SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Wagner, Charles Mix County
LCL-Lake-64-001
2020

Lake Information

Name: Wagner

County: Charles Mix

Legal Description: T96-R63-S33

Surface Area: 9 Acres

Maximum Depth: 13 Feet

Mean Depth: 6 Feet

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Oct 01, 2020	1535 seconds
frame net (std 3/4 in)	Jul 06, 2020	5 net-nights
frame net (std 3/4 in)	Jul 07, 2020	4 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

Channel Catfish

Yellow Perch

Common Carp

Sunfish Hybrid

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	67	143.4	27.1	67	9	35	9	99	1
frame net (std 3/4 in)	Black Bullhead	17	1.9	1.0	24		0		87	3
	Black Crappie	243	20.8	7.9	94	3	0		88	1
	Bluegill	133	14.8	4.4	12	4	0		98	2
	Channel Catfish	2	0.2	0.2	100		50		101	0
	Common Carp	1	0.1	0.2	100		100		76	
	Sunfish Hybrid	3	0.0	0.0						
	Yellow Perch	2	0.2	0.2	0		0		86	7

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 Crappie							12.7				12.70
	Bluegill							17.1				17.10
	Common Carp							0.1				0.10
	Green Sunfish							0.5				0.50
	Largemouth Bass							0.0				0.00
	Yellow Perch							0.5				0.50
boat shocker (night)	Largemouth Bass			120.0				76.5			143.4	113.30
frame net (std 3/4 in)	Black Bullhead			0.0							1.9	0.95
	Black Crappie			10.0							20.8	15.40
	Bluegill			10.0							14.8	12.40
	Channel Catfish			0.2							0.2	0.20
	Common Carp			0.5							0.1	0.30
	Green Sunfish			0.0							0.0	0.00
	Largemouth Bass			0.2							0.0	0.10
	Sunfish Hybrid			0.0							0.0	0.00
	Walleye			0.1							0.0	0.05
	Yellow Perch			0.1							0.2	0.15

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 Crappie	PSD							2			
		PSD-P							0			
		Wr							86			
	Bluegill	PSD							4			
		PSD-P							0			
		Wr							82			
	Common Carp	PSD							0			
		PSD-P							0			
		Wr							85			
	Largemouth Bass	PSD							0			
		PSD-P							0			
	Yellow Perch	PSD							0			
		PSD-P							0			
		Wr							73			
boat shocker (night)	Largemouth Bass	PSD			75				78			67
		PSD-P			53				46			35
		Wr			97				98			99
frame net (std 3/4 in)	Black Bullhead	PSD										24
		PSD-P										0
		Wr										87
	Black Crappie	PSD			2							94
		PSD-P			0							0
		Wr			89							88
	Bluegill	PSD			29							12
		PSD-P			0							0
		Wr			88							98
	Channel Catfish	PSD			100							100
		PSD-P			0							50
		Wr			96							101
	Common Carp	PSD			100							100
		PSD-P			0							100
		Wr			97							76

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
frame net (std 3/4 in)	Largemouth Bass	PSD			100							
		PSD-P			100							
		Wr			102							
	Yellow Perch	PSD			0							0
		PSD-P			0							0
		Wr			69							86

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	1	3	89 (1.9)									
2018	2	8	83 (1.9)	115 (6.6)								
2017	3	4	90 (3.9)	132 (7.3)	167 (6.8)							
2016	4	12	84 (2.2)	131 (2.5)	173 (2.1)	199 (2.1)						
2015	5	10	79 (2.4)	120 (5.1)	157 (3.6)	186 (3.4)	210 (3.3)					
2014	6	2	77 (11.2)	129 (6.6)	157 (7.9)	183 (8.6)	201 (8.5)	217 (7.1)				
Weighted Mean		39	83	124	165	192	209	217				

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	1	3										
2018	2	8										
2017	3	4										
2016	4	12										
2015	5	10										
2014	6	2										
Weighted Mean		39										

