

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
White, Marshall County
WWR-Lake-42-000
2016

Lake Information

Name:	White	Maximum Depth:	20 Feet
County:	Marshall	Mean Depth:	8 Feet
Surface Area:	185 Acres		

Surveys and Investigations

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

Gear	Date	Effort
AFS std frame net	June 01, 2016	6 net-nights
AFS std frame net	June 02, 2016	6 net-nights
AFS std gill net	June 01, 2016	3 net-nights
AFS std gill net	June 02, 2016	3 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Black Crappie

Black Bullhead

White Sucker

Northern Pike

Common Carp

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
AFS std frame net	Black Bullhead	9.8	2.8	100		36	6	88	1
	Black Crappie	12.8	7.8	99		14	4	99	1
	Common Carp	0.5	0.3	100		83		87	17
	Northern Pike	0.1	0.1	100		100			
	Walleye	0.9	0.6	9		9		78	2
	White Sucker	8.5	4.0	100		100		93	1
	Yellow Perch	2.5	1.2	90		20	12	90	2
AFS std gill net	Black Bullhead	12.0	4.0	100		31	8	92	1
	Black Crappie	1.0	0.9	100		17		99	4
	Common Carp	0.3	0.3	100		50		99	1
	Northern Pike	0.5	0.5	67		67		101	8
	Walleye	3.0	0.8	61	19	33	18	78	2
	White Sucker	7.2	3.0	100		100		102	1
	Yellow Perch	7.8	4.1	98		23	9	94	1

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	
AFS std frame net	Black Bullhead										9.8	9.8
	Black Crappie										12.8	12.8
	Common Carp										0.5	0.5
	Northern Pike										0.1	0.1
	Walleye										0.9	0.9
	White Sucker										8.5	8.5
	Yellow Perch										2.5	2.5
AFS std gill net	Black Bullhead										12.0	12.0
	Black Crappie										1.0	1.0
	Common Carp										0.3	0.3
	Northern Pike										0.5	0.5
	Walleye										3.0	3.0
	White Sucker										7.2	7.2
	Yellow Perch										7.8	7.8
frame net (std 3/4 in)	Black Bullhead		14.5				114.4					64.5
	Black Crappie		47.3				166.9					107.1
	Northern Pike		0.2									0.2
	Walleye		2.5				0.3					1.4
	Western Painted Turtle		0.0									0.0
	White Sucker		3.3				3.9					3.6
	Yellow Perch		0.6				2.4					1.5
std exp gill net	Black Bullhead	8.7	25.0				89.7					41.1
	Black Crappie	4.7	3.7				0.0					2.8
	Common Carp	4.3	0.3				0.3					1.6
	Northern Pike	0.3	1.7				0.7					0.9
	Walleye	1.3	10.0				5.3					5.5
	White Sucker	3.0	3.3				3.7					3.3
	Yellow Perch	7.7	18.0				17.7					14.5

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		
AFS std frame net	Black Crappie	PSD											99	
		PSD-P											14	
		Wr											99	
	Northern Pike	PSD												100
		PSD-P												100
		Wr												
	Walleye	PSD												9
		PSD-P												9
		Wr												78
	Yellow Perch	PSD												90
		PSD-P												20
		Wr												90
AFS std gill net	Black Crappie	PSD											100	
		PSD-P											17	
		Wr											99	
	Northern Pike	PSD												67
		PSD-P												67
		Wr												101
	Walleye	PSD												61
		PSD-P												33
		Wr												78
	Yellow Perch	PSD												98
		PSD-P												23
		Wr												94
frame net (std 3/4 in)	Black Crappie	PSD		99						40				
		PSD-P		18						17				
		Wr		94						114				
	Northern Pike	PSD		100										
		PSD-P		100										
		Wr		89										
	Walleye	PSD		3						0				
		PSD-P		0						0				

Gear	Species	Index	Year									
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
frame net (std 3/4 in)	Walleye	Wr		82					88			
	Yellow Perch	PSD		100					69			
		PSD-P		29					0			
		Wr		93					99			
std exp gill net	Black Crappie	PSD	50	100					0			
		PSD-P	0	27					0			
		Wr	104	97								
	Northern Pike	PSD	0	100					100			
		PSD-P	0	40					50			
		Wr	90	91					97			
	Walleye	PSD	50	3					75			
		PSD-P	25	0					6			
		Wr	84	88					89			
	Yellow Perch	PSD	43	72					70			
		PSD-P	4	2					2			
		Wr	94	102					107			

