

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-47

Name: Hayes Lake **County(ies):** Stanley
Legal Description: T5N-R26W-Sec. 29-30 **GPS:** 44°21'53.28"N 101°00'46.92"W
Location from nearest town: ½ mile east of Hayes

Date of present survey: June 16-18, 2014 (netting); September 17, 2014 (electrofishing)
Date of last survey: June 13-15, 2011 (netting); October 19, 2011 (electrofishing)
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
Largemouth Bass	Black Crappie
Bluegill	Yellow Perch
	Black Bullhead
	Walleye
	Saugeye

PHYSICAL DATA

Surface Area: 64 acres **Watershed:** 23,680 acres
Maximum Depth: 15 feet **Mean Depth:** 6 feet
Lake elevation at time of survey (field observations): Full
Contour map: Yes **Date:** 1968

Ownership of lake and adjacent lakeshore properties:

Hayes Lake is a 64-acre impoundment located in west central Stanley County. The construction of the rolled earth dam and concrete spillway was completed in 1937 by the Works Progress Administration (WPA). No easements for the lake or for public access could be found in the Register of Deeds office in Stanley County. In 1953, Stanley County, for the sum of one dollar, gave a quick claim deed to the State of South Dakota for approximately 80 acres. This deeded land is now a Game Production Area owned and managed by the South Dakota Department of Game, Fish and Parks and contains most of Hayes Lake.

Watershed condition with percentages of land use types:

The watershed of Hayes Lake is made up of 23,680 acres or approximately 37 square miles. The watershed is located primarily north of the lake. The immediate shoreline of Hayes Lake is native grasses within the Game Production Area. The remainder of the watershed is composed of 50% native grasses utilized as hay and pastureland, 45% cultivated agricultural land, and 5% farmyards, tree belts, and the town of Hayes.

Fishing access:

Hayes Lake has a good gravel road to a good boat ramp on the east side for boat access. There is also ample shoreline for shore fishing around most of the lake. Vegetation is the only problem for angling during open water periods.

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

The boat ramp is in good condition, but there is no dock. The spillway and dam are in good condition. There are also two outdoor bathrooms at the lake that are in good condition.

Field observations of aquatic vegetation condition:

Cattails surround about 90% of the shoreline with a few other species of emergents mixed in. Submergents are also found around most of the shoreline to a depth of about 7-8 feet during the summer months. The submergents are comprised of a mixture of various pondweed species.

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 3 feet. Other water quality characteristics were measured in the field on June 16, 2014, 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 Hayes Lake, Stanley County, June 16, 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	68.7	6.29	45.6	227	319	8.74	1017	508	0.50	-148.6	3
A	15.5	66.8	2.60	55.6	247	296	8.12	1018	509	0.51	-165.9	

BIOLOGICAL DATA**Methods:**

Hayes Lake was sampled on June 16-18, 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 nets were used during this survey. On the evening of September 17, 2014, Hayes Lake was electrofished for 60 minutes (6-ten minute transects) to sample the largemouth bass population. The boat was set up with 120 pulses per second of DC current at 170 volts to electrofish the lake that had a water temperature of 63°F. 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 Hayes Lake, Stanley County, June 16-18, 2014.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	292	51.9	29.2	± 11.4	85.5	44	1	91
Bluegill	241	42.8	24.1	± 12.9	18.7	65	13	111
Green Sunfish	22	3.9	2.2	± 1.6	1.5	86	77	124
Northern Pike	8	1.4	0.8	± 0.3	1.1	63	0	83

* Fourteen year mean (1968, 1971, 1975, 1978, 1985, 1988, 1991, 1994, 1997, 2000, 2003, 2006, 2009, 2011)

Electrofishing Catch

Table 3. Total catch from six, ten minute runs of nighttime electrofishing at Hayes Lake, Stanley County, September 17, 2014.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	22	100	22.0	± 8.5	47.4	100	33	108

* Eight year mean (1985, 1988, 1991, 1994, 1997, 2000, 2003, 2011)

