SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Menno Dam, Hutchinson County
2102-F-21-R-47
2014

Figure 1. Menno Dam, Hutchinson County

Legal Description: T98N-R57W-Sec. 32
Location from nearest town: 1 mi. west, 1½ miles north, ½ mi. west of Menno, SD

Surface Area: 47 acres
Meandered (Y/N): no
OHWM elevation: no data
Outlet elevation: no data
Max. depth at outlet elevation: 34 feet
Observed water level: 10 feet low
Contour map available: yes

Watershed area: 14.4 square miles
Shoreline length: 1.5 miles
Date set: NA
Date set: NA
Mean depth at outlet elevation: 13 feet
Lake volume: no data
Date mapped: no data

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

Introduction

General

The original Menno Lake was an artificial impoundment created by the construction of a dam across Furlong Creek by the Works Progress Administration (WPA) in 1936. The original dam was destroyed by flood waters in 1984. Reconstruction of the dam in a new location slightly downstream was completed in 1995 and fisheries management resumed in 1996.

Ownership of Lake and Adjacent Lakeshore Properties

The State of South Dakota owns Menno Dam, and the fishery is managed by the Department of Game, Fish and Parks (GFP). GFP owns some land on the south side of the lake but the rest of the shoreline is privately owned. To allow recreational access, GFP has a 15-foot easement above the Ordinary High Water Mark around the privately owned shoreline.

Fishing Access

The Menno Dam Access Area contains a boat ramp with a dock and a public toilet. The Lake Menno Association manages a small campground that has camper hookups and a picnic shelter. Shore fishing opportunities are abundant. The entire lake has been designated as a no-wake zone. At no time can boats exceed 5 mph or produce a visible wake.

Water Quality and Aquatic Habitat

Although the water in Menno Dam was stained brown during the survey, it was still fairly clear with a Secchi depth measurement of 0.81 m (32 in). Some scattered beds of sago pondweed (*Potamogeton pectinatus*) were observed in shallow areas and duckweed (*Lemna* spp) was seen on the surface in protected areas. The lake still contains a considerable amount of flooded brush and timber.

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

Year	***Water Temp ^{o}C (^{o}F)***	***Secchi Depth cm (in)***	***Observations/Comments (algae, aquatic vegetation, water quality, etc.)***
2014	26 (78)	81 (32)	Sago pondweed
2013	26 (79)	69 (27)	No observations were recorded
2011	24 (75)	61 (24)	Sago pondweed
2009	19 (66)	100 (39)	Green algae and sago pondweed
2007	24 (76)	91 (36)	Bulrush, sago and baby pondweed

Fish Community

Menno Lake supports a fish community typical of southeastern South Dakota impoundments (Table 2). The lake contains a variety of panfish including largemouth bass, bluegill, black crappie, green sunfish and yellow perch. Panfish abundance varies substantially from year to year. The lake also has channel catfish and black bullheads. Several summer fish kills have been documented at Marindahl Lake (Table 3).

Table 2. Fish species commonly found in Menno Dam, Hutchinson County.

Game Species	*Other Species*
Largemouth Bass Bluegill Black Crappie Channel Catfish Black Bullhead Yellow Perch Green Sunfish	White Sucker

Fish Management

GFP manages Menno Lake for largemouth bass, bluegill and channel catfish. Bluegills grow relatively slowly, but do obtain a size desirable to anglers and provide a fishery. Natural reproduction maintains a high abundance of largemouth bass, especially for eastern South Dakota. Channel catfish have been stocked to provide additional fishing opportunities (Table 4).

Table 3. Fish kill history for Menno Dam, Hutchinson County.

Year	*Severity*	*Comments*
2008	Moderate	Summer bluegill mortality caused by parasites
2007	Light	Summer kill of small crappies caused by parasites

Table 4. Stocking history for Menno Dam, HutchinsonCounty, 2005-2014.

Year	*Number*	*Species*	*Size*
2005	100	Channel Catfish	Adult
2006	95	Largemouth Bass	Adult
	50	Channel Catfish	Adult
2013	4,950	Channel Catfish	Fingerling

Methods

Menno Dam was sampled on August 13-14, 2014 with five overnight trap net sets. The trap nets are constructed with 19-mm-bar-mesh (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. One hour and twenty minutes of electrofishing was done on June 2, 2014 to sample the largemouth bass population.

