

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-48

Name: Bear Butte Lake

County: Meade

Legal description: Sec 25 & 30, T 6N, R 7E

Location from nearest town: 4 mi. W, 2.5 mi. N of Sturgis, SD

Dates of present survey: July 6-8, 29, September 23, 2015

Date last surveyed: June 18-20, August 26, 2014

Management classification: Warmwater semi-permanent

Primary Species: (game and forage)

1. Largemouth bass
2. Yellow perch
3. Black crappie
4. Northern pike

Secondary and other species:

1. Green sunfish
2. Gizzard shad
3. Walleye
4. Black bullhead

PHYSICAL CHARACTERISTICS

Surface Area: 180 acres

Watershed: 2,000 acres

Maximum depth: 13 feet;

Mean depth: 7 feet

Lake elevation at survey (from known benchmark): 3 feet below full pool

Ownership of lake and adjacent lakeshore property

The lake and lakeshore are owned by the South Dakota Department of Game, Fish and Parks. Bear Butte State Park manages the lakeshore property adjacent to the lake.

Fishing Access

Bear Butte Lake is surrounded by a state park which provides public access to the entire shoreline (Figure 1). A state park entrance license is required. A gravel road, 203rd Street, runs adjacent to the north side of the lake and provides access to a concrete plank boat ramp on the northeast side of the lake. A picnic/parking area is on the north central side and a fishing pier and campground is on the northwest side of the lake. A smaller, unnamed gravel road provides access to the south side of the lake.

Observations of Water Quality and Aquatic Vegetation

Emergent vegetation is present in varying amounts, especially on the east side, consisting mostly of cattail. Submerged vegetation is excessive from mid summer to freeze up with large amounts of clasping leaf and sago pondweed.

Observations on condition of all structures, i.e. spillway, level regulators, boat ramps, etc.

The boat ramp is a new concrete ramp, installed during the summer of 2013. No other structures were inspected for condition.

