

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
South Island, Minnehaha and McCook County
2102-F-21-R-47
2014



Figure 1. South Island Lake, Minnehaha County

Legal Description: T104-R 52-Sec. 30; T 104-R 53-Sec 25

Location from nearest town: 10 miles west of Colton, SD

Surface Area: 131 acres

Meandered (Y/N): no

OHWM elevation: none set

Outlet elevation: no data

Max. depth at outlet elevation: 16 feet

Observed water level: 1 foot low

Contour map available (Y/N): no

Watershed area: no data

Shoreline length: no data

Date set: NA

Date set: NA

Mean depth at outlet elevation: no data

Lake volume: no data

Date mapped: NA

DENR beneficial use classifications: (5) Warmwater semi-permanent fish propagation, (7) immersion recreation, (8) limited-contact recreation, (9) fish and wildlife propagation, recreation and stock watering.

Introduction

General

Island Lake is divided by a county highway into North and South Island lakes. .

Ownership of Lake and Adjacent Lakeshore Properties

South Island Lake is not listed as meandered public water in the State of South Dakota Listing of Meandered Lakes. Approximately half the lake and western shoreline is owned by the South Dakota Department of Game, Fish and Parks (GFP). The remainder is privately owned.

Fishing Access

Shore fishermen frequently park along the county road to fish. Boat access is limited to a gravel ramp with a dock on the north shore. Ice fishing is popular.

Water Quality and Aquatic Vegetation

Scattered beds of sago pondweed and clasping leaf pondweed were observed (Table 1). Cattails surround the southern basin of the lake.

Table 1. Water temperature, Secchi depth and observations/comments on water quality and aquatic vegetation in South Island Lake, Minnehaha County, 2005-2014.

<i>Year</i>	<i>Water Temp °C (°F)</i>	<i>Secchi Depth cm (in)</i>	<i>Observations/Comments (algae, aquatic vegetation, water quality, etc.)</i>
2014	24 (76)	203 (80)	Beds of sago and clasping leaf pondweed
2013			Sago and clasping leaf pondweed
2011	24 (75)	183 (72)	Sago and clasping leaf pondweed, some milfoil
2009	23 (74)	190 (75)	Sago and clasping leaf pondweed, cattails, bulrushes

Fish Community

South Island Lake has a fish community similar to many eastern South Dakota lakes (Table 2). Common carp were first sampled in 2013 (Table 7). It is not known how they entered the but it was possibly through the outlet pipe structure.

Table 2. Fish species commonly found in South Island Lake, Minnehaha County.

<i>Game Species</i>	<i>Other Species</i>
Walleye Yellow Perch Northern Pike Black Crappie Green Sunfish Channel Catfish Black Bullhead	Common Carp

Fish Management

South Island is primarily managed for walleye and yellow perch. These populations are largely maintained through stocking (Table 4). Northern pike and black crappie are also popular with anglers and their populations are maintained by natural reproduction. No fish kills have been reported on South Island (Table 3).

Table 3. Fish kill history for South Island Lake, Minnehaha County.

Year	Severity	Comments
		No fish kills have been observed or recorded on South Island

Table 4. Stocking history for South Island Lake, Minnehaha County, 2005-2014.

Year	Number	Species	Size
2005	532	Northern Pike	Adult
2006	142	Channel Catfish	Adult
2007	365	Walleye	Adult
	452	Walleye	Juvenile
	200	Yellow Perch	Fingerling
2008	106	Walleye	Adult
2009	743	Walleye	Adult
2011	75,400	Yellow Perch	Fingerling
	478	Walleye	Large Fingerling
2013	138,250	Yellow Perch	Fingerling
2014	14,300	Walleye	Fingerling

Methods

South Island was sampled on June 24-25, 2014 with three overnight gill-net sets. The gill nets were 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh ($\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and 2 in) monofilament netting.

Results and Discussion

Net Catch Results

Like North Island, black bullheads comprised the majority of fish (93%) sampled in the gill nets (Table 5). Northern pike were second in abundance.

Table 5. Total catch from three overnight gill-nets set in South Island Lake, Minnehaha County, June 24-25, 2014.

