SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Oakwood West, Brookings County
MBS-Lake-215-000
2020

Lake Information

Name: Oakwood West

County: Brookings

OHWM Elevation: 1,627

Surface Area: 1,183 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 28, 2020	6 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Northern Pike

White Sucker

Black Bullhead

Common Carp

Bigmouth Buffalo

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	Bigmouth Buffalo	9	0.0	0.0	0		0			
	Black Bullhead	19	2.3	1.2	14		0			
	Common Carp	381	0.0	0.0	0		0			
	Northern Pike	16	2.7	1.6	88		0		97	1
	Walleye	32	5.3	1.6	53	13	13		95	2
	White Sucker	14	2.3	1.6	93		71			
	Yellow Perch	50	8.3	2.8	24	9	4		96	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**

		CPUE										
Gear	Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
AFS std gill net	Bigmouth Buffalo							0.3	1.0	0.7	0.0	0.50
	Black Bullhead							7.0	11.5	1.8	2.3	5.65
	Common Carp							1.7	0.3	0.0	0.0	0.50
	Northern Pike							1.3	0.3	0.5	2.7	1.20
	Walleye							16.5	25.0	0.3	5.3	11.78
	White Sucker							1.7	1.2	4.3	2.3	2.38
	Yellow Perch							16.3	35.2	12.3	8.3	18.03
frame net (std 3/4 in)	Bigmouth Buffalo		1.6									1.60
	Black Bullhead		157.0									157.00
	Common Carp		8.7									8.70
	Green Sunfish		0.0									0.00
	Northern Pike		2.6									2.60
	Walleye		1.7									1.70
	White Sucker		9.5									9.50
	Yellow Bullhead		15.2									15.20
	Yellow Perch		20.8									20.80
std exp gill net	Bigmouth Buffalo		4.7		1.7	1.0	0.0					1.85
	Black Bullhead		27.0		43.7	8.7	6.3					21.43
	Common Carp		5.3		2.0	0.3	0.3					1.98
	Green Sunfish		0.3		0.0	0.0	0.0					0.08
	Northern Pike		10.0		6.0	7.7	2.3					6.50
	Orangespotted Sunfish		0.0		0.0	0.0	0.0					0.00
	Walleye		20.3		16.3	31.3	33.3					25.30
	White Sucker		12.3		4.0	4.0	1.3					5.40
	Yellow Bullhead		0.0		0.3	0.0	0.0					0.08
	Yellow Perch		272.0		59.3	37.3	101.3					117.48

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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFS std gill net	Bigmouth Buffalo	PSD							100	67	0	0
		PSD-P							0	17	0	0
	Black Bullhead	PSD							24	61	0	14
		PSD-P							12	13	0	0
	Common Carp	PSD							90	100		0
		PSD-P							10	100		0
	Northern Pike	PSD							100	100	33	88
		PSD-P							63	50	33	0
		Wr							84	75	100	97
	Walleye	PSD							97	41	100	53
		PSD-P							20	22	50	13
		Wr							96	89	109	95
	White Sucker	PSD							100	100	92	93
		PSD-P							80	100	73	71
	Yellow Perch	PSD							57	41	53	24
		PSD-P							28	9	4	4
		Wr							95	96	110	96
frame net (std 3/4 in)	Bigmouth Buffalo	PSD		56								
		PSD-P		25								
		Wr		93								
	Black Bullhead	PSD		46								
		PSD-P		0								
		Wr		81								
	Common Carp	PSD		46								
		PSD-P		29								
		Wr		98								
	Northern Pike	PSD		77								
		PSD-P		19								
		Wr		91								
	Walleye	PSD		35								
		PSD-P		0								
		Wr		94								
	White Sucker	PSD		86								

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
frame net (std 3/4 in)	White Sucker	PSD-P		76								
		Wr		91								
	Yellow Perch	PSD		33								
		PSD-P		3								
		Wr		85								
std exp gill net	Bigmouth Buffalo	PSD		0		80	67					
		PSD-P		0		20	0					
		Wr		103								
	Black Bullhead	PSD		41		39	62	68				
		PSD-P		0		1	0	53				
		Wr		101								
	Common Carp	PSD		13		83	0	100				
		PSD-P		0		17	0	100				
		Wr		102								
	Northern Pike	PSD		70		67	91	86				
		PSD-P		13		28	35	14				
		Wr		90		95	87	89				
	Walleye	PSD		39		61	26	92				
		PSD-P		8		8	5	0				
		Wr		95		98	87	91				
	White Sucker	PSD		35		67	92	100				
		PSD-P		16		25	33	100				
		Wr		85								
	Yellow Perch	PSD		57		29	56	49				
		PSD-P		8		5	14	18				
		Wr		94		102	97	97				

Fish Condition

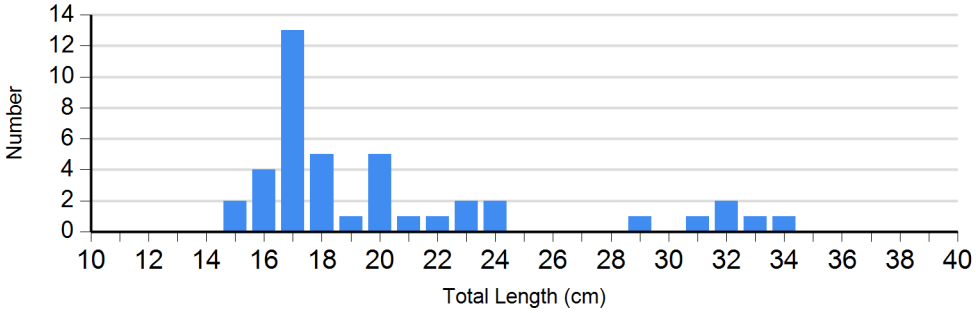
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2016	1	84	5	91 (3.2)	1	86	0	
	2017	0		3	90 (4.6)	2	81 (5.1)	3	81 (1.8)
	2018	0		1	74	1	75	0	
	2019	2	103 (5.9)	0		1	95	0	
	2020	2	101 (0.0)	14	97 (1.0)	0		0	
Walleye Gill Net	2016	8	94 (0.5)	92	90 (0.8)	0		0	
	2017	3	98	76	96 (0.5)	19	96 (1.7)	1	
	2018	88	85 (0.5)	29	93 (1.1)	33	93 (0.8)	0	
	2019	0		1	105	1	112	0	
	2020	15	98 (2.0)	13	93 (1.8)	4	95 (1.6)	0	
Yellow Perch Gill Net	2016	154	99 (0.8)	95	96 (0.9)	55	91 (1.2)	0	
	2017	42	94 (1.5)	29	100 (2.0)	27	92 (1.0)	0	
	2018	124	98 (0.8)	67	96 (1.1)	20	93 (1.3)	0	
	2019	35	118 (2.4)	36	104 (1.2)	3	104	0	
	2020	38	96 (1.4)	10	95 (1.8)	2	100 (0.6)	0	

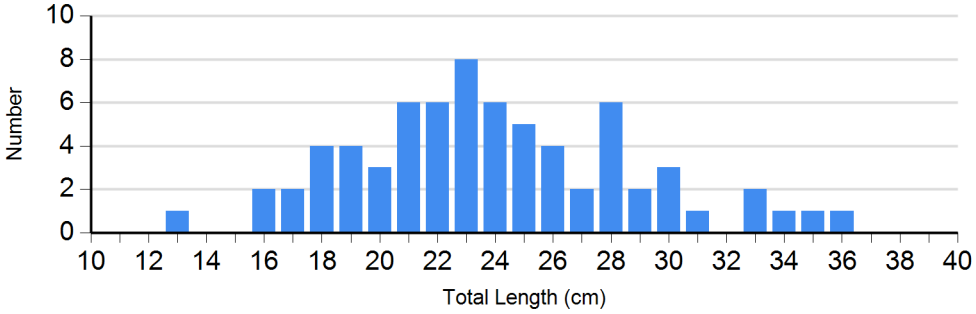
Length Frequency Distribution

Length frequency histogram of species sampled by year.

