

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Island South, Minnehaha County
LBS-Lake-213-001
2019

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 11, 2019	4 net-nights
frame net (std 3/4 in)	Jul 18, 2019	5 net-nights

Common Fish Species Present

Black Crappie

Walleye

Common Carp

Yellow Perch

Black Bullhead

Bluegill

Northern Pike

Green Sunfish

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	9	2.3	1.2	100		0			
	Black Crappie	8	2.0	1.2	25		0	120	3	
	Common Carp	36	5.5	1.9	68	11	5			
	Walleye	61	15.3	1.8	43	6	10	4	92	1
	Yellow Perch	16	4.0	1.9	75	12	6		103	3
frame net (std 3/4 in)	Black Bullhead	13	2.6	0.9	92		23	13		
	Black Crappie	95	19.0	8.1	42	5	5	2	125	2
	Bluegill	8	1.6	0.7	75		38	20	127	11
	Common Carp	10	0.8	0.5	75		75			
	Green Sunfish	1	0.2	0.2	100		0		110	
	Northern Pike	2	0.2	0.2	100		100		96	
	Walleye	15	3.0	1.4	93		87		90	3
	Yellow Perch	7	1.4	0.6	71		29		98	5

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
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
AFS std frame net	Black Bullhead								7.6			7.60
	Black Crappie								2.4			2.40
	Bluegill								3.0			3.00
	Common Carp								3.0			3.00
	Golden Shiner								0.0			0.00
	Northern Pike								1.0			1.00
	Smallmouth Bass								0.2			0.20
	Walleye								1.6			1.60
	Yellow Perch								1.6			1.60
AFS std gill net	Black Bullhead								5.3	5.0	2.3	4.20
	Black Crappie								0.3	1.3	2.0	1.20
	Common Carp								22.0	4.0	5.5	10.50
	Northern Pike								0.8	0.3	0.0	0.37
	Walleye								6.3	13.3	15.3	11.63
	White Sucker								0.3	0.0	0.0	0.10
	Yellow Perch								2.8	2.5	4.0	3.10
frame net (std 3/4 in)	Black Bullhead		142.0		205.8					4.3	2.6	88.68
	Black Crappie		0.6		0.2					7.3	19.0	6.78
	Bluegill		0.0		0.4					1.5	1.6	0.88
	Channel Catfish		0.0		0.0					0.0	0.0	0.00
	Common Carp		0.0		0.6					2.0	0.8	0.85
	Golden Shiner		0.0		0.0					0.0	0.0	0.00
	Green Sunfish		0.0		0.0					0.0	0.2	0.05
	Northern Pike		0.0		1.4					1.3	0.2	0.73
	Sunfish Hybrid		0.0		0.0					0.0	0.0	0.00
	Walleye		0.2		0.8					0.5	3.0	1.13
	White Sucker		0.0		0.0					0.3	0.0	0.08
	Yellow Perch		1.0		0.6					1.3	1.4	1.08
std exp gill net	Black Bullhead		115.3		156.7	151.7	101.3	58.0				116.60
	Black Crappie		0.0		1.7	0.0	0.0	1.0				0.54
	Channel Catfish		0.0		0.0	0.0	0.0	0.0				0.00
	Common Carp		0.0		0.0	1.7	5.3	2.7				1.94
	Golden Shiner		0.0		0.0	0.0	0.0	0.0				0.00
	Northern Pike		1.0		1.3	7.3	9.0	1.3				3.98

		CPUE										
Gear	Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
std exp gill net	Walleye		6.7		2.0	0.7	2.3	4.7				3.28
	White Sucker		0.0		0.3	0.0	0.0	0.3				0.12
	Yellow Perch		41.7		6.0	0.3	6.0	7.7				12.34

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												
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019			
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										136			
	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	100		
		PSD-P									19	15	0		
	Black Crappie	PSD										100	20	25	
		PSD-P										0	0	0	
		Wr											116	120	
	Common Carp	PSD										11	100	68	
		PSD-P										10	6	5	
	Northern Pike	PSD										100	100		
		PSD-P										0	100		
		Wr										81	80		
	Walleye	PSD										60	92	43	
		PSD-P										36	19	10	
		Wr										84	92	92	
	Yellow Perch	PSD										73	50	75	

Gear	Species	Index	Year										
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
AFS std gill net	Yellow Perch	PSD-P									18	10	6
		Wr									93	99	103
frame net (std 3/4 in)	Black Bullhead	PSD		22		17						82	92
		PSD-P		0		1						24	23
		Wr		80		82							
	Black Crappie	PSD		33		100						7	42
		PSD-P		33		100						3	5
		Wr		104		117						115	125
	Bluegill	PSD				50						50	75
		PSD-P				50						17	38
		Wr				131						107	127
	Common Carp	PSD				100						100	75
		PSD-P				33						75	75
		Wr				110							
	Green Sunfish	PSD											100
		PSD-P											0
		Wr											110
	Northern Pike	PSD				57						100	100
		PSD-P				0						60	100
		Wr				103						75	96
Walleye	PSD		100		100						100	93	
	PSD-P		0		100						0	87	
	Wr		90		101						90	90	
Yellow Perch	PSD		100		67						0	71	
	PSD-P		0		0						0	29	
	Wr		99		74						100	98	
std exp gill net	Black Bullhead	PSD		25		4	32	27	86				
		PSD-P		0		0	1	0	0				
		Wr		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						
	Northern Pike	PSD		33		75	91	100	100				

Gear	Species	Index	Year									
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
std exp gill net	Northern Pike	PSD-P		0		25	5	15	50			
		Wr		97		87	85	89	80			
	Walleye	PSD		100		83	100	100	57			
		PSD-P		15		33	50	86	36			
		Wr		89		92	86	96	83			
	Yellow Perch	PSD		67		6	0	0	22			
		PSD-P		1		6	0	0	0			
		Wr		105		106	92	92	88			

Fish Condition

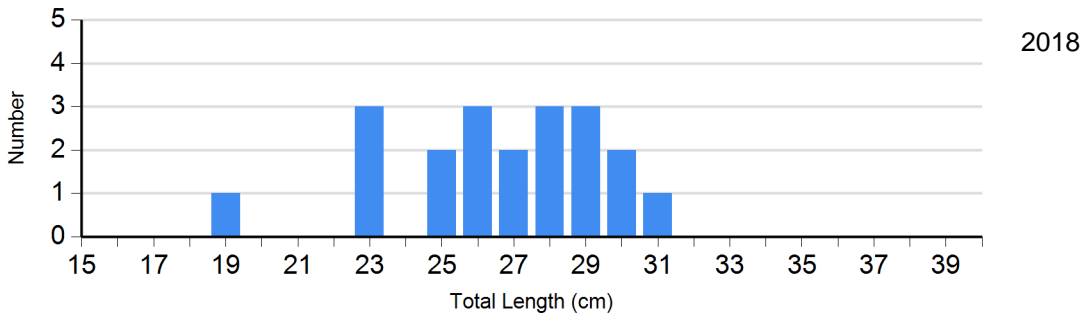
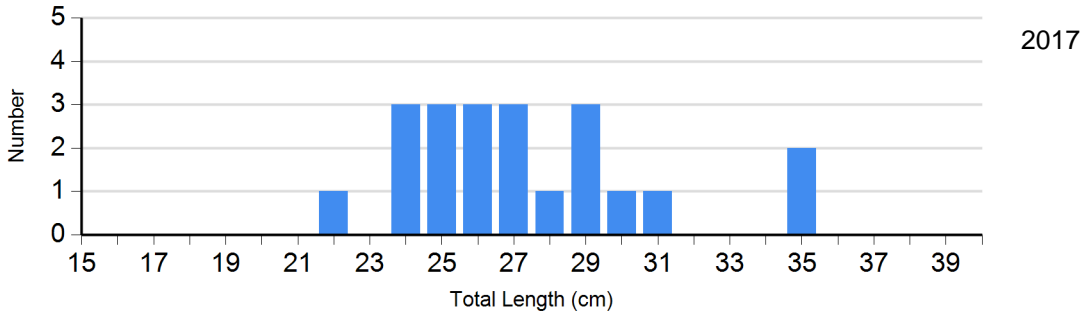
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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
	2019	55	134 (1.3)	35	117 (2.5)	1		4	98 (6.4)
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	
	2019	2	147 (21.9)	3	139 (9.3)	3	106 (5.5)	0	
Northern Pike Gill Net	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	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)
	2019	35	93 (0.8)	20	90 (1.2)	5	88 (0.4)	1	90
Yellow Perch Gill Net	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	
	2019	4	113 (5.9)	11	99 (1.9)	1	103	0	

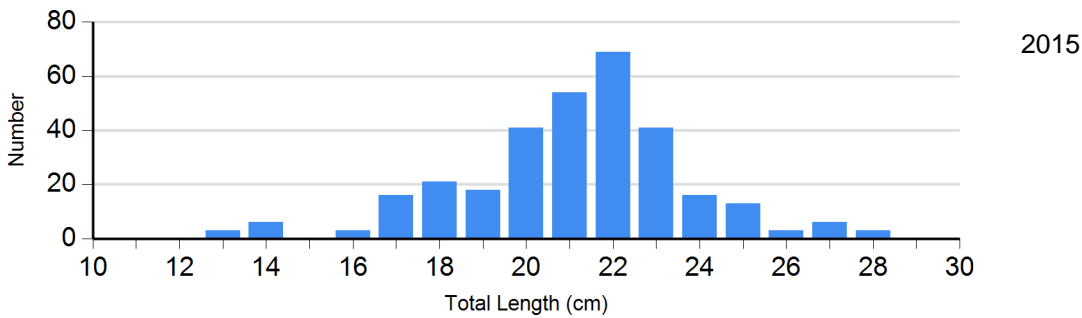
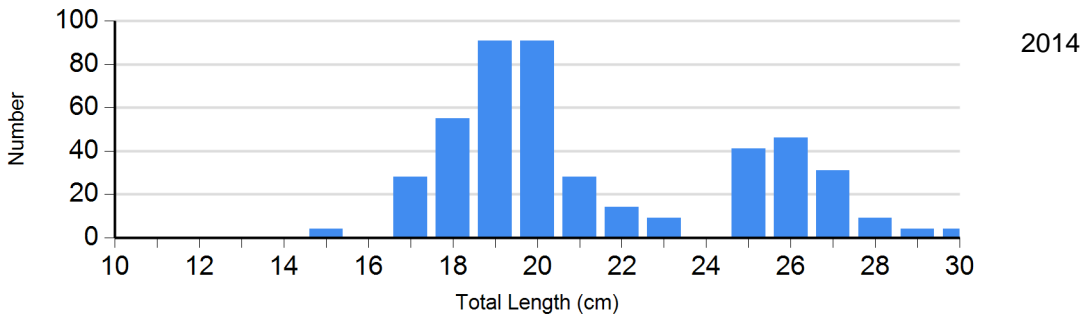
Length Frequency Distribution

