SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Opal, Meade County
CHE-Lake-200-000
2018

Lake Information

Name: Opal

County: Meade

Surface Area: 25 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 13, 2018	1 net-nights
AFS std gill net	Jun 14, 2018	1 net-nights
frame net (std 3/4 in)	Jun 13, 2018	4 net-nights
frame net (std 3/4 in)	Jun 14, 2018	4 net-nights

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Bluegill

Black Bullhead

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).

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	137	68.5	4.6	10	4	0		85	1
	Northern Pike	10	5.0	3.1	100		30		89	5
frame net (std 3/4 in)	Black Bullhead	389	48.6	13.7	1		0		87	1
	Bluegill	80	10.0	3.1	89	5	4		121	1
	Green Sunfish	4	0.5	0.3	75		50		119	6
	Northern Pike	16	2.0	0.7	63	20	0		86	5
	Yellow Perch	4	0.5	0.4	50		0		99	3

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									8.5		8.5
	Bluegill									2.0		2.0
	Green Sunfish									0.3		0.3
	Largemouth Bass									0.0		0.0
	Northern Pike									0.8		0.8
	Yellow Perch									0.8		0.8
AFS std gill net	Black Bullhead										68.5	68.5
	Northern Pike										5.0	5.0
boat shocker (night)	Largemouth Bass									60.0		60.0
frame net (std 3/4 in)	Black Bullhead		4.5	23.9		179.0	25.1	764.8	131.8		48.6	168.2
	Bluegill		0.5	0.6		11.5	2.1	0.2	11.3		10.0	5.2
	Green Sunfish							0.2	0.3		0.5	0.3
	Largemouth Bass								0.0			0.0
	Northern Pike		0.5	1.4		2.5	0.9	2.0	0.3		2.0	1.4
	Yellow Perch		0.3				0.4	0.8	3.8		0.5	1.2
std exp gill net	Black Bullhead		2.0	32.5		43.0	0.5	57.5				27.1
	Green Sunfish							0.5				0.5
	Northern Pike		5.0	11.5		9.0	0.5	1.5				5.5
	Yellow Perch		0.0				0.5	6.5				2.3

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									0	
		PSD-P									0	
		Wr									79	
	Bluegill	PSD									50	
		PSD-P									25	
		Wr									112	
	Green Sunfish	PSD									0	
		PSD-P									0	
		Wr									89	
	Largemouth Bass	PSD									0	
		PSD-P									0	
	Northern Pike	PSD									100	
		PSD-P									0	
		Wr									82	
	Yellow Perch	PSD									0	
		PSD-P									0	
		Wr									90	
AFS std gill net	Black Bullhead	PSD										10
		PSD-P										0
		Wr										85
	Northern Pike	PSD										100
		PSD-P										30
		Wr										89
boat shocker (night)	Largemouth Bass	PSD									70	
		PSD-P									20	
		Wr									112	
frame net (std 3/4 in)	Black Bullhead	PSD		0	13		9	40	0	1		1
		PSD-P		0	0		0	0	0	0		0
		Wr		83	89			60		72		87
	Bluegill	PSD		100	100		100	67	100	47		89
		PSD-P		0	40		85	0	0	44		4
		Wr		112	126		112	104	115	122		121

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	Green Sunfish	PSD							0	100		75
		PSD-P							0	100		50
		Wr							124	112		119
	Largemouth Bass	PSD								0		
		PSD-P								0		
	Northern Pike	PSD		50	27		60	100	80	0		63
		PSD-P		0	9		20	67	50	0		0
		Wr		86	83		84	83	101	91		86
	Yellow Perch	PSD		100				0	0	61		50
		PSD-P		100				0	0	0		0
		Wr		104				80	104	97		99
std exp gill net	Black Bullhead	PSD		100	9		14	0	0			
		PSD-P		0	0		0	0	0			
		Wr		107	95		90	64	85			
	Green Sunfish	PSD							0			
		PSD-P							0			
		Wr							110			
	Northern Pike	PSD		40	57		89	100	100			
		PSD-P		0	17		78	100	67			
		Wr		92	89		92	76	94			
	Yellow Perch	PSD		0				0	8			
		PSD-P		0				0	0			
		Wr						93	97			

Fish Condition

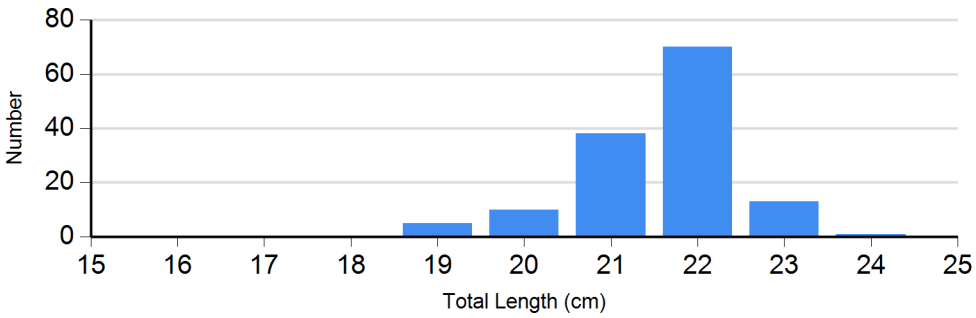
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2	64 (0.0)	0		0		0	
	2015	230	85 (0.6)	0		0		0	
	2018	123	85 (0.6)	14	81 (0.6)	0		0	
Bluegill Frame Net	2014	10	116 (2.2)	20	98 (1.1)	0		0	
	2015	0		2	115 (0.0)	0		0	
	2016	72	132 (1.4)	4	118 (8.9)	60	110 (0.9)	0	
	2017	4	114 (7.1)	2	108 (6.7)	2	113 (2.3)	0	
	2018	9	121 (5.1)	68	120 (1.1)	3	121 (5.9)	0	
Largemouth Bass Electro Fishing	2017	9	110 (2.9)	15	112 (1.6)	6	117 (3.3)	0	
Northern Pike Gill Net	2014	0		0		2	76 (0.0)	0	
	2015	0		2	97 (0.0)	2	97 (0.0)	2	88 (0.0)
	2018	0		7	90 (5.2)	3	89 (4.2)	0	
Yellow Perch Gill Net	2014	2	93 (0.0)	0		0		0	
	2015	24	98 (2.9)	2	94 (0.0)	0		0	

