

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Island South, Minnehaha County
LBS-Lake-213-001
2018

Lake Information

Name: Island South
County: Minnehaha
Surface Area: 125 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 23, 2018	4 net-nights
frame net (std 3/4 in)	Jul 23, 2018	4 net-nights

Common Fish Species Present

Walleye

Black Crappie

Black Bullhead

Common Carp

Yellow Perch

Bluegill

Northern Pike

White Sucker

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 Bullhead	20	5.0	1.8	95		15	9		
	Black Crappie	5	1.3	0.5	20		0		116	8
	Common Carp	25	4.0	1.7	100		6			
	Northern Pike	1	0.3	0.3	100		100		80	
	Walleye	53	13.3	3.0	92	4	19	6	92	1
	Yellow Perch	10	2.5	1.3	50	18	10		99	5
frame net (std 3/4 in)	Black Bullhead	17	4.3	1.8	82	10	24	11		
	Black Crappie	35	7.3	2.8	7		3		115	2
	Bluegill	6	1.5	0.9	50	25	17		107	5
	Common Carp	15	2.0	1.2	100		75			
	Northern Pike	5	1.3	0.5	100		60		75	4
	Walleye	2	0.5	0.3	100		0		90	2
	White Sucker	1	0.3	0.4	100		100			
	Yellow Perch	5	1.3	0.8	0		0		100	4

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	Black Bullhead									7.6		7.6	
	Black Crappie									2.4		2.4	
	Bluegill									3.0		3.0	
	Common Carp									3.0		3.0	
	Golden Shiner									0.0		0.0	
	Northern Pike									1.0		1.0	
	Smallmouth Bass									0.2		0.2	
	Walleye									1.6		1.6	
	Yellow Perch									1.6		1.6	
AFS std gill net	Black Bullhead									5.3	5.0	5.2	
	Black Crappie									0.3	1.3	0.8	
	Common Carp									22.0	4.0	13.0	
	Northern Pike									0.8	0.3	0.6	
	Walleye									6.3	13.3	9.8	
	White Sucker									0.3		0.3	
	Yellow Perch									2.8	2.5	2.7	
frame net (std 3/4 in)	Black Bullhead	46.4		142.0		205.8						4.3	99.6
	Black Crappie	0.2		0.6		0.2						7.3	2.1
	Bluegill	1.2				0.4						1.5	1.0
	Channel Catfish	0.2											0.2
	Common Carp					0.6						2.0	1.3
	Golden Shiner	0.0											0.0
	Green Sunfish	3.2											3.2
	Northern Pike					1.4						1.3	1.4
	Sunfish Hybrid					0.0							0.0
	Walleye	0.6		0.2		0.8						0.5	0.5
	White Sucker											0.3	0.3
Yellow Perch	4.4		1.0		0.6						1.3	1.8	
std exp gill net	Black Bullhead	19.7		115.3		156.7	151.7	101.3	58.0				100.5
	Black Crappie					1.7	0.0	0.0	1.0				0.7
	Channel Catfish	0.7											0.7
	Common Carp						1.7	5.3	2.7				3.2
	Golden Shiner						0.0	0.0					0.0
	Northern Pike	0.3		1.0		1.3	7.3	9.0	1.3				3.4

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
std exp gill net	Walleye	8.3		6.7		2.0	0.7	2.3	4.7			4.1
	White Sucker	0.3				0.3			0.3			0.3
	Yellow Perch	21.7		41.7		6.0	0.3	6.0	7.7			13.9

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	Black Bullhead	PSD											79
		PSD-P											16
		Wr											102
	Black Crappie	PSD											100
		PSD-P											25
		Wr											102
	Bluegill	PSD											60
		PSD-P											27
		Wr											136
	Common Carp	PSD											87
		PSD-P											87
		Wr											80
	Northern Pike	PSD											80
		PSD-P											60
		Wr											79
	Walleye	PSD											63
		PSD-P											0
		Wr											96
Yellow Perch	PSD											38	
	PSD-P											13	
	Wr											97	
AFS std gill net	Black Bullhead	PSD										95	95
		PSD-P										19	15
	Black Crappie	PSD										100	20
		PSD-P										0	0
	Common Carp	PSD										11	100
		PSD-P										10	6
	Northern Pike	PSD										100	100
		PSD-P										0	100
	Walleye	PSD										81	80
		PSD-P										60	92
	White Sucker	PSD										36	19
		Wr										84	92

Gear	Species	Index	Year										
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	White Sucker	PSD-P										100	
	Yellow Perch	PSD										73	50
		PSD-P										18	10
		Wr										93	99
frame net (std 3/4 in)	Black Bullhead	PSD	0		22		17						82
		PSD-P	0		0		1						24
		Wr	85		80		82						
	Black Crappie	PSD	100		33		100						7
		PSD-P	100		33		100						3
		Wr	114		104		117						115
	Bluegill	PSD	83				50						50
		PSD-P	0				50						17
		Wr	133				131						107
	Common Carp	PSD					100						100
		PSD-P					33						75
		Wr					110						
	Northern Pike	PSD					57						100
		PSD-P					0						60
		Wr					103						75
	Walleye	PSD	100		100		100						100
		PSD-P	33		0		100						0
		Wr	103		90		101						90
	White Sucker	PSD											100
		PSD-P											100
	Yellow Perch	PSD	23		100		67						0
PSD-P		14		0		0						0	
Wr		102		99		74						100	
std exp gill net	Black Bullhead	PSD	17		25		4	32	27	86			
		PSD-P	0		0		0	1	0	0			
		Wr	92		94		98						
	Black Crappie	PSD					0	0	0	33			
		PSD-P					0	0	0	0			
		Wr					127			93			
	Common Carp	PSD						100	13	75			
		PSD-P						40	0	13			
		Wr						106					

Gear	Species	Index	Year									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
std exp gill net	Northern Pike	PSD	100		33		75	91	100	100		
		PSD-P	0		0		25	5	15	50		
		Wr	88		97		87	85	89	80		
	Walleye	PSD	96		100		83	100	100	57		
		PSD-P	24		15		33	50	86	36		
		Wr	97		89		92	86	96	83		
	White Sucker	PSD	100				100			100		
		PSD-P	100				100			100		
		Wr	65				100					
Yellow Perch	PSD	62		67		6	0	0	22			
	PSD-P	22		1		6	0	0	0			
	Wr	90		105		106	92	92	88			

Fish Condition

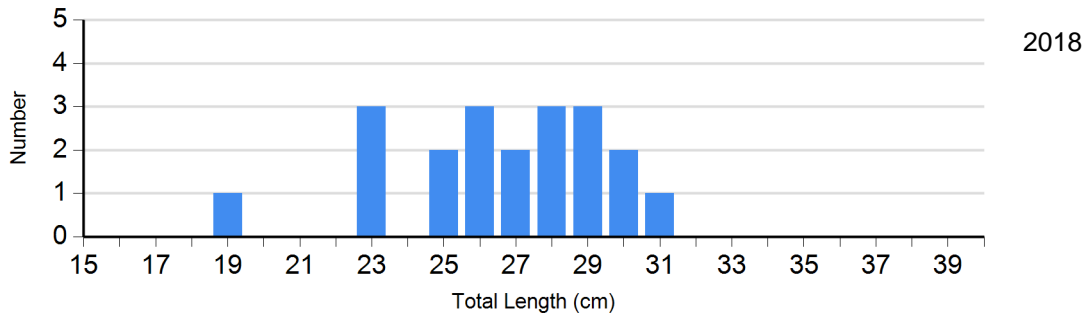
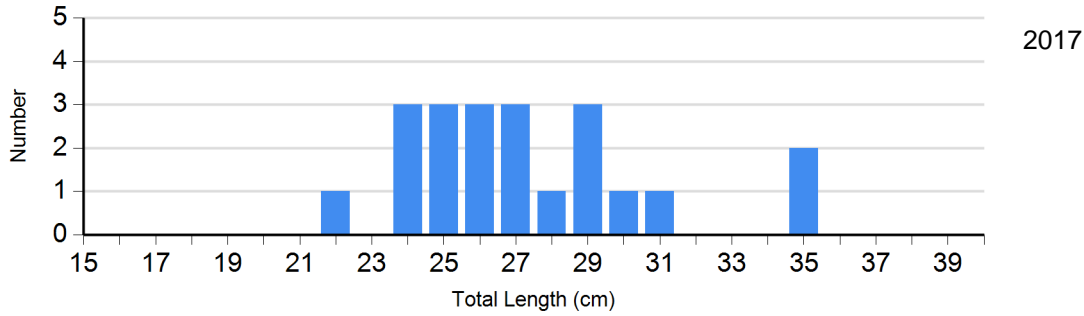
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2017	0		9	103 (2.4)	3	99 (2.1)	0	
	2018	27	116 (1.8)	1	112	0		1	94
Bluegill Frame Net	2017	6	169 (24.4)	5	117 (10.3)	4	110 (13.6)	0	
	2018	3	113 (2.1)	2	107 (5.9)	1	89	0	
Common Carp Gill Net	2014	0		3	106	2		0	
Northern Pike Gill Net	2014	2	84 (3.8)	19	85 (2.4)	1	90	0	
	2015	0		23	88 (1.3)	4	91 (2.5)	0	
	2016	0		2	79 (2.7)	2	81 (1.9)	0	
	2017	0		3	81 (4.4)	0		0	
	2018	0		0		1	80	0	
Walleye Gill Net	2014	0		1	83	1	89	0	
	2015	0		1	101	5	96 (2.0)	1	87
	2016	6	82 (2.4)	3	87 (4.5)	3	82 (1.9)	2	79 (3.8)
	2017	10	92 (2.3)	6	85 (1.4)	3	64 (22.6)	6	85 (3.1)
	2018	4	99 (2.8)	39	93 (1.0)	6	89 (2.7)	4	88 (2.3)
Yellow Perch Gill Net	2014	1	92	0		0		0	
	2015	18	92 (2.8)	0		0		0	
	2016	18	88 (2.0)	5	88 (3.2)	0		0	
	2017	3	96 (3.7)	6	93 (3.0)	2	92 (4.4)	0	
	2018	5	105 (5.9)	4	97 (2.2)	1	82	0	

