

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-46

Name: Newell Lake

County: Butte

Legal description: Sec 9, T 10N, R 6E

Location from nearest town: 8 miles north and 2 miles east of Newell, SD

Dates of present survey: July 22-24, 2013

Date last surveyed: July 22-24, September 26, 2012

Management classification: Warm-water permanent

Primary Species: (game and forage)

1. Largemouth Bass
2. Bluegill
3. Northern Pike
4. Yellow Perch
5. Walleye

Secondary and other species:

1. Smallmouth Bass
2. European Rudd
3. White Sucker
4. Black Bullhead
5. _____

PHYSICAL CHARACTERISTICS

Surface Area: 183 acres

Watershed: 7,680 acres

Maximum depth: 32 feet

Mean depth: 13.6 feet

Lake elevation at survey (from known benchmark): -4 feet

Ownership of lake and adjacent lakeshore property:

The Department of Game, Fish and Parks owns Newell Lake, as well as the surrounding property. The shoreline is managed as a recreation area and a Game Production Area.

Fishing Access

Anglers must drive 2 miles along a maintained gravel road to access Newell Lake. Gravel roads and trails also allow access to the south and northwest shorelines. Shore fishing is generally good with open shorelines. A boat ramp and dock are located on the southeast side of the lake.

Observations of Water Quality and Aquatic Vegetation

The area has been negatively affected by the recent drought and heavy cattle grazing. Submerged aquatic vegetation in Newell Lake consists of coontail and cattail. Summer months are often characterized as having large amounts of vegetation in the shallow bays and inlets. Emergent vegetation consists of bulrush and cattail.

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

In 1998, following the lake survey, major damage occurred to the tubes that required rebuilding the spillway. Work on the spillway was completed in 1999. The spillway, dam and boat ramp are in good condition. At the time of the survey, low water made the boat ramp barely useable.

MANAGEMENT OBJECTIVES

- Objective 1.** Maintain a Walleye fishery with a minimum gill-net CPUE for stock length and longer fish equal to or greater than 10/net and a PSD range of 30-60.
- Objective 2.** Maintain a Largemouth Bass fishery with a minimum night-time electrofishing CPUE for stock length and longer fish of 20/hr, PSD greater than 50, and PSD-P greater than 30.
- Objective 3.** Maintain Bluegill trap net CPUE-S greater than 20, PSD at least 20 and PSD-P of 5 or greater.

BIOLOGICAL DATA

Sampling Effort and Catch

A fish survey was conducted at Newell Lake during July 22-24, 2013. Sampling consisted of seven modified fyke (trap) nets with 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 and two experimental gill nets measuring 45.7 m (150 ft) long and 1.8 m (6 ft) deep with six 7.6 m (25 ft) panels of bar mesh sizes: 12.7 mm (0.5 in), 19.1 mm (0.75 in), 25.4 mm (1.0 in), 31.8 mm (1.25 in), 38.1 mm (1.5 in), and 50.8 mm (2.0 in) and (Figure 1, Tables 1 and 2). Discussion on selected fish species follows and completes this report.

