

Fishing access:

A new boat ramp was constructed on the west side of the lake for access. There is also shore fishing opportunities all around the lake due to the lake being entirely on public land. Shore fishing may be limited during the summer months due to the emergent and submergent vegetation.

Condition of all structures (i.e. spillway, boat ramps, level regulators, etc.):

The dam grade and concrete water regulation structure are all in good condition. The boat ramp is new.

Field observations of aquatic vegetation condition:

Emergent vegetation covers most of the shoreline and consists of mainly cattails. There is also heavy submergent vegetation in the shallow bay areas out to a depth of around 4.5 feet. Submergents are a mixture of pondweed species.

CHEMICAL DATA

Field observations of water quality and pollution problems:

The main degrading factor is siltation and nutrients from a nearby farm yard flowing into the watershed of the lake. This provides excess nutrients, which results in heavy vegetation growth. Water clarity is poor with a secchi disc reading of 1.8 inches. Other water quality characteristics were measured in the field on June 8, 2013, using a HACH water quality kit and a Hanna multiparameter meter. Results are found in Table 1.

Presence of a thermocline and depth from surface: No

Station for water chemistry located on attached map: Yes

Table 1. Water chemistry results from Beaulieu Lake, Tripp County, June 8, 2013.

Station	Depth (ft)	Temp (F)	DO (ppm)	CO2 (ppm)	ALK (mg/L)	HRD (mg/L)	pH	Cond. (µS/cm)	TDS (ppm)	Sal.	ORP	Secchi (in)
A	Surface	80.0	0.32	74.2	359	413	8.41	981	489	0.49	123.5	1.8
A	13.5	64.0	0.00	146.2	479	478	7.62	1093	546	0.54	-310.7	

BIOLOGICAL DATA

Methods:

Beaulieu Lake was sampled on June 8-10, 2013, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ inch knotted mesh. No experimental gill nets were set during this sampling period. On the evening of October 8, 2013, Beaulieu Lake was electrofished for 30 minutes (3-ten minute transects) to sample the largemouth bass population. The boat was set up with 120 pulses per second of DC current at 340 volts with around 10 amps to electrofish the lake that had a conductivity of 1122 µS/cm with a water temperature of 53.5°F. Fish indices and statistics were completed using Winfin.

Results and Discussion:

Trap Net Catch

Table 2. Total catch of ten overnight ¾ inch mesh frame nets at Beaulieu Lake, Tripp County, June 8-10, 2013.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Bluegill	1040	67.4	104.0	± 23.8	50.0	6	2	109
Black Bullhead	439	28.4	43.9	± 21.1	2.6	6	3	87
Black Crappie	55	3.5	5.5	± 2.4	59.9	7	7	107
Yellow Perch	9	0.6	0.9	± 0.8	0.4	--	--	92
Largemouth Bass	1	0.1	0.1	± 0.1	0.5	--	--	112

* Seventeen year mean (1959, 1961, 1964, 1966, 1972, 1975, 1978, 1983, 1988, 1991, 1993, 1996, 1999, 2002, 2004, 2009, 2011)

Electrofishing Catch

Table 3. Total catch from three, ten-minute runs of fall nighttime electrofishing on Beaulieu Lake, Tripp County, October 8, 2013.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	27	100	54.0	± 17.3	225.6	77	73	113

* Five year mean (1988, 1991, 2002, 2004, 2011)

Bluegill

Beaulieu continues to contain a good but changing bluegill population. The CPUE of 104.0 is well above the 8.0 from the 2011 survey (Table 8) as well as the 50.0 seventeen year mean (Table 2). Size structure has declined this survey as can be seen in Figures 1 through 3, which illustrate the length frequency histograms for the last three surveys. The current PSD of 6 with an RSD-P of 2 is significantly lower than the 94 and 43, respectively, from the 2011 survey. Growth is good with means right around statewide, regional and SLI means (Table 4). Condition is also good with a mean Wr of 109. Looking at past surveys, the population is in a rebuilding phase and size should rebound in a couple years.

Table 4. Average back-calculated lengths (mm) for each age class of bluegill sampled in Beaulieu Lake, Tripp County, 2013.

