

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Swan, Turner County

VER-Lake-113-000

2018

## Lake Information

<b>Name:</b>	Swan	<b>Maximum Depth:</b>	6 Feet
<b>County:</b>	Turner	<b>Mean Depth:</b>	3 Feet
<b>Legal Description:</b>	T97N-R53W-Sec 15-16	<b>OHWM Elevation:</b>	1,253
<b>Surface Area:</b>	183 Acres	<b>Outlet Elevation:</b>	1,252

## Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 30, 2018	6 net-nights
frame net (std 3/4 in)	May 30, 2018	5 net-nights

## **Common Fish Species Present**

Walleye

White Crappie

Black Bullhead

Channel Catfish

White Sucker

Bigmouth Buffalo

Common Carp

Green Sunfish

River Carpsucker

O. Spotted X Gr. Sunfish Hybrid

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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	16	2.7	1.2	88		0			
	Black Bullhead	3	0.5	0.5	67		0			
	Channel Catfish	39	6.5	3.7	59	12	3	87	2	
	Common Carp	15	2.5	1.2	93		33			
	Walleye	42	7.0	0.9	98		55	11	80	1
	White Crappie	2	0.3	0.3	50		50		95	16
	White Sucker	1	0.2	0.2	100		100			
frame net (std 3/4 in)	Black Bullhead	115	23.0	4.6	78	6	0			
	Channel Catfish	7	1.4	0.9	43		0	86	4	
	Common Carp	1	0.2	0.3	100		0			
	Green Sunfish	2	0.4	0.4	0		0			
	O. Spotted X Gr. Sunfish Hybrid	11	0.0	0.0						
	River Carpsucker	1	0.2	0.3	100		100			
	Walleye	11	2.2	1.6	91		73		77	2
White Crappie	128	25.6	3.8	100		100		90	1	
White Sucker	15	3.0	1.0	100		87				

## 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 frame net	Bigmouth Buffalo									0.4		0.4
	Black Bullhead									1.0		1.0
	Common Carp									0.2		0.2
	Green Sunfish									0.6		0.6
	Orangespotted Sunfish									0.0		0.0
	River Carpsucker									0.6		0.6
	Shortnose Gar									0.0		0.0
	Sunfish Hybrid									0.0		0.0
	Walleye									0.6		0.6
	White Crappie									49.4		49.4
White Sucker									0.6		0.6	
AFS std gill net	Bigmouth Buffalo									0.8	2.7	1.8
	Black Bullhead									2.0	0.5	1.3
	Channel Catfish									3.3	6.5	4.9
	Common Carp									7.7	2.5	5.1
	Walleye									6.0	7.0	6.5
	White Crappie										0.3	0.3
	White Sucker										0.2	0.2
frame net (std 3/4 in)	Bigmouth Buffalo	2.8				0.4	0.2	0.4	0.4			0.8
	Black Bullhead	184.2		162.0		37.8	40.4	31.8	60.6		23.0	77.1
	Black Crappie	3.6								0.2		1.9
	Bluegill			0.8			0.4	0.4				0.5
	Channel Catfish	1.0		0.6		1.2	0.4		5.2		1.4	1.6
	Common Carp	0.2		0.4		0.4	2.4	0.2	3.4		0.2	1.0
	Green Sunfish	4.0		13.0		0.2	0.4	22.8	0.4		0.4	5.9
	Northern Pike			0.4		0.2						0.3
	O. Spotted X Gr. Sunfish Hybrid										0.0	0.0
	Orangespotted Sunfish			0.0					0.0			0.0
	River Carpsucker										0.2	0.2
	Shortnose Gar			0.0		0.0						0.0
	Sunfish Hybrid							0.0	0.0	0.0		0.0
	Walleye			2.8		3.2	2.4	1.8	2.4		2.2	2.5
	White Crappie	69.6		5.8			5.0	5.0	46.2		25.6	26.2
	White Sucker	11.0		18.8		4.4	10.6	10.2	2.8		3.0	8.7

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
frame net (std	Yellow Perch	1.4		2.0								1.7
std exp gill net	Bigmouth Buffalo	1.7				3.7	2.7	1.7	2.7			2.5
	Black Bullhead	5.7		21.3		8.0	13.7	21.7	5.3			12.6
	Channel Catfish	2.0		0.0			0.7	3.0	2.0			1.5
	Common Carp	0.7		1.0		2.3	0.3	1.7	3.0			1.5
	River Carpsucker					0.3						0.3
	Shortnose Gar			0.0								0.0
	Sunfish Hybrid						0.0					0.0
	Walleye	1.3		10.0		2.3	20.3	34.7	20.7			14.9
	White Crappie	13.7		0.7				0.7	1.3			4.1
	White Sucker	1.3		11.3		2.3	2.3	0.7				3.6
	Yellow Perch	0.0		3.3				4.0	0.3			1.9

## 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 frame net	Bigmouth Buffalo	PSD										100			
		PSD-P											0		
	Black Bullhead	PSD											60		
		PSD-P											0		
	Common Carp	PSD											0		
		PSD-P											0		
	Green Sunfish	PSD											33		
		PSD-P											0		
	River Carpsucker	PSD											100		
		PSD-P											100		
	Walleye	PSD											100		
		PSD-P											33		
	White Crappie	Wr											71		
		PSD											98		
		PSD-P											63		
	White Sucker	Wr											91		
		PSD											100		
		PSD-P											33		
AFS std gill net	Bigmouth Buffalo	PSD										60		88	
		PSD-P											0		0
	Black Bullhead	PSD											42		67
		PSD-P											0		0
	Channel Catfish	PSD											80		59
		PSD-P											0		3
		Wr											87		87
	Common Carp	PSD											87		93
		PSD-P											17		33
	Walleye	PSD											97		98
		PSD-P											31		55
		Wr											78		80
	White Crappie	PSD													50
		PSD-P													50
		Wr													95



Gear	Species	Index	Year										
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	White Sucker	PSD											100
		PSD-P											100
frame net (std 3/4 in)	Bigmouth Buffalo	PSD	57				0	0	100	100			
		PSD-P	0				0	0	0	0			
		Wr	86				92						
	Black Bullhead	PSD	44		1		5	5	62	73			78
		PSD-P	0		0		0	0	0	0			0
		Wr	68		90		82						
	Channel Catfish	PSD	100		100		33	50		35			43
		PSD-P	0		33		17	0		0			0
		Wr	89		95		92	101		93			86
	Common Carp	PSD	100		50		100	75	100	94			100
		PSD-P	0		0		0	0	0	35			0
		Wr	70		89		87						
	Green Sunfish	PSD	5		11		0	0	5	50			0
		PSD-P	0		0		0	0	0	0			0
		Wr	95		114		95		129	84			
	River Carpsucker	PSD											100
		PSD-P											100
	Walleye	PSD			21		88	83	100	100			91
PSD-P				7		31	50	11	50			73	
Wr				86		87	88	94	85			77	
White Crappie	PSD	0		34			28	84	15			100	
	PSD-P	0		0			28	68	15			100	
	Wr	93		92			108	109	106			90	
White Sucker	PSD	100		98		100	100	100	100			100	
	PSD-P	56		45		100	100	100	100			87	
	Wr	85		92		95							
std exp gill net	Bigmouth Buffalo	PSD	20				0	25	40	38			
		PSD-P	0				0	0	0	25			
		Wr	82				98						
	Black Bullhead	PSD	35		0		0	2	46	31			
		PSD-P	0		0		0	0	0	0			
		Wr	75		94		95						
	Channel Catfish	PSD	100		0			100	11	83			
		PSD-P	0		0			0	0	0			

Gear	Species	Index	Year									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
std exp gill net	Channel Catfish	Wr	84					78	102	93		
	Common Carp	PSD	100		33		29	100	60	78		
		PSD-P	0		0		0	0	0	11		
		Wr	73		94		89					
	River Carpsucker	PSD					100					
		PSD-P					100					
		Wr					119					
	Walleye	PSD	100		7		29	18	93	87		
		PSD-P	25		0		14	2	2	5		
		Wr	84		93		92	87	93	88		
	White Crappie	PSD	7		0				50	25		
		PSD-P	5		0				50	0		
		Wr	80		96				110	106		
	White Sucker	PSD	100		91		100	100	100			
		PSD-P	25		21		100	100	100			
		Wr	93		96		101					

