

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-46

Name: East Lemmon Lake (a.k.a. Lemmon State Lake)

County: Perkins

Legal description: Sec 16 & 21, T 21N, R 17E

Location from nearest town: 11 mi. S. 7 mi. E Lemmon, SD

Dates of present survey: June 17-18, October 1, 2013

Date last surveyed: May 28-29, October 2, 2012

Management classification: Warmwater semi-permanent

Primary Species: (game and forage)

1. Largemouth Bass

2. Yellow Perch

3. Northern Pike

4. _____

Secondary and other species:

1. Whiter Sucker

2. Black Bullhead

3. Golden Shiner

4. Smallmouth Bass

PHYSICAL CHARACTERISTICS

Surface Area: 165 acres

Watershed: 49,500 acres

Maximum depth: 16 feet

Mean depth: 8.5 feet

Lake elevation at survey (from known benchmark): lake was at full pool

Describe ownership of lake and adjacent lakeshore property:

East Lemmon Lake is owned and managed by the South Dakota Department of Game, Fish and Parks. The dam structure and a small portion of the lake are located on private land.

Describe watershed condition and percentages of land use:

Ninety percent of the East Lemmon Lake watershed is privately owned agricultural land, the remainder is part of the Grand River National Grassland. The privately owned land is predominantly pasture and row crops, while the National Grassland is exclusively grazing land.

Describe aquatic vegetative condition:

Cattails and bulrush comprise much of the shoreline and littoral areas. During mid to late summer large mats of submergent vegetation are present throughout the lake.

Describe pollution problems:

No pollution problems were identified by department personnel during the 2013 survey.

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

The spillway at East Lemmon Lake developed a cavity during the spring of 1995. A temporary repair of the badly damaged structure occurred in the fall of 1997. In the fall of 2000, a full repair of the dam including intakes, tubes and spillway was completed. The cost of the project at completion was \$147,198. East Lemmon Lake has a new boat ramp with a boat dock.

BIOLOGICAL DATA

Sampling Effort and Catch

Trap nets and experimental gill nets were used on June 17-18, 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 four trap net nights and one gill net night and catch data is displayed in Tables 1 and 2.

Night boat electrofishing was used on October 1, 2013 to sample the Largemouth Bass population. Three 10-minute sites were accomplished during the survey and catch data is summarized in Table 3.

