SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Smith Dam, Stanley County
FTR-Lake-3716-000
2015

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)	June 09, 2015	4 net-nights
frame net (std 3/4 in)	June 10, 2015	4 net-nights

<u>Common Fish Species Present</u>

Largemouth Bass

Bluegill

Black Crappie

Yellow Perch

White Crappie

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).

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

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.

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

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

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.

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

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

Species Name	Stock (in)	Stock (cm)	Quality (in)	Quality (cm)	Preferred (in)	Preferred (cm)	Memorable (in)	Memorable (cm)	Trophy (in)	Trophy (cm)
Blue Catfish	12	30	20	51	30	76	35	89	45	114
Bluegill	3	8	6	15	8	20	10	25	12	30
Bluegill X Gr. Sunfish Hybrid	3	8	6	15	8	20	10	25	12	30
Brown Bullhead	5	13	8	20	11	28	14	36	17	43
Burbot	8	20	15	38	21	53	26	67	32	82
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Common Carp	11	28	16	41	21	53	26	66	33	84
Flathead Catfish	14	35	20	51	28	71	34	86	40	102
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
Longnose Gar	16	41	27	69	36	91	45	114	55	140
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Paddlefish	16	41	26	66	33	84	41	104	51	130
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Redear Sunfish	4	10	7	18	9	23	11	28	13	33
River Carpsucker	7	18	11	28	14	36	18	46	22	56
Rock Bass	4	10	7	18	9	23	11	28	13	33
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
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
Smallmouth Buffalo	11	28	18	46	24	61	30	76	37	94
Spotted Bass	7	18	11	28	14	35	17	43	20	51
Striped Bass	12	30	20	51	30	76	35	89	45	114
Striped Bass Hybrid (wiper)	8	20	12	30	15	38	20	51	25	63
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 Perch	5	13	8	20	10	25	12	30	15	38
White Sucker	6	15	10	25	13	33	16	41	20	51
Yellow Bass	4	10	7	18	9	23	11	28	13	33
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
frame net (std 3/4 in)	Black Crappie	2.1	0.8	71		12		96	4
	Bluegill	12.6	9.7	79	6	62	7	97	2
	Largemouth Bass	0.1	0.2	100		0		103	
	White Crappie	0.1	0.2	100		100		82	
	Yellow Perch	0.1	0.2	0		0		121	

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.

| Gear | Species | CPUE | | | | | | | | | | |
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Avg
frame net (std 3/4 in)	Black Crappie	8.4			11.9			11.8			2.1	8.6
	Bluegill	12.5			12.5			12.5			12.6	12.5
	Golden Shiner	0.0										0.0
	Largemouth Bass	0.1			0.1						0.1	0.1
	White Crappie	1.9						0.6			0.1	0.9
	Yellow Perch	0.6									0.1	0.4

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.

Gear	Species	Index	Year 2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
frame net (std 3/4 in)	Black Crappie	PSD	12			33			96			71
		PSD-P	7			1			2			12
		Wr	97			89			88			96
	Yellow Perch	PSD	40									0
		PSD-P	20									0
		Wr	87									121

Back-Calculated Lengths

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

Species: Black Crappie

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2013	2	16	58 (.8)	108 (3.1)								
2010	5	1	65	88	111	177	202					
2009	6	5	69 (2)	114 (5)	154 (4.3)	191 (1.9)	212 (2.5)	224 (4.3)				
2008	7	4	65 (4.8)	97 (10.1)	141 (11.8)	174 (6.3)	206 (1.8)	231 (2.6)	247 (2.6)			
2007	8	2	59 (6.1)	93 (10.2)	140 (11.1)	166 (4.6)	187 (.9)	211 (2.7)	229 (2.4)	248 (2.1)		
Weighted Mean		28	61	106	144	180	205	224	241	248		

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2013	2	16										
2010	5	1										
2009	6	5										
2008	7	4										
2007	8	2										
Weighted Mean		28										

Length at Capture

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

Species: Black Crappie

| Year | N | Mean Length (expanded sample number) at capture by age | | | | | | | | | |
		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)			
2006	100	105 (1)	125 (53)	189 (40)		243 (1)	264 (3)		260 (1)	274 (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).

| Species | Year | Length Groups | | | | | | | |
| | | S-Q | | Q-P | | P-M | | M | |
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2012	4	101 (1.4)	88	87 (0.5)	2	82 (2.3)	0	
	2015	5	110 (3.4)	10	92 (2.4)	2	79 (4.3)	0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

2012

2015
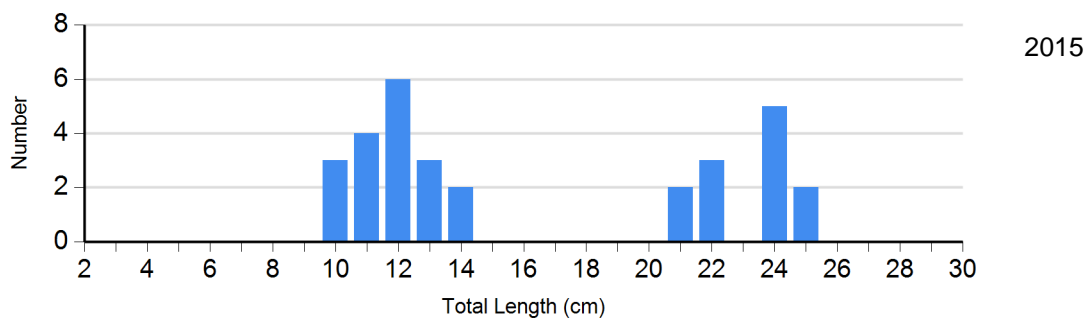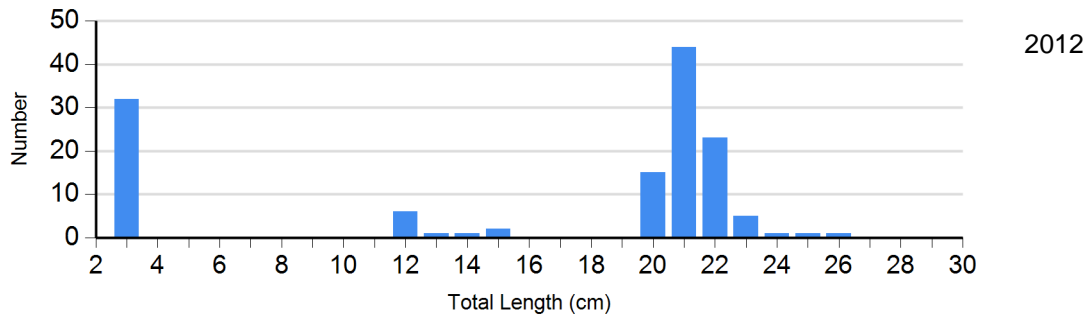
Historic Fish Sizes and Relative Abundance

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

Species: Black Crappie
Gear: Frame Net