

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Clear, Marshall County

UJA-Lake-917-001

2020

## Lake Information

<b>Name:</b>	Clear	<b>Maximum Depth:</b>	20 Feet
<b>County:</b>	Marshall	<b>Mean Depth:</b>	12 Feet
		<b>OHWM Elevation:</b>	1,824
<b>Surface Area:</b>	1,217 Acres	<b>Outlet Elevation:</b>	1,823

## Surveys and Investigations

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

Gear	Date	Effort
spring night EF-LMB	Jun 03, 2020	3000 seconds

## **Common Fish Species Present**

Yellow Perch

Walleye

Smallmouth Bass

Northern Pike

Largemouth Bass

Bluegill

Black Crappie

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## Terminology

Catch per unit effort (**CPUE**) refers to the relative abundance of a species. It is defined as the number of fish captured per unit of effort (i.e., number of fish captured per net-night or number of fish captured per hour electrofishing). In this report CPUE is typically given for only stock-length fish (see length categories table for stock lengths).

A statewide effort to help make netting efforts comparable to all waters sampled across the state, occurred in 2017, with a switch to American Fisheries Society gill nets. Past gill netting efforts were completed with different style/types of nets and are not comparable side by side.

- **AFS std gill net** – 80 ft experimental gill net containing eight panels (10 ft each) of varying monofilament meshes of 0.75, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25 and 2.50 inches.
- **std experimental gill net for non-Missouri River waters** - 150 ft experimental gill net containing six panels (25 ft each) of varying monofilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.
- **std experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

$$PSD = \left( \frac{\text{number of fish} \geq \text{quality length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

$$PSD - P = \left( \frac{\text{number of fish} \geq \text{preferred length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (**W**) compared to a length-specific standard weight (**Ws**) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

$$Wr = \left( \frac{W}{W_s} \right) \times 100$$

Confidence intervals (CI) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (S), quality (Q), preferred (P), memorable (M) and trophy (T). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
Walleye	10	25	15	38	20	51	25	63	30	76
White Bass	6	15	9	23	12	30	15	38	18	46
White Crappie	5	13	8	20	10	25	12	30	15	38
Yellow Bullhead	4	10	7	18	9	23	11	28	14	36
Yellow Perch	5	13	8	20	10	25	12	30	15	38

## Catch Summary of Stock Length Fish

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

\* **Methods/Species that ignore stock length**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
spring night EF-LMB*	Largemouth Bass	74	88.8	41.7	61	8	32	8	114	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.

\* Methods/Species that ignore stock length

Gear	Species	CPUE										Avg
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
AFS std frame net	Black Bullhead						7.8	3.6				5.70
	Black Crappie						1.9	2.3				2.10
	Bluegill						15.2	19.9				17.55
	Common Carp						0.6	0.9				0.75
	Largemouth Bass						0.0	0.2				0.10
	Northern Pike						0.8	0.8				0.80
	Smallmouth Bass						0.1	0.3				0.20
	Walleye						0.0	0.2				0.10
	Yellow Perch						9.9	1.3				5.60
AFS std gill net	Black Bullhead						15.0	9.8	6.4	5.8		9.25
	Black Crappie						1.3	1.3	3.1	1.9		1.90
	Bluegill						2.0	1.5	0.8	3.8		2.03
	Channel Catfish						0.0	0.1	0.0	0.0		0.03
	Common Carp						0.1	0.1	0.2	0.1		0.13
	Largemouth Bass						0.1	0.1	0.1	0.3		0.15
	Northern Pike						2.2	3.5	1.2	2.2		2.28
	Smallmouth Bass						1.5	1.9	2.4	2.9		2.18
	Walleye						5.1	2.6	2.8	2.8		3.33
	White Sucker						0.8	2.3	0.3	0.2		0.90
Yellow Perch						7.5	0.5	4.5	24.9		9.35	
boat shocker (night)	Walleye*	340.8	13.5	51.0	3.0	17.0	1.5					71.13
boat shocker (night, AC)	Largemouth Bass	54.0		92.0								73.00
boat shocker (night, DC)	Smallmouth Bass	83.0		31.0		28.0						47.33
fall night EF-WAE*	Walleye								1.5	40.0		20.75
frame net (std 3/4 in)	Black Bullhead		7.2	29.7	26.4				9.1	3.5		15.18
	Black Crappie		5.2	10.7	2.4				3.6	1.2		4.62
	Bluegill		18.6	39.0	22.9				67.8	95.3		48.72
	Common Carp		0.1	0.0	0.0				0.1	0.0		0.04
	Largemouth Bass		0.0	0.1	0.0				0.1	0.1		0.06
	Northern Pike		1.8	0.6	1.1				0.6	0.7		0.96
	Smallmouth Bass		3.4	2.4	1.1				0.2	0.8		1.58
Walleye		0.2	0.4	0.5				0.0	0.5		0.32	

		CPUE											
Gear	Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg	
frame net (std 3/4 in)	White Sucker		0.1	0.1	0.0				0.1	0.0		0.06	
	Yellow Perch		10.4	3.9	1.8				6.0	2.1		4.84	
spring night EF-LMB*	Largemouth Bass										88.8	88.80	
std exp gill net	Bigmouth Buffalo	0.0	0.0	0.0	0.2	0.0						0.04	
	Black Bullhead	0.1	7.5	20.3	21.7	10.3						11.98	
	Black Crappie	0.3	14.0	6.2	11.7	1.5						6.74	
	Bluegill	0.0	1.0	0.3	2.5	1.5						1.06	
	Common Carp	0.1	0.0	0.0	0.0	0.0						0.02	
	Northern Pike	0.9	3.3	3.8	6.0	5.5						3.90	
	Smallmouth Bass	0.8	2.0	4.3	3.3	3.0						2.68	
	Walleye	2.3	4.2	10.7	9.2	10.8							7.44
	White Sucker	1.1	5.2	1.3	2.2	1.3							2.22
	Yellow Perch	40.8	84.8	40.5	25.5	7.0							39.72

## 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										
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
AFS std frame net	Black Crappie	PSD						82	10				
		PSD-P						73	10				
		Wr						95	108				
	Bluegill	PSD						25	8				
		PSD-P						3	2				
		Wr						108	104				
	Largemouth Bass	PSD						0	100				
		PSD-P						0	100				
		Wr							111				
	Northern Pike	PSD						85	93				
		PSD-P						15	20				
		Wr						81	81				
	Smallmouth Bass	PSD						100	60				
		PSD-P						100	60				
		Wr						70	96				
	Walleye	PSD							100				
		PSD-P							100				
		Wr							90				
Yellow Perch	PSD						7	4					
	PSD-P						0	4					
	Wr						85	88					
AFS std gill net	Black Crappie	PSD						67	31	51	39		
		PSD-P						67	31	24	26		
		Wr						100	108	102	106		
	Bluegill	PSD						42	39	0	7		
		PSD-P						13	22	0	0		
		Wr						111	111	108	110		
	Largemouth Bass	PSD						100	0	100	67		
		PSD-P						0	0	0	33		
		Wr						115	129	125	121		
	Northern Pike	PSD						69	76	71	92		
		PSD-P						0	5	7	8		
		Wr						90	85	91	90		



Gear	Species	Index	Year									
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFS std gill net	Smallmouth Bass	PSD						89	100	83	89	
		PSD-P						61	91	66	86	
		Wr						104	95	103	93	
	Walleye	PSD						70	84	73	82	
		PSD-P						11	16	24	33	
		Wr						93	87	91	90	
	Yellow Perch	PSD						9	17	4	1	
		PSD-P						2	0	0	0	
		Wr						94	90	90	102	
boat shocker (night)	Walleye	PSD	0	0	0	0	0	0				
		PSD-P	0	0	0	0	0	0				
		Wr	94		97	94	92	80				
boat shocker (night, AC)	Largemouth Bass	PSD	94		43							
		PSD-P	83		12							
		Wr	115		110							
boat shocker (night, DC)	Smallmouth Bass	PSD	55		35		71					
		PSD-P	41		32		50					
		Wr	105		93		102					
frame net (std 3/4 in)	Black Crappie	PSD		80	99	100				53	33	
		PSD-P		0	58	100				24	14	
		Wr		110	102	100				95	105	
	Bluegill	PSD		70	43	48				20	23	
		PSD-P		10	4	26				4	4	
		Wr		119	108	111				99	103	
	Largemouth Bass	PSD		0	0	0				100	0	
		PSD-P		0	0	0				50	0	
		Wr								112	105	
	Northern Pike	PSD		56	64	50				80	67	
		PSD-P		25	36	0				20	8	
		Wr		87	86	87				78	86	
	Smallmouth Bass	PSD		46	48	37				67	87	
		PSD-P		15	34	26				67	73	
		Wr		98	97	101				91	95	
	Walleye	PSD		75	75	22				0	33	
		PSD-P		0	25	0				0	0	
		Wr		81	84	91					86	

Gear	Species	Index	Year										
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
frame net (std 3/4 in)	Yellow Perch	PSD		21	32	41					5	8	
		PSD-P		0	0	0					0	0	
		Wr		91	85	91					84	88	
spring night EF-LMB	Largemouth Bass	PSD											61
		PSD-P											32
		Wr											114
std exp gill net	Black Crappie	PSD	0	64	100	97	100						
		PSD-P	0	0	76	96	100						
		Wr	185	116	106	101	100						
	Bluegill	PSD		33	0	67	44						
		PSD-P		0	0	47	22						
		Wr		118	141	110	113						
	Northern Pike	PSD	69	35	52	50	55						
		PSD-P	13	10	9	8	3						
		Wr	89	88	87	87	84						
	Smallmouth Bass	PSD	60	33	58	85	89						
		PSD-P	60	17	35	35	72						
		Wr	99	105	103	102	97						
	Walleye	PSD	32	32	22	15	37						
		PSD-P	10	16	3	2	5						
		Wr	88	90	89	86	88						
	Yellow Perch	PSD	0	14	32	36	24						
		PSD-P	0	0	0	2	0						
		Wr	99	99	95	92	93						

## Length at Capture

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

### Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	1714		93 (374)	119 (823)	151 (346)	181 (92)	204 (56)	205 (14)		224 (9)	
2018	1084		101 (555)	138 (395)	162 (48)	192 (66)	216 (15)	218 (5)			
2017	369	95 (154)	111 (165)	144 (28)	178 (12)	198 (9)	213 (3)				
2016	611	61 (362)	97 (98)	138 (108)	177 (27)	191 (12)	227 (6)				
2014	413	91 (84)	109 (80)	142 (45)	189 (135)	195 (59)	230 (10)	255 (1)			
2013	718	49 (1)	120 (435)	184 (267)	212 (5)	226 (10)					
2012	334	91 (12)	155 (282)	209 (39)		244 (1)					

### Species: Largemouth Bass

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	41		209 (16)	245 (6)	264 (4)	326 (16)					
2013	92		230 (45)	312 (33)	361 (1)	385 (3)	408 (6)	433 (2)		514 (1)	514 (1)
2011	35		200 (1)	296 (3)		395 (9)	407 (16)	423 (2)		440 (2)	502 (2)

