

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



**Figure 1.** Loss Lake, Minnehaha County

**Legal Description:** T101- R52-Sec. 4

**Location from nearest town:** ½ west, 4½ south and ½ east of Humboldt, SD

**Surface Area:** 90 acres

**Meandered (Y/N):** no

**OHWM elevation:** None set

**Outlet elevation:** None set

**Max. depth:** 8.4 feet

**Observed water level:** 3-4 feet low

**Contour map available (Y/N):** yes

**Watershed area:** 1,920 acres

**Shoreline length:** no data

**Date set:** NA

**Date set:** NA

**Mean depth:** 6.1 feet

**Lake volume:** no data

**Date mapped:** 2010

**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

No general information at this time.

### Ownership of Lake and Adjacent Lakeshore Properties

Loss Lake is not listed as a meandered lake in the State of South Dakota Listing of Meandered Lakes. The fishery is managed by the South Dakota Department of Game, Fish, and Parks (GFP). GFP also owns most of the western shoreline which consists of a Lake Access Area and a Game Production Area. The remainder of the shoreline is privately owned.

### Fishing Access

The Loss Lake Access Area contains a concrete plank boat ramp, dock, fishing pier, shore fishing access and a gravel parking lot located on the southwest corner of the lake.

### Water Quality and Aquatic Vegetation

Loss Lake is a shallow turbid lake with very little aquatic vegetation (Table 1).

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

<b>Year</b>	<b>Water Temp °C (°F)</b>	<b>Secchi Depth cm (in)</b>	<b>Observations/Comments (algae, aquatic vegetation, water quality, etc.)</b>
2014	23 (74)	43 (17)	No aquatic vegetation was observed
2012	27 (80)	66 (26)	No aquatic vegetation was observed
2010	26 (79)	30 (12)	Sago pondweed and filamentous algae
2008	25 (77)	91 (36)	Sago and clasping leaf pondweed, cattails

### Fish Community

Loss Lake contains a variety of game and non-game fish (Table 2).

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

<b>Game Species</b>	<b>Other Species</b>
Black Crappie	Orange-spotted Sunfish
Yellow Perch	Green Sunfish
Channel Catfish	Common Carp
Walleye	
Black Bullhead	
Largemouth Bass	

## **Fish Management**

Poor water quality, shallow depth, and lack of aquatic habitat make it a challenge to maintain a fishery in Loss Lake. Frequent stocking is needed to maintain game fish populations (Table 4). Black bullheads are well-suited to the conditions in Loss Lake and frequently overpopulate.

**Table 3.** Fish kill history for Loss Lake, Minnehaha County.

<b>Year</b>	<b>Severity</b>	<b>Comments</b>
2001	Severe	Winterkill, only 10 bullheads in test nets

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

<b>Year</b>	<b>Number</b>	<b>Species</b>	<b>Size</b>
2005	804	Channel Catfish	Adult
	1,236	Yellow Perch	Adult
2006	260	Channel Catfish	Adult
	252	Yellow Perch	Adult
	2,055	Yellow Perch	Juvenile
	1,158	Walleye	Juvenile
	625	Walleye	Large Fingerling
2010	8,600	Walleye	Fingerling
2011	618	Walleye	Large Fingerling
	1,628	Yellow Perch	Adult
2012	480	Walleye	Juvenile
2014	38,000	Walleye	Fingerling

## **Methods**

Loss Lake was sampled on July 15-16, 2014 with three overnight gill net sets and four overnight trap net sets. The trap nets were constructed with 19-mm-bar-mesh ( $\frac{3}{4}$  in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. 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

Nearly all species were sampled in lower numbers than they were in 2012 and several species were absent in 2014.

**Table 5.** Total catch from three overnight gill nets set in Loss Lake, Minnehaha County, July 15-16, 2014.

<i>Species</i>	<i>#</i>	<i>%</i>	<i>CPUE</i> <sup>1</sup>	<i>80% C.I.</i>	<i>Mean CPUE*</i>	<i>PSD</i>	<i>RSD-P</i>	<i>Mean Wr</i>
Black Bullhead	205	84.4	68.3	$\pm 12.7$	130.5	1	0	--
Common Carp	36	14.8	12.0	$\pm 7.5$	5.1	--	--	--
Walleye	2	0.8	0.7	$\pm 0.9$	7.7	--	--	--

\*10 years (2005-2014)

**Table 6.** CPUE by length category for selected species sampled with gill nets in Loss Lake, Minnehaha County, July 15-16, 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	15.3	53.0	53.0	--	--	68.3	$\pm 12.7$
Common Carp	9.7	2.3	0.3	2.0	--	12.0	$\pm 7.5$
Walleye	0.3	0.3	--	--	0.3	0.7	$\pm 0.9$

Length categories can be found in Appendix A.

