Horseshoe Lake Survey Summary

Horseshoe Lake, located 9.0 miles south and 4.5 miles west of Webster, is managed as a smallmouth bass, walleye and yellow perch fishery; other fish species are present and contribute to the fishery.

In 2018, daytime electrofishing was used to monitor the smallmouth bass population in Horseshoe Lake; no other sampling was conducted.

- **Smallmouth bass.** More smallmouth bass were sampled in 2018 (19.0/hour) than 2015 (12.0/hour). In 2018, sampled fish ranged in length from 13.0 to 19.3 inches; more than half (10 of 19; 53%) exceeded 17.0 inches. Though smallmouth bass are not abundant in Horseshoe Lake, those present tend to be larger and of interest to a segment of anglers.

For more detailed results see the computer generated South Dakota Statewide Fisheries Survey for Horseshoe Lake (below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Horseshoe, Day County
UBS-Lake-303-001
2018

Lake Information

Name: Horseshoe

County: Day

Surface Area: 614 Acres

Maximum Depth: 24 Feet

Mean Depth: 15 Feet

Surveys and Investigations

Survey methods used by gear type, date, and effort.

Gear	Date	Effort
spring EF-SMB	May 15, 2018	3600 seconds

Common Fish Species Present

Yellow Perch

Walleye

Smallmouth Bass

Terminology

Catch per unit effort (**CPUE**) refers to the relative abundance of a species. It is defined as the number of fish captured per unit of effort (i.e., number of fish captured per net-night or number of fish captured per hour electrofishing). In this report CPUE is typically given for only stock-length fish (see length categories table for stock lengths).

A statewide effort to help make netting efforts comparable to all waters sampled across the state, occurred in 2017, with a switch to American Fisheries Society gill nets. Past gill netting efforts were completed with different style/types of nets and are not comparable side by side.

- **AFS std gill net** – 80 ft experimental gill net containing eight panels (10 ft each) of varying monofilament meshes of 0.75, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25 and 2.50 inches.
- **std experimental gill net for non-Missouri River waters** - 150 ft experimental gill net containing six panels (25 ft each) of varying monofilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.
- s**td experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

$$CPUE = \frac{number\ of\ fish}{effort}$$

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

$$PSD = \left(\frac{number\ of\ fish \geq quality\ length}{number\ of\ fish \geq stock\ length}\right) \text{x } 100$$

$$PSD - P = \left(\frac{number\ of\ fish\ \geq preferred\ length}{number\ of\ fish \geq stock\ length}\right) \text{x } 100$$

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (W) compared to a length-specific standard weight (Ws) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

$$Wr = \left(\frac{W}{Ws}\right) \text{x } 100$$

Confidence intervals (**CI**) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (**S**), quality (**Q**), preferred (**P**), memorable (**M**) and trophy (**T**). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Bigmouth Buffalo	11	28	18	46	24	61	30	76	37	94
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Common Carp	11	28	16	41	21	53	26	66	33	84
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Gizzard Shad	7	18	11	28						
Green Sunfish	3	8	6	15	8	20	10	25	12	30
Lake Herring	5	13	8	20	11	28	14	35	17	43
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rock Bass	4	10	7	18	9	23	11	28	13	33
Rudd	6	15	10	25	12	30	15	38	19	48
Saugeye	9	23	14	35	18	46	22	56	27	69
Shorthead Redhorse	6	15	10	25	13	33	16	41	20	51
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
Walleye	10	25	15	38	20	51	25	63	30	76
White Bass	6	15	9	23	12	30	15	38	18	46
White Crappie	5	13	8	20	10	25	12	30	15	38
White Sucker	6	15	10	25	13	33	16	41	20	51
Yellow Bullhead	4	10	7	18	9	23	11	28	14	36
Yellow Perch	5	13	8	20	10	25	12	30	15	38

Catch Summary of Stock Length Fish

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

		Abundance		Stock Density Indices				Condition	
Gear	Species	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
spring EF-SMB	Smallmouth Bass	19.0	3.6	100		95		122	5

10-Year Catch Per Unit Effort by Gear and Species

Catch per unit effort (CPUE) and average (Avg) of species across 10 years using different gear types.

