

## Waubay Lake

### Site Description

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#### Location

Water designation number (WDN)	22-0031-00
Legal description	T122N-R54 W-Sec. 4-6; T122N-R55W-Sec. 1-5, 7-10, 15-19 T123N-R53W-Sec. 17,20; T123N-R54W-Sec. 7, 18-20, 29-32 T123N-R55W-Sec. 12-14, 23-28, 31-36
County (ies)	Day
Location from nearest town	Southeast of Grenville, SD.

#### Survey Dates and Sampling Information

Survey dates	August 14-17, 2012 (FN, GN) September 12, 2012 (EF-WAE)
Frame net sets (n)	31
Gill net sets (n)	8
Fall electrofishing-WAE (min)	60

#### Morphometry (Figure 1)

Watershed area (acres)	186,967
Surface area (acres)	≈15,540
Maximum depth (ft)	≈31
Mean depth (ft)	13

#### Ownership and Public Access

Waubay Lake is a meandered lake owned by the State of South Dakota and the fishery is managed by the SDGFP. Eight public access sites are present on Waubay Lake (Figure 1). Two (Kanago and Grenville) are maintained by the SDGFP, and six (Buster's, West Bay Ranch, Breske's Bay, Vic's Landing, Wika's Access, and Buckshot) are privately maintained and require a fee or donation for access (Figure 1). Lands adjacent to Waubay Lake are under mixed ownership by the State of South Dakota, private parties, and the U.S. Fish and Wildlife Service (i.e., Waubay National Wildlife Refuge).

#### Watershed and Land Use

Land use within the Waubay Lake watershed is primarily agricultural including cropland, pasture or grassland, and small wooded areas (e.g., shelterbelts).

#### Water Level Observations

The South Dakota Water Management Board established OHWM on Waubay Lake is 1787.0 and is below the current water elevation. On May 9, 2012 the elevation of Waubay Lake was 1804.5 fmsl, similar to the fall 2011 elevation of 1804.6 fmsl. By September 27, 2012 the elevation of Waubay Lake had declined to 1802.6 fmsl.

#### Fish Management Information

Primary species	Smallmouth Bass, Walleye, Yellow Perch
Other species	Black Bullhead, Black Crappie, Bluegill, Common Carp, Lake Herring, Northern Pike, Rock Bass, Spottail Shiner, White Bass, White Sucker
Lake-specific regulations	Smallmouth/Largemouth bass daily limit of 5. Only those less than 14", or 18" and longer may be taken. Of those no more than one may be 18" or longer.
Management classification	warm-water semi permanent
Fish consumption advisories	none

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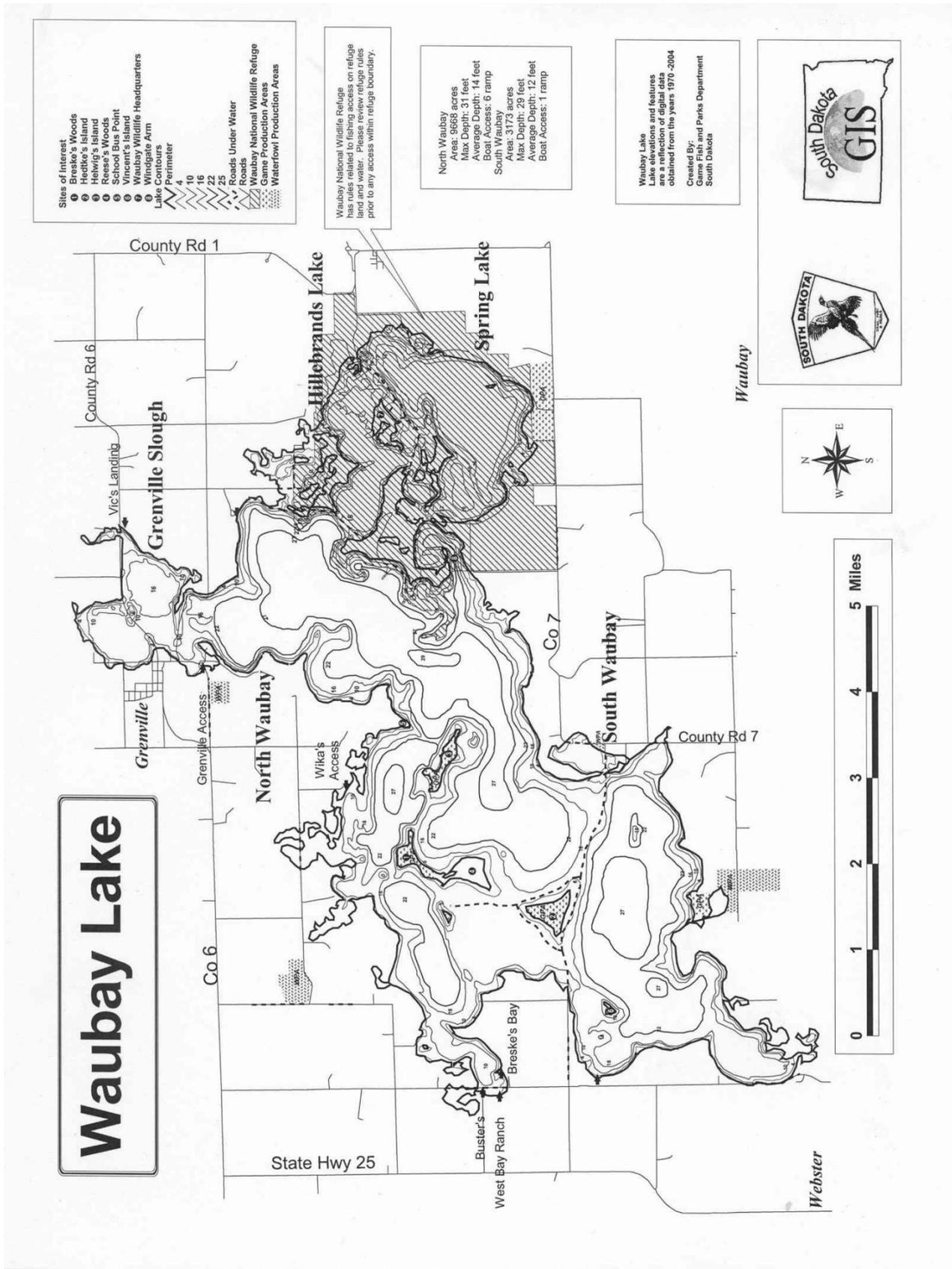


