

Are *Dinosaurs* Making a Comeback?



DEC Helping to
Recover Sturgeon
in New York

BY TONY COLYER-PENDAS, AMANDA HIGGS, LISA HOLST,
GREGG KENNEY, KIM MCKOWN, RICH PENDLETON, AND LISA SULLIVAN

Sturgeon are found in fossil records as far back as 150 million years, and they survived the mass extinction event that wiped out the dinosaurs. However, overfishing and habitat loss have led to severe declines in their numbers worldwide. But now, there is hope for the resurgence of these ancient fish.

New York State is home to three different sturgeon species: Atlantic sturgeon (*Acipenser oxyrinchus*), lake sturgeon (*Acipenser fulvescens*), and shortnose sturgeon (*Acipenser brevirostrum*). A combination of factors and actions have resulted in significant declines in the numbers of all three sturgeon species.

During the 1800s and early 1900s, there was a great demand for sturgeon eggs (caviar) and smoked flesh of the fish that resulted in

overexploitation. Construction of dams, for hydroelectric and navigation purposes, cut off sturgeon from their historic upriver spawning grounds. And decades of pollution further hindered recovery in both the Great Lakes and Hudson River.

By the early twentieth century, all three species of New York's sturgeon populations collapsed, and they have been slow to recover. Yet, due to the combined efforts of the New York State Department of Environmental Conservation (DEC), the U.S. Fish and Wildlife Service, the National Marine Fisheries Service (NMFS), the Atlantic States Marine Fisheries Commission (ASMFC), and other partners, recent surveys indicate that these amazing and prehistoric fish may be recovering.



Top: Staff removing an Atlantic sturgeon from the net during sampling. Bottom: An Atlantic sturgeon is temporarily held before being measured, weighed, and tagged.

Atlantic sturgeon

Atlantic sturgeon are the largest species of New York's sturgeon, and one of the largest and longest-lived anadromous fish in North America— anadromous fish spend many years in the ocean until they mature, and then migrate to the freshwater portions of rivers to spawn. Adult Atlantic sturgeon returning to spawn in the Hudson River can weigh more than 300 pounds and reach eight to nine feet in length. In 2019, an Atlantic sturgeon in the Hudson River was estimated to be more than 14 feet long and weigh 800 pounds.

These fish were once plentiful in the Hudson River, until overfishing, pollution, and blockage of access to spawning areas drastically depleted the population. Due to declines in Atlantic sturgeon, New York State established a moratorium on harvest and landings in 1996.



Top: Staff use ropes to lift a sturgeon into the boat to measure, weigh, and tag it. **Bottom:** Before the sturgeon is tagged, it is scanned for any previous tags, to identify the fish.

In 1998, ASMFC issued a coastwide moratorium on the harvest of Atlantic sturgeon to promote species recovery and allow the spawning stock to rebuild. The moratorium remains in effect through at least 2038. In 2012, the National Oceanic Atmospheric Administration (NOAA) listed Atlantic sturgeon in the New York bight as federally Endangered.

The 40-year moratorium is due to the slow maturation of Atlantic sturgeon, which can take 12 years for males and 15 years for females before they are ready to return to the Hudson River to spawn. DEC's Division of Marine Resources, Hudson River Fisheries Unit, in cooperation with Cornell University, have been working together to effectively monitor and protect Atlantic sturgeon in both its marine and freshwater habitats. In the

Hudson River, DEC conducts annual monitoring programs for both juvenile and adult Atlantic sturgeon to inform coastwide management and to track recovery.

For the juveniles, long-term data indicate a significant increase in catch rates since monitoring began—the average catch rate in recent years (2012 to 2019) is two times higher than that observed during the first eight years (2004 to 2011) of monitoring. This increase suggests the effects of the moratorium are benefiting this slow maturing species, and offspring of protected-year classes are returning to produce new offspring of their own.

Newer technologies, such as high-resolution side-scan sonar and acoustic telemetry, provided enhanced population estimates. Acoustic telemetry uses receivers to detect signals emitted from tagged animals, whereas side-scan sonar uses sound to create an image of the

river floor and objects in the water column, which allows researchers to count individual fish. These technologies were merged to estimate the number of fish in New York's spawning areas. The adult estimate combined with the increasing juvenile catches indicate that the Hudson River may hold one of the largest present-day populations of Atlantic sturgeon, yet their numbers on the east coast remain severely depleted.

Lake sturgeon

Lake sturgeon is the largest completely freshwater fish species in New York State, with a lifespan of 50 to 60 years for males, and up to 100 to 150 years for females. Mature adults average between four to five feet in length and 20 to 60 pounds in weight, although they can grow to seven feet long and weigh more than 300 pounds. These sturgeon were formerly abundant from southern

A juvenile lake sturgeon from DEC's Oneida Fish Hatchery is ready for stocking.



Canada to the southeastern U.S., but are currently listed as Threatened in many states, including New York.

A combination of stocking, habitat enhancement, and natural recovery has resulted in slow and steady progress in reestablishing populations of lake sturgeon throughout their historic range in New York State. A restoration stocking program for the species began in 1993, and recovery plans were developed in 1994 and revised in 2000, 2005, and 2018.

Since 1993, more than 275,000 lake sturgeon have been stocked into New York waters. From 1995 to 2004, DEC stocked lake sturgeon in 13 locations. Populations were established in seven waters: the Genesee River, Cayuga Lake, Oneida Lake, the Oswegatchie River, Black Lake, the Raquette River, and the

St. Regis River. In 2021, DEC and the U.S. Fish and Wildlife Service stocked lake sturgeon fingerlings in 10 locations across New York State.

