SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Roosevelt, Tripp County

PON-Lake-203-000

2018

Lake Information

Name: Roosevelt

County: Tripp

Legal Description: T97-R74-S20

Surface Area: 86 Acres

Maximum Depth: 6 Feet

Mean Depth: 18 Feet

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Oct 14, 2018	3601 seconds
boat shocker (night)	Oct 31, 2018	3600 seconds

Common Fish Species Present

Walleye

Largemouth Bass

Bluegill

Black Crappie

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.

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

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

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.

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

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).

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(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**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
boat shocker (night)	Largemouth Bass	92	40.0	12.9	54	8	18	6	110	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.

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std frame net	Black Crappie									2.6		2.6
	Bluegill									5.3		5.3
	Northern Pike									0.5		0.5
	Yellow Perch									2.1		2.1
AFS std gill net	Black Crappie									0.5		0.5
	Largemouth Bass									0.5		0.5
	Northern Pike									3.0		3.0
	Yellow Perch									4.0		4.0
boat shocker (night)	Largemouth Bass			99.0		65.0			82.5	76.0	40.0	72.5
	Walleye			1.0								1.0
frame net (std 3/4 in)	Black Bullhead			1.7		1.1						1.4
	Black Crappie			6.1		10.0						8.1
	Bluegill			10.0		10.0						10.0
	Green Sunfish			0.8								0.8
	Largemouth Bass			0.1		0.7						0.4
	Northern Pike			0.1		0.7						0.4
	Walleye			0.1		0.1						0.1
	Yellow Perch			1.0		1.9						1.5
std exp gill net	Black Bullhead			2.0		0.5						1.3
	Black Crappie			5.0		1.0						3.0
	Bluegill			3.0		3.5						3.3
	Golden Shiner			0.0								0.0
	Largemouth Bass					0.0						0.0
	Northern Pike			4.5		3.5						4.0
	Walleye			1.5		0.5						1.0
	Yellow Perch			15.5								15.5

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.

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std frame net	Black Crappie	PSD									92	
		PSD-P									23	
		Wr									106	
	Bluegill	PSD									36	
		PSD-P									23	
		Wr									111	
AFS std gill net	Black Crappie	PSD									100	
		PSD-P									0	
		Wr									120	
	Largemouth Bass	PSD									100	
		PSD-P									100	
		Wr									86	
boat shocker (night)	Largemouth Bass	PSD			63		89			33	53	54
		PSD-P			33		57			33	33	18
		Wr			111		119			111	112	110
	Walleye	PSD			100							
		PSD-P			0							
		Wr			111							
frame net (std 3/4 in)	Black Crappie	PSD			59		24					
		PSD-P			3		0					
		Wr			105		112					
	Bluegill	PSD			71		53					
		PSD-P			11		3					
		Wr			104		116					
	Largemouth Bass	PSD			100		100					
		PSD-P			100		86					
		Wr			102		104					
	Walleye	PSD			100		100					
		PSD-P			100		100					
		Wr			83		90					
std exp gill net	Black Crappie	PSD			0		100					

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
std exp gill net	Black Crappie	PSD-P			0		0					
		Wr			104		104					
	Bluegill	PSD			50		100					
		PSD-P			0		43					
		Wr			102		102					
	Largemouth Bass	PSD					0					
		PSD-P					0					
	Walleye	PSD			100		100					
		PSD-P			33		0					
		Wr			77		90					

Back-Calculated Lengths

Mean species back-calculated total length (mm) at age, standard error (SE), and sample size (N).

Species: Largemouth Bass

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2017	1	8	72 (2)									
2016	2	28	75 (1.8)	149 (4.5)								
2015	3	14	81 (2.4)	163 (7.8)	241 (9.6)							
2014	4	26	75 (1.6)	144 (6.3)	241 (5.9)	298 (4.5)						
2013	5	5	84 (3.9)	174 (15.9)	268 (22.4)	344 (26.2)	387 (32)					
2012	6	2	81 (3.1)	163 (29)	266 (36.2)	342 (14.3)	394 (15.6)	430 (12.9)				
2011	7	3	83 (7.3)	158 (8.5)	245 (18.9)	304 (27.2)	358 (20.4)	393 (19.7)	424 (22.1)			
2010	8	1	81	162	221	273	355	378	404	424		
2009	9	1	78	137	229	292	360	403	431	444	463	
Weighted Mean		88	77	152	244	306	376	403	421	434	463	

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2017	1	8										
2016	2	28										
2015	3	14										
2014	4	26										
2013	5	5										
2012	6	2										
2011	7	3										
2010	8	1										
2009	9	1										
Weighted Mean		88										

