

# Cattail/Kettle Lake

## Site Description

---

### Location

|                                |   |
|--------------------------------|---|
| Water designation number (WDN) | 48-0012-00  |
| Legal description              | T125N-R55W-Sec. 6,7,18,19<br>T125N-R56W-Sec. 1,2,10,11,12,13,14,23,24 |
| County (ies)                   | Marshall  |
| Location from nearest town     | 5 miles west and 3 miles north of Eden, South Dakota.                 |

### Survey Dates and Sampling Information

|                    |                             |
|--------------------|-----------------------------|
| Survey dates       | August 18-20, 2009 (FN, GN) |
| Gill net sets (n)  | 6                           |
| Frame net sets (n) | 18                          |

### Morphometry

|                        |         |
|------------------------|---------|
| Watershed area (acres) | unknown |
| Surface area (acres)   | ≈2,800  |
| Maximum depth (ft)     | unknown |
| Mean depth (ft)        | unknown |

### Ownership and Public Access

Cattail/Kettle Lake is a non-meandered lake; however, a significant amount of land previously managed as a Game Production Area (GPA) is now submerged. Water elevations have spilled over on private lands creating private ownership of much of the lakeshore. Both private and public land can be found beneath the water. A public access site is located on the west shore of Cattail/Kettle Lake and is maintained by the SDGFP (Figure 1).

### Watershed and Land Use

Land use within the Cattail/Kettle watershed is primarily agricultural including cropland, pasture and woodlands.

### Water Level Observations

Cattail/Kettle Lake has no established Ordinary High Water Mark and an outlet elevation was not available. On April 28, 2009 the elevation of Cattail/Kettle Lake was 1794.4 fmsl and above the fall 2008 elevation of 1792.4 fmsl. By September 2, 2009 the elevation of Cattail/Kettle Lake had declined to 1792.5 fmsl.

### Aquatic Nuisance Species Monitoring

#### Plant Survey

Areas of emergent vegetation (primarily cattails) and submerged vegetation are present in Cattail-Kettle Lake. Submerged aquatic plant species identified during the 2009 survey include northern milfoil and sago pondweed. No aquatic nuisance plant species were encountered.

#### Macro-Invertebrate/Mussel Survey

No aquatic nuisance macro-invertebrate or mussel species were sampled in 2009.

#### Fish Community Survey

Common carp was the only aquatic nuisance fish species captured during the 2009 survey.

### Fish Management Information

|                             |   |
|-----------------------------|---|
| Primary species             | walleye, yellow perch   |
| Other species               | black bullhead, black crappie, bluegill, common carp, largemouth bass, northern pike, smallmouth bass, white sucker |
| Lake-specific regulations   | NE Panfish Management Area: 10 daily; 50 possession<br>Walleye/Saugeye: minimum length 16"                          |
| Management classification   | warm-water marginal   |
| Fish Consumption Advisories | none  |

---

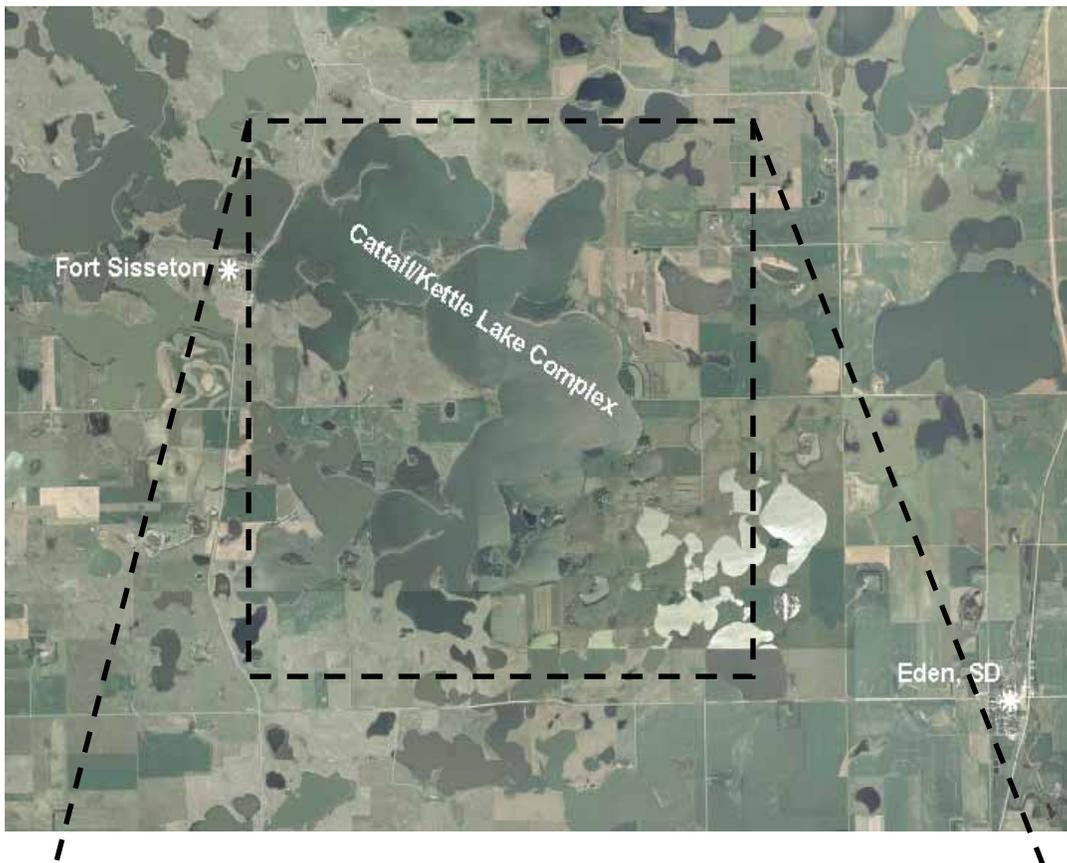


Figure 1. Map depicting location of the Cattail/Kettle Lake Complex from Eden, Marshall County, South Dakota. Also noted are standardized net locations and the access area which includes boat ramp, dock, and public toilet. CKFN = frame nets, CKGN= gill nets

## Management Objectives

- 1) Maintain a mean gill net CPUE of stock-length walleye  $\geq 10$ , a PSD of 30-60, and a PSD-P of 5-10.
- 2) Maintain a mean gill net CPUE of stock-length yellow perch  $\geq 30$ , a PSD of 30-60, and a PSD-P of 5-10.
- 3) Maintain a mean frame net CPUE of stock-length bullhead  $\leq 100$ .

