

Common Fish Species Present

Walleye

Black Bullhead

Common Carp

Black Crappie

Yellow Bullhead

Yellow Perch

White Sucker

Northern Pike

Bigmouth Buffalo

Green Sunfish

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	0.7	1.3	0		0			
	Black Bullhead	56.0	5.4	52	5	1			
	Black Crappie	6.0	3.3	44	19	0		111	2
	Common Carp	20.7	7.3	65	9	3			
	Freshwater Drum	0.3	0.6	100		0			
	Northern Pike	0.3	0.6	100		0		91	
	Walleye	13.3	3.8	83	9	3		92	1
	Yellow Bullhead	0.3	0.6	100		100		98	
	Yellow Perch	2.3	0.6	71		0		98	5
std frame net (3/8 inch)	Black Bullhead	247.2	128.9	38	2	0			
	Black Crappie	17.4	8.0	48	8	7	4	108	1
	Common Carp	4.0	1.7	65	17	45	18		
	Green Sunfish	0.4	0.6	0		0		94	1
	Northern Pike	1.6	1.0	88		25		92	2
	Sunfish Hybrid	0.0	0.0						
	Walleye	1.0	1.2	80		20		91	5
	White Sucker	1.6	1.1	100		88			
	Yellow Bullhead	5.2	2.3	100		62	15		
Yellow Perch	0.2	0.3	100		100		77		

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	
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015		
large frame net	Bigmouth Buffalo						0.1						0.1
	Black Bullhead	129.8		109.2		23.2	577.3		342.0				236.3
	Black Crappie	23.4		41.2		199.8	83.5		20.2				73.6
	Bluegill					0.4							0.4
	Common Carp	16.8		3.0		5.1	11.4		4.2				8.1
	Green Sunfish					0.1	0.6						0.4
	Northern Pike	1.6					0.3		0.2				0.7
	Saugeye			0.6									0.6
	Snapping Turtle	0.0											0.0
	Walleye	2.6		7.0		0.4	0.1						2.5
	White Sucker						0.9		0.8				0.9
	Yellow Bullhead	0.8		0.2			0.7						0.6
Yellow Perch	0.2		0.6		0.3	0.5						0.4	
std exp gill net	Bigmouth Buffalo											0.7	0.7
	Black Bullhead	16.0		3.3		32.7	62.7		30.7	170.7	56.0		53.2
	Black Crappie	1.5		2.7		34.0	15.7		0.3	1.3	6.0		8.8
	Common Carp	36.0		6.7		12.7	15.7		10.0	11.3	20.7		16.2
	Freshwater Drum										0.3		0.3
	Northern Pike						0.7		1.7	1.0	0.3		0.9
	Saugeye			6.3									6.3
	Walleye	4.5		47.3		1.3	0.3		2.0	3.7	13.3		10.3
	White Sucker						0.3		0.7				0.5
	Yellow Bullhead						0.3				0.3		0.3
	Yellow Perch						0.3		2.3	1.7	2.3		1.7
	std frame net (3/8 inch)	Black Bullhead									159.6	247.2	
Black Crappie										17.2	17.4		17.3
Common Carp										0.2	4.0		2.1
Green Sunfish											0.4		0.4
Northern Pike										0.4	1.6		1.0
Sunfish Hybrid											0.0		0.0
Walleye										0.6	1.0		0.8
White Sucker										0.8	1.6		1.2
Yellow Bullhead										1.4	5.2		3.3

		CPUE										
Gear	Species	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Avg
std frame net (20' x 1')	Yellow Perch									0.2	0.2	0.2

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											
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015		
large frame net	Black Crappie	PSD	98		30			1	78		100			
		PSD-P	58		26			0	0		91			
		Wr	98		114			96	103		92			
	Northern Pike	PSD	100						100		100			
		PSD-P	100							33	100			
		Wr	83							88	97			
	Walleye	PSD	15		9			75	0					
		PSD-P	8		0			50	0					
		Wr	86		92			91	98					
	Yellow Perch	PSD	100		100			100	80					
		PSD-P	0		100			0	0					
		Wr	83		86			101	89					
std exp gill net	Black Crappie	PSD	100		25			2	89		100	0	44	
		PSD-P	33		25			0	0		100	0	0	
		Wr	96		86			104	104		89	119	111	
	Northern Pike	PSD								100		60	67	100
		PSD-P								0		0	0	0
		Wr								95		88	98	91
	Walleye	PSD	22		0			25	100			67	45	83
		PSD-P	22		0			0	0			0	0	3
		Wr	87		87			102	96			79	99	92
	Yellow Perch	PSD								100		43	100	71
		PSD-P								0		14	80	0
		Wr								104		81	92	98
std frame net (3/8 inch)	Black Crappie	PSD										76	48	
		PSD-P										76	7	
		Wr										120	108	
	Northern Pike	PSD										50	88	
		PSD-P										0	25	
		Wr										105	92	
	Walleye	PSD										33	80	

