

Round Lake

Site Description

Location

Water designation number (WDN)	18-0008-00
Legal description	T118N-R58W-Sec. 11, 14
County (ies)	Clark
Location from nearest town	10 miles west and 2 miles north of Clark, SD.

Survey Dates and Sampling Information

Dates of current survey	June 5-6, 2007
Dates of most recent survey	May 31-June 1, 1995
Gill net sets (n)	3
Frame net sets (n)	10

Morphometry (Figure 1)

Watershed area (acres)	2500
Surface area (acres)	100
Maximum depth (ft)	≈ 9
Mean depth (ft)	≈ 5

Ownership and Public Access

Round Lake is a non-meandered lake owned primarily by the State of South Dakota, and one private landowner. Round Lake is managed by the SDGFP, and a single public access site (including boat ramp) is located on the west shoreline and is maintained by the SDGFP (Figure 1). Lands adjacent to Round Lake are under state and private ownership.

Watershed and Land Use

The Round Lake watershed is primarily agricultural with approximately 50% cropland, 49% pasture (grassland) and 1% shelterbelt.

Water Level Observations

Spring run-off coupled with heavy spring rains resulted in increased water levels in Round Lake. In fact, Round Lake was connected slightly to the slough area directly south of the lake at the time of our survey (Figure 1); water levels were below those experienced during the late 1990's when water connected Round with Reid Lake.

Aquatic Vegetation and Exotics

Emergent vegetation is prevalent along the majority of the Round Lake shoreline. Submergent vegetation was not highly visible at the time of our survey in early-June; however past surveys have indicated that submergent vegetation was common, and often covers approximately 25% of the lakebed. The type of emergent and submergent vegetation has not been documented in Round Lake. No exotic vegetation or wildlife was reported during this survey.

Fish Management Information

Primary species	northern pike, walleye, yellow perch
Other species	black bullhead, fathead minnow, green sunfish, rock bass
Management classification	warm-water marginal
Fish Consumption Advisories	none



Figure 1. Map depicting location of Round Lake (including public access point) from Clark, South Dakota.

Management Objectives

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

Results and Discussion

Round Lake is a relatively-shallow natural lake with good public access. A large State Game Production Area borders Round Lake on the south, while much of the northern shore is under private ownership. In the past, Round Lake has been susceptible to partial and complete winterkills resulting in a fish community often dominated by black bullheads. However, above normal precipitation during the 1990's resulting in increased water levels coupled with several consecutive mild winters has lessened the frequency of winter-kill in recent years. Round Lake is currently managed as a northern pike, walleye, and yellow perch fishery.

Primary Species

Northern Pike: The mean gill net CPUE of stock-length northern pike in Round Lake during 2007 was 0.7 and below the minimum objective of (≥ 3 stock-length fish/net; Table 1-3). It appears that abundance is low, likely the result of receding water levels limiting recruitment. Northern pike depend on flooded vegetation during the spring for spawning and conditions have not been favorable (i.e., lack of spring rise since 2001). However, rising water levels during the Spring of 2007 may increase the likelihood of successful northern pike recruitment in Round Lake.

Walleye: The mean gill net CPUE of stock-length walleye during 2007 was 18.7, and above the minimum objective (≥ 10 stock-length fish/net night; Tables 1-3). Based on the 2007 walleye gill net catch, walleye relative abundance is considered high.

Both the length-frequency histogram of the 2007 walleye gill net catch, and age-structure information suggest consistent recruitment in recent years (Table 4; Table 6 Figure 2). Age estimates obtained from otoliths of gill net captured walleye during 2007 indicate the presence of four year-classes (1998, 2004-2006; Table 4; Table 6). Recruitment of naturally-produced walleye appears successful in two of the past five years (2004-2005; Table 6). Natural recruitment potentially occurred in 2006; however,

an unmarked walleye stocking made in 2006 made it impossible to differentiate the contribution of stocked or naturally-produced walleye. It appears that a relatively strong walleye year-class was produced in 2006 (Table 6). Success of the walleye fry stocking and/or natural recruitment in 2007 is unknown, as walleye from the 2007 year-class would not have been recruited to our gear at the time of the 2007 fish community survey.

Walleye captured in gill nets during 2007 ranged in total length from 240 to 590 mm (Figure 2). PSD and RSD-P values of 34 and 5, respectively, indicate a balanced population, as defined by PSD and RSD-P ranges of 30-60 and 5-10, respectively (Table 1; Table 3; Figure 2).

Growth rates appear good with a weighted mean length at capture for age-3 walleyes being 469 mm during the 2007 survey (Table 4). No comparisons can be made to other years as walleye from Round Lake have not previously been aged. Condition of walleye captured in gill nets during 2007 was good with the mean W_r of stock-length (≥ 250 mm) walleye being 104. No length-related trends in W_r were apparent in 2007.

Yellow Perch: The mean gill net CPUE of stock-length (130 mm) yellow perch in 2007 was 1.7, and below the minimum objective (≥ 25 fish/net night; Tables 1-3). Yellow perch relative abundance is considered low based on the 2007 gill net catch. Limited yellow perch recruitment in recent years, likely related to receding water levels, has led to the low relative abundance.

The condition of sampled yellow perch in Round Lake was good with mean relative weight (W_r) values for all five stock-length yellow perch exceeding 100.

Other Species

Black bullheads, green sunfish, and rock bass were also captured during the 2007 survey, however their densities appear low and their impact on the fishery is likely minimal at this time (Table 1).

