

Hurricane Lake

Site Description

Location

Water designation number (WDN)	55-0002-00
Legal description	T123N-R52W-Sec. 26, 27, 34, 35
County (ies)	Roberts
Location from nearest town	4.0 miles north and 3.0 miles east of Ortley, SD

Survey Dates and Sampling Information

Survey dates	May 29, 2014 (GN)
Gill net sets (n)	3

Morphometry

Watershed area (acres)	35,992
Surface area (acres)	335
Maximum depth (ft)	12
Mean depth (ft)	6

Ownership and Public Access

Hurricane Lake is a meandered lake owned by the State of South Dakota and the fishery is managed by the SDGFP. An access site in the southwest corner and two-track trail on the east side of the lake provide access; however, both are privately owned and require permission. At the southwest access, donations are accepted for use. The access site has no boat ramp and is primarily designed for winter use. Lands adjacent to Hurricane Lake are owned by private individuals.

Watershed and Land Use

The 35,992 acre Owens Creek sub-watershed (HUC-12) encompasses Hurricane Lake and is located within the larger Waubay Lakes (HUC-10) watershed. Land use within the watershed is primarily agricultural including a mix of pasture or grassland, cropland, and scattered shelterbelts.

Water Level Observations

No Ordinary High Water Mark has been established by the South Dakota Water Management Board on Hurricane Lake. The elevation of Hurricane Lake on May 6, 2014 was 1752.7 fmsl; 0.3 ft higher than the fall 2013 elevation of 1752.4 fmsl. On October 29, 2014 the water level was 1750.2 fmsl.

Fish Management Information

Primary species	northern pike, yellow perch
Other species	black bullhead, golden shiner, white sucker
Lake-specific regulations	none
Management classification	warm-water marginal
Fish consumption advisories	none

