SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Flat Creek Dam, Perkins County
GRA-Lake-767-000
2022

Lake Information

Name: Flat Creek Dam

County: Perkins

Surface Area: 164 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 22, 2022	2 net-nights
boat shocker (day)	Aug 24, 2022	3111 seconds
boat shocker (day)	Sep 19, 2022	2520 seconds
frame net (std 3/4 in)	Jul 22, 2022	4 net-nights

Common Fish Species Present

Channel Catfish

Bluegill

Black Crappie

Yellow Perch

Walleye

Northern Pike

Common Carp

Black Bullhead

White Sucker

White 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.

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

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

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	9	4.0	9.2	13		0		80	1
	Common Carp	24	12.0	9.2	50	16	0		81	1
	Northern Pike	2	1.0	3.1	100		0		79	6
	Walleye	1	0.5	1.5	0		0		79	
boat shocker (day)	Walleye*	145	93.3	39.4	38	8	2		90	1
frame net (std 3/4 in)	Black Bullhead	30	7.0	5.3	11		0		75	2
	Black Crappie	1	0.3	0.4	100		0		107	
	Common Carp	35	8.8	3.6	31	12	0		81	1
	Northern Pike	14	3.5	2.5	100		36	22	83	2
	Walleye	11	2.0	1.2	25		0		85	2
	White Crappie	1	0.3	0.4	100		100		104	
	White Sucker	2	0.5	0.8	50		50		74	5
	Yellow Perch	1	0.3	0.4	0		0		95	

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**

		CPUE										
Gear	Species	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg
AFS std frame net	Black Bullhead					8.0						8.00
	Black Crappie					0.2						0.20
	Common Carp					1.3						1.30
	Northern Pike					0.1						0.10
	Smallmouth Bass					0.0						0.00
	Walleye					1.0						1.00
	White Crappie					0.9						0.90
	White Sucker					0.2						0.20
	Yellow Perch					0.1						0.10
AFS std gill net	Black Bullhead					18.8		6.5		3.0	4.0	8.08
	Channel Catfish					0.3		0.0		0.0	0.0	0.08
	Common Carp					23.0		9.5		4.5	12.0	12.25
	Northern Pike					1.3		1.0		0.5	1.0	0.95
	Walleye					1.8		0.5		0.0	0.5	0.70
	White Sucker					0.0		0.5		1.0	0.0	0.38
	Yellow Perch					0.3		0.0		0.0	0.0	0.08
boat shocker (day)	Walleye*										93.3	93.30
frame net (std 3/4 in)	Black Bullhead	99.0	63.8	80.1				9.7		0.7	7.0	43.38
	Black Crappie	0.0	0.1	0.5				0.5		0.3	0.3	0.28
	Channel Catfish	0.0	0.0	0.0				0.0		0.0	0.0	0.00
	Common Carp	6.5	2.9	4.9				0.3		4.5	8.8	4.65
	Green Sunfish	0.0	0.1	0.0				0.3		0.2	0.0	0.10
	Northern Pike	0.8	2.6	0.5				0.2		1.0	3.5	1.43
	Walleye	1.0	0.8	1.0				1.7		1.2	2.0	1.28
	White Crappie	0.0	0.0	0.4				0.0		0.7	0.3	0.23
	White Sucker	0.3	0.0	0.1				0.0		0.5	0.5	0.23
	Yellow Perch	1.3	1.3	0.1				0.7		0.0	0.3	0.62
std exp gill net	Black Bullhead	32.0	79.0	23.5								44.83
	Common Carp	1.0	17.0	7.5								8.50
	Northern Pike	2.0	2.5	2.0								2.17
	Walleye	1.0	1.0	0.5								0.83
	White Sucker	0.0	1.0	1.0								0.67
	Yellow Perch	0.0	0.0	0.0								0.00

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	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AFS std frame net	Black Bullhead	PSD					0					
		PSD-P					0					
		Wr					76					
	Black Crappie	PSD					50					
		PSD-P					50					
		Wr					107					
	Common Carp	PSD					38					
		PSD-P					8					
		Wr					84					
	Northern Pike	PSD					100					
		PSD-P					0					
		Wr					77					
	Walleye	PSD					60					
		PSD-P					30					
		Wr					76					
	White Crappie	PSD					100					
		PSD-P					0					
		Wr					97					
	White Sucker	PSD					50					
		PSD-P					0					
		Wr					75					
	Yellow Perch	PSD					100					
		PSD-P					0					
		Wr					88					
AFS std gill net	Black Bullhead	PSD					0		0		17	13
		PSD-P					0		0		0	0
		Wr					78		88		82	80
	Channel Catfish	PSD					100					
		PSD-P					0					
		Wr					89					
	Common Carp	PSD					12		32		67	50
		PSD-P					1		0		0	0
		Wr					85		82		80	81

			Year									
Gear	Species	Index	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AFS std gill net	Northern Pike	PSD					100		100		100	100
		PSD-P					60		100		0	0
		Wr					81		91		93	79
	Walleye	PSD					100		0			0
		PSD-P					71		0			0
		Wr					86		85			79
	White Sucker	PSD							100		100	
		PSD-P							100		50	
		Wr							91		87	
	Yellow Perch	PSD					0					
		PSD-P					0					
		Wr					111					
boat shocker (day)	Walleye	PSD										38
		PSD-P										2
		Wr										90
frame net (std 3/4 in)	Black Bullhead	PSD	5	3	0				0		0	11
		PSD-P	0	0	0				0		0	0
		Wr	87	75	77				88		82	75
	Black Crappie	PSD		100	100				100		0	100
		PSD-P		0	0				100		0	0
		Wr		91	98				92		108	107
	Common Carp	PSD	15	9	0				0		37	31
		PSD-P	0	0	0				0		0	0
		Wr	79	82	85				82		85	81
	Northern Pike	PSD	100	100	100				100		83	100
		PSD-P	67	81	50				100		50	36
		Wr	97	88	84						87	83
	Walleye	PSD	100	50	63				20		100	25
		PSD-P	50	50	25				10		100	0
		Wr	91	83	87				82		86	85
	White Crappie	PSD			100						75	100
		PSD-P			100						0	100
		Wr			100						98	104
	White Sucker	PSD	100		0						100	50
		PSD-P	0		0						67	50
		Wr	80		92						90	74

			Year									
Gear	Species	Index	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
frame net (std 3/4 in)	Yellow Perch	PSD	0	10	0				100			0
		PSD-P	0	0	0				0			0
		Wr	82	76	95				92			95
std exp gill net	Black Bullhead	PSD	3	0	0							
		PSD-P	0	0	0							
		Wr	89	82	89							
	Common Carp	PSD	0	0	7							
		PSD-P	0	0	7							
		Wr	83	82	81							
	Northern Pike	PSD	100	100	75							
		PSD-P	100	80	75							
		Wr	95	96	88							
	Walleye	PSD	100	100	0							
		PSD-P	0	50	0							
		Wr	86	93	80							
	White Sucker	PSD		50	0							
		PSD-P		0	0							
		Wr		79	85							

Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Black Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	1					258 (1)					

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	7			423 (2)	585 (1)		585 (1)	605 (1)	613 (2)		

Species: White Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	9		200 (1)	227 (8)							

Fish Condition

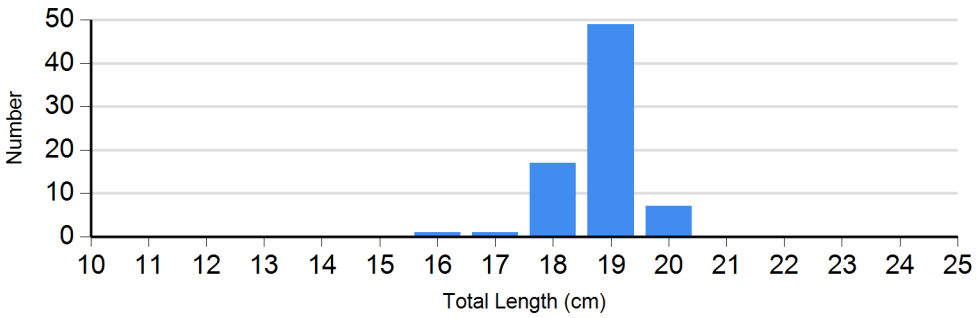
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2019	13	88 (1.6)	0		0		0	
	2021	5	82 (3.8)	1	83	0		0	
	2022	7	80 (0.9)	1	82	0		0	
Black Crappie Frame Net	2019	0		0		3	92 (1.2)	0	
	2021	2	108 (1.1)	0		0		0	
	2022	0		1	107	0		0	
Common Carp Gill Net	2019	13	82 (1.8)	6	82 (2.1)	0		0	
	2021	3	76 (4.4)	6	81 (1.8)	0		0	
	2022	12	80 (1.5)	12	81 (1.7)	0		0	
Northern Pike Gill Net	2019	0		0		0		2	91
	2021	0		1	93	0		0	
	2022	0		2	79 (4.4)	0		0	
Walleye Gill Net	2019	1	85	0		0		0	
	2022	1	79	0		0		0	
White Crappie Frame Net	2021	1	106	3	95 (2.8)	0		0	
	2022	0		0		0		1	104
White Sucker Gill Net	2019	0		0		1	91	0	
	2021	0		1	81	0		1	94

