SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Little White River Project, Bennett County
LIW-Lake-8-000
2016

Lake Information

Name: Little White River Project

County: Bennett

Surface Area: 160 Acres

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (day)	September 24, 2016	3600 seconds
boat shocker (night)	September 24, 2016	3600 seconds
frame net (std 3/4 in)	July 06, 2016	14 net-nights
std exp gill net	July 06, 2016	4 net-nights

Common Fish Species Present

Northern Pike

Largemouth Bass

Channel Catfish

Black Crappie

Walleye

Black Bullhead

Shorthead Redhorse

Yellow Perch

Common Carp

Gizzard Shad

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 (day)	Largemouth Bass	35.0	17.3	60	13	34	12	113	2
	Walleye	1.0	1.5	0		0			
boat shocker (night)	Largemouth Bass	35.0	17.3	60	13	34	12	113	2
	Walleye	1.0	1.5	0		0			
frame net (std 3/4 in)	Black Bullhead	10.7	2.2	39	6	0		93	1
	Black Crappie	29.0	6.7	38	3	19	3	110	1
	Bluegill	0.1	0.1	100		0		93	0
	Channel Catfish	2.9	1.6	40	12	10		118	16
	Common Carp	0.9	0.4	100		17		89	0
	Gizzard Shad	0.1	0.1	0					
	Golden Shiner	0.0	0.0						
	Green Sunfish	0.3	0.2	50		0		99	0
	Largemouth Bass	0.4	0.3	0		0		117	1
	Northern Pike	1.9	0.6	69	14	0		94	2
	Shorthead Redhorse	3.6	0.9	96		24	9	87	0
	Walleye	0.7	0.5	80		60		91	2
	Yellow Perch	0.1	0.1	100		0		72	0
std exp gill net	Black Bullhead	11.5	0.5	30	10	0		88	2
	Black Crappie	1.5	0.5	100		33		104	2
	Channel Catfish	2.5	1.4	60		20		89	3
	Common Carp	2.0	0.9	25		0		90	2
	Gizzard Shad	1.0	0.9	0					
	Shorthead Redhorse	0.5	0.5	100		100		91	0
	Walleye	3.5	1.4	71		14		95	2
	Yellow Perch	3.5	0.5	57	22	0		90	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 (day)	Largemouth Bass									18.0	35.0	26.5
	Walleye								39.6		1.0	20.3
boat shocker (night)	Largemouth Bass										35.0	35.0
	Walleye										1.0	1.0
frame net (std 3/4 in)	Black Bullhead			11.8		23.3		9.1	16.8	6.9	10.7	13.1
	Black Crappie			2.3		9.8		14.9	11.0	24.0	29.0	15.2
	Bluegill									0.4	0.1	0.3
	Bullhead Catfish Family			0.0								0.0
	Channel Catfish			4.5		7.3		0.1	0.1	0.2	2.9	2.5
	Common Carp			2.3		1.2		0.1	0.4	0.2	0.9	0.9
	Gizzard Shad							0.1		0.3	0.1	0.2
	Golden Shiner							0.0		0.0	0.0	0.0
	Green Sunfish					0.5			0.4		0.3	0.4
	Largemouth Bass								0.3	0.2	0.4	0.3
	Northern Pike			5.3		1.3		2.9	1.3	1.3	1.9	2.3
	Shorthead Redhorse			0.5		0.2		0.1	0.9	1.3	3.6	1.1
	Walleye					0.3		0.1	0.3	0.2	0.7	0.3
	Yellow Perch					0.2		0.3	0.1	0.1	0.1	0.2
std exp gill net	Black Bullhead							13.0			11.5	12.3
	Black Crappie							1.0			1.5	1.3
	Channel Catfish							2.0			2.5	2.3
	Common Carp							1.0			2.0	1.5
	Gizzard Shad										1.0	1.0
	Northern Pike							0.5				0.5
	Shorthead Redhorse							0.5			0.5	0.5
	Walleye							2.0			3.5	2.8
	Yellow Perch							1.5			3.5	2.5
std exp gill net (150 ft)	Black Bullhead			2.0		1.0			11.5	111.5		31.5
	Black Crappie					1.0			2.5	4.0		2.5
	Channel Catfish			5.0		3.5			1.5	7.5		4.4
	Common Carp			5.0		1.0			2.5	4.5		3.3
	Gizzard Shad									2.0		2.0
	Golden Shiner			0.0						0.0		0.0

		CPUE										
Gear	Species	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Avg
std exp gill net (150 ft)	Northern Pike			4.5		2.5			1.5	0.5		2.3
	Shorthead Redhorse					0.5			2.5			1.5
	Walleye			3.0		3.0			5.0	6.0		4.3
	Yellow Perch			0.5					0.5	1.5		0.8

