

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-46

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 1-3, 2013

Date last surveyed: June 12-14, 2012

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. Fathead Minnow
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 lots of Claspings 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.

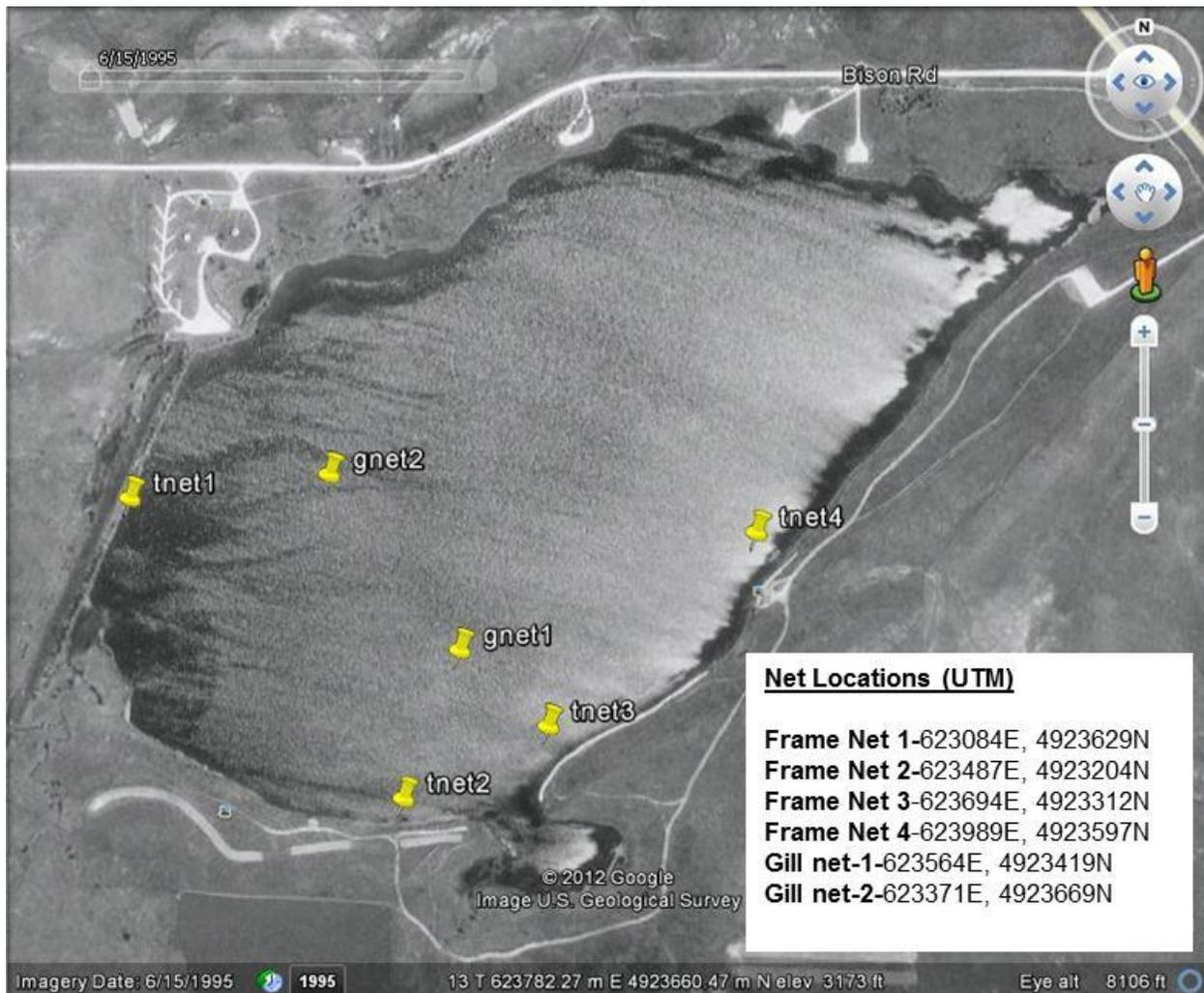


Figure 1. Locations, including GPS points, of experimental gill nets (gnets) and trap nets (tnets) during the annual fishery survey of Bear Butte Lake, Meade County, South Dakota, 2013.