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+
2017	97	101 (71)		211 (18)	206 (2)	297 (3)	303 (3)				
2013	102		146 (56)	126 (2)	199 (32)	205 (13)					
2011	73	85 (1)	135 (34)	191 (2)	214 (34)	253 (2)					

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	42		135 (27)	195 (6)	216 (3)	253 (5)	255 (2)				
2013	100		101 (14)	137 (40)	151 (10)	183 (13)		185 (8)	187 (9)	196 (5)	194 (3)
2011	100			120 (3)	156 (65)	190 (24)	201 (7)	211 (1)			222 (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+
2018	90	177 (8)	224 (29)	279 (14)	328 (26)	421 (6)	455 (3)	443 (3)	436 (1)	479 (1)	
2013	64		240 (1)	299 (3)	327 (11)	374 (11)	388 (14)	404 (8)	434 (4)	440 (7)	472 (6)
2011	109	172 (9)	223 (28)	277 (9)	322 (16)	352 (9)	383 (15)	409 (13)	411 (3)	466 (2)	472 (5)

Fish Condition

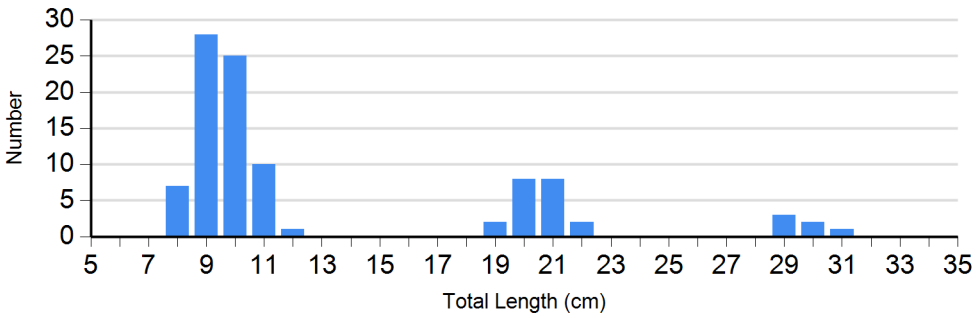
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2017	2	105 (0.4)	18	109 (3.0)	3	96 (4.9)	3	98 (4.6)
Bluegill Frame Net	2017	34	106 (2.4)	7	112 (2.9)	8	127 (3.0)	4	118 (6.2)
Largemouth Bass Electro Fishing	2016	110	112 (0.7)	1	124	53	109 (1.3)	1	79
	2017	36	116 (1.5)	15	109 (2.2)	25	108 (2.2)	0	
	2018	37	111 (2.1)	29	108 (1.3)	14	108 (2.4)	0	

Length Frequency Distribution

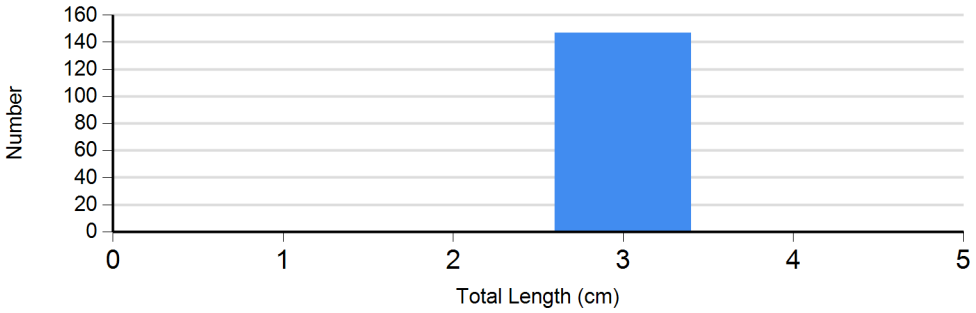
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net