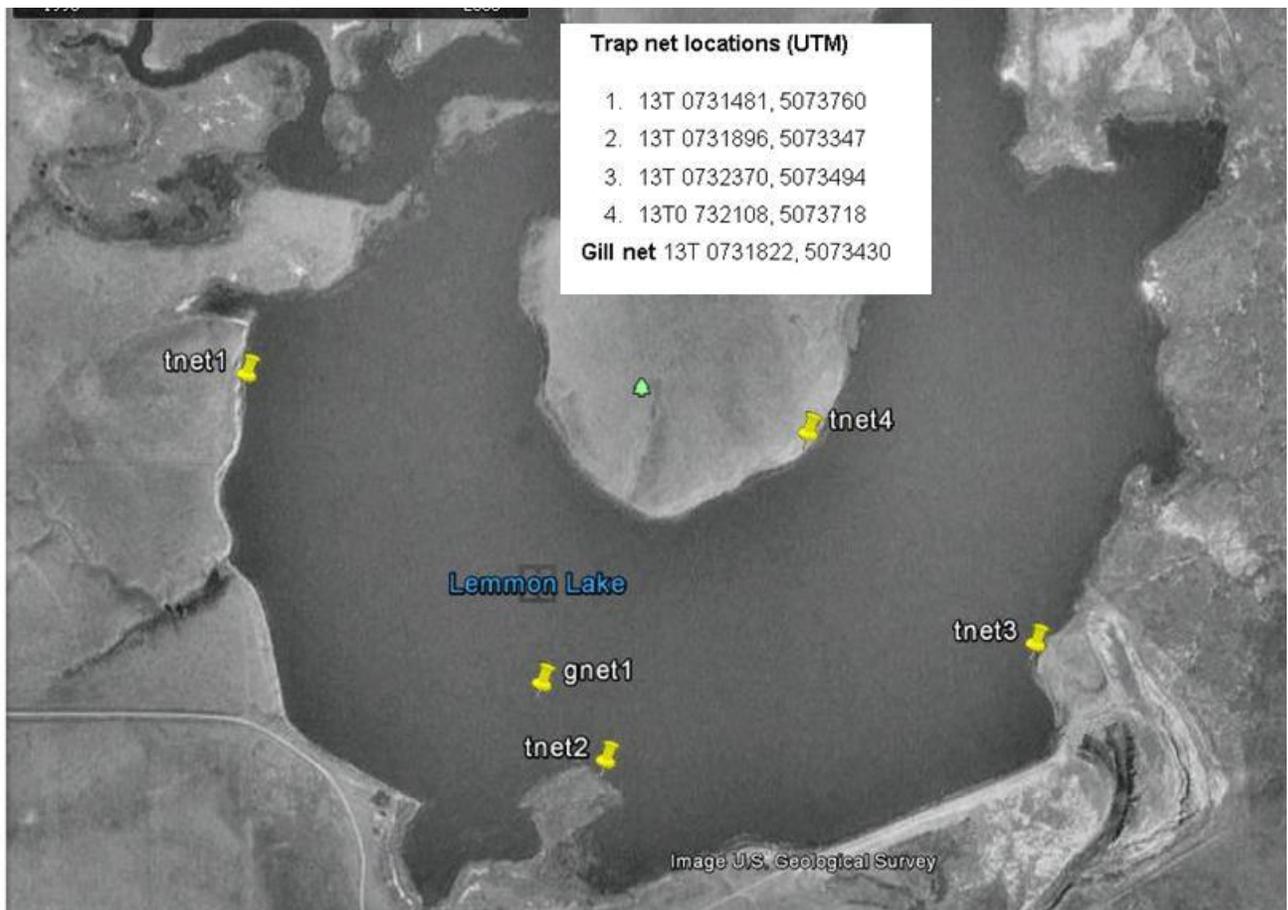


Figure 1. Net locations with GPS coordinates from the 2013 survey on East Lemmon Lake.

Table 1. Catch data from all species collected in three trap nets in East Lemmon Lake, Perkins County, June 17-18, 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	RSD-P	<i>Wr</i> ≥S
Black Bullhead	562	187.3 (47.5)	177.7 (44.0)	11 (2)	0	93.3 (1.4)
Golden Shiner	3	1.0 (1.9)	--	--	--	--
Smallmouth Bass	1	0.3 (0.6)	0.3 (0.6)	--	--	96.5 (--)
White Sucker	47	15.7 (13.6)	15.7 (13.6)	98 (4)	57 (13)	91.6 (0.9)
Yellow Perch	1	0.3 (0.6)	0.3 (0.6)	--	--	100.6 (--)

Table 2. Catch data from all species collected in one gill net in East Lemmon Lake, Perkins County, June 17-18, 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	RSD-P	<i>Wr</i> ≥S
Black Bullhead	102	102.0	102.0	7 (4)	1 (2)	102.1 (2.0)
Northern Pike	3	3.0	3.0	--	--	110.0 (12.4)
White Sucker	19	19.0	18.0	100	72 (19)	92.3 (1.9)
Yellow Perch	54	54.0	54.0	22 (10)	0	101.8 (0.9)

Table 3. Catch data from night electrofishing at East Lemmon Lake, Perkins County, October 1, 2013. CPUE's with 80% confidence intervals in parentheses. *Wr* with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	RSD-P	<i>Wr</i> ≥S
Largemouth Bass	4	8.0 (7.5)	8.0 (7.5)	--	--	131.7 (5.6)
Smallmouth Bass	2	4.0 (3.8)	4.0 (3.8)	--	--	111.5 (10.1)

Black Bullhead

Black Bullheads were the most abundant fish captured in the trap nets and gill net. Last year, CPUE in trap nets was 186.5, compared to 187.3 this survey (Table 1). Also, the single gill net caught 102 Black Bullheads, compared to a catch of 52 last year. Size structure was also similar with PSD for the trap net sample at 11 this year, versus 10 in 2012. These values and the lengths of fish sampled (Figure 2) show a stable population that hasn't changed much in the last three years.