CURRENT 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 to add to angler opportunity.
- Objective 3.** Provide Northern Pike to add to angler opportunity
- Objective 4.** Annually provide catchable Rainbow Trout to add to winter angler opportunity.

BIOLOGICAL DATA

Sampling Effort and Catch

Adult Fish survey

Trap and gill nets were used on July 1-3, 2013 to sample adult fish populations in the lake (Figure 1). Trap nets were modified fyke nets consisting of a 1.3 X 1.5 m frame, 19.1 mm (0.75 in) mesh and a 1.2 X 23 m (3.9 X 75.5 ft) lead. The gill net was an experimental-type measuring 45.7 m (150 ft) long and 1.8 m (6 ft) deep with six 7.6 m (25 ft) panels with bar mesh sizes: 12.7 mm (0.5 in), 19.1 mm (0.75 in), mm (1.25 in), 38.1 mm (1.5 in), and 50.8 mm (2.0 in). The net sampling consisted of eight trap net nights and one gill net night and catch data is displayed in Tables 1 and 2. Discussion on selected fish species follows and completes this report.

Table 1. Catch data from all species collected in eight trap nets in Bear Butte Lake, Meade County, July 1-3, 2013. 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	16,928	2,116.0 (608.5)	2,116.0 (608.5)	0	0	78.2 (2.2)
Black Crappie	85	10.6 (4.2)	10.6 (4.2)	92 (5)	0	96.6 (0.6)
Bluegill	3	0.4 (0.4)	0.4 (0.4)	--	--	106.4 (8.2)
Largemouth Bass	1	0.1 (0.2)	0.1 (0.2)	--	--	102.3 (--)
Northern Pike	4	0.5 (0.5)	0.4 (0.4)	--	--	87.3 (--)
Walleye	2	0.3 (0.2)	0.1 (0.2)	--	--	75.5 (--)
Yellow Perch	46	5.8 (2.9)	5.8 (2.9)	43 (13)	0	79.6 (0.6)

Table 2. Catch data from all species collected in one gill net in Bear Butte Lake, Meade County, July 1-3, 2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and Wr with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
Black Bullhead	159	79.5 (143.1)	79.0 (144.7)	0	0	82.4 (2.0)
Black Crappie	2	1.0 (0.0)	1.0 (0.0)	--	--	105.7 (--)
Channel Catfish	7	3.5 (4.6)	3.5 (4.6)	--	--	91.1 (6.9)
Northern Pike	4	2.0 (0.0)	2.0 (0.0)	--	--	103.7 (41.6)
Rainbow Trout	1	0.5 (1.5)	0.5 (1.5)	--	--	--

Black Bullhead

Black Bullheads continue to dominate the fish population of Bear Butte Lake comprising 99.2% of the trap net catch and 91.9% of the gill net catch. Black Bullhead catch rates were the highest recorded in recent years with a trap net CPUE of 2,116.0 (Tables 1 and 3). Size structure was low with no fish sampled over quality length (230 mm) for the past two years (Figure 2). The length frequency shows an overabundant year class apparently experiencing no growth, as sizes were 160-170 mm, the same as last year. As expected, fish condition was poor with a $Wr \geq S$ of 78.2 from the trap net sample.

All Black Bullhead sampled were removed from the lake to help reduce density. Stockings of Largemouth Bass, Channel Catfish, Walleye and Northern Pike have been completed the past few years 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, 2010-2013. 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)

