SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-48

Name: Mission Lake **County(ies):** Hyde
Legal Description: T109N-R71W-Sec. 18 **GPS:** 44°14'27.60"N 99°24'46.86"W
Location from nearest town: 1 mile east, ½ mile south of Mac's Corner

Date of present survey: June 29-July 1, 2015 (netting)
Date of last survey: July 16-18, 2012 (netting)
Most recent lake management plan: F-21-R-41 (January 1, 2009 to December 31, 2013)
Management classification: Warmwater Semi-Permanent

Primary Game Species	Secondary and Other Species
White Crappie	White Sucker
Black Bullhead	Green Sunfish
Northern Pike	Common Carp
Channel Catfish	Yellow Perch
	Bluegill
	Largemouth Bass

PHYSICAL DATA

Surface Area: 55 acres **Watershed:** 9,600 acres
Maximum Depth: 17 feet **Mean Depth:** 6 feet
Lake elevation at time of survey (field observations): 1 foot low
Contour map: No **Date:** NA

Ownership of lake and adjacent lakeshore properties:

Mission Lake is a 55-acre impoundment located in Hyde County. The artificial impoundment was created in 1939 when the Works Progress Administration (WPA) constructed an earthen dam on a tributary to the west fork of Elm Creek. To allow for the construction of the dam and the flooding of the land which would create the lake, three public use easements were granted to the State of South Dakota for the lake and a strip of land 12 feet above the high water contour.

Watershed condition with percentages of land use types:

The watershed for Mission Lake is relatively small at 9,600 acres or approximately 15 square miles. The immediate shoreline is 100% native grass that is grazed annually. Gravel mining activities take place in the watershed directly adjacent to the upper end of the lake. Land use in the remainder of the watershed is approximately 85% pasture or hayland, 10% cultivated agricultural land, and 5% shelterbelts and farmyards.

Fishing access:

There is an access trail from the highway to a fair boat ramp for water access. Although this trail may become impassable during wet periods. There is also ample shoreline access for shore fishing due to easements. No boat dock exists at the ramp area though.

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

The boat ramp is in fair condition but a lot of times it is overgrown with vegetation. The dam and spillway are in good condition. And the access trail is a fair trail through a pasture.

Field observations of aquatic vegetation condition:

Submergent vegetation was observed around the entire shoreline to a depth of around 3ft and consisted of different species of pondweed. There was some emergent vegetation around sections of the shoreline that consisted of cattails, sedges and rushes.

CHEMICAL DATA

Field observations of water quality and pollution problems:

No pollution problems were evident during the current survey. The water clarity is poor with a secchi disc reading of 1.0 feet. Cattle graze around the entire shoreline, which is probably affecting the water clarity. Other water quality characteristics were measured in the field on June 29, 2015 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 Mission Lake, Hyde County, June 29, 2015.

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	74.5	5.65		149	771	8.52	1721	861	0.87	-222.5	1
A	12.2	73.6	1.17	39.7	232	--	7.25	1742	870	0.88	-445.2	

BIOLOGICAL DATA

Methods:

Mission Lake was sampled on June 29-July 1, 2015, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ inch knotted mesh. No gill netting or electrofishing was performed during this years sampling 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 Mission Lake, Hyde County, June 29-July 1, 2015.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	276	87.9	27.6	± 10.1	42.6	32	12	86
Black Crappie	16	5.1	1.6	± 1.7	0.0**	100	100	102
Walleye	11	3.5	1.1	± 0.6	0.02	100	91	95
Common Carp	6	1.9	0.6	± 0.4	1.3	75	25	79
Yellow Perch	3	1.0	0.3	± 0.3	1.2	--	--	97
Northern Pike	1	0.3	0.1	± 0.1	0.4	--	--	206
Green Sunfish	1	0.3	0.1	± 0.1	1.4	--	--	120

