

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-44

Name: Menno Dam

County: Hutchinson

Legal Description: T98N-R57W-Sec. 32

Location from nearest town: 1 mi. west, 1½ miles north, ½ mi. west of Menno, SD

Dates of present survey: August 15-17, 2011 (netting); May 23, 2011 (electrofishing)

Dates of last survey: August 17-18, 2009 (netting); June 4, 2009 (electrofishing)

Most recent lake management plan: F-21-R-32 (January 1, 2000-December 31, 2004)

Management classification: Warmwater Permanent

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

PHYSICAL DATA

Surface Area: 47 acres

Watershed: 14.4 square miles

Maximum depth: 34 feet

Mean depth: 13 feet

Volume: No data

Shoreline length: No data

Contour map available: No

Date mapped: NA

OHWM elevation: None set

Date set: NA

Outlet elevation: None set

Date set: NA

Lake elevation observed during the survey: Full

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

Introduction

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 Property

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.

Field Observations of Water Quality and Aquatic Vegetation

Although the water in Menno Dam was stained brown during the survey, it was still fairly clear with a Secchi depth measurement of 0.61 m (24 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.

BIOLOGICAL DATA

Methods:

Menno Dam was sampled on August 15-17, 2011 with ten overnight trap net sets. 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. One hour and fifteen minutes of nighttime electrofishing was done on May 23, 2011 to sample the largemouth bass population. Sampling sites are displayed in Figure 4.

Results and Discussion:

Trap Net Catch

Bluegill and black crappie comprised 94.6% of the trap-net catch (Table 1). Six other species were also sampled.

Table 1. Total catch from ten overnight trap net sets at Menno Dam, Hutchinson County, August 15-17, 2011.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Bluegill	1,058	69.8	105.8	+35.7	12.1	66	1	88
Black Crappie	376	24.8	37.6	+12.0	29.5	48	3	96
Black Bullhead	50	3.3	5.0	+2.8	561.0	96	22	93
Yellow Perch	19	1.3	1.9	+1.2	2.6	0	0	89
White Sucker	8	0.5	0.8	+0.4	1.7	--	--	--
Green Sunfish	2	0.1	0.2	+0.2	4.0	--	--	--
Largemouth Bass	2	0.1	0.2	+0.2	0.3	--	--	--
Hybrid Sunfish	1	0.1	0.1	+0.1	0.7	--	--	--

* 6 years (1999, 2001, 2003, 2005, 2007, 2009)

Table 2. Catch per unit effort by length category for various fish species captured with trap nets in Menno Dam, August 15-17, 2011.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Bluegill	--	105.8	35.7	69.1	1.0	105.8	+35.7
Black Crappie	8.2	29.4	15.2	13.3	0.9	37.6	+12.0
Black Bullhead	--	5.0	0.2	3.7	1.1	5.0	+2.8
Yellow Perch	--	1.9	1.9	--	--	1.9	+1.2
White Sucker	--	0.8	--	0.2	0.6	0.8	+0.4
Green Sunfish	--	0.2	0.2	--	--	0.2	+0.2
Largemouth Bass	--	0.2	--	--	0.2	0.2	+0.2
Hybrid Sunfish*	--	--	--	--	--	0.1	+0.1

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

Electrofishing Catch

One hundred fifty-one largemouth bass were sampled during one hour and fifteen minutes of nighttime electrofishing on May 23, 2011.

Table 3. Largemouth bass sampled during one hour of nighttime electrofishing on Menno Dam, Hutchinson County, May 23, 2011.

Species	Number	Catch/Hour	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	151	113.3	48.9	68	37	104

* 6 years (1998, 2001, 2003, 2005, 2007, 2009)

Largemouth Bass

Management objective: Maintain a largemouth bass fishery with an electrofishing CPH of at least 20 and RSD-P between 20 and 40.

Menno Dam has an excellent largemouth bass population that meets or exceeds the management objective with high CPUE and population size structure, adequate natural reproduction, growth, and condition. The largemouth bass sampled ranged in length from 130-490 mm (5.1-19.3 in).

All sampled bass over 200 mm (8 in) were PIT tagged and fin clipped to validate ages assigned using scales and to determine longevity. Four fin clipped bass were sampled but did not have tags. Growth remains just below regional means (Table 5). About 66% of the bass sampled in 2011 would be protected from harvest under the 38.1 cm (15 inch) minimum length limit.