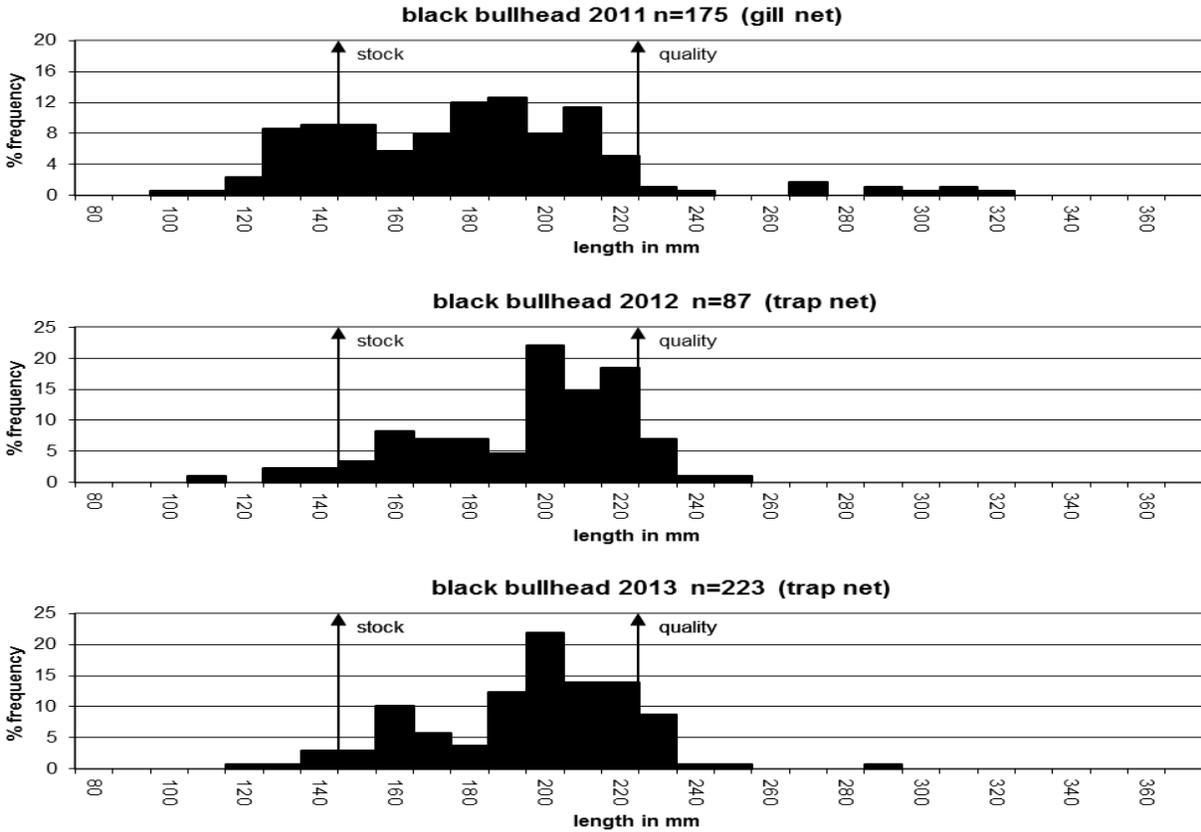


Figure 2. Length frequencies of Black Bullheads collected from East Lemmon Lake, Perkins County, 2011-2013.

Largemouth Bass

After low water and a winterkill in 2009, six thousand Largemouth Bass fingerlings were stocked. Another 7,000 fingerlings were stocked in 2010. The electrofishing survey in 2012 yielded a CPUE of 336 bass per hour with a PSD of 8. This year the thirty minute electrofishing survey had a CPUE of 8 fish per hour (Table 3). Water temperatures were much colder this survey compared to last year which may explain the huge decrease in catch rates. Many age-0 Largemouth Bass were observed during the survey but were not collected, indicating good natural reproduction. The length frequency shows the huge decline between this year's survey and last year's (Figure 3).

