

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Menno, Hutchinson County

LJA-Lake-52-000

2019

## Lake Information

<b>Name:</b>	Menno	<b>Maximum Depth:</b>	34 Feet
<b>County:</b>	Hutchinson	<b>Mean Depth:</b>	13 Feet
<b>Legal Description:</b>	T98N-R57W-Sec. 32		
<b>Surface Area:</b>	39 Acres		

## Surveys and Investigations

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

Gear	Date	Effort
boat shocker (day)	Jun 10, 2019	3600 seconds
frame net (std 3/4 in)	Jun 03, 2019	4 net-nights

## **Common Fish Species Present**

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

Green Sunfish

Sunfish Hybrid

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## Terminology

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

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

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

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

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

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

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

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

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

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

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

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

## **Catch Summary of Stock Length Fish**

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

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

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
boat shocker (day)	Largemouth Bass	224	162.0	33.8	38	5	0		90	1
frame net (std 3/4 in)	Black Bullhead	33	8.3	5.4	94		36	13		
	Bluegill	71	17.8	17.7	90	5	58	8	113	2
	Green Sunfish	2	0.5	0.5	100		0		113	1
	Largemouth Bass	2	0.5	0.5	100		0		93	8
	Sunfish Hybrid	3	0.0	0.0						

## 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								0.4			0.40
	Black Crappie								0.0			0.00
	Bluegill								5.6			5.60
	Green Sunfish								0.4			0.40
	Sunfish Hybrid								0.0			0.00
AFS std gill net	Black Bullhead								3.8			3.80
	Channel Catfish								0.5			0.50
	Green Sunfish								0.3			0.30
	Largemouth Bass								1.8			1.80
	White Sucker								0.3			0.30
boat shocker (day)	Largemouth Bass										162.0	162.0
boat shocker (night)	Largemouth Bass	112.0		84.0	29.1	48.0	132.6					81.14
frame net (std 3/4 in)	Black Bullhead	5.0		10.8	3.0	3.2	0.8		0.2	8.3		4.47
	Black Crappie	29.4		20.6	27.0	13.3	1.9		0.2	0.0		13.20
	Bluegill	105.8		43.0	27.2	13.7	8.9		13.6	17.8		32.86
	Channel Catfish	0.0		0.0	0.2	0.1	0.0		0.0	0.0		0.04
	Green Sunfish	0.2		0.0	0.0	0.3	0.4		0.6	0.5		0.29
	Largemouth Bass	0.2		0.1	0.0	0.2	2.4		0.2	0.5		0.51
	Sunfish Hybrid	0.0		0.0	0.0	0.0	0.0		0.0	0.0		0.00
	White Sucker	0.8		1.2	0.4	0.9	0.1		0.0	0.0		0.49
	Yellow Perch	1.9		1.9	0.4	0.1	0.0		0.0	0.0		0.61

## 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										100			
		PSD-P										100			
		Wr											108		
	Black Crappie	PSD											0		
		PSD-P											0		
		Wr													
	Bluegill	PSD											50		
		PSD-P											39		
		Wr													
Green Sunfish	PSD											100			
	PSD-P											50			
	Wr													119	
AFS std gill net	Black Bullhead	PSD										93			
		PSD-P										73			
	Green Sunfish	PSD										100			
		PSD-P										0			
	Largemouth Bass	PSD										100			
		PSD-P										14			
boat shocker (day)	Largemouth Bass	PSD												38	
		PSD-P												0	
		Wr													90
boat shocker (night)	Largemouth Bass	PSD		68		86	100	64	7						
		PSD-P		37		61	69	64	5						
		Wr		105		100	91	94	101						
frame net (std 3/4 in)	Black Bullhead	PSD		96		99	100	88	88			100	94		
		PSD-P		22		94	87	84	63			100	36		
		Wr		93		77									
	Black Crappie	PSD		48		40	100	89	84			100			
		PSD-P		3		0	18	71	68			100			
		Wr		97		87	106	101	99			95			
	Bluegill	PSD		66		95	100	100	98			85	90		
		PSD-P		1		2	50	91	93			25	58		

Gear	Species	Index	Year									
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
frame net (std 3/4 in)	Bluegill	Wr		89		81	120	104	112		104	113
		PSD		0				0	50		100	100
	Green Sunfish	PSD-P		0				0	0		0	0
		Wr		92				90	126		156	113
	Largemouth Bass	PSD		100		100	0	0	0		100	100
		PSD-P		100		0	0	0	0		0	0
		Wr		114		105		93	109		100	93



## 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+
2015	133	162 (14)	218 (6)			255 (113)					
2014	135			212 (1)	242 (134)						
2013	206	145 (2)		197 (204)							
2011	376	134 (189)	209 (129)	232 (53)	280 (6)						

Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	137				202 (19)	214 (24)	215 (84)	214 (11)			
2014	136			171 (5)	188 (22)	201 (87)	202 (14)	195 (9)			
2013	430	112 (3)	140 (7)	174 (84)	168 (280)	177 (38)	184 (17)				
2011	1058	106 (10)	123 (151)	153 (580)	185 (181)	191 (112)	192 (23)				

Species: Largemouth Bass

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	82		252 (8)	291 (6)	314 (8)	382 (16)	411 (21)	442 (9)	425 (9)	467 (2)	463 (2)
2011	136		260 (45)	332 (20)	359 (12)	374 (17)	390 (21)	429 (23)			

