SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Lemmon East, Perkins County
GRA-Lake-392-000
2018

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 gill net	Jul 10, 2018	1 net-nights
AFS std gill net	Jul 11, 2018	1 net-nights
frame net (std 3/4 in)	Jul 10, 2018	3 net-nights
frame net (std 3/4 in)	Jul 11, 2018	3 net-nights

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Black Bullhead

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).

A statewide effort to help make netting efforts comparable to all waters sampled across the state, occurred in 2017, with a switch to American Fisheries Society gill nets. Past gill netting efforts were completed with different style/types of nets and are not comparable side by side.

- **AFS std gill net** – 80 ft experimental gill net containing eight panels (10 ft each) of varying monofilament meshes of 0.75, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25 and 2.50 inches.
- **std experimental gill net for non-Missouri River waters** - 150 ft experimental gill net containing six panels (25 ft each) of varying monofilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.
- s**td experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

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

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.

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

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

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.

$$Wr = \left(\frac{W}{Ws}\right) \text{x } 100$$

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).

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
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
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).

*** Methods/Species that ignore stock length**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	28	14.0	6.2	100		96		97	2
	Northern Pike	3	1.5	4.6	100		33		91	12
	Yellow Perch	1	0.5	1.5	100		100		83	
frame net (std 3/4 in)	Black Bullhead	30	5.0	1.4	100		100		89	1
	Northern Pike	4	0.7	0.7	50		0		90	5
	Yellow Perch	2	0.3	0.3	50		50		99	24

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.

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
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	14.0	27.9
	Largemouth Bass									0.5		0.5
	Northern Pike									3.0	1.5	2.3
	White Sucker									0.3		0.3
	Yellow Perch									0.8	0.5	0.7
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 (std 3/4 in)	Black Bullhead		26.3	18.4	176.0	177.7	140.8	40.0			5.0	83.5
	Golden Shiner			0.0		0.0						0.0
	Largemouth Bass						0.3					0.3
	Northern Pike		0.0	0.5	0.8		0.1	0.3			0.7	0.4
	Smallmouth Bass					0.3						0.3
	White Sucker		10.5	11.0	14.5	15.7	3.6	0.5				9.3
	Yellow Perch		1.5	2.5	3.3	0.3	1.1	0.6			0.3	1.4
std exp gill net	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.

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std frame net	Black Bullhead	PSD									100	
		PSD-P									100	
		Wr									97	
	Largemouth Bass	PSD									100	
		PSD-P									50	
		Wr									94	
	Northern Pike	PSD									25	
		PSD-P									25	
		Wr									87	
	Yellow Perch	PSD									100	
		PSD-P									100	
		Wr									99	
AFS std gill net	Black Bullhead	PSD									100	100
		PSD-P									89	96
		Wr									102	97
	Largemouth Bass	PSD									50	
		PSD-P									0	
		Wr									113	
	Northern Pike	PSD									92	100
		PSD-P									58	33
		Wr									91	91
	Yellow Perch	PSD									100	100
		PSD-P									67	100
		Wr									106	83
boat shocker (night)	Largemouth Bass	PSD				8	100	7				
		PSD-P				0	0	3				
		Wr				123	132	122				
boat shocker (night, AC)	Largemouth Bass	PSD			0							
		PSD-P			0							
		Wr			145							
frame net (std 3/4 in)	Black Bullhead	PSD		32	76	10	11	86	97			100

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	Black Bullhead	PSD-P		0	22	0	0	0	3			100
		Wr		98	102		94	83	91			89
	Largemouth Bass	PSD						100				
		PSD-P						0				
		Wr						108				
	Northern Pike	PSD		0	25	100		100	0			50
		PSD-P		0	0	33		0	0			0
		Wr			107	108		84				90
	Yellow Perch	PSD		100	45	8	0	100	100			50
		PSD-P		17	10	8	0	44	60			50
		Wr		102	86	94	101	100	113			99
std exp gill net	Black Bullhead	PSD			9	12	7	72	94			
		PSD-P			3	0	1	0	4			
		Wr				98	102	84	97			
	Largemouth Bass	PSD							0			
		PSD-P							0			
		Wr							109			
	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

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

Fish Condition

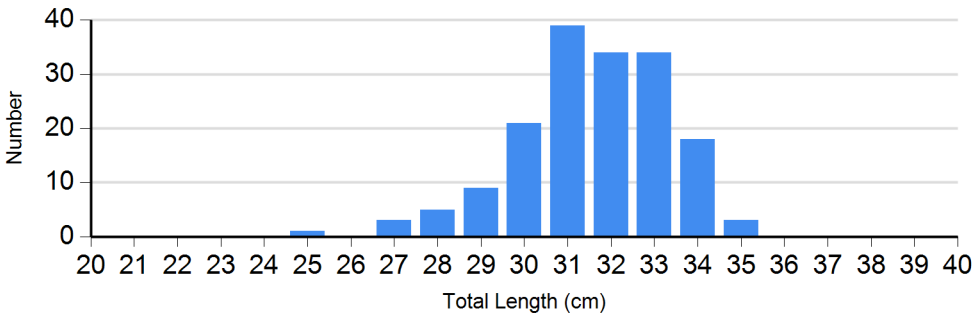
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2014	126	85 (1.1)	320	84 (0.8)	0		0	
	2015	6	115 (0.9)	86	98 (1.1)	4	45 (0.0)	0	
	2017	0		18	103 (2.4)	149	102 (0.9)	0	
	2018	0		1	101	27	97 (1.5)	0	
Largemouth Bass Electro Fishing	2014	140	121 (0.7)	6	132 (3.7)	4	134 (8.0)	0	
Northern Pike Gill Net	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)
	2018	0		2	82 (5.1)	1	108	0	
Yellow Perch Gill Net	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
	2018	0		0		0		1	83

