

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Bullhead, Deuel County

UBS-Lake-320-000

2024

## Lake Information

<b>Name:</b>	Bullhead	<b>Maximum Depth:</b>	11 Feet
<b>County:</b>	Deuel	<b>Mean Depth:</b>	7 Feet
		<b>OHWM Elevation:</b>	1,862
<b>Surface Area:</b>	453 Acres	<b>Outlet Elevation:</b>	1,861

## Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 02, 2024	6 net-nights
AFS std gill net	Jul 03, 2024	6 net-nights

## **Common Fish Species Present**

Yellow Perch

Walleye

Northern Pike

Black Bullhead

Common Carp

White Sucker

Bigmouth Buffalo

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## 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	CI-80
AFS std gill net	Bigmouth Buffalo	28	0.4	0.3	40		0		116	2
	Black Bullhead	81	6.8	2.6	2		1		112	2
	Common Carp	51	4.2	0.9	32	10	32	10	106	1
	Northern Pike	11	0.9	0.4	91		55		98	5
	Walleye	50	3.3	0.5	78	10	58	12	91	2
	White Sucker	5	0.4	0.3	100		100		107	5
	Yellow Perch	55	4.6	0.9	71	9	9		116	2

## **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
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
AFS std gill net	Bigmouth Buffalo		0.6				0.0				0.4	0.33
	Black Bullhead		16.8				0.0				6.8	7.87
	Common Carp		1.1				0.7				4.2	2.00
	Northern Pike		0.4				0.5				0.9	0.60
	Walleye		25.3				5.7				3.3	11.43
	White Sucker		0.4				0.7				0.4	0.50
	Yellow Perch		9.8				12.8				4.6	9.07

## 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													
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024				
AFS std gill net	Bigmouth Buffalo	PSD		14											40	
		PSD-P		0												0
		Wr		97												116
	Black Bullhead	PSD		100												2
		PSD-P		2												1
		Wr		86												112
	Common Carp	PSD		100							100					32
		PSD-P		100							25					32
		Wr		94							95					106
	Northern Pike	PSD		100							33					91
		PSD-P		20							33					55
		Wr		92							89					98
	Walleye	PSD		73							79					78
		PSD-P		21							18					58
		Wr		97							98					91
	White Sucker	PSD		100							100					100
		PSD-P		100							75					100
		Wr		92							104					107
Yellow Perch	PSD		86							51					71	
	PSD-P		31							21					9	
	Wr		94							110					116	

## Length at Capture

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

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2024	50	191 (10)	279 (9)	433 (8)	515 (1)	577 (8)		565 (4)		674 (1)	690 (9)
2020	38	232 (5)	384 (1)	391 (26)	488 (2)						662 (4)
2016	303	277 (69)	391 (82)	442 (2)	491 (94)		527 (44)	607 (1)	634 (10)		669 (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+
2024	55	152 (16)	224 (31)	249 (6)	253 (1)	253 (1)					
2020	80	135 (30)	201 (22)	248 (26)	279 (2)						
2016	118	151 (2)	194 (25)	238 (51)	258 (24)	276 (1)	292 (10)	244 (5)			



## **Fish Condition**

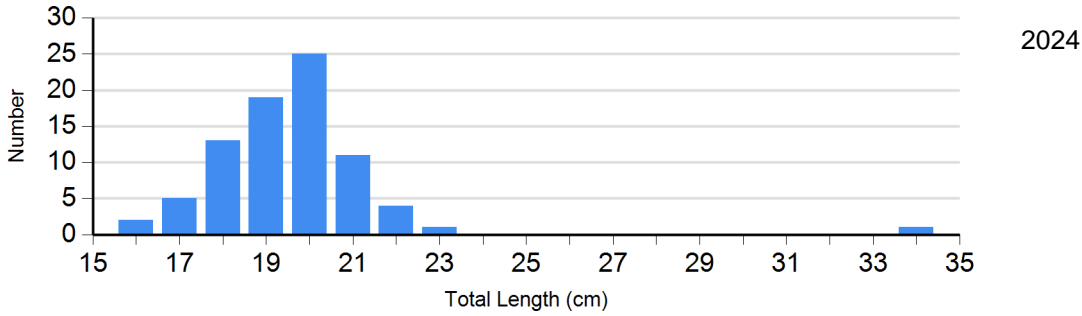
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2024	79	112 (1.2)	1	98	1	112	0	
Common Carp Gill Net	2020	0		3	94 (6.6)	0		1	95
	2024	34	106 (1.2)	0		3	85	13	98
Northern Pike Gill Net	2020	2	90 (0.3)	0		1	87	0	
	2024	1	77	4	96 (4.9)	5	108 (3.1)	1	90
Walleye Gill Net	2020	7	97 (3.0)	21	100 (0.9)	2	94 (4.7)	4	93 (3.5)
	2024	9	95 (2.0)	8	84 (7.3)	14	91 (1.8)	9	93 (2.3)
White Sucker Gill Net	2020	0		1	112	1	106	2	98 (1.9)
	2024	0		0		0		5	107 (3.7)
Yellow Perch Gill Net	2020	38	113 (1.2)	23	109 (1.0)	16	106 (2.1)	0	
	2024	16	120 (3.0)	34	115 (1.3)	5	114 (3.0)	0	

