DEPARTMENT OF NATURAL RESOURCES

LAKE SURVEY REPORT

Fisheries Management

Lake Name: Clearwater | **Survey Type: Standard Survey**

DOW Number: 86-0252-00 | **Survey ID Date: 07/22/2019**

Lake Identification

Alternate Lake Name:	N/A	DNR Sounding Map Number:	N/A
Primary Lake Class ID:	22	Alternate Lake Class ID:	N/A

Lake Location

Primary County:	Wright	Nearest Town:	Annandale
All Counties:	Stearns, Wright.		

Legal Descriptions

Lake Center:	Township - 121N	Range - 27W	Section - 17
PLS Section Lake Center:	12102717		

All Legal Descriptions:

Stearns County:	Township - 121N	Range - 28W	Sections - 1, 11
	Township - 122N	Range - 27W	Section - 31
	Township - 122N	Range - 28W	Section - 36
Wright County:	Township - 121N	Range - 27W	Sections - 5, 6, 7, 8, 9, 16, 17, 18, 21
	Township - 121N	Range - 28W	Section - 12
	Township - 122N	Range - 27W	Section - 32

Area Office

Area Name:	Sauk Rapids	ORG Code:	F315
Region Name:	Central	Region Number:	3

Lake Access

(Information based on Targeted Survey dated 10/20/2016)

Station ID	Ownership	Public Use	Type	Location / Comments
AC - 1	DNR	Open to Public use	Concrete	West side of lake north of Clearwater River inlet off of Bayview Road.
AC - 2	DNR	Open to Public use	Concrete	The black pool access is located on the northwest side of the west basin off of Bayberry Road.
AC - 3	Private Property	Fee/Permit needed	Concrete	Private pay access on east side of the on MN State Hwy 24.

Lake Characteristics

Lake Area (planimetered acres):	3,158.00	GIS Shoreline Length (miles):	34.83
GIS Lake Area (acres):	3,186.89	Maximum Fetch (miles):	4.28
DOW Lake Area (acres):	3,704.00	Fetch Orientation (degrees):	315
Littoral Area (acres):	1,595.60	USGS Quad Map Number:	Q13d
Area in MN (acres):	3,158.27	USGS Quad 24K GIS Index:	3326
Maximum Depth (feet):	73.0		
Mean Depth (feet):	19.2		

Watershed Characteristics

Major Watershed

Name: Miss R-St. Cloud
Watershed Number: 17
Watershed size (acres): 717,374

Minor Watershed

Name: Clearwater L
Watershed Number: 6
Watershed size (acres): 9,116

Surveys and Investigations

Initial Survey: 09/10/1962.
Re-Survey: 07/18/2005, 07/14/1997, 07/29/1985, 07/29/1974.
Population Assessment: 07/21/2014, 07/30/1991, 08/01/1980.
Special Assessment: 04/20/2015, 10/21/2014, 05/05/2014, 10/02/2012, 10/09/2008, 10/05/2006, 10/05/2005, 09/01/1971, 06/05/1946.
Research Survey: 09/09/2019.
External Management Survey: 07/15/2008.
Standard Survey: 07/22/2019.
Targeted Survey: 10/07/2019, 07/29/2019, 06/19/2019, 10/22/2018, 10/12/2017, 10/20/2016, 10/21/2015, 05/02/2015.

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	07/22/2019	57.0	1.0	77.7	8.1
			3.0	77.9	7.9
			5.0	78.1	7.8
			7.0	78.1	7.6
			9.0	78.1	7.4
			10.0	77.7	5.8
			11.0	77.0	1.8
			12.0	76.5	1.0
			13.0	75.4	0.1
			14.0	74.1	0.1
			15.0	73.4	0.1
			17.0	71.4	0.0
			19.0	69.1	0.0
			21.0	66.2	0.0
			25.0	63.0	0.0
			30.0	60.6	0.0
			35.0	58.8	0.0
			40.0	57.7	0.0
			45.0	56.7	0.0
			50.0	55.2	0.0
			55.0	53.4	0.0
WQ - 2	07/22/2019	66.0	1.0	78.3	8.6
			3.0	78.4	8.6
			5.0	78.4	8.5
			7.0	78.4	8.5
			9.0	78.3	8.3
			11.0	78.1	8.1
			13.0	78.1	7.9
			15.0	77.4	6.9
			16.0	76.5	5.9
			17.0	76.1	5.6
			18.0	75.7	5.2
			19.0	72.0	1.6
			20.0	68.9	0.8
			21.0	67.5	0.6
			22.0	65.1	0.3
			25.0	62.2	0.2
			30.0	60.1	0.3
			35.0	59.0	0.2
			40.0	58.3	0.2
			45.0	57.7	0.1
			50.0	55.9	0.0
			55.0	55.0	0.0
			60.0	54.5	0.0
			65.0	54.0	0.0

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	07/22/2019	Surface	7.0	N\A	N/A	Lt Green	Algae
WQ - 2	07/22/2019	Surface	7.0	N\A	N/A	Lt Green	Algae

Net Catch Summary by Numbers for GN

Standard gill net sets

Number of Sets: 15
First Set Date: 07/22/2019
Last Lift Date: 07/26/2019
Target Species: N/A

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 22* 25%	50%	75%
BLC	Black Crappie	13	0.87	0.22	0.42	1.14
BLG	Bluegill	166	11.07	N/A	N/A	N/A
BOF	Bowfin (Dogfish)	1	0.07	0.08	0.13	0.24
BRB	Brown Bullhead	6	0.40	0.25	0.50	1.62
GSF	Green Sunfish	2	0.13	0.11	0.20	0.46
HSF	Hybrid Sunfish	4	0.27	N/A	N/A	N/A
LMB	Largemouth Bass	30	2.00	0.25	0.62	1.20
NOP	Northern Pike	203	13.53	3.00	5.00	7.89
PMK	Pumpkinseed	35	2.33	N/A	N/A	N/A
RKB	Rock Bass	41	2.73	1.00	2.93	6.63
WAE	Walleye	26	1.73	4.01	6.61	9.63
WTS	White Sucker	1	0.07	1.02	2.00	3.49
YEB	Yellow Bullhead	289	19.27	0.65	2.59	6.43
	Total Fish/Set:		54.47	* 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	Quartiles for Lake Class 22* 25%	50%	75%
BLC	Black Crappie	6.99	0.47	0.54	0.24	0.38	0.55
BLG	Bluegill	25.14	1.68	0.15	N/A	N/A	N/A
BOF	Bowfin (Dogfish)	3.87	0.26	3.87	3.01	4.13	5.18
BRB	Brown Bullhead	5.10	0.34	0.85	0.67	0.90	1.19
GSF	Green Sunfish	0.14	0.01	0.07	N/A	N/A	N/A
HSF	Hybrid Sunfish	0.95	0.06	0.24	N/A	N/A	N/A
LMB	Largemouth Bass	37.14	2.48	1.24	0.55	0.77	1.05
NOP	Northern Pike	477.46	31.83	2.35	1.68	2.25	2.80
PMK	Pumpkinseed	4.94	0.33	0.14	N/A	N/A	N/A
RKB	Rock Bass	16.10	1.07	0.39	0.30	0.41	0.52
WAE	Walleye	69.74	4.65	2.68	1.12	1.43	1.90
WTS	White Sucker	2.28	0.15	2.28	1.52	1.89	2.28
YEB	Yellow Bullhead	211.84	14.12	0.73	0.62	0.75	0.95
	Total Pounds Fish/Set:		57.45		* Quartiles for Mean Weight		