Currently, DEC recovery efforts include stocking thousands of four-month-old lake sturgeon reared from eggs taken from the St. Lawrence River. These stocked fish have survived in sufficient numbers that we are now detecting their own offspring in a few places. Like other sturgeon species, lake sturgeon females are thought to spawn every four to nine years, making recovery slow. Ongoing studies are finding that lake sturgeon numbers seem to be stable or increasing throughout their current range.

DEC recently achieved a milestone with the collection of a spawning female lake sturgeon in the lower Genesee River for the first time in more than 50 years. On May 25, 2021, Dr. Dawn Dittman and the field crew from the U.S. Geological Survey's Tunison Laboratory of Aquatic Science netted a 61-inch, nearly 70-pound female lake sturgeon. DEC began stocking lake sturgeon into the Lower Genesee River in 2003 as part of the State's efforts to support the species' recovery. DEC's investments and efforts to stock and clean up the Genesee River Watershed have started to yield results.

Lake sturgeon have been re-established across the Great Lakes and their tributaries in New York, and current stocking is seeking to enhance the genetic diversity of the stocked populations. Natural recovery is also being monitored in Lake Erie and the lower Niagara River. DEC hopes to gather enough evidence of recovery of sufficient self-sustaining populations of lake

sturgeon to initiate the removal of the fish from the list of Threatened species in New York by 2024.

Shortnose sturgeon

Shortnose sturgeon are the smallest of New York's sturgeons, rarely exceeding 3.5 feet in length and 14 pounds in weight. It is resident year-round in the Hudson River and is amphidromous, moving between saltwater and freshwater for purposes other than breeding. In New York State, these fish migrate up the Hudson River and can be found from the southern tip of Manhattan to their spawning areas between Coxsackie and the Federal Dam at Troy.

Shortnose sturgeon live a long time; the oldest known female reached 67 years of age and the oldest known male was 32 years old. Spawning is not a yearly event for most shortnose sturgeon, as males spawn every other year and females every third year. The shortnose sturgeon was the first fish listed as Endangered federally, with enactment of the 1966 Endangered Species Preservation Act, which later became the 1973 Endangered Species Act. It is also listed as Endangered under New York State's Environmental Conservation Law.

Soon after being listed as Endangered, researchers conducted a population estimate for Hudson River shortnose sturgeon to develop recommendations for managing the recovery of this fish. A second population study, conducted in the 1990s, indicated a substantial increase in the spawning population compared to an earlier study. The Hudson River shortnose sturgeon population may now be the largest in the world. However, this assessment is based on research that is several decades old, and new studies are needed to support the management and recovery actions outlined in the 1998 recovery plan developed by NMFS.



This lake sturgeon that washed up on a Lake Erie beach in the late 1980s was over 6 feet long.



Top left: A shortnose sturgeon is caught for monitoring near its overwintering area on the Hudson River. Top right: Staff quickly remove the shortnose from the nets, measure the fish and release them. Bottom: Staff confirm the species and size of a fish that was identified during a side scan sonar survey.

In the spring of 2021, academic, federal, and state research scientists embarked on a large-scale project that will provide an updated estimate of the Hudson River's shortnose sturgeon population using similar methods as the adult Atlantic sturgeon estimate. Last April and May, 50 adult shortnose sturgeon were netted north of Coxsackie (Greene County) and surgically implanted with long-lived (10-year) acoustic transmitters. These transmitters will be detected by an array of acoustic receivers as the fish move throughout the Hudson River Estuary. The receivers will store the unique tag number and the date and time that a fish swims past a receiver (like E Z Pass for sturgeon).

This past winter, fisheries staff used side-scan sonar to image and count individual shortnose sturgeon in overwintering areas. These estimates

will be mathematically merged with the river-wide telemetry data to estimate the number of individual fish in the overwintering areas and the Hudson River. This provides a robust and relatively low-cost means to track recovery of America's first endangered fish and will help determine if the population is continuing to increase since the last estimate conducted in the 1990s.

Sturgeon Today

Most sturgeon are protected and regulated to help maintain or increase their numbers. Targeting these fish while angling is prohibited. Even though all species of sturgeon are protected by state and/or federal laws, they still face risks to recovery, including being captured as bycatch (see call out box), degraded water quality, and lost access to spawning areas from dams.

Since sturgeon are such slow growing, long-lived fish, it may take many years before we see their populations resembling the numbers of the past. The public can help with sturgeon recovery and management efforts by reporting any washed up sturgeon to DEC's Marine Life Incident Report online survey, which can be found on DEC's Marine Life webpage at <https://www.dec.ny.gov/animals/117322.html>.

Tony Colyer-Pendas is the Assistant Editor of the *Conservationist*; Lisa Holst is the Rare and Endangered Fish Unit Leader of DEC's Division of Fish and Wildlife; Amanda Higgs and Rich Pendleton are Research Support Specialists with the Hudson River Estuary Program/Cornell University/DEC Division of Marine Resources; and Gregg Kenney, Kim McKown, and Lisa Sullivan are biologists with DEC's Division of Marine Resources.

Threats to Sturgeon

While sturgeon are showing signs of recovery, they are still suffering human-induced mortality that is likely slowing the pace of their return. Bycatch (accidental capture) and ship strikes are two of the primary threats that can hinder recovery efforts. Researchers and managers are actively seeking ways to reduce these sources of mortality.