### Species: Smallmouth Bass

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	28			218 (4)	280 (8)	374 (4)	358 (3)	412 (7)	461 (1)		461 (1)
2013	29		195 (11)	249 (9)			387 (4)			427 (1)	460 (4)
2011	81		204 (4)	248 (41)	324 (4)	367 (1)	408 (6)	433 (5)	449 (7)	456 (9)	450 (3)

### Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	34		291 (7)		425 (6)	473 (2)	462 (4)		523 (9)	627 (2)	550 (4)
2018	33		325 (1)	354 (10)	406 (4)	434 (5)	522 (1)	506 (10)		668 (1)	656 (1)
2017	31		301 (2)	370 (4)	420 (6)	435 (1)	498 (15)	582 (1)	493 (1)		582 (1)

Mean Length (expanded sample number) at capture by age

Year	N	1	2	3	4	5	6	7	8	9	10+
2016	61		277 (2)	339 (16)	384 (4)	456 (36)	505 (1)			639 (1)	693 (1)
2015	70	149 (1)	241 (5)	324 (7)	373 (52)	420 (1)	481 (3)	575 (1)			
2014	60	187 (5)		345 (51)	394 (1)	461 (2)				589 (1)	
2013	67		279 (42)	359 (5)	394 (17)		481 (1)				652 (2)
2012	29	194 (4)	313 (3)	348 (15)		472 (1)		561 (3)	483 (1)		573 (2)
2011	45	190 (1)	272 (31)	429 (2)	461 (4)		514 (6)	481 (1)			

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age

Year	N	1	2	3	4	5	6	7	8	9	10+
2019	315		138 (262)	157 (39)	182 (14)						
2018	55		149 (5)	157 (38)	160 (9)	187 (2)			243 (1)		
2017	6		142 (1)	151 (2)	165 (1)	187 (1)	230 (1)				
2016	90		134 (2)	153 (69)	178 (11)	215 (1)	235 (6)	235 (1)			
2015	114	93 (3)	115 (72)	151 (27)		210 (11)	237 (1)				
2014	233	98 (13)	125 (101)	159 (14)	192 (53)	208 (28)	230 (18)	221 (7)			
2013	345	99 (81)	123 (34)	166 (93)	188 (59)	216 (77)					
2012	576	102 (67)	148 (243)	178 (110)	193 (158)						
2011	1176	98 (419)	142 (342)	164 (415)							

## **Fish Condition**

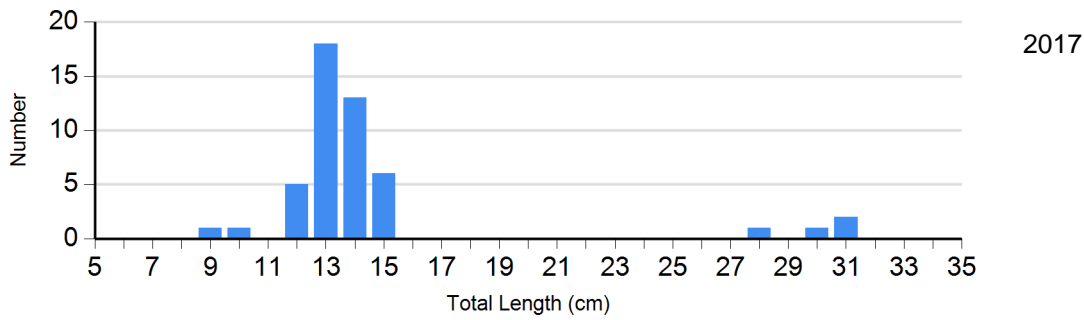
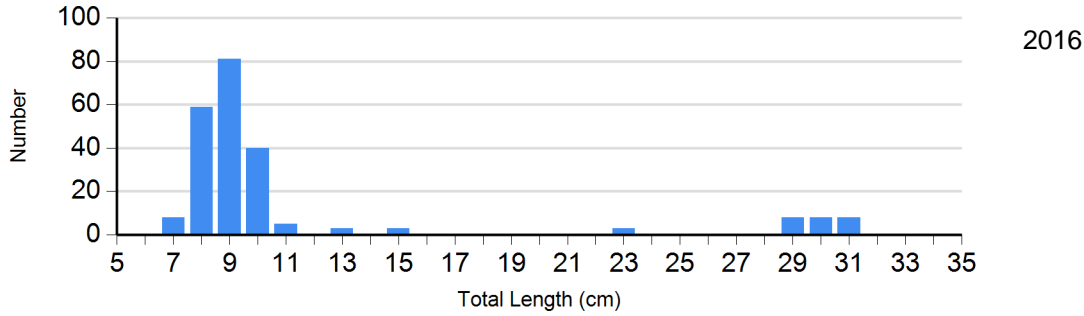
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2016	6	104 (2.5)	3	102	8	89 (1.1)	16	93 (2.0)
	2017	37	110 (1.6)	0		1	89	3	92 (1.0)
	2018	27	97 (1.1)	17	95 (2.4)	3	94 (1.4)	11	89 (2.6)
	2019	14	106 (2.8)	4	109 (2.4)	1	87	2	95 (1.9)
Bluegill Frame Net	2016	194	106 (1.1)	57	114 (1.2)	8	113 (2.1)	0	
	2017	330	103 (0.6)	21	104 (1.2)	8	106 (2.8)	0	
	2018	869	99 (0.5)	177	101 (0.8)	38	95 (1.3)	0	
	2019	1326	101 (0.6)	321	106 (1.0)	68	107 (1.6)	0	
Largemouth Bass Electro Fishing	2020	29	115 (1.1)	21	114 (1.3)	24	113 (1.6)	0	
Northern Pike Gill Net	2016	8	93 (1.2)	18	89 (1.3)	0		0	
	2017	10	85 (1.3)	30	85 (1.2)	2	81 (1.4)	0	
	2018	4	101 (0.9)	9	87 (2.9)	1	86	0	
	2019	2	91 (1.4)	22	91 (1.3)	2	88 (2.8)	0	
Walleye Gill Net	2016	18	91 (1.1)	36	94 (0.9)	5	91 (2.5)	2	89 (3.0)
	2017	5	86 (1.5)	21	87 (1.1)	5	89 (2.8)	0	
	2018	9	89 (1.7)	16	95 (1.4)	6	88 (2.5)	2	86 (2.5)
	2019	6	87 (2.6)	16	90 (1.2)	10	90 (2.3)	1	96
Yellow Perch Gill Net	2016	82	95 (0.9)	6	91 (3.8)	2	89 (1.0)	0	
	2017	5	92 (3.1)	1	81	0		0	
	2018	52	90 (0.9)	2	92 (3.0)	0		0	
	2019	297	103 (0.6)	2	85	0		0	

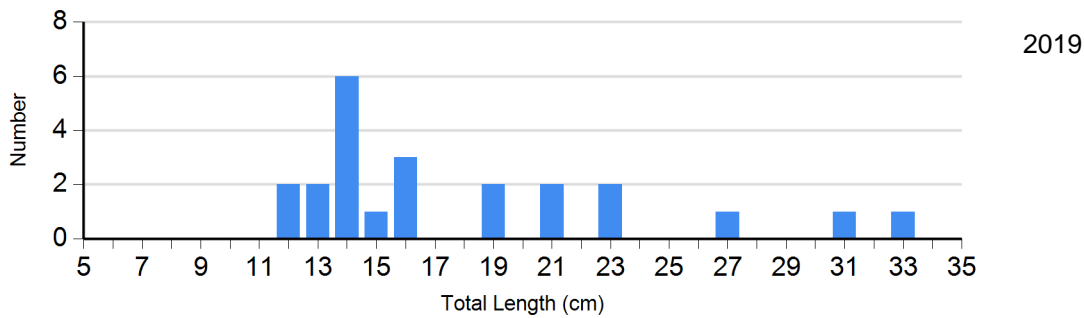
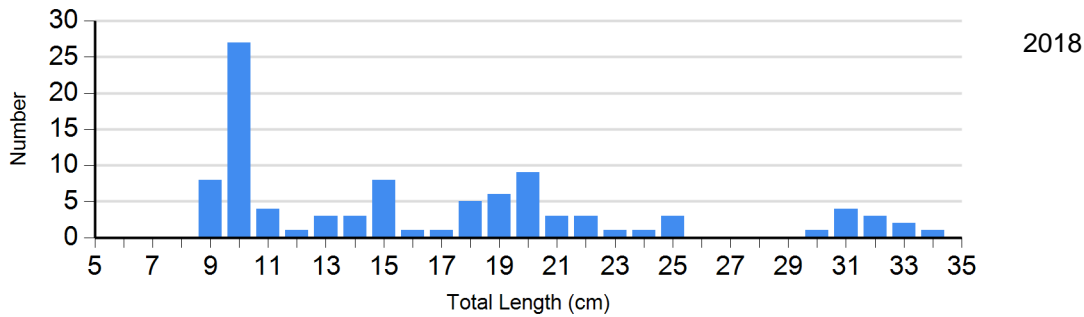
# Length Frequency Distribution

Length frequency histogram of species sampled by year.

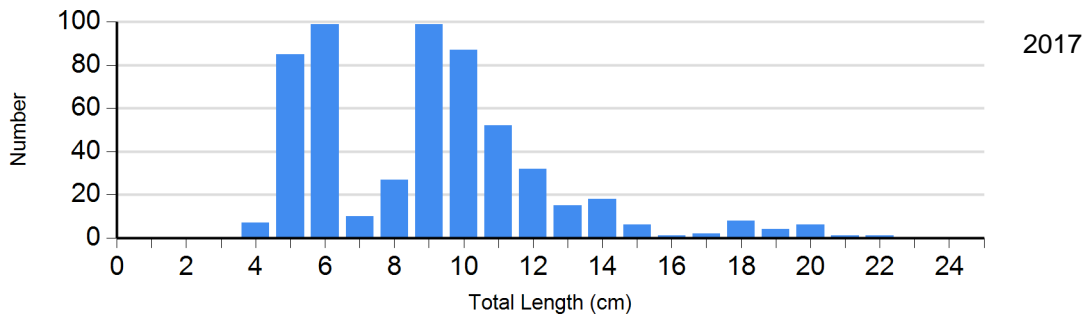
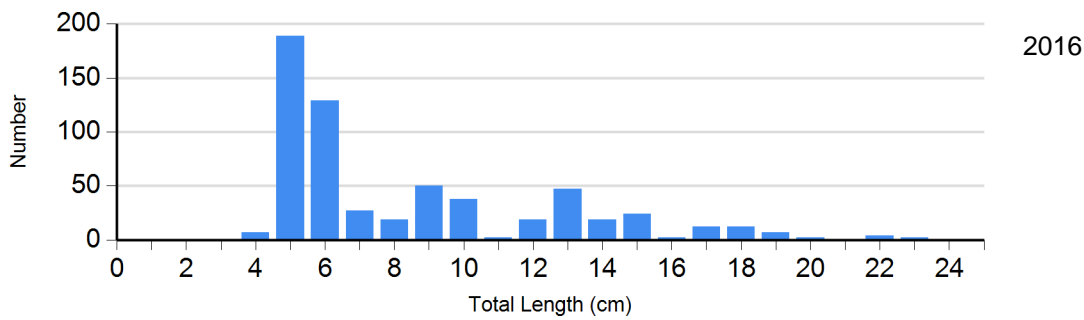
Species: Black Crappie  
Gear: AFS std frame net



