



Illinois Department of Natural Resources
Division of Fisheries
District 7

Highland Lake



**Private/Organizational Lake
Survey Report
Prepared by Andrew Plauck
February 21st, 2024**

Photo courtesy Google Earth

INTRODUCTION

A fish survey was conducted at Highland Lake at the request of Mr. Patrick Herendeen. The survey was initiated to assess the fish community as a follow up to a 2009 IDNR survey. The survey took place on June 1st, 2023. Results from the survey as well as management recommendations are included in this report.

FISH COMMUNITY

The Highland Lake fish survey consisted of 40 minutes of electrofishing with a 5000-watt DC boat mounted electrofishing unit. We made one lap around the lake sampling all available habitat types. Water temperature was 77°F. All fish were measured, weighed, and released. The following paragraphs describe the findings in order of species abundance:

We captured 88 fish belonging to nine species (Table 1). Yellow Perch were the most abundant species in the sample making up 36% (N=32) of the fish captured. Common Carp were the next most abundant with 23 fish observed or captured. Largemouth Bass were the third most abundant at 15% of the sample (N=13). Only ten Bluegill were collected. Walleye, Black Crappie, Golden Shiner, Channel Catfish and Pumpkinseed were collected in lower numbers (less than 10 fish). We did observe four adult Smallmouth Bass, but they were not completely stunned by the electric field and eluded capture. Young-of-year Yellow Perch were very numerous and only a small sample was collected to measure and document. Previous surveys of Highland Lake have shown the presence of Banded Killifish, Blacknose Shiner, Bluntnose Minnow, Central Mudminnow, Green Sunfish, Northern Pike, Warmouth, Yellow Bass, and Yellow Bullhead. Muskie, Northern Pike, Smallmouth Bass, Tiger Muskie, Walleye, and Yellow Perch have been stocked in recent years.

Overall, catch was low due to clear water, limited vegetation, and timing of the sample. Our electrofishing gear can only sample fish down to five or six feet. The majority of the lake's shallow water habitat is sand and gravel and void of structure. When we did sample the vegetation, we caught some fish. After reviewing the report from 2009 survey, it sounds like this was the case back then as well. Here is an excerpt from Frank Jakubicek's (retired IDNR) 2010 report:

The lack of vegetation hampered sampling and reduces the capacity of this lake to produce and support fish. We collected several bass, bluegill and a northern pike near the inflow at Washington Street and fish were near vegetation. Sparse patches of vegetation were spread around the lake. Few fish were collected over sand. Several species of fish now absent from Highland Lake could thrive if vegetation were present including bluntnose minnows, emerald shiners, lake chubsuckers and the local E&T fishes: blackchin shiners, blacknose shiners and banded killifish. Sufficient vegetation helps the food web, ties up nutrients, reduces re-suspension of fine sediments, and provides a platform a strong diversified fishery. Perennial elimination of vegetation is detrimental to a lakes ecology and disrupts the interdependence necessary for a balanced fishery and a healthy aquatic ecosystem. It's true too much vegetation can

cause problems, but vegetation can be managed to allow access and control its abundance.

Yellow Perch were the most abundant fish in the sample. Stocking history shows they were stocked 2018 (600 fish) and 2019 (1200 fish). This is promising because we did see young-of-year Perch as well as fish that would have been hatched in 2022 and earlier. The longest Perch captured was 9.25 inches. About 30% of the Yellow Perch collected were longer than six inches. Yellow Perch are a popular sportfish so it would be a good idea to implement a limit on this species while the species takes hold. A nine-inch minimum length limit, for a few more years, would protect the large spawning adults. A few more stockings would also add numbers to the population.

Common Carp were the second-most abundant fish. We took a sub-sample of the largest and smallest fish observed and counted the rest for a total of 23 fish. The Carp were all fairly large adults, between 23 and 28 inches. Carp are an undesirable fish to have in the lake due to their feeding behavior. When Carp are rooting through the lake bottom for invertebrates, they can stir up sediments and dislodge aquatic vegetation. Carp should be removed whenever caught. Several area lakes have Carp tournaments to help control their numbers. It is a good idea to hold this sort of an event during Illinois' "Free Fishing Weekend" (which falls on Father's Day Weekend) so everyone can fish!

