SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Island, Minnehaha County
LBS-Lake-213-000
2016

Lake Information

Name: Island

County: Minnehaha

Surface Area: 447 Acres

Surveys and Investigations

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

Gear	Date	Effort
std exp gill net	June 28, 2016	3 net-nights
std frame net (3/8 inch)	June 28, 2016	5 net-nights

Common Fish Species Present

Black Bullhead

Yellow Perch

Walleye

Common Carp

Smallmouth Bass

Bluegill

Black Crappie

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
std exp gill net	Black Bullhead	36.3	27.7	98		11	4		
	Common Carp	2.3	1.3	100		100			
	Walleye	4.0	2.9	0		0		82	1
	Yellow Perch	5.0	1.9	20		7		111	3
std frame net (3/8 inch)	Black Bullhead	16.4	4.1	98		18	6		
	Black Crappie	0.4	0.6	100		0		96	3
	Bluegill	0.4	0.4	50		50		111	5
	Common Carp	0.2	0.3	100		100			
	Northern Pike	0.2	0.3	100		100		73	
	Smallmouth Bass	1.6	1.0	63		0		81	3
	Walleye	0.2	0.3	100		0		84	
	Yellow Perch	0.2	0.3	0		0		87	

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
large frame net	Black Bullhead	211.0		88.7		81.0		150.9				132.9
	Black Crappie	4.5		0.0								2.3
	Bluegill	0.3		9.3		1.8		0.9				3.1
	Channel Catfish	0.4										0.4
	Common Carp	0.0		1.0		0.2		13.1				3.6
	Green Sunfish	2.5		0.5		0.5		0.2				0.9
	Muskellunge							0.1				0.1
	Northern Pike	0.5		0.2				1.0				0.6
	Smallmouth Bass	0.5				0.9		2.6				1.3
	Sunfish Hybrid			0.0								0.0
	Walleye	0.7		1.0		0.3		0.1				0.5
	White Sucker	0.1		0.1								0.1
	Yellow Perch	6.3				0.2						3.3
std exp gill net	Black Bullhead	34.5		4.8		132.0		111.7	112.0	99.0	36.3	75.8
	Common Carp							4.0	1.0	0.7	2.3	2.0
	Green Sunfish	0.8										0.8
	Muskellunge							0.3				0.3
	Northern Pike							0.3				0.3
	Smallmouth Bass	1.0		1.5		1.5		0.0		0.3		0.9
	Walleye	2.8		6.3		2.3		0.7	1.7	1.3	4.0	2.7
	Yellow Perch	3.5						1.7		3.7	5.0	3.5
std frame net (3/8 inch)	Black Bullhead								163.4	171.8	16.4	117.2
	Black Crappie										0.4	0.4
	Bluegill								0.6	0.4	0.4	0.5
	Common Carp								0.8		0.2	0.5
	Green Sunfish									0.2		0.2
	Northern Pike								0.2	0.4	0.2	0.3
	Smallmouth Bass								0.8	1.0	1.6	1.1
	Walleye										0.2	0.2
	Yellow Perch								1.2		0.2	0.7

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
large frame net	Black Crappie	PSD	54		0							
		PSD-P	4		0							
		Wr	118									
	Northern Pike	PSD	100		0				100			
		PSD-P	13		0				30			
		Wr	75						79			
	Walleye	PSD	55		40		33		100			
		PSD-P	27		10		0		100			
		Wr	91		91		85		91			
	Yellow Perch	PSD	13				50					
		PSD-P	7				50					
		Wr	109				107					
std exp gill net	Northern Pike	PSD							100			
		PSD-P							100			
		Wr							83			
	Walleye	PSD	0		16		44		100	100	50	0
		PSD-P	0		4		0		100	80	25	0
		Wr	87		94		90		94	89	90	82
	Yellow Perch	PSD	7						20		45	20
		PSD-P	7						0		0	7
		Wr	113						100		99	111
std frame net (3/8 inch)	Black Crappie	PSD										100
		PSD-P										0
		Wr										96
	Northern Pike	PSD								100	100	100
		PSD-P								0	0	100
		Wr								74	79	73
	Walleye	PSD										100
		PSD-P										0
		Wr										84
	Yellow Perch	PSD								100		0

			Year									
Gear	Species	Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
std frame net (3/8 inch)	Yellow Perch	PSD-P								0		0
		Wr								91		87

