

**REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR
SHAD AND RIVER HERRING (*Alosa spp.*)
2013**



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Shad & River Herring Plan Review Team

Marin Hawk, Atlantic States Marine Fisheries Commission (Chair)

Claire Enterline, Maine Division of Marine Resources

Cheri Patterson, New Hampshire Fish and Game Department

Heather Corbett, New Jersey Division of Fish and Wildlife

Phil Edwards, Rhode Island Division of Fish and Wildlife

Genine Lipkey, Maryland Department of Natural Resources

Chris Harper, Georgia Department of Natural Resources

Steve Meyers, NOAA Fisheries

REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR SHAD AND RIVER HERRING (*Alosa spp.*)

I. Status of the Fishery Management Plan

| | |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Date of FMP Approval:</u> | October 1985 |
| <u>Amendments:</u> | Amendment 1 (April 1999) Amendment 2 (August 2009) Amendment 3 (February 2010) |
| <u>Addenda:</u> | Technical Addendum #1 (February 2000) Addendum I (August 2002) |
| <u>Management Unit:</u> | Migratory stocks of American shad, hickory shad, alewife, and blueback herring from Maine through Florida |
| <u>States With Declared Interest:</u> | Maine through Florida, including the Potomac River Fisheries Commission and the District of Columbia |
| <u>Active Boards/Committees:</u> | Shad & River Herring Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Plan Review Team, Plan Development Team |

The 1985 Fishery Management Plan (FMP) for Shad and River Herring was one of the very first FMPs developed at the ASMFC. In 1994, the Management Board determined that the original 1985 FMP was no longer adequate for protecting or restoring the remaining shad and river herring stocks. As a result, Amendment 1, which required and recommended specific monitoring programs to inform future stock assessments, was implemented in October 1998. A Technical Addendum #1 to Amendment 1 was approved in 1999 to correct technical errors in Amendment 1.

The Board approved Addendum I in February 2002. Addendum I: did the following: changed the conditions for marking hatchery-reared alosines; clarified the definition and intent of *de minimis* status for the American shad fishery; and modified and clarified the fishery-independent and dependent monitoring requirements. These measures went into effect on January 1, 2003.

In August 2009, the Shad and River Herring Management Board approved Amendment 2, which deals only with river herring management. The Amendment prohibited commercial and recreational river herring fisheries in state waters beginning January 1, 2012, unless a state or jurisdiction has a sustainable management plan reviewed by the Technical Committee and approved by the Management Board. The Amendment defines a sustainable fishery as “a commercial and/or recreational fishery that will not diminish the potential future stock reproduction and recruitment.” Amendment 2 required states to implement fisheries-dependent and independent monitoring programs. Sustainable fishery management plans have been approved by the Management Board for Maine, New Hampshire, New York, North Carolina and South Carolina (Table 1).

In February 2010, the Shad and River Herring Management Board approved Amendment 3, which revised American shad regulatory and monitoring programs. The Amendment was developed in response to the 2007 American shad stock assessment, which found that most American shad stocks were at all-time lows and did not appear to be recovering. The Amendment requires similar management and monitoring as developed in Amendment 2. Specifically, Amendment 3 prohibits shad commercial and recreational fisheries in state waters beginning January 1, 2013, unless a state or jurisdiction has a sustainable management plan reviewed by the Technical Committee and approved by the Management Board. The Amendment defines a sustainable fishery as “a commercial and/or recreational fishery that will not diminish the potential future stock reproduction and recruitment.” The Amendment allows any river systems to maintain a catch and release recreational fishery. Sustainable fishing plans have been approved by the Management Board for Florida, Georgia, South Carolina, North Carolina, the Potomac River Fisheries Commission, and the Delaware River Basin Fish and Wildlife Management Cooperative (on behalf of New York, Delaware, New Jersey, and Pennsylvania) and Connecticut (Table 1). All states and jurisdictions are also required to identify local significant threats to American shad critical habitat and develop a plan for mitigation and restoration.