## Results and Discussion

Cattail/Kettle Lake is a natural lake located in Marshall County of northeastern South Dakota. High water levels during the 1990's combined Cattail and Kettle lakes along with several smaller sloughs into one large water body that is now commonly referred to as Cattail/Kettle Lake. Water flows into Cattail/Kettle Lake from Lost Lake to the north and through a series of shallow lakes to the northwest. The outlet is located on the southwest corner of Cattail/Kettle Lake and flows toward Hickman Dam to the west. During high water events many area lakes become connected allowing fish to move among the various water basins allowing many fish species to be introduced to Cattail/Kettle Lake via these waters.

Cattail/Kettle Lake was a popular winter fishery for large yellow perch and northern pike during the mid-1990's. SDGFP personnel first stocked walleyes into Cattail/Kettle Lake in 1997. Cattail/Kettle Lake is primarily managed as a walleye and yellow perch fishery. Overall, as many as 10 species of fish contribute to the fishery in Cattail/Kettle Lake.

### *Primary Species*

Walleye: The mean gill net CPUE of stock-length walleye during 2009 was 6.7 (Table 1) and below the minimum objective ( $\geq 10$  stock length walleye/net night; Table 3). Since 2002, relative abundance of walleye in the gill net catch has fluctuated from a low of 4.2 (2002) to a high of 20.7 (2005; Table 2). The 2009 gill net CPUE represented a slight increase from the 5.3 observed in 2008 (Table 2) and indicated moderate relative abundance.

Walleye captured in the 2009 gill net catch ranged in total length from 12 to 58 cm (4.7 to 22.8 in), had a PSD of 90 and a PSD-P of 3 (Figure 2). The 2009 PSD was above the objective range of 30-60; while the PSD-P was slightly below the objective range of 5-10 (Table 3).

Otoliths were collected from a sub-sample of gill net captured walleye in 2009. Age structure information indicated the presence of four year classes (2005, 2006, 2008, and 2009; Table 6). Year classes produced in 2006 and 2008 coincide with fry stockings and comprise approximately 57% and 18%, respectively, of walleye in the 2009 gill net catch (Table 5; Table 6). Age-0 walleye comprised approximately 21% of walleye in the 2009 gill net catch and were a result of natural reproduction (Table 6);

however, recruitment of these fish to the adult population is unknown and will be assessed in future surveys.

Walleye in Cattail/Kettle Lake tend to exhibit relatively fast growth with most surpassing quality-length 38 cm; 15 in) by mid-August of their fourth growing season at age-3+ (Table 4). Since 2005, the weighted mean total length at capture for age-3 walleye has ranged from 411 to 463 mm (16.2 to 18.2 in; Table 4). Mean Wr values of walleye captured in the 2009 gill net catch ranged from 81 to 92 for all length categories sampled with the mean Wr of stock-length walleye being 88 (Table 1). No length-related trends in walleye condition were apparent.

Yellow Perch: The mean gill net CPUE of stock-length yellow perch in 2009 was 83.0 (Table 1) and above the minimum objective ( $\geq 30$  stock-length yellow perch/net night; Table 3). Since 2002, the mean gill net CPUE of stock-length yellow perch has fluctuated from a low of 21.5 (2006) to a high of 83.0 (2009) with the 2002-2009 average being 48.0 (Table 2). Based on the 2009 gill net catch, relative abundance is high.

Yellow perch captured in the 2009 gill net catch ranged in total length from 7 to 28 cm (2.8 to 11.0 in) with the majority being in the stock-quality length category resulting in low PSD and PSD-P values of 3 and 0, respectively (Table 1; Figure 3). Both the 2009 PSD and PSD-P were below the desired management objectives of 30-60 and 5-10 (Table 3).

Otoliths were collected from a sub-sample of gill net captured yellow perch in 2009. Age structure information indicates that yellow perch in Cattail/Kettle Lake have exhibited relatively-consistent recruitment of varying magnitude in recent years (Table 8). Yellow perch from the 2008 year class comprised approximately 95% of perch in the 2009 gill net catch (Table 8).

The weighted mean total length at capture for male yellow perch from the 2008 cohort (age-1) was 150 mm (5.9 in; Table 7). The weighted mean total length at capture for female yellow perch from the 2008 cohort (age-1) was 160 mm (6.3 in; Table 7). Mean Wr values for yellow perch in the 2009 gill net catch ranged from 97 to 112 for all length categories sampled with the mean Wr of stock-length yellow perch being 105 (Table 1).

### *Other Species*

Black bullhead: No black bullheads were captured in gill nets or frame nets during the 2009 survey (Table 2; Figure 4). Since 2002, the mean frame net CPUE of black bullhead has ranged from 548.7 (2003) to 0.0 (2009) with the 2002-2009 average being 109.9 (Table 2). Poor recruitment of black bullheads in many northeastern South Dakota lakes has been common in recent years limiting their abundance.