Length at Capture

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

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	2				555 (1)						644 (1)
2011	17	229 (10)	351 (5)		469 (2)						
2009	25	270 (5)	351 (17)	454 (2)					575 (1)		
2007	23	245 (22)	330 (1)								

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	4		188 (4)								

Fish Condition

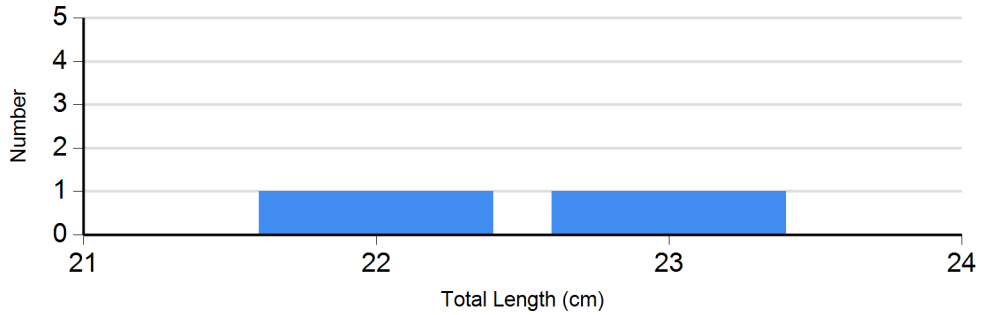
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2016	0		2	96 (2.1)	0		0	
Northern Pike Gill Net	2013	0		0		1	83	0	
Walleye Gill Net	2013	0		0		1	90	1	98
	2014	0		1	85	4	90 (3.0)	0	
	2015	2	77 (0.4)	1	103	1	103	0	
	2016	12	82 (1.1)	0		0		0	
Yellow Perch Gill Net	2013	4	98 (4.9)	1	107	0		0	
	2015	6	101 (4.8)	5	97 (3.0)	0		0	
	2016	12	114 (2.3)	2		1	102	0	

Length Frequency Distribution

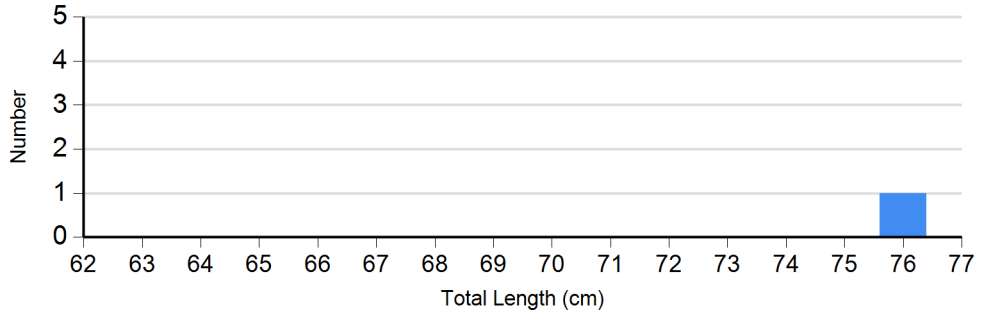
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: std frame net (3/8 inch)