* Eighteen year mean (1962, 1963, 1968, 1971, 1976, 1981, 1983, 1986, 1988, 1990, 1992, 1994, 1997, 2000, 2003, 2006, 2009, 2012)
**First sampling occurrence (2012)

Black Bullhead

Black bullheads continue to remain a top density species in Mission Lake. The CPUE of 27.6 is up from the 4.5 from the 2012 survey (Table 4) but still below the 42.6 eighteen year mean (Table 2). Figures 1 through 7 illustrate the length frequency histograms for the fish sampled over the last seven surveys. Figure 1 from the current survey shows the increased density with the increase coming in the substock and stock sized fish. Condition is good with a mean Wr of 86.

Figure 1. Length frequency histogram for black bullhead sampled from Mission Lake, Hyde County, 2015.

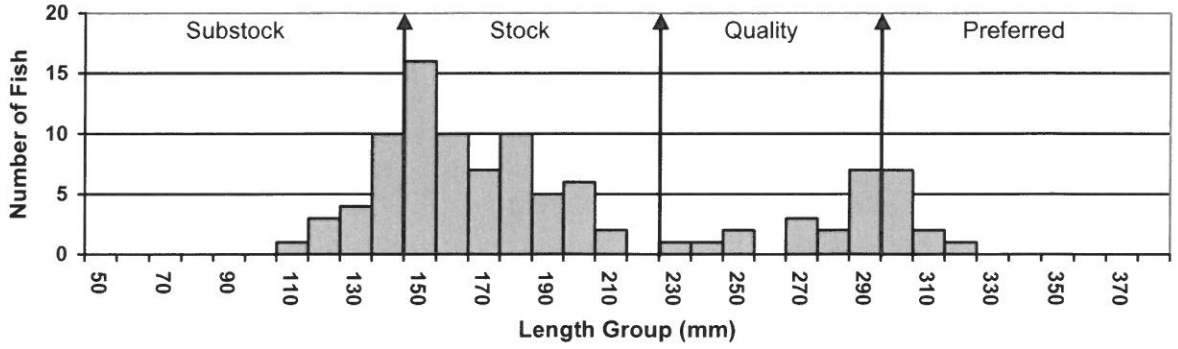


Figure 2. Length frequency histogram for black bullhead sampled from Mission Lake, Hyde County, 2012.

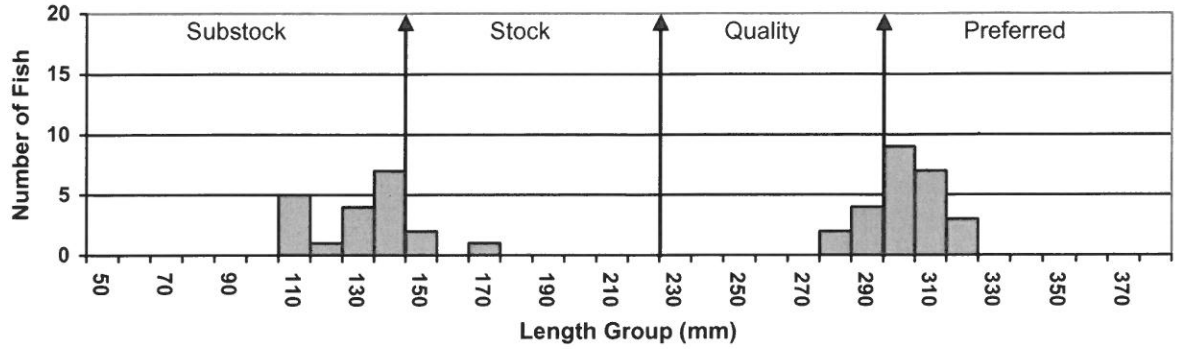


Figure 3. Length frequency histogram for black bullhead sampled from Mission Lake, Hyde County, 2009.