Results and Discussion

Net Catch Results

Bluegill, black crappie and largemouth bass were most abundant in the trap net catch (Table 4). All bluegills and black crappies were quality-length and greater (Table 5). Black bullheads, white sucker, yellow perch and channel catfish were also caught in the nets (Table 4).

Table 4. Total catch from five overnight trap nets set in Menno Dam, Hutchinson County, August 13-14, 2014.

Species	*#*	*%*	*CPUE*	*80% C.I.*	*Mean CPUE**	*PSD*	*RSD-P*	*Mean Wr*
Bluegill	136	40.7	27.2	±18.6	40.5	100	50	120
Black Crappie	135	40.4	27.0	±15.5	20.8	100	18	106
Largemouth Bass	43	12.9	8.6	±8.8	1.9	--	--	--
Black Bullhead	15	4.5	3.0	±3.2	11.1	100	87	--
White Sucker	2	0.6	0.4	±0.3	0.9	--	--	--
Yellow Perch	2	0.6	0.4	±0.3	1.1	--	--	--
Channel Catfish	1	0.3	0.2	±0.3	0.1	--	--	--

*10 years (2005-2014)

Table 5. CPUE by length category for selected species sampled with trap nets in Menno Dam, Hutchinson County, August 13-14, 2014.

Species	*Substock*	*Stock*	*S-Q*	*Q-P*	*P+*	*All sizes*	*80% C.I.*
Bluegill	--	27.2	--	13.6	13.6	27.2	±18.6
Black Crappie	--	27.0	--	22.2	4.8	27.0	±15.5
Largemouth Bass	8.6	--	--	--	--	8.6	±8.8
Black Bullhead	--	3.0	--	0.6	2.4	3.0	±3.2
White Sucker	--	0.4	--	--	0.4	0.4	±0.3
Yellow Perch	--	0.4	--	0.4	--	0.4	±0.3
Channel Catfish	--	0.2	--	0.2	--	0.2	±0.3

Length categories can be found in Appendix A.

Table 6. Trap-net CPUE for all fish species sampled in Menno Dam, Hutchinson County, 2005-2014.

Species	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Black Bullhead	29.8		7.8		10.4		5.0		10.8	3.0
Black Crappie	2.8		32.4		4.5		37.6		20.6	27.0
Bluegill	0.8		23.3		43.1		105.8		43.0	27.2
Channel Catfish	0.1		0.1		0.1		--		--	0.2
Green Sunfish	2.6		0.5		--		0.2		--	--
Hybrid Sunfish	--		0.1		1.3		0.1		--	--
Largemouth Bass	--		--		0.3		0.2		2.4	8.6
White Sucker	1.2		0.4		1.3		0.8		1.2	0.4
Yellow Perch	--		--		2.6		1.9		1.9	0.4

Largemouth Bass

Management Objective

- Maintain a largemouth bass population with an electrofishing CPUE of at least 20.

Management Strategy

- Stock hatchery-reared large fingerling largemouth bass in the spring if electrofishing CPUE falls below the management objective.

Sixty-eight largemouth bass ranging from 94 to 485 mm (3.7-19.1 in, Figure 3) were sampled during 1.33 hours of electrofishing. Electrofishing CPUE has declined from 2011 and 2013, but is still well above the management objective (Table 7). About 50% of the sample was comprised of sub-stock length bass (< 20 cm (8-in), Figures 2 and 3) indicating good natural production and future recruitment of fish to the fishery. Separation in length between young fish and adults suggests that several year classes are missing from the fishery (Figure 3).