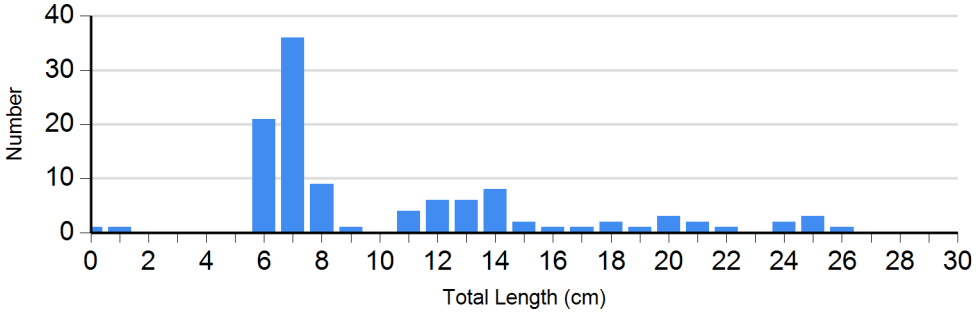
2017

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



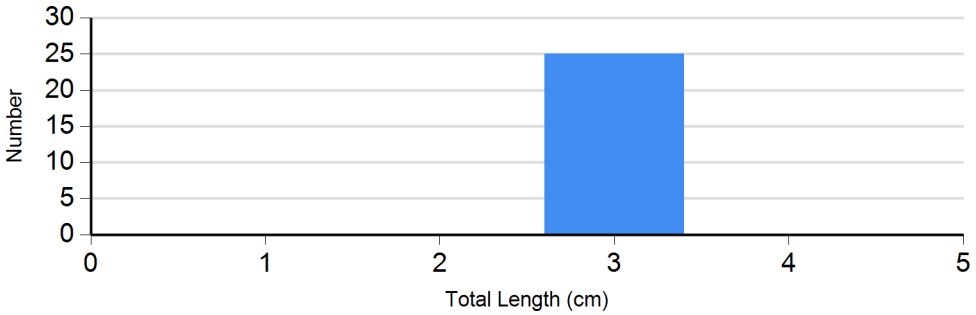
2013

Species: Bluegill
Gear: AFS std frame net



2017

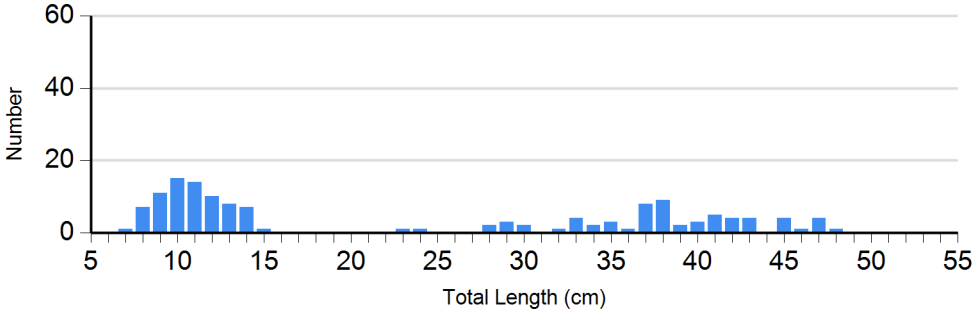
Species: Bluegill
Gear: frame net (std 3/4 in)



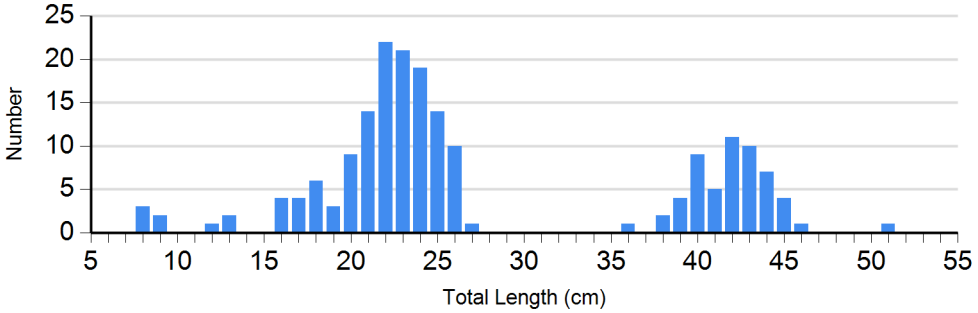
2013

Species: Largemouth Bass
Gear: boat shocker (night)