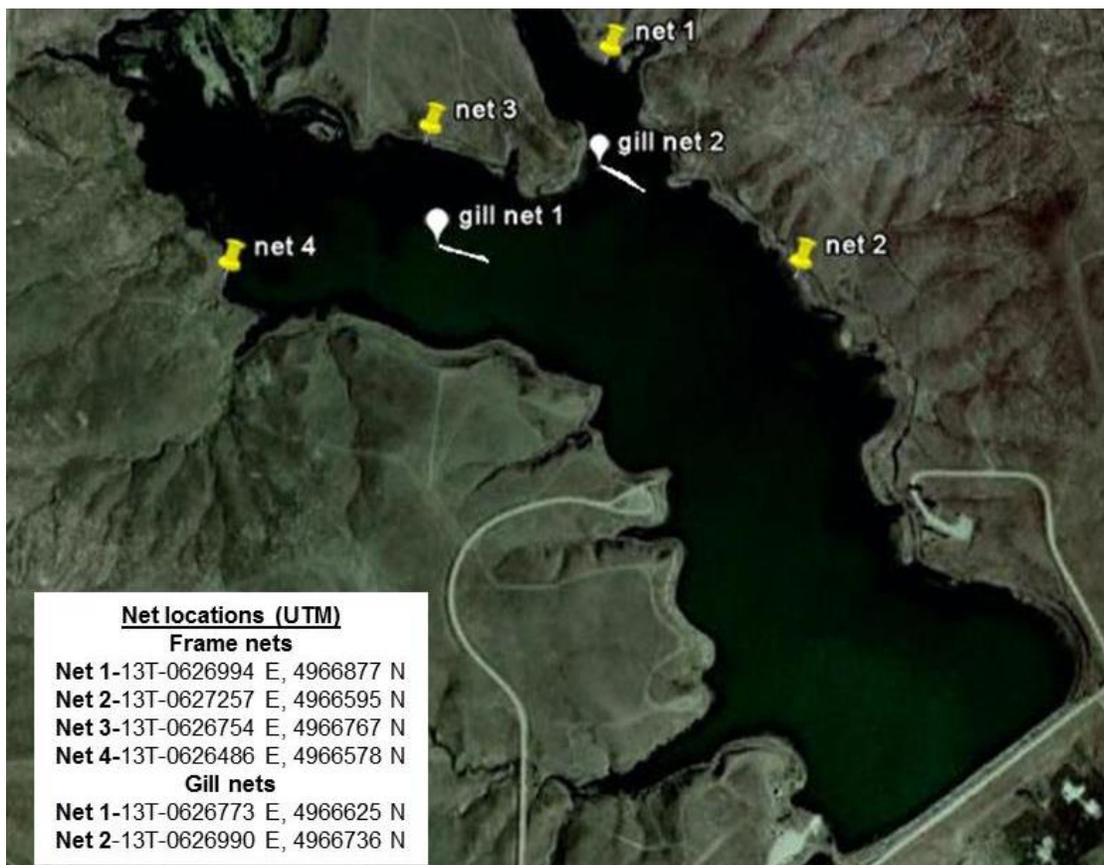


Figure 1. Locations (with GPS coordinates) of experimental gill nets and trap nets (net) during the fisheries survey of Newell Lake, Butte County, South Dakota, 2012.

Table 1. Catch data from all species collected in seven trap nets in Newell Lake, Butte County, July 22-24, 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	$Wr \geq S$
Bluegill	204	29.1 (10.8)	29.1 (10.8)	38 (6)	10 (4)	113.1 (1.4)
Northern Pike	2	0.3 (0.3)	0.3 (0.3)			83.3 (17.3)
European Rudd	322	46.0 (16.7)	46.0 (16.7)	85 (3)	49 (5)	--
Smallmouth Bass	1	0.1 (0.2)	0.1 (0.2)			93.5 (--)
Walleye	8	1.1 (0.5)	1.1 (0.5)	75 (31)	25 (31)	80.2 (3.9)
White Sucker	13	1.9 (1.0)	1.9 (1.0)	100	100	90.9 (2.7)
Yellow Perch	7	1.0 (0.6)	0.9 (0.6)			87.8 (3.7)

Table 2. Catch data from all species collected in two gill nets in Newell Lake, Butte County, July 22-24, 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	$Wr \geq S$
Northern Pike	9	4.5 (1.5)	4.5 (1.5)	11 (21)	0	80.8 (2.1)
Walleye	17	8.5 (10.8)	8.5 (10.8)	35 (21)	12 (14)	84.1 (1.7)
White Sucker	6	3.0 (0.0)	3.0 (0.0)	--	--	89.7 (8.6)
Yellow Perch	33	16.5 (7.7)	3.0 (6.2)	33 (43)	0	100.3 (5.0)

Bluegill

Bluegill was the most abundant game fish sampled in Newell Lake with a trap net CPUE of 29.1 (Table 1), an increase from 21.5 in 2012. Bluegill density is consistent with management objectives and sizes are exceeding the current objectives with a proportional stock density (PSD) of 38 and a proportional stock density for preferred-length fish (PSD-P) of 10. Fish condition of adult Bluegill remains high with a mean relative weight for stock-length and larger fish ($Wr > S$) of 113.1, similar to last year at 106.4. Length frequency histograms indicate a large number of Bluegill under quality length which hasn't been seen in recent years (Figure 2).