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 (day)	Walleye	PSD								70		0
		PSD-P								30		0
		Wr								87		
boat shocker (night)	Walleye	PSD										0
		PSD-P										0
frame net (std 3/4 in)	Black Crappie	PSD			33		7		53	59	66	38
		PSD-P			33		0		4	20	43	19
		Wr					111		104	93	96	110
	Northern Pike	PSD			48		63		85	80	67	69
		PSD-P			0		50		50	30	11	0
		Wr					79		91	89	90	94
	Walleye	PSD					100		100	100	100	80
		PSD-P					0		0	100	100	60
		Wr					85		89	92	96	91
	Yellow Perch	PSD					100		100	100	0	100
		PSD-P					0		0	0	0	0
		Wr					92		92	92	92	72
std exp gill net	Black Crappie	PSD							50			100
		PSD-P							0			33
		Wr							112			104
	Northern Pike	PSD							0			
		PSD-P							0			
		Wr							88			
	Walleye	PSD							75			71
		PSD-P							25			14
		Wr							91			95
	Yellow Perch	PSD							33			57
		PSD-P							0			0
		Wr							101			90
std exp gill net (150 ft)	Black Crappie	PSD					0			60	75	

			Year									
Gear	Species	Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
std exp gill net (150 ft)	Black Crappie	PSD-P					0			0	50	
		Wr					119			95	103	
	Northern Pike	PSD			44		100			67	100	
		PSD-P			0		40			33	100	
		Wr					85			88	91	
	Walleye	PSD			0		100			60	17	
		PSD-P			0		0			10	8	
		Wr					84			86	95	
	Yellow Perch	PSD			0					0	67	
		PSD-P			0					0	0	
		Wr								92	94	

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	782	115 (472)	173 (110)	221 (8)	242 (87)	276 (12)	278 (95)				
2014	254	115 (94)	141 (2)	196 (79)	214 (22)	251 (52)	313 (6)				

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2016	14		376 (8)	483 (4)	547 (2)						
2015	24		364 (20)	486 (2)				530 (2)			

Fish Condition

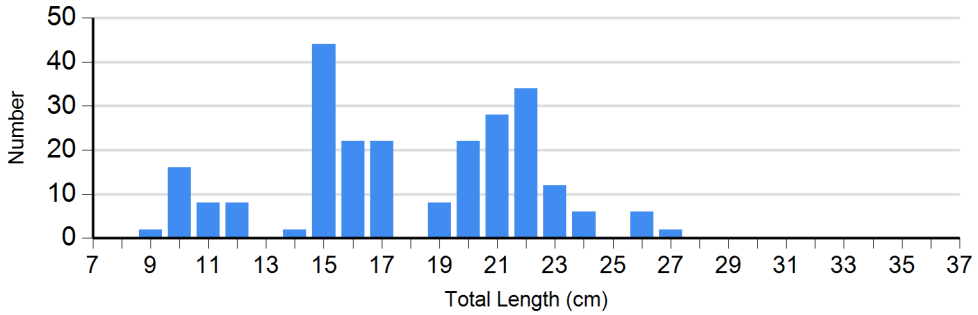
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2013	98	114 (0.9)	102	96 (0.6)	8	97 (1.9)	0	
	2014	72	101 (0.7)	68	88 (0.5)	26	85 (0.5)	10	88 (0.4)
	2015	120	105 (0.7)	80	96 (0.7)	138	93 (0.4)	10	94 (0.6)
	2016	252	122 (0.6)	78	102 (0.7)	60	97 (0.7)	16	103 (1.8)
Northern Pike Gill Net	2013	2	88 (0.0)	0		0		0	
	2014	2	83 (0.0)	2	80 (0.0)	2	100 (0.0)	0	
	2015	0		0		0		2	91 (0.0)
Walleye Gill Net	2013	2	79 (0.0)	4	96 (6.2)	2	94 (0.0)	0	
	2014	8	88 (2.9)	10	85 (1.3)	2	84 (0.0)	0	
	2015	20	95 (1.2)	2	102 (0.0)	2	92 (0.0)	0	
	2016	4	92 (0.3)	8	98 (2.6)	2	91 (0.0)	0	
Yellow Perch Gill Net	2013	4	110 (8.1)	2	84 (0.0)	0		0	
	2014	2	92 (0.0)	0		0		0	
	2015	2	99 (0.0)	4	91 (1.4)	0		0	
	2016	6	95 (0.6)	8	86 (1.5)	0		0	

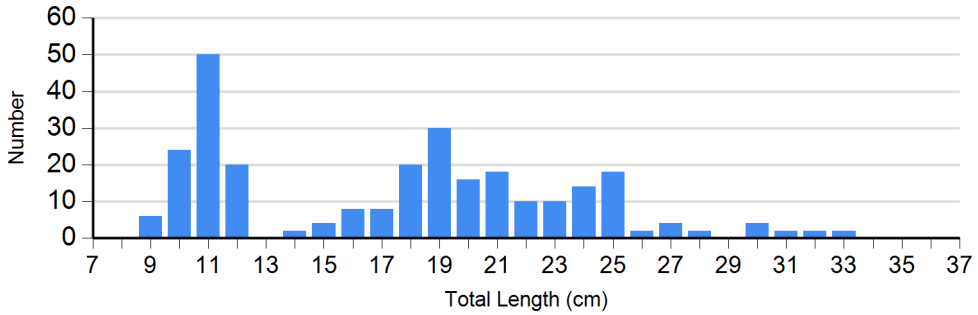
Length Frequency Distribution

Length frequency histogram of species sampled by year.

