# Campbell Slough

## Site Description

***Location***

| | |
|---|---|
| Water designation number (WDN) | 22-0015-00 |
| Legal description | T123N-R53W-Sec. 22,23,26,27 |
| County (ies) | Day |
| Location from nearest town | 1 mile east and 6 miles north of Waubay, South Dakota |

***Survey Dates and Sampling Information***

| | |
|---|---|
| Dates of current survey | August 12-14, 2008 (FN,GN) |
| Dates of most recent survey | August 20-21, 1970 (FN) |
| Gill net sets (n) | 6 |
| Frame net sets (n) | 18 |

***Morphometry (Figure 1)***

| | |
|---|---|
| Watershed area (acres) | unknown |
| Surface area (acres) | ≈600 |
| Maximum depth (ft) | 9 |
| Mean depth (ft) | unknown |

***Ownership and Public Access***

Campbell Slough is a meandered lake owned by the State of South Dakota; however, public access to Campbell Slough is limited. The majority of land adjacent to Campbell Slough is privately owned.

***Water Level Observations***

The Water Management Board established Ordinary High Water Mark is 1,854.4 fmsl and the outlet elevation of Enemy Swim Lake/Campbell Slough is 1,853.6 fmsl. On May 7, 2008, the elevation of Enemy Swim Lake/Campbell Slough was 0.9 ft. higher than fall 2007 and near the Ordinary High Water Mark with an elevation of 1,854.5 fmsl. By October 21, 2008 water level on Enemy Swim Lake/Campbell Slough had declined to an elevation of 1,853.6 fmsl.

***Aquatic Vegetation and Exotics***

Emergent and submersed vegetation is common throughout Campbell Slough; however the type and extent has not been documented. Common carp has been the only exotic species reported in Campbell Slough.

***Fish Management Information***

| | |
|---|---|
| Species | black bullhead, black crappie, bluegill, common carp, hybrid sunfish, largemouth bass, northern pike, orangespotted sunfish, rock bass, smallmouth bass, white bass, white sucker, yellow perch |
| Lake-Specific regulations | NE Panfish Management Area: 10 daily; 50 possession.<br>bluegill/sunfish: High-grading prohibited.<br>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.<br>walleye/saugeye: minimum length 14”. |
| Management classification | warm-water marginal |
| Fish consumption advisories | none |

