SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Lemmon East, Perkins County
GRA-Lake-392-000
2021

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 29, 2021	2 net-nights
frame net (std 3/4 in)	Jun 29, 2021	6 net-nights

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Black Bullhead

Bluegill

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.

- 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.

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

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

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.

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

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 (in)	(cm)	Quality (in)	(cm)	Preferred (in)	(cm)	Memorable (in)	(cm)	Trophy (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	108	54.0	6.2	89	4	13	5	102	1
	Northern Pike	3	1.5	1.5	100		33		92	4
	Yellow Perch	1	0.5	1.5	100		100		113	
frame net (std 3/4 in)	Black Bullhead	108	17.3	7.2	96		14	5		
	Black Crappie	2	0.3	0.3	50		50		106	11
	Bluegill	5	0.8	0.7	60		60		134	7
	Largemouth Bass	1	0.2	0.2	100		0		106	
	Northern Pike	10	1.3	0.3	50		0		83	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.
* Methods/Species that ignore stock length

| Gear | Species | CPUE | | | | | | | | | | |
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg
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	23.86
	Largemouth Bass						0.5	0.0	0.0	0.0	0.0	0.10
	Northern Pike						3.0	1.5	2.5	3.0	1.5	2.30
	White Sucker						0.3	0.0	0.0	0.0	0.0	0.06
	Yellow Perch						0.8	0.5	1.5	0.0	0.5	0.66
boat shocker (night)	Largemouth Bass	334.0	8.0	90.0								144.00
	Smallmouth Bass	44.0	4.0	1.2								16.40
frame net (std 3/4 in)	Black Bullhead	176.0	177.7	140.8	40.0			5.0	13.3	151.2	17.3	90.16
	Black Crappie	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.3	0.04
	Bluegill	0.0	0.0	0.0	0.0			0.0	0.0	0.2	0.8	0.13
	Golden Shiner	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.00
	Largemouth Bass	0.0	0.0	0.3	0.0			0.0	0.0	0.0	0.2	0.06
	Northern Pike	0.8	0.0	0.1	0.3			0.7	0.6	2.2	1.3	0.75
	Smallmouth Bass	0.0	0.3	0.0	0.0			0.0	0.0	0.0	0.0	0.04
	Walleye	0.0	0.0	0.0	0.0			0.0	0.1	0.0	0.0	0.01
	White Sucker	14.5	15.7	3.6	0.5			0.0	0.0	0.2	0.0	4.31
	Yellow Perch	3.3	0.3	1.1	0.6			0.3	0.4	0.2	0.0	0.78
std exp gill net	Black Bullhead	52.0	102.0	111.5	24.0							72.38
	Golden Shiner	0.0	0.0	0.0	0.0							0.00
	Largemouth Bass	0.0	0.0	0.0	3.5							0.88
	Northern Pike	2.0	3.0	1.5	11.0							4.38
	White Sucker	20.0	18.0	3.0	1.0							10.50
	Yellow Perch	11.0	54.0	21.0	21.5							26.88

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFS std frame net	Black Bullhead	PSD						100				
		PSD-P						100				
		Wr						97				
	Bluegill	PSD						100				
		PSD-P						40				
		Wr						218				
	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
		PSD-P						89	96	100	50	13
		Wr						102	97	110	101	102
	Largemouth Bass	PSD						50				
		PSD-P						0				
		Wr						113				
	Northern Pike	PSD						92	100	100	83	100
		PSD-P						58	33	40	0	33
		Wr						91	91	84	102	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	8	100	7							
		PSD-P	0	0	3							
		Wr	123	132	122							
frame net (std 3/4 in)	Black Bullhead	PSD	10	11	86	97			100	100	11	96
		PSD-P	0	0	0	3			100	100	1	14

							Year					
Gear	Species	Index	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
frame net (std 3/4 in)	Black Bullhead	Wr		94	83	91			89	90	93	
	Black Crappie	PSD										50
		PSD-P										50
		Wr										106
	Bluegill	PSD									100	60
		PSD-P									100	60
		Wr									112	134
	Largemouth Bass	PSD			100							100
		PSD-P			0							0
		Wr			108							106
	Northern Pike	PSD	100		100	0			50	100	92	50
		PSD-P	33		0	0			0	80	0	0
		Wr	108		84				90	89	93	83
	Yellow Perch	PSD	8	0	100	100			50	33	100	
		PSD-P	8	0	44	60			50	0	100	
		Wr	94	101	100	113			99	89	88	
std exp gill net	Black Bullhead	PSD	12	7	72	94						
		PSD-P	0	1	0	4						
		Wr	98	102	84	97						
	Largemouth Bass	PSD				0						
		PSD-P				0						
		Wr				109						
	Northern Pike	PSD	100	100	100	36						
		PSD-P	0	100	100	36						
		Wr	118	110	100	100						
	Yellow Perch	PSD	27	22	86	84						
		PSD-P	9	0	31	60						
		Wr	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	2017	0		18	103 (2.4)	149	102 (0.9)	0	
	2018	0		1	101	27	97 (1.5)	0	
	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	
Black Crappie Frame Net	2021	1	115	0		1	97	0	
Bluegill Frame Net	2017	0		3	278 (152.8)	2	127 (9.6)	0	
	2020	0		0		1	112	0	
	2021	2	131 (9.3)	0		3	137 (8.1)	0	
Northern Pike Gill Net	2017	1	95	4	87 (4.1)	1	100	6	91 (11.3)
	2018	0		2	82 (5.1)	1	108	0	
	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	
Yellow Perch Gill Net	2017	0		1	108	1	109	1	100
	2018	0		0		0		1	83
	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