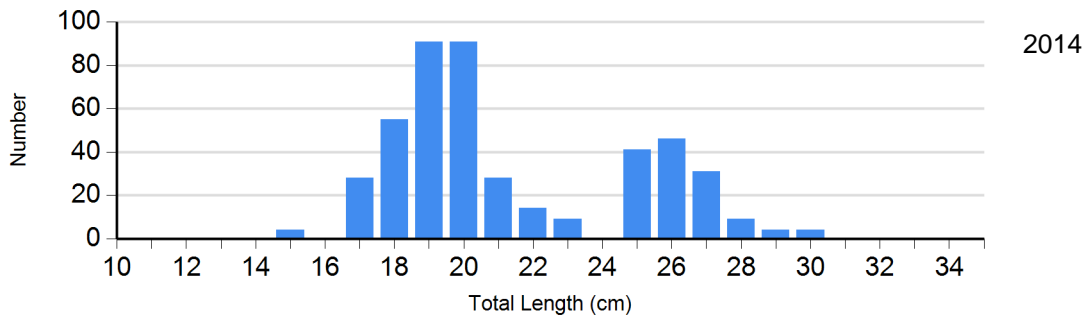
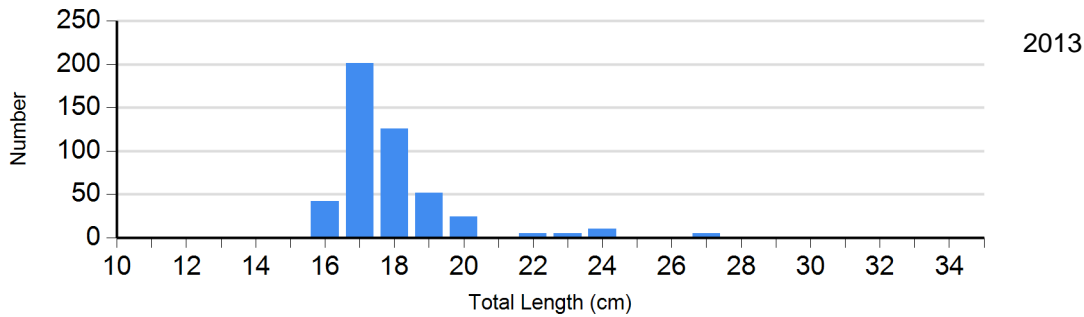
Length Frequency Distribution

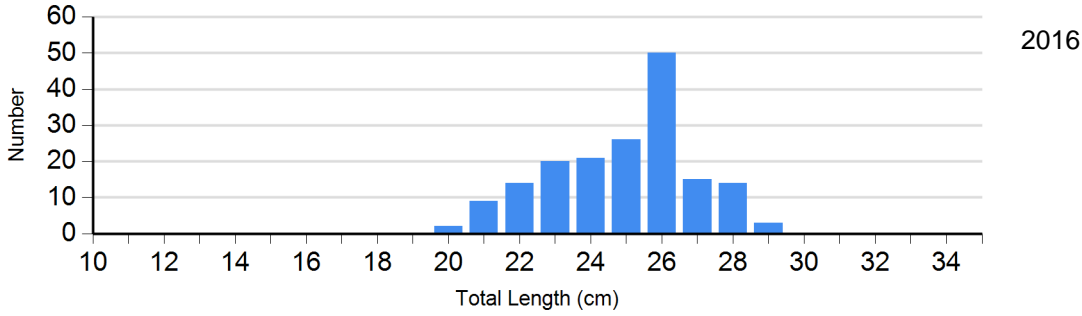
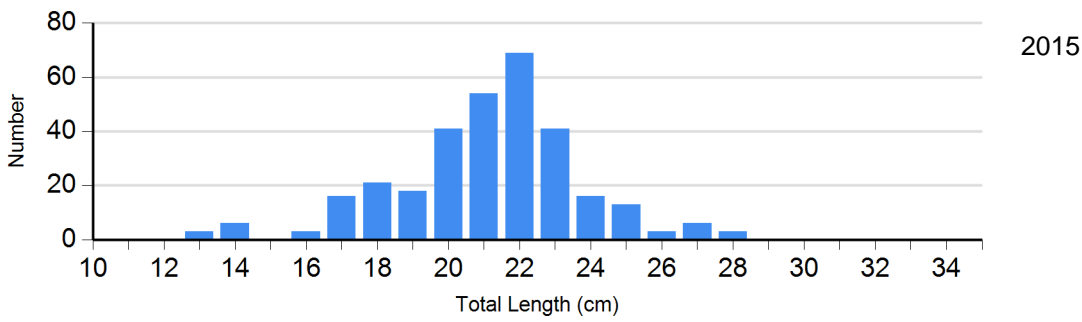
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

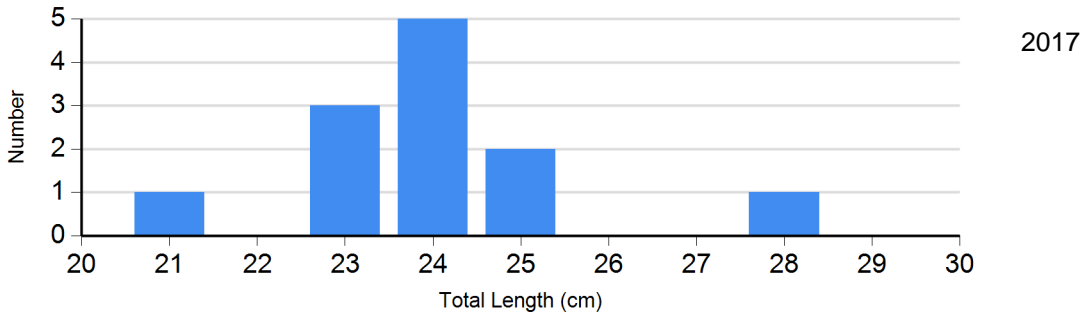


Species: Black Bullhead
Gear: std exp gill net

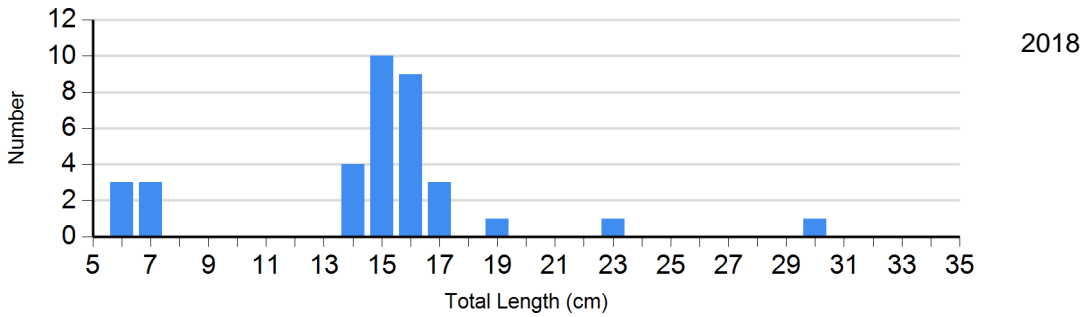




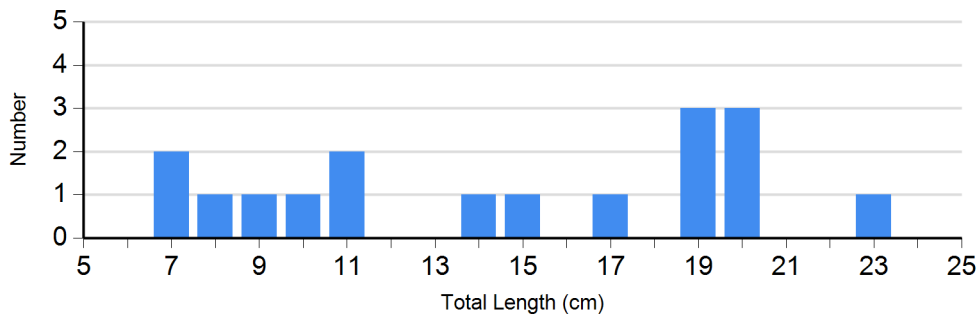
Species: Black Crappie
 Gear: AFS std frame net



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

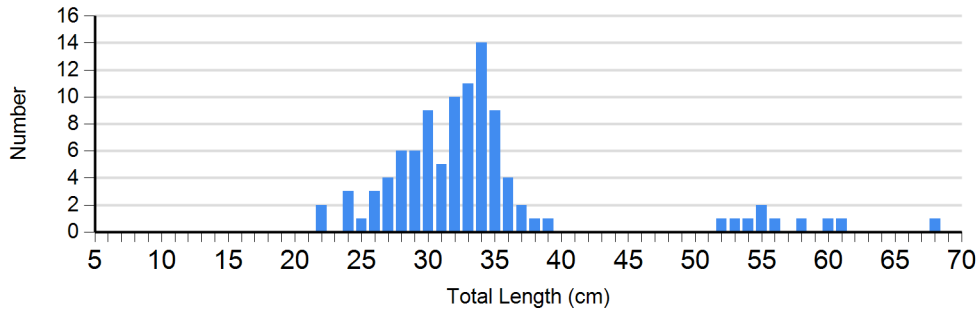


Species: Bluegill
 Gear: AFS std frame net

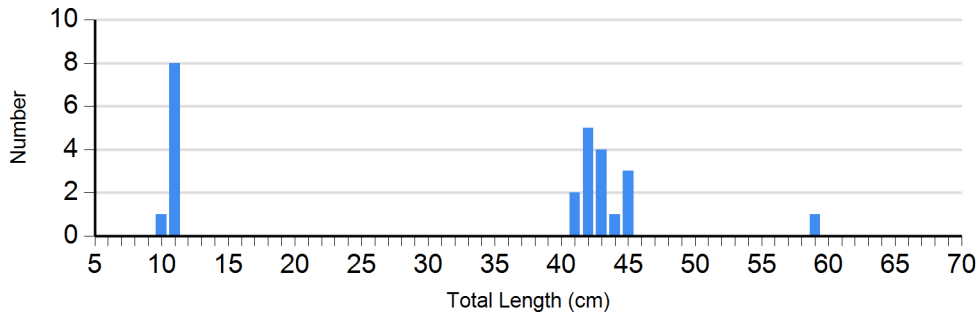


2017

Species: Common Carp
 Gear: AFS std gill net

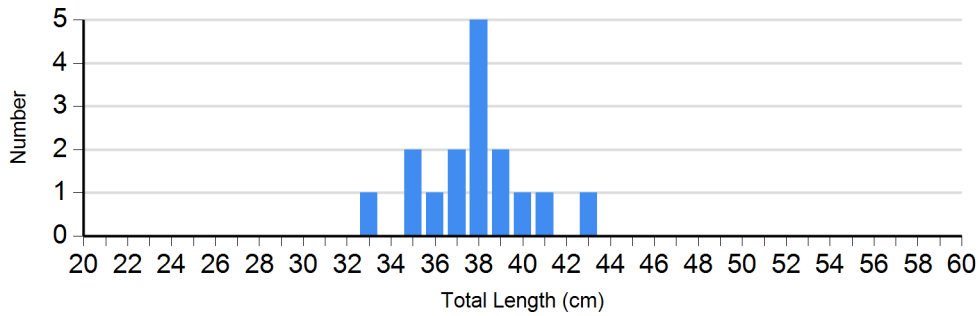


2017



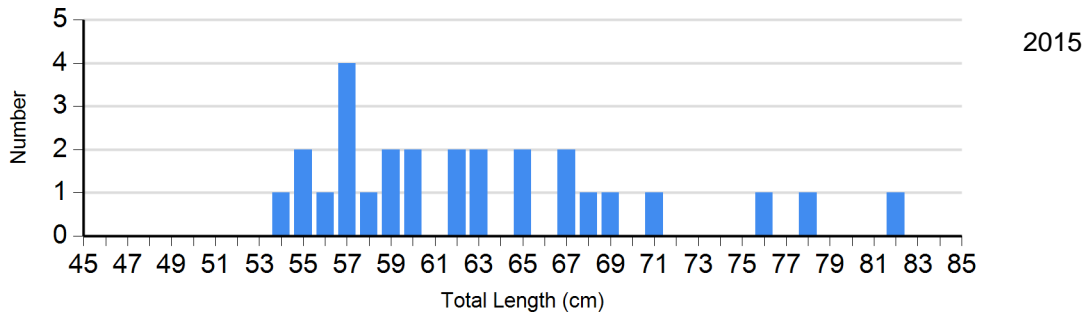
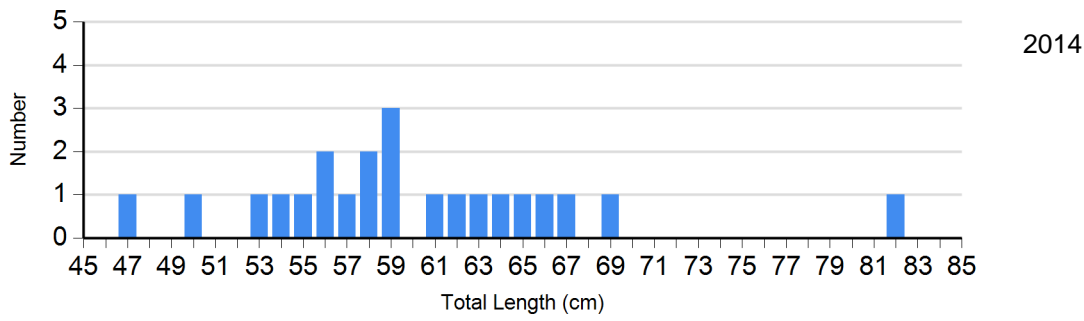
2018

