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	2.0 miles south and 1.0 mile west of Lake City, SD

Survey Dates and Sampling Information

Survey dates	July 8-10, 2014 (FN, GN) September 22, 2014 (EF-WAE) June 3, 2014 (EF-LMB) May 19, 2014 (EF-SMB)
Frame net sets (n)	24
Gill net sets (n)	6
Electrofishing-WAE (min)	60
Electrofishing-LMB (min)	60
Electrofishing-SMB (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 owned by the State of South Dakota and the fishery is 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 is on the northeastern shore within the Roy Lake State Park-East Unit (Figure 1); all are maintained by the SDGFP. 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 OHWM is 1795.7 fmsl, and the outlet elevation of Roy Lake is 1795.2 fmsl. On May 6, 2014 the elevation was 1795.9, slightly above the OHWM, and 1.0 ft higher than the fall 2013 elevation of 1794.9 fmsl. The water level had declined to an elevation of 1795.4 fmsl on October 29, 2014.

Fish Management Information

Primary species	largemouth bass, northern pike, smallmouth bass, walleye, yellow perch
Other species	black bullhead, black crappie, bluegill, channel catfish, common carp, green sunfish, white sucker
Lake-specific regulations	largemouth/smallmouth bass: only those less than 14", or 18" and longer may be taken; of those no more than one may be 18" or longer walleye: minimum length 15"
Management classification	warm-water permanent
Fish consumption advisories	none

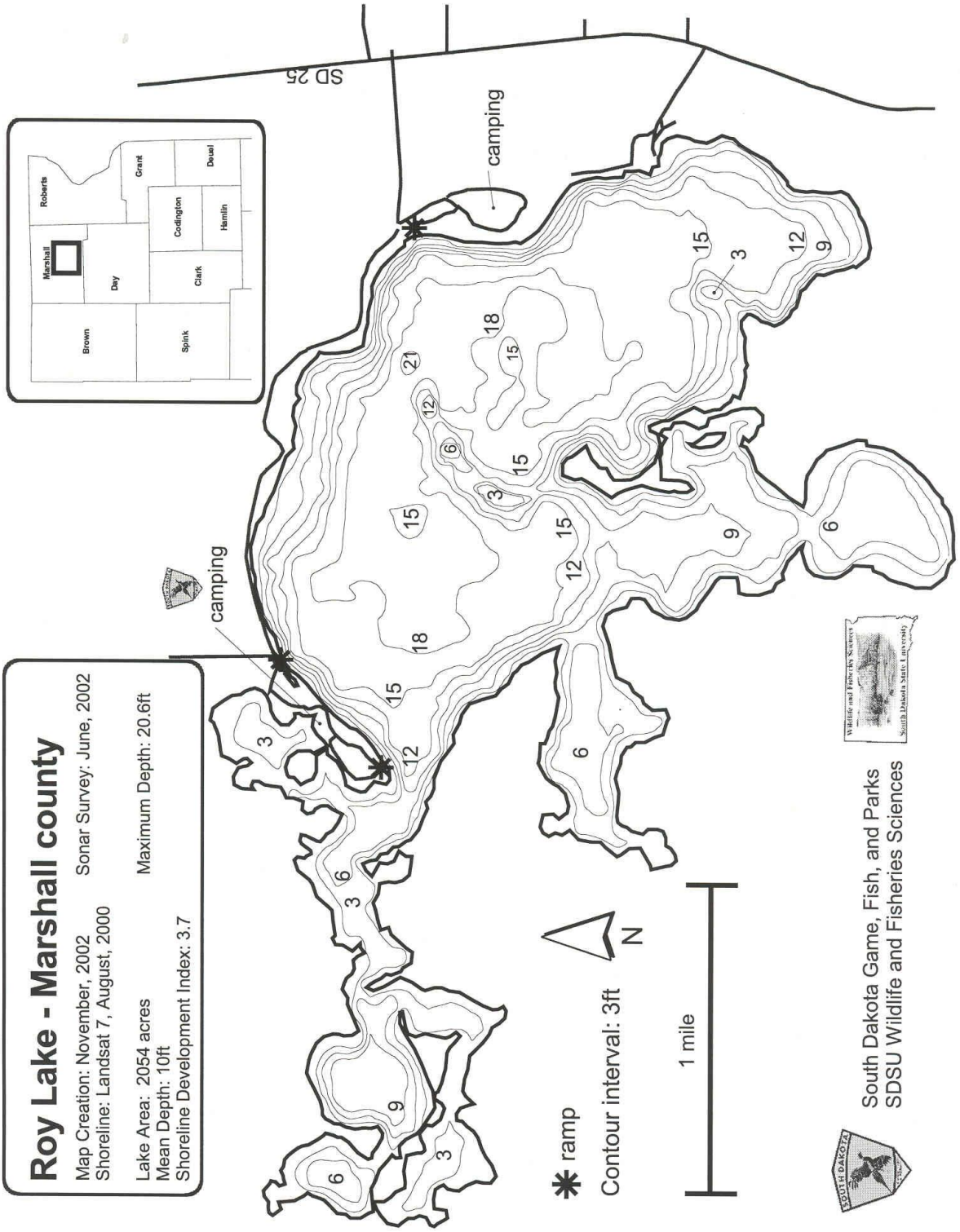

Figure 1. Contour map depicting access locations and depth contours of Roy Lake, Marshall County, South Dakota.

