

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-46

Name: Durkee Lake

County: Meade

Legal description: Sec 21 & 28, T 12N, R 17E

Location from nearest town: 3 miles south of Faith, SD

Dates of present survey: June 25-27, 2013

Date last surveyed: June 14, 25-27, 2012

Management classification: Warmwater permanent

Primary Species: (game and forage)

1. Largemouth Bass
2. Yellow Perch
3. Bluegill
4. Black Crappie

Secondary and other species:

1. Northern Pike
2. Channel Catfish
3. Black Bullhead
4. Golden Shiner

PHYSICAL CHARACTERISTICS

Surface Area: 70 acres

Watershed: 6,400 acres

Maximum depth: 20 feet

Mean depth: 15 feet

Lake elevation at survey (from known benchmark): -5 feet

Ownership of lake and adjacent lakeshore property:

The City of Faith owns Durkee Lake and the SD Department of Game, Fish and Parks manages the fishery in the lake. Hunting is illegal in or around Durkee Lake by city ordinance. A city-administered golf course is located adjacent to the lake.

Fishing Access

Fishing access is reasonable with a few shore fishing areas along the north side, but by June is very limited with heavy vegetation surrounding the entire lake. A boat ramp and dock are located on the north side. The concrete on the boat ramp was replaced during June 2013.

Observations of Water Quality and Aquatic Vegetation

Rooted aquatic vegetation consists of bulrushes and cattails. The vegetation covers approximately 90% of the shoreline. Submerged vegetation is excessive from mid summer until freeze up in all water under 8 feet. Siltation due to natural erosion and cattle grazing has decreased depth and area of the lake. No other pollution problems were identified by the department during the 2013 survey.

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

The dam grade was repaired in 1997, and is in good condition. A new boat ramp was put in by the city in June 2013.

MANAGEMENT OBJECTIVES

- Objective 1.** Maintain a Largemouth Bass fishery with a minimum night-time electrofishing CPUE for stock-length fish of 40, a PSD range between 40 and 70, PSD-P \geq 10.
- Objective 2.** Reach and maintain panfish (Bluegill, Black Crappie and Yellow Perch) trap-net CPUE greater than 10 and less than 75 for each species. Maintain PSD's greater than 30 for at least two of the panfish species.
- Objective 3.** Maintain a mean trap net CPUE of stock-length Black Bullhead $<$ 100 and PSD between 30 and 60.

BIOLOGICAL DATA

Sampling Effort and Catch

Trap nets and experimental gill nets were used on June 25-27, 2013 to sample adult fish populations in the reservoir (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 nets were 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 four gill net nights and catch data is displayed in Tables 1 and 2. Discussion on selected fish species follows and completes this report.

