SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
New Underwood Dam, Pennington County
MCE-Lake-8-000
2018

Lake Information

Name: New Underwood Dam

County: Pennington

Surface Area: 18 Acres

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Sep 19, 2018	1200 seconds
frame net (std 3/4 in)	Jun 27, 2018	3 net-nights

Common Fish Species Present

Yellow Perch

Largemouth Bass

Channel Catfish

Bluegill

Black Crappie

Black Bullhead

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.

- s**td 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.

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

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.

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

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

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.

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

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 (night)	Largemouth Bass	46	102.0	0.0	41	13	12		96	1
frame net (std 3/4 in)	Black Bullhead	5	1.7	1.7	100		60		99	4
	Black Crappie	5	1.7	2.3	40		0		101	2
	Bluegill	73	24.3	14.2	86	6	3		106	2
	Yellow Perch	12	4.0	2.9	75		0		100	2

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										
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std frame net	Black Bullhead									0.5		0.5
	Black Crappie									13.8		13.8
	Bluegill									62.8		62.8
	Golden Shiner									0.0		0.0
	Green Sunfish									0.3		0.3
	Yellow Perch									1.3		1.3
boat shocker (night)	Largemouth Bass	97.1		51.7			205.1				102.0	114.0
frame net (std 3/4 in)	Black Bullhead	68.8	5.0	6.0		23.3		2.3			1.7	17.9
	Black Crappie	10.3	3.3	1.8		3.3		1.3			1.7	3.6
	Bluegill	9.5	48.0	26.3		149.3		67.0			24.3	54.1
	Channel Catfish	1.0	0.3	0.3				0.5				0.5
	Golden Shiner					0.0						0.0
	Green Sunfish	5.3	9.0	0.3				0.8				3.9
	Largemouth Bass							0.5				0.5
	White Sucker					0.3		0.3				0.3
	Yellow Perch	7.5	0.7	3.5		14.0		55.3			4.0	14.2

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std frame net	Black Bullhead	PSD									100	
		PSD-P									100	
		Wr									89	
	Black Crappie	PSD									44	
		PSD-P									7	
		Wr									96	
	Bluegill	PSD									59	
		PSD-P									8	
		Wr									99	
	Yellow Perch	PSD									60	
		PSD-P									20	
		Wr									82	
boat shocker (night)	Largemouth Bass	PSD	14		45			16				41
		PSD-P	0		5			11				12
		Wr	116		94			95				96
frame net (std 3/4 in)	Black Bullhead	PSD	1	60	63		99		100			100
		PSD-P	1	0	0		14		89			60
		Wr	106	104	102		112		93			99
	Black Crappie	PSD	98	80	0		70		100			40
		PSD-P	24	80	0		0		0			0
		Wr	106	94	102		98		99			101
	Bluegill	PSD	8	60	73		96		91			86
		PSD-P	0	1	4		6		1			3
		Wr	126	119	110		115		106			106
	Channel Catfish	PSD	100	100	100				50			
		PSD-P	0	0	0				50			
		Wr	95	79					83			
	Largemouth Bass	PSD							100			
		PSD-P							100			
		Wr							103			
	Yellow Perch	PSD	100	100	0		55		41			75
		PSD-P	53	50	0		0		0			0

Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	Yellow Perch	Wr	110	92	96		90		95			100

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+
2017	248	94 (1)	132 (94)	158 (51)	188 (72)	192 (22)	202 (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	296		205 (15)	195 (49)	222 (120)	269 (73)	323 (35)	441 (4)			
2011	40	203 (2)	209 (4)	301 (30)	349 (2)		410 (2)				

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).