Species: Common Carp
 Gear: std exp gill net

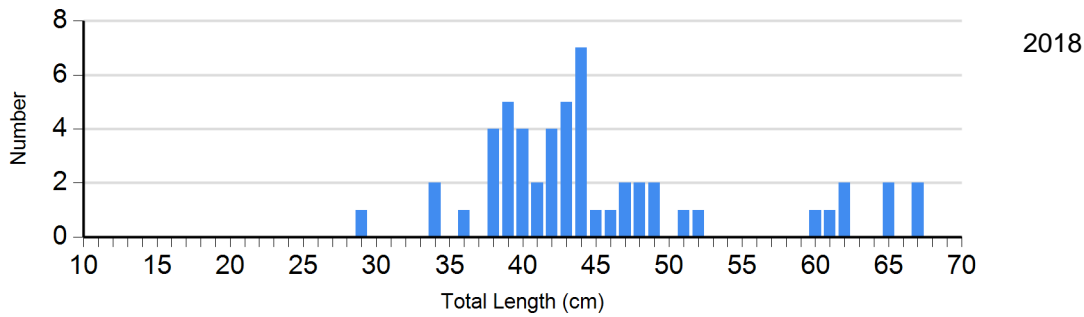
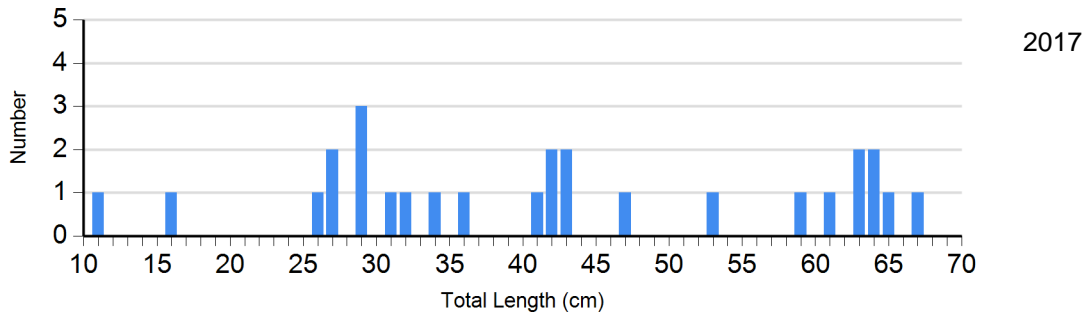


2015

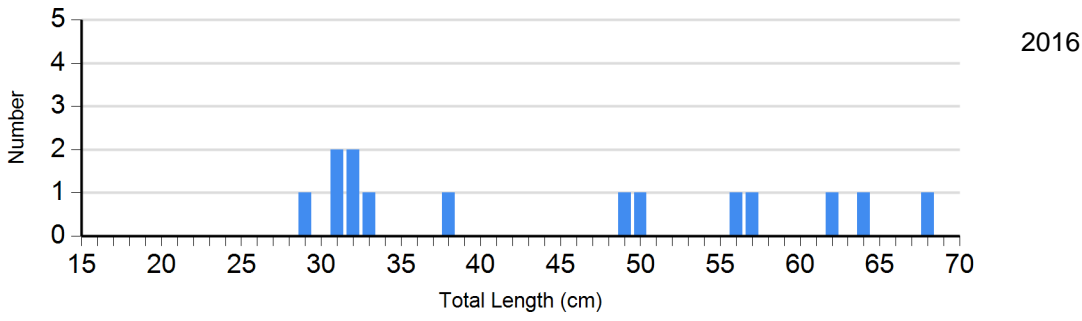
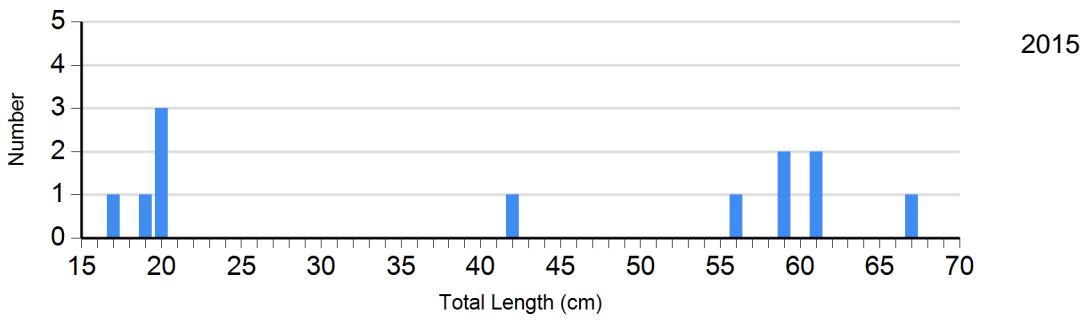
Species: Northern Pike
 Gear: std exp gill net



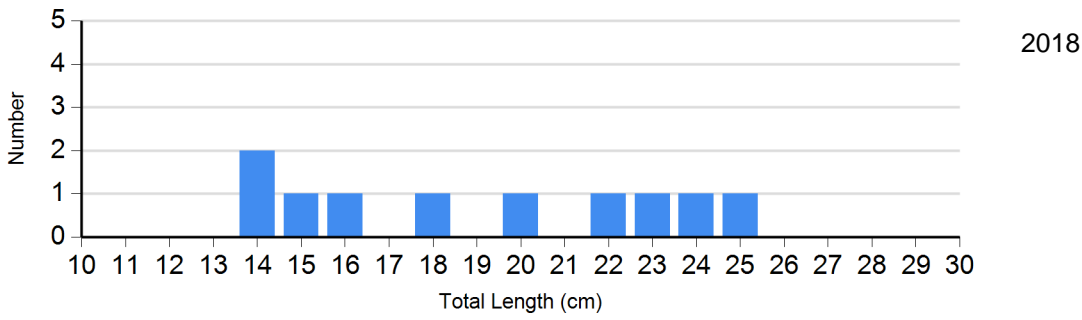
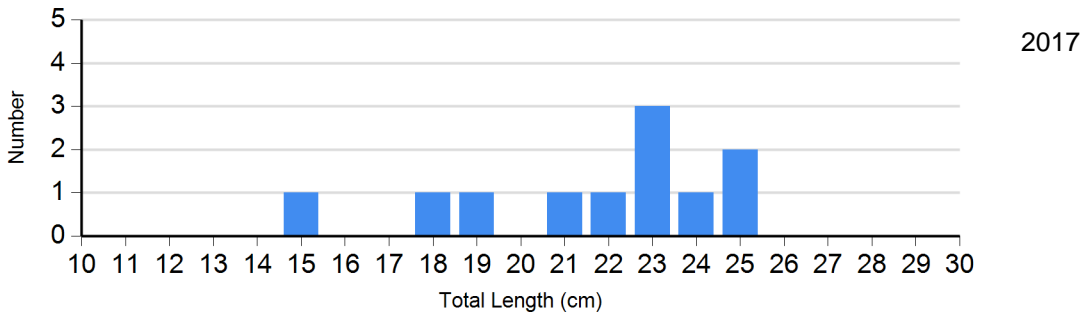
Species: Walleye
 Gear: AFS std gill net



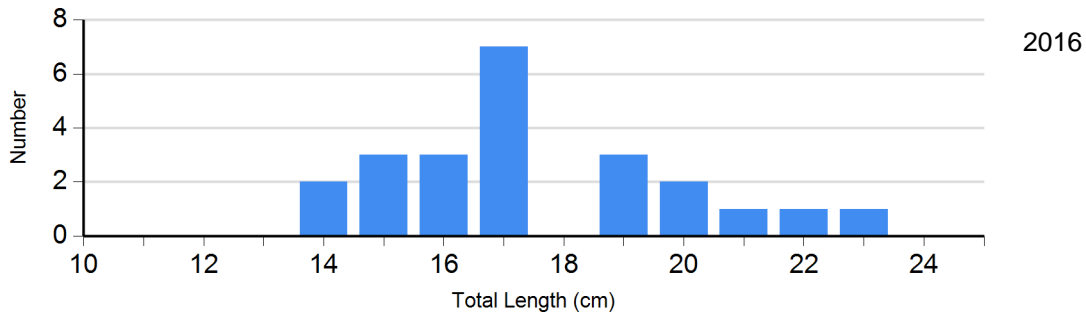
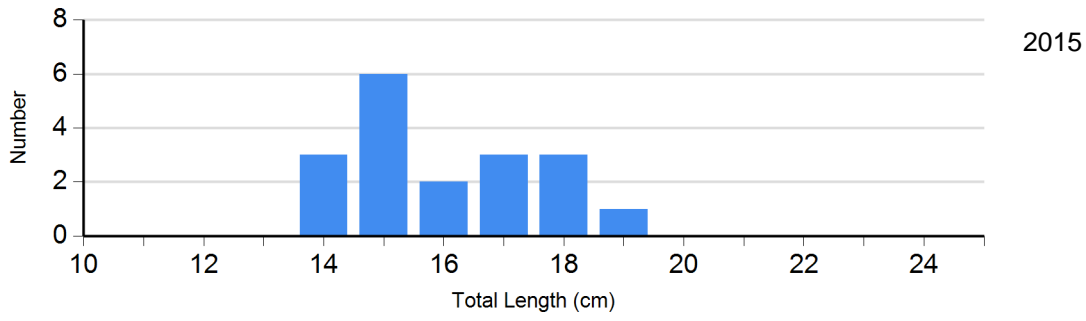
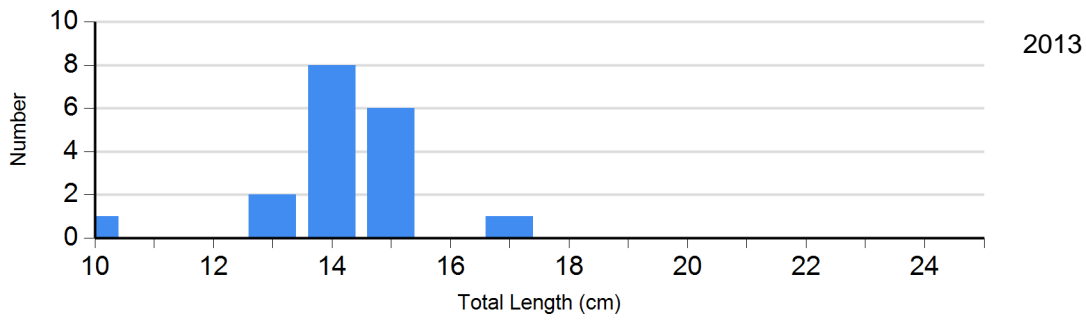
Species: Walleye
 Gear: std exp gill net



