

East Lemmon Lake Survey

East Lemmon Lake is a 165-acre lake located 11 miles South and 7 miles East of Lemmon. The primary species found in this lake are Black Bullhead, Northern Pike and Yellow Perch. This lake's clear water leads to large amounts of vegetation, which can cause frequent winterkills as the plants die and decompose using up oxygen in the winter.

Black Bullhead. Black Bullheads comprised 98.6% of the entire number of fish sampled in the 2023 trap net survey, and 94.5% of the gill net survey. Bullhead size was very small on average, but there were some fish over 12 inches in the sample.

Northern Pike. Pike were the only top level predator sampled in the survey with 8 fish sampled in the frame nets and five sampled in the gill nets. Multiple year classes were sampled with fish ranging from 13-37 inches.

Yellow Perch. Perch numbers remain low with only 6 fish sampled in the entire survey.

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Lemmon East, Perkins County

GRA-Lake-392-000

2023

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	Jun 27, 2023	2 net-nights
frame net (std 3/4 in)	Jun 27, 2023	5 net-nights

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Black Bullhead

Black Crappie

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	CI-80
AFS std gill net	Black Bullhead	105	52.0	21.5	46	7	35	7	103	1
	Northern Pike	5	2.5	1.5	100		80		92	6
frame net (std 3/4 in)	Black Bullhead	953	114.0	60.5	63	3	9	2		
	Black Crappie	1	0.2	0.3	100		0		105	
	Northern Pike	8	1.0	0.5	60		20		90	6
	Yellow Perch	5	1.0	0.8	0		0		108	6

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				0.8								0.80
	Bluegill				0.5								0.50
	Largemouth Bass				0.2								0.20
	Northern Pike				0.4								0.40
	White Sucker				0.2								0.20
	Yellow Perch				0.2								0.20
AFS std gill net	Black Bullhead				41.8	14.0	5.5	4.0	54.0		52.0		28.55
	Largemouth Bass				0.5	0.0	0.0	0.0	0.0		0.0		0.08
	Northern Pike				3.0	1.5	2.5	3.0	1.5		2.5		2.33
	White Sucker				0.3	0.0	0.0	0.0	0.0		0.0		0.05
	Yellow Perch				0.8	0.5	1.5	0.0	0.5		0.0		0.55
boat shocker (night)	Largemouth Bass	90.0											90.00
	Smallmouth Bass	1.2											1.20
frame net (std 3/4 in)	Black Bullhead	140.8	40.0			5.0	13.3	151.2	17.3	52.8	114.0		66.80
	Black Crappie	0.0	0.0			0.0	0.0	0.0	0.3	0.0	0.2	0.06	0.06
	Bluegill	0.0	0.0			0.0	0.0	0.2	0.8	0.2	0.0	0.15	0.15
	Golden Shiner	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
	Largemouth Bass	0.3	0.0			0.0	0.0	0.0	0.2	0.0	0.0	0.06	0.06
	Northern Pike	0.1	0.3			0.7	0.6	2.2	1.3	0.6	1.0	0.85	0.85
	Smallmouth Bass	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
	Walleye	0.0	0.0			0.0	0.1	0.0	0.0	0.0	0.0	0.01	0.01
	White Sucker	3.6	0.5			0.0	0.0	0.2	0.0	0.0	0.0	0.54	0.54
	Yellow Perch	1.1	0.6			0.3	0.4	0.2	0.0	0.0	1.0	0.45	0.45
std exp gill net	Black Bullhead	111.5	24.0										67.75
	Golden Shiner	0.0	0.0										0.00
	Largemouth Bass	0.0	3.5										1.75
	Northern Pike	1.5	11.0										6.25
	White Sucker	3.0	1.0										2.00
	Yellow Perch	21.0	21.5										21.25

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				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	100	88	89			46
			PSD-P				89	96	100	50	13			35
			Wr				102	97	110	101	102			103
Largemouth Bass		PSD				50								
		PSD-P				0								
		Wr				113								
Northern Pike		PSD				92	100	100	83	100				100
		PSD-P				58	33	40	0	33				80
		Wr				91	91	84	102	92				92
Yellow Perch		PSD				100	100	100		100				
		PSD-P				67	100	100		100				
		Wr				106	83	99		113				
boat shocker (night)		Largemouth Bass	PSD	7										
			PSD-P	3										
			Wr	122										
frame net (std 3/4 in)	Black Bullhead	PSD	86	97			100	100	11	96	63	63		
		PSD-P	0	3			100	100	1	14	7	9		
		Wr	83	91			89	90	93		96			
	Black Crappie	PSD									50		100	
		PSD-P									50		0	

