

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Little Moreau #1, Dewey County
LMO-Lake-1058-000
2019

Lake Information

Name:	Little Moreau #1	Maximum Depth:	20 Feet
County:	Dewey	Mean Depth:	10 Feet
Legal Description:	T16-R25-S17		
Surface Area:	34 Acres		

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Sep 10, 2019	3600 seconds
boat shocker (night)	Sep 19, 2019	3600 seconds
frame net (std 3/4 in)	Jun 18, 2019	5 net-nights
frame net (std 3/4 in)	Jun 19, 2019	5 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Yellow Perch

Northern Pike

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.
- **std 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.

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

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.

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

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

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.

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

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	244	29.0	7.9	57	10	50	10	113	2
frame net (std 3/4 in)	Black Crappie	56	5.3	4.6	19	8	0		107	2
	Bluegill	144	14.4	6.9	36	6	1		117	4
	Northern Pike	17	1.7	0.7	100		35	19	91	4
	Yellow Perch	30	2.9	1.3	21	12	3		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										Avg
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
boat shocker (night)	Largemouth Bass	18.0				24.0		70.0		33.0	29.0	34.80
frame net (std 3/4 in)	Black Bullhead	0.1			0.1			0.0			0.0	0.05
	Black Crappie	3.3			1.8			2.1			5.3	3.13
	Bluegill	3.9			9.9			7.9			14.4	9.03
	Green Sunfish	0.1			2.9			0.0			0.0	0.75
	Largemouth Bass	0.1			0.0			0.0			0.0	0.03
	Northern Pike	1.0			2.4			1.4			1.7	1.63
	Yellow Perch	4.6			2.4			2.0			2.9	2.98

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	Year										
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
boat shocker (night)	Largemouth Bass	PSD	92					88		49		76	57
		PSD-P	50				56		30		39	50	
		Wr	121				120		121		105	113	
frame net (std 3/4 in)	Black Crappie	PSD	12			39				52			19
		PSD-P	0			39				10			0
		Wr	99			98				103			107
	Bluegill	PSD	64			4				16			36
		PSD-P	5			1				4			1
		Wr	106			114				125			117
	Largemouth Bass	PSD	100								0		
		PSD-P	100								0		
		Wr	99										
	Northern Pike	PSD	100			88				93			100
		PSD-P	20			33				29			35
		Wr	97			98				98			91
Yellow Perch	PSD	26			25				65			21	
	PSD-P	2			0				5			3	
	Wr	96			97				98			100	

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								
2018	1	1	84																	
2017	2	11	89 (3.4)	128 (2.6)																
2016	3	9	91 (3)	124 (2.6)	161 (3.6)															
2015	4	3	97 (15.7)	139 (17.1)	177 (5.7)	185 (5.5)														
2014	5	10	94 (3.3)	123 (2.9)	143 (2.9)	169 (2.1)	189 (1.4)													
2013	6	1	92	120	146	162	185	196												
2012	7	1	80	104	132	166	175	191	199											
2010	9	1	83	115	140	160	179	197	207	217	233									
Weighted Mean		37	91	125	153	171	187	195	203	217	233									
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20								
2018	1	1																		
2017	2	11																		
2016	3	9																		
2015	4	3																		
2014	5	10																		
2013	6	1																		
2012	7	1																		
2010	9	1																		
Weighted Mean		37																		

Species: Bluegill

Mean back-calculated length (SE) at age

Year Class	Age	N	1	2	3	4	5	6	7	8	9	10
2018	1	6	72 (2.7)									
2017	2	21	70 (2.3)	104 (2.6)								
2016	3	7	83 (4.6)	115 (3.4)	137 (3.5)							
2015	4	5	87 (2.8)	111 (3.8)	133 (3.6)	151 (4.1)						
2014	5	7	90 (3.1)	114 (3.9)	136 (2)	150 (2.8)	163 (2)					
2013	6	4	91 (5.4)	123 (9.7)	143 (9.1)	158 (7)	167 (5.6)	176 (4.1)				
2012	7	2	96 (3.4)	119 (1.4)	137 (2.8)	159 (.3)	165 (1.2)	172 (1.5)	180 (2)			
2011	8	5	87 (3.7)	120 (8.2)	138 (4.6)	151 (4.4)	166 (1.8)	173 (1.7)	180 (1.5)	186 (1.2)		
2010	9	1	79	97	121	129	145	162	172	179	191	
2009	10	1	96	111	125	138	145	153	160	178	188	198
2008	11	1	101	122	148	160	166	174	180	187	195	199
Weighted Mean		60	80	111	137	151	163	172	177	184	191	199
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2018	1	6										
2017	2	21										
2016	3	7										
2015	4	5										
2014	5	7										
2013	6	4										
2012	7	2										
2011	8	5										
2010	9	1										
2009	10	1										
2008	11	1	204									
Weighted Mean		60	204									

