

**SOUTH DAKOTA STATEWIDE FISHERIES SURVEY**  
**Oakwood West, Brookings County**  
**MBS-Lake-215-000**  
**2018**

**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 07, 2018	6 net-nights

## **Common Fish Species Present**

Yellow Perch

Walleye

Black Bullhead

White Sucker

Bigmouth Buffalo

Northern Pike

Common Carp

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## 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.
- **std 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.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

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.

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

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

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.

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

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		Quality		Preferred		Memorable		Trophy	
	(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**

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	Bigmouth Buffalo	6	1.0	0.8	67		17			
	Black Bullhead	70	11.5	4.0	61	9	13	6		
	Common Carp	2	0.3	0.5	100		100			
	Northern Pike	2	0.3	0.3	100		50		75	1
	Walleye	156	25.0	3.4	41	6	22	5	89	1
	White Sucker	7	1.2	0.9	100		100			
	Yellow Perch	211	35.2	18.4	38	5	11	3	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.

Gear	Species	CPUE										Avg
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	Bigmouth Buffalo									0.3	1.0	0.7
	Black Bullhead									7.0	11.5	9.3
	Common Carp									1.7	0.3	1.0
	Northern Pike									1.3	0.3	0.8
	Walleye									16.5	25.0	20.8
	White Sucker									1.7	1.2	1.5
	Yellow Perch									16.3	35.2	25.8
frame net (std 3/4 in)	Bigmouth Buffalo		4.1		1.6							2.9
	Black Bullhead		10.1		157.0							83.6
	Common Carp		0.9		8.7							4.8
	Green Sunfish				0.0							0.0
	Northern Pike		0.5		2.6							1.6
	Walleye		1.4		1.7							1.6
	White Sucker		0.1		9.5							4.8
	Yellow Bullhead				15.2							15.2
std exp gill net	Bigmouth Buffalo				4.7		1.7	1.0				2.5
	Black Bullhead		8.0		27.0		43.7	8.7	6.3			18.7
	Common Carp		0.0		5.3		2.0	0.3	0.3			1.6
	Green Sunfish				0.3							0.3
	Northern Pike				10.0		6.0	7.7	2.3			6.5
	Orangespotted Sunfish						0.0	0.0	0.0			0.0
	Walleye		16.3		20.3		16.3	31.3	33.3			23.5
	White Sucker		8.0		12.3		4.0	4.0	1.3			5.9
	Yellow Bullhead						0.3					0.3
	Yellow Perch		39.3		272.0		59.3	37.3	101.3			101.8

## 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.

Gear	Species	Index	Year										
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	Bigmouth Buffalo	PSD										100	67
		PSD-P										0	17
	Black Bullhead	PSD										24	61
		PSD-P										12	13
	Common Carp	PSD										90	100
		PSD-P										10	100
	Northern Pike	PSD										100	100
		PSD-P										63	50
	Walleye	Wr										84	75
		PSD										97	41
		PSD-P										20	22
	White Sucker	Wr										96	89
		PSD										100	100
		PSD-P										80	100
	Yellow Perch	PSD										57	38
		PSD-P										28	11
		Wr										95	96
	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							
Common Carp		PSD		89		46							
		PSD-P		78		29							
		Wr		101		98							
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							

Gear	Species	Index	Year									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	White Sucker	PSD-P		100		76						
		Wr		101		91						
	Yellow Perch	PSD		23		33						
		PSD-P		10		3						
		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						
Common Carp		PSD		0		13		83	0	100		
		PSD-P		0		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		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**

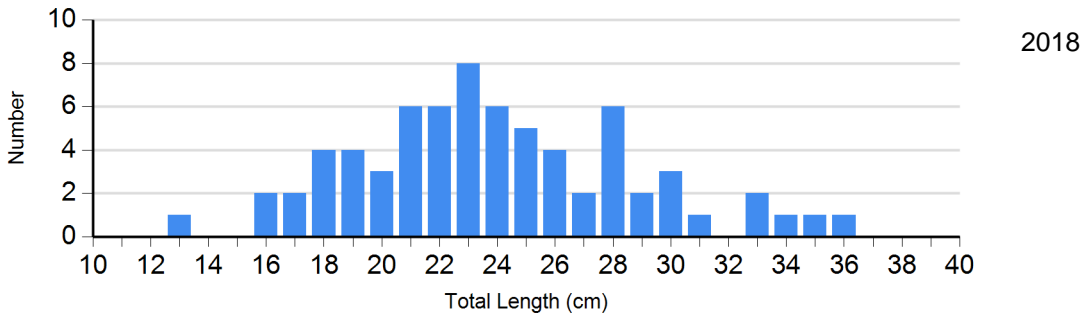
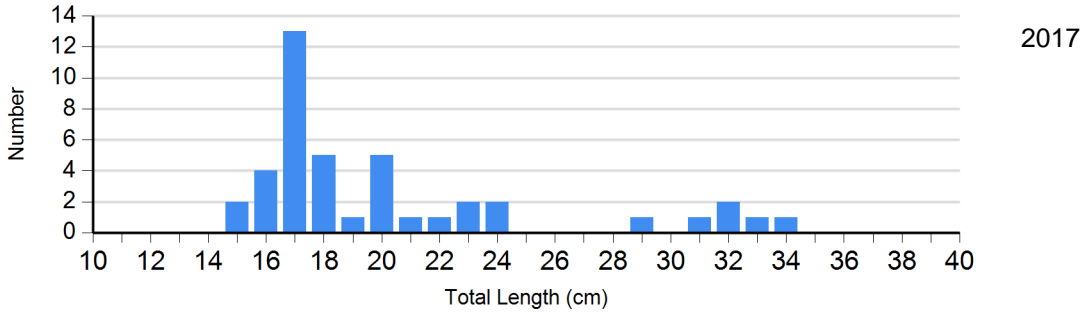
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2014	6	98 (1.0)	7	94 (1.8)	5	93 (2.0)	0	
	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	
Walleye Gill Net	2014	19	89 (0.9)	26	103 (1.0)	4	104 (2.9)	0	
	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	
Yellow Perch Gill Net	2014	126	105 (0.8)	43	98 (1.5)	9	92 (2.1)	0	
	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	131	98 (0.8)	57	96 (1.1)	23	93 (1.3)	0	

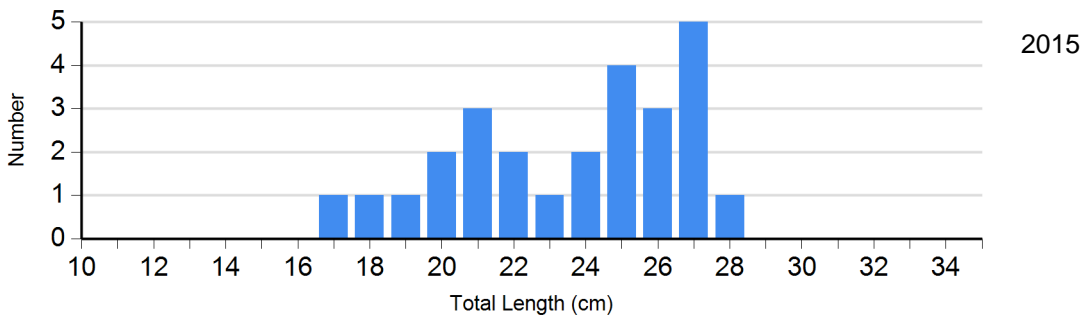
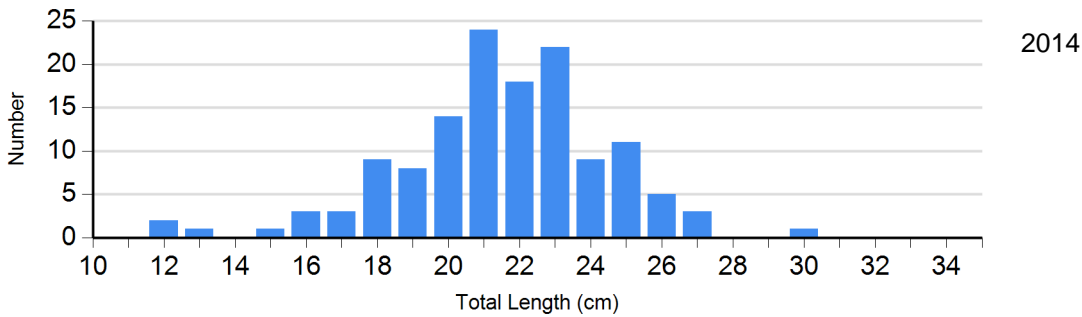
# Length Frequency Distribution

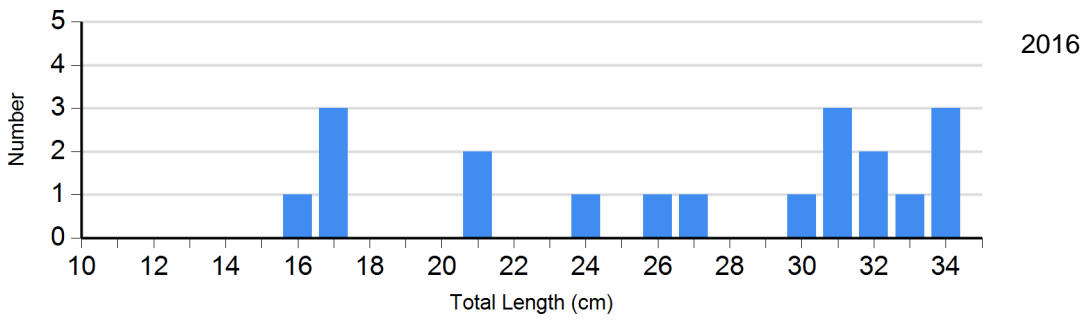
Length frequency histogram of species sampled by year.

