

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Hurley, Potter County
LLO-Lake-2201-000
2017

Lake Information

Name:	Hurley	Maximum Depth:	29 Feet
County:	Potter	Mean Depth:	12 Feet
Legal Description:	T11-R77-S28		
Surface Area:	97 Acres		

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

Yellow Perch

Walleye

Largemouth Bass

Bluegill

Black Bullhead

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).

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

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	59.8	13.8	0		0		85	1
	Black Crappie	10.2	4.7	0		0		117	1
	Bluegill	2.8	1.7	86		4		115	3
	Largemouth Bass	0.1	0.1	100		100		102	
	Northern Pike	0.9	0.4	67		11		79	3
	Walleye	0.2	0.2	50		50		93	5
	Yellow Perch	1.8	0.6	89		0		103	2
AFS std gill net	Black Bullhead	38.3	16.6	0		0		97	1
	Black Crappie	5.0	3.2	0		0		110	2
	Largemouth Bass	0.5	0.5	100		50		101	14
	Northern Pike	5.5	1.1	95		14		84	2
	Walleye	1.0	1.6	100		75		82	4
	Yellow Perch	1.5	1.1	67		0		111	3
boat shocker (night)	Largemouth Bass	32.0	31.0	100		88		111	2

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
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
AFS std frame net	Black Bullhead										59.8	59.8
	Black Crappie										10.2	10.2
	Bluegill										2.8	2.8
	Largemouth Bass										0.1	0.1
	Northern Pike										0.9	0.9
	Walleye										0.2	0.2
	Yellow Perch										1.8	1.8
AFS std gill net	Black Bullhead										38.3	38.3
	Black Crappie										5.0	5.0
	Largemouth Bass										0.5	0.5
	Northern Pike										5.5	5.5
	Walleye										1.0	1.0
	Yellow Perch										1.5	1.5
boat shocker (night)	Largemouth Bass	12.0			8.0			22.0			32.0	18.5
	Walleye	1.2			8.0							4.6
frame net (std 3/4 in)	Black Bullhead	1.8			9.8		10.0					7.2
	Black Crappie	3.8			1.0		0.2					1.7
	Bluegill	4.9			4.9		0.7					3.5
	Golden Shiner	0.0										0.0
	Largemouth Bass	0.0										0.0
	Northern Pike	0.6			2.7		1.1					1.5
	Walleye	0.2					0.2					0.2
	Yellow Perch	7.2			0.9		0.1					2.7
std exp gill net	Black Bullhead				6.5		28.0					17.3
	Northern Pike	1.5			2.5		5.5					3.2
	Walleye	0.5					1.5					1.0
	Yellow Perch	22.0					1.0					11.5

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										
			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
AFS std frame net	Black Crappie	PSD											0
		PSD-P											0
		Wr											117
	Northern Pike	PSD											67
		PSD-P											11
		Wr											79
	Walleye	PSD											50
		PSD-P											50
		Wr											93
Yellow Perch	PSD											89	
	PSD-P											0	
	Wr											103	
AFS std gill net	Black Crappie	PSD										0	
		PSD-P										0	
		Wr										110	
	Northern Pike	PSD										95	
		PSD-P										14	
		Wr										84	
	Walleye	PSD										100	
		PSD-P										75	
		Wr										82	
Yellow Perch	PSD										67		
	PSD-P										0		
	Wr										111		
boat shocker (night)	Walleye	PSD	100			67							
		PSD-P	50			0							
		Wr	101			88							
frame net (std 3/4 in)	Black Crappie	PSD	0			80		100					
		PSD-P	0			30		100					
		Wr	109			102		98					
	Northern Pike	PSD	100			70		91					

