

Reid Lake

Site Description

Location

Water designation number (WDN)	18-0010-00
Legal description	T118N-R57W-Sec. 18,19 T118N-R58W-Sec. 13, 14, 23, 24
County (ies)	Clark
Location from nearest town	5.5 miles west and 4.5 miles south of Bradley, SD.

Survey Dates and Sampling Information

Survey dates	August 7-8, 2012 (GN)
Gill net sets (n)	6

Morphometry

Watershed area (acres)	44,706
Surface area (acres)	≈ 1,030
Maximum depth (ft)	≈18
Mean depth (ft)	unknown

Ownership and Public Access

Reid Lake is a meandered lake owned by the State of South Dakota and the fishery is managed by the SDGFP. A single public access site (including boat ramp) is located on the northwest shoreline and is maintained by the SDGFP (Figure 1). Reid Lake is closed to boating from September 1 through December 31. Lands adjacent to the lake are owned by the State of South Dakota and private individuals.

Watershed and Land Use

The 44,706 acre Reid Lake sub-watershed (HUC-12) is located within the larger Grass, Dry, and Still Lakes (HUC-10) watershed. Land use within the watershed is primarily agricultural with a mix of pasture or grassland, cropland, and scattered shelterbelts.

Water Level Observations

Reid Lake has no established OHWM and an outlet elevation was not available. On April 26, 2012 the elevation of Reid Lake was 1757.8 fmsl. The water level had declined to an elevation of 1755.7 fmsl on September 25, 2012.

Fish Management Information

Primary species	Walleye, Yellow Perch
Other species	Black Bullhead, Green Sunfish, Northern Pike
Lake-specific regulations	none
Management classification	warm-water marginal
Fish consumption advisories	Mercury: Walleye (>23"). See the South Dakota Fishing Handbook for more details on meal and portion size recommendations. Also see Department of Health website: http://doh.sd.gov/Fish/Default.aspx for more information.

