

Enemy Swim Lake Site Description

Location

Water designation number (WDN)	22-0006-00
Legal description	T123N-R53W-Sec.10-16
County (ies)	Day
Location from nearest town	1.5 miles east and 6.5 miles north of Waubay, SD

Survey Dates and Sampling Information

Survey dates	July 19-21, 2011 (FN, GN) September 21, 2011 (EF-WAE)
Gill net sets (n)	6
Frame net sets (n)	24
Electrofishing-WAE (min)	60

Morphometry

Watershed area (acres)	22,310
Surface area (acres)	2,146
Maximum depth (ft)	26
Mean depth (ft)	16

Ownership and Public Access

Enemy Swim Lake is a meandered lake managed by the SDGFP. Two public access sites are located on Enemy Swim Lake (southwest and south shore) and each is maintained by the SDGFP (Figure 1; Figure 2). Lands adjacent to Enemy Swim Lake are owned by the State of South Dakota, Bureau of Indian Affairs, and private individuals.

Watershed and Land Use

Land use within the Enemy Swim Lake watershed is primarily agricultural with a mix of pasture or grassland, cropland, and woodland.

Water Level Observations

The Water Management Board established Ordinary High Water Mark is 1854.4 fmsl, and the outlet elevation of Enemy Swim Lake is 1853.6 fmsl. On May 17, 2011 the elevation of Enemy Swim Lake was 1854.8 fmsl; 1.1 ft. higher than fall 2010 elevation of 1853.7 fmsl and slightly above the Ordinary High Water Mark. By October 5, 2011 water levels on Enemy Swim Lake had declined to an elevation of 1853.6 fmsl.

Aquatic Nuisance Species Monitoring

Plant Survey

Both emergent and submergent vegetation are common in Enemy Swim Lake. In 2010, aquatic vegetation species identified included: bulrush, cattail, clasping-leaf pondweed, coontail, floating-leaf pondweed, Illinois pondweed, long-leaf pondweed, water crowfoot, and water stargrass. Chara (a macro algae) was also sampled. No aquatic plant survey was conducted in 2011. To date, no aquatic nuisance plant species have been encountered.

Shoreline Survey

No shoreline survey was conducted in 2011.

Fish Community Survey

Common carp were the only aquatic nuisance fish species captured during the 2011 survey (Table 1).

Fish Management Information

Primary species	black crappie, bluegill, largemouth bass, smallmouth bass, walleye, yellow perch
Other species	black bullhead, common carp, northern pike, pumpkinseed, rock bass, white bass, white sucker
Lake-specific regulations	Bluegill/sunfish: High-grading prohibited. Smallmouth/Largemouth Bass: Only those <14", or 18" and longer may be taken. Of those no more than one may be 18" or longer. Walleye: minimum length 15".
Management classification	warm-water permanent
Fish Consumption Advisories	none

South Dakota Game, Fish, and Parks
 SDSU Wildlife and Fisheries Sciences




Enemy Swim Lake - Day county
 Map Creation: November, 2002 Sonar Survey: August, 2002
 Shoreline: Landsat 7, August, 2000

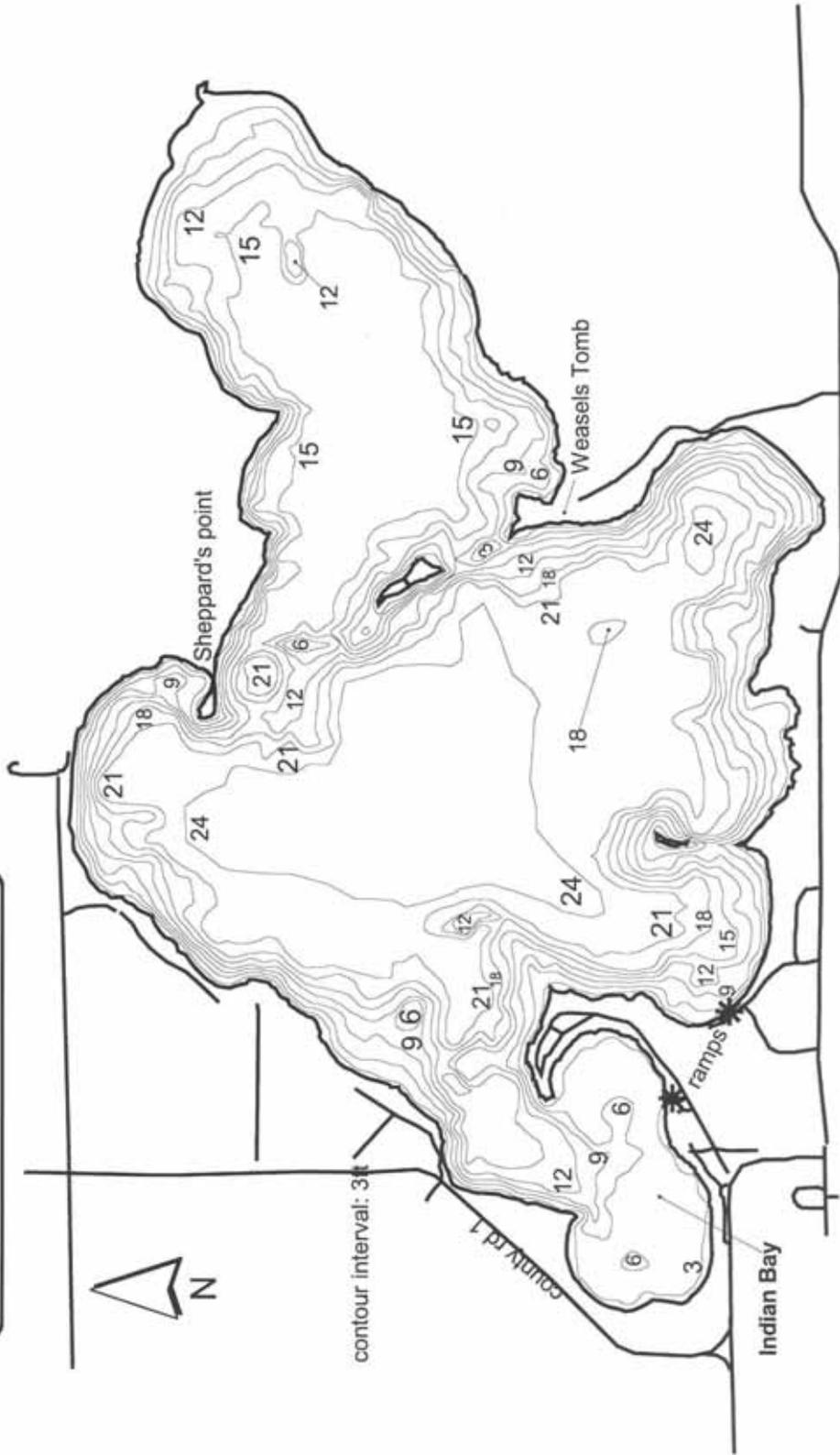


Figure 1. Contour map of Enemy Swim Lake, Day County, South Dakota.