Gear	Species	Index	Year										
			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
frame net (std 3/4 in)	Northern Pike	PSD-P	17			15		9					
		Wr	91			86		82					
	Walleye	PSD	50					50					
		PSD-P	50					0					
		Wr	92					76					
		Yellow Perch	PSD	1			33		100				
	PSD-P		0			33		0					
	Wr		95			101		107					
	std exp gill net	Northern Pike	PSD	100			80		100				
			PSD-P	0			20		9				
			Wr	88			86		82				
		Walleye	PSD	0					100				
PSD-P			0					33					
Wr			91					84					
Yellow Perch		PSD	0					100					
		PSD-P	0					0					
		Wr	104					119					

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		
2016	1	1	70											
2014	3	6	79 (2.2)	119 (3.5)	151 (5.5)									
2014	3	23	77 (1.3)	115 (1.8)	146 (2.2)									
2013	4	1	74	91	108	139								
Weighted Mean		31	77	115	146	139								
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20		
2016	1	1												
2014	3	6												
2014	3	23												
2013	4	1												
Weighted Mean		31												

Species: Walleye

Year Class	Age	N	Mean back-calculated length (SE) at age											
			1	2	3	4	5	6	7	8	9	10		
2014	3	1	165	347	429									
2014	3	1	250	320	332									
2012	5	1	190	312	434	511	538							
2012	5	1	207	322	434	499	513							
2010	7	2	165 (9.2)	294 (21)	392 (13.4)	450 (14.2)	560 (14.5)	613 (3.9)	623 (2)					
Weighted Mean		6	190	315	402	478	543	613	623					
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20		
2014	3	1												
2014	3	1												
2012	5	1												
2012	5	1												
2010	7	2												
Weighted Mean		6												

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	1	93												
2014	3	4	91 (4.6)	134 (4.2)	173 (5)										
2014	3	8	82 (5)	130 (6.3)	182 (5.5)										
2013	4	1	78	114	149	186									
2013	4	9	96 (4.5)	138 (3.7)	170 (2.3)	204 (3)									
Weighted Mean		23	89	133	174	202									
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20			
2016	1	1													
2014	3	4													
2014	3	8													
2013	4	1													
2013	4	9													
Weighted Mean		23													

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	103	94 (1)		162 (102)							
2013	4				250 (2)				275 (2)		
2011	20			206 (14)	269 (4)	266 (2)					
2008	78		142 (72)	191 (6)							

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	4			446 (1)		521 (1)		628 (2)			
2013	6			448 (4)	540 (2)						
2008	2		305 (2)								

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	5			204 (4)	216 (1)						
2013	4				210 (4)						
2008	18		154 (18)								

Fish Condition

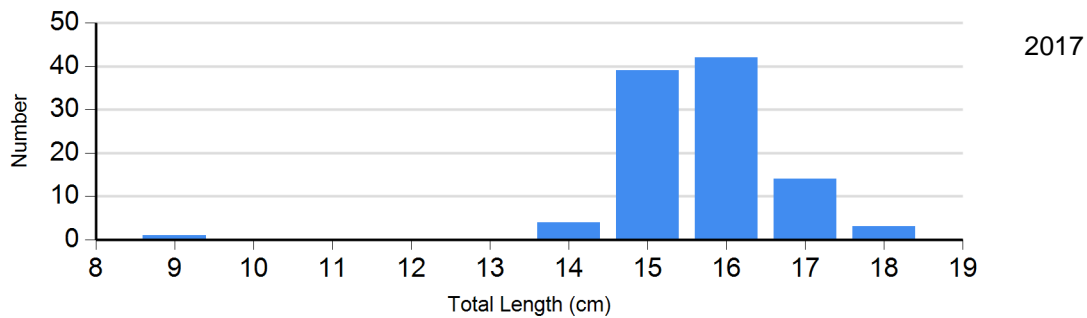
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	0		0		4	98 (1.9)	0	
	2017	102	117 (0.7)	0		0		0	
Northern Pike Gill Net	2013	0		20	83 (2.1)	2	80 (0.0)	0	
	2017	1	79	18	84 (1.7)	3	88 (3.3)	0	
Walleye Gill Net	2013	0		4	87 (0.6)	2	77 (0.0)	0	
	2017	0		1	77	2	83 (5.5)	1	86
Yellow Perch Gill Net	2013	0		4	119 (0.0)	0		0	
	2017	2	113 (0.9)	4	110 (3.4)	0		0	

