

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR ATLANTIC MENHADEN
(Brevoortia tyrannus)

2017 FISHING YEAR



Prepared by the Plan Review Team

Approved by the Atlantic Menhaden Management Board
May 2018

**REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN AND STATE COMPLIANCE FOR
ATLANTIC MENHADEN (*Brevoortia tyrannus*) FOR THE 2017 FISHERY**

Management Summary

<u>Date of FMP:</u>	Original FMP: August 1981
<u>Amendments:</u>	Plan Revision: September 1992 Amendment 1: July 2001 Amendment 2: December 2012 Amendment 3: November 2017
<u>Management Unit:</u>	The range of Atlantic menhaden within U.S. waters of the Northwest Atlantic Ocean, from the estuaries eastward to the offshore boundary of the Exclusive Economic Zone (EEZ).
<u>States With Declared Interest:</u>	Maine – Florida, including Pennsylvania
<u>Additional Jurisdictions:</u>	Potomac River Fisheries Commission, National Marine Fisheries Service, United States Fish and Wildlife Service
<u>Active Boards/Committees:</u>	Atlantic Menhaden Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Plan Review Team, Plan Development Team, Biological Ecological Reference Point Work Group
<u>Stock Status:</u>	Not overfished, and overfishing is not occurring (2017 stock assessment update)

I. Status of the Fishery Management Plan

Atlantic menhaden management authority is vested in the states because the vast majority of landings come from state waters. All Atlantic coast states and jurisdictions, with the exception of the District of Columbia, have declared an interest in the Atlantic menhaden management program.

The first coastwide fishery management plan (FMP) for Atlantic menhaden was passed in 1981 (ASMFC 1981). The 1981 FMP did not recommend or require specific management actions, but provided a suite of options should they be needed. In 1992, the plan was revised to include a suite of objectives intended to improve data collection and promote awareness of the fishery and its research needs (ASMFC 1992).

Amendment 1, passed in 2001, provided specific biological, ecological and socioeconomic management objectives for Atlantic menhaden. No recreational or commercial management measures were implemented as a result of Amendment 1; however, subsequent addenda instituted a harvest cap on the reduction fishery in the Chesapeake Bay, based on average landings from 2001-2005. Two addenda (Addendum I and V) revised the biological reference points for menhaden and specified that stock assessments are to occur every three years.

Amendment 2, approved in December 2012, established a 170,800 metric ton (metric tons) total allowable catch (TAC) for the commercial fishery beginning in 2013. This TAC represented a 20% reduction from average landings between 2009 and 2011. The 2009-2011 time period was also used to allocate the TAC among the jurisdictions. In addition, the Amendment established requirements for timely reporting of commercial landings and required states to be accountable for their respective quotas by paying back any overages the following year. Amendment 2 also included provisions that allowed for the transfer of quota between jurisdictions and a bycatch allowance of 6,000 pounds per day for non-directed fisheries that operate after a jurisdiction's quota has been landed. Further, it reduced the Chesapeake Bay reduction fishery harvest cap by 20% to 87,216 metric tons.

In May 2013, the Board approved Technical Addendum I which established an episodic events set aside program. This program set aside 1% of the coastwide TAC for the New England states (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut) to harvest Atlantic menhaden when they occur in higher abundance than normal. In order to participate in the program, a state must reach its individual quota prior to September 1, implement daily trip level harvester reporting, restrict harvest to state waters, and implement a daily trip limit no greater than 120,000 pounds/vessel. At its October 2013 meeting, the Board extended the episodic event set aside program through 2015, adding a provision that re-allocated unused set aside as of October 31 to the coastwide states based on the same allocation percentages included in Amendment 2. At its May 2016 meeting, the Board again extended the episodic events program until final action on Amendment 3 and added New York as an eligible state to harvest under the program.

At its May 2015 meeting, the Board established a TAC of 187,880 metric tons for the 2015 and 2016 fishing years. This represented a 10% increase from the 2013 and 2014 TAC. In October 2016, the Board approved a TAC of 200,000 metric tons for the 2017 fishing year, representing a 6.45% increase from the 2015 and 2016 TAC.

In August 2016, the Board approved Addendum I which added flexibility to the bycatch provision by allowing two licensed individuals to harvest up to 12,000 pounds of menhaden bycatch when working together from the same vessel using stationary multi-species gear. The intent of this Addendum was to accommodate cooperative fishing practices that traditionally take place in the Chesapeake Bay.

At its February 2014 meeting, the Board passed a motion to manage cast net fisheries for Atlantic menhaden under the bycatch allowance for 2014 and 2015, with the states bearing responsibility for reporting. At its November 2015 meeting, the Board approved a motion to continue the management of cast net fisheries under the bycatch allowance for 2016. In February 2017, the Board extended management of the cast net fishery under the bycatch provision until implementation of Amendment 3.

