ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR ATLANTIC MENHADEN
(Brevoortia tyrannus)

2015 FISHING YEAR

Prepared by the Plan Review Team

Approved by the Atlantic Menhaden Management Board
May 2016

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

Management Summary

Date of FMP:	Original FMP: August 1981
Amendments:	Plan Revision: September 1992 Amendment 1: July 2001 Amendment 2: December 2012
Management Unit:	Maine through Florida
States With Declared Interest:	Maine – Florida, (Pennsylvania added in 2016))
Additional Jurisdictions:	Potomac River Fisheries Commission, National Marine Fisheries Service, United States Fish and Wildlife Service
Active Boards/Committees:	Atlantic Menhaden Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Plan Review Team, and Plan Development Team.
Stock Status:	Not overfished, and overfishing is not occurring (benchmark assessment; ASMFC 2015)

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 except the District of Columbia have declared an interest in the Atlantic menhaden management program.

Amendment 1 to the Interstate Fisheries Management Plan (FMP) for Atlantic Menhaden was approved at the 2001 Spring Meeting of the Atlantic States Marine Fisheries Commission (Commission). The goal of Amendment 1 was "to manage the Atlantic menhaden fishery in a manner that is biologically, economically, socially, and ecologically sound while protecting the resource and those who benefit from it." The amendment established new overfishing/overfished definitions based on fishing mortality and spawning stock biomass (SSB). Addendum I to Amendment 1, approved in August 2004, revised the biological reference points, changed the frequency of stock assessments, and updated the habitat section. The biomass target and threshold were based on fecundity instead of SSB. A new fishing mortality target and threshold were also adopted. Stock assessments were to take place every third

year; however, the Technical Committee was required to meet annually to review the previous year's landings and indices.

Addendum II, approved in October 2005, initiated a research program to examine the possibility of localized depletion of menhaden in Chesapeake Bay. Read more about the research in Section V of this report. Addendum III, approved in Fall 2006, established a harvest cap for the reduction fishery in the Chesapeake Bay. The annual total allowable harvest from the Chesapeake Bay by the reduction fishery was set at 109,020 metric tons. If harvest was greater than the cap in a given year, the cap would be reduced by the overage amount for the following year. Similarly, if harvest was less than the cap, the cap could be increased to a maximum of 122,740 metric tons for the following year. The cap established by Addendum III remained in effect through the 2010 fishing season. Addendum IV, approved in November 2009, extended the provisions of Addendum III and the Chesapeake Bay reduction fishery harvest cap through 2013.

Addendum V, approved in November 2011, established a new F threshold and target rate based on maximum spawning potential (MSP) with the goal of increasing abundance, spawning stock biomass, and Atlantic menhaden availability as a forage species.

Amendment 2, approved in December 2012, established a 170,800 metric ton (mt) total allowable catch (TAC) for the commercial fishery beginning in 2013 and continuing until completion of, and Board action on, the next benchmark stock assessment, scheduled for 2014. The TAC is allocated by state based on landings history of each state's fishery from 2009-2011; allocation will be revisited three years after implementation. States are accountable for their respective quotas and must pay back any overages the following year. The amendment includes provisions to allow for the transfer of quota between states and a bycatch allowance of 6,000 pounds for non-directed fisheries that are operating after a state's quota has been landed. Further, it reduces the Chesapeake Bay reduction fishery harvest cap by 20%; and establishes requirements for timely reporting and improved biological monitoring. Lastly, new SSB reference points were implemented that match the MSP based fishing mortality reference points approved through Addendum V.

In early 2013, the Board approved a one-year exemption from Amendment 2's bycatch allowance provision to enable two permit holders fishing aboard one vessel to harvest 12,000 pounds (one landing event per calendar day). Beginning in 2014, all states were limited to the amendment's 6,000 pound per vessel bycatch trip limit regardless of the number of permit holders on the vessel (one landing event per calendar day).

