SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
King, Tripp County
LWH-Lake-529-000
2021

Lake Information

Name: King

County: Tripp

Surface Area: 9 Acres

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Oct 04, 2021	1200 seconds
frame net (std 3/4 in)	Jun 21, 2021	4 net-nights
frame net (std 3/4 in)	Jun 22, 2021	4 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

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.
- 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	33	99.0	64.6	45	13	6		100	2
frame net (std 3/4 in)	Black Crappie	207	25.9	7.5	59	5	18	4	1028	1017
	Bluegill	631	78.9	16.7	95	1	28	2	97	1
	Largemouth Bass	8	0.6	0.5	0		0		97	3
	Yellow Perch	32	4.0	2.3	97		63	13	89	1

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg
AFS std frame net	Black Crappie							4.5				4.50
	Bluegill							13.3				13.30
	Yellow Perch							0.3				0.30
boat shocker (night)	Largemouth Bass							79.1			99.0	89.05
frame net (std 3/4 in)	Black Crappie				11.8						25.9	18.85
	Bluegill				12.5						78.9	45.70
	Largemouth Bass				0.1						0.6	0.35
	Yellow Perch				8.4						4.0	6.20

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFS std frame net	Black Crappie	PSD							100			
		PSD-P							0			
		Wr							97			
	Bluegill	PSD							85			
		PSD-P							6			
		Wr							101			
	Yellow Perch	PSD							0			
		PSD-P							0			
		Wr							93			
boat shocker (night)	Largemouth Bass	PSD							22			45
		PSD-P							22			6
		Wr							101			100
frame net (std 3/4 in)	Black Crappie	PSD				41						59
		PSD-P				15						18
		Wr				102						1028
	Bluegill	PSD				46						95
		PSD-P				25						28
		Wr				112						97
	Largemouth Bass	PSD				0						0
		PSD-P				0						0
		Wr				107						97
	Yellow Perch	PSD				61						97
		PSD-P				19						63
		Wr				86						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
2019	2	1	73	111								
2018	3	6	77 (2.4)	121 (3.7)	177 (3.4)							
2017	4	13	66 (2)	105 (5.3)	141 (5.7)	181 (4.5)						
2016	5	5	69 (2.4)	113 (5.7)	158 (4.3)	192 (3.8)	223 (5.2)					
2015	6	10	72 (2)	107 (2.1)	145 (4.2)	182 (4.1)	210 (3.9)	227 (3)				
Weighted Mean		35	70	110	151	183	214	227				

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	2	1										
2018	3	6										
2017	4	13										
2016	5	5										
2015	6	10										
Weighted Mean		35										

Species: Bluegill

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2019	2	6	80 (1.7)	130 (2.2)								
2018	3	11	51 (4.4)	101 (3.9)	145 (3.6)							
2017	4	6	49 (1.8)	91 (4.9)	121 (5)	158 (2.3)						
2016	5	11	54 (3.4)	95 (4.6)	128 (5.4)	162 (3.6)	185 (2.3)					
2015	6	8	45 (.8)	78 (2.8)	113 (2.9)	147 (4)	168 (4.7)	183 (4.4)				
Weighted Mean		42	55	98	129	156	178	183				

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	2	6										
2018	3	11										
2017	4	6										
2016	5	11										
2015	6	8										
Weighted Mean		42										

Species: Largemouth Bass

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2018	3	11	89 (3.4)	149 (9.1)	202 (6.4)							
2017	4	8	90 (5.4)	142 (9.4)	207 (14.6)	260 (14.9)						
2016	5	8	86 (4.4)	154 (6.3)	213 (9.3)	260 (10.1)	303 (10.9)					
2015	6	4	73 (3.6)	139 (7.2)	216 (16.2)	261 (15.9)	304 (20.9)	349 (21.5)				
2014	7	1	90	169	234	284	374	416	454			
2013	8	1	84	84	172	172	278	278	323	323		
Weighted Mean		33	86	146	208	257	307	348	389	323		

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2018	3	11										
2017	4	8										
2016	5	8										
2015	6	4										
2014	7	1										
2013	8	1										
Weighted Mean		33										

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+
2021	203		137 (1)	195 (34)	201 (80)	248 (33)	246 (55)				
2015	99		134 (28)	156 (30)	225 (27)	260 (7)	274 (1)	271 (6)			