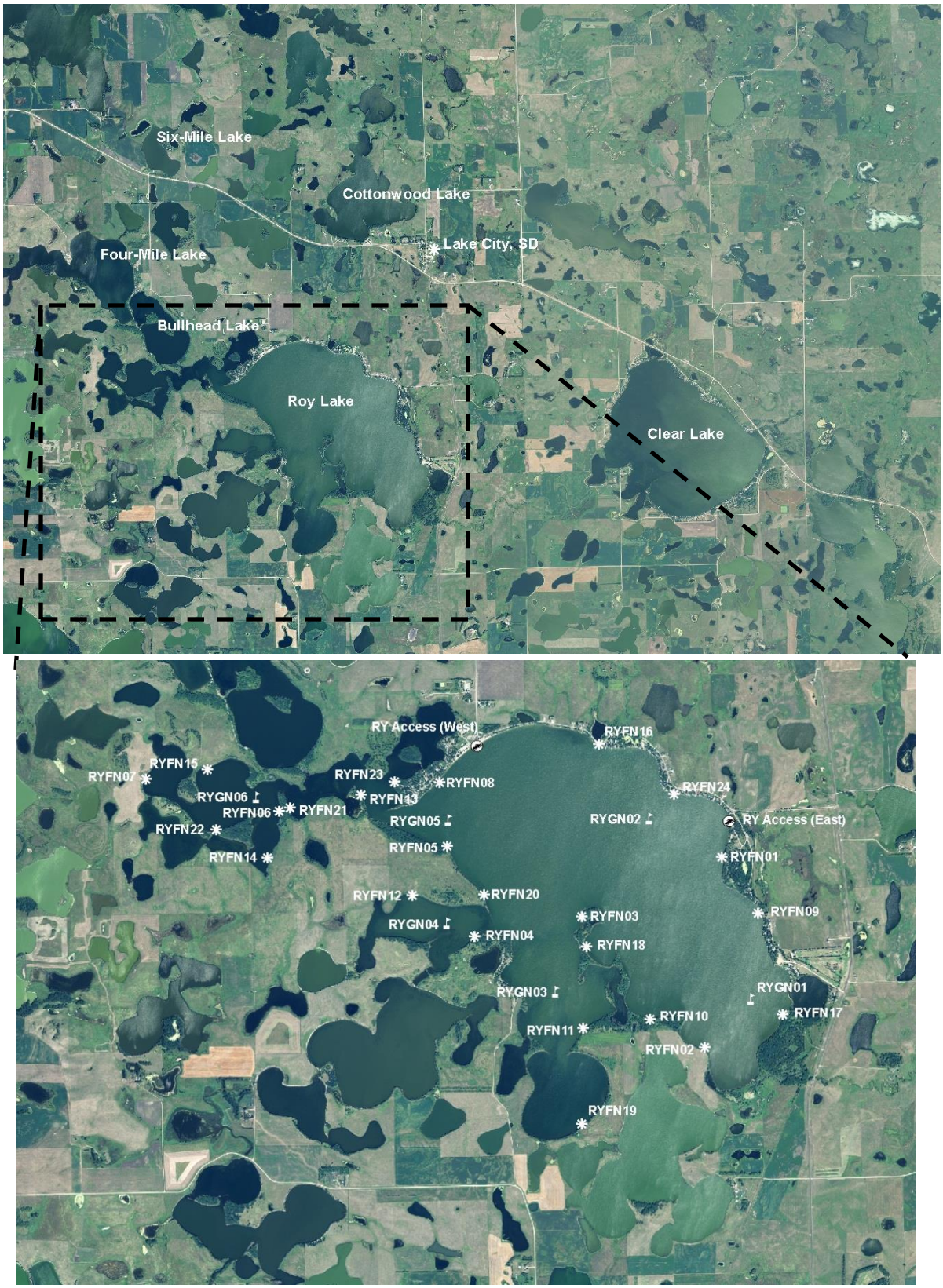

Figure 2. Map depicting geographic locations of Bullhead, Clear, Cottonwood, Four-Mile, Six-Mile, and Roy Lakes from Lake City, Marshall County, South Dakota (top). Also noted are public access and standardized net locations for Roy Lake (bottom). RYFN= frame net; RYGN= gill net

Management Objectives

1) 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.

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

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

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

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 in the southwest portion of Roy Lake enters Lost Lake before draining into Cattail/Kettle Lakes (SDDENR 2007).

Roy Lake is a popular destination for aquatic recreation primarily boating, swimming, and fishing (SDDENR 2007). A resort, state park, and approximately 140 homes and cabins are located on the northern shoreline of Roy Lake; while the southern shore remains relatively undeveloped. Currently, Roy Lake is managed as a black bass (largemouth and smallmouth), northern pike, walleye, and yellow perch fishery.

Note: Curlyleaf pondweed is an invasive species present in Roy Lake. Care should be taken by all user groups to prevent the spread of this species to other waterbodies. Information about curlyleaf pondweed and how to prevent the spread of invasive species is available at: http://gfp.sd.gov/wildlife/nuisance/aquatic/default.aspx

Primary Species

Largemouth Bass: Spring night electrofishing for largemouth bass is conducted during even numbered years at Roy Lake. In 2014, the mean electrofishing CPUE of stock-length largemouth bass was 58.8 (Table 1). The 2014 spring night electrofishing CPUE represented an increase from the 2012 CPUE of 36.6 (Table 2).

Largemouth bass sampled by spring night electrofishing ranged in TL from 23 to 48 cm (9.1 to 18.9 in), had a PSD of 86, and an PSD-P of 41 (Table 1; Figure 3). The PSD and PSD-P values exceeded management objective ranges of 40-70 and 10-40, respectively, indicating a population skewed towards larger individuals (Figure 3).

Since 2008, scales have been collected from a sub-sample of largemouth bass captured during spring night electrofishing. Age structure information suggests relatively consistent recruitment in recent years (Table 4). In 2014, eight year classes were represented; however, the magnitude of individual year classes was low (i.e., < 15 individuals; Table 4).

Largemouth Bass in Roy Lake tend to exhibit relatively-fast growth. Since 2008, weighted mean TL at capture values for age-4 largemouth bass (collected during spring electrofishing) have ranged from 345 to 375 mm (13.6 to 14.8 in); compared to the Region IV mean back-calculated length of 325 mm (12.8 in; Willis et al. 2001). In 2014 the weighted mean TL at capture of age-4 individuals was 362 mm (14.3 in; Table 4). Condition of largemouth bass was high (i.e., $\geq$ 95 for all 10-mm length groups sampled) and likely influenced by spawning activity, as electrofishing was conducted during early-June. The mean Wr of stock-length individuals was 116 (Table 1) and no length-related trends in condition were apparent.

Northern Pike: Northern pike relative abundance in Roy Lake has generally been considered moderate to high with mean gill net CPUE values ranging from 1.5 to 10.3 from 2005-2014 (Table 2). In 2014, the mean gill net CPUE of stock-length northern pike was 6.3 (Table 1) and above the minimum objective ($\geq$ 3 stock-length northern pike/net night). Currently, relative abundance is considered high.

Gill net captured northern pike ranged in TL from 45 to 84 cm (17.7 to 33.1 in), had a PSD of 61 and PSD-P of 5 (Table 1; Figure 4). The PSD was slightly above the management objective of 30-60; while the PSD-P was within the management objective of 5-10; Table 3).

No northern pike 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 Clear Lakes). Stock-length northern pike had a mean Wr of 84 (Table 1) and no length-related trends in condition were apparent.

Smallmouth Bass: Research has recommended that smallmouth bass population parameters be monitored during standardized spring (May and June) electrofishing over suitable habitat (i.e., rocky substrate) in northeastern South Dakota glacial lakes (Bacula 2009).

In 2014, water clarity was high and electrofishing catch rates were low. Twenty one smallmouth bass ranging in TL from 17 to 40 cm (6.7 to 15.7 in) and representing six year classes were captured during spring electrofishing (Table 6; Figure 5); the mean spring electrofishing CPUE of stock-length individuals was 19.7 (Table 1). The PSD was 65 and the PSD-P was 20; both were within management objectives of 40-70 and 10-40 (Table 1; Table 3).

Smallmouth bass in Roy Lake tend to exhibit moderate to fast growth. Since 2009, weighted mean TL at captures values for age-3 and age-4 individuals (collected

during spring electrofishing) have ranged from 252 to 296 mm (9.9 to 11.7 in) and 317 to 389 mm (12.5 to 15.3 in), respectively; Table 7); compared to Region IV back-calculated mean of means of 249 and 316 mm (9.8 and 12.4 in; Willis et al. 2001). Spring electrofished smallmouth bass were in good condition with mean Wr's > 90 for all 10-mm groups represented. The mean Wr of stock-length fish was 104 (Table 1) and no length-related trends in condition were apparent.

Walleye: While not abundant, the walleye population in Roy Lake has been largely self-sustaining with stocking occurring only twice since 2000 (Table 8; Table 10). With the exception of 2012, strong year classes (defined as ≥ 75 age-0 walleye/hour electrofishing) have been produced annually since 2001 (Table 2; Ermer et al. 2006). Unfortunately, recruitment to the adult population has been limited.

Since 2005, the relative abundance of stock-length walleye has remained low to moderate with mean gill net CPUE values that have ranged from 1.8 (2011) to 9.7 (2004; Table 2). In 2014, gill nets captured 40 stock-length walleye ranging in TL from 22 to 73 cm (8.7 to 28.7 in); the mean gill net CPUE of stock-length individuals was 6.3 (Table 1; Figure 6). The 2014 gill net CPUE was below the minimum objective (≥ 10 stock-length fish/net night; Table 3) and suggested moderate relative abundance.

