

Atlantic Menhaden Technical Committee Report
February 2-3, 2004

The Atlantic Menhaden Technical Committee met in Baltimore, MD February 2-3, 2004. The Technical Committee addressed the following charges assigned by the Management Board at the Annual Meeting on December 17, 2003. The charges are listed below with a response from the Technical Committee.

1. Review and evaluate the following papers and letters:

- A. "Chesapeake Bay Forage Base Collapse & Interactions of Striped Bass & Atlantic Menhaden" by the Chesapeake Bay Ecological Foundation, INC
- B. "A Recommendation to Amend the Atlantic Menhaden Fishery Management Plan to Protect and Preserve Menhaden's Ecological Role in Chesapeake Bay and Throughout its Range" by the National Coalition for Marine Conservation
- C. Letter from Environmental Defense, RE: Atlantic States Marine Fisheries Commission Menhaden Fishery Management Plan
- D. Statement from Omega Protein to the Atlantic Menhaden Management Board
- E. Letter from CCA
- F. Review the Advisory Panel Report

The Technical Committee should review these documents in their entirety but focus on specific conclusions and recommendations in each. The Technical Committee should respond to the following questions for each document: 1) are the data cited in these reports accurate? 2) Is the use of these data appropriate? 3) Are the conclusions and recommendations realistic and justified and what would it take in the way of additional work to implement those recommendations?

- The TC acknowledges that the issues brought forth by the stakeholders are important to menhaden and the ecosystems in which they reside
- The TC is unable to address the issue of lack of forage and health of predator populations because of a lack of expertise with Striped Bass.
- TC is curious why many of these issues have not been charged to the Striped Bass, Weakfish, or Bluefish TCs
- Some of the letters used data that was not referenced, so it is impossible to adequately assess the statements and resulting recommendations.
- Some of the letters used terms incorrectly (i.e. overfishing of an age class), or used other terms that are subjective (i.e. ecosystem overfishing).
- It is inappropriate to technically review the conclusions and recommendations because of questions of methodology, data sources, and assumptions.
- TC noted that many of the issues brought forward are also charges from the Board and will respond below.

The TC recommends either the formulation of a multispecies technical committee or a series of joint meetings with the technical committees of important predators to address, the role of menhaden as forage, and the impact of forage on the health of predator species.

2. *Examine the issue of localized depletion within Chesapeake Bay, and if concentrated removals of menhaden are of biological concern. Please comment on the ability of the current scientific methods to address this issue, and what future research is required to fully address localized depletion of forage species*

- Recognized that local depletion is an important issue for any species, particularly for forage species such as menhaden.
- Noted a reduction in the numbers of juveniles (age 0-2) and adults as measured by fishery independent indices, resulting from lower recruitment. Lower recruitment could be the result of diminished transport from the spawning ground into Chesapeake Bay, a migration of the primary recruitment center to more northerly areas, or increased predation mortality after menhaden enter the Bay.
- Observed that reduction landings from Chesapeake Bay, while higher as a proportion of the total coast wide catch, are less than they were between 1987-1997 (Figure 1).
- Fewer landings from the Bay are a result of a decrease in effort.
- Removal of forage-sized menhaden (Ages 0-1) is not of concern. Current levels of removals are much less for these ages (0-1) when compared to natural mortality and population size, coast wide.
- There is some debate as to what is “prime forage size” menhaden. Current multispecies assessment, peer reviewed FPM, and other information point to age 0 & 1 as forage size. Some suggest that age 2’s may also be important as forage. The TC will investigate the role of Age 2’s as forage

The current assessment method is not capable of addressing or investigating this issue of local depletion. However, ASMFC’s spatial model may help to address this issue. The TC feels that if a biological concern exists, it would be because of short term (in-season) removals of age classes that may not be of prime forage size.

3. *Determine if ecologically relevant reference points can be derived for the Chesapeake Bay with regards to menhaden extraction and role as forage.*

- Any setting of reference points must be prefaced by an expression of measurable goals and objective that these reference points are designed to achieve. What are the goals?
- The current single species assessment cannot address this issue
- Management can always be more restrictive in setting targets, or threshold reference points as an allocation issue. Targets may be as restrictive as desired, so long as they are sufficiently distinguishable from thresholds.

