

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



Figure 1. Lake Hanson, Hanson County

Legal Description: T102-R58-Sec. 21

Location from nearest town: 2 miles south of Alexandria, SD

Surface Area: 61 acres

Meandered (Y/N): no

OHWM elevation: none set

Outlet elevation: no data

Max. depth at outlet elevation: 14.5 feet

Observed water level: full

Contour map available: Yes

Watershed area: 40,053 acres

Shoreline length: 2.2 miles

Date set: NA

Date set: NA

Mean depth at outlet elevation: 6.3 feet

Lake volume: 381 acre-feet

Date mapped: 2010

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

Introduction

General

Lake Hanson is an artificial impoundment constructed by the Works Progress Administration (WPA) in 1934. It was named by a local lake committee in honor of the county. On May 6, 2007, the emergency spillway section of the dam washed out following a major rain event and the lake was almost completely drained. The dam was repaired and the lake refilled later that summer.

Ownership of Lake and Adjacent Lakeshore Properties

The dam impounding Lake Hanson is owned by the South Dakota Department of School and Public Lands and the South Dakota Department of Game, Fish, and Parks (GFP) is responsible for managing the fishery. The land surrounding Lake Hanson is privately owned. However, two easements created in 1934 grant public access to a strip of land lying 12 feet above the ordinary high water mark around the entire lake.

Fishing Access

There is a concrete-plank boat ramp owned by Hanson County on the north side of the lake capable of handling most boats. Shore fishing is available at various sites along the north shore.

Water Quality and Aquatic Vegetation

Water clarity in Lake Hanson has varied from 30-86 cm (12-34 in) since 2006 (Table 1). This explains the generally low abundance of submerged aquatic vegetation observed during lake surveys over the same time period.

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

Year	Water Temp °C (°F)	Secchi Depth cm (in)	Observations/Comments (algae, aquatic vegetation, water quality, etc.)
2014	27 (82)	70 (27+)	Cattails and small amount of sago pondweed
2012	25 (77)	56 (22)	Cattails, sago pondweed and coontail
2010	26 (79)	75 (30)	Cattails and coontail
2008	26 (78)	86 (34)	Cattails, coontail, and sparse sago
2006	24 (75)	30 (12)	Sago, cattails, and coontail

Fish Community

Lake Hanson contains a diverse mixture of species commonly found in small impoundments and large lakes (Table 2).

Table 2. Fish species commonly found in Lake Hanson, Hanson County.

Game Species	Other Species
Largemouth Bass Bluegill White Crappie Black Crappie Channel Catfish Black Bullhead Yellow Perch Northern Pike Walleye	Common Carp White Sucker

Fish Management

Until recently, Lake Hanson has been managed as a typical largemouth bass/panfish fishery. However, poor water clarity and resulting lack of abundant submerged aquatic vegetation has prompted a change to manage the fishery for walleyes and panfish.

Table 3. Fish kill history for Lake Hanson, Hanson County.

Year	Severity	Comments
2006	Severe	Dam washed out and flushed most fish downstream

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

Year	Number	Species	Size
2008	22,900	Bluegill	Fingerling
	6,560	Largemouth Bass	Fingerling
2014	55,000	Walleye	Fry

Methods

Lake Hanson was sampled on July 9-10, 2014 with three overnight gill nets and five overnight trap nets. 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 ($\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and 2 in) monofilament netting. The trap nets are 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.

Results and Discussion

Net Catch Results

Black bullheads dominated the trap net and gill net catches in 2014 (Tables 5, 7) and a high percentage of those sampled were smaller than stock length (Tables 6, 8). Overall, few game fish were sampled in either gear.