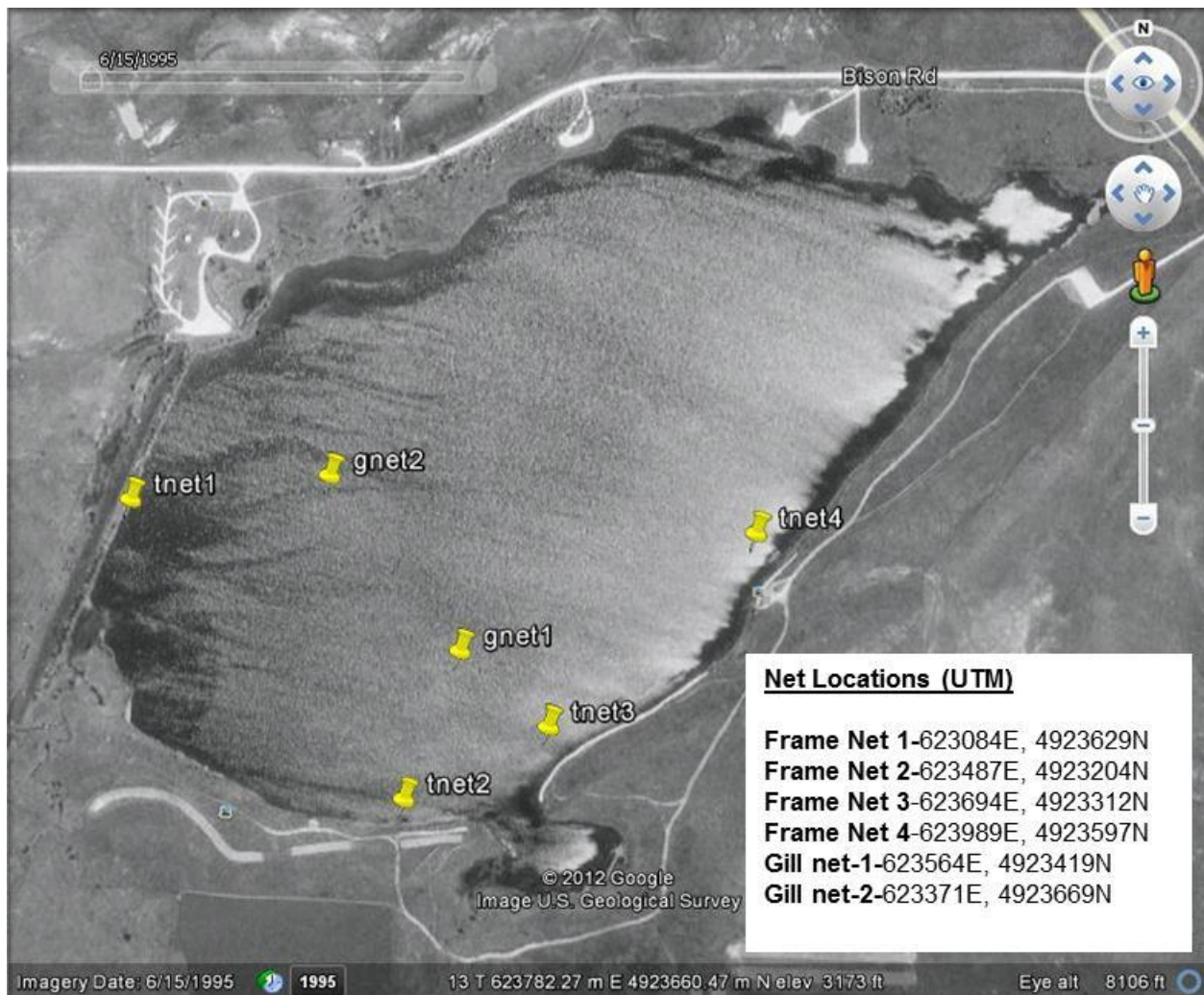


Figure 1. Locations, including GPS points, of experimental gill nets (gnet) and trap nets (tnet) during the annual fishery survey of Bear Butte Lake, Meade County, South Dakota, 2014.

MANAGEMENT OBJECTIVES, STRATEGIES AND ACTIONS

- Objective 1.** Maintain largemouth bass PSD between 40 and 70 and maintain bluegill, black bullhead, yellow perch and black crappie PSD's at 20 or greater.
- Objective 2.** Provide channel catfish and northern pike to add to angler opportunity.
- Objective 3.** Work towards improving fish condition and growth through stockings of forage fish.
- Objective 4.** Annually provide catchable rainbow trout to add to winter angler opportunity.

BIOLOGICAL DATA

Sampling Effort and Catch

Adult Fish survey

Trap nets and gill nets were used on July 8-10, 2015 to sample adult fish populations in the lake (Figure 1). Forty minutes of night electrofishing was completed on September 23 to sample largemouth bass and walleye (Table 2). The net sampling consisted of ten trap net nights, catch data is displayed in Tables 1. Twenty five minutes of daytime electrofishing was completed on July 29 to index gizzard shad reproduction (Table 5). Discussion on selected fish species follows and completes this report.

Table 1. Catch data from all species collected in ten trap nets in Bear Butte Lake, Meade County, July 8-10, 2015. CPUE's are listed with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr \geq S$ values are listed with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
Black bullhead	4,042	404.2 (142.9)	404.2 (142.9)	0 (--)	0 (--)	88.0 (0.9)
Black crappie	62	6.2 (3.0)	6.2 (3.0)	100 (--)	13 (7)	95.2 (0.5)
Bluegill	3	0.3 (0.2)	0.3 (0.2)	--	--	125.6 (4.2)
Northern pike	6	0.6 (0.4)	0.6 (0.4)	--	--	78.8 (3.3)
Walleye	2	0.2 (0.2)	0.2 (0.2)	--	--	--
Yellow perch	12	1.2 (0.7)	1.2 (0.7)	83 (20)	17 (20)	84.3 (2.9)

Table 2. Catch data for largemouth bass, smallmouth bass and walleye collected from 40 minutes of electrofishing in Bear Butte Lake, Meade County, South Dakota, September 23, 2015. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr \geq S$ values with 90% confidence intervals in parentheses

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
Largemouth bass	6	9.0 (2.8)	9.0 (2.8)	--	--	110.1 (10.5)
Smallmouth bass	1	1.5 (2.5)	1.5 (2.5)	--	--	102.6 (--)
Walleye	15	22.5 (16.2)	22.5 (16.2)	33 (23)	0	102.5 (1.6)

