management procedures before implementation, explore sensitivity to key uncertainties, and furnish the Council with a transparent basis for decision-making.

## **What is the MSE**

A MSE is a simulation framework that couples biology, monitoring, and management decision rules to compare alternative management procedures (MPs) against agreed-upon objectives. It explicitly tests robustness of the MPs to uncertainty (e.g., natural mortality, recruitment, catch/effort levels). A management procedure that only succeeds if the future outcomes are modelled perfectly may not end up being the preferred management scenario for the fishery.

It should not be expected that a MSE will forecast of a single best outcome, a replacement for SEDAR assessments, or a mechanism that prescribes one “right answer.” MSEs are another tool that the Council can use to guide their decision making.

Developing the management scenarios can be challenging because often the stakeholders are asked to develop management scenarios without seeing all the potential output of the operating models. Additionally, stakeholders may suggest not considering certain scenarios for biological, economic, social, or political reasons. Sometimes these unfavorable scenarios may be modeled to help test the scenarios and other times they can be left out.

## **Summary of Work to Date**

The first SAFMC MSE for the Snapper Grouper fishery was constructed using recent stock assessments (Beaufort Assessment Model or BAM-based) for Red Snapper, Gag, and Black Sea Bass, enabling an apples-to-apples comparison of different stock performances under similar harvest control rules. In these examples, size limits varied for the different species, but other management options were consistent (e.g., area closed was closed for all species).

Five management scenarios were developed:

- Status Quo (fishing mortality was fixed at the geometric mean of the last three years of the assessment)
- Full Retention (no discarding except for fish that did not meet the size limit)
- Minimum Size Limits modifications
- Nearshore Spatial Closures (area <100 ft)
- Offshore Spatial Closures (areas between 100-300 ft)

Combinations of the management scenarios were explored such as status quo with full retention or nearshore closures with changes in minimum size limits.

Performances of the management scenarios were scored against four objectives:

- Probability of rebuilding (or staying at target)
- Relative short-term landings
- Relative long-term landings
- Fraction discarded

To test the robustness of the scenario outcomes alternative levels of natural mortality, catch/effort, and recent recruitment were tested to understand when rankings of MPs hold or flip. These robustness test were selected because natural mortality is known to change the stock status outcomes of different scenarios, MRIP's pilot study discovered possible overestimation of recreational effort by as much as 40%, recruitment of Gag and Black Bass have been lower than average recruitment for 10 years, and recruitment of Red Snapper has been higher than average recruitment for 10 years.

### **Outcomes:**

- Spatial closures (nearshore vs. offshore) could alter rebuilding outcomes and discards, especially for Red Snapper and Gag.

- Status quo frequently underperforms on rebuilding metrics relative to spatially targeted alternatives.
- Full retention with nearshore area closures can aid rebuilding for Red Snapper and Gag but may generate trade-offs for others (e.g., Black Sea Bass), underscoring the need for multi-species views.
- Minimum size limits tend to be weaker levers for the objectives of greatest current concern (rebuilding and discards) compared with spatial and effort-focused tools.

These insights are intended to focus Council guidance; they are not policy recommendations.

## **Decisions Requested from the Council**

### **Decision 1. Prioritize the Scenario Menu**

We propose a shortlist-first approach to keep results interpretable and on schedule. Please indicate Must-Test, Nice-to-Have, and Defer among the following:

1. Spatial management (nearshore vs. offshore allocations/closures, or spatially explicit limits). It would be good to provide guidance on minimum and maximum number of area closures and an estimate of size to evaluate. Example 1 to 4 areas per state with the areas to being no larger than 10 square miles.
2. Seasonal management (targeted opening/closures to reduce discards or release mortality). Example: seasons should remain open for minimum of one wave and a maximum of five waves.
3. Size Limits (recognizing lower leverage in prior tests). Example: provide modifications to current size limits or explore in one inch interval up to 4 inches from the current size limits for species like Gag or 2 inches for species like Black Sea Bass.
4. Bag Limits. Example: explore reducing bag limits up to 2 fish per person. If the current bag limit is less than 2 fish per person, consider vessel limits.
5. Harvest tags. Additional questions: Which species would be eligible for harvest tags? Is there mandatory retention if harvest tag species is caught? Can the fishermen still target Snapper Grouper Species if they no longer have a harvest tag?
6. Mandatory retention / stopping rules (e.g., immediate stop upon reaching discard caps or species retention caps)
7. Mandatory reporting (e.g., improved timeliness; test via compliance scenarios)
8. Aggregate bag limits (see Decision 2)

