

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Lemmon East, Perkins County
GRA-Lake-392-000
2017

Lake Information

Name: Lemmon East
County: Perkins
Surface Area: 162 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

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Black Bullhead

Bluegill

White Sucker

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	0.8	0.6	100		100		97	3
	Bluegill	0.5	0.5	100		40		218	117
	Largemouth Bass	0.2	0.2	100		50		94	7
	Northern Pike	0.4	0.3	25		25		87	2
	White Sucker	0.2	0.2	100		100		86	2
	Yellow Perch	0.2	0.2	100		100		99	3
AFS std gill net	Black Bullhead	41.8	13.3	100		89	3	102	1
	Largemouth Bass	0.5	0.5	50		0		113	3
	Northern Pike	3.0	2.4	92		58	24	91	7
	White Sucker	0.3	0.4	100		100		81	
	Yellow Perch	0.8	0.4	100		67		106	4

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										0.8	0.8
	Bluegill										0.5	0.5
	Largemouth Bass										0.2	0.2
	Northern Pike										0.4	0.4
	White Sucker										0.2	0.2
	Yellow Perch										0.2	0.2
AFS std gill net	Black Bullhead										41.8	41.8
	Largemouth Bass										0.5	0.5
	Northern Pike										3.0	3.0
	White Sucker										0.3	0.3
	Yellow Perch										0.8	0.8
boat shocker (night)	Largemouth Bass					334.0	8.0	90.0				144.0
	Smallmouth Bass					44.0	4.0	1.2				16.4
boat shocker (night, AC)	Largemouth Bass				3.0							3.0
frame net (1/2 inch)	Black Bullhead			26.3								26.3
	Northern Pike			0.0								0.0
	White Sucker			10.5								10.5
	Yellow Perch			1.5								1.5
frame net (std 3/4 in)	Black Bullhead				18.4	176.0	177.7	140.8	40.0			110.6
	Golden Shiner				0.0		0.0					0.0
	Largemouth Bass							0.3				0.3
	Northern Pike				0.5	0.8		0.1	0.3			0.4
	Smallmouth Bass						0.3					0.3
	White Sucker				11.0	14.5	15.7	3.6	0.5			9.1
	Yellow Perch				2.5	3.3	0.3	1.1	0.6			1.6
std exp gill net (150 ft)	Black Bullhead				138.0	52.0	102.0	111.5	24.0			85.5
	Golden Shiner				0.0				0.0			0.0
	Largemouth Bass								3.5			3.5
	Northern Pike				1.0	2.0	3.0	1.5	11.0			3.7
	White Sucker			5.0	161.0	20.0	18.0	3.0	1.0			34.7
	Yellow Perch			1.0	4.0	11.0	54.0	21.0	21.5			18.8

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	Northern Pike	PSD											25	
		PSD-P											25	
		Wr											87	
	Yellow Perch	PSD												100
		PSD-P												100
		Wr												99
AFS std gill net	Northern Pike	PSD											92	
		PSD-P											58	
		Wr											91	
	Yellow Perch	PSD												100
		PSD-P												67
		Wr												106
frame net (1/2 inch)	Northern Pike	PSD			0									
		PSD-P			0									
	Yellow Perch	PSD			100									
		PSD-P			17									
		Wr			102									
frame net (std 3/4 in)	Northern Pike	PSD				25	100		100	0				
		PSD-P				0	33		0	0				
		Wr				107	108		84					
	Yellow Perch	PSD				45	8	0	100	100				
		PSD-P				10	8	0	44	60				
		Wr				86	94	101	100	113				
std exp gill net (150 ft)	Northern Pike	PSD				100	100	100	100	36				
		PSD-P				0	0	100	100	36				
		Wr				113	118	110	100	100				
	Yellow Perch	PSD			100	100	27	22	86	84				
		PSD-P			0	75	9	0	31	60				
		Wr			102	107	98	103	107	112				

Length at Capture

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

Species: Yellow Perch

Year	N	Mean Length (expanded sample number) at capture by age									
		1	2	3	4	5	6	7	8	9	10+
2014	84	144 (8)	191 (4)	245 (70)	294 (2)						

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).

