SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Rahn, Tripp County
KYP-Lake-122-000
2020

Lake Information

Name: Rahn
County: Tripp
Legal Description: T96-R76-S28
Surface Area: 18 Acres
Maximum Depth: 16 Feet
Mean Depth: 6 Feet

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Oct 06, 2020	3600 seconds
boat shocker (night)	Sep 28, 2020	3600 seconds
frame net (std 3/4 in)	Jun 22, 2020	5 net-nights
frame net (std 3/4 in)	Jun 23, 2020	5 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

Northern Pike

Yellow Perch

Green Sunfish

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	85	30.0	7.3	57	9	35	9	112	2
frame net (std 3/4 in)	Black Bullhead	990	98.1	25.2	10	1	0		90	1
	Black Crappie	57	5.7	2.0	28	9	0		99	4
	Bluegill	224	22.4	14.7	80	4	0		92	1
	Green Sunfish	4	0.3	0.2	33		0		115	10
	Northern Pike	30	2.9	1.2	34	14	3		87	1
	Yellow Perch	11	1.1	0.5	64		0		89	5

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**

		CPUE										
Gear	Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
AFS std frame net	Black Bullhead							16.6				16.60
	Black Crappie							2.8				2.80
	Bluegill							6.0				6.00
	Green Sunfish							0.2				0.20
	Largemouth Bass							0.1				0.10
	Northern Pike							0.4				0.40
	Yellow Perch							2.8				2.80
boat shocker (night)	Largemouth Bass			36.0	25.2		19.0	24.0	13.5	24.5	30.0	24.60
frame net (std 3/4 in)	Black Bullhead	10.0		9.1							98.1	39.07
	Black Crappie	6.8		2.5							5.7	5.00
	Bluegill	6.8		0.6							22.4	9.93
	Green Sunfish	0.2		0.0							0.3	0.17
	Northern Pike	1.4		0.4							2.9	1.57
	Yellow Perch	7.1		2.2							1.1	3.47

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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFS std frame net	Black Bullhead	PSD							0			
		PSD-P							0			
		Wr							84			
	Black Crappie	PSD							21			
		PSD-P							4			
		Wr							88			
	Bluegill	PSD							35			
		PSD-P							2			
		Wr							94			
	Green Sunfish	PSD							50			
		PSD-P							0			
		Wr							94			
	Largemouth Bass	PSD							100			
		PSD-P							0			
		Wr							104			
	Northern Pike	PSD							50			
		PSD-P							25			
		Wr							85			
	Yellow Perch	PSD							18			
		PSD-P							0			
		Wr							94			
boat shocker (night)	Largemouth Bass	PSD			63	100		71	79	81	88	57
		PSD-P			33	71		13	63	44	61	35
		Wr			121	114		109	115	117	120	112
frame net (std 3/4 in)	Black Bullhead	PSD	3		73							10
		PSD-P	0		0							0
		Wr	85		97							90
	Black Crappie	PSD	6		32							28
		PSD-P	1		0							0
		Wr	101		118							99
	Bluegill	PSD	29		17							80
		PSD-P	1		0							0

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
frame net (std 3/4 in)	Bluegill	Wr	103		112							92
	Green Sunfish	PSD	50									33
		PSD-P	0									0
		Wr	113									115
	Northern Pike	PSD	57		100							34
		PSD-P	0		25							3
		Wr	86		75							87
	Yellow Perch	PSD	24		59							64
		PSD-P	1		5							0
		Wr	93		115							89

Back-Calculated Lengths

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

Species: Black Crappie

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2017	3	12	75 (2.5)	103 (2)	136 (1.7)							
2016	4	7	80 (1.5)	101 (2.7)	132 (3.7)	152 (2.4)						
2015	5	12	79 (3.6)	110 (5.7)	143 (4.7)	178 (4.1)	198 (3.3)					
2014	6	1	83	126	172	192	204	219				
Weighted Mean		32	78	106	139	170	198	219				

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2017	3	12										
2016	4	7										
2015	5	12										
2014	6	1										
Weighted Mean		32										

Species: Bluegill

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2019	1	1	80									
2017	3	9	64 (4.4)	98 (3.8)	127 (4.2)							
2016	4	17	66 (2.5)	102 (2.4)	131 (2)	152 (2.3)						
2015	5	5	64 (3.6)	98 (3.4)	122 (1.8)	144 (4.4)	166 (4.6)					
Weighted Mean		32	66	100	128	150	166					

