

Opal Lake Survey Summary

Opal Lake is a 31-acre impoundment located 17 miles West, 9 miles South of Faith. Opal is managed as a Bluegill, Largemouth Bass, Northern Pike, Yellow Perch fishery. It also has Black Bullhead and Green Sunfish. Opal suffered a winterkill the winter of 2022/2023. It seems to be a partial winterkill as all species except bluegill were still in the system. Two hundred adult Bluegill were stocked in the spring of 2023 to reestablish them in the lake.

Largemouth Bass. A large age-one year class dominates the bass population currently. Presumably, the adult bass took a hit from the winterkill as many were seen floating after ice out. The electrofishing survey also indicated this with 88 of the 95 fish sample being under six inches.

Yellow Perch. Five hundred adult perch were stocked in the lake during the spring of 2023 and showed up nicely on our frame nets with 22.2 perch per net. Fish sizes sampled correlated to the same sizes as the ones stocked at 5 to 7 inches.

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Opal, Meade County

CHE-Lake-200-000

2023

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
boat shocker (day)	Jul 14, 2023	2400 seconds
boat shocker (day)	Oct 17, 2023	2400 seconds
frame net (std 3/4 in)	Jul 17, 2023	5 net-nights

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Bluegill

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.
- **std 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.

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

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)
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**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition	
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr
boat shocker (day)	Largemouth Bass	215	8.3	2.7	64		27	128	5
frame net (std 3/4 in)	Black Bullhead	2	0.4	0.4	100		100	84	2
	Bluegill	1	0.2	0.3	100		100	59	
	Northern Pike	3	0.6	0.4	100		33	92	4
	Yellow Perch	108	21.6	15.8	0		0	95	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.

* Methods/Species that ignore stock length

Gear	Species	CPUE										Avg
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
AFS std frame net	Black Bullhead				8.5							8.50
	Bluegill				2.0							2.00
	Green Sunfish				0.3							0.30
	Largemouth Bass				0.0							0.00
	Northern Pike				0.8							0.80
	Yellow Perch				0.8							0.80
AFS std gill net	Black Bullhead					68.5						68.50
	Northern Pike					5.0						5.00
boat shocker (day)	Largemouth Bass									8.3		8.30
boat shocker (night)	Largemouth Bass				60.0							60.00
frame net (std 3/4 in)	Black Bullhead	25.1	764.8	131.8		48.4	8.3		4.7		0.4	140.50
	Bluegill	2.1	0.2	11.3		10.0	19.7		155.7		0.2	28.46
	Green Sunfish	0.0	0.2	0.3		0.5	0.0		0.0		0.0	0.14
	Largemouth Bass	0.0	0.0	0.0		0.0	0.0		0.7		0.0	0.10
	Northern Pike	0.9	2.0	0.3		2.0	0.5		2.7		0.6	1.29
	Sunfish Hybrid	0.0	0.0	0.0		0.0	0.2		3.7		0.0	0.56
	Yellow Perch	0.4	0.8	3.8		0.5	4.8		3.7		21.6	5.09
std exp gill net	Black Bullhead	0.5	57.5									29.00
	Green Sunfish	0.0	0.5									0.25
	Northern Pike	0.5	1.5									1.00
	Yellow Perch	0.5	6.5									3.50

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											
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
AFS std frame net	Black Bullhead	PSD				0								
		PSD-P				0								
		Wr				79								
	Bluegill	PSD				50								
		PSD-P				25								
		Wr				112								
	Largemouth Bass	PSD				0								
		PSD-P				0								
		Wr												
	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 (day)	Largemouth Bass	PSD											64	
		PSD-P											27	
		Wr											128	
boat shocker (night)	Largemouth Bass	PSD				70								
		PSD-P				20								
		Wr				112								
frame net (std 3/4 in)	Black Bullhead	PSD	40	0	1		9	38		100			100	
		PSD-P	0	0	0		0	0		0			100	
		Wr	60		72		87	82		84			84	
	Bluegill	PSD	67	100	47		89	40		21			100	
		PSD-P	0	0	44		4	22		6			100	
		Wr												

Gear	Species	Index	Year									
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
frame net (std 3/4 in)	Bluegill	Wr	104	115	122		121	111		106		59
	Largemouth Bass	PSD			0			0		0		
		PSD-P			0			0		0		
		Wr								98		
	Northern Pike	PSD	100	80	0		63	67		100		100
		PSD-P	67	50	0		0	33		38		33
		Wr	83	101	91		86	93		89		92
	Yellow Perch	PSD	0	0	61		50	72		45		0
		PSD-P	0	0	0		0	14		9		0
		Wr	80	104	97		99	108		81		95
std exp gill net	Black Bullhead	PSD	0	0								
		PSD-P	0	0								
		Wr	64	85								
	Northern Pike	PSD	100	100								
		PSD-P	100	67								
		Wr	76	94								
	Yellow Perch	PSD	0	8								
		PSD-P	0	0								
		Wr	93	97								

