2024 Murdo Lake Survey Summary

Murdo Lake is 87-acre impoundment 2 miles north of Murdo in central Jones County. The Lake was created in 1938 when the Works Project Administration (WPA) created an earthen dam on a tributary to the upper portion of the White Clay Creek. It has a mean of 9 feet with a maximum depth of 28 feet. Murdo Lake is accessible with a concrete boat ramp and large dock on the northwest side of the lake.

The Primary fish species managed at Murdo Lake include Largemouth Bass, Black Crappie, Bluegill, Yellow Perch, and Black Bullhead also have a historical presence. Murdo Lake was surveyed on Jan 26, 2024, and Feb 7, 2024, with rod and reel through the ice. Largemouth Bass and Yellow Perch were sampled. Night electrofishing was done on May 20, 2024, to monitor the Bass population. Frame nets (std. ¾ in.) were used on May 22-24, 2024. Yellow Perch, Bluegill, Black Crappie, Largemouth Bass, Black Bullhead, and Golden Shiners were observed.

Bluegill: Bluegill were sampled at an average rate of 9.9 fish per net. Many of the fish sampled were 5-6 inches. There were several Bluegills measured around 9-10 inches as well.

Black Crappie: Black Crappies were sampled at a slightly lower than average rate of 3.1 fish per net. Many of the fish sampled were 10-12.5 inches with some smaller fish present.

Yellow Perch: Yellow Perch catch rate was extremely high at 44.2 fish per net. However, most of them were smaller than 6 inches.

Largemouth Bass: 9 Bass were sampled from the electrofishing night survey. Most of the fish measured were over 15 inches. Condition was comparable to the statewide average. While electrofishing there were large numbers of smaller bass observed less than 5 inches.

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Murdo, Jones County
BAD-Lake-2898-000
2024

Lake Information

Name: Murdo

County: Jones

Legal Description: T1-R28-S36

Surface Area: 87 Acres

Maximum Depth: 28 Feet

Mean Depth: 9 Feet

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	May 20, 2024	3600 seconds
frame net (std 3/4 in)	May 23, 2024	5 net-nights
frame net (std 3/4 in)	May 24, 2024	5 net-nights
rod and reel	Feb 07, 2024	405 minutes
rod and reel	Jan 22, 2024	820 minutes

Common Fish Species Present

Largemouth Bass

Black Crappie

Yellow Perch

Bluegill

Black Bullhead

Golden Shiner

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
boat shocker (night)	Largemouth Bass	9	8.0		100		88		112	3
frame net (std 3/4 in)	Black Bullhead	30	3.0	1.0	97		93		110	3
	Black Crappie	53	3.1	2.2	90		90		105	3
	Bluegill	99	9.9	4.8	61	7	27	6	89	3
	Golden Shiner	28	0.0	0.0						
	Yellow Perch	453	44.2	17.6	24	3	4	1	99	2
rod and reel	Largemouth Bass	1	0.0	0.0	0		0			
	Yellow Perch	144	1.8	1.0	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 gill net	Black Bullhead					0.8		0.0				0.40
	Black Crappie					0.2		0.0				0.10
	Bluegill					0.5		0.0				0.25
	Channel Catfish					0.2		0.0				0.10
	Walleye					0.2		0.0				0.10
	Yellow Perch					17.8		84.0				50.90
boat shocker (day)	Largemouth Bass					34.0						34.00
boat shocker (night)	Largemouth Bass	54.5			12.0			164.0		8.7	8.0	49.44
frame net (std 3/4 in)	Black Bullhead	10.0				4.9		4.0			3.0	5.48
	Black Crappie	10.9				3.3		7.7			3.1	6.25
	Bluegill	10.0				6.5		29.7			9.9	14.03
	Golden Shiner	0.0				0.0		0.0			0.0	0.00
	Largemouth Bass	0.1				0.0		0.5			0.0	0.15
	Smallmouth Bass	0.0				0.1		0.0			0.0	0.03
	Yellow Perch	5.9				42.8		6.8			44.2	24.93
rod and reel	Largemouth Bass										0.0	0.00
	Yellow Perch										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	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std gill net	Black Bullhead	PSD					40					
		PSD-P					20					
		Wr					117					
	Black Crappie	PSD					100					
		PSD-P					0					
		Wr					98					
	Bluegill	PSD					100					
		PSD-P					100					
		Wr					105					
	Yellow Perch	PSD					84		26			
		PSD-P					7		8			
		Wr					94		86			
boat shocker (day)	Largemouth Bass	PSD					47					
		PSD-P					9					
		Wr					113					
boat shocker (night)	Largemouth Bass	PSD	56			83			11		100	100
		PSD-P	39			8			4		89	88
		Wr	101			113			104		116	112
frame net (std 3/4 in)	Black Bullhead	PSD	97				96		93			97
		PSD-P	14				92		75			93
		Wr	89				103		121			110
	Black Crappie	PSD	4				97		69			90
		PSD-P	0				24		26			90
		Wr	103				91		105			105
	Bluegill	PSD	32				100		75			61
		PSD-P	5				28		49			27
		Wr	120				107		102			89
	Largemouth Bass	PSD	100						80			
		PSD-P	0						40			
		Wr	105						102			
	Yellow Perch	PSD	59				84		29			24
		PSD-P	12				7		8			4

