

RIVER HERRING, *Alosa pseudoharengus* *Alosa aestivalis*



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Life History

River herring is a collective term for alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*). River herring are anadromous fishes, meaning they migrate from the ocean, through inlets into coastal bays and sounds and ascend into freshwater rivers and streams to spawn. Alewife spawn in rivers, lakes, and tributaries from northeastern Newfoundland to South Carolina, but are most abundant in the Mid-Atlantic and the Northeast. 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 3 to 8) and blueback herring (ages 3 to 6) migrate rapidly downstream after spawning. 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 river herring after they emigrate to the sea and before they mature and return to freshwater to spawn.

Adult river herring feed primarily on zooplankton (small, often microscopic animals floating in the water column) although they may also feed on fish eggs, crustacean eggs, insects and insect eggs, and small fish in some areas

and in larger individuals. In general, alewife are larger than blueback herring of the same age and with each species females are larger than males. Total length for either species in North Carolina rarely exceeds 12 inches.

Fisheries

River herring fisheries in North Carolina's coastal sounds and rivers were once among the largest freshwater fisheries in the world. The major concentrations of river herring historically and currently are found in the Albemarle Sound and its tributaries, with the Chowan River accounting for most of the landings. From 1950 through the early 1980s, landings averaged 13 million pounds annually. Due to habitat loss, water quality degradation, and high levels of fishing mortality, river herring landings in North Carolina began to decline in the mid to late 1980s. Since 2007, the commercial and recreational harvest of river herring has been prohibited in all coastal and joint waters of the state (Figure 1).

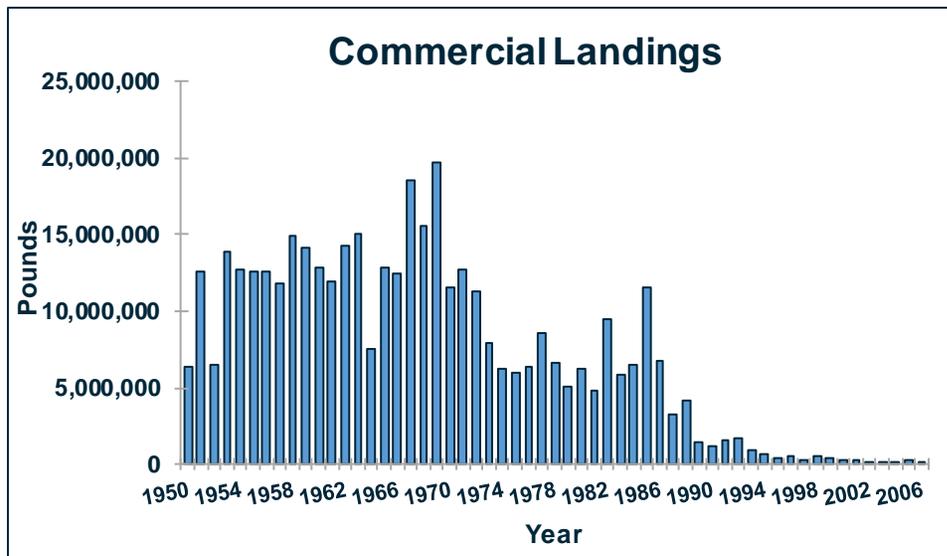


Figure 1. Annual commercial landings of river herring (blueback and alewife) in North Carolina, 1950-2006.

Historically, river herring have been taken for personal consumption in every major North Carolina coastal river system. In recent years, river herring have been taken for use as cut bait in the striped bass fishery, especially in the

Roanoke River. The recreational fishery for river herring closed in 2007 in joint and coastal waters. For the years leading up to the 2007 harvest closure, the extent of river herring harvest for personal consumption and bait in coastal North Carolina is unknown.

It is now illegal to possess river herring greater than 6 inches in total length, regardless of origin, while aboard a vessel or while fishing in all state waters. Recreational fishermen can possess river herring less than 6 inches taken from sources other than North Carolina joint and coastal fishing waters. River herring less than 6 inches used for cut bait in joint and coastal fishing waters must be cut so the head and tail are attached.

Management

River herring in North Carolina are managed under both the North Carolina Fishery Management Plan for Interjurisdictional Fisheries (Amendment 2 to the Atlantic States Marine Fisheries Commission Fishery Management Plan for Shad and River Herring, 2009) and a state plan (Amendment 2 to the North Carolina River Herring Fishery Management Plan, 2015). The Interjurisdictional plan requires management measures from the Atlantic States Marine Fisheries Commission be adopted by North Carolina as the minimum standard for the fishery, while the North Carolina plan can adopt more restrictive measures.

