

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Beaulieu, Tripp County

LWH-Lake-458-000

2018

Lake Information

Name: Beaulieu **Maximum Depth:** 15 Feet
County: Tripp **Mean Depth:** 12 Feet
Legal Description: T98-R76-S14
Surface Area: 19 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std frame net	Jun 19, 2018	5 net-nights
AFS std frame net	Jun 20, 2018	5 net-nights
boat shocker (night)	Oct 21, 2018	2800 seconds

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

Channel Catfish

Bluegill X Gr. Sunfish Hybrid

Yellow Perch

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 frame net	Black Bullhead	50	1.8	0.7	72	18	0		87	3
	Black Crappie	7	0.7	0.7	86		14		97	4
	Bluegill	14	1.4	0.9	100		7		112	3
	Bluegill X Gr. Sunfish Hybrid	4	0.4	0.4	100		0			
	Yellow Perch	3	0.3	0.4	100		100		100	0
boat shocker (night)	Black Bullhead	363	32.4	26.0	26	13	0		88	1
	Black Crappie	3	0.0	0.0	0		0			
	Bluegill	258	34.8	24.9	63	16	21	14	98	12
	Channel Catfish	1	1.2	1.8	100		0		102	
	Largemouth Bass	14	19.8	15.2	21		0		110	3

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										1.8	1.8
	Black Crappie										0.7	0.7
	Bluegill										1.4	1.4
	Bluegill X Gr. Sunfish Hybrid										0.4	0.4
	Yellow Perch										0.3	0.3
boat shocker (night)	Black Bullhead										32.4	32.4
	Black Crappie										0.0	0.0
	Bluegill										34.8	34.8
	Channel Catfish										1.2	1.2
	Largemouth Bass			214.0		52.0		46.5	31.9		19.8	72.8
frame net (std 3/4 in)	Black Bullhead					3.5		10.0				6.8
	Black Crappie			0.4		5.4		3.4				3.1
	Bluegill	10.1		8.0		10.1		9.9				9.5
	Channel Catfish							0.7				0.7
	Green Sunfish			0.1				0.2				0.2
	Largemouth Bass	0.3				0.0		0.0				0.1
	Yellow Perch			0.1		0.9		0.2				0.4

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													72	
		PSD-P														0
		Wr														87
	Black Crappie	PSD														86
		PSD-P														14
		Wr														97
	Bluegill	PSD														100
		PSD-P														7
		Wr														112
	Yellow Perch	PSD														100
		PSD-P														100
		Wr														100
	boat shocker (night)	Black Bullhead	PSD													26
			PSD-P													0
			Wr													88
Black Crappie		PSD													0	
		PSD-P													0	
		Wr													98	
Bluegill		PSD													63	
		PSD-P													21	
		Wr													98	
Channel Catfish		PSD													100	
		PSD-P													0	
		Wr													102	
Largemouth Bass		PSD					12		77		94	84			21	
		PSD-P					1		73		87	76			0	
		Wr					105		115		109	108			110	
frame net (std 3/4 in)	Black Bullhead	PSD						3		49						
		PSD-P						0		0						
		Wr							81		90					
	Black Crappie	PSD					0		7		6					
		PSD-P					0		7		6					
		Wr					107		109		97					

Gear	Species	Index	Year									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	Bluegill	PSD	56		94		6		1			
		PSD-P	1		43		2		0			
		Wr	128		123		111		102			
	Channel Catfish	PSD							43			
		PSD-P							0			
		Wr							106			
	Largemouth Bass	PSD	33				0		0			
		PSD-P	33				0		0			
		Wr	119									
Yellow Perch	PSD			0		100		100				
	PSD-P			0		89		100				
	Wr			95		91		74				

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	34		141 (2)	168 (19)	167 (11)				344 (2)		
2013	55		146 (51)			294 (2)			301 (2)		

Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	99		98 (1)	114 (57)	125 (41)						
2013	101		98 (74)	126 (23)	182 (3)	211 (1)					
2011	80		108 (5)	175 (19)	192 (9)	198 (26)	206 (14)	209 (7)			
2009	101		136 (53)	159 (47)				214 (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+
2015	71	164 (43)		379 (5)	407 (3)	440 (3)	448 (7)	480 (9)	505 (1)		
2013	27	225 (7)	339 (1)			424 (17)		470 (1)		485 (1)	
2011	107		258 (27)	288 (79)				431 (1)			

