2015 Maryland FMP Report (July 2016)
Section 4. Atlantic Menhaden (*Brevoortia tyrannus*)

Management measures were implemented by the Atlantic States Marine Fisheries Commission (ASMFC) in 2013 in response to the 2012 stock assessment results that indicated the menhaden stock was overfished and overfishing was occurring.[1] Amendment 2 to the ASMFC Interstate FMP established a total allowable catch (TAC) and individual state quotas. The updated 2014 benchmark stock assessment concluded that the menhaden stock is not overfished and overfishing is not occurring.[2] As a result, ASMFC increased the TAC by 10% in 2016 and will consider increasing the TAC again in 2017 until a new amendment is completed and approved for management use (slated for 2018). A socioeconomic study is also being conducted in 2016 for the menhaden bait and reduction fisheries to better understand the economic impacts of management changes. Addendum 1 to Amendment 2 was released for public comment and, if adopted, will provide operational flexibility to Chesapeake Bay pound netters during the 2016 bycatch fishery. The ASMFC has also initiated the development of Amendment 3. The new amendment will focus on evaluating state allocations and will develop new reference points that take into account the ecological importance of menhaden.

ASMFC Fishery Management

A coastal Atlantic menhaden fishery management plan (FMP) was developed by the ASMFC in 1981. The plan was revised in 1992, replaced by Amendment 1(2001: including 5 addenda; 2004, 2005, 2006, 2009 2011) and currently managed under Amendment 2 (2012). The coastal stock has been assessed several times since 1999. The update and revision in 2010 resulted in Addendum V to Amendment 1 (2011) with new biological reference points. The goal of Addendum V was to increase abundance, to increase spawning stock biomass, and to increase menhaden availability as forage. The 2011 threshold and target for biomass was based on a maximum spawning potential (MSP) of 15% and 30%, respectively. Amendment 2 was developed to reduce fishing mortality, to reduce the risk of recruitment failure, to reduce the impacts to other species that are dependent on menhaden as prey, and to minimize adverse effects on the fishery. ASMFC is developing Addendum I (draft for public comment approved in May, 2016) to allow two qualifying commercial fisherman utilizing stationary multispecies gear to harvest two bycatch limits from the same vessel on the same day. This provision was requested by MD DNR and PRFC to accommodate the standard working practices of Chesapeake Bay pound net fishermen. ASMFC continues to place a high priority on developing ecosystem based reference points to address the forage needs of predator species. Menhaden are important prey for many fish, bird and marine mammal species. A workshop on menhaden ecosystem management objectives was conducted by ASMFC in 2014, and another workshop on ecological reference points was conducted in 2015. The outcome of these workshops will be used to guide the development of ecosystem-based reference points. The ASMFC initiated the development of Amendment 3 in May, 2015, with a projected completion date in 2019. Drafting of the public information document is scheduled to begin in mid- to late 2016 to reevaluate the state by state allocation and to complete a socioeconomic study of the Atlantic menhaden commercial fishery. This study began in March, 2016, with an objective to understand the impacts of potential regulation changes on the fishing industry.

There is no Chesapeake Bay fishery management plan (FMP) for Atlantic menhaden. Menhaden was one of the species slated for the development of an ecosystem based fishery management plan (EBFMP). Maryland Sea Grant facilitated the EBFM process and developed biological briefs on key ecosystem topics for menhaden in Chesapeake Bay. More information on the EBFM process and the completed menhaden briefs can be found at the following website: http://www.mdsg.umd.edu/programs/policy/ebfm.