Species: Black Bullhead  
Gear: AFS std gill net

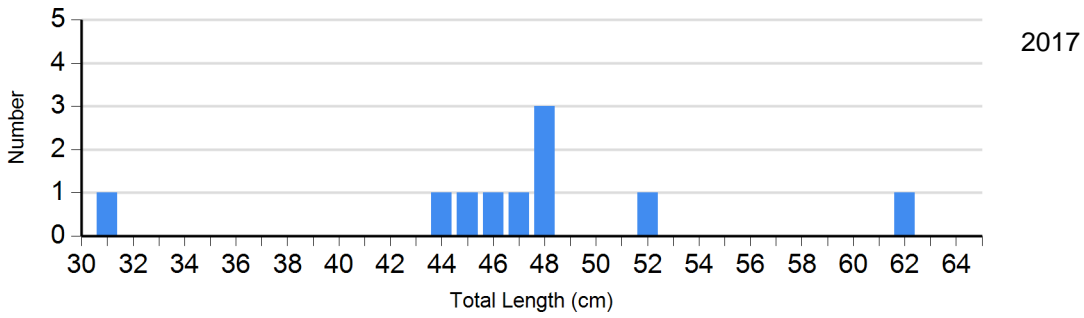


Species: Black Bullhead  
Gear: std exp gill net

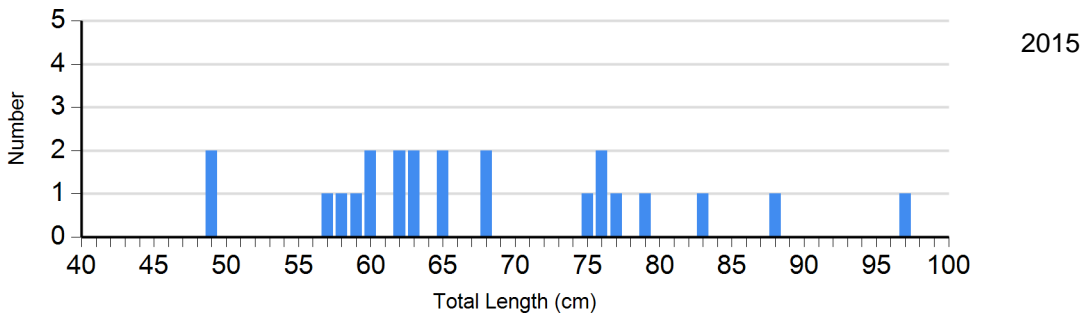
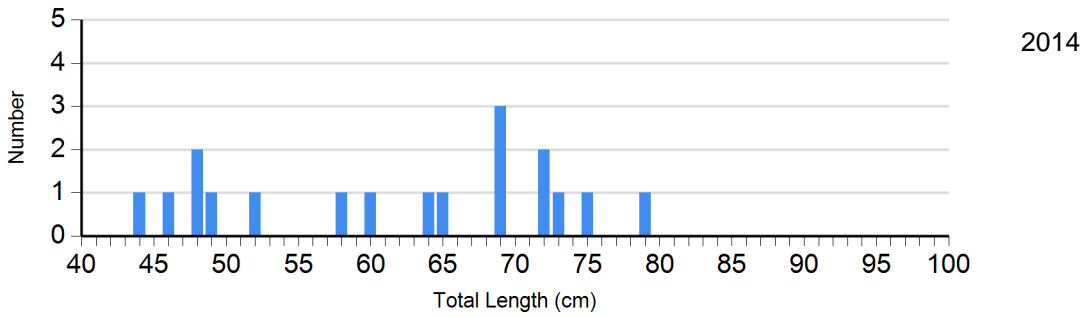




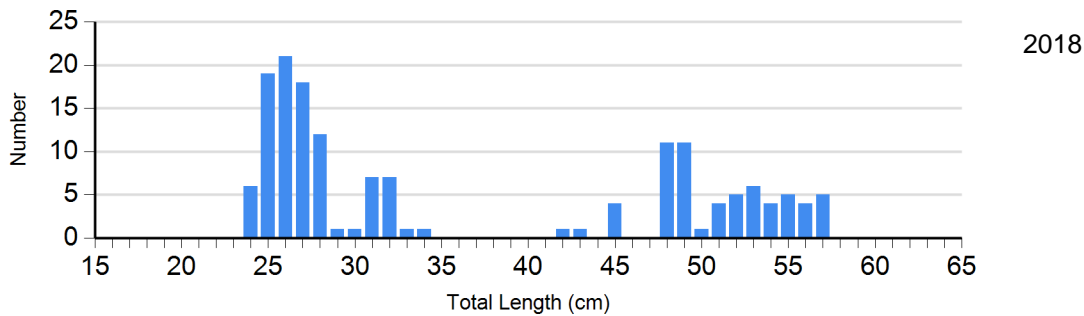
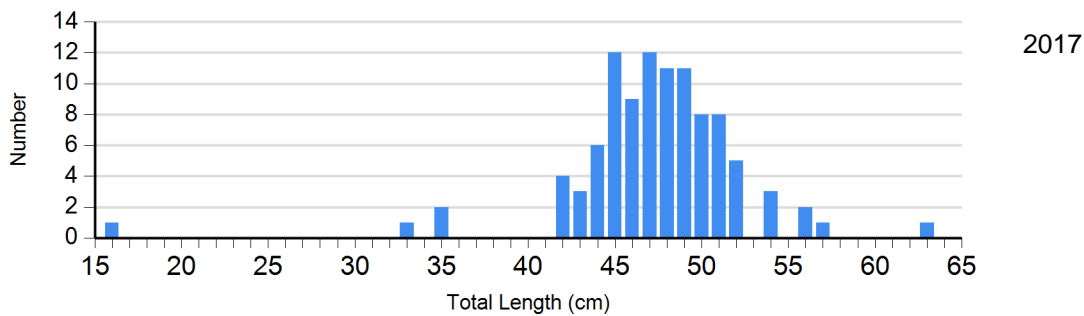
Species: Common Carp  
Gear: AFS std gill net