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	1	1										
2017	3	9										
2016	4	17										
2015	5	5										
Weighted Mean		32										

Species: Largemouth Bass

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2019	1	2	79 (8.8)									
2018	2	7	87 (4.7)	139 (7)								
2017	3	6	100 (7.2)	172 (10.9)	229 (15.1)							
2016	4	8	91 (6.8)	174 (7)	243 (6.5)	293 (8.6)						
2015	5	4	96 (12.1)	174 (5.6)	235 (18.2)	285 (15)	323 (21.5)					
2014	6	6	91 (5.4)	163 (7.9)	223 (8.3)	289 (5)	337 (7)	379 (9)				
2013	7	3	98 (10.2)	187 (19.3)	249 (12.6)	308 (20.8)	362 (24.9)	399 (24.7)	424 (17.4)			
Weighted Mean		36	92	166	235	292	338	386	424			

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	1	2										
2018	2	7										
2017	3	6										
2016	4	8										
2015	5	4										
2014	6	6										
2013	7	3										
Weighted Mean		36										

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+
2020	57			153 (32)	161 (8)	212 (16)	231 (1)				
2017	27		142 (1)	194 (26)							
2013	26	109 (1)	176 (17)	213 (7)			207 (1)				
2011	69	107 (1)	154 (10)	173 (48)	195 (9)			230 (1)			

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	224	102 (1)		150 (64)	163 (140)	176 (19)					
2017	59		116 (9)	136 (34)	178 (11)	190 (5)					
2011	68			141 (23)	141 (42)	154 (4)		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+
2020	71	160 (3)	172 (15)	255 (20)	322 (12)	358 (8)	409 (9)	459 (6)			
2018	27	125 (1)	235 (1)	298 (8)	319 (7)	397 (1)	430 (6)	449 (2)	479 (2)		
2013	22	247 (9)	326 (2)	381 (6)	418 (2)	456 (3)					

Fish Condition

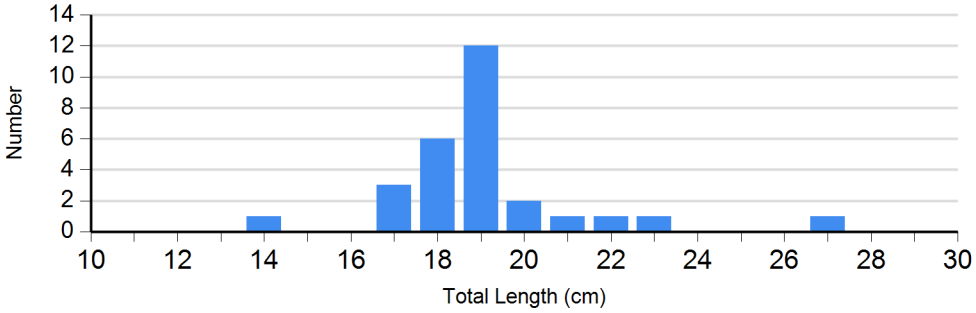
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	22	92 (2.8)	5	79 (3.4)	1	66	0	
	2020	41	105 (4.2)	16	84 (1.6)	0		0	
Bluegill Frame Net	2017	39	95 (1.2)	20	92 (1.5)	1	94	0	
	2020	44	96 (1.6)	180	91 (0.9)	0		0	
Largemouth Bass Electro Fishing	2016	11	108 (1.9)	22	108 (0.9)	4	118 (5.9)	1	105
	2017	5	107 (2.2)	4	113 (2.0)	12	117 (3.3)	3	123 (6.8)
	2018	5	113 (3.7)	10	113 (1.8)	11	122 (4.3)	1	120
	2019	6	123 (3.3)	13	123 (1.3)	27	118 (2.7)	3	124 (2.1)
	2020	26	112 (2.5)	13	107 (2.6)	20	114 (2.2)	1	113