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	1	2	103 (5.4)											
2016	3	17	100 (2.3)	137 (3.1)	164 (3)									
2015	4	2	119 (3.6)	165 (17.3)	188 (16.6)	210 (9.9)								
2014	5	2	91 (4.7)	135 (.3)	169 (1.5)	204 (6.7)	237 (7.9)							
2011	8	1	113	150	176	229	281	305	341	375				
2010	9	1	104	146	191	232	253	279	294	317	330			
2008	11	2	117 (2.6)	157 (3.5)	205 (15.3)	229 (18.1)	269 (2)	306 (11.3)	329 (5.2)	352 (7)	370 (1.6)	382 (1)		
2007	12	3	103 (11.4)	146 (2.9)	172 (6.9)	207 (14.7)	271 (16.3)	299 (15.1)	326 (16.1)	348 (12.3)	368 (9.9)	380 (10.9)		
2006	13	2	124 (14.8)	178 (11.8)	231 (19.2)	278 (21.7)	302 (29.3)	344 (19.6)	365 (20.2)	391 (29.7)	407 (33.8)	417 (31.2)		
2005	14	1	102	171	228	246	278	307	347	366	389	402		
Weighted Mean		33	104	145	177	226	270	309	335	359	375	393		

Year Class	Age	N	Mean back-calculated length (SE) at age											
			11	12	13	14	15	16	17	18	19	20		
2018	1	2												
2016	3	17												
2015	4	2												
2014	5	2												
2011	8	1												
2010	9	1												
2008	11	2	394 (1.7)											
2007	12	3	394 (7.6)	408 (6.5)										
2006	13	2	428 (32.4)	440 (35)	449 (36.3)									
2005	14	1	420	440	457	473								
Weighted Mean		33	406	424	452	473								

Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age											
			1	2	3	4	5	6	7	8	9	10		
2017	2	1	91	111										
2016	3	9	97 (1.8)	127 (2.4)	144 (1.9)									
2015	4	7	97 (3.8)	125 (4)	150 (4)	165 (2.5)								
2013	6	2	90 (.5)	141 (1.3)	163 (2.3)	180 (6.5)	194 (7.5)	207 (2.7)						
2012	7	3	96 (3.5)	137 (5.8)	155 (5.7)	169 (4.2)	191 (4.7)	199 (2.8)	209 (1.4)					
2008	11	1	91	122	141	157	180	205	225	235	244	257		
Weighted Mean		23	96	128	149	168	190	203	213	235	244	257		

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2017	2	1										
2016	3	9										
2015	4	7										
2013	6	2										
2012	7	3										
2008	11	1	265									
Weighted Mean		23	265									

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+
2019	54	98 (1)	140 (17)	173 (12)	192 (5)	195 (15)	203 (2)	203 (2)		240 (1)	
2016	21		153 (9)	211 (10)		269 (1)		292 (1)			
2013	18		151 (10)	190 (1)		264 (1)			287 (4)	267 (2)	
2010	39	108 (6)	168 (28)	231 (1)	219 (3)	185 (1)					

Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	144	92 (15)	110 (68)	149 (15)	158 (13)	170 (12)	179 (7)	184 (2)	190 (8)	193 (2)	206 (2)
2016	78		120 (66)	154 (5)	178 (5)	207 (2)					
2013	99		104 (95)	163 (1)			178 (1)	199 (1)		200 (1)	
2010	39		120 (4)	150 (11)	162 (10)	167 (10)	178 (2)	211 (2)			

