

Richmond Lake

Site Description

Location

Water designation number (WDN)	03-0008-00
Legal description	T124N-R64W-Sec.1,12,13,14,25,36; T125N-R65W-Sec.19,22,23,24,25
County (ies)	Brown
Location from nearest town	5 miles north and 4 miles west of Aberdeen

Survey Dates and Netting Information

Dates of current survey	August 5-7, 2008 (FN, GN) September 8, 2008 (EF-WAE)
Date of most recent survey	August 7-9, 2007 (FN, GN) August 28, 2007 (EF-WAE)
Gill net sets (n)	6
Frame net sets (n)	18
Fall electrofishing (min)	61

Morphometry (Figure 1)

Watershed area (acres)	103,128
Surface area (acres)	829
Maximum depth (ft)	29
Mean depth (ft)	15

Ownership and Public Access

Richmond Lake is an impoundment managed by the SDGFP. Two main public access sites are present on Richmond Lake; these are located on the south (recreation area), and southwest (spillway access) shorelines and are maintained by the SDGFP. Richmond Lake is managed by the State of South Dakota and lands adjacent to the lake are generally under state and private ownership.

Watershed and Land Use

The Richmond Lake watershed is a sub-watershed within the Moccasin Creek watershed and is predominately comprised of agricultural lands with a small municipality (Leola) being located in the northwestern portion of the watershed. Much of the shoreline of Richmond Lake is rimmed with homes and cabins which are connected to a central sewer collection system (McLaury 2006).

Water Level Observations

Water levels on Richmond Lake are not monitored by SDDENR; however, water levels appeared to be at or slightly below full pool in late-Fall 2008.

Aquatic Vegetation and Exotics

Emergent and submersed vegetation is limited to the upper reaches of Richmond Lake. Bulrush and cattail predominate and cover less than 5% of the entire shoreline. McLaury (2006) reported the presence of sago pondweed, eel grass, and horned pondweed. Common carp has been the only exotic species reported in Richmond Lake.

Fish Management Information

Primary species	black crappie, bluegill, largemouth bass, walleye
Other species	black bullhead, channel catfish, common carp, fathead minnow, green sunfish, northern pike, pumpkinseed, rock bass, smallmouth bass, spottail shiner, white bass, white sucker, yellow perch
Lake-Specific regulations	NE Panfish Management Area: 10 daily; 50 possession Largemouth bass: minimum length 15" Walleye/Saugeye: minimum length 14"
Management classification	warm-water permanent impoundment
Fish Consumption Advisories	none

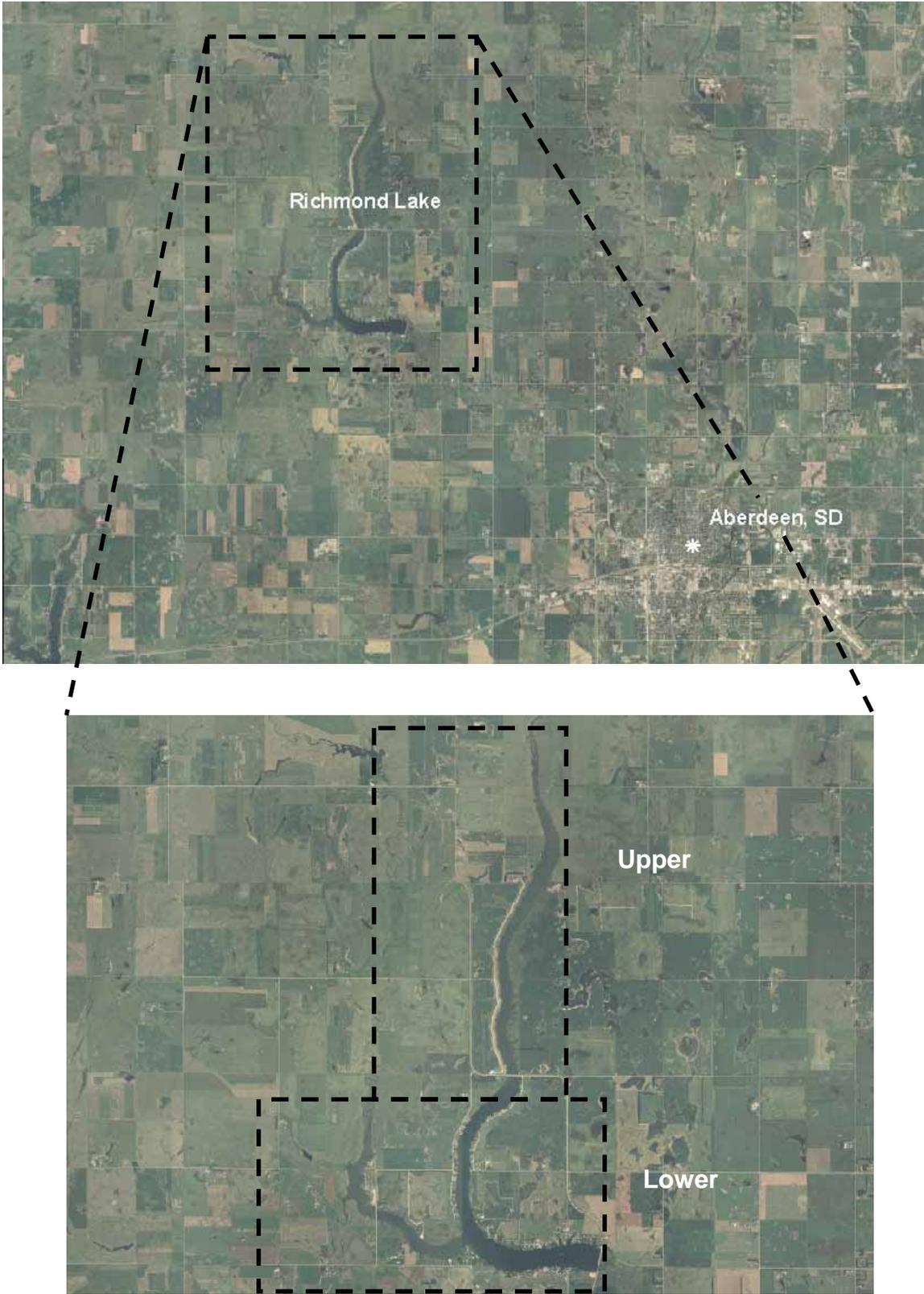


Figure 1. Map depicting location of Richmond Lake from Aberdeen, South Dakota. Map also includes upper and lower divisions.

