SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Oakwood West, Brookings County
MBS-Lake-215-000
2019

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	Aug 06, 2019	6 net-nights

Common Fish Species Present

Walleye

Yellow Perch

White Sucker

Black Bullhead

Bigmouth Buffalo

Northern Pike

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	12	0.7	0.7	0		0			
	Black Bullhead	11	1.8	2.1	0		0			
	Northern Pike	6	0.5	0.5	33		33		100	6
	Walleye	2	0.3	0.5	100		50		109	4
	White Sucker	26	4.3	2.7	92		73	14		
	Yellow Perch	74	12.3	8.0	53	8	4		110	2

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.

		CPUE										
Gear	Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
AFS std gill net	Bigmouth Buffalo								0.3	1.0	0.7	0.67
	Black Bullhead								7.0	11.5	1.8	6.77
	Common Carp								1.7	0.3	0.0	0.67
	Northern Pike								1.3	0.3	0.5	0.70
	Walleye								16.5	25.0	0.3	13.93
	White Sucker								1.7	1.2	4.3	2.40
	Yellow Perch								16.3	35.2	12.3	21.27
frame net (std 3/4 in)	Bigmouth Buffalo	4.1		1.6								2.85
	Black Bullhead	10.1		157.0								83.55
	Common Carp	0.9		8.7								4.80
	Green Sunfish	0.0		0.0								0.00
	Northern Pike	0.5		2.6								1.55
	Walleye	1.4		1.7								1.55
	White Sucker	0.1		9.5								4.80
	Yellow Bullhead	0.0		15.2								7.60
	Yellow Perch	7.0		20.8								13.90
std exp gill net	Bigmouth Buffalo	0.0		4.7		1.7	1.0	0.0				1.48
	Black Bullhead	8.0		27.0		43.7	8.7	6.3				18.74
	Common Carp	0.0		5.3		2.0	0.3	0.3				1.58
	Green Sunfish	0.0		0.3		0.0	0.0	0.0				0.06
	Northern Pike	0.0		10.0		6.0	7.7	2.3				5.20
	Orangespotted Sunfish	0.0		0.0		0.0	0.0	0.0				0.00
	Walleye	16.3		20.3		16.3	31.3	33.3				23.50
	White Sucker	8.0		12.3		4.0	4.0	1.3				5.92
	Yellow Bullhead	0.0		0.0		0.3	0.0	0.0				0.06
	Yellow Perch	39.3		272.0		59.3	37.3	101.3				101.84

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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AFS std gill net	Bigmouth Buffalo	PSD								100	67	0
		PSD-P								0	17	0
	Black Bullhead	PSD								24	61	0
		PSD-P								12	13	0
	Northern Pike	PSD								100	100	33
		PSD-P								63	50	33
		Wr								84	75	100
	Walleye	PSD								97	41	100
		PSD-P								20	22	50
		Wr								96	89	109
	White Sucker	PSD								100	100	92
		PSD-P								80	100	73
	Yellow Perch	PSD								57	41	53
		PSD-P								28	9	4
		Wr								95	96	110
frame net (std 3/4 in)	Bigmouth Buffalo	PSD	34		56							
		PSD-P	20		25							
		Wr	92		93							
	Black Bullhead	PSD	7		46							
		PSD-P	0		0							
		Wr	96		81							
	Northern Pike	PSD	60		77							
		PSD-P	0		19							
		Wr	93		91							
	Walleye	PSD	100		35							
		PSD-P	7		0							
		Wr	92		94							
	White Sucker	PSD	100		86							
		PSD-P	100		76							
		Wr	101		91							
	Yellow Perch	PSD	23		33							
		PSD-P	10		3							

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
frame net (std 3/4 in)	Yellow Perch	Wr	102		85							
std exp gill net	Bigmouth Buffalo	PSD			0		80	67				
		PSD-P			0		20	0				
		Wr			103							
	Black Bullhead	PSD	4		41		39	62	68			
		PSD-P	0		0		1	0	53			
		Wr	94		101							
	Northern Pike	PSD			70		67	91	86			
		PSD-P			13		28	35	14			
		Wr			90		95	87	89			
	Walleye	PSD	100		39		61	26	92			
		PSD-P	2		8		8	5	0			
		Wr	99		95		98	87	91			
	White Sucker	PSD	33		35		67	92	100			
		PSD-P	21		16		25	33	100			
		Wr	102		85							
	Yellow Perch	PSD	26		57		29	56	49			
		PSD-P	6		8		5	14	18			
		Wr	102		94		102	97	97			

Fish Condition

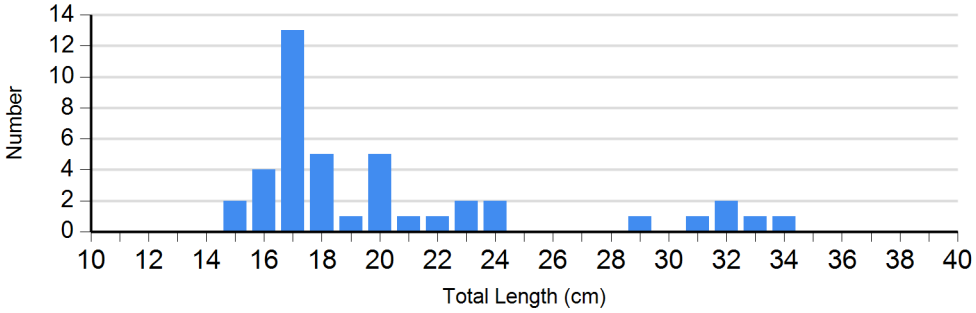
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2015	2	87 (1.1)	13	88 (1.6)	6	86 (2.6)	2	81 (4.5)
	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	
Walleye Gill Net	2015	70	86 (0.5)	19	90 (0.7)	3	89 (2.9)	2	86 (0.2)
	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	
Yellow Perch Gill Net	2015	49	102 (1.3)	47	97 (1.2)	16	93 (1.5)	0	
	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	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



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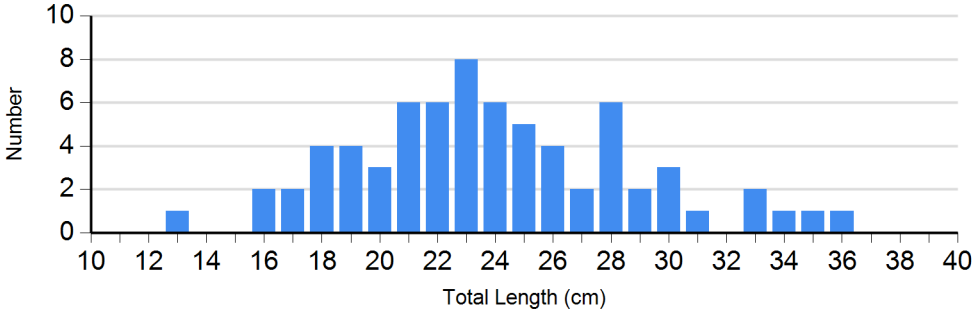