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	16	65 (2.7)									
2018	2	19	66 (2)	114 (2.4)								
2017	3	10	71 (3.1)	108 (4.3)	139 (4.3)							
2016	4	4	57 (5.3)	96 (1.8)	131 (5.8)	149 (2)						
Weighted Mean		49	66	110	137	149						

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	1	16										
2018	2	19										
2017	3	10										
2016	4	4										
Weighted Mean		49										

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	2	9	95 (5)	162 (5.3)								
2017	3	12	97 (4.1)	168 (7.6)	224 (6.9)							
2016	4	16	101 (3.5)	175 (4.7)	238 (7)	287 (8.1)						
2015	5	12	110 (7.1)	188 (7.4)	256 (8)	307 (8.3)	350 (9.4)					
2014	6	12	110 (6.5)	196 (10)	266 (9.4)	320 (8.7)	368 (6.8)	406 (7.3)				
2013	7	3	116 (29.5)	189 (28.6)	231 (32.2)	287 (33.6)	340 (23.5)	385 (26.1)	429 (26.9)			
Weighted Mean		64	103	179	245	302	357	402	429			

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2018	2	9										
2017	3	12										
2016	4	16										
2015	5	12										
2014	6	12										
2013	7	3										
Weighted Mean		64										

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	243	117 (18)	121 (40)	204 (19)	216 (86)	224 (74)	236 (7)				
2017	158	111 (31)	159 (19)	173 (107)	211 (1)						
2013	100		153 (23)	175 (5)	183 (66)	192 (5)	210 (1)			240 (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	133	94 (46)	132 (61)	148 (21)	164 (5)						
2017	171	92 (52)	122 (84)	142 (33)	161 (1)	172 (1)					
2013	100		108 (13)	129 (6)	142 (39)	149 (21)	151 (14)	164 (1)	153 (4)		

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	67		205 (9)	268 (12)	321 (18)	378 (12)	433 (13)	464 (3)			
2017	47	160 (11)	271 (2)	314 (8)	355 (13)	427 (5)	451 (3)	479 (5)			
2013	39		269 (10)		346 (4)	394 (2)	387 (5)	399 (7)	424 (5)	464 (2)	490 (4)

Fish Condition

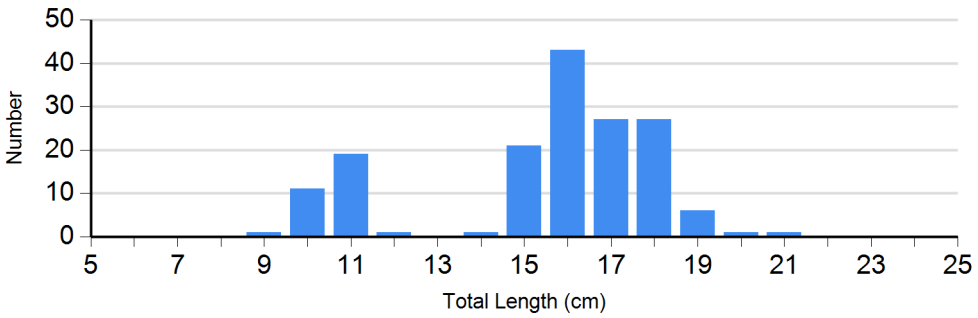
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	125	86 (0.6)	2	84 (1.0)	0		0	
	2020	11	95 (1.7)	176	87 (0.4)	0		0	
Bluegill Frame Net	2017	164	82 (1.2)	7	71 (5.1)	0		0	
	2020	117	99 (1.4)	16	88 (2.3)	0		0	
Largemouth Bass Electro Fishing	2017	8	96 (2.5)	12	96 (3.3)	17	100 (1.5)	0	
	2020	21	96 (1.4)	20	100 (1.5)	21	101 (1.8)	1	103

