

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Durkee, Meade County

CHE-Lake-516-000

2019

Lake Information

Name: Durkee
County: Meade
Surface Area: 108 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 11, 2019	2 net-nights
boat shocker (night)	Jun 13, 2019	3600 seconds
frame net (std 3/4 in)	May 11, 2019	8 net-nights

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

Golden Shiner

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	5	2.5	1.5	60		0	101	8	
	Golden Shiner	1	0.0	0.0						
	Northern Pike	2	1.0	0.0	0		0	92	15	
	Yellow Perch	7	3.5	7.7	0		0	88	5	
boat shocker (night)	Largemouth Bass	9	9.0	7.1	100		56	105	5	
frame net (std 3/4 in)	Black Bullhead	283	35.0	13.8	98	1	0	98	1	
	Black Crappie	123	14.9	5.3	26	6	6	3	97	1
	Bluegill	1	0.1	0.2	100		0	125		
	Golden Shiner	1	0.0	0.0						
	Largemouth Bass	2	0.3	0.4	100		100	101	0	
	Northern Pike	8	1.0	0.5	88		25	86	3	
	Yellow Perch	36	4.5	4.2	17	10	6	86	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
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
AFS std frame net	Black Bullhead								27.0			27.00
	Black Crappie								9.4			9.40
	Bluegill								9.7			9.70
	Golden Shiner								0.0			0.00
	Largemouth Bass								0.3			0.30
	Northern Pike								0.6			0.60
	Yellow Perch								1.9			1.90
AFS std gill net	Black Bullhead								10.0	25.5	2.5	12.67
	Black Crappie								0.3	0.5	0.0	0.27
	Bluegill								0.0	0.5	0.0	0.17
	Channel Catfish								0.0	0.5	0.0	0.17
	Golden Shiner								0.0	0.0	0.0	0.00
	Northern Pike								2.3	3.5	1.0	2.27
	White Bass								0.5	0.0	0.0	0.17
Yellow Perch								5.0	13.5	3.5	7.33	
boat shocker (night)	Largemouth Bass					28.2	22.5	47.1	59.0	39.6	9.0	34.23
frame net (std 3/4 in)	Black Bullhead	490.5	162.5	234.9	370.9	228.4	162.4	42.8		19.6	35.0	194.11
	Black Crappie	0.3	2.6	4.4	96.4	73.4	10.3	23.9		11.4	14.9	26.40
	Bluegill	12.3	96.9	223.1	82.0	45.0	12.1	85.5		34.4	0.1	65.71
	Channel Catfish	0.0	0.0	0.0	0.0	0.1	0.0	0.0		0.0	0.0	0.01
	Golden Shiner	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.00
	Green Sunfish	0.0	0.0	0.0	0.0	0.0	0.3	0.0		0.0	0.0	0.03
	Largemouth Bass	0.3	0.0	0.6	0.0	0.0	0.1	0.0		0.0	0.3	0.14
	Northern Pike	1.8	0.5	2.0	0.6	0.3	0.0	1.5		1.6	1.0	1.03
Yellow Perch	3.5	0.8	3.6	1.3	2.4	18.6	3.4		6.2	4.5	4.92	
spring night EF-LMB	Largemouth Bass		30.0	54.0								42.00
std exp gill net	Black Bullhead	5.0	34.0	57.0	82.5	27.0	32.0	17.0				36.36
	Black Crappie	0.0	0.5	1.5	4.0	42.0	1.0	7.0				8.00
	Bluegill	2.0	0.5	0.0	0.5	0.0	1.0	0.0				0.57
	Channel Catfish	0.0	0.0	0.0	0.0	0.0	0.5	0.0				0.07
	Golden Shiner	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.00
	Northern Pike	6.0	4.0	3.0	8.5	2.5	1.0	6.0				4.43
	Yellow Perch	0.0	2.5	9.0	12.0	36.0	54.0	30.0				20.50

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									89				
		PSD-P									0				
		Wr									89				
	Black Crappie	PSD										55			
		PSD-P										0			
		Wr										107			
	Bluegill	PSD										78			
		PSD-P										7			
		Wr										106			
	Largemouth Bass	PSD										100			
		PSD-P										0			
		Wr										110			
	Northern Pike	PSD										50			
		PSD-P										50			
		Wr										95			
	Yellow Perch	PSD										85			
		PSD-P										0			
		Wr										88			
AFS std gill net	Black Bullhead	PSD									88	100	60		
		PSD-P									0	0	0		
		Wr									92	90	101		
	Black Crappie	PSD										0	100		
		PSD-P										0	0		
		Wr										103	97		
	Bluegill	PSD											100		
		PSD-P											100		
		Wr											64		
	Northern Pike	PSD										89	100	0	
		PSD-P										33	14	0	
		Wr										91	84	92	
	Yellow Perch	PSD										40	11	0	
		PSD-P										0	0	0	

Gear	Species	Index	Year										
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
AFS std gill net	Yellow Perch	Wr									91	98	88
boat shocker (night)	Largemouth Bass	PSD						88	80	56	81	85	100
		PSD-P					21	57	33	31	18	56	
		Wr					95	108	128	106	102	105	
frame net (std 3/4 in)	Black Bullhead	PSD	54	9	4	3	21	60	80		95	98	
		PSD-P	5	2	2	0	0	0	0		0	0	
		Wr	90	91	81		84	88	85		97	98	
	Black Crappie	PSD	100	0	6	10	7	6	38		40	26	
		PSD-P	0	0	0	1	0	0	1		2	6	
		Wr	83	106	99	100	98	126	105		103	97	
	Bluegill	PSD	49	21	5	60	84	80	94		80	100	
		PSD-P	16	1	0	0	0	0	8		9	0	
		Wr	110	107	104	105	112	115	106		105	125	
	Largemouth Bass	PSD	0		75				100				100
		PSD-P	0		25				0				100
		Wr	99		115				102				101
	Northern Pike	PSD	43	75	100	100	100	0	58		100	88	
		PSD-P	29	50	29	60	50	0	8		38	25	
		Wr	86	94	89	85	94		84		87	86	
	Yellow Perch	PSD	100	67	12	20	0	46	48		52	17	
		PSD-P	57	67	12	0	0	0	4		13	6	
		Wr	95	91	98	96	91	102	89		87	86	
spring night EF-LMB	Largemouth Bass	PSD		73	65								
		PSD-P		40	15								
		Wr		111	113								
std exp gill net	Black Bullhead	PSD	20	1	1	0	15	31	88				
		PSD-P	0	1	1	0	0	0	0				
		Wr	102	88	88	89	91	91	88				
	Black Crappie	PSD	0	0	0	0	92	0	14				
		PSD-P	0	0	0	0	0	0	0				
		Wr		111	94	124	95	125	109				
	Bluegill	PSD	0	0		0		50					
		PSD-P	0	0		0		0					
		Wr	113	116		97		115					
	Northern Pike	PSD	0	50	100	100	100	100	67				

Gear	Species	Index	Year									
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
std exp gill net	Northern Pike	PSD-P	0	0	0	35	20	100	17			
		Wr	98	95	92	95	98	94	94			
	Yellow Perch	PSD	0	0	0	4	0	15	23			
		PSD-P	0	0	0	4	0	0	0			
		Wr		91	97	95	96	102	92			

Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Black Crappie

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2016	380		162 (74)	197 (251)	185 (8)	214 (13)	225 (35)				
2014	1174		147 (14)	181 (1082)	205 (70)	222 (8)					

Species: Largemouth Bass

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2014	64			228 (2)	295 (2)	327 (12)	352 (44)	335 (2)	429 (2)		
2011	42			281 (24)	368 (16)	303 (2)					

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2016	60		131 (2)	175 (40)	204 (4)	215 (8)	216 (6)				
2014	228	103 (90)	149 (20)	156 (62)	165 (28)	181 (27)					

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).

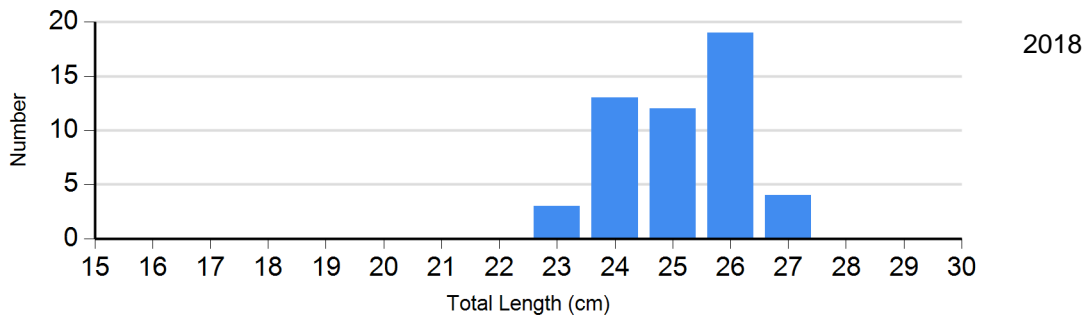
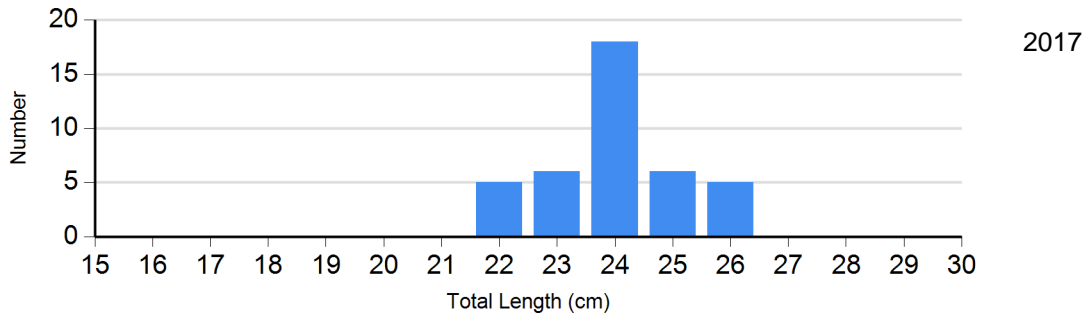
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2015	88	90 (1.1)	40	92 (2.1)	0		0	
	2016	4	90 (6.9)	30	88 (1.6)	0		0	
	2017	5	101 (5.2)	35	90 (2.0)	0		0	
	2018	0		51	90 (1.4)	0		0	
	2019	2	111 (3.7)	3	94 (6.9)	0		0	
Black Crappie Frame Net	2015	154	127 (1.0)	10	103 (1.2)	0		0	
	2016	238	106 (0.4)	142	101 (0.5)	2		0	
	2017	30	119 (8.1)	36	96 (1.0)	0		0	
	2018	34	105 (1.1)	22	99 (1.1)	1		0	
	2019	88	99 (1.0)	24	92 (0.9)	7	96 (2.9)	0	
Bluegill Frame Net	2015	38	133 (3.3)	156	110 (0.6)	0		0	
	2016	80	107 (0.9)	1180	106 (0.5)	108	101 (0.0)	0	
	2017	15	110 (2.6)	48	106 (1.5)	5	91 (4.0)	0	
	2018	34	109 (1.0)	123	106 (0.7)	15	94 (2.2)	0	
	2019	0		1	125	0		0	
Largemouth Bass Electro Fishing	2015	12	109 (1.4)	14	109 (0.9)	34	107 (1.5)	0	
	2016	48	151 (26.7)	26	109 (1.7)	36	111 (2.9)	0	
	2017	11	112 (3.3)	30	107 (1.7)	18	101 (1.9)	0	
	2018	5	110 (1.7)	22	101 (2.3)	6	96 (5.0)	0	
	2019	0		4	105 (6.3)	5	104 (4.7)	0	
Northern Pike Gill Net	2015	0		0		2	101 (0.0)	2	87 (0.0)
	2016	4	93 (0.6)	6	97 (1.6)	2	84 (0.0)	0	