<i>Species</i>	<i>#</i>	<i>%</i>	<i>CPUE</i> ¹	<i>80% C.I.</i>	<i>Mean CPUE*</i>	<i>PSD</i>	<i>RSD-P</i>	<i>Mean Wr</i>
Black bullhead	455	92.7	151.7	+27.5	118.8	32	1	--
Northern pike	22	4.5	7.3	+3.0	2.5	91	5	85
Common carp	5	1.0	1.7	+0.4	0.4	--	--	--
Black crappie	3	0.6	1.0	+0.7	0.7	--	--	--
Yellow perch	2	0.4	0.7	+0.4	17.8	--	--	--
Walleye	2	0.4	0.7	+0.4	4.9	--	--	--
Golden shiner	2	0.4	0.7	+0.4	0.2	--	--	--

*10 years (2005-2014)

Table 6. CPUE by length category for selected species sampled with gill-nets in South Island Lake, Minnehaha County, June 24-25, 2014.

<i>Species</i>	<i>Substock</i>	<i>Stock</i>	<i>S-Q</i>	<i>Q-P</i>	<i>P+</i>	<i>All sizes</i>	<i>80% C.I.</i>
Black bullhead	--	151.7	103.7	46.7	1.3	151.7	+27.5
Northern pike	--	7.3	0.7	6.3	0.3	7.3	+3.0
Common carp	--	1.7	--	1.0	0.7	1.7	+0.4
Black crappie	1.0	--	--	--	--	1.0	+0.7
Yellow perch	0.3	0.3	0.3	--	--	0.7	+0.4
Walleye	--	0.7	--	0.3	0.3	0.7	+0.4
Golden shiner*	--	--	--	--	--	0.7	+0.4

*No length categories established. Length categories can be found in Appendix A.

Table 7. Gill-net CPUE for selected fish species sampled in South Island Lake, Minnehaha County, 2005-2014.

<i>Species</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>
Black Bullhead					20.0		146.7		156.7	151.7
Black Crappie					--		--		1.7	1.0
Channel Catfish					0.7		--		--	--
Common Carp					--		--		--	1.7
Golden Shiner					--		--		--	0.7
Northern Pike					0.3		1.0		1.3	7.3
Walleye					8.3		8.3		2.0	0.7
White Sucker					0.3		--		0.3	--
Yellow Perch					21.7		42.7		6.3	0.7

¹ See Appendix A for definitions of CPUE, PSD, RSD, RSD-P and mean Wr.

Walleye

Management Objective

- Maintain a walleye population with a total gill net CPUE of at least 15.

Management Strategy

- Stock walleye as needed to achieve the management objective.

Walleye CPUE was at a 10 year low in 2014 with only two fish sampled (Table 8). Small fingerlings, stocked in 2014, will hopefully produce a strong year class (Table 9) and provide better fishing in 3-4 years.

Table 8. CPUE, PSD, RSD-P, and mean Wr for all walleye sampled with gill nets in South Island Lake, Minnehaha County, 2005-2014. Columns for stocked years are shaded.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPUE					8.3		8.3		2.0	0.7
PSD					96		100		--	--
RSD-P					24		15		--	--
Mean Wr					97		89		--	--

Table 9. Walleye stocked into South Island Lake, Minnehaha County, 2005-2014.

Year	Number	Size
2007	365	Adult
	452	Juvenile
2008	106	Adult
2009	743	Adult
2011	478	Lrg. Fingerling
2014	14,300	Fingerling

