

## SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-47

**Name:** Wanalain Lake

**County(ies):** Brule

**Legal Description:** T104N-R70W-Sec.17, 20, & 21**GPS:** 43°48'37.95"N 99°15'08.01"W

**Location from nearest town:** 3 miles west and 2 miles north of Pukwana

**Date of present survey:** July 14-16, 2014 (netting)

**Date of last survey:** October 16-18, 2011 (netting)

**Most recent lake management plan:** F-21-R-41 (January 1, 2009 to December 31, 2013)

**Management classification:** Warmwater Permanent

Primary Game Species	Secondary and Other Species
Bluegill	Northern Pike
Black Crappie	Flathead Catfish
Largemouth Bass	Green Sunfish
Black Bullhead	Yellow Perch

### PHYSICAL DATA

**Surface Area:** 79 acres

**Watershed:** 3,200 acres

**Maximum Depth:** 10 feet

**Mean Depth:** 6.2 feet

**Lake elevation at time of survey (field observations):** Full

**Contour map:** No

**Date:** NA

### **Ownership of lake and adjacent lakeshore properties:**

Wanalain Lake was created in 1936 with the completion of a rolled earth dam on American Creek by the Works Progress Administration (WPA). The dam was built on land owned by the State of South Dakota due to foreclosure in 1929. The State still owns the land on which the dam grade and spillway were constructed though an easement to develop a park was granted to Brule County in 1937. The remaining land surround Wanalain Lake is privately owned or within the railroad right-of-way.

### **Watershed condition with percentages of land use types:**

The watershed for Wanalain Lake is relatively small at 3,200 acres or approximately 5 square miles. Topography varies from nearly level to moderately sloping. Native grasses that are utilized for hay and pastureland primarily surround the immediate shoreline. The remainder of the watershed is 30% cultivated agricultural land, 50% native grass utilized as pasture or hayland and 20% marshland.

**Fishing access:**

The access trail to the lake may become impassable during wet periods. Fishing during the summer becomes severely restricted due to the dense amounts of aquatic vegetation throughout the lake. There is no boat ramp for water access.

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

The dam grade and spillway are in good condition with no other structures located at Wanalain.

**Field observations of aquatic vegetation condition:**

Cattails and bulrushes are the main emergent vegetation covering about 75% of the shoreline. The only places that emergents are not found is where cattle have access to the lake for watering. Numerous species of submergents cover 90-95% of the lake to varying depths.

**CHEMICAL DATA****Field observations of water quality and pollution problems:**

No pollution problems were evident at the time of the survey. Water quality is fair with a secchi disc reading of 2.0 feet. Other water quality characteristics were measured in the field on July 15, 2014, using a HACH water quality kit and a Hanna multiparameter meter. Results are found in Table 1.

**Table 1.** Water chemistry results from Wanalain Lake, Brule County, July 15, 2014.

Station	Depth (ft)	Temp (F)	DO (ppm)	CO2 (ppm)	ALK (mg/L)	HRD (mg/L)	pH	Cond. (μS/cm)	TDS (ppm)	Sal.	ORP	Secchi (ft)
A	Surface	73.3	4.36	38.2	413	973	8.31	3678	1841	1.94	-163.4	2.0
A	8.0	71.6	3.14	49.6	409	960	8.22	3706	1853	1.96	162.0	

**BIOLOGICAL DATA****Methods:**

Wanalain Lake was sampled on July 14-16, 2014, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ inch knotted mesh. No experimental gill net sets or electrofishing was done during this survey period. Fish indices and statistics were completed using Winfin.

