

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-41

Name: Waggoner Lake County(ies): Haakon
Legal description: T 1N, R 20E Sec. 1 and T 1N, R 21E Sec. 6
Location from nearest town: 3 miles north of Philip, SD
Dates of present survey: September 30, 2008
Date last surveyed: October 9, 2007
Most recent lake management plan: F21-R-32 Date: 1998
Management classification: Warmwater permanent
Contour mapped: Yes Date: 1995

Primary Species: (game and forage)

1. Largemouth bass
2. Bluegill
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Secondary and other species:

1. Black crappie
2. Northern pike
3. Yellow perch
4. Green sunfish
5. Walleye
6. Channel catfish
7. Smallmouth bass
8. White sucker

PHYSICAL CHARACTERISTICS

Surface Area: 107 acres; Watershed: 16,600 acres
Maximum depth: 21 feet; Mean depth: 10 feet
Lake elevation at survey (from known benchmark): full

1. Describe ownership of lake and adjacent lakeshore property:

The State of South Dakota has an easement for public access up to 12 feet above the high water mark. A majority of the lakeshore property is privately owned with small portions owned by the city of Philip and Haakon County.

2. Describe watershed condition and percentages of land use:

Approximately 90% of the watershed consists of livestock grazing. An increasing portion of the watershed has been tilled for small grain row crops. The increased tillage has accelerated siltation of the lake. The primary source of water for Waggoner Lake is a city owned hot water well and Grindstone Creek. A continual water supply is rare for lakes in western South Dakota; the lake does experience fluctuations as the well water is also used by a nearby golf course. The hot water well provides some benefit to fish in the winter months; however, it makes ice conditions near the inlet unpredictable.

3. Describe aquatic vegetative condition:

Emergent vegetation is limited to bulrushes and cattails, which are abundant in the bays and inlet areas of the lake. Submerged vegetation is a problem annually in mid-summer. Approximately fifty percent of the shoreline was covered by submergent vegetation.

4. Describe pollution problems:

There is moderate siltation from run-off. Currently no pollution problems have been detected by Departmental personnel during lake surveys.

5. Describe condition of all structures, i.e. spillway, level regulators, boat ramps, etc.:

A new boat ramp was put in 2004, and is a huge upgrade from the old ramps.

BIOLOGICAL DATA

Methods

Night electrofishing was conducted at Waggoner Lake on September 30, 2008. Electrofishing was conducted using a Smith-Root control unit with pulsed-DC. Six, ten-minute runs were completed. All smallmouth bass and largemouth bass were collected, measured for total length (TL; mm) and weighed (g). Age and growth was not calculated due to recent adult stockings. All data was entered into WinFin 2.95.

Fish population parameters, confidence intervals and standard errors were computed using WinFin Analysis (Francis 2000). Parameters calculated were catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr) based on length categories. Abundance was expressed as the mean catch per unit effort (CPUE; mean number per net night or mean number per hour of electrofishing). Actual pedal time (time the electrofishing unit produced current) was recorded from the digital display on the Smith-Root control box and used to calculate electrofishing CPUE. Population structural characteristics were expressed as length frequency histograms and stock density indices (PSD and RSD-P). Fish condition was expressed as mean Wr.

Results and Discussion

Night electrofishing Catch

Waggoner Lake was night electrofished for a total of 3,600 seconds (1.0 hours) pedal time (Table 3). Only largemouth bass (N=42) and smallmouth bass (N=0) were targeted.

Table 1. Total catch (N), catch per hour of electrofishing (CPUE) with 80% CI's in parentheses, catch per hour of stock length fish (CPUE-S) with 80% CI's, and proportional stock densities (PSD, RSD-P) with 90% CI's in parentheses for largemouth bass collected by electrofishing in Waggoner Lake, Haakon County,.

