

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Byron, Beadle County

MJA-Lake-531-800

2016

Lake Information

Name:	Byron	Maximum Depth:	10 Feet
County:	Beadle	Mean Depth:	7 Feet
Legal Description:	T113N- R61W- Sec. 22-23, 25-26, 28, 34-35	OHWM Elevation:	1,250
Surface Area:	1,858 Acres	Outlet Elevation:	1,248

Surveys and Investigations

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

Gear	Date	Effort
std exp gill net	June 22, 2016	3 net-nights

Common Fish Species Present

Walleye

Black Bullhead

Bigmouth Buffalo

Freshwater Drum

White Sucker

River Carpsucker

Northern Pike

Common Carp

Shortnose Gar

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).

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

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.

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

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

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.

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

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).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(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		Quality		Preferred		Memorable		Trophy	
	(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).

Gear	Species	Abundance		Stock Density Indices			Condition		
		CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
std exp gill net	Bigmouth Buffalo	16.7	10.7	6		2			
	Black Bullhead	19.7	8.3	92		3			
	Common Carp	0.7	1.3	100		0			
	Freshwater Drum	2.0	1.9	33		33			
	Northern Pike	1.0	1.1	100		33		89	9
	River Carpsucker	1.3	1.3	100		75			
	Shortnose Gar	0.0	0.0						
	Walleye	1.0	1.1	67		0		91	3
	White Sucker	1.7	1.3	100		100			

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										Avg		
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016			
large frame net	Bigmouth Buffalo	4.7		5.3		4.0		0.2						3.6
	Black Bullhead	12.7		5.8		65.6		1,085.8						292.5
	Black Crappie	11.7		21.6		11.9		0.8						11.5
	Bluegill			0.1		1.1								0.6
	Channel Catfish	0.3		0.5		3.0		0.6						1.1
	Common Carp	15.6		8.2		3.6		2.0						7.4
	Freshwater Drum	1.4		0.4		1.1		0.8						0.9
	Gizzard Shad	0.0		0.0										0.0
	Green Sunfish	0.1				0.4								0.3
	Northern Pike	1.4		1.5		0.8		0.6						1.1
	Orangespotted Sunfish	0.0		0.0										0.0
	River Carpsucker	0.1		0.2		0.1								0.1
	Shorthead Redhorse	0.1				0.3		0.2						0.2
	Shortnose Gar	0.0		0.0		0.0		0.0						0.0
	Sunfish Hybrid	0.0												0.0
	Walleye	1.1		0.7		0.3		0.6						0.7
	White Sucker	2.0		4.5		2.3		2.8						2.9
	Yellow Bullhead			0.3		0.5								0.4
	Yellow Perch	0.4		0.5		0.1								0.3
std exp gill net	Bigmouth Buffalo	27.7		2.3		4.3		4.0	0.3	5.0	16.7		8.6	
	Black Bullhead	16.0		4.3		20.7		94.0	26.7	18.3	19.7		28.5	
	Black Crappie	1.0		1.7		1.7			0.3	1.3			1.2	
	Channel Catfish			0.3		0.3				1.0			0.5	
	Common Carp	4.7		1.0		0.3		1.0	0.3	0.7	0.7		1.2	
	Freshwater Drum	5.7		0.3		0.7		0.5		1.7	2.0		1.8	
	Gizzard Shad	0.3		0.0		0.0							0.1	
	Northern Pike	0.7				0.7		2.0	1.0		1.0		1.1	
	River Carpsucker			0.3					0.3		1.3		0.6	
	Shorthead Redhorse							0.5		0.3			0.4	
	Shortnose Gar	0.0		0.0				0.0			0.0		0.0	
	Walleye	4.3		9.3		10.3		3.0	6.3	2.7	1.0		5.3	
	White Sucker			1.7		2.7		4.5	1.7	3.7	1.7		2.7	
	Yellow Perch	3.3		2.7		12.0		7.0	0.3	0.7			4.3	