Length Frequency Distribution

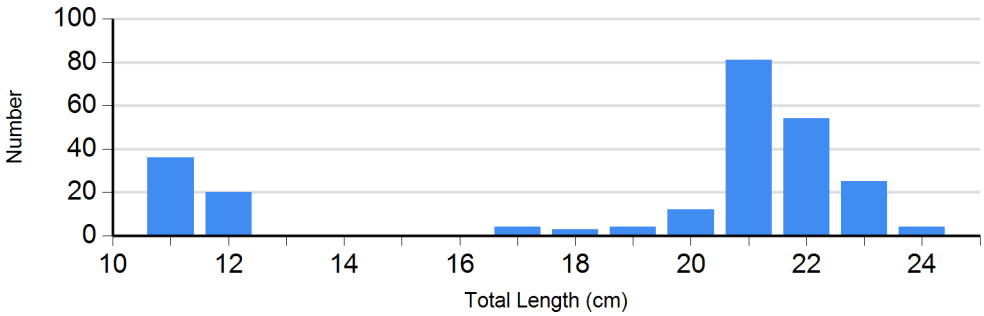
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net



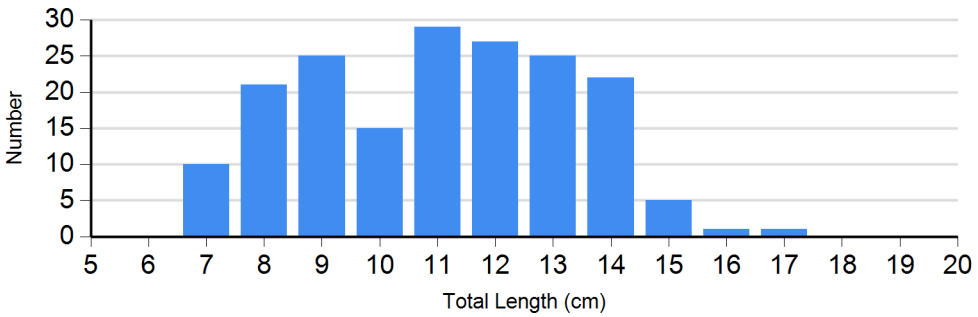
2017

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



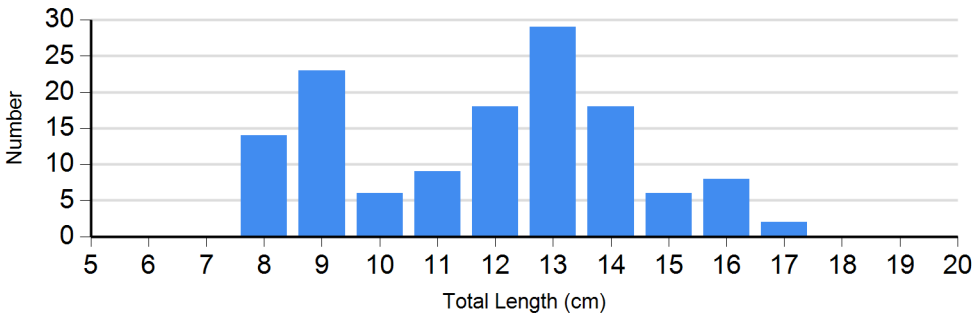
2020

Species: Bluegill
Gear: AFS std frame net



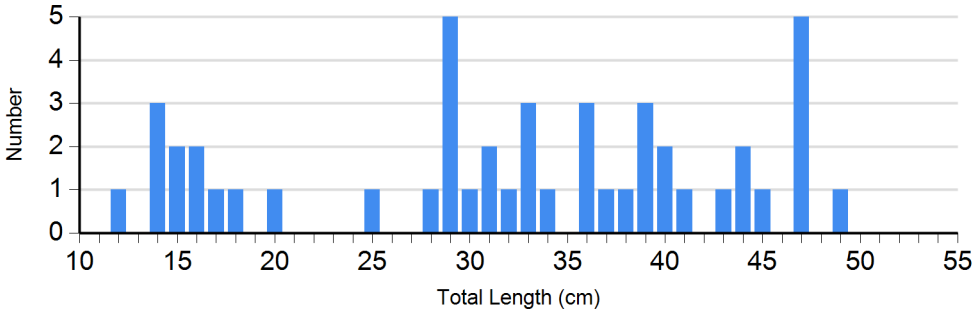
2017

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

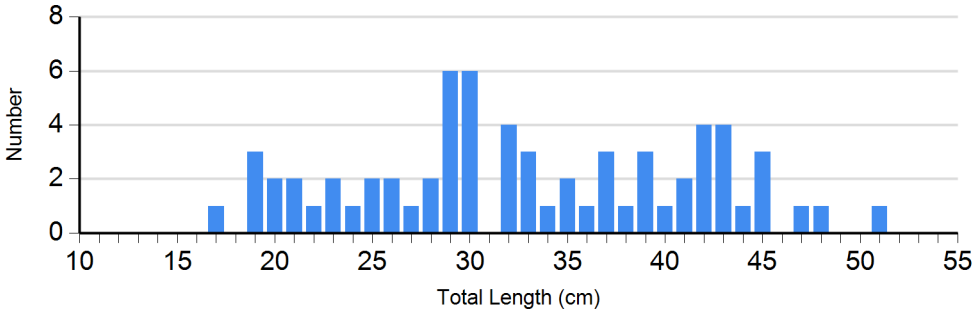


2020

Species: Largemouth Bass
Gear: boat shocker (night)