Amendment 3 to the Atlantic Menhaden Fishery Management Plan:

The Board approved Amendment 3 in November 2017. First, Amendment 3 maintains the management program's current single-species biological reference points until the review and adoption of menhaden-specific ERPs as part of the 2019 benchmark stock assessment process. In doing so, the Board placed the development of menhaden-specific ERPs as its highest priority and supports the efforts of the Ecological Reference Point Work Group (ERP WG) to reach that goal (see *Section III*). The intent of menhaden-specific ERPs is to provide a method to assess the status of menhaden not only in regard to their own sustainability, but also in regard to their interactions with predators and the status of other prey species. The benefit of this approach is that it allows fishery managers to consider the harvest of menhaden within a broad ecosystem context, which includes other fish, birds, mammals, and humans who utilize and depend on marine resources.

Amendment 3 also changes commercial quota allocations in order to strike an improved balance between gear types and jurisdictions, and to facilitate future growth opportunities. The Amendment allocates a baseline quota of 0.5% to each jurisdiction, and then allocates the rest of the TAC based on historic landings between 2009 and 2011. This measure provides fishing opportunities to states which had little quota under Amendment 2, while still recognizing historic landings in the fishery. Furthermore, states have the option to relinquish all or part of their quota by December 1st of the preceding fishing year. Any relinquished quota is then redistributed to the other jurisdictions based on the historic landings period (2009-2011). The Amendment also prohibits the rollover of unused quota; maintains the quota transfer process; maintains the 6,000 pound trip limit for non-directed and small-scale gears following the closure of a directed fishery; and sets aside 1% of the TAC for episodic events in the states of Maine through New York.

Finally, the Amendment reduces the Chesapeake Bay cap, which was first implemented in 2006 to limit the amount of reduction harvest within the Bay, to 51,000 metric tons. This recognizes the importance of the Chesapeake Bay as nursery grounds for many species by capping recent reduction landings from the Bay to current levels.

In addition to its Amendment 3 deliberations, the Board set the TAC for the 2018 and 2019 fishing seasons at 216,000 metric tons. This represents an 8% increase from the 2016 and 2017 TAC.

II. Status of the Stock

Threshold reference points are the basis for determining stock status. When the fishing mortality rate (F) exceeds the F -threshold, overfishing is occurring. When the reproductive output measure, in this case population fecundity (FEC), falls below its threshold, then the stock is overfished, meaning there is insufficient egg production to replenish the stock.

Amendment 2 (2013) implemented maximum spawning potential (MSP) based reference points that relate current stock conditions as a percent of unfished conditions. Considering the modeling and data input changes that occurred in the 2015 Benchmark Stock Assessment, the TC and Peer Review Panel recommended new MSP based reference points that are applicable to the results of the assessment (SEDAR 2015). These new reference points were accepted by the Board in 2015 and continue to be used under Amendment 3 (2017).

As recommended by the Peer Review Panel, and accepted by the TC, the values of the threshold and target fishing mortality reference points are calculated as the maximum and median geometric mean fishing mortality rate for ages-2 to -4 during the reference period of 1960-2012. These ages represent the fully selected fishing mortality rates depending upon the year and fishery (i.e., bait and reduction). The fecundity (FEC) reference points match the F reference points meaning they are equal to the fecundity estimated when F reaches equilibrium at its target and threshold MSP levels, respectively.

According to the 2017 stock assessment update (ASMFC 2017), the fishing mortality reference points are F -target ($F_{36\%MSP}$) = 0.80 and F -threshold ($F_{21\%MSP}$) = 1.85. Associated reference points for population fecundity are FEC -target ($FEC_{36\%MSP}$) = 99,467 (billions of eggs), and FEC -threshold ($FEC_{21\%MSP}$) = 57,295 (billions of eggs). Based on the 2017 stock assessment, overfishing is not occurring because fishing mortality for the terminal year (2016) is estimated to be $F = 0.51$ ($F_{48\%MSP}$), below both the target and the threshold. Additionally, the stock is not overfished because fecundity for 2016 is estimated to be $FEC = 83,486$ billion eggs, above the threshold but below the target.

A benchmark assessment is expected to be completed and peer-reviewed at the end of 2019.

III. Progress of the Ecological Reference Point Work Group

The Ecological Reference Point Work Group (ERP Work Group; formerly known as the BERP Work Group) has been tasked with developing menhaden-specific ecosystem reference points that account for the abundance of menhaden and the species role as a forage fish. In 2017, the ERP Work Group held three workshops to review candidate ERP models. The candidate models include a Bayesian surplus production model with a time-varying population growth rate, a Steele-Henderson model which permits non-fisheries effects (predation and environment) to be quantified and incorporated into the single species stock assessments, and a multispecies statistical catch-at-age model in which single species models are linked to provide a predator-prey feedback between the population models. An Ecopath with Ecosim model is also being evaluated for strategic planning purposes and exploring tradeoffs.

The ERP Work Group decided to continue to pursue the development of each modeling approach until available data has been full vetted. A Data Workshop is scheduled for April 2018. It is expected that a peer-review of the menhaden-specific ERP model(s) will coincide with the peer-review of the singles-species benchmark assessment at the end of 2019.