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									
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
large frame net	Black Crappie	PSD	79		47		64		75			
		PSD-P	9		3		13		25			
		Wr	123		122		116		129			
	Northern Pike	PSD	86		93		100		100			
		PSD-P	50		27		0		100			
		Wr	74		88		86		93			
	Walleye	PSD	100		14		50		100			
		PSD-P	18		14		50		0			
		Wr	84		103		88		98			
	Yellow Perch	PSD	50		20		0					
		PSD-P	0		20		0					
		Wr	101		107		93					
std exp gill net	Black Crappie	PSD	100		100		60				0	0
		PSD-P	0		20		20				0	0
		Wr	132		126		121			122	119	
	Northern Pike	PSD	50				100		100	67		100
		PSD-P	0				50		0	33		33
		Wr	96				79		94	88		89
	Walleye	PSD	92		43		61		50	42	63	67
		PSD-P	0		14		0		0	11	0	0
		Wr	98		91		97		102	97	93	91
	Yellow Perch	PSD	100		25		56		71	100	100	
		PSD-P	50		0		0		21	0	100	
		Wr	99		106		105		112	93	92	

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).

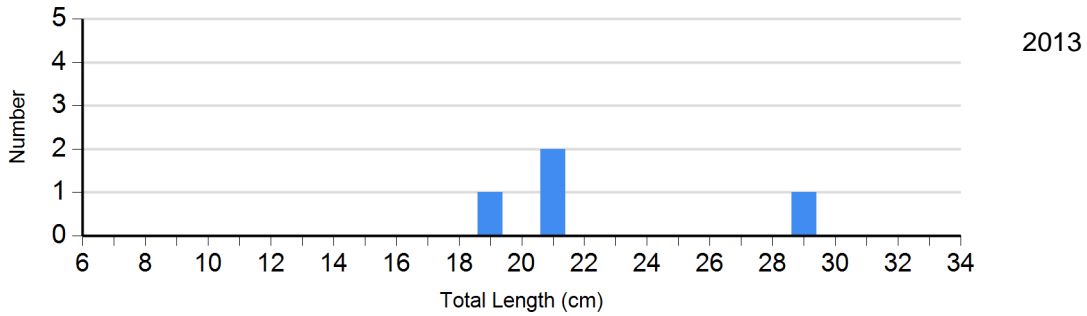
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2013	1	133	2	131 (8.1)	1	120	0	
Northern Pike Gill Net	2013	0		4	94 (2.6)	0		0	
	2014	1	98	1	106	1	62	0	
	2016	0		2	92 (11.8)	1	84	0	
Walleye Gill Net	2013	3	105 (2.1)	3	100 (4.1)	0		0	
	2014	11	91 (2.7)	6	103 (2.0)	2	109 (12.0)	0	
	2015	3	94 (0.9)	5	92 (1.8)	0		0	
	2016	1	95	2	90 (1.9)	0		0	
Yellow Perch Gill Net	2013	4	119 (3.1)	7	109 (2.7)	3	107 (2.8)	0	
	2014	0		1	93	0		0	
	2015	0		0		0		2	92 (5.4)

Length Frequency Distribution

Length frequency histogram of species sampled by year.