Fish Condition

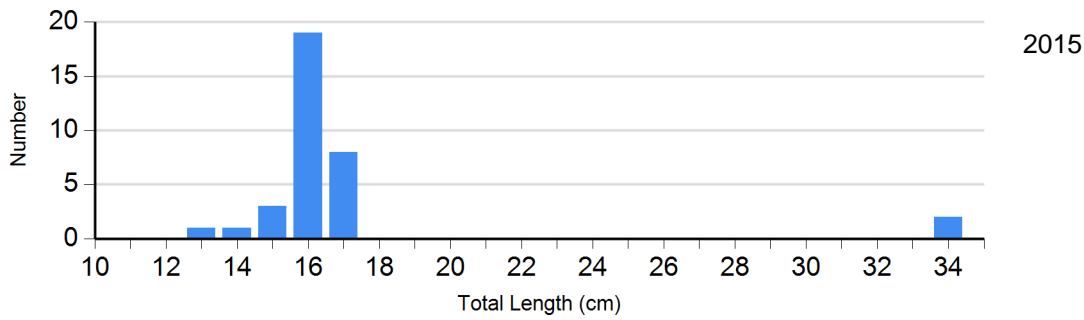
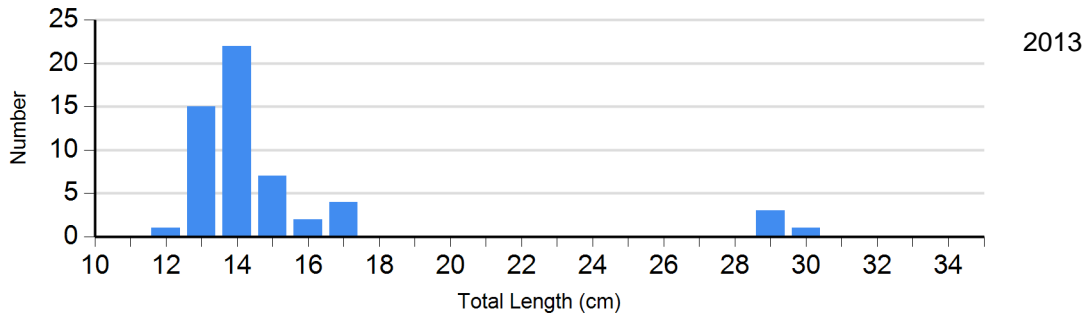
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	32	98 (1.6)	0		0		2	83 (3.4)
	2018	1	108	5	96 (3.7)	1	89	0	
Bluegill Frame Net	2015	98	102 (1.0)	1	93	0		0	
	2018	0		13	112 (2.5)	1	104	0	
Largemouth Bass Electro Fishing	2015	2	94 (3.4)	2	106 (12.4)	26	110 (1.9)	1	117
	2016	10	90 (3.4)	5	102 (2.1)	46	113 (1.2)	2	117 (4.0)
	2018	11	109 (2.6)	3	115 (1.9)	0		0	

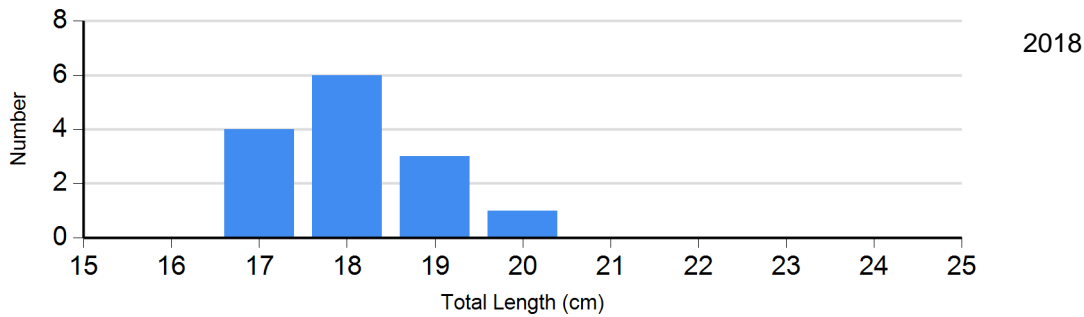
Length Frequency Distribution

Length frequency histogram of species sampled by year.