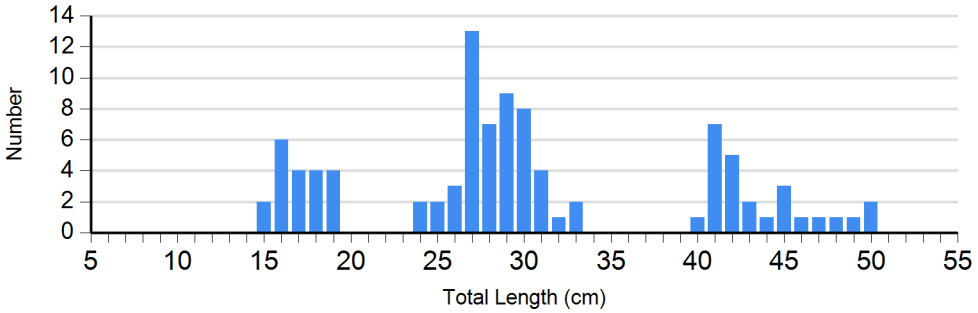
2013



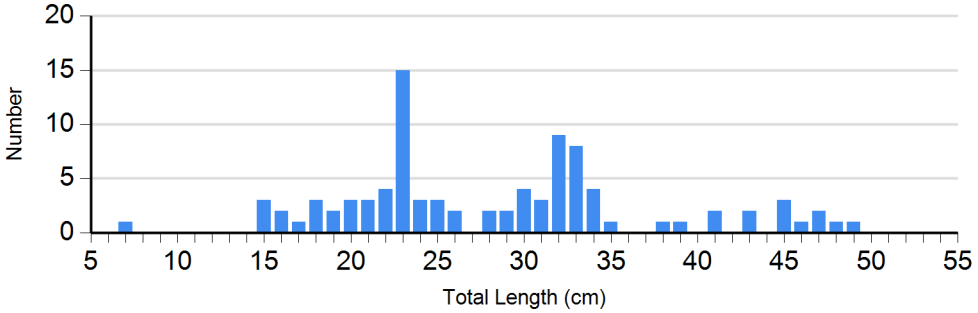
2016



2017