## **Fish Condition**

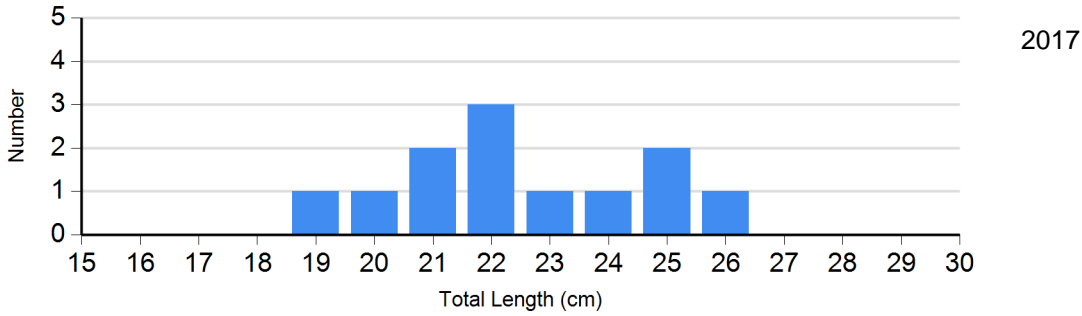
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Channel Catfish Gill Net	2014	0		2	78 (3.6)	0		0	
	2015	8	105 (2.7)	1	79	0		0	
	2016	1	98	5	93 (3.6)	0		0	
	2017	4	86 (3.3)	16	88 (3.5)	0		0	
	2018	16	86 (1.9)	22	88 (2.3)	1	77	0	
Walleye Gill Net	2014	50	87 (1.1)	10	87 (1.2)	1	81	0	
	2015	7	97 (3.5)	95	93 (0.5)	2	87 (5.0)	0	
	2016	8	96 (4.1)	51	87 (0.8)	3	80 (13.6)	0	
	2017	1	75	24	78 (1.8)	9	76 (1.5)	2	81 (1.2)
	2018	1	87	18	82 (1.1)	22	77 (0.7)	1	81
White Crappie Frame Net	2014	18	112 (1.7)	0		3	96 (2.0)	4	100 (1.5)
	2015	4	120 (3.0)	4	117 (8.2)	14	108 (4.5)	3	90 (4.7)
	2016	196	107 (0.9)	0		28	104 (1.5)	7	91 (8.6)
	2017	6	96	85	91 (1.3)	145	90 (0.6)	11	91 (2.3)
	2018	0		0		113	90 (0.6)	15	89 (1.1)

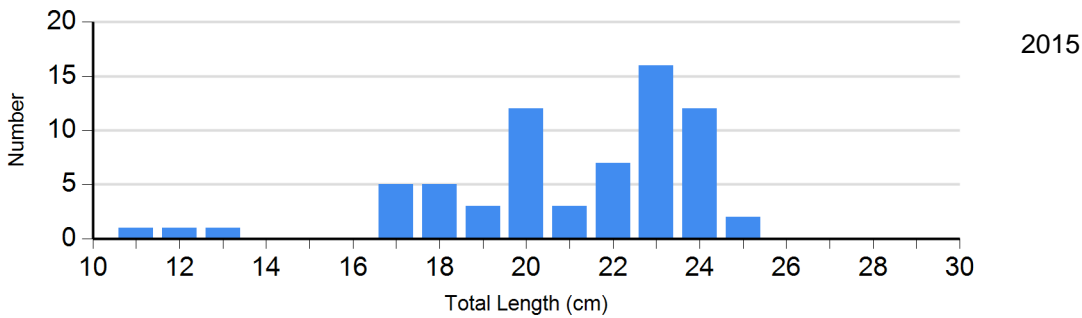
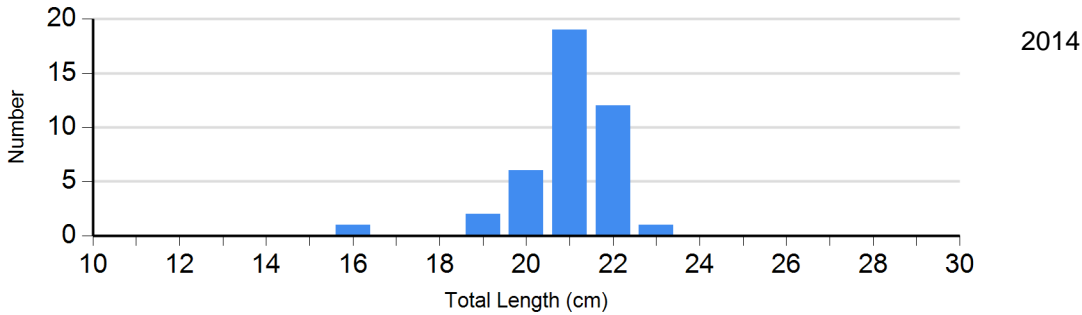
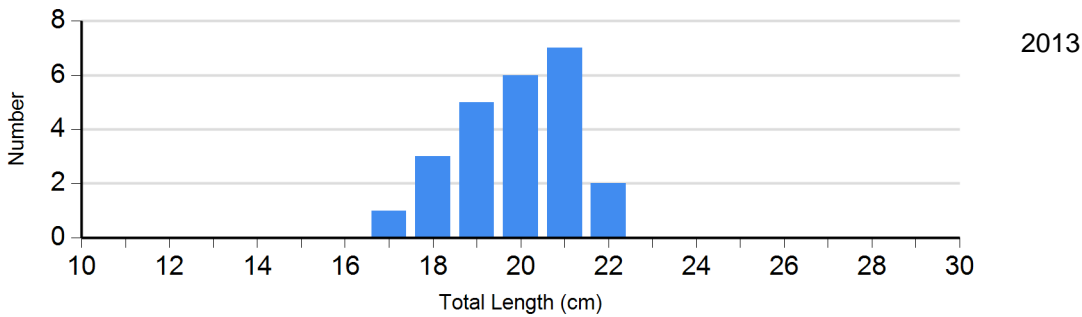
# Length Frequency Distribution

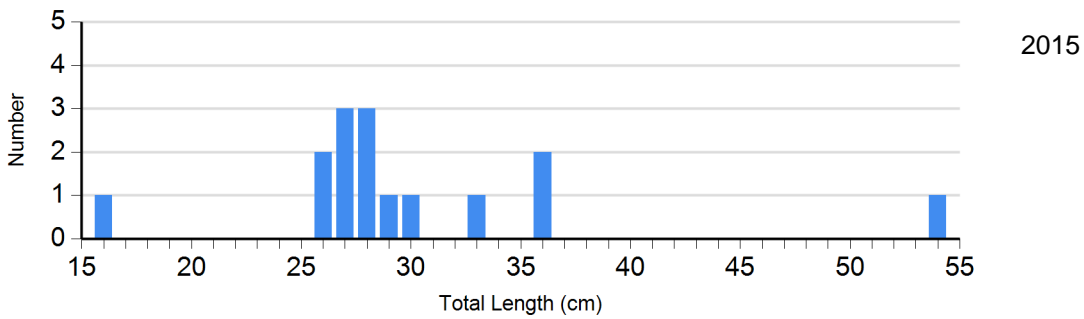
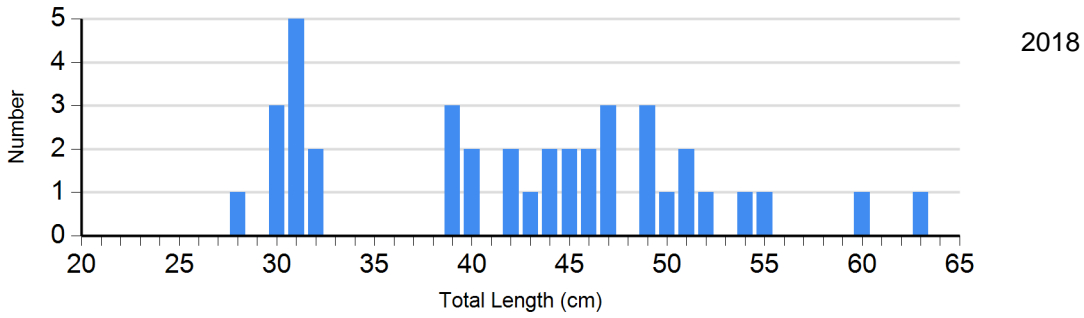
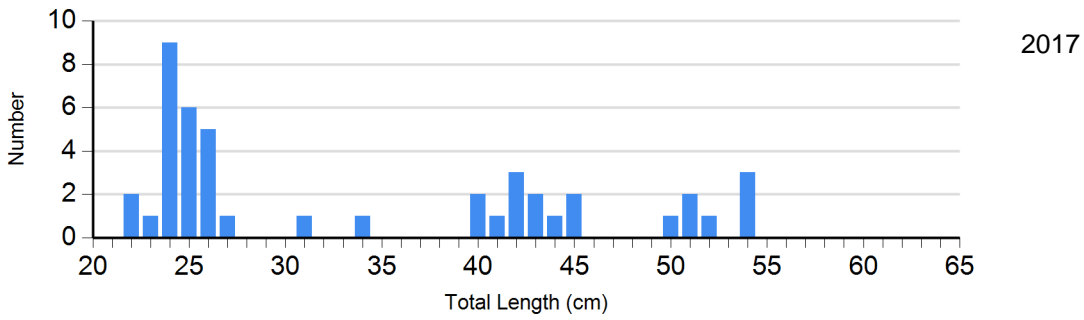
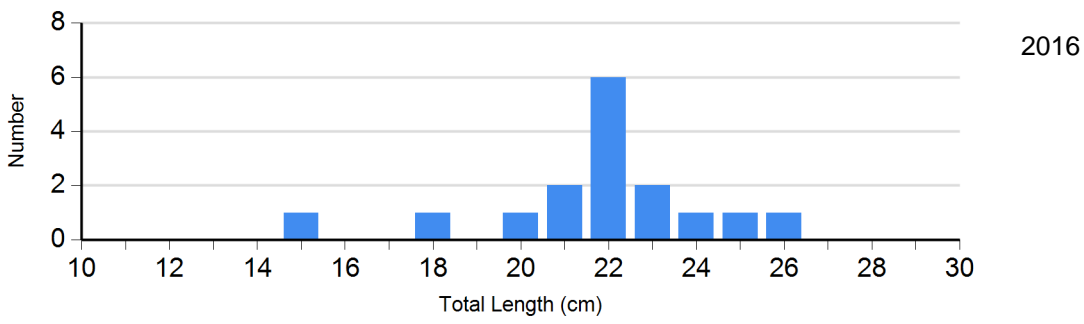
Length frequency histogram of species sampled by year.