The TC is not capable of developing biologically defensible reference points specifically for Chesapeake Bay. The forward projection model may address some questions about Chesapeake Bay, given appropriate data needs are met (below). However, the forward

projection model, as currently formulated, and the developing MSVPA are not able to address this question. Both models assess a unit stock and are therefore coastwide models. There is a possibility that a Chesapeake Bay Ecopath model (being developed by NOAA Ches Bay) could be used to evaluate the question, but has not been completed. In addition, the Commission's spatial model may be able to address the request. However, it will not be available until at least 2006. The TC discussed needed information to produce Bay specific reference points:

- 1) Menhaden abundance in Chesapeake Bay
- 2) Migration rates into and out of the Bay, both short term and among seasons
- 3) Chesapeake Bay specific consumption by predators
- 4) Menhaden recruitment indices for Chesapeake Bay

4. *Review Amendment 1 to the Atlantic Menhaden FMP and determine if the management measures achieve the objectives laid out in the plan regarding the ecological role of menhaden.*

- TC cannot evaluate the ecological role of menhaden as filter feeders. TC lacks the proper expertise to address this issue.
- As with other species, reference points are in place using a single species model. No other management measures exist.
- In the event that overfishing or a depleted status is found for menhaden, there are management measures outlined in the FMP to address this issue.
- Current plan objectives, while important in recognizing the role of menhaden in an ecological context, are not currently measurable.
- Because the current model is a single species assessment, the success or failure of any developed management measures would not be measurable.

Currently, the only management measures in the FMP are the fishing mortality and SSB reference points. These reference points, as in other species, were developed in a single species framework. They do not, and cannot address the ecological role. There is no evidence that these reference points will be sufficient in managing menhaden in an ecosystem-based approach. In the future it maybe possible to address reference points using the MSVPA. However, this model is still under development and is not scheduled for peer review until spring 2005.

The TC recommends a workshop with other experts versed in the filtering ability of menhaden, water quality experts, and individuals with knowledge of other ecologically important predator and prey species in Chesapeake Bay. Such a workshop will enlighten the TC on the ecological role of menhaden as filter feeders in coastal embayments.

5. *Clarify change in reference points (SSB to Fecundity) with side-by-side comparison of stock recruitment relationships.*

- Fecundity is a better measure of what the reference point is trying to capture, reproductive output.
- Current SSB reference points do not account for increased egg production of older females. Fecundity reference point account for increases in reproductive potential with age
- Peer reviewers have agreed that fecundity is a better estimate of reproductive output than female SSB
- Improvement in the stock recruitment relationship by moving to fecundity may be swamped by the environmental variables that effect recruitment (Figure 2)

The TC recommends moving to Fecundity and mortality reference points, as outlined in the stock assessment report.

Other issues:

6. *Timing of the assessment for Atlantic Menhaden*

- FMP mandates a “turn of the crank” assessment each year
- The new Forward Projection Model is difficult and time consuming to run (2-3 months) when compared to the Murphy VPA (~2 weeks)
- Removals, independent indices, and stock size have been stable over the past few years
- It is impossible to explore other methods (i.e. spatial model or MSVPA), improving the current assessment, or developing a risk assessment for the current model, if the TC is updating this assessment yearly.
- Many committee members serve on other technical committees. Updating the assessment will hamper their ability update assessments for other species
- Many state and federal agencies have reduced their funding levels, resulting in increased workload for committee members

The TC recommends moving to a “turn of the crank” assessment once every three years. On each non-assessment year the TC will meet to review landings, effort, and fishery independent abundance data. If a significant change from previous years is noted the TC will commence an update of the assessment. The first scheduled update would occur in 2006.

