Roy Lake

Site Description

Location

Water designation number (WDN)	48-0033-00
Legal description	T126N-R55W-Sec.20,21,22,27,28,29,31,32,33,34
County (ies)	Marshall
Location from nearest town	2 miles south and 1 mile west of Lake City, SD

Survey Dates and Sampling Information

Dates of current survey	June 23, 2008 (EF-LMB) July 8-10, 2008 (FN, GN) September 15, 2008 (EF-WAE)
Date of most recent survey	July 10-12, 2007 (FN, GN) September 25, 2007 (EF-WAE)
Gill net sets (n)	6
Frame net sets (n)	24
Electrofishing-LMB (min)	61
Electrofishing-WAE (min)	60

Morphometry (Figure 1)

Watershed area (acres)	9,614
Surface area (acres)	2,054
Maximum depth (ft)	21
Mean depth (ft)	10

Ownership and Public Access

Roy Lake is a meandered lake managed by the SDGFP. Three public access sites are present. Two are located within the Roy Lake State Park-West Unit (northwest portion of lake) and the other on the northeastern shore within the Roy Lake State Park-East Unit; all are maintained by the SDGFP (Figure 1). Roy Lake is owned by the State of South Dakota and lands adjacent to the lake are generally under state and private ownership.

Watershed and Land Use

Major land use in the Roy Lake watershed is agricultural, primarily pasture and rangeland (SDDENR 2007).

Water Level Observations

The South Dakota Water Management Board established Ordinary High Water Mark is 1795.7 fmsl, and the outlet elevation of Roy Lake is 1795.2 fmsl. On May 6, 2008, the elevation of Roy Lake was above the OHWM with an elevation of 1796.1. By October 28, 2008 water levels on Roy Lake had declined to an elevation of 1795.7 fmsl.

Aquatic Vegetation and Exotics

Cattail and bulrushes are present on approximately 75% of the shoreline, and submersed vegetation is extensive in shallow areas. Submersed plant species identified in Roy Lake include widgeon grass and sago pondweed (Stueven and Stewart 1996). Common carp are the only exotic species that has been reported in Roy Lake.

Fish Management Information

Primary species	black crappie, bluegill, largemouth bass, smallmouth bass, walleye, yellow perch
Other species	black bullhead, bluegill x green sunfish hybrid, common carp, fathead minnow, green sunfish, Johnny darter, northern pike, white sucker
Lake-specific regulations	NE Panfish Management Area: 10 daily; 50 possession. Smallmouth/Largemouth bass daily limit of 3. Only those <12", or 18" and longer may be taken. Of those no more than one may be 18" or longer. Walleye/Saugeye: minimum length 14".
Management classification	warm-water permanent
Fish Consumption Advisories	none

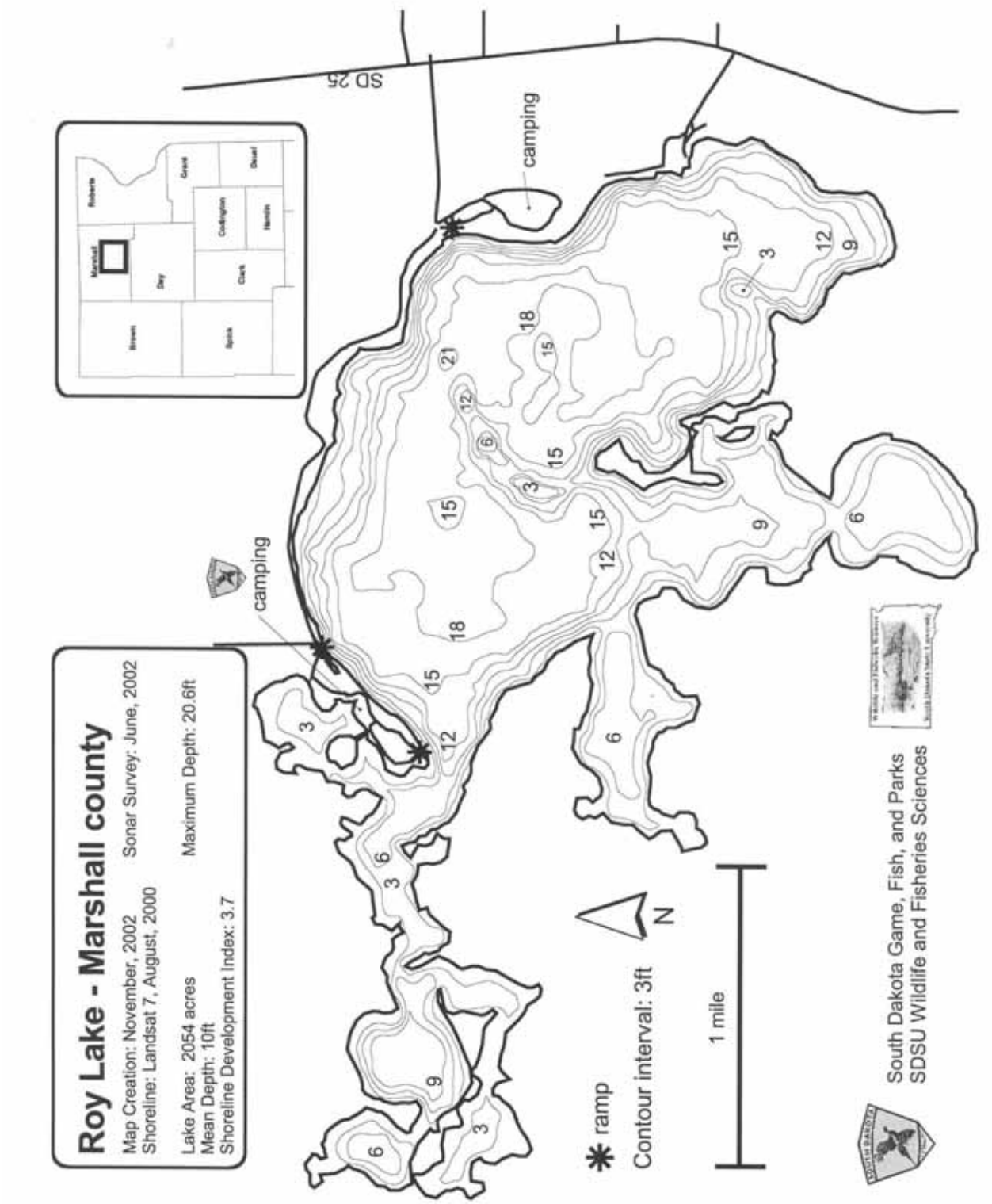

Figure 1. Roy Lake contour map.