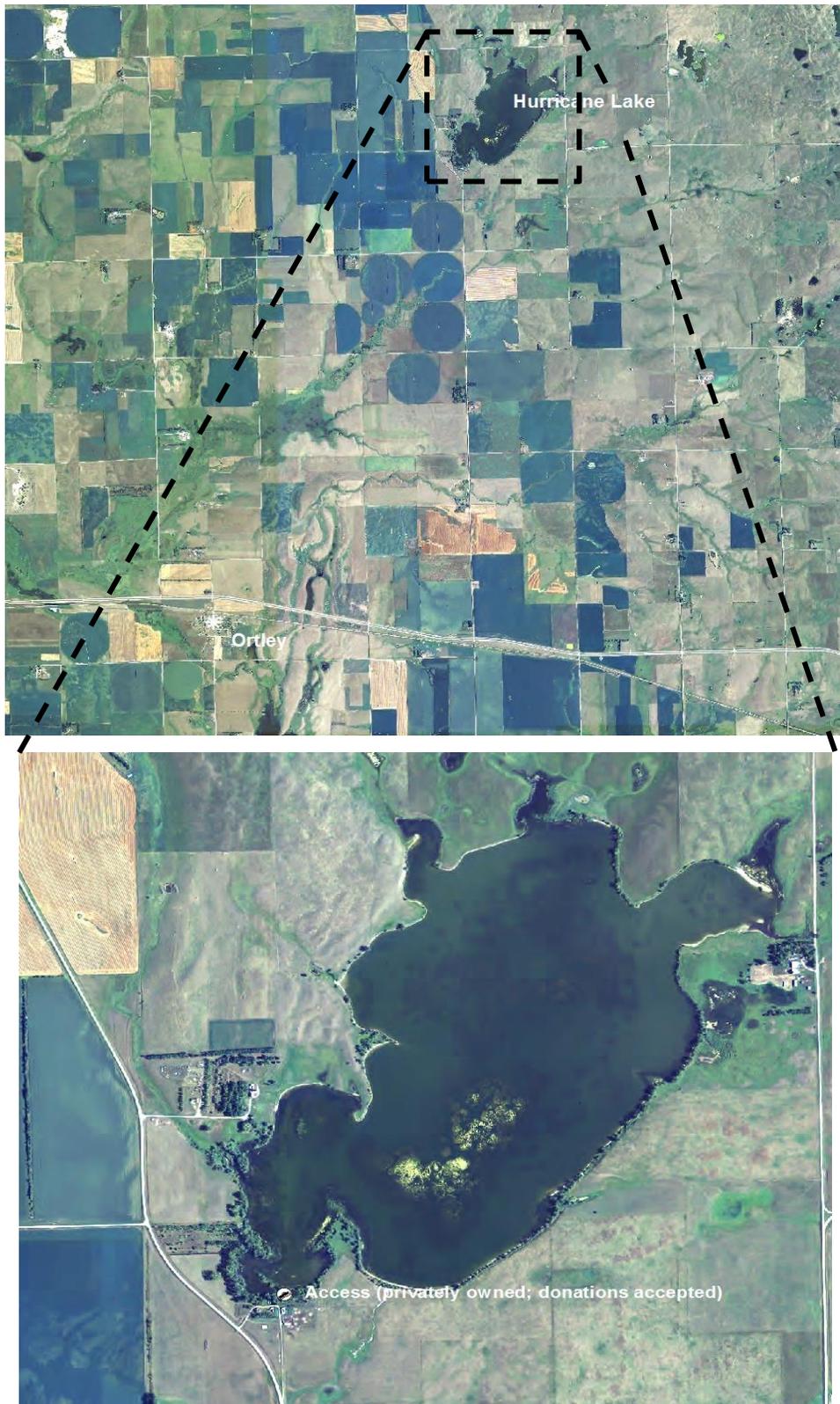


Figure 1. Map depicting geographic location of Hurricane Lake (Roberts County) from Ortley, South Dakota (top). Also provided, a close-up image of Hurricane Lake including privately owned (donations accepted) access area (bottom).

Management Objectives

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

Results and Discussion

Hurricane Lake is a shallow natural lake with a surface area of 335 acres located northeast of Ortle, South Dakota. Major surface water inlets enter the lake on the southwest, north and northeast. The outlet is located in the south end of the southwest bay near the access site.

No boat ramp exists on Hurricane Lake; therefore fishing is primarily limited to shore and ice anglers. Due to the potential for frequent winterkill related to the shallow nature of the lake, combined with relatively-poor public access Hurricane Lake has primarily been managed as a self-sustaining northern pike and yellow perch fishery. Since 1993, when 200,000 northern pike fry were stocked, no fish stockings have taken place in Hurricane Lake.

Primary Species

Northern Pike: Northern pike were the second most abundant fish species in the gill net catch, with a mean gill net CPUE for stock-length individuals of 16.0 (Table 1). The 2014 mean gill net CPUE represented a slight decrease from the 2008 CPUE (Table 2), but remained well above the minimum objective (≥ 3 stock-length northern pike/net night; Table 3). Currently, relative abundance appears to be high.

Gill net captured northern pike ranged in TL from 26 to 81 cm (10.2 to 31.9 in), had a PSD of 50 and a PSD-P of 15 (Table 1; Figure 2). The PSD was within the management objective of 30-60; while the PSD-P was above the management objective of 5-10; Table 3).

No age or growth information was collected. Condition of gill net captured northern pike was similar to that of northern pike captured from other northeast South Dakota lakes, with W_r values that ranged from 76 to 88 for all length categories (e.g., stock to quality) sampled. A slight decreasing trend in condition was apparent as TL increased. Stock-length individuals had a mean W_r of 77 (Table 1). Condition was likely at a seasonal low at the time of sampling (i.e., late-May). Neumann and Willis (1995) reported that W_r values were lowest during spring following the spawn and throughout the summer in Lake Thompson, South Dakota.

Yellow Perch: In 2014, gill nets captured 18 stock-length yellow perch that ranged in TL from 11 to 27 cm (4.3 to 10.6 in; Figure3) resulting in a mean gill net CPUE for stock-length fish of 6.0 (Table 1). The 2014 mean gill net CPUE represented an increase from the 2008 CPUE of 3.0, but remained well below the minimum objective (≥ 30 stock-length perch/net night) and suggest low relative abundance (Table 2; Table 3).