| | | Length Groups | | | | | | | |
| | | S-Q | | Q-P | | P-M | | M | |
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2015	0		10	99 (0.9)	0		0	
	2017	31	98 (0.9)	20	95 (1.3)	4	88 (0.9)	0	
	2018	3	101 (1.6)	2	101 (2.7)	0		0	
Bluegill Frame Net	2015	46	108 (0.8)	486	106 (0.3)	4		0	
	2017	102	105 (1.1)	130	93 (0.8)	19	83 (1.5)	0	
	2018	10	112 (3.8)	61	106 (1.2)	2	73 (0.0)	0	
Largemouth Bass Electro Fishing	2014	204	95 (0.7)	14	93 (2.5)	26	96 (1.5)	0	
	2018	20	97 (1.3)	10	96 (1.4)	4	91 (1.9)	0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net
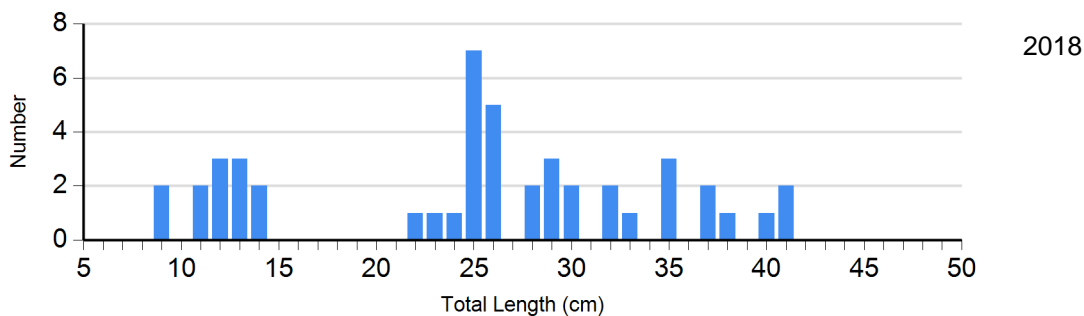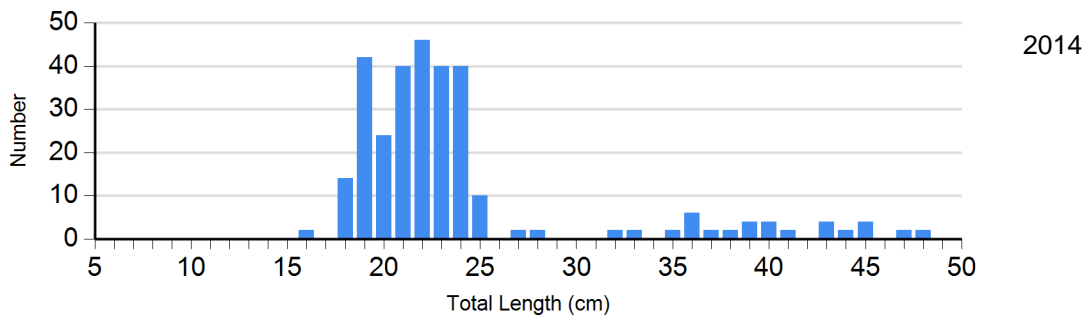

2017

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

2013

2015

Species: Bluegill
Gear: AFS std frame net

2017

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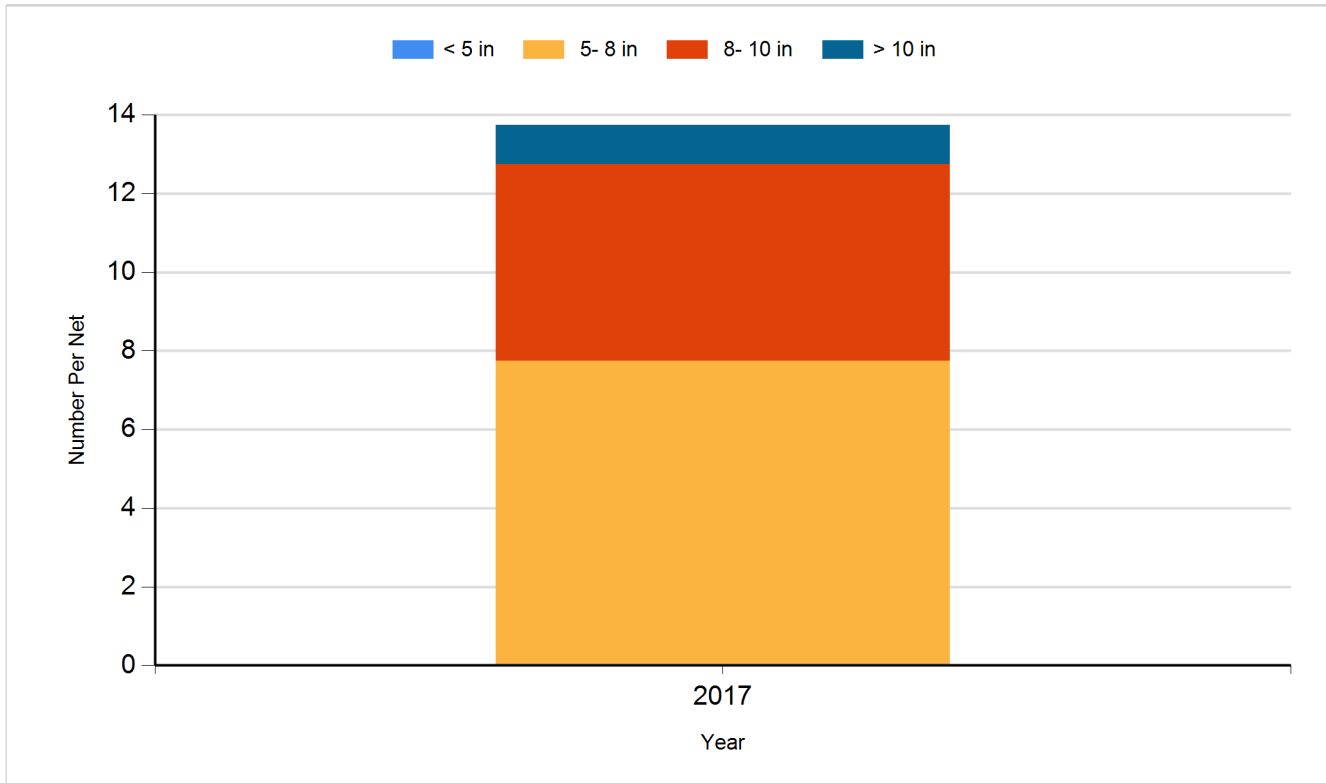Gear: frame net (std 3/4 in)