Table 4. Largemouth bass electrofishing CPUE, PSD, RSD-P, and mean Wr for Menno Dam, Hutchinson County, 2003-2011.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean*
CPUE	43.5		18.0		71.0		51.0		113.3	58.7
PSD	23		100		41		52		68	56
RSD-P	10		75		7		27		37	32
Mean Wr	98		102		97		107		104	99

*5 years (2001, 2003, 2005, 2007, 2009)

Table 5. Average back-calculated lengths (mm) for each age class of largemouth bass in Menno Dam, Hutchinson County, 2011.

Year Class	Age	N	Back-calculation Age							
			1	2	3	4	5	6	7	8
2009	2	45	115	249						
2008	3	19	88	190	321					
2007	4	10	116	217	302	353				
2006	5	17	92	180	257	322	367			
2005	6	20	96	167	250	310	357	382		
2004	7	23	105	216	296	342	383	406	422	
All Classes		151	102	203	285	332	369	394	422	
Statewide Mean			96	182	250	305	342			
Region III Mean			111	212	287	347	383			
SLI* Mean			99	183	246	299	332			

*Small Lakes and Impoundments (<150 acres)

Black Crappie

Management objective: Maintain a black crappie fishery with a trap net CPUE of at least 20 and PSD of at least 40.

Black crappie trap net CPUE and size structure has increased in 2011 (Table 6). Strong year classes were produced each of the last two years and together comprised 84% of the sample. Black crappie condition is good and growth has improved and now surpasses statewide and regional means (Table 7). Most age-2+ crappies were 19-23 cm (about 8-9 in) long (Figure 20), a size acceptable to many anglers.

Table 6. Black crappie trap-net CPUE, PSD, RSD-P, and mean Wr for Menno Dam, Hutchinson County, 2003-2011.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean*
CPUE	51.9		2.8		32.4		4.5		37.6	29.5
PSD	39		43		75		56		48	36
RSD-P	0		0		1		0		3	0
Mean Wr	94		100		102		111		96	107

*6 years (1999, 2001, 2003, 2005, 2007, 2009)

Table 7. Average back-calculated lengths (mm) for each age class of black crappie in Menno Dam, Hutchinson County, 2011.

Year Class	Age	N	Back-calculation Age							
			1	2	3	4	5	6	7	8
2010	1	189	87							
2009	2	129	76	182						
2008	3	53	73	160	221					
2007	4	6	80	168	233	271				
All Classes		377	79	170	227	271				
Statewide Mean			83	147	195	229	249			
Region III Mean			95	167	219	253	274			
SLI* Mean			78	134	180	209	226			

*Small Lakes and Impoundments (<150 acres)

Bluegill

Management objective: Maintain a bluegill fishery with a trap-net CPUE of at least 20 and RSD-18 of at least 20.

Bluegill abundance and size structure surpass the management objective (Table 8 and Figure 3) and the lake is currently providing a good fishery. Growth is similar to the statewide and small lakes and impoundments means, but below the regional mean (Table 9). Condition decreased slightly to a mean relative weight of 88 (Table 8).

Table 8. Bluegill trap-net CPUE, PSD, RSD-18, RSD-P, and mean Wr for Menno Dam, Hutchinson County, 2003-2011.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean*
CPUE	2.2		0.8		23.3		43.1		105.8	12.1
PSD	100		--		24		91		66	80
RSD-18	27		--		3		40		27	30
RSD-P	9		--		2		3		1	3
Mean Wr	109		--		91		104		88	100

*6 years (1999, 2001, 2003, 2005, 2007, 2009)

Table 9. Average back-calculated lengths (mm) for each age class of bluegill in Menno Dam, Hutchinson County, 2011.

Year Class	Age	N	Back-calculation Age							
			1	2	3	4	5	6	7	8
2010	1	10	74							
2009	2	151	42	98						
2008	3	581	44	81	138					
2007	4	181	53	104	154	178				
2006	5	112	49	100	140	170	186			
2005	6	23	56	117	145	160	175	189		
All Classes		1,058	53	100	144	169	180	189		
Statewide Mean			55	103	141	166				
Region III Mean			60	116	157	180				
SLI* Mean			53	101	138	163				

*Small Lakes and Impoundments (<150 acres)

Black Bullhead

Management objective: Maintain a black bullhead population with a trap net CPUE of no more than 100.