Otoliths collected from a sub-sample of gill net captured yellow perch suggested the presence of five consecutive year classes (2008-2012); each was represented by a relatively-low number of individuals (Table 4). Given the low sample size, few inferences can be made concerning the size structure, growth, and condition of yellow perch in Hurricane Lake (Table 1; Table 5).

Other Species

Black Bullhead: Black bullheads were the most abundant species in the gill net catch (Table 1). The mean gill net CPUE for stock-length individuals of 72.7 (Table 1) represented a substantial increase from the 2008 CPUE of 3.0 (Table 2). Gill net captured black bullheads ranged in TL from 9 to 29 cm (3.5 to 11.4 in), had a PSD of 50 and a PSD-P of 0 (Table 1).

No age and growth information was collected. Mean W_r values ranged from 82 to 93 for all length categories (e.g., stock to quality) sampled and a slight increasing trend in condition was apparent as TL increased. The mean W_r of stock-length black bullheads was 90 (Table 1).

Other: Golden shiner and white sucker were other fish species captured in low numbers during the 2014 fish community survey (Table 1).

Management Recommendation

- 1) Conduct fish community surveys utilizing gill nets every fifth year (next survey scheduled in summer 2019) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.
- 2) Continue to manage as a self-sustaining northern pike and yellow perch fishery.
- 3) Collect otoliths from yellow perch to assess age structure and growth rate of the population.
- 4) Monitor winter and summer kill events. In cases of substantial winter/summer kill stock with northern pike and yellow perch to re-establish a fish community.
- 5) Work with willing landowners to develop public access that would include 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 experimental gill nets from Hurricane Lake, 2014. Confidence intervals include 80 percent (\pm CI-80) or 90 percent (\pm CI-90). BLB= black bullhead; GOS= golden shiner; NOP= northern pike; 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>Gill nets</i>								
BLB	72.7	53.0	50	6	0	---	90	1
GOS	0.3	0.6	---	---	---	---	---	---
NOP	16.0	5.8	50	12	15	9	79	1
WHS	1.3	0.6	100	0	100	0	100	19
YEP	6.0	3.9	72	19	11	13	90	2

Table 2. Historic mean catch rate (CPUE; catch/net night) of stock-length fish for various fish species captured experimental gill nets from Hurricane Lake, 2008-2014. BLB= black bullhead; GOS= golden shiner; NOP= northern pike; WHS= white sucker; YEP= yellow perch

Species	CPUE						
	2008	2009	2010	2011	2012	2013	2014
<i>Gill nets</i>							
BLB	3.0	---	---	---	---	---	72.7
GOS	13.3	---	---	---	---	---	0.3
NOP	19.0	---	---	---	---	---	16.0
WHS	2.0	---	---	---	---	---	1.3
YEP	3.0	---	---	---	---	---	6.0

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 from Hurricane Lake, 2008-2014. NOP= northern pike; YEP = yellow perch

Species	2008	2009	2010	2011	2012	2013	2014	Objective
<i>Gill nets</i>								
NOP								
CPUE	19	---	---	---	---	---	16	≥ 3
PSD	74	---	---	---	---	---	50	30-60
PSD-P	5	---	---	---	---	---	15	5-10
Wr	84	---	---	---	---	---	79	---
YEP								
CPUE	3	---	---	---	---	---	6	≥ 30
PSD	22	---	---	---	---	---	72	30-60
PSD-P	11	---	---	---	---	---	11	5-10
Wr	83	---	---	---	---	---	90	---

Table 4. Year class distribution based on expanded age/length summary for yellow perch sampled in gill nets from Hurricane Lake, 2014.

Survey Year	Year Class						
	2014	2013	2012	2011	2010	2009	2008
2014			3	2	8	5	1

Table 5. Weighted mean total length (mm) at capture by gender for yellow perch captured in experimental gill nets (expanded sample size) from Hurricane Lake, 2014.