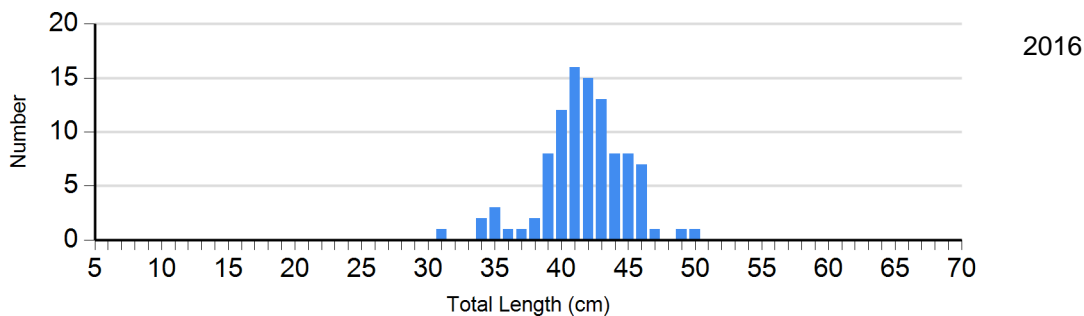
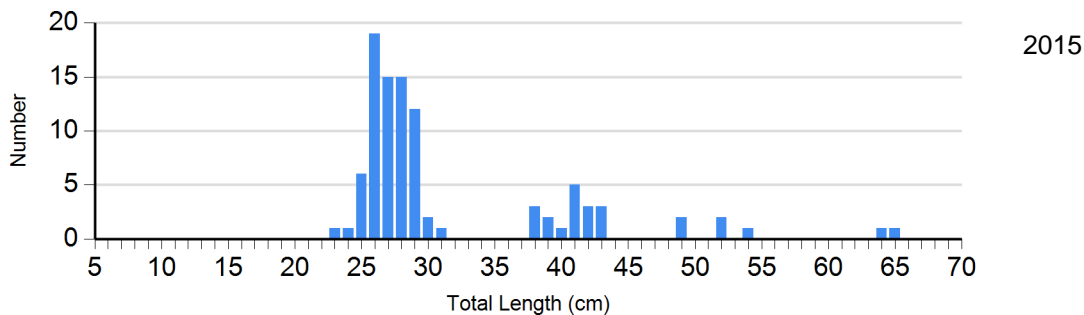
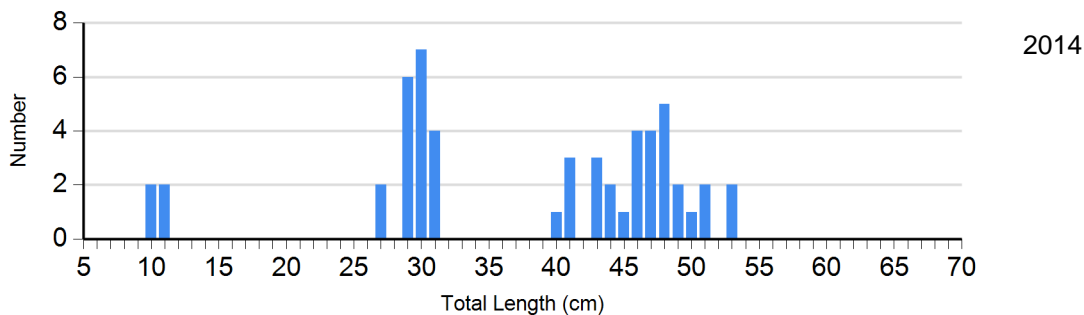
Species: Northern Pike  
Gear: std exp gill net



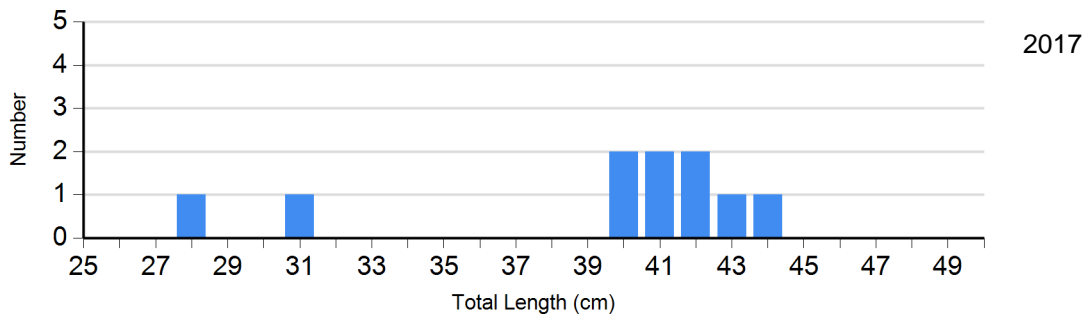
Species: Walleye  
 Gear: AFS std gill net



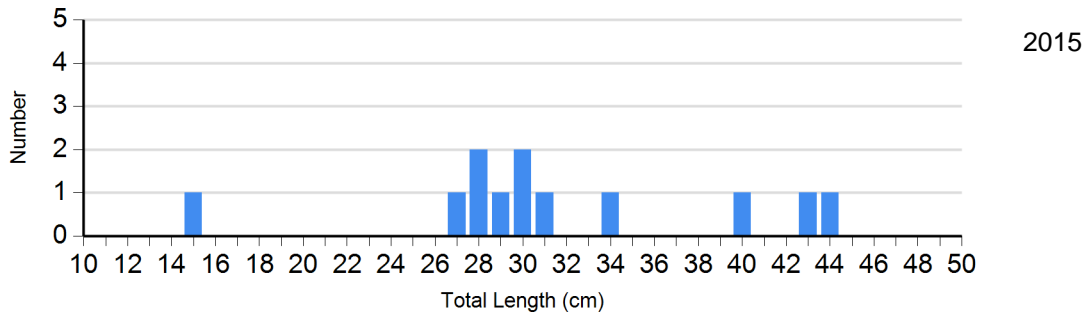
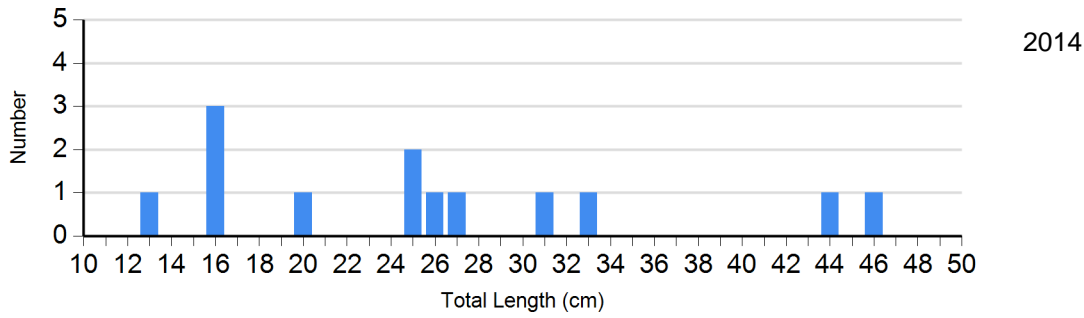
Species: Walleye  
 Gear: std exp gill net



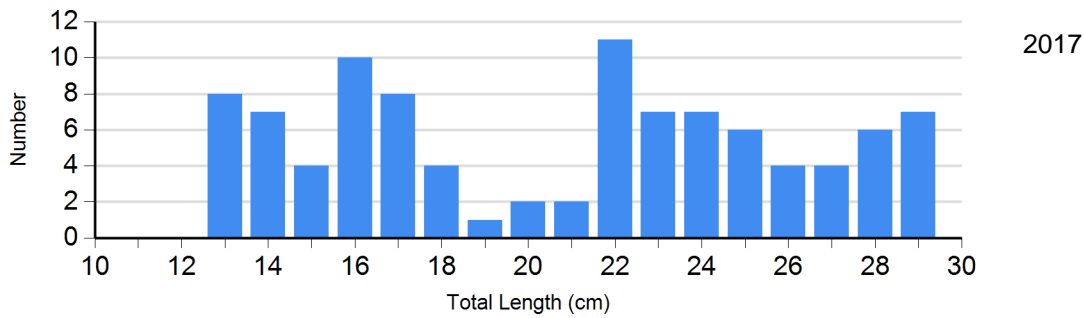
Species: White Sucker  
 Gear: AFS std gill net