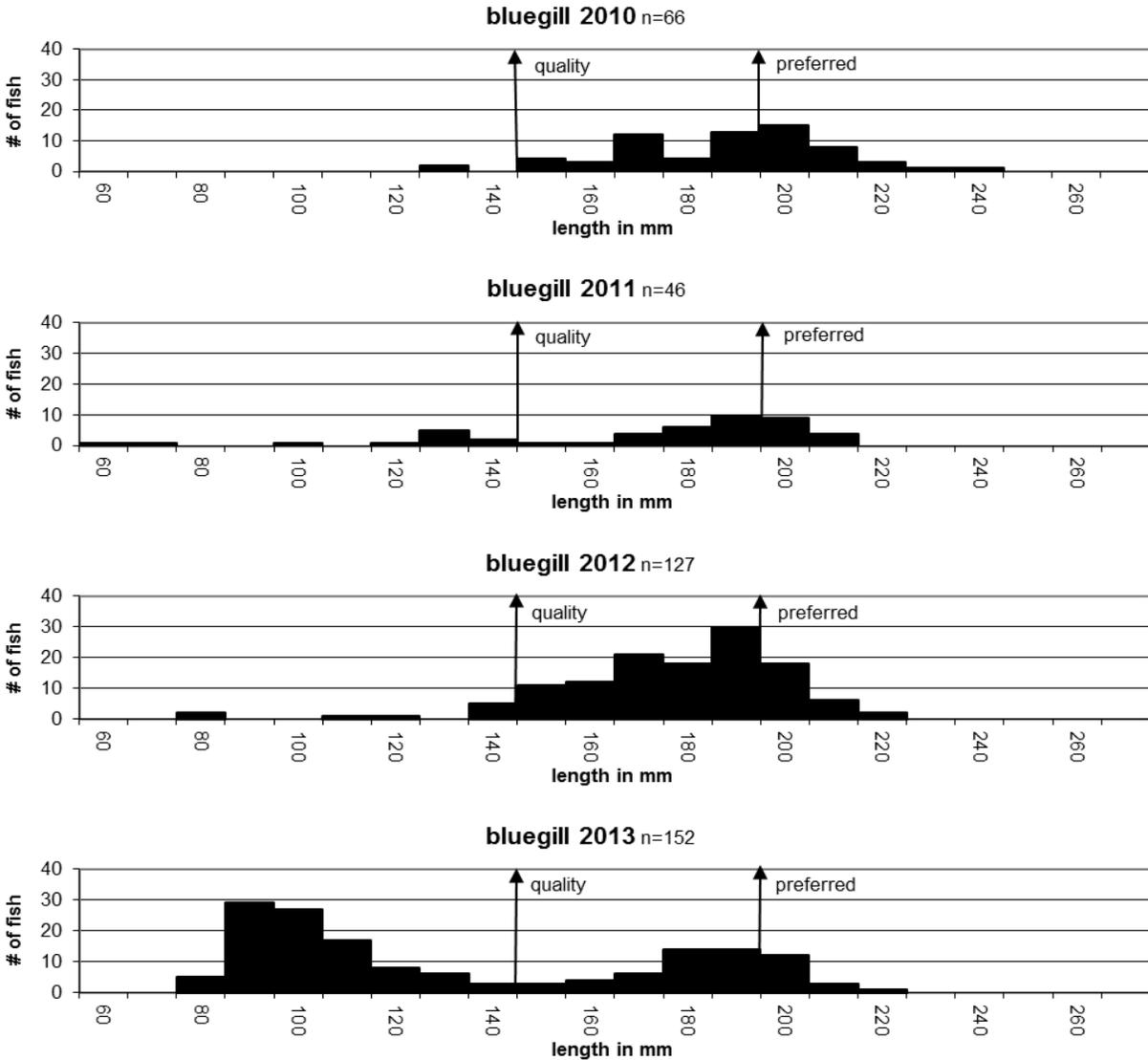


Figure 2. Length frequencies of Bluegill collected in trap nets in Newell Lake, Butte County, South Dakota, 2010-2013.

European Rudd

European Rudd was the most abundant species sampled in trap nets, with a catch per unit effort (CPUE) of 46.1 (Table 1). This is the highest CPUE recorded in recent history (Table 3). Sizes of sampled European Rudd have changed since 2010 and lengths indicate consistent recruitment, as well as the presence of older year classes (Figure 3). Currently, Largemouth Bass density is low, which may be part of the reason European Rudd recruitment appears so successful. Increasing stocking efforts to improve predator abundance, specifically Largemouth Bass and Smallmouth Bass, will be done with intent to reduce European Rudd densities as well as to provide more fish for anglers.