Stock Status

Biological reference points (BRPs) were established in ASMFC Amendment 1 and updated in 2004. A benchmark assessment was conducted during 2009, peer reviewed, and released in 2010. The assessment included two new components: a factor for aging error and natural mortality rates that varied with age and time. The assessment was updated in 2012 with data from 2009 through 2011 and indicated that fishing mortality rates were above the overfishing reference point and overfishing was occurring.[1] Results of the 2012 update were inconclusive to determine if the stock was overfished. The 2010 BRPs were considered interim benchmarks until the 2014 coastal assessment was completed. The BRPs were intended to protect the spawning stock and to take into account the needs of top predators. Stock assessment workshops were conducted in 2014 and the assessment was peer reviewed by the Southeast Data, Assessment and Review (SEDAR) process.[2] The 2014 assessment addressed several issues from the previous assessments. The age at maturity was corrected and selectivity in the fishery was considered and resulted in a higher estimated proportion of age 1, 2, and 3 year old fish in the population. Most significantly, the new assessment used nine new fishery-independent indices rather than the single Chesapeake Bay pound net index that was used in the 2010 assessment. The 2014 benchmark assessment concluded that the Atlantic menhaden resource is not overfished. Total instantaneous fishing mortality was estimated at 0.27, well under the threshold of 2.98 and the target of 1.03. As a result, overfishing is not occurring Details of the 2014 assessment can be found on the ASMFC webpage (www.asmfc.org) under the Atlantic Menhaden fishery page.

Coastal recruitment indices have been generally low since the 1980s. In Maryland, juvenile menhaden are sampled annually through the Estuarine Juvenile Finfish Survey. The index of juvenile menhaden has been low since 1992 (Figure 1). The

development of new management actions and reduced harvest could contribute to higher recruitment but environmental conditions seem to be a major factor driving recruitment.

Management Measures

The coastal overfishing designation in 2013 resulted in management measures to reduce harvest by 20% compared to the 2009 to 2011 average harvest. Based on the 2010 BRPs, a total allowable catch (TAC) of 170,800 MT (376,549,574 lbs.) was calculated for the Atlantic states for 2013. The coastal TAC was allocated state- by-state based on average state landings (2009-2011). Maryland's quota was 1.37% of the TAC or 2,320 MT (5,185,729 lbs.). Maryland's 2014 quota was 5,116,874 lbs. and the 2015 quota was set at 5,628,568 lbs. The Potomac River and Virginia portion of the TAC was 0.62% and 85.32%, respectively. The Virginia quota for 2014 was set at 318,066,790lbs. and 349,873,884 lbs. for 2015. Since Maryland did not have any regulations for menhaden other than a prohibition on purse seining, new regulations were required to implement the ASMFC management measures. Following the 2014 coastal stock assessment, ASMFC increased the TAC by 10% to 187,880 MT for 2015 and 2016 as an interim measure until new reference points and possible allocation changes are addressed in Amendment 3. The increased TAC is to be divided by the allocation set in Amendment 2.

The coastwide commercial menhaden fishery is composed of two different components: the reduction fishery (fish caught by purse seines and processed for fish oil/fish meal) and the bait fishery (fish for other commercial and recreational fisheries such as the blue crab fishery). Purse seining, the predominant gear type for harvesting menhaden, is not allowed in the Maryland portion of the Chesapeake Bay. However, menhaden are harvested from pound nets for the bait fishery. Virginia allows purse seining in the lower bay. Omega Protein has a menhaden reduction plant in Reedville, Virginia, which is the only active menhaden reduction factory on the Atlantic coast. ASMFC Addendum II to Amendment I (2006) established a harvest cap (109,020 MT) for the reduction fishery in Chesapeake Bay. With the adoption of ASMFC Amendment 2, there was a 20% reduction in the harvest cap based on average landings from 2001-2005. The new harvest cap for the Chesapeake Bay reduction fishery is 87,216 MT (192,278,382 lbs.).

The Fishery

The 2015 Maryland open fishery was closed on August 30, 2015 at 12:01am, and landed 5,601,853 lbs.[3] The fishery was then capped at a 6,000 lb. per day bycatch limit for pound net fishermen who held bycatch landing permits and a 1,500 lb. per day limit for all other fisheries. The bycatch fishery landed an additional 1,949,577 lbs. for a total 2015 Maryland harvest of 7,551,430[4] lbs. (Figure 2). The bait fishery in Maryland is primarily a pound net fishery. This single gear type accounted for 90.3% of the 2015 total reported harvest. Virginia's total Atlantic menhaden harvest for 2014 was 326,592,125 lbs.[5] (Figure 3) and includes the reduction and bait fishery from both Chesapeake Bay and Atlantic Ocean. None of the Bay jurisdictions exceeded their open fishery quota since the quotas were enacted in 2013.