An episodic events set aside program, approved in May 2013, established 1% of the coastwide TAC as a set aside quota for the New England States (ME, NH, MA, RI, CT) to harvest Atlantic menhaden when they occur in higher abundance than normal (see Technical Addendum I to Amendment 2). An eligible state must have reached its individual quota prior to September 1 before harvesting from the set aside. For a New England state to be eligible, it must

demonstrate that it meets the mandatory provisions (i.e., daily reporting, 120,000-pound trip limit, restricting harvest to state waters). At its October 2013 meeting, the Board extended the episodic event set aside program through 2015 adding a re-allocation provision, meaning any unused set aside as of October 31 of each year will be re-allocated to the coastwide states based on the same allocation percentages included in Amendment 2.

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 provision for 2016.

At its May 2015 meeting, the Board established a 414.2 million pound TAC (187,880 mt) for both 2015 and 2016 fishing years. This represents a 10% increase from the 2013 and 2014 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 has recommended new MSP based reference points that are applicable to the results of the assessment (ASMFC 2015).

As recommended by the Peer Review Panel, and accepted by the TC, the value of fishing mortality reference points will be the geometric mean of fishing mortality on ages-2 to -4. 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.

As a result, the fishing mortality reference points are *F*-target ($F_{57\% MSP}$) = 0.38 and *F*-threshold ($F_{26\% MSP}$) = 1.26. Associated reference points for population fecundity are *FEC*-target ($FEC_{57\%MSP}$) = 189,270 (billions of eggs), and *FEC*-threshold ($FEC_{26\%MSP}$) = 86,821 (billions of eggs). Based on the 2015 stock assessment, overfishing is not occurring because fishing mortality for the terminal year (2013) is estimated to be *F* = 0.22 ($F_{70\%MSP}$), below both the target and the threshold. Additionally, the stock is not overfished because fecundity for 2013 is estimated to be *FEC* = 170,536 billion eggs, above the threshold and just below the target.

The MSP based reference points continue to be interim reference points while the ASMFC's Biological Ecological Reference Points Workgroup (BERP) develops ecological-based reference points (ERP) expected in 2019 or 2020.

The next stock assessment will be an update assessment in 2017.

III. Status of Assessment Advice

The peer review panel report contains of the 2015 Benchmark Stock Assessment contains the Panel's conclusions and recommendations for moving forward. Below is a summary of their applicable findings.

The panel reached consensus on all its recommendations and conclusions. The research, data collection, and assessment methodology recommendations of the assessment team were generally supported by the panel; overall the panel was very impressed with both the thoroughness and the clarity of the assessment reports.

- The panel recommends that the length composition data from the fishery independent surveys be down-weighted during the model fit. This change was implemented, demonstrating that the conclusions of the assessment would not be affected by this change. The panel also suggests that future analyses consider the covariance structure in the input parameters to lessen inflation of the estimated magnitude of uncertainty.
- The panel supports the development of ecological reference points (ERPs) to reflect the entire role of the species in the Atlantic coastal ecosystem, especially the inclusion of predator and prey relative abundances as a priority. However, the panel cautioned to maintain "minimum sufficient complexity" when developing ERPs.
- The panel endorses the acquisition of age composition data for the fishery independent surveys and the completion of a management strategy evaluation guided by an inclusive structured decision making process.

IV. Status of the Fishery

<u>Recreational</u>

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 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. Since menhaden caught by recreational fishermen are used as bait during their trip, they will not be a part of the catch that is typically seen by the surveyor completing the intercept.

The MRIP estimated harvest of Atlantic Menhaden in 2015 was 914,572 pounds.

Commercial

Total commercial Atlantic menhaden landings in 2015 (preliminary), including reduction, bait, bycatch, and episodic event set aside (EESA) landings, was 416.5 mil pounds. The bycatch landings[1] of 5.9 mil pounds do not count toward the coastwide commercial TAC of 414.2 mil pounds. The non-bycatch landings total was 410.6 mil pounds, representing a 1% underage of the coastwide TAC in 2015, and a 10.5% increase from the 371.7 mil pounds landed in 2014. The increase from 2014 was expected because of the 10% increase in the TAC that occurred in 2015.