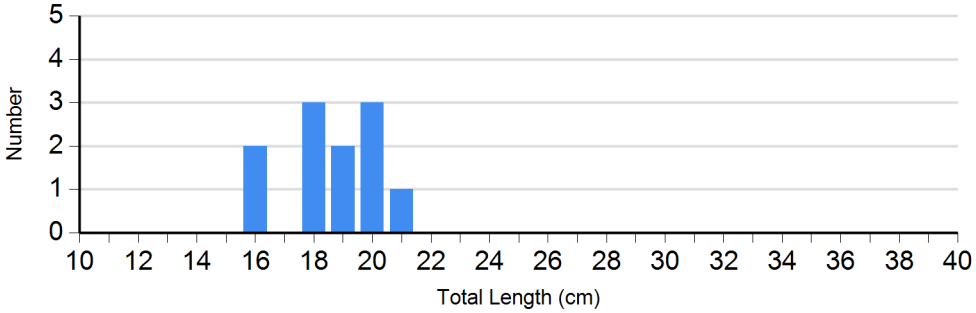
Species: Black Bullhead
Gear: AFS std gill net



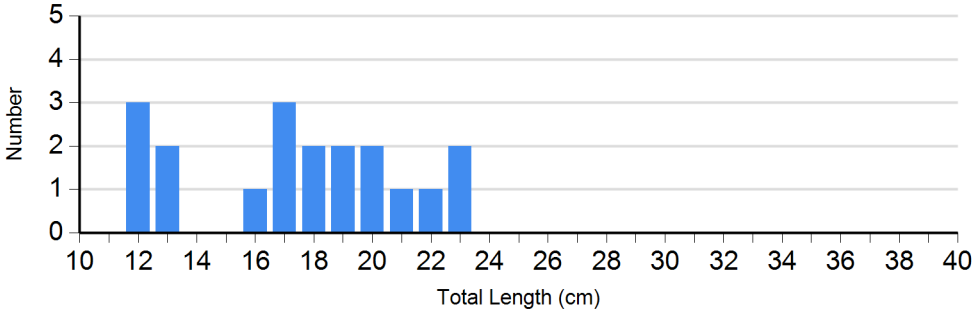
2017



2018

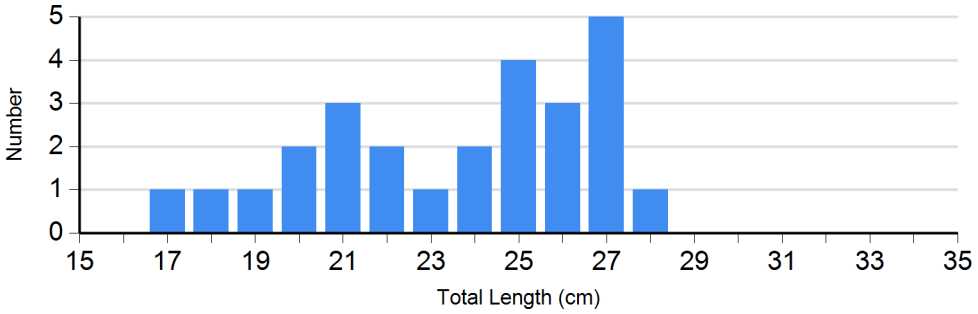


2019

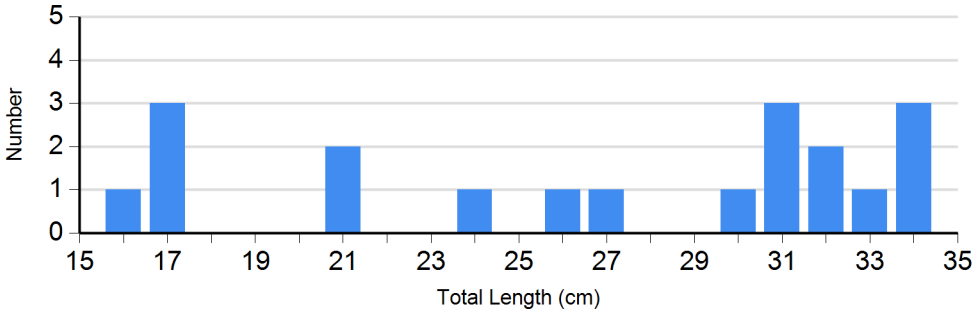


2020

Species: Black Bullhead
Gear: std exp gill net

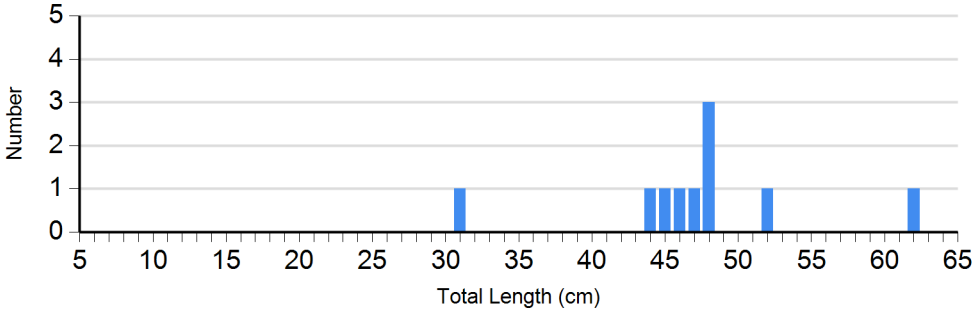


2015

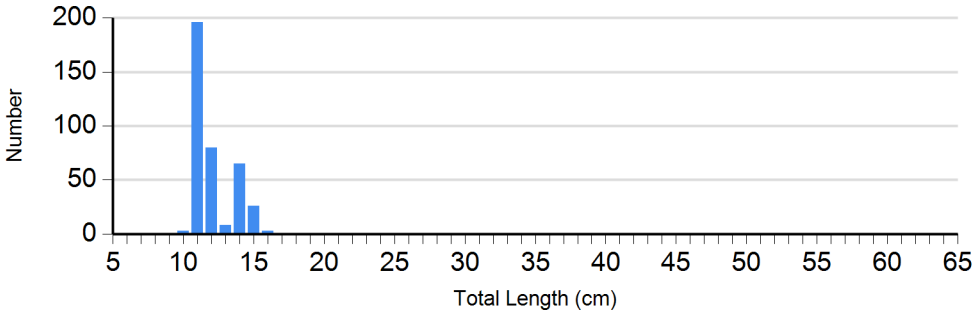


2016

Species: Common Carp
Gear: AFS std gill net

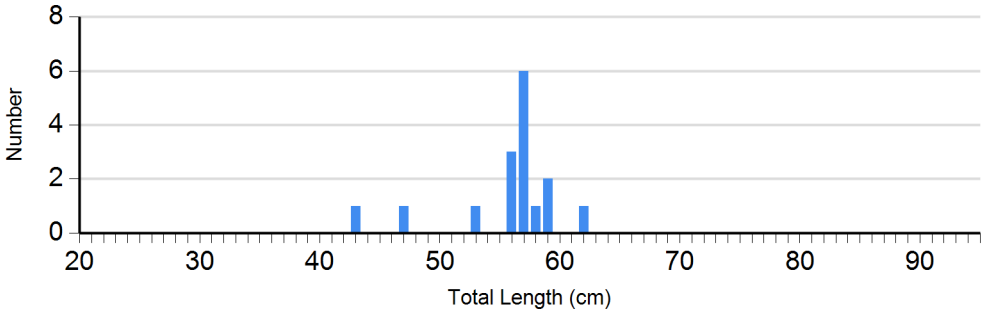


2017



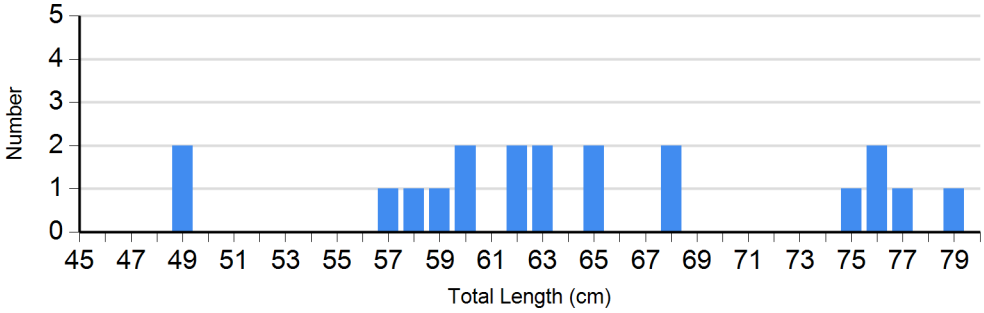
2020

Species: Northern Pike
Gear: AFS std gill net