Length Frequency Distribution

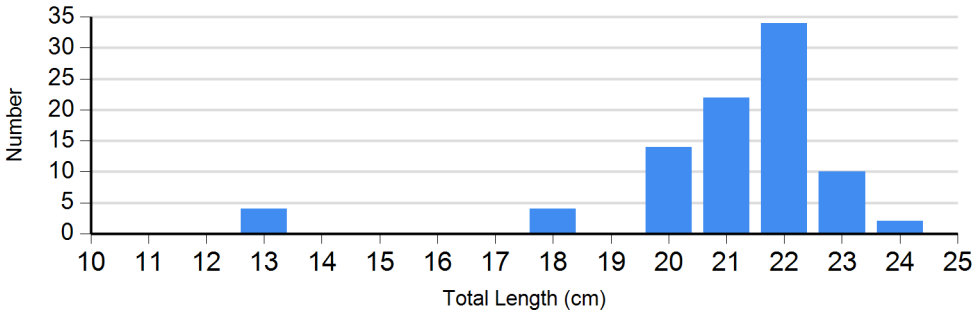
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

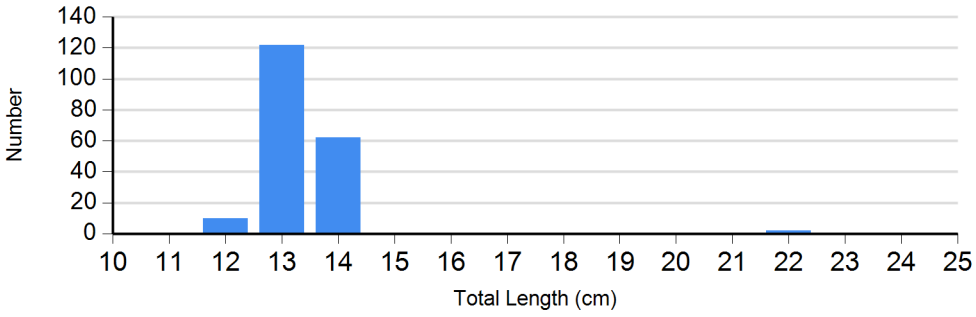


2018

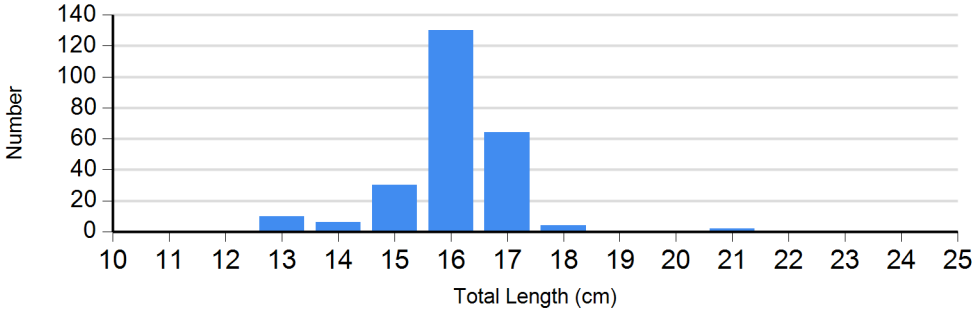
Species: Black Bullhead
Gear: std exp gill net



