

## New York's Sturgeon

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Imagine going fishing on your favorite lake or river and hooking a 300 pound monster. Or perhaps, while boating, you see a seven to ten foot "floating log" suddenly dive beneath the water's surface. Or imagine not being able to take your boat out on the river because the channel is so full of huge spawning sturgeon that navigation is dangerous.

Scenes like these were commonplace occurrences as people came into contact with our once plentiful sturgeon. Beginning in the late 1700s and through the early 1900s, however, sturgeon populations decreased drastically as the industrial revolution occurred and man became aware of the value of sturgeon, particularly for its meat and eggs (caviar). Today, most sturgeon populations are protected and regulated to help maintain or increase their population numbers.

Longfellow's *Song of Hiawatha* described Hiawatha's pursuit of the great sturgeon Nahma, King of Fishes. The largest and longest-lived of any of the freshwater fishes, sturgeon are indeed the king of fishes. They are enormous when compared to other freshwater fish species. Certain sturgeon species, such as the beluga of Eurasia, can reach 19 feet in length and 2500 pounds in weight. In the western United States during the 1700s, sturgeon as large as 1500 pounds and over 100 years old were common.

### Biology

Sturgeon are prehistoric looking creatures that have been around since before the dinosaurs. Unique in appearance, sturgeon look somewhat sharklike with large submarine-like bodies and strongly upturned heterocercal (top is two to three times longer than bottom) tails. They have flattened prominent snouts with underslung mouths and barbels (whiskers).

Instead of scales, five rows of large bony plates or shields (called scutes) cover the sturgeon's leatherlike skin. The scutes provide protection against predators and add to the fish's primitive appearance.

Toothless, sturgeons are bottom feeders. They drag their barbels along the bottom to locate food and then extend their tubular mouth to suck it up. Any silt, gravel, or other bottom materials also taken in is expelled through the gills. The food is then ground by their muscular gizzard-like stomachs.

Sturgeon are extremely long-lived, living to 60 plus years old. They are slow to mature and generally do not spawn for the first time until they are nine to 23 years old, depending on the species. Mature sturgeon do not spawn every year. During spawning, the eggs are broadcast over a large area and left unattended to hatch in eight to ten days. A large female sturgeon can lay as many as two million eggs.

Sturgeon live only in the Northern Hemisphere. Of the 26 species found worldwide, three species of sturgeon occur in New York State's waters: Atlantic sturgeon, lake sturgeon, and shortnose sturgeon.

# Atlantic Sturgeon



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The largest of New York's sturgeons, Atlantic sturgeon in the Hudson River occasionally reach over 200 pounds in weight and six to eight feet in length. Individuals up to 14 feet long and 800 pounds have been recorded from New Brunswick, Canada.

The Atlantic sturgeon is olive green to blue-black on its back and upper sides, shading to white on the belly. It can be told apart from its cousins by its long, narrow snout with a relatively small underslung mouth and four barbels.

## Life History

Atlantic sturgeon are anadromous, migrating from saltwater to spawn in freshwater. While much is known about its habits in freshwater, little is known about this sturgeon while at sea.

At spawning time, male sturgeon move into the river first followed by the females. Spawning occurs from April-June upstream of the salt front. Individual fish have been known to travel over 900 miles to spawn.

Following spawning, female Atlantic sturgeon will move out of the river while males may remain until the fall. Female Atlantic sturgeon reach sexual maturity at 18-19 years of age when they are six to eight feet long and over 70 pounds. Males become sexually mature at 12-14 years of age, when they are 3.5 to 6.5 feet long. The oldest recorded individuals were over 60 years old.

Spawning sturgeon scatter the eggs across a wide area. The eggs are sticky and attach themselves to stones and vegetation. Following hatching, the young fish remain in freshwater for two to seven years before moving out to sea. As they grow, they feed on a variety of benthic or bottom organisms, including worms, amphipods, isopods, midge larvae, plants, and small fishes.

Atlantic sturgeon are sometimes seen basking at the water's surface and making spectacular jumps.

## Habitat and Distribution

After spending up to the seven years of life in freshwater, Atlantic sturgeon migrate out to sea to spend the rest of their lives. Only during spawning season do adult sturgeon return to large coastal rivers and estuaries.

In New York, Atlantic sturgeon are generally found in the deeper portions of the Hudson River. While occasionally found as far upriver as Albany, young fish are rarely seen upstream of Hudson.