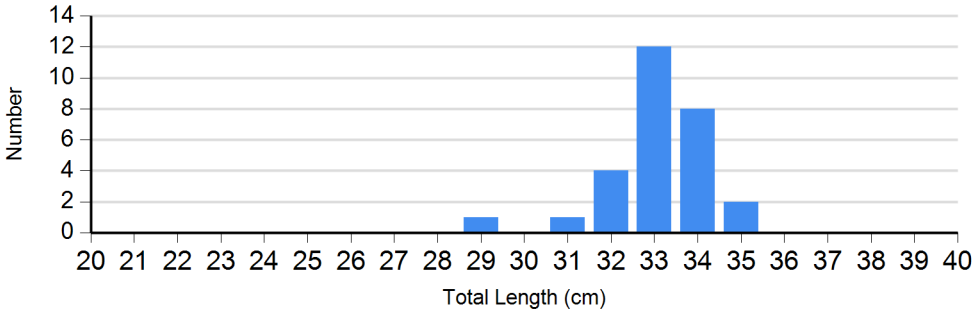
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

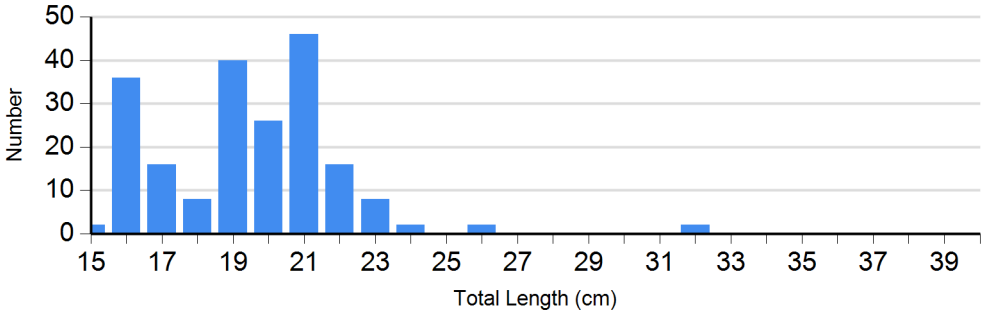


2017

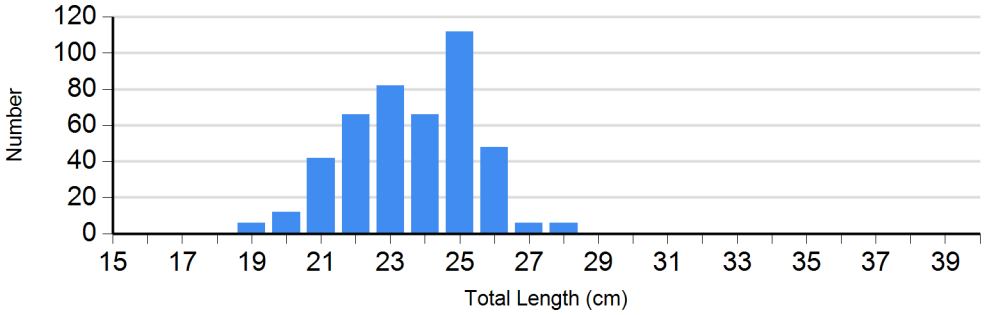


2018

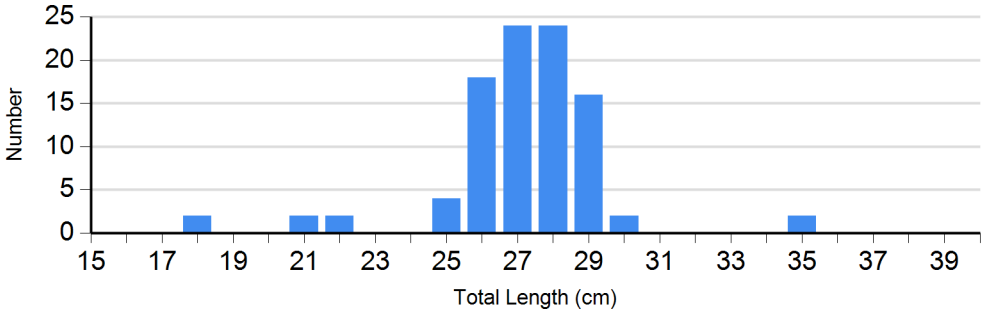
Species: Black Bullhead
Gear: std exp gill net



