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

Figure 1. Lake George, Lake County

Legal Description: T105-R54-Sec.15, 16, 21
Location from nearest town: 7 miles south and 2 miles east of Winfred, SD

Surface Area: 193 acres
Meandered (Y/N): Yes
OHWM elevation: no data
Outlet elevation: no data
Max. depth at outlet elevation: 9 feet
Observed water level: insert
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: 4 feet
Lake volume: 27,153 acre-feet
Date mapped: NA

DENR beneficial use classifications: no information

Introduction

General

No information.

Ownership of Lake and Adjacent Lakeshore Properties

Lake George is listed as meandered public water in the State of South Dakota Listing of Meandered Lakes and the South Dakota Department of Game, Fish, and Parks (GFP) manages the fishery. Other than some road right of way, all the shoreline is privately owned.

Fishing Access

There is no boat ramp on Lake George. Small boats can be launched off a flooded road grade on the south side of the lake (Figure 1). The road right of way is also the only shore fishing access available. Most of the fishing use occurs during the winter.

Water Quality and Aquatic Vegetation

The Secchi depth measurement in Lake George this year was 43 cm (17 in) and a few cattails and bulrushes were observed.

Fish Community

Lake George has a very simple fish community consisting of only four species (Table 1).

Table 1. Fish species commonly found in Lake George, Lake County.

Game Species	***Other Species***
Walleye	Black Bullhead
Yellow Perch	Green Sunfish

Fish Management

Fisheries management on Lake George started in 2006 with the stocking of walleye fry (Table 3) after surrounding landowners supported the establishment of a fishery. The light fish kill in 2014 was believed to have been caused by gas bubble disease during the spring ice out. Yellow perch were stocked in 2010 and 2011 to diversify the fishery.

Table 2. Fish kill history for Lake George, Lake County.

Year	***Severity***	***Comments***
2014	Light	A few dead walleyes observed in east portion of lake

Table 3. Stocking history for Lake George, Lake County, 2005-2014. Sort by most recent to less recent for last ten years

Year	*Number*	*Species*	*Size*
2006	1,200,000	Walleye	Fry
2007	28,060	Walleye	Small Fingerling
2010	51,210	Walleye	Small Fingerling
	112,258	Yellow Perch	Small Fingerling
2011	25,100	Walleye	Small Fingerling
	2,065,000	Yellow Perch	Fry
2014	233,000	Walleye	Fry

Methods

Lake George was sampled on June 17-18, 2014 with three overnight gill-net sets. The gill nets are 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 (½, ¾, 1, 1¼, 1½, and 2 in) monofilament netting.

Results and Discussion

Net Catch Results

Walleyes were the most abundant species sampled in the gill nets (Table 4) and all were stock length or longer (Table 5).

Table 4. Total catch from 3 overnight gill-nets set in Lake George, Lake County, June 17-18, 2014.

Species	*#*	*%*	*CPUE*[1]	*80% C.I.*	*Mean CPUE**	*PSD*	*RSD-P*	*Mean Wr*
Walleye	122	80.8	40.7	±15.0	60.7	81	3	98
Black Bullhead	16	10.6	5.3	±2.3	5.1	20	0	--
Yellow Perch	12	7.9	4.0	±1.5	23.7	42	25	103
Green Sunfish	1	0.7	0.3	±0.4	0.1	--	--	--

*3 years (2011-2012, 2014)

Table 5. CPUE by length category for selected species sampled with gill-nets in Lake George, Lake County, June 17-18, 2014.

Species	*Substock*	*Stock*	*S-Q*	*Q-P*	*P+*	*All sizes*	*80% C.I.*
Walleye	--	40.7	7.7	31.7	1.3	40.7	±15.0
Black Bullhead	0.3	5.0	4.0	1.0	--	5.3	±2.3
Yellow Perch	--	4.0	2.3	0.7	1.0	4.0	±1.5
Green Sunfish	--	0.3	--	0.3	--	0.3	±0.4

Length categories can be found in Appendix A.