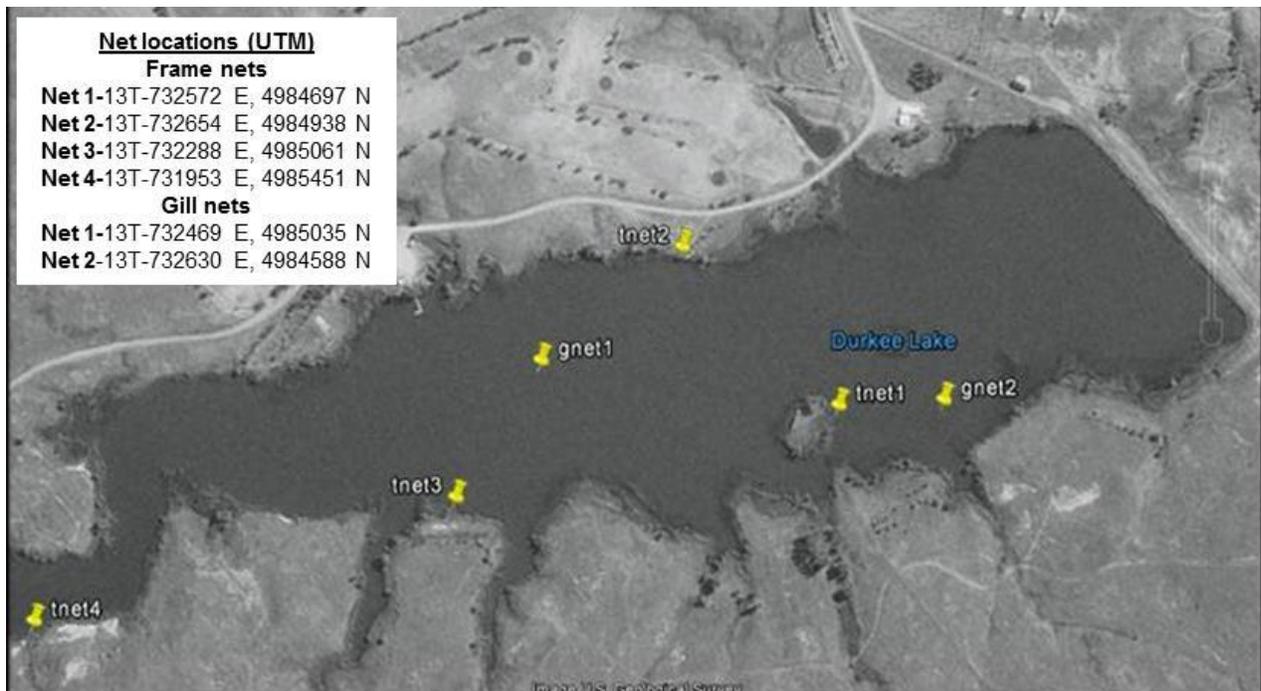


Figure 1. Locations of experimental gill (gnet) and trap (tnet) nets, including GPS coordinates, during the fisheries survey of Durkee Lake, Meade County, 2013

Table 1. Catch data from all fish species collected in eight trap nets in Durkee Lake, Meade County, June 25-27, 2013. CPUE 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	<i>Wr</i> ≥ S
Black Bullhead	2,967	370.9 (130.9)	370.9 (130.9)	3 (1)	0	--
Black Crappie	771	96.4 (36.7)	96.4 (36.7)	10 (2)	1	99.0 (1.8)
Bluegill	656	82.0 (39.3)	82.0 (39.3)	60 (4)	0	104.8 (1.6)
Northern Pike	5	0.6 (0.4)	0.6 (0.4)	--	--	83.7 (1.7)
Yellow Perch	10	1.3 (0.5)	1.3 (0.5)	20 (24)	0	93.0 (2.0)

Table 2. Catch data from all fish species collected in two experimental gill nets in Durkee Lake, Meade County, June 25-27, 2013. CPUE 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	<i>Wr</i> ≥ S
Black Bullhead	165	82.5 (32.3)	82.5 (32.3)	0	0	89.2 (1.1)
Black Crappie	8	4.0 (3.1)	4.0 (3.1)	--	--	122.4 (5.4)
Bluegill	1	0.5 (1.5)	0.5 (1.5)	--	--	96.6
Northern Pike	17	8.5 (1.5)	8.5 (1.5)	100	35(21)	94.8 (2.6)
Yellow Perch	24	12.0 (3.1)	12.0 (3.1)	4 (7)	4 (7)	93.5 (1.4)

Bluegill

Efforts were made to reestablish Bluegill by stocking 50 adult and 22,000 fingerlings during the summer of 2008 after a winterkill the previous winter. Catch rates continued to increase and peaked last year with a CPUE of 223.1 (Table 3). This year catch rates have fallen to 82.0 fish per trap net (Tables 1 and 3). Size structure has risen from a PSD of 5 last year, to 60 this year (Table 3) with most fish sampled over quality length (Figure 2). Fish condition also increased slightly to a *Wr* of 104.8, versus 101.7 last year. If Largemouth Bass abundance can be increased, size structure numbers should continue to get larger and provide a better quality and preferred size structure.

Table 3. Composite listing of data for Bluegill collected by trap nets in Durkee Lake, 2010-2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* with 90% confidence intervals in parentheses.