2013

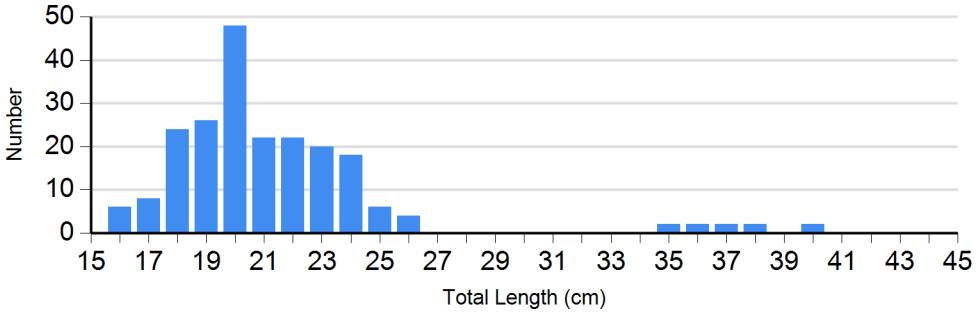


2014



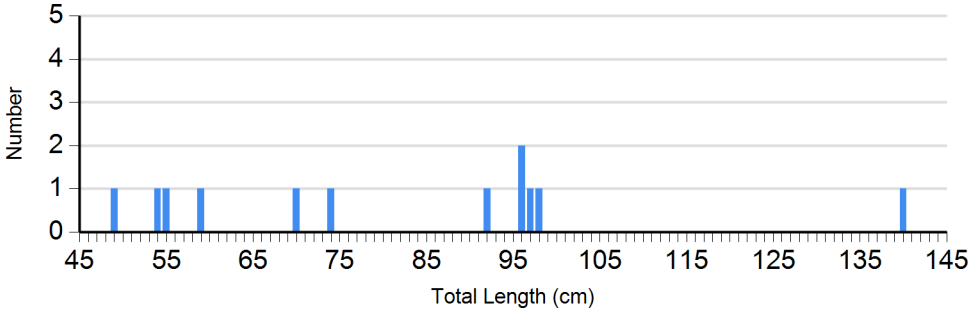
2015

Species: Largemouth Bass
Gear: boat shocker (night)



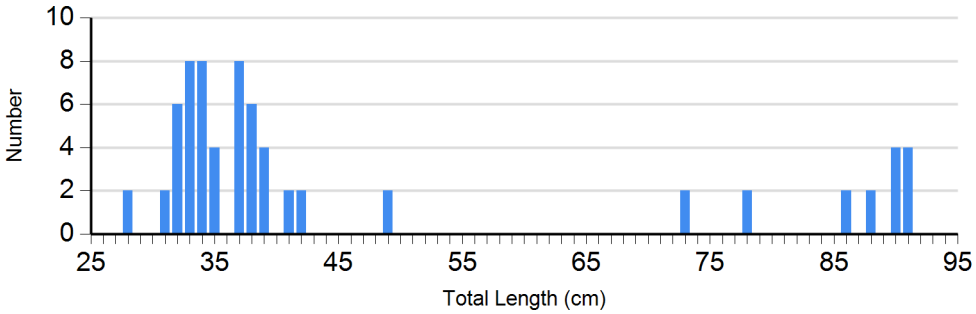
2014

Species: Northern Pike
Gear: AFS std gill net



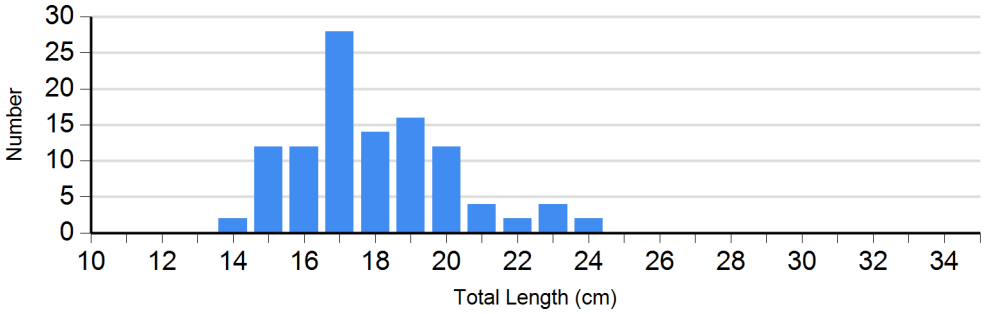
2017

Species: Northern Pike
Gear: std exp gill net

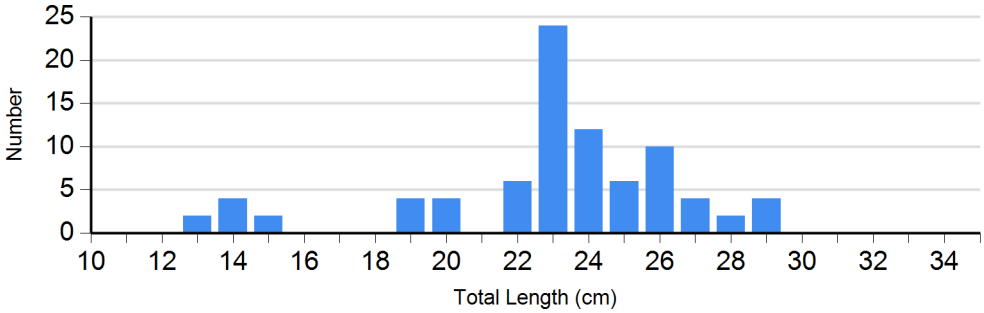


2015

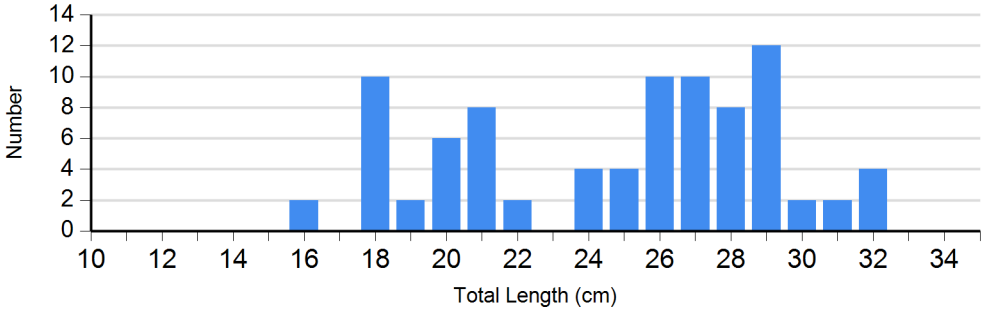
Species: Yellow Perch
Gear: std exp gill net