## **Fish Condition**

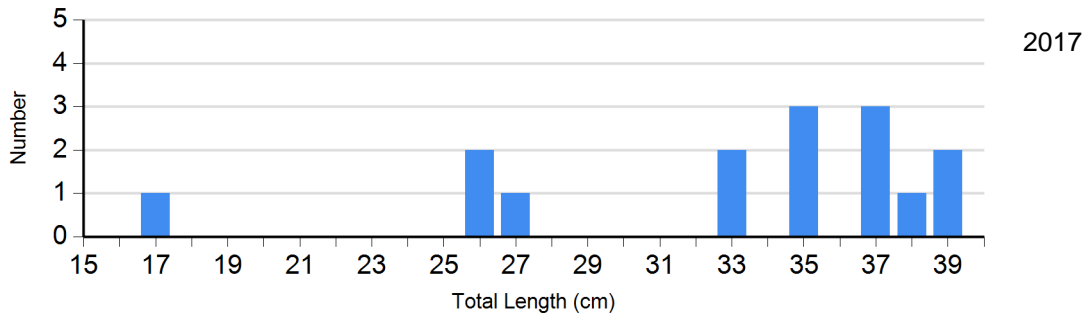
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2015	15	110 (2.1)	24	100 (1.3)	94	98 (0.5)	0	
	2016	3	112 (1.4)	3	109 (2.9)	13	94 (1.5)	0	
	2018	0		0		1	95	0	
Bluegill Frame Net	2015	0		13	108 (2.0)	124	103 (0.6)	0	
	2016	2	123	4	123 (3.3)	83	111 (0.8)	0	
	2017	14	102 (1.7)	3	123 (0.6)	9	112 (2.5)	2	112 (2.0)
	2018	10	96 (2.0)	41	104 (1.3)	14	108 (2.2)	3	107 (6.4)
	2019	7		23	119 (1.4)	40	110 (1.6)	1	104
Largemouth Bass Electro Fishing	2015	23	94 (0.7)	0		41	95 (1.7)	0	
	2016	205	102 (1.0)	4	100 (1.5)	12	95 (1.5)	0	
	2019	101	93 (1.3)	61	87 (0.8)	0		0	

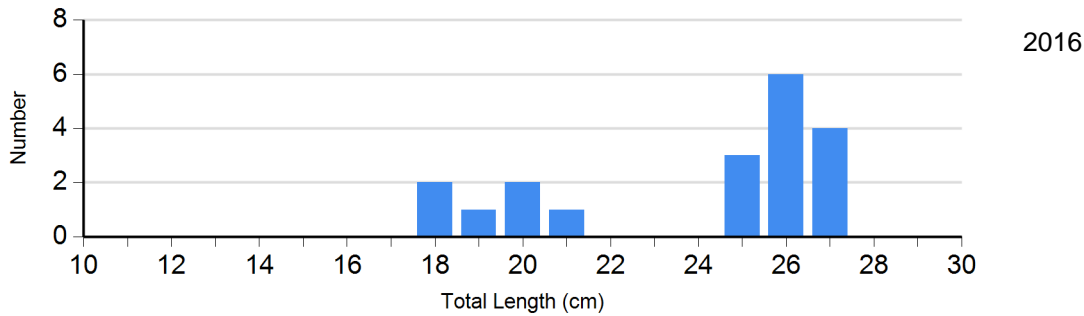
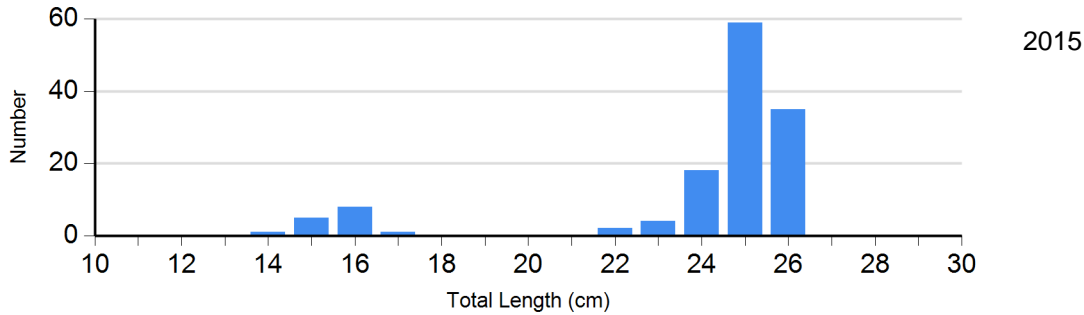
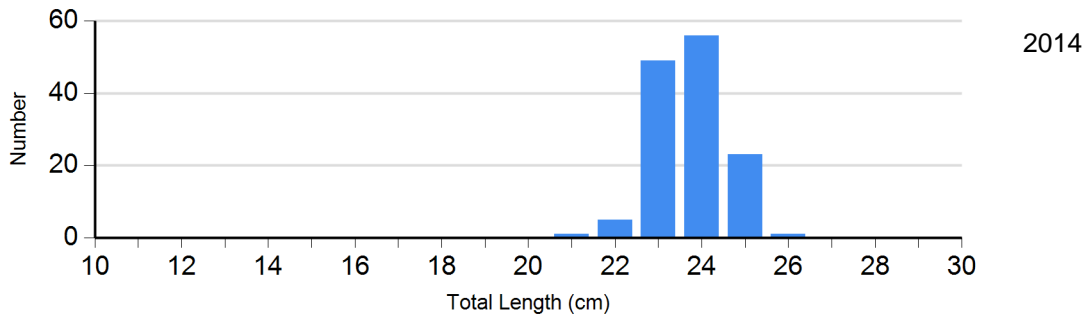
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

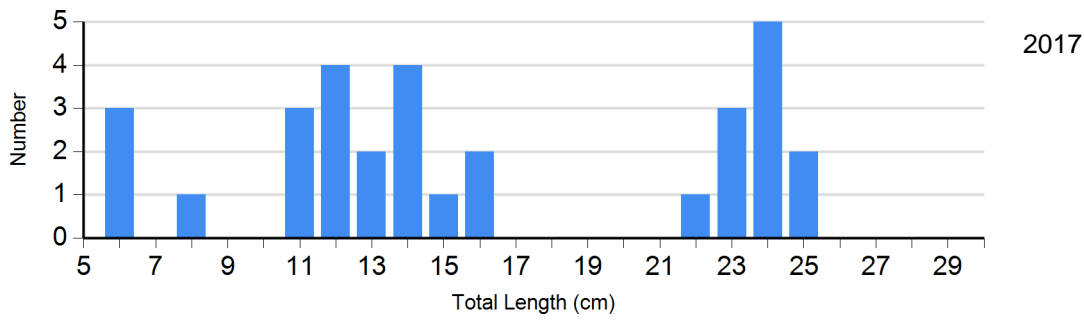
Species: Black Bullhead  
Gear: AFS std gill net