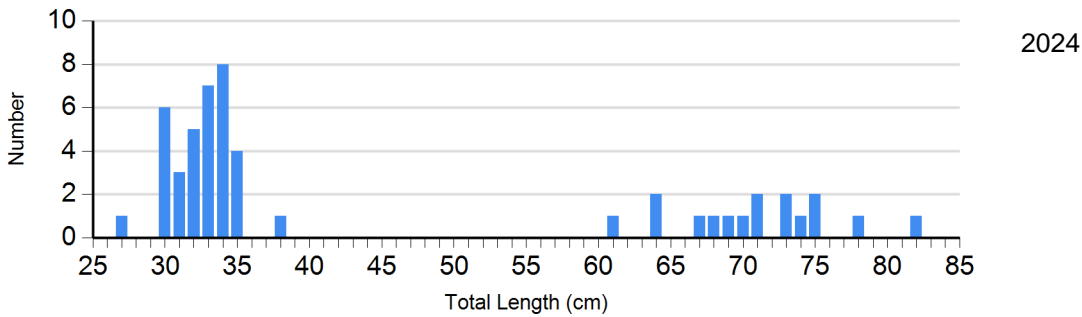
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

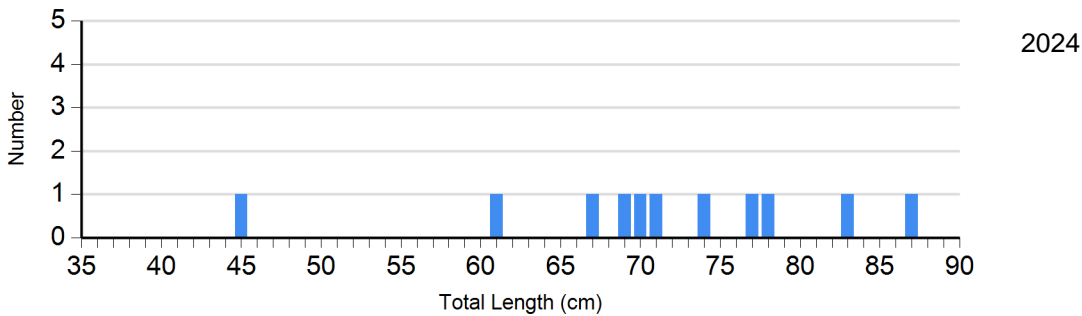
Species: Black Bullhead  
Gear: AFS std gill net



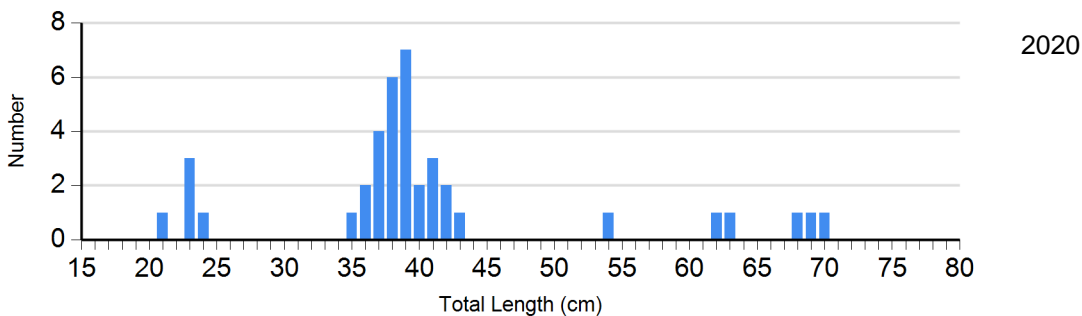
Species: Common Carp  
Gear: AFS std gill net