Species: Yellow Perch
 Gear: AFS std gill net



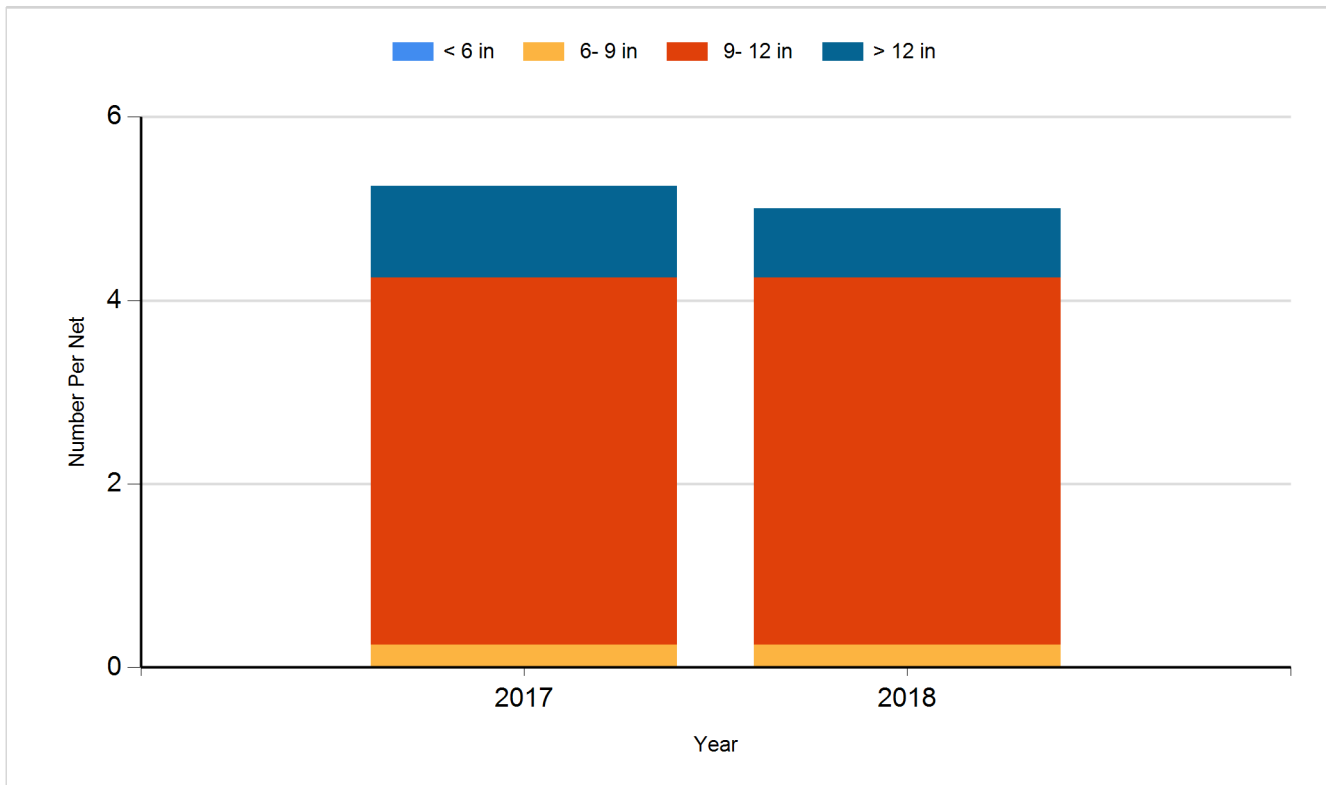
Species: Yellow Perch
Gear: std exp gill net



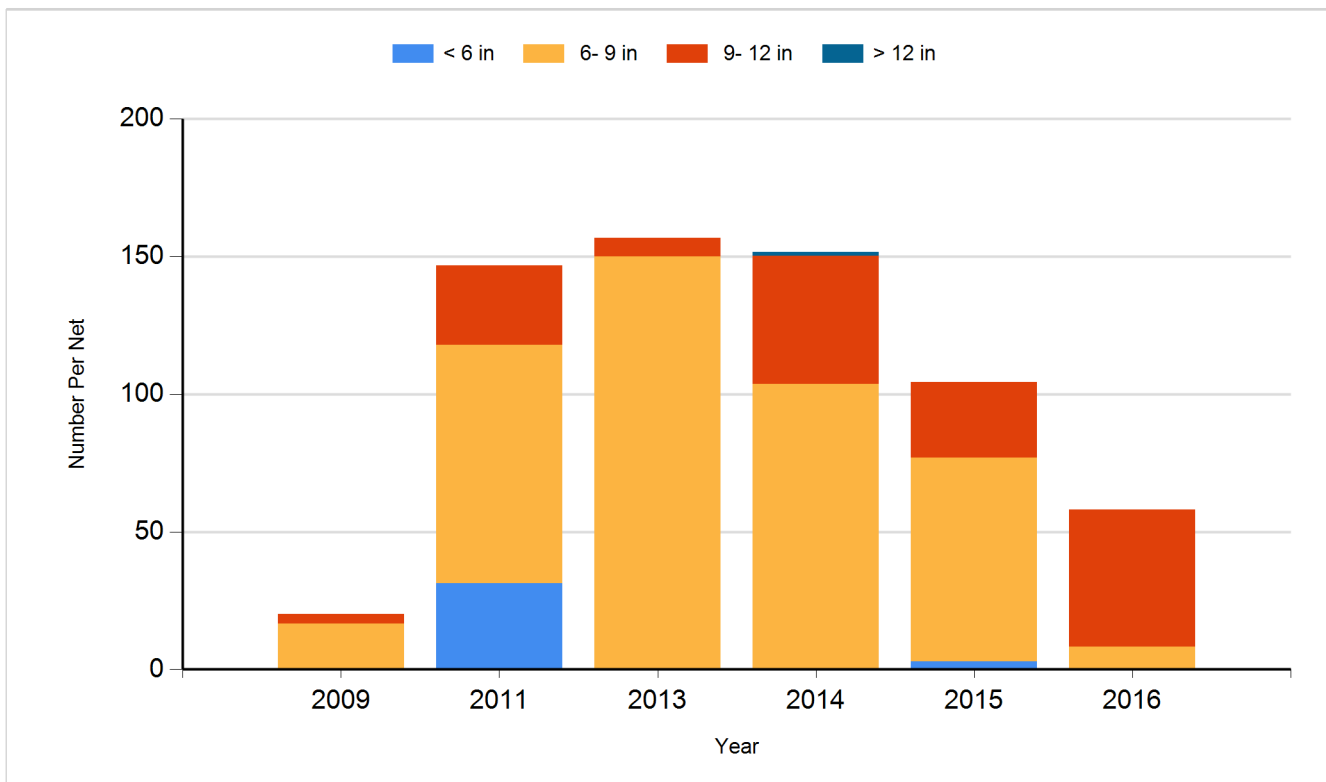
Historic Fish Sizes and Relative Abundance

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

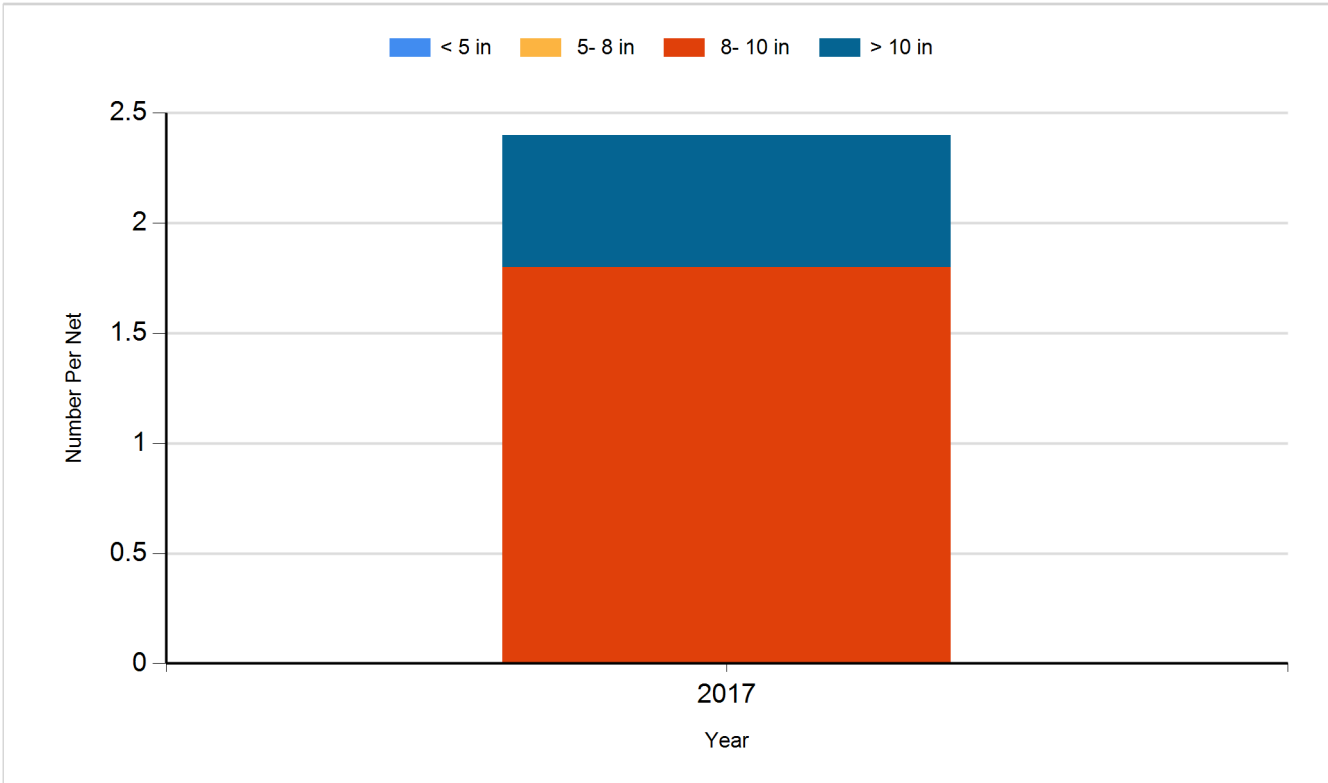
Species: Black Bullhead
Gear: AFS std gill net



