

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Lehrman Slough, McCook County
2102-F-21-R-46
2013

Legal Description: T103-R56-Sec 32; T104-R56-Sec 5
Location from nearest town: 3 miles south of Spencer, SD

Dates of present survey: June 18-19, 2013
Dates of last survey: July 13-14, 2005

Game Species	Other Species
Yellow Perch	Common Carp
Walleye	White Sucker
Black Bullhead	
Bluegill	
Channel Catfish	

PHYSICAL DATA

Surface area: 184 acres **Watershed area:** No data
Maximum depth: 15 feet **Mean depth:** 8 feet
Contour map available: No **Date mapped:** Shoreline (2004)
Lake elevation observed during the survey: 2 feet low
Beneficial use classifications: (6) warmwater marginal fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Introduction

Lehrman Slough is a small, shallow lake located in west central McCook County just off Interstate 90. It derived its name from the Lehrman family who own a portion of the lake and surrounding shoreline. For years, Lehrman Slough was too shallow to support a fishery but heavy rains and snowfall in the early 1990's increased the lake's maximum depth to about 15 feet.

Ownership of Lake and Adjacent Lakeshore Properties

Lehrman Slough contains 80 acres of Game Production Area (GPA) on the north shore that is owned and managed by the South Dakota Department of Game, Fish and Parks. The remainder of the lake is privately owned.

Fishing Access

Shore fishing is available on the county road right-of-way at the west end of the lake. Small boats can be launched off this road as well. Lehrman Slough is primarily a winter ice fishery.

Field Observations of Water Quality and Aquatic Vegetation:

The water in Lehrman Slough was fairly clear with a Secchi depth measurement of 89 cm (35 in) and the water temperature was 24 C (78 F). No aquatic vegetation observations were recorded.

BIOLOGICAL DATA

Methods:

Lehrman Slough was sampled on June 18-19, 2013 with three overnight gill-net sets and five overnight trap-net sets. The trap nets are constructed with 19-mm-bar-mesh (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. 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 (1/2, 3/4, 1, 1 1/4, 1 1/2, and 2 in) monofilament netting

Results and Discussion:

Gill Net Catch

Black bullheads made up the vast majority of the gill net sample (Table 1). Walleye, common carp, yellow perch, and white sucker were also caught.

Table 1. Total catch from three overnight gill net sets at Lehrman Slough, McCook County, June 18-19, 2013.

Species	#	%	CPUE ¹	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	239	91.9	79.7	+5.7	85.9	2	0	89
Walleye	9	3.5	3.0	+0.7	6.8	--	--	--
Common Carp	6	2.3	2.0	+0.7	0.0	--	--	--
Yellow Perch	4	1.5	1.3	+0.4	5.8	--	--	--
White Sucker	2	0.8	0.7	+0.4	0.0	--	--	--

* 4 years (1999, 2001, 2003, 2005)

Table 2. Catch per unit effort by length category for various fish species captured with gill nets in Lehrman Slough June 18-19, 2013.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Bullhead	1.0	78.7	77.0	1.7	--	79.7	+5.7
Walleye	--	3.0	0.3	2.7	--	3.0	+0.7
Common Carp	--	2.0	1.7	0.3	--	2.0	+0.7
Yellow Perch	--	1.3	--	0.7	0.6	1.3	+0.4
White Sucker	--	0.7	--	--	0.7	0.7	+0.4

Length categories can be found in Appendix A.

¹ See Appendix A for definitions of CPUE, PSD, and mean Wr.

Trap Net Catch

Black bullheads also dominated the trap net catch (Table 2).