V. Status of the Fishery

Recreational

Menhaden are important bait in many recreational fisheries; some recreational fishermen employ cast nets to capture menhaden or snag them with hook and line for use as bait, both dead and live. Recreational harvest is not well captured by the Marine Recreational Information Program (MRIP) because there is not a known identified direct harvest for menhaden, other than for bait. MRIP intercepts typically capture the landed fish from recreational trips as fishermen come to the dock or on the beach. However, since menhaden caught by recreational fishermen are used as bait during their trip, they are typically not a part of the catch that is seen by the surveyor completing the intercept.

The preliminary MRIP estimate of Atlantic menhaden harvest in 2017 is 1,067,309 pounds. This is a 36% decrease from the 2016 recreational harvest estimate (1,674,912 pounds), but only 5% below the previous 5-year average (1,118,214 pounds).

Commercial

Total commercial Atlantic menhaden landings in 2017, including reduction, bait, bycatch, and episodic event set aside (EESA) landings, was 380.85 million pounds. The bycatch landings¹ of 2.60 million pounds do not count toward the coastwide commercial TAC of 440.9 million pounds. The non-bycatch landings² total was 378.12 million pounds, representing a 14% underage of the coastwide TAC in 2017, and a 4.7% decrease from the 396.8 million pounds landed in 2016³.

Reduction Fishery

The 2017 harvest for reduction purposes was 284.2 million pounds. This represents a 6.2% decrease from 2016 reduction landings, and is 8% below the previous 5-year average of 310.2 million pounds (Figure 1). Omega Protein's plant in Reedville, Virginia, is the only active Atlantic menhaden reduction factory on the Atlantic coast.

Bait Fishery

The preliminary estimate of the coastwide bait harvest for 2017, including directed, bycatch and EESA landings, is 96.62 million pounds; this is a 1.8% increase from the 2016 bait harvest, and is 5.2% less than the previous 5-year average of 101.9 million pounds (Figure 1). New Jersey

¹ Landed under the 6,000 pound bycatch allowance

² Directed landings and episodic events set aside landings, combined

³ Based on 2018 state compliance reports

(49%), Virginia (33%), Maine (4.2%), Massachusetts (3.8%), and Maryland (3.0%) landed the five largest shares.

Bycatch Landings

In 2017, the states of Maine, New Hampshire, Rhode Island, Connecticut, New York, Delaware, PRFC and Florida reported bycatch landings (Table 1). Preliminary bycatch landings in 2017 totaled 2.73 million pounds, which represents a 6% increase from 2016 bycatch landings⁴. The 2017 bycatch landings accounted for approximately 0.72% of the coastwide landings, but do not count towards the coastwide TAC. Although bycatch increased in 2017, this may not be an issue considering the large increase in state-specific quotas in 2018. It should also be noted that due to unusual computer programming errors, PRFC closed its 2017 directed fishery earlier than is typical. As a result, PRFC's combined directed landings and bycatch landings in 2017 were less than its 2017 quota.

A total of 3,387 trips landed bycatch of Atlantic menhaden in 2017, which is a 78% increase relative to 2016 (1,908 trips) but 6% below average from 2013-2017. A majority of the bycatch trips (73%) landed less than 1,000 pounds in 2017 (70% on average from 2013 through 2017; Table 2). The predominant gears used from 2013-2017 include pound nets (56%) and anchored/staked gill nets (24%). Refer to Table 3 for average landings under the bycatch allowance from 2013-2017 by gear type and jurisdiction.

Episodic Events Set Aside Program

One percent of the TAC is set aside for episodic events. Episodic events are defined as any instance when a qualified state has reached its individual state quota prior to September 1, and has information indicating the presence of unusually large amounts of menhaden in its state waters. In 2017, Maine, Rhode Island, and New York⁵ declared participation in the set aside. In total, 4.69 million pounds were harvested under the set aside which represents a 6% overage of the 4.41 million pound set aside quota and a 23% increase from 2016. The overage (285,398 pounds) will be deducted from the 2018 set aside quota. The resulting quota for 2018 is 4.48 million pounds.

VI. Status of Research and Monitoring

Commercial fisheries monitoring

Reduction fishery - The NMFS Southeast Fisheries Science Center Beaufort Laboratory in Beaufort, North Carolina, continues to monitor and process landings and biological sample data collected from the Atlantic menhaden purse-seine reduction fishery. The Beaufort Laboratory processes and ages all reduction samples collected on the East Coast. In addition, the purse-seine reduction fishery continues to provide Captains Daily Fishing Reports (CDFRs) to the

⁴ Based on the 2018 state compliance reports, estimated bycatch landings for 2016 totaled 2,581,534 pounds

⁵ While not a New England state, New York was approved by the Board in May 2016 to harvest under the set aside program. This exemption is codified in Amendment 3.

Beaufort Laboratory where NMFS personnel enter data into a database for storage and analysis.

