# SEDAR Project Schedule
November 2023

During the October 2023 SEDAR Steering Committee meeting, SAFMC representatives at the meeting adjusted species recommended for 2026 projects due to potential bias in recreational estimates identified in NOAA Fisheries' Fishing Effort Pilot Study and potential for multiple Red Grouper stocks in the South Atlantic region (**Figure 1**). There were three changes.

- Gray Triggerfish Operational Assessment moved up from 2026 to 2025 to be closer to the end of the research track assessment.
- Snowy Grouper Operational Assessment moved back from 2025 to 2026 to accommodate the change in Gray Triggerfish.
- Red Grouper changed from an operational assessment to a benchmark assessment.

Statements of work were updated for the Gag and King Mackerel, both of which were submitted for 2025. Snowy Grouper was previously planned for 2026. Statements of work are provided to Council members to complete the record. Red Grouper does not have a statement of work since it will be a benchmark assessment.

| SEDAR Committee Recommendations | | | | | | |
|---|---|---|---|---|---|---|
| | | STC approved and scheduled | STC approved not scheduled | *To be finalized* | Future request | |
| | 1 | 2 | 3 | 4 | CMP | FWC |
| 2023 | | **S82 Gray Triggerfish RT** | | | | **S79 Mutton Snapper Benchmark** |
| 2024 | | **S92 Blueline Tilefish OA** | | **S89 Tilefish OA** | | *Yellowtail Snapper* |
| 2025 | **S90 Red Snapper RT** | **S82 Gray Triggerfish OA** | Atl Migratory Cobia | Dolphin MSE Review | | **S94 Hogfish Benchmark** |
| 2026 | | **Gag OA** | **Snowy Grouper** | **Red Grouper Benchmark** | **King Mackerel OA (Gulf and SA)** | Black Grouper Benchmark/ MSE |
| 2027 | S90 Red Snapper OA | | Red Porgy OA | | | |
| 2028 | Vermilion Snapper OA | Greater Amberjack RT or Benchmark | Spanish Mackerel Benchmark | Scamp/ Yellowmouth Grouper OA | | |
| 2029 | | | | | | |

**Figure 1.** SEDAR Project Schedule based on the outcome of the October 2023 SEDAR Steering Committee meeting. Ongoing and scheduled projects (green bolded and underlined text), projects approved by the SEDAR Steering Committee but not scheduled (orange and bolded text), projects that have not been finalized (yellow and italicized text), and future requests. Timing is approximate.

**Submitted SAFMC Statements of Work for 2026**

**Species:**
Snowy Grouper

**Model and Additional Data Years:**
- Prior Assessment: South Atlantic Snowy Grouper SEDAR 36 Update (2021)
- Prior Terminal Year: 2018
- Data providers should provide all new and recent available data sufficient for use in the stock assessment through 2024. Data providers may decide to include preliminary or partial data for more recent years that could be used in the stock assessment models or projection analyses. Data inclusion for the stock assessment models and projection analyses will be determined by the lead analyst based on quantity and quality of the most recent data.
- Apply the current BAM configuration.

**Requested Data Updates (Please be as specific as possible):**
- Review any new and updated information to determine if it warrants consideration for modifying existing assumptions to life history, discard mortality, and steepness.
- Following NMFS Procedure 01-101-11, provide a model run using the SEDAR 36 Update configuration including recent years data.

**Requested Model Modification to previously approved assessment (Please be as specific as possible):**
- Separate landings and discards into different data streams due to potential change in discard mortality (current research at NCSU), which may result in a selectivity change due to the seasonal recreational fishery, low bag limit, and survivorship of some released fish when descending devices are used.
- Indices of Abundance:
  - Develop an index of abundance for Snowy Grouper using the South Atlantic Deepwater Longline Survey.
  - Investigate other techniques to develop indices of abundance for Snowy Grouper for current indices of abundance (Chevron Trap and Short Bottom Longline Surveys). Consider adding the video component into the Chevron Trap survey.
- Use MRIP recommended approaches for recreational landings to reduce PSEs below 50%.
- Explore use of average recruitment instead of relying on Beverton-Holt stock recruitment curve.
- Consider estimating commercial discards with observer program vs commercial discard logbook.
- Consider using different methods for estimating Snowy Grouper natural mortality including a subset of Then et al. 2015, Hammel and Cope 2022, or other research.
- Address recommendations of the Catch Level Projections Workgroup in the assessment report.