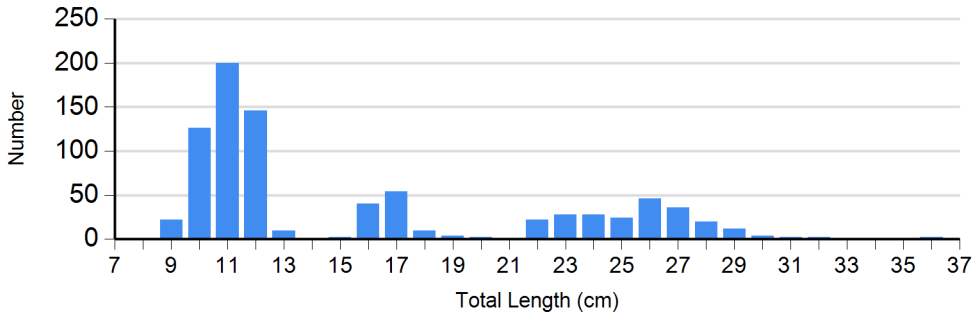
Species: Black Crappie
Gear: frame net (std 3/4 in)



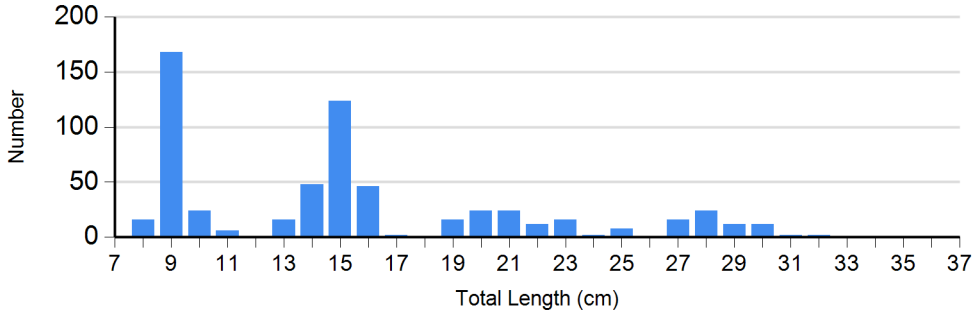
2013



2014

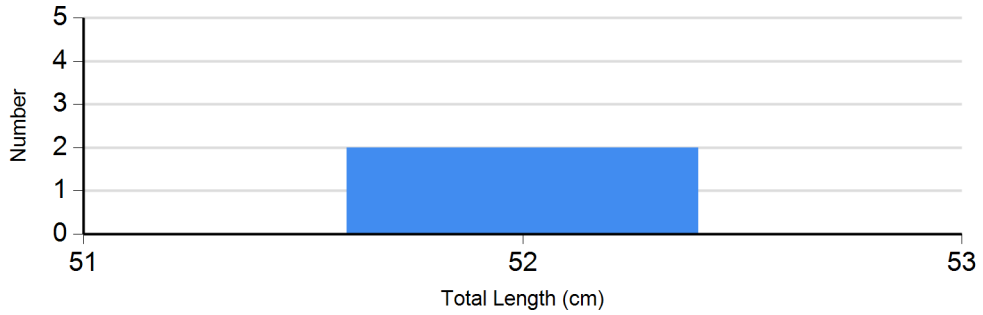


2015



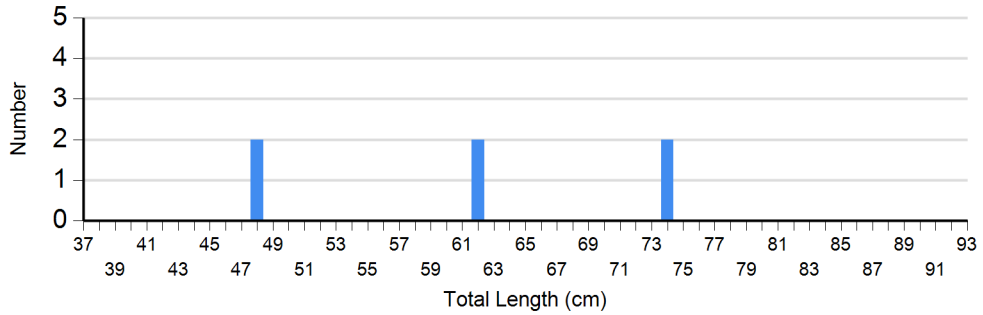
2016

Species: Northern Pike
Gear: std exp gill net

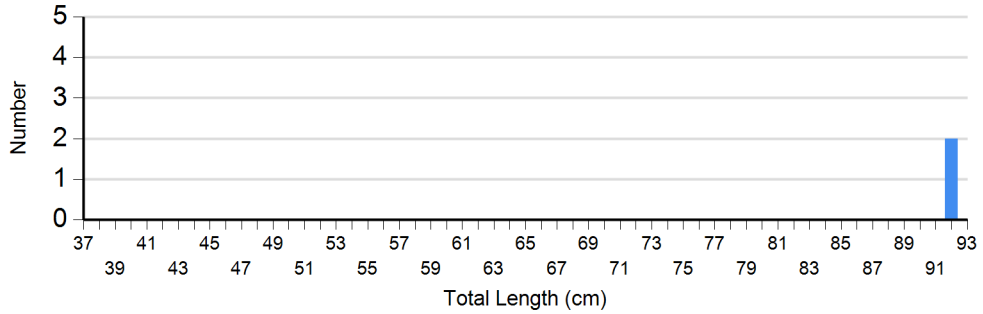


2013