Black bullhead trap net CPUE remains low (Table 10) and the size structure of the population is good (Figure 4). The mean length of bullheads sampled this year was 281 mm (11.1 in). Increased largemouth bass predation, angler harvest, and poor bullhead recruitment are likely responsible for the low-density, high-quality population.

Table 10. Black bullhead trap-net CPUE and PSD for Menno Dam, Hutchinson County, 2003-2011.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean*
CPUE	168.1		29.8		7.8		10.4		5.0	487.0
PSD	1		92		86		98		96	60
RSD-P	0		0		4		49		22	16
Mean Wr	83		86		86		100		93	72

*6 years (1999, 2001, 2003, 2005, 2007, 2009)

All Species

Bluegill, black crappie and largemouth bass abundance is relatively high and black bullhead abundance is the lowest on record. Channel catfish, which were never abundant, were not sampled this year. Overall, the Menno fishery is in very good shape.

Table 11. Electrofishing (EF) and trap-net (TN) CPUE for all fish species sampled in Menno Dam, Hutchinson County, 2003-2011.

Species	2003	2004	2005	2006	2007	2008	2009	2010	2011
WHS (TN)	3.6		1.2		0.4		1.3		0.8
BLB (TN)	168.1		29.8		7.8		10.4		5.0
CCF (TN)	0.8		0.1		0.1		0.1		--
GSF (TN)	0.2		2.6		0.5		--		0.2
HYB (TN)	--		--		0.1		1.3		0.1
BLG (TN)	2.2		0.8		23.3		43.1		105.8
LMB (EF)	43.5		18.0		71.0		51.0		113.3
LMB (TN)	0.1		--		--		0.3		0.2
BLC (TN)	51.9		2.8		32.4		4.5		37.6
YEP (TN)	0.5		--		--		2.6		1.9

WHS (White Sucker), BLB (Black Bullhead), CCF (Channel Catfish), NOP (Northern Pike), GSF (Green Sunfish), HYB (Hybrid Sunfish), BLG (Bluegill), LMB (Largemouth Bass), BLC (Black Crappie), YEP (Yellow Perch),

MANAGEMENT RECOMMENDATIONS

1. Continue to monitor the lake by conducting biennial netting and electrofishing surveys.
2. Stock channel catfish adults to diversify the fishery.

Table 12. Stocking record for Menno Dam, Hutchinson County, 1996-2011.

Year	Number	Species	Size
1996	360	Black Crappie	Fingerling
	250	Black Crappie	Adult
	4,700	Channel Catfish	Fingerling
	4,770	Largemouth Bass	Fingerling
	5,000	Rainbow Trout	Fingerling
1997	1,120	Black Crappie	Adult
	4,700	Channel Catfish	Fingerling
1998	210	Largemouth Bass	Fingerling
	313	Black Crappie	Adult
1999	4,700	Largemouth Bass	Fingerling
	2,200	Black Crappie	Juvenile
2000	393	Largemouth Bass	Adult
	4,700	Largemouth Bass	Fingerling
	2,500	Largemouth Bass	Fingerling
2004	71	Largemouth Bass	Adult
	170	Channel Catfish	Adult
2005	100	Channel Catfish	Adult
2006	95	Largemouth Bass	Adult
	50	Channel Catfish	Adult

