

Opitz Lake

Site Description

Location

Water designation number (WDN)	22-0050-00
Legal description	T124N-R54W-Sec.6,7;T125N-R56W-Sec.35-36
County (ies)	Day; Marshall
Location from nearest town	5 miles west and 1 mile south of Eden, SD

Survey Dates and Sampling Information

Survey dates	June 26-28, 2012 (FN, GN) September 20, 2012 (EF-WAE)
Gill net sets (n)	6
Frame net sets (n)	18
Electrofishing-WAE (min)	60

Morphometry

Watershed area (acres)	38,077
Surface area (acres)	1,564
Maximum depth (ft)	16
Mean depth (ft)	unknown

Ownership and Public Access

Opitz Lake is a meandered lake managed by the SDGFP. High water conditions have limited public access to a single access site that includes a primitive boat launch with landing dock (Figure 1). Lands adjacent to the lake are generally under state and private ownership.

Watershed and Land Use

The 38,077 acre Opitz Lake sub-watershed (HUC-12) is located within the larger Northern Coteau Lakes-Upper James River (HUC-10) watershed. Land use within the watershed is primarily agricultural with a mix of pasture or grassland, cropland, and scattered shelterbelts.

Water Level Observations

No OHWM has been established by the South Dakota Water Management Board on Opitz Lake. The elevation of Opitz Lake on May 16, 2012 was 1793.8 fmsl and indicated a slight increase from the fall 2011 elevation of 1793.3 fmsl. The water level had declined to an elevation of 1792.1 fmsl on October 2, 2012.

Fish Management Information

Primary species	Walleye, Yellow Perch
Other species	Black Bullhead, Black Crappie, Common Carp, Northern Pike, Orangespotted Sunfish, Rock Bass, White Sucker
Lake-specific regulations	Walleye: 2 daily; minimum length 15"
Management classification	none
Fish consumption advisories	Mercury: Northern Pike (> 25"). See the South Dakota Fishing Handbook for more details on meal and portion size recommendations. Also see Department of Health website: http://doh.sd.gov/Fish/Default.aspx for more information.

