



Minnesota Department of Natural Resources  
 Fisheries Management  
 STANDARD LAKE SURVEY REPORT



Lake Name: East Battle  
 DOW Number: 56-0138-00

Survey Type: Special Assessment  
 Survey ID Date: 07/29/2013

**SPECIAL ASSESSMENT**  
**Gill Netting**  
**Lake Access Observation**  
**Water Level Measurement**  
**Water Quality Measurement**

**Lake Identification**

Alternate Lake Name: N/A  
 Primary Lake Class ID: 22

DNR Sounding Map Number: B0217  
 Alternate Lake Class ID: N/A

**Lake Location**

Primary County: Otter Tail

Nearest Town: Henning

**Legal Descriptions**

Lake Center: Township - 133N Range - 39W Section - 35  
 PLS Section Lake Center: 13303935

**All Legal Descriptions:**

Otter Tail County: Township - 132N Range - 39W Sections - 1, 2, 3  
 Township - 133N Range - 38W Section - 30  
 Township - 133N Range - 39W Sections - 23, 24, 25, 26, 34, 35, 36

**Area Office**

Area Name: Fergus Falls  
 Region Name: Northwest

ORG Code: F115  
 Region Number: 1

**Lake Access**

Station ID	Ownership	Public Use	Type	Location / Comments
AC - 1	DNR	Open to Public use	Concrete	A state owned public access is located off of County Road 55 along the north shoreline of the lake.

**Lake Characteristics**

Lake Area (planimetered acres): 1949.00	GIS Shoreline Length (miles): 14.59
GIS Lake Area (acres): 1985.09	Maximum Fetch (miles): 3.20
DOW Lake Area (acres): 2360.00	Fetch Orientation (degrees): 67
Littoral Area (acres): 825.00	USGS Quad Map Number: M07d
Area in MN (acres): 1985.09	USGS Quad 24K GIS Index: 2514
Maximum Depth (feet): 87.0	
Mean Depth (feet): N/A	

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**Dissolved Oxygen And Temperature Profile Of Lake Water**

<u>Station ID</u>	<u>Sampling Date</u>	<u>Bottom Depth (Feet)</u>	<u>Sample Depth (Feet)</u>	<u>Water Temperature (°F)</u>	<u>Dissolved Oxygen (ppm)</u>
WQ - 1	07/29/2013	37.0	Surface	72.0	7.5
			3.0	72.0	7.6
			6.0	72.0	7.5
			9.0	71.8	7.5
			12.0	71.8	7.5
			15.0	71.4	7.0
			18.0	71.4	7.0
			21.0	71.2	7.1
			24.0	70.2	5.2
			25.0	67.8	2.3
			26.0	66.2	0.1
			27.0	61.2	0.1
			30.0	59.4	0.1
			33.0	58.1	0.1

**Field Measurements Of Water Quality**

<u>Station ID</u>	<u>Sampling Date</u>	<u>Sample Depth (Feet)</u>	<u>Secchi Depth (Feet)</u>	<u>Field pH</u>	<u>Alkalinity (ppm)</u>	<u>Water Color</u>	<u>Color Cause</u>
WQ - 1	07/29/2013	Surface	9.6	N/A	N/A	Green	Algae

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**Length Frequency Distribution For GN**

**Standard gill net sets**

(Field work conducted between 07/29/2013 and 08/02/2013)

