

Bullhead Lake

Site Description

Location

Water designation number (WDN)	23-0006-00
Legal description	T117N-R50W-Sec. 10, 11, 14, 15, 22, 23
County (ies)	Deuel
Location from nearest town	4 ½ miles north and 2 miles east of Goodwin

Survey Dates and Sampling Information

Dates of current survey	June 3-4, 2008 (FN,GN)
Dates of most recent survey	August 1-3, 1988
Gill net sets (n)	3
Frame net sets (n)	10

Morphometry (Figure 1)

Watershed area (acres)	3,374
Surface area (acres)	571
Maximum depth (ft)	11
Mean depth (ft)	7

Ownership and Public Access

Bullhead Lake is a meandered lake owned by the State of South Dakota and managed by the SDGFP. A public access site which includes boat ramp and public toilet is located in the northwest corner of the lake (Figure 1). Lands adjacent to Bullhead Lake are owned by the State of South Dakota and private individuals.

Watershed and Land Use

The Bullhead Lake watershed is 3,374 acres and includes portions of Round and School lakes. The watershed is approximately 53% water, 25% grassland, 22% cropland, and 1% other. Upland areas within the watershed are characterized by rolling terrain which is predominately grass; while flatter areas have been tilled for cropland (SDDENR 2005).

Water Level Observations

The South Dakota Water Management Board established Ordinary High Water Mark is 1,862.0 fmsl, and the outlet elevation of Bullhead Lake is 1,861.1 fmsl. On April 29, 2008, Bullhead Lake was slightly below the outlet elevation with an elevation of 1,859.6 fmsl, by October 7, 2008 the elevation had declined to 1,859.2 fmsl.

Aquatic Vegetation and Exotics

Emergent vegetation was limited to shoreline areas in the northeast corner of Bullhead Lake during the 2008 fish community survey. Submergent vegetation was not abundant at the time our survey; however, Stueven and Stewart (1996) reported 50% coverage of Bullhead Lake by coontail and sago pondweed beds. No exotic vegetation or wildlife was reported during this survey; however, common carp have been captured in previous surveys.

Fish Management Information

Primary species	northern pike, walleye, yellow perch
Other species	black bullhead; common carp; white sucker
Lake-Specific regulations	NE Panfish Management Area: 10 daily; 50 possession
Management classification	warm-water semi-permanent
Fish consumption advisories	none