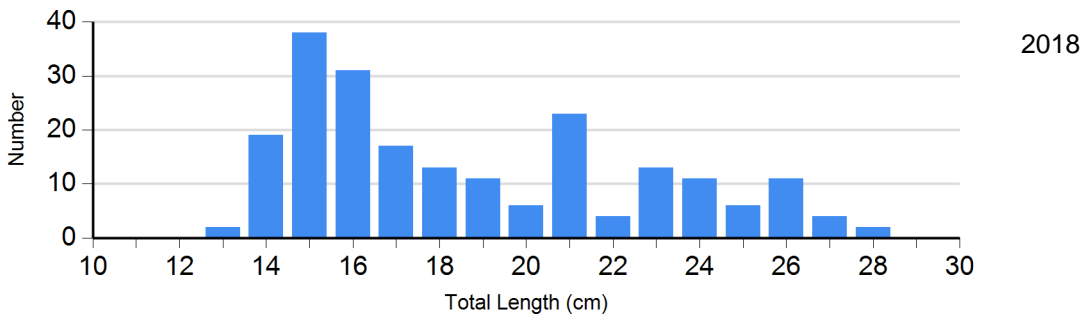


Species: White Sucker  
 Gear: std exp gill net

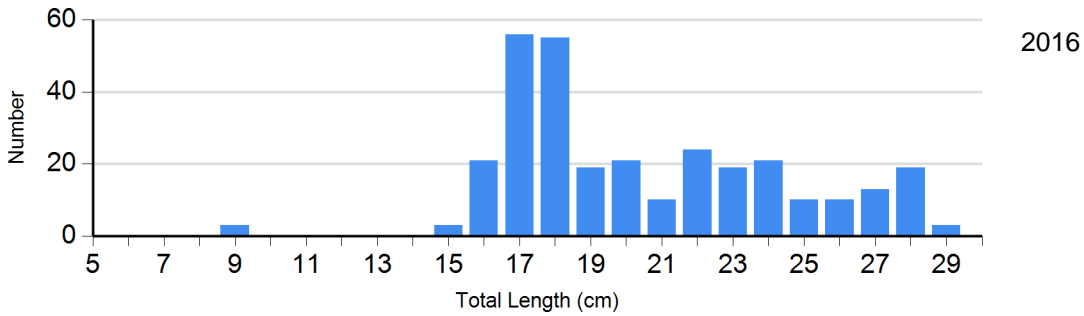
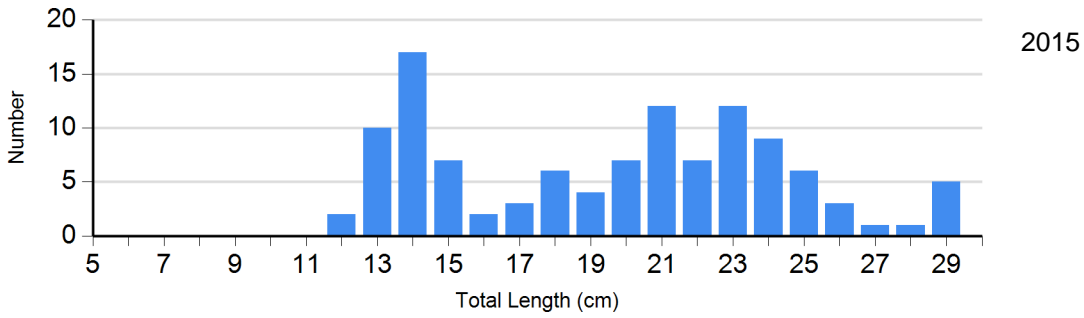
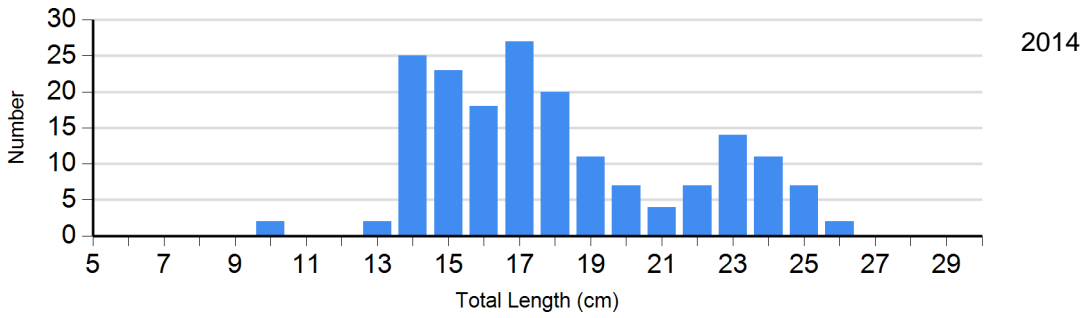


