SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Name: Twin Lakes **County**: Minnehaha
Legal Description: T105N-R52W Sec. 16-17, 20-21
Location from nearest town: 6 miles north and 1 mile west of Humboldt, SD

Dates of present survey: July 16-18, 2012
Dates of last survey: July 11-13, 2011

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

PHYSICAL DATA

Surface Area: 287 acres **Watershed area**: Unknown acres
Maximum depth: 20 feet **Mean depth**: 9 feet
Contour map available: No **Date mapped**: 2003 (shoreline)
Lake elevation observed during the survey: Full
Ownership of Lake and Adjacent Lakeshore Properties

Twin Lakes is not listed as meandered public water in the State of South Dakota Listing of Meandered Lakes; however, the fishery is managed by the South Dakota Department of Game, Fish and Parks (GFP). GFP also owns and manages a 254 acre Game Production Area which includes much of the lakes. The remainder of the shoreline is privately owned.

Fishing Access

The Twin Lakes Fishing Access Area, located on the west side of the south lake, features a boat ramp, boat dock, toilet and parking for about 15 vehicle-trailer rigs. There are also several areas to shore fish located east of the boat ramp. A navigation channel connecting the north and south lakes was constructed in the winter of 2010-2011.

Field Observations of Water Quality and Aquatic Vegetation:

The Secchi reading was 1.3 m (40.5 in). Abundant beds of sago pondweed (*Potamogeton pectinatus*), clasping leaf pondweed (*Potamogeton richardsonii*), northern water milfoil (*Myriophyllum exalbescens*), water buttercup (*Ranunculus longirostris*), and coontail (*Ceratophyllum demersum*) were observed in water up to 1.82 m (6 ft) deep. Common cattail (*Typha spp.*) and bulrush (*Scirpus spp.*) were abundant in shallow areas.

BIOLOGICAL DATA

Methods:

Twin Lakes was sampled on July 16-18, 2012 with two overnight gill-net sets and 10 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. 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:

Gill Net Catch

Black bullhead, yellow perch and walleye were the only species sampled in the gill nets this year (Table 1). Approximately 64% of the walleyes sampled were substock length fish (Table 2).

Table 1. Total catch from two overnight gill net sets at Twin Lakes, Minnehaha County, July 16-18, 2012.

Species	Number	Percent	CPUE[1]	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	217	54.4	108.5	±63.4	55.1	2	0	97
Yellow Perch	127	31.8	63.5	±35.2	7.2	97	54	100
Walleye	55	13.8	27.5	±7.0	30.5	40	25	74

* 5 years (2004, 2006, 2007, 2009, 2011)

Table 2. Catch per unit effort by length category for various fish species captured with gill nets in Twin Lakes, Minnehaha County, July 16-18, 2012.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Bullhead	--	108.5	106.5	2.0	--	108.5	±63.4
Yellow Perch	--	63.5	2.0	27.5	34.0	63.5	±35.2
Walleye	17.5	10.0	6.0	1.5	2.5	27.5	±7.0

Length categories can be found in Appendix A.

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

Trap Net Catch

Black bullheads comprised the majority of the trap net sample this year on Twin Lakes (Table 3). Walleye, yellow perch, bluegill and green sunfish were also caught. Similar to the gill nets, some of the walleyes sampled were substock length fish (Table 4).

Table 3. Total catch from ten overnight trap net sets at Twin Lakes, Minnehaha County, July 16-18, 2012.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	5,421	95.2	542.1	±241.0	380.7	29	2	91
Walleye	211	3.7	21.1	±6.5	9.2	52	6	73
Yellow Perch	38	0.7	3.8	±1.1	4.1	100	74	98
Bluegill	15	0.3	1.5	±0.9	0.0	73	7	130
Green Sunfish	8	0.1	0.8	±0.7	0.0	--	--	--

* 4 years (2006, 2007, 2009, 2011)

Table 4. Catch per unit effort by length category for various fish species captured with trap nets in Twin Lakes, Minnehaha County, July 16-18, 2012.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Bullhead	--	542.1	384.8	146.4	10.9	542.1	±241.0
Walleye	0.7	20.4	9.8	9.3	1.3	21.1	±6.5
Yellow Perch	--	3.8	--	1.0	2.8	3.8	±1.1
Bluegill	--	1.5	0.4	1.0	0.1	1.5	±0.9
Green Sunfish	--	0.8	--	0.8	--	0.8	±0.7

Length categories can be found in Appendix A.