Fish Condition

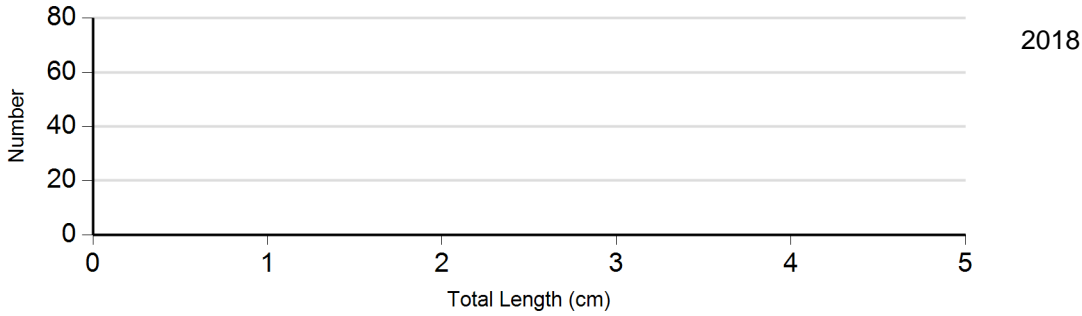
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2019	71	109 (1.5)	21	121 (5.5)	26	109 (1.8)	0	
	2021	370	106 (1.4)	67	107 (2.3)	28	100 (2.6)	2	
	2023	0		0		0		1	59
Largemouth Bass Electro Fishing	2023	4	115 (3.5)	4	133 (4.5)	3	138 (6.6)	0	

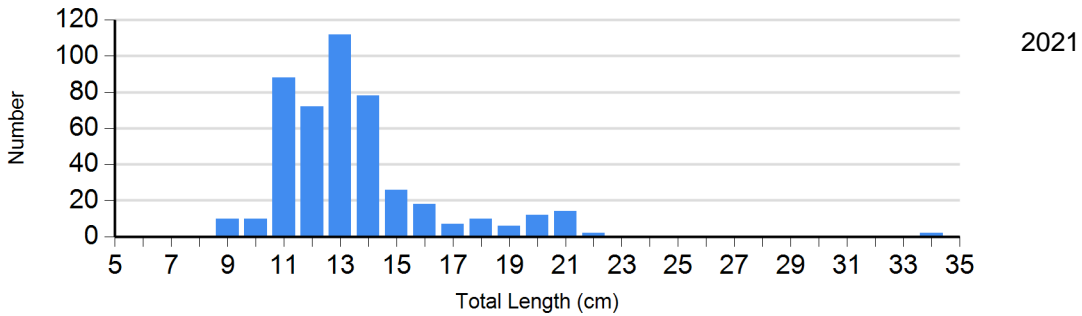
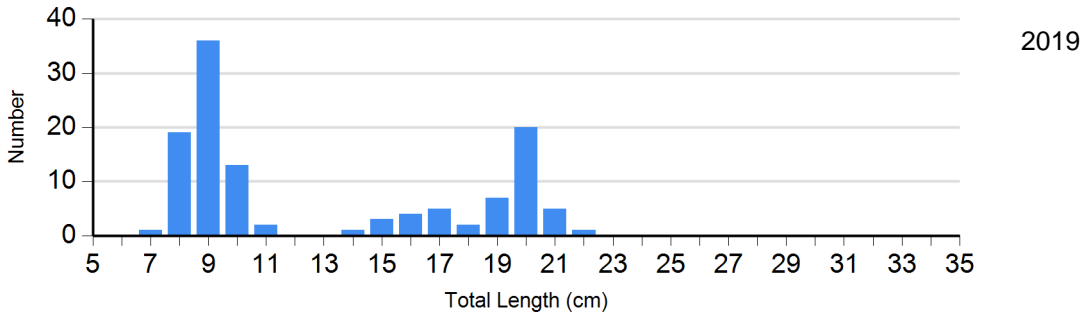
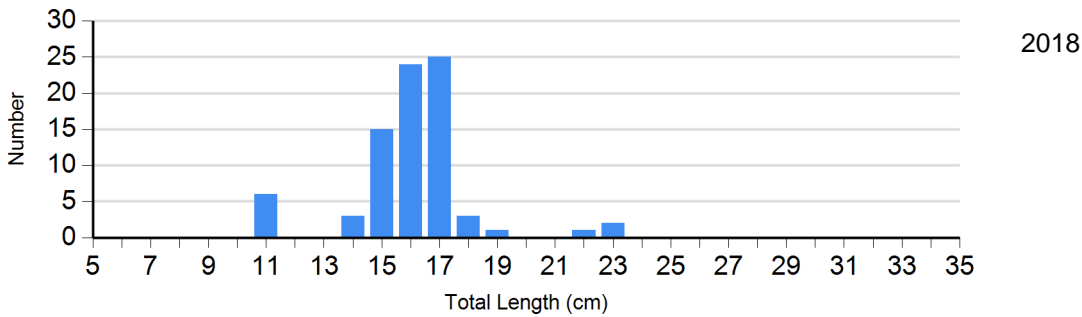
Length Frequency Distribution

Length frequency histogram of species sampled by year.

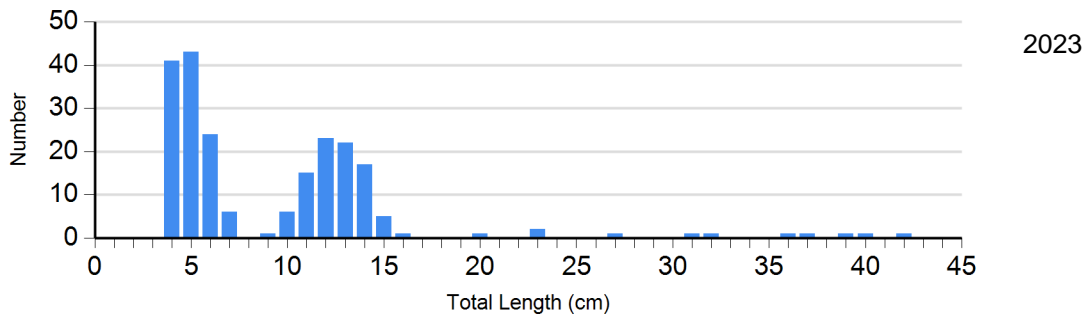
Species: Black Bullhead
Gear: AFS std gill net