Net Catch Summary by Numbers for TN

Standard 3/4-in mesh, double frame trap net sets

Number of Sets: 21
First Set Date: 07/22/2019
Last Lift Date: 07/26/2019
Target Species: N/A

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 22* 25%	50%	75%
BLB	Black Bullhead	1	0.05	0.30	0.67	2.06
BLC	Black Crappie	6	0.29	0.25	0.75	1.74
BLG	Bluegill	434	20.67	3.73	15.28	42.85
BOF	Bowfin (Dogfish)	18	0.86	0.30	0.61	1.10
BRB	Brown Bullhead	1	0.05	0.30	0.71	1.65
CAP	Common Carp	1	0.05	0.18	0.46	1.00
GSF	Green Sunfish	5	0.24	0.20	0.50	1.00
HSF	Hybrid Sunfish	53	2.52	N/A	N/A	N/A
LMB	Largemouth Bass	6	0.29	0.37	0.75	1.38
NOP	Northern Pike	6	0.29	N/A	N/A	N/A
PMK	Pumpkinseed	103	4.90	1.59	3.33	6.86
RKB	Rock Bass	12	0.57	0.67	1.67	3.28
WAE	Walleye	5	0.24	0.25	0.55	0.85
YEB	Yellow Bullhead	89	4.24	0.92	2.13	4.75
YEP	Yellow Perch	2	0.10	0.73	1.68	3.74
	Total Fish/Set:		35.33	* Quartiles for Number Per Set		

Net Catch Summary by Weight for TN

Standard 3/4-in mesh, double frame trap net sets

Abbr	Species	Total Weight (Pounds)	Pounds Per Set	Mean Weight	Quartiles for Lake Class 22* 25%	50%	75%
BLB	Black Bullhead	1.25	0.06	1.25	0.41	0.60	0.84
BLC	Black Crappie	2.04	0.10	0.34	0.30	0.40	0.57
BLG	Bluegill	35.08	1.67	0.08	0.12	0.16	0.22
BOF	Bowfin (Dogfish)	82.65	3.94	4.59	3.93	4.43	5.07
BRB	Brown Bullhead	0.75	0.04	0.75	0.65	0.83	1.05
CAP	Common Carp	5.63	0.27	5.63	3.53	5.00	7.40
GSF	Green Sunfish	0.32	0.02	0.06	0.08	0.10	0.19
HSF	Hybrid Sunfish	13.25	0.63	0.25	N/A	N/A	N/A
LMB	Largemouth Bass	1.88	0.09	0.31	0.27	0.41	0.68
NOP	Northern Pike	18.79	0.89	3.13	N/A	N/A	N/A
PMK	Pumpkinseed	17.68	0.84	0.17	0.14	0.18	0.25
RKB	Rock Bass	1.48	0.07	0.12	0.24	0.35	0.50
WAE	Walleye	14.31	0.68	2.86	1.01	1.49	2.23
YEB	Yellow Bullhead	77.72	3.70	0.87	0.66	0.79	0.95
YEP	Yellow Perch	0.18	0.01	0.09	0.12	0.16	0.21
	Total Pounds Fish/Set:		13.00		* Quartiles for Mean Weight		

Electrofishing Catch Summary for EF

Standard electrofishing

Total run-time for all stations: 04:42:00
Total on-time for all stations: 03:39:06
First Sampling Date: 06/05/2019
Last Sampling Date: 06/07/2019
Daylight Sampling: No
Target Species: All ages largemouth bass

		Summary By Numbers			Summary By Weight (pounds)			
		Total	Number per Hour		Total	Lbs per Hour		Mean
Abbr	Species	Number	Run-Time	On-Time	Weight	Run-Time	On-Time	Weight
LMB	Largemouth Bass	154	32.77	42.17	213.17	45.35	58.37	1.38
WAE	Walleye	3	0.64	0.82	0.48	0.10	0.13	0.16

Length Frequency Distribution for GN

Standard gill net sets

(Field work conducted between 07/22/2019 and 07/26/2019)

	BLC	BLG	BOF	BRB	GSF	HSF	LMB	NOP	PMK	RKB	WAE	WTS	YEB
< 3.00	-	-	-	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	-	-	-	-	-	-	-	-	-	-	-	-
3.50 - 3.99	-	29	-	-	-	-	-	-	6	3	-	-	-
4.00 - 4.49	-	19	-	-	1	-	-	-	2	3	-	-	-
4.50 - 4.99	2	12	-	-	1	1	-	-	10	5	-	-	-
5.00 - 5.49	1	16	-	-	-	-	-	-	3	3	-	-	4
5.50 - 5.99	-	26	-	-	-	1	2	-	2	2	-	-	16
6.00 - 6.49	-	18	-	-	-	-	2	-	9	-	-	-	6
6.50 - 6.99	-	33	-	-	-	1	-	-	2	3	-	-	2
7.00 - 7.49	-	8	-	-	-	-	-	-	-	2	-	-	10
7.50 - 7.99	2	1	-	-	-	1	1	-	1	3	-	-	5
8.00 - 8.49	1	3	-	-	-	-	-	-	-	2	1	-	5
8.50 - 8.99	-	-	-	-	-	-	-	-	-	3	1	-	13
9.00 - 9.49	-	-	-	-	-	-	-	-	-	4	2	-	19
9.50 - 9.99	-	-	-	-	-	-	3	-	-	3	3	-	14
10.00 - 10.49	1	-	-	1	-	-	3	-	-	3	-	-	30
10.50 - 10.99	-	-	-	1	-	-	-	-	-	2	-	-	25
11.00 - 11.49	3	-	-	-	-	-	2	-	-	-	1	-	28
11.50 - 11.99	3	-	-	3	-	-	-	-	-	-	-	-	25
12.00 - 12.99	-	-	-	-	-	-	-	-	-	-	1	-	56
13.00 - 13.99	-	-	-	1	-	-	4	-	-	-	-	-	27
14.00 - 14.99	-	-	-	-	-	-	5	1	-	-	-	-	1
15.00 - 15.99	-	-	-	-	-	-	5	-	-	-	1	-	-
16.00 - 16.99	-	-	-	-	-	-	1	1	-	-	1	-	-
17.00 - 17.99	-	-	-	-	-	-	1	4	-	-	-	1	1
18.00 - 18.99	-	-	-	-	-	-	-	11	-	-	-	-	-
19.00 - 19.99	-	-	-	-	-	-	-	20	-	-	1	-	-
20.00 - 20.99	-	-	-	-	-	-	-	32	-	-	3	-	-
21.00 - 21.99	-	-	-	-	-	-	-	34	-	-	2	-	-
22.00 - 22.99	-	-	1	-	-	-	-	30	-	-	1	-	-
23.00 - 23.99	-	-	-	-	-	-	-	25	-	-	1	-	-
24.00 - 24.99	-	-	-	-	-	-	-	18	-	-	4	-	-
25.00 - 25.99	-	-	-	-	-	-	-	9	-	-	1	-	-
26.00 - 26.99	-	-	-	-	-	-	-	4	-	-	2	-	-
27.00 - 27.99	-	-	-	-	-	-	-	3	-	-	-	-	-
28.00 - 28.99	-	-	-	-	-	-	-	3	-	-	-	-	-
29.00 - 29.99	-	-	-	-	-	-	-	-	-	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	1	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	1	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	2	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	1	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	1	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-	-	-	-