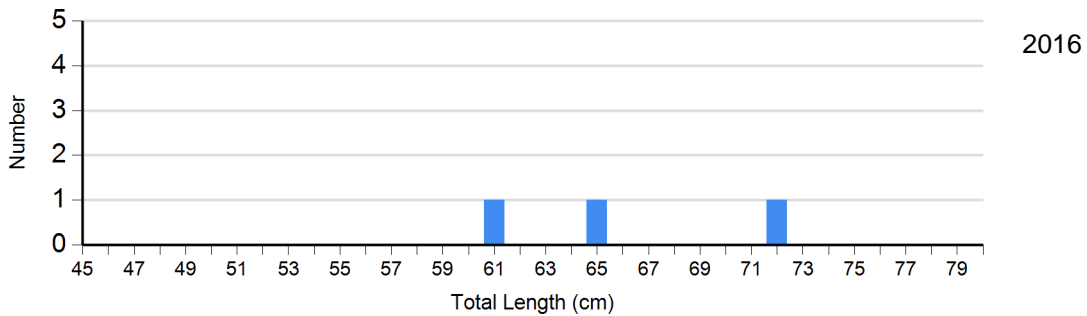
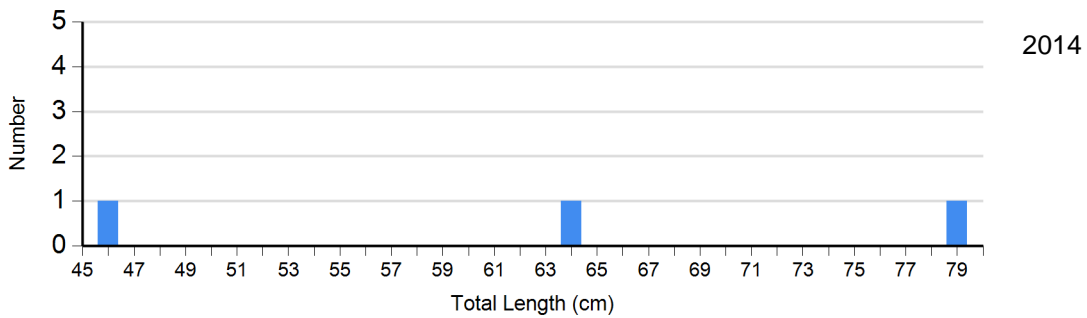
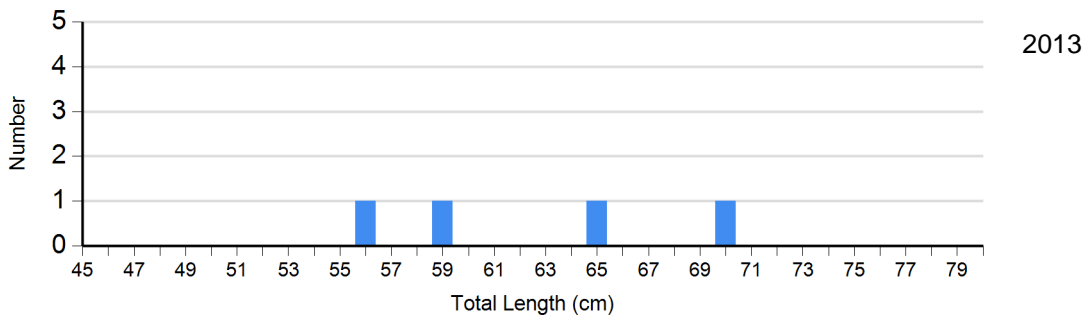
Species: Black Crappie