			Year									
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
frame net (std 3/4 in)	Yellow Perch	Wr	88				84		82			99
rod and reel	Largemouth Bass	PSD										0
		PSD-P										0
	Yellow Perch	PSD										0
		PSD-P										0

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+
2019	33			213 (3)	222 (13)	245 (14)	266 (1)	268 (2)			
2015	109		145 (12)	163 (26)	177 (65)	192 (6)	207 (1)				

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	64				194 (8)	185 (3)	198 (39)	187 (14)		214 (1)	
2015	100		140 (59)	152 (29)	191 (9)	207 (2)	211 (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+
2019	56	127 (19)	200 (10)	252 (13)	346 (6)	368 (7)	374 (1)	445 (1)			
2015	151	200 (87)	225 (3)	364 (1)	360 (15)	400 (21)	432 (19)	454 (5)	511 (1)	483 (1)	

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	107		172 (10)	221 (12)	222 (78)	240 (7)					

Fish Condition

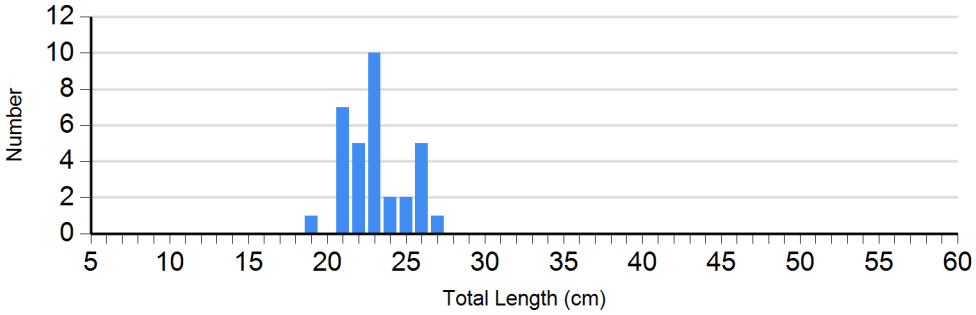
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2021	26	125 (7.3)	37	101 (1.0)	20	93 (2.0)	2	7
	2024	3		0		15	112 (4.0)	13	101 (1.8)
Bluegill Frame Net	2021	81	97 (1.2)	86	107 (2.3)	160	101 (1.4)	0	
	2024	39	89 (3.6)	33	83 (3.3)	27	110 (3.4)	0	
Largemouth Bass Electro Fishing	2021	146	105 (0.6)	11	95 (1.4)	6	101 (4.9)	1	122
	2023	0		1	129	8	114 (4.9)	0	
	2024	0		1	109	7	112 (2.5)	0	
Yellow Perch Gill Net	2021	62	90 (1.7)	15	80 (1.5)	7	68 (2.4)	0	

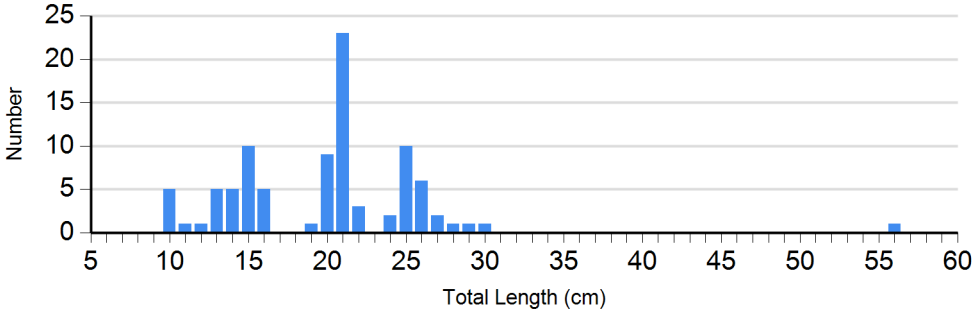
Length Frequency Distribution

Length frequency histogram of species sampled by year.

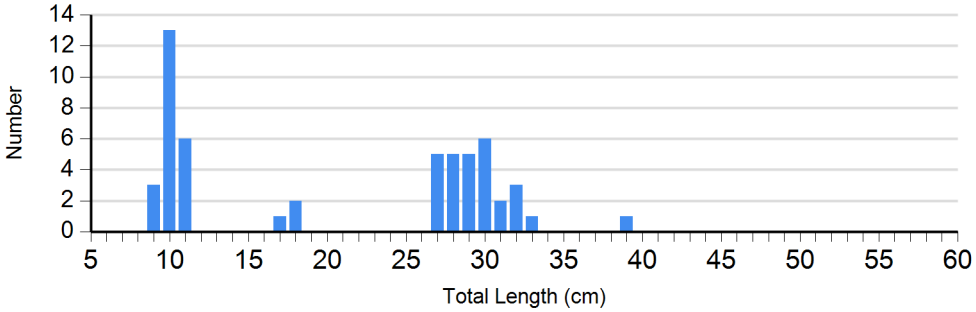
Species: Black Crappie
Gear: frame net (std 3/4 in)



