

Species Profile: Shad & River Herring: Atlantic States Seek to Improve Knowledge of Stock Status and Protect Populations Coastwide

Introduction

Interest in American shad and river herring has heightened recently at ASMFC. At the August Board meeting, the Shad and River Herring Management Board accepted the American Shad Advisory Report and Stock Assessment. The approval of the stock assessment marks the completion of over four years of hard work. At the same meeting, the Board initiated the development of a Public Information Document to solicit public comment on potential management action to protect river herring stocks coastwide.

Shad and river herring, anadromous fish that spend the majority of their adult lives at sea, historically spawned in virtually every accessible river and tributary along the coast during the spring. However, blockage of spawning rivers by dams and other impediments, combined with degradation of water quality, has severely depleted suitable spawning habitat. Species of shad and river herring once supported important commercial and recreational fisheries along the Atlantic coast. Today, these fisheries are just a fraction of what they were due to riverine habitat loss and fishing pressure.

Management under Amendment 1 to the Interstate Fishery Management Plan for Shad & River Herring (Amendment 1) seeks to restore these species through conservative regulatory measures and state-by-state monitoring requirements to improve our understanding of species stock status.

Life History

American & Hickory Shad

American shad, *Alosa sapidissima*, are found in many Atlantic coastal rivers from Newfoundland to the St. Johns River in Florida. Shortly after recruitment, juveniles emigrate from estuarine nursery areas and join a mixed-stock, migratory population. After four to six years as coastal migrants, individuals become sexually mature and migrate to their natal rivers during spring spawning seasons that vary by latitude. The percentage of American shad that survive to spawn more than once decreases from north to south. American shad that spawn in more northerly rivers may survive to spawn again, while shad native to the rivers south of Cape Fear, North Carolina die after spawning. American shad adults that exhibit repeat spawning return to the sea soon after spawning and migrate northward to summer feeding grounds in the Gulf of Maine.

Hickory shad, *Alosa mediocris*, spawn in rivers and tributaries along the Atlantic coast from the Bay of Fundy to the Tomoka River in Florida. After spawning, hickory shad return to the ocean, but their distribution and movements are essentially unknown. Fertilized eggs are carried by river currents, and eventually develop into larvae, which begin to feed four to seven days after hatching. Larvae drift downstream into



Photo courtesy of Jim Turek, NOAA Restoration Center



American Shad
Alosa sapidissima



General Characteristics:

- **Largest of the herrings**
- **Can reach up to 2 ½' in length, weighing about 11 ½ lbs**
- **Age at maturity**
Female = 5 years
Male = 4 years
- **Range from south-eastern coast of Newfoundland to St. Johns River, Florida**
- **Primarily feed on plankton**
- **Stock status varies by river system**

See side-bar on page 3 for information on remaining alosine species

tidal freshwater reaches of the spawning rivers, and gradually mature into juveniles. In early to late summer, juvenile hickory shad migrate out of their nursery areas to the sea. With increasing water temperatures in the spring, mature hickory shad will migrate back to their native rivers to complete their life cycle.

Alewife & Blueback Herring

Alewife and blueback herring (collectively known as “river herring”) are relatively small anadromous fish, spending most of their adult life at sea, but returning to freshwater areas to spawn in the spring. Alewife spawn in rivers, lakes, and tributaries from northeastern Newfoundland to South Carolina, but are most abundant in the Mid-Atlantic and the Northeast states. Blueback herring prefer to spawn in swift flowing rivers and tributaries from Nova Scotia to northern Florida, but are most numerous in waters from the Chesapeake Bay south. Mature alewife (ages three to eight) and blueback herring (ages three to six) migrate rapidly downstream after spawning. Larvae begin to feed three to five days after hatching, and transform gradually into the juvenile stage. Juveniles remain in tidal freshwater nursery areas in spring and early summer, but may also move upstream with the encroachment of saline water. As water temperatures decline in the fall, juveniles move downstream to more saline waters. Little information is available on the life history of juvenile and adult alewife and blueback herring after they emigrate to the sea as young-of-year or yearlings, and before they mature and return to freshwater to spawn.

Stock Status

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.

In 1990, ASMFC assessed 15 river herring stocks between New Brunswick and North Carolina. At the time of the assessment, five stocks were found to be overfished: St. John River, NB (alewife and blueback), Damariscotta River, ME (alewife), Potomac River, VA (alewife), and Chowan River, NC (alewife). Four other stocks were found to be in decline: Potomac River, VA (blueback), Chowan, NC (blueback), Nanticoke River, MD (alewife), and Rappahannock River, VA (alewife). The assessment stated that heavy fishing pressure in Maine, Virginia, and North Carolina was primarily responsible for the continued decline of river herring stocks in the Damariscotta, Rappahannock, and Chowan rivers. The report recommended additional conservation measures be implemented to reduce fishing mortality.

A stock assessment for American shad was completed in 1997 and submitted for peer review in 1998. The 1998 assessment estimated fishing mortality rates for nine shad stocks and general trends in abundance for 13 shad stocks. At the time of the 1998 assessment, current stock levels appeared greatly reduced from historic levels. Three of the seven stocks assessed (Hudson, Edisto, and Altamaha rivers) were fully exploited. The short time series used in this stock assessment is of limited applicability in analyzing the long-term health of American shad stocks.

Table 1. Trends in Stock Status of American Shad Populations from the 2007 and 1998 Benchmark Assessments. A “?” in the status column indicates that either there was insufficient data or various data analyses gave conflicting indications of trend.

