

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	May 15, 2012 (EF-SMB) June 5, 2012 (EF-LMB) July 10-12, 2012 (FN, GN) October 12, 2012 (EF-WAE)
Electrofishing-SMB (min)	60
Electrofishing-LMB (min)	50
Frame net sets (n)	24
Gill net sets (n)	6
Electrofishing-WAE (min)	60

Morphometry (Figure 1)

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 owned by the State of South Dakota and the fishery is 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 woodlands (e.g., shelterbelts).

Water Level Observations

The South Dakota Water Management Board established OHWM is 1854.4 fmsl, and the outlet elevation of Enemy Swim Lake is 1853.6 fmsl. On May 9, 2012 the elevation of Enemy Swim Lake was 1854.5 fmsl; 0.9 ft. higher than fall 2011 elevation of 1853.6 fmsl and near the OHWM. On September 27, 2012 water levels had declined to an elevation of 1852.8 fmsl.

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, Spottail Shiner, White Bass, White Sucker
Lake-specific regulations	Smallmouth/Largemouth bass: Only those less than 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

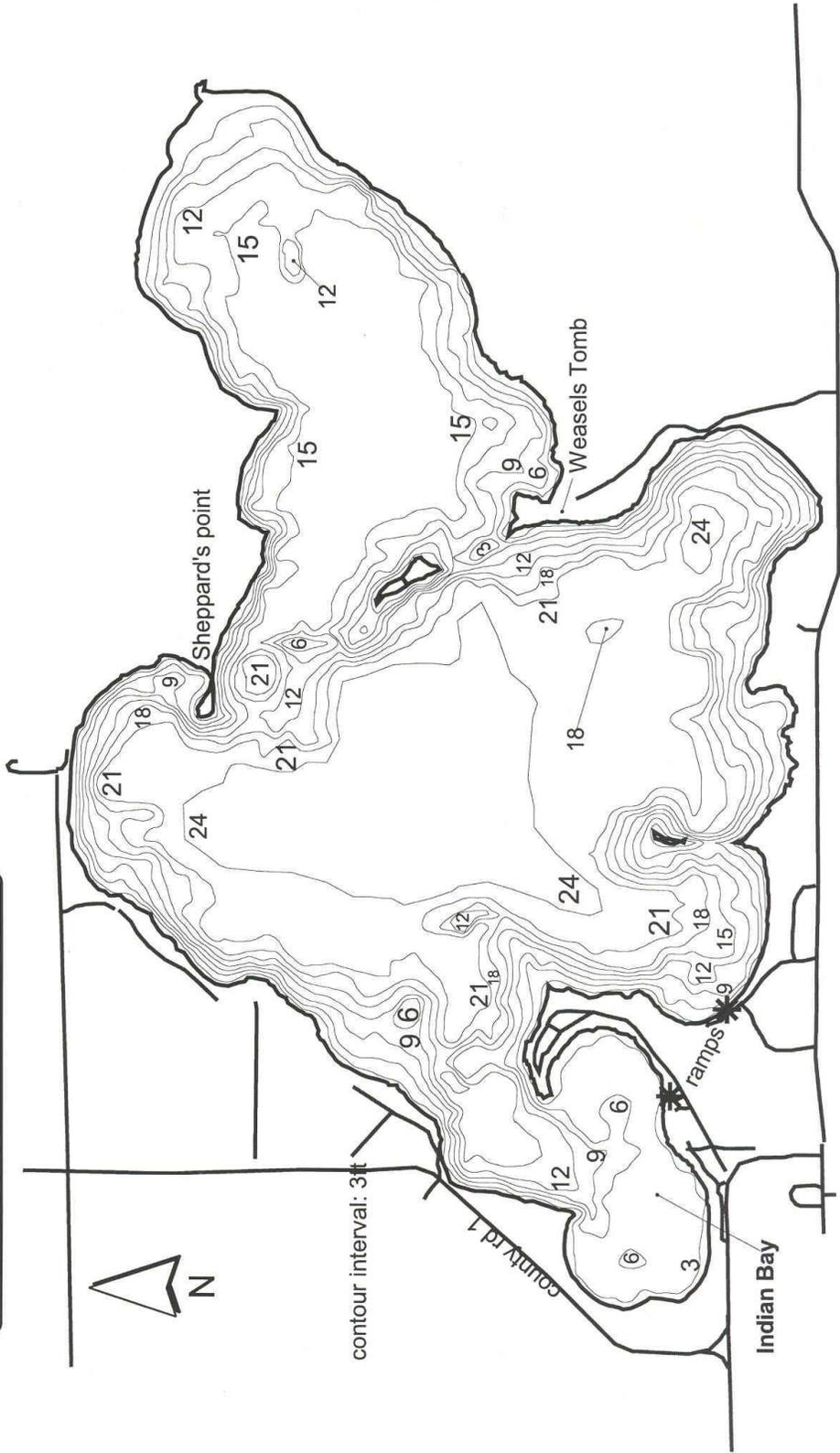


Figure 1. Contour map of Enemy Swim Lake, Day County, South Dakota.



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 2.1 (Table 1) and below the minimum objective (≥ 10 stock-length Black Crappie/net night; Table 3). The 2012 frame net CPUE represented a decrease from the 8.3 observed in 2011 (Table 2). Currently, Black Crappie relative abundance is considered low.

Black Crappies captured in frame nets ranged in TL from 15 to 36 cm (5.9 to 14.2 in.), had a PSD of 84 and PSD-P of 57 (Figure 3). Both PSD and PSD-P were above management objective ranges (30-60 and 5-10, respectively; Table 3) indicating a population dominated by Black Crappie \geq quality-length (i.e., 20 cm; 8 in).

No growth information was collected. Condition was good with mean Wr values ranging from 87 to 97 for all length categories (e.g., stock to quality) sampled. The mean Wr for stock-length Black Crappie was 95 (Table 1). A slight decreasing trend in Wr was observed as TL increased.

Bluegill: The mean frame net CPUE of stock-length Bluegill was 53.8 (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 2012 frame net CPUE, relative abundance is considered high.

Frame net captured Bluegill ranged in TL from 8 to 22 cm (3.1 to 8.7 in.; Figure 4), had a PSD of 78 and PSD-P of 7 (Table 1). The PSD was above the management objective of 30-60 and PSD-P was within the management objective of 5-10 (Table 3).

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 2012, seven consecutive year classes (2004-2010) were present in the frame net sample (Table 4).

Bluegills in Enemy Swim Lake typically attain quality-length (15 cm; 6 in) at approximately age-5 (Table 5). In 2012, weighted mean TL at capture values for age-4 and age-5 Bluegill was 158 and 176 mm (6.2 to 6.9 in; Table 5). Frame net captured Bluegill had mean Wr values that ranged from 103 to 114 for all length categories (e.g., stock to quality) sampled with the mean Wr of stock-length Bluegill being 107 (Table 1). Seasonal influences (i.e., spawning behavior) may have influenced Wr values for Bluegill in Enemy Swim Lake.