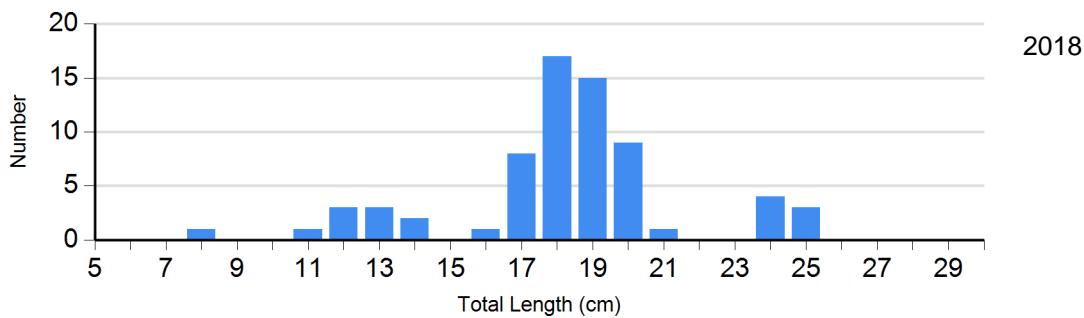
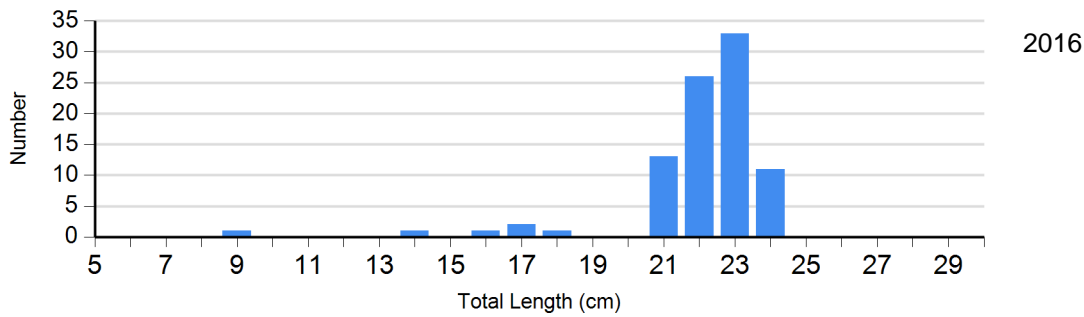
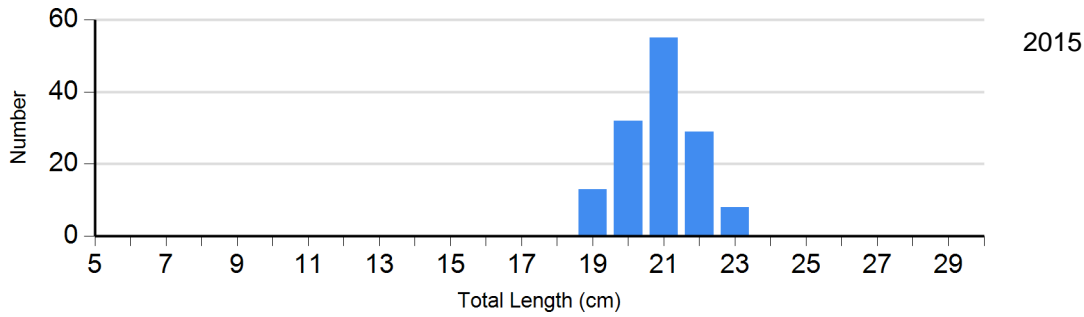
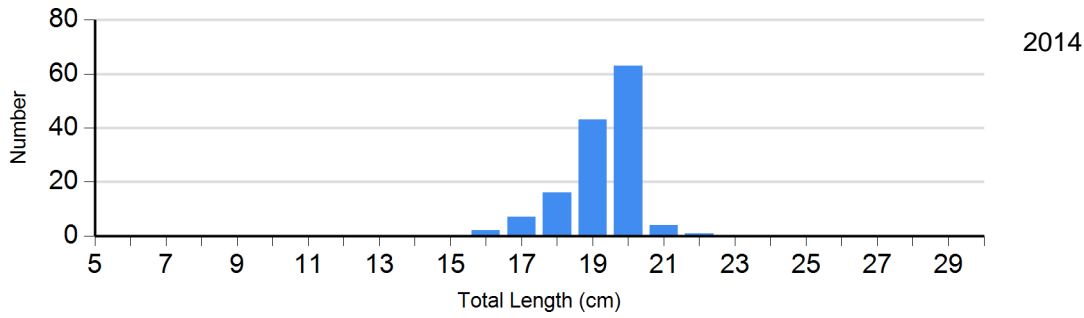
Species: Black Crappie  
Gear: frame net (std 3/4 in)