2013



2014

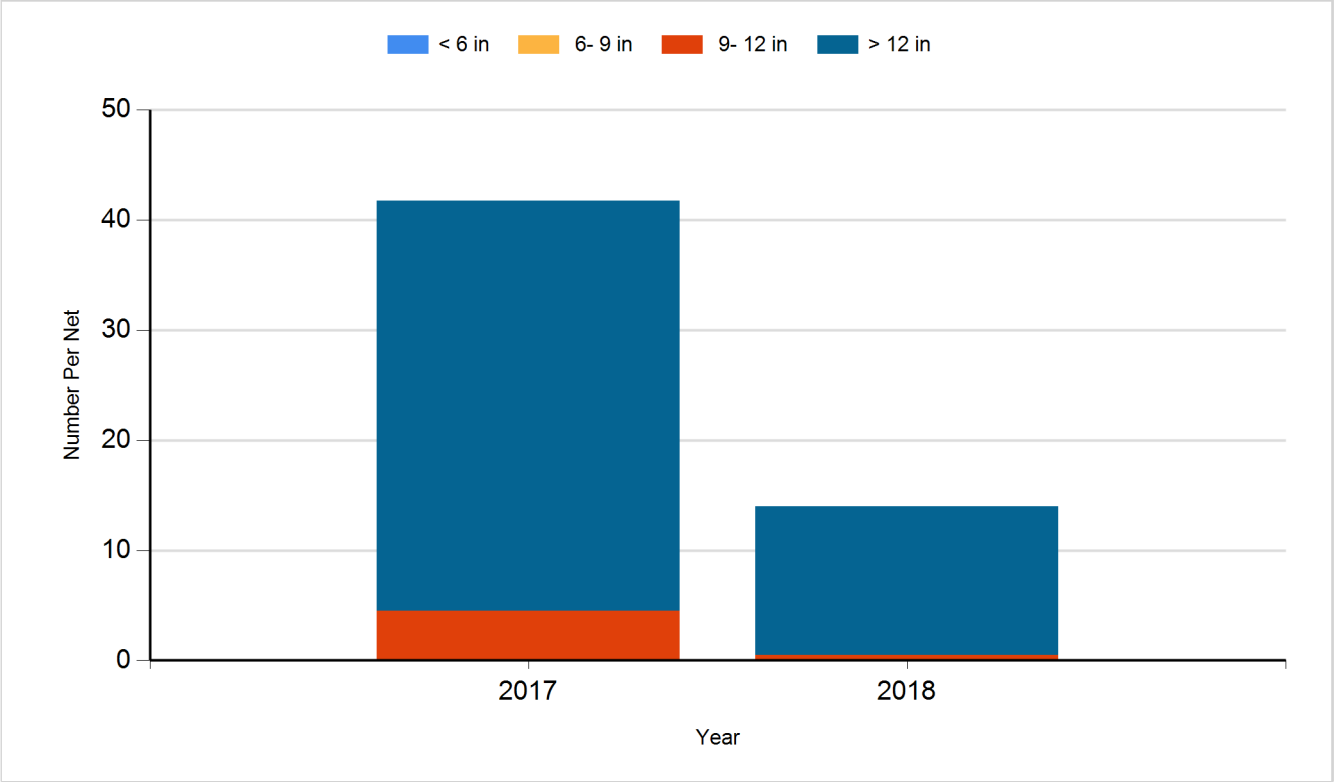


2015

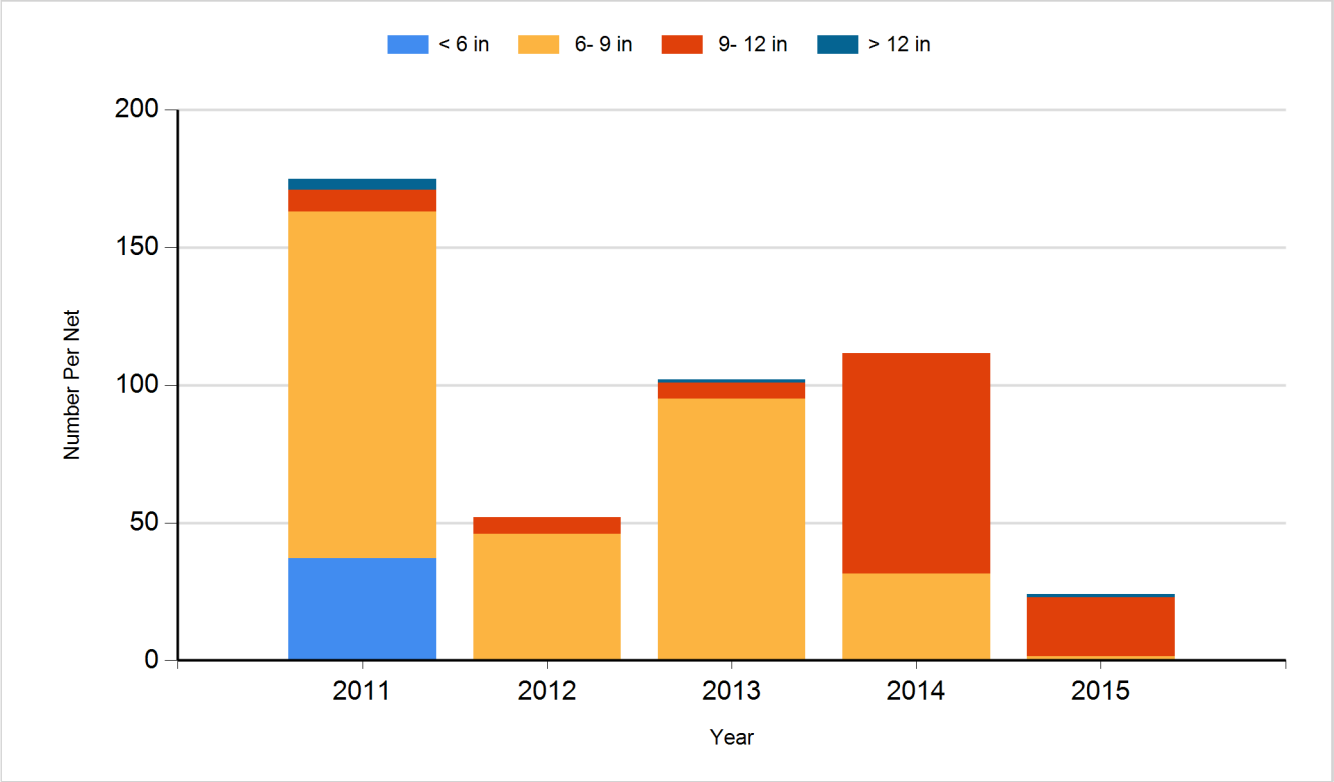
Historic Fish Sizes and Relative Abundance