Table 1. States with approved sustainable fishery management plans (SFP) for river herring or shad.

| State | River Herring SFP | Shad SFP |
|-----------------------|--------------------------|-----------------|
| Maine | Approved | |
| New Hampshire | Approved | |
| Massachusetts | | |
| Connecticut | | Approved |
| Rhode Island | | |
| Pennsylvania | | Approved |
| New York | Approved | |
| New Jersey | | Approved |
| Delaware | | Approved |
| PRFC | | Approved |
| Maryland | | |
| Virginia | | |
| North Carolina | Approved | Approved |
| South Carolina | Approved | Approved |
| Georgia | | Approved |
| Florida | | Approved |

II. Status of the Stocks

While the FMP addresses four species, American shad, hickory shad, alewife, and blueback herring, lack of comprehensive and accurate commercial and recreational fishery data for the latter three species make it difficult to ascertain the status of these stocks. A coastwide American shad stock assessment was completed and accepted in August 2007. The 2007 assessment found that American shad stocks are currently at all-time lows and do not appear to be recovering. Recent declines of American shad were reported for Maine, New Hampshire, Rhode Island, and

Georgia stocks, and for the Hudson (NY), Susquehanna (PA), James (VA), and Edisto (SC) rivers. Low and stable stock abundance was indicated for Massachusetts, Connecticut, Delaware, the Chesapeake Bay, the Rappahannock River (VA), and some South Carolina and Florida stocks. Stocks in the Potomac and York Rivers (VA) have shown some signs of recovery in recent years. Data limitations and conflicting data precluded the report from indicating much about the current status or trend of many of the stocks from North or South Carolina.

The 2007 report identified primary causes for stock decline as a combination of overfishing, pollution, and habitat loss due to dam construction. In recent years, coastwide harvests have been on the order of 500-900 metric tons, nearly two orders of magnitude lower than in the late 19th century. Given these findings, the peer review panel recommended that current restoration actions need to be reviewed and new ones need to be identified and applied. The peer review panel suggested considering a reduction of fishing mortality, enhancement of dam passage and mitigation of dam-related fish mortality, stocking, and habitat restoration.

In 2008, a new river herring stock assessment conducted in response to concern over population decline and the impact of ocean bycatch. The stock assessment report concluded that, of the 52 stocks of alewife and blueback herring for which data were available, 23 were depleted relative to historic levels, one stock was increasing, and the status of 28 stocks could not be determined because the time-series of available data was too short. Estimates of abundance and fishing mortality could not be developed because of the lack of adequate data. The “depleted” determination was used instead of “overfished” and “overfishing” because of the many factors that have contributed to the declining abundance of river herring, which include not just directed and incidental fishing, but also habitat loss, predation, and climate changes.

III. Status of the Fisheries

American shad, hickory shad, and river herring formerly supported important commercial and recreational fisheries throughout their range. Fisheries are executed in rivers (both freshwater and saltwater), estuaries, tributaries, and oceans. Although recreational harvest data are scarce, most harvest is believed to come from the commercial industry. Commercial landings for all these species have declined dramatically from historic highs. Following is a summary of fisheries by species:

AMERICAN SHAD:

Total combined river and ocean commercial landings decreased from a high of 2,364,263 pounds in 1985 to a low of 1,390,512 pounds in 1999, but increased in 2000 to 1,816,979 pounds. The closure of the ocean-intercept fishery has lowered the coastwide total landings of American shad. The total landings reported in compliance reports from individual states and jurisdictions in 2013 was 604,372 pounds, which is a 5% decrease from landings in 2012 (635,960 pounds).

Landings from North Carolina and South Carolina accounted for 43% and 33% of the commercial harvest, respectively, in 2013. The remainder of the harvest came from Maine, Connecticut, Pennsylvania, PRFC, Virginia, and Georgia. In 2013 New Hampshire, Massachusetts, Rhode Island, New Jersey, Delaware, Maryland, District of Columbia and Florida reported no directed shad harvest in their state compliance reports.

Table 2. American shad and river herring in-river commercial and ocean bycatch landings (in pounds) provided by states, jurisdictions and NOAA Fisheries for 2013.

| | American Shad | River Herring | Hickory Shad |
|-------------------------------|----------------------|----------------------|---------------------|
| Maine³ | | 1,423,878 | |
| New Hampshire | | 4,420 | |
| Massachusetts | | | |
| Rhode Island | | | |
| Connecticut | 65,679 | | |
| New York¹ | 932 | 10,349 | |
| New Jersey² | | | 3,483 |
| Pennsylvania | 2,854 | | |
| Delaware | | | |
| Maryland | | 305 | |
| D.C. | | | |
| PRFC | 3,799 | | |
| Virginia | 4,825 | | 755 |
| North Carolina | 257,869 | 743 | 71,326 |
| South Carolina | 205,368 | 192,454 | 652 |
| Georgia | 62,017 | | 2,162 |
| Florida | | | |
| Total | 608,428 | 1,632,149 | 78,378 |