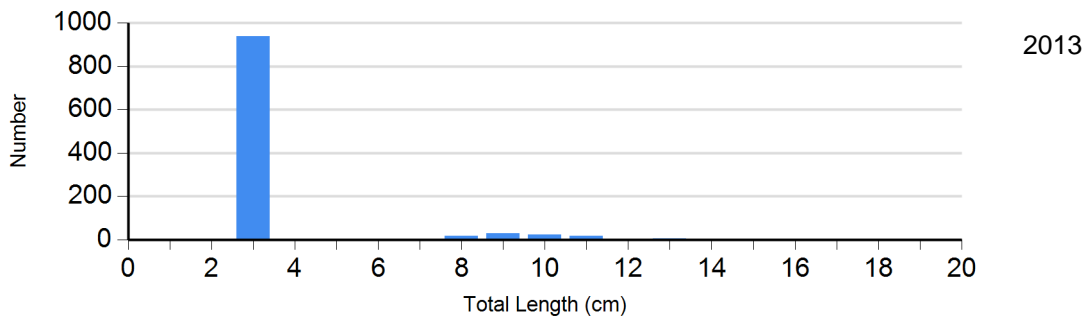
Species: Black Crappie
Gear: frame net (std 3/4 in)

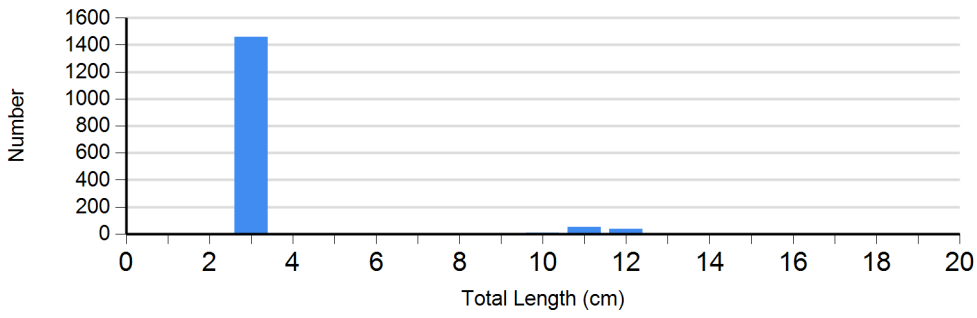


Species: Bluegill
Gear: AFS std frame net



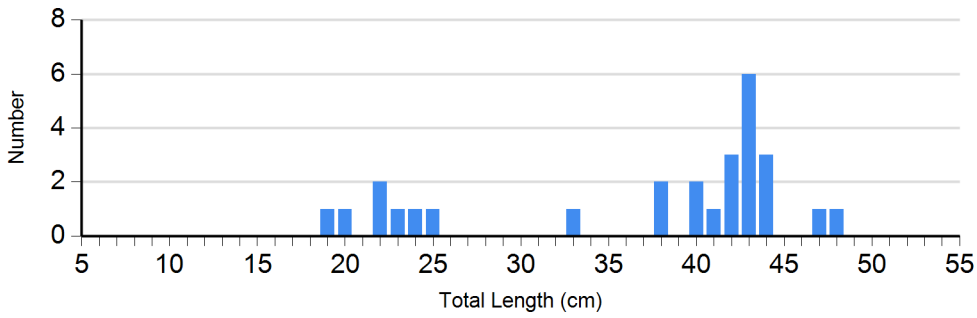
Species: Bluegill
Gear: frame net (std 3/4 in)