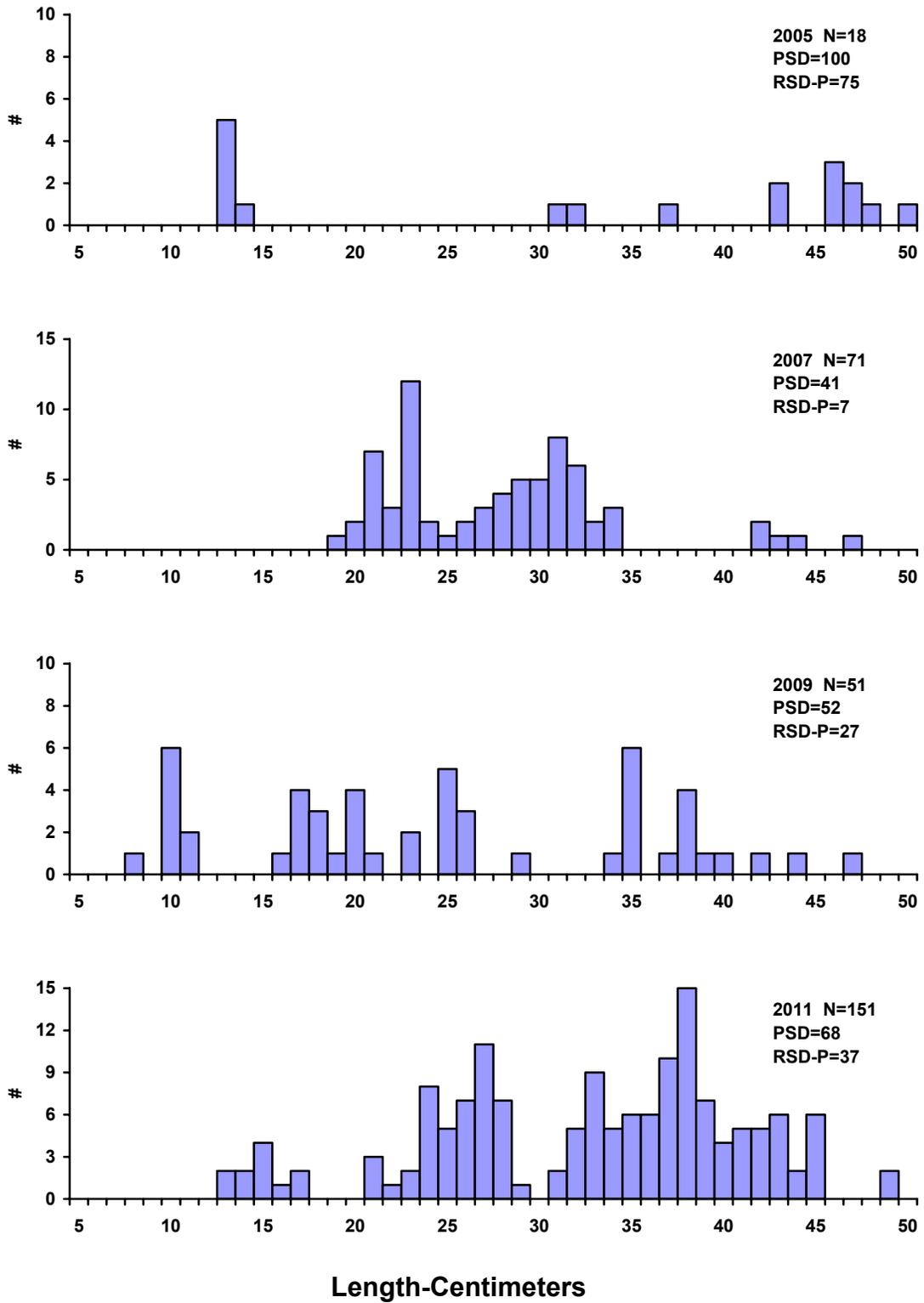


Figure 1. Length frequency histogram for largemouth bass sampled by electrofishing in Menno Dam, Hutchinson County, 2005, 2007, 2009, and 2011.