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

Table 6. Gill-net (GN) and trap-net (TN) CPUE for selected fish species sampled in Lake George, Lake County, 2005-2014.

Species	*Gear*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Black Bullhead	GN							3.0	10.0		5.3
	TN								289.8		
Green Sunfish	GN										0.3
	TN								2.0		
Walleye	GN							42.3	99.0		40.7
	TN								39.0		
Yellow Perch	GN							27.7	39.3		4.0
	TN								6.0		

Walleye

Management Objective

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

Management Strategy

- stock small walleye fingerlings at the rate of 70/acre (13,510) as needed to achieve the management objective

Lake George has an excellent population of walleyes. Abundance exceeds the management objective (Table 7) and the population has an excellent size distribution (Figures 2, 3). It is assumed that stocking has created and maintained the fishery since it was started in 2006 (Table 8).

Table 7. CPUE, PSD, RSD-P, and mean Wr for all walleye sampled with gill-nets in Lake George, Lake County, 2005-2014. Stocked years are shaded.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE							42.3	99.0		40.7
PSD							4	8		81
RSD-P							4	0		3
Mean Wr							--	94		98

Table 8. Walleye stocked into Lake George, Lake County, 2005-2014.

Year	***Number***	***Size***
2006	1,200,000	Fry
2007	28,060	Small Fingerling
2010	51,210	Small Fingerling
2011	25,100	Small Fingerling
2014	233,000	Fry

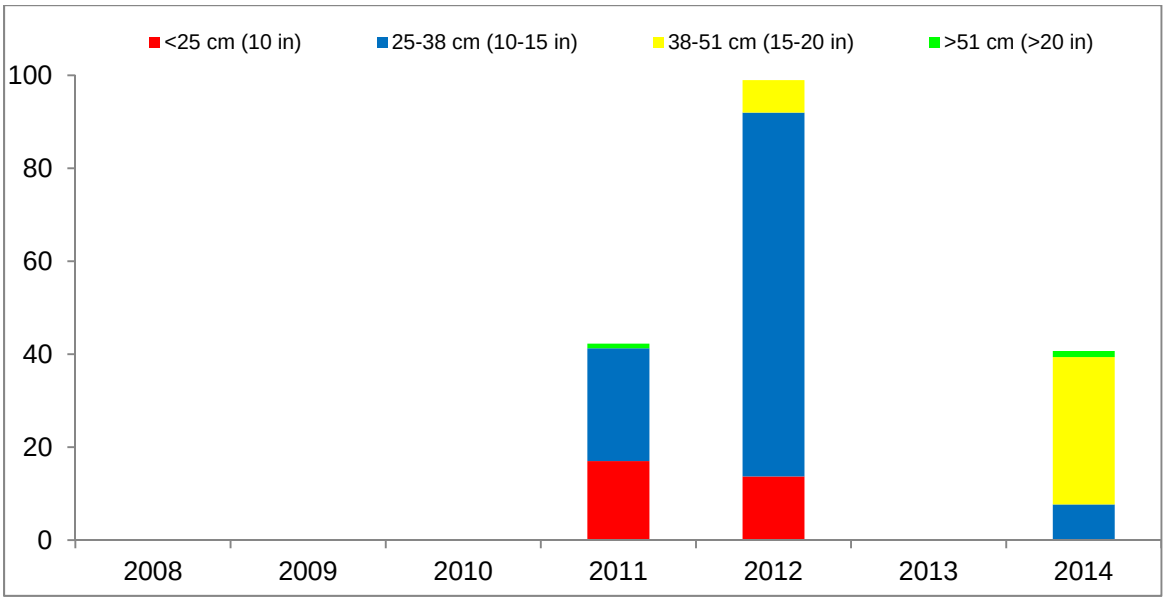

Figure 2. CPUE by length category for walleye sampled with gill nets in Lake George, Lake County, 2011, 2012, 2014.

