Atlantic Menhaden Technical Committee
Meeting Summary

September 21, 2007
Raleigh, North Carolina

Attendees

Committee Members:
Behzad Mahmoudi, (FL)
Brandon Muffley (NJ)
Alexei Sharov, Chair (MD)
Gary Nelson (MA)
Joseph Smith (NMFS)
John Maiolo (NC)
Douglas Vaughan (NMFS)
Trish Murphey (NC)
Brad Spear, Staff (ASMFC)

Guests
Ken Hinman
Bill Goldsborough
Wilson Laney
Jeff Kaelin

Review of 2007 Menhaden Fishery through August

Coastwide reduction landings through August are 107,203 metric tons. This is up 21% from 2006 for the equivalent time and up 19% from the previous 5-year average for the equivalent time. The fishery this year has consisted of 10 reduction vessels out of Reedville, 3 bait vessels in Virginia, 5-6 bait vessels in New Jersey, and about 2 bait vessels in New England. New England has seen good catches of adult menhaden and large concentrations of 'peanuts'. The Virginia pound net fishery saw one of the 'best spring runs of menhaden in years'. Most of the catches in Chesapeake Bay have been 'down bay' near the mouth.

Port samples continue to be collected providing age structure of the catch. The 2005 year class maintains a strong showing in the samples as age-2 fish.

Brandon Muffley is compiling bait landings and will solicit that information from states as Joe Smith does for the reduction fishery. Brandon will report back to the TC in 2008 on a summary of 2007 bait landings by state and gear.

Questions were raised about monitoring of the Chesapeake Bay reduction harvest cap and confidentiality of the landings data. Every week Omega Protein submits its Captain's Daily Fishing Reports to the NMFS Beaufort Lab. The Lab compiles the landings, breaks them out by area (in and outside the Bay) and submits the summary information monthly to Virginia and ASMFC. Omega has requested that the detailed landings information remain confidential and not be circulated publicly. Virginia is responsible for monitoring the landings against the cap and ensuring that its fishery is in compliance with the current ASMFC management measures.

Defining 'Localized Depletion'
The concept of localized depletion originated outside of ASMFC from stakeholders. Alexei Sharov asked public attendees to comment on their definition of localized depletion. They explained that it's looking at depletion of menhaden with an eye toward availability to predators at the time and area when the prey is needed. Further, the definition of localized depletion must provide a link to management to guide future action. The stakeholders also suggested teasing out environmental and man-made effects.

Behzad Mahmoudi experienced the localized depletion discussion in the 1980s in Tampa Bay with the sardine/herring fishery. There was intense fishing in certain areas for a brief time. No science or data was available to make a determination, so the managers decided to take action based on external pressures that perceived the harvest to negatively affect game fish in the area. Scientists recommended a five-year research project to specifically address the question (with and without control areas), however, the project was never implemented.

John Maiolo noted that a complete definition of localized depletion has to consider human behavior and its effect on localized depletion and vice versa. He argued that humans who are involved with a fishery or ecosystem are part of that ecosystem. The committee agreed and included reference to economic, social/cultural functions in the definition. John further explained that the socioeconomic focus is on the unavailability where and when the people (harvesters—commercial and recreational) want to capture them. Also from this perspective both the commercial the recreational harvesters, like their marine animal counterparts, are not seen as *intruders*, but as *legitimate shareholders* in the allocation of the resource.

Wilson Laney, in the audience, raised the unanswered question of "What is the baseline from which localized depletion can be measured?". Joe Smith provided catch and effort data by areas within Chesapeake Bay from 1990. These data might be useful if the committee attempts to quantify localized depletion.

The committee submits the following definition for the Board's consideration:

> "Localized depletion in the Chesapeake Bay is defined as a reduction in menhaden population size or density below the level of abundance that is sufficient to maintain its basic ecological (e.g. forage base, grazer of plankton), economic, and social/cultural functions. It can occur as a result of fishing pressure, environmental conditions, and predation pressures on a limited spatial and temporal scale."

Research Addressing Localized Depletion
The committee reviewed research projects that fall under the umbrella of research addressing the potential of localized depletion in Chesapeake Bay. It looked at each project on a list provided at the meeting and evaluated its expected usefulness in better understanding localized depletion. The list did not include a few recent projects that have started since the original projects began.

The general conclusion is none of the research projects alone is going to provide the answer to the localized depletion question. However, several projects in combination have the potential to

provide useful pieces of the puzzle. The modeling work led by Steve Martell shows the most promise for a spatial stock assessment that focuses on menhaden stock health in Chesapeake Bay. However, the work is in the conceptual stage and will only be useful if necessary data become available. The main missing component is direct estimates of menhaden movement in and out of Chesapeake Bay by age over the course of one year. This information is not being collected nor are there plans to do so. Possible ways of getting at this is through aerial surveys or tagging studies, both of which have their limitations.

Ed Houde's work on productivity and recruitment of menhaden in the Bay and temporal and spatial variability in growth of menhaden directly addresses important portions of the question but more years of data are needed.

