SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Waggoner, Haakon County
BAD-Lake-2426-000
2016

Lake Information

Name: Waggoner

County: Haakon

Surface Area: 95 Acres

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	September 08, 2016	7200 seconds

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Bluegill

Black 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.

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

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

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

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(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
boat shocker (night)	Largemouth Bass	29.0	7.7	48	10	28	9	110	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	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Avg
boat shocker (night)	Largemouth Bass	86.6	38.0		71.4				73.0	45.0	29.0	57.2
	Smallmouth Bass	1.5										1.5
	Walleye								2.0			2.0
boat shocker (night, AC	Largemouth Bass					130.0						130.0
frame net (1/2 inch)	Black Bullhead				0.9							0.9
	Black Crappie				21.0							21.0
	Bluegill				16.9							16.9
	Golden Shiner				0.0							0.0
	Northern Pike				0.9							0.9
	White Sucker				0.4							0.4
	Yellow Perch				7.1							7.1
frame net (std 3/4 in)	Black Bullhead						0.6			1.1		0.9
	Black Crappie						74.3			42.1		58.2
	Bluegill						56.1			72.4		64.3
	Golden Shiner						0.0			0.0		0.0
	Largemouth Bass						0.9					0.9
	Northern Pike						5.0			2.4		3.7
	White Sucker						0.4			0.4		0.4
	Yellow Perch						1.5			0.6		1.1
std exp gill net	Black Bullhead				9.0							9.0
	Black Crappie				28.0							28.0
	Bluegill				6.0							6.0
	Golden Shiner				0.0							0.0
	Largemouth Bass				1.0							1.0
	Northern Pike				2.0							2.0
	Yellow Perch				22.0							22.0
std exp gill net (150 ft)	Black Bullhead						4.5			1.0		2.8
	Black Crappie						4.0			7.0		5.5
	Bluegill						1.5			3.0		2.3
	Golden Shiner						0.0			0.0		0.0
	Largemouth Bass									0.5		0.5
	Northern Pike						7.0			2.0		4.5
	White Sucker						1.0			0.5		0.8

		CPUE										
Gear	Species	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Avg
std exp gill net (150 ft)	Yellow Perch						5.5					5.5

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	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
boat shocker (night)	Walleye	PSD								100		
		PSD-P								50		
		Wr								100		
frame net (1/2 inch)	Black Crappie	PSD				2						
		PSD-P				0						
		Wr				98						
	Northern Pike	PSD				67						
		PSD-P				0						
		Wr				86						
	Yellow Perch	PSD				82						
		PSD-P				22						
		Wr				93						
frame net (std 3/4 in)	Black Crappie	PSD						51			93	
		PSD-P						0			0	
		Wr						103			95	
	Northern Pike	PSD						55			79	
		PSD-P						30			16	
		Wr						77			94	
	Yellow Perch	PSD						75			100	
		PSD-P						25			100	
		Wr						97			101	
std exp gill net	Black Crappie	PSD				0						
		PSD-P				0						
		Wr				106						
	Northern Pike	PSD				100						
		PSD-P				0						
		Wr				85						
	Yellow Perch	PSD				73						
		PSD-P				0						
		Wr				92						

			Year									
Gear	Species	Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
std exp gill net (150 ft)	Black Crappie	PSD						13			29	
		PSD-P						0			0	
		Wr						104			109	
	Northern Pike	PSD						79			50	
		PSD-P						7			0	
		Wr						87			92	
	Yellow Perch	PSD						64				
		PSD-P						27				
		Wr						95				

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	676	101 (2)	164 (36)	197 (12)	221 (160)	220 (107)	230 (294)	226 (66)			
2010	294		151 (190)	177 (102)		225 (2)					

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2010	46	100 (2)	162 (6)	200 (10)	222 (10)	229 (14)	233 (4)				