2017

2018

2019
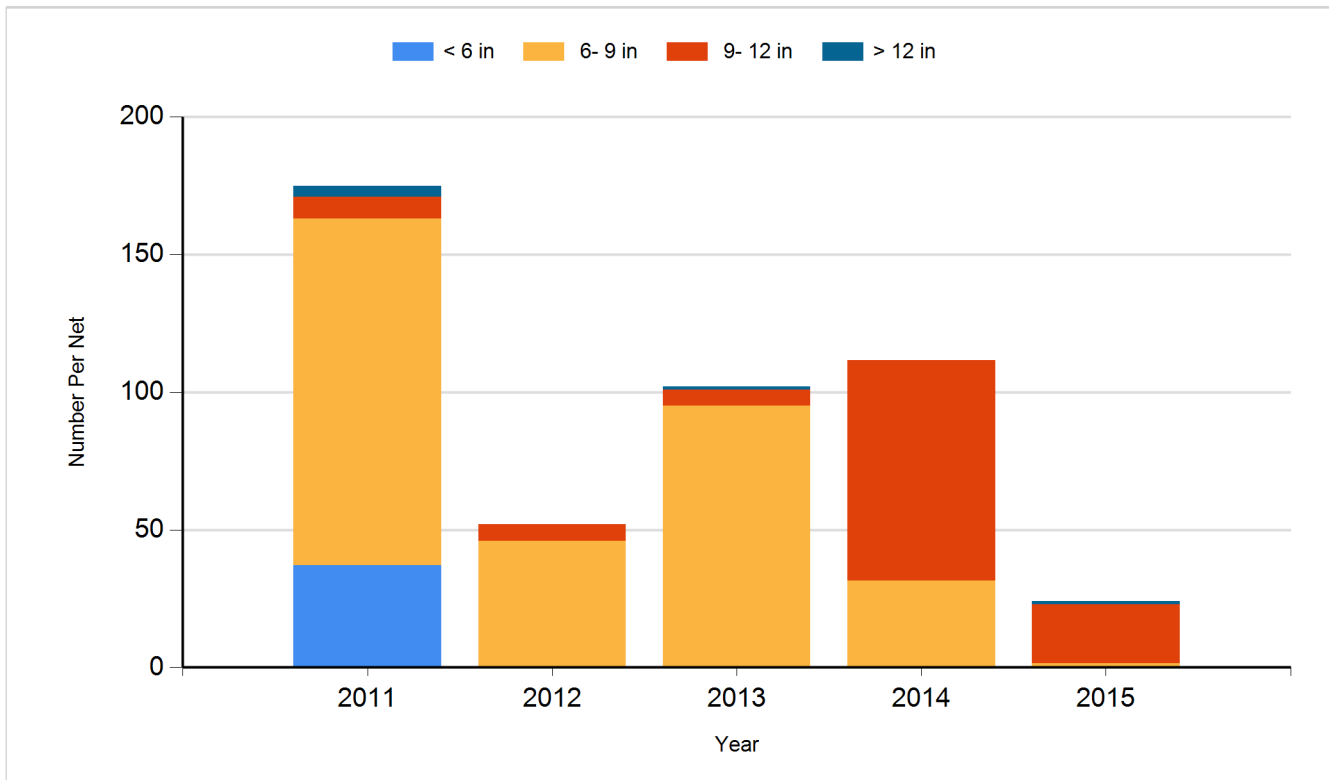

2021
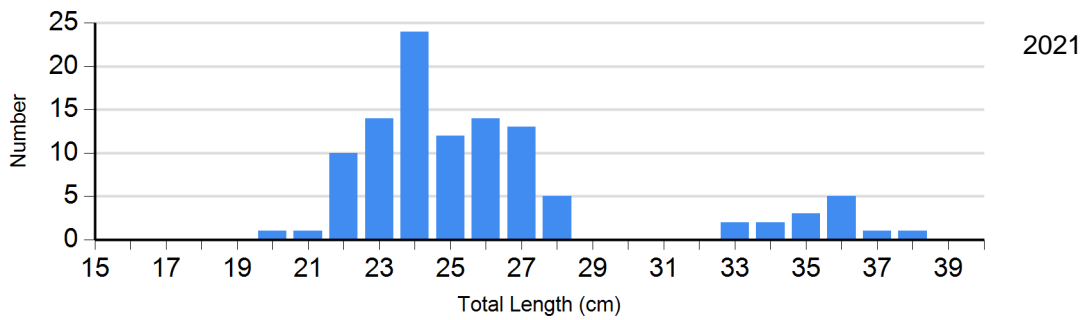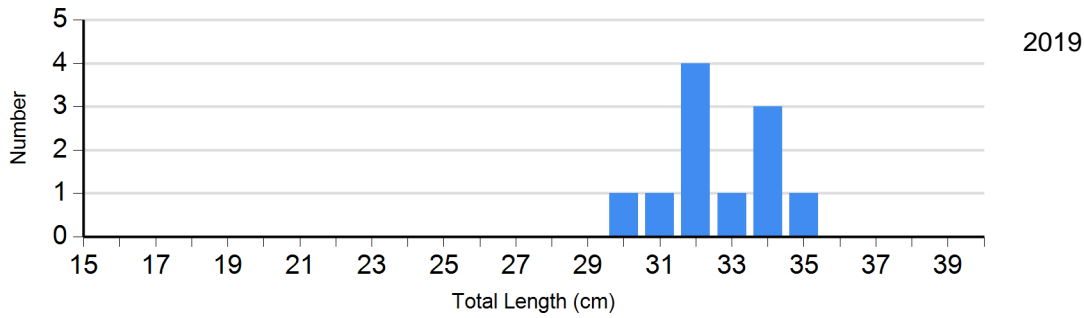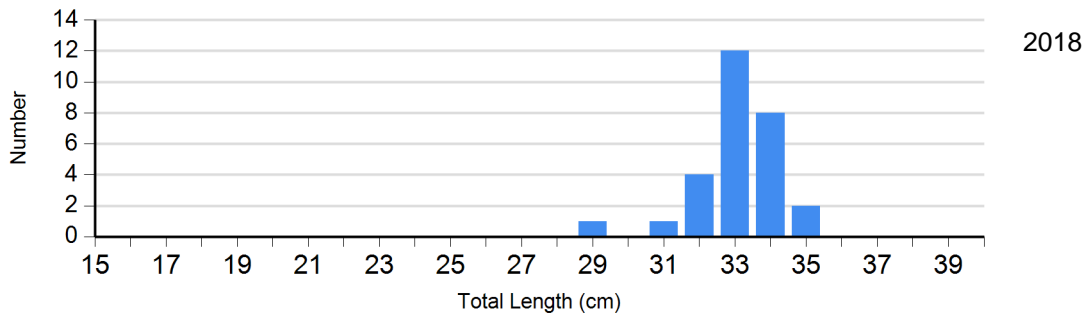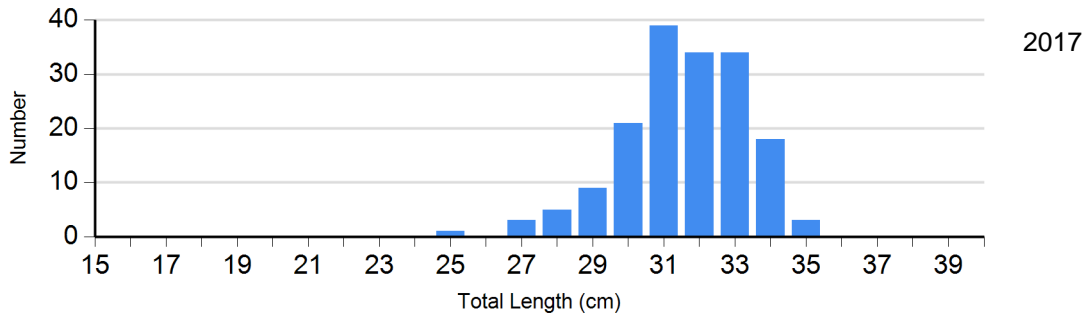
Species: Northern Pike
Gear: AFS std gill net