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2021	631		145 (44)	161 (132)	173 (63)	198 (244)	196 (151)				
2018	53			156 (18)	178 (34)	193 (1)					
2015	100		101 (54)	169 (9)	169 (2)	195 (10)	205 (10)	210 (14)	223 (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+
2021	33			237 (11)	294 (8)	337 (8)	386 (4)	482 (1)	375 (1)		
2018	27		245 (11)	261 (10)		431 (2)	447 (3)		505 (1)		

Fish Condition

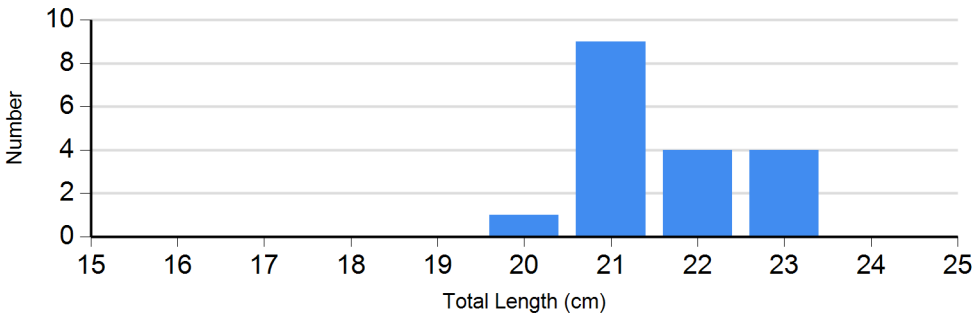
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2018	0		18	97 (2.9)	0		0	
	2021	84	2376 (1,955.2)	85	92 (1.9)	38	86 (0.7)	0	
Bluegill Frame Net	2018	8	107 (2.2)	42	100 (2.8)	3	103 (3.9)	0	
	2021	31	95 (1.4)	424	97 (0.8)	176	98 (0.9)	0	
Largemouth Bass Electro Fishing	2018	21	100 (1.1)	0		6	105 (3.5)	0	
	2021	18	100 (1.4)	13	99 (2.0)	2	109 (2.0)	0	

Length Frequency Distribution

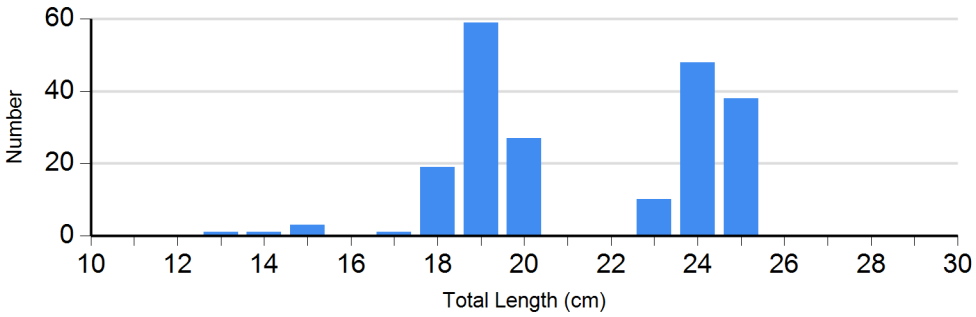
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net



