SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Mallard, Corson County
GRA-Lake-993-000
2018

Lake Information

Name: Mallard

County: Corson

Legal Description: T22-R21-S2

Surface Area: 34 Acres

Maximum Depth: 16 Feet

Mean Depth: 7 Feet

Surveys and Investigations

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

Gear	Date	Effort
frame net (std 3/4 in)	Jun 13, 2018	5 net-nights
frame net (std 3/4 in)	Jun 14, 2018	5 net-nights

Common Fish Species Present

Black Crappie

Largemouth Bass

Northern Pike

Yellow Perch

Channel Catfish

Black Bullhead

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
frame net (std 3/4 in)	Black Bullhead	1	0.1	0.1	100		0		88	
	Black Crappie	298	19.0	4.9	15	4	2		100	1
	Channel Catfish	1	0.1	0.1	100		100		101	
	Largemouth Bass	1	0.1	0.1	100		100		101	
	Northern Pike	7	0.7	0.6	100		100		90	4
	Yellow Perch	5	0.5	0.4	80		0		84	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.

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
boat shocker (day)	Largemouth Bass							48.0				48.0
frame net (std 3/4 in)	Black Bullhead	2.3			9.3			1.6			0.1	3.3
	Black Crappie	4.1			8.0			8.6			19.0	9.9
	Channel Catfish	1.2			0.0			0.2			0.1	0.4
	Golden Shiner				0.0							0.0
	Largemouth Bass	0.1									0.1	0.1
	Northern Pike	1.3			0.9						0.7	1.0
	Orangespotted Sunfish				0.0							0.0
	Pumpkinseed							0.8				0.8
	Yellow Perch	0.2			0.2			1.1			0.5	0.5

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
boat shocker (day)	Largemouth Bass	PSD							13			
		PSD-P							8			
		Wr							110			
frame net (std 3/4 in)	Black Bullhead	PSD	22			65			81			100
		PSD-P	0			0			6			0
		Wr	90			88			88			88
	Black Crappie	PSD	7			36			38			15
		PSD-P	0			1			10			2
		Wr	105			99			105			100
	Channel Catfish	PSD	67			0			100			100
		PSD-P	0			0			0			100
		Wr	87						84			101
	Largemouth Bass	PSD	100									100
		PSD-P	100									100
		Wr	104									101
	Northern Pike	PSD	92			100						100
		PSD-P	69			67						100
		Wr	90			88						90
	Yellow Perch	PSD	50			0			9			80
		PSD-P	0			0			0			0
		Wr	94			90			103			84

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	1	13	88 (3.4)									
2016	2	13	94 (2.1)	116 (4)								
2015	3	27	98 (1.9)	130 (3.1)	150 (3.2)							
2014	4	4	100 (3.4)	136 (5.8)	162 (3.5)	182 (3.1)						
2013	5	5	102 (3.4)	131 (5.1)	156 (4.5)	179 (4.9)	196 (4.5)					
2012	6	4	117 (3.6)	151 (3.7)	173 (6)	192 (6.3)	213 (6.9)	227 (7.3)				
2011	7	1	102	117	131	159	173	189	208			
2010	8	3	108 (7.2)	129 (8.3)	152 (11.8)	173 (10.2)	193 (10.3)	218 (5.2)	239 (5.7)	254 (3.8)		
Weighted Mean		70	97	129	154	181	199	219	231	254		

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2017	1	13										
2016	2	13										
2015	3	27										
2014	4	4										
2013	5	5										
2012	6	4										
2011	7	1										
2010	8	3										
Weighted Mean		70										

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+
2018	298	108 (53)	124 (75)	166 (133)	196 (12)	210 (12)	231 (7)	214 (3)	265 (3)		
2015	100	89 (3)	138 (63)	193 (2)	231 (3)	230 (9)	244 (4)	249 (13)	252 (5)		
2012	99	91 (6)	128 (21)	151 (1)	172 (20)	186 (17)	202 (10)	213 (15)	215 (5)	240 (4)	284 (1)
2009	100	95 (4)	124 (72)	167 (10)	182 (9)	202 (4)	241 (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+
2015	43	157 (19)	235 (22)				422 (1)		484 (1)		

Fish Condition

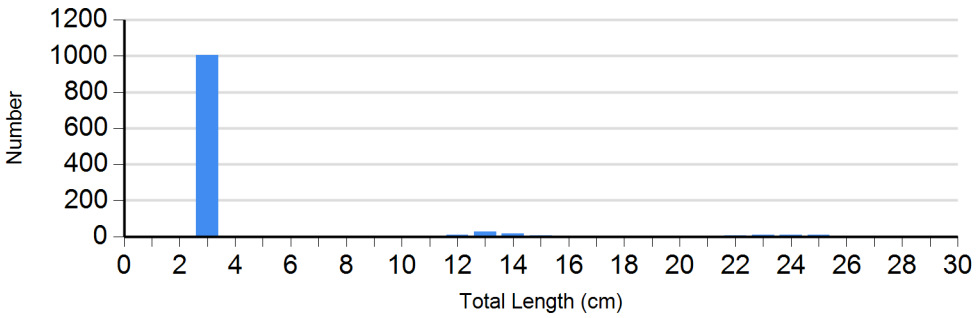
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2015	53	114 (1.4)	24	91 (1.3)	9	90 (2.2)	0	
	2018	161	101 (0.6)	26	95 (1.4)	3	85 (3.4)	0	
Largemouth Bass Electro Fishing	2015	21	109 (1.5)	1	117	2	118 (2.3)	0	

