

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-46

Name: Belvidere Lake

County: Jackson

Legal description: Sec 32, T 2S, R 24E,

Location from nearest town: Within the city limits of Belvidere, South Dakota.

Dates of present survey: June 10-12, 2013

Date last surveyed: July 28-29, 2010

Management classification: Warmwater permanent

Primary Species: (game and forage)

1. Largemouth Bass

2. Bluegill

3. Black Bullhead

Secondary and other species:

1. Yellow Perch

2. Channel Catfish

3. Common Carp

PHYSICAL CHARACTERISTICS

Surface Area: 42.3 acres

Maximum depth: 8 feet

Lake elevation at survey (from known benchmark): full

Watershed: 5,800 acres

Mean depth: 4 feet

Ownership of lake and adjacent lakeshore property

Belvidere Lake is located on the east edge of the City of Belvidere, SD. The lake is owned by the city and there are no developed recreational facilities located around the lake. There is some private land near the northern side of the lake.

Fishing Access

There are some areas of emergent vegetation; however, open shorelines around large portions of the lake provide adequate shoreline access. During the later summer months shore angling may be difficult due to the dense submergent vegetation around the lake. Main street Belvidere (Hwy 63) runs through Belvidere Lake. However, to get to an adequate parking area anglers must turn onto Railway Street, and follow a low maintenance gravel road approximately 300 yards to the east. There is also a place where a small boat could be launched.

Observations of Water Quality and Aquatic Vegetation

There is emergent and submergent vegetation around Belvidere Lake. Emergent vegetation (mostly rushes and cattails) are around a large portion of the lake. During the later summer months dense submergent vegetation covers much of the shoreline. No apparent pollution problems were observed during the survey.

Observations on conditions of structures (i.e. spillway, boat ramps and docks, roads, etc)

There is a low maintenance gravel road (Railway Street) along the south side of the lake. Belvidere Lake does not have a concrete boat ramp or a dock. There were no apparent issues with the dam or spillway during the survey.

MANAGEMENT OBJECTIVES

- Objective 1.** Develop a quality Largemouth Bass/panfish fishery.
- Objective 2.** Provide Channel Catfish to add to angler opportunity and add a second predator that will prey on overabundant Black Bullheads.
- Objective 3.** Keep the Local Wildlife Conservation Officer and the public informed of fish management activities and solicit their input when planning future changes the fishery.

BIOLOGICAL DATA

Sampling Effort and Catch

Belvidere Lake was surveyed using four trap nets set overnight (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. During the 2013 trap net survey 6 fish species were collected, totaling 635 fish (Table 1).

An angling survey was also completed on June 10, 2013 to survey the Largemouth Bass population. A variety of lures of different sizes and colors popular to Largemouth Bass angling were used. During two angler hours only a single Largemouth Bass was collected. No other fish species were targeted during the angling survey and further discussion on this method is included with the Largemouth Bass portion of this report.

Results and Discussion

During the drought of the early to mid-2000s Belvidere Lake went completely dry. Belvidere Lake refilled and was stocked with Largemouth Bass and Bluegill fingerlings in 2008. The lake was stocked again in 2009 with Largemouth Bass fingerlings. In 2010, a fisheries survey was conducted and Largemouth Bass and Bluegill were collected in the sample. Other fishes (Black Bullhead and Yellow Perch) were also found during the 2010 survey. These fishes were not stocked by South Dakota Game, Fish, and Parks (SDGF&P) personnel. During the 2013 survey two additional species (Channel Catfish and Common Carp) were collected (Table 1). Prior to the drought, Belvidere Lake was last surveyed in 1999. During that survey only Largemouth Bass, Black Bullhead, and Green Sunfish were collected. Green Sunfish have not been collected in either of the past two surveys after the lake refilled.