Species: Yellow Perch  
 Gear: AFS std gill net





Species: Yellow Perch  
Gear: std exp gill net

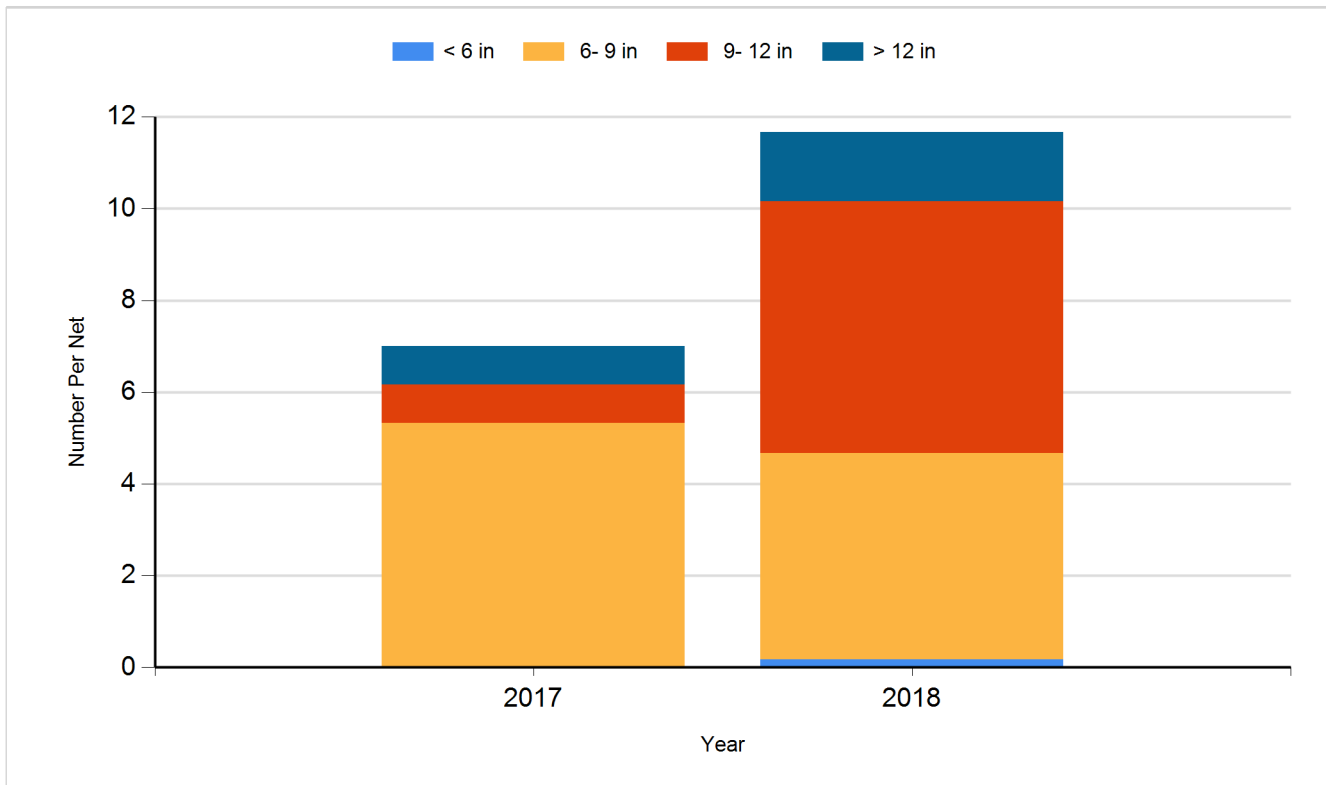


## Historic Fish Sizes and Relative Abundance

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

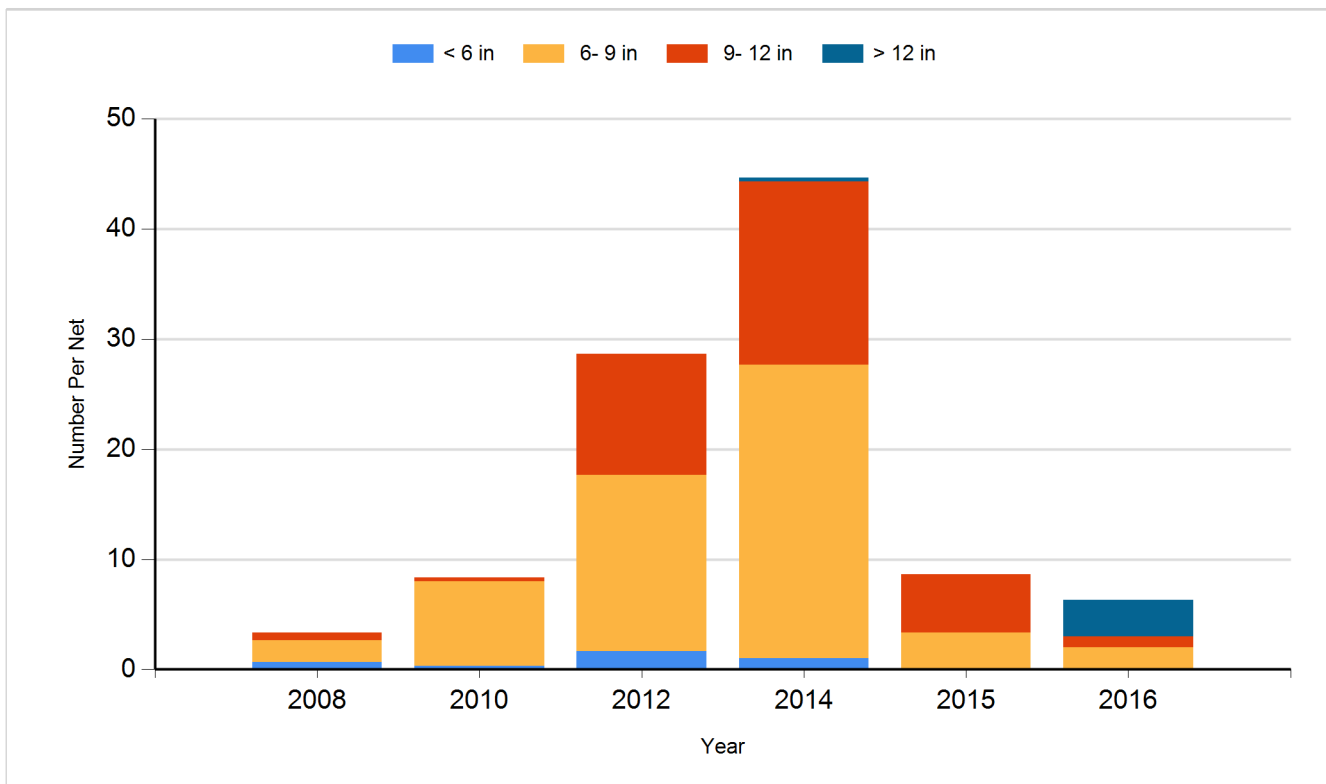
Species: Black Bullhead

Gear: AFS std gill net

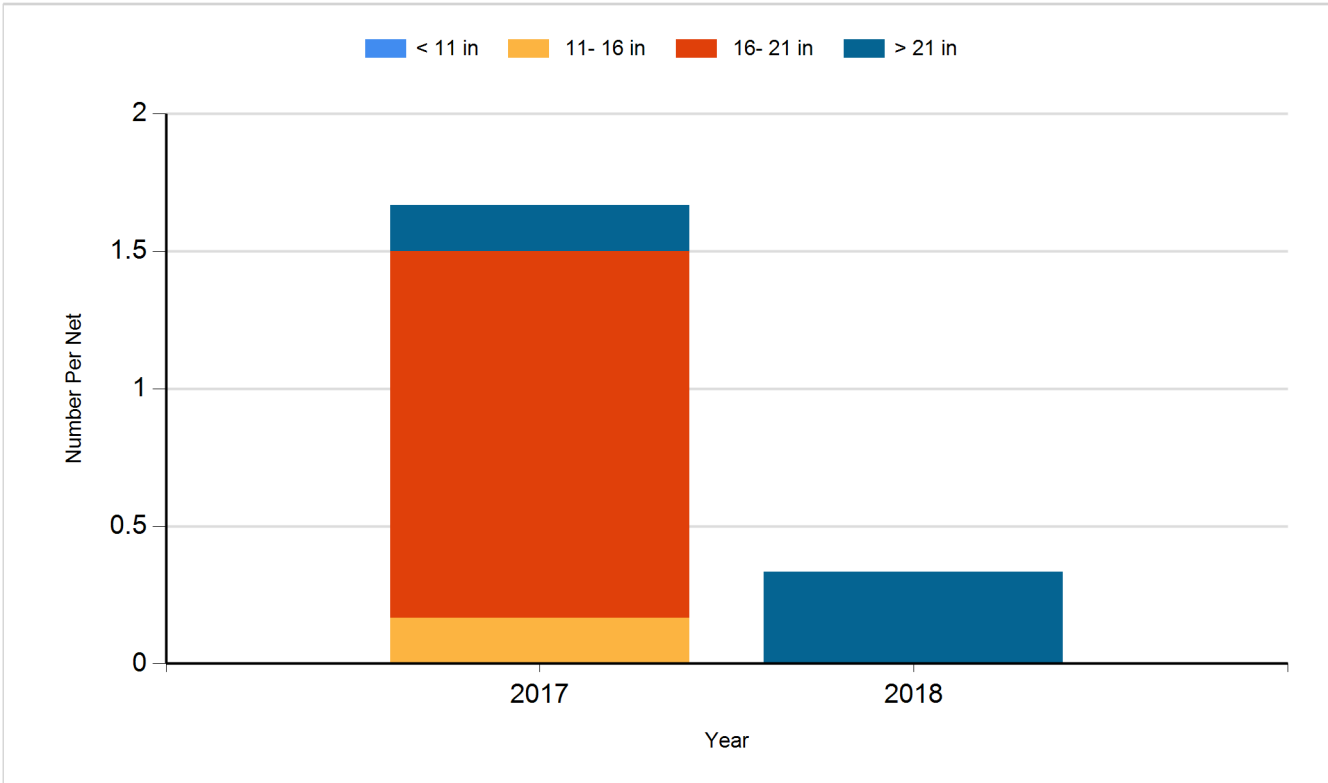


