SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-44

Name: Sully Lake **County(ies):** Sully
Legal Description: T114N-R78W-Sec. 2 & T115N-R78W-Sec. 35 & 36
GPS: 44º42'31.88"N 100º11'33.54"W
Location from nearest town: 5.5 miles west of Onida

Date of present survey: July 25-27, 2011 (netting)
Date of last survey: May 11-12, 2009 (netting)
Most recent lake management plan: F-21-R-39 (January 1, 2007 to December 31, 2011)
Management classification: Warmwater Marginal

Primary Game Species	Secondary and Other Species
Northern Pike	Black Bullhead
Largemouth Bass	Walleye
Yellow Perch	Common Carp
Bluegill	Black Crappie

PHYSICAL DATA

Surface Area: 205 acres **Watershed:** 81,280 acres
Maximum Depth: 10 feet **Mean Depth:** 5.5 feet
Lake elevation at time of survey (field observations): Full
Contour map: NA **Date:** NA

Ownership of lake and adjacent lakeshore properties:

Sully Lake is a 205-acre impoundment 5.5 miles west of Onida in central Sully County. The artificial lake was created in 1936 when the Works Progress Administration (WPA) completed construction of an earthen dam on Okobojo Creek. To allow for the construction of the dam, four public use easements to the State of South Dakota for the lake and a strip of land 12 feet above the high-water mark were recorded with the Sully County Register of Deeds from 1926 to 1930. In addition the Department of Game, Fish and Parks Purchased 3.89 acres of land on the southwest edge of the dam grade in 1929 which contains the fill of the impoundment.

Watershed condition with percentages of land use types:

The watershed of Sully Lake is approximately 81,280 acres or 131 square miles. Land use is estimated at 70% cultivated farmland consisting of small grains and row crops, and 30% native grasses utilized as hay or pastureland, land enrolled in the Conservation Reserve Program, farmsteads, tree belts and roads.

Fishing access:

Fishing at Sully Lake is pretty much confined to shorefishing as no boat ramp exists. Although, a small duck type boat could be launched in a few areas. Plus there is ample ice fishing opportunities.

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

The dam and spillway are in good shape. No other structures are found at Sully Lake.

Field observations of aquatic vegetation condition:

Submergent vegetation consists of dense areas of cattails, rushes and sedges around most of the shoreline. Emergent vegetation consists of multiple species of pondweeds and is forming very dense mats throughout the lake.

CHEMICAL DATA

Field observations of water quality and pollution problems:

No pollution problems were evident at the time of the survey. Water clarity was fine with a secchi disc reading of 2 feet. Other water quality characteristics were measured in the field on July 25, 2011, 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: No

Table 1. Water chemistry results from Sully Lake, Sully County, July 25, 2011.

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	83.67	9.32	34.2	192	471	8.89	1577	789	0.79	-41.5	2
A	10	79.24	2.90	39.0	285	494	8.33	1606	803	0.81	-142	

BIOLOGICAL DATA

Methods:

Sully Lake was sampled on July 25-27, 2011, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ inch knotted mesh. Two experimental gill nets were also set. The gill nets are 150ft x 6ft with 25ft panels of ½, ¾, 1, 1-1/4, 1-1/2, and 2 inch monofilament mesh. No nighttime electrofishing was done during this survey period. Fish indices and statistics were completed using Winfin.

Results and Discussion:

Gill net catch

Table 2. Total catch of two, 150 ft. experimental gill nets at Sully Lake, Sully County, July 25-27, 2011.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Northern Pike	61	55.0	30.5	± 29.2	14.8	0	0	107
Black Bullhead	24	21.6	12.0	± 9.2	33.0	60	0	91
Common Carp	21	18.9	10.5	± 4.6	2.0	0	0	96
Yellow Perch	5	4.5	2.5	± 1.5	11.3	--	--	106

* Four year mean (1984, 1994, 1995, 1998)

Trap Net Catch

Table 3. Total catch of ten, overnight ¾-inch frame nets at Sully Lake, Sully County, July 25-27, 2011.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	3949	89.5	394.9	± 101.7	311.1	16	0	88
Common Carp	427	9.7	42.7	± 11.3	3.4	21	7	95
Northern Pike	22	0.5	2.2	± 0.6	6.2	0	0	101
Yellow Perch	15	0.3	1.5	± 0.7	1.8	53	13	104

