

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Scott Lake, Minnehaha County
2102-F-21-R-47
2014



Figure 1. Scott Lake, Minnehaha County

Legal Description: T102-R51-Sec. 7-8

Location from nearest town: 1 mile north, 2 miles west of Hartford, SD

Surface Area: 107 acres

Meandered (Y/N): No

Max. depth at outlet elevation: 11 feet

Observed water level: Full

Contour map available (Y/N): no

Watershed area: no data

Shoreline length: no data

Mean depth at outlet elevation: 4 feet

Lake volume: no data

Date mapped: NA

DENR beneficial use classifications: (6) warmwater marginal fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Introduction

General

Old maps call it Scott Slough but it has increased in depth and area and is now considered a lake.

Ownership of Lake and Adjacent Lakeshore Properties

Scott Lake is not listed as meandered public water in the State of South Dakota Listing of Meandered Lakes. Most of the lake lies within a Game Production Area (GPA) owned and managed by the South Dakota Department of Game, Fish, and Parks (GFP), however, the land under the very west end of the lake is privately owned.

Fishing Access

A major fishing access improvement project consisting of a new boat ramp, boat dock, floating fishing pier, concrete vault toilet, fishing access trails, shore fishing access points and parking was completed in 2012.

Water Quality and Aquatic Vegetation

The water level at Scott Lake during the survey period was above full and had inundated shoreline vegetation (Table 1). Water temperature and Secchi depth (79 cm or 31 in) were typical of Scott Lake in mid-June (Table 1).

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

Year	Water Temp °C (°F)	Secchi Depth cm (in)	Observations/Comments (algae, aquatic vegetation, water quality, etc.)
2014	23 (73)	79 (31)	Flooded terrestrial vegetation, cattails
2013	-- (--)	-- (--)	Heavy sago pondweed
2011	23 (73)	244 (96)	Sago pondweed
2009	23 (74)	50 (20)	Sago pondweed
2007	26 (78)	74 (29)	Heavy sago and coontail around entire lake
2005	27 (80)	66 (26)	Heavy sago and coontail interfering with trap nets

Fish Community

No rough fish or aquatic invasive species have been sampled in Scott Lake (Table 2).

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

Game Species	Other Species
Yellow Perch	
Walleye	
Black Crappie	
Northern Pike	
Black Bullhead	
Green Sunfish	
Orange-spotted Sunfish	

Fish Management

Scott Lake has a history of overabundant black bullheads which can affect the success of walleye and yellow perch stockings (Table 4).

Table 3. Fish kill history for Scott Lake, Minnehaha County.

Year	Severity	Comments
2002	Moderate	July 14, hundreds of black bullheads killed by <i>Aeromonas</i> bacteria

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

Year	Number	Species	Size
2005	2,200	Yellow Perch	Adult
	4,384	Walleye	Fingerling
2006	1,875	Yellow Perch	Juvenile
	480	Yellow Perch	Adult
2007	331	Walleye	Juvenile
2009	10,800	Walleye	Small Fingerling
	600	Walleye	Large Fingerling
2011	12,480	Walleye	Small Fingerling
	57,680	Yellow Perch	Fingerling
2012	96,640	Yellow Perch	Fingerling
2013	3,516	Yellow Perch	Adult
2014	3,570	Yellow Perch	Adult
	108,000	Walleye	Fry

Methods

Scott Lake was sampled on June 18-19, 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

Black bullheads dominated the gill net catch (Table 5) but, there were some larger fish caught (Table 6).

Table 5. Total catch from three overnight gill net sets at Scott Lake, Minnehaha County, June 18-19, 2014.

<i>Species</i>	<i>#</i>	<i>%</i>	<i>CPUE¹</i>	<i>80% C.I.</i>	<i>Mean CPUE*</i>	<i>PSD</i>	<i>RSD-P</i>	<i>Mean Wr</i>
Black Bullhead	651	93.7	217.0	<u>+23.9</u>	187.4	24	0	--
Yellow Perch	29	4.2	9.7	<u>+5.2</u>	11.6	0	0	102
Walleye	13	1.9	4.3	<u>+2.8</u>	6.8	62	8	92
Black Crappie	2	0.3	0.7	<u>+0.4</u>	0.2	--	--	--

*10 years (2005-2014)

Table 6. CPUE by length category for selected species sampled with gill nets in Scott Lake, June 18-19, 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	--	217.0	164.7	52.3	--	217.0	<u>+23.9</u>
Yellow Perch	0.7	9.0	9.0	--	--	9.7	<u>+5.2</u>
Walleye	--	4.3	1.7	2.3	0.3	4.3	<u>+2.8</u>
Black Crappie	0.3	0.3	0.3	--	--	0.7	<u>+0.4</u>

Length categories can be found in Appendix A.