Species: Black Bullhead

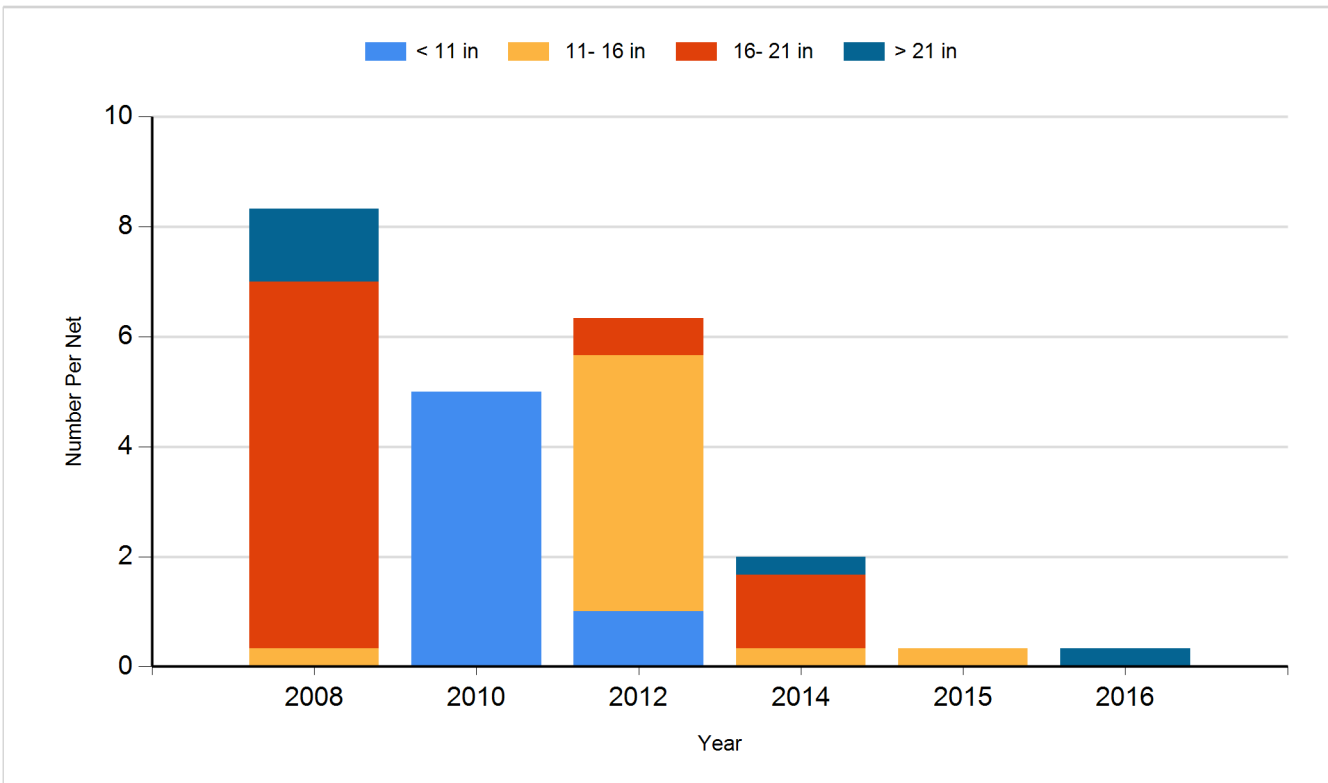
Gear: std exp gill net



Species: Common Carp  
Gear: AFS std gill net

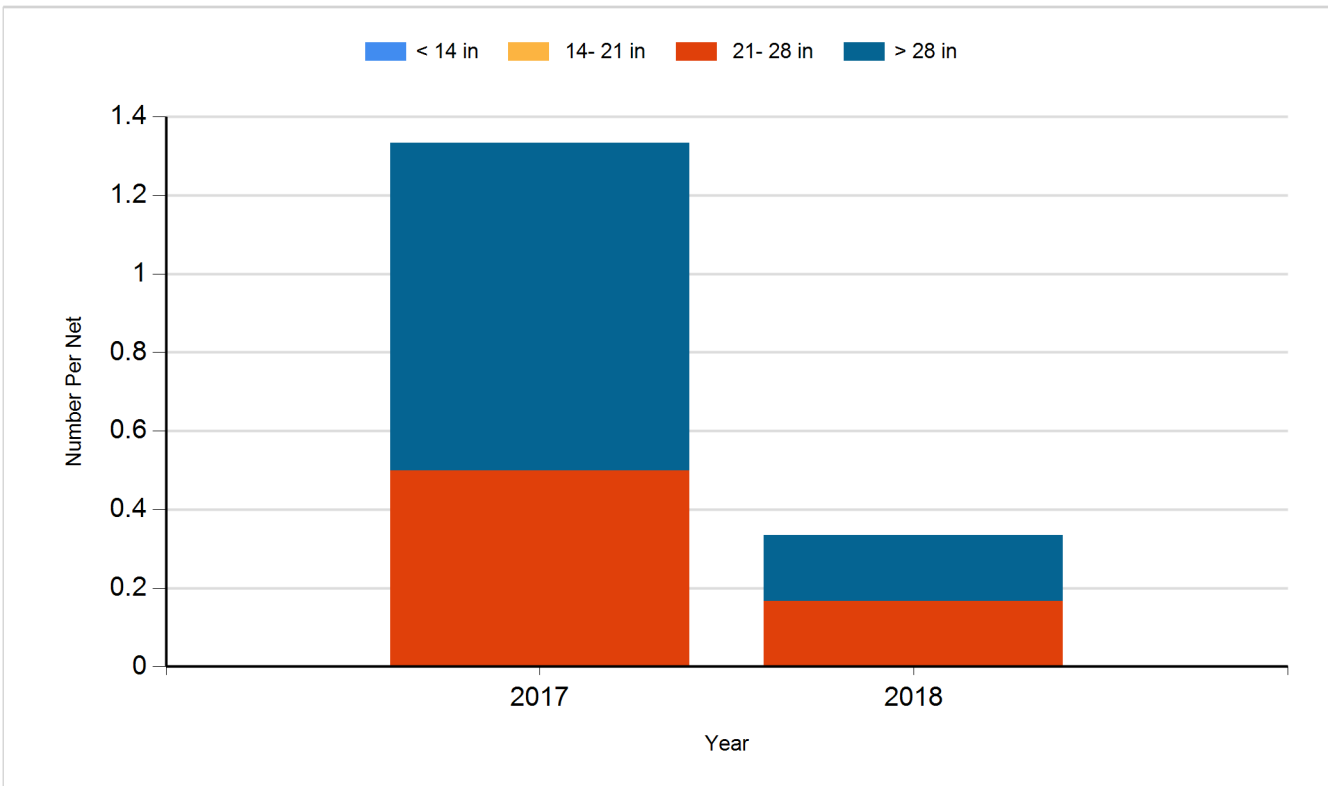


Species: Common Carp  
Gear: std exp gill net

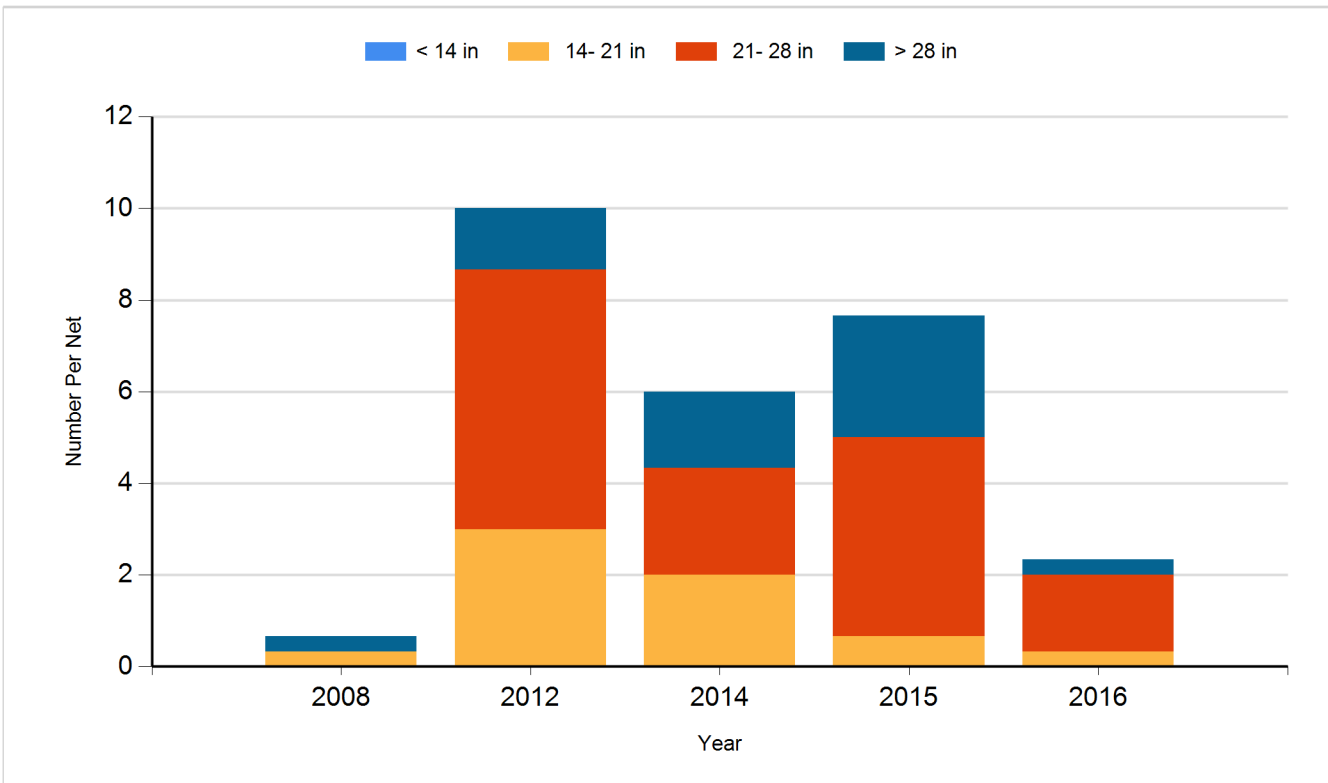




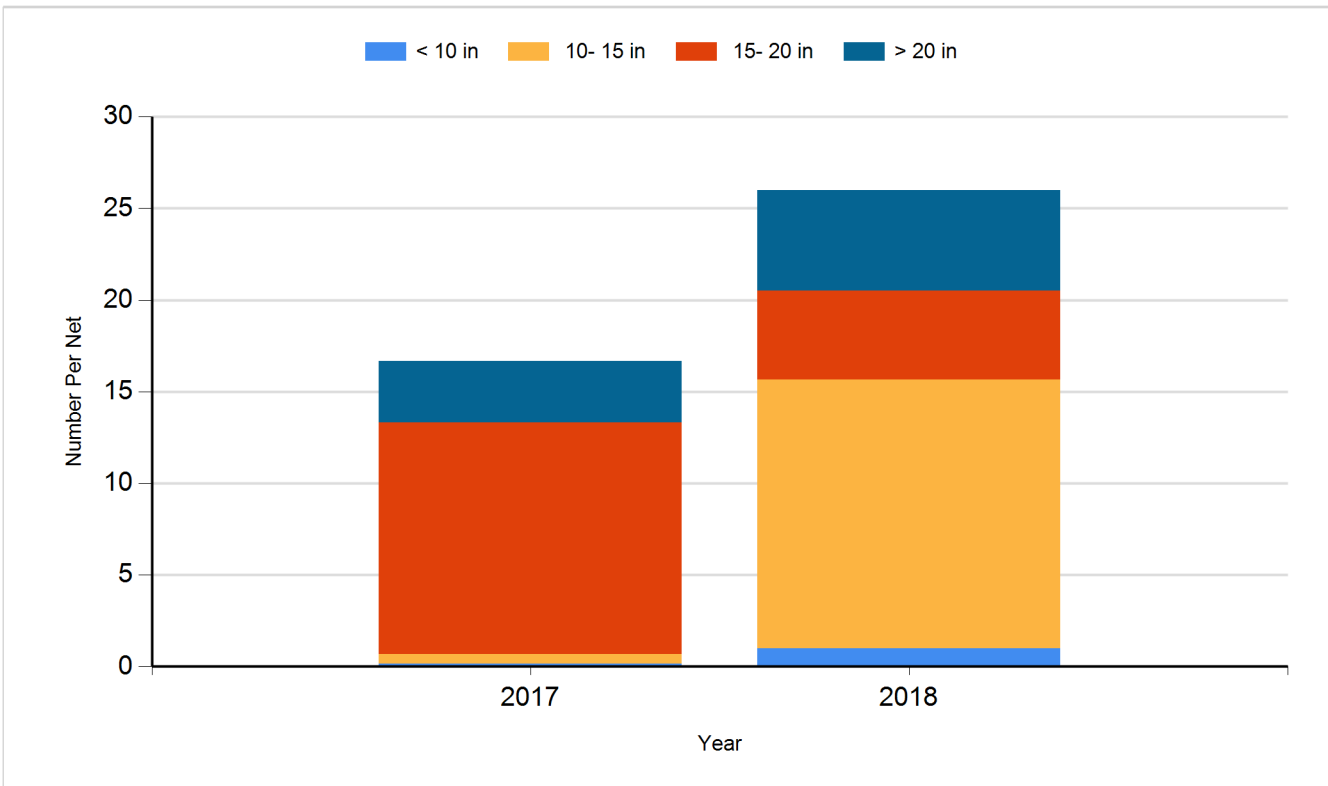
Species: Northern Pike  
Gear: AFS std gill net