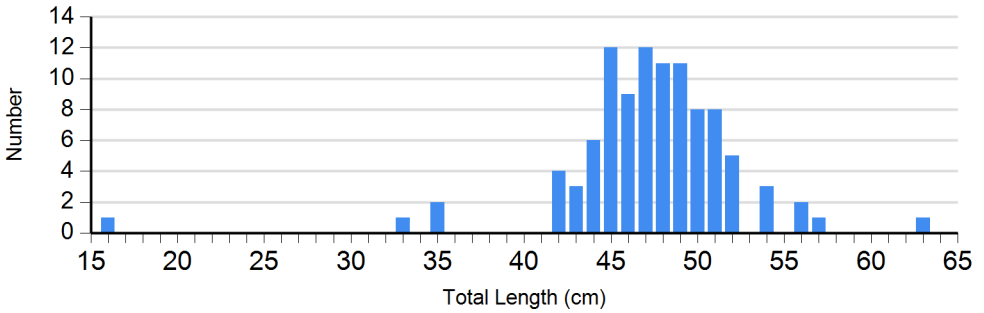
2020

Species: Northern Pike
Gear: std exp gill net

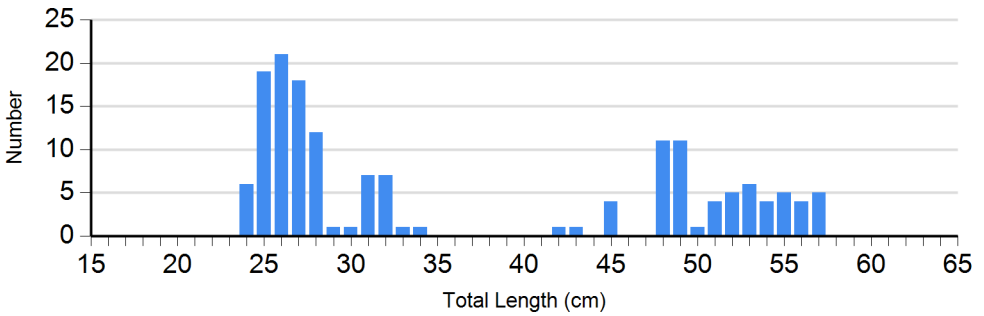


2015

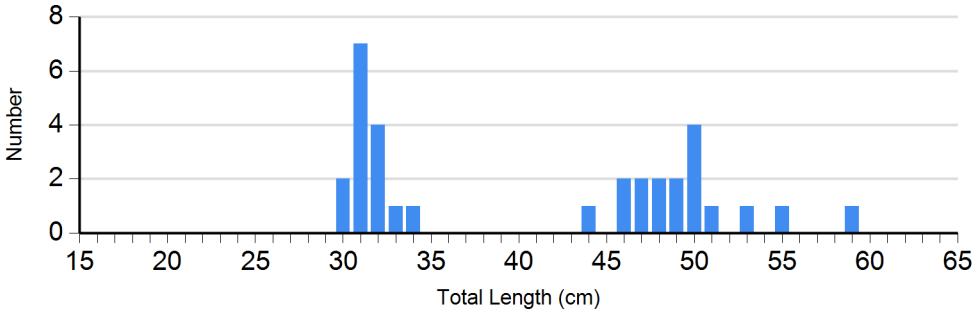
Species: Walleye
Gear: AFS std gill net



2017

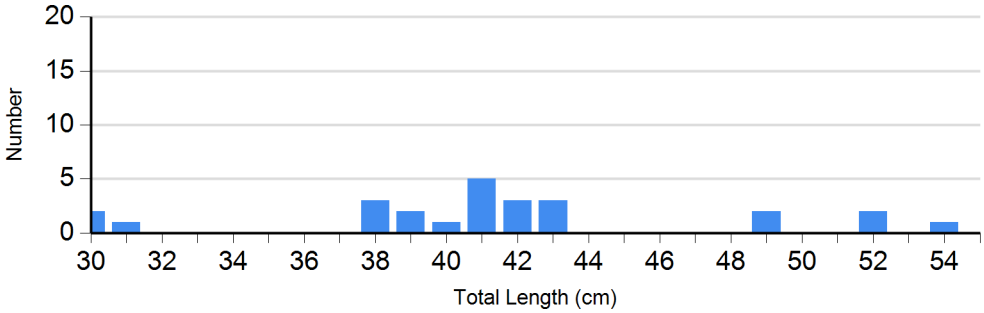


2018

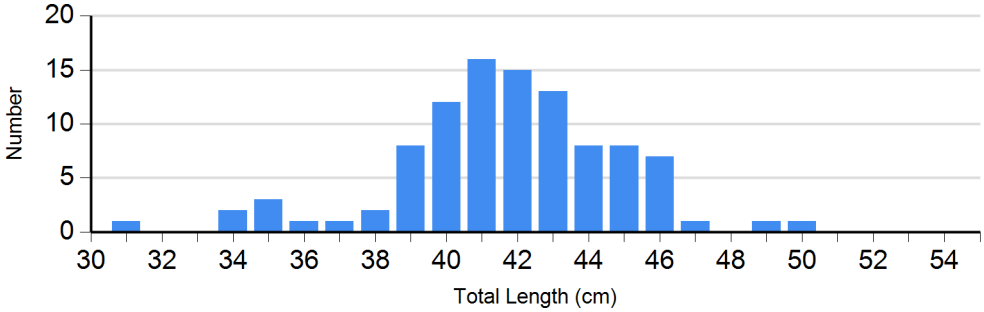


2020

Species: Walleye
Gear: std exp gill net

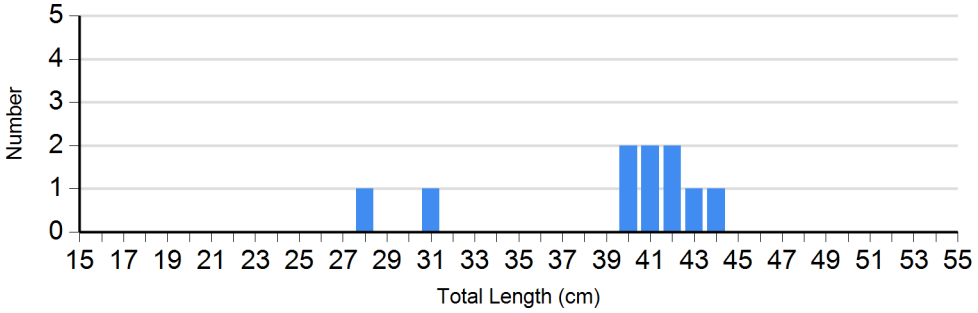


2015

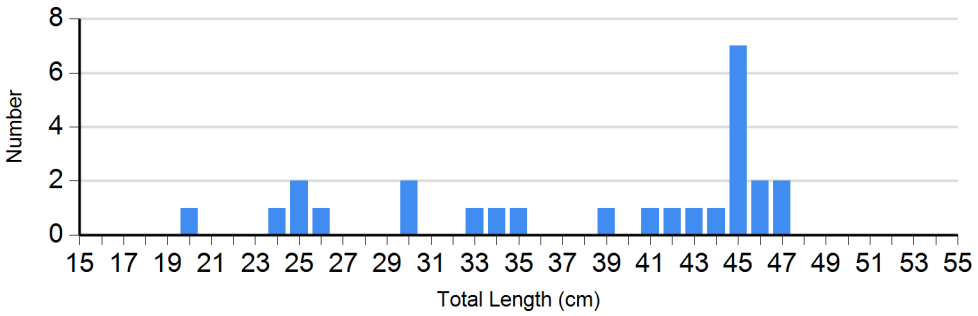


2016

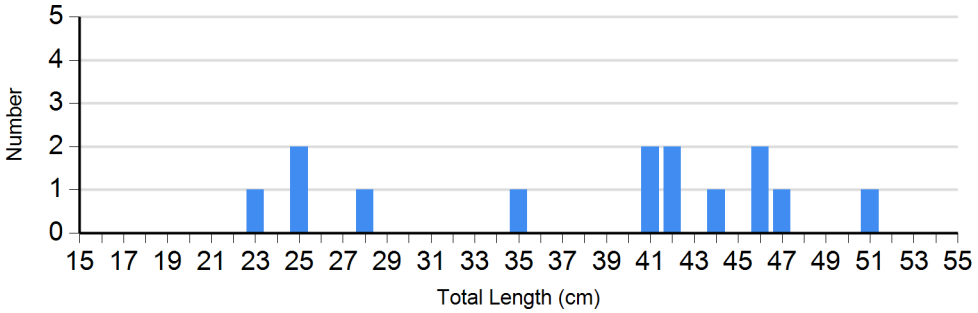
Species: White Sucker
Gear: AFS std gill net



