SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-43

Name: Dakotah Lake **County(ies):** Hand
Legal Description: T112N-R69W-Sec. 35 **GPS:** 44º27'29.06"N 99º05'16.87"W
Location from nearest town: 5 miles west and 5 miles south of Miller

Date of present survey: July 26-28, 2010 (netting); October 12, 2010 (electrofishing)
Date of last survey: June 11-13, 2007 (netting); October 23, 2007 (electrofishing)
Most recent lake management plan: F-21-R-39 (January 1, 2007 to December 31, 2011)
Management classification: Warmwater Permanent

Primary Game Species	Secondary and Other Species
Largemouth Bass	Bluegill
	Black Crappie
	Black Bullhead

PHYSICAL DATA

Surface Area: 12 acres **Watershed:** 2,240 acres
Maximum Depth: 20 feet **Mean Depth:** 8 feet
Lake elevation at time of survey (field observations): Full
Contour map: No **Date:** NA

Ownership of lake and adjacent lakeshore properties:

Dakotah Lake is a twelve-acre impoundment 5 miles west and 5 miles south of Miller in central Hand County. The artificial lake was created in 1936 when the Civilian Conservation Corps constructed an earthen dam on the upper end of Ree Creek. The Boy Scouts of America owned the impoundment and surrounding land from the time the lake was developed until the late 1980's. Ownership of the lake and 160 acres of surrounding land was acquired by the South Dakota Department of Game, Fish and Parks in 1990. The area is currently managed as a Lake Access and Game Production Area. The Wildlife Division of the Game, Fish and Parks conducts fisheries management activities at Dakotah Lake.

Watershed condition with percentages of land use types:

The watershed for Dakotah Lake is approximately 2,240 acres or 3.5 square miles that is primarily privately owned agricultural and grass land. Land use in the watershed is estimated at 75% pasture or hayland composed mostly of native grasses, 20% cultivated farm ground, and 5% woody draws. The immediate shoreline of Dakotah Lake is native grasses with steep, woody banks.

Fishing access:

There is fishing access to Dakotah Lake via a boat ramp. There is some shore fishing opportunities in certain areas around the lake as well. Access may be limited during wet times as the access road is via a dirt trail.

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

The boat ramp is in good shape. There is some woody debris on the spillway. No other structures exist at Dakotah Lake. Access road may be impassible during wet times.

Field observations of aquatic vegetation condition:

Submergent vegetation during the summer occupies about 80% of the lake to a depth of around 4.5 feet and consists of a variety of pondweed species. Emergent vegetation is mainly cattails and is found in mainly the upper end of the lake in the creek channel.

CHEMICAL DATA

Field observations of water quality and pollution problems:

No pollution problems were evident at the time of the survey. Water clarity is good with a secchi disc reading of 3 feet. Other water quality characteristics were measured in the field on July 26, 2010, 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 Dakotah Lake, Hand County, July 26, 2010.

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	82.8	3.31	36	160	242	8.80	419	210	0.20	110	3
A	21.0	70.3	0.11	43	248	310	7.74	642	317	0.31	57	

BIOLOGICAL DATA

Methods:

Dakotah Lake was sampled on July 26-28, 2010, 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 survey period. On October 12, 2010, Dakotah Lake was electrofished for 20 minutes (2-ten minute transects) to sample the largemouth bass population. The boat was set at 120 pulses per second of DC current at 340 volts and 10 amps. Conductivity was 365 µS/cm with a water temperature of 60.2°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 Dakotah Lake, Hand County, July 26-28, 2010.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	363	53.5	36.3	± 17.2	3.0	44	32	86
Bluegill	300	44.2	30.0	± 11.0	26.1	8	0	110
Largemouth Bass	15	2.3	1.5	± 1.4	0.2	--	--	116

* Two year mean since eradication in 1992 (2004, 2007)

Electrofishing Catch

Table 3. Total catch from two ten-minute runs of fall nighttime electrofishing on Dakotah Lake, Hand County, October 12, 2010.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	116	100	348.0	± 313.9	154.5	40	20	115

* Two year mean since eradication in 1992 (2004, 2007)

Largemouth Bass

Dakotah Lake continues to contain a high density largemouth bass population. The electrofishing CPUE was 348.0 fish per hour, which is well above the 177.0 from the 2007 survey (Table 7) as well as the 154.5 two year mean (Table 3). The population is dominated by young fish this survey as can be seen in Figure 1. Figures 1 through 3 illustrate the changes to the size structure of this population over the past three surveys. Every year the population is dominated by young fish with a few adults mixed in. The Game and Fish uses this over abundance of young fish as a source to stock other state waters that are in need. Fish can be removed for a year or two and then let go and will rebuild again in a couple years. Growth is good with means at or above statewide, regional and SLI means (Table 4). Condition is good with a mean Wr of 115.