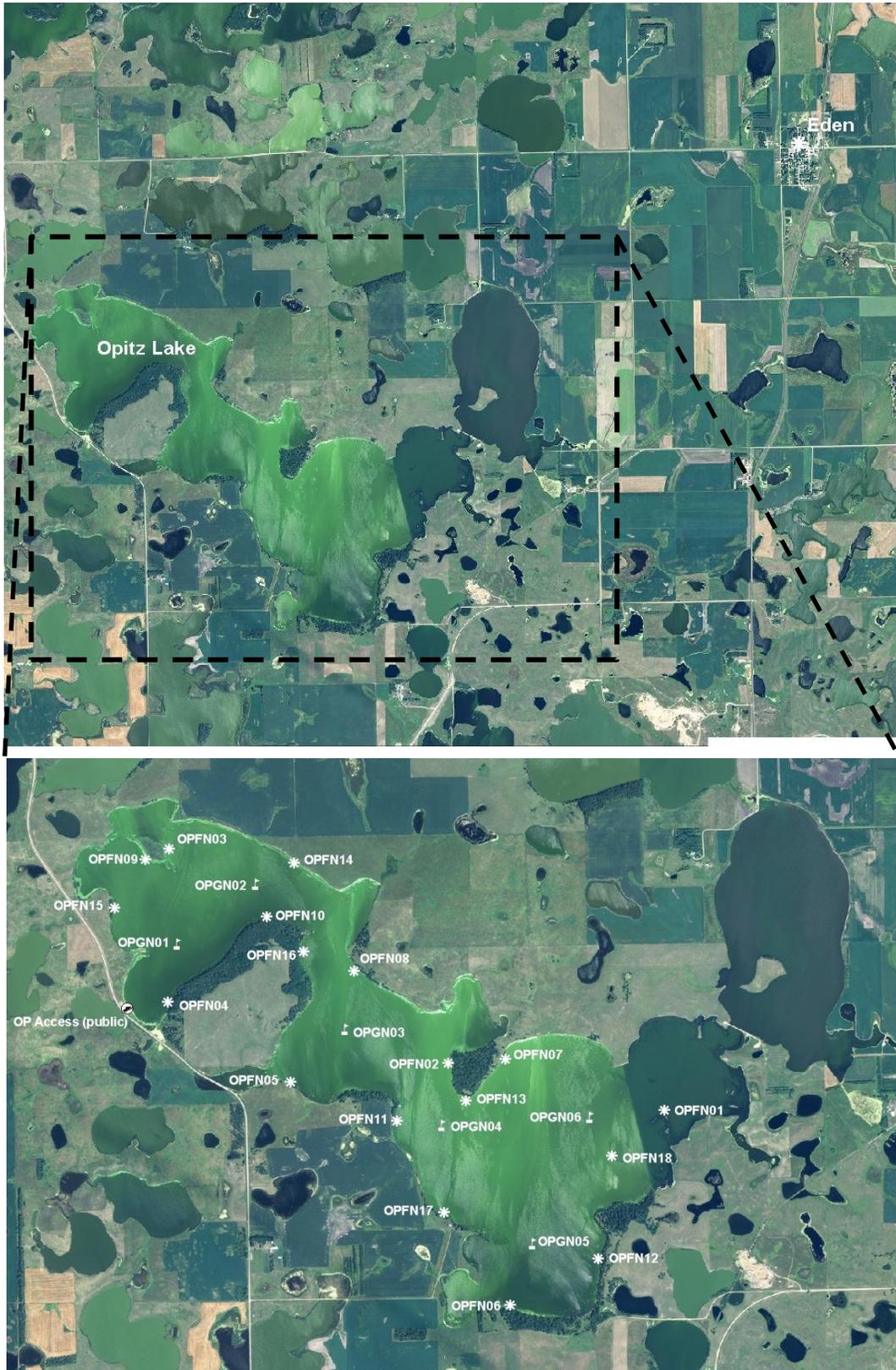


Figure 1. Map depicting geographic location of Opitz Lake (Day; Marshall Counties) from Eden, South Dakota (top). Also noted is the public access location and standardized net locations for Opitz Lake (bottom). OPFN= frame net; OPGN= gill net

Management Objectives

- 1) Maintain a mean gill net CPUE of stock-length Walleye ≥ 10 , a PSD of 30-60, and a PSD-P of 5-10.
- 2) Maintain a mean gill net CPUE of stock-length Yellow Perch ≥ 30 , a PSD of 30-60, and a PSD-P of 5-10.
- 3) Maintain a mean frame net CPUE of stock-length Black Bullhead ≤ 100 .

Results and Discussion

Prior to the 1990's, the lake that is now called Opitz Lake consisted of four shallow cattail sloughs. High water conditions since the mid 1990's have increased the water depth and surface area of Opitz Lake which now covers in excess of 1,500 acres. In 2000, SDGFP began stocking efforts to supplement the fishery (Table 6). Currently, Opitz Lake is managed as Walleye and Yellow Perch fishery.

Primary Species

Walleye: The mean gill net CPUE of stock-length Walleye was 29.0 (Table 1) and above the minimum objective (≥ 10 stock-length Walleye/net night; Table 3). Since 2007, mean gill net CPUE values have ranged from a low of 10.2 (2010) to a high of 39.7 (2011; Table 2). The 2012 gill net CPUE represented a decrease from the 39.7 observed in 2011 (Table 2), but still indicated high relative abundance.

Gill net captured Walleye ranged in TL from 15 to 46 cm (5.9 to 18.1; Figure 2). The PSD was 68 and above the management objective (30-60); while no preferred-length Walleye were captured (Table 1; Table 3; Figure 2). Growth of individuals from the strong 2009 cohort to preferred-lengths resulted in the increased PSD observed during 2012 (Table 3; Figure 2); However, PSD values are expected to decline as Walleye from the strong 2011 cohort, which are currently sub-stock (i.e., < 25 cm; 10 in), attain stock-length (i.e., 25 cm ; 10 in; Figure 2). In 2012, approximately 38% of the gill net captured Walleye were above the 38-cm (15-in) minimum length restriction and available for angler harvest (Figure 2).