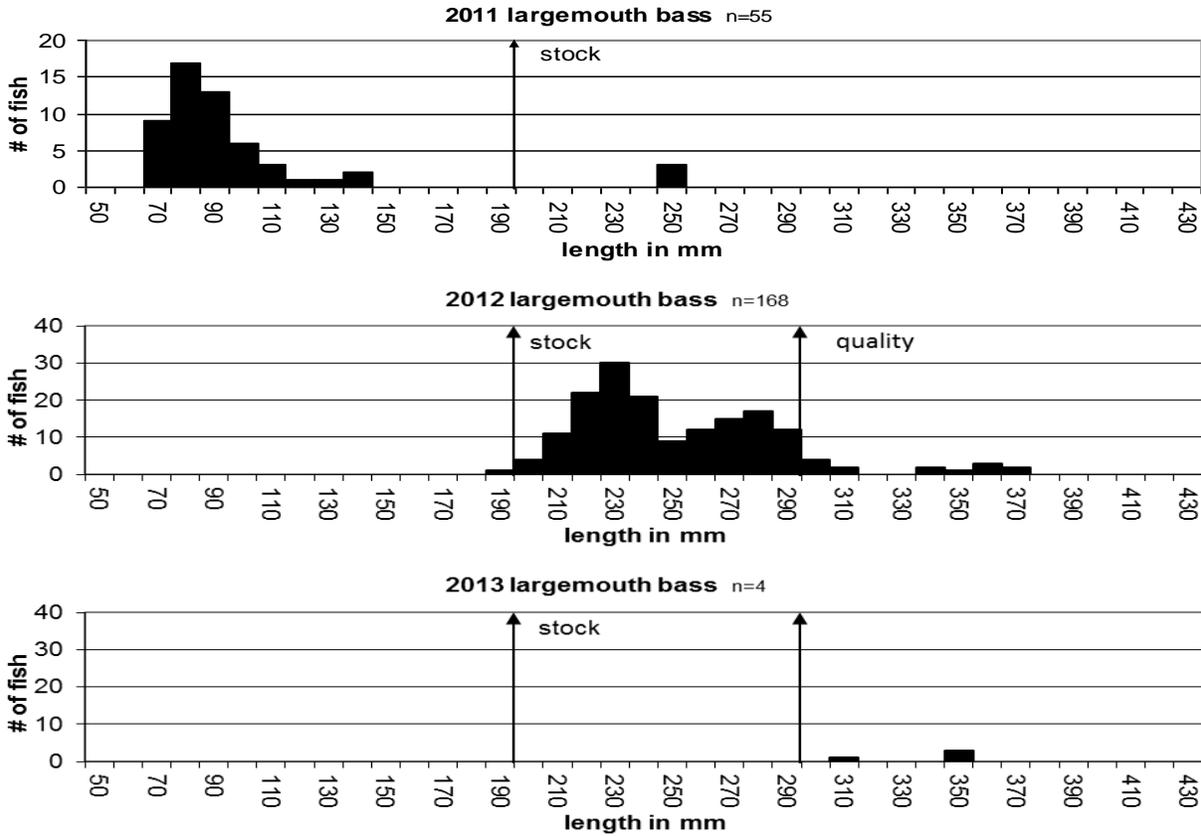


Figure 3. Length frequencies of Largemouth Bass collected from East Lemmon Lake, Perkins County, 2011-2013.

Northern Pike

With East Lemmon Lake facing frequent winterkills, Northern Pike fry were stocked in the spring of 2010 to establish a fast growing fish and create a quality fishery before the next winterkill. During the 2012 survey, the gill net caught two, while the trap net CPUE was 0.8. This year the gill net caught three, while the trap nets didn't sample any (Tables 1 and 2). The length frequency histogram indicates the low density population is experiencing no recruitment at this time (Figure 4).