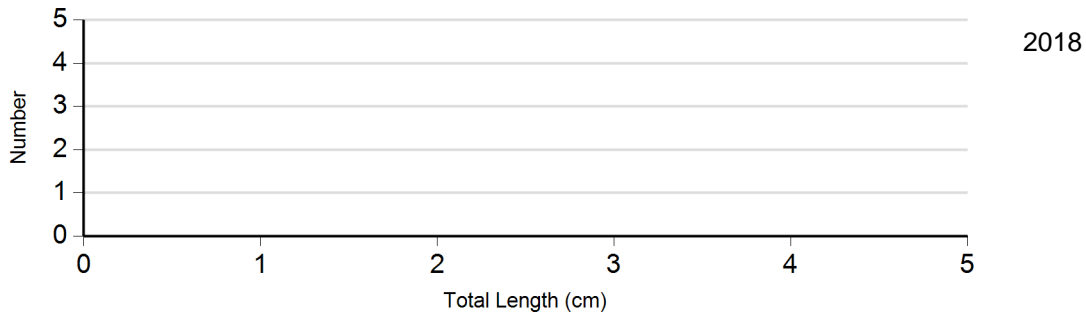
Species: Bluegill
Gear: frame net (std 3/4 in)



Species: Largemouth Bass
Gear: boat shocker (day)



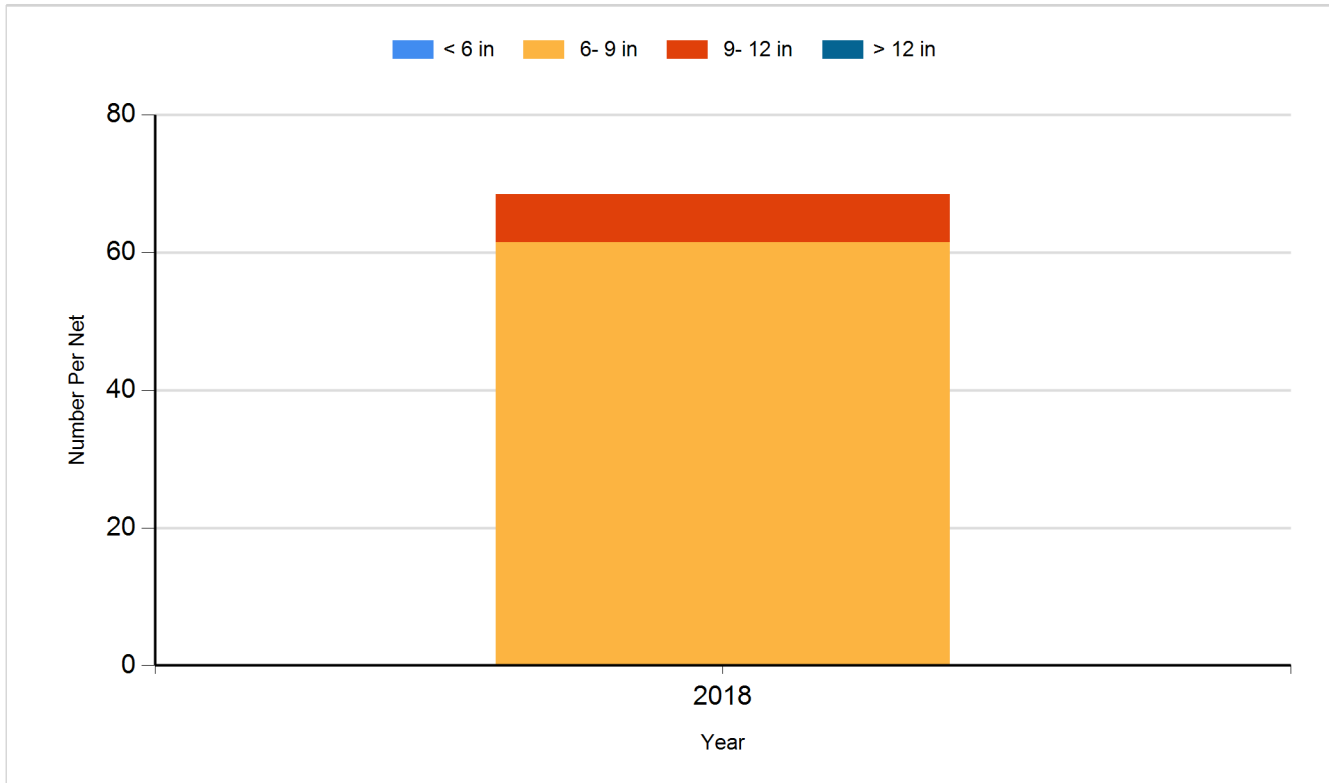
Species: Northern Pike
Gear: AFS std gill net