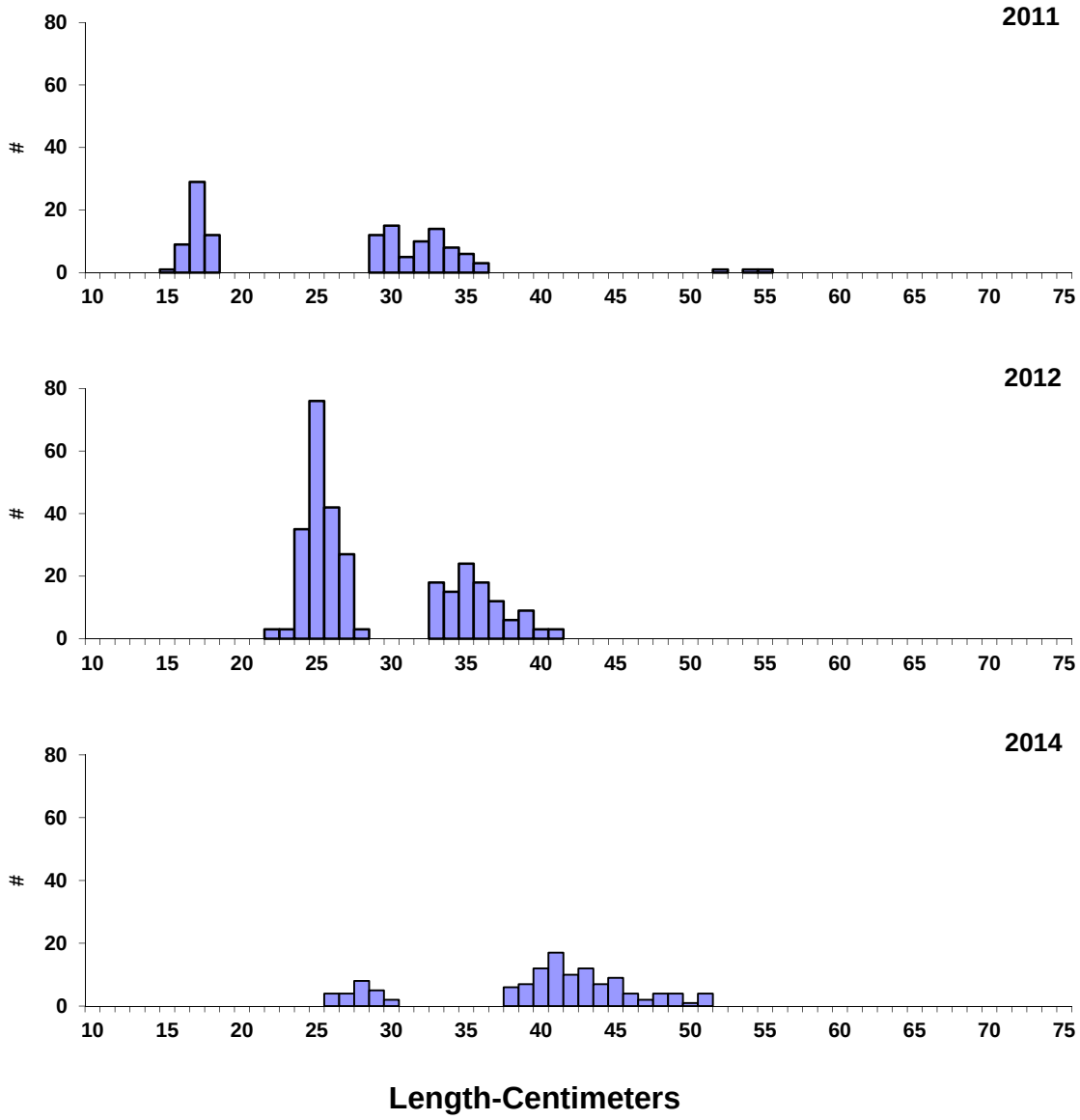

Figure 3. Length frequency histograms for walleye sampled with gill-nets in Lake George, Lake County, 2011, 2012, 2014.