Table 5. Total catch from three overnight gill nets set in Lake Hanson, Hanson County, July 9-10, 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	169	89.9	56.3	<u>+22.9</u>	--	--	--	--
Common Carp	9	4.8	3.0	<u>+0.7</u>	--	--	--	--
Northern Pike	5	2.7	1.7	<u>+0.4</u>	--	--	--	--
Bluegill	3	1.6	1.0	<u>+0.7</u>	--	--	--	--
Channel Catfish	1	0.5	0.3	<u>+0.4</u>	--	--	--	--
White Sucker	1	0.5	0.3	<u>+0.4</u>	--	--	--	--

*1 year (2014)

Table 6. CPUE by length category for selected species sampled with gill nets in Lake Hanson, Hanson County, July 9-10, 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	54.3	2.0	1.0	0.7	0.3	56.3	<u>+22.9</u>
Common Carp	1.0	2.0	2.0	--	--	3.0	<u>+0.7</u>
Northern Pike	--	1.7	1.0	--	0.7	1.7	<u>+0.4</u>
Bluegill	0.3	0.7	0.3	0.3	--	1.0	<u>+0.7</u>
Channel Catfish	--	0.3	--	0.3	--	0.3	<u>+0.4</u>
White Sucker	--	0.3	0.3	--	--	0.3	<u>+0.4</u>

Length categories can be found in Appendix A.

Table 7. Total catch from five overnight trap nets set in Lake Hanson, Hanson County, July 9-10, 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	1,533	96.1	306.6	<u>+179.0</u>	88.3	0	0	--
Bluegill	39	2.4	7.8	<u>+5.2</u>	13.2	15	0	95
Black Crappie	14	0.9	2.8	<u>+2.7</u>	23.5	--	--	--
White Crappie	6	0.4	1.2	<u>+1.0</u>	6.4	--	--	--
Common Carp	2	0.1	0.4	<u>+0.3</u>	0.7	--	--	--
Northern Pike	2	0.1	0.4	<u>+0.5</u>	1.7	--	--	--

*10 years (2005-2014)

Table 8. CPUE by length category for selected species sampled with trap nets in Lake Hanson, Hanson County, July 9-10, 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	275.8	30.8	30.8	--	--	306.6	<u>+179.0</u>
Bluegill	--	7.8	6.6	1.2	--	7.8	<u>+5.2</u>
Black Crappie	1.4	1.4	1.2	--	0.2	2.8	<u>+2.7</u>
White Crappie	--	1.2	0.2	--	1.0	1.2	<u>+1.0</u>
Common Carp	--	0.4	0.4	--	--	0.4	<u>+0.3</u>
Northern Pike	--	0.4	--	0.2	0.2	0.4	<u>+0.5</u>

Length categories can be found in Appendix A.

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

Table 9. Gill-net (GN), or trap-net (TN) CPUE for selected fish species sampled in Lake Hanson, Hanson 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 Bullhead	GN										56.3
	TN	--			--		46.6				306.6
Black Crappie	GN										--
	TN	74.2			5.8		11.2				2.8
Bluegill	GN										1.0
	TN	36.6			3.3		5.0				7.8
Channel Catfish	GN										0.3
	TN	0.8			0.5		0.2				--
Common Carp	GN										3.0
	TN	0.1			1.5		0.8				0.4
Largemouth Bass	GN										--
	TN	--			0.3		--				--
Northern Pike	GN										1.7
	TN	0.4			5.0		1.0				0.4
White Crappie	GN										--
	TN	2.4			2.0		19.8				1.2
Yellow Perch	GN										--
	TN	35.9			0.5		0.6				--

Bluegill

Management Objective

- None

Management Strategy

- Monitor the bluegill population during annual lake surveys and report the results.

Bluegill trap-net CPUE has been slowly increasing since 2008 (Table 10). However, the majority of bluegills sampled were only 11-17 cm (4-7 in) long (Figures 2, 3). This low abundance of small fish is unlikely to provide much fishing opportunity.

Table 10. CPUE, PSD, RSD-P, and mean Wr for all SPECIES sampled with trap nets in Lake Hanson, Hanson County, 2005-2014. Stocked years are shaded.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPUE		36.6		3.3		5.0				7.8
PSD		45		54		40				15
RSD-18		16		0		8				3
RSD-P		12		0		0				0
Mean Wr		96		95		91				95

Table 11. Bluegill stocked into Lake Hanson, Hanson County, 2005-2014.