Otoliths were collected from a sub-sample of gill net captured walleye. Eight year classes (2004-2011) were represented, with the 2009 and 2011 cohorts, which coincided with fry stockings dominating the gill net catch (Table 4; Table 6). The 2009 year class comprised 49% of walleye in the gill net catch; while the 2011 cohort accounted for an additional 44% (Table 4). Walleye stocked in 2011 were marked with Oxytetracycline (OTC) so that the contribution of stocked fish could be evaluated (Table 4). The estimated stocking contribution for the 2011 year classes was 36% (Table 4). In 2012, the mean fall night electrofishing CPUE of age-0 Walleye was 167.0 (Table 1)

and indicated that a strong year class was naturally produced. However, recruitment of the 2012 year class is currently unknown and will be assessed in future surveys.

Walleye in Opitz Lake exhibit variable growth and typically approach or surpass quality-length and the minimum length limit (38 cm; 15 in) by age 3 (Table 5). Since 2007, weighted mean TL at capture values for age-2 Walleye have ranged from 276 to 338 (10.9 to 13.3 in); while weighted mean TL at capture values for age-3 Walleye have ranged from 355 to 414 mm (14.0 to 16.3 in; Table 5). In 2012, the weighted mean TL at capture of age-2 and age-3 Walleye was 320 and 386 mm (12.6 and 15.2 in; Table 5). A decreasing trend in walleye condition was apparent as TL increased. Walleye in the sub-stock length category had the highest condition (i.e., mean Wr of 92); while Walleye in the quality-preferred length category had the lowest condition (i.e., mean Wr of 83).

Yellow Perch: Since 2007, the relative abundance of Yellow Perch has remained low to moderate, with mean gill net CPUE values that ranged from 0.5 (2010) to 11.7 (2011; Table 2). In 2012, the mean gill net CPUE was 6.0 (Table 1) and below the minimum objective (≥ 30 stock-length Yellow Perch/net night; Table 3). Currently, relative abundance is considered low.

Gill net captured yellow perch ranged in TL from 15 to 28 cm (5.9 to 11.0 in), had a PSD of 92 and PSD-P of 56 (Table 1; Table 3; Figure 3). The PSD and PSD-P values were above management objective ranges of 30-60 and 5-10 and indicated a population comprised of a high proportion of larger (i.e., >20 cm; 8 in) yellow perch (Table 3; Figure 3). Based on age estimates from otoliths, five year classes were represented in the gill net catch (Table 7). The 2009 cohort was the most abundant and comprised 89% of Yellow Perch in the gill net catch (Table 7).

In 2012, male Yellow Perch from the 2009 year class had a weighted mean TL at capture of 230 mm (9.1 in) at age 3; while female Yellow Perch from the 2009 cohort had a weighted mean TL at capture of 258 mm (10.2 in) at age 3 (Table 8). Gill net captured Yellow Perch had high condition, with mean Wr values that were ≥ 109 for all length categories (e.g., stock to quality) sampled. The mean Wr of stock-length yellow perch was 119 (Table 1) and no length-related trends in yellow perch condition were apparent.

Other Species

Black bullhead: In surveys conducted from 2007-2012, black bullhead relative abundance has remained low (Table 2). In 2012, the mean frame net CPUE of stock-length Black Bullhead was 0.2 (Table 1) and within the objective range (≤ 100 stock-length Black Bullhead/net; Table 3). Poor recruitment of Black Bullheads in many northeastern South Dakota lakes has been common in recent years limiting their abundance.

Black Crappie: Black crappie were introduced into Opitz Lake in 2001 (Table 6), but their relative abundance has remained low with mean frame net CPUE values of stock-length black crappie ≤ 0.6 from 2007-2012 (Table 2). Lack of recruitment has limited the population; however, adult black crappies are present and the potential exists for population abundance to increase.

Northern Pike: High water conditions during the late 1990's, allowed northern pike to prosper in Opitz Lake. In 2002, northern pike relative abundance was considered high with a mean gill net CPUE of 8.2. However, in recent years northern pike relative abundance has declined and mean gill net CPUE values of stock-length northern pike have remained ≤ 0.7 in surveys conducted from 2007-2012 (Table 2).