Gear	Species	Index	Year											
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
frame net (std 3/4 in)	Black Crappie	Wr									106		105	
	Largemouth Bass	PSD	100									100		
		PSD-P	0									0		
		Wr	108									106		
	Northern Pike	PSD	100	0				50	100	92	50	67	60	
		PSD-P	0	0				0	80	0	0	67	20	
		Wr	84					90	89	93	83	88	90	
	Yellow Perch	PSD	100	100				50	33	100				0
		PSD-P	44	60				50	0	100				0
		Wr	100	113				99	89	88				108
	std exp gill net	Black Bullhead	PSD	72	94									
			PSD-P	0	4									
Wr			84	97										
Largemouth Bass		PSD		0										
		PSD-P		0										
		Wr		109										
Northern Pike		PSD	100	36										
		PSD-P	100	36										
		Wr	100	100										
Yellow Perch		PSD	86	84										
		PSD-P	31	60										
		Wr	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

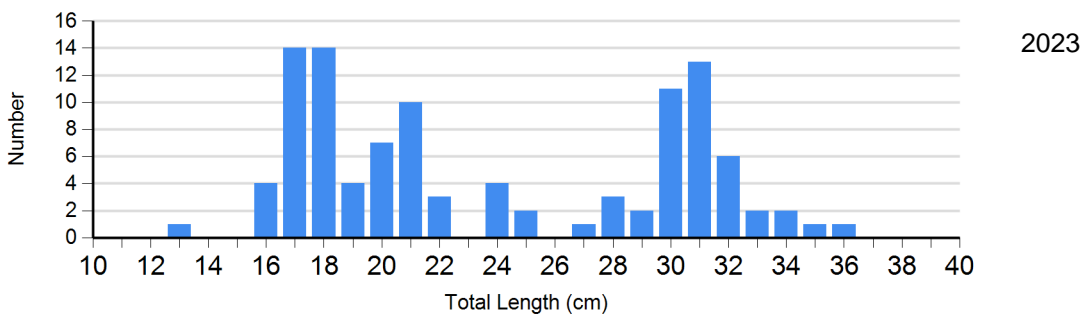
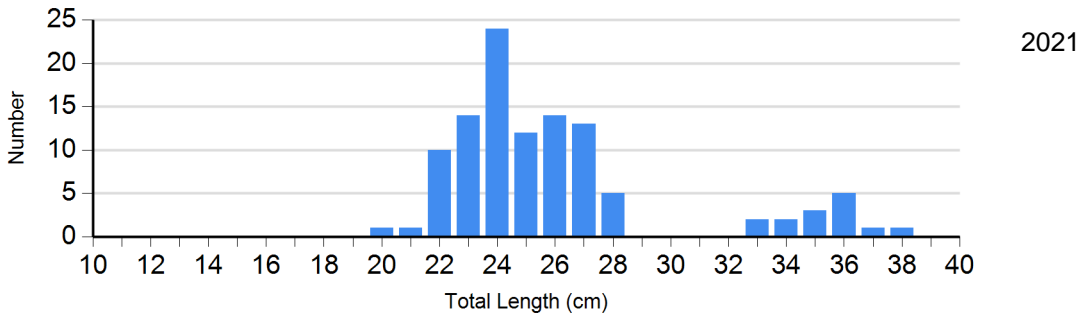
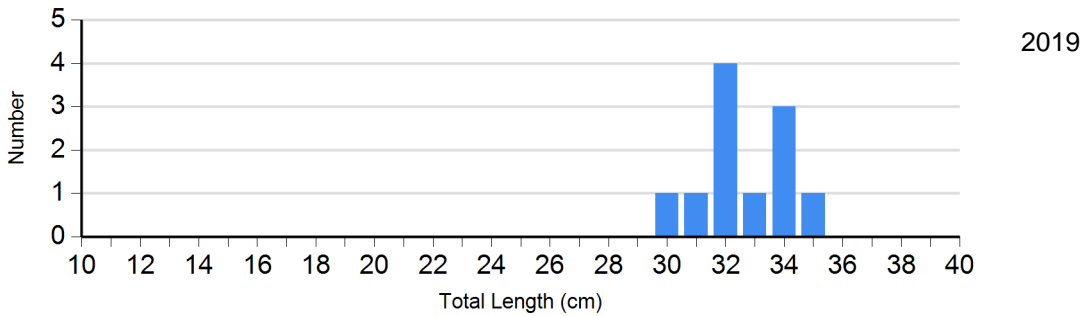
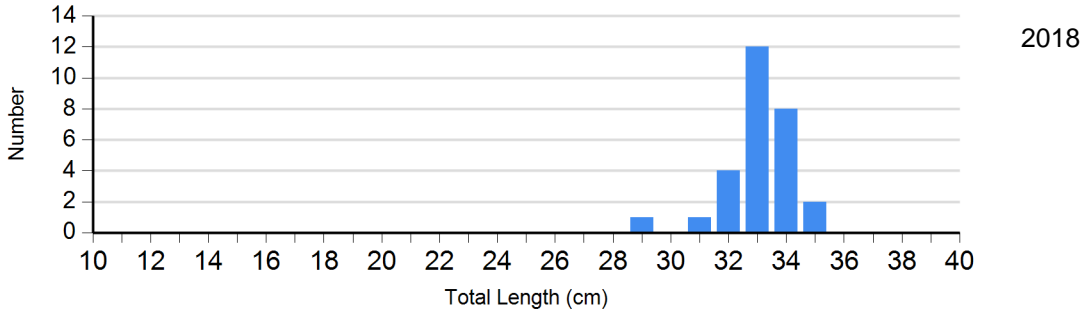
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2019	0		0		11	110 (3.8)	0	
	2020	1	92	3	109 (3.1)	4	97 (6.4)	0	
	2021	12	100 (1.9)	82	103 (1.0)	13	98 (2.1)	1	
	2023	56	101 (1.4)	12	110 (1.5)	36	103 (1.6)	0	
Black Crappie Frame Net	2021	1	115	0		1	97	0	
	2023	0		1	105	0		0	
Northern Pike Gill Net	2019	0		3	78 (3.8)	2	92 (1.2)	0	
	2020	1	100	5	102 (2.0)	0		0	
	2021	0		2	94 (1.9)	1	87	0	
	2023	0		1	96	2	87 (10.9)	2	97
Yellow Perch Gill Net	2019	0		0		0		3	99 (6.3)
	2021	0		0		1	113	0	