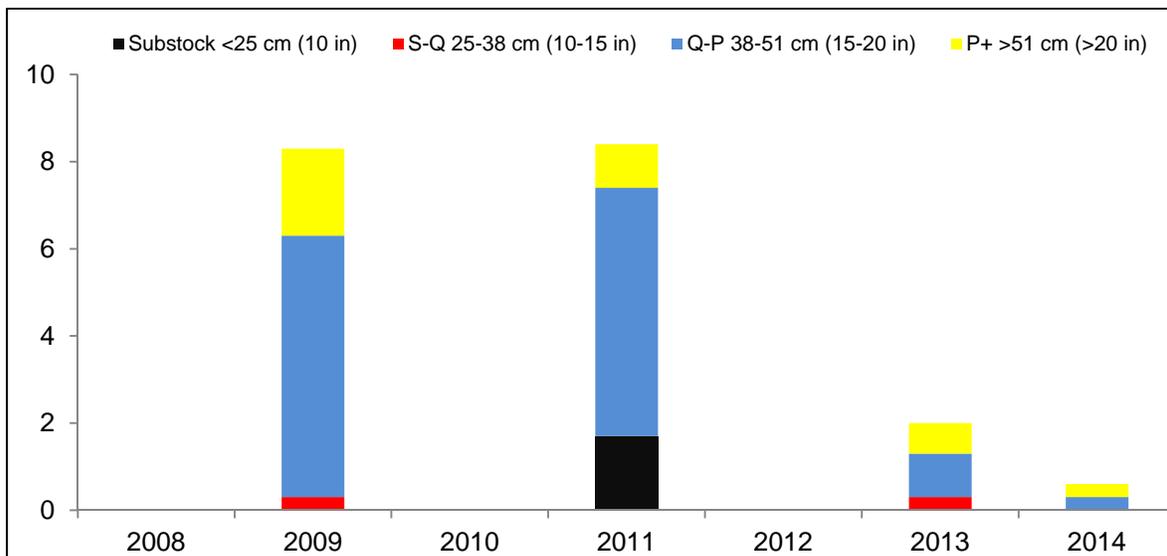


Figure 2. CPUE by length category for walleye sampled with gill nets in South Island Lake, Minnehaha County, 2009, 2011, 2013, 2014.

