



Life History and Habitat Needs

Geographic Range: On the Atlantic coast, Atlantic menhaden inhabit nearshore and inland tidal waters from Florida to Nova Scotia, Canada.

Movement/Migration: Adult menhaden undergo extensive seasonal migrations north and south along the coast. By June, the population is distributed by size and age, with mature adults in the northern portion of the range, and sub-adults and some juveniles in the southern portion of the range. By December, schools of migratory juveniles, sub-adults, and adults can be found off the North Carolina capes.

Spawning: Spawning principally occurs at-sea over the continental shelf, with the majority occurring in the U.S. South Atlantic region during October – March. There is some spawning activity in bays and sounds in the northern portion of its range. Sites are identified by the presence of buoyant pelagic eggs.

Habitat Use: Eggs hatch at sea. Larvae are transported to estuaries by ocean currents where they develop into juveniles. Much of the early development takes place in estuarine water where the salinity is normally < 10 ppt. Juvenile habitat is unconsolidated bottom consisting mostly of sand and mud, with various mixtures of organic material. In more northerly areas, juveniles can be found in rocky coves, with mixtures of cobble, rock, and sand bottoms. Sub-adults habitat are found in temperate, nearshore marine and estuarine areas that have a bottom composition of sand and mud, and more organic material than in marine areas. Adult habitat ranges from a bottom composition of sand, mud and organic material to marine sand and mud with increasing amounts of rocks in the more northerly areas. Adults appear to prefer water temperatures near 18° C; adult migrations and movement may be attributed to seeking waters within a certain temperature range.

Threats to Habitat

Marine-subtidal:

- Petroleum products from maritime shipping accidents
- Offshore drilling accidents
- Excessive quantities of domestic waste from sewage outfalls

Estuarine-subtidal:

- Nutrient and chemical overloading of pesticides, herbicides, chemical fertilizers, and livestock waste
- Coastal development including dredge and fill activities
- Water quality (hypoxic conditions, toxic dinoflagellates)
- Ulcerative mycosis (UM), fungal infection

Riverine-tidal:

- Hypoxic conditions
- UM infection

ASMFC Habitat Areas of Particular Concern

Marine-subtidal: This habitat type is utilized by spawning adults (eggs), pre-estuarine immigrant larvae, post-estuarine emigrant juveniles and sub-adults.

Estuarine-subtidal: In the Mid- and South Atlantic, estuarine habitat utilized for transformation and early development is one of the most critical and vulnerable habitats.

Riverine-tidal: The interface with this habitat type and estuarine areas represent the upstream extent of larval movement for transformation and early juvenile development.

Recommendations to Improve Habitat Quality

- Identify habitats associated with sensitive life stages or critical life history events, and areas of higher density and use
- Provide habitat information to local, state, and federal permitting agencies to minimize habitat loss, aid in mitigation where losses have occurred, and allow scheduling of potentially damaging habitat alterations during less sensitive times
- Improve water quality. Water borne contaminants can increase Atlantic menhaden's susceptibility to disease and parasites and increase negative impacts at individual and population levels.
- Work to restore or maintain historic salinity gradients by considering freshwater runoff patterns, river drainage basins, and integrity of estuarine systems
- Monitor sediment loads and sediment borne contaminants
- Ensure that actions such as construction of jetties do not threaten inlet integrity and larval passage for menhaden
- Scrutinize projects involving water withdrawal from nursery habitats (e.g., power plants, irrigation, water supply projects) to minimize adverse impacts from impingement/entrainment, modification of flow, and temperature and salinity regime changes due to water removal.

Habitat Research Needs

- Continue to research issues related to factors causing/exacerbating *Pfiesteria* sp. and *Pfiesteria*-like fish kills. Linkages/associations with UM need to be further investigated. Infection rates among fishery pre-recruits need to be determined and monitored, and potential impact on recruitment quantified.
- Clarify factors causing hypoxic conditions in some of the key nursery areas and determine impact on the population.
- Expand knowledge of geographic and seasonal distributions of sub-adult and adult menhaden need to be expanded by using incidences of catches by gear other than commercial purse seines.
- Collect information on tolerances of individual life stages to environmental variables such as temperature and salinity to enhance and supplement laboratory studies.

Additional Information

Atlantic menhaden are managed under Amendment 1 (2001) and Addendum 1 (2004) to the Fishery Management Plan for Atlantic Menhaden. These documents can be found on the ASMFC website at www.asmfc.org or by contacting the ASMFC Habitat Specialist at (202) 289-6400.

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