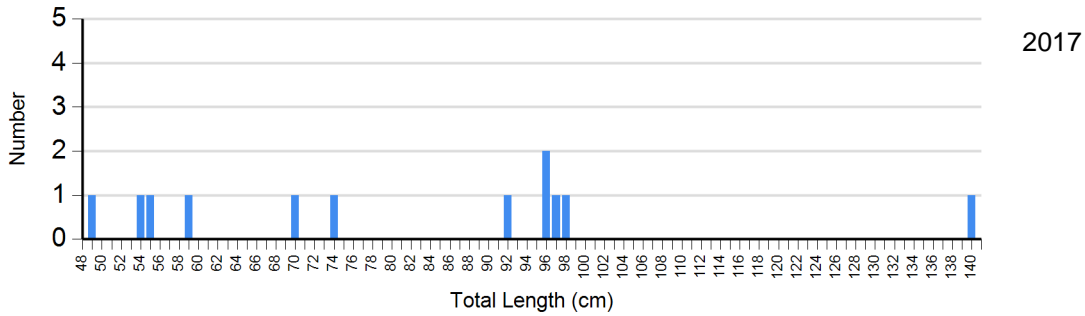
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2013	0		0		6	110 (2.7)	0	
	2014	0		0		6	100 (5.6)	0	
	2015	28	86 (0.6)	0		4	119 (0.0)	12	106 (2.3)
	2017	1	95	4	87 (4.1)	1	100	6	91 (11.3)
Yellow Perch Gill Net	2013	84	104 (0.8)	24	96 (1.3)	0		0	
	2014	12	116 (2.6)	46	107 (0.8)	26	101 (1.1)	0	
	2015	14	114 (0.1)	20	110 (1.0)	44	108 (0.0)	8	
	2017	0		1	108	1	109	1	100

Length Frequency Distribution

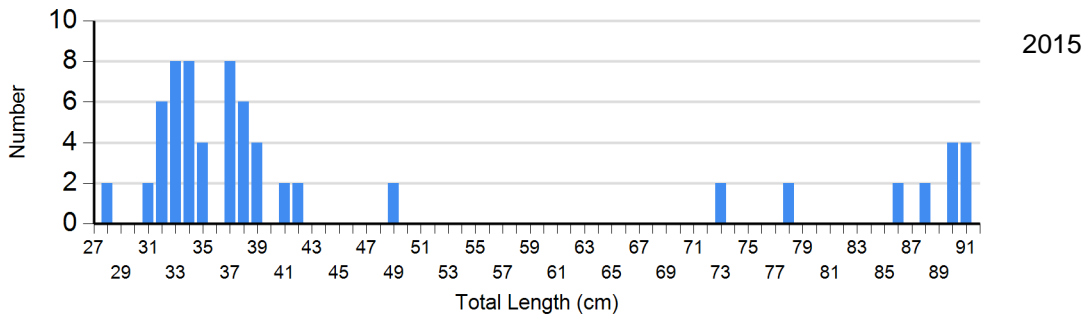
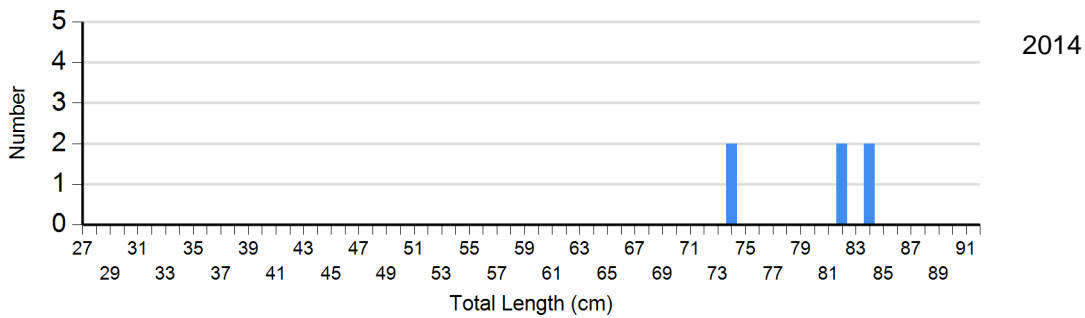
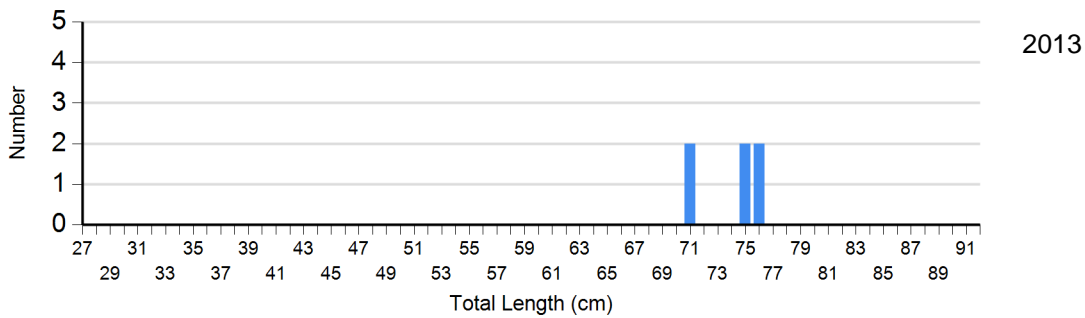
Length frequency histogram of species sampled by year.

