



Life History and Habitat Needs

Geographic Range:

Atlantic herring inhabit both the eastern and western

halves of the North Atlantic Ocean basin. In the western Atlantic Ocean, Atlantic herring range from Labrador, Nova Scotia to Cape Hatteras, North Carolina.

Movement/Migration: Adult herring make extensive north-south migrations between summer spawning grounds on Georges Bank and the Gulf of Maine and overwintering areas in southern New England and the Mid-Atlantic region. Migration is triggered by thermal, oceanic fronts that develop between cold continental shelf waters and warm continental slope waters.

Spawning: In U.S. waters, herring spawn mainly in two areas: the Gulf of Maine and Georges Bank/Nantucket Shoals. Spawning begins in July and continues until December. Spawning grounds are located in high-energy environments with strong tidal currents and high salinity (32-33 ppt).

Habitat Use: Forming thick beds, herring eggs adhere to a variety of bottom substrates including rocks (ranging from pebbles to boulders), gravel, shell fragments, sand, and aquatic plants. Eggs are found in areas with water temperatures ranging from 7-15°C, and depths from 5-73 m. Egg viability is particularly sensitive to sediments suspended in the water. Mortality is common in eggs covered by sediment, the prevalence and duration of which may increase from dredging and other bottom-disruptive activities.

Although observed offshore, larvae are generally found in pelagic waters at depths of about 50-90 m and temperatures below 16°C in the Gulf of Maine, Georges Bank, and southern New England. Larvae that develop in the coastal portions of the Gulf of Maine usually remain inshore, and enter bays and estuaries to overwinter. Larvae from Nantucket Shoals and Georges Bank typically drift southwest, occasionally moving as far south as southern New Jersey.

Similar to other zooplankton, Atlantic herring larvae exhibit daily vertical movements in the water column. These vertical migrations are thought to be a mechanism by which larvae hold their relative position in response to strong tidal currents. Over the course of a day, juveniles also demonstrate vertical migration, possibly in response to prey movements or as a mechanism of predator avoidance. Such movements also correspond to changes in light intensity.

In summer and fall, juveniles migrate from nearshore waters to wintering grounds in deep bays or offshore areas. Residing in open waters and bottom habitats, juveniles may be found throughout southern New England and the Mid-Atlantic. In general, juveniles prefer waters with temperatures from 8-12°C, depths of 5-135 m, and salinities ranging from 26-32 ppt. Adults occupy the same geographic range and similar habitats as juveniles, but typically occur in slightly deeper (20-130 m) and more saline (> 28 ppt) waters.

Threats to Habitat

- Physical alteration and disturbance caused by natural processes (storms, climate change) and human activities (coastal development, channel dredging, marina construction, bottom trawling)
- Destructive or unregulated practices in agriculture and silviculture
- Contaminants from nonpoint and point source pollution (i.e., heavy metals, oil, nutrients, pesticides)

ASMFC Habitat Areas of Particular Concern

Estuaries and embayments are important nursery grounds for juveniles.

Recommendations to Improve Habitat Quality

- Establish measures to protect spawning aggregations or egg masses.
- Develop permitting conditions and planning considerations to avoid or mitigate adverse impacts to habitat areas of particular concern (e.g., dredging windows to reduce impacts to locations of eggs and spawning activity).
- Coordinate development and implementation of nonpoint source pollution control plans.
- Strengthen enforcement of sewage discharge controls and ensure proper operation of septic systems.
- Review adequacy of water quality standards to protect all life-stages of Atlantic herring.
- Review oil spill prevention and response plans and implement area wide oil spill contingency plans.
- Develop contaminated sediment remediation plans.
- Establish and enforce no discharge zones in marinas and ports.
- Educate recreational boaters on how to reduce water contamination from fuel spills and waste disposal.
- Identify and implement habitat protection and restoration needs in National Estuary Program Comprehensive Coastal Management Plans.

Habitat Research Needs

- Identify Atlantic herring spawning areas.
- Collect data on species distribution and relative abundance in inshore waters.
- Collect information on how oceanographic features (waters masses and currents) affect the distribution of larval, juvenile, and adult herring.
- Determine the value of using protected areas to conserve and enhance herring stocks.

Additional Information

Atlantic herring are managed by the ASMFC under Amendment 1 to the Fishery Management Plan (1999) for Atlantic Sea Herring. Amendment 1 can be obtained on the ASMFC website www.asmfmc.org or by contacting the ASMFC Habitat Specialist at (202) 289-6400.

www.asmfmc.org