2013

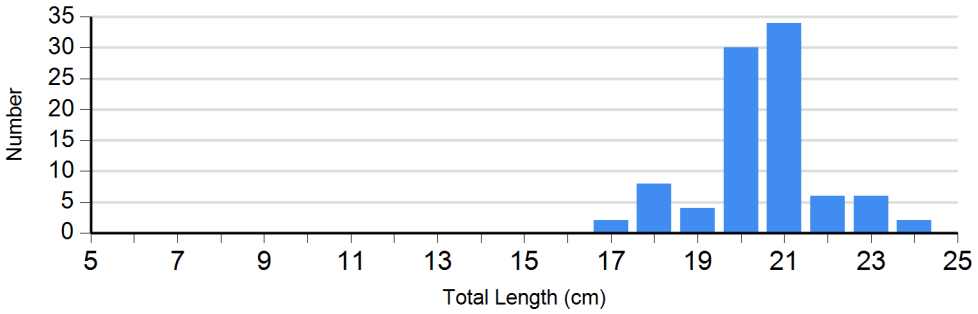


2014

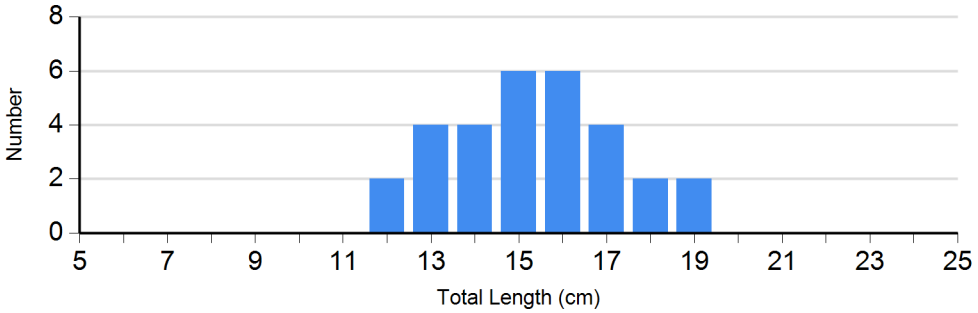


2015

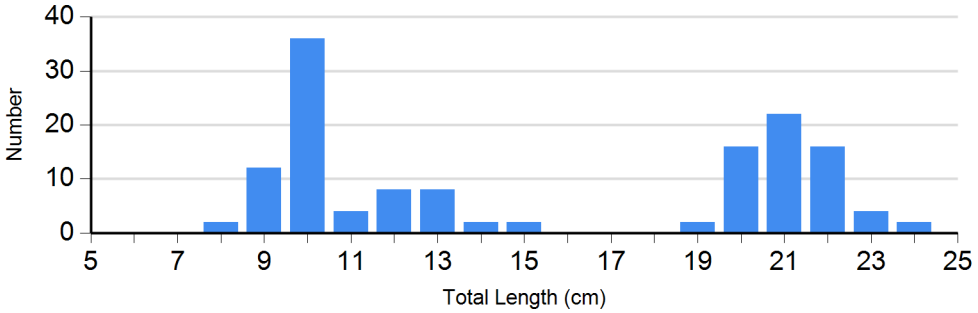
Species: Bluegill
Gear: frame net (std 3/4 in)



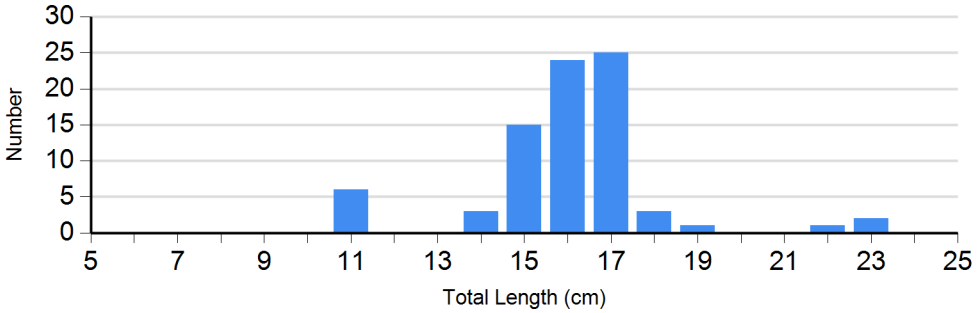
2013



2014

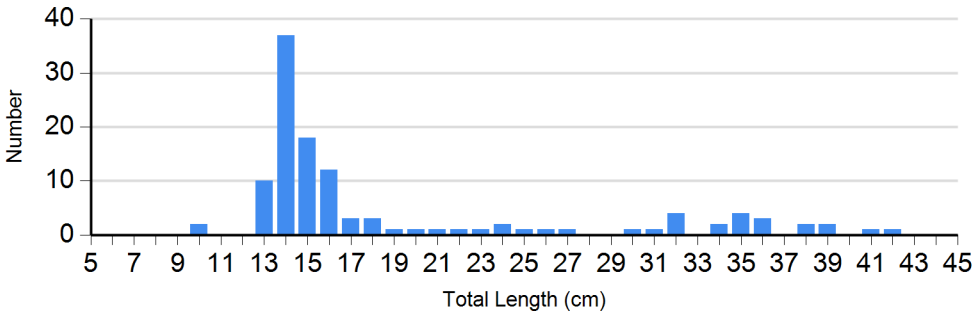


2016



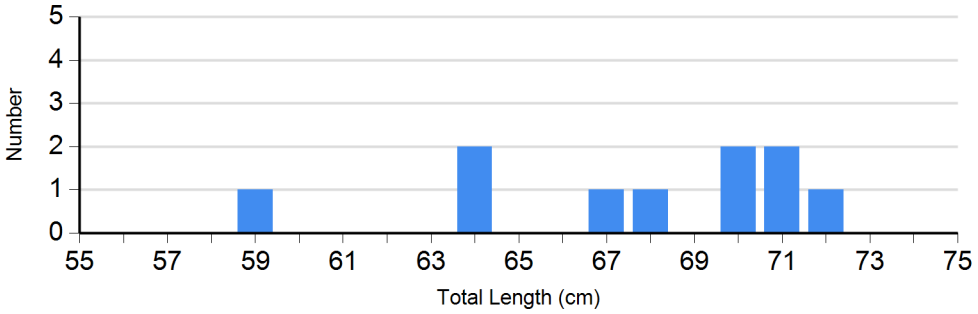
2018

Species: Largemouth Bass
Gear: boat shocker (night)