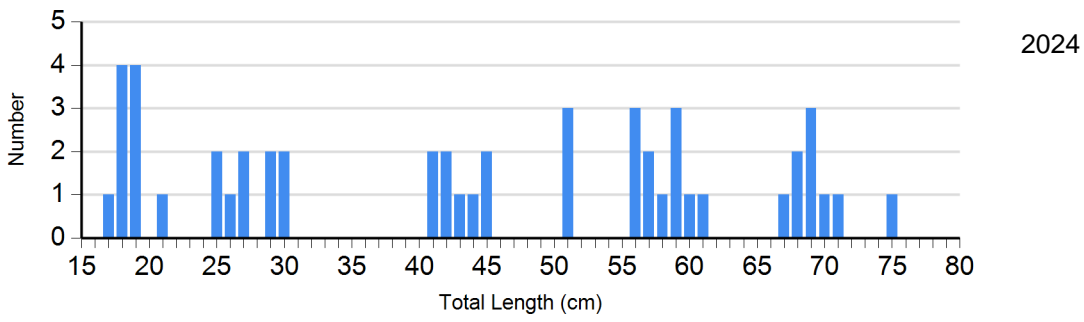


Species: Northern Pike  
Gear: AFS std gill net

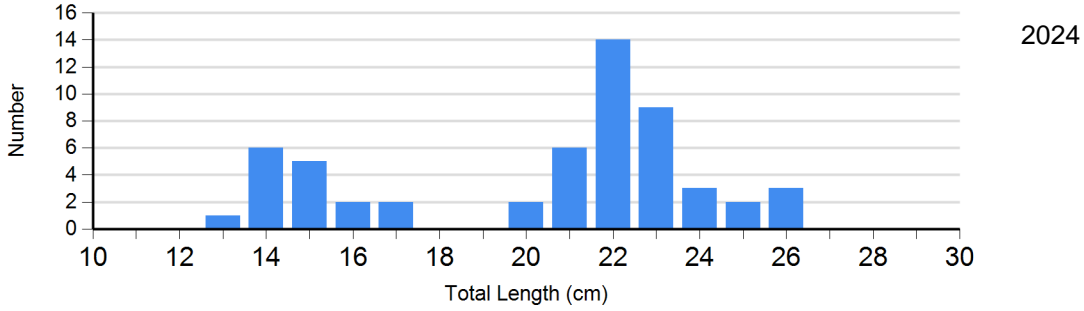
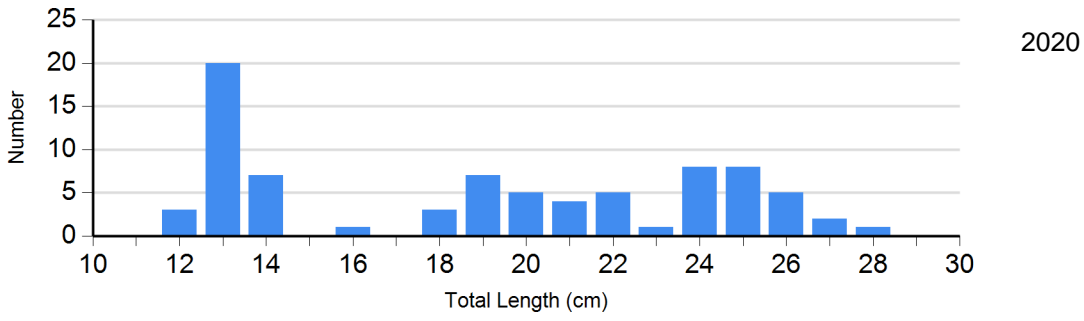