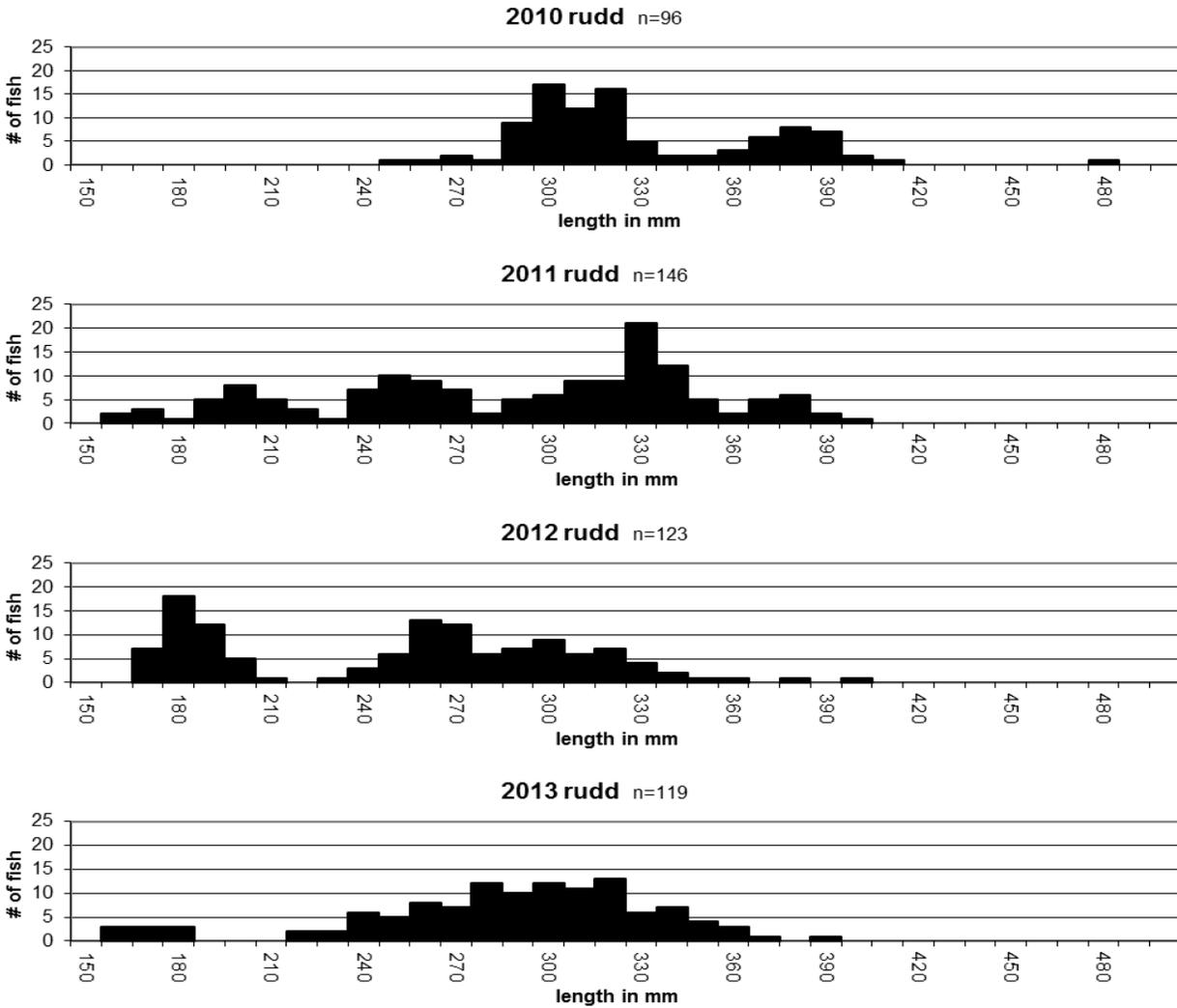


Figure 3. Length frequencies of European Rudd collected in trap nets in Newell Lake, Butte County, South Dakota, 2010-2013.

Table 3. Year, number captured (N) and catch per unit effort (CPUE; 80% confidence intervals given in parentheses), for European Rudd collected in trap nets in Newell Lake, Butte County, South Dakota, 2002, 2004, 2006, 2007, 2010- 2013.

Year	N	CPUE
2002	144	18.6 (6.4)
2004	53	21.6 (11.9)
2006	173	7.6 (3.4)
2007	130	18.0 (9.2)
2010	96	12.0 (6.4)
2011	146	18.3 (5.8)
2012	123	15.4 (9.6)
2013	322	46.0 (16.7)

Walleye

In attempt to increase Walleye density, a 15 inch minimum length limit with a daily limit of two Walleye was placed on Newell Lake on January 1, 2010. In addition to the regulation, 50,000 fingerlings were stocked annually from 2007-2009. Increased Walleye density could potentially keep Bluegill and European Rudd density low.

