

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-38

Name: Lost Lake **County (ies):** Minnehaha
Legal Description: T103N-R52W-Sec 34
Location from nearest town: 2 miles north of Humboldt, SD

Dates of present survey: July 13-14, 2005
Date last surveyed: July 26-27, 2000

Primary Game Species	Other Species
Yellow Perch	Black Bullhead
Northern Pike	Common Carp

PHYSICAL DATA

Surface Area: 163 acres **Watershed area:** No data
Maximum depth: 7 feet **Mean depth:** 5 feet
Volume: No data **Shoreline length:** No data
Contour map available: No **Date mapped:** NA
Lake elevation observed during the survey: Full
Beneficial use classifications: (6) marginal fish life propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Introduction

Lost Lake is a small, shallow lake located north of Humboldt in west central Minnehaha County. It was named Lost Lake because it's surrounded by hills and not visible until you get close to the shore.

Ownership of the Lake and Adjacent Lakeshore Property

Lost Lake is listed as a meandered lake in the State of South Dakota Listing of Meandered lakes. The fishery is managed by the South Dakota Department of Game, Fish and Parks (GFP). Most of the eastern shoreline lies within a Waterfowl Production Area (WPA) owned and managed by the United States Fish and Wildlife Service (USFWS). The remainder of the shoreline is privately owned.

Fishing Access

There is a short stretch of sandy shoreline on the east side of the lake suitable for launching small boats with a four-wheel drive vehicle. This area is also suitable for shore fishing.

Field Observations of Water Quality and Aquatic Vegetation

The water in Lost Lake was stained green by a blue-green algae bloom during the survey. There was a little sago pondweed (*Potamogeton pectinatus*) and some cattails (*Typha spp.*) scattered around the shoreline. The Secchi depth was 0.28 m (11 in.). A large cattle feedlot on the north shore and other livestock and farming operations in the watershed are believed to be major contributors to Lost Lake's poor water quality.

BIOLOGICAL DATA

Methods:

Lost Lake was sampled on July 13-14, 2005 with five overnight trap net sets. The trap nets are constructed with 19-mm-bar-mesh ($\frac{3}{4}$ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. Trap-net sites are displayed in Figure 3.

Results and Discussion:

Trap-Net Catch

Black bullheads (90.7 %) were the most abundant species sampled in the trap nets. Northern pike CPUE was high at 15.4. Only one common carp was sampled.

Table 1. Total catch from 5 overnight trap net sets at Lost Lake, Minnehaha County, July 13-14, 2005.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD- P	Mean Wr
Black Bullhead	761	90.7	152.2	<u>+43.4</u>	5,056.3	10	0	97
Northern Pike	77	9.2	15.4	<u>+8.9</u>	0.0	88	1	94
Common Carp	1	0.1	0.2	<u>+0.3</u>	0.0	--	--	--

* 2 years (1988, 2000)

Black Bullhead

Management objective: Maintain a black bullhead population that has a trap net CPUE of 100 or less.

Black bullhead CPUE in previous surveys was 9,460 in 1988 and 652.6 in 2000. A severe winterkill occurred during the winter of 2000-01 and large numbers of dead bullheads were observed along the shorelines that spring. The Region III fisheries crew removed and additional 23,760 pounds (145 pounds per acre) of bullheads from the lake between May 26, 2005 and June 9, 2005. This year's trap net CPUE of 152.2 indicates we are close to accomplishing our management objective.

Northern Pike

Management objective: Establish and maintain a northern pike population with a trap net CPUE of 10 or greater.

For years we have struggled to create a fishery in Lost Lake due to poor water quality and frequent winterkill. In 2003, 1,610 adult northern pike were removed from Lake Preston and stocked in Lost Lake (Table 2). Since northern pike are tolerant to low oxygen levels, we hope they will survive and provide some fishing opportunity. A secondary objective for the pike stocking is to control the overabundant bullhead population.

The average weight of the pike when stocked was 650 g (1.43 lbs.). This year, their average weight had increased to 1,219 g (2.7 lbs.). In addition, the mean relative weight was 94, which is high for northern pike in the summer. The stocked pike are doing quite well, however, few anglers have attempted to catch them yet.