Rock Bass: Although not abundant, Rock Bass were well represented in the 2012 frame net catch (Table 2). The mean frame net CPUE of stock-length Rock Bass was 2.2 (Table 1) and has increased in each of the past three surveys (Table 2). Rock bass captured in the frame net catch ranged in TL from 14 to 21 cm (5.5 to 8.3 in). Few inferences can be made concerning the size structure, growth, and condition of rock bass due to low sample size.

Other: Common Carp, Orangespotted Sunfish, and White Sucker were other fish species captured in low numbers during the 2012 survey (Table 1).

Management Recommendations

- 1) Conduct fish community assessment surveys utilizing gill nets and frame nets annually (next survey scheduled in summer 2013) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.
- 2) Collect otoliths from Walleye and Yellow Perch to assess the age structure and growth rates of each population.
- 3) Stock walleye (≈ 500 fry/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 of age-0 walleye < 75 fish/hour].
- 4) Maintain the 381-mm (15-in) minimum length limit and daily limit of two on Walleye. The regulation is designed to protect smaller fish from harvest, increase average fish size, and provide a more equitable distribution of the Walleye harvest (Lucchesi and Blackwell 2009).
- 5) Improve public access to Opitz Lake via enhancements to the current boat launch and parking areas.

Table 1. Mean catch rate (CPUE; 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 frame nets, experimental gill nets and electrofishing in Opitz Lake, 2012. Confidence intervals include 80 percent (\pm CI-80) or 90 percent (\pm CI-90). BLB= black bullhead; BLC= black crappie; COC= common carp; NOP= northern pike; OSF= orangespotted sunfish; ROB= rock bass; WAE= walleye; 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	0.2	0.2	75	59	25	59	109	6
BLC	0.1	0.1	100	---	0	---	100	48
COC	0.3	0.2	100	0	60	52	107	10
NOP	0.1	0.1	100	---	0	---	83	---
OSF ¹	0.1	0.1	---	---	---	---	---	---
ROB	2.2	0.6	60	13	0	---	106	1
WAE	4.0	1.6	93	5	7	5	82	<1
WHS	0.1	0.1	100	---	100	---	87	---
YEP	0.7	0.4	8	15	8	15	90	3
<i>Gill nets</i>								
NOP	0.3	0.3	100	---	0	---	83	5
ROB	0.8	0.5	60	52	0	---	110	9
WAE	29.0	4.0	68	6	0	---	84	<1
YEP	6.0	2.9	97	5	56	14	119	2
<i>Electrofishing</i>								
WAE ²	167.0	---	---	---	---	---	---	---

¹ All fish sizes

² Fall night electrofishing-WAE; catch rate (CPUE) represents age-0 walleye not stock length.

Table 2. Historic mean catch rate (CPUE; gill nets = catch/net night, electrofishing = catch/hour) of stock-length fish for various fish species captured in frame nets, experimental gill nets and electrofishing from Opitz Lake, 2007-2012. BLB= black bullhead; BLC= black crappie; COC= common carp; NOP= northern pike; OSF= orangespotted sunfish; ROB= rock bass; WAE= walleye; WHS= white sucker; YEP= yellow perch

Species	CPUE				
	2007 ¹	2008	2010	2011	2012
<i>Frame nets</i>					
BLB	0.8	0.6	0.1	0.0	0.2
BLC	0.3	0.6	0.6	0.2	0.1
COC	1.5	0.4	0.3	0.0	0.3
NOP	0.5	0.2	0.3	0.2	0.1
OSF ²	0.0	0.0	0.0	0.0	0.1
ROB	0.1	0.0	0.6	1.4	2.2
WAE	10.1	6.8	2.9	3.9	4.0
WHS	0.1	0.0	0.0	0.0	0.1
YEP	0.1	0.4	0.0	0.0	0.7
<i>Gill nets</i>					
BLB	0.0	0.3	0.0	0.0	0.0
COC	0.3	0.0	0.0	0.0	0.0
NOP	0.7	0.3	0.0	0.0	0.3
ROB	0.0	0.0	0.0	0.0	0.8
WAE	31.7	12.5	10.2	39.7	29.0
YEP	4.0	4.2	0.5	11.7	6.0
<i>Electrofishing</i>					
WAE ³	---	---	0.0	283.5	167.0

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

² All fish sizes

² Fall night electrofishing-WAE; catch rate (CPUE) represents age-0 walleye not stock length.