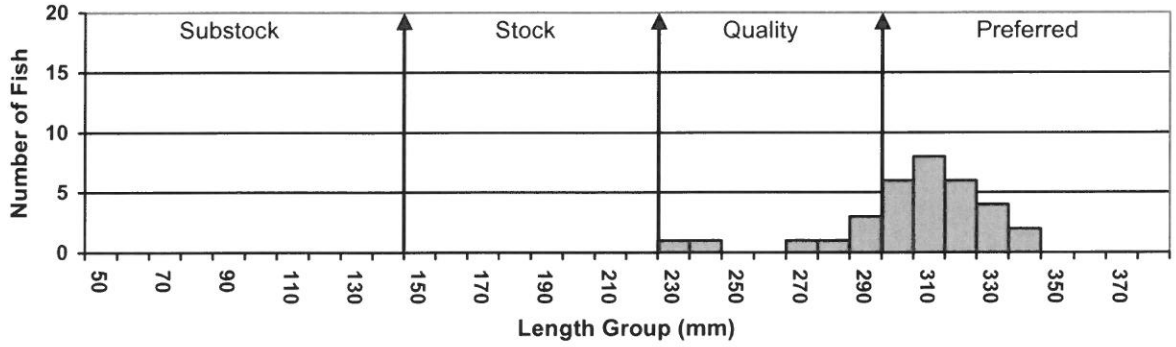


Figure 4. Length frequency histogram for black bullhead sampled from Mission Lake, Hyde County, 2006.

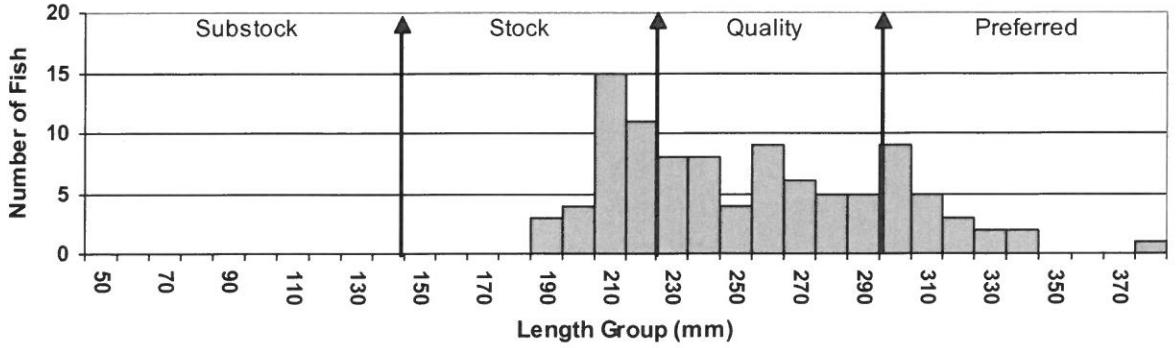


Figure 5. Length frequency histogram for black bullhead sampled from Mission Lake, Hyde County, 2003.

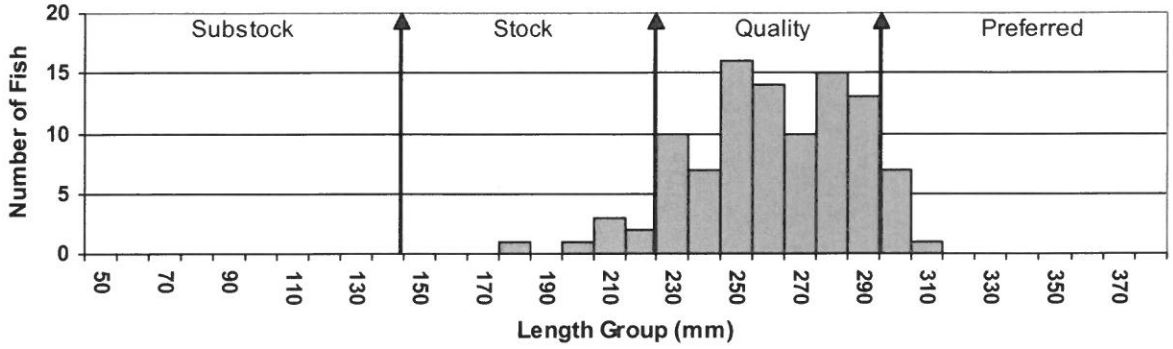


Figure 6. Length frequency histogram for black bullhead sampled from Mission Lake, Hyde County, 2000.