Figure 1. Waubay Lake contour map.

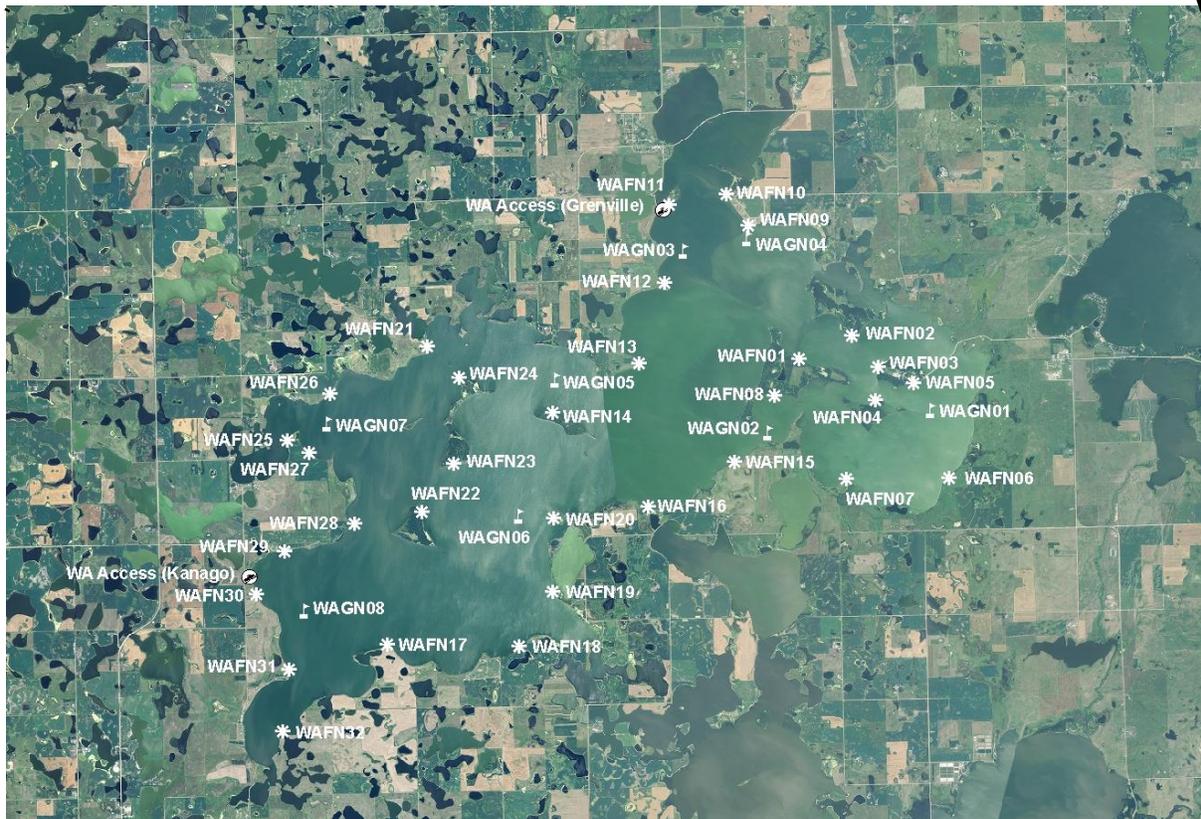


Figure 2. Map depicting geographic location of several Day County, South Dakota lakes including Waubay Lake (top). Also noted are state-owned public access locations and standardized net locations for Waubay Lake (bottom). WAFN= frame nets; WAGN= gill nets

## Management Objectives

- 1) Maintain a moderate density Smallmouth Bass population with a PSD of 40-70, and a PSD-P of 10-40.
- 2) Maintain a mean gill net CPUE of stock-length Walleye  $\geq 10$ , a PSD of 30-60, and a PSD-P of 5-10.
- 3) Maintain a mean gill net CPUE of stock-length Yellow Perch  $\geq 30$ , a PSD of 30-60, and a PSD-P of 5-10.
- 4) Maintain a mean frame net CPUE of stock-length Black Bullhead  $\leq 100$ .

