

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Henry, Kingsbury County

LKT-Lake-55-003

2018

## Lake Information

**Name:** Henry **Maximum Depth:** 8 Feet  
**County:** Kingsbury **Mean Depth:** 4 Feet  
**Legal Description:** T110-R56-Sec. 13, 18, 19, 24  
**Surface Area:** 2,539 Acres

## Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 18, 2018	6 net-nights

## **Common Fish Species Present**

Walleye

Yellow Perch

White Bass

Northern Pike

Common Carp

Black Crappie

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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	Black Crappie	1	0.2	0.2	100		100		93	
	Common Carp	5	0.8	0.6	100		60			
	Northern Pike	6	1.0	0.5	83		33		81	6
	Walleye	15	1.7	0.6	80		30		89	3
	White Bass	12	2.0	1.9	83		83		96	2
	Yellow Perch	18	3.0	2.4	6		0		104	3

## 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	Black Bullhead									0.2		0.2
	Black Crappie										0.2	0.2
	Common Carp									3.0	0.8	1.9
	Northern Pike									0.5	1.0	0.8
	Walleye									3.3	1.7	2.5
	White Bass									0.2	2.0	1.1
	Yellow Perch									0.2	3.0	1.6
frame net (std 3/4 in)	Bigmouth Buffalo		0.4									0.4
	Black Bullhead		0.2									0.2
	Common Carp		9.4									9.4
	Northern Pike		2.0									2.0
	Walleye		2.2									2.2
	White Sucker		0.2									0.2
	Yellow Perch		0.2									0.2
std exp gill net	Bigmouth Buffalo						0.0			0.0		0.0
	Black Bullhead		0.3		74.3		7.3	6.0	1.7			17.9
	Black Crappie		0.0		1.0		3.3	2.3	0.3			1.4
	Common Carp		0.3		2.7		0.3	0.7	1.3			1.1
	Northern Pike		3.3		8.0		4.7	3.0	2.0			4.2
	Walleye		30.0		25.3		13.0	20.3	11.0			19.9
	White Bass						0.3	0.7				0.5
	Yellow Perch		3.3		12.7		13.0	24.0	8.0			12.2

## 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	Black Crappie	PSD												100
		PSD-P												100
		Wr												93
	Common Carp	PSD											78	100
		PSD-P											17	60
		Wr												
	Northern Pike	PSD											100	83
		PSD-P											33	33
		Wr											83	81
	Walleye	PSD											50	80
		PSD-P											15	30
		Wr											82	89
	White Bass	PSD											100	83
		PSD-P											100	83
		Wr											95	96
Yellow Perch	PSD											100	6	
	PSD-P											100	0	
	Wr											96	104	
frame net (std 3/4 in)	Common Carp	PSD		96										
		PSD-P		94										
		Wr		104										
	Northern Pike	PSD		20										
		PSD-P		0										
		Wr		90										
	Walleye	PSD		27										
		PSD-P		9										
		Wr		85										
Yellow Perch	PSD		100											
	PSD-P		100											
std exp gill net	Black Crappie	PSD		0		33		20	29	0				
		PSD-P		0		33		20	0	0				
		Wr				112		122	106	133				
	Common Carp	PSD		100		88		100	100	75				

Gear	Species	Index	Year											
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
std exp gill net	Common Carp	PSD-P		100		63		100	50	75				
		Wr		84		91								
	Northern Pike	PSD		40		46		86	56	83				
		PSD-P		0		0		21	44	0				
		Wr		88		76		85	84	77				
	Walleye	PSD		1		26		54	61	73				
		PSD-P		0		1		5	18	12				
		Wr		87		79		88	76	84				
	White Bass	PSD						100	100					
		PSD-P						100	100					
		Wr						97	87					
	Yellow Perch	PSD		20		42		36	33	42				
		PSD-P		20		37		23	10	21				
		Wr		117		107		112	98	103				

## 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+
2018	15	233 (5)	345 (2)	405 (4)		674 (1)			510 (2)		657 (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+
2018	17	148 (16)	248 (1)								

## Fish Condition

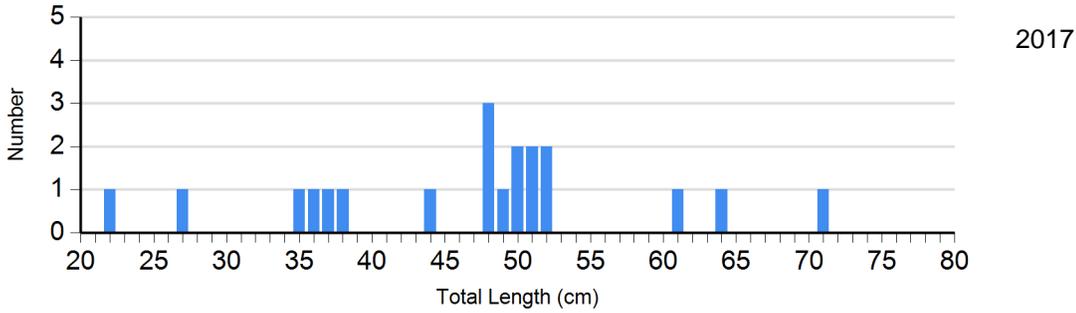
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2	83 (3.3)	9	86 (2.1)	2	85 (0.3)	1	81
	2015	4	83 (6.0)	1	85	4	85 (3.0)	0	
	2016	1	72	5	78 (3.6)	0		0	
	2017	0		2	82 (2.8)	1	83	0	
	2018	1	98	3	81 (4.4)	2	71 (1.7)	0	
Walleye Gill Net	2014	18	86 (1.3)	19	89 (1.2)	2	88 (0.8)	0	
	2015	24	78 (0.6)	26	76 (2.9)	11	74 (3.1)	0	
	2016	9	88 (1.1)	20	83 (1.1)	4	83 (0.2)	0	
	2017	10	88 (2.1)	7	76 (2.0)	3	76 (2.6)	0	
	2018	2	90 (1.1)	5	90 (4.1)	1	96	2	82 (6.7)
White Bass Gill Net	2018	2	98 (4.2)	0		10	96 (1.4)	0	
White Bass Gill Net	2014	0		0		1	97	0	
	2015	0		0		0		2	87 (0.8)
	2017	0		0		1	95	0	
Yellow Perch Gill Net	2014	25	114 (2.2)	5	114 (3.0)	6	105 (6.2)	3	108 (1.6)
	2015	48	98 (1.1)	17	100 (4.0)	6	94 (5.1)	1	89
	2016	14	102 (2.0)	5	107 (4.6)	4	103 (4.7)	1	103
	2017	0		0		1	96	0	
	2018	17	104 (2.4)	1	101	0		0	