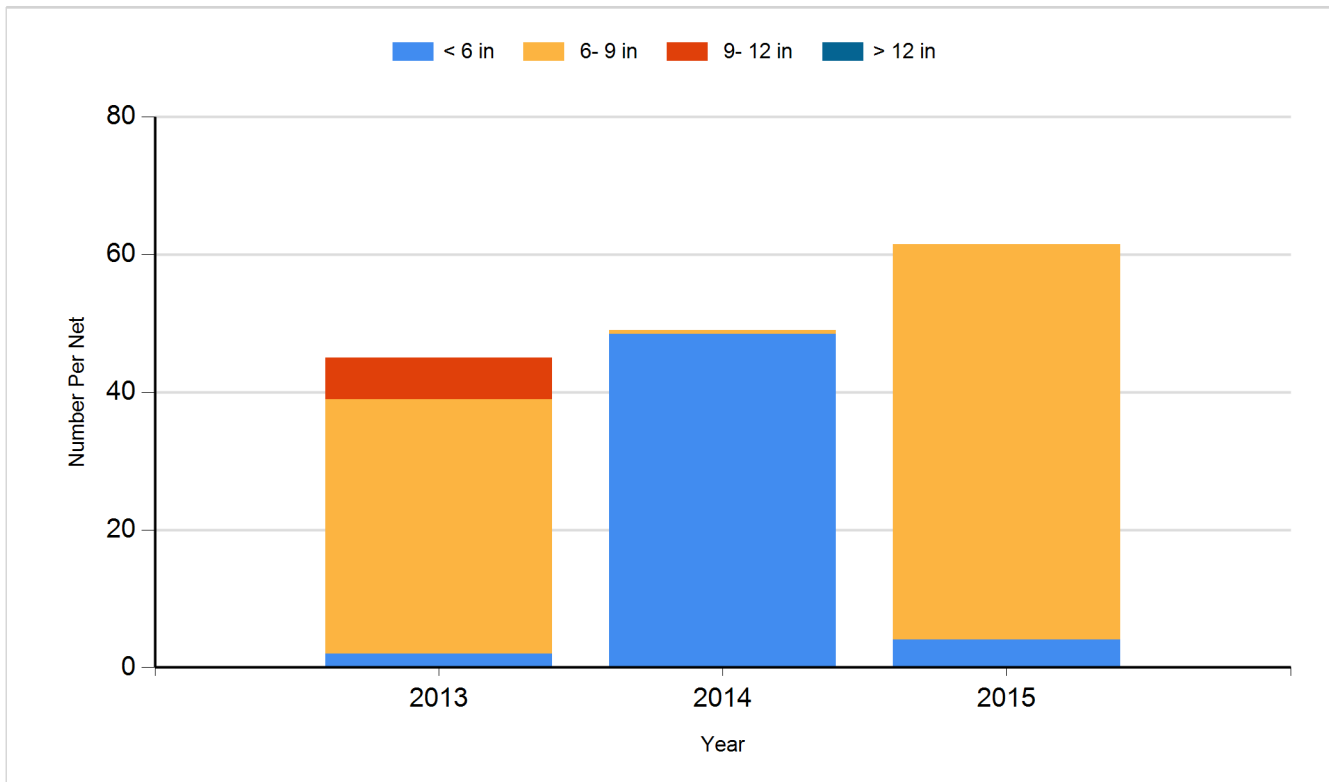
Historic Fish Sizes and Relative Abundance

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

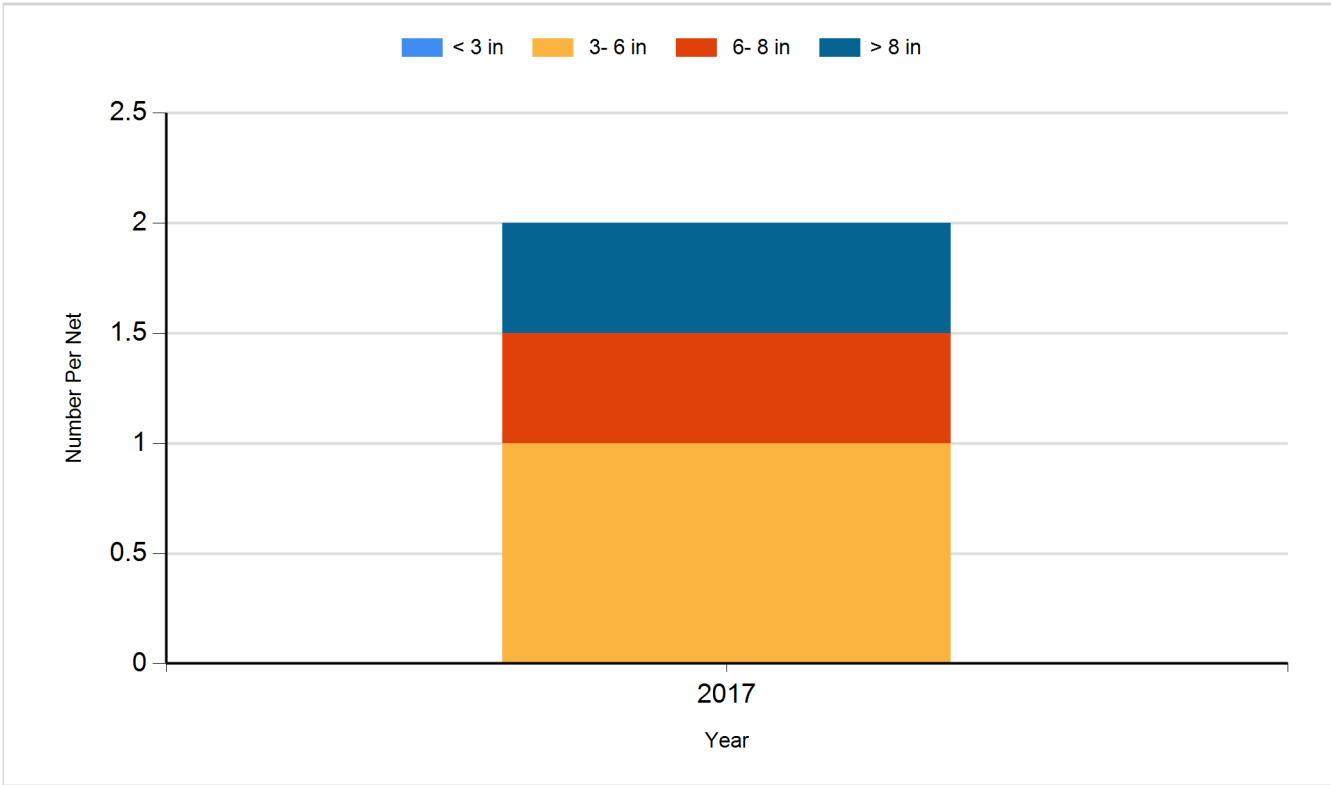
Species: Black Bullhead
Gear: AFS std gill net