Year	Number	Size
2008	22,900	Fingerling

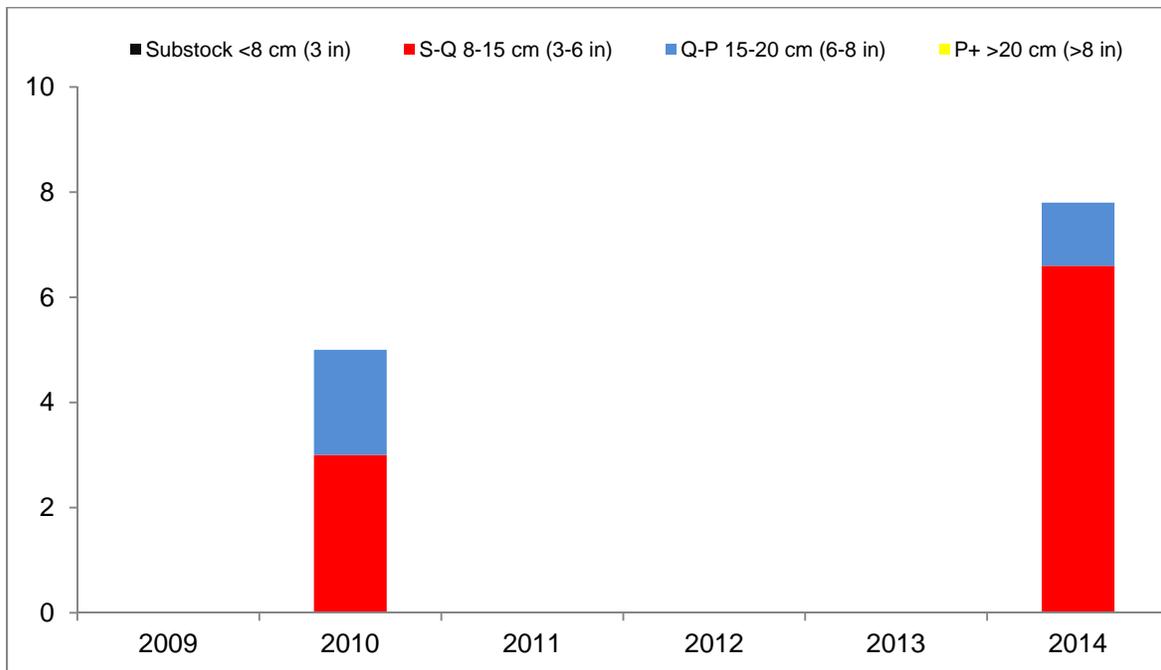


Figure 2. CPUE by length category for bluegill sampled with trap nets in Lake Hanson, Hanson County, 2009-2014.