2019

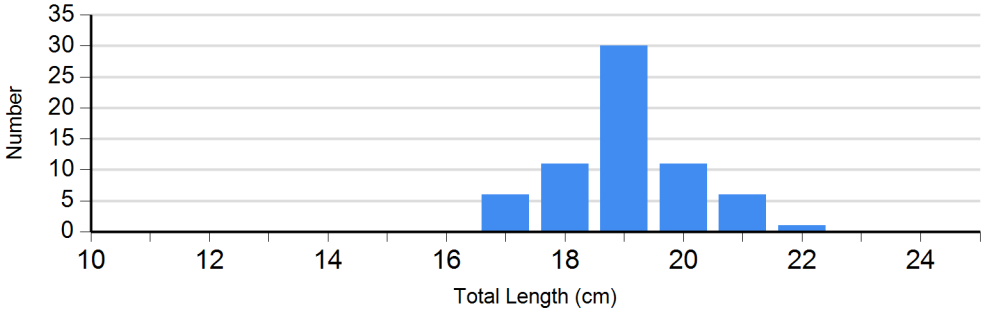


2021

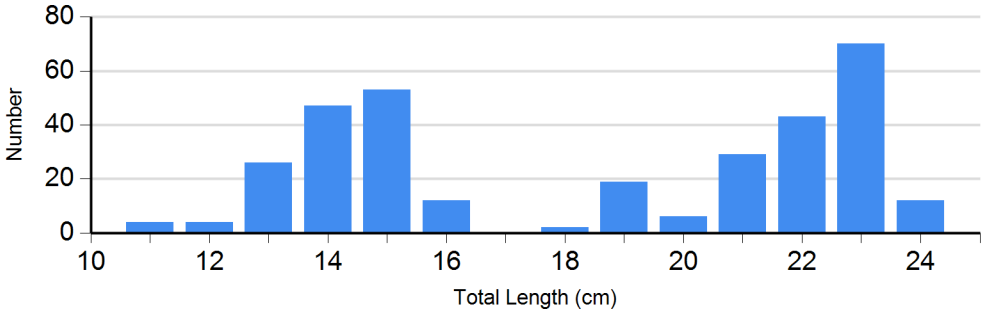


2024

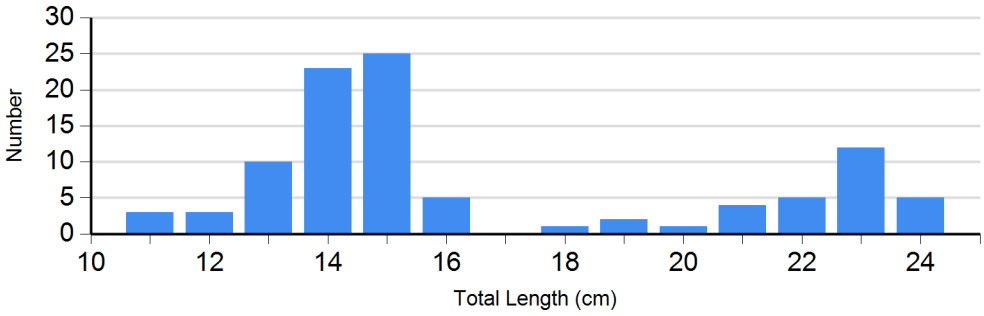
Species: Bluegill
Gear: frame net (std 3/4 in)



2019

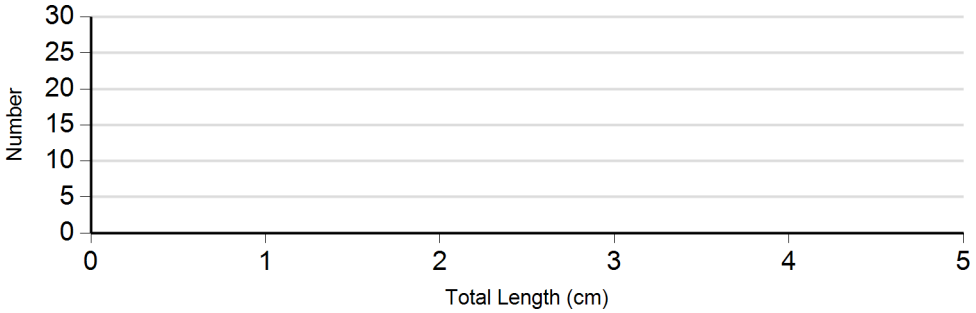


2021



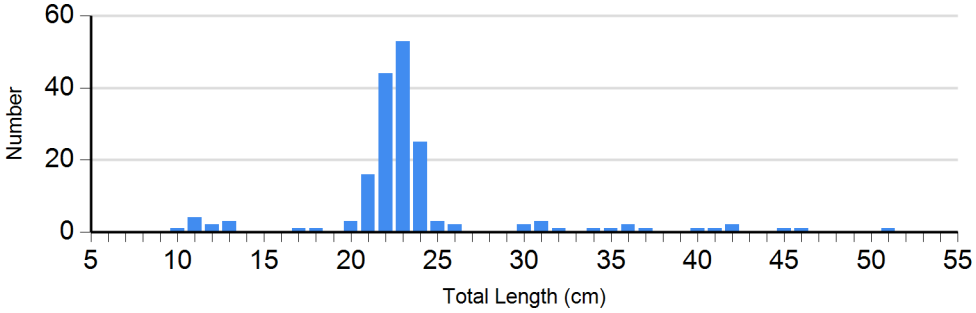
2024

Species: Largemouth Bass
Gear: boat shocker (day)