Otoliths collected from walleye in 2014 revealed the presence of seven year-classes (2001, 2007-2012); year classes produced in 2010 and 2011 were the most abundant (Table 8). No walleye from the 2013 year class, which coincided with a fry stocking, were captured (Table 8); however, these fish may have been too small to sample during July. Fry stocked in 2013 were marked with oxytetracycline (OTC) to determine stocking contribution; the estimated stocking contribution was 80% (Table 8). In 2014, the mean fall night electrofishing CPUE of age-0 walleye was 90.0 (Table 1) suggesting that another strong cohort was naturally produced. Recruitment of both the 2013 and 2014 cohorts is currently unknown and will be assessed in future surveys.

Walleye in Roy Lake typically reach quality length and the minimum length limit (38 cm; 15 in) at approximately age-3 (Table 9). Since 2005, the weighted mean TL at capture of age-3 walleye has ranged from 334 to 438 mm (13.1 to 17.2 in); while the weighted mean TL at capture of age-4 walleye has ranged from 408 to 530 mm (16.1 to 20.9 in; Table 9). However, due to low sample sizes weighted mean TL at capture values may at times represent a single walleye. In 2014, the weighted mean TL at capture of age-3 and age-4 individuals was 377 and 408 mm (14.8 and 16.1 in; Table 9). Gill net captured walleye were in good condition with mean Wr values ranging from 80 to 98 for all 10-mm length groups sampled. The mean Wr for all stock-length walleye was 88 (Table 1). No length-related trend in Wr was observed.

Yellow Perch: The mean gill net CPUE for stock-length yellow perch of 10.0 was below the minimum objective (≥ 30 stock-length yellow perch/net night) and the lowest recorded since 2005 (Table 1; Table 2; Table 3). Based on the 2014 gill net CPUE, relative abundance appears to be moderate to low.

Gill net captured yellow perch ranged in TL from 8 to 24 cm (3.1 to 9.4 in; Figure 7). The majority of yellow perch in the gill net catch were ≤ quality-length (20 cm; 8 in) as indicated by the low PSD and PSD-P values of 7 and 0, respectively (Table 1;

Figure 7). Both the PSD and PSD-P were below management objectives of 30-60 and 5-10 (Table 3).

Otoliths were collected from a sub-sample of gill net captured yellow perch; five consecutive year classes (2009-2013) were present (Table 11). The 2012 and 2013 year-classes were the most represented and comprised 62% and 20% of yellow perch in the gill net catch (Table 11).

Since 2009, weighted mean TL at capture values for age-2 yellow perch have ranged from 116 to 150 mm (4.6 to 5.9 in); while the weighted mean TL at capture for age-3 fish has ranged from 131 to 184 mm (5.2 to 7.2 in; Table 12). In 2014, the weighted mean TL at capture for age-2 and age-3 individuals was 117 and 131 mm (4.6 and 5.2 in), respectively (Table 12). As with most populations, males tend to be smaller at a given age than females, particularly at older ages (Table 12). Gill net captured yellow perch had mean Wr values that ranged from 86 to 102 for all 10-mm length groups sampled; the mean Wr of stock-length fish was 98 (Table 1) and no length-related trends in condition were apparent.

Other Species

Black Bullhead: The mean frame net CPUE of stock-length black bullhead was 3.3 (Table 1) and within the objective (≤ 100 stock-length black bullhead/net night; Table 3). Since 2005, the mean frame net CPUE has ranged from a low of 0.5 (2009, 2010) to a high of 8.2 (2012; Table 2). Currently, relative abundance is considered low and their impact on the sport fishery is likely minimal.

Black Crappie: Black crappie relative abundance was low from 2001-2005, but increased in 2006, as black crappie from year classes produced in 2004 and 2005 recruited to our gear (Table 2: Ermer et al. 2006). However, relative abundance quickly declined and has remained low from 2007-2014 (Table 2). The 2014 mean frame net CPUE was 0.2 (Table 1). Sampled black crappie ranged in TL from 29 to 30 cm (11.4 to 11.8 in). Few inferences can be made concerning size structure or condition due to low sample size.

Bluegill: The mean frame net CPUE of stock-length bluegill was 8.0 (Table 1). Since 2005, the frame net mean CPUE has ranged from a low of 7.2 (2011) to a high of 63.0 (2006; Table 2). Based on the 2014 frame net CPUE, relative abundance is considered moderate.

Frame net captured bluegill ranged in TL from 7 to 22 cm (2.8 to 8.7 in), had a PSD of 12 and a PSD-P of 7 (Table 1; Figure 8). Otoliths collected from a sub-sample of frame net captured bluegill suggested the presence of five consecutive year classes (2009-2013; Table 13). The 2011 and 2013 cohorts were the most represented and comprised 31% and 43%, respectively, of bluegill in the frame net catch (Table 13).

Bluegills in Roy Lake typically reach quality-length (15 cm; 6 in) at age-3 (Table 14). Since 2007, the weighted mean TL at capture of age-3 bluegill has ranged from 128 to 189 mm (5.0 to 7.4 in; Table 14). In 2014, the weighted mean TL at capture for age-3 individuals was 128 mm (5.0 in; Table 14). Frame net captured bluegill had high condition, with mean Wr values that were > 110 for all length categories (e.g., stock to

quality) sampled. The mean Wr of stock-length bluegill was 111 (Table 1) and no length-related trends in condition were apparent. Seasonal influences (i.e., spawning behavior) may have influenced Wr values.

Other: White sucker was the only other fish species captured during the 2014 survey (Table 1).

Management Recommendations

1) Conduct fish community assessment surveys utilizing frame nets and gill nets on an annual basis (next survey scheduled in summer 2015) to monitor fish relative abundance, fish population size structures, and fish growth.

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

3) Conduct fall night electrofishing on an annual basis to monitor age-0 walleye relative 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 walleye (≈25 large fingerlings/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 sub-stock (< 25 cm; 10 in) walleye and/or fall night electrofishing CPUE of age-0 walleye < 75 fish/hour].

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).

7) Maintain the 381-mm (15 in) minimum length limit on walleye. The regulation is designed to protect smaller fish from harvest and increase average fish size (Lucchesi and Blackwell 2009).

8) Partner with willing landowners on shoreline restoration projects designed to restore native plant fauna along highly-developed shorelines providing improvements to water quality and littoral habitats within the lake.

