Smith Dam Survey Summary

Smith Dam is located in Stanley County approximately 6 miles south and 3 miles east of Fort Pierre, South Dakota. This 8.4 acre impoundment averages about 7 feet in depth with a maximum of 14 feet. The entire impoundment is surrounded by land owned by U.S. Department of Agriculture under the Fort Pierre National Grasslands. Majority of the shoreline is surrounded by cattails making shore fishing difficult except from the dam grade. Access is available to launch a small boat from the shore or carry-in and ice fishing access is good. Submergent vegetation was established to a depth of about 4 feet throughout the pond. In 2018, several Mossback Artificial fish habitat structures were installed in Smith Dam. These structures will help attract and increase fish habitat within the pond for many years. These structures were placed in the shallow and deeper water of the pond.

A few water quality parameters were tested at the time of survey on Smith Dam and dissolved oxygen was adequate above the thermocline which was established at approximately 6 feet. Below the thermocline there was no dissolved oxygen which is normal for small impoundments similar to Smith Dam throughout the summer. Water clarity was about 21 inches.

Smith Dam has a population of Bluegill, Yellow Perch, Largemouth Bass, Black and White Crappie, and Golden Shiner. During the survey completed in 2018, very few Largemouth Bass, Yellow Perch, White Crappie, and Golden Shiner were collected. A full survey of Largemouth Bass could not be completed due to access for larger boats such as the electrofishing boat to sample Largemouth Bass effectively.

The Bluegill population in Smith Dam has increase in numbers and sizes from previous surveys. They ranged from 3.5 to 9 inches and averaged 6.5 inches. The growth rate for Bluegill is slower growth than the statewide average. Fish at the age of 3 should be 5.5 inches but on Smith Dam they averaged 4 inches. This slowed growth may be due to an abundance of fish within the pond. The plumpness or condition of the Bluegill is good but lower when compared to other waters nearby. Some additional harvest of extra Bluegill may increase growth and condition of these fish.

Black Crappie in Smith Dam ranged from 4 to 10 inches with an average length of 7.5 inches. Condition of these fish was fair with growth of this Black Crappie population slower when compared to the statewide average.

Smith Dam is a popular fishery on the Fort Pierre National Grasslands, especially due to the close proximity of it to Pierre-Fort Pierre. This fishery can provide many hours of entertainment for the entire family fishing.

For more information, please contact South Dakota Game, Fish and Parks Ft. Pierre office – (605) 223-7700.

Prepared 01-29-2019 by KDP

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Smith Dam, Stanley County
FTR-Lake-3716-000
2018

Lake Information

Name: Smith Dam

County: Stanley

Surface Area: 8 Acres

Surveys and Investigations

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

Gear	Date	Effort
frame net (std 3/4 in)	Jun 26, 2018	4 net-nights
frame net (std 3/4 in)	Jun 27, 2018	4 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Yellow Perch

Golden Shiner

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)
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
Brown Trout	6	15	9	23	12	30	15	38	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
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
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
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
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).

*** Methods/Species that ignore stock length**

		Abundance		Stock Density Indices				Condition	
Gear	Species	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
frame net (std 3/4 in)	Black Crappie	17.5	5.7	53	6	9	4	95	1
	Bluegill	65.3	26.5	91	2	9	2	95	1
	Golden Shiner	0.0	0.0						
	Yellow Perch	0.4	0.4	100		33		93	2

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
frame net (std 3/4 in)	Black Crappie	11.9			11.8			2.1			17.5	10.8
	Bluegill	12.5			12.5			12.6			65.3	25.7
	Golden Shiner										0.0	0.0
	Largemouth Bass	0.1						0.1				0.1
	White Crappie				0.6			0.1				0.4
	Yellow Perch							0.1			0.4	0.3

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
frame net (std 3/4 in)	Black Crappie	PSD	33			96			71			53
		PSD-P	1			2			12			9
		Wr	89			88			96			95
	Bluegill	PSD	33			92			79			91
		PSD-P	1			3			62			9
		Wr	89			93			97			95
	Largemouth Bass	PSD	0						100			
		PSD-P	0						0			
		Wr	92						103			
	White Crappie	PSD				100			100			
		PSD-P				60			100			
		Wr				78			82			
	Yellow Perch	PSD							0			100
		PSD-P							0			33
		Wr							121			93

Back-Calculated Lengths

Mean species back-calculated total length (mm) at age, standard error (SE), and sample size (N).