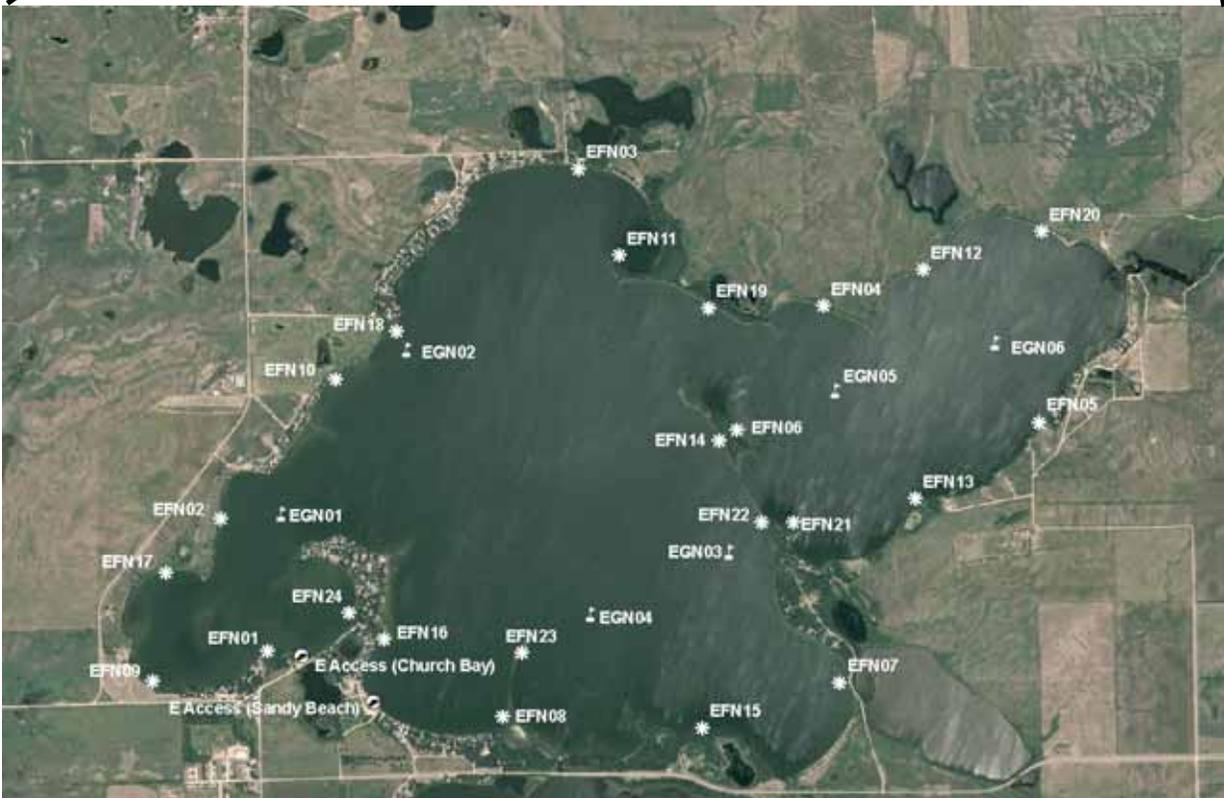


Figure 2. Map depicting location of several Day County, South Dakota lakes including Enemy Swim (top). Also noted, are public access sites and standardized net locations for Enemy Swim Lake. EFN= frame nets; EGN=gill nets

Management Objectives

- 1) Maintain a frame net mean CPUE of stock-length black crappie ≥ 10 , a PSD of 30-60, and a PSD-P of 5-10.
- 2) Maintain a frame net mean CPUE of stock-length bluegill ≥ 25 , a PSD of 30-60, and a PSD-P of 5-10.
- 3) Maintain a mean spring night electrofishing CPUE of stock-length largemouth bass ≥ 30 , a PSD of 40-70, and a PSD-P of 10-40.
- 4) Maintain a moderate density smallmouth bass population with a PSD of 40-70 and a PSD-P of 10-40.
- 5) Maintain a gill net mean CPUE of stock-length walleye ≥ 10 , a PSD of 30-60, and a PSD-P of 5-10.
- 6) Maintain a gill net mean CPUE of stock-length yellow perch ≥ 30 , a PSD of 30-60, and a PSD-P of 5-10.

Results and Discussion

Enemy Swim Lake is a permanent-natural lake with a moderately-sized watershed. Major surface water inlets to Enemy Swim Lake include Lewandowski Creek at the northeast and Burns Slough at the southeast. Water exiting Enemy Swim Lake drains into Campbell Slough from there it flows into Blue Dog Lake and then into a series of connected lakes (Rush Lake, Minnewasta Lake, Waubay Lake and Bitter Lake).

Portions of the Enemy Swim Lake shoreline are highly developed (i.e., south, west and northeast corner of East Lake); while other areas remain relatively undeveloped. Enemy Swim Lake supports one of the most diverse fish assemblages in northeast South Dakota. Currently, Enemy Swim Lake is primarily managed as a panfish (i.e., black crappie, bluegill, and yellow perch), black bass (largemouth and smallmouth), and walleye fishery.

Primary Species

Black crappie: The mean frame net CPUE of stock-length black crappie was 8.3 (Table 1) and below the minimum objective (≥ 10 stock-length black crappie/net night; Table 3). The 2011 frame net CPUE represented an increase from the 1.3 observed in 2010 and was the highest CPUE recorded from 2003-2011 (Table 2). Currently, black crappie relative abundance is considered moderate.

Black crappies captured in frame nets ranged in total length from 10 to 34 cm (3.9 to 13.4 in) with a high proportion being in the quality-preferred length category (Figure 3). The PSD was 84 and above the management objective (30-60); while the PSD-P was 5 and within the objective range of 5-10 (Table 1; Table 3; Figure 3).

No growth information was collected. Frame net captured black crappie exhibited a decreasing trend in condition as total length increased; however, sample size was low for larger (i.e., \geq preferred-length) black crappie. The majority of stock-length black crappie were in the quality-preferred length category which had a mean Wr of 104.

Bluegill: The mean frame net CPUE of stock-length bluegill was 90.2 (Table 1) and well above the minimum objective (≥ 25 stock-length bluegill/net night; Table 3). Since 2003, frame net mean CPUE values of stock-length bluegill have ranged from a low of 39.7 (2004) to a high of 90.2 (2011; Table 2). Based on the 2011 frame net CPUE, relative abundance is considered high.

Frame net captured bluegill ranged in total length from 9 to 20 cm (3.5 to 7.9 in) with nearly all being in the stock-quality and quality-preferred length categories (Figure 4). The PSD was 61 and slightly above the management objective of 30-60 (Table 1; Table 3). Frame nets captured only four preferred-length bluegill which resulted in a PSD-P of 0 (Table 1; Table 3; Figure 4).

