



Minnesota Department of Natural Resources

Fisheries Management

LAKE SURVEY REPORT



DRAFT VERSION - PRELIMINARY DATA (AS OF 07/31/2015)

Lake Name: Benton

Survey Type: Standard Survey

DOW Number: 41-0043-00

Survey ID Date: 07/27/2015

Lake Identification

Alternate Lake Name: N/A
Primary Lake Class ID: 41

DNR Sounding Map Number: C0436
Alternate Lake Class ID: N/A

Lake Location

Primary County: Lincoln

Nearest Town: Lake Benton

Legal Descriptions

Lake Center: Township - 110N Range - 45W Section - 34
PLS Section Lake Center: 11004534

All Legal Descriptions:

Lincoln County: Township - 109N Range - 45W Sections - 3, 4, 5, 8, 9, 10
Township - 110N Range - 44W Sections - 30, 31
Township - 110N Range - 45W Sections - 25, 26, 27, 28, 33, 34, 35, 36

Area Office

Area Name: Windom
Region Name: Southern

ORG Code: F418
Region Number: 4

Lake Access

(Information based on Special Assessment dated 10/26/1995)

Station ID	Ownership	Public Use	Type	Location / Comments
AC - 3	DNR	Open to Public use	Concrete	DNR OWNED ACCESS ON SOUTHWEST SHORE. LAKE BENTON CITY LIMITS.

(Data excludes records where public use is not designated or is designated "No Public Use")

Lake Characteristics

Lake Area (planimetered acres):	2,857.00	GIS Shoreline Length (miles):	18.01
GIS Lake Area (acres):	2,699.48	Maximum Fetch (miles):	5.60
DOW Lake Area (acres):	2,875.00	Fetch Orientation (degrees):	45
Littoral Area (acres):	2,699.47	USGS Quad Map Number:	U04d
Area in MN (acres):	2,699.47	USGS Quad 24K GIS Index:	4108
Maximum Depth (feet):	9.0		
Mean Depth (feet):	N/A		

Watershed Characteristics**Major Watershed**

Name: Redwood River
 Watershed Number: 27
 Watershed size (acres): 447,531

Minor Watershed

Name: L Benton
 Watershed Number: 6
 Watershed size (acres): 13,209

Surveys and Investigations

Re-Survey: 07/25/2000, 08/03/1992, 07/06/1983.

Population Assessment: 07/29/2013, 08/01/2011, 08/02/2010, 07/30/2009, 07/30/2007, 07/17/2006, 07/18/2005, 07/21/2003, 07/29/1996, 08/01/1988.

Special Assessment: 08/13/2012, 06/12/2012, 09/23/1999, 10/26/1995, 07/02/1956.

Creel Survey: 04/25/1996.

Dissolved Oxygen Check: 02/19/2015, 01/02/2014, 02/06/2013, 01/03/2013, 01/10/2012, 12/29/2010, 01/05/2010.

Standard Survey: 07/27/2015.

Current Water Level

Station ID	Date	Level	Reading (feet)	Reading Type
BM - 1	07/30/2015	Normal	-3.50	Above or below Benchmark

Benchmark and Gauge Descriptions / Locations

Station ID	Location Description
BM - 1	X on west wing of dam.

Water Level History - Readings

Station ID	Date	Level	Reading (feet)	Reading Type
BM - 1	07/30/2015	Normal	-3.50	Above or below Benchmark
	07/31/2013	Normal	-3.60	Above or below Benchmark
	08/04/2010	High	-2.80	Above or below Benchmark
	08/01/2009	Low	N/A	Above or below Benchmark
	08/01/2007	Low	-3.90	Above or below Benchmark
GA - 1	08/04/2010	High	4.86	Direct Gauge Reading
	07/29/2009	N/A	4.20	Direct Gauge Reading

Water Level History - Station Summary

Station ID	Minimum Level		Maximum Level		Range (feet)	Average Level (feet)	Reading Type (and number of readings)
	Feet	Date	Feet	Date			
BM - 1	-3.90	08/01/2007	-2.80	08/04/2010	1.10	-3.45	Above or below Benchmark (4)
GA - 1	4.20	07/29/2009	4.86	08/04/2010	0.66	4.53	Direct Gauge Reading (2)

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	07/27/2015	9.0	Surface	74.8	8.9
			1.0	74.8	8.9
			2.0	74.8	8.9
			3.0	74.8	8.9
			4.0	74.8	8.9
			5.0	74.8	8.9
			6.0	74.8	8.9
			7.0	74.8	8.8
			8.0	74.8	8.8
			9.0	74.8	6.9