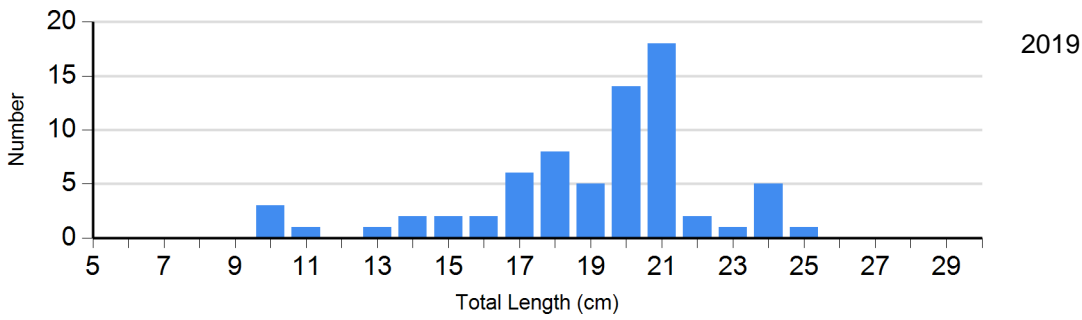


Species: Bluegill  
Gear: AFS std frame net

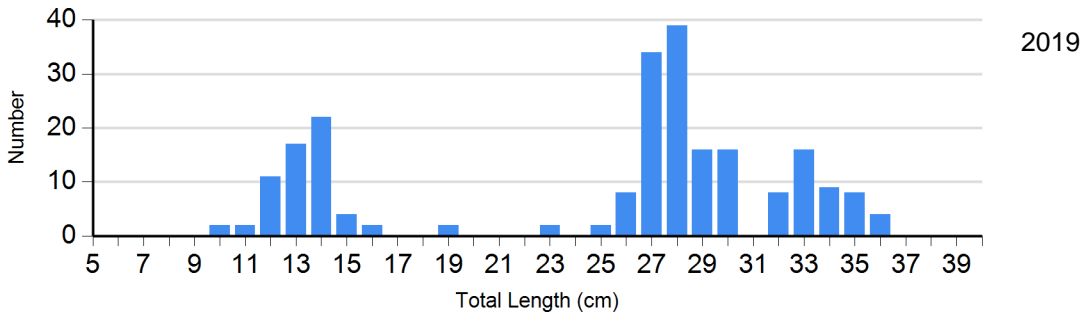


Species: Bluegill  
Gear: frame net (std 3/4 in)

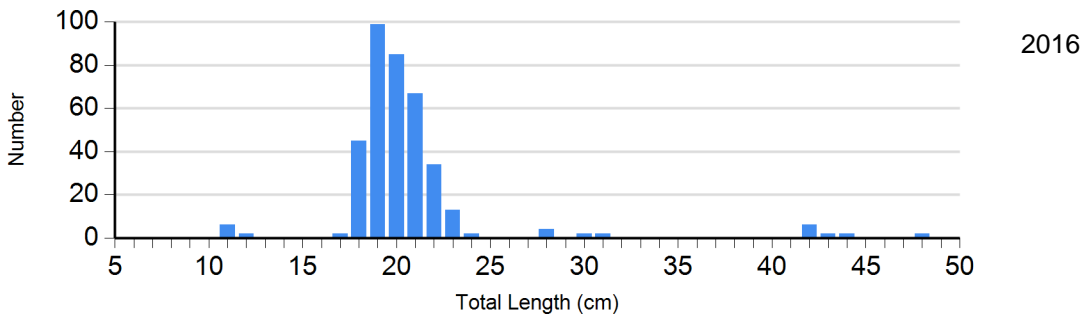
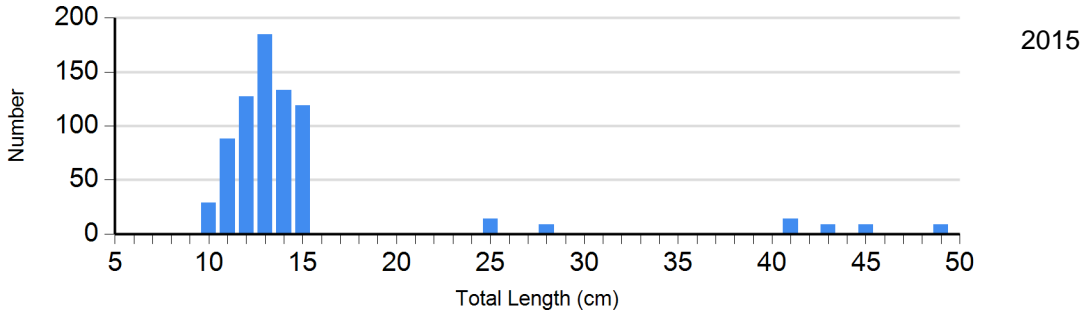
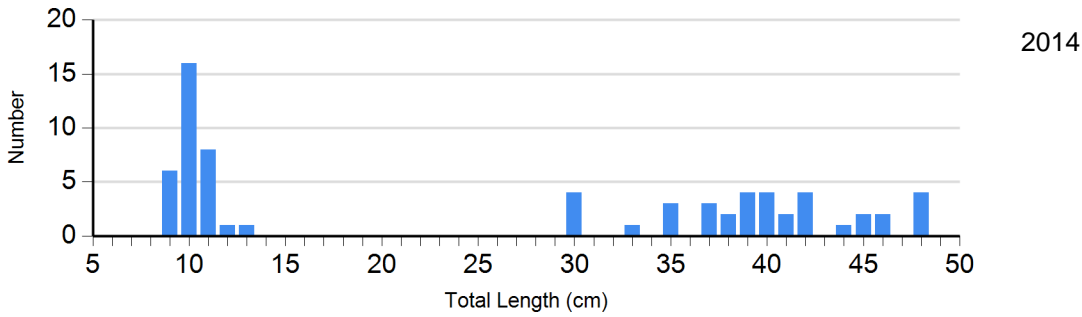




Species: Largemouth Bass  
Gear: boat shocker (day)