Bait fishery - Per Amendment 2 (and Amendment 3), states are required to implement a timely quota monitoring system in order to maintain menhaden harvest within the TAC and minimize the potential for overages. The SAFIS daily electronic dealer reporting system allows near real time data acquisition for federally permitted bait dealers in the Mid-Atlantic and Northeast. Landings by Virginia's purse-seine for-bait vessels (snapper rigs) in Chesapeake Bay are tabulated (at season's end) using CDFRs maintained on each vessel during the fishing season. A bait-fishery sampling program for size and age composition has been conducted since 1994. The Beaufort Laboratory, and some states, age the bait samples collected. See *Section VII: Implementation for FMP Compliance Requirements for 2017* for further information on age and length sampling requirements.

Atlantic menhaden research

The following studies relevant to menhaden assessment and management have been published within the last year:

- Whitehead, J.C., and Harrison, J. 2017. Socioeconomic Analysis of the Atlantic Menhaden Commercial Bait and Reduction Fishery. A report to the Atlantic States Marine Fisheries Commission:
http://www.asmfc.org/files/Atlantic%20Menhaden/ASMFC_MenhadenSocioeconomicReport_June2017.pdf
- Able, K.W., Valenti J.L., and Grothues, T.M. 2017. Fish Larval Supply to and within a Lagoonal Estuary: Multiple Sources for Barnegat Bay, New Jersey." *Environmental Biology of Fishes* 100.6: 663-83
- Aguilar et al. 2017. Gutsy Genetics: Identification of Digested Piscine Prey Items in the Stomach Contents of Sympatric Native and Introduced Warmwater Catfishes Via DNA Barcoding. *Environmental Biology of Fishes* 100.4: 325-36
- Allen, D.M., Virginia, O.M., and Kenny, P.D. 2017. Nekton use of Flooded Salt Marsh and an Assessment of Intertidal Creek Pools as Low-Tide Refuges." *Estuaries and Coasts* 40.5: 1450-63
- Anstead, K.A., Schaffler, J.J., and Jones, C.M. 2017. Contribution of Nursery Areas to the Adult Population of Atlantic Menhaden. *Transactions of the American Fisheries Society* 146.1 (2017): 36-46
- Güt, J.A., and Curran, M.C. 2017. Assessment of Fish Assemblages before Dredging of the Shipping Channel Near the Mouth of the Savannah River in Coastal Georgia. *Estuaries and Coasts* 40.1: 251-67
- Kornis et al. 2017. Linking the Abundance of Estuarine Fish and Crustaceans in Nearshore Waters to Shoreline Hardening and Land Cover." *Estuaries and Coasts* 40.5: 1464-86

- Korsman, B.M., Kimball M.E., and Hernandez, F.J. 2017. Spatial and Temporal Variability in Ichthyoplankton Communities Ingressing through Two Adjacent Inlets Along the Southeastern US Atlantic Coast. *Hydrobiologia* 795.1: 219-37
- Schueller, A.M., and Williams, E.H. 2017. Density-Dependent Growth in Atlantic Menhaden: Impacts on Current Management. *North American Journal of Fisheries Management* 37.2: 294-301
- Valenti, J.L., Grothues, T.M., and Able, K.W. 2017. Estuarine Fish Communities Along a Spatial Urbanization Gradient. *Journal of Coastal Research* SI.78: 254-68
- Vasslides, J.M., and Jensen, O.P. 2017. Quantitative Vs. Semiquantitative Ecosystem Models: Comparing Alternate Representations of an Estuarine Ecosystem. *Journal of Coastal Research* SI.78: 287-96
- Vasslides, J.M., et al. 2017. Modeling the Effects of a Power Plant Decommissioning on an Estuarine Food Web. *Estuaries and Coasts* 40.2: 604-16

Theses and Dissertations of Potential Interest:

- Liljestrand, Emily Morgan. 2017. Mortality and Movement of Adult Atlantic Menhaden during 1966-1969. Order No. 10618597 University of Maryland, College Park
- Siple, Margaret Clark. 2017. Implications of Demographic Diversity for Forage Fish, their Fisheries, and Ecosystems. Order No. 10680836 University of Washington

VII. Implementation of FMP Compliance Requirements for 2017

All states are required to submit annual compliance reports by April 1.

Quota Monitoring and Results

Menhaden purse seine and bait seine vessels (or snapper rigs) are required to submit Captain's Daily Fishing Reports (CDFRs). Maine, New York and Virginia fulfilled this requirement in 2017. New Jersey did not require purse seine vessels to fill out the specific CDFR but did require monthly trip level reporting on state forms that include complementary data elements to the CDFR. Rhode Island purse seine vessels must call in daily reports to RI DFW and fill out daily trip level logbooks. Massachusetts requires trip level reporting for all commercial fishermen.

Through Amendment 2, the Board approved timely quota monitoring programs for each state that were intended to minimize the potential for quota overages. Table 5 contains a summary of each state's approved quota monitoring system.