**Is a Topical Working Group Needed?** No

**POTENTIAL SCHEDULE:**

- Assessment Species are approved at Spring SEDAR Steering Committee Meeting (ex. May 2023)
- Cooperators use their process to develop SoWs
- Initial Cooperator-approved SoWs submitted to SEFSC by November 1, 2023
- SEFSC provides feedback to Cooperators via memo no later than February 1, 2024
- Cooperators/Technical review bodies review feedback and negotiate final SoWs with SEFSC
- Final SoWs provided to SEDAR Program Manager by May 1, 2024
- Target Final Report Completion:  2026

**Species:**
Gag Grouper

**Model and Additional Data Years:**
- Prior Assessment: SEDAR 71 Gag Operational Assessment
- Prior Terminal Year: 2019
- Data providers should provide all new and recent available data sufficient for use in the stock assessment through 2024. Data providers may decide to include preliminary or partial data for more recent years that could be used in the stock assessment models or projection analyses. Data inclusion for the stock assessment models and projection analyses will be determined by the lead analyst based on quantity and quality of the most recent data.
- Apply the current BAM configuration.

**Requested Data Updates (Please be as specific as possible):**
- Review any new and updated information to determine if it warrants consideration for modifying existing assumptions to life history, discard mortality, and steepness.
- Following NMFS Procedure 01-101-11, provide a model run using the SEDAR 71 Gag Operational Assessment configuration including recent years data.

**Potential Modifications to previously approved assessment (Please be as specific as possible):**

- Incorporate length composition from the SERFS video survey, as feasible.
- Incorporate catch level working group recommendations.
- Consider new methods for estimating natural mortality including a subset of Then et al. 2015, Hammel and Cope 2022, or other research. Consider direct estimation methods such as telemetry or conventional tagging approaches if available.

**Is a Topical Working Group Needed?** Yes
- Low recruitment: The Center recommends a SEDAR Procedural Workshop (PW) be conducted in 2024 or 2025 to examine the potential sources of recent recruitment declines in several reef fish species in the South Atlantic, including: gag, scamp, and red porgy. The Center will work with the Council to draft appropriate terms of reference for that PW.
- Reproductive Dynamics: A TWG is recommended if sufficient information is made available to better characterize the reproductive dynamics of gag (e.g. sex ratio, maturity schedule, batch fecundity, spawning seasonality, and spawning frequency, sperm limitation).

**Suggested Topical Working Group Process:**
Webinar

**POTENTIAL SCHEDULE:**
- Cooperators use their process to develop SoWs
- SSC reviews SoWs at April meeting, then SAFMC reviews in September, 2023
- Initial Cooperator-approved SoWs submitted to SEFSC by November 1, 2023

- SEFSC provides feedback to Cooperators via memo no later than February 1, 2024
- Cooperators/Technical review bodies review feedback and negotiate final SoWs with SEFSC
- Final SoWs provided to SEDAR Program Manager by May 1, 2024
- Terms of Reference to SSC in October 2024 and SAFMC in March 2025
- Target Final Report Completion:  2026

**Species:**
King Mackerel

**Model and Additional Data Years:**
- Prior Assessment: SEDAR 38 King Mackerel Update Assessment
- Prior Terminal Year: 2017/2018 FY
- Data providers should provide all new and recent available data sufficient for use in the stock assessment through 2024/2025 FY. Data providers may decide to include preliminary or partial data for more recent years that could be used in the stock assessment models or projection analyses. Data inclusion for the stock assessment models and projection analyses will be determined by the lead analyst based on quantity and quality of the most recent data.
- Apply the current SS3 configuration.

**Requested Data Updates (Please be as specific as possible):**
- Review any new and updated information to determine if it warrants consideration for modifying existing assumptions to life history, discard mortality, and steepness.
- Following NMFS Procedure 01-101-11, provide a model run using the SEDAR 38 Update Assessment configuration including recent years data.

**Potential Modifications to previously approved assessment (Please be as specific as possible):**

- Provide a means to model projected discards in a manner that relaxes the assumption that discards would increase/decrease in proportion to changes in the landings.
- Explore alternative age references, or age-specific time series for the SEAMAP fishery independent survey.
- Explore model sensitivity to the exclusion of sub-legal fish observations. Explore assumptions regarding the size/age of discards and bycatch.
- Evaluate model sensitivity to the age-data and explore alternative parameterizations (such as inverse age-length key).
- Explore cause of high max gradient for the model. Describe the cause and implement improvements feasible.
- As feasible, explore the possibility to include a sensitivity run with FISHStory length data (1950s-1970s).
- Incorporate catch level working group recommendations.

**Is a Topical Working Group Needed?**   No

**POTENTIAL SCHEDULE:**
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Research Recommendations for future Gag Assessments:
- Implement systematic age sampling for the general recreational and commercial sectors. Age samples were important for this assessment for identifying strong year classes, but sample sizes were limited, particularly for the general recreational sector, which accounts for the majority of the recent landings.
- Age-dependent natural mortality was estimated by indirect methods (Lorenzen) for this assessment. Telemetry- and conventional-tagging programs can provide alternative estimates of natural mortality.