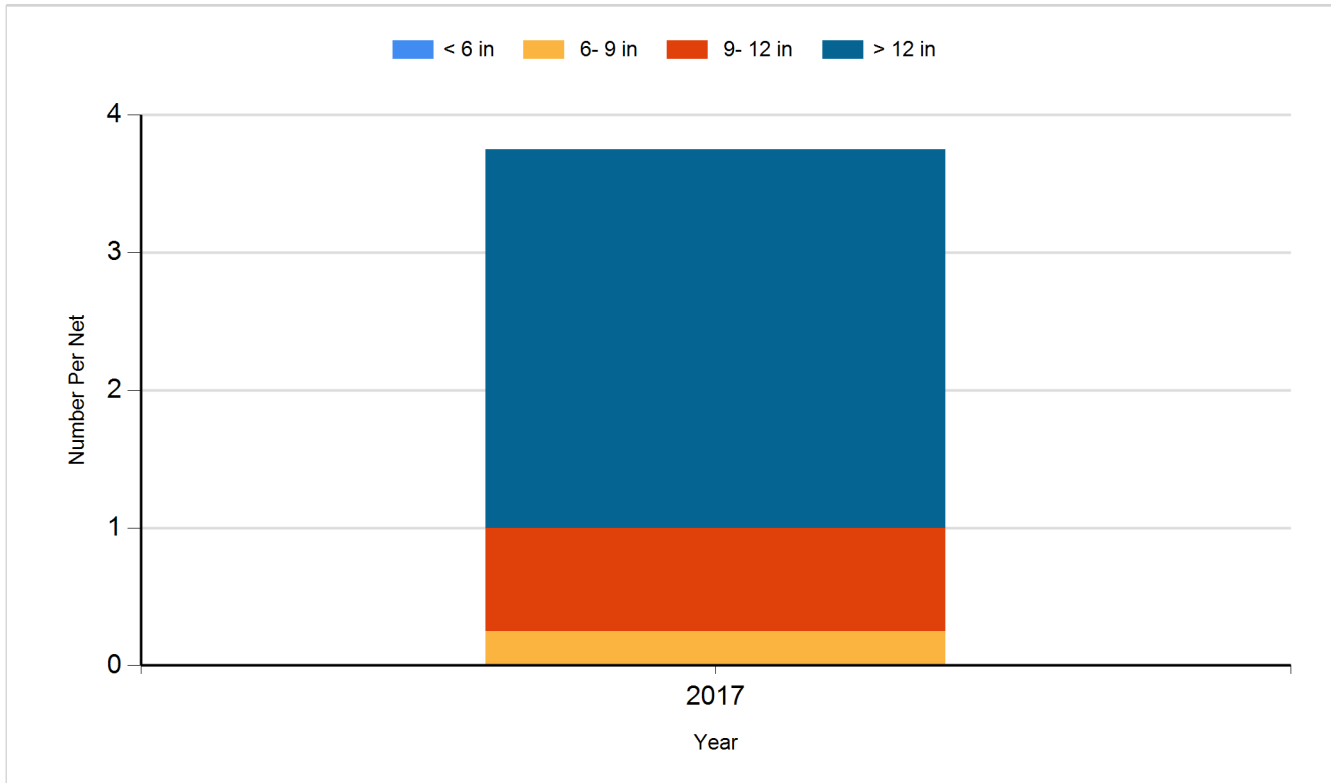
Species: Largemouth Bass  
Gear: boat shocker (night)



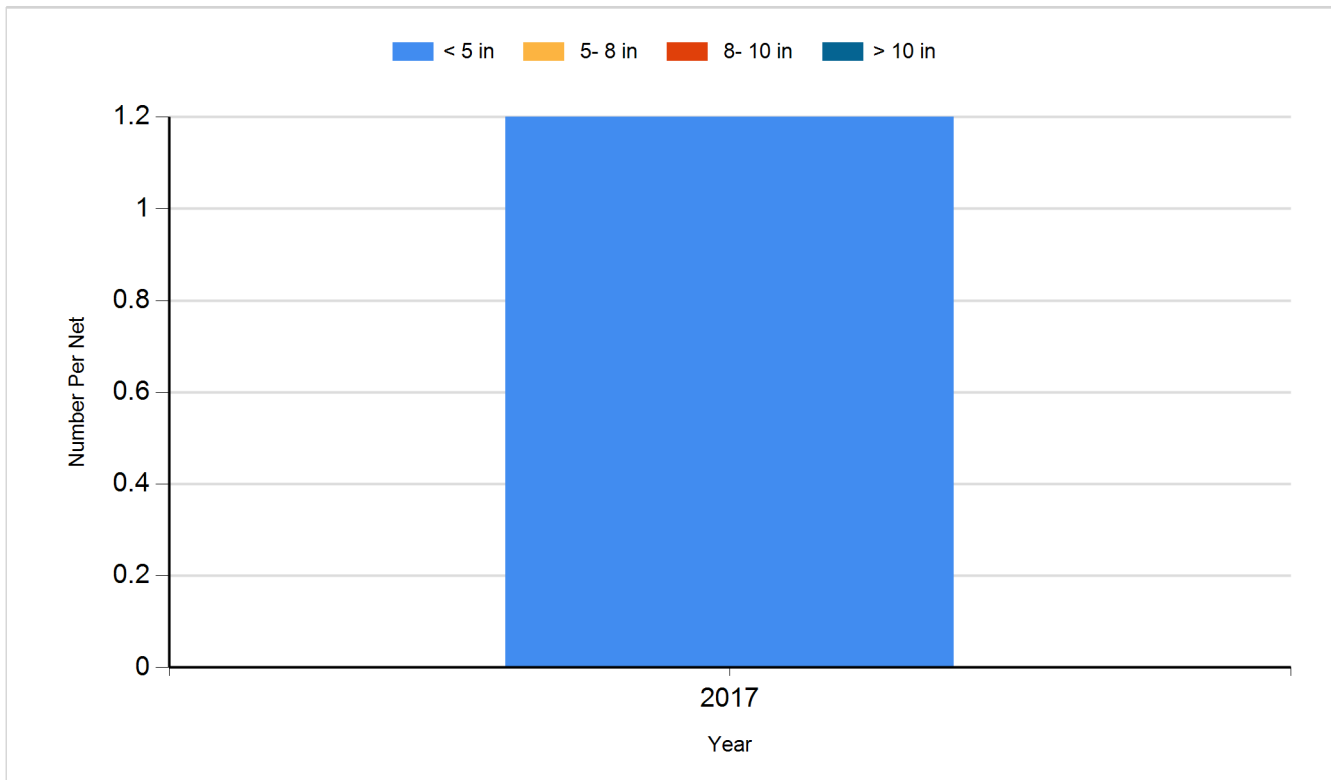
## Historic Fish Sizes and Relative Abundance