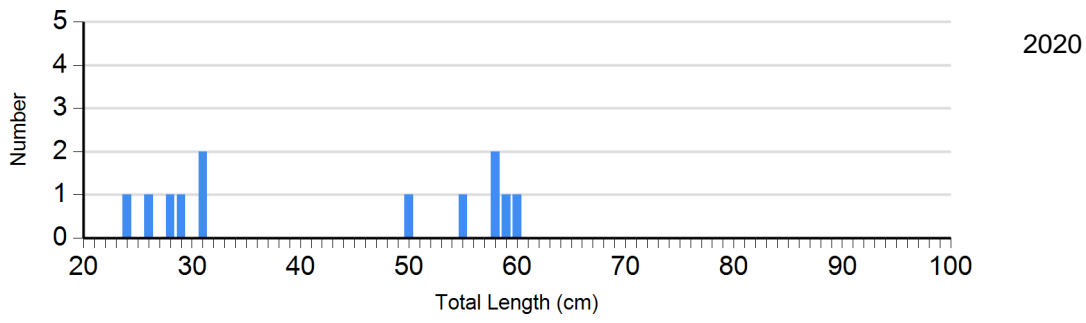
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



Species: Northern Pike
Gear: AFS std gill net

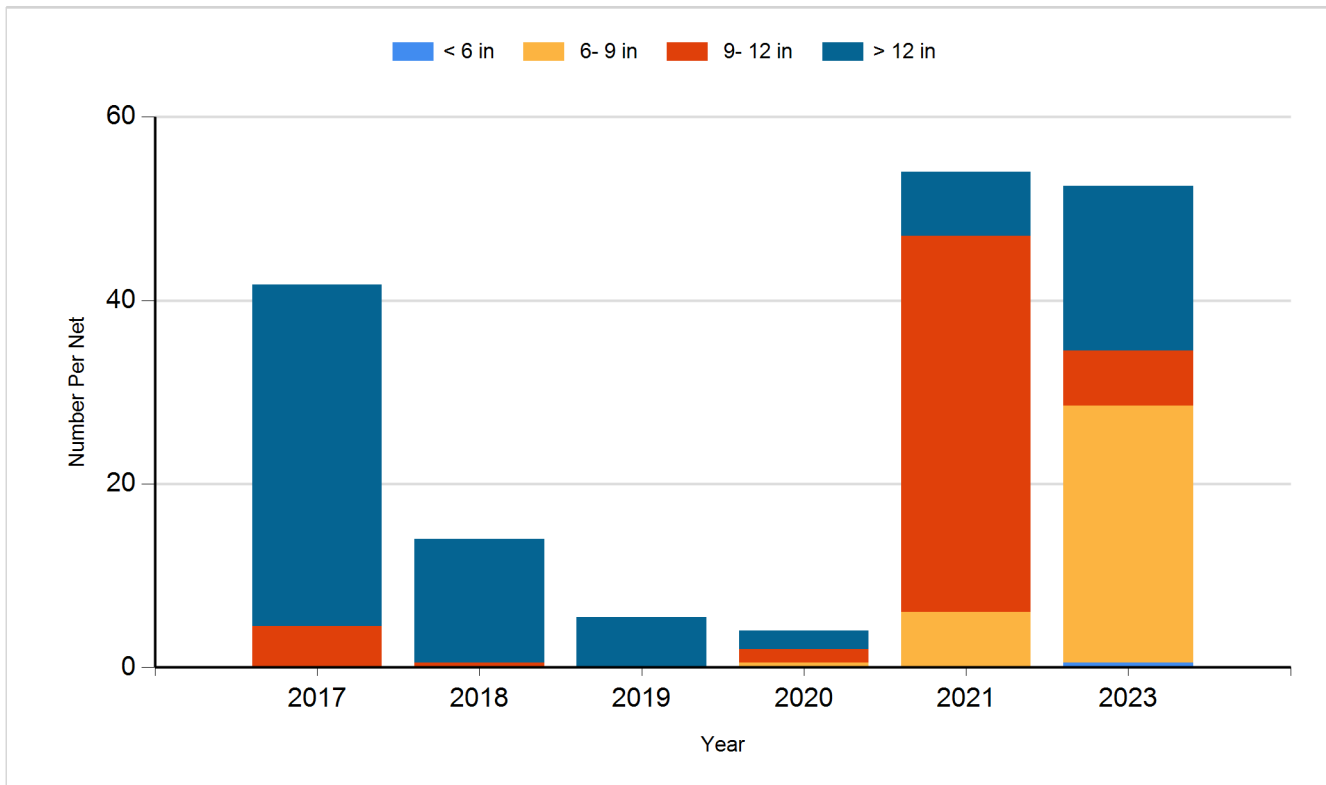


Historic Fish Sizes and Relative Abundance

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