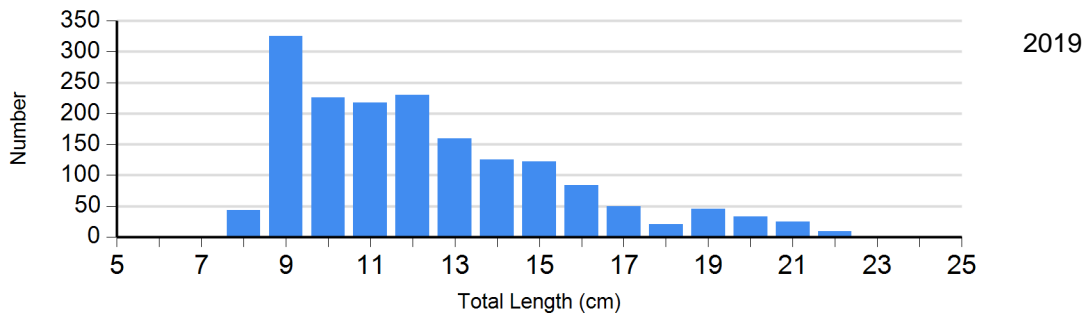
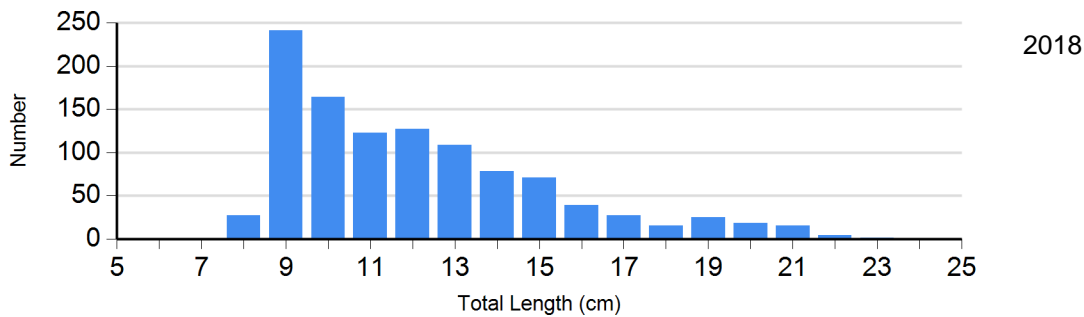
Species: Black Crappie  
Gear: frame net (std 3/4 in)



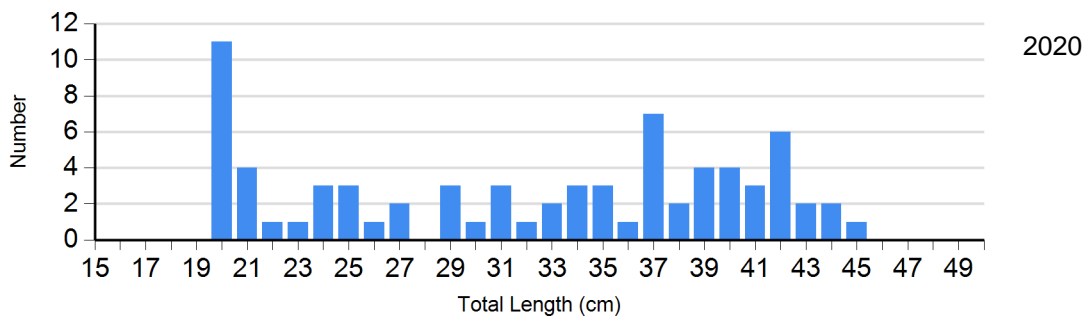
Species: Bluegill  
Gear: AFS std frame net



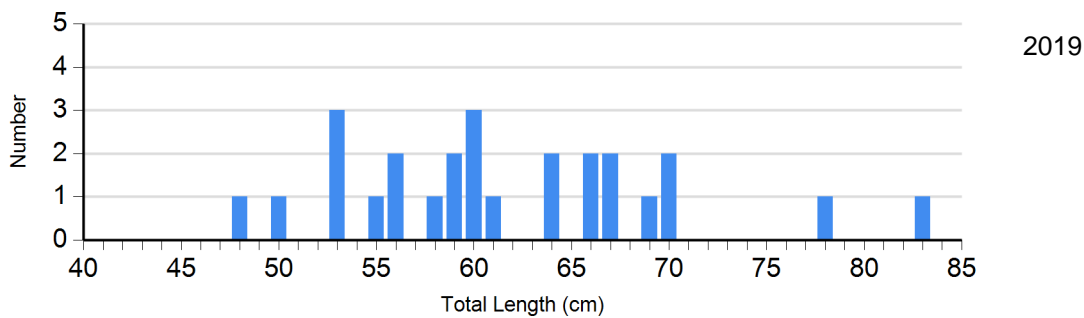
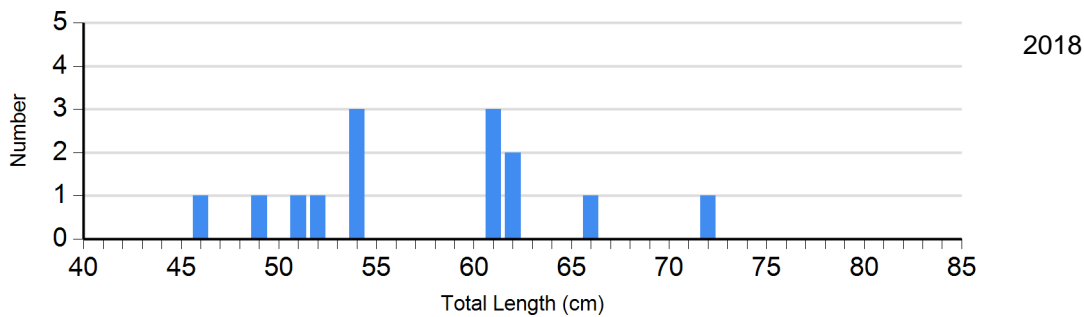
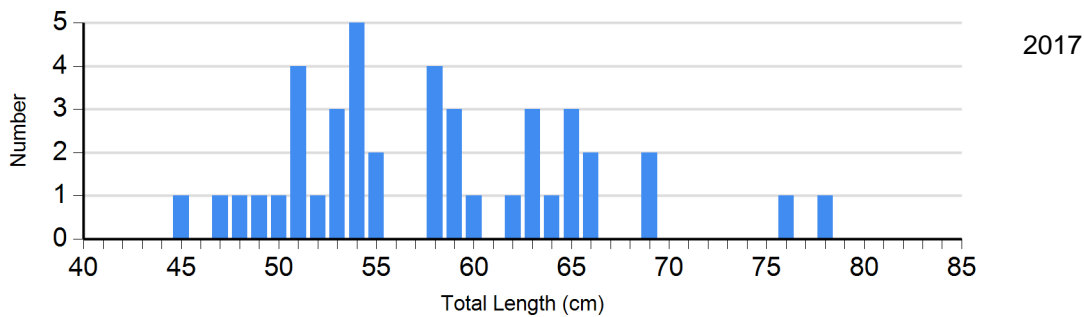
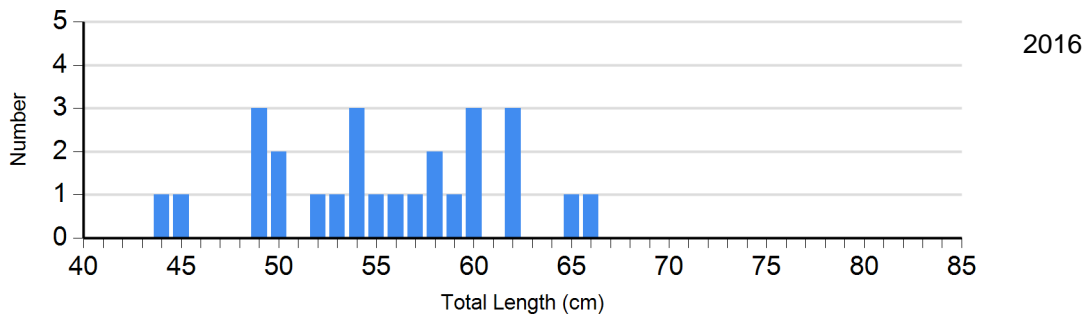
Species: Bluegill  
Gear: frame net (std 3/4 in)