Species: Bluegill

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2015	3	5	37 (5.1)	62 (5.8)	104 (7.1)							
2014	4	13	40 (1.4)	69 (2.8)	104 (4.7)	140 (5.7)						
2013	5	13	41 (1.5)	77 (4)	115 (5.9)	150 (5.7)	174 (4.7)					
2012	6	7	38 (1.7)	69 (3.6)	100 (3.8)	126 (4.6)	151 (5.2)	172 (6.7)				
2011	7	1	33	60	98	127	139	149	160			
2010	8	3	36 (2.6)	71 (6.7)	100 (8.9)	124 (7.6)	149 (7.1)	180 (11.5)	196 (6.4)	212 (4.9)		
Weighted Mean		42	39	71	106	139	163	172	187	212		

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2015	3	5										
2014	4	13										
2013	5	13										
2012	6	7										
2011	7	1										
2010	8	3										
Weighted Mean		42										

Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2014	4	2	93 (1.6)	138 (8.2)	184 (5.8)	210 (2.6)						
2013	5	1	94	139	198	226	248					
Weighted Mean		3	93	138	189	215	248					

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2014	4	2										
2013	5	1										
Weighted Mean		3										

Length at Capture

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

Species: Black Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	30		122 (18)			216 (1)	227 (5)	247 (4)	250 (2)		
2012	99		132 (9)		156 (1)	205 (15)	215 (35)	220 (18)	228 (20)	242 (1)	
2009	100		129 (9)	155 (11)	191 (49)	203 (27)	239 (2)	268 (2)			

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	504			121 (19)	171 (129)	186 (186)	187 (144)	175 (12)	220 (18)		
2015	101		110 (21)		163 (3)	182 (3)	192 (3)	198 (7)	204 (19)	208 (30)	216 (16)
2012	100		113 (1)	133 (1)		154 (18)	157 (18)	172 (19)	181 (16)	177 (23)	164 (5)
2009	100			104 (10)	135 (45)	149 (36)	181 (6)	183 (2)	237 (1)		

Species: White Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	1							308 (1)			

Fish Condition

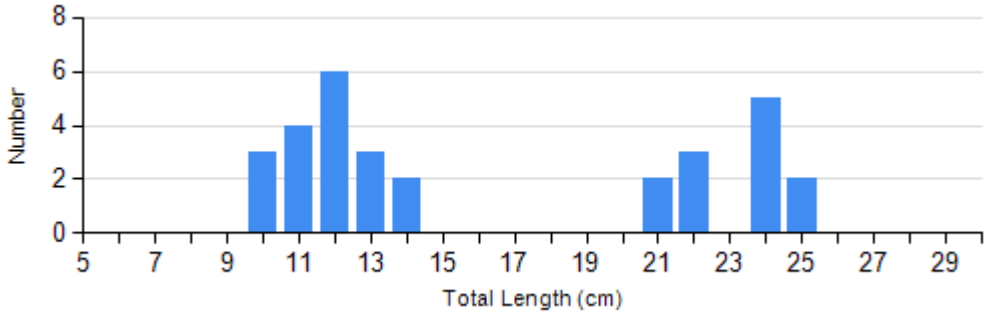
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2015	5	110 (3.4)	10	92 (2.4)	2	79 (4.3)	0	
	2018	66	101 (1.1)	62	90 (0.7)	12	84 (1.0)	0	
Bluegill Frame Net	2015	21	109 (4.4)	17	96 (2.4)	63	94 (0.8)	0	
	2018	47	109 (2.4)	427	95 (0.9)	48	85 (1.5)	0	
White Crappie Frame Net	2015	0		0		0		1	82

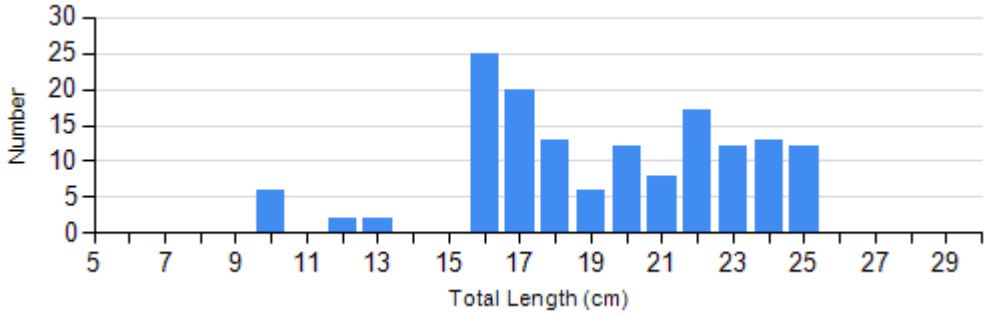
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: frame net (std 3/4 in)