**Results and Discussion:**

**Trap Net Catch**

**Table 2.** Total catch of ten, overnight ¾-inch frame nets at Wanalain Lake, Brule County, July 14-16, 2014.

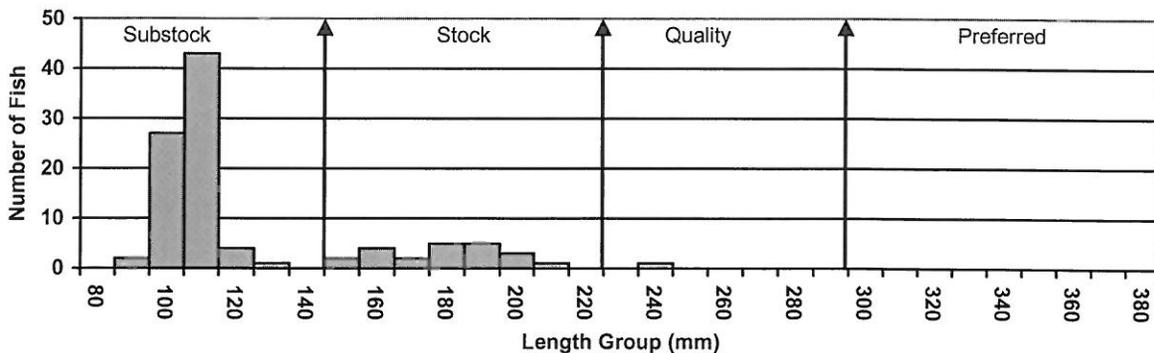
Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	2,838	96.7	283.8	± 118.4	217.3	4	0	82
Common Carp	90	3.1	9.0	± 3.2	2.5	7	0	90
Northern Pike	6	0.2	0.6	± 0.5	1.2	--	--	87

\* Eleven year mean (1958, 1962, 1985, 1991, 1994, 1997, 1999, 2003, 2005, 2008, 2011)

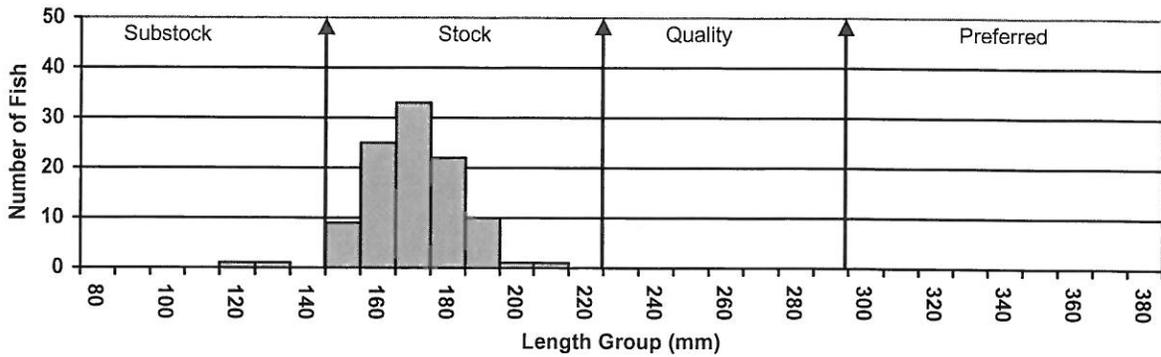
**Black Bullhead**

Black bullheads continue to be the dominant species sampled in Wanalain Lake. The CPUE of 283.8 is well above the 140.9 from the 2011 survey (Table 4) as well as the eleven year mean of 118.4 (Table 2). Figures 1 through 6 illustrate the length frequency histograms for the last six surveys. These show how the sizes have changed over the years. The change in this year's over the 2011 survey is the size structure is decreased and the population is dominated by substock fish. Not a good sign of the direction for the population, and it is indicating that there must not be any more predator fish left in the lake. Condition is fair with a mean Wr of 82.