Year	N	CPUE	CPUE-S	PSD	PSD-P	<i>Wr</i> ≥ S
2010	49	12.3 (8.0)	12.3 (8.0)	49 (12)	16 (9)	108.8 (1.5)
2011	775	96.9 (19.5)	96.9 (19.5)	21 (3)	1 (1)	105.1 (1.7)
2012	1,562	223.1 (49.3)	223.1 (49.3)	5 (1)	0	101.7 (1.9)
2013	656	82.0 (39.3)	82.0 (39.3)	60 (4)	0	104.8 (1.6)

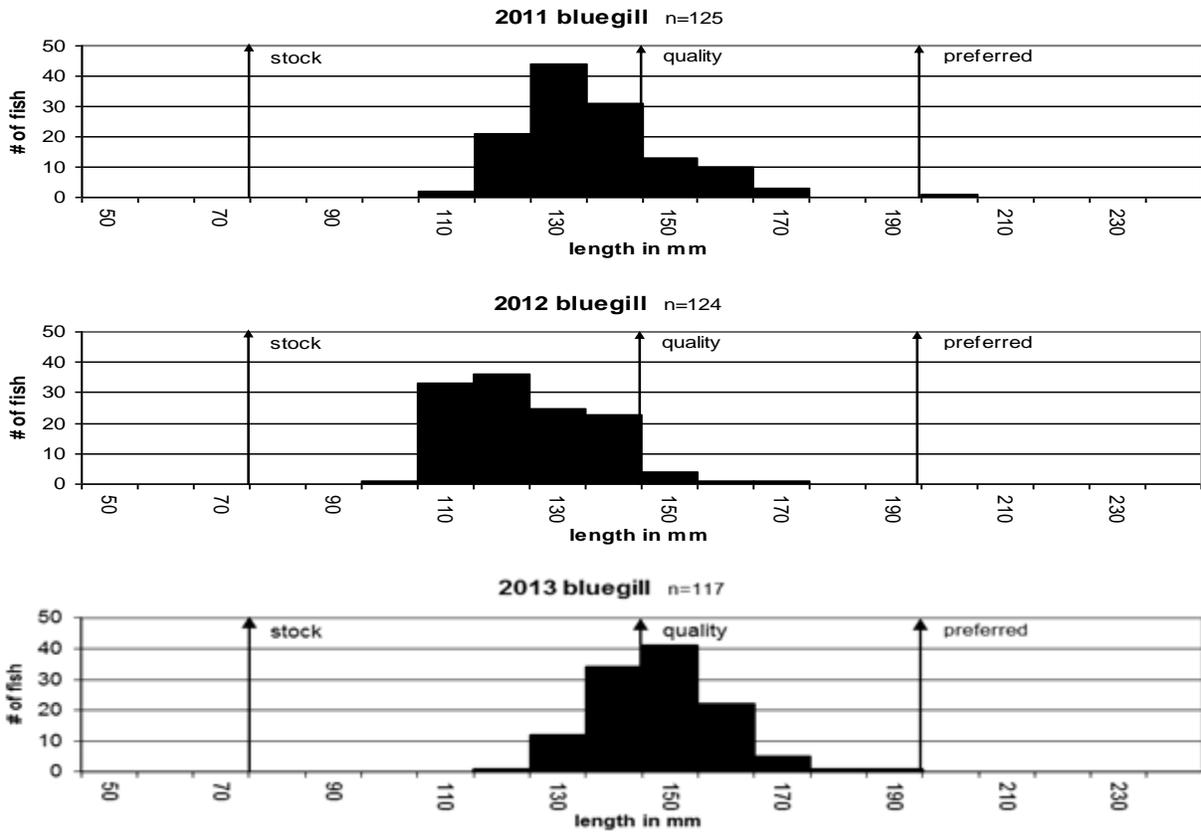


Figure 2. Length frequency histogram of Bluegill collected from trap nets in Durkee Lake 2011-2013.