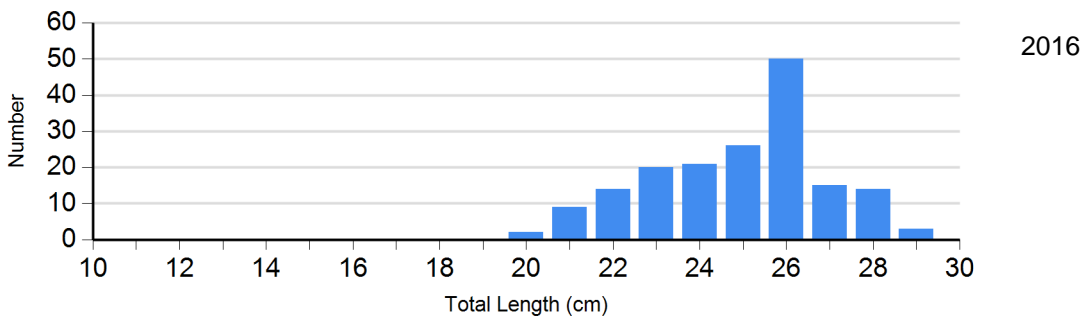
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

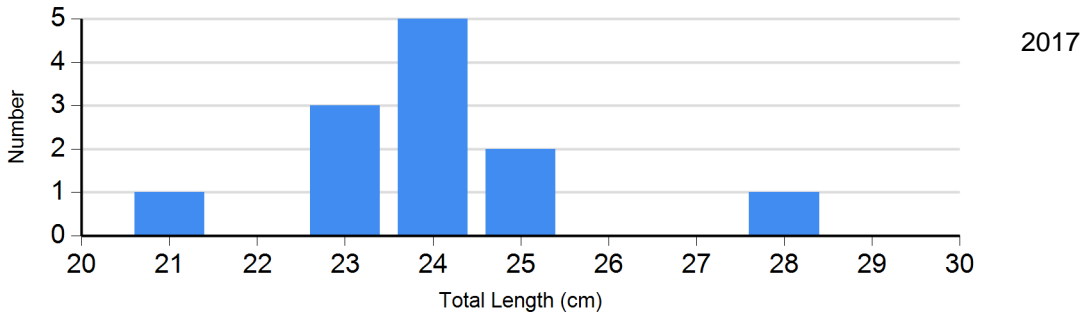


Species: Black Bullhead
Gear: std exp gill net

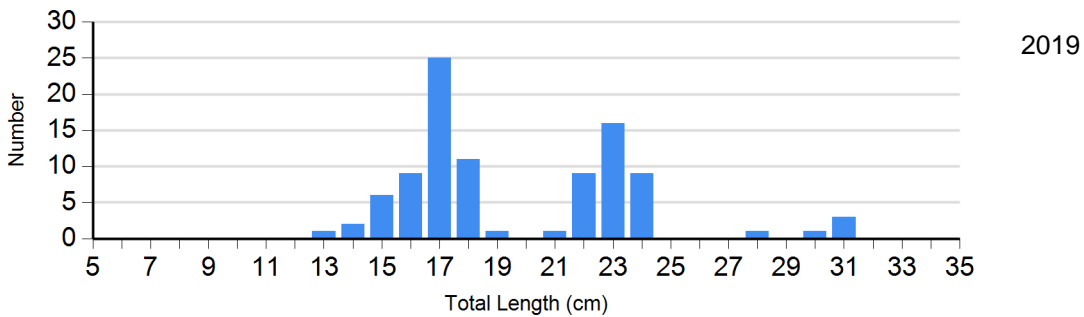
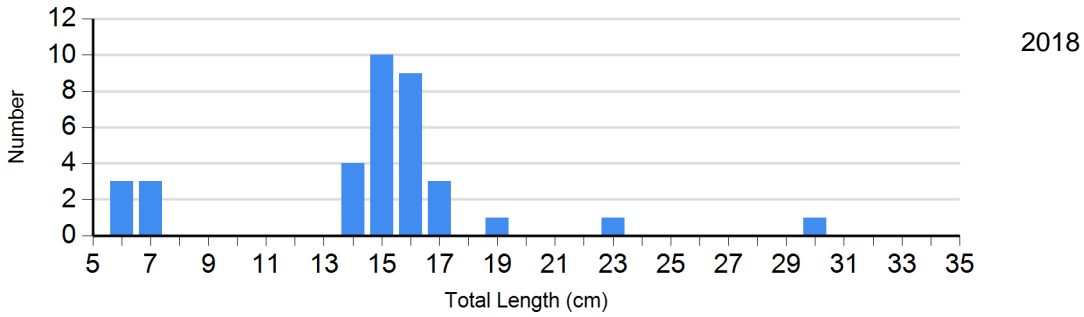




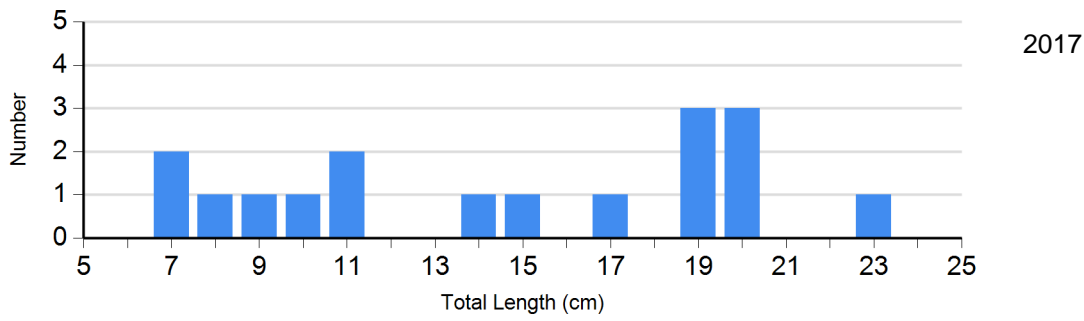
Species: Black Crappie
Gear: AFS std frame net



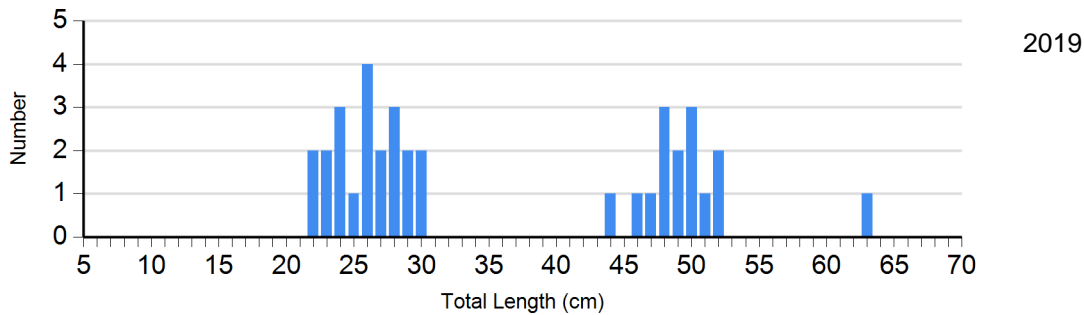
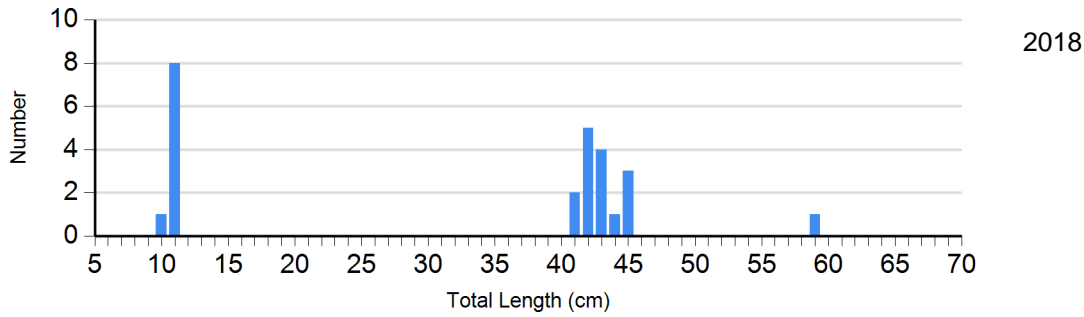
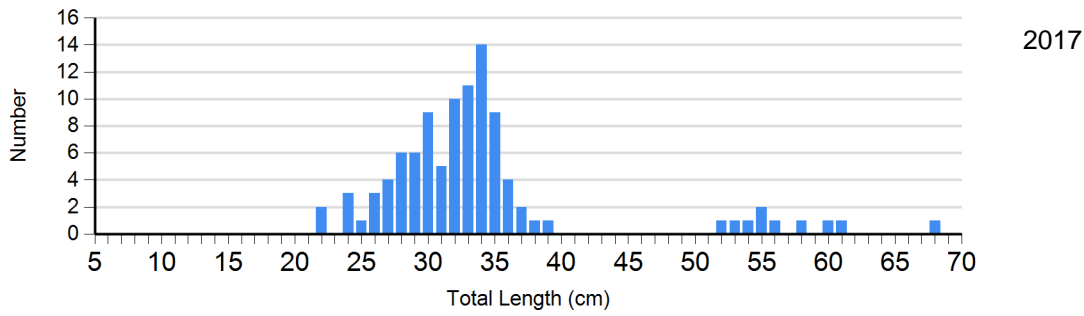
Species: Black Crappie
Gear: frame net (std 3/4 in)



