DEPARTMENT OF NATURAL RESOURCES

Fisheries Management

LAKE SURVEY REPORT

Lake Name: Sturgeon | **Survey Type: Targeted Survey**

DOW Number: 69-0939-01 | **Survey ID Date: 07/17/2023**

TARGETED SURVEY
Gill Netting
Water Quality Measurement

Lake Identification

Alternate Lake Name: N/A
Primary Lake Class ID: 7
DNR Sounding Map Number: N/A
Alternate Lake Class ID: N/A

Lake Location

Primary County: St. Louis
Nearest Town: Chisholm

All Counties: Itasca, St. Louis.

Legal Descriptions

Lake Center: Township - 60N Range - 21W Section - 18
PLS Section Lake Center: 6002118

All Legal Descriptions:

Itasca County: Township - 60N Range - 22W Sections - 12, 13, 24
St. Louis County: Township - 60N Range - 21W Sections - 7, 8, 17, 18, 19, 20

Area Office

Area Name: Grand Rapids
Region Name: Northeast
ORG Code: F216
Region Number: 2

Lake Access

(Information based on Standard Survey dated 07/11/2016)

Station ID	Ownership	Public Use	Type	Location / Comments
AC - 2	Private Property	Fee/Permit needed	Gravel	Sixberries Landing, between SW bay and West Sturgeon. Private property.

Lake Characteristics

Lake Area (planimetered acres): 1,664.00
GIS Lake Area (acres): 1,584.98
DOW Lake Area (acres): 0.00
Littoral Area (acres): 667.00
Area in MN (acres): 1,584.98
Maximum Depth (feet): 79.8
Mean Depth (feet): N/A
GIS Shoreline Length (miles): 10.78
Maximum Fetch (miles): 2.30
Fetch Orientation (degrees): 315
USGS Quad Map Number: H17a
USGS Quad 24K GIS Index: 1434

Watershed Characteristics

Major Watershed

Name: Little Fork River
Watershed Number: 76
Watershed size (acres): 1,198,291

Minor Watershed

Name: Sturgeon R
Watershed Number: 62
Watershed size (acres): 26,568

Surveys and Investigations

Initial Survey: 08/11/1975.
Re-Survey: 08/20/1984.
Population Assessment: 07/27/2009, 07/22/2002, 07/10/1995, 07/09/1990.
Special Assessment: 08/27/1979, 08/22/1969, 08/22/1949.
Standard Survey: 07/11/2016.
Targeted Survey: 07/17/2023.

Water Level History - Readings

Station ID	Date	Level	Reading (feet)	Reading Type
BM - 2	07/14/2016	High	-4.40	Above or below Benchmark
	07/31/2009	Low	-5.65	Above or below Benchmark
BM - 3	07/31/2009	N/A	N/A	Destroyed
BM - 4	07/14/2016	High	-2.90	Above or below Benchmark
	07/30/2009	Low	-4.53	Above or below Benchmark

Water Level History - Station Summary

	Minimum Level		Maximum Level		Range	Average	Reading Type
Station ID	Feet	Date	Feet	Date	(feet)	Level (feet)	(and number of readings)
BM - 2	-5.65	07/31/2009	-4.40	07/14/2016	1.25	-5.03	Above or below Benchmark (2)
BM - 3	N/A	N/A	N/A	N/A	N/A	N/A	Destroyed - 07/31/2009 (0)
BM - 4	-4.53	07/30/2009	-2.90	07/14/2016	1.63	-3.72	Above or below Benchmark (2)

Fish Diseases and Parasites

	Number of Fish Examined			Examination Results	
Species Examined	Internally	Externally	In Lab	Condition Observed	Number of Fish
lake whitefish	-	-	-	None observed	6
				Triaenophorus	2
tullibee (cisco)	19	-	-	None observed	12
				Triaenophorus	8

Dissolved Oxygen and Temperature Profile of Lake Water

Station ID	Sampling Date	Bottom Depth (Feet)	Sample Depth (Feet)	Water Temperature (°F)	Dissolved Oxygen (ppm)
WQ - 1	07/18/2023	67.0	Surface	66.9	9.7
			3.0	66.9	9.6
			6.0	66.9	9.6
			9.0	66.7	9.6
			12.0	66.7	9.5
			15.0	66.7	9.5
			16.0	66.6	9.4
			17.0	66.6	9.4
			18.0	61.7	8.9
			19.0	57.6	8.9
			20.0	55.4	8.5
			21.0	53.2	8.4
			22.0	51.1	7.9
			23.0	50.0	8.1
			24.0	48.9	7.7
			25.0	47.5	7.5
			26.0	46.4	7.5
			27.0	46.2	7.4
			28.0	45.9	7.4
			29.0	45.7	7.3
			30.0	45.5	7.3
			33.0	44.6	7.0
			36.0	44.4	6.8
			39.0	43.9	6.4
			42.0	43.7	6.3
			45.0	43.5	6.2
			48.0	43.5	6.1
			51.0	43.3	6.1
			55.0	43.3	6.1
			60.0	43.0	5.9
			65.0	42.4	4.7