Black Bullhead

Black Bullheads continue to dominate the catch during surveys and were the most abundant fish sampled in 2013. In 2010, Black Bullhead numbers peaked with a CPUE of 739.8 (Table 4). This year numbers have again increased to 370.9 per trap net. These numbers are above the management objectives for Durkee Lake. Size structure is characteristic of a high density, competing population with a small size structure (i.e. PSD of 3 with a PSD-P of 0). Fish condition was below average with a *Wr* for stock length and larger fish of 89.2. A large year class dominates the population with lengths ranging from 190-220 mm (Figure 3). The length frequency histogram indicates very little growth in the last three years.

Table 4. Composite listing of data for Black Bullhead collected by trap nets in Durkee Lake, 2010-2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* with 90% confidence intervals in parentheses.

Year	N	CPUE	CPUE-S	PSD	RSD-P	<i>Wr</i> ≥S
2010	2,959	739.8 (352.3)	490.5 (724.1)	54 (2)	5 (1)	91.0 (2.8)
2011	1,312	164.0 (58.9)	162.5 (58.3)	9 (1)	2 (1)	91.7 (2.7)
2012	1,644	234.9 (60.0)	234.9 (60.0)	4 (1)	2 (1)	81.3 (2.4)
2013	2,967	370.9 (130.9)	370.9 (130.9)	3 (1)	0	*89.2 (1.1)