Gear	Species	Index	Year										
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
std frame net (3/8 inch)	Walleye	PSD-P										0	20
		Wr										88	91
	Yellow Perch	PSD										100	100
		PSD-P										100	100
		Wr									107	77	

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+
2010	1998			186 (1998)							
2006	117		194 (2)	226 (17)	234 (13)	260 (82)	296 (3)				

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2010	4	286 (1)		371 (3)							
2006	9		322 (5)	379 (3)			615 (1)				

Fish Condition

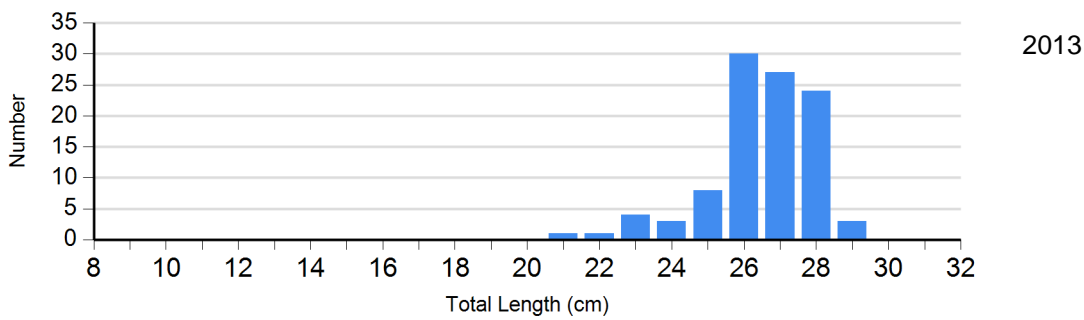
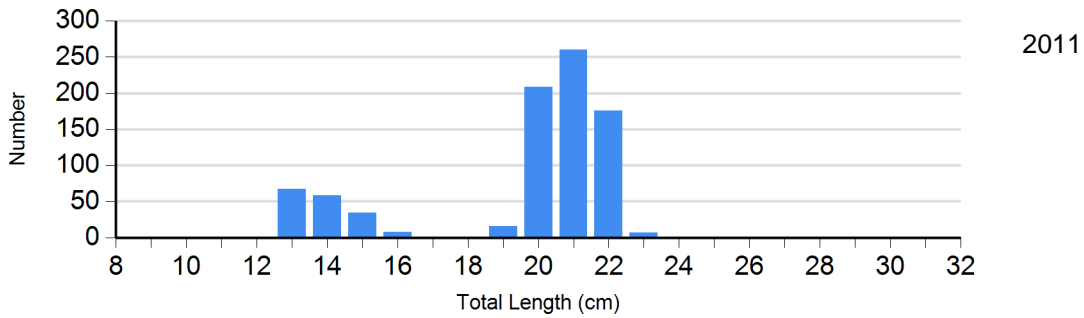
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2011	183	116 (1.3)	652	96 (0.4)	0		0	
	2013	0		9	99 (2.6)	92	91 (0.7)	0	
	2014	21	160 (12.1)	0		34	114 (1.1)	31	112 (0.7)
	2015	45	108 (1.3)	36	110 (1.5)	0		6	99 (1.9)
Northern Pike Gill Net	2011	0		2	95 (7.1)	0		0	
	2013	2	90 (11.5)	3	87 (2.1)	0		0	
	2014	1	102	2	96 (3.7)	0		0	
	2015	0		1	91	0		0	
Walleye Gill Net	2011	0		1	96	0		0	
	2013	2	76 (1.0)	4	81 (5.3)	0		0	
	2014	6	98 (3.3)	5	99 (3.4)	0		0	
	2015	7	87 (2.2)	32	93 (1.1)	1	91	0	
Yellow Perch Gill Net	2011	0		1	104	0		0	
	2013	4	81 (3.8)	2	79 (19.7)	1	87	0	
	2014	0		1	87	4	94 (0.7)	0	
	2015	2	108 (6.3)	5	94 (2.6)	0		0	