Species: Black Bullhead  
Gear: AFS std gill net

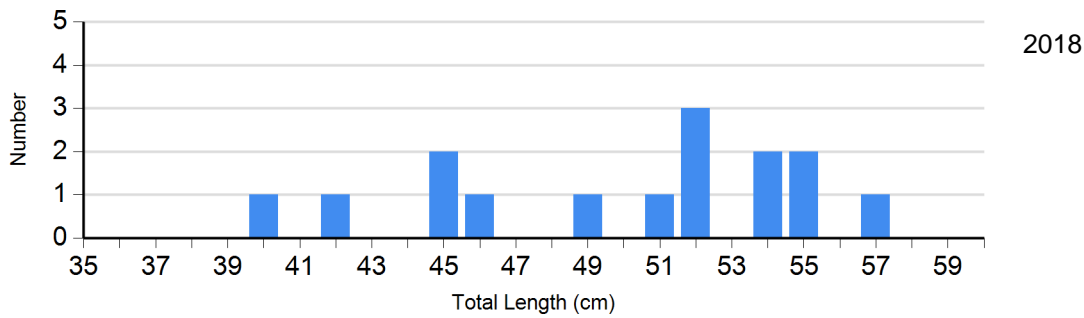
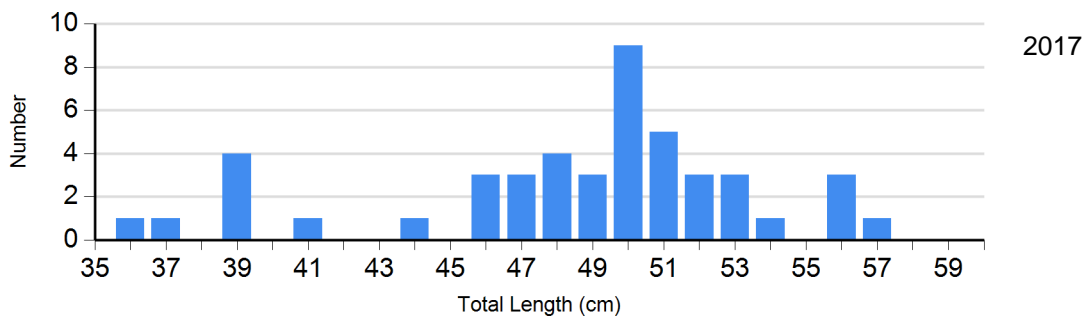


Species: Black Bullhead  
Gear: std exp gill net

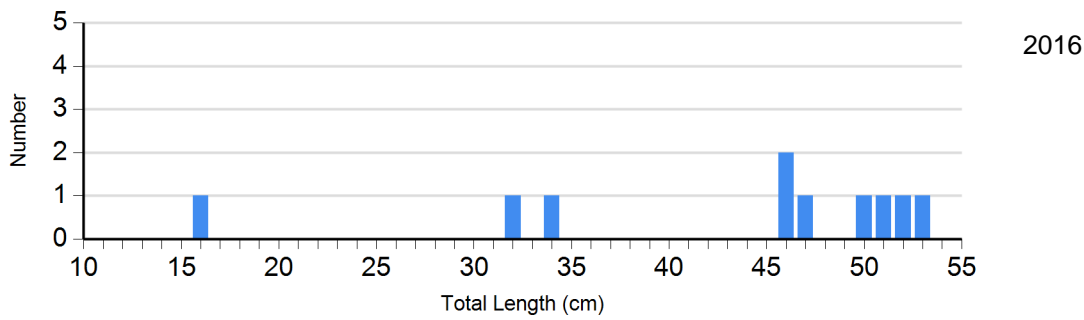




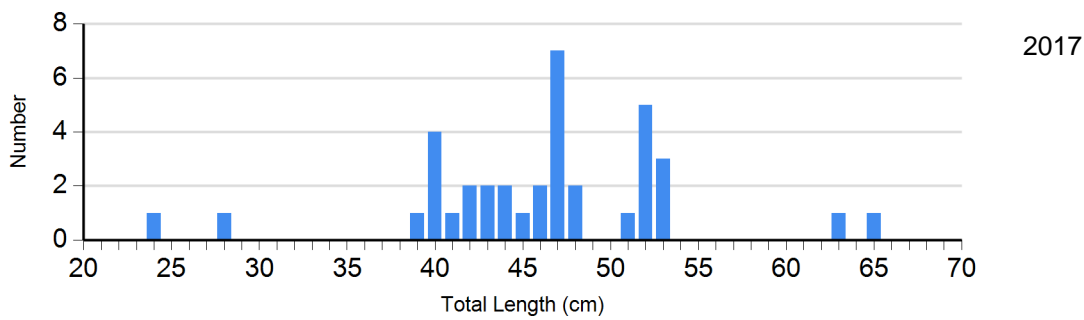
Species: Common Carp  
Gear: AFS std gill net

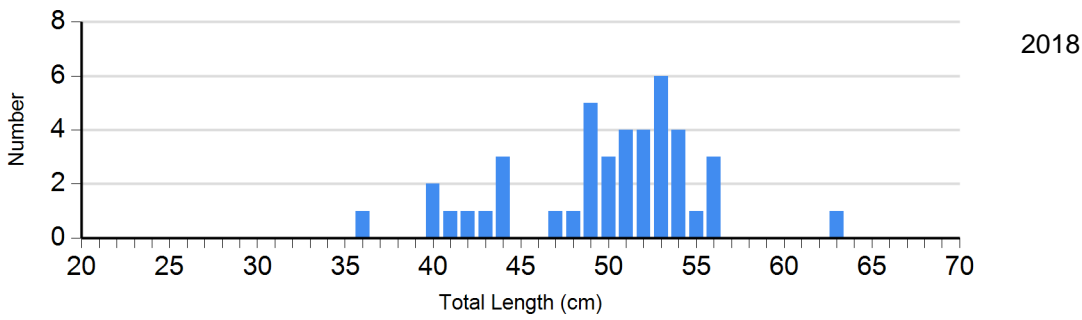


Species: Common Carp  
Gear: std exp gill net

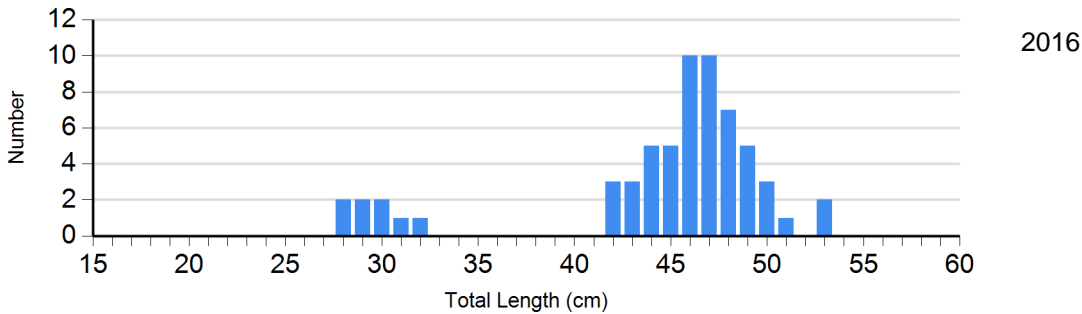
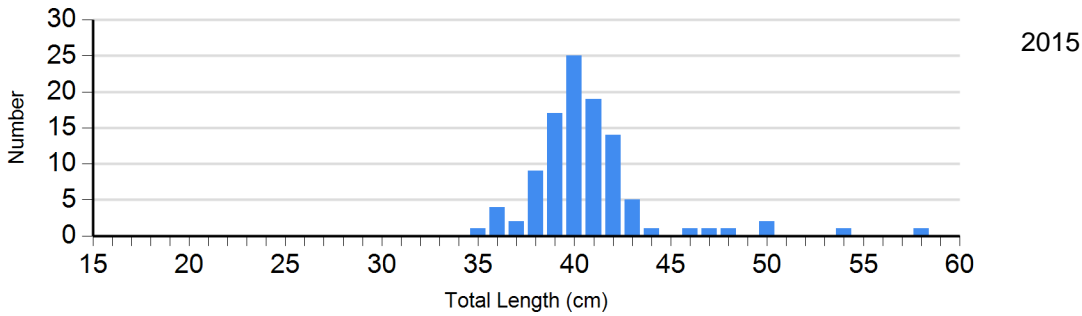
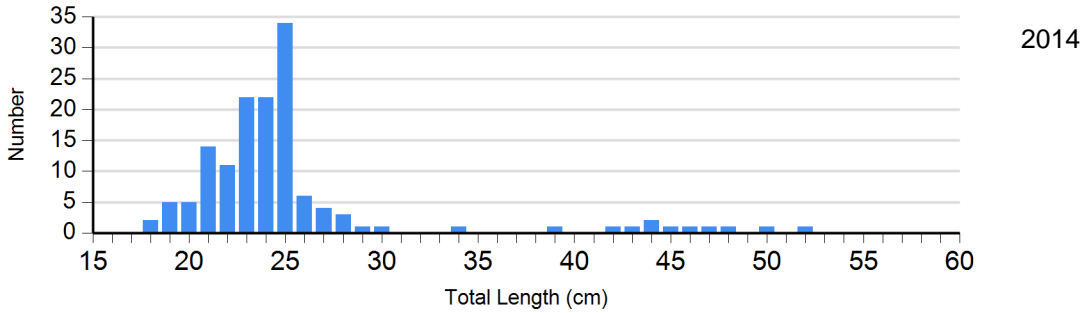