	BLC	BLG	BOF	BRB	GSF	HSF	LMB	NOP	PMK	RKB	WAE	WTS	YEB
Total	13	165	1	6	2	4	29	201	35	41	26	1	287
Min. Length	4.72	3.58	22.09	10.20	4.13	4.92	5.63	14.37	3.66	3.78	8.31	17.20	5.28
Max. Length	11.77	8.35	22.09	13.23	4.80	7.72	17.72	34.33	7.83	10.83	26.97	17.20	17.48
Mean Length	9.05	5.46	22.09	11.58	4.47	6.37	12.08	22.32	5.27	7.17	18.36	17.20	10.51
# Measured	13	146	1	6	2	4	29	181	33	41	25	1	286
No Lengths for	0	20	0	0	0	0	1	22	2	0	1	0	3

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 Frequency Distribution for TN

Standard 3/4-in mesh, double frame trap net sets

(Field work conducted between 07/22/2019 and 07/26/2019)

	BLB	BLC	BLG	BOF	BRB	CAP	GSF	HSF	LMB	NOP	PMK	RKB	WAE	YEB	YEP
< 3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	-	29	-	-	-	-	-	-	-	1	-	-	-	-
3.50 - 3.99	-	-	162	-	-	-	1	1	-	-	7	1	-	-	-
4.00 - 4.49	-	1	64	-	-	-	1	9	-	-	15	5	-	-	-
4.50 - 4.99	-	1	28	-	-	-	3	4	-	-	16	-	-	-	-
5.00 - 5.49	-	-	56	-	-	-	-	5	2	-	5	2	-	-	-
5.50 - 5.99	-	-	35	-	-	-	-	3	-	-	10	1	-	-	1
6.00 - 6.49	-	-	27	-	-	-	-	3	1	-	20	-	-	-	1
6.50 - 6.99	-	-	17	-	-	-	-	4	-	-	18	2	-	-	-
7.00 - 7.49	-	-	10	-	-	-	-	12	-	-	7	1	-	1	-
7.50 - 7.99	-	1	4	-	-	-	-	8	-	-	4	-	-	1	-
8.00 - 8.49	-	-	1	-	-	-	-	3	-	-	-	-	-	2	-
8.50 - 8.99	-	-	-	-	-	-	-	1	1	-	-	-	-	3	-
9.00 - 9.49	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
9.50 - 9.99	-	2	-	-	-	-	-	-	-	-	-	-	-	5	-
10.00 - 10.49	-	-	-	-	-	-	-	-	1	-	-	-	1	4	-
10.50 - 10.99	-	1	-	-	-	-	-	-	-	-	-	-	-	11	-
11.00 - 11.49	-	-	-	-	1	-	-	-	1	-	-	-	-	5	-
11.50 - 11.99	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-
12.00 - 12.99	1	-	-	-	-	-	-	-	-	1	-	-	-	29	-
13.00 - 13.99	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-
14.00 - 14.99	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
15.00 - 15.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.00 - 16.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.00 - 17.99	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
18.00 - 18.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.00 - 19.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.00 - 20.99	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-
21.00 - 21.99	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-
22.00 - 22.99	-	-	-	2	-	1	-	-	-	1	-	-	1	-	-
23.00 - 23.99	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
24.00 - 24.99	-	-	-	4	-	-	-	-	-	-	-	-	1	-	-
25.00 - 25.99	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
26.00 - 26.99	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
27.00 - 27.99	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-
28.00 - 28.99	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
29.00 - 29.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	BLB	BLC	BLG	BOF	BRB	CAP	GSF	HSF	LMB	NOP	PMK	RKB	WAE	YEB	YEP
Total	1	6	433	18	1	1	5	53	6	6	103	12	5	89	2
Min. Length	12.99	4.13	3.27	20.16	11.30	22.99	3.62	3.98	5.04	12.68	3.23	3.62	10.00	7.05	5.55
Max. Length	12.99	10.67	8.43	27.56	11.30	22.99	4.80	8.82	11.14	28.94	7.91	7.40	24.09	14.02	6.14
Mean Length	12.99	7.78	4.59	23.65	11.30	22.99	4.39	6.31	7.82	23.38	5.63	5.14	19.05	11.50	5.85
# Measured	1	6	431	18	1	1	5	53	6	6	103	12	5	89	2
No Lengths for	0	0	3	0	0	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 Frequency Distribution for EF

Standard electrofishing

(Field work conducted between 06/05/2019 and 06/07/2019)

	LMB	WAE
< 3.00	-	-
3.00 - 3.49	-	-
3.50 - 3.99	-	-
4.00 - 4.49	-	-
4.50 - 4.99	-	-
5.00 - 5.49	-	-
5.50 - 5.99	3	-
6.00 - 6.49	-	-
6.50 - 6.99	4	-
7.00 - 7.49	13	1
7.50 - 7.99	6	-
8.00 - 8.49	3	1
8.50 - 8.99	2	1
9.00 - 9.49	3	-
9.50 - 9.99	3	-
10.00 - 10.49	3	-
10.50 - 10.99	3	-
11.00 - 11.49	3	-
11.50 - 11.99	4	-
12.00 - 12.99	16	-
13.00 - 13.99	25	-
14.00 - 14.99	19	-
15.00 - 15.99	17	-
16.00 - 16.99	9	-
17.00 - 17.99	13	-
18.00 - 18.99	4	-
19.00 - 19.99	-	-
20.00 - 20.99	1	-
21.00 - 21.99	-	-
22.00 - 22.99	-	-
23.00 - 23.99	-	-
24.00 - 24.99	-	-
25.00 - 25.99	-	-
26.00 - 26.99	-	-
27.00 - 27.99	-	-
28.00 - 28.99	-	-
29.00 - 29.99	-	-
30.00 - 30.99	-	-
31.00 - 31.99	-	-
32.00 - 32.99	-	-
33.00 - 33.99	-	-
34.00 - 34.99	-	-
35.00 - 35.99	-	-
= > 36.00	-	-

	LMB	WAE
Total	154	3
Min. Length	5.51	7.36
Max. Length	20.35	8.82
Mean Length	12.83	8.11
# Measured	154	3
No Lengths for	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.

