SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
McGee, Corson County
GRA-Lake-513-000
2020

Lake Information

Name:	McGee	**Maximum Depth:**	20 Feet
County:	Corson	**Mean Depth:**	10 Feet
Legal Description:	T23-R23-S36		
Surface Area:	33 Acres		

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Sep 22, 2020	3000 seconds
frame net (std 3/4 in)	Jun 16, 2020	5 net-nights
frame net (std 3/4 in)	Jun 17, 2020	5 net-nights

Common Fish Species Present

Largemouth Bass

Black Crappie

Black Bullhead

Northern Pike

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.

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

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

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.

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

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 (in)	(cm)	Quality (in)	(cm)	Preferred (in)	(cm)	Memorable (in)	(cm)	Trophy (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	34	10.8	5.4	44		44		135	3
frame net (std 3/4 in)	Black Bullhead	151	13.0	3.1	16	5	12	4	100	1
	Black Crappie	21	2.0	0.9	65	17	40	18	113	3
	Largemouth Bass	1	0.1	0.1	100		100		108	
	Northern Pike	23	2.1	0.7	81		33	17	94	2
	Yellow Perch	4	0.4	0.3	75		25		102	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
boat shocker (night)	Largemouth Bass				3.0		32.4		21.0		10.8	16.80
frame net (std 3/4 in)	Black Bullhead			10.0			97.4		9.7		13.0	32.53
	Black Crappie			1.9			2.2		2.5		2.0	2.15
	Largemouth Bass			0.0			0.0		0.1		0.1	0.05
	Northern Pike			1.4			0.6		1.7		2.1	1.45
	Yellow Perch			0.7			0.6		1.1		0.4	0.70

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									
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
boat shocker (night)	Largemouth Bass	PSD				50		67		100		44
		PSD-P				0		44		86		44
		Wr				94		124		120		135
frame net (std 3/4 in)	Black Bullhead	PSD			63			10		100		16
		PSD-P			2			0		5		12
		Wr			92			92		98		100
	Black Crappie	PSD			100			36		92		65
		PSD-P			95			36		44		40
		Wr			102			108		111		113
	Largemouth Bass	PSD								100		100
		PSD-P								100		100
		Wr								119		108
	Northern Pike	PSD			86			50		88		81
		PSD-P			57			50		47		33
		Wr			83			86		90		94
	Yellow Perch	PSD			29			50		18		75
		PSD-P			14			33		0		25
		Wr			110			94		106		102

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	1	84									
2018	2	5	106 (2.6)	143 (2.1)								
2017	3	5	112 (2.3)	143 (1.9)	187 (4.9)							
2016	4	1	100	138	172	202						
2013	7	2	114 (4.7)	136 (7.4)	166 (8.8)	188 (3.5)	201 (4.1)	220 (1.1)	247 (2.5)			
2012	8	3	128 (5.6)	152 (15.2)	167 (13.3)	181 (19.3)	212 (14.3)	224 (19.5)	239 (17)	245 (19.9)		
2011	9	3	119 (8.2)	155 (7.1)	187 (5.4)	201 (6.5)	223 (5)	242 (6)	255 (6.1)	271 (5.1)	287 (3)	
2009	11	1	122	158	184	204	215	241	267	277	291	315
Weighted Mean		21	113	146	179	193	214	231	249	261	288	315

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	1	1										
2018	2	5										
2017	3	5										
2016	4	1										
2013	7	2										
2012	8	3										
2011	9	3										
2009	11	1	328									
Weighted Mean		21	328									

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	12	100 (2.2)									
2017	3	3	100 (3.7)	133 (9.2)	174 (14.3)							
2016	4	3	113 (8.7)	148 (8.5)	182 (10.2)	219 (12.2)						
2009	11	4	132 (9.5)	190 (10.5)	226 (16)	253 (16.8)	287 (15.4)	315 (20.5)	339 (18.7)	363 (17)	381 (17)	399 (15.3)
Weighted Mean		22	108	160	197	238	287	315	339	363	381	399

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	1	12										
2017	3	3										
2016	4	3										
2009	11	4	424 (10.4)									
Weighted Mean		22	424									

Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2019	1	1	117									
2017	3	1	131	172	195							
2015	5	2	139 (22.2)	169 (27.2)	196 (15.7)	218 (14.9)	233 (15.7)					
Weighted Mean		4	132	170	196	218	233					

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

Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Black Crappie

Year	N	Mean Length (expanded sample number) at capture by age

Year	N	1	2	3	4	5	6	7	8	9	10+
2020	21	91 (1)	157 (5)	201 (5)	216 (1)			255 (2)	258 (3)	304 (3)	335 (1)
2018	26	94 (1)	141 (2)		233 (1)	228 (7)	246 (4)	259 (1)	331 (1)	324 (6)	325 (3)
2016	24		135 (3)	162 (13)	251 (1)	275 (1)	314 (5)		313 (1)		
2013	19					284 (2)	267 (4)	277 (4)	284 (6)	276 (1)	276 (1)

Species: Largemouth Bass

| Year	N	1	2	3	4	5	6	7	8	9	10+
		Mean Length (expanded sample number) at capture by age								
2020	30	119 (20)		205 (3)	239 (3)						436 (4)
2018	8	133 (1)					342 (1)	428 (4)	499 (1)		527 (1)
2016	35	171 (8)	211 (1)	293 (11)	364 (5)	425 (5)	446 (2)			484 (2)	544 (1)
2014	32	143 (29)	196 (2)		368 (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	2016	14	117 (2.1)	0		2	105 (2.7)	6	90 (2.4)
	2018	2	128 (7.2)	12	118 (1.1)	1	111	10	99 (1.8)
	2020	7	121 (4.6)	5	114 (2.1)	4	109 (3.0)	4	103 (1.4)
Largemouth Bass Electro Fishing	2016	9	122 (4.4)	6	121 (2.6)	11	127 (3.0)	1	110
	2018	0		1	122	5	121 (4.1)	1	116
	2020	5	133 (2.8)	0		4	137 (5.1)	0	

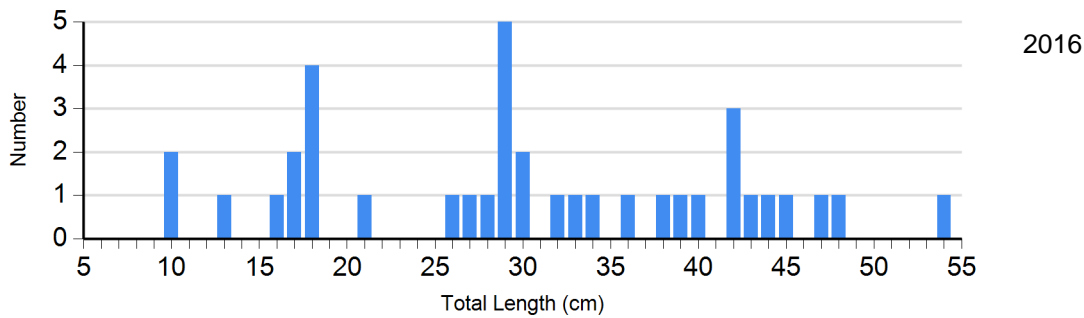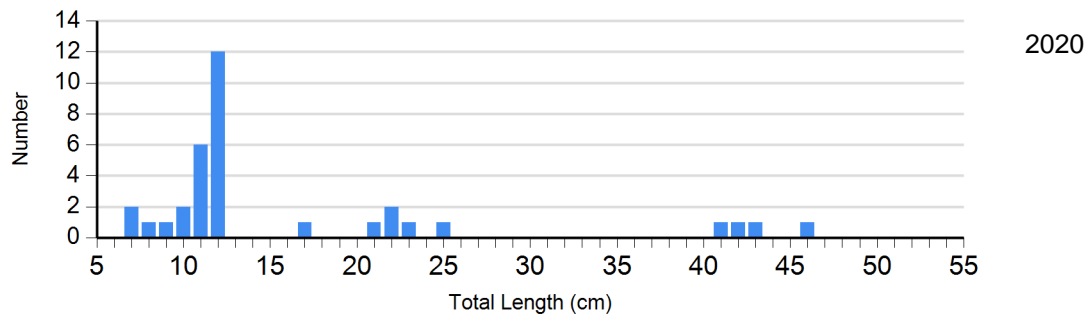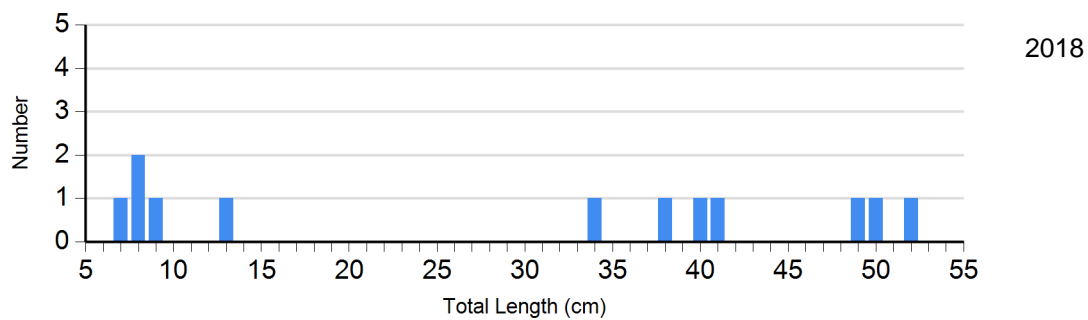# Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