Species: Northern Pike

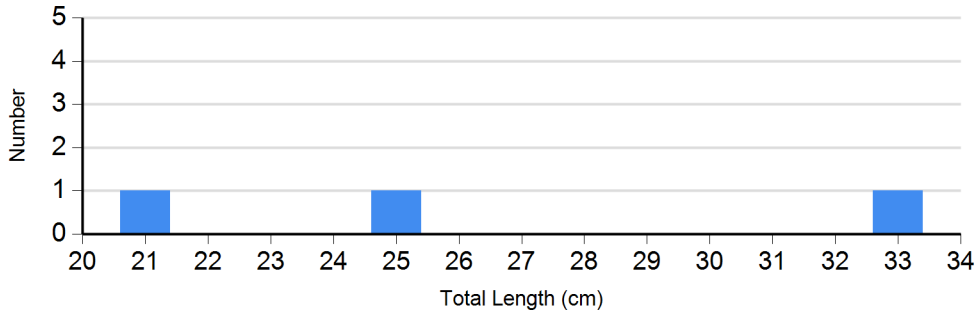
Gear: AFS std gill net



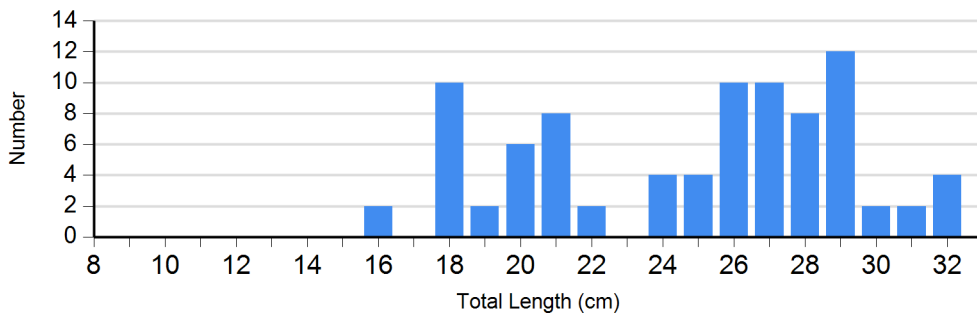
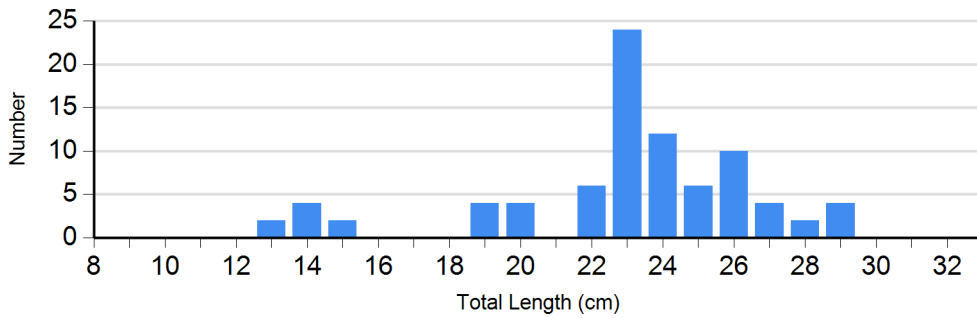
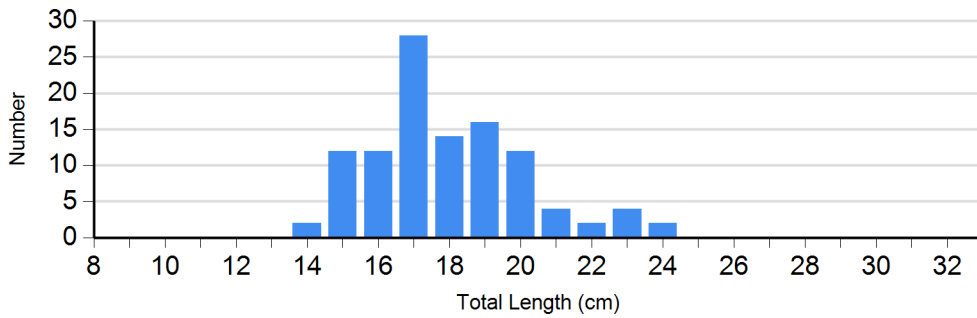
Species: Northern Pike
Gear: std exp gill net (150 ft)