Table 7. Largemouth bass electrofishing CPH, PSD, RSD-P, and mean Wr for Menno Dam, Hutchinson County, 2005-2014.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE	18.0		71.0		51.0		113.3		84.0	51.1
PSD	100		41		52		68		86	100
RSD-P	75		7		27		37		61	69
Mean Wr	102		97		107		104		100	91

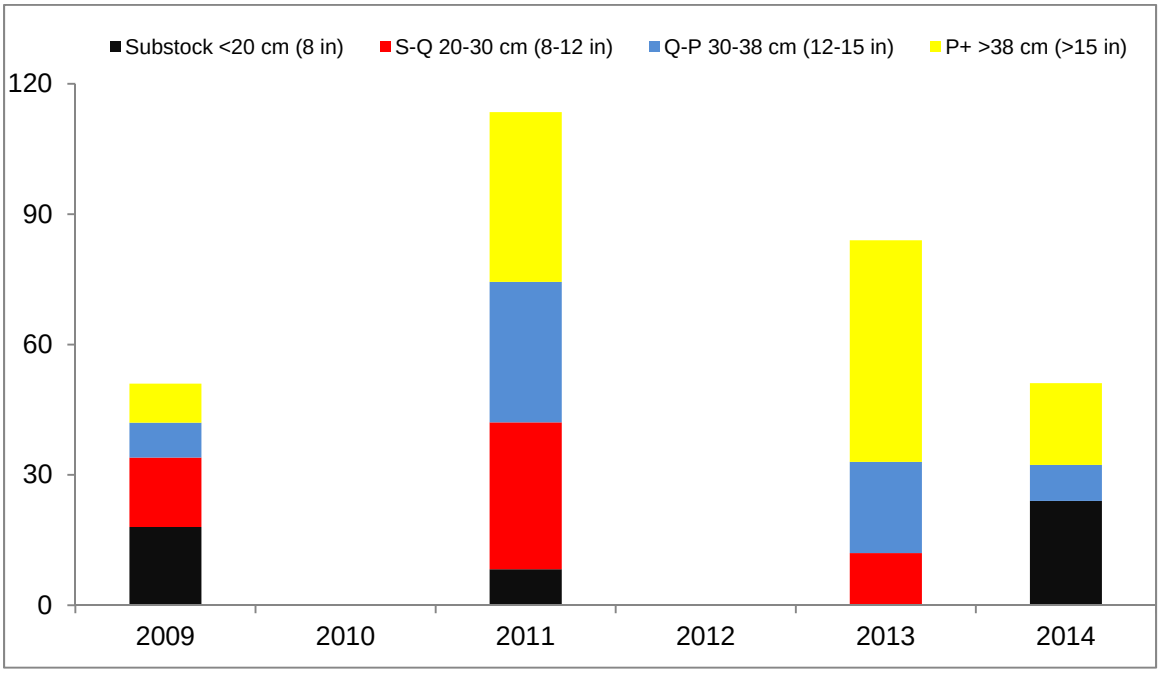

Figure 2. CPUE by length category for largemouth bass sampled by electrofishing in Menno Dam, Hutchinson County, 2009-2014.