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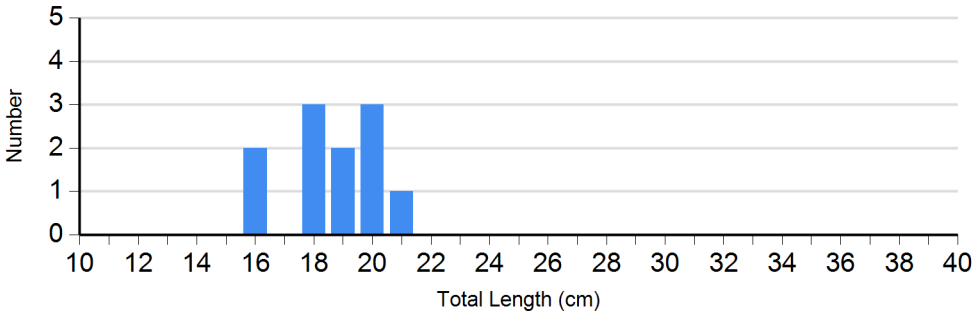
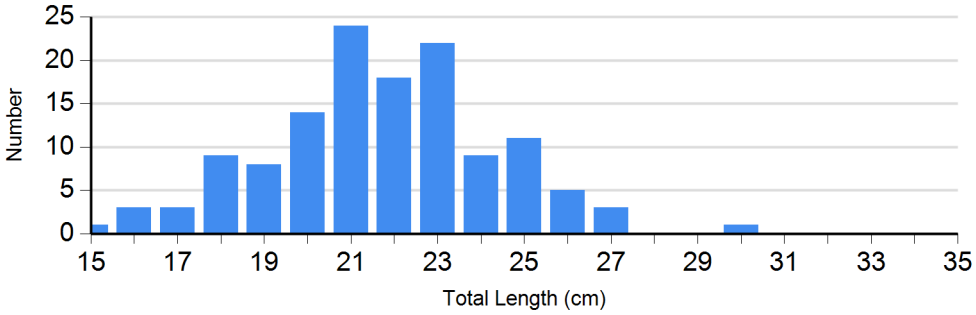
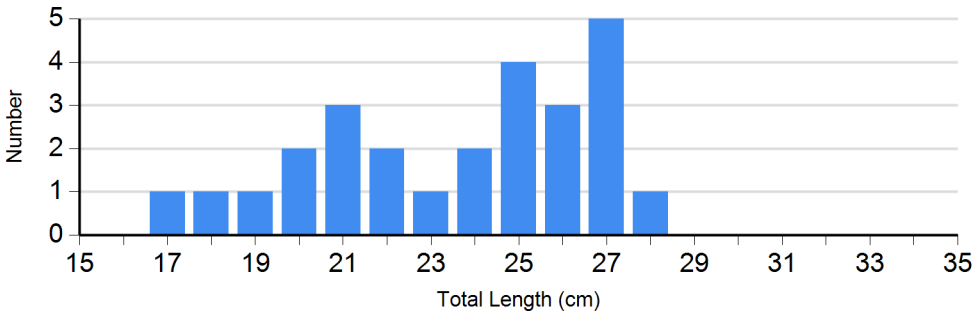


2019

Species: Black Bullhead
Gear: std exp gill net



2014



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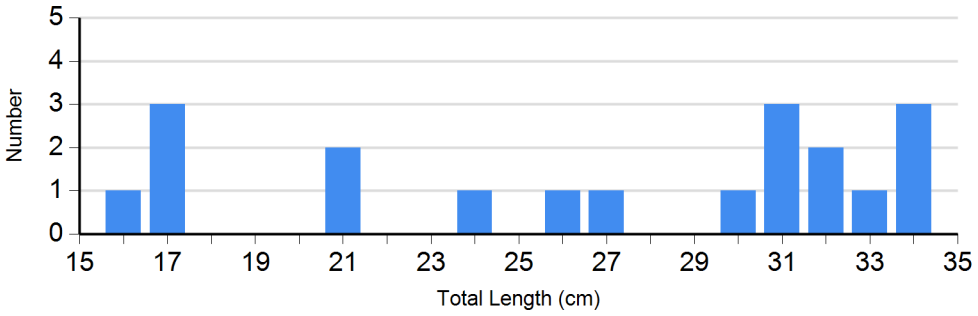
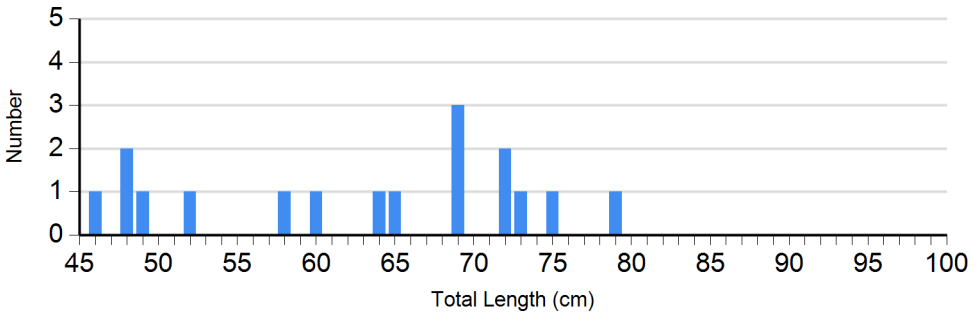


2016

Species: Northern Pike
Gear: std exp gill net



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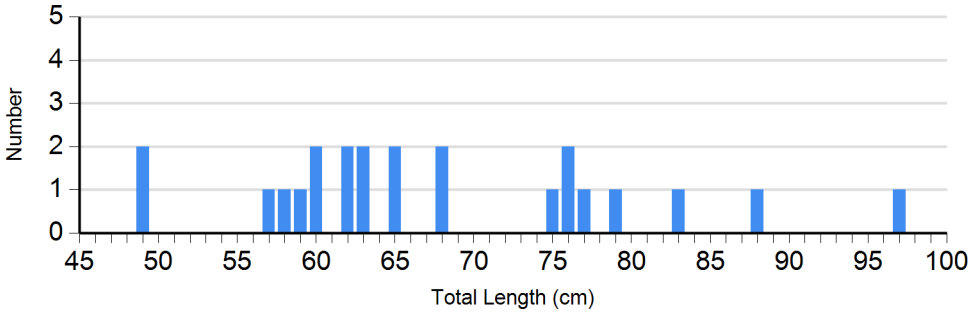
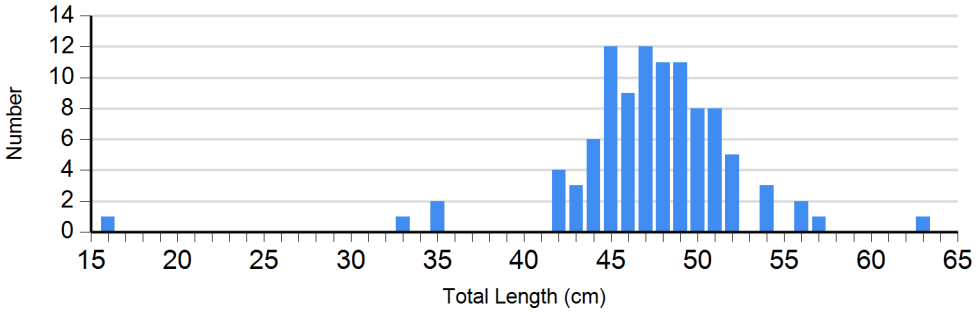


2015

Species: Walleye
Gear: AFS std gill net



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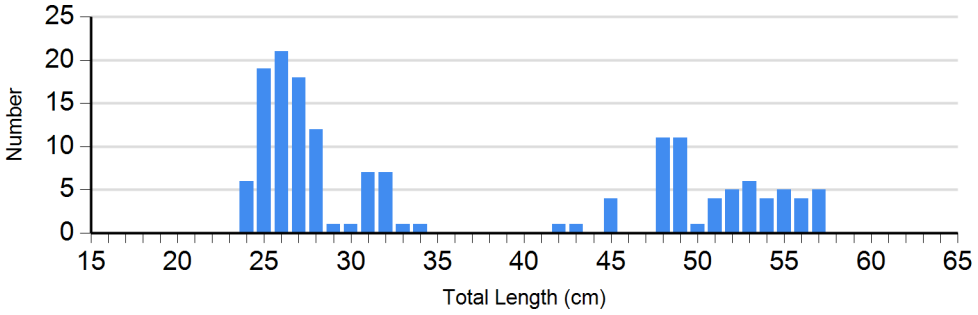
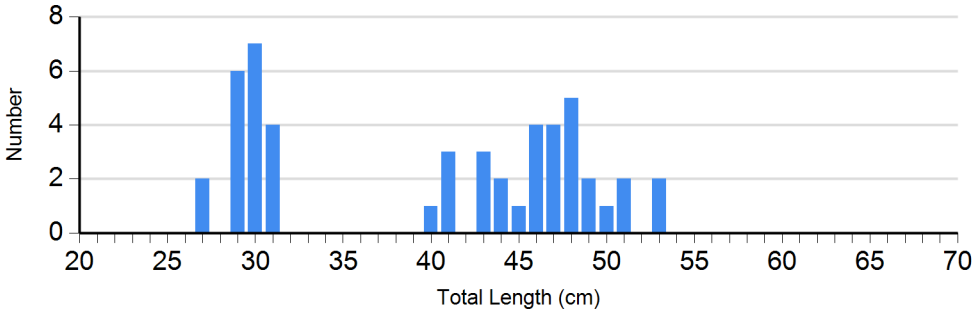