Since 2005, otoliths have been collected from a sub-sample of frame net captured bluegill. Age structure analysis indicates that bluegills tend to exhibit consistent recruitment in Enemy Swim Lake (Table 4). In 2011, four consecutive year classes (2005-2008) were present (Table 4). All year classes were well represented and comprised 34, 31, 23, and 12%, respectively, of bluegill in the frame net catch (Table 4).

Bluegills in Enemy Swim Lake typically attain quality-length (15 cm; 6 in) at approximately age-5 (Table 5). In 2011, weighted mean total length at capture values for age-4 and age-5 bluegill was 131 and 172 mm (5.2 to 6.8 in; Table 5). Frame net captured bluegill had mean Wr values that ranged from 98 to 105 for all length categories (e.g., stock to quality) sampled with the mean Wr of stock-length bluegill being 102 (Table 1). Seasonal influences (i.e., spawning behavior) may have influenced Wr values for bluegill in Enemy Swim Lake.

Largemouth bass: Largemouth bass populations are typically assessed using night electrofishing conducted during June when water temperatures are approximately 65°F in northeastern South Dakota. Spring night electrofishing to monitor the largemouth bass population will be conducted biennially during even years (e.g., 2012, 2014, 2016...).

Smallmouth bass: Prior to 2009, fall night electrofishing was used to assess smallmouth bass populations in northeast South Dakota. However, recent research has recommended that smallmouth bass population dynamics be monitored utilizing standardized spring (May and June) night electrofishing over suitable habitat (i.e., rocky substrate) in northeast South Dakota glacial lakes (Bacula 2009). Spring night electrofishing to monitor the smallmouth bass population will be conducted biennially during even years (e.g., 2012, 2014, 2016...).

Walleye: The mean gill net CPUE of stock-length walleye was 10.8 (Table 1) and slightly above the minimum objective (≥ 10 stock-length walleye/net night; Table 3). Since 2003, the mean gill net CPUE has ranged from a low of 3.0 (2008) to a high of 18.2 (2005; Table 2). The 2011 gill net CPUE represented an increase from the 5.7 observed in 2010 (Table 2) and indicated moderate relative abundance.

Walleye in the gill net catch ranged in total length from 19 to 63 cm (7.5 to 24.8 inches) with the majority being in the stock-quality length category (Figure 5). The PSD was 14 and below the management objective of 30-60; while the PSD-P of 5 was within the management objective of 5-10 (Table 1; Table 3). Approximately 12% of walleye in the gill net catch were above the 381-mm (15-inch) minimum length restriction (Figure 5).

Since 2005, otoliths have been collected from gill net captured walleye. In 2011, seven year classes (1999, 2002, 2005, 2007-2010) were present with the 2009 year class being the most represented (Table 6). The 2009 year class, which coincided with a large fingerling stocking, comprised 84% of walleye in the gill net catch (Table 6; Table 8). Fall electrofishing indicated that relatively strong year-classes (defined as > 20 age-0 walleye/hour; Ermer et al. 2005) were naturally produced from 2006-2008; however, recruitment was limited (Table 6). In 2010, standardized electrofishing sites were adjusted to include areas believed to be more conducive to sampling age-0 walleye (i.e., less coarse or sandy substrates). The 2010 mean fall night electrofishing CPUE of age-0 walleye was 34.7 (Table 2). In early-summer 2011, an estimated 235,460 small fingerling walleye were stocked (Table 8). Following the stocking, the mean fall night electrofishing CPUE of age-0 walleye was 25.0 (Table 1). Given the low gill net catch rates in recent years and relatively-low 2011 fall night electrofishing CPUE, large fingerling walleye were also stocked (Table 2; Table 8). Recruitment of the 2011 cohort is currently unknown and will be assessed in future surveys.

In recent years (2009-2011), walleye in Enemy Swim have attained quality-length (38 cm; 15 in) by age 3 (Table 7). Since 2005, the weighted mean length at capture for age-3 walleye has ranged from 313 to 411 mm (12.3 to 16.2 in; Table 7). The 2009 year class had a weighted mean total length at capture of 210 and 298 mm (8.3 and 11.7 in) at age 1 and age 2 (Table 7). The majority of gill net captured walleye were in the stock-quality length category which had a mean W_r of 84.

Yellow Perch: The mean gill net CPUE of stock-length yellow perch was 152.2 (Table 1) and well above the minimum objective (≥ 30 stock-length yellow perch/net night). The mean gill net CPUE has increased in each of the past three surveys (2009-2011; Table 2). The 2011 gill net CPUE was the highest recorded from 2003-2011 (Table 2) and indicated high relative abundance.

Yellow perch in the gill net catch ranged in total length from 9 to 20 cm (3.5 to 7.9 in.; Figure 6). Few yellow perch \geq quality-length (20 cm; 8 in) were captured resulting in low PSD and PSD-P values of 1 and 0, which were well below the management objectives of 30-60 and 5-10, respectively (Table 1; Table 3; Figure 6).

In recent years, otoliths have been collected from a sub-sample of gill net captured yellow perch. In 2011, age structure information indicated that year classes produced in 2007-2009 comprised the entire sample, with the 2008 year class being the most represented (Table 9). The weighted mean total length at capture for age-2 and

age-3 male yellow perch was 107 and 142 mm (4.2 and 5.6 in; Table 10); while the weighted mean total length at capture for age-2 and age-3 female yellow perch was 110 and 152 mm (4.3 and 6.0 in; Table 10). Yellow perch in the sub-stock and stock-quality length categories dominated the gill net catch and had mean W_r values of 94 and 91.

Other Species

Black bullhead: Relative abundance of black bullhead in Enemy Swim Lake has remained low with the mean frame net CPUE not exceeding 5.0 stock-length black bullhead/net from 2003-2011 (Table 2). In 2011, 11 stock-length black bullhead ranging in total length from 27 to 40 cm (10.6 to 15.7 in) were captured resulting in a frame net mean CPUE of 0.5 (Table 1). The frame net CPUE was within management objective (≤ 100 stock-length black bullhead/net night) and indicated low relative abundance. Relatively high predator abundance provided by several species of predatory fish (i.e., walleye, largemouth and smallmouth bass) likely aids in maintaining the low abundance of black bullhead in Enemy Swim Lake.

Northern Pike: Northern pike typically are not sampled effectively during standardized mid-summer fish community surveys. As a result, mean gill net CPUE values are often low. Northern pike relative abundance in Enemy Swim Lake has generally been considered low to moderate with mean gill net CPUE values that ranged from 0.5 to 2.8 from 2003-2011 (Table 2). In 2011, 17 stock-length northern pike that ranged in total length from 42 to 75 cm (16.5 to 29.5 in) were captured in the gill net catch which resulted in a mean gill net CPUE of 2.8 (Table 1). Few inferences can be made concerning the size structure and condition of northern pike due to low sample size.

Rock Bass: Rock bass were the third most abundant species in the frame net catch, with a mean frame net CPUE of 12.7 (Table 1). Since 2003, frame net CPUE values have ranged from a low of 5.3 (2010) to a high of 17.6 (2003; Table 2).