Walleye

Management objective: Maintain a walleye population with a gill-net CPUE of at least 15.

Walleye gill-net CPUE remained similar to 2011 and continues to exceed the management objective (Table 5). Although age-1 fish comprised a significant percentage of the 2012 sample, fish up to seven years old were also caught (Table 6).

Table 5. Walleye gill-net CPUE, PSD, RSD-P, and mean Wr for Twin Lakes Minnehaha County, 2003-2012.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CPUE				70.0	37.8		16.8		28.0	27.5
PSD				42	24		84		13	40
RSD-P				3	4		4		1	25
Mean Wr				97	92		97		84	74

Table 6. Weighted mean length at capture (mm) for walleye captured in gill nets in Twin Lakes Minnehaha County, 2006-2012. Sample size is in parentheses.

Year	1	2	3	4	5	6	7	8	9	10	11	12
2012	217 (55)	310 (5)	358 (9)	475 (1)	--	544 (3)	541 (2)	--	--	--	--	--
2011	248 (112)	324 (22)	407 (78)	480 (8)	488 (2)	--	--	--	--	--	--	--
2009	244 (101)	381 (28)	418 (1)	463 (46)	500 (19)	--	--	--	--	--	--	--
2007	297 (190)	363 (100)	416 (51)	472 (20)	499 (10)	523 (3)	538 (2)	558 (2)	--	670 (1)	--	--
2006	267 (71)	408 (104)	444 (34)	-- (9)	491 (2)	547 (3)	--	--	--	--	--	--

Although 57% of the fish sampled were produced by the 2012 fingerling stocking, overall year class strength was relatively weak (Table 7). The age-0 walleyes were of average length and in good condition. The high abundance of yearling walleyes indicated a strong year class was naturally produced in 2011. The age-1 walleyes were also of average length and condition.

Table 7. Age-0 and age-1 walleyes sampled during 2 hours of nighttime electrofishing on Twin Lakes (only South Twin sampled in 2003-6), Minnehaha County, 2003-2012.

Year	Stocking	Age-0 CPH	80% C.I.	% stocked	Mean length (range; mm)	Wr	Age-1 CPH	80% C.I.	Mean length (range; mm)	Wr
2012	fingerling	21	5-35	57	170 (151-203)	91	69	51-87	273 (235-305)	86
2006	fingerling	19	0-43	[3]	222 (204-239)	124	5	0-10	300 (290-309)	95
2005	large fgl[1]	0					2	0-6	237 (235-238)	106
2004	large fg1[2]	0					3	0-5	307 (299-314)	100
2003	fingerling	60	8-111		145 (115-192)	90				

[1] Stocked with 7,232 large walleye fingerlings (32/lb) after electrofishing was completed

[2] 25 juvenile walleyes (6/lb) were stocked on May 27, 2004. Additionally, large fingerling walleyes were stocked after fall electrofishing.

[3] No OTC marking evaluation of 2003-2006 stocked walleyes has been done.

Yellow Perch

Management objective: Maintain a yellow perch population with a gill-net CPUE of at least 25.

Yellow perch CPUE increased this year and now exceeds the management objective (Table 7). No yellow perch stocking has been done since 2009 (Table 12) and the population size structure remains excellent (Tables 2, 8 and Figure 2).