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	2017	1	86	5	91 (3.4)	1	94	2	
	2018	0		6	84 (1.6)	1	84	0	
	2019	2	92 (11.5)	0		0		0	
Yellow Perch Gill Net	2015	184	104 (0.8)	32	93 (1.2)	0		0	
	2016	46	94 (1.1)	14	85 (2.2)	0		0	
	2017	12	93 (2.9)	8	88 (2.5)	0		0	
	2018	24	99 (1.3)	3	89 (3.6)	0		0	
	2019	7	88 (4.1)	0		0		0	

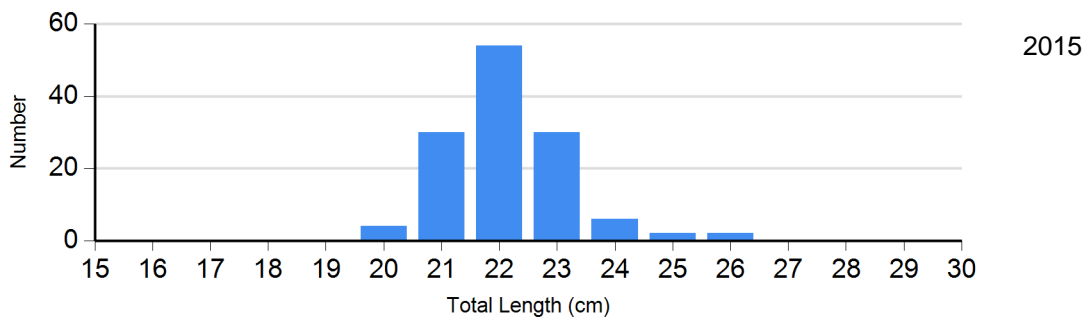
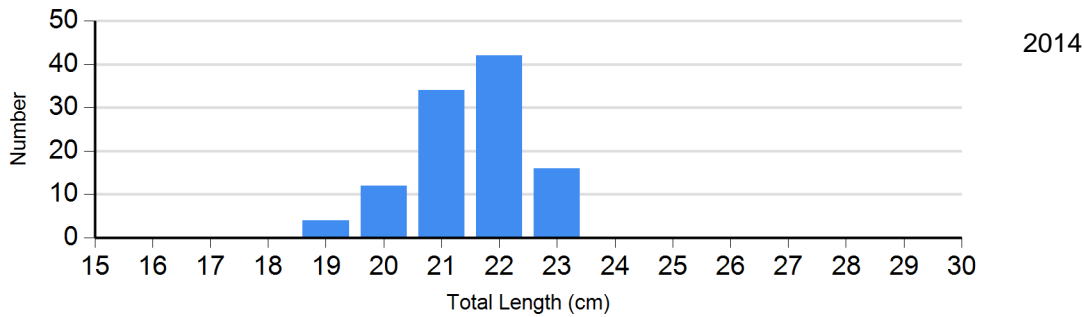
Length Frequency Distribution

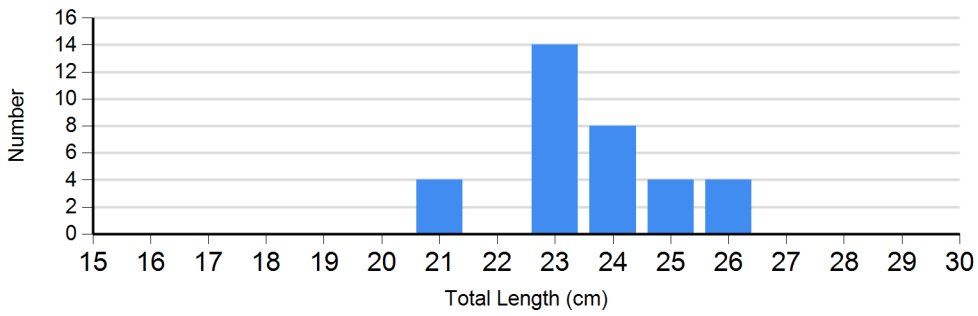
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



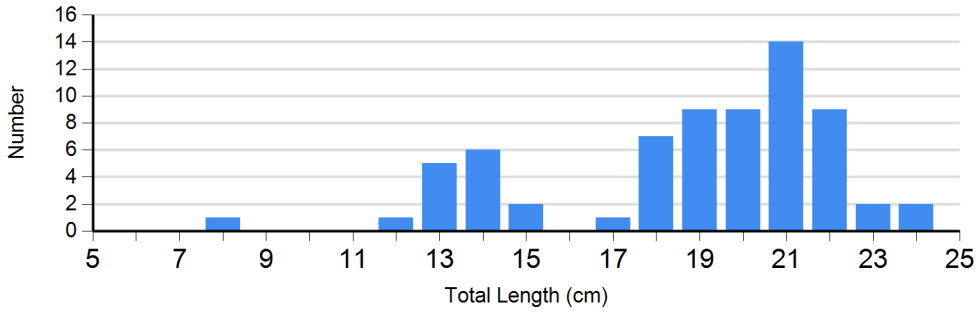
Species: Black Bullhead
Gear: std exp gill net





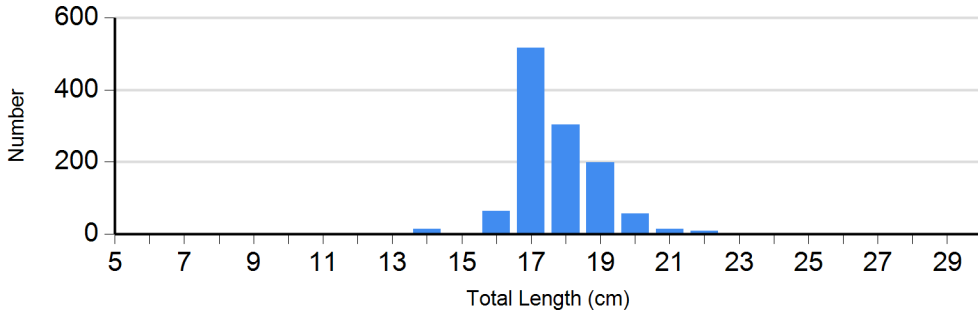
2016

Species: Black Crappie
Gear: AFS std frame net

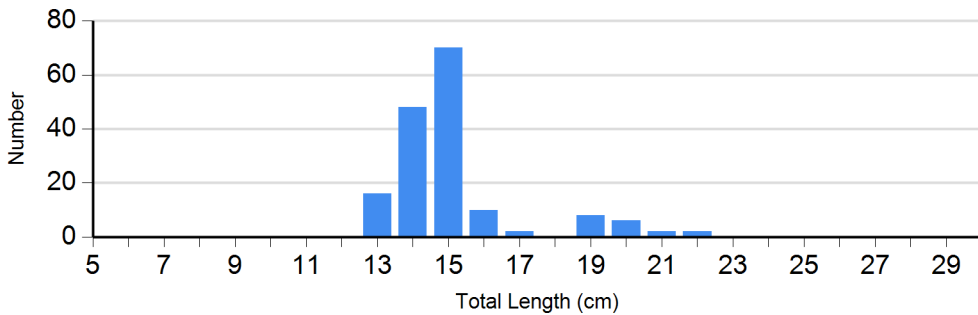


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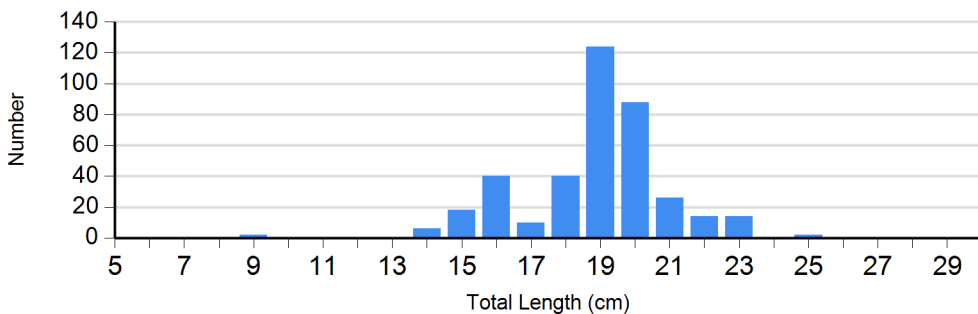
Species: Black Crappie
Gear: frame net (std 3/4 in)