Table 4. Average back-calculated lengths (mm) for each age class of largemouth bass sampled from Dakotah Lake, Hand County, 2010.

			Back-calculated Age					
Year Class	Age	N	1	2	3	4	5	6
2009	1	85	91					
2008	2	12	74	108				
2007	3	2	73	178	232			
2004	6	1	126	216	316	386	428	453
All Classes		**100**	**91**	**167**	**274**	**386**	**428**	**453**
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 Dakotah Lake, Hand County, 2010.

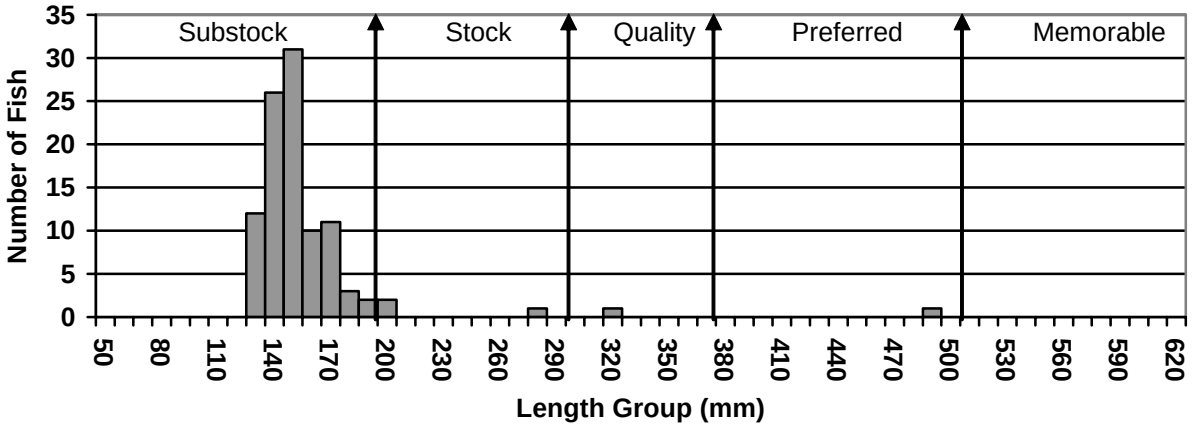


Figure 2. Length frequency histogram for largemouth bass sampled from Dakotah Lake, Hand County, 2007.

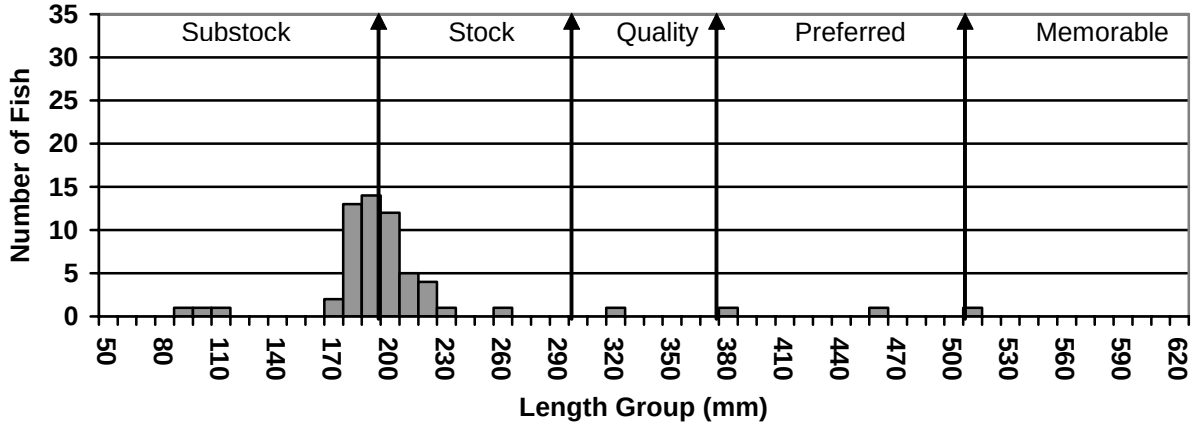
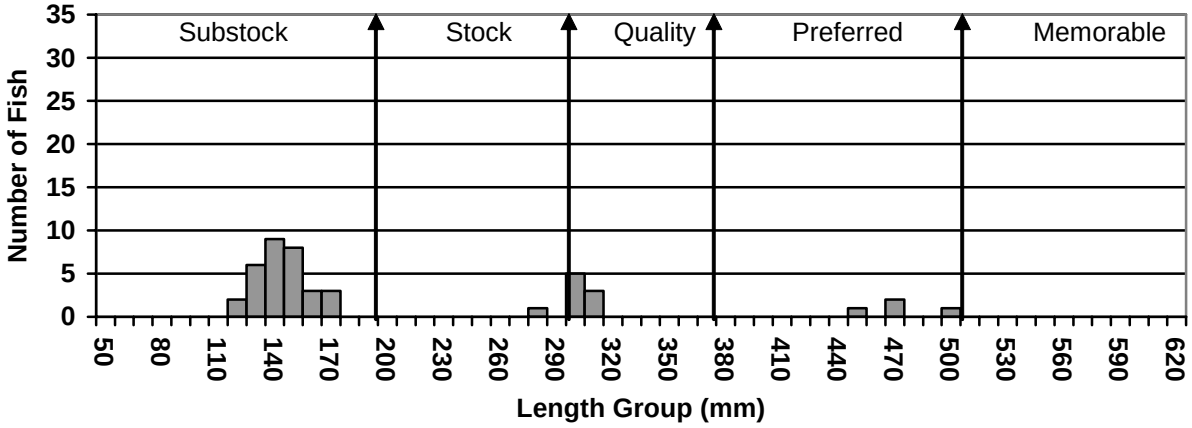