Length-frequency analysis indicated consistent recruitment, as frame net captured rock bass ranged in total length from 8 to 28 cm (3.1 to 11.0 in) with nearly all 1-cm length groups being represented (Figure 7). The PSD was 63 and the PSD-P was 24 (Table 1; Figure 7). Despite relatively high abundance and quality size structure, angler interest in rock bass appears low. Blackwell et al. (2007) reported that rock bass were a minor component to the overall fishery in creel surveys conducted during winter and summer periods from December 2004 through August 2006.

Other: Common carp, pumpkinseed, white bass and white sucker were other fish species captured in low numbers during the 2011 survey (Table 1).

Management Recommendations

- 1) Conduct fish community assessment surveys on an annual basis (next survey scheduled in summer 2012) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.
- 2) Conduct spring night electrofishing biennially (even years) to monitor largemouth and smallmouth bass population parameters.
- 3) Conduct fall night electrofishing on an annual basis to monitor age-0 walleye relative abundance.
- 4) Collect otoliths from bluegill, walleye, and yellow perch; scales from largemouth and smallmouth bass to assess the age structure and growth rates of each population.
- 5) Stock walleye at (≈ 25 large fingerling/acre) to establish additional year classes if fall night electrofishing CPUE of age-0 walleye and gill netting results warrant (i.e., low gill net CPUE of < 25 cm (10 in) walleye and/or fall night electrofishing CPUE of age-0 walleye < 75 age-0 walleye/hour).
- 6) Maintain length limit on largemouth and smallmouth bass to benefit population and comply with toolbox options (Blackwell and Lucchesi 2009). Largemouth and smallmouth bass must be less than 14" or longer than 18", but only one 18" or longer can be kept in the daily creel.
- 7) Maintain the 381-mm (15 in) minimum length limit on walleye to benefit the population and comply with tool box options (Lucchesi and Blackwell 2009).
- 8) Partner with willing landowners on shoreline restoration projects designed to restore native plant fauna along highly-developed shorelines providing improvements to water quality and littoral habitats within the lake.

Table 1. Mean catch rate (CPUE; frame/gill nets= catch/net night, electrofishing= catch/hour) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) of stock-length fish for various fish species captured in gill nets, frame nets, and electrofishing in Enemy Swim Lake, 2011. Confidence intervals include 80 percent (\pm CI-80) or 90 percent (\pm CI-90). BLB= black bullhead; BLC= black crappie; BLG= bluegill; COC= common carp; NOP= northern pike; PUS= pumpkinseed; ROB= rock bass; SMB= smallmouth bass; WAE= walleye; WHB= white bass; WHS= white sucker; YEP= yellow perch

Species	Abundance		Stock Density Indices				Condition	
	CPUE	CI-80	PSD	CI-90	PSD-P	CI-90	Wr	CI-90
<i>Frame nets</i>								
BLB	0.5	0.3	100	0	64	28	92	4
BLC	8.3	2.0	84	4	5	3	104	<1
BLG	90.2	18.7	61	2	0	---	102	1
COC	0.1	0.1	100	0	100	0	79	---
NOP	0.3	0.1	83	34	0	---	89	4
PUS	2.3	1.7	20	9	0	---	109	1
ROB	12.7	3.7	63	5	24	4	99	<1
SMB	14.9	5.1	15	3	2	1	95	1
WAE	0.6	0.3	7	12	0	---	78	4
WHB	0.1	0.1	33	67	33	67	96	6
WHS	0.1	0.1	100	0	100	0	91	29
YEP	7.4	3.5	3	2	0	---	73	1
<i>Gill nets</i>								
BLC	2.0	1.4	50	27	0	---	114	7
BLG	2.5	2.5	33	22	0	---	107	5
COC	0.3	0.3	100	0	100	0	82	5
NOP	2.8	1.3	53	22	12	14	92	3
ROB	0.2	0.2	100	0	0	---	118	---
SMB	1.5	1.7	67	31	56	33	98	2
WAE	10.8	3.6	14	7	5	4	85	1
WHB	1.8	1.5	45	29	45	29	97	6
WHS	3.3	2.5	90	12	65	19	98	3
YEP	152.2	27.1	1	0	0	---	91	1
<i>Electrofishing</i>								
WAE ¹	25.0	---	---	---	---	---	---	---

¹ Fall night electrofishing-WAE; catch rate (CPUE) represents age-0 walleye/hour

Table 2. Historic mean catch rate (CPUE; frame/gill nets= catch/net night, electrofishing= catch/hour) of stock-length fish for various fish species captured in gill nets, frame nets, and electrofishing in Enemy Swim Lake, 2003-2011. BLB= black bullhead; BLC= black crappie; BLG= bluegill; COC= common carp; LMB= largemouth bass; NOP= northern pike; PUS= pumpkinseed; ROB= rock bass; SMB= smallmouth bass; SPS= spottail shiner; WAE= walleye; WHB= white bass; WHS= white sucker; YEP= yellow perch

Species	CPUE									
	2003	2004	2005	2006 ^b	2007 ^b	2008	2009	2010	2011	
<i>Frame nets</i>										
BLB	4.4	2.8	2.6	1.0	0.4	0.1	0.1	0.1	0.5	
BLC	5.9	1.5	1.0	2.3	0.8	0.0	0.2	1.3	8.3	
BLG	63.1	39.7	51.3	56.0	42.5	65.3	56.8	57.3	90.2	
COC	0.0	<0.1	0.0	0.0	<0.1	0.1	<0.1	0.0	0.1	
LMB	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	
NOP	0.4	0.4	0.4	0.1	0.3	0.3	0.1	0.3	0.3	
PUS	1.4	0.9	3.1	1.7	<0.1	0.5	0.3	1.7	2.3	
ROB	17.6	11.0	9.6	14.0	8.6	11.5	8.3	5.3	12.7	
SMB	4.1	1.9	2.1	6.3	1.3	2.7	1.8	1.9	14.9	
WAE	0.2	0.4	0.2	0.3	0.3	0.4	0.1	<0.1	0.6	
WHB	0.1	0.1	0.1	0.3	0.5	<0.1	<0.1	<0.1	0.1	
WHS	0.04	0.1	0.1	0.0	0.3	0.1	0.1	0.2	0.1	
YEP	1.4	0.5	2.3	4.4	3.5	<0.1	1.6	5.1	7.4	
<i>Gill nets</i>										
BLB	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
BLC	8.5	15.8	4.2	2.8	1.5	0.3	0.0	2.0	2.0	
BLG	16.2	19.7	12.5	8.7	5.8	0.5	2.8	3.8	2.5	
COC	0.2	0.3	0.0	1.2	1.8	0.2	0.5	0.2	0.3	
NOP	2.0	2.8	1.2	1.2	0.5	1.2	2.0	1.3	2.8	
PUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ROB	23.8	4.5	1.8	2.3	14.0	2.0	3.3	1.2	0.2	
SMB	6.0	3.5	5.0	1.2	1.8	2.2	4.2	0.7	1.5	
SPS ¹	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
WAE	14.5	11.0	18.2	13.5	14.7	3.0	4.7	5.7	10.8	
WHB	0.5	0.5	0.0	0.7	1.5	2.5	2.7	0.3	1.8	
WHS	3.5	3.7	3.0	4.0	1.7	3.5	4.5	7.7	3.3	
YEP	20.7	19.2	18.0	19.8	14.3	4.5	40.5	112.3	152.2	
<i>Electrofishing</i>										
LMB ²	181.9	131.5	84.4	202.0	---	102.2	81.7	112.1	---	
SMB ³	---	---	---	---	---	---	123.7	107.0	---	
WAE ⁴	24.0	1.0	8.7	21.0	38.5	52.6	8.2	34.7	25.0	

¹ All fish sizes.