## Results and Discussion

Waubay Lake is a meandered lake located in Day County, South Dakota, and is comprised of four previously distinct water bodies (North Waubay, South Waubay, Spring Lake, and Hillebrands). High water conditions since the mid 1990's have connected these four lakes and formed a single waterbody (Waubay Lake). Currently, the surface area of Waubay Lake exceeds 15,000 acres and has a maximum depth of >31 ft. A portion of Waubay Lake is located within the boundaries of the Waubay National Wildlife Refuge (Figure 1). Neither boating nor fishing is allowed within the refuge boundaries during open-water periods; however, fishing is allowed during the winter months.

Currently, Waubay Lake is primarily managed as a Smallmouth Bass, Walleye, and Yellow Perch fishery; however, Northern Pike and White Bass are important components of the fishery. Overall, as many as 13 fish species have been collected from Waubay Lake (Table 2).

### *Primary Species*

Smallmouth bass: 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 northeastern South Dakota glacial lakes (Bacula 2009). Spring night electrofishing to monitor Smallmouth Bass population parameters in Waubay Lake is scheduled to be conducted biennially during odd years, with 2013 being the next scheduled sample year.

Walleye: The mean gill net CPUE of stock-length Walleye was 11.1 (Table 1) and slightly above the minimum objective ( $\geq 10$  stock-length Walleye/net night; Table 3). Since 2003, the mean gill net CPUE has ranged from a low of 11.1 (2012) to a high of 34.4 (2007; Table 2). The 2012 gill net CPUE represented a decrease from the 2011 CPUE of 15.9 (Table 2), but still indicated high relative abundance.

Gill net captured Walleye ranged in TL from 17 to 60 cm (6.7 to 23.6 in; Figure 3), with a high proportion (59%) being sub-stock (i.e., < 25 cm; 10 in; Figure 3). The PSD of 48 and PSD-P of 7 were within management objectives and indicated a relatively balanced population (defined as PSD of 30-60 and a PSD-P of 5-10; Table 3; Figure 3).

Otoliths were collected from a sub-sample of gill net captured walleye. Eight year classes (1999, 2005-2011) were present in the gill net catch, with the 2011 year class being the most represented (Table 4). Age structure information indicated that natural recruitment has contributed to the Walleye population (e.g., 2008 and 2010); however, the strongest year classes tend to coincide with fry stockings (Table 4; Table 6). Year classes produced in 2005, 2009, and 2011, which coincided with fry stockings, were the most represented and comprised 14%, 14% and 61%, respectively, of Walleye in the gill net catch; while naturally-produced Walleye from the 2006-2008, and 2010 cohorts accounted for an additional 10% (Table 4; Table 6).

Although the 2011 year class was not well represented in the 2011 fall night electrofishing or gill net catch, it appears that a strong year class was produced (Table 4). In 2012, approximately 8,000,000 walleye fry were stocked into Waubay Lake (Table 6). However, no age-0 walleye were captured in gill nets and only five were captured during fall night electrofishing potentially indicating limited production of the 2012 year class (Table 1; Table 4). Walleye fry stocked in 2009 and 2011 were marked with Oxytetracycline (OTC) so that the contribution of stocked fish could be evaluated. The estimated stocking contribution for the 2009 year classes was 90%; while the 2011 cohort had an estimated stocking contribution of 14%; however, few age-0 Walleye were captured in 2011 and results should be interpreted with caution (Table 4).

Walleye growth in Waubay Lake tends to be highly variable (Table 5). Since 2005, the weighted mean TL at capture of age-3 walleye has ranged from 314 to 367 mm (12.4 to 14.4 in; Table 5). The 2005 year class had a weighted mean TL at capture of 314 mm (12.4 in) at age 3; while year class produced in 2008 and 2009 had weighted mean TL at capture values of 366 and 367 mm (14.4 in) at age 3 (Table 5). Increased growth of the 2008 and 2009 year classes can likely be attributed to reduced Walleye abundance coupled with improved prey conditions provided by strong natural reproduction of white bass in 2010. Stock-length Walleye in the gill net catch had mean  $W_r$  values that ranged from 81 to 85 for all length categories (e.g., stock to quality) sampled, with the mean  $W_r$  of stock-length Walleye being 83 (Table 1). No length-related trends in condition were apparent.

Yellow Perch: The mean gill net CPUE of stock-length Yellow Perch was 28.1 (Table 1) and slightly below the minimum objective ( $\geq 30$  stock-length perch/net night; Table 3). Since 2003, the gill net CPUE of stock-length Yellow Perch has fluctuated from a low of 13.8 (2009) to a high of 58.3 (2004; Table 2). The 2012 gill net CPUE was similar to the 27.6 observed in 2011 and indicated moderate relative abundance.

Gill net captured Yellow Perch ranged in TL from 11 to 33 cm (4.3 to 13.0 in), had a PSD of 85 and a PSD-P of 32. The PSD and PSD-P values were above the management objective ranges of 30-60 and 5-10 indicating a population comprised of a high proportion of larger (i.e., >20 cm; 8 in) Yellow Perch (Table 3; Figure 4).

Otoliths were collected from a sub-sample of gill net captured Yellow Perch. Age structure information indicated the presence of nine year classes (2000-2001, 2003-2004, and 2007-2011; Table 7). Year classes produced in 2009 and 2010 were the most represented and comprised 48% and 28% of Yellow Perch in the gill net catch (Table 7).