Historic Fish Sizes and Relative Abundance

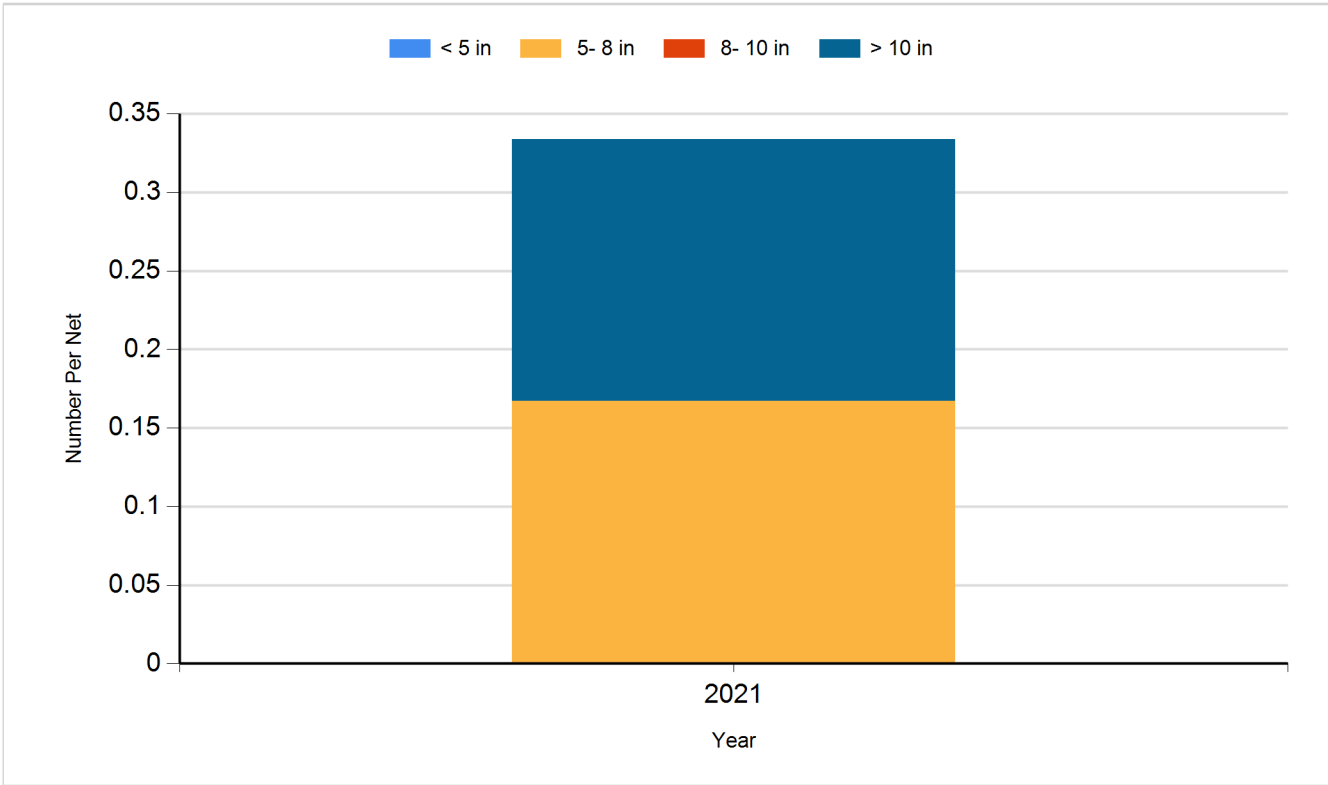Size distribution per net by color for species sampled by year.