² Spring night electrofishing-LMB

³ Spring night electrofishing-SMB.

⁴ Fall night electrofishing-WAE; catch rate (CPUE) represents age-0 walleye/hour

⁵ Monofilament gill net mesh size change (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")

Table 3. Mean catch rate (CPUE; frame/gill nets= catch/net night, electrofishing= catch/hour), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) for selected species captured in experimental gill nets, frame nets, and electrofishing in Enemy Swim Lake, 2003-2011. BLC= black crappie; BLG= bluegill; LMB= largemouth bass; SMB= smallmouth bass; WAE= walleye; YEP= yellow perch

Species	2003	2004	2005	2006 ³	2007 ³	2008	2009	2010	2011	Objective
<i>Frame nets</i>										
BLC										
CPUE	6	2	1	2	1	0	<1	1	8	≥ 10
PSD	87	97	84	64	56	---	20	23	84	30-60
RSD-P	24	31	84	53	39	---	20	16	5	5-10
Wr	100	107	110	99	94	---	106	101	104	---
BLG										
CPUE	63	40	51	56	43	65	57	57	90	≥ 25
PSD	72	47	18	34	15	29	15	41	61	30-60
RSD-P	13	16	14	7	1	3	4	7	0	5-10
Wr	104	130	116	109	100	106	101	100	102	---
<i>Gill nets</i>										
WAE										
CPUE	15	11	18	14	15	3	5	6	11	≥ 10
PSD	52	27	12	57	63	61	96	56	14	30-60
RSD-P	6	3	6	7	14	17	18	9	5	5-10
Wr	82	84	85	87	89	88	91	92	85	---
YEP										
CPUE	21	19	18	20	14	5	41	112	152	≥ 30
PSD	48	57	35	24	8	4	0	0	1	30-60
RSD-P	3	12	12	5	1	4	0	0	0	5-10
Wr	89	96	94	96	93	99	97	97	91	---
<i>Electrofishing</i>										
LMB ¹										
CPUE	182	131	84	202	---	102	82	112	---	≥ 30
PSD	37	63	80	59	---	81	91	99	---	40-70
RSD-P	3	9	5	6	---	29	45	55	---	10-20
Wr	110	105	106	108	---	104	105	109	---	---
SMB ²										
CPUE	---	---	---	---	---	---	124	107	---	---
PSD	---	---	---	---	---	---	7	72	---	40-70
RSD-P	---	---	---	---	---	---	6	41	---	10-20
Wr	---	---	---	---	---	---	87	95	---	---

¹ Spring night electrofishing-LMB.

² Spring night electrofishing-SMB.

³ Monofilament gill net mesh size change (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")

Table 4. Year class distribution based on the expanded age/length summary for bluegill sampled in frame nets from Enemy Swim Lake, 2006-2011.

Survey Year	Year Class													
	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998
2011				265	504	669	727							
2010	---			57	196	307	728	77	6					3
2008	---	---	---				811	519	152	34	21	6	20	
2007	---	---	---	---			285	306	365	88	6		6	
2006 ¹	---	---	---	---	---			58	232	246	565	161	17	60

¹ Older bluegill were sampled, but are not reported in this table.

Table 5. Weighted mean total length (mm) at capture for bluegill age-2 through age-9 sampled in frame nets (expanded sample size) from Enemy Swim Lake, 2005-2011.

Year	Age							
	2	3	4	5	6	7	8	9
2011	---	107(265)	131(504)	172(669)	183(727)	---	---	---
2010 ¹	91(57)	105(196)	129(307)	153(728)	212(77)	217(6)	---	---
2008	---	105(811)	149(519)	161(152)	173(34)	199(21)	227(6)	249(20)
2007	91(285)	113(306)	133(365)	149(88)	180(6)	---	240(6)	---
2006 ¹	94(58)	112(232)	110(246)	145(565)	176(161)	220(17)	227(60)	242(3)
2005	76(5)	87(122)	104(843)	141(71)	193(51)	219(76)	---	237(5)

¹ Older bluegill were sampled, but are not reported in this table.

Table 6. Year class distribution based on the expanded age/length summary for walleye sampled in gill nets and associated stocking history (Number stocked x 1,000) from Enemy Swim Lake, 2007-2011.

Survey Year	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2011		3	61	1	2		2			2			2
2010 ¹	---		52	13	1	3	4			3	3	3	2
2009 ¹	---	---		1	1	1	4		6	8	3	2	1
2008 ¹	---	---	---		2	1	8			1	3	1	2
2007 ^{1,2}	---	---	---	---		1	26	6	7	16	11	5	7
# stocked													
fry													
sm. fingerling	236											439	158
lg. fingerling	39		15				58			12			

¹ Older walleye were sampled, but are not reported in this table.

² Monofilament gill net mesh size change (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")

Table 7. Weighted mean total length at capture (mm) for walleye age-1 through age-10 sampled in experimental gill nets (expanded sample size) from Enemy Swim Lake, 2005-2011. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends.

Year	Age									
	1	2	3	4	5	6	7	8	9	10
2011 ¹	209(3)	298(61)	399(1)	480(2)	---	479(2)	---	---	536(2)	---
2010 ¹	210(52)	311(13)	402(1)	446(3)	445(4)	---	---	478(3)	493(3)	542(3)
2009 ¹	198(1)	311(1)	411(1)	426(4)	---	472(6)	484(8)	467(3)	482(2)	625(1)
2008 ¹	176(2)	259(1)	356(8)	---	---	485(1)	465(3)	421(1)	531(2)	---
2007 ¹	180(1)	273(26)	329(6)	407(7)	430(16)	447(11)	500(5)	525(7)	504(3)	560(2)
2006 ¹	198(10)	255(6)	336(12)	378(28)	411(16)	420(2)	466(6)	432(1)	482(1)	502(8)
2005	190(2)	261(9)	313(48)	341(39)	379(7)	452(3)	---	576(3)	564(2)	460(1)

¹ Older walleye were sampled, but are not reported in this table.