Length Frequency Distribution

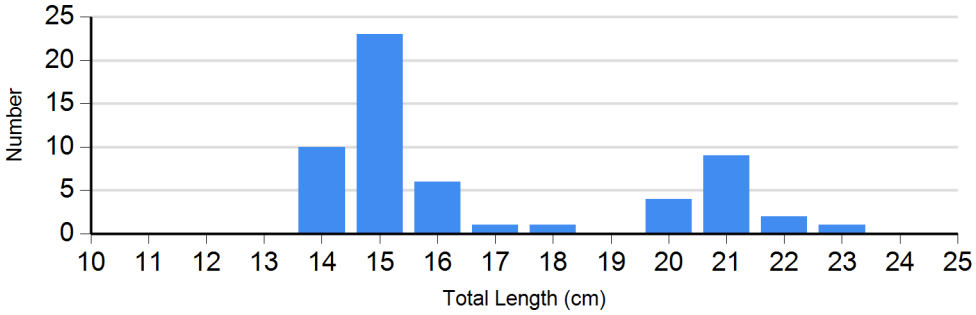
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net



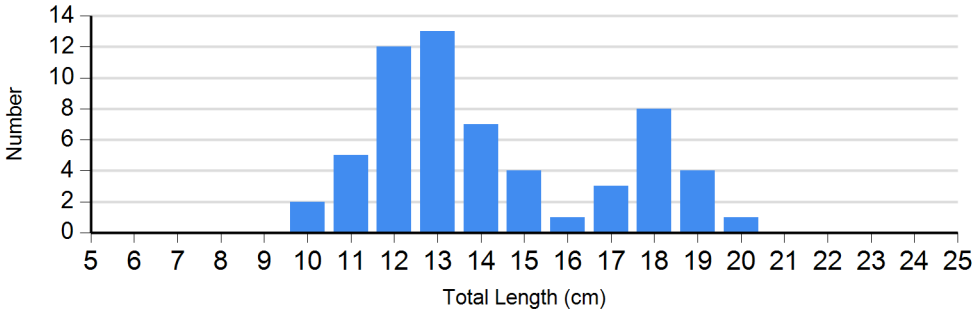
2017

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



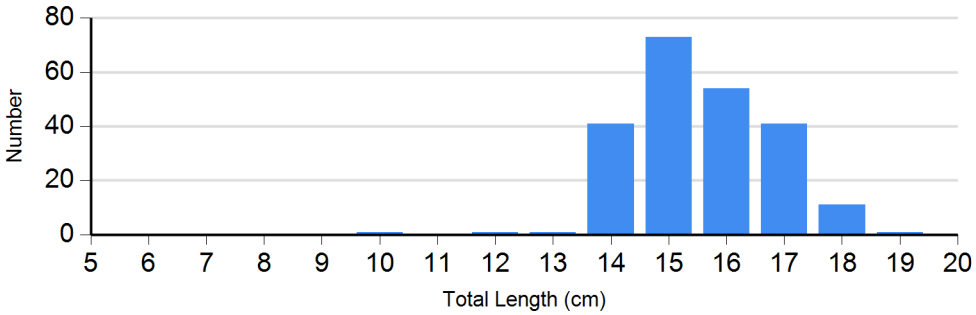
2020

Species: Bluegill
Gear: AFS std frame net



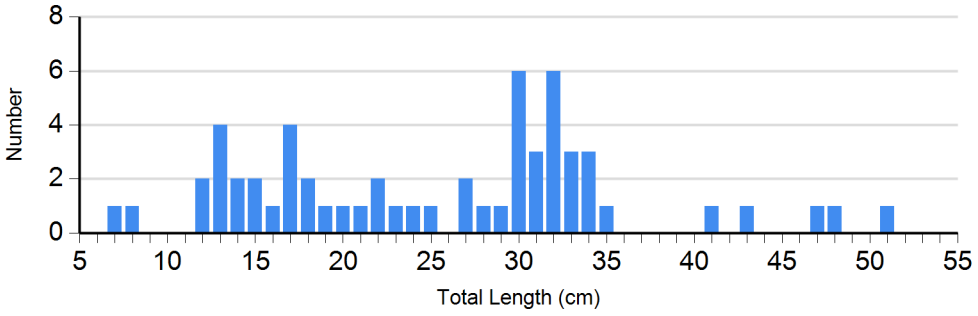
2017

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

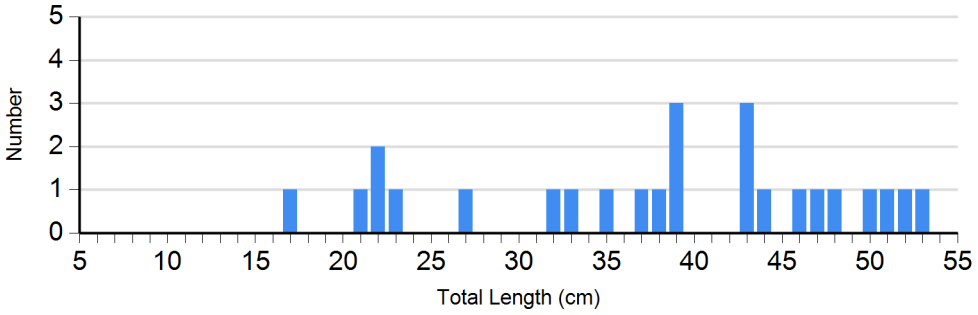


2020

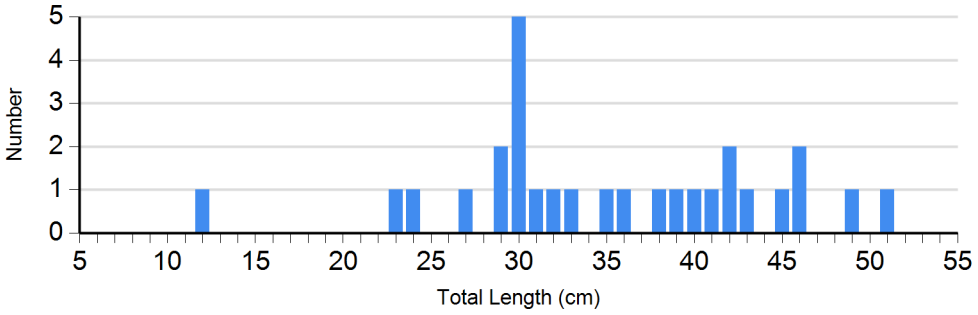
Species: Largemouth Bass
Gear: boat shocker (night)