Largemouth Bass

The largemouth bass population in Hayes Lake appears to have taken a few steps in the wrong direction. The fall electrofishing CPUE of 22.0 fish per hour is well below the 84 from the 2011 survey (Table 7) as well as the 47.4 eight year mean (Table 3). This is even a little more misleading as the CPUE of fish stock length and over is 3.0. Most of the fish sampled were young fish just produced this year which can be seen in Figure 1. Figures 1 and 2 illustrate the length frequency histograms for the fish sampled the last two surveys. Growth is good with means above statewide, regional and SLI means (Table 4). Condition is also good with a mean Wr of 108. Not sure what caused the downturn in the population as the other species in the lake all seem fine. The next survey will be interesting to see what the population looks like then.

Table 4. Average back-calculated lengths (mm) for each age class of largemouth bass sampled from Hayes Lake, Stanley County, 2014.

Year Class	Age	N	Back-calculated Age				
			1	2	3	4	5
2013	1	8	66				
2012	2	1	77	265			
2010	4	1	70	155	239	313	
2009	5	1	68	196	301	372	397
All Classes		11	70	206	270	343	397
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 1. Length frequency histogram for largemouth bass sampled from Hayes Lake, Stanley County, 2014.

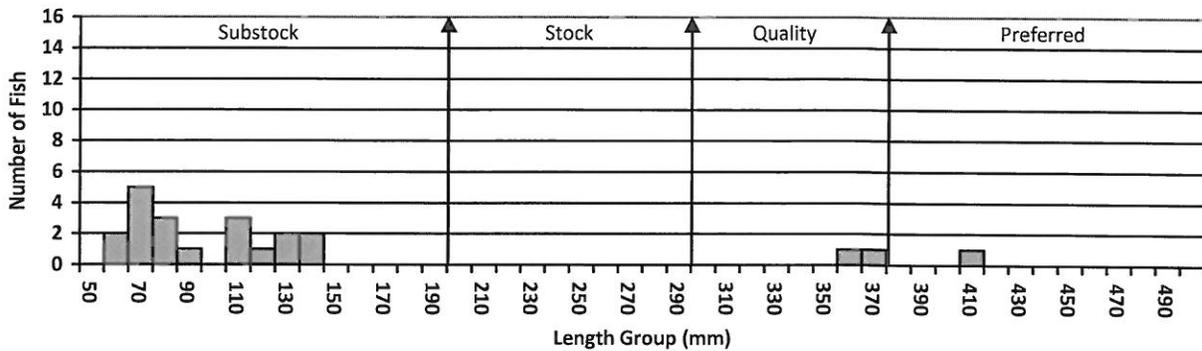
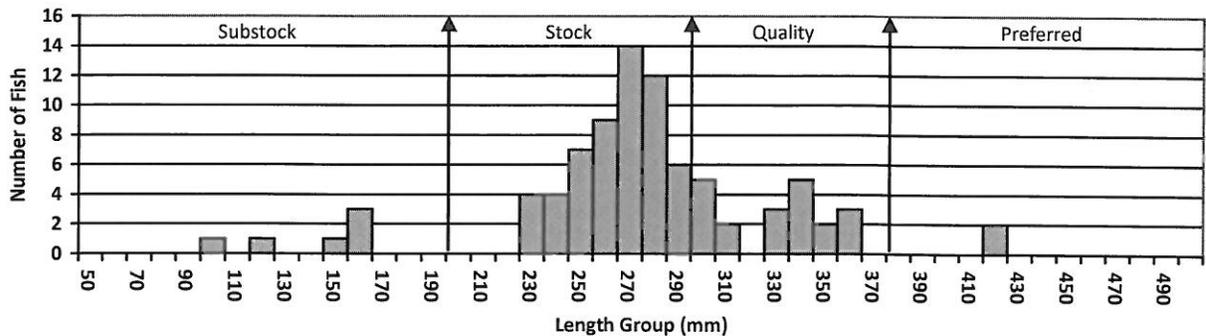


Figure 2. Length frequency histogram for largemouth bass sampled from Hayes Lake, Stanley County, 2011.