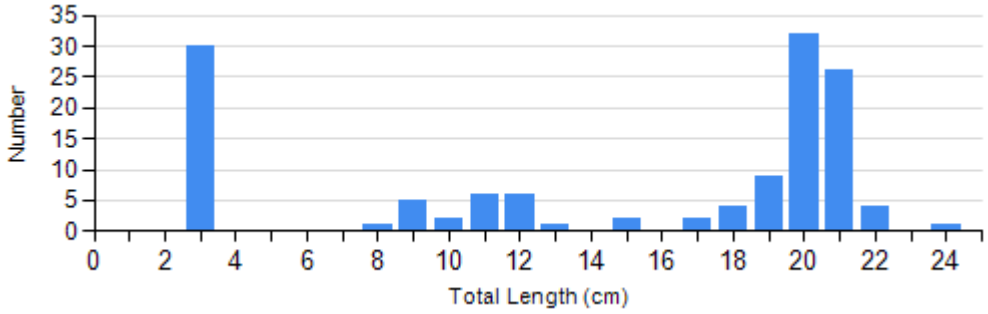


2015

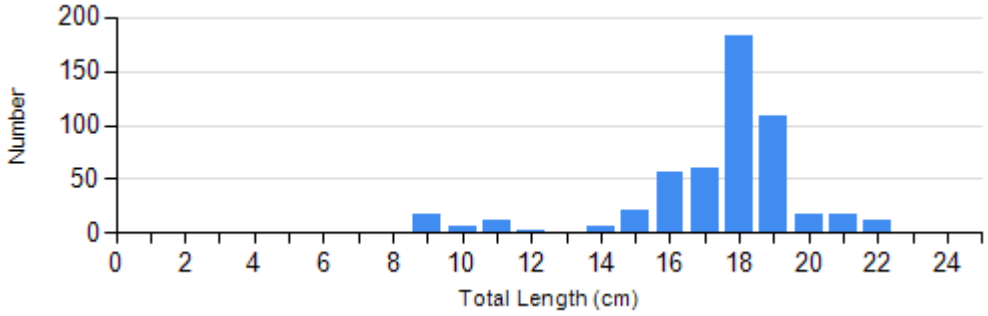


2018

Species: Bluegill
Gear: frame net (std 3/4 in)