2013

2015

2018

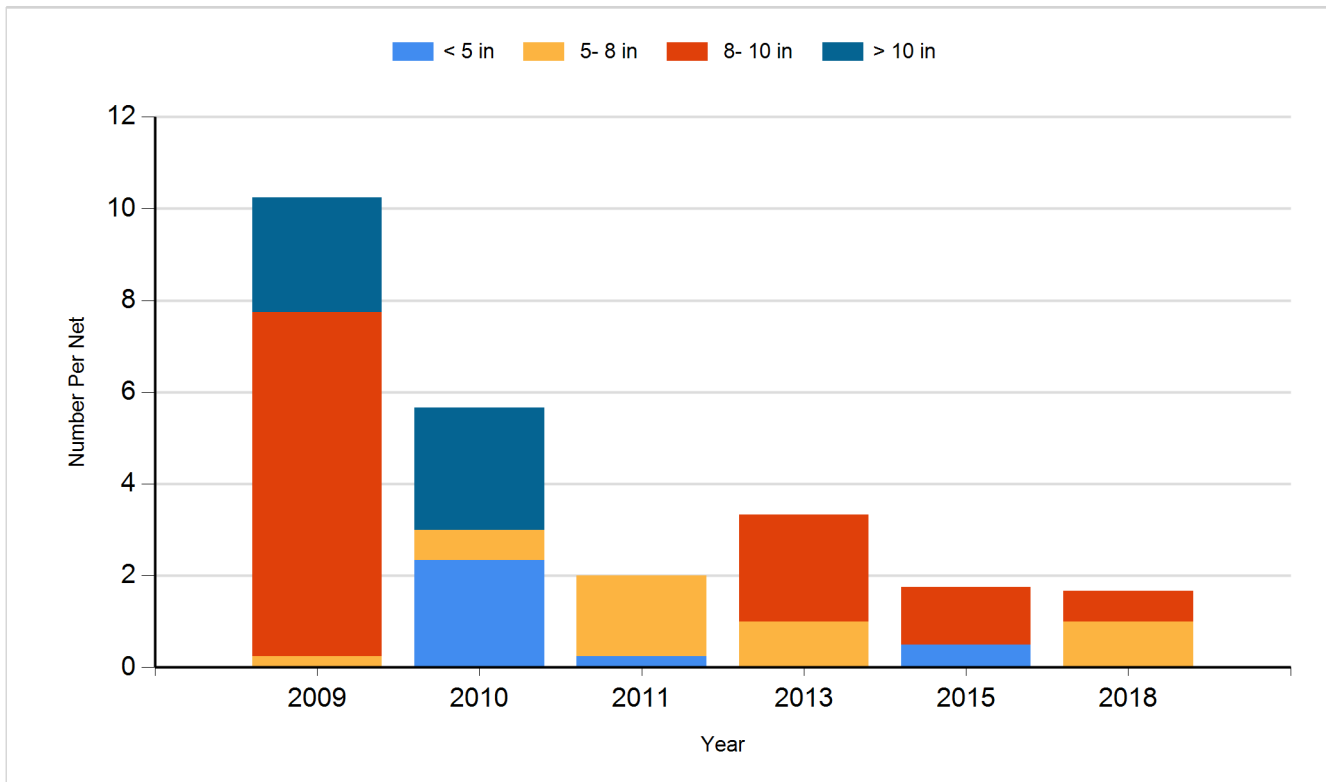Species: Largemouth Bass
Gear: boat shocker (night)