The original state River Herring plan, adopted in February 2000, focused on issues pertaining to stock conditions of overfished (a stock exploited to a level of abundance considered too low to ensure safe reproduction) and recruitment overfishing (the number of fish removed is greater than the number gained from fish remain and reproducing in the population), habitat degradations, and research/monitoring expansion to provide assessment data and socioeconomic data. Amendment 1 to the state plan, effective in 2007, implemented a no-harvest provision for commercial and recreational fisheries of river herring in coastal waters of the state. This was a result of the North Carolina Division of Marine Fisheries 2005 stock assessment of river herring (data through 2003) that determined blueback herring and alewife were overfished and overfishing was occurring, there was minimal recruitment (number of fish entering the stock) with continued declines for both species, and high fishing mortality rates. Additional management strategies included gear restrictions and stock recovery indicators. It also included a 7,500-pound limited research set-aside harvest to be used for data collection and to provide product to local herring festivals. The division director allocated a maximum of 4,000 pounds to be used for the research season, which occurred in the Chowan River Herring Management Area around Easter week each year. Additional outcomes of Amendment 1 included implementing monitoring programs, endorsing additional research on predation, restoration, impediments, bycatch and supporting spawning area habitat protection.

Amendment 2 to the state plan, approved in 2015, eliminated the discretionary river herring harvest season, recodifies the Albemarle Sound/Chowan River Herring Management Areas in rule, and removed alewife and blueback herring from exceptions in the Mutilated Finfish Rule. Additionally, Amendment 2 prohibited the possession of river herring greater than or equal to 6 inches total length from sources other than North Carolina coastal fishing waters aboard a vessel or while engaged in fishing.

Stock Status Overview

River herring in North Carolina are currently listed as “depleted” in the Albemarle Sound by the Atlantic States Marine Fisheries Commission. This designation is based on the results of the 2012 Atlantic States Marine Fisheries Commission Atlantic coastwide stock assessment on river herring, including data through 2009. The North Carolina portion of the coastwide stock assessment is for the Albemarle Sound blueback herring stock only, due to the long-term data available for this area. River herring in other parts of the state are currently listed as “Unknown” by the Atlantic States Marine Fisheries Commission due to the lack of data for these systems. The stock assessment found that, although the North Carolina stock in the Albemarle Sound was not experiencing overfishing (harvesting from a stock at a rate greater than the stock’s reproductive capacity to replace fish removed through harvest) due to the harvest moratorium, it remained overfished. The spawning stock biomass was less than five percent of the amount necessary for replacement and due to the biology of the species, significant improvements would not be likely within a short time frame.

Currently, the status of North Carolina river herring stocks in the Chowan River is monitored through three stock status indicators, most recently adopted under Amendment 2 to the state plan. The first indicator is a catch-per-unit-effort of 60 young-of-year per haul from the Albemarle Sound Survey (Figure 2). The second indicator is percent repeat spawners (the number of fish that have spawned two or more times) from the Chowan River Pound Net Survey (Figure 3). The third is the female spawning stock biomass (weight of mature fish) in pounds of river herring for the Chowan River (Figure 4). The first two stock status indicators (juvenile abundance and repeat spawners) serve as triggers for doing a stock assessment earlier than 10 years. If a three-year moving average of each of the indicators was above the threshold, it would trigger the need for a new stock assessment. Currently the percent repeat spawners is above its threshold, but juvenile recruitment is still very low compared to historical levels.

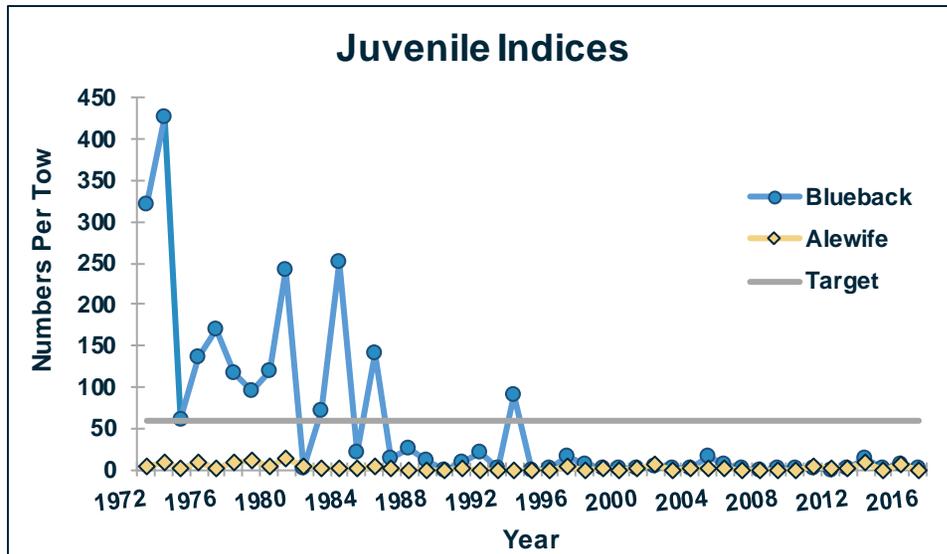


Figure 2. Annual indices of relative juvenile abundance of river herring (blueback and alewife), N.C. Division of Marine Fisheries Albemarle Sound Juvenile Survey, 1972-2016.