2017

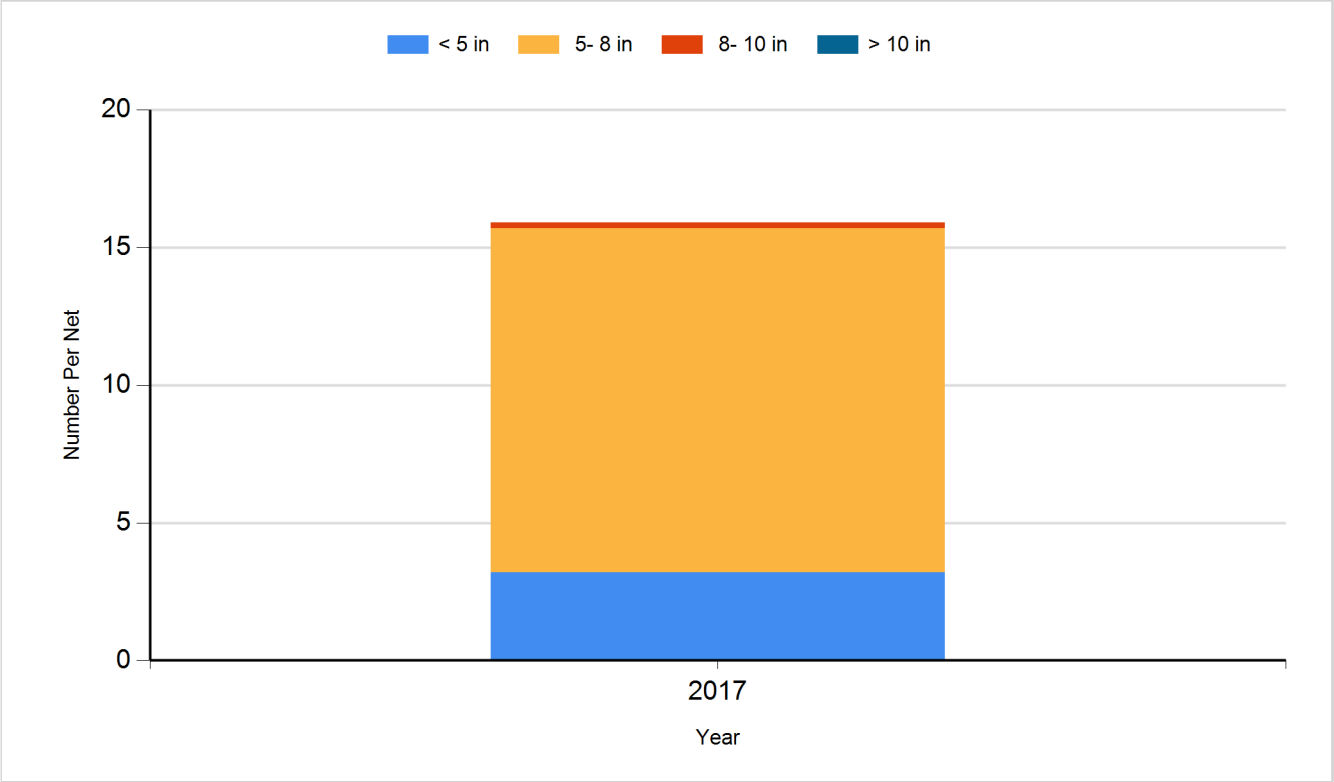


2020

