THE SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

Scientific and Statistical Committee

April 2024 Meeting Report

Minimizing Red Snapper Discards

Received: 14 April 2023 | Revised: 18 September 2023 | Accepted: 22 September 2023
DOI: 10.1002/nafm.10966

ARTICLE

Fishery management strategies for Red Snapper in the southeastern U.S. Atlantic: A spatial population model to compare approaches

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Funding information
Office of Sustainable Fisheries' National Catch Share Program and Magnuson-Stevens Act Implementation

Abstract

Objective: Red Snapper *Lutjanus campechanus* is an iconic species in the southeast U.S. Atlantic Ocean, sought by both commercial and recreational fleets. Five stock assessments over the past quarter century have shown Red Snapper to be experiencing overfishing. Highly restricted landings since 2010 have been insufficient to end overfishing because fishing effort is not species specific but rather applies generally to a complex of reef-associated species. Consequently, Red Snapper are discarded as bycatch when regulations prohibit their retention, and many of the discarded fish die from hook injury, barotrauma, or depredation.

Methods: Here we developed a spatial population model of Red Snapper and the multispecies fishery that captures them in the southeast U.S. Atlantic. We then simulated and compared 25 different management measures that fall broadly into the categories of gear modifications, discard mortality mitigation, size limits, spatial approaches, or temporal approaches. Criteria for comparison address the management goals of decreasing dead discards, rebuilding the age structure, and increasing landings and spawning biomass.

Result: We found that the most effective measures reduced fishing effort, either temporally or spatially, and that benefits could largely be obtained by focusing on the recreational fleet. Discard mortality mitigation (e.g., through use of descender devices) displayed a wide range in effectiveness depending on plausible levels of mortality reduction, but it addressed all management goals and in practice could be paired with other measures. A measure with restricted recreational effort combined with full retention of all fish caught showed the greatest potential to simultaneously rebuild the stock, increase landings, and eliminate dead discards.

Conclusion: To end overfishing of Red Snapper as required by law, resource managers should reconsider the policy of unrestricted effort of the private recreational fleet to this multispecies fishery. The benefits of restricted effort would include increased catch rates, larger landed fish, and fewer dead discards.

KEYWORDS
fishery management strategies, Red Snapper, simulation modeling, snapper–grouper fishery, spatial population model

- Valuable tool to understand and explore management options.
- Continuing this model exploration by adding other species.

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- Study looked at rebuilding strategies in equilibrium time-frame, but shorter-term tactical analyses are needed.
- Current MSE in conjunction with assessment projects can inform those short-term recommendations.
- Strategies can be applied short-term, but planning for longer-term strategies should begin now.
  → Process likely take several years.

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- Significant effort reduction required to meet management objectives.
- Once red snapper is rebuilt, MSE, assessment update, or other harvest policy analysis needed to prevent return to overfished/ overfishing.

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- Give following management approaches a lower priority:
  - Size limits.
  - Red Snapper species-specific season length.
  - Area closures for bottom fishing.
    (but area closures may be very effective in rebuilding stock)
  - Gear modifications/selectivity.
  - Annual catch limits.
  - Species-specific bag limits.

- MSE Development Team should retain above list of strategies to:
  - Demonstrate they have been explored.
  - Show relative effectiveness of strategies.

Image: SERFS - SCDNR

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- Potential strategies to explore for Snapper-Grouper MSE:
  - Effort control strategy with a broader range of reduction in effort (specifically beneficial: 25% - 75%).
  - Alternative ways to implement effort control (e.g., capping vessel trips, angler trips, trips per individual vessel, trip lotteries, harvest tags).
  - Potential non-linear responses in effort control or other effects (biological, economic, social).
  - Response to different levels of compliance with full retention or other management strategies (e.g., descending device usage, etc.).

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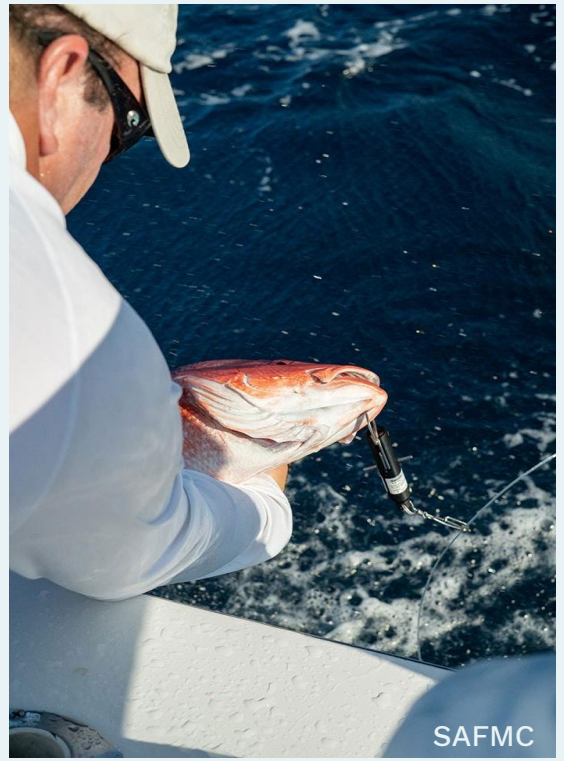
- Potential strategies to explore for Snapper-Grouper MSE (cont'd):
  - Retain descending device usage/best fishing practices
    - Provide more detail on calculations of fish conserved using barotrauma mitigation.
  - Combined strategies and additive benefits.
  - Area closures for bottom fishing
    - Scenario 20 has a substantial potential for rebuilding spawning biomass and mean age.
    - A combination of different spatial/temporal closures can also be considered.