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

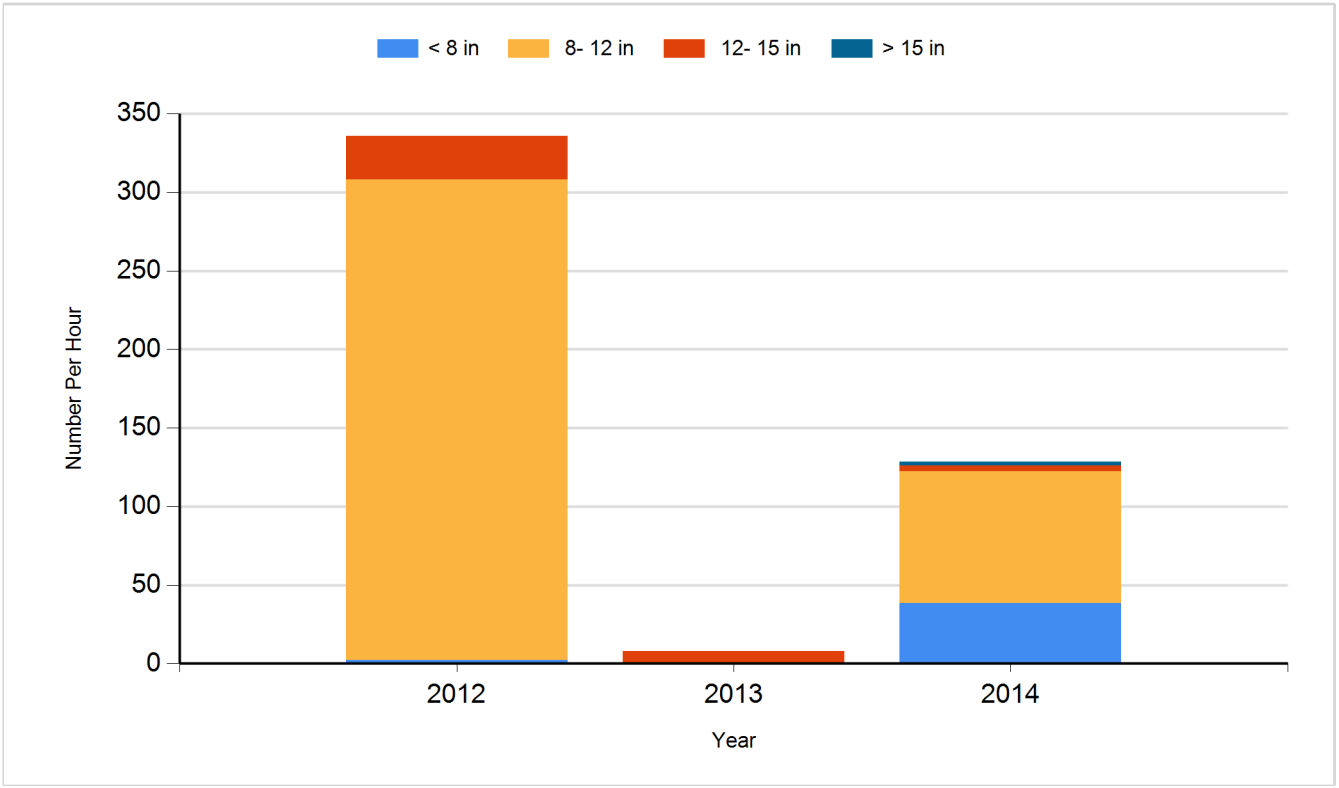
Species: Black Bullhead
Gear: AFS std gill net