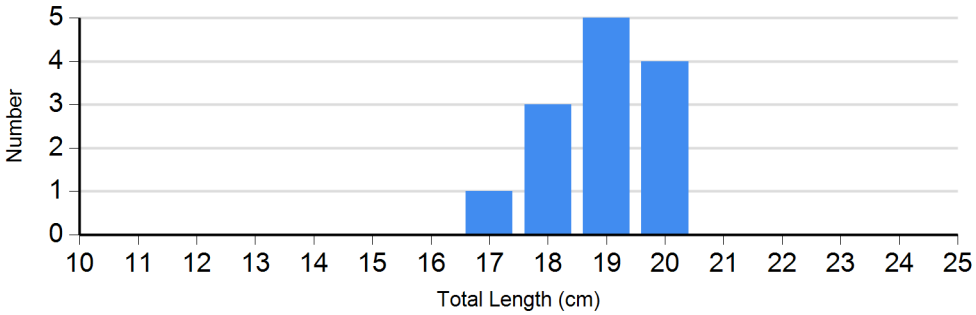
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

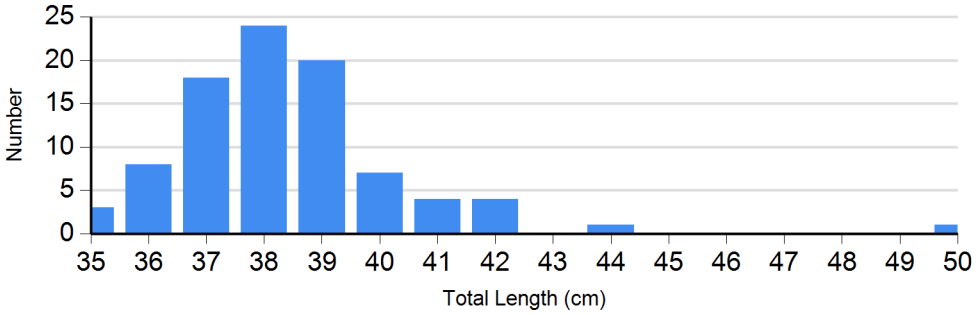


2017

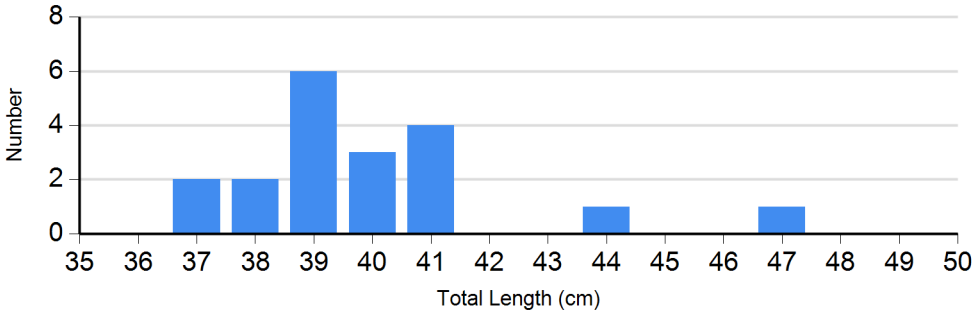


2019

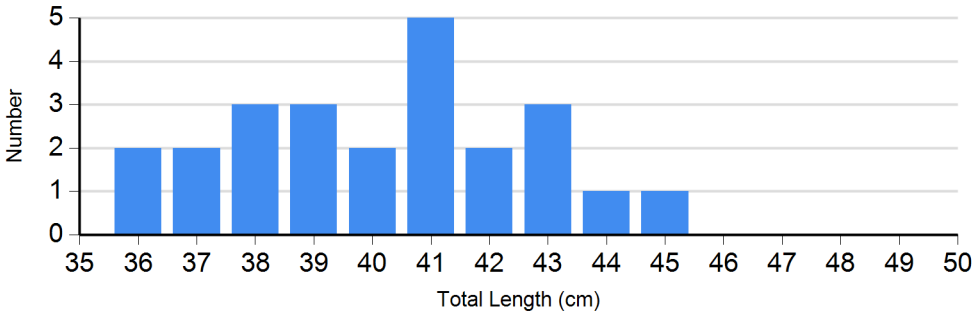
Species: Common Carp
Gear: AFS std gill net



2017



2019

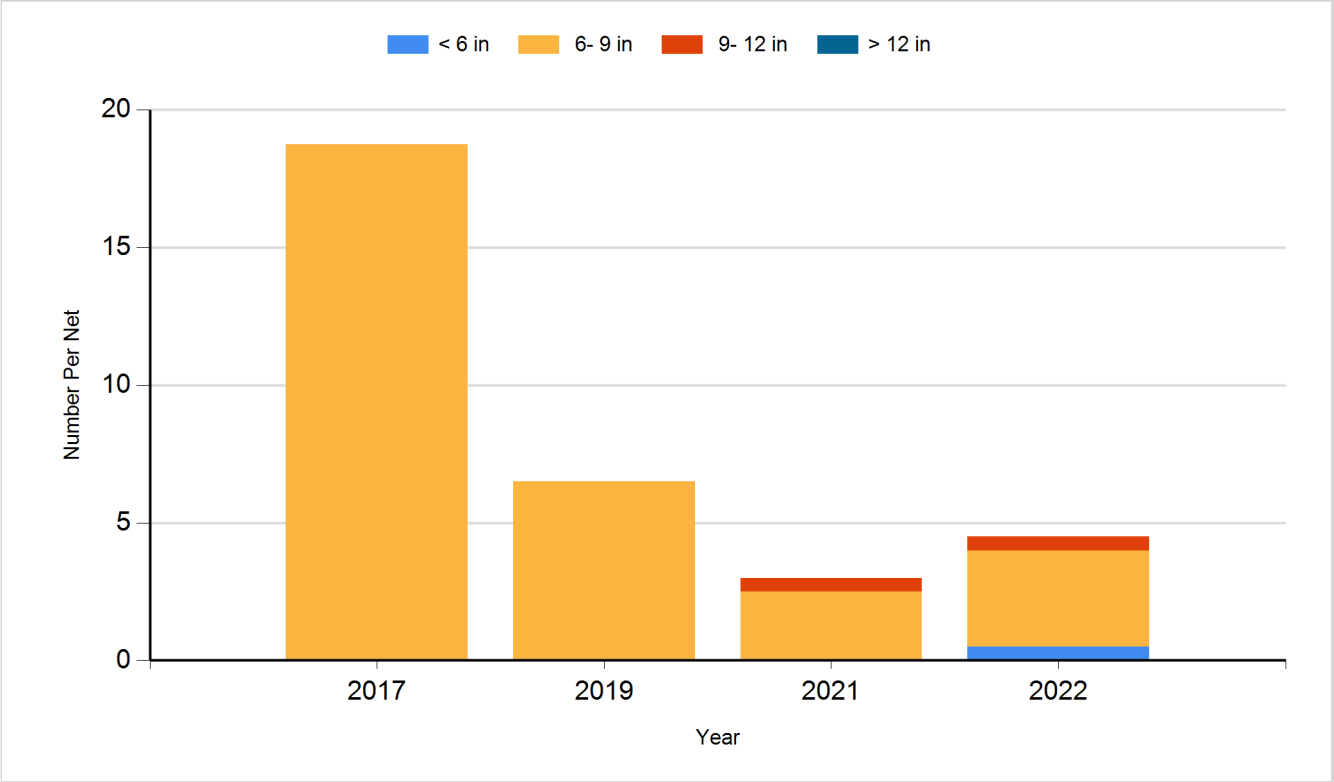

Number
5
4
3
2
1
0
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
Total Length (cm)

