

ASMFC Critical Research Needs in Support of Interjurisdictional Fisheries Management

2009

American Eel

- Formulate a coastwide fishery-independent sampling program for yellow and silver American eels using standardized and statistically robust methodologies.
- Investigate: fecundity, length, and weight relationships for females throughout their range; growth rates for males and females throughout their range; age and maturity data.
- Investigate, develop, and improve technologies for American eel passage upstream and downstream at various barriers for each life stage. In particular, investigate low-cost alternatives to traditional fishway designs for passage of eel.

American Lobster

- Develop reliable sex-specific estimates of molt frequency and molt increment for each stock.
 - Address problems associated with the growth matrix through aging studies or use of the extensive Canadian tag database for obtaining better estimates of growth and molt frequency. Apply the biochemical assessment of lipofuscin content to help estimate growth.
- Develop a reliable recruitment index, based on the ventless trap catches, larval/settlement indices, etc. A standardized coast-wide fishery-independent survey that is designed to target American lobster, such as the ventless trap survey, is critical for this.
- Increase biological sampling (either port or sea-sampling), especially in offshore areas of the Gulf of Maine, Georges Bank, and the Southern New England Canyons.

American Shad/River Herring

- Determine American shad and river herring bycatch within state and ocean waters.
- Determine which stocks are impacted by coastal intercept fisheries (including bycatch fisheries) and evaluate the fishing mortality on those stocks. Methods to be considered to differentiate among stocks could include otolith micro-chemistry, oxytetracycline otolith marking, tagging or DNA/RNA methods.
- Conduct population assessments on river herring, including biosampling - particularly needed in the south.
- Continue to assess current aging techniques for American shad and river herring, using known age fish, scales, otoliths, and spawning marks.
- Determine predation by fish, mammals and birds on American shad and river herring.

Atlantic Croaker

- Develop fishery-dependent and independent size, age and sex specific relative abundance estimates to monitor long term changes in croaker abundance.
- Improve catch and effort statistics from the commercial and recreational fisheries, along with size and age structure of the catch.
- Conduct stock identification research on croaker via otoliths microchemistry, tagging, or genetics.

Atlantic Menhaden

- Develop and improve fishery-independent estimates of adult abundance at age on a coast-wide scale to replace or augment the existing pound net index. Aerial survey has been discussed, perhaps in cooperation with the menhaden industry using spotter pilots.
- Develop and test methods for estimating size of recruiting year-classes of juveniles using fishery-independent survey techniques. State seine indices are used for juvenile abundance indices, but there is a need to update information on stream productivity for combining across state surveys for a coastwide index.

Atlantic Sea Herring

- Synthesize predator/prey information and conduct investigations to address information gaps; investigate the role of herring in the Northwest Atlantic ecosystem and the importance of herring as a forage species for other commercial fish stocks; assess the importance of herring as forage relative to other forage species in the region.
 - Re-evaluate Atlantic herring natural mortality by age and the response to changing predator population sizes through an ecosystem based assessment.
- Investigate bycatch/discards in the directed herring fishery through both at-sea and portside sampling.
- Continue tagging and morphometric studies to explore uncertainties in stock structure and the impacts of harvest mortality on different components of the stock. Although tagging studies may be problematic for assessing survivorship for a species like herring, they may be helpful in identifying the stock components and the proportion of these components taken in the fishery on a seasonal basis.

Atlantic Striped Bass

- Develop a spatial, temporal and sex specific catch-at-age model incorporating tag-based movement information.
- Compare scale and otolith ages and develop methodology to incorporate otolith ages into the assessment.
- Continue in-depth analysis of migrations, stock compositions, etc. using mark-recapture data (ongoing, e.g., Cooperative Winter Tagging Cruise 20 Year Report, W. Laney).
- Examine potential biases associated with the number of tagged individuals, such as gear-specific mortality (associated with trawls, pound nets, gill nets, and electrofishing), tag-induced mortality, and tag loss.