Species: Largemouth Bass  
 Gear: spring night EF-LMB

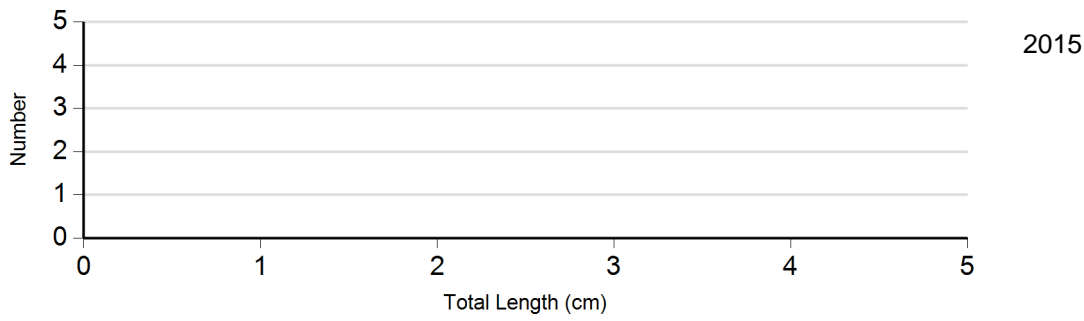


Species: Northern Pike  
 Gear: AFS std gill net

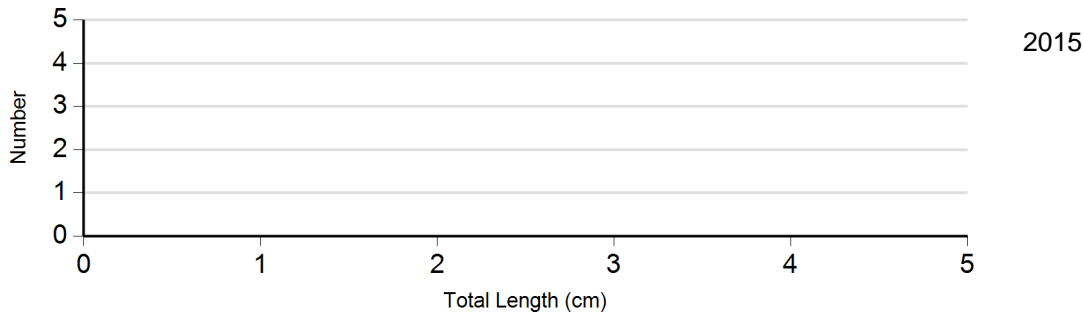




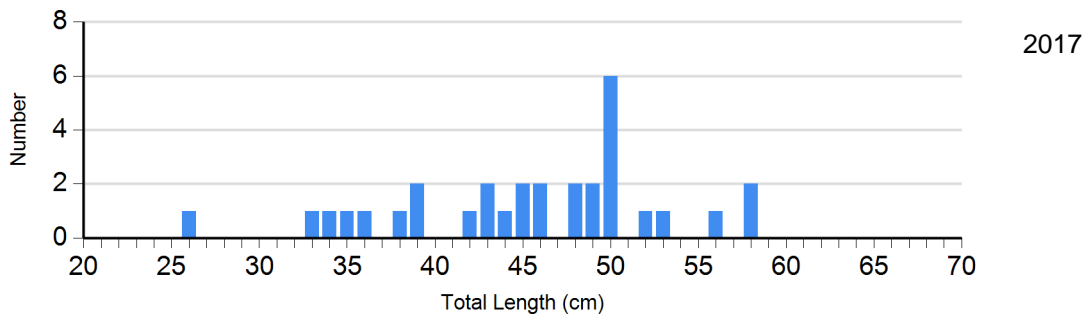
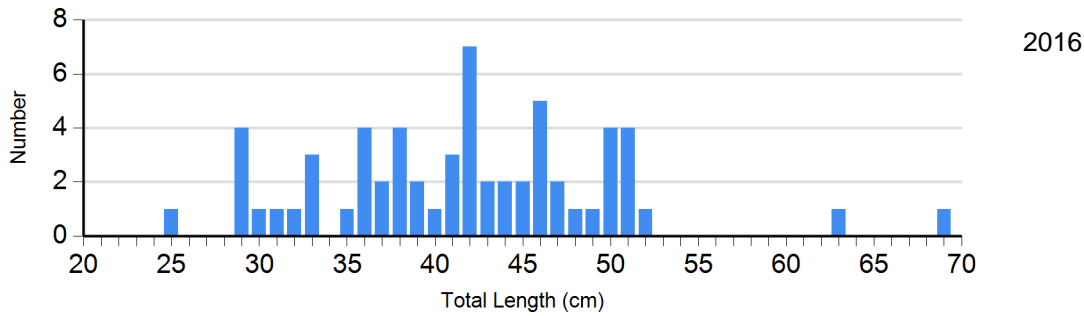
Species: Northern Pike  
Gear: std exp gill net

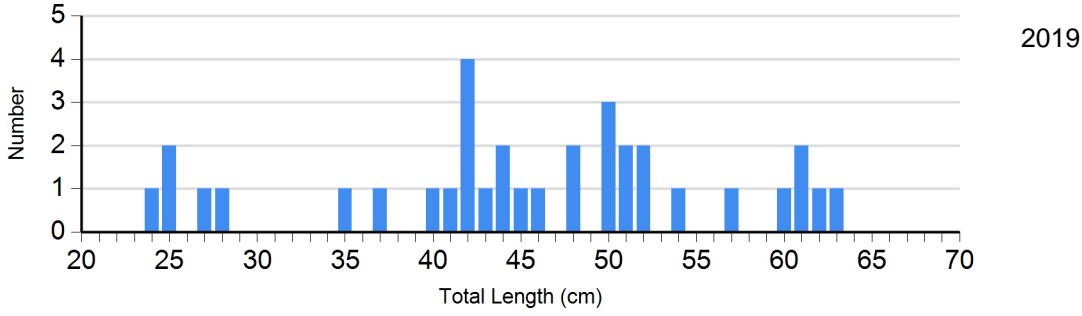
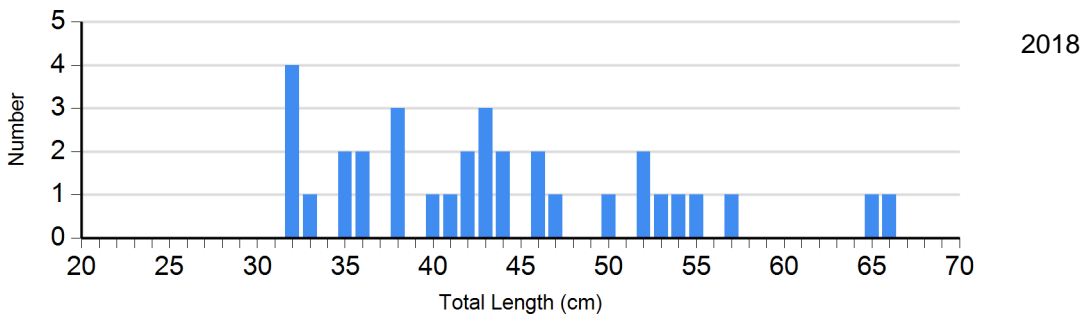


Species: Smallmouth Bass  
Gear: boat shocker (night, DC)

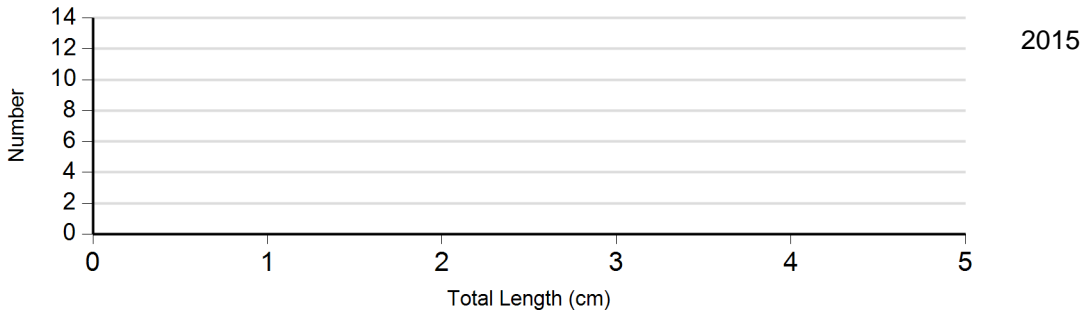


Species: Walleye  
Gear: AFS std gill net

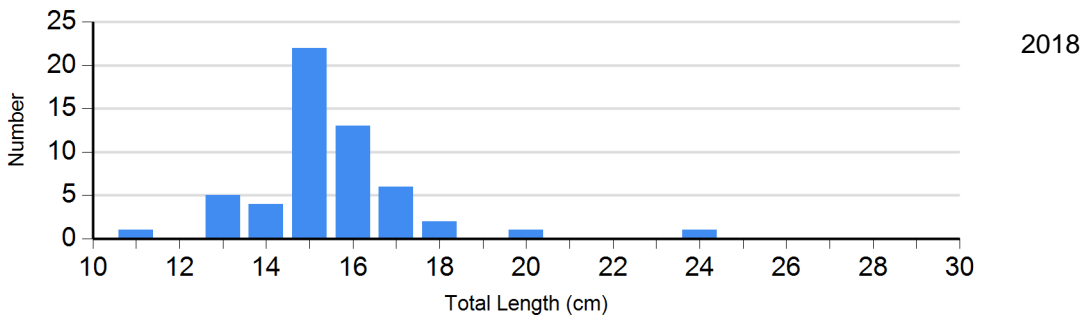
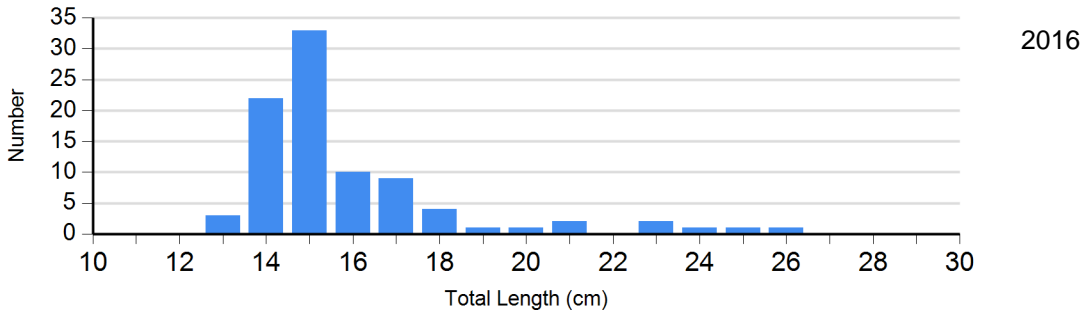