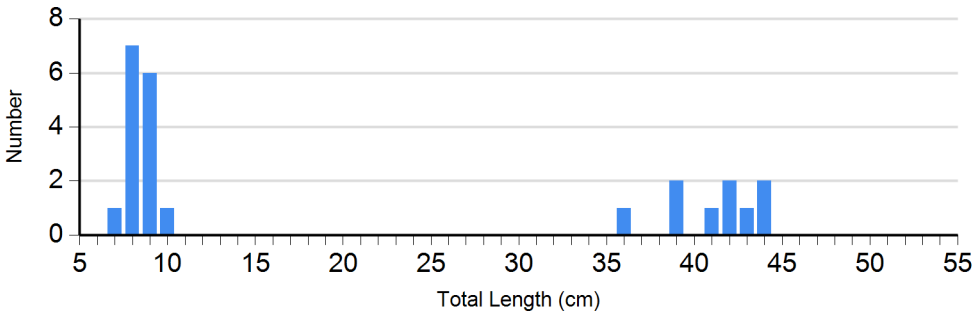


2019

Species: Largemouth Bass
Gear: boat shocker (night)

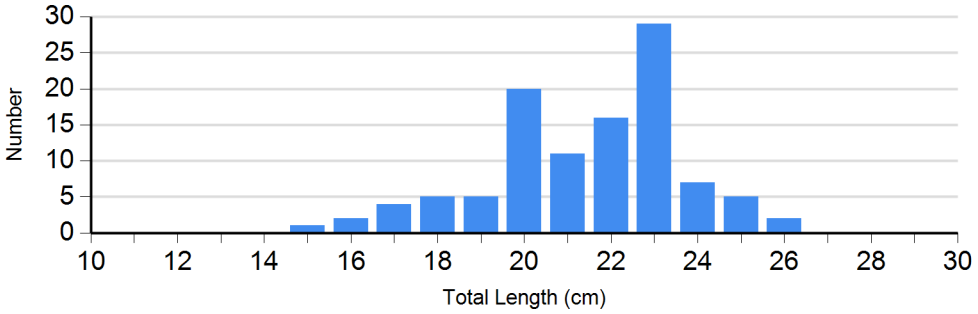


2021

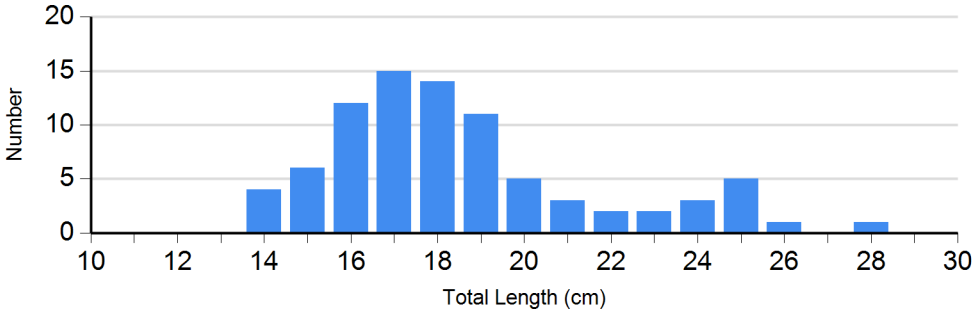