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

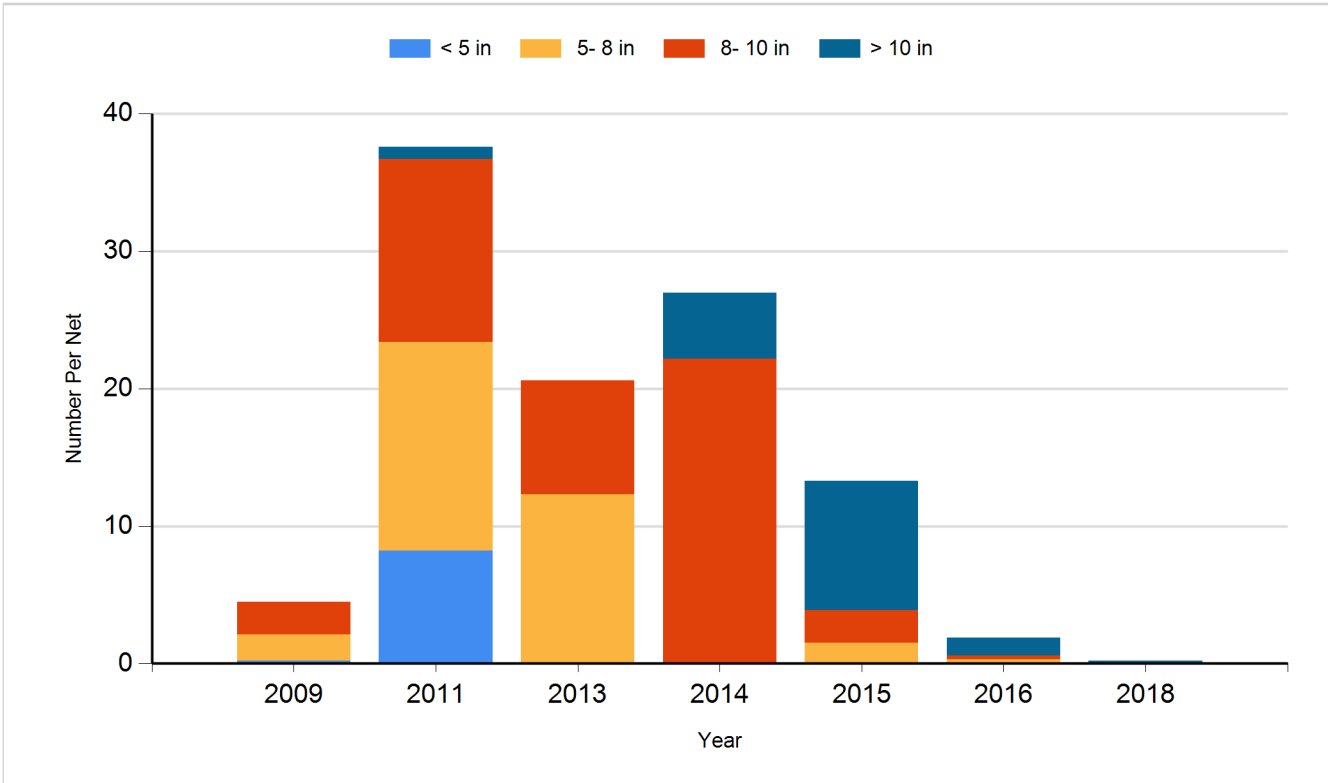
Species: Black Bullhead  
Gear: AFS std gill net



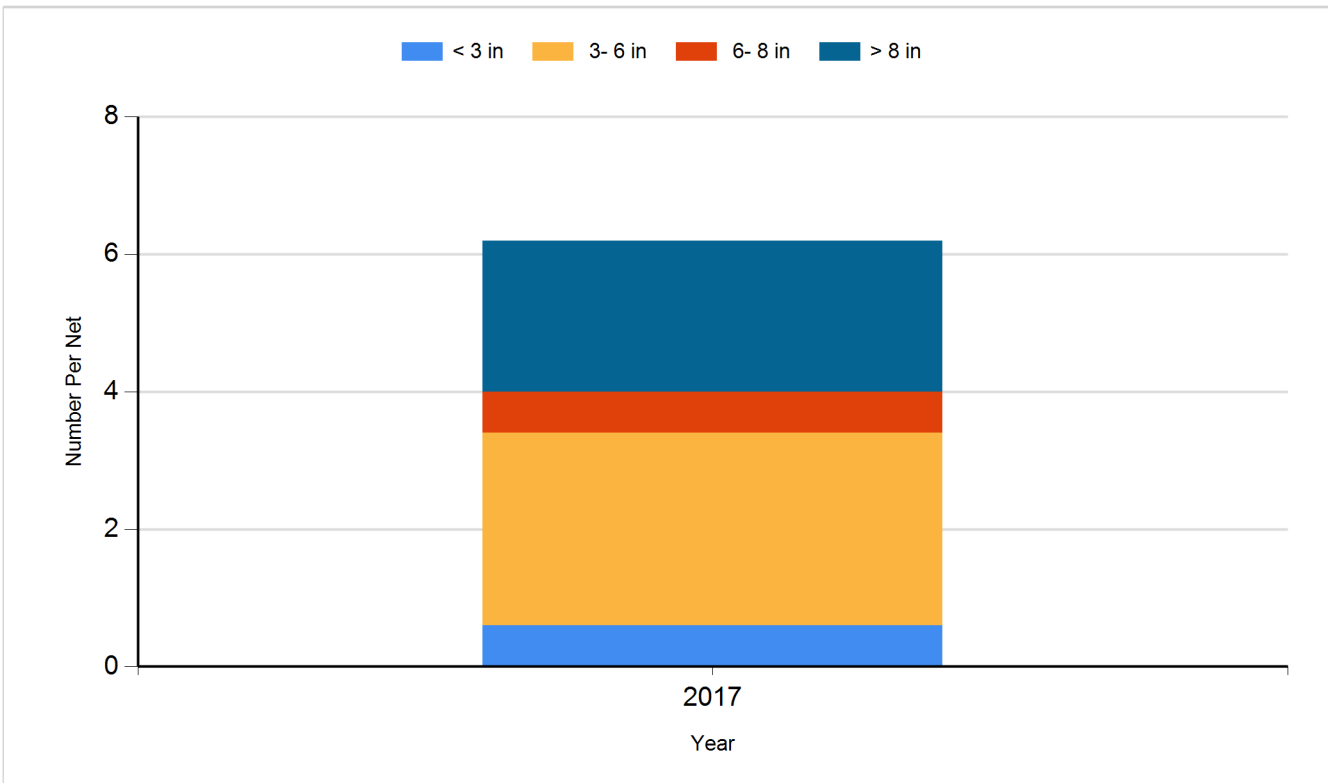
Species: Black Crappie  
Gear: AFS std frame net