Reduction Fishery

The 2015 harvest for reduction purposes was 316.2 mil pounds. This represents a 9.4% increase from the 2014 landings, and a 1.8% decrease from the previous 5-year (2010-2014) average of 321.9 mil pounds (Figure 1). Omega Protein's plant, at Reedville, Virginia, is the only active Atlantic menhaden reduction factory on the Atlantic coast. During 2015, seven purse seine steamers unloaded Atlantic menhaden for reduction at Reedville, Virginia.

Bait Fishery

The preliminary estimate of the coastwide directed bait harvest for 2015 is 92.5 mil pounds; this is a 10.6% increase from the 2014 bait harvest, and a 10.4% decrease from the average harvest of the previous five years (2010-2014) 102.1 mil pounds (Figure 1). New Jersey (51%), Virginia (35%), Maryland (6%), Massachusetts (3%), and the Potomac River Fisheries Commission (2.5%) landed the five largest shares while all other states landed less than 1% of the 2015 commercial bait harvest.

Bycatch Landings

Bycatch landings in 2015, harvested under the 6,000 pound bycatch allowance, totaled 5.9 mil pound) which represents a 10% decrease from 2014 bycatch landings. The 2015 bycatch landings accounted for approximately 1.4% of the coastwide landings, but do not count towards the coastwide TAC. From 2013 through 2015, the Chesapeake Bay jurisdictions of Maryland (41%), Virginia (25%), and PRFC (15%) comprised 81% of the average bycatch with the states of New Jersey, New York, Delaware, Florida, and Rhode Island accounting for the remaining 19% (Table 2). The predominant gears used from 2013-2015 were pound nets (61%) and gill nets (24%), which accounted for 85% of the average landings from 2013 through 2015 (Table 2).

[1] Landed under the 6,000 pound bycatch allowance

Table 1. Average landings under the bycatch allowance from 2013–2015 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 were 209,277 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	MD	VA	PRFC	NY	NJ**	FL	DE	RI*	Sum lbs (NonConf)	% of Total
Stationary Gears While Fishing										
Pound net	2,306,552	122,913	884,843	128,854	C	-	-	57,231	**3,500,393**	60.9%
Anchored/stake gill net	5,131	1,242,512	-	-	100,202	C	28,998	C	**1,376,843**	24.0%
Pots	10,001	-	-	C	-	C	C	-	**10,001**	0.2%
Fyke nets	C	C	-	-	C	-	-	-	**918**	0.0%
Mobile Gears While Fishing										
Cast Net	C	-	-	183,137	C	163,776	-	C	**346,913**	6.0%
Drift Gill net	16,082	57,794	-	18,175	129,620	-	66,117	-	**287,788**	5.0%
Seines Haul/Beach	C	5,119	-	206,587	-	-	-	-	**211,706**	3.7%
Trawl	-	-	-	9,733	C	-	-	C	**9,733**	0.2%
Hook & Line	C	-	-	-	-	C	-	C	**278**	0.0%
Sum lbs (NonConf)	**2,337,766**	**1,428,339**	**884,843**	**546,485**	**229,822**	**163,776**	**95,116**	**57,231**	**5,744,572**	
% of Total	40.7%	24.9%	15.4%	9.5%	4.0%	2.9%	1.7%	1.0%		

A total of 4,668 trips landed bycatch of Atlantic menhaden in 2015. A majority of the bycatch trips (68%) landed less than 1,000 pounds from 2013 through 2015 (Table 2). Maryland reported occurrences of pound net bycatch trips that were over the 6,000 pound limit because some license holders were using two vessels to legally land more than 6,000 pounds a day.

Table 2. Total number of trips by year from 2013-2015 separated into 1,000 pound landings bins.