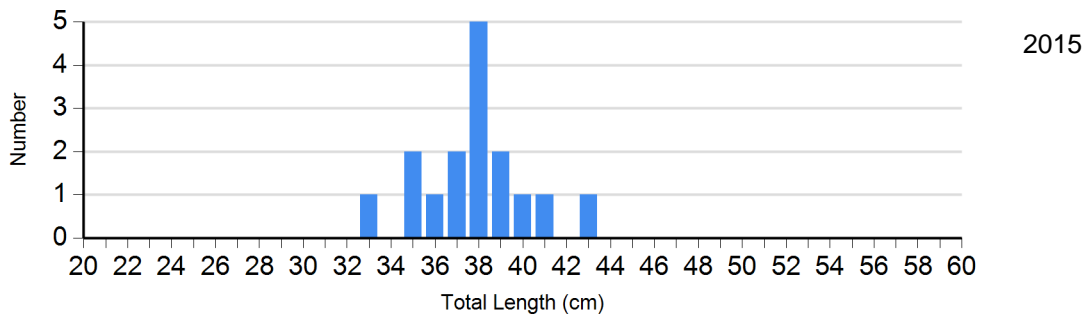
Species: Bluegill
Gear: AFS std frame net



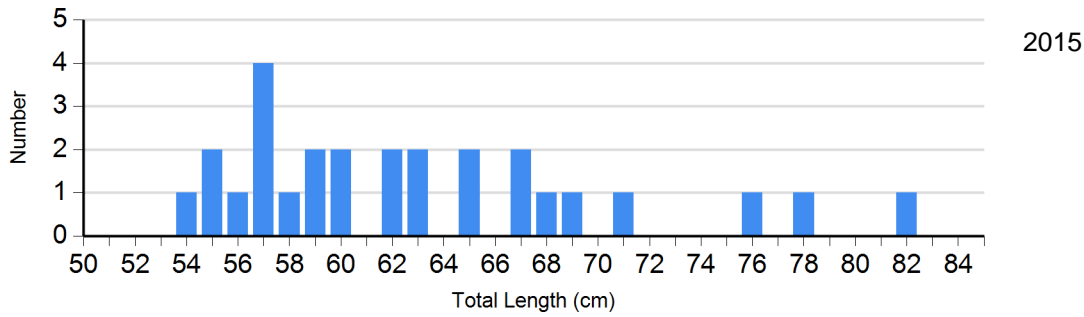
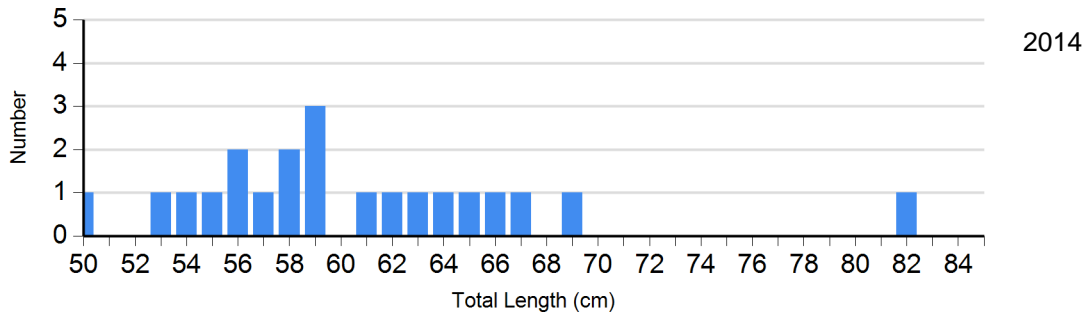
Species: Common Carp
Gear: AFS std gill net



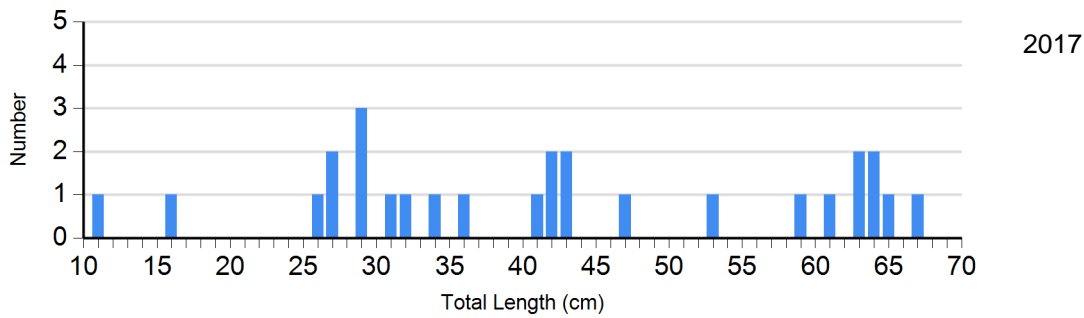
Species: Common Carp
Gear: std exp gill net

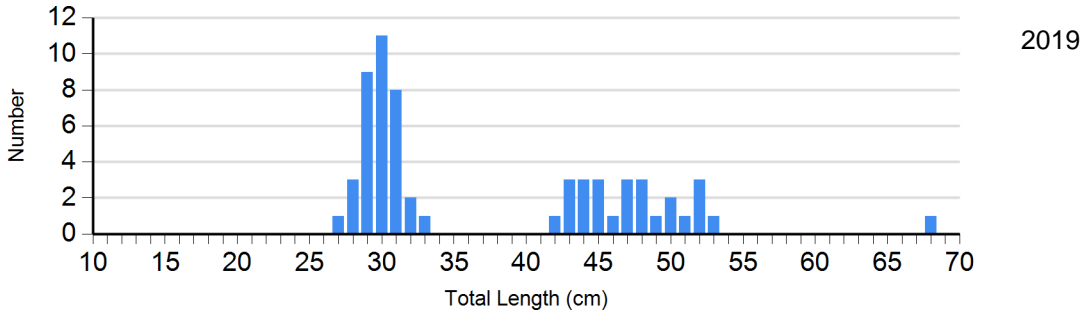
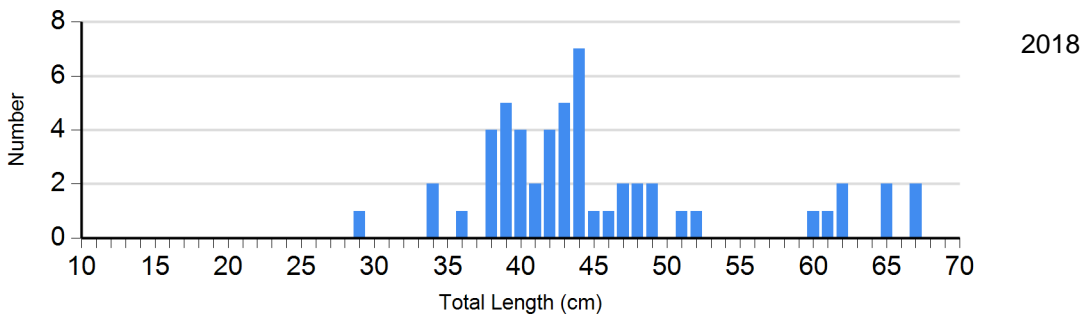


Species: Northern Pike
Gear: std exp gill net

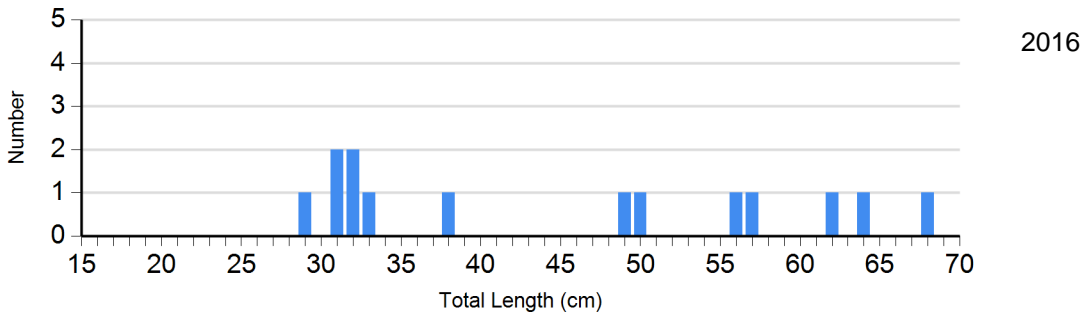
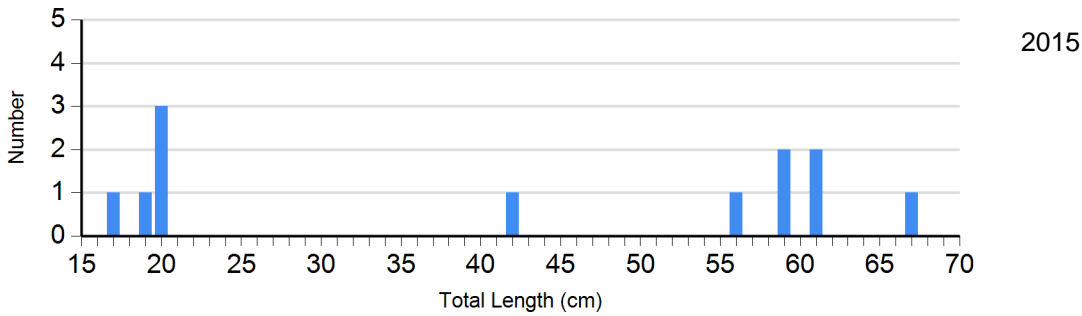