¹New York American shad landings are from ocean bycatch

²Includes in-river and coastal harvest

³Maine (shad) landings are confidential

Substantial shad recreational fisheries occur on the Connecticut (CT and MA), Delaware (NY, PA and NJ), Susquehanna (MD), Santee and Cooper (SC), Savannah (GA), and St. Johns (FL) Rivers. Shad recreational fisheries are also pursued on several other rivers in Massachusetts, Virginia, North Carolina, South Carolina, and Georgia. Tens of thousands of shad are caught by hook and line from large east coast rivers each year, but detailed creel surveys are generally not available. Actual harvest (catch and removal) may amount to only about 20-40% of total catch, but hooking mortality could boost this “harvest” value substantially. Several comprehensive angler use and harvest surveys are planned or have been recently completed. In October 2006, the Management Board suspended the requirement to monitor the recreational fishery.

As of 2009, MRFSS data are no longer provided for American shad. This is a result of the unreliable design of MRFSS that focuses on active fishing sites along coastal and estuarine areas. In previous years the proportional standard error (PSE) has ranged from 0-100.

HICKORY SHAD:

In 2013, New Jersey, Virginia, North Carolina, South Carolina, and Georgia reported hickory shad landings. North Carolina accounts for a vast majority of the landings with 91%. The coastwide commercial landings were 78,378 pounds in 2013, a 15% increase from 2012 landings (68,014 pounds) (Table 2).

RIVER HERRING (BLUEBACK HERRING/ALEWIFE COMBINED):

Commercial landings of river herring declined 95% from over 13 million pounds in 1985 to about 700 thousand pounds in 2005. In 2013, river herring landings were reported from Maine, New Hampshire, New York, Maryland, North Carolina, and South Carolina, totaling 1,632,149 pounds.

IV. Status of Research and Monitoring

Under Amendment 2 (2009) and Amendment 3 (2010), fishery-independent and fishery-dependent monitoring programs are now mandatory for American shad and river herring. Juvenile abundance index (JAI) surveys, annual spawning stock surveys (Table 3), and hatchery evaluations are required for states and jurisdictions. All States are required to calculate mortality and/or survival estimates, and monitor and report data relative to landings, catch, effort, and bycatch. States must submit annual reports including all monitoring and management program requirements, on or before July 1 of each year.

Table 3. American shad and river herring passage counts at select rivers along the Atlantic Coast in 2013.

| State/River | Shad | River Herring |
|---------------------------------------|----------------|----------------------|
| Maine | | |
| Androscoggin | 14 | 69,297 |
| Saco | 6171 | 43,414 |
| Kennebec | 0 | 94,456 |
| Sebasticook | 114 | 2,272,492 |
| St. Croix | | 16,677 |
| New Hampshire | | |
| Cocheco | | 18,337 |
| Oyster | | 7,149 |
| Lamprey | | 79,408 |
| Exeter | | 378 |
| Taylor | | 128 |
| Winnicut | | 0 |
| Massachusetts | | |
| Merrimack | 37,149 | 17,359 |
| Connecticut | | |
| Holyoke Dam | 392,967 | 976 |
| Rhode Island | | |
| Gilbert Stuart | | 91,240 |
| Nonquit | | 52,563 |
| Buckeye Brook | | 45,244 |
| Pennsylvania/Maryland/Delaware | | |
| Susquehanna (Conowingo) | 12,733 | 7 |
| Susquehanna (Holtwood) | 2,503 | |
| Susquehanna (Safe Harbor) | 1,927 | |
| Susquehanna (York Haven) | 202 | |
| South Carolina | | |
| St. Stephen Dam | 324,984 | |
| Total 2013 | 774,132 | 2,808,149 |
| Total 2012 | 205,928 | 2,493,322 |

Note: Passage numbers on Susquehanna River are cumulative. For example, any shad counted at the York Haven dam has also passed the previous three dams (Safe Harbor, Holtwood and Conowingo). The dams are listed in ascending order of passage mile.

In addition to the mandatory monitoring requirements stipulated under Amendments 2 and 3, some states and jurisdictions continue important research initiatives for these species. For example, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, and USFWS are actively involved in shad restoration using hatchery-cultured fry and fingerlings. All hatchery fish are

marked with oxytetracycline marks on otoliths to allow future distinction from wild fish. During 2013, several jurisdictions reared American shad, hickory shad, and alewife, stocking a total of 18,192,310 American shad and 269,430 alewife (Table 4).