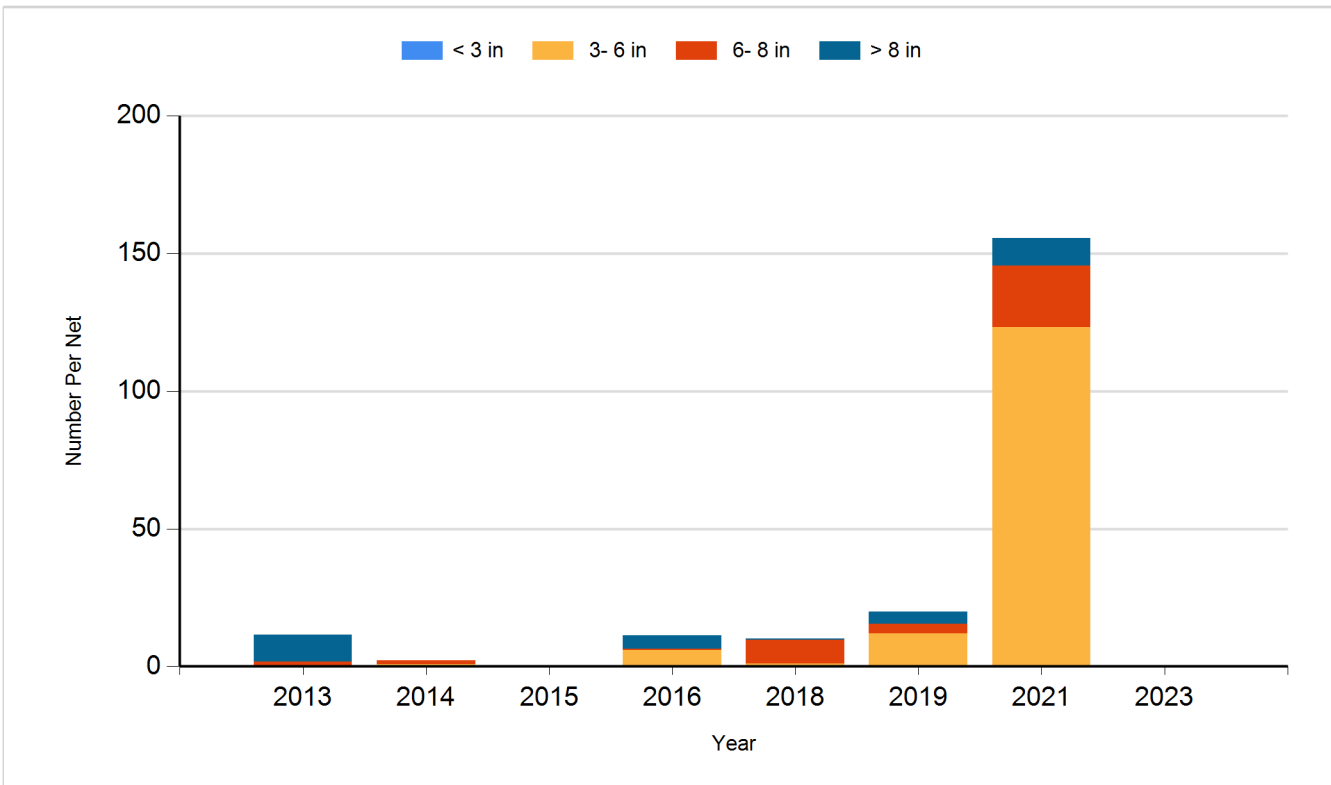
Species: Black Bullhead
Gear: std exp gill net