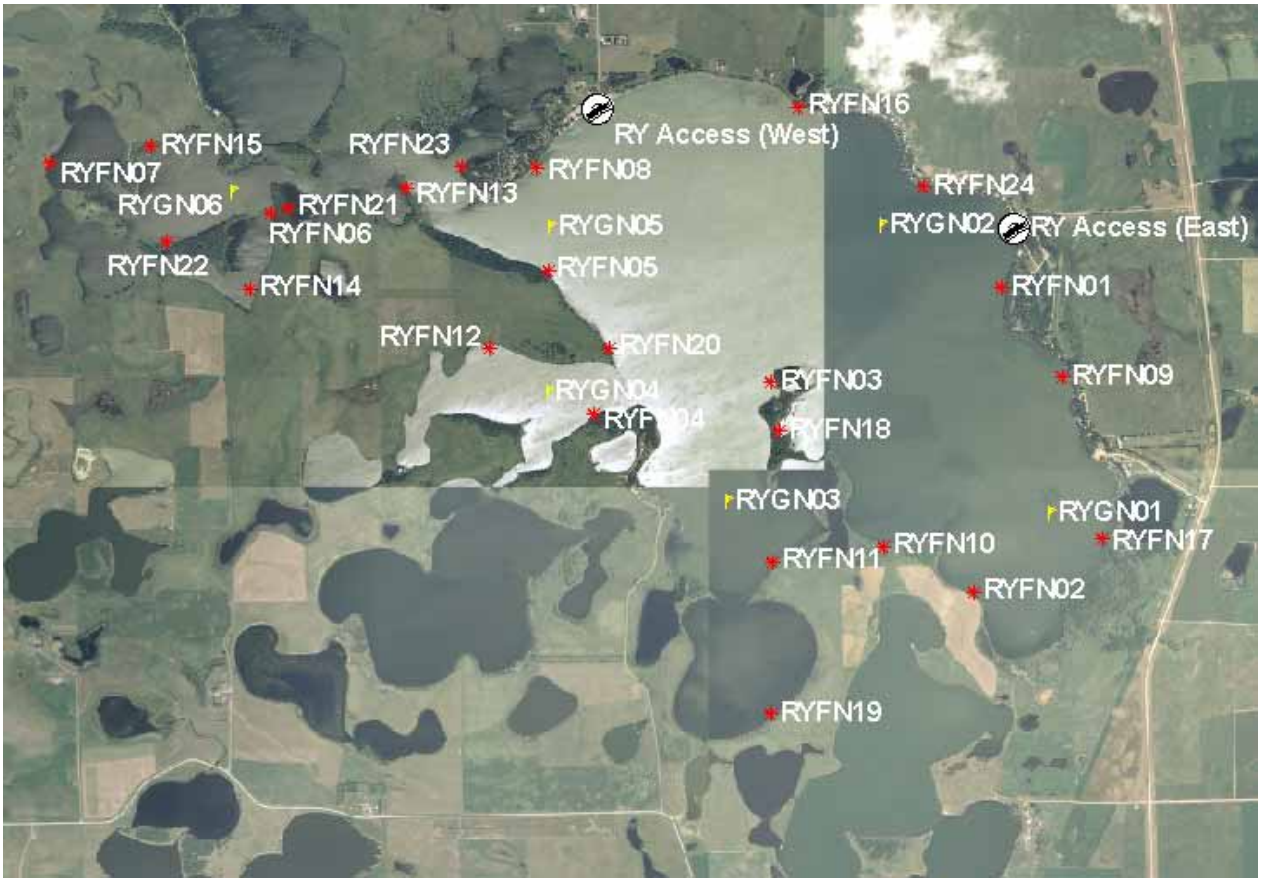

Figure 2. . Map depicting access sites and standardized net locations for Roy Lake, Marshall County, South Dakota. RYFN= frame nets, RYGN= gill nets

Management Objectives

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

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

3) Maintain a mean spring night electrofishing CPUE of stock-length largemouth bass ≥ 10, a PSD of 40-70, and a PSD-P of 10-20.

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

5) Maintain a moderate density smallmouth bass population with a PSD of 40-70, and a PSD-P of 10-20.

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

7) Maintain a mean gill net CPUE of stock-length yellow perch ≥ 25, a PSD of 30-60, and a PSD-P of 5-10.

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

Results and Discussion

Roy Lake is a permanent, natural lake situated in the Coteau des Prairie. Major surface water inlets flow into Roy Lake from Clear Lake on the east, Cottonwood Lake to the north and Four Mile/Bullhead Lakes to the northwest. Discharge from the surface outlet on Roy Lake enters Lost Lake before draining into Cattail/Kettle Lakes (SDDENR 2007).

Roy Lake is a popular destination for water-based recreation primarily boating, swimming and fishing (SDDENR 2007). A resort, a state park, and approximately 140 homes and cabins are located on the northern shoreline of Roy Lake; while the southern shore remains relatively undeveloped. Roy Lake is primarily managed as a panfish (i.e., black crappie, bluegill, and yellow perch), black bass (largemouth and smallmouth), northern pike and walleye fishery. Overall, as many as 12 fish species contribute to the Roy Lake fishery.

Primary Species

Black crappie: Eight black crappies ranging in total length from 11 to 27 cm (4.3 to 10.6 in) were captured in the 2008 frame net catch from Roy Lake (Figure 3). Low sample size limits the usefulness of size structure, growth and relative weight information.

Black crappie relative abundance was low (< 3 stock-length black crappie/net) from 2001-2005, but increased in 2006, as black crappie from year classes produce in 2004 and 2005 recruited to our gear (Table 2; Figure 3). However, black crappie relative abundance has declined in each of the past two surveys (2007 and 2008; Table 2). The 2008 mean frame net CPUE of stock-length black crappie was 0.3 (Table 1), and below the minimum objective (≥ 10 stock-length black crappie/net; Table 3). Year-classes produced in 2004-2006 comprised 100% of black crappie in the 2007 and 2008 frame net catch; however, fewer individuals were captured in 2008 which may be a result of high annual mortality on young black crappie or sampling variability (Table 5).

Bluegill: The 2008 mean frame net CPUE of stock-length bluegill was 32.4 (Table 1) and above the minimum objective (≥ 25 stock-length bluegill/net) for Roy Lake (Table 3). Since 2001, the mean frame net CPUE has ranged from a low of 0.5 (2004) to a high of 63.0 (2006) with the 2001-2008 average being 16.6 (Table 2). Length-frequency analysis coupled with age structure information from the 2008 frame net catch indicated that relatively-strong year classes were produced from 2005-2007 resulting in the increased relative abundance (Table 2; Table 7). Based on the 2008 frame net catch, relative abundance appears to be high (>24 stock-length bluegill/net).

Bluegill captured in the 2008 frame net catch from Roy Lake ranged in total length from 8 to 18 cm (3.1 to 7.1 in), had a PSD of 8, and a PSD-P of 0 (Table 1; Figure 4). Both the 2008 PSD and PSD-P were below the management objectives of 30-60 and 5-10, respectively as the majority of bluegill captured in the 2008 frame net catch were from year classes produced in 2006-2007 which were less than quality-length (Table 3; Table 6; Figure 4).