Table 8. Stocking history including size and number for fishes stocked into Enemy Swim Lake, 1999-2011. LMB= largemouth bass; WAE= walleye

Year	Species	Size	Number
1999	WAE	small fingerling	158,300
2000	WAE	small fingerling	439,450
2002	WAE	juvenile	2,971
		large fingerling	9,388
		large fingerling	57,791
2005	WAE	large fingerling	116,460
2006	LMB	fingerling	14,949
2009	WAE	large fingerling	235,640
2011	WAE	small fingerling	38,634
2011	WAE	large fingerling	

Table 9. Year class distribution based on the age/length summary for yellow perch sampled in gill nets from Enemy Swim Lake, 2009-2011.

Survey Year	Year Class						
	2011	2010	2009	2008	2007	2006	2005
2011	---	---	682	811	112	---	---
2010	---	---	25	1517	277	7	---
2009	---	---	---	241	636	35	1

Table 10. Weighted mean total length (mm) at capture by gender for yellow perch captured in experimental gill nets (expanded sample size) from Enemy Swim Lake, 2009-2011.

Year	Age			
	1	2	3	4
2011				
Male	---	107(301)	142(181)	165(14)
Female	---	110(328)	152(664)	180(60)
Combined	---	109(682)	149(811)	171(112)
2010				
Male	93(14)	114(569)	152(29)	---
Female	95(7)	126(890)	170(219)	200(7)
Combined	94(25)	120(1517)	166(277)	200(7)
2009				
Male	98(72)	116(97)	103(15)	---
Female	102(87)	127(532)	169(11)	222(1)
Combined	100(241)	126(636)	124(35)	222(1)

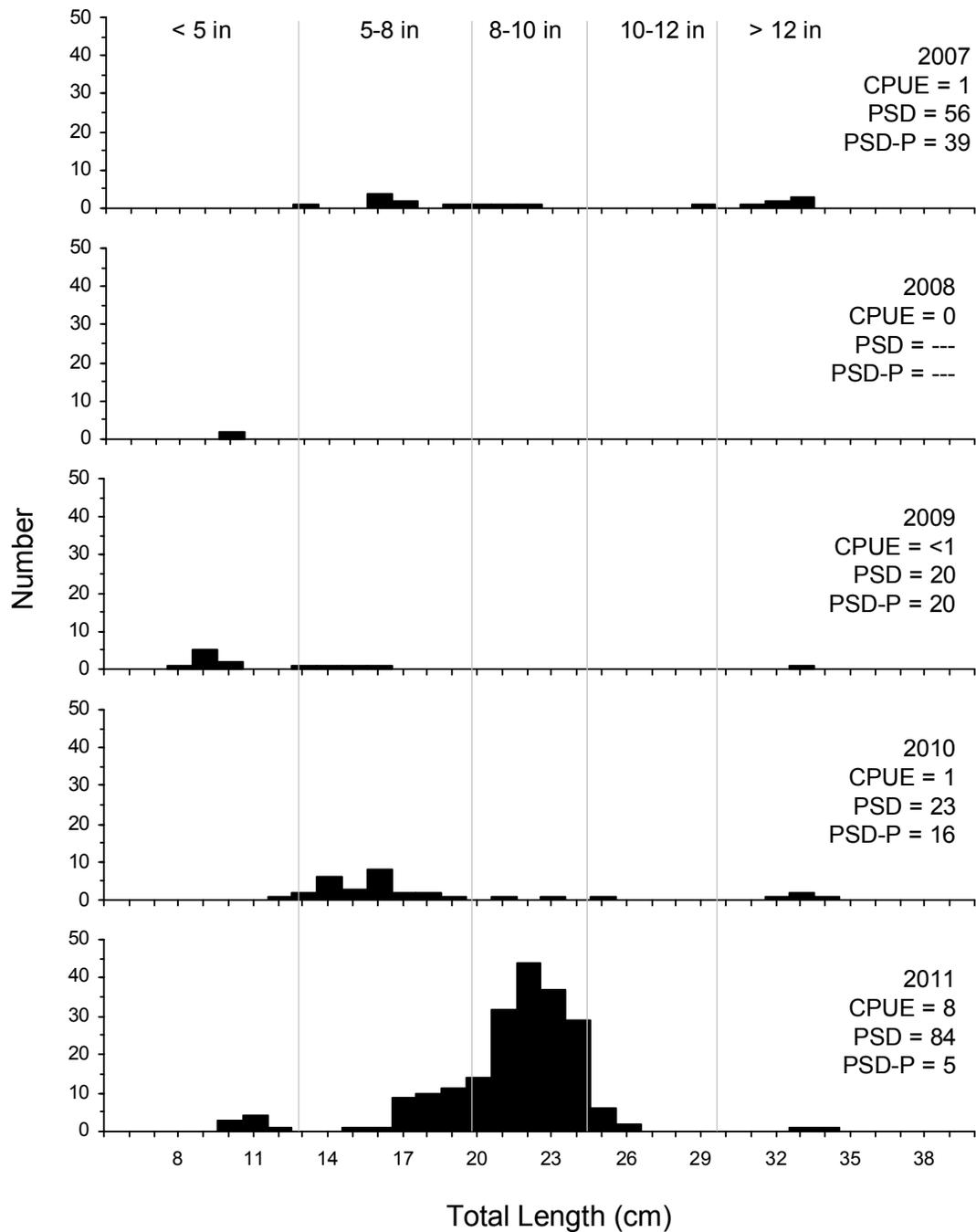


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black crappie captured using frame nets in Enemy Swim Lake, 2007-2011.