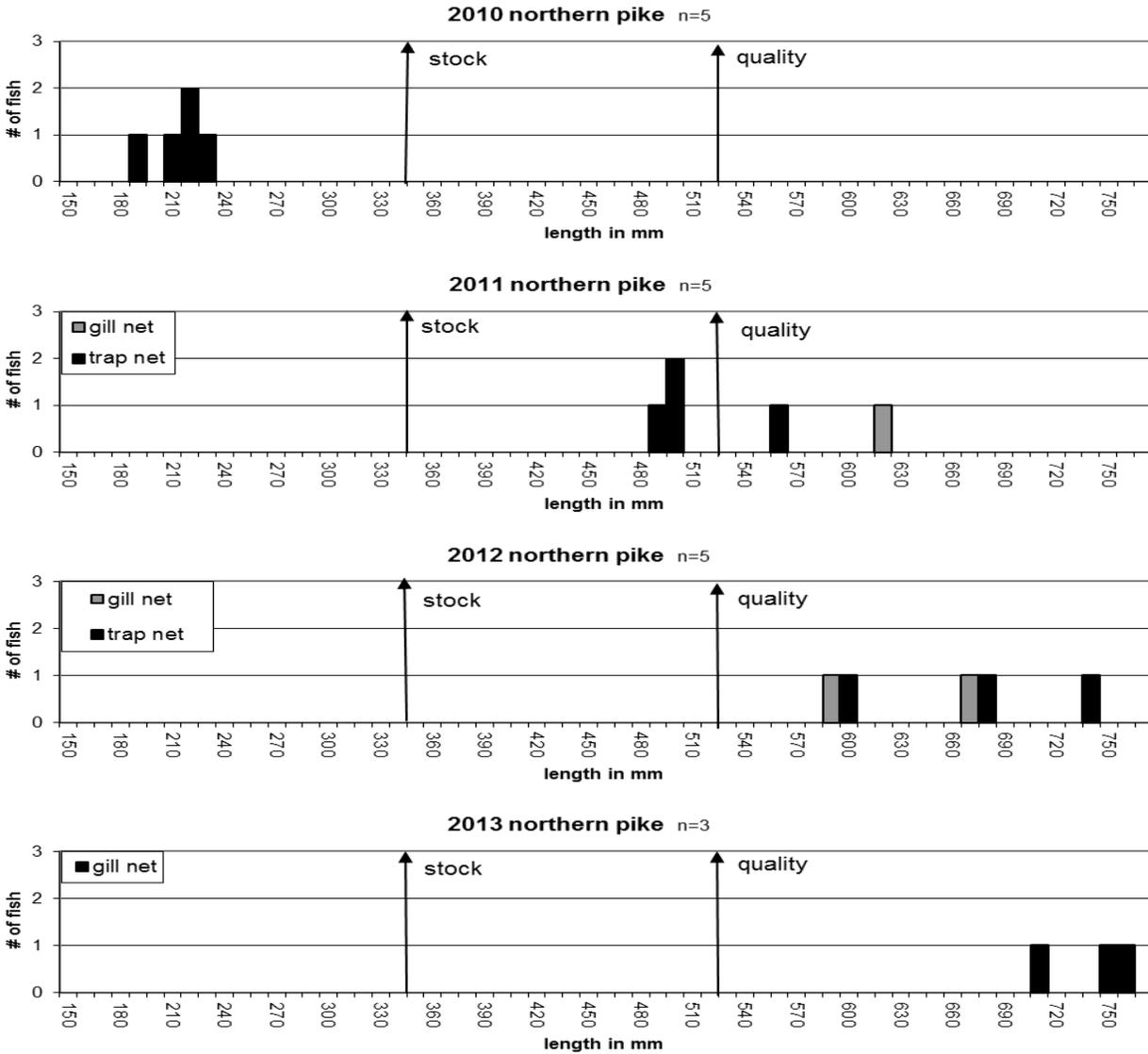


Figure 4. Lengths of Northern Pike collected in trap nets from East Lemmon Lake, Perkins County, 2010-2013.

White Sucker

The White Sucker density remains similar with trap net CPUE 15.7 and gill net CPUE 19 (Tables 1 and 2), compared to CPUE's of 14.5 and 20, respectively, in 2012. The population appears to be dominated by a single year class which can be seen in the length frequency histograms over the past three years (Figure 5).

