South Buffalo Lake

Site Description

Location

Water designation number (WDN)	48-0034-00
Legal description	T125N-R53W-Sec.2,10,11,14,15,16,17
County (ies)	Marshall
Location from nearest town	6.0 miles east of Eden, SD

Survey Dates and Sampling Information

Survey dates	June 11, 2015 (EF-LMB) June 23-25, 2015 (FN,GN)
Spring electrofishing-LMB (min)	61
Frame net sets (n)	17
Gill net sets (n)	6

Morphometry (Figure 1)

Watershed area (acres)	16,000
Surface area (acres)	1,788
Maximum depth (ft)	14
Mean depth (ft)	8

Ownership and Public Access

South Buffalo Lake is a meandered lake owned by the State of South Dakota and the fishery is managed by the SDGFP. Two public access sites located on the northeast and southwest shorelines are present and both are maintained by the SDGFP (Figure 1; Figure 2). Lands adjacent to the lake have mixed ownership including State of South Dakota, Bureau of Indian Affairs, and private individuals.

Watershed and Land Use

The South Buffalo Lake watershed is primarily comprised of agricultural grazing land, with some cropland (Hanson 2007). The shoreline is heavily wooded with scattered lake cabins primarily along the northern shore.

Water Level Observations

The Water Management Board established Ordinary High Water Mark is 1835.4 fmsl and the outlet elevation of South Buffalo Lake is 1834.8 fmsl. On April 28, 2015 South Buffalo Lake was above the OHWM and outlet elevation at 1835.6 fmsl. On October 20, 2015 water levels had declined and the elevation was below the OHWM and the outlet with an elevation of 1834.7 fmsl.

Fish Management Information

Primary species	bluegill, largemouth bass, northern pike, walleye, yellow perch
Other species	black bullhead, black crappie, common carp, emerald shiner, golden shiner, orangespotted sunfish, smallmouth bass, white sucker
Lake-Specific regulations	None
Management classification	warm-water semi-permanent
Fish Consumption Advisories	none

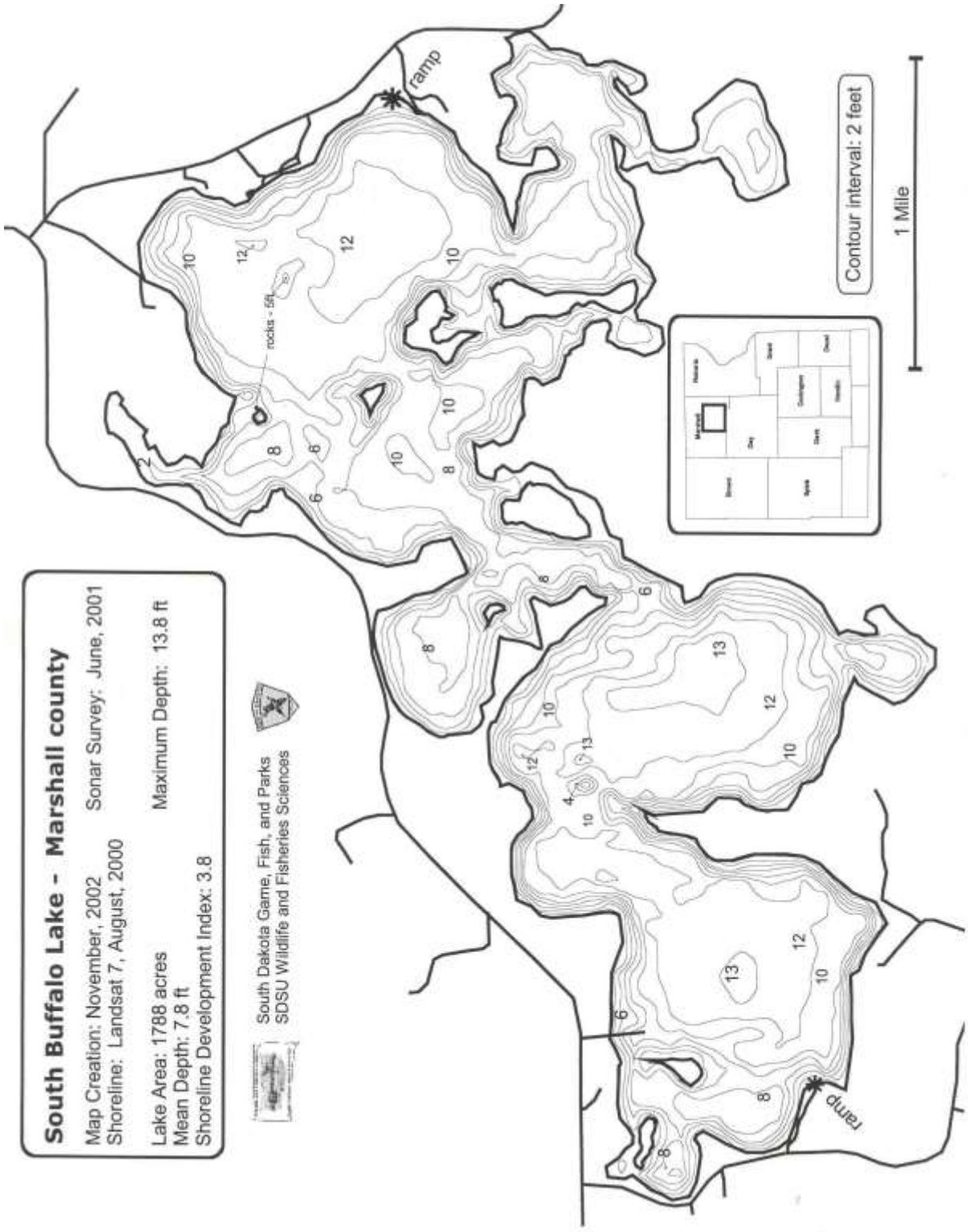

Figure 1. South Buffalo Lake depth contour map.