*gill net data

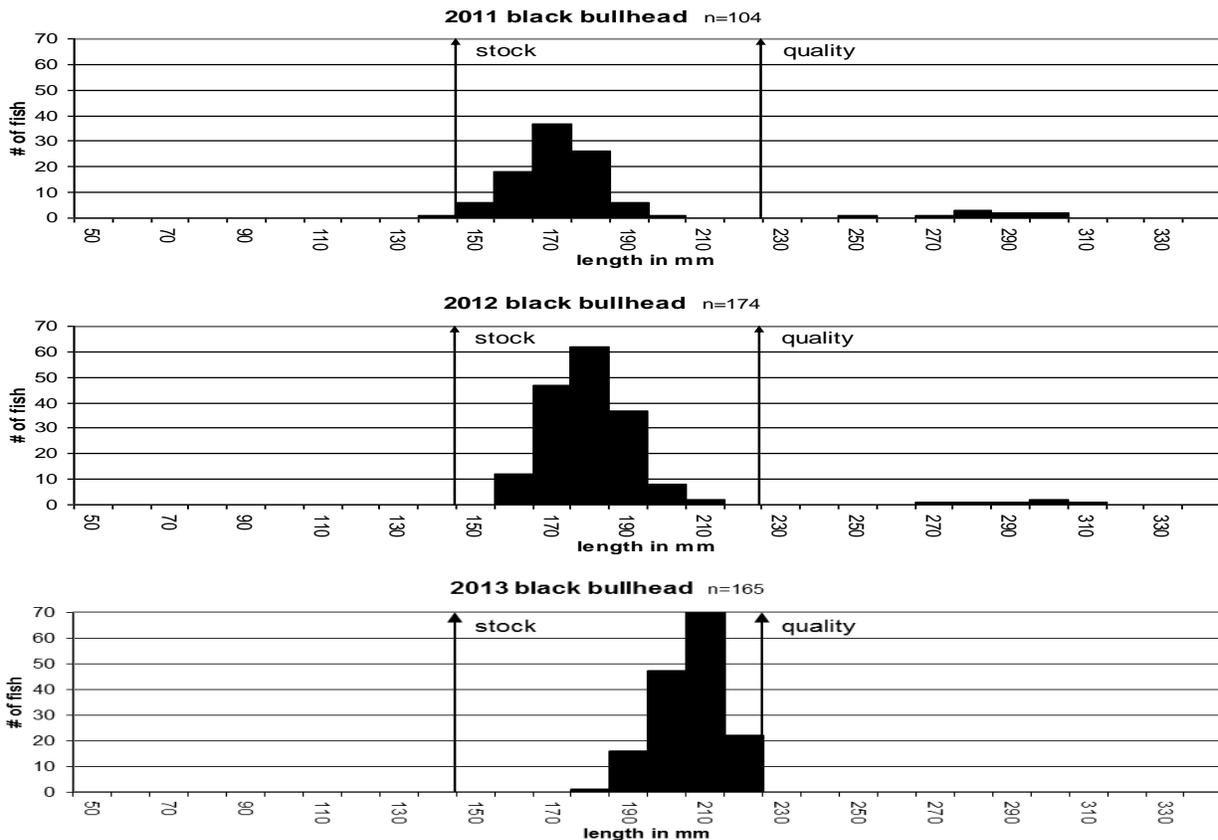


Figure 3. Length frequencies of Black Bullhead collected in Durkee Lake, 2011-2013. The 2011-2012 data is from trap nets and the 2013 data is from gill nets.

Black Crappie

After a winterkill in 2007, no Black Crappies were sampled in the 2008 survey. In 2009, 150 adults were stocked to reestablish Black Crappies in Durkee Lake. Last year, 31 Black Crappies were sampled in the trap nets and during this survey, trap net CPUE was 96.4 (Tables 1 and 5). PSD increased slightly from 6 last year to 10 this year (Table 5). Fish condition remains good with a *Wr* of 99.0. These numbers are below the objectives currently set for panfish in Durkee Lake. The length frequency shows a good number of fish just below quality length (Figure 4).

Table 5. Composite listing of data for Black Crappie collected by trap nets in Durkee Lake, 2010-2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* with 90% confidence intervals in parentheses.

Year	N	CPUE	CPUE-S	PSD	RSD-P	<i>Wr</i> ≥S
2010	1	0.3 (0.4)	0.3 (0.4)	--	--	82.5 (--)
2011	21	2.6 (0.8)	2.6 (0.8)	0	0	104.6 (0.2)
2012	31	4.4 (1.7)	4.4 (1.7)	6 (--)	0	98.5 (1.5)
2013	771	96.4 (36.7)	96.4 (36.7)	10 (2)	1	99.0 (1.8)

