

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-48

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 8, 15-17, 2015

Date last surveyed: June 2, 16-18, 2014

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): full

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 in 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 less than 8 feet of water. 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 2015 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 15-17, 2015 to sample fish populations in the reservoir (Figure 1). The net sampling consisted of eight trap net nights and two gill net nights. The catch data is displayed in Tables 1 and 2. Electrofishing was done on June 8, 2015. Water temperature was 75 degrees Fahrenheit. Catch data is listed in Table 3. Discussion on selected fish species follows and completes this report.

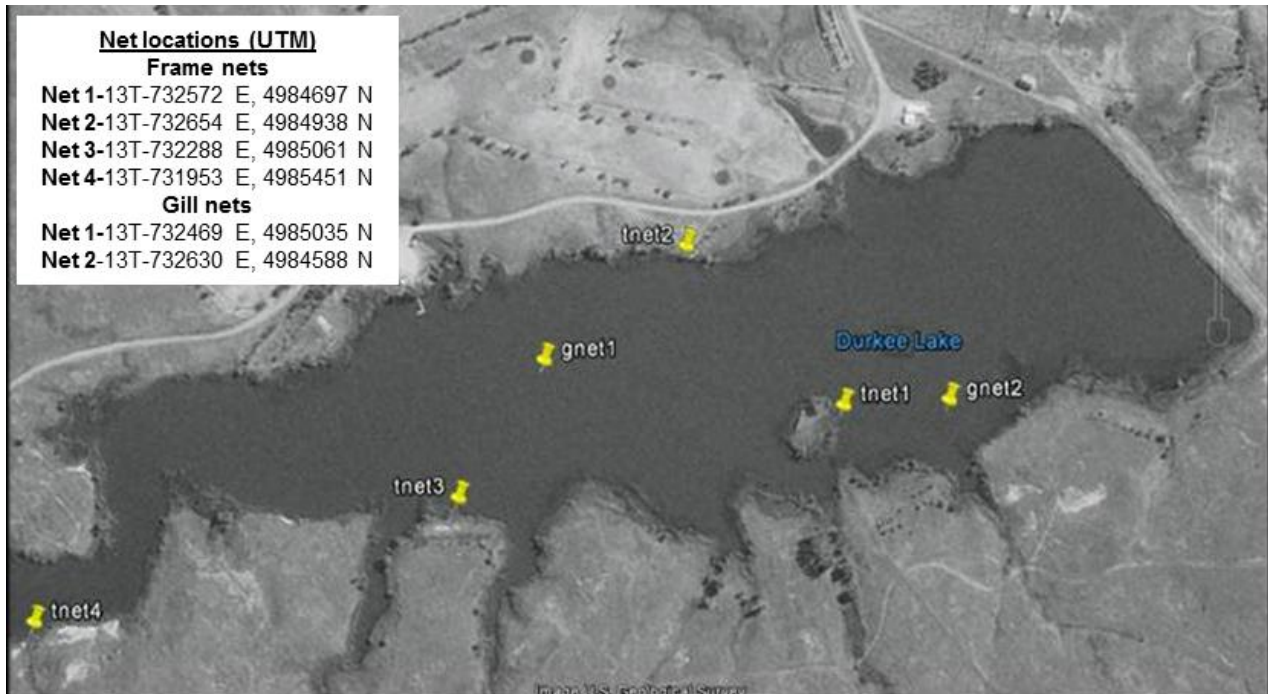


Figure 1. Locations of experimental gill (gnet) and trap net (tinet), including GPS coordinates, during the fish survey of Durkee Lake, Meade County, 2015

Table 1. Catch data from all fish species collected in eight trap nets in Durkee Lake, Meade County, June 15-17, 2015. 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	1299	162.4 (51.3)	162.4 (51.3)	60 (3)	0	87.7 (1.0)
Black crappie	82	10.3 (6.6)	10.3 (6.6)	6 (5)	0	124.2 (1.7)
Bluegill	97	12.1 (6.3)	12.1 (6.3)	80 (7)	0	113.8 (1.7)
Green sunfish	2	0.3 (0.2)	0.3 (0.2)	--	--	--
Largemouth bass	1	0.1 (0.2)	0.1 (0.2)	--	--	102.3 (--)
Northern pike	1	0.1 (0.2)	0.1 (0.2)	--	--	90.7 (--)
Yellow perch	149	18.6 (7.9)	18.6 (7.9)	46 (7)	0	100.8 (1.6)