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 Roy Lake, 2014. 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; HYB= hybrid sunfish; 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	3.3	1.5	96	4	44	10	88	1
BLC	0.2	0.3	100	0	100	0	101	3
BLG	8.0	3.0	12	4	7	3	111	<1
HYB	0.2	0.0	50	---	0	---	---	---
NOP	1.0	0.3	42	18	0	---	85	4
SMB	0.9	0.7	38	19	24	17	102	2
WAE	0.2	0.1	40	52	0	---	82	4
WHS	<0.1	0.1	100	---	100	---	113	---
YEP	4.1	1.7	10	5	0	---	90	1
Gill nets								
BLB	1.5	0.7	100	0	44	33	88	4
BLC	0.3	0.3	100	0	100	0	98	5
NOP	6.3	2.1	61	14	5	6	84	2
SMB	4.0	1.0	92	10	58	18	101	3
WAE	6.3	2.3	68	13	18	11	88	1
WHS	8.5	2.2	94	6	59	12	102	1
YEP	10.0	3.4	7	6	0	---	98	1
Electrofishing								
LMB[1]	58.8	20.4	86	8	41	11	116	1
SMB[2]	19.7	11.0	65	19	20	16	104	4
WAE[3]	90.0	---	---	---	---	---	---	---

[1] Spring night electrofishing-LMB
[2] Spring night electrofishing-SMB; day/night samples combined
[3] Fall Electrofishing-WAE; catch rate (CPUE) represents age-0 walleye/hour

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 using frame nets, experimental gill nets, and electrofishing in Roy Lake, 2005-2014. BLB= black bullhead; BLC= black crappie; BLG= bluegill; HYB= hybrid sunfish; 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	2005	2006[5]	2007[5]	2008	2009	2010	2011	2012	2013	2014
Frame nets										
BLB	5.0	2.0	3.7	1.5	0.5	0.5	0.6	8.2	6.5	3.3
BLC	0.3	8.9	2.9	0.3	0.0	0.2	0.5	0.6	0.6	0.2
BLG	7.4	63.0	24.2	32.4	16.8	8.2	7.2	12.9	8.0	8.0
HYB[1]	0.0	0.0	0.4	0.0	0.2	<0.1	0.5	0.0	0.1	0.2
COC	0.3	0.1	0.3	0.3	0.0	0.1	<0.1	0.1	0.1	0.0
GSF	0.0	1.3	0.0	0.7	0.7	0.1	0.0	0.7	0.2	0.0
LMB	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOP	1.0	1.0	0.6	1.0	0.8	0.5	0.5	1.5	1.2	1.0
SMB	1.0	1.5	0.5	0.5	0.3	0.5	0.8	0.3	0.2	0.9
WAE	0.4	0.5	0.5	1.0	0.5	0.3	0.1	0.5	0.2	0.2
WHS	< 0.1	0.2	0.3	0.2	0.3	<0.1	<0.1	<0.1	0.1	<0.1
YEP	5.6	31.6	26.0	5.5	6.8	20.9	19.6	21.3	9.8	4.1
Gill nets										
BLB	0.3	1.3	1.8	0.2	0.0	0.0	0.0	4.3	1.2	1.5
BLC	0.3	2.5	1.7	0.0	0.2	0.2	0.0	0.2	0.0	0.3
BLG	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.3	0.0
COC	0.2	0.7	2.0	0.3	0.3	0.7	0.3	0.0	0.0	0.0
NOP	2.0	5.0	1.5	3.7	1.5	2.7	7.8	10.3	7.5	6.3
SMB	1.2	0.8	2.5	0.2	0.3	0.8	0.2	0.5	2.3	4.0
WAE	4.7	6.3	4.0	2.8	3.0	3.3	1.8	2.8	8.3	6.3
WHS	2.5	1.7	2.5	2.2	6.2	4.7	7.2	6.7	4.7	8.5
YEP	91.3	99.8	63.7	15.3	14.7	51.0	80.3	99.3	82.2	10.0
Electrofishing										
LMB[2]	---	---	---	22.5	18.7	26.3	---	36.6	---	58.8
SMB[3]	---	---	---	---	17.3	42.4	---	110.8	---	19.7
WAE[4]	104.5	81.6	275.7	235.0	285.7	153.0	466.5	4.0	286.0	90.0

[1] All fish sizes
[2] Spring Electrofishing-LMB
[3] Spring Electrofishing-SMB; day/night samples combined
[4] Fall Electrofishing-WAE; catch rate (CPUE) represents age-0 walleye/hour
[5] Monofilament gill net mesh size (0.75”, 1.00”, 1.25”, 1.50”, 2.00” and 2.50”)

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 frame nets, experimental gill nets, and electrofishing in Roy Lake, 2005-2014. BLB= black bullhead; LMB= largemouth bass; NOP= northern pike; SMB= smallmouth bass; WAE= walleye; YEP= yellow perch

Species	2005	2006[3]	2007[3]	2008	2009	2010	2011	2012	2013	2014	Objective
Frame nets											
BLB											
CPUE	5	2	4	2	1	1	1	8	7	3	≤ 100
PSD	99	75	66	91	92	100	67	42	68	96	---
PSD-P	68	48	22	63	85	100	27	8	15	44	---
Wr	96	87	90	91	104	102	91	90	81	88	---
Gill nets											
NOP											
CPUE	2	5	2	4	2	3	8	10	8	6	≥ 3
PSD	100	77	67	68	100	81	66	65	51	61	30-60
PSD-P	17	3	11	0	11	19	15	5	0	5	5-10
Wr	86	91	91	93	87	93	90	90	88	84	---
WAE											
CPUE	5	6	4	3	3	3	2	3	8	6	≥ 10
PSD	82	68	71	65	83	45	64	41	36	68	30-60
PSD-P	25	50	25	35	39	10	27	41	14	18	5-10
Wr	93	90	90	91	87	87	94	86	91	88	---
YEP											
CPUE	91	100	64	15	15	51	80	99	82	10	≥ 30
PSD	1	6	8	1	1	0	0	7	13	7	30-60
PSD-P	0	0	0	0	0	0	0	0	0	0	5-10
Wr	104	101	100	100	101	99	102	100	91	98	---
Electrofishing											
LMB [1]											
CPUE	---	---	---	23	19	26	---	37	---	59	≥ 10
PSD	---	---	---	83	100	96	---	84	---	86	40-70
PSD-P	---	---	---	26	85	78	---	65	---	41	10-40
Wr	---	---	---	110	110	109	---	124	---	116	---
SMB [2]											
CPUE	---	---	---	---	17	42	---	111	---	20	---
PSD	---	---	---	---	78	70	---	25	---	65	40-70
PSD-P	---	---	---	---	72	58	---	11	---	20	10-40
Wr	---	---	---	---	89	111	---	97	---	104	---

[1] Spring night electrofishing-LMB.
[2] Spring night electrofishing-SMB.
[3] 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 the expanded age/length summary for largemouth bass sampled during spring night electrofishing from Roy Lake, 2009-2014.

	Year Class														
Year	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
2014			7	10	11	7	2		7	10	3				
2012	---	---			6	4	4	2	2	10	6		1	1	
2010[1]	---	---	---	---			1		2	11	8	4			
2009[1]	---	---	---	---	---					1	6	4		1	
2008[1]	---	---	---	---	---	---			1	8	8	3		1	

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

Table 5. Weighted mean TL (mm) at capture for largemouth bass age-1 through age-10 sampled during spring night electrofishing (expanded sample size) from Roy Lake, 2005-2014.

	Age									
Year	1	2	3	4	5	6	7	8	9	10
2014	---	251(7)	320(10)	362(11)	372(7)	371(2)	---	442(7)	450(10)	443(3)
2012[1]	---	252(6)	331(4)	375(4)	405(2)	416(2)	445(10)	450(6)	---	472(1)
2010[1]	---	245(1)	---	345(2)	382(11)	419(8)	409(4)	---	---	---
2009	---	---	---	366(1)	393(6)	430(4)	---	466(1)	---	514(1)
2008	---	209(1)	307(8)	357(8)	399(3)	---	450(1)	---	501(2)	---

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

Table 6. Year class distribution based on the expanded age/length summary for smallmouth bass sampled during spring electrofishing from Roy Lake, 2009-2014; includes both day and night samples (2014).