2022

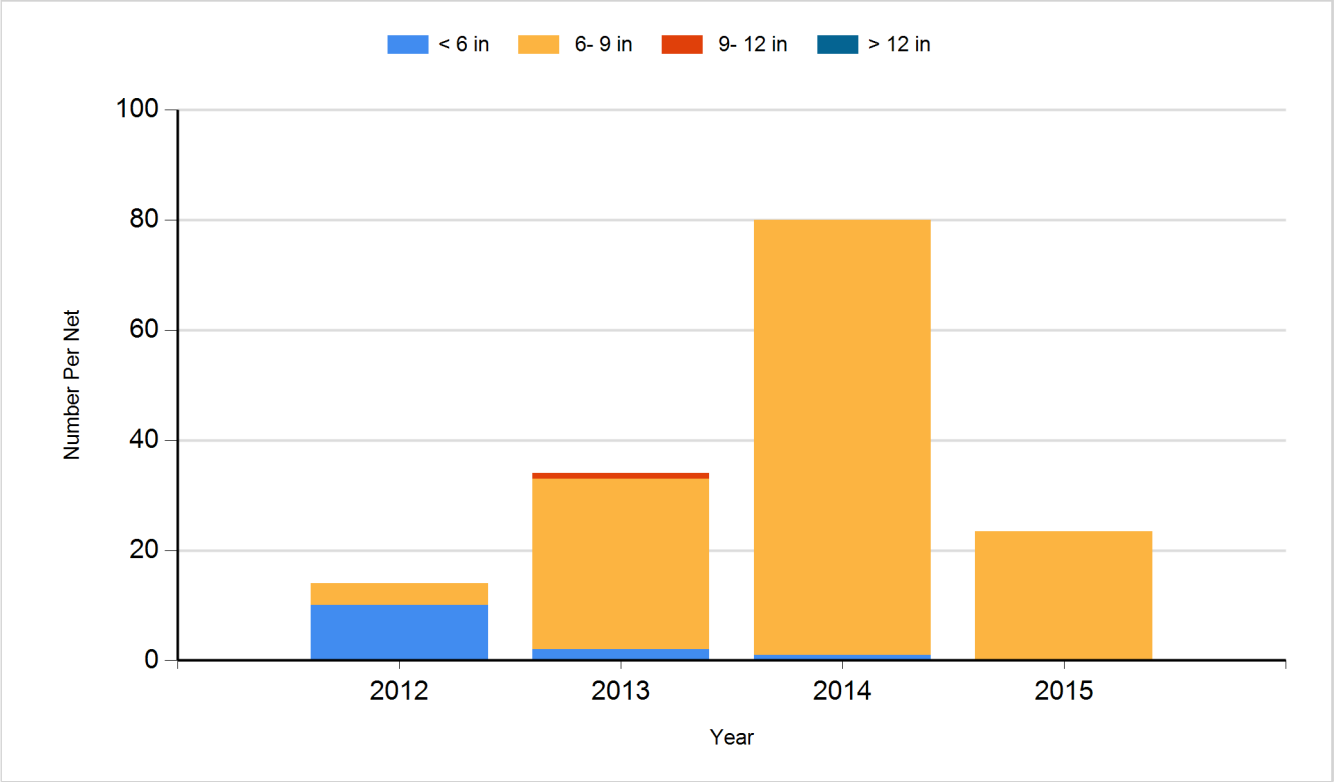
Historic Fish Sizes and Relative Abundance

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

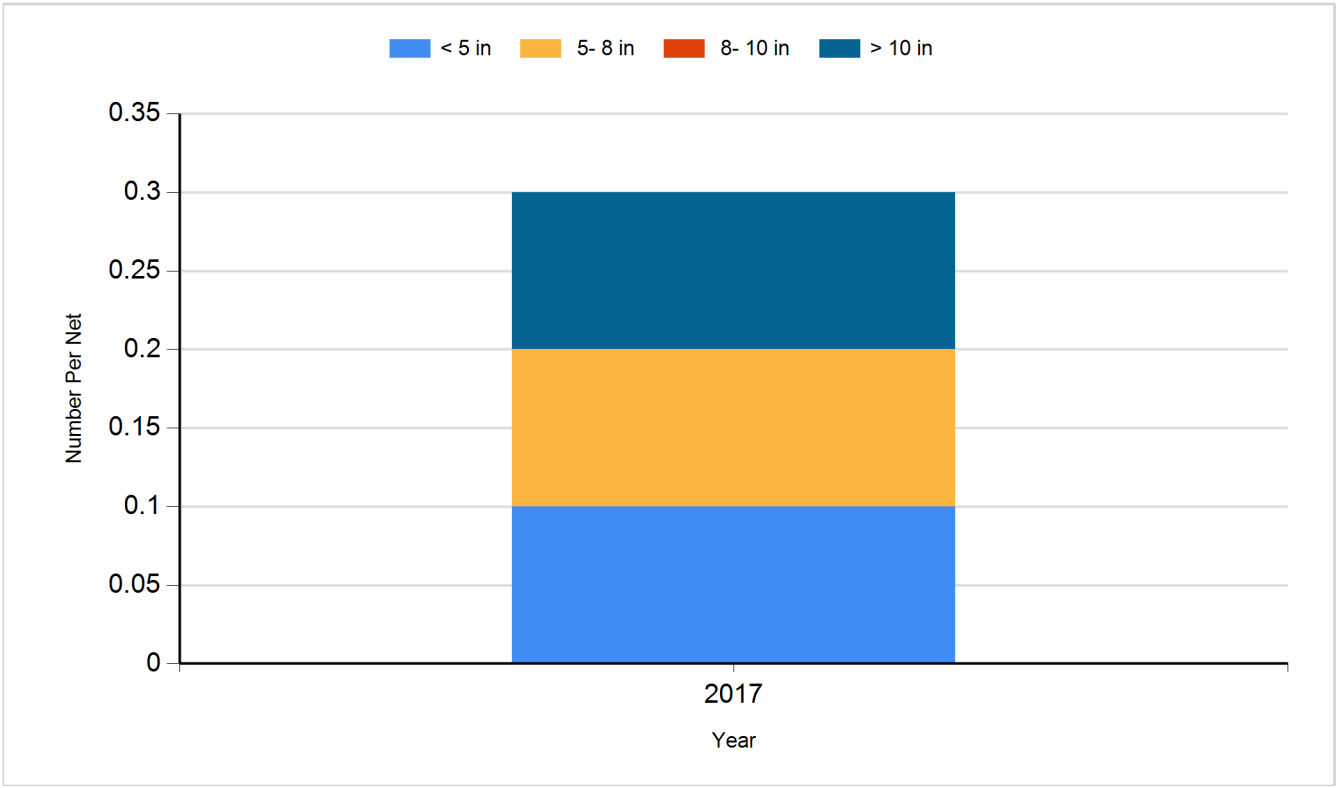
Species: Black Bullhead
Gear: AFS std gill net



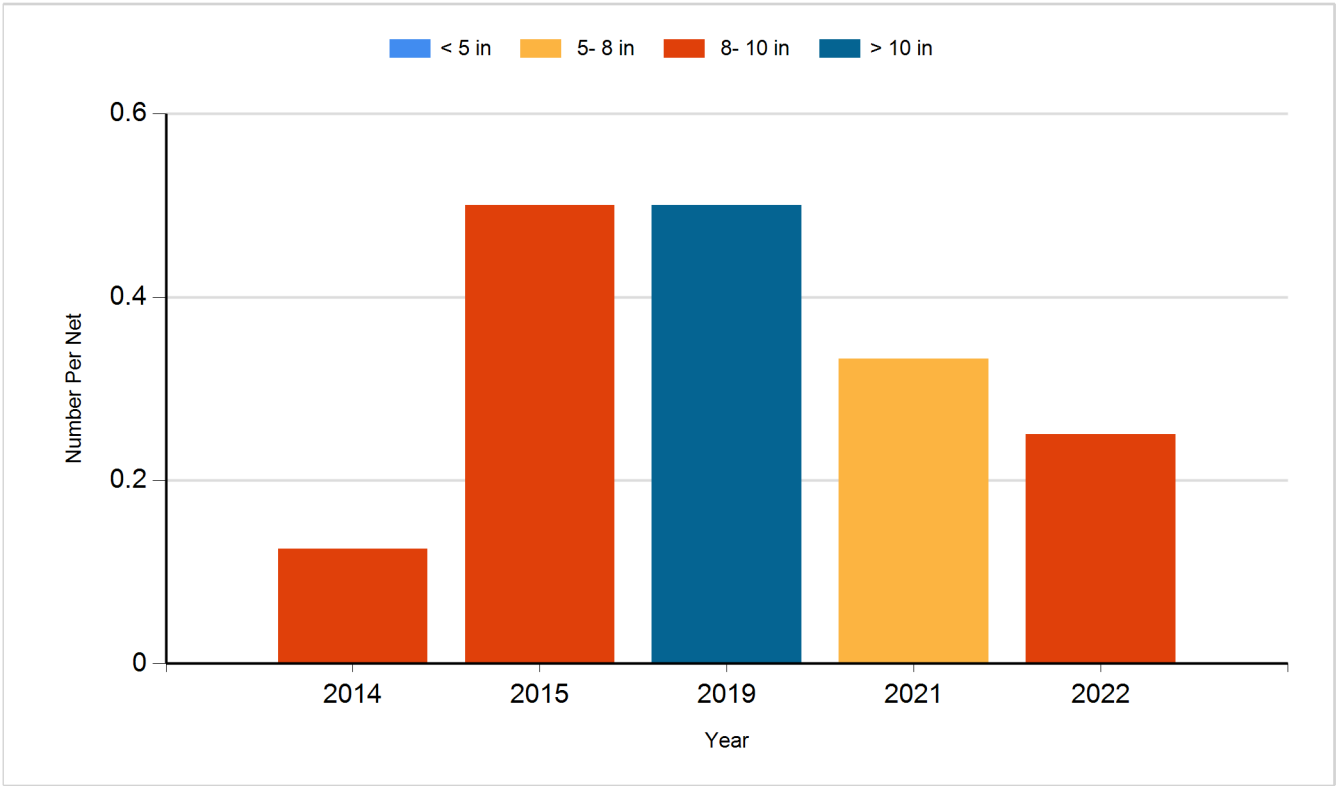
Species: Black Bullhead
Gear: std exp gill net