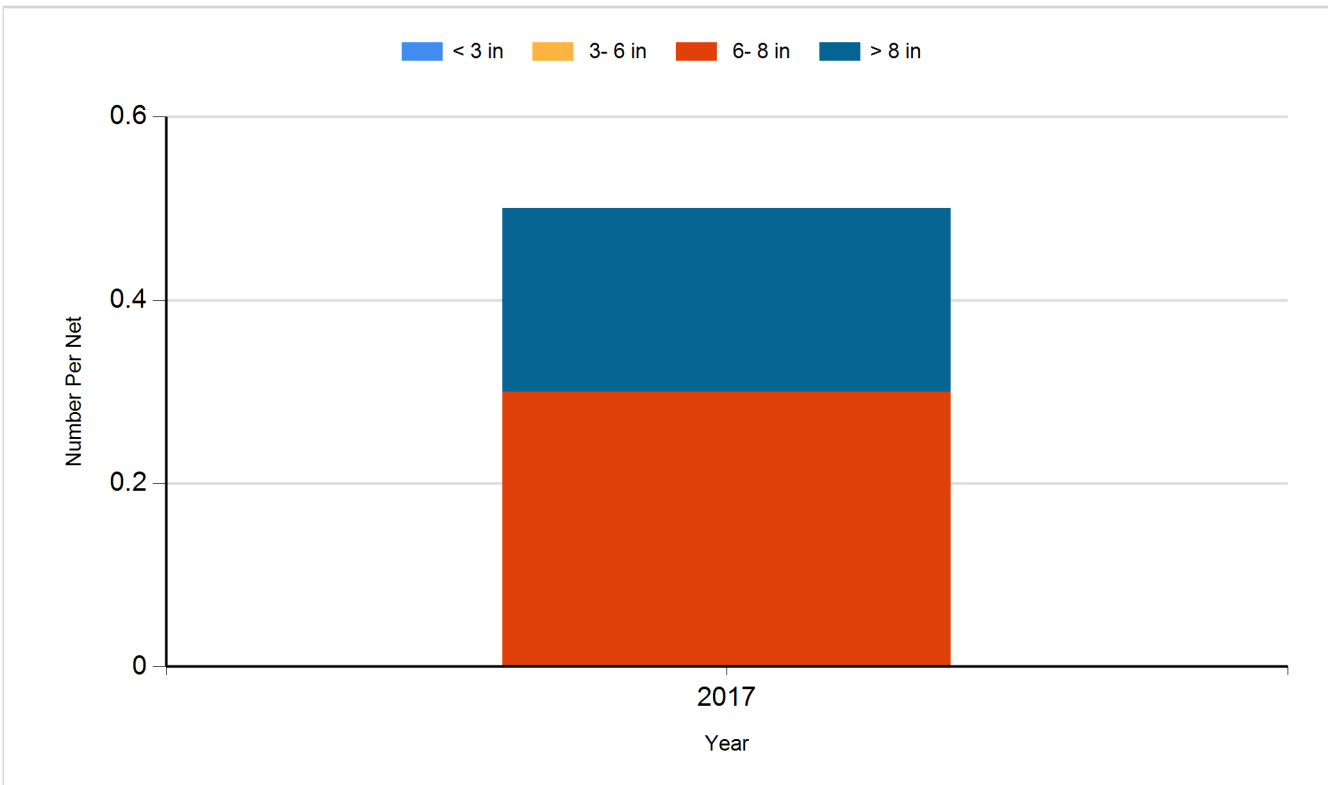
Species: Black Bullhead
Gear: AFS std gill net
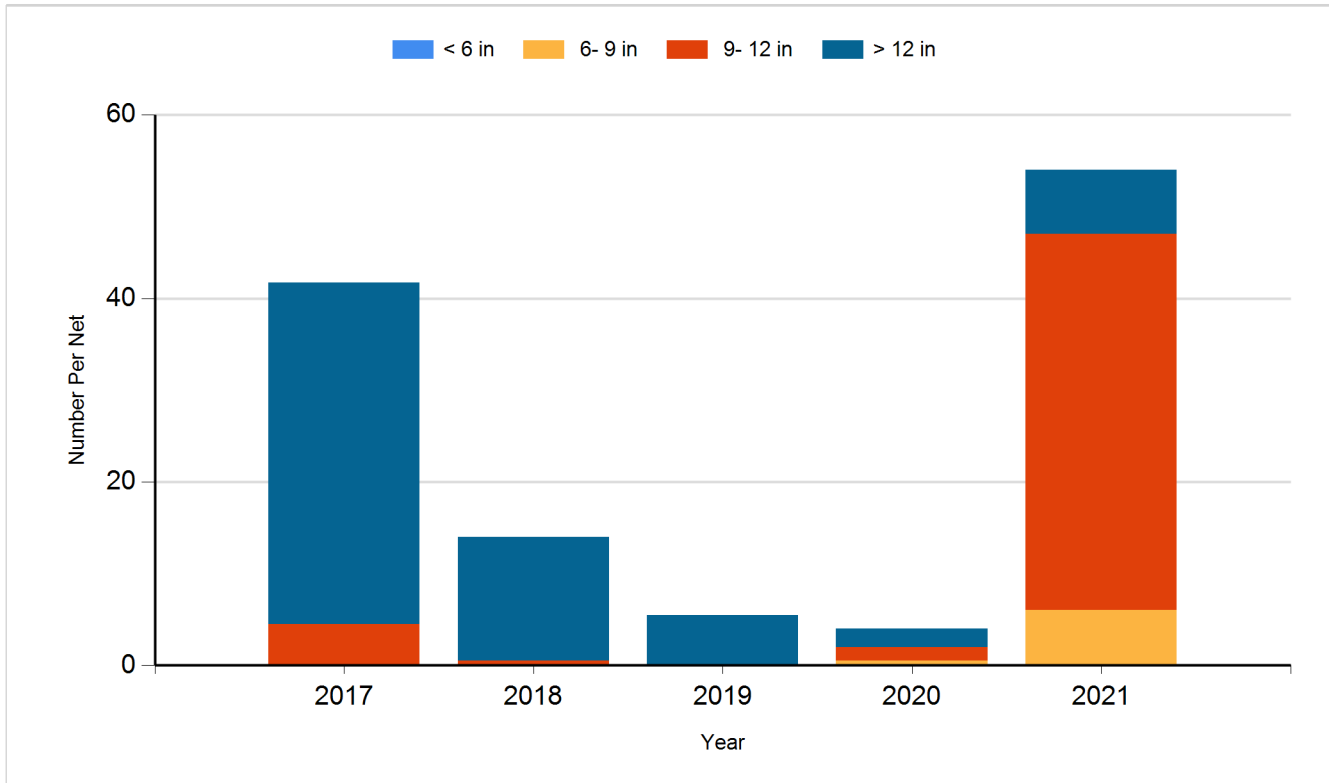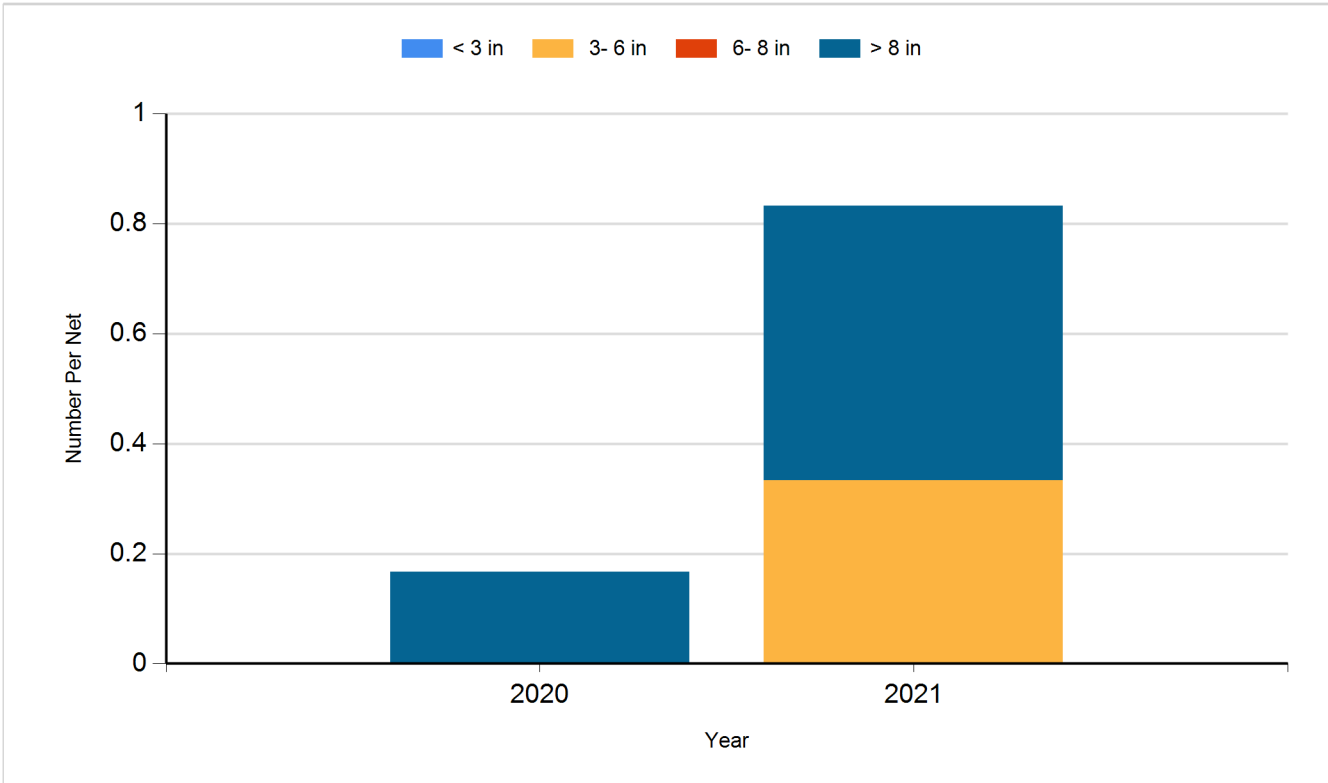

