

Sylvan Lake

Sylvan Lake is a 19-acre lake located 6.8 miles north of Custer on Sylvan Lake Road. It is located within Custer State Park so a state park pass is required to fish. Sylvan's primary species are Rainbow Trout, Tiger Trout and Yellowstone Cutthroat Trout. The secondary species are Golden Shiner, Fathead Minnow and Johnny Darter.

Rainbow trout. Sylvan Lake gets stocked with Rainbow Trout on a yearly basis. In 2023, 9,195 Rainbow Trout were stocked. The surveys averaged 17.5 rainbow trout in the frame nets with most of the fish in the 14–16-inch range.

Yellowstone Cutthroat Trout. Yellowstone Cutthroat Trout were recently introduced into Sylvan Lake. In 2022, 2,164 cutthroat were stocked with an average size of 15 inches. The surveys averaged 13 cutthroat trout per net in 2023.

Tiger Trout. Tiger Trout were introduced into Sylvan Lake in 2022. In 2023, 1,313 Tiger Trout were stocked at an average length of 11 inches.

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Sylvan, Custer County
MCS-Lake-4-000
2023

Lake Information

Name: Sylvan
County: Custer
Surface Area: 19 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std frame net	Jun 20, 2023	2 net-nights
miniature frame net	Jun 20, 2023	1 net-nights
purse seine	Jun 20, 2023	1 hauls

Common Fish Species Present

Rainbow Trout

Fathead Minnow

Johnny Darter

Golden Shiner

Tiger Trout

Bluegill

Cutthroat Trout (lentic)

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
AFS std frame net	Bluegill	1	0.5	1.5	100		100		100
	Cutthroat Trout (lentic)	26	0.0	0.0					
	Golden Shiner	686	0.0	0.0					
	Rainbow Trout	37	17.5	4.6	3		0	73	3
miniature frame net	Fathead Minnow	1	0.0						
	Golden Shiner	20	0.0						
	Tiger Trout	1	0.0						
purse seine*	Fathead Minnow	74	74.0						
	Golden Shiner	4	4.0						
	Johnny Darter	33	33.0						
	Tiger Trout	1	1.0						

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

Gear	Species	CPUE										Avg
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
AFS std frame net	Bluegill								0.0		0.5	0.25
	Creek Chub								0.0		0.0	0.00
	Cutthroat Trout (lentic)								0.0		0.0	0.00
	Golden Shiner								0.0		0.0	0.00
	Rainbow Trout								0.0		17.5	8.75
backpack shocker	Fathead Minnow			0.0								0.00
	Iowa Darter			0.0								0.00
frame net (1/4 inch)	Fathead Minnow			0.0								0.00
frame net (std 3/4 in)	Golden Shiner			0.0					0.0			0.00
	Rainbow Trout			5.5					2.0			3.75
miniature frame net	Fathead Minnow										0.0	0.00
	Golden Shiner										0.0	0.00
	Tiger Trout										0.0	0.00
minnow trap	Fathead Minnow			0.0								0.00
purse seine*	Fathead Minnow								13.0		74.0	43.50
	Golden Shiner								0.0		4.0	2.00
	Iowa Darter								1.0		0.0	0.50
	Johnny Darter								0.0		33.0	16.50
	Tiger Trout								0.0		1.0	0.50
std exp gill net	Rainbow Trout			8.5								8.50

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										
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
AFS std frame net	Bluegill	PSD											100
		PSD-P											100
		Wr											100
	Rainbow Trout	PSD											3
		PSD-P											0
		Wr											73
frame net (std 3/4 in)	Rainbow Trout	PSD			0						0		
		PSD-P			0						0		
		Wr			68						66		
std exp gill net	Rainbow Trout	PSD			0								
		PSD-P			0								
		Wr			82								

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).