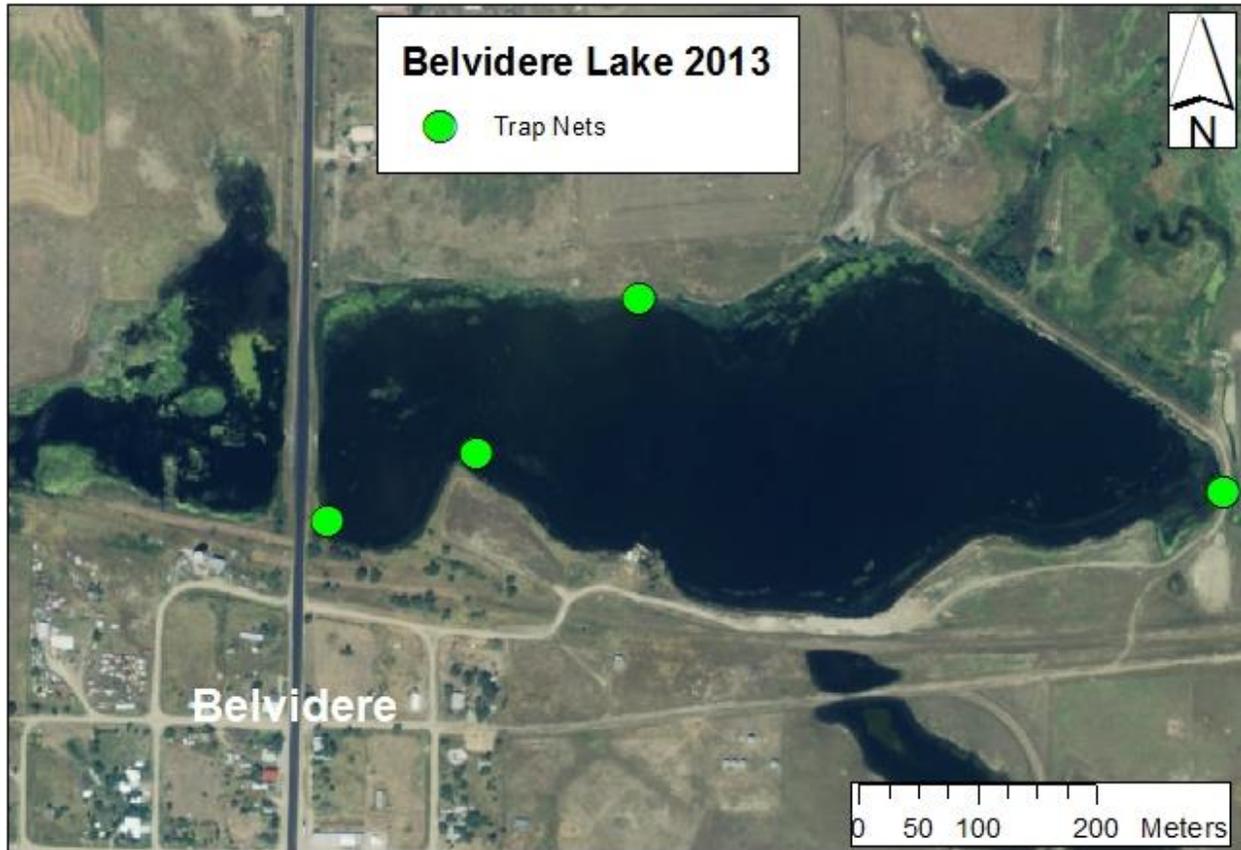


Figure 1. Map of Belvidere Lake net locations in 2013.

Table 1. Catch data from all species collected in four trap nets in Belvidere Lake, Jackson County, June 10-12, 2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr \geq S$ with 95% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
Black Bullhead	562	140.5 (89.6)	140.5 (89.6)	94 (2)	0	94.3 (1.7)
Bluegill	67	16.8 (8.6)	16.8 (8.6)	64 (12)	7 (7)	105.5 (0.5)
Yellow Perch	2	0.5 (0.5)	0.5 (0.5)	100	100	91.0 (53.6)
Largemouth Bass	1	0.3 (0.4)	0.3 (0.4)	0	0	79.9 (--)
Channel Catfish	1	0.3 (0.4)	0.3 (0.4)	100	0	107.1 (--)
Common Carp	2	0.5 (0.8)	0.3 (0.4)	0	0	128.0 (--)

Black Bullhead

Black Bullhead was the most abundant fish in the survey sample comprising 88.5% of the total fish sample. This is slightly higher than the 2010 survey when they made up 81% of the sample. Catch-per-unit-effort (CPUE) of stock length or greater bullheads increased from 76.5 in 2010 to 140.5 in 2013 (Table 1). The more notable change to the Belvidere Lake Black Bullhead population is the growth of the large year class that were mostly between 150 mm and 230 mm in 2010 to being mostly over quality length (230 mm) (Figures 2 and 3). The size

structure of the population increased from a proportional stock density (PSD) of zero in 2010 to a PSD of 94 in 2013 (Table 1). There were no Black Bullheads over preferred length (300 mm) in the survey sample (PSD-P= 0) (Table 1; Figure 3). Condition was good for Black Bullheads over stock length with a relative weight (*Wr*) of 94.3 (Table 1).