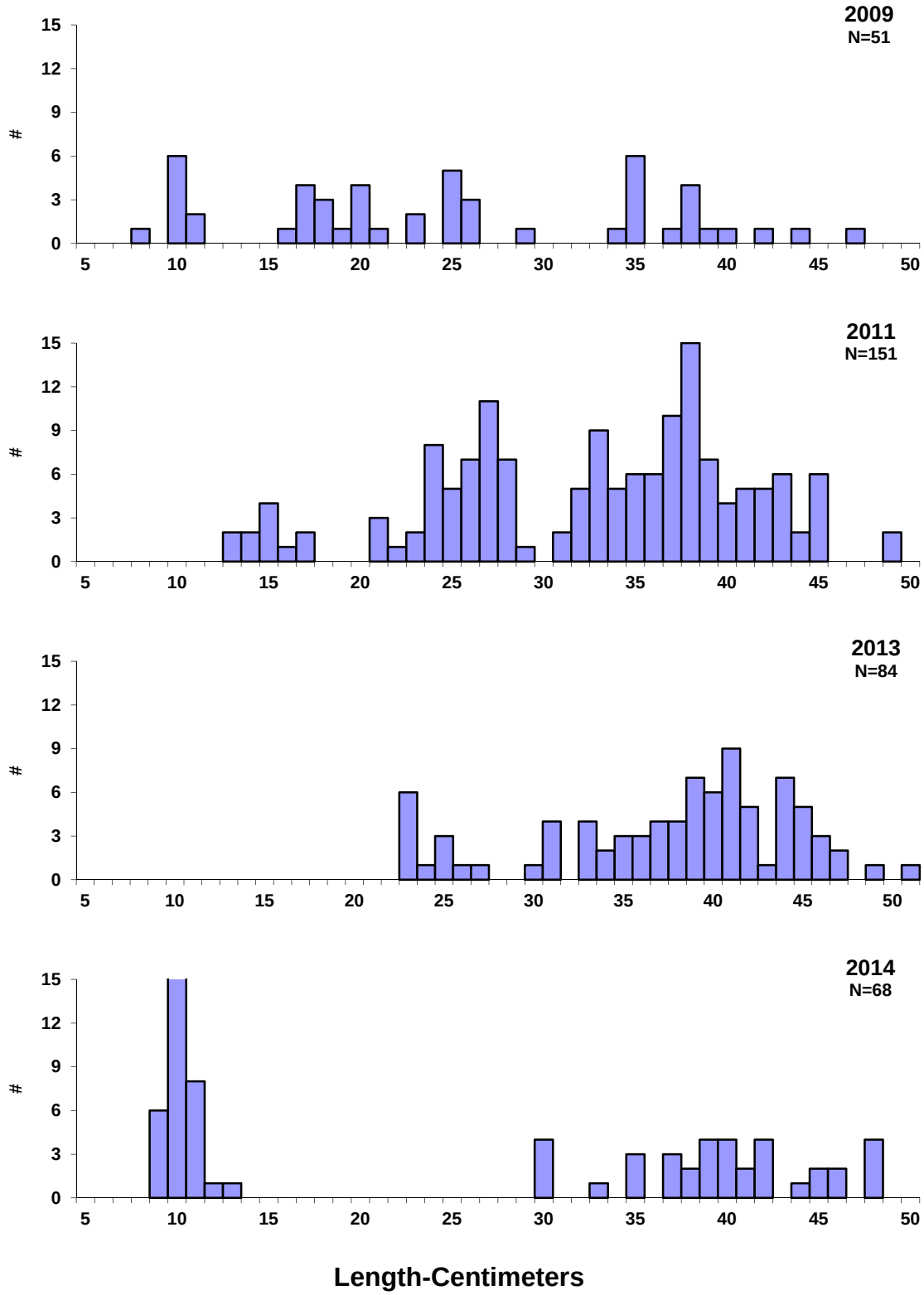

Figure 3. Length frequency histograms for largemouth bass sampled by electrofishing in Menno Dam, Hutchinson County, 2009-2014.

Bluegill

Management Objective

- Maintain a bluegill population with a total trap-net CPUE of 25-50 and RSD-18 of at least 20.

Management Strategy

- Conduct annual trap net surveys to monitor the population.

Bluegill trap-net CPUE declined from 2011 and 2013, however CPUE and size structure still exceeded the management objective (Tables 8 and 9). Bluegill growth is relatively slow, but fish are long-lived and most attain a size desirable to anglers (RSD-18 of 93, Tables 8 and 9, Figures 4 and 5). The absence of bluegills less than 15 cm (6 in) long in the trap nets indicates few fish will be recruited in the next few years (Figure 5).

Table 8. Bluegill trap-net CPUE, PSD, RSD-18, RSD-P, and mean Wr for Menno Dam, Hutchinson County, 2005-2014.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE	0.8		23.3		43.1		105.8		43.0	27.2
PSD	--		24		91		66		95	100
RSD-18	--		3		40		27		23	93
RSD-P	--		2		3		1		2	50
Mean Wr	--		91		104		88		80	120

Table 9. Average back-calculated lengths (mm) for each age class of bluegill in Menno Dam, Hutchinson County, 2014.

			Back-calculation Age							
Year Class	***Age***	***N***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
2011	3	5	58	116	154					
2010	4	22	55	92	128	168				
2009	5	86	37	79	109	144	178			
2008	6	14	32	74	102	144	172	189		
2007	7	9	43	60	90	101	128	150	176	
All Classes		**136**	**45**	**85**	**117**	**139**	**159**	**169**	**176**	
Statewide Mean			55	103	141	166				
Region III Mean			60	116	157	180				
SLI* Mean			53	101	138	163				