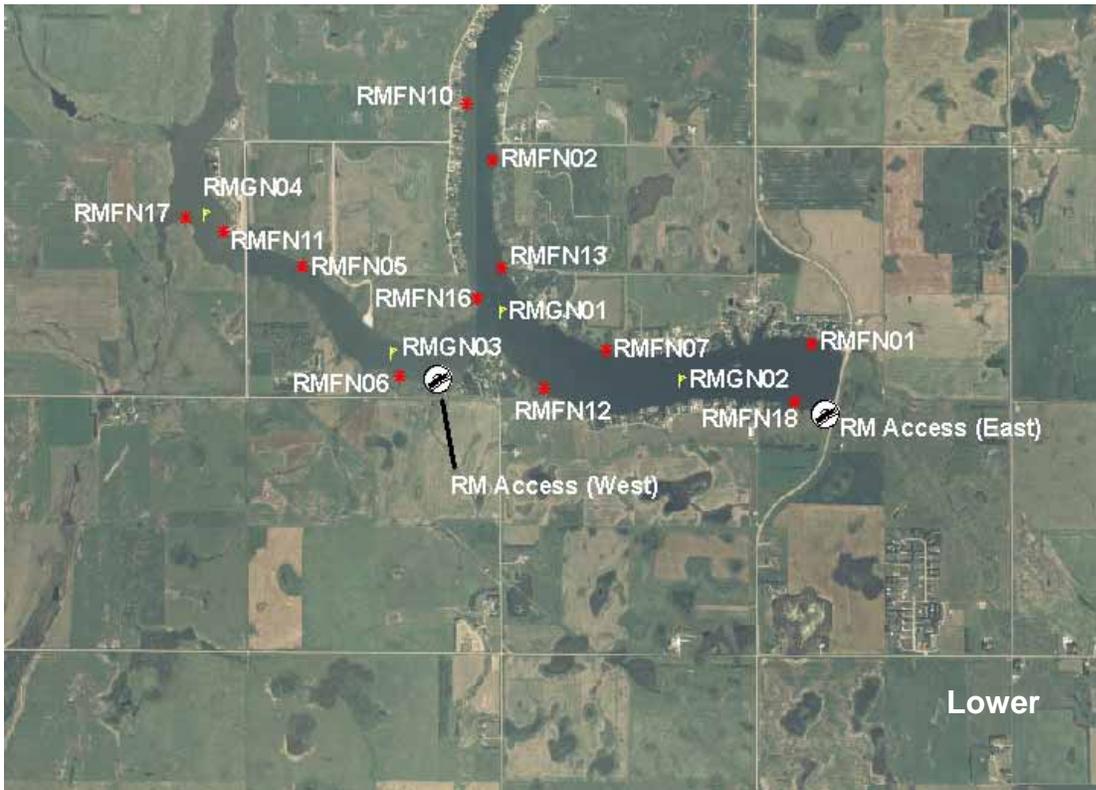
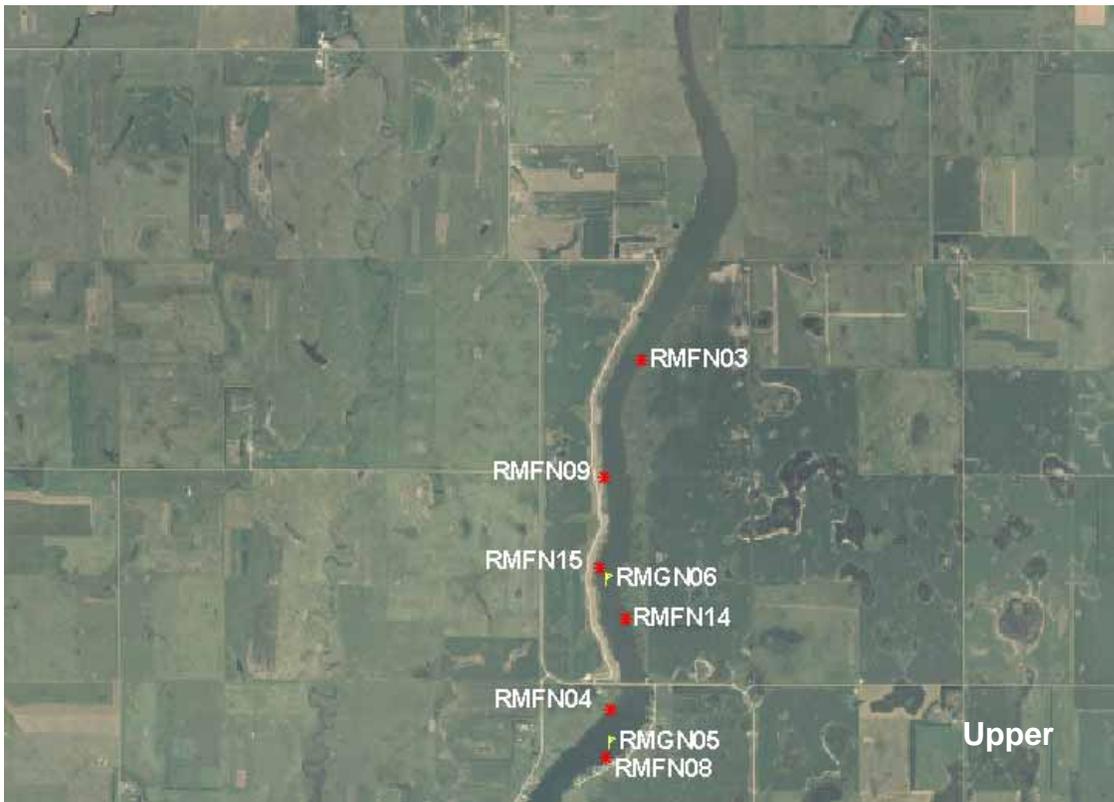


Figure 2. Map depicting access points and standardized net locations for Richmond Lake, Brown County, South Dakota. RMFN= frame nets, RMGN= gill nets

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 fall night electrofishing mean CPUE of stock-length largemouth bass ≥ 10 , a PSD of 40-70, and an RSD-P of 10-20.
- 4) Maintain a gill net mean CPUE of stock-length walleye ≥ 20 , a PSD of 10-40, and a PSD-P of <5 .
- 5) Maintain a frame net mean CPUE of stock-length bullhead ≤ 100 .

Results and Discussion

Richmond Lake is an impoundment located five miles north and four miles west of Aberdeen, SD. The Richmond Lake impoundment was constructed by the damming of Foot Creek in the mid 1930's by the Works Progress Administration (McLaury 2006). Foot Creek (west arm) and an unnamed tributary (north arm) are the major surface water inlets to Richmond Lake (Figure 1). Water exiting Richmond Lake through the outlet on the eastern side of the lake flows into Foot Creek and eventually drains into the James River (Figure 1; McLaury 2006).

Currently, Richmond Lake is primarily managed as a bluegill, black crappie, largemouth bass, and walleye fishery. Overall, as many as 17 species of fish contribute to the fishery in Richmond Lake.

Primary Species

Black crappie: Relative abundance of black crappie in Richmond Lake appeared high in 2008. The frame net mean CPUE of stock-length black crappie was 101.7 (Table 1) and well above the minimum objective (≥ 10 stock-length black crappie/net) in Richmond Lake (Table 3). Length-frequency analysis and age structure information for black crappie in the 2008 frame net catch indicated the presence of a relatively-strong 2005 year-class. This year-class dominated the size structure and resulted in the increased relative abundance (Table 2; Table 5; Figure 3). Since 2001, abundance of black crappie, as indexed by frame net mean CPUE has fluctuated from a low of 10.5 (2004) to high of 127.2 (2007), with the 2001-2008 average being 57.5 (Table 2).

Black crappie captured in frame nets during 2008 ranged in total length from 12 to 29 cm (4.7 to 11.4 in; Figure 3). Black crappie from the 2005 year-class comprised approximately 92% of black crappie sampled in the 2008 frame net catch and most exceeded quality-length (20 cm; 8 in) resulting in a PSD of 88 and a PSD-P of 2 (Table 1; Table 5; Figure 3).

Black crappie from the 2005 year-class, which dominated the population, had a weighted mean length at capture of 190 mm at age-2 and 209 mm at age-3 (Table 4). Mean W_r values of black crappies captured in frame nets ranged from 83-111 for all length categories sampled. The majority of black crappies captured in the 2008 frame net catch were in the quality- to preferred-length category which had a mean W_r value of 105.