Age Class Frequency Distribution

Species & SS Type (1)	Number of Fish (2)			Number of Fish in Year Class ('yy) and Age Class														
				'19	'18	'17	'16	'15	'14	'13	'12	'11	'10	'09	'08	'07	'06	'05	<'05
	Aged	Keyed	Unaged	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
Walleye																			
GN	24	1	1	0	7	2	2	0	2	3	0	2	3	0	2	0	1	0	1
TN	1	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals:	25	1	5	0	8	2	2	0	2	3	0	2	3	0	2	0	1	0	1

(1) Key to Sampling Station (SS) Type abbreviations:

GN = Standard gill net sets

TN = Standard 3/4-in mesh, double frame trap 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.

Other Species

Gear Type (1)	Other Species (Gender) (2)	Total Num	Number Measured	Length (inches) Min - Mean - Max	Number Weighed	Weight (pounds) Min - Mean - Max
TN	Painted Turtle	64	0	N/A	0	N/A
	Snapping Turtle	6	0	N/A	0	N/A
	Spiney Softshell Turtle	5	0	N/A	0	N/A

(1) Key to sampling gear abbreviations:

TN = Standard 3/4-in mesh, double frame trap net sets

(2) Gender: If identified and reported.

Survey Crew Notes

null

Area Signed by user 'jostewig' on 03/20/2020

Region Signed by user 'Nevander' on 03/23/2020

Discussion

Clearwater Lake is a 3,158 acre lake located two miles north of the City of Annandale on the border of Wright and Stearns counties. The lake has a maximum depth of 73 feet and is classified as Lake Class 22. The last survey was in 2014. The watershed is large (101,623 acres) and land use is primarily agriculture (54%) with some forest (12%). Clearwater Lake is the largest lake in the Sauk Rapids management area and a popular destination for bass fishing (6 to 8 tournaments annually) and other recreation. The lake is divided into an east and west basin. There are two public accesses on the west basin and a private fee access on the east basin. Walleye are the primary management species.

Emergent and floating-leaf vegetation was abundant, particularly in the west basin, and covered 20% of the lake and 53% of the shoreline. Primary species were bulrush, cattail, and white waterlily. Submerged vegetation was abundant, but not surveyed. Water clarity was good; Secchi depth was 7.0 feet in late July for both basins. MPCA data show a ten year summer average Secchi depth of 6.6 feet. Dissolved oxygen was adequate to support fish to 18 feet in the east basin, but only 10 feet in the west basin. Invasive species include Eurasian Watermilfoil (since 1989) and Zebra Mussels (since 2015). All boaters should take extra care not to spread these species to other water bodies.

The Walleye fishery has been sustained by biennial fry stocking with additional fry, fingerling, and other life stages stocked to supplement years with poor fry survival.
Walleye numbers in 2019 (1.7/gill net) were below the expected range of values for Lake Class 22 and the lowest on record. Historical catches have ranged from 2.4 to 7.2/gill net and have been declining since 1997. Lengths ranged from 8.3 to 27.0 inches with a mean length and weight of 18.4 inches and 2.7 pounds. PSD was 88 and RSD-20 was 71. Eleven year classes were represented and Walleye grew to 15 inches in two to three years. A few aged Walleye were from non-stocked years, indicating a low level of natural recruitment. It is unclear why Walleye abundance has been declining. Abundant Northern Pike likely have some effect on recruitment via predation, but fry survival appears to be poor as well. Zebra Mussels are not likely to blame because the decline began well before they were established in the lake. Biennial fry stocking will continue with supplemental fry and fingerling stocking as needed.

Northern Pike numbers (13.5/gill net) were similar to 2014 (15.0/gill net) and the historical average (10.2), but well above the expected range of values for the lake class. Historical catches have ranged from 4.9 to 15.0/gill net, but catches have been higher (12.6 to 15.0/gill net) since 1997. Northern Pike lengths ranged from 12.7 to 34.3 inches with a mean length and weight of 22.3 inches and 2.4 pounds. PSD was 66, RSD-26 was nine and RSD-30 was three. New Northern Pike regulations began in 2019, allowing more harvest of small pike in central Minnesota. It is hoped that this will result in lower pike abundance and better size structure.

Largemouth Bass were sampled by night electrofishing on June 5 and 6. The catch rate of 42.2/hour (on-time) was below the Sauk Rapids area average of 73.6/hr, but similar to 2014 results (44.9/hr). Bass lengths ranged from 5.5 to 20.4 inches with a mean length of 12.8 inches. PSD was 81 and RSD-15 was 34.

Bluegill numbers (20.7/trap net) were higher than 2014 (6.6/trap net) and within the expected range of values. Lengths ranged from 3.3 to 8.4 inches with a mean length of 4.9 inches. PSD was 20 and one percent of Bluegill were eight inches or longer. A targeted survey using trap nets around spawning time was conducted on June 19 and 20 to better assess the size structure of the Bluegill population.
Bluegill were somewhat larger than in summer nets; PSD was 49 and two percent were eight inches or longer. Mean length was 5.1 inches and the largest Bluegill was 8.5 inches long. However, a late ice-out and rapidly warming water may have resulted in missing the pre-spawn period. It would be beneficial to repeat the survey during a more typical spring.

Discussion (*Continued*)

The Black Crappie catch rate (0.9/gill net) was similar to 2014 (0.7/gill net) and within the expected range of values. Trap net numbers (0.3/trap net) were also similar to 2014. Black Crappie catches were higher in the 1980s, ranging from 9.6 to 12.1/gill net. Lengths ranged from 4.1 to 11.8 inches with a mean length of 8.7 inches. A targeted survey conducted in the spring of 2014 and 2015 was used to better assess Black Crappie size structure and growth. Spring nets showed a diversity of sizes and ages and much higher numbers than seen during standard summer surveys. The Black Crappie population in Clearwater Lake healthy based on these results. Summer surveys are likely inadequate for sampling crappies in Clearwater and targeted spring surveys are recommended at regular intervals in the future.