## Population Status

Prior to 1900, Atlantic sturgeon were abundant in the Hudson River estuary, especially south of Hyde Park. People caught large numbers of these huge fish for their delicious meat and for the caviar. Nicknamed "Albany Beef," the once plentiful Atlantic sturgeon was commonplace dining fare in New York's Capital Region.

Atlantic sturgeon numbers have dramatically decreased since then. Currently, they are protected and no one is allowed to fish for them.

## Lake Sturgeon



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Also called rock sturgeon, reddy sturgeon, or common sturgeon, the lake sturgeon is New York State's largest completely freshwater fish. Mature adults average between three and five feet in length and ten to 80 pounds in weight, but can occasionally grow as large as seven plus feet and 300 plus pounds.

Body coloration changes with age. Adult lake sturgeon are a uniform dull grey color with the scutes the same color as the background. Younger sturgeon are brownish grey with clear green on the lower parts of the head and body.

Lake sturgeon have sharp, cone-shaped mouths with four smooth barbels on the underside. The mouth is wide and there are two smooth lobes on the lower lip.

As lake sturgeon age, their clearly-defined, pointed scutes smooth out. In certain older individuals, the plates are barely visible.

### Life History

Lake sturgeon spawn in the spring from May to June. Prior to spawning, adult sturgeon form groups in deep holes near the spawning site. At this time, the fish may perform "staging" displays that include rolling near the bottom then leaping out of the water to fall with a loud splash.

Actual spawning takes place in areas of clean, large rubble such as along the windswept rocky shores of islands and in the rapids in streams. The eggs are scattered by currents and stick to rocks and logs. Young fish grow rapidly, reaching 7.5 inches by the end of the first year growing season.

Female lake sturgeon do not reach sexual maturity until 14-23 years old and may live up to 80 years. Once sexual maturity is reached, females will only spawn every four to six years. Male lake sturgeon reach sexual maturity at eight to 19 years old and can live up to 55 years. In 1953, a 154 year old lake sturgeon was caught in Lake of the Woods, Canada. It weighed 208 pounds.

Lake sturgeon eat a variety of organisms including leeches, snails, clams, other invertebrates, small fish, and even algae.

### Habitat and Distribution

The lake sturgeon is found primarily in freshwater lakes and large rivers in northeastern North America, but can also occur in the brackish waters of Hudson Bay and the St. Lawrence River. It prefers clean sand, gravel, or rock bottom areas where food is abundant.

In New York, lake sturgeon have been collected in the St. Lawrence River, Lake Ontario, Lake Erie, the Niagara River, Lake Champlain, Cayuga Lake, the Seneca and Cayuga canals, and in the Grasse, Oswego, and Oswegatchie rivers.

## Population Status

At one time, lake sturgeon were so abundant that they were considered a trash fish. Commercial fishermen found them a nuisance because their rough skin would ruin their nets used to catch more valuable fish species. It has been described how fishermen would stack them like cordwood on shore and either burn them or leave them there to rot.

But as the value of their eggs for caviar, skin for leather, swim bladders for isinglass, and their delicious meat became known, the Great Lakes fishery exploded. Within a relatively short time, population levels plummeted.

The American Fisheries Society lists the lake sturgeon as threatened in all the states where it occurs, including New York State. In addition to overfishing, construction of dams that cut off key upstream spawning grounds, and pollution are also reasons for declines in the lake sturgeon populations. DEC is currently researching lake sturgeon populations in order to ensure their populations are properly protected, managed and, when feasible, enhanced.

## Shortnose Sturgeon



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The shortnose sturgeon is the smallest of New York's sturgeons, rarely exceeding 3.5 feet in length and 14 pounds in weight. It has a short, blunt, conical snout with four barbels in front of its large underslung mouth.

Its body color is generally olive-yellow to gray or bluish on the back, and milky white to dark yellow on the belly. Its scutes are pale and contrast with its background.

## Life History

While much is still not fully understood about the spawning behavior and early life stages of the shortnose sturgeon, a few facts are known.

The shortnose sturgeon is semi-anadromous. Each year, between April and May, adult sturgeon migrate up the Hudson River from their mid-Hudson overwintering area to spawn in freshwater sites north of Coxsackie. Males spawn every other year and females every third year.

Eggs are deposited and hatch in approximately 13 days. The newly-hatched fry are poor swimmers and drift with the currents along the bottom. As they grow and mature, the fish move downriver into the most brackish waters of the lower Hudson.

Like all sturgeon, shortnose sturgeon are long-lived. The oldest known female was 67 years old and the oldest known male was 32.

Using their barbels to locate food, shortnose sturgeon eat sludge worms, aquatic insect larvae, plants, snails, shrimp, and crayfish.