Recommendation: Consider spatial + seasonal + one effort/behavior lever (e.g., aggregate or retention) to balance efficacy and interpretability.

### **Decision 2. Aggregate Bag Limit Design (if included)**

Aggregate limits are sensitive to design details. To avoid ambiguous results, we request guidance on:

- Species to include: Which species should belong in the aggregate? Should inclusion vary by sub-region?
- Magnitude: What aggregate level would be good to investigate (e.g., 5, 10) and should it vary for different components of the recreational sector?
- Interaction with existing species aggregates: How do we handle overlaps with current rules? We are assuming that the current bag limits (single species and aggregate) would remain in place and may add additional complexity for anglers (remembering which species would count for this aggregate).
- Behavioral response: If lower-value species can fill the aggregate (e.g., Tomtate), should the design be adjusted so that fishermen continue to target higher profile species?

Providing these details up front ensures that modeled outcomes match the Council’s intent and facilitates transparent interpretation.

### **Decision 3. Species Set for This Phase**

We developed four options:

1. All Snapper Grouper Species: not recommended due to a lack of information for all stocks.
2. Tier 1 - Assessment-Rich Focus (recommended baseline): Species with recent stock assessments (federal and state) to maintain alignment with SEDAR products.
3. Tier 1 (Assessments) + Tier 2 (Indexed Species): Add species with reliable abundance indices (trap/diver surveys) to broaden relevance without over-extending timelines.
4. Subset of Tier 1 and Tier 2 based on assessment type and retention in the recreational fishery. See Staff recommendations.

Appendix B has list of species by tiers.

### **Decision 4. Performance Objectives to Report**

Retain the objectives for evaluating the outcomes to enable consistent cross-species comparisons:

- Rebuilding probability or maintaining current stock size
- Short-term landings
- Long-term landings
- Fraction discarded

Optional add-ons (select sparingly to avoid overload):

- Access (e.g., angler days or trip opportunities)
- Economic proxy (e.g., revenue index by sector/gear/region)
- Distributional equity (e.g., shares by region/mode)

If selecting add-ons, please specify which sector(s), region(s), and time horizons to track. The add-ons could replace previous objectives.

## Staff Recommendations for Council Action Items

- Scenarios to test – seasonal closure, stopping rules, and aggregate bag limit analysis  
*Rationale: Aggregate bag limits are a management approach the Council is actively considering. Seasonal management is relatively straightforward to define and could provide an additional tool to control effort. Stopping rules may help reduce discards, though enforcement would be challenging. Spatial management options could also be explored but would require clear definitions of size and area.*
- Aggregate bag limit analysis –current regulations would remain in place.
  - *Rationale: Because species interact differently across regions, retaining current size limits and aggregate measures will help avoid unintended shifts in retention patterns that could occur if existing rules were removed.*
- Species to include - all assessed species plus species that rank in the top ten of number of recreational fish caught and have index of abundance.
  - Tier 1 –
    - Keep: Black Sea Bass, Blueline Tilefish, Gag, Gray Triggerfish, Greater Amberjack, Red Porgy, Red Grouper, Red Snapper, Scamp, Snowy Grouper, Tilefish, Vermilion Snapper (12 species)
    - Remove: Black Grouper, Hogfish, Mutton Snapper, Yellowtail Snapper, Wreckfish  
*Rationale: Retained species are primarily assessed using BAM, which integrates smoothly into the MSE framework. Removed species are generally assessed with SS3, which can be incorporated but performs differently. Several of the removed species are jointly managed with the Gulf Council and concentrated in South Florida. Black Grouper and Wreckfish already have separate, ongoing MSEs.*
  - Tier 2 –
    - Keep: Lane Snapper, White Grunt (2)
    - Remove: Gray Snapper, Tomtate, Atlantic Spadefish  
*Rationale: Lane Snapper (31% retention 2019 to 2024) and White Grunt (52% retention) have higher retention than species recommended for removal (<25% retention).*
- Continue with current performance metrics and additional metric for number of days season is open.  
*Rationale: Existing performance metrics meet Magnuson-Stevens Act requirements to rebuild overfished stocks, optimize yield, and reduce discards. Adding “number of days season is open” will address stakeholder feedback emphasizing access to the fishery.*

