2023 Mission Dam Survey Summary

Stephan Mission Dam is located west of Mac's Corner just off Highway 34. It is a 57-acre lake with a mean depth of 6 feet and maximum depth of 17 feet. Fishing access at Mission consists of a two-track dirt road and single rock boat ramp. The upper third of the lake closest to the inlet has become too silted in for boat passage. Shore fishing is possible around much of the pond. Mission is managed as a multi-species fishery consisting of panfish Black Bullhead, Black Crappie, Channel Catfish, Common Carp, and Green Sunfish. Sampling occurs every three years, consisting of frame netting in late spring.

- **Channel Catfish:** The catch rate of Channel Catfish in 2023 was 0.3 fish per frame net. Condition was good with a relative weight (Wr) of 99 and 33% of fish were at or longer than 11 inches.

- **Black Bullhead:** The catch rate of Black Bullhead in 2023 was 12.7 fish per frame net. Of the Black Bullhead sampled, 37% were 6 inches or larger, with 0% larger than 9 inches. Black Bullhead condition was good with a relative weight (Wr) of 91.

- **Green Sunfish:** The catch rate of Green Sunfish in 2023 was 4.2 fish per frame net. Of the Green Sunfish sampled, the majority were less than 3 inches total length. Condition was excellent with a relative weight (Wr) 129.

In 2020, 253 adult Channel Catfish were stocked.

Created 02/06/2024 by Liz Renner

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Mission, Hyde County
CRW-Lake-891-000
2023

Lake Information

Name: Mission

County: Hyde

Legal Description: T109-R71-S18

Surface Area: 57 Acres

Maximum Depth: 17 Feet

Mean Depth: 6 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std frame net	Jun 05, 2023	10 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

Green Sunfish

Common Carp

Channel Catfish

Catfish

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
AFS std frame net	Black Bullhead	139	12.7	5.5	37	6	0		91	1
	Black Crappie	1	0.1	0.1	0		0		171	
	Bullhead	51	0.0	0.0						
	Catfish	1	0.0	0.0						
	Channel Catfish	11	0.3	0.3	33		0		99	6
	Common Carp	5	0.5	0.4	60		0		84	3
	Green Sunfish	43	4.2	1.7	7		0		129	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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
AFS std frame net	Black Bullhead										12.7	12.70
	Black Crappie										0.1	0.10
	Bullhead										0.0	0.00
	Catfish										0.0	0.00
	Channel Catfish										0.3	0.30
	Common Carp										0.5	0.50
	Green Sunfish										4.2	4.20
frame net (std 3/4 in)	Black Bullhead		8.2				21.3					14.75
	Black Crappie		1.6				0.3					0.95
	Bluegill		0.0				0.0					0.00
	Channel Catfish		0.0				0.0					0.00
	Common Carp		0.4				2.1					1.25
	Green Sunfish		0.1				0.3					0.20
	Northern Pike		0.1				0.0					0.05
	Smallmouth Bass		0.0				0.0					0.00
	Walleye		1.1				0.0					0.55
	Yellow Perch		0.3				0.0					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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std frame net	Black Bullhead	PSD										37
		PSD-P										0
		Wr										91
	Black Crappie	PSD										0
		PSD-P										0
		Wr										171
	Channel Catfish	PSD										33
		PSD-P										0
		Wr										99
	Common Carp	PSD										60
		PSD-P										0
		Wr										84
	Green Sunfish	PSD										7
		PSD-P										0
		Wr										129
frame net (std 3/4 in)	Black Bullhead	PSD		32				89				
		PSD-P		12				14				
		Wr		85				85				
	Black Crappie	PSD		100				100				
		PSD-P		100				100				
		Wr		101				95				
	Common Carp	PSD		75				48				
		PSD-P		25				0				
		Wr		79				70				
	Green Sunfish	PSD		100				33				
		PSD-P		0				0				
		Wr		121				133				

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+
2015	16						319 (7)	295 (6)	293 (3)		

Fish Condition

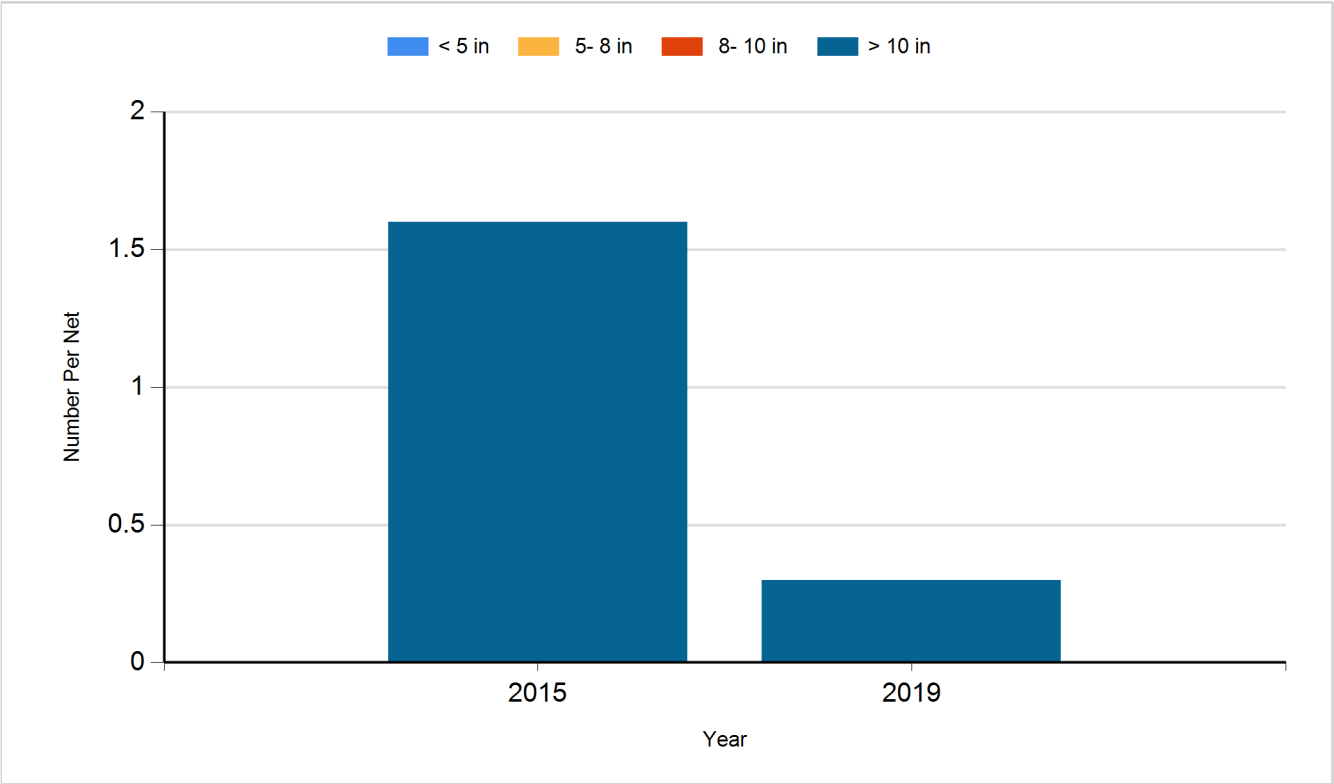
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2019	0		0		0		3	95 (4.8)
	2023	1	171	0		0		0	

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)



Fish Stocking

Number of fish stocked by year, species, and size.

Year	Species	Size	Number
2013	Yellow Perch	Adult	200
2020	Channel Catfish	Adult	253