Yellow Perch

Management Objective

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

Management Strategy

- stock small yellow perch fingerlings at the rate of 500/acre (96,500) as needed to achieve the management objective

Yellow perch gill-net CPUE has fallen below the management objective (Table 9). Since we have no survey data that would indicate the presence of yellow perch prior to 2011, we assume the 2010 and 2011 stockings (Table 10) successfully established the population. However, it appears there has been no significantly large year class produced naturally since 2011 and abundance has declined. Periodic stocking may be needed to maintain the population.

Table 9. CPUE, PSD, RSD-P, and mean Wr for all yellow perch sampled with gill-nets in Lake George, Lake County, 2005-2014. Stocked years are shaded.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE							27.7	39.3		4.0
PSD							41	76		42
RSD-P							0	20		25
Mean Wr							--	112		103

Table 10. Yellow perch stocked into Lake George, Lake County, 2005-2014.

Year	***Number***	***Size***
2010	112,258	Small Fingerling
2011	2,065,000	Fry

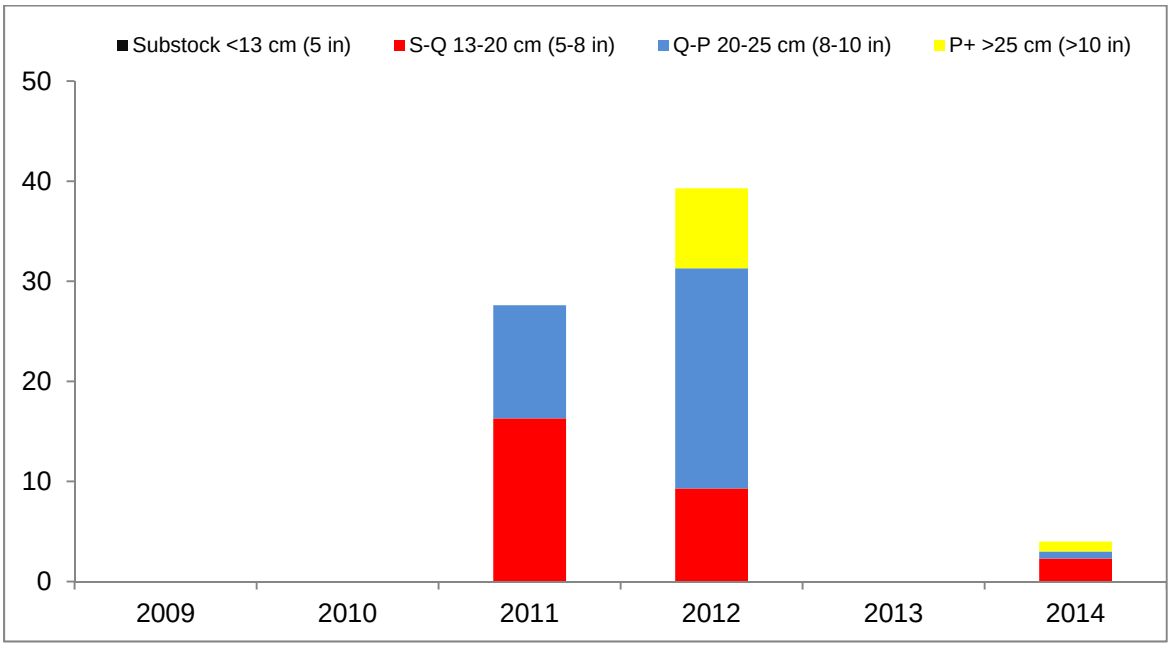

Figure 4. CPUE by length category for yellow perch, sampled with gill nets in Lake George, Lake County, 2009-2014.