Species: Walleye
Gear: AFS std gill net

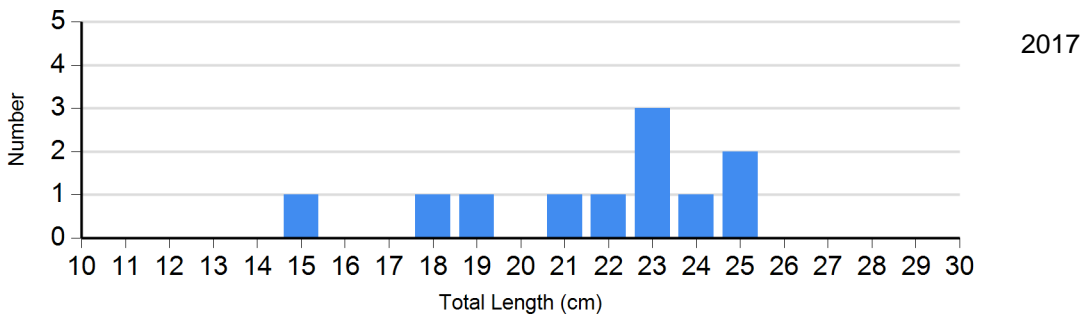


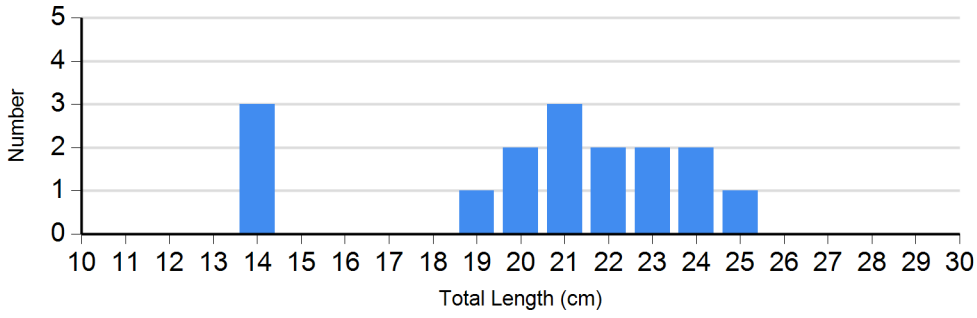
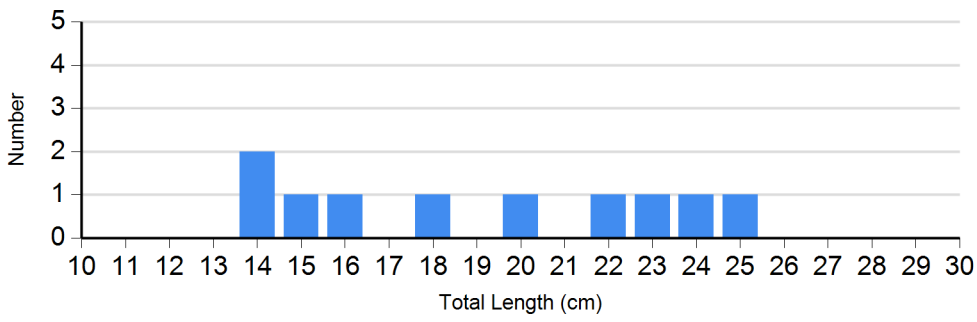


Species: Walleye
Gear: std exp gill net

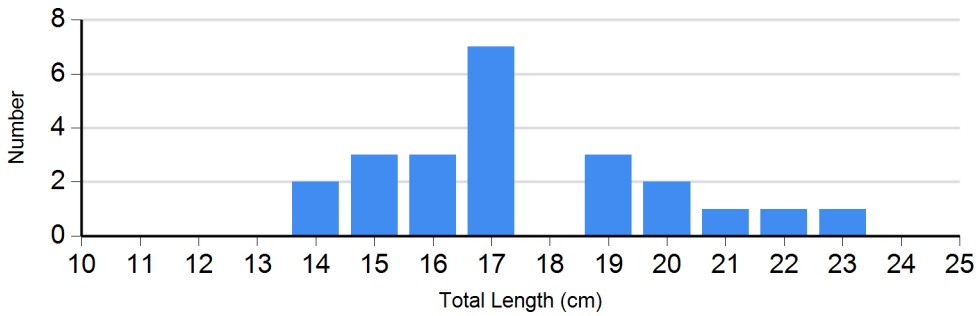
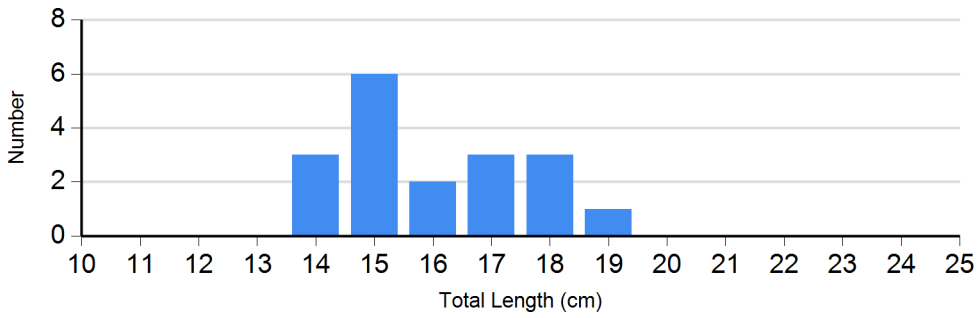


Species: Yellow Perch
Gear: AFS std gill net





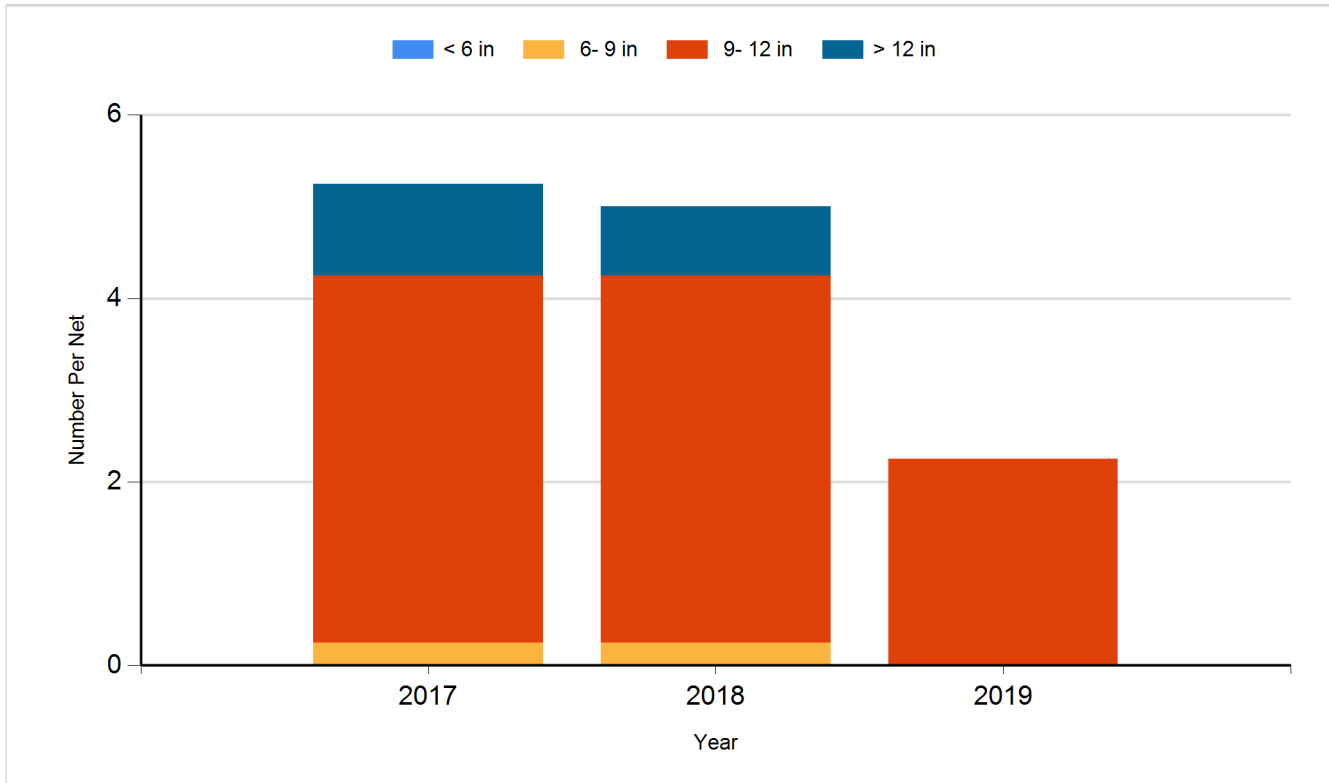
Species: Yellow Perch
 Gear: std exp gill net



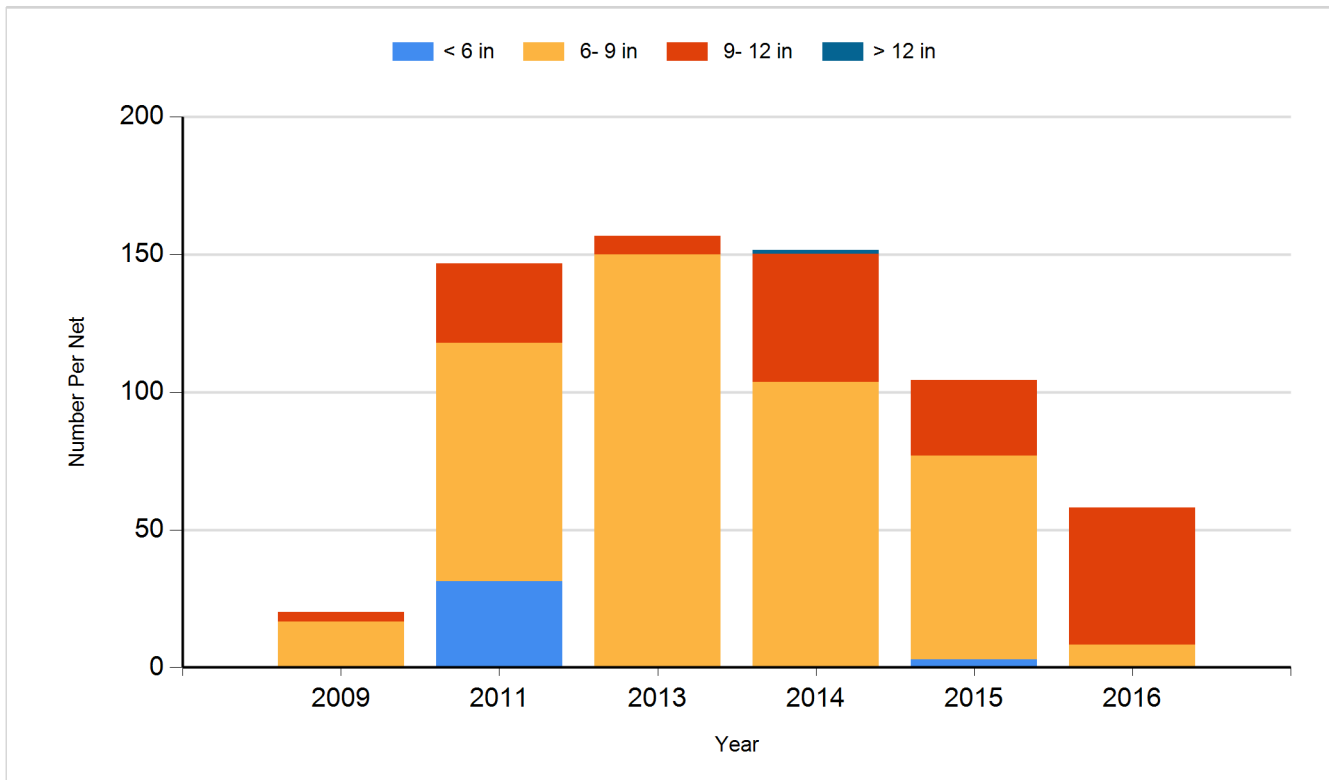
Historic Fish Sizes and Relative Abundance