Largemouth Bass: Spring night electrofishing to monitor the Largemouth Bass population is conducted biennially during even years (e.g., 2014, 2016, 2018...). The spring night electrofishing CPUE for Largemouth Bass in 2012 was 67.2 (Table 1) and is above the management objective (≥ 30 Largemouth Bass/hour; Table 3). Spring electrofishing CPUE values since 2003 have ranged from 67.2 (2012) to 202.0 (2006; Table 2). The 2012 CPUE is a substantial decrease from the 112.1 observed in 2010 (Table 2), however, relative abundance is still considered to be high.

Largemouth Bass ranged in TL from 20 to 46 cm (7.9 to 18.1 in.; Figure 5), had a PSD of 86 and PSD-P of 79 (Table 1). Both PSD and PSD-P were above the management objective ranges (40-70 and 10-40, respectively; Table 3) indicating a population dominated by preferred-length Largemouth Bass.

Scales were collected from a sub-sample of Largemouth Bass. Ten consecutive year classes were represented indicating consistent recruitment (Table 6). Largemouth Bass in Enemy Swim Lake typically have slower growth compared to regional means. Mean back-calculated lengths at age for age-3 and age-4 Largemouth Bass in Enemy Swim Lake were 226 and 289 mm (8.9 and 11.4 in.; Table 6). Willis et al. (2001) reported regional mean back-calculated lengths at age of 266 and 325 mm (10.5 and 12.8 in.) for age-3 and age-4 Largemouth Bass (Table 6). Condition of Largemouth

Bass, as indexed using W_r values may have been influenced by spawning activity during 2012, as spring night electrofishing was conducted during early-June. Sampled Largemouth Bass had mean W_r values that ranged from 100 to 112 for all length categories (e.g., stock to quality) sampled, with the mean W_r of stock-length Largemouth Bass being 107 (Table 1).

Smallmouth Bass: Spring night electrofishing to monitor the Smallmouth Bass population is conducted biennially during even years (e.g., 2014, 2016, 2018...). In 2012, the spring night electrofishing CPUE for Smallmouth Bass was 299.0 (Table 1) and represented a substantial increase from the 2010 CPUE of 107.0 (Table 2). Sampled Smallmouth Bass ranged in TL from 18 to 47 cm (7.1 to 18.5 in.; Figure 6), had a PSD of 8 and PSD-P of 3 (Table 1). Both PSD and PSD-P were below the management objective ranges (40-70 and 10-40, respectively; Table 3).

Scales were collected from a sub-sample of spring electrofished Smallmouth Bass. Age structure information suggested relatively-consistent recruitment, with seven year classes (2002-2003, 2006-2010) being represented (Table 7). The 2008 cohort was abundant (i.e., comprised 70% of sampled Smallmouth Bass) and less than quality-length resulting in the low size structure (Table 7; Figure 6).

Smallmouth bass in Enemy Swim Lake tend to exhibit slow to moderate growth. In 2012, the mean back-calculated length of age-3 and age-4 Smallmouth Bass was 197 and 257 mm (7.8 and 10.1 in.); compared to the region IV mean of means of 249 and 316 mm (9.8 and 12.4 in; Willis et al. 2001; Table 7). Smallmouth bass in the spring electrofishing catch had mean W_r values that ranged from 82 to 96 for all length categories (e.g., stock to quality) sampled. The mean W_r for stock-length Smallmouth Bass was 83 (Table 1). An increasing trend in W_r was observed as TL increased.

Walleye: The mean gill net CPUE of stock-length Walleye was 7.5 (Table 1) and below 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 2012 gill net CPUE represented a decrease from the 10.8 observed in 2011 (Table 2) and indicated moderate relative abundance.

Walleye in the gill net catch ranged in TL from 14 to 63 cm (5.5 to 24.8 inches) with the majority being in the stock-quality length category (Figure 7). The PSD was 18 and below the management objective of 30-60; while the PSD-P of 9 was within the management objective of 5-10 (Table 1; Table 3). Approximately 15% of Walleye in the gill net catch were above the 381-mm (15-inch) minimum length restriction (Figure 7).

Otoliths were collected from a sub-sample of gill net captured Walleye in 2012. Seven year classes (1996, 2001, 2003, 2005, and 2009-2011) were present in the gill net catch (Table 8). The 2009 year class, which coincided with a large fingerling stocking, was the most represented and comprised 83% of Walleye in the gill net catch (Table 8; Table 10).

Fall electrofishing indicated that relatively strong year-classes (defined as > 20 age-0 Walleye/hour) were naturally produced from 2006-2008; however, recruitment was limited (Table 8). 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 2012 mean fall night electrofishing CPUE of age-0 Walleye was 3.0 (Table 1) indicating poor natural recruitment.

From 2009-2011, Walleye in Enemy Swim have attained quality-length (38 cm; 15 in) by age 3 (Table 9). However, the strong 2009 year-class experienced slower growth with weighted mean length at capture for age-3 Walleye of 320 mm (12.6 in.; Table 9). 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 9). The majority of gill net captured Walleye were in the stock-quality length category which had a mean Wr of 81.

Yellow Perch: The mean gill net CPUE of stock-length Yellow Perch was 34.0 (Table 1) and above the minimum objective (≥ 30 stock-length Yellow Perch/net night). The 2012 gill net CPUE was substantially lower than the 2011 gill net CPUE of 152.2 which was the highest recorded since 2003 (Table 2). Relative abundance is considered high.

Yellow Perch in the gill net catch ranged in TL from 9 to 21 cm (3.5 to 8.3 in.; Figure 8). Few Yellow Perch \geq quality-length (20 cm; 8 in) were captured resulting in low PSD and PSD-P values of 3 and 0, which were well below the management objectives of 30-60 and 5-10, respectively (Figure 8).

Otoliths were collected from a sub-sample of gill net captured Yellow Perch. In 2012, age structure information indicated that five consecutive year classes (2007-2011; Table 11) were represented. The weighted mean TL at capture for age-2 and age-3 male Yellow Perch was 112 and 132 mm (4.4 and 5.2 in; Table 12); while the weighted mean TL at capture for age-2 and age-3 female Yellow Perch was 111 and 146 mm (4.4 and 5.7 in; Table 12). Yellow Perch in the sub-stock and stock-quality length categories dominated the gill net catch and had mean Wr values of 90 and 93, respectively.

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 2003-2012 (Table 2). In 2012, seven stock-length Black Bullhead ranging in TL from 23 to 36 cm (9.1 to 14.2 in) were captured resulting in a frame net mean CPUE of 0.3 (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. The 2012 mean gill net CPUE was 3.7 (Table 1). Since 2003 Northern Pike mean gill net CPUE values that ranged from 0.5 (2007) to 3.7 (2012; Table 2). Relative abundance in 2012 is considered high.