Table 3. Mean catch rate (CPUE; gill/frame nets = catch/net night), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) for selected species captured in frame nets and experimental gill nets from Opitz Lake, 2007-2012. BLB= black bullhead; WAE= walleye; YEP= yellow perch

Species	2007 ¹	2008	2010	2011	2012	Objective
<i>Frame nets</i>						
BLB						
CPUE	1	1	<1	0	0.2	≤ 100
PSD	100	100	100	---	75	---
PSD-P	100	90	100	---	25	---
Wr	92	104	107	---	109	---
<i>Gill nets</i>						
WAE						
CPUE	32	13	10	40	29	≥ 10
PSD	58	16	52	14	68	30-60
PSD-P	2	0	0	0	0	5-10
Wr	81	86	90	95	84	---
YEP						
CPUE	4	4	1	12	6	≥ 30
PSD	88	100	100	77	97	30-60
PSD-P	63	64	100	16	56	5-10
Wr	113	120	121	115	119	---

¹ 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 walleye sampled in gill nets and associated stocking history (# stocked x 1,000) from Opitz Lake, 2008-2012.

Survey Year	Year Class								
	2012	2011	2010	2009	2008	2007	2006	2005	2004
2012		135	8	152	3	1	7	2	1
2011	---		1	207	2	1	27		1
2010	---	---		86	5	9	44		3
2008	---	---	---	---		1	58	2	16
# stocked									
fry		900 ¹		750			1,500		
sm. fingerling									258
lg. fingerling									

¹ Stocked Walleye were OTC marked; 18 of 50 otoliths collected from fall electrofished age-0 walleye exhibited marks for an estimated stocking contribution of 36%.

Table 5. Weighted mean TL at capture (mm) for walleye sampled in experimental gill nets (expanded sample size) from Opitz Lake, 2007-2012. 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
2012	200(135)	320(8)	386(152)	402(3)	462(1)	438(7)	466(2)	455(1)
2011	225(1)	330(207)	414(2)	402(1)	441(27)	---	435(1)	---
2010	203(86)	328(5)	375(9)	386(44)	---	406(3)	---	---
2008	202(1)	276(58)	355(2)	389(16)	---	---	---	---
2007	203(160)	338(32)	391(152)	---	---	---	537(3)	---

Table 6. Stocking history including size and number for fishes stocked into Opitz Lake, 2000-2012. BLC= black crappie; WAE= walleye;

Year	Species	Size	Number
2000	WAE	fry	1,500,000
2001	BLC	fingerling	175,200
	WAE	fry	1,500,000
2002	WAE	fry	1,500,000
2004	WAE	fingerling	258,000
2006	WAE	fry	1,500,000
2009	WAE	fry	750,000
2011	WAE	fry	900,000

Table 7. Year class distribution based on the expanded age/length summary for yellow perch sampled in gill nets from Opitz Lake, 2010-2012.

Survey Year	Year Class											
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
2012	---	1	1	32	1	1	---	---	---	---	---	---
2011	---	---	---	51	11	5	---	2	---	---	---	1
2010	---	---	---	1	---	2	---	---	---	---	---	1

Table 8. Weighted mean TL (mm) at capture by gender for yellow perch captured in experimental gill nets (expanded sample size) from Opitz Lake, 2010-2012.