2014

2018

Historic Fish Sizes and Relative Abundance

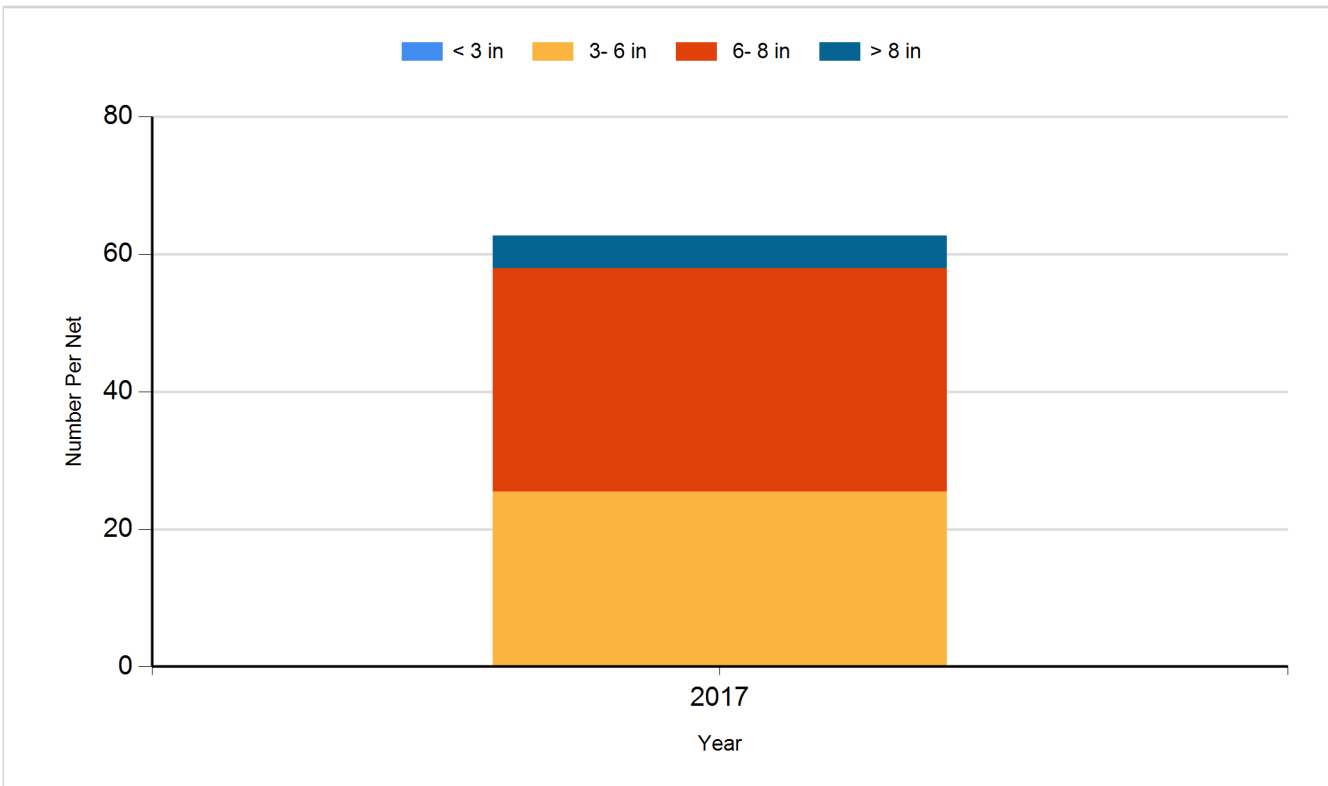Size distribution per net by color for species sampled by year.