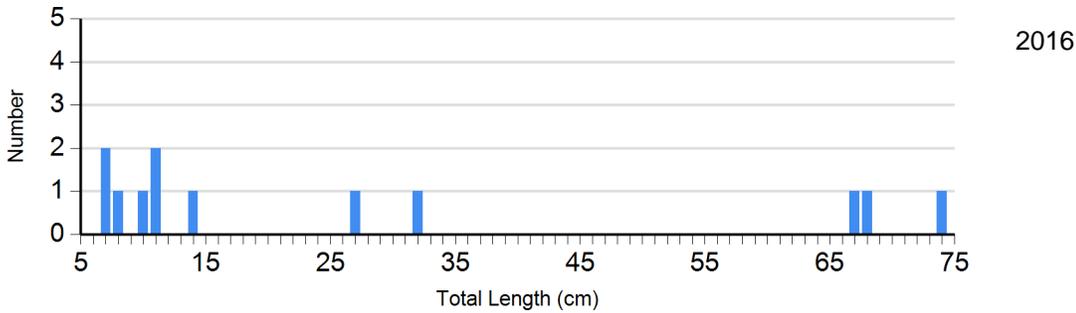
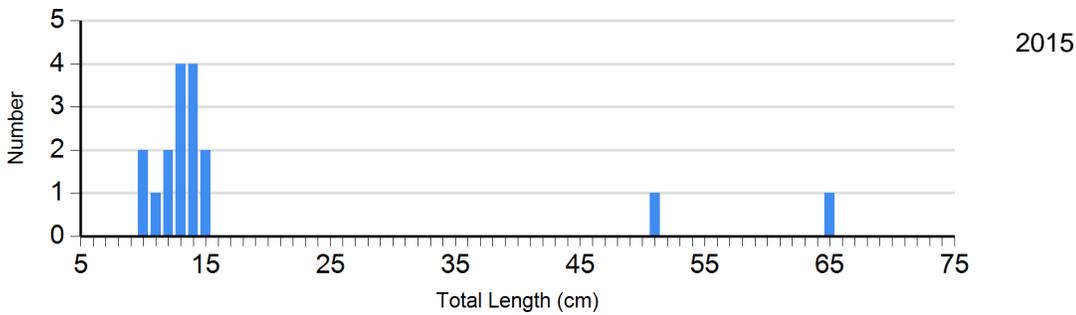
# Length Frequency Distribution

Length frequency histogram of species sampled by year.

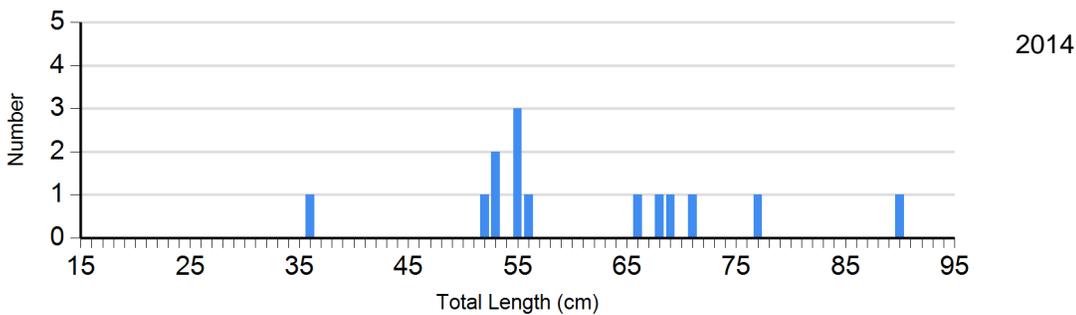
Species: Common Carp  
Gear: AFS std gill net



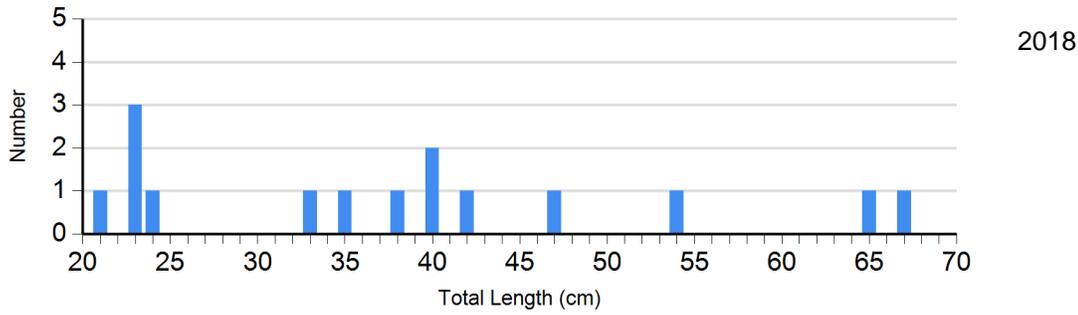
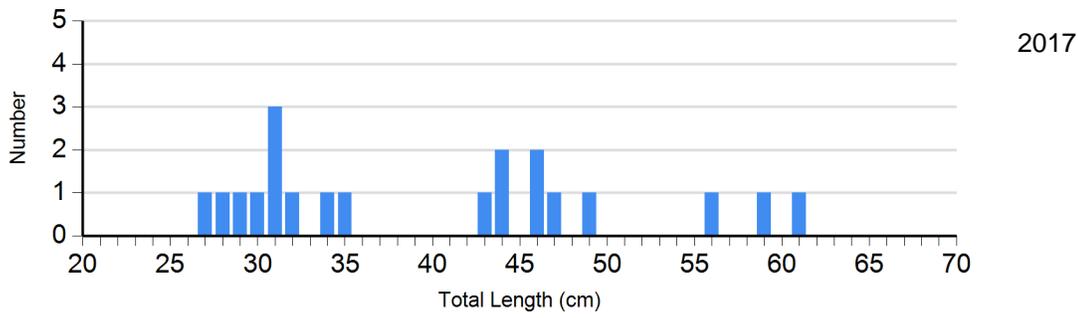
Species: Common Carp  
Gear: std exp gill net