Bluegill: The 2008 frame net mean CPUE of stock-length bluegill from Richmond Lake was 35.2 (Table 1) and above the minimum objective (≥ 25 stock-length bluegill/net; Table 3). Since 2001, bluegill relative abundance in Richmond Lake has fluctuated from a low of 18.7 (2001) to a high of 55.4 (2004) stock-length bluegill/net with the 2001-2008 average being 37.3 (Table 2). Based on the frame net mean CPUE in 2008, relative abundance appears to be high.

Bluegill captured in the 2008 frame net catch ranged in total length from 8 to 20 cm (3.1 to 7.9 in), had a PSD of 94 and a PSD-P of 2 (Figure 4). The 2008 PSD was above the objective range of 30-60 as bluegill from the strong 2005 year-class, which dominated the size structure and comprised approximately 93% of bluegill captured in the 2007 frame net catch, exceeded quality-length (15 cm; 6 in; Figure 4). The number of preferred-length (20 cm; 8 in) bluegill in the frame net samples declined each year from 2005-2007, likely the result of high mortality, either natural or by angling (Table 3; Figure 4). In 2008, the number of preferred-length bluegill remained similar to 2007 with a PSD-P of 2 (Table 3; Figure 4).

Bluegill from the 2005 year-class, which dominated the population, had a weighted mean length at capture of 157 mm at age-2 and 179 mm at age-3 (Table 6). Mean W_r values of bluegill captured in the 2008 frame net catch ranged from 111-119 for all length categories sampled. The majority of bluegills captured in the 2008 frame net catch were in the quality- to preferred-length category which had a mean W_r value of 119. Bluegill in the preferred- to memorable-length category had the lowest mean W_r value of 111; however, the mean W_r value was based on a three fish sub-sample.

Largemouth bass: Spring night electrofishing is typically used to assess largemouth bass populations in NE South Dakota; however, spring night electrofishing has not recently been conducted in Richmond Lake. Largemouth bass have consistently been sampled during fall night electrofishing in Richmond Lake. From 2001-2007, the fall night electrofishing mean CPUE of stock-length largemouth bass has ranged from a low of 7.0 (2007) to a high of 71.7 (2006) with the average being 29.1 (Table 2). Largemouth bass were not sampled in 2008.

Walleye: In 2008, the gill net mean CPUE of stock-length walleye was 1.5 (Table 1) and below the minimum objective (≥ 20 stock-length fish/net; Table 3). Since 2001, gill net mean CPUE values have ranged from a low of 1.5 (2008) to a high of 33.0 (2002) stock-length walleye/net with the 2001-2008 average being 16.9 (Table 2). Based on the 2008 gill net catch, relative abundance of walleye appears to be low in Richmond Lake.

The Richmond Lake walleye population has relied on large fingerling stockings to establish year-classes. Kaufman et al. (2008) reported that large fingerling stockings made in 2000; 2001 and 2004 were well represented in the 2006 gill net catch (Table 9; Table 10; Figure 5). However, it appears that mortality since the 2006 survey was high as few walleye from these year-classes were sampled in the 2007 or 2008 gill net catch. Walleye large fingerling stocks were made in 2006, 2007, and 2008 (Table 9); however, recruitment of the 2006 and 2007 year-classes appeared to be low as few walleye from these year classes were captured in the 2008 gill net catch (Table 10). Recruitment of walleye from the 2008 stocking is unknown and will be assessed in future surveys. Richmond Lake is scheduled for a large fingerling stocking in 2009.

Walleye captured in gill nets during 2008 ranged in total length from 19 to 62 cm (7.5 to 24.4 in), had a PSD of 67 and a PSD-P of 11 (Figure 5). In 2008, both the PSD and PSD-P values for walleye in the 2008 gill net catch exceeded the management objectives of 30-60 and 5-10, respectively (Table 3). Approximately 46% of walleye in the 2008 gill net catch exceeded the 356-mm (14-inch) minimum length restriction enforced on Richmond Lake (Figure 5).

Growth rates can be influenced by the length at which large fingerlings are stocked into Richmond Lake, as the size of stocked fish can vary greatly from year to year. Walleyes typically achieve the 356-mm (14-inch) minimum length restriction during their fourth growing season at age-3+ (Table 8). In 2008, the weighted mean total length at capture of age-4 walleye was 404 mm (Table 8). Mean W_r values of walleye captured in gill nets during 2008 ranged from 80 to 89 for all length categories sampled; however, sample size consisted of only nine walleye. The mean W_r value of stock-length walleye in the 2008 gill net catch was 83 (Table 1).

Other Species

Black bullhead: The frame net mean CPUE of stock-length black bullhead during 2008 was 1.5 (Table 1) and within the management objective (≤ 100 stock-length black bullhead/net) for Richmond Lake (Table 3). Since 2001, the frame net mean CPUE of stock-length black bullhead has ranged from a low of 1.5 (2008) to high of 45.9 (2002) with the 2001-2008 average being 19.1 (Table 2).

Frame net captured black bullheads from Richmond Lake during 2008 ranged in total length from 12 to 28 cm (4.7 to 11.0 in), had a PSD of 93 and an PSD-P of 0 (Figure 6). No growth information was collected in 2008. The majority of black bullheads in the 2008 frame net catch were in the quality- to preferred-length category which had a mean W_r value of 89.

Channel catfish: In 2008, mean CPUE values were 1.9 and 2.5 for frame nets and gill nets, respectively. The majority of channel catfish in the 2008 frame net catch ranged in total length from 30 to 41 cm (11.8 to 16.1 in) and appeared to be a single year class (Figure 7). Since 2001, the frame net mean CPUE has ranged from a low of 0.3 (2001, 2002) to a high of 4.2 (2007) with the 2001-2008 average being 1.5 (Table 2).

No growth information was available in 2008. Mean Wr values of frame net captured channel catfish ranged from 86 to 92 for all length categories sampled. The majority of channel catfish in the 2008 frame net catch were in the stock to quality – length category which had a mean Wr value of 86.

Smallmouth bass: Smallmouth bass populations are typically sampled using fall night electrofishing in north-east South Dakota. However, in recent years fall night electrofishing has been conducted on Richmond Lake in areas generally not considered optimal smallmouth bass habitat (i.e., rocky substrate). Anglers fishing near the Dam face and along the north road where rip-rap is present have impeded electrofishing efforts; therefore, fall night electrofishing sites have been adjusted over time. As a result, frame net mean CPUE of smallmouth bass may be a better indicator of smallmouth bass abundance in Richmond Lake.

Hubers (2002) suggested that abundance was likely high in areas of suitable habitat. Since 2001, the frame net mean CPUE of stock-length smallmouth bass has not exceeded 2.0, indicating a low density population (Table 2). However, areas that contain suitable habitat (i.e., rip-rap along the dam face and north road) are not conducive to frame netting as they drop-off sharply. In 2008, the frame net mean CPUE of stock-length fish was 0.8 (Table 1). Twenty-nine smallmouth bass ranging in total length from 13 to 40 cm (5.1 to 15.7 in) were captured in frame nets during 2008. The majority of smallmouth bass captured in the 2008 frame net catch were from the 2007 year class (age-1) and had a weighted mean total length at capture of 162 mm. Stock-length smallmouth bass in the 2008 frame net catch had a mean Wr value of 95 (Table 1).

