SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Herman, Lake County
LBS-Lake-136-000
2023

Lake Information

Name:	Herman	**Maximum Depth:**	13 Feet
County:	Lake	**Mean Depth:**	5 Feet
Legal Description:	T106N-R35W-Sec, 10-11, 14-15, 22-23	**OHWM Elevation:**	1,669
Surface Area:	1,279 Acres	**Outlet Elevation:**	1,668

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 13, 2023	6 net-nights

Common Fish Species Present

Walleye

Yellow Perch

White Sucker

Channel Catfish

Black Bullhead

White Bass

Northern Pike

Common Carp

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	5	0.8	0.7	100		0			
	Channel Catfish	6	1.0	0.7	100		83		102	6
	Common Carp	1	0.2	0.2	100		100			
	Northern Pike	3	0.3	0.3	100		50		79	
	Walleye	7	1.2	0.7	71		0		95	4
	White Bass	2	0.3	0.5	100		100		94	0
	White Sucker	14	2.3	1.5	100		100			
	Yellow Perch	3	0.5	0.7	67		0		92	5

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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
AFS std gill net	Bigmouth Buffalo				0.8	0.3	0.7		0.7		0.0	0.50
	Black Bullhead				8.0	2.2	0.3		12.0		0.8	4.66
	Channel Catfish				0.5	1.5	1.3		1.5		1.0	1.16
	Common Carp				5.3	2.3	0.5		7.8		0.2	3.22
	Northern Pike				0.0	0.0	0.0		0.7		0.3	0.20
	Walleye				1.2	0.5	0.7		0.5		1.2	0.82
	White Bass				8.0	8.0	1.3		2.0		0.3	3.92
	White Sucker				10.2	4.5	6.8		4.8		2.3	5.72
	Yellow Perch				2.7	5.8	3.8		2.5		0.5	3.06
std exp gill net	Bigmouth Buffalo	0.3	0.0	0.0								0.10
	Black Bullhead	35.0	40.0	14.0								29.67
	Black Crappie	0.0	0.0	0.3								0.10
	Channel Catfish	0.3	0.0	0.0								0.10
	Common Carp	1.3	0.0	0.3								0.53
	Green Sunfish	0.0	0.0	0.0								0.00
	Northern Pike	0.7	0.7	1.0								0.80
	Walleye	4.0	1.0	6.3								3.77
	White Bass	0.3	2.0	7.3								3.20
	White Sucker	6.7	13.0	14.0								11.23
	Yellow Perch	4.0	8.3	18.0								10.10

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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std gill net	Black Bullhead	PSD				71	100	100		90		100
		PSD-P				48	69	0		6		0
	Channel Catfish	PSD				67	22	88		100		100
		PSD-P				33	11	0		22		83
		Wr				105	97	92		91		102
	Common Carp	PSD				6	100	67		89		100
		PSD-P				3	14	67		9		100
	Northern Pike	PSD								75		100
		PSD-P								25		50
		Wr								73		79
	Walleye	PSD				43	33	100		33		71
		PSD-P				29	33	0		0		0
		Wr				82	81	92		87		95
	White Bass	PSD				63	100	75		100		100
		PSD-P				46	54	75		58		100
		Wr				83	79	93		91		94
	White Sucker	PSD				97	96	78		100		100
		PSD-P				87	96	71		97		100
	Yellow Perch	PSD				81	80	17		80		67
		PSD-P				6	54	17		33		0
		Wr				105	97	112		106		92
std exp gill net	Black Bullhead	PSD	18	97	60							
		PSD-P	2	8	19							
	Channel Catfish	PSD	100									
		PSD-P	100									
		Wr	100									
	Common Carp	PSD	100		100							
		PSD-P	100		100							
	Northern Pike	PSD	50	50	67							
		PSD-P	50	0	0							
		Wr	83	86	84							
	Walleye	PSD	67	33	21							
		PSD-P	17	0	5							

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
std exp gill net	Walleye	Wr	95	79	85							
	White Bass	PSD	100	83	95							
		PSD-P	100	67	14							
		Wr	89	88	93							
	White Sucker	PSD	80	97	93							
		PSD-P	80	97	88							
	Yellow Perch	PSD	100	40	33							
		PSD-P	0	36	11							
		Wr	100	106	104							

Length at Capture

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

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	7	263 (1)	297 (1)	422 (1)	446 (4)						
2018	5	204 (2)			335 (2)	537 (1)					

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	3	154 (1)	242 (2)								
2018	35	167 (7)	224 (5)	261 (16)	300 (5)		323 (2)				

Fish Condition

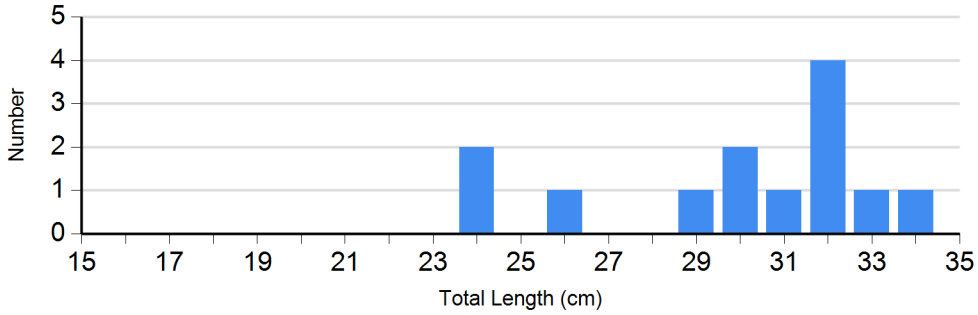
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Channel Catfish Gill Net	2019	1	95	7	92 (2.4)	0		0	
	2021	0		7	91 (2.7)	2	91 (5.8)	0	
	2023	0		1	102	5	102 (5.9)	0	
Northern Pike Gill Net	2021	1	73	2	73 (2.6)	1	71	0	
	2023	0		1	79	1		0	
Walleye Gill Net	2019	0		4	92 (2.8)	0		0	
	2021	2	88 (2.8)	1	85	0		0	
	2023	2	90 (5.7)	5	97 (3.4)	0		0	
White Bass Gill Net	2019	2	102 (0.7)	0		5	89 (1.6)	1	91
	2021	0		5	92 (0.9)	7	90 (3.4)	0	
	2023	0		0		1	95	1	94
Yellow Perch Gill Net	2019	19	114 (3.0)	0		3	105 (6.7)	1	101
	2021	3	117 (3.5)	7	107 (4.1)	5	98 (2.0)	0	
	2023	1	98	2	89 (4.9)	0		0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



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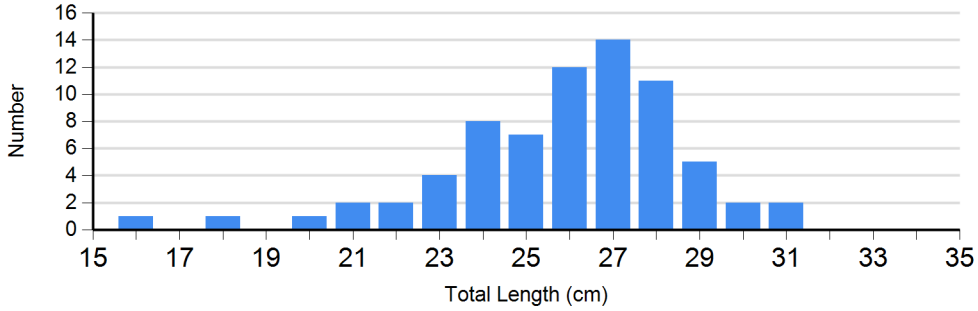
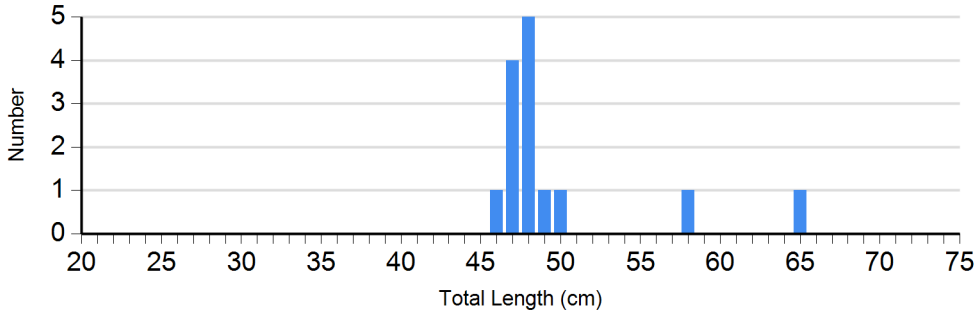


