

Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management

SUMMER FLOUNDER

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Fishery-Dependent Priorities

- Develop an ongoing sampling program for the recreational fishery landings and discards (i.e., collect age, length, sex) to develop appropriate age-length keys for ageing the recreational catch¹.
- Evaluate fully the sex- and size distribution of landed and discarded fish, by sex, in the summer flounder fisheries¹.

Modeling / Quantitative Priorities

- Explore the potential mechanisms for recent slower growth that is observed in both sexes.
- The reference points are internally consistent with the current assessment. It may be useful to carry uncertainty estimates through all the components of the assessment, BRPs, and projections.
- Evaluate uncertainties in biomass to determine potential modifications to default OFL CV².
- Incorporate sex -specific differences in size at age into the stock assessment^{3,1,8}.
- Apply standardization techniques to all of the state and academic-run surveys, to be evaluated for potential inclusion in the assessment⁴.
- Determine and evaluate the sources of the over-optimistic stock projections⁵.

¹ No ongoing, synoptic sampling program has been developed, although comprehensive data collections were conducted in 2010-2012 and 2016 by Jason Morson and Daphne Munroe at Rutgers University, NJ.

² The SFWG was unable to recommend on OFL CV modification, and there is not a strong analytical basis for any adjustment to the OFL CV. The calculated assessment OFL CVs for 2019-2023 range from 11-14% (TOR7). The MAFMC SSC (Paul Rago) has work in progress to provide options for alternative quantitative calculations of the OFL CV.

³ Sex-specific differences were incorporated and tested in the supportive modeling approaches presented under TOR4.

⁴ Significant progress has been made by the SFWG during SAW 66 under TOR2 to explore these approaches and develop sensitivity analyses to the primary assessment model, although ongoing work to improve treatment of age composition in the aggregated indices and estimation of uncertainty is needed.

⁵ This recommendation has been explored over the last few years, with results presented to the MAFMC SSC (Paul Rago analyses); however, with newly calibrated recreational catch estimates included in the assessment, a new baseline for projection performance must be established and evaluated in the future.

- Further work examining aspects that create greater realism to the summer flounder assessment (e.g., sexually dimorphic growth, sex-specific F, differences in spatial structure [or distribution by size?]) should be conducted⁶. This could include:
 - a) Simulation studies to determine the critical data and model components that are necessary to provide reliable advice, and need to determine how simple a model can be while still providing reliable advice on stock status for management use, and should evaluate both simple and most complex model configurations.
 - b) Development of models incorporating these factors that would create greater realism.
 - c) These first steps (a or b) can be used to prioritize data collection, and determine if additional investment in data streams (e.g., collection of sex at age and sex at length and maturity data from the catch, additional information on spatial structure and movement, etc.) are worthwhile in terms of providing more reliable assessment results.
 - d) The modeling infrastructure should be simultaneously developed to support these types of modeling approaches (flexibility in model framework, MCMC/bootstrap framework, projection framework).

Life History, Biological, and Habitat Priorities

- Continue to explore changes in the distribution of recruitment. Develop studies, sampling programs, or analyses to better understand how and why these changes are occurring, and the implications to stock productivity.
- Evaluate the causes of decreased recruitment and changes in recruitment per spawner in recent years⁷.
- Continue efforts to improve understanding of sexually dimorphic mortality and growth patterns. This should include monitoring sex ratios and associated biological information in the fisheries and all ongoing surveys to allow development of sex-structured models in the future⁸.

⁶ Some progress has been made (for b) as demonstrated in the development of sex-specific supportive models in SAW 66 described under TOR4. Gains in the reliability of advice produced from the inclusion of sex-specific complexity have not been shown (for a or b), with the sex-specific supportive models providing similar overall results/advice to the primary assessment model presented. Some fine scale and regional analyses have been conducted that examine the distribution and movement by sex (for c), as well as distribution of adults and recruits along the shelf, which has provided some insight into the complexity of patterns in movement for this species (see TOR3). Work will continue in the future by different researchers on these topics for future SAWs.

⁷ Some progress has been made by the SFWG in describing potential causes for recent below average recruitment. However, understanding and verifying the mechanisms that may be causing the observed patterns warrants further research. Under TOR3, factors causing the shifts in the distribution of recruits and changes in habitat use/availability by early life stage are identified as two areas to be considered for further work.

⁸ These continue to be monitored in at least the NEFSC, NEAMAP, and MADMF trawl surveys as described under TOR2.

Process

- Provide an opportunity for the NMFS stock assessment scientists and Council SSCs to meet in person to promote common understanding of how the assessment products are used and considered in the process of developing SSC acceptable biological catch (ABC) limit advice for the Councils. The intent of this meeting is to align expectations and find opportunities to improve products and the process for both groups.