In 2012, 22 stock-length Northern Pike that ranged in TL from 44 to 67 cm (17.3 to 26.4 in.), had a PSD of 59 and PSD-P of 0 (Table 1). Condition was good with mean Wr values ranging from 89 to 93 for all length categories (e.g., stock to quality) sampled. The mean Wr for stock-length Northern Pike was 91 (Table 1). No length related trend in Wr was observed.

Rock Bass: Rock Bass were the second most abundant species in the frame net catch, with a mean frame net CPUE of 8.2 (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 TL from 10 to 29 cm (3.9 to 11.4 in.) with all 1-cm length groups being represented (Figure 9). The PSD was 40 and the PSD-P was 16 (Table 1). 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.

White Bass: White Bass were third most abundant species in the gill net catch with a mean gill net CPUE of 8.0 (Table 1) which is the highest CPUE observed since 2003 (Table 1).

Other: Common Carp, Pumpkinseeds and White Sucker were captured in low numbers in 2012 (Table 1).

Management Recommendations

- 1) Conduct fish community assessment surveys utilizing frame nets and gill nets on an annual basis (next survey scheduled in summer 2013) 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 (\approx 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 sub-stock ($<$ 25 cm; 10 in) Walleye and/or fall night electrofishing CPUE $<$ 75 age-0 Walleye/hour].
- 6) Maintain the 356-457 mm (14-18 in) protected slot length limit on Largemouth and Smallmouth Bass. The regulation is designed to increase the average size of black bass while allowing harvest of small bass to avoid slowing of growth (Blackwell and Lucchesi 2009).
- 7) Maintain the 381-mm (15 in) minimum length limit on Walleye. The regulation is designed to protect smaller fish from harvest and increase average fish size (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, 2012. 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; LMB= Largemouth Bass; 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	0.3	0.2	100	0	71	36	90	7
BLC	2.1	0.5	84	9	57	12	95	1
BLG	53.8	9.2	78	2	7	1	107	8
COC	<0.1	0.1	100	---	100	---	100	---
NOP	0.3	0.1	67	42	0	---	72	11
PUS	0.6	0.4	40	23	0	---	101	7
ROB	8.2	2.6	40	6	16	4	96	1
SMB	4.6	0.9	35	8	12	5	88	1
WAE	1.2	0.5	28	14	0	---	80	1
WHB	0.2	0.2	100	0	40	52	85	4
WHS	0.1	0.1	100	0	100	0	93	21
YEP	0.9	0.5	9	11	0	---	87	2
<i>Gill nets</i>								
BLC	4.0	1.8	83	13	50	18	105	2
BLG	54.8	44.0	81	4	7	2	108	1
COC	1.2	0.6	100	0	100	0	84	7
NOP	3.7	1.8	59	18	0	---	91	2
PUS	0.2	0.2	0	---	0	---	108	---
ROB	0.7	0.6	100	0	50	50	104	5
SMB	2.7	1.4	69	21	32	21	91	2
WAE	7.5	2.3	18	10	9	7	81	1
WHB	8.0	6.7	100	0	23	10	86	1
WHS	1.5	1.4	89	21	78	27	98	9
YEP	34.0	27.1	3	2	0	---	93	<1
<i>Electrofishing</i>								
LMB ¹	67.2	25.8	86	8	79	9	107	2
SMB ²	299.0	114.0	8	3	3	2	83	<1
WAE ³	3.0	---	---	---	---	---	---	---

¹ Spring night electrofishing-LMB.

² Spring night electrofishing-SMB.

³ 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, 2003-2012. 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; WAE= Walleye; WHB= White Bass; WHS= White Sucker; YEP= Yellow Perch

Species	CPUE									
	2003	2004	2005	2006 ¹	2007 ¹	2008	2009	2010	2011	2012
<i>Frame nets</i>										
BLB	4.4	2.8	2.6	1.0	0.4	0.1	0.1	0.1	0.5	0.3
BLC	5.9	1.5	1.0	2.3	0.8	0.0	0.2	1.3	8.3	2.1
BLG	63.1	39.7	51.3	56.0	42.5	65.3	56.8	57.3	90.2	53.8
COC	0.0	<0.1	0.0	0.0	<0.1	0.1	<0.1	0.0	0.1	<0.1
LMB	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	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	0.3
PUS	1.4	0.9	3.1	1.7	<0.1	0.5	0.3	1.7	2.3	0.6
ROB	17.6	11.0	9.6	14.0	8.6	11.5	8.3	5.3	12.7	8.2
SMB	4.1	1.9	2.1	6.3	1.3	2.7	1.8	1.9	14.9	4.6
WAE	0.2	0.4	0.2	0.3	0.3	0.4	0.1	<0.1	0.6	1.2
WHB	0.1	0.1	0.1	0.3	0.5	<0.1	<0.1	<0.1	0.1	0.2
WHS	0.04	0.1	0.1	0.0	0.3	0.1	0.1	0.2	0.1	0.1
YEP	1.4	0.5	2.3	4.4	3.5	<0.1	1.6	5.1	7.4	0.9
<i>Gill nets</i>										
BLB	0.2	0.3	0.0	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	4.0
BLG	16.2	19.7	12.5	8.7	5.8	0.5	2.8	3.8	2.5	54.8
COC	0.2	0.3	0.0	1.2	1.8	0.2	0.5	0.2	0.3	1.2
NOP	2.0	2.8	1.2	1.2	0.5	1.2	2.0	1.3	2.8	3.7
PUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
ROB	23.8	4.5	1.8	2.3	14.0	2.0	3.3	1.2	0.2	0.7
SMB	6.0	3.5	5.0	1.2	1.8	2.2	4.2	0.7	1.5	2.7
WAE	14.5	11.0	18.2	13.5	14.7	3.0	4.7	5.7	10.8	7.5
WHB	0.5	0.5	0.0	0.7	1.5	2.5	2.7	0.3	1.8	8.0
WHS	3.5	3.7	3.0	4.0	1.7	3.5	4.5	7.7	3.3	1.5
YEP	20.7	19.2	18.0	19.8	14.3	4.5	40.5	112.3	152.2	34.0
<i>Electrofishing</i>										
LMB ²	181.9	131.5	84.4	202.0	---	102.2	81.7	112.1	---	67.2
SMB ³	---	---	---	---	---	---	123.7	107.0	---	299.0
WAE ⁴	24.0	1.0	8.7	21.0	38.5	52.6	8.2	34.7	25.0	3.0

¹ Monofilament gill net mesh size change (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")

² Spring night electrofishing-LMB

³ Spring night electrofishing-SMB.