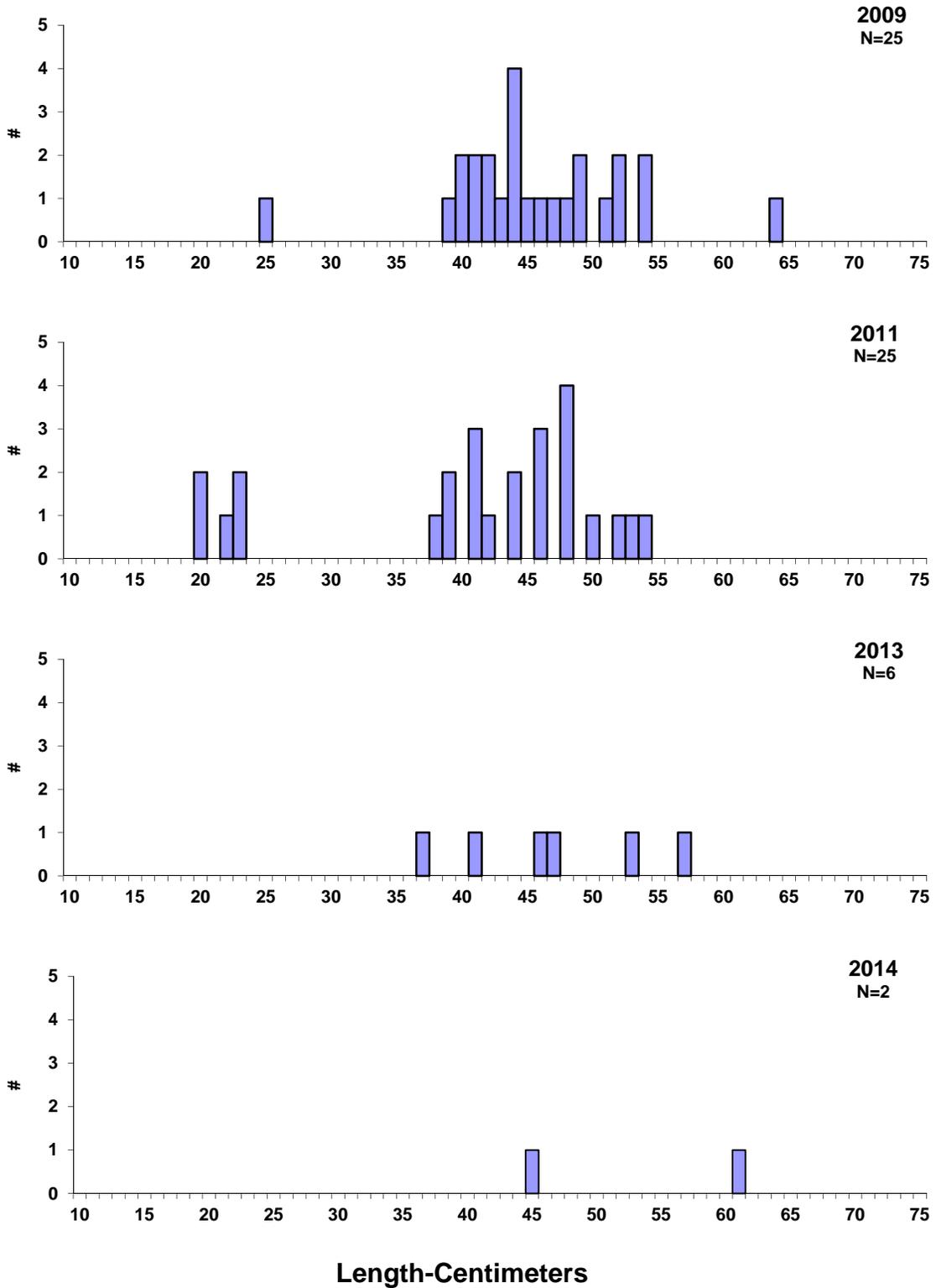


Figure 3. Length frequency histograms for walleyes sampled with gill nets in South Island, Minnehaha County, 2009, 2011, 2013, 2014.

Yellow Perch

Similar to walleye, yellow perch abundance is also at a 10-year low (Table 10). The 2013 stocking of 138,250 fingerlings did not recruit to the population (Table 11).

Table 10. CPUE, PSD, RSD-P, and mean Wr for all yellow perch sampled with gill nets in South Island, Minnehaha County, 2005-2014. Columns for stocked years are shaded.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPUE					21.7		42.7		6.3	0.7
PSD					62		67		6	--
RSD-P					22		1		6	--
Mean Wr					90		105		105	--

Table 11. Yellow perch stocked into South Island, Minnehaha County, 2005-2014.

Year	Number	Size
2007	200	Fingerling
2011	75,400	Fingerling
2013	138,250	Fingerling

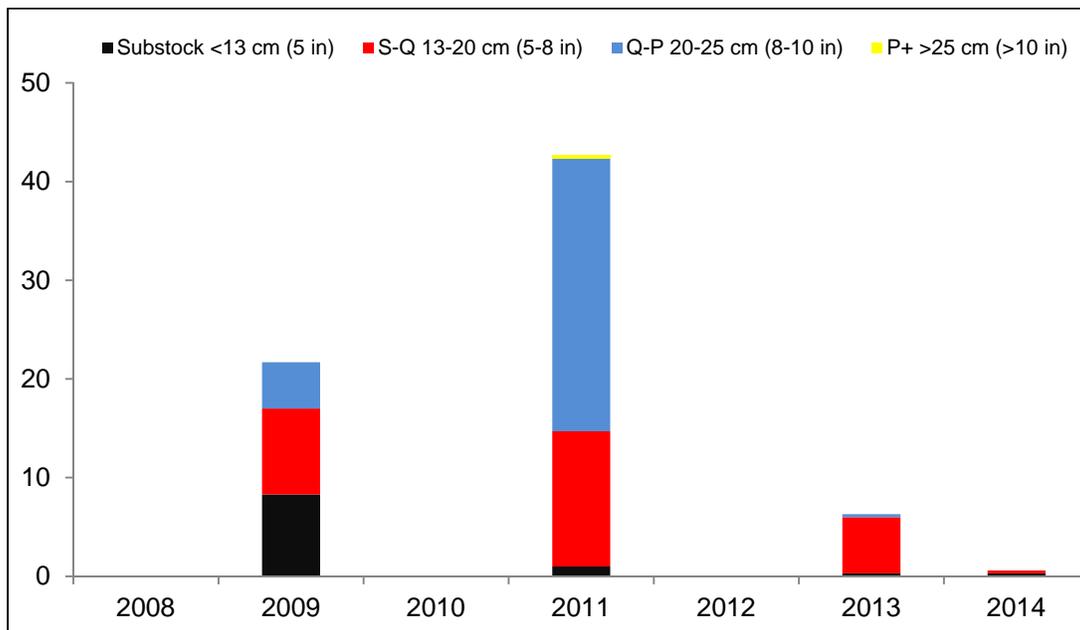


Figure 4. CPUE by length category for yellow perch sampled with gill nets in South Island Lake, Minnehaha County, 2009, 2011, 2013, 2014.