2018

Species: Walleye
Gear: std exp gill net



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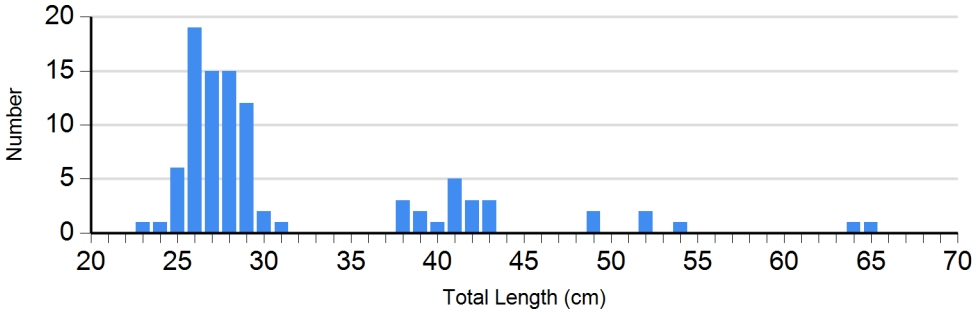

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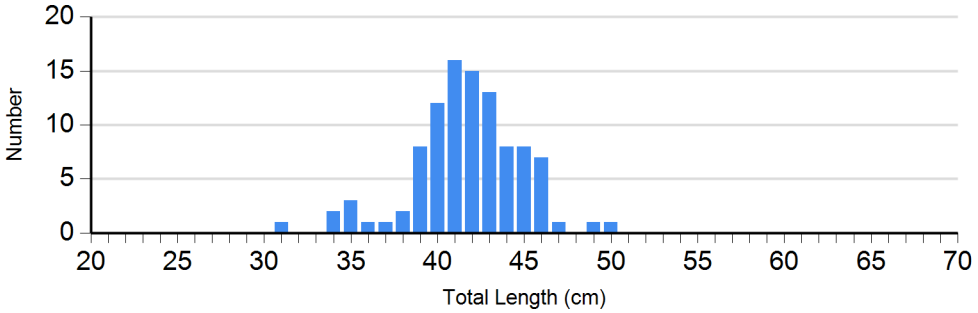
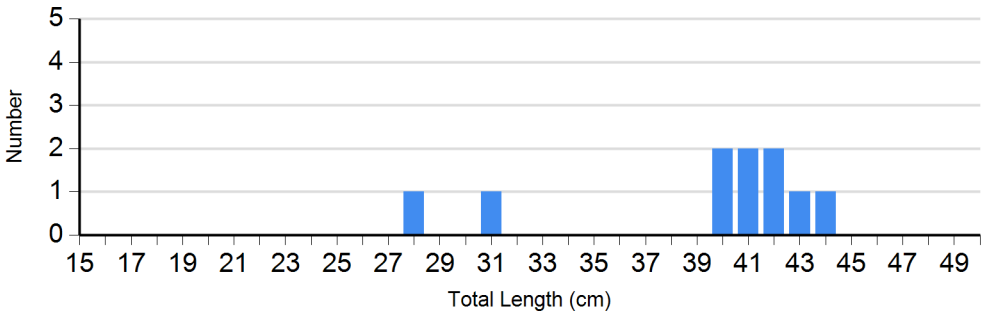


2016

Species: White Sucker
Gear: AFS std gill net



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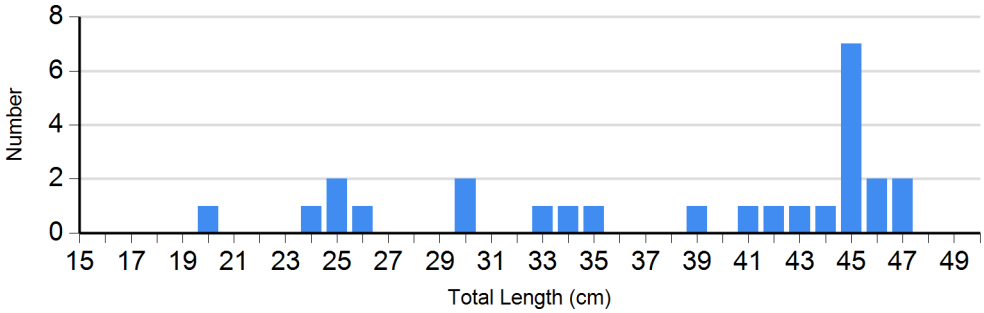
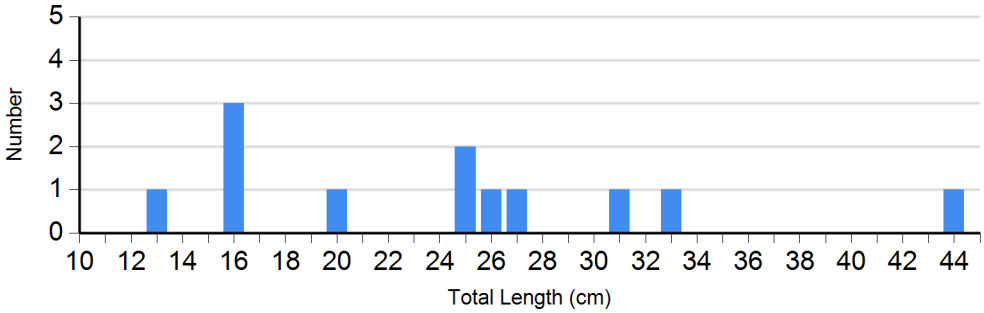


2019

Species: White Sucker
Gear: std exp gill net



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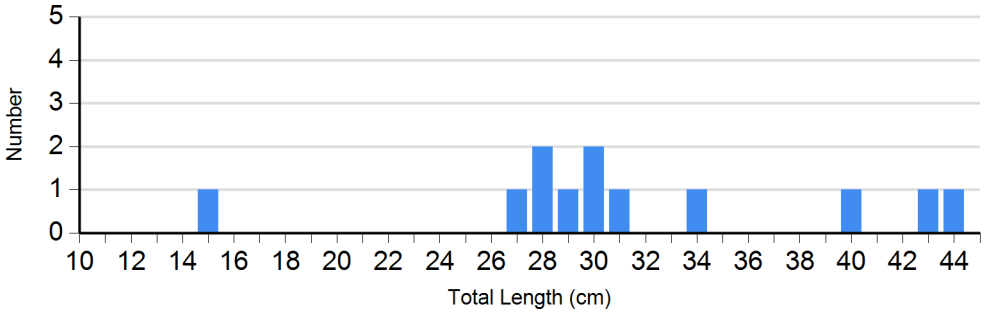
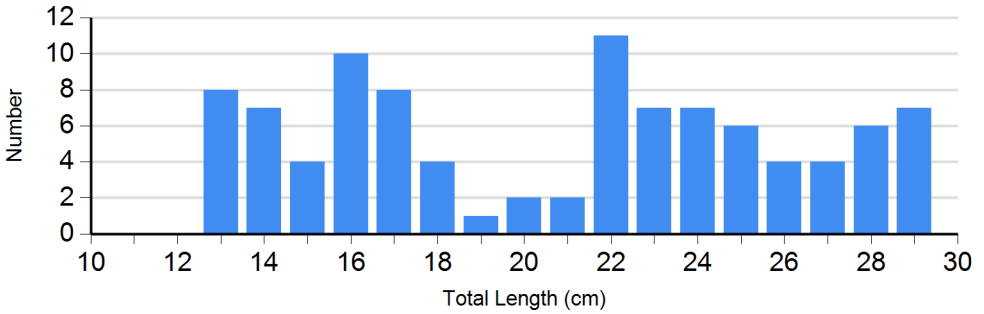