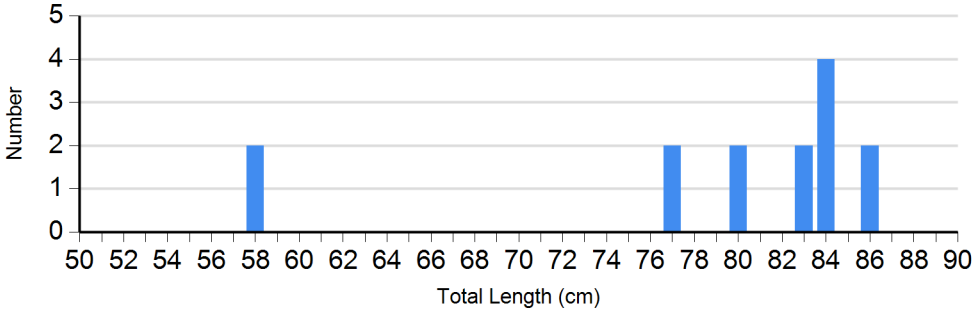
2017

Species: Northern Pike
Gear: AFS std gill net



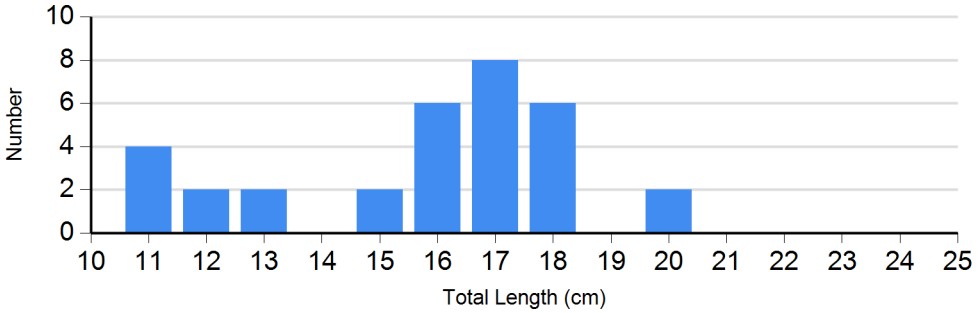
2018

Species: Northern Pike
Gear: std exp gill net



2013

Species: Yellow Perch
Gear: std exp gill net

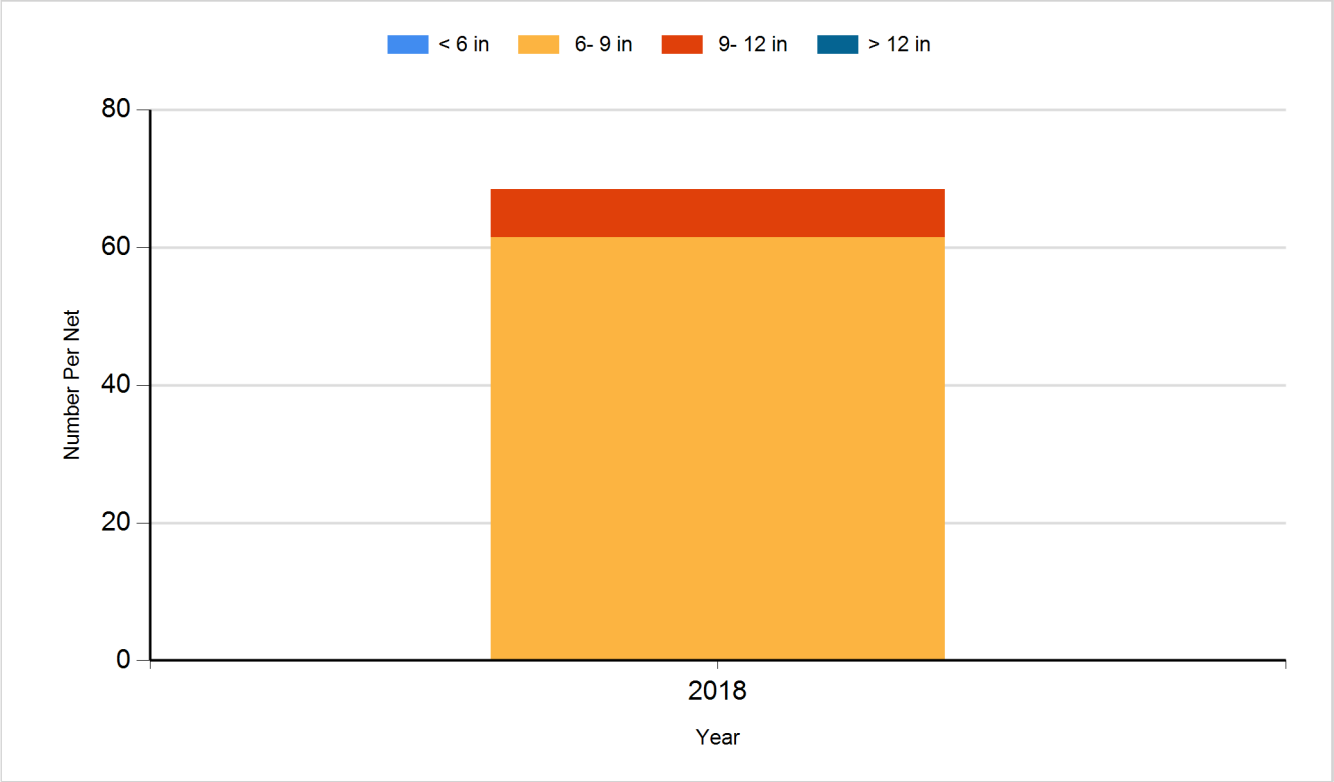


2015

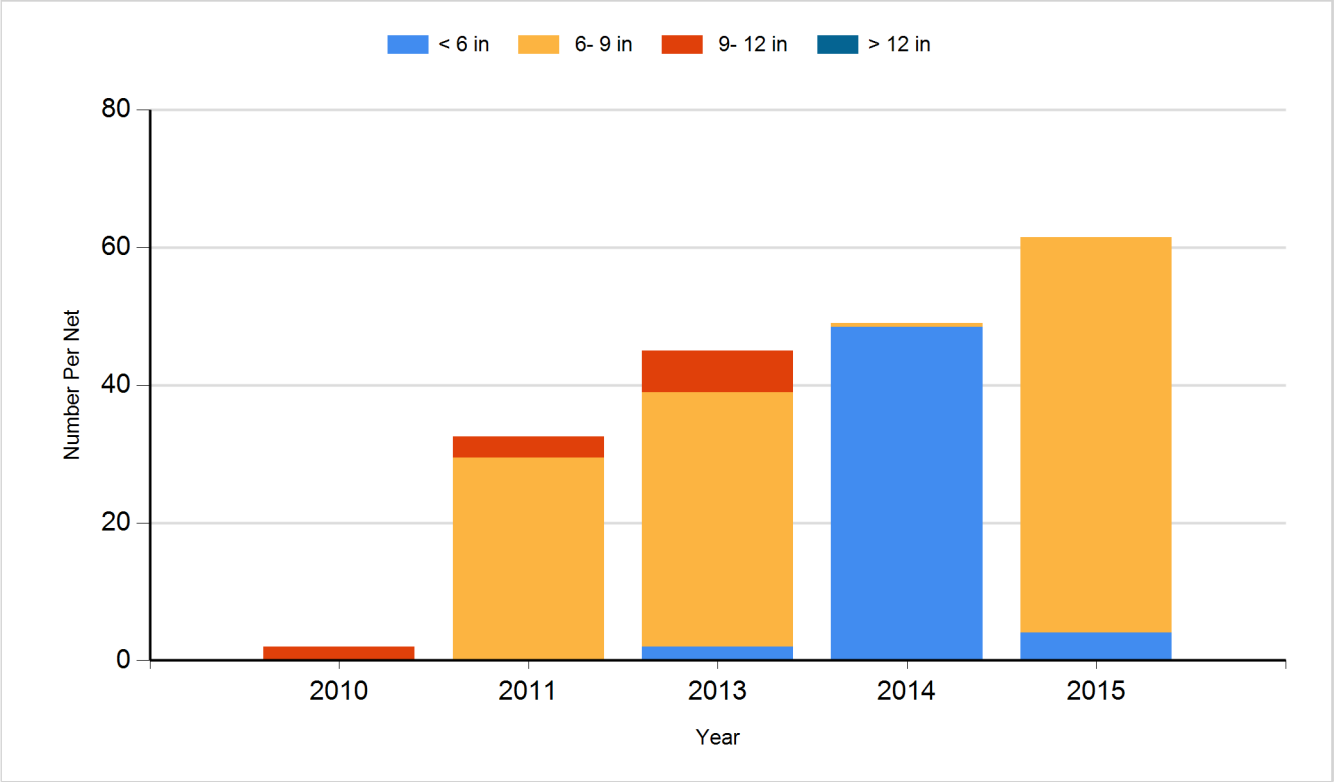
Historic Fish Sizes and Relative Abundance