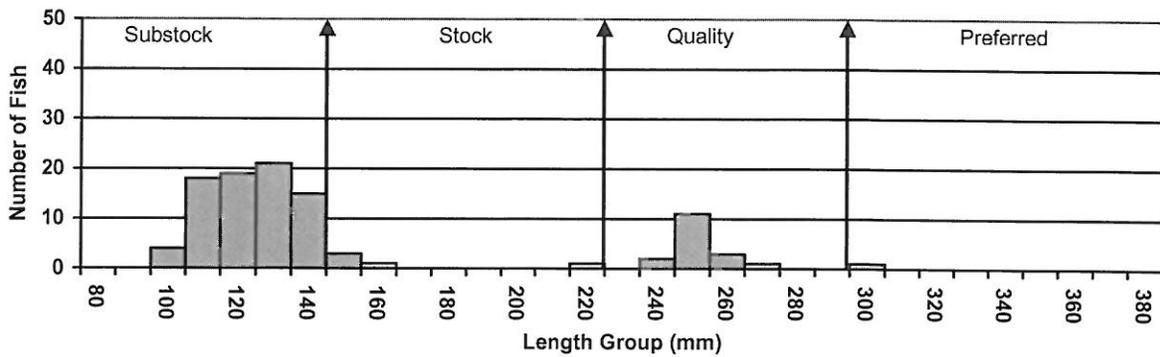
**Figure 1.** Length frequency histogram for black bullhead sampled from Wanalain Lake, Brule County, 2014.



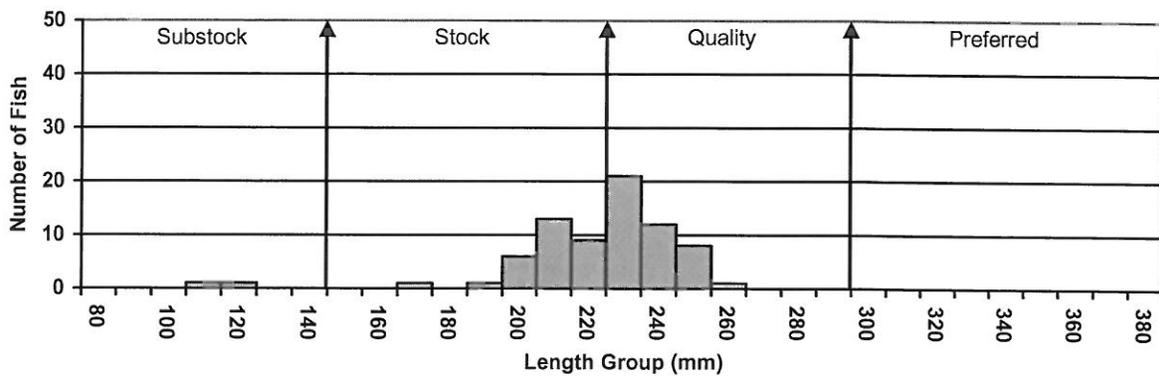
**Figure 2.** Length frequency histogram for black bullhead sampled from Wanalain Lake, Brule County, 2011.



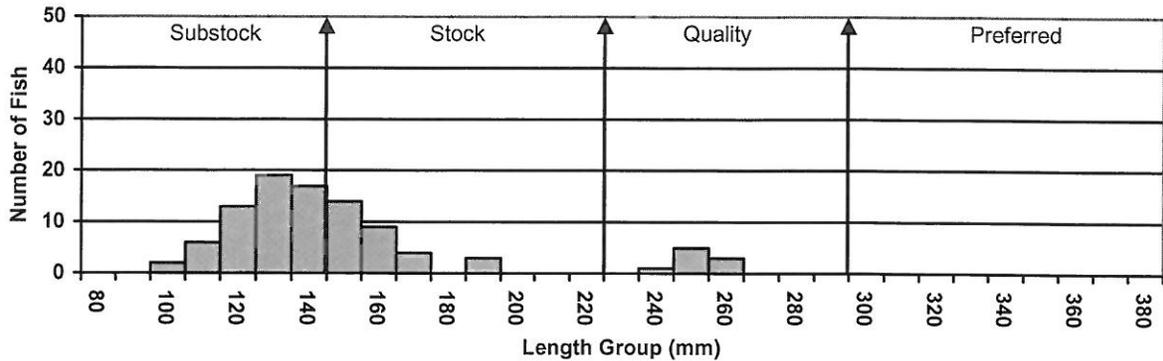
**Figure 3.** Length frequency histogram for black bullhead sampled from Wanalain Lake, Brule County, 2008.