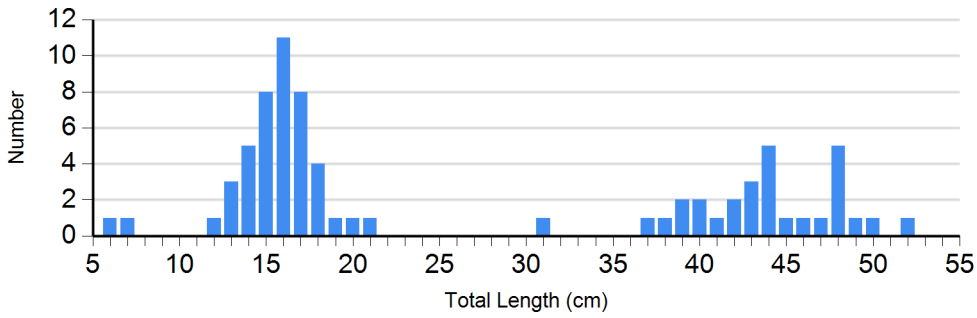


2015

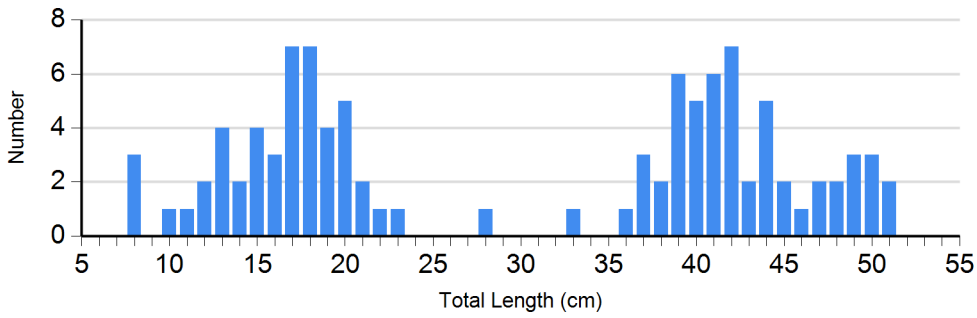
Species: Largemouth Bass
Gear: boat shocker (night)