**Table 7.** Total catch from four overnight trap nets set in Loss Lake, Minnehaha County, July 15-16, 2014.

<i>Species</i>	<i>#</i>	<i>%</i>	<i>CPUE</i>	<i>80% C.I.</i>	<i>Mean CPUE*</i>	<i>PSD</i>	<i>RSD-P</i>	<i>Mean Wr</i>
Black Bullhead	1,965	98.8	491.3	$\pm 170.1$	447.1	0	0	--
Common Carp	14	0.7	3.5	$\pm 1.8$	2.5	--	--	--
Channel Catfish	5	0.3	1.3	$\pm 1.2$	0.7	--	--	--
Walleye	4	0.2	1.0	$\pm 0.5$	1.4	--	--	--
O. S. Sunfish	1	0.1	0.3	$\pm 0.3$	0.1	--	--	--

\*10 years (2005-2014)

**Table 8.** CPUE by length category for selected species sampled with trap nets in Loss Lake, Minnehaha County, July 15-16, 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	294.5	196.8	196.8	--	--	491.3	$\pm 170.1$
Common Carp	3.0	0.5	--	0.5	--	3.5	$\pm 1.8$
Channel Catfish	1.3	--	--	--	--	1.3	$\pm 1.2$
Walleye	--	1.0	--	0.2	0.8	1.0	$\pm 0.5$
O. S. Sunfish*	--	--	--	--	--	0.3	$\pm 0.3$

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

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

**Table 9.** Gill-net (GN), and trap-net (TN) CPUE for selected fish species sampled in Loss Lake, Minnehaha County, 2005-2014.

<i>Species</i>	<i>Gear</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	GN		114.0		147.3		120.0		202.7		68.3
Bullhead	TN		198.0		212.4		731.2		602.6		491.3
Black	GN		--		0.3		--		0.7		--
Crappie	TN		1.0		2.0		0.4		0.2		--
	GN		--		--		--		--		--
Bluegill	TN		--		--		0.2		--		--
Channel	GN		10.5		5.7		0.3		2.0		--
Catfish	TN		1.0		0.2		--		0.8		1.3
Common	GN		2.0		2.3		3.0		6.3		12.0
Carp	TN		--		0.6		7.6		0.6		3.5
Green	GN		--		--		--		--		--
Sunfish	TN		0.4		--		0.4		--		--
O. S.	GN		--		--		--		--		--
Sunfish	TN		--		--		--		--		0.3
Largemouth	GN		--		--		--		1.0		--
Bass	TN		--		--		--		--		--
	GN		--		4.0		12.3		21.3		0.7
Walleye	TN		--		1.0		2.0		3.0		1.0
Yellow	GN		2.5		173.3		30.0		20.7		--
Perch	TN		18.6		4.4		0.6		6.0		--

# Walleye

## Management Objective

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

## Management Strategies

- stock advanced fingerling or juvenile walleyes at the rate of 10/acre (900) if available and as needed to achieve the management objective
- if large fingerlings or juveniles are not available, stock small walleye fingerlings at the rate of 70/acre (6,300) as needed to achieve the management objective

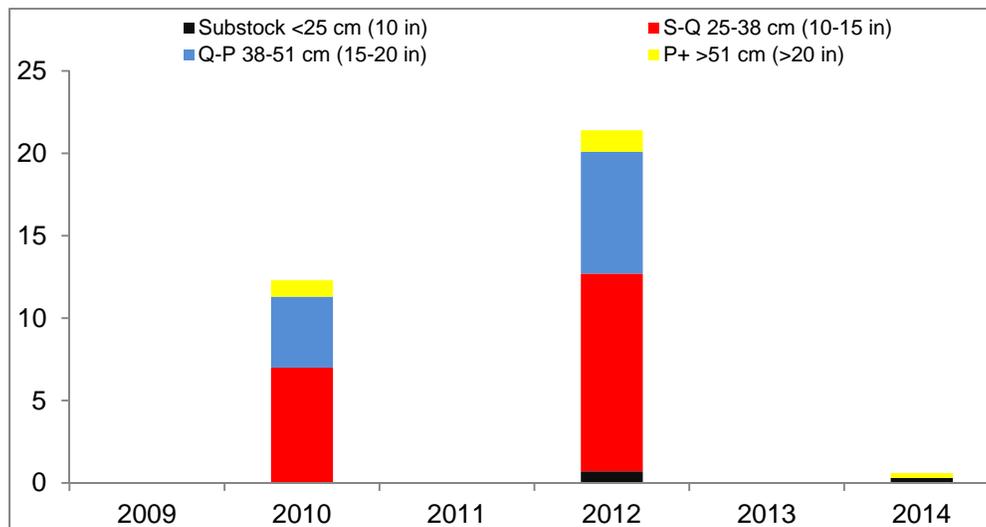
Walleye abundance has decreased since 2012 only two walleyes were sampled in this survey (Table 5). Low water conditions may be affecting walleye survival.

