

# Historical Conditions of the Onondaga Lake Watershed

Numerous historical sources including the oral history of the Onondaga Nation, the indigenous people of this area, agree that before the industrialization of the landscape, the Onondaga Lake watershed was a beautiful and bountiful place.



Great blue heron

Salt water and potable freshwater springs were found around the shores of the lake, creating unique habitats that supported a great diversity of life. It is not known how much the salt springs may have influenced the salinity of the lake, but there are some historical reports that the lake's waters had low salt concentrations compared to the nearby salt springs.



*The species of the vanished "Onondaga Lake whitefish" is unknown, but it may have been the cisco (Coregonus artedii), pictured above. Whitefish spawned in the shallows of the lake.*

Onondaga Lake was interconnected with the various wetlands that surrounded it, creating highly productive zones of shallow water where aquatic and land-based organisms interacted. The plants that grew in marshes along much of the lakeshore, such as the cattails and wild rice that were cultivated and harvested for food by the Onondagas, provided spawning and nursery habitat for fish. These fish formed complex food webs with the insects, amphibians, reptiles, birds, mammals, and other organisms that lived in or visited these shallow water areas.



Cattails

We know from historical records that the watershed supported large populations of Atlantic salmon and whitefish, meaning that the lake and its tributaries had cold water with plenty of dissolved oxygen to support these species. Historical writers also reported the presence of a variety of other fish species in this region, including American eels, lake sturgeon, trout, burbot, pike, pickerel, bass, yellow perch, and catfish.



Atlantic salmon

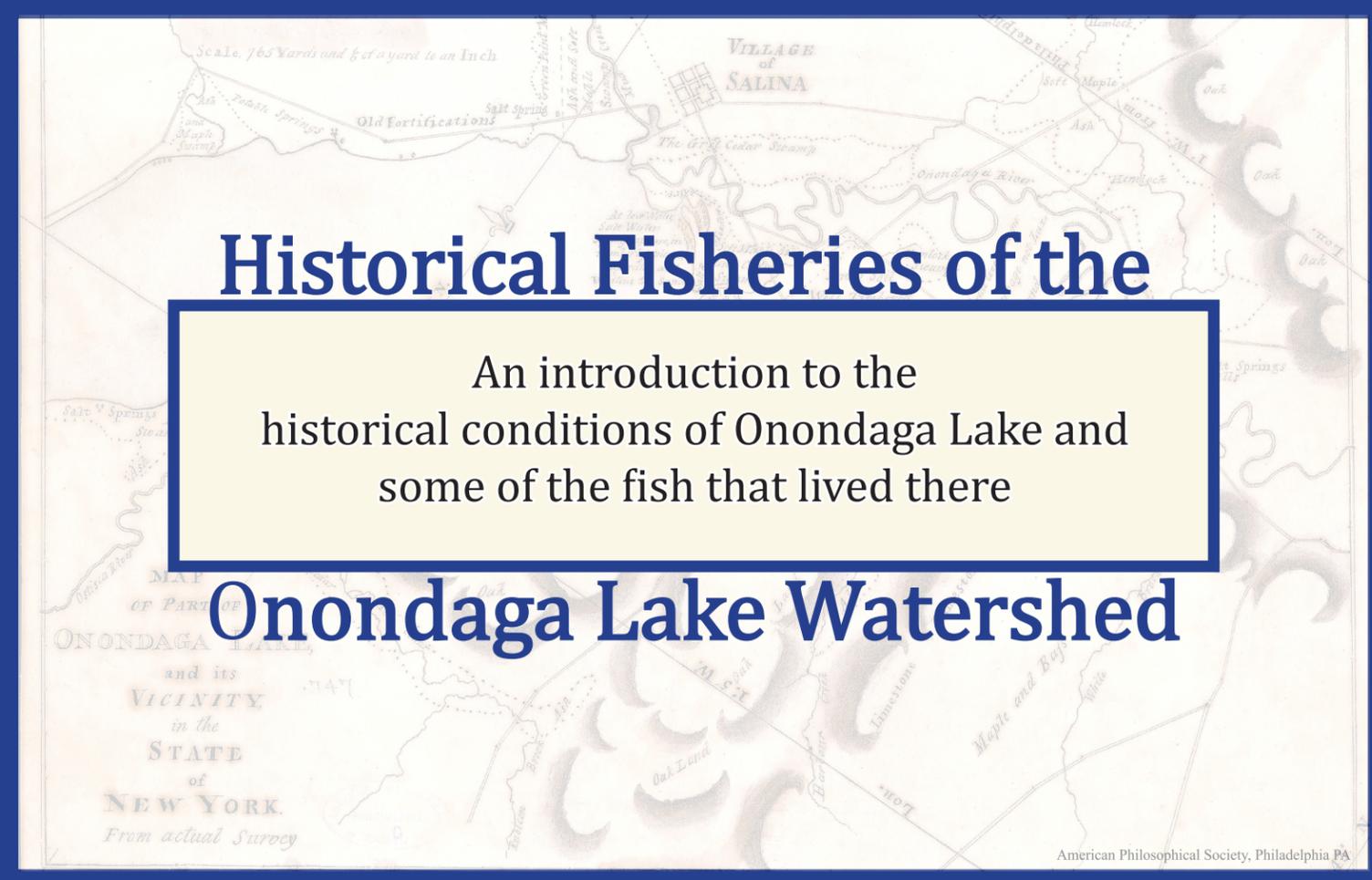
The fish of the Onondaga Lake watershed were a major year-round food source for the Onondagas, who controlled fishing intensity by assigning families rights to specific locations. The lake later supported sport fishing and a very profitable commercial fishery. The whitefish in particular was served as a delicacy by restaurants in New York City.