Table 8. Yellow perch gill-net CPUE, PSD, RSD-P, and mean Wr for Twin Lakes Minnehaha County, 2003-2012.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CPUE		16.5		5.8	5.2		1.0		24.0	63.5
PSD		8		75	69		--		71	97
RSD-P		8		42	38		--		21	54
Mean Wr		89		101	109		--		108	100

Table 9. Weighted mean length at capture (mm) for yellow perch captured in gill nets in Twin Lakes Minnehaha County, 2012. Sample size is in parentheses.

Year	1	2	3	4	5	6	7	8
2012	185	247	264	--	--	--	--	--
(127)	(4)	(100)	(23)					

Black Bullhead

Management objective: Maintain a black bullhead population with a trap-net CPUE of 100 or less.

Black bullhead trap-net CPUE declined by nearly 50% from 2011 but remains well above the management objective (Table 10). However, increases in PSD and RSD-P (Table 10), the presence of fish in the larger length categories (Table 4) and an obvious shift in the population size structure (Figure 3) indicate that the population is not stunting as it did before the restrictive walleye size limit was implemented.

Table 10. Black bullhead trap net CPUE, PSD, RSD-P, and mean Wr for Twin Lakes, Minnehaha County, 2003-2012.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CPUE		250.6		514.3	69.5		23.2		1,045.8	542.1
PSD		76		11	33		82		0	29
RSD-P		6		8	1		26		0	2
Mean Wr		98		113	89		112		81	91

Other Species

Bluegills were sampled for the first time in 2012 and green sunfish have now been caught the last two years (Table 11).

Table 11. Gill-net (GN) and trap-net (TN) CPUE for all fish species sampled in Twin Lakes, Minnehaha County, 2003-2012.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BLB (GN)				122.5	42.8		66.0		44.3	108.5
BLB (TN)		250.6		514.3	69.5		23.2		1,045.8	542.1
GSF (GN)										
GSF (TN)									0.1	0.8
BLG (GN)										
BLG (TN)										1.5
WAE (GN)				70.0	37.8		16.8		28.0	27.5
WAE (TN)				17.3	8.1		13.0		7.4	21.1
YEP (GN)				5.8	5.2		1.0		24.0	63.5
YEP (TN)				5.2	2.3		1.8		11.1	3.8

BLB (Black Bullhead), GSF (Green Sunfish), BLG (Bluegill), WAE (Walleye), YEP (Yellow Perch)

MANAGEMENT RECOMMENDATIONS

1. Conduct annual netting surveys to monitor the adult fish populations and annual fall electrofishing surveys to monitor stocked or natural walleye recruitment.

2. Stock walleyes and yellow perch as needed to achieve the management objectives.

Table 12. Stocking record for Twin Lakes, Minnehaha County, 1995-2012.

Year	Number	Species	Size
1995	32	Walleye	Adult
1996	500	Yellow Perch	Adult
2000	1,920	Yellow Perch	Adult
2002	109	Walleye	Adult
2003	58,784	Walleye	Fingerling
2004	5,606	Walleye	Large Fingerling
	25	Walleye	Juvenile
2005	19,616	Walleye	Large Fingerling
2006	31,030	Walleye	Fingerling
	5,372	Yellow Perch	Adult
2007	1,493	Yellow Perch	Adult
2009	29,300	Walleye	Fingerling
	3,980	Yellow Perch	Adult
2011	29,120	Walleye	Fingerling
2012	58,730	Walleye	Fingerling