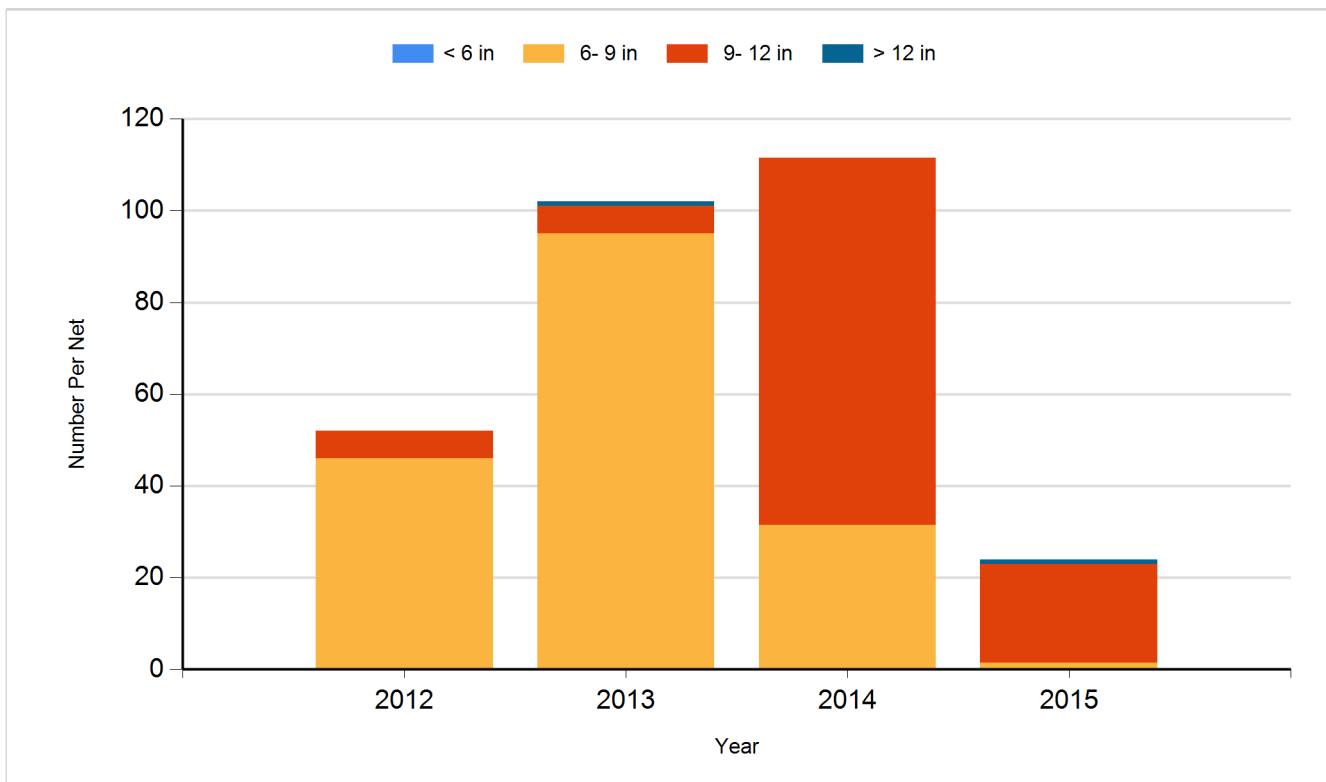
Species: Black Bullhead

Gear: AFS std gill net

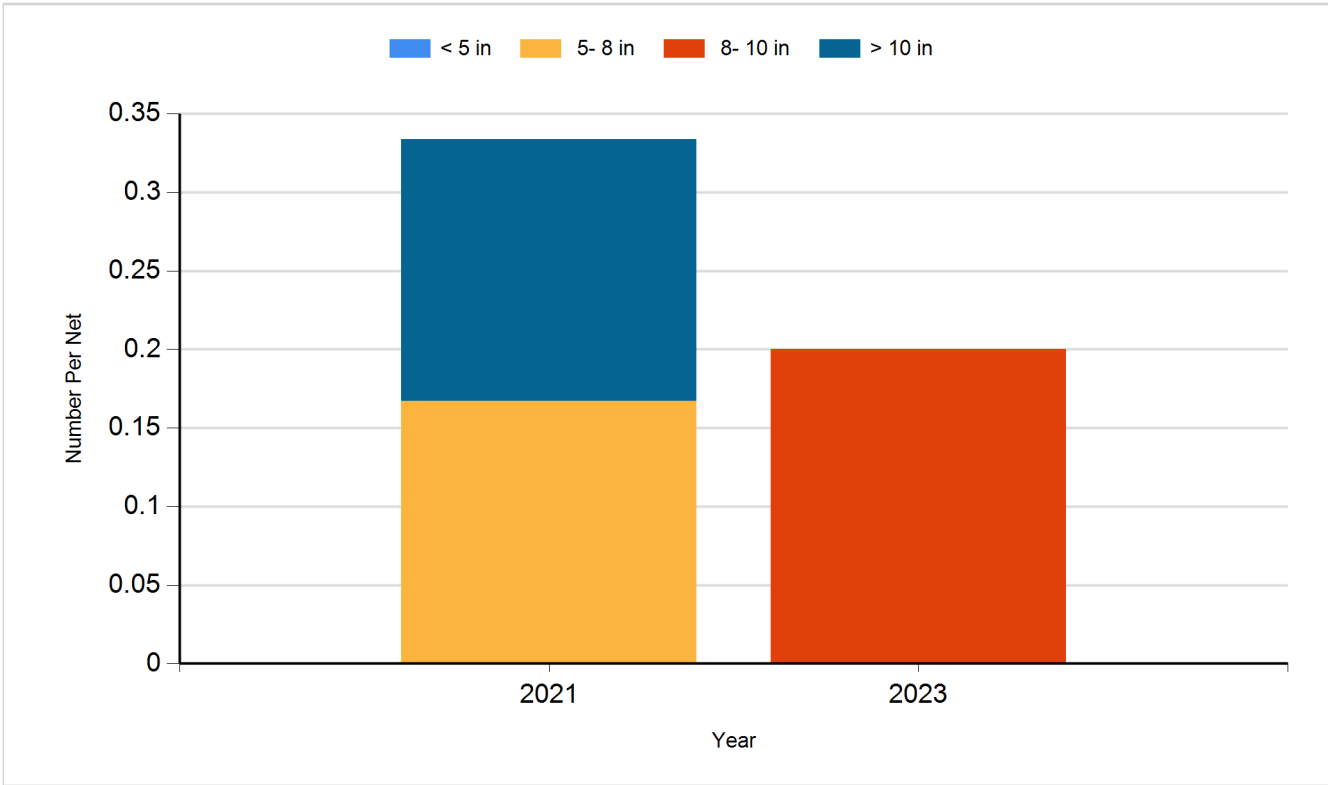


Species: Black Bullhead