Black bullhead

Black bullhead continue to dominate the fish population of Bear Butte Lake, comprising 97.9% of the trap net catch. Black bullhead trap net catch rates fell from 879.9 in 2014 to 404.2 in 2015 (Tables 1 and 3). Size structure was low with no fish sampled over quality length (230 mm) for the past four years (Figure 2). The length frequency indicates an overabundant year class likely experiencing slow growth. All black bullhead sampled were removed from the lake. Stockings of largemouth bass, channel catfish, walleye and northern pike have been completed the past few years to in efforts to increase densities of predatory fish. It is intended that the higher predatory pressures on the abundant black bullhead population will also help decrease black bullhead density and increase size structure.

Table 3. Composite listing of data for black bullhead collected by trap nets in Bear Butte Lake, Meade County, 2010-2015. CPUE's are listed with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr \geq S$ are listed with 90% confidence intervals in parentheses.

Year	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
2010	6,435	919.3 (583.8)	260.4 (165.4)	14 (2)	0	*90.1 (4.0)
2011	7,794	1,948.5 (701.5)	863.8 (310.7)	11 (1)	0	80.5 (4.3)
2012	6,060	757.5 (223.6)	757.5 (223.6)	0	0	78.2 (2.2)
2013	16,928	2,116.0 (608.5)	2,116.0 (608.5)	0	0	82.4 (2.0)
2014	7,039	879.9 (451.6)	879.9 (451.6)	0	0	90.1 (1.7)
2015	4,042	404.2 (142.9)	404.2 (142.9)	0	0	88.0 (0.9)