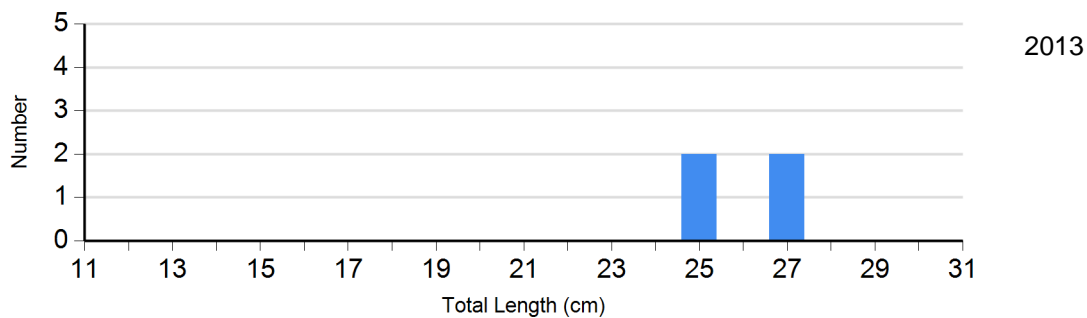
Length Frequency Distribution

Length frequency histogram of species sampled by year.

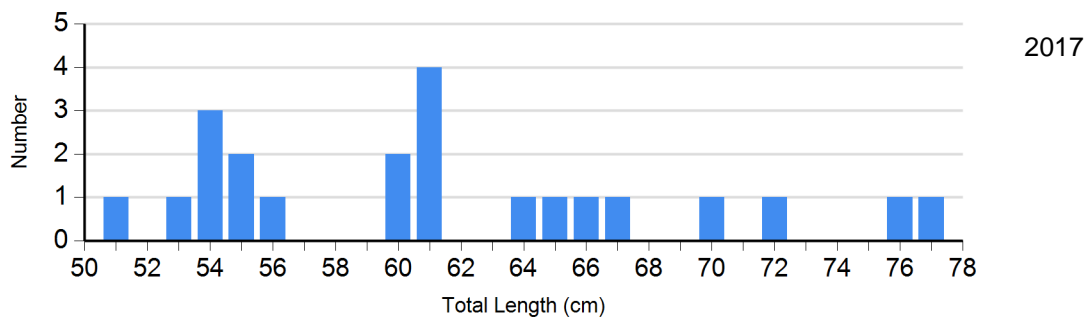
Species: Black Crappie
Gear: AFS std frame net



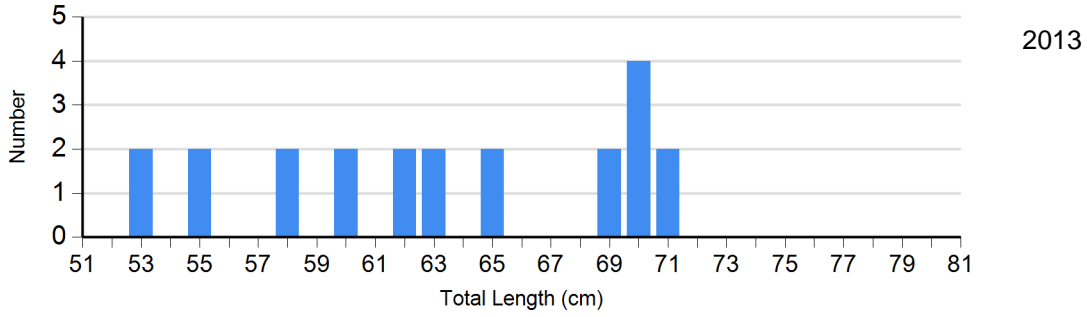
Species: Black Crappie
Gear: frame net (std 3/4 in)