## Habitat and Distribution

The shortnose sturgeon is restricted in range to the Atlantic seaboard in North America. It occurs in estuaries and large coastal rivers.

In New York State, it is found in the lower portion of the Hudson River from the southern tip of Manhattan upriver to the Federal Dam at Troy.

### **Population Status**

The shortnose sturgeon is officially listed as endangered in all states where it occurs. It is unlawful to kill or possess this fish.

A combination of factors is responsible for the declines in shortnose sturgeon populations. During the 1800s and early 1900s, large tidal rivers such as the Hudson served as dumping grounds for pollutants. This led to major oxygen depletion and resulting high fish losses. In addition, dam construction that cut off upstream breeding grounds, and demands for sturgeon meat and caviar also contributed to the decreases in shortnose sturgeon populations.

## **Sturgeon - An Ancient Species**

Sturgeon belong to one of the most primitive groups of bony fishes. They're a relict species, having survived since the Mesozoic era, 65-230 million years ago. While some characteristics have changed over time, sturgeon remain basically the same as they have been since their beginning.

Today's sturgeon have a mostly cartilaginous skeletal system, a sharklike tail fin (called heterocercal) which has the upper lobe longer than the lower lobe, and fine horny fin rays. These characteristics are known from fishes present during the Devonian period, which occurred 360-408 million years ago.

Sturgeon also have a notocord, the precursor to the bony vertebral column found in most other "advanced" fish species. The bony scutes covering their bodies are remnants of primitive ganoid scales, scales that have an outer enamel layer made up of a distinct substance called ganoine.

The order to which sturgeon belong (*Acipenseriformes*) includes an extinct fossil family that dates from the Lower Jurassic to Lower Cretaceous periods of 144-213 million years ago. Rare fossil finds indicate that the current genus for sturgeon (*Acipenser*) dates from the Upper Cretaceous period, 65 million years ago.

## **Sturgeon and People**

Few freshwater fish species have had such a yo-yo relationship with man. Eastern Forest Indian tribes worshipped these huge fish, admiring them for their remarkable size and strength, and relying on the annual harvest of their meat and skins for sustenance.

During colonial times, most people considered sturgeon a nuisance and trash fish. Certain accounts state that sturgeon were so plentiful they actually clogged rivers during their spawning runs. Large sturgeon that were caught accidentally by fishermen were either discarded, fed to pigs, used as fuel to power steamboats, or used for fertilizer. Hudson River sturgeon were so common that caviar was given away.

Beginning in the mid to late 1800s, North Americans became aware of the value of sturgeon. Europeans considered caviar a delicacy and so the demand for sturgeon exploded. In addition to caviar, sturgeon were harvested for a number of purposes: sturgeon meat was delicious, especially smoked; the skin was tanned for leather; and the swim bladders were used for isinglass, a high quality gelatin used for pottery cement, waterproofing, and for clarifying wine and beer.

Slow growing creatures, sturgeon populations could not take this kind of intense fishing. Coupled with the effects from pollution and the building of dams that prevented these fish from reaching their upstream spawning grounds, sturgeon

populations rapidly reached extreme low numbers. It took man only a little over 100 years to jeopardize the existence of a fish that had been around for hundreds of millions of years.

Today, sturgeon populations are closely monitored. Both state and national governments are working together to reestablish healthy populations. Rehabilitation efforts, including biological research and strict regulations with stiff penalties for violators, are helping ensure there will be sturgeon populations for future generations to enjoy.

But while sturgeon populations are being aided by these actions, people must remember that since sturgeon are such slow-growing, long-lived fish, it may take many years before we see populations rebuilt to the levels resembling anything experienced in the past.

## Scientific Names

Many species of fish look alike, making it difficult to tell them apart. In addition, many types of fish have different common names in different parts of the country. To distinguish one organism from another, biologists give each a scientific name that is unique to that organism. The names are derived from the Latin language and consist of a genus and a species. The genus name is first and is capitalized. The species is second and is in lower case. Both the genus and species are either underlined or italicized when written. While several organisms in the same "family" share a common genus name (like family members sharing a last name), they have different species names. Occasionally, two members of a family are so similar that one is considered a subspecies of the other. In these cases, the organisms are given two species names. Here are the common and scientific names of New York State's sturgeon:

### Scientific Names of Fish Species

Common Name	Scientific Name
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>
lake sturgeon	<i>Acipenser fulvescens</i>
shortnose sturgeon	<i>Acipenser brevirostrum</i>