Table 4. Stocking of Alosines in State Waters, 2013.

| State | American Shad | Alewife |
|-----------------------|-------------------|----------------|
| Maine | | |
| Androscoggin | | 60,004 |
| Kennebec | | 55,796 |
| Union River | | 153,630 |
| Massachusetts | | |
| Merrimack | 4,600,000 | |
| Charles River | 3,000,000 | |
| Pennsylvania | | |
| Susquehanna | 2,362,501 | |
| Lehigh | 402,089 | |
| Schuykill | 338,084 | |
| North Carolina | | |
| Roanoke River | 4,570,144 | |
| South Carolina | | |
| Edisto River | 10,159 | |
| Santee River | 2,909,333 | |
| Total | 18,192,310 | 269,430 |

V. Status of Management Measures

All state programs must implement commercial and recreational management measures or an alternative program approved by the Management Board. The current status of each state's compliance with these measures is provided in the Shad and River Plan Review Team Report (enclosed).

Shad and river herring are currently managed under Amendments 2 and 3. In 2009 the Board approved Amendment 2, which was initiated in response to concerns over river herring stock. The amendment prohibits state waters commercial and recreational fisheries beginning January 1, 2012, unless a state or jurisdiction has a sustainable management plan in place. Sustainable fishery management plans have been approved by the Management Board for Maine, New Hampshire, New York, North Carolina and South Carolina.

In 2010, the Board approved Amendment 3, which revised American shad regulatory and monitoring programs under Amendment 1. The Amendment was developed in response to the 2007 American shad stock assessment, which found that most American shad stocks were at all time lows and did not appear to be recovering. The Amendment requires similar management and monitoring as developed in Amendment 2, specifically the development of a Sustainable

Fishing Management Plan (SFP) for any jurisdiction that will maintain a commercial or recreational fishery after January 1, 2013 (with the exception of catch and release recreational fisheries). SFPs have been approved by the Management Board for Florida, Georgia, South Carolina, North Carolina, the Potomac River Fisheries Commission, Connecticut and the Delaware River Basin Fish and Wildlife Management Cooperative (on behalf of New York, Delaware, New Jersey, and Pennsylvania).

V. Prioritized Research Needs

Fishery-Dependent Priorities

High

- Expand observer and port sampling coverage to quantify additional sources of mortality for alosine species, including bait fisheries, as well as rates of bycatch in other fisheries to reduce uncertainty.¹

Moderate

- Identify directed harvest and bycatch losses of American shad in ocean and bay waters of Atlantic Maritime Canada.

Low

- Identify additional sources of historical catch data of the US small pelagic fisheries to better represent earlier harvest of river herring and improve model formulation.

Fishery-Independent Priorities

Moderate

- Develop demersal and pelagic trawl CPUE indices of offshore river herring biomass.

Modeling / Quantitative Priorities

High

- Conduct population assessments on river herring, particularly in the south.²
- Analyze the consequences of interactions between the offshore bycatch fisheries and population trends in the rivers.
- Quantify fishing mortality for major river stocks after ocean closure of directed fisheries (river, ocean bycatch, bait fisheries).
- Improve methods to develop biological benchmarks used in assessment modeling (fecundity-at-age, sex specific mean weight-at-age, partial recruitment vector/maturity schedules) for river herring and American shad of both semelparous and iteroparous stocks.
- Improve methods for calculating M.

Moderate

- Consider standardization of indices with a GLM to improve trend estimates and uncertainty characterization.
- Explore peer-reviewed stock assessment models for use in additional river systems as more data become available.

¹ A prior statistical study of observer allocation and coverage should be conducted (see Hanke et al. 2012).

² A peer reviewed river herring stock assessment was completed in 2012 by the ASMFC.

Low

- Develop models to predict the potential impacts of climate change on river herring distribution and stock persistence.

Life History, Biological, and Habitat Priorities

High

- Conduct studies to quantify and improve fish passage efficiency and support the implementation of standard practices.
- Assess the efficiency of using hydroacoustics to repel alosines or pheromones to attract alosines to fish passage structures. Test commercially available acoustic equipment at existing fish passage facilities. Develop methods to isolate/manufacture pheromones or other alosine attractants.
- Investigate the relationship between juvenile river herring/American shad and subsequent year class strength, with emphasis on the validity of juvenile abundance indices, rates and sources of immature mortality, migratory behavior of juveniles, and life history requirements.
- Develop an integrated coastal remote telemetry system or network that would allow tagged fish to be tracked throughout their coastal migration and into the estuarine and riverine environments.
- Continue studies to determine river herring population stock structure along the coast and enable determination of river origin of catch in mixed stock fisheries and incidental catch in non-targeted ocean fisheries. Spatially delineate mixed stock and Delaware stock areas within the Delaware system. Methods to be considered could include otolith microchemistry, oxytetracycline otolith marking, genetic analysis, and/or tagging.³
- Validate the different values of M for river herring and American shad stocks through shad ageing techniques and repeat spawning information.
- Continue to assess current ageing techniques for river herring and American shad, using known-age fish, scales, otoliths, and spawning marks. Conduct biannual ageing workshops to maintain consistency and accuracy of ageing fish sampled in state programs.⁴
- Summarize existing information on predation by striped bass and other species. Quantify consumption through modeling (e.g., MSVPA), diet, and bioenergetics studies.
- Refine techniques for tank spawning of American shad. Secure adequate eggs for culture programs using native broodstock.