Year Class	Age	N	Back-calculated Age				
			1	2	3	4	5
2011	2	74	46	83			
2010	3	23	37	73	116		
2009	4	3	43	97	155	175	
2008	5	1	54	110	181	189	203
All Classes		101	45	91	151	182	203
Statewide Mean			55	103	141	166	180
Region II Mean			52	97	134	164	180
SLI* Mean			53	101	138	163	180

* Small Lakes and Impoundments

Figure 1. Length frequency histogram for bluegill sampled from Beaulieu Lake, Tripp County, 2013.

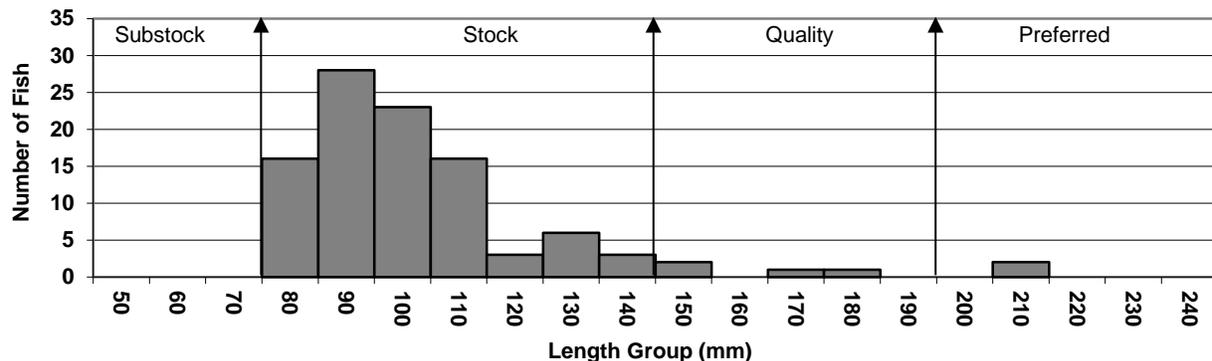


Figure 2. Length frequency histogram for bluegill sampled from Beaulieu Lake, Tripp County, 2011.

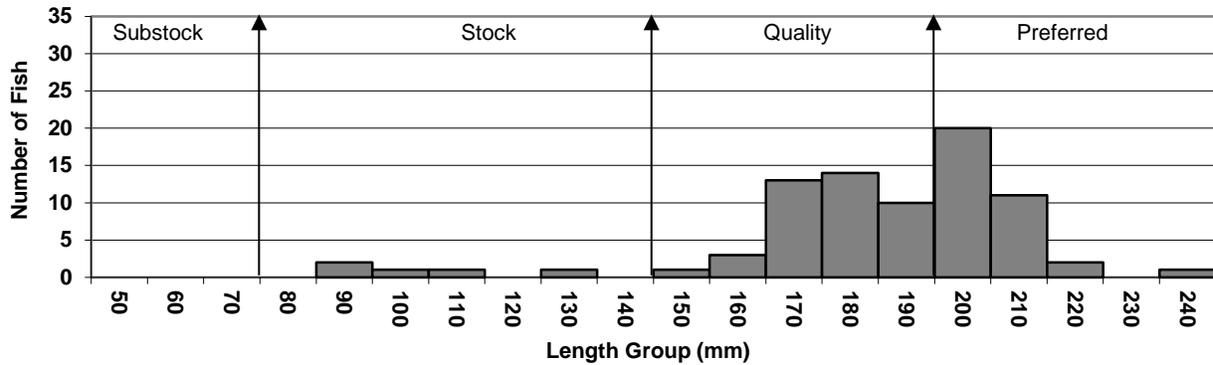
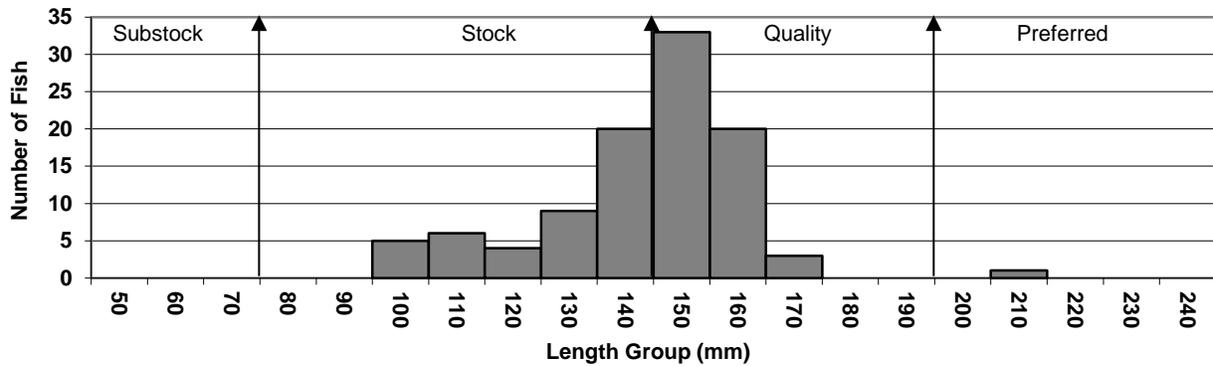