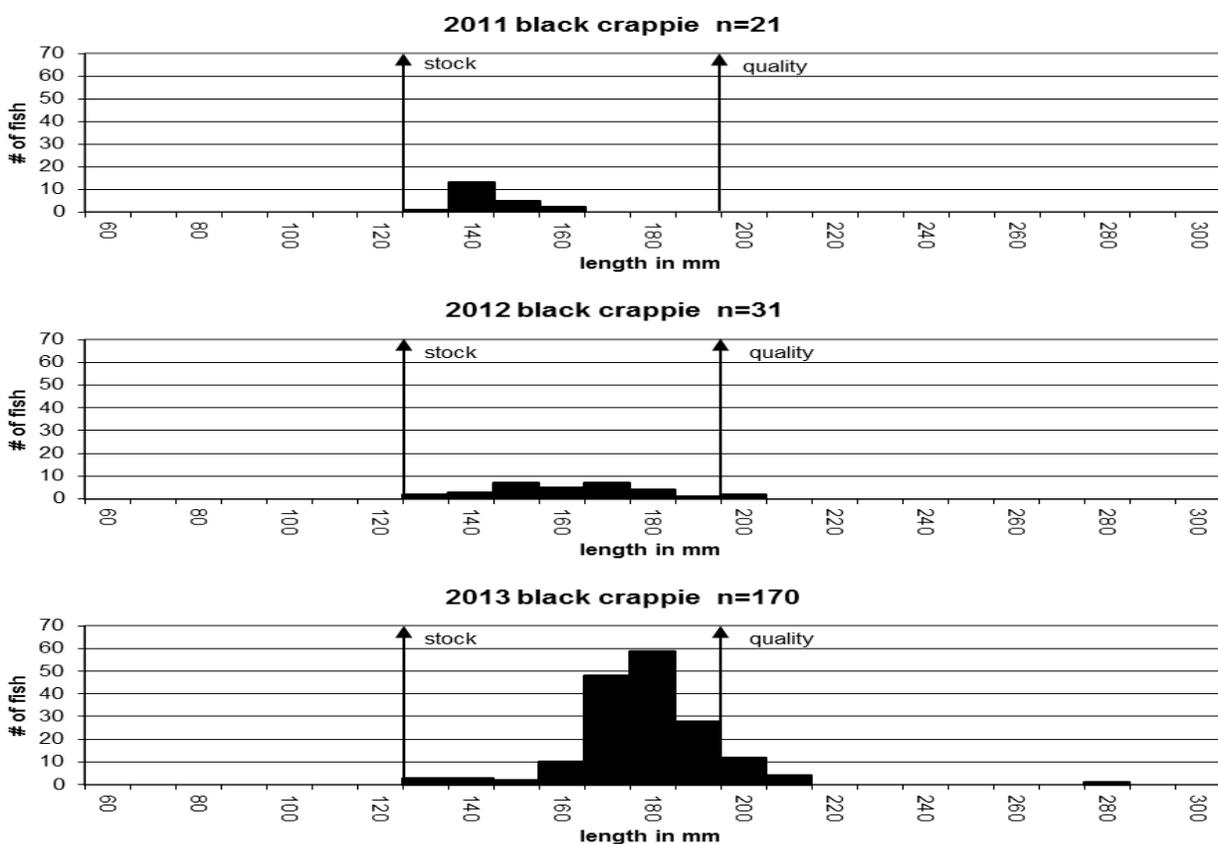


Figure 4. Length frequency histogram of Black Crappie collected in Durkee Lake, 2011-2012.

Northern Pike

The Northern Pike population remains at a fairly low density with a trap net CPUE of 0.6 and a gill net CPUE of 8.5 (Tables 1 and 2). Last survey, trap net CPUE was 2.0 with a gill net CPUE of 3.0. The seventeen Northern Pike sampled in the gill nets this year yielded an average *Wr* for stock length and larger fish of 94.5, which is good for a small impoundment in western South Dakota. All but one fish in the sample were greater than quality length (Figure 5) showing limited recruitment in recent years, possibly due to lower water levels.