The LIDAR study is the most direct link to answering the localized depletion question. It is designed to provide menhaden abundance estimates in Chesapeake Bay. These estimates can be compared with estimates of abundance outside of the Bay. The LIDAR study is in its second year; 2006 was the pilot phase of the study. The results of the 2007 survey should be available late winter or early spring. Alexei Sharov is optimistic that LIDAR may receive a third year of funding in 2008.

Economic Research on Menhaden

The Board tasked the Technical Committee to briefly review past economics studies on menhaden and evaluate what the current VIMS study will add to the body of knowledge. Peter Schuhmann was asked to take the lead on this. Below is an excerpt taken from a report he provided to the committee at its meeting.

"Research on the economic value of Atlantic menhaden is lacking. Exceptions are Kirkley et al. (2005), who used an input/output model to estimate the economic impact (direct, indirect and induced effects on sales, incomes and jobs) of the menhaden fishery in Virginia. They found that the menhaden fishery contributed approximately $52 million in sales and incomes and supported 281 jobs in 2004. This work did not include an economic assessment of the reduction fishery. In 2006, Southwick Associates published "Menhaden Math", based in part on the Kirkley et al. work, and found that sport fisheries dependent upon menhaden contributed over $235 million to Virginia's economy (also 2004). This value excludes the commercial industry related to the predator species under study, the economic value of the fishery to non-anglers, and the economic value of health benefits associated with products derived from menhaden.

No economic information is available regarding the contribution of menhaden to the health of the ecosystems that they inhabit (filtering and water quality, etc) and the resulting economic values (property, tourism, non-fishing recreation, etc). No economic information is available regarding non-use values for the fishery. Most importantly, none of the available research provides any understanding of how the magnitude or distribution of economic values are dependent upon stock abundance, distribution, or age composition, or how economic values might change following changes in stock or changes in harvest. Of course, this state of affairs is not unique to the menhaden fishery. Finally, with the notable exceptions of work done by Blomo, Orbach and Maiolo, (1985 and 1988 [edited dates]), information on the social, community and livelihood aspects of the fishery – beyond an historical perspective – is nonexistent. If we are to understand

this fishery so as to manage it in a way that provides the greatest net benefits to society (that is what we want to do isn't it?), then there is a great deal of work to be done.

The "Atlantic Menhaden Study", initiated this past summer by researchers at the Virginia Institute of Marine Science (VIMS) and College of William and Mary, proposes a comprehensive economic valuation of the menhaden fishery in the Chesapeake Bay region using state-of-the-art economic valuation techniques. In short, from a purely economic perspective, they are covering all the bases and filling most (if not all) of the gaps. Should the results of this work match what is outlined in the research proposal, we will have a detailed and comprehensive look at the economics of Atlantic menhaden in the Chesapeake Bay region."

"Two years ago, Brian Cheuvront and I proposed three short and relatively inexpensive socioeconomic studies of the fishery to the committee. Many of the ideas that we proposed are included in the VIMS study. Unfortunately, we received no feedback or support for these projects. In light of the VIMS study and John's suggestions, it might be prudent to revisit these ideas to determine what we can add to the state of knowledge. Conducting similar, smaller-scale studies in areas beyond the Chesapeake would provide a sense of the geographical distribution of value and could serve as a reference point to evaluate the VIMS results. This will require a great deal of collaboration and input from other members of the committee as well as individuals outside the committee, as a detailed understanding the economics of the fishery is not possible without first understanding the biological and social aspects of the fishery."

John Maiolo was asked to comment on the economics research evaluation task, and related topics. From the standpoint of sociological issues, the study proposal refers to social impacts on several occasions but the discussion is not clear in terms of specific topics. This becomes more of a concern farther into the proposal in the sections on methods and field protocols. Reference is made there to *ethnographic* field work but the description of field protocols reveals limitations on data gathering that alternatives would otherwise produce more robust information and perhaps a better response rate. John discussed an approach labeled "Social Indicators Analysis" which would produce social and cultural data equivalent to time series economic reports of a locality or group and the data represent actual, not hypothetical, situations one of the methods to be used in the Kirkley study. Some of the initiatives John suggests that need to be done could be included in the Kirkley study at a comparatively low cost. Also, he endorsed the studies proposed by Schuhmann and Cheuvront of several years ago that would address the socio-economic issues in localized depletion as well.

John also noted that Michael Orbach, one of the most respected social scientists in the marine field, is willing to speak to the TC about the notion of integrating social, economic, and cultural matters in to the concept of an ecosystem. ASMFC staff is looking into the timing and venue of such a presentation.

Cooperative Research Meeting Update

A subcommittee of the technical committee is planning to hold a meeting with industry representatives to explore the possibility of implementing a coastwide aerial survey for menhaden. The meeting will likely be held in early November based on industry availability.

Jason McNamee submitted to the committee a brief summary of collaborative research efforts in Rhode Island. The summary is included as Attachment A. Jason expects to formally present results at the cooperative research subcommittee meeting.