*gill net data

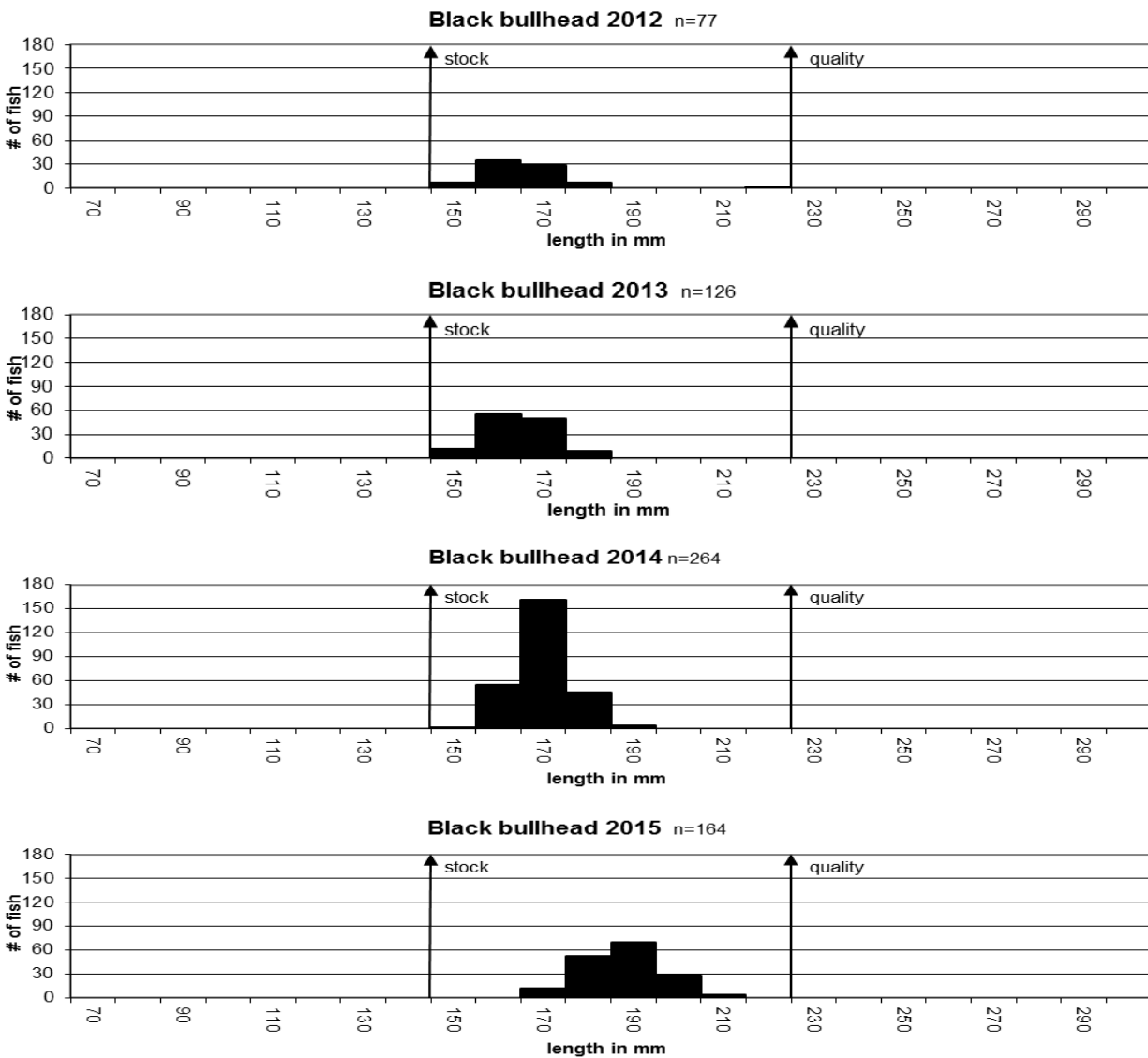


Figure 2. Length frequency histograms for black bullhead sampled from trap nets in 2012-2015, Bear Butte Lake, Meade County, South Dakota.

Black crappie

The black crappie population also appears to be dominated by one year class. Trap net CPUE was 6.2 in 2015, down from 26.8 in 2014 (Table 1). Fish condition was good with a *Wr* for stock length and larger fish of 95.2. Size structure was high with a PSD of 100 (Figure 3).