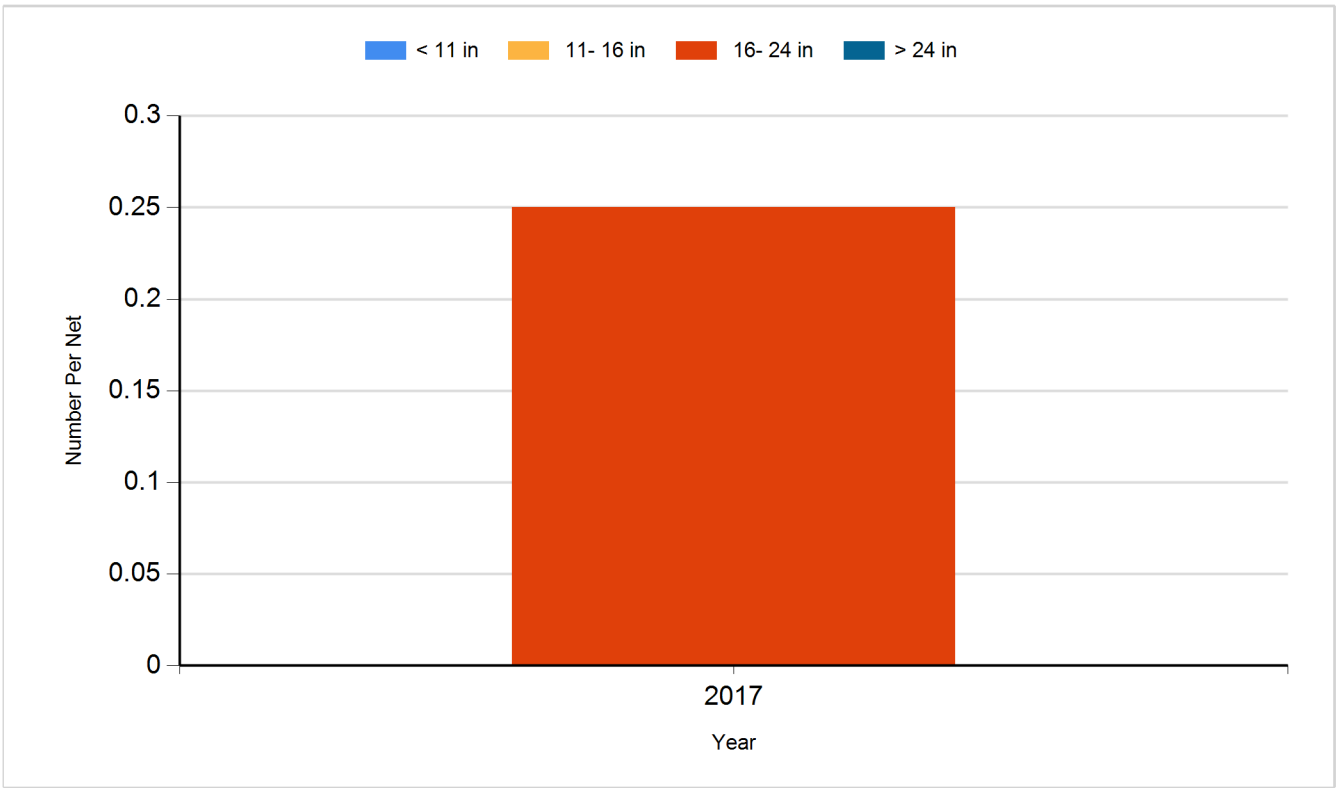
Species: Black Crappie
Gear: AFS std frame net



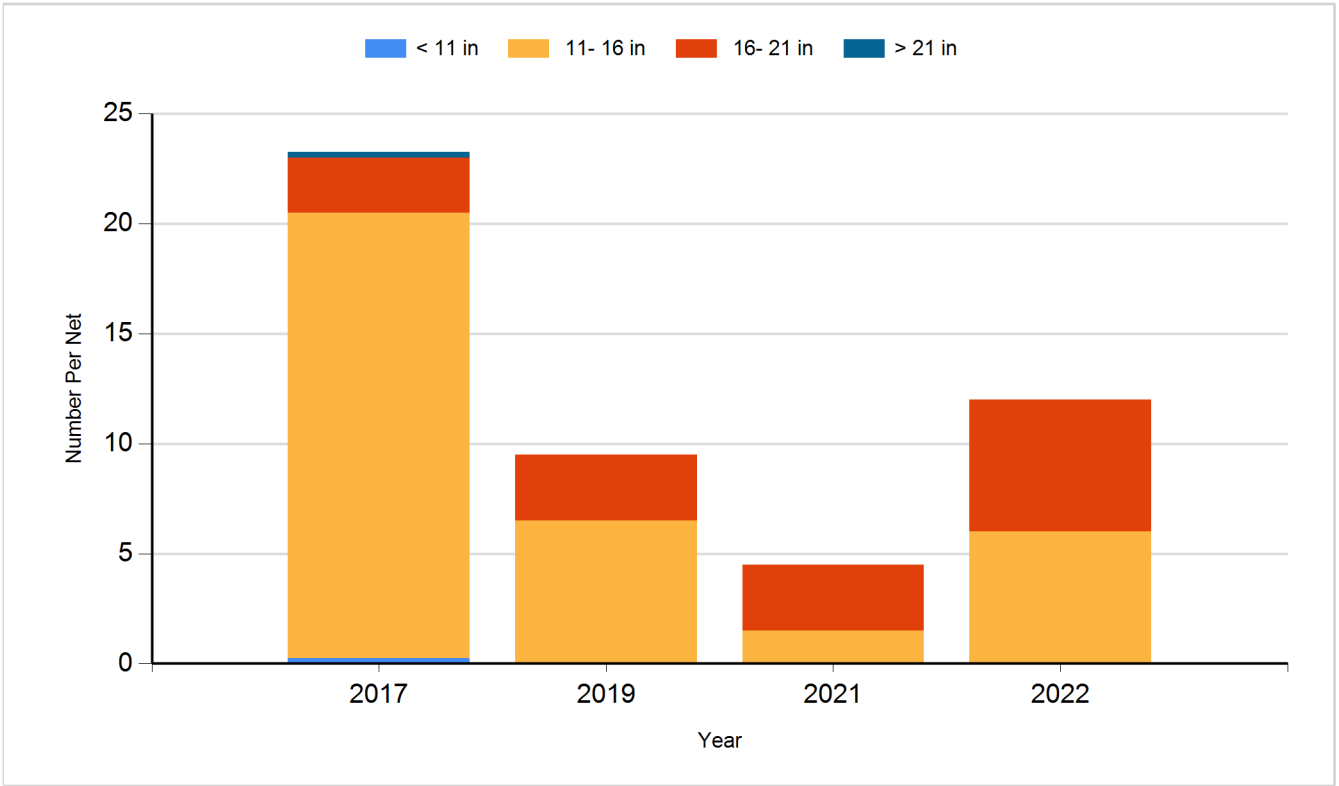
Species: Black Crappie
Gear: frame net (std 3/4 in)