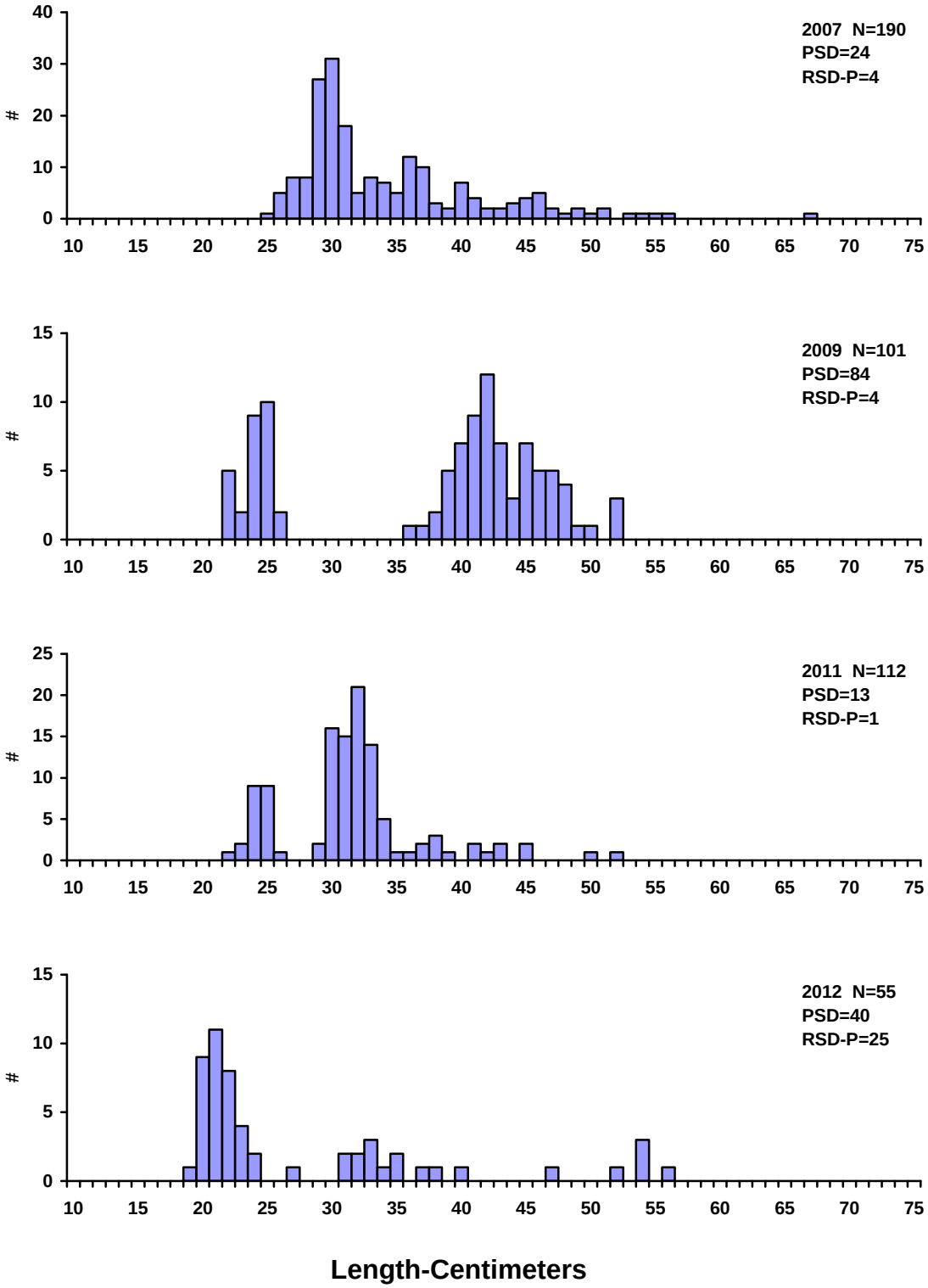

Figure 1. Length frequency histograms for walleye sampled with gill nets in Twin Lakes, Minnehaha County, 2007, 2009, 2011, and 2012.