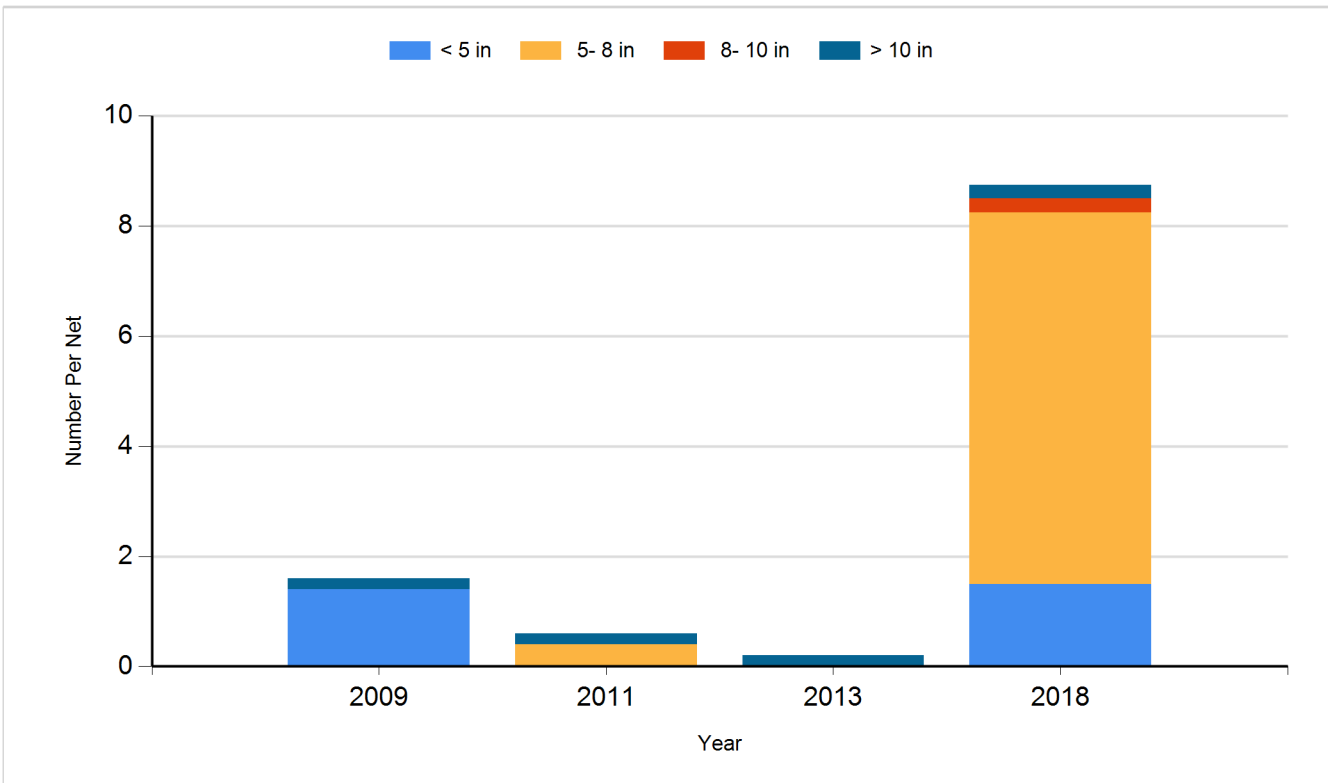
Species: Black Bullhead
Gear: std exp gill net



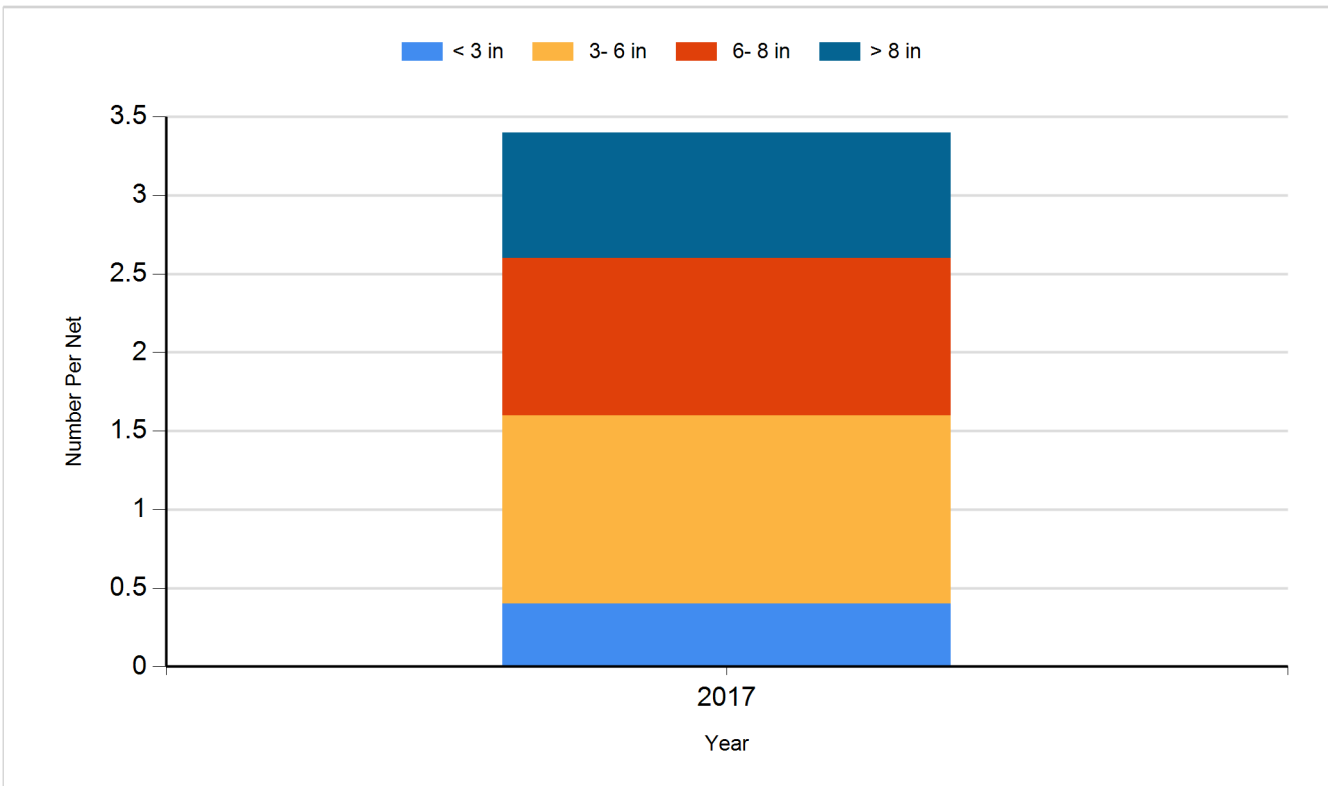
Species: Black Crappie
Gear: AFS std frame net



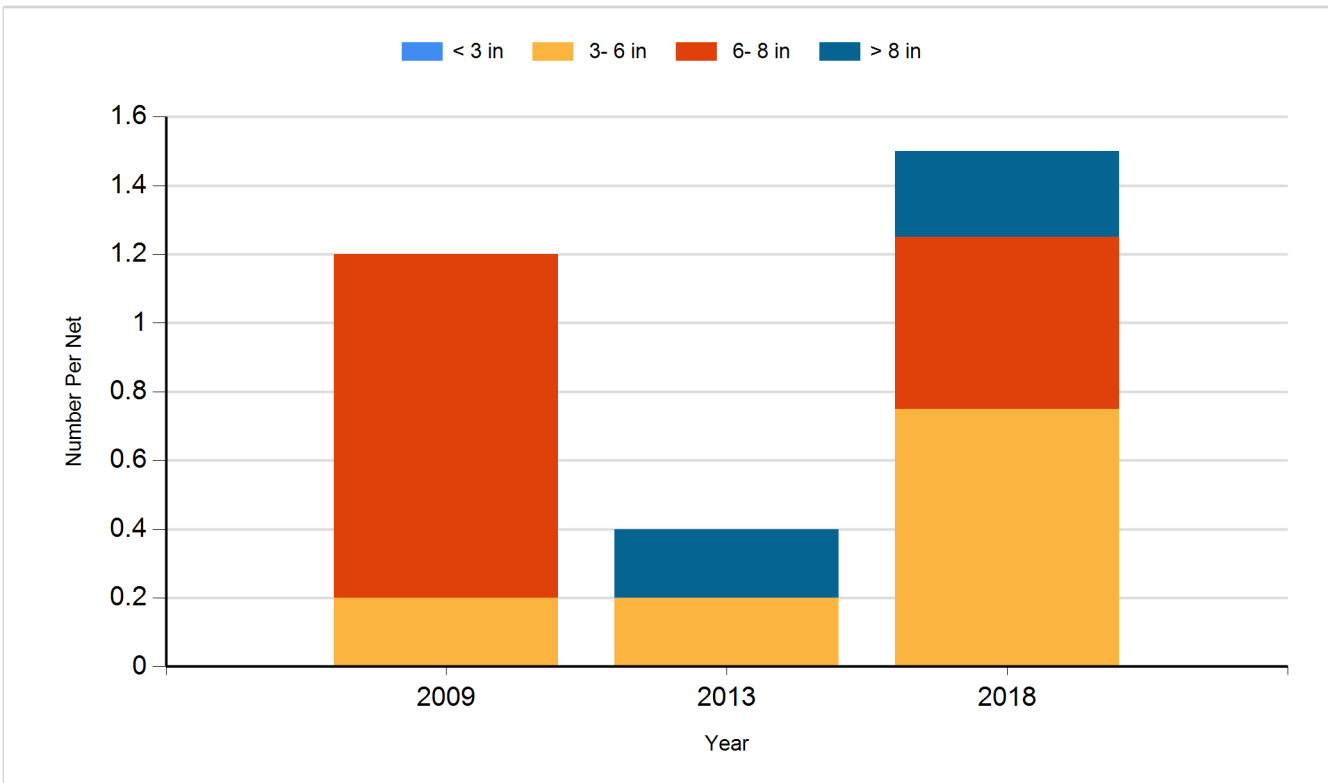
Species: Black Crappie
Gear: frame net (std 3/4 in)