	<u>BLB</u>	<u>BLC</u>	<u>BLG</u>	<u>BUB</u>	<u>HSF</u>	<u>LMB</u>	<u>NOP</u>	<u>PMK</u>	<u>RKB</u>	<u>TLC</u>	<u>WAE</u>	<u>WTS</u>	<u>YEB</u>
< 3.00	-	-	-	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	-	-	-	-	-	-	-	-	-	-	-	-
3.50 - 3.99	-	-	14	-	2	-	-	-	2	-	-	-	-
4.00 - 4.49	-	-	1	-	1	-	-	-	1	-	-	-	-
4.50 - 4.99	-	-	1	-	2	-	-	-	-	-	-	-	-
5.00 - 5.49	-	-	-	-	1	-	-	-	-	-	-	-	-
5.50 - 5.99	-	2	3	-	2	-	-	-	1	-	-	-	-
6.00 - 6.49	-	1	8	-	3	-	-	2	-	-	-	-	-
6.50 - 6.99	-	2	23	-	5	-	-	3	-	-	-	-	-
7.00 - 7.49	1	-	25	-	6	-	-	3	1	-	-	-	-
7.50 - 7.99	-	-	9	-	3	2	-	-	2	-	-	-	-
8.00 - 8.49	-	-	2	-	3	3	-	-	5	-	-	-	2
8.50 - 8.99	-	-	6	-	-	7	-	-	-	-	-	-	1
9.00 - 9.49	-	1	-	-	-	11	-	-	2	-	-	-	3
9.50 - 9.99	-	-	-	-	-	3	-	-	2	-	1	-	-
10.00 - 10.49	-	-	-	-	-	4	-	-	1	-	-	-	1
10.50 - 10.99	-	-	-	-	-	3	-	-	-	-	-	-	6
11.00 - 11.49	-	-	-	-	-	9	-	-	-	1	-	-	18
11.50 - 11.99	-	1	-	-	-	6	-	-	-	1	-	-	11
12.00 - 12.99	-	-	-	-	-	4	-	-	-	-	3	-	19
13.00 - 13.99	2	-	-	-	-	2	3	-	-	-	17	-	9
14.00 - 14.99	-	-	-	-	-	3	11	-	-	-	12	-	2
15.00 - 15.99	1	-	-	-	-	-	22	-	-	-	7	-	-
16.00 - 16.99	1	-	-	-	-	-	21	-	-	-	19	1	-
17.00 - 17.99	-	-	-	-	-	-	22	-	-	-	11	-	-
18.00 - 18.99	-	-	-	-	-	-	17	-	-	-	13	1	-
19.00 - 19.99	-	-	-	-	-	-	8	-	-	-	6	1	-
20.00 - 20.99	-	-	-	-	-	-	5	-	-	-	3	-	-
21.00 - 21.99	-	-	-	-	-	-	2	-	-	-	3	-	-
22.00 - 22.99	-	-	-	1	-	-	1	-	-	-	-	-	-
23.00 - 23.99	-	-	-	-	-	-	2	-	-	-	-	1	-
24.00 - 24.99	-	-	-	-	-	-	-	-	-	-	1	-	-
25.00 - 25.99	-	-	-	-	-	-	-	-	-	-	1	-	-
26.00 - 26.99	-	-	-	-	-	-	-	-	-	-	-	-	-
27.00 - 27.99	-	-	-	-	-	-	1	-	-	-	2	-	-
28.00 - 28.99	-	-	-	-	-	-	-	-	-	-	-	-	-
29.00 - 29.99	-	-	-	-	-	-	-	-	-	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	1	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>5</b>	<b>7</b>	<b>92</b>	<b>1</b>	<b>28</b>	<b>57</b>	<b>116</b>	<b>8</b>	<b>17</b>	<b>2</b>	<b>99</b>	<b>4</b>	<b>72</b>
Min. Length	7.40	5.87	3.54	22.05	3.74	7.56	13.46	6.14	3.82	11.34	9.84	16.65	8.03
Max. Length	16.10	11.50	8.86	22.05	8.43	14.53	31.30	7.48	10.28	11.93	27.95	23.43	14.41
Mean Length	13.19	7.43	6.53	22.05	6.50	10.47	17.41	6.79	7.62	11.63	16.75	19.37	11.74
# Measured	5	7	92	1	28	57	116	8	17	2	99	4	72
No Lengths for	0	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

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**Length At Capture With Last Incremental Length (Continued)**

Species: Walleye  
 Body-Scale Constant: 1.10  
 Total Sample Size: 59

**Length at Capture in 2013 for Each Age Class, with Incremental Lengths for 2013**

Year Class	Age	Sample Size	Length At Capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2012	1	1	9.84	9.84	9.84	N/A	2.18	N/A
2011	2	4	13.01	13.15	12.83	0.067	2.57	0.289
2010	3	23	14.45	16.97	12.83	0.238	1.67	0.122
2009	4	21	16.94	18.78	14.96	0.218	0.88	0.059
2008	5	9	18.45	19.57	16.77	0.283	0.69	0.040
2007	6	1	17.76	17.76	17.76	N/A	0.52	N/A

