SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Simon, Potter County
LLO-Lake-2144-000
2017

Lake Information

Name: Simon

County: Potter

Legal Description: T120-R74-S29

Surface Area: 47 Acres

Maximum Depth: 15 Feet

Mean Depth: 9 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std frame net	July 12, 2017	5 net-nights
AFS std frame net	July 13, 2017	5 net-nights
AFS std gill net	July 12, 2017	2 net-nights
AFS std gill net	July 13, 2017	2 net-nights
boat shocker (night)	September 11, 2017	3600 seconds

Common Fish Species Present

Largemouth Bass

Black Crappie

Yellow Perch

Northern Pike

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
AFS std frame net	Black Crappie	0.5	0.4	100		40		112	1
	Northern Pike	1.1	0.6	55		27		82	3
	Yellow Perch	0.2	0.2	100		0		115	2
AFS std gill net	Northern Pike	1.8	1.4	57		14		82	3
	Yellow Perch	7.5	6.5	87		3		114	3
boat shocker (night)	Largemouth Bass	1.0	1.5	100		100		138	

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	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Avg
AFS std frame net	Black Crappie										0.5	0.5
	Northern Pike										1.1	1.1
	Yellow Perch										0.2	0.2
AFS std gill net	Northern Pike										1.8	1.8
	Yellow Perch										7.5	7.5
boat shocker (night)	Largemouth Bass			92.0	3.0						1.0	32.0
frame net (std 3/4 in)	Black Crappie			2.9	10.0			0.5				4.5
	Largemouth Bass	0.1		0.1	0.6							0.3
	Northern Pike				1.3			1.1				1.2
	Yellow Perch	1.0		2.0	1.6							1.5
std exp gill net	Black Crappie			0.0								0.0
	Channel Catfish			0.5								0.5
	Northern Pike			0.5	2.5			2.0				1.7
	Yellow Perch	1.5		14.5	0.5			1.0				4.4

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.

			Year									
Gear	Species	Index	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
AFS std frame net	Black Crappie	PSD										100
		PSD-P										40
		Wr										112
	Northern Pike	PSD										55
		PSD-P										27
		Wr										82
	Yellow Perch	PSD										100
		PSD-P										0
		Wr										115
AFS std gill net	Northern Pike	PSD										57
		PSD-P										14
		Wr										82
	Yellow Perch	PSD										87
		PSD-P										3
		Wr										114
frame net (std 3/4 in)	Black Crappie	PSD			0	33			100			
		PSD-P			0	0			100			
		Wr			117	113			100			
	Northern Pike	PSD				31			82			
		PSD-P				23			0			
		Wr				90			93			
	Yellow Perch	PSD	100		10	69						
		PSD-P	20		0	6						
		Wr	93		105	98						
std exp gill net	Black Crappie	PSD			0							
		PSD-P			0							
	Northern Pike	PSD			100	0			75			
		PSD-P			100	0			0			
		Wr			104	93			105			
	Yellow Perch	PSD	100		0	0			100			
		PSD-P	67		0	0			0			

			Year									
Gear	Species	Index	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
std exp gill net	Yellow Perch	Wr	96		109	105			107			

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
2015	2	3	112 (2.5)	204 (3.7)								
2014	3	2	124 (15.5)	213 (10.7)	254 (9.4)							
Weighted Mean		5	117	208	254							

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2015	2	3										
2014	3	2										
Weighted Mean		5										

Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2016	1	4	116 (.3)									
2015	2	2	114 (4.7)	191 (2.7)								
2015	2	24	113 (1.4)	206 (1.7)								
2013	4	1	110	206	259	303						
Weighted Mean		31	113	205	259	303						

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2016	1	4										
2015	2	2										
2015	2	24										
2013	4	1										
Weighted Mean		31										

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+
2017	5		216 (3)	260 (2)							
2011	200		185 (200)								
2010	200	121 (200)									

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	30	143 (4)	230 (25)		314 (1)						
2010	66	138 (66)									