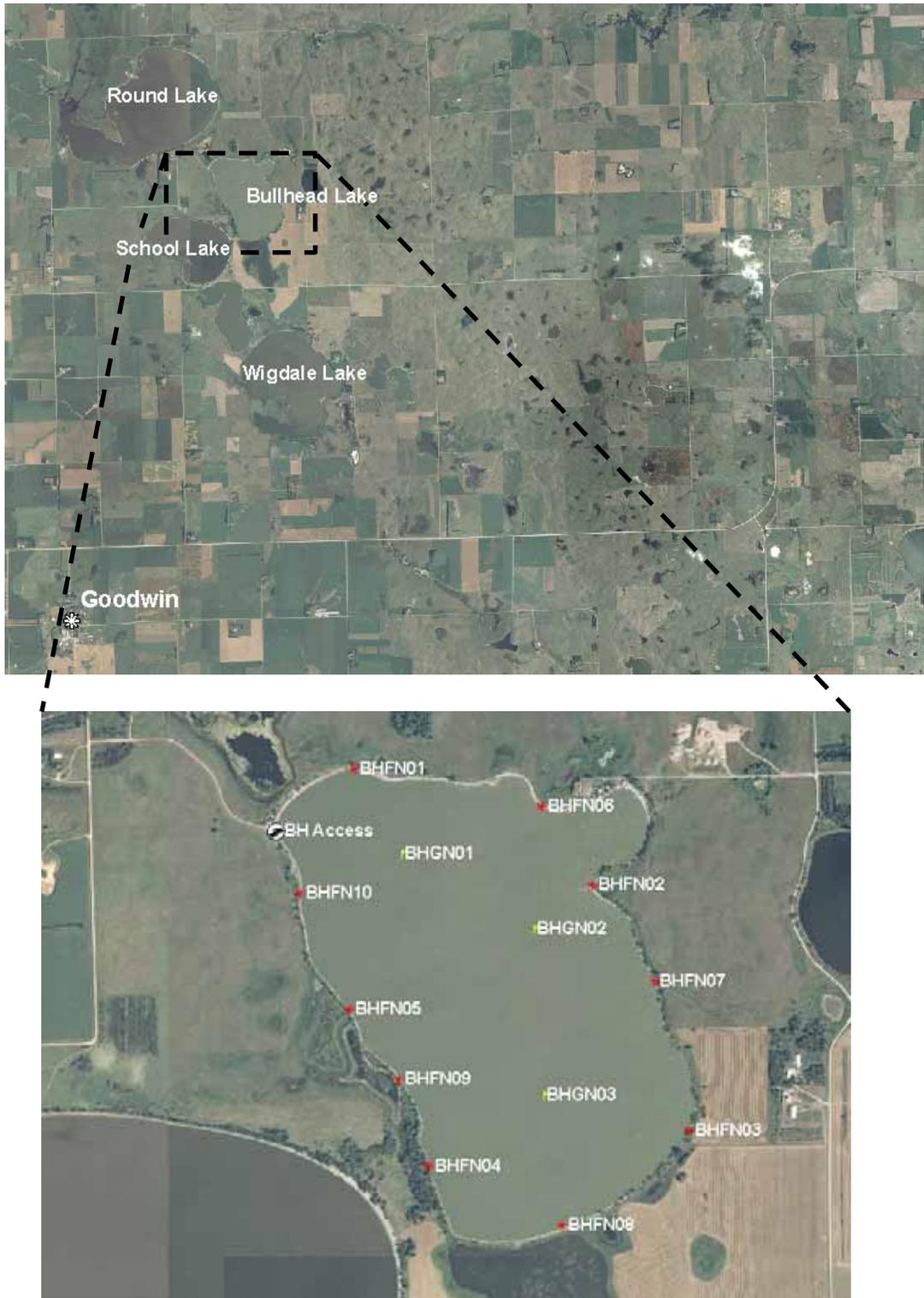


Figure 1. Map depicting geographic of location Bullhead Lake (Deuel County) from Goodwin, South Dakota (top). Also noted are standardized net locations and west access point which includes boat ramp, dock, and public toilet for Bullhead Lake (Deuel County). BHFN= frame net; BHGN= gill net

Management Objectives

- 1) Maintain a mean gill net CPUE of stock-length walleye ≥ 10 , a PSD of 30-60, and an PSD-P of 5-10.
- 2) Maintain a mean gill net CPUE of stock-length yellow perch ≥ 25 , a PSD of 30-60, and an PSD-P of 5-10.
- 3) Maintain a mean frame net CPUE of stock-length bullhead ≤ 100 .

Results and Discussion

Bullhead Lake is a shallow-natural lake with good public access. Large tracts of State owned Game Production Area's (GPA's) border the west and northeast shores of the lake. Bullhead Lake has no major surface water inlets or outlets; however, during high water periods water from Bullhead Lake flows into Round Lake to the northwest and then into Willow Creek before eventually reaching the Big Sioux River.

Although, susceptible to periodic winterkill Bullhead Lake has a history of providing a quality walleye and yellow perch fishery within 25 miles of a major population center (Watertown) in northeast South Dakota. Bullhead Lake is primarily managed as a walleye and yellow perch fishery; however, species such as northern pike and black bullheads may also contribute to the fishery.

Primary Species

Walleye: The mean gill net CPUE of stock-length walleye during 2008 was 5.0, and below the minimum objective (≥ 10 stock-length fish/net night; Table 1). Based on the 2008 walleye gill net catch, relative abundance appears to be moderate (4-11 stock-length walleye/net-night).

Age structure information from gill net captured walleye in 2008 suggests relatively consistent natural recruitment of low magnitude as year-classes produced in 2001, 2002, 2004, and 2005 coincided with non-stock years (Table 4). Walleye from the 2005 year-class were the most represented in the 2008 gill net catch (Table 4). Walleye fry and small fingerlings were stocked into Bullhead Lake in 2006; however, recruitment appears to be poor as few walleye from the 2006 year-class were captured in gill nets during the 2008 survey (Table 3; Table 4).

Walleye captured in gill nets during 2008 ranged in total length from 34 to 53 cm (13.4 to 20.9 in; Figure 2). The majority of walleye captured were greater than quality-length resulting in a PSD of 93. Both PSD and PSD-P values of 93 and 27 exceeded the management objectives of 30-60 and 5-10, respectively.

Although sample size was low, walleye growth rates appear to be fast with the weighted mean total length at capture of age-3 being 442 mm (17.4 in; Table 2). Walleye were in good condition with mean W_r values ranging from 92-97 for all length groups sampled. The mean W_r of stock-length walleye captured in gill nets during 2008 was 94 (Table 1), and no length-related trends in W_r values were apparent.