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std gill net	Northern Pike									0.1		0.1
	Smallmouth Bass									3.6		3.6
	Walleye									3.9		3.9
	Yellow Perch									19.2		19.2
boat shocker (night, DC)	Smallmouth Bass	45.3		23.9		49.9						39.7
frame net (std 3/4 in)	Black Bullhead			0.0			0.1	0.0				0.0
	Black Crappie			0.0			0.0	0.0				0.0
	Bluegill			1.4			17.9	3.6				7.6
	Green Sunfish			0.0			0.4	0.0				0.1
	Northern Pike			0.6			1.6	0.4				0.9
	Smallmouth Bass			0.8			2.5	1.8				1.7
	Walleye			0.8			1.4	0.3				0.8
	Yellow Perch			0.4			5.2	0.2				1.9
spring EF-SMB	Smallmouth Bass							12.0			19.0	15.5
std exp gill net	Bluegill			0.0			0.0	0.3				0.1
	Northern Pike			2.0			1.3	1.2				1.5
	Smallmouth Bass			0.0			0.3	0.0				0.1
	Walleye			8.3			3.5	4.0				5.3
	Yellow Perch			18.2			8.2	29.7				18.7

10-Year Size Structure and Condition Statistics by Gear and Species

Species proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) collected by different gear types across 10 years.

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
spring EF-SMB	Smallmouth Bass	PSD							100			100
		PSD-P							100			95
		Wr							120			122

Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Smallmouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	10		233 (1)		368 (3)		445 (1)	444 (3)	455 (1)		485 (1)
2013	58		253 (1)	337 (5)	376 (7)	386 (8)	435 (6)	441 (8)	454 (5)	467 (9)	473 (10)
2011	24		237 (7)		369 (4)		437 (5)	441 (5)	453 (1)	453 (1)	
2009	48		206 (4)	319 (2)	358 (16)	410 (8)	437 (7)	448 (6)	454 (2)	463 (4)	

Fish Condition

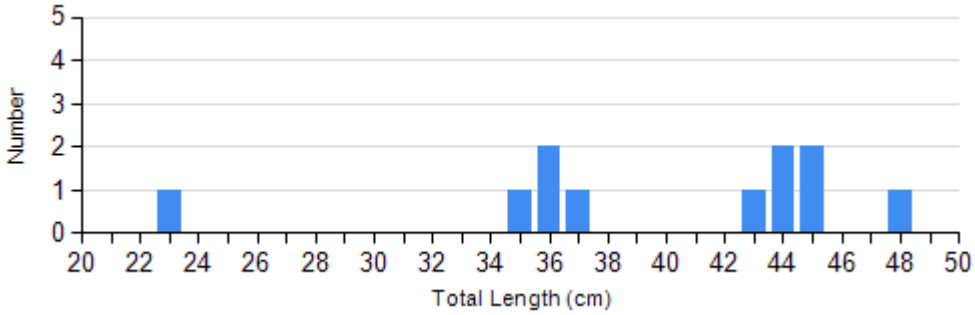
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Smallmouth Bass Electro Fishing	2015	1	104	0		4	128 (4.8)	6	118 (2.7)
	2018	0		1	101	8	126 (6.8)	10	121 (5.0)

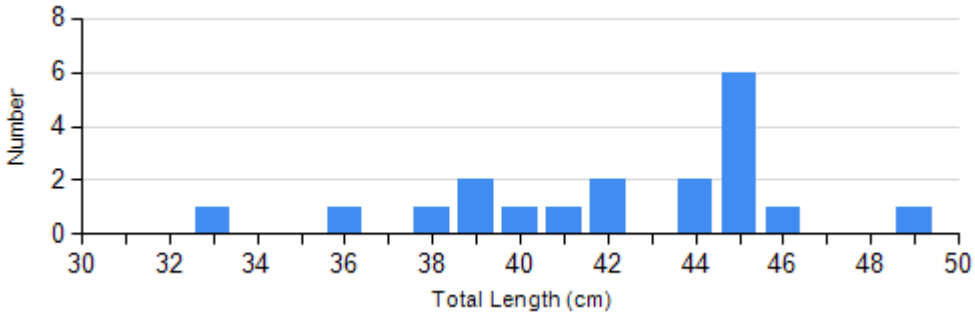
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Smallmouth Bass
Gear: Spring EF-SMB