	Year Class														
Year	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
2014			6	6	6	1	1	1							
2012	---	---			56	38	7	4			5		1		
2010[1]	---	---	---	---			1	12	5	3	5	5	5	2	1
2009	---	---	---	---	---			2	2	1	3	2	3	4	

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

Table 7. Weighted mean TL (mm) at capture for smallmouth bass age-2 through age-10 sampled during spring electrofishing (expanded sample size) from Roy Lake, 2009-2014; includes both day and night samples (2014).

	Age								
Year	2	3	4	5	6	7	8	9	10
2014	203(6)	296(6)	317(6)	331(1)	408(1)	405(1)	---	---	---
2012	206(56)	268(38)	335(7)	380(4)	---	---	447(5)	---	481(1)
2010[1]	220(1)	265(12)	328(5)	367(3)	412(5)	432(5)	467(5)	462(2)	493(1)
2009	218(2)	252(2)	389(1)	388(3)	415(2)	446(3)	458(4)	---	---

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

Table 8. Year class distribution based on the expanded age/length summary for walleye sampled in gill nets and associated stocking history (# stocked x 1,000) from Roy Lake, 2010-2014.

	Year Class													
Survey Year	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
2014[1]			2	19	10	2	2	1						3
2013[1]	---			21	15	6	3							1
2012[1]	---	---		6	2	8	1							
2011[1]	---	---	---		4	5	1	2	1		1			
2010	---	---	---	---		3	12	1	2	3	2			1
# stocked														
fry		850[2]												
sm. fingerling												209		
lg. fingerling														

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

[2] Stocked walleye were OTC marked; 41 of 51 otoliths collected from fall electrofished age-0 walleye exhibited marks for an estimated stocking contribution of 80%.

Table 9. Weighted mean TL at capture (mm) for walleye age-1 through age-10 sampled in experimental gill nets (expanded sample size) from Roy Lake, 2005-2014. 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
2014[1]	---	232(2)	377(19)	408(10)	482(2)	591(2)	476(1)	---	---	---
2013[1]	---	300(21)	367(15)	424(6)	535(3)	---	---	---	---	---
2012[1]	197(6)	294(2)	351(8)	530(1)	---	---	---	---	---	---
2011[1]	183(4)	276(5)	398(1)	483(2)	467(1)	---	513(1)	---	---	---
2010	177(3)	294(12)	384(1)	464(2)	522(3)	473(2)	---	---	485(1)	---
2009[1]	194(4)	301(2)	398(5)	465(2)	502(2)	506(1)	561(1)	570(3)	---	---
2008[1]	262(1)	324(4)	438(1)	408(5)	557(1)	---	---	---	626(1)	---
2007	210(8)	327(6)	423(7)	466(3)	538(1)	504(1)	---	535(1)	641(1)	---
2006[1]	168(1)	223(4)	334(11)	445(2)	510(8)	527(3)	558(2)	---	580(3)	---
2005[1]	183(2)	301(3)	396(5)	447(10)	471(1)	---	524(1)	553(2)	530(1)	---

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

Table 10. Stocking history including size and number for fishes stocked into Roy Lake, 2000-2014. LMB= largemouth bass; WAE= walleye

Year	Species	Size	Number
2003	LMB	fingerling	4,200
2003	WAE	small fingerling	208,600
2013	WAE	fry	850,000

Table 11. Year class distribution based on the age/length summary for yellow perch sampled in gill nets from Roy Lake, 2010-2014.

	Year Class							
Survey Year	2014	2013	2012	2011	2010	2009	2008	2007
2014		55	172	23	22	4		
2013	---		563	44	258	163	32	8
2012	---	---		45	412	105	80	
2011	---	---	---		764	548	194	
2010	---	---	---	---		208	926	44

Table 12. Weighted mean TL (mm) at capture by gender for yellow perch captured in experimental gill nets (expanded sample size) from Roy Lake, 2009-2014.

	Age					
Year	1	2	3	4	5	6
2014						
Male	94(18)	111(61)	114(6)	179(12)	192(2)	---
Female	97(36)	121(108)	135(16)	187(10)	236(2)	---
Combined	96(55)	117(172)	131(23)	182(22)	214(4)	---
2013						
Male	98(127)	133(14)	157(105)	176(101)	188(12)	193(4)
Female	100(361)	143(18)	176(161)	203(68)	217(13)	241(2)
Combined	100(563)	138(44)	168(258)	188(163)	202(32)	205(8)
2012						
Male	105(18)	146(130)	173(27)	184(23)	---	---
Female	100(22)	153(270)	191(85)	211(33)	---	---
Combined	102(45)	150(412)	184(105)	196(80)	---	---
2011						
Male	96(151)	124(80)	155(39)	---	---	---
Female	100(288)	135(316)	166(93)	---	---	---
Combined	99(764)	128(548)	157(194)	---	---	---
2010						
Male	96(66)	114(275)	143(4)	---	---	---
Female	96(123)	126(611)	169(29)	---	---	---
Combined	96(208)	122(926)	158(44)	---	---	---
2009						
Male	90(45)	108(131)	164(1)	---	---	---
Female	95(86)	121(218)	179(4)	193 (2)	---	---
Combined	93(138)	116(361)	176(5)	193 (2)	---	---

Table 13. Year class distribution based on the expanded age/length summary for bluegill sampled in frame nets from Roy Lake, 2010-2014.

	Year Class									
Survey Year	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
2014		85	29	61	17	5				
2013	---		5	84	100	1	1			
2012	---	---		32	260	5	4	4	4	1
2011	---	---	---		37	26	66	35	11	
2010	---	---	---	---			62	106	29	

Table 14. Weighted mean TL (mm) at capture for bluegill sampled in frame nets (expanded sample size) from Roy Lake, 2007-2014.

	Age						
Year	1	2	3	4	5	6	7
2014	85(85)	97(29)	128(61)	188(17)	199(5)	---	---
2013	93(5)	133(84)	176(100)	218(1)	236(1)	---	---
2012	89(32)	138(260)	189(5)	203(4)	219(4)	228(4)	247(1)
2011	83(37)	119(26)	151(66)	179(35)	202(11)	---	---
2010	---	101(62)	146(106)	165(29)	---	---	---
2009	81(19)	106(338)	150(41)	183(7)	---	---	---
2008	104(443)	115(221)	150(104)	177(3)	---	---	---
2007	83(6)	123(527)	158(52)	218(1)	234(1)	---	---