MANAGEMENT RECOMMENDATIONS

1. Investigate possibilities for working with landowners next to the lake and in the watershed to improve water quality.
2. If Lost Lake suffers another total fish kill, management options include use as a natural rearing pond for yellow perch or walleyes or another attempt to establish a northern pike fishery.

Table 3. Stocking record for Lost Lake, Minnehaha County, 1990-2005.

Year	Number	Species	Size
1990	250	Northern Pike	Adult
1993	850,000	Walleye	Fry
1994	591	Black Crappie	Adult
1995	805	Black Crappie	Lost
	1,260	Black Crappie	Fingerling
1997	4,500	Walleye	Fingerling
	230	Yellow Perch	Adult
	14,300	Yellow Perch	Fingerling
1998	1,647	Yellow Perch	Adult
1999	8,164	Yellow Perch	Juvenile
2000	1,630	Yellow Perch	Adult
2003	1,610	Northern Pike	Adult

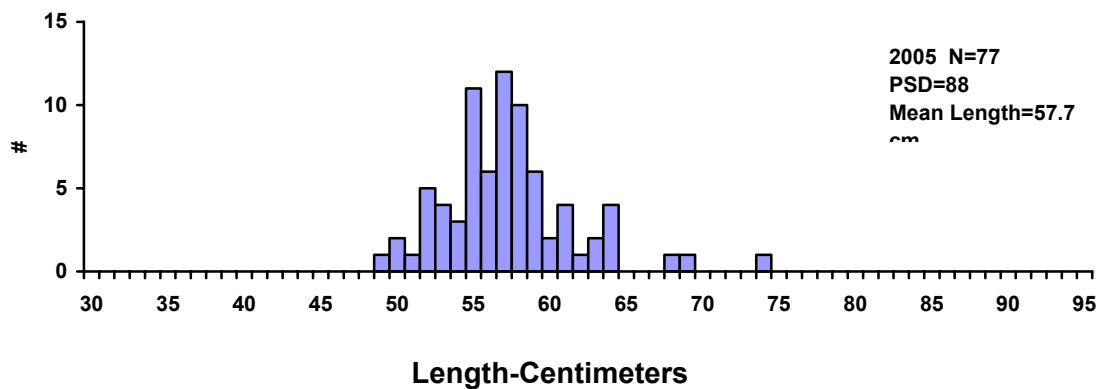


Figure 1. Length frequency histograms for northern pike sampled with trap nets in Lost Lake, Minnehaha County, 2005.

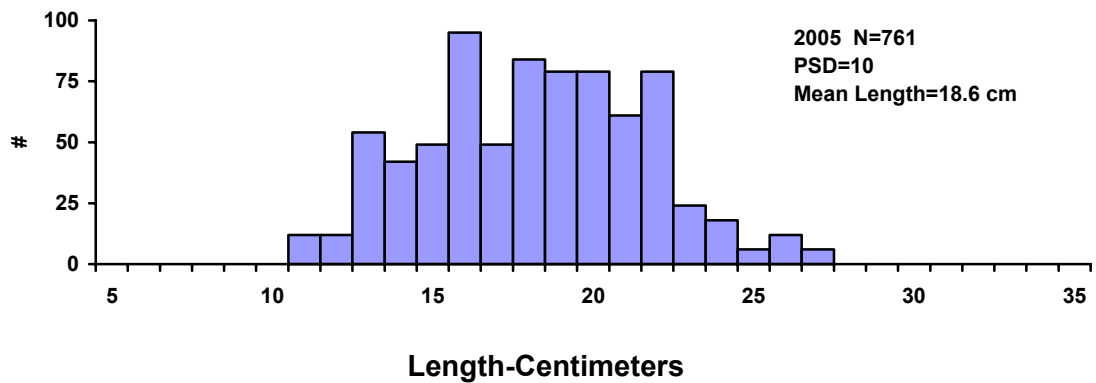


Figure 2. Length frequency histograms for black bullheads sampled with trap nets in Lost Lake, Minnehaha County, 2005.

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:

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

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

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

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.