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

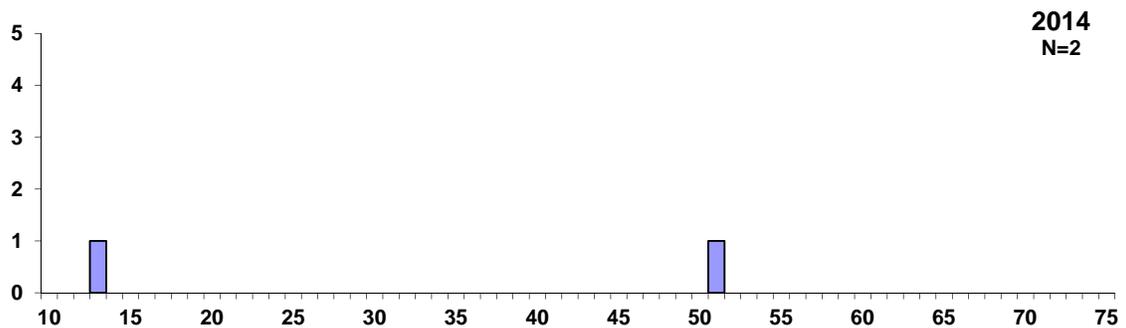
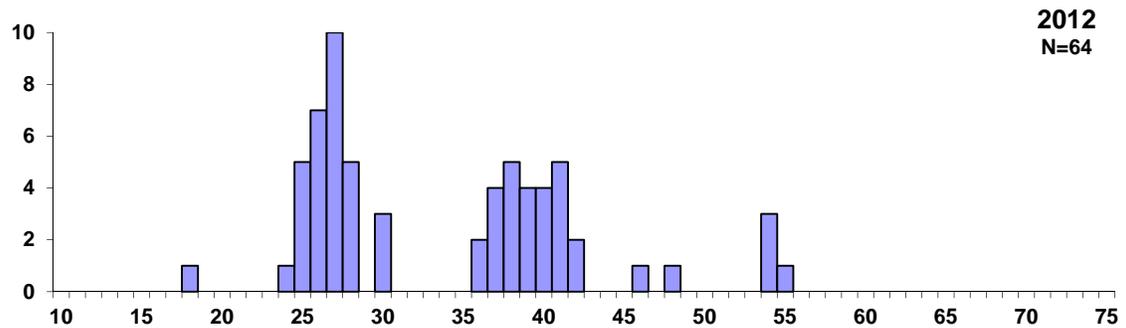
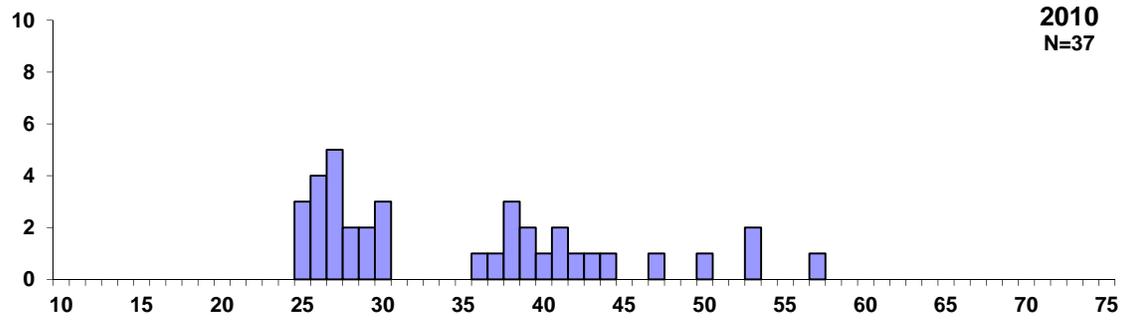
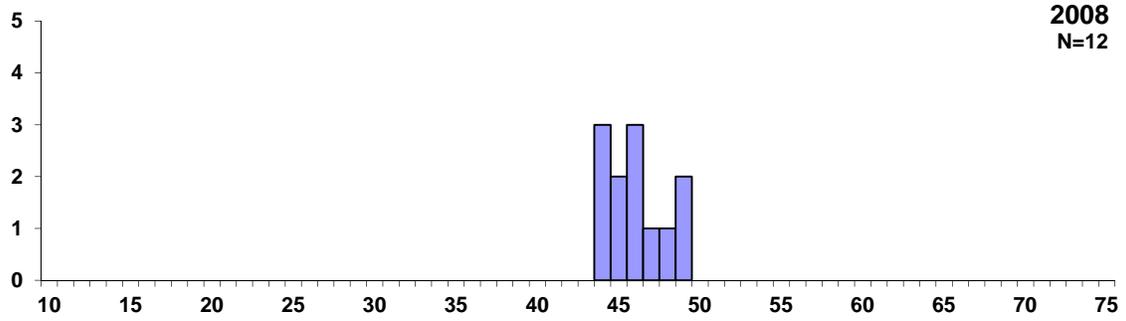
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>CPUE</b>		--		4.0		12.3		21.3		0.7
<b>PSD</b>		--		100		43		42		--
<b>RSD-P</b>		--		0		8		6		--
<b>Mean Wr</b>		--		103		90		85		--