Species	N	CPUE	CPUE-S	PSD	RSD-P	Wr > S
Largemouth bass	42	42.0 (7.9)	38.0 (7.4)	79 (11)	41 (14)	109.7 (2.3)
Totals						

Largemouth bass

A total of 67 largemouth bass were captured during night electrofishing (Tables 3 and 6). Mean CPUE was 90.5 for all largemouth bass and mean CPUE for largemouth bass stock length or greater was 86.6. Size of fish collected ranged from 180 mm to 500 mm (Figure 6). Stock density indices indicate a balanced population with a PSD was 69 and RSD-P was 41. Mean Wr for stock length and larger fish was 112.7. Growth was done on smaller fish but not calculated on large fish due to recent adult stockings.

Over the years the largemouth bass population has been variable. Density and size structure were high from 1996-1999, but number declined dramatically in 2000. Adult stockings appear to be helping the population recover. Currently, bass resemble a moderate density population with excellent size structure. GF&P management plan objectives for CPUE of adult bass is greater than 20 with a PSD range of 50-80 and an RSD-P of greater than 30. Our current survey shows that the population is doing excellent and exceeding these objectives.

Table 2. Total catch (N), pedal time (seconds), catch per hour of electrofishing (CPUE), proportional stock densities (PSD, RSD; 90% confidence intervals are given in parentheses) for largemouth bass collected by electrofishing in Waggoner Lake, Haakon County, 1996-2007.

Year	N	Pedal Time				
		(sec)	CPUE	CPUE-S	PSD	RSD-P
1996	96	2,942	117.5	111.4	66 (8)	29 (8)
1997	88	6,944	45.6	42.5	63 (8)	24 (8)
1998	107	4,200	91.7	90.9	72 (8)	24 (7)
1999	111	6,350	62.9	62.4	56 (8)	17 (6)
2000	19	4,140	18.1	18.1	74 (18)	16 (15)
2001	56	6,028	33.5 (4.6)	26.3 (4.6)	52 (13)	0 (-)
2002	24	2,959	29.2 (14.6)	29.2 (14.6)	71 (16)	4 (7)
2003	39	3,800	38.5 (21.5)	18.8 (10.7)	95 (9)	58 (20)
2004	88	3,600	88.0 (38.1)	57.0 (20.7)	46 (11)	35 (11)
2005	77	3,898	71.0 (12.0)	59.7 (10.2)	58 (11)	32 (10)
2006	57	3,000	68.4 (11.9)	48.0 (10.9)	63 (14)	25 (12)
2007	68	2,828	90.5 (40.7)	86.6 (38.9)	69 (10)	41 (11)
2008	42	3,600	42.0 (7.9)	38.0 (7.4)	79 (11)	41 (14)