Year	Age									
	1	2	3	4	5	6	7	8	9	10
2012										
Male	150(1)	204(1)	230(10)	---	---	---	---	---	---	---
Female	---	---	258(22)	278(1)	276(1)	---	---	---	---	---
Combined	150(1)	204(1)	249(32)	278(1)	276(1)	---	---	---	---	---
2011										
Male	---	176(6)	229(5)	259(2)	---	274(1)	---	---	---	---
Female	---	208(47)	259(4)	285(3)	---	306(1)	---	---	---	351(1)
Combined	---	204(51)	236(11)	274(5)	---	290(2)	---	---	---	351(1)
2010										
Male	---	---	---	---	---	---	---	---	---	---
Female	92(1)	---	263(2)	---	---	---	---	---	300(1)	---
Combined	92(1)	---	263(2)	---	---	---	---	---	300(1)	---

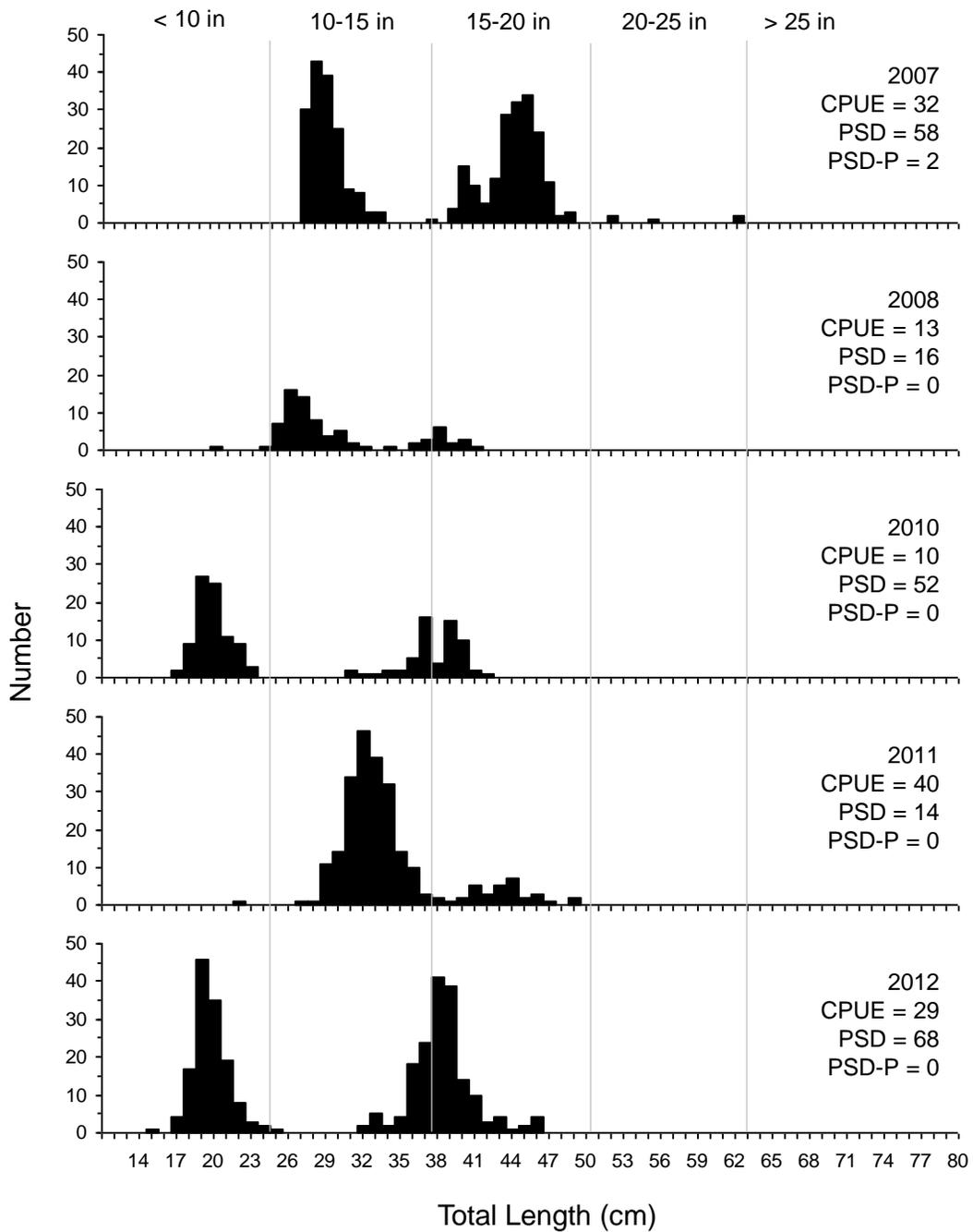


Figure 2. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Walleye captured using experimental gill nets in Opitz Lake, 2007-2012.