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+
2016	153			229 (134)		282 (6)	292 (13)				
2012	2003		194 (1657)			290 (40)	290 (20)	312 (172)	297 (38)	309 (79)	
2008	567			215 (194)	233 (264)	261 (56)	274 (27)	284 (2)		255 (17)	301 (8)

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2016	18		271 (2)	343 (6)	382 (1)		524 (5)	603 (4)			
2012	16		333 (3)	412 (6)	459 (5)	454 (1)		520 (1)			
2008	32	209 (2)	286 (7)	343 (23)							
2007	3		322 (1)	330 (1)		498 (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+
2016	47		191 (2)	236 (33)		260 (8)	266 (4)				
2012	55	104 (2)	195 (24)	223 (26)	237 (3)						

Fish Condition

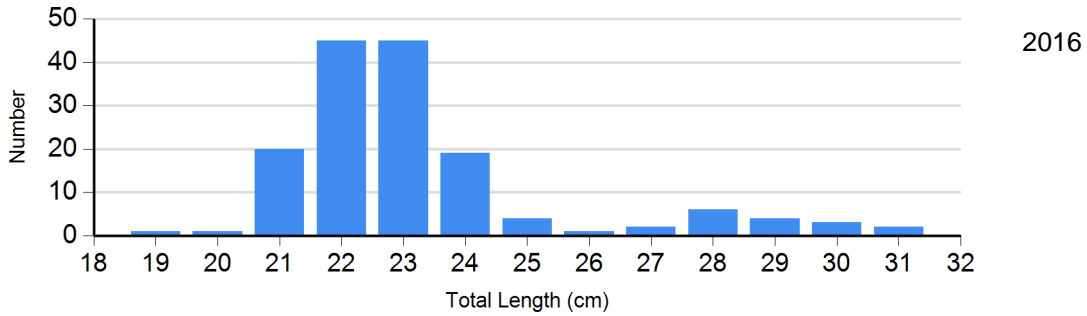
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2012	1202	121 (0.6)	455	115 (0.6)	86	97 (1.1)	260	92 (0.5)
	2016	1	89	130	101 (0.5)	17	89 (1.4)	5	86 (1.3)
Northern Pike Gill Net	2012	0		1	100	1	94	0	
	2016	1	89	0		0		2	107 (4.7)
Walleye Gill Net	2012	4	92 (2.2)	11	88 (1.6)	1	78	0	
	2016	7	81 (1.7)	5	72 (1.7)	4	78 (4.2)	2	84 (6.0)
Yellow Perch Gill Net	2012	16	109 (2.1)	36	107 (1.1)	1	94	0	
	2016	1	91	35	95 (1.2)	11	90 (2.3)	0	

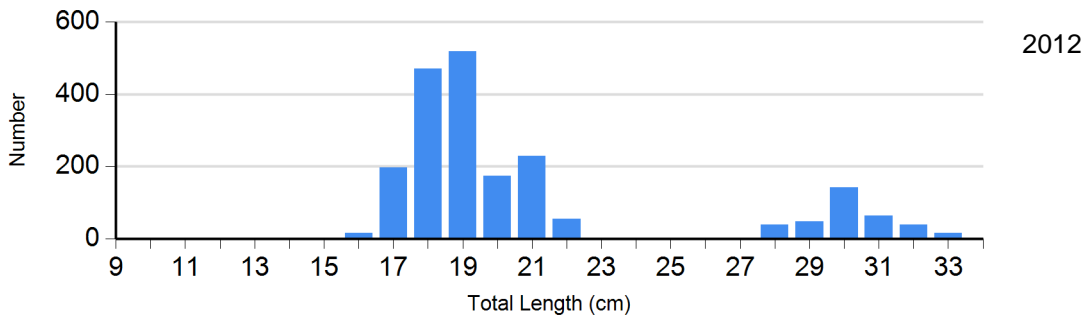
Length Frequency Distribution

Length frequency histogram of species sampled by year.