* Ten year mean (1963, 1970, 1984, 1986, 1989, 1994, 1995, 1998, 2001, 2009)

Yellow Perch

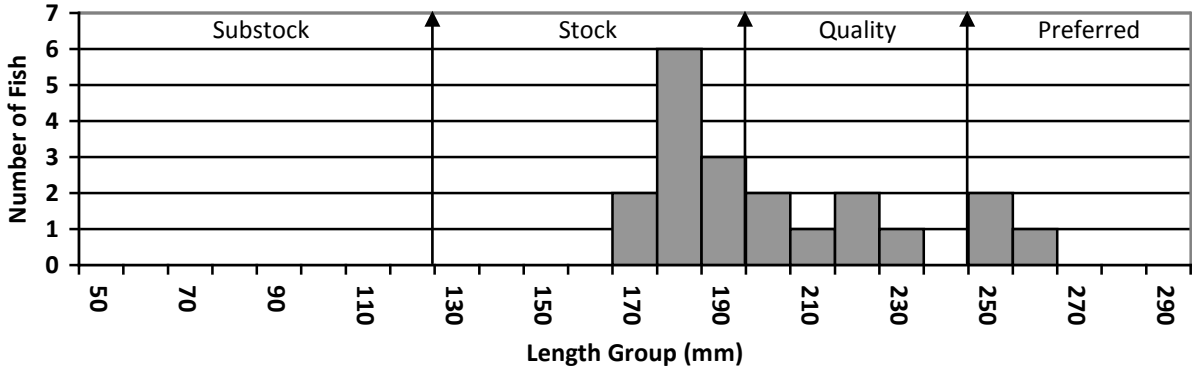
Sully Lake is starting to gain a yellow perch population, although it they may struggle with the high density black bullhead and common carp populations. The trap net CPUE is 1.5 which is right on with the ten year mean of 1.8 (Table 3). The gill net CPUE is 2.5, which is below the 11.3 four year mean (Table 2). Most of the population is comprised of the fish from the stockings, although they may have produced a small year class as a couple fish are age 1 from 2010 (Table 4). Growth is slow compared to statewide, regional and SLI means (Table 4). The slow growth is expected as they came out of a stunted population and they have to compete with a very high density black bullhead population. Condition is good with a mean Wr of 105. Figure 1 illustrates the length frequency histogram for the fish sampled this survey.

Table 4. Average back-calculated lengths (mm) for each age class of yellow perch sampled from Sully Lake, Sully County, 2011.

			Back-calculated Age			
Year Class	Age	N	1	2	3	4
2010	1	5	128			
2009	2	3	116	173		
2008	3	5	80	107	128	
2007	4	8	103	147	176	207
All Classes		**21**	**107**	**142**	**152**	**207**
Statewide Mean			86	145	190	220
Region II Mean			91	152	196	219
SLI* Mean			87	142	185	205

* Small Lakes and Impoundments

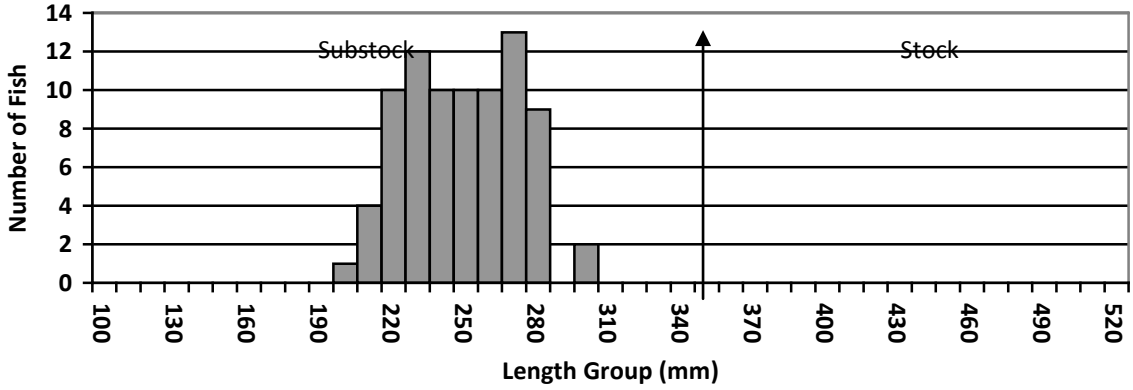
Figure 1. Length frequency histogram for yellow perch sampled from Sully Lake, Sully County, 2011.