2015

Species: Yellow Perch
Gear: AFS std gill net



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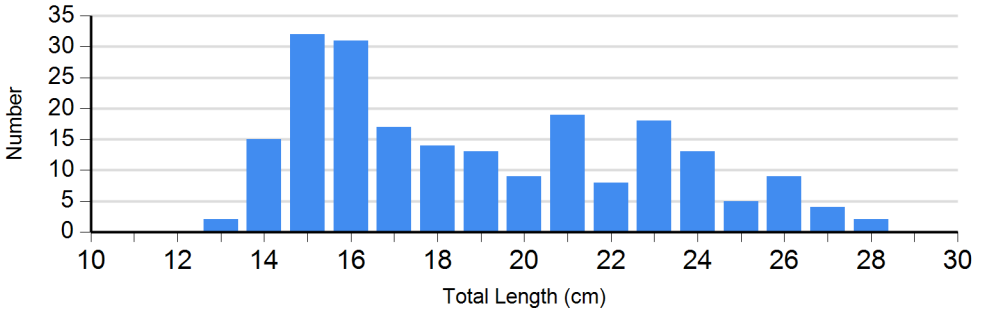

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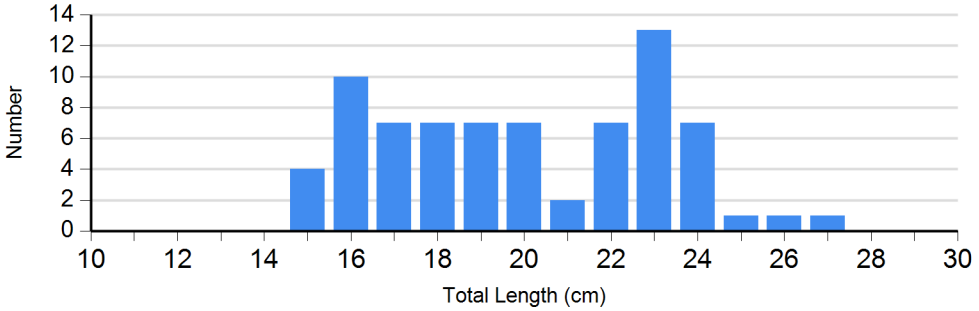
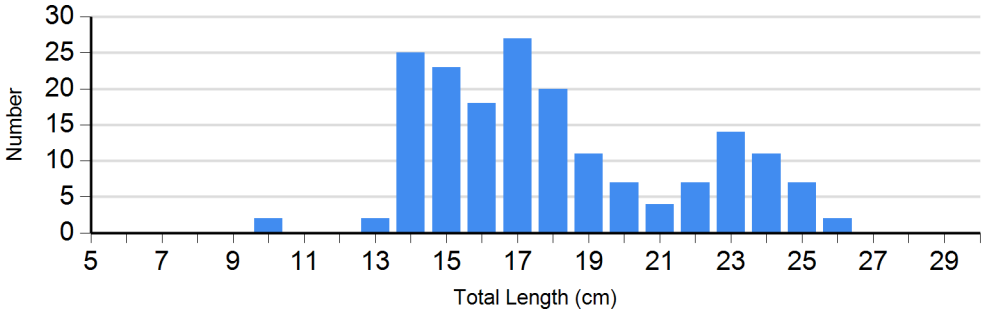


2019

Species: Yellow Perch
Gear: std exp gill net



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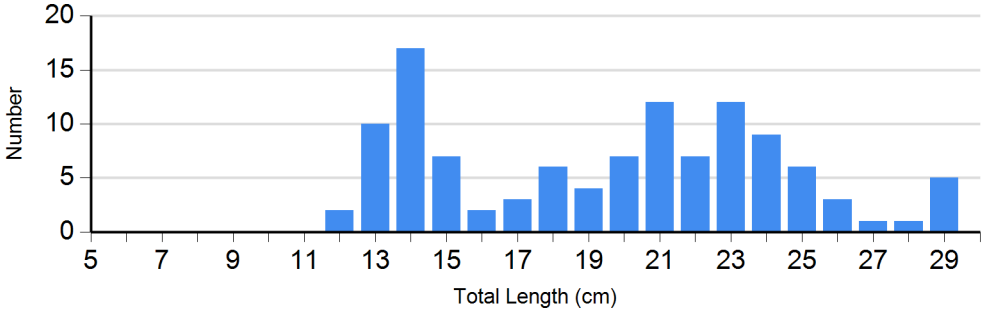

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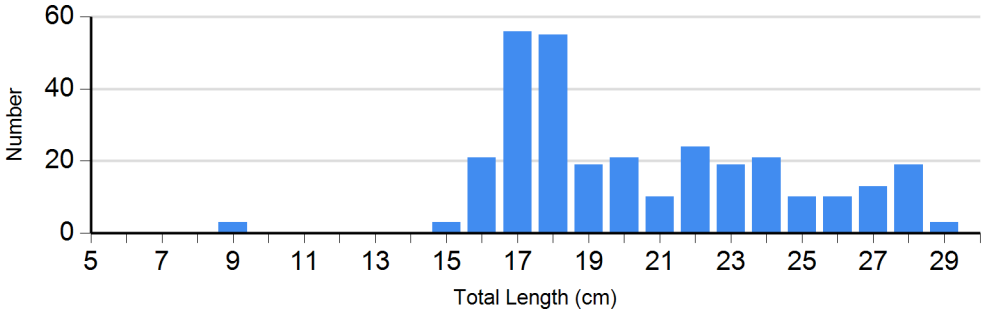
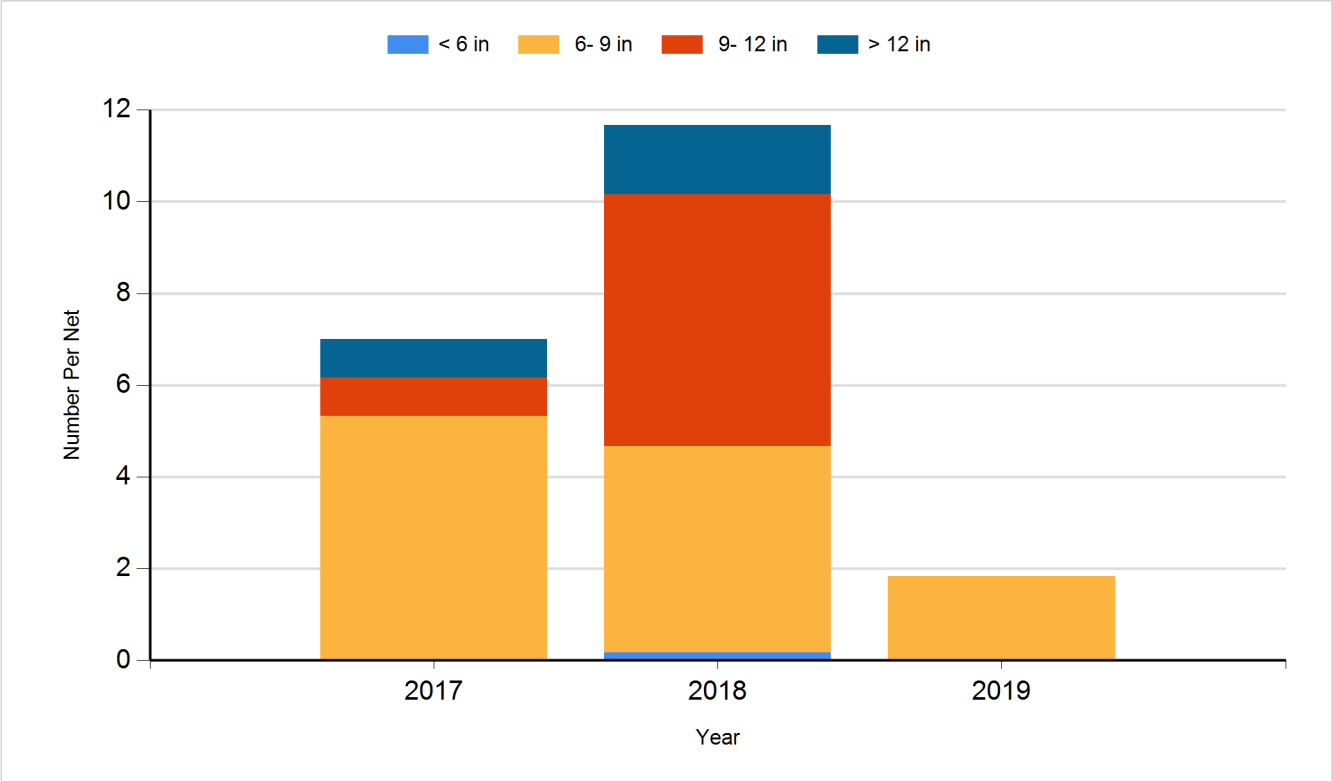