Walleye abundance was similar to last year with a trap net CPUE of 1.1 and a gill net CPUE of 8.5 (Table 7), which is slightly lower than current management objectives. No electrofishing was completed in 2013 due to an early fall blizzard that dropped water temperatures greatly. Fish condition was good with a *Wr* for stock length and larger fish of 84.1 from the gill net sample (Table 2). Growth was fairly slow with the average four year old walleye measuring 360 mm (Table 8). The seventeen fish gill net sample yielded a PSD of 35 and a PSD-P of 12, within the management objective range.

Table 7. Year and catch per unit effort by gear type (CPUE with 80% CI's) for Walleye collected during fisheries surveys in Newell Lake, Butte County, South Dakota, 2002–2007, 2010-2013.

Year	Gill net	Trap net	Fall electrofishing
2002	2.0 (3.1)	1.1 (0.6)	----
2004	6.0 (9.2)	0.1 (0.2)	11.0 (5.3)
2005	----	----	16.4 (7.5)
2006	0.5 (1.5)	0.4 (0.4)	26.8 (5.7)
2007	2.0 (3.1)	2.6 (1.3)	67.1 (22.1)
2010	11.5 (7.7)	2.4 (0.8)	77.5 (35.7)
2011	4.0 (9.2)	1.0 (0.5)	68.0 (17.7)
2012	12.5 (7.7)	0.8 (0.6)	46.8 (20.9)
2013	8.5 (10.8)	1.1 (0.5)	----

Table 8. Walleye age, minimum, maximum and weighted mean lengths (mm) at capture by age (determined from otoliths), and number sampled in experimental gill nets in Newell Lake, Butte County, South Dakota, 2013.

Age	Minimum length @ capture	Weighted mean length @ capture	Maximum length @ capture	Number of fish in survey
2	296	318	360	4
3	312	323	330	4
4	340	360	394	3
5	362	371	380	2
7	500	500	500	1
8	564	564	564	1
10	688	688	688	1