Gear: large frame net

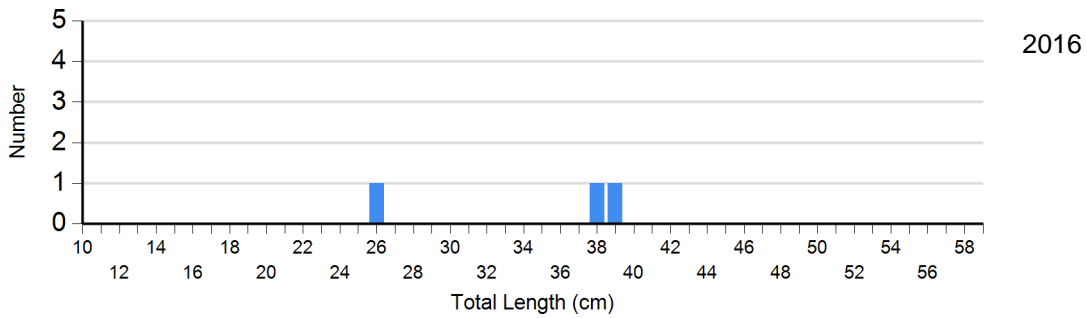
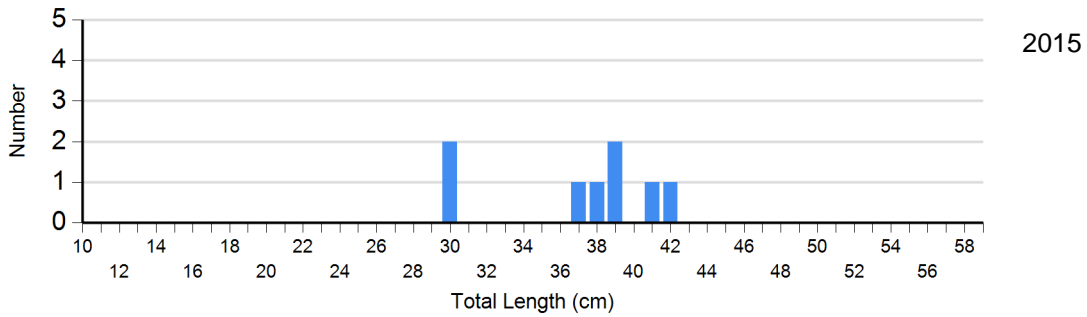
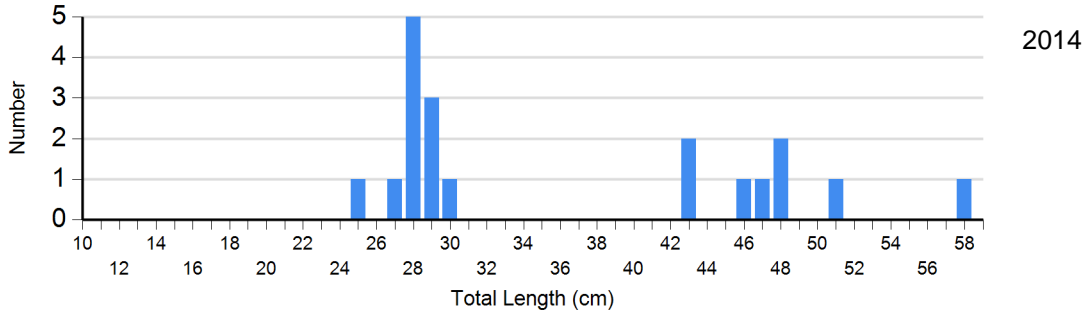
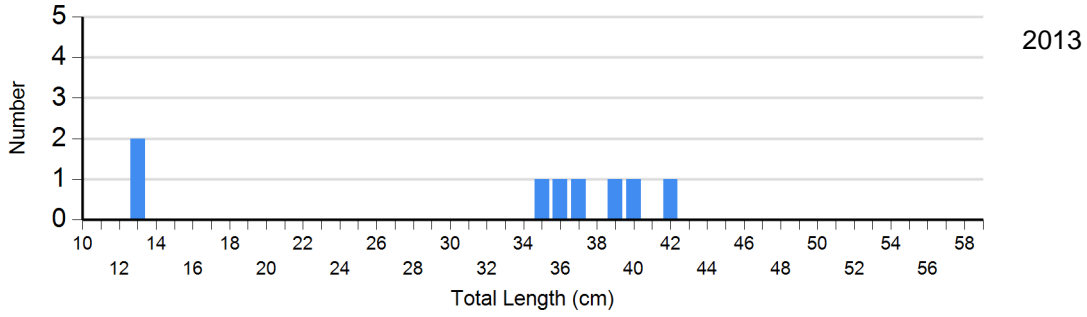