White bass: From 1991-1999 no white bass were sampled during annual fish population assessments. From 2000-2005, white bass abundance was low, with gill net mean CPUE values of stock-length fish ≤ 5 fish/net night (Table 2). In 2006, the gill net mean CPUE of stock-length white bass increased to 29.0, as a relatively-strong cohort ranging in total length from 19 to 26 cm (7.5 to 10.2 in) successfully recruited to the population (Figure 8). The gill net mean CPUE decreased to 10.2 in 2007 and remained similar in 2008 with a gill net mean CPUE of 10.5 (Table 2).

White bass sampled in the 2008 gill net catch ranged in total length from 17 to 28 cm (6.7 to 11.0 in), had a PSD of 81 and a PSD-P of 0 (Figure 8). No growth information was collected in 2008. Most white bass captured in the 2008 gill net catch from Richmond Lake were in the quality- to preferred-length category and had a mean Wr value of 89.

Yellow Perch: The gill net mean CPUE of stock-length yellow perch in 2008 was 4.8 (Table 1) and indicative of low relative abundance. Since 2001, the gill net CPUE of stock-length yellow perch has fluctuated from a low of 0.6 (2006) to a high of 7.5 (2003; Table 2). Hubers (2002) suggested that low abundance since the inception of annual surveys indicates that the yellow perch population abundance may be limited by habitat characteristics in Richmond Lake.

Other: Common carp, northern pike and white sucker were also captured in low numbers during the 2008 survey (Table 1).

Management Recommendations

- 1) Conduct fish community assessment surveys on an annual basis (next survey scheduled in summer 2009) to monitor fish relative abundance, fish population size structure, fish growth, and stocking success.
- 2) Conduct fall night electrofishing on an annual basis to monitor walleye young-of-the-year abundance and to assess the largemouth bass population.
- 3) Collect otoliths from black crappie, bluegill, and walleye; scales from largemouth bass and smallmouth bass to assess the age structure and growth rates of each population.
- 4) Stock channel catfish fingerlings (≈ 50 fingerlings/acre) every third year (when available) in an attempt to bolster the channel catfish fishery in Richmond Lake.
- 5) Stock large fingerling walleyes (≈ 25 walleye/acre) if fall night electrofishing CPUE of young-of-the-year walleye and gill netting results warrant (i.e., low gill net CPUE of < 250 mm (10 inch) walleye and/or fall night electrofishing CPUE of age-0 walleye < 75 fish/hour). The walleye population in Richmond Lake should be maintained at a high-density (i.e., a gill net mean CPUE of approximately 20 stock-length walleye/net-night) to effectively impact black crappie and bluegill size structures through predation.
- 6) Evaluate walleye and black bass (largemouth and smallmouth) population dynamics and implement regulations to benefit the population and comply with tool box options.

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 Richmond Lake, 2008. Confidence intervals include 80 percent (\pm CI-80) or 90 percent (\pm CI-90). BLB= black bullhead; BLC= black crappie; BLG= bluegill; CCF= channel catfish; COC= common carp; LMB= largemouth bass; NOP= northern pike; 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	0.8	93	7	0	---	89	1
BLC	101.7	15.9	88	1	2	0	106	1
BLG	35.2	8.2	94	2	2	1	119	1
CCF	1.9	1	6	7	0	---	86	< 1
COC	1.9	0.8	76	13	12	9	97	2
LMB	0.3	0.2	40	52	20	43	100	8
NOP	0.3	0.1	20	43	20	43	79	10
SMB	0.8	0.6	13	16	7	11	95	2
WAE	0.7	0.3	31	24	15	19	82	3
WHB	14.1	4.4	98	1	1	1	89	1
WHS	0.2	0.1	100	0	100	0	91	14
YEP	0.4	0.5	75	25	13	23	98	4
<i>Gill nets</i>								
BLB	3.5	4.3	86	13	0	---	90	2
BLC	61.3	25.5	82	3	0	---	107	< 1
BLG	0.3	0.3	100	0	0	---	118	22
CCF	2.5	1.9	7	11	0	---	93	2
COC	2.0	1.8	42	26	25	23	101	4
NOP	0.3	0.3	0	---	0	---	90	1
WAE	1.5	0.3	67	31	11	21	83	5
WHB	10.5	7.7	81	8	0	---	90	1
YEP	4.8	1.6	41	16	7	8	101	2
<i>Electrofishing</i>								
WAE ¹ (age-0)	2.9	---	---	---	---	---	---	---

¹ fall night electrofishing.

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 Richmond Lake, 2001-2008. BLB= black bullhead; BLC= black crappie; BLG= bluegill; CCF= channel catfish; COC= common carp; GSF= green sunfish; LMB= largemouth bass; NOP= northern pike; ROB= rock bass; SMB= smallmouth bass; WAE= walleye; WHB= white bass; WHS= white sucker; YEP= yellow perch

Species	CPUE								Mean
	2001	2002	2003	2004	2005	2006 ²	2007 ²	2008	
<i>Frame nets</i>									
BLB	37.7	45.9	21.2	22.3	2.1	2.8	19.2	1.5	19.1
BLC	26.6	65.2	24.1	10.5	40.3	64.3	127.2	101.7	57.5
BLG	18.7	33.4	41.3	55.4	23.8	46.9	43.9	35.2	37.3
CCF	0.3	0.3	1.9	0.5	0.9	2.1	4.2	1.9	1.5
COC	0.9	0.4	0.4	0.5	3.3	0.9	1.3	1.9	1.2
GSF	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LMB	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.3	0.1
NOP	0.7	0.8	0.6	0.1	0.3	0.3	0.2	0.3	0.4
ROB	0.5	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1
SMB	1.8	1.2	0.7	0.5	1.4	1.4	0.6	0.8	1.1
WAE	2.5	10.9	8.6	13.4	2.6	13.5	1.5	0.7	6.7
WHB	0.8	1.2	5.8	5.5	2.7	59.7	28.1	14.1	14.7
WHS	0.2	0.7	0.9	1.1	0.5	1.4	0.8	0.2	0.7
YEP	0.4	0.3	0.7	0.1	0.3	0.0	0.2	0.4	0.3
<i>Gill nets</i>									
BLB	37.0	23.5	18.7	2.0	1.3	4.0	6.3	3.5	12.0
BLC	5.8	9.8	1.3	0.8	4.7	18.4	27.2	61.3	16.2
BLG	1.5	1.8	1.5	1.0	0.7	1.0	0.2	0.3	1.0
CCF	0.0	0.2	0.3	0.5	0.7	1.6	2.7	2.5	1.1
COC	1.0	0.3	0.2	1.8	0.8	7.6	5.5	2.0	2.4
LMB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOP	0.3	1.0	0.5	0.0	0.0	0.0	0.0	0.3	0.3
SMB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WAE	17.0	33.0	26.2	25.8	10.8	18.0	2.7	1.5	16.9
WHB	0.0	3.0	2.3	1.5	4.0	29.0	10.2	10.5	7.6
WHS	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
YEP	6.7	5.7	7.5	3.8	4.5	0.6	0.8	4.8	4.3
<i>Electrofishing</i>									
LMB ¹	50.6	30.9	13.7	20.6	8.9	71.7	7.0	---	29.1
WAE ¹ (age-0)	10.1	2.0	0.0	0.0	0.0	0.0	0.0	2.9	1.9

¹ Fall night electrofishing.