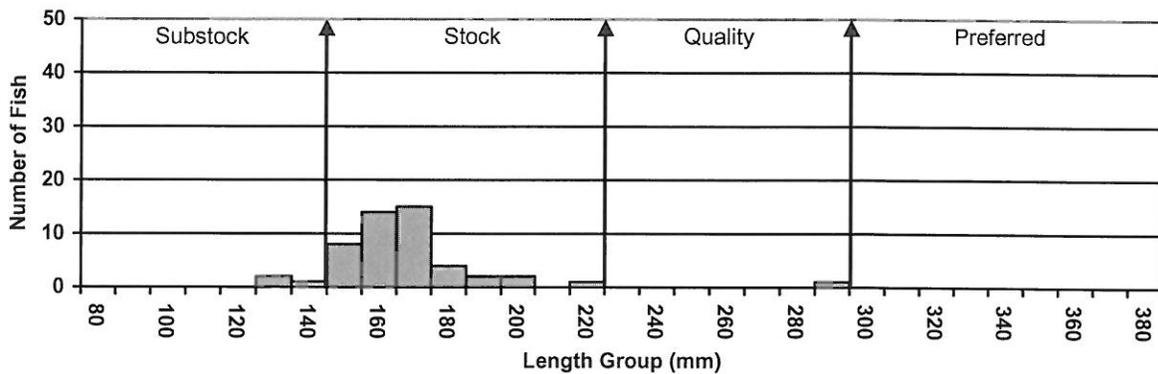
**Figure 4.** Length frequency histogram for black bullhead sampled from Wanalain Lake, Brule County, 2005.



**Figure 5.** Length frequency histogram for black bullhead sampled from Wanalain Lake, Brule County, 2003.



**Figure 6.** Length frequency histogram for black bullhead sampled from Wanalain Lake, Brule County, 1999.



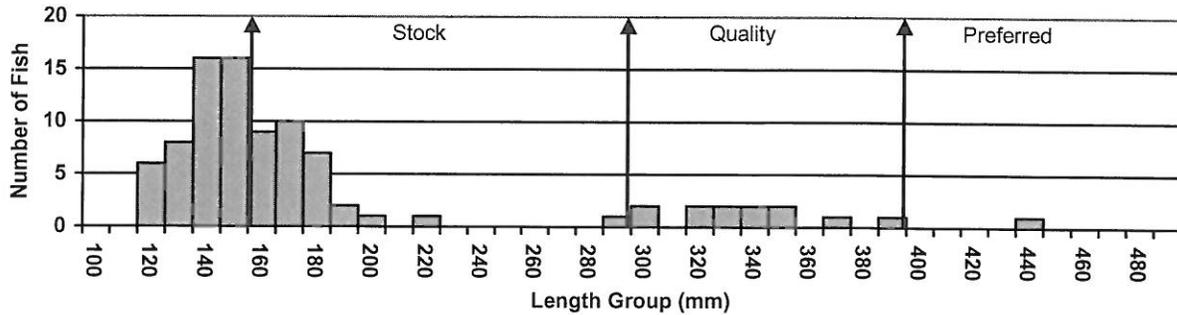
### Other Species

Common carp was the next dominant species sampled this survey. The CPUE of 9.0 is below the 11.4 from the 2011 survey (Table 4), but above the eleven year mean of 2.5 (Table 2). Figures 7 and 8 illustrate the length frequency histograms for the fish sampled from the last two surveys. The main difference is that the current population is dominated by younger, smaller fish. Condition is good with a mean Wr of 90.