Biological monitoring from the Maryland pound net (bait) fishery indicated that the majority of harvested menhaden were age 1 through age 3 fish (97%). Menhaden ages 1 through 5 were present in the samples. Maryland DNR will continue to collect biological data on fish sampled from commercial pound nets.

Issues/Concerns

Significant changes in management were put in place in Maryland on June 29, 2013 to meet the state-specific quotas set forth by ASMFC compliance requirements. The commercial fishery continues to be managed under a coastal TAC with subsequent state quotas. All watermen harvesting menhaden from pound nets are required to obtain a bycatch permit and to report their catch on a daily basis. Once the fishery is closed a bycatch limit of 6,000 lbs. per day is allowed for permit holders. Non-permit holders are restricted to a 1,500 lb. bycatch limit.

Menhaden have a unique role in the Chesapeake Bay ecosystem as both a primary filter-feeder and an important forage species for top predators (striped bass, bluefish, osprey, etc.). The development of ecosystem based biological reference points would be useful for managing the stock. Menhaden support a major commercial fishery and are the Bay's largest fishery by weight. Consequently, they are an economically important species.

Two ways to improve the menhaden stock assessments (and recommended by ASMFC) are the development of a coastwise fishery-independent survey to assess adult abundance at age and better estimates of natural mortality by age class.

Figure 1. Geometric mean catch per haul of menhaden juveniles in the Maryland portion of the Chesapeake Bay, 1959-2015.[6]

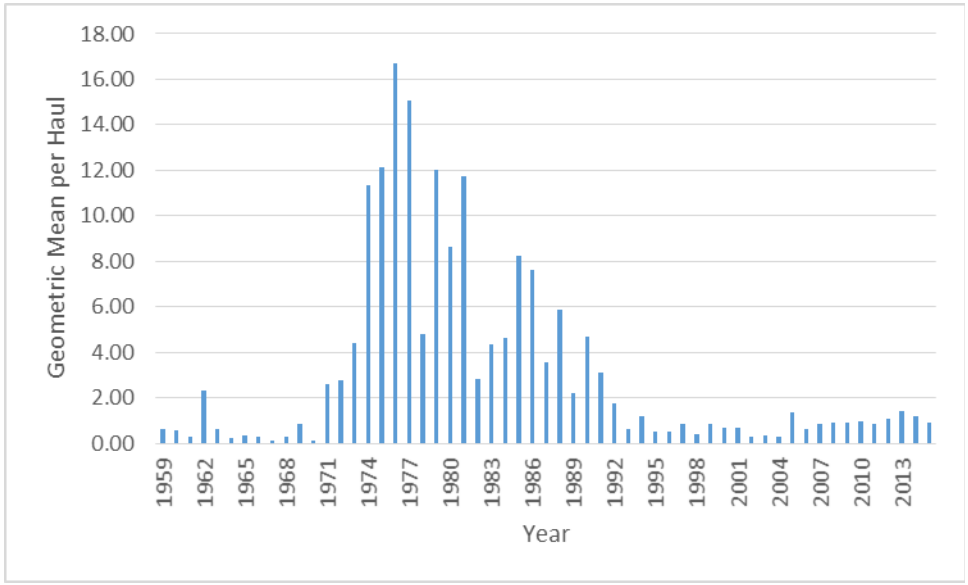


Figure 2. Maryland Atlantic menhaden commercial landings, 1981-2015.