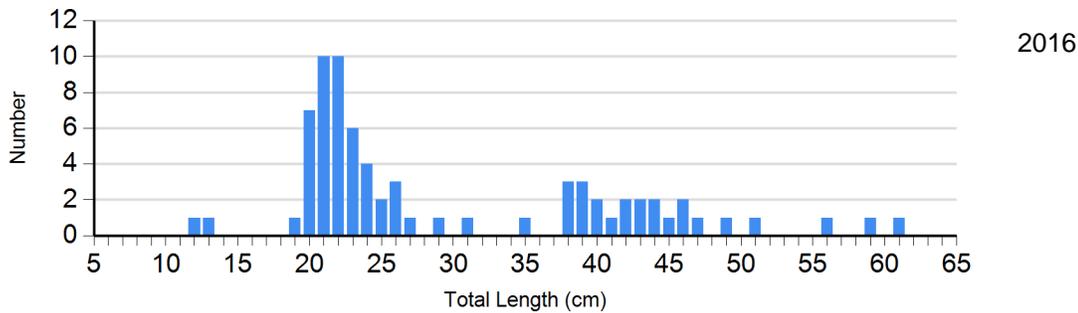
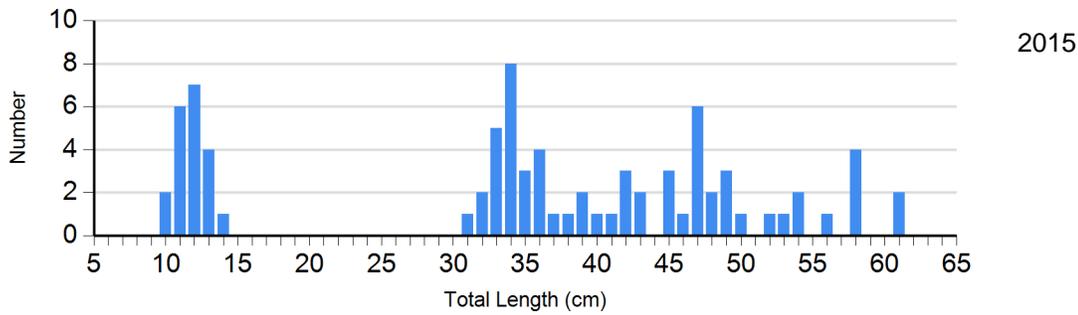
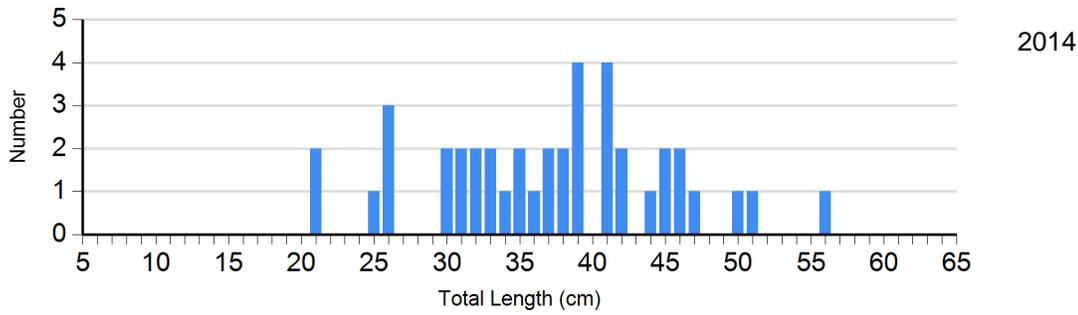
Species: Northern Pike  
Gear: std exp gill net



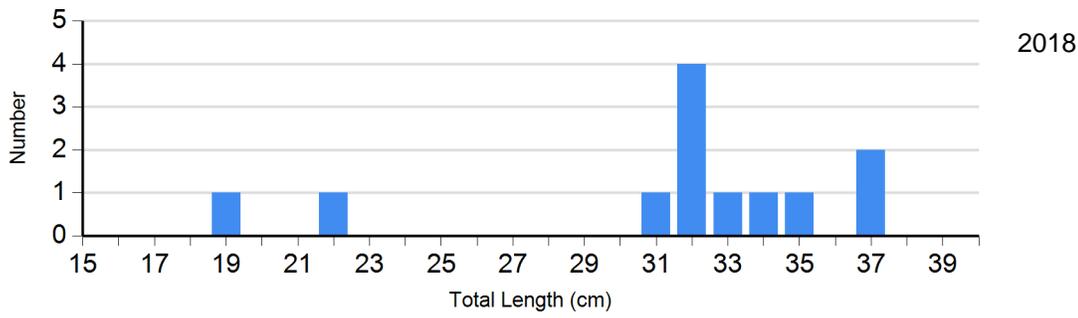
Species: Walleye  
 Gear: AFS std gill net



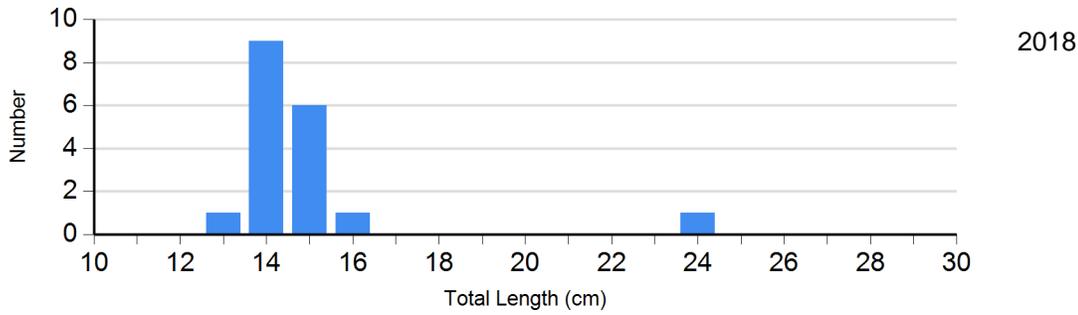
Species: Walleye  
 Gear: std exp gill net



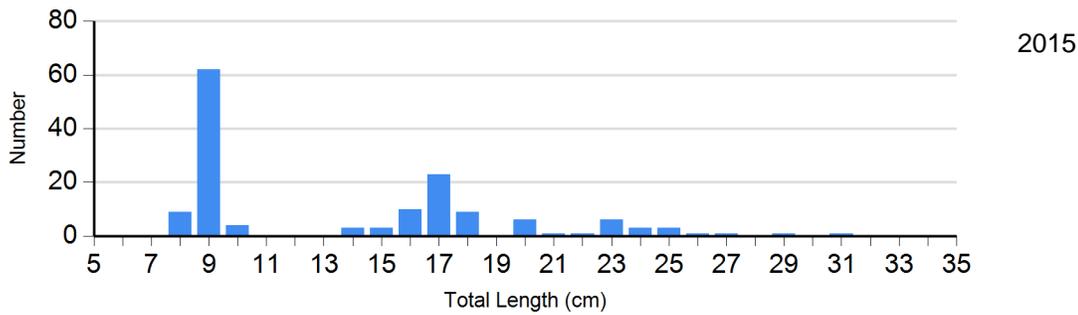
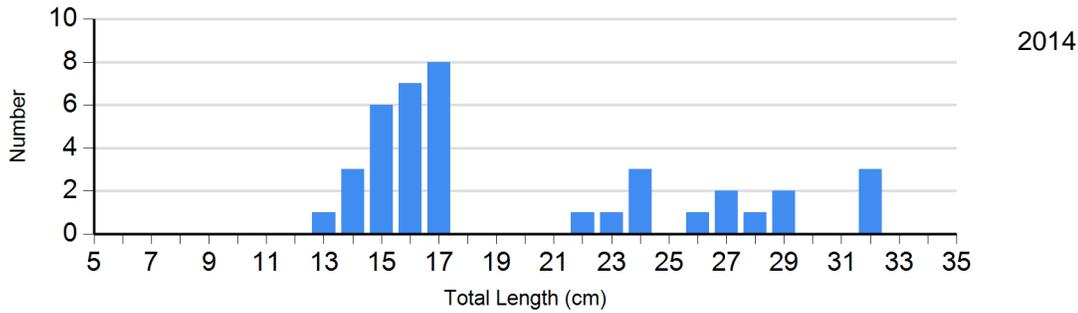
Species: White Bass  
 Gear: AFS std gill net