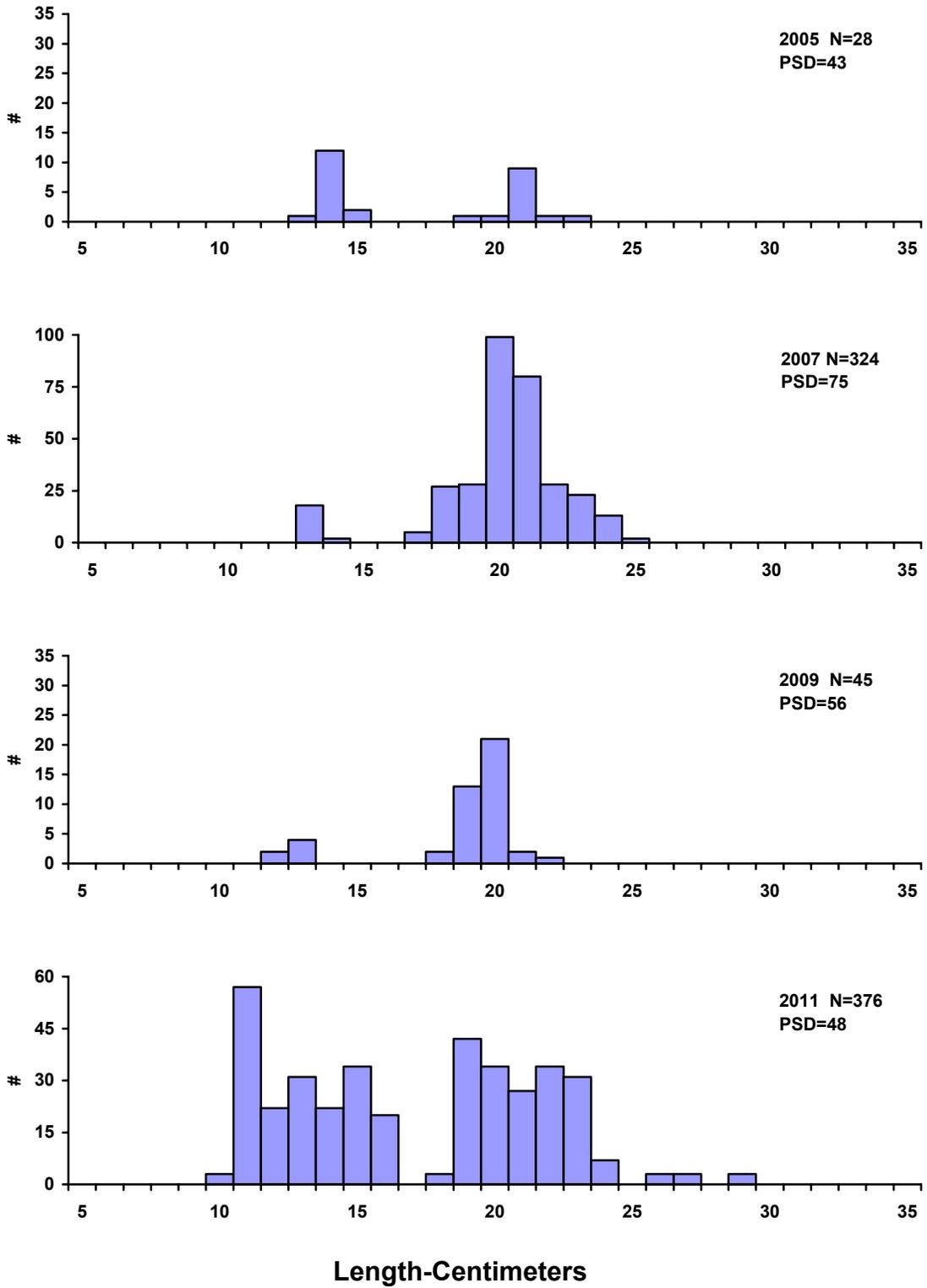


Figure 2. Length frequency histograms for black crappies sampled with trap nets in Menno Dam, Hutchinson County, 2005, 2007, 2009, and 2011.