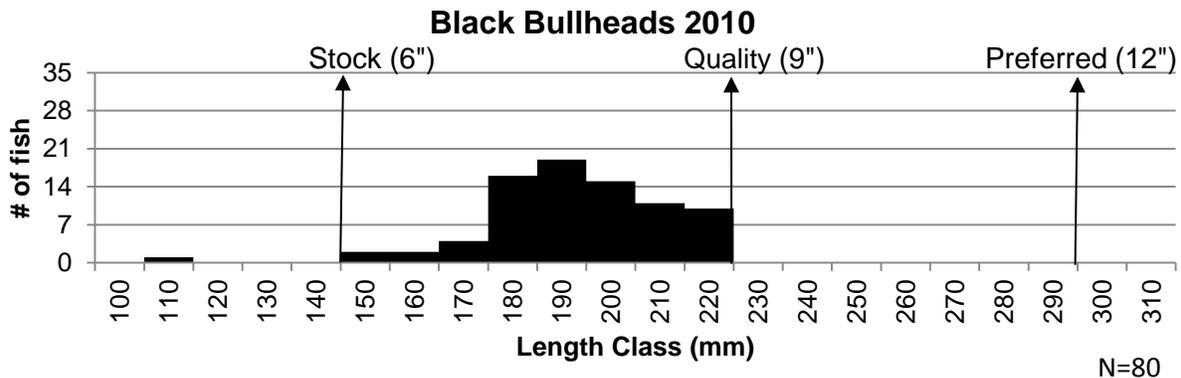


Figure 2. Length frequency histogram for Black Bullheads collected by trap net from Belvidere Lake in 2010.

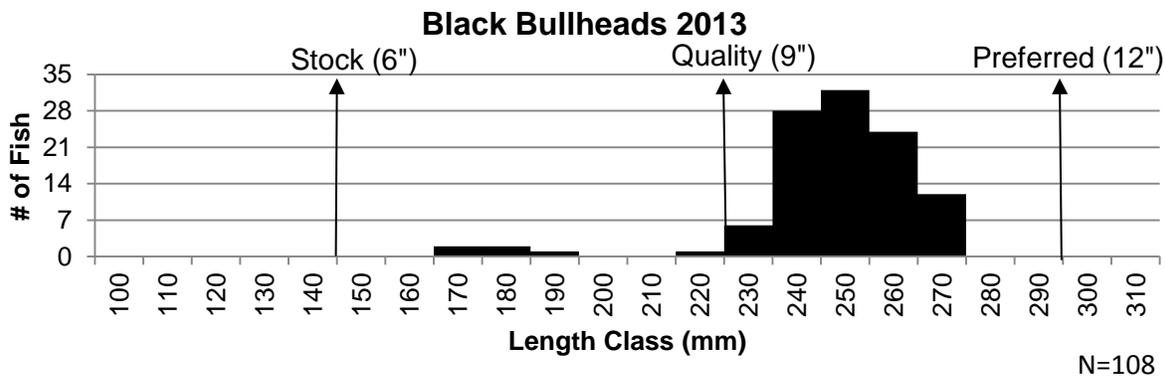


Figure 3. Length frequency histogram for Black Bullheads collected by trap net from Belvidere Lake in 2013.

Bluegill

Bluegill was the second most abundant fish collected during the 2013 survey representing approximately 10.5% of the sample (Table 1). Most of the Bluegills were between quality (150 mm; 6 in) and preferred (200 mm; 8 in) length during the 2010 survey (Figure 4). These fish were likely from the Bluegill fingerling stocking in 2010. In 2013, there was a at least two year classes, ranging from 120 mm to 190 mm and 200 to 230 mm (Figure 5). The larger fish may be the original Bluegill fingerlings stocked in 2008. Bluegill PSD and PSD-P was 64 and 7, respectively, in 2013. The condition of Bluegills greater than stock length in Belvidere Lake continues to be excellent with a mean $Wr_{\geq S}$ of 105.5 (Table 1).