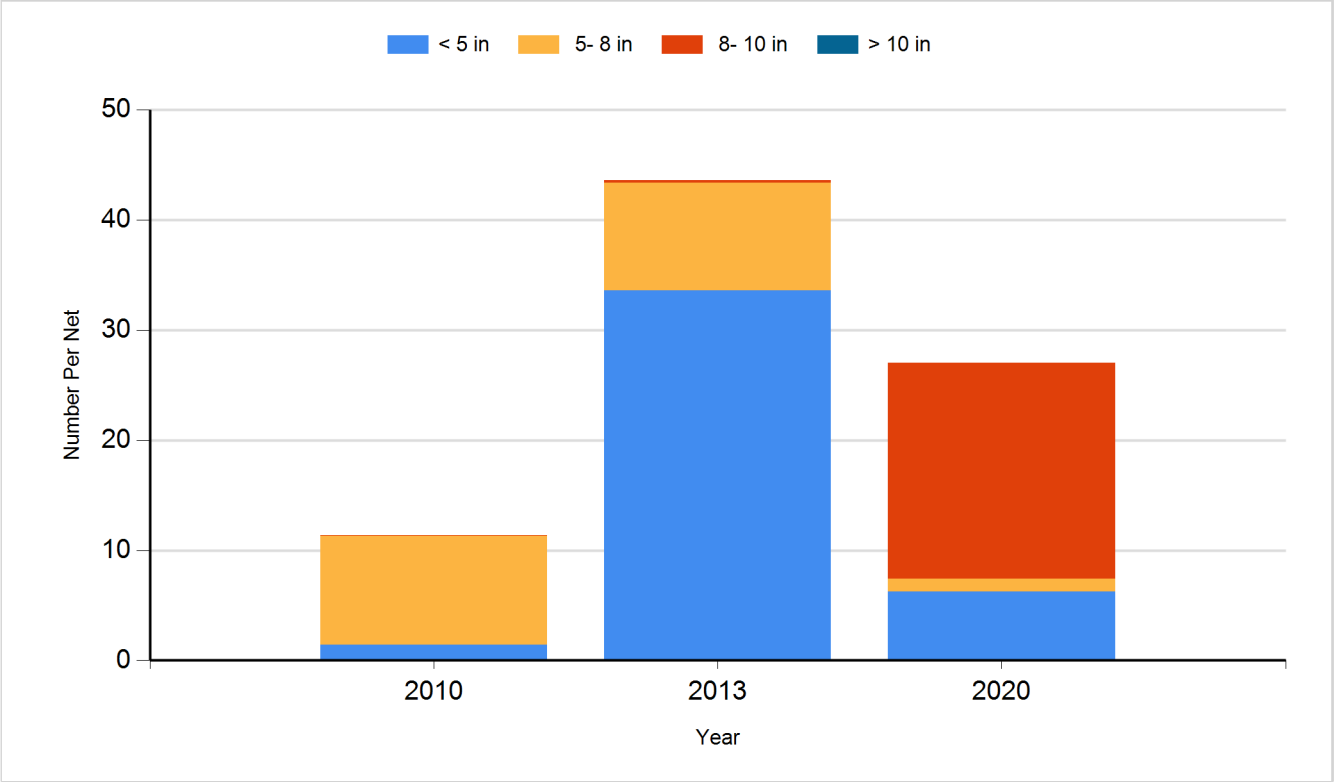
Historic Fish Sizes and Relative Abundance