2016

2018

2020

Species: Largemouth Bass
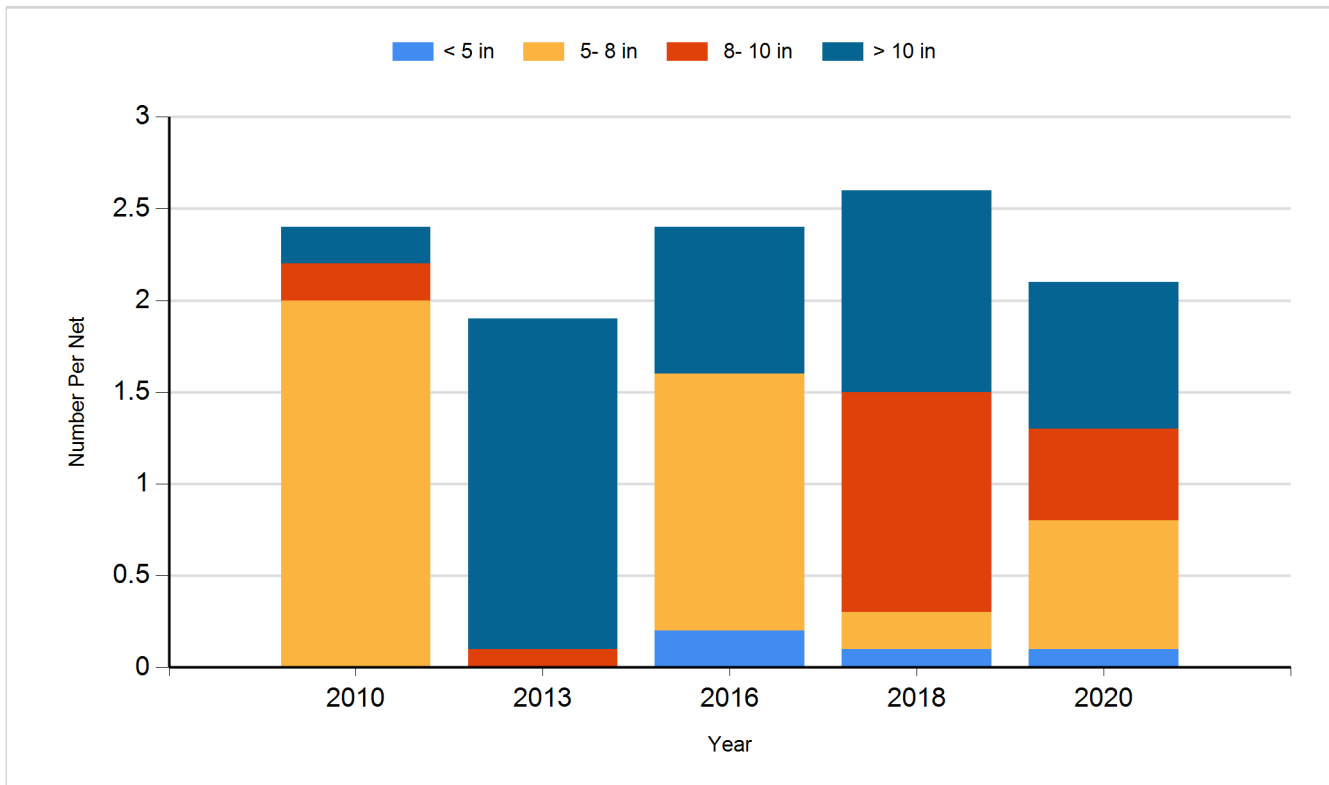Gear: boat shocker (night)