² Monofilament gill net mesh size change (.75", 1", 1.25", 1.5", 2" and 2.5")

Table 3. Mean catch rate (CPUE; gill/frame nets= catch/net night, electrofishing= catch/hour), proportional size distribution 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 Richmond Lake, 2001-2008. BLB= black bullhead; BLC= black crappie; BLG= bluegill; LMB= largemouth bass; WAE= walleye

Species	2001	2002	2003	2004	2005	2006 ²	2007 ²	2008	Average	Objective
<i>Frame nets</i>										
BLB										
CPUE	38	46	21	22	2	3	19	2	19	≤ 100
PSD	84	100	100	99	97	61	23	93	82	---
PSD-P	6	18	28	30	79	41	1	0	25	---
Wr	92	90	84	89	84	86	78	89	87	---
BLC										
CPUE	27	65	24	10	40	64	127	102	57	≥ 10
PSD	69	100	100	76	83	11	13	88	68	30-60
PSD-P	38	7	43	66	13	2	2	2	22	5-10
Wr	116	115	106	107	117	110	95	106	109	
BLG										
CPUE	19	33	41	55	24	47	44	35	37	≥ 25
PSD	68	98	99	36	75	82	90	94	80	30-60
PSD-P	23	18	47	24	47	22	2	2	23	5-10
Wr	145	118	117	108	119	106	102	119	117	---
<i>Gill nets</i>										
WAE										
CPUE	17	33	26	26	11	18	3	2	17	≥ 20
PSD	31	19	13	24	32	34	81	67	38	30-60
PSD-P	0	4	1	1	3	3	44	11	8	5-10
Wr	87	90	90	88	90	83	78	83	86	---
<i>Electrofishing</i>										
LMB ¹										
CPUE	51	31	14	21	9	72	7	---	29	≥ 10
PSD	85	94	94	59	78	33	43	---	69	30-60
PSD-P	41	61	65	47	22	17	29	---	40	5-10
Wr	117	121	117	120	126	112	110	---	118	---
WAE ¹										
CPUE (age-0)	10	2	0	0	0	0	0	3	2	---

¹ Fall night electrofishing.

² Monofilament gill net mesh size change (.75", 1", 1.25", 1.5", 2" and 2.5")

Table 4. Weighted mean length at capture (mm) for black crappie captured using frame nets in Richmond Lake, 2007-2008.

Year	N	Age					
		1	2	3	4	5	6
2008	1,842	136	128	209	240	294	---
2007	2,290	---	190	182	231	227	281

Table 5. Numbers of black crappie sampled (n) using frame nets by year class in Richmond Lake, 2007-2008.

Survey Year	Year Class							
	2008	2007	2006	2005	2004	2003	2002	2001
2008		20	70	1,689	46	17		
2007	---			2,072	142	37	1	38

Table 6. Weighted mean length at capture (mm) for bluegill captured using frame nets in Richmond Lake, 2007-2008.

Year	N	Age							
		1	2	3	4	5	6	7	8
2008	632	100	148	179	201	---	---	---	---
2007	793		157	169	181	194	214	226	234

Table 7. Numbers of bluegills sampled (n) using frame nets by year class in Richmond Lake, 2007-2008.

Survey Year	Year Class									
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2008		32	3	590	7					
2007	---			620	95	55	6	3	10	4

Table 8. Weighted mean length at capture (mm) for walleye captured in experimental gill net sets in Richmond Lake, 2001-2008. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends.

Year	N	Age												
		1	2	3	4	5	6	7	8	9	10	11	12	13
2008 ¹	13	203	247	---	404	---	432	480	624	495	---	---	---	---
2007 ¹	19	205	455	380	522	---	542	493	---	521	---	500	513	631
2006 ¹	90	---	329	427	411	427	470	634	593	---	---	---	---	---
2005 ¹	93	245	---	300	375	434	---	564	495	---	---	---	---	---
2004	102	---	---	358	386	426	---	549	485	---	---	---	---	---
2003	158	---	307	361	433	490	458	450	639	---	---	---	---	---
2002	233	227	323	387	469	454	482	524	565	---	---	---	---	---
2001	127	253	349	401	431	461	477	504	---	---	---	---	---	---

¹Age assignments made using otoliths; scales were used in previous years.

Table 9. Stocking history including size and number for fishes stocked into Richmond Lake, 1995-2008. SXW= saugeye; CCF= channel catfish; WAE= walleye

Year	Species	Size	Number
1995	SXW	large fingerling	9,262
1996	SXW	large fingerling	10,212
1997	SXW	large fingerling	44,467
1998	SXW	large fingerling	6,030
2000	CCF	large fingerling	25,000
	WAE	large fingerling	9,285
2001	WAE	large fingerling	60,984
2004	WAE	large fingerling	32,535
2006	WAE	large fingerling	23,828
2007	WAE	large fingerling	11,766
2008	WAE	large fingerling	4,218

Table 10. Numbers of walleye sampled (n) using gill nets by year class and associated stocking history (Number stocked x 1,000) for walleye captured in Richmond Lake, 2001-2008.

Survey Year	Year Class													
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
2008 ^{1,2}		3	3		3		1	1	1	1				
2007 ^{1,2}	---		3	1	5	1		1	4		1		1	1
2006 ^{1,2}	---	---			60	1	3	17	7	1	1			
2005 ¹	---	---	---		47		1	39	4		1	1		
2004	---	---	---	---				21	8	1		2		
2003	---	---	---	---	---			101	48	2	3	2	1	
2002	---	---	---	---	---	---		48	138	24	7	4	8	
2001	---	---	---	---	---	---	---		62	32	10	12	6	
# stocked														
fry					---	---	---	---	---	---	---	---	---	---
sm. fingerling					---	---	---	---	---	---	---	---	---	---
lg. fingerling	4	12	28		33	---	---	61	9	---	6	44	10	9

¹Age assignments made using otoliths; scales were used in previous years.

² Monofilament gill net mesh size change (.75", 1", 1.25", 1.5", 2" and 2.5")