Species: Walleye  
Gear: AFS std gill net





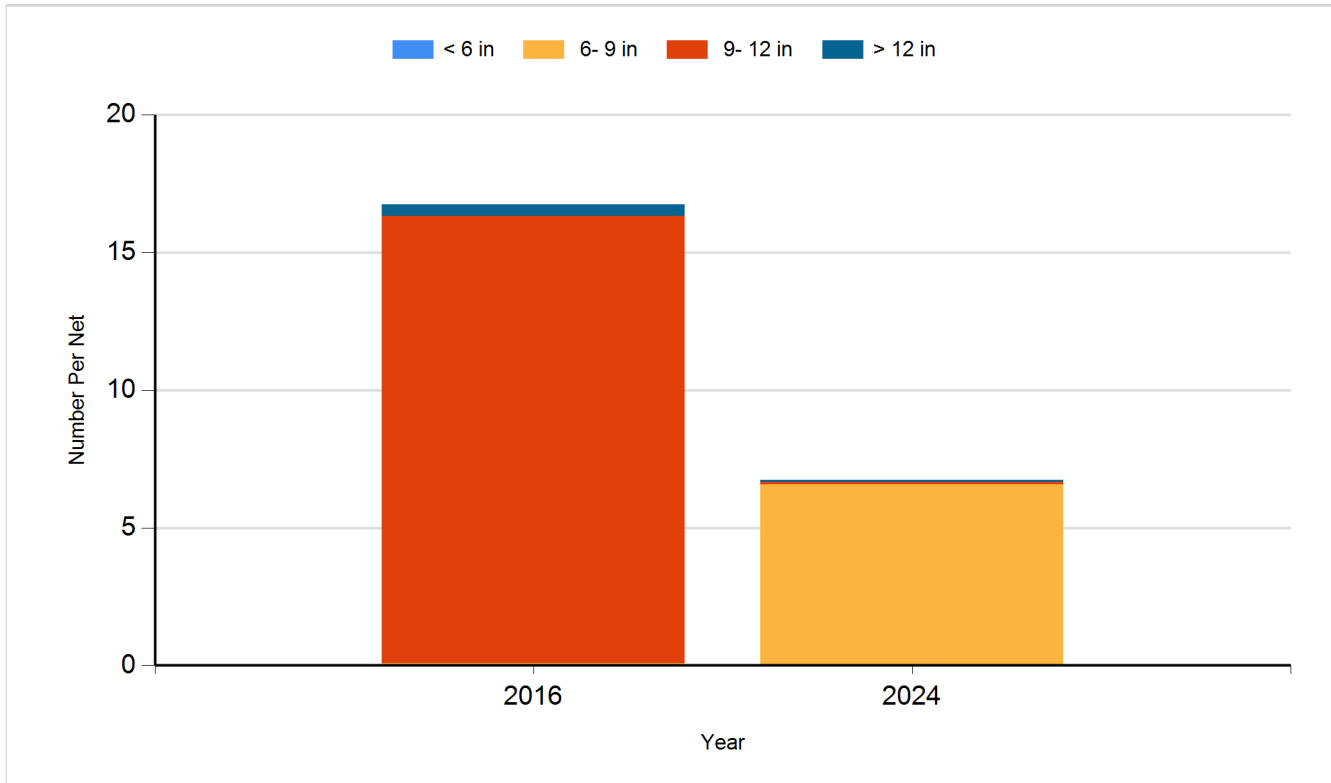
Species: Yellow Perch  
 Gear: AFS std gill net