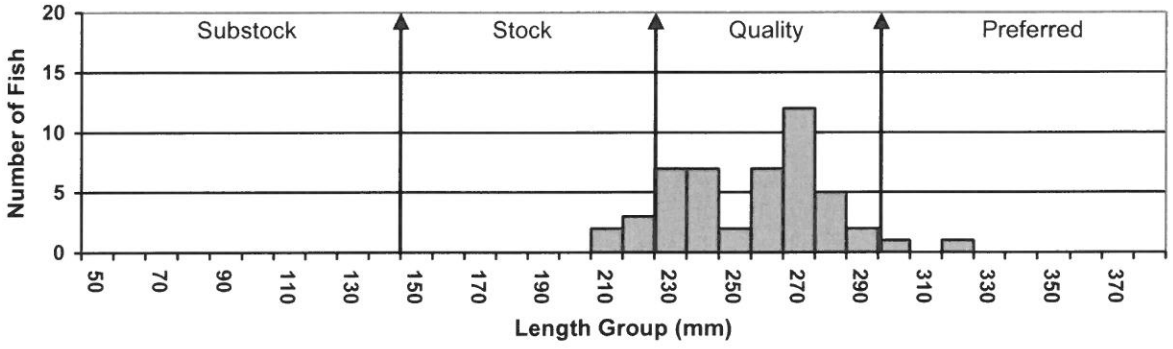
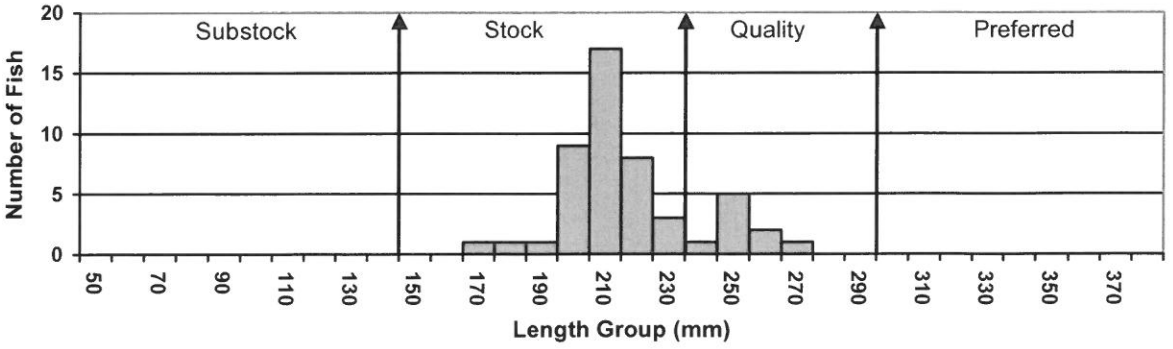