* Small Lakes and Impoundments

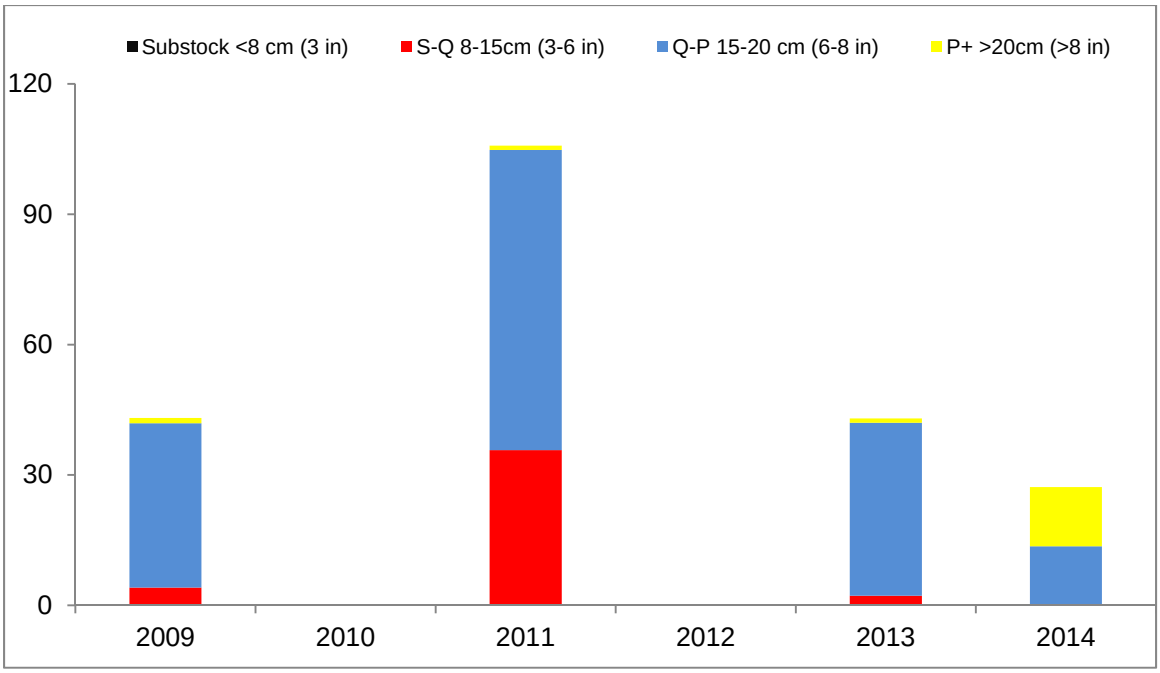

Figure 4. CPUE by length category for bluegill sampled with trap nets in Menno Dam, Hutchinson County, 2009-2014.