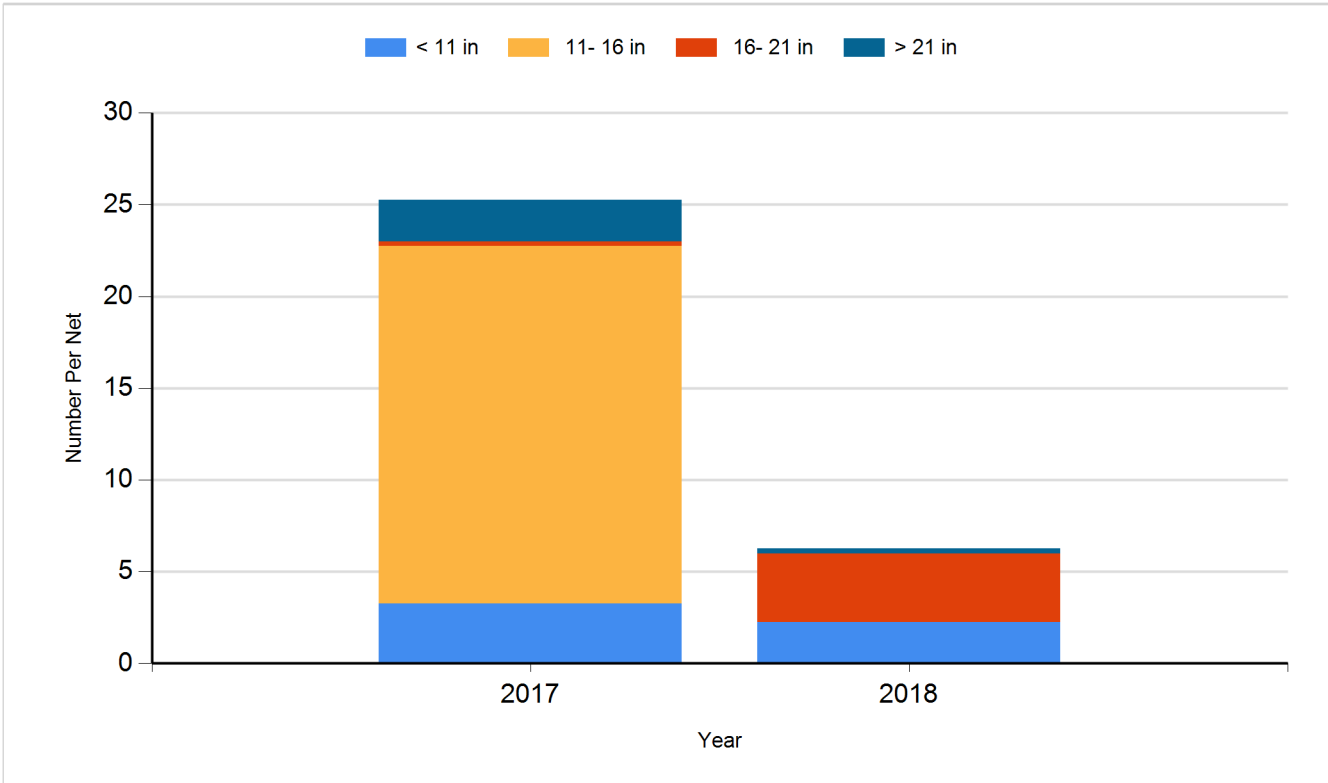
Species: Bluegill
Gear: AFS std frame net



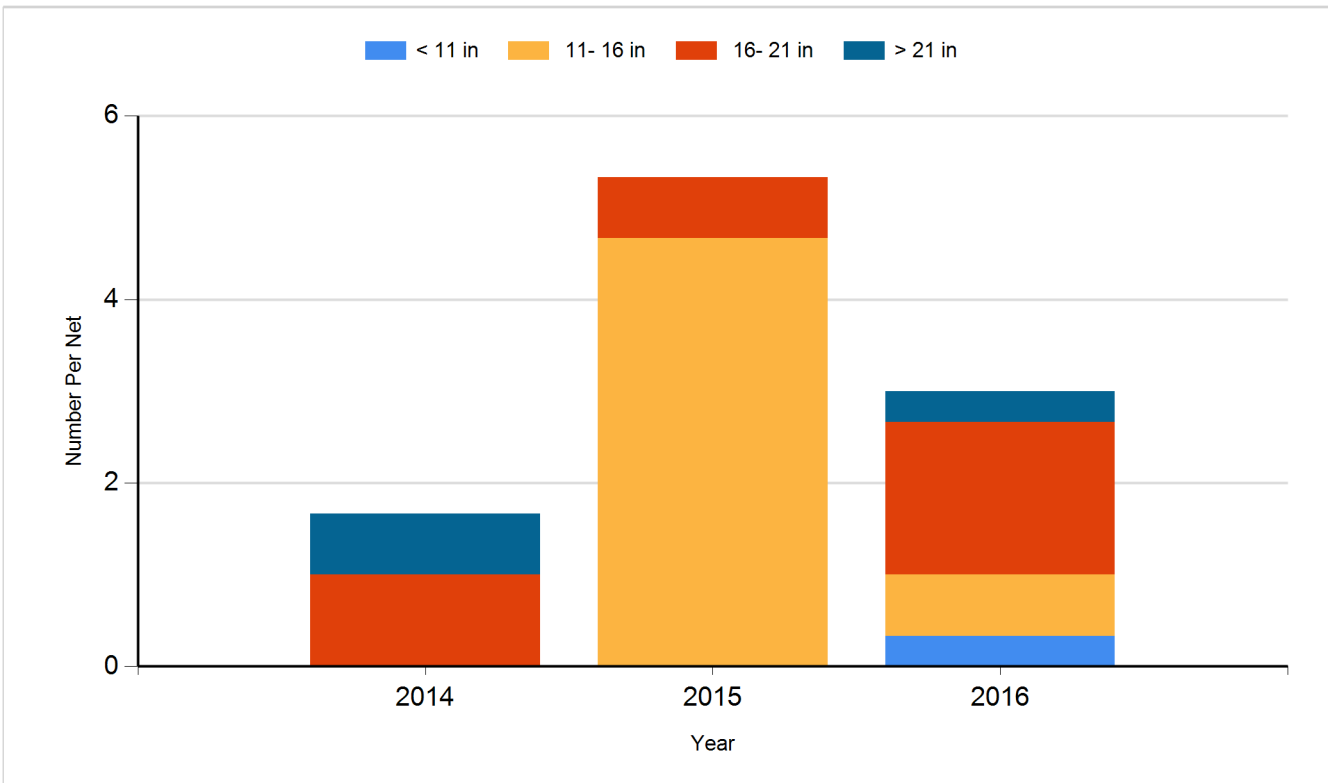
Species: Bluegill
Gear: frame net (std 3/4 in)



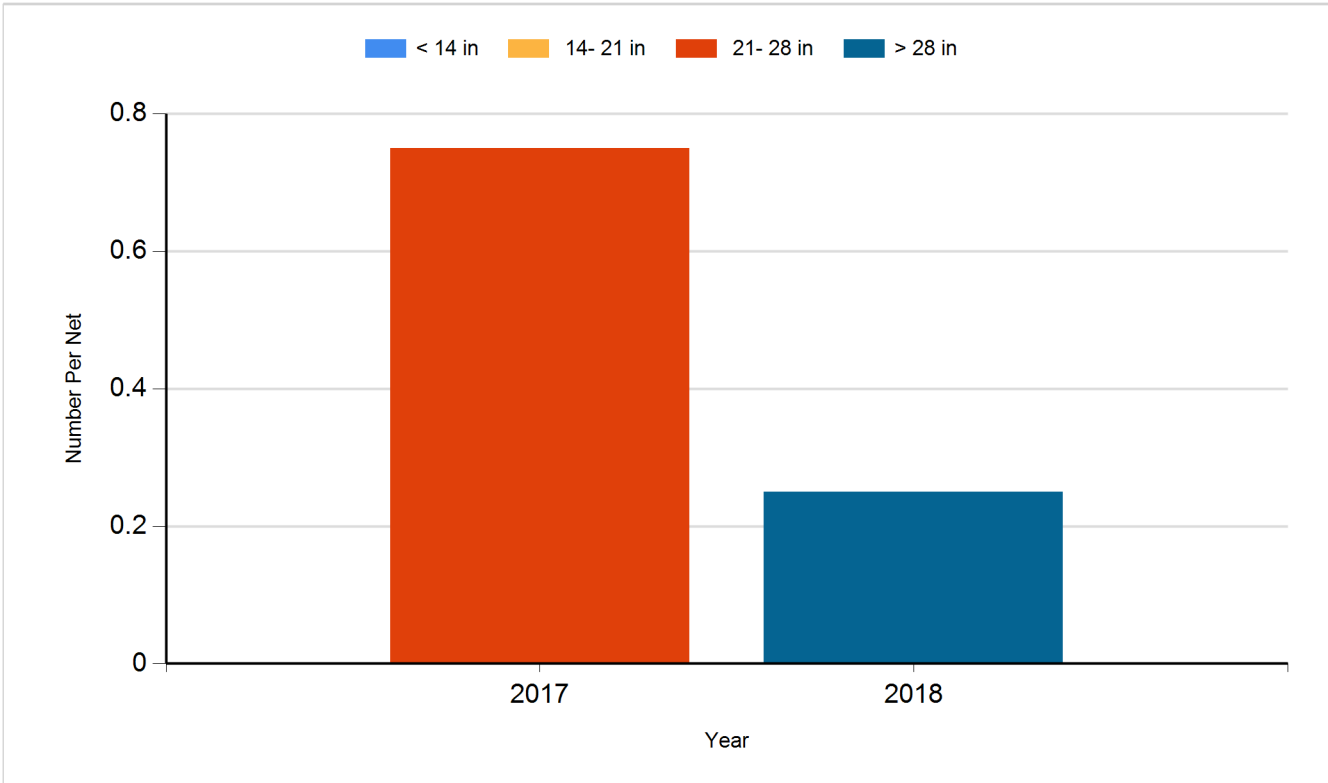
Species: Common Carp
Gear: AFS std gill net



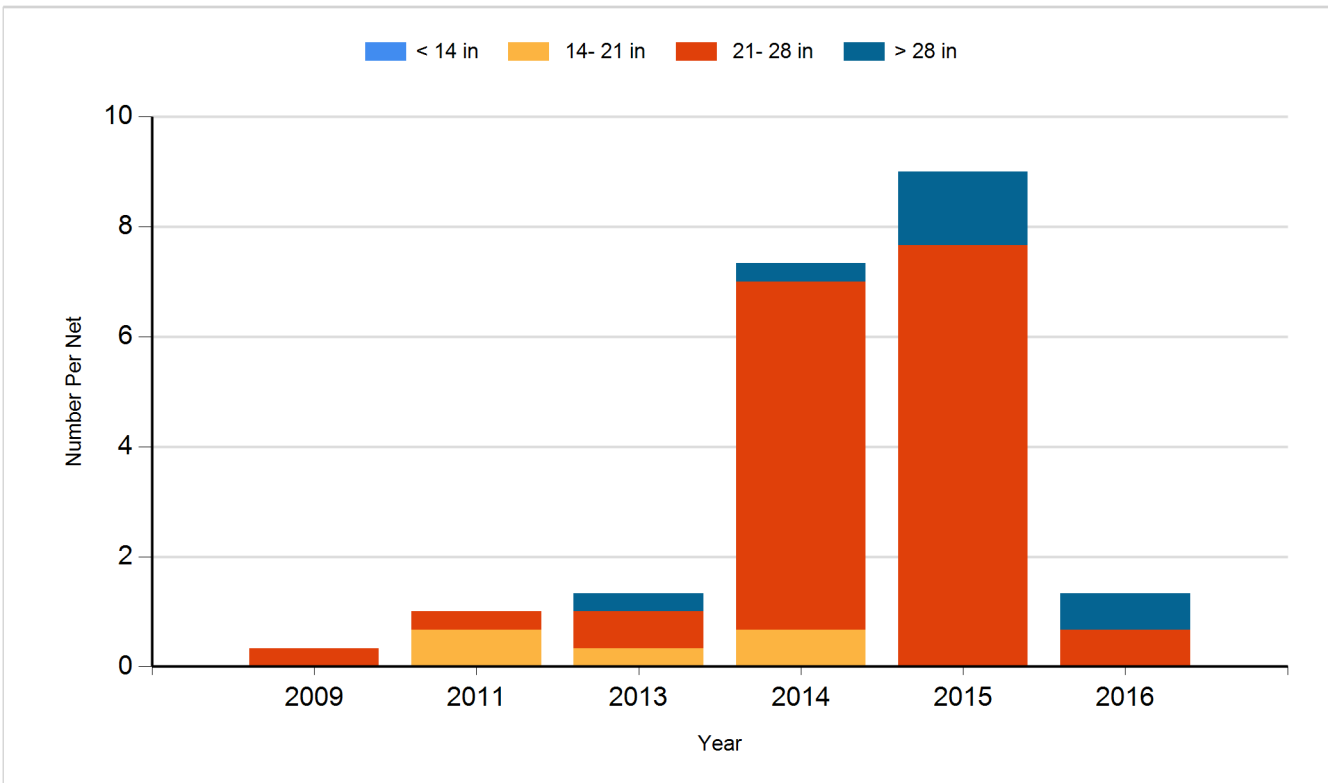
Species: Common Carp
Gear: std exp gill net