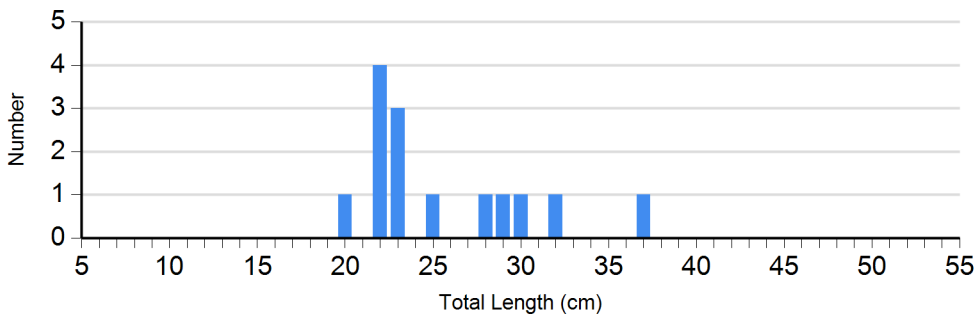
2013



2015



2016

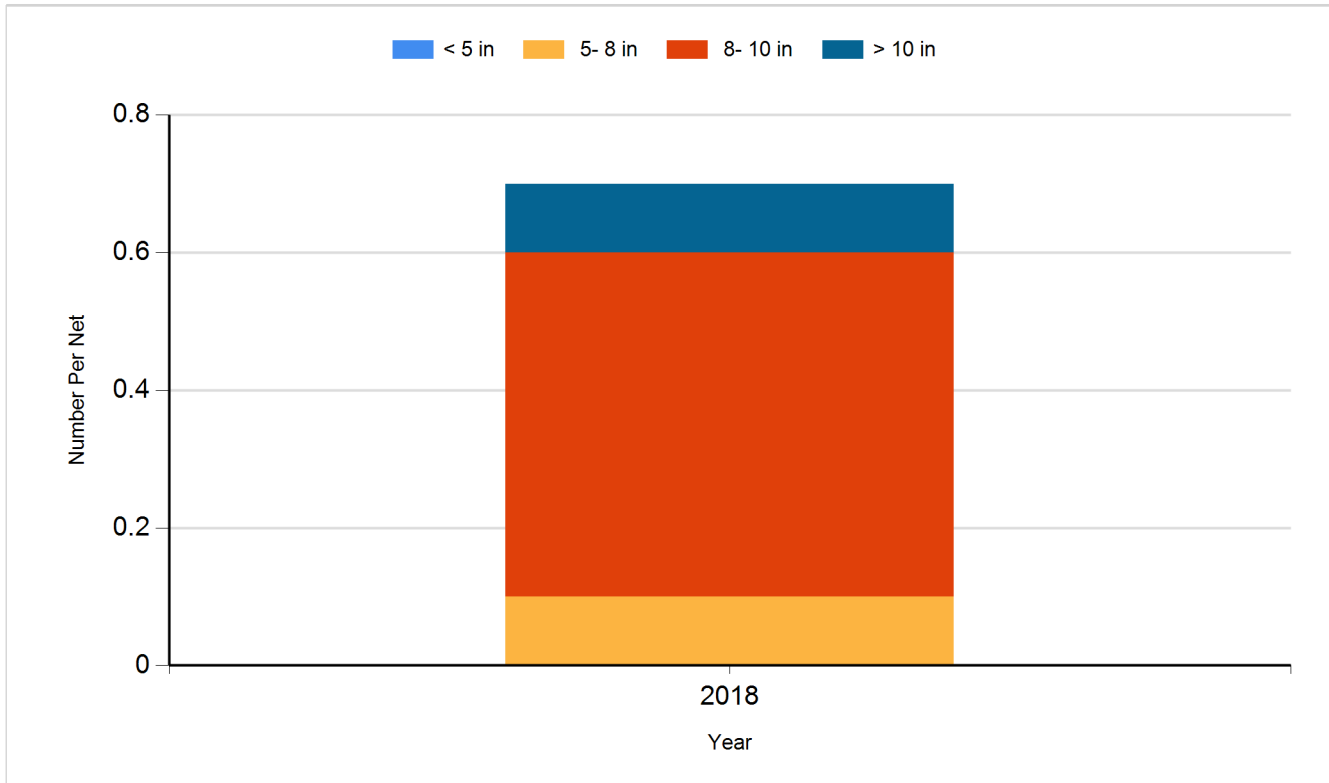


2018

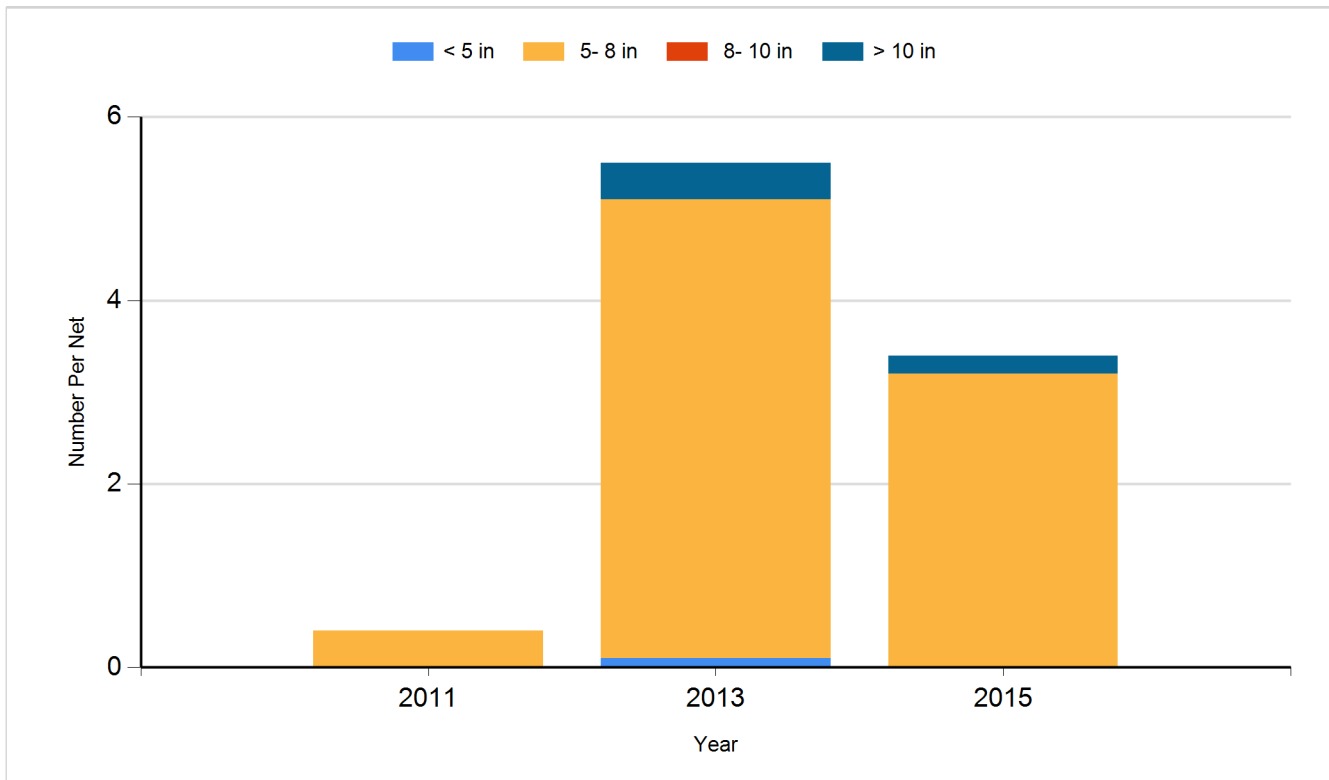
Historic Fish Sizes and Relative Abundance