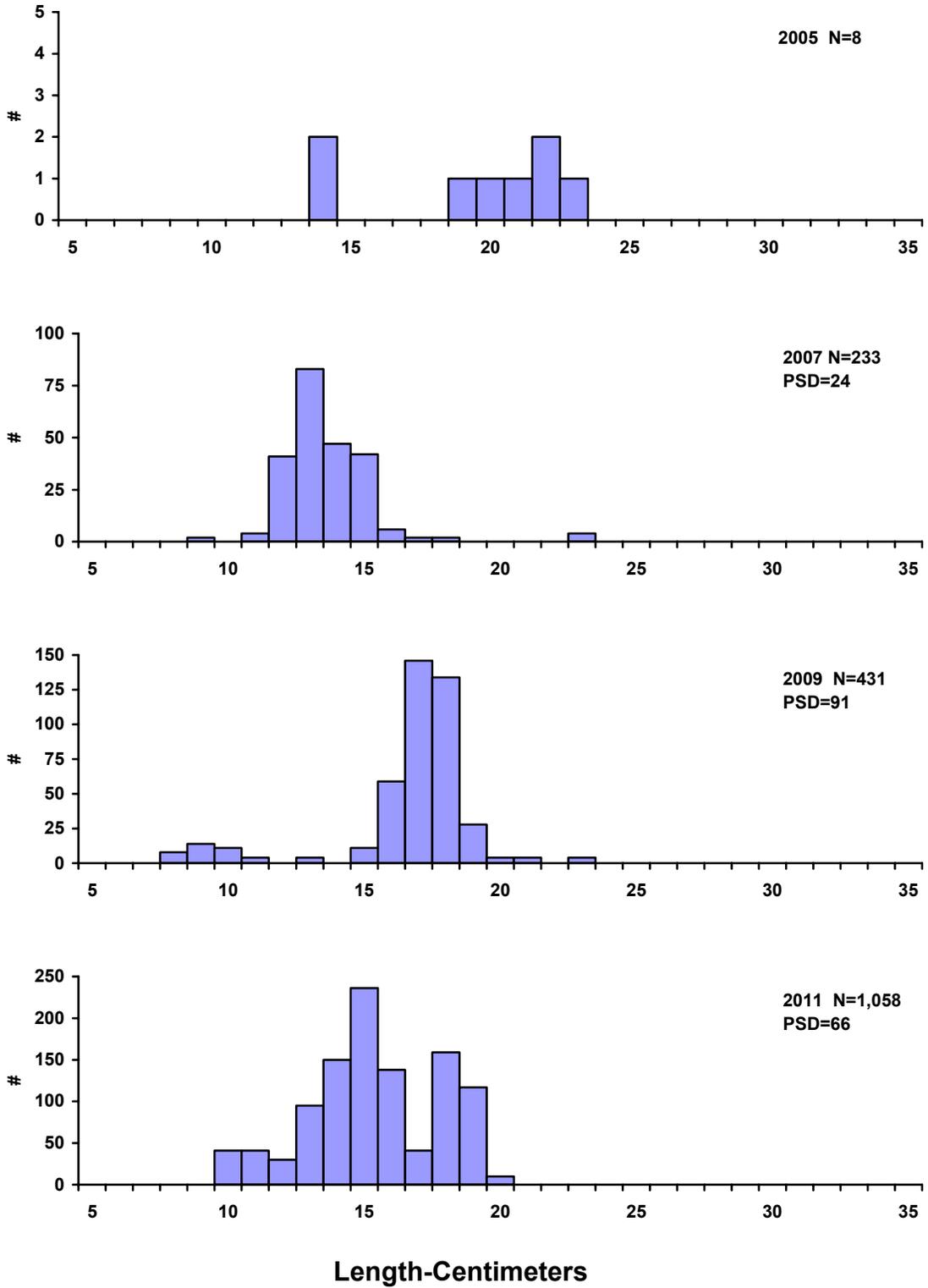


Figure 3. Length frequency histograms for bluegills sampled with trap nets in Menno Dam, Hutchinson County, 2005, 2007, 2009, and 2011.