2015

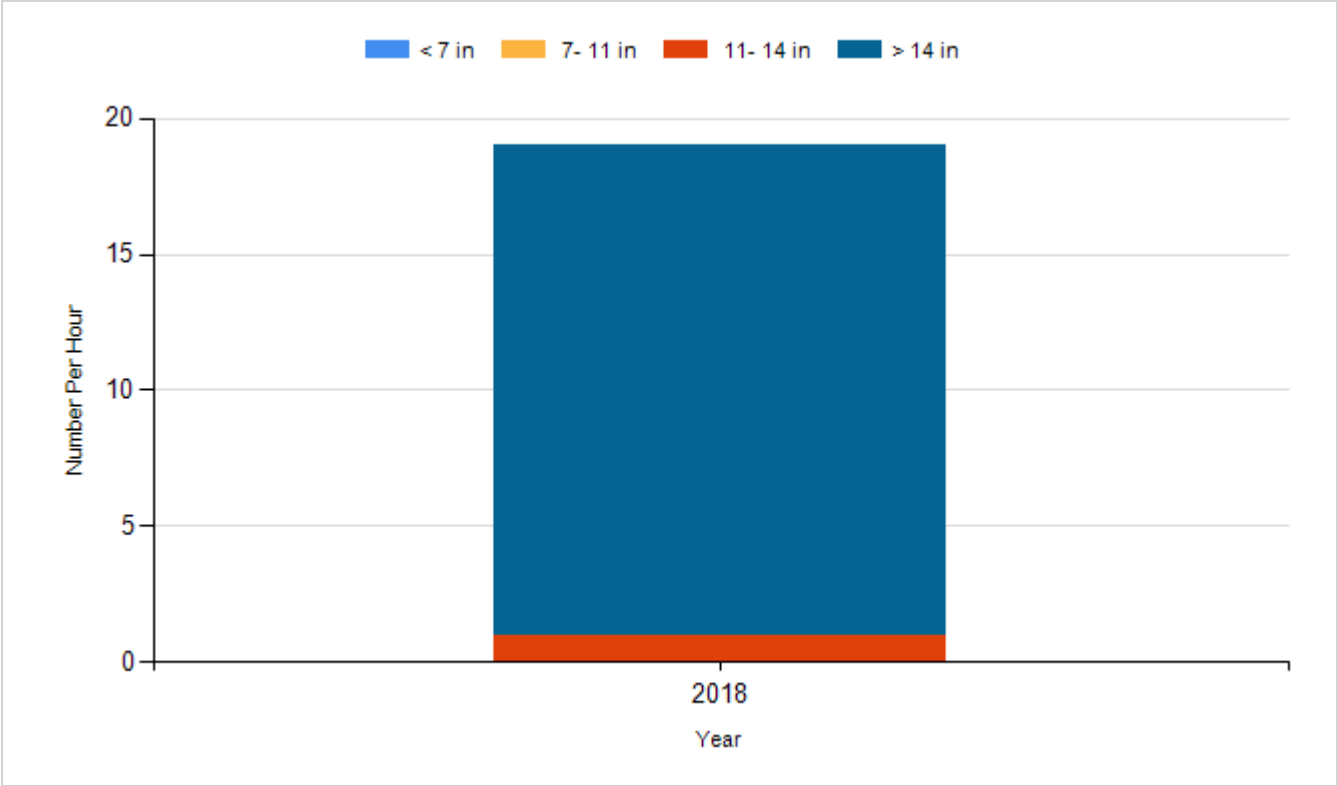


2018

Historic Fish Sizes and Relative Abundance

Size distribution per net by color for species sampled by year.

Species: Smallmouth Bass
Gear: spring night EF-SMB



Fish Stocking

Number of fish stocked by year, species, and size.

Year	Species	Size	Number
2008	Walleye	Small Fingerling	55,480
2010	Walleye	Fry	600,000
2012	Walleye	Small Fingerling	60,510
2014	Walleye	Fry	300,000
2016	Walleye	Fry	300,000
2018	Walleye	Fry	300,000