2017

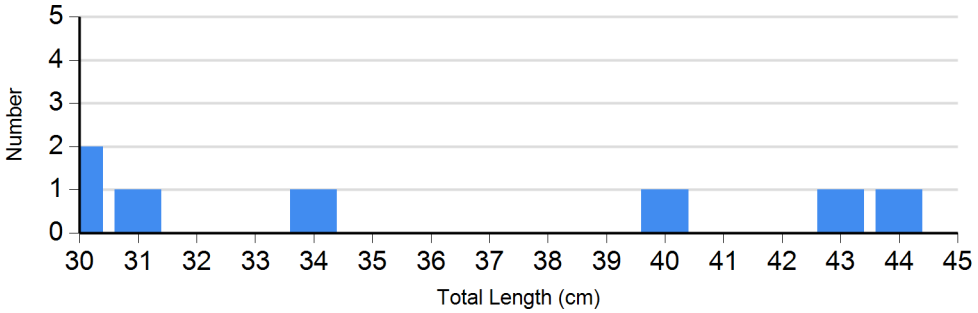


2019



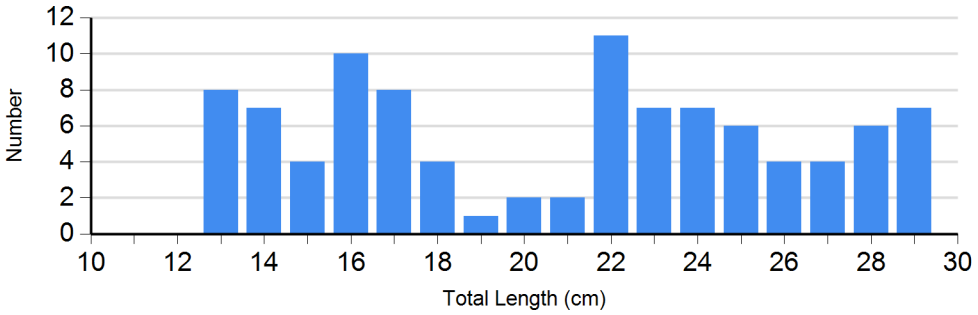
2020

Species: White Sucker
Gear: std exp gill net

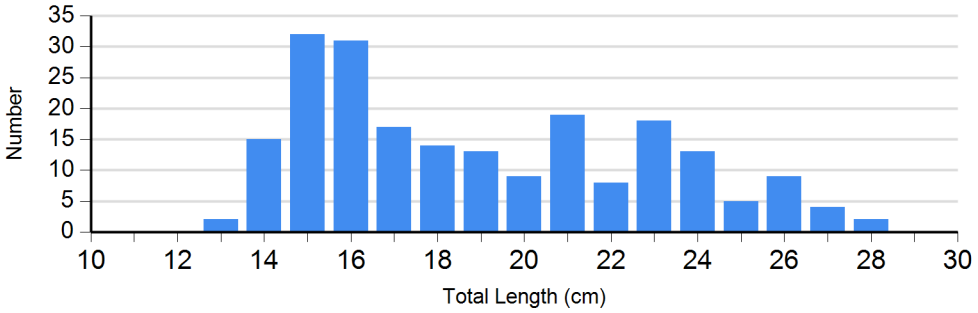


2015

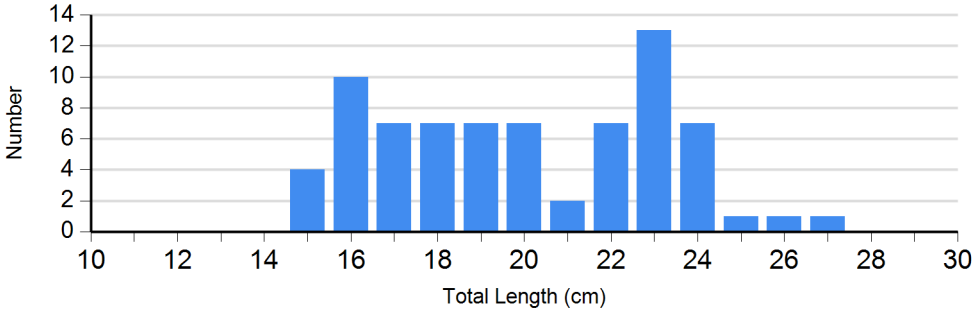
Species: Yellow Perch
Gear: AFS std gill net



