Sylvan Lake

Sylvan lake is a 19-acre lake located within Custer State Park and a state park pass is needed to access this lake. It is a very popular tourist destination. The beautiful scenery makes a great backdrop for fishing. This lake gets stocked annually with Rainbow Trout, Cutthroat Trout and Tiger Trout. In 2024 SD GFP stocked adult Smallmouth Bass into the lake. The lake has a high abundance of Golden Shiners and Fathead Minnows. Access is great around 75% of the lake. A state park lodge and resort are located on the lake with kayak and canoe rentals, food and souvenir shops. It is a great lake to spend the day with the family. The parking lot is also used for a popular hike to the highest point in the Black Hills, Black Elk Peak.

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Sylvan, Custer County
MCS-Lake-4-000
2024

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
frame net (std 3/4 in)	Jun 20, 2024	3 net-nights
purse seine	Jun 20, 2024	2 hauls

Common Fish Species Present

Rainbow Trout

Fathead Minnow

Johnny Darter

Smallmouth Bass

Tiger Trout

Golden Shiner

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.
- 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)	Cutthroat Trout (lentic)	2	0.0	0.0						
	Golden Shiner	36	0.0	0.0						
	Rainbow Trout	2	0.7	0.6	50		0		101	31
	Smallmouth Bass	1	0.3	0.6	100		100		107	
	Tiger Trout	4	0.0	0.0						
purse seine*	Fathead Minnow	45	22.5	10.8						
	Johnny Darter	16	8.0	0.0						

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**

		CPUE										
Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
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)	Cutthroat Trout (lentic)		0.0					0.0			0.0	0.00
	Golden Shiner		0.0					0.0			0.0	0.00
	Rainbow Trout		5.5					2.0			0.7	2.73
	Smallmouth Bass		0.0					0.0			0.3	0.10
	Tiger Trout		0.0					0.0			0.0	0.00
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	22.5	36.50
	Golden Shiner							0.0		4.0	0.0	1.33
	Iowa Darter							1.0		0.0	0.0	0.33
	Johnny Darter							0.0		33.0	8.0	13.67
	Tiger Trout							0.0		1.0	0.0	0.33
std exp gill net	Rainbow Trout		8.5									8.50

10-Year Size Structure and Condition Statistics by Gear and Species

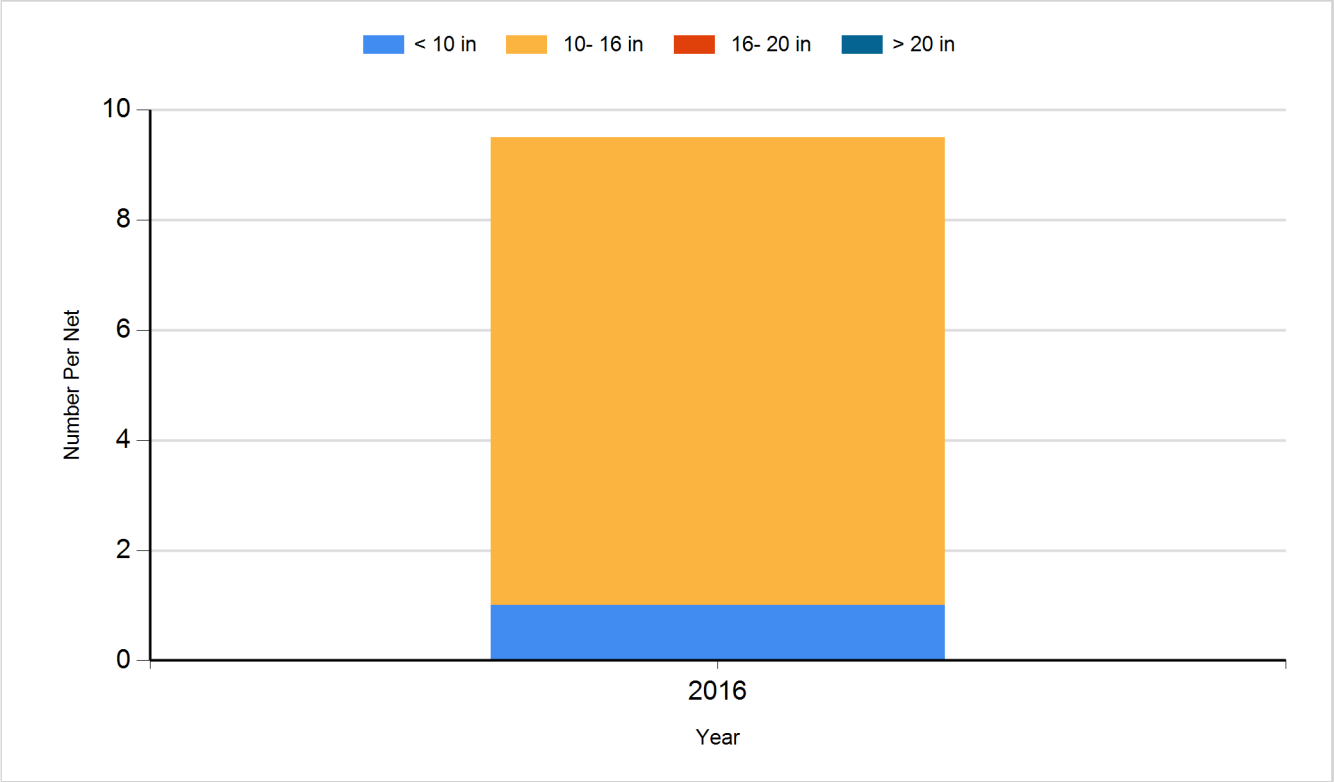
Species proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) collected by different gear types across 10 years.

			Year									
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std frame net	Rainbow Trout	PSD									3	
		PSD-P									0	
		Wr									73	
frame net (std 3/4 in)	Rainbow Trout	PSD		0					0			50
		PSD-P		0					0			0
		Wr		68					66			101
	Smallmouth Bass	PSD										100
		PSD-P										100
		Wr										107
std exp gill net	Rainbow Trout	PSD		0								
		PSD-P		0								
		Wr		82								

Historic Fish Sizes and Relative Abundance

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

Species: Rainbow Trout
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
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
2024	Cutthroat Trout (lotic)	Juvenile	2,413
2024	Rainbow Trout	Adult	9,149
2024	Smallmouth Bass		78