Year	Age					
	1	2	3	4	5	6
2014						
Male	---	---	---	---	176 (1)	---
Female	---	137 (3)	190 (2)	217 (8)	230 (4)	274 (1)
Combined	---	137 (3)	190 (2)	217 (8)	219 (5)	274 (1)

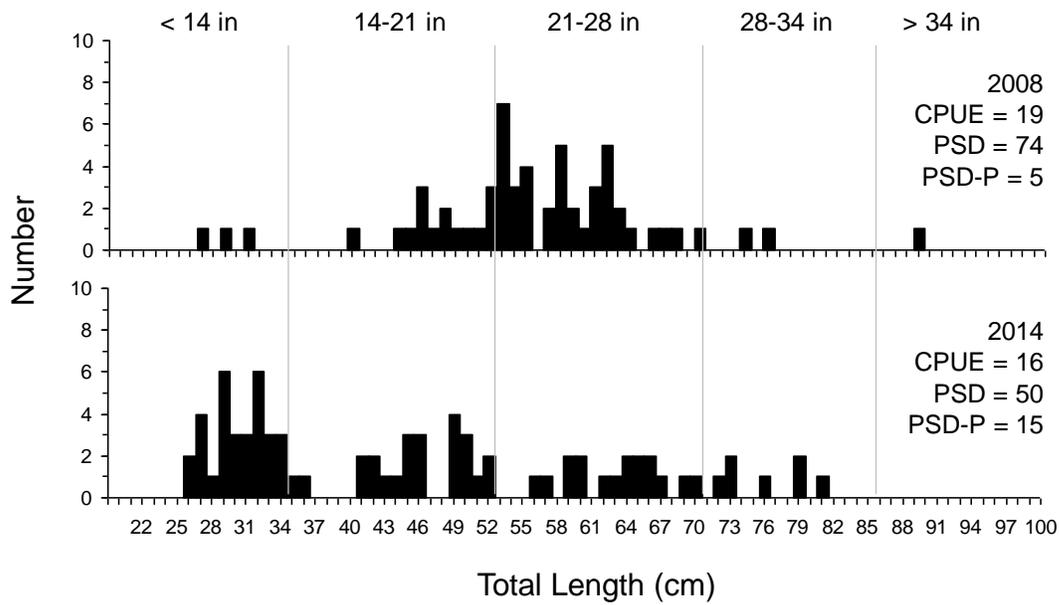


Figure 2. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for northern pike captured using experimental gill nets in Hurricane Lake, 2008-2014.

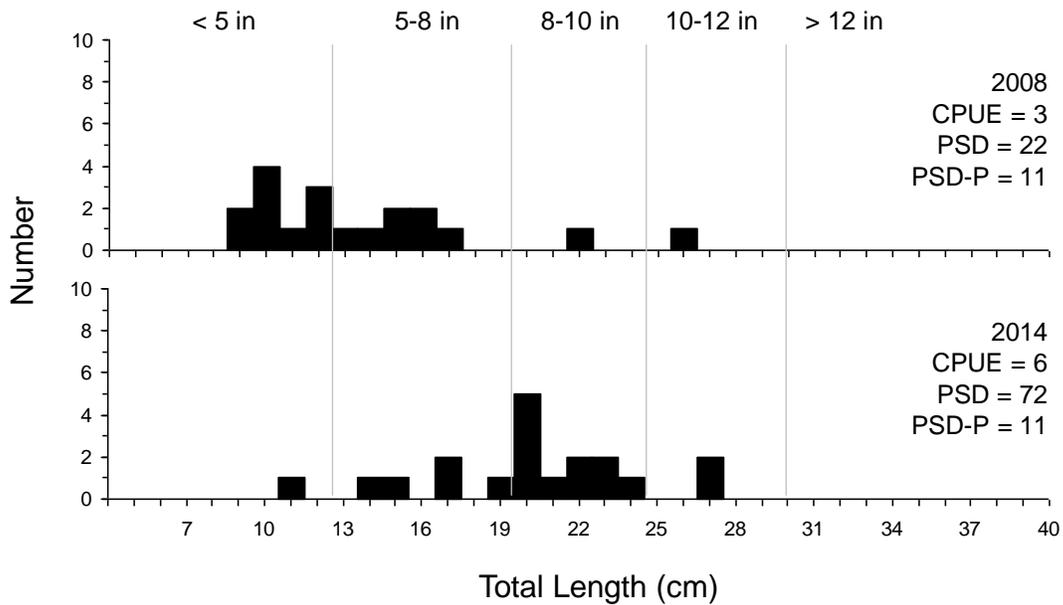


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