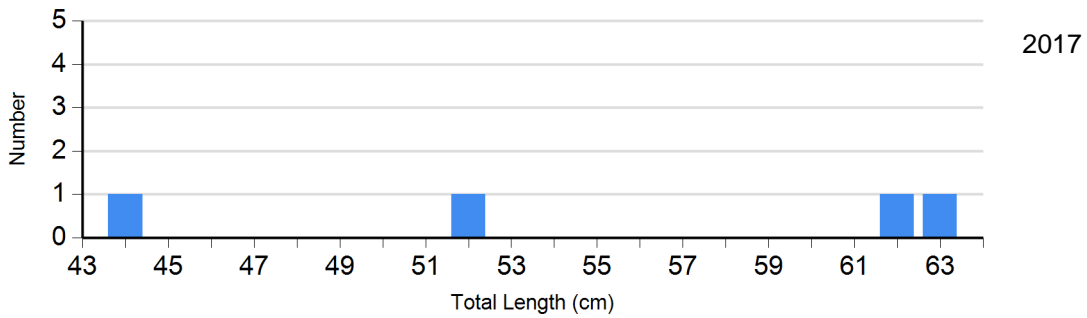
Species: Northern Pike
Gear: AFS std gill net



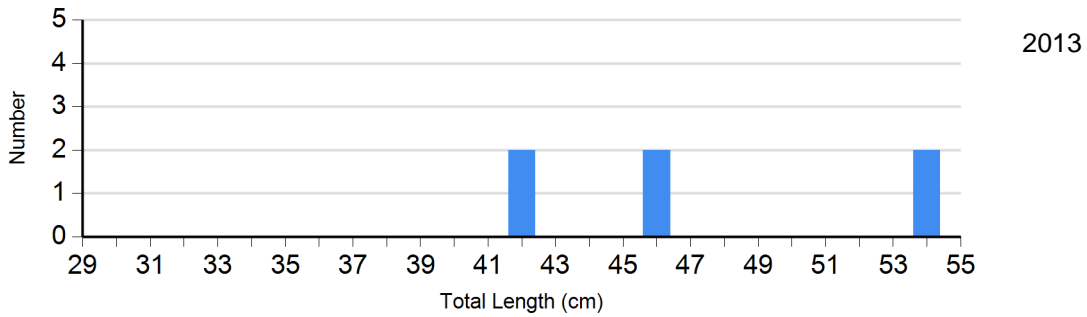
Species: Northern Pike
Gear: std exp gill net