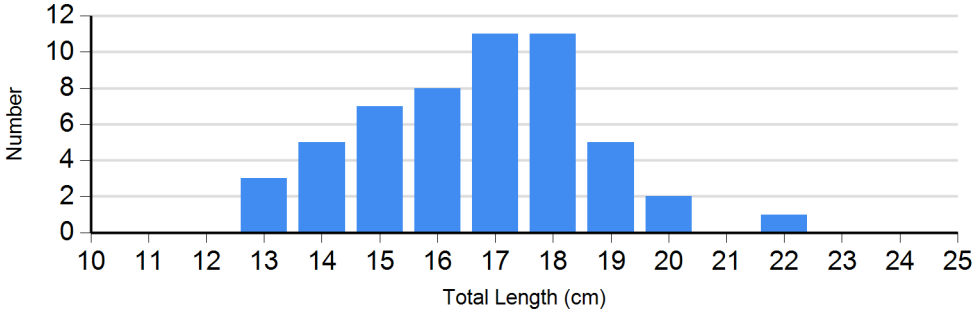
2018

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



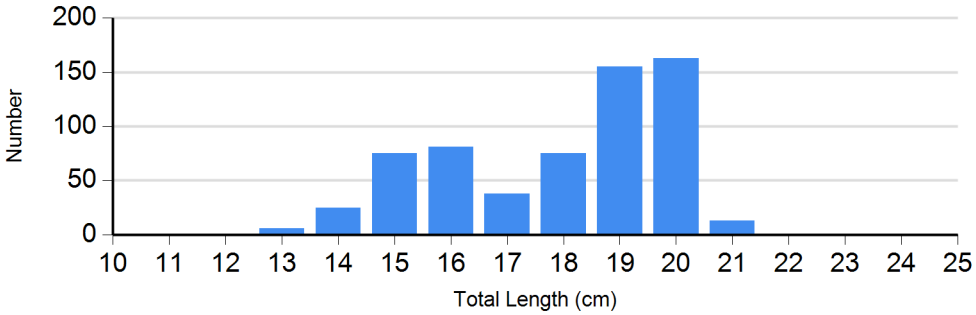
2021

Species: Bluegill
Gear: AFS std frame net



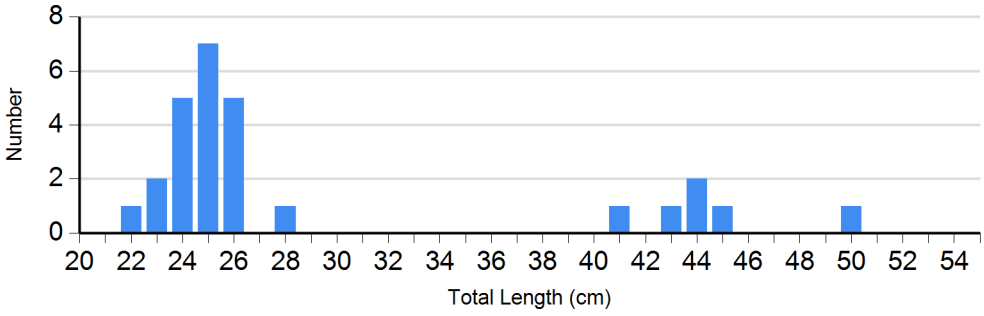
2018

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

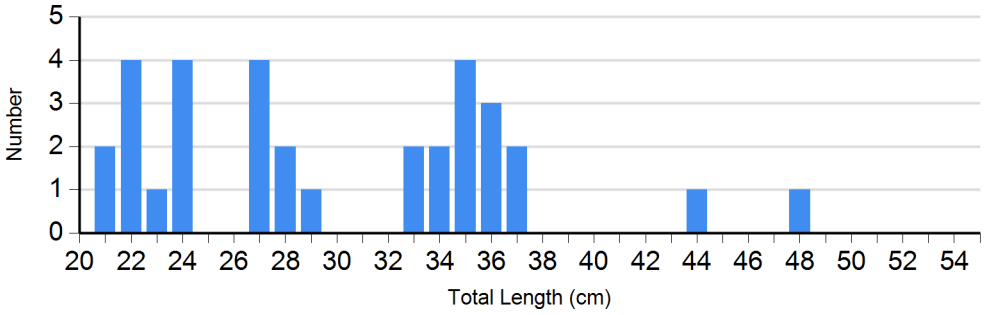


2021

Species: Largemouth Bass
Gear: boat shocker (night)