## Stakeholder Engagement and Parallel Efforts

- Situation Assessment (University of Florida): Completed to capture user perspectives and priority concerns.

- Stakeholder Panel & Public Survey (University of Florida): Co-develop preference information and ensure strategies are socially feasible.
- Coordination with SEDAR & SEFSC: Align with current assessments, data availability, and review pathways; ensure outputs are interpretable within Council processes.

## **Proposed Next Steps & Timeline**

1. Council Direction (Today): Finalize scenario shortlist, aggregate design principles, species set, and performance objectives.
2. Stakeholder Panel and Public Survey completed (December 2025).
3. Model Configuration (September to December 2025): Implement Council guidance; finalize uncertainty and monitoring variants.
4. Simulation Runs (January to March 2026): Execute design grid; quality assurance; preliminary synthesis.
5. Stakeholder Review (April 2026): Share draft results with stakeholder panel, Advisory Panel, and SSC; incorporate feedback.
6. Council Workshop/Briefing (September 2026): Present trade-offs, robustness results, and management-ready insights.

## **Requested Council Actions (Checklist)**

- ☐ Approve scenario shortlist and rank by priority (Must-Test / Nice-to-Have / Defer).
- ☐ Provide aggregate bag limit guidance (species to include, how to analyze, if any).
- ☐ Confirm species scope (select species to include).
- ☐ Reaffirm performance objectives (consider any add-ons; specify sector/region/time horizon if used).

## Appendix A. Glossary

- **MSE (Management Strategy Evaluation):** Simulation approach to compare management procedures under uncertainty.
- **MP (Management Procedure):** A complete rule that translates monitoring outputs into management actions.
- **Operating Model:** The “true” simulated population and fishery system in MSE.
- **Robustness Set:** Alternative assumptions to test sensitivity and stability of outcomes.
- **Trade-off Plot:** A visual that compares two performance objectives across many MPs.

## Appendix B. Species by Data Category

Table of Snapper Grouper Species. Tier 1 are species with stock assessments. Tier 2 are species with potential indices of abundance (normal text – trap/video survey, italics – diver survey off Florida Keys). Tier 3 are species without know assessment or index.

Tier 1 Species	Tier 2 Species	Tier 3 Species
Black Grouper	Almaco Jack	Lesser Amberjack
Black Sea Bass	Knobbed Porgy	Coney
Blueline Tilefish	Tomtate	Goliath Grouper
Gag	White Grunt	Misty Grouper
Gray Triggerfish	Speckled Hind	Nassau Grouper
Greater Amberjack	Scup	Red Hind
Hogfish	<i>Atlantic Spadefish</i>	Rock Hind
Mutton Snapper	<i>Bar Jack</i>	Warsaw Grouper
Red Porgy	<i>Cottonwick</i>	Yellowedge Grouper
Red Grouper	<i>Gray Snapper</i>	Yellowfin Grouper
Red Snapper	<i>Graysby</i>	Margate
Scamp	<i>Lane Snapper</i>	Sailor's Choice
Snowy Grouper	<i>Ocean Triggerfish</i>	Whitebone Porgy
Tilefish	<i>Saucereye Porgy</i>	Banded Rudderfish
Vermilion Snapper		Bank Sea Bass
Wreckfish		Blackfin Snapper
Yellowtail Snapper		Cubera Snapper
		Queen Snapper
		Silk Snapper
		Sand Tilefish