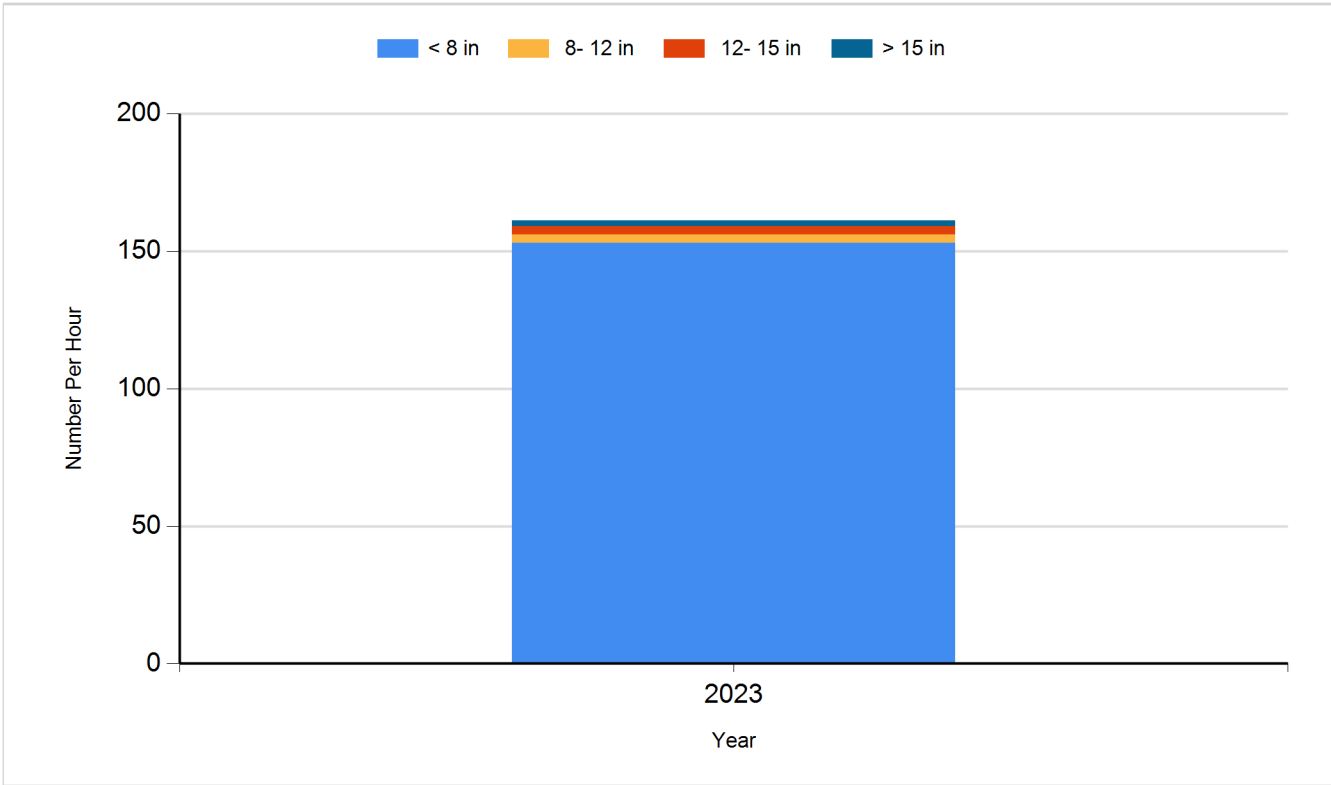
Species: Bluegill
Gear: AFS std frame net



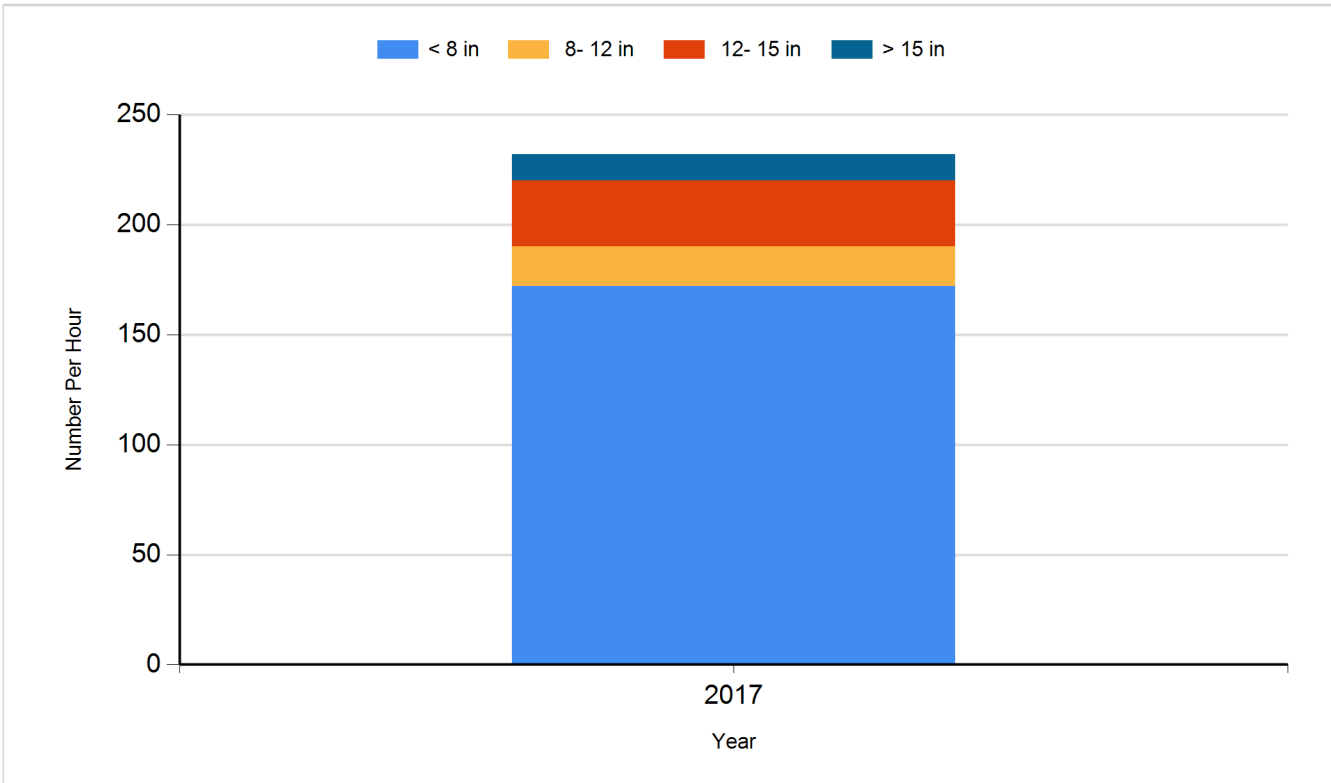
Species: Bluegill
Gear: frame net (std 3/4 in)