Table 4 contains state specific quotas and harvest that occurred in 2017. Table 5 displays the breakdown in directed versus bycatch landings by jurisdiction. The final state quotas for 2017 include an adjustment from two inter-state quota transfers; North Carolina transferred 195,180 pounds to Maine, and 300,000 pounds to New York. These quota transfers were pursued to ameliorate overages. Quota overages resulted from the fact that there was a high and/or variable volume of landings over a short period of time relative to the size of the quota.

At their November 2017 meeting, the Board set the 2018 TAC at 216,000 metric tons (476.2 million pounds), an 8% increase from the 2017 TAC. State-specific quotas for the 2018 fishing year are displayed in Table 4. The 2018 quota for Massachusetts, Rhode Island, and Delaware will be reduced by the amount of their overage in 2017. Furthermore, Massachusetts indicated that its quota overage was due to a single transaction being inadvertently categorized as “Research Set-Aside” and thus omitted from totals during quota monitoring. Rhode Island indicated that it went from being under its quota to over its quota in one day. However, this should not be a problem considering both states quotas increased significantly under the Amendment 3 allocations.

Biological Monitoring Requirements

Amendment 2 implemented monitoring requirements for non *de minimis* states as follows:

- One 10-fish sample (age and length) per 300 metric tons landed for bait purposes for ME, NH, MA, RI, CT, NY, NJ, and DE; and
- One 10-fish sample (age and length) per 200 metric tons landed for bait purposes for MD, PRFC, VA, and NC.

Table 6 provides the number of 10-fish samples required for 2017. These are based on the best available 2017 total bait landings data (including bycatch and episodic events) provided to the Commission by the states. Table 6 also provides the number of ages and lengths collected by the states in 2016, and an indication of the gear type sampled during collections. All states met the biological monitoring requirements of Amendment 2 in 2017. Connecticut continued to collect age and length samples from fishery-independent sources to fulfill this requirement. Although Maine collected five of six required samples, the PRT determined that Maine made a strong effort to fulfill the sampling requirement, and likely would have succeeded if the fishery were open another week (Maine DMR collects samples from the menhaden bait fishery once per week while the directed fishery is open, and Maine’s directed fisheries were only open for 5-weeks in 2017).

The PRT discussed whether a sufficient number of samples are being collected from different gear types and regions, and whether additional sampling should be conducted from bycatch fisheries. The 2019 benchmark provides an opportunity for the Technical Committee to evaluate age and length data from commercial bait fishery catches and respond to the PRT’s comments.

Adult CPUE Index Requirement

Amendment 2 required that, at a minimum, each state with a pound net fishery must collect catch and effort data elements for Atlantic menhaden as follows; total pounds landed per day, number of pound nets fished per day. These are harvester trip level ACCSP data requirements. In May of 2013, the Board approved North Carolina’s request to omit this information on the basis that it does not have the current reporting structure to require a quantity of gear field by

harvesters or dealers⁶. All other states with a pound net fishery met this requirement. New Jersey did note, however, that there appeared to be some confusion in the reporting of effort. New Jersey Staff is working with industry to clarify the reporting requirement.

Chesapeake Bay Reduction Fishery Cap

In 2017, and under the provisions of Amendment 2, the Chesapeake Bay Cap for the reduction fishery was set at 98,192 metric tons (87,216 metric tons plus an eligible rollover of 10,976 metric tons from the 2016 fishing year). Reported reduction landings from the Chesapeake Bay for 2017 was about 20,000 metric tons, which is below the Cap.

Amendment 3 implemented a change to the Chesapeake Bay Harvest Cap for the reduction fishery, starting in 2018. The Cap is set at 51,000 metric tons which is roughly the average harvest from the Chesapeake Bay reduction fishery over the 5-year time period from 2012-2016. Harvest for reduction purposes shall be prohibited within the Chesapeake Bay when 100% of the cap is harvested from the Chesapeake Bay. Harvest above the Cap in any given year will be deducted from the next year's allowable harvest. Transfer of quota to the Cap to reduce an overage is not permitted. Furthermore, any amount of un-landed fish under the cap cannot be rolled over into the subsequent year. As a result, the cap in a given year cannot exceed 51,000 metric tons.

De Minimis Status

To be eligible for *de minimis* status, a state's bait landings must be less than 1% of the total coastwide bait landings for the most recent two years. State(s) with a reduction fishery are not eligible for *de minimis* consideration. If granted *de minimis* status by the Board, states are exempt from implementing biological sampling as well as pound net catch and effort data reporting. The Board also approved a *de minimis* exemption for New Hampshire, South Carolina and Georgia from implementation of timely reporting

The states of New Hampshire, Pennsylvania, South Carolina, Georgia, and Florida requested and qualify for *de minimis* status for the 2017 fishing season. As a result, the Plan Review Team (PRT) recommends that New Hampshire, Pennsylvania, South Carolina, Georgia, and Florida be granted *de minimis* status.