Atlantic Sturgeon

- Establish current spawning stock status in historic spawning rivers, and evaluate habitat use, or suitability.
 - Conduct assessments of population abundance and age structure in various river systems. Particular emphasis should be placed in documenting occurrence of age 0-1 juveniles and spawning adults as indicators of natural reproduction.
- Characterize size, condition, and relative abundance of Atlantic sturgeon by gear and season taken as bycatch in various fisheries.
- Establish stocking goals and success criteria prior to development of stock enhancement or recovery programs.

Black Sea Bass

- Develop fishery-independent surveys and expand existing surveys to capture all sizes and age classes in order to develop independent catch-at-age and CPUE. Expansion could include improvements or augmentation of existing trawl surveys and/or addition of a pot type survey to acquire older ages.
- Increase sea sampling to verify information from commercial logbooks to provide better estimates of discards. Should be part of a comprehensive fisheries dependent sampling program for both the recreational and commercial fisheries.
- Increase age sampling across all components of the fishery. Could be done through a comprehensive multispecies market and recreational catch sampling program.

Bluefish

- Collect size and age composition of the fisheries by gear type and statistical area.
- Initiate fishery-dependent and independent sampling of offshore populations of bluefish during the winter months.
- Evaluate amount and length frequency of discards from the commercial and recreational fisheries.

Coastal Sharks

- Continue to acquire better species-specific landings information on number of species, including smooth dogfish, by weight, from dealers.
- Conduct smooth dogfish assessment.
- Better identify and quantify the use of Essential Fish Habitat and nursery areas for shark species found along the Atlantic Coast of the U.S. Continue and expand long term shark monitoring programs to assess population status, and trends in demographic parameters.
- Identify and evaluate the effects of shark bycatch in other fisheries. Initiate or expand species identification of bycatch in shrimp trawls to allow for better bycatch estimates particularly of blacknose sharks and other shark species.

Horseshoe Crab

- Model relationship between egg availability and spawning biomass/abundance.
- Expand or implement fishery-independent surveys to encompass the full range of horseshoe crabs along the coast including inland waters.
- Assess horseshoe crab prey availability and determine whether horseshoe crab population growth will be/is limited by prey availability.

Northern Shrimp

- Refine annual estimates of consumption by predators. Consumption estimates could lead to annual estimates of M that would be more realistic than assuming constant M , for use in models that include M explicitly. Alternatively, consumption estimates could be used in production models as annual removals similar to fishery removals.
 - Continue NEFSC bottom trawl survey finfish stomach sampling. Initiate a similar program for the ME/NH and MA surveys. Improve predator/prey spatial and temporal overlaps from available data.
- Better characterize shrimp discards in the shrimp and other small-mesh (i.e., herring and whiting) fisheries. Resources required: more at-sea sampling; several person-months for analysis of existing VTR and sea-sampling databases.
- Explore the stock-recruitment relationship and the impact of environmental factors on larval and juvenile abundance, growth, and survival.
 - Extend the range of environmental variables and datasets used previously. Integrate the biological and environmental data sets and conduct multivariate analyses of effects of the environmental variables.

Red Drum

- Support fishery-independent sampling of sub-adult and adult red drum in each state from Virginia to Florida. The purpose of this survey would be to: 1) verify escapement to the spawning population, 2) provide an index of recruitment to age-1, and 3) provide an estimate of the biomass of adult red drum.
- Continue tagging studies to determine stock identity, inshore/offshore migration patterns and mortality estimation.

Scup

- Maintain the current level of sampling, particularly of the discards, to adequately characterize the length composition of both landings and discards, to ensure reliability of the analytic assessment and forecasts of catch and stock biomass for this stock.
 - Expanded age sampling of scup from commercial and recreational catches is required, with special emphasis on the acquisition of large specimens. Need to increase observer coverage for winter I offshore directed scup fishery and bycatch squid fishery.
- Continue to support and fund both the Rhode Island commercial fish trap survey and the Fishery Independent Scup Survey of Hard Bottom Areas in Southern New England Waters. Expand the fishery independent survey to include waters farther west and collect scales for aging.