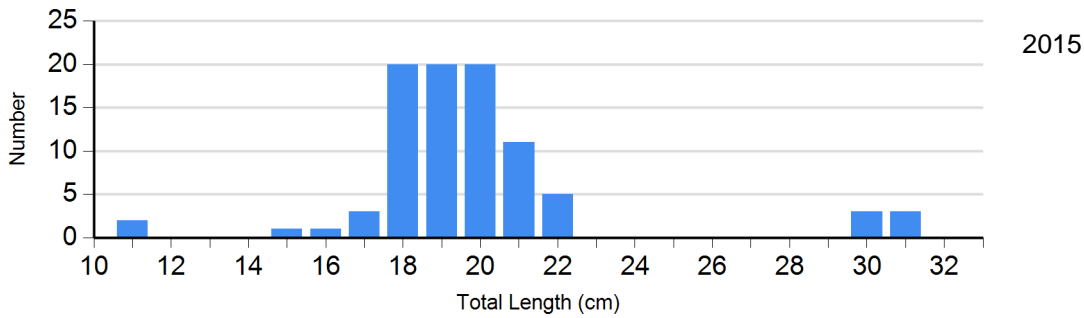
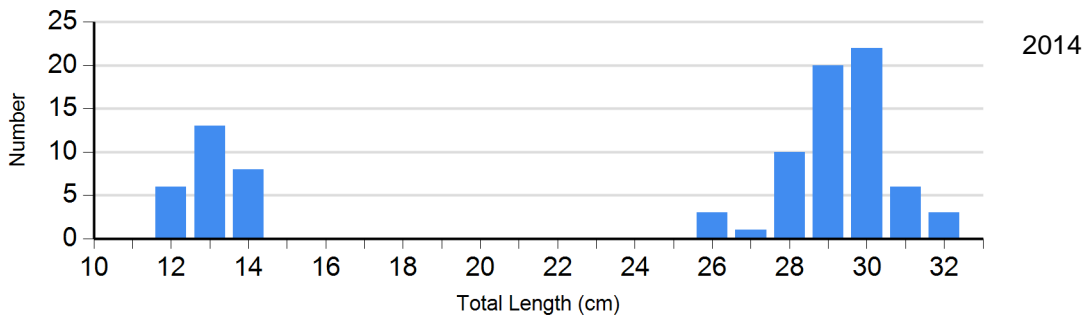
Length Frequency Distribution

Length frequency histogram of species sampled by year.

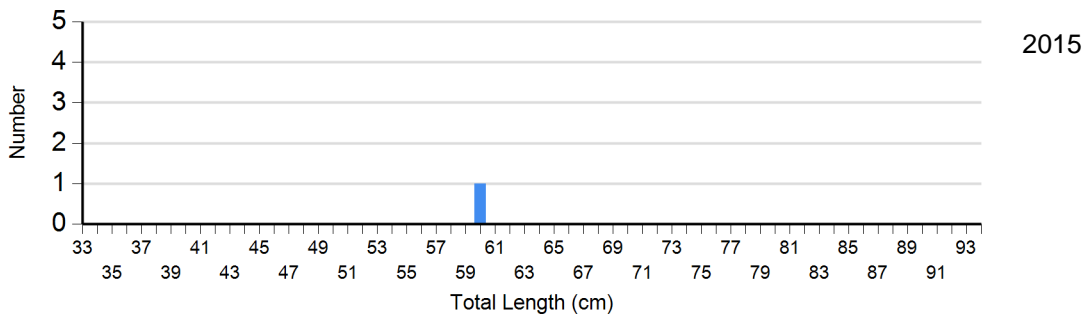
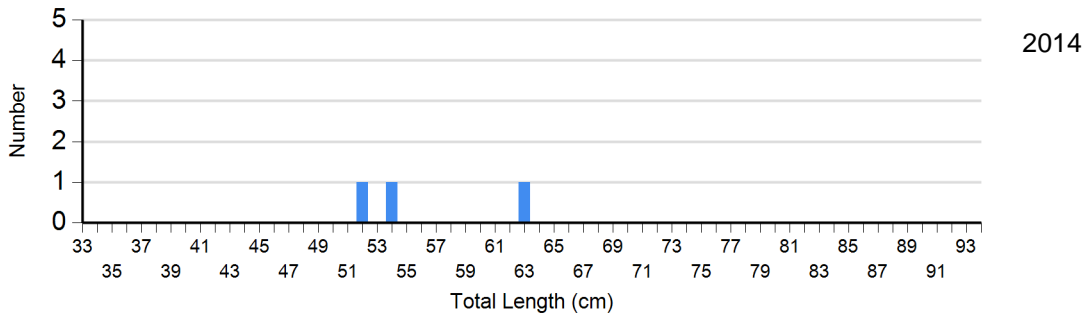
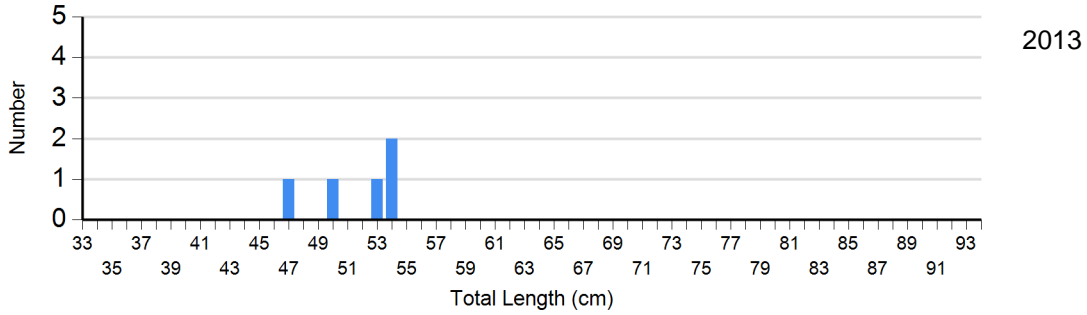
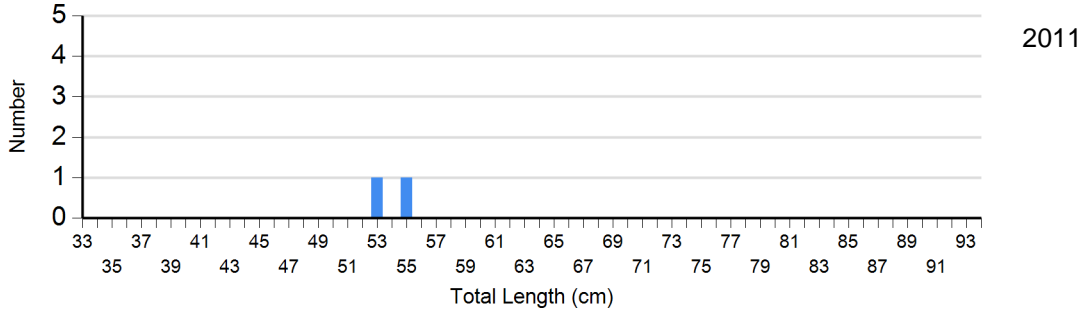
Species: Black Crappie
Gear: large frame net