Bluegill

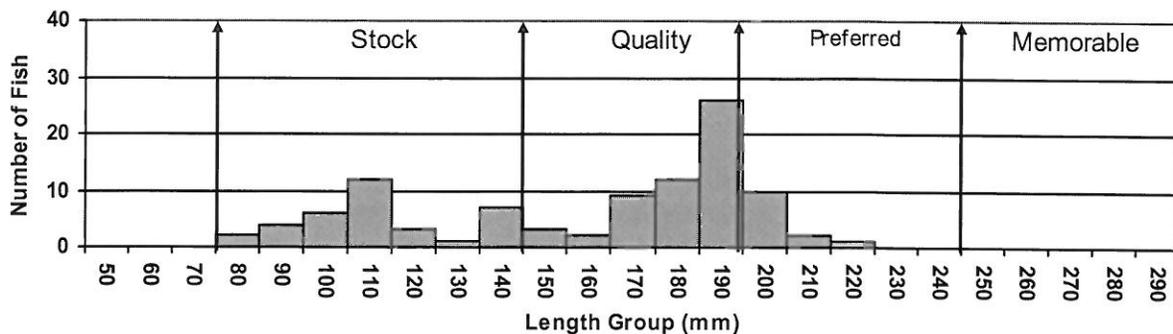
The bluegill population in Hayes Lake continues to build. The CPUE of 24.1 is well above the 2.1 from the 2011 survey (Table 7) as well as the 18.7 fourteen year mean (Table 2). Figure 3 illustrates the length frequency histogram for the fish sampled this survey and reveal that fish are starting to push into sizes that would be desirable to anglers. The PSD of 65 with an RSD-P of 13 is getting closer to a balanced population. Growth is good with means right on with statewide, regional, and SLI means (Table 5). Condition is good with a mean Wr of 111.

Table 5. Average back-calculated lengths (mm) for each age class of bluegill sampled from Hayes Lake, Stanley County, 2014.

Year Class	Age	N	Back-calculated Age								
			1	2	3	4	5	6	7	8	
2012	2	26	47	86							
2011	3	12	44	77	125						
2010	4	12	47	87	127	165					
2009	5	16	42	90	140	168	180				
2008	6	18	43	94	148	166	178	188			
2007	7	13	44	90	138	160	174	185	194		
2006	8	2	41	98	147	164	171	180	188	197	
All Classes		99	44	89	138	165	176	185	191	197	
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 3. Length frequency histogram for bluegill sampled from Hayes Lake, Stanley County 2014.



Black Bullhead

Black bullheads are still the dominant species present in Hayes Lake. The CPUE of 29.2 is below the 57.4 from the 2011 survey (Table 7) as well as the 85.5 fourteen year mean (Table 2). Figures 4 through 6 illustrate the length frequency histograms for the last three surveys. Most of the fish in this survey are on the small side with a PSD of 44 and an RSD-P of 1. The reduced numbers should start to allow for growth to increase, which will in turn produce bigger fish. Condition is good with a mean W_r of 91. Hopefully with the reduced bass population, the bullheads to not start to get out of control again.

Figure 4. Length frequency histogram for black bullheads sampled from Hayes Lake, Stanley County 2014.