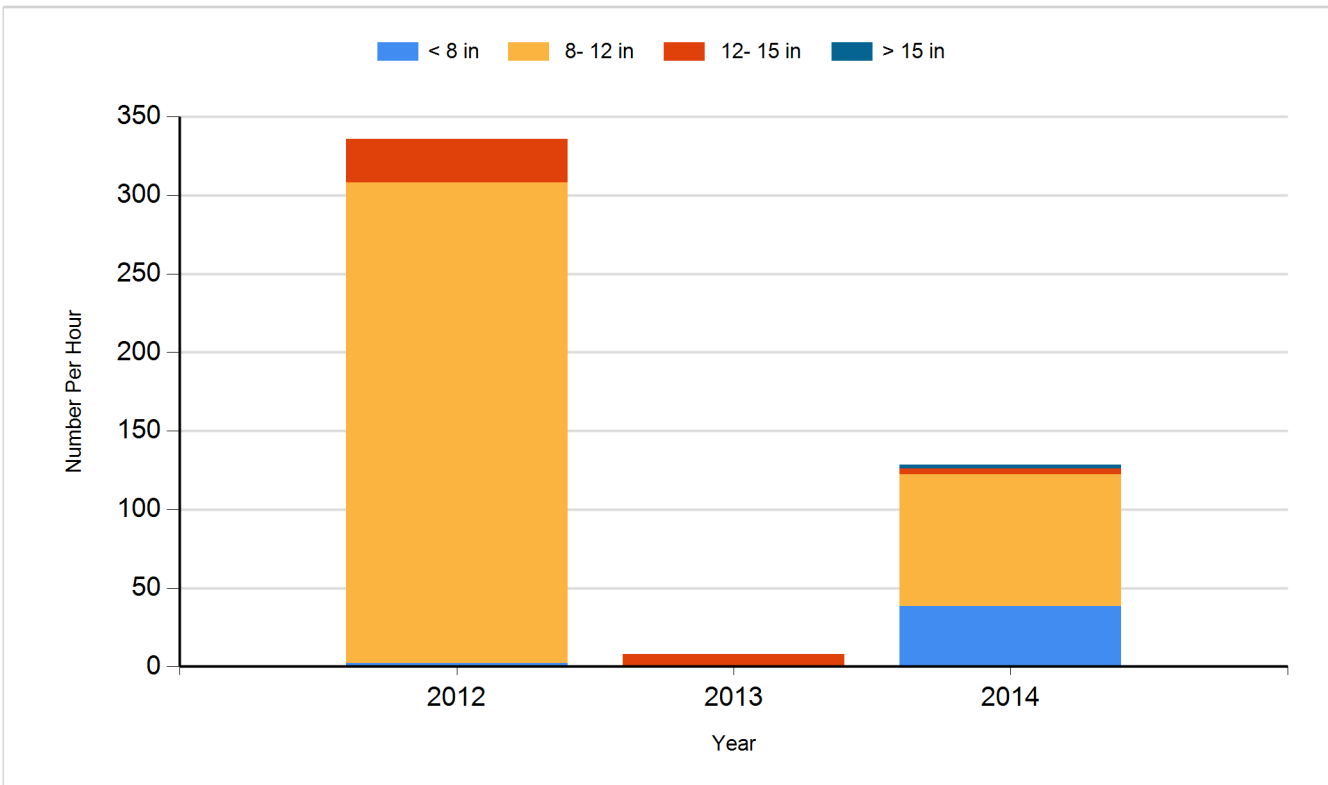
Gear: std exp gill net



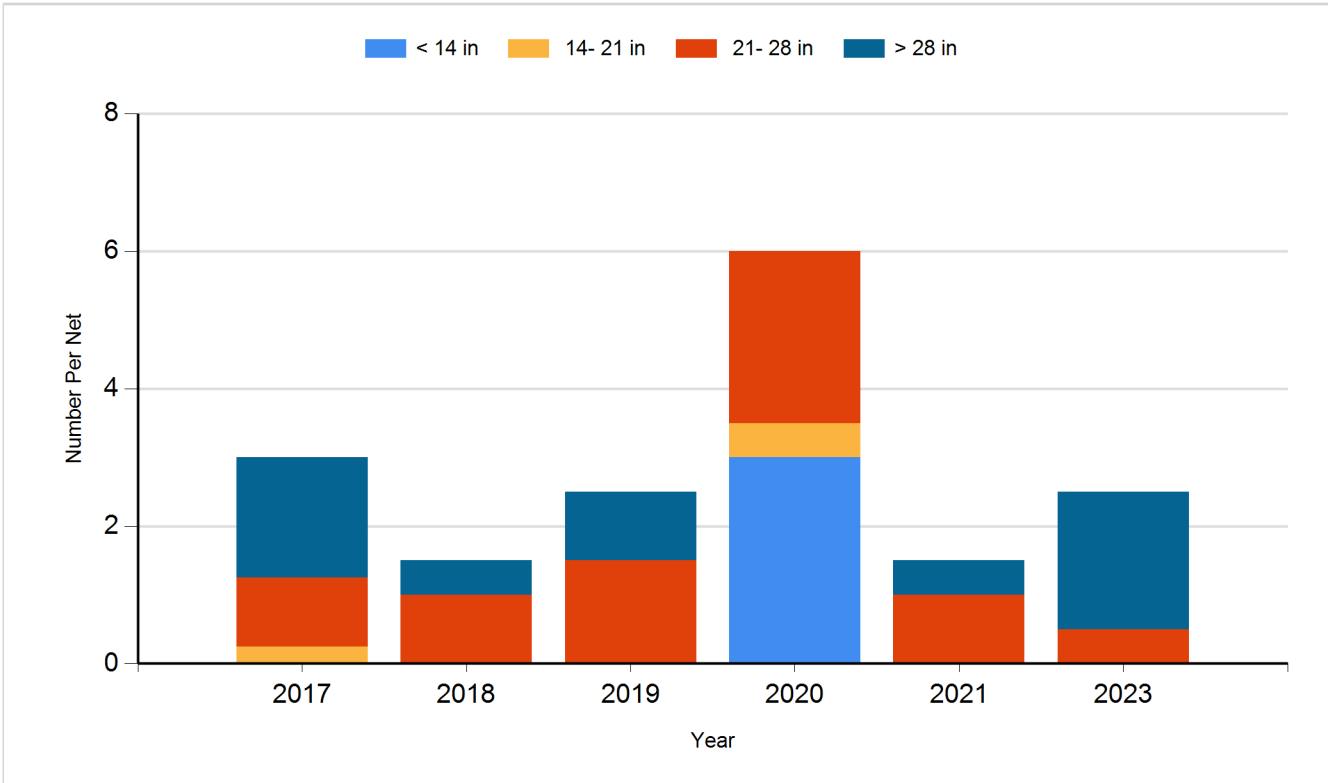
Species: Black Crappie
Gear: frame net (std 3/4 in)