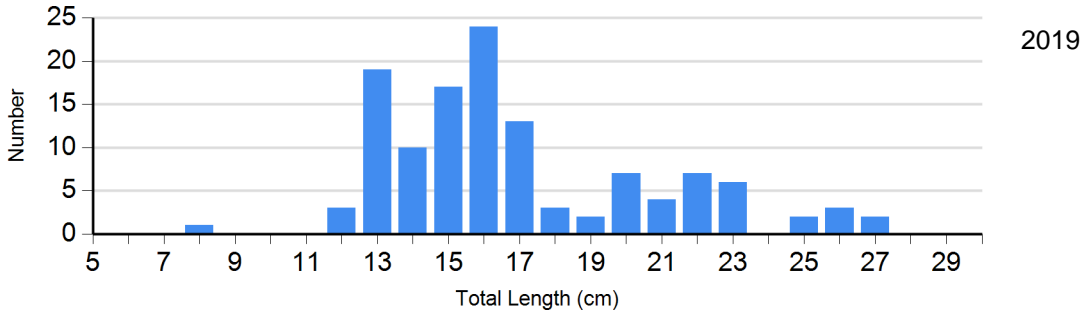
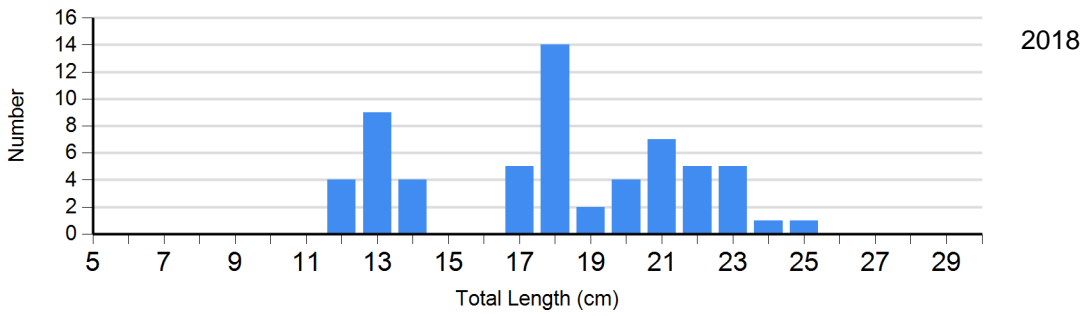
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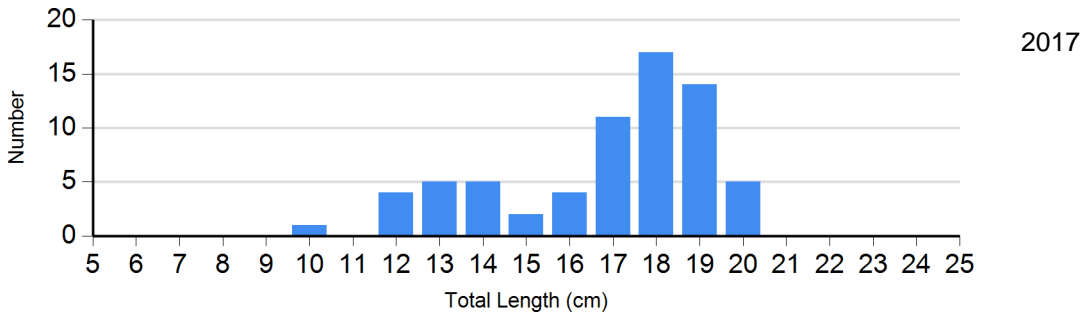
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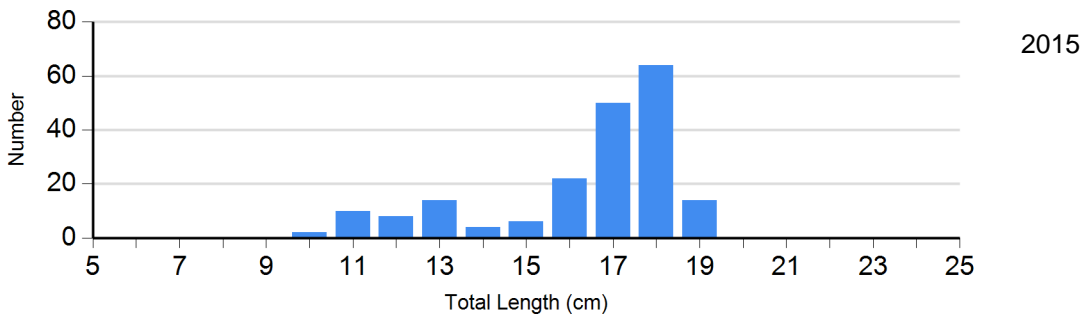
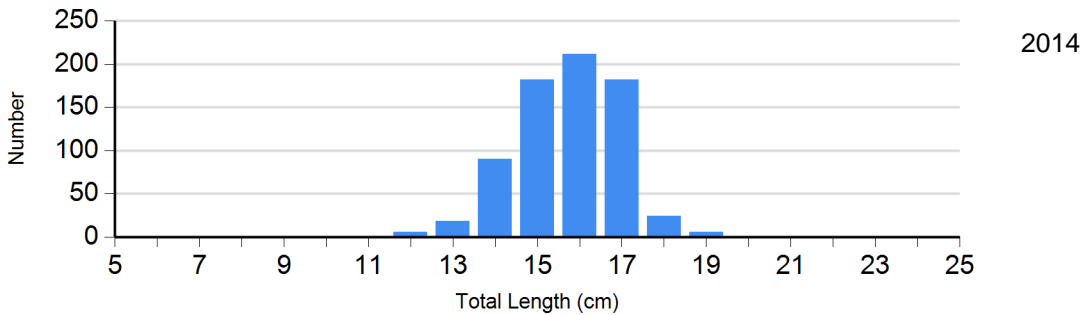
2016

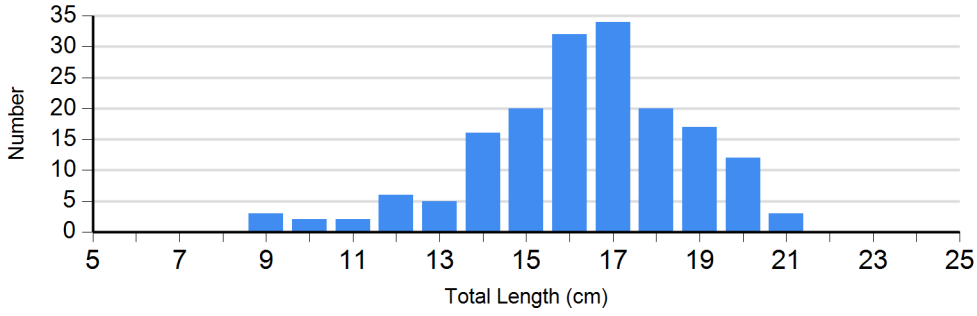
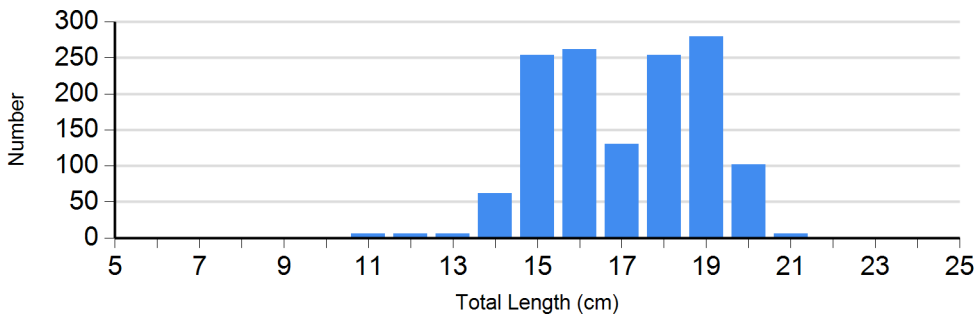


Species: Bluegill
Gear: AFS std frame net

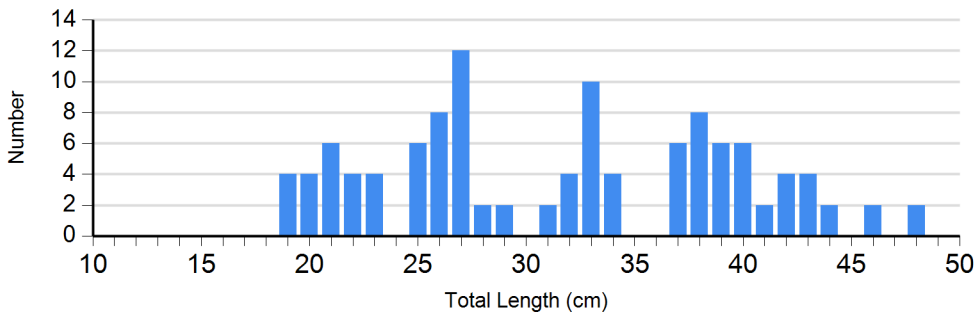
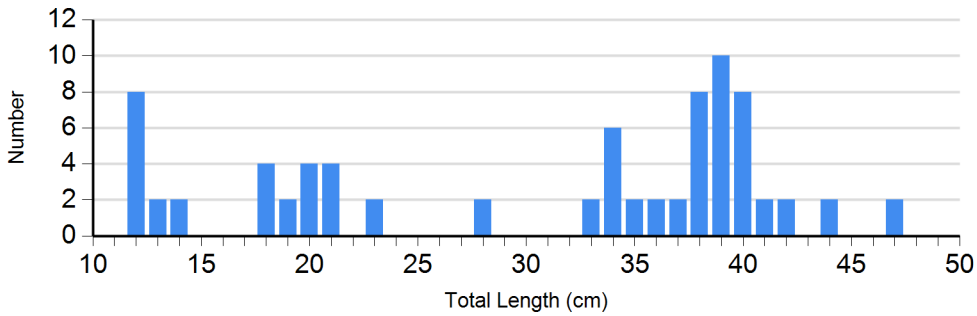
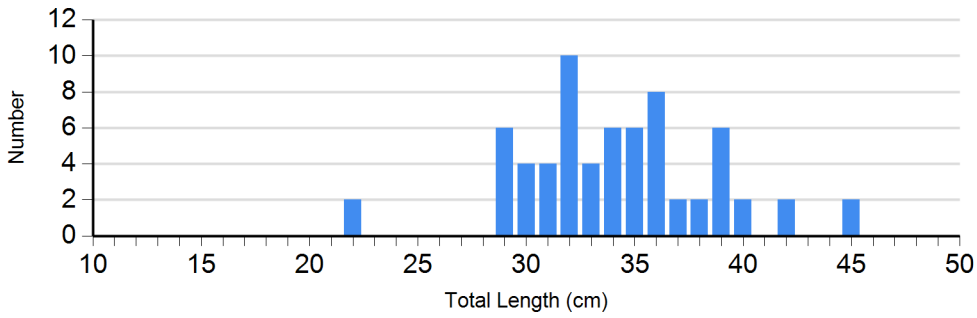