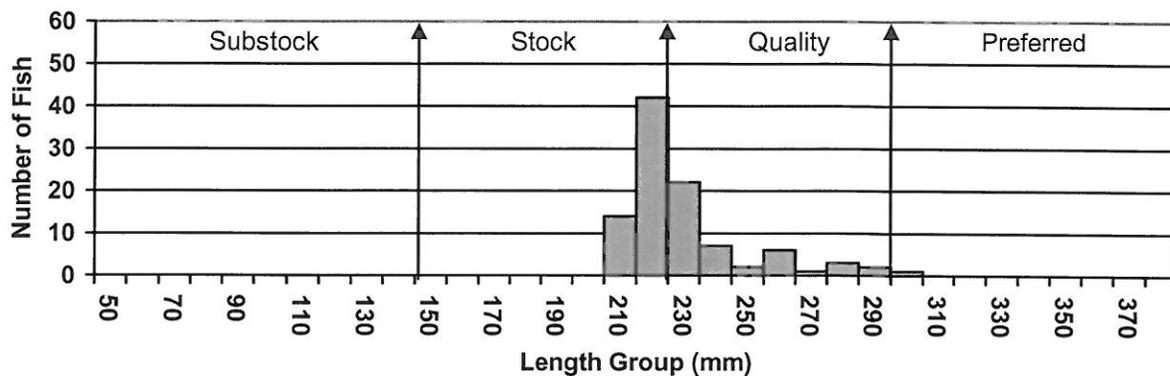


Figure 5. Length frequency histogram for black bullheads sampled from Hayes Lake, Stanley County 2011.

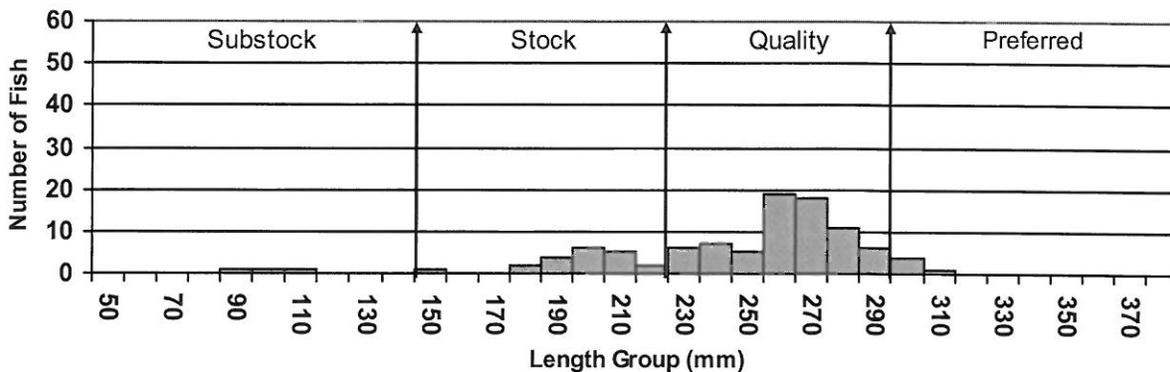
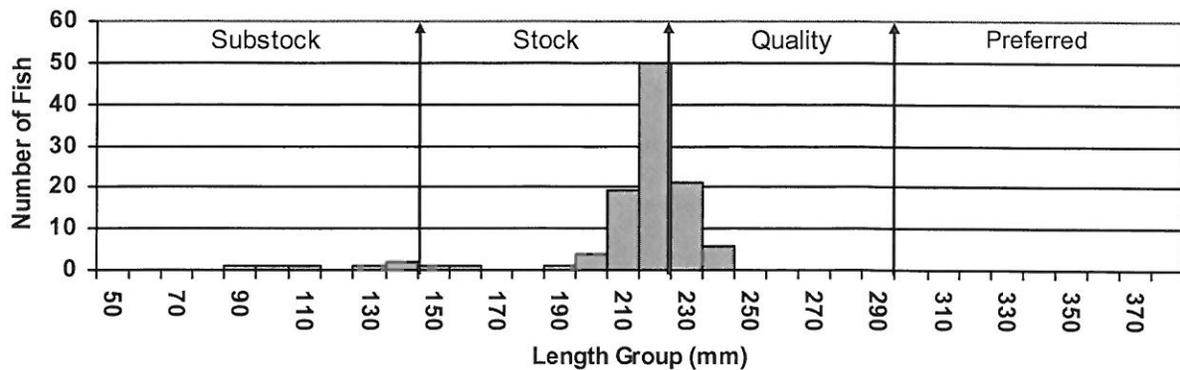


Figure 6. Length frequency histogram for black bullheads sampled from Hayes Lake, Stanley County 2009.