Species: Largemouth Bass

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	59	120 (2)		195 (25)	235 (7)	265 (4)			391 (1)	350 (1)	436 (19)
2016	80	208 (32)	258 (9)	273 (5)	364 (16)	431 (8)	475 (1)	466 (1)		499 (4)	492 (4)
2014	17	201 (3)		357 (6)		420 (2)	431 (2)	450 (2)	493 (1)	477 (1)	
2010	17	187 (5)	321 (3)	371 (3)	436 (4)			474 (1)		474 (1)	

Fish Condition

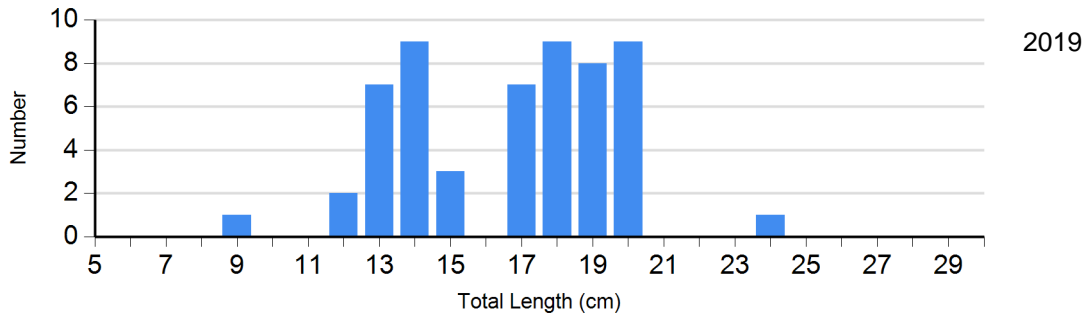
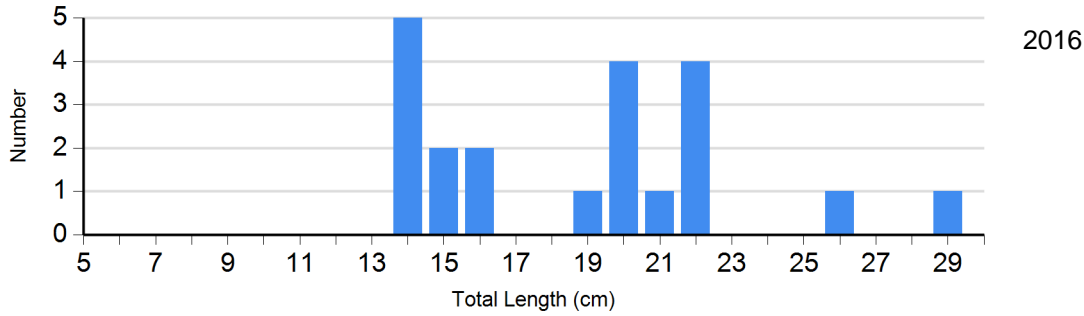
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2016	10	107 (2.4)	9	102 (1.5)	2	90 (0.9)	0	
	2019	43	108 (1.3)	10	103 (1.7)	0		0	
Bluegill Frame Net	2016	66	126 (1.3)	10	128 (4.7)	2	124 (0.3)	1	0
	2019	92	122 (4.3)	50	107 (1.1)	2	111 (4.1)	0	
Largemouth Bass Electro Fishing	2016	36	122 (5.6)	13	115 (1.8)	20	121 (2.3)	1	134
	2018	8	104 (2.0)	12	108 (2.5)	12	102 (8.6)	1	120
	2019	25	121 (2.0)	4	112 (2.5)	28	107 (1.8)	1	112