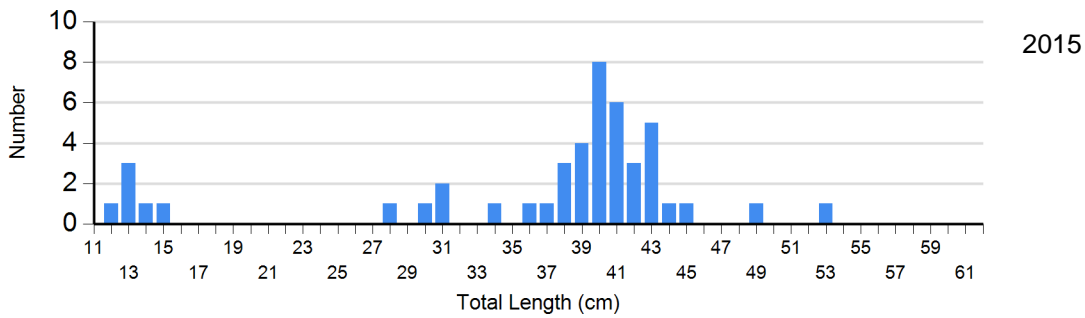
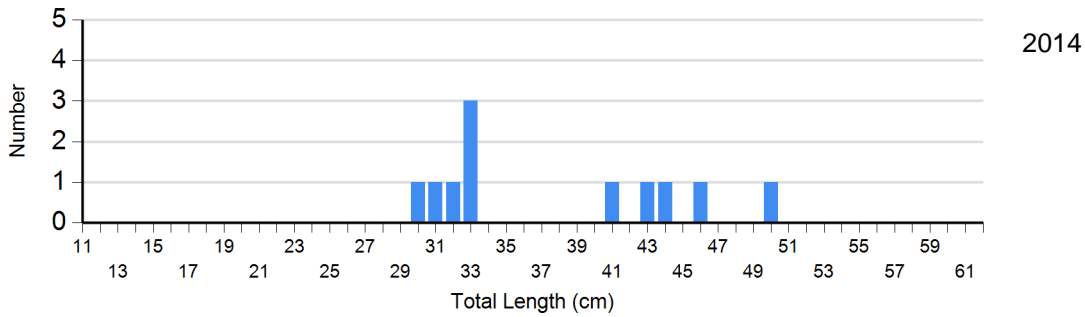
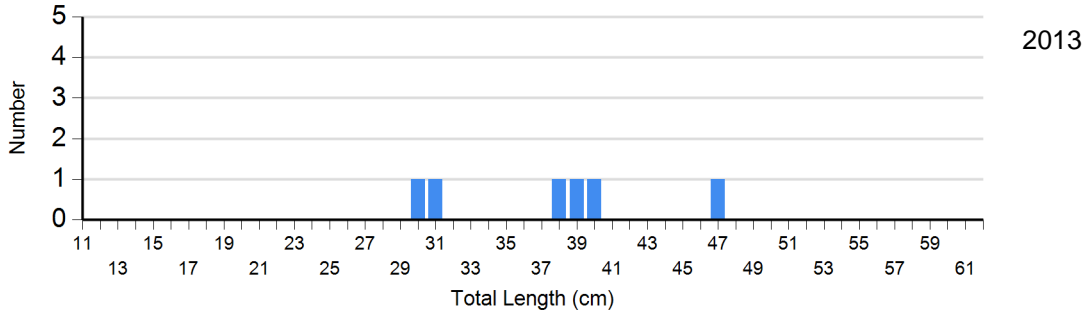
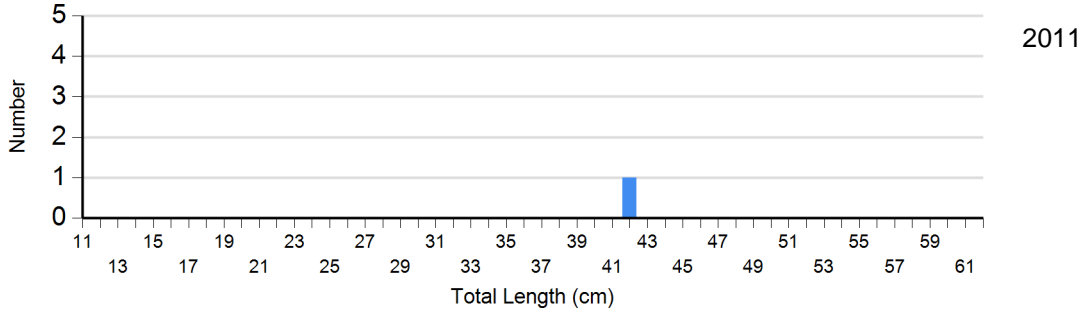
Species: Black Crappie
Gear: std frame net (3/8 inch)