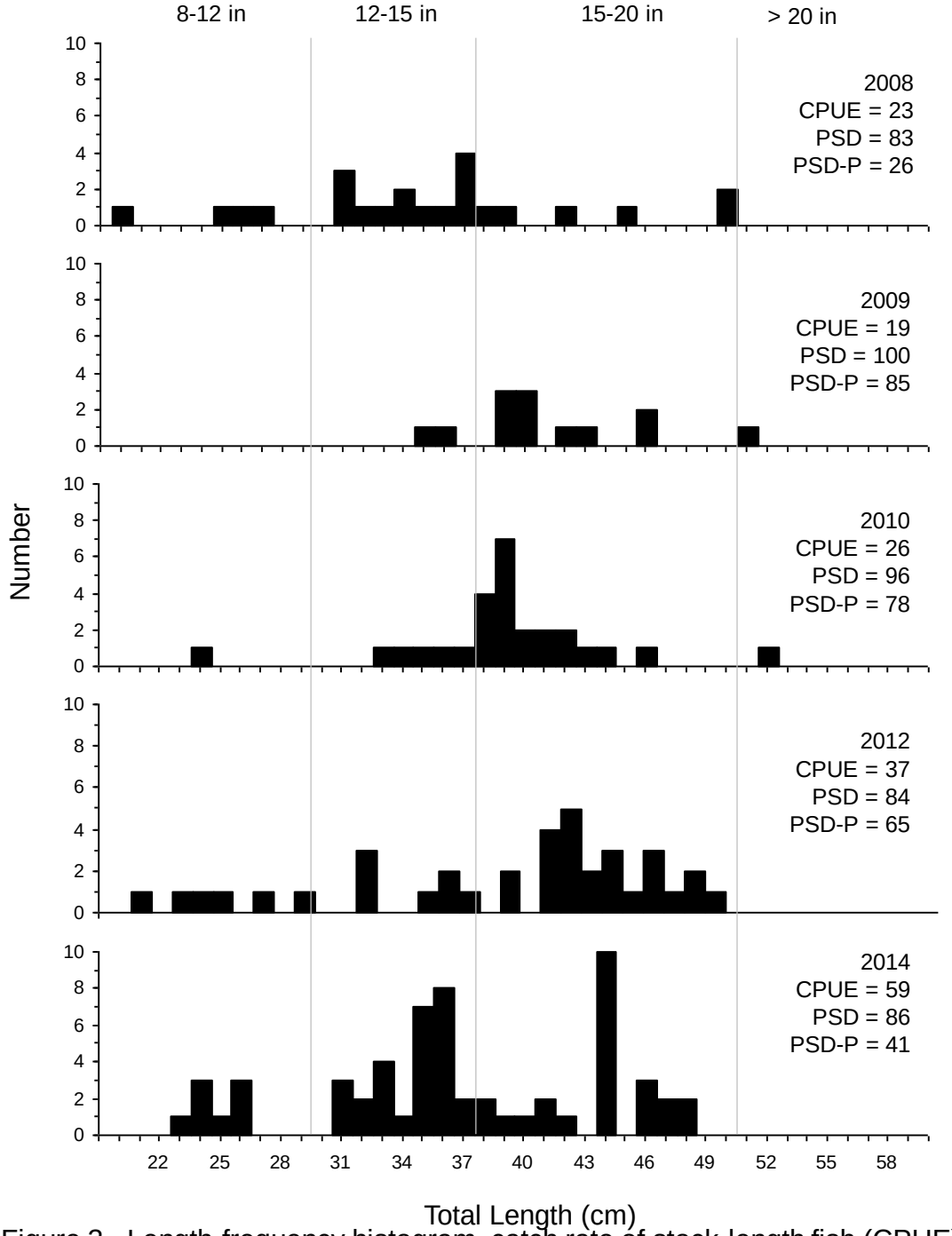

Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for largemouth bass captured during spring electrofishing in Roy Lake, 2008-2014.

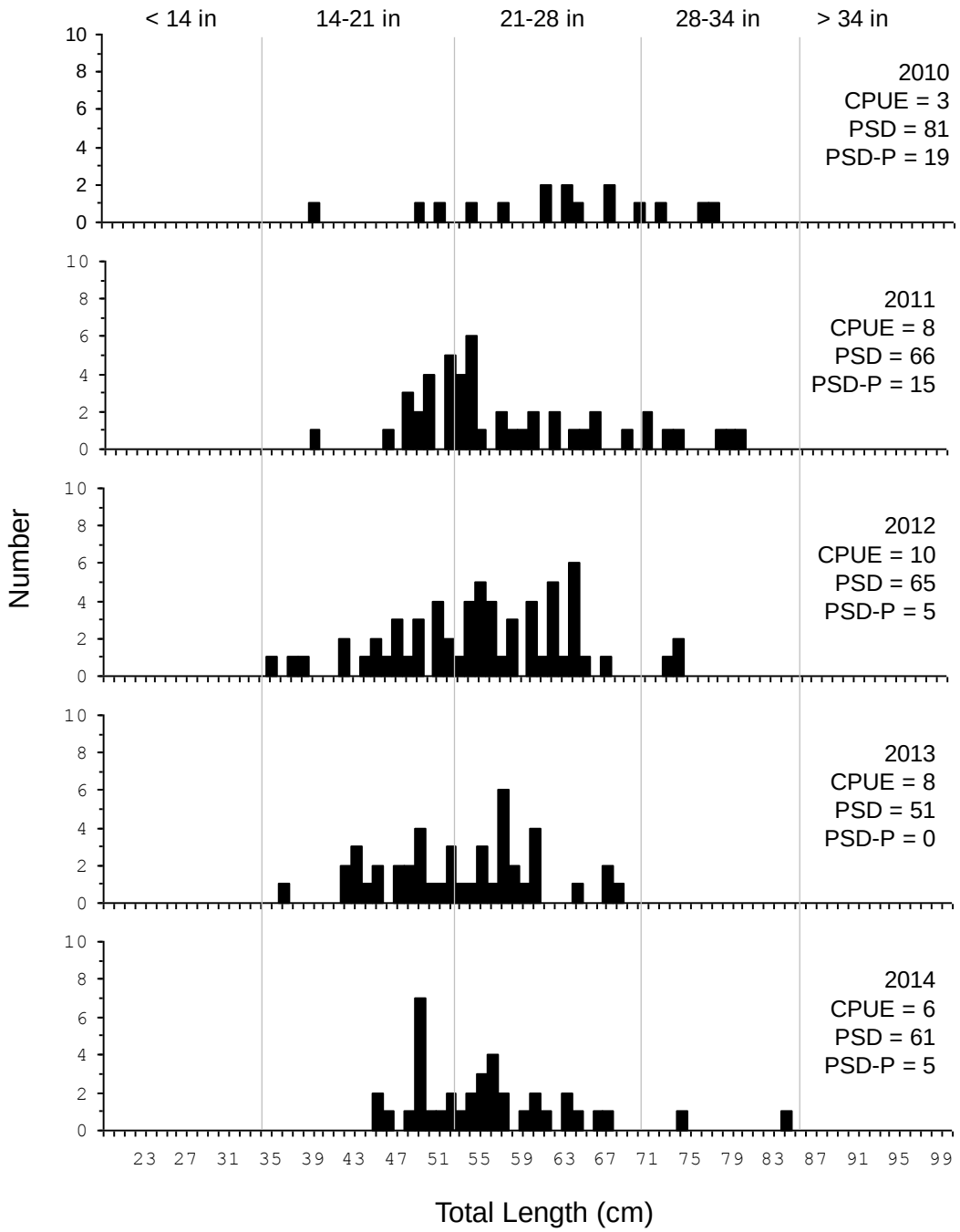

Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for northern pike captured using gill nets in Roy Lake, 2010-2014.