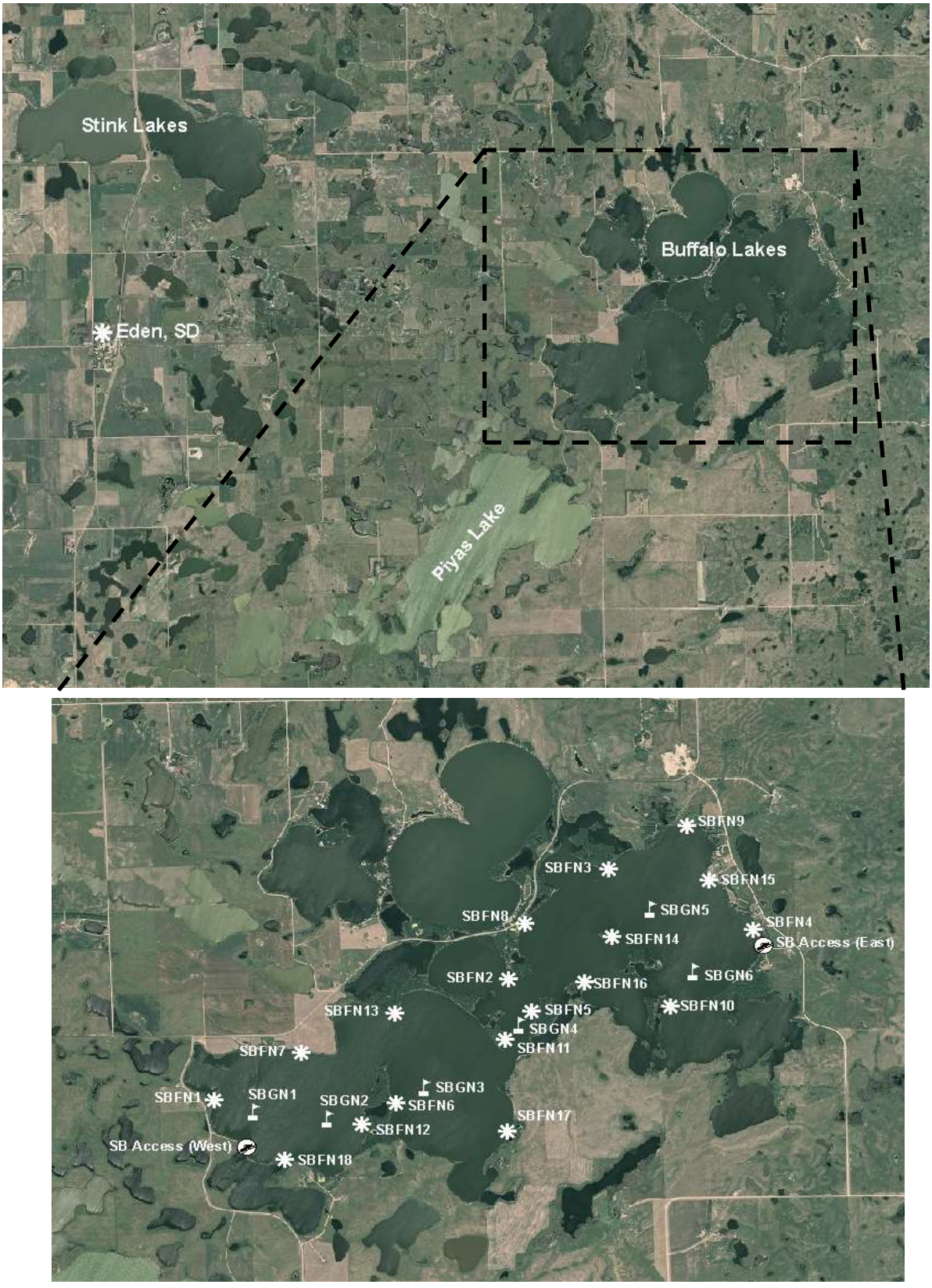

Figure 2. Map depicting geographic location of South Buffalo Lake from Eden, South Dakota (top). Also noted are access locations and standardized net locations for South Buffalo Lake (bottom). SBFN= frame nets, SBGN= gill nets

Management Objectives

1) Maintain a mean frame net CPUE of stock-length bluegill ≥ 25, a PSD of 30-60, and a PSD-P of 5-10.

2) Maintain a mean spring night electrofishing CPUE of stock-length largemouth bass ≥ 10, a PSD of 40-70, and a PSD-P of 10-40.

3) Maintain a mean gill net CPUE of stock-length northern pike ≥ 3, a PSD of 30-60, and a PSD-P of 5-10.

4) Maintain a mean gill net CPUE of stock-length walleye ≥ 10, a PSD of 30-60, and a PSD-P of 5-10.

5) Maintain a mean gill net CPUE of stock-length yellow perch ≥ 30, a PSD of 30-60, and a PSD-P of 5-10.

6) Maintain a mean frame net CPUE of stock-length black bullhead ≤ 100.

Results and Discussion

South Buffalo Lake is a large, permanent, natural lake with complex morphometry (i.e., numerous basins, islands, and bays) located in Marshall County, South Dakota. The major inlet to South Buffalo Lake is located at the northeast corner of the lake. Other tributaries enter at the south and southeast. Water exiting South Buffalo Lake runs into North Buffalo and Almos Lakes, then through a chain of Coteau Lakes before eventually emptying into the James River.

Currently, South Buffalo Lake is primarily managed as a bluegill, northern pike, walleye and yellow perch fishery. Overall, as many as 13 species of fish have been sampled in South Buffalo Lake.

Primary Species

Bluegill: The mean frame net CPUE of stock-length bluegill was 9.5 (Table 1) and below the minimum objective (≥ 25 stock-length bluegill/net night; Table 3). Since 2002, mean frame net CPUE values have ranged from a low of 9.5 (2015) to a high of 255.6 (2007; Table 2). A substantial decrease in mean frame net CPUE has been observed since 2007 (Table 2). Currently, relative abundance is considered to be moderate.

Bluegill captured in frame nets ranged in TL from 7 to 25 cm (2.8 to 9.8 in; Figure 3). The PSD was 45 and the PSD-P was 45 (Table 1); PSD was within the management objective of 30-60 and PSD-P was above the management objective of 5-10 (Table 3; Figure 3).

Based on age estimates made using otoliths, bluegills in South Buffalo Lake tend to exhibit relatively-consistent recruitment of varying magnitude. In 2015, eight year classes were represented (2006-2008, 2010-2014; Table 4) in the frame net catch.

Bluegills in South Buffalo Lake typically attain quality-length (15 cm; 6 in) by age 4 (Table 5). Since 2007, the weighted mean TL at capture of age-4 bluegill has ranged from 153 to 213 mm (6.0 to 8.4 in) with the highest values reported in the most recent surveys (i.e., 2011 to 2015; Table 5). Mean Wr values of bluegill in the 2015 frame net catch exceeded 103 for all length categories (e.g., stock to quality) sampled. The mean Wr of stock-length fish was 120 (Table 1) and a decreasing trend in Wr was observed as TL increased. Mean Wr values were likely influenced by seasonal sampling bias (i.e., spawning behavior).

Largemouth Bass: Spring night electrofishing is used to assess largemouth bass population dynamics on a biennial basis on odd years. The 2015 spring night electrofishing mean CPUE of stock-length largemouth bass was 27.8 (Table 1) and was similar to the mean CPUE of 33.0 observed in 2013 (Table 2).

Largemouth bass ranged in TL from 20 to 46 cm (7.9 to 18.1 in; Figure 4), had a PSD of 61 and PSD-P of 21 (Table 1). Both the PSD and PSD-P were within the management objectives of 40-70 and 10-40 (Table 3), respectively, indicating a balanced population.

Scales were collected from a sub-sample of largemouth bass representing seven year classes (2005-2006, 2009-2013; Table 6). Since 2006 the weighted mean length at capture for largemouth bass at age-2 has ranged from 239 to 244 mm (9.4 to 9.6 in), and at age-4 from 356 to 370 mm (14.0 to 14.6 in; Table 7). Condition was good with mean Wr values >110 for all length categories (e.g., stock to quality) sampled. No length related trend in Wr was observed.

Northern Pike: The mean gill net CPUE of stock-length northern pike was 4.5 (Table 1) and above the minimum objective ($\geq$ 3 stock-length northern pike/net; Table 3). Since 2002, mean gill net CPUE values have ranged from a low of 3.0 (2005) to a high of 14.8 (2013; Table 2). Currently, relative abundance is high.

Northern pike sampled in gill nets ranged in TL from 36 to 83 cm (14.2 to 32.7 in; Figure 5). The PSD of 37 was within the management objective of 30-60 and the PSD-P of 15 was above the management objective of 5-10 (Table 1; Table 3; Figure 5).

No age or growth information was collected. The condition of gill net captured northern pike was similar to that of northern pike captured from other northeast South Dakota glacial lakes (e.g., Cattail/Kettle and Roy Lakes). The mean Wr of stock-length northern pike was 83 (Table 1) and no length related trend in Wr was observed.