Moderate

- Determine the effects of passage barriers on all life history stages of American shad and river herring. Conduct studies on turbine mortality, migration delay, downstream passage, and sub-lethal effects.
- Evaluate and ultimately validate large-scale hydroacoustic methods to quantify river herring and American shad escapement in major river systems.
- Conduct studies of egg and larval survival and development.
- Conduct studies on energetics of feeding and spawning migrations of American shad on the Atlantic coast.
- Resource management agencies in each state shall evaluate their respective state water quality standards and criteria and identify hard limits to ensure that those standards, criteria,

³ Genetic research currently underway in combination with otolith chemistry.

⁴ River herring ageing workshop occurred in 2013.

and limits account for the special needs of alosines. Primary emphasis should be on locations where sensitive egg and larval stages are found.

- Encourage university research on hickory shad.
- Develop better fish culture techniques, marking techniques, and supplemental stocking strategies for river herring.

Low

- Characterize tributary habitat quality and quantity for Alosine reintroductions and fish passage development.
- States should identify and quantify potential shad and river herring spawning and nursery habitat not presently utilized, including a list of areas that would support such habitat if water quality and access were improved or created, and analyze the cost of recovery within those areas. States may wish to identify areas targeted for restoration as essential habitat.¹¹
- Investigate contribution of landlocked versus anadromous produced river herring.

VII. PRT Recommendations

State Compliance

All states with a declared interest in the management of shad and river herring have submitted reports and have regulations in place that meet the requirements of the Interstate Fisheries Management Plan for Shad and River Herring. The PRT notes, however, that some states were not able to complete the required fishery independent monitoring due to budgetary restrictions.

1. Several of the states did not report all of the monitoring requirements listed under Amendments 2 and 3 (see PRT Report). The states should take note of the required monitoring programs that were not reported and make concerted effort to report all monitoring programs in forthcoming annual reports (most common omissions were: characterization of other losses, variance, length frequency, age frequency and degree of repeat spawning).
2. The PRT requests that those states and jurisdictions that share monitoring should report who was responsible for the required monitoring in lieu of not including the information. In addition, one report could be sent for each state or jurisdiction.

De Minimis Status

Maine, New Hampshire and Massachusetts have requested *de minimis* status for the 2014 American shad fisheries. New Hampshire and Massachusetts also requested *de minimis* status for the 2014 river herring fisheries. These states continue to meet the standards for commercial *de minimis* as defined in Amendment 2 and Amendment 3.

The following states had landings that were reported to be less than 1% of the coast-wide commercial landings for American shad: Maine, New Hampshire, Massachusetts, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, PRFC, D.C., Virginia, and Florida. The following states had landings that were reported to be less than 1% of the coast-wide commercial landings for river herring: New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, D.C., PRFC, Virginia, North Carolina, Georgia, and Florida.

The PRT recommends granting all requests for *de minimis* status.

REVIEW OF SHAD AND RIVER HERRING ANNUAL COMPLIANCE REPORTS

INTRODUCTION

In accordance with the Shad and River Herring Fishery Management Plan, the states are required to submit an annual compliance report by July 1st of each year. The Plan Review Team reviewed all state reports for compliance with the mandatory measures in Amendments 2 (River Herring) and 3 (American shad). The following report provides an evaluation of each state program.

MAINE

De minimis

- The state of Maine requests *de minimis* for the commercial fishing year 2014 in the American shad fishery.