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

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, 2003-2012. 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	2012	Objective
<i>Frame nets</i>											
BLC											
CPUE	6	2	1	2	1	0	<1	1	8	2	≥ 10
PSD	87	97	84	64	56	---	20	23	84	84	30-60
RSD-P	24	31	84	53	39	---	20	16	5	57	5-10
Wr	100	107	110	99	94	---	106	101	104	95	---
BLG											
CPUE	63	40	51	56	43	65	57	57	90	54	≥ 25
PSD	72	47	18	34	15	29	15	41	61	78	30-60
RSD-P	13	16	14	7	1	3	4	7	0	7	5-10
Wr	104	130	116	109	100	106	101	100	102	107	---
<i>Gill nets</i>											
WAE											
CPUE	15	11	18	14	15	3	5	6	11	8	≥ 10
PSD	52	27	12	57	63	61	96	56	14	18	30-60
RSD-P	6	3	6	7	14	17	18	9	5	9	5-10
Wr	82	84	85	87	89	88	91	92	85	81	---
YEP											
CPUE	21	19	18	20	14	5	41	112	152	34	≥ 30
PSD	48	57	35	24	8	4	0	0	1	3	30-60
RSD-P	3	12	12	5	1	4	0	0	0	0	5-10
Wr	89	96	94	96	93	99	97	97	91	93	---
<i>Electrofishing</i>											
LMB ¹											
CPUE	182	131	84	202	---	102	82	112	---	67	≥ 30
PSD	37	63	80	59	---	81	91	99	---	86	40-70
RSD-P	3	9	5	6	---	29	45	55	---	79	10-40
Wr	110	105	106	108	---	104	105	109	---	107	---
SMB ²											
CPUE	---	---	---	---	---	---	124	107	---	299	---
PSD	---	---	---	---	---	---	7	72	---	8	40-70
RSD-P	---	---	---	---	---	---	6	41	---	3	10-40
Wr	---	---	---	---	---	---	87	95	---	83	---

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, 2006-2012.

Survey Year	Year Class													
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2012			54	63	357	530	128	112	45					
2011	---				265	504	669	727						
2010 ¹	---	---			57	196	307	728	77	6				
2008	---	---	---	---				811	519	152	34	21	6	20

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

Table 5. Weighted mean TL (mm) at capture for Bluegill age-2 through age-9 sampled in frame nets (expanded sample size) from Enemy Swim Lake, 2005-2012.

Year	Age								
	2	3	4	5	6	7	8	9	
2012	93(54)	124(63)	158(357)	176(530)	192(128)	193(112)	199(45)	---	
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. Mean back-calculated length (mm) at age and standard error (SE) for Largemouth Bass captured during spring night electrofishing in Enemy Swim Lake, 2012.

Year	Age	N	Age											
			1	2	3	4	5	6	7	8	9	10	11	
2010	2	3	118	209										
2009	3	5	56	136	243									
2008	4	2	68	154	251	302								
2007	5	1	83	169	257	305	351							
2006	6	2	71	102	178	262	320	359						
2005	7	7	64	120	219	286	340	371	385					
2004	8	10	78	140	218	294	341	372	398	416				
2003	9	14	80	156	229	295	341	367	386	404	420			
2002	10	9	67	142	208	277	335	361	383	401	416	427		
2001	11	3	78	166	232	288	327	367	393	413	430	442	452	
Mean	---	56	76	150	226	289	336	366	389	408	422	434	452	
SE	---		5	9	8	5	4	2	3	3	4	8	0	
<i>Mean Comparison</i> ¹														
			99	183	246	299	332	---	---	---	---	---	---	---
			89	178	256	316	359	---	---	---	---	---	---	---
			80	180	266	325	356	---	---	---	---	---	---	---
			96	182	250	305	342	---	---	---	---	---	---	---

¹ Willis et al. 2001.

Table 7. Mean back-calculated length (mm) at age and standard error (SE) for Smallmouth Bass captured during spring night electrofishing in Enemy Swim Lake, 2012.

Year	Age	N	Age												
			1	2	3	4	5	6	7	8	9	10			
2010	2	1	104	182											
2009	3	59	83	152	207										
2008	4	208	77	123	191	241									
2007	5	25	79	136	196	265	307								
2006	6	1	77	146	205	267	287	298							
2005	7	0													
2004	8	0													
2003	9	3	86	141	197	266	324	365	401	431	443				
2002	10	1	85	127	187	246	300	340	361	423	455	478			
Mean	---	298	84	144	197	257	304	335	381	427	449	478			
SE	---		3	7	3	6	8	20	20	4	6	0			
<i>Mean Comparison</i> [†]															
			98	180	241	291	---	---	---	---	---	---	---	---	---
			92	169	237	304	335	---	---	---	---	---	---	---	---
			96	179	249	316	339	---	---	---	---	---	---	---	---
			91	171	242	300	333	---	---	---	---	---	---	---	---

[†] Willis et al. 2001.

Table 8. Year class distribution based on the expanded age/length summary for Walleye sampled in gill nets and associated stocking history (# stocked x 1,000) from Enemy Swim Lake, 2008-2012.

Survey Year	Year Class													
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2012 [†]		3	1	40				1		1		1		
2011			3	61	1	2		2			2			2
2010 [†]				52	13	1	3	4			3	3	3	2
2009 [†]					1	1	1	4		6	8	3	2	1
2008 [†]						2	1	8			1	3	1	2
# stocked														
fry														
sm. fingerling		236											439	158
lg. fingerling		39		15			58				12			

[†] Older Walleye were sampled, but are not reported in this table.

Table 9. Weighted mean TL at capture (mm) for Walleye age-1 through age-10 sampled in experimental gill nets (expanded sample size) from Enemy Swim Lake, 2005-2012. 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
2012 ¹	167(3)	260(1)	320(40)	---	---	---	552(1)	---	636(1)	---
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 10. Stocking history including size and number for fishes stocked into Enemy Swim Lake, 1999-2012. 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
2002	WAE	large fingerling	9,388
2005	WAE	large fingerling	57,791
2006	LMB	fingerling	116,460
2009	WAE	large fingerling	14,949
2011	WAE	small fingerling	235,640
2011	WAE	large fingerling	38,634

Table 11. Year class distribution based on the age/length summary for Yellow Perch sampled in gill nets from Enemy Swim Lake, 2009-2012.

Survey Year	Year Class							
	2012	2011	2010	2009	2008	2007	2006	2005
2012		2	7	20	168	18		
2011	---			682	811	112		
2010	---	---		25	1517	277	7	
2009	---	---	---		241	636	35	1

Table 12. Weighted mean TL (mm) at capture by gender for Yellow Perch captured in experimental gill nets (expanded sample size) from Enemy Swim Lake, 2009-2012.