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

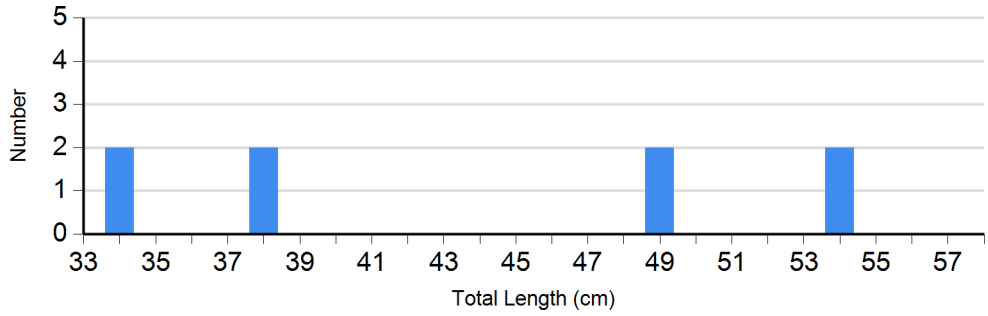


2014

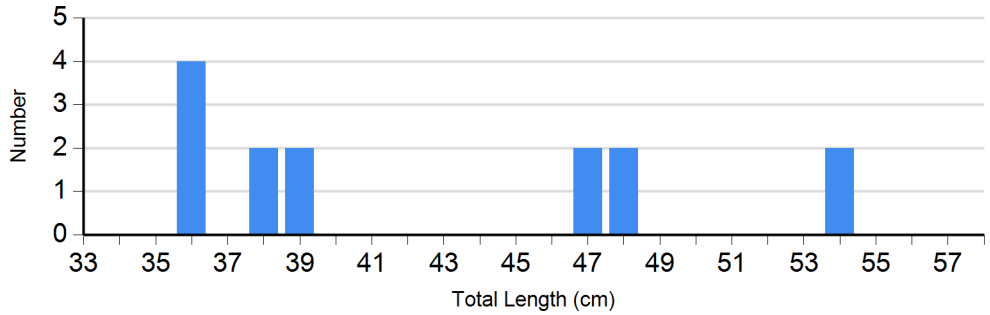


2015

Species: Walleye
Gear: std exp gill net

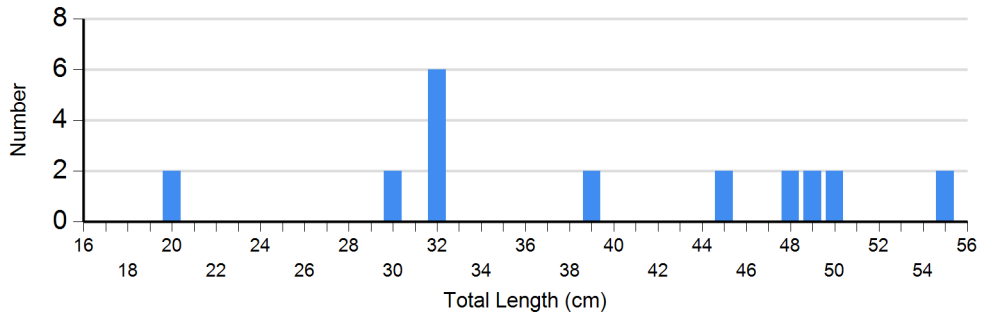


2013

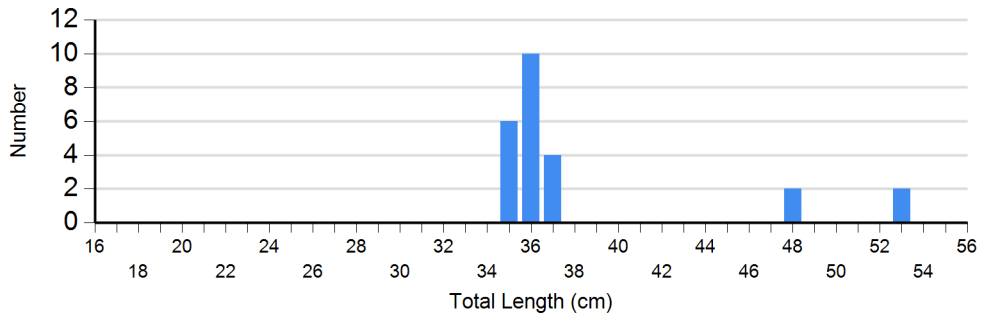


2016

Species: Walleye
Gear: std exp gill net (150 ft)