Only two Yellow Perch were captured during the survey. Perch numbers have been below the expected range of values in all previous surveys, but catch rates dropped noticeably in the 1990s. Northern Pike numbers increased during the 1990s, possibly contributing to the decline of Yellow Perch. However, small Yellow Perch have been commonly seen during fall Walleye electrofishing in Clearwater Lake. Fine mesh gill nets (GFM) have been used in other lakes to sample perch, often finding relatively high numbers of perch which mature at small sizes. Fall night electrofishing and GFM sets were conducted as part of a research project to evaluate Yellow Perch maturity and growth among lakes statewide. Preliminary results show relatively high numbers of perch maturing at small sizes (<4 inches) in Clearwater Lake.

Other species captured included Black, Brown, and Yellow Bullhead, Bowfin, Common Carp, Green Sunfish, Hybrid Sunfish, Pumpkinseed, Rock Bass, and White Sucker.

Status Of The Fishery

Clearwater Lake is a 3,158 acre lake located two miles north of the city of Annandale on the border of Wright and Stearns County. The watershed is large (>100,000 acres) and land use is primarily agriculture with some forest. Clearwater is the largest lake in the Sauk Rapids management area and a popular destination for bass fishing (6 to 8 tournaments annually) and other recreation. The lake is divided between a west and an east basin and there are two public accesses on the west basin. A private fee access is located on the east basin. Maximum depth is 73 feet and the last survey was in 2014. Anglers can expect good fishing for Northern Pike, Largemouth Bass, and panfish.

Emergent and floating-leaf vegetation was abundant, particularly in the west basin. Primary species were bulrush, cattail, and white waterlily. Submerged vegetation was also abundant, but not surveyed. Water clarity was good; Secchi depth was 7.0 feet in late July for both basins. MPCA data show a ten year summer average Secchi depth of 6.6 feet. Dissolved oxygen was adequate to support fish to 18 feet in the east basin, but only 10 feet in the west basin. Invasive species include Eurasian Watermilfoil (since 1989) and Zebra Mussels (since 2015). All boaters should take extra care not to spread these species to other water bodies.

The Walleye fishery has been sustained by biennual fry stocking with additional fry, fingerling, and other life stages stocked to supplement years with poor fry survival. Walleye numbers in 2019 were below the expected range of values for lakes similar to Clearwater and the lowest on record. Walleye catches have declined since 1997. Lengths ranged from 8.3 to 27.0 inches with an average length and weight of 18.4 inches and 2.7 pounds. Seventy-one percent of Walleye were 20 inches or longer. Eleven year classes were represented and Walleye grew to 15 inches in two to three years. A few Walleye were from non-stocked years and indicate a low level of natural recruitment. It is unclear why Walleye abundance has been declining. However, abundant Northern Pike prey on young Walleye and fry survival appears to be poor as well. Zebra Mussels are not likely to blame because the decline began well before they were established in the lake. Biennual fry stocking will continue with supplemental fry and fingerlings stocked as needed.

Northern Pike numbers were similar to 2014 and the historical average, but well above the expected range of values for the lake class. Catches have been trending higher since 1997. Northern Pike lengths ranged from 12.7 to 34.3 inches with an average length and weight of 22.3 inches and 2.4 pounds. Nine percent of pike were 26 inches or longer and three percent were 30 inches or longer. New Northern Pike regulations began in 2019, allowing more harvest of small pike in central Minnesota. It is hoped that this will result in lower pike abundance and better size structure.

Largemouth Bass were sampled by night electrofishing on June 5 and June 6. The catch rate of 42.2/hour was below the Sauk Rapids area average of 73.6/hr, but similar to 2014 results (44.9/hr). Bass lengths ranged from 5.5 to 20.4 inches with an average length of 12.8 inches. Thirty-four percent of Largemouth Bass were 15 inches or longer.

Bluegill numbers were higher than 2014 and within the expected range of values. Lengths ranged from 3.3 to 8.4 inches with an average length of 4.9 inches and one percent of Bluegill were eight inches or longer. A targeted trap net survey was conducted on June 19 and 20 to better assess the size structure of the Bluegill population. Bluegill were somewhat larger than in summer nets; two percent were eight inches or longer, average length was 5.1 inches, and the largest Bluegill was 8.5 inches long. However, a late ice-out and rapidly warming water may have resulted in missing the pre-spawn period when large Bluegill are most vulnerable.

The Black Crappie catch rate was similar to 2014 and within the expected range of values. Lengths ranged from 4.1 to 11.8 inches with an average length of 8.7 inches. A targeted survey in the spring of 2014 and 2015 was used to better assess the Black Crappie population. Spring trap nets showed a diversity of sizes and ages and much higher numbers than seen during standard summer surveys. The Black Crappie population in Clearwater Lake seems healthy based on these results.

Only two Yellow Perch were captured during the survey. Perch numbers have been below the expected range of values in all previous surveys, but catch rates dropped noticeably in the 1990s. Northern Pike numbers increased during the 1990s, possibly contributing to the decline of Yellow Perch. However, small Yellow Perch have been commonly seen during fall Walleye electrofishing in Clearwater Lake. Fall night electrofishing and small mesh gill nets were used as part of a research project to evaluate Yellow Perch populations among lakes statewide.