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**Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths (Continued)**

**Species:** Walleye

**Gear Type:** Combined Gear Types (GN)

Class	Age	N	1	2	3	4	5	6
2012	1	1	7.66	-	-	-	-	-
			7.66	-	-	-	-	-
2011	2	4	6.33	10.44	-	-	-	-
			6.33	4.11	-	-	-	-
2010	3	23	6.64	9.76	12.78	-	-	-
			6.64	3.12	3.02	-	-	-
2009	4	21	6.01	9.96	13.56	16.06	-	-
			6.01	3.95	3.61	2.49	-	-
2008	5	9	5.80	10.02	13.42	15.98	17.76	-
			5.80	4.22	3.40	2.56	1.77	-
2007	6	1	5.04	8.60	11.57	14.27	16.06	17.24
			5.04	3.56	2.97	2.70	1.79	1.18
Mean Length			6.25	9.90	13.17	15.98	17.59	17.24
Mean Increment			6.25	3.67	3.31	2.52	1.78	1.18
Total N			59	58	54	31	10	1

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## Discussion

A special gill net assessment was conducted to analyze the Walleye, Northern Pike, and Yellow Perch populations of East Battle Lake. Twelve gill nets were utilized to obtain a standardized fish sample. The initial survey of East Battle Lake was conducted in 1958. Twelve lake surveys have been conducted from 1958 to 2013. East Battle Lake is included in lake class 22 of the MN DNR lake classification system.

Northern Pike gill net CPUE was 9.7 per net, which exceeds the third quartile of the normal range for lake class 22 (interquartile range = 3.0 - 7.9). Northern Pike gill net CPUE has exceeded the third quartile in every survey except the 2002 survey. In previous surveys, Northern Pike gill net CPUE ranged from 7.2 to 13.9 per net. Northern Pike in the gill net sample ranged in length from 13.5 to 31.3 inches with a mean length and weight of 17.4 inches and 1.1 pounds. Northern Pike size structure continues to be poor. Two percent of the pike in the gill net sample were 24.0 inches or greater in length compared to 6%, 6%, 9%, 4%, and 4% in the five previous surveys. Pike attain a mean length of 18.8 inches at age-IV. Growth rate estimates are slower than mean Northern Pike growth rates for class 22 lakes in the Fergus Falls Management Area.

Common Carp are present in East Battle Lake; however, catch rates have consistently been low. Common Carp were initially sampled in the 1976 survey. Common Carp were not sampled in this survey.

Yellow Bullhead gill net CPUE was 6.0 per net and is considered within the normal range for lake class 22 (interquartile range = 0.7 - 6.4). Yellow Bullhead numbers had been on an increasing trend since 2002 (9.3 per net) and peaked at 17.1 per net in 2008. Yellow Bullheads in the gill net sample ranged in length from 8.0 to 14.4 inches with a mean length of 11.7 inches.

Largemouth Bass gill net CPUE was 4.8 per net, which exceeds the third quartile (interquartile range = 0.3 - 1.2). Largemouth Bass in the gill net sample ranged in length from 7.6 to 14.5 inches with a mean length and weight of 10.5 inches and 0.7 pounds. Largemouth Bass attain a mean length of 11.1 inches at age IV. Growth rate estimates are equivalent to mean Largemouth Bass growth rates for class 22 lakes in the Fergus Falls Management Area.

Yellow Perch were not sampled in this survey. Yellow Perch gill net CPUE was 2.1 per net in 2005 and 0.3 per net in 2008. This is first survey in which Yellow Perch were not sampled via gill nets. Yellow Perch gill net CPUE has been below the first quartile (interquartile range = 7.1 - 33.9) in every survey since 1986. Historically, Yellow Perch gill net CPUE has ranged from 0.5 to 39.5 per net. In an effort to increase the Yellow Perch population, the East Battle Lake Association purchased and stocked adult fish in 2004, 2005, and 2008.