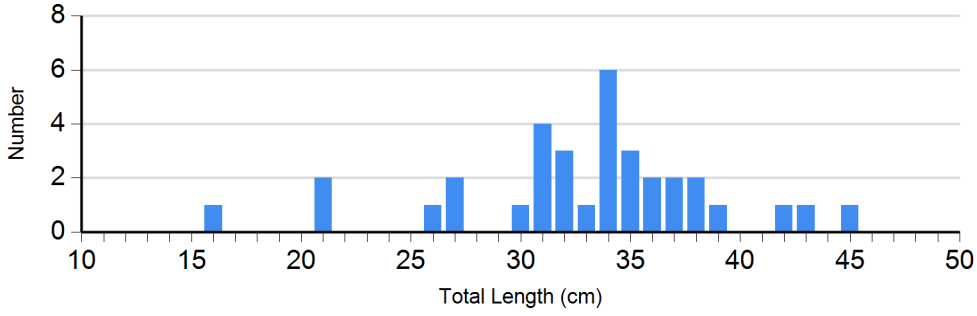
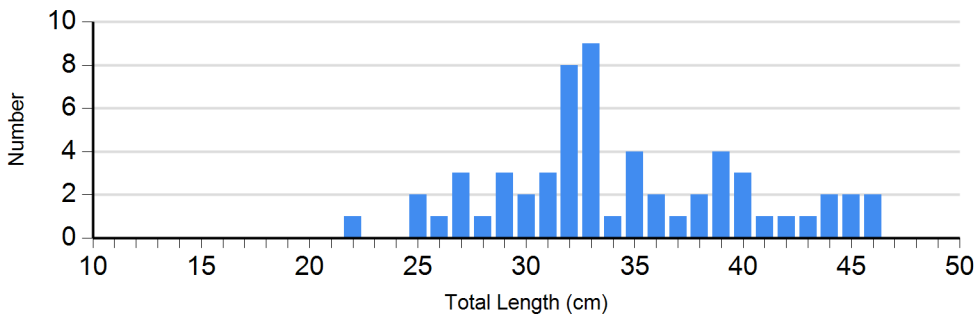
Species: Bluegill
Gear: frame net (std 3/4 in)



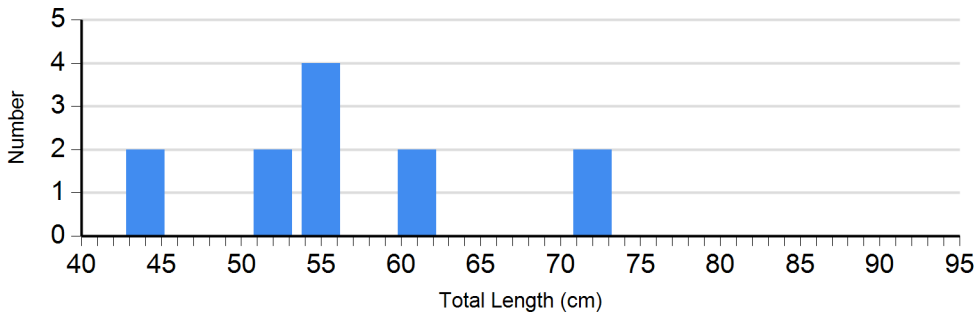
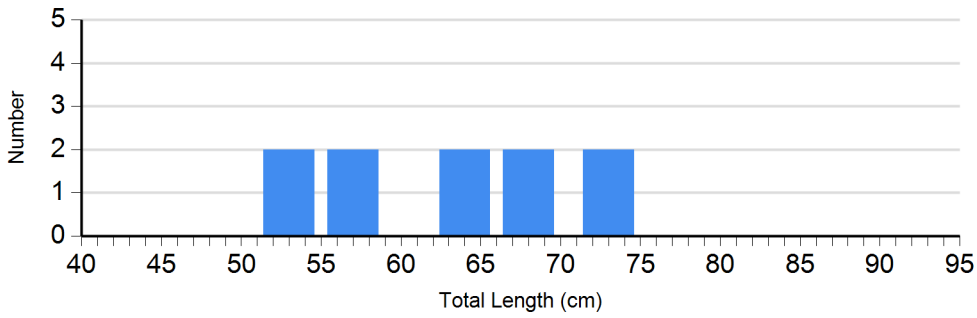


Species: Largemouth Bass
Gear: boat shocker (night)

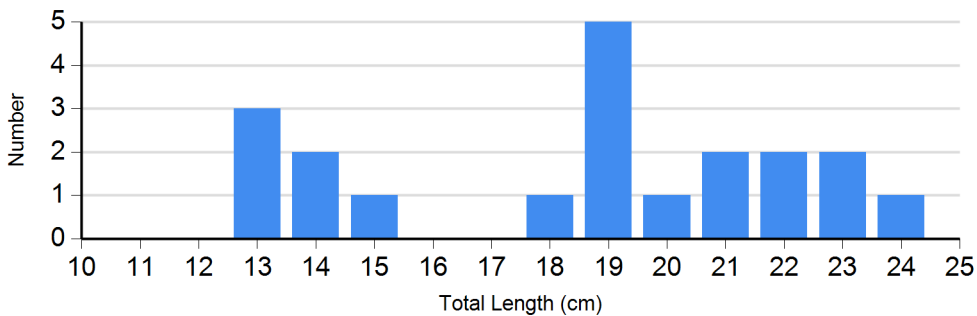


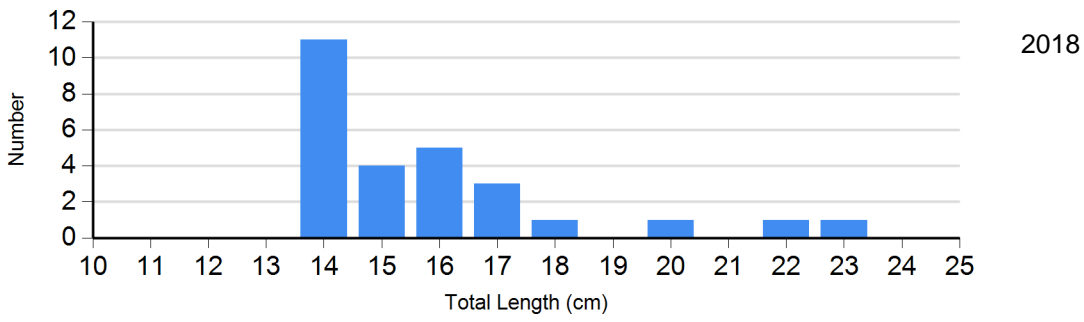


Species: Northern Pike
 Gear: std exp gill net

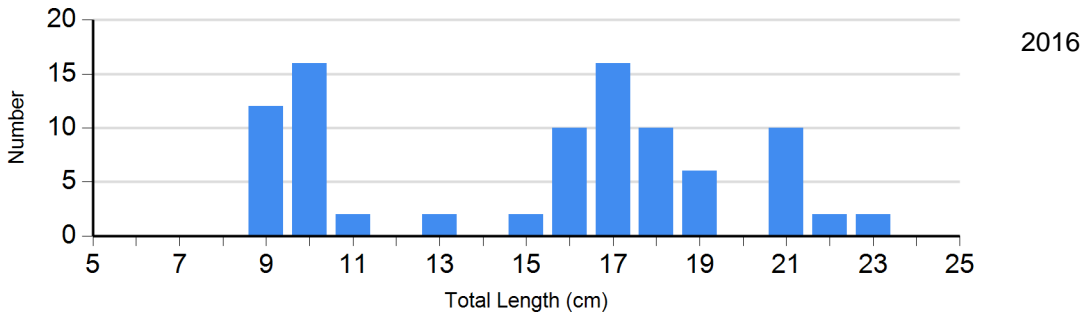
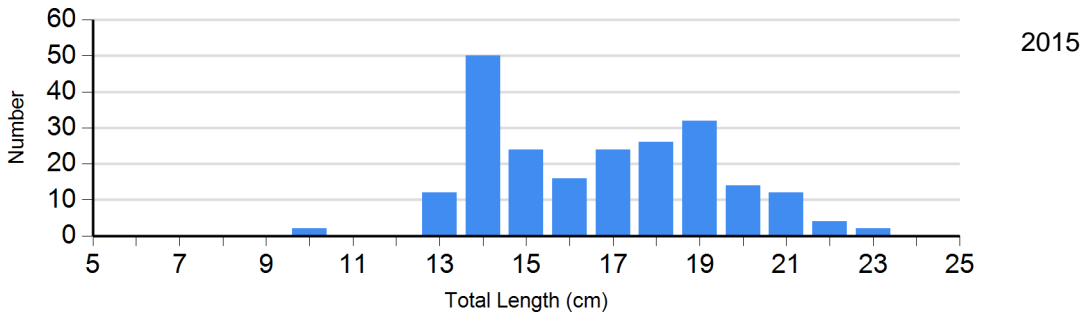
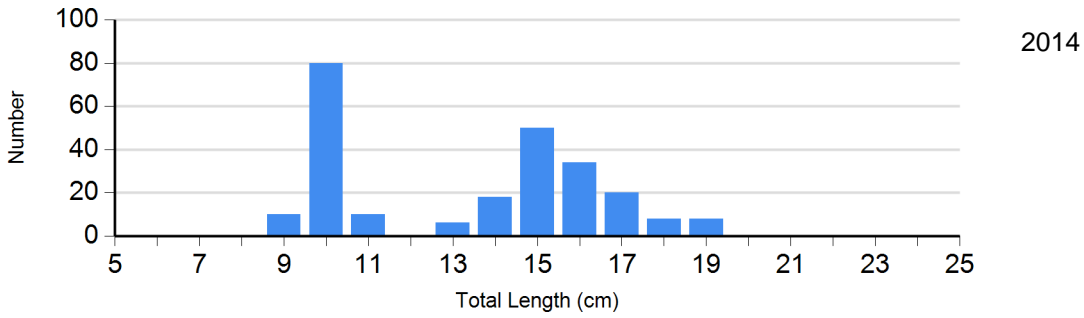