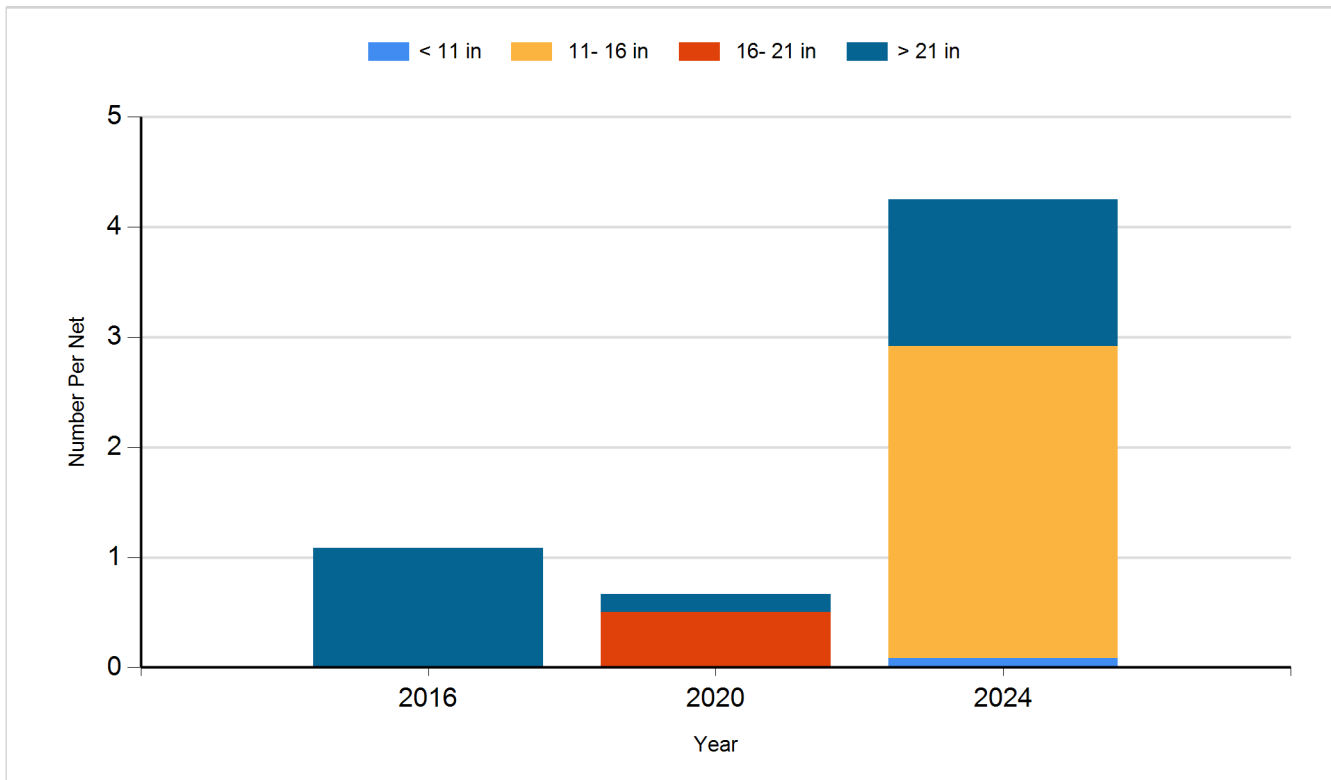
## Historic Fish Sizes and Relative Abundance

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

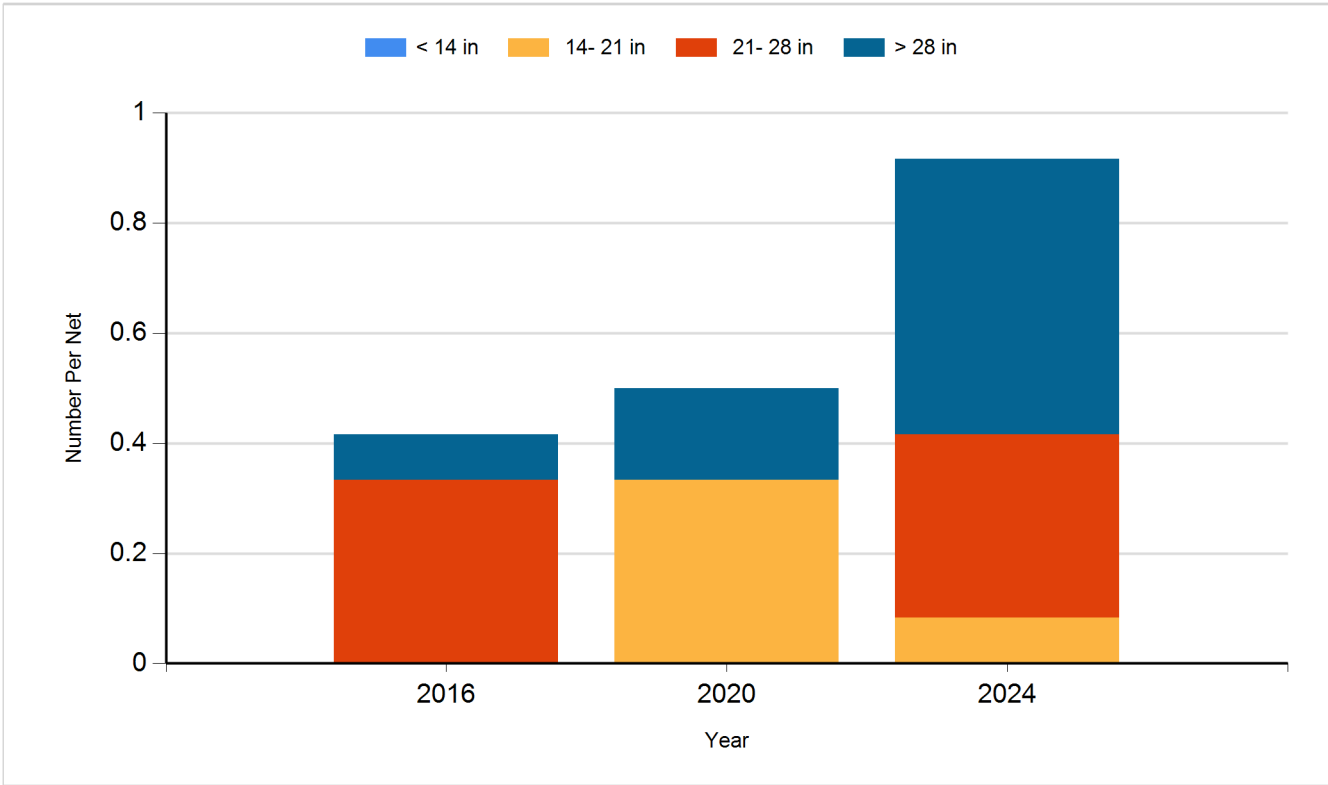
Species: Black Bullhead  
Gear: AFS std gill net



