

September, 2009

Onondaga County Department of  
Water Environment Protection



# Onondaga Lake Fishery: 2008-2009 Fact Sheet

Joanne M. Mahoney, County Executive  
Patricia M. Pastella, P.E., BCEE, Commissioner

## Onondaga County Ambient Monitoring Program

Each year, Onondaga County Department of Water Environment Protection (OCDWEP) monitors Onondaga Lake to measure how the lake is changing as water quality continues to improve. The 2009 OCDWEP Ambient Monitoring Program (AMP) represents the 40<sup>th</sup> consecutive year of Onondaga County's lake monitoring program.

The County monitoring program measures physical, chemical, and biological conditions and compares the results to state and federal standards. By Federal law, all waters are to support recreational use and a balanced biological community. This national requirement is often referred to as "fishable and swimmable".

OCDWEP conducts an extensive biological monitoring program each year. This progress report highlights some recent findings of the fisheries monitoring program. A detailed report of the annual monitoring program is available on the County's web site <http://www.ongov.net/wep/we1507.html>.



*Fish sampling demonstration using  
OCDWEP electrofishing boat.*



*Sampling for larval fishes using a  
trawl.*

## Measures of Progress

The County's biological monitoring program tracks a number of plant and animal communities in the lake ecosystem. The monitoring program collects data for the evaluation of fish, aquatic plants, macroinvertebrates, phytoplankton (algae), zooplankton, zebra mussels, and quagga mussels.

Results are very encouraging. Onondaga Lake supports a diverse and productive biological community. Fish are quite abundant, and angling is becoming increasingly popular. The lake now resembles other regional lakes with respect to the number of fish species present, the balance of the fish community, the extent of aquatic vegetation, and summertime water clarity. Algal blooms are rare and recreational boating is a pleasure.



*OCDWEP staff showing the catch from a  
seine haul at an Onondaga Lake public  
education event.*

**What fish live in Onondaga Lake?**

For years, it was thought that that Onondaga Lake’s legacy of pollution had left the lake a biological wasteland. Research and monitoring by Onondaga County and others, notably SUNY-ESF, have clearly documented that the lake supports a diverse and productive warm water fish community comparable to other regional lakes. Fish species found in Onondaga Lake over the last decade are listed in Table 1. These fish have been collected by the County using various techniques, including electrofishing, seining, trawls, and gill nets.

**Table 1.** Forty-eight (48) fish species collected in Onondaga Lake between 2000 and spring 2009.

Abundant Species			Common Species			Uncommon Species			
Alewife	Banded Killifish	Bluegill	Bluntnose Minnow	Bowfin	Brook Silverside	Black Bullhead	Black Crappie	Brown Trout	Goldfish
Brown Bullhead	Carp	Channel Catfish	Brook Stickleback	Emerald Shiner	Fathead Minnow	Greater Redhorse	Green Sunfish	Johnny Darter	Lake Sturgeon
Gizzard Shad	Golden Shiner	Largemouth Bass	Freshwater Drum	Longnose Gar	Logperch	Longnose Dace	Northern Hogsucker	Quillback	Rainbow Smelt
Pumpkinseed	Shorthead Redhorse	Smallmouth Bass	Northern Pike	Rock Bass	Tessellated Darter	Rainbow Trout	Rudd	Silver Redhorse	Spotfin Shiner
White Perch	White Sucker	Yellow Perch	Tiger Musky	Walleye		Trout Perch	White Bass	Yellow Bullhead	



*Lake sturgeon caught in Onondaga Lake during the OCDWEP monitoring program.*

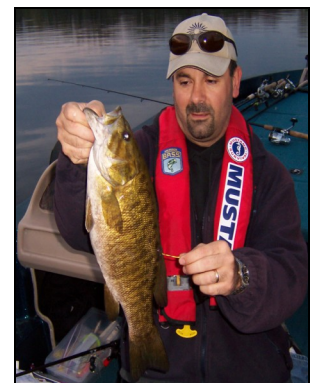
**How do new species enter the lake?**

Nearly every year the County team finds a new fish species in the lake. Recent examples include lake sturgeon, rainbow smelt, green sunfish, silver redhorse, black bullhead, and quillback. Several factors are responsible for the ever-increasing species list. Onondaga Lake is an open system, meaning its waters are connected to the Seneca River and the large drainage area of the Finger Lakes. Some species, such as the endangered lake sturgeon, are stocked in interconnected waters - in this case, Oneida Lake. Perhaps most importantly, other pollution-sensitive fish, such as the rainbow smelt, may be entering Onondaga Lake as water quality and habitat conditions improve.