Table 7. Gill-net CPUE for selected fish species sampled in Scott 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	78.0		44.7		163.7		348.3		272.7	217.0
Black Crappie	--		0.7		--		--		--	0.7
Green Sunfish	--		--		--		0.3		--	--
Northern Pike	--		--		--		0.3		0.7	--
Walleye	1.5		23.7		3.7		4.3		3.3	4.3
Yellow Perch	12.0		2.7		20.0		17.3		8.0	9.7

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 10

Management Strategy

- stock small walleye fingerlings at the rate of 70/acre (7,560) as needed to achieve the management objective

Walleye CPUE is still well below the management objective (Table 8) despite stocking in five of the last 10 years (Table 9). Several year classes of walleyes were sampled in the gill nets (Figures 2 and 3) and some are large enough to provide bonus fishing opportunity for anglers.

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

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPUE	1.5		23.7		3.7		4.3		3.3	4.3
PSD	--		17		82		--		50	62
RSD-P	--		1		0		--		13	8
Mean Wr	--		91		92		--		92	92

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

Year	Number	Size
2005	4,384	Fingerling
2007	331	Juvenile
2009	10,800	Small Fingerling
	600	Large Fingerling
2011	12,480	Small Fingerling
2014	108,000	Fry

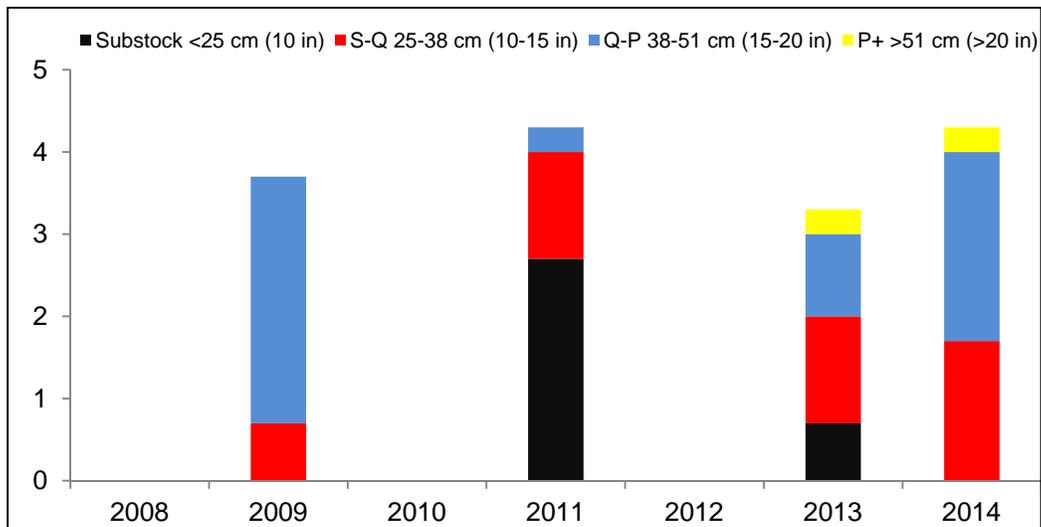


Figure 2. CPUE by length category for walleye sampled with gill nets in Scott Lake, Minnehaha County, 2009, 2011, 2013, 2014.