Walleye: The mean gill net CPUE of stock-length walleye was 6.1 (Table 1) and below the minimum objective ($\geq$ 10 stock-length walleye/net night; Table 3). Since 2002, the mean gill net CPUE has fluctuated from a low of 0.8 (2009) to a high of 10.5 (2002; Table 2). Based on the 2015 gill net CPUE, relative abundance is considered moderate.

Gill net captured walleye ranged in TL from 14 to 64 cm (5.5 to 25.2 in; Figure 6), had a PSD of 32 and PSD-P of 8 (Table 1). Both the PSD and PSD-P were within the

management objective ranges (30-60 and 5-10, respectively; Table 3) indicating a balanced size structure. Age estimates made using otoliths revealed the presence of seven consecutive year classes (2008-2014) with the 2013 year class comprising 53% of gill net captured walleye (Table 8). Recruitment of both stocked and naturally-produced walleye has been limited (Table 6; Table 8). The stronger 2013 year class was naturally produced (Table 8). Small fingerlings stocked in 2008, 2010, and 2012 were marked with Oxytetracycline (OTC) so that the contribution of stocked fish could be evaluated; each stocking produced what appeared to be substantial year classes (i.e., mean fall night electrofishing CPUE values for age-0 walleye that ranged from 61.0 to 130.9; Table 8). Unfortunately, few individuals from these stocked cohorts have recruited to the population.

Walleye in South Buffalo Lake typically exceed 38 cm (15 in) between age-3 and age-4 (Table 9). The weighted mean length at capture in 2015 for age-3 and age-4 walleye were 347 and 405 mm, respectively (13.7 and 15.9 in, respectively; Table 9). Condition was good with mean Wr of 88 (Table 1) and no length related trend in Wr was observed.

Yellow Perch: The mean gill net CPUE of stock-length yellow perch was 19.3 (Table 1) and below the minimum objective (≥ 30 stock-length yellow perch/net night). Since 2002, mean gill net CPUE values have ranged from 4.7 (2004) to 57.0 (2002; Table 2). Based on the 2015 gill net catch, relative abundance appears to be moderate.

Gill net captured yellow perch ranged in TL from 8 to 23 cm (3.1 to 9.1 in) had a PSD of 29 and PSD-P of 0 (Table 1; Figure 7). The PSD and PSD-P were below the management objectives of 30-60 and 5-10 (Table 3) and indicated a population comprised of smaller (i.e., < 20 cm; 8 in) individuals.

Otoliths collected from a sub-sample of gill net captured yellow perch revealed the presence of six year classes (2008-2010 and 2012-2014; Table 11). Year classes produced in 2009 and 2013 were the most abundant and comprised 43% and 29%, respectively, of yellow perch sampled (Table 11). No fish from the 2011 cohort (age 2) were sampled, likely indicating a weak or missing year class (Table 11). In the 2009 and 2011 surveys, few yellow perch older than age 4 were captured (Table 11). In the 2013 and 2015 surveys, a high proportion (58% and 59%, respectively) exceeded age 4 (Table 11).

Yellow perch in South Buffalo Lake exhibit slow growth. In 2015, the weighted mean TL at capture for age-6 yellow perch was 196 mm (7.7 in; Table 12). A slight decreasing trend in condition was apparent as TL increased; however, mean Wr values exceeded 85 for all cm-length groups sampled.

Other Species

Black Bullhead: The 2015 mean frame net CPUE of stock-length black bullheads was 19.2 (Table 1) and within the management objective (≤ 100 stock-length black bullhead/net night; Table 3). Black bullheads in the frame net catch ranged in TL from 21 to 35 cm (8.3 to 13.8 in), had a PSD of 99, and a PSD-P of 33 (Table 1; Figure 8). Length-frequency analysis indicates that recruitment has been limited in recent years as few individuals less than quality length (23 cm; 9 in) were present in the frame net catch

(Figure 8). No growth information was collected during 2015. Mean Wr values ranged from 80 to 88 for all length categories (e.g., stock to quality) sampled. The mean Wr for stock-length black bullheads was 88 (Table 1).

Black Crappie: The mean frame net CPUE of stock-length black crappie was 1.4 (Table 1). The 2015 frame net CPUE represented a decrease from the 2013 CPUE of 5.2 (Table 2). Although not abundant, black crappie have consistently been sampled in South Buffalo Lake.

In the frame net survey 24 black crappie were captured ranging in TL from 16 to 31 cm (6.3 to 12.2 in; Figure 9). No age data were collected and small sample size limits the utility of size structure and condition data.

Other: Smallmouth bass and white sucker were other fish species captured in low numbers during the 2015 survey (Table 1).

Management Recommendations

1) Conduct fish population assessment surveys on a biennial basis (next survey scheduled in summer 2017) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.

2) Conduct spring electrofishing biennially (next survey scheduled in spring 2017) to monitor the largemouth bass population.

3) Collect otoliths from bluegill, walleye, and yellow perch; scales from largemouth bass to assess age structure and growth rates of the population.

4) Stock walleye (≈100 small fingerlings/acre) on a biennial basis to establish additional year classes.

Table 1. Mean catch rate (CPUE; gill/frame net = 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 South Buffalo Lake, 2015. Confidence intervals include 80 percent (± CI-80) or 90 percent (± CI-90). BLB= black bullhead; BLC= black crappie; BLG= bluegill; LMB= largemouth bass; NOP= northern pike; SMB= smallmouth bass; WAE= walleye; WHS= white sucker; YEP= yellow perch

	Abundance		Stock Density Indices				Condition	
Species	CPUE	CI-80	PSD	CI-90	PSD-P	CI-90	Wr	CI-90
Frame nets								
BLB	19.2	9.3	99	1	33	4	88	2
BLC	1.4	0.5	96	7	92	10	97	2
BLG	9.5	2.8	45	7	45	7	120	2
NOP	0.4	0.3	13	23	0	---	80	2
SMB	0.1	0.1	100	---	100	---	113	---
WAE	0.2	0.2	50	50	50	50	129	113
YEP	2.0	0.9	85	11	3	5	87	2
Gill nets								
BLB	25.0	7.5	97	3	10	4	90	1
BLC	0.3	0.5	100	0	100	0	94	0
NOP	4.5	0.7	37	16	15	12	83	1
WAE	6.1	1.1	32	14	8	8	88	1
WHS	7.6	1.3	98	4	85	9	105	2
YEP	19.3	5.7	29	7	0	---	100	0
Electrofishing								
LMB[1]	27.8	9.1	61	16	21	14	113	2

[1] Spring Electrofishing-LMB.