Black crappie: In 2009, seven stock-length black crappie ranging in total length from 13 to 32 cm (5.1 to 12.6 in) were captured in the frame net catch resulting in a mean frame net CPUE of 0.4 (Table 1). The mean frame net CPUE has declined in each of the past three surveys (2007-2009; Table 2). Based on the 2009 frame net catch, relative abundance is low. Few inferences can be made concerning black crappie size structure, growth, and condition due to low sample size.

Otoliths were collected from a sub-sample of frame net captured black crappie in 2009. Three black crappie year classes were present (2005, 2008, and 2009); however, each year class was represented by few individuals (Table 10).

Few inferences can be made concerning black crappie size structure, growth, and condition due to low sample size.

Largemouth and Smallmouth bass: Largemouth and smallmouth bass are present in Cattail/Kettle Lake, but densities are believed to be low. However, spring night electrofishing over suitable habitat, the primary technique utilized to monitor largemouth and smallmouth bass populations in northeast South Dakota glacial lakes, has not been conducted in Cattail/Kettle Lake.

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.

In 2009, five stock-length northern pike ranging in total length from 58 to 74 cm (22.8 to 29.1 in) were captured resulting in a mean gill net CPUE of 0.8 (Table 1). Since 2002, northern pike relative abundance has varied from 0.0 (2006) to 4.8 (2002; Table 2). Few inferences can be made concerning northern pike size structure and condition due to low sample size.

Other: Bluegill, common carp, and white sucker were captured in low numbers during the 2009 survey and likely are contributing little to the fishery (Table 1).

### **Management Recommendations**

- 1) Conduct fish community assessment surveys annually (next survey scheduled in summer 2010) to monitor fish relative abundance, size structure, growth and stocking success.
- 2) Conduct fall night electrofishing annually to monitor age-0 walleye relative abundance.
- 3) Collect otoliths from walleye and yellow perch to assess the age structure and growth rates of each population.
- 4) Stock walleye at ( $\approx$ 500 fry/acre; 50% OTC marked) to establish additional year classes if fall night electrofishing CPUE of age-0 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).
- 5) Evaluate walleye population dynamics and implement regulations to benefit the population and comply with tool box options.

Table 1. Mean catch rate (CPUE; catch/net night) 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 by experimental gill nets and frame nets in Cattail/Kettle Lake, 2009. Confidence intervals include 80 percent ( $\pm$  CI-80) or 90 percent ( $\pm$  CI-90). BLC= black crappie; BLG= bluegill; COC= common carp; LMB= largemouth bass; NOP = northern pike; SMB= smallmouth bass; WAE = walleye; 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> |           |       |                       |       |       |       |           |       |
| BLC               | 0.4       | 0.2   | 57                    | 39    | 57    | 39    | 112       | 8     |
| BLG               | 0.1       | <0.1  | 0                     | ---   | 0     | ---   | 135       | ---   |
| COC               | 0.4       | 0.4   | 100                   | 0     | 71    | 29    | 106       | 16    |
| LMB               | 0.1       | <0.1  | 100                   | ---   | 100   | ---   | 107       | ---   |
| NOP               | 0.6       | 0.2   | 100                   | 0     | 20    | 24    | 86        | 5     |
| SMB               | 0.2       | 0.2   | 50                    | 50    | 0     | ---   | 112       | 7     |
| WAE               | 1.2       | 0.4   | 90                    | 10    | 19    | 15    | 89        | 3     |
| WHS               | 0.1       | <0.1  | 100                   | ---   | 100   | ---   | 103       | ---   |
| YEP               | 5.6       | 2.5   | 0                     | ---   | 0     | ---   | 97        | <1    |
| <i>Gill nets</i>  |           |       |                       |       |       |       |           |       |
| BLC               | 0.7       | 0.5   | 25                    | 59    | 25    | 59    | 124       | 14    |
| COC               | 1.5       | 0.6   | 100                   | 0     | 100   | 0     | 107       | 2     |
| NOP               | 0.8       | 0.5   | 100                   | 0     | 20    | 43    | 83        | 12    |
| SMB               | 0.3       | 0.5   | 100                   | 0     | 0     | ---   | 122       | <1    |
| WAE               | 6.7       | 2.1   | 90                    | 8     | 3     | 4     | 88        | 1     |
| WHS               | 0.3       | 0.5   | 0                     | ---   | 0     | ---   | 92        | <1    |
| YEP               | 83.0      | 7.5   | 3                     | 2     | 0     | 1     | 105       | <1    |

Table 2. Historic mean catch rate (CPUE; frame/gill nets= catch/net night, electrofishing= catch/hour) of stock-length fish for various fish species captured by experimental gill nets, frame nets, and electrofishing from Cattail/Kettle Lake, 2002-2009. BLB = black bullhead; BLC= black crappie; BLG= bluegill; COC= common carp; LMB= largemouth bass; NOP = northern pike; SMB = smallmouth bass; WAE = walleye; WHS = white sucker; YEP = yellow perch