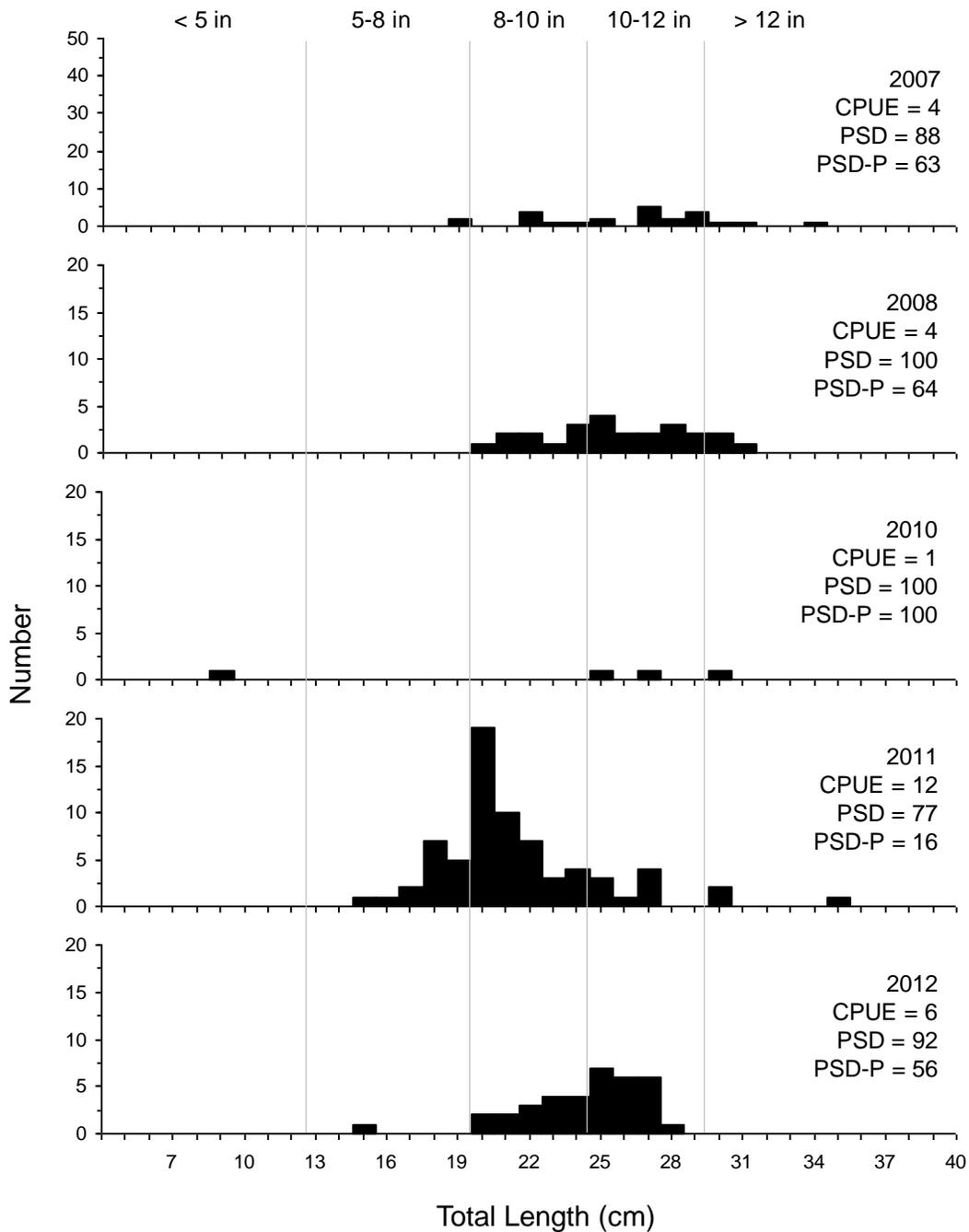


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Yellow Perch captured using experimental gill nets in Opitz Lake, 2007-2012.