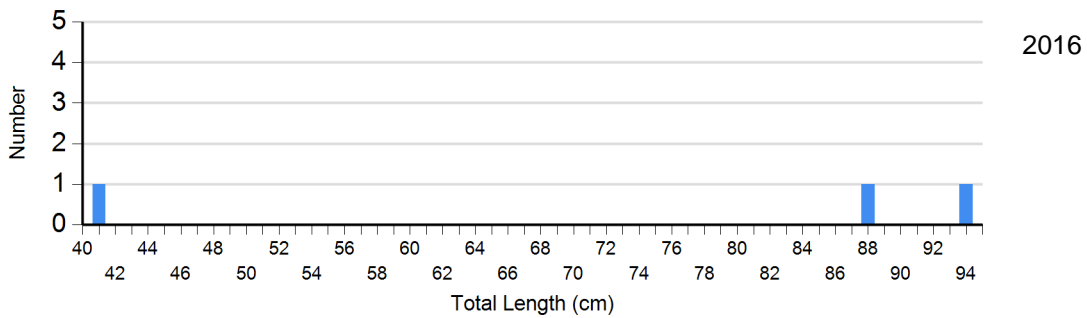
Species: Black Crappie
Gear: AFS std frame net



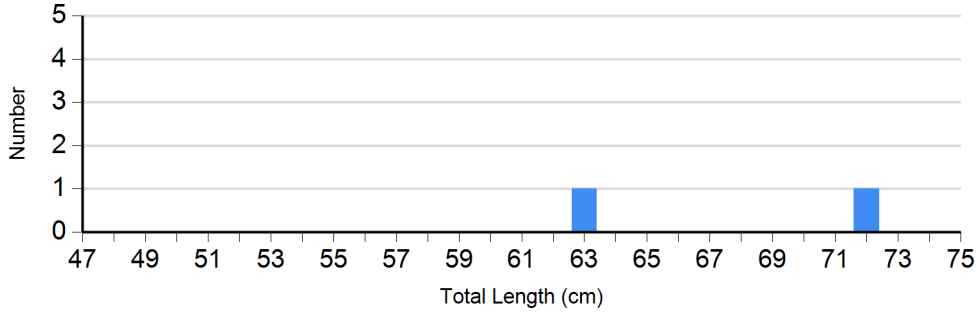
Species: Black Crappie
Gear: frame net (std 3/4 in)