Species: Walleye  
Gear: AFS std gill net

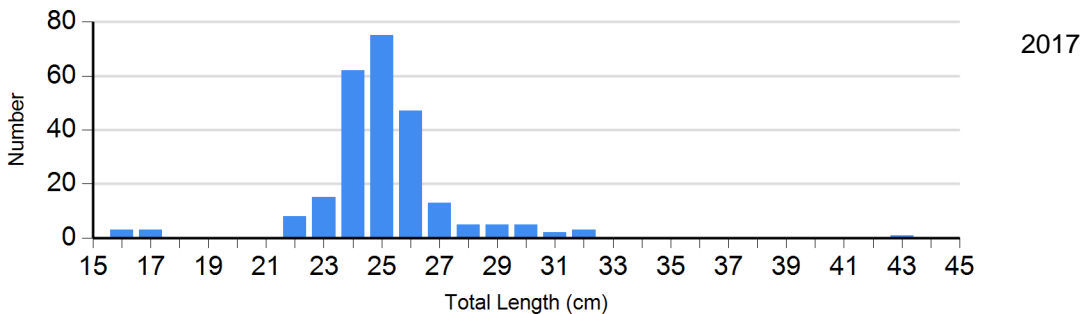




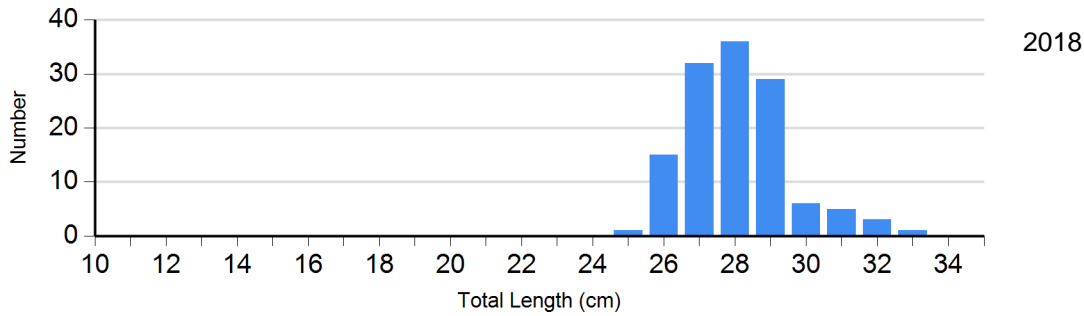
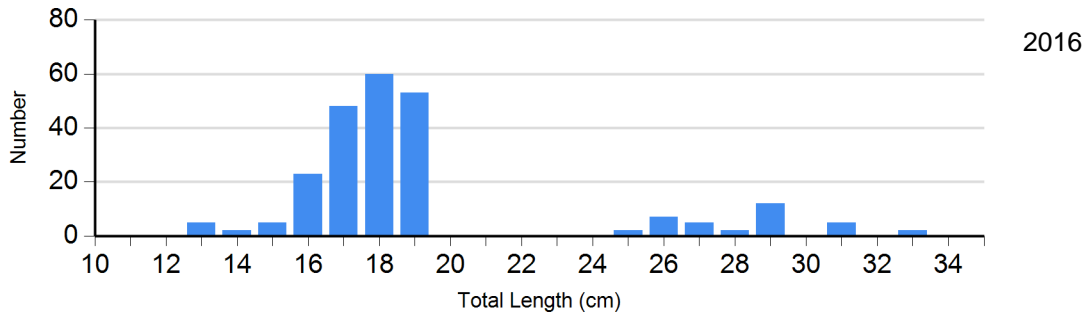
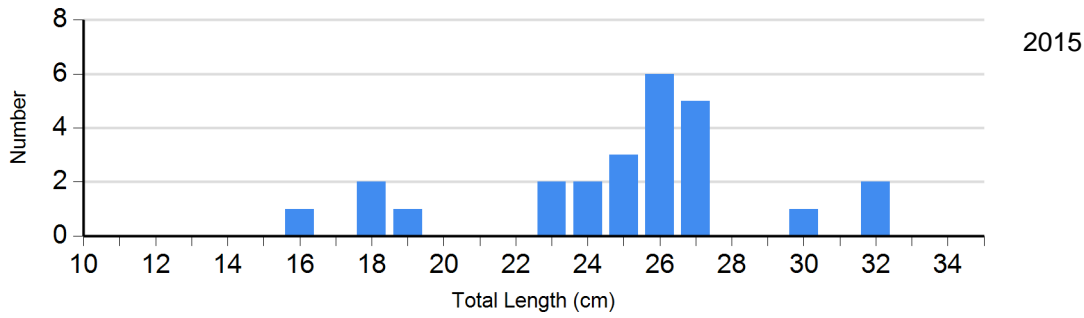
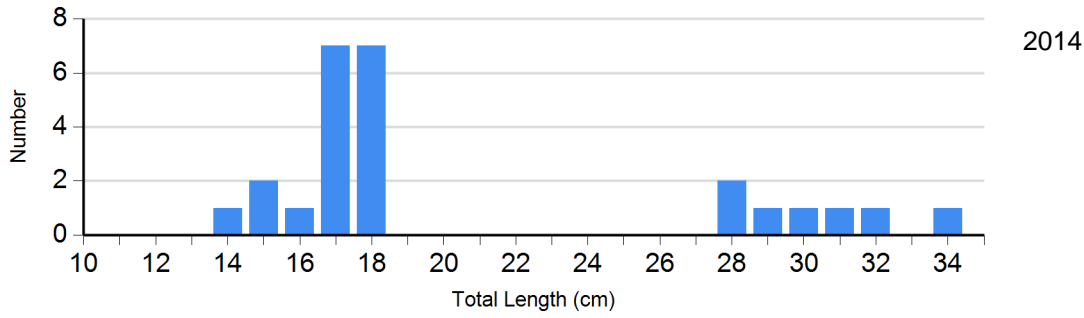
Species: Walleye  
Gear: std exp gill net



Species: White Crappie  
Gear: AFS std frame net



Species: White Crappie  
Gear: frame net (std 3/4 in)