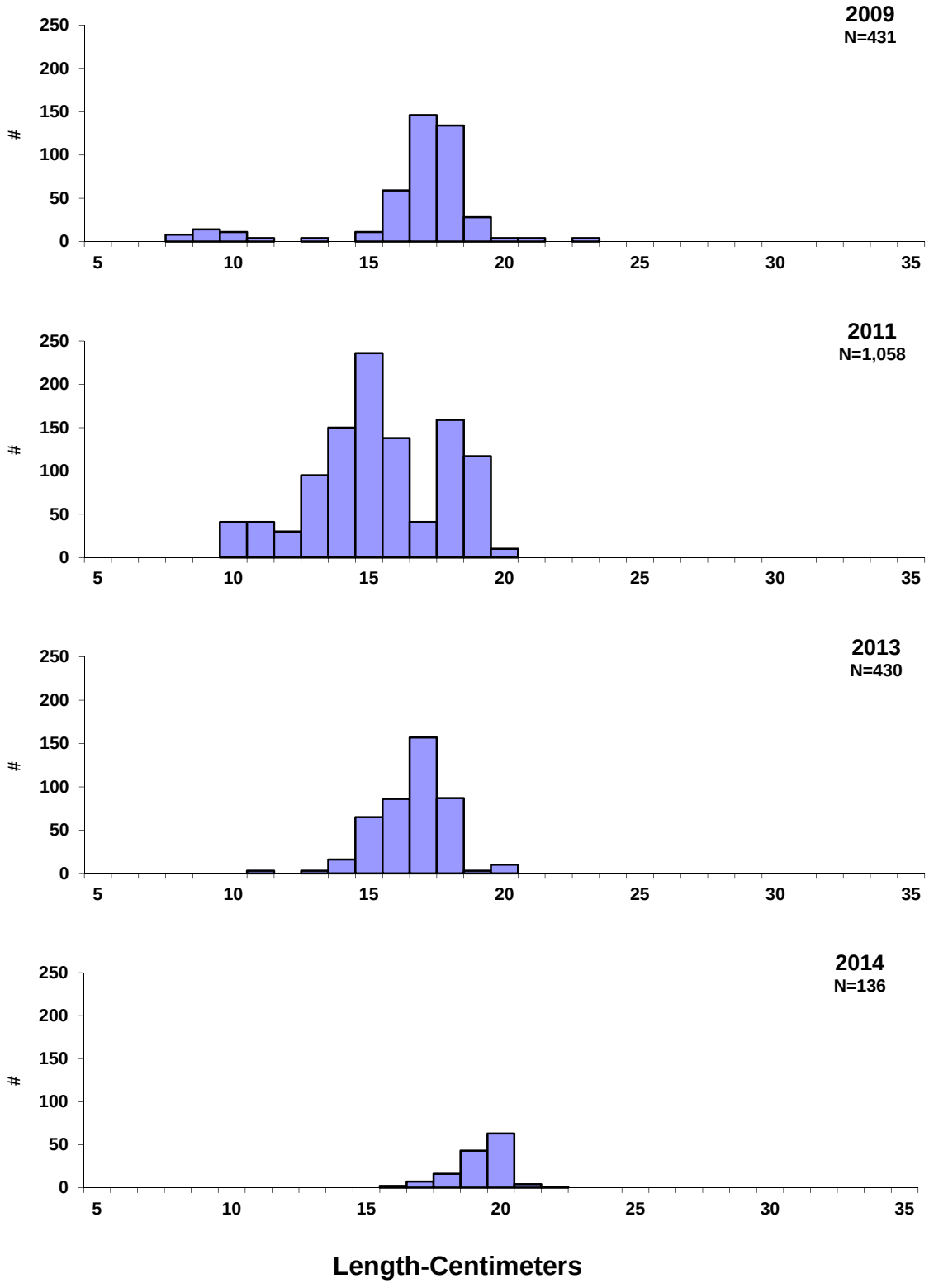

Figure 5. Length frequency histograms for bluegill sampled with trap nets in Menno Dam, Hutchinson County, 2009, 2011, 2013 and 2014.

Black Crappie

Management Objective

- Maintain a black crappie population with a total trap-net CPUE of 20-30 and PSD of at least 40.

Management Strategy

- Conduct annual trap net surveys to monitor the population.

Black crappie trap-net CPUE and size structure both met the management objective (Tables 10 and 11). Growth of crappies is relatively slow in Menno, but some fish still attain a size desirable to anglers (PSD = 100, Tables 10 and 11, Figures 6 and 7). Like bluegills, small crappies were absent from the trap net catch indicating a gap in future recruitment (Figure 7).

Table 10. CPUE, PSD, RSD-P, and mean Wr for all black crappie sampled with trap nets in Menno Dam, Hutchinson County, 2005-2014.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE	2.8		32.4		4.5		37.6		20.6	27.0
PSD	43		75		56		48		40	100
RSD-23	4		12		0		16		2	96
RSD-P	0		1		0		3		0	18
Mean Wr	100		102		111		96		85	106

Table 11. Average back-calculated lengths (mm) for each age class of black crappie in Menno Dam, Hutchinson County, 2014.

			Back-calculation Age							
Year Class	***Age***	***N***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
2011	3	1	70	120	158					
2010	4	134	76	123	163	209				
All Classes		**135**	**73**	**122**	**161**	**209**				
Statewide Mean			83	147	195	229	249			
Region III Mean			95	167	219	253	274			
SLI* Mean			78	134	180	209	226			