Species: Yellow Perch
 Gear: AFS std gill net





Species: Yellow Perch
 Gear: std exp gill net

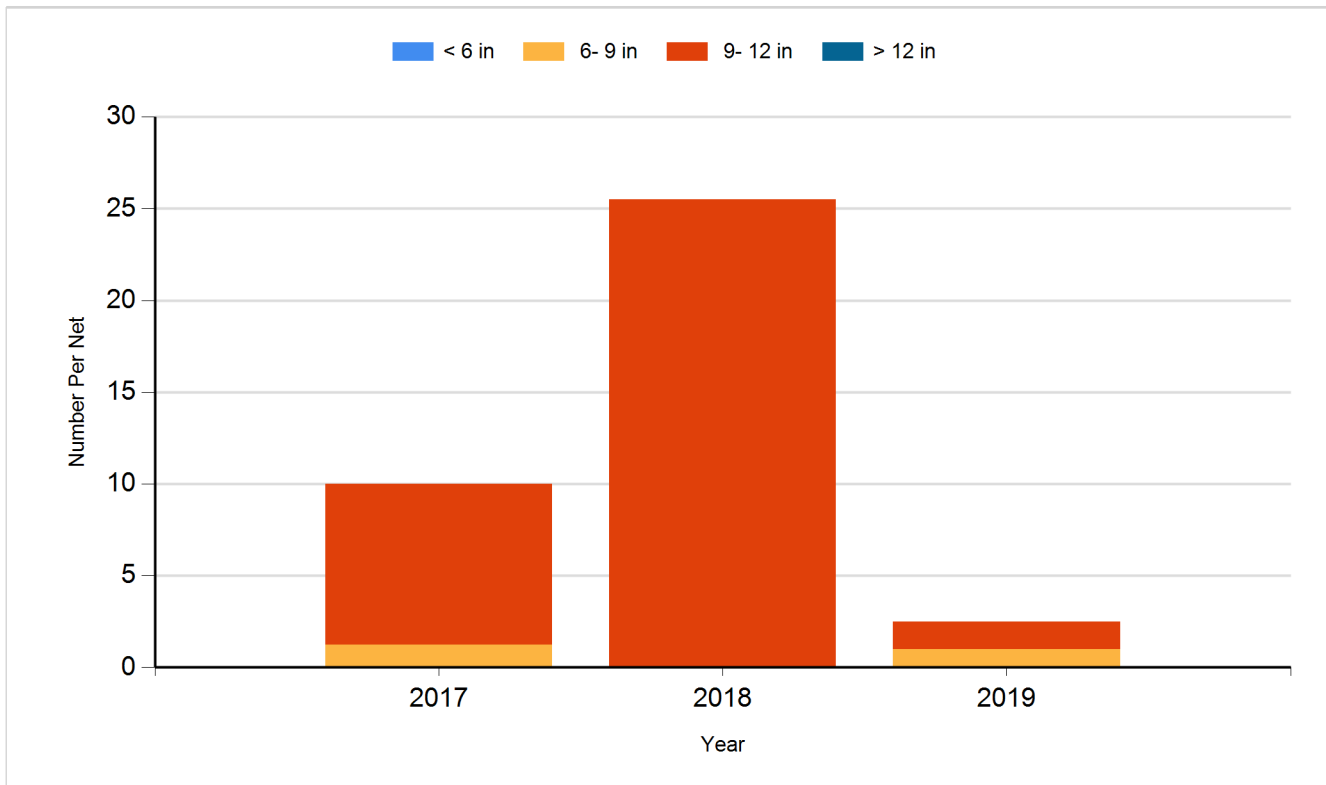


Historic Fish Sizes and Relative Abundance

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

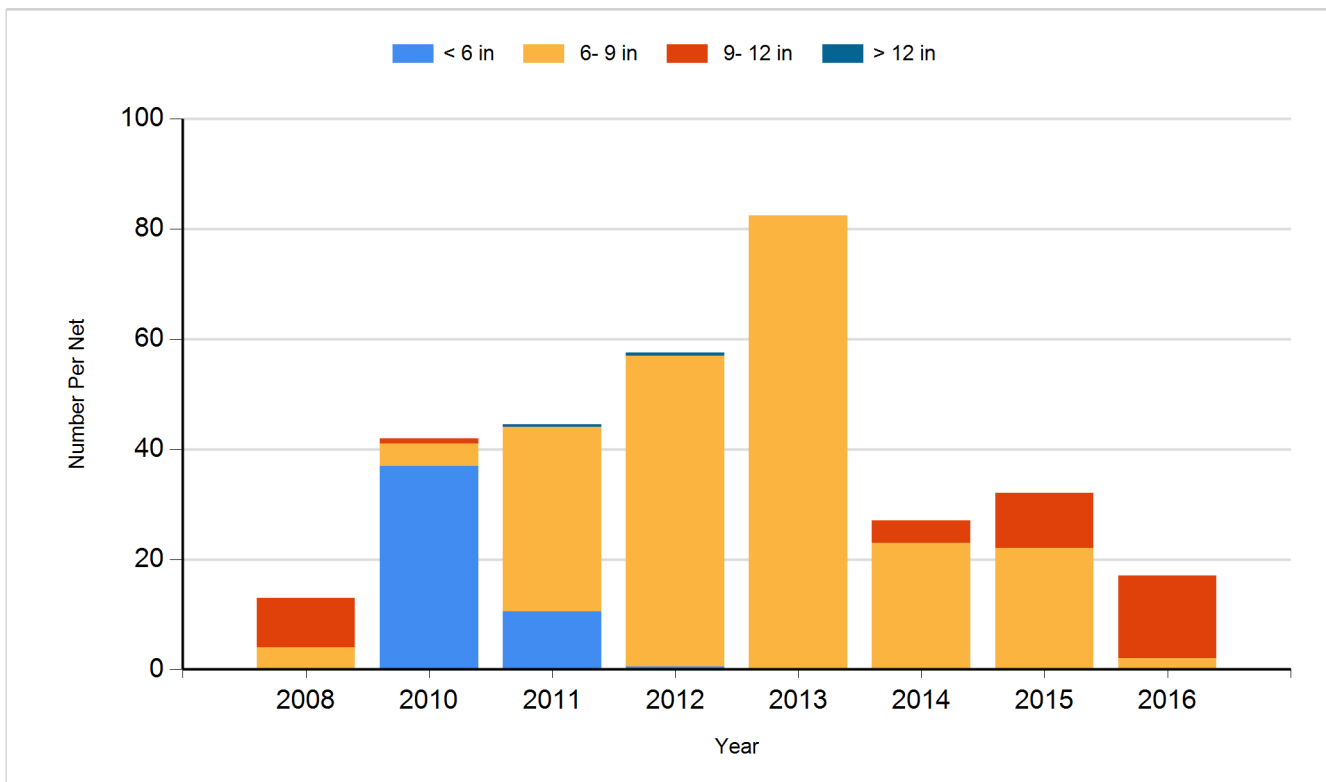
Species: Black Bullhead

Gear: AFS std gill net