Species: Northern Pike

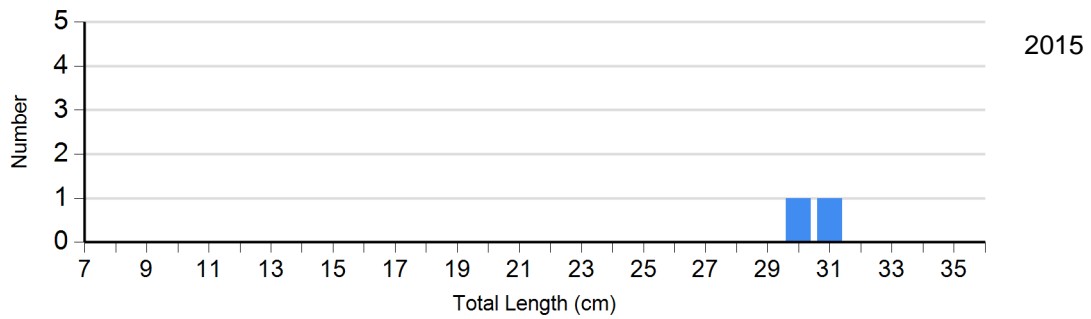
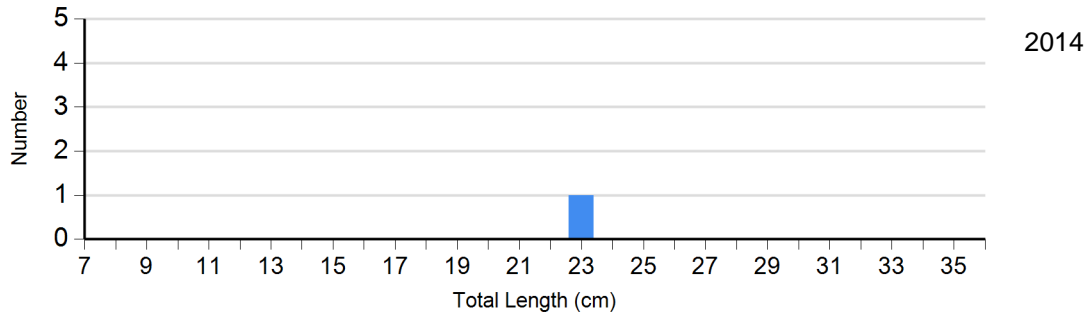
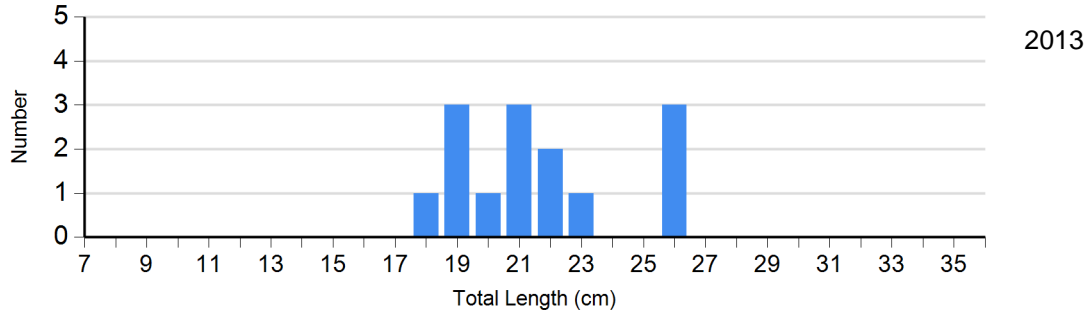
Gear: std exp gill net