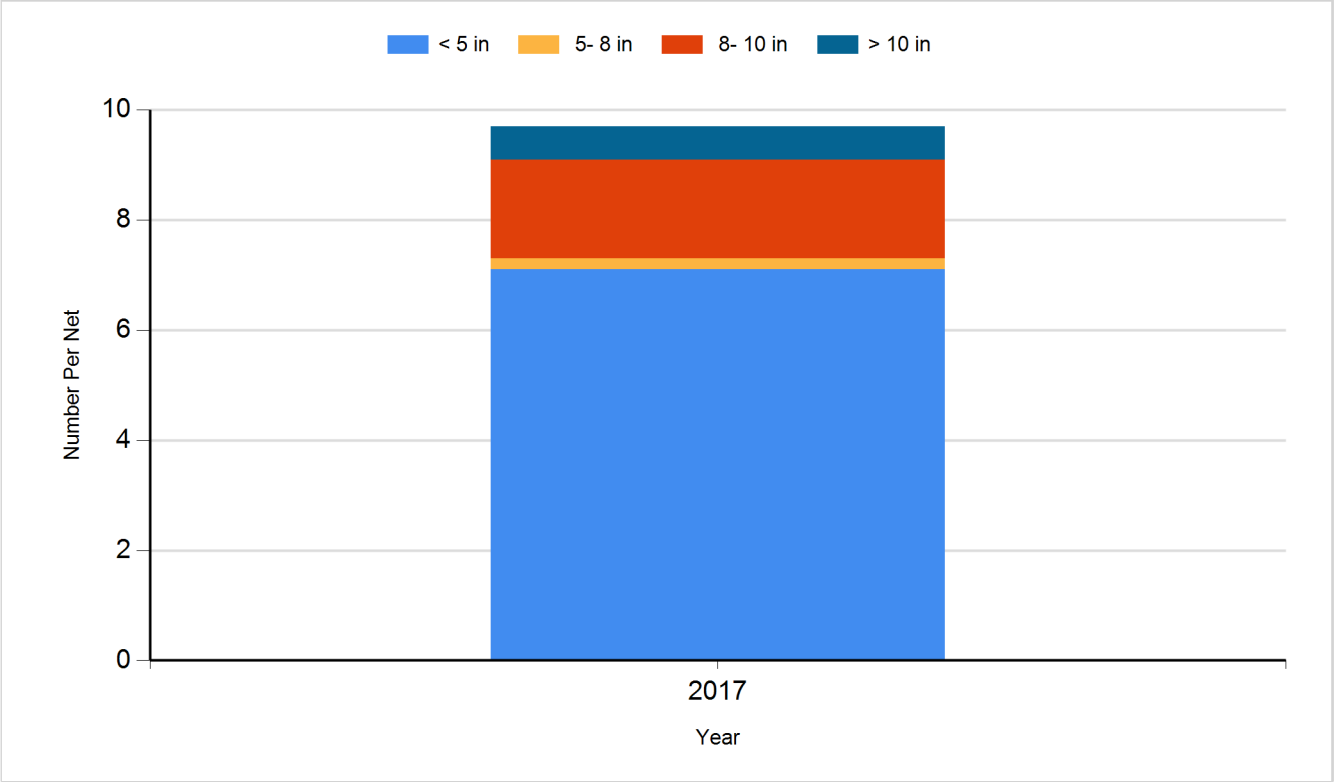
2018



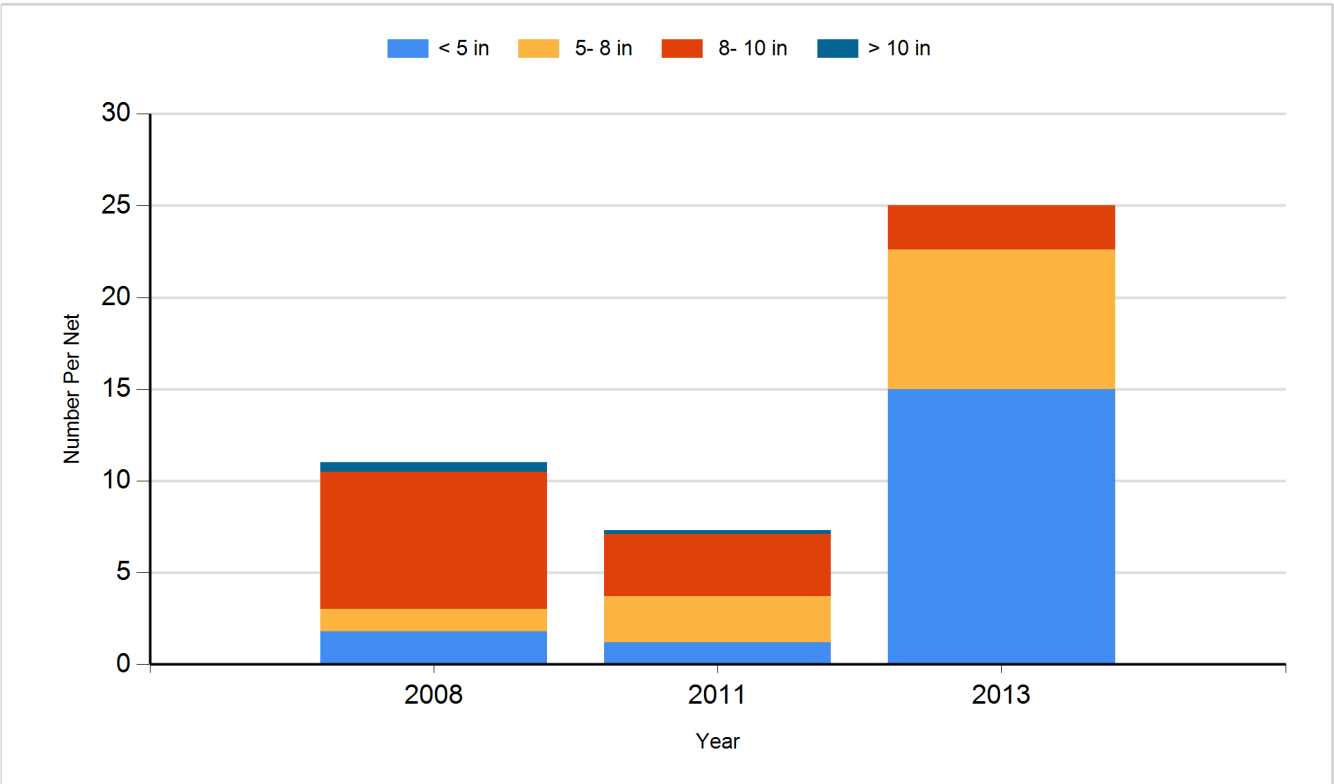
Historic Fish Sizes and Relative Abundance