Species: Yellow Perch
Gear: AFS std gill net



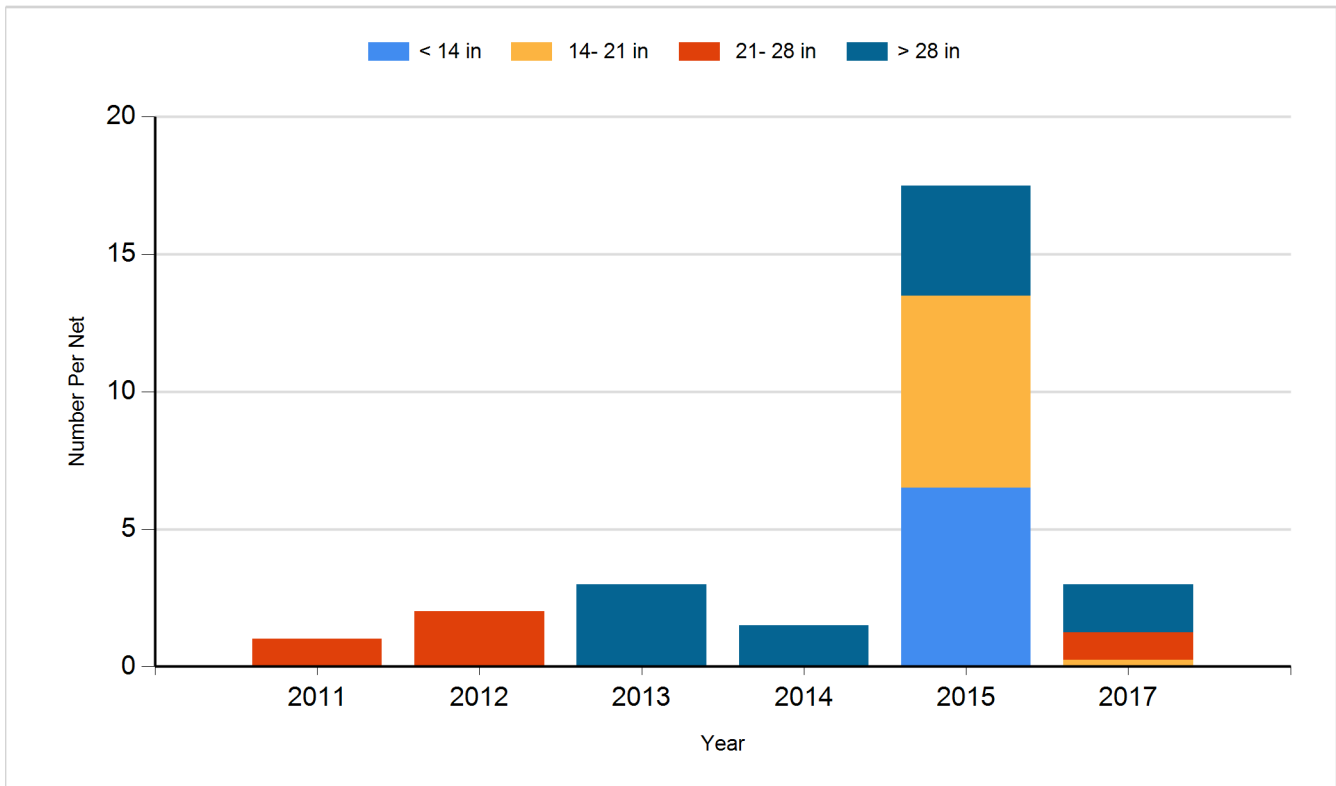
Species: Yellow Perch
Gear: std exp gill net (150 ft)