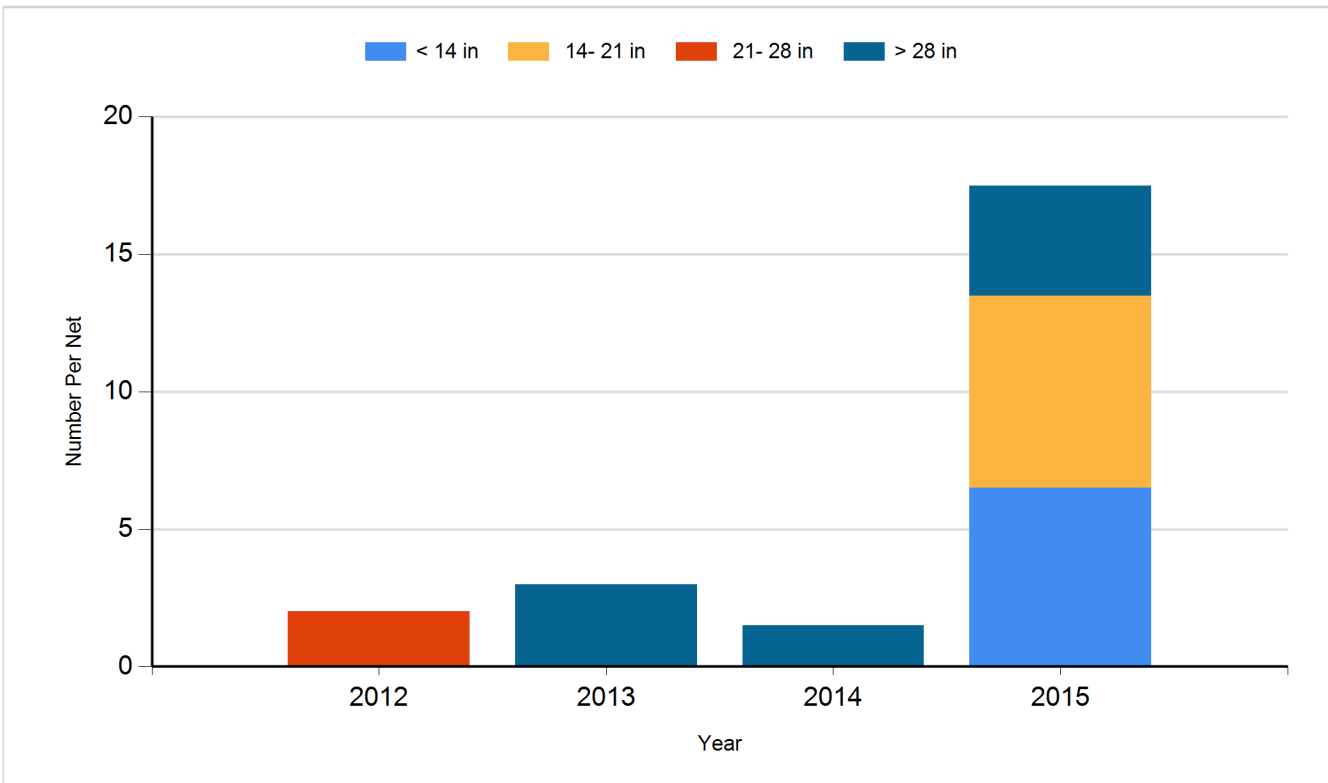
Species: Largemouth Bass
Gear: boat shocker (night)



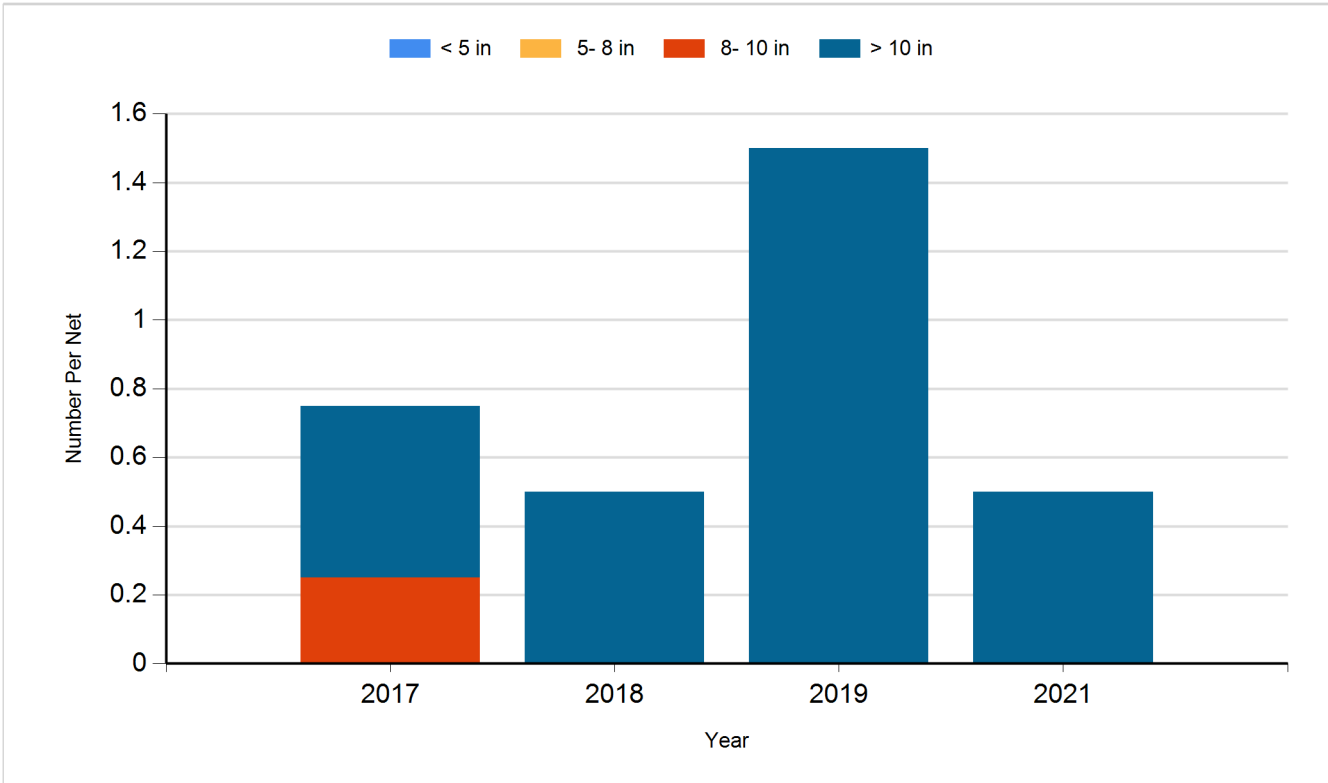
Species: Northern Pike
Gear: AFS std gill net