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

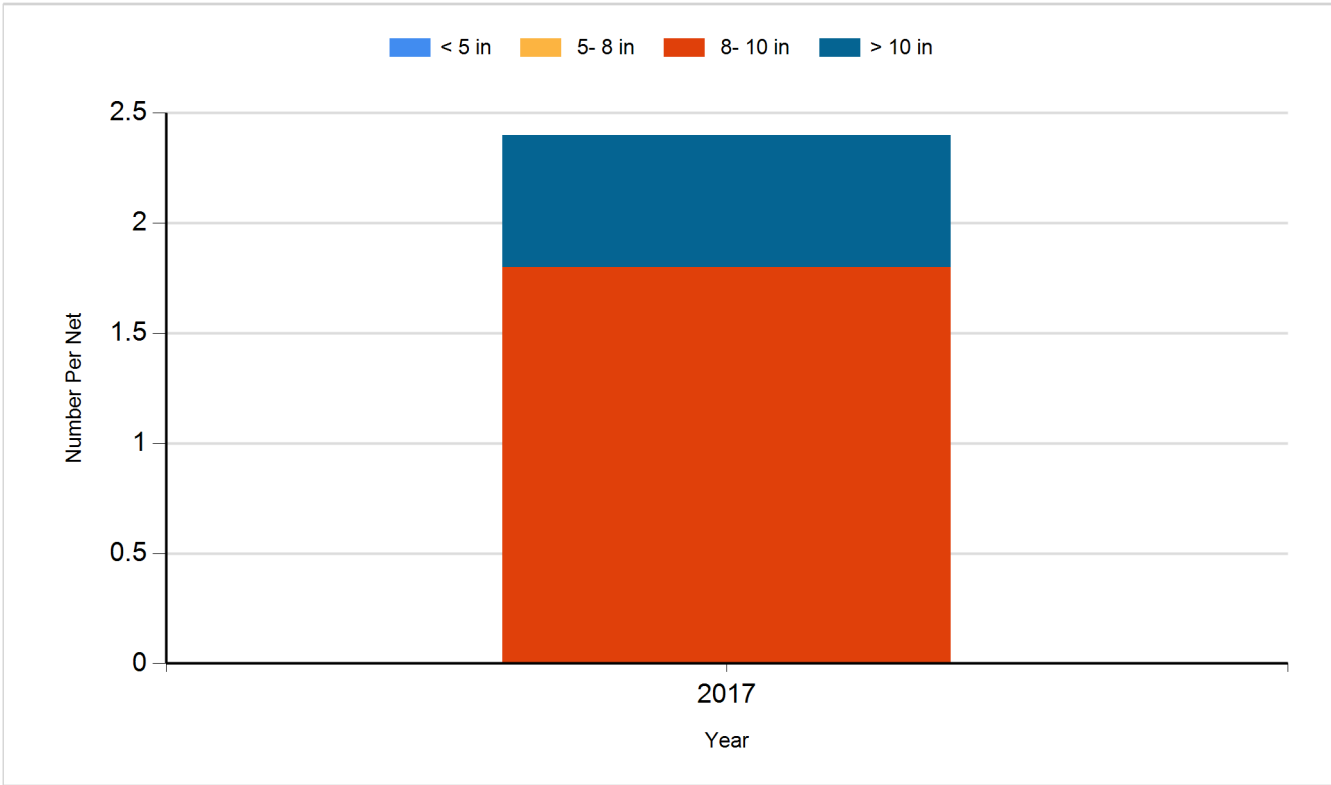
Species: Black Bullhead
Gear: AFS std gill net



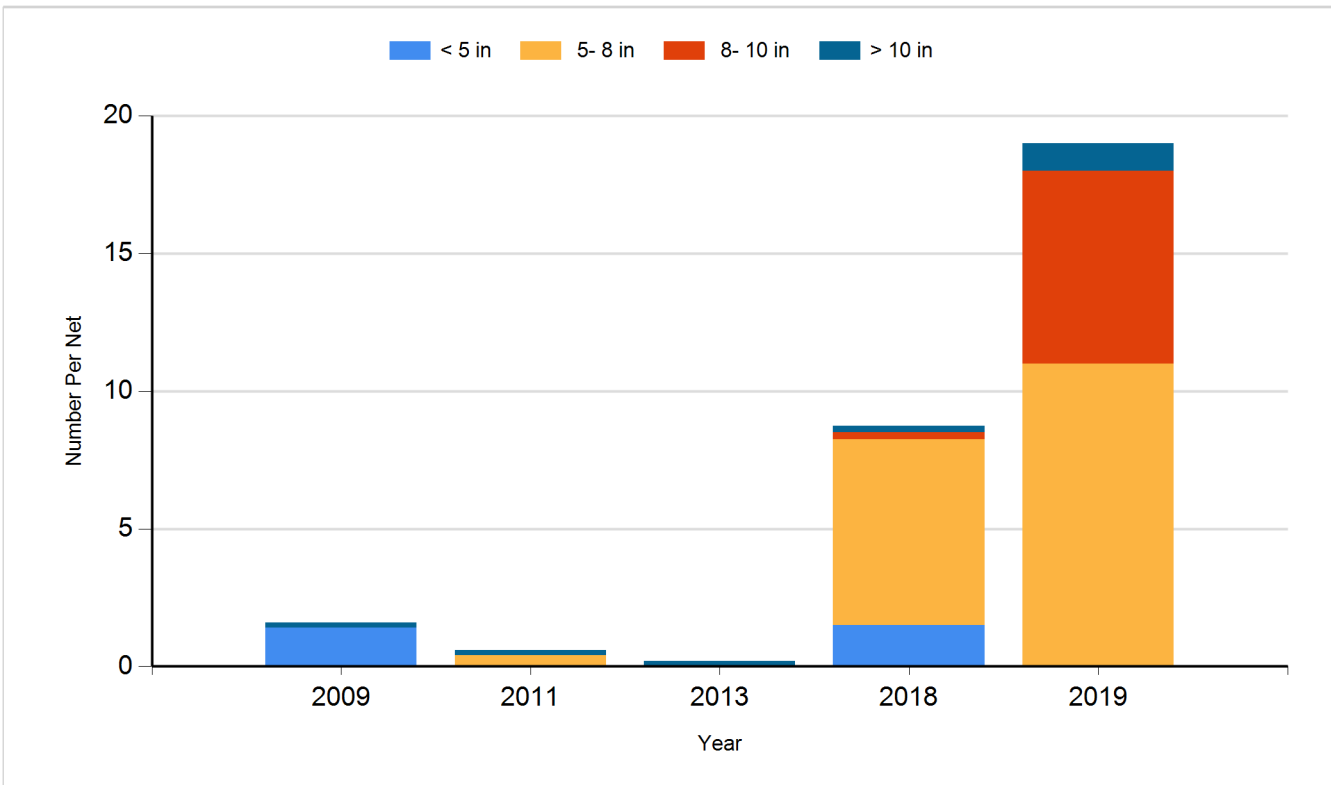
Species: Black Bullhead
Gear: std exp gill net



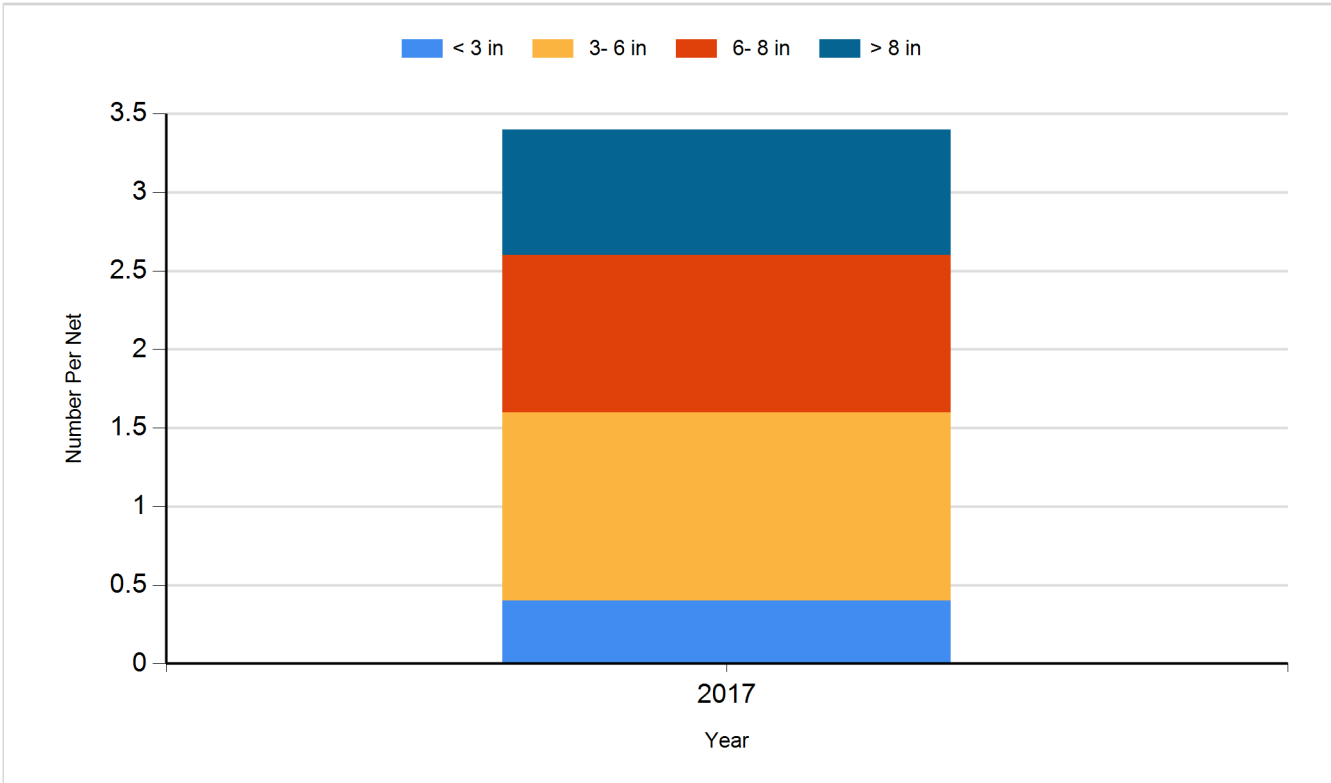
Species: Black Crappie
Gear: AFS std frame net