Species: Walleye
Gear: std exp gill net



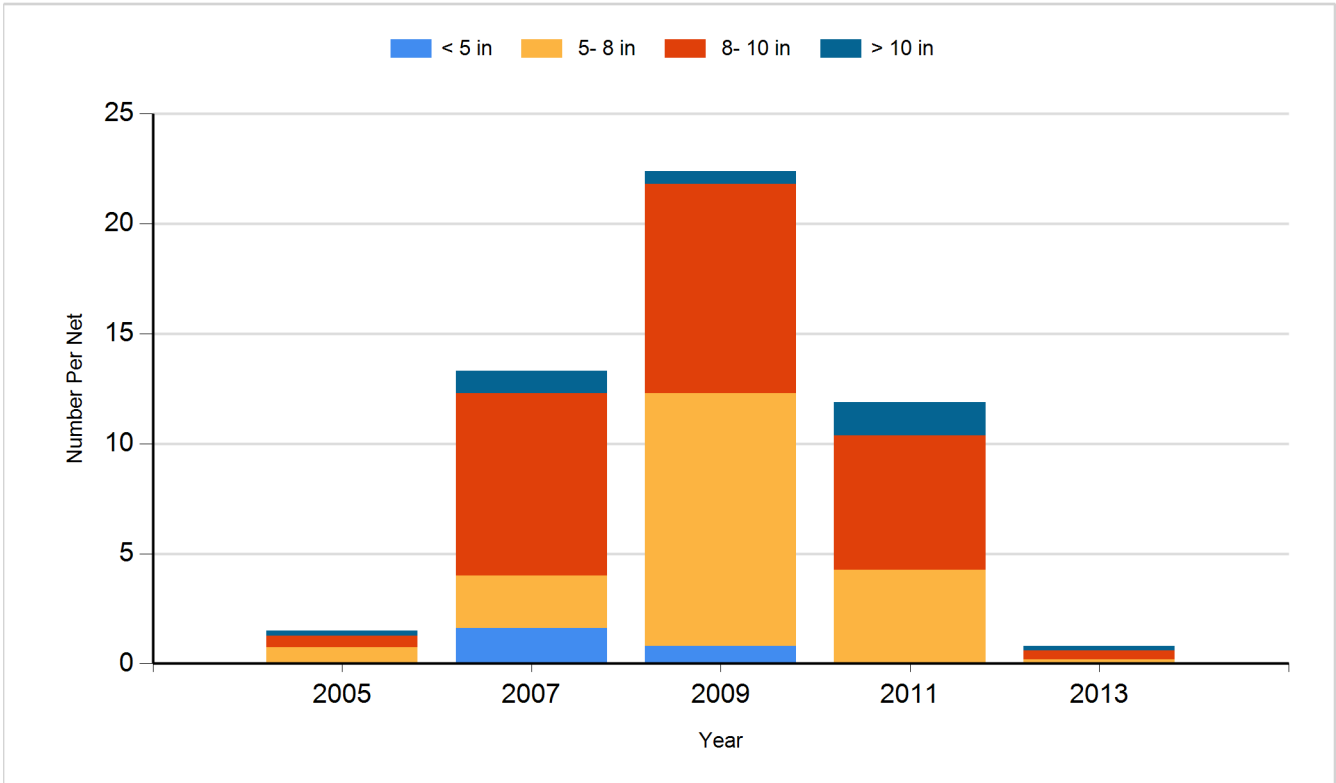
Species: Yellow Perch
Gear: std exp gill net



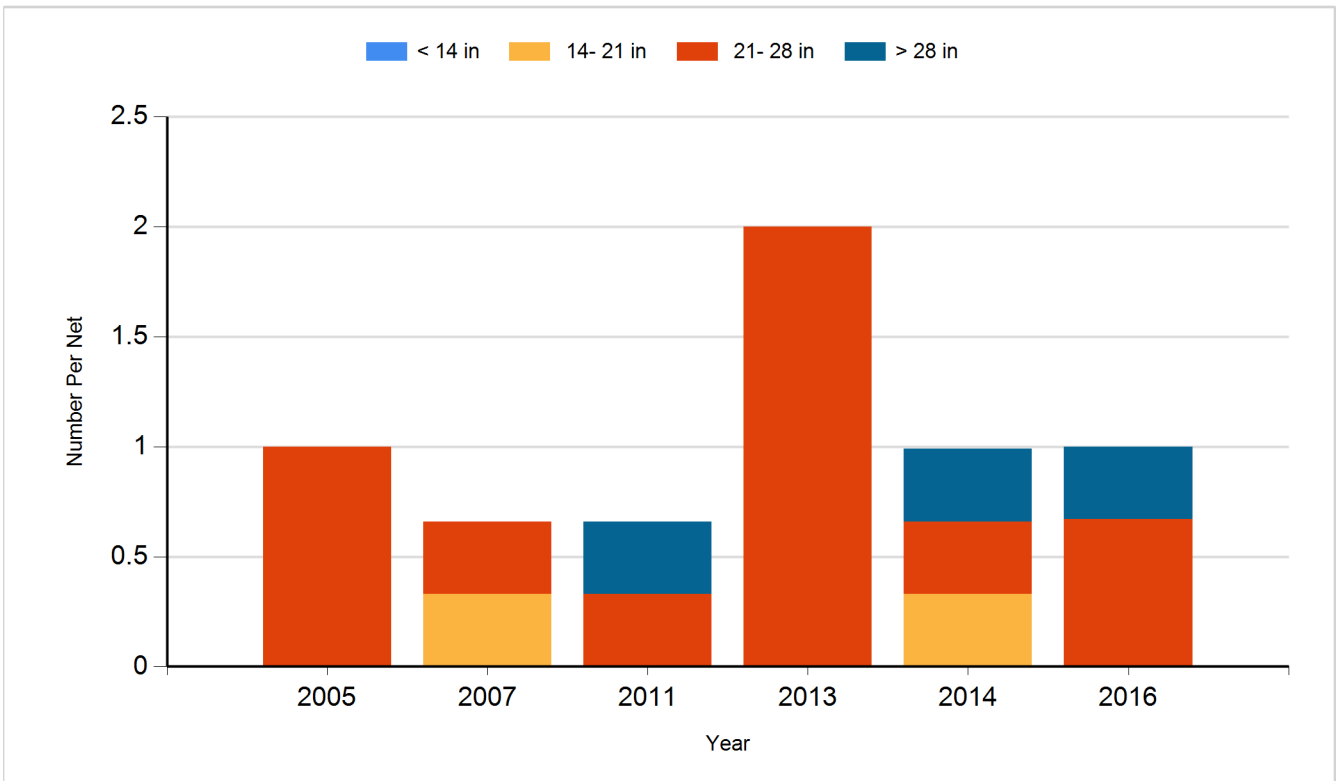
Historic Fish Sizes and Relative Abundance