Management Recommendations

- 1) Conduct fish population assessment surveys utilizing gill nets and frame nets on an every third year basis (next survey scheduled in summer 2010) 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 add additional year classes.
- 4) Monitor water levels and winter/summer kill events. In cases of complete winter/summerkill, stock northern pike, walleye, and yellow perch to re-establish a fish community.

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 and frame nets in Round Lake, 2007. Confidence intervals include 80 percent (\pm CI-80) or 90 percent (\pm CI-90). BLB= black bullhead; GSF= green sunfish; NOP= northern pike; ROB= rock bass; 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	1.5	0.6	100	0	87	13	112	6
GSF	0.1	0.1	0	---	0	---	156	---
NOP	0.1	0.1	100	---	0	---	98	---
ROB	0.2	0.2	100	0	100	0	133	---
WAE	2.2	0.9	91	9	45	19	101	5
YEP	0.2	0.3	0	---	0	---	---	---
<i>Gill nets</i>								
NOP	0.7	0.6	50	50	0	---	96	8
WAE	18.7	9.8	34	11	5	5	104	1
YEP	1.7	0.6	40	52	0	---	105	4

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 Round Lake, 2000 - 2007. BLB= black bullhead; GSF= green sunfish; NOP= northern pike; ROB= rock bass; WAE= walleye; YEP= yellow perch

Species	CPUE								Mean
	2000	2001	2002	2003	2004	2005	2006	2007	
<i>Frame nets</i>									
BLB	---	---	---	---	---	---	---	1.5	1.5
GSF	---	---	---	---	---	---	---	0.1	0.1
NOP	---	---	---	---	---	---	---	0.1	0.1
ROB	---	---	---	---	---	---	---	0.2	0.2
WAE	---	---	---	---	---	---	---	2.2	2.2
YEP	---	---	---	---	---	---	---	0.2	0.2
<i>Gill nets</i>									
NOP	---	---	---	---	---	---	---	0.7	0.7
WAE	---	---	---	---	---	---	---	18.7	18.7
YEP	---	---	---	---	---	---	---	1.7	1.7

Table 3. Mean catch rate (CPUE; catch/net night) of stock-length fish, proportional stock density (PSD), relative stock density of preferred-length fish (RSD-P), and relative weight (Wr) for selected species captured in frame nets and experimental gill nets in Round Lake, 2000 - 2007. BLB= black bullhead; YEP= yellow perch; WAE= walleye

Species	2000	2001	2002	2003	2004	2005	2006	2007	Average	Objective
<i>Frame nets</i>										
BLB										
CPUE	---	---	---	---	---	---	---	2	2	< 100
PSD	---	---	---	---	---	---	---	100	100	---
RSD-P	---	---	---	---	---	---	---	87	87	---
Wr	---	---	---	---	---	---	---	112	112	---
<i>Gill nets</i>										
YEP										
CPUE	---	---	---	---	---	---	---	2	2	≥25
PSD	---	---	---	---	---	---	---	40	40	30-60
RSD-P	---	---	---	---	---	---	---	0	0	5-10
Wr	---	---	---	---	---	---	---	105	105	
WAE										
CPUE	---	---	---	---	---	---	---	19	19	≥10
PSD	---	---	---	---	---	---	---	34	34	30-60
RSD-P	---	---	---	---	---	---	---	5	5	5-10
Wr	---	---	---	---	---	---	---	104	104	

Table 4. Weighted mean length at capture (mm) for walleye captured in experimental gill nets in Round Lake, 2007.

Year	N	Age										
		0	1	2	3	4	5	6	7	8	9	10
2007	57	---	271	389	469	---	---	---	---	---	598	---

Table 5. Stocking history including size and number for fishes stocked into Round Lake, 1997 - 2007. YEP= yellow perch; WAE= walleye

Year	Species	Size	Number
2006	WAE	fry	100,000
2007	WAE	fry	100,000

Table 6. Numbers of walleye sampled (n) by year class and associated stocking history (Number stocked x 1,000) for walleye captured in Round Lake, 2007.

Survey Year	Year Class											
	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1999	1998
2007		33	14	9								1
Number stocked												
fry	100	100										
small fingerling												
large fingerling												

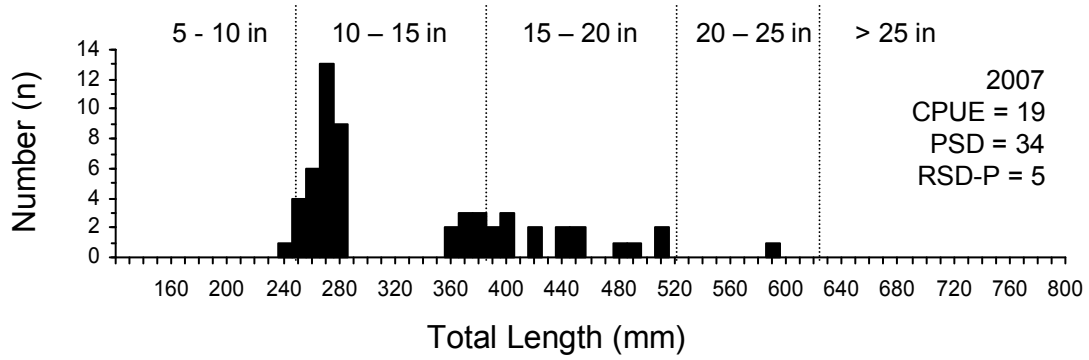


Figure 2. Length-frequency, catch rate of stock-length fish (CPUE), proportional stock density (PSD), and relative stock density of preferred-length fish (RSD-P) for walleye captured in gill nets in Round Lake, 2007.