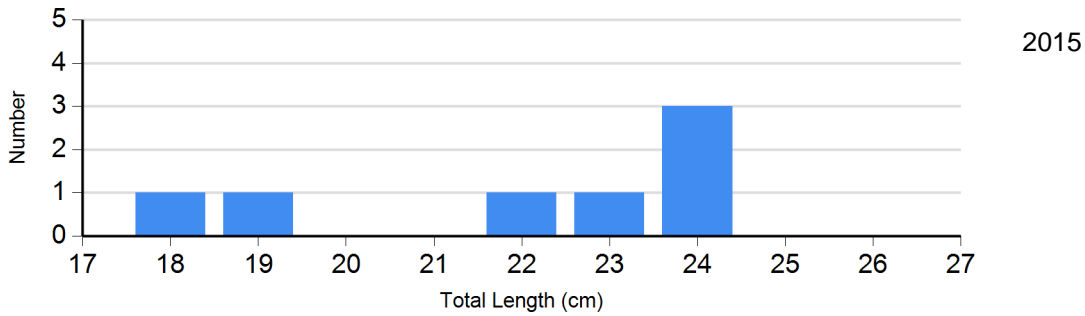
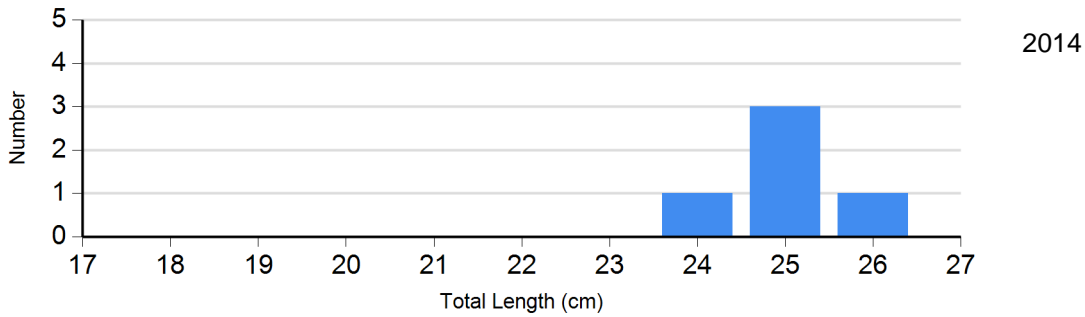
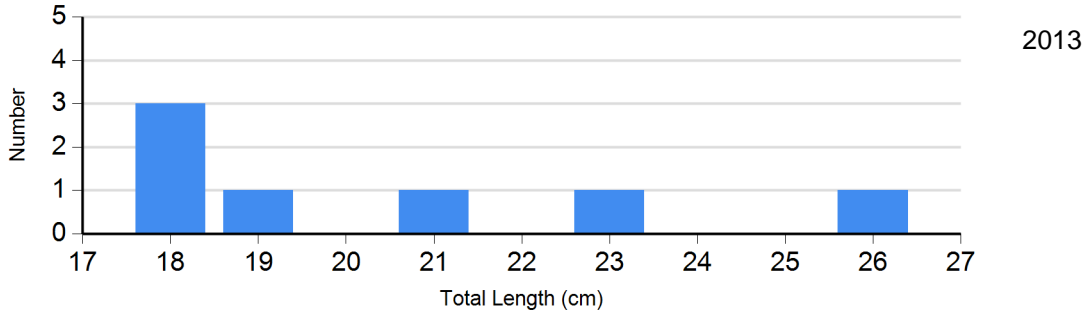
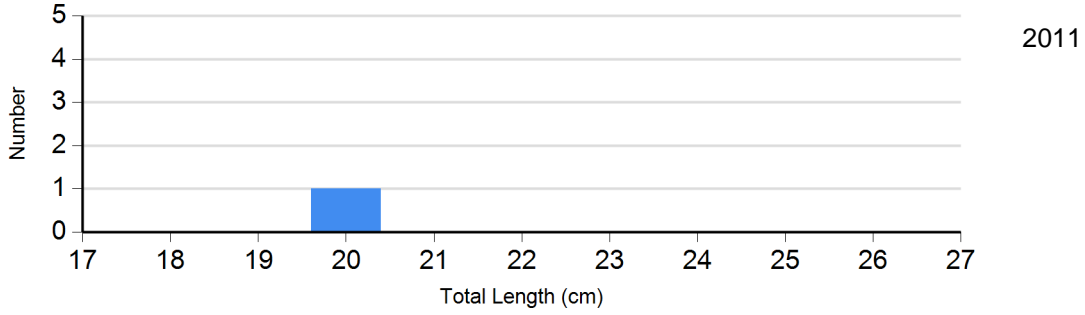
Species: Northern Pike
Gear: std exp gill net