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	07/27/2015	Surface	2.5	9.08	187	Green	Algae

Laboratory Analysis of Water Chemistry

Station ID	Sampling Date	Analysis Date	Sample Depth (ft)	Chemical Parameter	Chemical Value
WQ - 1	07/27/2015	06/12/2015	Surface	Sulphate ion	117.0 ppm
				Total phosphorus	0.148 ppm
				Total alkalinity	225 ppm
				Total dissolved solids	484 ppm
				Chlorophyll-a trichromatic method calculation	8.8 ppb
				Conductivity	694 :S/cm
				pH	8.31 pH
				Chlorophyll-a corrected for pheophytin	6.63 ppb

Net Catch Summary by Numbers for GN

Standard gill net sets

Number of Sets: 4
First Set Date: 07/27/2015
Last Lift Date: 07/29/2015
Target Species: N/A

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 41*		
				25%	50%	75%
BLB	Black Bullhead	99	24.75	4.56	23.42	83.00
BLC	Black Crappie	3	0.75	0.83	2.63	11.10
BLG	Bluegill	1	0.25	N/A	N/A	N/A
CAP	Common Carp	3	0.75	0.52	1.80	9.13
NOP	Northern Pike	4	1.00	1.20	3.50	7.79
WAE	Walleye	92	23.00	3.22	7.67	15.33
WTS	White Sucker	200	50.00	0.75	2.00	5.88
YEP	Yellow Perch	100	25.00	3.00	8.94	22.50
Total Fish/Set:			125.50	* 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 41*		
					25%	50%	75%
BLB	Black Bullhead	48.45	12.11	0.49	0.21	0.38	0.60
BLC	Black Crappie	0.31	0.08	0.10	0.17	0.25	0.37
BLG	Bluegill	0.93	0.23	0.93	N/A	N/A	N/A
CAP	Common Carp	17.94	4.48	5.98	1.00	2.39	4.88
NOP	Northern Pike	17.02	4.25	4.25	1.53	2.12	2.95
WAE	Walleye	93.79	23.45	1.02	0.88	1.37	1.90
WTS	White Sucker	257.62	64.40	1.29	1.44	1.87	2.20
YEP	Yellow Perch	50.23	12.56	0.50	0.14	0.24	0.36
Total Pounds Fish/Set:			121.57	* Quartiles for Mean Weight			

Net Catch Summary by Numbers for TN

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

Number of Sets: 15
First Set Date: 07/27/2015
Last Lift Date: 07/30/2015
Target Species: N/A

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 41*		
				25%	50%	75%
BLB	Black Bullhead	131	8.73	1.33	14.73	78.13
BLC	Black Crappie	9	0.60	0.98	2.96	12.33
BLG	Bluegill	7	0.47	1.05	3.00	14.93
CAP	Common Carp	21	1.40	0.70	1.80	5.11
NOP	Northern Pike	2	0.13	N/A	N/A	N/A
WAE	Walleye	15	1.00	0.31	0.73	1.69
WTS	White Sucker	99	6.60	0.25	0.50	1.29
YEP	Yellow Perch	4	0.27	0.25	0.81	2.62
Total Fish/Set:			19.20	* 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 41*		
					25%	50%	75%
BLB	Black Bullhead	71.56	4.77	0.55	0.21	0.36	0.59
BLC	Black Crappie	1.22	0.08	0.14	0.23	0.34	0.49
BLG	Bluegill	4.88	0.33	0.70	0.16	0.25	0.38
CAP	Common Carp	127.59	8.51	6.08	2.33	4.10	5.64
NOP	Northern Pike	11.36	0.76	5.68	N/A	N/A	N/A
WAE	Walleye	12.00	0.80	0.80	0.85	1.63	2.41
WTS	White Sucker	137.67	9.18	1.39	1.35	1.97	2.62
YEP	Yellow Perch	1.94	0.13	0.48	0.13	0.20	0.31
Total Pounds Fish/Set:			24.55	* Quartiles for Mean Weight			

Length Frequency Distribution for GN

Standard gill net sets

(Field work conducted between 07/27/2015 and 07/29/2015)