Fish Condition

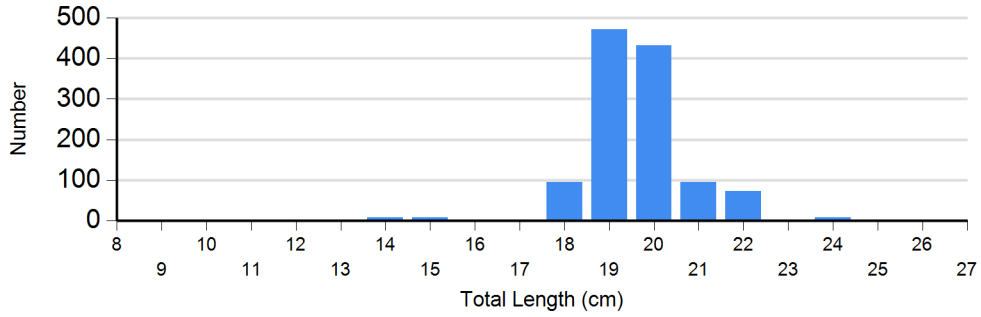
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2012	582	103 (0.5)	606	102 (0.7)	0		0	
	2015	48	102 (0.8)	624	94 (0.3)	2	99 (0.0)	0	
Northern Pike Gill Net	2012	6	80 (1.3)	20	86 (1.3)	2	110 (0.0)	0	
	2015	4	96 (0.7)	4	89 (2.4)	0		0	
Yellow Perch Gill Net	2012	8	101 (4.0)	8	87 (2.0)	6	98 (0.9)	0	

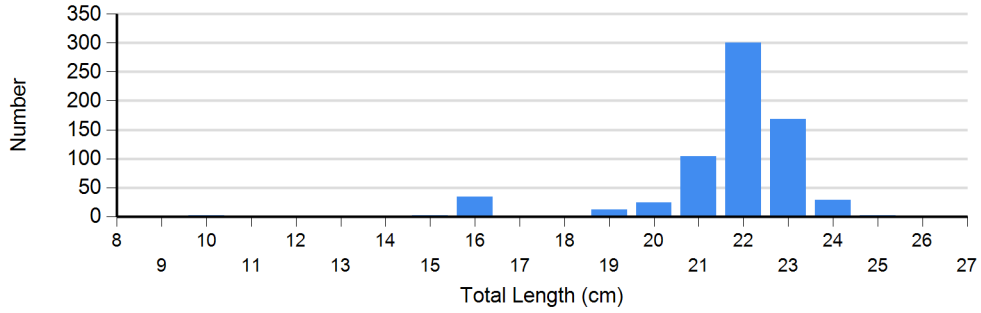
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

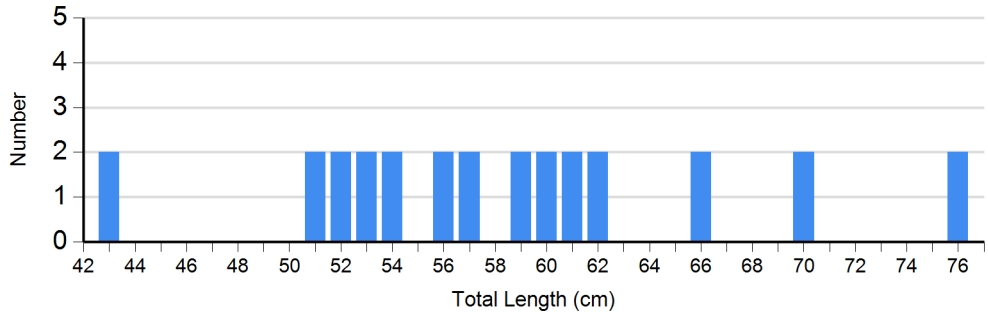


2012

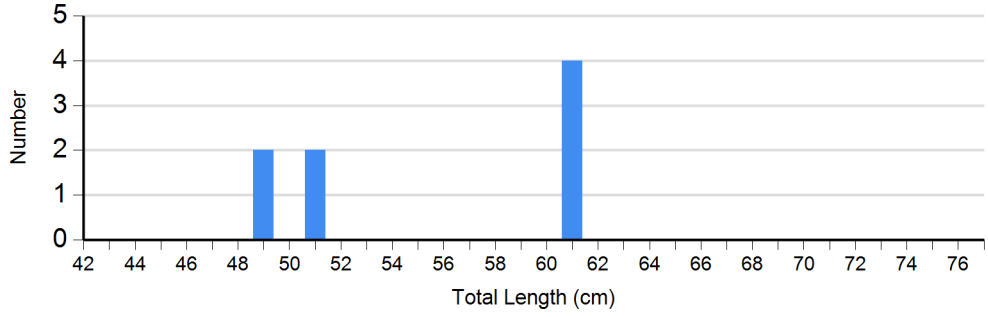


2015

Species: Northern Pike
Gear: std exp gill net (150 ft)