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- Spatial and temporal closures and effort reductions need to be implemented for entire snapper-grouper fishery to ensure efficacy and feasibility
  - would affect all species, independent of biomass or stock status.
  - shifting effort from spatial and/or temporal closures may impact species in other areas or seasons.

Thank you.

Questions?

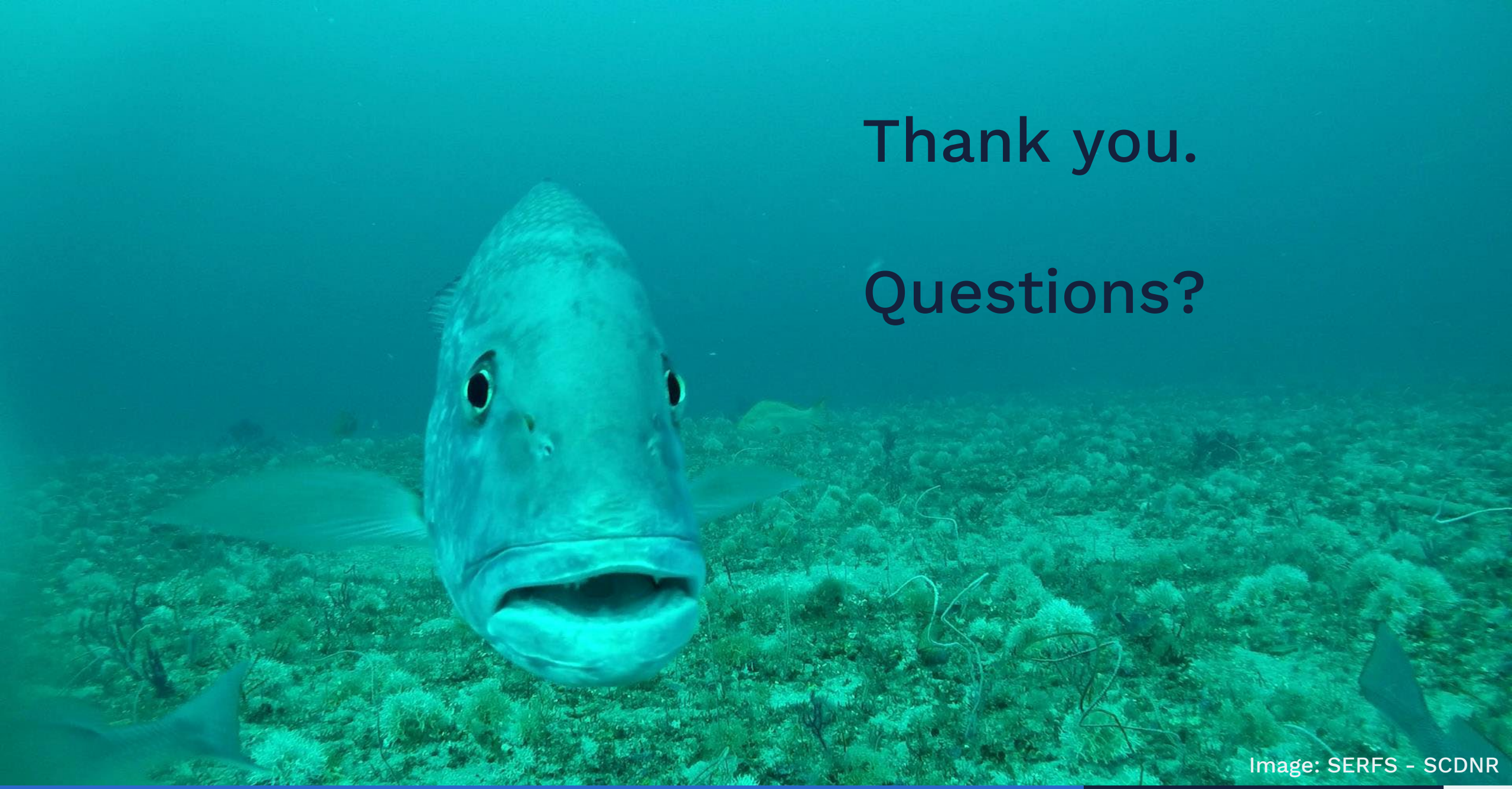

Image: SERFS - SCDNR