SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Glad Valley Dam, Ziebach County
GRA-Lake-271-000
2021

Lake Information

Name: Glad Valley Dam

County: Ziebach

Surface Area: 25 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 09, 2021	2 net-nights
frame net (std 3/4 in)	Jun 09, 2021	5 net-nights

Common Fish Species Present

Yellow Perch

Black Bullhead

Largemouth Bass

Green Sunfish

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 gill net	Black Bullhead	4	2.0	0.0						
	Largemouth Bass	6	3.0	6.2	100		50		108	6
	Yellow Perch	98	49.0	3.2						
frame net (std 3/4 in)	Black Bullhead	18	3.6	3.3	100		94		101	4
	Green Sunfish	3	0.6	0.4	33		33		112	11
	Largemouth Bass	19	2.8	1.9	71		57	22	99	2
	Yellow Perch	122	24.4	20.5	52	6	10	4	88	1

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg
AFS std frame net	Black Bullhead						5.5					5.50
	Green Sunfish						1.2					1.20
	Largemouth Bass						0.4					0.40
	Yellow Perch						1.2					1.20
AFS std gill net	Black Bullhead						4.5				2.0	3.25
	Largemouth Bass						0.5				3.0	1.75
	Yellow Perch						13.0				49.0	31.00
frame net (std 3/4 in)	Black Bullhead										3.6	3.60
	Green Sunfish										0.6	0.60
	Largemouth Bass										2.8	2.80
	Yellow Perch										24.4	24.40
rod and reel	Largemouth Bass				1.8							1.80

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFS std frame net	Black Bullhead	PSD						98				
		PSD-P						62				
		Wr						99				
	Green Sunfish	PSD						100				
		PSD-P						58				
		Wr						129				
	Largemouth Bass	PSD						50				
		PSD-P						0				
		Wr						98				
	Yellow Perch	PSD						92				
		PSD-P						42				
		Wr						105				
AFS std gill net	Black Bullhead	PSD						100				
		PSD-P						83				
		Wr						108				
	Largemouth Bass	PSD						0				100
		PSD-P						0				50
		Wr						111				108
	Yellow Perch	PSD						98				
		PSD-P						83				
		Wr						101				
frame net (std 3/4 in)	Black Bullhead	PSD										100
		PSD-P										94
		Wr										101
	Green Sunfish	PSD										33
		PSD-P										33
		Wr										112
	Largemouth Bass	PSD										71
		PSD-P										57
		Wr										99
	Yellow Perch	PSD										52
		PSD-P										10

			Year									
Gear	Species	Index	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
frame net (std 3/4 in)	Yellow Perch	Wr										88
rod and reel	Largemouth Bass	PSD				71						
		PSD-P				14						
		Wr				106						

Back-Calculated Lengths

Mean species back-calculated total length (mm) at age, standard error (SE), and sample size (N).

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	2	8	137 (8.2)	179 (6.5)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)
2018	3	1	130	212	237	20	20	20	20	20	20	20
2016	5	1	108	192	230	254	283	20	20	20	20	20
2016	5	1	133	205	266	292	328	20	20	20	20	20
2015	6	2	111 (3.3)	186 (20.2)	229 (10.3)	264 (4.1)	301 (8.2)	341 (9.2)	20 (0)	20 (0)	20 (0)	20 (0)
2014	7	1	118	164	197	250	314	335	359	20	20	20
2013	8	1	134	185	233	283	308	332	357	371	20	20
2013	8	2	108 (2.8)	185 (13)	251 (10.9)	293 (6.9)	325 (2.2)	349 (2)	373 (7.7)	386 (7.9)	20 (0)	20 (0)
2012	9	2	122 (13.3)	186 (11.1)	229 (18.1)	285 (3.2)	311 (3.7)	325 (6.2)	350 (3.2)	373 (2.3)	391 (4.3)	20 (0)
2011	10	1	103	151	196	239	280	312	336	354	377	393
2011	10	1	115	182	215	247	271	318	341	364	376	393
2010	11	2	111 (5.2)	166 (6)	202 (5.7)	234 (9.7)	272 (4.6)	301 (9.4)	324 (6.2)	344 (10.5)	369 (15.6)	384 (16.2)
2009	12	1	90	143	183	212	265	297	310	333	354	370
2009	12	1	121	181	236	298	355	387	398	428	455	479
Weighted Mean		25	122	180	224	264	301	330	350	369	385	401