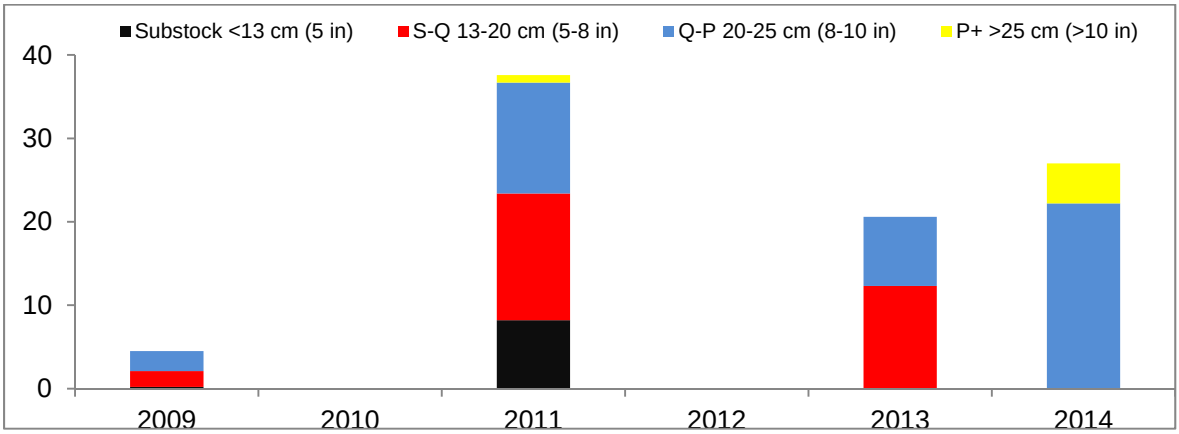

Figure 6. CPUE by length category for black crappies sampled with trap nets in Menno Dam, Hutchinson County, 2009-2014.