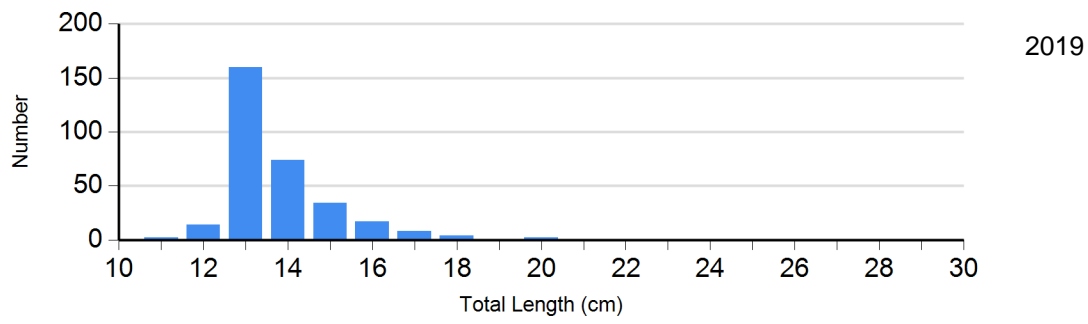


Species: Walleye  
Gear: std exp gill net

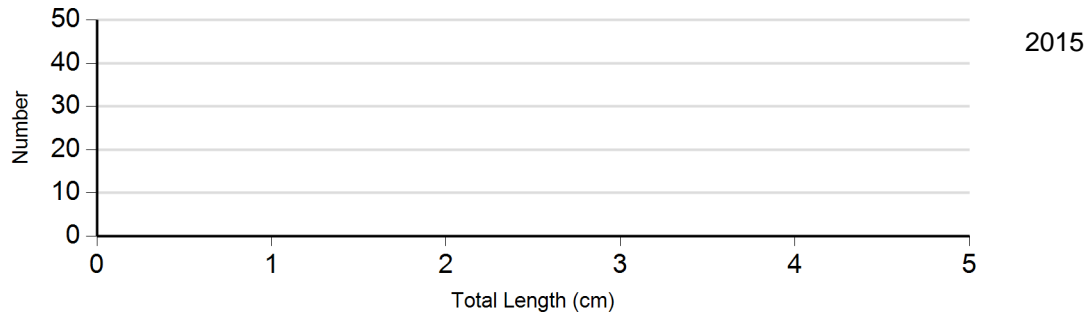


Species: Yellow Perch  
Gear: AFS std gill net





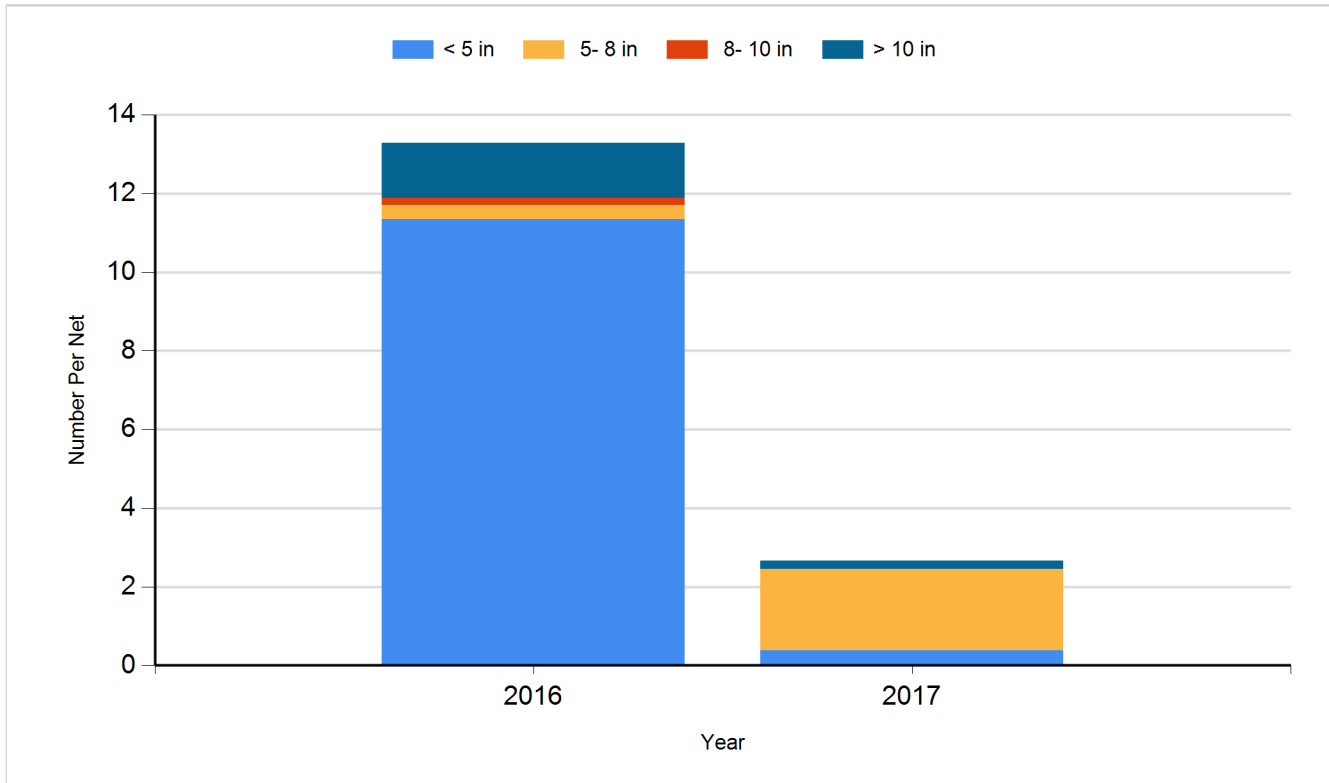
Species: Yellow Perch  
 Gear: std exp gill net



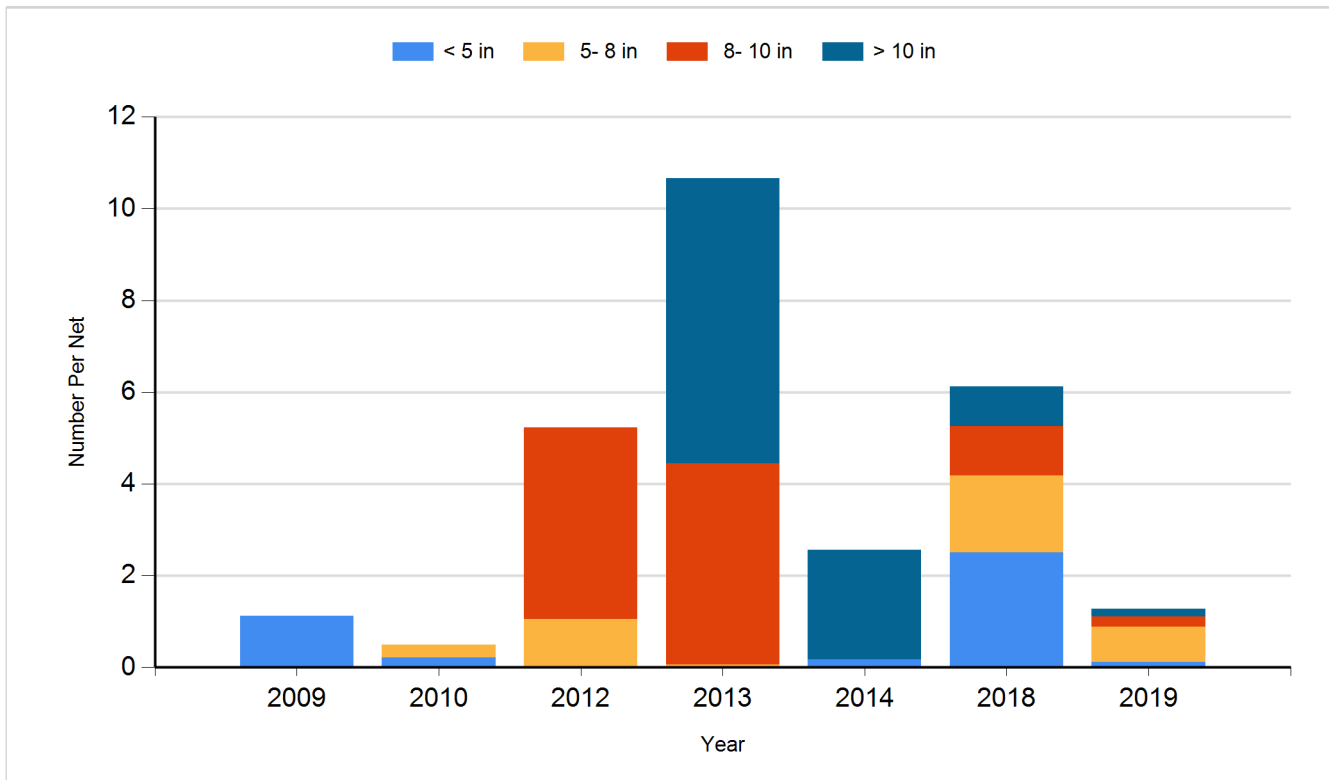
## Historic Fish Sizes and Relative Abundance

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

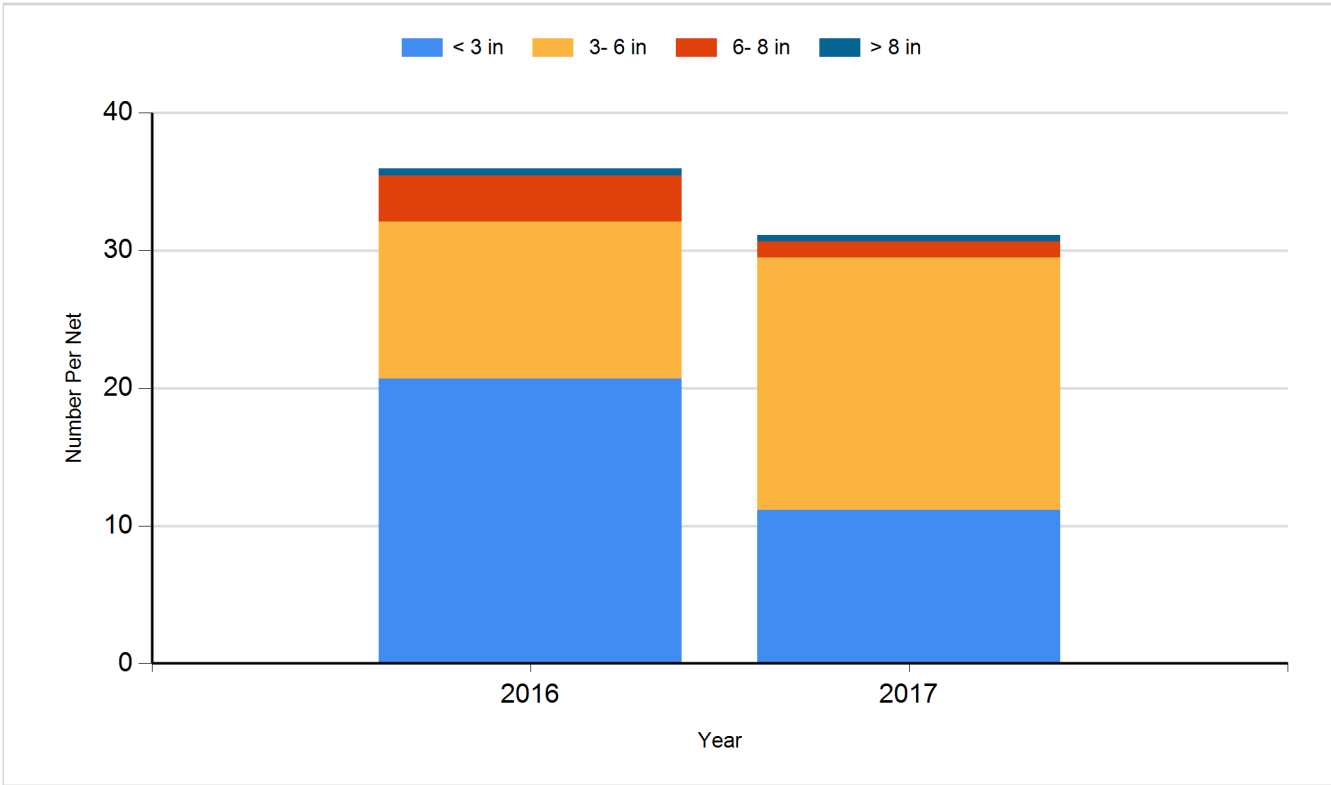
Species: Black Crappie  
Gear: AFS std frame net