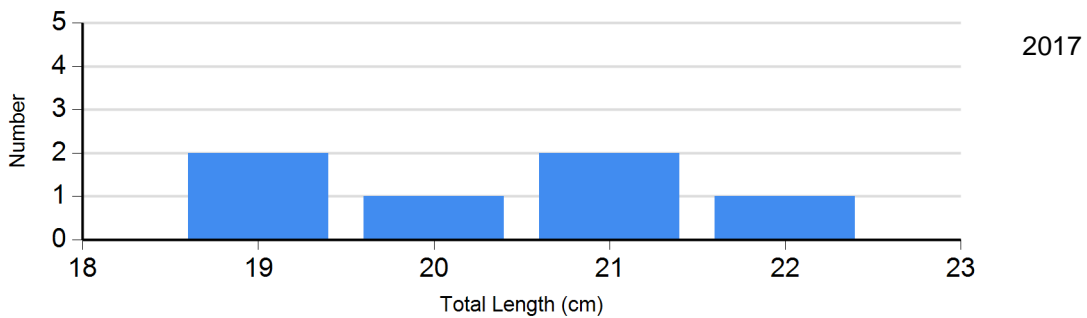
Species: Walleye
Gear: AFS std gill net



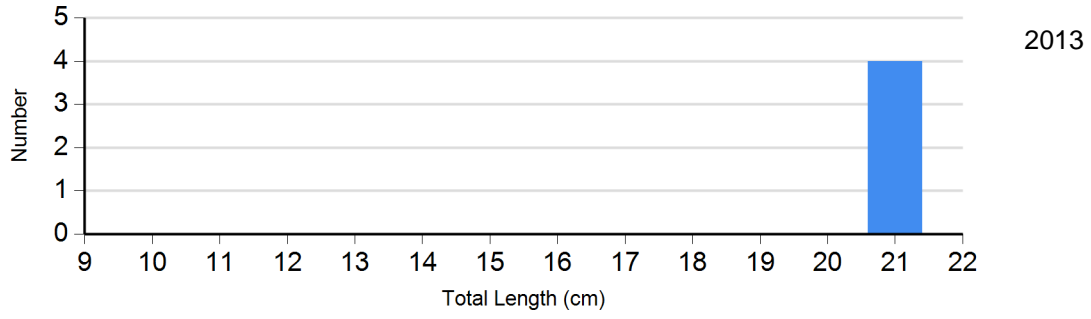
Species: Walleye
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



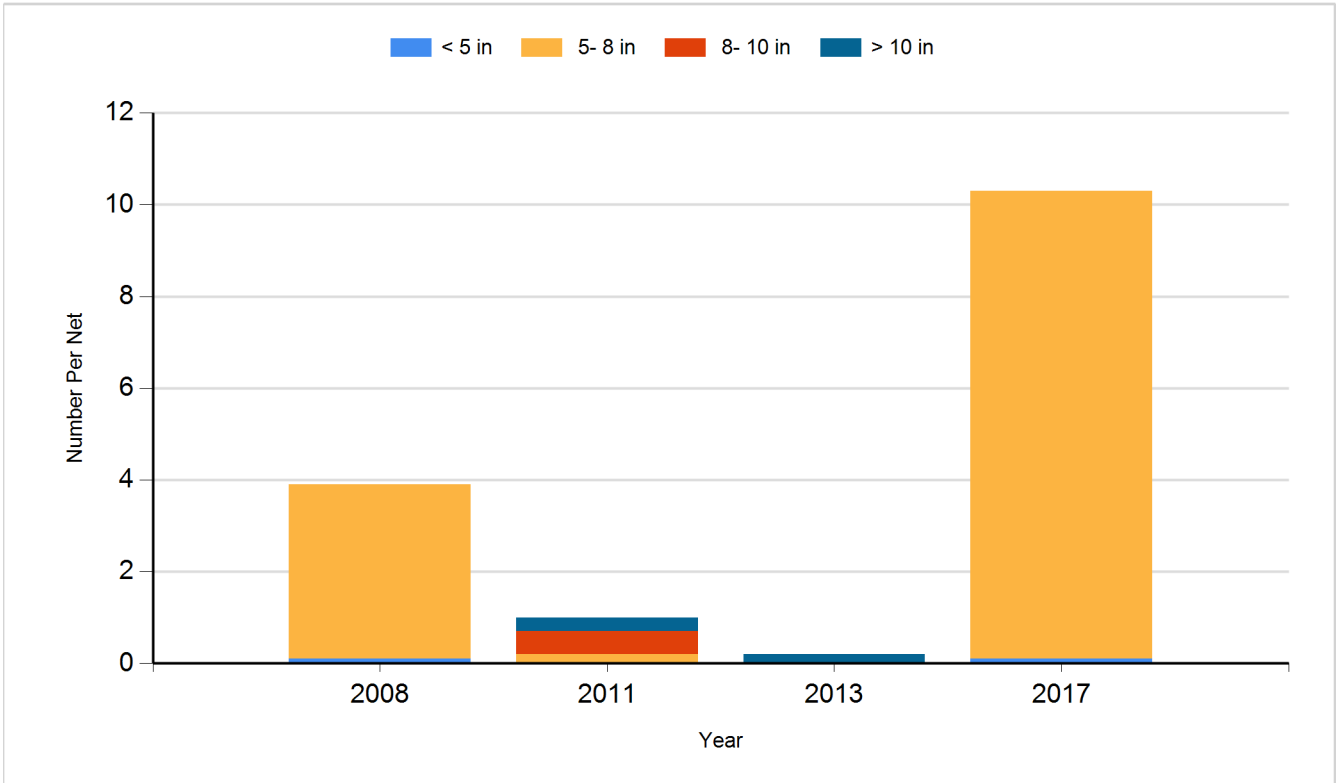
Species: Yellow Perch
Gear: std exp gill net