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	2	8	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)
2018	3	1	20	20	20	20	20	20	20	20	20	20
2016	5	1	20	20	20	20	20	20	20	20	20	20
2016	5	1	20	20	20	20	20	20	20	20	20	20
2015	6	2	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)

2014	7	1	20	20	20	20	20	20	20	20	20	20
2013	8	1	20	20	20	20	20	20	20	20	20	20
2013	8	2	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)
2012	9	2	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)
2011	10	1	20	20	20	20	20	20	20	20	20	20
2011	10	1	20	20	20	20	20	20	20	20	20	20
2010	11	2	404 (8.1)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)	20 (0)
2009	12	1	394	405	20	20	20	20	20	20	20	20
2009	12	1	494	504	20	20	20	20	20	20	20	20
Weighted Mean		25	424	455								

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	2	3	79 (5)	140 (3)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2018	3	29	90 (1.4)	148 (2.8)	179 (3.3)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2017	4	12	92 (6.2)	160 (3.1)	200 (4.4)	227 (4.8)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2016	5	9	91 (4.3)	139 (6.9)	179 (7.3)	214 (6.2)	236 (6.7)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2015	6	4	92 (3)	158 (12.2)	204 (12.7)	240 (11.8)	269 (9.1)	289 (7.8)	30 (0)	30 (0)	30 (0)	30 (0)
2014	7	1	104	158	214	253	291	312	332	30	30	30
2013	8	2	99 (5.6)	144 (6.4)	186 (3.9)	212 (6.6)	240 (6.8)	272 (13.7)	285 (11.9)	295 (13.3)	30 (0)	30 (0)
Weighted Mean		60	91	149	186	225	248	287	301	295		

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	2	3	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2018	3	29	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2017	4	12	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2016	5	9	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2015	6	4	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
2014	7	1	30	30	30	30	30	30	30	30	30	30
2013	8	2	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)	30 (0)
Weighted Mean		60										

Length at Capture

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

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	52		216 (6)	249 (7)		297 (22)	298 (14)	273 (2)			

Fish Condition

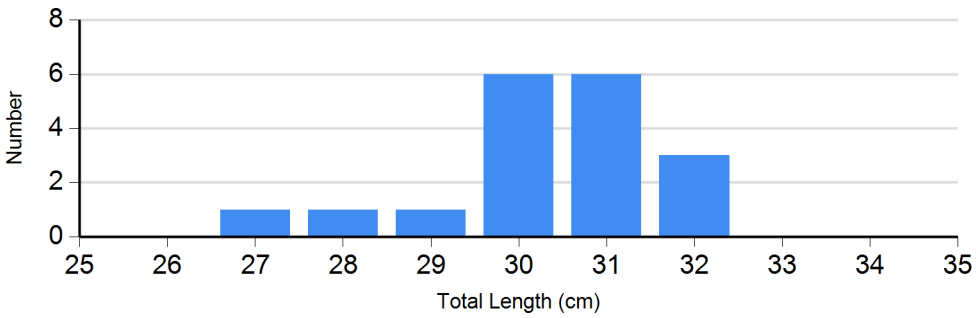
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2017	0		3	112 (10.3)	15	107 (3.6)	0	
Yellow Perch Gill Net	2017	1	93	8	113 (9.7)	26	103 (2.0)	17	92 (1.4)