| Species                  | 2002  | 2003  | 2004 | 2005 | 2006 <sup>1</sup> | 2007 <sup>1</sup> | 2008               | 2009 | Mean               |
|--------------------------|-------|-------|------|------|-------------------|-------------------|--------------------|------|--------------------|
| <i>Frame nets</i>        |       |       |      |      |                   |                   |                    |      |                    |
| BLB                      | 305.5 | 548.7 | 5.4  | 1.3  | 15.1              | 2.9               | 0.1                | 0.0  | 109.9              |
| BLC                      | 4.6   | 0.9   | 0.6  | 1.3  | 10.3              | 7.1               | 2.5                | 0.4  | 3.5                |
| BLG                      | 0.0   | 0.0   | 0.0  | 0.0  | 0.0               | 0.0               | 1.8                | 0.1  | 0.2                |
| COC                      | 0.9   | 0.6   | 0.4  | 1.7  | 4.2               | 3.2               | 0.9                | 0.4  | 1.5                |
| LMB                      | 0.2   | 0.1   | 0.1  | 0.2  | 0.1               | 0.0               | 0.1                | 0.1  | 0.1                |
| NOP                      | 1.1   | 1.9   | 1.1  | 1.3  | 0.8               | 0.2               | 1.3                | 0.6  | 1.0                |
| SMB                      | 0.1   | 0.3   | 0.0  | 0.0  | 0.8               | 0.0               | 0.8                | 0.2  | 0.3                |
| WAE                      | 2.6   | 4.1   | 2.3  | 5.4  | 3.8               | 2.3               | 2.0                | 1.2  | 3.0                |
| WHS                      | 0.0   | 0.9   | 0.4  | 3.9  | 0.8               | 0.1               | 0.2                | 0.1  | 0.8                |
| YEP                      | 10.3  | 0.7   | 0.9  | 0.6  | 2.7               | 1.9               | 3.2                | 5.6  | 3.2                |
| <i>Gill nets</i>         |       |       |      |      |                   |                   |                    |      |                    |
| BLB                      | 51.7  | 42.2  | 6.2  | 1.3  | 38.0              | 2.8               | 0.0                | 0.0  | 17.8               |
| BLC                      | 0.0   | 0.8   | 0.5  | 0.8  | 9.7               | 4.7               | 0.3                | 0.7  | 2.2                |
| COC                      | 0.0   | 0.0   | 0.0  | 0.0  | 2.5               | 8.5               | 2.0                | 1.5  | 1.8                |
| LMB                      | 0.0   | 0.0   | 0.0  | 0.0  | 0.0               | 0.0               | 0.0                | 0.0  | 0.0                |
| NOP                      | 4.8   | 0.7   | 1.5  | 0.5  | 0.0               | 1.7               | 1.3                | 0.8  | 1.4                |
| SMB                      | 0.0   | 0.0   | 0.0  | 0.0  | 0.0               | 0.0               | 0.0                | 0.3  | 0.0                |
| WAE                      | 4.2   | 15.5  | 15.0 | 20.7 | 10.8              | 15.0              | 5.3                | 6.7  | 11.7               |
| WHS                      | 1.2   | 1.3   | 0.5  | 0.0  | 0.2               | 0.2               | 0.2                | 0.3  | 0.5                |
| YEP                      | 39.7  | 42.3  | 42.5 | 23.5 | 21.5              | 72.5              | 58.7               | 83.0 | 48.0               |
| <i>Electrofishing</i>    |       |       |      |      |                   |                   |                    |      |                    |
| WAE <sup>2</sup> (age-0) | ---   | ---   | ---  | ---  | ---               | ---               | 295.1 <sup>3</sup> | ---  | 295.1 <sup>3</sup> |

<sup>1</sup> Monofilament gill net mesh size (.75", 1", 1.25", 1.5", 2" and 2.5")

<sup>2</sup> Fall Electrofishing-WAE.

<sup>3</sup> Catch rate (CPUE) represents age-0 walleye/hour, not stock-length walleye/hour.

Table 3. Mean catch rate (CPUE; catch/net night) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) for selected species captured in experimental gill nets and frame nets from Cattail/Kettle Lake, 2002-2009. BLB = black bullhead; BLC= black crappie; NOP = northern pike; WAE = walleye; YEP = yellow perch

| Species           | 2002 | 2003 | 2004 | 2005 | 2006 <sup>1</sup> | 2007 <sup>1</sup> | 2008 | 2009 | Average | Objective |
|-------------------|------|------|------|------|-------------------|-------------------|------|------|---------|-----------|
| <i>Frame nets</i> |      |      |      |      |                   |                   |      |      |         |           |
| BLB               |      |      |      |      |                   |                   |      |      |         |           |
| CPUE              | 306  | 549  | 5    | 1    | 15                | 3                 | <1   | 0    | 110     | ≤ 100     |
| PSD               | 47   | 8    | 87   | 100  | 53                | 71                | 100  | ---  | 67      | ---       |
| RSD-P             | 18   | 8    | 83   | 92   | 39                | 6                 | 100  | ---  | 49      | ---       |
| Wr                | 81   | 88   | 100  | 98   | 95                | 91                | 85   | ---  | 91      | ---       |
| BLC               |      |      |      |      |                   |                   |      |      |         |           |
| CPUE              | 5    | 1    | 1    | 1    | 10                | 7                 | 3    | <1   | 4       | ---       |
| PSD               | 33   | 71   | 70   | 4    | 4                 | 84                | 78   | 57   | 50      | ---       |
| RSD-P             | 20   | 71   | 60   | 4    | 0                 | 9                 | 64   | 57   | 36      | ---       |
| Wr                | 108  | 98   | 112  | 121  | 112               | 111               | 111  | 112  | 111     | ---       |
| <i>Gill nets</i>  |      |      |      |      |                   |                   |      |      |         |           |
| NOP               |      |      |      |      |                   |                   |      |      |         |           |
| CPUE              | 5    | 1    | 2    | 1    | 0                 | 2                 | 1    | 1    | 2       | ---       |
| PSD               | 79   | 100  | 100  | 100  | ---               | 90                | 100  | 100  | 96      | ---       |
| RSD-P             | 3    | 50   | 11   | 33   | ---               | 20                | 0    | 20   | 20      | ---       |
| Wr                | 82   | 78   | 85   | 92   | ---               | 88                | 84   | 83   | 85      | ---       |
| WAE               |      |      |      |      |                   |                   |      |      |         |           |
| CPUE              | 4    | 16   | 15   | 21   | 11                | 15                | 5    | 7    | 12      | ≥ 10      |
| PSD               | 68   | 88   | 51   | 71   | 95                | 53                | 16   | 90   | 67      | 30-60     |
| RSD-P             | 12   | 23   | 12   | 15   | 18                | 27                | 9    | 3    | 15      | 5-10      |
| Wr                | 91   | 90   | 94   | 97   | 97                | 89                | 87   | 88   | 92      | ---       |
| YEP               |      |      |      |      |                   |                   |      |      |         |           |
| CPUE              | 40   | 42   | 43   | 24   | 22                | 73                | 59   | 83   | 48      | ≥ 30      |
| PSD               | 13   | 16   | 19   | 11   | 72                | 24                | 26   | 3    | 23      | 30-60     |
| RSD-P             | 0    | 0    | 7    | 3    | 17                | 6                 | 2    | 0    | 4       | 5-10      |
| Wr                | 92   | 106  | 99   | 101  | 98                | 103               | 107  | 105  | 101     | ---       |