2016

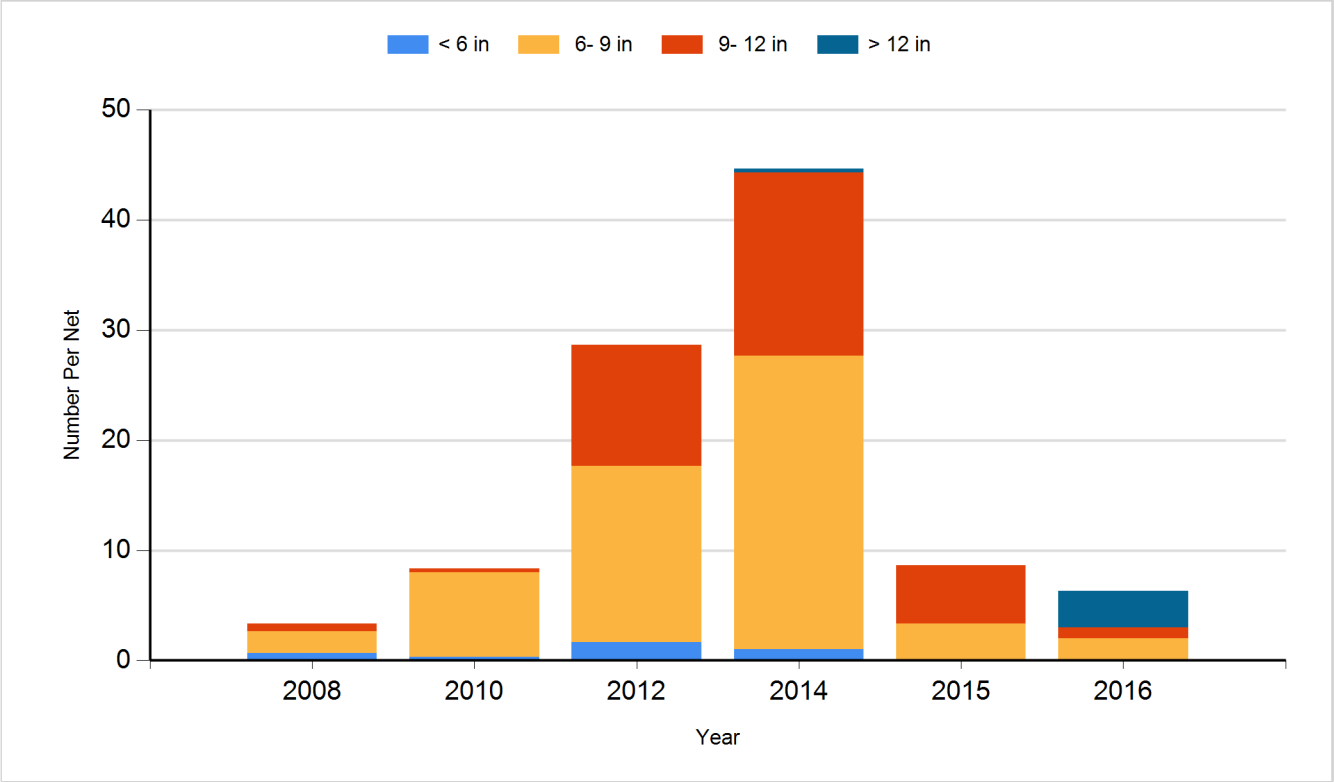
Historic Fish Sizes and Relative Abundance

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

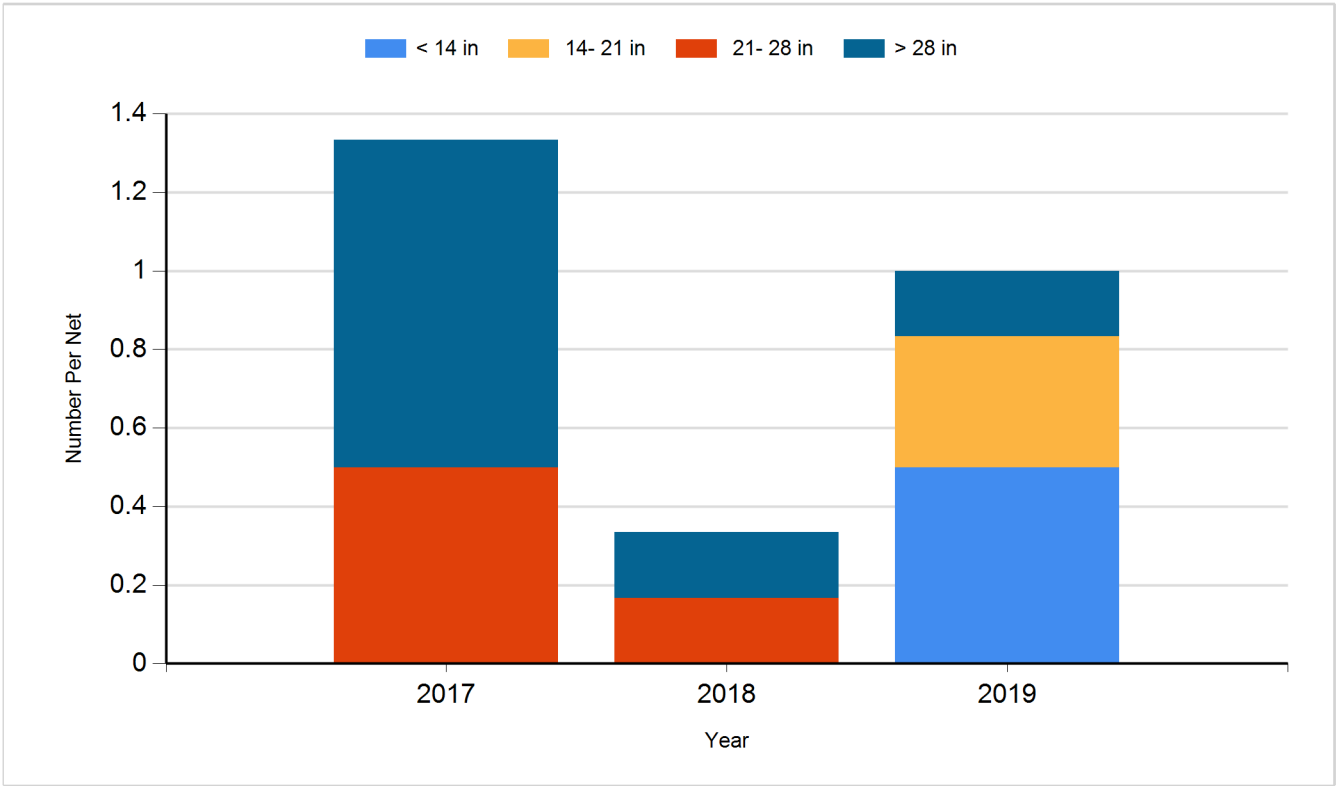
Species: Black Bullhead
Gear: AFS std gill net