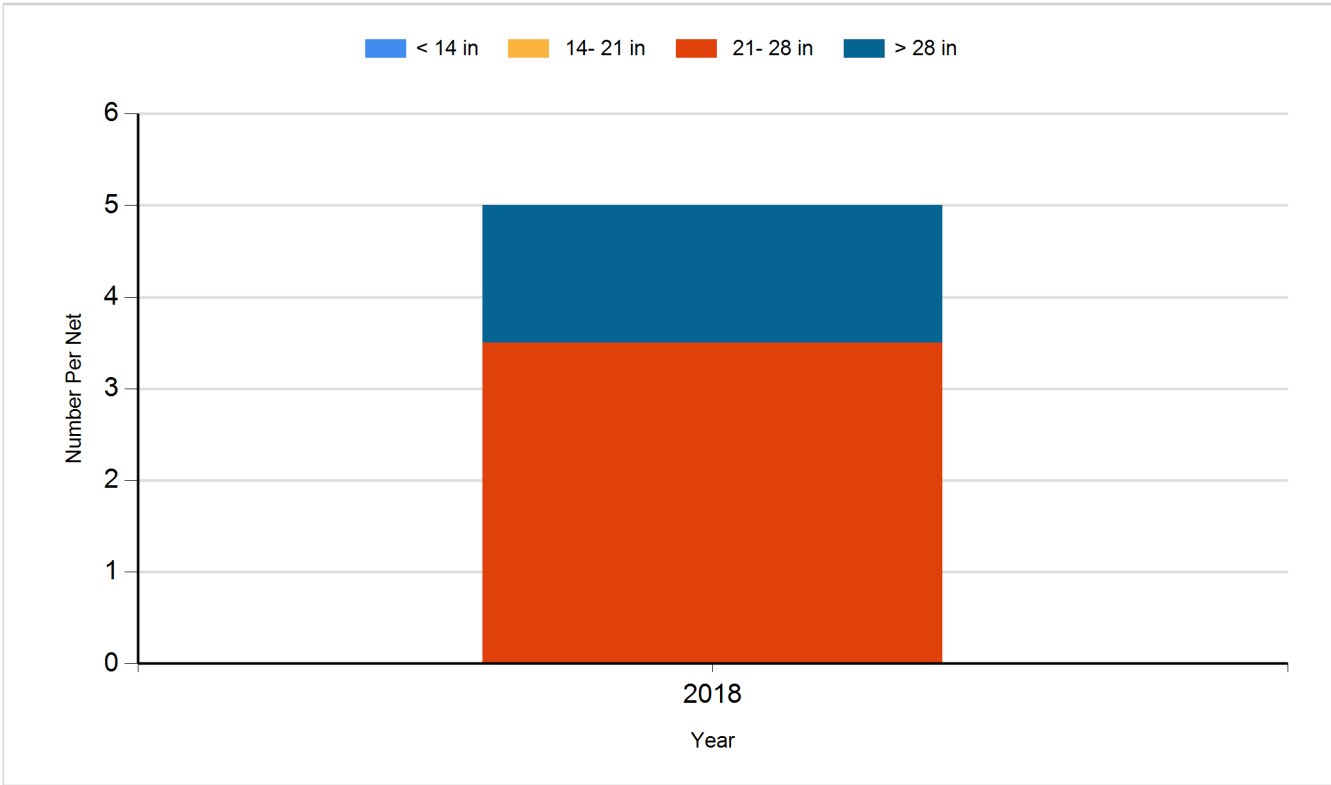
Species: Largemouth Bass
Gear: boat shocker (day)