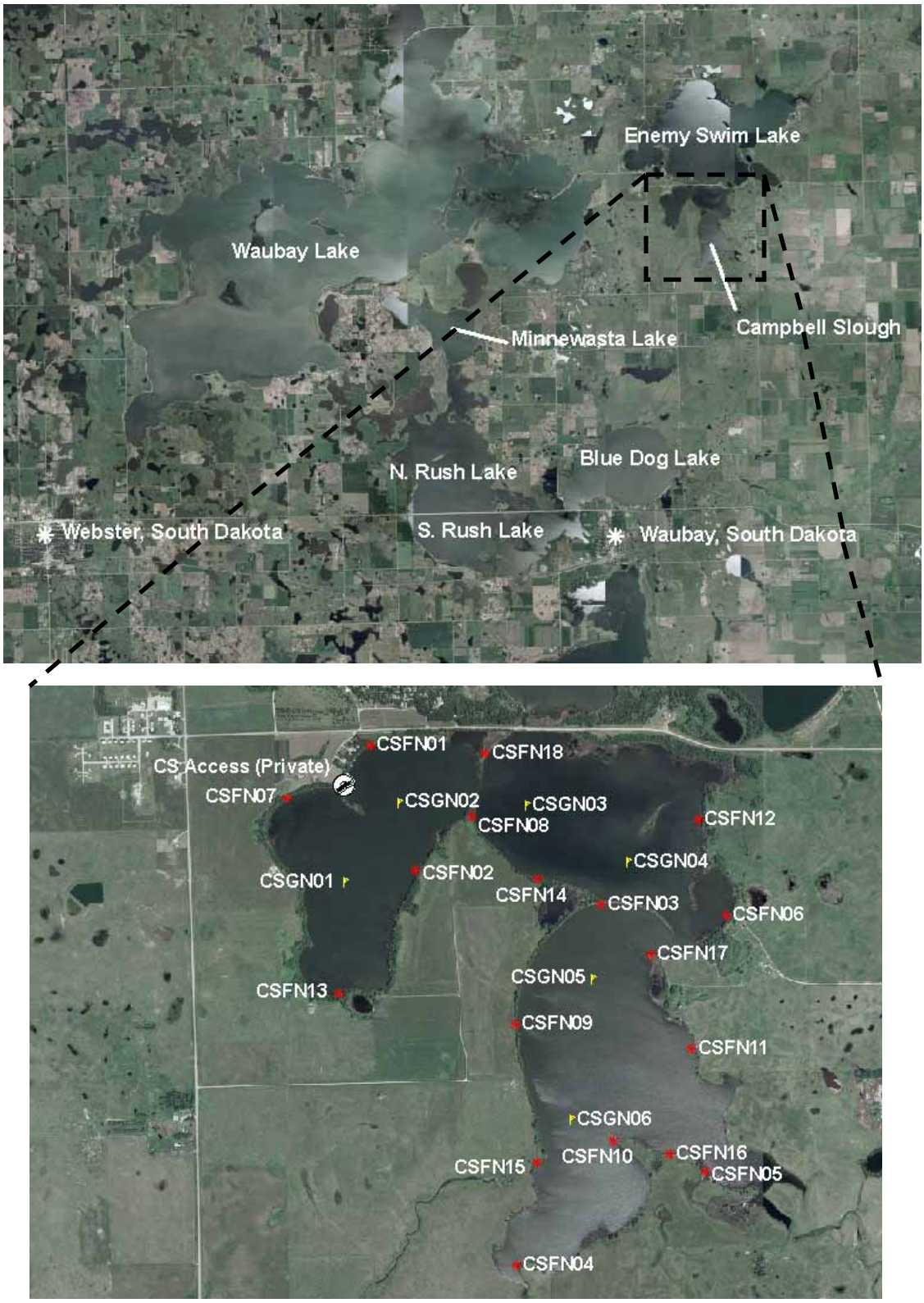


Figure 1. Map depicting geographic of location Campbell Slough (Day County), South Dakota from Webster and Waubay, South Dakota (top); also noted is the access point (private) and standardized net locations Campbell Slough (bottom). CSFN= frame nets, CSGN= gill nets

## Results and Discussion

Campbell Slough is a shallow-natural lake with a surface area of approximately 600 acres. A relatively narrow channel connects Campbell Slough to Enemy Swim Lake allowing fish movement to occur; however, the fish communities appear to differ.

The outlet structure for Enemy Swim Lake/Campbell Slough is located on the southwest shoreline of Campbell Slough (Figure 1). Water exiting Enemy Swim Lake drains into Campbell Slough from there it flows into Blue Dog Lake and then into a series of inter-connected lakes (Rush Lake, Minnewasta Lake, Waubay Lake and Bitter Lake).

*Species*

Black Crappie: In 2008, the mean frame net CPUE of stock-length black crappie was 4.1 (Table 1). Relative abundance of black crappie in Campbell Slough is considered low. Length-frequency analysis indicates consistent, but variable, recruitment (Figure 2). In the 2008 frame net survey 44% of the black crappies caught were sub-stock, which may result in an increase CPUE of stock-length black crappie in future surveys.

Black crappie ranged in total length from 10 to 35 cm (3.9 to 13.8 inches; Figure 2). The PSD and PSD-P were 57 and 45, respectively (Table 1, Figure 2). The PSD-P is high indicating a population comprised of a high percentage of preffered-length or larger black crappie. The high number of substock black crappie captured in 2008 may decrease the PSD-P in future surveys as they recruit to stock-length.

No growth data was collected in 2008. Condition of stock-length black crappie in Campbell Slough was good with a mean Wr of 106 (Table 1). A slight decreasing trend in Wr was observed as length increased.

Bluegill: The 2008 mean frame net CPUE of stock-length bluegill was 33.7 (Table 1). Relative abundance of bluegill in Campbell Slough is considered to be moderate-low. Length-frequency analysis indicates consistent recruitment (Figure 3).

Bluegill ranged in total length from 7 to 27 cm (2.8 to 10.6 inches; Figure 3). The PSD and PSD-P were 46 and 6, respectively, indicating a balanced population (Table 1, Figure 3). No growth data was collected in 2008. Condition of stock-length bluegill in Campbell Slough was good with a mean Wr of 112 (Table 1). An increasing trend in Wr was observed as length increased.

Northern Pike: The mean gill net CPUE of stock-length northern pike was 4.3 (Table 1). Based on the 2008 gill net catch, relative abundance of northern pike in Campbell Slough appears to be high (>3 stock-length northern pike/net-night).

Northern pike sampled in gill nets during 2008 ranged in total length from 41 to 72 cm (16.1 to 28.3 in), had a PSD of 69, and a PSD-P of 8 (Figure 4). The mean Wr for stock-length northern pike was 84 (Table 1). A decreasing trend in Wr was observed as total length increased.

Yellow Perch: The mean gill net CPUE of stock-length yellow perch in 2008 was 40.7 (Table 1). Length-frequency analysis indicates consistent recruitment in recent years as all cm-length groups from 9 to 22 cm were represented in the 2008 gill net catch (Figure 5). Relative abundance is considered to be moderate.