State	River	2007 Status Trend	1998 Status Trend
ME	Merrymeeting Bay	Declining	
	Kennebec		
	Androscoggin		
	Saco		
NH	Exeter	Declining	
MA	Merrimack	Stable	Stable
RI	Pawcatuck	Declining	Stable
CT & MA	Connecticut	Stable	Stable
NY	Hudson	Declining	Declining
NY, PA, NJ, DE	Delaware River & Bay	Stable	Stable
MD	Nanticoke	Stable	Increasing
PA & MD	Susquehanna River & Flats	Declining	
MD, DC, VA	Potomac	Increasing	
VA	York	Increasing	Declining
	James	Declining	Stable
	Rappahannock	Stable	Stable
NC	Albemarle Sound	Stable	
	Roanoke	Stable	
	Tar-Pamlico	?	
	Neuse	?	
SC	Cape Fear	?	
	Winyah Bay	Stable	
	Waccamaw	?	
	Great Pee Dee	?	
	Santee	?	Increasing
	Cooper	Stable	
	Combahee	?	
	Edisto	Declining	Stable
SC & GA	Savannah	Stable	
GA	Altamaha (+ Ocmulgee)	Declining	Increasing
	Ogeechee		
FL	St. Johns	Stable	

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 rebounding 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.

American shad, hickory shad, and river herring formerly supported significant commercial and recreational fisheries throughout their range. Fisheries were traditionally executed in rivers, estuaries, and coastal waters. 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. In 2005, the commercial ocean-intercept fishery for American shad was closed. Fishing in the Chesapeake Bay for American shad has been banned since 1994, but there are currently small bycatch allowances. As of 2007, four states—Connecticut, Rhode Island, Massachusetts, and North Carolina—have instituted moratoria on the harvest of river herring.

American Shad

Total in-river commercial landings have declined steadily from over 3.2 million pounds in 1980 to 711,840 pounds in 2002. Coastal intercept landings rose steadily from 1980 to a peak of two million pounds in 1989, then declined thereafter to 1.1 million pounds in 2002. Since 2005, landings of American shad from the ocean are only permitted as bycatch. Total landings for 2006 totaled 677,362 pounds.

Hickory Shad

Atlantic coast (Maryland to Florida) hickory shad landings are poorly monitored. Federal and state data collected for this species is questionable because of mixing with American shad upon landing, poorly understood geographic ranges, and poorly monitored recreational fishing areas. This species supports a significant recreational fishery in some areas, but good recreational harvest data do not exist. North Carolina has historically dominated the commercial fishery. Total hickory shad landings appeared to have a recent peak in the late 1990s and again in 2004 and 2005. In 2006, landings dropped from over 200,000 pounds to about 83,000 pounds.

Alewife & Blueback Herring

Commercial landings of Atlantic coast river herring have ranged from a high of 74.9 million pounds in 1958 to a low of less than 1.5 million pounds in recent years. New England landings have declined dramatically from the 1970s to the

Hickory Shad *Alosa mediocris*



General Characteristics:

- **Can reach up to 2' in length; 18" fish weighs about 2 lbs**
- **Range from Bay of Fundy to Tomoka River, Florida**
- **Prey on small fish such as lance, anchovies, cunners, and silversides**
- **Stock status unknown**

Alewife *Alosa pseudoharengus*



General Characteristics:

- **Adults average 10 - 11" in length; 8 - 9 oz in weight**
- **Range from Nova Scotia to South Carolina**
- **Primarily feed on plankton**
- **Congregate in large schools, numbering in the thousands**
- **Excellent food fish, marketed both fresh and salted**
- **Stock status unknown**

Blueback Herring *Alosa aestivalis*



General Characteristics:

- **Adults average 11" in length; 7 oz in weight**
- **Range from Nova Scotia to Northern Florida**
- **Primarily feed on plankton**
- **Name derived from dark blue/bluish gray coloring on back**
- **Stock status unknown**

end of the 1990s. In the Mid-Atlantic, landings have declined dramatically since the mid-1960s and have remained very low in recent years. In the South Atlantic, the landings are steadily declining from an all time high of 11.5 million pounds in 1985 to less than 500,000 in 1999. During 2005, Maine, Virginia, and North Carolina accounted for the majority of coastwide commercial landings.

Atlantic Coastal Management Considerations

All 15 Atlantic coastal states from Maine through Florida currently manage shad and river herring species under Amendment 1. The Amendment focuses primarily on American shad regulations and monitoring programs, but also requires states to initiate fishery-dependent monitoring programs for river herring and hickory shad, in addition to current fishery-independent programs.

The goal of the monitoring programs is to improve data collection and stock assessment capabilities. Furthermore, Amendment 1 contains specific measures to control exploitation of American shad populations, while maintaining the status quo in other fisheries for hickory shad and river herring.



Amendment 1 contains three primary regulatory requirements. The first is a five-year phase out of the ocean-intercept fishery, which began on January 1, 2000. States were required to achieve at least a 40% reduction in effort in the ocean-intercept fishery by December 31, 2002. The total closure of the fishery occurred on December 31, 2004. The second requirement establishes a fishing mortality target for in-river fisheries, and calls for the maintenance of existing or more conservative regulations for river herring and hickory shad.

Lastly, the Amendment implements an aggregate 10-fish daily creel limit in recreational fisheries for American and hickory shad, with all jurisdictions maintaining existing or more conservative recreational regulations for river herring.

In August 2007, the Shad and River Herring Management Board initiated the development of Public Information Document for Amendment 2. This Document will discuss potential management actions for river herring. The Management Board will review and possibly approve the document for public comment at the Commission's 66th Annual Meeting in October. For more information, please contact Erika Robbins, Shad & River Herring FMP Coordinator, at (202)289-6400 or erobbins@asmfc.org.