Finally, several of the newly-reported species are uncommon, and may simply have avoided capture in previous years.

**How does the fish community compare with that of other lakes?**

Each lake supports a unique fish community, depending on its habitat conditions, water quality, stocking history, size, and fishing pressure. Nearby Oneida Lake also has a diverse warm water fish community, and long-term monitoring by Cornell University has documented the presence of more than 60 fish species over the years, a number that is comparable to the 48 species identified by the County as present in Onondaga Lake. Anglers from across the region, both recreational and professional, enjoy fishing in Onondaga Lake. Local amateur and regional/national professional tournaments are increasingly popular on the lake; the only other regional lake hosting these professional events is Oneida Lake.



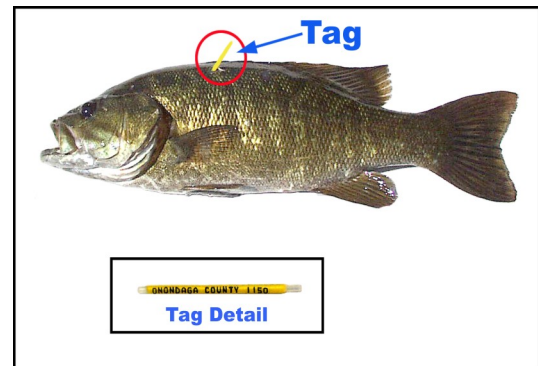
*Smallmouth bass are abundant in Onondaga Lake (note the OCDWEP tag the angler is holding).*

### Are the fish safe to eat?

Fish in Onondaga Lake have had elevated levels of mercury for many years. There is currently a health advisory issued by the NYS Department of Health. Specifically, the advisory states to eat no walleye of any size, to eat no largemouth or smallmouth bass over 15 inches, and to eat no more than one meal per month of any other legal species caught in Onondaga Lake. For additional information on fish consumption advisories in New York waters, see the State's health advisory report at: <http://www.health.state.ny.us/environmental/outdoors/fish/docs/fish.PDF>.

### Why are some fish tagged and what should anglers do?

As part of its ongoing monitoring, the County tags fish in Onondaga Lake with a yellow "spaghetti tag" below the dorsal fin (fin on the fish's back). The information gathered from these tags, such as how far the fish moved and how much it has grown since it was tagged, is important in helping managers understand the fish community. Anyone catching a tagged fish should record the tag number, the length, weight, and location caught, and report this information to OCDWEP at (315) 435-2260 ext. 360. Please DO NOT REMOVE THE TAG.

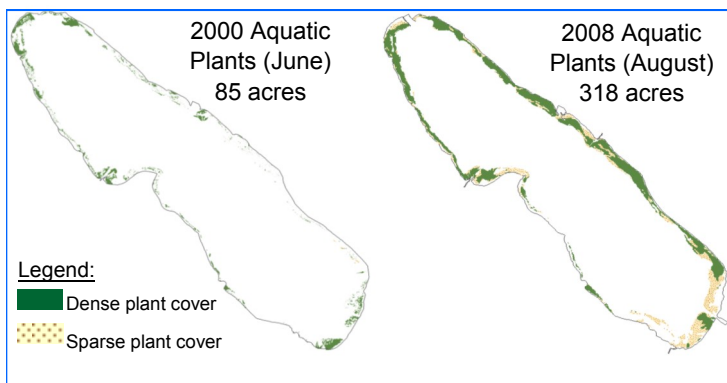


### How else can anglers support the Onondaga County program?

The AMP team is continually recruiting anglers to participate in a diary program, documenting their fishing effort and success. Please call the Department of Water Environment Protection, (315) 435-2260 ext. 360 or check it out on the web at [www.ongov.net/wep/we1506.html](http://www.ongov.net/wep/we1506.html).