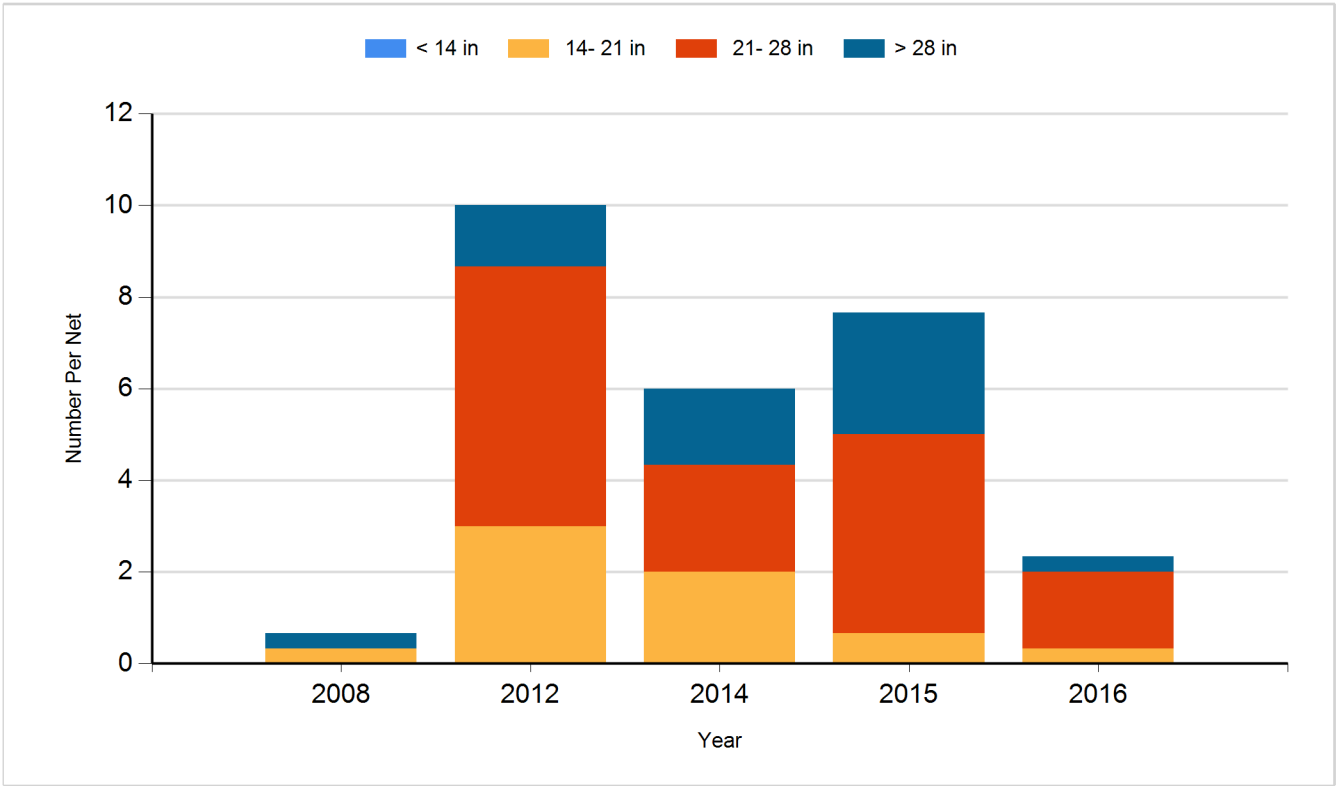
Species: Black Bullhead
Gear: std exp gill net



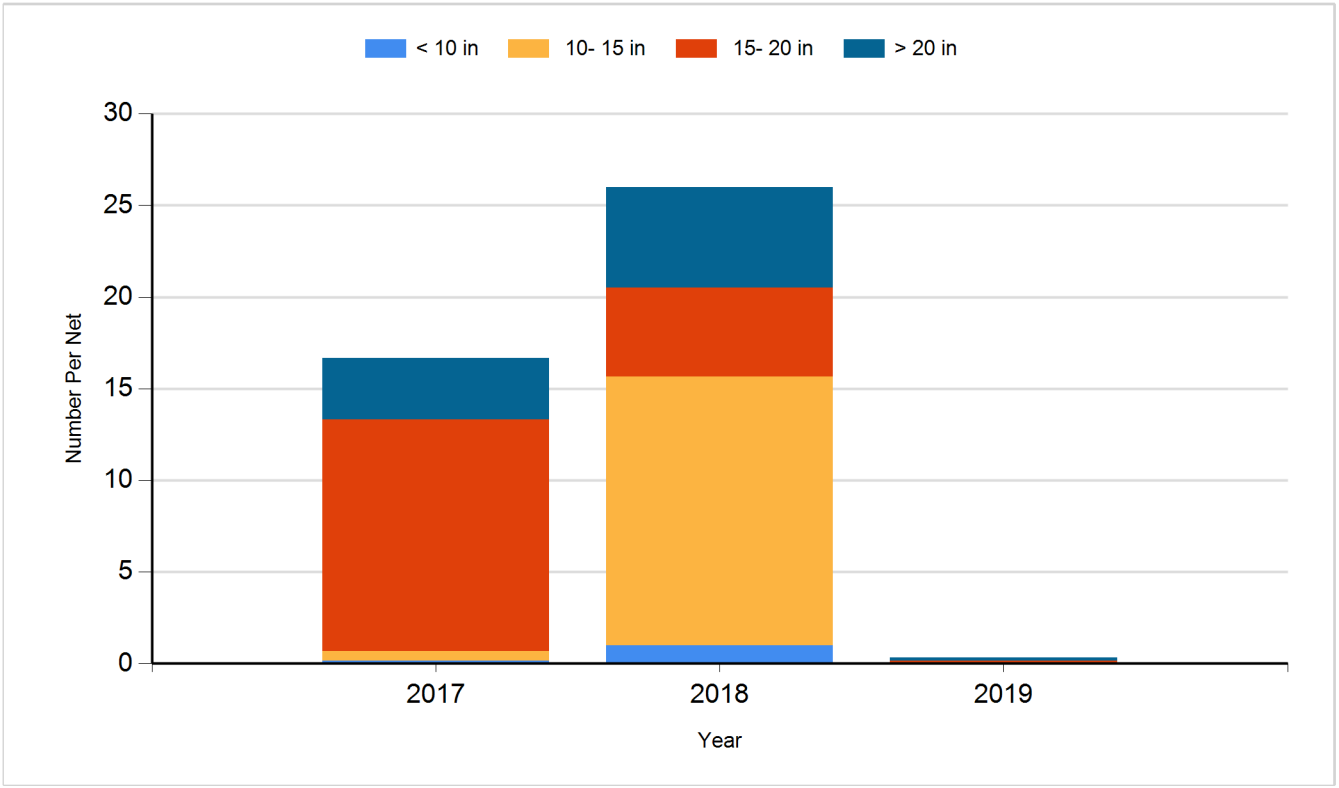
Species: Northern Pike
Gear: AFS std gill net