The weighted mean TL at capture of age-2 and age-3 male Yellow Perch was 204 and 221 mm (8.0 and 8.7 in); while female Yellow Perch had a weighted mean TL at capture of 219 and 251 mm (8.6 and 9.9 in) at age 2 and age 3, respectively (Table 8). Stock-length yellow perch in the gill net catch had mean Wr values that exceeded 105 for all length categories (e.g., stock to quality) sampled, with the mean Wr of stock-length Yellow Perch being 117 (Table 1). Yellow perch in the quality-preferred length category had the highest condition (i.e., mean Wr of 119); while Yellow Perch in the memorable-trophy length category had the lowest condition (i.e., mean Wr of 106).

### *Other Species*

Black Bullhead: The mean frame net CPUE for Black Bullhead was 1.5 (Table 1) and within the management objective ( $\leq 100$  stock-length Black Bullhead/net night; Table 3). Predator densities, coupled with the cyclic nature of black bullhead populations have likely aided in limiting Black Bullhead recruitment. Currently, the black bullhead population in Waubay Lake likely has minimal effect on the overall fishery.

Black crappie: Lack of recruitment since 1998 has resulted in low relative abundance of black crappie (Table 2). In 2012, the mean frame net CPUE of stock-length black crappie was 1.3 (Table 1). Until a substantial year-class of black crappies recruit to the population, their impact on the fishery will be minimal.

Lake Herring: Lake Herring were first captured from Waubay Lake during 2002, and have been sampled in low numbers annually from 2003-2012 (Table 2). In 2012, a single 41 cm (16.1 in) lake herring was captured in the gill net catch resulting in a mean gill net CPUE of 0.1 (Table 1). The lake herring population in Waubay Lake likely originated from lake herring that were hatched at Blue Dog Lake State Fish Hatchery and entered Blue Dog Lake (Blackwell and Hubers 2003).

White bass: White bass were first sampled in Waubay Lake during 2001 and have become an important component of the fishery. White bass have not been well represented in the gill net catch, but have typically been one of the more abundant species in the frame net catch (Table 2). In 2012, the mean frame net CPUE of stock-length White Bass was 5.1 (Table 1).

Frame net captured White Bass ranged in TL from 29 to 43 cm (11.4 to 16.9 in), had a PSD of 99 and a PSD-P of 97 (Table 1; Figure 5). Limited recruitment and relatively fast growth to quality- and preferred-lengths contribute to the high size structure. No age and growth information was available in 2012. White Bass in the frame net catch had mean Wr values that ranged from 93-97 for all length categories

(e.g., stock to quality) sampled, with the mean  $W_r$  of stock-length fish being 95 (Table 1).

Other: Bluegill, Common Carp, Northern Pike, Rock Bass, and White Sucker were other fish species captured in low numbers during the 2012 survey (Table 1).

### **Management Recommendations**

- 1) Conduct fish population 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 fall night electrofishing on an annual basis to monitor age-0 Walleye relative abundance.
- 3) Stock Walleye ( $\approx 500$  fry/acre) to establish additional year-classes if gill netting and/or fall night electrofishing CPUE of age-0 Walleye 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) Collect otoliths from Walleye and Yellow Perch, and scales from Smallmouth Bass to assess age structure and growth rates of each population.
- 5) Conduct spring night electrofishing on a biennial basis (odd years) to monitor Smallmouth Bass population parameters.
- 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).

Table 1. Mean catch rate (CPUE; gill/frame 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 experimental gill nets, frame nets, and electrofishing in Waubay 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; LAH= Lake Herring; NOP= Northern Pike; 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	1.5	0.9	78	10	13	8	93	1
BLC	1.3	0.4	90	8	8	7	108	1
BLG	0.9	0.5	89	11	7	9	127	3
COC	0.5	0.2	93	13	36	24	98	3
NOP	0.2	0.1	83	34	50	45	87	6
ROB	0.9	0.3	61	16	7	8	107	1
SMB	5.1	0.9	35	6	17	5	96	<1
WAE	2.9	0.6	80	7	7	4	79	1
WHB	5.1	1.6	99	1	97	2	95	<1
WHS	0.1	0.1	100	0	100	0	92	16
YEP	0.1	0.1	67	67	67	67	92	8
<i>Gill nets</i>								
BLB	4.3	1.7	62	14	9	8	105	2
BLG	0.3	0.2	0	---	0	---	109	13
COC	0.5	0.5	50	50	25	59	104	5
LAH	0.1	0.2	100	---	100	---	110	---
NOP	0.1	0.2	0	---	0	---	75	---
ROB	1.4	0.8	27	26	0	---	102	1
WAE	11.1	2.1	48	9	7	4	83	<1
WHB	1.5	0.9	100	0	75	23	97	1
YEP	28.1	8.6	85	4	32	5	117	1
<i>Electrofishing</i>								
WAE <sup>1</sup>	5.0	---	---	---	---	---	---	---

<sup>1</sup> Fall night electrofishing-WAE; catch rate (CPUE) represents age-0 Walleye not stock length