Walleye gill net CPUE was 8.3 per net, which is within the normal range (interquartile range = 4.0 - 9.6). In previous surveys, Walleye gill net CPUE ranged from 6.1 to 15.0 per net. Walleye in the gill net sample ranged in length from 9.8 to 28.0 inches with a mean length and weight of 16.8 inches and 1.7 pounds. Age data from recent assessments indicate that natural reproduction and recruitment can be substantial in some years; however, it is inconsistent. The strongest year classes have consistently corresponded to years of fry stocking/natural reproduction which suggests that fry stocking is supplementing natural reproduction by increasing abundance or by offsetting weak natural year classes. Since 2003, the East Battle Lake Association has stocked Walleye fingerlings and yearlings in skip years of the fry stocking sequence. This stocking approach doesn't appear to be negatively impacting the lakes other fish species; however, it does make evaluating natural year class strength difficult. Walleyes attain a mean length of 16.0 inches at age-IV. Growth rate estimates are faster than the mean Walleye growth rates for class 22 lakes in the Fergus Falls Management Area.

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**Approval Dates And Notices**

Date Approved By Fergus Falls Area Fisheries Supervisor: 03/12/2014

Date Approved By Northwest Region Fisheries Manager: \_\_\_\_\_



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Standard Lake Survey Report revision: 03/10/2014-RJE. Data Date: 03/12/2014 at 1:55 pm .





# HISTORICAL NETTING SUMMARY

Trap Nets

Lake Name: Battle, East DOW No. 56-138 Otter Tail County



Species	1958 30		1976 12		1983 12		1986 5		1989 11		1992 10		1996 14		1999 15	
	Number Per Set	Pounds Per Set	Number Per Set	Pounds Per Set	Number Per Set	Pounds Per Set	Number Per Set	Pounds Per Set	Number Per Set	Pounds Per Set	Number Per Set	Pounds Per Set	Number Per Set	Pounds Per Set	Number Per Set	Pounds Per Set
Black Bullhead	0.10	0.06	0.60	0.52	0.70	0.48	0.40	0.24	0.10	0.05	0.10	0.20	0.50	0.30	0.07	0.02
Black Crappie	0.60	0.40	0.30	0.15	1.30	0.79	0.40	0.22	1.70	0.64	0.20	0.07	0.50	0.30	0.47	0.29
Bluegill	24.20	3.23	37.20	6.42	35.60	4.34	30.80	6.56	50.40	7.35	30.20	4.29	17.80	3.20	17.40	2.12
Bowfin	0.10	0.68	0.30	1.79	0.70	3.24	0.20	0.64	1.30	6.75	0.20	1.05	0.30	1.60	0.27	ND
Brown Bullhead	0.40	0.52	0.60	0.54			1.00	0.58	0.10	0.05	0.20	0.16	0.10	0.20	0.13	0.20
Brown Trout	0.03	0.16														
Carp			0.20	0.75	0.30	2.12	0.60	2.36	0.30	1.11					0.07	0.25
Green Sunfish	0.10	0.01	2.90	0.63												
Hybrid Sunfish	0.30	0.14			1.10	0.15	3.20	0.66	3.70	0.55	2.90	0.58	1.90	0.40	0.60	0.17
Largemouth Bass	1.20	0.64	0.80	0.25	1.20	0.17			1.40	0.43	1.00	6.90	0.50	0.20	0.13	0.06
Northern Pike	0.40	0.86	0.60	0.29	1.40	0.68	1.40	0.76	0.60	0.33	0.70	0.37	1.00	0.80	1.27	1.92
Painted Turtle													3.50	0.00	1.13	ND
Pumpkinseed	4.40	1.31	5.20	0.92	4.50	0.75	4.40	0.86	5.40	0.75	3.40	0.74	1.00	0.20	3.53	0.55
Rock Bass	2.30	0.76	1.90	0.48	1.00	0.29	0.60	0.14	1.00	0.19	1.50	0.18	1.80	0.30	0.80	0.23
Snapping Turtle																
Wall-eye	0.60	0.97	1.50	2.79	0.70	1.02	0.20	0.14	0.50	0.74	0.30	0.56	0.10	0.00	0.13	ND
White Sucker	0.70	2.49	0.20	0.63	0.30	0.83					0.10	0.27				
Yellow Bullhead	1.00	1.15	0.30	0.27	4.50	4.98	5.60	6.30	4.50	4.16	2.40	2.56	1.80	2.00	5.80	5.57
Yellow Perch	0.70	0.10	0.90	0.25	0.10	0.02	0.60	0.04			0.20	0.02	0.20	0.00	1.27	0.17