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

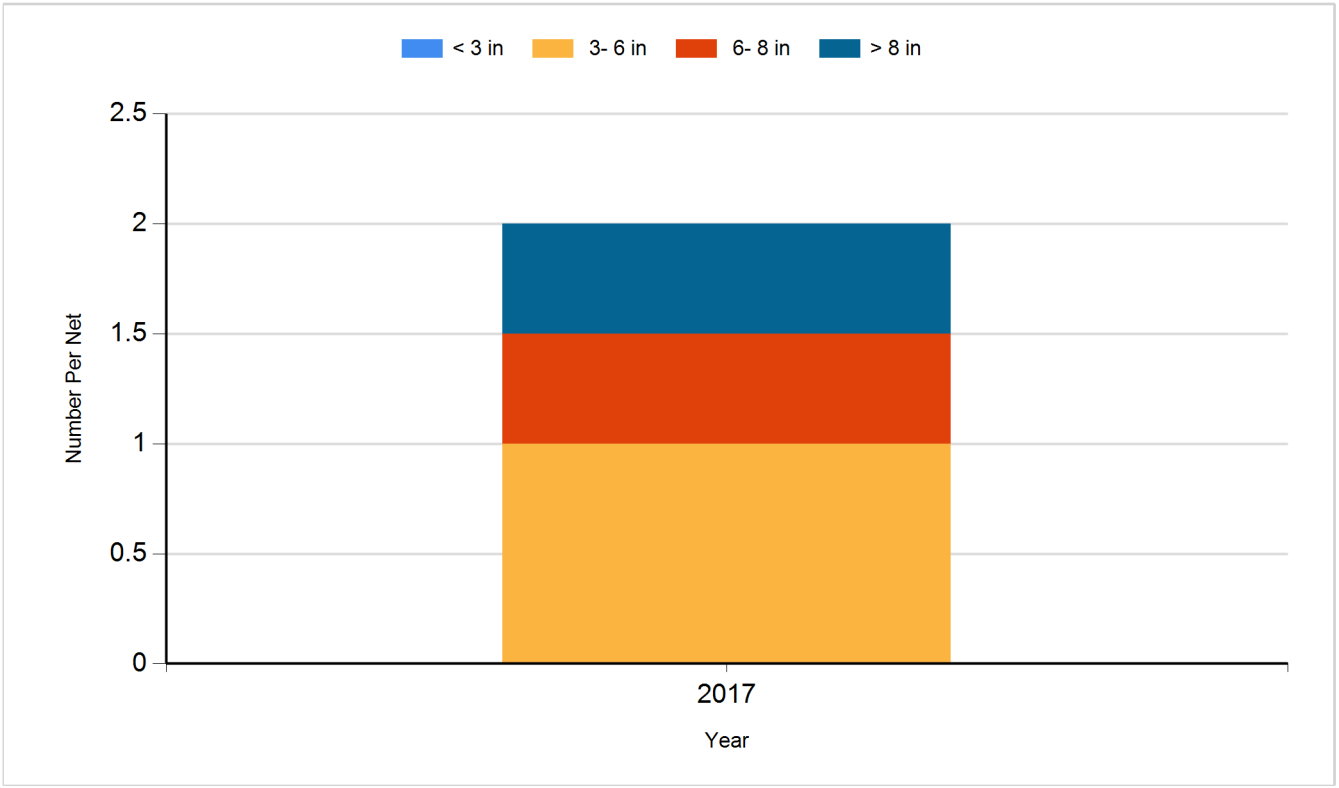
Species: Black Bullhead
Gear: AFS std gill net