Table 2. Catch data from all fish species collected in two experimental gill nets in Durkee Lake, Meade County, June 15-17, 2015. 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	64	32.0 (9.2)	32.0 (9.2)	31 (10)	0	90.5 (0.7)
Black crappie	2	1.0 (3.1)	1.0 (3.1)	--	--	123.8 (--)
Bluegill	2	1.0 (3.1)	1.0 (3.1)	--	--	113.9 (17.5)
Channel catfish	1	0.5 (1.5)	0.5 (1.5)	--	--	97.0 (--)
Golden shiner	1	0.5 (1.5)	0.5 (1.5)	--	--	--
Northern pike	2	1.0 (3.1)	1.0 (3.1)	--	--	94.3 (43.5)
Yellow perch	109	54.5 (20.0)	54.0 (18.5)	15 (6)	0	101.0 (1.0)

Table 3. Catch data for largemouth bass collected from 80 minutes of electrofishing in Durkee Lake, Meade County, June 8, 2015. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* ≥ S values with 90% confidence intervals in parentheses

Species	N	CPUE	CPUE-S	PSD	PSD-P	<i>Wr</i> ≥ S
Largemouth bass	39	29.3 (10.2)	22.5 (7.5)	80 (13)	57 (16)	107.3 (1.5)

Bluegill

Efforts were made to reestablish bluegill by stocking 50 adult and 22,000 fingerlings during the summer of 2008 after a winterkill in 2007. Catch rates increased each year since the initial stocking, peaking in 2012 with a CPUE of 223.1 (Table 4). This year catch rates have fallen to 12.1 fish per trap net (Table 1). Size structure has risen to a PSD of 80 this year which is well above the management goal of greater than 30. Fish condition also increased slightly to a *Wr* of 113.8, versus 112.0 in 2014. Size structure has remained similar in recent years (Figure 2).

Table 4. Composite listing of data for bluegill collected by trap nets in Durkee Lake, 2010-2015. 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	PSD-P	$Wr \geq S$
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)
2014	360	45.0 (24.8)	45 (24.8)	84 (3)	0	112.0 (1.3)
2015	97	12.1 (6.3)	12.1 (6.3)	80 (7)	0	113.8 (1.7)