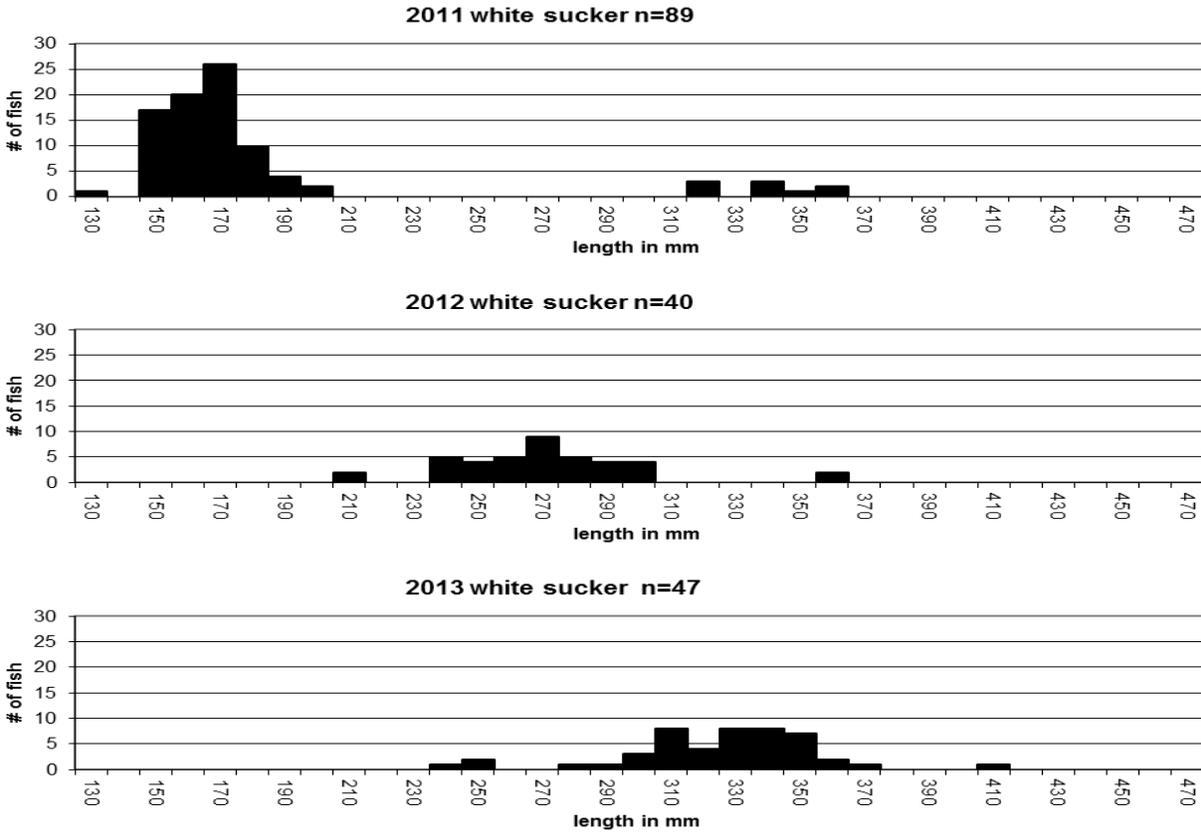


Figure 5. Length frequencies of White Sucker collected from East Lemmon Lake, Perkins County, 2011-2013.

Yellow Perch

The current management objective is to increase and maintain Yellow Perch gill-net CPUE at 25 or greater for stock-length and larger fish, and maintain PSD between 20 and 40. Last year, gill net CPUE was 23, this year it was 54 (Table 2). Stock density remained similar and just within the objective range with PSD of 22 this year, and 27 last year. Length frequencies indicate several year classes within the gill net sample (Figure 6).