Attachment A

Rhode Island Menhaden Collaborative Research Information Document

Presented to the ASMFC Menhaden Technical Committee
9/21/07

Overview

Beginning in 2005, large schools of adult menhaden migrated in to Narragansett Bay during the spring and summer months. The schools of adults had not been seen in large numbers in RI for several years prior to 2005, thus the commercial bait fishery, which is prosecuted in RI state waters, had moved south to the NJ area. With the migratory event back in to Narragansett Bay in 2005, the commercial fishery, based out of Fall River, MA began to fish again in Narragansett Bay. The initiation of activity by the commercial bait fishery in RI waters reinvigorated the user conflicts that have been present in Narragansett Bay and coastwide between commercial menhaden fishing and recreation user groups. This conflict was exacerbated by the introduction of a second large scale commercial bait fishing operation in 2007.

Atlantic Menhaden have been managed in RI through the use of seasons and management areas. Beginning January 9, 2003, purse seining for Menhaden for use in the reduction fishery was prohibited in RI state waters. This regulation is still in effect. In general, Narragansett Bay (hereafter referred to as the Bay) in its entirety is considered a Menhaden Management Area. The management area allows purse seine fishing for menhaden through the main stems of the Bay while excluding most of the major embayments such as Greenwich Bay, Allen's Harbor, Nannaquacket Pond, Kickemuit River, etc. There are also a number of seasonal, weekend, holiday, and Sunday closures for specific areas in the Bay. While the general season is open year round, many of the major embayments have stricter seasonal closures such as in the Providence River and the Hope Island Management area, which are closed to purse seining from August through December 31.

On July 3, 2007 a set of emergency management measures were put in place in RI waters. The term emergency simply refers to the regulatory mechanism that was employed to promulgate the rules, namely making the rules effective immediately with the public hearing to be conducted within 120 days (or the rule will expire). These regulations set forth a daily possession limit for commercial menhaden fishing at 75,000 pounds of fish per vessel per day, a requirement to contact the RI state fisheries enforcement division (RIDEM Law Enforcement) both before and after engaging in fishing in RI waters, and lastly it sets forth a closure trigger based on an estimated standing stock in Narragansett Bay, namely once 50% of the estimated standing stock in Narragansett Bay is harvested, the commercial fishery in the Bay will close.

Collaborative Research and Estimation of Narragansett Bay Standing Stock

The final requirement under the new emergency regulations is the most interesting aspect, yet also the most labor intensive. The data gathering required for this estimation was accomplished through a collaborative research project, which had actually begun prior to the implementation of the emergency rules.

The research consisted of two observers working with and sampling from the commercial fishing operations in Narragansett Bay. The first observer conducted trips to a floating fish trap operator (a stationary commercial fishing gear located at the mouth of the Bay) where she received a landings report from the operation and sampled fish for age analysis (age analysis to be conducted by NMFS laboratory, Beaufort, NC). The observer sampled 16 days at the floating fish trap, which was approximately 60% of the days menhaden were caught at the trap. Logbook data was also collected from the floating fish trap operator.

The second observer conducted trips aboard the commercial purse seining vessels operating in the Bay, where landings data was recorded, as well as some spotter plane observer trips. During the observer trips aboard the fishing vessels, samples were taken for age analysis. Periodically the landed fish were sampled by the observer to develop a temporal index of sexual maturity. The purse seining operations fished 53 days from May 17 until August 9. The observer covered 40 of those 53 days.

A second data source complementing the observer data was achieved through the completion of spotter pilot logbook data. The logbooks captured the abundance of menhaden in Narragansett Bay in both a numerical (weight) and spatial context during each flight day. The majority of the data was collected and recorded by the commercial spotter pilot. The observer working with the purse seine fishery observed 53% (observed 10 of 19 flights) of the trips made by the commercial spotter pilot.

All of the data sources noted above were fed in to a depletion model for open populations developed by Mark Gibson (Deputy Chief, RIDEM Division of Fish and Wildlife), which he in turn adapted and modified from Hilborn and Walters (1992). The basis of the model is to use the spotter pilot log data as both an index of Bay abundance as well as an indicator of emigration, the floating fish trap data as a sentinel indicator of fish immigrating in to the Bay, and landings data as fisheries removal. A natural mortality term is also involved in the model based on the coastwide estimate of natural mortality. This model was used to determine and predict the standing stock of menhaden in the Bay at a given time. This estimate was then compared to landings data to determine the 50% removal closure trigger as required in the regulation.

Future Projects

At the current time the collaborative data collection in RI, despite the labor intensive nature of it, is planned to be continued during the next fishing season (spring through summer of 2008). The model described above continues to be reviewed and will be presented to the ASMFC Menhaden Technical Committee at a later date. RI Sea Grant and RIDEM Division of Fish and Wildlife are cosponsoring a menhaden symposium in November of 2007 (see http://seagrant.gso.uri.edu/fisheries/menhaden/) at which point the depletion model for open populations, developed by Mark Gibson, will be presented.

Citation

Hilborn, R and Walters, C (1992) Quantitative Fisheries Stock Assessment. International Thomson Publishing. 570 pages.