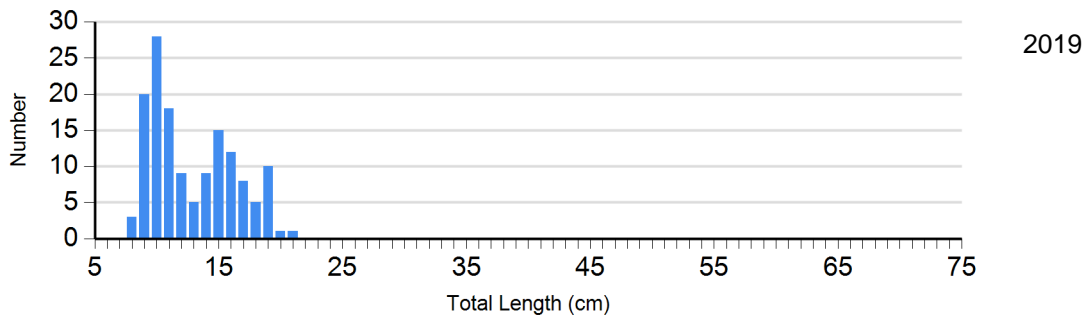
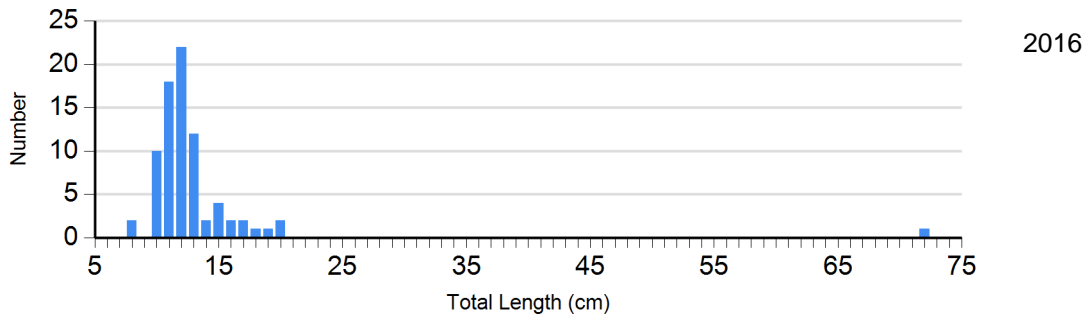
Length Frequency Distribution

Length frequency histogram of species sampled by year.

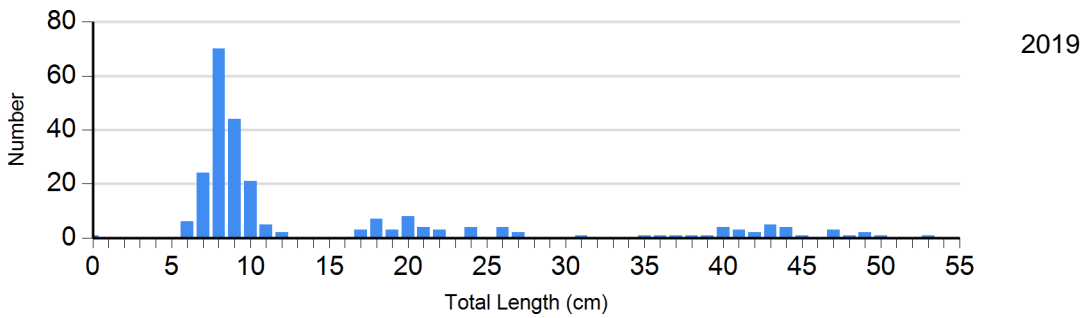
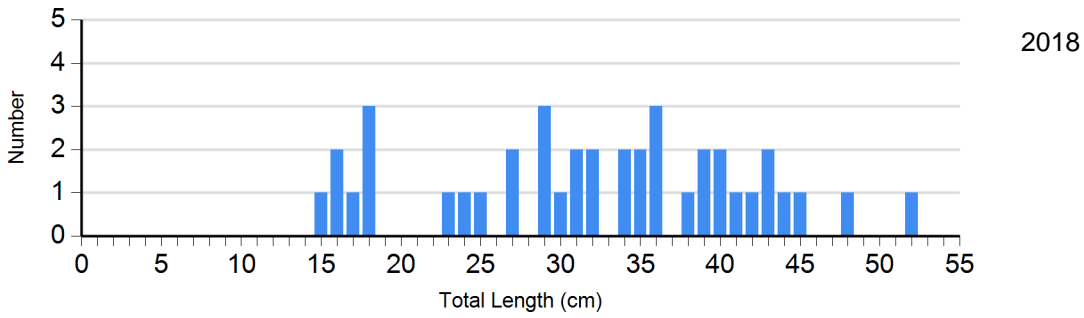
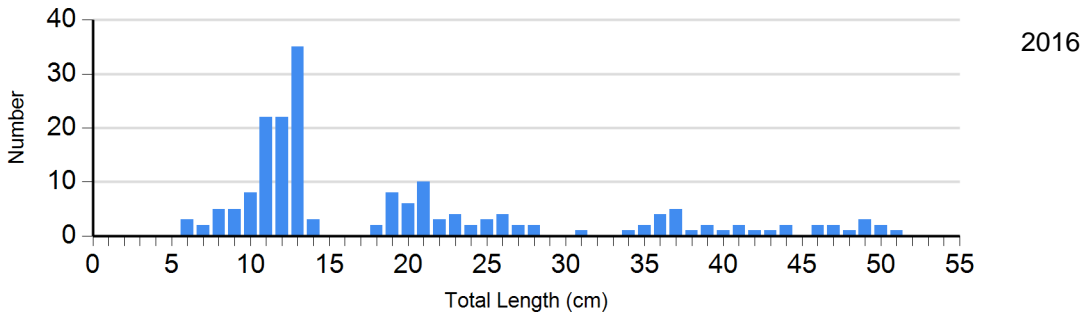
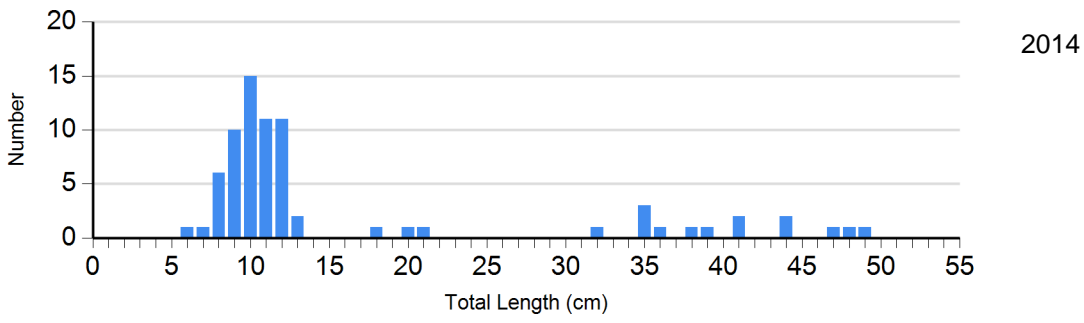
Species: Black Crappie
Gear: frame net (std 3/4 in)