**Table 11.** Walleye stocked into Loss Lake, Minnehaha County, 2005-2014.

Year	Number	Size
2006	1,158	Juvenile
	625	Large Fingerling
2010	8,600	Small Fingerling
2011	618	Large Fingerling
2012	480	Juvenile
2014	38,000	Small Fingerling



**Figure 2.** CPUE by length category for walleye sampled with gill nets in Loss Lake, Minnehaha County, 2009-2014.



**Length-Centimeters**

**Figure 3.** Length frequency histograms for walleye sampled with gill nets in Loss Lake, Minnehaha County, 2008, 2010, 2012, and 2014.

## Yellow Perch

### Management Objective

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

### Management Strategies

- stock yellow perch small fingerlings at the rate of 500/acre (45,000) or, adult yellow perch at the rate of 50/acre (4,500), as needed to achieve the management objective
- mark stocked yellow perch small fingerlings with oxytetracycline to allow evaluation of stocking success

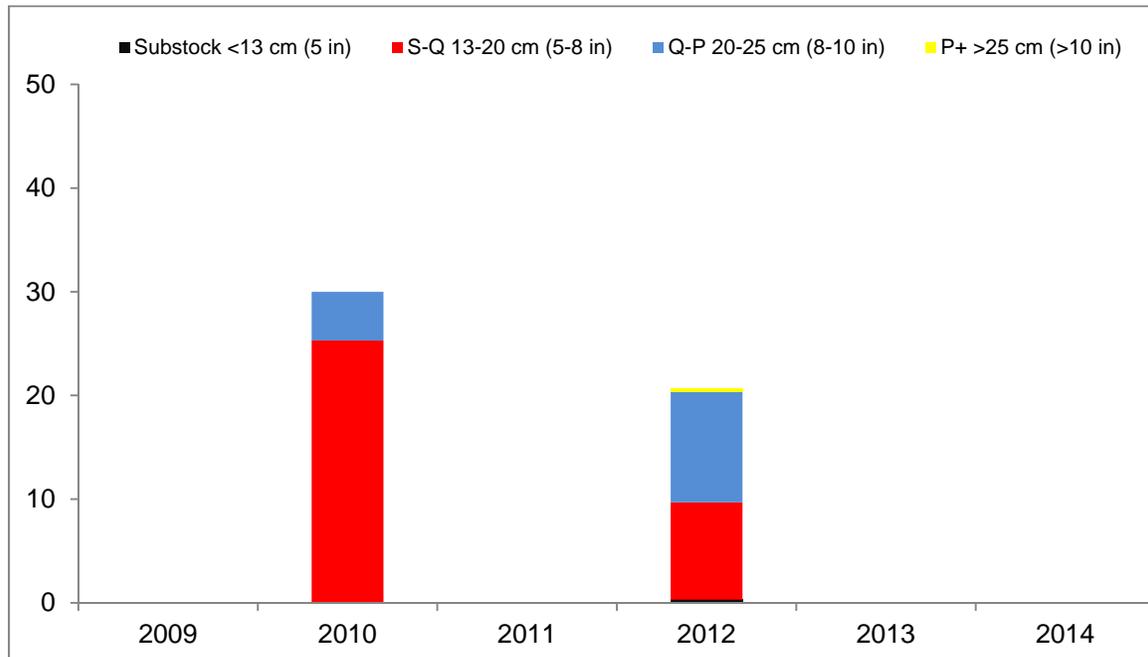
No yellow perch were sampled in the 2014 survey after a steady decline in abundance since 2008 (Table 12).