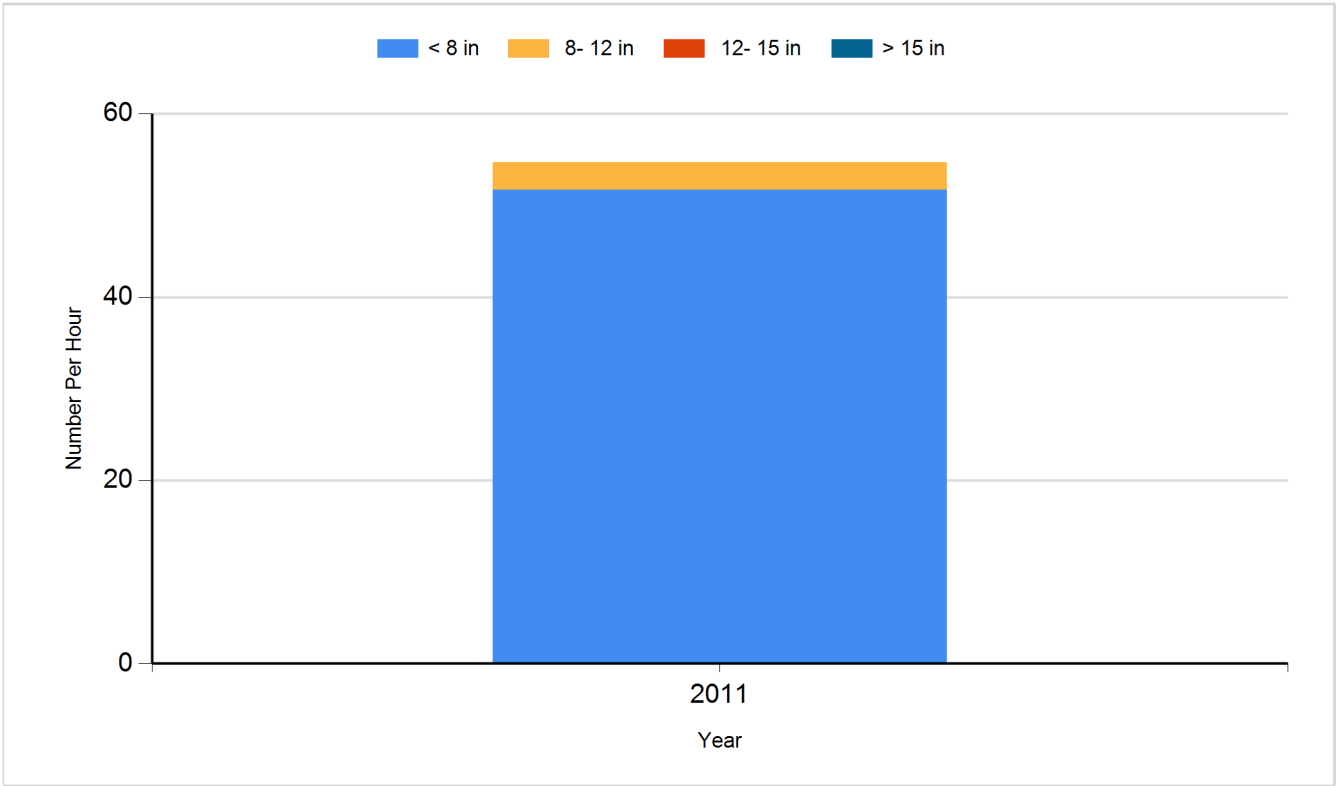
Species: Black Bullhead
Gear: std exp gill net



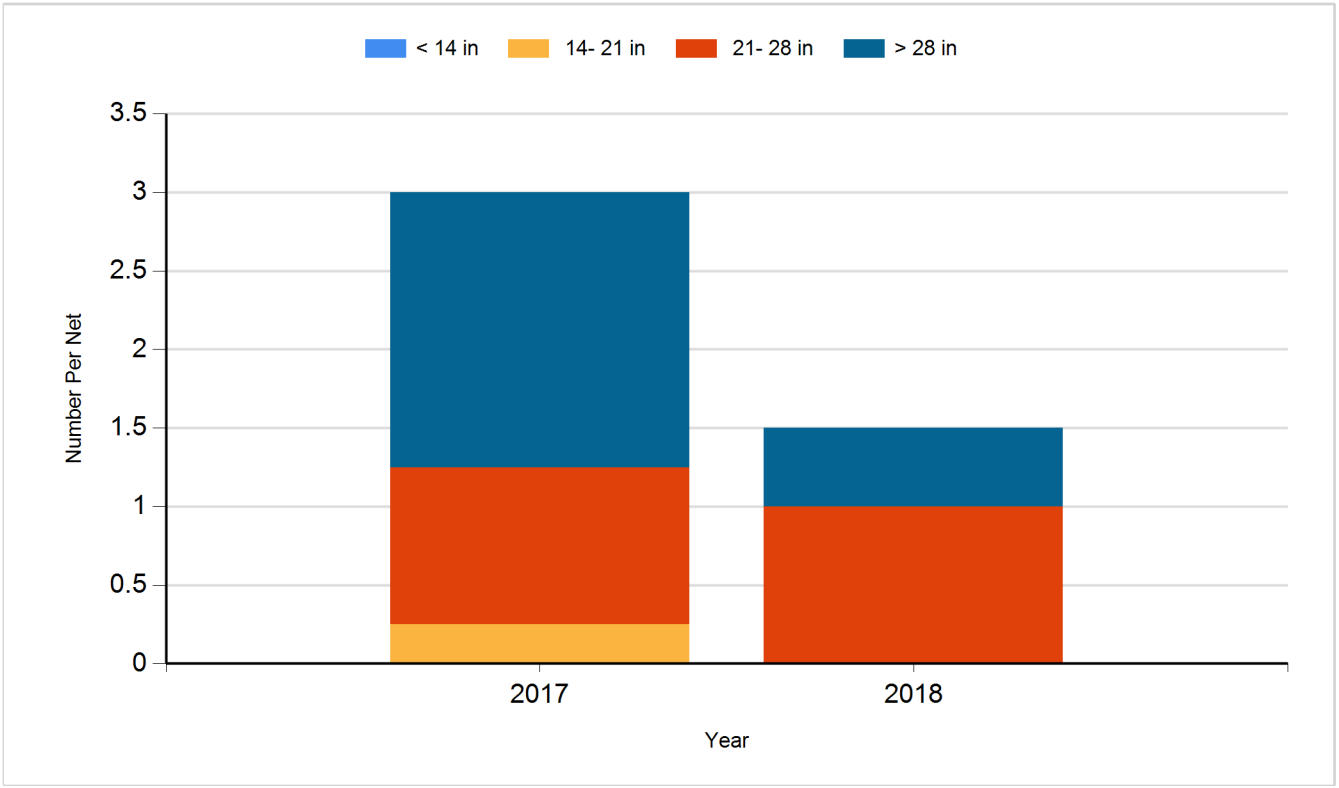
Species: Largemouth Bass
Gear: boat shocker (night)