Figure 3. Length frequency histogram for bluegill sampled from Beaulieu Lake, Tripp County, 2009.



Largemouth Bass

Largemouth bass numbers have taken a significant drop since the last survey. The CPUE of 54.0 fish per hour is well below the 214.0 from the 2011 survey (Table 8) as well as the 225.6 five year mean (Table 3). In 2011, the population was made up of pretty much two year classes (Figure 5); now the population is represented by several year classes (Figure 4). Figures 4 and 5 illustrate the length frequency histograms for the fish sampled from the last two surveys. Size structure is good with a PSD of 77 and an RSD-P of 73 compared to the 12 and 1, respectively, from the 2011 survey. Growth is good with means right on with statewide, regional and SLI means (Table 5). Condition is also good with a mean Wr of 113.

Table 5. Average back-calculated lengths (mm) for each age class of largemouth bass sampled from Beaulieu Lake, Tripp County, 2013.

Year Class	Age	N	Back-calculated Age									
			1	2	3	4	5	6	7	8	9	
2012	1	7	107									
2011	2	1	105	221								
2008	5	17	78	171	211	255	362					
2006	7	1	75	142	224	309	373	399	446			
2004	9	1	124	228	321	349	366	392	419	440	472	
All Classes		27	98	191	252	304	367	395	433	440	472	
Statewide Mean			96	182	250	305	342					
Region II Mean			105	183	246	296	328					
SLI* Mean			99	183	246	299	332					

* Small Lakes and Impoundments

Figure 4. Length frequency histogram for largemouth bass sampled from Beaulieu Lake, Tripp County, 2013.

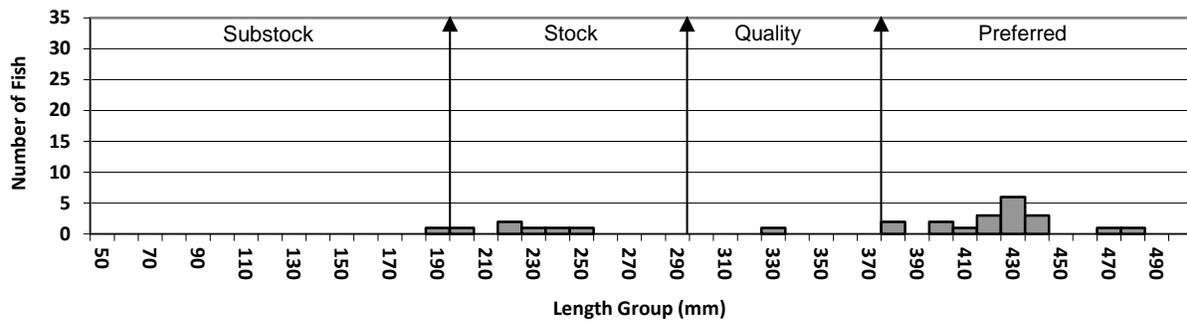
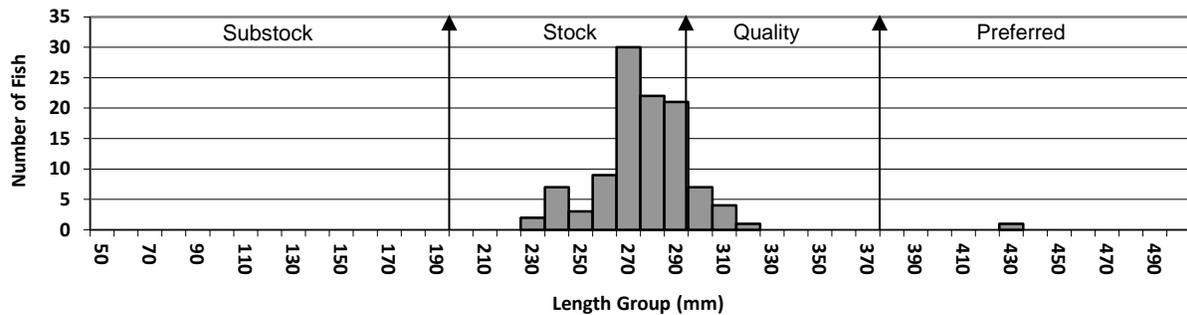


Figure 5. Length frequency histogram for largemouth bass sampled from Beaulieu Lake, Tripp County, 2011.