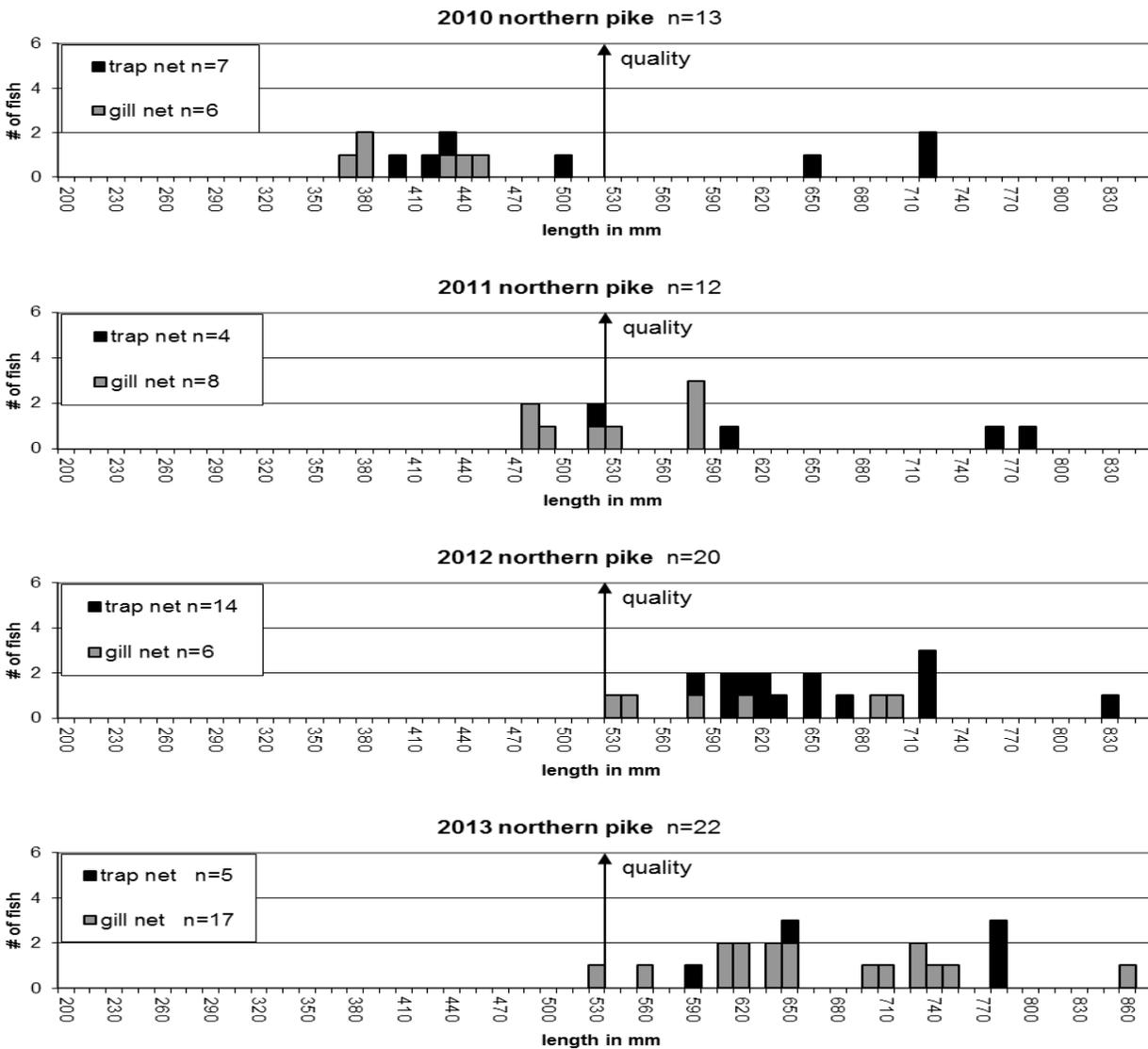


Figure 5. Length frequency histogram of Northern Pike collected by trap nets and gill nets in Durkee Lake, 2010-2013.

Yellow Perch

The Yellow Perch density remained similar to 2012 when gill net CPUE was 13.5 (Table 6). This survey gill net CPUE was 12.0. Fish condition was average with a *Wr* for stock length and longer fish of 93.5 (Table 6). Size structure remains low with a PSD of 4, compared to zero last year. The length frequency histogram shows some recruitment with few fish reaching the quality length of eight inches (Figure 6). The lake completely filled in October of 2013 after an early snow storm and high water conditions should help the Yellow Perch population grow and provide a quality fishery.

Table 6. Composite listing of data for Yellow Perch collected by gill nets in Durkee Lake, 2010-2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr_{\geq S}$ with 90% confidence intervals in parentheses

Year	N	CPUE	CPUE-S	PSD	RSD-P	$Wr_{\geq S}$
2010	5	5.0 (--)	0.0 (--)	--	--	--
2011	22	11.0 (9.2)	2.5 (1.5)	0	0	90.0 (8.9)
2012	27	13.5 (20.0)	9.0 (9.2)	0	0	95.9 (1.5)
2013	24	12.0 (3.1)	12.0 (3.1)	4 (7)	4 (7)	93.5 (1.4)