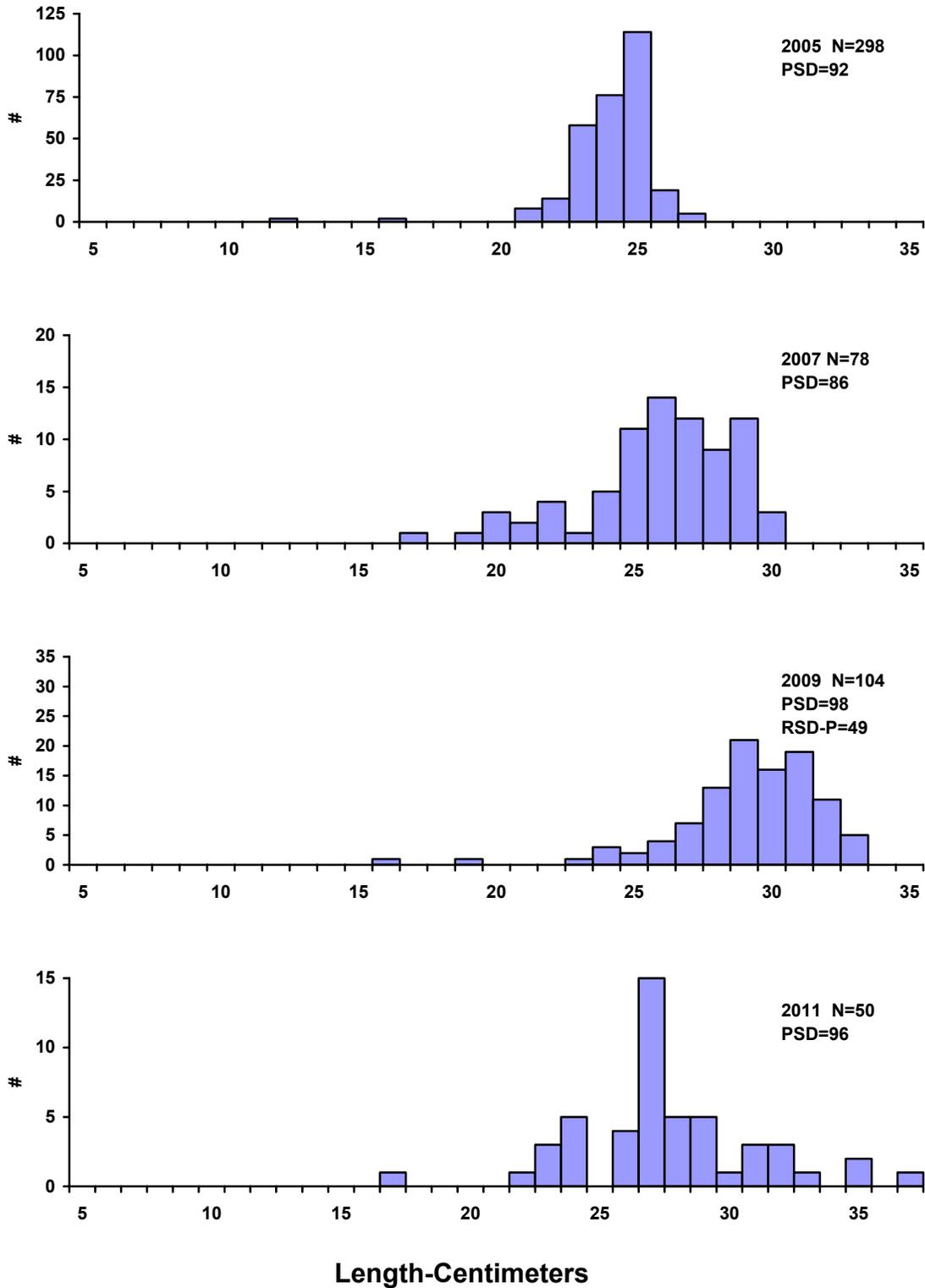


Figure 4. Length frequency histograms for black bullheads sampled with trap nets in Menno Dam, Hutchinson County, 2005, 2007, 2009, and 2011.

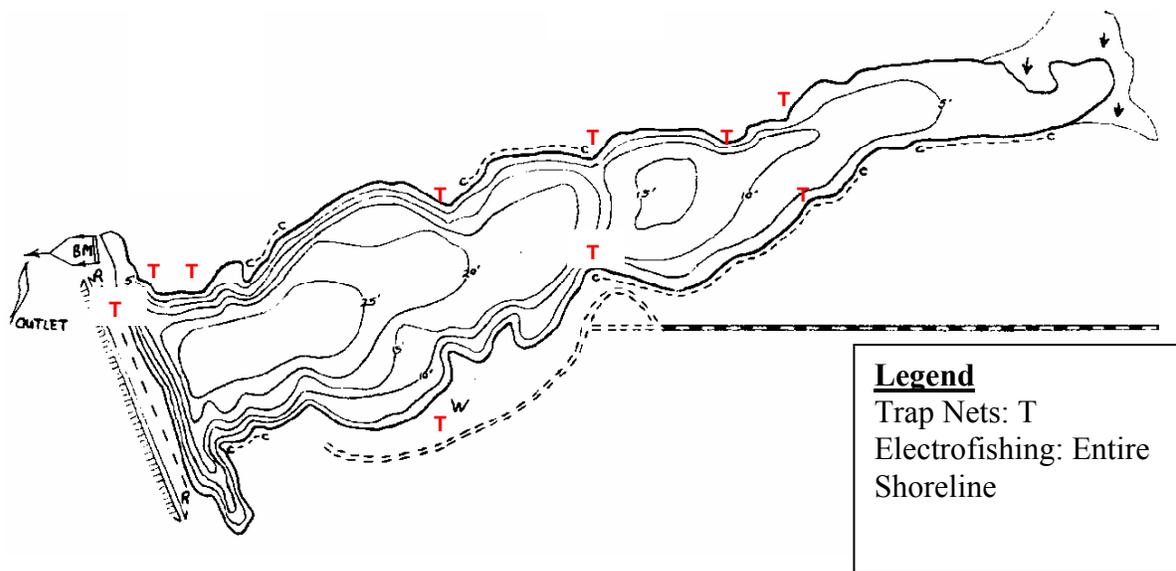


Figure 5. Sampling locations on Menno Dam, Hutchinson County, 2011.

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.