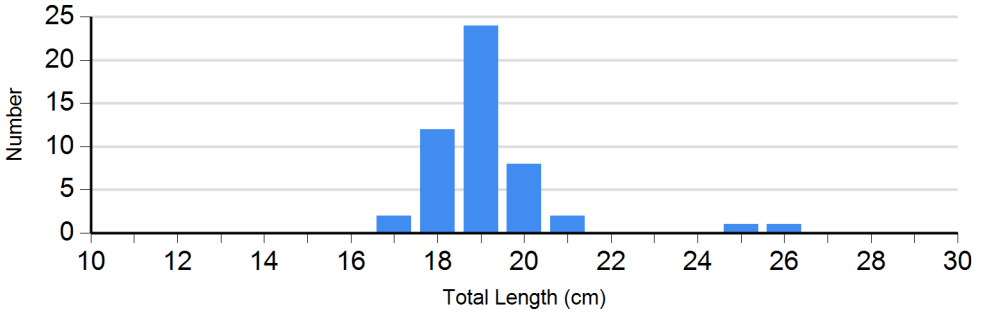
2017



2018

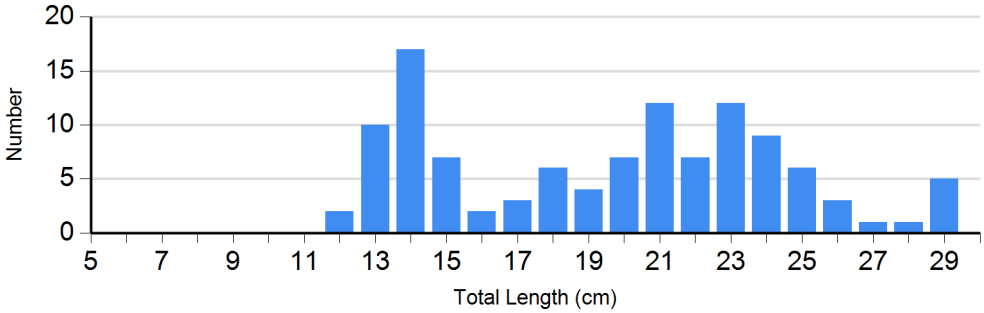


2019

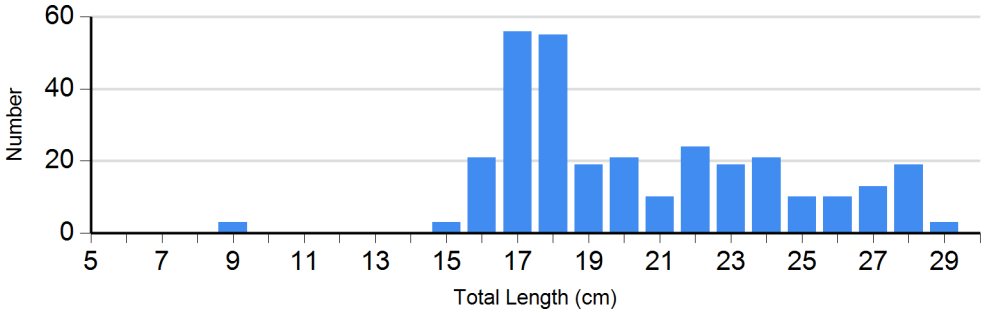


2020

Species: Yellow Perch
Gear: std exp gill net



2015

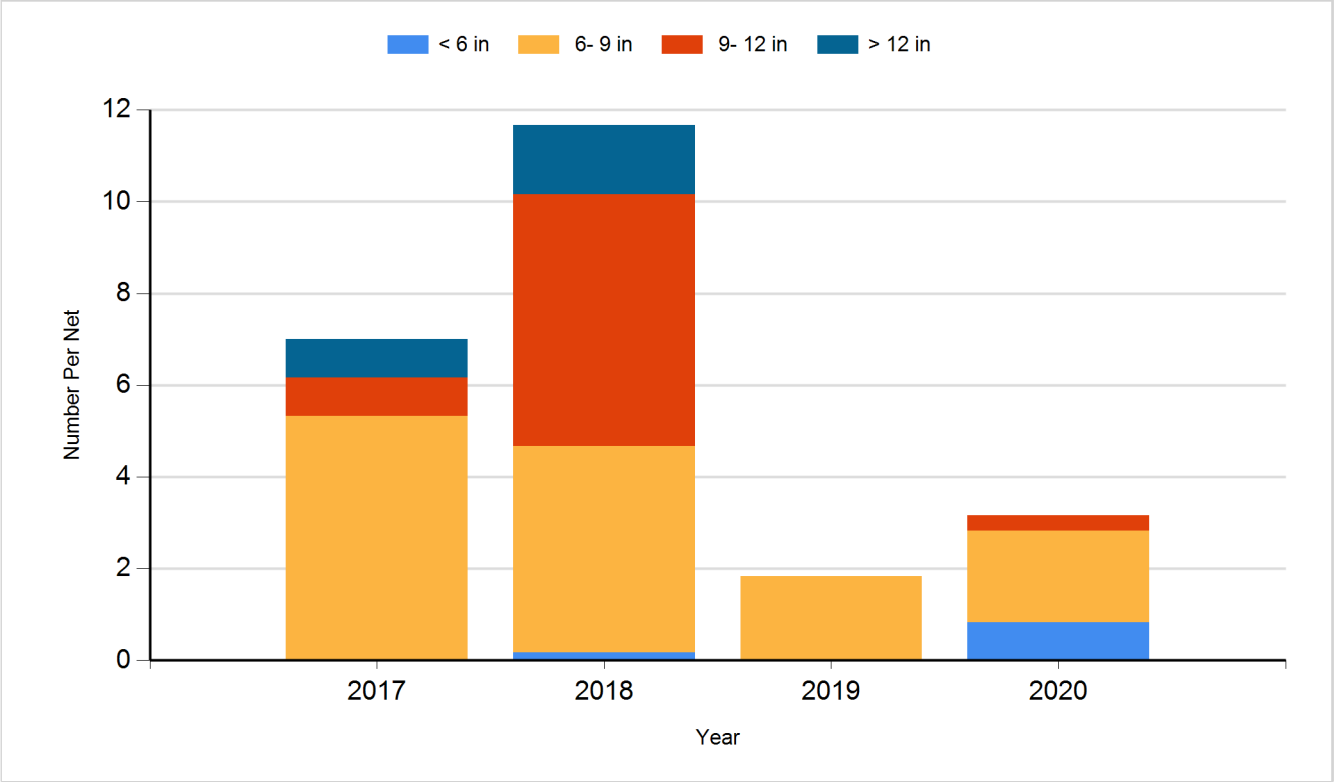


2016

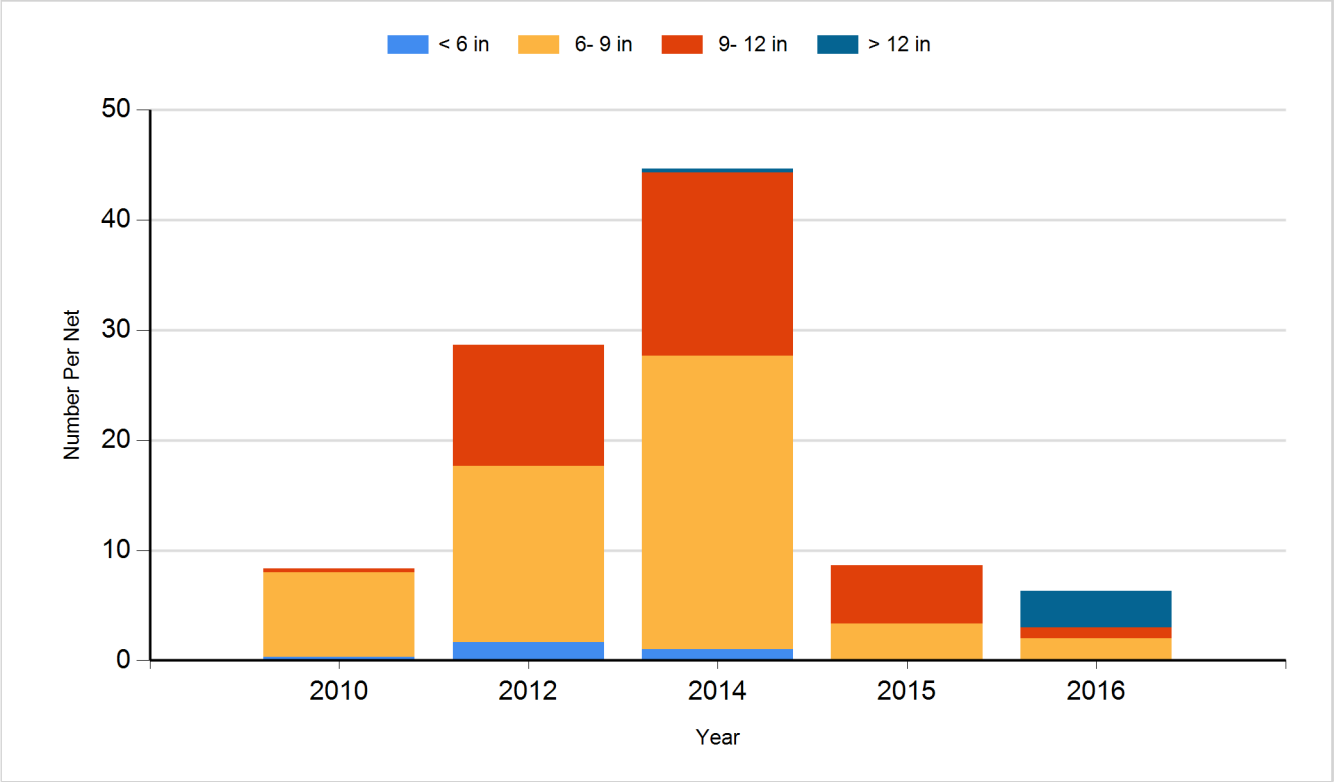
Historic Fish Sizes and Relative Abundance

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

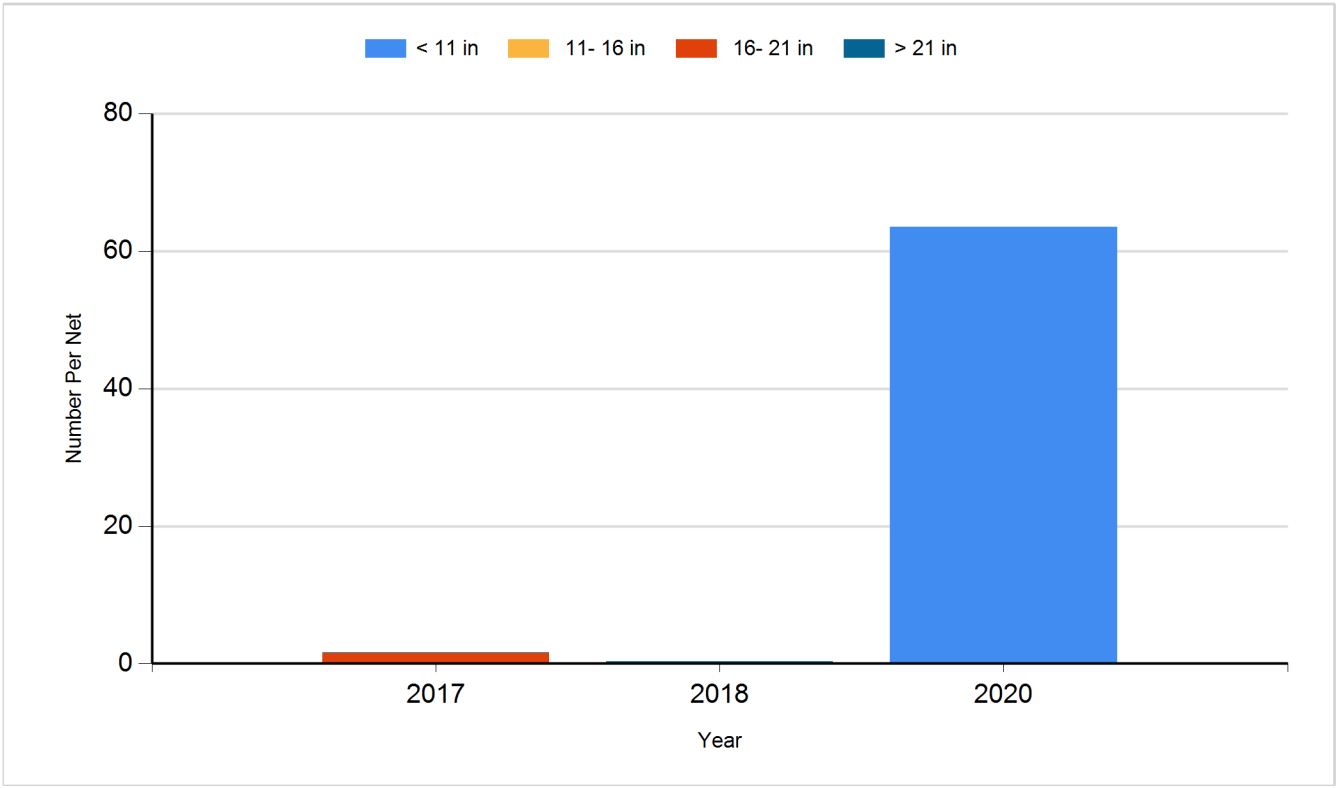
Species: Black Bullhead
Gear: AFS std gill net



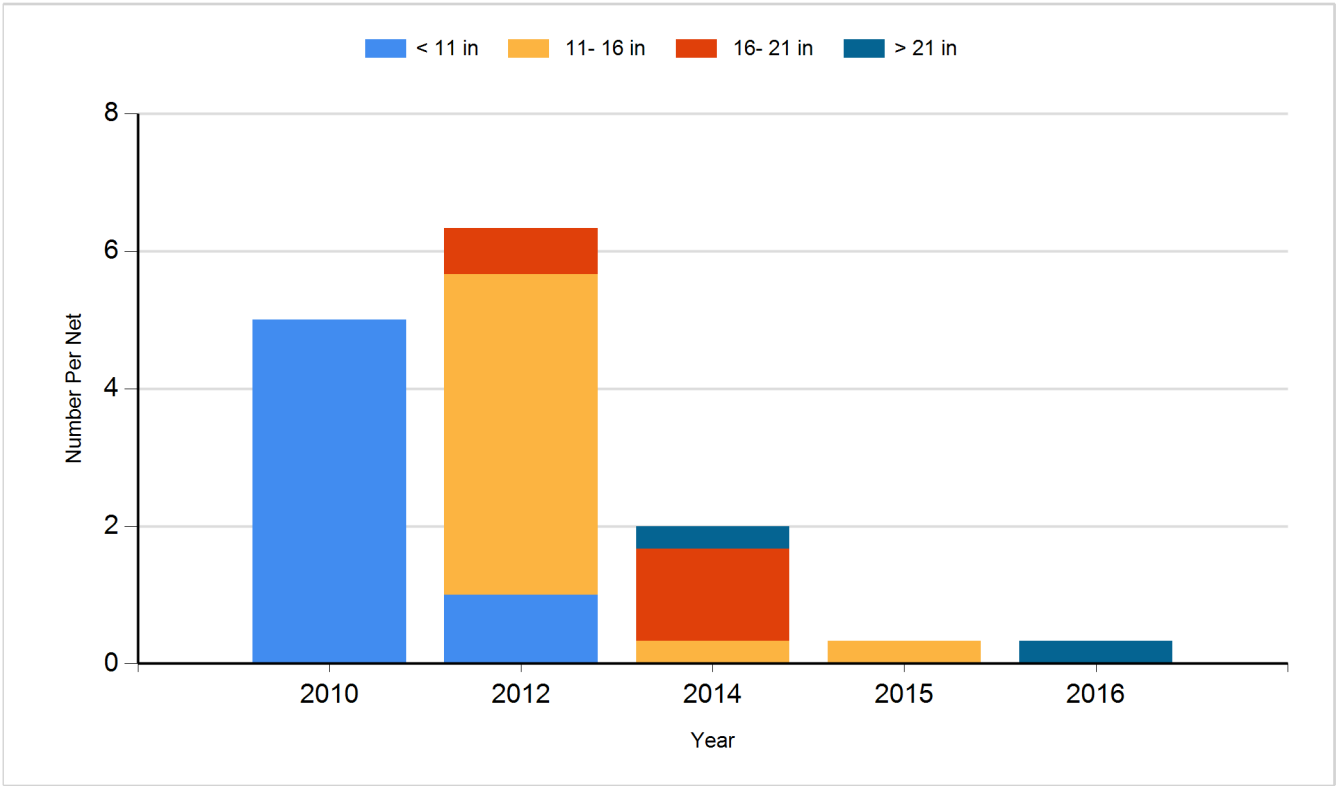
Species: Black Bullhead
Gear: std exp gill net