Fish Condition

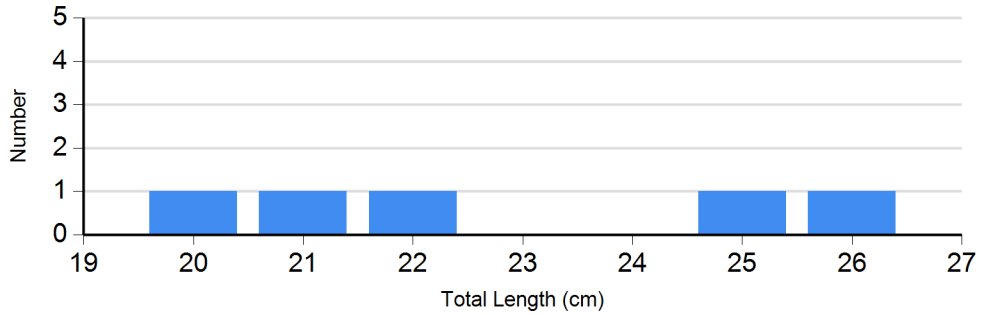
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2014	0		0		10	100 (1.7)	0	
	2017	0		3	113 (1.0)	2	111 (0.8)	0	
Northern Pike Gill Net	2014	2	108 (0.0)	6	104 (3.0)	0		0	
	2017	3	80 (5.3)	3	80 (1.1)	1	90	0	
Yellow Perch Gill Net	2014	0		4	107 (0.9)	0		0	
	2017	4	134 (3.9)	25	112 (2.3)	0		1	98

Length Frequency Distribution

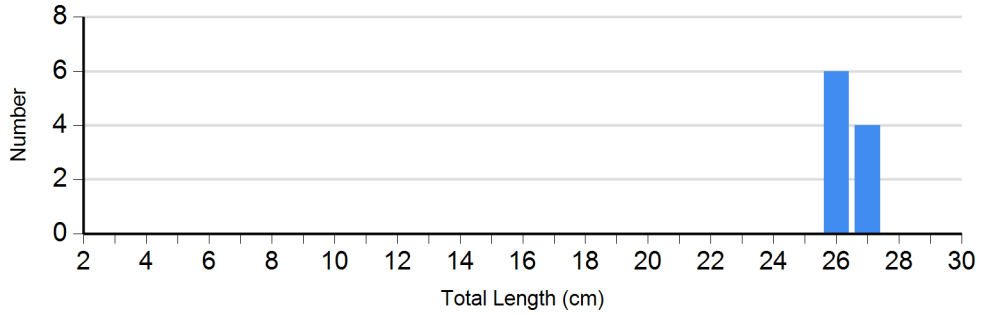
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net