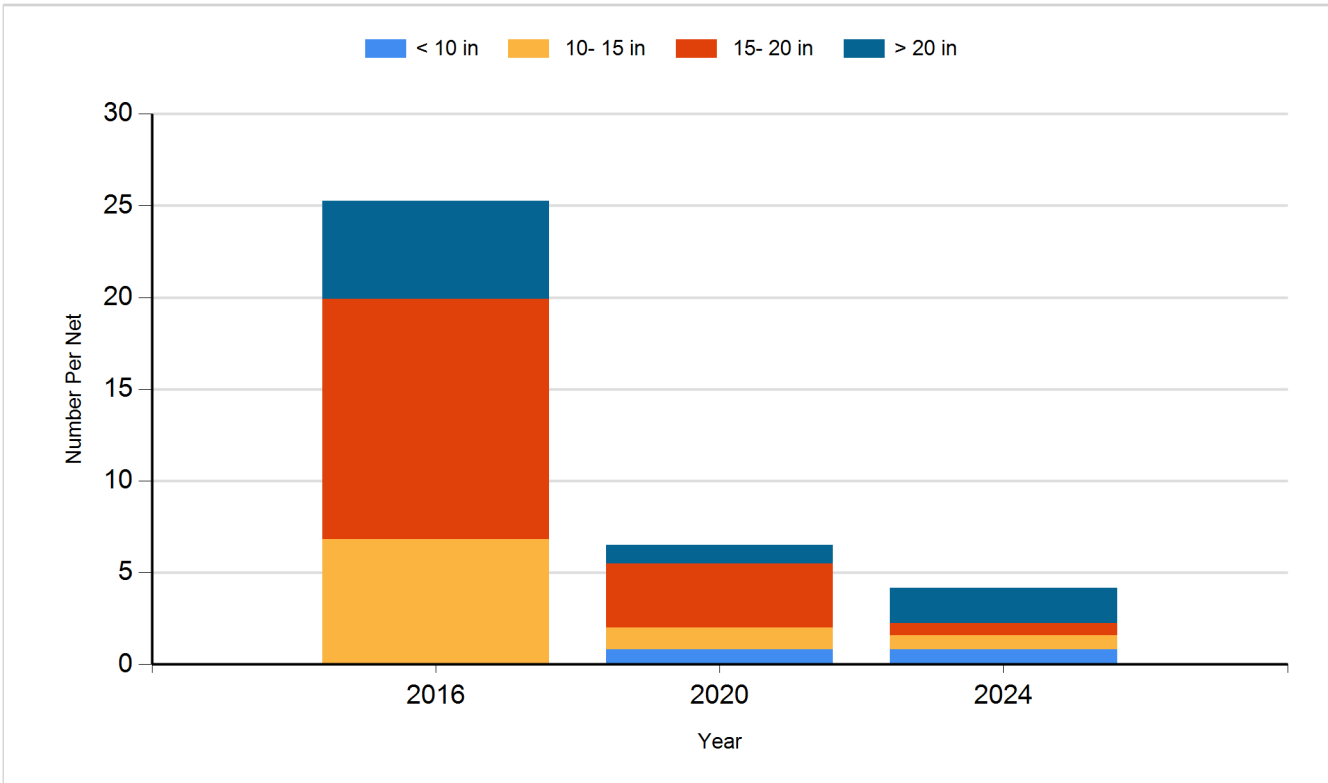
Species: Common Carp  
Gear: AFS std gill net