Species: Northern Pike
Gear: AFS std gill net

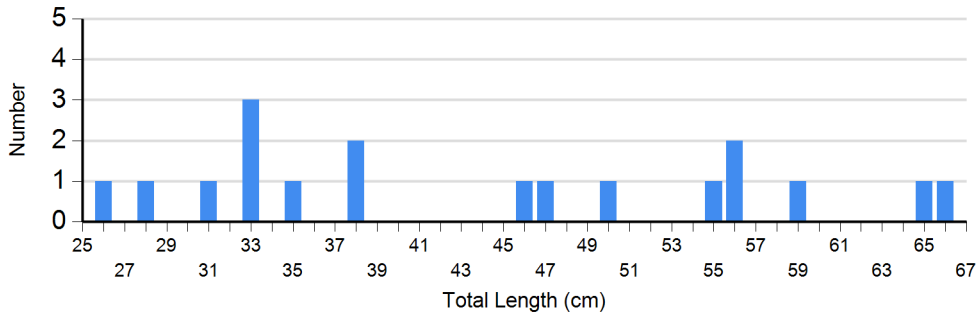


Species: Northern Pike
Gear: std exp gill net



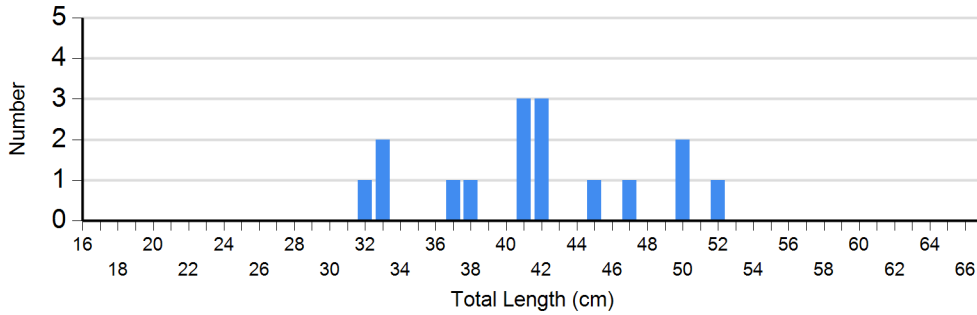
2012

Species: Walleye
Gear: AFS std gill net



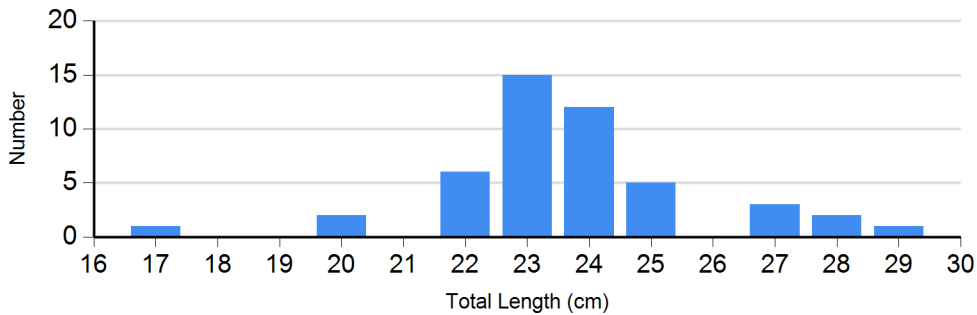
2016

Species: Walleye