Species: Black Bullhead
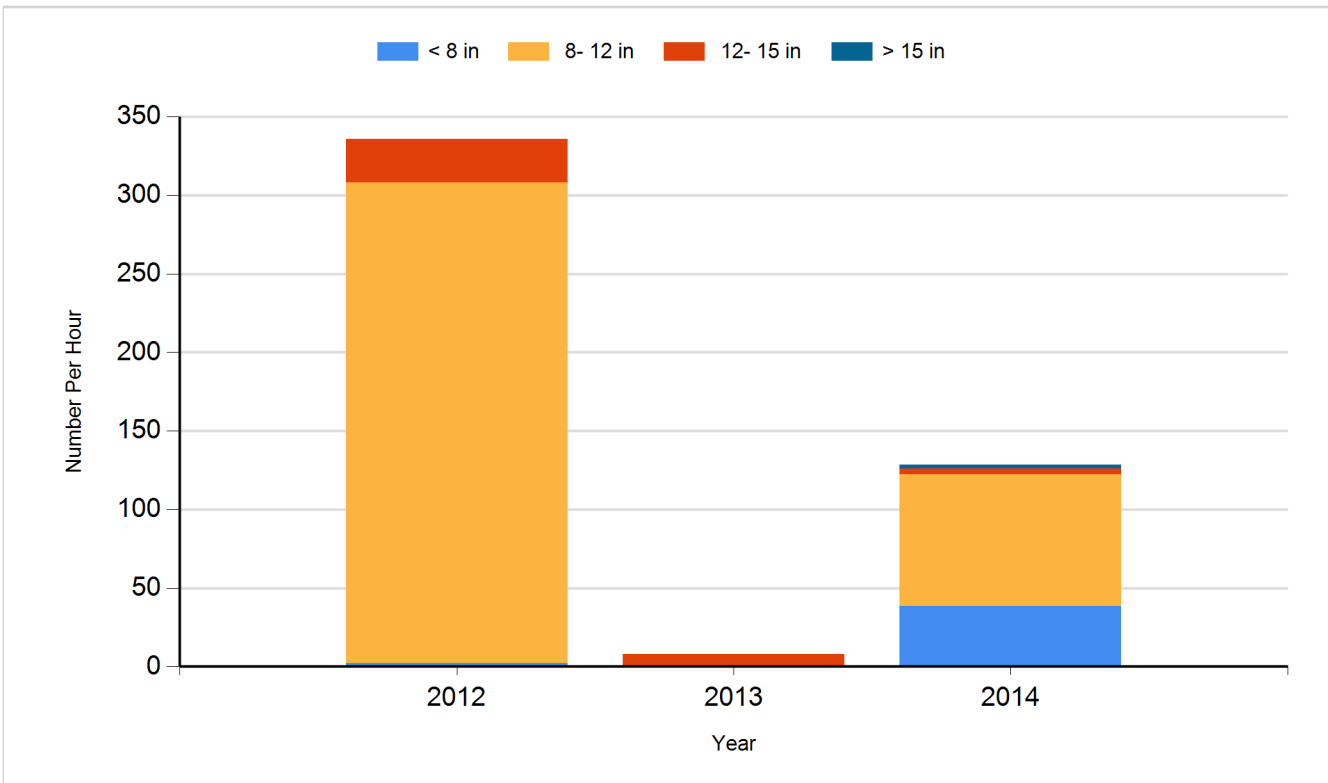Gear: std exp gill net