2015

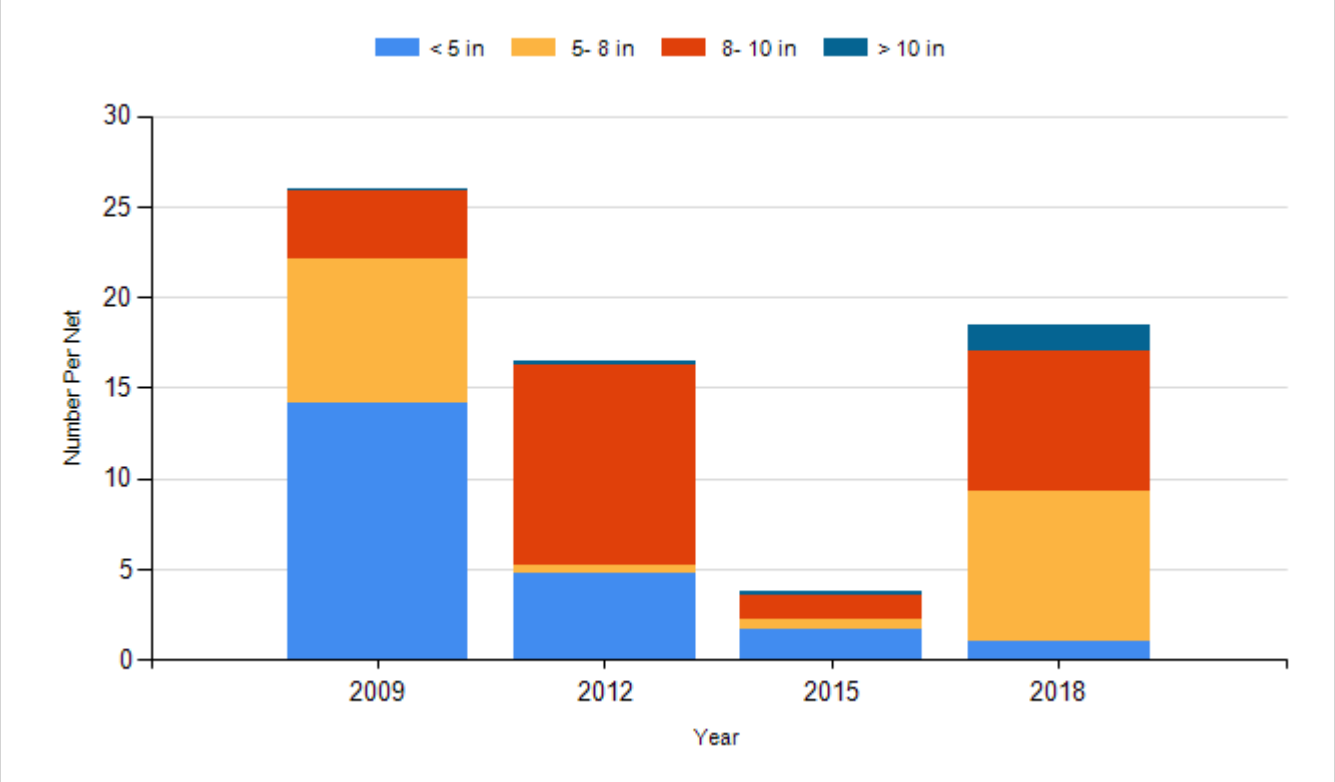


2018

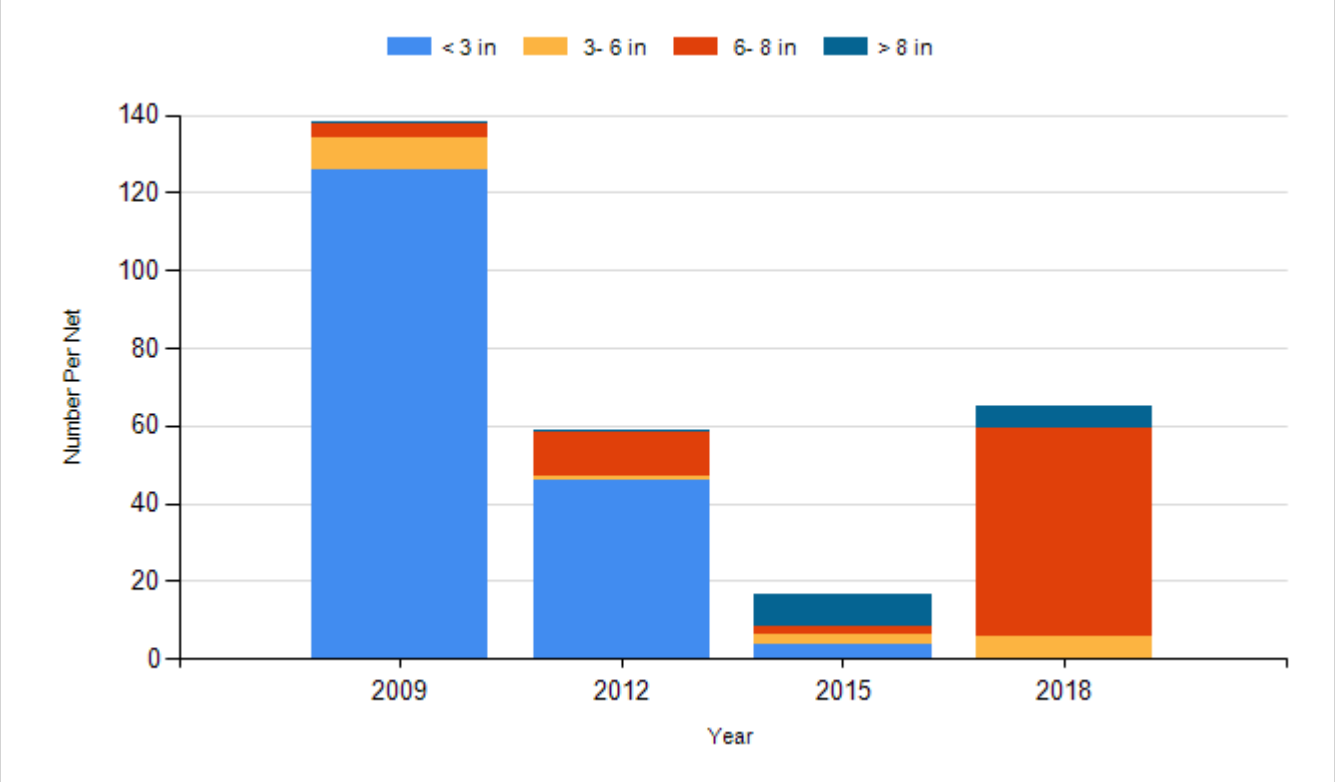
Historic Fish Sizes and Relative Abundance

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

Species: Black Crappie
Gear: frame net (std 3/4 in)



Species: Bluegill
Gear: frame net (std 3/4 in)



Species: White Crappie
Gear: frame net (std 3/4 in)