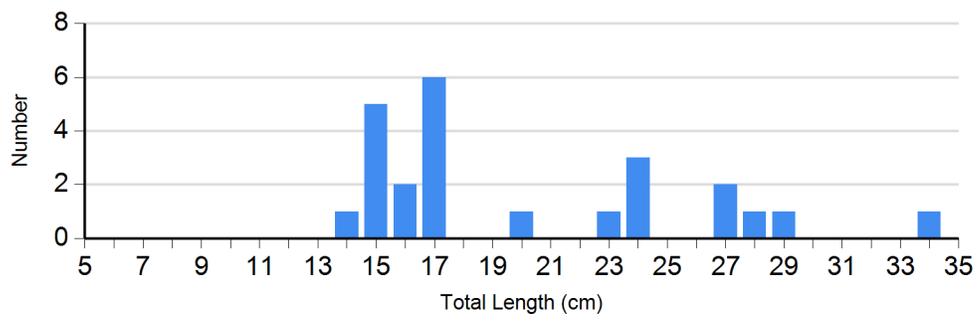


Species: Yellow Perch  
 Gear: AFS std gill net



Species: Yellow Perch  
 Gear: std exp gill net



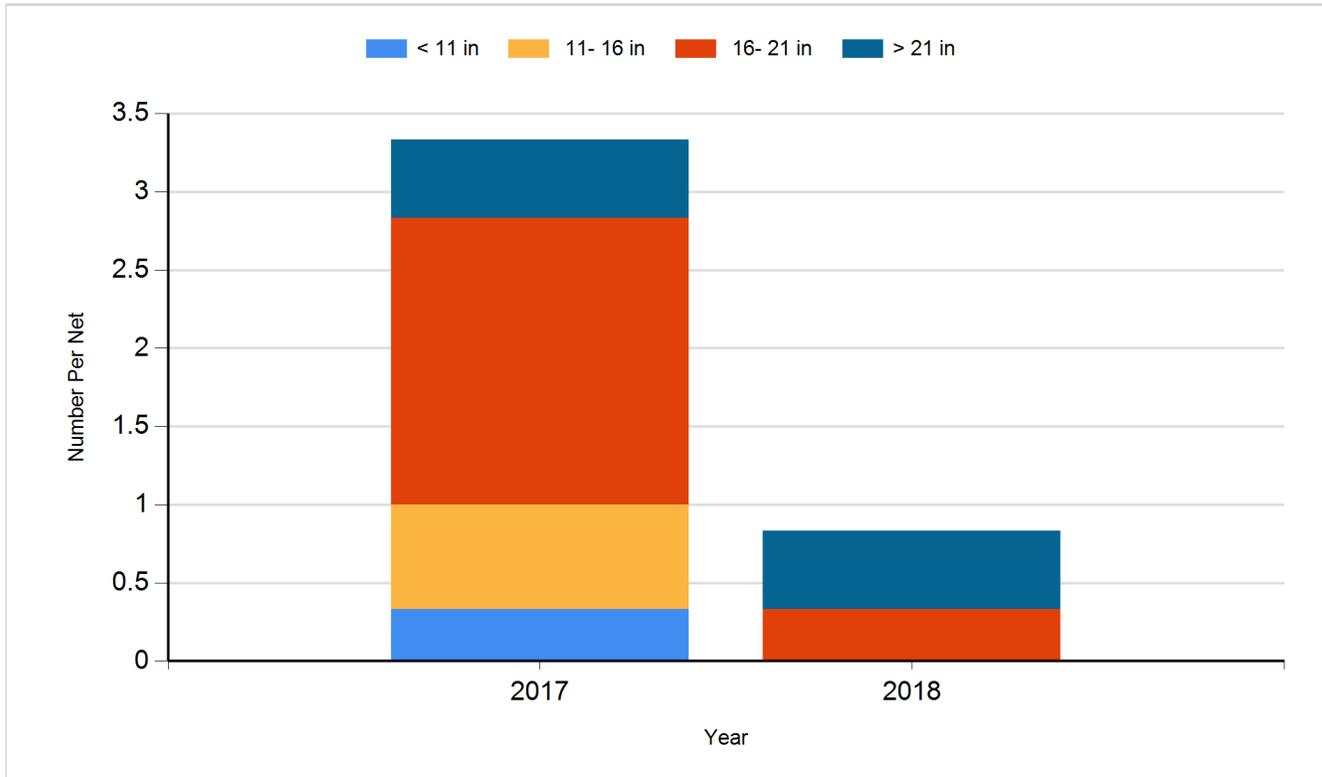


2016

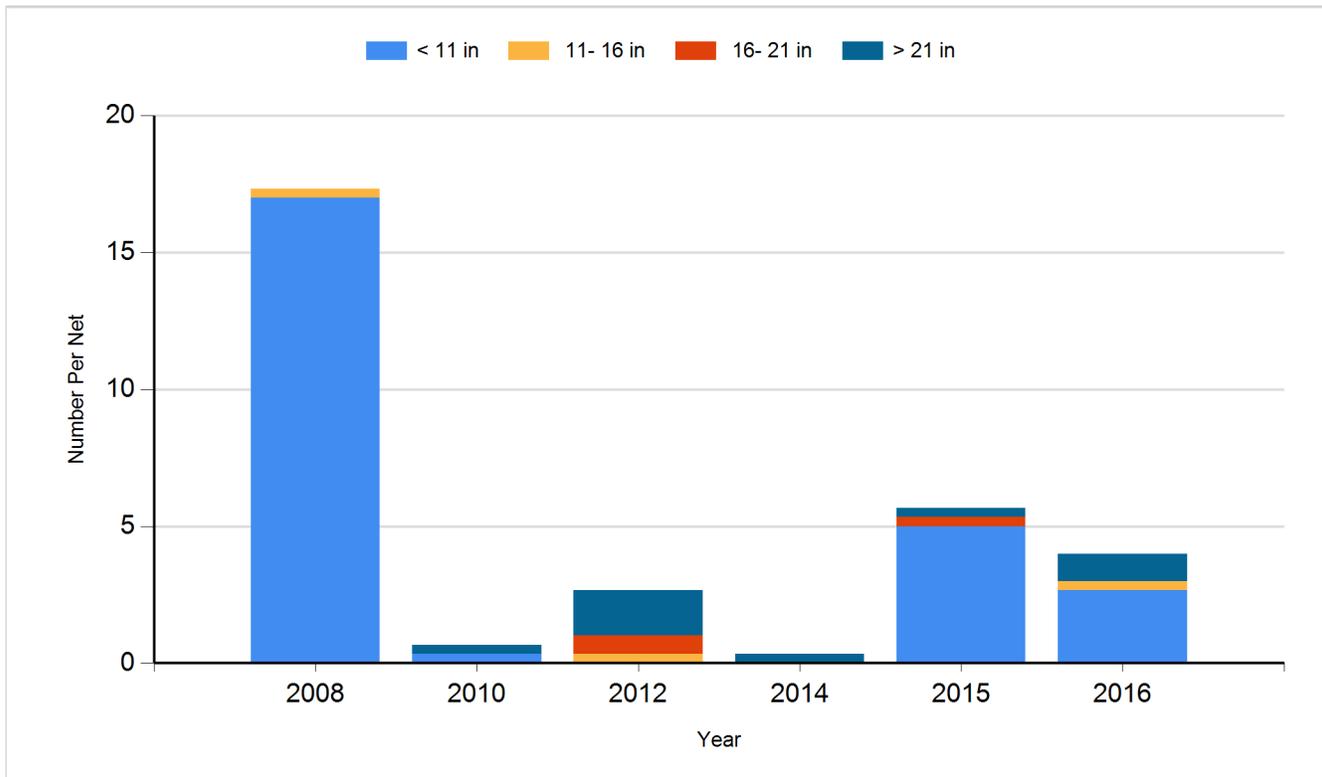
## Historic Fish Sizes and Relative Abundance