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

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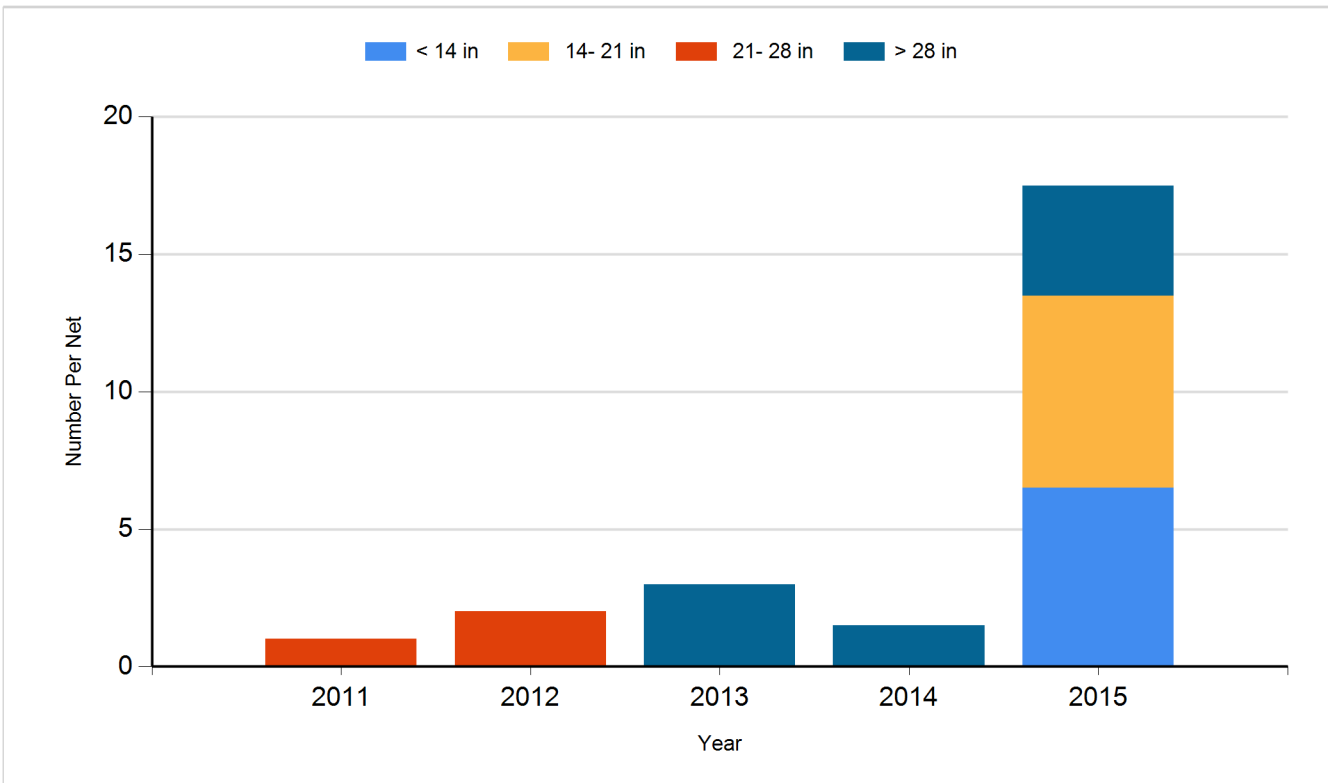
Species: Bluegill
Gear: frame net (std 3/4 in)