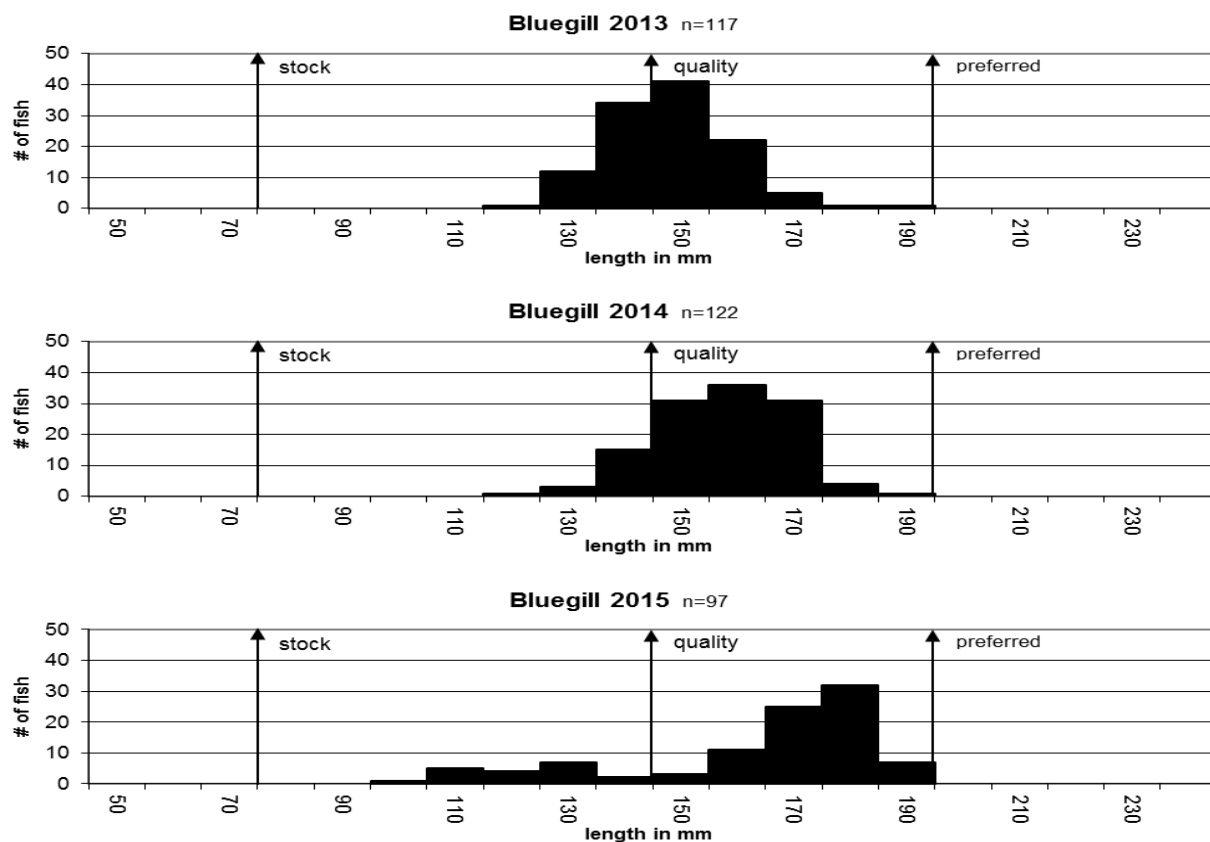


Figure 2. Length frequency histograms of bluegill collected from trap nets in Durkee Lake, Meade County, 2013-2015.

Black bullhead

Black bullhead were the most abundant fish sampled in 2015. In 2010, black bullhead numbers peaked with a CPUE of 739.8 (Table 5). This year numbers have decreased to 162.4 per trap net (Table 1). Size structure has increased with a PSD of 60 compared to 21 in 2014. Size structure has reached our management objective, while density is improving, CPUE still remains above the objective range of less than 100. In addition, mean fish condition was better than last

year with a *Wr* for stock length and larger fish of 87.7. A large year class dominates the population with lengths ranging from 210-240 mm and length frequencies indicate very little growth in the last three years (Figure 3).

Table 5. Data for black bullhead collected by trap nets in Durkee Lake, Meade County, 2010-2015. 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)
2014	1827	228.4 (77.3)	228.4 (77.3)	21 (2)	0	84.7 (2.1)
2015	1299	162.4 (51.3)	162.4 (51.3)	60 (3)	0	87.7 (1.0)