Field Measurements of Water Quality

Station ID	Sampling Date	Sample Depth (Feet)	Secchi Depth (Feet)	Field pH	Alkalinity (ppm)	Water Color	Color Cause
WQ - 1	07/18/2023	Surface	15.0	N\A	N/A	Brown	Organic stain

Net Catch Summary by Numbers for GN

Standard gill net sets

Number of Sets: 15
First Set Date: 07/17/2023
Last Lift Date: 07/21/2023
Target Species: N/A

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 7[1] 25%	50%	75%
BLC	Black Crappie	15	1.00	0.21	0.50	1.40
BLG	Bluegill	11	0.73	N/A	N/A	N/A
LKW	Lake Whitefish	15	1.00	0.20	0.60	3.00
LMB	Largemouth Bass	4	0.27	0.18	0.40	0.81
NOP	Northern Pike	75	5.00	1.21	2.08	3.59
PMK	Pumpkinseed	3	0.20	N/A	N/A	N/A
TLC	Tullibee (Cisco)	110	7.33	1.83	5.25	12.43
WAE	Walleye	8	0.53	3.06	6.24	9.80
WTS	White Sucker	13	0.87	2.83	4.06	6.66
YEP	Yellow Perch	4	0.27	1.88	4.00	7.13
	Total Fish/Set:		17.20	[1] Quartiles for Number Per Set		

Net Catch Summary by Weight for GN

Standard gill net sets

Abbr	Species	Total Weight (Pounds)	Pounds Per Set	Mean Weight[2]	Quartiles for Lake Class 7[1] 25%	50%	75%
BLC	Black Crappie	3.42	0.23	0.23	0.17	0.27	0.46
BLG	Bluegill	1.73	0.12	0.16	N/A	N/A	N/A
LKW	Lake Whitefish	54.49	3.63	3.63	0.86	2.00	3.00
LMB	Largemouth Bass	5.66	0.38	1.42	0.89	1.07	1.29
NOP	Northern Pike	178.89	11.93	2.39	1.93	2.74	3.61
PMK	Pumpkinseed	0.15	0.01	0.05	N/A	N/A	N/A
TLC	Tullibee (Cisco)	38.69	2.58	0.35	0.22	0.37	0.50
WAE	Walleye	19.01	1.27	2.38	0.68	0.88	1.25
WTS	White Sucker	37.77	2.52	2.91	1.29	1.69	2.00
YEP	Yellow Perch	1.25	0.08	0.31	0.13	0.18	0.25
	Total Pounds Fish/Set:		22.74		[1] Quartiles for Mean Weight		

[2] Mean Weights are based on measured fish counts only.

Length Frequency Distribution for GN

Standard gill net sets

(Field work conducted between 07/17/2023 and 07/21/2023)