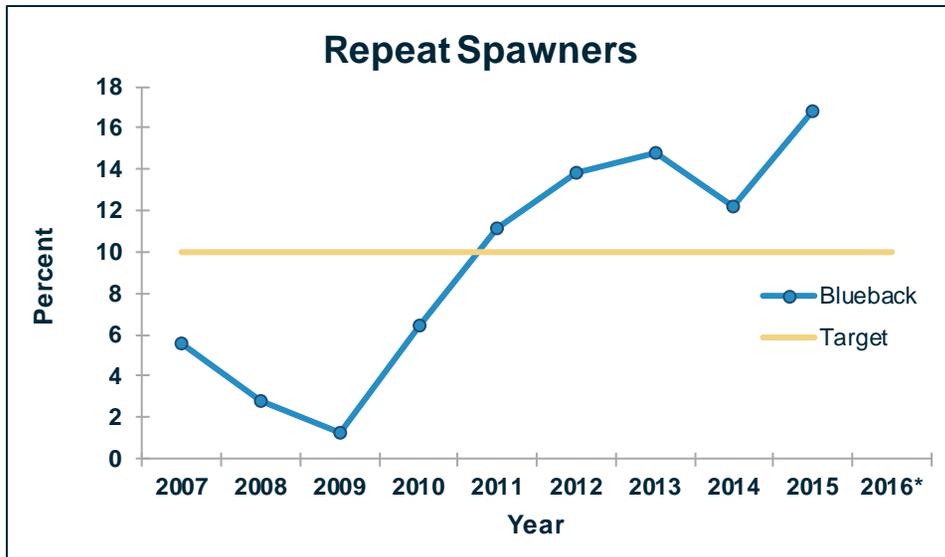


Figure 3. Percent repeat spawners for the Chowan River blueback herring, N.C. Division of Marine Fisheries Chowan River Pound Net Survey 2007-2016. *2016 ageing data incomplete.

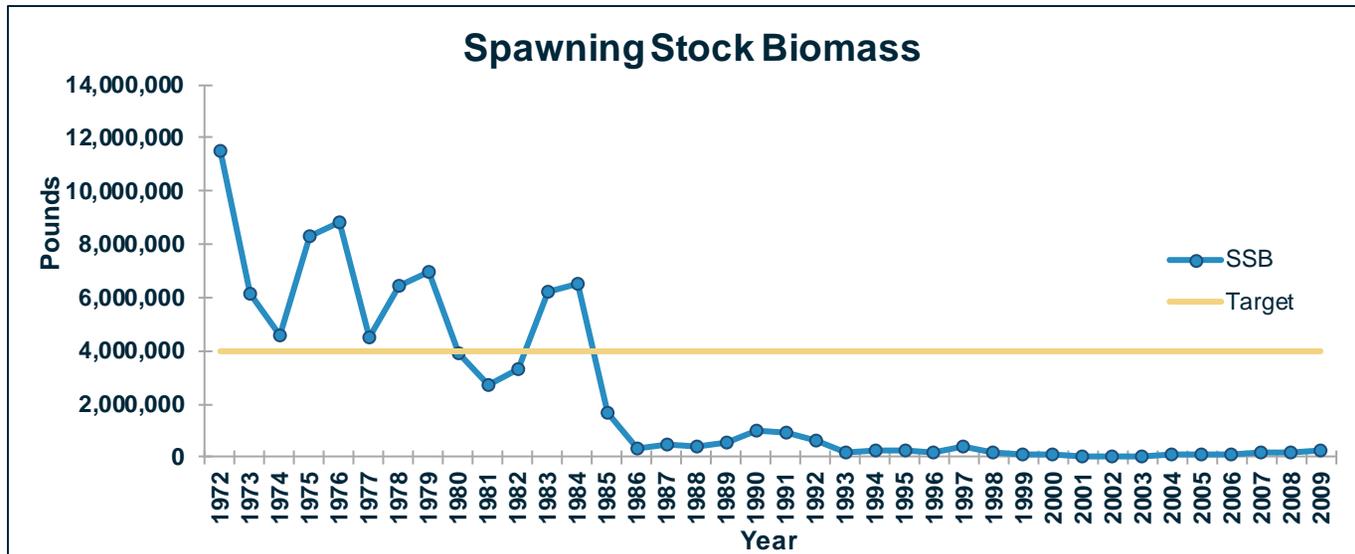


Figure 4. Annual estimate of female spawning stock biomass (SSB) in pounds for the Chowan River blueback herring stock, 1972-2009.

Research Needs

Research needs include life history studies of river herring egg and larval survival and development in North Carolina river systems, commercial discard estimates from incidentally caught river herring in Atlantic Ocean fisheries, fisheries independent data on recruitment of juvenile fish to adults in North Carolina river systems, and evaluating the effects of water quality and habitat loss on the recruitment of juvenile river herring in North Carolina river systems.

Links

Management Agencies

[North Carolina Division of Marine Fisheries](#)

[Atlantic States Marine Fisheries Commission](#)

Fishery Management Plans, Amendments, Revisions, & Supplements

[North Carolina Division of Marine Fisheries](#)

[Atlantic States Marine Fisheries Commission](#)

Stock Assessment Reports

[Atlantic States Marine Fisheries Commission](#)

Contacts

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