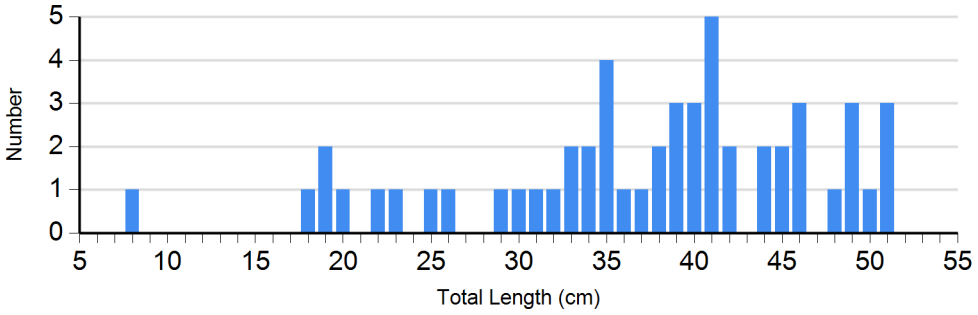
2016



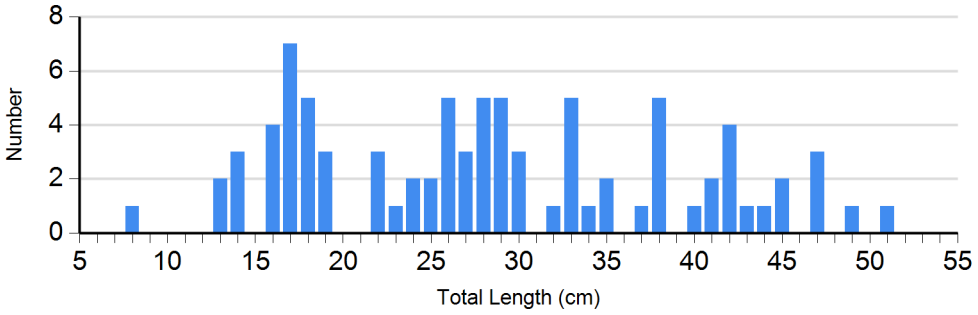
2017



2018



2019