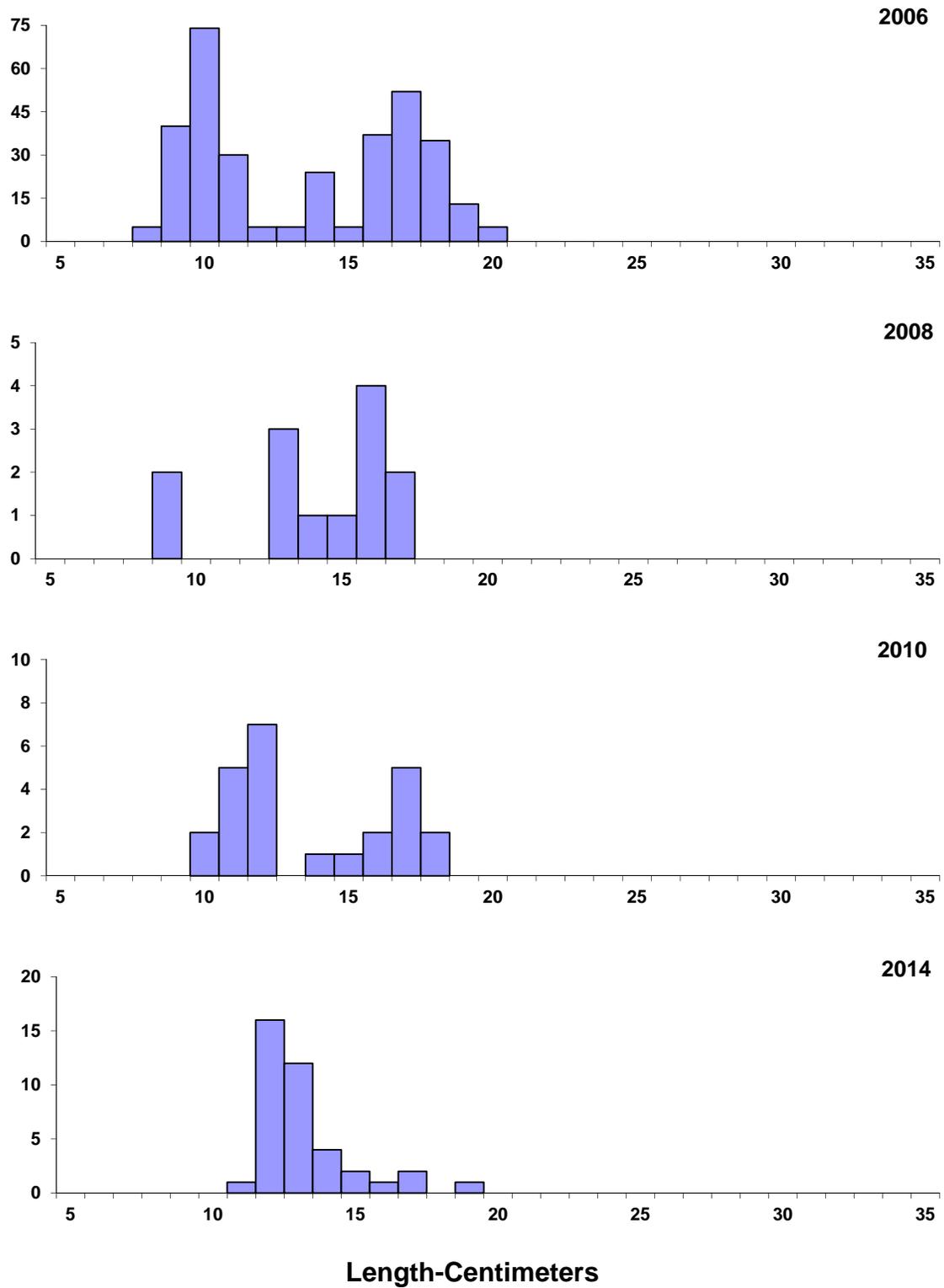


Figure 3. Length frequency histograms for bluegills sampled with trap nets in Lake, Hanson, Hanson County, 2006, 2008, 2010, 2014.

Black Crappie

Management Objective

- none

Management Strategy

- monitor the population during annual lake surveys and report the results

Black crappie abundance in Lake Hanson has declined substantially since 2006 (Table 12). It is likely that the majority of the population was washed out of the lake in 2007 when the emergency spillway failed and there has been no significantly large year class produced to restore abundance since then.

Table 12. CPUE, PSD, RSD-P, and mean Wr for all black crappie sampled with trap nets in Lake Hanson, Hanson County, 2005-2014. Stocked years are shaded.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPUE		74.2		5.8		11.2				2.8
PSD		14		100		38				--
RSD-23		13		68		29				--
RSD-P		5		55		29				--
Mean Wr		99		107		92				--