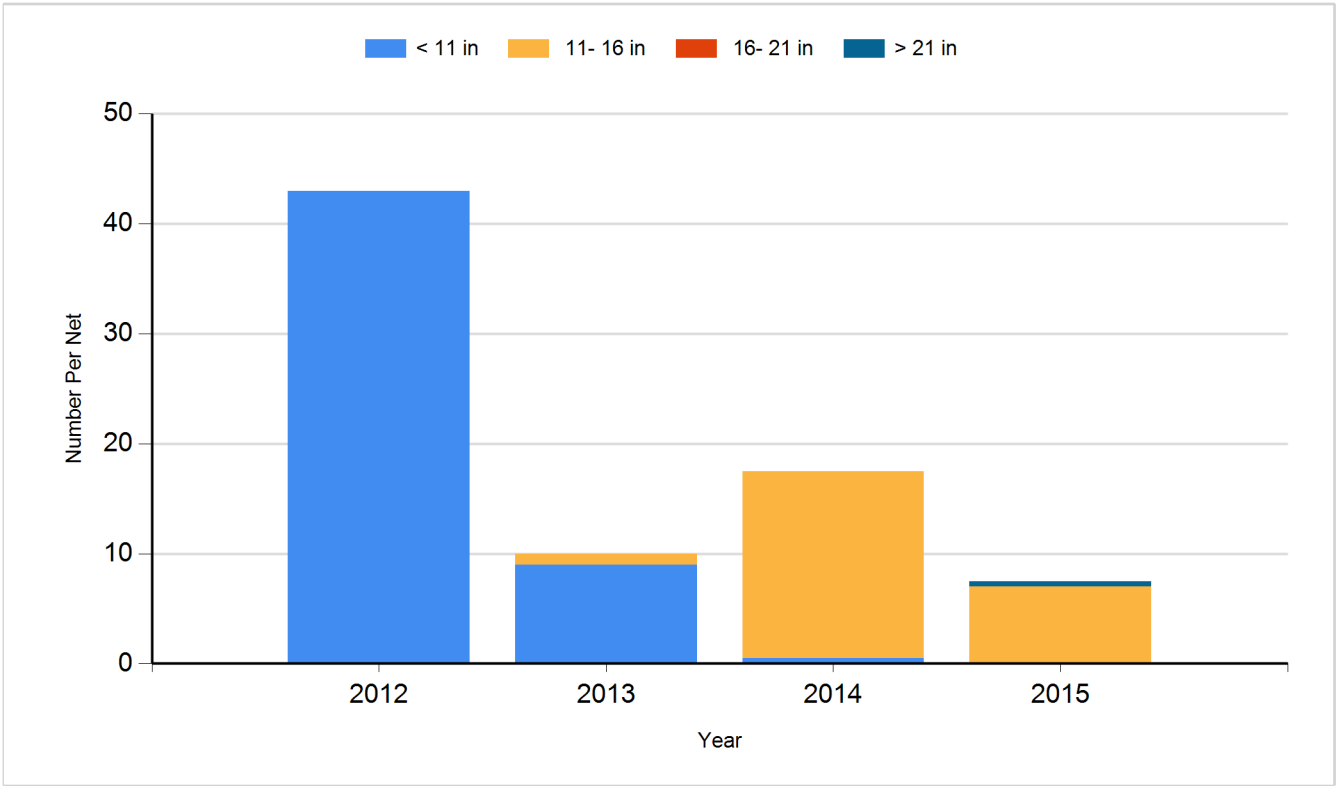
Species: Channel Catfish
Gear: AFS std gill net



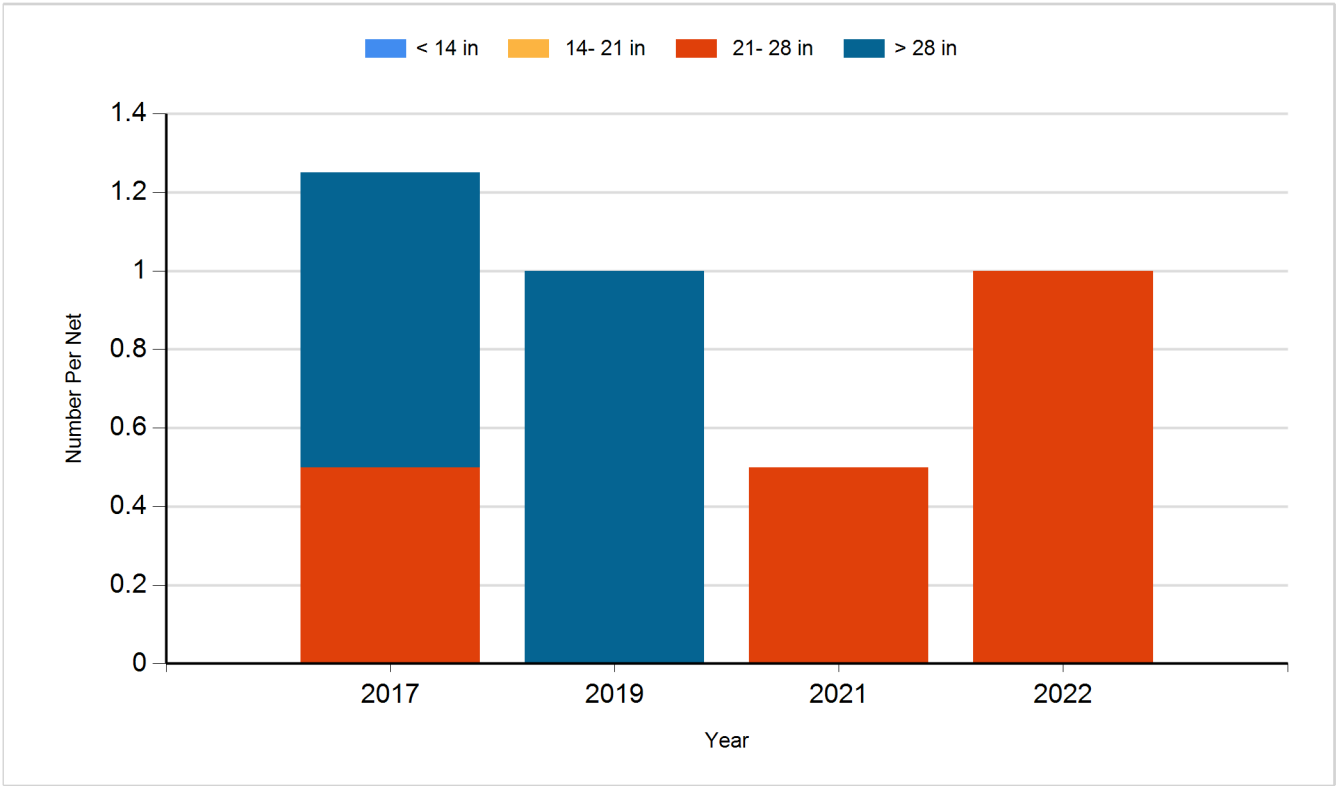
Species: Common Carp
Gear: AFS std gill net



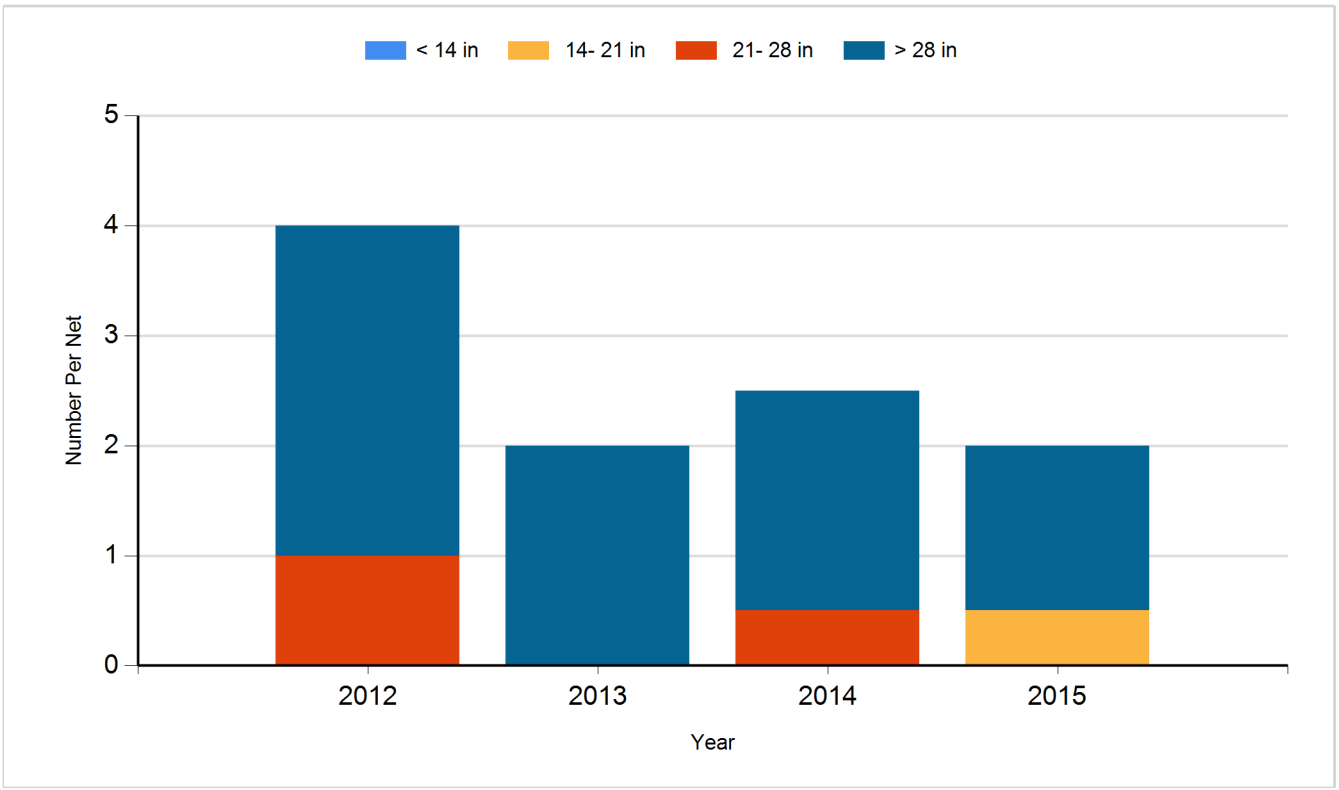
Species: Common Carp
Gear: std exp gill net