Figure 3. Length frequency histogram for largemouth bass sampled from Dakotah Lake, Hand County, 2004.



Bluegill

Adult bluegills were stocked in 2000 (Table 6) and have consistently produced year classed every year since the partial winterkill in the winter of 2000-2001. The CPUE is 30.0, which is right on with the 26.8 from the 2007 survey (Table 7) and the two year mean of 26.1 (Table 2). Condition is good with a mean Wr of 110. Growth is on the slow side with means below statewide, regional and SLI means (Table 5). The size structure has regressed slightly since the 2007 survey. The PSD is 8 with an RSD-P of 0 compared to the PSD of 33 with an RSD-P of 0 from the 2007 survey. This can also be seen by looking at the changes over the past three surveys in Figures 4 through 6.

Table 5. Average back-calculated lengths (mm) for each age class of bluegill sampled from Dakotah Lake, Hand County, 2010.

			Back-calculated Age				
Year Class	Age	N	1	2	3	4	5
2008	2	31	40	85			
2007	3	60	41	96	121		
2006	4	6	43	78	119	136	
2005	5	3	41	71	120	139	156
All Classes		**100**	**41**	**82**	**120**	**138**	**156**
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 4. Length frequency histogram for bluegill sampled from Dakotah Lake, Hand County, 2010.

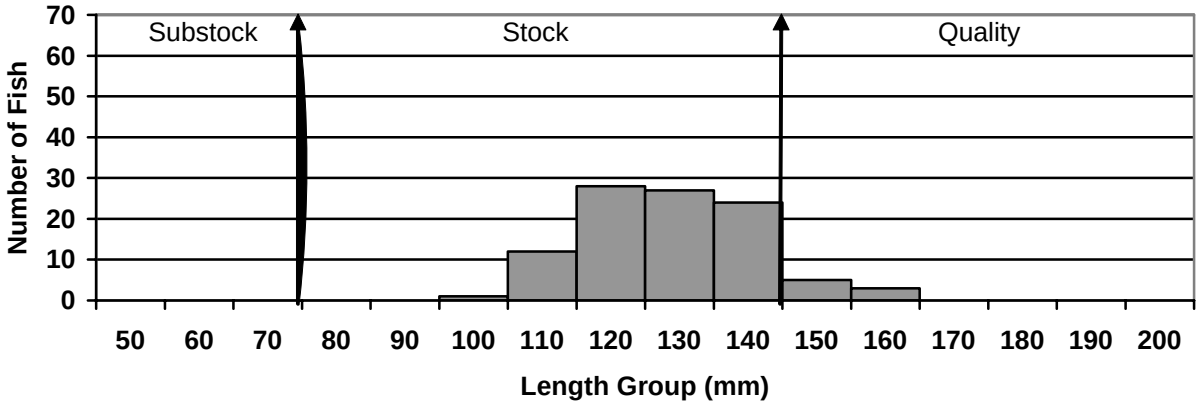


Figure 5. Length frequency histogram for bluegill sampled from Dakotah Lake, Hand County, 2007.