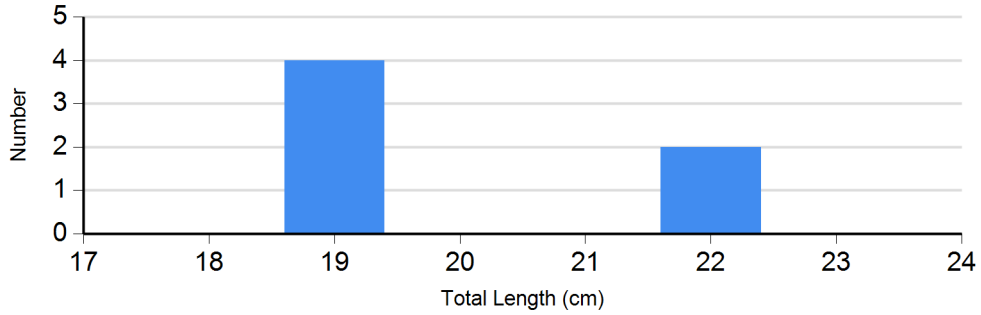


2014

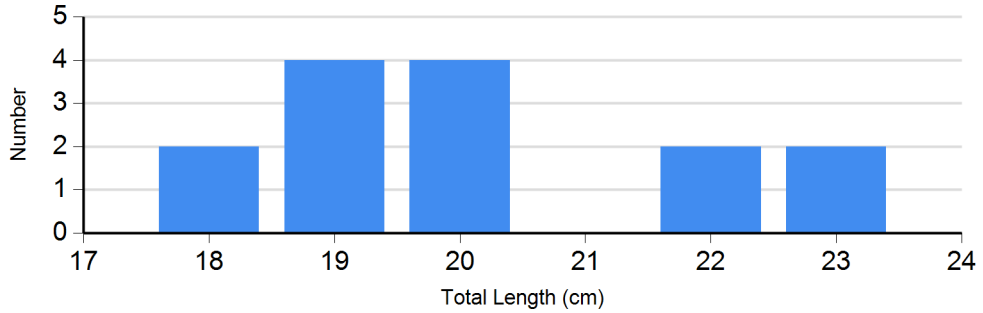


2015

Species: Yellow Perch
Gear: std exp gill net

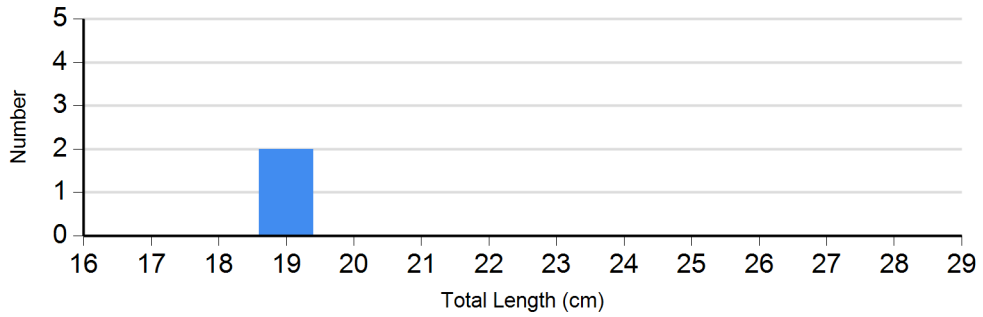


2013

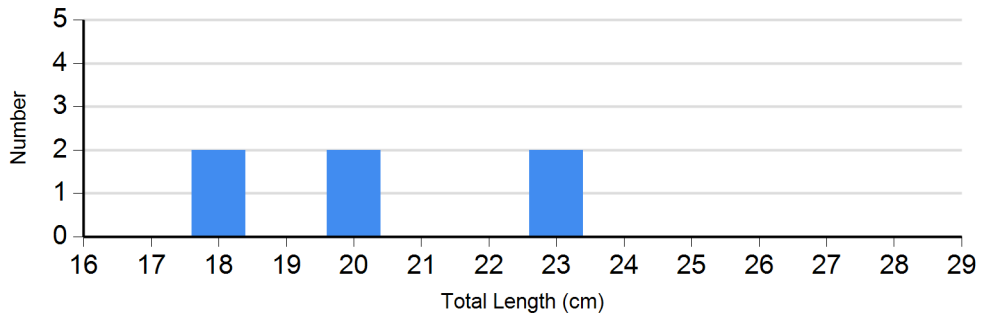