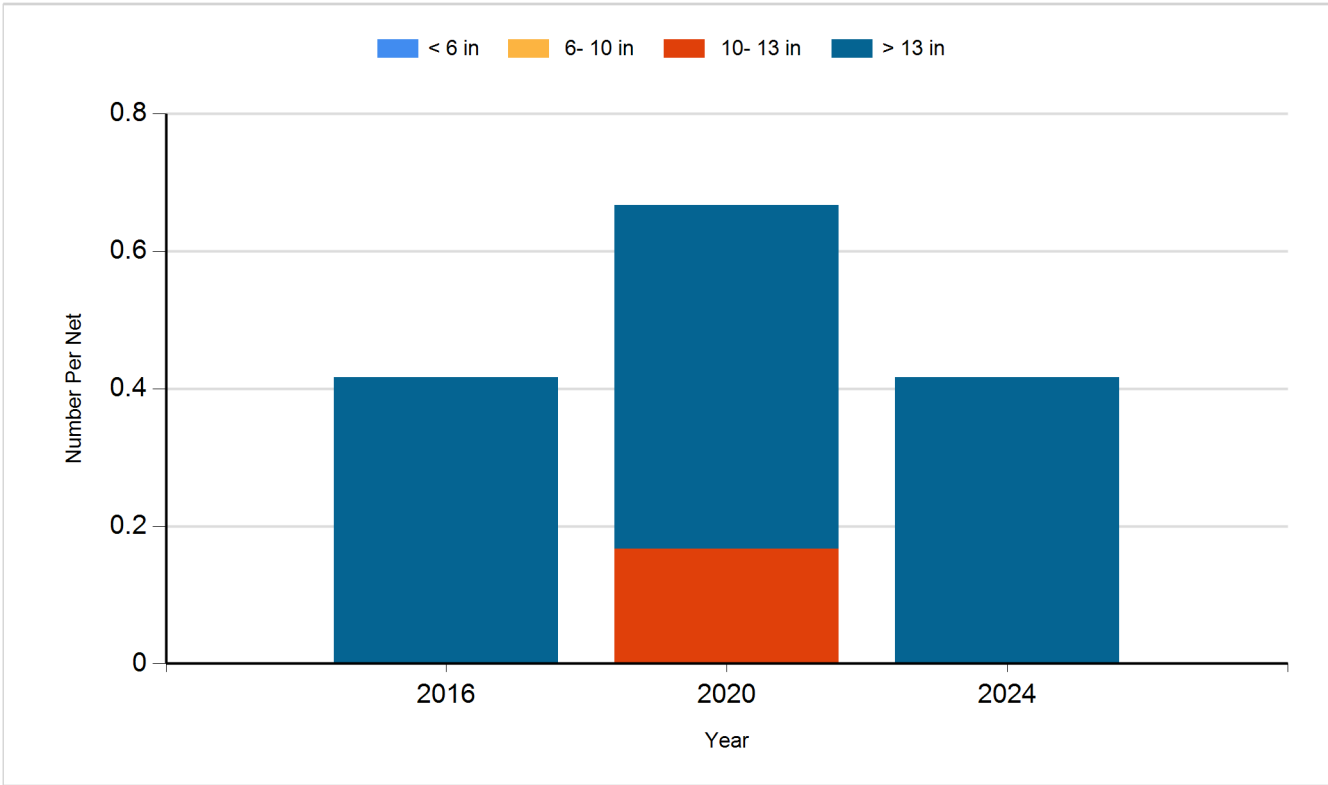
Species: Northern Pike  
Gear: AFS std gill net