Northern Pike

Sully Lake contains a fair up and coming northern pike population that will serve as the main predator species in the lake. The trap net CPUE of 2.2 is below the 6.2 ten year mean (Table 3). The gill net CPUE of 30.5 is well above the four year mean of 14.8 (Table 2). These results are what would be expected and the fish are dominated by young fish. Figure 2 illustrates the length frequency histogram for the fish sampled this survey and show that most of the fish were young fish. They are more than like the fish that were stocked in the spring prior to this survey. Hopefully they will pull off some year classes in the next few years to boost this population as there are a ton of black bullhead and carp to thin down. Condition is good with a mean Wr of 104.

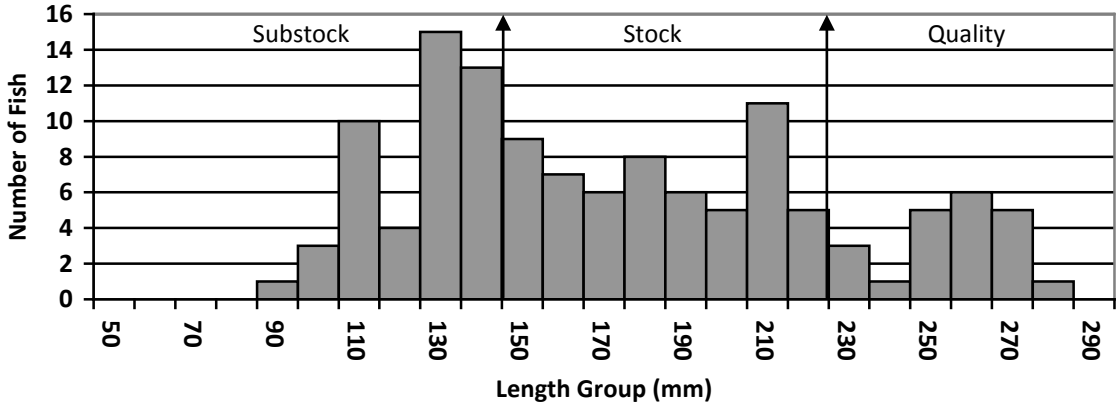
Figure 2. Length frequency histogram for northern pike sampled from Sully Lake, Sully County, 2011.



Other Species

Black bullheads are going crazy in Sully Lake. The trap net CPUE of 394.9 is very high and actually higher than the ten year mean of 311.1 (Table 3). The gill net CPUE of 12.0 is below the four year mean of 33.0 (Table 2). Condition is fair with a mean Wr of 90. Figure 3 illustrates the length frequency histogram for the fish sampled this survey. There is actually a few of the larger fish that may be of a size desirable to anglers.

Figure 3. Length frequency histogram for black bullhead sampled from Sully Lake, Sully County, 2011.



Common carp were the only other species sampled this survey. The trap net CPUE of 42.7 is well above the 3.4 ten year mean (Table 3). The gill net CPUE of 10.5 is also well above the four year mean of 2.0 (Table 2). Condition is fine with a mean Wr of 96. Figure 4 illustrates the length frequency histogram for the fish sampled from this survey and shows a large group of fish but also others scattered around the sizes.

Figure 4. Length frequency histogram for common carp sampled from Sully Lake, Sully County, 2011.