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

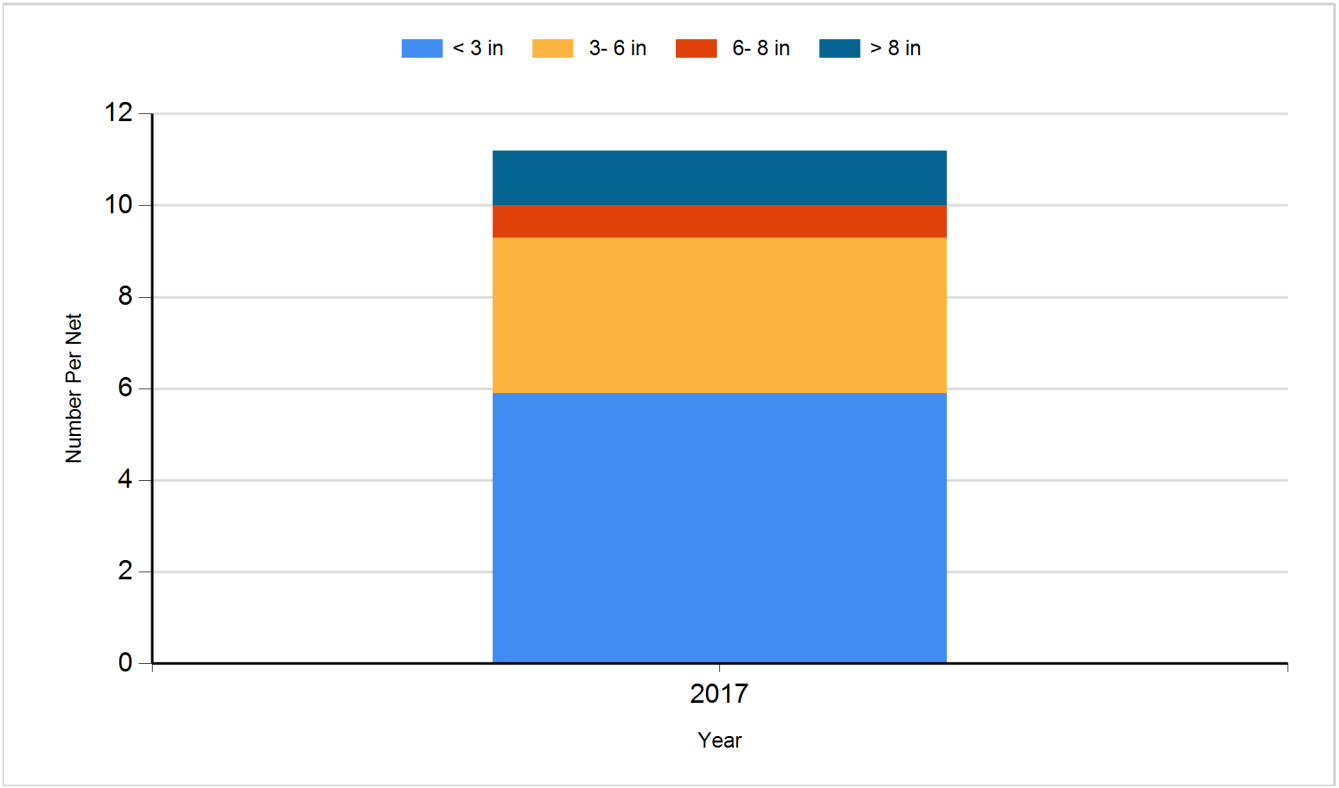
Species: Black Crappie
Gear: AFS std frame net



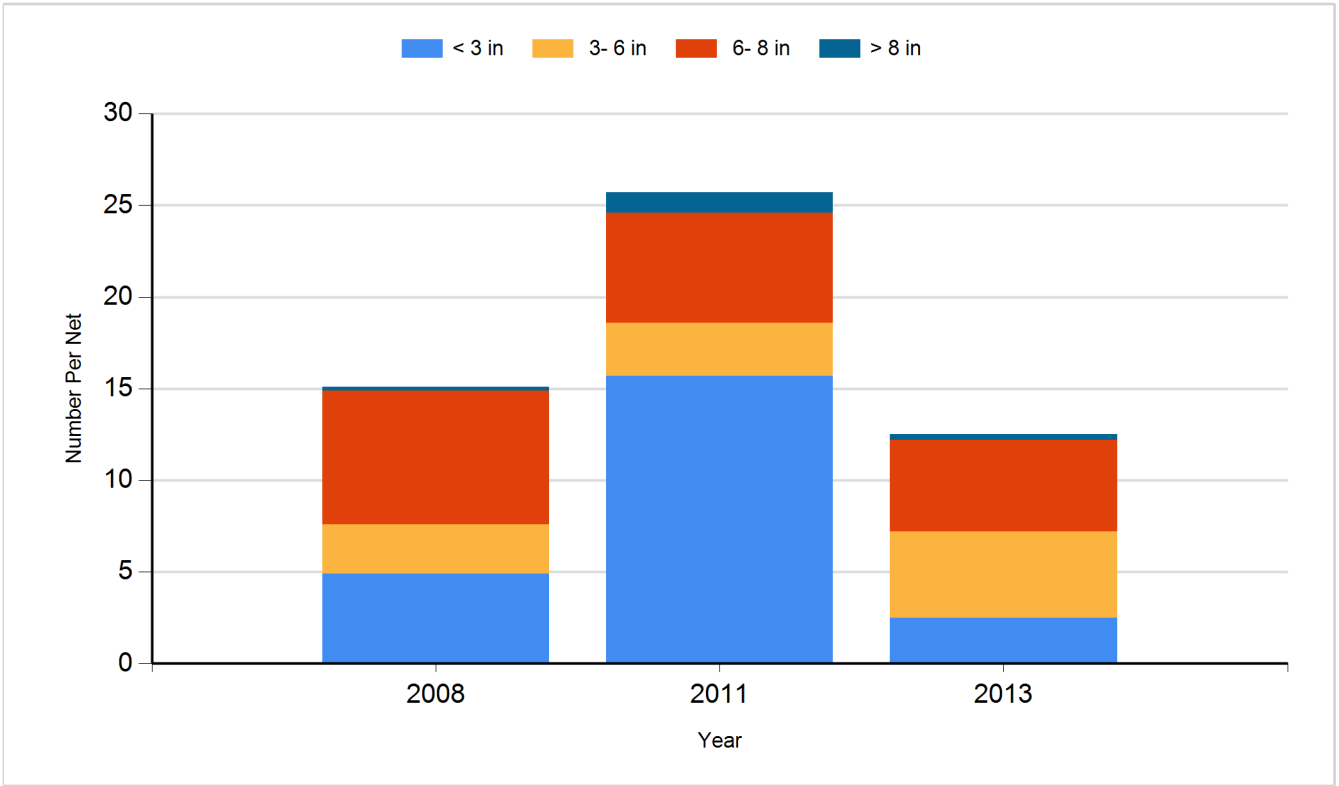
Species: Black Crappie
Gear: frame net (std 3/4 in)