Table 3. Total catch from five overnight trap net sets at Lehrman Slough, McCook County, June 18-19, 2013.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	1,529	96.4	305.8	<u>+136.4</u>	642.1	9	0	84
Common Carp	49	3.1	9.8	<u>+4.6</u>	0.0	71	2	94
Yellow Perch	5	0.3	1.0	<u>+1.0</u>	0.3	--	--	--
White Sucker	1	0.1	0.2	<u>+0.3</u>	0.0	--	--	--
Bluegill	1	0.1	0.2	<u>+0.3</u>	0.0	--	--	--
Channel Catfish	1	0.1	0.2	<u>+0.3</u>	0.0	--	--	--

*5 years (1997, 1999, 2001, 2003,2005)

Table 4. Catch per unit effort by length category for various fish species captured with trap nets in Lehrman Slough June 18-19, 2013.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Bullhead	24.6	281.2	256.6	24.6	--	305.8	<u>+136.4</u>
Common Carp	--	9.8	2.8	6.8	0.2	9.8	<u>+4.6</u>
Yellow Perch	--	1.0	0.8	0.2	--	1.0	<u>+1.0</u>
White Sucker	--	0.2	--	--	0.2	0.2	<u>+0.3</u>
Bluegill	--	0.2	--	--	0.2	0.2	<u>+0.3</u>
Channel Catfish	--	0.2	--	0.2	--	0.2	<u>+0.3</u>

Length categories can be found in Appendix A.

Table 5. Gill-net (GN) and trap-net (TN) CPUE for all fish species sampled in Lehrman Slough, McCook County, 1997-2013.

Species	1997	1998	1999	2000	2001	2002	2003	2004	2005	2013
COC (GN)			0.0		0.0		0.0		0.0	2.0
COC (TN)	0.0		0.0		0.0		0.0		0.0	9.8
WHS (GN)			0.0		0.0		0.0		0.0	0.7
WHS (TN)	0.0		0.0		0.0		0.0		0.0	0.2
BLB (GN)			117.7		100.7		122.0		3.0	79.7
BLB (TN)	58.5		825.0		27.8		2275		24.4	305.8
CCF (GN)			0.0		0.0		0.0		0.0	0.0
CCF (TN)	0.0		0.0		0.0		0.0		0.0	0.2
OSF (GN)			1.3		0.0		0.0		0.0	0.0
OSF (TN)	1.0		5.8		0.0		0.0		0.0	0.0
WHC (GN)			0.3		0.0		0.0		0.0	0.0
WHC (TN)	0.0		1.6		0.0		0.0		0.0	0.0
YEP (GN)			0.0		0.0		20.7		2.5	1.3
YEP (TN)	0.0		0.0		0.0		0.4		1.0	1.0
SXW (GN)			4.3		0.0		0.0		0.0	0.0
SXW (TN)	0.0		1.8		0.0		0.0		0.0	0.0
WAE (GN)			0.0		0.0		22.3		5.0	3.0
WAE (TN)	0.0		0.0		0.0		0.2		7.0	0.0

COC (Common Carp), WHS (White Sucker), BLB (Black Bullhead), CCF (Channel Catfish), OSF (Orange-spotted Sunfish), WHC (White Crappie), YEP (Yellow Perch), SXW (Saugeye), WAE (Walleye)

Discussion

Lehrman Slough is a difficult water to maintain fishing opportunity in because of its shallow depth and frequent fish kills. Walleye and yellow perch stockings in 2011 (Table 6) created a brief fishery during the winter of 2012-2013 but fishing has been poor since then.

Management Recommendations

1. Due to frequent fish kills, manage Lehrman Slough primarily for yellow perch by stocking up to 50 adults per acre annually. Northern pike and/or walleyes should also be stocked when carp and bullhead abundance is high.

Table 6. Stocking record for Lehrman Slough, McCook County, 1991-2013.

Year	Number	Species	Size
1994	5,382	Saugeye	Lrg. Fingerling
	427	White Crappie	Adult
1995	30,000	Saugeye	Fingerling
1997	6,480	Saugeye	Lrg. Fingerling
1998	1,581	Saugeye	Juvenile
	3,479	White Crappie	Adult
1999	826	White Crappie	Adult
2000	10,930	Yellow Perch	Juvenile
2002	400	Walleye	Juvenile
	5,130	Yellow Perch	Adult
2003	33,040	Walleye	Fingerling
2004	30,000	Walleye	Fingerling
2011	30	Walleye	Adult
	184	Walleye	Lrg. Fingerling
	93,260	Yellow Perch	Fingerling

