

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 ½ miles west and 4 ½ miles south of Bradley, SD.

Survey Dates and Netting Information

Dates of current survey	August 15-17, 2006
Dates of last survey	None
Gill net sets (n)	6
Frame net sets (n)	11

Morphometry (Figure 1)

Watershed area (acres)	unknown
Surface area (acres)	≈980
Maximum depth (ft)	≈18
Mean depth (ft)	unknown

Ownership and Public Access

Reid Lake is a meandered lake 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 2). Reid Lake is closed to boating September 1 – December 31. Reid Lake is owned by the State of South Dakota and lands adjacent to the lake are generally under private ownership.

Watershed and Land Use

The Reid Lake watershed is comprised of a mix of pasture or grassland, cropland, and woodland.

Trophic State

The trophic state of Reid Lake is likely eutrophic to hypereutrophic similar to most waters in northeast South Dakota.

Aquatic Vegetation and Exotics

Submergent vegetation was abundant in Reid Lake during the 2006 survey. The type and extent of submergent vegetation has not been documented. No exotic vegetation or wildlife was reported during this survey.

Fish Management Information

Primary species	walleye, yellow perch
Other species	black bullhead, green sunfish, northern pike
Management classification	warm-water permanent
Fish Consumption Advisories	none

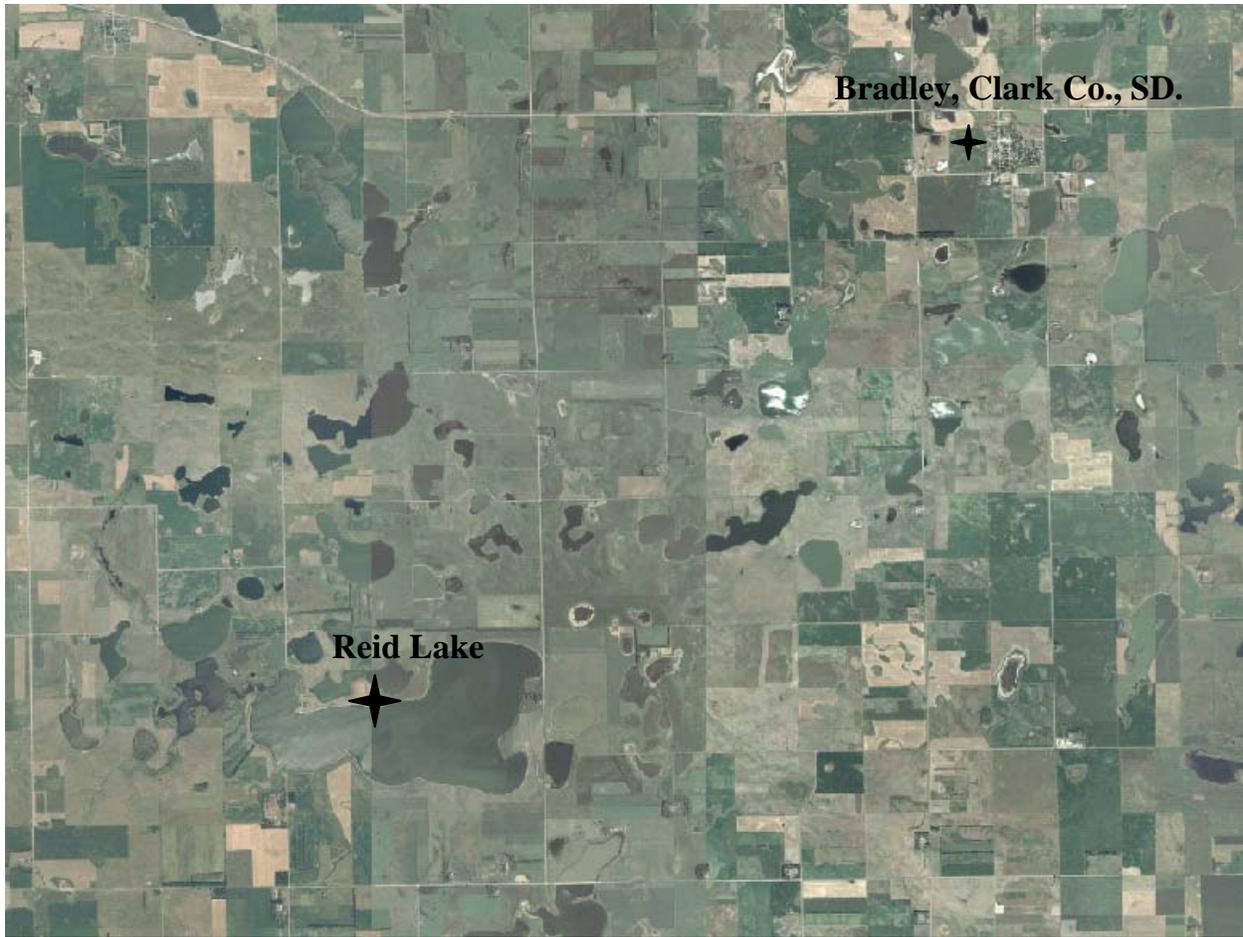


Figure 1. Map depicting location of Reid Lake, Clark County., South Dakota from the city of Bradley, Clark County., South Dakota.

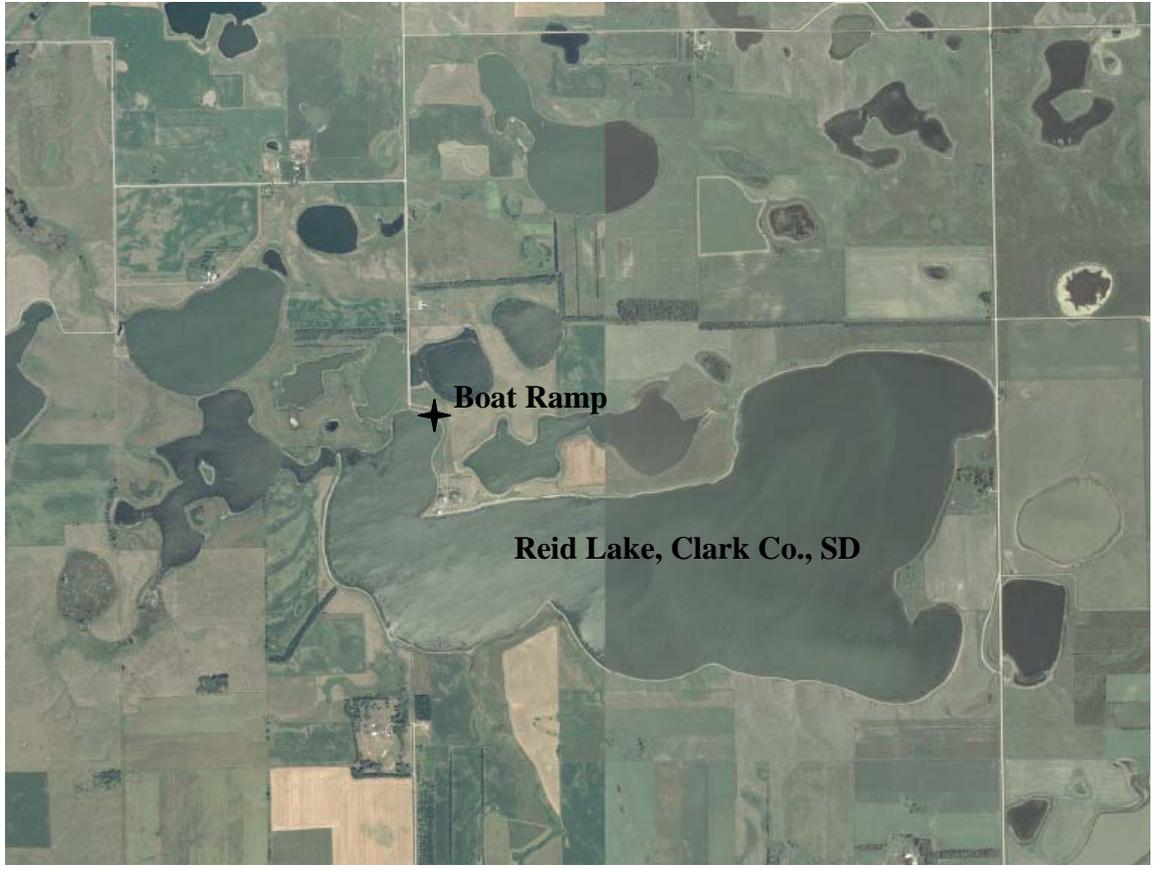


Figure 2. Map of Reid Lake indicating the public boat ramp.