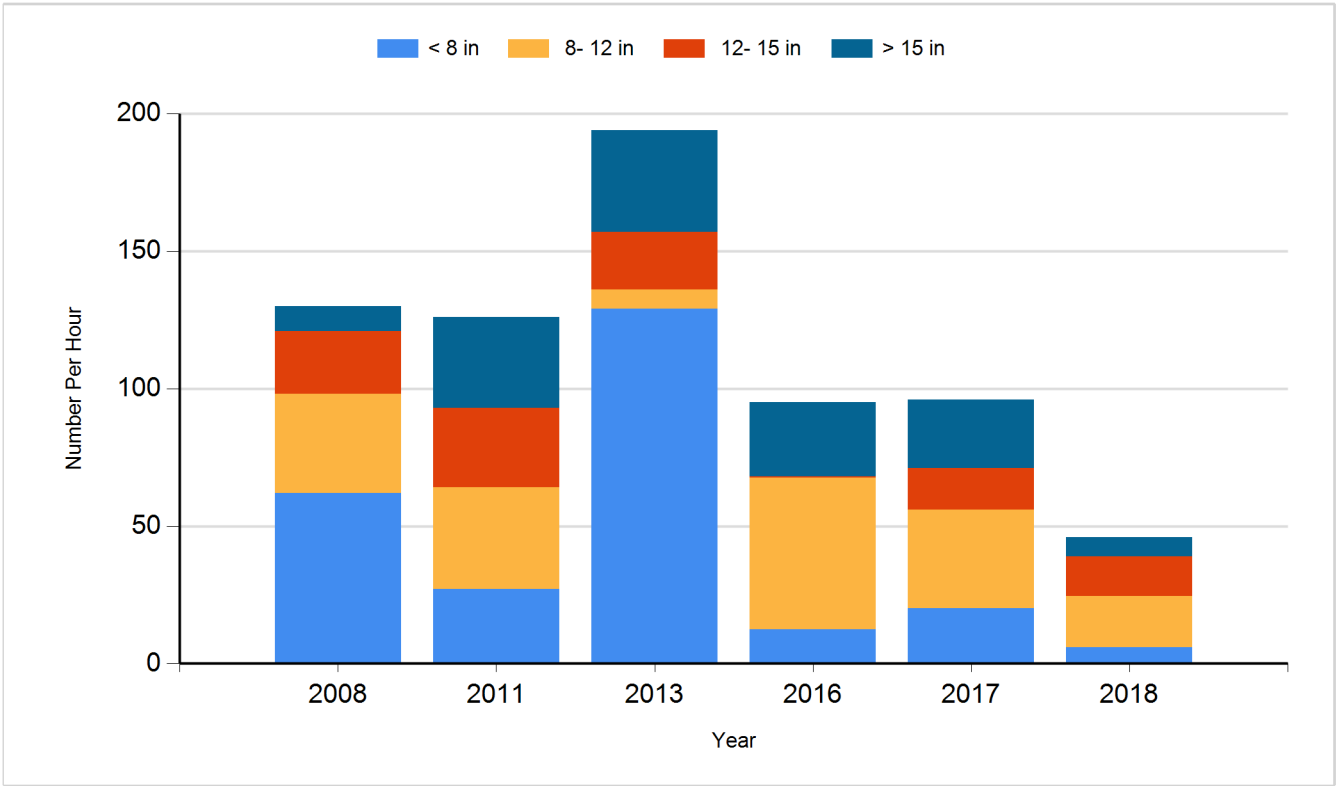
Species: Bluegill
Gear: AFS std frame net