Species: Largemouth Bass
Gear: boat shocker (night)

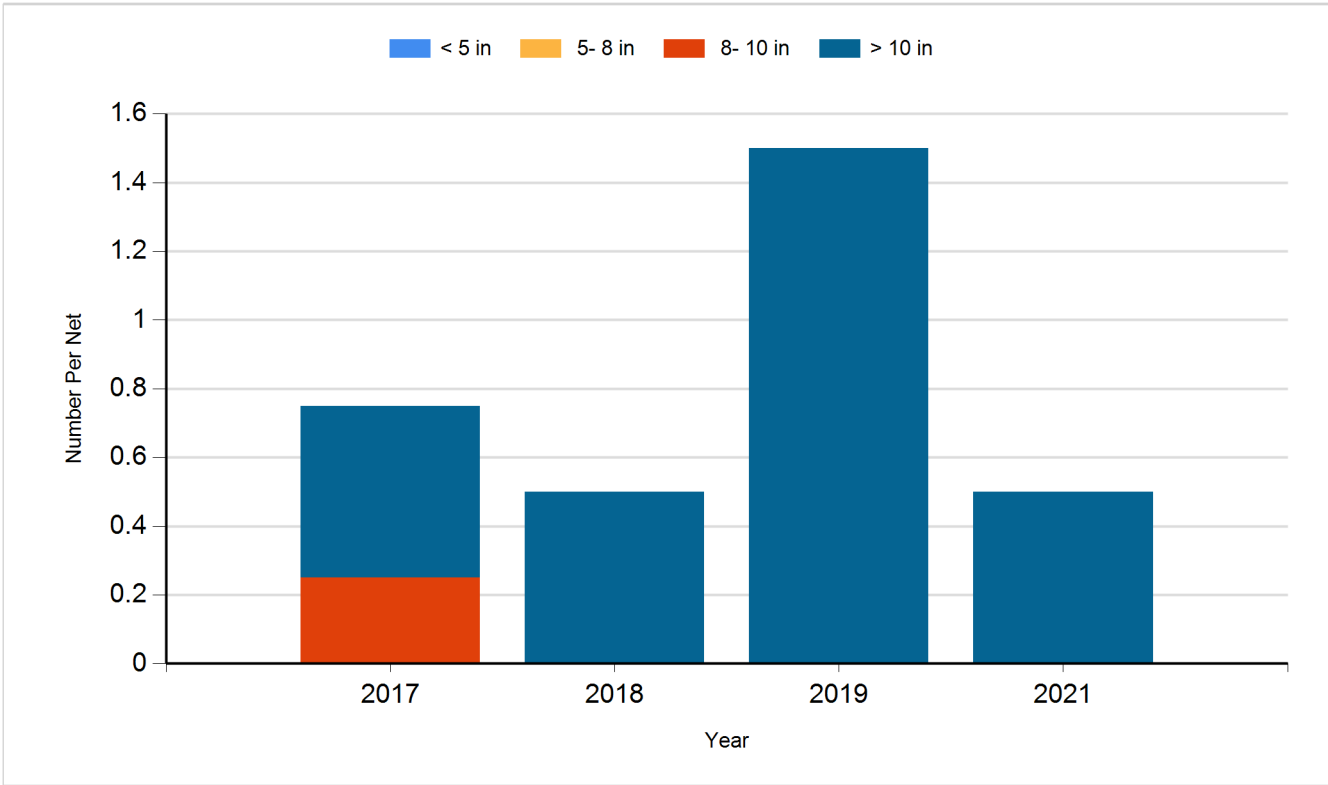Species: Northern Pike
Gear: AFS std gill net
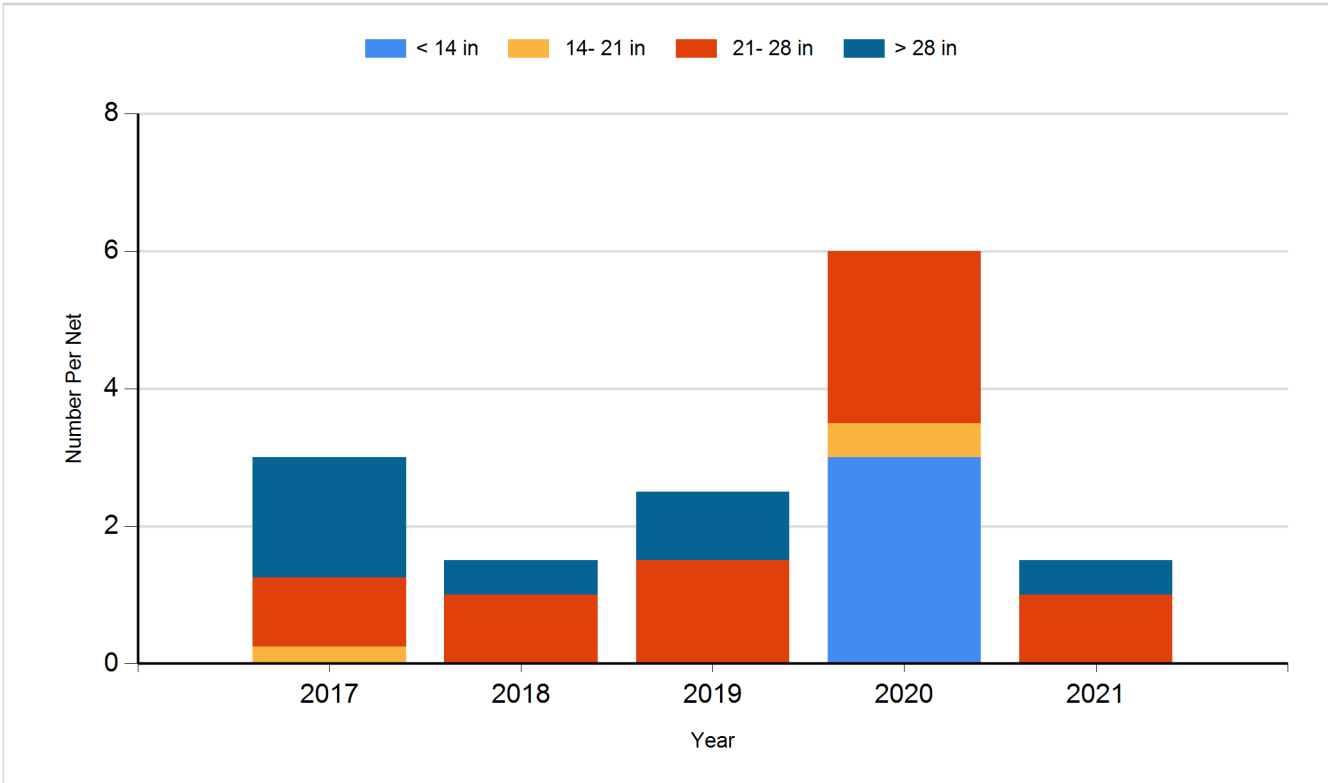