Species: Walleye
Gear: std exp gill net



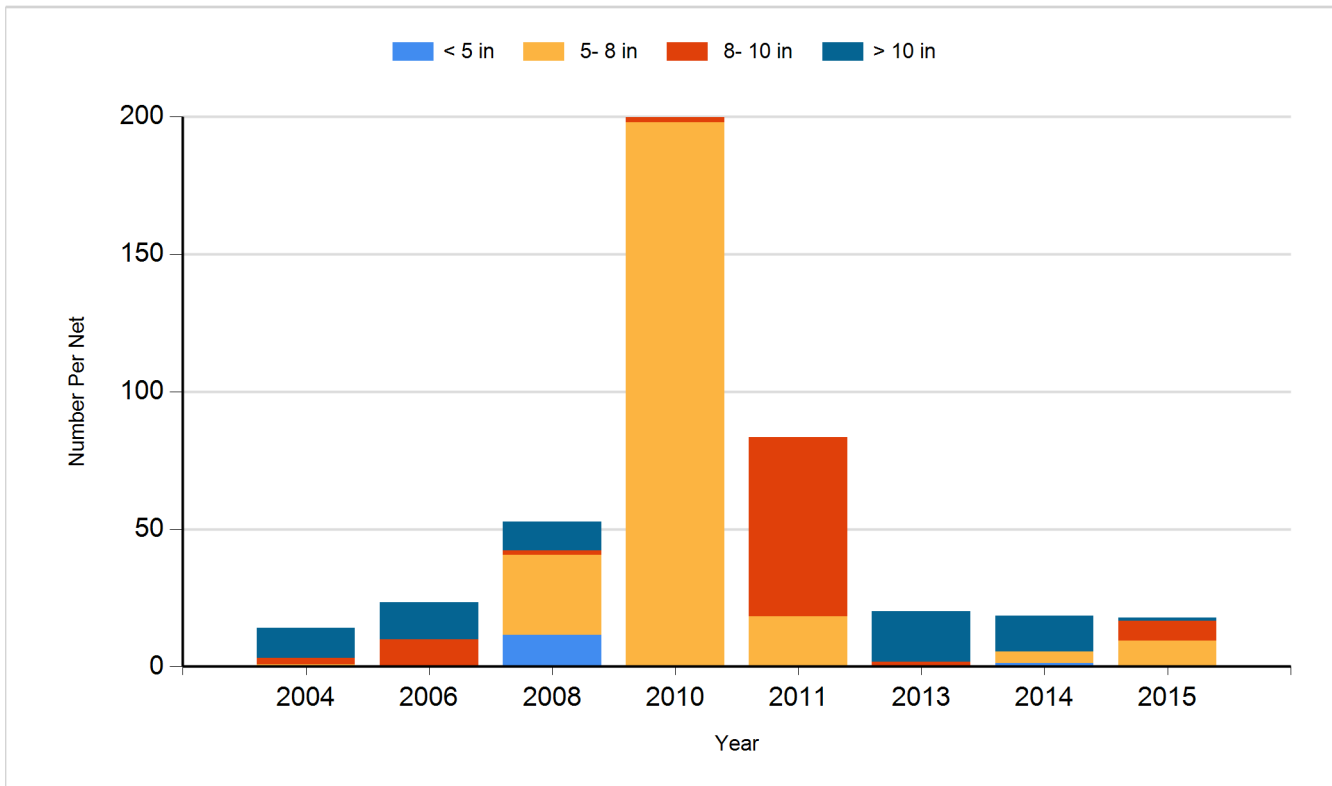
Species: Yellow Perch
Gear: std exp gill net