	BLC	BLG	LKW	LMB	NOP	PMK	TLC	WAE	WTS	YEP
< 3.00	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	-	-	-	-	-	-	-	-	-
3.50 - 3.99	-	3	-	-	-	2	-	-	-	-
4.00 - 4.49	-	1	-	-	-	-	-	-	-	-
4.50 - 4.99	-	2	-	-	-	1	-	-	-	-
5.00 - 5.49	5	1	-	-	-	-	-	-	-	-
5.50 - 5.99	1	1	-	-	-	-	-	-	-	-
6.00 - 6.49	1	1	-	-	-	-	2	-	-	-
6.50 - 6.99	3	-	-	-	-	-	1	-	-	-
7.00 - 7.49	3	-	-	-	-	-	-	-	-	-
7.50 - 7.99	-	-	-	-	-	-	-	-	-	1
8.00 - 8.49	1	1	-	-	-	-	13	-	-	2
8.50 - 8.99	-	1	-	-	-	-	21	-	-	-
9.00 - 9.49	-	-	-	1	-	-	3	-	-	-
9.50 - 9.99	-	-	-	-	1	-	10	-	-	-
10.00 - 10.49	-	-	-	-	-	-	19	-	-	1
10.50 - 10.99	-	-	-	-	-	-	16	-	-	-
11.00 - 11.49	-	-	-	-	-	-	11	-	-	-
11.50 - 11.99	-	-	-	1	-	-	8	-	-	-
12.00 - 12.99	-	-	-	-	-	-	6	-	-	-
13.00 - 13.99	1	-	-	1	-	-	-	1	-	-
14.00 - 14.99	-	-	1	-	1	-	-	-	-	-
15.00 - 15.99	-	-	-	-	2	-	-	-	-	-
16.00 - 16.99	-	-	-	-	8	-	-	1	-	-
17.00 - 17.99	-	-	-	1	10	-	-	1	3	-
18.00 - 18.99	-	-	1	-	8	-	-	-	5	-
19.00 - 19.99	-	-	1	-	7	-	-	1	4	-
20.00 - 20.99	-	-	2	-	7	-	-	1	-	-
21.00 - 21.99	-	-	6	-	6	-	-	2	1	-
22.00 - 22.99	-	-	3	-	3	-	-	1	-	-
23.00 - 23.99	-	-	1	-	1	-	-	-	-	-
24.00 - 24.99	-	-	-	-	4	-	-	-	-	-
25.00 - 25.99	-	-	-	-	2	-	-	-	-	-
26.00 - 26.99	-	-	-	-	5	-	-	-	-	-
27.00 - 27.99	-	-	-	-	2	-	-	-	-	-
28.00 - 28.99	-	-	-	-	-	-	-	-	-	-
29.00 - 29.99	-	-	-	-	1	-	-	-	-	-
30.00 - 30.99	-	-	-	-	1	-	-	-	-	-
31.00 - 31.99	-	-	-	-	1	-	-	-	-	-
32.00 - 32.99	-	-	-	-	1	-	-	-	-	-
33.00 - 33.99	-	-	-	-	1	-	-	-	-	-
34.00 - 34.99	-	-	-	-	3	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-

	BLC	BLG	LKW	LMB	NOP	PMK	TLC	WAE	WTS	YEP
Total	15	11	15	4	75	3	110	8	13	4
Min. Length	5.12	3.78	14.76	9.06	9.84	3.66	6.18	13.62	17.40	7.91
Max. Length	13.39	8.70	23.23	17.13	34.76	4.53	12.56	22.44	21.65	10.04
Mean Length	6.76	5.35	20.83	12.83	21.42	4.04	9.93	19.01	18.83	8.61
# Measured	15	11	15	4	75	3	110	8	13	4
No Lengths for	0	0	0	0	0	0	0	0	0	0

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish.

Length At Capture with Last Incremental Length

(Body-Scale constant, all lengths, and all length increments in inches)

Species: Walleye
Body-Scale Constant: 1.10
Total Sample Size: 6

Length at Capture in 2023 for Each Age Class, with Incremental Lengths for 2023

Year Class	Age	Sample Size	Length At Capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2020	3	1	13.62	13.62	13.62	N/A	1.26	N/A
2019	4	1	17.24	17.24	17.24	N/A	1.75	N/A
2018	5	2	20.47	21.18	19.76	0.709	0.78	0.161
2017	6	1	21.65	21.65	21.65	N/A	0.58	N/A
2016	7	0	-	-	-	-	-	-
2015	8	0	-	-	-	-	-	-
2014	9	0	-	-	-	-	-	-
2013	10	0	-	-	-	-	-	-
2012	11	0	-	-	-	-	-	-
2011	12	0	-	-	-	-	-	-
2010	13	0	-	-	-	-	-	-
2009	14	1	20.00	20.00	20.00	N/A	0.19	N/A

Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths

Species: Walleye
Gear Type: Combined Gear Types (GN)