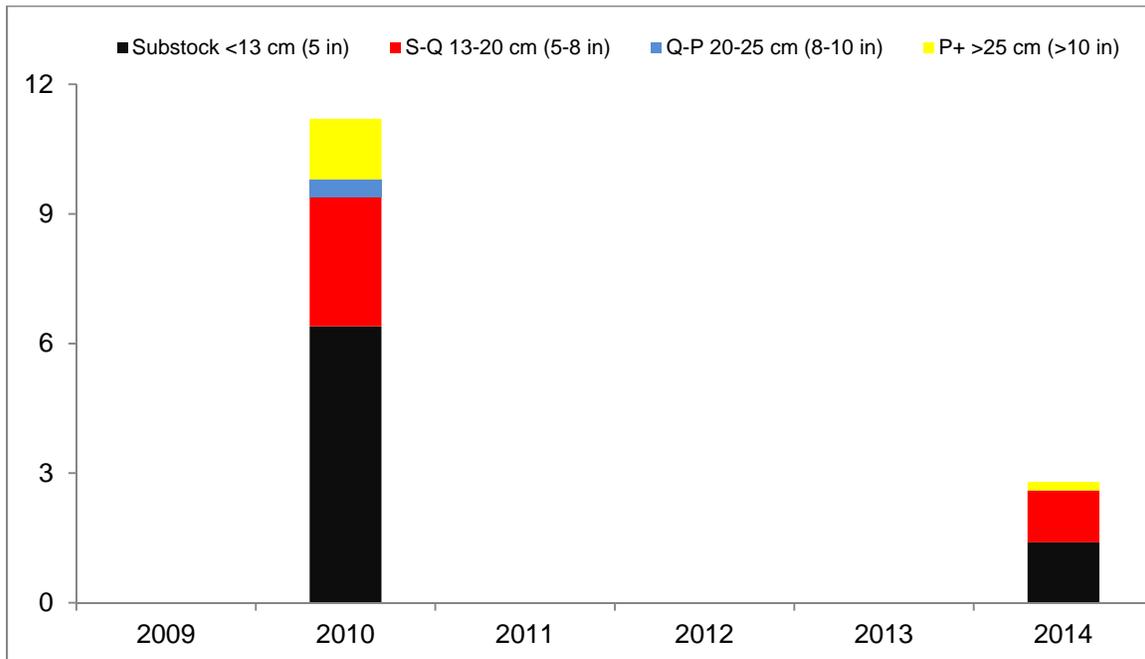


Figure 4. CPUE by length category for black crappie, sampled with trap nets in Lake Hanson, Hanson County, 2009-2014.