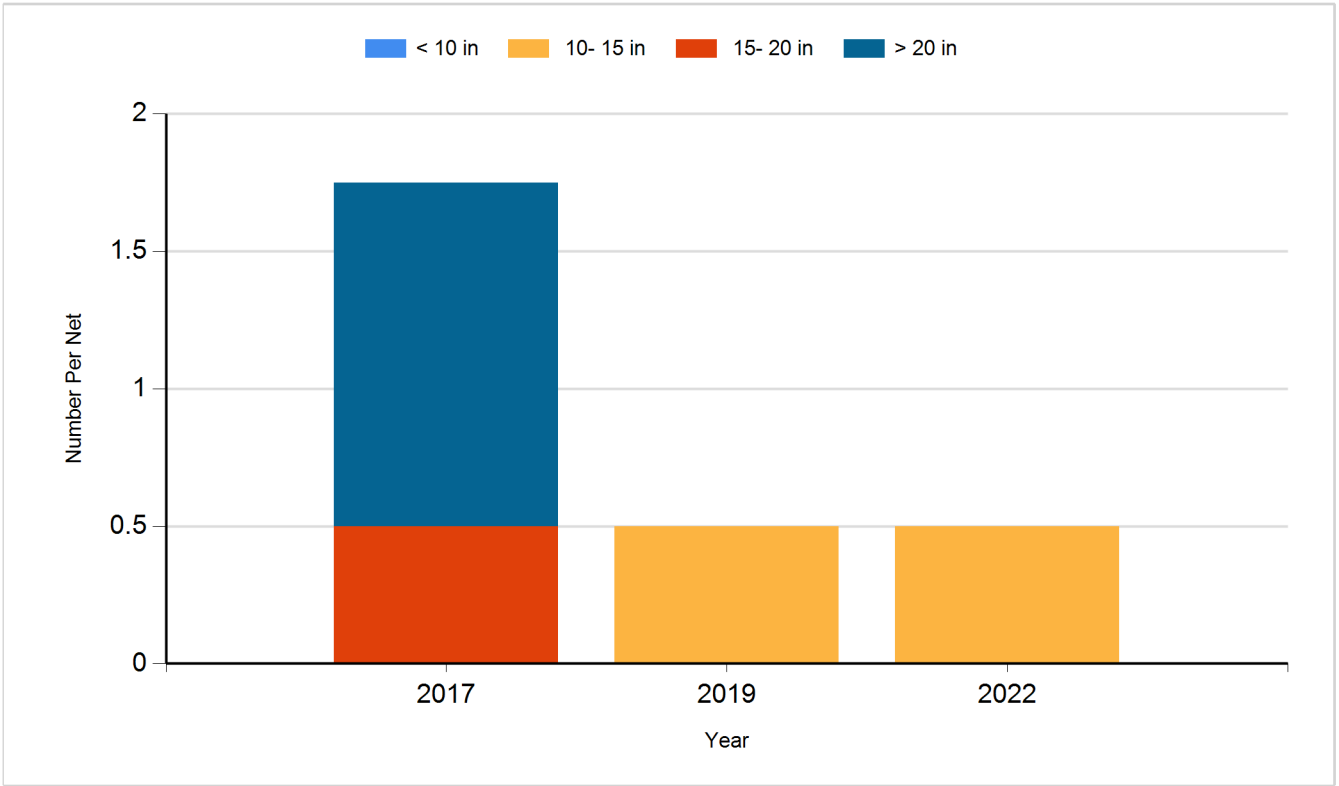
Species: Northern Pike
Gear: AFS std gill net



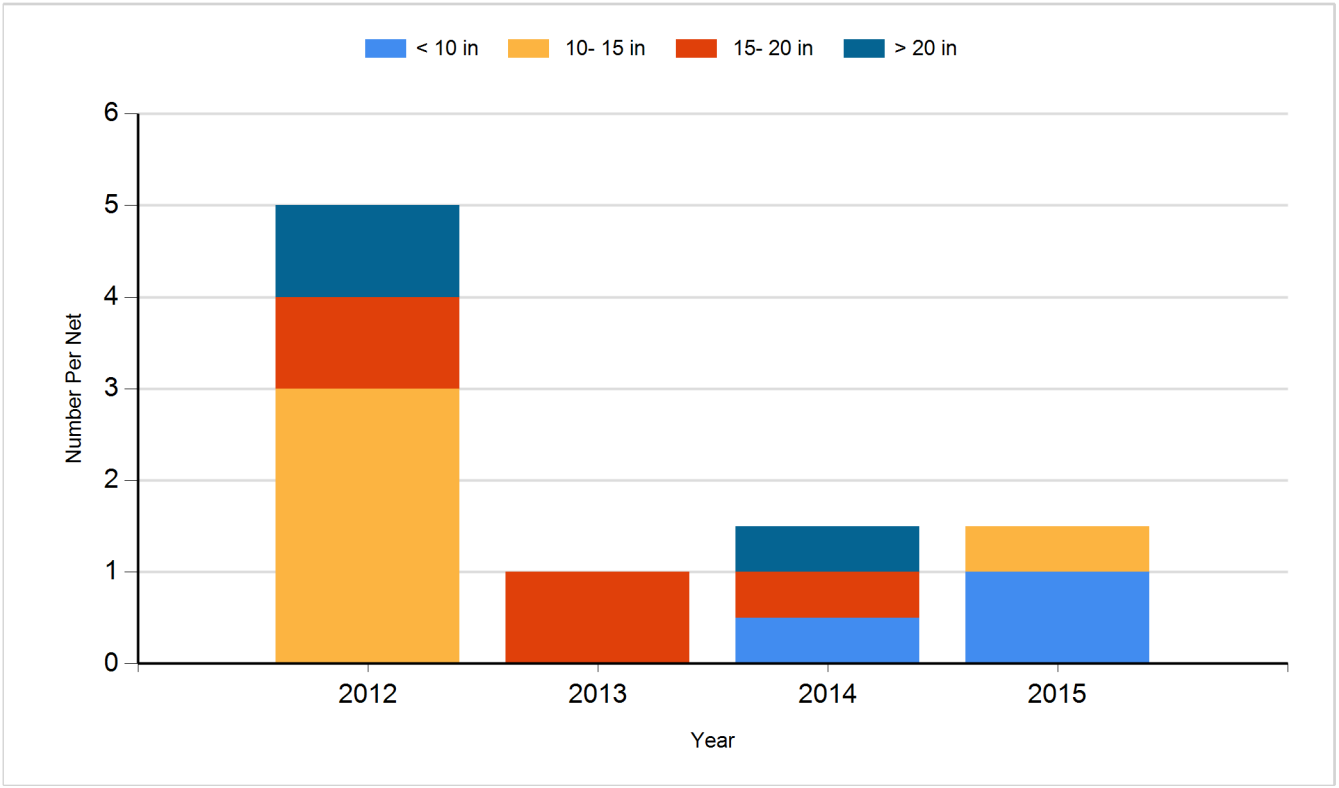
Species: Northern Pike
Gear: std exp gill net