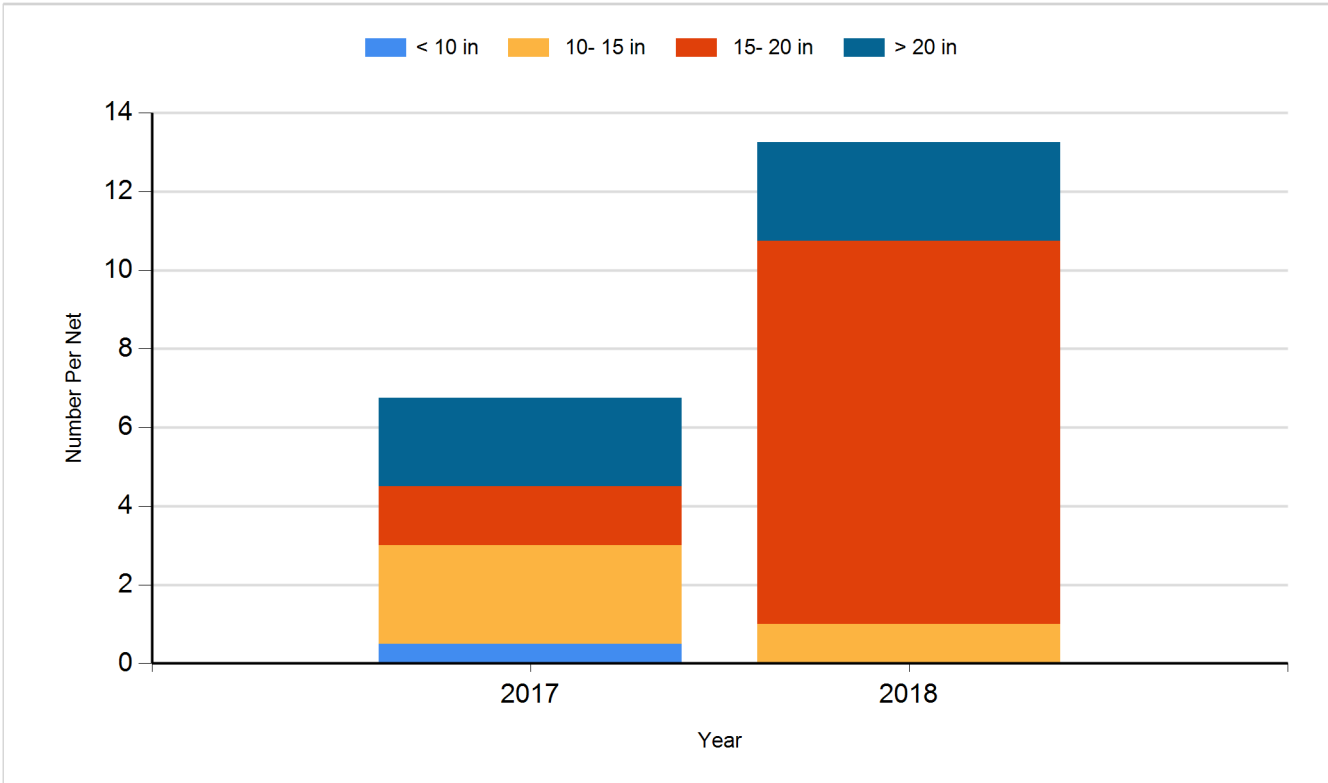
Species: Northern Pike
Gear: AFS std gill net



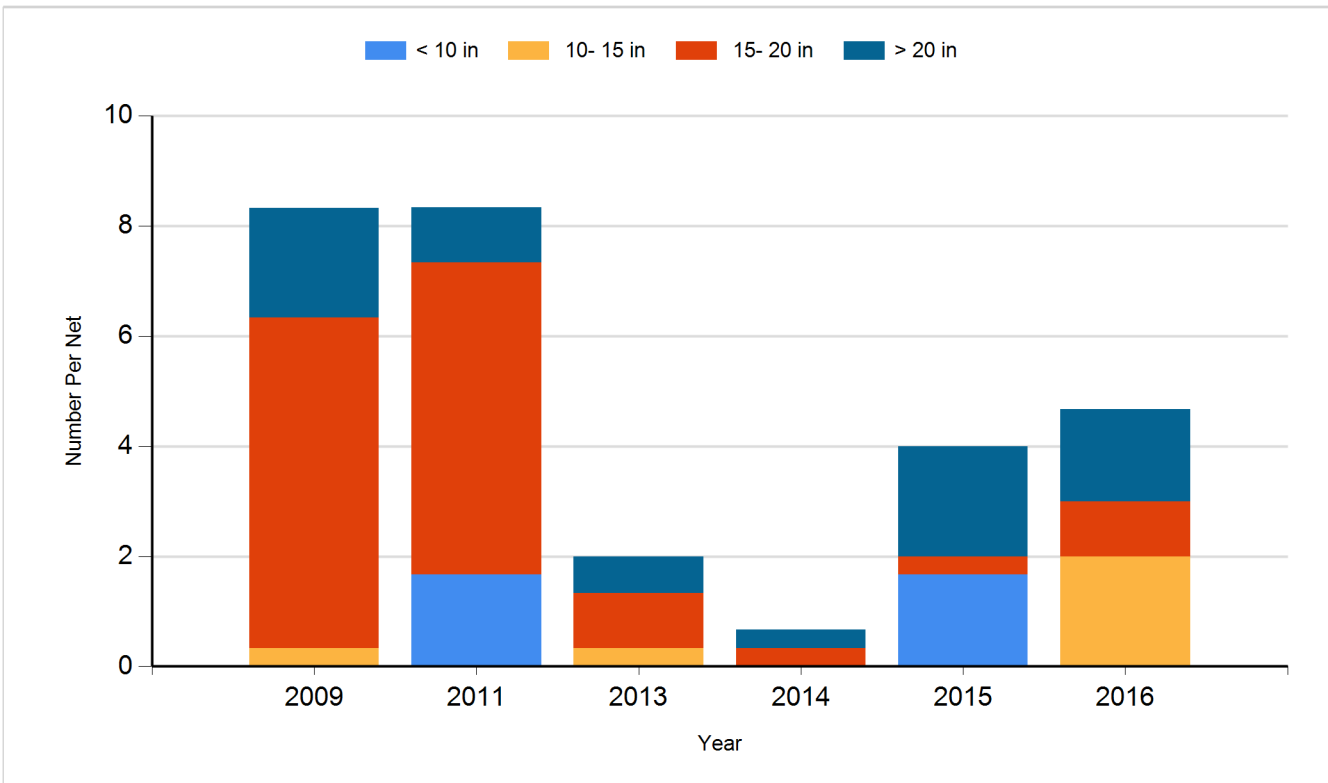
Species: Northern Pike
Gear: std exp gill net