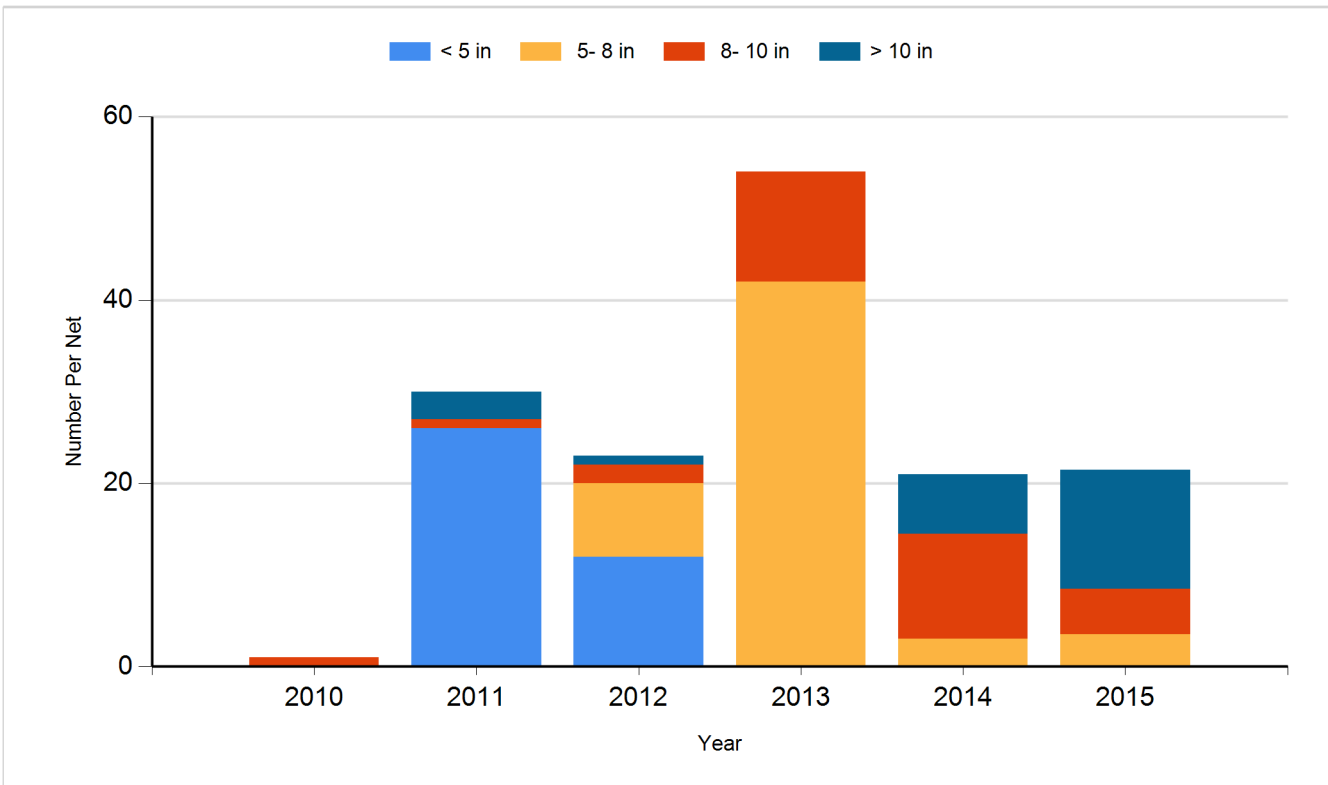Species: Northern Pike
Gear: std exp gill net

Species: Yellow Perch
Gear: 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
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