VIII. State Implementation of Amendment 3

2018 is the first year of Amendment 3 implementation. State implementation plans were due January 1 with regulations to be implemented by April 15. Implementation plans were to include proposed, or already implemented regulatory language which fulfills each of the requirements of Amendment 3. Following review, the PRT determined that each state has fulfilled the requirements of Amendment 3, with one exception; Virginia's 2018 harvest cap for the reduction fishery in the Chesapeake Bay is higher than that permitted under Amendment 3

⁶ North Carolina indicated that it may be able to provide a proxy for this information on an annual basis from existing information collected on permits. The state will consider this for the 2018 compliance report.

(Virginia's 2018 quota is more conservative than that permitted under Amendment 3). South Carolina's and Georgia's implementation plan indicated that if a directed fishery develops in its jurisdiction, it would submit an updated implementation plan outlining all mechanisms to fulfill the requirements of Amendment 3 for Board review and approval.

IX. Plan Review Team Recommendations

Management Recommendations

- That the Board approve the *de minimis* requests from New Hampshire, Pennsylvania, South Carolina, Georgia, and Florida.

IX. Literature Cited

- Atlantic States Marine Fisheries Commission (ASMFC). 1981. Fishery Management Plan for Atlantic Menhaden. 146 pp.
- ASMFC. 1992. Fishery Management Plan for Atlantic Menhaden 1992 Revision. 170 pp.
- ASMFC. 2001. Amendment 1 to the Interstate Fishery Management Plan for Atlantic Menhaden. 146 pp.
- ASMFC. 2004. Addendum I to Amendment 1 to the Interstate Fishery Management Plan for Atlantic Menhaden. 52 pp.
- ASMFC. 2011. Addendum V to Amendment 1 to the Interstate Fishery Management Plan for Atlantic Menhaden. 17 pp.
- ASMFC. 2012. Amendment 2 to the Interstate Fishery Management Plan for Atlantic Menhaden. 114 pp.
- ASMFC. 2013. Technical Addendum I to Amendment 2 to the Interstate Fishery Management Plan for Atlantic Menhaden. 4 pp.
- ASMFC. 2016. Addendum I to Amendment 2 to the Interstate Fishery Management Plan for Atlantic Menhaden. 12 pp.
- ASMFC. 2017. Atlantic Menhaden Stock Assessment Update. Prepared by the ASMFC Atlantic Menhaden Stock Assessment Subcommittee. 180 pp.
- Southeast Data, Assessment, and Review (SEDAR). 2015. SEDAR 40 – Atlantic Menhaden Stock Assessment Report. SEDAR, North Charleston SC. 643 pp.

Table 1. Directed, bycatch, and episodic landings (pounds) for 2017 by jurisdiction.
 NA = not applicable.

	Directed	Bycatch	Episodic
ME	344,130	699,874	C
NH	-	C	-
MA	3,697,744	-	-
RI	153,408	135,748	C
CT	76,152	123,666	-
NY	509,430	807,392	C
NJ	46,881,174	-	NA
DE	58,174	26,625	NA
MD	2,912,256	-	NA
PRFC	1,444,316	670,447	NA
VA	316,592,852	-	NA
NC	755,136	-	NA
SC	-	-	NA
GA	-	-	NA
FL	4,475	263,643	NA

Table 2. Total number of bycatch trips by year from 2013-2017 separated into 1,000 pound landings bins.

Bins (LBS)	2013 Trips	2014 Trips	2015 Trips	2016 Trips	2017 Trips	Total Trips	% of Total Trips 2013-2017
1-1000	1,875	3,673	3,146	1,450	2,458	12,602	70%
1001-2000	252	517	584	148	399	1,900	11%
2001-3000	148	318	316	73	135	990	5%
3001-4000	110	190	139	48	82	569	3%
4001-5000	131	206	132	48	94	611	3%
5001-6000	158	265	196	108	197	924	5%
6000+	130	109	140	33	22	434	2%
Total	2,804	5,278	4,653	1,908	3,387	18,030	

Table 3. Average landings under the bycatch allowance from 2013–2017 by gear type (stationary and mobile) and jurisdiction. Highlighted cells represent the gear type with the highest landings within a jurisdiction. (C) = confidential landings, and (-) = no landings. Total confidential landings are 121,906 pounds (i.e., the sum of all C's in the table below). Note that 'sum of pounds' and 'percent of total' columns do not include confidential data.