### Indicators of improvement: aquatic plants

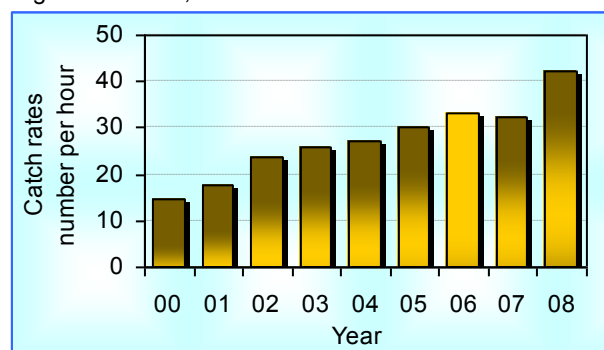
Figure 1: Change in shoreline plant coverage, 2000—2008.



Aquatic plants provide essential rearing and nursery habitat for fish, they help stabilize the bottom, and also help clear the water. The extent of near-shore areas with a healthy cover of aquatic plants has increased in recent years, from 85 acres in 2000 to 318 acres in 2008 (Figure 1). As long as plant growth doesn't get out of control, this is a very good thing for the lake.

Bass thrive in lakes with abundant plant cover, and the increase in the catch of largemouth and smallmouth bass, as documented by the County's annual electrofishing effort, mirrors the expansion of the aquatic vegetation in Onondaga Lake (Figure 2).

Figure 2: Change in catch rate of smallmouth and largemouth bass, 2000—2008.

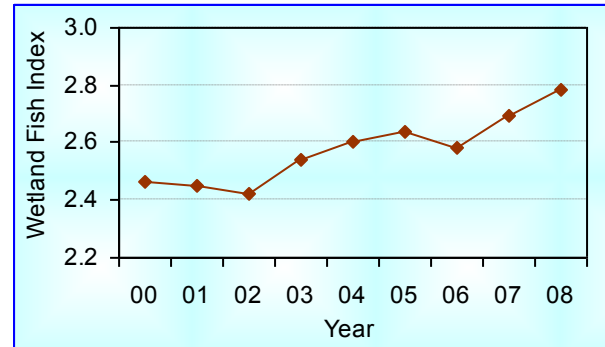


**How have improvements in wastewater treatment affected the lake's fish community?**

Ammonia and phosphorus concentrations in the lake are in steep decline, in response to the improvements in wastewater treatment realized at the Metro plant as well as the watershed projects initiated by the Onondaga Lake Partnership and the Onondaga County Soil and Water Conservation District. Less phosphorus means less algae, and clearer water is a factor in the expanding aquatic vegetation. Elevated ammonia concentrations can be harmful to certain forms of aquatic life, especially native (non-invasive) mussels and early life stages of sensitive fish, and the reduction in ammonia has also significantly improved conditions for the fish community.

One indicator of the overall health of a fish community is the Wetland Fish Index, an index of biotic integrity recently developed by researchers working throughout the Great Lakes basin. The more fish species found in the lake that are sensitive to pollution, the higher the score. Data from the Onondaga County monitoring program have been examined using this approach, with some very interesting results as displayed in Figure 3.

**Figure 3.** Improvement in the Wetland Fish Index, as calculated for Onondaga Lake, 2000—2008.



Of great interest to the AMP team is the region of Onondaga Lake contributing to this increase in the index over the years. This improvement reflects the expansion of sensitive fish species to more areas within the lake. A trend toward improved water quality is especially noted in the lake's southern region, close to the major tributaries and the outflow of the wastewater treatment plant.

**The Future of the Fish Community**

Onondaga Lake has responded rapidly to the decrease in nutrient input from the wastewater treatment plant. For decades considered hyper-eutrophic (ultra-enriched with nutrients), Onondaga Lake is now moving toward mesotrophic conditions, meaning it has a moderate level of productivity. Given the large watershed and multiple nutrient sources, Onondaga Lake should continue to support a diverse and productive warm water fishery.



*OCDWEP employees conducting a seine haul.*



**Onondaga County Department of  
Water Environment Protection**

650 Hiawatha Blvd West Phone: 315-435-2260  
Syracuse, New York Fax: 315-435-5023  
13204-1194

*Summary and a Look Ahead*

Real progress is being made in Onondaga Lake. The water is clearer, there are less algae, and water quality conditions support a thriving warm water aquatic community.

The improvements to water quality are seen throughout the biological community. Fish more sensitive to pollution are expanding their distribution, and important gamefish such as largemouth and smallmouth bass are becoming more abundant.