Other Species

Green sunfish and northern pike were the only other species sampled this survey. Black crappie, yellow perch, channel catfish, walleye, saugeye, hybrid sunfish and golden shiner were the species not sampled that had been in survey past (Table 7).

The northern pike CPUE of 0.8 is slightly below the 1.1 from the 2011 survey (Table 7) as well as the 1.1 fourteen year mean (Table 2). The green sunfish CPUE of 2.2 is above the 0.4 from the 2011 survey (Table 7) as well as the 1.5 fourteen year mean (Table 2).

Table 6. Stocking records since the drought ended in 2009 to the present for Hayes Lake, Stanley County.

Year	Number	Species	Size
2009	450	Bluegill	Adult
2009	54	Largemouth Bass	Juvenile
2009	6,510	Largemouth Bass	Fingerling
2010	561	Largemouth Bass	Juvenile

RECOMMENDATIONS

1. Resurvey in 2017 to monitor the fish populations.
2. Continue to stock largemouth bass of all sizes to reestablish the main predator population.
3. Continue to stock bluegill as needed to rebuild the population.
4. Stock black crappie to reestablish the population.
5. Potentially stock any other species that may be wanted to continue to rebuild the fishery per the management plan.

Table 7. Gill net (GN), trap net (TN) and electrofishing (EF) for all fish species sampled in Hayes Lake, Stanley County since surveys began.

Species	1968	1971	1975	1978	1985	1988	1991	1994	1997	2000	2003	2006	2009	2011	2014
BLB (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLB (TN)	2.4	6.5	24.6	13.9	112.4	606.3	57.9	12.1	30.6	41.8	9.4	194.9	26.9	57.4	29.2
BLC (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLC (TN)	--	--	--	--	--	--	--	--	1.5	8.3	18.2	38.5	--	--	--
YEP (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YEP (TN)	--	--	--	--	--	1.4	0.4	7.8	9.1	0.8	0.3	3.6	--	--	--
LMB (EF)	--	--	--	--	37.5	14.6	12.0	6.3	43.4	117.0	64.0	--	--	84.0	22.0
LMB (GN)	--	--	1.0	--	--	--	--	--	--	--	--	--	--	--	--
LMB (TN)	0.6	--	1.0	0.1	0.5	2.9	0.8	--	0.3	0.4	--	0.3	--	--	--
NOP (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NOP (TN)	0.3	1.3	1.5	0.6	0.8	0.4	1.8	0.4	1.5	2.8	0.5	2.9	--	1.1	0.8
CCF (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CCF (TN)	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--
WAE (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WAE (TN)	--	--	--	--	--	--	--	--	--	--	0.7	0.5	--	--	--
BLG (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLG (TN)	--	--	--	--	6.6	32.1	28.1	33.3	45.1	49.8	11.5	52.5	--	2.1	24.1
GSF (GN)	--	--	2.0	--	--	--	--	--	--	--	--	--	--	--	--
GSF (TN)	5.4	1.5	0.4	--	12.8	--	--	--	--	--	--	--	0.1	0.4	2.2
SXW (EF)	--	--	--	--	--	--	--	--	--	3.0	--	--	--	--	--
SXW (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SXW (TN)	--	--	--	--	--	--	--	--	--	1.0	--	--	--	--	--
HYB (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HYB (TN)	--	--	--	--	--	--	--	--	1.4	1.8	--	--	--	--	--
GOS (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GOS (TN)	--	--	--	--	--	--	--	--	--	--	--	0.4	--	--	--

BLB-Black Bullhead, BLC-Black Crappie, YEP-Yellow Perch, LMB-Largemouth Bass, NOP-Northern Pike, CCF-Channel Catfish, WAE-Walleye, BLG-Bluegill, GSF-Green Sunfish, SXW-Saugeye, HYB-Hybrid Sunfish, GOS-Golden Shiner