Bins (LBS)	2013 Trips	2014 Trips	2015 Trips	Total Trips	% of total trips 2013-2015
1-1000	1,875	3,673	3,163	8,711	68%
1001-2000	252	517	582	1,351	11%
2001-3000	148	318	316	782	6%
3001-4000	110	190	139	439	3%
4001-5000	131	206	132	469	4%
5001-6000	158	265	196	619	5%
6000+	130	109	140	379	3%
Total	**2,804**	**5,278**	**4,668**	**12,750**	

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. The states of Maine, Massachusetts and Rhode Island all qualified for the set aside program because they implemented mandatory fishery management provisions of the set aside (i.e., daily reporting, 120,000 pound trip limit, restricting harvest to state waters). In 2015, only one state—Rhode Island—declared participation in the set aside (on May 29). Rhode Island harvested 1.9 mil pounds from the set aside in 2015, and the remaining unused set aside

of 2.3 mil pounds was re-allocated to all the coastal states on November 1, 2015 using the allocation percentages from Amendment 2.

V. 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 bio sample data collected on 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 Beaufort Laboratory where NMFS personnel enter data into a database for storage and analysis.

Bait fishery - The SAFIS daily electronic dealer reporting system allows near real time data acquisition for federally permitted bait dealers in the Mid-Atlantic and Northeast. However, 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 (of mostly the purse-seine catch) has been conducted since 1994. In New Jersey and New England, state fisheries personnel collect and process the bait samples and forward the data to the NMFS Beaufort Laboratory. Maryland has been collecting age and length samples since 2005. In 2010, the Potomac River Fisheries Commission began collecting samples for size and age composition from their pound net fishery; Beaufort Laboratory personnel process the fish. The Beaufort Laboratory ages all bait samples collected.

Atlantic menhaden research

The following research projects relevant to menhaden assessment and management have been recently completed:

- Publication: *Lynch, P. , Brush, Mark J., and Latour, Robert J. 2011. Simulated short-term impacts of the Atlantic Menhaden reduction fishery on Chesapeake Bay water quality. North American Journal of Fisheries Management 31(1): 70-78.*
    - A simulation study was performed to estimate the monthly and annual water quality impacts caused by the reduction fishery harvesting its current total allowable catch in Chesapeake Bay of Atlantic menhaden, a filter-feeding fish that consume phytoplankton. The study concluded that average feeding rates are relatively low and that the probable impact of the fishery on water quality is negligible.
- Publication: *Lozano, C. & Houde, E. D. 2013. Factors contributing to variability in larval ingress of Atlantic menhaden, Brevoortia tyrannus. Estuarine, Coastal and Shelf Science 118:1-10.*
    - A larval ingress study was conducted at the Chesapeake Bay mouth during 2005-2008. Two peaks in larval menhaden spawning activity were identified –

one in November/December and a second in January/February – with stronger recruitment resulting from the later pulse. Environmental variables were not correlated consistently with temporal and spatial variability in abundance of larvae at ingress. Larval abundance was not correlated with juvenile survey abundance in the three study years.

- Report (Not peer-reviewed, funded by Omega Protein): *Sulikowski, J., Morgan, A., Carlson, A., and Butterworth, D. 2012. Inferences from aerial surveys on the abundance of Atlantic menhaden from outside the normal fishery range: implications for improved management of this resource.*
    - A pilot study was initiated to test the feasibility of an aerial survey for menhaden in New England to estimate the abundance of ages 3+ that may reside outside the area fished. The ratio of estimated biomass for the northern vs. southern region was estimated through the use of commercial spotter plane data from the fishery. Results suggest that biomass estimates of menhaden in absolute terms for the New England survey was negatively biased, possibly due to deep-swimming schools not observed. The relative biomass ratio suggested that New England biomass may be more than twice that of southern region biomass.

The following research projects relevant to menhaden assessment and management are ongoing:

- Dr. Robert Latour of the Virginia Institute of Marine Science is developing a statistical design for an aerial survey of adult Atlantic menhaden along the Eastern Seaboard of the United States. An aerial survey could be used to develop a coastwide adult index of abundance which is currently lacking in the stock assessment. Funding for implementation of the aerial survey has not been identified.
- Dr. Cynthia Jones and Mr. Jason Schaffler of Old Dominion University are using stable isotope and trace element analyses to assess Atlantic menhaden population structure and connectivity, and to identify essential areas. Signatures of juvenile menhaden from Massachusetts to Florida are being determined and adults collected from the fishery are being assigned back to region of origin. To date, age-1 trace element analysis is complete, and juvenile signature analysis from 2009-2011 is nearly complete.
- Drs. Edward Houde and David Secor at the University of Maryland Center for Environmental Science Chesapeake Biological Laboratory are comparing the precision of relative abundance estimates of YOY menhaden sampled by seining and mid-water trawling gears in principal sub-estuaries of the Chesapeake Bay. Hydrographic and environmental correlates associated with YOY menhaden catches will be investigated. Size, age, and spatial variability of YOY caught will be compared with Maryland DNR juvenile index surveys. The first field season was completed in 2012; however, funding for future research is uncertain.