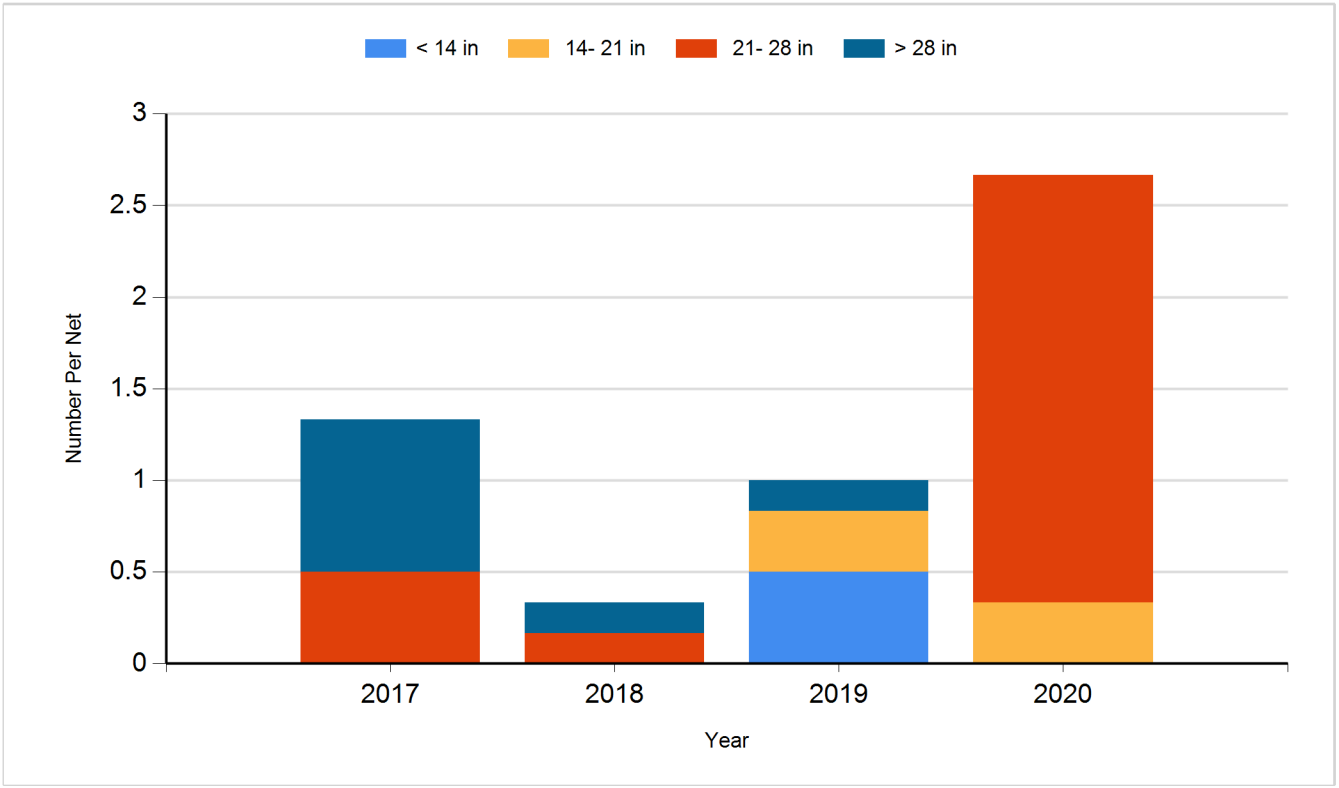
Species: Common Carp
Gear: AFS std gill net



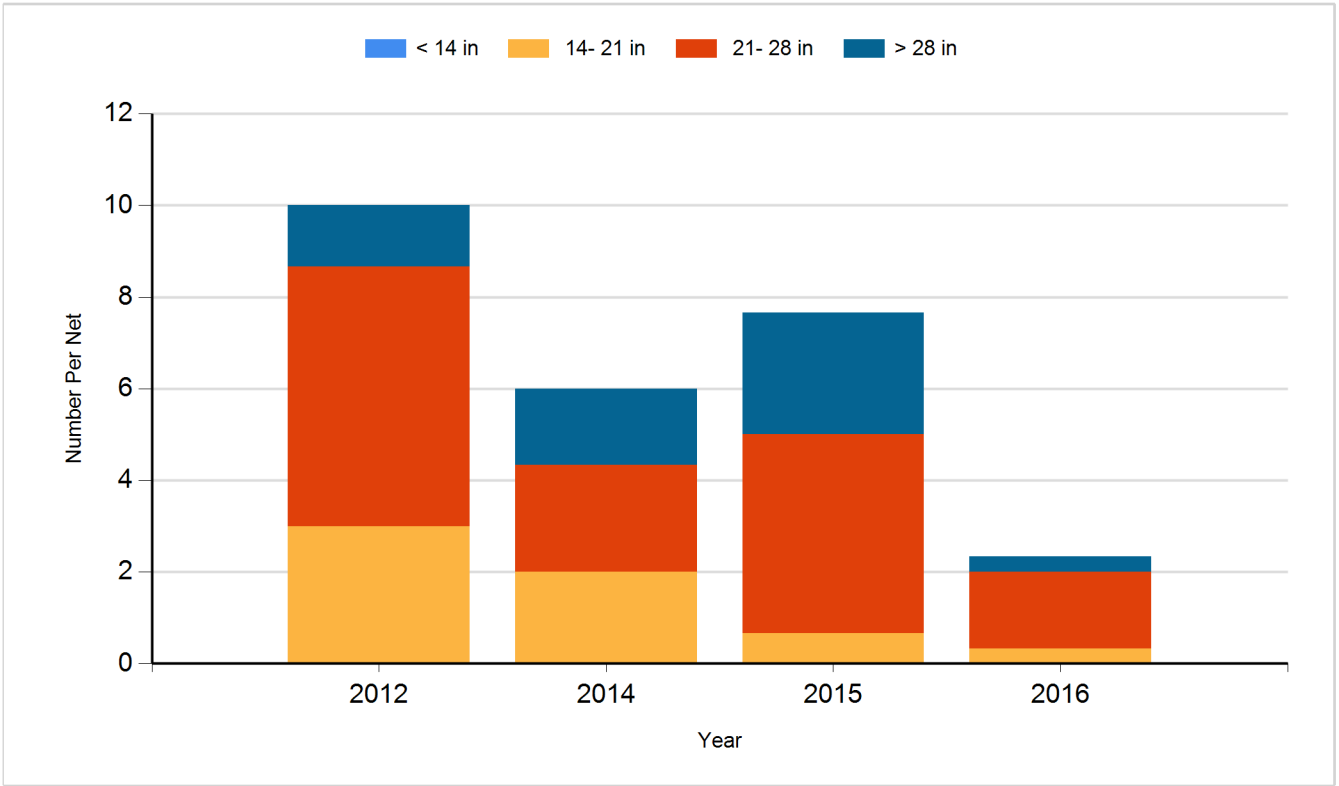
Species: Common Carp
Gear: std exp gill net



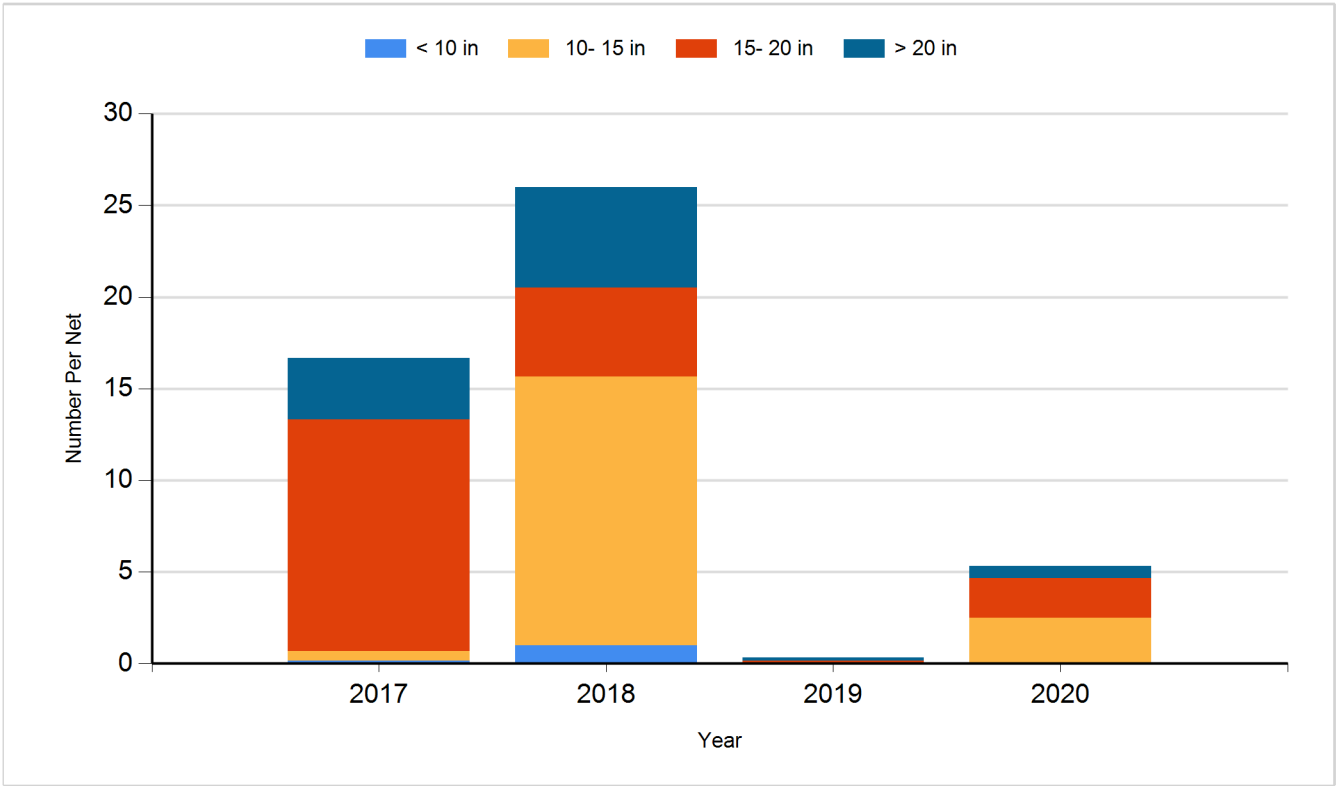
Species: Northern Pike
Gear: AFS std gill net