2016

2018

2020
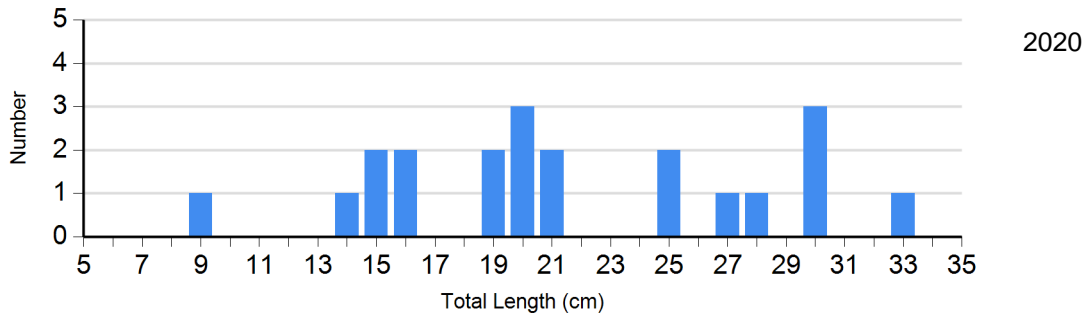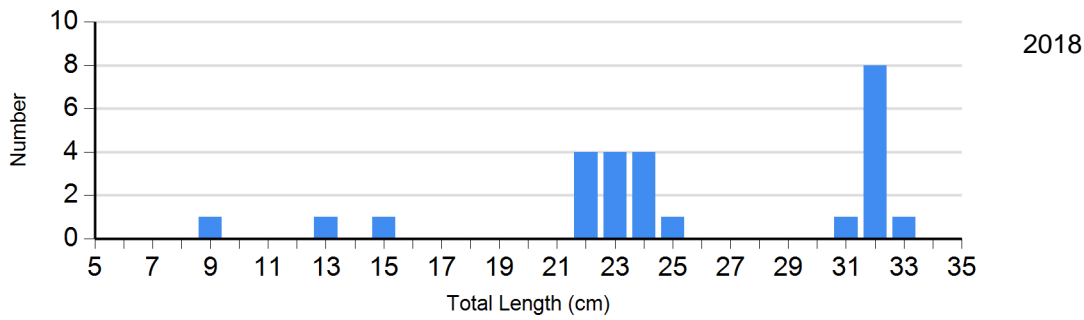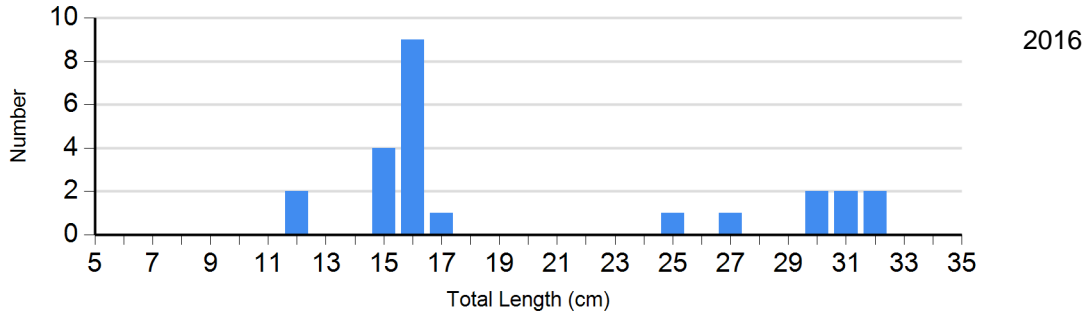
Historic Fish Sizes and Relative Abundance

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

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

Species: Largemouth Bass
Gear: boat shocker (night)