<sup>1</sup> Monofilament gill net mesh size (.75", 1", 1.25", 1.5", 2" and 2.5")

Table 4. Weighted mean length at capture (mm) for walleye age-0 through age-10 captured in experimental gill nets (expanded sample size) from Cattail/Kettle Lake, 2005-2009. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends.

| Year | Age     |         |         |         |        |        |        |        |         |        |         |
|------|---------|---------|---------|---------|--------|--------|--------|--------|---------|--------|---------|
|      | 0       | 1       | 2       | 3       | 4      | 5      | 6      | 7      | 8       | 9      | 10      |
| 2009 | 135(13) | 242(11) | ---     | 411(35) | 438(1) | ---    | ---    | ---    | ---     | ---    | ---     |
| 2008 | 124(29) | 257(2)  | 323(26) | ---     | ---    | 473(1) | ---    | ---    | ---     | 635(1) | ---     |
| 2007 | ---     | 256(62) | 403(10) | 444(7)  | 479(5) | 570(1) | 499(2) | 553(3) | 558(7)  | ---    | 590(13) |
| 2006 | 183(15) | 199(2)  | 326(3)  | 429(49) | 522(1) | 507(1) | 563(1) | 568(4) | 554(4)  | 643(1) | 543(1)  |
| 2005 | ---     | 305(25) | 393(52) | 463(13) | 482(3) | 490(8) | 507(4) | ---    | 537(18) | ---    | ---     |

Table 5. Stocking history including size (Size) and number (Number) for fishes stocked into Cattail/Kettle Lake, 1997-2009.

| Year | Species | Size       | Number    |
|------|---------|------------|-----------|
| 1997 | WAE     | fingerling | 243,900   |
| 1999 | WAE     | fry        | 3,900,000 |
|      | WAE     | fingerling | 200,000   |
| 2000 | WAE     | fry        | 3,000,000 |
| 2001 | WAE     | fry        | 3,000,000 |
| 2003 | WAE     | fingerling | 300,290   |
| 2006 | WAE     | fry        | 2,700,000 |
| 2008 | WAE     | fry        | 4,000,000 |

Table 6. Year class distribution based on the expanded age/length summary for walleye sampled in gill nets and associated stocking history (Number stocked x 1,000) from Cattail/Kettle Lake, 2005-2009.

| Survey Year       | Year Class |       |      |       |      |      |      |      |       |       |       |      |      |
|-------------------|------------|-------|------|-------|------|------|------|------|-------|-------|-------|------|------|
|                   | 2009       | 2008  | 2007 | 2006  | 2005 | 2004 | 2003 | 2002 | 2001  | 2000  | 1999  | 1998 | 1997 |
| 2009              | 13         | 11    |      | 35    | 1    |      |      |      |       |       |       |      |      |
| 2008              | ---        | 29    | 2    | 26    |      |      | 1    |      |       |       | 1     |      | 2    |
| 2007 <sup>1</sup> | ---        | ---   |      | 62    | 10   | 7    | 5    | 1    | 2     | 3     | 7     |      | 13   |
| 2006 <sup>1</sup> | ---        | ---   | ---  | 15    | 2    | 3    | 49   | 1    | 1     | 1     | 4     | 4    | 1    |
| 2005              | ---        | ---   | ---  | ---   |      | 25   | 52   | 13   | 3     | 8     | 4     |      | 18   |
| # stocked         |            |       |      |       |      |      |      |      |       |       |       |      |      |
| fry               |            | 4,000 |      | 2,700 |      |      |      |      | 3,000 | 3,000 | 3,900 |      |      |
| small fingerling  |            |       |      |       |      |      | 300  |      |       |       | 200   |      | 244  |
| large fingerling  |            |       |      |       |      |      |      |      |       |       |       |      |      |

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

Table 7. Weighted mean total length (mm) at capture by gender for yellow perch captured in experimental gill nets (expanded sample size) from Cattail/Kettle Lake, 2009.

| Year     | Age    |           |          |         |     |     |
|----------|--------|-----------|----------|---------|-----|-----|
|          | 0      | 1         | 2        | 3       | 4   | 5   |
| 2009     |        |           |          |         |     |     |
| Male     | 89 (9) | 150 (118) | 217 (2)  | ---     | --- | --- |
| Female   | ---    | 160 (370) | 228 (15) | 285 (1) | --- | --- |
| Combined | 89 (9) | 157 (488) | 227 (17) | 285 (1) | --- | --- |

Table 8. Year class distribution based on expanded age/length summary for yellow perch sampled in gill nets from Cattail/Kettle Lake, 2009.