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

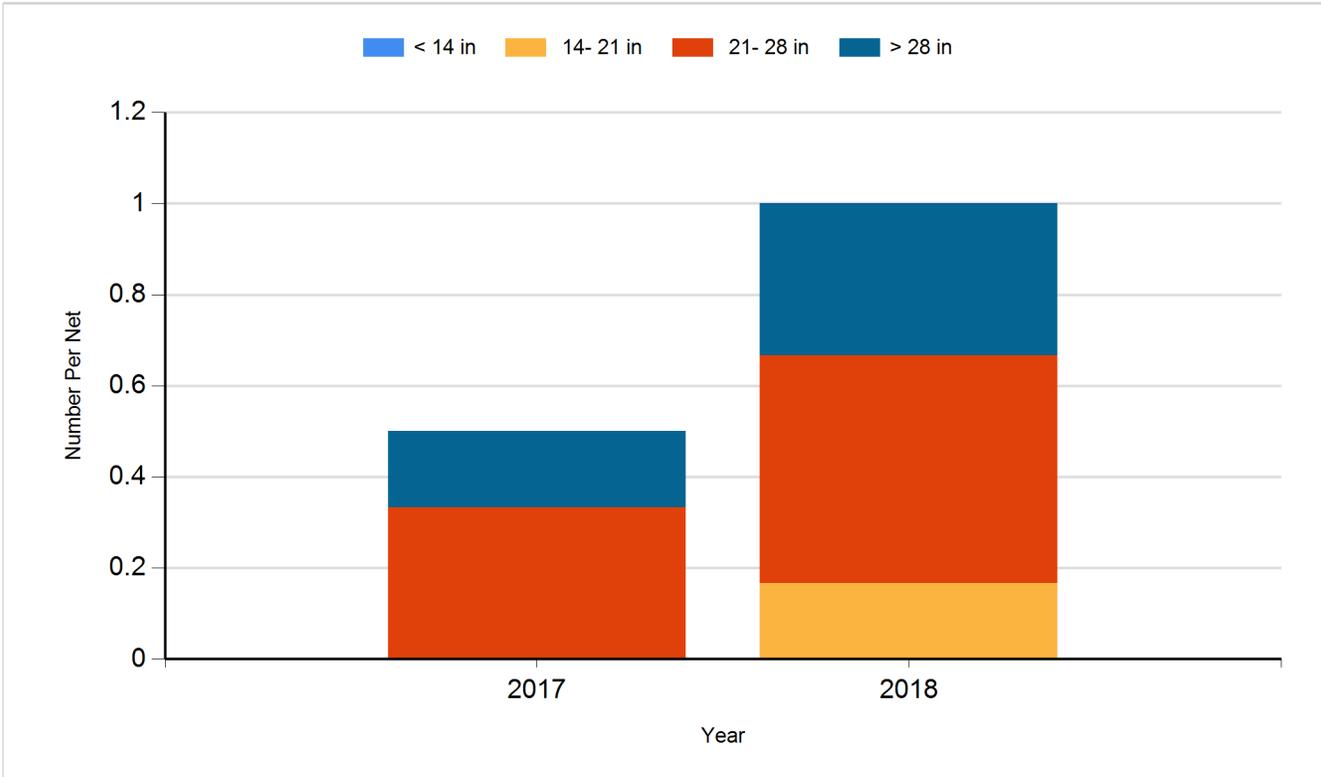
Species: Common Carp  
Gear: AFS std gill net



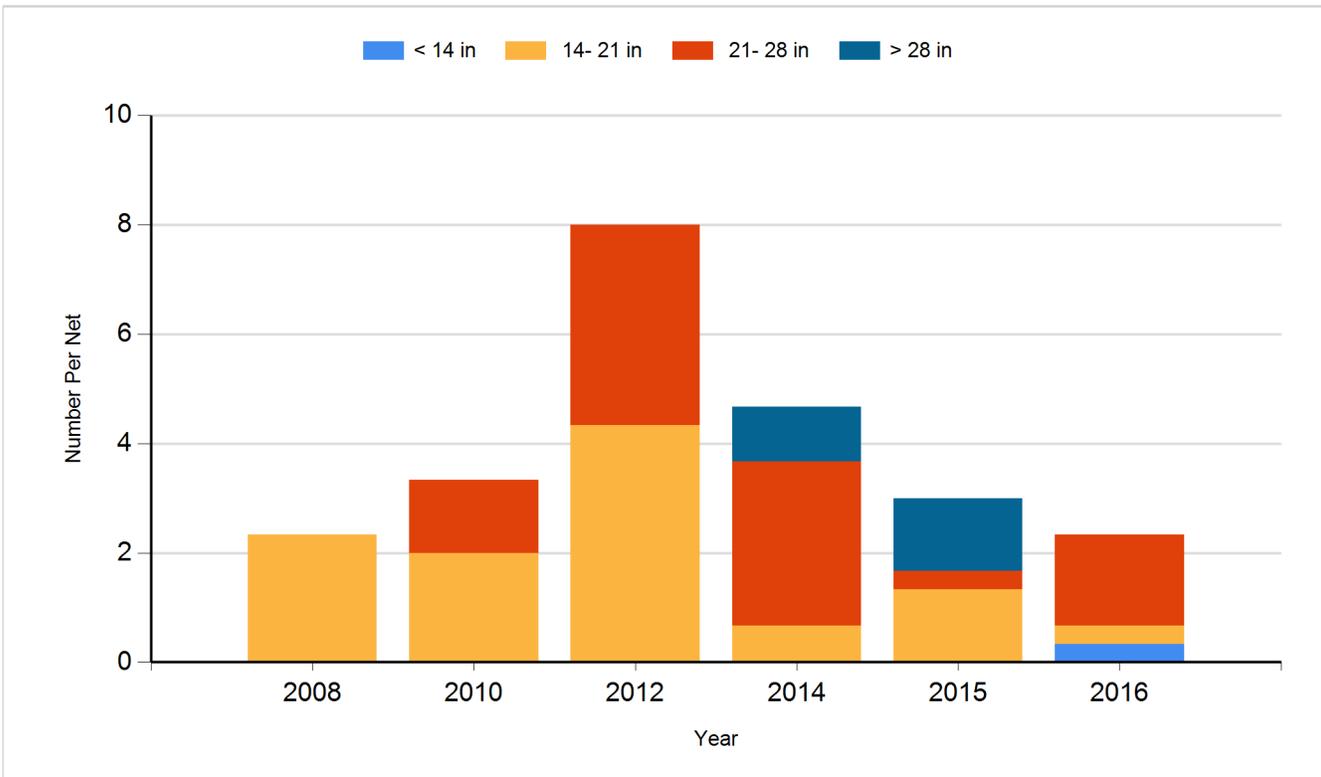
Species: Common Carp  
Gear: std exp gill net