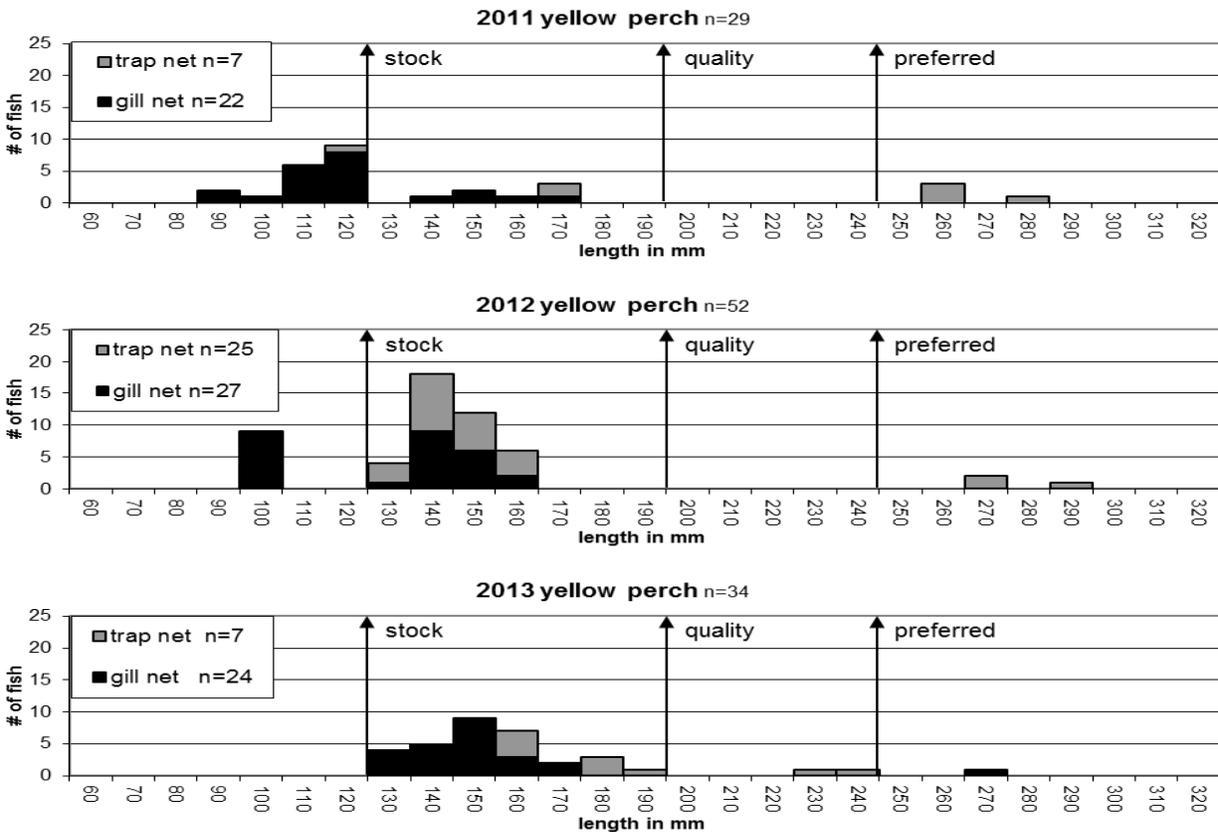


Figure 6. Length frequency histogram of Yellow Perch collected in experimental gill and trap nets in Durkee Lake, 2011-2013.

RECOMMENDATIONS

1. Continue conducting night electrofishing surveys annually to monitor the Largemouth Bass population in Durkee Lake.
2. Re-evaluate Yellow Perch, Bluegill and Black Bullhead populations in 2014 with a netting survey. Remove Black Bullheads to reduce density. Use the Bluegill population as a source of adult fish for transferring to other waters.

3. Stock adult Largemouth Bass when available to increase predation on over abundant panfish species which will bring their numbers more into objective ranges

APPENDIX

Appendix A. Stocking history, including year, number, species and size of fish stocked into Durkee Lake, Meade County, South Dakota, 2000-2013.

Year	Number	Species	Size
2000	500	Black Crappie	Adult
	8,500	Largemouth Bass	Fingerling
2002	7,700	Largemouth Bass	Fingerling
	589	Largemouth Bass	Adult
	100	Smallmouth Bass	Adult
2008	192,500	Northern Pike	Fry
	50	Bluegill	Adult
	22,000	Bluegill	Fingerling
	200	Largemouth Bass	Adult
	10,000	Largemouth Bass	Fingerling
2009	1,155	Largemouth Bass	Juvenile
	150	Black Crappie	Adult
2011	400	Yellow Perch	Adult