*In this fact sheet, you will find profiles of three important species historically present in the Onondaga Lake watershed: American eel, lake sturgeon, and brook trout.*

## Historical Fisheries of the

An introduction to the historical conditions of Onondaga Lake and some of the fish that lived there

## Onondaga Lake Watershed



All fish illustrations by Ellen Edmonson, courtesy of the New York State Department of Environmental Conservation

For more information about the Onondaga Nation and the Haudenosaunee Confederacy, please visit: [www.onondaganation.org](http://www.onondaganation.org)

For information about the references cited for this fact sheet, please contact the Onondaga Environmental Institute.



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### Additional Resources:

Atlantic States Legal Foundation: [www.onondagalake.org](http://www.onondagalake.org)

Neighbors of the Onondaga Nation: [www.peacecouncil.net/NOON/index.html](http://www.peacecouncil.net/NOON/index.html)

Onondaga Co. Dept. of Water Environment Protection: <http://www.ongov.net/wep/>

NYS Dept. of Environmental Conservation: <http://www.dec.ny.gov/animals/269.html>



# Profiles of Fish Species in the Historical Onondaga Lake Watershed

## American Eel (*Anguilla rostrata*)

American eels have flexible, snake-like bodies and can grow to be to 3 ½ feet long. They were so abundant in Onondaga Lake that in 1655, a Jesuit missionary reported 1,000 eels could be caught in a single night during certain times of the year. According to Onondaga oral history, they were also common in Onondaga Creek.

Adult eels are most commonly found near the bottoms of large rivers or shallow areas of lakes. During the day, they hide under rocks or bury themselves in mud, sand, or gravel. At night, they come out to feed on dead animal matter and to hunt animals like crustaceans, frogs, and fish.

Eels were a very important source of food for the Onondagas, who harvested them by building weirs. They also hunted eels with long spears. Eels were so significant to the Onondagas that one of the nation's clans was named after them.

American eels are unique among the fish of New York because many of them are catadromous: they spawn in the ocean and then live most of their lives in freshwater. Young eels make an extraordinary journey from spawning grounds southeast of Bermuda in the Atlantic Ocean to inland freshwaters all over the Americas. After spending up to 25 years in freshwater, adult eels return to their ocean birthplace to spawn and die.



Fish drawings courtesy of NYSDEC

*Current status: For most of the 20th century, the species was very rare in the lake. None were found in the lake between 2000 and 2009, although they have been caught in Onondaga Creek.*



Flickr photo by: Charles & Clinton

## Lake Sturgeon (*Acipenser fulvescens*)



The lake sturgeon is one of the largest freshwater fish found in New York State, generally 3 to 5 feet long and 10 to 80 pounds. Some individuals can reach over 7 feet long and weigh over 300 pounds. Lake sturgeon were once common in the Seneca River (the outlet of Onondaga Lake) and probably visited the lake as well.

Lake sturgeon are bottom feeders, spending most of their time in larger lakes and rivers with beds of clean sand or rocks. They use their barbels (sensory organs that look like whiskers) to find fish, algae, and invertebrates like insect larvae and snails, which they suck into their large mouths.