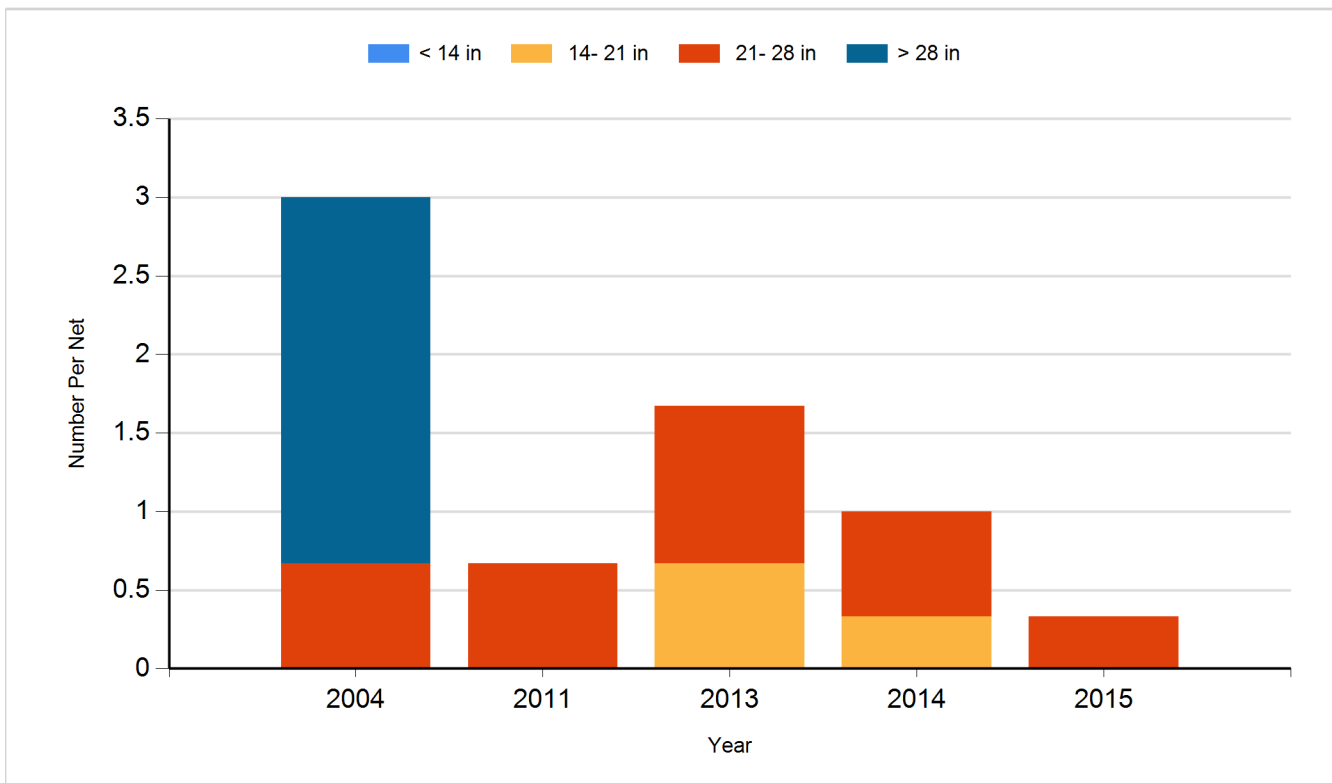
Historic Fish Sizes and Relative Abundance