Year	Age				
	1	2	3	4	5
2012					
Male	---	112(2)	132(3)	153(37)	---
Female	101(2)	111(5)	146(20)	170(124)	185(22)
Combined	101(2)	111(7)	144(20)	165(168)	189(18)
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)	

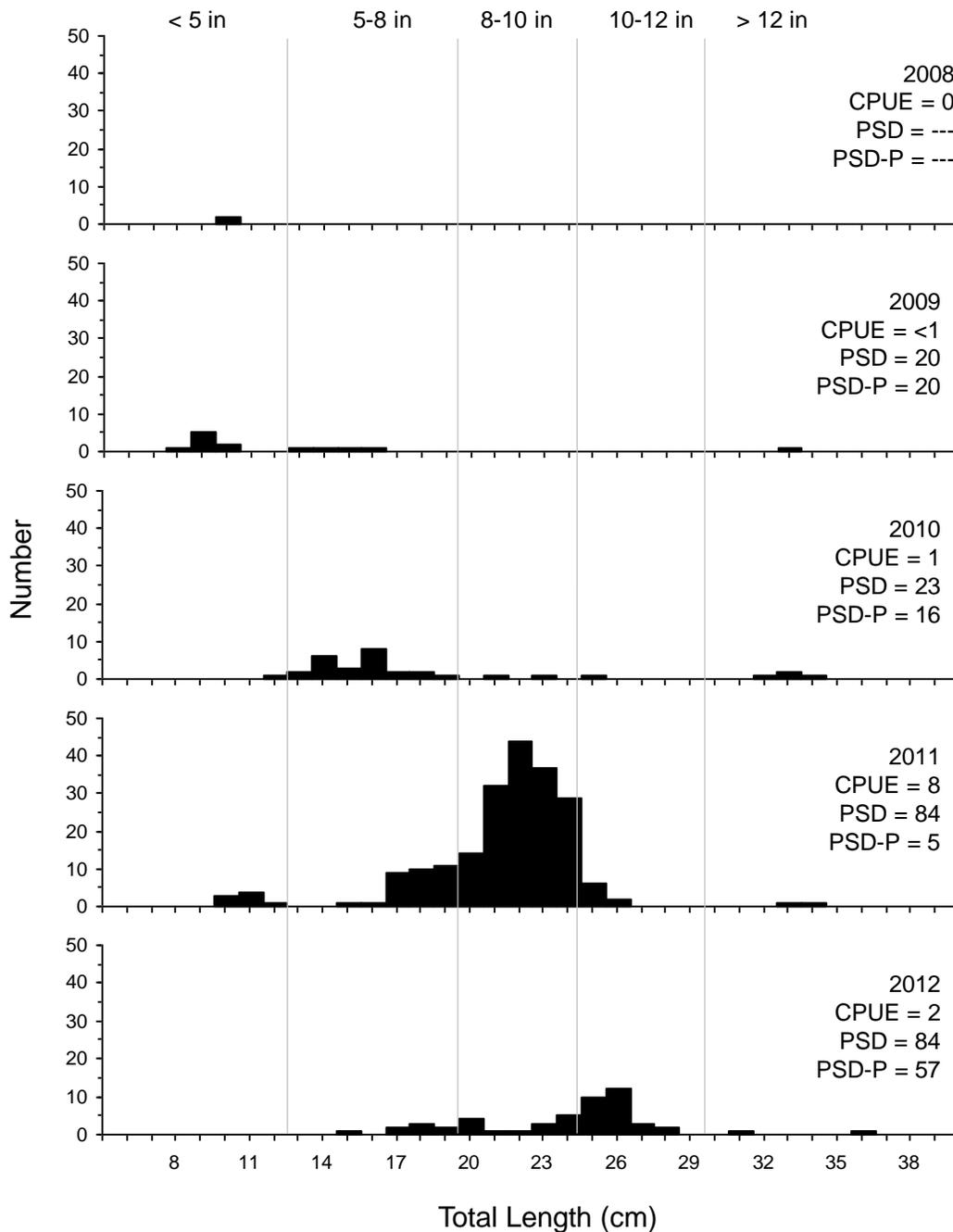


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Black Crappie captured using frame nets in Enemy Swim Lake, 2008-2012.

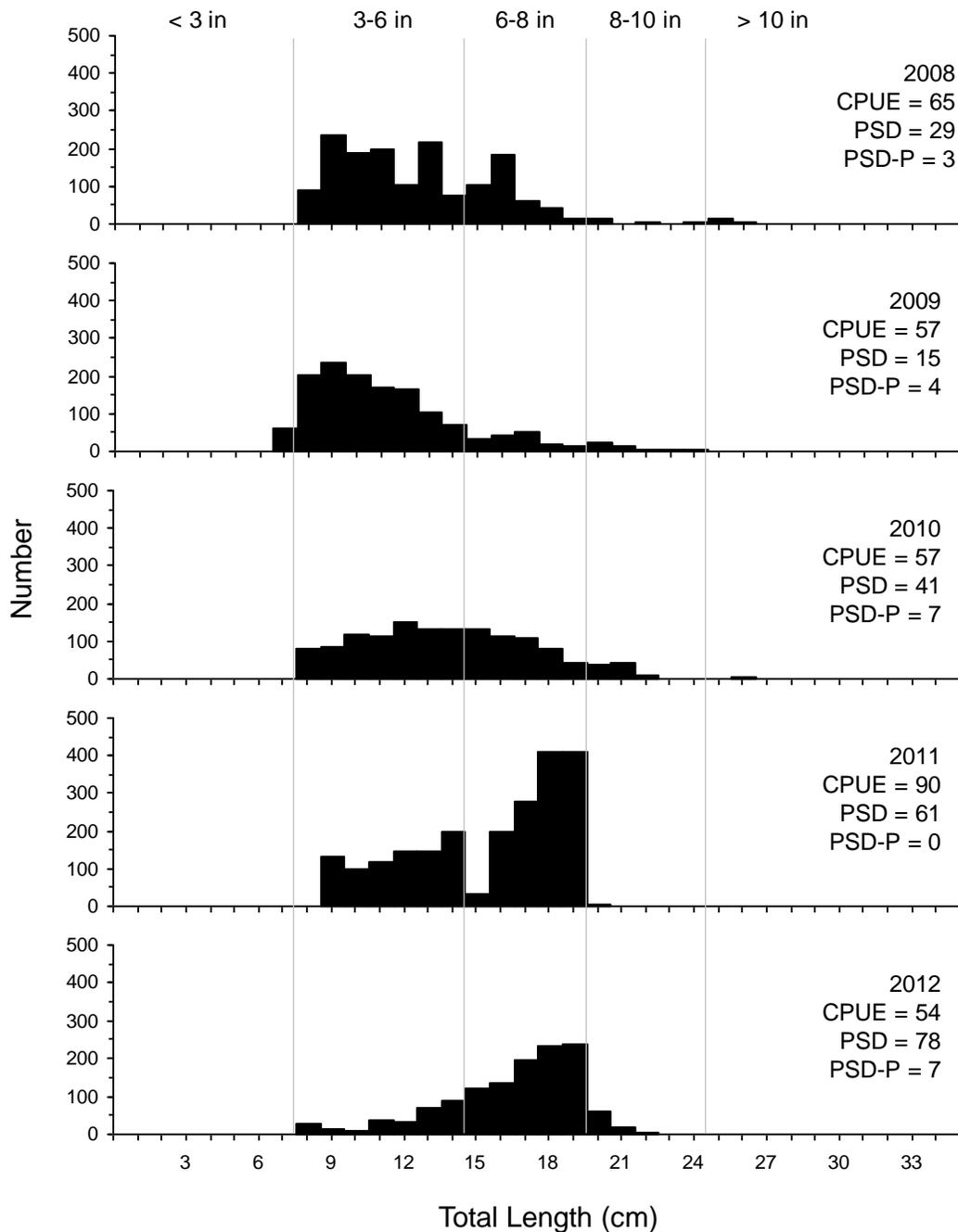


Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Bluegill captured using frame nets in Enemy Swim Lake, 2008-2012.