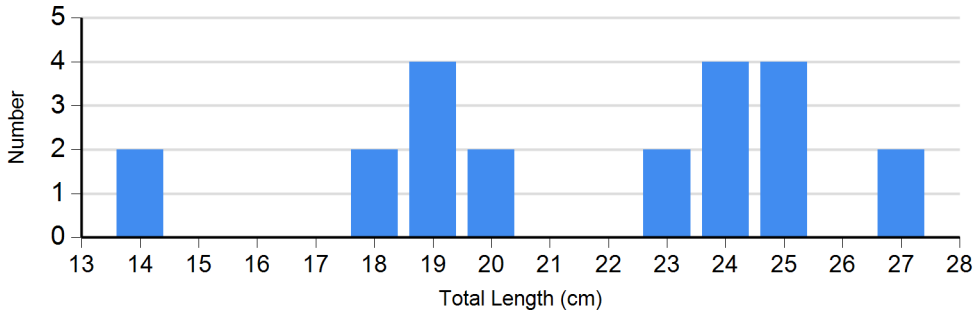


2012



2015

Species: Yellow Perch
Gear: std exp gill net (150 ft)

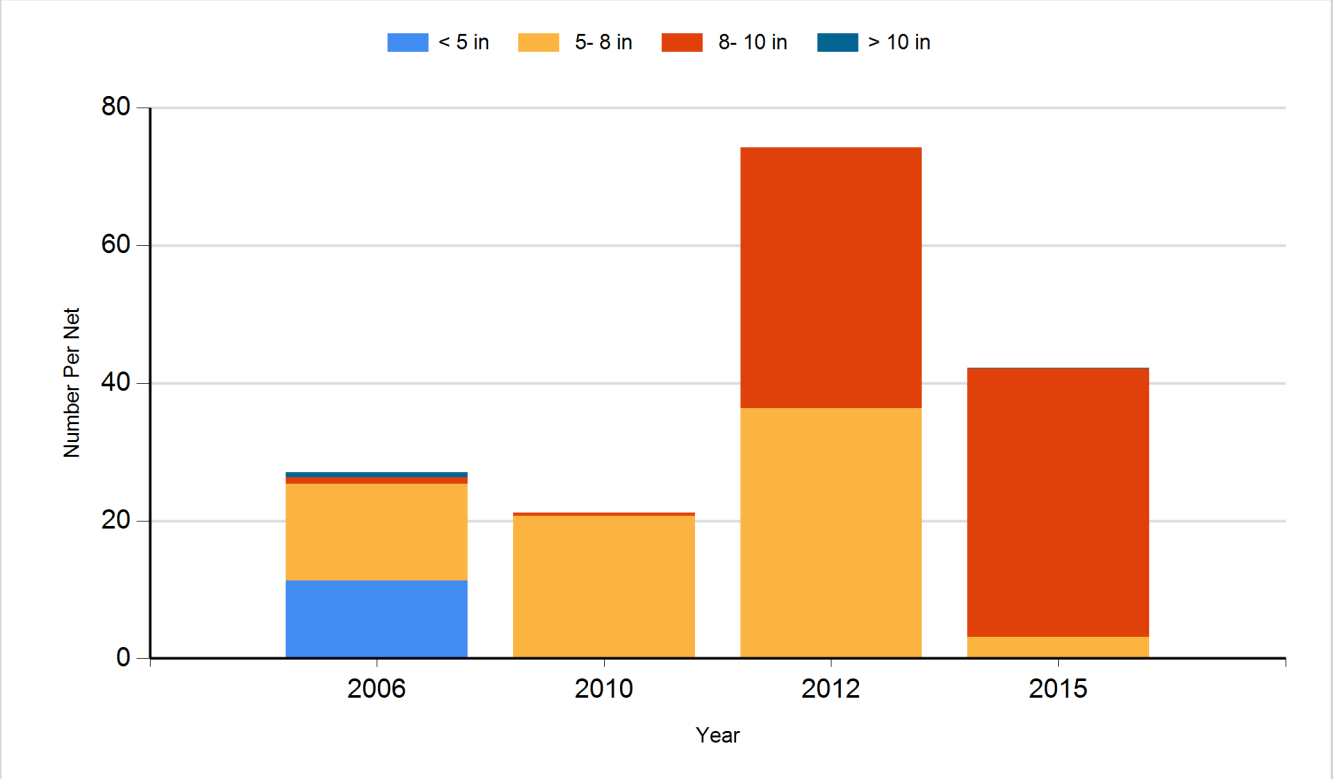


2012

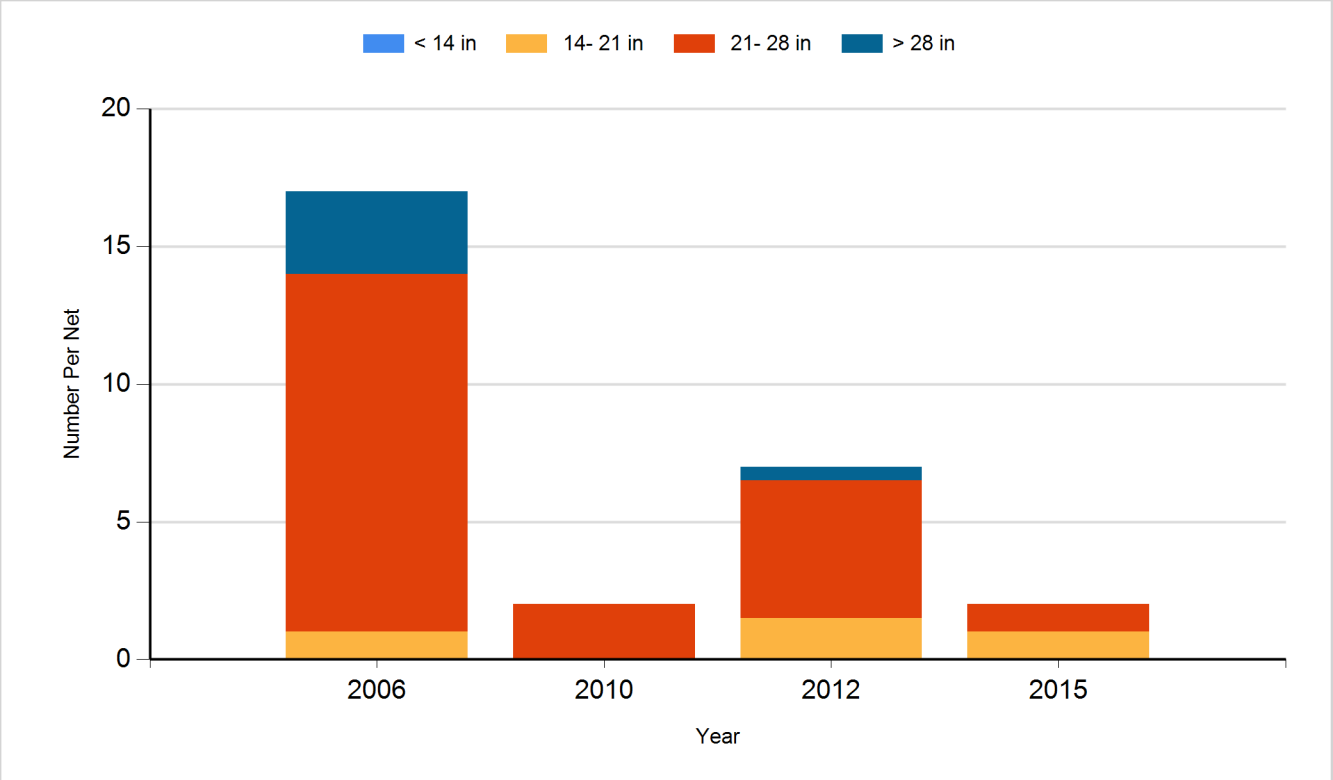
Historic Fish Sizes and Relative Abundance

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

Species: Black Crappie
Gear: Frame Net



Species: Northern Pike
Gear: Gill Net



Species: Yellow Perch
Gear: Gill Net