VI. Status of Management Measures and Issues

Amendment 2 was adopted in December of 2012, and was implemented on July 1, 2013 (see Section I for FMP details).

The Board placed a high priority on continuing work on developing ecosystem reference points using a multispecies modeling approach (MSVPA). Ecosystem reference points would explicitly address the forage needs of menhaden's predator species such as striped bass, weakfish, and bluefish. This work is anticipated to take some time because of its complexity.

The Board has initiated Amendment 3 to the FMP which will consider ecosystem based reference points and a revisit of allocation. Amendment 3 is expected to be developed during the 2016 and 2017 fishing years for possible implementation in 2018.

VII. Implementation of FMP Compliance Requirements for 2015

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

Quota Results
The final state quotas for 2015 include an adjustment from the reallocation of unused episodic event set aside that occurred on November 1, as well as two inter-state quota transfers (Table 3). Massachusetts transferred 33,685 pounds to Rhode Island and 475,000 pounds to New York to cover quota overages that occurred within those states in 2015. Table 3 contains state specific quotas and harvest that occurred in 2015. Table 4 displays the breakdown in directed versus bycatch landings by jurisdiction.

The 2016 TAC is the same as it was in 2015 at 414.2 mil pounds (187,880 mt). State-specific quotas are displayed in Table 3. New Jersey's and Florida's 2016 quotas will be reduced by the amount of their overages in 2015 unless inter-state quota transfers are processed.

Quota Monitoring
All menhaden purse seine and bait seine vessels (or snapper rigs) are required to submit the Captain's Daily Fishing Reports (CDFRs). States that have purse seine and bait seine fisheries met the CDFR requirements in 2015.

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. Quota overages occurred in four states in 2015 (Table 3). The PRT recommends the Board consider requiring more timely reporting for New York because of its quota overage in 2015 (and 2014). Overages in Rhode Island and Florida are attributed to high and/or variable daily landings rates relative to their small quotas. New Jersey's overage was a result of delinquent dealer reports from the purse seine fishery.

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 2015. These are based on the best available 2015 landings data (including bycatch) provided to the Commission by the states. Table 6 also provides the number of ages and lengths collected by the states in 2015, and an indication of the gear type sampled during collections. All states met the biological monitoring requirements of Amendment 2 in 2015.

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 dealers. All other states with a pound net fishery met this requirement.

Chesapeake Bay Reduction Fishery Cap

Amendment 2 implemented a change to the Chesapeake Bay Cap for the reduction fishery, starting in 2013 and continuing indefinitely. More specifically, the new cap is 87,216 metric tons (a 20% reduction from 109,020 which was the average landings from 2001-2005). Harvest for reduction purposes shall be prohibited within the Chesapeake Bay when 100% of the 87,216 cap is harvested from the Chesapeake Bay.

Reported reduction landings from the Chesapeake Bay for 2015 was less than 50,000 metric tons (110.2 mil pounds). The maximum rollover of unlanded fish is 10,976 metric tons (a 20% reduction from the prior maximum rollover amount of 13,720 metric tons). As a result, the 2016 Chesapeake Bay Cap for the reduction fishery is 98,192 metric tons. The rollover applies to the following year only, and will not be carried for multiple years.

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 implementation of biological sampling and 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 2016 fishing season. As a result, the PRT recommends that New Hampshire, Pennsylvania, South Carolina, Georgia, and Florida be granted *de minimis* status.