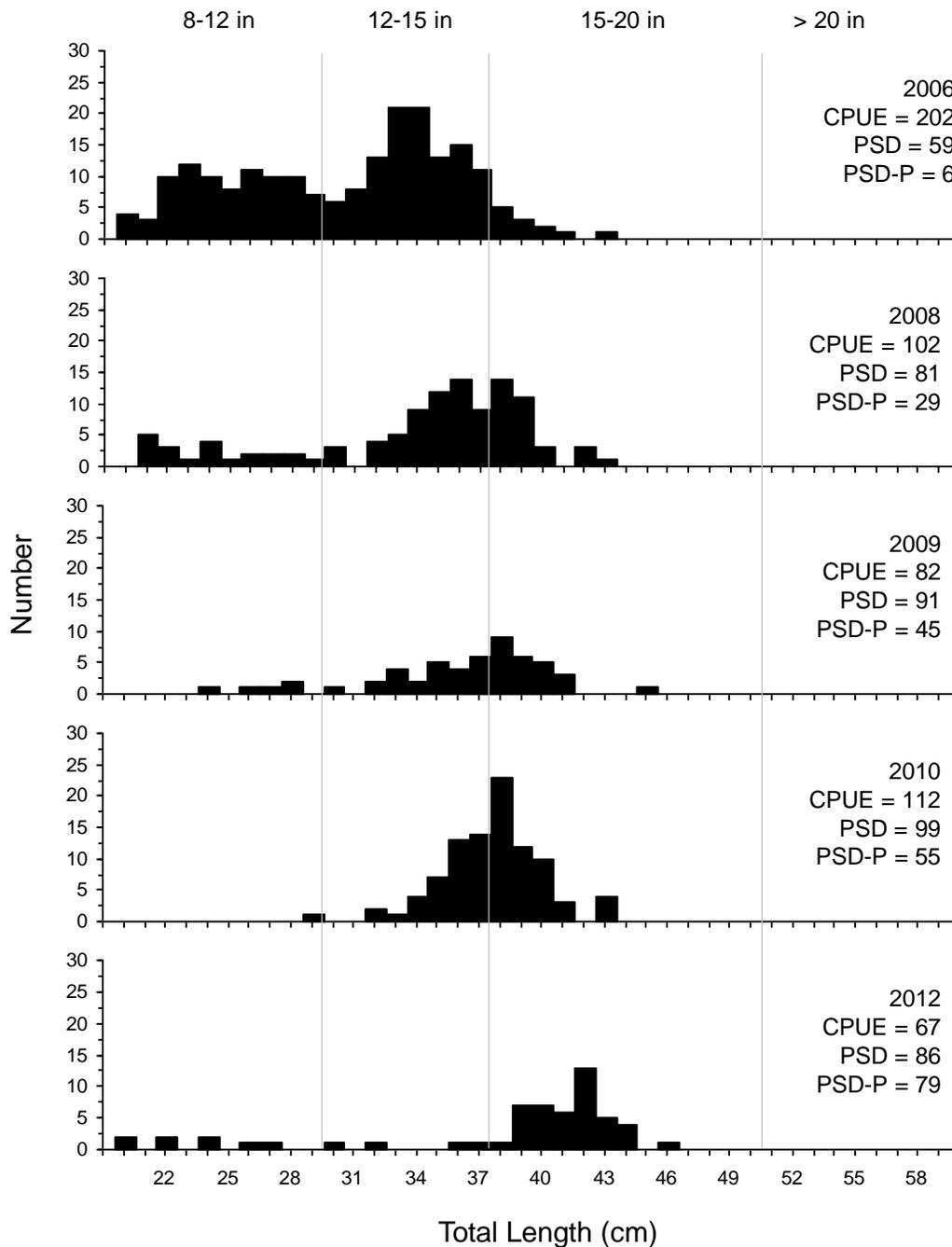


Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Largemouth Bass captured using spring night electrofishing in Enemy Swim Lake, 2006-2012.