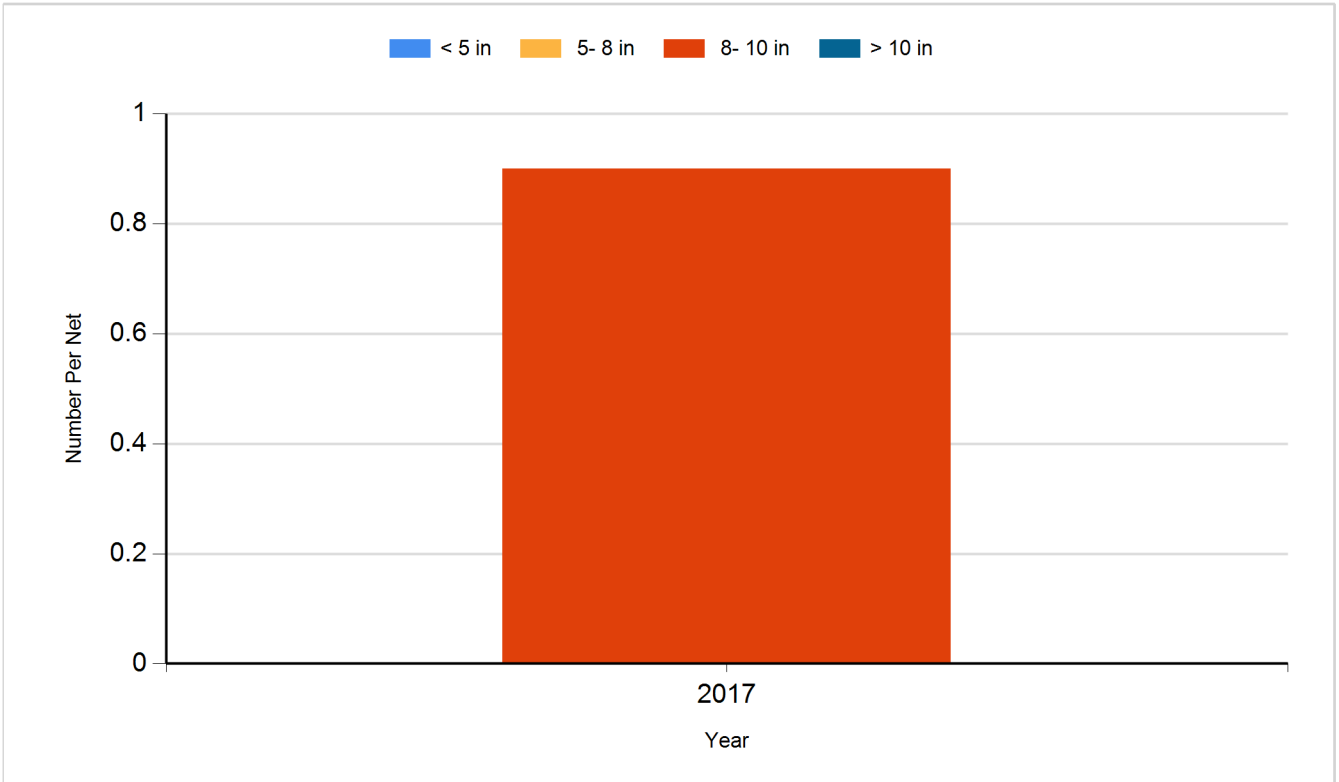
Species: Walleye
Gear: AFS std gill net



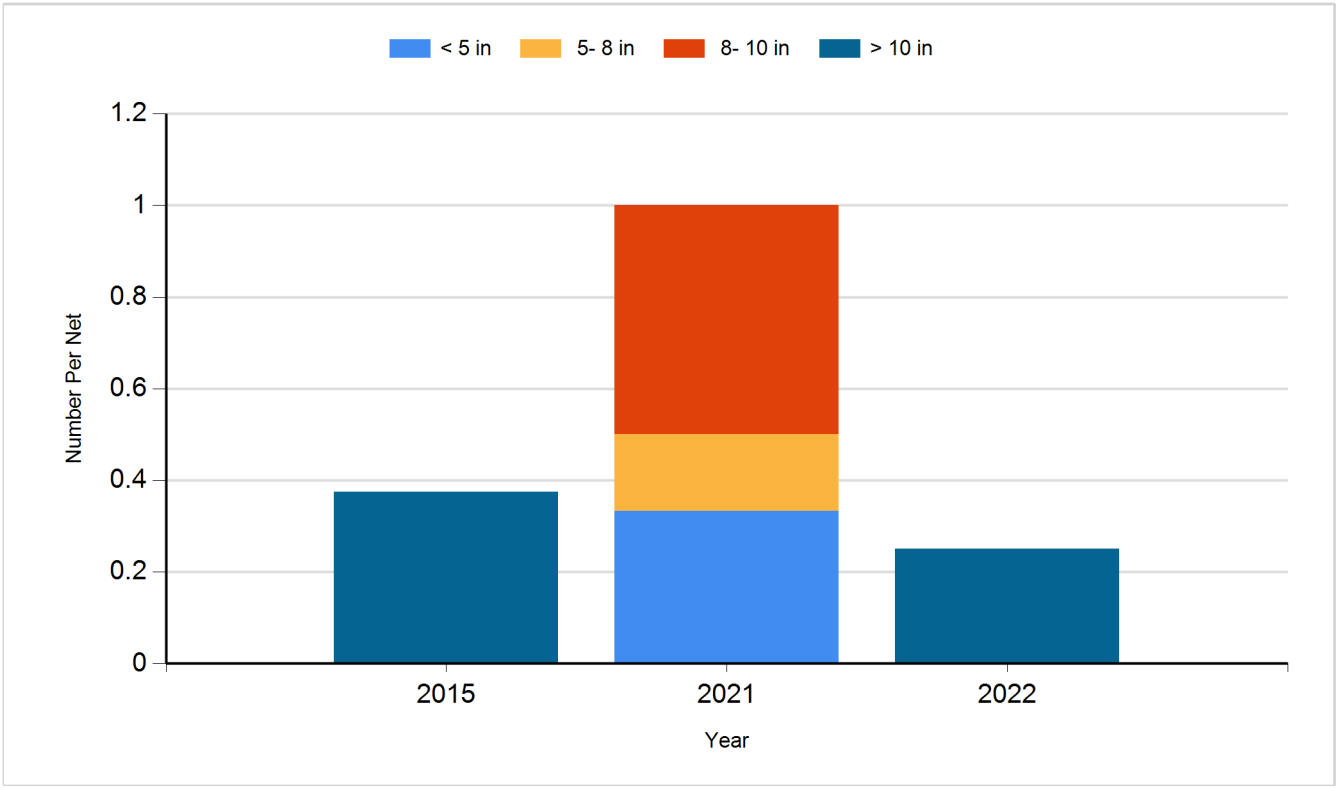
Species: Walleye
Gear: std exp gill net



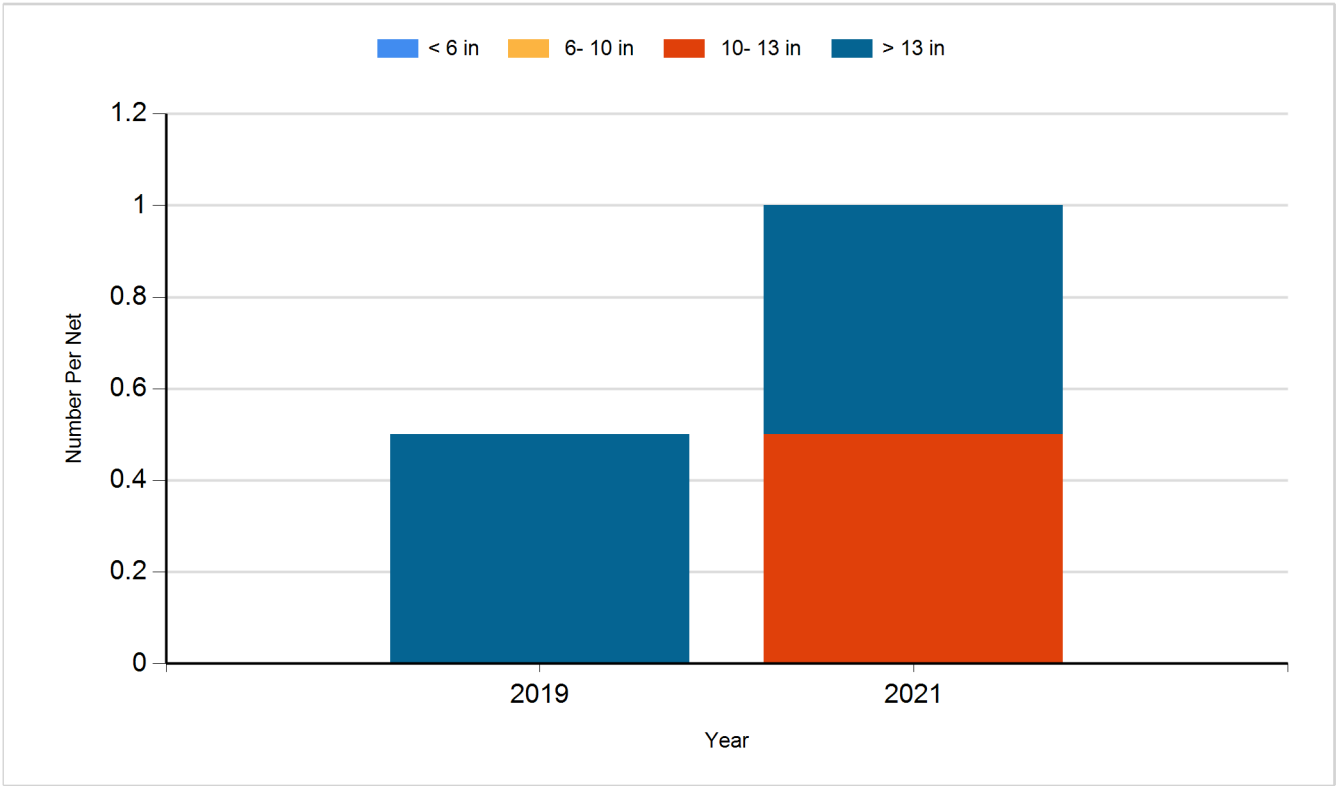
Species: White Crappie
Gear: AFS std frame net