	<u>BLB</u>	<u>BLC</u>	<u>BLG</u>	<u>CAP</u>	<u>NOP</u>	<u>WAE</u>	<u>YWAE</u>	<u>WTS</u>	<u>YEP</u>
< 3.00	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	-	-	-	-	-	-	-	-
3.50 - 3.99	-	-	-	-	-	-	1	-	-
4.00 - 4.49	-	-	-	-	-	-	-	-	-
4.50 - 4.99	-	-	-	-	-	-	-	-	-
5.00 - 5.49	-	2	-	-	-	-	-	-	-
5.50 - 5.99	-	1	-	-	-	-	-	-	-
6.00 - 6.49	-	-	-	-	-	-	-	-	1
6.50 - 6.99	1	-	-	-	-	-	-	-	-
7.00 - 7.49	2	-	-	-	-	-	-	-	-
7.50 - 7.99	7	-	-	-	-	-	-	-	1
8.00 - 8.49	10	-	-	-	-	-	-	2	-
8.50 - 8.99	22	-	-	-	-	-	-	-	5
9.00 - 9.49	30	-	1	-	-	1	-	-	34
9.50 - 9.99	14	-	-	-	-	-	-	-	38
10.00 - 10.49	6	-	-	-	-	3	-	-	13
10.50 - 10.99	3	-	-	-	-	8	-	1	6
11.00 - 11.49	1	-	-	1	-	4	-	-	-
11.50 - 11.99	-	-	-	-	-	-	-	3	-
12.00 - 12.99	1	-	-	-	-	20	-	26	1
13.00 - 13.99	1	-	-	-	-	34	-	81	-
14.00 - 14.99	-	-	-	-	-	7	-	75	-
15.00 - 15.99	-	-	-	-	-	-	-	6	-
16.00 - 16.99	-	-	-	-	1	2	-	1	-
17.00 - 17.99	-	-	-	-	-	2	-	-	-
18.00 - 18.99	-	-	-	-	-	-	-	3	-
19.00 - 19.99	-	-	-	-	-	5	-	2	-
20.00 - 20.99	-	-	-	-	-	-	-	-	-
21.00 - 21.99	-	-	-	-	-	1	-	-	-
22.00 - 22.99	-	-	-	-	1	-	-	-	-
23.00 - 23.99	-	-	-	1	-	2	-	-	-
24.00 - 24.99	-	-	-	-	1	1	-	-	-
25.00 - 25.99	-	-	-	-	-	-	-	-	-
26.00 - 26.99	-	-	-	-	-	-	-	-	-
27.00 - 27.99	-	-	-	-	-	-	-	-	-
28.00 - 28.99	-	-	-	-	-	-	-	-	-
29.00 - 29.99	-	-	-	1	-	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	1	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-

	<u>BLB</u>	<u>BLC</u>	<u>BLG</u>	<u>CAP</u>	<u>NOP</u>	<u>WAE</u>	<u>YWAE</u>	<u>WTS</u>	<u>YEP</u>
Total	98	3	1	3	4	90	1	200	99
Min. Length	6.85	5.12	9.41	11.42	16.18	9.37	3.94	8.03	6.34
Max. Length	13.15	5.75	9.41	29.84	33.78	24.21	3.94	19.57	12.36
Mean Length	9.15	5.35	9.41	21.69	24.13	13.80	3.94	13.82	9.62
# Measured	96	3	1	3	4	88	1	111	97
No Lengths for	3	0	0	0	0	3	0	89	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 07/27/2015 and 07/30/2015)

	<u>BLB</u>	<u>BLC</u>	<u>BLG</u>	<u>CAP</u>	<u>NOP</u>	<u>WAE</u>	<u>WTS</u>	<u>YEP</u>
< 3.00	-	-	-	-	-	-	-	-
3.00 - 3.49	-	-	-	-	-	-	-	-
3.50 - 3.99	-	-	-	1	-	-	-	-
4.00 - 4.49	-	-	-	-	-	-	-	-
4.50 - 4.99	-	1	-	-	-	-	-	-
5.00 - 5.49	-	-	-	-	-	-	-	-
5.50 - 5.99	-	3	-	-	-	-	1	-
6.00 - 6.49	-	2	-	-	-	-	-	-
6.50 - 6.99	-	1	-	-	-	-	-	-
7.00 - 7.49	-	1	1	-	-	-	-	-
7.50 - 7.99	9	-	-	-	-	-	-	-
8.00 - 8.49	15	-	-	-	-	-	-	-
8.50 - 8.99	29	-	2	-	-	-	-	-
9.00 - 9.49	35	-	4	-	-	-	-	1
9.50 - 9.99	22	-	-	-	-	-	-	3
10.00 - 10.49	4	-	-	-	-	3	-	-
10.50 - 10.99	-	-	-	-	-	3	-	-
11.00 - 11.49	4	-	-	-	-	-	-	-
11.50 - 11.99	4	-	-	-	-	1	-	-
12.00 - 12.99	2	-	-	-	-	1	5	-
13.00 - 13.99	5	-	-	-	-	4	24	-
14.00 - 14.99	1	-	-	-	-	-	49	-
15.00 - 15.99	-	-	-	-	-	-	14	-
16.00 - 16.99	-	-	-	-	-	1	-	-
17.00 - 17.99	-	-	-	-	-	-	1	-
18.00 - 18.99	-	-	-	-	-	1	-	-
19.00 - 19.99	-	-	-	4	-	1	1	-
20.00 - 20.99	-	-	-	5	-	-	4	-
21.00 - 21.99	-	-	-	-	-	-	-	-
22.00 - 22.99	-	-	-	1	-	-	-	-
23.00 - 23.99	-	-	-	2	-	-	-	-
24.00 - 24.99	-	-	-	-	1	-	-	-
25.00 - 25.99	-	-	-	3	-	-	-	-
26.00 - 26.99	-	-	-	2	-	-	-	-
27.00 - 27.99	-	-	-	1	-	-	-	-
28.00 - 28.99	-	-	-	-	-	-	-	-
29.00 - 29.99	-	-	-	2	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	1	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-