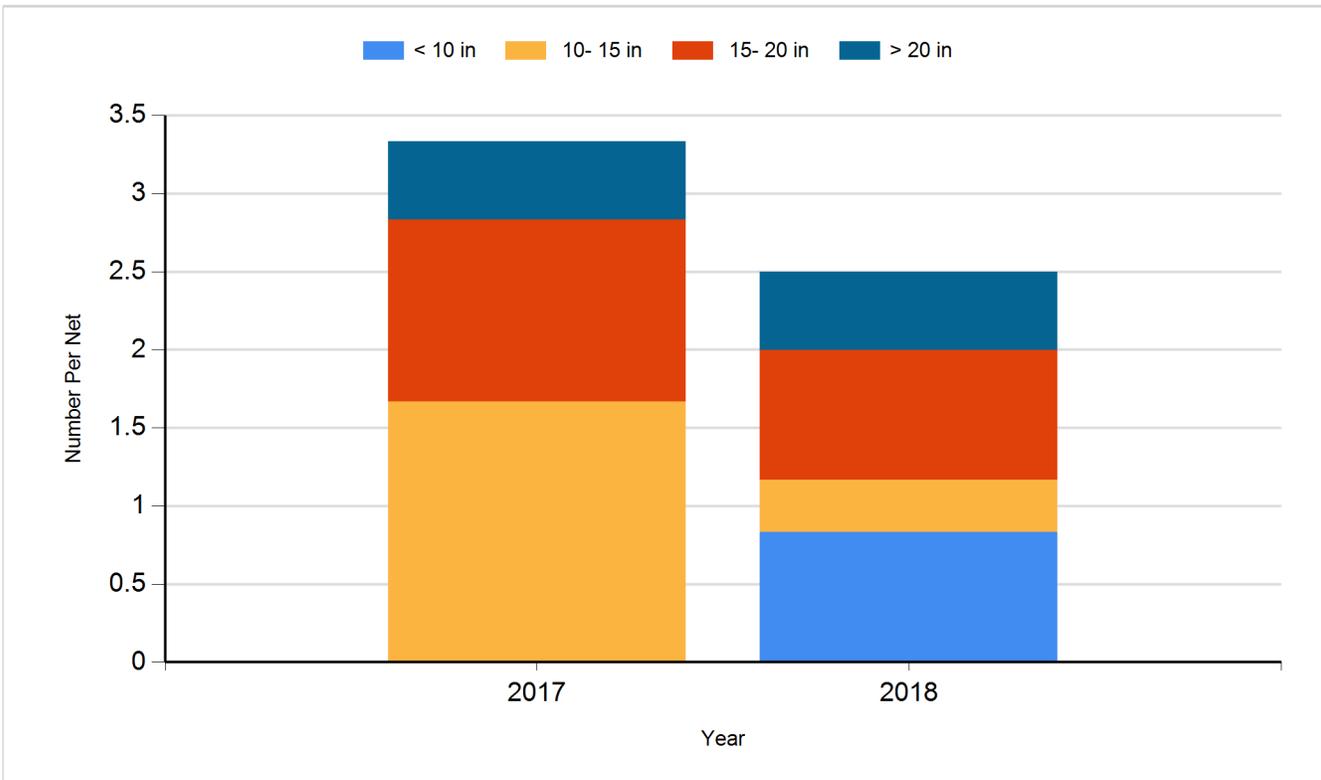
Species: Northern Pike  
Gear: AFS std gill net



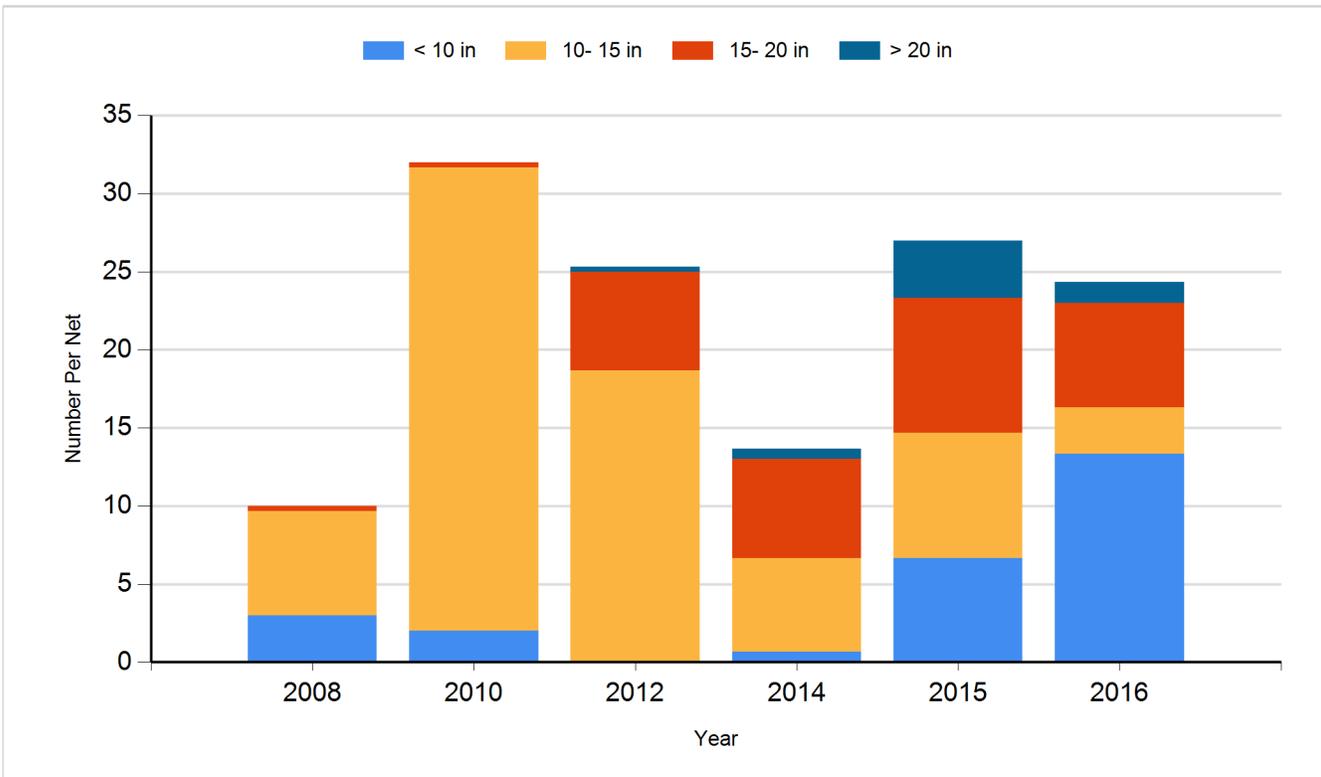
Species: Northern Pike  
Gear: std exp gill net