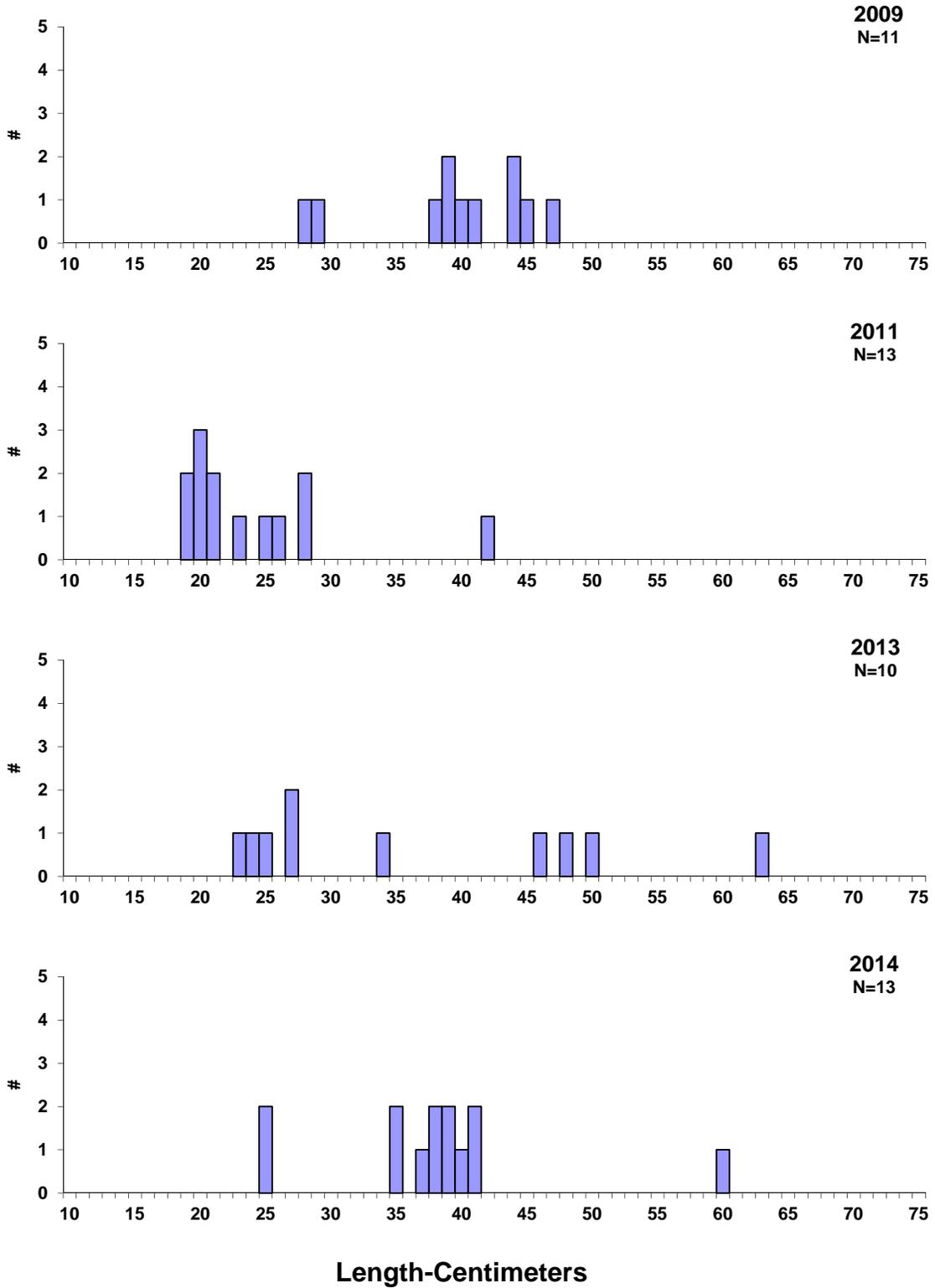


Figure 3. Length frequency histogram for walleye sampled in gill nets from Scott Lake, Minnehaha County, 2009, 2011, 2013 and 2014.

Yellow Perch

Management Objective

- maintain a yellow perch population with a total gill net CPUE of at least 25

Management Strategy

- stock adult yellow perch at the rate of 50/acre (5,400) as needed to achieve the management objective

Yellow perch CPUE remained below the management objective (Table 10). Nearly all of the larger individuals from the fall 2013 adult stocking (Table 11) must have been harvested because no fish sampled this year were over 15 cm (6 in) (Figure 4 and 5).

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

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPUE	12.0		2.7		20.0		17.3		8.0	9.7
PSD	79		--		2		21		43	0
RSD-P	54		--		0		0		17	0
Mean Wr	98		--		106		106		106	102

Table 11. Yellow perch stocked into Scott Lake, Minnehaha County, 2005-2014.