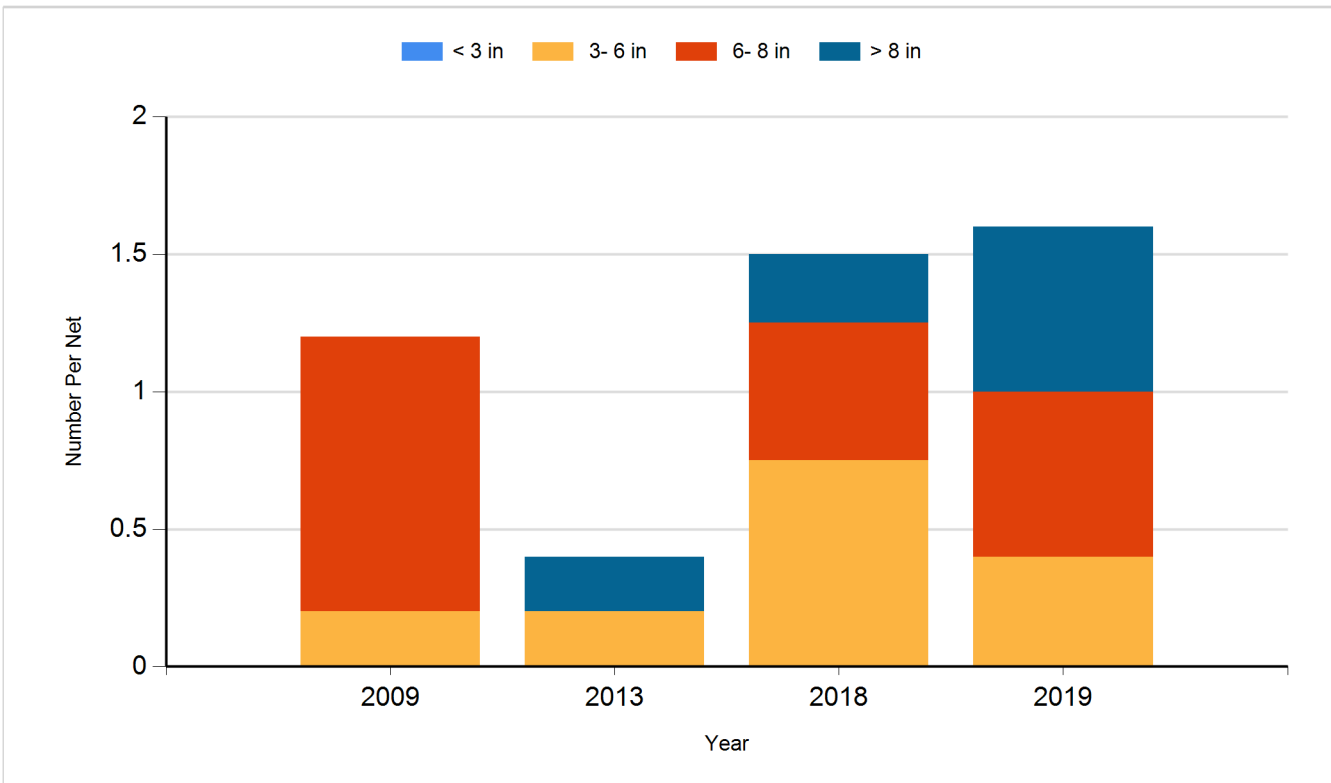
Species: Black Crappie
Gear: frame net (std 3/4 in)



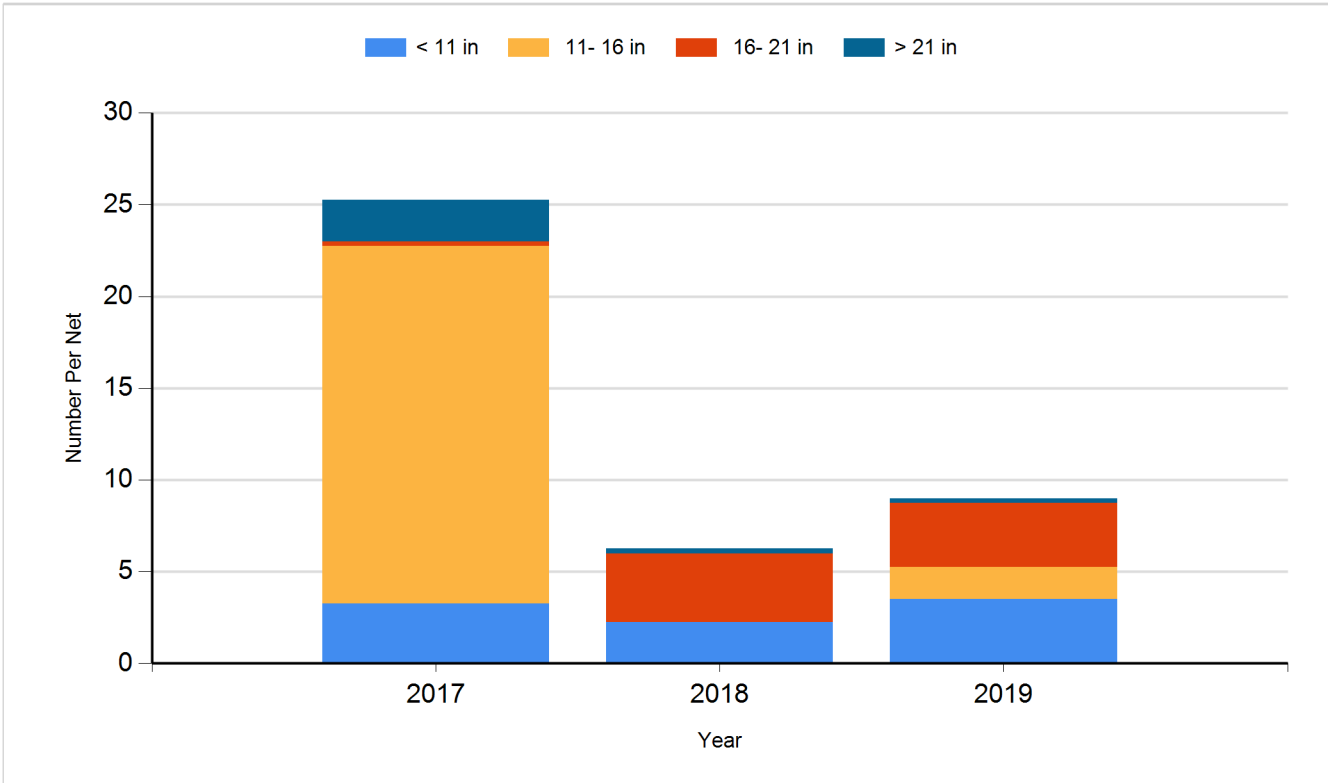
Species: Bluegill
Gear: AFS std frame net



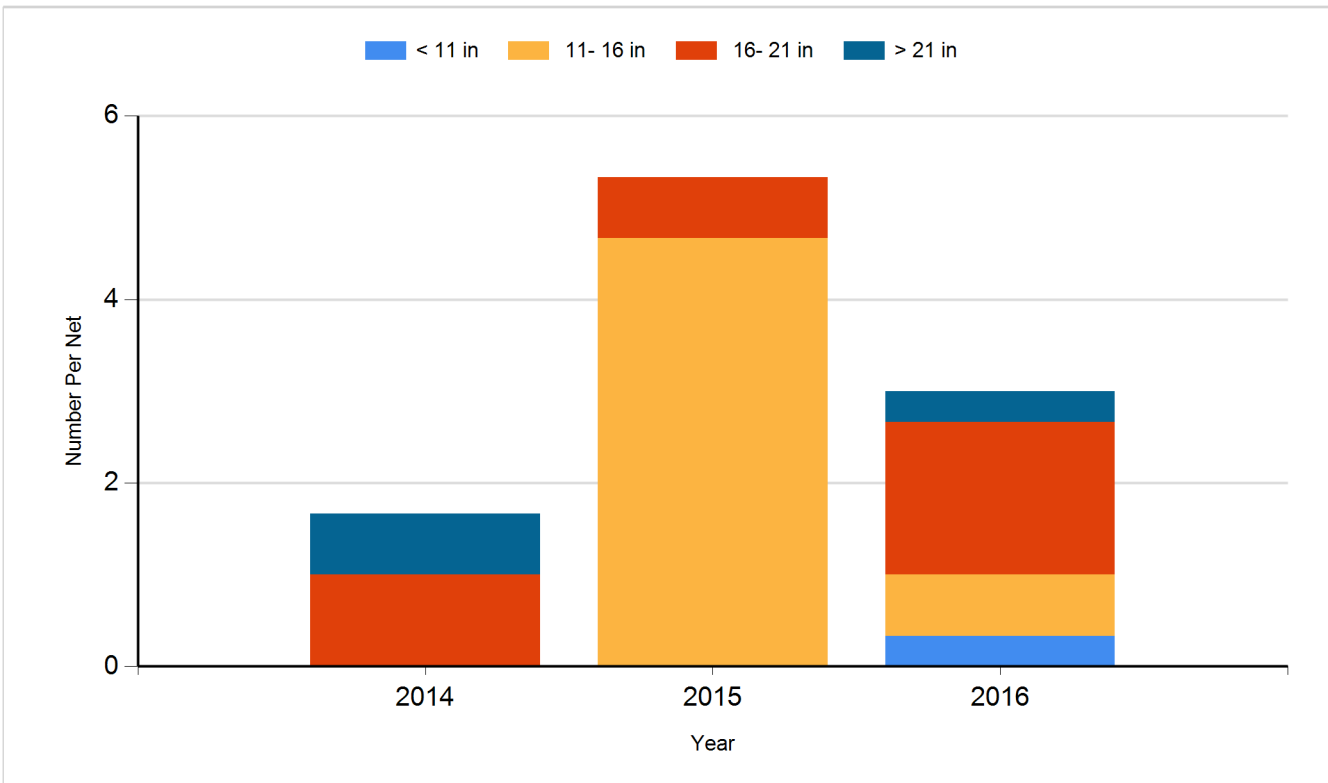
Species: Bluegill
Gear: frame net (std 3/4 in)