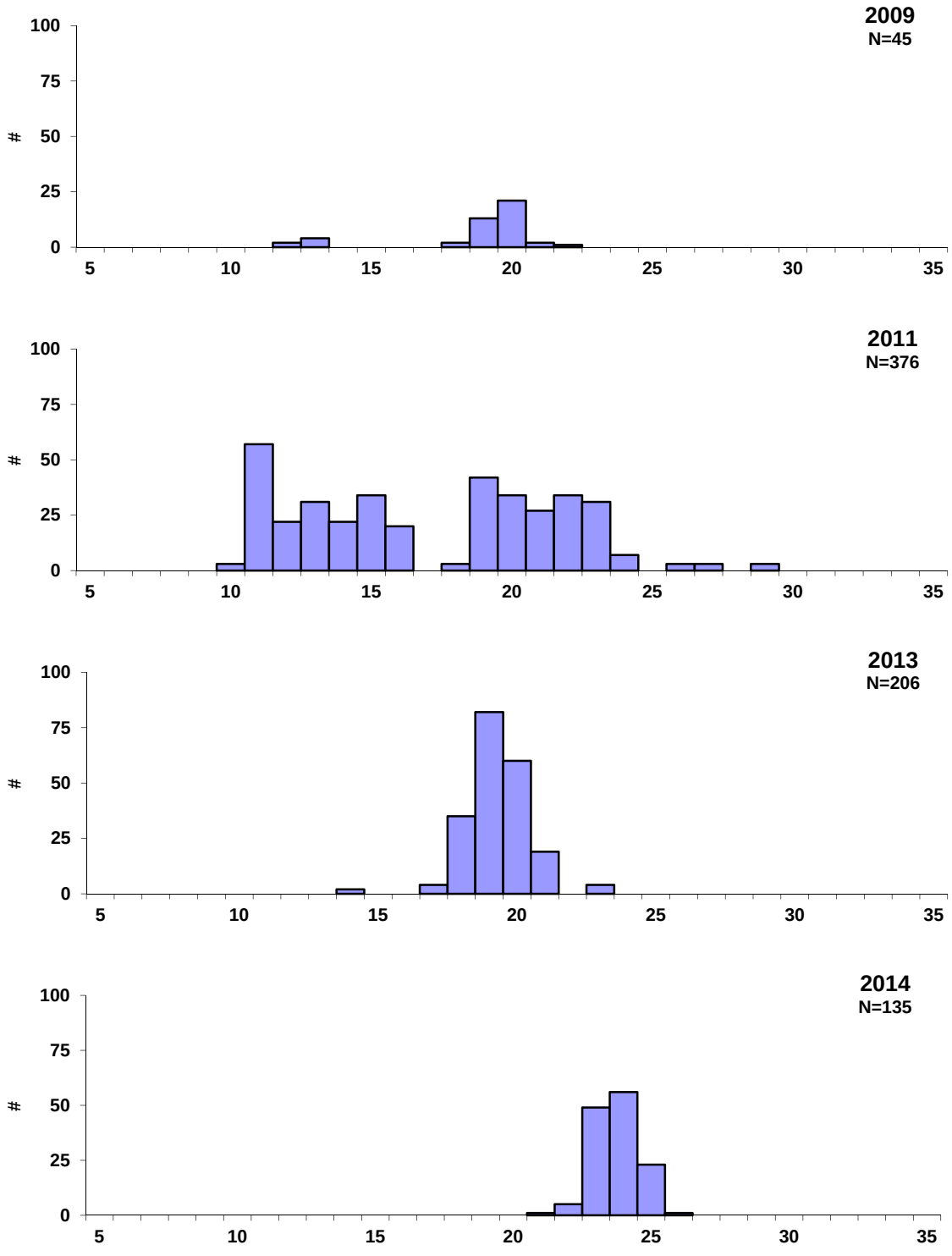

Figure 7. Length frequency histograms for black crappie sampled with trap nets in Menno Dam, Hutchinson County, 2009, 2011, 2013 and 2014.

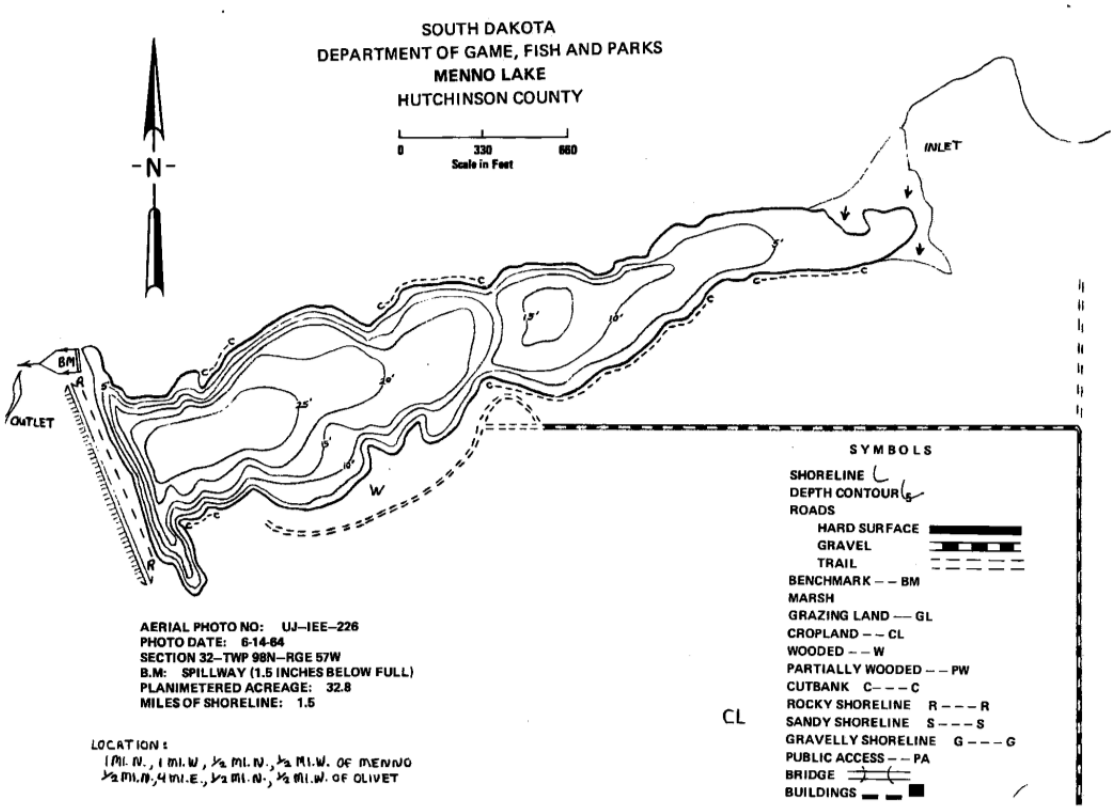

Figure 8. Contour map of Menno Dam, Hutchinson County.

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:

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

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.