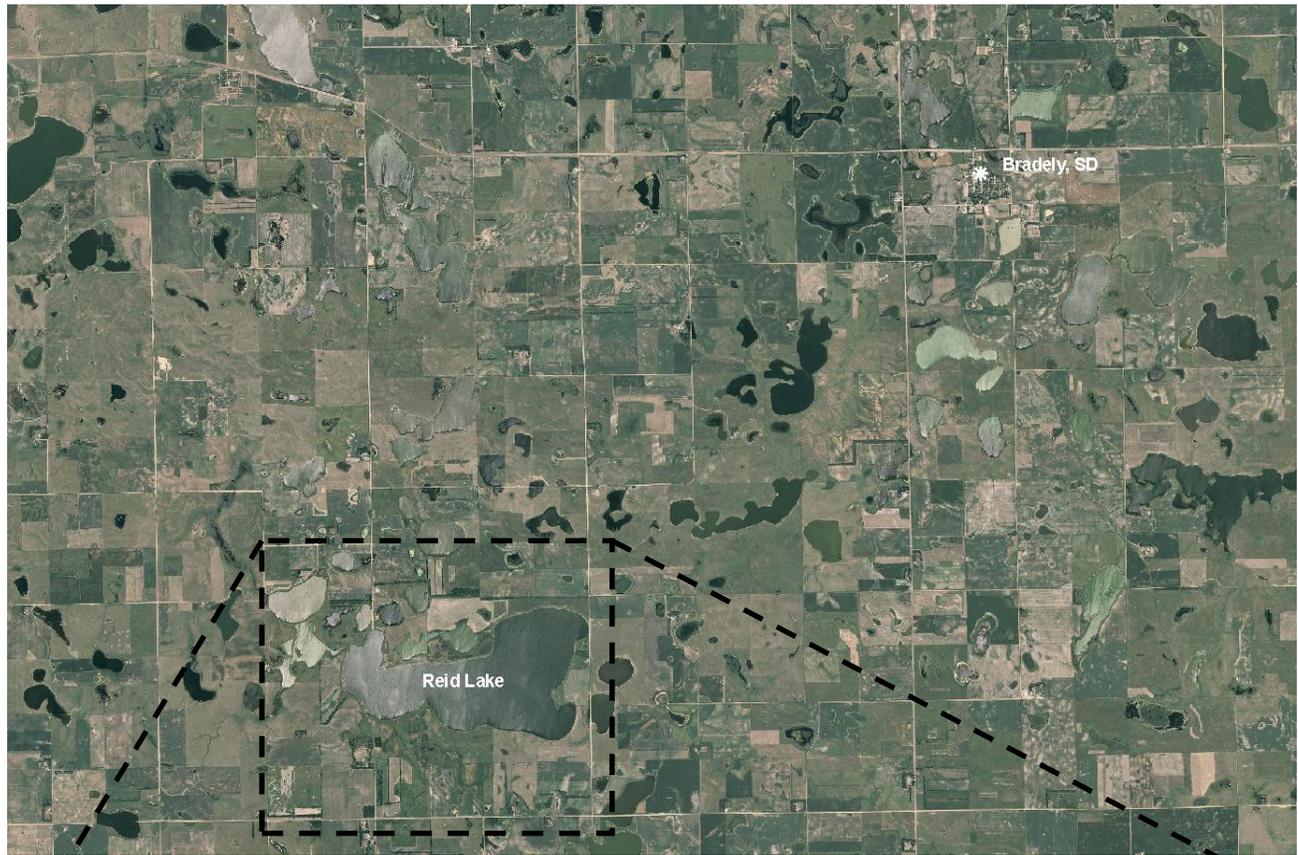


Figure 1. Map depicting geographic location of Reid Lake from Bradely , South Dakota (top). Also noted is the public access point and standardized net locations for Reid Lake RDGN= gill nets

Management Objectives

- 1) Maintain a mean gill net CPUE of stock-length Walleye ≥ 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 ≥ 30 , a PSD of 30-60, and a PSD-P of 5-10.

Results and Discussion

Prior to 1990's Reid Lake was a shallow slough and did not support a sport fishery. Above average precipitation during the 1990's provided an increase in the water surface area and depth of Reid Lake. Subsequently, Reid Lake has sustained a sport fishery, and is currently managed for Walleye and Yellow Perch.

Primary Species

Walleye: The mean gill net CPUE of stock-length Walleye during 2012 was 8.7 (Table 1) and below the minimum objective (≥ 10 stock-length Walleye/net night; Table 3). The 2012 gill net CPUE represents a decrease from the 2009 CPUE of 13.3 (Table 2), and indicates moderate relative abundance. Walleye captured in gill nets during 2012 ranged in TL from 11 to 67 cm (4.3 to 26.4 in), had a PSD of 83 and PSD-P of 31 (Table 1; Figure 2). The PSD and PSD-P observed in 2012 are both above the management objective of 30-60 and 5-10 (Table 3), respectively and represent a population dominated by quality- and preferred-length fish.

Walleye recruitment has been consistent, as year classes have been produced in each of the last five years (Table 4). Natural reproduction does contribute to the population in Reid Lake as no Walleye were stocked in 2009, 2010 and 2011 yet fish from each year-class were represented in the 2012 gill net survey (Tables 4-5).

Growth rates appear to be fast with the weighted mean TL at capture for age-1 and age-2 Walleye being 304 and 419 mm (12.0 and 16.5 in), respectively (Table 5). Walleye were in good condition with mean W_r values ranging from 90-94 for all length groups sampled. The mean W_r of stock-length Walleye in the 2012 gill net catch was 92 (Table 1) and no length-related trends in condition were apparent.