2023

Species: Yellow Perch
Gear: AFS std gill net



2019

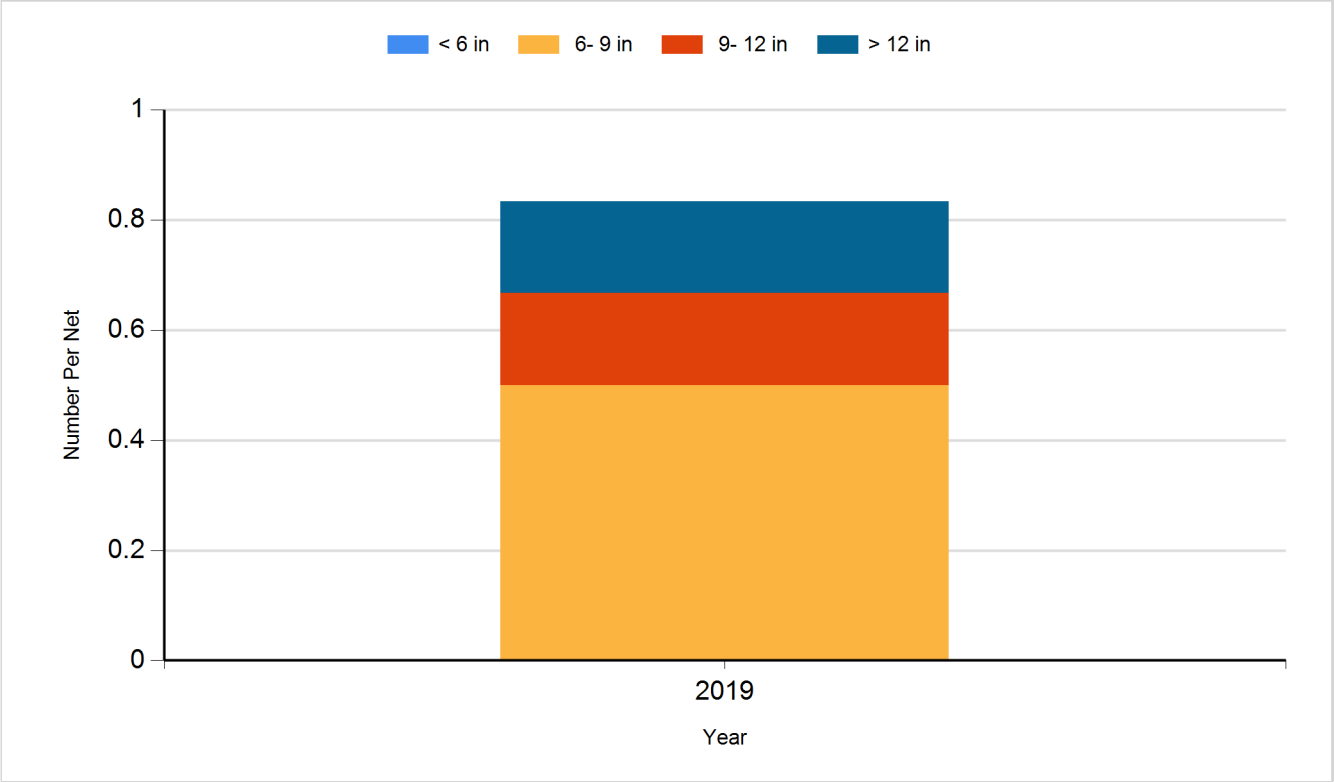


2021

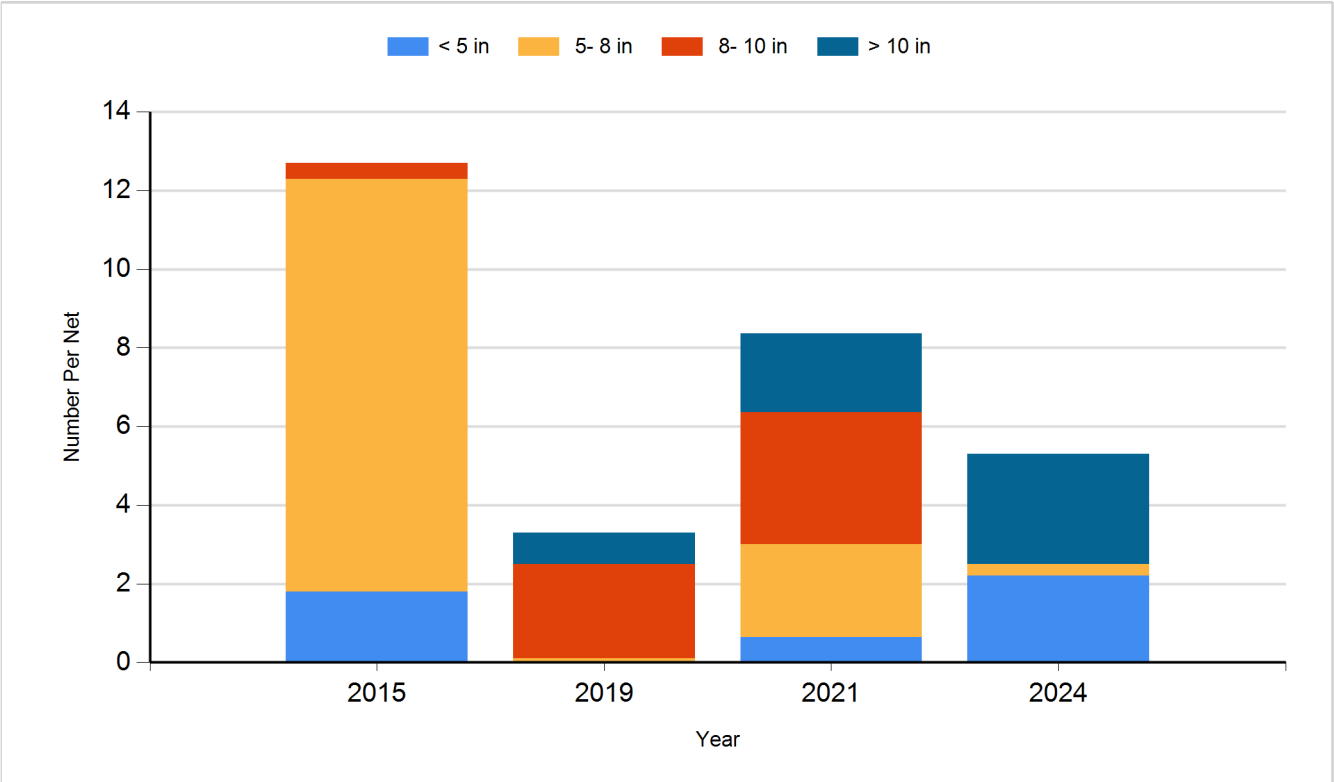
Historic Fish Sizes and Relative Abundance