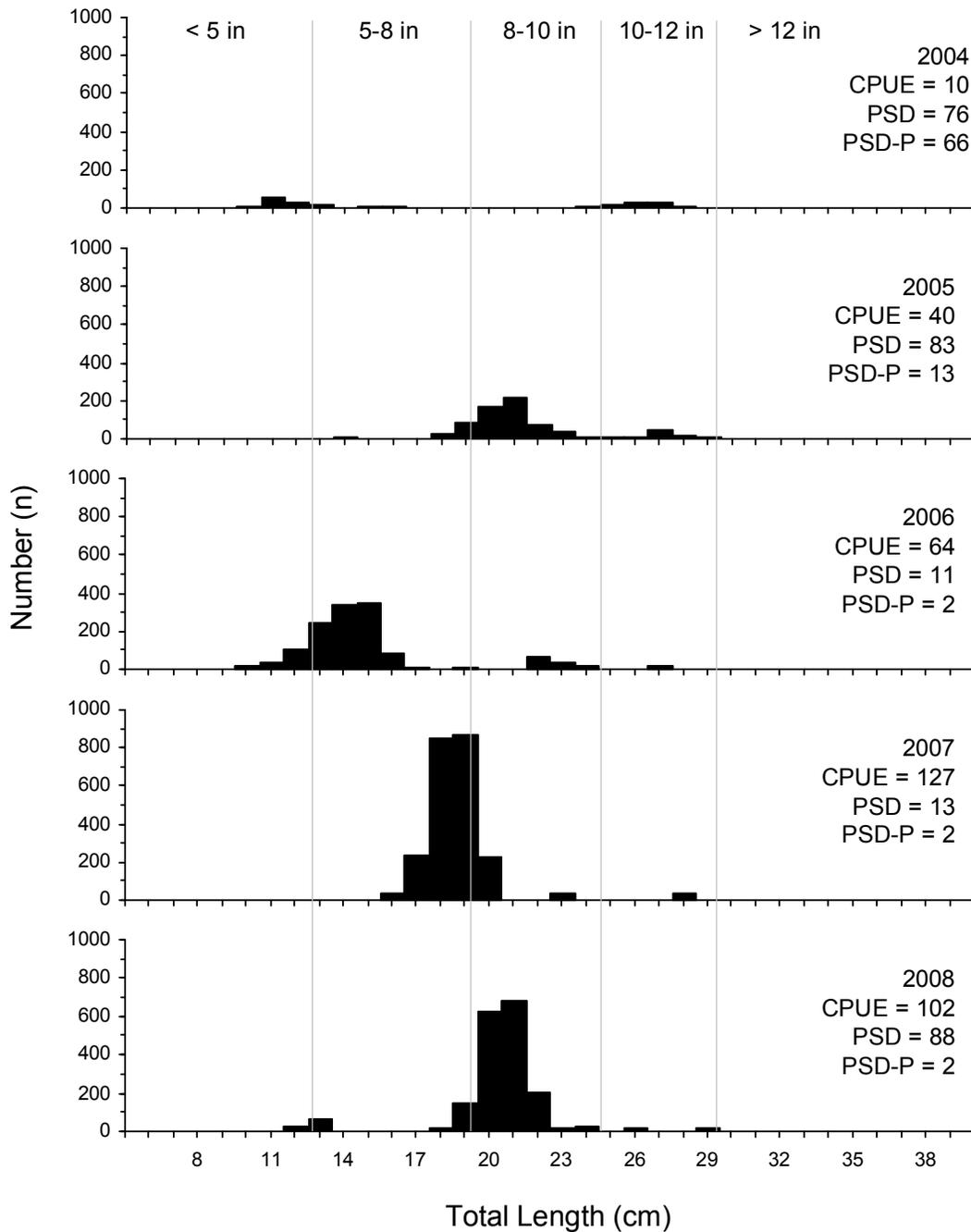


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black crappie captured using frame nets in Richmond Lake, 2004-2008.

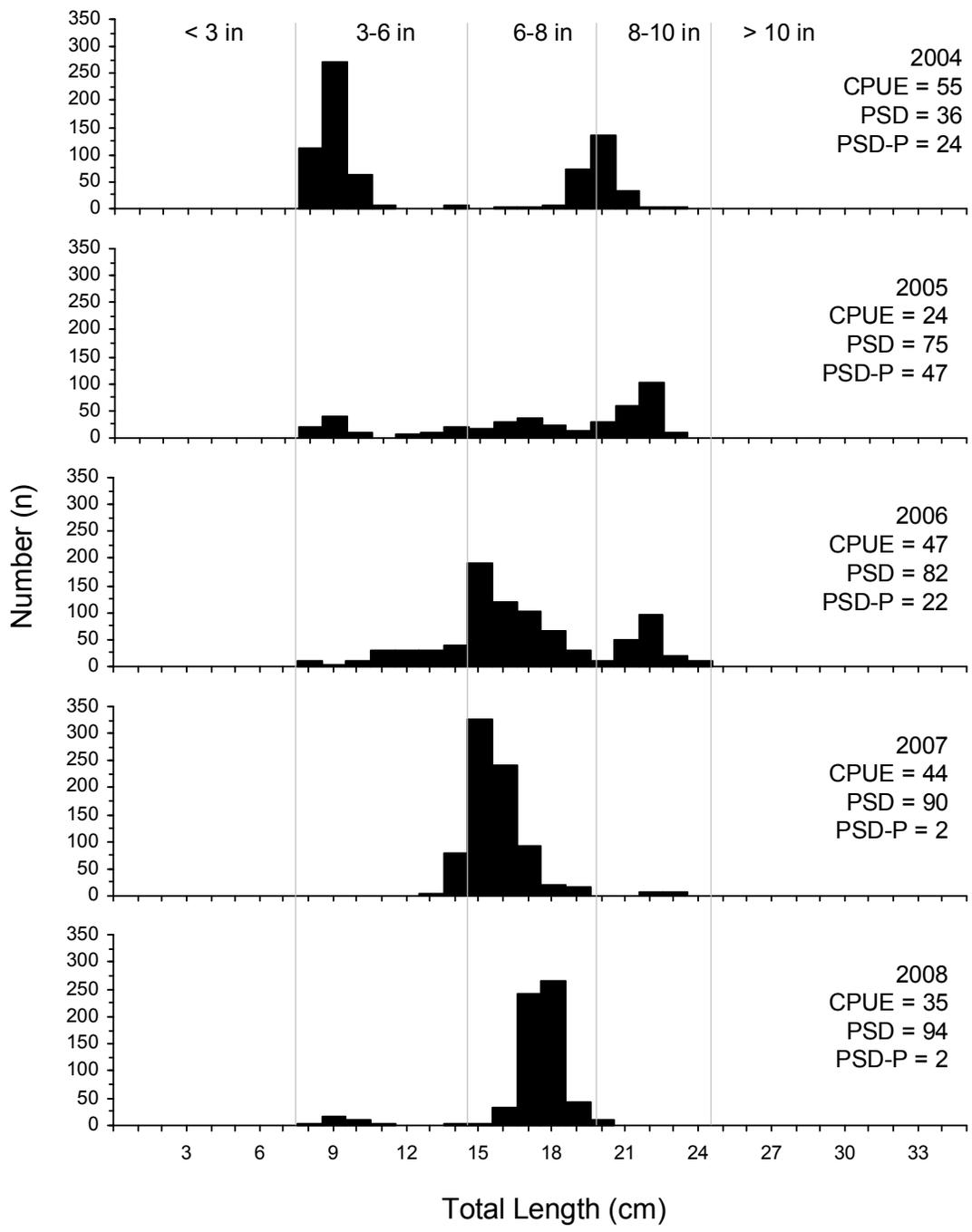


Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for bluegill captured using frame nets in Richmond Lake, 2004-2008.