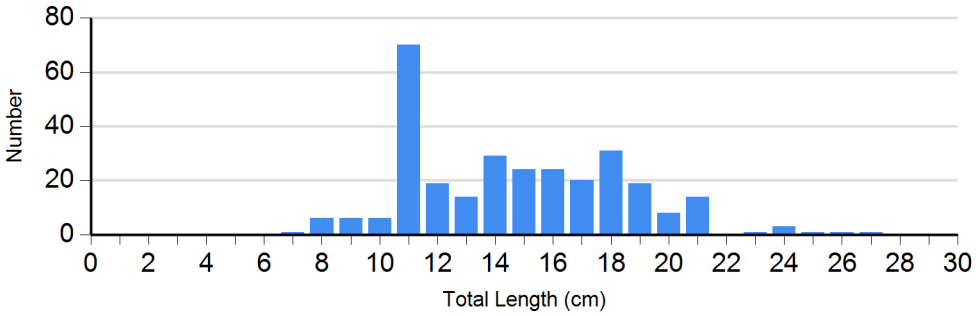
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

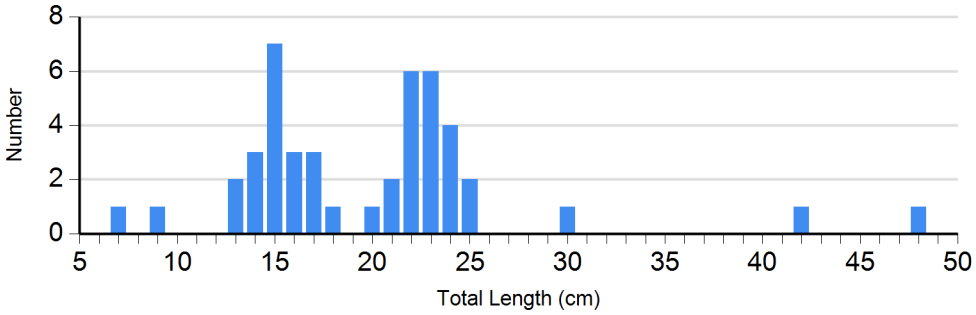


2015



2018

Species: Largemouth Bass
Gear: boat shocker (day)

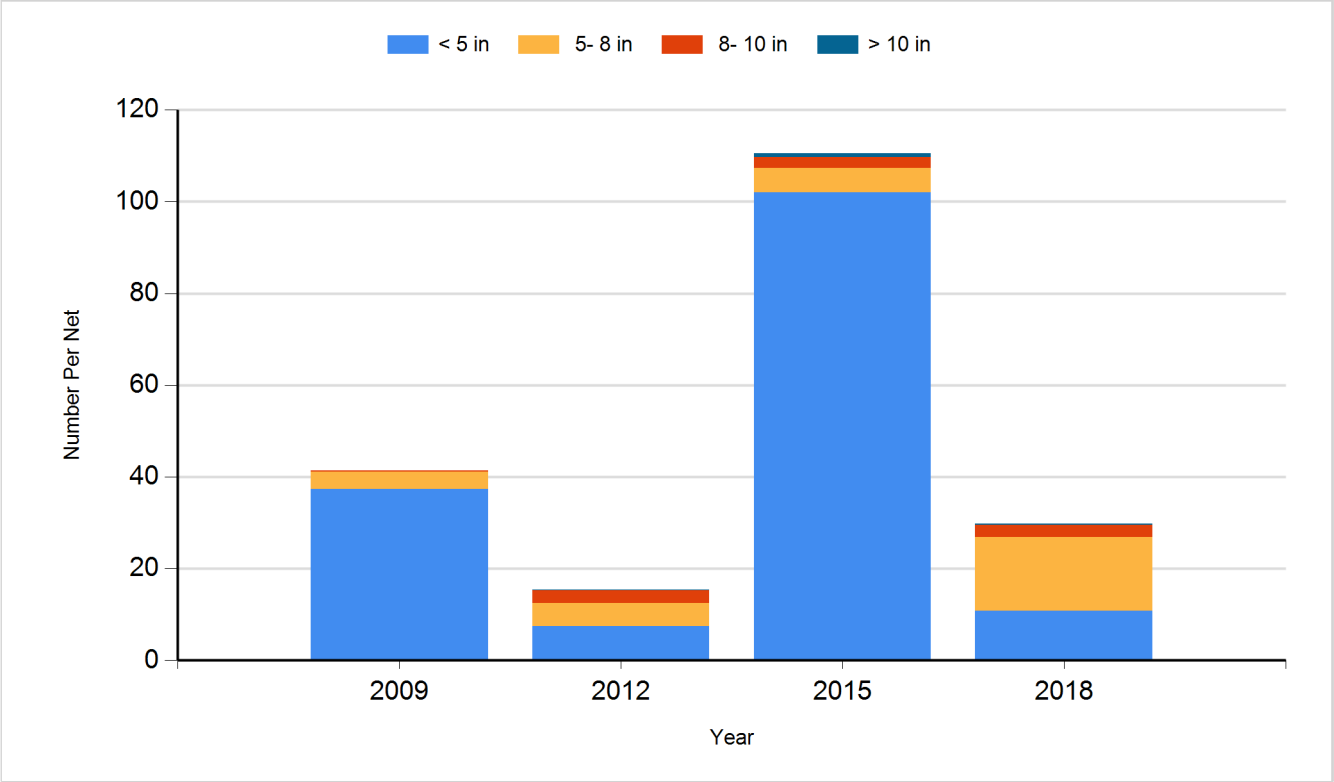


2015

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 (day)