Management Objectives

- 1) Maintain a mean gill net CPUE of stock-length walleye ≥ 10 , a PSD of 30 – 60, and an RSD-P of 5 – 10.
- 2) Maintain a mean gill net CPUE of stock-length yellow perch ≥ 25 , a PSD of 30-60, and an RSD-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 been capable of sustaining 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 2006 was 21.8, and is above the minimum objective (≥ 10 stock-length fish/net night; Tables 1-3). Based on the 2006 walleye gill net catch results walleye abundance would be quantified as high.

Both the length-frequency histogram of the 2006 walleye gill net catch, and age-structure information suggest consistent recruitment in Reid Lake (Table 6; Figure 3). Age estimates obtained from otoliths identify the presence of ten consecutive year-classes in the 2006 walleye gill net sample (Table 4; Table 6). Recruitment of naturally-produced walleye appears successful in six of the past ten years (1996-1998, 2002-2003, and 2006), with the 2002 and 2003 year-classes being relatively strong (Table 6). Although, not fully recruited to the adult walleye population or our gear at time of sampling, it appears that natural reproduction may have been successful in 2006 with two age-0 walleye being collected during the 2006 gill net survey. Natural recruitment potentially occurred in other years; however, unmarked walleye stockings made in 1999-2001 and 2004-2005 make it impossible to differentiate the contribution of stocked or naturally produced walleye. Relatively strong year-classes were produced in 1999, 2004, and 2005 when walleye were stocked.

The size structure of gill net captured walleye in 2006 was exceptional with walleye ranging in total length from 170 to 700 mm (Figure 3). The 2006 PSD of 54 was within the objective PSD range (30 – 60) while the RSD-P of 29 was above the objective range (5-10) indicating a population skewed slightly toward larger walleye (Table 1; Table 3; Figure 3).

Growth rates appear good with a weighted mean length at capture for age-3 walleyes being 447 mm during the 2006 survey (Table 4). No comparisons can be made to other years as Reid Lake has not been previously sampled, and no back-

calculations were made from age estimates achieved using otoliths. Condition of walleye captured in gill nets in 2006 was good with mean W_r values ranging from the mid 80's to above 90 for all length groups sampled indicating sufficient prey availability.

Yellow Perch: The mean gill net CPUE of stock-length (130 mm) yellow perch in 2006 was 81.8, and above the minimum objective (≥ 25 fish/net night; Table 1-3). Yellow perch abundance is quantified as high based on the 2006 gill net catch.

Examination of the 2006 gill net length-frequency histogram for yellow perch shows all 10-mm length groups represented in the catch from 120 to 310 mm, indicating consistent recruitment in recent years (Figure 4). PSD and RSD-P values of gill net captured yellow perch in 2006 were 27 and 5 respectively, indicating a population dominated by smaller individuals (Table 1; Table 3; Figure 4). The low size structure is a result of the large year-class of yellow perch ranging in length from 150 to 190 mm, as these fish grow and reach quality-length (≥ 200 mm) PSD values should improve (Figure 4).

The condition of yellow perch in Reid Lake was exceptional with mean W_r values exceeding 105 for all length groups sampled in 2006 indicating ample prey availability.

Other Species

Black bullheads, green sunfish, and northern pike were also captured during the 2006 survey, however densities appear low and their impact on the fishery is likely minimal at this time (Table1).

Management Recommendations

- 1) Conduct fish population assessment surveys (gill nets only) on an every third year basis (next survey scheduled in summer 2009) 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 (≈ 1000 fry/acre) biennially to add additionally year classes to the population.
- 4) Monitor water levels and winter/summer kill events.

Table 1. Mean catch rate (CPUE; Catch/net night) of stock-length fish, mean relative weight (Wr) of stock-length fish, proportional stock density (PSD) and relative stock density of preferred-length fish (RSD-P) of various fish species captured in experimental gill nets or frame nets in Reid Lake, 2006. Confidence intervals include 80 percent (\pm CI-80) or 90 percent (\pm CI-90). BLB= black bullhead; GSF= green sunfish; NOP= northern pike; WAE= walleye; YEP= yellow perch