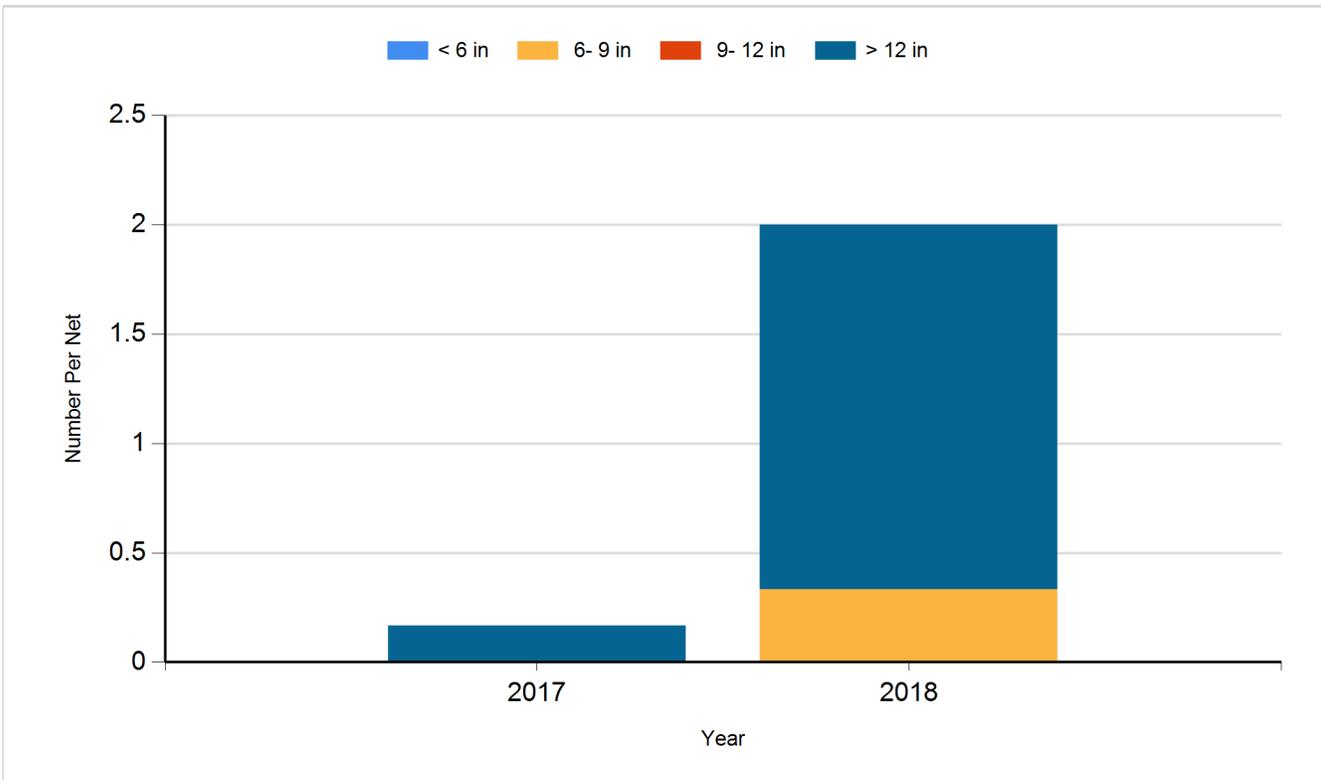
Species: Walleye  
Gear: AFS std gill net



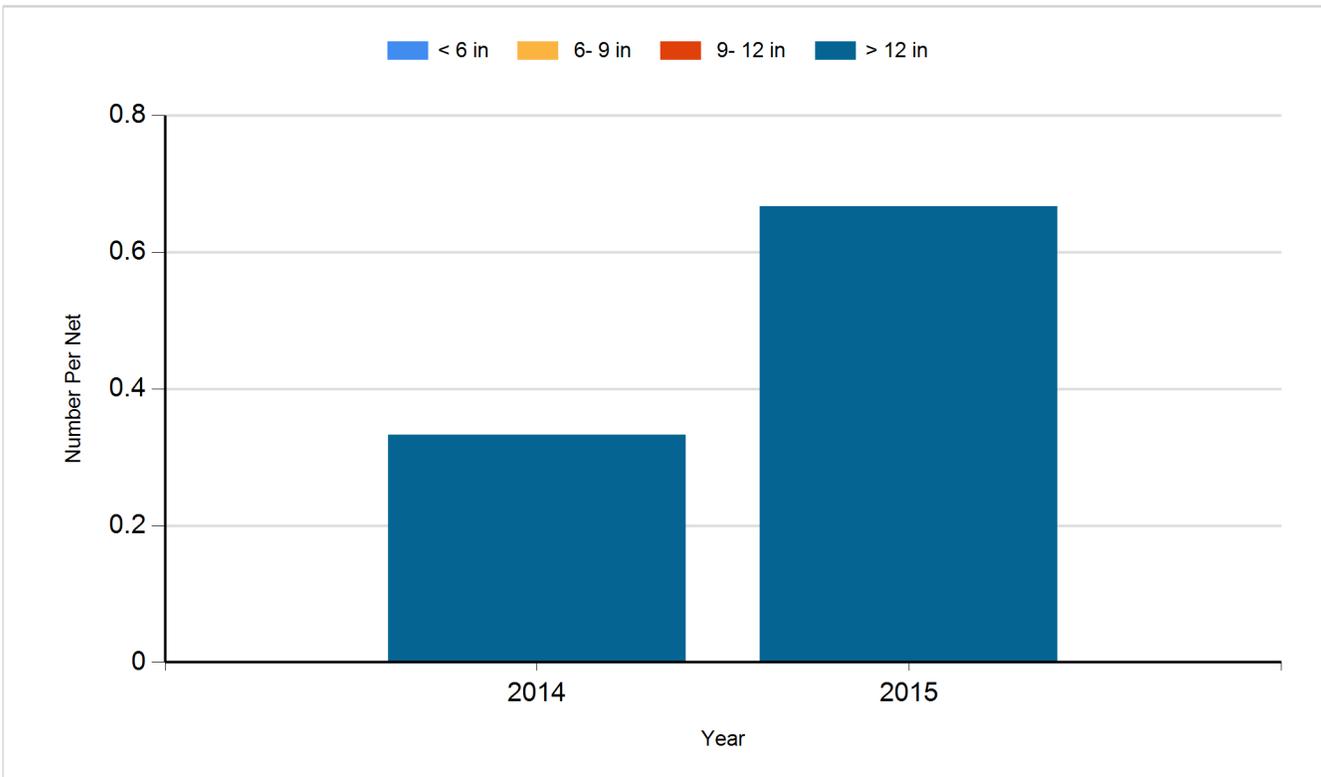
Species: Walleye  
Gear: std exp gill net