Gear: std exp gill net



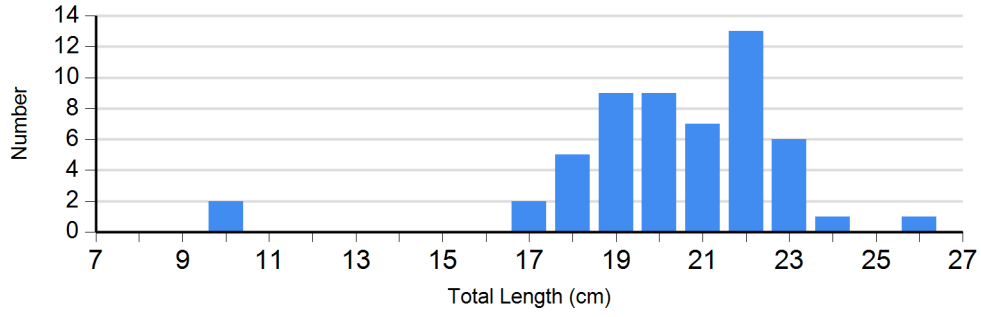
2012

Species: Yellow Perch
Gear: AFS std gill net



2016

Species: Yellow Perch
Gear: std exp gill net

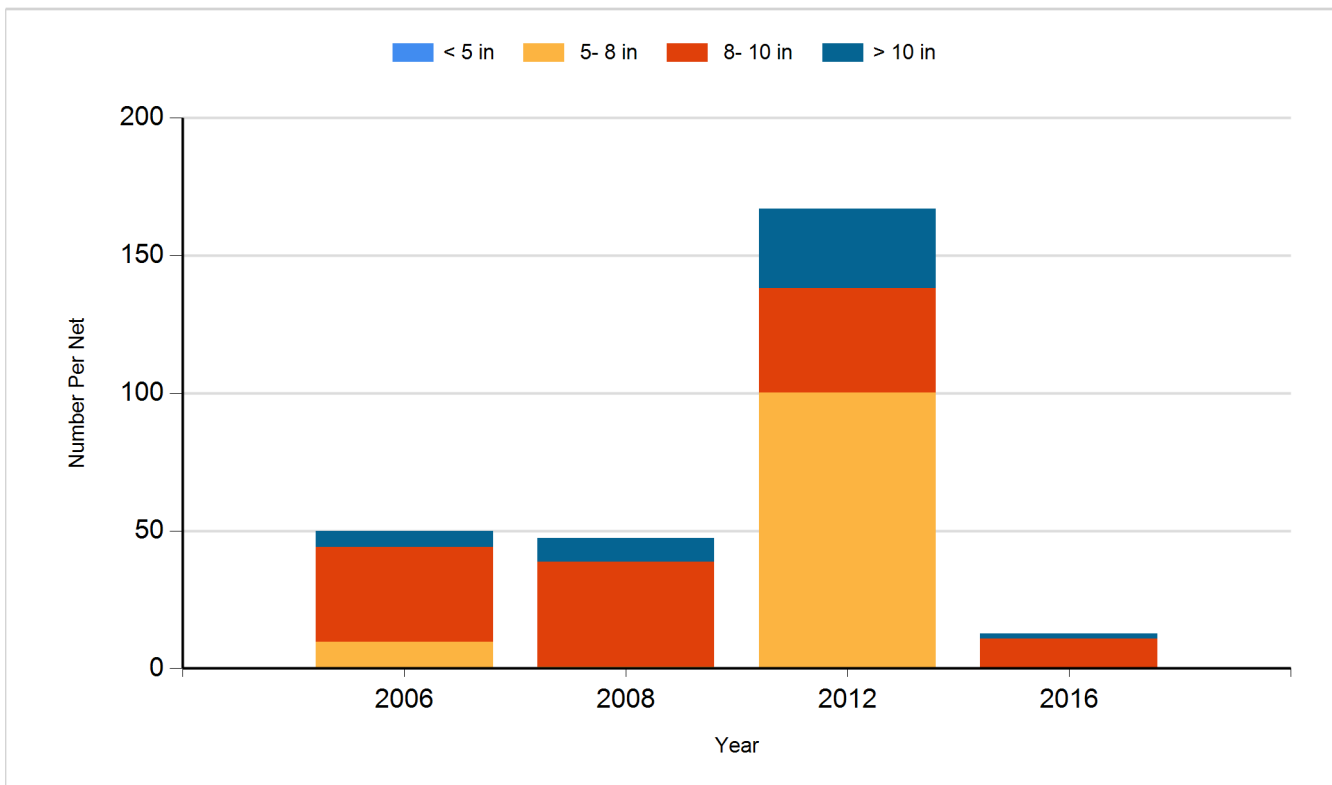


2012

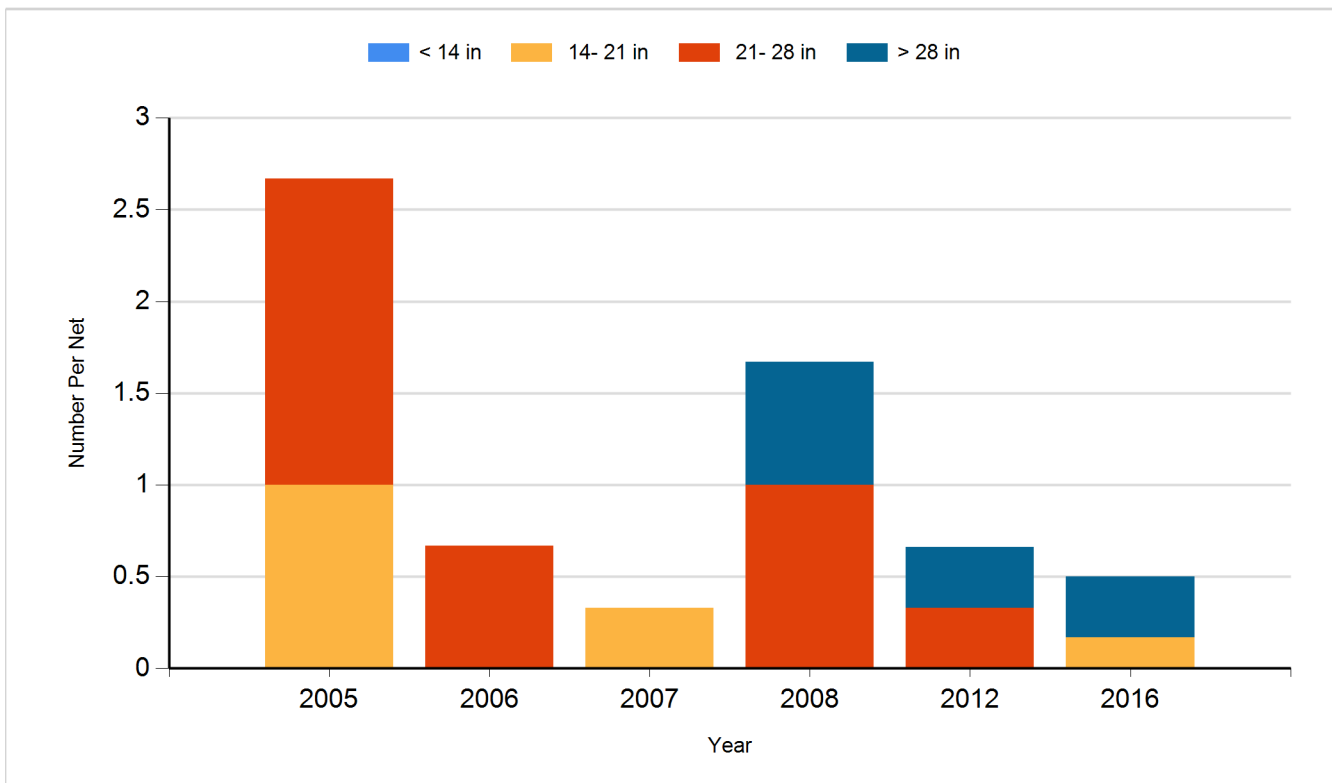
Historic Fish Sizes and Relative Abundance