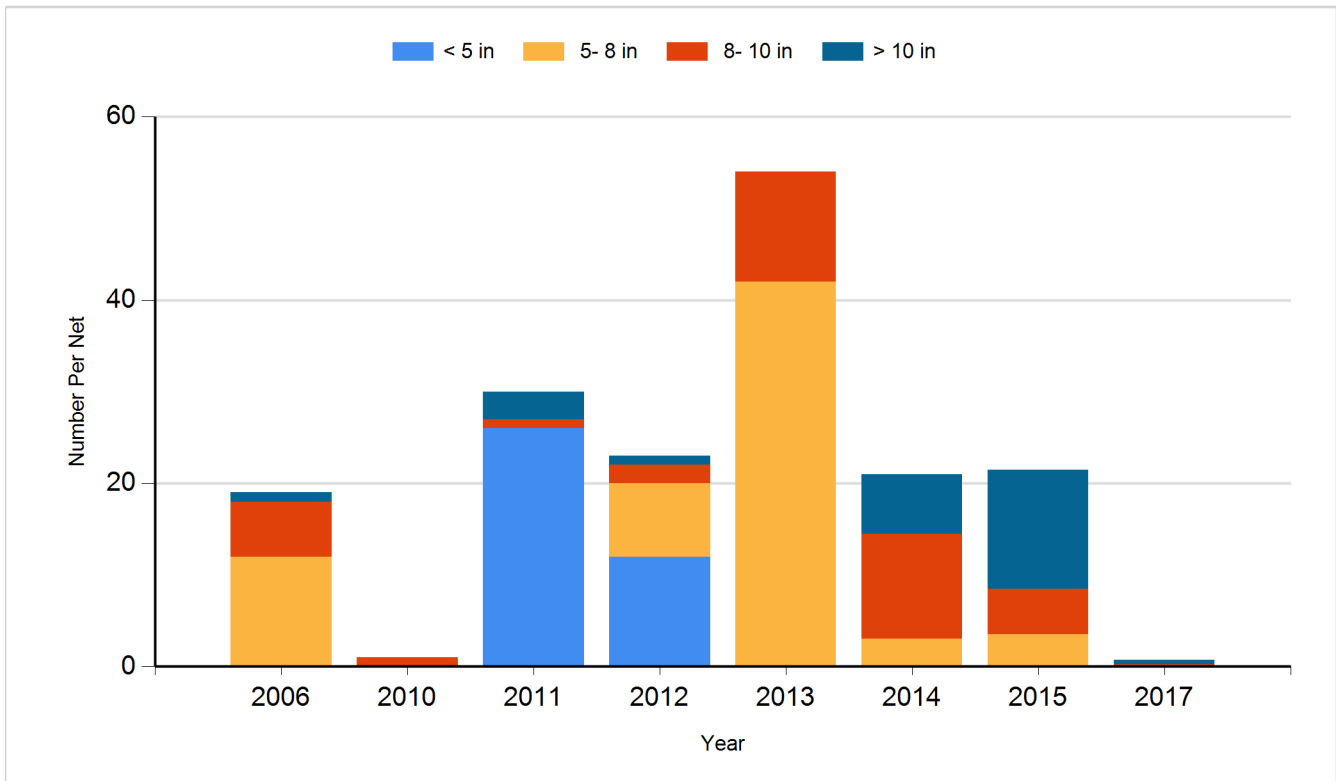
Historic Fish Sizes and Relative Abundance

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

Species: Northern Pike
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	Tiger Muskellunge	Fingerling	500
2010	Largemouth Bass	Fingerling	6,000
2010	Northern Pike	Fry	166,000
2010	Yellow Perch	Adult	400
2011	Golden Shiner	Adult	40
2011	Largemouth Bass	Fingerling	7,000
2011	Yellow Perch	Adult	385
2016	Bluegill	Adult	600