Yellow perch sampled in gill nets during 2008 ranged in total length from 9 to 28 cm (3.5 to 11.0 inches; Figure 5), had a PSD of 6, PSD-P of 1, and the mean Wr of stock-length yellow perch was 94 (Table 1).

Other Species: Largemouth and smallmouth bass were sampled in low numbers; however the 2008 survey may not accurately represent the at-large population. Black bass populations are more reliably sampled using night electrofishing.

Black bullhead, common carp, orangespotted sunfish, rock bass, white bass, and white sucker were also captured during the 2008 survey. These species likely have minimal impact on the sport fishery in Campbell Slough due to their low relative abundance.

## Management Recommendations

1) Conduct fish community surveys utilizing gill nets and frame nets on an every third year basis (next survey scheduled in summer 2011) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.

2) Collect otoliths from walleye and yellow perch to assess age structure and growth rates of each population.

3) Conduct spring night electrofishing to assess relative abundance, size structures, and growth of the black bass population.

4) Establish a public access site that would include a boat ramp and dock.

Table 1. Mean catch rate (CPUE; catch/net night) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P), and mean relative weight (Wr) of stock-length fish for various fish species captured in frame nets and gill nets from Campbell Slough, 2008. Confidence intervals include 80 percent (± CI-80) or 90 percent (± CI-90). BLB= black bullhead; BLC=black crappie; BLG=bluegill; COC=common carp; HYB=hybrid sunfish; LMB=largemouth bass; NOP= northern pike; OSF=orangespotted sunfish; ROB=rock bass; SMB=smallmouth bass; WHB=white bass; 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 | 0.2 | 0.2 | 100 | 0 | 50 | 50 | 88 | 3 |
| BLC | 4.1 | 1.6 | 57 | 9 | 45 | 9 | 106 | 1 |
| BLG | 33.7 | 8.0 | 46 | 3 | 6 | 2 | 112 | 1 |
| COC | 0.4 | 0.2 | 100 | 0 | 100 | 0 | 84 | 8 |
| HYB[1,2] | 0.1 | <0.1 | --- | --- | --- | --- | --- | --- |
| LMB | 0.1 | 0.1 | 100 | 0 | 100 | 0 | 106 | 8 |
| NOP | 0.8 | 0.3 | 86 | 14 | 0 | --- | 80 | 3 |
| OSF[1] | 0.2 | 0.1 | --- | --- | --- | --- | --- | --- |
| ROB | 0.3 | 0.2 | 50 | 45 | 33 | 43 | 111 | 6 |
| SMB | 0.6 | 0.3 | 100 | 0 | 100 | 0 | 97 | 5 |
| WHB | 0.1 | <0.1 | 100 | --- | 100 | --- | 89 | --- |
| WHS | 0.2 | 0.1 | 100 | 0 | 100 | 0 | 97 | 17 |
| YEP | 5.2 | 2.5 | 4 | 4 | 0 | --- | 92 | <1 |
| *Gill nets* | | | | | | | | |
| BLC | 0.5 | 0.5 | 67 | 33 | 67 | 33 | 110 | 12 |
| BLG | 1.7 | 0.7 | 60 | 30 | 20 | 24 | 118 | 5 |
| COC | 0.7 | 0.5 | 100 | 0 | 100 | 0 | 97 | 3 |
| NOP | 4.3 | 1.5 | 69 | 16 | 8 | 9 | 84 | 3 |
| SMB | 1.0 | 0.8 | 67 | 33 | 33 | 43 | 109 | 9 |
| WAE | 0.2 | 0.2 | 100 | --- | 100 | --- | 97 | --- |
| WHB | 2.8 | 1.4 | 94 | 6 | 53 | 22 | 103 | 2 |
| WHS | 1.0 | 0.9 | 50 | 45 | 33 | 43 | 106 | 12 |
| YEP | 40.7 | 13.5 | 6 | 2 | 1 | 1 | 94 | <1 |