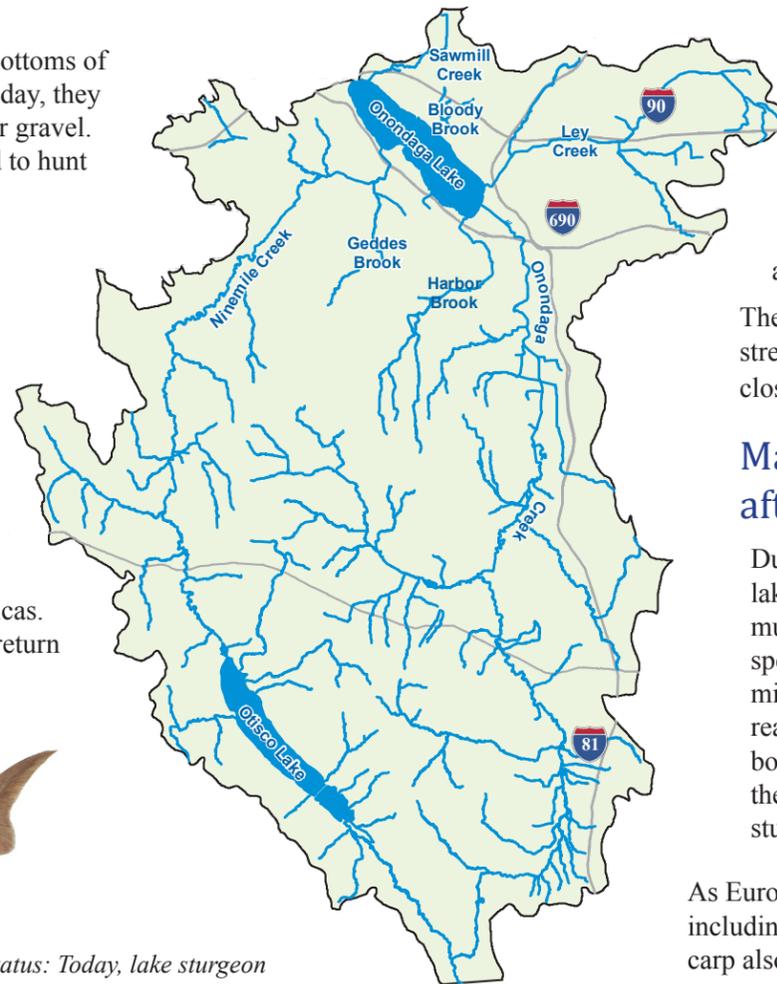
Between May and June, lake sturgeon move into smaller streams or unsheltered rocky shorelines to spawn. It was during this annual migration that the Onondagas would harvest lake sturgeon with hatchets. Young lake sturgeon grow quickly, but take many years to reach sexual maturity. Lake sturgeon can live to be over a hundred years old.



Eric Engbretson / USFWS

*Current status: Today, lake sturgeon are threatened in New York and are rarely found in Onondaga Lake.*

## MAP OF CURRENT ONONDAGA LAKE WATERSHED



## Brook Trout (*Salvelinus fontinalis*)

The brook trout is the official New York State fish. Historically, the species was common throughout the state and was present in the Onondaga Lake watershed.

This colorful fish is the smallest of the trout species found in the state today, with an average length of 6 to 12 inches depending on environmental conditions. Most brook trout weigh up to 2 pounds.

Brook trout need cold water (below 65 degrees F) to thrive. They live in small or medium sized streams, ponds, and lakes with high levels of dissolved oxygen. Insects make up most of their diet, but they will eat other animals like tadpoles, snakes, and salamanders.

They spawn between mid-October and early December in streams or shallow lake bays with gravel bottoms, usually close to springs.

## Major challenges for these species after the mid-1700s:

During the late 1700s and early 1800s, the region was deforested and local waterways, including lake tributaries, were dammed. Exposed and slow-moving water was warmed by the sun and lost much-needed dissolved oxygen, changing stream communities and decreasing habitat for cold-water species like brook trout. As more dams were built over the following 100 years, they disrupted fish migrations, reducing eels' access to upland stream feeding grounds and preventing lake sturgeon from reaching spawning beds. In the 20th century, channeling sections of streams further destroyed stream bottom habitat and lowered fish food availability. The draining and filling in of wetlands around the lake with eroded sediment, lake dredgings, and industrial waste destroyed feeding habitat for sturgeon, eel, brook trout, and many other species.

As Euro-American settlements grew, over-fishing became a major problem. Many species suffered, including lake sturgeon and brook trout. The introduction of non-native species like brown trout and carp also put pressure on native fish.

The dumping of large amounts of domestic and industrial wastes had especially devastating impacts on water quality: dissolved oxygen levels and water clarity decreased, salinity greatly increased, the lake bed was altered, toxic chemicals accumulated in fish tissues, and aquatic plants (vital habitat for fish and other species) and invertebrates (important fish food sources) declined. Cold-water species like the Atlantic salmon, whitefish, and brook trout were eliminated, and the cold-water fishery disappeared by the late 1800s. Today the lake supports a warm-water fishery. Water quality has improved due to reduced industrial pollution and improved sewage treatment, and there have been positive responses from some of the fish and other organisms of the lake. Recovery of the lake sturgeon, brook trout, and American eel would require additional significant improvements in the lake, its watershed, and downstream waters.



Industrial pollution on the southwestern shore of Onondaga Lake, 1938



*Current status: Today, brook trout are only found in the cold upper reaches of Onondaga Lake tributaries. Some of these fish have been stocked, but there is a small wild population still in existence.*



Eric Engbretson / USFWS