Species	Abundance		Stock Density Indices				Condition	
	CPUE	CI-80	PSD	CI-90	RSD-P	CI-90	Wr	CI-90
<i>Frame nets</i>								
BLB	0.2	0.1	100	0	100	0	---	---
GSF	0.1	0.1	---	---	---	---	---	---
NOP	0.3	0.2	100	0	100	0	89	39
WAE	5.5	2.4	85	8	75	10		
YEP	0.8	0.8	---	---	---	---	---	---
<i>Gill nets</i>								
WAE	21.8	4.8	54	7	29	7	90	1
YEP	81.8	18.5	27	3	5	1	115	<1

Table 2. Historic mean catch rate (CPUE; Catch/net night) of stock-length fish for various fish species captured in experimental gill nets and frame nets in Reid Lake, 1999 - 2006. BLB= black bullhead; GSF= green sunfish; NOP= northern pike; WAE= walleye; YEP= yellow perch

Species	CPUE								Mean
	1999	2000	2001	2002	2003	2004	2005	2006	
<i>Frame nets</i>									
BLB	---	---	---	---	---	---	---	0.2	0.2
GSF	---	---	---	---	---	---	---	0.1	0.1
NOP	---	---	---	---	---	---	---	0.3	0.3
WAE	---	---	---	---	---	---	---	5.5	5.5
YEP	---	---	---	---	---	---	---	0.8	0.8
<i>Gill nets</i>									
WAE	---	---	---	---	---	---	---	21.8	21.8
YEP	---	---	---	---	---	---	---	81.8	81.8

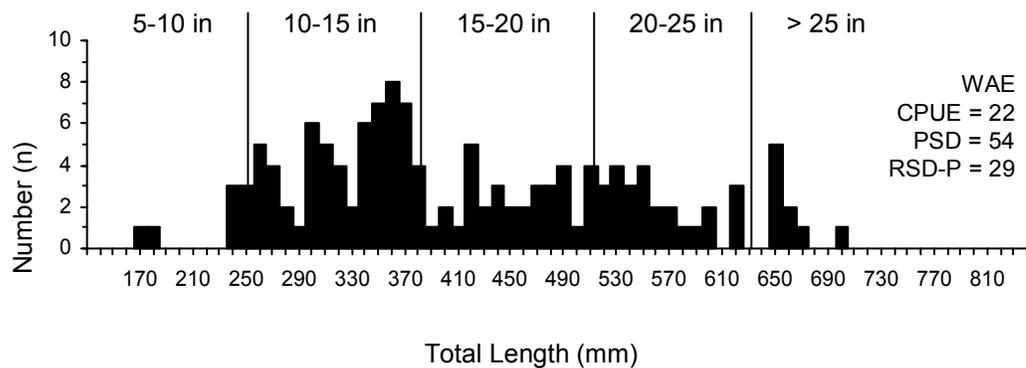


Figure 3. Length-frequency, catch rate of stock-length fish (CPUE), proportional stock density (PSD), and relative stock density of preferred-length fish (RSD-P) for walleye captured in gill nets sets in Reid Lake, 2006.

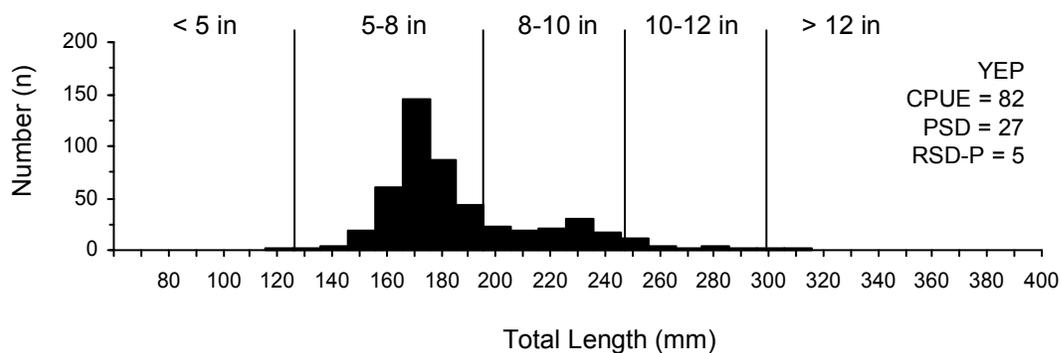


Figure 4. Length-frequency, catch rate of stock-length fish (CPUE), proportional stock density (PSD), and relative stock density of preferred-length fish (RSD-P) for yellow perch captured in gill nets in Reid Lake, 2006.