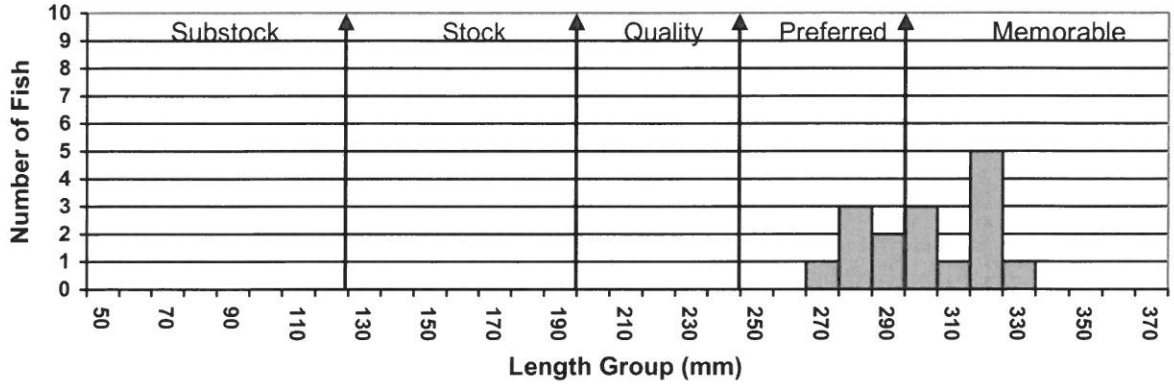
Figure 7. Length frequency histogram for black bullhead sampled from Mission Lake, Hyde County, 1997.



Other Species

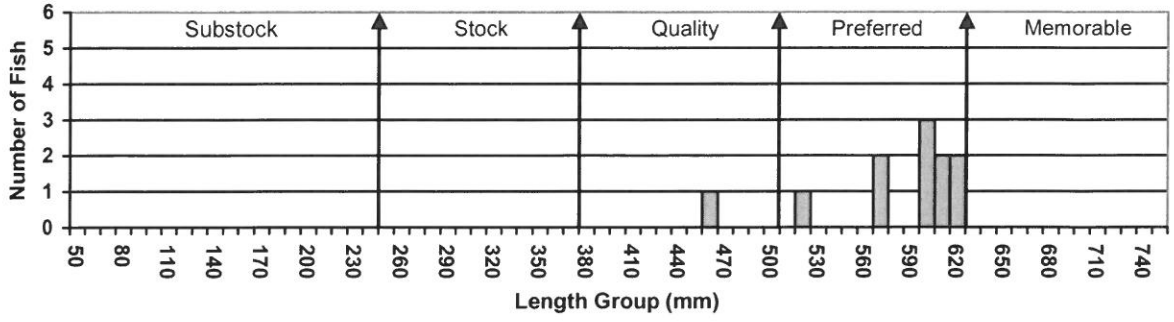
Black crappie and walleye were the two big surprises of the survey. This was the first recorded sampling of black crappies (Table 4). The CPUE of 1.6 was actually the second highest this survey. The fish sampled were large fish as can be seen in the length frequency histogram (Figure 8). Condition is good with a mean Wr of 102. Not sure where they came from, but they are a very nice addition to the population and hopefully they continue.

Figure 8. Length frequency histogram for black crappie sampled from Mission Lake, Hyde County, 2015.



Walleyes were sampled for the second straight survey but the surprise was the size of the fish sampled. The CPUE of 1.1 is above the 0.3 from the 2012 survey (Table 4). Condition is good with a mean Wr of 95. Figure 9 illustrates the length frequency histogram for the fish sampled this survey and show just how big most of the fish were. A stocking of walleye fingerlings was made in 2004, so there is a chance that these fish may have come from that stocking, but more than likely they made their way in the lake some other way.

Figure 9. Length frequency histogram for walleye sampled from Mission Lake, Hyde County, 2015.



Common carp, yellow perch, northern pike and green sunfish were the other species sampled this survey. None were sampled in large enough numbers to really make any inferences about their populations.

White crappie, largemouth bass, channel catfish, white sucker, bluegill and smallmouth bass were the species not sampled that had been in surveys past (Table 4).

Table 3. Stocking records for 1991 to the present for Mission Lake, Hyde County.