| Survey Year | Year Class |      |      |      |      |      |
|-------------|------------|------|------|------|------|------|
|             | 2009       | 2008 | 2007 | 2006 | 2005 | 2004 |
| 2009        | 9          | 488  | 17   | 1    |      |      |

Table 9. Weighted mean total length (mm) at capture for black crappie captured in frame nets (expanded sample size) from Cattail/Kettle Lake, 2008 and 2009.

| Year | Age    |          |         |          |         |     |         |
|------|--------|----------|---------|----------|---------|-----|---------|
|      | 0      | 1        | 2       | 3        | 4       | 5   | 6       |
| 2009 | 82 (7) | 136 (3)  | ---     | ---      | 299 (4) | --- | ---     |
| 2008 | 81 (1) | 136 (11) | 211 (4) | 276 (27) | 306 (3) | --- | 325 (1) |

Table 10. Year class distribution based on expanded age/length summary for black crappie sampled in frame nets from Cattail/Kettle Lake, 2008 and 2009.

| Survey Year | Year Class |      |      |      |      |      |      |      |
|-------------|------------|------|------|------|------|------|------|------|
|             | 2009       | 2008 | 2007 | 2006 | 2005 | 2004 | 2003 | 2002 |
| 2009        | 7          | 3    | ---  | ---  | 4    | ---  | ---  | ---  |
| 2008        | ---        | 1    | 11   | 4    | 27   | 3    | ---  | 1    |

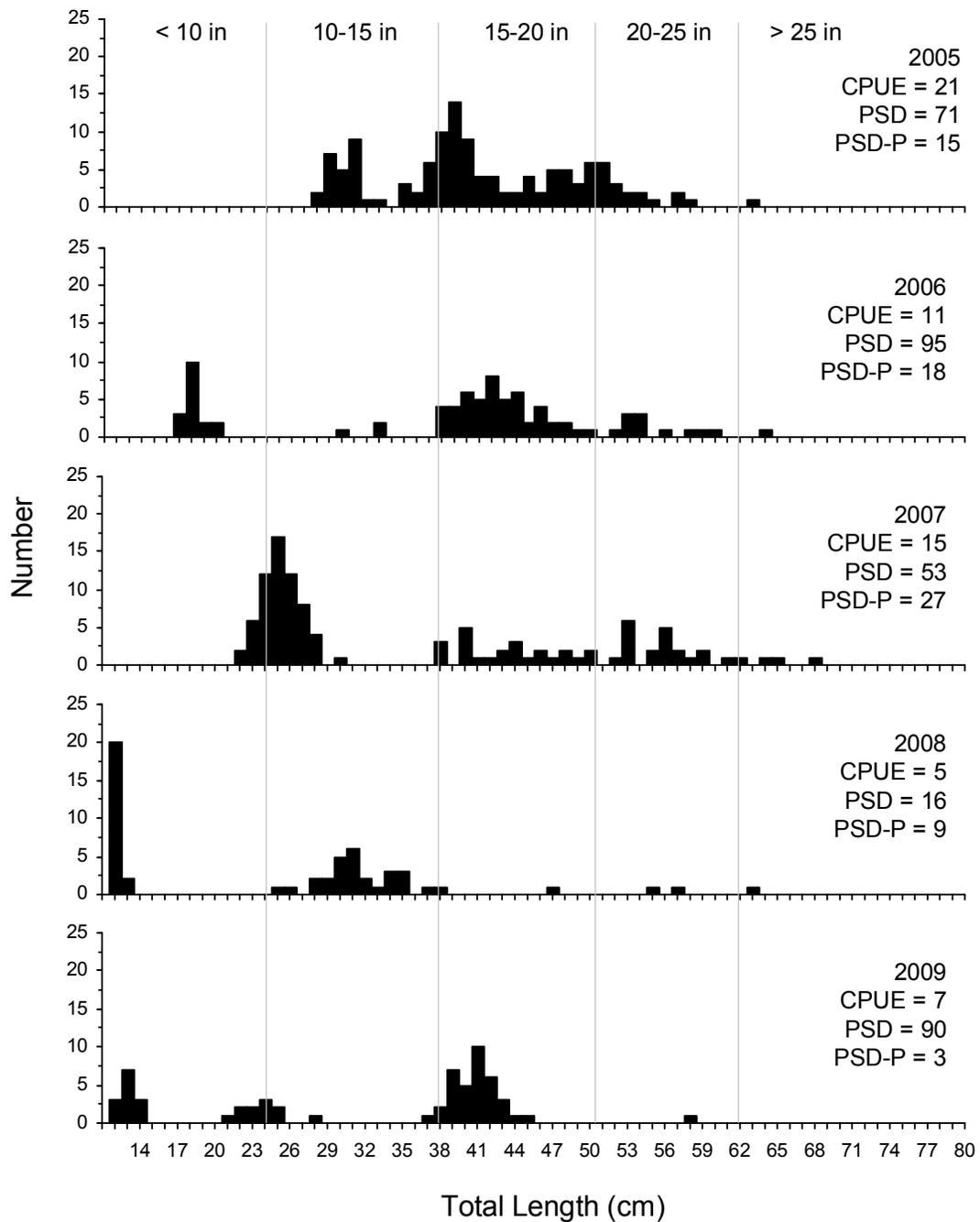


Figure 2. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for walleye captured using experimental gill nets in Cattail/Kettle Lake, 2005-2009.