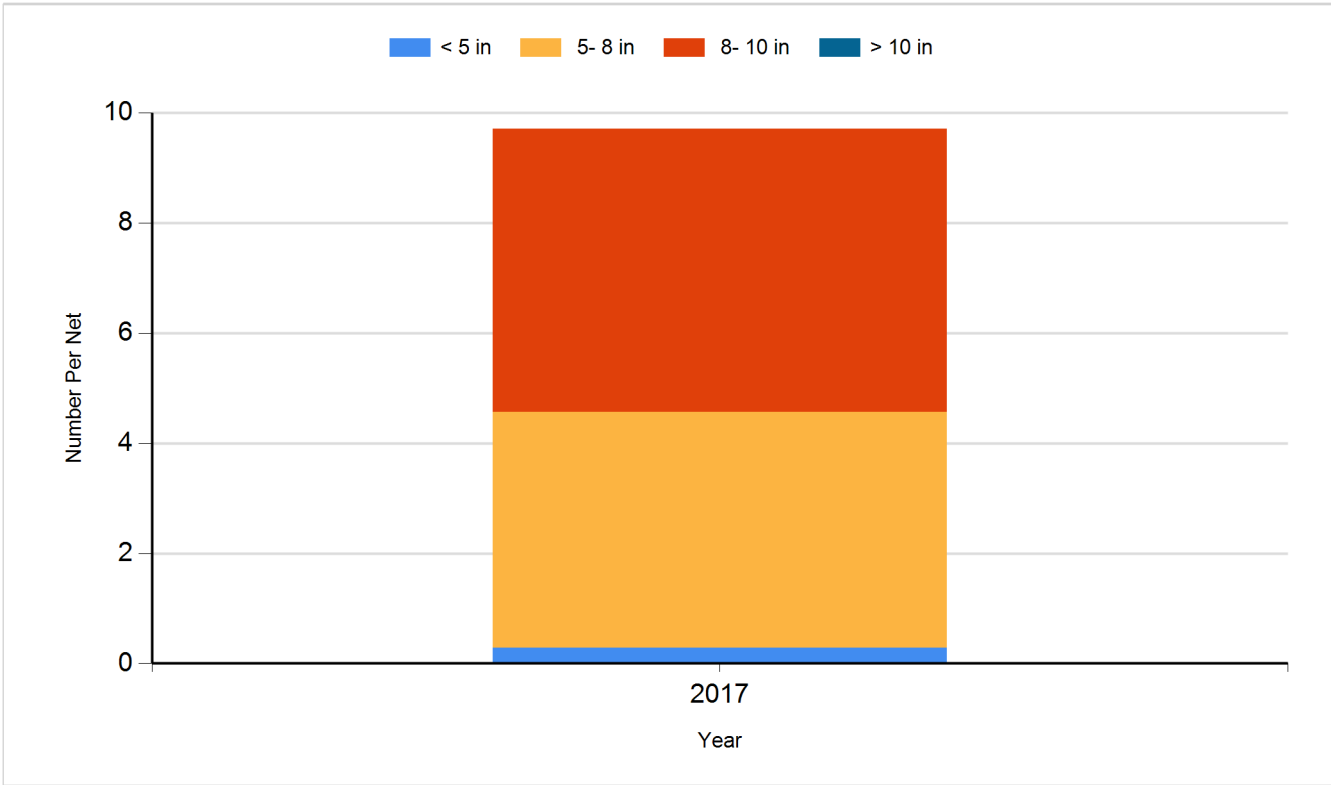


Species: Black Bullhead

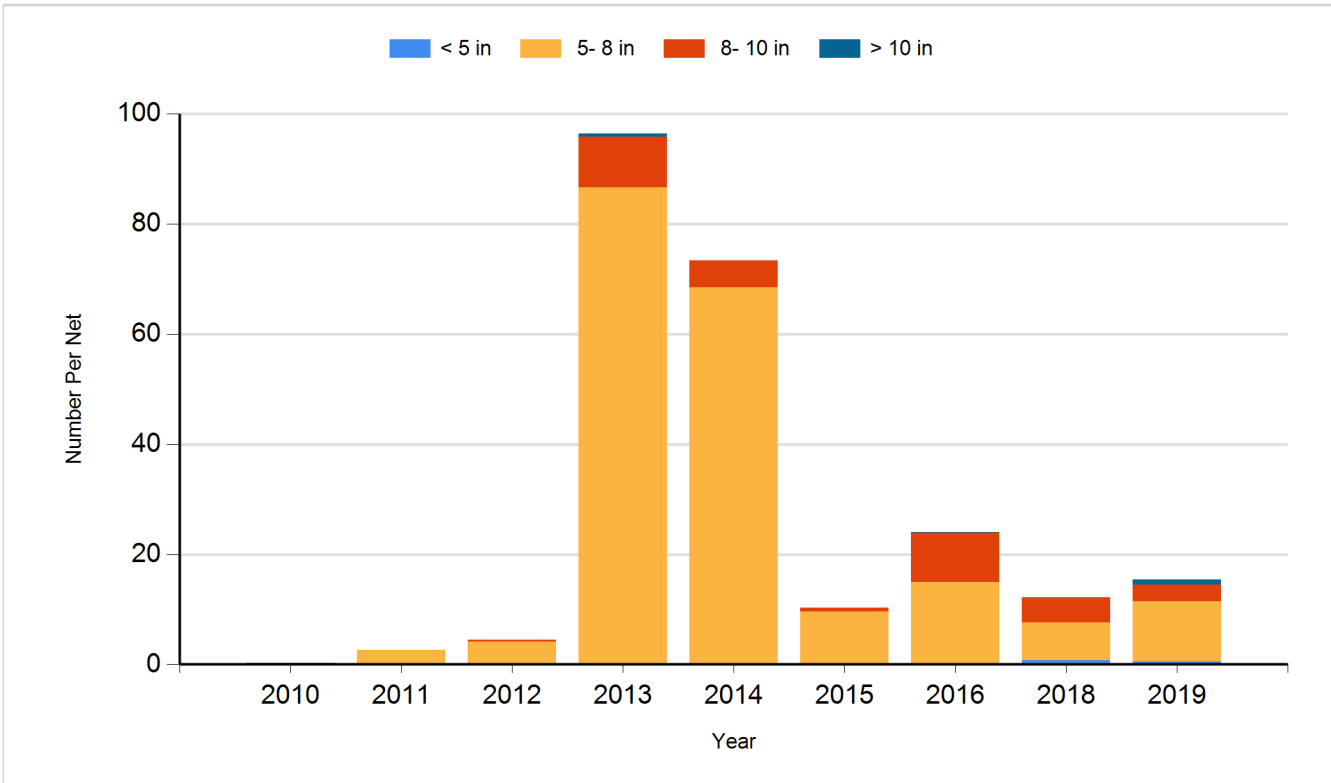
Gear: std exp gill net



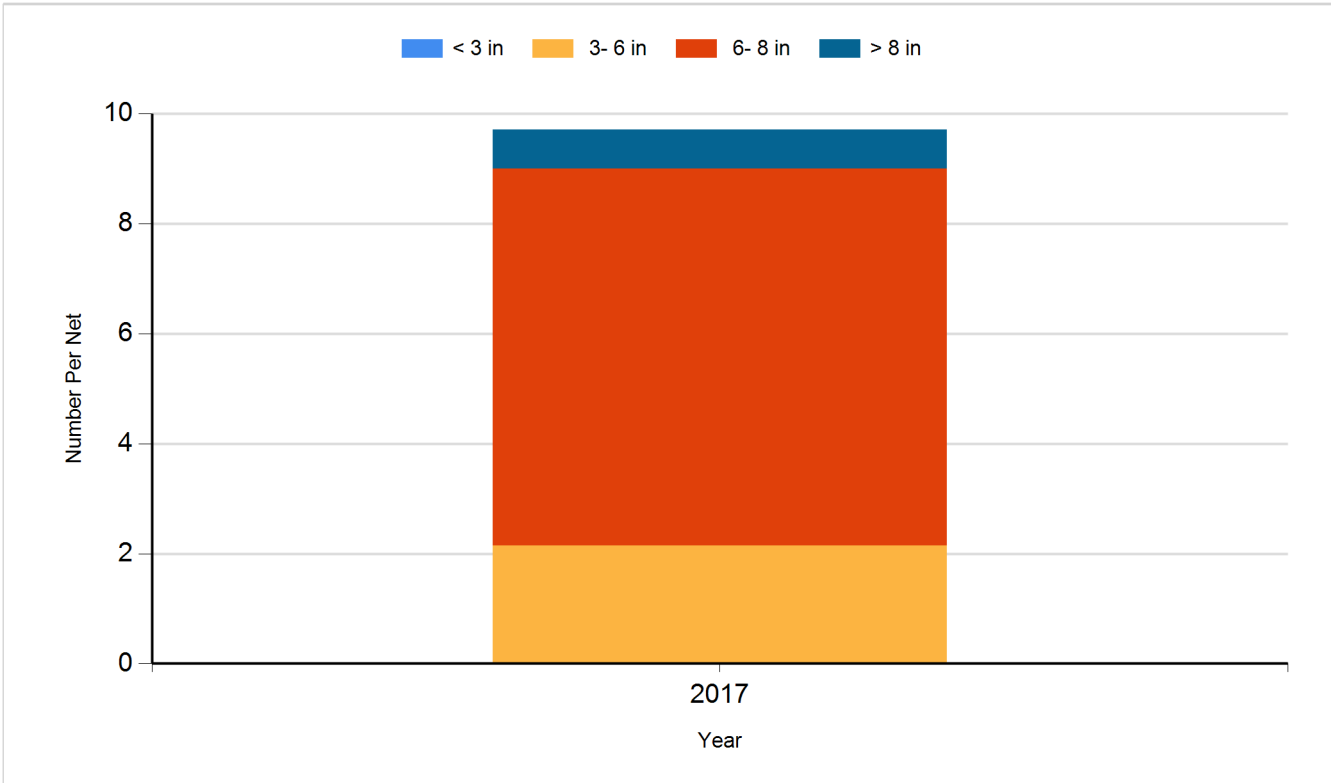
Species: Black Crappie
Gear: AFS std frame net



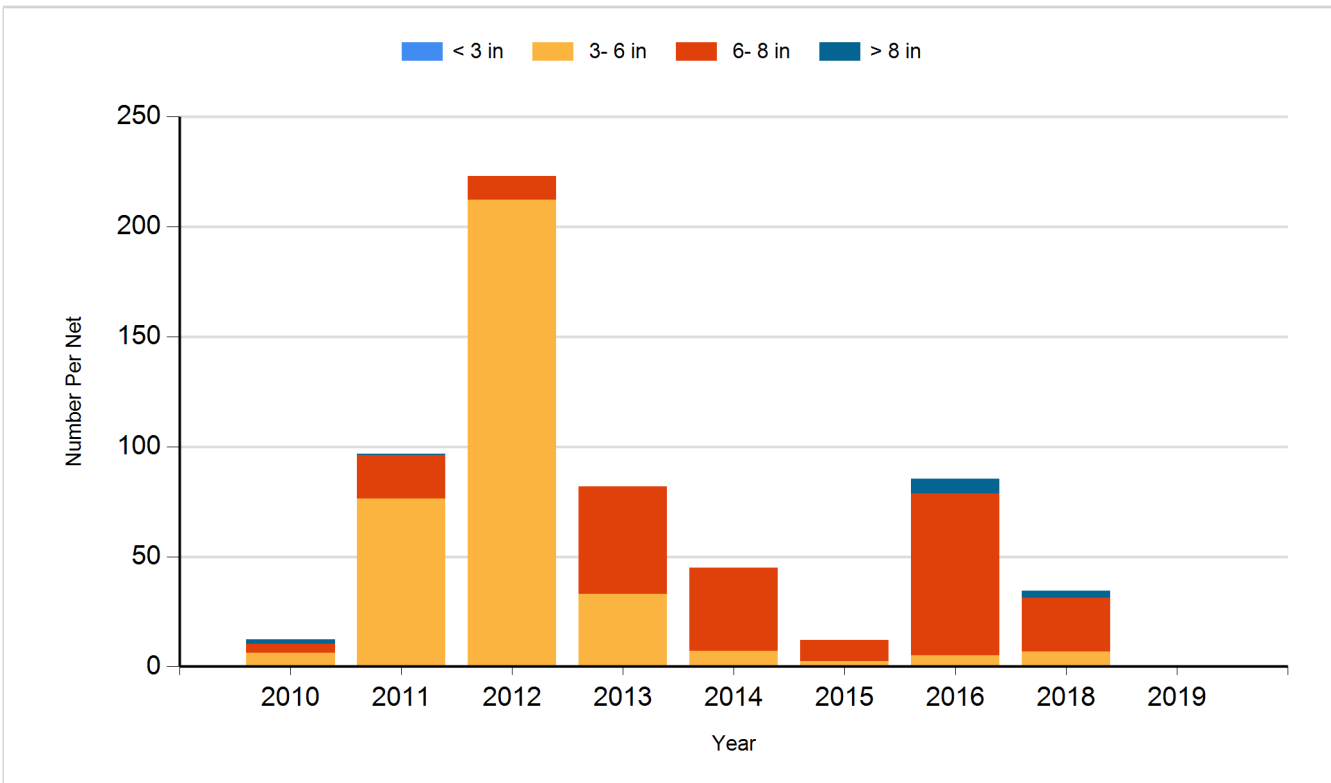
Species: Black Crappie
Gear: frame net (std 3/4 in)