Class	Age	N	1	2	3	4	5	6	7	8	9	10	11	12
2020	3	1	4.80	8.46	12.36	-	-	-	-	-	-	-	-	-
			4.80	3.66	3.90	-	-	-	-	-	-	-	-	-
2019	4	1	5.39	8.84	12.05	15.49	-	-	-	-	-	-	-	-
			5.39	3.45	3.21	3.44	-	-	-	-	-	-	-	-
2018	5	2	5.70	11.00	15.24	17.86	19.70	-	-	-	-	-	-	-
			5.70	5.30	4.25	2.62	1.84	-	-	-	-	-	-	-
2017	6	1	5.42	10.06	14.46	17.52	19.55	21.08	-	-	-	-	-	-
			5.42	4.64	4.40	3.06	2.03	1.53	-	-	-	-	-	-
2009	14	1	3.89	6.45	8.69	10.65	12.15	13.39	14.58	15.59	16.57	17.47	18.16	18.78
			3.89	2.56	2.24	1.96	1.50	1.24	1.19	1.01	0.98	0.90	0.69	0.62
Mean Length			5.15	9.30	13.01	15.88	17.77	17.24	14.58	15.59	16.57	17.47	18.16	18.78
Mean Increment			5.15	4.15	3.71	2.74	1.80	1.39	1.19	1.01	0.98	0.90	0.69	0.62
Total N			6	6	6	5	4	2	1	1	1	1	1	1

(*Continued from above table*)

Class	Age	N	13	14
2009	14	1	19.33	19.81
			0.55	0.48
Mean Length			19.33	19.81
Mean Increment			0.55	0.48
Total N			1	1

Age Class Frequency Distribution

Species & SS Type (1)	Number of Fish (2)			Number of Fish in Year Class ('yy) and Age Class															
				'23	'22	'21	'20	'19	'18	'17	'16	'15	'14	'13	'12	'11	'10	'09	<'09
	Aged	Keyed	Unaged	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
Walleye																			
GN	6	0	2	0	0	0	1	1	2	1	0	0	0	0	0	0	0	1	0

(1) Key to Sampling Station (SS) Type abbreviations:
GN = Standard gill net sets

(2) Notes:
Number of Fish Aged: Fish that were aged from bony parts.
Number of Fish Keyed: Fish assigned an age with an age-length key or by expansion of mesh or station age distributions.
Number of Fish Unaged: Fish that were not aged and were not assigned an age.

Survey Crew Notes

Survey Crew: Doyle Hass and Kris Koski. Naturalist from McCarthy Beach State Park (Alli) went along one day also.

Field Notes - General Field

Launched out of Six Berry Landing.

A couple boats fishing each day, also people kayaking and enjoying the lake.

Discussion

Sturgeon Lake is a 1,664-acre lake located 14 miles northwest of Chisholm, MN, within the Little Fork River watershed. A public access is located on the southeast shore within McCarthy Beach State Park. The lake has a maximum depth of 80 feet and 40 percent of the lake is less than 15 feet deep. Water chemistry analysis shows the lake has soft water and low fertility indicating the lake has a limited capacity to support a lot of fish. The lakes water is clear resulting in visibility to 15 feet. The temperature and oxygen profile in mid-July 2023 found sufficient oxygen from the surface to the bottom of the lake to support fish. The Sturgeon Lake inlet and outlet are located on the southwest side of the lake and are navigable by boat. The inlet flows from West Sturgeon Lake while the outlet flows into Little Sturgeon Lake. Water ultimately flows from the Sturgeon Lake Chain to the Sturgeon River, which is a tributary to the Little Fork River.

The 2023 gill net only survey was the tenth survey of the Sturgeon Lake fish community since 1969. The Lake Management Plan (LMP) was last revised in 2017. It lists Northern Pike as a primary management species and Walleye as a secondary management species. Surveys are conducted to monitor the fish population for changes in abundance, size distribution, and growth. The 2023 targeted survey was conducted primarily to evaluate the effectiveness of Walleye stocking to the fishery. Walleye fry were stocked at a rate of 1,000/littoral acre (667,000; acres of water less than 15 feet) annually from 2011 to 2016. Six years of fry stocking yielded minimal contributions to the fishery warranting a new alternate-year fingerling stocking plan 2017 through the present.

In 2023, the Walleye catch declined to 0.5/gill net which is an all-time low over survey history. The catch remained below the long-range goal of 2.0/net for the seventh survey in a row, indicating this goal is likely not attainable. Low Walleye numbers typically reflect limited or no natural production and low survival of stocked fish. It appears that conditions for juvenile Walleye survival are poor. Walleye lengths in 2023 ranged from 13 to 23 inches. The six Walleye aged represented five different year classes. Growth appeared average with Walleye exceeding 15 inches after 4 years of growth. Despite multiple fry and fingerling stocking strategies since 2011, Walleye numbers remain low likely due to low perch numbers, soft water, and low lake fertility. In general, the population is low in number and has average growth rates.