2021

Species: Common Carp
Gear: AFS std gill net



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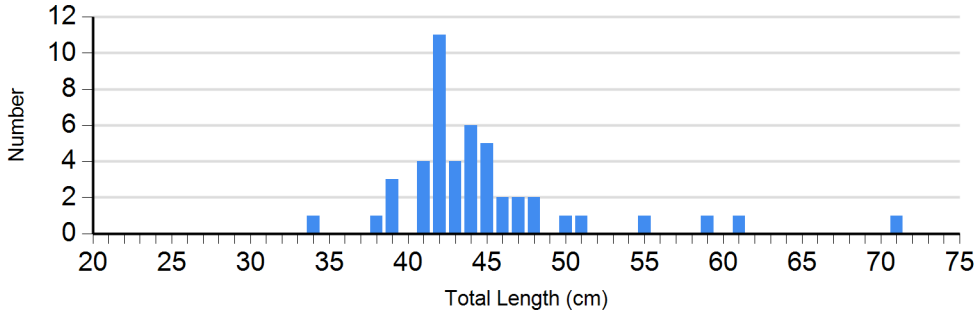
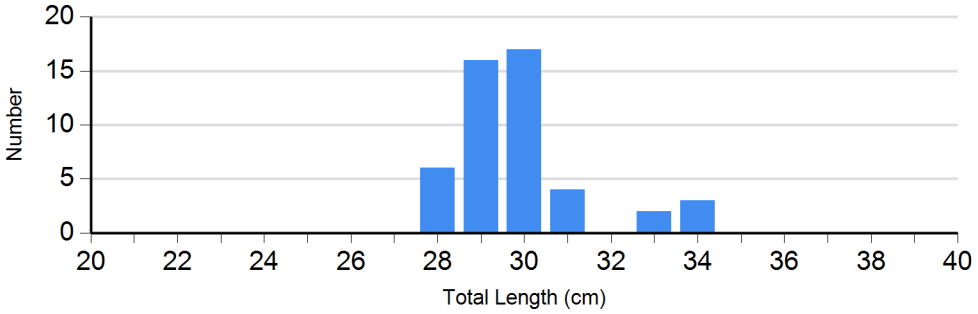
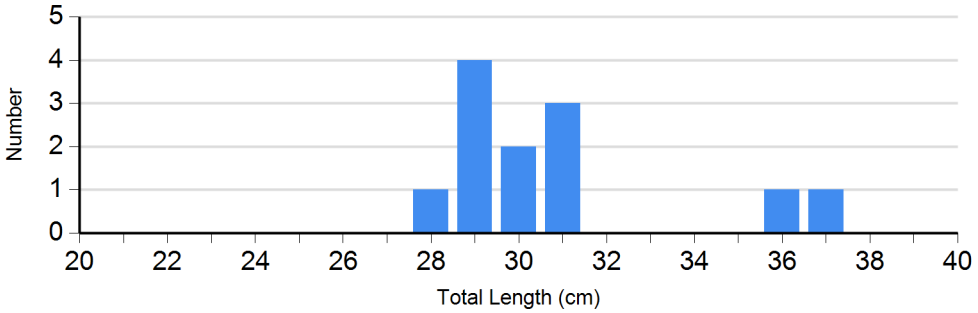


2021

Species: White Bass
Gear: AFS std gill net

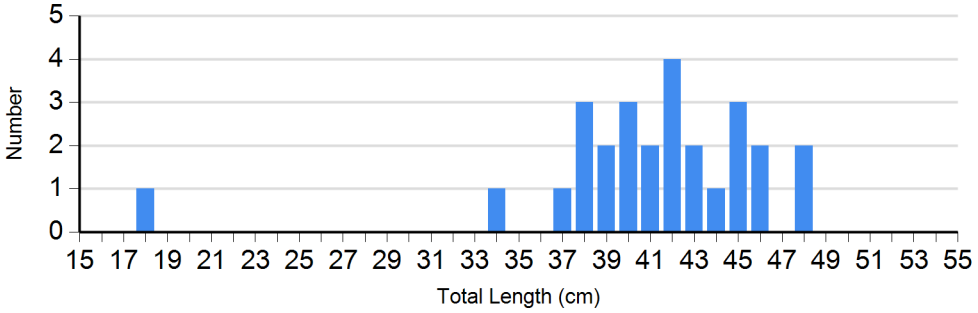


2018



2021

Species: White Sucker
Gear: AFS std gill net



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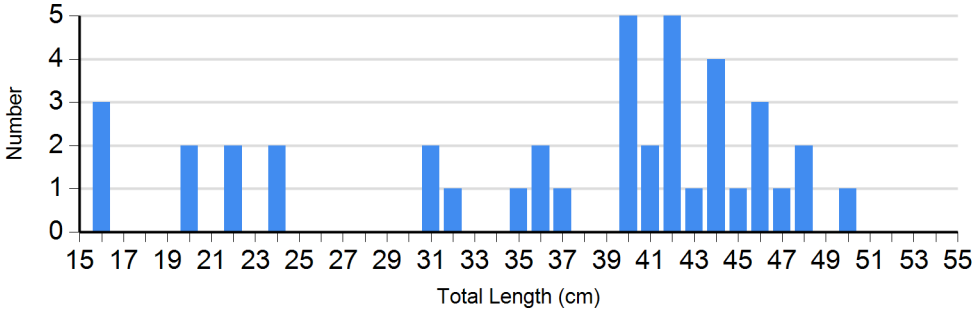
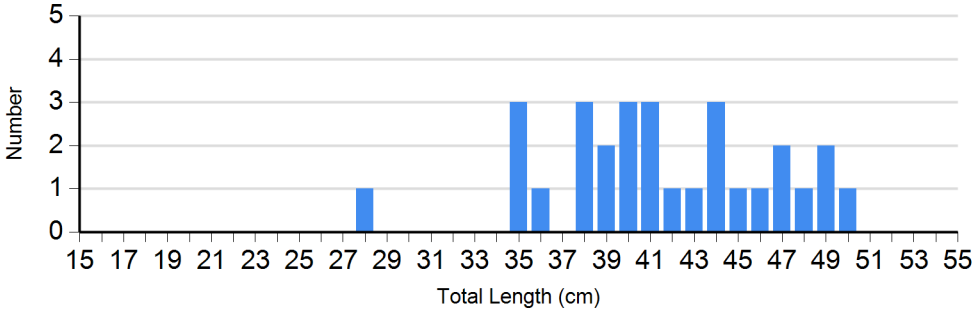
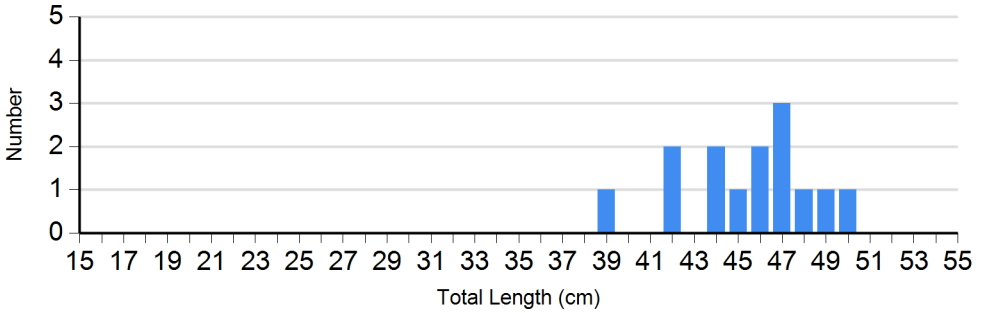


2019

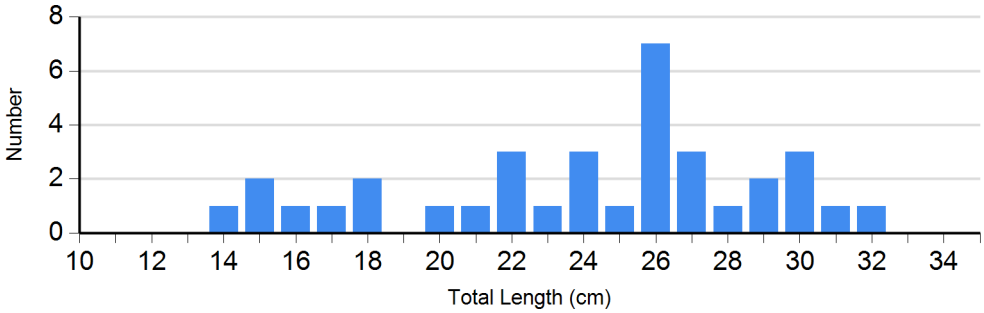


2021



2023

Species: Yellow Perch
Gear: AFS std gill net



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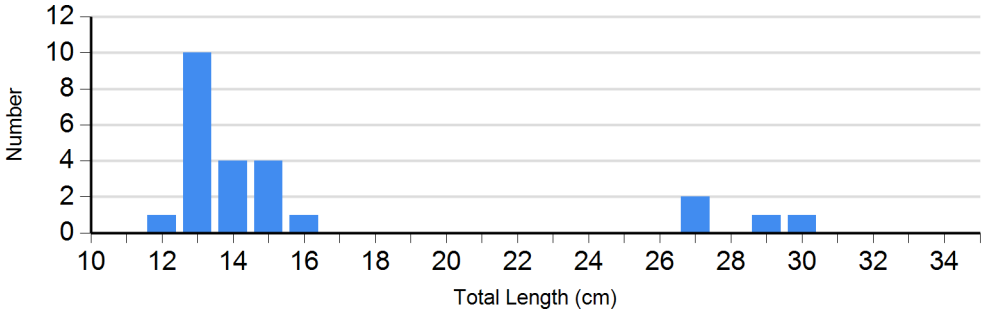
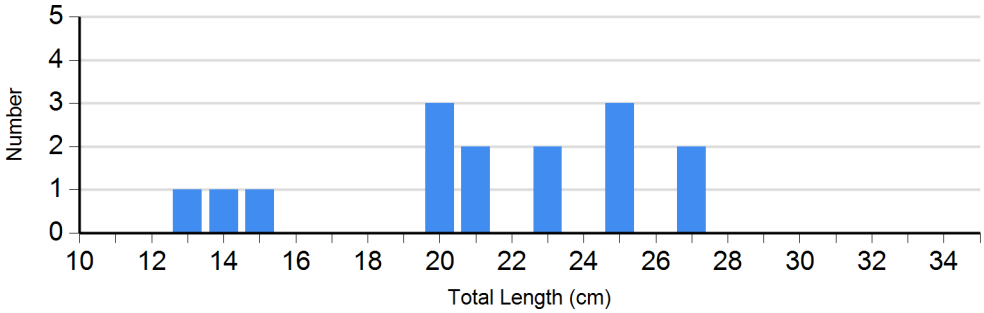