Only 13 **Largemouth Bass** were collected during this survey. We typically like to see Largemouth Bass abundance around 60 fish per hour of electrofishing. Lower catch may have been attributed Bass leaving the shallow water areas after spawning as the water had already warmed to 77°F. Seven of the 13 Bass were 14 inches or longer, with the largest measuring 15.1 inches. It is difficult to make any inferences on population size or size structure with such a small sample. Largemouth Bass populations in the area are typically self-sustaining and do not require supplemental stocking. Self-monitoring by local fisherman may be a better estimate of the Bass population in Highland Lake due to its clarity and depth.

We use relative weight (W_r) to measure the "plumpness" or health of a fish. A healthy fish will have a W_r value somewhere between 90 and 105. The average W_r value for this sample in Highland Lake was 84, which is nothing to be concerned over as the adult Bass were less than a month out from their spawning season. Post spawn Bass will often be in poor condition, with females losing their weight from eggs and males spending their energy guarding the nest.

Ten **Bluegill** were present in the sample. The Bluegill ranged in length from 6.3 to 8.3 inches. This species is typically much more abundant in area lakes. The panfish population in Highland Lake also includes Black Crappie, Warmouth, and Pumpkinseed. We did notice about 15 dead Bluegill that probably succumbed to spawning stress in the rapidly warming shallow water.

Four **Walleye** were present in the sample. Two of the Walleye were longer than 14 inches (IDNR minimum length limit). The larger Walleyes were 17.6 and 18.9 inches. The other two were smaller fish (8-9-inches) and likely from the 2022 stocking. If a Walleye fishery is desired, they will need regular stockings, as Walleye typically don't spawn successfully in smaller lakes in the area.

Three Black Crappie were present in the sample. The Crappie were between eight and twelve inches in length. This species is difficult to sample after they've moved out of shallow water in the late Spring. Fluctuations in catch for Crappie is quite common in area lakes and ponds.

One **Channel Catfish** (21.2 inches) was caught in this survey. If Channel Catfish are desired in the fishery, they need to be stocked every few years.

No **Smallmouth Bass** were caught but we did see four nice fish that avoided the electric field. This is common when Smallmouth are stocked alongside their larger-mouthed cousins. Smallmouth tend to use deeper water and are less likely to be detected during our surveys.

No **Muskie** (or Tiger Muskie) were caught during the survey. Muskie, like Walleye, will need to be stocked at regular intervals if a Muskie Fishery is desired. Stocking rates for Muskie should be no more than one fish per acre.

Conclusion

Highland Lake has a diverse fish population with lower numbers of fish but there are numerous catchable species. I've included the recommendations from 2010 and wouldn't really change anything from them. I've added a few general recommendations that I include in all Lake Management Reports. I've also trimmed down the stocking numbers for the last 20 years to have a more user friendly spreadsheet in Table 2 below.

2010 Recommendations (in priority order):

1. Aquatic plants are part of every lake ecosystem and should be allowed to grow so the lake remains healthy. Re-evaluate your goals and the health of the lake as you move forward.

2023 Update: Vegetation management can be contentious subject for different user groups on any lake. The Lake County Health Department's 2019 survey has a comprehensive vegetation report. Their report can be found here:

<https://www.lakecountyil.gov/2400/Lake-Reports>

2. Establish a 15-inch minimum length limit and 1 per day catch limit on Largemouth Bass and stock as many Largemouth Bass as the Lake Committee can afford so a strong predator base becomes established. This will help keep forage species in check.

2023 Update: Since Largemouth Bass numbers are low, hold off on stocking Largemouth and focus on the Smallmouth Bass stocking if desired.

3. Establish a 24-inch minimum length limit and 1 per day catch limit on Northern Pike. Stock Northern Pike when funds are available so larger predators are present to feed on larger prey.
4. Rotate your predator stockings so various year classes are present.
5. Conduct a fish survey to re-evaluate progress of the fishery in four or five years (updated dates).

2024 New Recommendations:

1. Stock Yellow Perch (600-1200 fish) two more times over the next three years.
2. Establish a nine-inch minimum length limit and ten fish creel limit on Yellow Perch for the next four years.
3. **Avoid stocking Hybrid Sunfish.** They are great for a put and take fishery, but when they spawn with Bluegill their offspring are 100% Green Sunfish.
4. Stock 500 Bluegill annually for the next two years to increase their abundance. Bluegill can be purchased from County Soil and Water Conservation District Fish Sale or from a private dealer.
5. Continue Walleye stocking as desired.