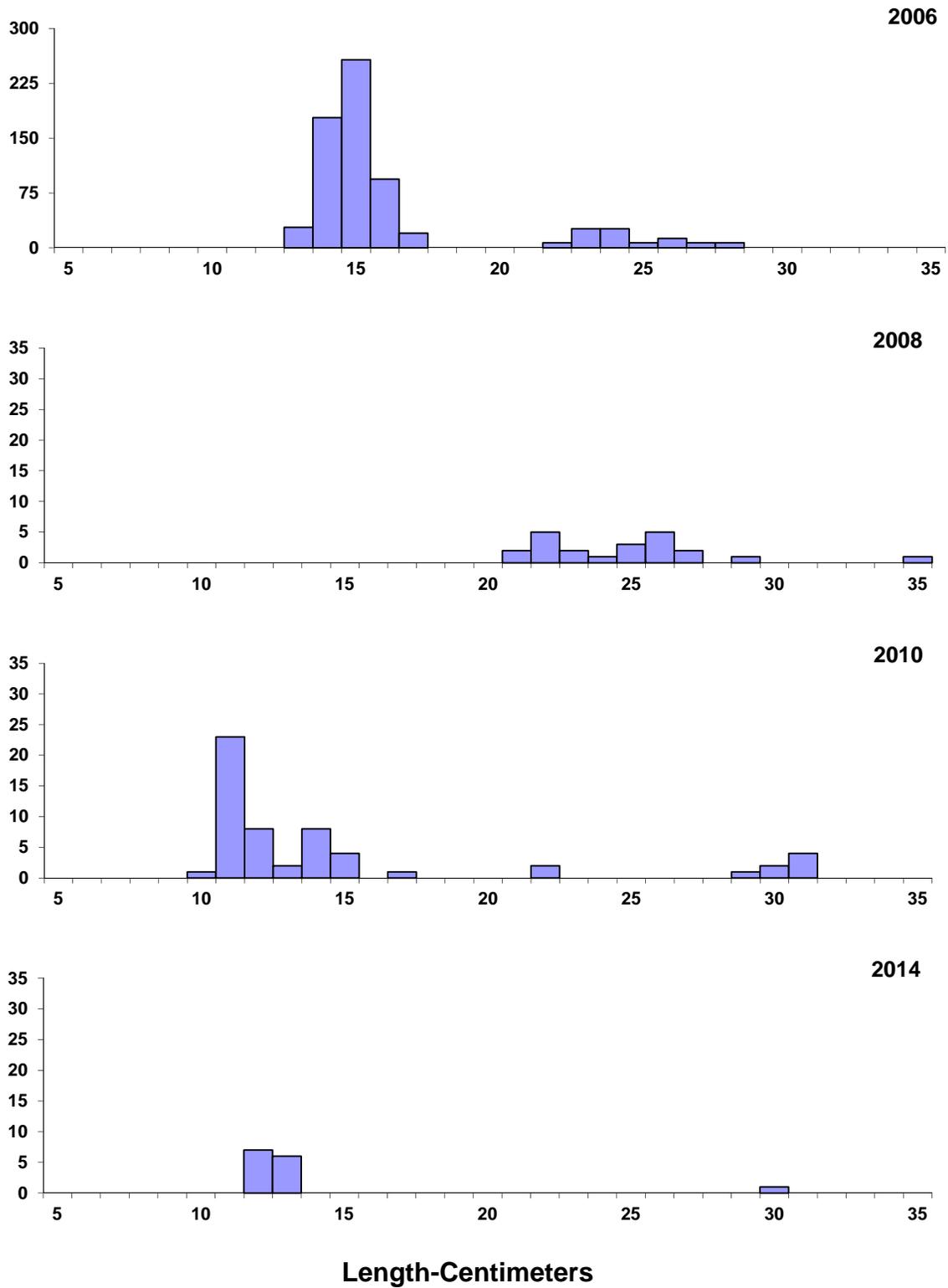


Figure 5. Length frequency histograms for black crappies sampled with trap nets in Lake, Hanson, Hanson County, 2006, 2008, 2010, 2014.

White Crappie

Management Objective

- none

Management Strategy

- monitor the white crappie population during annual lake surveys and report the results

Similar to black crappies, white crappie abundance has declined due to lack of natural reproduction for several years (Table 13). Lake Hanson has produced some very large white crappies at times (Figures 6, 7).

Table 13. CPUE, PSD, RSD-P, and mean *Wr* for all white crappie sampled with trap nets in Lake Hanson, Hanson County, 2005-2014. Stocked years are shaded.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPUE		2.4		2.0		19.8				1.2
PSD		68		--		16				--
RSD-23		64		--		14				--
RSD-P		64		--		14				--
Mean <i>Wr</i>		89		--		85				--