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

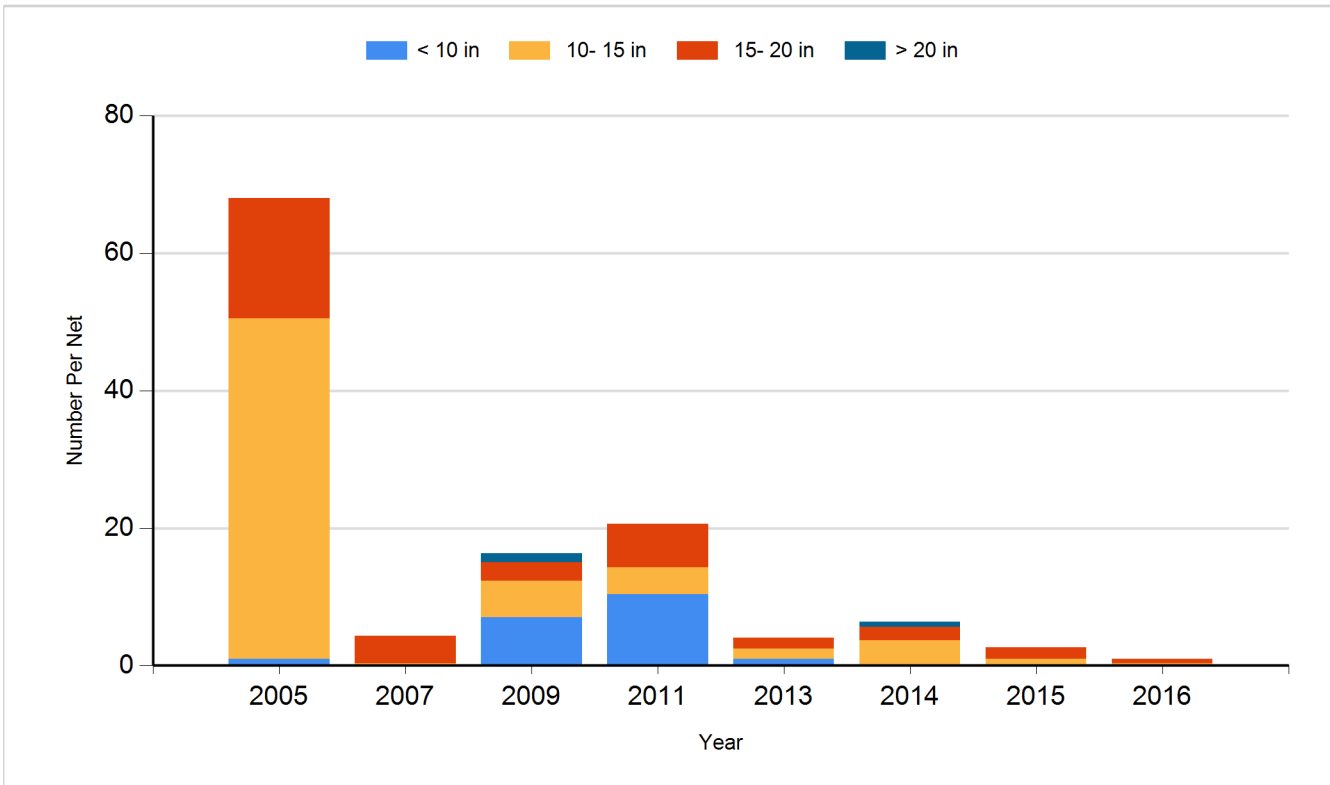
Species: Black Crappie
Gear: Frame Net



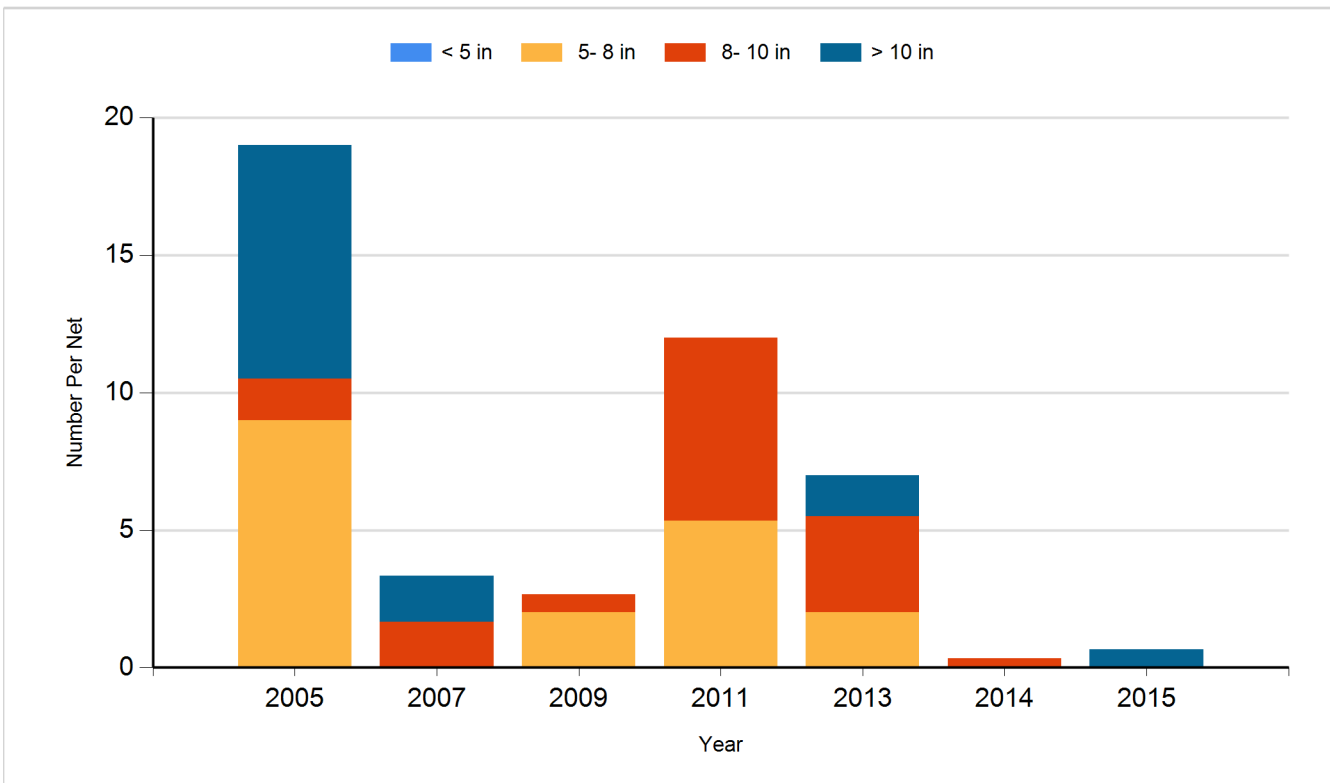
Species: Northern Pike
Gear: Gill Net



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	Walleye	Fry	2,000,000
2010	Walleye	Fry	2,000,000
2012	Walleye	Fry	1,003,118
2013	Walleye	Fry	950,000
2014	Walleye	Fry	950,000
2015	Walleye	Fry	891,071
2016	Walleye	Fry	900,000