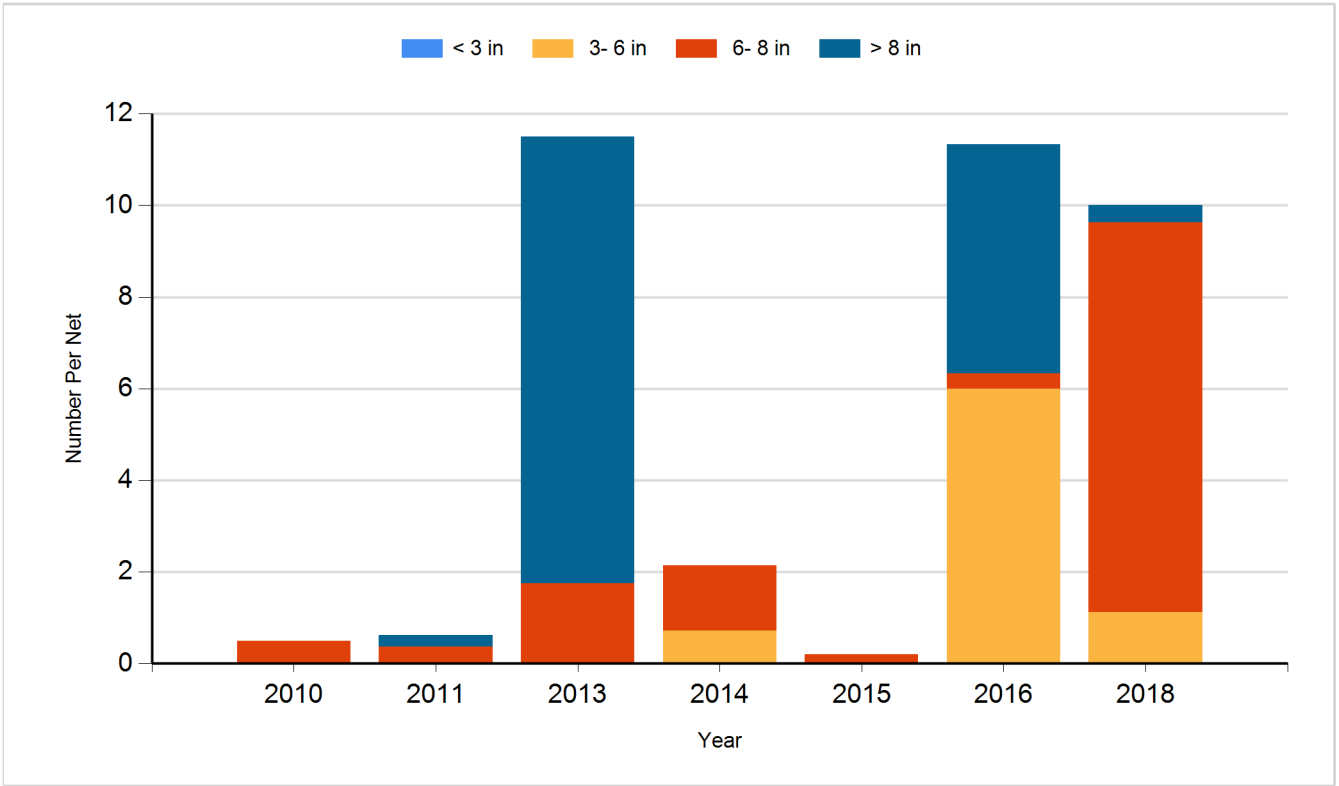
Species: Black Bullhead
Gear: std exp gill net



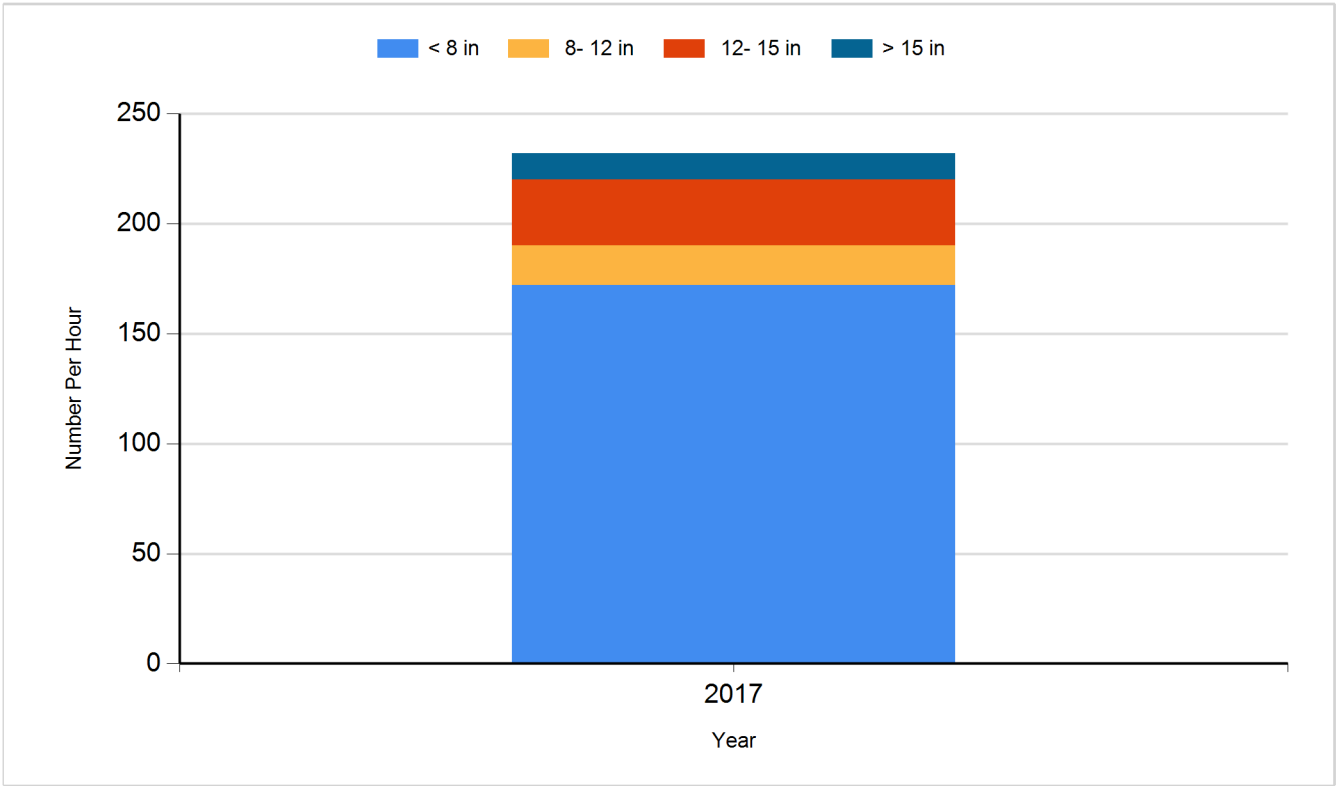
Species: Bluegill
Gear: AFS std frame net