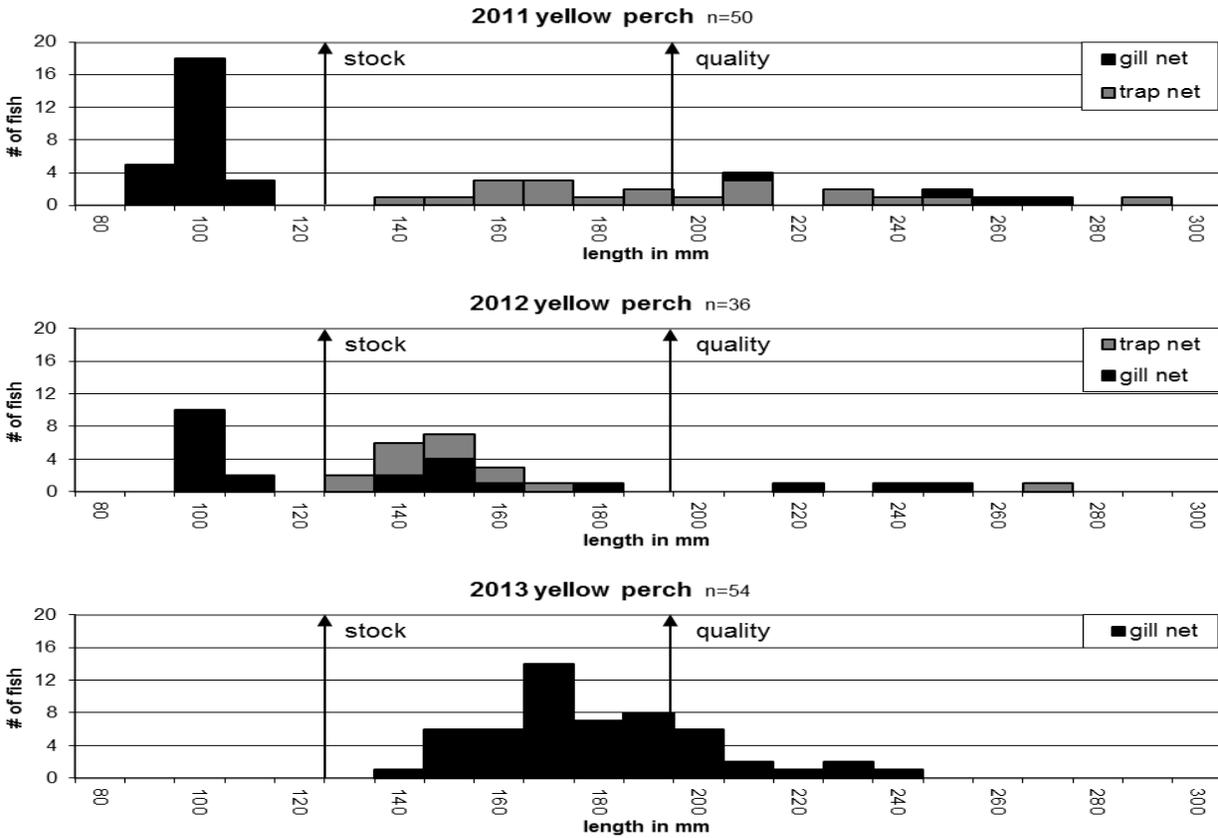


Figure 6. Length frequencies of Yellow Perch from East Lemmon Lake, Perkins County, 2010-2013.

RECOMMENDATIONS

1. Conduct a lake survey next year including electrofishing to evaluate fish populations and stocking success.
2. Stock Northern Pike fingerlings to help establish another year class and possibly increase predatory pressures on the White Sucker and Black Bullheads populations.

APPENDIX

Appendix A. Stocking records for East Lemmon Lake, Perkins County, 2002-2013.

Year	Number	Species	Size
2002	13,525	Largemouth Bass	Fingerling
2004	500	Yellow Perch	Adult
2005	884	Tiger muskie	Fingerling
2006	500	Tiger muskie	Fingerling
2010	166,000	Northern Pike	fry
	400	Yellow Perch	Adult
	6,000	Largemouth Bass	Fingerling
2011	40	Golden Shiner	Adult
	385	Yellow Perch	Adult
	7,000	Largemouth Bass	Fingerling