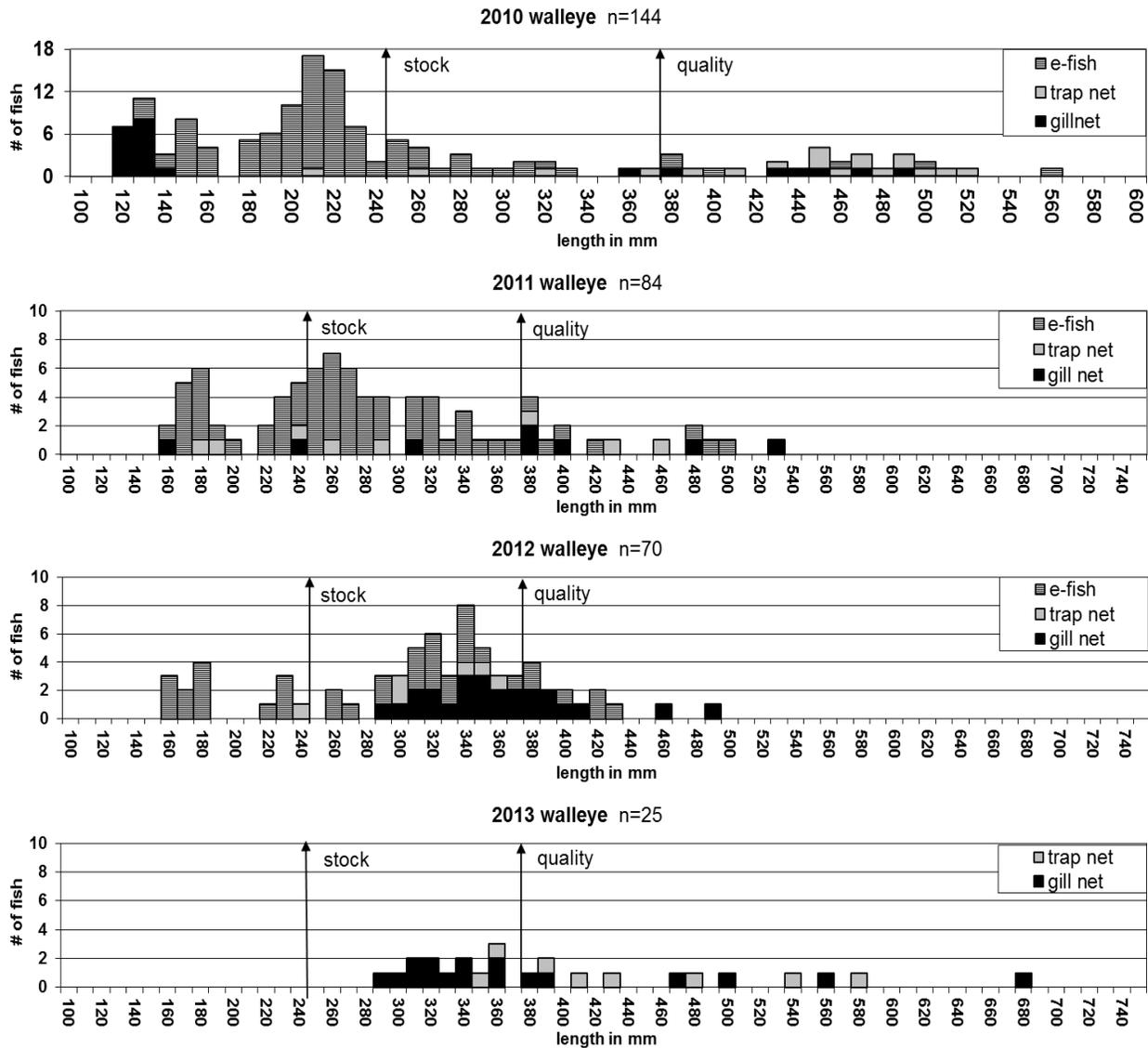


Figure 4. Length frequency histograms of Walleye collected from nighttime boat electrofishing (electrofishing), gill nets and trap nets at Newell Lake, Butte County, South Dakota, 2010-2013.

Yellow Perch

Yellow Perch abundance increased from last year when the two gill nets caught a total seven fish. This year, 33 Yellow Perch were caught in the gill nets (Table 2). PSD was 33 with no fish sampled over the preferred length of ten inches. The length frequency histogram shows a good year class from 2012 recruiting to the population (Figure 5).

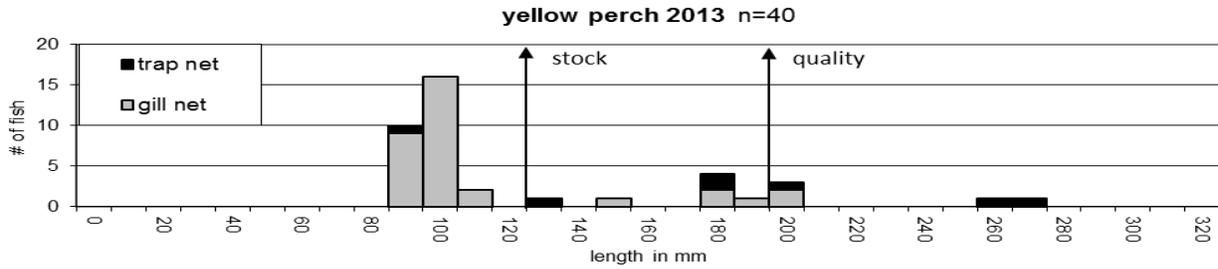


Figure 5. Length frequencies of Yellow Perch from trap nets and gill nets in Newell Lake, Butte County, 2013.

RECOMMENDATIONS

1. Conduct standard fish netting surveys every 1 to 3 years to monitor fish populations.
2. Sample Largemouth Bass, Smallmouth Bass and Walleye annually with nighttime boat electrofishing to identify population changes and effectiveness of special regulations.
3. Stock adult or fingerling Largemouth Bass when available to supplement the population.

APPENDIX

Appendix A. Stocking history, including year, number stocked, species and size of fish stocked into Newell Lake, Butte County, South Dakota, 2004-2013.

Year	Number	Species	Size
2004	308	Walleye	Large fingerling
2005	2,230	Walleye	Large fingerling
2006	180	Largemouth Bass	Adult
	187	Walleye	Large fingerling
2007	50,000	Walleye	Small fingerlings
2008	53,975	Walleye	Small fingerlings
2009	54,100	Walleye	Small fingerlings
2012	5,130	Smallmouth Bass	Small-fingerlings
	9,120	Largemouth Bass	Small-fingerlings
	540	Largemouth Bass	Adult
2013	11,970	Largemouth Bass	Small-fingerlings