Table 2. Historic mean catch rate (CPUE; gill/frame nets= catch/net night, electrofishing= catch/hour) of stock-length fish for various fish species captured in experimental gill nets, frame nets, and electrofishing in Waubay Lake, 2003-2012. BLB= Black Bullhead; BLC= Black Crappie; BLG= Bluegill; COC= Common Carp; LAH= Lake Herring; NOP= Northern Pike; 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 <sup>1</sup>	2007 <sup>1</sup>	2008	2009	2010	2011	2012
<i>Frame nets</i>										
BLB	8.0	4.6	3.8	3.8	1.7	0.8	0.9	0.8	0.4	1.5
BLC	0.9	1.3	0.4	0.2	0.2	0.3	0.1	0.2	0.3	1.3
BLG	0.0	0.1	0.0	<0.1	0.2	0.1	0.1	0.6	0.7	0.9
COC	1.5	1.3	1.5	0.7	1.1	0.4	0.3	0.5	0.5	0.5
NOP	1.6	0.2	0.7	0.2	0.4	0.8	0.7	0.4	0.1	0.2
ROB	<0.1	0.0	0.0	0.0	<0.1	0.3	0.7	0.9	0.6	0.9
SMB	0.9	1.1	1.3	2.1	6.3	1.9	3.4	6.3	6.1	5.1
WAE	17.3	7.8	7.2	9.7	8.3	6.1	5.4	5.5	3.1	2.9
WHB	1.3	0.5	1.8	9.1	6.6	3.2	7.1	3.1	6.5	5.1
WHS	0.2	0.1	0.2	0.7	0.4	0.1	0.2	0.1	0.1	0.1
YEP	0.2	<0.1	0.1	<0.1	<0.1	0.0	0.3	0.2	<0.1	0.1
<i>Gill nets</i>										
BLB	0.3	0.5	0.1	0.3	0.6	0.0	0.1	0.0	0.5	4.3
BLG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
COC	0.1	0.9	0.1	1.9	1.5	0.6	0.0	0.8	0.1	0.5
LAH	0.1	0.5	1.1	2.3	1.9	0.6	1.5	4.3	1.0	0.1
NOP	0.3	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1
ROB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	1.4
SMB	0.0	0.0	0.0	0.0	0.4	0.9	0.1	0.1	0.1	0.0
SPS <sup>2</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
WAE	30.5	15.5	18.1	13.5	34.3	28.8	12.4	16.0	15.9	11.1
WHB	0.0	0.0	0.0	0.3	2.0	4.6	0.3	0.9	2.9	1.5
WHS	0.1	0.0	0.4	0.0	0.3	0.1	0.0	0.4	0.0	0.0
YEP	32.4	58.3	30.4	27.6	42.8	32.4	13.8	19.8	27.6	28.1
<i>Electrofishing</i>										
SMB <sup>3</sup>	---	---	---	---	---	---	40.4	---	---	---
WAE <sup>4</sup>	30.7	114.3	148.4	2.0	0.0	5.0	88.0	0.0	6.0	5.0

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

<sup>2</sup> All fish sizes

<sup>3</sup> Spring night electrofishing-SMB

<sup>4</sup> 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, electrofishing= catch/hour), proportional stock density of quality- (PSD) and preferred-length (PSD-P) fish, and relative weight (Wr) for selected species captured in experimental gill nets, frame nets, and electrofishing in Waubay Lake, 2003-2012. BLB= Black Bullhead; SMB= Smallmouth Bass; WAE= Walleye; YEP= Yellow Perch

Species	2003	2004	2005	2006 <sup>1</sup>	2007 <sup>1</sup>	2008	2009	2010	2011	2012	Objective
<i>Frame nets</i>											
BLB											
CPUE	8	5	4	4	2	1	1	1	<1	2	≤ 100
PSD	88	100	100	96	98	96	100	83	91	78	---
PSD-P	61	84	89	90	87	96	100	78	45	13	---
Wr	90	87	85	83	86	86	96	92	84	93	---
<i>Gill nets</i>											
WAE											
CPUE	31	16	18	14	34	29	12	16	16	11	≥ 10
PSD	23	29	26	29	7	12	16	25	42	48	30-60
PSD-P	3	6	3	1	0	1	3	0	0	7	5-10
Wr	80	78	86	81	88	85	90	88	83	83	---
YEP											
CPUE	32	58	30	28	43	32	14	20	28	28	≥ 30
PSD	96	97	88	86	79	61	75	59	72	85	30-60
PSD-P	45	47	46	43	32	33	20	22	22	32	5-10
Wr	107	112	113	116	121	114	116	114	114	117	---
<i>Electrofishing</i>											
SMB <sup>2</sup>											
CPUE	---	---	---	---	---	---	40	---	---	---	---
PSD	---	---	---	---	---	---	57	---	---	---	40-70
PSD-P	---	---	---	---	---	---	27	---	---	---	10-20
Wr	---	---	---	---	---	---	102	---	---	---	---

<sup>1</sup> Monofilament gill net mesh size change (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50").

<sup>2</sup> Spring night electrofishing-SMB

Table 4. Year class distribution based on the expanded age/length summary for Walleye sampled in gill nets and associated stocking history (# stocked x 10,000) from Waubay Lake, 2008-2012.