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

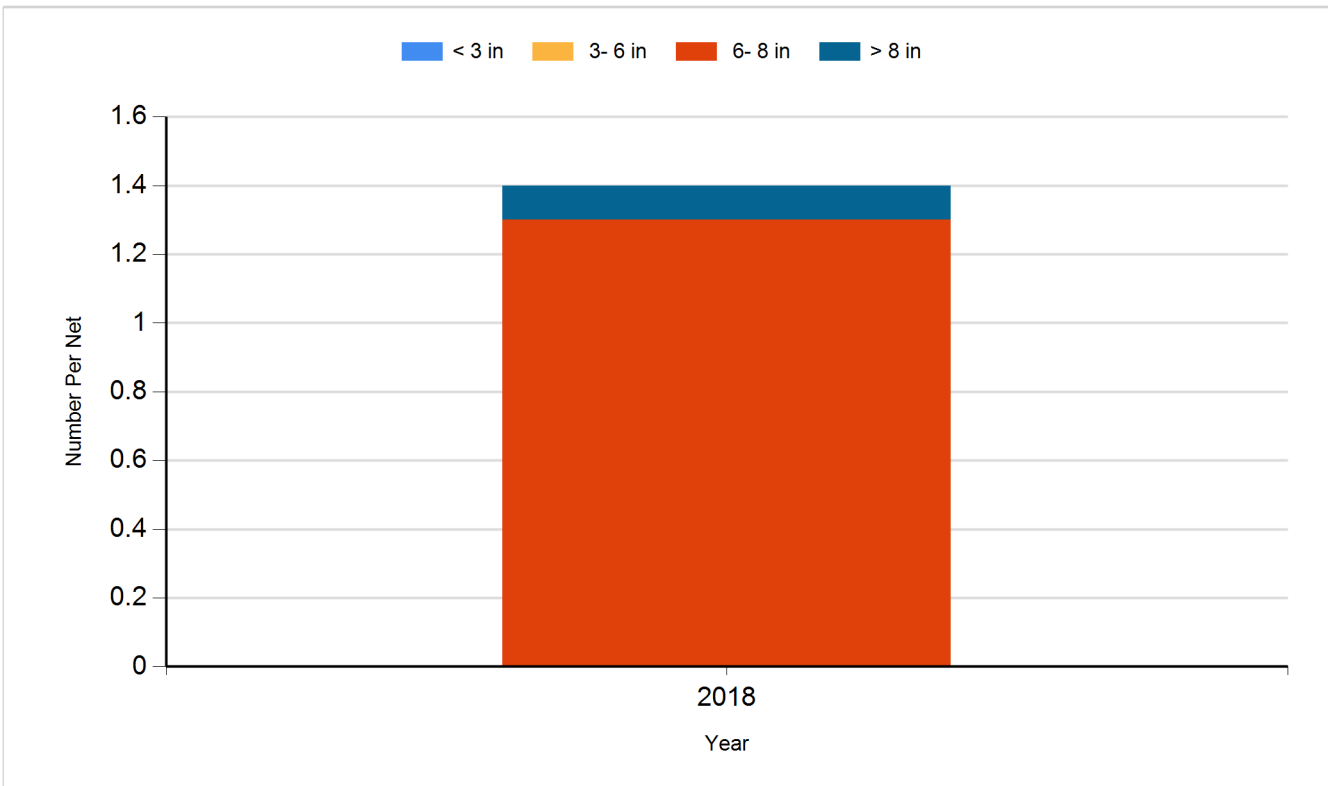
Species: Black Crappie
Gear: AFS std frame net