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



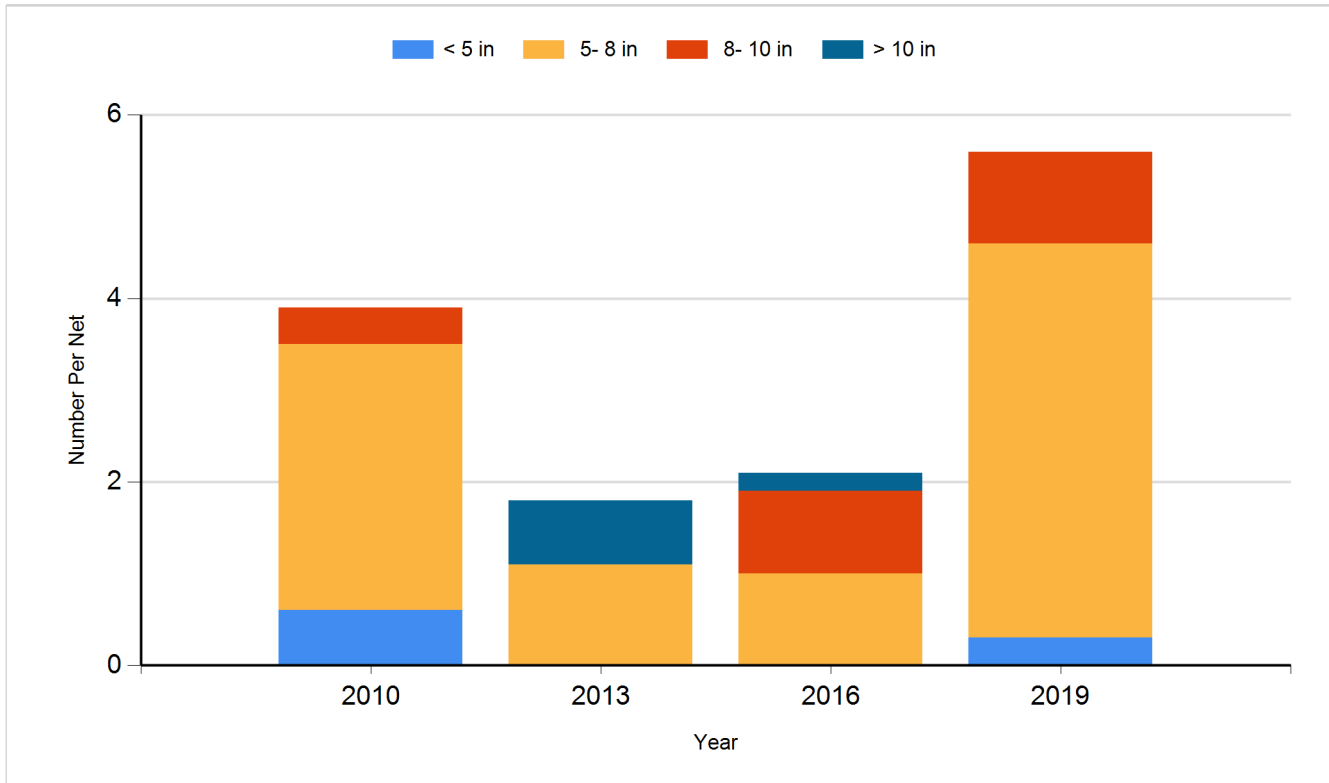
Species: Largemouth Bass
Gear: boat shocker (night)