Survey Year	Year Class													
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2012		131	14	30	7	1	2	30						1
2011	---	1	5	50	17			54	3	1				
2010	---	---	1	47	24			55	3					
2009 <sup>1</sup>	---	---	---	4	6	6		77	6		2	2		3
2008	---	---	---	---		2	1	188	10	13		5	3	11
# stocked														
fry	800	800 <sup>2</sup>		400 <sup>3</sup>				600	870	900	850			1345
sm. fingerling										49				
lg. fingerling														

<sup>1</sup> Older Walleye were sampled, but are not reported in this table

<sup>2</sup> 56% of stocked Walleye were OTC marked; 1 of 12 otoliths collected from fall electrofished age-0 Walleye exhibited marks. The estimated stocking contribution was 14%, but sample size was low and the results should be interpreted with caution

<sup>3</sup> Stocked Walleye were OTC marked; 45 of 50 otoliths collected from fall electrofished age-0 Walleye exhibited marks for an estimated stocking contribution of 90%

Table 5. Weighted mean TL (mm) at capture for Walleye age-0 through age-10 sampled in experimental gill nets (expanded sample size) from Waubay 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										
	0	1	2	3	4	5	6	7	8	9	10
2012 <sup>1</sup>	---	213(131)	325(14)	367(30)	402(7)	488(1)	360(2)	447(30)	---	---	---
2011	119(1)	248(5)	322(50)	366(17)	---	---	407(54)	392(3)	457(1)	---	---
2010	151(1)	270(47)	347(24)	---	---	380(55)	394(3)	---	---	---	---
2009 <sup>1</sup>	120(4)	239(6)	315(6)	---	349(77)	377(6)	---	368(2)	492(2)	---	422(3)
2008	---	214(2)	267(1)	314(188)	377(10)	383(13)	---	407(5)	405(3)	425(11)	---
2007	---	246(5)	280(190)	332(25)	354(34)	---	---	437(1)	412(20)	657(1)	---
2006 <sup>1</sup>	---	223(72)	289(26)	332(20)	---	381(4)	---	385(54)	---	---	---
2005	125(15)	229(14)	295(31)	321(4)	344(4)	349(1)	371(98)	---	---	626(3)	697(1)

<sup>1</sup> Older Walleye were sampled, but are not reported in this table.

Table 6. Stocking history including size and number for fishes stocked into Waubay Lake, 1999-2012. SMB= Smallmouth Bass; WAE= Walleye

Year	Species	Size	Number
1999	SMB	fingerling	23,900
1999	WAE	fry	13,449,000
2000	SMB	fingerling	25,540
2001	SMB	fingerling	26,900
2002	WAE	fry	8,500,000
2003	WAE	fry	9,000,000
2003	WAE	small fingerling	496,655
2004	WAE	fry	8,700,000
2005	WAE	fry	6,000,000
2009	WAE	fry	4,000,000
2011	WAE	fry	8,000,000
2012	WAE	fry	8,000,000

Table 7. Year class distribution based on the age/length summary for Yellow Perch sampled in gill nets from Waubay Lake, 2009-2012.

Survey Year	Year Class													
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2012	---	26	63	111	13	7	---	---	1	1	---	1	6	---
2011	---	---	23	131	26	31	8	---	---	---	---	---	---	---
2010	---	---	---	60	31	61	7	---	3	---	---	---	---	---
2009 <sup>1</sup>	---	---	---	---	2	75	14	2	5	1	---	4	2	2

<sup>1</sup> Older Yellow Perch were sampled, but are not reported in this table

Table 8. Weighted mean TL (mm) at capture by gender for Yellow Perch age-1 through age-10 captured in experimental gill nets (expanded sample size) from Waubay Lake, 2009-2012.

Year	Age									
	1	2	3	4	5	6	7	8	9	10
2012 <sup>1</sup>										
Male	142(5)	204(9)	221(16)	---	217(2)	---	---	---	---	---
Female	144(21)	219(58)	251(89)	263(14)	296(4)	---	---	309(1)	335(1)	---
Combined	143(26)	216(63)	245(111)	266(13)	262(7)	---	---	309(1)	335(1)	---
2011										
Male	151(10)	194(34)	234(1)	249(2)	---	---	---	---	---	---
Female	153(13)	209(95)	241(28)	271(28)	281(8)	---	---	---	---	---
Combined	152(23)	206(131)	242(26)	269(31)	281(8)	---	---	---	---	---
2010										
Male	153(17)	191(4)	218(10)	---	---	---	---	---	---	---
Female	151(43)	220(28)	252(48)	251(7)	---	280(3)	---	---	---	---
Combined	151(60)	216(31)	245(61)	251(7)	---	280(3)	---	---	---	---
2009 <sup>1</sup>										
Male	136(1)	198(15)	233(2)	---	239(2)	---	---	268(1)	235(1)	---
Female	157(1)	206(61)	254(11)	261(2)	286(3)	255(1)	---	298(3)	298(1)	299(2)
Combined	147(2)	204(75)	249(14)	261(2)	267(5)	255(1)	---	291(4)	267(2)	299(2)