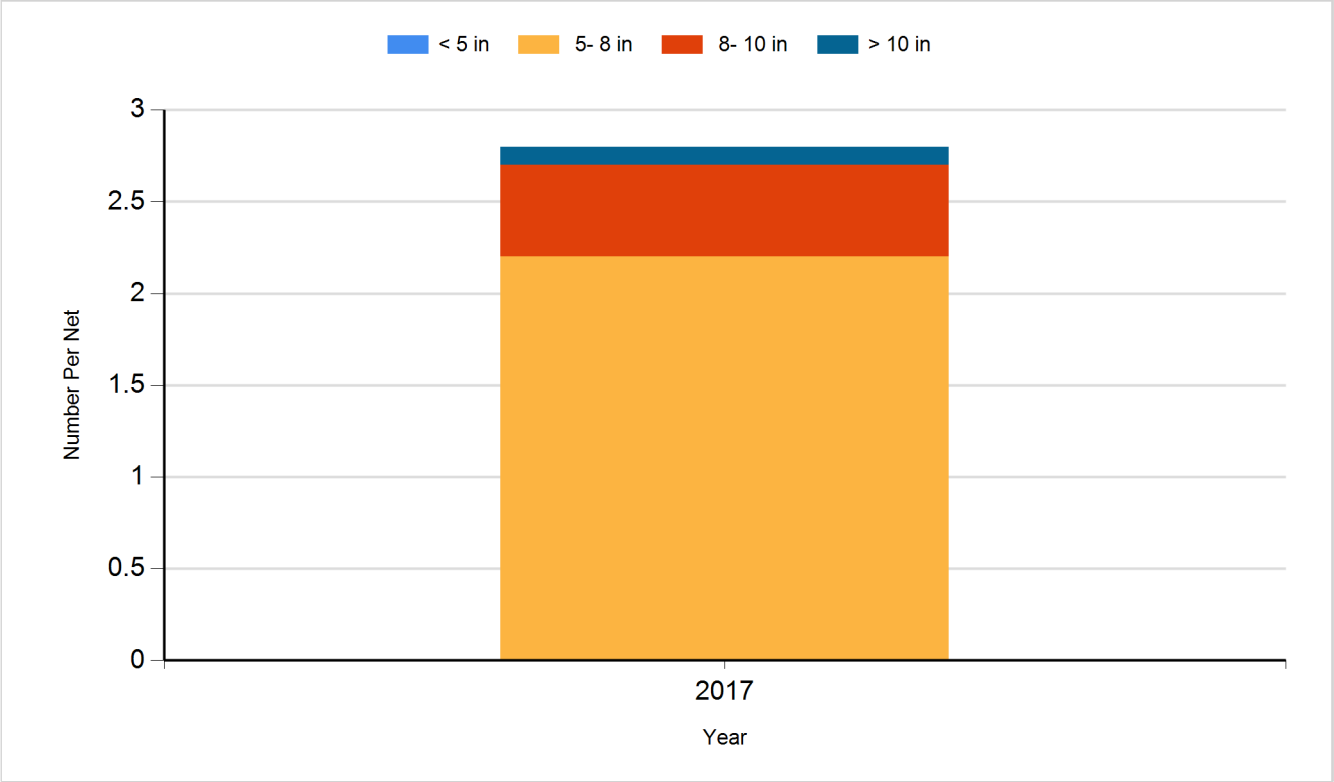


2020

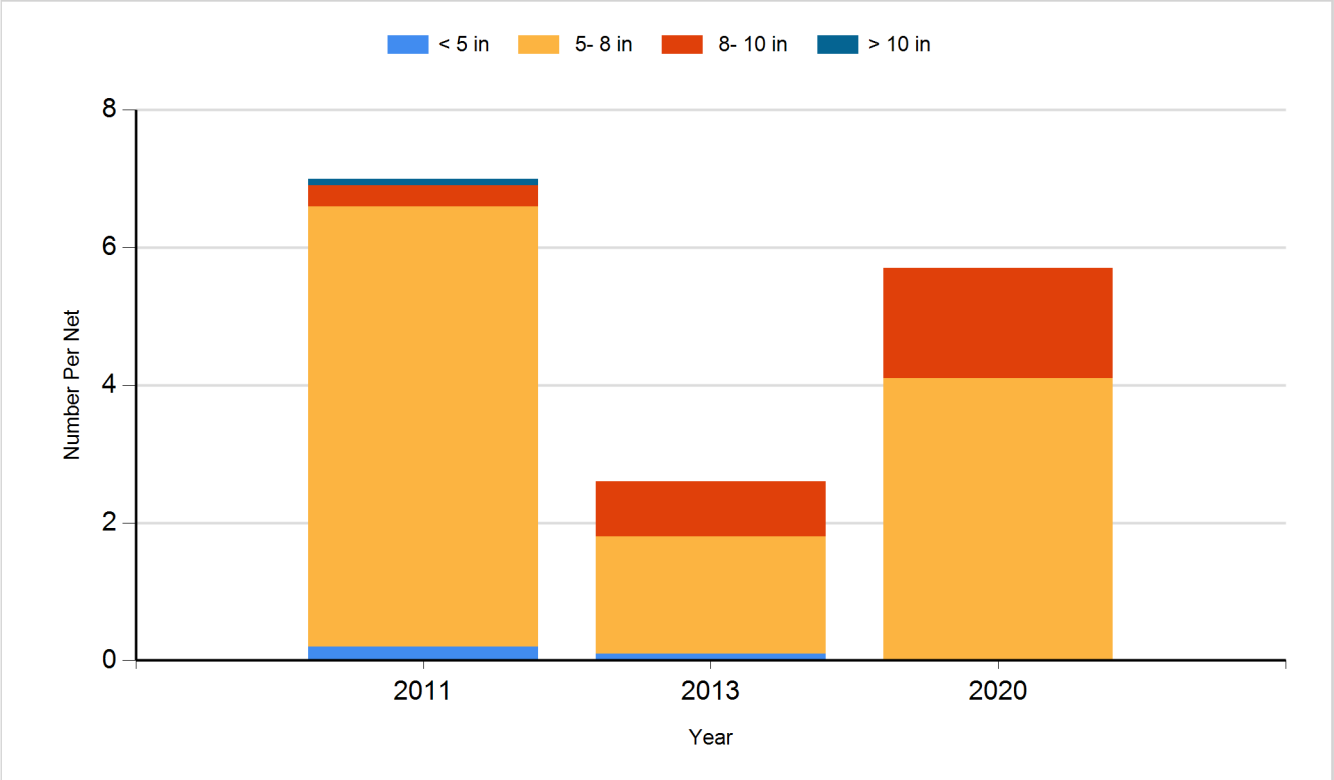
Historic Fish Sizes and Relative Abundance