[1] All fish sizes.
[2] *Lepomis spp.*

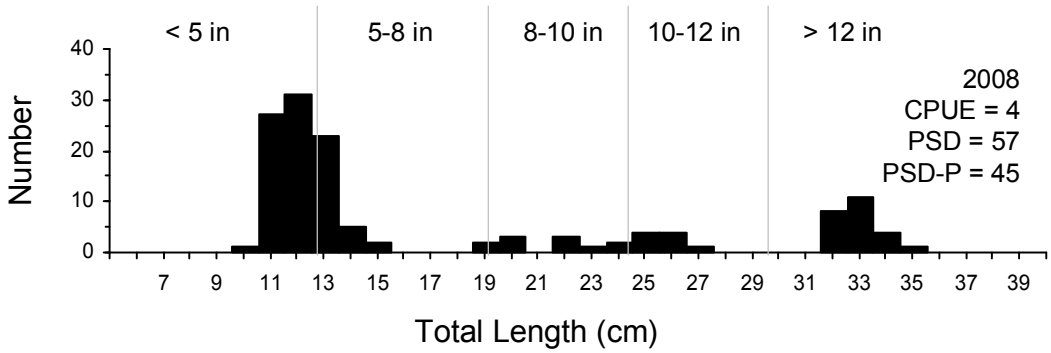


Figure 2. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P) for black crappie captured in frame nets in Campbell Slough, 2008.

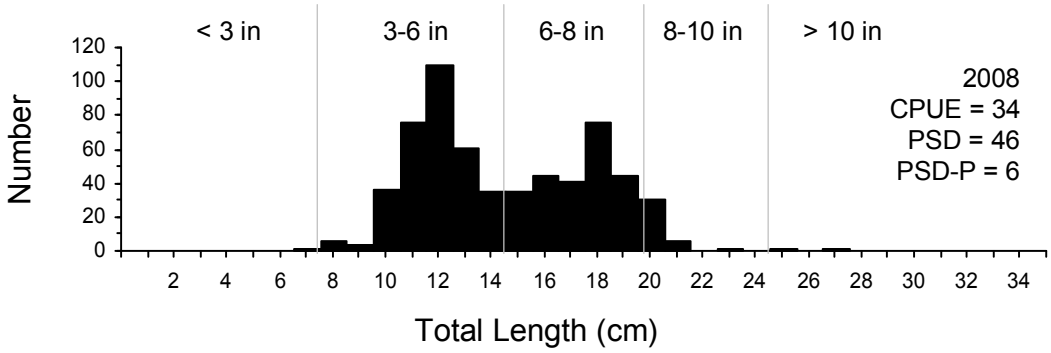


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P) for bluegill captured in frame nets in Campbell Slough, 2008.

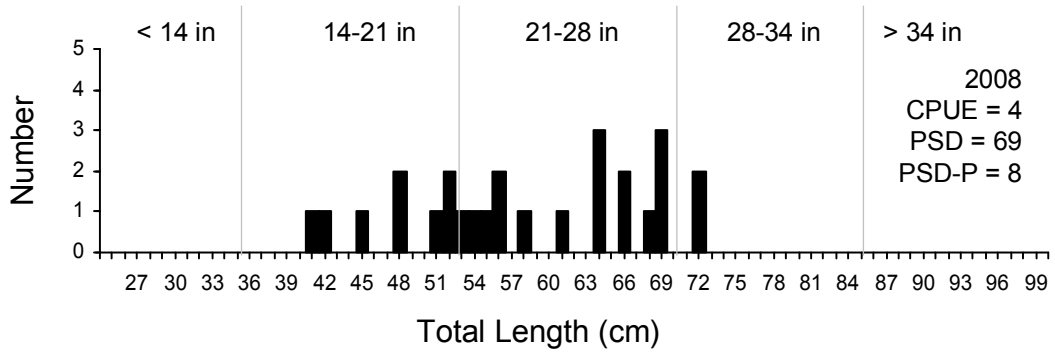


Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P) for northern pike crappie captured in gill nets in Campbell Slough, 2008.

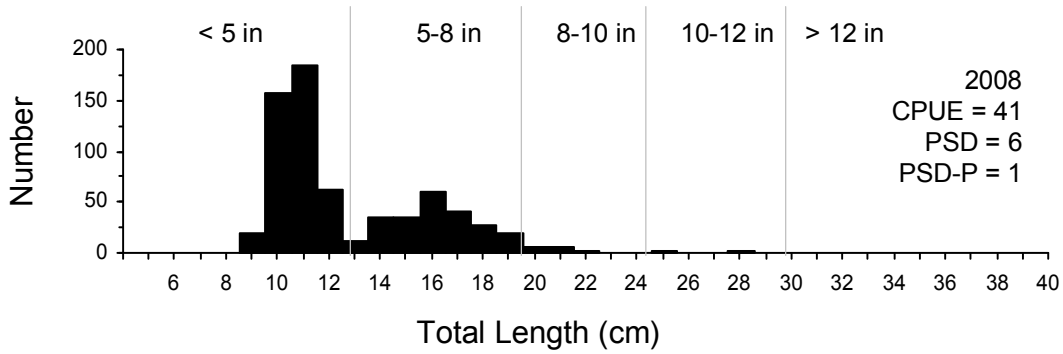


Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P) for yellow perch captured in gill nets in Campbell Slough, 2008.