2018

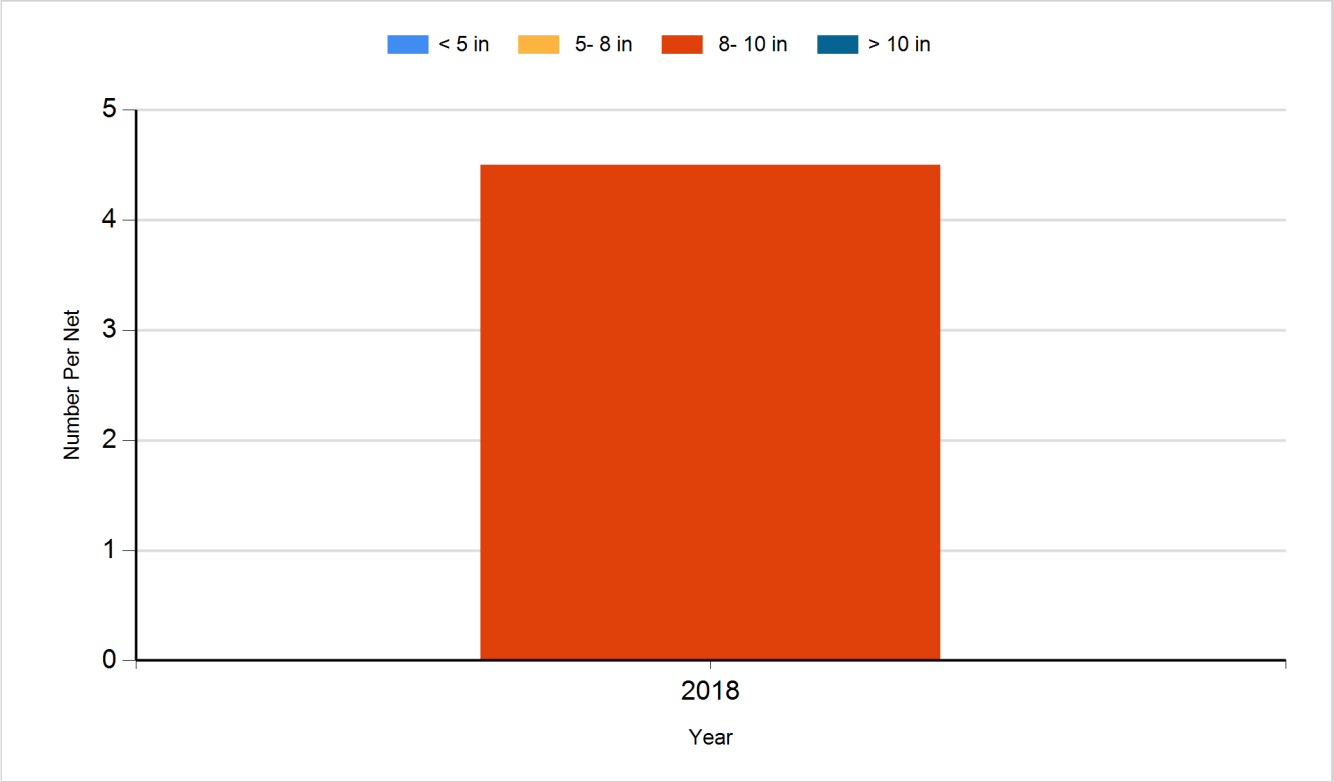


2021

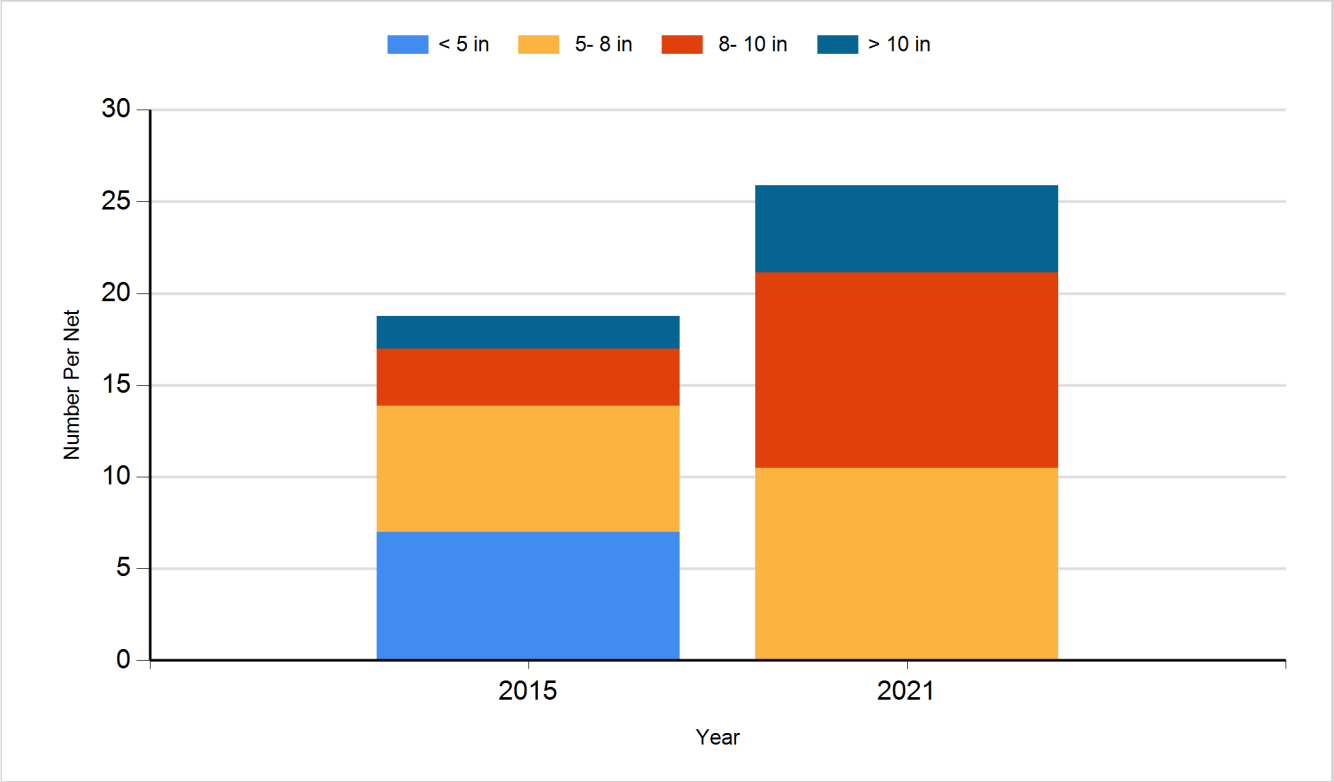
Historic Fish Sizes and Relative Abundance