*gill net data

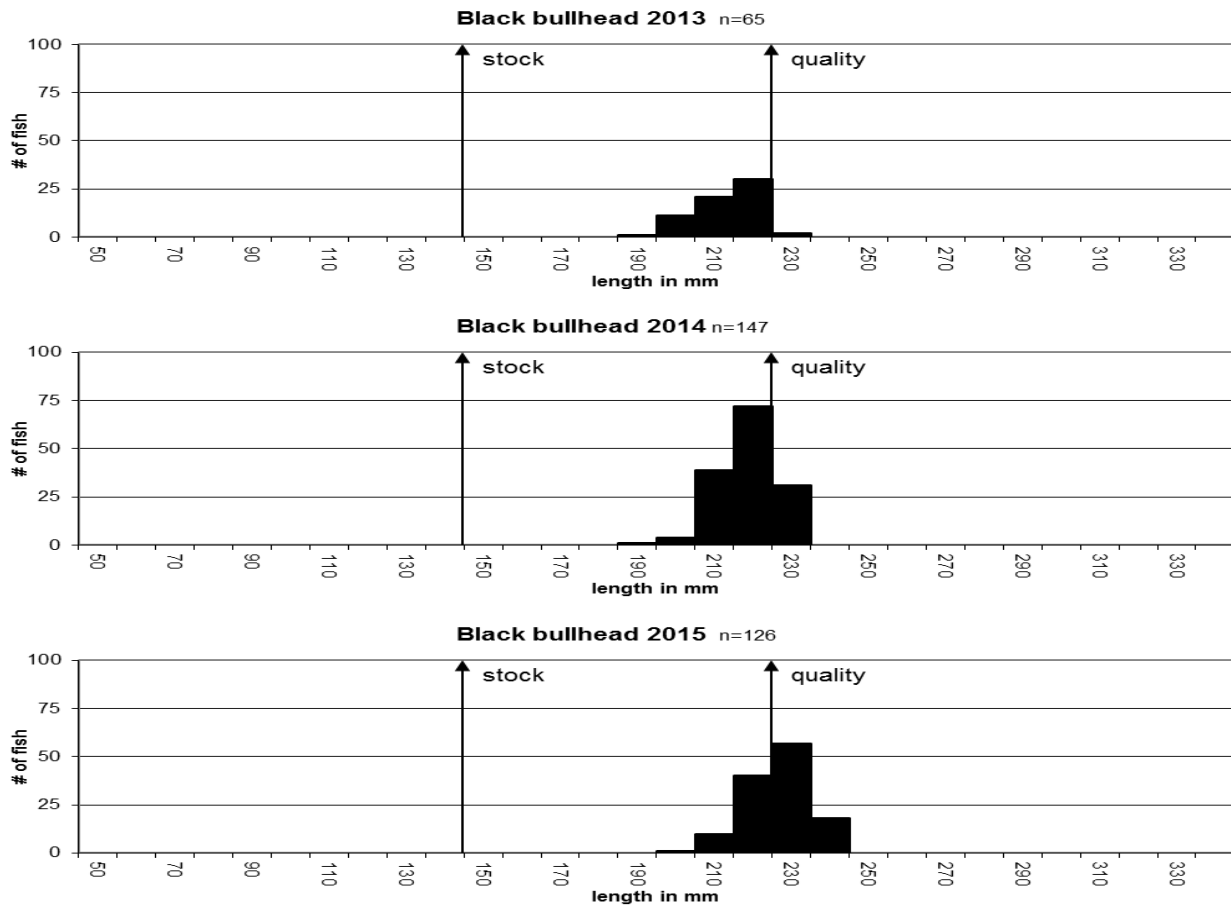


Figure 3. Length frequency histograms of black bullhead collected from trap nets in Durkee Lake, Meade County, 2013-2015.

Black crappie

After a winterkill in 2007, no black crappie were sampled in the 2008 survey. In 2009, 150 adults were stocked to reestablish black crappie in Durkee Lake. Last year, black crappie sampled from trap nets had a CPUE of 73.4. This year CPUE fell to 10.3 (Tables 1 and 6). PSD decreased slightly from 7 last year to 6 this year. Fish condition was excellent with a *Wr* of 124.2. These numbers are below the size structure objectives currently set for panfish in Durkee Lake. The length frequency shows a good number of fish just above stock length (Figure 4).

Table 6. Composite listing of data for black crappie collected by trap nets in Durkee Lake, Meade County, 2010-2014. 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)
2014	587	73.4 (26.8)	73.4 (26.8)	7 (2)	0	97.8 (1.4)
2015	82	10.3 (6.6)	10.3 (6.6)	6 (5)	0	124.2 (1.7)