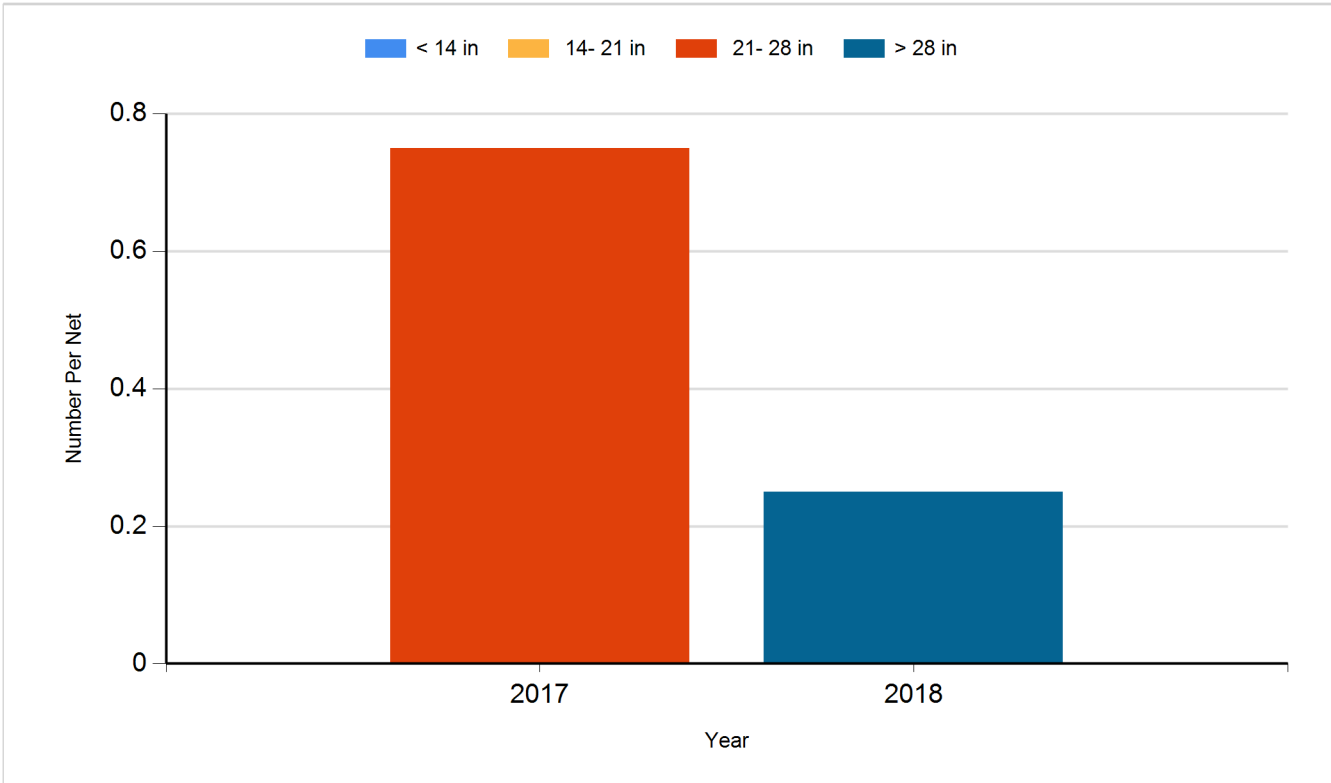
Species: Common Carp
Gear: AFS std gill net



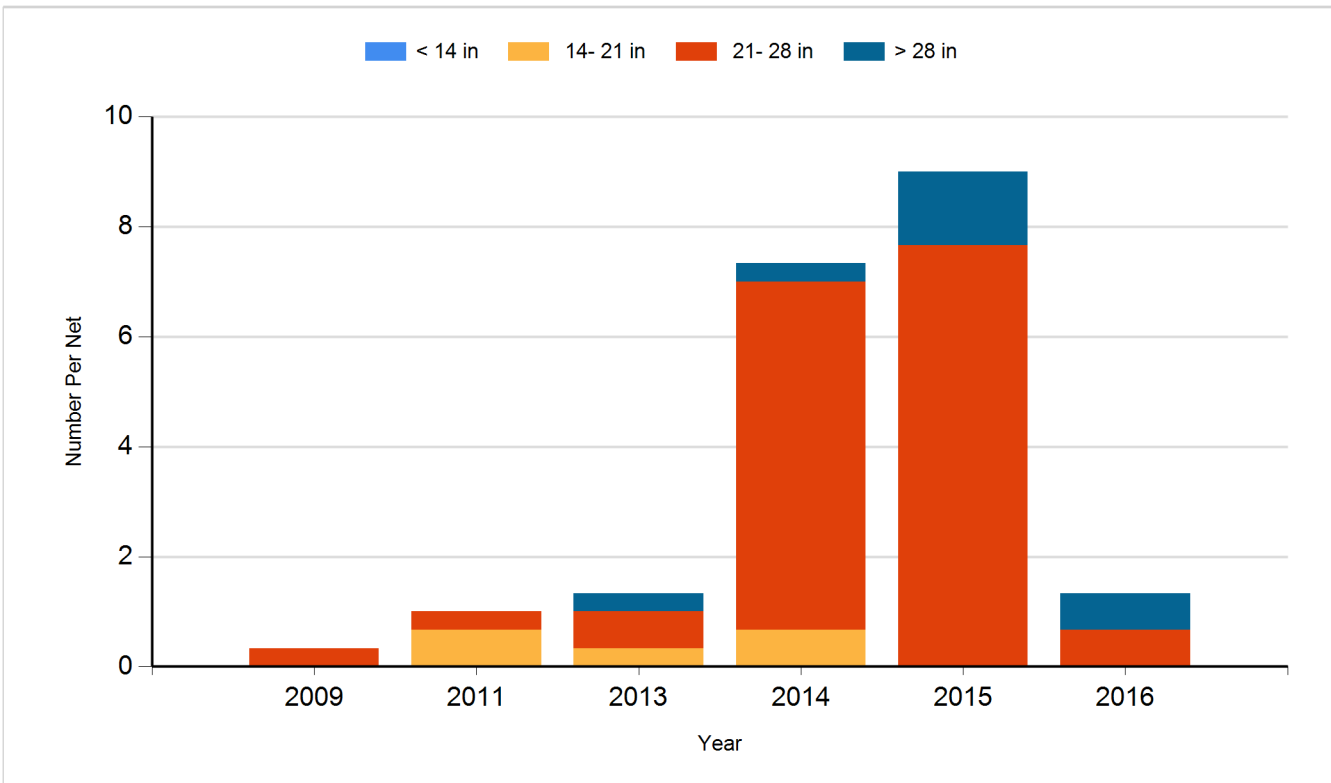
Species: Common Carp
Gear: std exp gill net



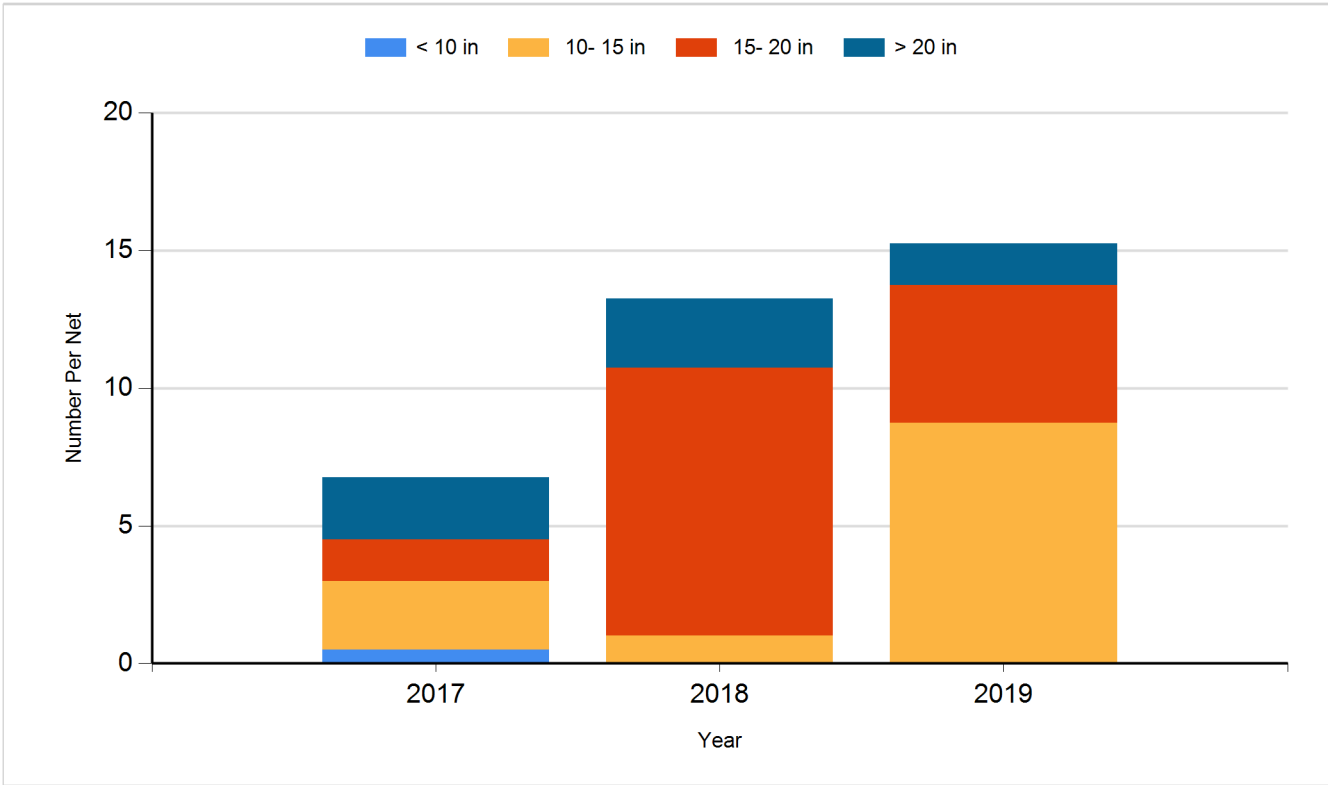
Species: Northern Pike
Gear: AFS std gill net