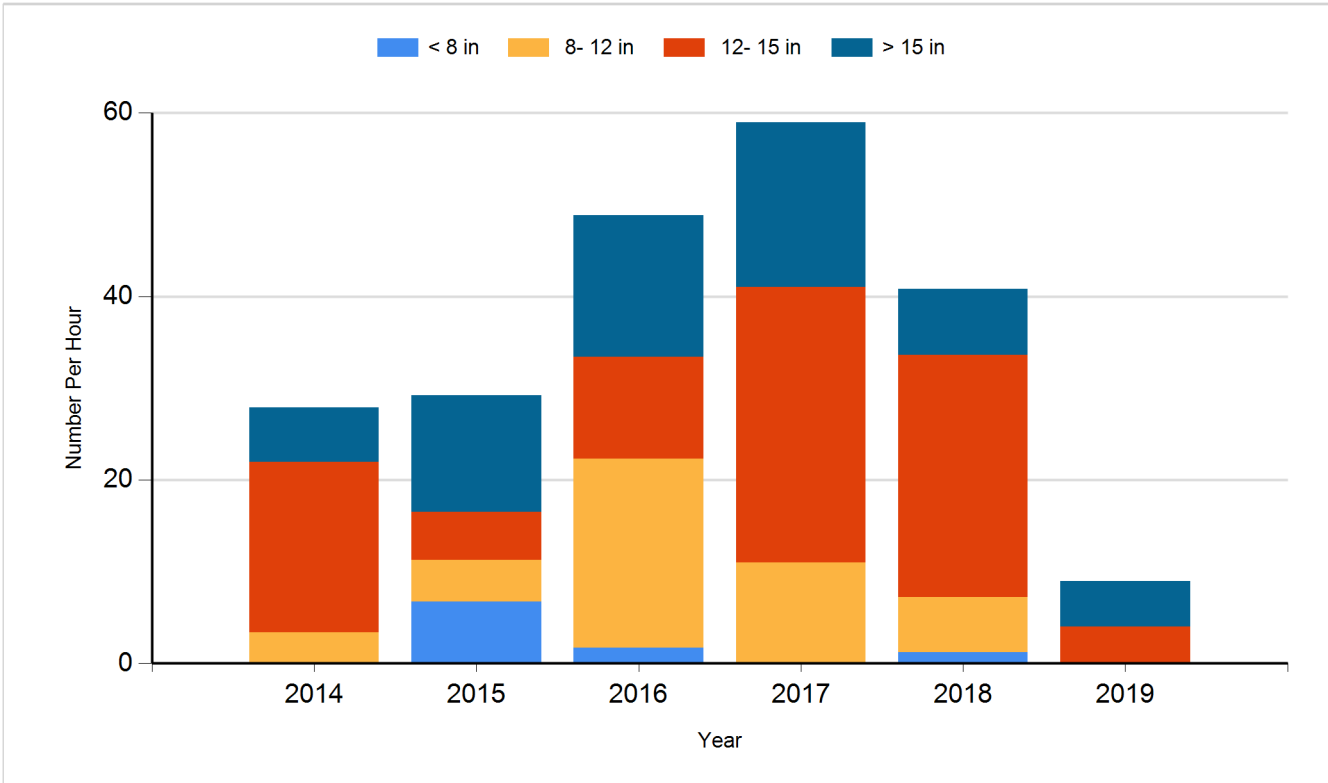
Species: Bluegill
Gear: AFS std frame net



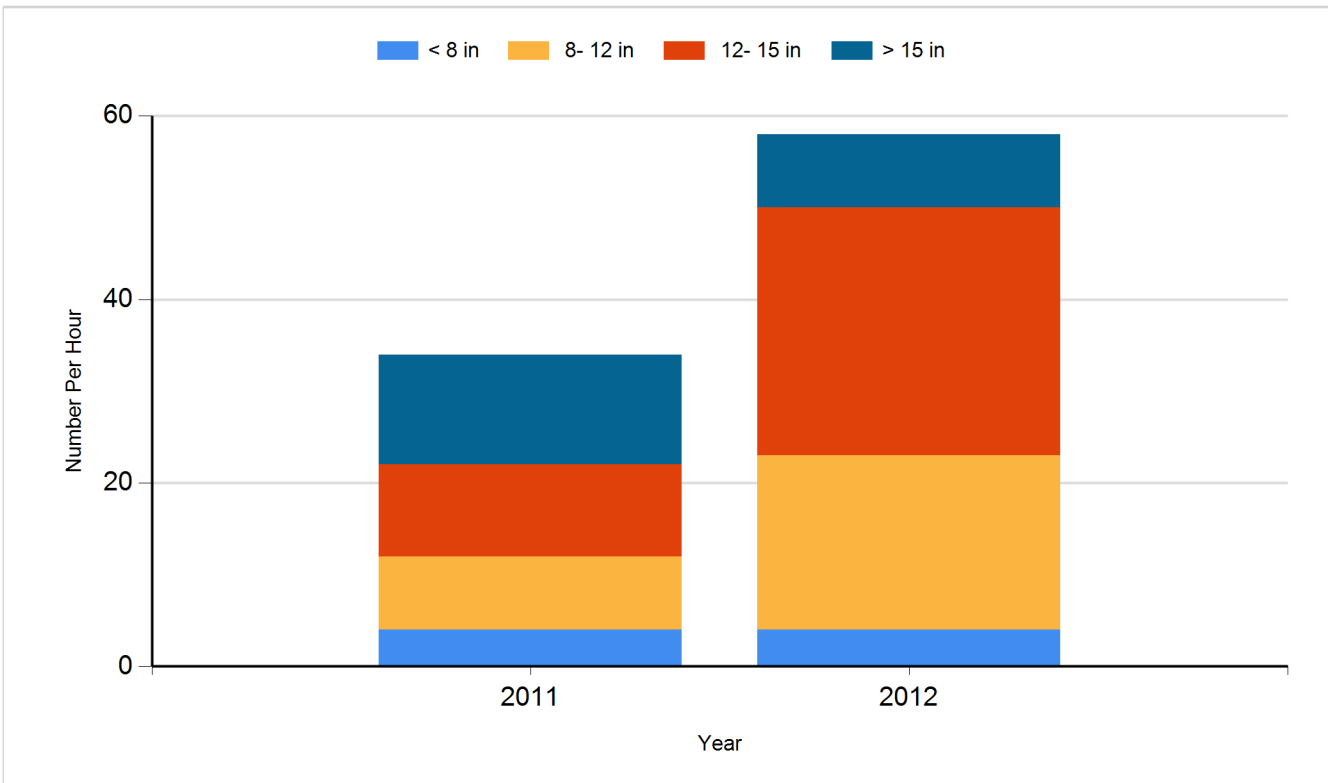
Species: Bluegill
Gear: frame net (std 3/4 in)



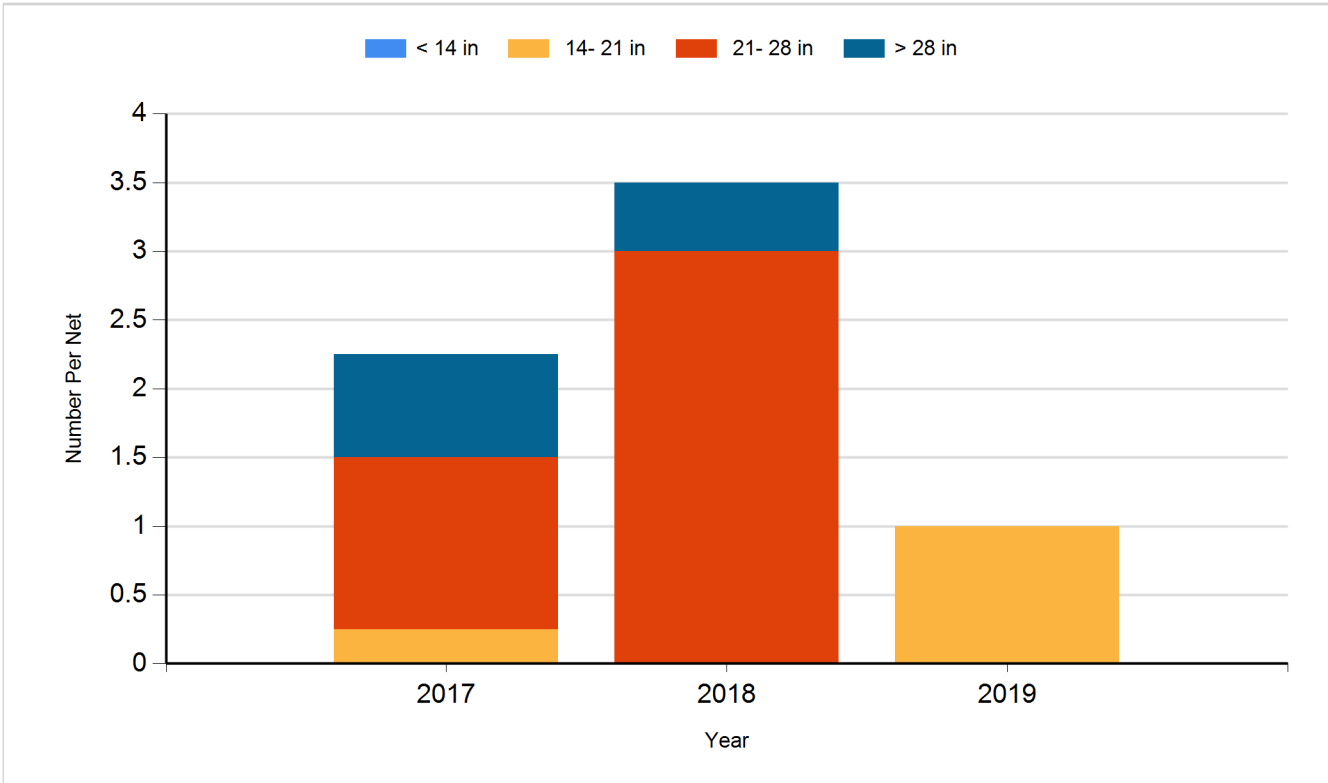
Species: Largemouth Bass
Gear: boat shocker (night)