2016

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



2014

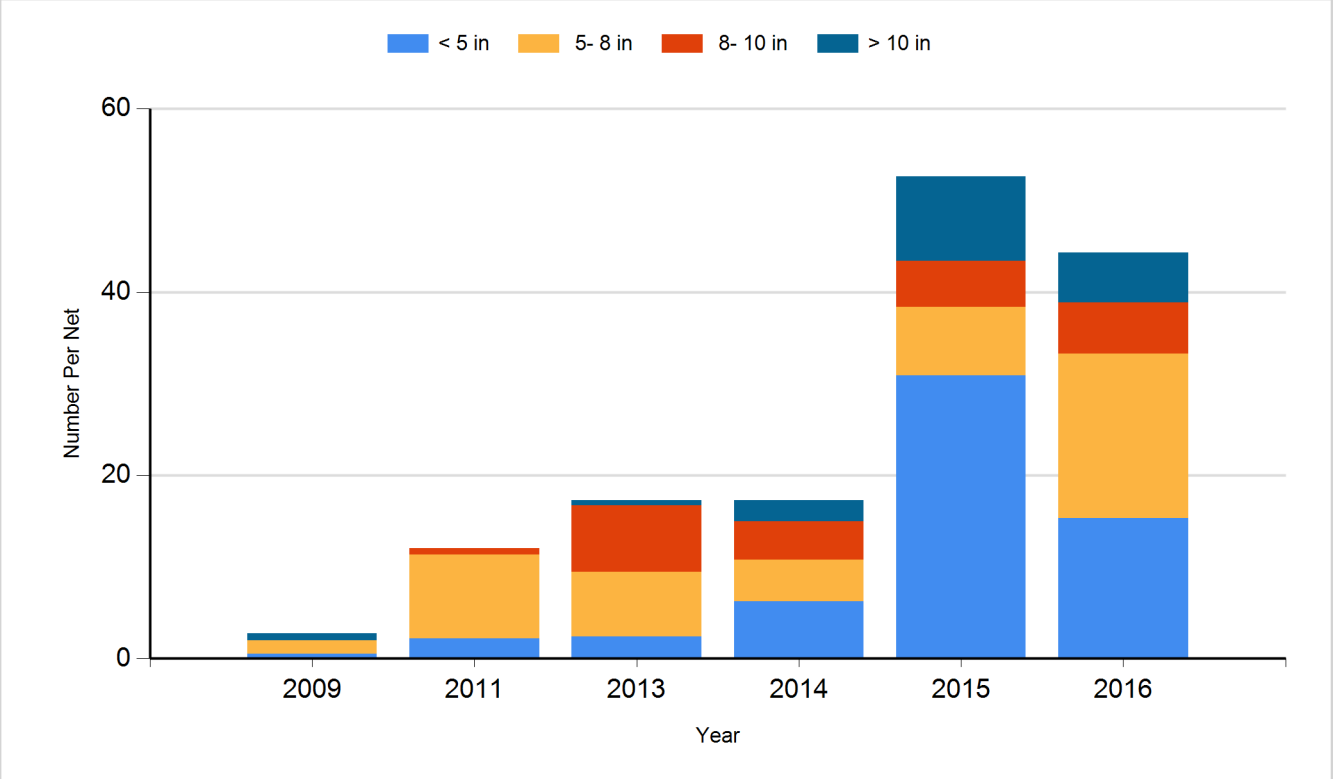


2015

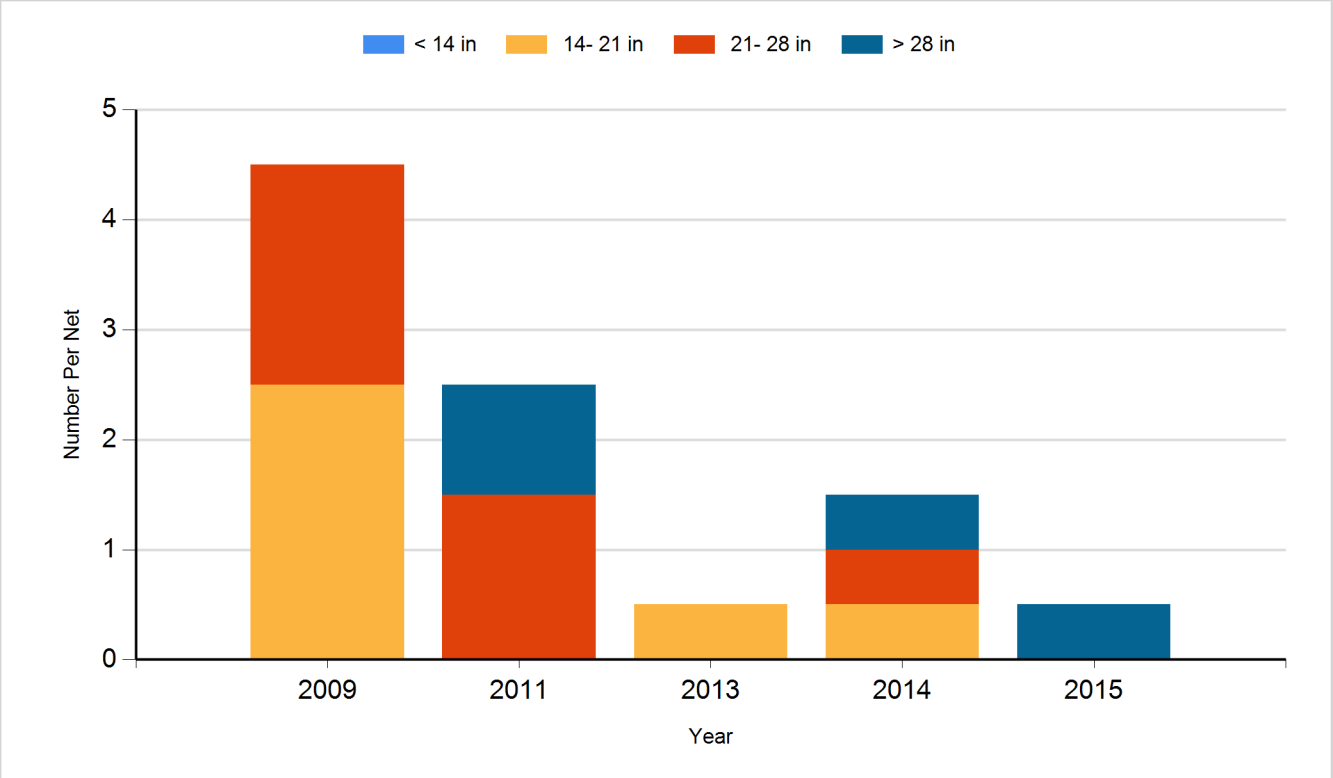
Historic Fish Sizes and Relative Abundance

