



## Life History and Habitat Needs

### Geographic Range

Historically, the coastal range of alewife is from South Carolina to northeastern Newfoundland; however, updated surveys indicate they do not occur south of North Carolina. Movement/Migration: Adults and sub-adults spend most of their lives at sea following a north-south seasonal migration along the Atlantic coast and only return to rivers to spawn. After spawning, fish return downstream. Eggs and larvae are found near or slightly downstream of presumed spawning areas. Beginning in late summer, juveniles move downstream in waves in response to dropping water temperatures and generally are found in the lower ends of rivers and in freshwater tributaries. Other factors prompting downstream migration include changes in water flow, water levels, precipitation, and light intensity. Most juveniles emigrate offshore their first year but others may spend their first winter in inshore waters.

### Spawning

Spawning runs begin in the south and move progressively north as the season progresses and water temperatures increase. Alewife spawn in slow-moving shallow sections of rivers or streams, and in lakes, freshwater coves behind barrier beaches, and ponds that form headwaters. Spawning has been reported in rivers as far south as North Carolina and as far north as the St. Lawrence River, Canada. Spawning migration is triggered mostly by water temperature, but water flow may also be a factor. They are believed to be repeat spawners, generally returning to their natal rivers. Habitat Use: Alewife can adjust to a wide range of salinities and may prefer cooler water than other anadromous fish. Spawning habitat ranges from areas with sand, gravel, or coarse stone substrate to those containing submerged aquatic vegetation (SAV) or organic detritus. Substrates with 75% silt or other soft material containing detritus and vegetation are suggested as optimal for spawning, egg, and larval habitat. In the Chesapeake Bay, juveniles can be found among SAV beds, which have been linked to improved water quality. Offshore, alewife have been caught most frequently in water depths between 56 -110 m.

## Threats to Habitat

- Dams and other physical obstructions
- Water withdrawal facilities
- Thermal and toxic discharges
- Channelization and dredging
- Land use (farming, logging and urbanization)
- Aluminum and other metals
- Changes in pH levels

## ASMFC Habitat Areas of Particular Concern

ASMFC Habitat Areas of Particular Concern include spawning sites; nursery areas; inlets that provide access to coastal bays, estuaries, and riverine habitat upstream to spawning grounds; and sub-adult and adult nearshore ocean habitat.

## Recommendations to Improve Habitat Quality

- Remove obstructions or improve passage to upstream migration. Evaluate effectiveness of passage at existing bypass facilities. Mitigate hydrological changes from dams. Determine if earlier upstream passage of adults would increase production and larval survival, and opening downstream bypass facilities sooner would reduce mortality of early emigrants.
- Take into account water flow needs for alosine migration, spawning, and nursery use when deciding river flow allocation. Alter water withdrawal rates or water intake velocities to reduce alosine mortality. Locate water withdrawal facilities along the river where impingement will be low.
- Improve water quality. Upgrade wastewater treatment plants. Reduce thermal effluent into rivers and discharge earlier in the year to reduce impacts to migrating fish. Determine the effects of dredging on alosine habitat. Implement erosion control measures and best management practices.
- Identify, quantify, and evaluate potential alosine spawning and nursery habitat. Coordinate with other agencies responsible for habitat restoration plans and promote cooperative interstate research, monitoring and law enforcement. Evaluate water quality standards and criteria to ensure they meet special needs of alosines. Review proposed projects for alosine spawning and nursery areas. Limit development projects.
- Determine biotic effects of alosine passage into previously restricted habitats and on other native species.

## Habitat Research Needs

- Determine optimal tolerances for salinity, dissolved oxygen, pH, depth, current velocity, and suspended solids for various life stages
- Use a multiple scale approach for restoring alosine habitat. Identify and assess indicators of suitable habitat, including potential spawning habitat.
- Document the impact of power plants and other water intakes on early life stage mortality in spawning areas
- Focus research on within-species variation in genetic, reproductive, morphological, reproductive, and ecological characteristics
- Review studies dealing with effects of acid deposition on anadromous alosines
- Determine how abundance and distribution of potential prey affect growth and mortality of early life stages
- Conduct additional studies on the effects of land use on riverine stages
- Determine if pH and aluminum levels lead to reduced reproductive success and if chlorinated sewage effluent slows recovery of depressed stocks

## Additional Information

Alewife are managed under Amendment 2 (2009) to the Interstate Fishery Management Plan for Shad and River Herring. Amendment 2 prohibits state waters commercial and recreational fisheries 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. As of January 2016, ME, NH, NC and SC have approved Sustainable FMPs. Additional information is contained in the ASMFC's Diadromous Fish Habitat document. These documents can be found on the ASMFC website at [www.asmfc.org](http://www.asmfc.org) or by contacting the ASMFC Habitat Program Coordinator at 703.842.0740.

The most recent river herring stock assessment, completed in 2012, found of the 52 stocks of alewife and blueback herring for which data were available for use in the assessment, 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. In 2013, NOAA Fisheries conducted a status review of river herring under the Endangered Species Act and found that the listing was not warranted in 2013. As part of that finding, NOAA Fisheries committed to partnering with the Commission and other stakeholders to develop a comprehensive conservation plan for river herring throughout its entire range. The plan can be found online at <http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/conserv/index.html>.