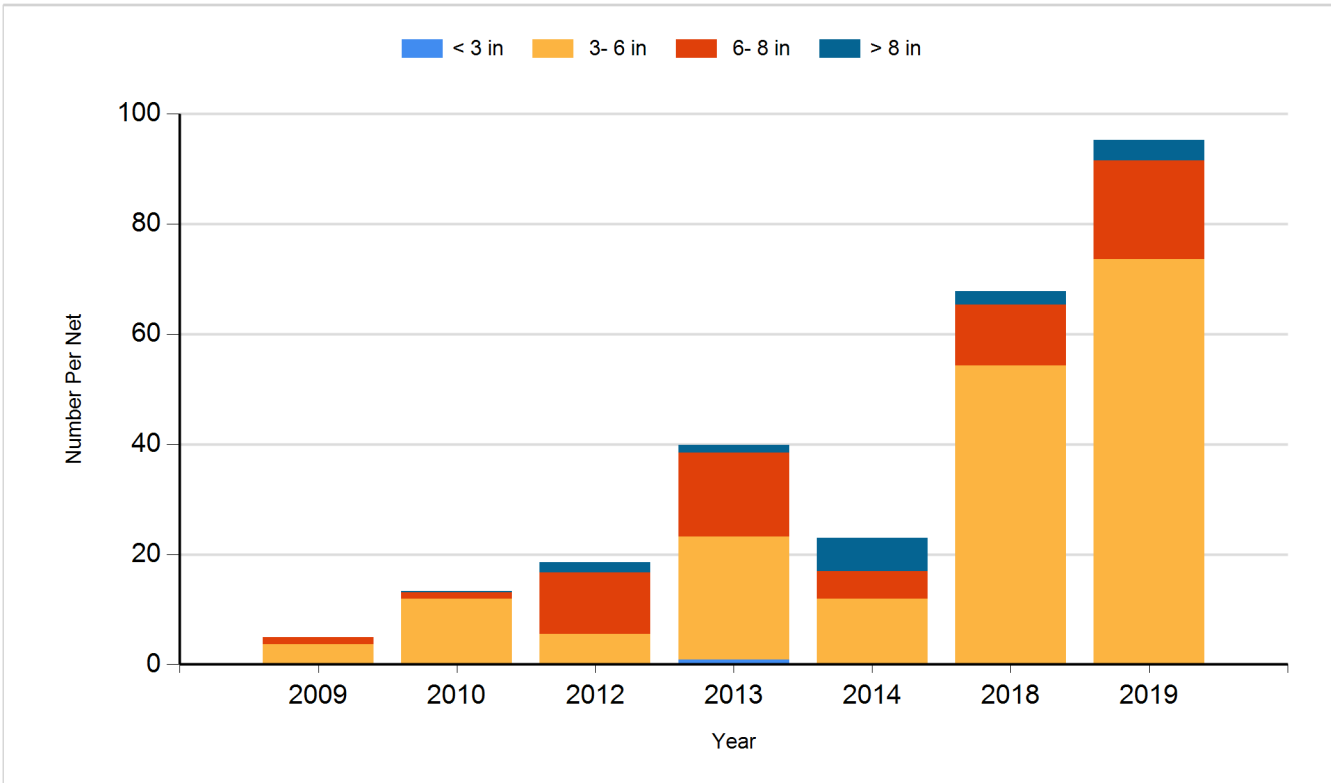
Species: Black Crappie  
Gear: frame net (std 3/4 in)



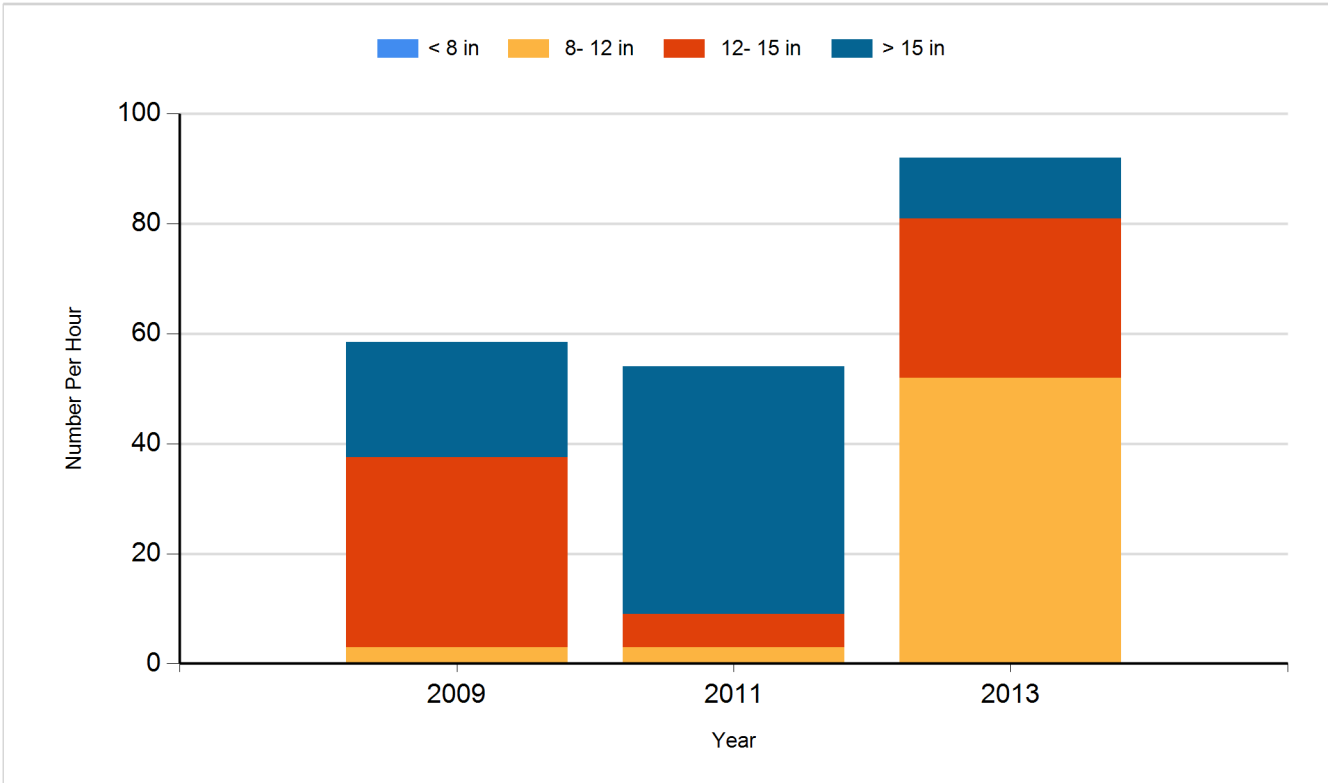
Species: Bluegill  
Gear: AFS std frame net



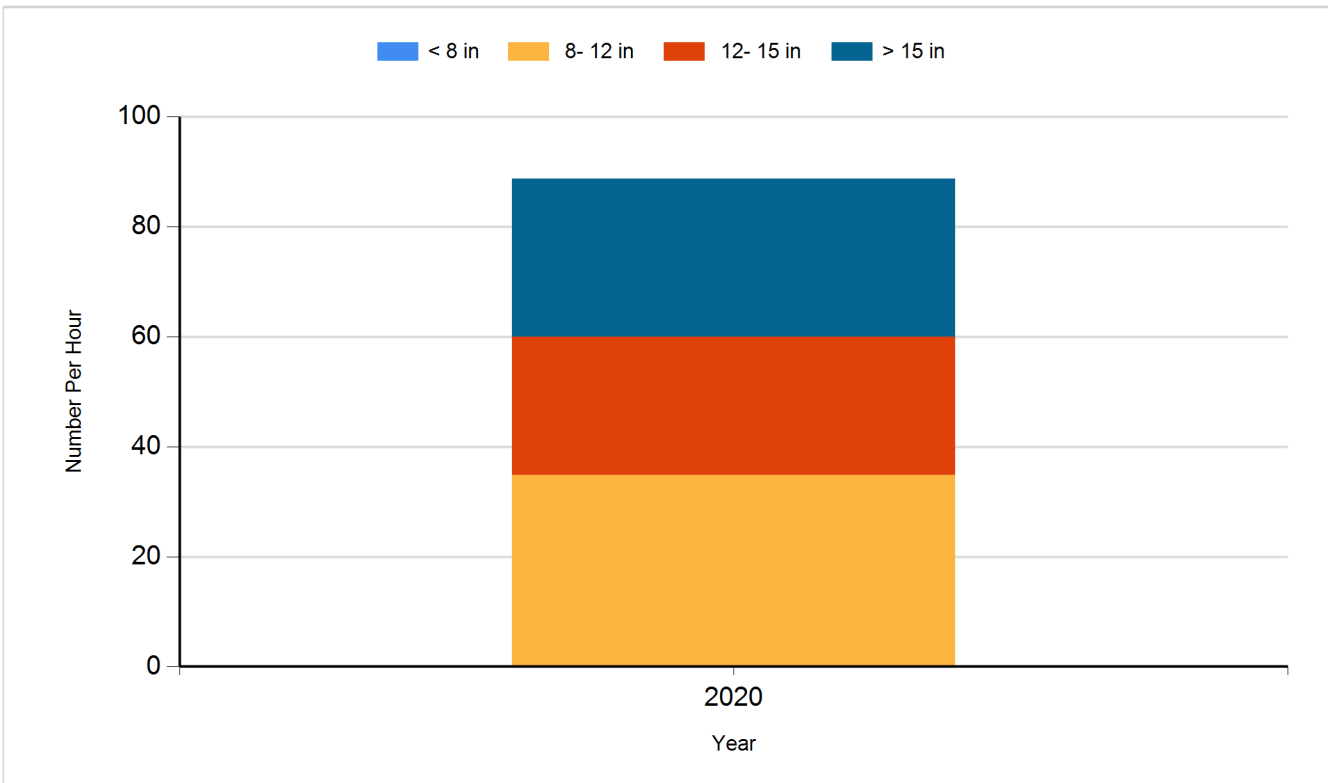
Species: Bluegill  
Gear: frame net (std 3/4 in)



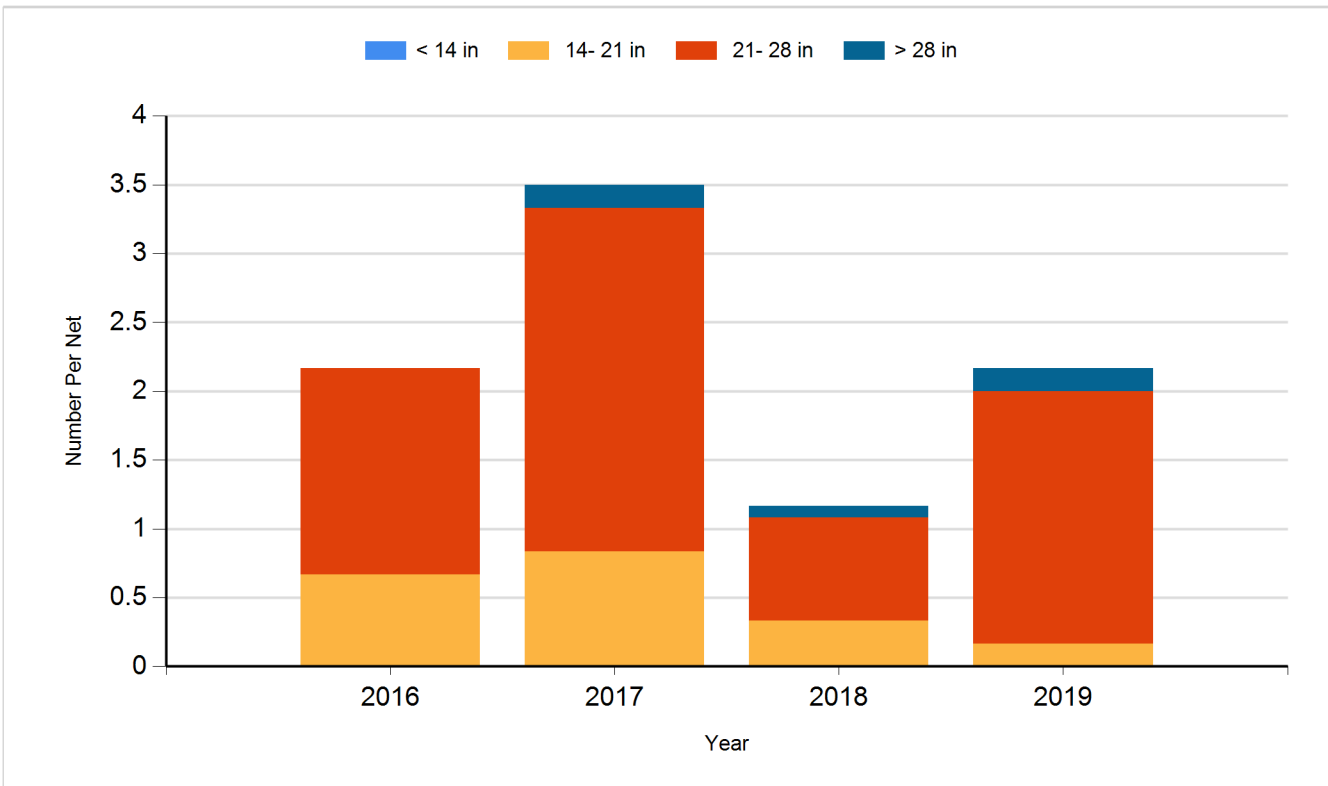
Species: Largemouth Bass  
Gear: boat shocker (night, AC)