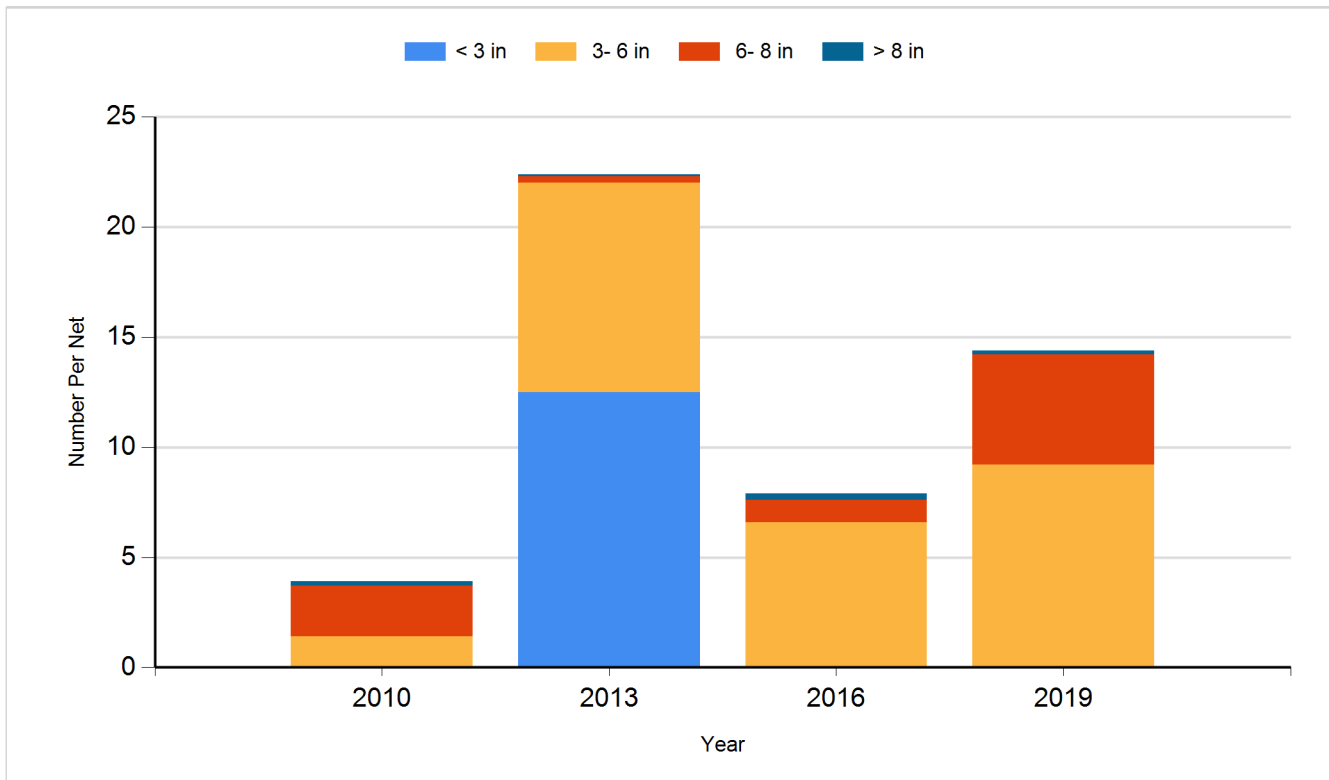
Historic Fish Sizes and Relative Abundance