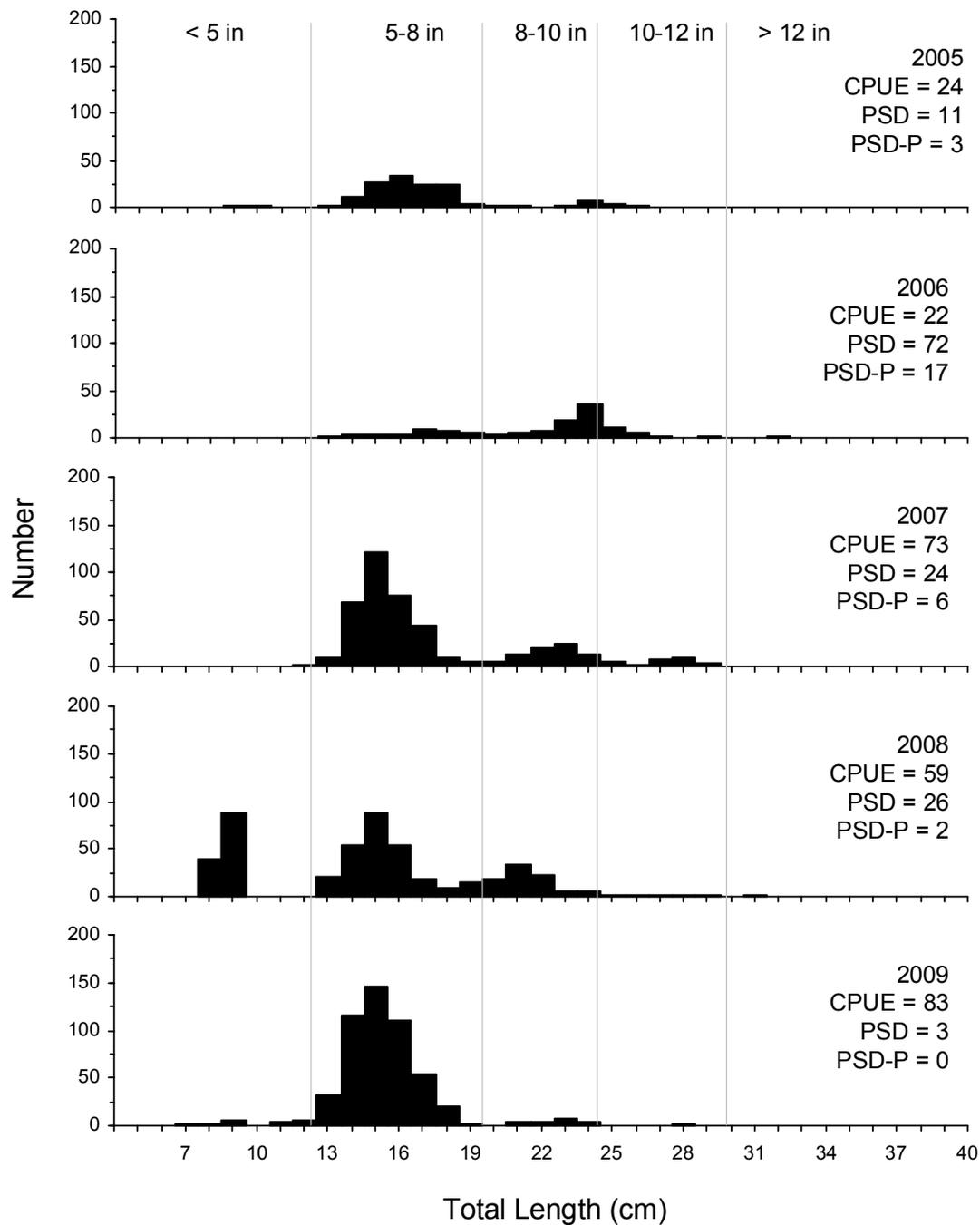


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for yellow perch captured using experimental gill nets in Cattail-Kettle Lake, 2005-2009.