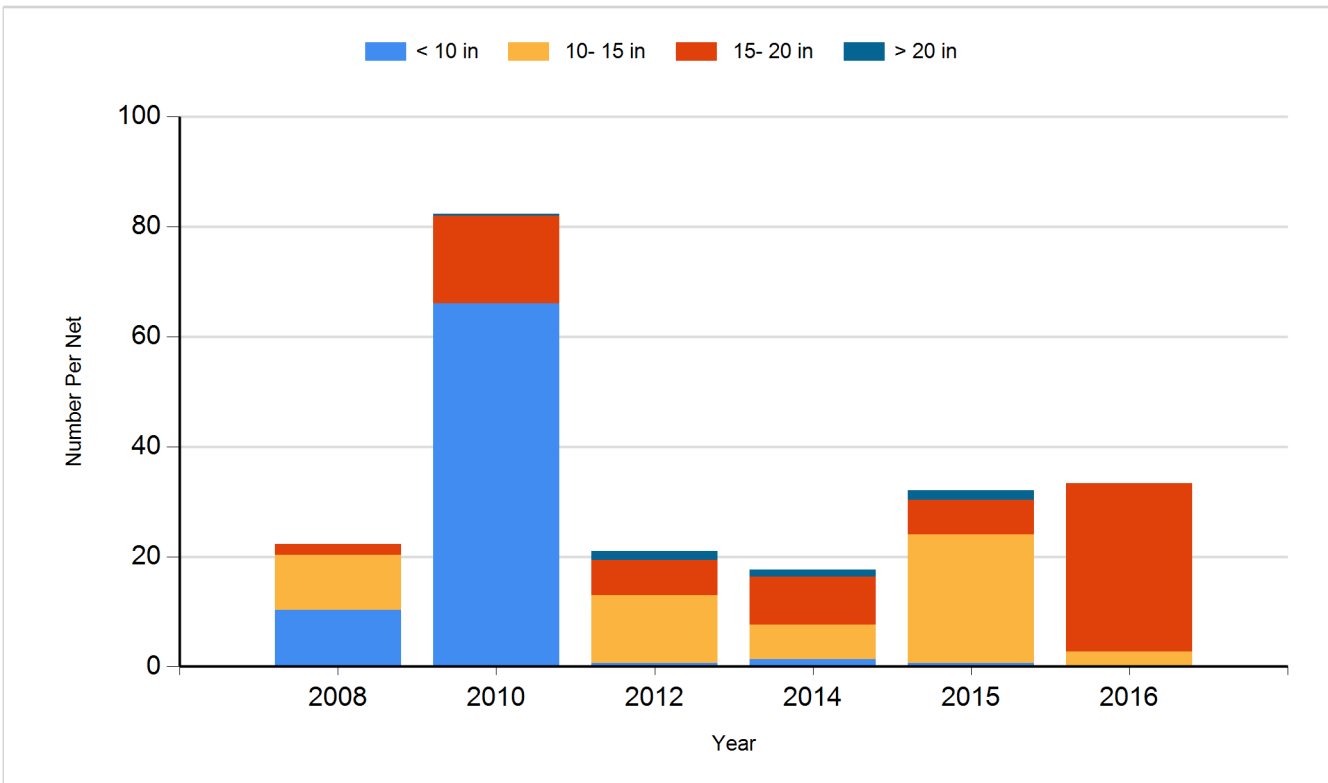
Species: Northern Pike  
Gear: std exp gill net



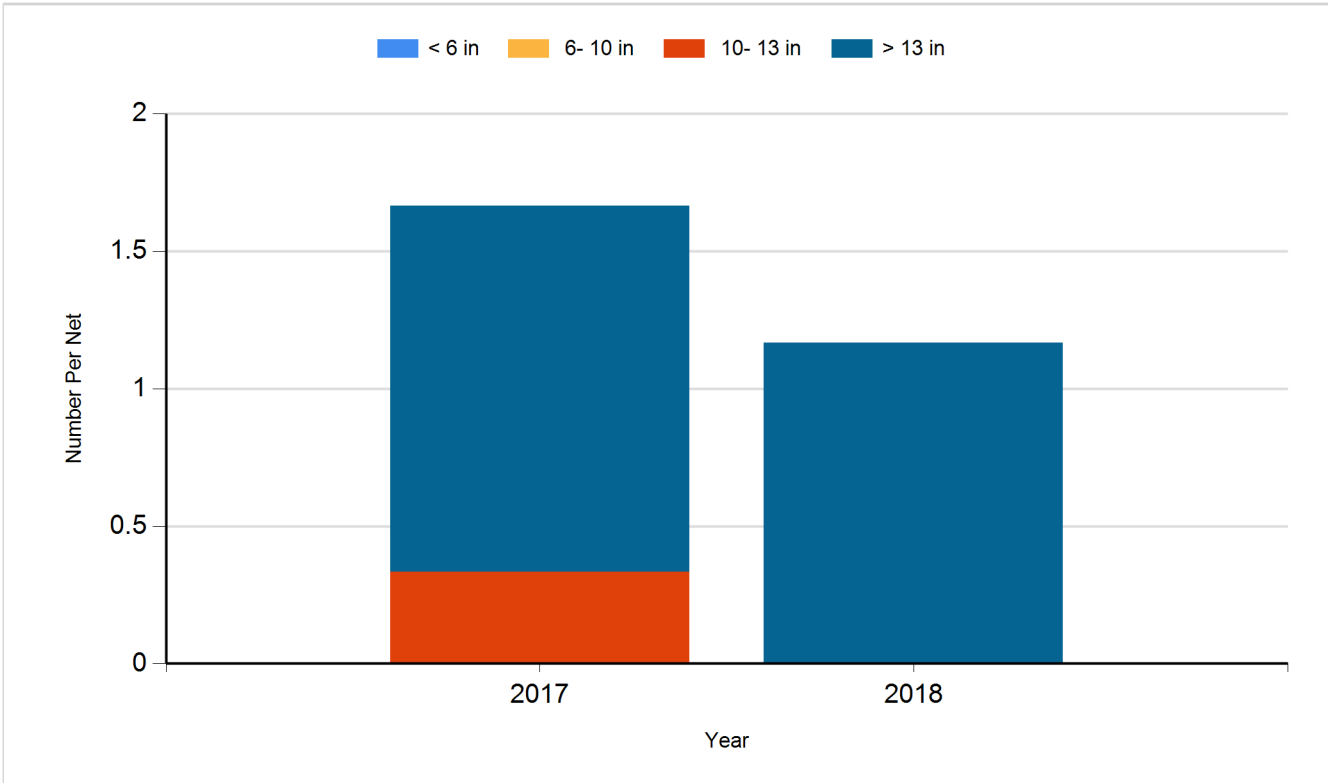
Species: Walleye  
Gear: AFS std gill net