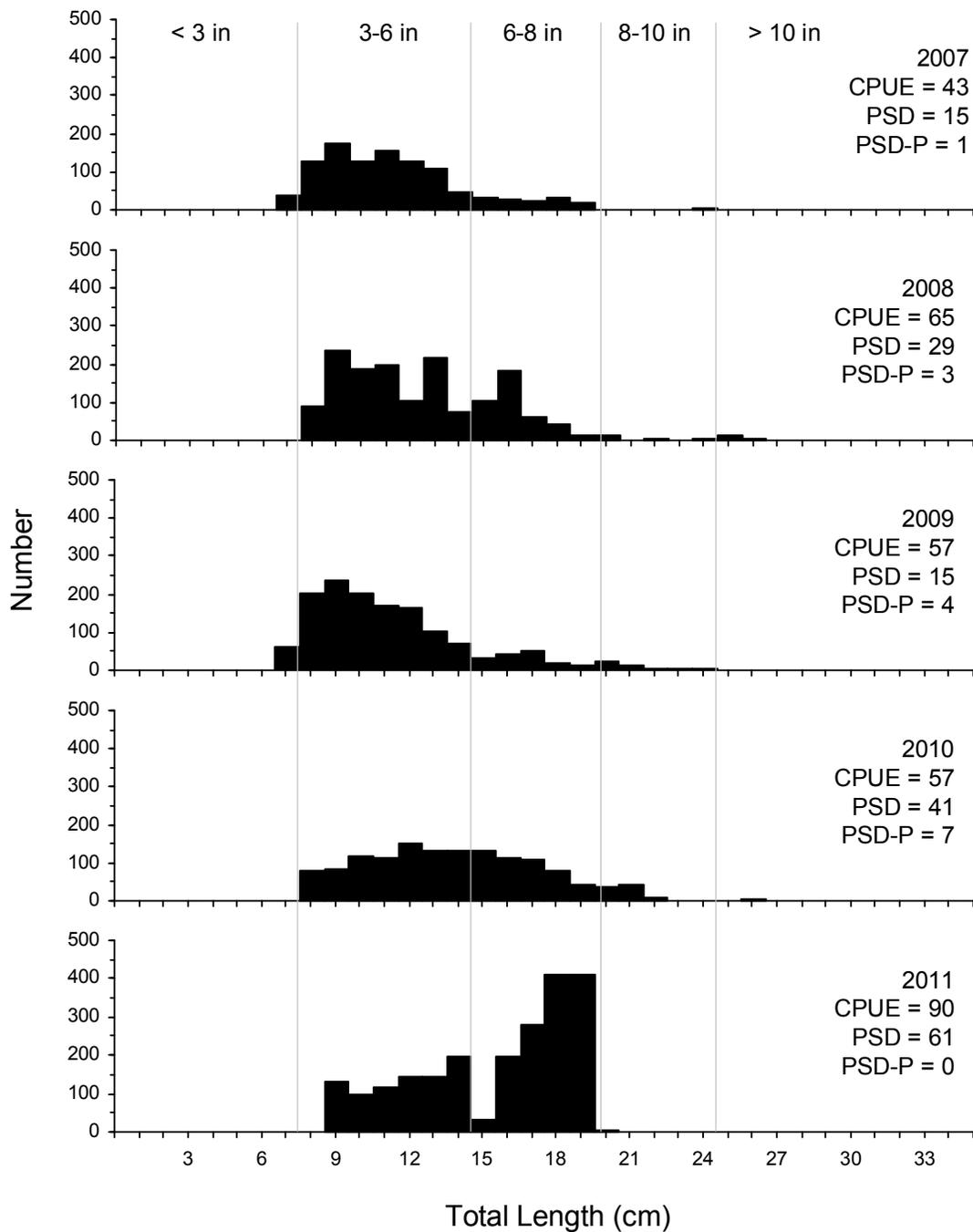


Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for bluegill captured using frame nets in Enemy Swim Lake, 2007-2011.

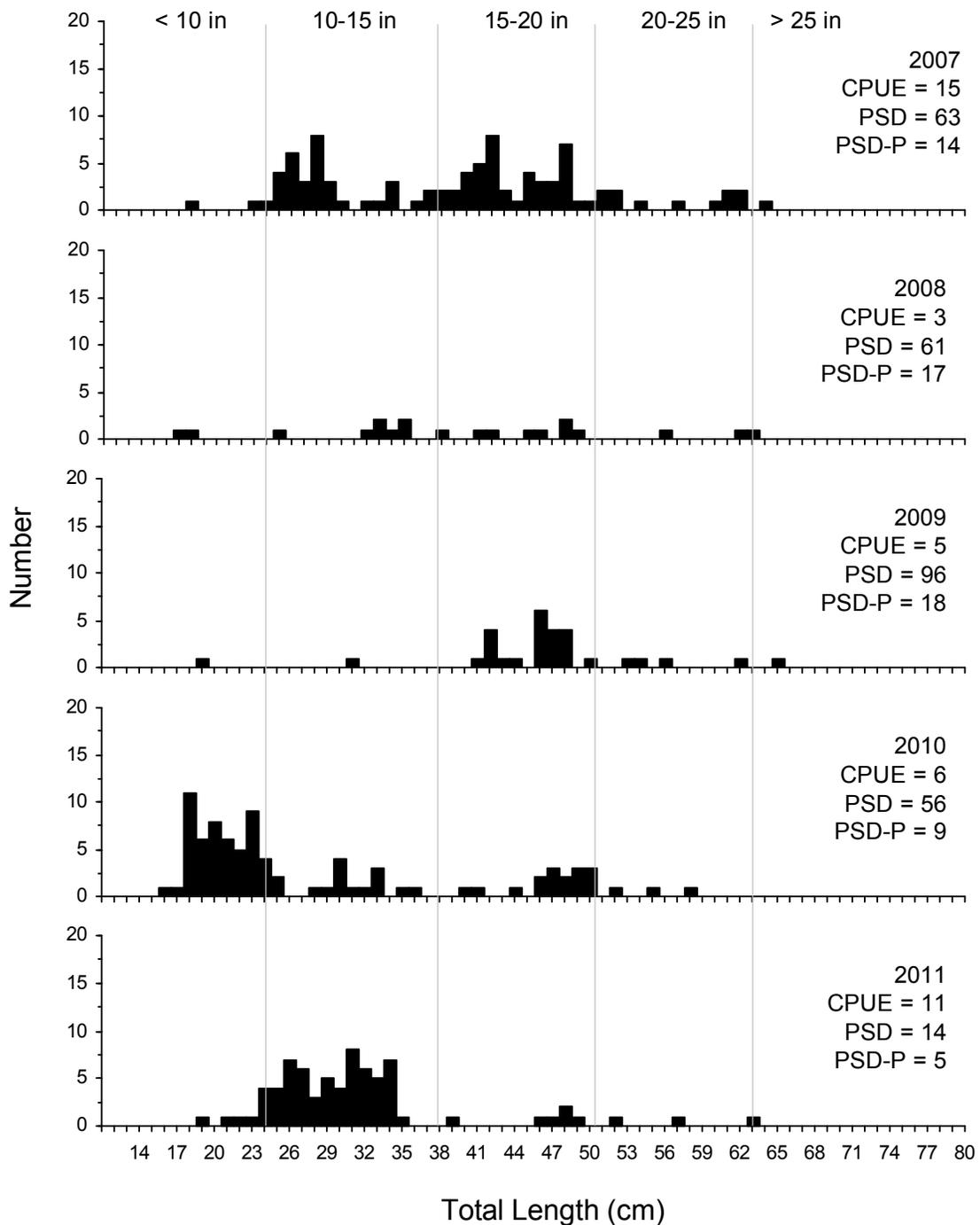


Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for walleye captured using gill nets in Enemy Swim Lake, 2007-2011.