*gill net data

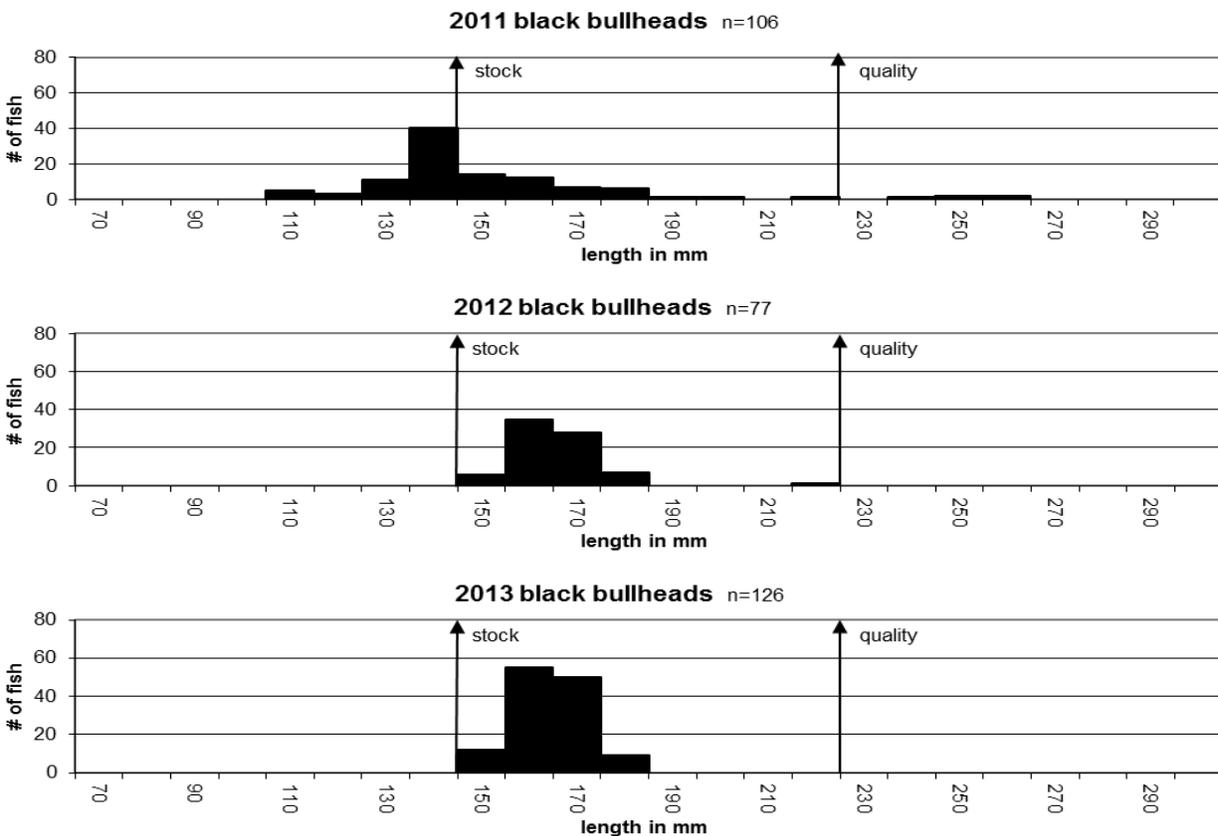


Figure 2. Length frequency histograms for Black Bullheads sampled from trap nets in 2011-2013, Bear Butte Lake, Meade County, South Dakota.

Black Crappie

After the lake refilled in 2008, two hundred-thirty adult Black Crappies were stocked to reintroduce them to the lake. It appears the Black Crappie population has been reestablished with a trap net CPUE of 10.6 (Table 1), down from 123.3 last year. Fish condition was good with a Wr for stock length and larger fish of 96.6. Size structure stayed steady with a PSD of 92. Despite the overabundance of Black Bullheads, Black Crappies have grown to a size large enough to provide a quality fishery at Bear Butte Lake (Figure 3).