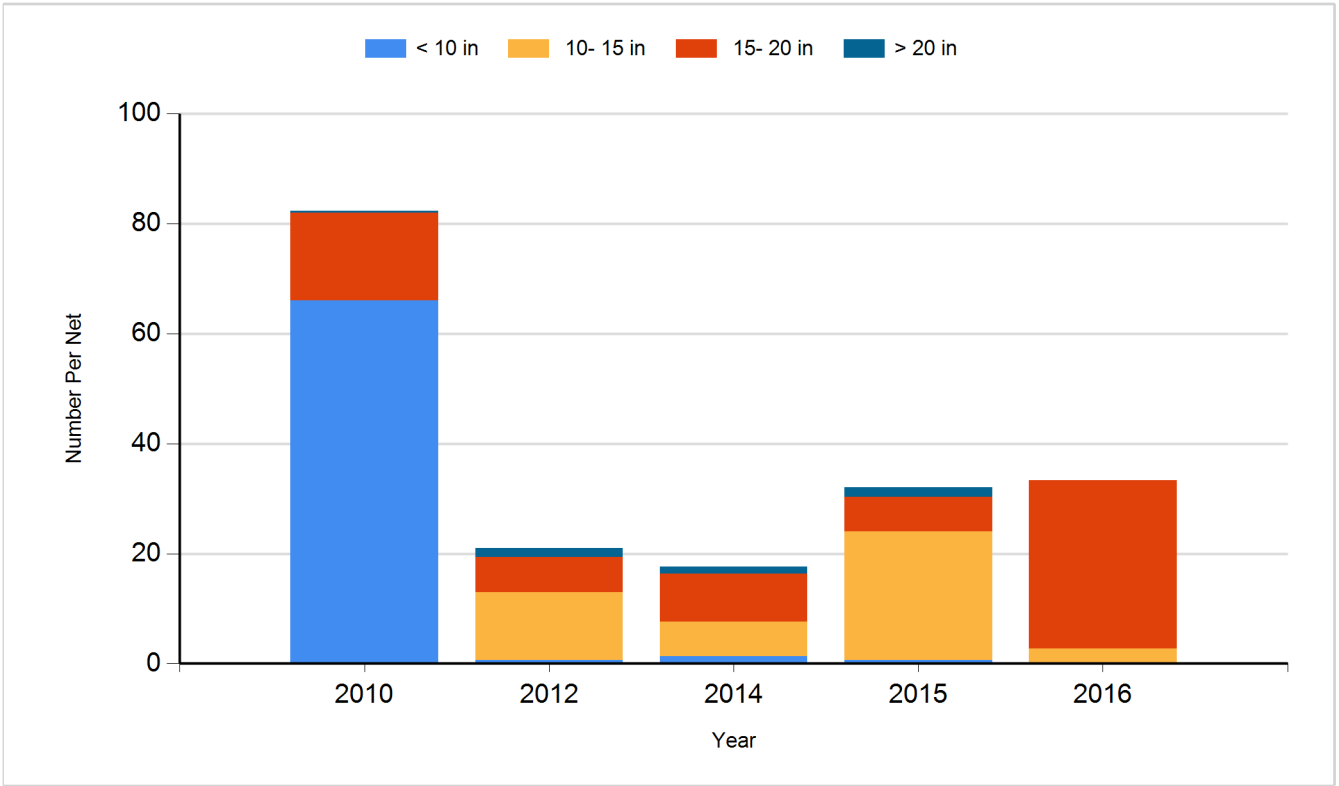
Species: Northern Pike
Gear: std exp gill net