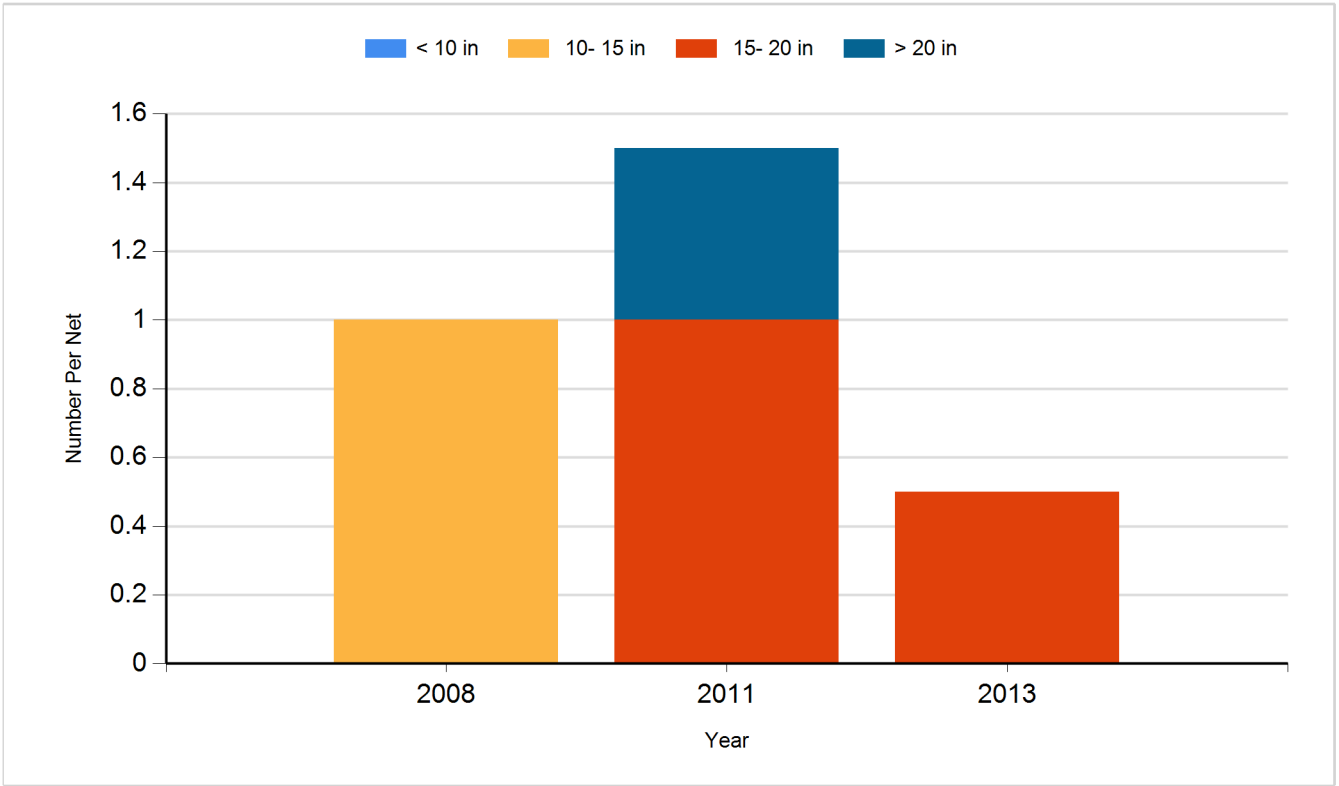
Species: Bluegill
Gear: frame net (std 3/4 in)



Species: Largemouth Bass
Gear: boat shocker (night)



Species: Walleye
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2008	Walleye	Large Fingerling	845
2011	Walleye	Large Fingerling	1,705
2013	Walleye	Large Fingerling	2,356
2015	Walleye	Large Fingerling	540