Based on age estimates from otoliths collected in 2007 and 2008, bluegill in Roy Lake appear to reach quality-length (15 cm; 6 in) between age-2 and age-3 (Table 6). In 2008, the weighted mean length at capture for age-2 and age-3 bluegills was 115 and 150, respectively (Table 6). Mean Wr values of bluegills captured in frame nets exceeded 110 for all length categories sampled with the mean Wr of stock-length bluegill being 114 (Table 1).

Largemouth bass: Prior to 2008, spring night electrofishing was last conducted on Roy Lake from 2000-2002. Largemouth bass relative abundance was considered low from 2000-2002 with mean CPUE values ranging from a low of 0.9 (2002) to high of 8.5 (2000; Table 2; McKibbin 2002). In 2008, the mean spring night electrofishing CPUE of stock-length largemouth bass was 22.5 (Table 1) and above the minimum objective (>10 stock-length largemouth bass/net; Table 3). The increased relative abundance in 2008 can be attributed to successful recruitment of year classes produced from 2003-2006 (Table 8).

Largemouth bass sampled during spring night electrofishing from Roy Lake ranged in total length from 20 to 50 cm (7.9 to 19.7 in), had a PSD of 83, and a PSD-P of 26 (Table 1; Figure 5). High PSD and PSD-P values can likely be attributed to relatively-low recruitment of largemouth bass to the population, coupled with fast growth which has resulted in a population dominated by larger individuals. McKibbon (2002) found largemouth bass populations in eastern South Dakota glacial lakes to generally be of low density, high size structure, high condition, and have fast growth as a result of inconsistent recruitment patterns. The 2008 PSD and PSD-P values were above the objective ranges of 40-70 and 10-20, respectively; (Table 3).

Largemouth bass growth in Roy Lake was faster than that reported by Willis et al. (2001) for large lakes/impoundments with mean back-calculated lengths of 316 mm and 361 mm for age-3 and age-4 largemouth bass (Table 8). Mean Wr values for largemouth bass captured during spring night electrofishing ranged from 109 to 113 for all length categories sampled with the mean Wr of stock-length largemouth bass being 110 (Table 1). Mean Wr values may have been influenced by largemouth bass that were in pre-spawn condition as sampling took place in mid-June.

Northern Pike: Northern pike typically are not sampled effectively using standard lake survey methods; therefore, reported values may not accurately represent the at-large population. Neumann and Willis (1995) reported the most reliable time to sample northern pike in eastern South Dakota natural lakes with gill nets was late spring following the spawn. Although, sampling of Roy Lake does not correspond with this suggested time frame, northern pike relative abundance has been considered moderate to high from 2002-2008, with mean gill net CPUE values of stock-length northern pike ranging from 1.3 (2002) to 5.0 (2006; Table 2). In 2008, the mean gill net CPUE of stock-length northern pike was 3.7 (Table 1). Increased relative abundance in the 2008 survey likely resulted from increased recruitment of northern pike in recent years, as substantial rises in spring water levels occurred during 2006 and 2007. Northern pike depend heavily on flooded vegetation for spawning and recruitment, and tend to have improved recruitment during springs that have rising water levels.

Northern pike collected by gill nets in 2008 ranged in total length from 48 to 69 cm (18.9 to 27.2 in), had a PSD of 68 and PSD-P of 0 (Table 1; Figure 6). The PSD of 68 was above the objective range of 30-60 while the PSD-P of 0 was below the objective range of 5-10 (Table 3).

No northern pike growth information was collected during 2008. The mean Wr value of stock-length northern pike captured in gill nets during 2007 was 93 (Table 1). The majority of northern pike captured in the 2008 gill net catch were in the quality- to preferred-length category which had a mean Wr of 92.

Smallmouth bass: Currently, fall night electrofishing is used to assess both smallmouth bass and age-0 walleye populations in NE South Dakota. However, concerns regarding the effectiveness of fall night electrofishing at sampling larger bass have resulted in a Master of Science project being designed to evaluate the most effective approach to sample smallmouth bass. Preliminary results from Roy and Enemy Swim Lakes suggest that spring night electrofishing over suitable habitat (i.e., rocky substrate) may provide a better index to smallmouth bass populations in NE

South Dakota glacial lakes (Thomas Bacula, South Dakota State University, pers. comm.). Research will be conducted on Clear and Pickerel Lakes in 2008 before a sampling recommendation is made.

In 2008, no smallmouth bass were captured during fall night electrofishing as sampling locations utilized were lacking suitable habitat (i.e., rocky substrate) and not conducive to smallmouth bass. Eleven smallmouth bass ranging in total length from 18 to 46 cm (7.1 to 18.1 in) were captured in the 2008 frame net catch resulting in a mean CPUE of 0.5 (Table 1).

Walleye: The 2008 mean gill net CPUE of stock-length walleye was 2.8 (Table 1) and below the minimum objective (≥ 10 stock-length walleye/net; Table 3). Since 2001, the mean gill net CPUE of stock-length walleye has ranged from a low of 2.8 (2008) to a high of 10.3 (2003) with the 2001-2008 average being 5.9 (Table 2). Relative abundance in 2008 was considered low.

Strong walleye year classes (defined as ≥ 75 age-0 walleye/hour electrofishing) were naturally produced in 2001-2002 and 2004-2007 (Table 2). A strong walleye year class was likely produced in 2003, but an unmarked stocking of small fingerling walleye make it impossible to differentiate the contribution of stocked or naturally-produced walleye (Table 10). Although abundant during fall night electrofishing, age-0 walleye apparently suffer high natural mortality as few individuals recruit to the adult population (Table 11). Nine different year-classes comprised the 2008 walleye gill net catch, but each year-class was represented by few individuals (Table 11). In 2008, the mean fall night electrofishing CPUE was 235.0 and indicative of a strong year class however, recruitment is unknown and will be assessed in future surveys (Table 1).

Walleye in the 2008 gill net catch ranged in total length from 26 to 64 cm (10.2 to 25.2 in), had a PSD of 65 and a PSD-P of 35 (Table 1; Figure 7). Both the PSD and PSD-P values were above their objective range of 30-60 and 5-10, indicating a population skewed toward larger walleye likely due to limited recruitment (Table 3; Figure 7). Approximately 70% of the walleye captured in gill nets were above the 356-mm (14-inch) minimum length restriction enforced on Roy Lake (Figure 7).

Walleye in Roy Lake generally reach 356 mm (14 inches) at approximately age-3 (Table 9). Since 2005, the weighted mean total length at capture of age-2 walleye has ranged from 223 to 327 mm and the weighted mean total length at capture of age-4 walleye has ranged from 408 to 466 mm (Table 9); however, weighted mean total length at capture values may at times represent a single walleye (Table 11). Mean Wr values of walleye captured in the 2008 gill net catch ranged from 86 to 92 for all length categories sampled with the mean Wr of stock-length walleye being 91 (Table 1). No length-related trends in walleye condition were apparent.