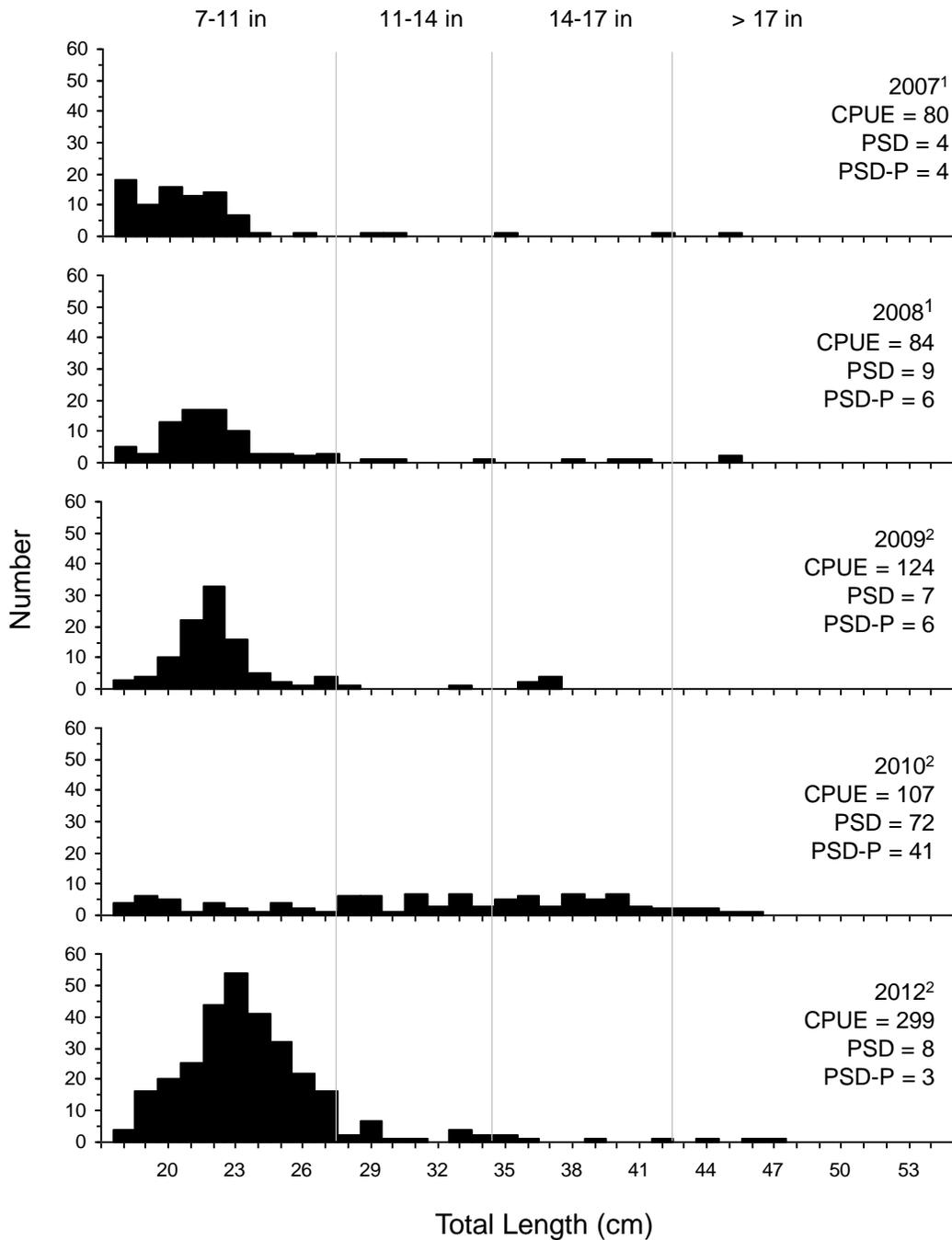


Figure 6. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Smallmouth Bass captured using night electrofishing in Enemy Swim Lake, 2007-2012.

1 Fall night electrofishing; 2 Spring night electrofishing

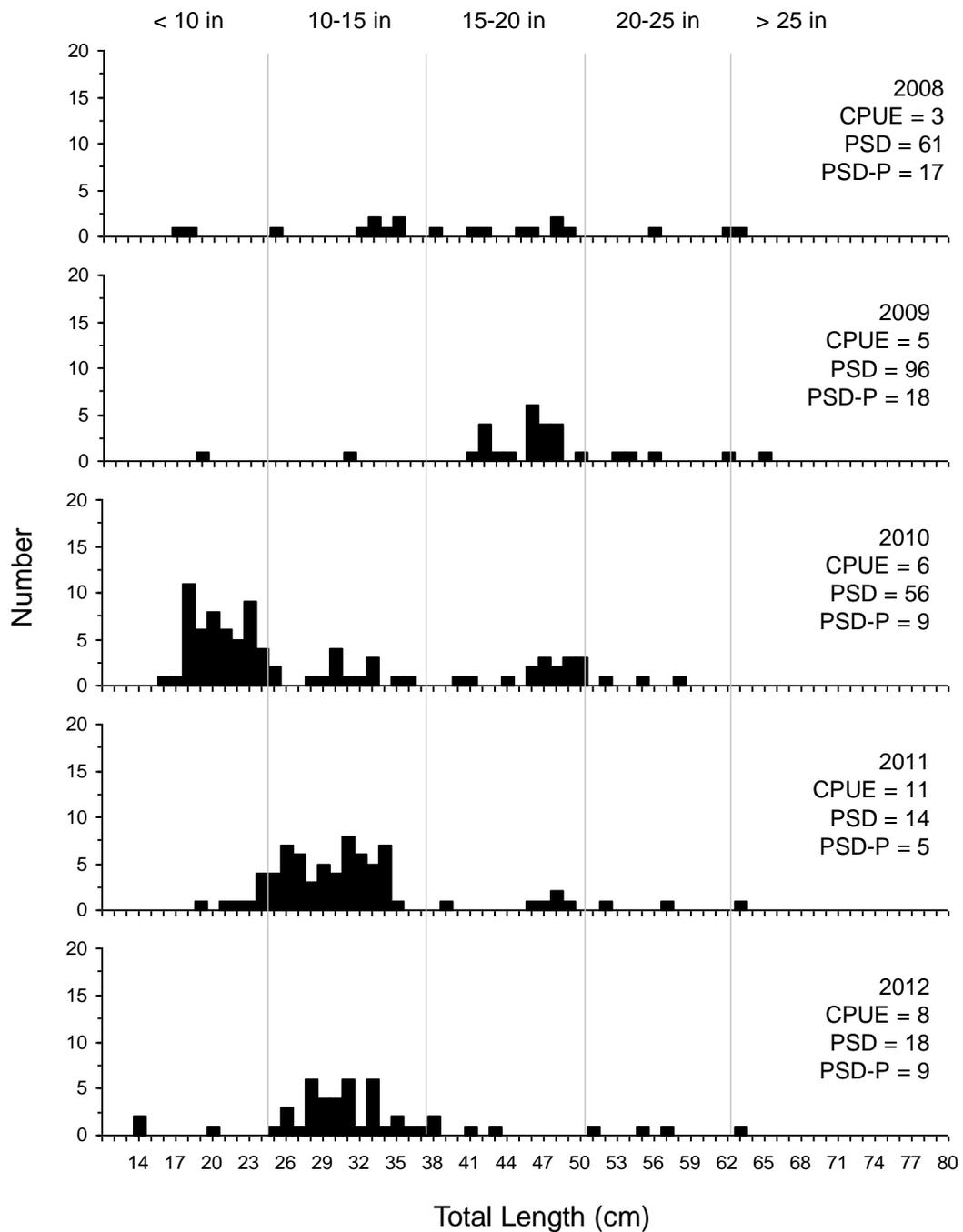


Figure 7. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Walleye captured using gill nets in Enemy Swim Lake, 2008-2012.