Year	Number	Species	Size
1991	460	Black Crappie	Adult
1991	2,900	Northern Pike	Fingerling
1995	51	Northern Pike	Adult
1995	5,500	Northern Pike	Fingerling
2001	180	Largemouth Bass	Adult
2001	5,500	Largemouth Bass	Fingerling
2004	5,800	Walleye	Fingerling
2009	5,880	Largemouth Bass	Fingerling
2010	5,890	Largemouth Bass	Fingerling
2011	43	Channel Catfish	Adult
2011	150	White Crappie	Adult
2012	100	Smallmouth Bass	Juvenile

RECOMMENDATIONS

1. Resurvey to monitor the fish population in 2018.

2. Stock walleye fingerlings to supplement the predator population.

3. Stock channel catfish to maintain the existing population.

Table 4. Gill net (GN), trap net (TN), and electrofishing (EF) CPUE for all fish species sampled in Mission Lake since surveys were started in 1962.

Species	1962	1963	1968	1971	1976	1981	1983	1986	1988	1990	1992	1994	1997	2000	2003	2006	2009	2012	2015
BLB (GN)	--	--	49.0	--	1.0	--	--	--	--	--	--	--	--	--	--	1.0	--	--	--
BLB (TN)	9.2	3.7	49.0	0.1	2.0	0.5	45.8	77.3	5.9	3.1	21.7	7.4	181.4	322.8	19.2	10.0	3.3	4.5	27.6
BLC (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLC (TN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6
WHC (GN)	--	--	--	--	2.0	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--
WHC (TN)	76.0	37.0	--	56.1	0.5	3.4	3.3	45.1	62.5	1.4	13.2	9.6	13.6	2.3	--	--	--	--	--
YEP (GN)	--	--	--	--	4.0	--	--	--	--	2.0	--	--	--	--	--	--	--	--	--
YEP (TN)	4.0	9.3	--	0.4	0.3	--	0.8	4.9	1.0	--	0.7	0.4	--	--	--	--	--	--	0.3
LMB (EF)	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0	--	--	--	--	--
LMB (GN)	--	--	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LMB (TN)	0.6	--	0.4	--	--	--	2.8	--	--	--	--	0.1	0.1	--	--	--	--	--	--
NOP (GN)	--	--	--	--	2.0	5.0	--	--	--	--	--	--	--	--	--	--	--	--	--
NOP (TN)	0.6	1.7	--	0.8	0.4	0.4	0.3	0.1	--	0.1	0.5	1.0	0.5	0.6	--	--	0.1	0.7	0.1
CCF (GN)	--	--	--	--	8.0	13.0	--	--	--	--	--	--	--	--	--	--	--	--	--
CCF (TN)	--	--	--	--	3.8	1.3	0.5	13.1	0.3	--	1.6	1.6	17.5	2.1	3.0	5.4	0.2	0.2	--
WHS (GN)	--	--	47.0	--	3.0	2.0	--	--	--	2.0	--	--	--	--	--	--	--	--	--
WHS (TN)	1.0	0.3	19.0	0.5	0.1	0.6	1.8	0.3	0.1	--	7.0	2.6	1.8	2.4	15.1	0.2	--	--	--
WAE (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WAE (TN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.3	1.1
COC (GN)	--	--	--	--	--	2.0	--	--	--	1.0	--	--	--	--	--	--	--	--	--
COC (TN)	4.0	4.7	--	0.1	1.3	0.4	0.5	0.4	0.1	--	0.3	0.8	0.1	0.0	0.3	2.4	4.8	3.2	0.6
BLG (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLG (TN)	--	--	--	0.1	--	--	--	--	--	--	--	--	3.1	2.4	--	--	--	9.7	--
SMB (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SMB (TN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0	--
GSF (GN)	--	--	29.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GSF (TN)	--	--	24.0	--	--	--	--	--	--	--	--	--	0.3	--	1.0	--	--	--	0.1

BLB-Black Bullhead, BLC – Black Crappie, WHC-White Crappie, YEP-Yellow Perch, LMB-Largemouth Bass, NOP-Northern Pike, CCF-Channel Catfish, WHS-White Sucker, WAE-Walleye, COC-Channel Catfish, BLG-Bluegill, SMB-Smallmouth Bass, GSF-Green Sunfish