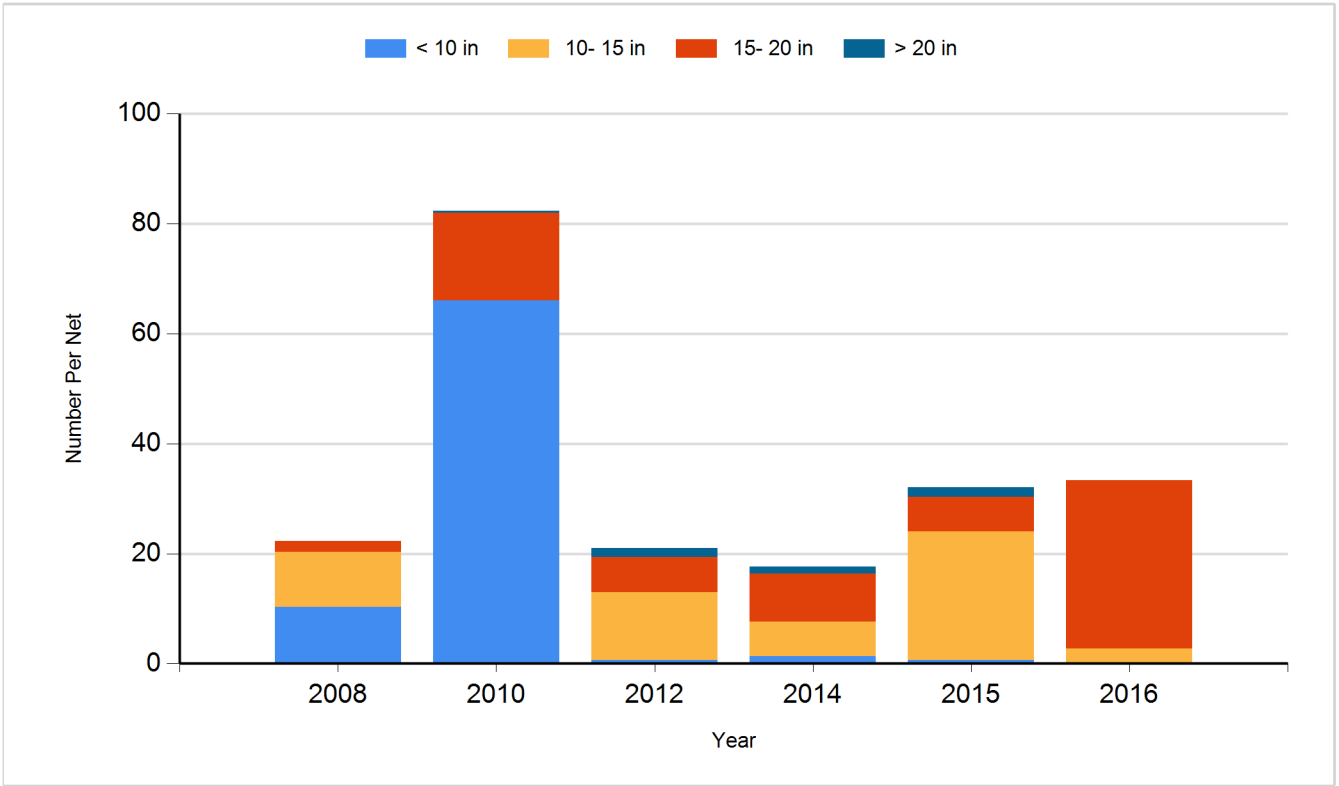
Species: Northern Pike
Gear: std exp gill net