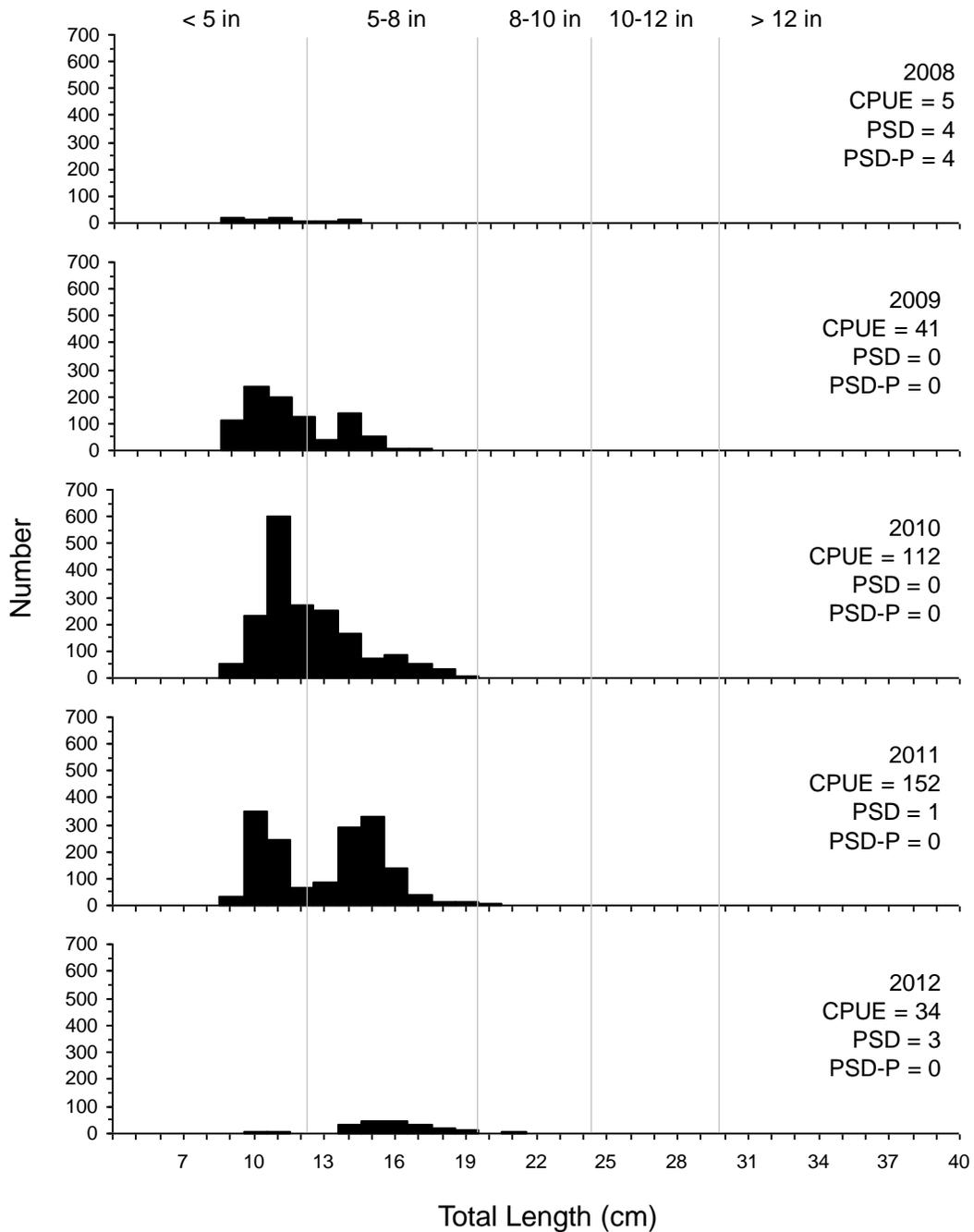


Figure 8. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Yellow Perch captured using gill nets in Enemy Swim Lake, 2008-2012.

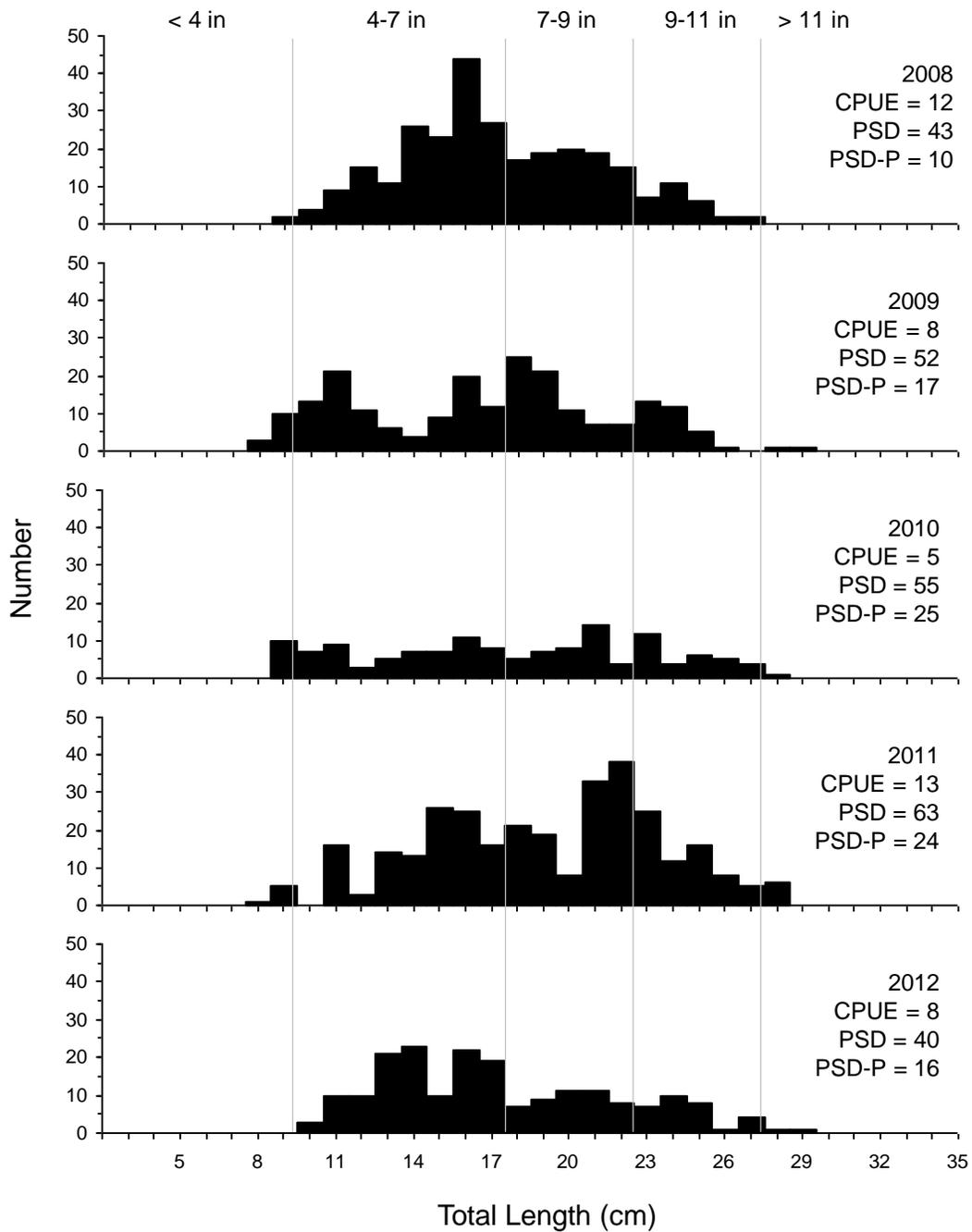


Figure 9. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Rock Bass captured using frame nets in Enemy Swim Lake, 2008-2012.