Length Frequency Distribution

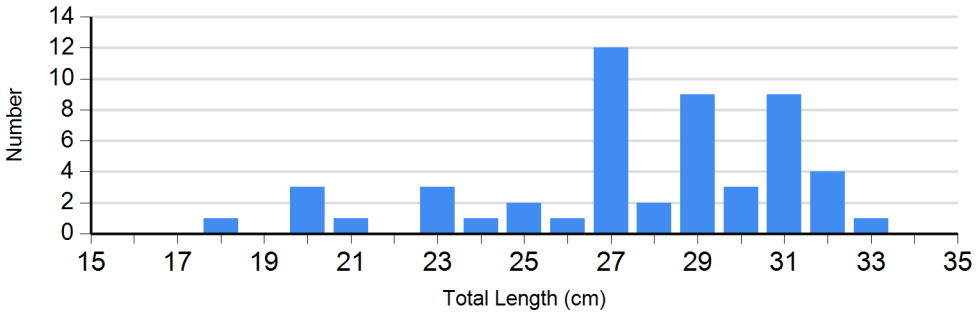
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



2017

Species: Yellow Perch
Gear: AFS std gill net

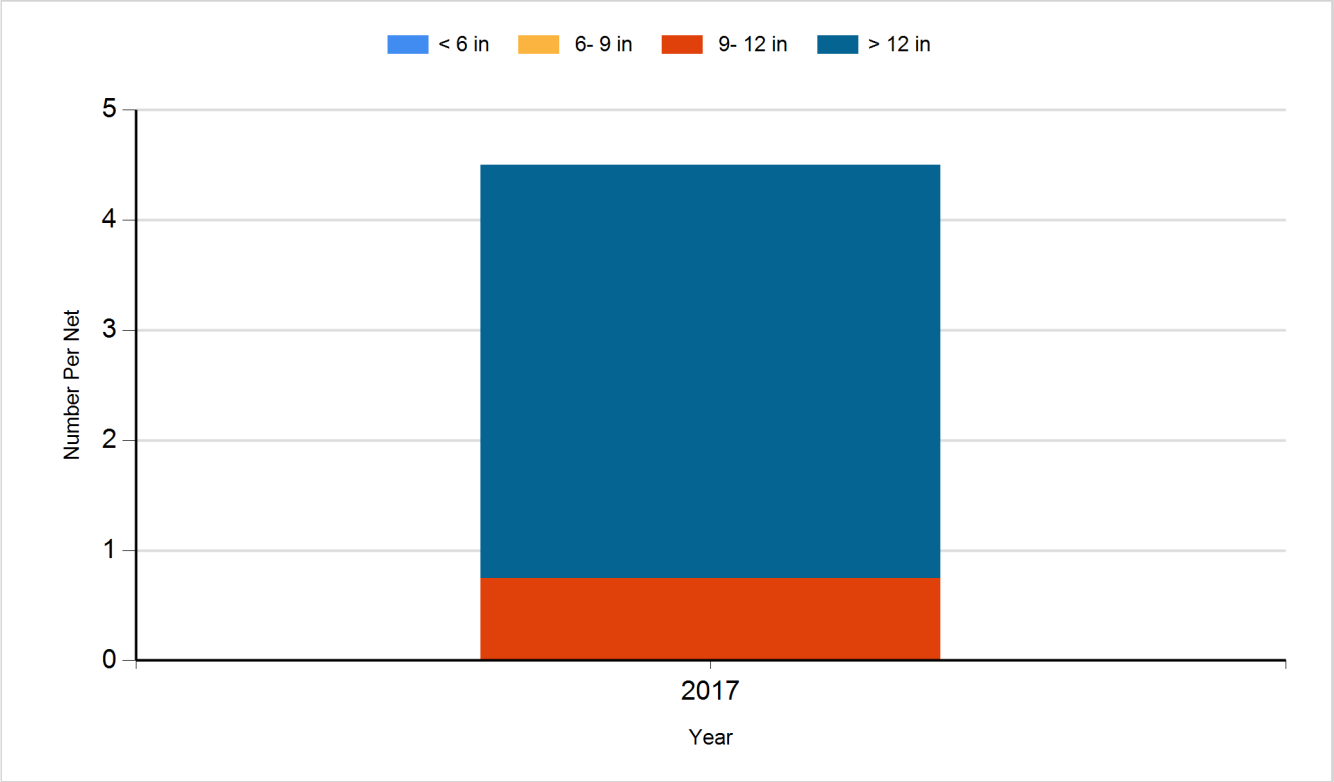


2017

Historic Fish Sizes and Relative Abundance

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

Species: Black Bullhead
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net