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

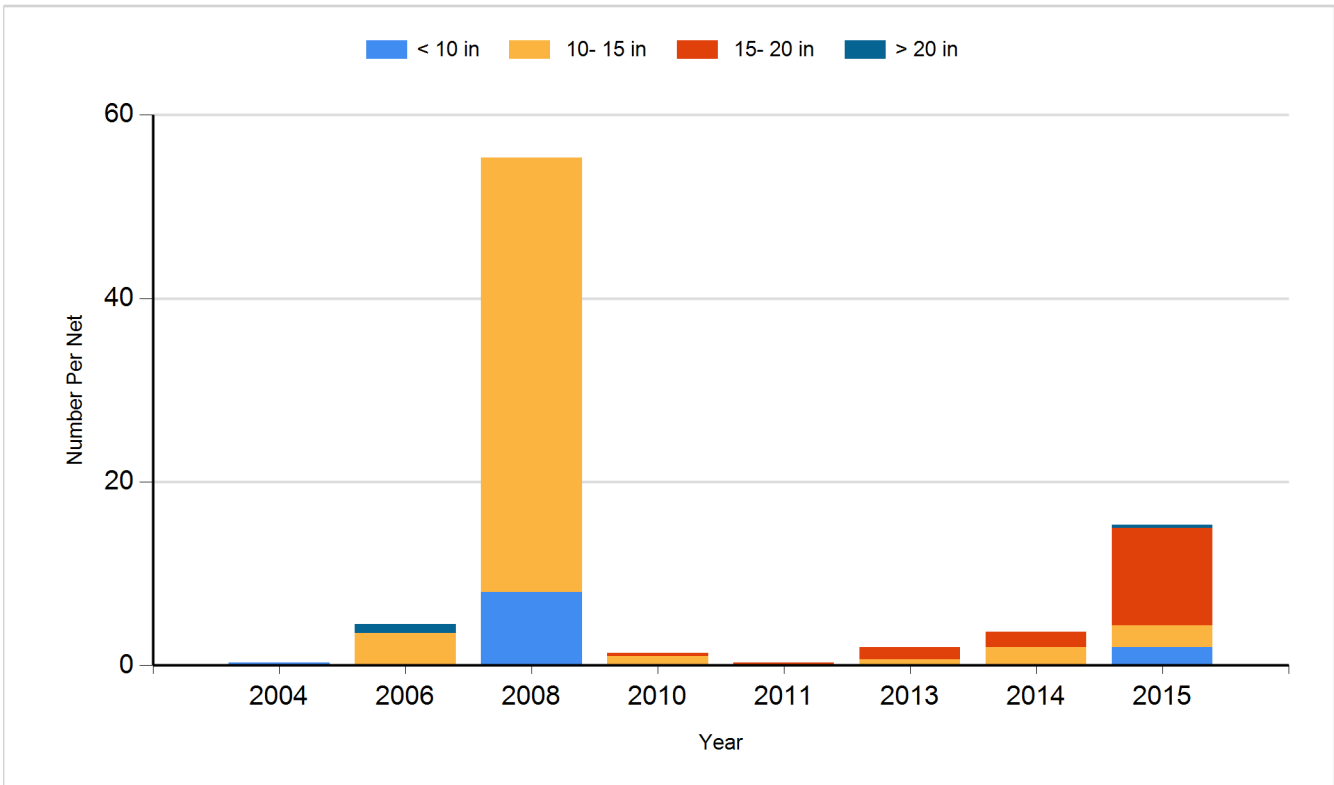
Species: Black Crappie
Gear: Frame Net



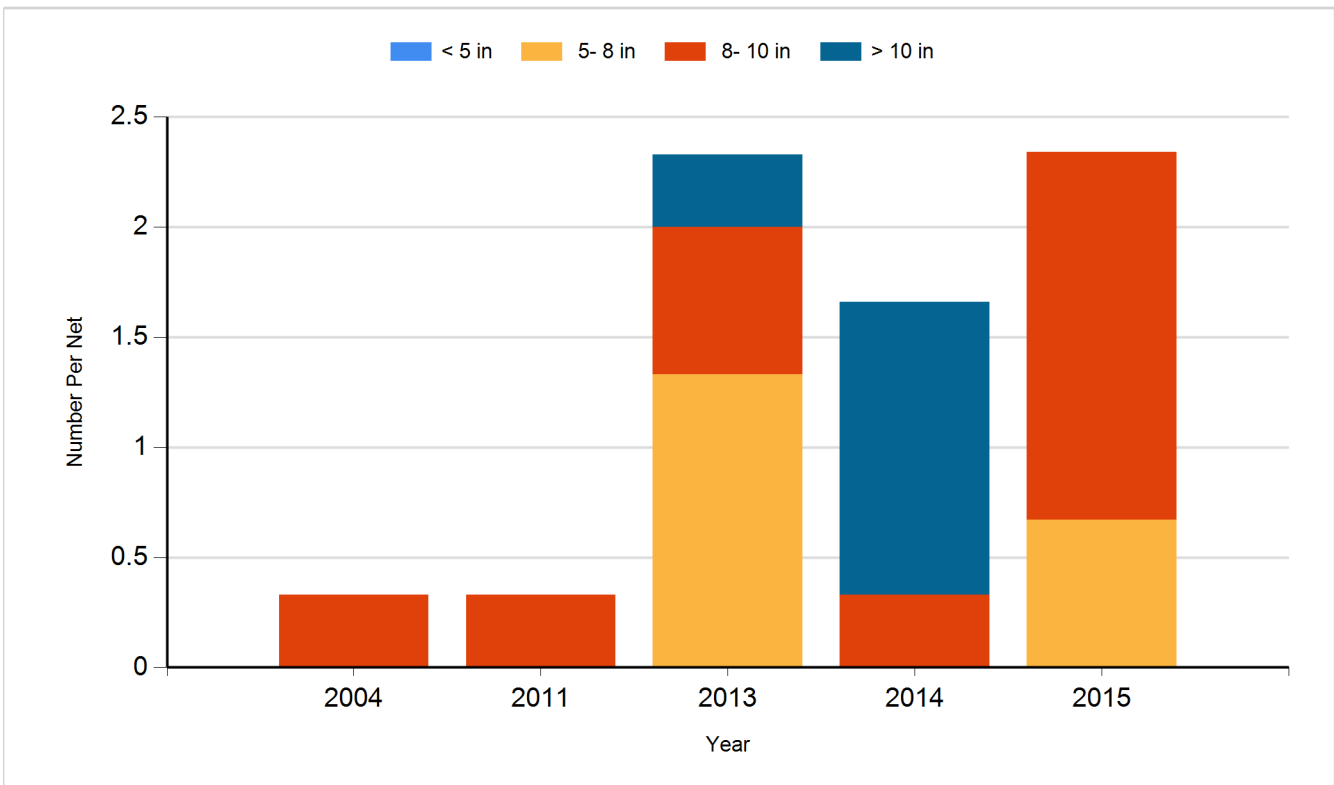
Species: Northern Pike
Gear: Gill Net



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
2007	Walleye	Small Fingerling	23,180
2011	Walleye	Small Fingerling	23,340
2012	Walleye	Small Fingerling	46,400
2014	Walleye	Fry	115,000
2015	Walleye	Small Fingerling	27,920