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

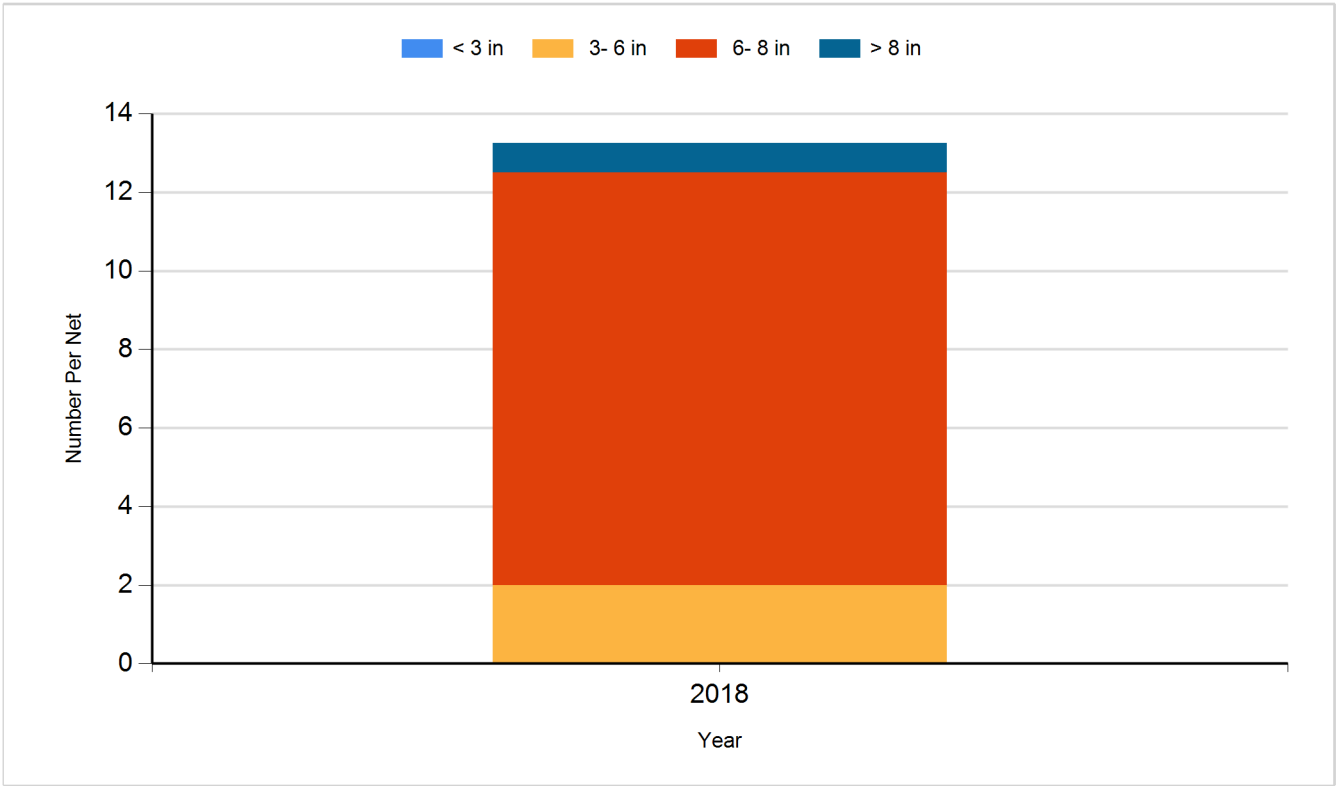
Species: Black Crappie
Gear: AFS std frame net