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 by frame nets, experimental gill nets and electrofishing in South Buffalo Lake, 2002-2015. BLB= black bullhead; BLC= black crappie; BLG= bluegill; COC= common carp; EMS= emerald shiner; GOS= golden shiner; LMB= largemouth bass; NOP= northern pike; OSF= orangespotted sunfish; SMB= smallmouth bass; WAE= walleye; WHS= white sucker; YEP= yellow perch

	CPUE									
Species	2002	2003	2004	2005	2006[1]	2007[1]	2009	2011	2013	2015
Frame nets										
BLB	112.9	18.4	121.9	45.7	---	21.2	17.9	22.0	14.1	19.2
BLC	1.7	2.4	2.4	0.5	---	6.1	0.5	1.2	5.2	1.4
BLG	40.9	47.5	44.0	19.3	---	255.6	73.7	14.9	10.1	9.5
COC	0.2	0.2	0.2	0.2	---	0.1	0.1	0.1	0.0	0.0
LMB	0.0	0.1	0.0	0.0	---	0.1	0.0	0.0	0.0	0.0
NOP	0.2	2.2	0.8	0.4	---	0.9	0.4	0.4	0.2	0.4
OSF[2]	0.0	0.0	0.0	0.0	---	0.0	0.1	0.0	0.0	0.0
SMB	0.0	0.2	0.0	0.0	---	0.2	0.2	0.1	0.1	0.1
WAE	0.3	0.4	0.4	0.1	---	0.1	0.1	0.1	0.2	0.2
WHS	0.1	0.6	0.3	0.1	---	0.2	0.6	0.0	0.0	0.0
YEP	8.1	0.4	0.1	0.2	---	16.7	8.4	8.7	0.9	2.0
Gill nets										
BLB	61.3	39.8	126.7	0.7	0.8	7.8	0.7	9.2	41.0	25.0
BLC	0.5	2.8	1.0	0.5	0.7	6.7	0.0	0.7	0.5	0.3
BLG	0.2	0.2	0.2	0.0	3.7	2.8	0.0	1.0	0.8	0.0
EMS[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
GOS[2]	0.0	0.5	0.0	0.0	0.0	0.2	0.0	1.3	0.0	0.0
LMB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
NOP	8.7	12.8	3.5	3.0	8.5	14.2	3.5	9.7	14.8	4.5
SMB	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WAE	10.5	7.2	7.2	1.2	3.5	4.5	0.8	2.2	3.0	6.1
WHS	9.7	5.2	6.8	5.2	4.7	4.3	4.0	5.5	4.8	7.6
YEP	57.0	18.3	4.7	13.3	47.7	47.3	40.3	44.7	26.0	19.3
Electrofishing										
LMB[3]	---	---	---	---	18.9	---	---	---	33.0	27.8

[1]Monofilament gill net mesh size (0.75”, 1.00”, 1.25”, 1.50”, 2.00” and 2.50”)
[2] All fish sizes.
[3] Spring night electrofishing.

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 relative weight (Wr) for selected species captured in frame nets and experimental gill nets from South Buffalo Lake, 2002-2015. BLB= black bullhead; BLG= bluegill; LMB= largemouth bass; NOP= northern pike; WAE= walleye; YEP= yellow perch

Species	2002	2003	2004	2005	2006[1]	2007[1]	2009	2011	2013	2015	Objective
Frame nets											
BLB											
CPUE	113	18	122	46	---	21	18	22	14	19	≤ 100
PSD	76	63	64	36	---	52	95	85	92	99	---
PSD-P	17	7	11	14	---	15	31	63	17	33	---
Wr	81	81	80	84	---	98	83	88	95	88	---
BLG											
CPUE	41	48	44	19	---	256	74	15	10	10	≥ 25
PSD	78	86	82	14	---	40	28	71	99	45	30-60
PSD-P	13	19	42	9	---	6	11	6	64	45	5-10
Wr	113	110	123	112	---	119	104	116	117	120	---
Gill nets											
NOP											
CPUE	9	13	4	3	9	14	4	10	15	5	≥ 3
PSD	56	29	43	22	53	48	81	69	48	37	30-60
PSD-P	0	3	5	0	2	7	10	14	4	15	5-10
Wr	86	84	81	85	94	92	88	91	84	83	---
WAE											
CPUE	11	7	7	1	4	5	1	2	3	6	≥ 10
PSD	35	53	63	43	90	59	100	54	17	32	30-60
PSD-P	3	9	21	0	33	30	0	23	6	8	5 – 10
Wr	93	90	90	98	98	100	99	92	88	88	---
YEP											
CPUE	57	18	5	13	48	47	40	45	26	19	≥ 30
PSD	14	6	18	5	2	2	0	2	10	29	30-60
PSD-P	0	1	0	0	0	0	0	0	0	0	5-10
Wr	93	92	104	104	108	101	95	93	101	100	---
Electrofishing											
LMB											
CPUE	---	---	---	---	19	---	---	---	33	28	≥ 10
PSD	---	---	---	---	58	---	---	---	48	61	40-70
PSD-P	---	---	---	---	26	---	---	---	24	21	10-40
Wr	---	---	---	---	121	---	---	---	111	113	---

[1] Monofilament gill net mesh size (0.75”, 1.00”, 1.25”, 1.50”, 2.00” and 2.50”)

Table 4. Year class distribution based on expanded age/length summary for bluegill sampled in frame nets from South Buffalo Lake, 2007-2015.

	Year Class														
Year	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
2015		12	80	2	5	1		41	20	7					
2013	---	---				25	20	79	49	1	2	6			
2011[1]	---	---	---	---				80	130	42	7	5		1	
2009[1]	---	---	---	---	---	---		31	174	650	295	84	29		48
2007[1]	---	---	---	---	---	---	---	---			71	2223	1748	338	16

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

Table 5. Weighted mean total length (mm) at capture for age-2 through age-10 bluegill captured in frame nets (expanded sample size) from South Buffalo Lake, 2007-2015.

	Age								
Year	2	3	4	5	6	7	8	9	10
2015	109(80)	142(2)	213(5)	205(1)	---	231(41)	237(20)	236(7)	---
2013	---	166(25)	181(20)	203(79)	216(49)	230(1)	257(2)	233(6)	---
2011[1]	---	133(80)	169(130)	181(42)	180(7)	213(5)	---	259(1)	---
2009	92(174)	119(650)	153(295)	182(84)	223(29)	---	250(48)	257(38)	260(7)
2007[1]	84(71)	117(2223)	153(1748)	179(338)	223(16)	227(48)	240(110)	257(67)	248(36)

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

Table 6. Year class distribution based on expanded age/length summary for largemouth bass captured during spring night electrofishing from South Buffalo Lake, 2013-2015.

	Year Class														
Year	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
2015			9	2	11	3	1			1	1				
2013	---	---			16	7	2		3		1	3	1		

Table 7. Weighted mean total length (mm) at capture for age-1 through age-10 largemouth bass captured during spring night electrofishing in South Buffalo Lake, 2006-2015.

	Age									
Year	1	2	3	4	5	6	7	8	9	10
2015	---	244(9)	262(2)	370(11)	371(3)	427(1)	---	---	465(1)	460(1)
2013	---	239(16)	320(7)	356(2)	---	415(3)	---	451(1)	474(3)	478(1)
2006	---	242(9)	---	---	383(9)	351(1)	442(1)	---	---	---

Table 8. Year class distribution based on the expanded age/length summary for walleye sampled in gill nets and associated stocking history (# stocked x 1000) from South Buffalo Lake, 2009-2015.

	Year Class												
Survey Year	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
2015[1]		3	23	5	5	5	1	1					
2013[1]	---	---			5	10	1	1					
2011[1]	---	---	---	---			7	5			4		
2009[1]	---	---	---	---	---	---		2			2	1	
# stocked													
Fry										2200			
sm. fingerling		178		214[2]		220[3]		221[4]			437		220
lg. fingerling													

[1] Older walleye were sampled, but are not reported in this table.
[2] 29% of stocked walleye were OTC marked; 10 of 40 otoliths (20%) collected from fall electrofished age-0 walleye (mean catch/hour = 61.0) exhibited marks. Chi-Square analysis indicated no significant difference in the proportion observed verses the proportion stocked (p-value=0.161); concluded that 2012 year class was largely produced by stocking.
[3] Stocked walleye were OTC marked; 50 of 50 otoliths collected from fall electrofished age-0 walleye (mean catch/hour = 130.9) exhibited marks for an estimated stocking contribution of 100%
[4] 77% of stocked walleye were OTC marked; 34 of 50 otoliths (68%) collected from fall electrofished age-0 walleye (mean catch/hour = 81.3) exhibited marks. Chi-Square analysis indicated no significant difference in the proportion observed verses the proportion stocked (p-value=0.130); concluded that 2008 year class was largely produced by stocking.

