CHAPTER 5: ASMFC RESEARCH RECOMMENDATIONS

5.0 SINGLE-SPECIES ASSESSMENTS

As the MSVPA assessment depends heavily on the quality of data from single-species stock assessments, completion of existing research recommendations for single-species assessments will improve the utility of the MSVPA-X (See Appendix D2. Single-species Research Recommendations). In future MSVPA-X assessments, the most recently updated and peer reviewed single-species stock assessments will be used in the MSVPA-X.

5.1 MULTISPECIES RECOMMENDATIONS FROM ASMFC INTERNAL PEER REVIEW

5.1.1 Model Formulation

Short-term

These short-term research recommendations from the ASMFC Internal Review have been completed:

- Document how parameters are estimated within model with a flow chart to present the order of the estimation process.
- Add option to permit partitioning of biomass (vary size-structure of biomass predators) predators in forecast projections.
- Add option to input a recruitment vector in the forecast projection model.
- Add option to input catch as opposed to F into forecast projection model to simulate quota management approaches.

Long-term

The following long-term research recommendations from the MSVPA-X Internal Peer Review still remain:

- Add uncertainty to model forecast and incorporate elements of Monte Carlo simulations on recruitment curves.
- Alter biomass predator bin sizes for more flexible way to vary for projection model.
- Add ICA and production model options to retrospective.
- Develop a similar application to the “amoeba” program that allows the user to easily vary changes in model parameters.

5.1.2 Data

Short-term research recommendations

Updated diet data were obtained from several of the sources cited in the MSVPA (pers. comm., Jeff Buckel, North Carolina State University; pers. comm., Anthony Overton, East Carolina University; pers. comm., Wilson Laney U.S. Fish and Wildlife Service; pers. comm., Chris

Bonzek Virginia Institute of Marine Science; pers. comm., Joe Smith, SEFSC); however, some of the data could be obtained or had not been updated from earlier compilation efforts.

New 'Other Prey' species were added to the model. The full suite of 'Other Prey' includes:

1. Sciaenids (spot, croaker)
2. Small Forage Fish (anchovy, silversides, and sand lance)
3. Medium Forage Fish (butterfish, squid, mullets)
4. Clupeids (Atlantic herring, thread herring, and others)
5. Benthic invertebrates (worms)
6. Benthic crustaceans (lobsters, blue crabs, jonah crabs, calico crabs)
7. Macrozooplankton (shrimps, mysids, amphipods)

A reasonable estimate of coast wide abundance could not be estimated for the *Alosa* spp. group and was not included in the "other prey" categories. A coast wide assessment of American shad is currently underway and may provide additional information that can be used to develop an abundance estimate. The shad assessment will be done on a river system specific basis and the quality of shad abundance data for Atlantic coast river systems is highly variable and may preclude development of a coast wide abundance estimate.

A coastal bay anchovy abundance estimate was developed using data from the New Jersey Ocean Trawl Survey along with a number of other fishery independent surveys – MD seine survey, MD coastal bay survey, VIMS seine and trawl surveys, DE trawl survey, NJ Delaware River seine survey and the SEAMAP survey.

New prey type selectivity ranks and spatial overlap indices were developed following quantitative algorithms.

Long-term

Two long-term recommendations from the ASMFC MSVPA-X Internal Review regarding data improvement have been addressed. Collection of diet data for adults of all three MSVPA-X predator species for the winter season off of Cape Hatteras, North Carolina has been initiated between the SEAMAP Cooperative Winter Tagging Cruise and VIMS Chesapeake Trophic Interaction Laboratory Services. In addition, an age-structured stock assessment model (ASAP) has been developed and peer reviewed for the coastwide bluefish stock (ASMFC, 2005).

The other long-term research recommendations remain:

- If not achieved before SARC review, add a bluefish age-structure/catch-at-age matrix.
- Adult index for menhaden (e.g., an aerial line transect survey) and other species.
- Obtain population weight-at-age estimates.
- Conduct a coast wide diet and abundance study (i.e., an Atlantic coast "year of the stomach").
- Collect more diet data for all three MSVPA-X predator species along the entire Atlantic coast, especially for nearshore sites, during all seasons.
- Conduct stomach selectivity research for predator species to improve prey ranking matrix.
- Encourage existing fishery-independent surveys to take regular gut contents.

- Evaluate if striped bass disease (mycobacteria) is correlated with natural mortality (M1) and food availability or if disease is disrupting striped bass feeding and causing starvation. The panel noted that if disease affects striped bass feeding in recent years, then using historical striped bass diet data might bias striped bass consumption in the model output.
- Estimate carrying capacity for the system to evaluate what model estimates/suggests for carrying capacity.
- Improve estimates of biomass for prey species on coast wide basis.
- Conduct a parallel comparison with ICES MSVPA model on a system that has the necessary data collected (Georges Bank or the North Sea) to identify the differences in results.
- Explore the ability to add other predators to model (birds, mammals, other fish, other systems).
- Explore the utility of implementing the Williamson spatial overlap index in the model.
- Investigate type II and type III feeding responses of the MSPVPA-X species in field studies.

5.1.3 Recommendations for Base Run & Sensitivity Analyses

The recommendations from the MSVPA-X Internal Peer Review regarding the tasks to necessary to develop a base run, conduct sensitivity analyses in the retrospective model, and to test the forward projecting model were addressed and covered in detail earlier in this report (see Chapters 1, 2, and 3 for additional information).

5.1.4 Recommendations for Forecast Projection Module (Still under development)

- Determine the affect and sensitivity of the model to the removal of all fishing pressure from system
- Insert recovery benchmarks
- Explore options for adaptive management framework with stock-recruitment options