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

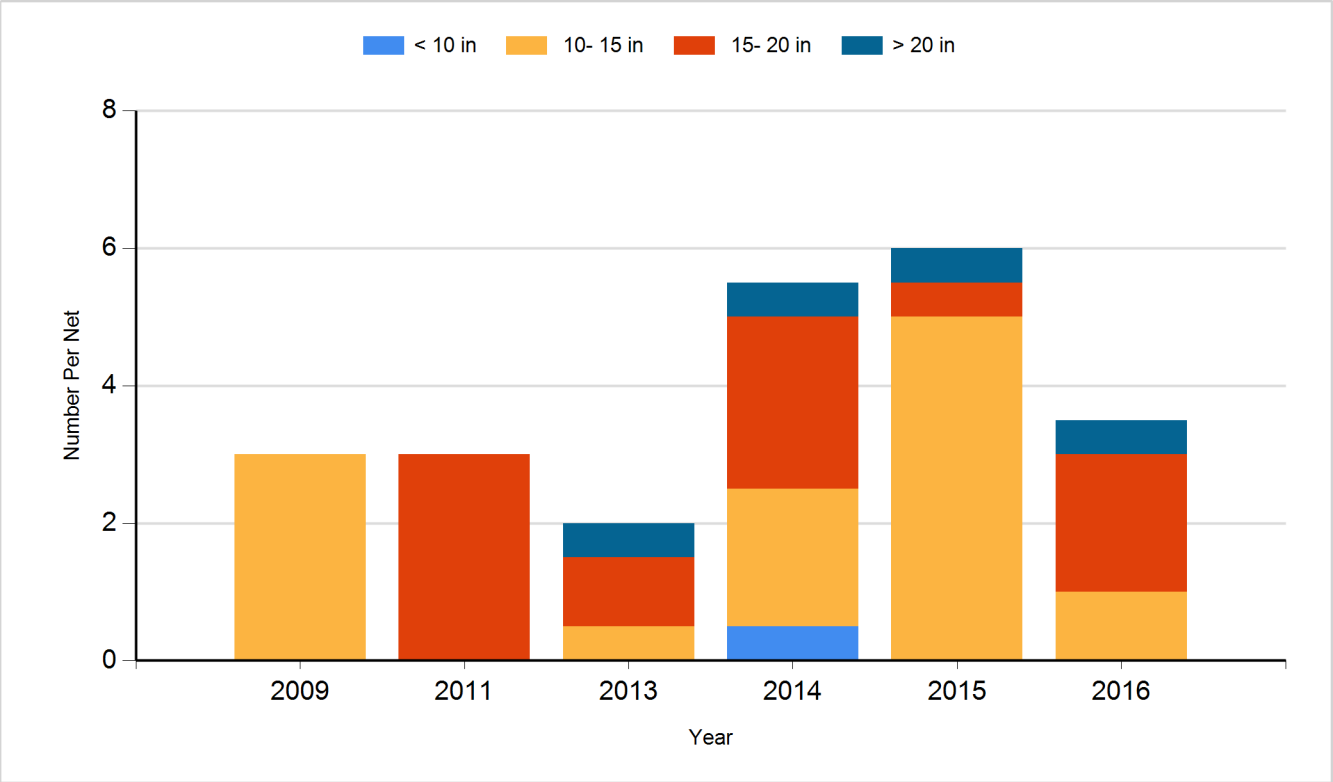
Species: Black Crappie
Gear: Frame Net



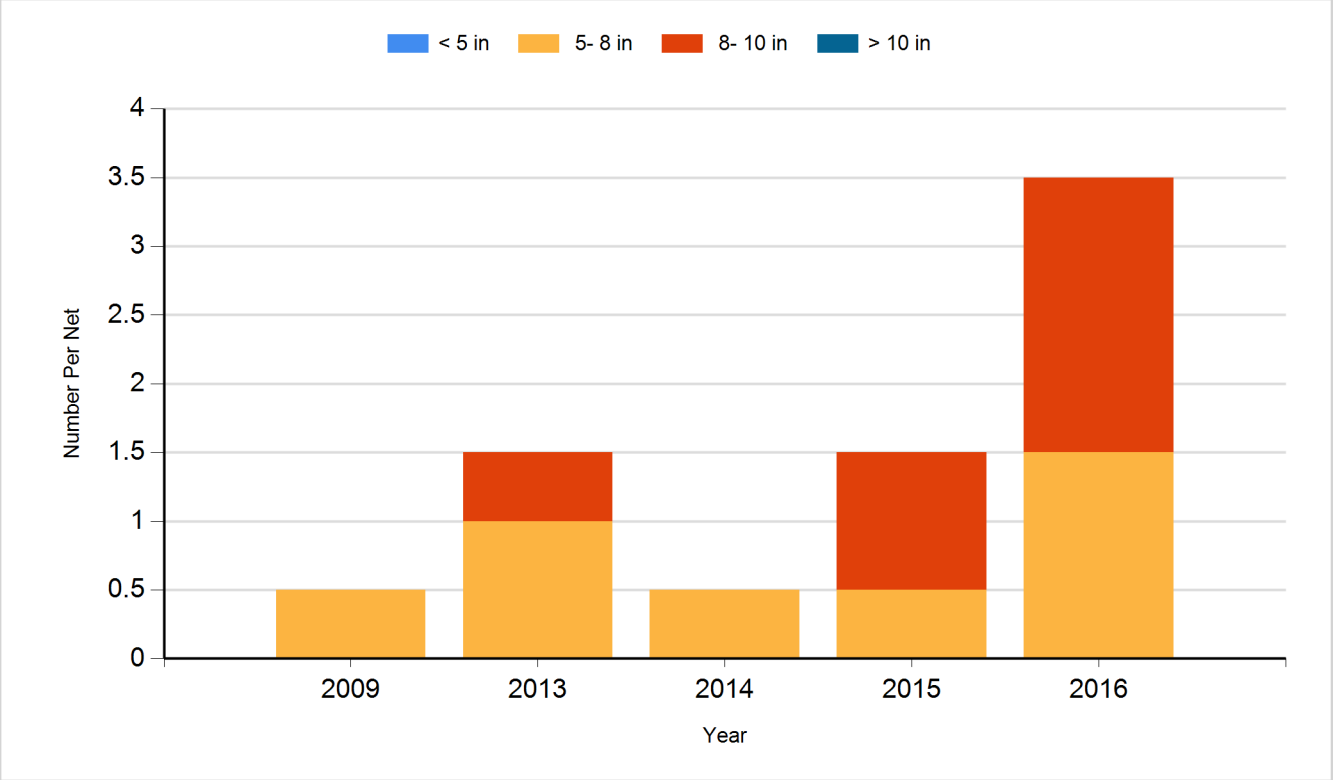
Species: Northern Pike
Gear: Gill Net



Species: Walleye
Gear: Gill Net



Species: Yellow Perch
Gear: Gill Net



Fish Stocking

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

Year	Species	Size	Number
2008	Black Crappie	Adult	385
2008	Channel Catfish	Adult	800
2008	Largemouth Bass	Fingerling	3,000
2008	Northern Pike	Fry	420,000
2008	Walleye	Fingerling	20,800
2008	Yellow Perch	Adult	1,710
2009	Largemouth Bass	Fingerling	20,000
2012	Gizzard Shad	Adult	25
2012	Largemouth Bass	Fingerling	4,500
2012	Walleye	Fingerling	20,304
2013	Gizzard Shad	Adult	32
2013	Walleye	Fingerling	22,626
2014	Gizzard Shad	Adult	30
2014	Walleye	Fingerling	20,000
2016	Walleye	Fingerling	25,500