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

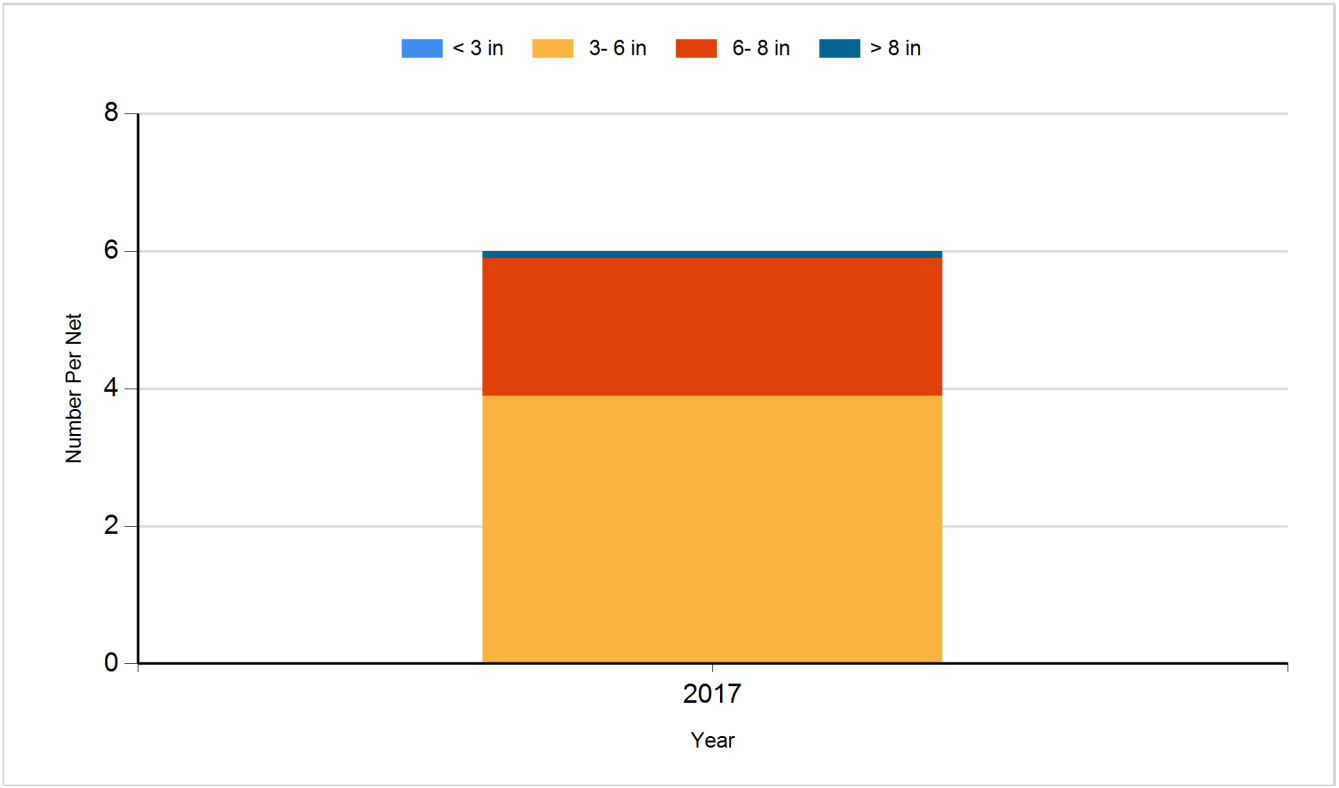
Species: Black Crappie
Gear: AFS std frame net