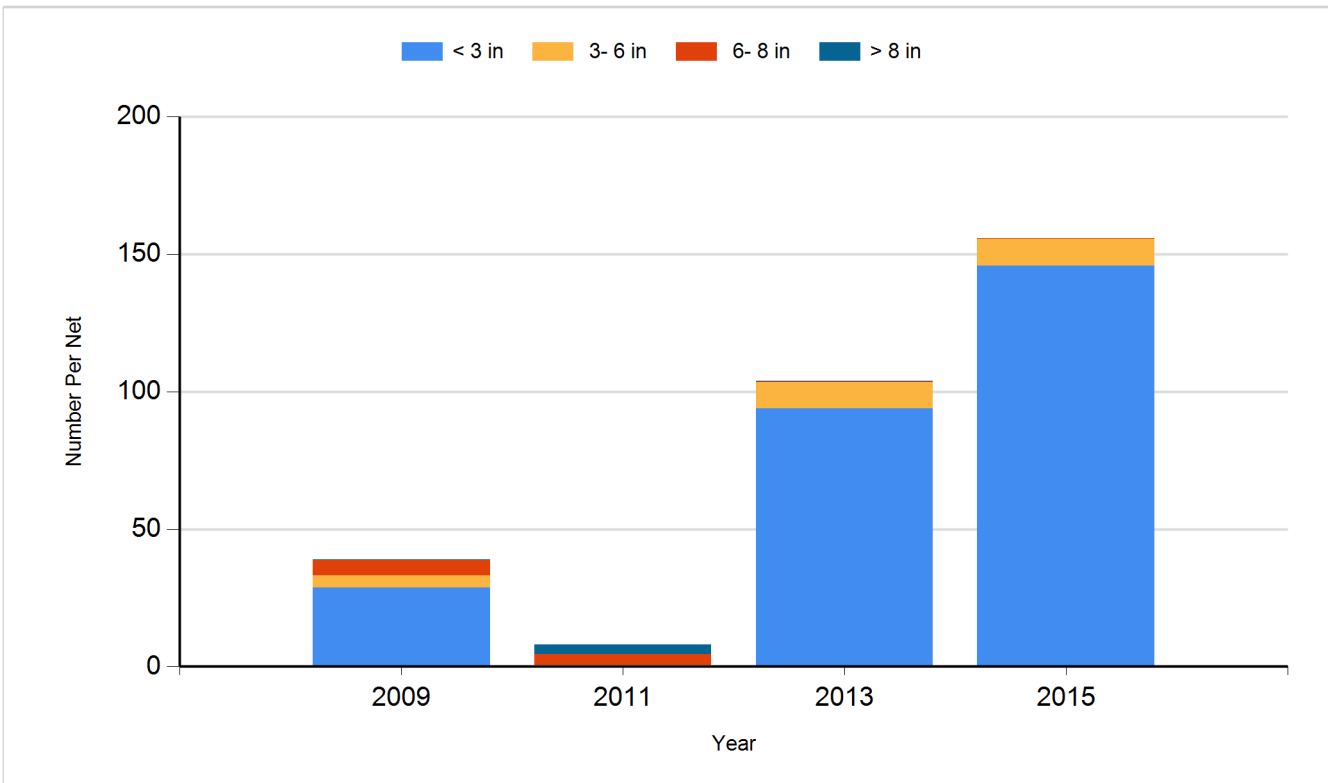
Species: Black Crappie
Gear: frame net (std 3/4 in)