**Table 12.** CPUE, PSD, RSD-P, and mean Wr for all yellow perch sampled with gill nets in Loss Lake, Minnehaha County, 2005-2014. Stocked years are shaded.

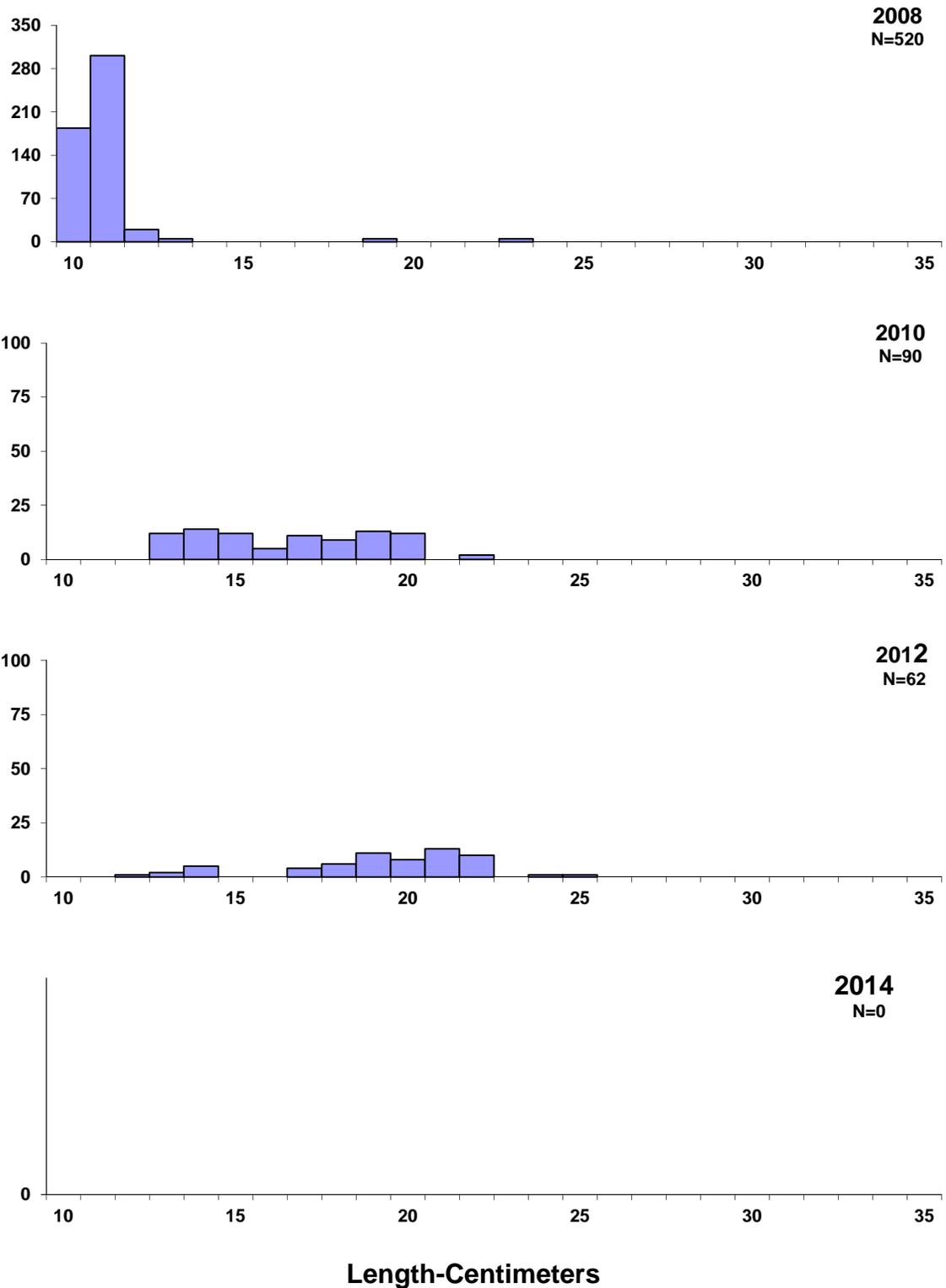
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>CPUE</b>		2.5		173.3		30.0		20.7		0.0
<b>PSD</b>		--		--		16		53		--
<b>RSD-P</b>		--		--		0		2		--
<b>Mean Wr</b>		--		102		109		89		--