2019

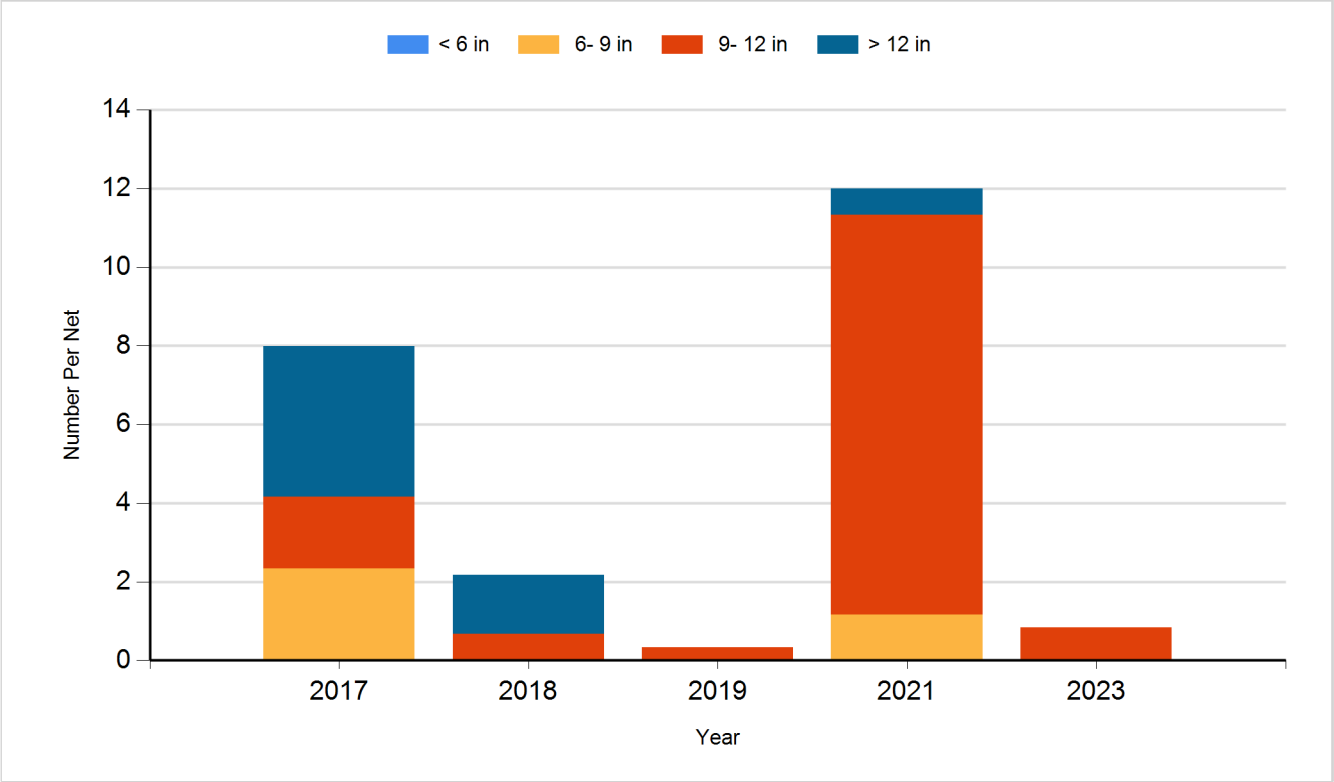


2021

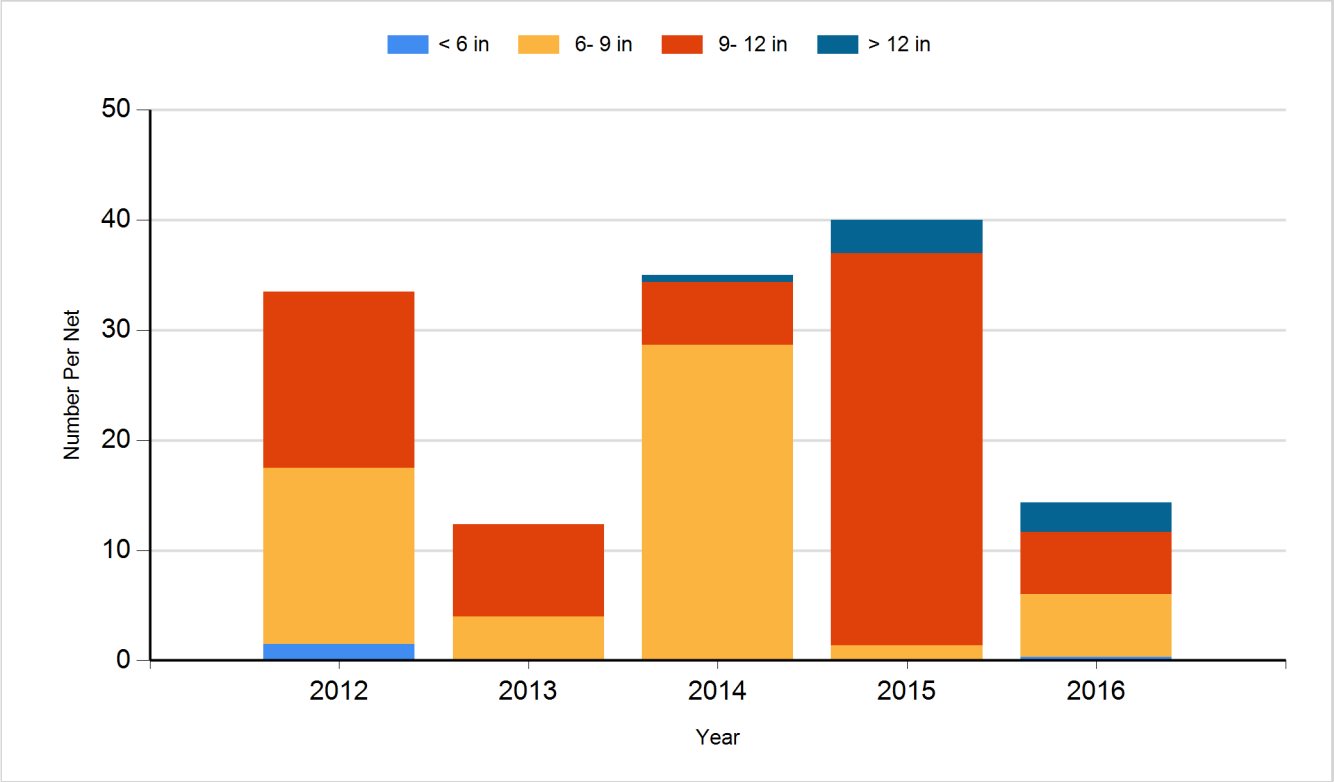
Historic Fish Sizes and Relative Abundance

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

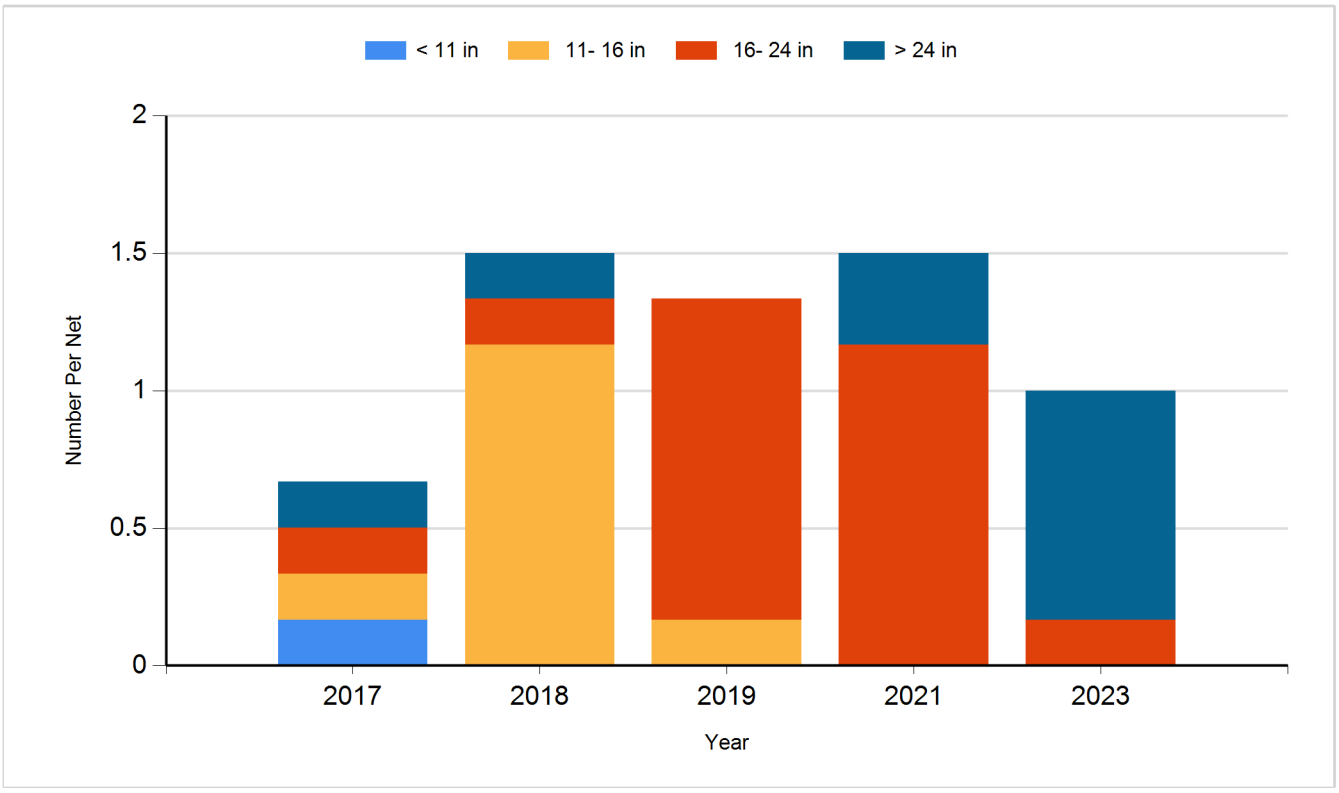
Species: Black Bullhead
Gear: AFS std gill net