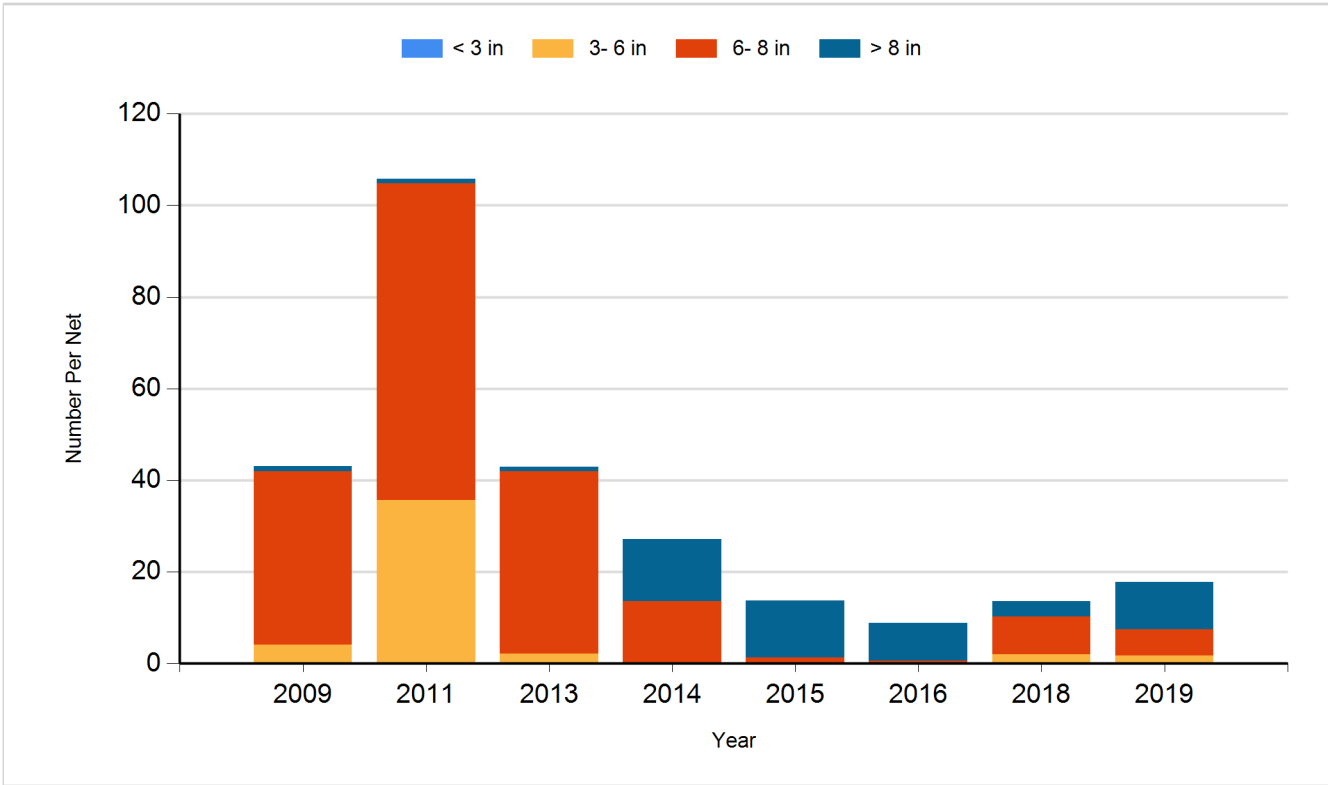
Species: Black Crappie  
Gear: frame net (std 3/4 in)