Table 9. Weighted mean total length at capture (mm) for walleye age-1 through age-10 captured in experimental gill net sets (expanded sample size) from South Buffalo Lake, 2006-2015. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends.

	Age									
Year	1	2	3	4	5	6	7	8	9	10
2015[1]	168(3)	270(23)	347(5)	405(5)	386(5)	540(1)	525(1)	---	---	---
2013[1]	---	276(5)	313(10)	461(1)	451(1)	---	---	---	---	---
2011[1]	---	254(7)	377(5)	---	---	521(4)	---	---	---	---
2009	161 (2)	---	---	407 (2)	458 (1)	---	---	499 (2)	---	---
2007[1]	---	256 (22)	380 (1)	489 (2)	---	488 (6)	478 (1)	545 (1)	545 (3)	675 (1)
2006[1]	181 (3)	---	390 (5)	---	452 (6)	517 (5)	---	---	593 (4)	---

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

Table 10. Stocking history including size and number for fishes stocked into South Buffalo Lake, 2003-2015. WAE= walleye; LMB= largemouth bass

Year	Species	Size	Number
2003	WAE	small fingerling	220,430
2005	WAE	small fingerling	437,300
2006	WAE	fry	2,200,000
2006	LMB	fingerlings	100,320
2008	WAE	small fingerling	220,560
2010	WAE	small fingerling	220,060
2012	WAE	small fingerling	213,730
2014	WAE	small fingerling	177,750

Table 11. Year class distribution based on the expanded age/length summary for yellow perch sampled in gill nets from South Buffalo Lake, 2009-2015.

	Year Class											
Survey Year	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
2015		13	41	3		8	60	14				
2013	---	---				2	64	87	3		1	
2011	---	---	---	---			239	264	82	2	2	
2009	---	---	---	---	---	---		244	608	98	17	6

Table 12. Weighted mean total length (mm) at capture for yellow perch captured in experimental gill nets (expanded sample size) from South Buffalo Lake, 2009-2015.

	Age							
Year	1	2	3	4	5	6	7	8
2015	97(13)	133(41)	162(3)	---	202(8)	196(60)	208(14)	---
2013	---	---	154 (2)	159 (64)	178 (87)	194 (3)	---	209 (1)
2011	---	101 (239)	134 (264)	154 (82)	188 (2)	201 (2)	---	---
2009	92 (244)	117 (608)	148 (98)	162 (17)	140 (6)	---	---	---

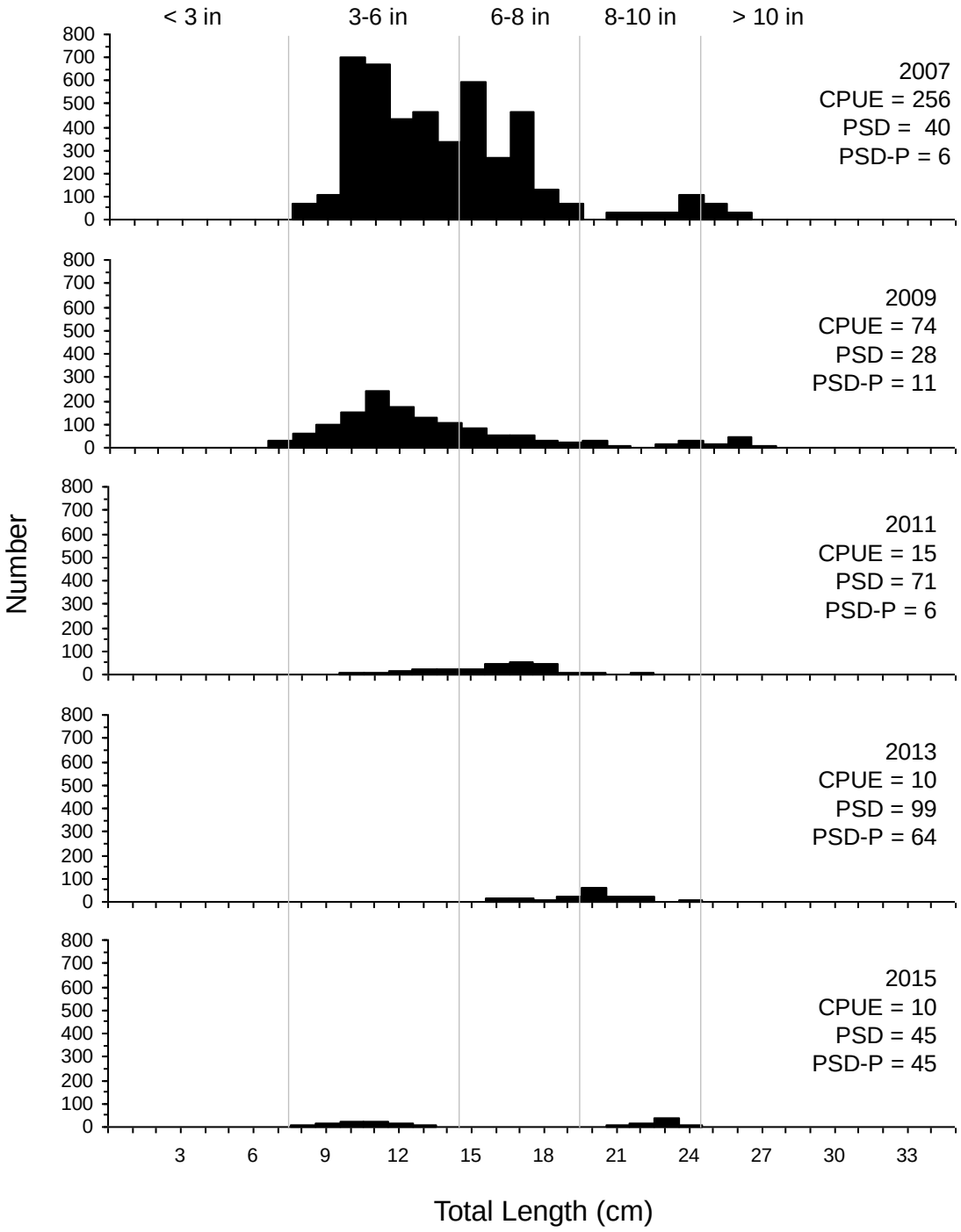

Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for bluegill captured using frame nets in South Buffalo Lake, 2007-2015.