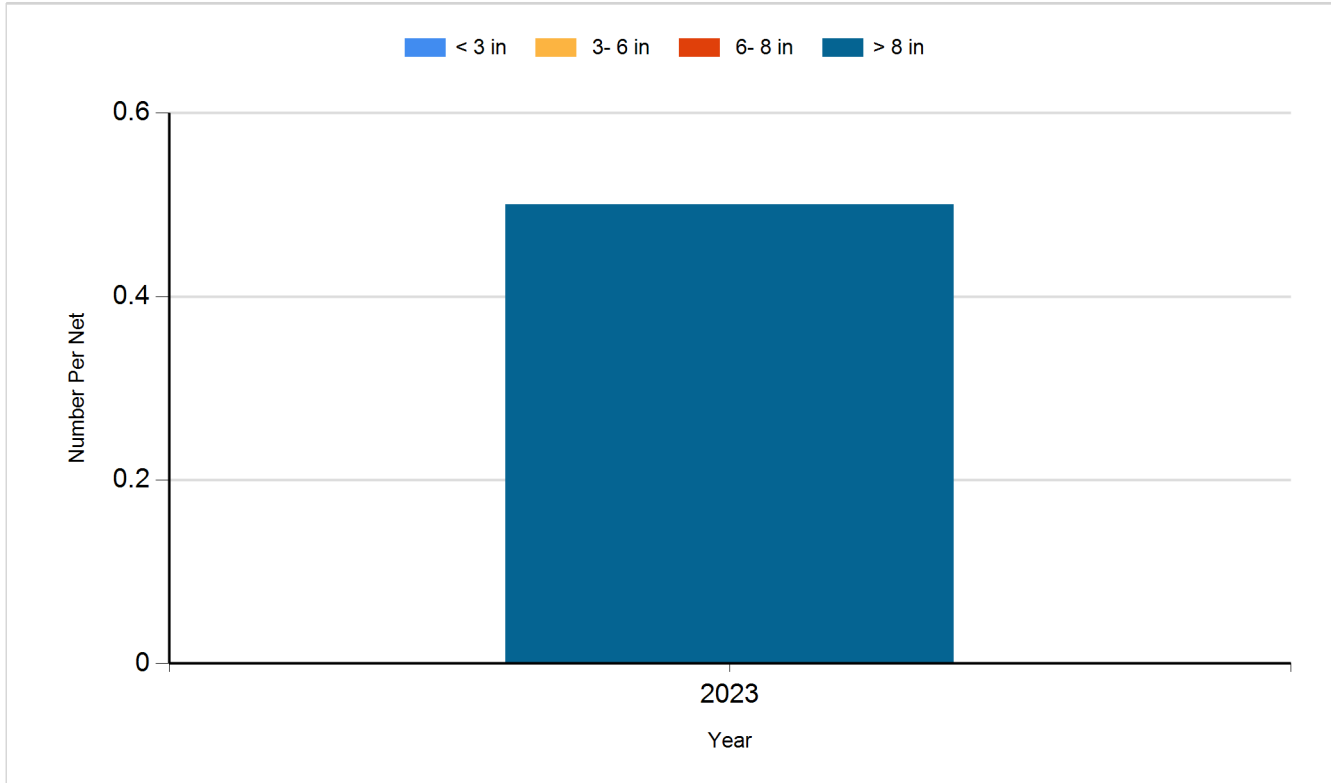
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2023	0		0		1	100	0	