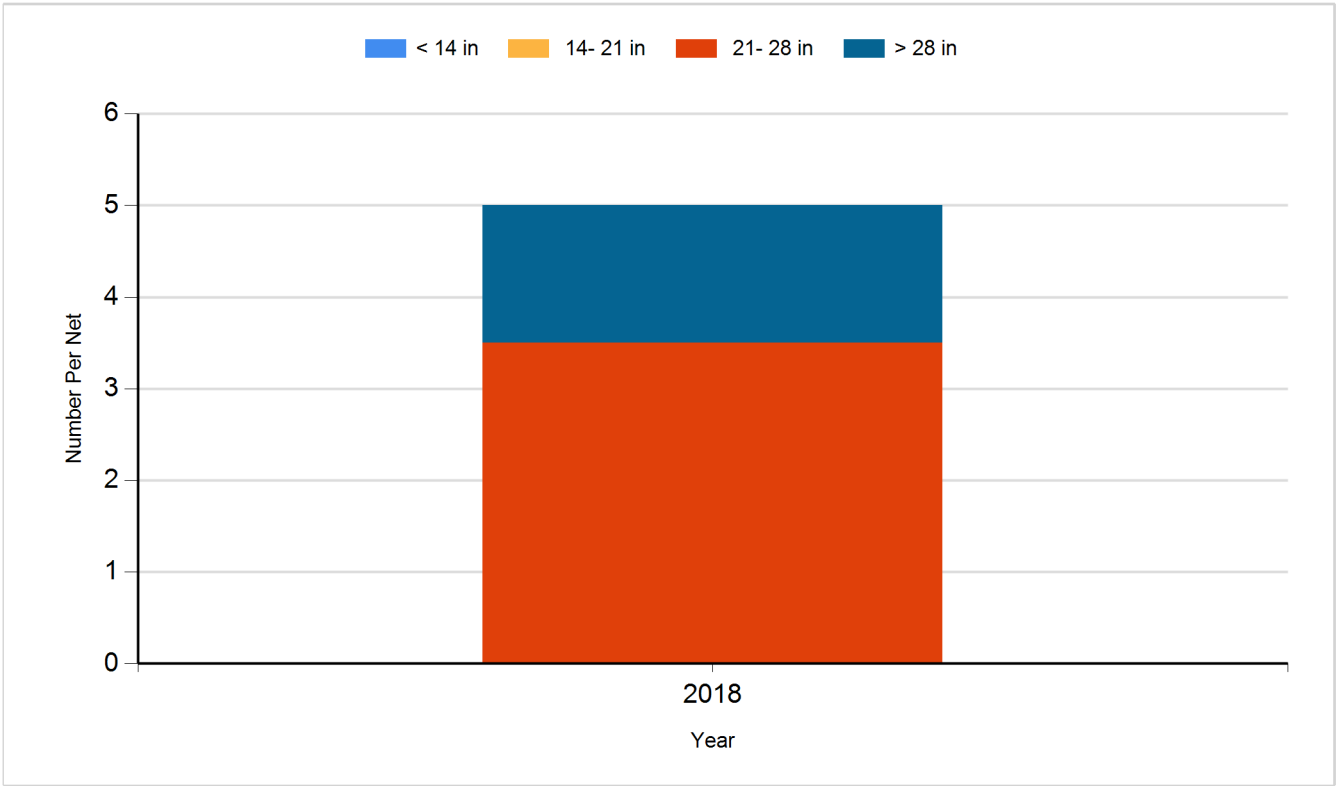
Species: Bluegill
Gear: frame net (std 3/4 in)



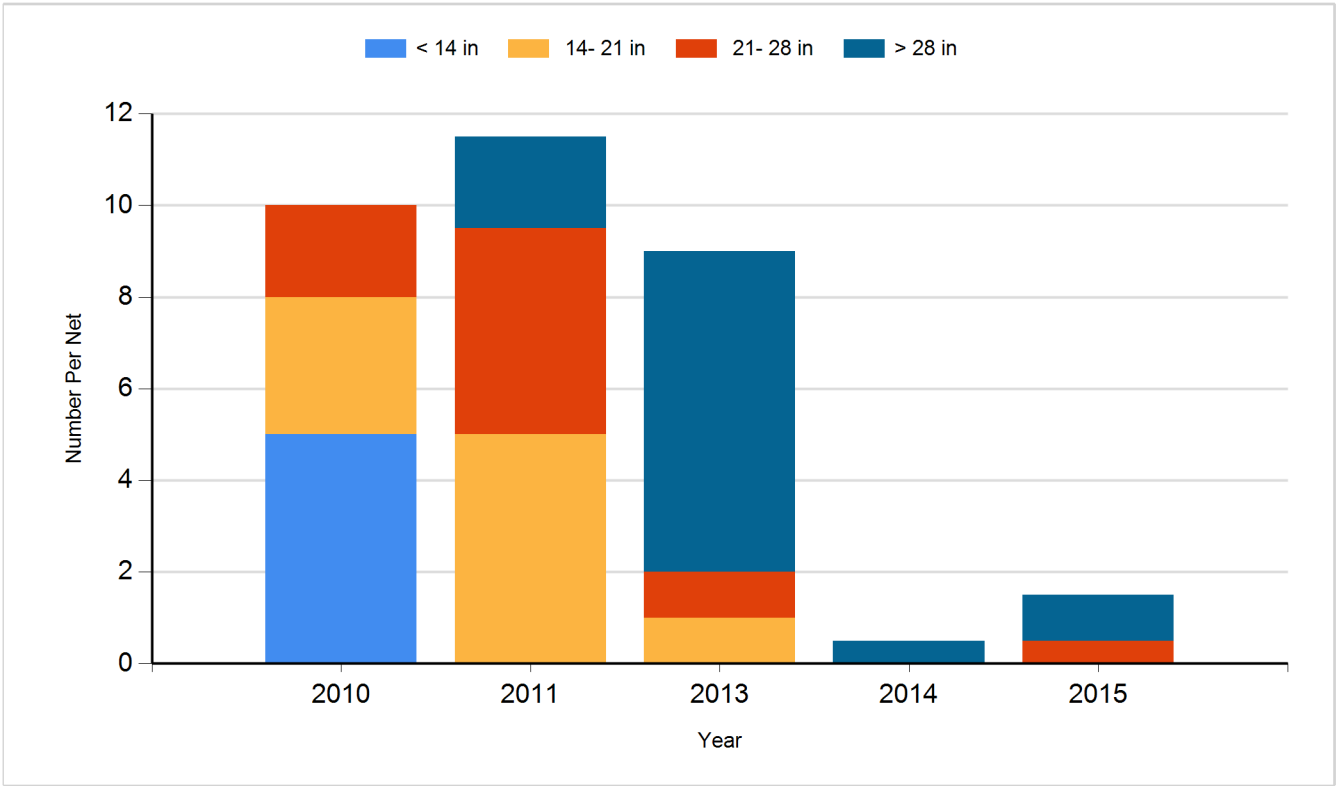
Species: Largemouth Bass
Gear: boat shocker (night)