Research Recommendations for future Snowy Grouper Assessments:
SEDAR 36 Update (2021) Research Recommendations
- Increased fishery independent information, particularly for developing reliable indices of abundance, would greatly improve the assessments of deepwater species.
- More age samples should be collected from the general recreational sector and with more complete spatial coverage.
- Snowy grouper were modeled in this assessment as a unit stock off the southeastern U.S. For any stock, variation in exploitation and life-history characteristics might be expected at finer geographic scales. Modeling such sub- stock structure would require more data, such as information on the movements and migrations of adults and juveniles, as well as spatial patterns of larval dispersal and recruitment. Even when fine-scale spatial structure exists, incorporating it into a model may or may not lead to better assessment results (e.g., greater precision, less bias). Spatial structure in a snowy grouper assessment model might range from the very broad (e.g., a single Atlantic stock) to the very narrow (e.g., a connected network of meta-populations living on individual reefs). What is the optimal level of spatial structure to model in an assessment of snapper-grouper species such as snowy grouper? Are there well defined zoogeographic breaks (e.g., Cape Hatteras) that should define stock structure? Research into these questions could help inform future stock assessments.
- Protogynous life history: 1) Investigate possible effects of hermaphroditism on the steepness parameter; 2) Investigate the sexual transition for temporal patterns, considering possible mechanistic explanations if any patterns are identified; 3) Investigate methods for incorporating the dynamics of sexual transition in assessment models.
- In this assessment, the number of spawning events per mature female per year was implicitly assumed to be constant. The underlying assumptions are that spawning frequency and spawning season duration do not change with age or size. Research is needed to address whether these assumptions for snowy grouper are valid. Age or size dependence in spawning frequency and/or spawning season duration would have implications for estimating spawning potential as it relates to age structure in the stock assessment (Fitzhugh et al. 2012).

SSC (Jan 2021 Meeting) Research Recommendations provided during review of SEDAR 36 Update
Research to reduce risk and uncertainty
- Increased collection of fishery independent data, particularly age samples.
- An evaluation of methods for estimating Snowy Grouper natural mortality.
- An evaluation of the utility of selectivity blocks chosen.

Major research recommendations
- Reduce uncertainty in natural mortality assumptions:
  - Subset species used in Then et al. analysis to include only grouper, snapper, or species with similar life histories.
  - Use empirical studies (tagging etc.) to come up with field-based natural mortality estimates at age.
  - Conduct a simulation study to examine which factors may reduce uncertainty in the choice of natural mortality in the BAM.
- Consider not specifying the stock recruitment relationship and model recruitment as an average value with random residuals. Rather than calculating MSY and BSY from the SR curve, consider alternative proxies.

Minor research recommendations
- Abundance indices:
  - Explore the effect of different methods used to develop indices of abundance (delta lognormal versus zero-inflated negative binomial). Determine why they generate different trends and peaks/valleys and how best to treat these data.
  - Overall low catches of Snowy Grouper in fishery independent surveys used to generate indices of abundance. A deep water survey is highly desirable.
  - Evaluate the use of inverse sampling methods for analysis for generating indices of abundance.
- Explore MRIP data in greater detail to a) understand what causes outliers (e.g., 2012), b) determine potential for bias in discard estimates, and c) determine how best to treat these data in the assessment.
- Examine temporal autocorrelation in both abundance index residuals and recruitment estimates and explore ways to account for that within the model.
- Investigate shore mode captures of Snowy Groupers in MRIP.
- Explore the effect of plus group definition up to a max age of 80.
- Explore alternative methods for addressing recruitment assumptions in projections.
- Evaluate the efficacy of recruitment estimation by subdividing the dataset and projecting forward using a shorter time series. Compare with recruitment estimates generated using the complete time series.
- Explore the prevalence of use of descending devices in the Snowy Grouper fishery.
- Consider the use of the South Atlantic Fishery Management Council EwE model to explore hypotheses regarding Snowy Grouper and its ecological relationships with other species (e.g., exploration of why recruitment has been low, predator-prey relationships, dietary overlap, etc.).

Uncertainties identified by SSC during review of SEDAR 36 Update

Major
- Uncertainties regarding maximum age assumptions and resulting estimation of natural mortality.
- Estimation of a Beverton-Holt stock recruitment curve with fixed steepness.

Minor
- Abundance indices:
  - Abundance indices were not well fit in the current model configuration.
  - Abundance index residuals appear temporally autocorrelated and that autocorrelation was not accounted for in the current model configuration.

- o Large uncertainty in estimated annual values for abundance indices, including unexplained shift in the peak year of the Chevron Trap Index (now 2000).
- Estimate of 2012 recreational landings is a potential outlier.
- The stock may be in a different productivity regime than implied by current biological reference points given it has been stable but well below biological reference points since 1984.
- Stock dynamics may be more controlled by natural processes than fishery processes given low recent fishing mortality relative to natural mortality.