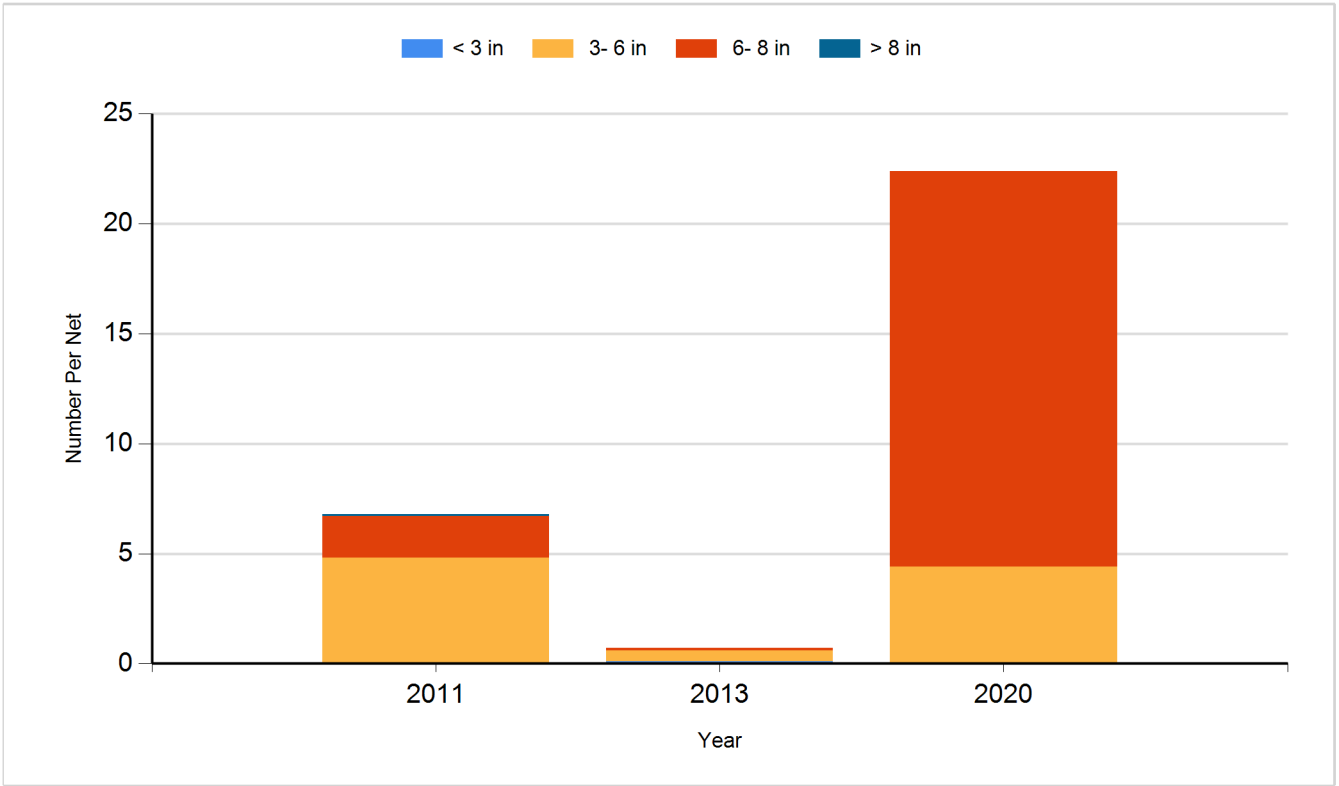
Species: Black Crappie
Gear: frame net (std 3/4 in)