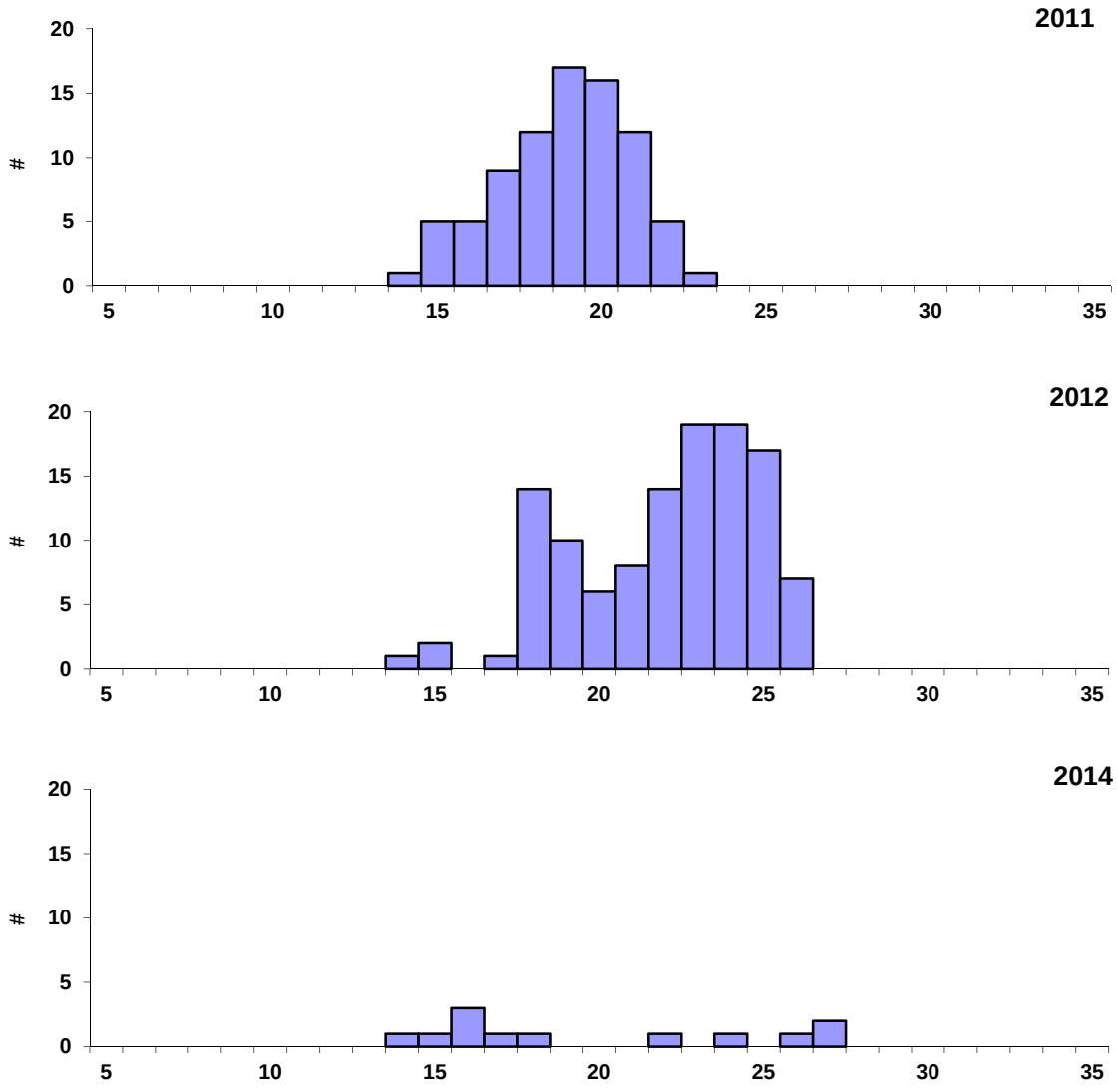

Figure 5. Length frequency histograms for yellow perch sampled with gill nets in Lake George, Lake County, 2011, 2012, and 2014.

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:

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

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

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

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.