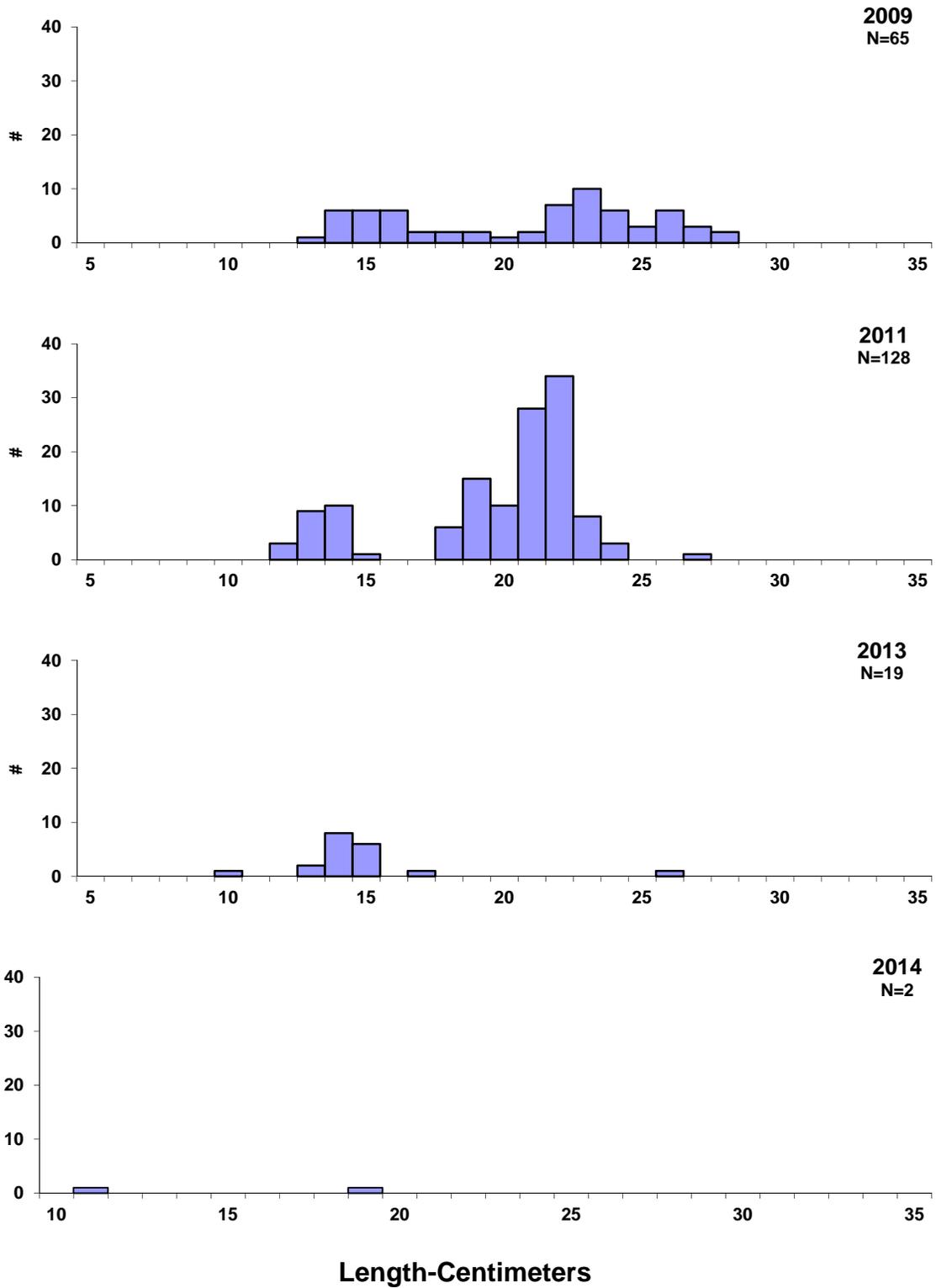


Figure 5. Length frequency histograms for yellow perch sampled with gill nets in South Island, Minnehaha County, 2009, 2011, 2013, 2014.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$\text{PSD} = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$\text{RSD-P} = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters (Inches in parenthesis).

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25 (10)	38 (15)	51 (20)	63 (25)	76 (30)
Yellow perch	13 (5)	20 (8)	25 (10)	30 (12)	38 (15)
Black crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
White crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
Bluegill	8 (3)	15 (6)	20 (8)	25 (10)	30 (12)
Largemouth bass	20 (8)	30 (12)	38 (15)	51 (20)	63 (25)
Smallmouth bass	18 (7)	28 (11)	35(14)	43 (17)	51 (20)
Northern pike	35 (14)	53 (21)	71 (28)	86 (34)	112 (44)
Channel catfish	28 (11)	41 (16)	61 (24)	71 (28)	91 (36)
Black bullhead	15 (6)	23 (9)	30 (12)	38 (15)	46 (18)
Common carp	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)
Bigmouth buffalo	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.