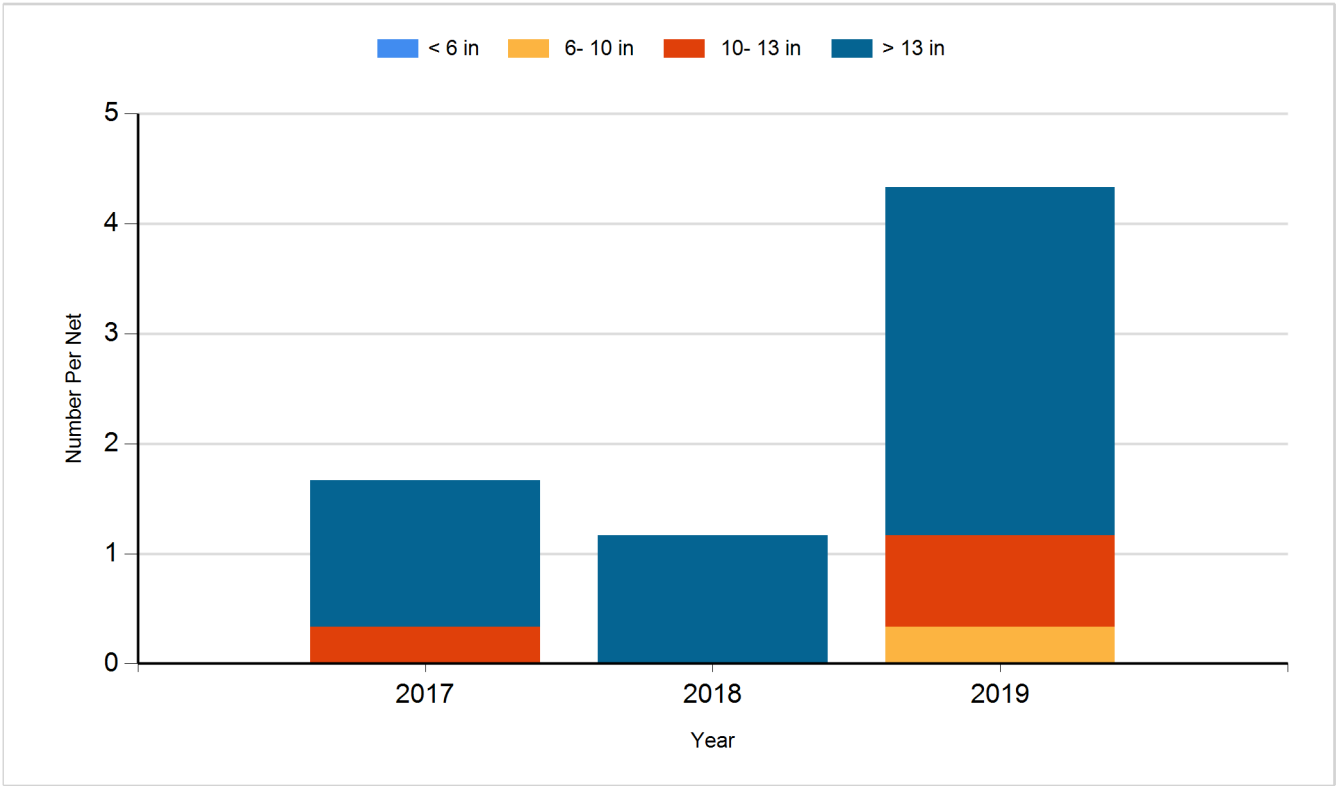
Species: Walleye
Gear: AFS std gill net



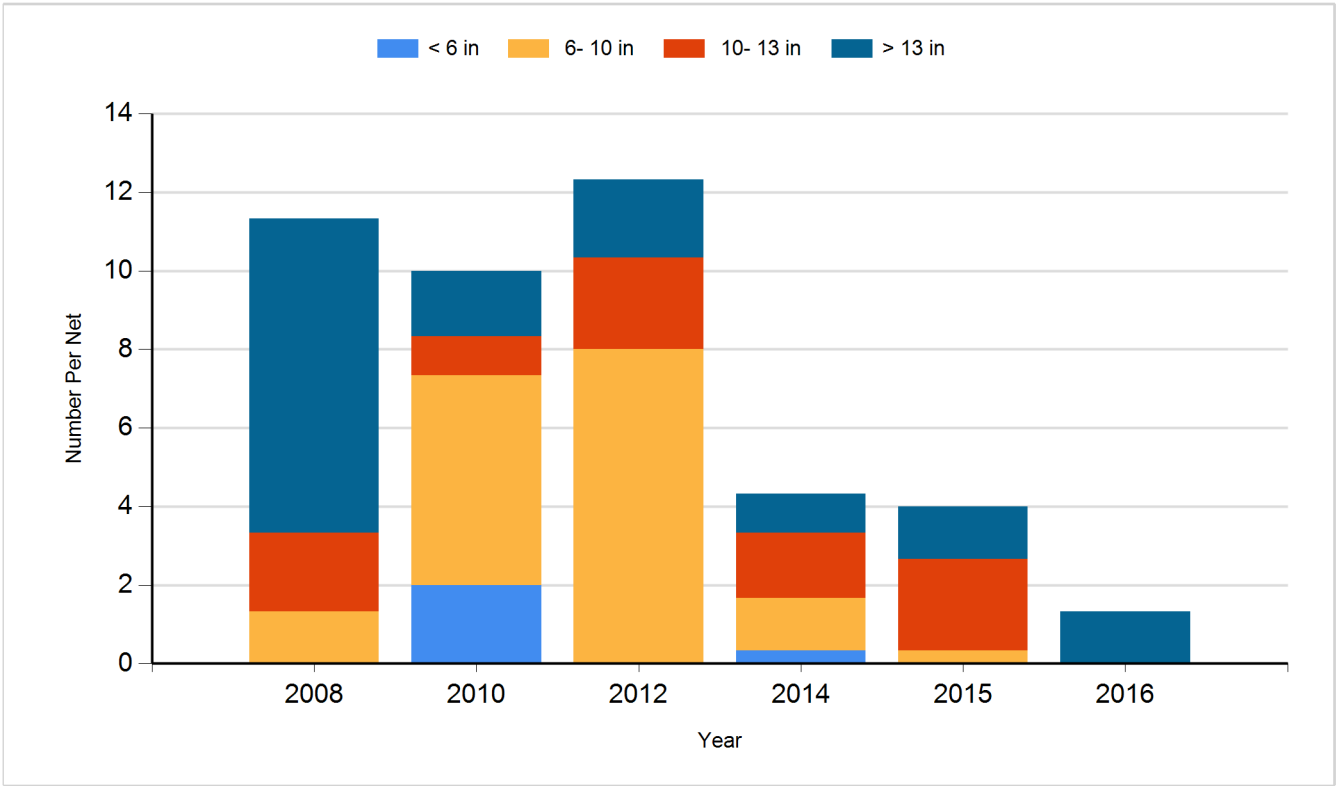
Species: Walleye
Gear: std exp gill net



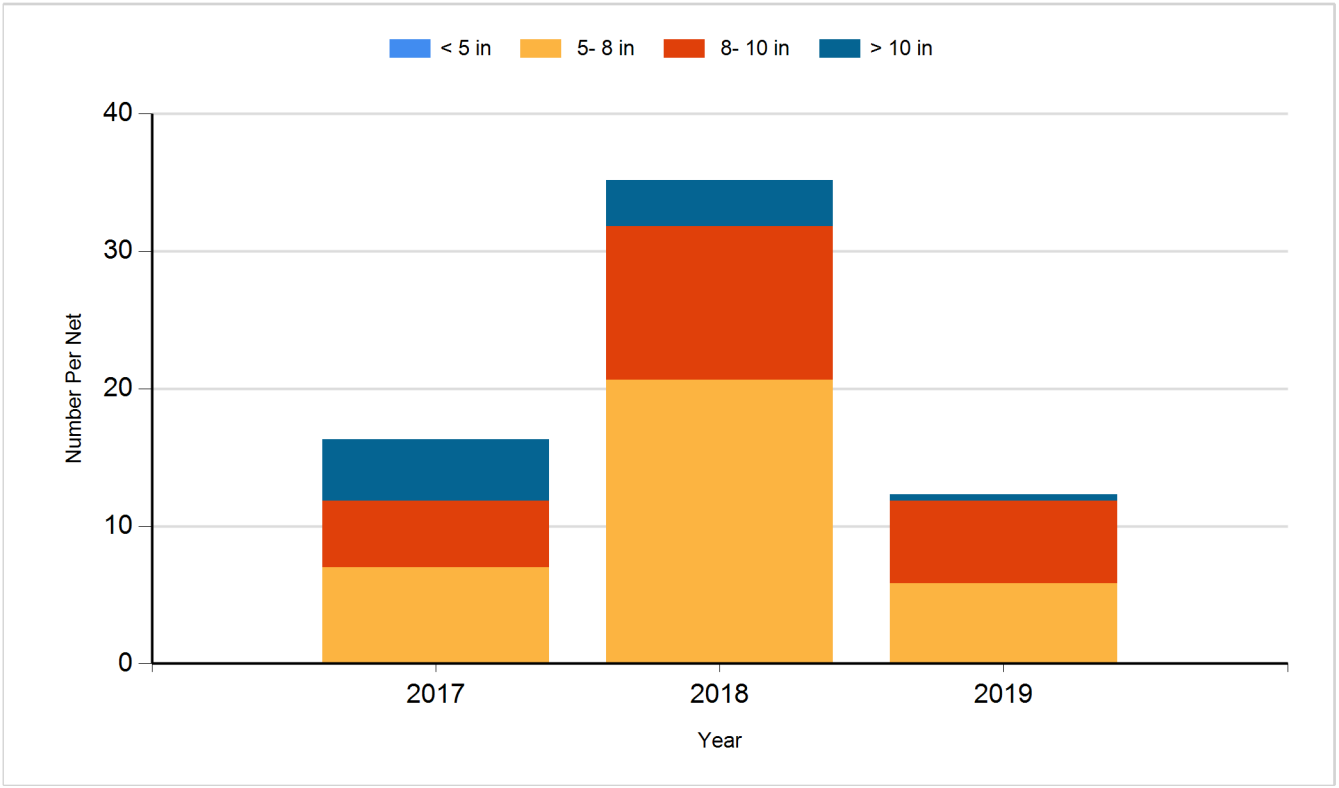
Species: White Sucker
Gear: AFS std gill net



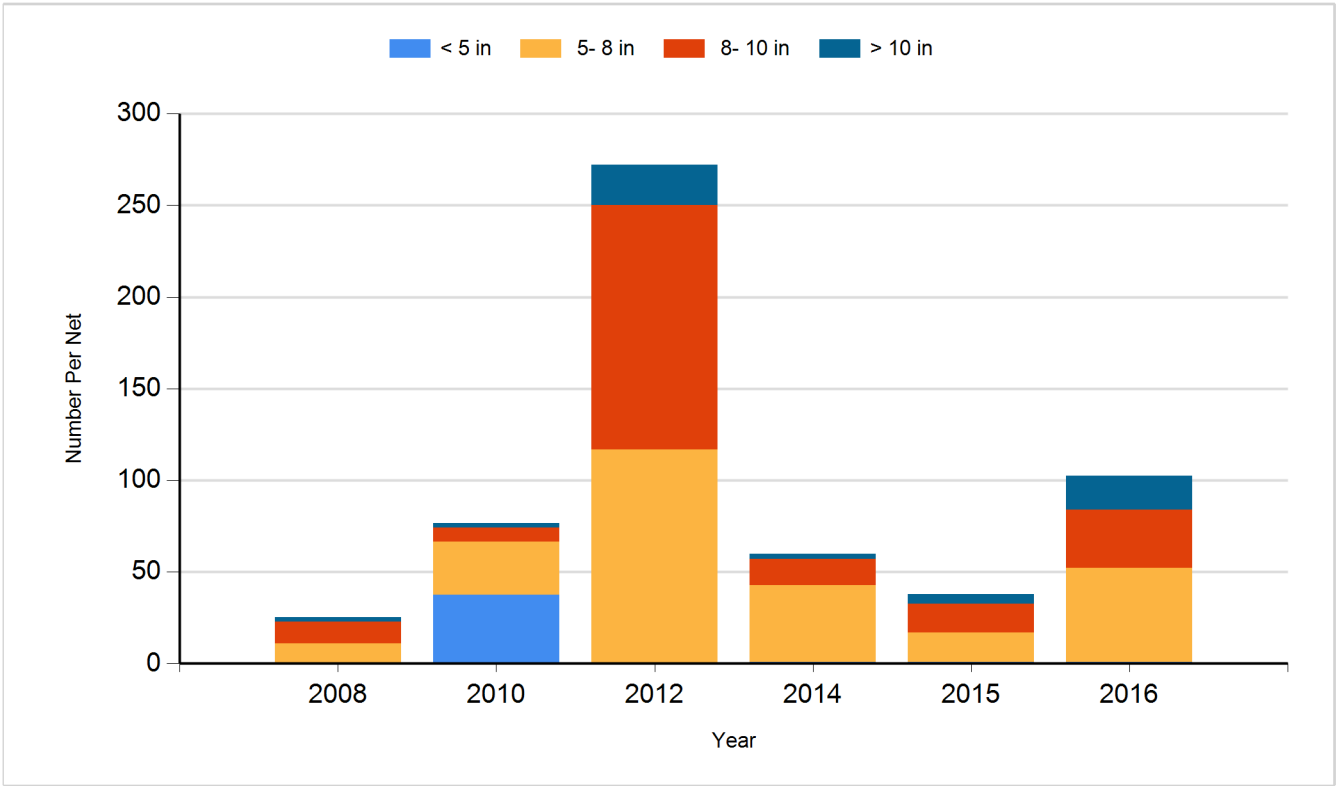
Species: White Sucker
Gear: std exp gill net



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