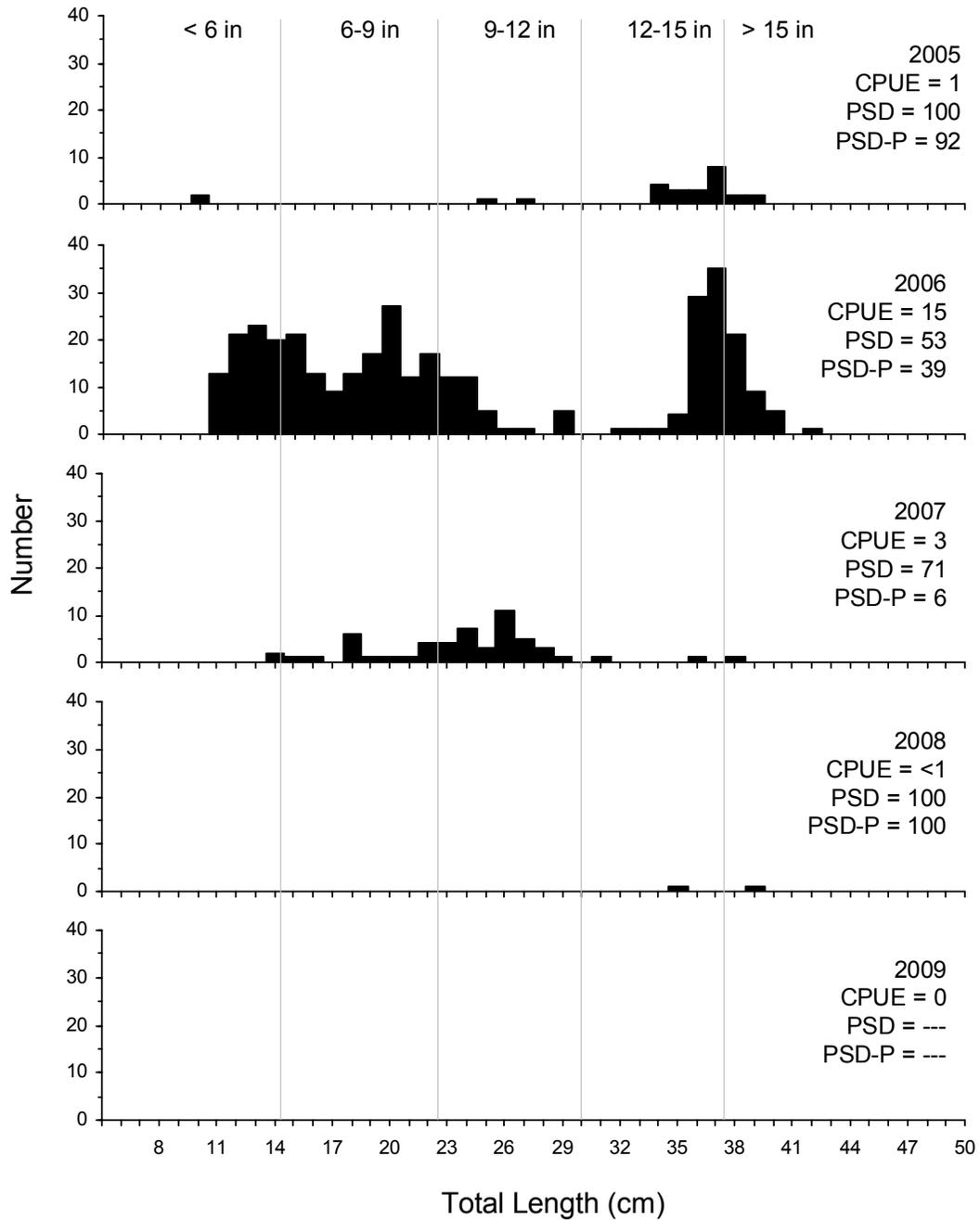


Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black bullhead captured using experimental gill nets in Cattail-Kettle Lake, 2005-2009.

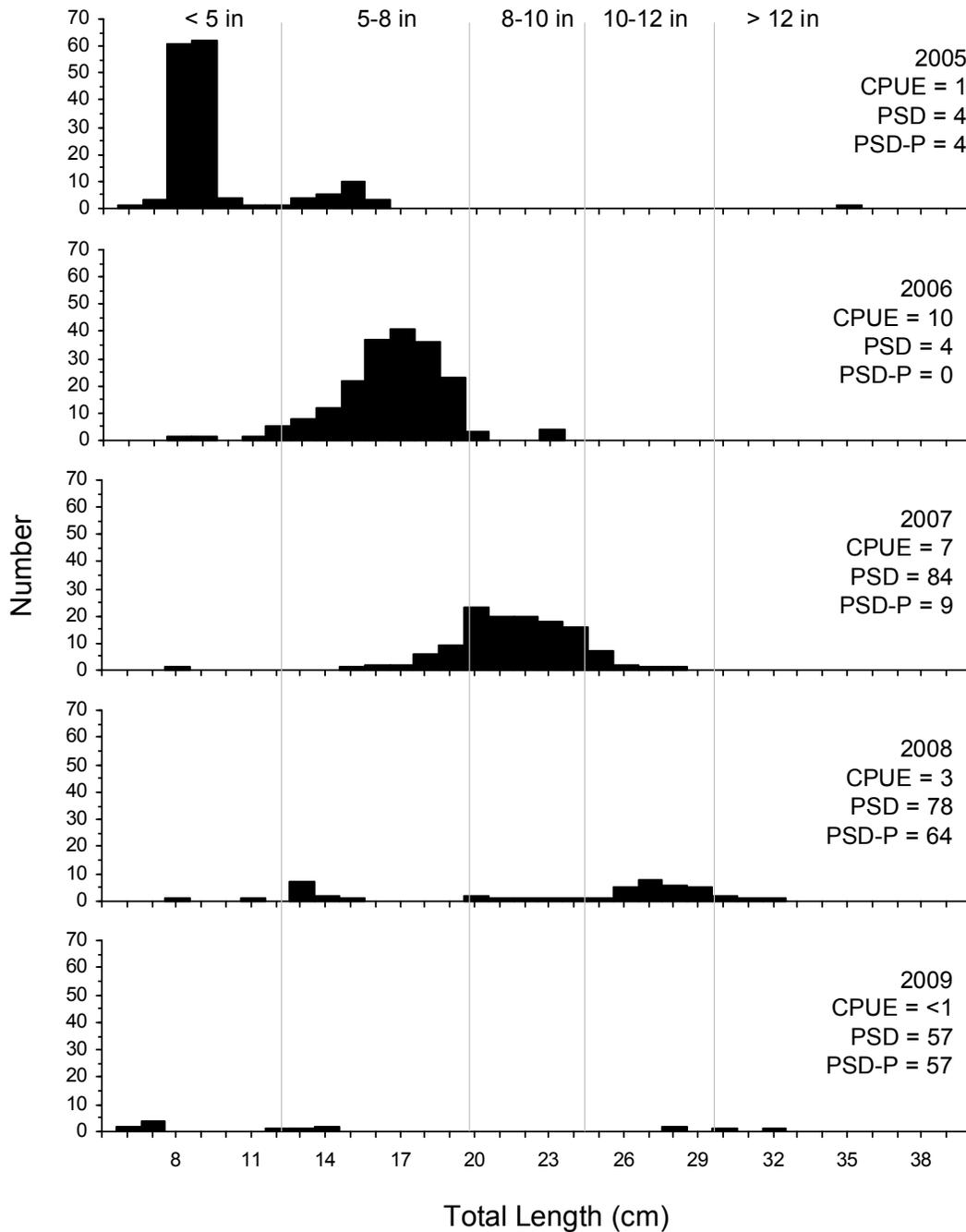


Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black crappie captured using experimental gill nets in Cattail-Kettle Lake, 2005-2009.