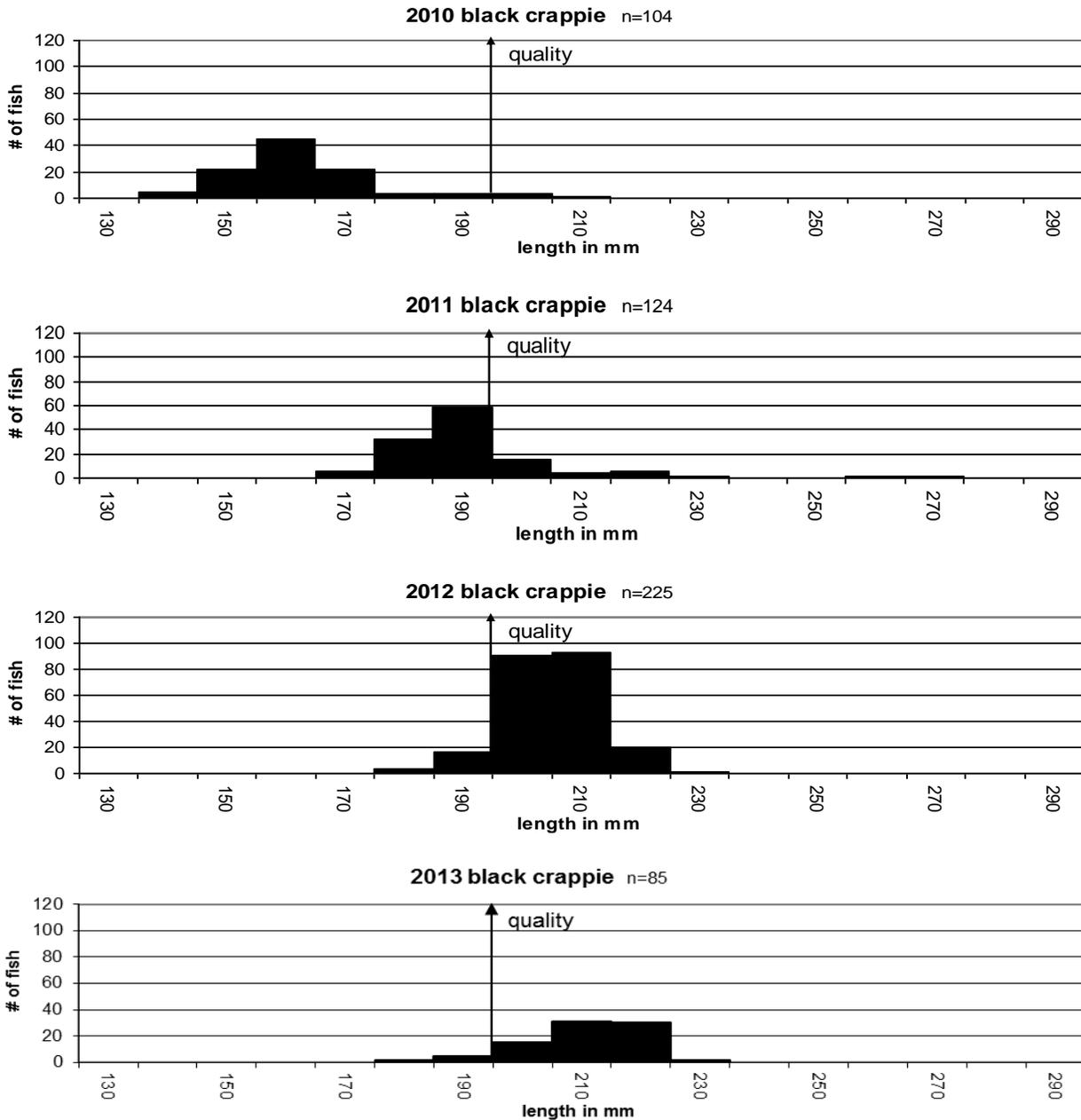


Figure 3. Length frequencies of Black Crappies sampled from Bear Butte Lake, 2010-2013.

Yellow Perch

In 2009, 1,400 pre-spawn Yellow Perch were stocked after the lake refilled the year before. Trap net CPUE was 5.8 in 2013 (Table 1), compared to last year's CPUE at 8.0. Size structure remains similar to last year (Figure 4). Stock density values from the trap net sample yielded a PSD of 43 compared to 55 last year. Fish condition was on the low side with a $Wr \geq S$ of 79.6, which may be a result of competition with the abundant Black Bullhead.