Yellow Perch: The mean gill net CPUE of stock-length yellow perch in 2008 was 15.3 (Table 1). This represents a decrease from the 63.7 observed in 2007 (Table 2) and is below the minimum objective (≥ 25 stock-length yellow perch/net; Table 3). Since 2001, the mean gill net CPUE of stock-length yellow perch has fluctuated from a low of 15.3 (2008) to a high of 99.8 (2006) with the 2001-2008 average being 63.9 (Table 2). The 2008 gill net CPUE of 15.3 indicated moderate relative abundance (8-30 stock-length yellow perch/net).

Yellow perch in Roy Lake currently exhibit consistent natural recruitment and high natural mortality of young (ages 1-3) perch resulting in a population dominated by yellow perch less than quality-length (20 cm; 8 in). Yellow perch captured in the 2008 gill net catch ranged in total length from 8 to 20 cm (3.1 to 7.8 in) with the majority being sub-stock (< 13 cm; 5 in; Figure 8). The 2008 PSD was 1 and below the objective range of 30-60 and no preferred-length yellow perch were captured (Table 3; Figure 8).

No growth information was available. Mean Wr values for gill net captured yellow perch ranged from 97 to 100 for all length categories sampled with the mean Wr of stock-length yellow perch being 100 (Table 1).

Other Species

Black bullhead: The mean frame net CPUE of stock-length black bullhead during 2008 was 1.5 (Table 1) and within the objective (≤ 100 stock-length black bullhead/net; Table 3). Since 2001, the mean frame net CPUE has ranged from a low of 1.5 (2008) to a high of 412.2 (2002) with the 2001-2008 average being 109.2 (Table 2). It appears that black bullheads have had poor recruitment in many northeastern South Dakota lakes in recent years resulting in their reduced abundance. Currently, black bullhead relative abundance is considered low (< 4 stock-length black bullhead/net) in Roy Lake and the impact on the sport fishery is likely minimal.

Other: Common carp, green sunfish and white sucker were other fish species captured 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 structures, fish growth, and stocking success.

2) Conduct spring night electrofishing on a biennial basis to monitor largemouth bass and smallmouth bass population parameters.

3) Conduct fall night electrofishing on an annual basis to monitor walleye young-of-the-year abundance.

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

5) Stock large fingerling walleyes (≈25 walleye/acre) to establish additional year classes if the 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).

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 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 experimental gill nets, frame nets, and night electrofishing in Roy Lake, 2008. Confidence intervals include 80 percent (± CI-80) or 90 percent (± CI-90). BLB= black bullhead; BLC= black crappie; BLG= bluegill; COC= common carp; GSF= green sunfish; 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	1.5	0.4	91	9	63	14	91	2
BLC	0.3	0.2	100	0	86	14	100	3
BLG	32.4	12	8	2	0	---	114	2
COC	0.3	0.1	83	17	83	17	89	14
GSF	0.7	0.5	6	10	0	---	123	5
NOP	1.0	0.3	83	14	33	17	84	2
SMB	0.5	0.2	45	29	36	28	97	4
WAE	1.0	0.6	96	4	92	8	84	1
WHS	0.2	0.1	100	0	100	0	90	2
YEP	5.5	2.3	4	3	0	---	93	1
Gill nets								
BLB	0.2	0.2	100	---	100	---	89	---
COC	0.3	0.3	50	50	50	50	100	57
NOP	3.7	0.8	68	18	0	---	93	2
SMB	0.2	0.2	100	---	100	---	96	---
WAE	2.8	1.4	65	21	35	21	91	2
WHS	2.2	1.2	85	15	77	22	107	5
YEP	15.3	5.8	1	2	0	---	100	1
Electrofishing								
LMB[1]	22.5	8.8	83	13	26	16	110	3
WAE[2] (age-0)	235.0	---	---	---	---	---	---	---

[1] Spring Electrofishing-LMB.
[2] Fall Electrofishing-WAE.

Table 2. Historic mean catch rate (CPUE; gill/frame net = catch/net night, electrofishing = catch/hour) of stock-length fish for various fish species captured in experimental gill nets, frame nets, and electrofishing in Roy Lake, 2001-2008. BLB= black bullhead; BLC= black crappie; BLG= bluegill; HYB= sunfish hybrid; COC= common carp; GSF= green sunfish; LMB= largemouth bass; NOP= northern pike; SMB= smallmouth bass; WAE= walleye; WHS= white sucker; YEP= yellow perch

	CPUE								
Species	2001	2002	2003	2004	2005	2006[3]	2007[3]	2008	Mean
Frame nets									
BLB	175.9	412.2	233.3	39.7	5.0	2.0	3.7	1.5	109.2
BLC	1.8	0.9	0.3	0.2	0.3	8.9	2.9	0.3	2.0
BLG	1.8	0.7	2.5	0.5	7.4	63.0	24.2	32.4	16.6
HYB	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.1
COC	0.5	0.0	0.1	0.0	0.3	0.1	0.3	0.3	0.2
GSF	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.7	0.3
LMB	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
NOP	1.0	0.7	1.0	0.4	1.0	1.0	0.6	1.0	0.8
SMB	0.2	0.2	0.3	0.6	1.0	1.5	0.5	0.5	0.6
WAE	0.6	0.3	0.6	0.9	0.4	0.5	0.5	1.0	0.6
WHS	0.4	1.0	0.5	0.5	< 0.1	0.2	0.3	0.2	0.4
YEP	6.8	4.0	1.3	1.7	5.6	31.6	26.0	5.5	10.3
Gill nets									
BLB	136.8	152.3	78.8	32.2	0.3	1.3	1.8	0.2	50.5
BLC	0.2	0.0	0.0	0.3	0.3	2.5	1.7	0.0	0.6
BLG	3.8	0.0	0.0	0.2	0.0	0.2	0.5	0.0	0.6
COC	0.0	0.0	0.2	0.7	0.2	0.7	2.0	0.3	0.5
NOP	0.0	1.3	4.0	1.8	2.0	5.0	1.5	3.7	2.4
SMB	0.2	0.3	1.3	0.3	1.2	0.8	2.5	0.2	0.9
WAE	4.7	5.0	10.3	9.7	4.7	6.3	4.0	2.8	5.9
WHS	1.0	0.0	1.0	1.2	2.5	1.7	2.5	2.2	1.5
YEP	97.3	67.7	51.2	24.5	91.3	99.8	63.7	15.3	63.9
Electrofishing									
LMB[1]	---	0.9	---	---	---	---	---	22.5	11.7
WAE[2](age-0)	920.7	119.2	1,106.0	420.9	104.5	81.6	275.7	235.0	408.0

[1] Spring night electrofishing-LMB.
[2] Fall night electrofishing-WAE.
[3] Monofilament gill net mesh size change (.75”, 1”, 1.25”, 1.5”, 2” and 2.5”)

Table 3. 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 relative weight (Wr) for selected species captured in experimental gill nets, frame nets, and electrofishing in Roy Lake, 2001-2008. BLB= black bullhead; BLC= black crappie; BLG= bluegill; LMB= largemouth bass; SMB= smallmouth bass; WAE= walleye; YEP= yellow perch