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

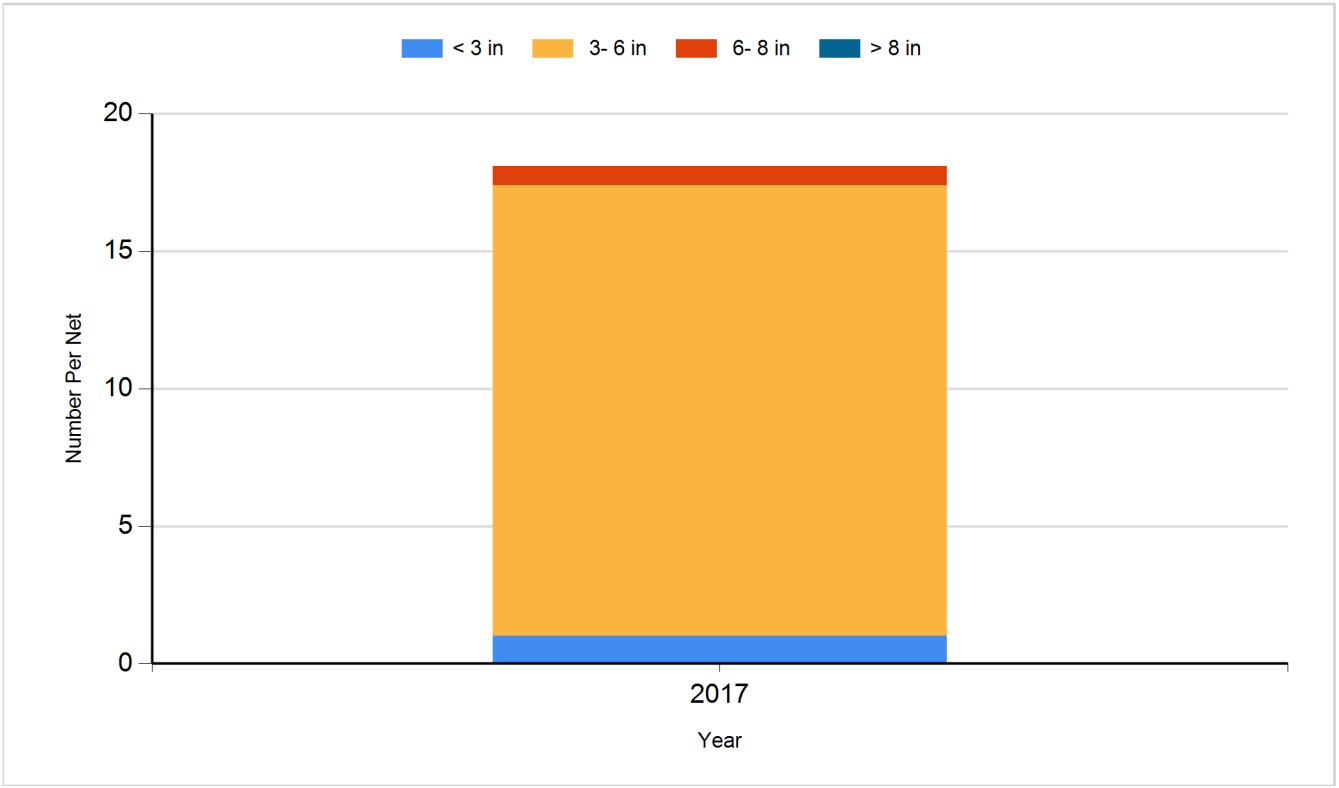
Species: Black Crappie
Gear: AFS std frame net



