

## Cayuga Lake Finger Lakes standard netting (Survey #:719133)

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6/3/2020

Cayuga Lake extends northward from the city of Ithaca through Tompkins, Cayuga and Seneca counties. At 43,560 acres, Cayuga Lake ranks second in size behind Seneca Lake, among the Finger Lakes. Cayuga Lake offers a diverse fishery for both coldwater and warmwater species. Cayuga Lake has a shallow, weedy area at its north end which extends south for approximately six miles and occupies 5,800 acres. The remainder of the lake is deep and supports a coldwater trout and salmon fishery. Many of Cayuga's tributaries also provide fisheries for rainbow trout in the spring and landlocked salmon and brown trout in the fall. Finger Lakes strain rainbow trout, landlocked Atlantic salmon, brown trout, and lake trout are all stocked by our state hatcheries. Boat launching is available at four state parks and a DEC launch at Mud Lock, as well as numerous private and municipal marinas around the lake. Management concerns range from nutritional deficiencies leading to spawning failures amongst salmonids, viral hemorrhagic septicemia disease outbreaks, invasive round goby impacts to the food web, and the impact of the nuisance species, sea lamprey, on native lake trout. This survey is part of our series of standardized surveys to sample the coldwater fisheries of each of the Finger Lakes using standardized sites, nets, and methodology.

During late July and early August 2019, the regional fisheries unit surveyed the coldwater fish community of Cayuga Lake using standard Finger Lakes gang gill nets set at 32 standard netting sites located at regular intervals around the lake. The main objectives of this survey were to determine the densities of lake trout and obtain information on species composition of the forage base. We also set 4 additional nets in shallower water to sample the warmwater community and lake sturgeon. Previous "standard gang" surveys between 1976 and 2011 utilized multifilament gill nets but monofilament gill nets were used in 2015 and this survey. Thirty-two sets were on bottom and below the thermocline perpendicular to shore. Four sets were on the bottom and above the thermocline and perpendicular to shore. Catches for two of the deepwater sets are either missing (1) or biased (1) due to tampering.

A total of 1446 fish were collected including 611 lake trout, 6 white suckers, 457 yellow perch, 8 smallmouth bass, 223 alewife, 5 rock bass, 3 rainbow trout, 20 Atlantic salmon and 46 brown trout, 44 round goby, and two lake sturgeon. Ages of 474 fish were determined by scale aging. A sample of 50 lake trout and 10 yellow perch collected were sent to the Hale Creek Field Station for contaminant analysis. In addition, 100 alewife were donated for scientific research at Yale University.

An average of 26.4 lake trout were caught per net in the 2015 survey, and 20.3 lake trout per net in 2019. When corrected to compare with the multifilament nets used previously (comparative studies in the Western Finger Lakes showed mono nets captured approximately 1.7 times more lake trout than multi nets), these are high catch rates for lake trout. Using the 1.7X correction factor, the long term average lake trout catch with multifilament of 14.7 fish/net, is equivalent to a monofilament catch of 25 fish/net. Both nettings with monofilament are within the range of the corrected long term average catch of lake trout with the multifilament nets, but the most recent netting was lower than the long term average. Between stocking reductions and lamprey impacts, we may finally be moving closer to a more balanced salmonid population in Cayuga Lake. The growth rate of lake trout collected in the 2019 Cayuga Lake standard gang survey was excellent. Length frequency distributions by fin clip yielded average length estimates of 7.5 in., 11.3 in., 14.0 in., 17.9 in., 21.8 in., 23.6 in., 26.1 in. and 27.0 in. for age-1 through age-8 fin clipped lake trout, respectively.

The two lake sturgeon caught were both juveniles. One lake sturgeon had no coded wire tag and was the appropriate size for a two year old fish, as a fish produced during the spawning event in Fall Creek in 2017 would be. This fish was assumed to be wild. The other fish had a coded wire tag, and was slightly larger, possibly corresponding with the 2016 year class stocked at Cayuga Lake state park. Both fish were tagged with passive integrated transponder tags and dorsal floy tags and released.



Year	Alewife	Atlantic Salmon	Brown Trout	Cisco Or Lake Herring	Lake Trout	Rainbow Smelt	Rainbow Trout	Sculpin Family	Trout-Perch	Yellow Perch
1976	611			10	146	812		2	109	392
1979	207		2	2	248	1273	5	2	102	347
1985	130	2	2		280	361		1	47	147
1986	89				535	592		6	51	209
1987	347				504	636		4	87	21
1988	38	1	1		501	621		4	53	47
1989	73				464	734		6	135	145
1990	180				523	895		4	76	41
1991	366	2	1		441	319		11	70	28
1995	523	1	8		346	340		5	203	8
1999	497	7	45		367	72	1	1	17	124
2007	99	1			410	13		2		
2011	128	7	15		399	2		2	1	16
2015	407	16	10		847		1			102
2019	164	4	7		611					6
2019a	136	16	39				3			1101

a- Shallow net sets

Sea lamprey wounding data is recorded from all sizes of lake trout but those in the 23.6-25.5 inch (600-649 mm) size range are used for the summer wounding rate index, which is recorded for the fishing season of the previous year, in this case 2020, to correlate with the spring wounding data collected from rainbow trout at the Cayuga Inlet fishway each year. A total of 611 lake trout were examined for sea lamprey wounds including 165 that were in the index size range. For lake trout in the index size range, the rate was zero active wounds per hundred fish, which is fantastic and well within our management target of less than 20 wounds per hundred fish of this size. Results of this survey indicate that the 2014 lampricide treatment of Cayuga Inlet, which targeted juvenile sea lamprey, has resulted in a significant reduction of the adult sea lamprey population of Cayuga Lake.

Sea lamprey control is essential for maintaining a viable coldwater fishery in Cayuga Lake. We will continue to monitor sea lamprey wounding rates on both rainbow trout at the Cayuga Inlet Fishway and lake trout during future egg takes. In addition, staff will continue to monitor for the presence of sea lamprey spawning and/or larval survival in Cayuga Inlet since, if left uncontrolled, it is by far the largest source of sea lamprey in Cayuga Lake. As a larval population of sea lamprey is now established in Cayuga Inlet, we will need to conduct a lampricide treatment of Cayuga Inlet in 2020.