

Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management

TAUTOG

Full Citation: Atlantic States Marine Fisheries Commission. 2013. Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management. Special Report # 89. ASMFC, Arlington, VA. 58pp.

Updated with information from: ASMFC. 2021. Tautog Regional Stock Assessment Update 2021. ASMFC, Arlington, VA. 97 pp.

Fishery-Dependent Priorities

High

- Expand biological sampling of the commercial catch for each gear type over the entire range of the stock (including weight, lengths, age, sex, and discards).
- Continue collecting operculum from the tautog catch as the standard for biological sampling in addition to collecting paired sub-samples of otoliths and operculum.
- Increase catch and discard length sampling from the commercial and recreational fishery for all states from Massachusetts through Virginia.
- Increase collection of effort data for determining commercial and recreational CPUE.
- Increase MRIP sampling levels to improve recreational catch estimates by state and mode. Current sampling levels are high during times of the year when more abundant and popular species are abundant in catches, but much lower in early spring and late fall when tautog catches are more likely.

Fishery-Independent Priorities

High

- Conduct workshop and pilot studies to design a standardized, multi-state fishery independent survey for tautog along the lines of MARMAP and the lobster ventless trap survey.¹
- Establish standardized state by state long-term fisheries-independent surveys to monitor tautog abundance and length-frequency distributions, and to develop YOY indices.²
- Enhance collection of age information for smaller fish (<20 cm) to better fill in age-length keys.

¹ In 2016, New Jersey began conducting a ventless trap survey within and around 3 artificial reef sites off the central New Jersey coast; the data from this survey may potentially be useful for the next benchmark assessment if the time-series meets the minimum requirement of 10 years.

² MD DNR has started a seagrass survey that has the potential to serve as a YOY index for tautog. The SAS recommends that this survey be continued and considered for use in the next benchmark.

- Address finer-scale spatial issues through techniques like otolith microchemistry analysis and next-generation genetic sequencing.

Modeling / Quantitative Priorities

Moderate

- Develop an alternative flexible selectivity curve to use in the stock assessment model given the characteristics of multiple gear types in the tautog fisheries.
- Consider using alternative catch-at-age modeling frameworks (e.g., Stock Synthesis) in order to overcome some constraints of the ASAP model in the NMFS Toolbox. Simpler methods, such as xDB-SRA, can also be performed in Stock Synthesis, providing a common modeling framework to develop and compare different models and their specifications.
- Explore utilizing a modeled age-length key to avoid borrowing age-length data from other years and regions.

Life History, Biological, and Habitat Priorities

Moderate

- Define local and regional movement patterns and site fidelity in the southern part of the species range. This information may provide insight into questions of aggregation versus recruitment to artificial reef locations, and to clarify the need for local and regional assessment.
- Assemble regional reference collections of paired operculum and otolith samples and schedule regular exchanges to maintain and improve the precision of age readings between states that will be pooled in the regional age-length keys.
- Consider expanding the use of pelvic fin spines as a less-invasive hard part for ageing.
- Identify the source of the disparity between MA and RI size-at-age if possible.
- Calibrate age readings every year by re-reading a subset of samples from previous years before ageing new samples. States that do not currently assess the precision of their age readings over time should do so by re-ageing a subset of their historical samples.
- Obtain biological metrics to match the spatial scale of the proposed models, to determine if there is biological justification for such models.

Low

- Evaluate the potential impacts of climate change on tautog range, life history, and productivity.
- Conduct a tag retention study to improve return rates, particularly in the northern region.
- Define the status (condition and extent) of optimum or suitable juvenile habitats and trends in specific areas important to the species. It is critical to protect these habitats or to stimulate restoration or enhancement, if required.
- Define the specific spawning and pre-spawning aggregating areas and wintering areas of juveniles and adults used by all major local populations, as well as the migration routes used by tautog to get to and from spawning and wintering areas and the criteria or times of use. This information is required to protect these areas from damage and overuse or excessive exploitation.

- Define larval diets and prey availability requirements. This information can be used as determinants of recruitment success and habitat function status. Information can also be used to support aquaculture ventures with this species.
- Define the role of prey type and availability in local juvenile/adult population dynamics over the species range. This information can explain differences in local abundance, movements, growth, fecundity, etc. Conduct studies in areas where the availability of primary prey, such as blue mussels or crabs, is dependent on annual recruitment, the effect of prey recruitment variability as a factor in tautog movements (to find better prey fields), mortality (greater predation exposure when leaving shelter to forage open bottom), and relationship between reef prey availability/quality on tautog condition/fecundity.
- Define the susceptibility of juveniles to coastal/anthropogenic contamination and resulting effects. This information can explain differences in local abundance, movements, growth, fecundity, and serve to support continued or increased regulation of the inputs of these contaminants and to assess potential damage. Since oil spills seem to be a too frequent coastal impact problem where juvenile tautog live, it may be helpful to conduct specific studies on effects of various fuel oils and typical exposure concentrations, at various seasonal temperatures and salinities. Studies should also be conducted to evaluate the effect of common piling treatment leachates and common antifouling paints on YOY tautog. The synergistic effects of leaked fuel, bilge water, treated pilings, and antifouling paints on tautog health should also be studied.
- Define the source of offshore eggs and larvae (in situ or washed out coastal spawning).
- Confirm that tautog, like cunner, hibernate in the winter, and in what areas and temperature thresholds, for how long, and if there are special habitat requirements during these times that should be protected or conserved from damage or disturbance. This information will aid in understanding behavior variability and harvest availability.

Management, Law Enforcement, and Socioeconomic Priorities

Moderate

- Collect data to assess the magnitude of illegal harvest of tautog.
- Collect data to assess the socioeconomic impacts of the recently implemented commercial tagging program

Low

- Collect basic sociocultural data on tautog user groups including demographics, location, and aspects of fishing practices such as seasonality.