General Lake Recommendations

1. Nutrients

- Reduce nutrient input from lawn fertilizers by practicing good fertilizing techniques and encouraging these practices throughout the subdivision. Try using and encouraging the use of zero phosphorus fertilizer to further reduce nutrient input to the lake. **Maintain a buffer strip of native vegetation around the perimeter of the lake, where feasible.** See the link below for EPA's "Lake Notes" articles for more information on nutrient reduction and buffer strips.
<http://www.epa.state.il.us/water/conservation/lake-notes/index.html>
- Nutrients can also be reduced by reducing Canada goose presence. A few methods are summarized in the EPA's "Lake Notes" mentioned above. Another goose deterrent is a flashing light. Since IDNR cannot endorse a commercially available product, an internet search of "flashing light goose deterrent" resulted in several available models. (I've personally talked with one lake owner who used a solar powered flasher with success). In theory, the geese use the lake during the

day but will leave at night meaning they won't nest there. As with any product, there are mixed reviews.

2. Aquatic plants

- Introduce desirable emergent plants in shallow, shoreline areas of parts of the pond to increase habitat for fish and other wildlife. Desirable species include: pickerelweed (*Pontedaria cordata*), arrowheads (*Sagittaria* spp.), water willow (*Justicia americana*), soft-stem bulrush (*Scirpus tabernaemontani*), and common bur reed (*Sparganium eurycarpum*). Avoid introducing other bulrushes (*Scirpus* spp.), cattails (*Typha* spp.), and purple loosestrife (*Lythrum salicaria*). A list of potential sources for these plants is enclosed.
- Allow submersed aquatic vegetation to develop in portions of the pond or plant desirable species, where feasible. Remember that IDNR recommends at least 20% coverage for healthy sport fish populations. Eel grass (*Vallisneria americana*), water star grass (*Heteranthera dubia*), Illinois pondweed (*Potamogeton Illinoensis*), and American pondweed (*P. nodosus*) are probably the best species to introduce because they do not typically reach nuisance levels of abundance and they provide excellent habitat for fish and invertebrates. Avoid all other pondweeds (*Potamogeton* spp.), watermilfoil (*Myriophyllum* spp.), bladderworts (*Utricularia* spp.), coontail (*Ceratophyllum* spp.), elodea (*Elodea* spp.), stoneworts (*Chara* spp.), water buttercups (*Ranunculus* spp.), naiads (*Najas* spp.), and most floating-leaved plants.

3. Artificial Fish Habitat (structure)

- Additional fish structure could also be added to the lake. Pallet style fish cribs, artificial structures, brush piles and gravel beds will tend to attract and congregate fish. Adding structure also allow "hiding spots" for small fish and macro-invertebrates. Remember in adding structure, wood will eventually decompose but structures made from rock or vinyl based materials will last for a long time. An internet search for "artificial fish structure" will give plenty of ideas if someone is willing to do the work.

Summary of Catch (Table 1):

Species	Number Collected	Length (Inches)			Weight (pounds)	
		Min	Max	Avg.	Min	Max
Yellow Perch	32	2.40	9.25	4.68	0.04	0.34
Common Carp	23	23.62	28.74	26.57	6.70	13.04
Largemouth Bass	13	6.89	15.04	13.38	0.16	1.50
Bluegill	10	6.30	8.27	7.22	0.18	0.42
Walleye	4	8.50	18.90	13.62	0.21	2.24
Black Crappie	3	8.86	12.01	10.63	0.36	0.88
Golden Shiner	1	5.51	5.51	5.51		
Channel Catfish	1	21.26	21.26	21.26	2.76	2.76
Pumpkinseed	1	7.28	7.28	7.28	0.30	0.30
Grand Total	88					

Table 2. Stocking Totals for Highland Lake (2004-2023)

Species	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	TOTAL	
LMB 5"-8"			500																		500
SMB 4" - 6"	50								400						500						950
NOP 12"-18"		50						23				57									130
WAE 5"-7"	400	550	200		825			514	300			500			300					1250	4839
YEP 4 - 7" inch															600	1200					1800
Hybrid Sunfish																			1200		1200
CCF 1-4 lbs	200																				200
Tiger MUE >10"					20																20
MUE 12"					15	10					10				8						43