SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Clear Lake, Minnehaha County

2102-F-21-R-47

2014

Figure 1. Clear Lake, Minnehaha County

Legal Description: T103-R51-Sec.6; T103-R52-Sec.1; T104-R51-Sec.31; T104-R52-Sec.36
Location from nearest town: 3 mi. west, 2 mi. south, and ¾ mi. west of Colton, SD

Surface Area: 472 acres
Meandered (Y/N): yes
OHWM elevation: none set
Outlet elevation: none set
Max. depth at outlet elevation: 11 feet
Observed water level: full
Contour map available (Y/N): no

Watershed area: no data
Shoreline length: no data
Date set: NA
Date set: NA
Mean depth at outlet elevation: 4 feet
Lake volume: no data
Date mapped: NA

DENR beneficial use classifications: (6) warmwater marginal fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) wildlife propagation and stock watering.

Introduction

General

It is believed that Clear Lake, a shallow, natural lake located in northwestern Minnehaha County, was named for the clear water it contained decades ago. The lake is now heavily degraded and suffers numerous algae blooms and fish kills. It receives its water from a relatively small local watershed and ground water. Outflows exit down a small, unnamed creek to Skunk Creek and then the Big Sioux River. On January 29, 2014, dissolved oxygen levels ranged from 0.34-0.41 PPM, well below the lethal limit for most fish species.

Ownership of Lake and Adjacent Lakeshore Properties

Clear Lake is listed as meandered public water in the State of South Dakota Listing of Meandered Lakes. The South Dakota Department of Game, Fish, and Parks (GFP) owns and manages Game Production Areas (GPAs) on the east and south shores of the lake. The United States Fish and Wildlife Service (USFWS) owns and manages a Waterfowl Production Area (WPA) on the north shore. The remainder of the shoreline is privately owned.

Fishing Access

Clear Lake has primitive boat launch on the east side access area that is suitable for launching small boats. Shore fishing is difficult due to lack of access. Ice fishing is the most popular activity on the lake.

Water Quality and Aquatic Vegetation

The water temperature during this year's lake survey was 25^{o}C (77^{o}F) and the water clarity was 46 cm (18 in). The reduced clarity was caused by an algae bloom.

Fish Community

Clear Lake has a very simple fish community with few species due to frequent fish kills (Table 1).

Table 1. Fish species commonly found in Clear Lake, Minnehaha County.

Game Species	***Other Species***
Walleye	Common Carp
Black Bullhead	White Sucker
Northern Pike	
Yellow Perch	

Fish Management

Due to frequent fish kills (Table 2), Clear Lake is managed for the primary purpose of rearing game fish for stocking in other waters but it also can provide fishing opportunity on the rare occasions fish survive for more than two years. Walleye and yellow perch are frequently stocked for these purposes (Table 3).

Table 2. Fish kill history for Clear Lake, Minnehaha County.

Year	*Severity*	*Comments*
2009	Light	Winterkill of common carp. Only one sucker and 20 bullheads netted.
2008	Light	Winterkill of carp.
2007	Light	Dead and live carp observed near boat launch.
2001	Severe	Winterkill. Only a few bullheads survived.
1997	Severe	Winterkill. Just a few bullheads were test netted.

Table 3. Stocking history for Clear Lake, Minnehaha County, 2005-2014.

Year	*Number*	*Species*	*Size*
2005	472	Northern Pike	Adult
	94,300	Walleye	Fingerling
2006	5,670	Yellow Perch	Juvenile
2007	765	Yellow Perch	Juvenile
	275	Yellow Perch	Adult
2008	48,000	Walleye	Fingerling
	12,636	Yellow Perch	Fingerling
2010	450,000	Walleye	Fry
	154,293	Yellow Perch	Fingerling
2011	472,000	Northern Pike	Fry
2012	627,694	Walleye	Fry
	2,750	Yellow Perch	Juvenile
2014	475,000	Walleye	Fry

Methods

Clear Lake was sampled on July 16-17, 2004 with three overnight gill nets. The gill nets are 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh (½, ¾, 1, 1¼, 1½, and 2 in) monofilament netting.

Results and Discussion

Net Catch Results

The eight walleyes sampled in the gill nets were the only game fish caught in 2014 (Table 4). Small common carp and black bullheads comprised the remainder of the sample.

Table 4. Total catch from three overnight gill nets set in Clear Lake, Minnehaha County, July 16-17, 2004.

Species	*#*	*%*	*CPUE[1]*	*80% C.I.*	*Mean CPUE**	*PSD*	*RSD-P*	*Mean Wr*
Common Carp	238	62.6	79.3	±29.3	35.1	92	58	--
Black Bullhead	134	35.3	44.7	±28.1	28.8	4	0	--
Walleye	8	2.1	2.7	±2.8	3.3	--	--	--

*10 years (2005-2014)

Table 5. CPUE by length category for selected species sampled with gill nets in Clear Lake, Minnehaha County, July 16-17, 2004.

Species	*Substock*	*Stock*	*S-Q*	*Q-P*	*P+*	*All sizes*	*80% C.I.*
Common Carp	67.3	12.0	1.0	4.0	7.0	79.3	±29.3
Black Bullhead	14.3	30.3	29.0	1.3	--	44.7	±28.1
Walleye	0.3	2.3	--	2.3	--	2.7	±2.8

Length categories can be found in Appendix A.

Table 6. Gill-net (GN), or trap-net (TN) CPUE for selected fish species sampled in Clear Lake, Minnehaha County, 2005-2014.

Species	*Gear*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Black Bullhead	GN	44.3		47.7		2.7				4.7	44.7
	TN	200.4		211.8		49.2				254.8	
Common Carp	GN	1.3		7.7		--				87.0	79.3
	TN	4.0		6.4		53.0				194.8	
Northern Pike	GN	3.0		0.3		--				0.3	--
	TN	11.8		--		--				0.8	
Walleye	GN	0.3		0.3		--				13.0	2.7
	TN	--		--		--				14.8	
White Sucker	GN	--		--		--				--	--
	TN	--		0.6		0.6				5.2	
Yellow Perch	GN	10.3		4.3		0.3				--	--
	TN	0.6		--		0.4				--	

[1] See Appendix A for definitions of CPUE, PSD, RSD, RSD-P and mean Wr.

Discussion

Clear Lake cannot be managed as a traditional fishery because of its shallow depth and frequent fish kills. However, it is still a valuable resource for rearing fish for restocking into other waters and it can still provide some fishing opportunity if stocked game fish can survive for 2-3 years.

Management Recommendations

1. Continue to manage Clear Lake by stocking game fish for the primary purpose of rearing them for restocking in other waters and to provide occasional fishing opportunity between fish kills. Stocking efforts should focus primarily on walleye due to recent success with occasional yellow perch stocking when fish are readily available.

2. Conduct basic fish population surveys whenever the game fish populations have survived long enough to provide fishing opportunity.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.