7. *Further management measures*

- TC recognizes that many stakeholders and others are requesting an amendment to address local depletion and ecosystems concerns
- TC acknowledges that these are difficult, yet important issues which need to be addressed
- The current assessment method is not capable of addressing or investigating the issue of local depletion, the role of menhaden as filter feeders, or the role of menhaden as forage

- While new methods are being developed to address some of these concerns, the current single species approach can not address these issues in any measurable way
- Any management goals, objectives, or alternatives currently can not be analyzed

The TC recommends that the board implement an addendum to the Atlantic Menhaden Fishery Management Plan. This addendum should address the issues of changing reference points and changes in the time line for updating the assessment. At this time the TC feels that a full amendment is not warranted because any management measures suggested to address ecosystem concerns would be unmeasurable.

8. The TC has outlined data and surveys which would be important to answering many of the issues brought to the forefront will examining these issues

- Chesapeake Bay absolute Abundance
- Larval studies to distinguish why lower recruitment is observed in Chesapeake Bay (transport or predation)
- Adult index to tune the new model as well as any MSVPA approach (possibly a coastwide LIDAR survey)
- Migration- stock structure studies to ensure that the model is assessing a unit stock
- Relative estuarine productivity studies to measure if production by geographic location has changed over the last few decades

Figure 1: Reduction removals from Chesapeake Bay
1955-present

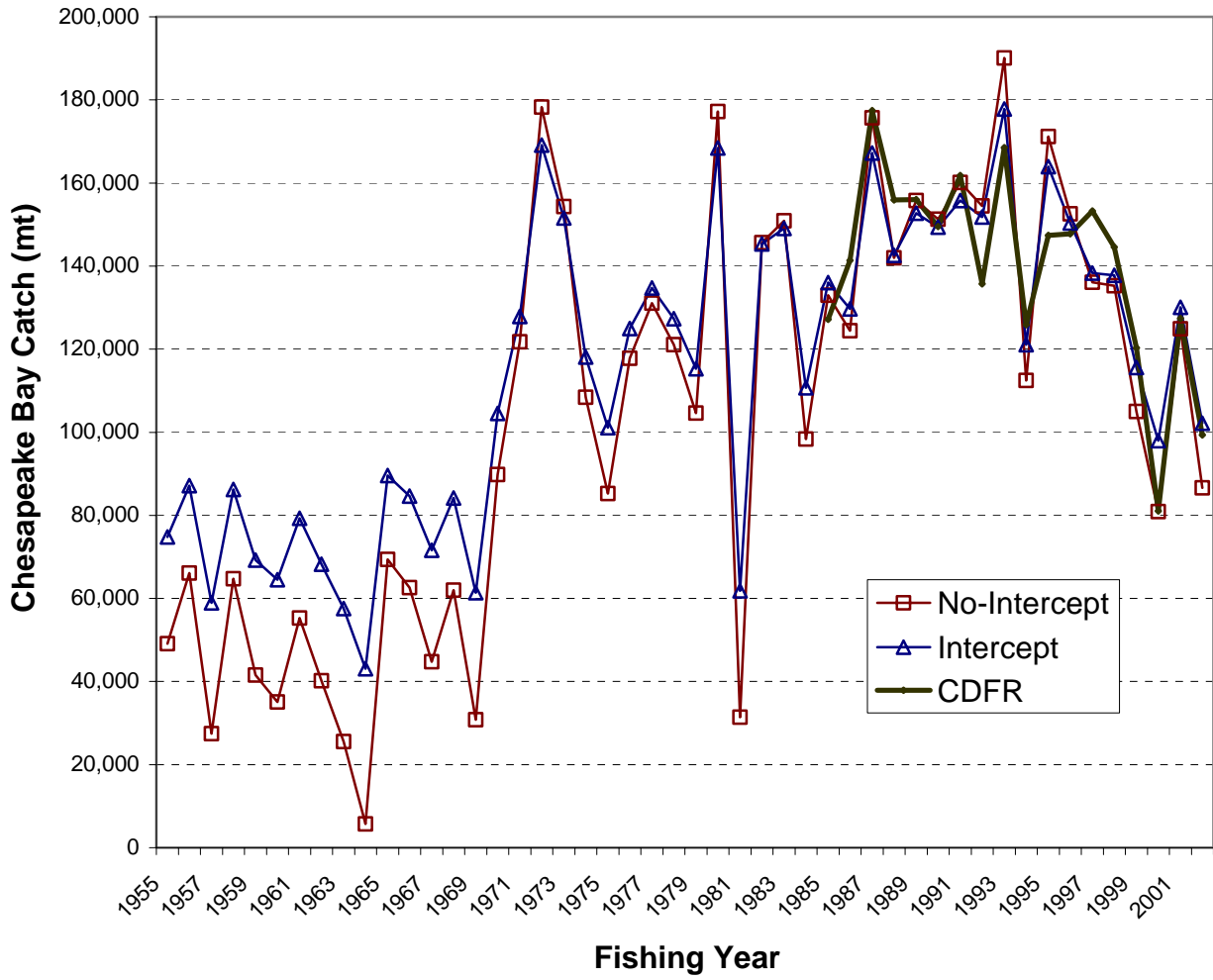
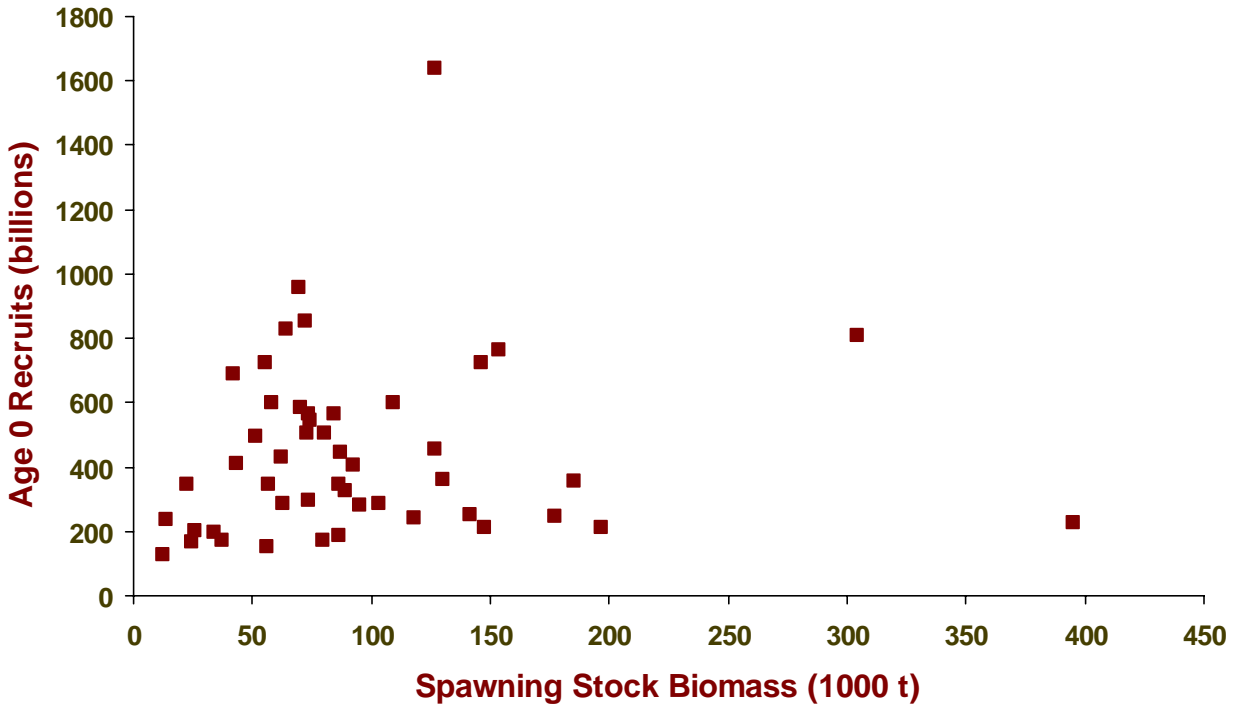


Figure 2: Comparison between SSB and Fecundity

Recruits to Age 0 versus spawning stock biomass for Atlantic menhaden



Recruits to Age 0 versus population fecundity for Atlantic menhaden