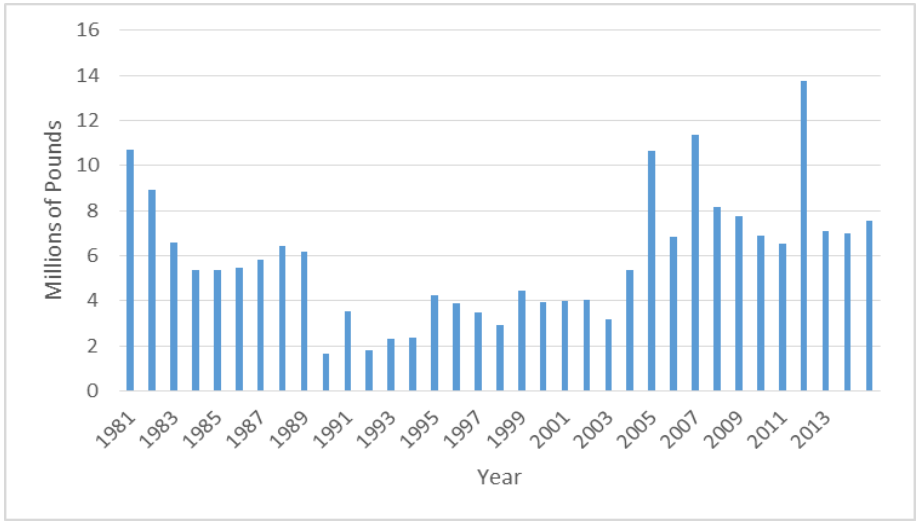
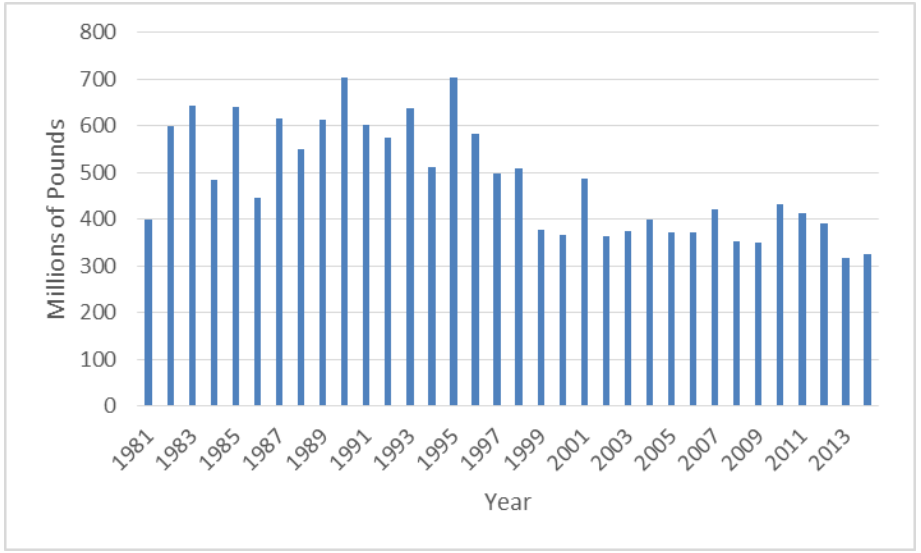


Figure 3. Virginia Atlantic menhaden commercial landings, 1981-2014.



References

[1]ASMFC 2012. 2012 Atlantic Menhaden Stock Assessment Update. A publication of the Atlantic States Marine Fisheries Commission. Arlington, VA. 213pp.

[2]SEDAR. 2015. SEDAR 40 - Atlantic Menhaden Stock Assessment Report. SEDAR, North Charleston SC, 643 pp. available online at: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=40.

[3]Rickabaugh, H.W. 2016. Maryland Atlantic Menhaden (Brevoortia tyrannus) Compliance Report to the Atlantic State Marine Fisheries Commission – 2015

[4]From Maryland's mandatory commercial reporting system. Personnel communication march 2016.

[5]Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, November 12, 2015.

[6]Durell, E.Q., and Weedon, C. 2015. Striped Bass Seine Survey Juvenile Index Web Page. http://dnr2.maryland.gov/fisheries/Pages/juvenile-index/index.aspx. Maryland Department of Natural Resources, Fisheries Service.