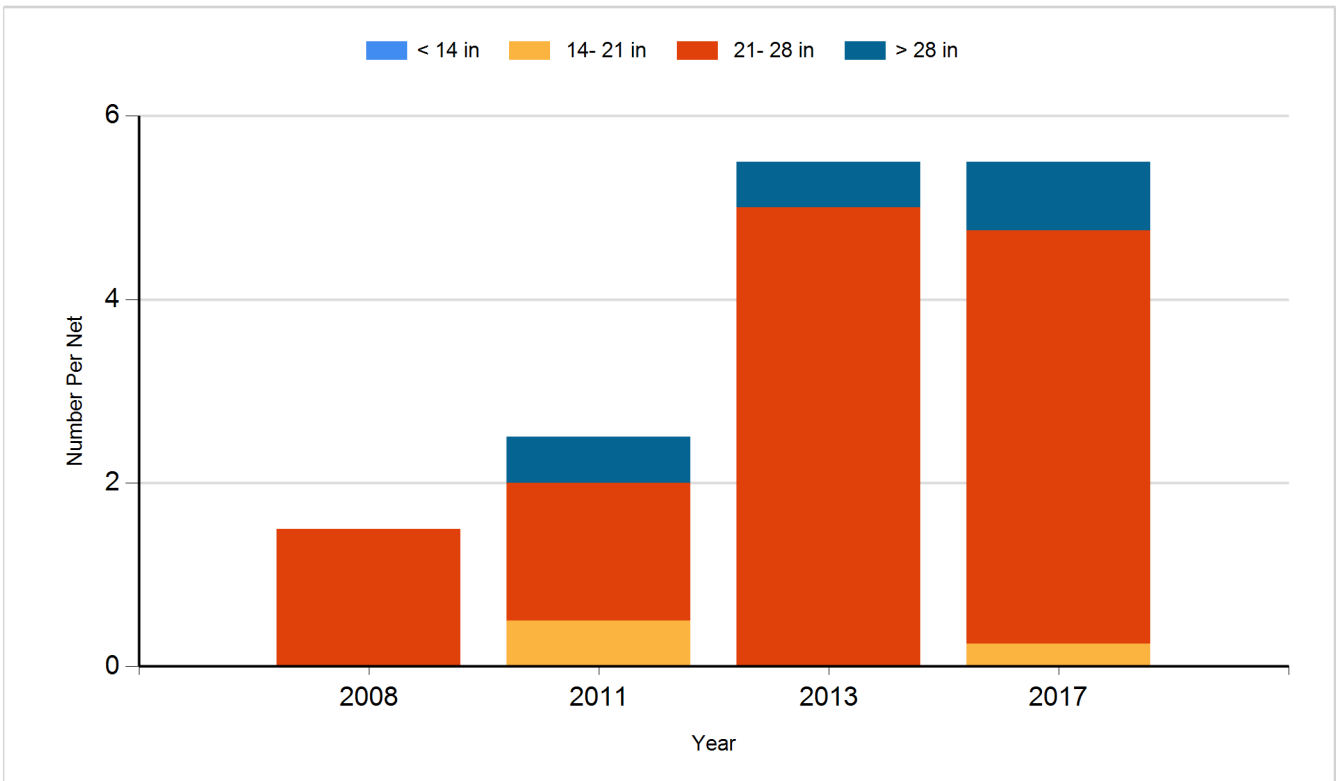
Historic Fish Sizes and Relative Abundance