Comments or trends highlighted in state report:

- American shad recreational catch estimates = 945 fish and 0 harvest (MRIP).
- Comparing the juvenile CPUE to past years, American shad CPUE were above average in Merrymeeting Bay, the Abbagaadasset, Eastern, and lower Kennebec rivers, but below average in the Androscoggin, Cathance and upper Kennebec rivers.
- 1,107,911 pounds of river herring reported harvested by towns (preliminary).
- MRIP estimates for alewife = 1,110 caught and 731 harvested and no blueback caught or harvested.
- Comparing the JAI CPUE to past years, alewife CPUE was above average only in the upper Kennebec River (where it was also the highest on record), but below average in all other river portions
- River herring run counts were above average for Saco, Androscoggin, Kennebec and Sebasticock rivers and below average in the St. Croix river
- American shad spawning stock survey and mortality estimate could not be completed due to extremely low population levels

Unreported information / Compliance Issues:

- River herring scale samples collected from commercial harvesters are being processed. Information should be sent to FMP Coordinator as soon as data are available.

Sturgeon bycatch report:

- There was no known bycatch of Atlantic or shortnose sturgeon within the recreational fishery.

NEW HAMPSHIRE

De minimis:

- The state of New Hampshire requests *de minimis* status for the commercial and recreational fishing year 2014 for the American shad and river herring fisheries.

Comments or trends highlighted in state report:

- River herring SFMP target met for 2013 – exploitation rate <20% (4.2%) and returns >72,293 fish (105,610 fish).
- 4,420 pounds river herring reported harvested from New Hampshire waters through mandatory coastal harvest reports

- Recreational harvest estimates for river herring were 2,366 fish through the NHF&G Marine Recreational Survey (MRIP)
- A few tickets were issued for harvest of river herring on closed days.
- Since 2007 JAI for alewife and blueback herring have been declining, however in 2013 the geometric mean for alewives was the highest recorded since 2006
- Zero shad were harvested from New Hampshire waters in 2013.

Unreported information / Compliance Issues:

- None identified.

Sturgeon bycatch report:

- No protected species were reported taken as bycatch from New Hampshire's coastal harvest program.

MASSACHUSETTS

De minimis:

- The Commonwealth of Massachusetts requests *de minimis* for the commercial fishing year 2014 for the American shad and river herring fisheries.

Comments or trends highlighted in state report:

- Dealer reporting = 0 pounds of shad landed.
- 2 reports of violations for illegal possession and use of shad as bait

Unreported information / Compliance Issues:

- The Native American harvest for river herring has not yet been reported.
- Degree of repeat spawning is not evaluated in the river herring spawning stock assessment.

Sturgeon bycatch report:

- No sturgeon interactions were reported in 2013.

RHODE ISLAND

Comments or trends highlighted in state report:

- None identified.

Unreported information / Compliance Issues:

- Herring scale samples were collected but not aged; mortality estimates are unavailable for 2013.

Sturgeon bycatch report:

- One Atlantic sturgeon was observed by the NOAA Fisheries Observer Program in 2013.

CONNECTICUT

Comments or trends highlighted in state report:

- The preliminary 2013 landings are 65,679 pounds (14,661 fish) of American shad from drift gillnets through harvester catch reporting.

- Shad spawning population relies on a few age classes and low rates of repeat spawners.

Unreported information / Compliance Issues:

- Commercial catch composition of shad is not made available.
- Estimate of other commercial losses is reported by weight instead of length and age.
- Directed recreational harvest of shad is not characterized.
- No sources of river herring loss are listed.
- No description of fishery independent monitoring requirements is provided for shad or herring.
- River herring JAI variance is not provided.
- No age frequency, degree of repeat spawning, or annual mortality rate calculation is provided for river herring.

Sturgeon bycatch report:

- A total of 7 sturgeons (species unclassified) were reported as caught and released by shad fishermen in 2013.

NEW YORK

Comments and trends highlighted in state report:

- Commercial and recreational shad fishery closed in 2010.
- Mandatory reporting of river herring harvest = 7,419 pounds landed in Hudson River.
- 2,930 pounds bycatch reported through ACCSP
- River herring spawning stock survey – 79:21 male:female alewife and 51:49 male:female blueback herring.

Unreported Information / Compliance Issues:

- Harvest and losses of shad and river herring are reported in weights but not numbers.
- Shad bycatch is reported, but 5% cap is not referenced.
- No data for commercial or recreational “other loss” of river herring is available.
- A river herring recreational creel survey was not conducted in 2013.
- Other losses (research, fish passage) attributed to river herring are not estimated.
- River herring commercial landings data entry is still ongoing. Sex ratio and age frequency are not evaluated.
- Degree of repeat spawning data for shad is not yet complete.
- River herring mortality rate analysis is not yet complete.

Sturgeon bycatch report:

- No data collected due to fishery closure.