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

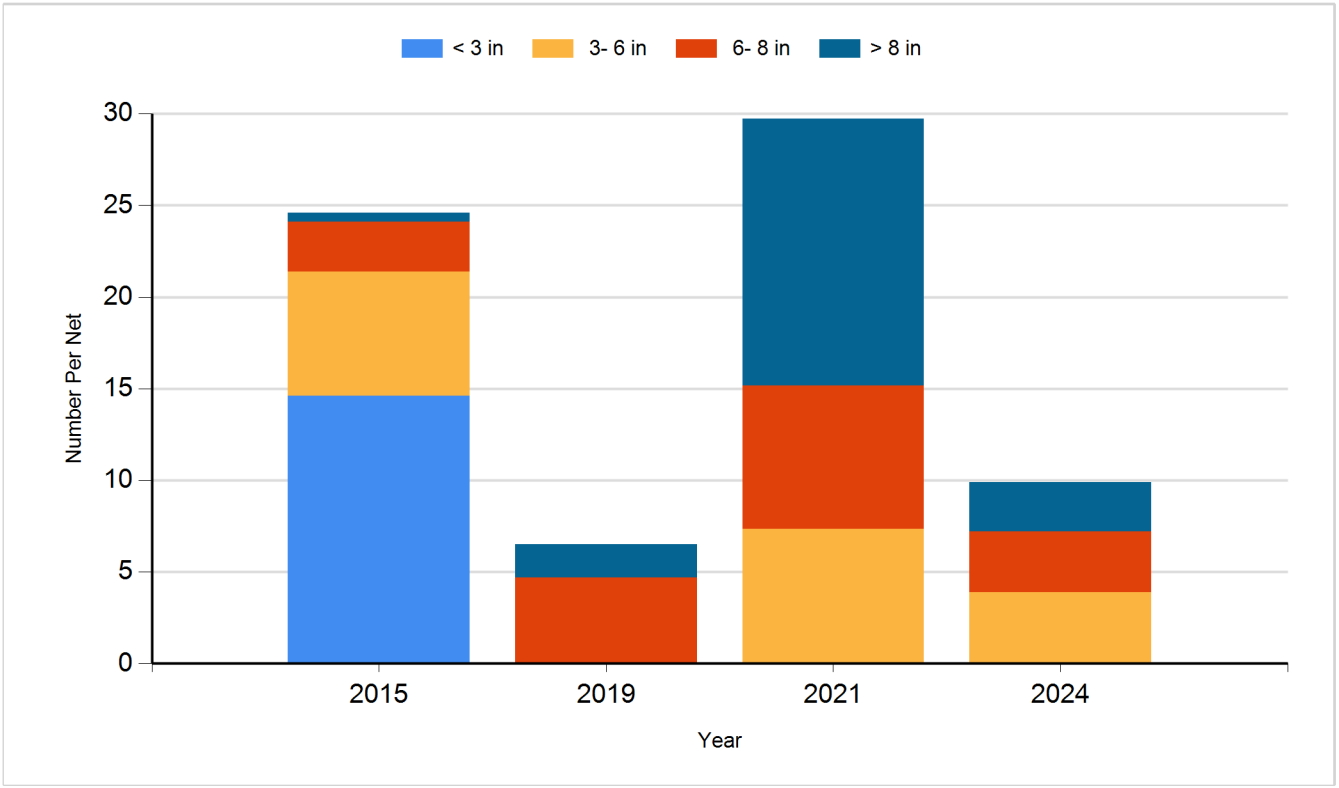
Species: Black Bullhead
Gear: AFS std gill net