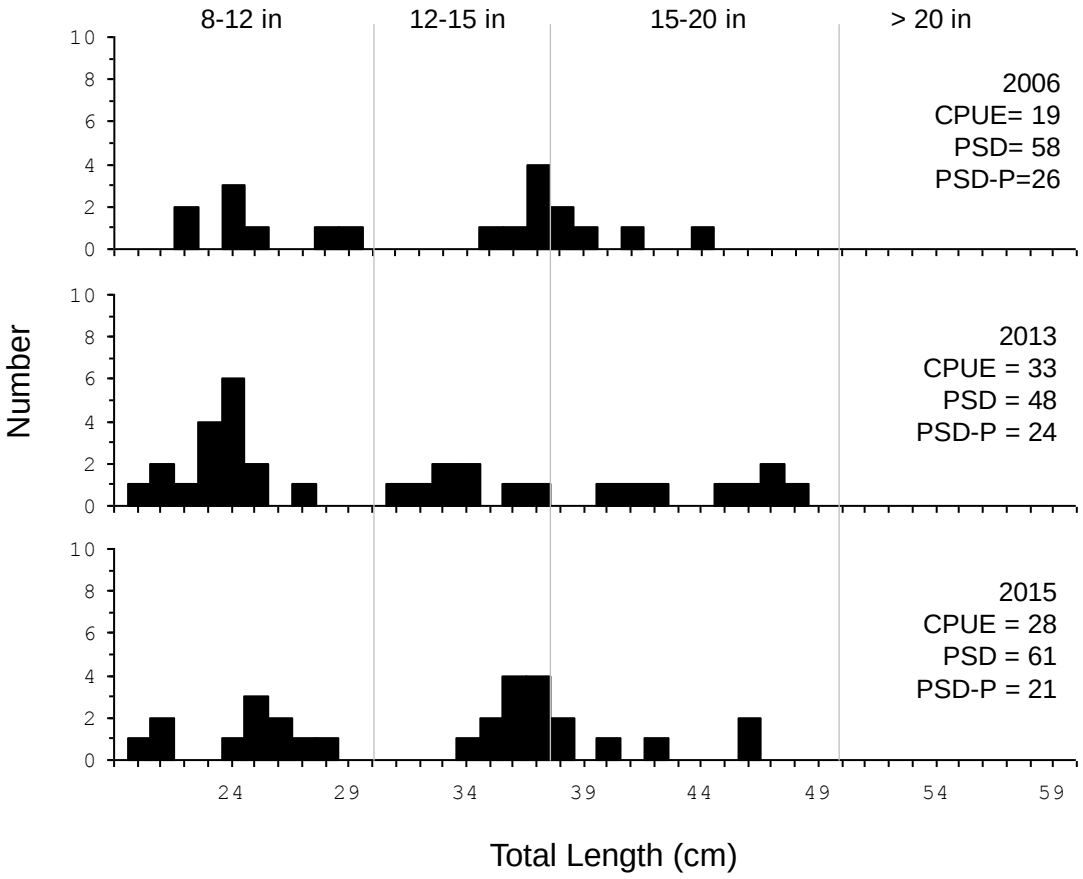

Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for largemouth bass captured during spring night electrofishing in South Buffalo Lake, 2006-2015.

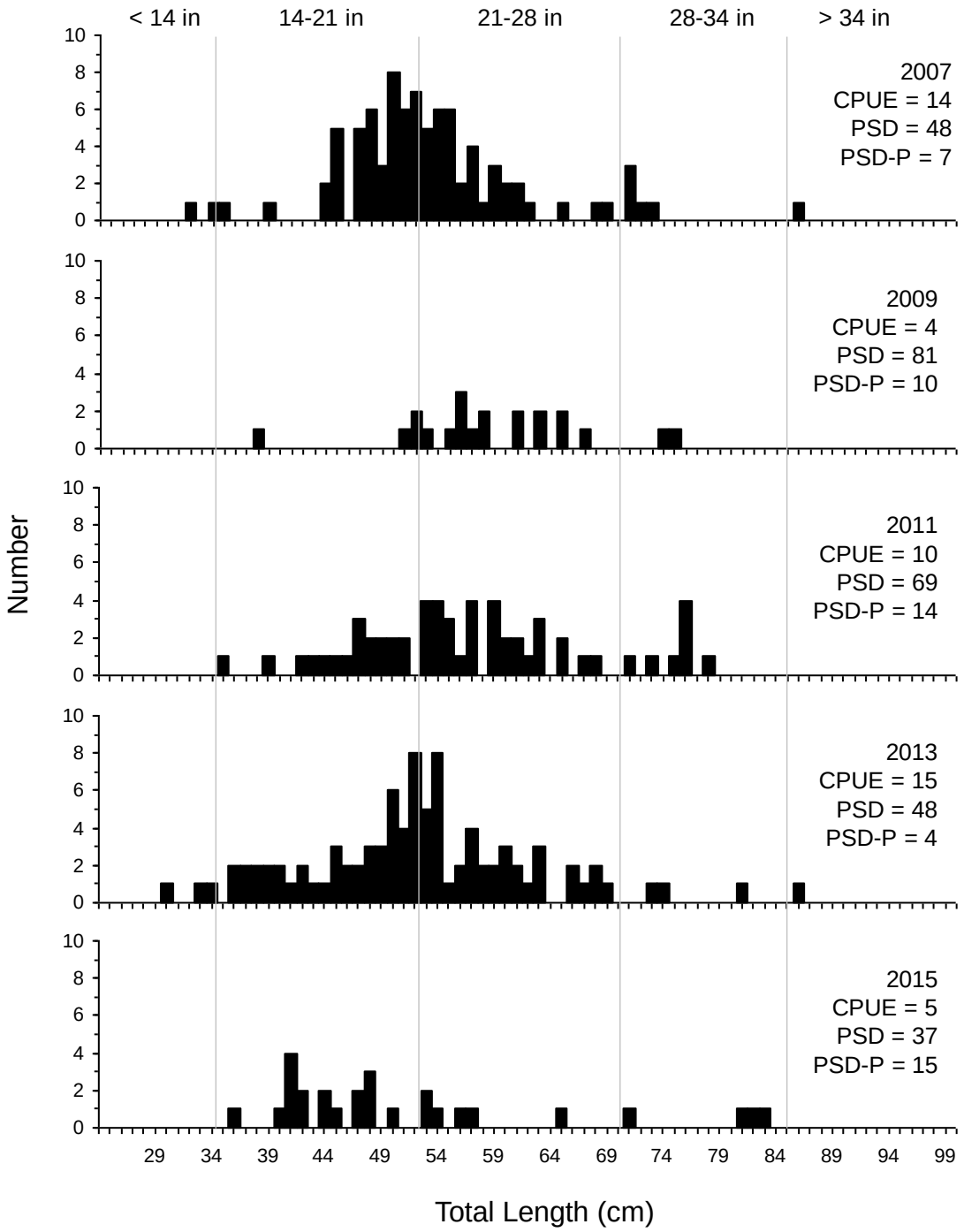

Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for northern pike captured using gill nets in South Buffalo Lake, 2007-2015.