State/Jurisdiction	ME	NH	RI	CT	NY	NJ	DE	MD	PRFC	VA	FL	Sum lbs (NonConf)	% of Total
Stationary Gears While Fishing													
Pound net	-	-	64,545	-	183,813	C	-	1,579,981	682,950	90,087	-	2,601,376	56.37%
Anchored/stake gill net	39,860	-	C	C	25,100	79,850	30,622	15,777	3,213	892,409	C	1,086,831	23.55%
Pots	-	-	-	-	3,425	-	C	C	-	-	C	3,425	0.07%
Fyke nets	-	-	-	-	-	C	-	C	52	62	-	114	0.00%
Mobile Gears While Fishing													
Cast Net	-	-	C	563	183,813	C	-	C	-	-	173,150	357,526	7.75%
Drift Gill net	-	-	-	-	-	66,958	35,988	-	-	-	-	102,946	2.23%
Purse Seine	201,344	-	-	-	-	-	-	-	-	-	-	201,344	4.36%
Seines Haul/Beach	-	-	-	-	250,433	-	-	C	28	3,072	-	253,533	5.49%
Trawl	-	C	C	C	7,836	C	-	-	-	-	-	7,836	0.17%
Hook & Line	-	-	C	C	-	-	-	C	-	-	C	-	0.00%
Sum lbs (NonConf)	241,204	0	64,545	563	654,420	146,807	66,610	1,595,758	686,243	985,630	173,150	4,614,930	
% of Total	5.23%	0.00%	1.40%	0.01%	14.18%	3.18%	1.44%	34.58%	14.87%	21.36%	3.75%		

Table 4: State quota reporting timeframes in 2017. The **bold** text indicates which reporting program (dealer or harvesters) the states use to monitor its quotas.

State	Dealer Reporting	Harvester Reporting	Notes
ME	monthly	monthly/daily	Harvesters landing greater than 6,000 lbs must report daily during episodic event
NH	weekly	monthly	Exempt from timely reporting. Implemented weekly, trip level reporting for state dealers.
MA	weekly	monthly/daily	Harvesters landing greater than 6,000 lbs must report daily
RI	twice weekly	quarterly/daily	Harvesters using purse seines must report daily
CT	weekly/monthly	monthly	No directed fisheries for Atlantic menhaden
NY	Weekly	monthly	Capability to require weekly harvester reporting if needed
NJ	weekly	monthly	All menhaden sold or bartered must be done through a licensed dealer
DE	—	monthly/daily	Harvesters landing menhaden report daily using IVR
MD	monthly	monthly/daily	PN harvest is reported daily, while other harvest is reported monthly.
PRFC	—	weekly	Trip level harvester reports submitted weekly. When 70% of quota is estimated to be reached, then pound netters must call in weekly report of daily catch.
VA	—	monthly/weekly/daily	Purse seines submit weekly reports until 97% of quota, then daily reports. Monthly for all other gears until 90% of quota, then reporting every 10 days.
NC	monthly (combined reports)		Single trip ticket with dealer and harvester information submitted monthly. Larger dealers (>50,000 lbs of landings annually) can report electronically, updated daily.
SC	monthly (combined reports)		Exempt from timely reporting. Single trip ticket with dealer and harvester information.
GA	monthly (combined reports)		Exempt from timely reporting. Single trip ticket with dealer and harvester information.
FL	monthly/weekly (combined reports)		Monthly until 50% fill of quota triggers implementation of weekly.

Table 5. Results of 2017 quota accounting in pounds. The 2017 landings do not include bycatch landings because they do not count towards the TAC. The episodic events set aside quota was exceeded by 285,398 pounds in 2017. The 2018 quotas account for overages which occurred in the 2017 fishery and the redistribution of 6,704,365 pounds of quota relinquished by Delaware (2 million pounds), South Carolina (2,347,183 pounds) and Georgia (2,357,183 pounds).

State	2017 quota	Returned Set Aside	Transfers	Total 2017 Quota	2017 Landings	Overage	2018 Quota (Amendment 3)	
ME	171,882	Set Aside Exceeded by 285,398 pounds	195,180	367,062	344,130	-	2,439,114	
NH	131		131		-	-	2,357,315	
MA	3,660,454			3,660,454	3,697,744	37,290	6,027,724	
RI	78,195			78,195	153,408	75,213	2,366,618	
CT	76,152			76,152	76,152	-	2,432,640	
NY	242,032			300,000	542,032	509,430	-	3,270,675
NJ	48,853,880				48,853,880	46,881,174	-	52,013,736
PA	-				-	-	-	2,357,183
DE	57,646				57,646	58,174	528	415,939
MD	5,991,662				5,991,662	2,912,256	-	9,002,733
PRFC	2,709,809				2,709,809	1,444,316	-	5,102,086
VA	372,443,990				372,443,990	316,592,852	-	376,543,327
NC	2,150,995			(495,180)	1,655,815	755,136	-	4,540,560
SC	-				-	-	-	10,000
GA	-				-	-	-	-
FL	74,279				74,279	4,475	-	2,443,819
TOTAL	436,511,109				436,511,109	373,429,247	113,031	471,323,470

Table 6. Biological monitoring results in 2017. Note that total bait landings include bycatch landings.