Species	2001	2002	2003	2004	2005	2006[2]	2007[2]	2008	Average	Objective
Frame nets										
BLB										
CPUE	176	412	233	40	5	2	4	2	109	≤ 100
PSD	48	93	19	38	99	75	66	91	66	---
PSD-P	6	0	0	11	68	48	22	63	27	---
Wr	91	89	97	93	96	87	90	91	92	---
BLC										
CPUE	2	1	<1	<1	<1	9	3	<1	2	≥ 10
PSD	95	86	100	20	0	2	30	100	54	30-60
PSD-P	73	76	86	20	0	1	1	86	43	5-10
Wr	106	103	102	106	115	113	115	100	108	---
BLG										
CPUE	1	1	3	1	7	63	24	32	17	≥ 25
PSD	41	31	7	0	6	12	9	8	14	30-60
PSD-P	9	25	3	0	0	0	0	0	5	5-10
Wr	120	106	117	130	125	109	100	114	115	---
Gill nets										
NOP										
CPUE	4	1	4	2	2	5	2	4	3	≥ 3
PSD	65	75	88	100	100	77	67	68	80	30-60
PSD-P	4	13	4	9	17	3	11	0	8	5-10
Wr	86	86	84	85	86	91	91	93	88	---
WAE										
CPUE	5	5	10	10	5	6	4	3	6	≥ 10
PSD	71	83	47	57	82	68	71	65	68	30-60
PSD-P	29	57	29	16	25	50	25	35	33	5-10
Wr	87	2	89	91	93	90	90	91	79	---
YEP										
CPUE	97	68	51	25	91	100	64	15	64	≥ 25
PSD	10	6	14	6	1	6	8	1	7	30-60
PSD-P	3	0	0	0	0	0	0	0	0	5-10
Wr	100	100	98	116	104	101	100	100	102	---
Electrofishing										
LMB [1]										
CPUE	---	1	---	---	---	---	---	23	12	≥ 10
PSD	---	100	---	---	---	---	---	83	92	40-70
PSD-P	---	100	---	---	---	---	---	26	63	10-20
Wr	---	102	---	---	---	---	---	110	106	---

[1] Spring night electrofishing-LMB.
[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 by frame nets in Roy Lake, 2007-2008.

		Age									
Year	N	1	2	3	4	5	6	7	8	9	10
2008	8	---	117	245	266	---	---	---	---	---	---
2007	90	126	184	236	---	---	---	---	---	---	---

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

	Year Class									
Survey Year	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2008			1	3	4					
2007	---		14	64	12					

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

		Age									
Year	N	1	2	3	4	5	6	7	8	9	10
2008	771	104	115	150	177	---	---	---	---	---	---
2007	587	83	123	158	218	234	---	---	---	---	---

Table 7. Numbers of bluegill captured using frame nets (n), by year class, in Roy Lake, 2007-2008.

	Year Class									
Survey Year	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2008		443	221	104	3					
2007	---		6	527	52	1	1			

Table 8. Mean back-calculated length (mm) at age and standard error (SE) for largemouth bass captured during spring night electrofishing in Roy Lake, 2008.

			Age								
Year	Age	N	1	2	3	4	5	6	7	8	9
2006	2	1	73	199							
2005	3	8	97	207	304						
2004	4	8	72	187	289	354					
2003	5	3	95	228	325	362	398				
2002	6	0									
2001	7	1	146	245	324	351	396	425	450		
2000	8	0									
1999	9	2	83	210	336	378	422	451	471	483	500
Mean		23	94	213	316	361	405	438	460	483	500
SE			11	8	9	6	8	13	10	0	0
Mean Comparison [1]											
Small lakes/impoundments			99	183	246	299	332	---	---	---	---
Large lakes/impoundments			89	178	256	316	359	---	---	---	---
Region IV			80	180	266	325	356	---	---	---	---
Statewide			96	182	250	305	342	---	---	---	---

[1] Willis et al. 2001.

Table 9. Weighted mean length at capture (mm) for walleye captured in experimental gill net sets in Roy Lake, 2001-2008. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends.

		Age														
Year	N	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2008[1]	17	---	262	324	438	408	557	---	---	---	626	---	640	557	---	545
2007[1]	31	170	210	327	423	466	538	504	---	535	641	---	---	---	651	---
2006[1]	42	---	168	223	334	445	510	527	558	---	580	---	---	---	---	---
2005[1]	25	---	183	301	396	447	471	---	524	553	530	---	---	---	---	---
2004	61	---	181	319	376	469	482	519	538	513	637	583	---	---	---	---
2003	74	---	202	288	365	399	489	507	586	583	664	---	---	---	---	---
2002	41	---	179	282	344	431	469	543	591	632	---	---	---	---	---	---
2001	28	---	---	280	330	407	489	501	609	613	---	---	---	---	---	---

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

Table 10. Stocking history including size and number for fishes stocked into Roy Lake, 1996-2008.

Year	Species	Size	Number
1997	WAE	fry	3,400,000
	WAE	small fingerling	170,000
1998	WAE	fry	1,800,000
2003	LMB	fingerling	4,200
	WAE	small fingerling	208,600

Table 11. Numbers of walleye sampled (n), by year class, and associated stocking history (Number stocked x 1,000) for walleye captured in Roy Lake, 2001-2008.

	Year Class													
Survey Year	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994
2008[1,2]	1	4	1	5	1				1		2	1		1
2007[1,2]	1	8	6	7	3	1			1	1				
2006[1,2]	---		1	4	11	2	8	3	2	---	3	---		
2005[1]	---	---		2	3	5	10	1		1	2	1		
2004	---	---	---	---	1	7	35	4	4	2	2	2		
2003	---	---	---	---	---	5	37	1	5	5	7	7		
2002	---	---	---	---	---	---	12	2	3	2	4	4		
2001	---	---	---	---	---	---	---		1	4	7	2		
# stocked														
fry										1,800	3,400			
sm. fingerling					209						170			
lg. fingerling														

[1]Age 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")

