

2023 Research Activities for Forest Preserves of Cook County

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Sites: Powderhorn Lake

Divisions: Calumet

Permitted activity: Through a partnership with the FPCC fisheries section, INHS biologists will use a variety of methods detailed in the research proposal to collect data on water quality, habitat quality, and fish populations within Powderhorn Lake. Surveys will include collection of water samples for nutrient and chlorophyll analyses and the collection of aquatic invertebrates (zooplankton) for identification in the laboratory.

2023 Summary: Researchers from the INHS (Anthony Porreca and Abigail Rick) visited Powderhorn Lake on May 24, June 20, July 10, August 7, September 13 and 21, October 4 and 24, and December 12.

During visits in May-September 2023, 3 vertical zooplankton tows and 3 ichthyoplankton samples were conducted at Powderhorn Lake. Zooplankton collected were preserved and brought to the Kaskaskia Biological Station for identification and enumeration. Ichthyoplankton samples were collected with a bow-mounted plankton net from each site. Larval fishes collected in these samples were preserved and brought back to Kaskaskia Biological Station for identification and enumeration. Additionally, approximately 1 L of lake water was collected during each visit to determine concentrations of chlorophyll-a and total phosphorus.

On October 24, adult and juvenile fish were sampled by a pulsed-DC electrofishing. A total of 15 minutes of electrofishing were conducted at each site. All fish collected (total = 179) were identified to species, measured for total length, weighted, and released alive. On October 4 a total of 4 net sets were conducted using standard fyke nets. All fish collected (total = 342) were identified to species, measured for total length, and released alive. During both the October 4 and October 24 visits, select fish that appeared to be of good health and greater than 75 mm of size

were implanted with PIT tags. During the fyke net surveys 18 fish of 2 species (Black Crappie and Pike) were implanted with PIT tags. During the DC electrofishing surveys 124 fish of 8 species (Bluegill, Grass Pickerel, Green Sunfish, Largemouth Bass, Northern Pike, Redear Sunfish, Warmouth, and Yellow Perch) were implanted with PIT tags.

Results: Zooplankton sample processing is ongoing. Summary data for collections during 2023 are presented below.

Water quality summary:

Month	Chl-a ($\mu\text{g/L}$)	Total Phosphorus (mg/L)
May	1.776	0.061
June	1.776	0.095
July	7.992	0.1
August	16.280	0.239
September	19.891	0.27

Larval fishes collected (individuals/L):

ID	May	June	July	August	September
Centrarchidae	0.07282	0.04583	0.03391	0.1069	0
Cyprinidae	0.01447	0	0	0	0

October 2023 – Adult and juvenile fishes collected and returned to each site (Fyke net survey):

Common name	Catch (fish)	CPUE (mean fish per net per night \pm SE)
Black Crappie	214	53.5 ± 2.22
Bluegill	113	28.25 ± 3.06
Pike	1	0.25 ± 1.74
Redear Sunfish	7	1.75 ± 11.98
Yellow Perch	7	1.75 ± 11.98

October 2023 – Adult and juvenile fishes collected and returned to each site (DC electrofishing):

Common name	Catch (fish)	CPUE (mean fish $\text{hr}^{-1} \pm$ SE)
Banded Killifish	3	3 ± 1.91

Bluegill	84	84 ± 58.31
Grass Pickerel	7	7 ± 3
Green Sunfish	2	2 ± 2
Johnny Darter	1	1 ± 1
Largemouth Bass	12	12 ± 3.65
Northern Pike	2	2 ± 2
Redear Sunfish	3	3 ± 1.91
Warmouth	2	2 ± 2
Yellow Perch	63	63 ± 31.51

Stream Antenna Detections:

Tag	Month of Detection	Number of Detections	Tag Source
989.001033466610 Bluegill	October November	1 4	Stream
989.001033466616 Bluegill	October	6	Stream
989.001033466635 Bluegill	October November	1 2	Stream
989.001033466639 Hybrid Sunfish	October	3	Stream
989.001033466640 Bluegill	October November	6 1	Stream
989.001033466647 Bluegill	October	1	Stream
989.001033466650 Bluegill	October	4	Stream
989.001033466652 Bluegill	October November	15 1	Stream
989.001033466653 Black Bullhead	October November December	1 5721 5	Stream
989.001033466666 Hybrid Sunfish	October November	10 6	Stream

989.001033466668 Bluegill	October	3	Stream
989.001033466669 Bluegill	November	1	Stream
989.001033466673 Bluegill	October	6	Stream
989.001033466773 Unknown	September October	1 2	Unknown
989.001038164087 Common Carp	October November	14 38	Stream
989.001038164139 Bluegill	October	4	Stream
989.001038164140 Common Carp	October November	23 27	Stream
989.001038164175 Unknown	October November	8 13	Unknown
989.001033467369 Bluegill	October	1	Powderhorn
999.000000007425 Unknown	September	201	Unknown