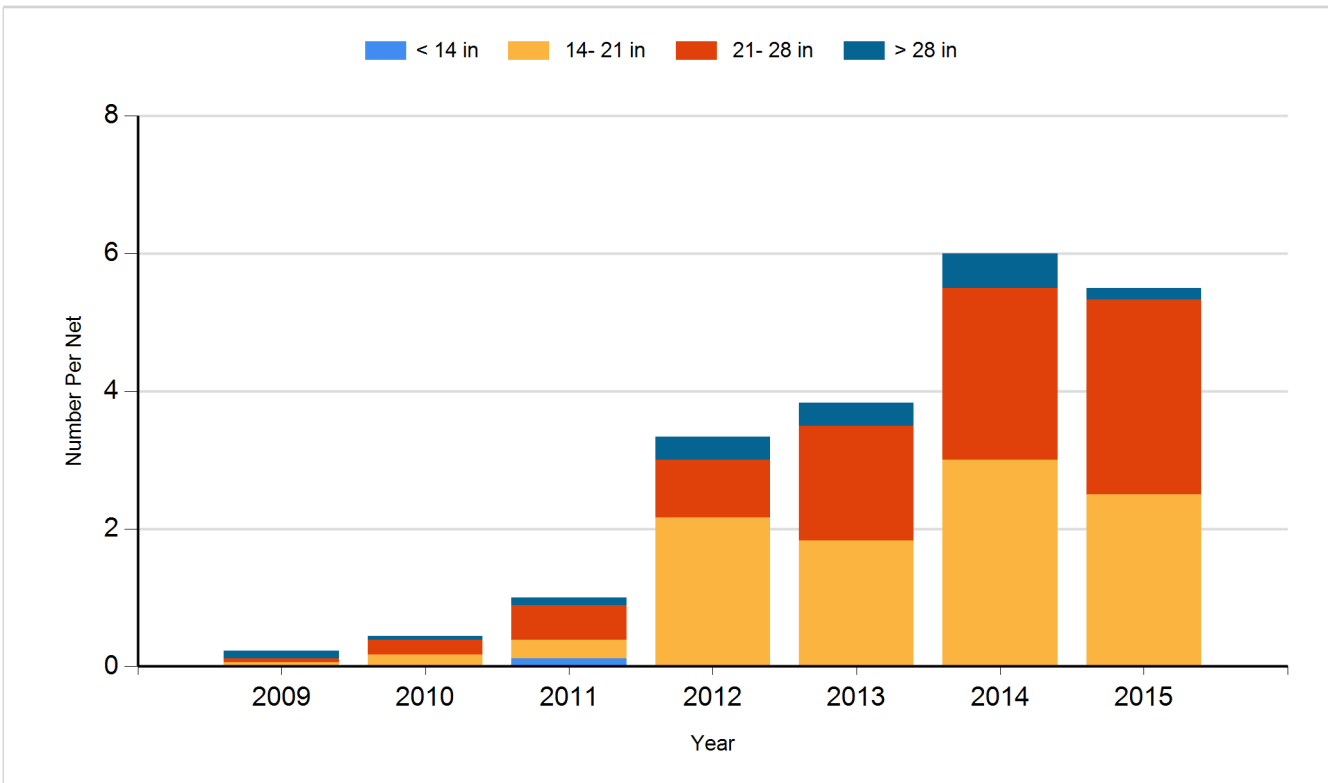
Species: Largemouth Bass  
Gear: spring night EF-LMB



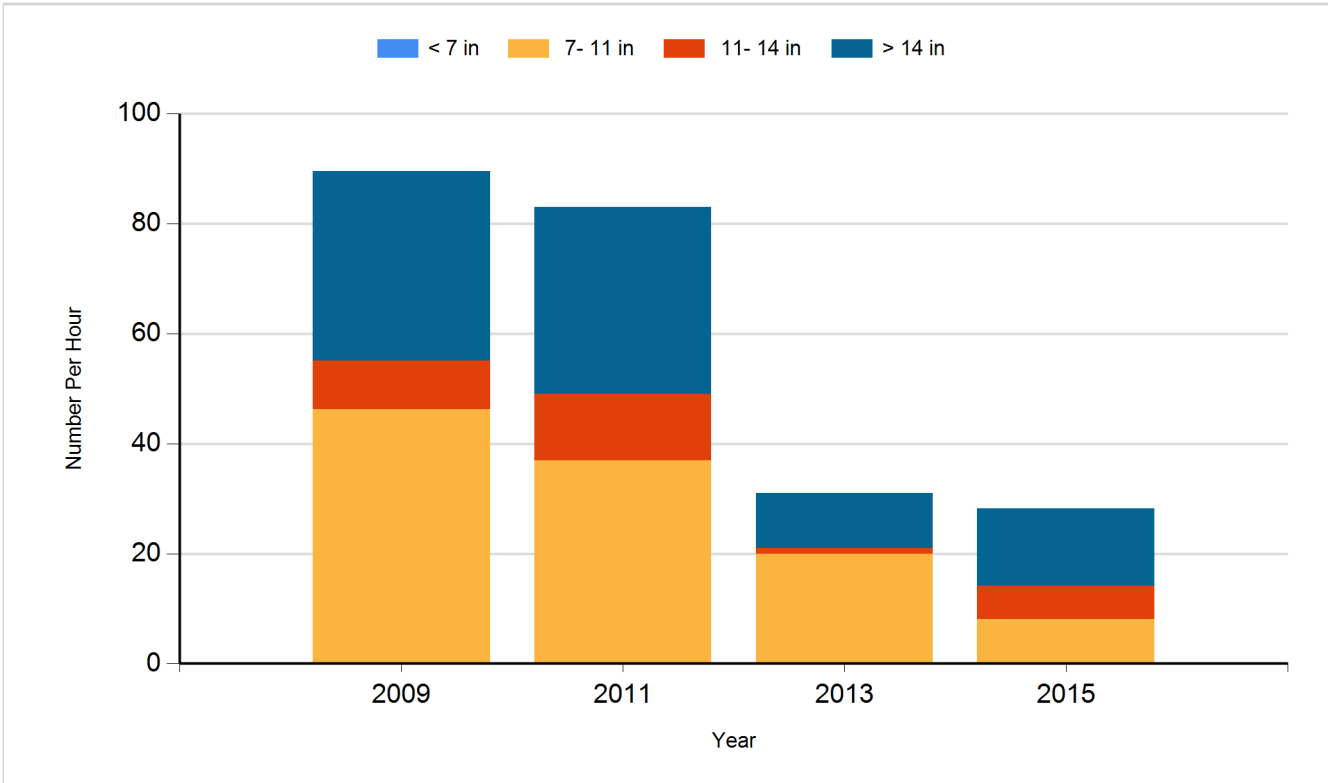
Species: Northern Pike  
Gear: AFS std gill net



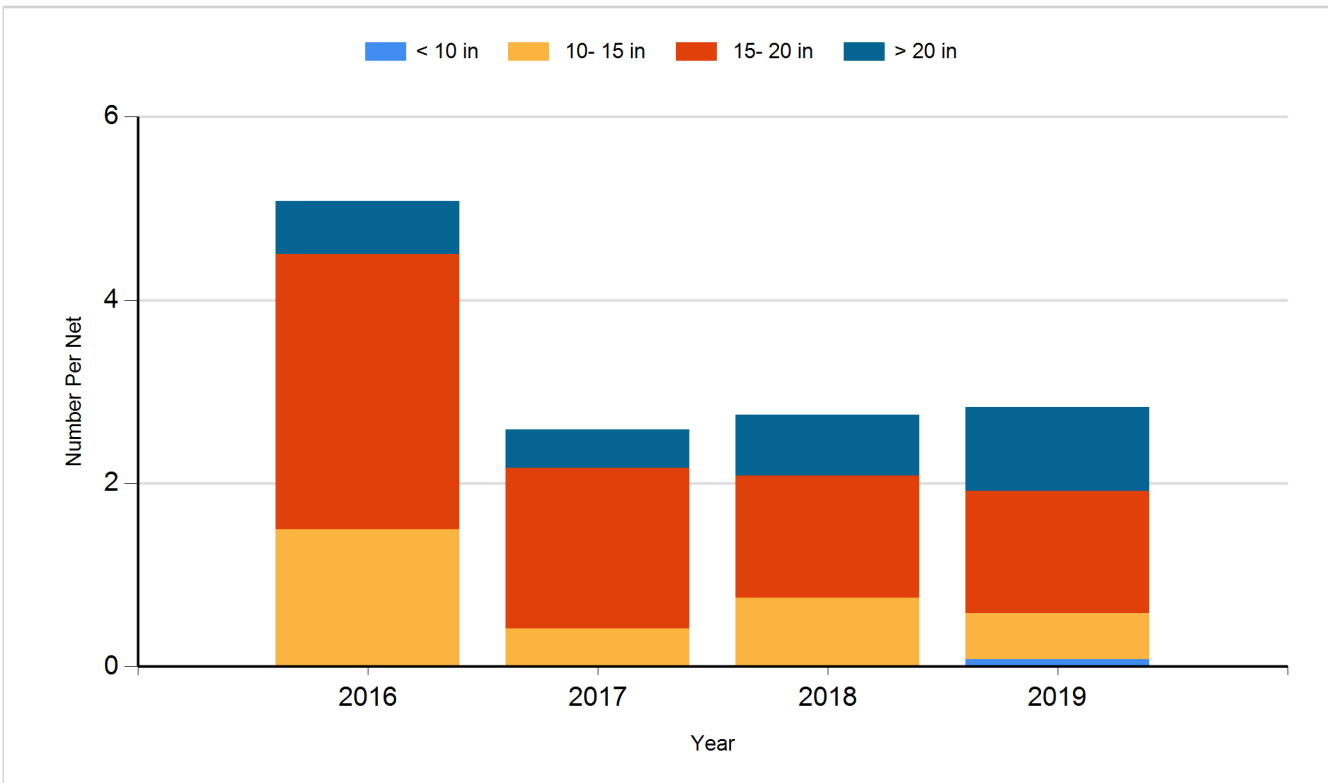
Species: Northern Pike  
Gear: std exp gill net