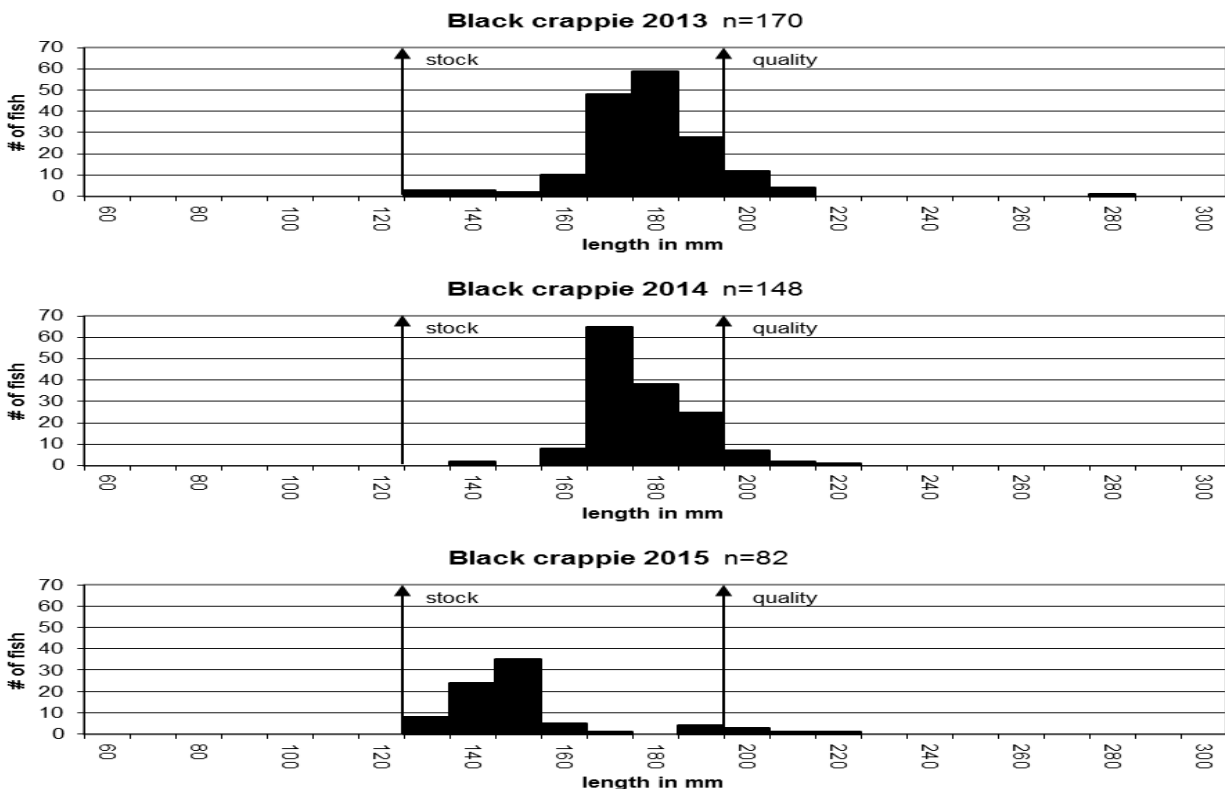


Figure 4. Length frequency histograms of black crappie collected in Durkee Lake, Meade County, 2013-2015.

Largemouth bass

Durkee Lake continues to exhibit a low density largemouth bass population with an electrofishing CPUE for stock length bass of 29.3 (Table 7). This is below the objective CPUE of 40 largemouth bass per hour. Size structure was above the objective PSD range of 40 to 70 with a PSD of 80. Fish condition was above average with a *Wr* of 107.3. The length frequency histogram shows some recruitment is occurring (Figure 5).

Table 7. Composite listing of data for largemouth bass collected by electrofishing in Durkee Lake, Meade County, 2011-2015. Total catch (N), pedal time (seconds), CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P, and *Wr* with 90% confidence intervals in parentheses.

Year	N	Pedal Time (sec)	CPUE	CPUE-S	PSD	PSD-P	<i>Wr</i> ≥S
2011	34	3600	34.0 (15.8)	30.0 (13.1)	73 (14)	40 (15)	110.9 (2.4)
2012	58	3600	58.0 (12.5)	54.0 (11.9)	65 (11)	15 (8)	112.8 (1.0)
2014	31	4260	28.2 (8.2)	28.2 (8.2)	88 (10)	21 (12)	94.9 (1.4)
2015	39	4800	29.3 (10.2)	22.5 (7.5)	80 (13)	57 (16)	107.3 (1.5)