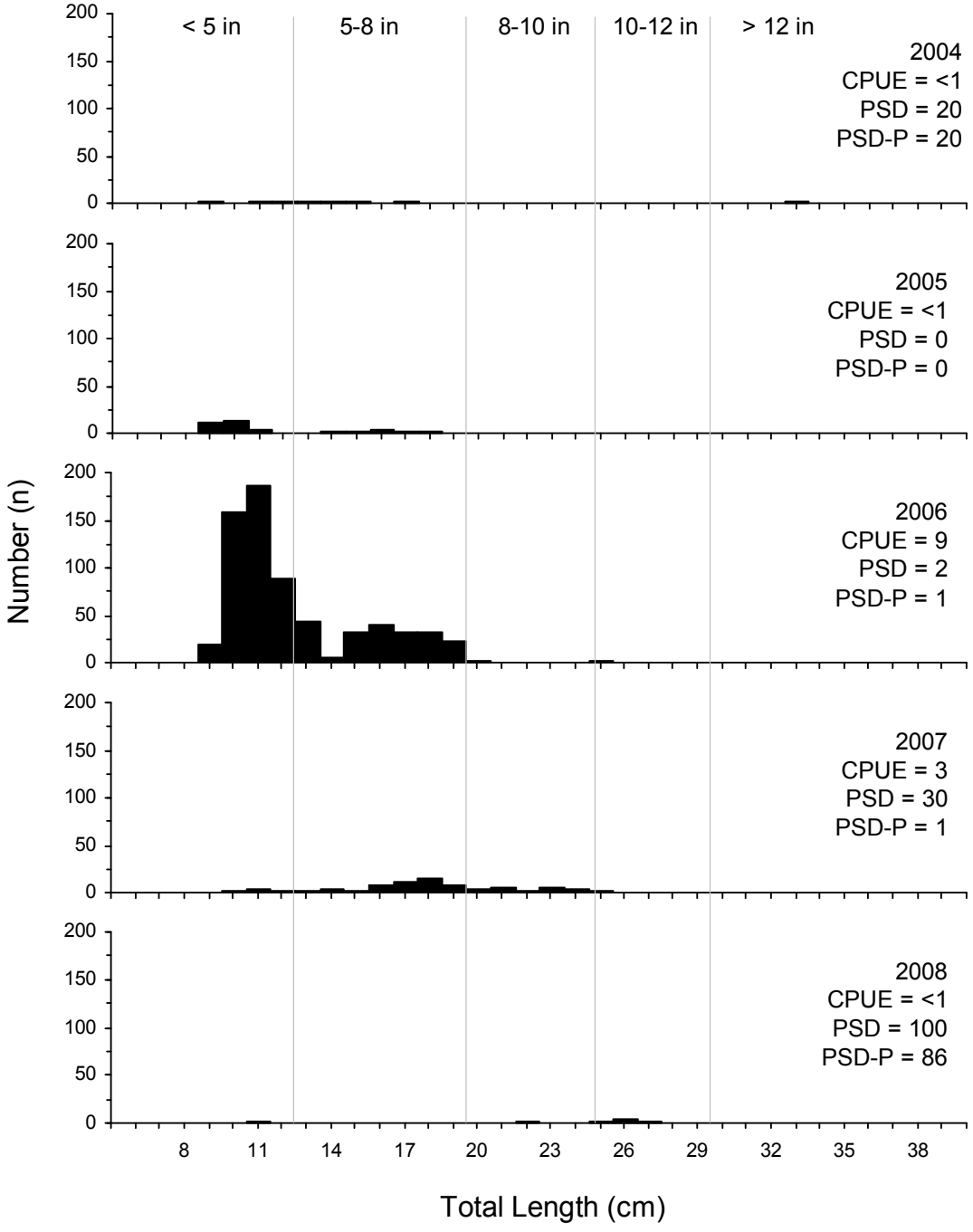

Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black crappie captured using frame nets in Roy Lake, 2004-2008.

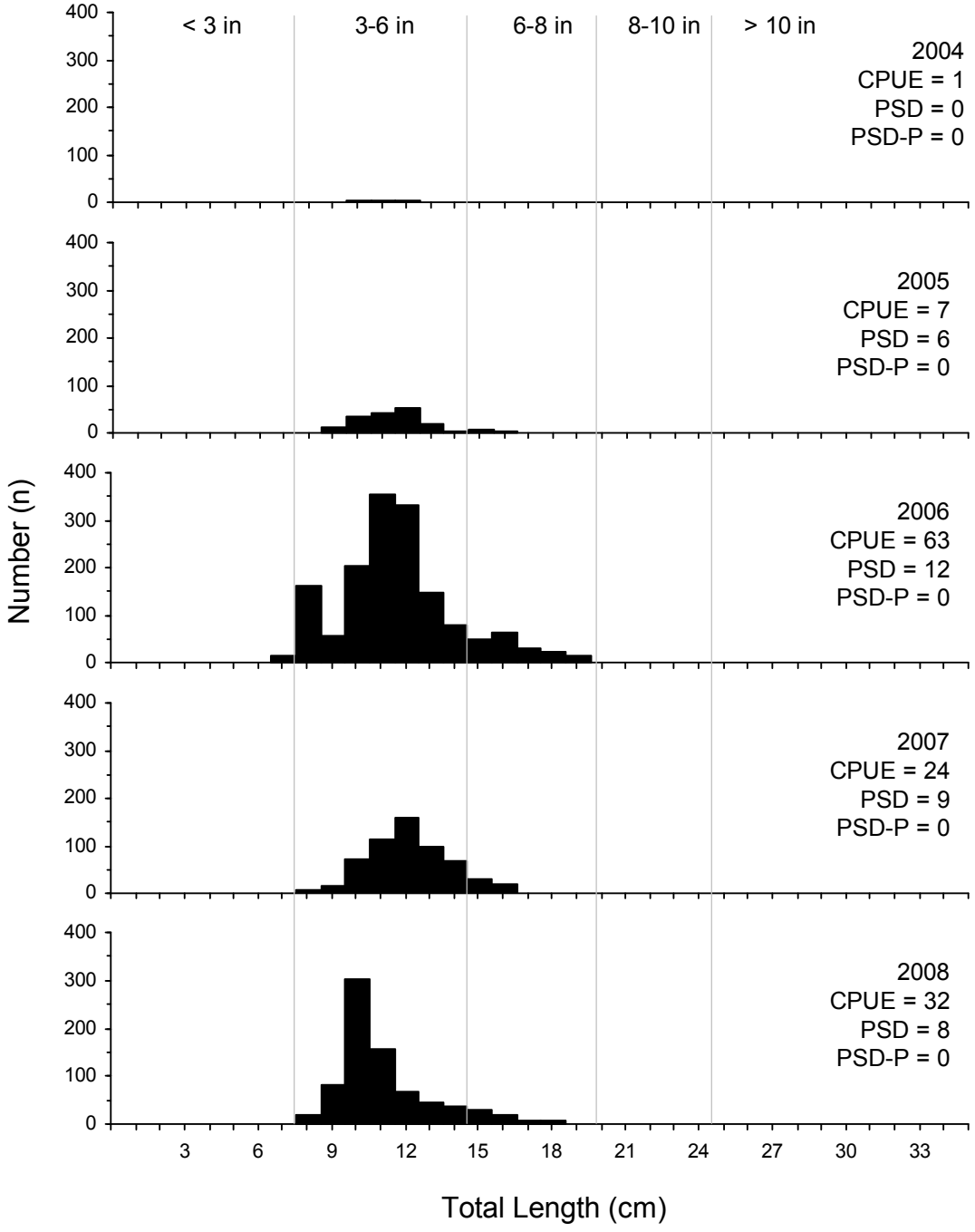

Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for bluegill captured using frame nets in Roy Lake, 2004-2008.