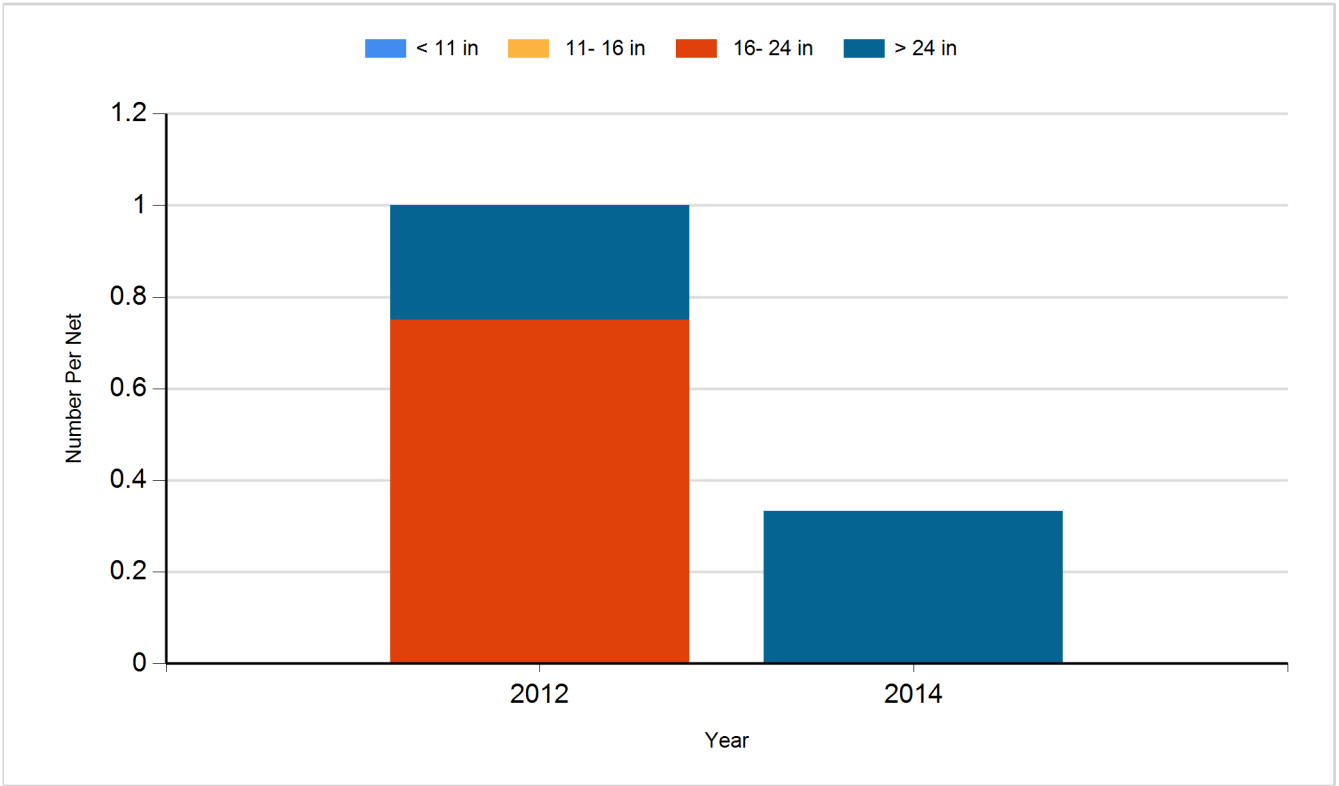
Species: Black Bullhead
Gear: std exp gill net



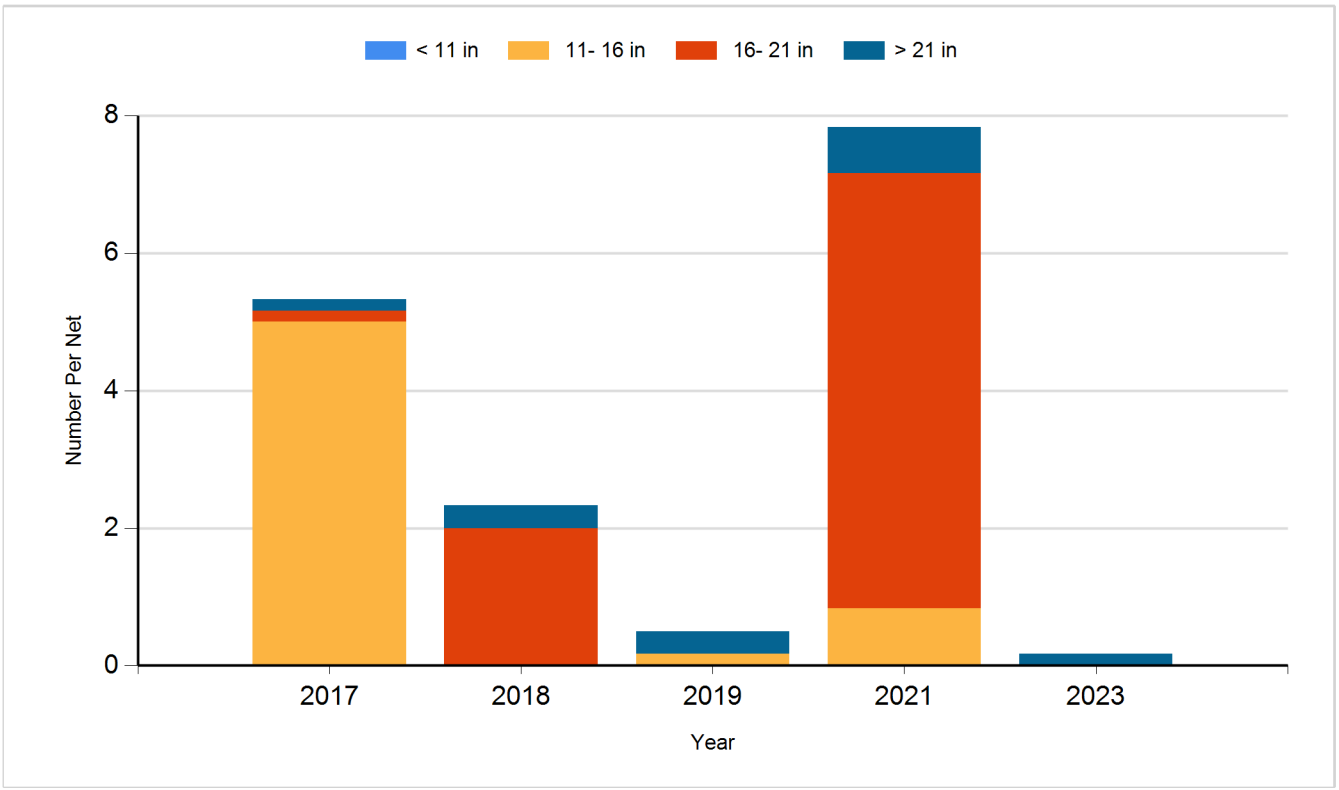
Species: Channel Catfish
Gear: AFS std gill net