	<u>BLB</u>	<u>BLC</u>	<u>BLG</u>	<u>CAP</u>	<u>NOP</u>	<u>WAE</u>	<u>WTS</u>	<u>YEP</u>
Total	130	8	7	21	2	15	99	4
Min. Length	7.95	4.84	7.13	3.54	24.57	10.20	5.55	9.45
Max. Length	14.33	7.44	9.49	29.13	32.72	19.88	20.91	9.88
Mean Length	9.66	6.05	8.79	22.46	28.64	12.97	14.46	9.69
# Measured	77	8	7	20	2	15	84	4
No Lengths for	54	1	0	1	0	0	15	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

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	11	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.

Approval Dates And Notices

Date Approved By Windom Area Fisheries Supervisor: _____

Date Approved By Southern Region Fisheries Manager: _____

**This DRAFT VERSION of the Lake Survey Report contains preliminary data
(as of 07/31/2015), and is therefore subject to change at any time.**



Minnesota Department of Natural Resources

By accepting the data in this report, the user agrees the data will be used for personal benefit and not for profit. Any other uses or publication of the data needs the consent of the Department. The Minnesota Department of Natural Resources assumes no responsibility for actual or consequential damage incurred as a result of any user's reliance on the data.

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REPORT OVERVIEW - FOR OFFICE USE ONLY

(This page is not part of the Lake Survey Report and should be discarded)

Lake Name: Benton

Survey Type: Standard Survey

DOW Number: 41-0043-00

Survey ID Date: 07/27/2015

Survey Status: Field Work Complete

The following 18 (of 32) report components are not included in this Lake Survey Report:

1. Water Level History¹
2. Lake Inlets
3. Additional Inlet Information
4. Lake Outlets
5. Additional Outlet Information
6. Water Control Structure (Dam)
7. Surrounding Watershed Characteristics, Shoreline Characteristics, and Riparian Landscape Observations²
8. Resorts And Campgrounds
9. Fish Spawning Conditions
10. Erosion And Pollution
11. Fish Diseases And Parasites
12. Aquatic Vegetation And Shoalwater Substrates
13. Length At Capture With Last Incremental Length*
14. Back-Calculated Lengths
15. Age Class Frequency Distributions
16. Status Of Fishery And Field Notes
17. Water Quality (Winter Observations) (added to revision 01/21/2010)
18. Survey Attachments (added to revision 20150622)

¹ Water Level History report: This data has not yet been migrated into the Fisheries LSM database. On 01/08/2009, two additional Water Level History report components (Readings and Station Summary) were added.

² Effective 03/25/2014, the Surrounding Watershed Characteristics, Shoreline Characteristics, and Riparian Landscape Observations report component was modified to be included in the Lake Survey report if it did not include any Watershed and Shoreline characteristics and only consisted of Riparian Landscape Observations.

* Length At Capture With Last Incremental Length report: The following criteria must be met for a report to be generated:

1. The fish species must have an assigned body scale constant.
2. Fish must have an "official" age assigned.
3. Fish must have a digitized measurement marked for back calculation use.

Note: The data source for Length and Age Class Frequency Distribution tables is updated twice daily - once at noon and once overnight. Any changes to the data made after noon on 07/31/2015 may not be reflected in the Distribution tables until 08/01/2015.

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