The Northern Pike catch rate of 5.0/net was up by 1 fish per net compared to the previous survey in 2017. The 2023 catch rate is essentially the long-term average for the lake but still exceeds catch rates for lakes with similar habitat. Lengths in 2023 ranged from 10 to 35 inches and averaged 21.4 inches. Gill-net PSD, PSD-P and PSD-M values of 42, 11 and 4 met the LMP goals for this survey indicating a slightly improved size structure in 2023. Lower Northern Pike numbers are thought to be beneficial as higher densities commonly result in slower pike growth, increased predation on Yellow Perch, and lower survival rates of stocked Walleye. High harvest of medium and large pike can negatively affect size structure. No age and growth information for pike was collected in this survey, but previous surveys showed slow growth patterns. Harvest limited to individuals less than 22 inches is recommended.

The gill net catch rate of Yellow Perch in 2023 (0.3/net) was below average for the lake and for lakes with similar habitat. Lengths in 2016 ranged from 7 to 10 inches. One fish 10-inch plus was sampled which is the first one of that size since 1984, indicating poor size structure in recent decades. Low Yellow Perch numbers likely limit the Walleye and Northern Pike populations. In general, the population is low in number, has a limited number of harvestable sized fish, and historically slow growth rates.

Sturgeon Lake supports Tullibee (cisco) and they were the most common fish in the gill nets is 2023. The catch rate (7.3/net) was typical for the lake class and above average for Sturgeon Lake. Captured Tullibee ranged from 6 to 13 inches and averaged 10 inches. Fall sport netting of Tullibee (and Lake Whitefish) is allowed on Sturgeon Lake.

Discussion (*Continued*)

Aside from providing an opportunity for sport netters, Tullibee are beneficial as a prey species and are associated with the production of large predators like Northern Pike.

Lake Whitefish have occasionally been sampled in Sturgeon Lake. The 2023 catch rate (1.0/net) was typical for the lake class and above average for Sturgeon Lake. Lengths ranged from 14 to 24 inches and averaged 21 inches. Otoliths were collected from Lake Whitefish for age analysis. Annuli were difficult to read, but it appeared a variety of year classes were present with estimated ages ranging from 7 to 12.

Other fish sampled in 2023 included: Black Crappie, Bluegill, Largemouth Bass, Pumpkinseed Sunfish and White Sucker.

Anglers and boaters are reminded to help slow the spread of invasive species by removing all aquatic plants from boats, trailers, and equipment. All drain plugs must be removed, and live and bait wells must be drained before leaving the access. Anglers and boaters are encouraged to power wash and thoroughly dry all equipment prior to use in another water body.

Status Of The Fishery

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The Northern Pike catch rate rose slightly compared to the previous survey in 2017. The 2023 catch rate was average for the Sturgeon Lake but still exceeded catch rates for lakes with similar habitat. Lengths in 2023 ranged from 10 to 35 inches and averaged 21 inches. The proportions of pike exceeding 21 inches and 28 inches met the LMP goals for this survey, indicating a slightly improved size structure in 2023. Lower Northern Pike numbers are thought to be beneficial as higher densities commonly result in slower pike growth, increased predation on Yellow Perch, and lower survival rates of stocked Walleye. High harvest of medium and large pike can negatively affect size structure. No age and growth information for pike was collected in this survey, but previous surveys showed slow growth patterns. Harvest limited to individuals less than 22 inches is recommended.

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Status Of The Fishery (*Continued*)

Sucker.

In order to maintain or improve fish and wildlife populations, water quality and habitat must be protected. People often associate water quality problems with large-scale agricultural, forestry, urban development, or industrial practices in the watershed. In reality, the impact of land use decisions on one lake lot may be relatively small, yet the cumulative impact of those decisions on many lake lots can result in a significant decline in water quality and habitat. For example, removing shoreline and aquatic vegetation, fertilizing lawns, mowing to the water's edge, installing beach sand blankets, failing septic systems and uncontrolled run-off, all contribute excess nutrients and sediment which degrade water quality and habitat. Understanding these cumulative impacts and taking steps to avoid or minimize them will help to ensure our quality fisheries can be enjoyed by future generations.

Anglers and boaters are reminded to help slow the spread of invasive species by removing all aquatic plants from boats, trailers, and equipment. All drain plugs must be removed, and live and bait wells must be drained before leaving the access. Anglers and boaters are encouraged to power wash and thoroughly dry all equipment prior to use in another water body.

Approval Dates And Notices

Date Approved By Grand Rapids Area Fisheries Supervisor: **02/01/2024**

Date Approved By Northeast Region Fisheries Manager: _____