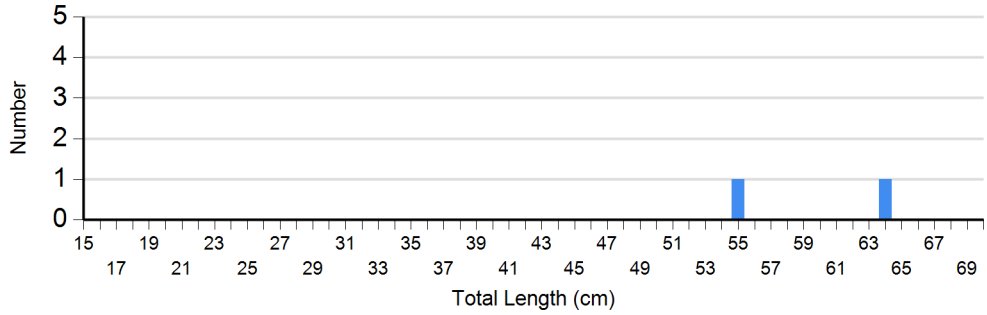
2016

Species: Northern Pike
Gear: std exp gill net

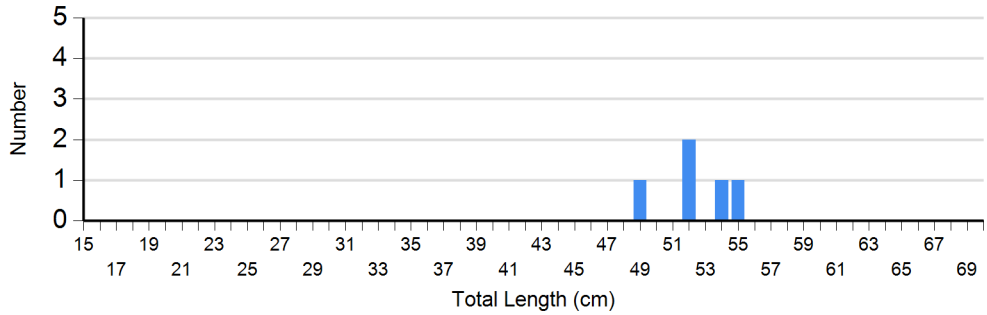


2013

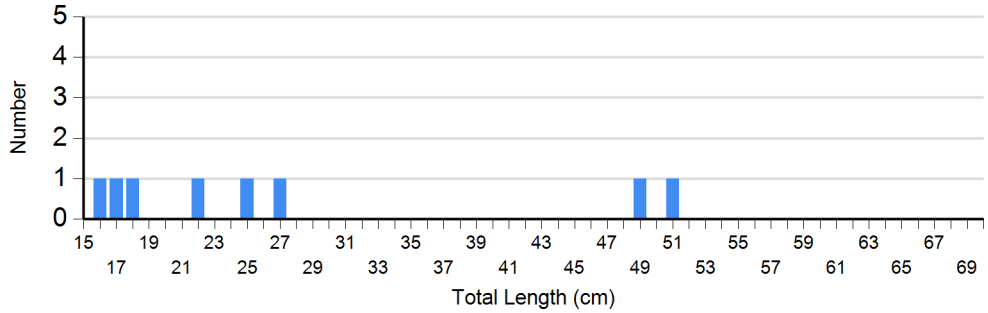
Species: Walleye
Gear: std exp gill net