NEW JERSEY

Comments or trends highlighted in state report:

- Commercial directed fishery for American shad in coastal waters was closed January 1, 2013.

Unreported Information / Compliance Issues:

- No biological samples were taken from the river herring commercial fishery.
- More thorough explanation of SAFIS is needed.

- Coastal herring report did not evaluate commercial catch composition and did not mention recreational fishery (no harvest & losses addressed).
- No biological data given (except for length frequencies) for shad or river herring from the ocean trawl surveys for coastal stocks. Age at length keys are mentioned to be in development.

Sturgeon bycatch report:

- One Atlantic sturgeon was caught as bycatch in Delaware Bay and was released alive.

PENNSYLVANIA

Comments or trends highlighted in state report:

- No commercial fishery for shad or river herring on Susquehanna; recreational fishery prohibited in 2013 for river herring; no recreational fishery for shad in Susquehanna.
- River herring juvenile indices fail to produce meaningful data due to low numbers.

Unreported Information / Compliance Issues:

- No estimates of other losses for river herring have been developed.
- Must develop river herring spawning stock assessment.
- Susquehanna river herring mortality rate is not calculated.

Sturgeon bycatch report:

- No sturgeon interactions reported in 2013.

DELAWARE BASIN F&W COOPERATIVE

Comments or trends highlighted in state report:

- Commercial landings of American Shad in the Delaware Estuary and Bay as reported to New Jersey in their directed fishery (37,659 pounds) increased over landings reported for five-year average (10,195 pounds; 2009 – 2013) and the ten year average (22,270 pounds; 2004 –2013).
- Landings of American shad as bycatch in their striped bass fishery reported to Delaware increased in 2013 (3,266 pounds) in comparison to the previous year (lowest level since 1985.)
- Adult American shad abundance in the Delaware River estimated in 2013 exhibited decline from 2012 but was greater than the 2009 low, based on gill net CPUE (.98 shad/foot-hr) at Smithfield Beach (RM 218).
- The river herring fishery was closed in the States of Delaware and New Jersey jurisdictional waters and in Pennsylvania jurisdictional waters in 2013. No estimates of angler use and harvest of recreational river herring or hickory shad catches were available for 2013.

Unreported information / Compliance Issues:

- River herring spawning stock assessment did not include age frequency, sex ratio, or degree of repeat spawning.
- Other losses for herring must be categorized.
- Harvest and losses table for herring not included.
- No biological data for commercial river herring fishery.
- No estimation of effort for river herring.
- Length frequency not reported for herring in NJ, PA, or DE.

- No river herring hatchery evaluation in NJ, PA, or DE.
- No recreational harvest or mortality estimates for shad.
- Commercial age data for shad remains to be processed
- Degree of repeat spawning data for shad was not collected in NJ and remains to be processed in DE.
- Monitoring of recreational landings catch and effort data in the Delaware River is required under Am. 3; this was not addressed.
- No fishery independent mortality rate was calculated for either species in NJ, PA, or DE.

Sturgeon bycatch report:

- According to logbooks collected from New Jersey commercial shad fishers there was 1 Atlantic sturgeon caught as bycatch during 2013 in Delaware Bay. The sturgeon was released alive at the time of tending the net.

MARYLAND

Comments or trends highlighted in state report:

- American shad and river herring commercial fishery is closed; catch and release only.
- Catch and release mortality estimated at 144 shad.
- No trend in Nanticoke and Patuxent Rivers shad JAI; increasing in Upper CB and Potomac River.
- Choptank River 94% hatchery origin (shad)
- Conowingo Dam tailrace population estimated at 80,910 shad.
- The JAI CPUE decreased for alewife and increased for blueback in 2013 in both the Nanticoke River and the Upper Bay

Unreported / Compliance Issues:

- 305 pounds of herring were landed despite of fishery closure due to similarity btwn species
- Other losses should be characterized for river herring and American shad pertaining to commercial and recreational fisheries.
- Shad harvest and losses table did not mention gear type or pounds of fish, only stated as number of fish per area.
- Further development of spawning stock assessment for river herring is necessary.

Sturgeon bycatch report:

- The Atlantic sturgeon bycatch for Maryland's American shad ocean intercept fishery has been zero since this fishery was closed in 2005.

DISTRICT OF COLUMBIA

Comments or trends highlighted in state report:

- River herring and shad directed fisheries are closed.
- Hatchery evaluation efforts are scheduled to begin in 2014

Unreported information / Compliance Issues:

- No estimate of potential other losses in any of the fisheries.
- The required harvest & losses table is not included.