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

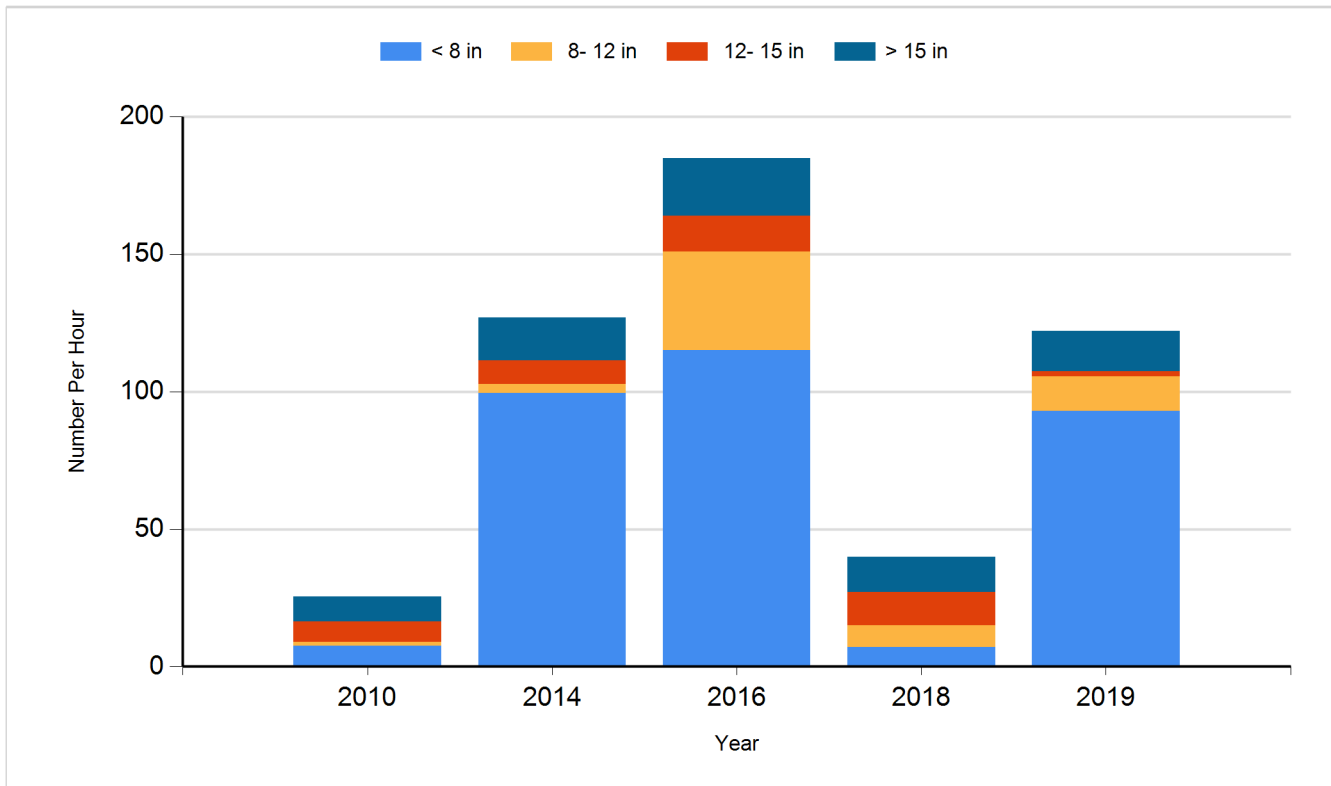
Species: Black Crappie
Gear: frame net (std 3/4 in)



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
2010	Largemouth Bass	Fingerling	3,000
2011	Largemouth Bass	Juvenile	25
2012	Largemouth Bass	Juvenile	100
2013	Largemouth Bass	Fingerling	1,300
2016	Black Crappie	Adult	205
2016	Yellow Perch	Adult	65
2017	Black Crappie	Adult	153