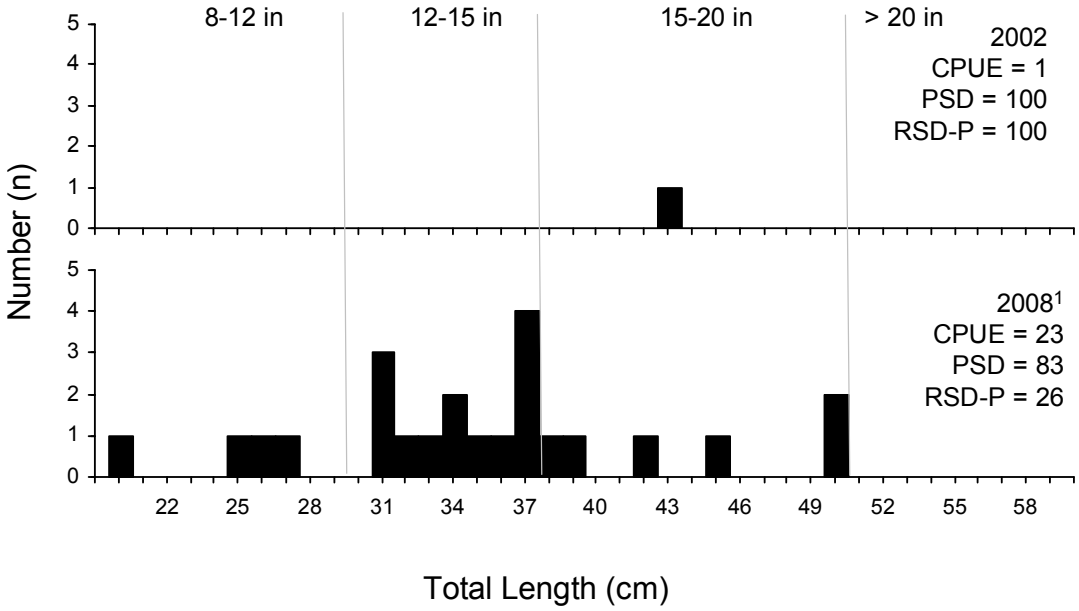

Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for largemouth bass captured by spring night electrofishing in Roy Lake, 2005 and 2008.

[1] Sampling locations different.

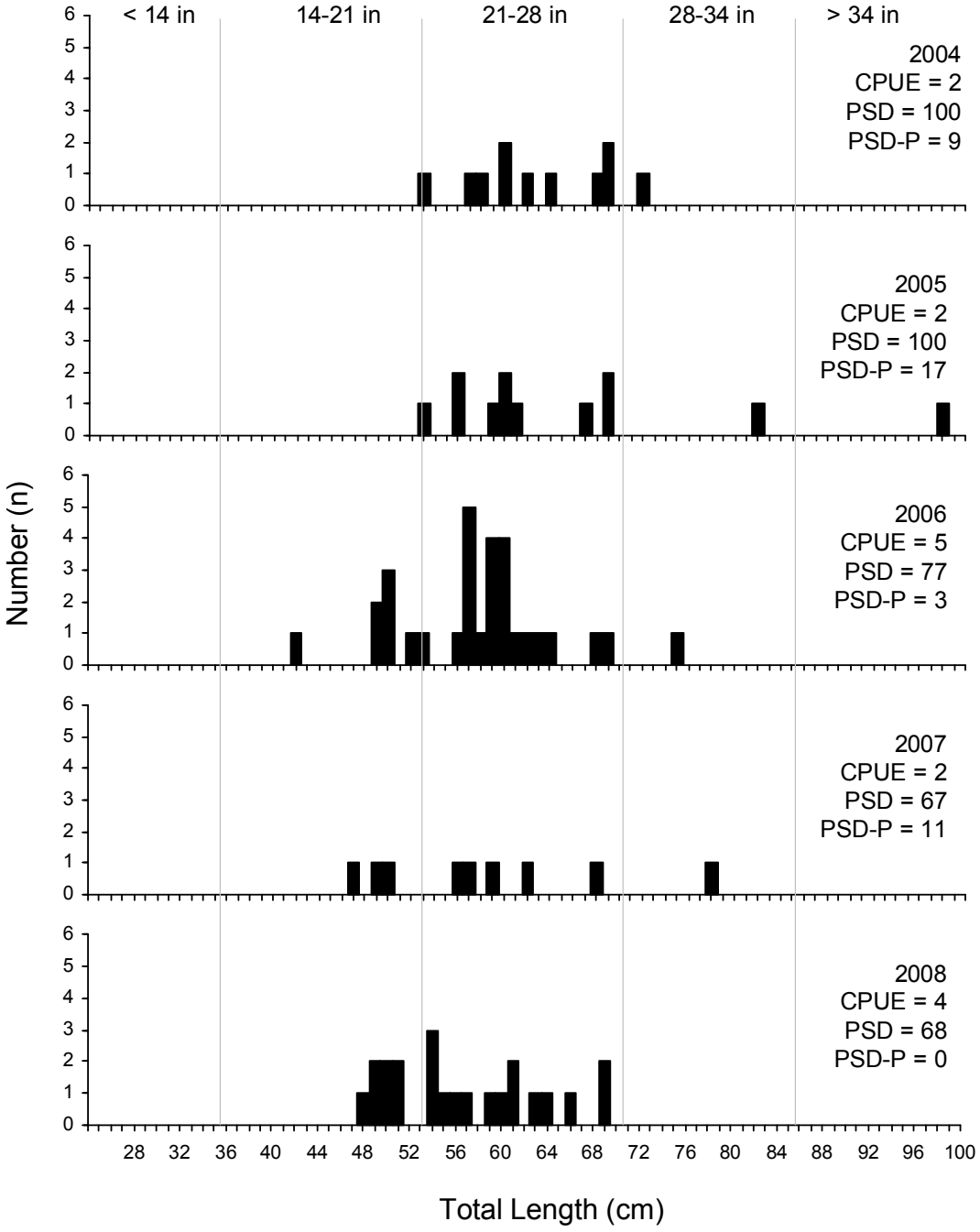

Figure 6. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for northern pike captured using gill nets in Roy Lake, 2004-2008.