- Include which rivers were sampled by the seine survey.
- No ageing has been done for American shad or river herring, thus age frequency, degree of repeat spawning and mortality estimates have not been reported.
- Length frequency and sex ratio not supplied for American shad.

Sturgeon bycatch report:

- There were no documented sturgeon captures reported in the District of Columbia during 2013.

POTOMAC RIVER FISHERIES COMMISSION

Comments or trends highlighted in state report:

- All fisheries are closed to the taking and/or possession of river herring and Shad in the Potomac River.
- American shad restoration target (31.1) was exceeded for the third year in a row in 2013 (39.4)
- 2013 JAI indices for American shad are significantly higher than the 2012 indices

Unreported information / Compliance Issues:

- Please include spawning stock assessment information in the same report.
- Harvest and losses table could be improved by including number of fish per gear type and mean weight per gear type.
- Variances for juvenile indices are missing.

Sturgeon bycatch report:

- In 2013, there were no Atlantic sturgeon captures in the Potomac River.

VIRGINIA

Comments or trends highlighted in state report:

- River herring and shad fisheries closed to both commercial and recreational fishing.
- The strength of the James River catch index continues to rely on the prevalence of hatchery shad.
- Catch indices on the James River for shad are trending downward and are near an all-time low.

Unreported information / Compliance Issues:

- Due to lack of available funding, the annual spawning stock survey, biological sampling, and resulting calculation of mortality and/or survival estimates were not performed in 2013 for river herring.
- No estimate of potential other losses. Both fisheries are closed, however.

Sturgeon bycatch report:

- 11 Atlantic sturgeon were caught as Bycatch and released alive in 2013 (James River, n=6; York River, n=4; Rappahannock River, n=1).

NORTH CAROLINA

Comments and trends highlighted in state report:

- 257,869 pounds of shad were reported landed (\$307,475) through the trip ticket program primarily from gill nets (95.4%).
- Juvenile American and hickory shad catches have been consistently low since the survey began in 1972.

Sturgeon bycatch report:

- Albemarle Sound Area; 63 Atlantic sturgeon interactions - DMF observer data (14 released alive), DMF IGNS (48 released alive, one fatality).
- Pamlico Sound Area, Pamlico, Neuse and Cape Fear River Areas; 3 Atlantic sturgeon captured and released alive in the near shore Atlantic Ocean.

SOUTH CAROLINA

Comments and trends highlighted in state report:

- 205,368 pounds shad reported through NOAA Fisheries (100% in-river)
- In 2013, observed sex ratios for American shad were 8.3 females per male in the Santee River and 17.7 females per male in the Waccamaw River. The high occurrence of females in these samples is most likely due to the marketability of females vs. males.

Unreported information / Compliance Issues:

- River herring commercial and recreational effort is not estimated.
- Characterize and quantify other losses related to all fisheries.
- Technical committee determined that river herring juvenile indices would not be required.
- Hatchery evaluation was not mentioned for herring.

Sturgeon bycatch report:

- Atlantics – 158 total, with 38% from Santee, 94% from the Winyah Bay, 4% from the Santee River, <1% from the Waccamaw and Savannah Rivers.
- Shortnose – 7 total, with 3 from the Waccamaw River, 3 from the Winyah Bay, and 1 from the Santee River.

GEORGIA

Comments and trends highlighted in state report:

- A creel survey was not conducted in 2013, but is planned for 2015.
- The population of American shad in the Altamaha River in 2013 was 227,218 shad, a 28% decrease from 2012.
- Commercial and recreational fisheries are non-existent in GA and commercial shad gear precludes river herring from being caught (communication with Don Harrison).

Unreported information / Compliance Issues:

- No shad recreational harvest data was reported, and no other recreational losses are estimated.
- Juvenile indices were not completed due to persistent high water.

Sturgeon bycatch report:

- Atlantic and shortnose sturgeon are caught in gill nets. In drift nets, essentially 100% of the sturgeon can be released unharmed. During 16 field days of tagging adult shad in

2012, 2 Atlantic and 5 shortnose sturgeon were captured in drift gill nets. All sturgeon were released unharmed. In addition, shad fishermen reported capturing 19 Atlantic and 23 shortnose sturgeon from the Altamaha River.

FLORIDA

Comments and trends highlighted in state report:

- No commercial fishery exists for shad or river herring.

Unreported information / Compliance Issues:

- Include more detail to characterize other losses related to commercial and recreational fisheries.
- Include more detail on river herring.

Sturgeon bycatch report:

- No netting is allowed for shad, so no sturgeon bycatch is expected.