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

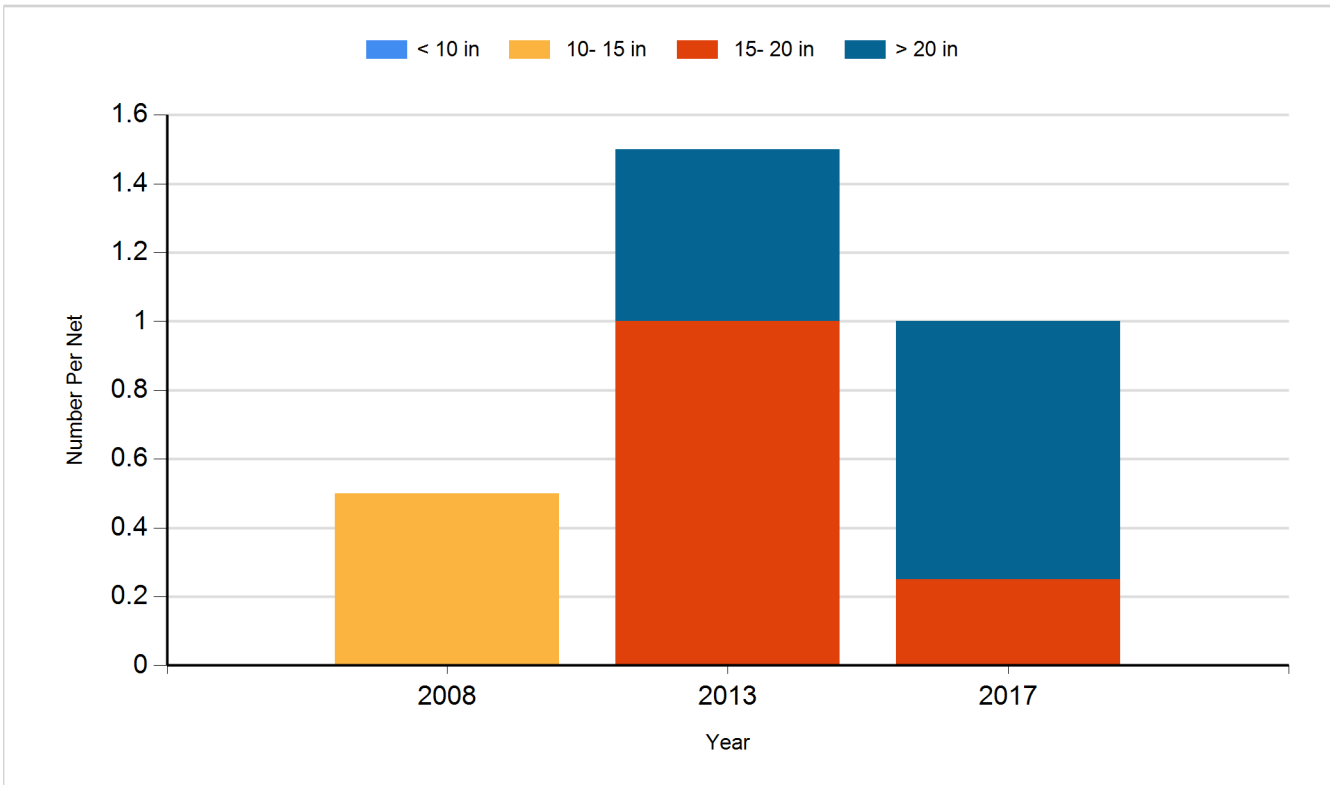
Species: Black Crappie
Gear: Frame Net



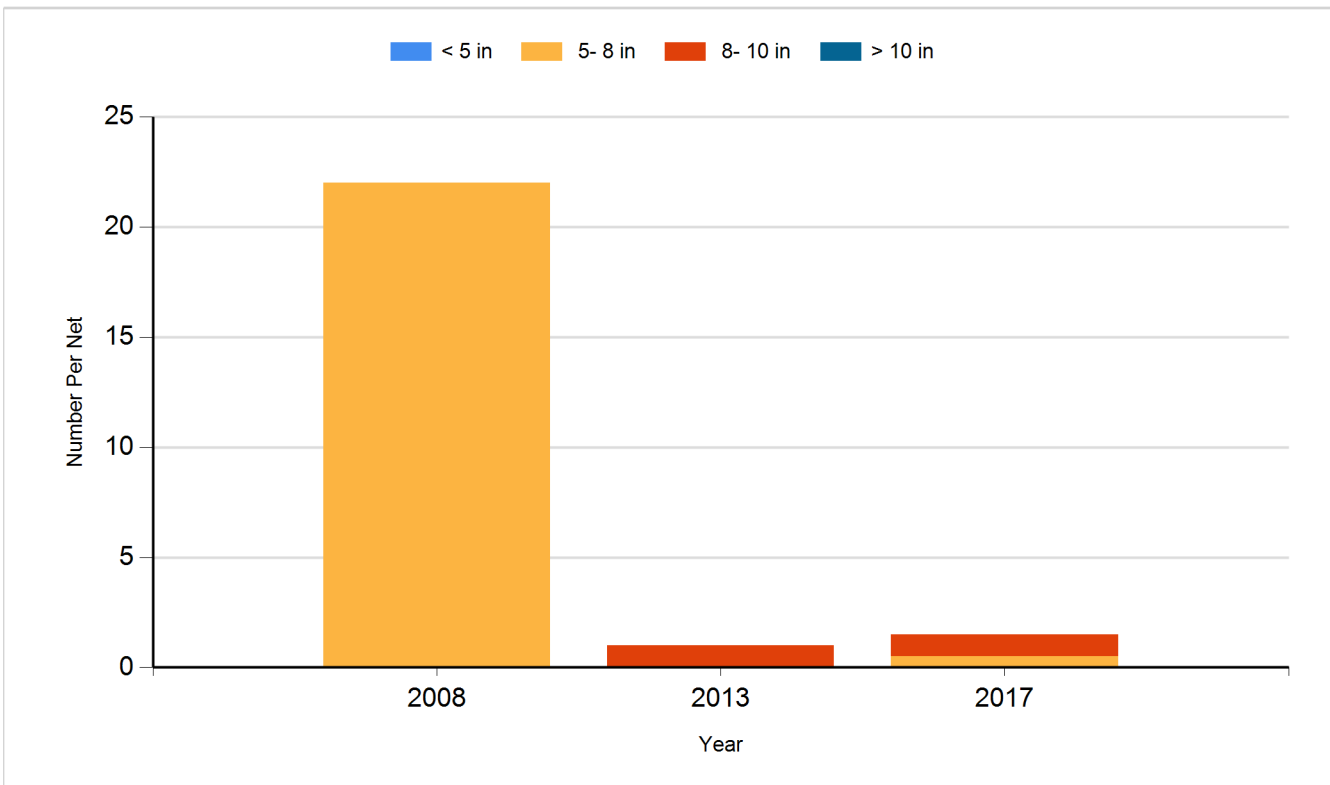
Species: Northern Pike
Gear: Gill Net



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
2006	Walleye	Large Fingerling	2,100
2008	Walleye	Large Fingerling	780
2010	Walleye	Small Fingerling	8,560
2012	Walleye	Large Fingerling	980
2013	Largemouth Bass	Large Fingerling	1,960
2014	Walleye	Large Fingerling	807
2016	Largemouth Bass	Adult	225
2017	Walleye	Large Fingerling	3,000