VIII. Plan Review Team Recommendations

Management Recommendations

- That the Board consider the reporting timeframe of New York to minimize future quota overages.
- That the Board consider the *de minimis* requests from New Hampshire, Pennsylvania, South Carolina, Georgia, and Florida.

IX. Literature Cited

Southeast Data, Assessment, and Review (SEDAR). 2015. SEDAR 40 – Atlantic Menhaden Stock Assessment Report. SEDAR, North Charleston SC. 643 pp.

Atlantic States Marine Fisheries Commission (ASMFC). 2012. Atlantic menhaden stock assessment update report. ASMFC, Arlington, VA, 228 p.

Atlantic States Marine Fisheries Commission. 2012. Amendment 2 to the Interstate Fishery Management Plan for Atlantic Menhaden. 114 pp.

Table 3. Results of 2015 quota accounting in pounds. Note, in this table, the 2015 landings do not include bycatch landings because they do not count towards the TAC. Some states' data are confidential, and therefore are not reported.

State	2015 Quota	Returned Set Aside	Transfer	Total 2015 Quota	2015 Landings	Overage	2016 Quota
ME	161,466	889		162,356	C		161,466
NH	123	1		124	0		123
MA	3,438,630	18,941	(508,685)	2,948,886	2,932,128		3,438,630
RI	73,457	405	33,685	107,546	107,142		73,457
CT	71,537	394		71,931	71,537		71,537
NY	227,365	1,252	475,000	703,617	698,853		227,365
NJ	45,893,335	252,794		46,146,129	47,569,115	1,422,986	44,470,349
DE	54,153	298		54,451	54,153		54,153
MD	5,628,568	31,004		5,659,572	5,601,853		5,628,568
PRFC	2,545,595	14,022		2,559,617	2,283,685		2,545,595
VA	349,873,884	1,927,211		351,801,096	348,490,296		349,873,884
NC	2,020,645	11,130		2,031,775	839637		2,020,645
SC	-	-		-	C		-
GA	-	-		-		-	-
FL	73,695	406		74,101	75766	1,665	72,030
Total	410,062,453	2,258,748		412,321,201	408,724,164.80	1,424,651	408,637,802

Table 4. Directed, bycatch, episodic and total landings (pounds) for 2015 by jurisdiction.

State	Directed	Bycatch	Episodic	Total
ME	Confidential	-		Confidential
NH	-	-		-
MA	2,932,128	-		2,932,128
RI	107,142	69,947	1,883,292	2,060,381
CT	71,537	5,466		77,003
NY	698,853	769,312		1,468,165
NJ	47,569,115	240,922		47,810,037
DE	54,153	96,389		150,542
MD	5,601,853	1,949,577		7,551,430
PRFC	2,283,685	455,350		2,739,035
VA	348,490,296	2,034,372		350,524,668
NC	839,637			839,637
SC	Confidential			Confidential
GA	-			-
FL	75,766	301,963		377,729
Total	**408,724,165**	**5,923,298**	**1,883,292**	**416,530,755**

Table 5: State quota reporting timeframes in 2015. 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
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 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 6. Biological monitoring results in 2015. Note that total bait landings includes bycatch landings.

State	Total Bait Landings (pounds)	#10-fish samples required	#10-fish samples collected	Age samples collected	Length samples collected	Gear/Comments
MA	2,932,128	4	4	40	40	all capture via cast net south of cape cod
RI	177089	0	9	110	110	floating fish trap (8) and purse seine (1)
CT	77,003	0	2	22	22	gill nets
NY	1,468,165	2	22	190	220	gill nets, pound nets, seines
NJ	47,810,037	72	130	1300	1300	purse seine (119), and other gears (11)
DE	150,542	0	1	10	10	gill net
MD	7,551,430	17	23	277	914	pound net (12 from CBay,11 from Potomac River)
PRFC	2,739,035	6	14	140	140	pound net
VA	34,312,808	78	79	794	794	pound net (9), gill net (9), haul seine (3)
NC	839,637	2	9	120	120	gillnet, seine, trawl
	Total	**183**	**293**	**3003**	**3670**	

