



Life History and Habitat Needs

Geographic Range:

Atlantic sturgeon range in the Atlantic Ocean from the Hamilton River and George River, Ungava Bay, Labrador, to the St. Johns River in Florida. In the winter, they range south to Port Canaveral and Hutchison Island, Florida. Historically, Atlantic sturgeon were found in every major river system along the Northeast, but now most of the populations have been extirpated, or remain at historically low levels.

Movement/Migration: Sub-adults and adults are known to make long distance migrations along the Atlantic coast, moving north in the late winter and south in fall and early winter to overwintering grounds. Likely cued by temperature, mature fish move up-estuary during spring spawning migrations. After spawning, fish migrate down-estuary to salt water. Larvae also migrate downstream, stopping to forage. Larval fish resume downstream migration when the temperature drops. Migration occurs at night at first; eventually, juveniles become active during both the day and night. Migrations out to coastal areas occur between 1 and 6 years of age and are seasonal in response to temperature changes. Inter-estuarine migrations have been documented.

Spawning: Spawning occurs in tidal freshwater regions of large estuaries in waters where the temperatures range from 13.2° - 23°C. The precise location of spawning sites remains unknown. Atlantic sturgeon mature at different times along the Atlantic coast, with maturity occurring earlier in the southern regions. Mature fish do not spawn every year, e.g., in South Carolina, females are thought to spawn every 3 to 5 years, while males spawn at 1 to 5 year intervals. The Hudson River, New York is one of the major spawning grounds for the Atlantic sturgeon coastwide. It is thought that the Kennebec, Androscoggin, and Sheepscot estuarine systems in Maine currently support the only spawning populations in New England. As of 2000, spawning areas have not been identified in any of the southeastern rivers, however, spawning may possibly occur in the Comabahee and Edisto Rivers in South Carolina.

Habitat Use: Substrate is a key habitat parameter for Atlantic sturgeon, as hard bottom is required for successful egg attachment and incubation, and protects larvae from predators. Reported spawning substrates include small rubble and gravel, hard clay, and limestone substrate. Sturgeon lay eggs in flowing water ranging from 46-76 cm/s and in regions well upstream of the salt front but below the fall-line. Juveniles have been found mostly over sand substrates, but also over rocks, cobble, and mud. Juveniles tend to congregate in deep waters, particularly in the summertime. Young sturgeon primarily use brackish water habitats and large juveniles are found in areas where the salinity exceeds 3 ppt. Dissolved oxygen is very important for Atlantic sturgeon because they show unusually high susceptibility to low oxygen. While at sea, adult Atlantic sturgeon have been documented using shallow nearshore habitats over sand and gravel substrates, and over silt, sand, clay and gravel. Little is known about the habitat use of larval fish and adult Atlantic sturgeon during the non-spawning season. Adults in South Carolina use a variety of habitats during the summer, including the upper fresh/brackish interface zone, the lower interface zone, and in the high salinity portions of the estuary in the Edisto River.

Threats to Habitat

- River blockages
- Loss of spawning substrate, especially loss of hard substrate from sedimentation and siltation
- Water quality deterioration, especially in summer/nursery habitat
- Dredging
- Water contamination, particularly polychlorinated biphenyls (PCBs), cadmium, mercury and lead

ASMFC Habitat Areas of Particular Concern

Important habitats for Atlantic sturgeon include spawning sites, nursery areas, inlets that act as migration corridors to and from freshwater spawning habitat and estuarine nursery grounds, and wintering grounds for adult and older juveniles that include nearshore areas off the Atlantic coast from the Gulf of Maine south to at least Cape Lookout, North Carolina.

Recommendations to Improve Habitat Quality

- Restore water flows to appropriate levels during spawning season
- Remove dams that block access to prime spawning areas or design effective fish passage facilities
- Reduce nutrient input to improve water quality and prevent hypoxia in estuarine nursery areas
- Restore hard substrate in spawning grounds, designate spawning areas as essential habitat, and protect and enhance spawning areas
- Apply seasonal restrictions to dredging operations to protect migrating fish

Habitat Research Needs

- Identify sturgeon spawning locations
- Document larval life history and identify larval habitat
- Continue to research and identify the wintering habitat of sub-adult sturgeons in many systems
- Develop sampling and tagging programs to determine distribution of Atlantic sturgeon
- Develop habitat maps for all life stages
- Identify habitat use of adult sturgeons during non-spawning seasons
- Determine age-distribution and sex ratio information for southern populations
- Quantify the suitability of spawning and nursery habitats
- Examine how egg, larval and juvenile abundance relates to spawning stock size and environmental factors
- Develop methods to quantify vital rates, population abundance, and habitat requirements during the first year of life
- Research the impacts of dredging on Atlantic sturgeon

Additional Information

Atlantic sturgeon are currently managed by under Amendment 1 (1998) and Addendum 1 (2001) to the Fishery Management Plan for Atlantic Sturgeon. Additional information is contained in the ASMFC's Diadromous Fish Habitat document. These documents can be found on the ASMFC website at www.asmf.org or by contacting the ASMFC Habitat Specialist at (202) 289-6400.

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