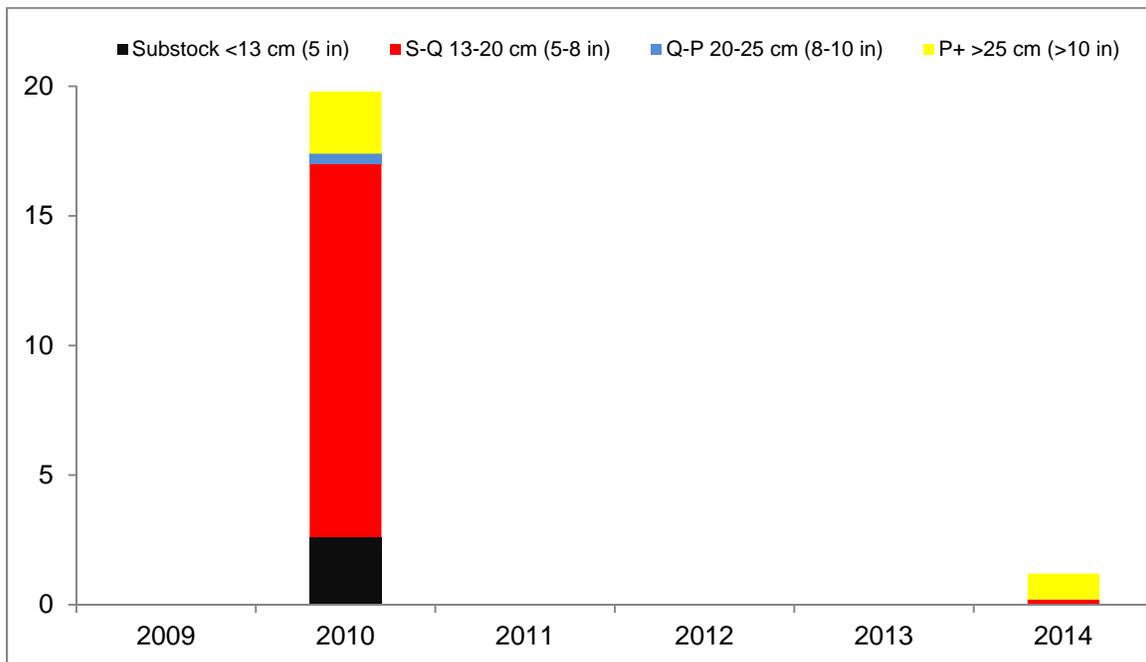


Figure 6. CPUE by length category for white crappie, sampled with trap nets in Lake Hanson, Hanson County, 2009-2014.