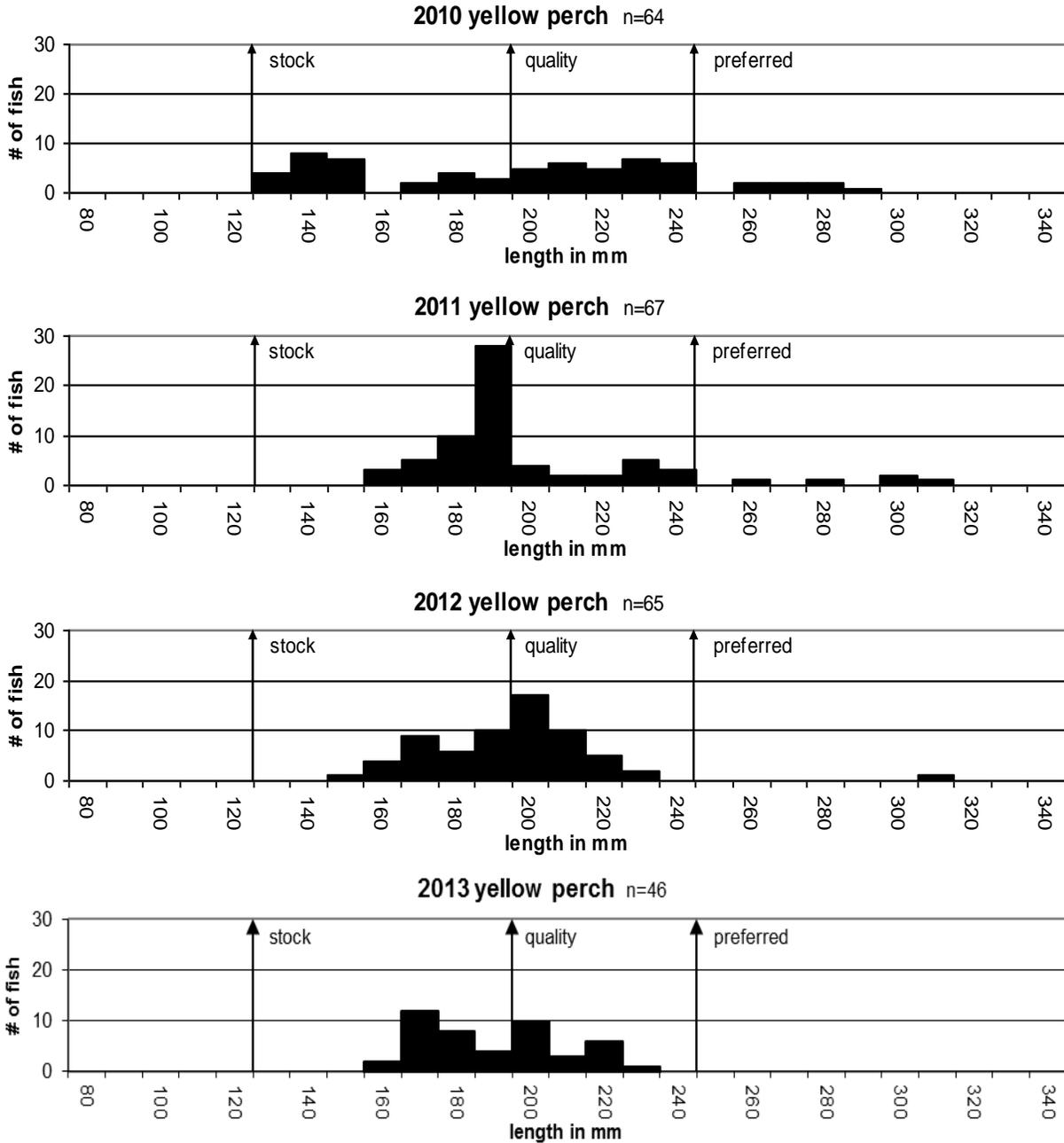


Figure 4. Length frequency histogram for Yellow Perch sampled from the trap nets in Bear Butte Lake, 2010-2013.

RECOMMENDATIONS

1. Continue to remove Black Bullheads and monitor fish populations annually until management objectives have been achieved.
2. Begin stocking Rainbow Trout in November 2014 to add to ice angling opportunity.

APPENDIX

Appendix A. Stocking history, including year, number, species and size of fish stocked in Bear Butte Lake, Meade County, South Dakota, 2008-2013.

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
2013	No fish stocked		