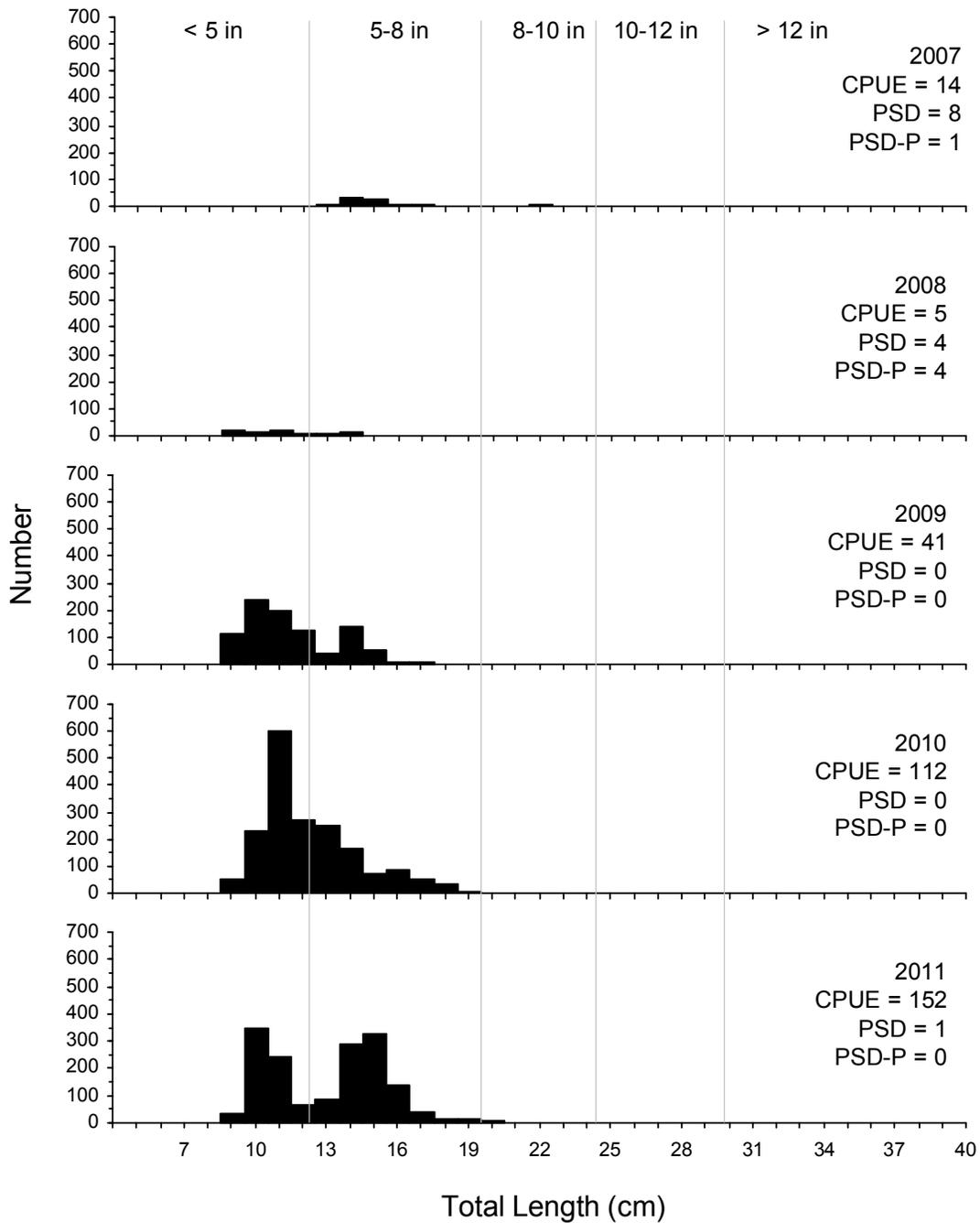


Figure 6. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for yellow perch captured using gill nets in Enemy Swim Lake, 2007-2011.

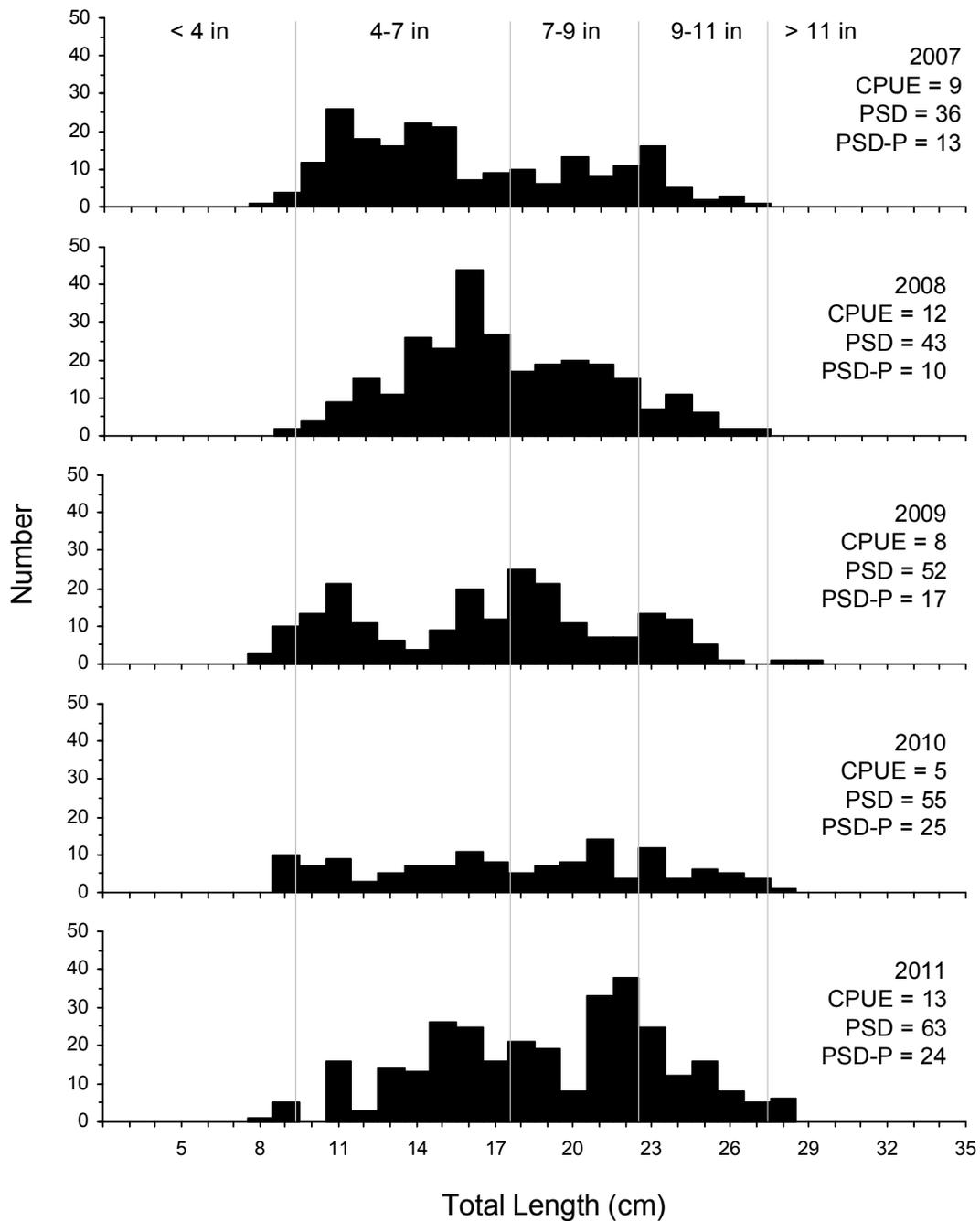


Figure 7. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for rock bass captured using frame nets in Enemy Swim Lake, 2007-2011.