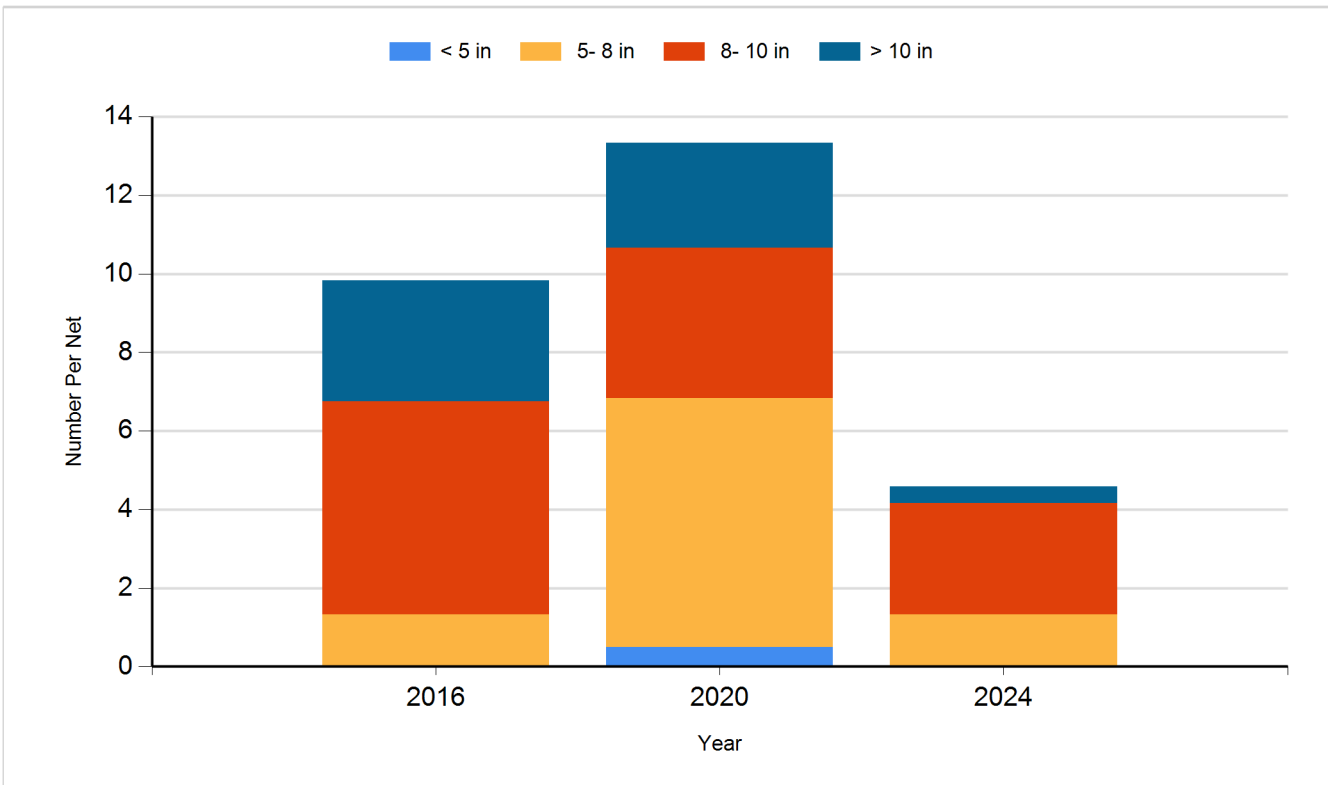
Species: Walleye  
Gear: AFS std gill net



Species: White Sucker  
Gear: AFS std gill net



Species: Yellow Perch  
Gear: AFS std gill net



## **Fish Stocking**

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

Year	Species	Size	Number
2014	Walleye	Fry	300,000
2016	Walleye	Fry	300,000
2017	Walleye	Fry	285,000
2019	Saugeye	Small Fingerling	44,500
2021	Walleye	Fry	300,000
2022	Walleye	Fry	300,000
2024	Walleye	Fry	300,000