Black Crappie

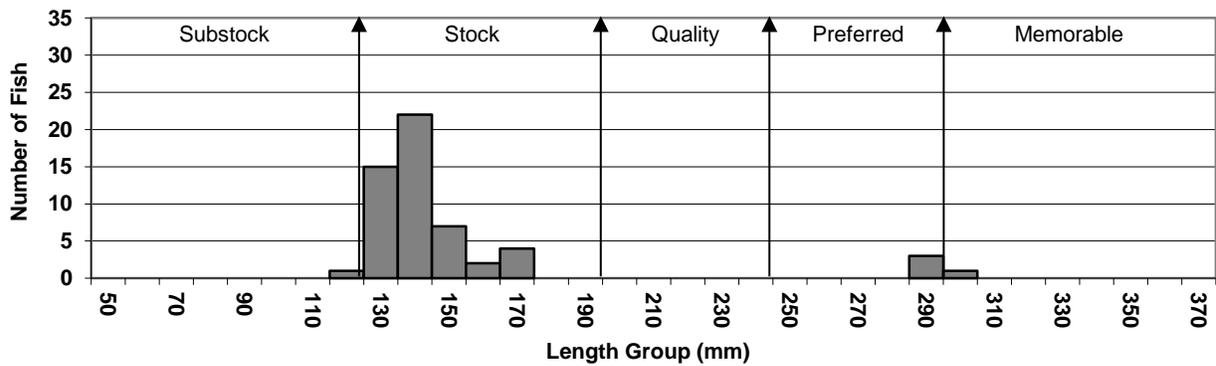
Black crappies appear to be on the rebound in Beaulieu Lake. The CPUE of 5.5 is up from the 0.4 from the 2011 survey (Table 8) but still well below the 59.9 seventeen year mean (Table 2). Figure 6 illustrates the length frequency histogram for the fish sampled from this survey. The PSD of 7 with an RSD-P of 7 is reflective of the rebuilding population. Growth is fine with means right around statewide, regional and SLI means (Table 6). Condition is also good with a mean Wr of 107. Hopefully this population will continue to grow and develop into the population that has been found in the lake in the past.

Table 6. Average back-calculated lengths (mm) for each age class of black crappie sampled from Beaulieu Lake, Tripp County, 2013.

Year Class	Age	N	Back-calculated Age								
			1	2	3	4	5	6	7	8	
2011	2	51	78	129							
2008	5	2	89	125	164	180	261				
2005	8	2	92	131	160	174	188	206	269	297	
All Classes		55	86	128	162	177	224	206	269	297	
Statewide Mean			83	147	195	229	249				
Region II Mean			75	132	177	209	235				
SLI* Mean			78	134	180	209	226				

*Small Lakes and Impoundments

Figure 6. Length frequency histogram for black crappie sampled from Beaulieu Lake, Tripp County, 2013.



Other Species

Black bullhead and yellow perch were the only other species sampled this survey (Table 2). White crappie, northern pike, channel catfish, walleye, green sunfish and golden shiner were the species not sampled this survey that had been in past surveys (table 8). Only 9 yellow perch were sampled, which is not enough to make any inferences about the population, although there never has been a huge number sampled.

Black bullheads have appeared in the survey for the first time in five surveys (Table 8). This was the biggest surprise as having none for several years to a CPUE of 43.9 fish per net. Figure 7 illustrates the length frequency histogram for the fish sampled this survey, which reveals that population is dominated by small, young fish. The small size structure is also seen in the PSD of 6 with an RSD-P of 3. Hopefully the bass numbers rebuild quickly and work on suppressing this black bullhead population before it gets out of control.

Figure 7. Length frequency histogram for black bullhead sampled from Beaulieu Lake, Tripp County, 2013.