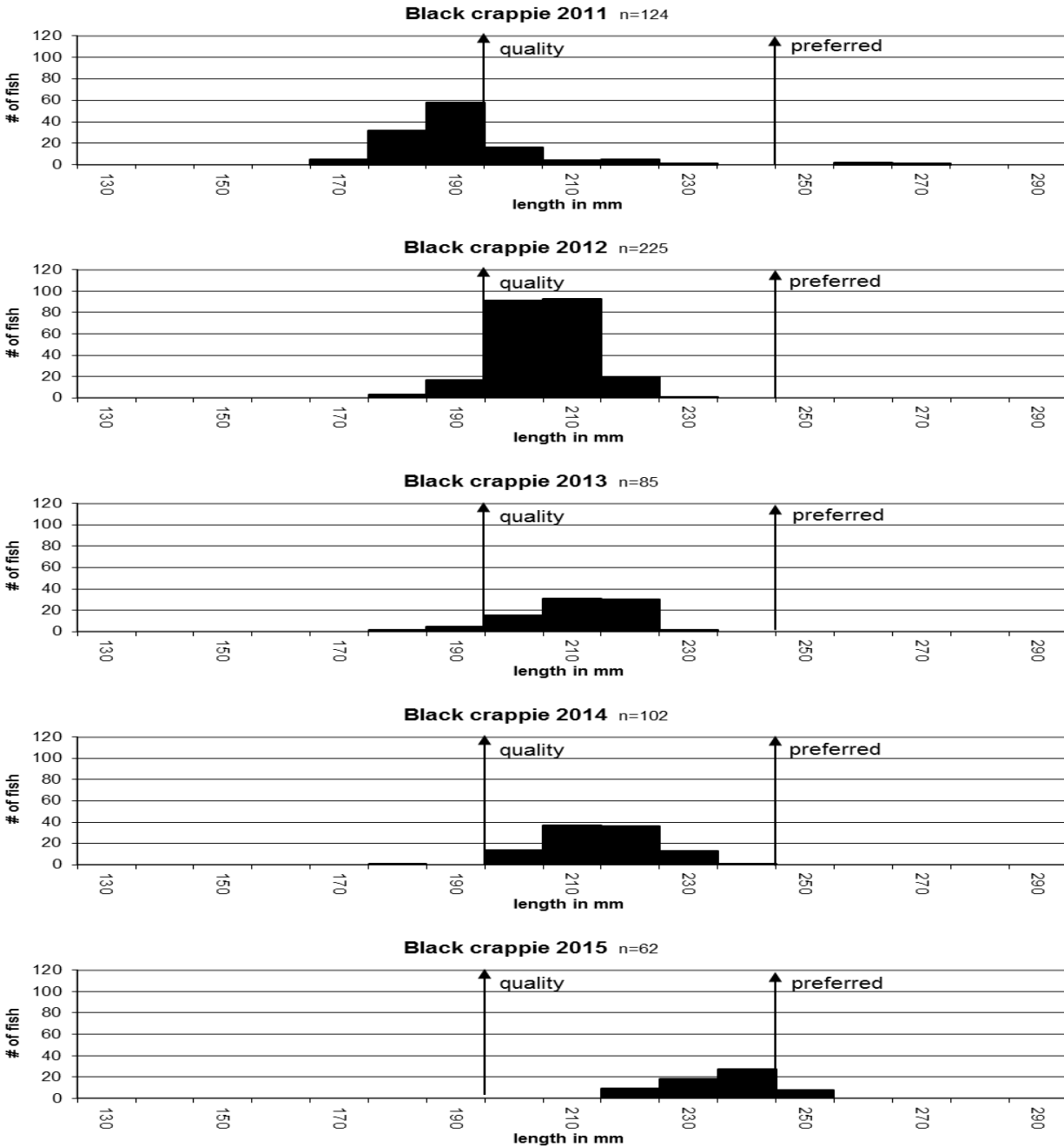


Figure 3. Length frequency histogram of black crappie sampled with trap nets from Bear Butte Lake, 2011-2015.

Gizzard shad

Twenty nine adult gizzard shad were stocked in the spring of 2015. The objective was to provide additional forage game species. Reproduction occurred with an overall catch rate of 2,518 young of year shad per hour (Table 5). This was the highest recorded in the region for lakes that were sampled in 2015.

Table 5. Site number, number collected per site (No./Site), effort, and estimated number per hour of gizzard shad sampled using daytime electrofishing from Bear Butte Lake, Meade County, South Dakota, July 29, 2015.

Site	No./Site	Effort (sec)	No./hr
1	440	300	5280
2	91	300	1092
3	85	300	1020
4	426	300	5112
5	7	300	84
Total	1,049	0.42 hr	2,518.0

RECOMMENDATIONS

1. Continue to remove black bullheads and monitor fish populations annually until management objectives have been achieved.
2. Stock catchable rainbow trout in the fall to add to ice angling opportunity.
3. Continue annual stocking of gizzard shad as a forage fish.

LITERATURE CITED

Willis, David W. Daniel A. Isermann, Matthew J. Hubers, Bruce A. Johnson, William H. Miller, Todd R. St. Sauver, Jason S. Sorensen, and Eric G. Unkenholz. 2001. Growth of South Dakota Fishes: A Statewide Summary with Means by Region and Water Type. South Dakota Game, Fish and Parks Special Report. Pierre, SD.

APPENDIX

Appendix A. Stocking history, including year, number, species and size of fish stocked in Bear Butte Lake, Meade County, South Dakota, 2008-2015.

Year	Number	Species	Size
2008	230	Black crappie	Adult
	2,400	Fathead minnow	Adult
	5,620	Largemouth bass	Fingerling
2009	500	Yellow perch	Adult
	570	Channel catfish	Adult
	13,000	Largemouth bass	Fingerling
2010	50	Golden shiner	Adult
	900	Yellow perch	Adult
	20,000	Walleye	Fingerling
	110	Northern pike	Adult
2011	77,600	Northern pike	Fry
	200	Channel catfish	Adult
	700	Yellow perch	Adult
	10,000	Largemouth bass	Fingerling
	150	Largemouth bass	Adult
2012	341	Yellow perch	Adult
	350	Largemouth bass	Adult
2014	305	Northern pike	Adult
	1,875	Largemouth bass	Fingerling
	100	Largemouth bass	Adult
	3,238	Walleye	Large fingerling
	100	Rainbow trout	Catchable
2015	55	Channel catfish	Adult
	20	Northern pike	Adult
	29	Gizzard shad	Adult
	190	Largemouth bass	Adult
	900	Walleye	Large fingerling
	600	Rainbow trout	Catchable