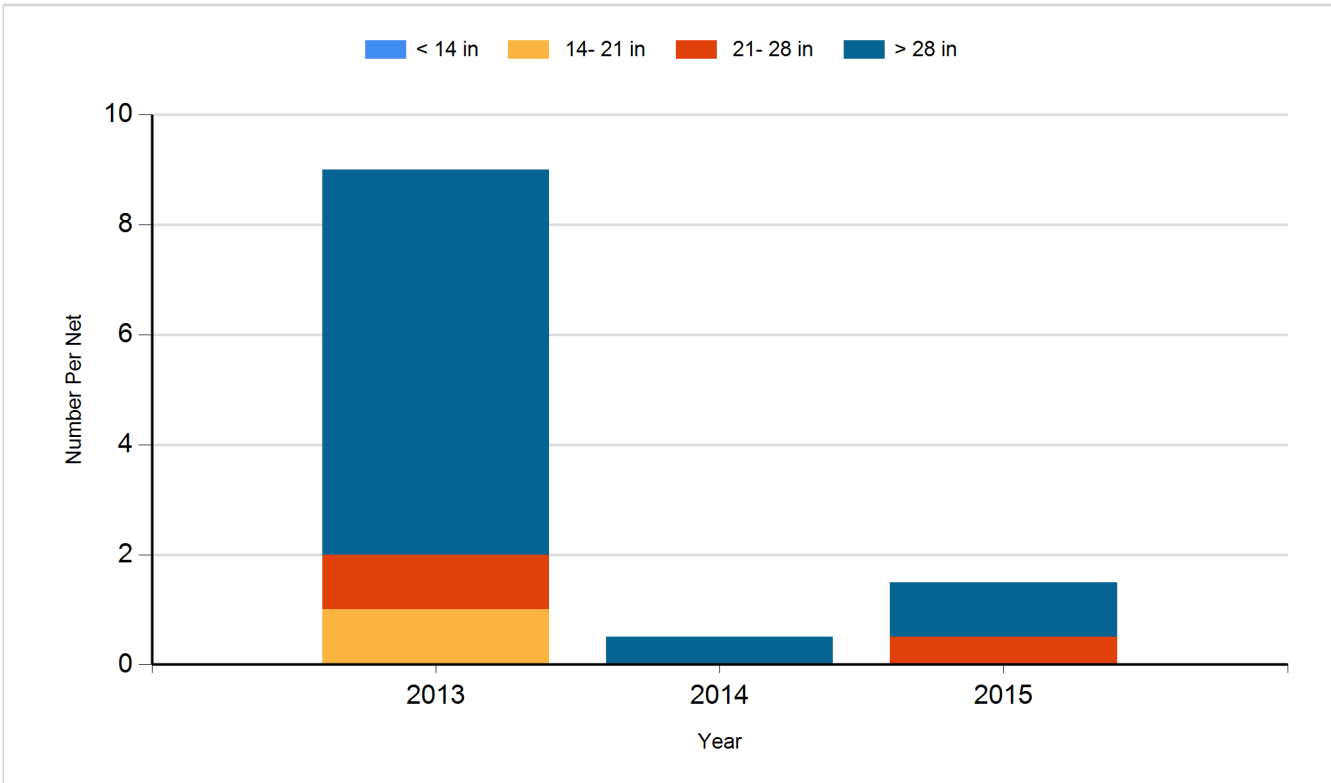
Species: Largemouth Bass
Gear: boat shocker (night)



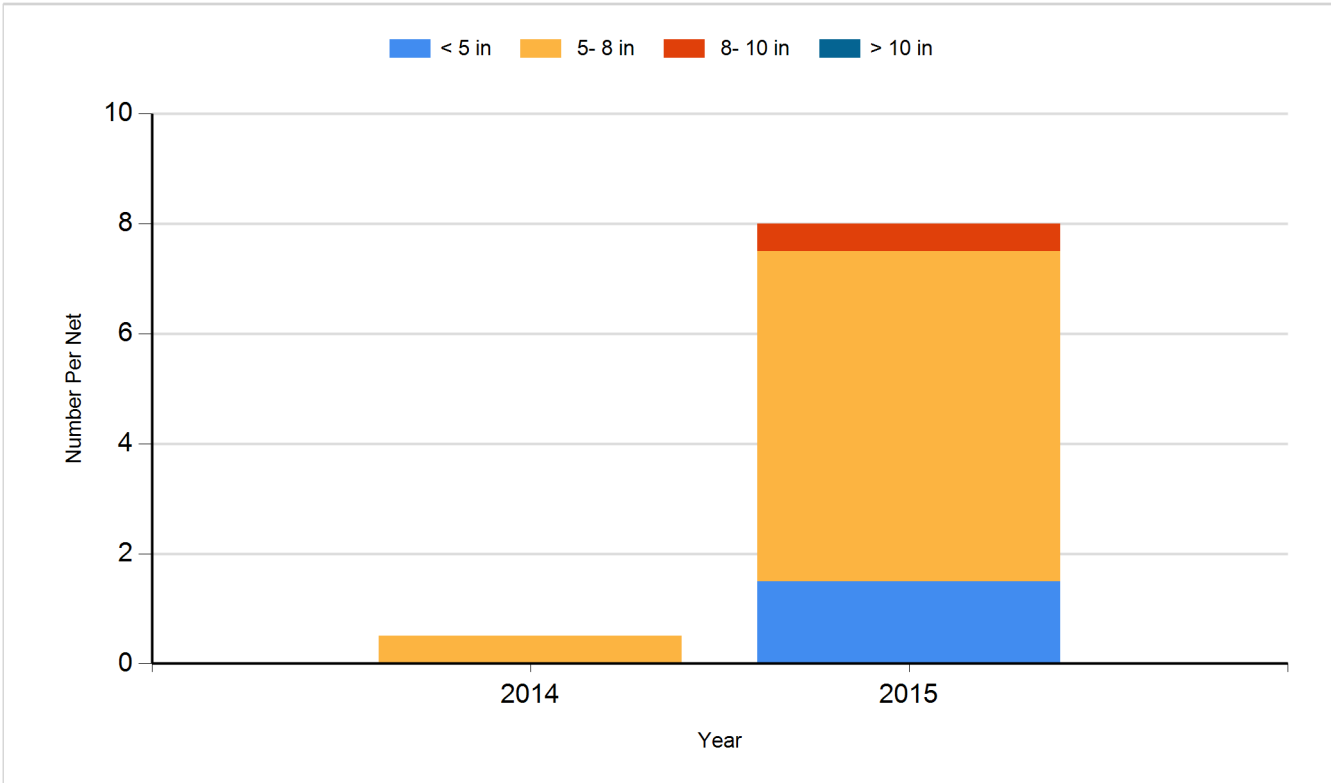
Species: Northern Pike
Gear: AFS std gill net



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
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
2023	Bluegill	Adult	200
2023	Largemouth Bass		47
2023	Largemouth Bass	Adult	100