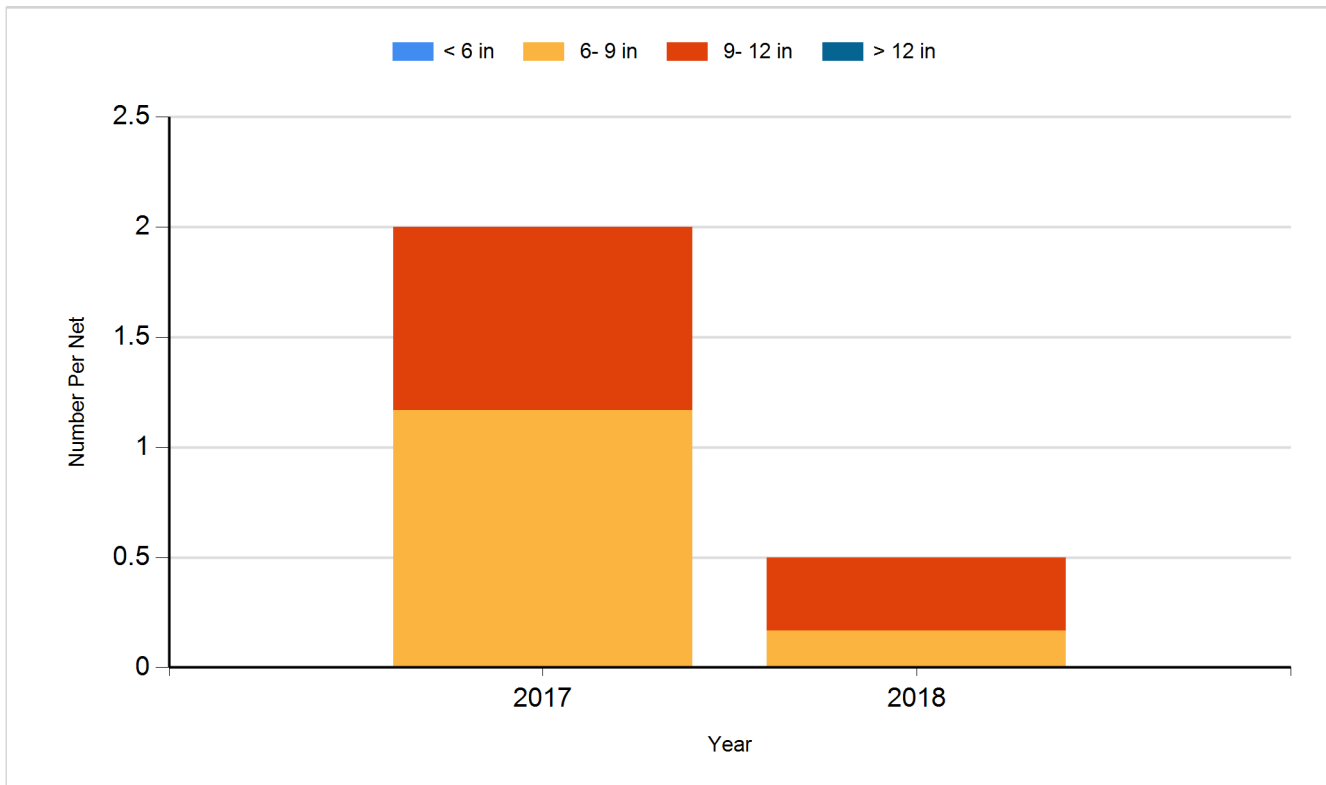


## Historic Fish Sizes and Relative Abundance

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

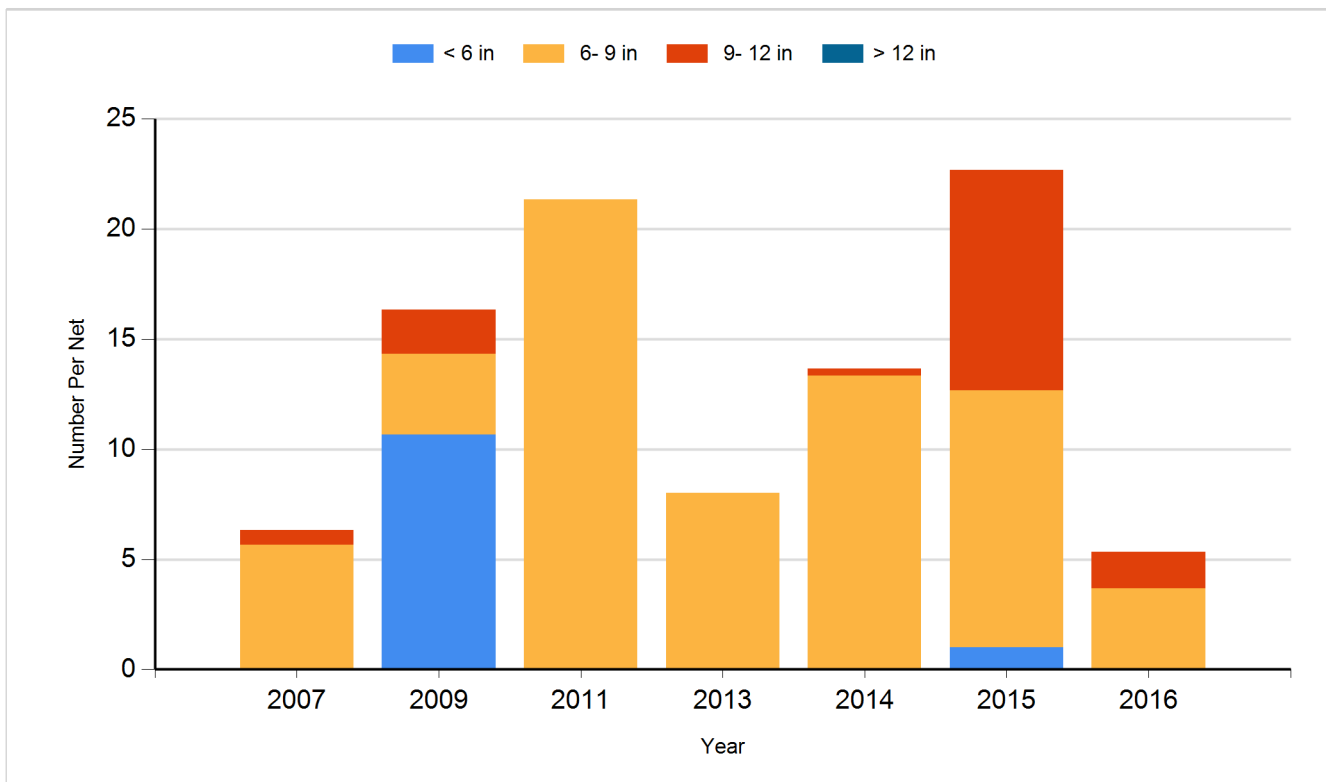
Species: Black Bullhead

Gear: AFS std gill net

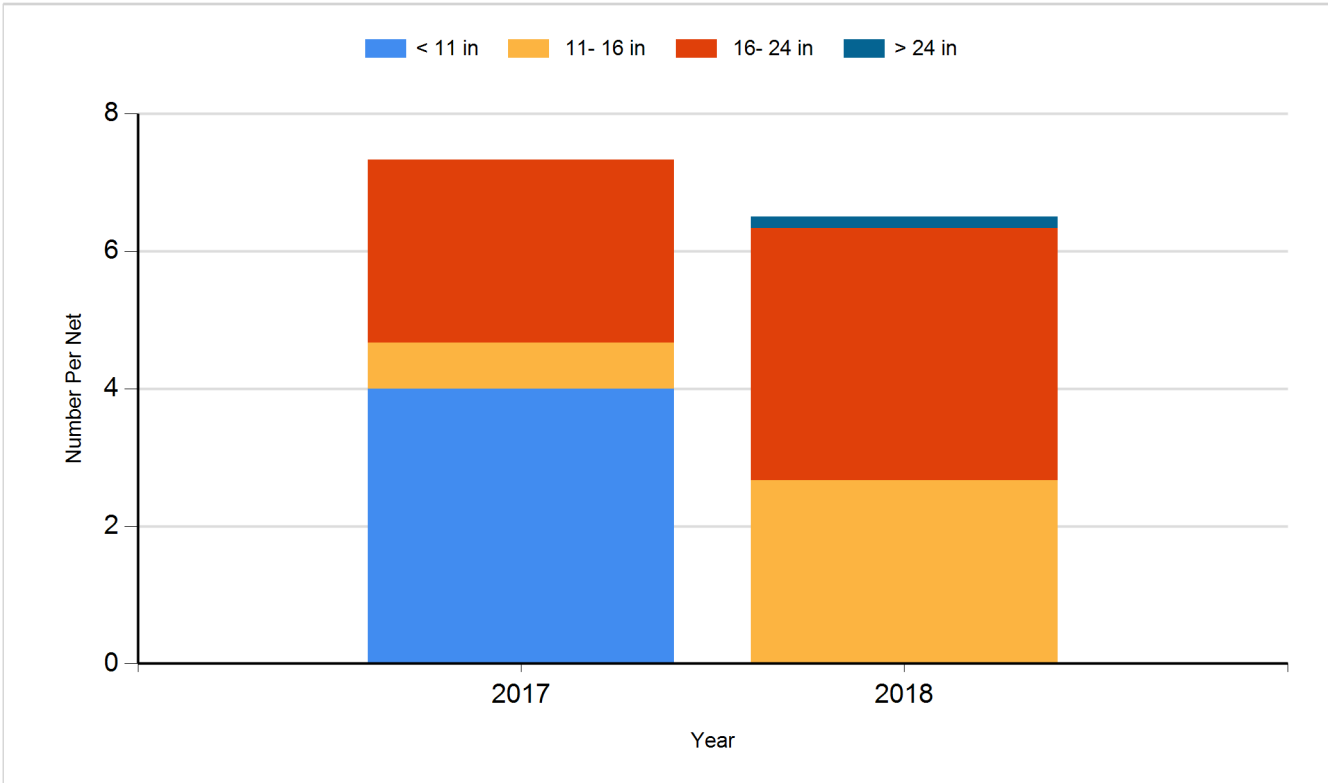


Species: Black Bullhead

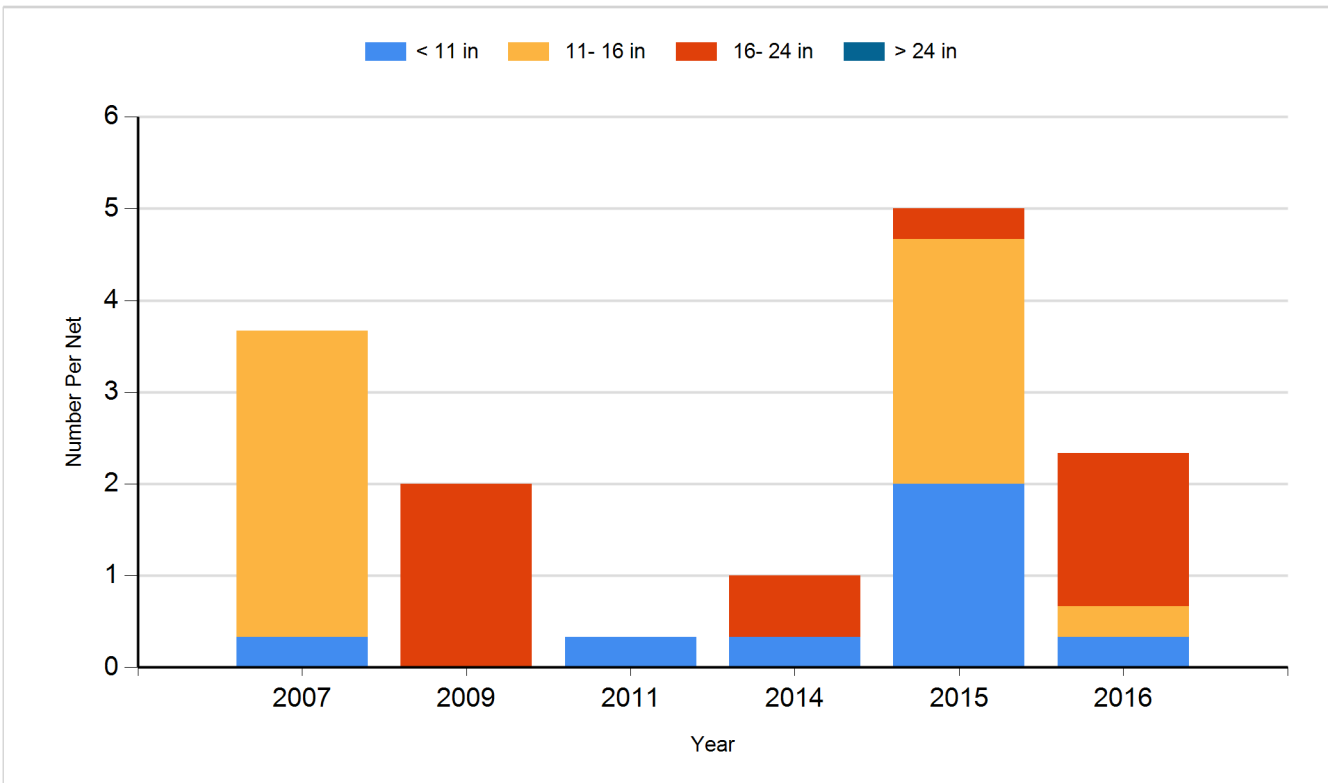