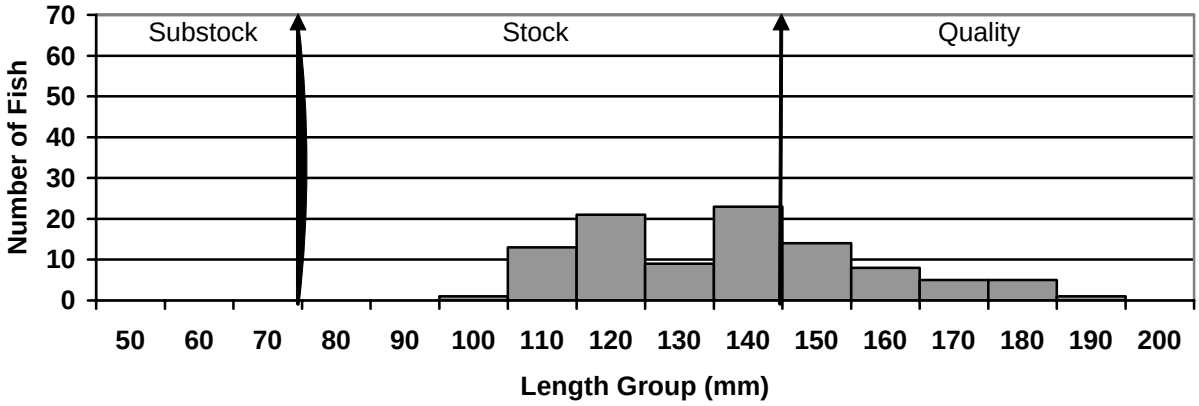
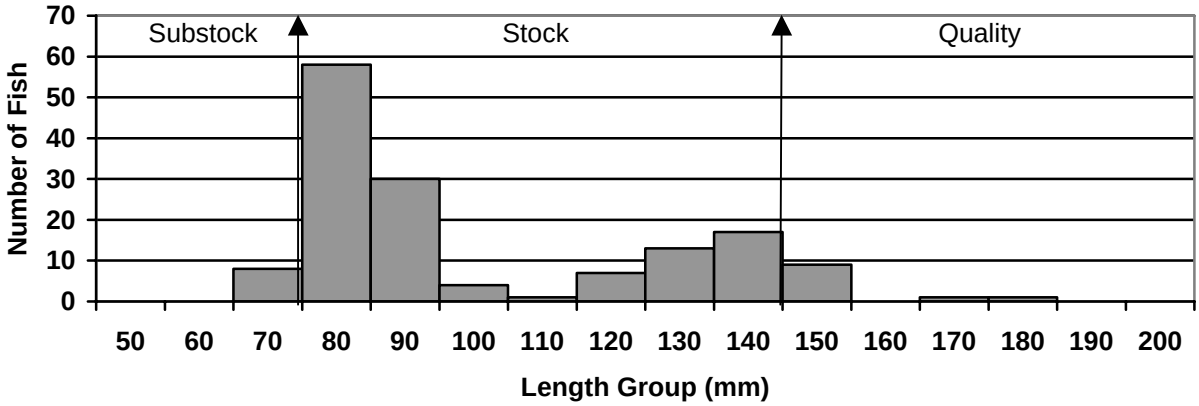


Figure 6. Length frequency histogram for bluegill sampled from Dakotah Lake, Hand County, 2004.



Other species

Black bullheads were the only other species sampled this survey. The CPUE was 36.3, which is well above the 5.0 from the 2007 survey (Table 7) as well as the 3.0 two year mean. Condition is fine with a mean Wr of 86. Size structure has not changed much on the upper side of things, but the increased CPUE is in the stock category. This change can be seen in Figures 7 and 8, which illustrate the size structure from the past two surveys.

Figure 7. Length frequency histogram for black bullhead sampled from Dakotah Lake, Hand County, 2010.