Spanish Mackerel

- Evaluate weight- and especially length-at-age, including updated conversion equations (e.g., gutted to whole weight) and sampling of age-0 fish.
- Improved information on discard rates and discard mortality, including 5-10 % observer coverage of commercial fisheries.
- Increase biological sampling, especially hard parts for aging, from all states where Spanish mackerel are landed.
- Determine the bycatch of Spanish mackerel in the directed shrimp fishery in Atlantic Coastal waters.
- Develop fishery-independent methods to monitor stock size of Atlantic Spanish mackerel (consider aerial surveys used in south Florida waters).

Spiny Dogfish

- Characterize and quantify bycatch of spiny dogfish in other fisheries.
- Determine coastwide discard mortality rate for fixed and mobile gear fisheries that catch dogfish as bycatch.
- Conduct a coastwide tagging study to explore stock structure, migration, and mixing rates.
- Standardize age determination along the entire East coast. Conduct an aging workshop for spiny dogfish, encouraging participation by NEFSC, NCDMF, Canada DFO, and other interested agencies, academia and other international investigators with an interest in dogfish aging (US and Canada Pacific Coast, ICES).

Spot

- Improve spot catch and effort statistics from the commercial and recreational fisheries, along with size and age structure of the catch, in order to develop production models.
- Develop fishery-dependent and independent size- and sex-specific relative abundance estimates.
- Develop cooperative coastwide spot juvenile indices to clarify stock status.
- Monitor and report on the extent of unutilized bycatch and fishing mortality on fish less than age-1 in trawl fisheries or other fisheries that take significant numbers of spot. Incorporate bycatch estimates into spot assessment models.
- Monitor long term changes in spot abundance, growth rates, and age structure.

Spotted Seatrout

- Initiate fishery-independent surveys of spotted seatrout, especially for juvenile abundance indices. Begin with a review of existing data and programs. States should conduct routine fishery-independent surveys using entanglement gear to generate annual indices of abundance for use in regional stock assessments.
- Collect the necessary biological data to be able to conduct stock assessments and to assist in drafting fishery management plans.

Summer Flounder

- Develop a program to annually sample the length- and age-frequency of summer flounder discards from the recreational fishery.
 - Expand MRIP for-hire survey to collect scale samples; expand to collect samples from other modes, or utilize existing volunteer angler surveys. Ideally, this would be part of a long term comprehensive fishery-dependent sampling program.
- Continue to collect and analyze age/length samples and catch/effort data from the commercial and recreational fisheries throughout the range of summer flounder. Increase the number of length samples taken by MRIP.
- Collect otoliths more comprehensively, for all components of the catch-at-age matrix, on a continuing basis for fish larger than 60 cm (~7 years). Collecting information on overall fecundity for the stock, both egg condition and production may be a better indicator of stock productivity.
- Continue fishery-independent surveys and expand existing surveys to capture all sizes and age classes in order to develop fishery-independent catch-at-age and CPUE.

Tautog

- Establish standardized state-by-state long-term fishery-independent surveys to monitor tautog abundance and length-frequency distributions, and to develop young-of-the-year indices.
- 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 than in early spring/late fall when tautog catches are more likely.
- Initiate biological sampling of the commercial catch for each gear type over the entire range of the stock (including weight, lengths, age, sex, and discards).

Weakfish

- Conduct spatial and temporal analysis of the fishery-independent survey data. The analysis should assess the impact of the variability of the surveys in regards to gear, time of year and geographic coverage on the use of the surveys as stock indicators.
- Analyze the spawner-recruit relationship and examine the relationships between parental stock size and environmental factors on year-class strength.
 - Analyze the characteristics of the process error variability (noise) in the recruitment dynamics.
- Identify stocks and determine coastal movements and the extent of stock mixing, including characterization of stocks in over-wintering grounds (e.g., tagging).
 - Develop an operational model(s) that incorporates catch uncertainty, to improve on limitations of the currently used VPA model.

Winter Flounder

- Expand sea sampling for estimation of commercial discards.