State	Total Bait Landings (pounds)	#10-fish samples required	#10-fish samples collected	Age samples collected	Length samples collected	Gear/Comments
ME	4,015,309	6	5 ¹	50	50	purse seine
MA	3,697,744	5.6	5	50	50	purse seine (4), midwater trawl (1)
RI	1,752,756	3	9	107	107	floating fish trap ²
CT ³	199,818	1	0	0	0	gill nets
NY	1,576,560	2	6	60	60	gill net, seine
NJ	46,881,174	71	140	1400	1400	purse seine (135), and other gears (5)
DE	84,799	1	1	225	225	drift gill net
MD	2,912,256	7	21	300	1058	pound net
PRFC	2,114,763	5	13	130	130	pound net
VA	32,360,092	74	92	920	920	pound net (35), gill net (44), haul seine (13)
NC	755,136	2	10	138	138	gillnet, pound net
Total	96,350,407	177	302	3380	4138	

¹ Sample schedule was once weekly for the duration of the directed and episodic fisheries; these fisheries were open for only 5 weeks and therefore the last required sample was not collected. However, the PRT determined that Maine made a strong effort to fulfill the biological monitoring requirement, and would have succeeded if the fishery were open another week.

² Thirteen lengths and ages were collected in addition to the table

³ Ages (228) and lengths (239) collected from menhaden encountered during the Long Island Sound Trawl Survey

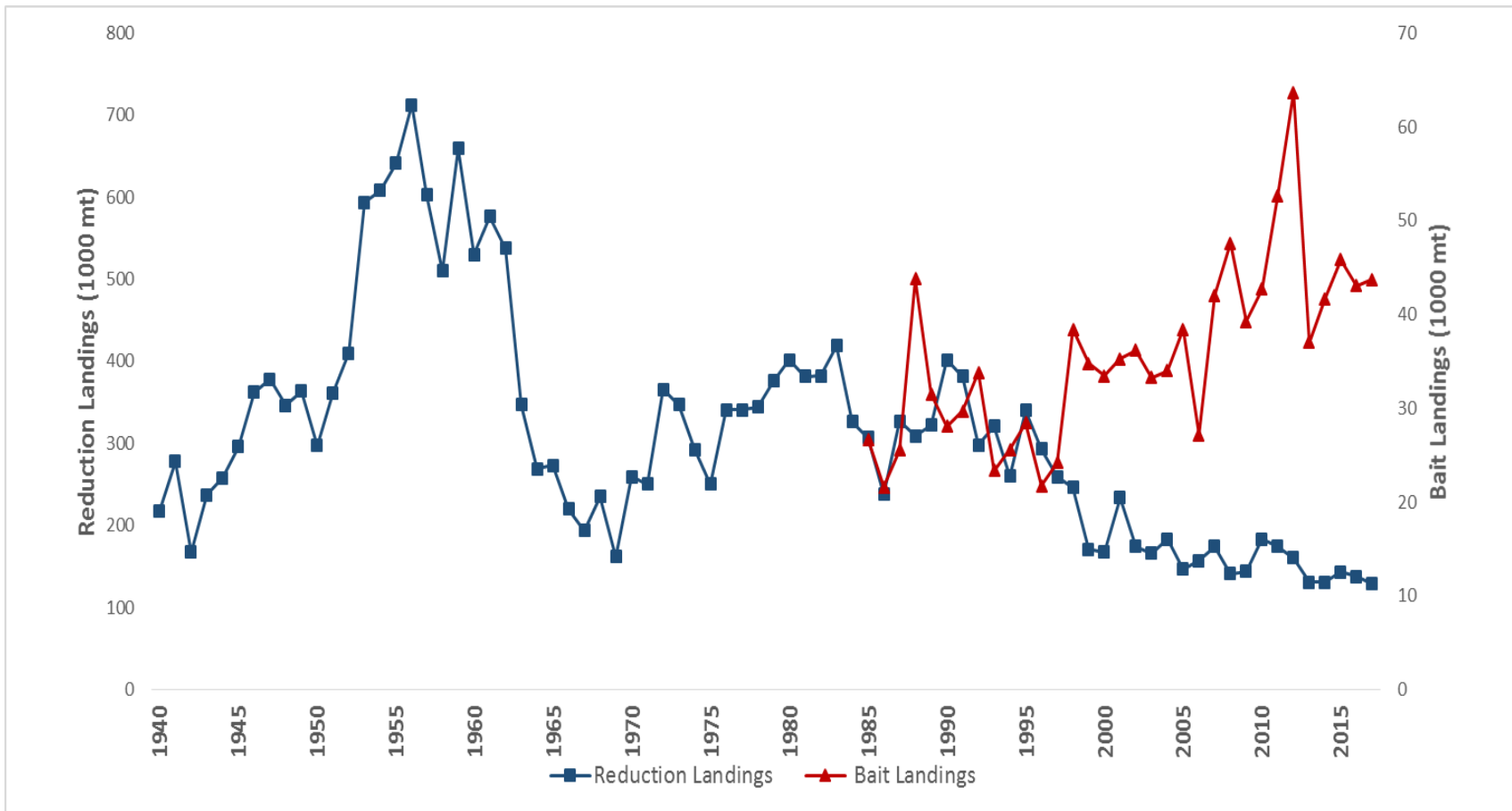


Figure 1. Landings from the reduction purse seine fishery (1940–2017) and bait fishery (1985–2017) for Atlantic menhaden. Note: there are two different scales on the y-axes.