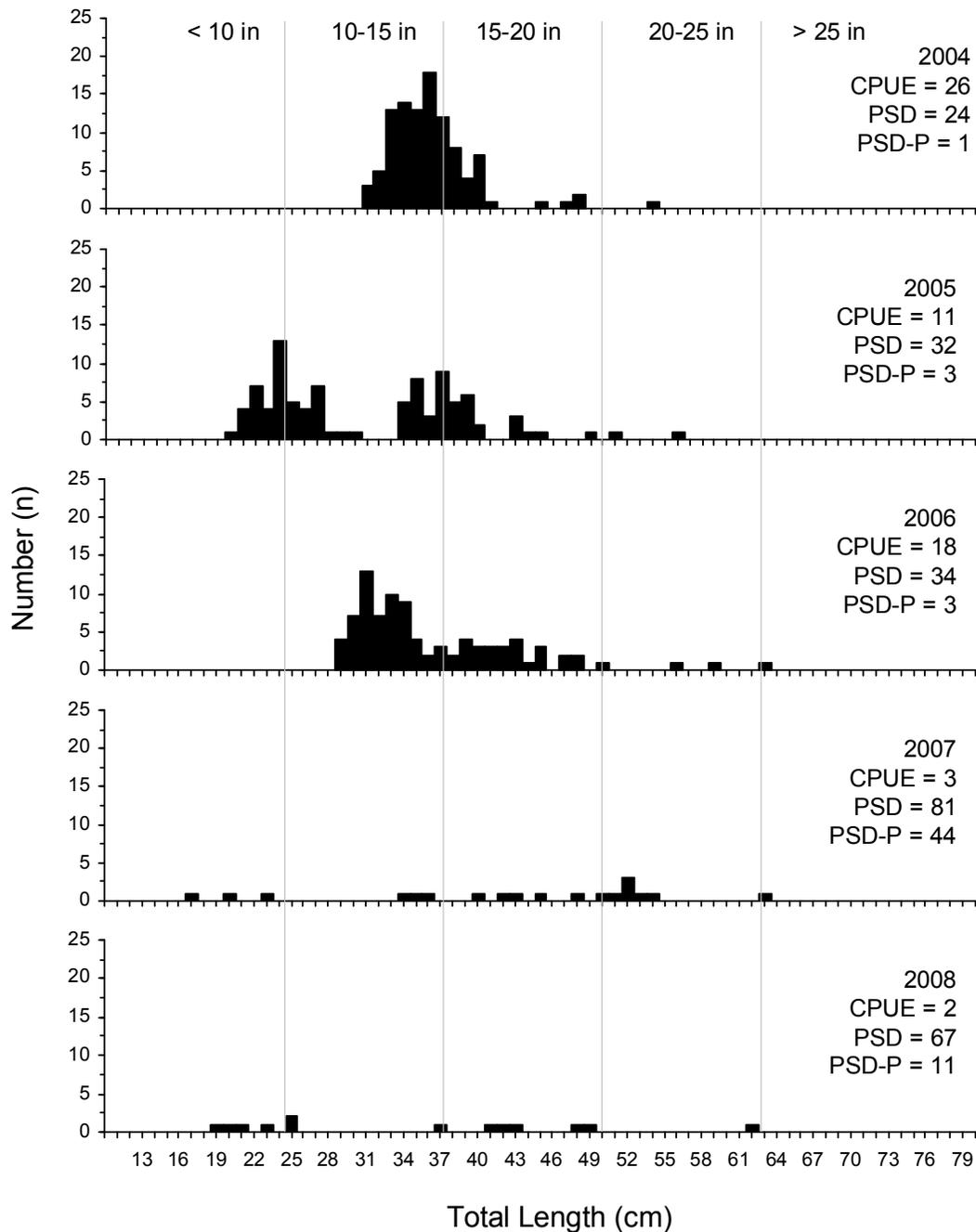


Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for walleye captured using gill nets in Richmond Lake, 2004-2008.

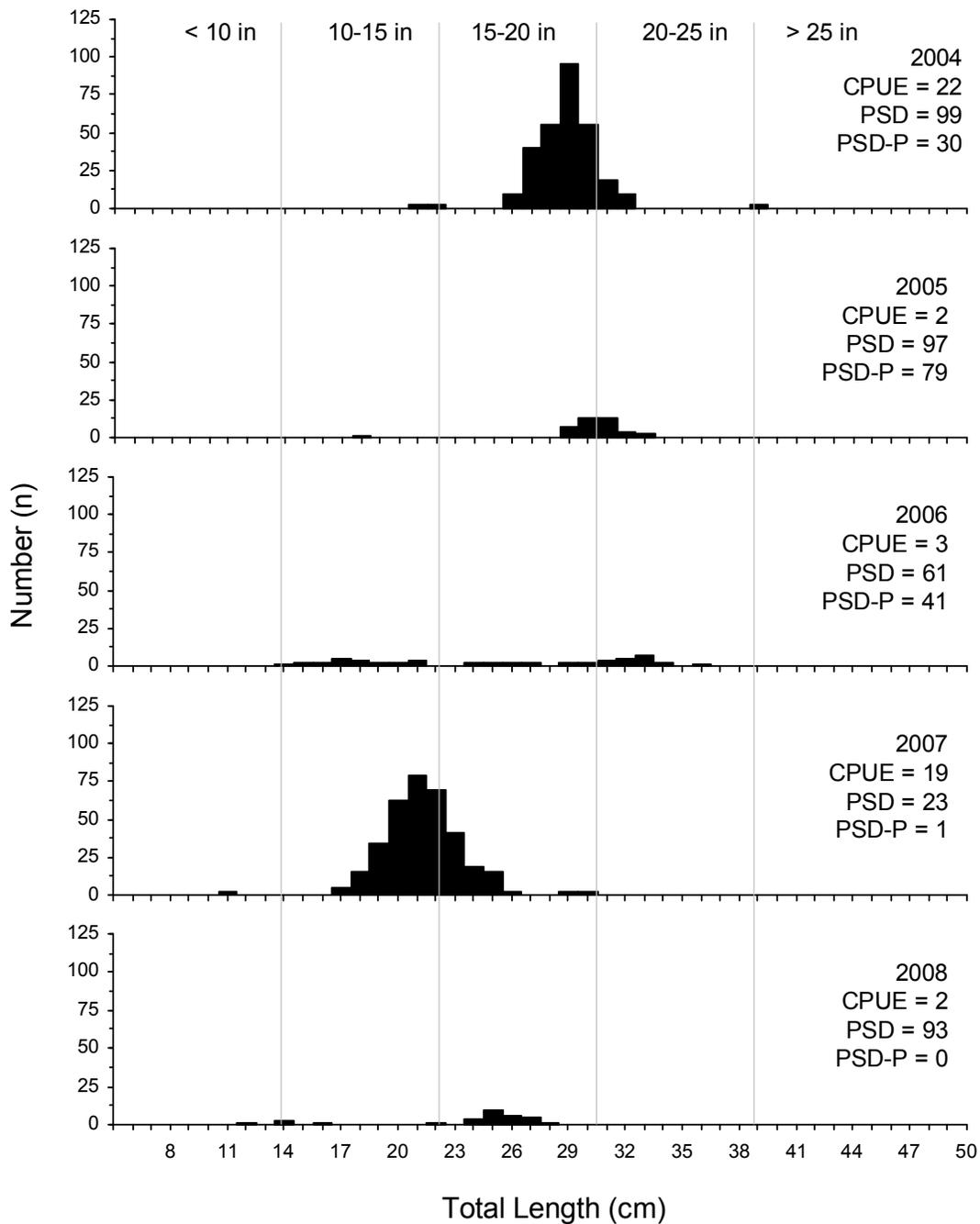


Figure 6. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black bullhead captured using frame nets in Richmond Lake, 2004-2008.