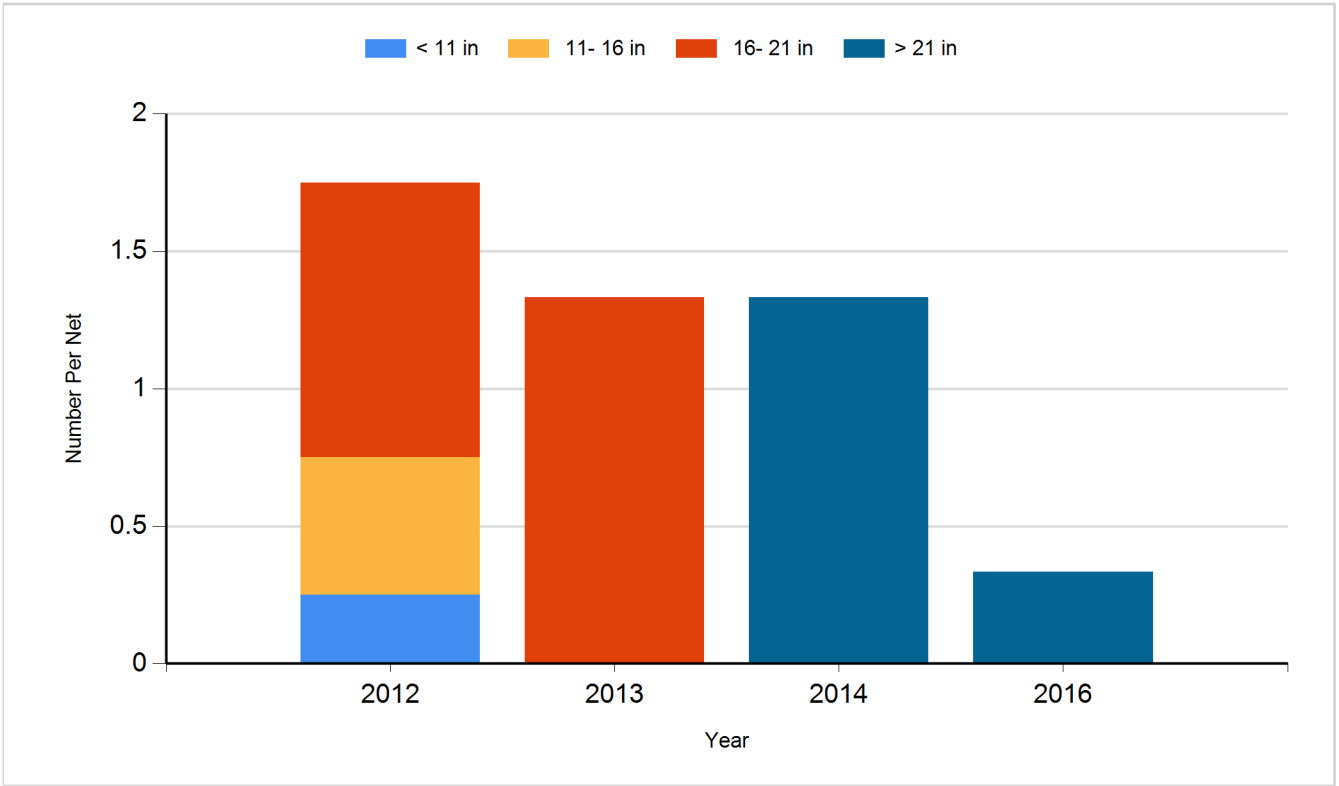
Species: Channel Catfish
Gear: std exp gill net



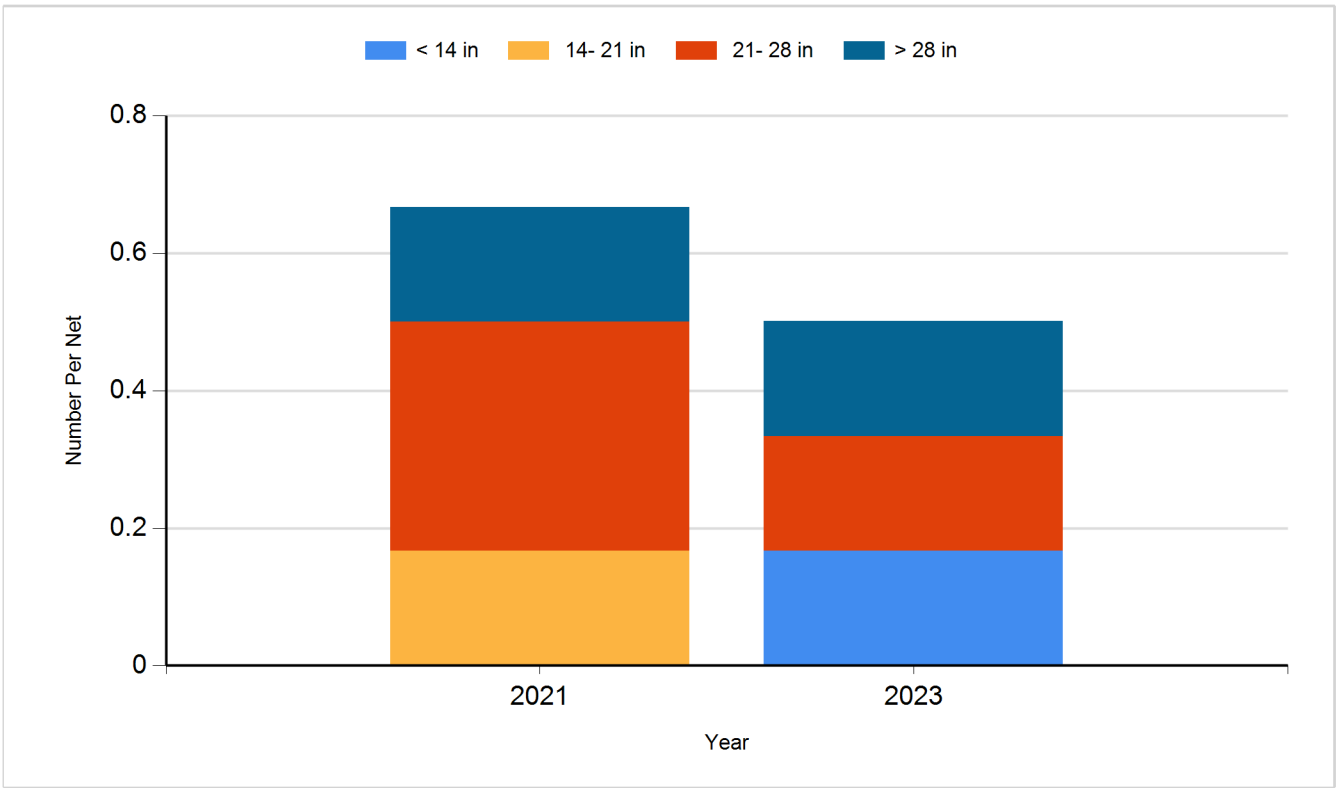
Species: Common Carp
Gear: AFS std gill net



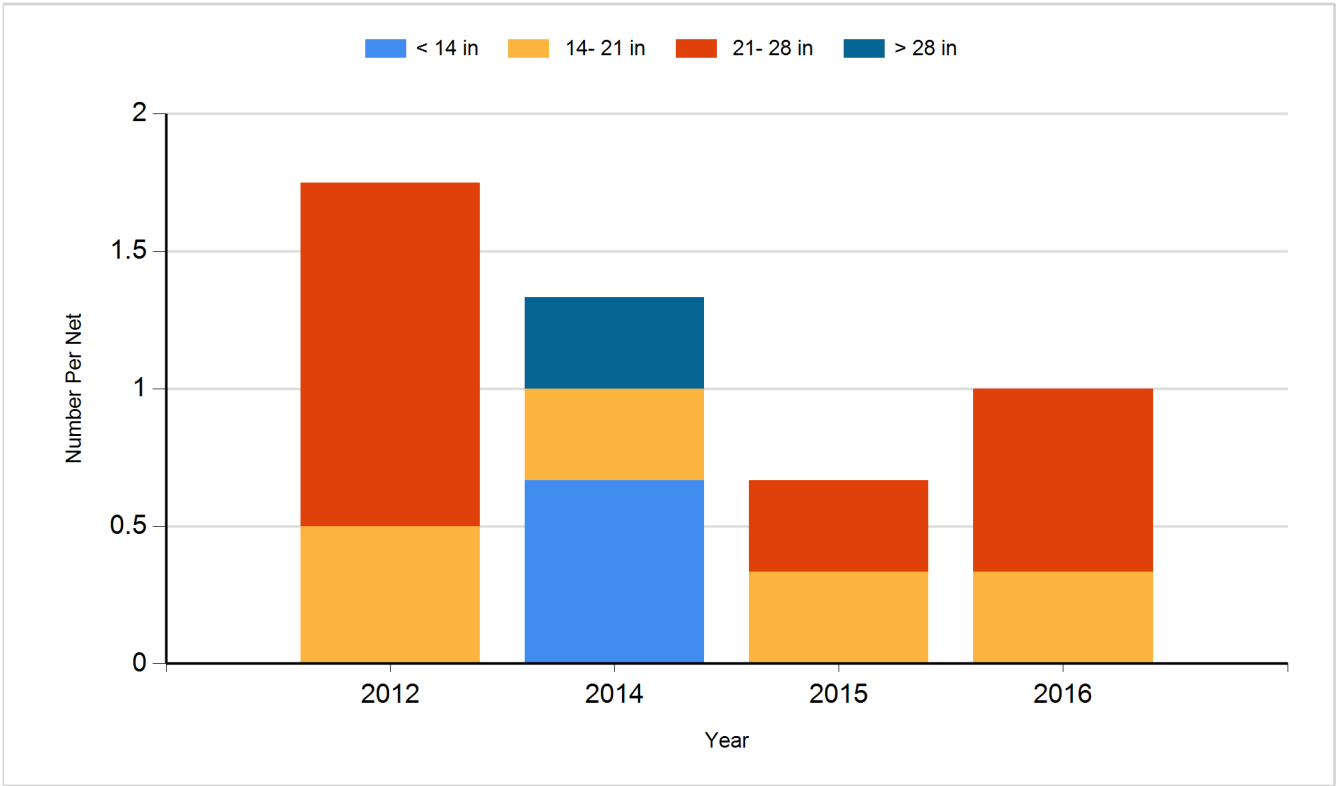
Species: Common Carp
Gear: std exp gill net