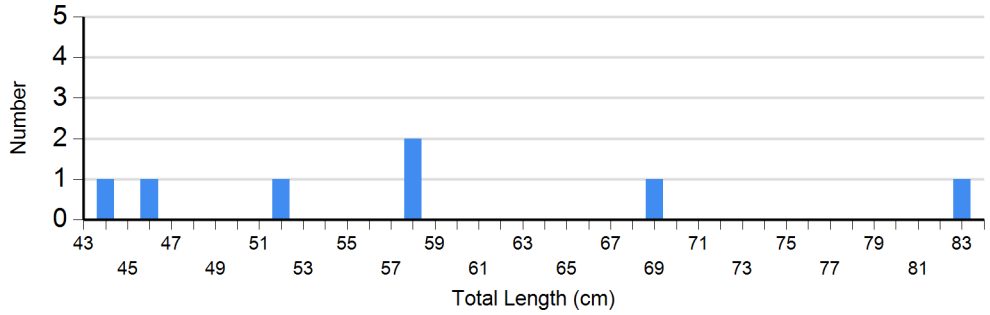
2017

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



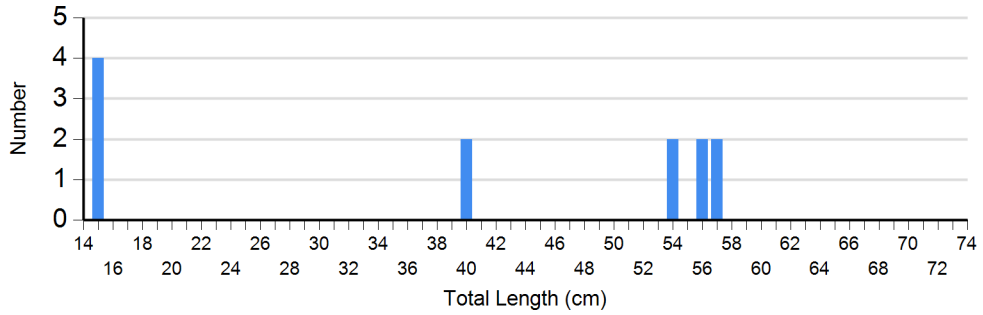
2014

Species: Northern Pike
Gear: AFS std gill net



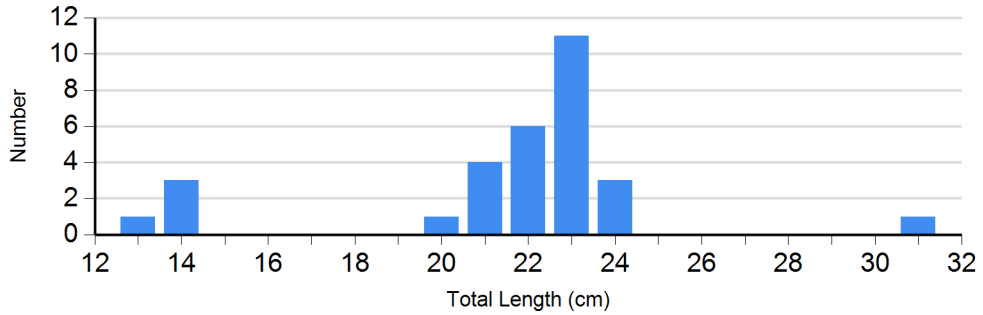
2017

Species: Northern Pike
Gear: std exp gill net