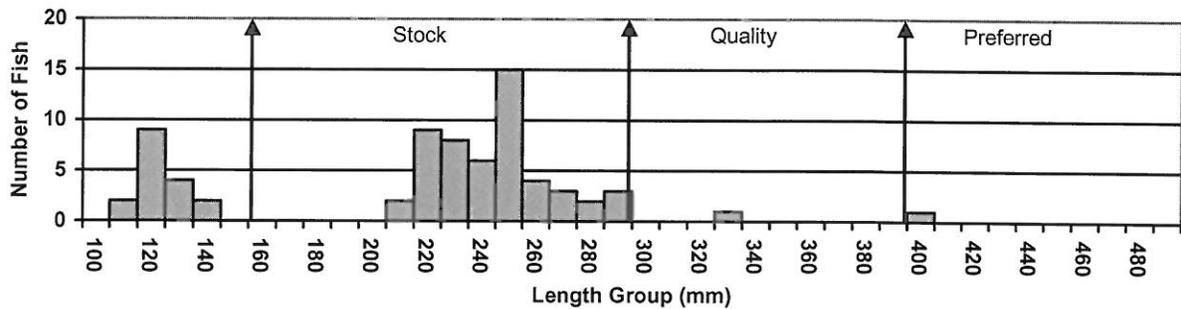
Northern pike was the only other species sampled this survey. The CPUE of 0.6 is slightly below the 2.1 from the 2011 survey (Table 4), as well as the eleven year mean of 1.2 (Table 2). Condition is fine with a mean Wr of 87.

Black crappie, yellow perch, largemouth bass, channel catfish, walleye, bluegill, green sunfish, hybrid sunfish and flathead catfish were the species not sampled this survey that had been in years past (Table 4).

**Figure 7.** Length frequency histogram for common carp sampled from Wanalain Lake, Brule County, 2014.



**Figure 8.** Length frequency histogram for common carp sampled from Wanalain Lake, Brule County, 2011.



**Table 3.** Stocking records from 1999 to the present for Wanalain Lake, Brule County.

Year	Number	Species	Size
1999	355	Largemouth Bass	Adult
1999	7,900	Largemouth Bass	Fingerling
1999	7,900	Northern Pike	Fingerling
2000	200	Largemouth Bass	Adult
2001	200	Largemouth Bass	Adult
2001	11,000	Largemouth Bass	Fingerling
2002	7,900	Largemouth Bass	Fingerling
2005	100	Largemouth Bass	Juvenile
2005	7,860	Largemouth Bass	Fingerling
2007	70	Largemouth Bass	Juvenile

## RECOMMENDATIONS

1. Resurvey in 2017 to monitor the fish populations.
2. Stock largemouth bass juvenile or adults to bolster the current population to help control the panfish and bullhead populations.
3. Stock a panfish species to add some variety for anglers.
4. Attempt to electrofish in 2014 to get a better handle of the current largemouth bass population.

**Table 4.** Trap net CPUE for all species sampled from all surveys for Wanalain Lake, Brule County.

Species	1958	1962	1985	1991	1994	1997	1999	2003	2005	2008	2011	2014
BLB	1.8	165.0	71.4	902.5	31.6	334.3	350.6	53.9	7.5	330.5	140.9	283.8
BLC	9.8	--	30.5	8.9	6.5	1.6	1.0	0.5	1.7	6.0	113.7	--
YEP	--	--	--	0.5	--	--	0.3	0.4	0.7	--	--	--
LMB	--	--	--	--	0.6	--	0.5	0.6	0.1	0.6	--	--
NOP	1.3	6.5	--	0.9	0.5	1.1	0.6	0.1	0.1	0.1	2.1	0.6
CCF	2.8	--	--	--	--	--	--	--	--	--	--	--
WAE	1.5	--	--	--	--	--	--	--	--	--	--	--
COC	6.8	3.8	--	--	--	--	--	--	--	5.9	11.4	9.0
BLG	--	--	44.9	14.1	25.6	10.4	23.4	15.7	16.2	65.0	13.8	--
GSF	--	--	--	--	--	0.1	0.4	--	0.1	5.9	--	--
HYB	--	--	--	--	--	--	--	0.3	--	--	--	--
FCF	--	--	--	--	--	0.1	--	--	--	--	--	--

BLB-Black Bullhead, BLC-Black Crappie, YEP-Yellow Perch, LMB-Largemouth Bass, NOP-Northern Pike, CCF-Channel Catfish, WAE-Walleye, COC-Common Carp, BLG-Bluegill, GSF-Green Sunfish, HYB-Hybrid Sunfish, FCF-Flathead Catfish