Historic Fish Sizes and Relative Abundance

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

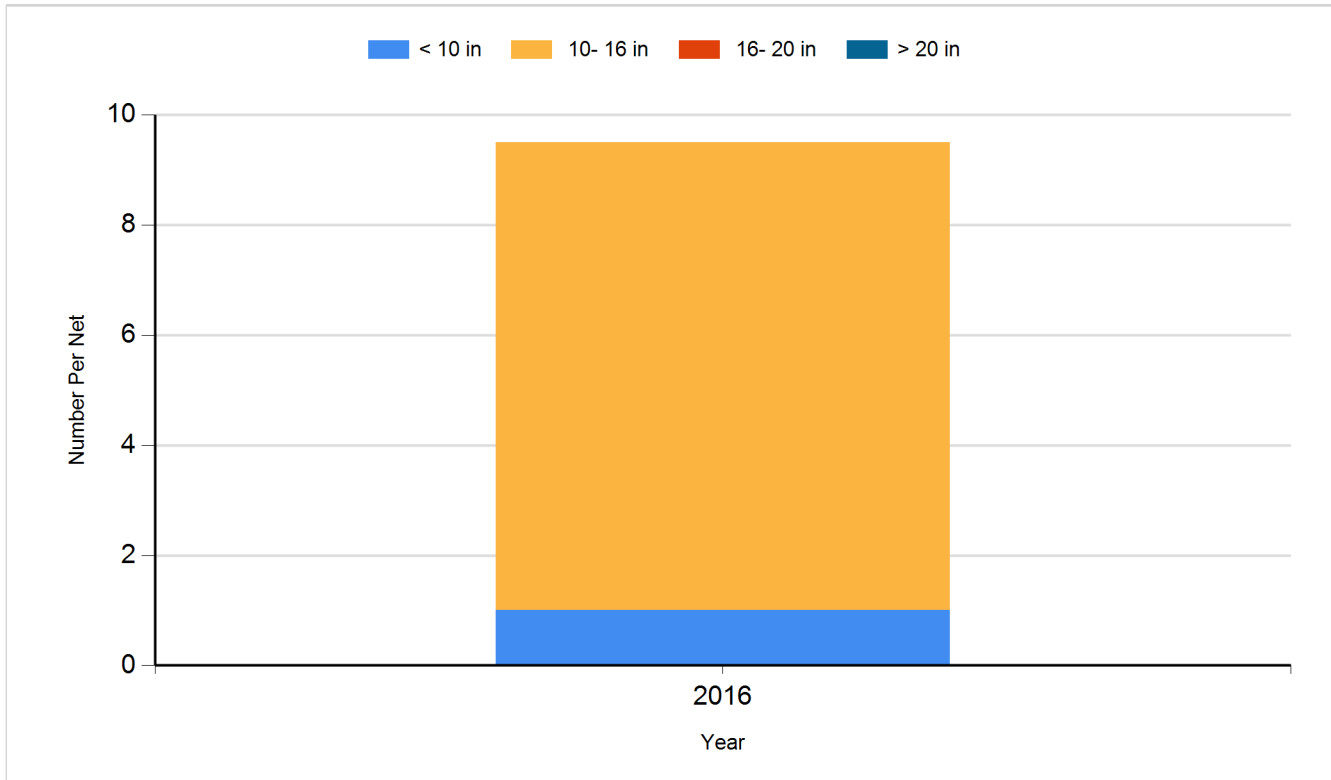
Species: Bluegill

Gear: AFS std frame net



Species: Rainbow Trout

Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2012	Rainbow Trout (Erwin x Arlee)	Catchable	3,040
2012	Rainbow Trout (Erwin x Arlee)	Catchable 15"	275
2012	Rainbow Trout (Shasta)	Catchable	5,140
2013	Rainbow Trout (Erwin x Arlee)	Catchable 15"	325
2013	Rainbow Trout (Shasta)	Catchable	9,120
2014	Rainbow Trout (Erwin x Arlee)	Catchable	1,520
2014	Rainbow Trout (Erwin x Arlee)	Catchable 15"	325
2014	Rainbow Trout (Shasta)	Catchable	7,600
2015	Rainbow Trout (Erwin x Arlee)	Catchable	3,040
2015	Rainbow Trout (Erwin x Arlee)	Catchable 15"	325
2015	Rainbow Trout (Shasta)	Catchable	5,978
2016	Rainbow Trout (Erwin x Arlee)	Catchable	3,040
2016	Rainbow Trout (Erwin x Arlee)	Catchable 15"	275
2016	Rainbow Trout (Shasta)	Catchable	6,080
2017	Rainbow Trout (Eagle Lake)	Catchable	3,040
2017	Rainbow Trout (Erwin x Arlee)	Catchable	2,051
2017	Rainbow Trout (Erwin x Arlee)	Catchable 15"	100
2017	Rainbow Trout (Shasta)	Catchable	4,029
2017	Rainbow Trout (Shasta)	Catchable 15"	100
2018	Rainbow Trout (Erwin x Arlee)	Catchable 11"	1,477
2018	Rainbow Trout (Shasta)	Catchable 11"	6,080
2018	Rainbow Trout (Shasta)	Catchable 15"	124
2019	Rainbow Trout (Shasta)	Catchable 11"	12,034
2019	Rainbow Trout (Shasta)	Catchable 15"	100
2020	Rainbow Trout (Arlee)	Catchable 11"	6,080
2020	Rainbow Trout (Arlee)	Catchable 15"	100
2020	Rainbow Trout (Shasta)	Catchable 11"	3,140
2020	Rainbow Trout (Shasta)	Catchable 15"	52
2021	Rainbow Trout (Arlee)	Adult	1,600
2021	Rainbow Trout (Shasta)	Adult	7,600
2022	Cutthroat Trout (lotic)	Adult	2,164
2022	Rainbow Trout (Shasta)	Adult	1,600
2022	Rainbow Trout (Trout Lodge)	Adult	3,316
2022	Tiger Trout (Utah)	Juvenile	6,287
2023	Rainbow Trout	Adult	9,195
2023	Tiger Trout (Utah)	Adult	1,313