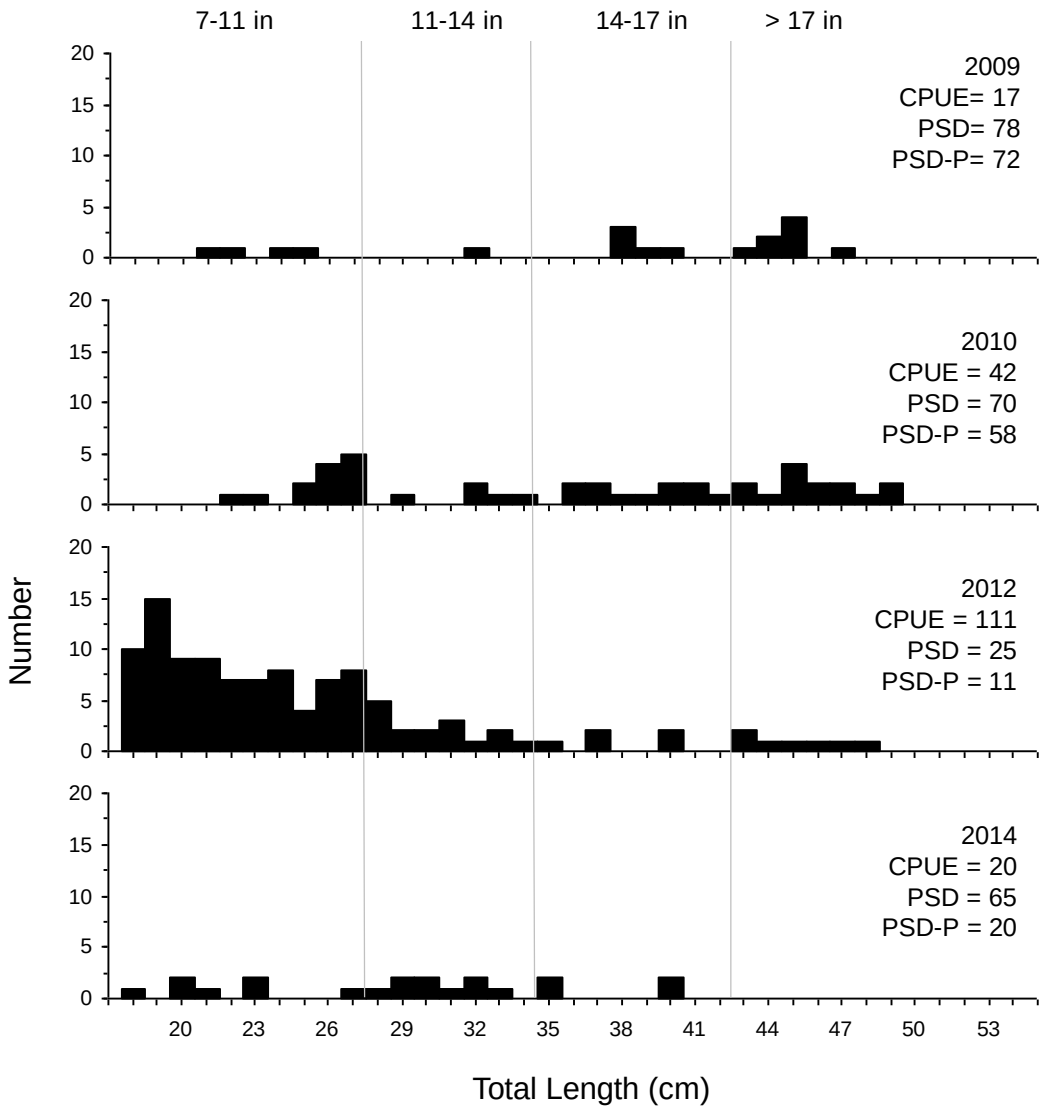

Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for smallmouth bass captured during spring electrofishing in Roy Lake, 2009-2014.

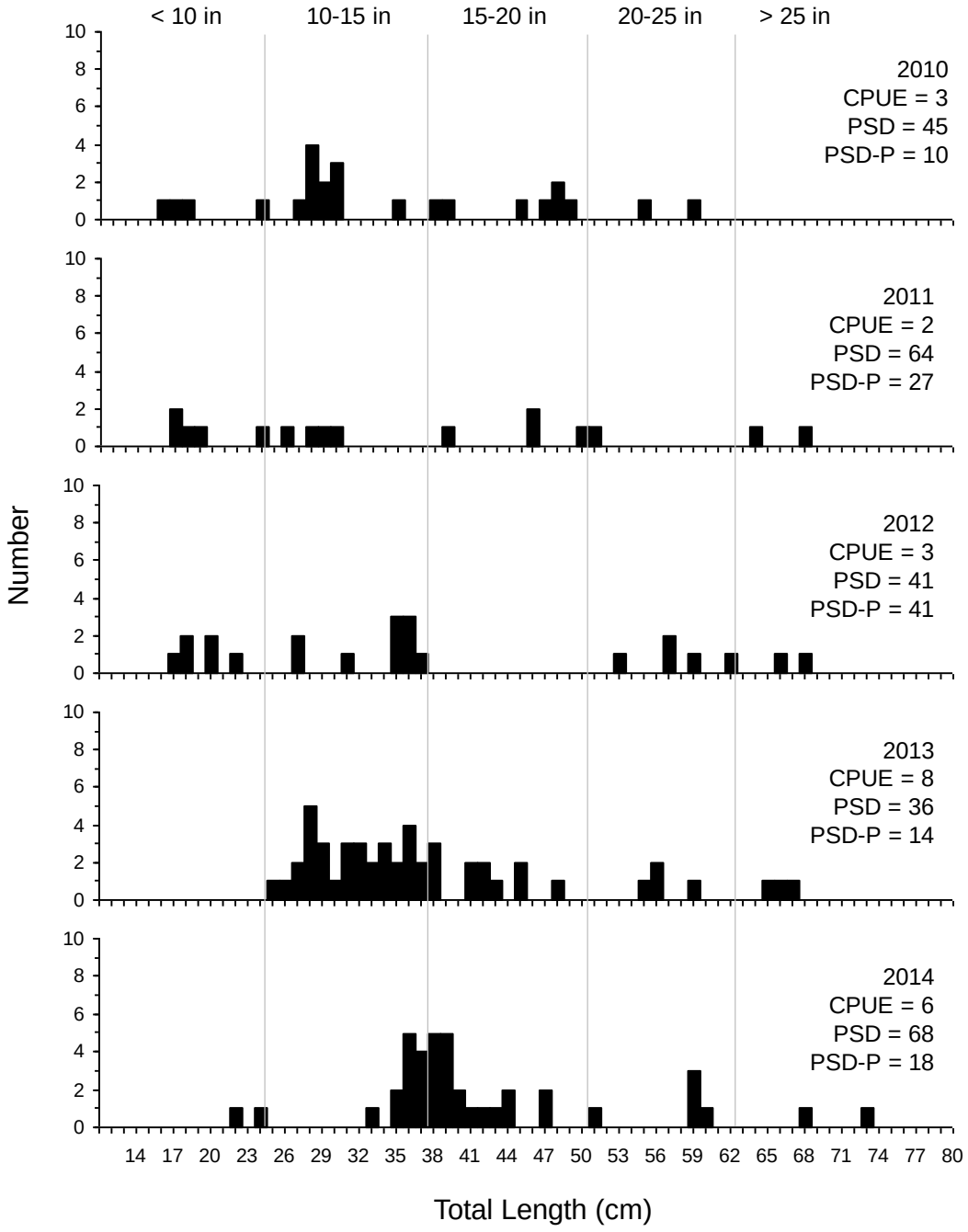

Figure 6. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for walleye captured using gill nets in Roy Lake, 2010-2014.