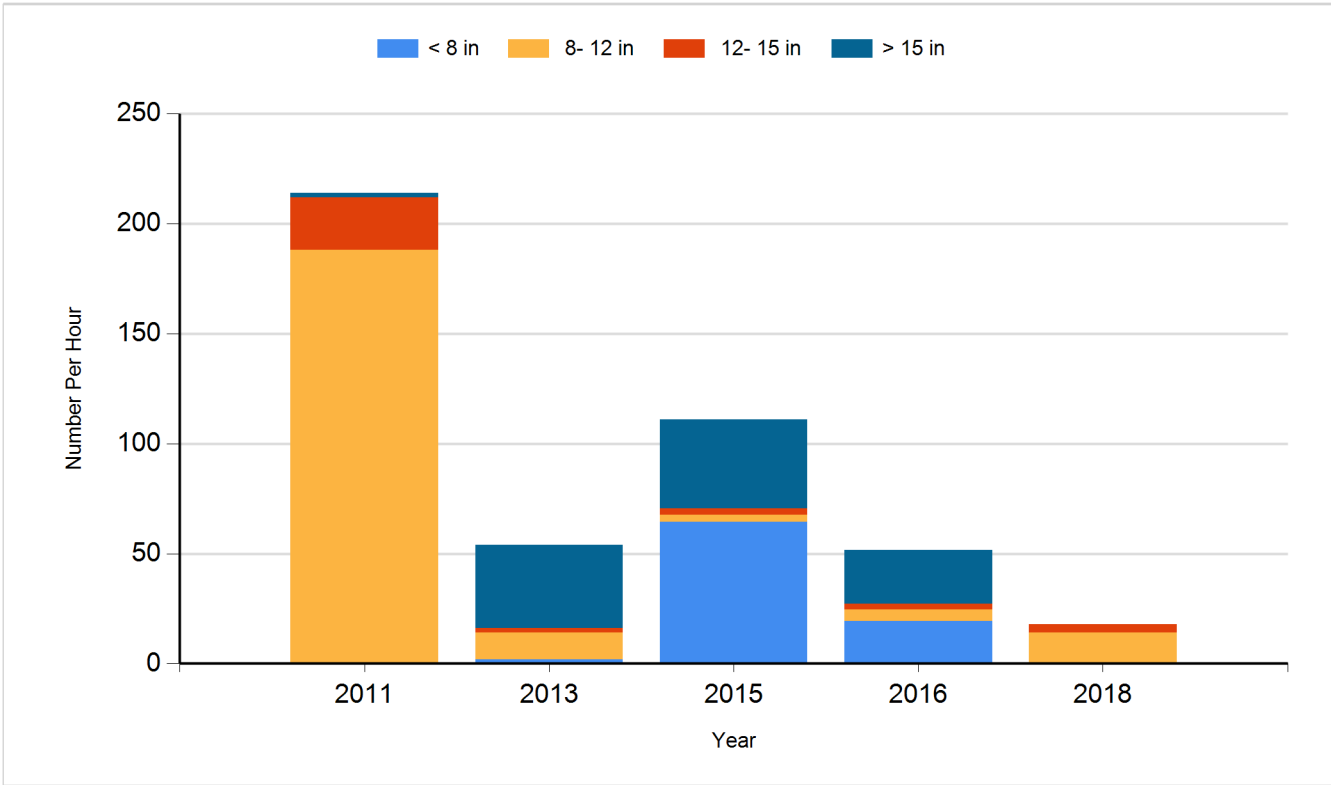
Species: Bluegill
Gear: AFS std frame net



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



Species: Largemouth Bass
Gear: boat shocker (night)



Fish Stocking

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

Year	Species	Size	Number
2008	Largemouth Bass	Fingerling	3,680
2008	Largemouth Bass	Juvenile	100
2014	Channel Catfish	Juvenile	100
2015	Largemouth Bass	Juvenile	645
2018	Black Crappie	Adult	2
2018	Bluegill	Adult	79
2018	Catfish	Adult	99
2018	Largemouth Bass	Adult	105