

Delaware River

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The shortnose sturgeon, *Acipenser brevirostrum*, and its cousin, the Atlantic sturgeon, *Acipenser oxyrinchus*, are ancient fish species that originated more than 70 million years ago. Of the seven species of sturgeon in North America, two are found in New Jersey.

Common names (mid-Atlantic region)

Shortnose sturgeon - shortnosed, little sturgeon, roundnoser and mamnose

Atlantic sturgeon - sea sturgeon, common sturgeon, sharp-nosed and big sturgeon

Characteristics

Sturgeon are part of the *Acipenseridae* family, possessing a skeleton made of cartilage, not bone. These fish have flattened, elongated bodies covered with five rows of bony plates called scutes. Sturgeon tails are heterocercal, meaning the upper lobe of the tail is much longer than the lower lobe.

Shortnose sturgeon have short, blunt snouts. Their upper body is olive-yellow to gray-blue; the underside is milky white to dark yellow.

Atlantic sturgeon snouts are tapered in the young but broad as adults and noticeably upturned. Their upper body is gray to blue-black with white spines on the scutes.

Both sturgeon species have two pairs of barbels (feelers) projecting from their lower jaw and used to detect food. Sturgeon are toothless and extend their tube-like mouths to ingest prey, which then is ground in the stomach.

Size

Shortnose sturgeon is the smallest sturgeon along the East

Coast. They grow to about 56 inches and can weigh up to 15 pounds, but average closer to 10 pounds. In contrast, **Atlantic sturgeon** reach an average mature length of 10 feet, but can grow to 15 feet and 800 pounds.

New Jersey's recreational state record Atlantic sturgeon, caught off Sandy Hook in 1994, weighed 82 pounds.

Range

Along the Atlantic Ocean coastline, sturgeon are found from Hamilton Inlet in Labrador, Canada, to St. Johns River, Florida.

Habitat

Both species are considered anadromous, meaning they migrate from the ocean to fresh water only to spawn. However, unlike classic anadromous fish, shortnose sturgeon live mainly in brackish portions of rivers, estuarine waters or near-shore marine waters and migrate upstream to faster-moving fresh water to spawn.

Life History

The male **shortnose sturgeon** matures at 3 years to 5 years; the female matures between 6 years and 7 years. One year to two years after reaching maturity, the males spawn for the first time while females may not spawn until five years or more after maturity. Shortnose sturgeon live 30 years to 60 years or more.

Spawning takes place over a five-day to 17-day period from late March into May (depending on the water temperature),



Shortnose Sturgeon

Delaware River Sturgeon

when adults move to the Delaware River's non-tidal water near Scudder Falls, just north of Trenton. Females lay 40,000 eggs to 200,000 eggs, which the males then fertilize. Hatchlings emerge 13 days later. Adults leave the spawning grounds while the young remain in the upper freshwater portion of the river for up to two weeks, then drift downstream until they reach a slow flow area suitable for feeding. Gradual travel downstream continues until they reach the adult foraging area in the lower part of the river.

Unlike their shortnose relatives, **Atlantic sturgeon** males reach maturity between 5 years and 24 years; females mature at 7 years to 30 years.



Females do not spawn annually and may return to their spawning grounds only every two years to six years, laying more than two million eggs. Spawning takes place from late March or April into May when adults move to fresh water in the upper tidal portion of the river. Adult females then return to the ocean while the males may stay in the river until autumn. Once hatched, juveniles remain in the river or estuary for up to six years. During this time,

juveniles and subadults inhabit estuarine waters, eventually joining adults in coastal waters. Atlantic sturgeon may live as long as 60 years.

Feeding

Atlantic and shortnose sturgeon are bottom feeders, using their barbels to locate food on the river bottom or ocean floor. Their diets consist mostly of mollusks, worms, shrimp, snails, insect larvae and small fish.

Commercial Fishing

The commercial fishery for sturgeon began during the 1700s. Within the next century, caviar and smoked flesh became a major export. Worldwide distribution centered from the Delaware estuary. In 1890, an estimated seven million pounds of sturgeon were landed on the east coast, with the Delaware Bay accounting for about six million pounds. By the early 1900s, the fishery began to focus primarily on Atlantic sturgeon. Overfishing continued, and the fishery crashed. Increased industrialization and its accompanying dams, dredging and poor water quality led to the destruction of sturgeon habitats.

Although wild Atlantic sturgeon are protected by a moratorium along the Atlantic Coast, cultured Atlantic sturgeon still are valued for their flesh and eggs, known as caviar.

Management

The shortnose sturgeon was listed as an endangered species in 1973 under the federal Endangered Species Act. However, the Atlantic sturgeons' slow growth rate, advanced age of maturity and long periods between spawning make this species especially vulnerable to human activity.

(continued on page 18)



Atlantic Sturgeon

STURGEON (continued from page 17)

Then in 1990, the Atlantic States Marine Fisheries Commission adopted the Atlantic Sturgeon Fishery Management Plan, requiring states to adopt a size limit or impose a fishing moratorium. In June 1998, the plan was amended and a moratorium for Atlantic sturgeon was implemented along the Atlantic Coast. The moratorium is expected to continue for more than 40 years. Data is now being evaluated to determine the Atlantic Sturgeon's status in New Jersey waters.

For both sturgeon there is good news: Advancements in wastewater treatment have dramatically improved the Delaware River's water quality during the past several decades. Since the late 1990s, dissolved oxygen levels in the river have been higher than minimum state standards. Conditions are more favorable for the possibility of sturgeon restoration from the Delaware's remnant population.

In August 2004, proof of such restoration surfaced from the Delaware River at Oldman's Point, Salem County, during a beach seine survey conducted by the New Jersey Department of Environmental Protection's Division of Fish & Wildlife fisheries biologists. A 4.6-inch shortnose sturgeon was caught, the first such appearance during the 25-year survey and one of the few young-of-year shortnose sturgeon caught there in years.

Past Studies

Several studies have focused on the Delaware River shortnose sturgeon population. In the 1980s, sturgeon were tagged to determine population size. Estimates ranged from 6,408 adults to 14,080 adults, making the population one of the healthiest on the Atlantic coast. A study conducted from 1981-87 determined that any river alteration plans should consider the impact on shortnose sturgeon, according to published reports.

During a 1998 study, researchers using gill nets caught dozens of sturgeon per haul; one catch contained more than 500 shortnose confirming the Delaware River is a healthy system for this primitive species. The study also showed the shortnose population to be the same as it was in the 1980s. However, only a few small shortnose sturgeon were captured during 1999 surveys, including one young-of-year. The National Oceanic and Atmospheric Association is funding shortnose sturgeon surveys in the Delaware.

In 1994, State of Delaware researchers' surveys of Atlantic sturgeon fisheries in the Delaware River resulted in a catch of 500 subadults. A few years later, a similar survey netted only 20 subadult sturgeon. More recently, only five juveniles were caught. Though the Atlantic sturgeon population had relatively high numbers during the 1980s, it has since decreased. In recent years, the Delaware River has probably declined to hundreds of fish.

Current Research

The U.S. Fish and Wildlife Service's Northeast Fishery Center in Lamar, Pa., is developing fish culture techniques to be used if breeding and stocking Atlantic sturgeon becomes necessary. The Pennsylvania Fish and Boat Commission recently issued a grant to Delaware State University to study Atlantic sturgeon populations in the Delaware River. They will investigate the current status and spawning habitat needs of this species. This spring, Pennsylvania also plans to use drift nets to catch fish larger than four feet. These fish will be quantified and transmitters will be implanted surgically. 