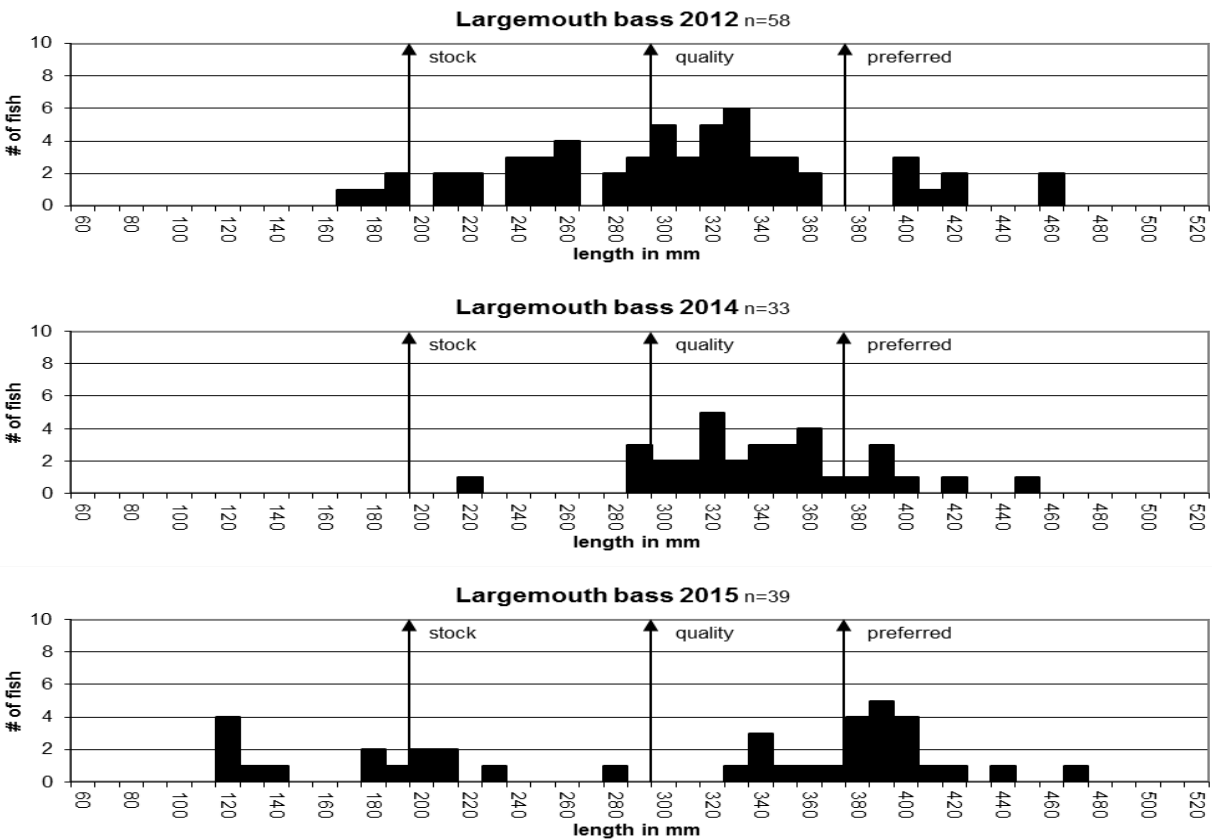


Figure 5. Length frequency histograms of largemouth bass collected by electrofishing in Durkee Lake, Meade County, 2012, 2014-2015.

Yellow perch

The yellow perch gill net CPUE was 54.5 (Table 2 and 8). Yellow perch sizes, however, were larger with a PSD of 15 from the gill net sample. The length frequency histogram shows quite a few fish over quality length (Figure 6). In 2014, no yellow perch were sampled over quality length in either gear type. Yellow perch condition was up from previous years with a Wr value of 101.0.