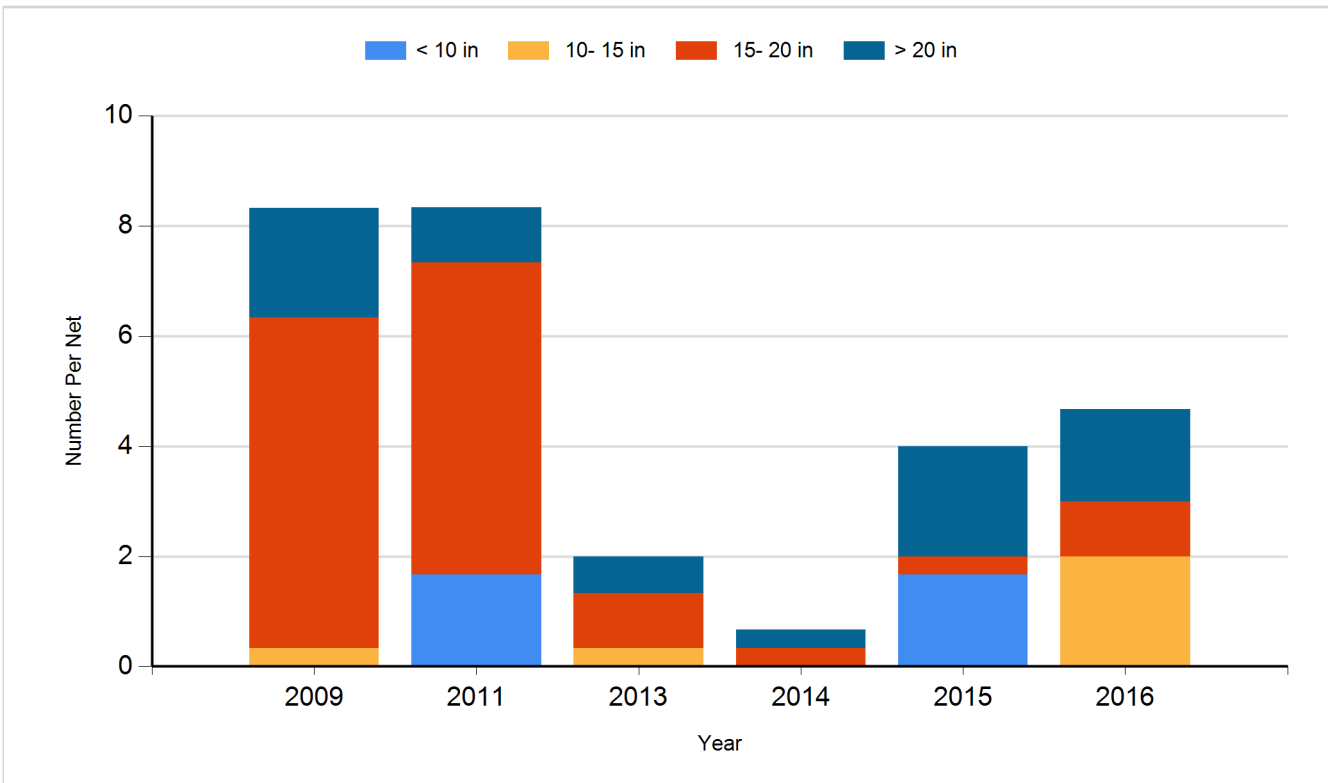
Species: Northern Pike
Gear: std exp gill net



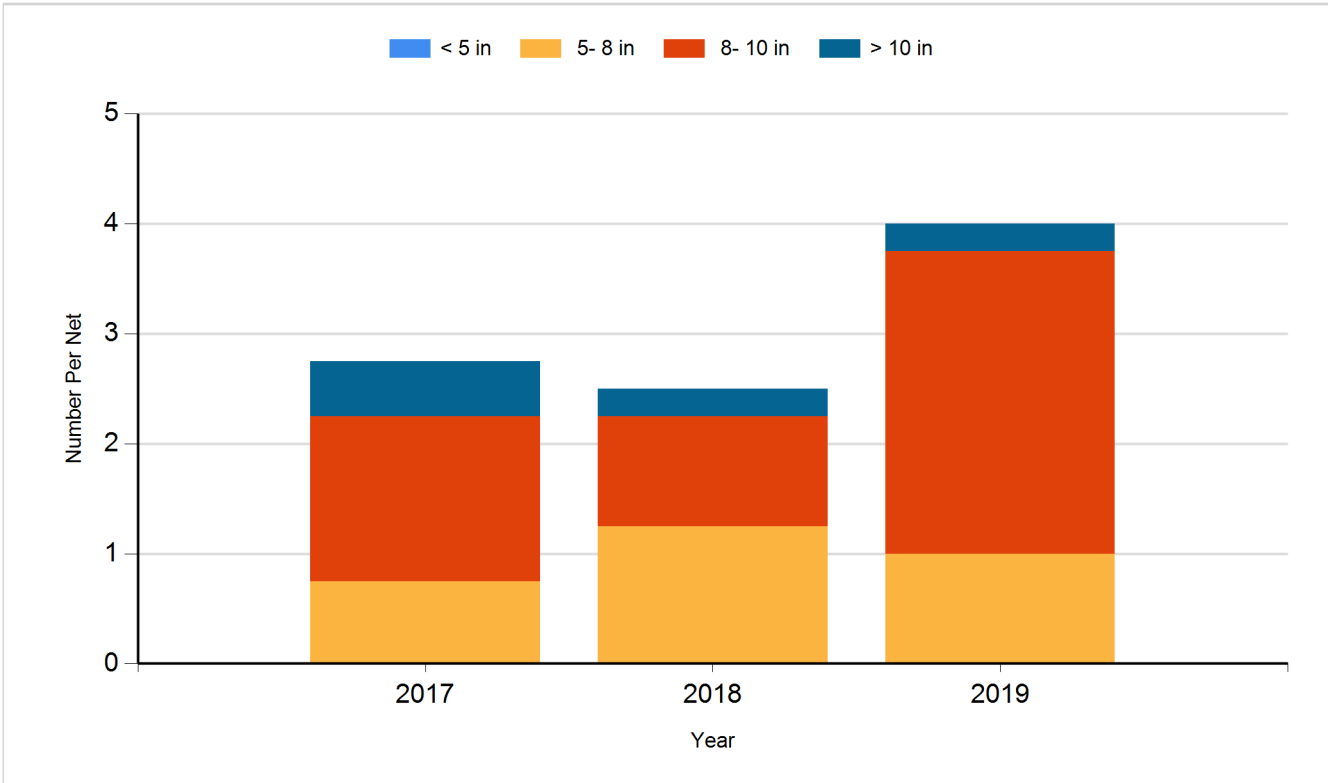
Species: Walleye
Gear: AFS std gill net



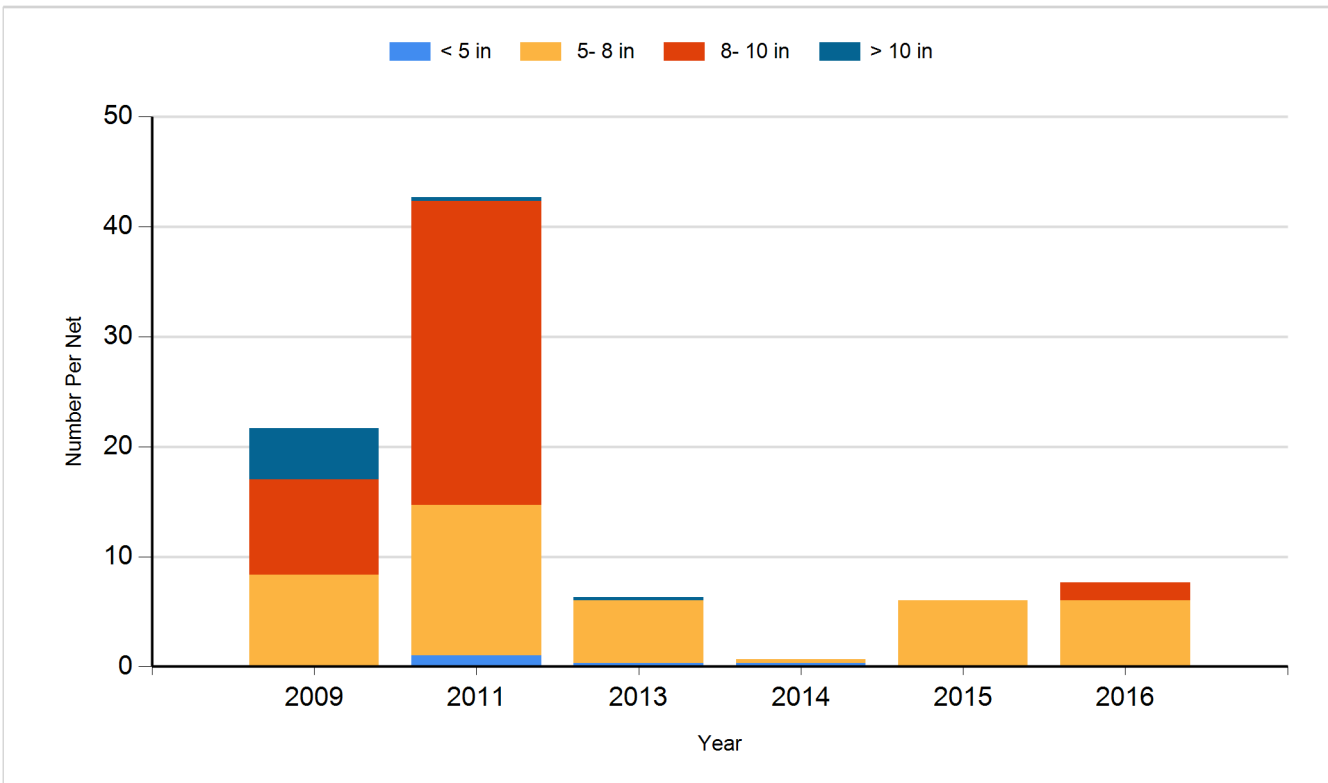
Species: Walleye
Gear: std exp gill net



Species: 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
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