Yellow Perch: The 2012 mean gill net CPUE of stock-length Yellow Perch was 145.3 (Table 1) and above the minimum objective (≥ 30 stock-length perch/net night). The 2012 gill net CPUE indicated high relative abundance. Recruitment is consistent with four year-classes present (Table 7-8). However, mortality appears to be high as no Yellow Perch over age-4 were captured in the gill nets.

Yellow Perch captured in the 2012 gill net catch ranged in TL from 10 to 32 cm (3.9 to 12.6 in), had a PSD of 23 and a PSD-P of 3. The 2012 PSD was below the management objectives of 30-60 as the majority of Yellow Perch captured were less than quality-length (Figure 3).

The weighted mean TL at capture for age-1 and age-2 male Yellow Perch was 135 and 183 mm (5.3 and 7.2 in), respectively (Table 8). The weighted mean TL at capture for age-1 and age-2 female Yellow Perch was 144 and 205 mm (5.7 and 8.1 in; Table 8). Mean W_r values of gill net captured Yellow Perch in 2012 ranged from 95 to 103 for all length categories sampled with the mean W_r of stock-length Yellow Perch being 103 (Table 1).

Other Species

Black Bullhead: The 2012 mean gill net CPUE of stock-length Black Bullhead was 38.2 (Table 1) and represents an increase from previous surveys. Bullhead abundance should continue to be monitored but at current levels few negative effects on the fishery can be expected.

Management Recommendations

- 1) Conduct fish community surveys utilizing gill nets on an every third year basis (next survey scheduled in summer 2015) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.
- 2) Stock Walleye on a biennial basis (≈ 500 fry/acre) to establish additional year classes.
- 3) Collect otoliths from Walleye and Yellow Perch to assess age structure and growth rates of each population.
- 4) Monitor winter and summerkill events. In cases of substantial winter/summer kill stock with northern pike and yellow perch to re-establish a fish community.

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 Reid Lake, 2012. Confidence intervals include 80 percent (\pm CI-80) or 90 percent (\pm CI-90). BLB= Black Bullhead; WAE= Walleye; 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	38.2	20.9	73	5	21	4	112	1
WAE	8.7	3.3	83	9	31	11	92	1
YEP	145.3	28.9	23	2	3	1	103	<1

Table 2. Historic mean catch rate (CPUE; catch/net night) of stock-length fish for various fish species captured in frame nets and experimental gill nets from Reid Lake, 2006-2012. BLB= Black Bullhead; GSF= Green Sunfish; NOP= Northern Pike; WAE= Walleye; YEP= Yellow Perch

Species	CPUE		
	2006	2009	2012
<i>Frame nets</i>			
BLB	0.2	---	---
GSF	0.1	---	---
NOP	0.3	---	---
WAE	5.5	---	---
YEP	0.8	---	---
<i>Gill nets</i>			
BLB	0.0	0.0	38.2
NOP	0.0	0.3	0.0
WAE	21.8	13.3	8.7
YEP	81.8	228.5	145.3

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 Reid Lake, 2006-2012. WAE = Walleye; YEP = Yellow Perch

Species	2006	2009	2012	Objective
<i>Gill nets</i>				
WAE				
CPUE	22	13	9	≥ 10
PSD	54	39	83	30-60
PSD-P	29	21	31	5-10
Wr	90	92	92	---
YEP				
CPUE	82	229	145	≥ 30
PSD	27	20	23	30-60
PSD-P	5	5	3	5-10
Wr	115	108	103	---

Table 4. 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 Reid Lake, 2006-2009.