Year	Number	Size
2005	2,200	Adult
2006	1,875	Juvenile
	480	Adult
2011	57,680	Fingerling
2012	96,640	Fingerling
2013	3,516	Adult
2014	3,570	Adult

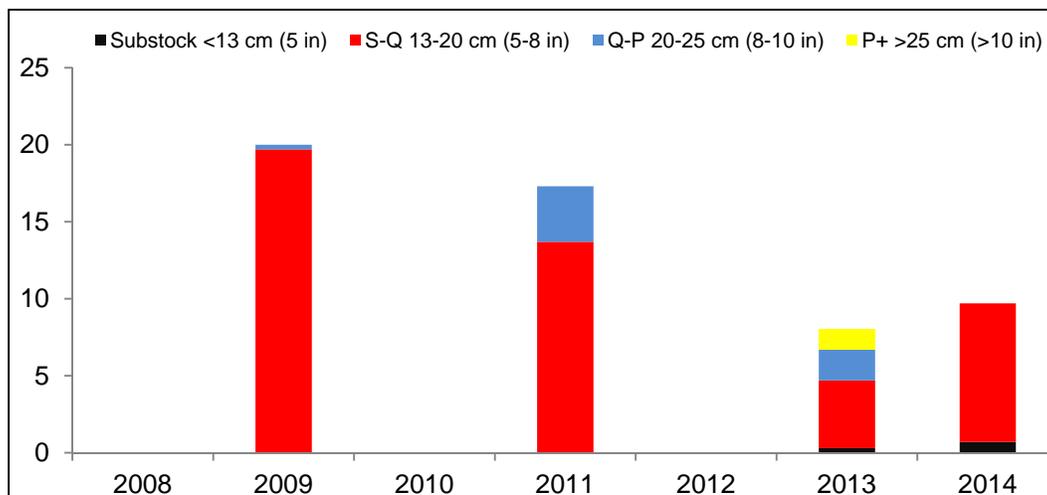


Figure 4. CPUE by length category for yellow perch sampled with gill nets in Scott Lake, Minnehaha County, 2008, 2012, 2014.