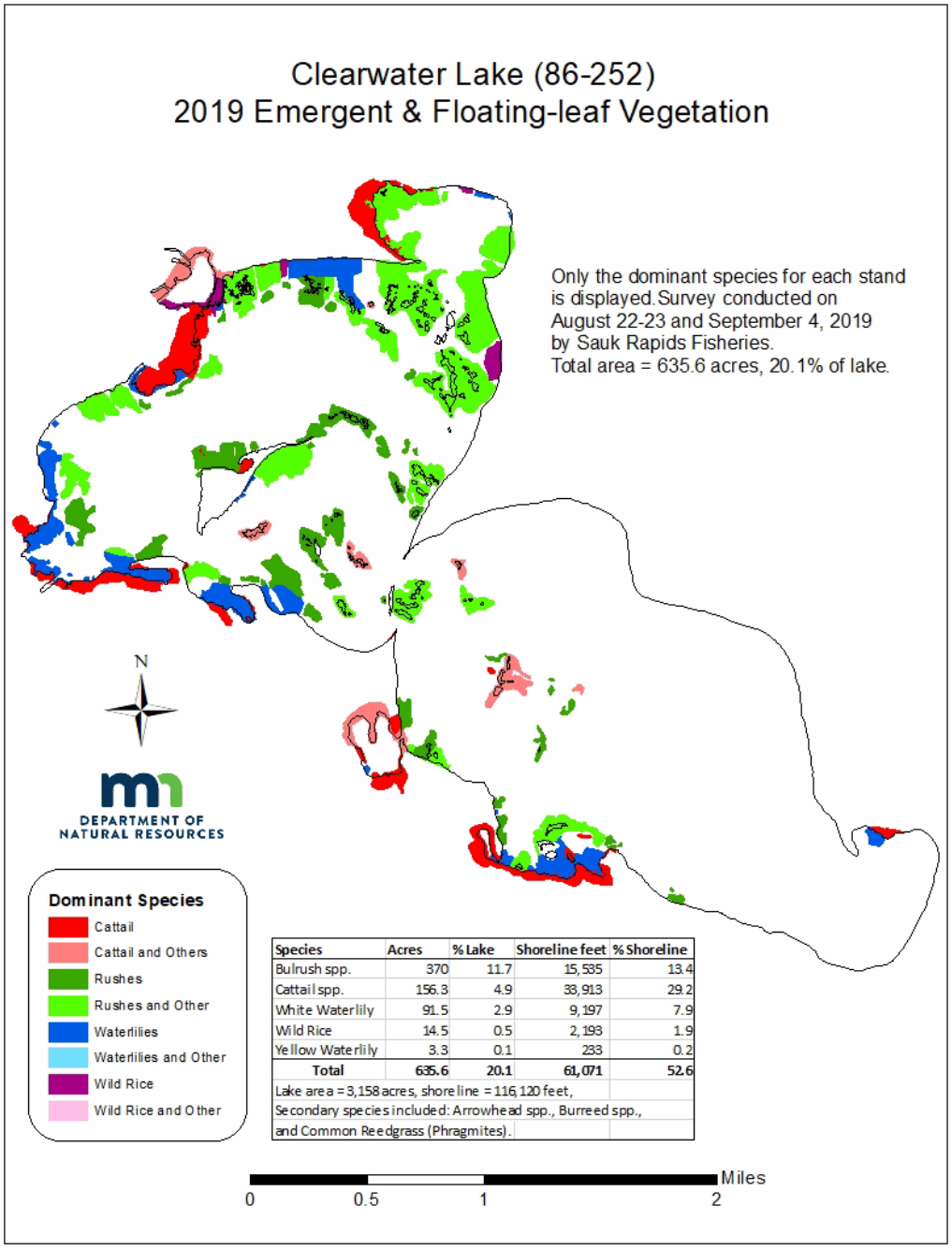
Status Of The Fishery (*Continued*)

Preliminary results show relatively high numbers of small perch in Clearwater Lake, mostly too small to catch in standard gill nets.

Other species captured included Black, Brown, and Yellow Bullhead, Bowfin, Common Carp, Green Sunfish, Hybrid Sunfish, Pumpkinseed, Rock Bass, and White Sucker.

Survey Attachments

Attachment #1: Map **Title:** Clearwater Emergents



Species	Acres	% Lake	Shoreline feet	% Shoreline
Bulrush spp.	370	11.7	15,535	13.4
Cattail spp.	156.3	4.9	33,913	29.2
White Waterlily	91.5	2.9	9,197	7.9
Wild Rice	14.5	0.5	2,193	1.9
Yellow Waterlily	3.3	0.1	233	0.2
Total	**635.6**	**20.1**	**61,071**	**52.6**

Lake area = 3,158 acres, shoreline = 116,120 feet,
Secondary species included: Arrowhead spp., Burreed spp., and Common Reedgrass (Phragmites).

File Name: Clearwater emergents 2019.jpg

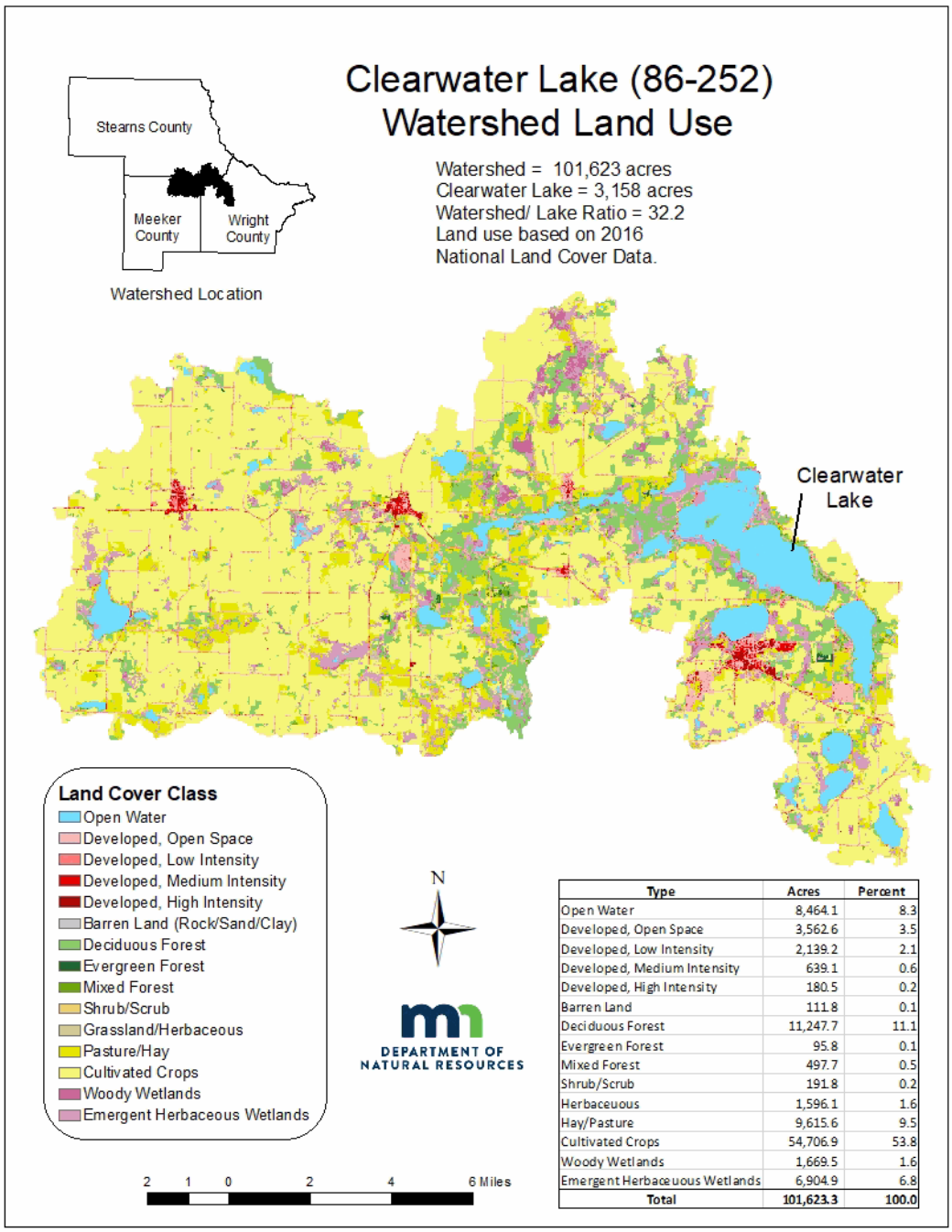
UTM Easting: -
UTM Northing: -

Date: 02/19/2020
Time: 11:22 am

Notes: -

Survey Attachments (***Continued***)