Survey Year	Year Class													
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2012 ¹	10	9	9	21	8							1		1
2009 ¹	---	---	---	66	62	8	3	2	5	5	3		2	1
2006 ^{1,2}	---	---	---	---	---	---	2	28	41	21	15	4	3	13
# stocked														
fry	600				1200				1000			700	1000	
small fingerling														150
large fingerling								14						

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

² Monofilament gill net mesh size change (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")

Table 5. Weighted mean length at capture (mm) for Walleye age-0 through age-10 captured in experimental gill nets (expanded sample size) from Reid Lake, 2006-2012. 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
2012 ¹	134(10)	304(9)	419(9)	487(21)	522(8)	---	---	---	---	---	---
2009 ¹	139(66)	267(62)	422(8)	489(3)	512(2)	515(5)	572(5)	578(3)	---	621(2)	520(1)
2006 ²	181(2)	281(28)	357(41)	447(21)	518(15)	533(4)	621(3)	577(13)	650(1)	648(7)	655(1)

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

² Monofilament gill net mesh size change (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")

Table 6. Stocking history including size and number for fishes stocked into Reid, 1999-2012. WAE= Walleye

Year	Species	Size	Number
1999	WAE	small fingerling	150,000
2000	WAE	fry	1,000,000
2001	WAE	fry	700,000
2004	WAE	fry	1,000,000
2005	WAE	large fingerling	14,101
2008	WAE	fry	1,200,000
2012	WAE	fry	600,000

Table 7. Year class distribution based on the expanded age/length summary for Yellow Perch sampled in gill nets from Reid Lake, 2009 and 2012.

Survey Year	Year Class						
	2012	2011	2010	2009	2008	2007	2006
2012		528	460	8	11		
2009	---	---	---		1108	253	13

Table 8. Weighted mean TL (mm) at capture by gender for Yellow Perch captured in experimental gill nets (expanded sample size) from Reid Lake, 2009 and 2012.

Year	Age			
	1	2	3	4
2012				
Male	135 (168)	183 (114)	264 (1)	264 (2)
Female	144 (232)	205 (313)	283 (7)	313 (9)
Combined	138 (528)	198 (460)	280 (8)	304 (11)
2009				
Male	159 (296)	223 (18)	---	---
Female	172 (812)	241 (235)	303 (13)	---
Combined	168 (1108)	239 (253)	303 (13)	---