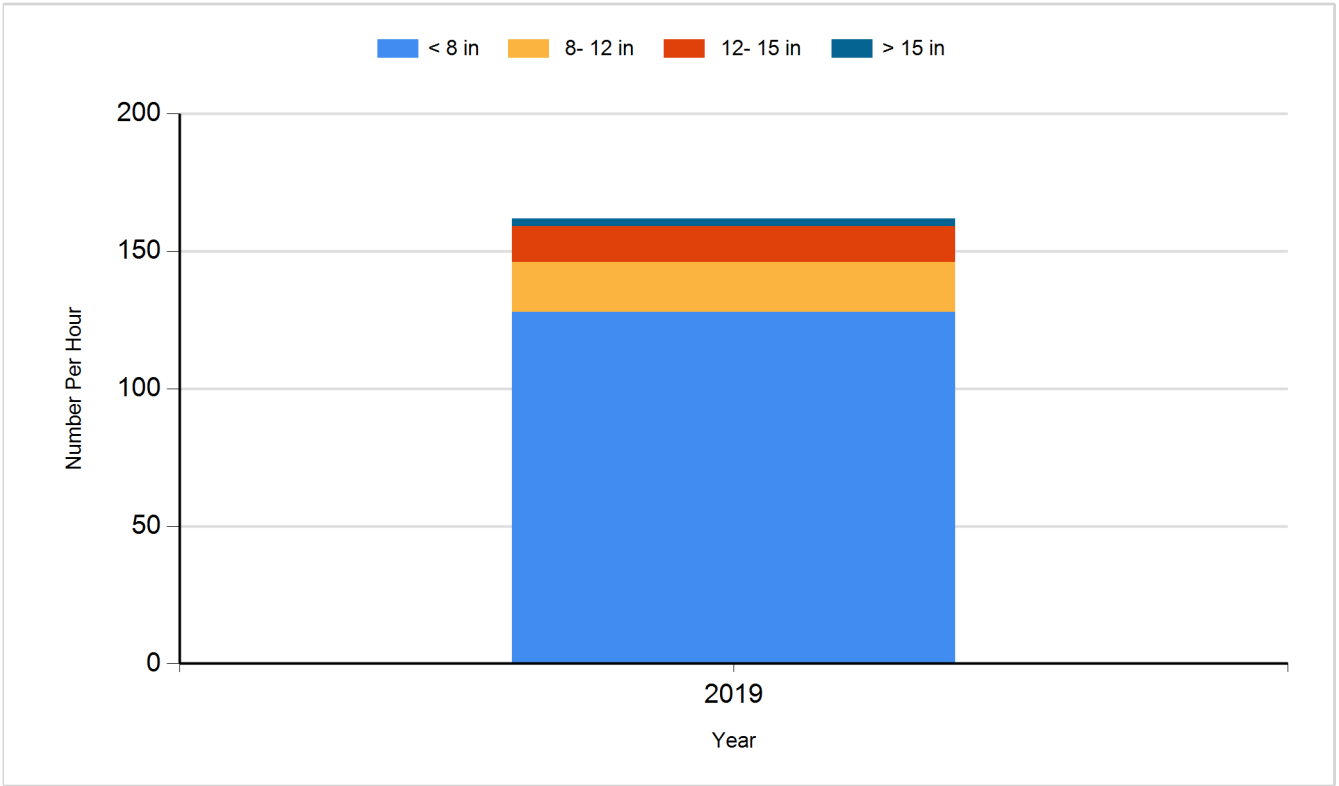
Species: Black Crappie
Gear: frame net (std 3/4 in)



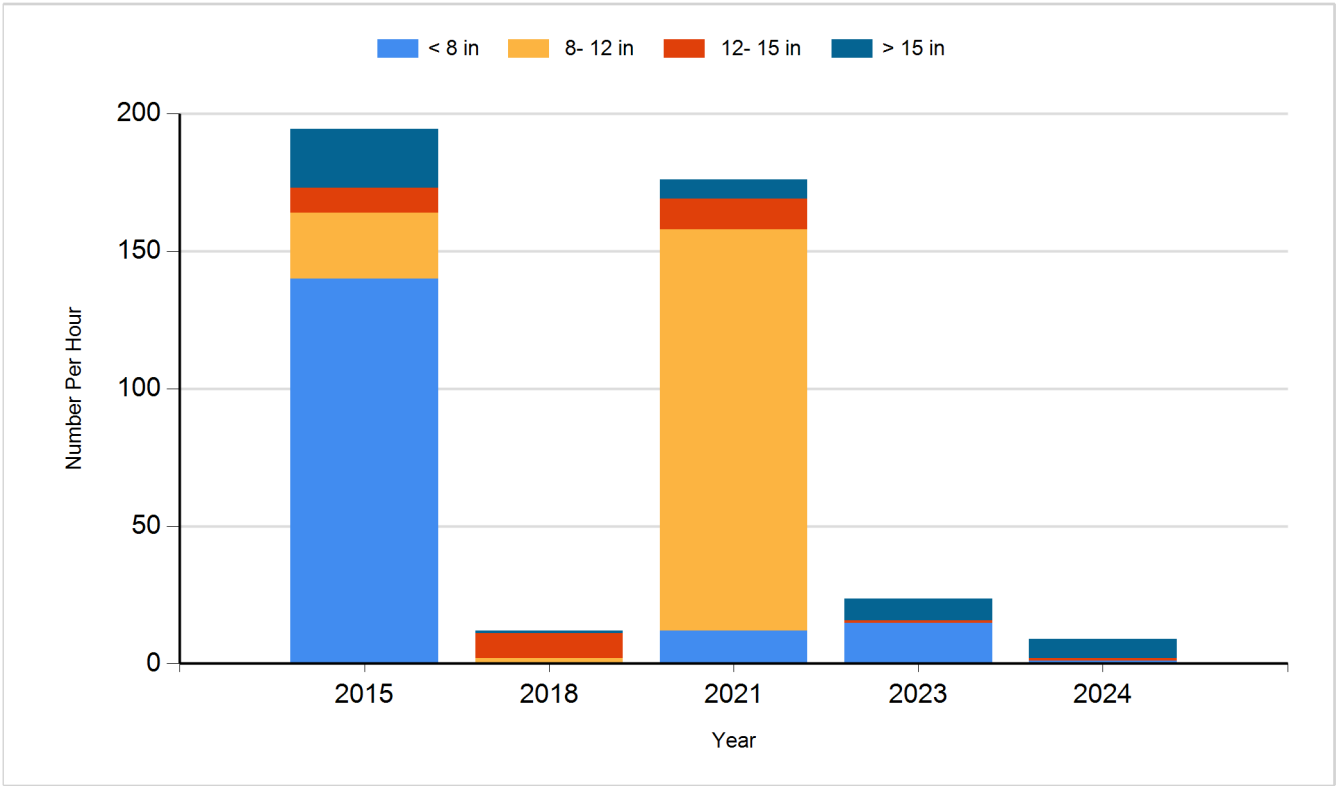
Species: Bluegill
Gear: frame net (std 3/4 in)