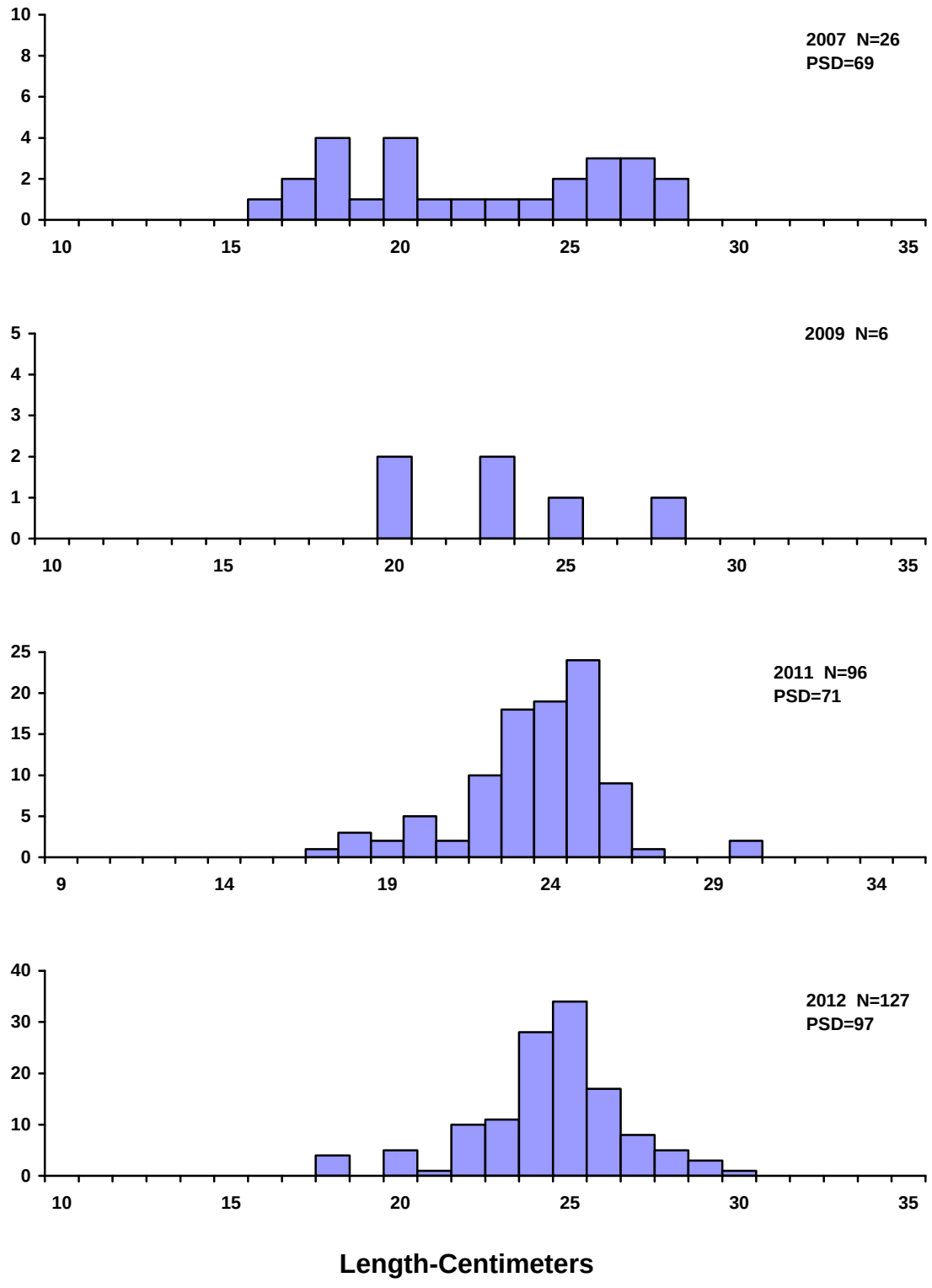

Figure 2. Length frequency histograms for yellow perch sampled with gill nets in Twin Lakes, Minnehaha County, 2007, 2009, 2011, and 2012.