Table 8. Composite listing of data for yellow perch collected by gill nets in Durkee Lake, Meade County, 2010-2015. CPUE with 80% and PSD, PSD-P and Wr 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)
2014	122	61.0 (9.2)	36.0 (36.9)	0 (--)	0 (--)	95.4 (0.4)
2015	109	54.5 (20.0)	54.0 (18.5)	15 (6)	0	101.0 (1.0)

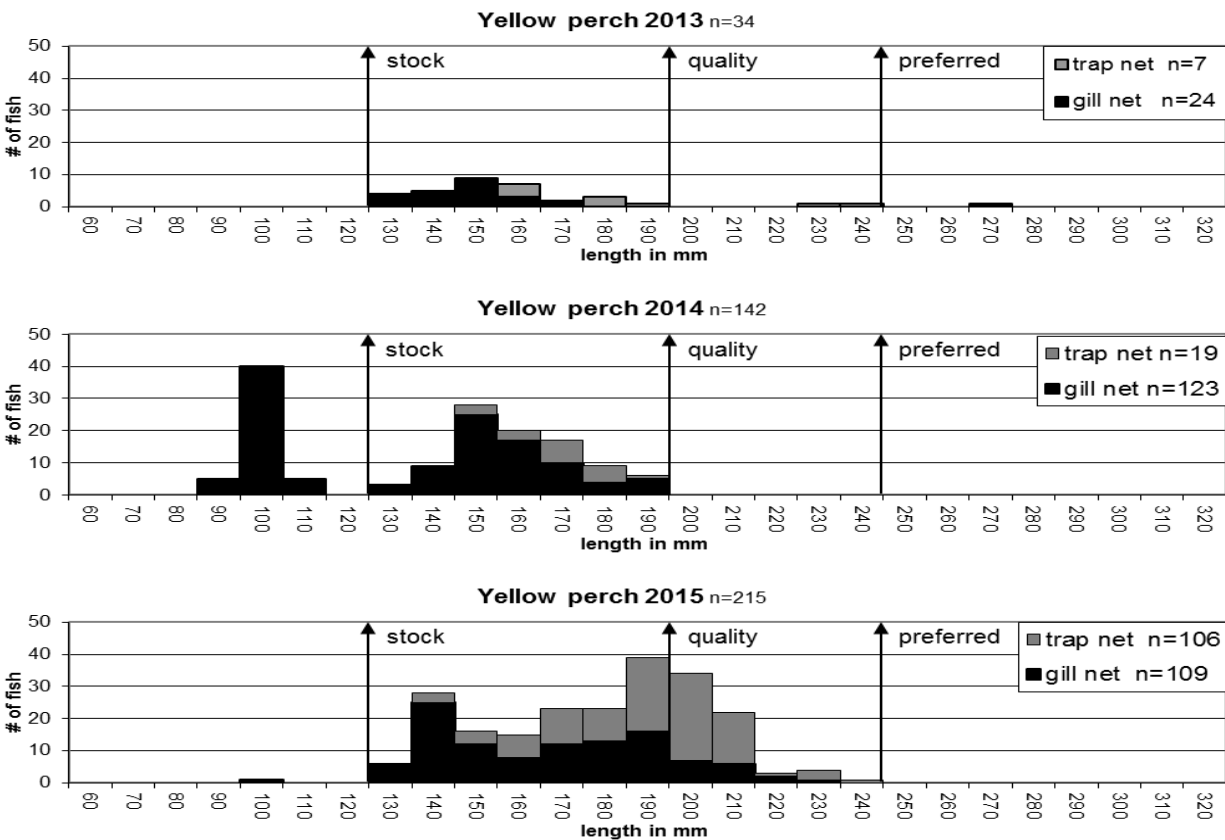


Figure 6. Length frequency histograms of yellow perch collected in experimental gill and trap nets in Durkee Lake, Meade County, 2013-2015.

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 2016 with a netting survey. Consider black bullhead removals to reduce density.
3. Stock adult largemouth bass when available to increase predation on over abundant panfish/bullhead and to increase abundance into objective ranges.

LITERATURE CITED

Willis, D.W., D.A. Isermann, M.J. Hubers, B.A. Johnson, W.H. Miller, T.R. St. Sauver, J.S. Sorenson, E.G. Unkenholz, and G.A. Wickstrom. 2001. Growth of South Dakota Fishes: A Statewide Summary with means by region and Water Type. Special Report. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota.

APPENDIX

Appendix A. Stocking history, including year, number, species and size of fish stocked into Durkee Lake, Meade County, South Dakota, 2000-2015.

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
2014	200	Largemouth bass	Juvenile
2015	112	Largemouth bass	Adult