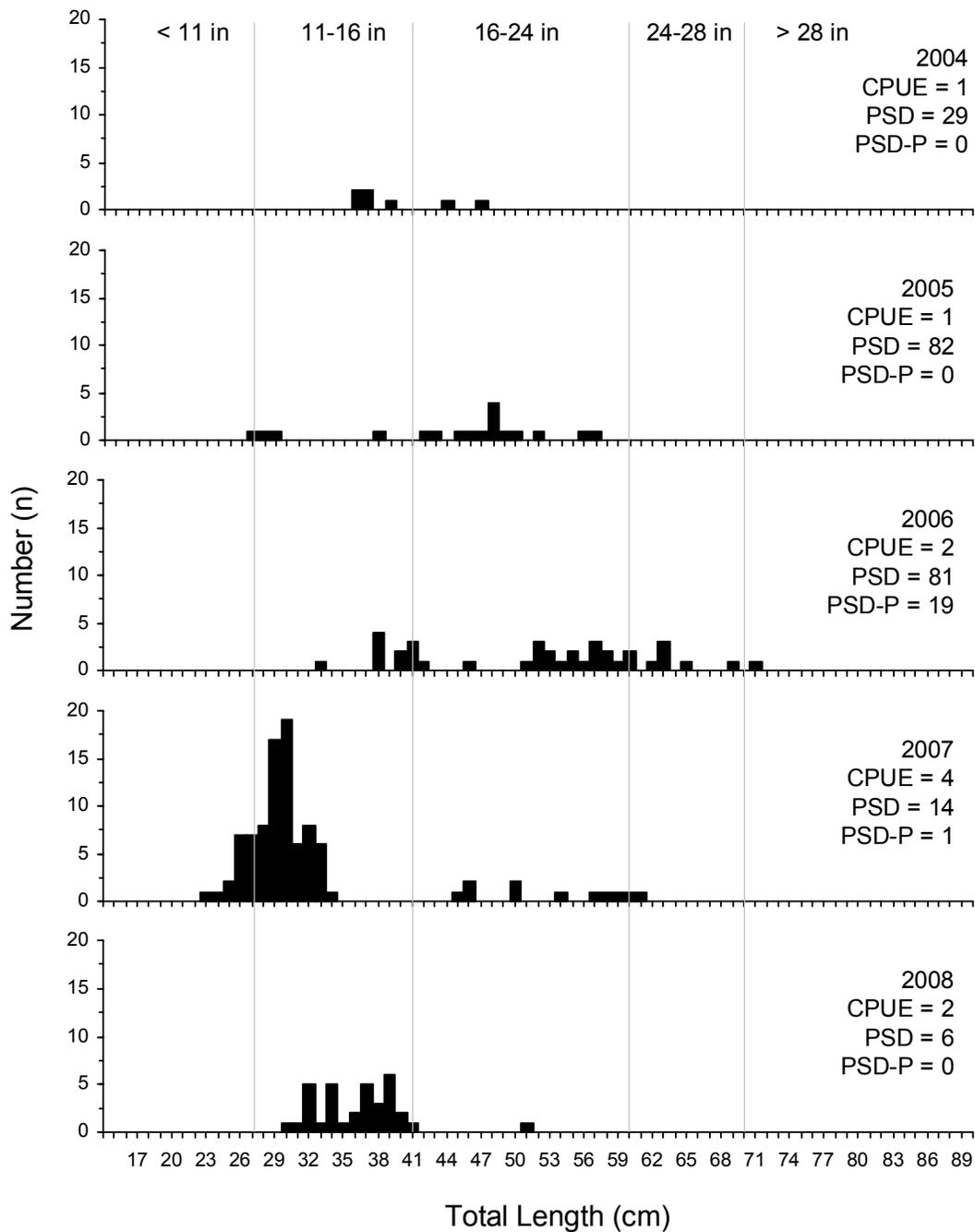


Figure 7. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for channel catfish captured using frame nets in Richmond Lake, 2004-2008.

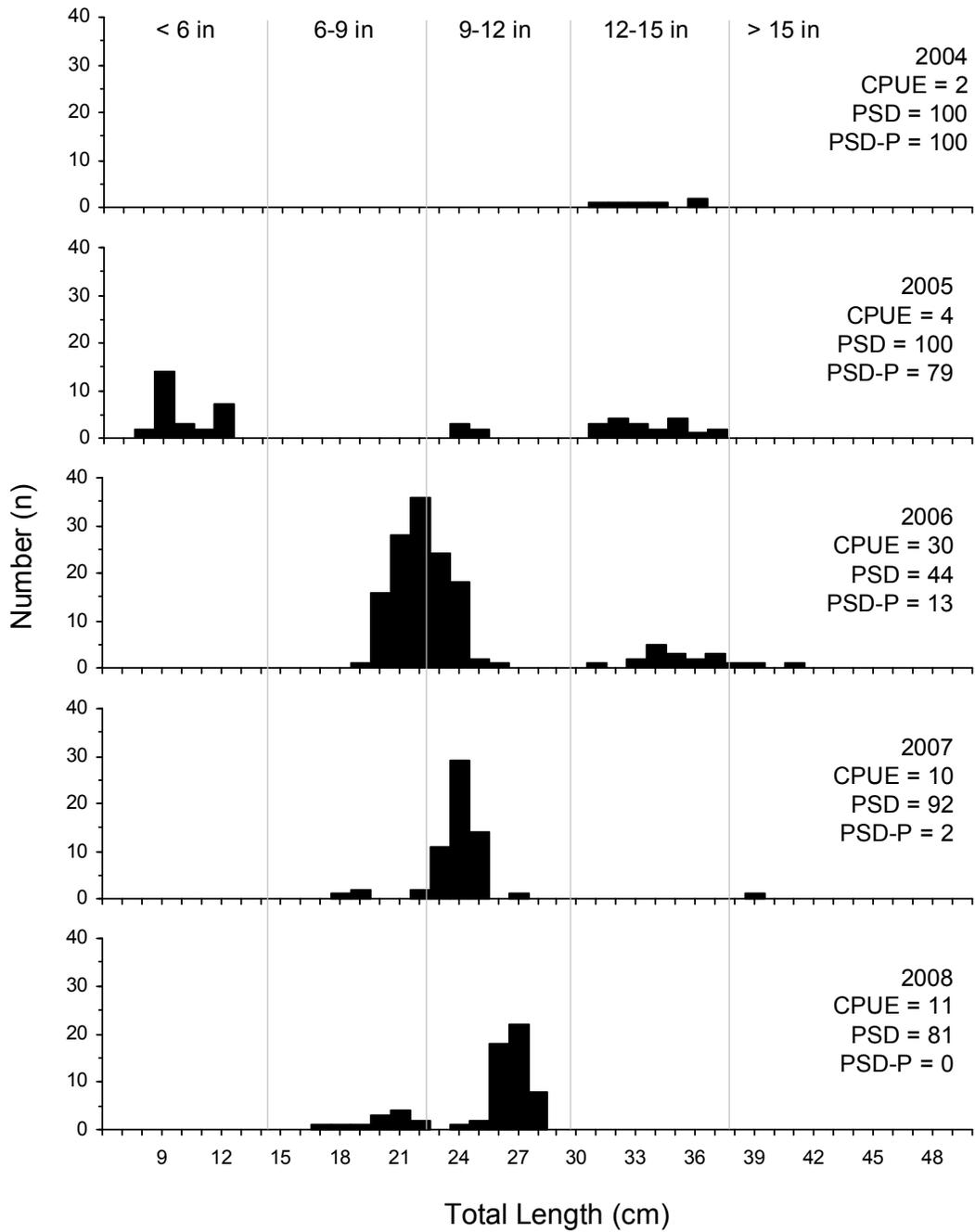


Figure 8. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for whitebass captured using frame nets in Richmond Lake, 2004-2008.