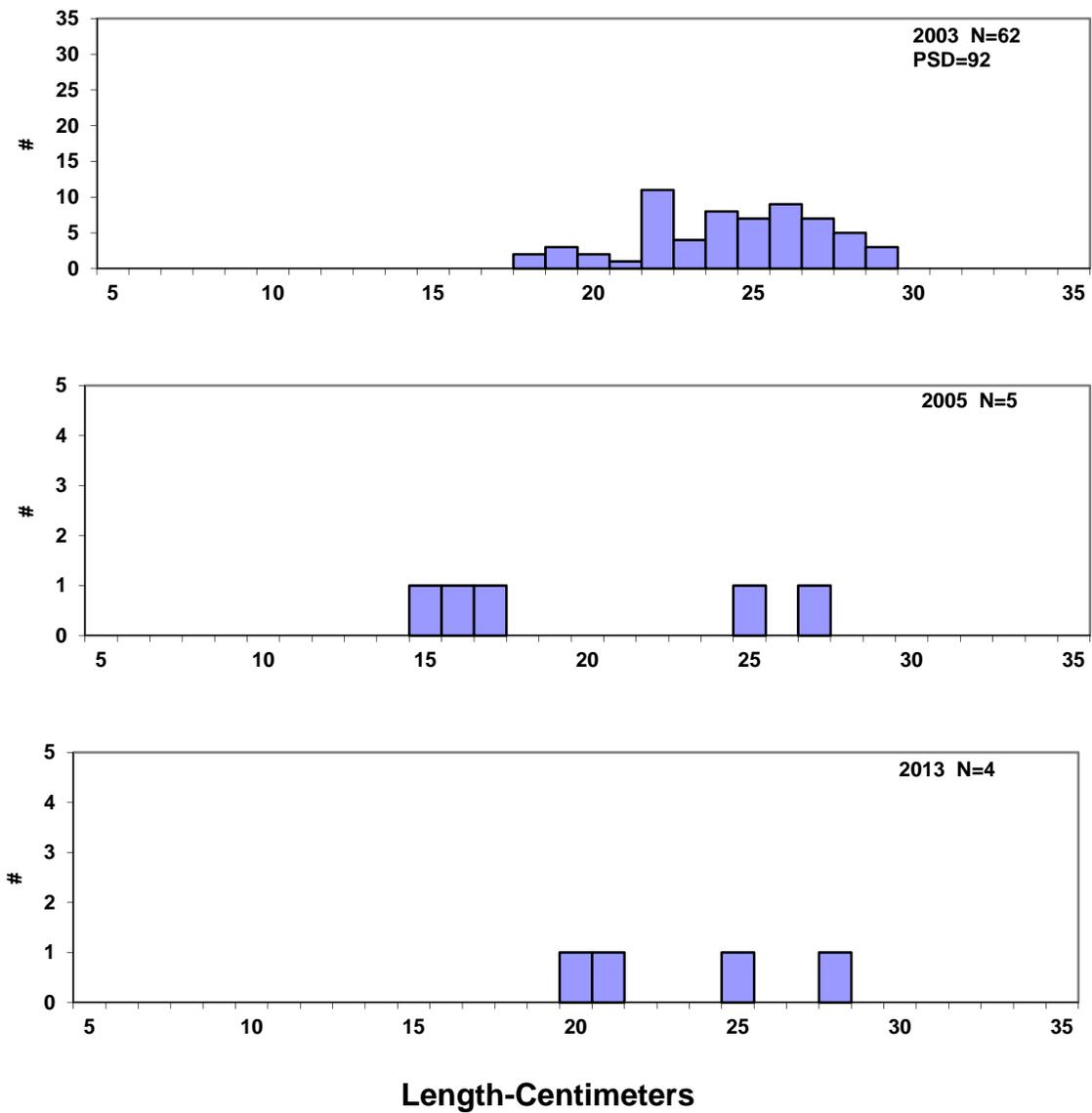


Figure 1. Length frequency histogram for yellow perch sampled with gill nets in Lehrman Slough, McCook County, 2003, 2005, and 2013.