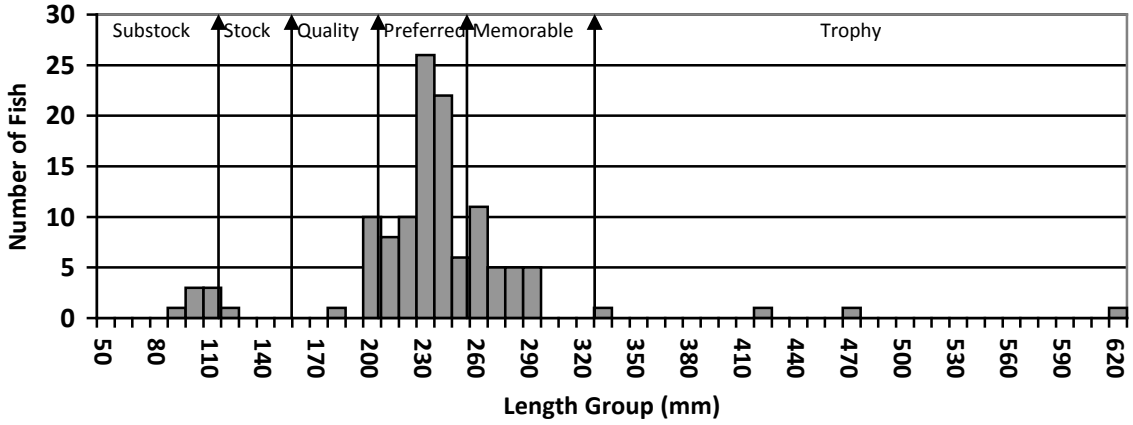


Table 5. Stocking records for the last ten years for Sully Lake, Sully County.

Year	Number	Species	Size
2007	210	Yellow Perch	Adult
2011	50	Northern Pike	Adult
2011	368	Yellow Perch	Adult

RECOMMENDATIONS

1. Resurvey in 2014 to further monitor the fish populations.

2. Stock more adult northern pike to bolster the population.

Figure 6. Gill net (GN) and trap net (TN) CPUE for all fish species sampled in Sully Lake since surveys records began.

Species	1963	1970	1984	1986	1989	1994	1995	1998	2001	2009	2011
BLB (GN)	--	--	16.0	--	--	97.0	10.0	9.0	--	--	12.0
BLB (TN)	76.1	1928.6	124.6	109.9	195.4	124.3	14.8	72.0	465.4	--	394.9
BLC (GN)	--	--	--	--	--	--	--	--	--	--	--
BLC (TN)	--	--	--	--	1.5	--	--	0.1	7.1	--	--
YEP (GN)	--	--	1.0	--	--	32.0	9.0	3.0	--	--	2.5
YEP (TN)	4.9	--	--	1.1	--	1.5	1.8	8.3	--	--	1.5
LMB (GN)	--	--	--	--	--	--	--	--	--	--	--
LMB (TN)	0.3	--	--	--	--	2.4	--	--	0.2	--	--
NOP (GN)	--	--	9.0	--	--	16.0	15.0	19.0	--	--	30.5
NOP (TN)	25.5	--	7.3	1.5	0.3	5.8	3.2	15.9	2.6	--	2.2
CCF (GN)	--	--	--	--	--	--	--	--	--	--	--
CCF (TN)	--	--	0.3	0.3	--	--	--	0.1	--	--	--
WHS (GN)	--	--	--	--	--	--	--	--	--	--	--
WHS (TN)	--	--	--	--	--	--	--	--	0.1	--	--
WAE (GN)	--	--	--	--	--	--	--	4.0	--	--	--
WAE (TN)	--	--	--	--	--	--	--	2.9	1.1	--	--
COC (GN)	--	--	--	--	--	--	--	8.0	--	--	10.5
COC (TN)	--	--	--	--	--	--	0.2	29.9	3.9	--	42.7
BLG (GN)	--	--	--	--	--	1.0	--	--	--	--	--
BLG (TN)	9.6	--	--	--	3.0	113.0	18.0	--	0.7	--	--
GOS (GN)	--	--	--	--	--	--	--	--	--	--	--
GOS (TN)	--	1.4	--	--	--	--	--	--	--	--	--

BLB – Black Bullhead, BLC – Black Crappie, YEP – Yellow Perch, LMB – Largemouth Bass, NOP – Northern Pike, CCF – Channel Catfish, WHS – White Sucker, WAE – Walleye, COC – Common Carp, BLG – Bluegill, GOS – Golden Shiner