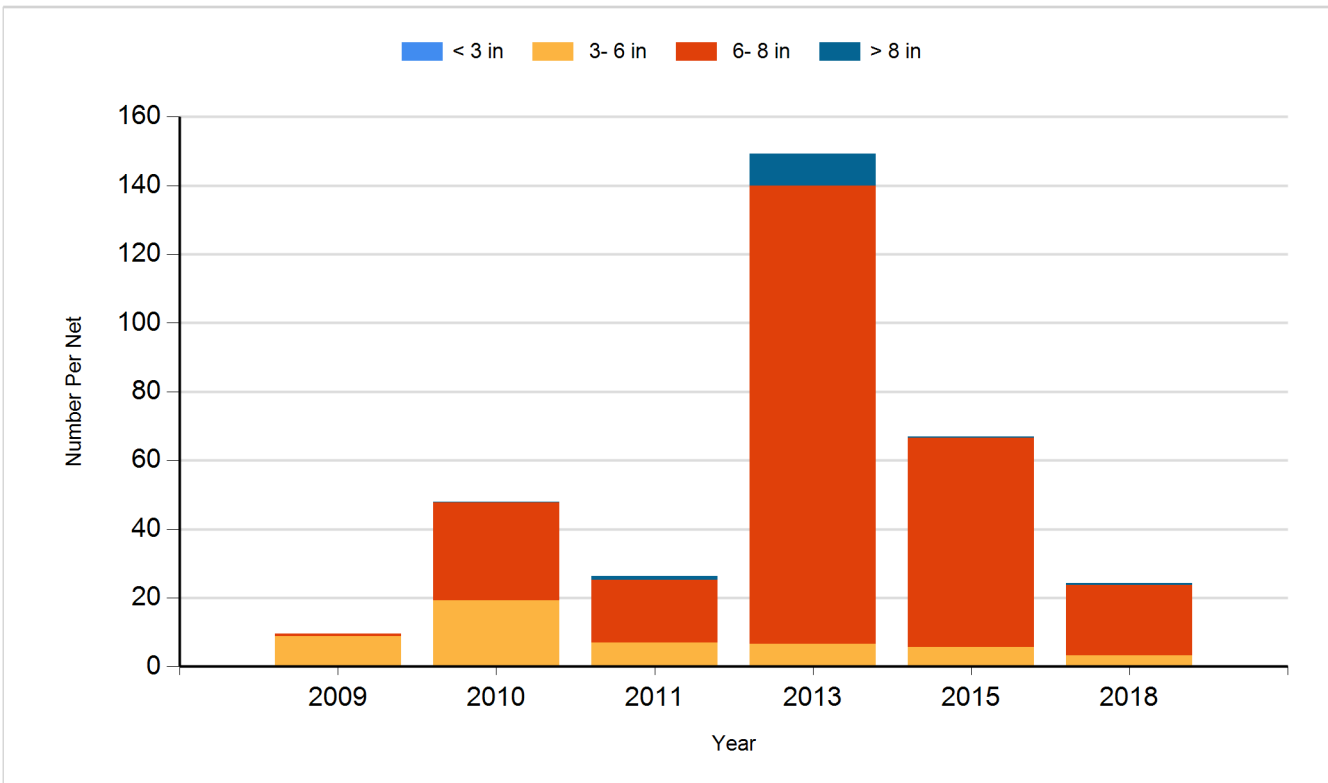Species: Black Crappie
Gear: AFS std frame net
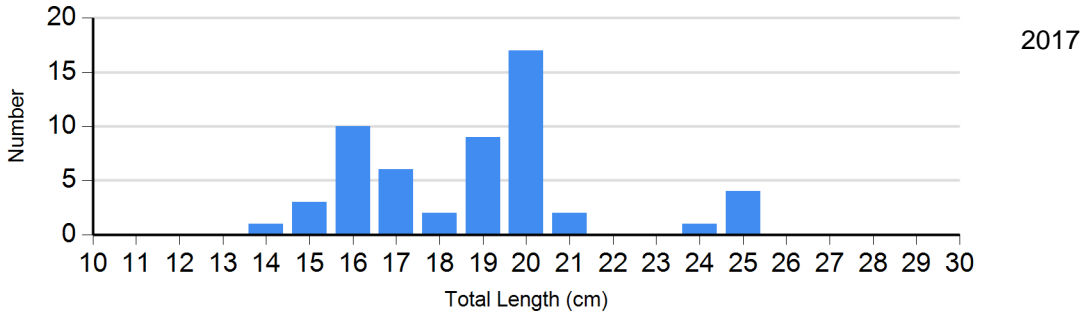
Species: Black Crappie
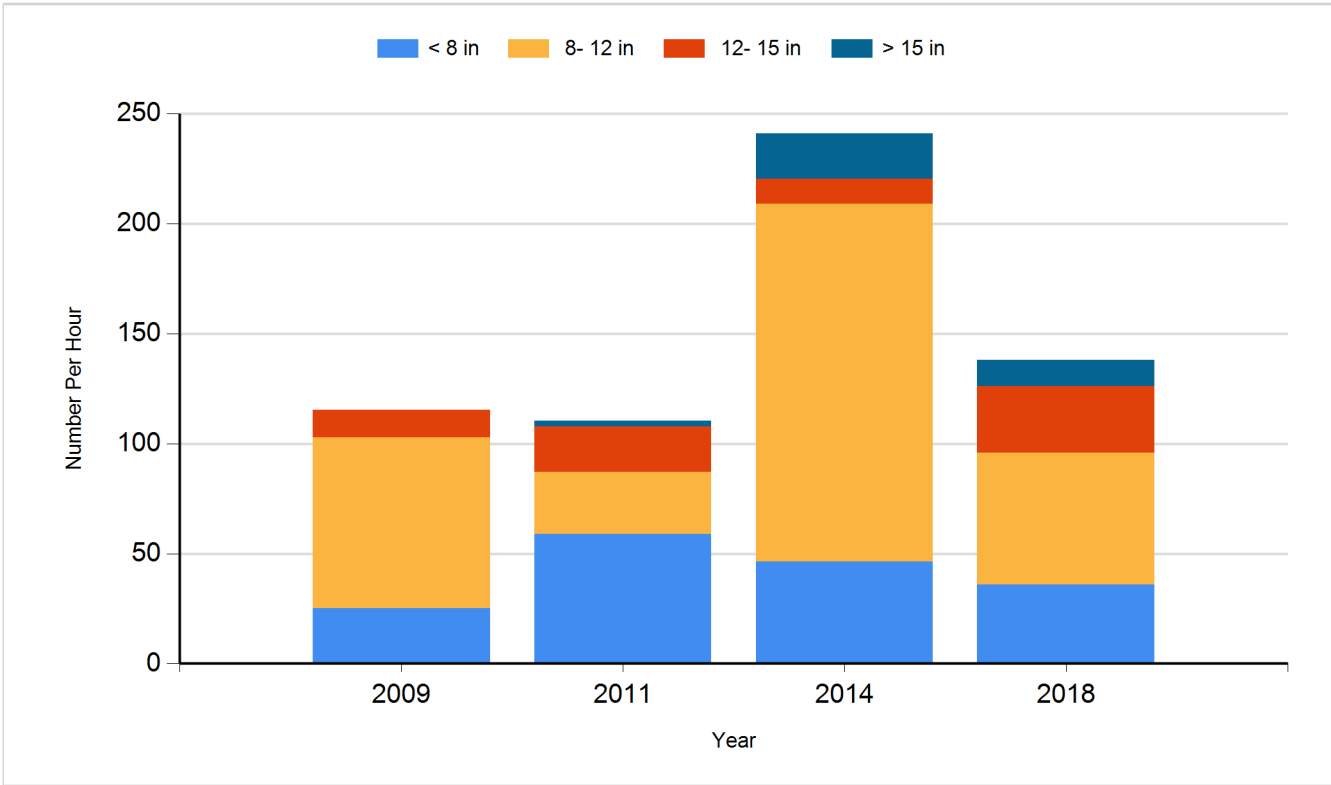Gear: frame net (std 3/4 in)
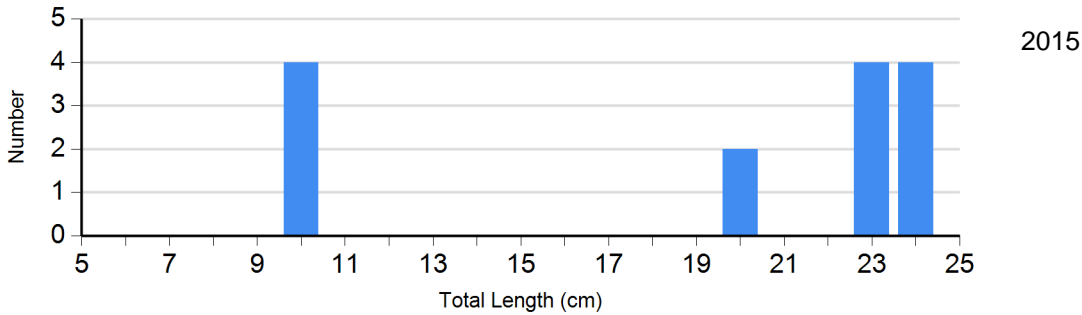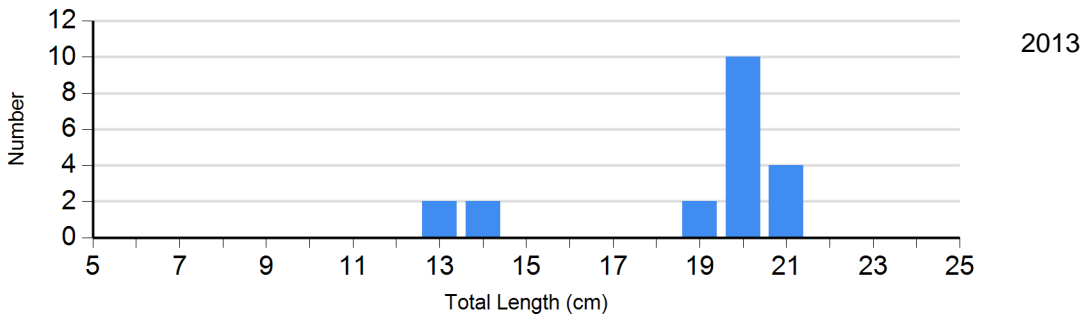
Species: Bluegill
Gear: AFS std frame net
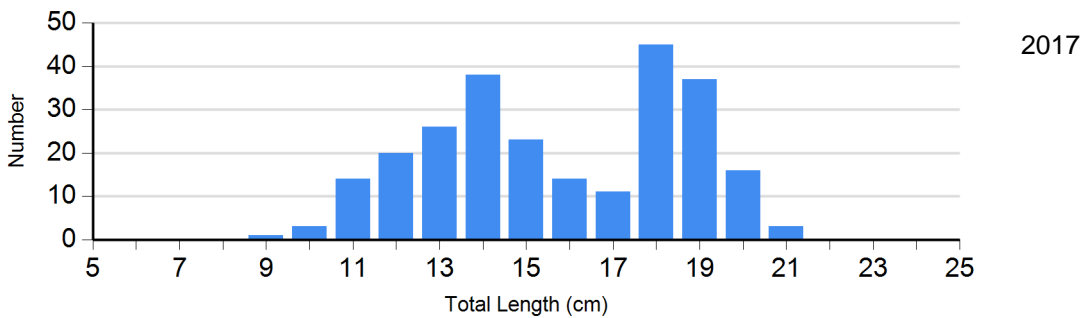
Species: Bluegill
Gear: frame net (std 3/4 in)

Species: Largemouth Bass
Gear: boat shocker (night)

Fish Stocking

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

Year	Species	Size	Number
2008	Black Crappie	Adult	300
2008	Bluegill	Adult	40
2008	Bluegill	Fingerling	8,000
2008	Largemouth Bass	Adult	90
2008	Largemouth Bass	Fingerling	1,500
2009	Channel Catfish	Adult	200
2009	Largemouth Bass	Juvenile	300
2010	Channel Catfish	Adult	74
2011	Channel Catfish	Adult	200
2012	Largemouth Bass	Fingerling	1,500
2014	Channel Catfish	Adult	143
2014	Yellow Perch	Adult	325
2015	Channel Catfish	Adult	100
2016	Channel Catfish	Adult	200
2017	Channel Catfish	Adult	137
2018	Channel Catfish	Adult	219
2018	Largemouth Bass	Juvenile	272