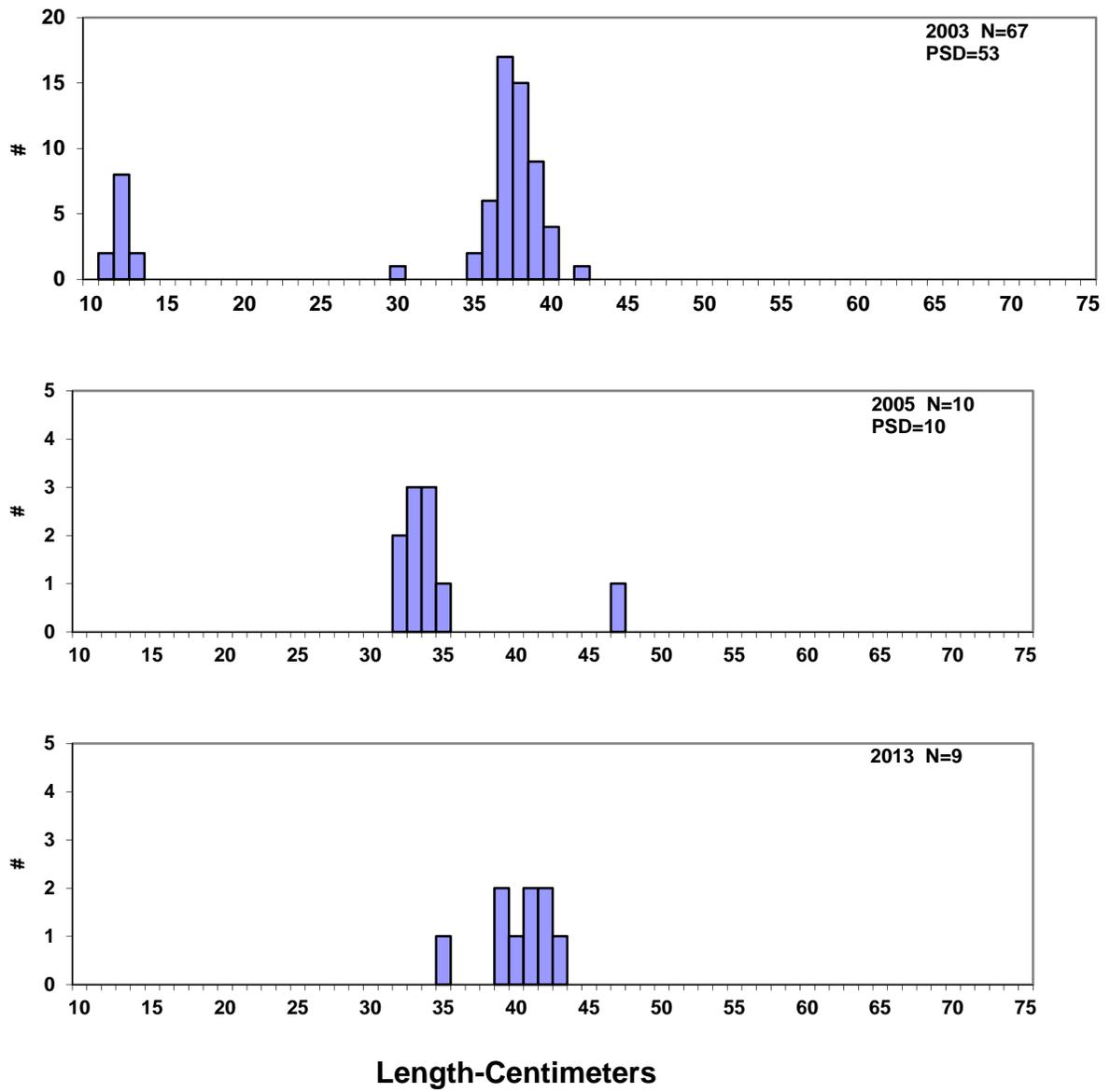


Figure 2. Length frequency histogram for walleyes sampled with gill nets in Lehrman Slough, McCook County, 2003, 2005, and 2013.

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.