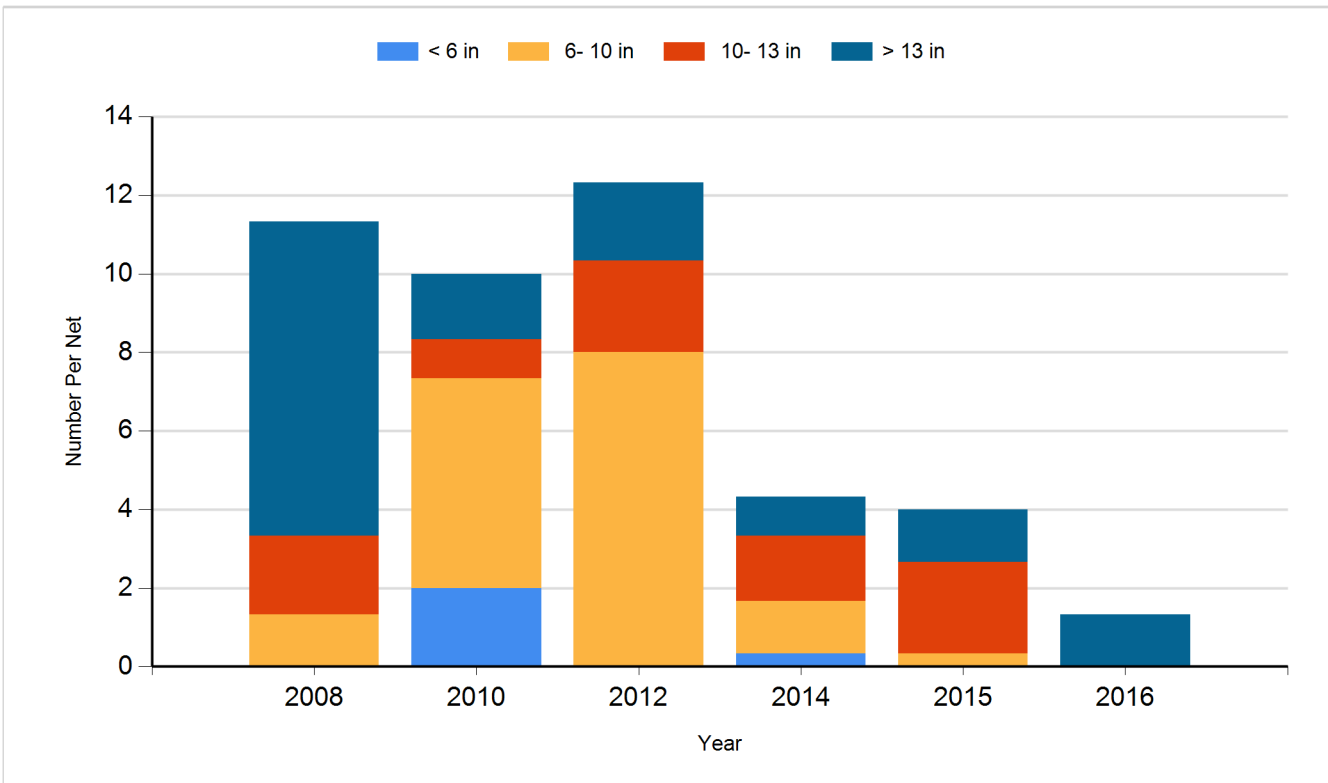
Species: Walleye  
Gear: std exp gill net



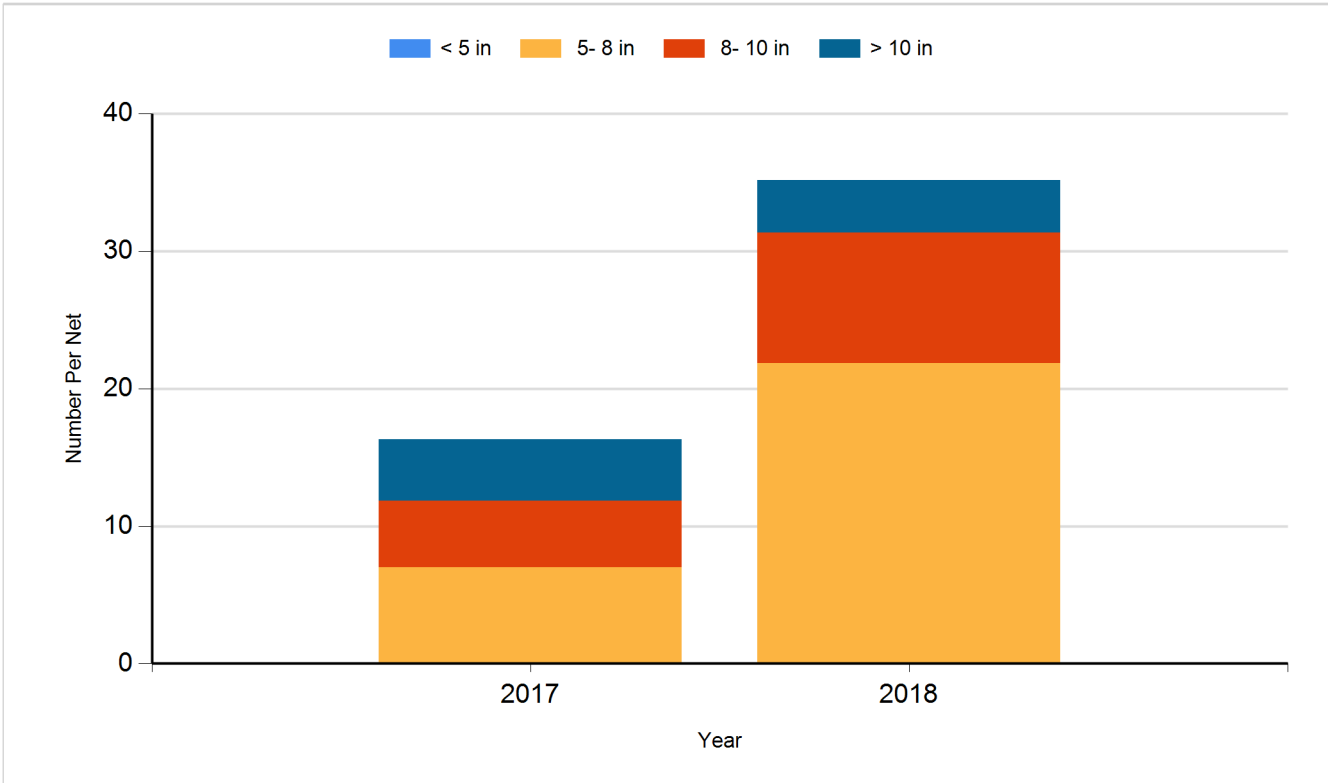
Species: White Sucker  
Gear: AFS std gill net



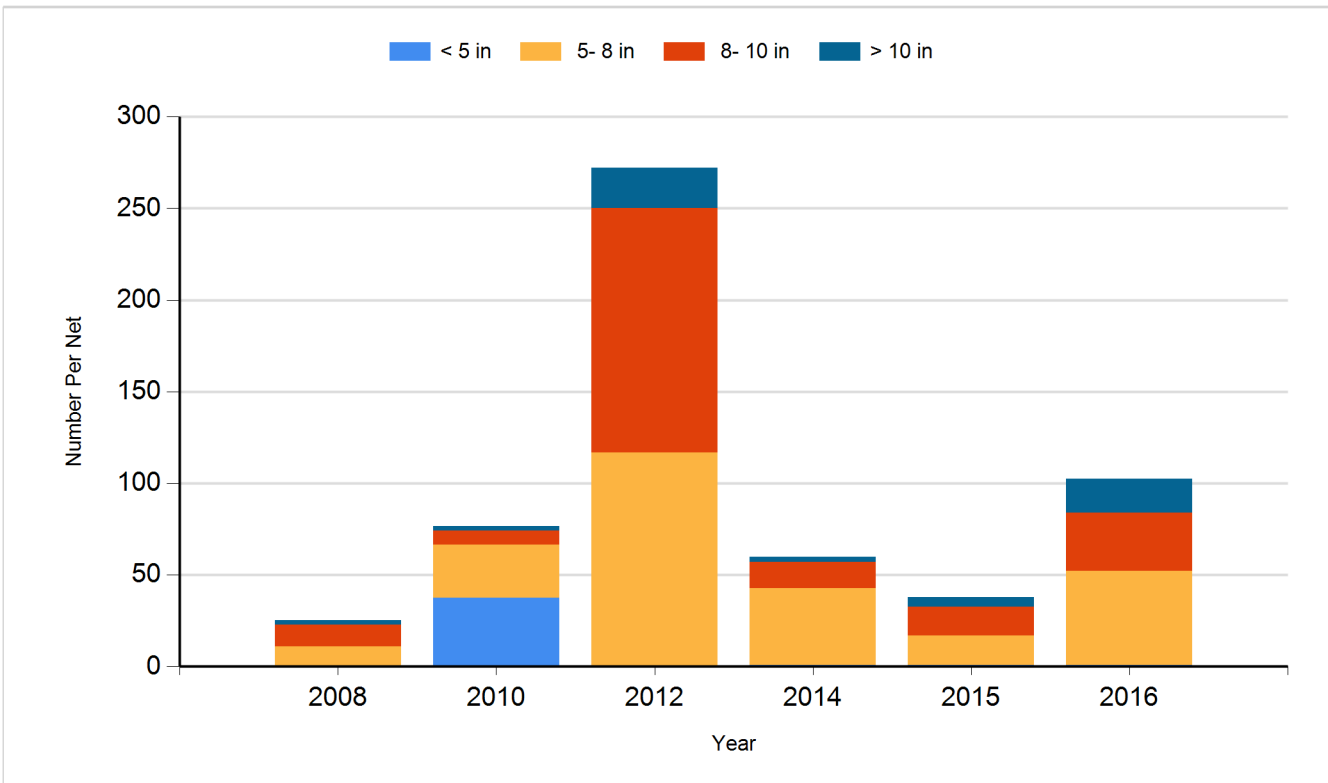
Species: White Sucker  
Gear: std exp gill net



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