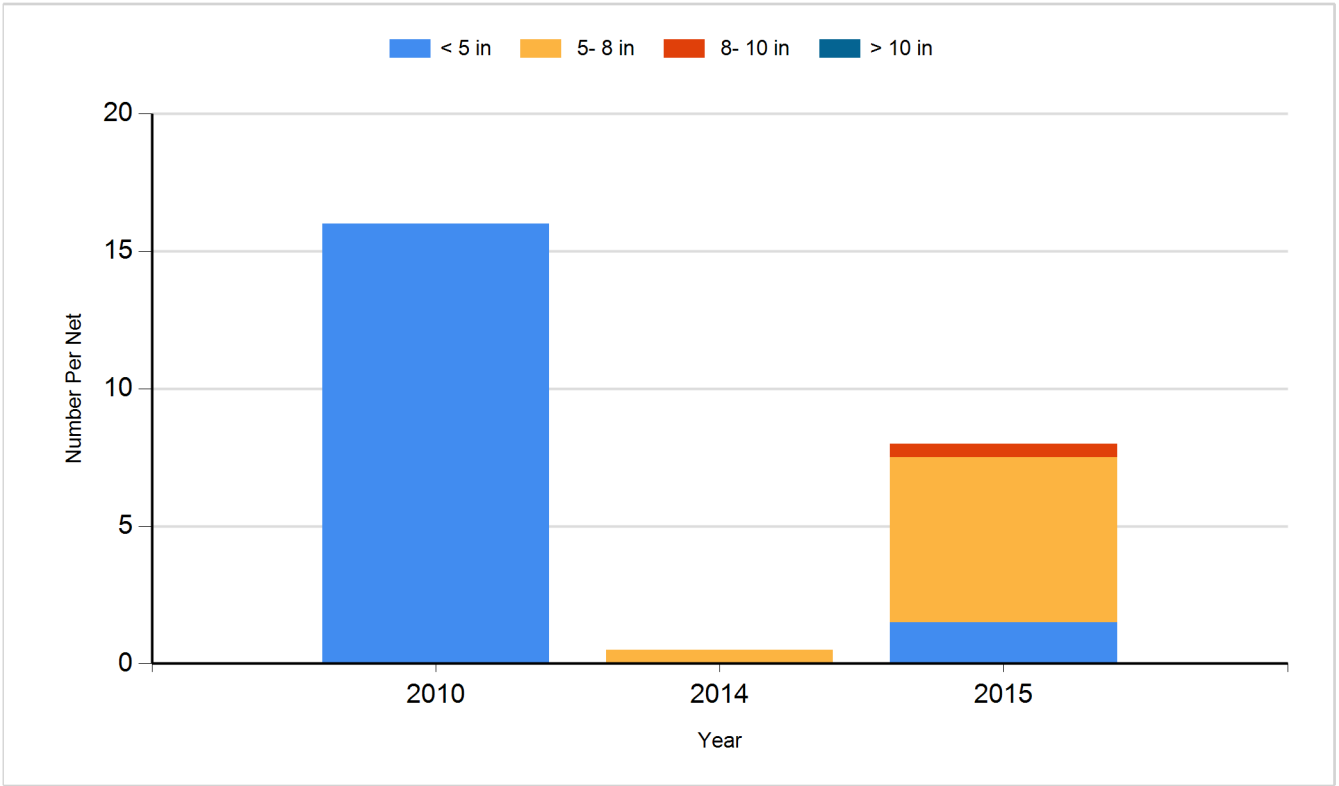
Species: Northern Pike
Gear: AFS std gill net



Species: Northern Pike
Gear: std exp 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
2008	Bluegill	Adult	20
2008	Bluegill	Fingerling	10,000
2008	Bluegill	Juvenile	200
2008	Northern Pike	Fry	192,500
2008	Yellow Perch	Adult	200
2010	Yellow Perch	Adult	200
2011	Golden Shiner	Adult	45
2011	Yellow Perch	Adult	450
2012	Bluegill	Adult	250
2012	Yellow Perch	Adult	275
2013	Yellow Perch	Adult	600
2014	Bluegill	Adult	125
2014	Largemouth Bass	Adult	211
2014	Largemouth Bass	Juvenile	200
2014	Yellow Perch	Adult	530
2015	Northern Pike	Adult	50
2015	Yellow Perch	Adult	320
2016	Northern Pike	Adult	30