Attachment #2: Map **Title:** Clearwater Watershed Land Use



Type	Acres	Percent
Open Water	8,464.1	8.3
Developed, Open Space	3,562.6	3.5
Developed, Low Intensity	2,139.2	2.1
Developed, Medium Intensity	639.1	0.6
Developed, High Intensity	180.5	0.2
Barren Land	111.8	0.1
Deciduous Forest	11,247.7	11.1
Evergreen Forest	95.8	0.1
Mixed Forest	497.7	0.5
Shrub/Scrub	191.8	0.2
Herbaceuous	1,596.1	1.6
Hay/Pasture	9,615.6	9.5
Cultivated Crops	54,706.9	53.8
Woody Wetlands	1,669.5	1.6
Emergent Herbaceuous Wetlands	6,904.9	6.8
Total	**101,623.3**	**100.0**

File Name:
Clearwater_luse.jpg

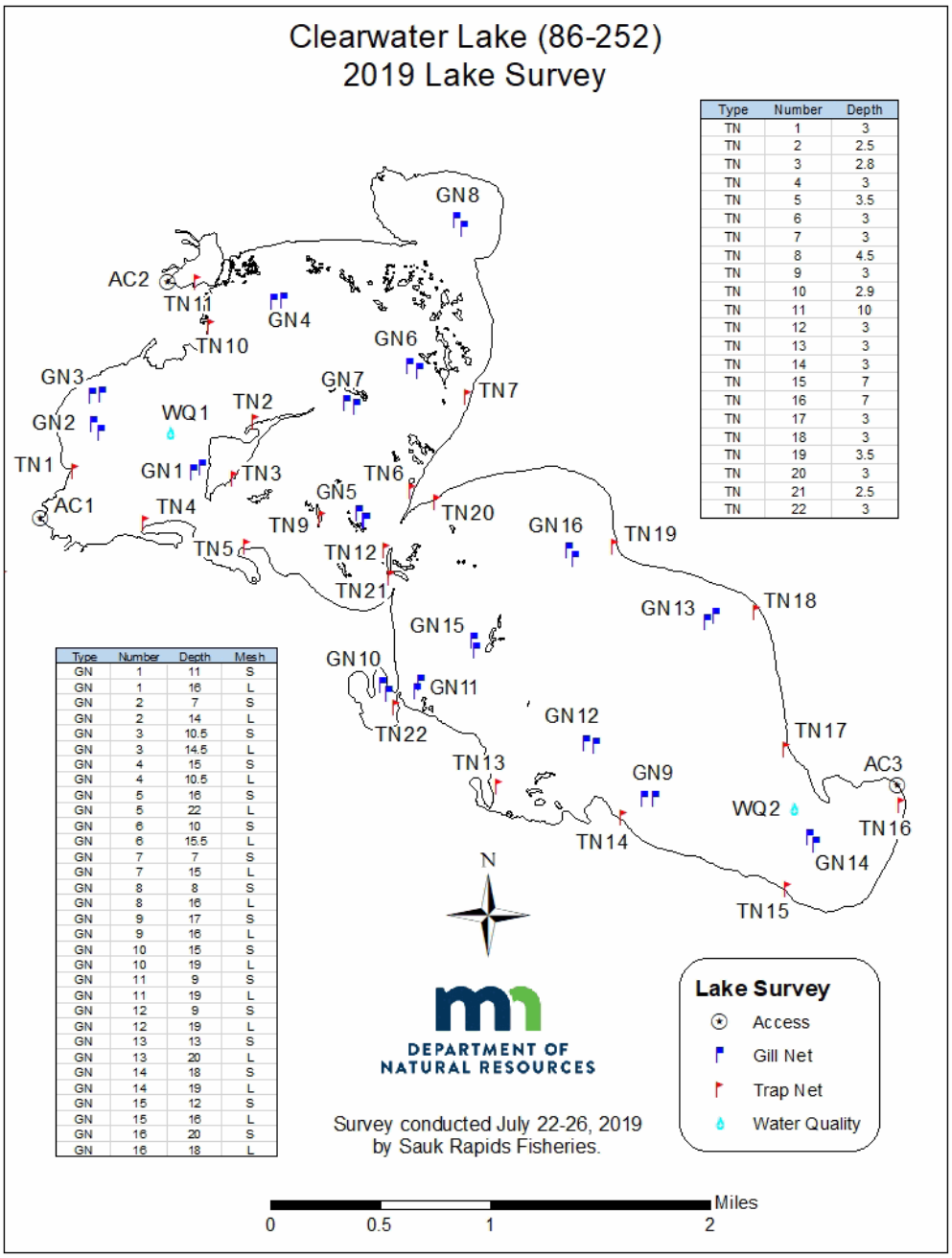
UTM Easting: -
UTM Northing: -

Date: 02/19/2020
Time: 11:23 am

Notes: -

Survey Attachments (***Continued***)

Attachment #3: Map **Title:** Clearwater Survey



Type	Number	Depth
TN	1	3
TN	2	2.5
TN	3	2.8
TN	4	3
TN	5	3.5
TN	6	3
TN	7	3
TN	8	4.5
TN	9	3
TN	10	2.9
TN	11	10
TN	12	3
TN	13	3
TN	14	3
TN	15	7
TN	16	7
TN	17	3
TN	18	3
TN	19	3.5
TN	20	3
TN	21	2.5
TN	22	3

Type	Number	Depth	Mesh
GN	1	11	S
GN	1	16	L
GN	2	7	S
GN	2	14	L
GN	3	10.5	S
GN	3	14.5	L
GN	4	15	S
GN	4	10.5	L
GN	5	16	S
GN	5	22	L
GN	6	10	S
GN	6	15.5	L
GN	7	7	S
GN	7	15	L
GN	8	8	S
GN	8	16	L
GN	9	17	S
GN	9	16	L
GN	10	15	S
GN	10	19	L
GN	11	9	S
GN	11	19	L
GN	12	9	S
GN	12	19	L
GN	13	13	S
GN	13	20	L
GN	14	18	S
GN	14	19	L
GN	15	12	S
GN	15	16	L
GN	16	20	S
GN	16	18	L