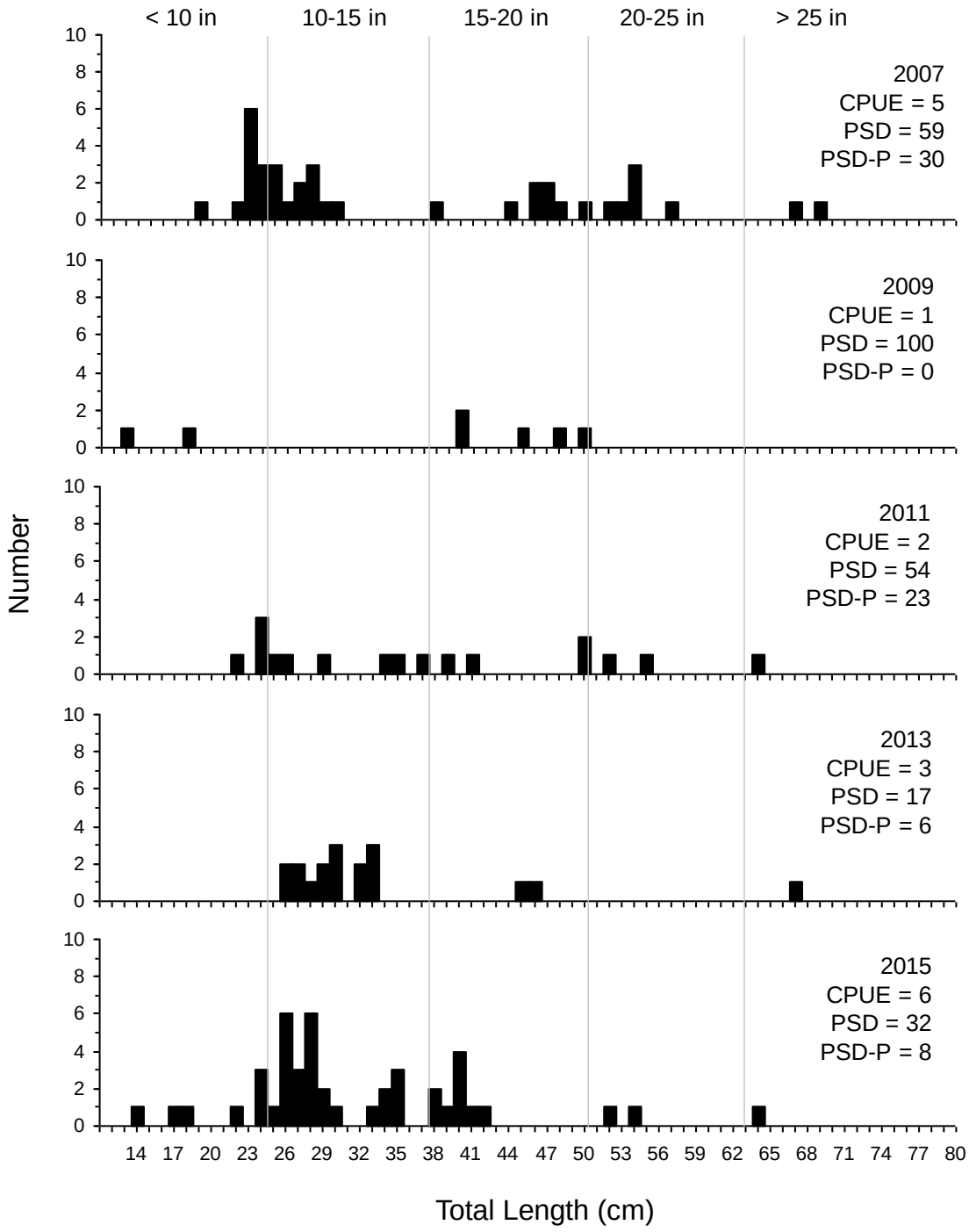

Figure 6. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for walleye captured using gill nets in South Buffalo Lake, 2007-2015.

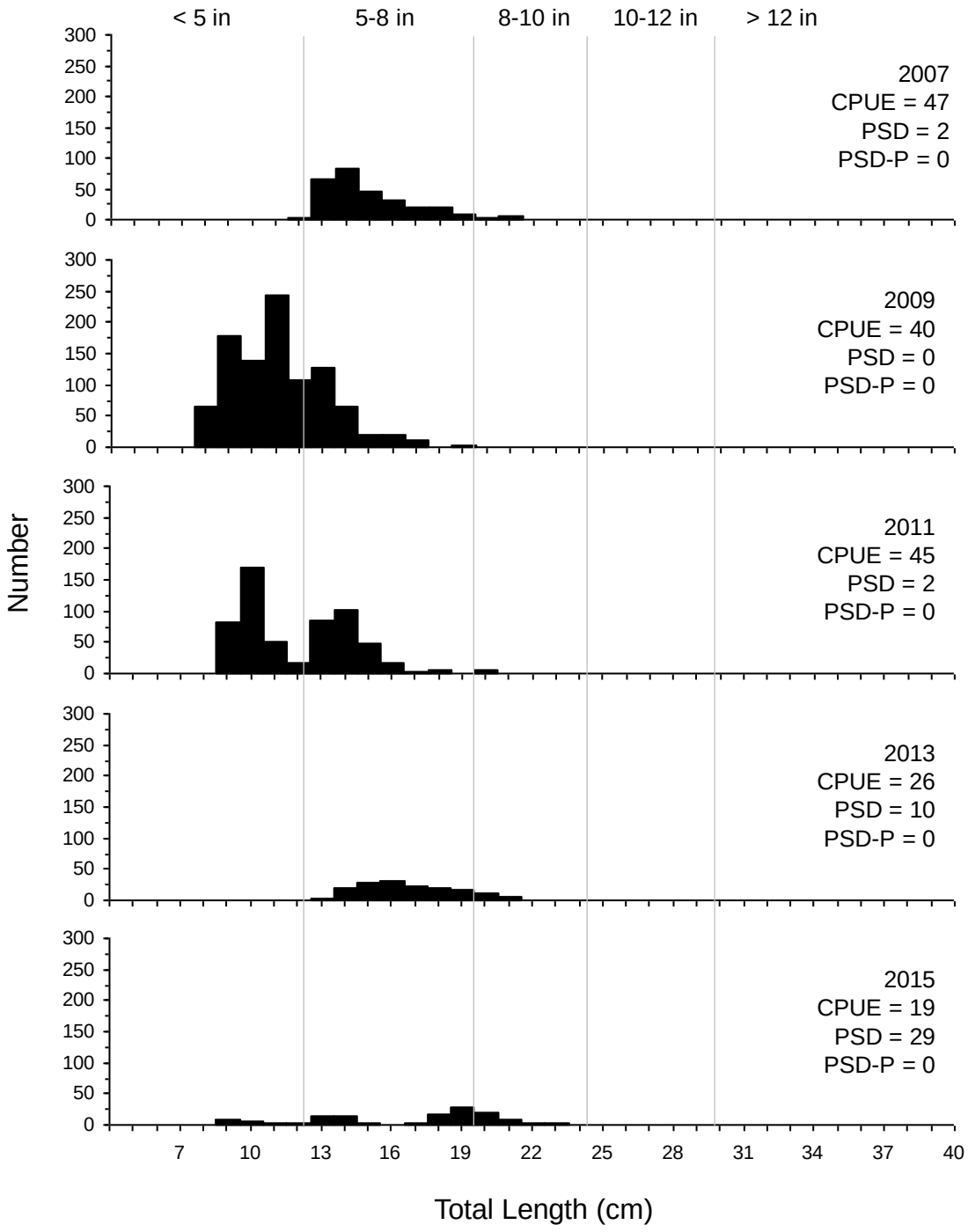

Figure 7. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for yellow perch captured using gill nets in South Buffalo Lake, 2007-2015.