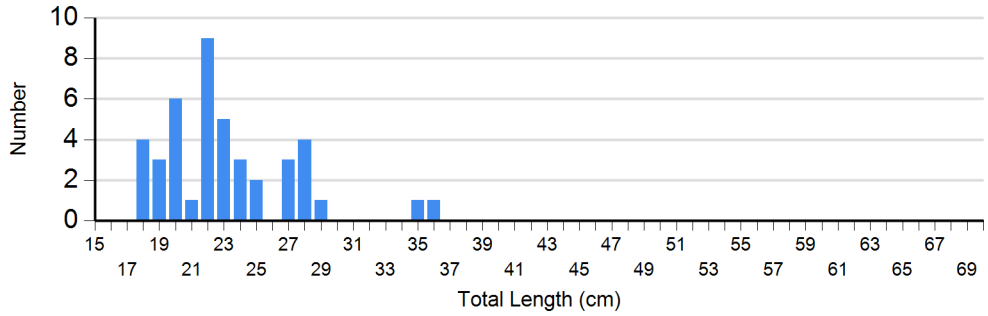
2013



2014

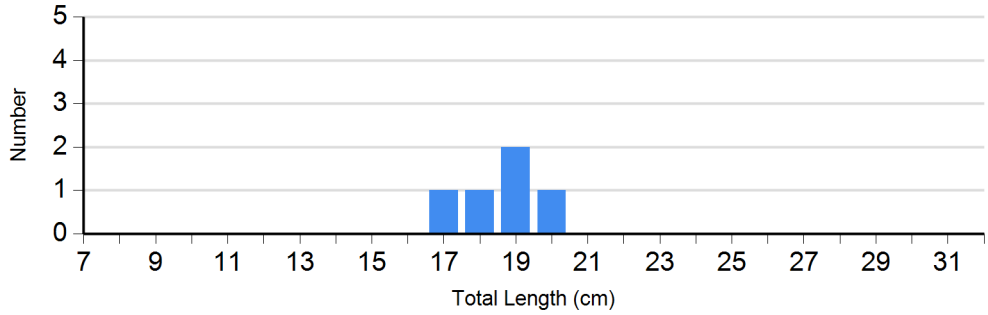


2015

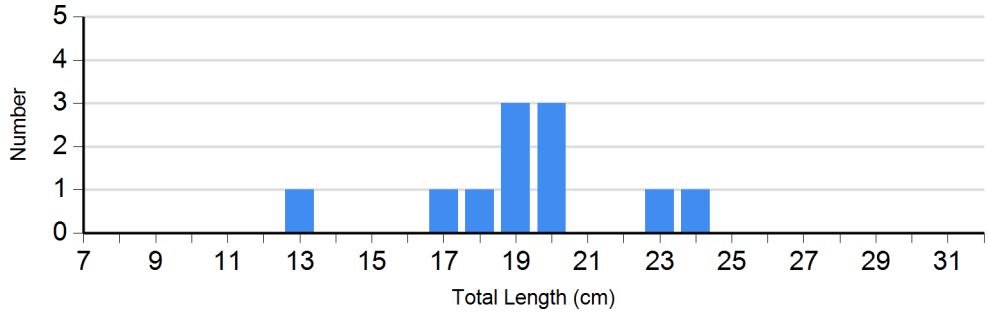


2016

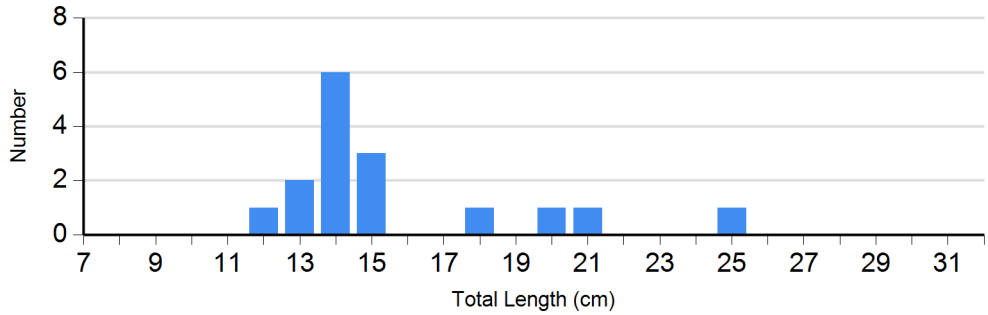
Species: Yellow Perch
Gear: std exp gill net