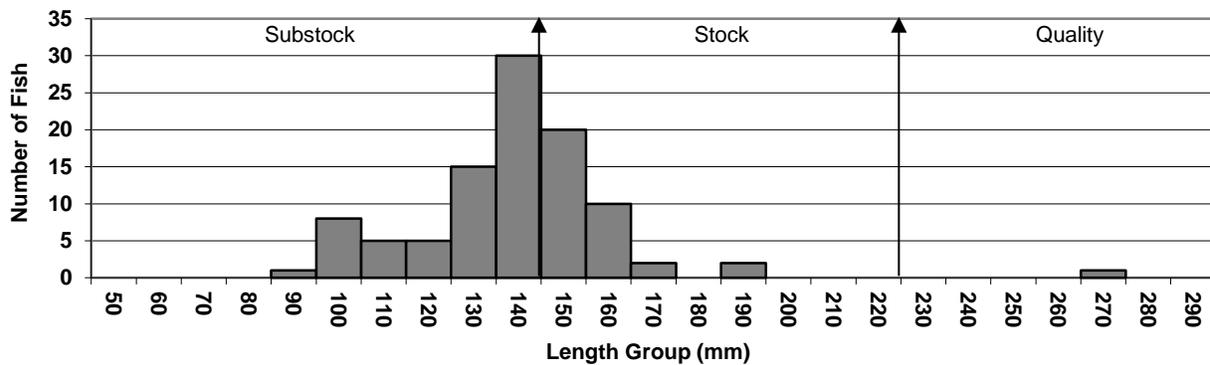


Table 7. Stocking records for Beaulieu Lake since the winterkill during the winter of 2000-01.

Year	Number	Species	Size
2001	2,600	Largemouth Bass	Fingerling
2008	100	Largemouth Bass	Juvenile
2008	3,680	Largemouth Bass	Fingerling

RECOMMENDATIONS

1. Resurvey in 2016 to monitor the status of the largemouth bass and panfish populations to see if any species would need supplemental stocking as well as to make sure the bullheads are not getting out of control.

Table 8. Gill net (GN), trap net (TN), and electrofishing (EF) CPUE for all fish species sampled in Beaulieu Lake since surveys started.

Species	1959	1961	1964	1966	1972	1975	1978	1983	1988	1991	1993	1996	1999	2002	2004	2009	2011	2013
BLB (GN)	--	--	--	--	--	--	--	1.0	--	--	--	--	--	--	--	--	--	--
BLB (TN)	21.8	1.0	--	--	0.5	0.3	--	6.0	3.4	1.6	--	4.8	5.6	--	--	--	--	43.9
BLC (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLC (TN)	232.2	168.9	--	0.7	33.3	85.3	79.1	--	160.6	11.8	1.8	8.9	235.5	--	--	--	0.4	5.5
WHC (GN)	--	--	--	--	--	--	--	1.0	--	--	--	--	--	--	--	--	--	--
WHC (TN)	--	--	--	--	--	--	--	193.0	--	--	--	--	--	--	--	--	--	--
YEP (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YEP (TN)	1.0	0.5	--	--	--	--	0.1	--	0.6	0.6	--	1.8	0.8	--	2.0	--	0.1	0.9
LMB (EF)	--	--	--	--	--	--	--	--	7.0	7.0	--	--	--	282.0	618.0	--	214.0	54.0
LMB (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LMB (TN)	1.2	--	1.3	0.3	0.1	0.2	0.3	0.1	0.3	0.4	--	1.8	0.8	0.1	2.0	0.4	--	0.1
NOP (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NOP (TN)	--	0.1	0.3	0.3	--	--	--	--	--	--	--	--	0.8	--	--	--	--	--
CCF (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CCF (TN)	1.2	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--
WAE (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WAE (TN)	0.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLG (GN)	--	--	--	--	8.0	--	--	--	--	--	--	--	--	--	--	--	--	--
BLG (TN)	277.0	38.2	72.0	88.3	55.3	32.8	5.5	5.5	66.6	47.0	34.1	14.6	64.3	--	1.5	38.9	8.0	104.0
GSF (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GSF (TN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.1	--	0.1	--
GOS (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GOS (TN)	--	--	--	--	--	--	--	--	--	0.3	--	--	4.9	--	--	--	--	--

BLB – Black bullhead, BLC – Black crappie, WHC – White crappie, YEP – Yellow perch, LMB – Largemouth bass, NOP – Northern pike, CCF – Channel catfish, WAE – Walleye, BLG – Bluegill, GSF – Green sunfish, GOS – Golden shiner