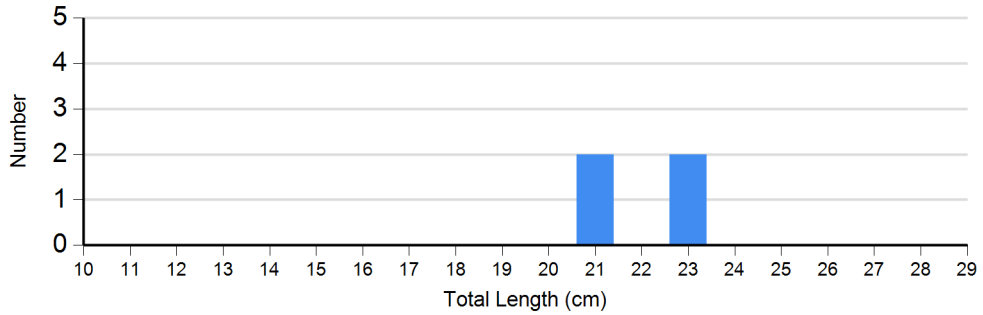
2014

Species: Yellow Perch
Gear: AFS std gill net



2017

Species: Yellow Perch
Gear: std exp gill net

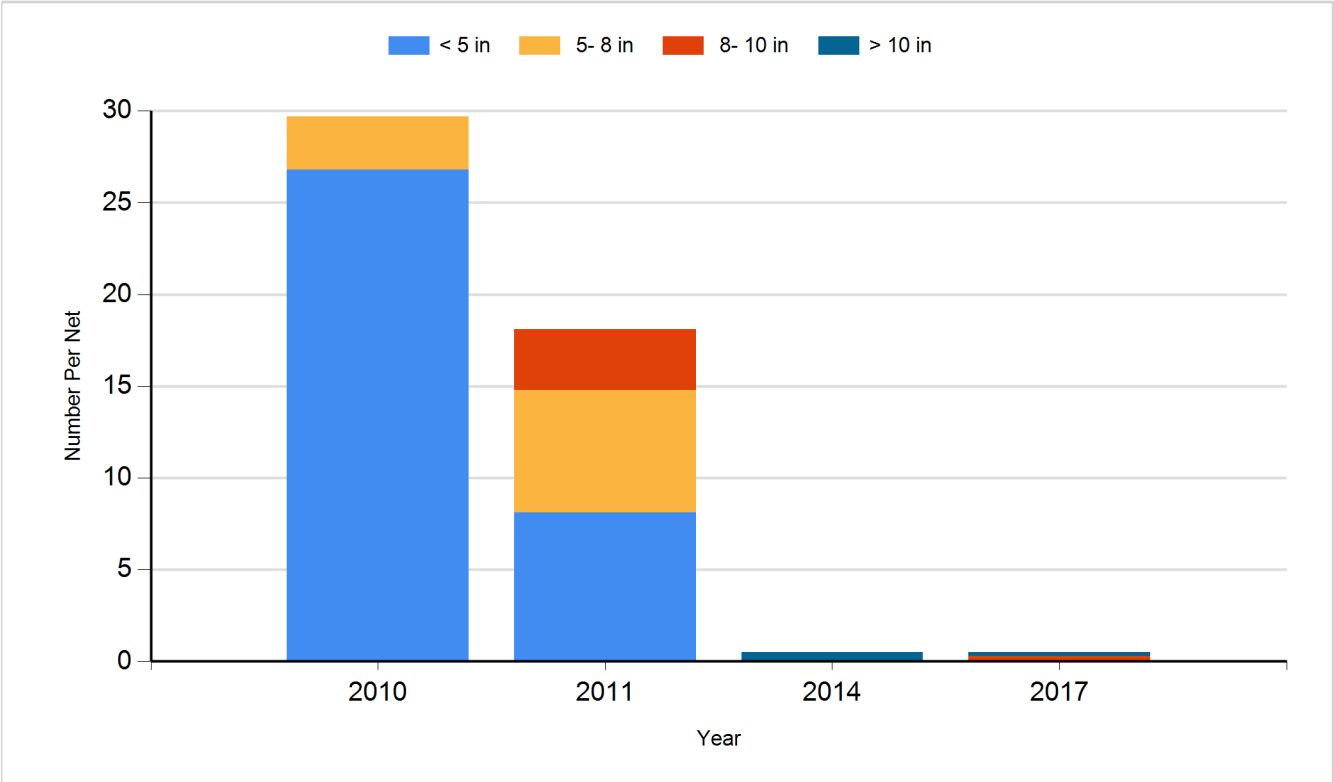


2014

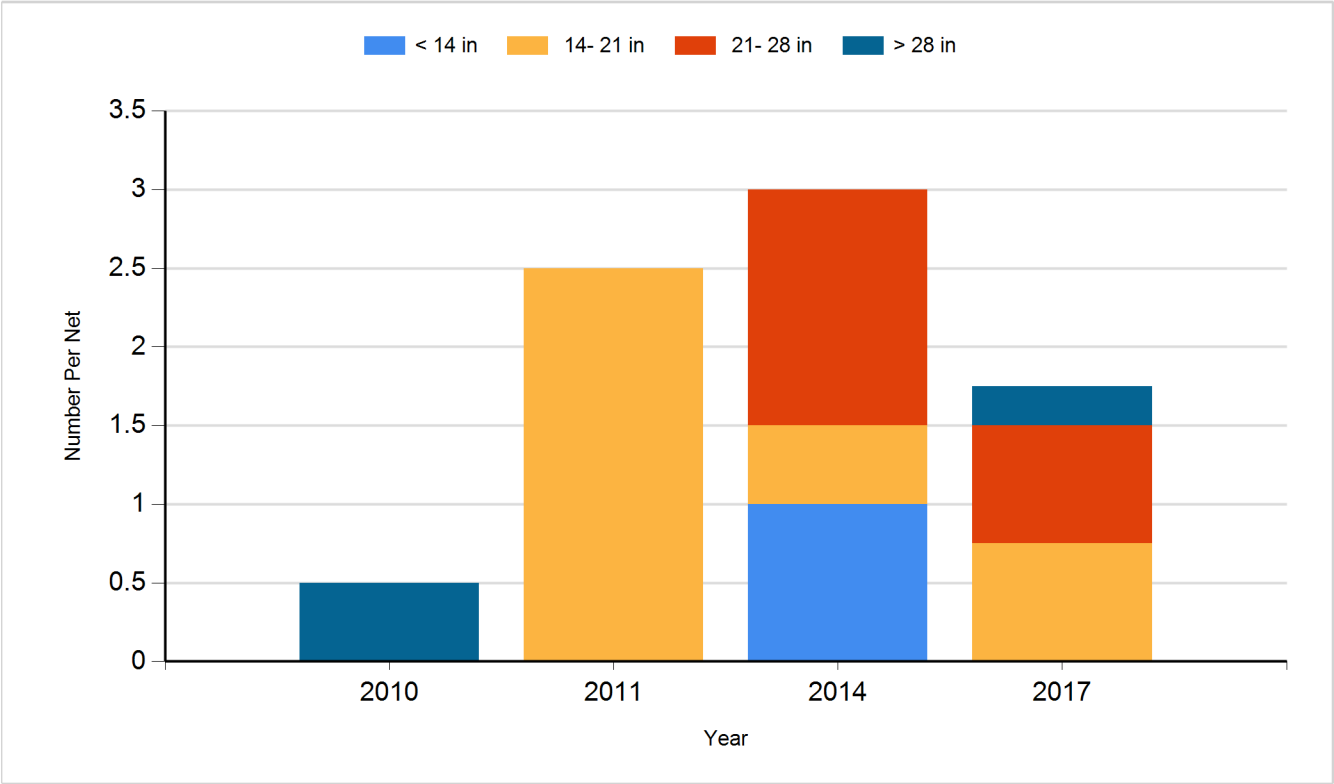
Historic Fish Sizes and Relative Abundance