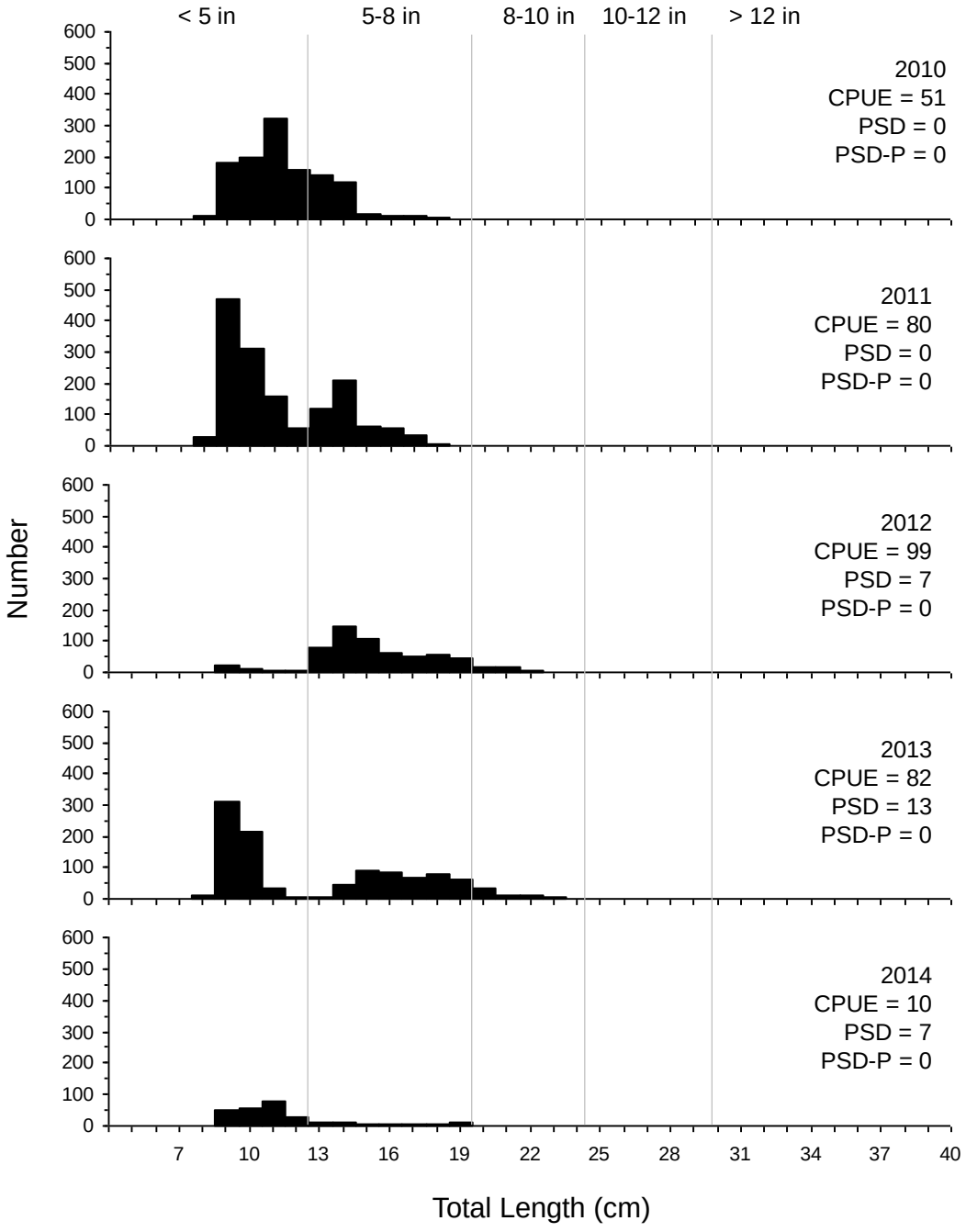

Figure 7. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for yellow perch captured using gill nets in Roy Lake, 2010-2014.

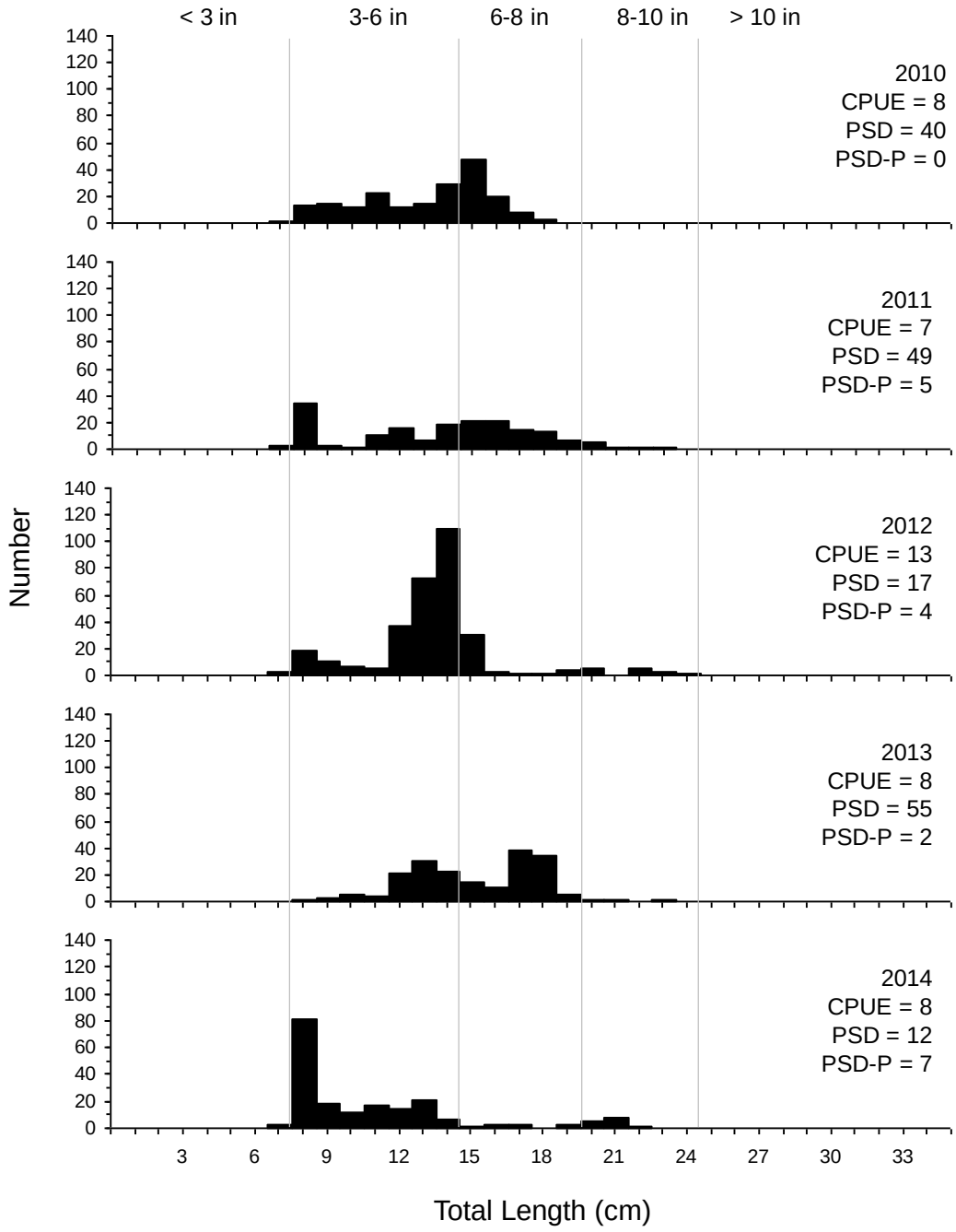

Figure 8. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for bluegill captured using frame nets in Roy Lake, 2010-2014.