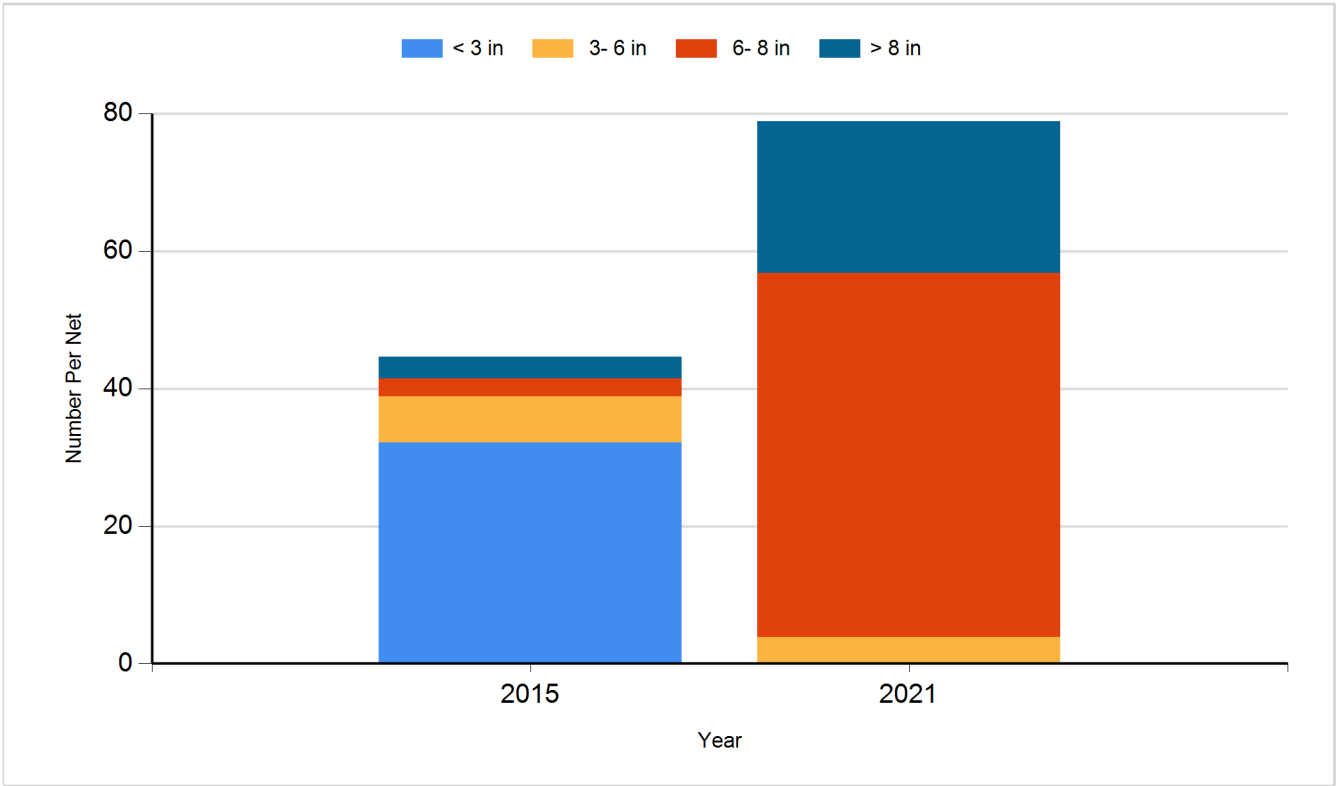
Species: Black Crappie
Gear: frame net (std 3/4 in)



Species: Bluegill
Gear: AFS std frame net



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



Species: Largemouth Bass
Gear: boat shocker (night)