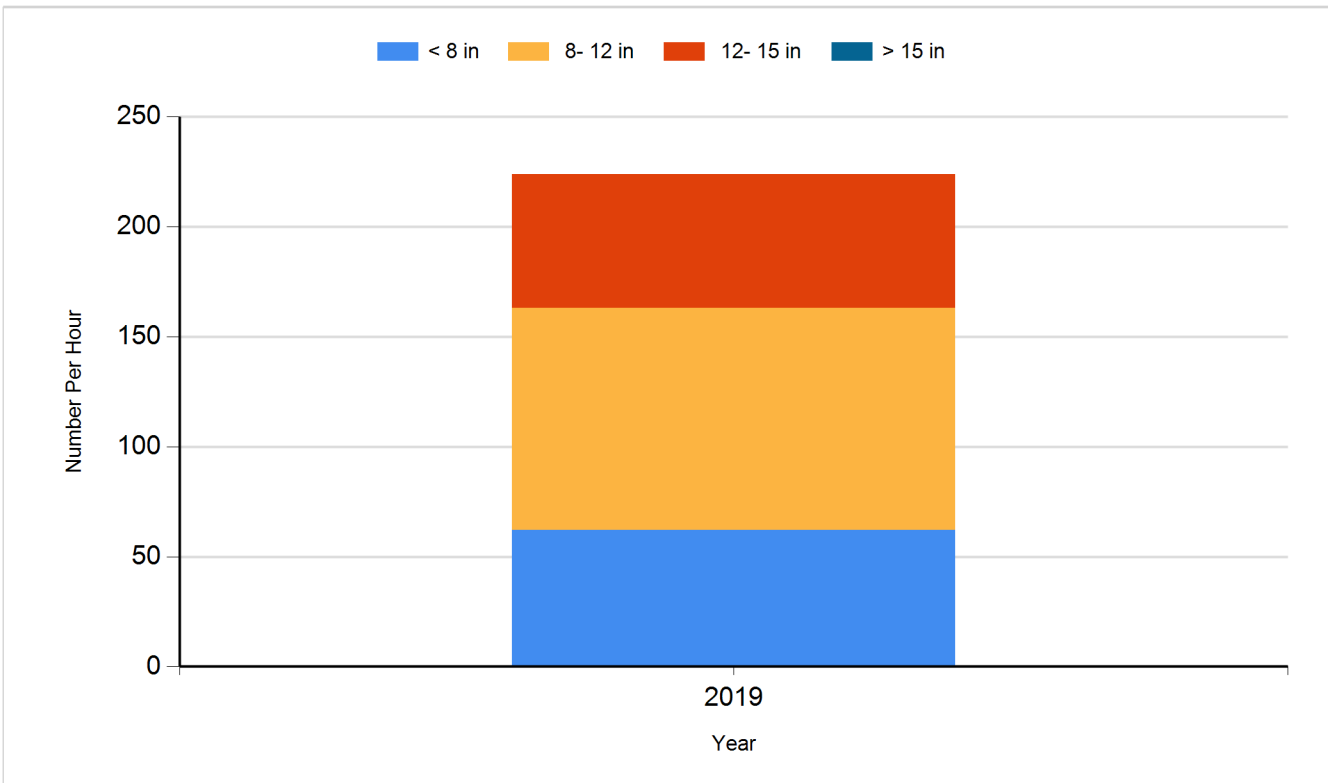
Species: Bluegill  
Gear: AFS std frame net



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

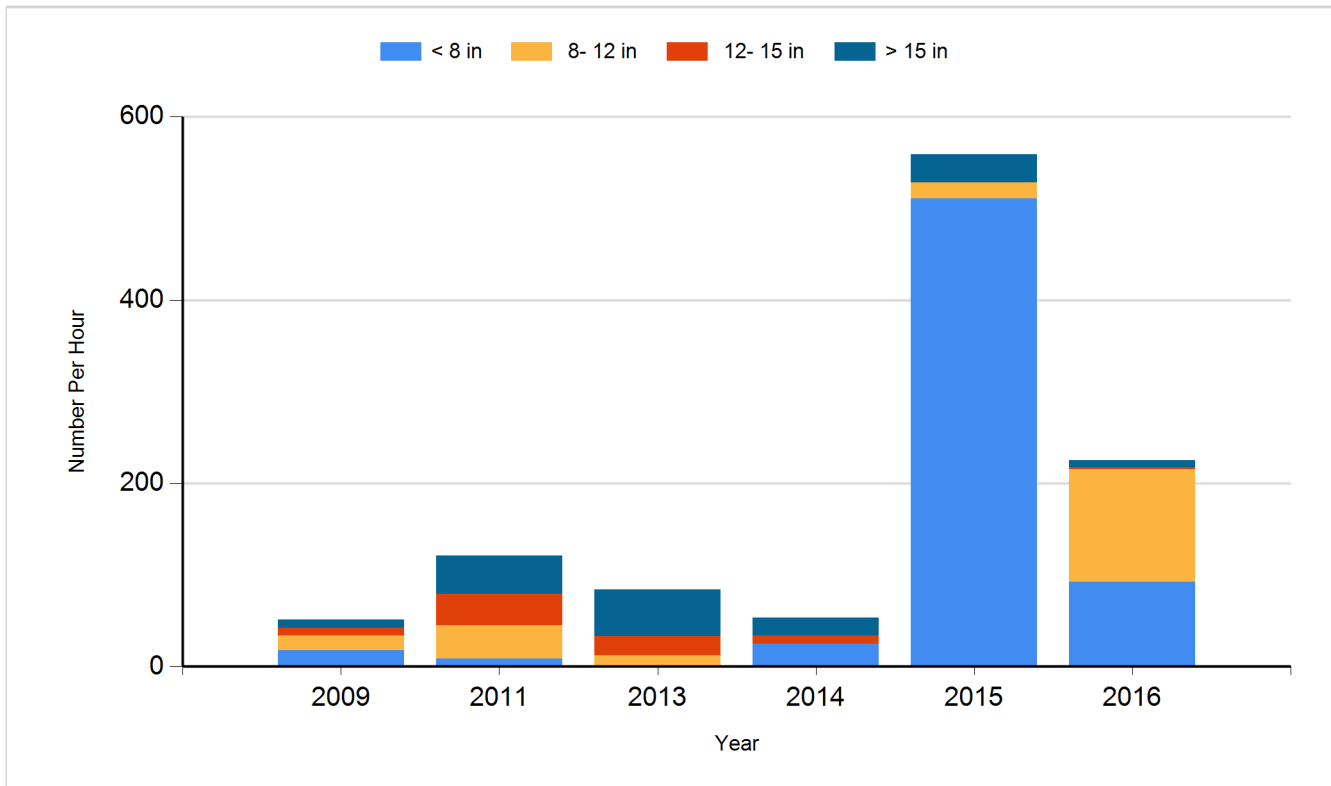


Species: Largemouth Bass  
Gear: boat shocker (day)





Species: Largemouth Bass  
Gear: boat shocker (night)



## **Fish Stocking**

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

Year	Species	Size	Number
2013	Channel Catfish	Large Fingerling	4,950