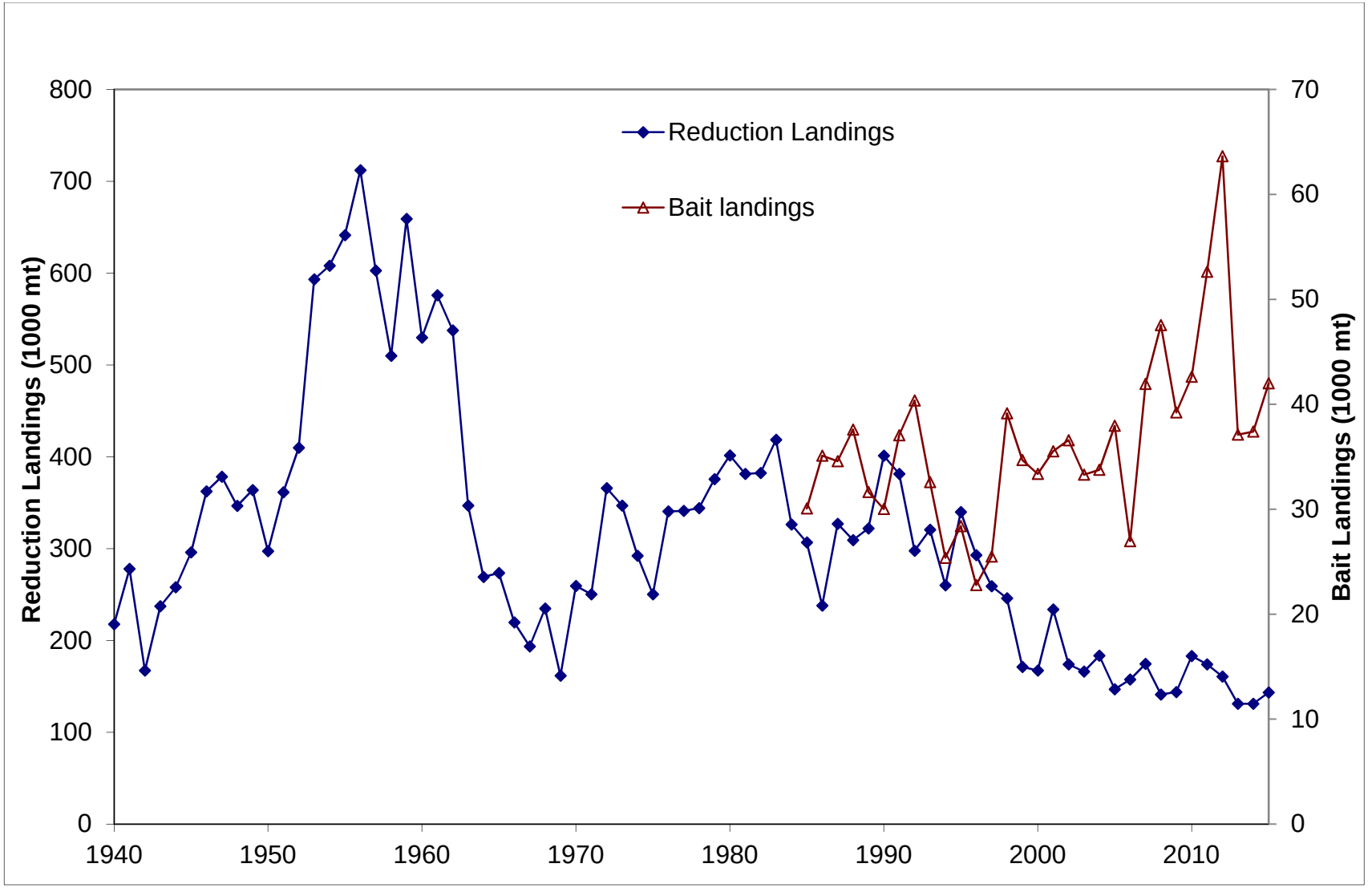

Figure 1. Landings from the reduction purse seine fishery (1940–2015) and bait fishery (1985–2015) for Atlantic menhaden.