**Table 13.** Yellow perch stocked into Loss Lake, Minnehaha County, 2005-2014.

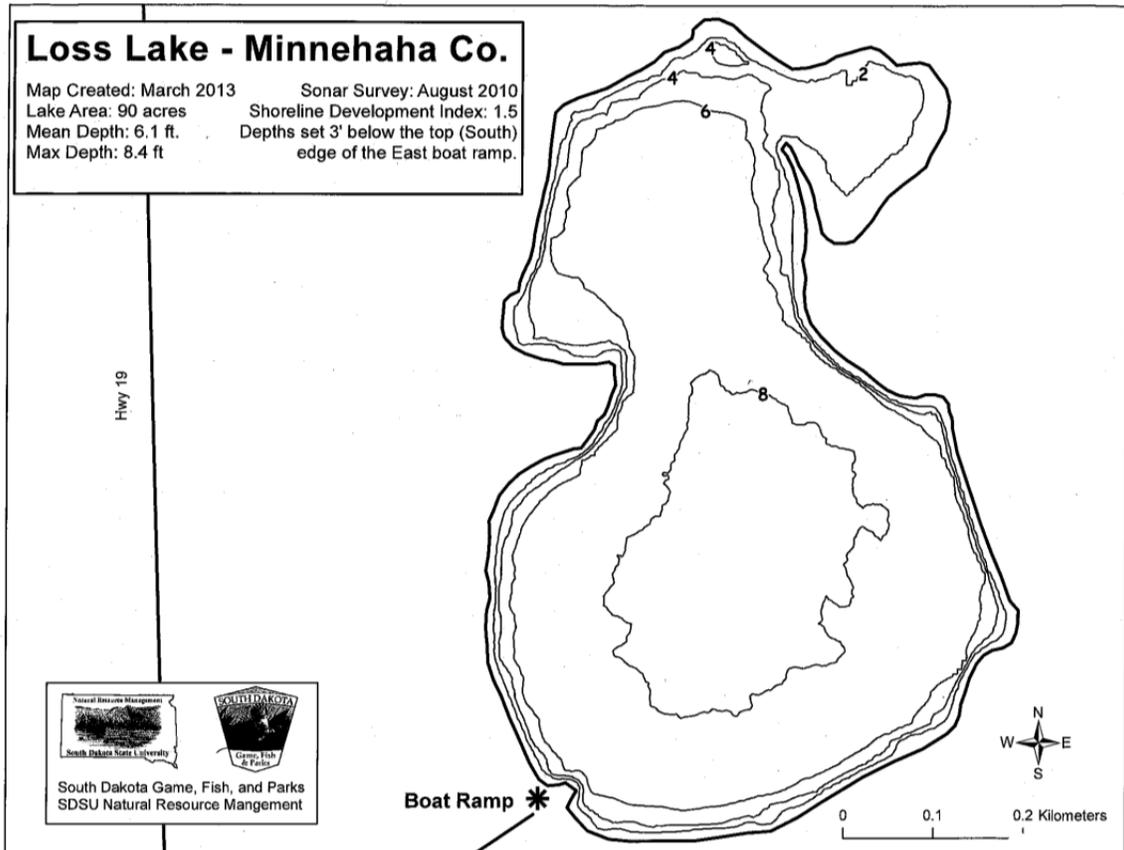
Year	Number	Size
2011	1,628	Adult



**Figure 4.** CPUE by length category for yellow perch, sampled with gill nets in Loss Lake, Minnehaha County, 2009-2014.



**Figure 5.** Length frequency histograms for yellow perch sampled with gill nets in Loss Lake, Minnehaha County, 2008, 2010, 2012, and 2014.



**Figure 6.** Contour map of Loss 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).

<b>Species</b>	<b>Stock</b>	<b>Quality</b>	<b>Preferred</b>	<b>Memorable</b>	<b>Trophy</b>
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.