## More about New York's Sturgeon:

- [Similarities And Differences Among New York's Sturgeon](#)

# Similarities And Differences Among New York's Sturgeon

### Similarities and differences among New York's sturgeon species

	Description	Habitat	Reproduction	Feeding	Population Status/ Comments
Atlantic Sturgeon	6-10 ft. long (up to 14 ft)	Young sturgeon spend the first 2-7 years in	Spawn April-June	Uses barbels to locate food	Largest of New York's sturgeon
	50-200 pounds		Anadromous; runs up freshwater river	Eat a variety of	Lives up to 60+ years

	<p>(up to 800 lbs.)</p> <p>Olive green to blue-black on back and upper sides, white on belly</p>	<p>large freshwater streams</p> <p>Adult sturgeon spend the bulk of their lives at sea, returning to freshwater to spawn</p>	<p>and streams to broadcast eggs upstream from the salt front. Males move into the river first</p> <p>Eggs are sticky and attach to stones and vegetation</p> <p>Females reach sexual maturity at 18-19 years old when they are 6-8 ft. and over 70 lbs. Males reach maturity at 12 years when they are 3.5-6.5 feet long.</p>	<p>organisms including worms, amphipods, isopods, midge larvae, plants and small fishes</p>	<p>In New York found in the deepest portions of the Hudson River, occasionally found as far north as Albany</p> <p>Prior to 1900 were abundant in the Hudson River estuary especially south of Hyde Park</p> <p>So abundant, were nicknamed "Albany beef". Numbers are down considerably since then</p>
<p>Lake Sturgeon</p>	<p>3-5 ft. long (up to 7 ft.)</p> <p>10-80 pounds (up to 300 lbs.)</p> <p>Adults are dull gray with scutes same color as body; with clear green on lower parts of body and head</p> <p>Angular and elongate snout; wide mouth</p> <p>Four barbels</p> <p>Bony plates absent along anal fin</p>	<p>Primarily found in freshwater lakes and large rivers. Prefers areas with clean sand, gravel, or rock bottoms.</p> <p>Can also occur in slightly brackish water.</p>	<p>Spawns in spring (May-June) in areas of clean, large rubble such as on windswept rocky shores of islands and in rapids in streams</p> <p>Prior to spawning, adult fish form groups in deep holes near the spawning site; fish sometimes seem leaping out of the water</p> <p>Eggs are scattered by currents and stick to logs and rocks</p> <p>Female lake sturgeon reach maturity at 14-23 years old; males mature at 8-19</p>	<p>Uses barbels to locate food</p> <p>Including: leaches, snails, clams, other invertebrates, small fish, and even algae</p>	<p>New York status: threatened. Lives up to 80-100 years old; one fish in Canada was 154 years old.</p> <p>In New York, lake sturgeon have been collected in the St. Lawrence River, Lake Ontario, Niagara River, Lake Erie, Lake Champlain, Cayuga Lake, Seneca and Cayuga canals, and the Grasse, Oswego &amp; Oswegatchie rivers.</p> <p>Once abundant they were considered a trash fish; but as value for caviar, smoked meat, and isinglass became known the fishery exploded. In addition, pollution and construction of dams affected sturgeon and</p>

			years. Females only spawn every 4-6 years		population numbers plummeted. Lake sturgeon are now protected
Shortnose Sturgeon	<p>Rarely exceed 3.5 feet and 14 pounds</p> <p>Olive yellow to gray or bluish on back; milky-white to dark yellow on belly</p> <p>Short, blunt, conical snout, large mouth</p> <p>Four barbels</p> <p>Bony plates absent along anal fin</p>	Occurs in estuaries and large coastal rivers	<p>Spawns April-May</p> <p>Semi-anadromous; migrates up the Hudson River from its mid-Hudson overwintering areas to scatter eggs in freshwater</p> <p>Spawns over rubble bottom with some gravel and large rocks; newly-hatched fry are poor swimmers and drift with the currents along the bottom</p> <p>Females first spawn at age 10, males at age 9. Females spawn every third year and males every other year</p>	Uses barbels to locate food. Eats sludge worms, aquatic insect larvae, plants, snails, shrimp and crayfish	<p>New York status: endangered.</p> <p>Smallest of New York's sturgeon</p> <p>Lives up to 65+ years old in New York. It is found in the lower portion of the Hudson River from the southern tip of Manhattan upriver to the Federal Dam at Troy</p> <p>Protected by law</p> <p>Combination of factors is responsible for population declines; pollution, construction of dams, demands for sturgeon meat and caviar</p>