Gear: std exp gill net



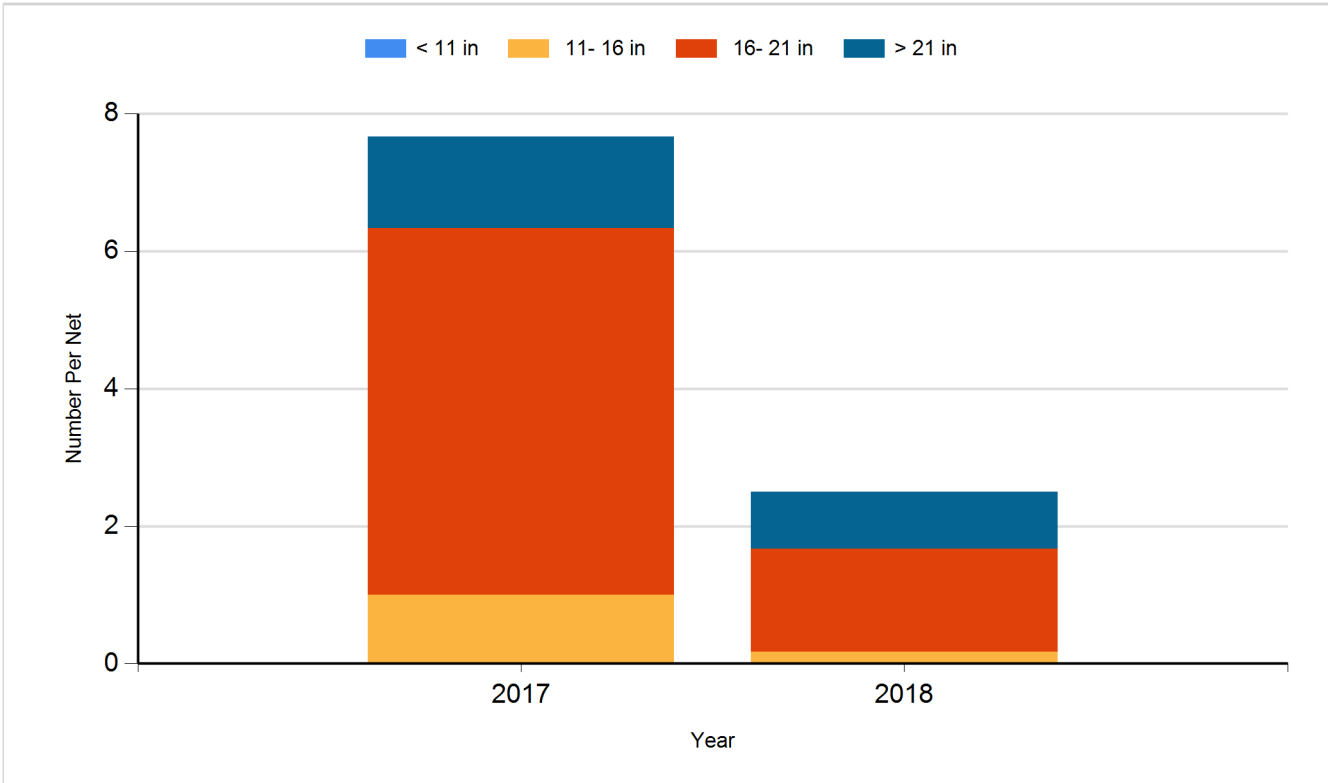
Species: Channel Catfish  
Gear: AFS std gill net



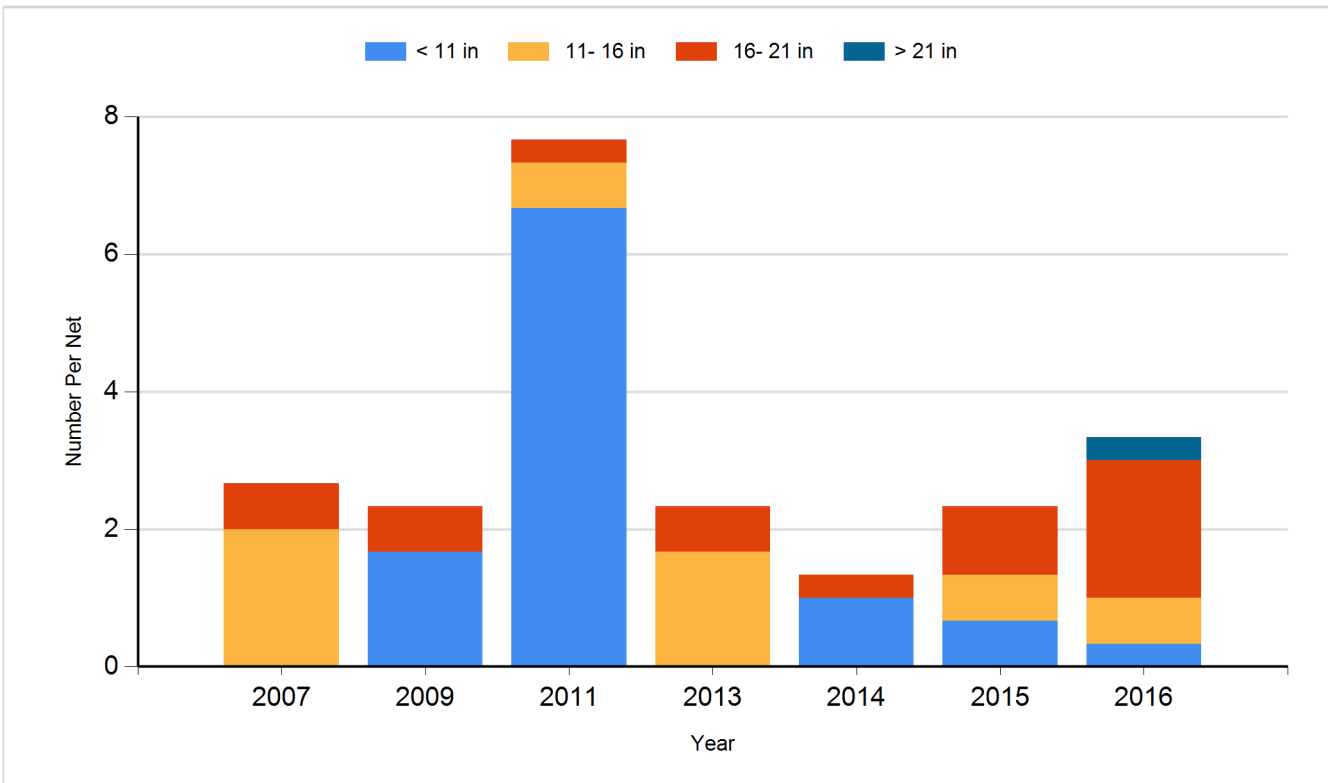
Species: Channel Catfish  
Gear: std exp gill net



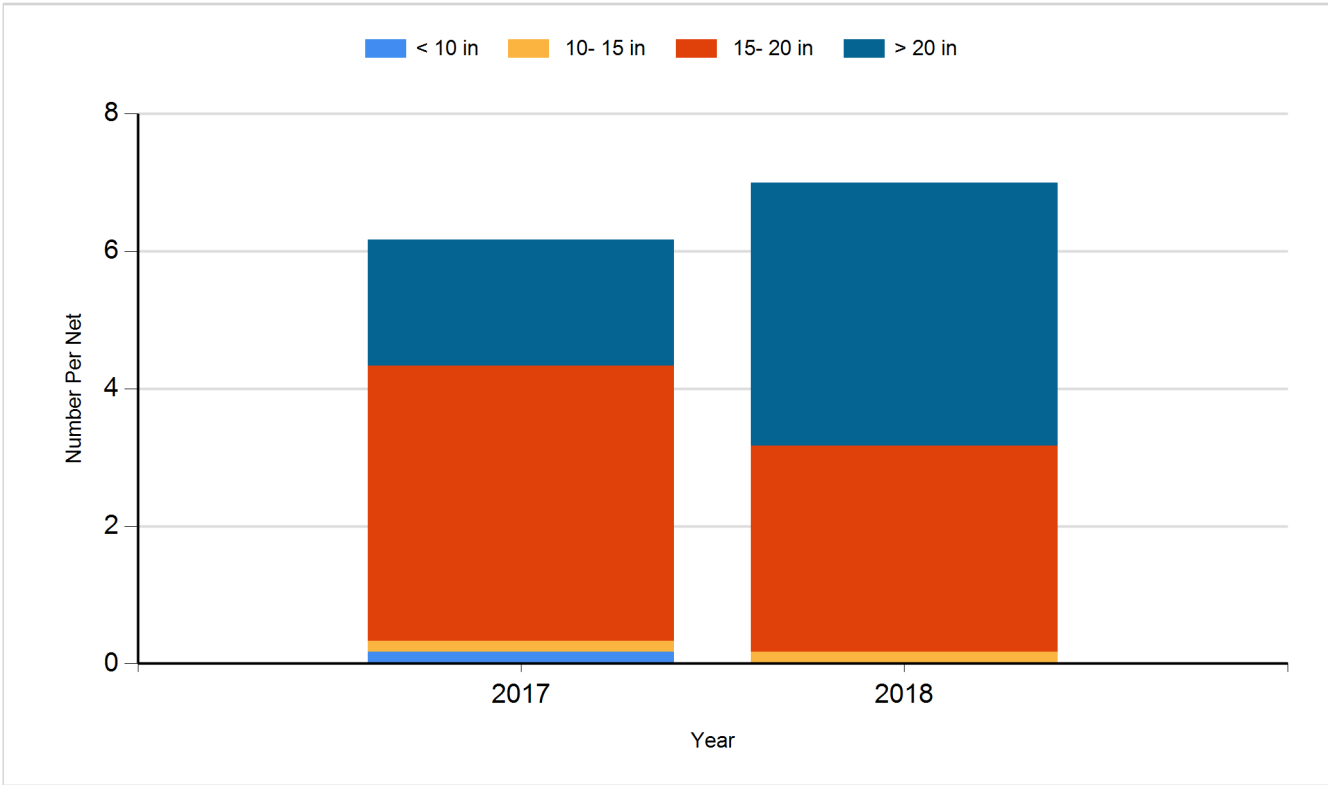
Species: Common Carp  
Gear: AFS std gill net