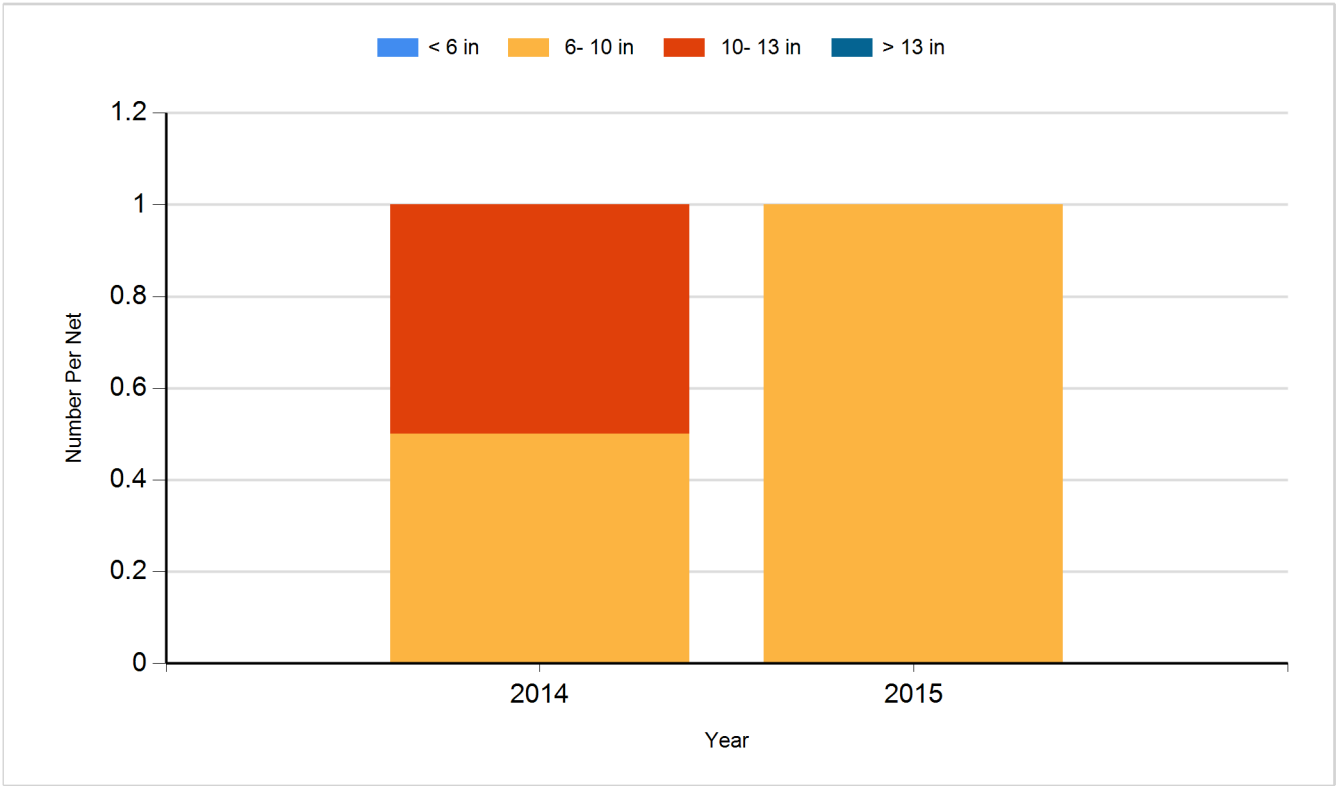
Species: White Crappie
Gear: frame net (std 3/4 in)



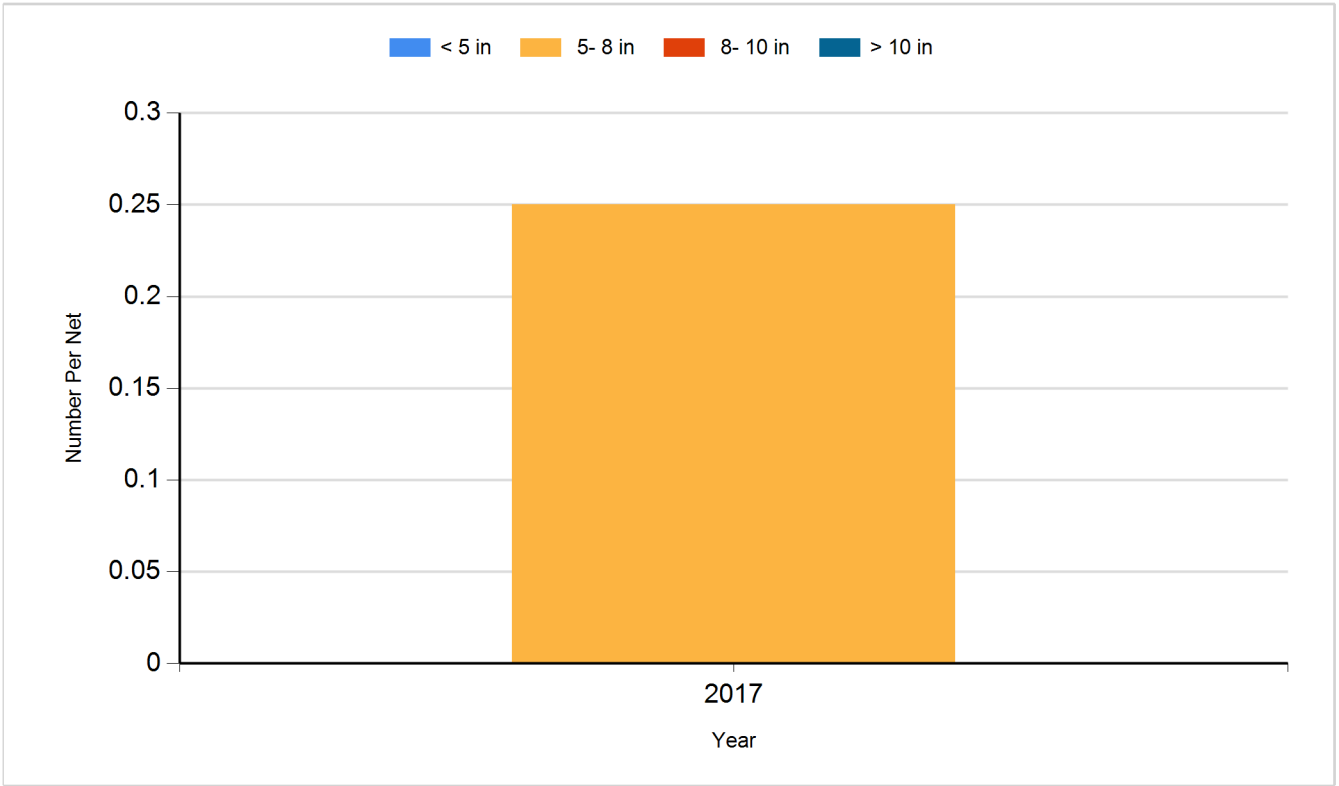
Species: White Sucker
Gear: AFS std gill net



Species: White Sucker
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



Fish Stocking

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

Year	Species	Size	Number
2011	Largemouth Bass	Fingerling	7,800
2011	Northern Pike	Fry	30,000
2011	Walleye	Small Fingerling	13,930
2012	Largemouth Bass	Fingerling	14,460
2013	Walleye	Large Fingerling	4,000
2014	Largemouth Bass	Adult	100
2014	Walleye	Small Fingerling	19,800
2016	Walleye	Fingerling	25,500
2017	Walleye	Small Fingerling	29,700
2018	Walleye	Small Fingerling	29,600
2019	Walleye	Small Fingerling	30,600
2021	Walleye	Juvenile	30,000
2022	Gizzard Shad	Adult	27
2022	Walleye	Juvenile	32,160