2013



2015

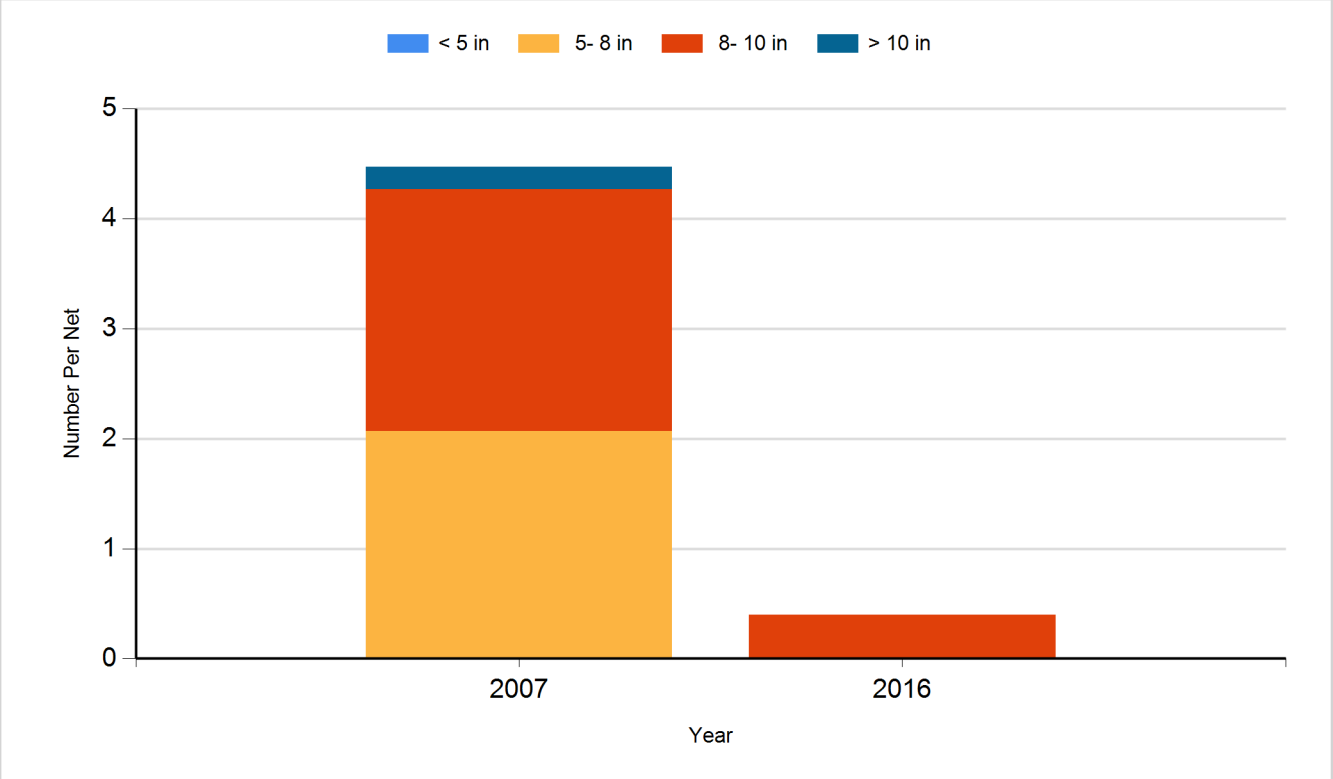


2016

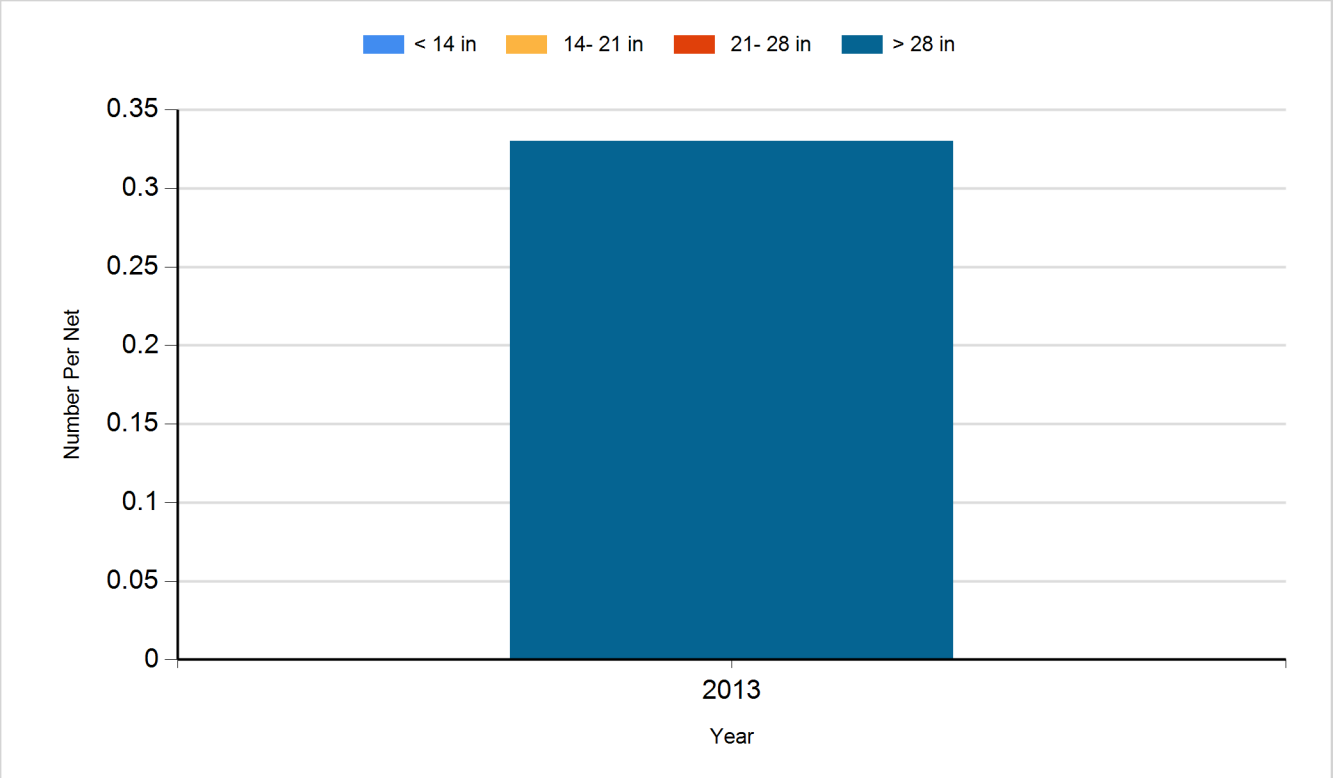
Historic Fish Sizes and Relative Abundance