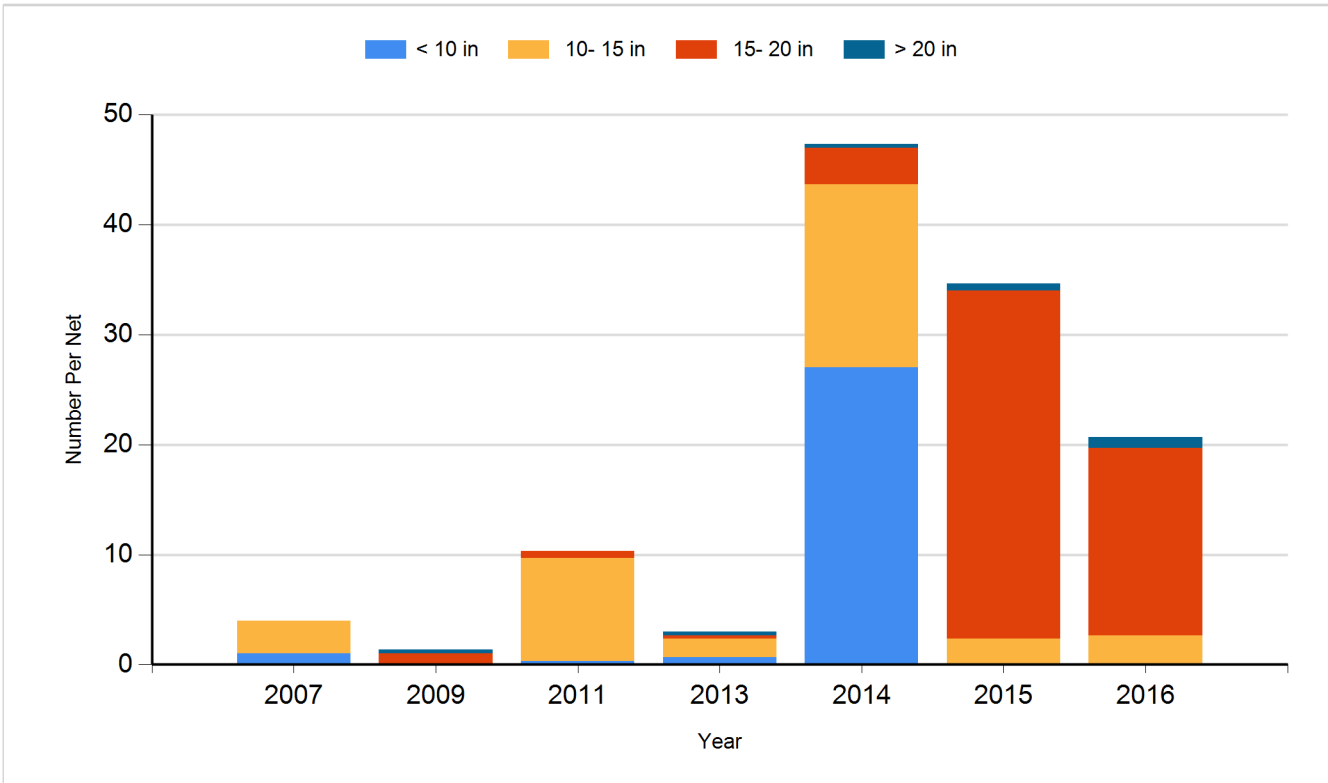
Species: Common Carp  
Gear: std exp gill net



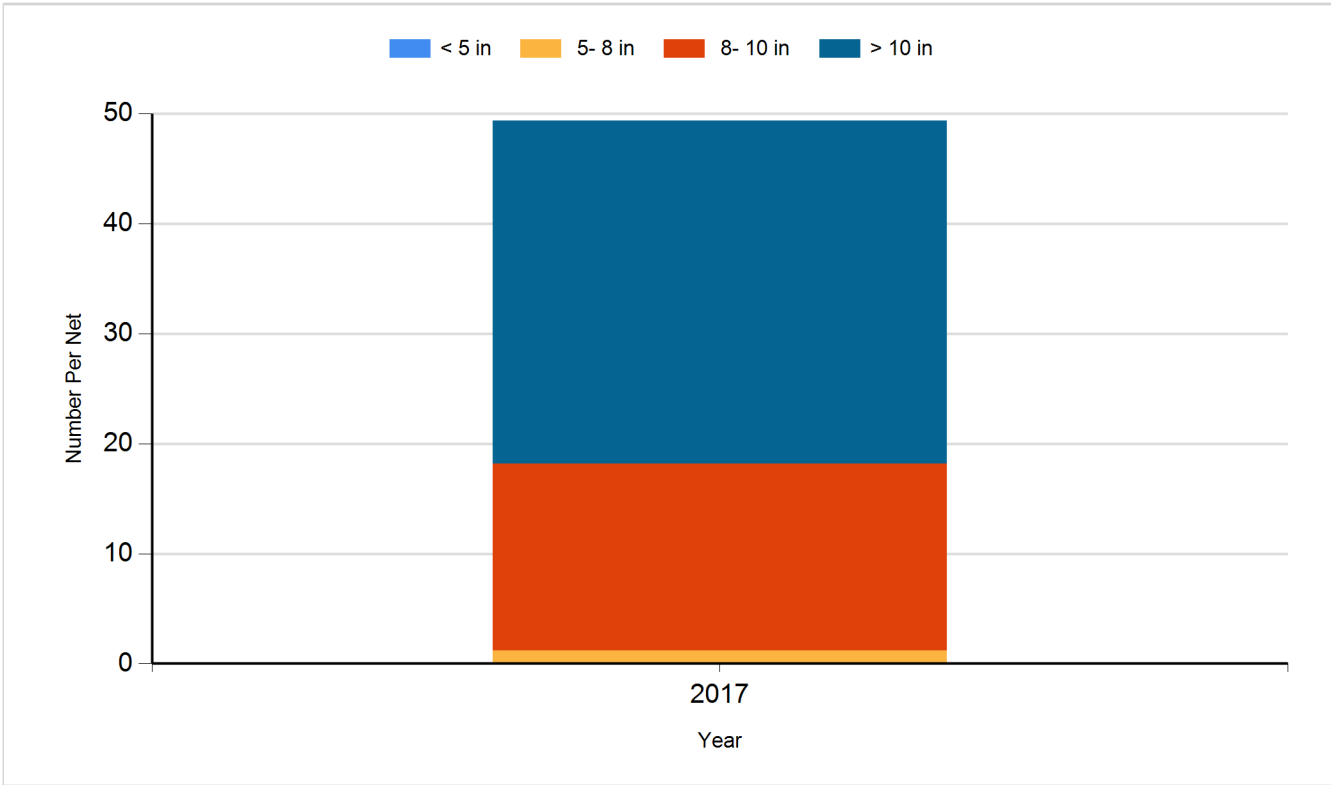
Species: Walleye  
Gear: AFS std gill net