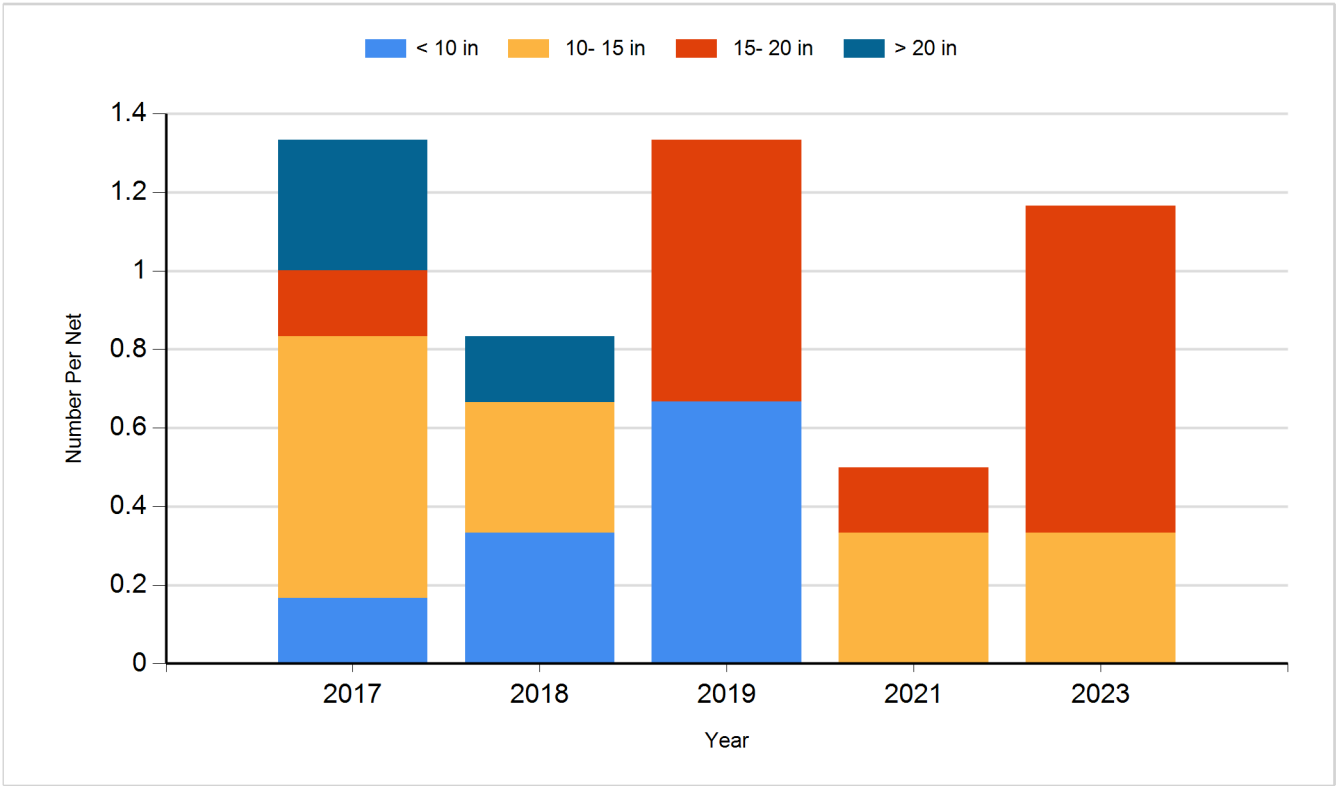
Species: Northern Pike
Gear: AFS std gill net



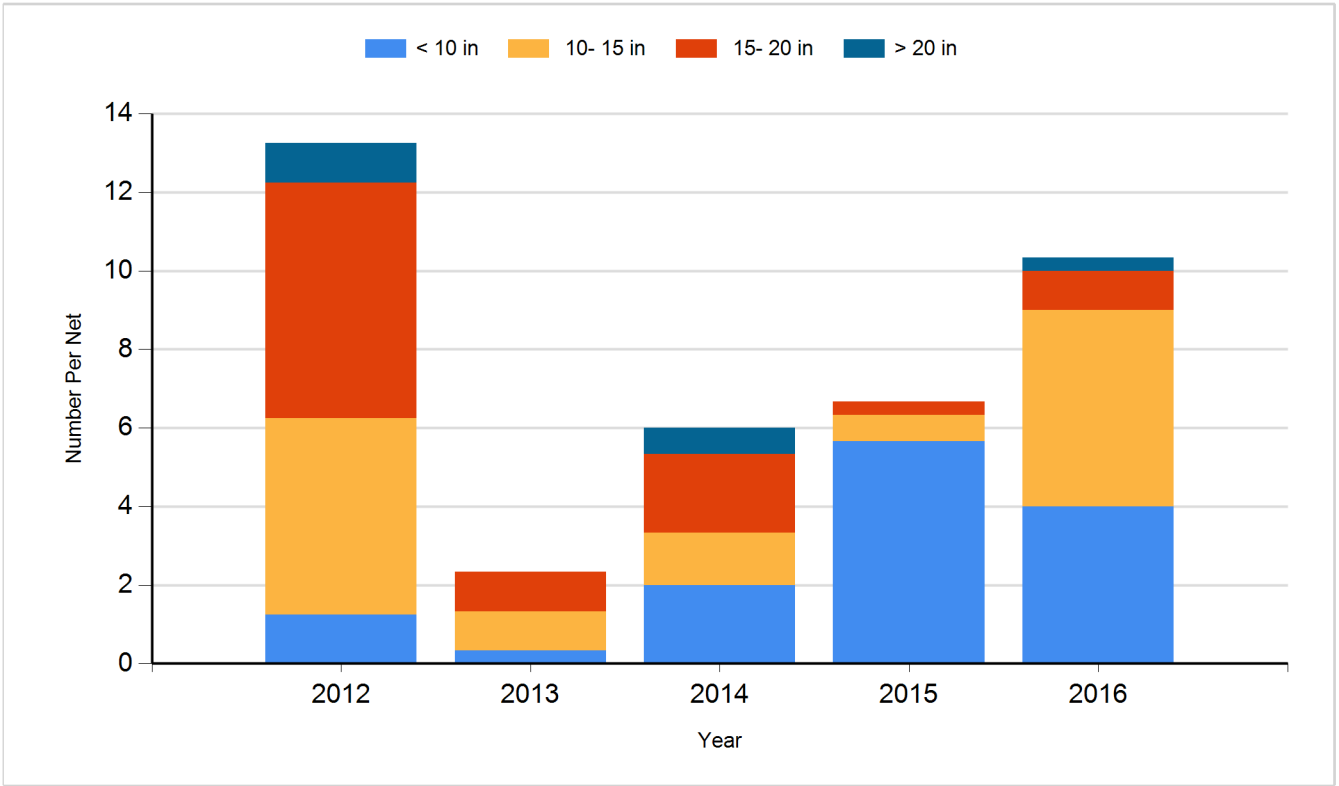
Species: Northern Pike
Gear: std exp gill net