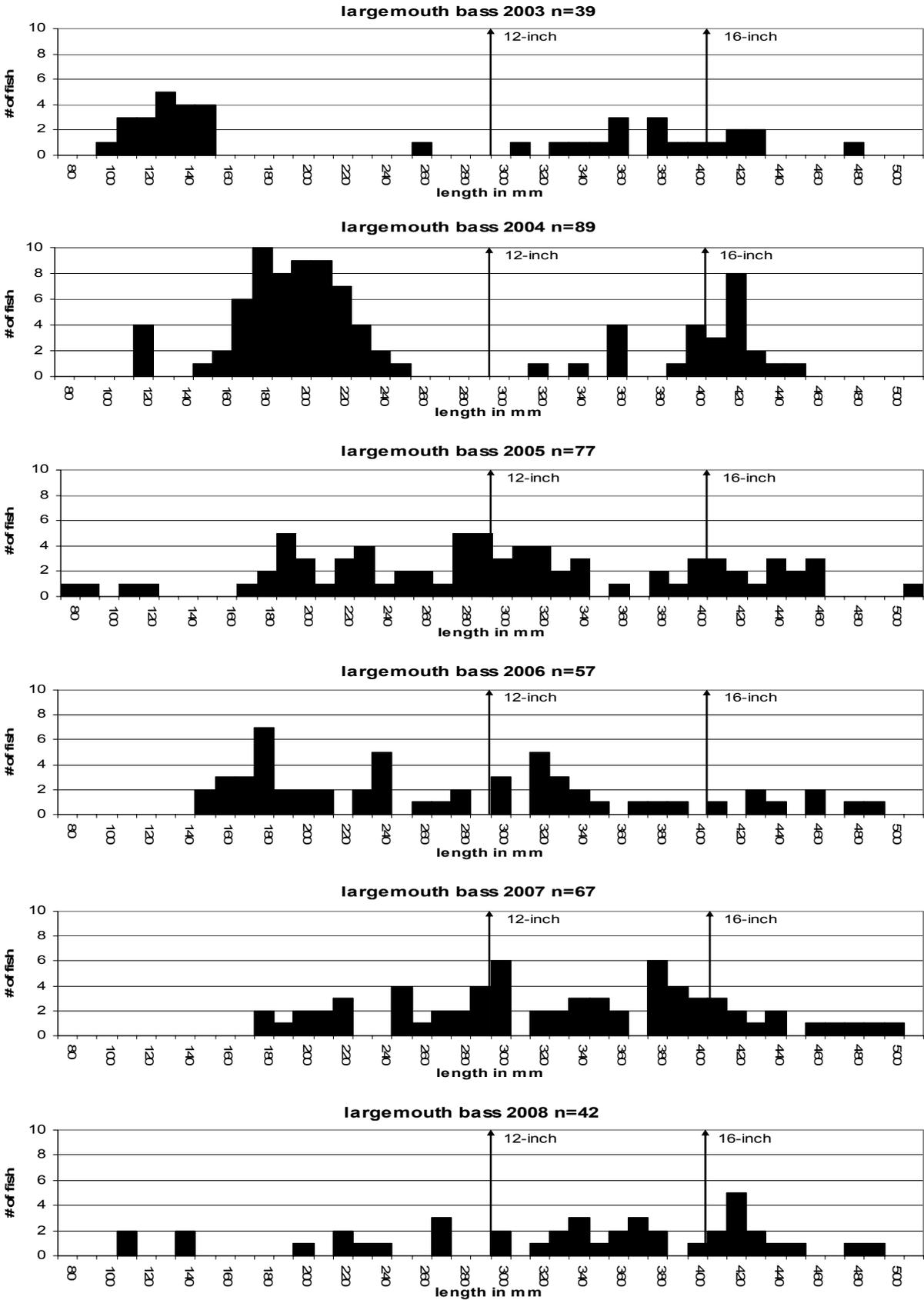


Figure 1. Length histogram of largemouth bass collected during night electrofishing from Waggoner Lake, Haakon County, 2003-2008.

LITERATURE CITED

- Francis, J. 1999. Winfin, Version 2.95; Microsoft Access Program for data entry. Nebraska Game and Parks Commission, Lincoln.
- Francis, J. 2000. WinFin Analysis Program. Version 1.5. Nebraska Game and Parks Commission, Lincoln.
- Willis, D.W., D.A. Isermann, M.J. Hubers, B.A. Johnson, W.H. Miller, T.R. St. Sauver, J.S. Sorenson, E.G. Unkenholz, and G.A. Wickstrom. 2001. Growth of South Dakota Fishes: A Statewide Summary with means by region and Water Type. Special Report. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota.

RECOMMENDATIONS

1. Continue conducting lake surveys once every 2 years to evaluate fish populations and stocking success as well as seeing if management objectives are being met.
2. Continue annual fall night electrofishing to develop long-term trend data of largemouth bass and continue monitoring the smallmouth bass population.

APPENDICES

Appendix A. Stocking record for Waggoner Lake, Haakon County, 1994-2007.

Year	Number	Species	Size
1994	2,000	Golden shiner	Adult
	120	Largemouth bass	Adult
1995	4,000	Largemouth bass	Fingerling
1996	4,000	Largemouth bass	Fingerling
1997	12,000	Largemouth bass	Fingerling
1998	12,000	Largemouth bass	Fingerling
1999	6,000	Largemouth bass	Fingerling
2000	12,000	Largemouth bass	Fingerling
2001	905	Largemouth bass	Adults
	12,620	Largemouth bass	Fingerling