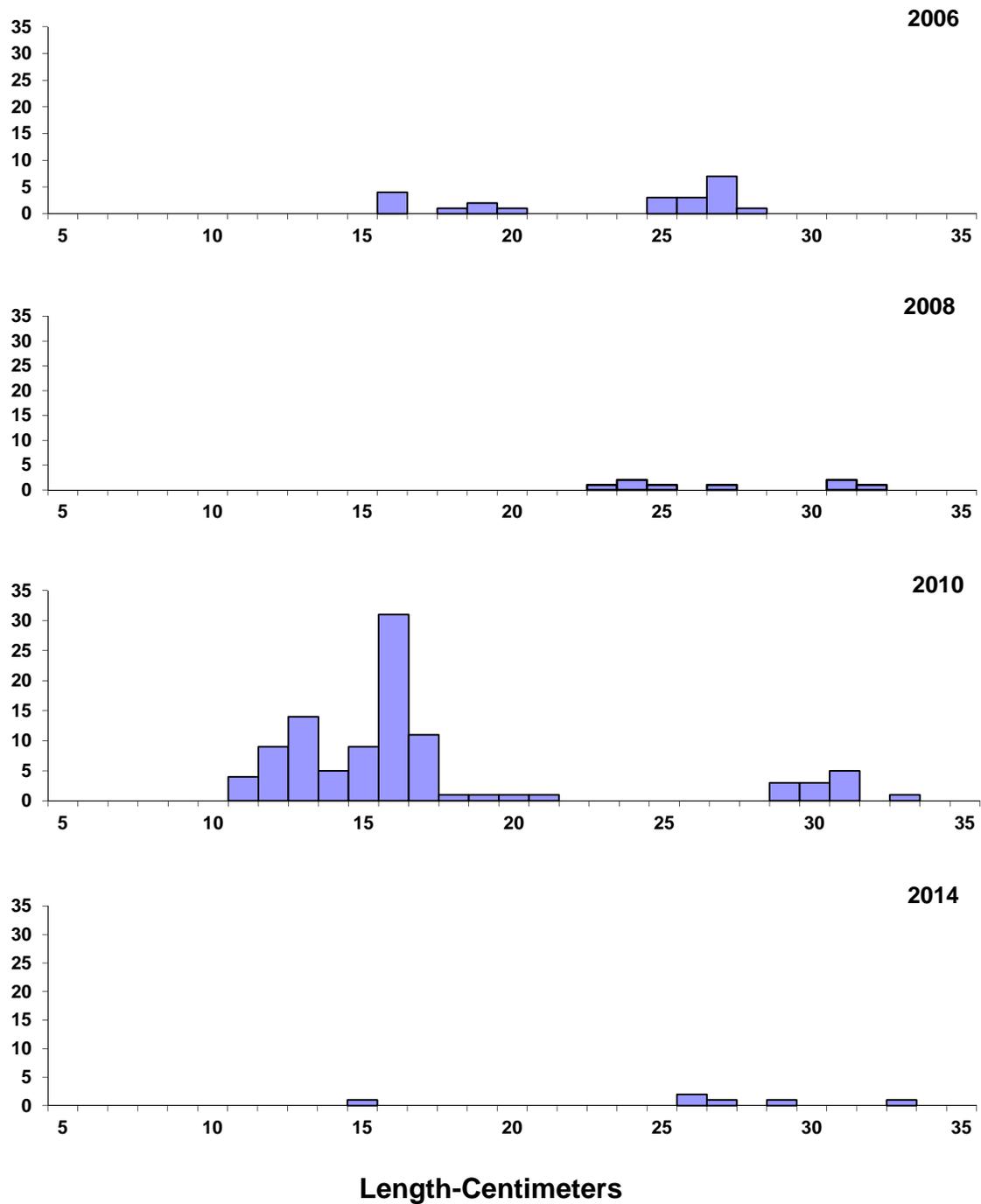


Figure 7. Length frequency histograms for white crappies sampled with trap nets in Lake Hanson, Hanson County, 2006, 2008, 2010, 2014.

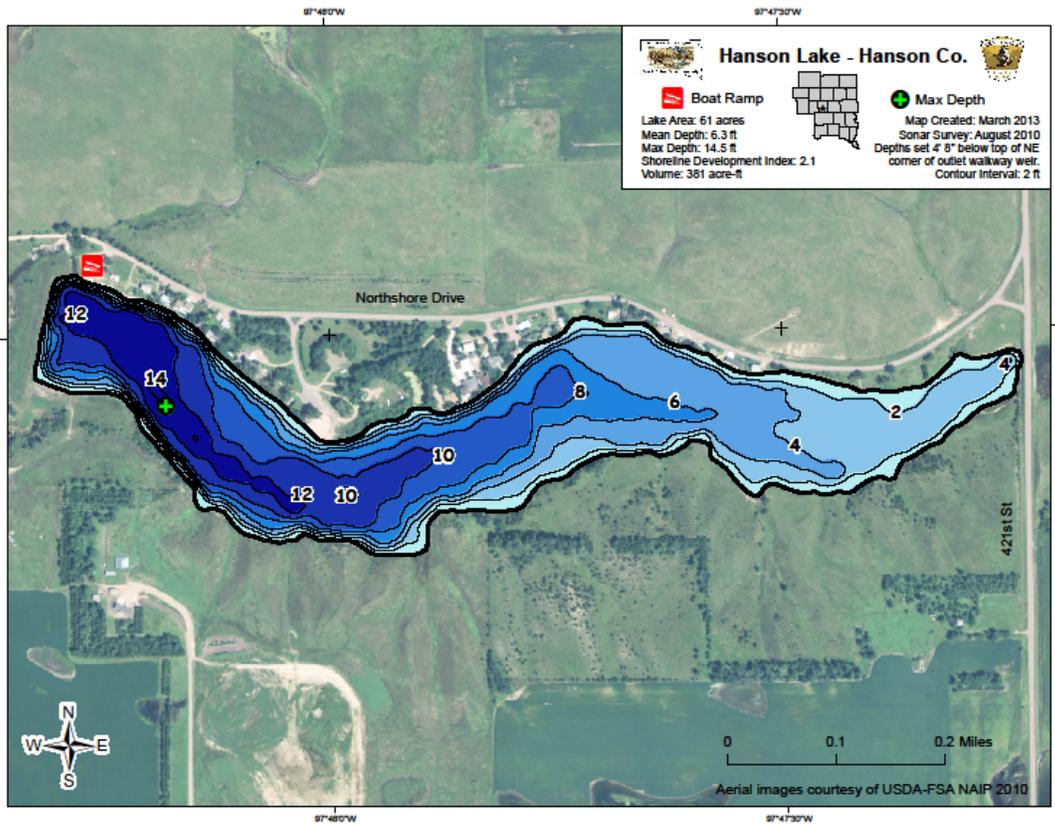


Figure 8. Contour map of Lake Hanson, Hanson County.

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.