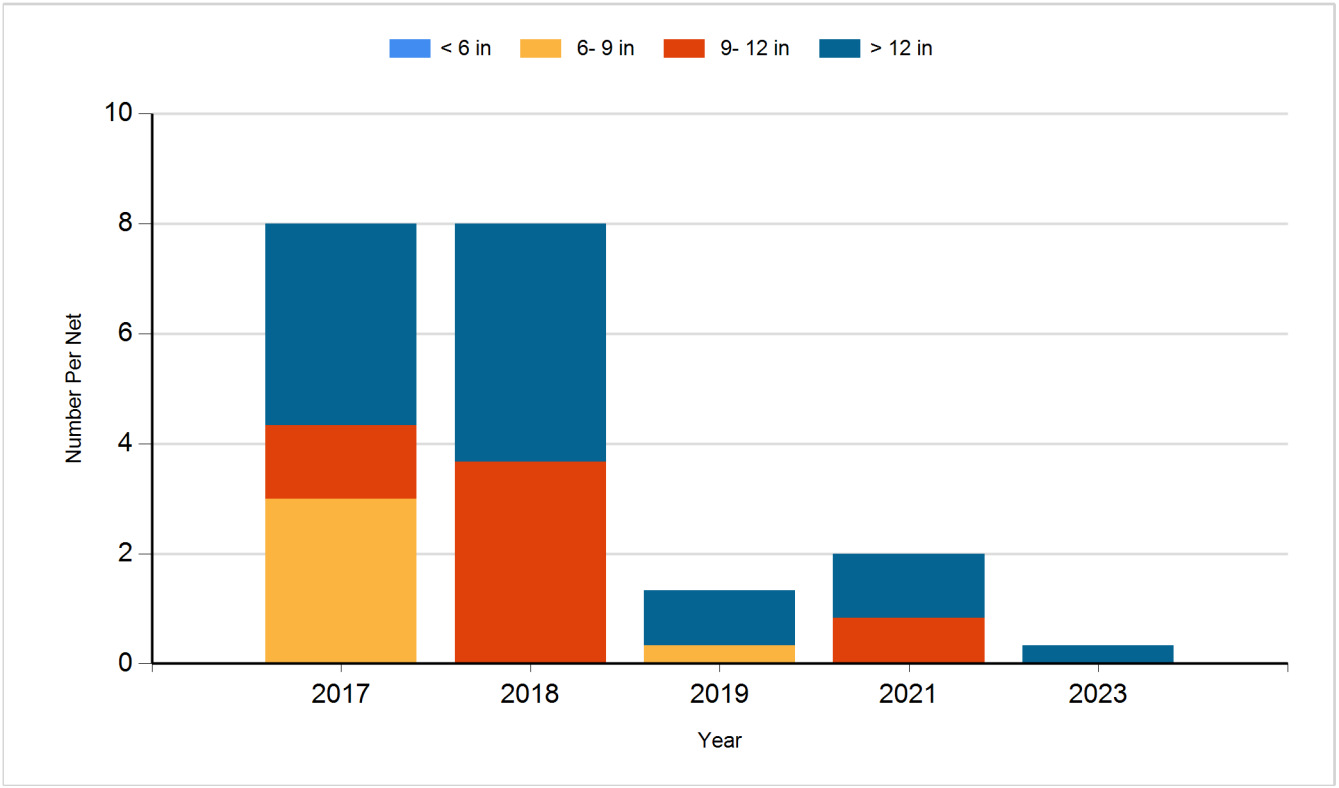
Species: Walleye
Gear: AFS std gill net



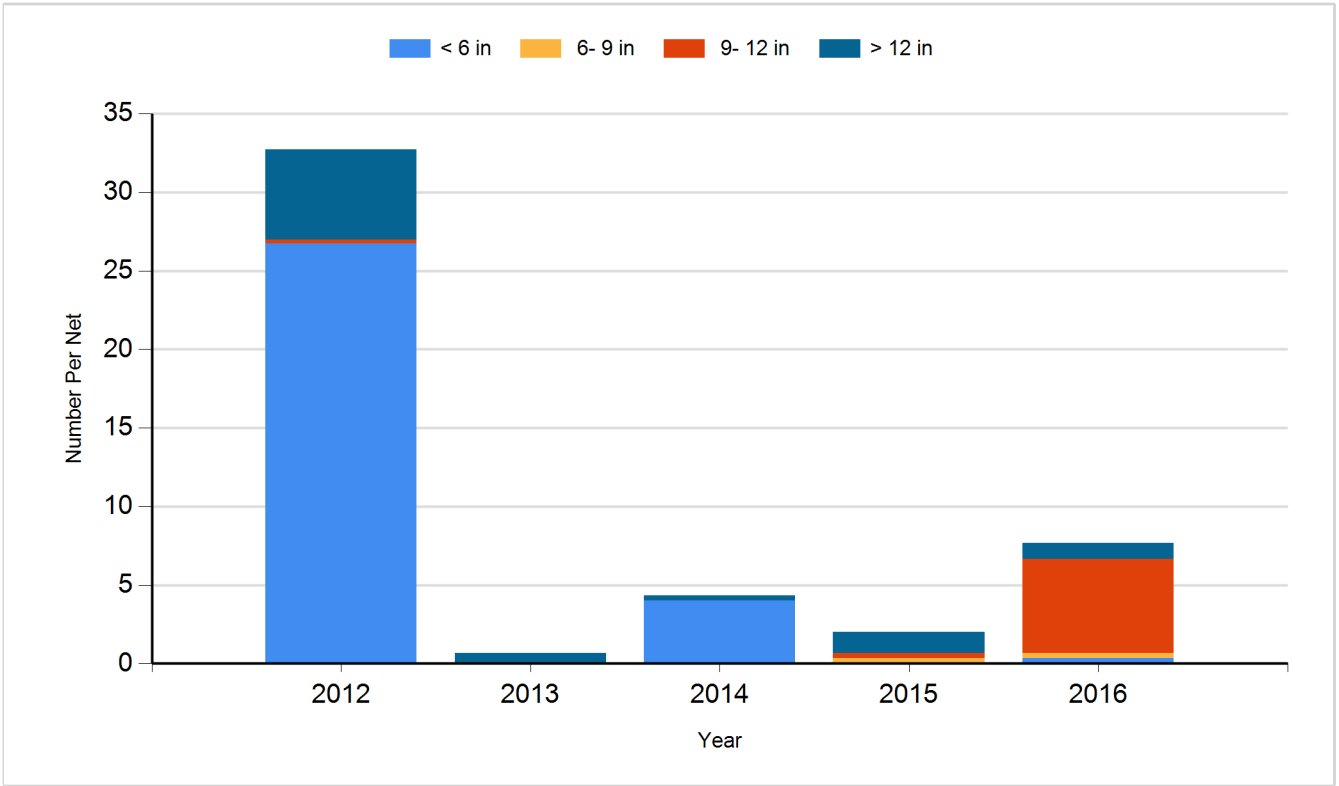
Species: Walleye
Gear: std exp gill net



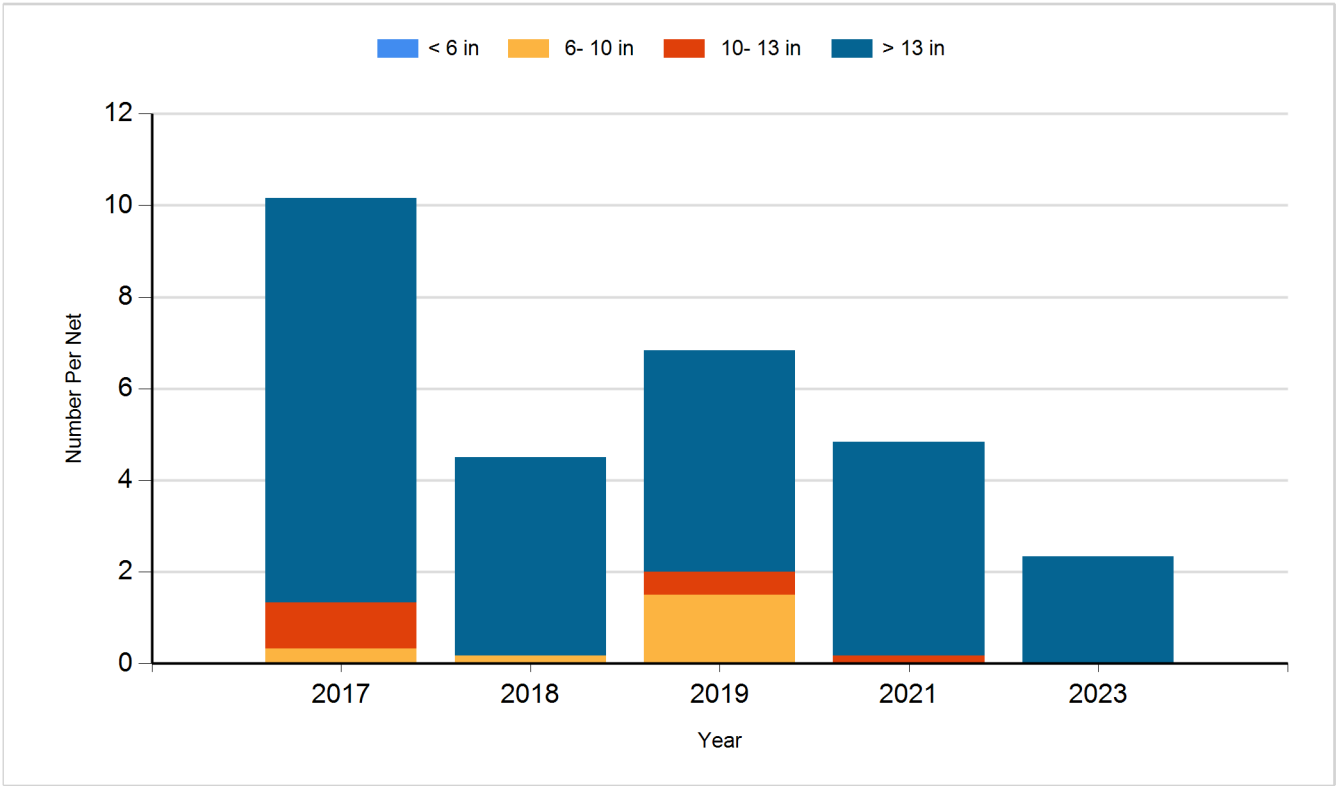
Species: White Bass
Gear: AFS std gill net