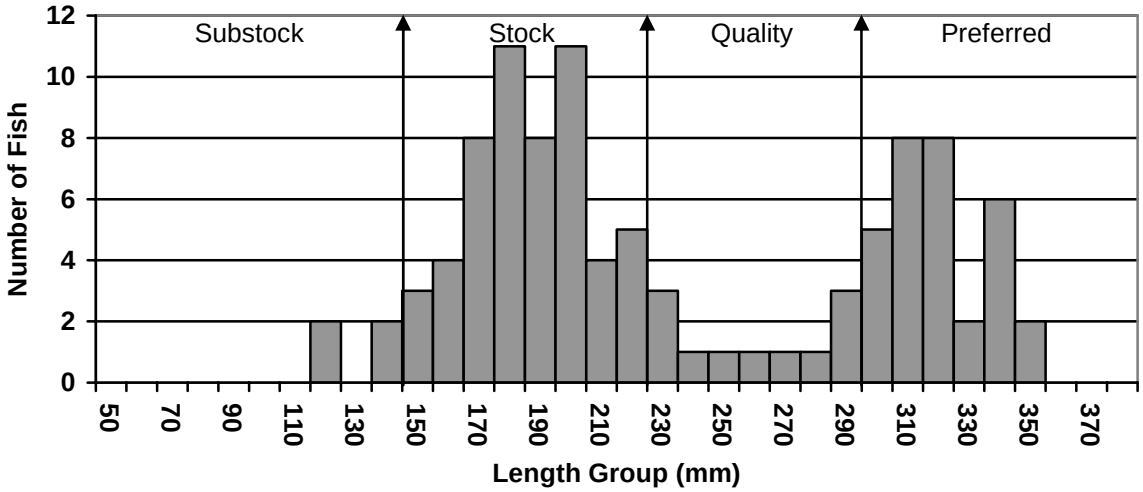


Figure 8. Length frequency histogram for black bullhead sampled from Dakotah Lake, Hand County, 2007.

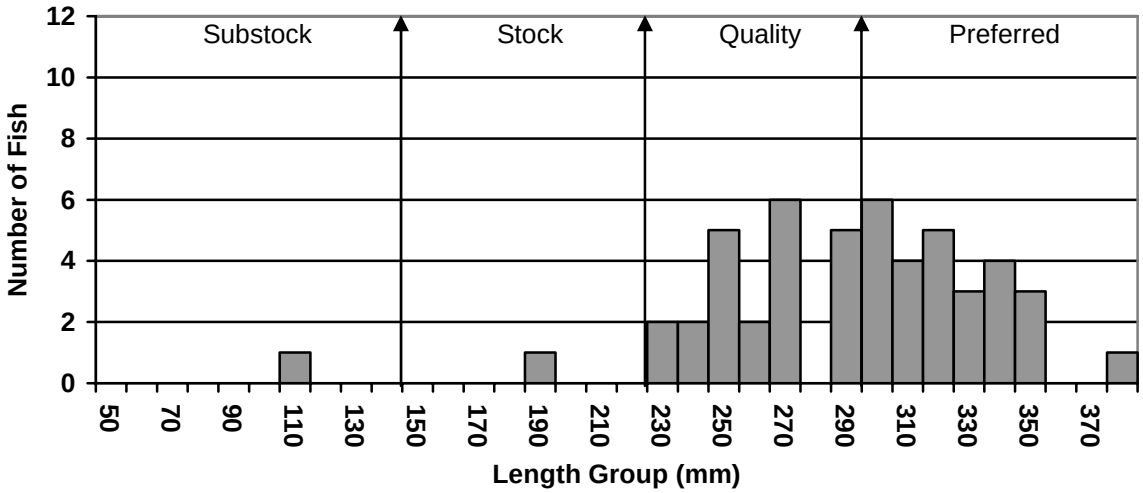


Table 6. Stocking records from the eradication in 1992 to the present for Dakotah Lake, Hand County.

Year	Number	Species	Size
1993	4,000	Rainbow Trout	Catchable
1994	4,000	Rainbow Trout	Catchable
1995	5	Rainbow Trout	Adult
1995	4,000	Rainbow Trout	Catchable
1996	3,880	Rainbow Trout	Catchable
1997	4,000	Rainbow Trout	Catchable
1998	3,760	Rainbow Trout	Catchable
2000	180	Bluegill	Adult

RECOMMENDATIONS

1. Resurvey in 2013 to continue to monitor this fishery.

2. Continue to monitor and remove largemouth bass juveniles for stocking into other public waters as needed.

Table 7. Trap net (TN) and electrofishing (EF) CPUE for all fish species sampled in Dakotah Lake since the last eradication in 1992.

Species	2004	2007	2010
Black Bullhead (TN)	0.9	5.0	36.3
Black Crappie (TN)	0.6	--	--
Largemouth Bass (EF)	132.0	177.0	348.0
Largemouth Bass (TN)	0.2	0.1	1.5
Bluegill (TN)	25.3	26.8	30.0