Yellow Perch: The mean gill net CPUE of stock-length yellow perch in 2008 was 7.0 (Table 1) and below the minimum objective (≥ 25 stock-length yellow perch/net). Based on the 2008 gill net catch relative abundance appears to be low (<8 stock-length yellow perch/net).

Yellow perch sampled in gill nets during 2008 ranged in total length from 8 to 21 cm (3.1 to 8.3 in) with the majority being sub-stock (Figure 3). Yellow perch sampled in the 2008 gill net catch had low size structure as only one yellow perch exceeded quality-length and no preferred-length yellow perch were captured resulting in a PSD of 5 and an PSD-P of 0 (Table 1). Mean W_r values of gill net captured yellow perch in 2008 ranged from 106-109 for all length categories sampled, and no length-related trends were apparent. The mean W_r of stock-length yellow perch in the 2008 gill net catch was 109 (Table 1).

Other Species

Black Bullhead: Few black bullheads were captured during the 2008 fish community survey. The mean frame net CPUE of stock-length black bullheads was 1.5, and within the management objective (≤ 100 stock-length black bullhead/net; Table 1). The majority of black bullheads captured in the 2008 frame net catch exceeded preferred-length indicating limited recruitment in recent years likely resulting in their low relative abundance (Table 1).

Northern Pike: Northern pike have been sampled in relatively high abundance during past surveys; however, no northern pike were captured during the 2008 fish community survey in Bullhead Lake.

Other: White sucker was the only other species captured during the 2008 fish community survey. Relative abundance of white sucker appeared to be low (Table 1).

Management Recommendations

- 1) Conduct fish community surveys utilizing gill nets and frame nets on an every fourth year basis (next survey scheduled in summer 2012) 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) Stock walleye on a biennial basis (1,000 fry/acre) to supplement walleye population.
- 4) Monitor winter and summer kill events. In cases of complete winter/summerkill stock with walleye and yellow perch to re-establish a fish community.

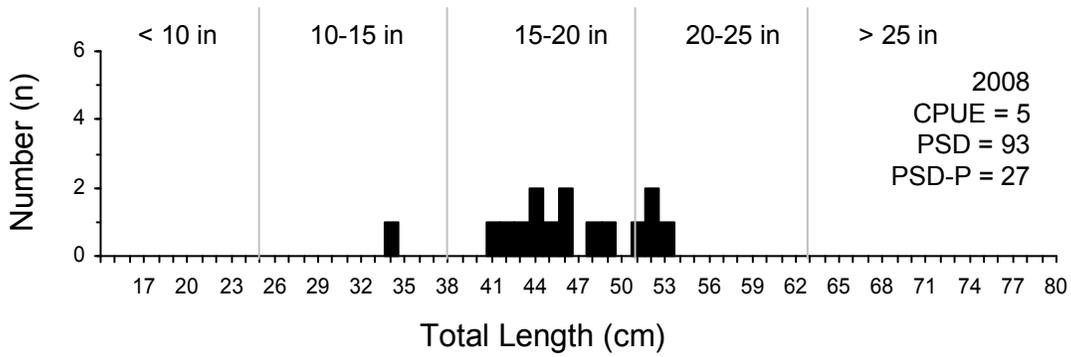


Figure 2. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P) for walleye captured in gill nets in Bullhead Lake, 2008.

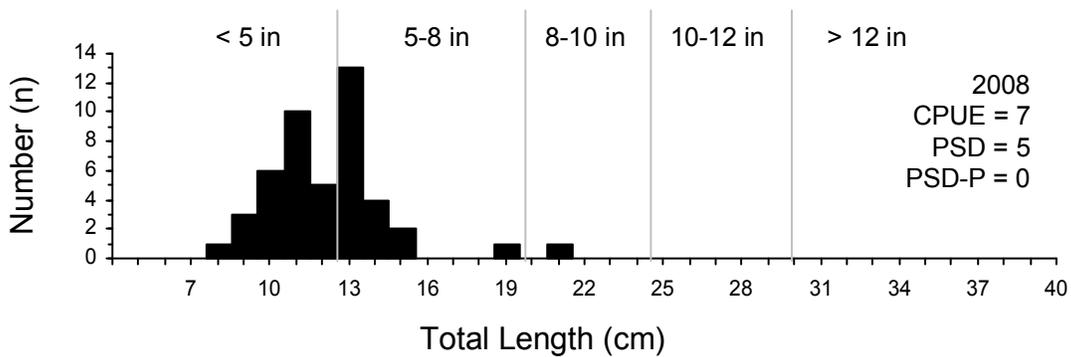


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P) for yellow perch captured in gill nets in Bullhead Lake, 2008.