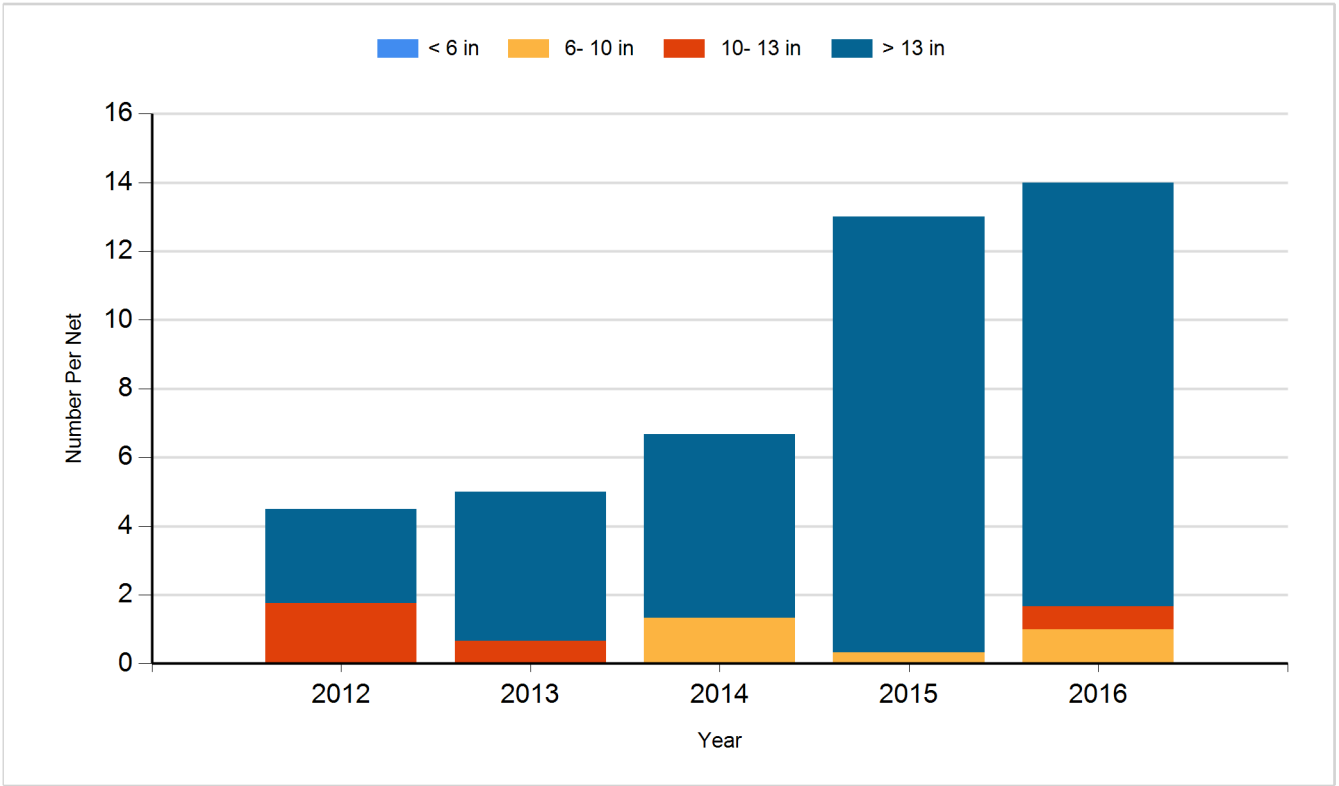
Species: White Bass
Gear: std exp gill net



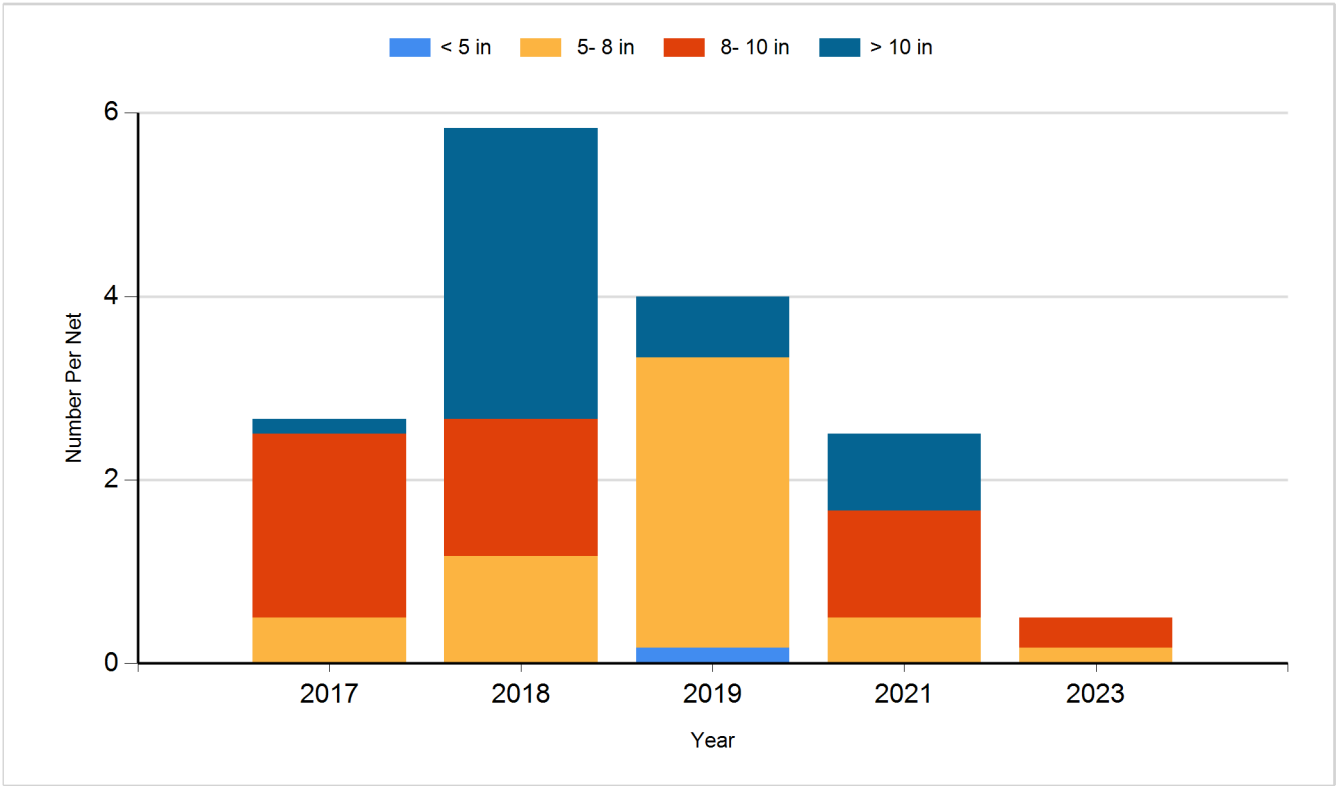
Species: White Sucker
Gear: AFS std gill net



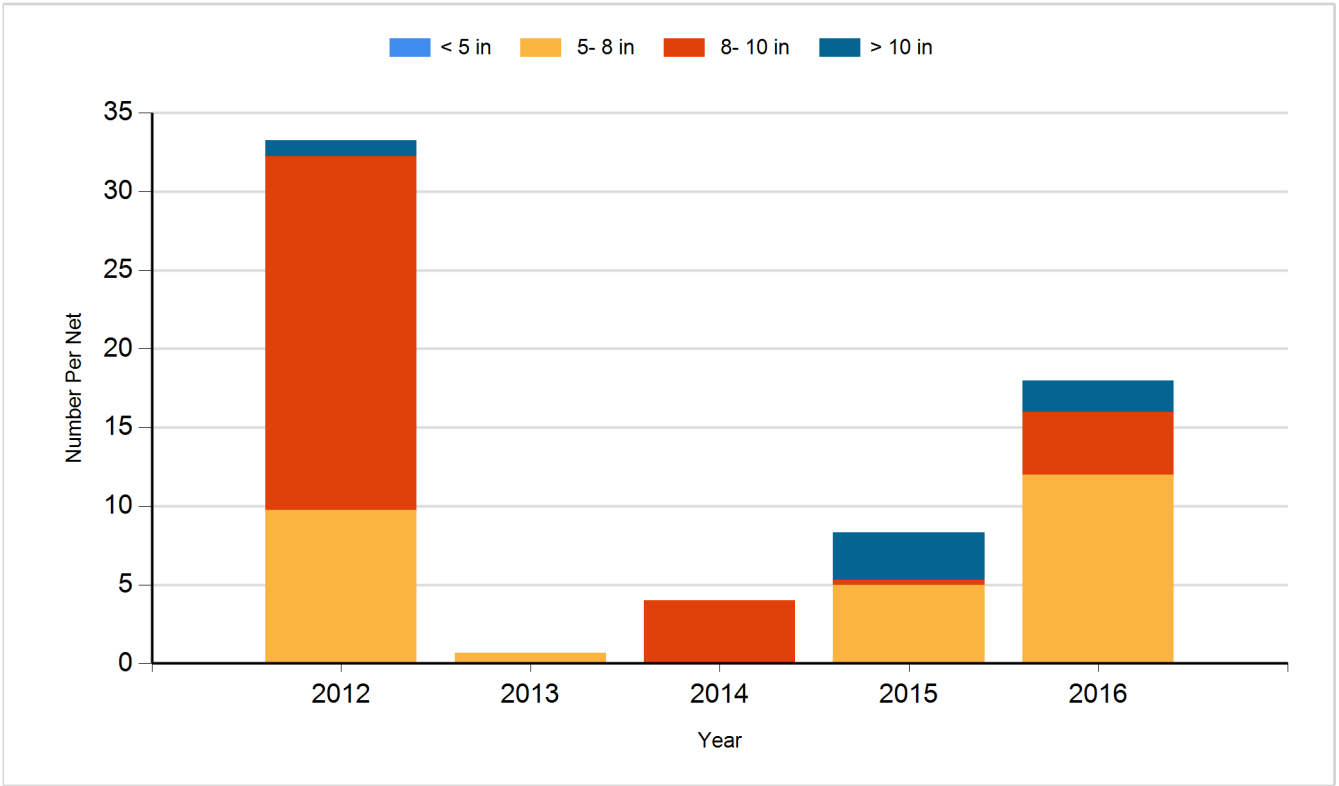
Species: White Sucker
Gear: std exp gill net



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
2012	Walleye	Small Fingerling	130,130
2013	Walleye	Small Fingerling	135,200
2014	Walleye	Small Fingerling	95,920
2015	Walleye	Fry	337,604
2016	Walleye	Fry	340,000
2017	Walleye	Fry	340,000
2018	Walleye	Fry	340,000
2019	Walleye	Fry	340,000
2021	Walleye	Fry	2,700,000
2022	Saugeye	Fry	650,000