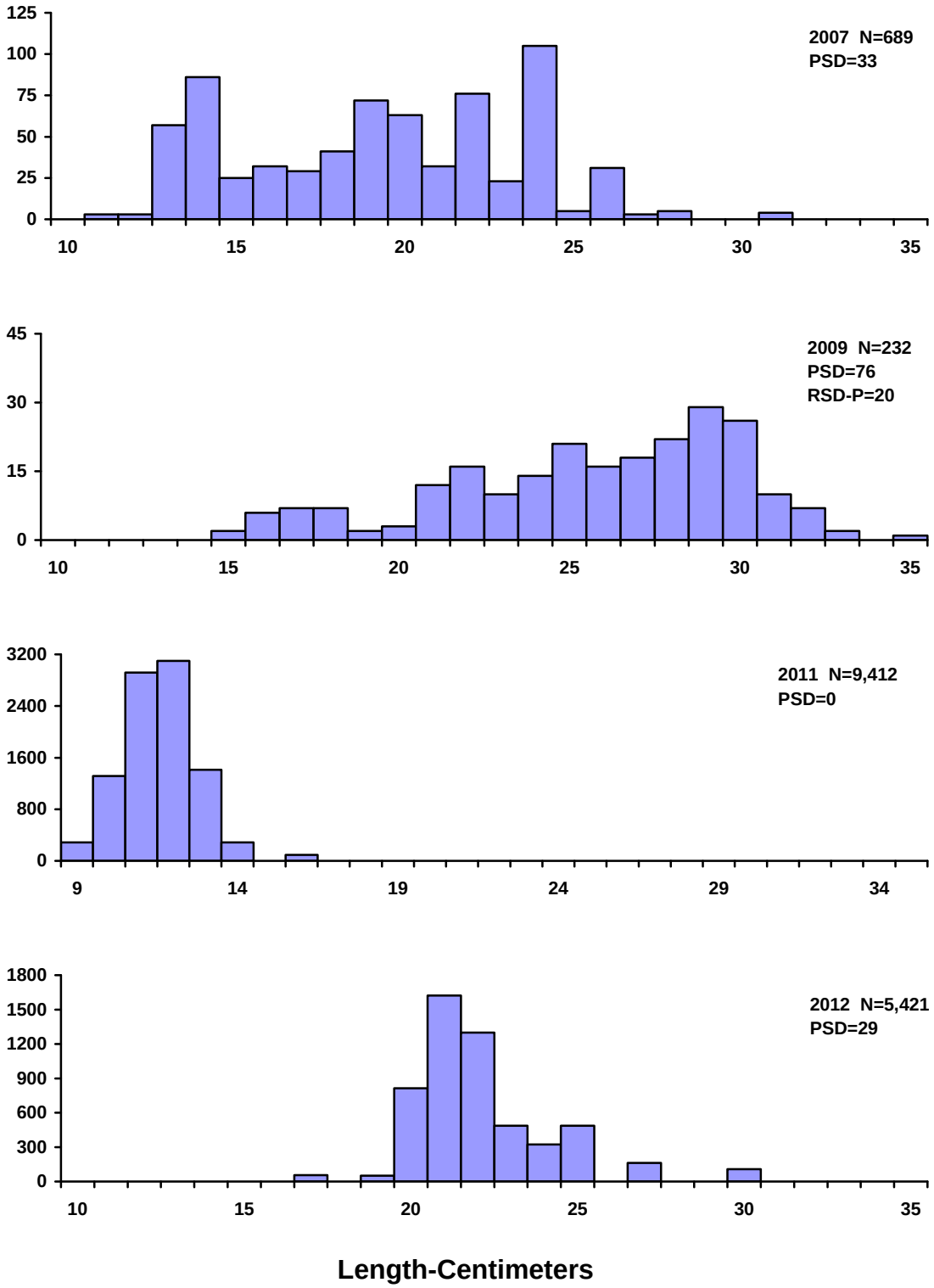

Figure 3. Length frequency histograms for black bullheads sampled with trap nets in Twin Lakes, Minnehaha County, 2007, 2009, 2011, and 2012.

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.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

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.