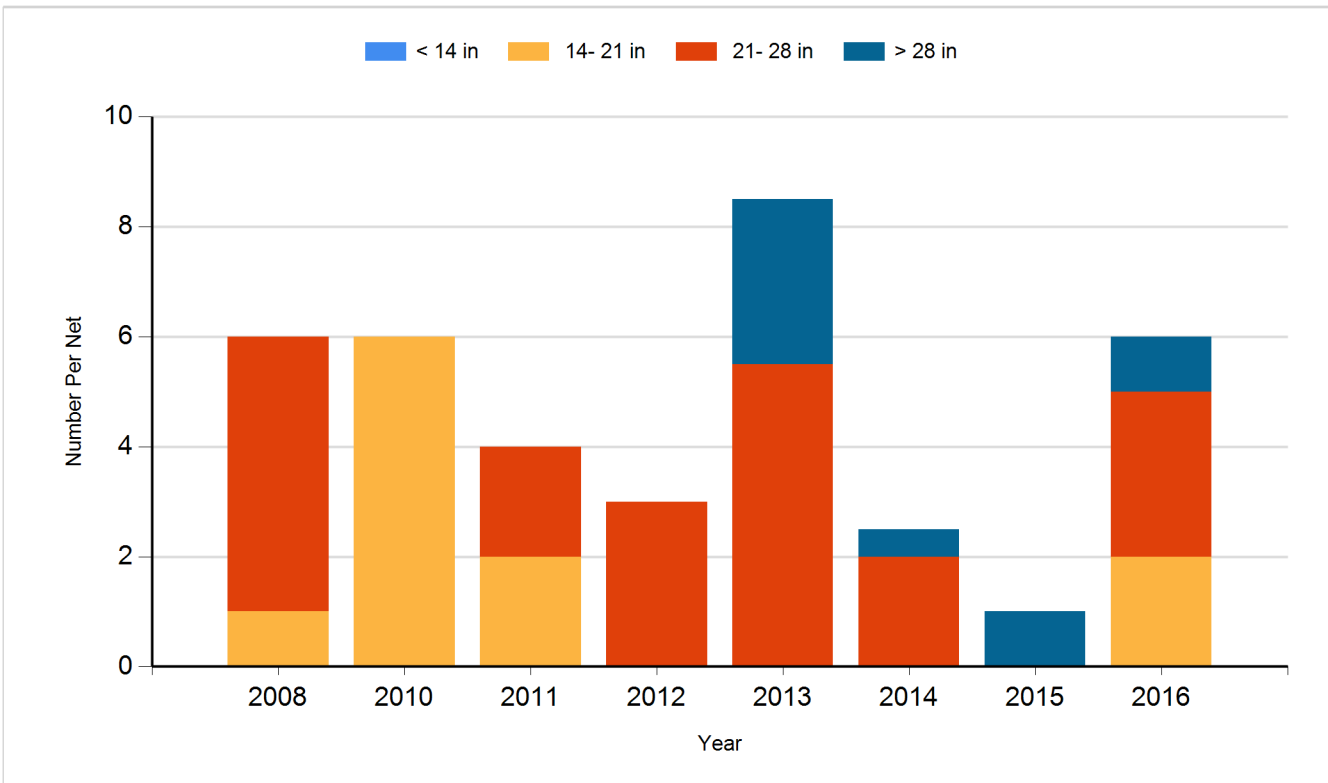
Species: Largemouth Bass
Gear: spring night EF-LMB



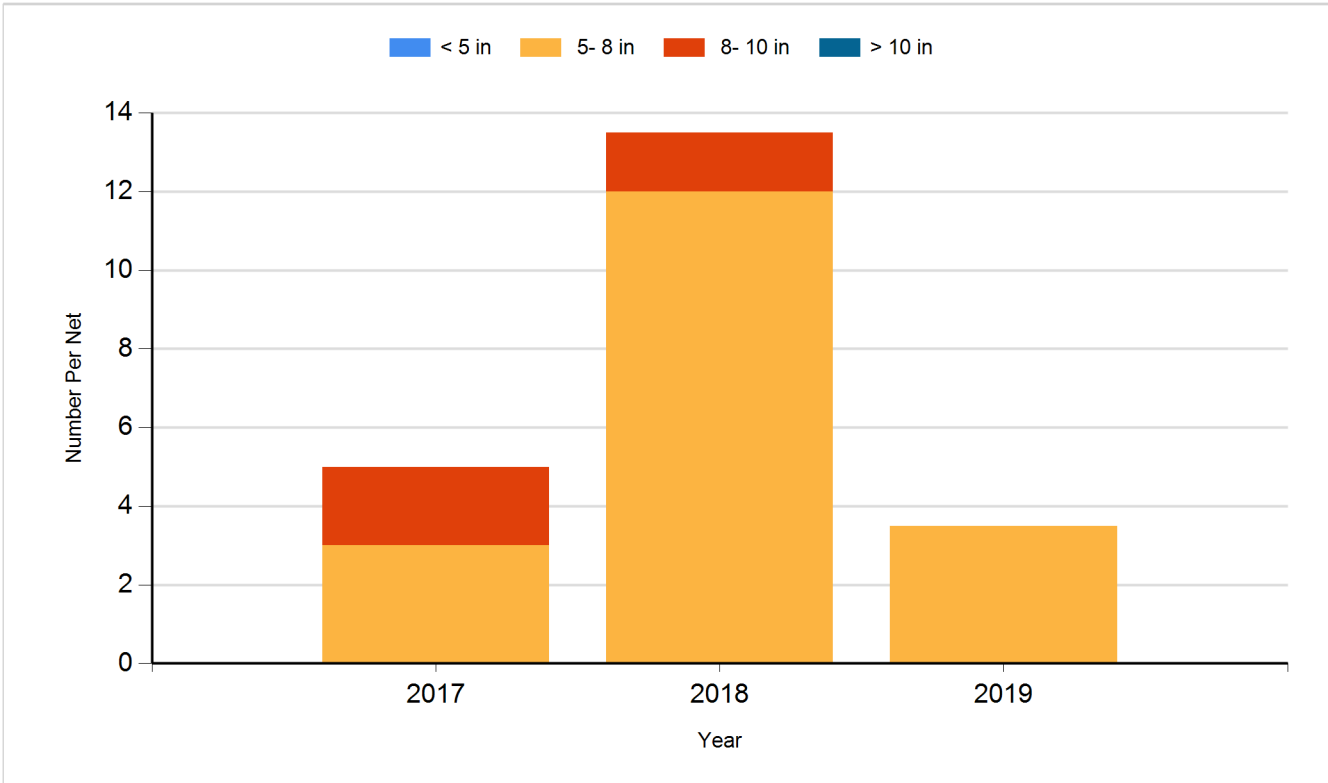
Species: Northern Pike
Gear: AFS std gill net



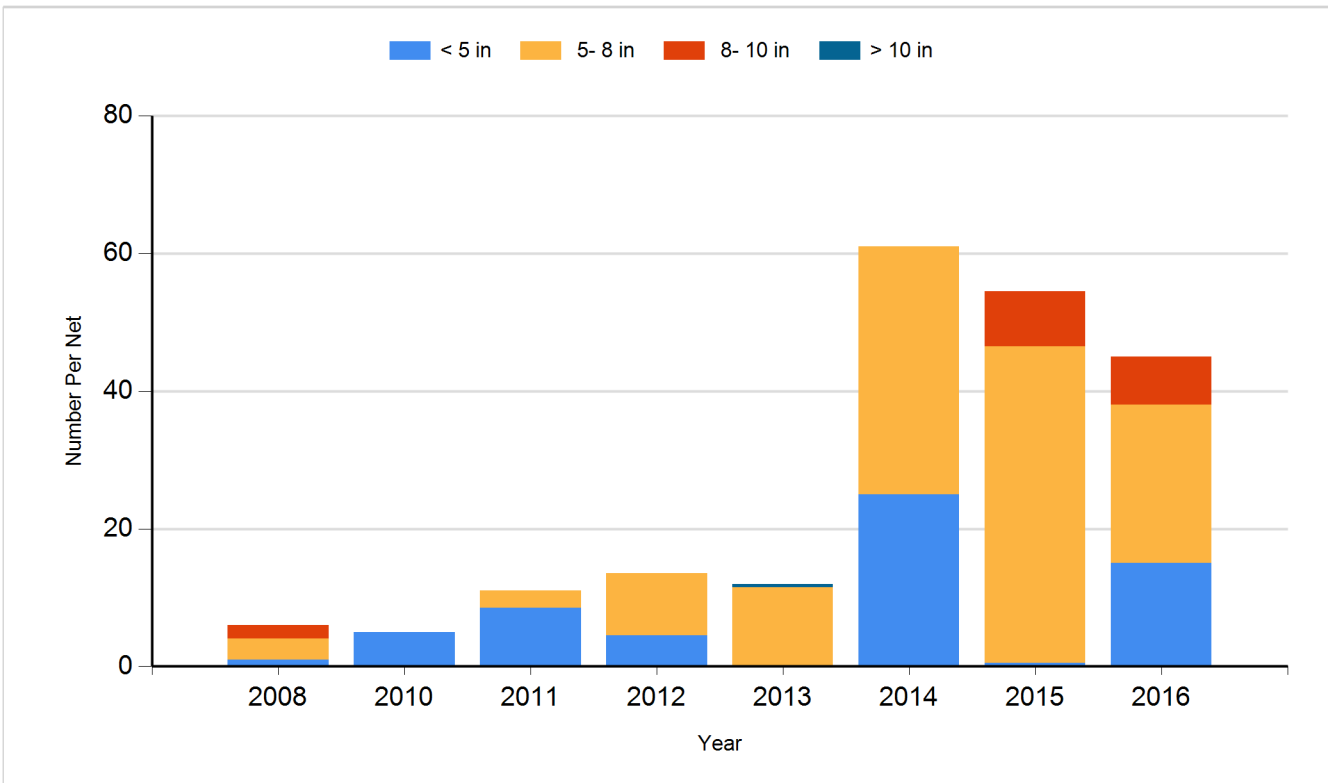
Species: Northern Pike
Gear: std exp gill net



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	Bluegill	Adult	50
2008	Bluegill	Fingerling	22,000
2008	Largemouth Bass	Adult	200
2008	Largemouth Bass	Fingerling	10,000
2008	Northern Pike	Fry	192,500
2009	Black Crappie	Adult	150
2009	Largemouth Bass	Juvenile	1,155
2011	Yellow Perch	Adult	400
2014	Largemouth Bass	Adult	175
2014	Largemouth Bass	Juvenile	200
2015	Largemouth Bass	Adult	112
2018	Largemouth Bass	Juvenile	601