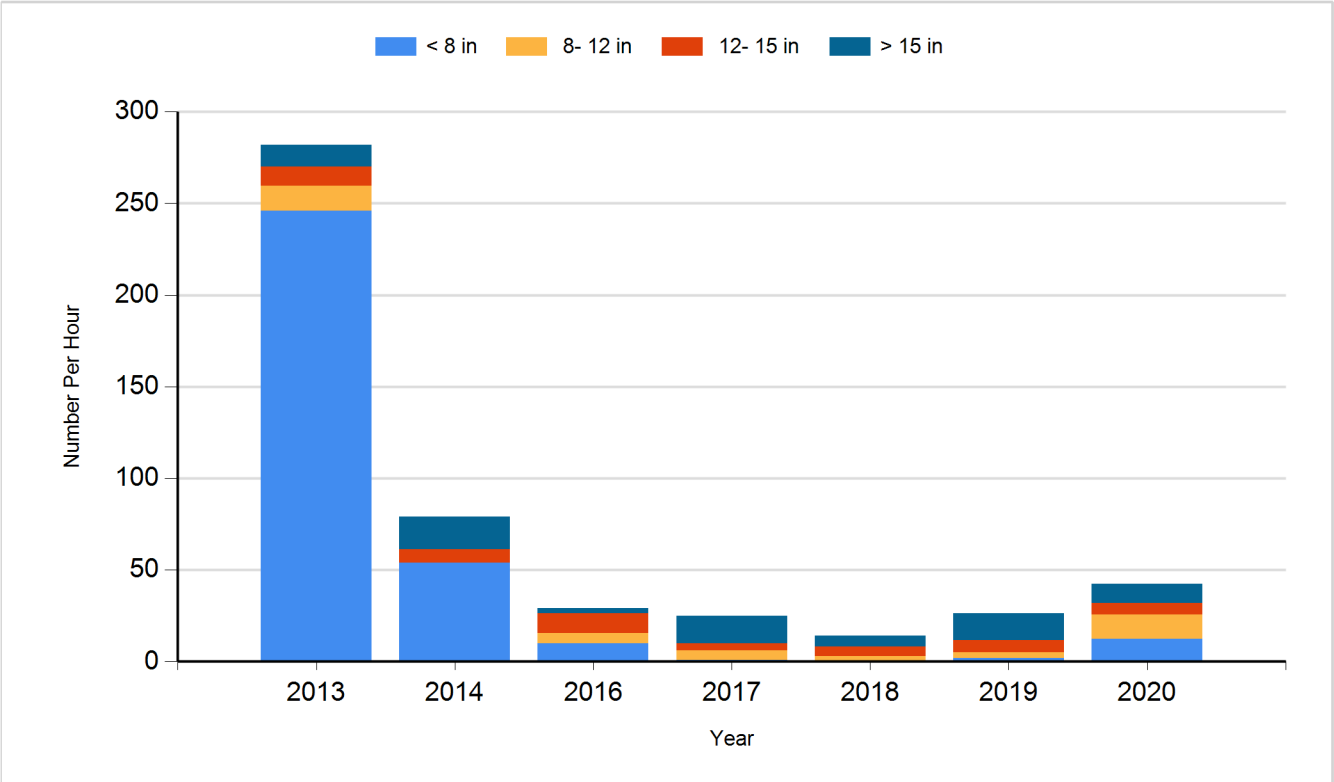
Species: Bluegill
Gear: AFS std frame net



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
2009	Largemouth Bass	Adult	150
2009	Largemouth Bass	Juvenile	175
2012	Largemouth Bass	Juvenile	100
2013	Largemouth Bass	Large Fingerling	648