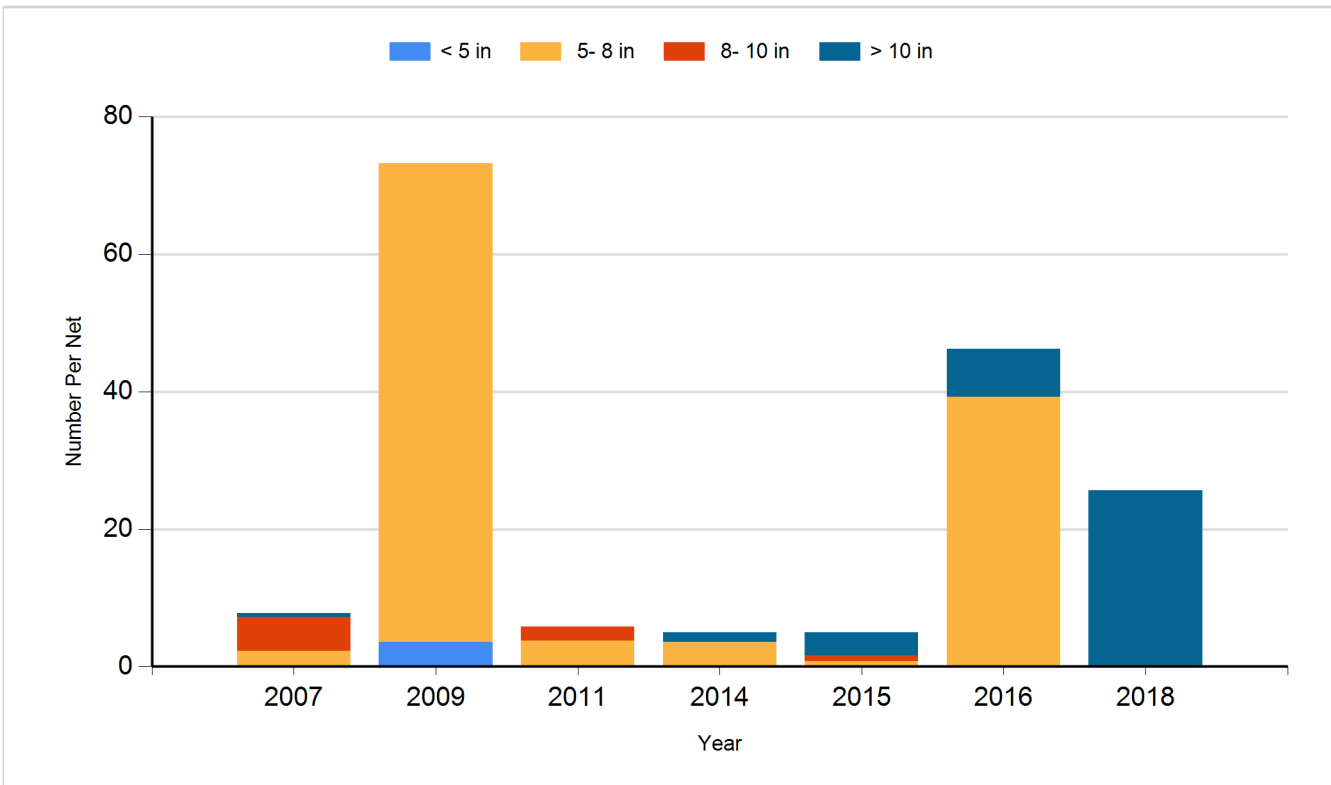
Species: Walleye  
Gear: std exp gill net



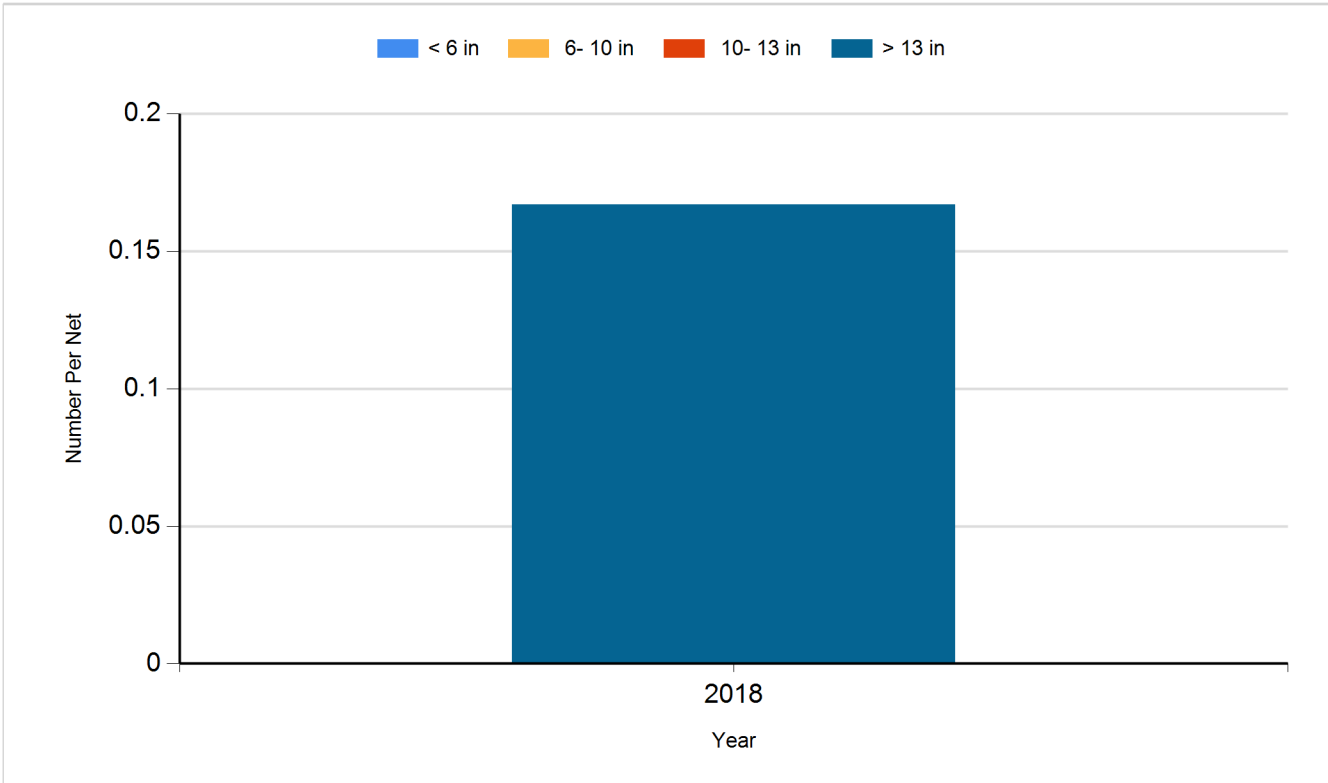
Species: White Crappie  
Gear: AFS std frame net



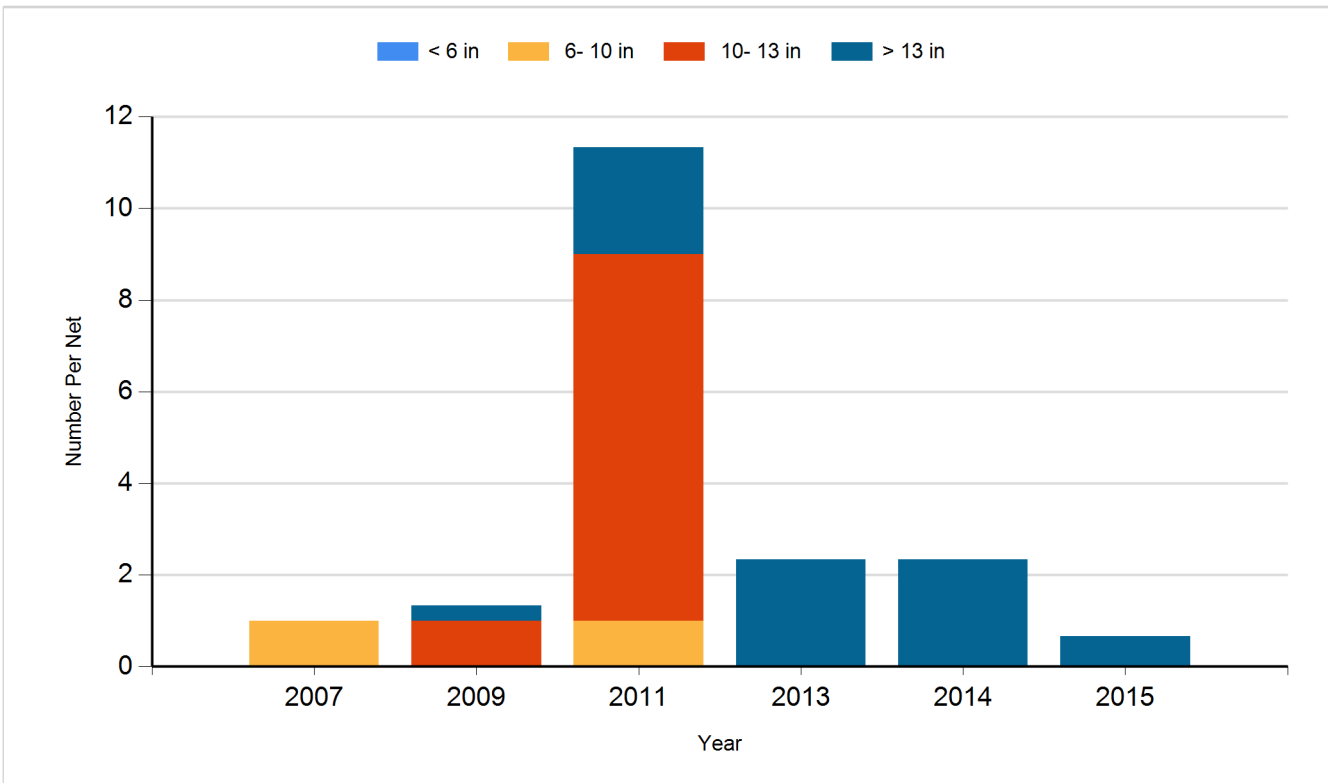
Species: White Crappie  
Gear: frame net (std 3/4 in)



Species: White Sucker  
Gear: AFS std gill net



Species: White Sucker  
Gear: std exp gill net



## **Fish Stocking**

Number of fish stocked by year, species, and size.

Year	Species	Size	Number
2009	Walleye	Large Fingerling	1,080
2010	Walleye	Small Fingerling	18,200
2011	Walleye	Large Fingerling	438
2011	Yellow Perch	Adult	2,260
2012	Walleye	Fingerling	36,750
2013	Walleye	Small Fingerling	20,000
2014	Walleye	Fry	232,000