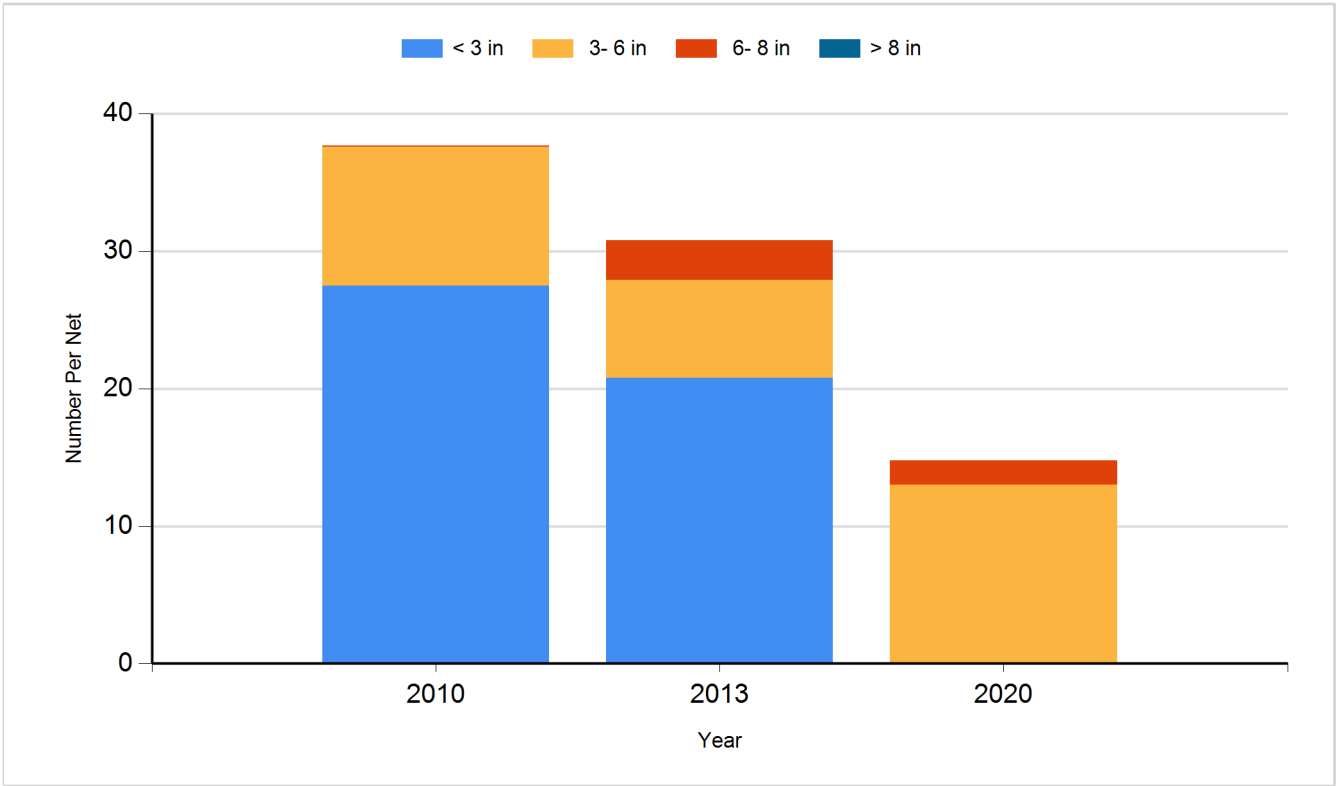
Species: Black Crappie
Gear: frame net (std 3/4 in)



Species: Bluegill
Gear: AFS std frame net



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



Species: Largemouth Bass
Gear: boat shocker (night)