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

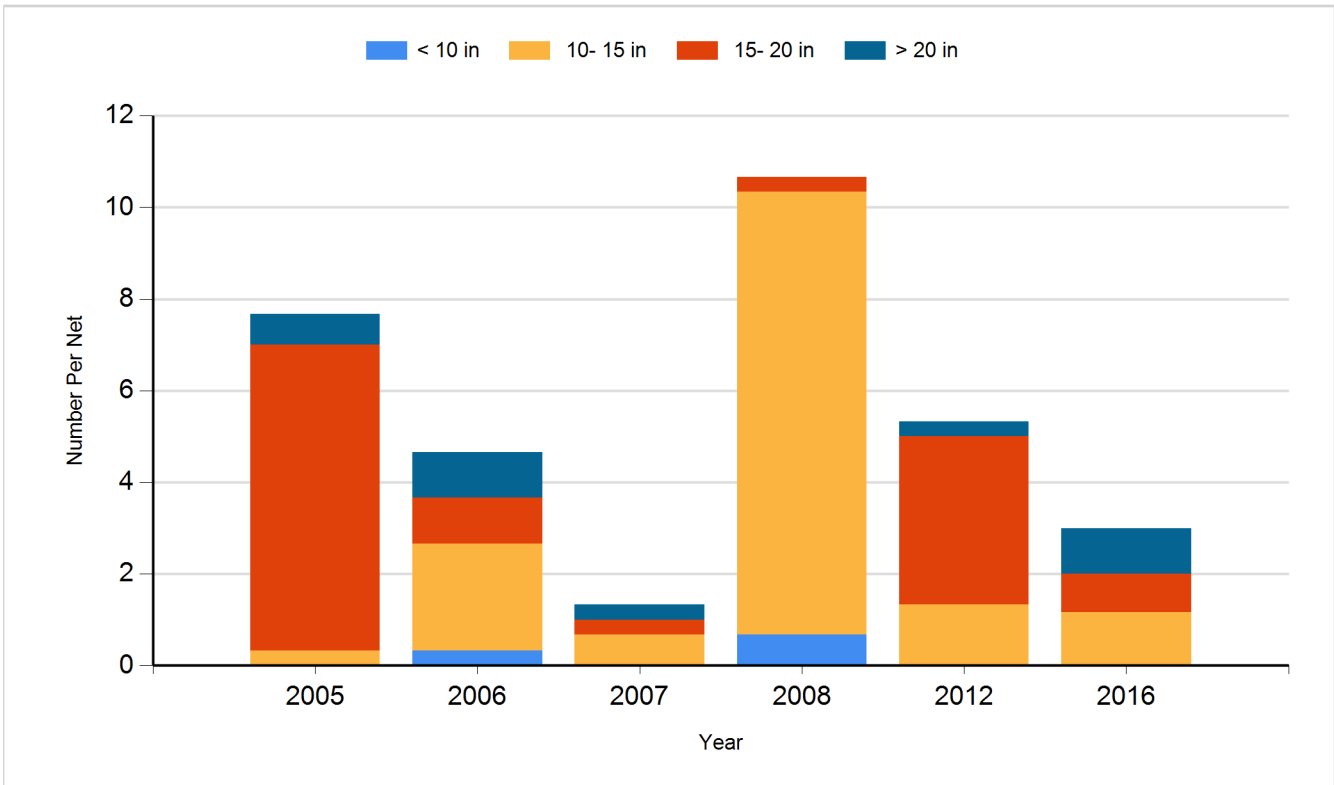
Species: Black Crappie
Gear: Frame Net



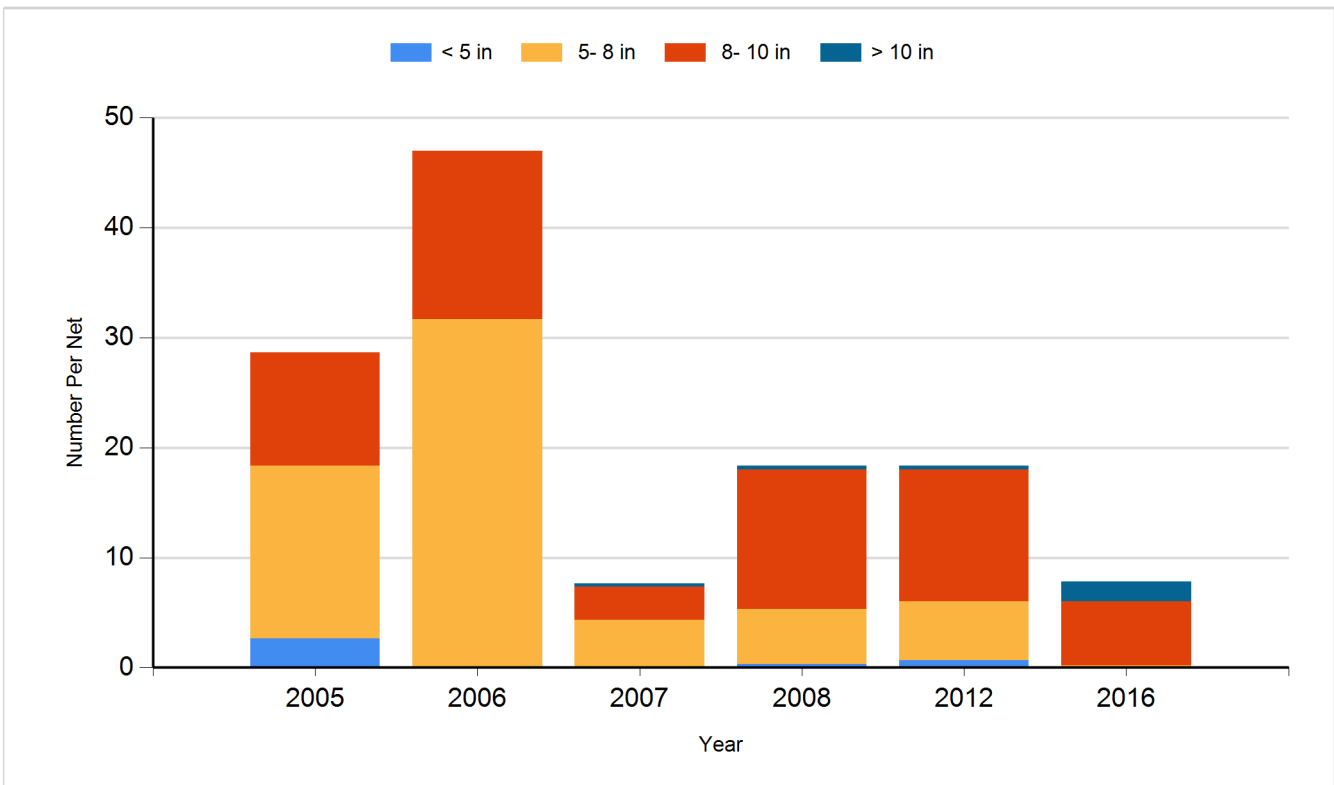
Species: Northern Pike
Gear: Gill Net



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	10,230
2006	Walleye	Small Fingerling	19,000
2008	Walleye	Fry	250,000
2010	Walleye	Small Fingerling	23,540
2012	Walleye	Fry	200,000
2014	Walleye	Fry	100,000
2016	Saugeye	Small Fingerling	9,680