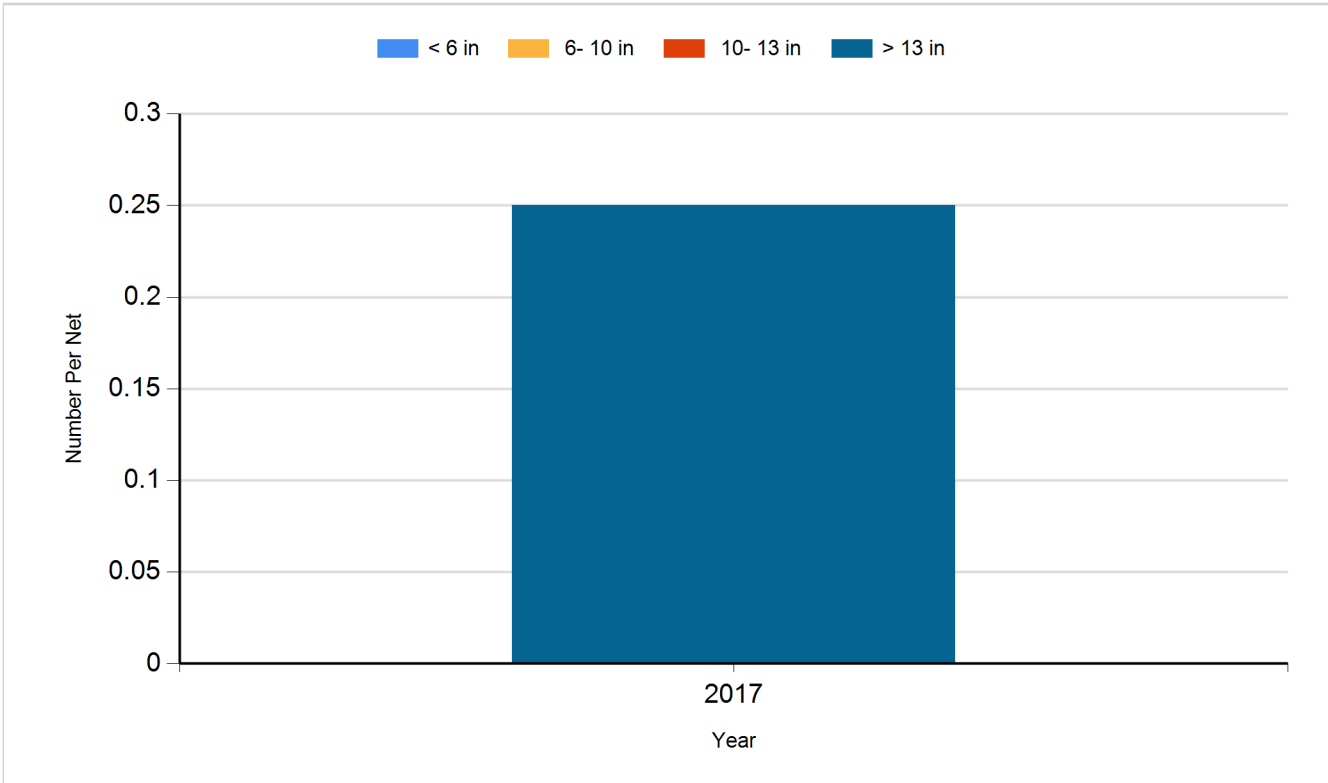
Species: Walleye
Gear: AFS std gill net



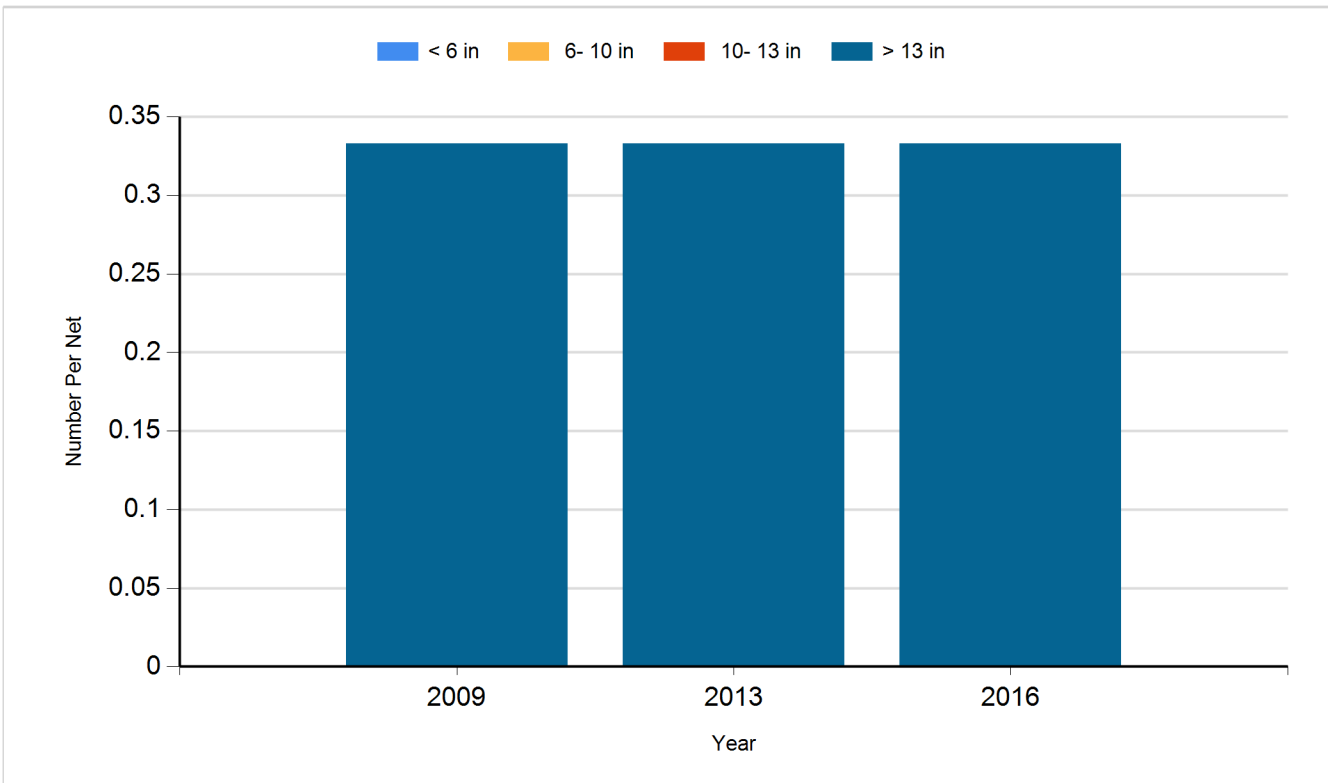
Species: Walleye
Gear: std exp gill net



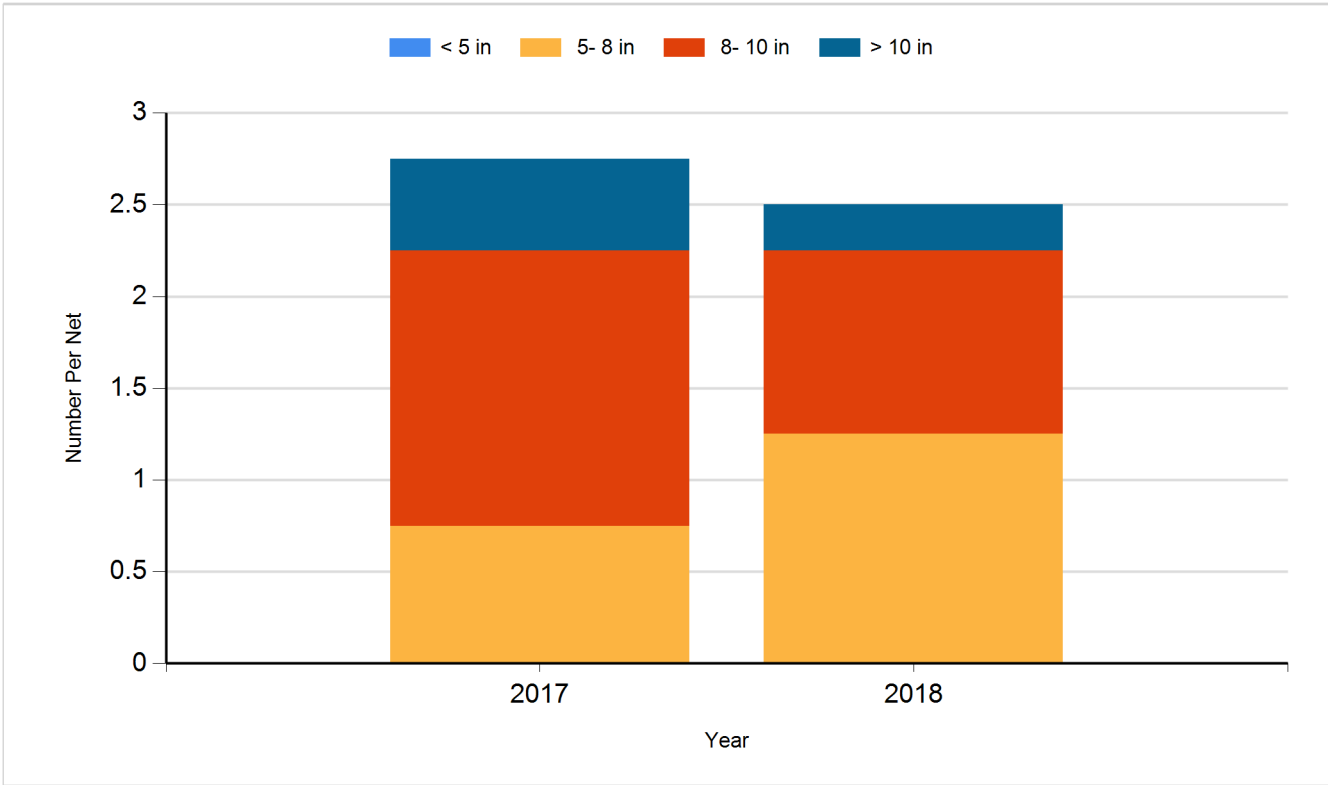
Species: White Sucker
Gear: AFS std gill net



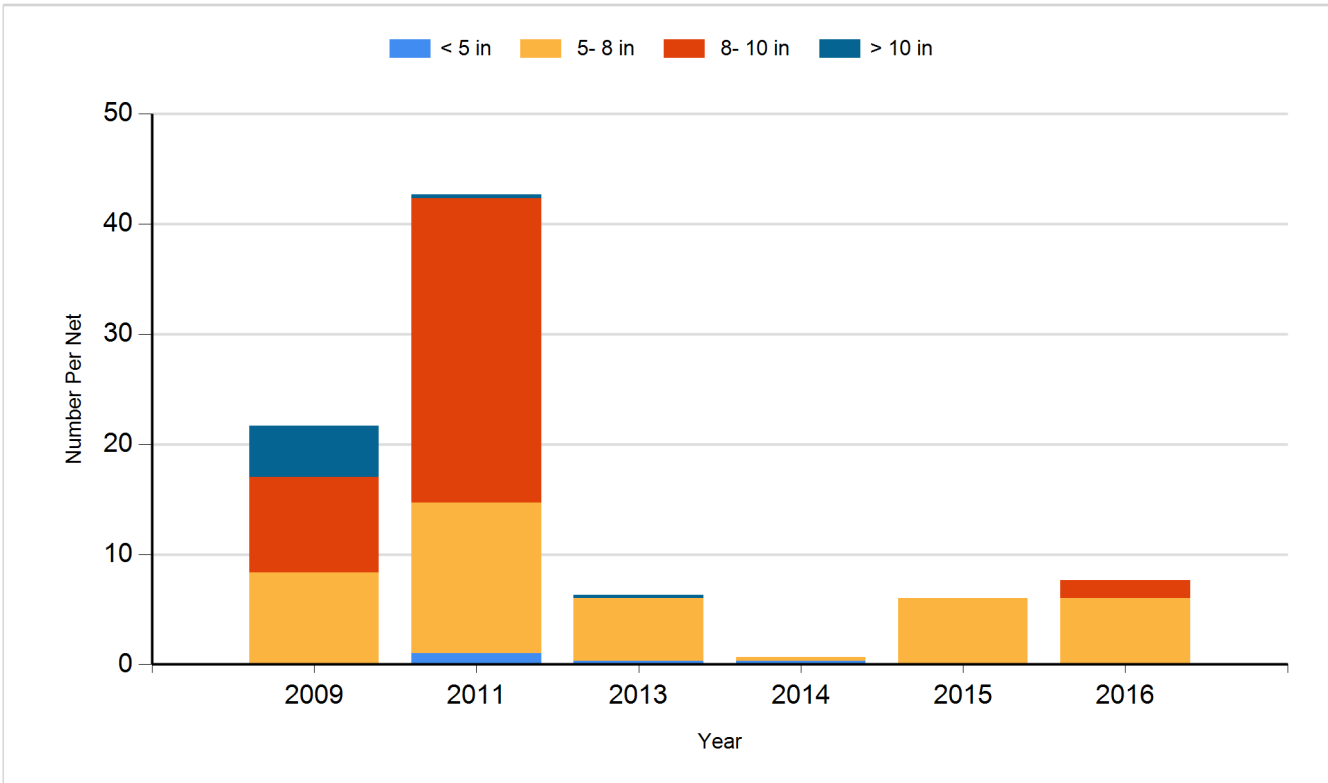
Species: White Sucker
Gear: std exp gill net



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
2007	Walleye	Adult	390
2007	Walleye	Juvenile	452
2007	Yellow Perch	Fingerling	200
2008	Walleye	Adult	106
2009	Walleye	Adult	743
2010	Walleye	Small Fingerling	14,200
2011	Walleye	Large Fingerling	478
2011	Yellow Perch	Small Fingerling	75,400
2013	Yellow Perch	Small Fingerling	138,250
2014	Walleye	Small Fingerling	14,300
2015	Walleye	Juvenile	666
2015	Walleye	Small Fingerling	5,082
2016	Walleye	Juvenile	703
2016	Walleye	Small Fingerling	5,670
2016	Yellow Perch	Adult	10,187
2017	Yellow Perch	Adult	3,362
2018	Yellow Perch	Adult	3,313