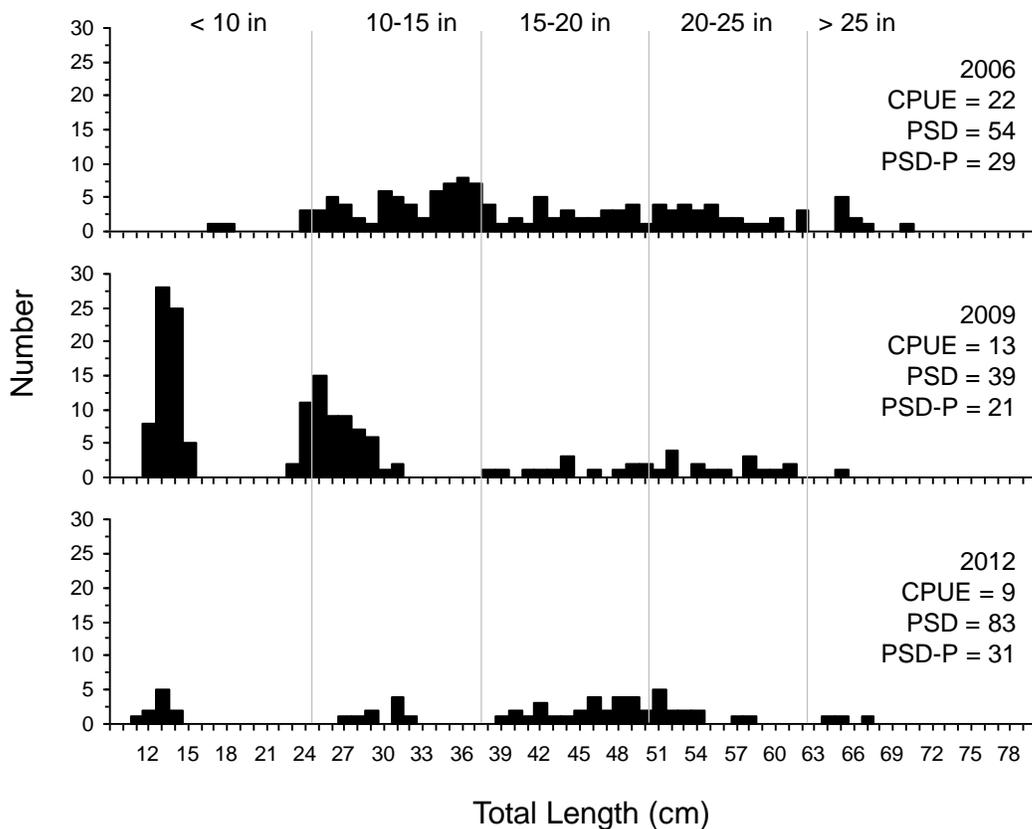


Figure 2. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Walleye captured using experimental gill nets in Reid Lake, 2006-2012.

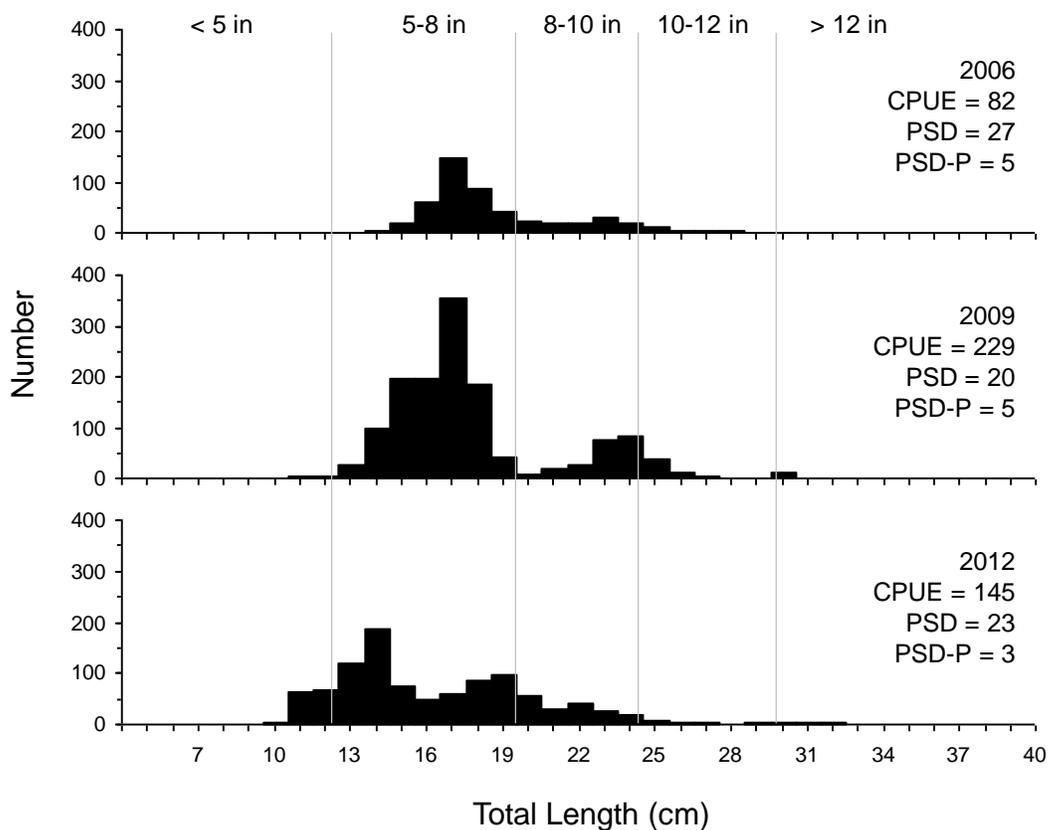


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Yellow Perch captured using experimental gill nets in Reid Lake, 2006-2012.