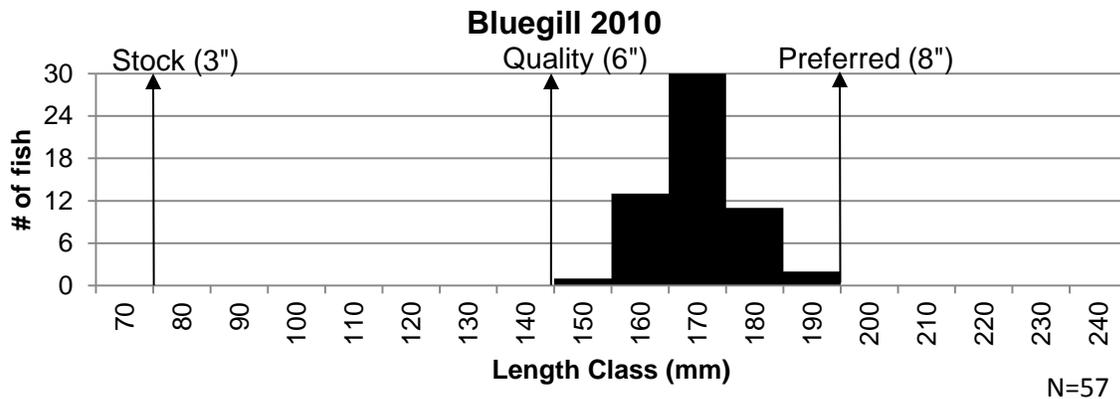


Figure 4. Length frequency histogram for Bluegill collected by trap net from Belvidere Lake in 2010.

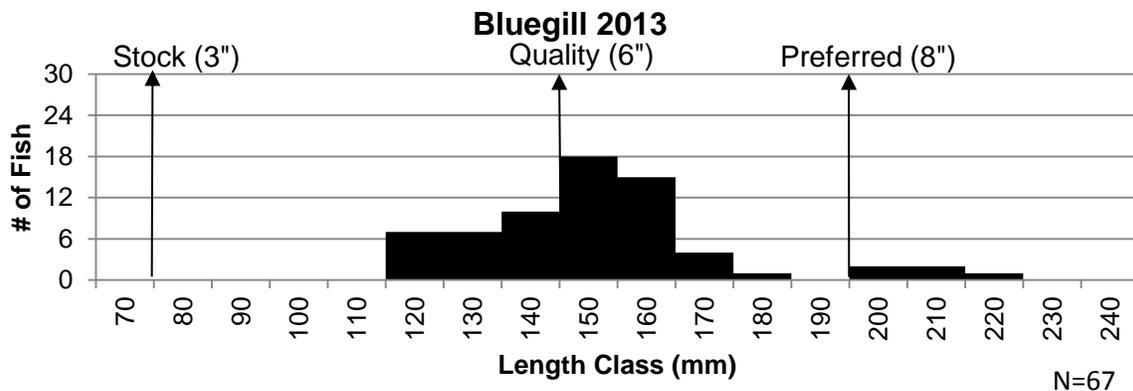


Figure 5. Length frequency histogram for Bluegill collected by trap net from Belvidere Lake in 2013.

Other Fishes

Yellow Perch, Channel Catfish, and Common Carp were collected during the 2013 survey. Yellow Perch were found in the 2010 survey as well. In 2013, two Yellow Perch were collected (Table 1). Both of the Yellow Perch surveyed were over preferred length (250 mm; 10 in) at 259 and 283 mm. A Channel Catfish measuring 524 mm and two Common Carp measuring 266 and 298 mm were also collected.

Angling Survey

Largemouth Bass

Largemouth Bass were sampled using two angler hours on Belvidere Lake in 2013. A single Largemouth Bass was collected measuring 193 mm in length. Belvidere Lake was very turbid and the water temperatures were fairly cool at the time of the angling survey as the result of heavy late spring and early summer precipitation and runoff. This made the angling conditions poor, and thus likely affected the success of the angling survey.

In 2010, 16 Largemouth Bass were collected in the trap nets and none of the fish were over quality length (300 mm; 12 in). There was one Largemouth Bass collected in the trap nets during the 2013 survey as well (Table 1). That fish was also under quality length.

These results are no indication on the status of the Belvidere Lake Largemouth Bass population in 2013. Anglers at Belvidere Lake indicated that they had caught Largemouth Bass reaching nearly 5 pounds (personal comm. with anglers). Size structure of Black Bullheads was very good (Table 1; Figure 2) and could be an indicator of a strong Largemouth Bass population. Both of the above mentioned are speculation and further examination of the Largemouth Bass in Belvidere Lake is necessary to assess the population.

MANAGEMENT RECOMMENDATIONS

1. Conduct another Largemouth Bass survey to get a better understanding of the population.
2. Stock Largemouth Bass and/or Bluegill as necessary to maintain growth and a fishable population of both species.
3. Conduct further surveys as necessary to evaluate stocking success, and to ensure a fishery is maintained.

APPENDIX

Appendix A. Stocking record for Belvidere Lake, Jackson County, 2008-2013.

Year	Number	Species	Size
2008	15,000	Bluegill	Fingerling
2008	2,000	Largemouth Bass	Fingerling
2009	5,000	Largemouth Bass	Fingerling