<sup>1</sup> Older Yellow Perch were sampled, but are not reported in this table

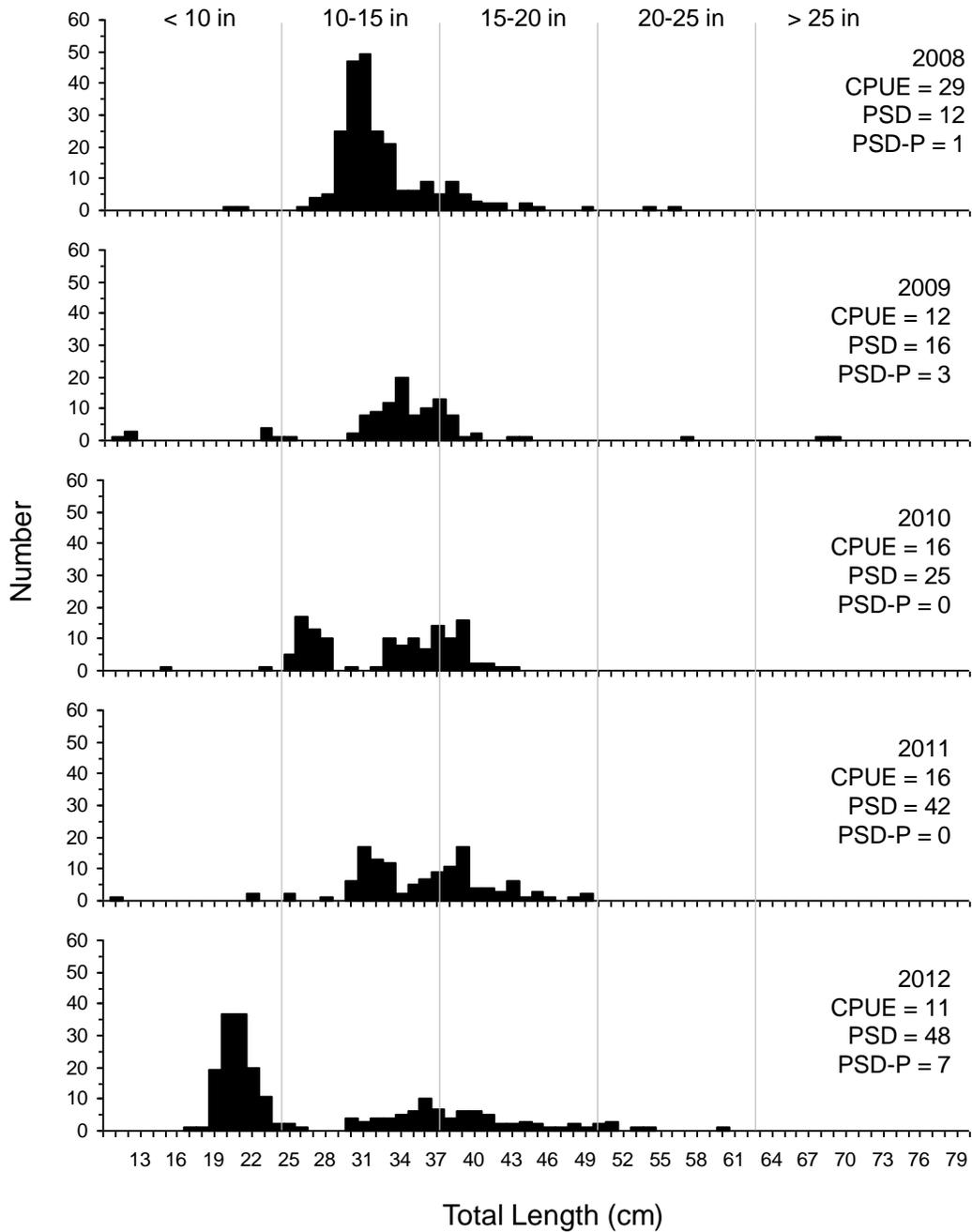


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Walleye captured using experimental gill nets in Waubay Lake, 2008-2012.