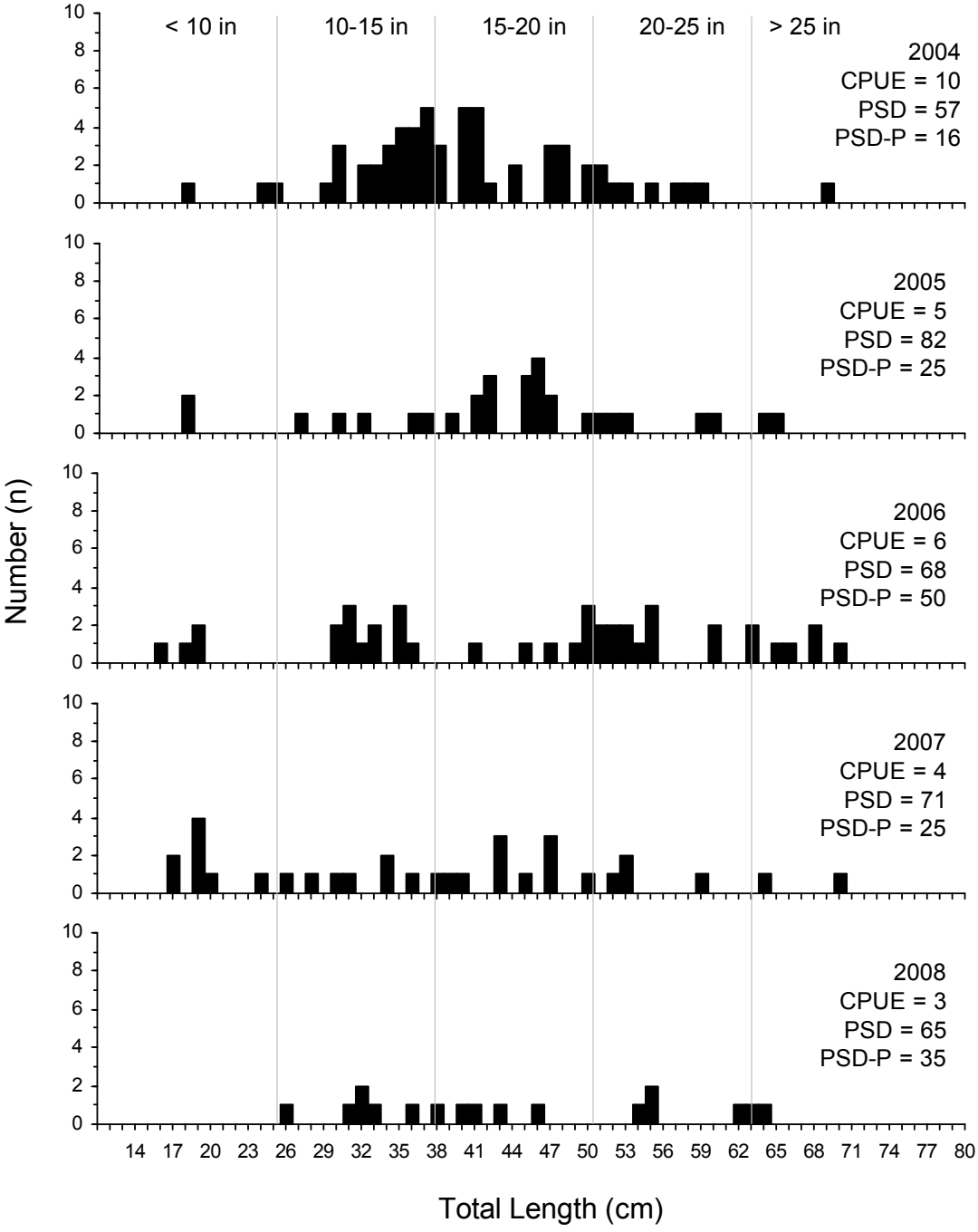

Figure 7. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for walleye captured using gill nets in Roy Lake, 2004-2008.

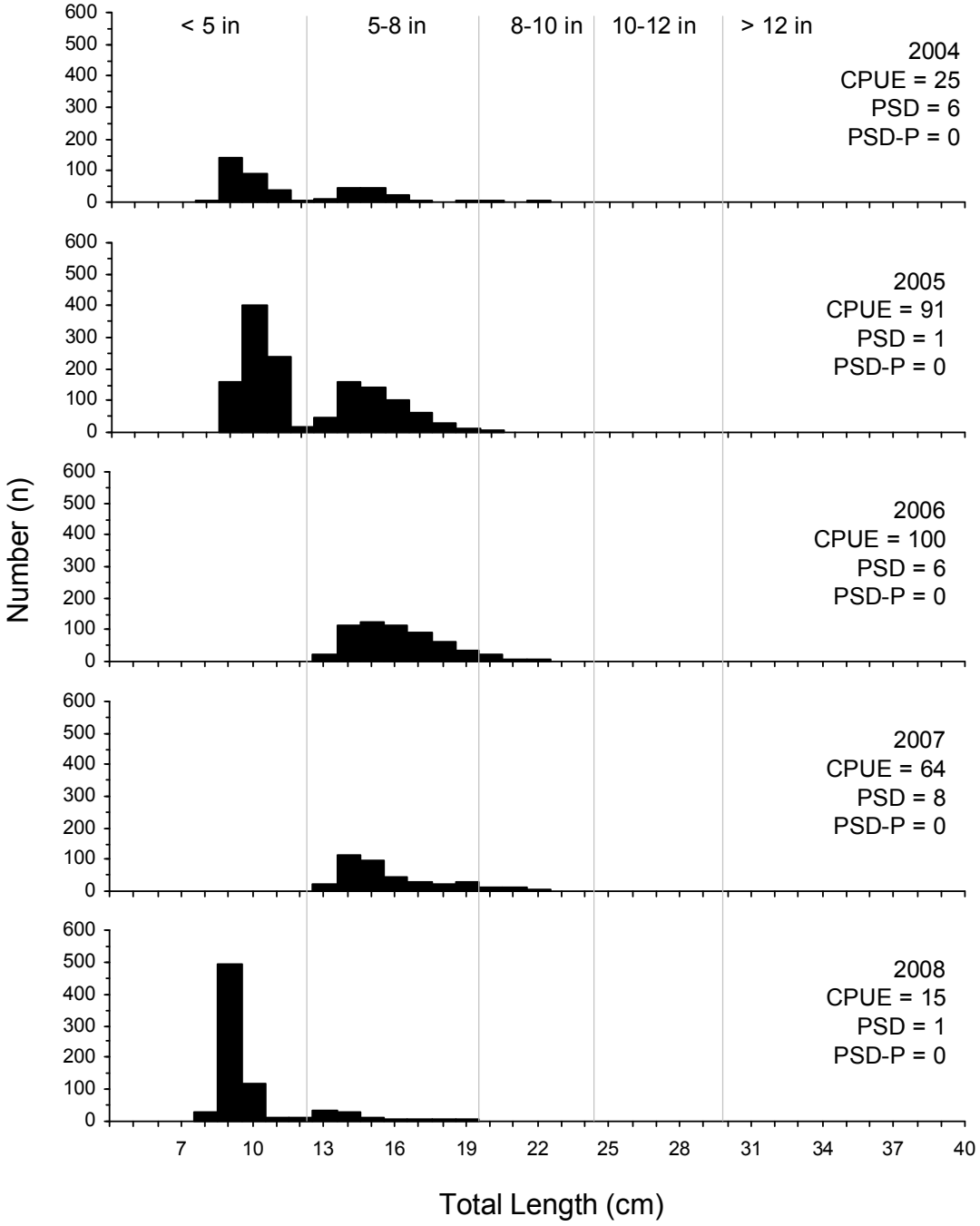

Figure 8. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for yellow perch captured using gill nets in Roy Lake, 2004-2008.