File Name: Clearwater survey 2019.jpg

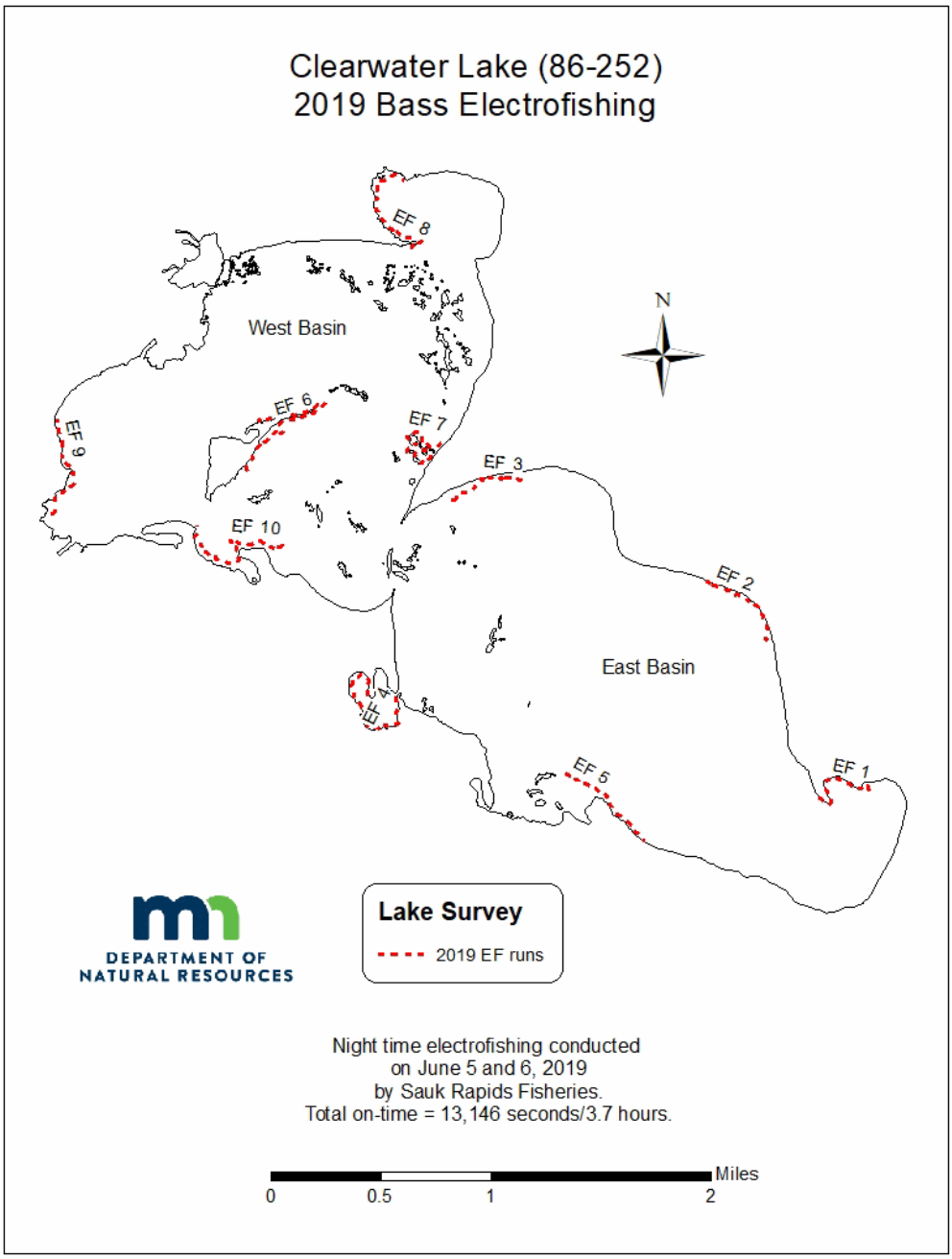
UTM Easting: -
UTM Northing: -

Date: 02/19/2020
Time: 11:24 am

Notes: -

Survey Attachments (***Continued***)

Attachment #4: Map **Title:** Clearwater Bass Electrofishing



File Name: Clearwater EF survey 2019.jpg

UTM Easting: -
UTM Northing: -

Date: 02/19/2020
Time: 11:25 am

Notes: -

Survey Attachments (*Continued*)

Attachment #5: Graph **Title:** Walleye Length at Age Table

File Name: Walleye Length at Age Table.jpg

UTM Easting: -
UTM Northing: -

Date: 02/24/2020
Time: 11:31 am

Notes: -

STANDARD LAKE SURVEY REPORT
RE-SURVEY DATED 07/15/2019 FOR DOW NUMBER 86-0252-00

Length at Capture By Sex For Aged Fish

Species: Walleye – female
Body-Scale Constant: NA
Total Sample Size: 16

Length at Capture in 2019 for Each Age Class

Year Class	Age	Sample Size	Length At Capture (inches) Average Length	Minimum Length	Maximum Length	Standard Error	Length Increments Increment	Standard Error
2018	1	4	9.6	8.9	10.0	0.23		
2017	2	1	15.4	15.4	15.4	N/A		
2016	3	1	16.7	16.7	16.7	N/A		
2015	4	1	19.1	19.1	19.1	N/A		
2014	5	2	20.4	19.6	21.1	0.75		
2013	6	2	22.1	20.3	23.9	N/A		
2011	8	1	24.4	24.4	24.4	N/A		
2010	9	1	24.7	24.7	24.7	N/A		
2008	11	2	25.6	24.2	27.0	1.38		
2004	15	1	27.0	27.0	27.0	N/A		

Species: Walleye – male
Body-Scale Constant: NA
Total Sample Size: 8

Length at Capture in 2019 for Each Age Class

Year Class	Age	Sample Size	Length At Capture (inches) Average Length	Minimum Length	Maximum Length	Standard Error	Length Increments Increment	Standard Error
2018	1	1	9.4	9.4	9.4	N/A		
2017	2	2	11.7	11.2	12.1	0.47		
2016	3	1	15.6	15.6	15.6	N/A		
2013	6	1	21.9	21.9	21.9	N/A		
2010	9	2	20.3	20.2	20.5	0.16		
2006	13	1	22.4	22.4	22.4	N/A		

Approval Dates And Notices

Date Approved By Sauk Rapids Area Fisheries Supervisor: **03/20/2020**

Date Approved By Central Region Fisheries Manager: **03/23/2020**