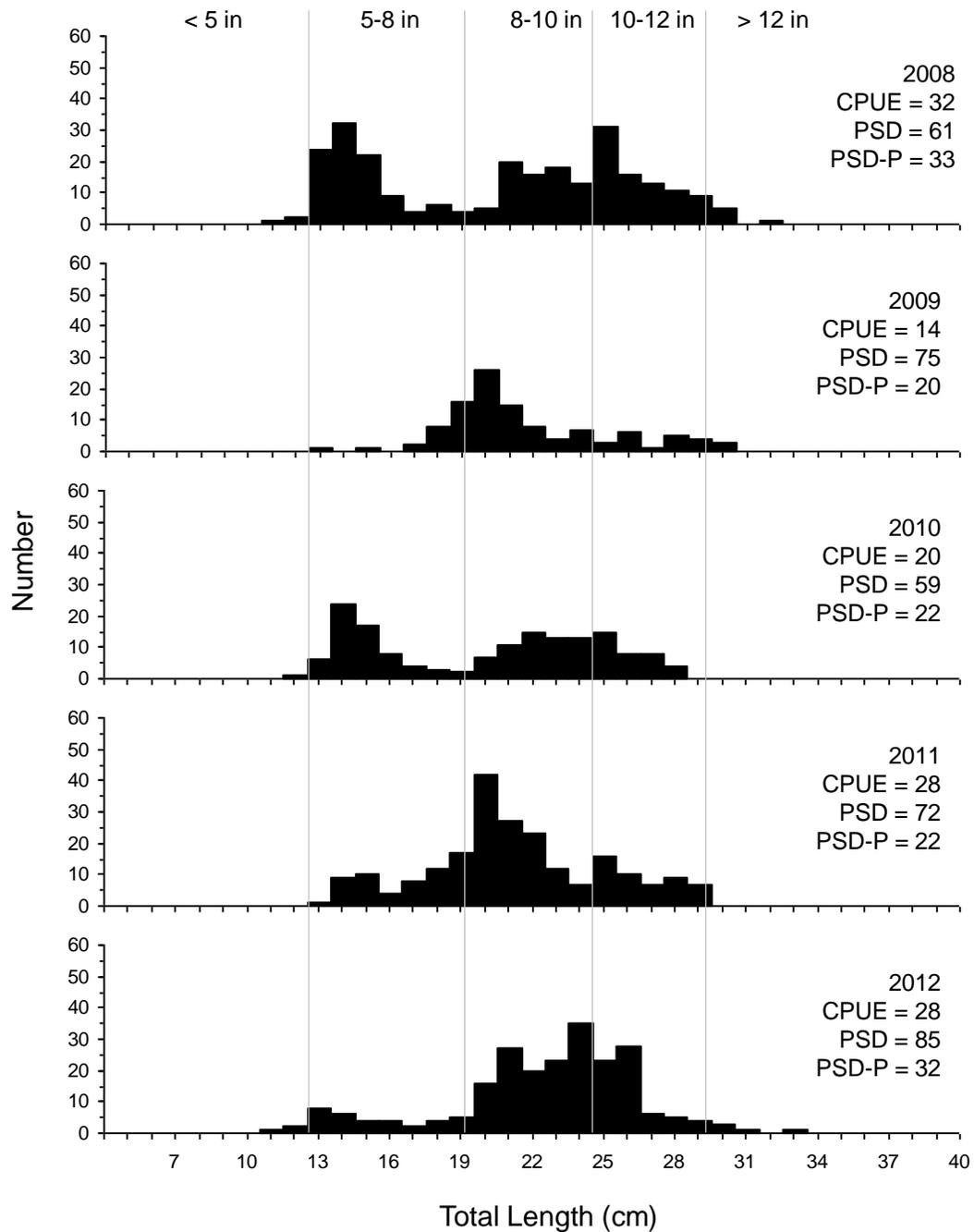


Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Yellow Perch captured using experimental gill nets in Waubay Lake, 2008-2012.

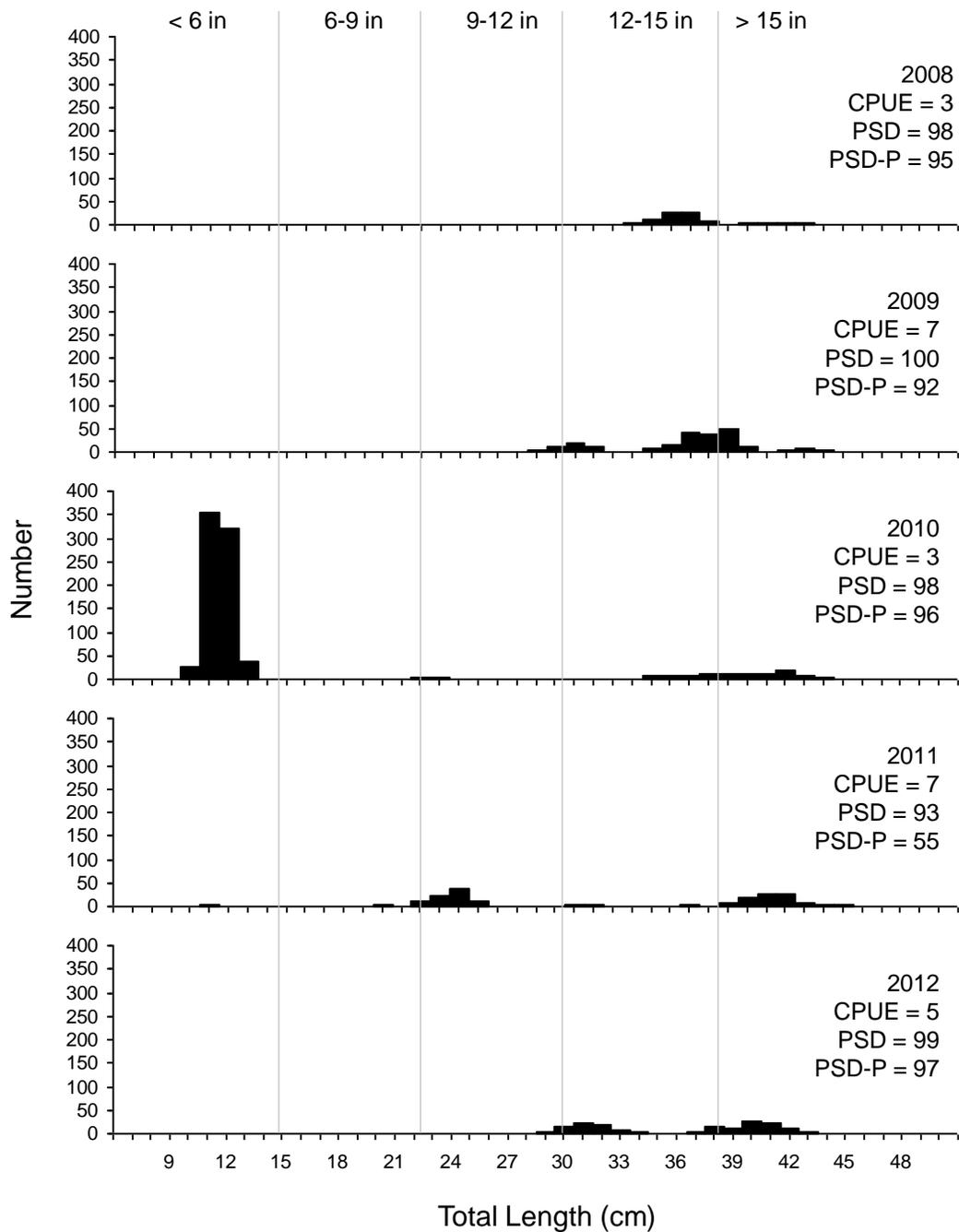


Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for White Bass captured using frame nets in Waubay Lake, 2008-2012.