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

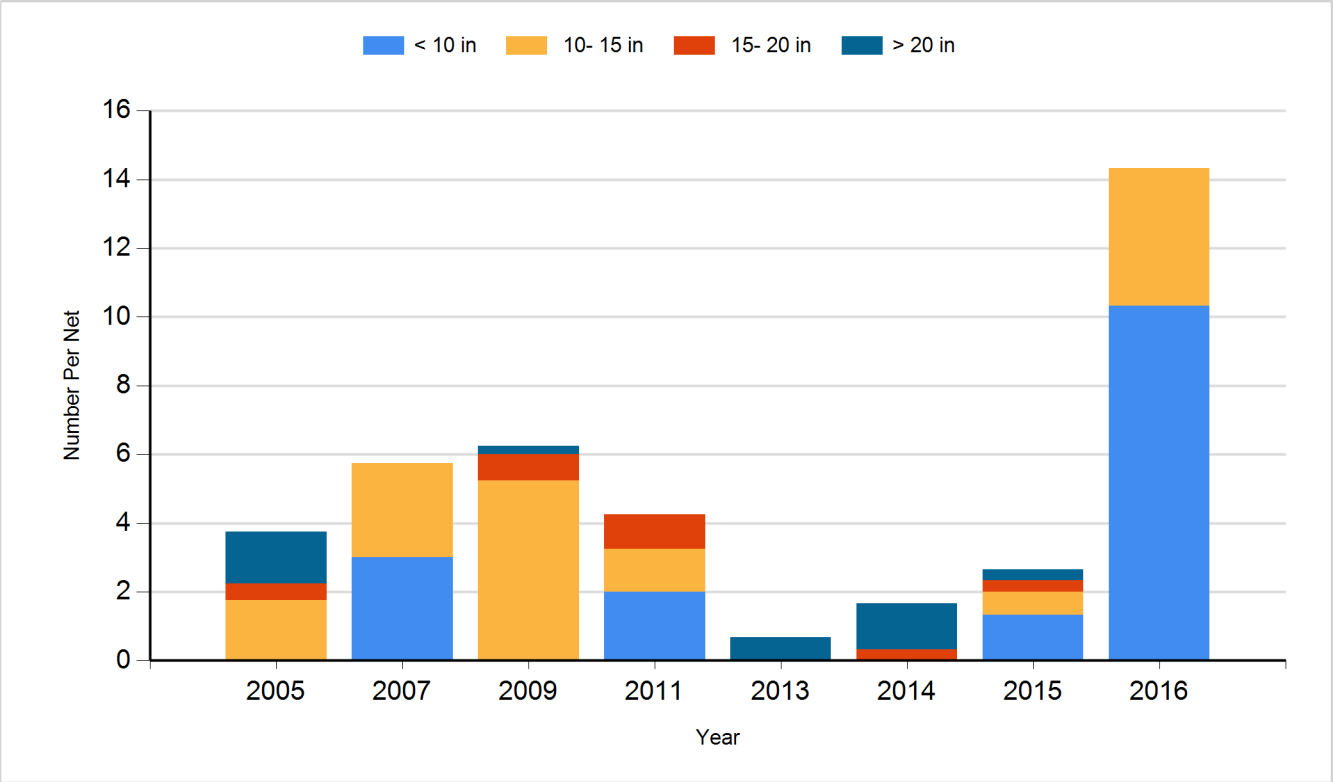
Species: Black Crappie
Gear: Frame Net



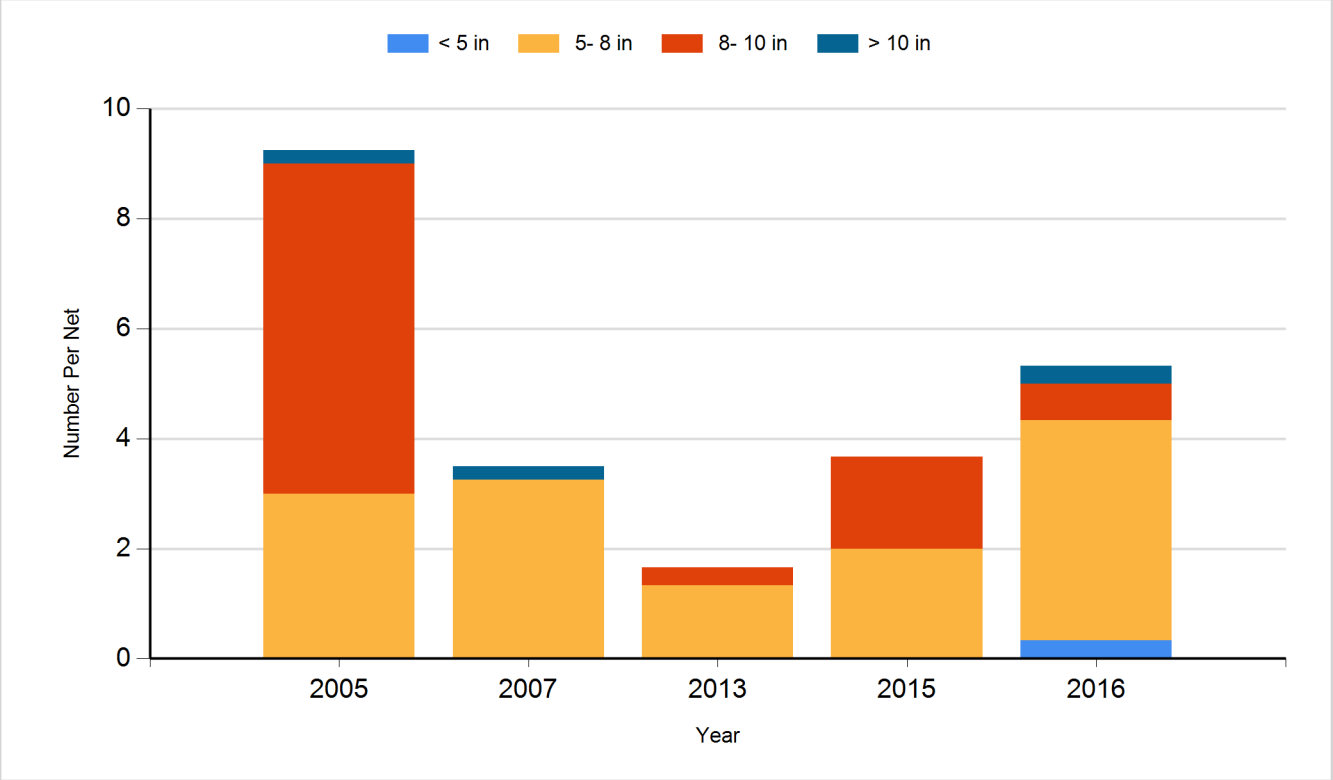
Species: Northern Pike
Gear: Gill Net



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
2005	Walleye	Fingerling	45,100
2005	Yellow Perch	Adult	77
2005	Yellow Perch	Fingerling	25,317
2007	Smallmouth Bass	Adult	164
2007	Walleye	Large Fingerling	3,224
2007	Yellow Perch	Juvenile	3,420
2008	Smallmouth Bass	Adult	185
2008	Smallmouth Bass	Juvenile	28
2009	Muskellunge	Adult	64
2009	Muskellunge	Juvenile	68
2009	Walleye	Large Fingerling	8,748
2009	Yellow Perch	Adult	310
2009	Yellow Perch	Fingerling	620
2010	Muskellunge	Adult	11
2010	Walleye	Small Fingerling	44,070
2011	Muskellunge	Fingerling	272
2011	Yellow Perch	Fingerling	10,058
2012	Muskellunge	Adult	4
2012	Walleye	Small Fingerling	43,860
2012	Yellow Perch	Adult	2,746
2012	Yellow Perch	Egg	34,020,000
2012	Yellow Perch	Juvenile	7,350
2014	Muskellunge	Large Fingerling	441
2014	Walleye	Small Fingerling	30,800
2015	Walleye	Juvenile	1,399
2015	Walleye	Small Fingerling	31,218
2016	Muskellunge	Large Fingerling	400
2016	Walleye	Small Fingerling	32,130