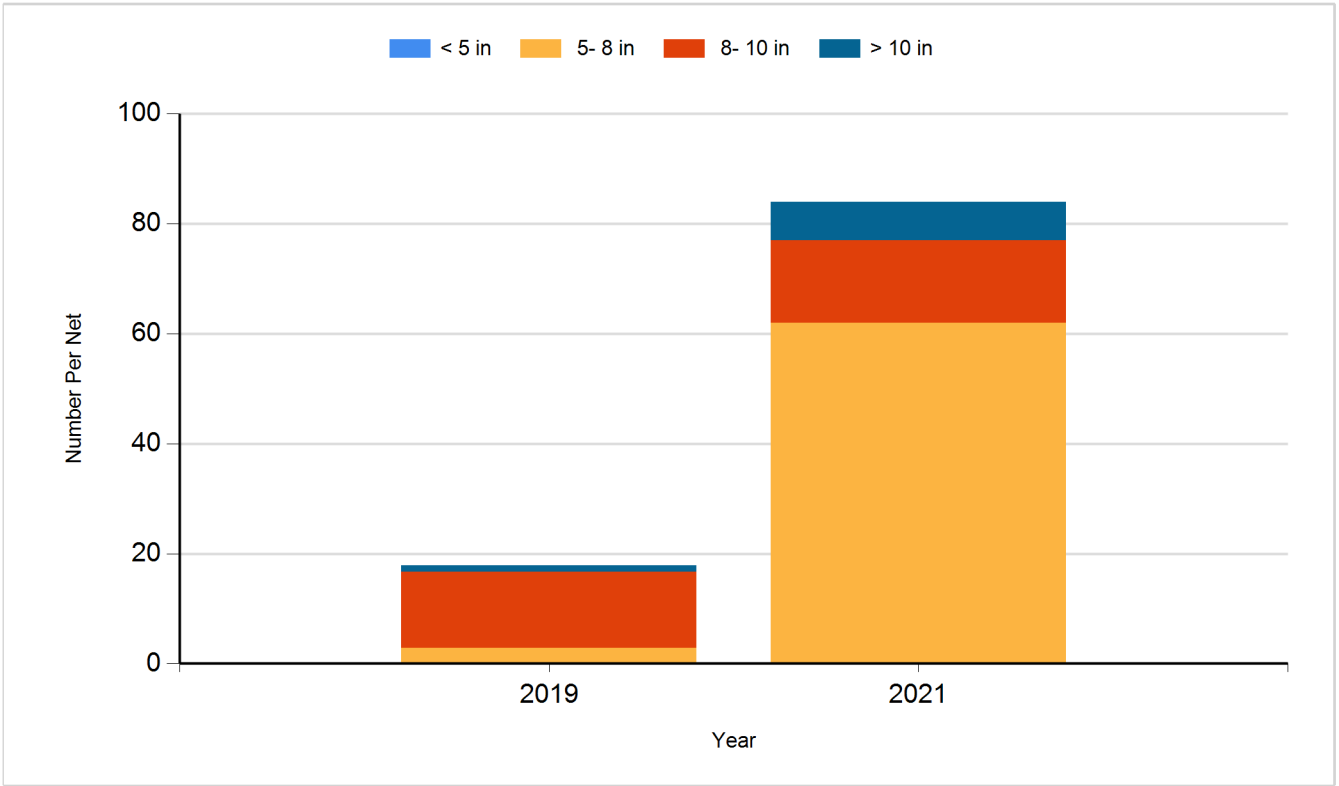
Species: Largemouth Bass
Gear: boat shocker (day)



Species: Largemouth Bass
Gear: boat shocker (night)



Species: Yellow Perch
Gear: AFS std gill net



Fish Stocking

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

Year	Species	Size	Number
2021	Walleye		100,000
2022	Walleye	Fry	20,000
2023	Largemouth Bass	Adult	100
2024	Bluegill	Adult	430