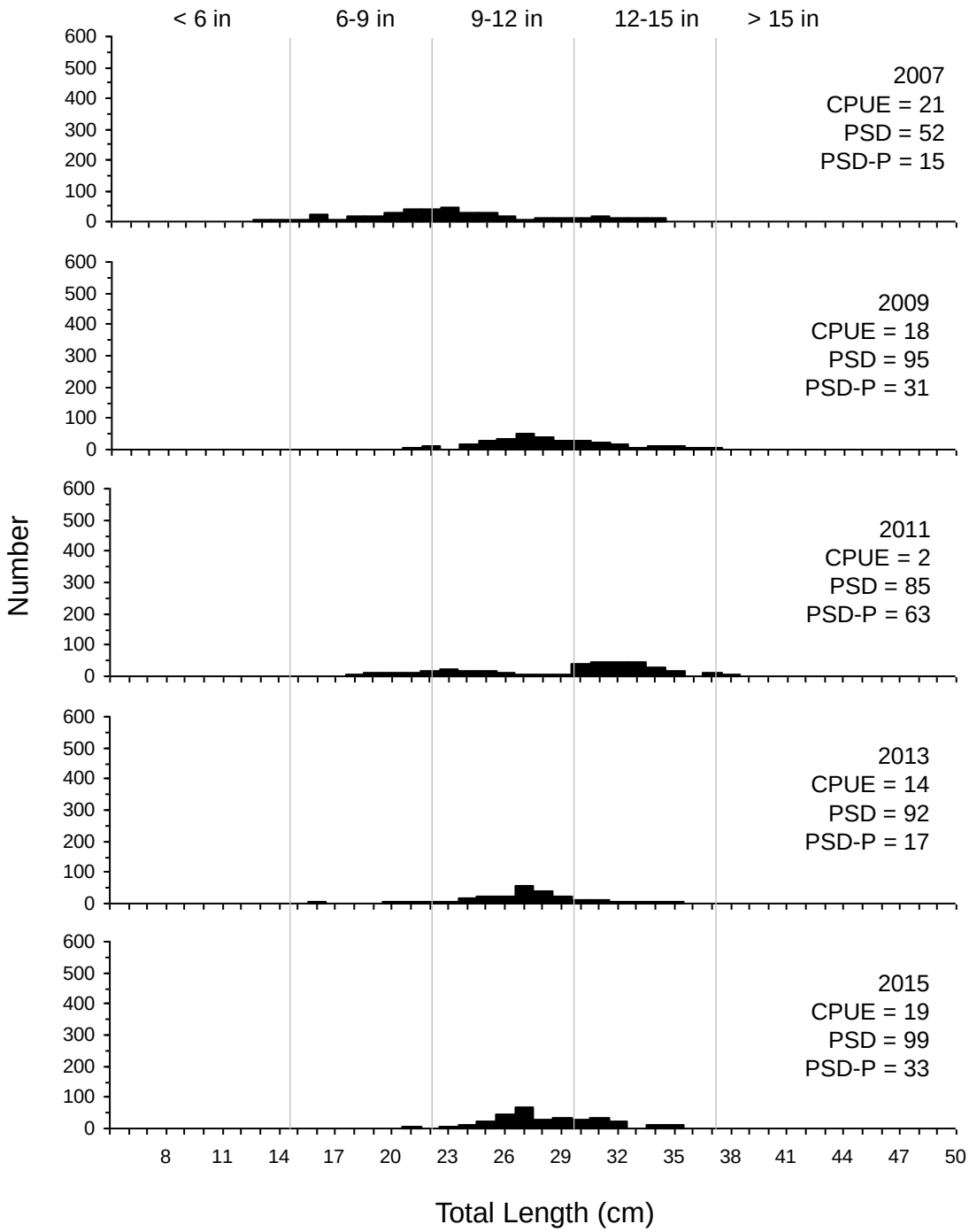

Figure 8. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black bullheads captured using frame nets in South Buffalo Lake, 2007-2015.

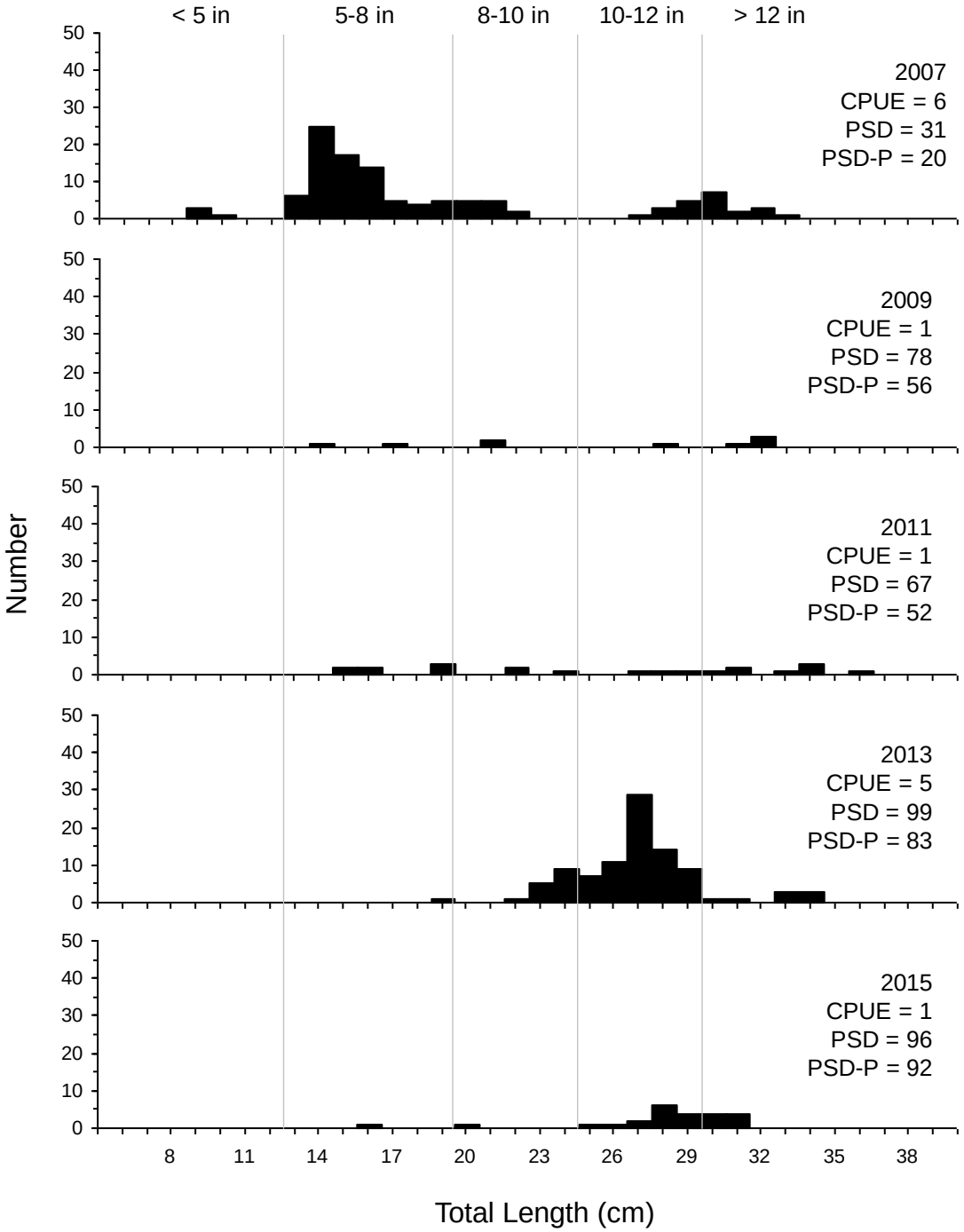

Figure 9. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black crappie captured using frame nets in South Buffalo Lake, 2007-2015.