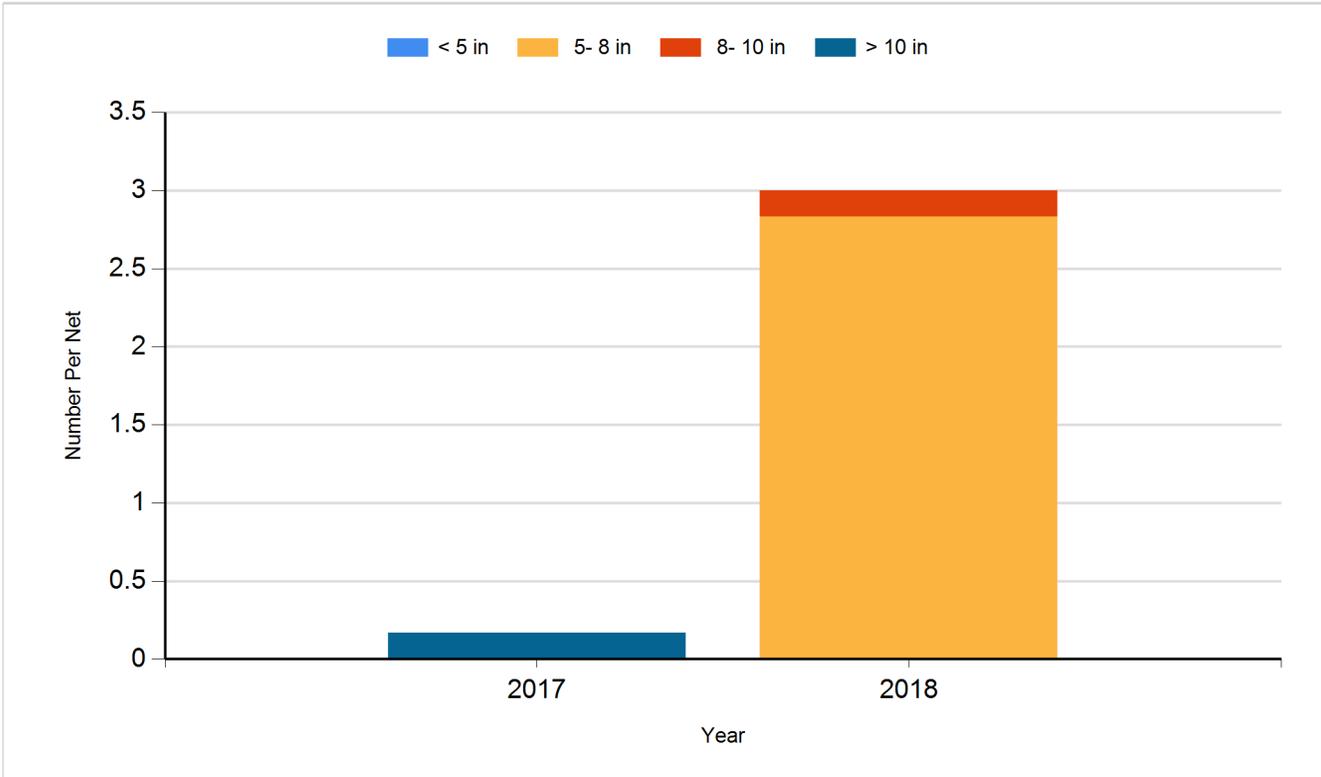
Species: White Bass  
Gear: AFS std gill net



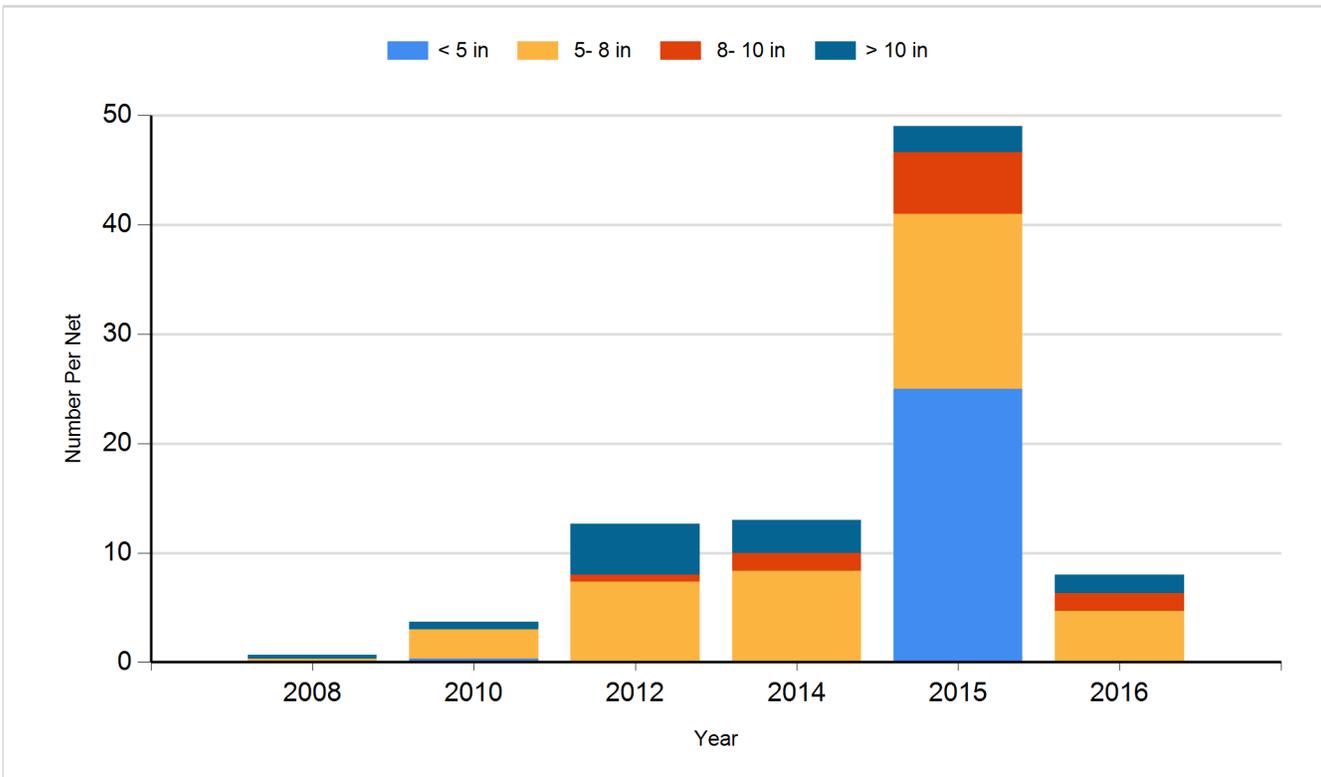
Species: White Bass  
Gear: std exp gill net



Species: 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
2007	Walleye	Fry	2,000,000
2008	Walleye	Fry	2,400,000
2010	Walleye	Fry	2,350,000
2012	Walleye	Fry	1,200,000
2013	Walleye	Fry	1,161,000
2014	Walleye	Fry	1,160,000
2015	Walleye	Fry	1,200,000
2018	Walleye	Fry	1,200,000