Species: Smallmouth Bass  
Gear: boat shocker (night, DC)

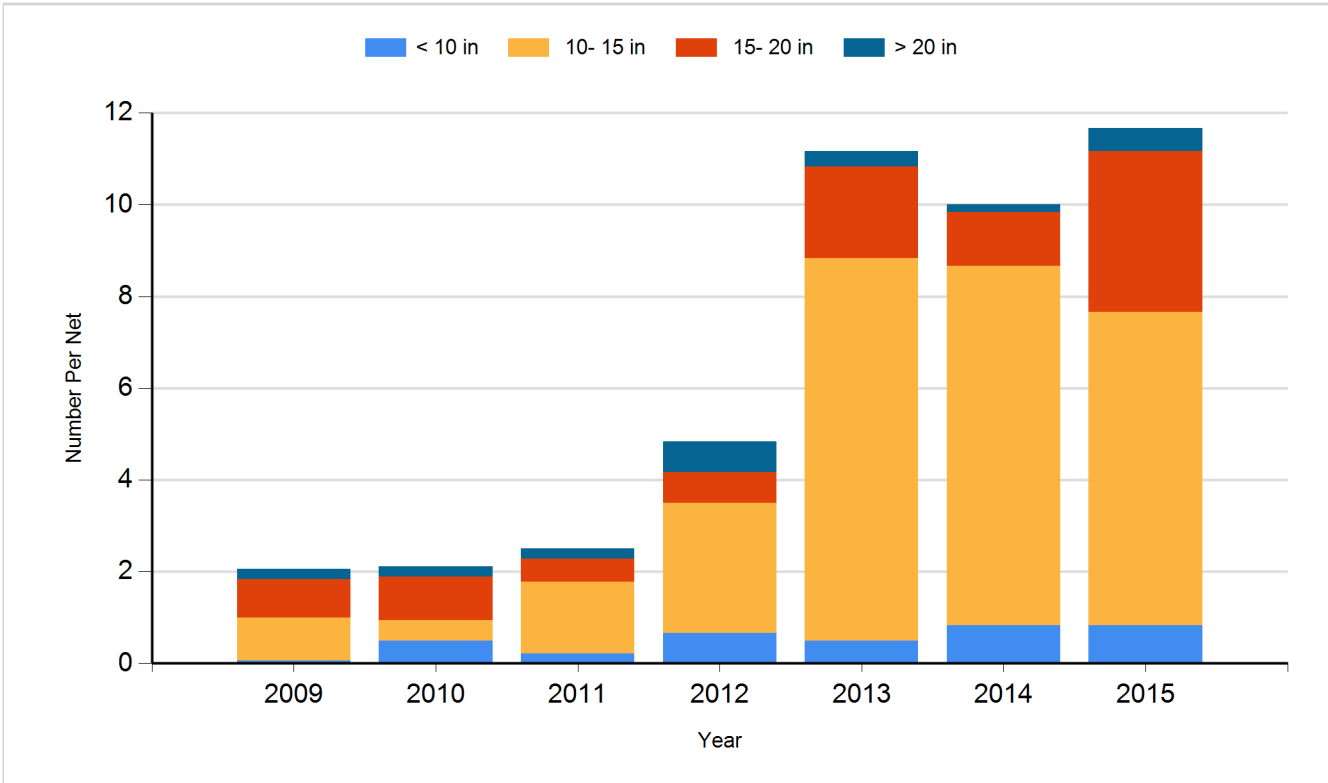


Species: Walleye  
Gear: AFS std gill net

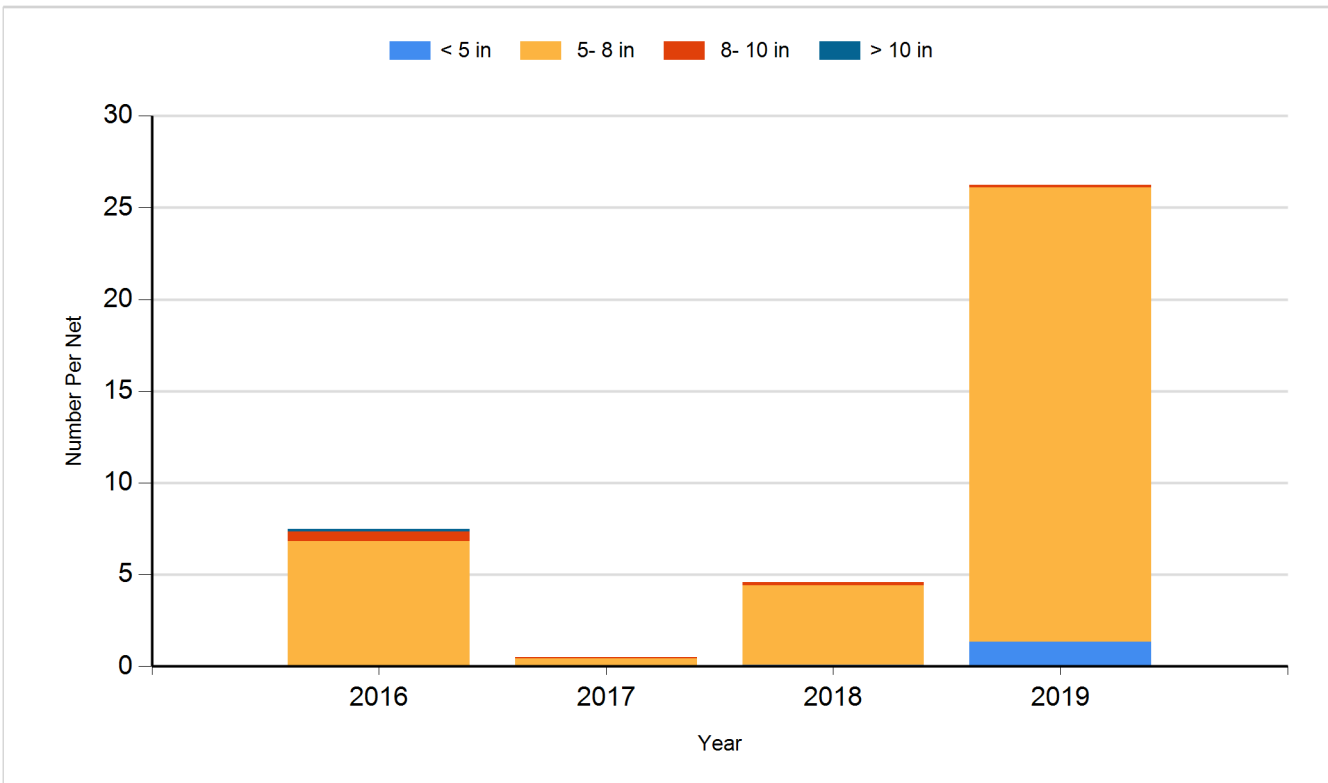




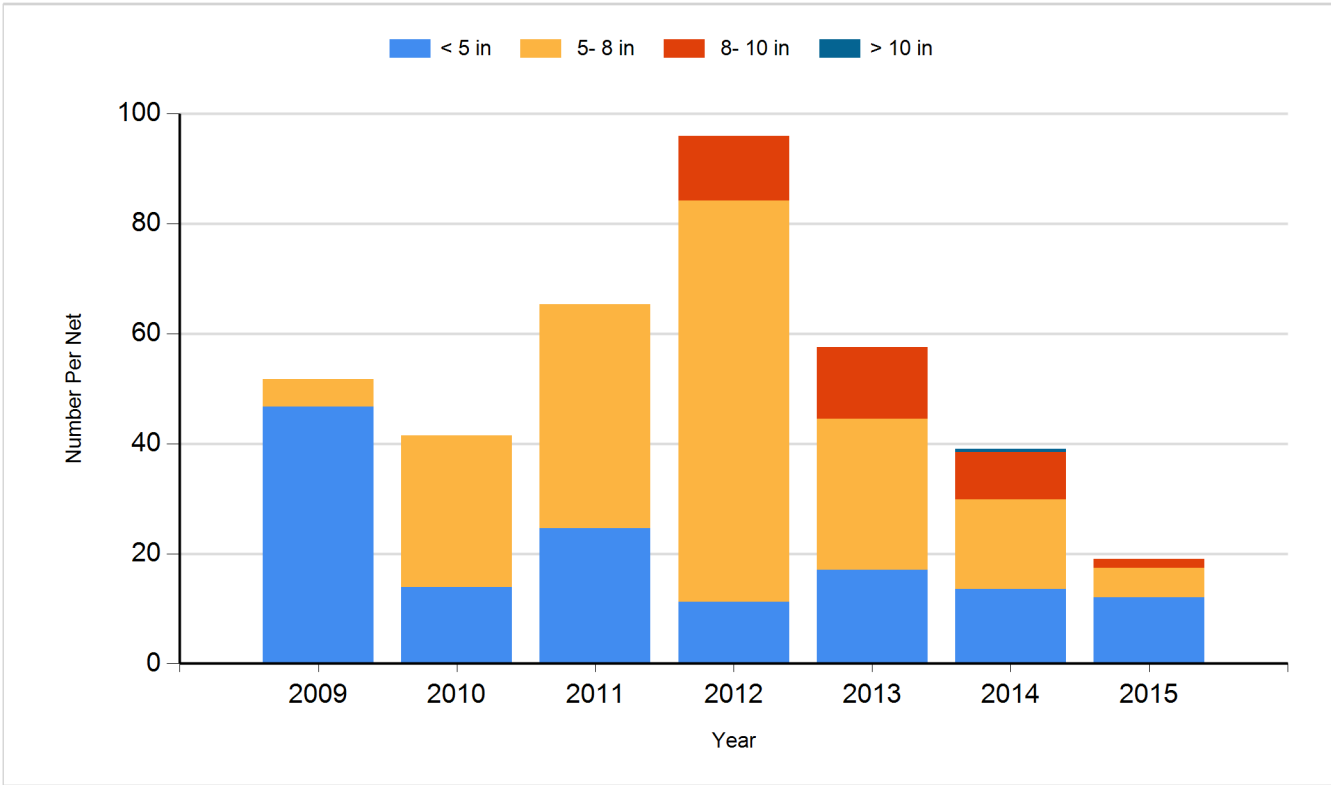
Species: Walleye  
Gear: std exp gill net



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
2009	Walleye	Fry	600,000
2011	Walleye	Fry	600,000
2012	Walleye	Fry	600,000
2013	Walleye	Fry	600,000
2014	Walleye	Fry	542,000
2014	Walleye	Large Fingerling	24,879
2015	Walleye	Fry	550,000
2016	Walleye	Fry	550,000
2017	Walleye	Large Fingerling	48,564
2019	Walleye	Large Fingerling	18,798