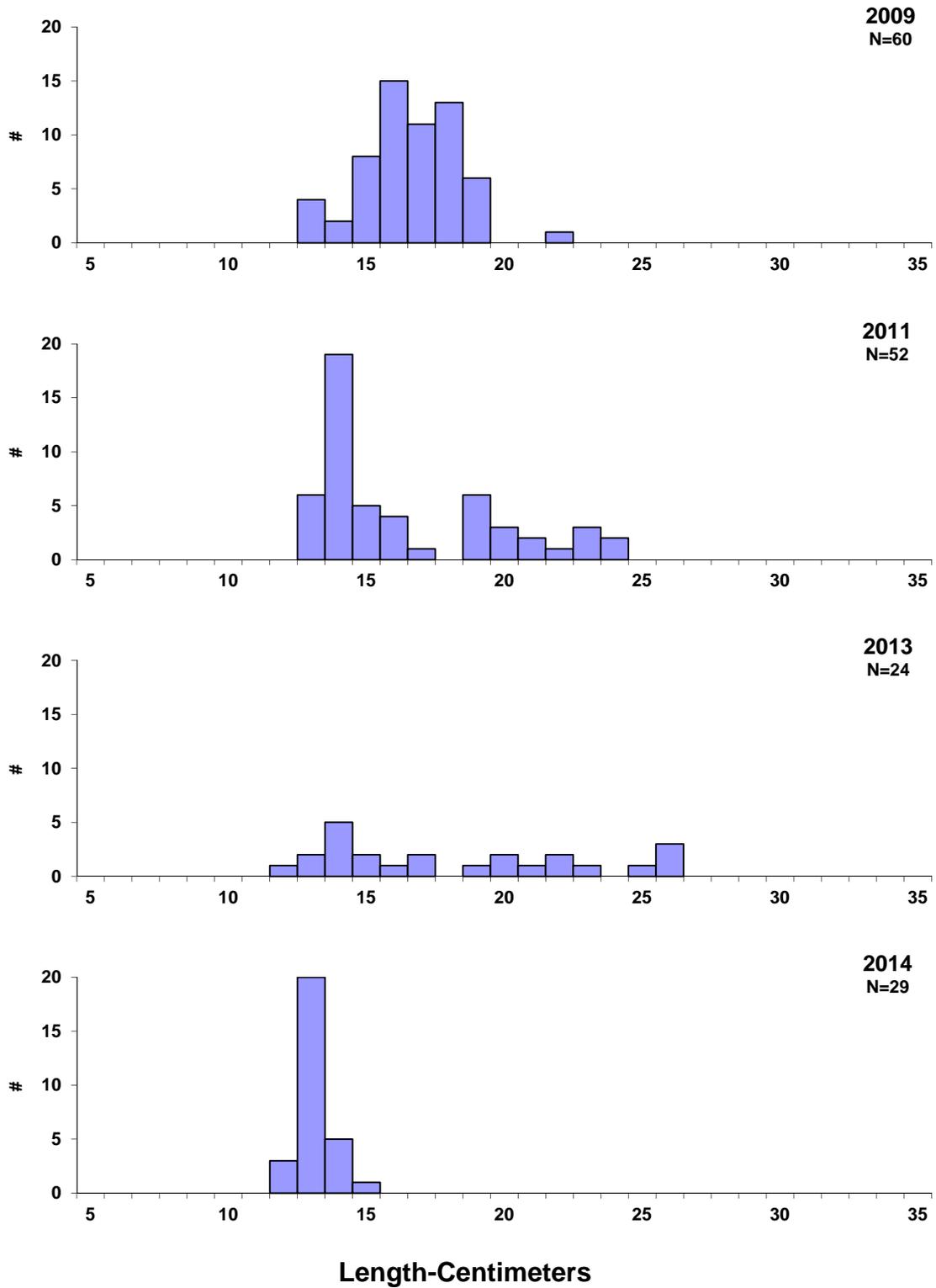


Figure 5. Length frequency histogram for yellow perch sampled in gill nets from Scott Lake, Minnehaha County, 2009, 2011, 2013 and 2014.

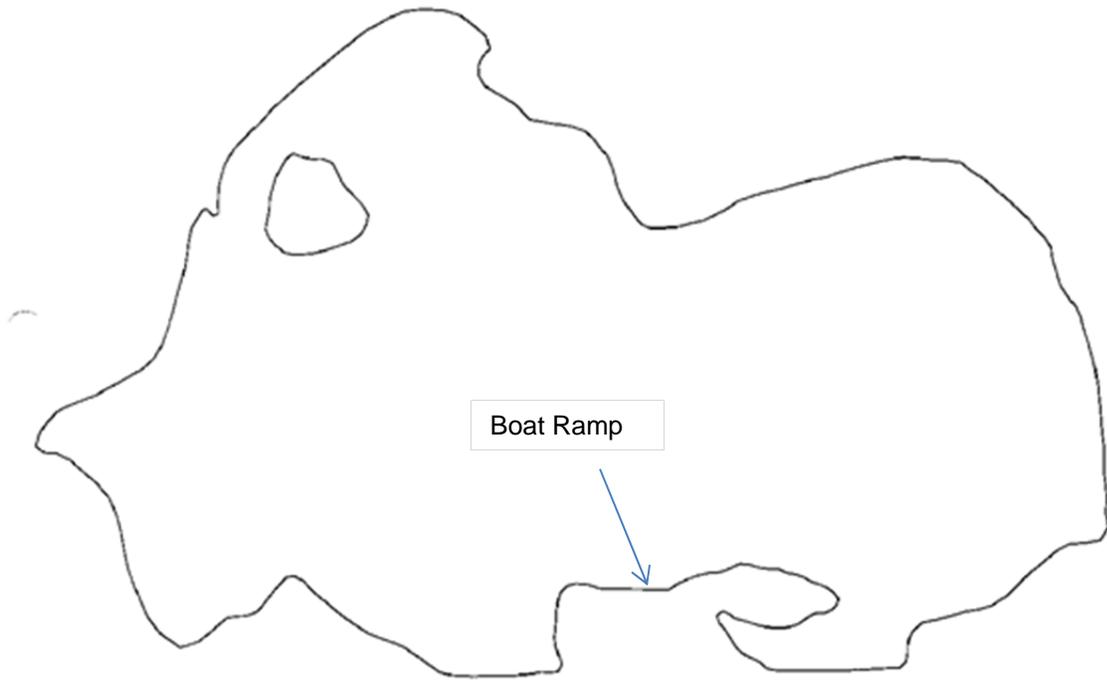


Figure 6. Shoreline outline map of Scott Lake, Minnehaha County.

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.