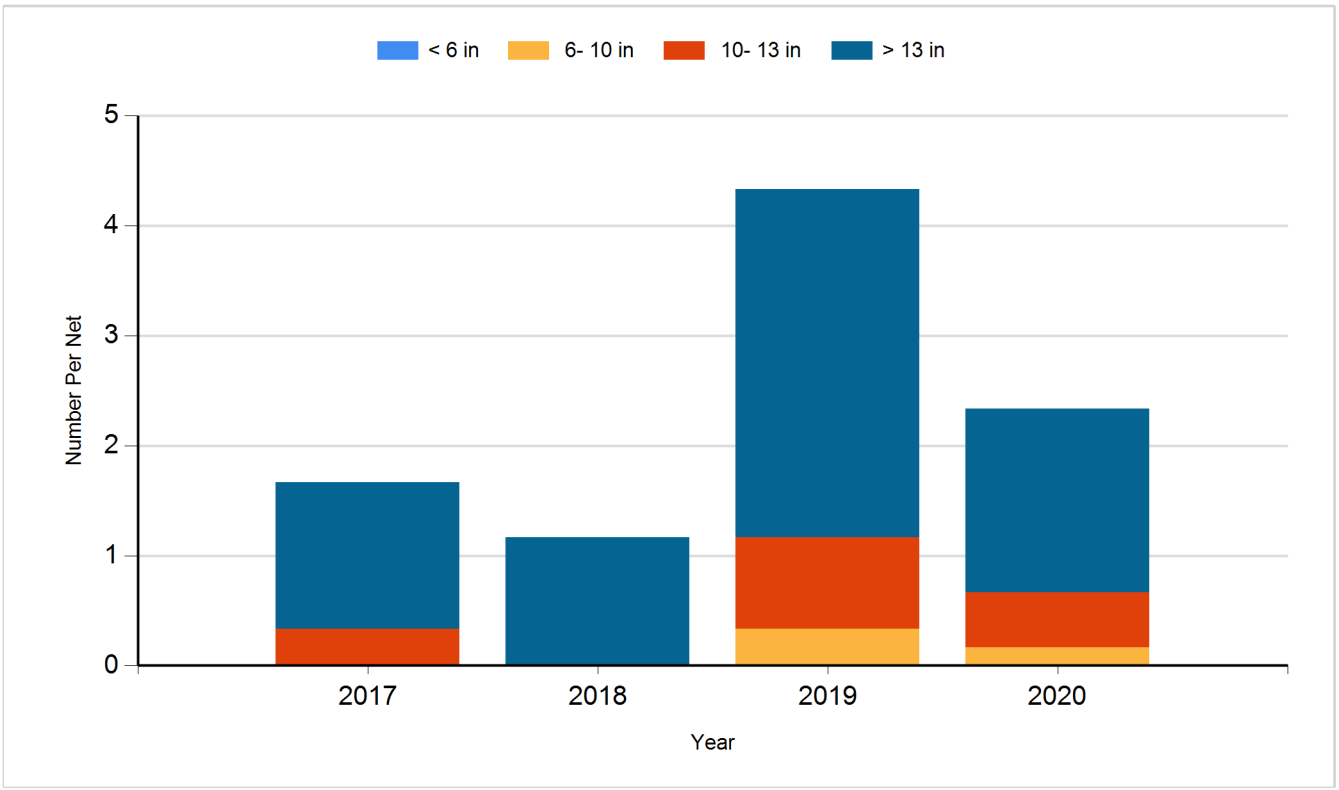
Species: Walleye
Gear: AFS std gill net



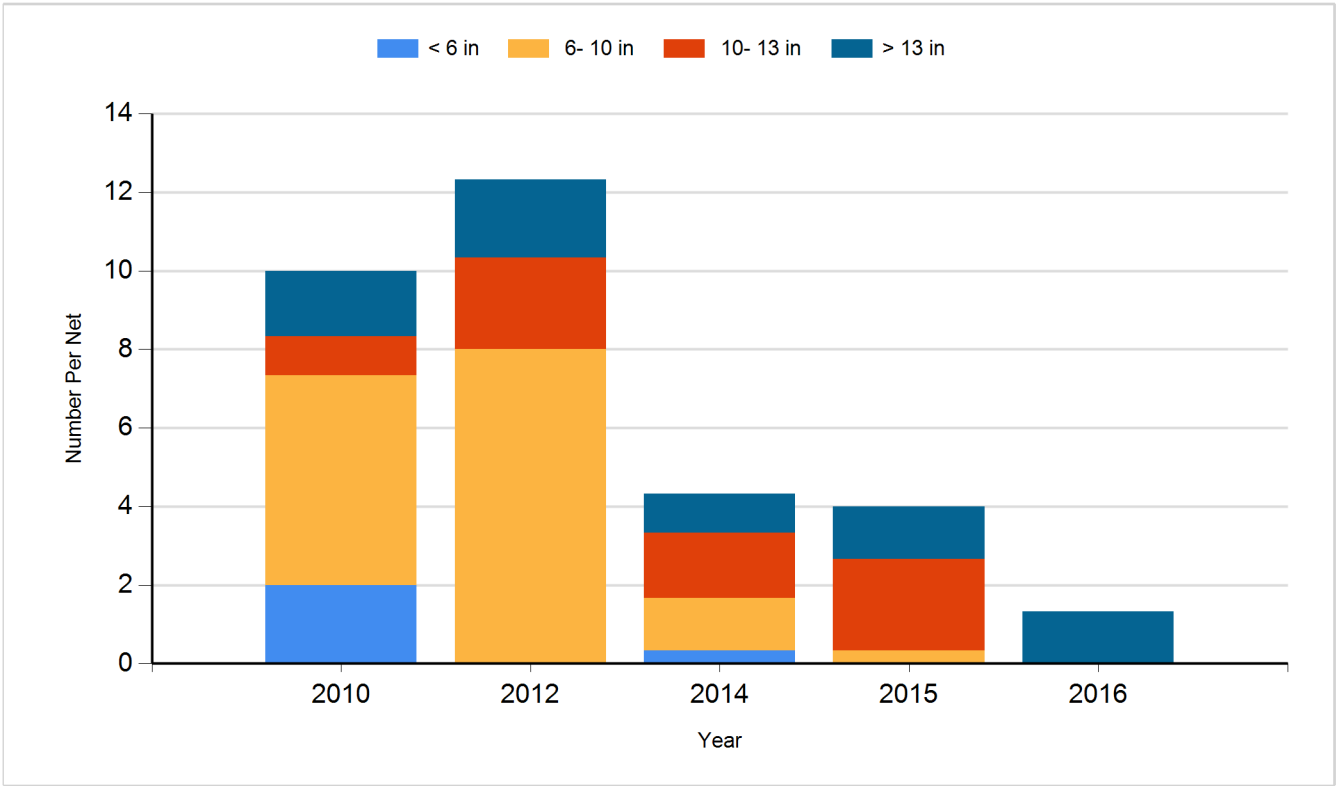
Species: Walleye
Gear: std exp gill net



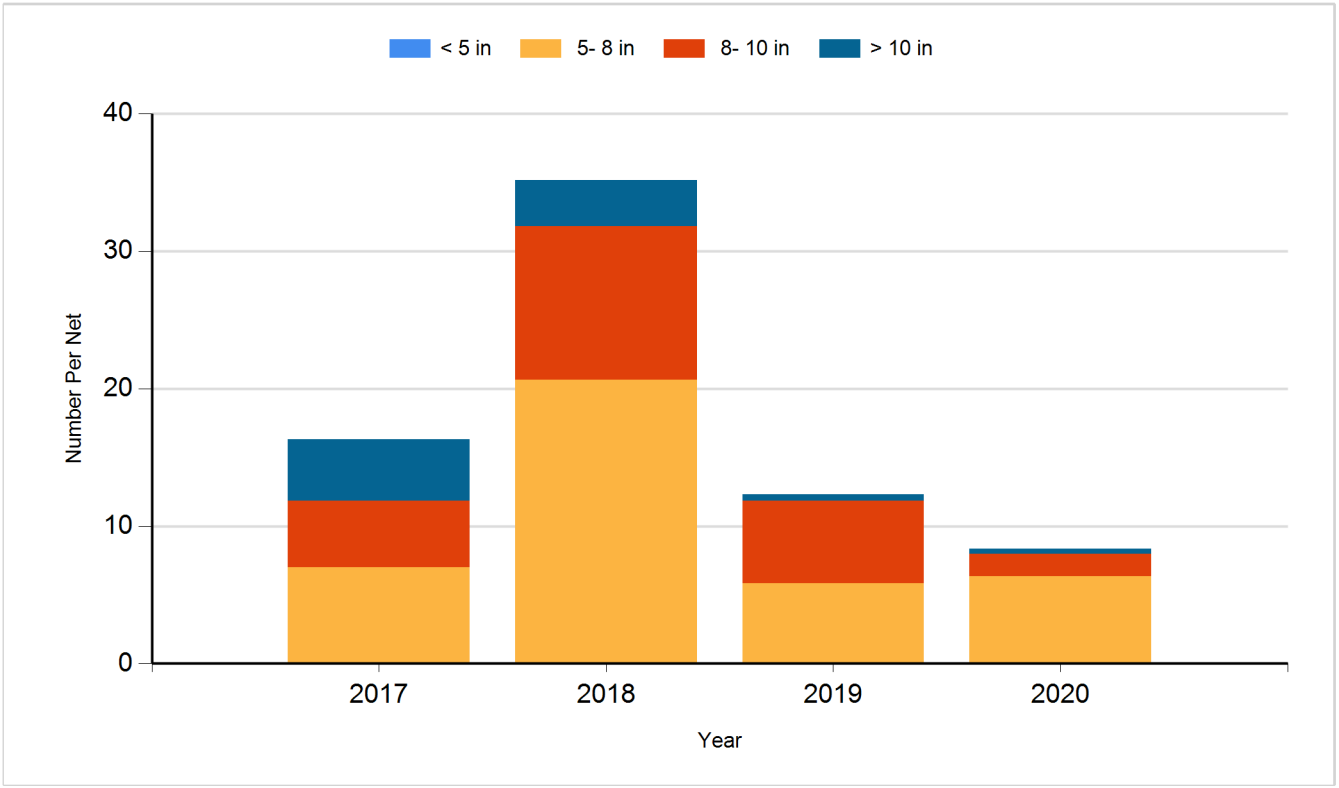
Species: White Sucker
Gear: AFS std gill net



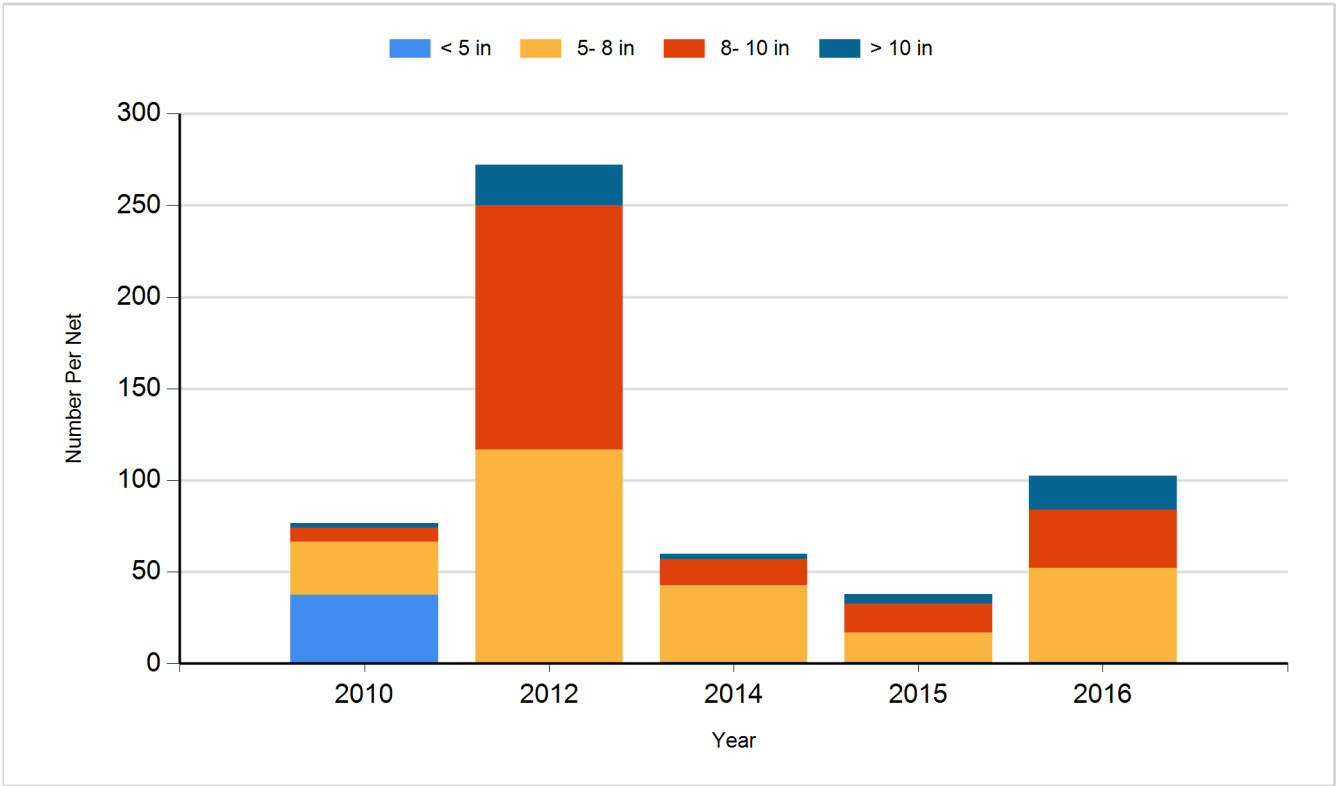
Species: White Sucker
Gear: std exp gill net



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
2010	Walleye	Fry	1,400,000
2012	Walleye	Fry	450,000
2012	Walleye	Juvenile	1,350
2014	Walleye	Fry	600,000
2017	Walleye	Fry	1,200,000
2019	Walleye	Fry	1,077,000