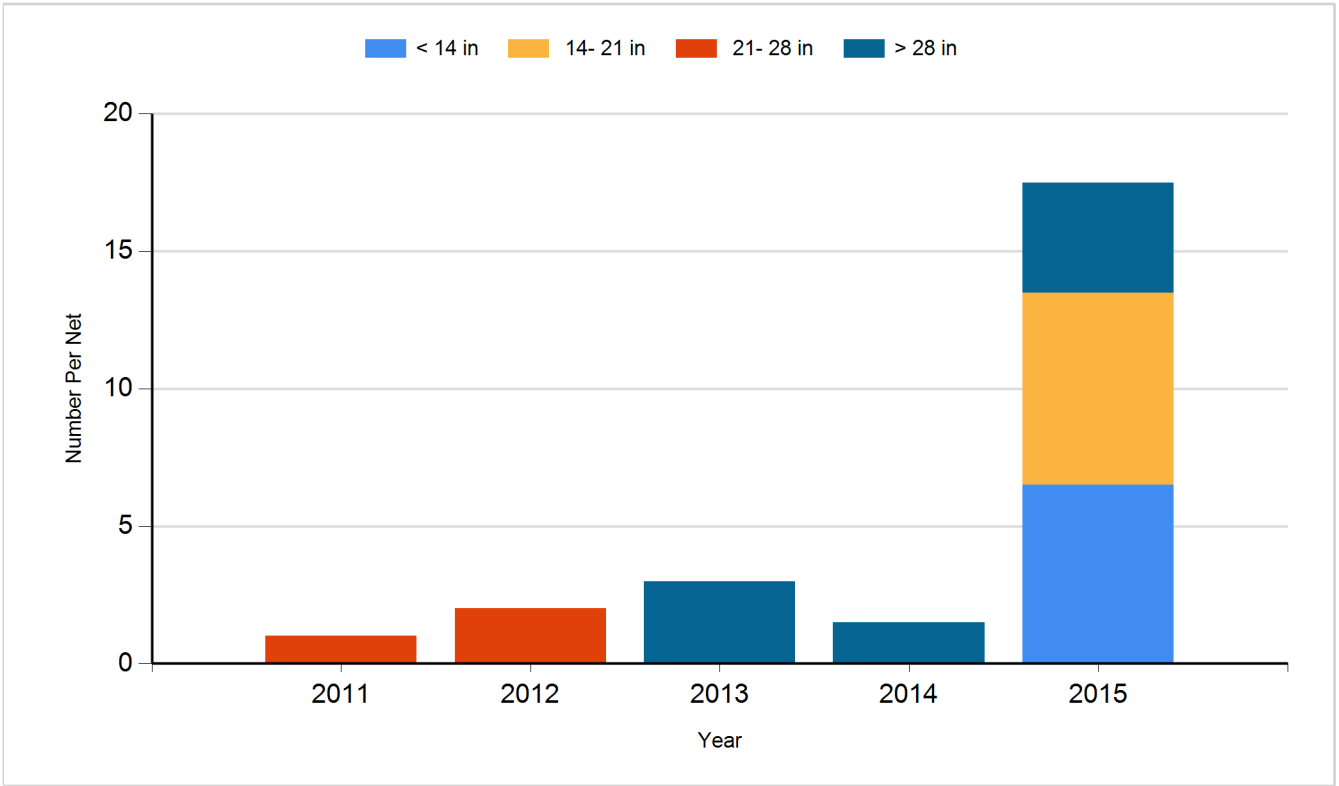
Species: Largemouth Bass
Gear: boat shocker (night, AC)