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

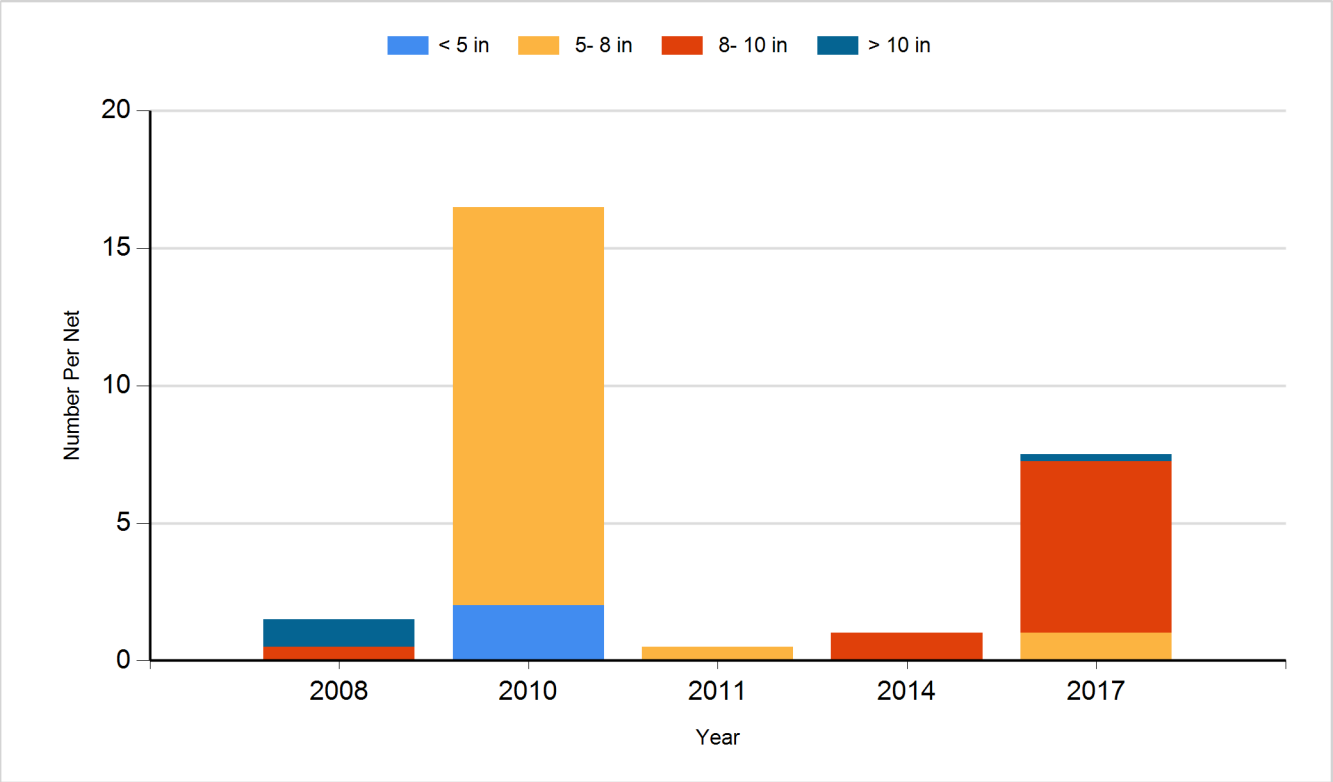
Species: Black Crappie
Gear: Frame Net



Species: Northern Pike
Gear: Gill Net



Species: Yellow Perch
Gear: Gill Net



Fish Stocking

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

Year	Species	Size	Number
2007	Largemouth Bass	Adult	100
2007	Walleye	Fry	250,000
2007	Yellow Perch	Adult	70
2008	Largemouth Bass	Fingerling	4,160
2008	Largemouth Bass	Juvenile	50
2009	Black Crappie	Adult	21
2009	Largemouth Bass	Adult	161
2009	Largemouth Bass	Fingerling	4,140
2009	Northern Pike	Adult	14
2009	Yellow Perch	Juvenile	105
2012	Yellow Perch	Adult	300
2013	Channel Catfish	Large Fingerling	720
2014	Channel Catfish	Juvenile	100
2016	Largemouth Bass	Adult	68
2017	Largemouth Bass	Adult	103