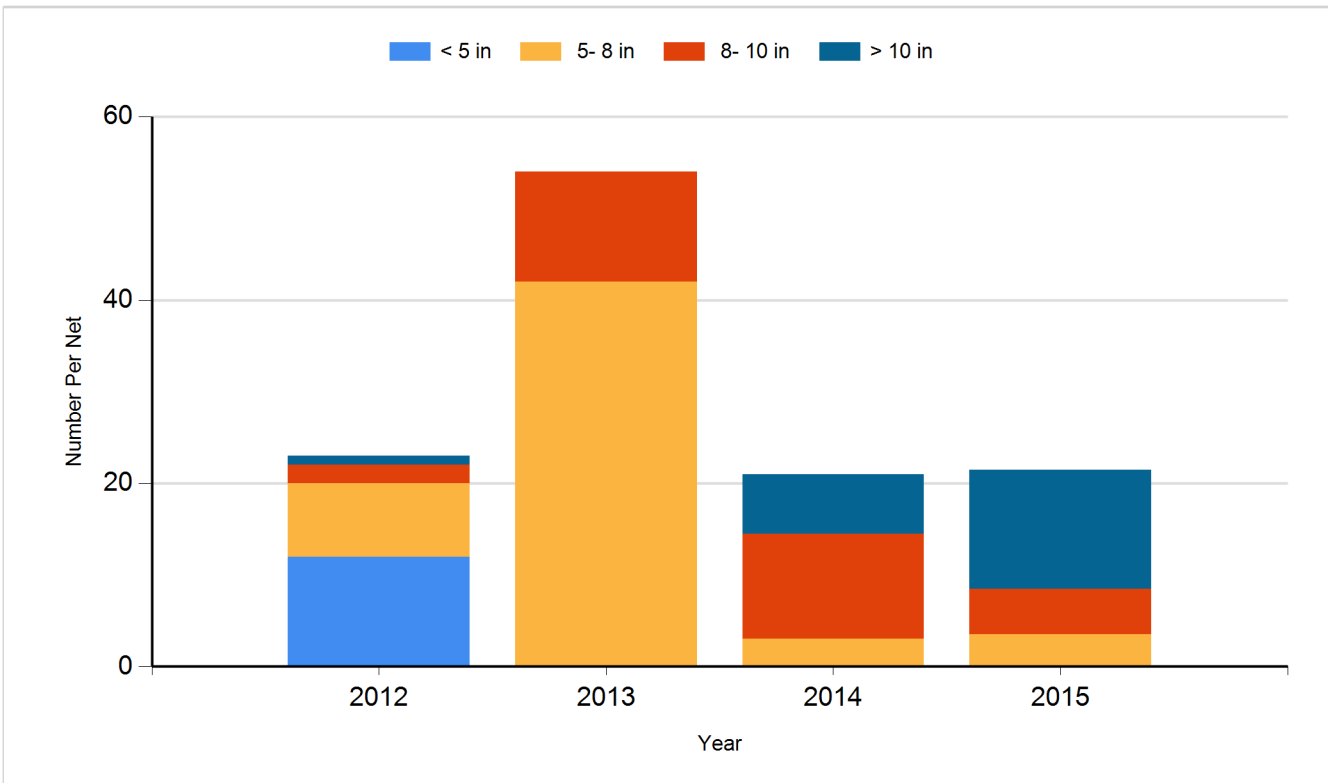
Species: Northern Pike
Gear: std exp gill net



Species: Yellow Perch
Gear: 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
2016	Bluegill	Adult	600
2019	Black Crappie	Adult	35
2019	Bluegill	Adult	67
2019	Largemouth Bass	Fingerling	1,500
2019	Northern Pike	Adult	50
2019	Yellow Perch	Adult	350
2020	Largemouth Bass	Small Fingerling	10,950
2021	Yellow Perch	Adult	1,100
2022	Bluegill	Juvenile	4,260
2022	Yellow Perch	Adult	1,000