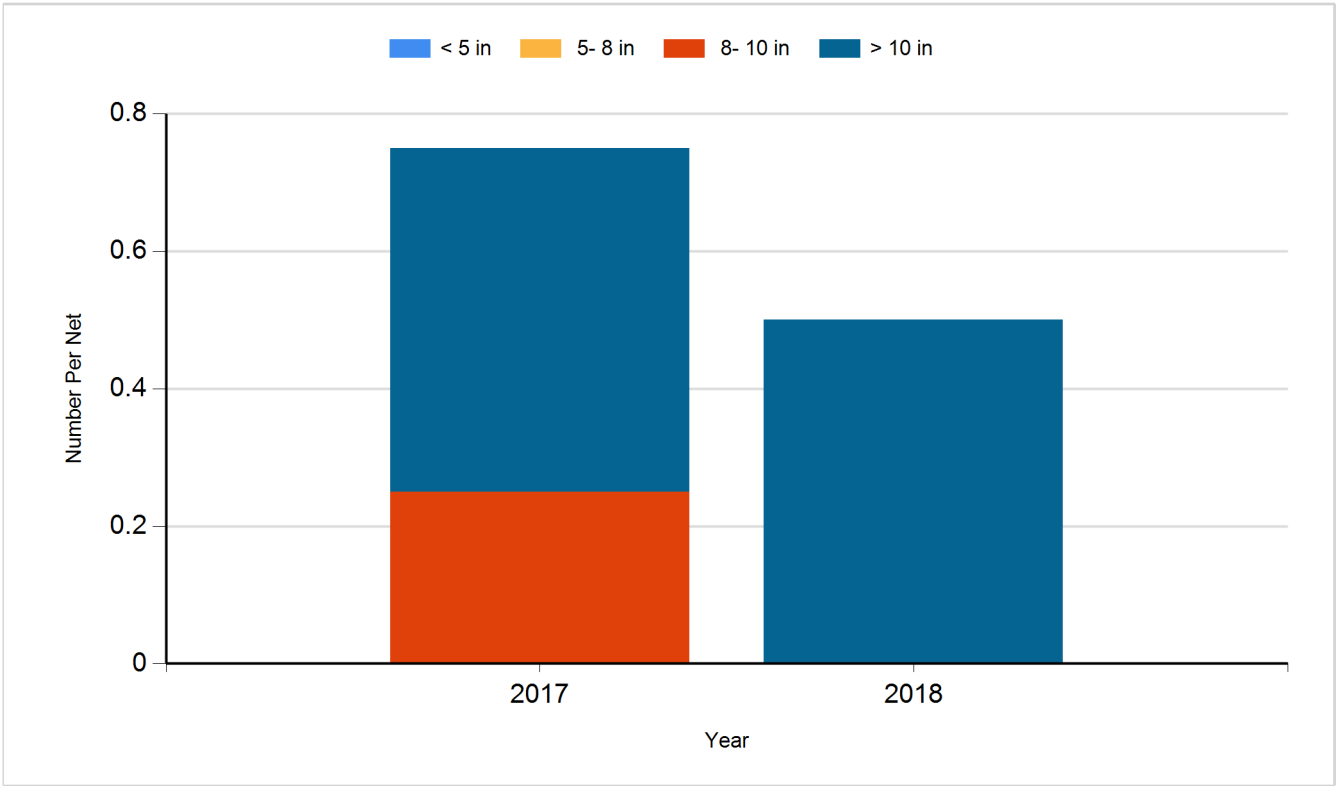
Species: Northern Pike
Gear: AFS std gill net



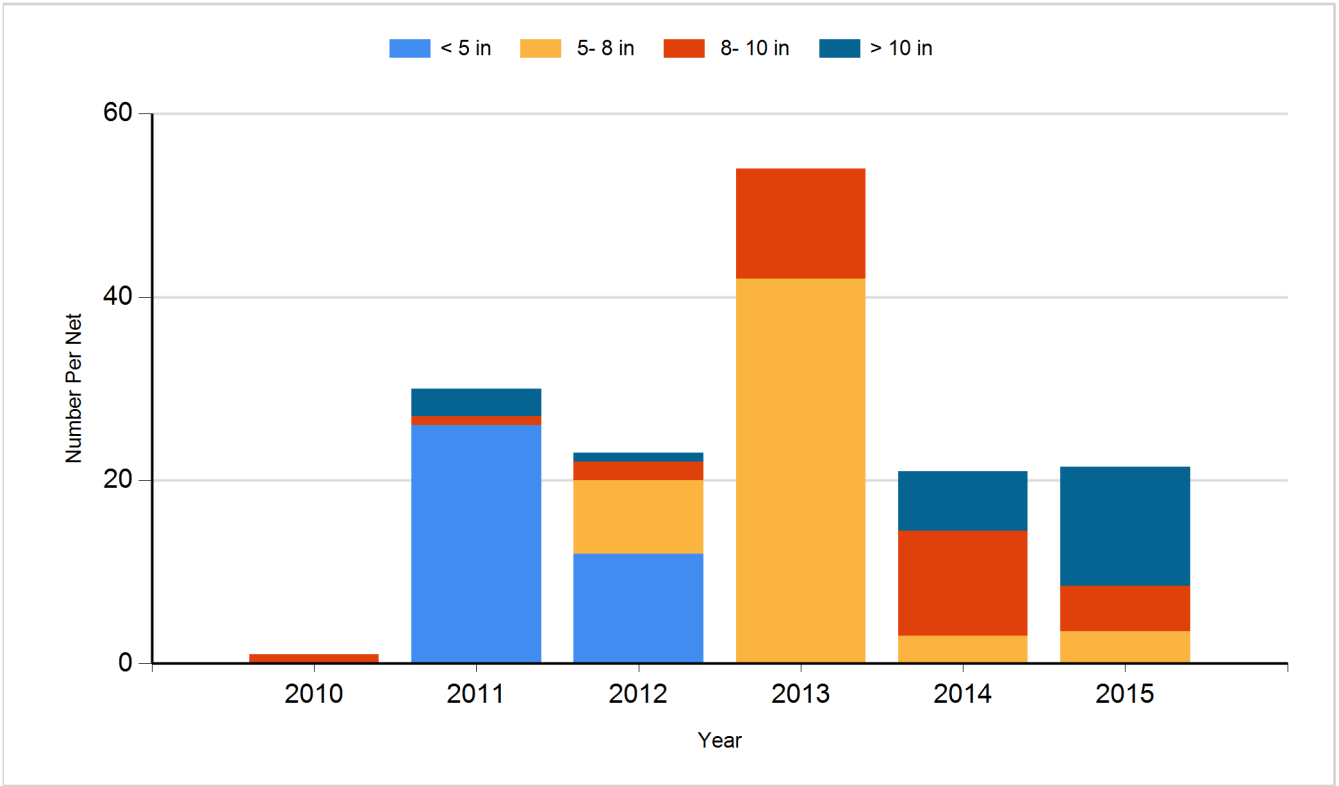
Species: Northern Pike
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



Species: Yellow Perch
Gear: std exp gill net



Fish Stocking

Number of fish stocked by year, species, and size.

Year	Species	Size	Number
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