

**SOUTH DAKOTA STATEWIDE FISHERIES SURVEY**  
**Spring, Walworth County**  
**LLO-Lake-239-000**  
**2024**

**Lake Information**

<b>Name:</b>	Spring	<b>Maximum Depth:</b>	9 Feet
<b>County:</b>	Walworth	<b>Mean Depth:</b>	6 Feet
<b>Legal Description:</b>	T122-R74-S6		
<b>Surface Area:</b>	852 Acres		

**Surveys and Investigations**

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

Gear	Date	Effort
frame net (std 3/4 in)	Jul 10, 2024	5 net-nights

## **Common Fish Species Present**

Yellow Perch

Walleye

Black Bullhead

Northern Pike

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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
frame net (std 3/4 in)	Black Bullhead	52	10.4	5.0	81	8	27	9	106	3
	Northern Pike	3	0.6	0.4	0		0		85	7
	Walleye	9	1.6	0.9	63		25		91	3
	Yellow Perch	16	3.0	2.7	47	21	0		102	3

## 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	Black Bullhead				0.0		0.0	5.0					1.67
	Northern Pike				0.3		0.0	1.0					0.43
	Walleye				29.7		0.0	14.0					14.57
	Yellow Perch				4.7		12.3	34.0					17.00
fall night EF-WAE*	Walleye							161.0					161.0
frame net (std 3/4 in)	Black Bullhead	0.3			1.3		2.2	66.1		13.2	10.4		15.58
	Black Crappie	0.0			0.0		0.1	0.0		0.0	0.0		0.02
	Green Sunfish	0.0			0.0		0.0	1.4		0.0	0.0		0.23
	Northern Pike	0.0			0.2		0.6	0.4		0.2	0.6		0.33
	Walleye	9.8			45.8		21.1	6.1		13.0	1.6		16.23
	Yellow Perch	0.5			0.6		2.0	14.9		0.4	3.0		3.57
std exp gill net	Walleye												29.50

## 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											
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
AFS std gill net	Black Bullhead	PSD								80				
		PSD-P								10				
		Wr								100				
	Northern Pike	PSD				100					100			
		PSD-P				0					100			
		Wr				102					96			
	Walleye	PSD				100					89			
		PSD-P				6					32			
		Wr				91					103			
	Yellow Perch	PSD				100			70	62				
		PSD-P				100			19	25				
		Wr				115			112	95				
frame net (std 3/4 in)	Black Bullhead	PSD	67			94		69	94		100	81		
		PSD-P	0			88		8	36		92	27		
		Wr	104			98		125	118		93	106		
	Northern Pike	PSD				100		14	100		0	0		
		PSD-P				0		0	0		0	0		
		Wr				101		98	89		98	85		
	Walleye	PSD	100			100		49	88		77	63		
		PSD-P	0			4		30	12		35	25		
		Wr	81			92		104	97		86	91		
	Yellow Perch	PSD	100			100		83	66		0	47		
		PSD-P	80			100		63	3		0	0		
		Wr	87			113		106	91		106	102		
std exp gill net	Walleye	PSD	100											
		PSD-P	0											
		Wr	86											

## Back-Calculated Lengths

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

Species: Walleye

Year Class	Age	N	Mean back-calculated length (SE) at age											
			1	2	3	4	5	6	7	8	9	10		
2023	1	1	140											
2021	3	1	156	275	350									
2019	5	2	179 (12.6)	263 (27.8)	345 (68.8)	419 (109.3)	458 (125)							
2018	6	3	184 (18.3)	267 (29.8)	350 (19.7)	412 (23.4)	443 (17.2)	475 (10)						
2014	10	1	140	140	305	305	407	407	455	455	497	497		
Weighted Mean		8	168	249	342	397	442	458	455	455	497	497		
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20		
2023	1	1												
2021	3	1												
2019	5	2												
2018	6	3												
2014	10	1												
Weighted Mean		8												



Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age											
			1	2	3	4	5	6	7	8	9	10		
2023	1	2	107 (2.4)											
2022	2	5	78 (4.1)	114 (2.1)										
2021	3	1	79	127	151									
2020	4	2	88 (5.4)	126 (1.5)	164 (1.2)	191 (1.8)								
2019	5	1	93	132	172	198	211							
2014	10	1	91	91	127	127	153	153	178	178	198	198		
Weighted Mean		12	87	117	156	177	182	153	178	178	198	198		
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20		
2023	1	2												
2022	2	5												
2021	3	1												
2020	4	2												
2019	5	1												
2014	10	1												
Weighted Mean		12												

## 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+
2021	28	263 (2)	473 (1)	393 (5)	443 (7)			470 (3)			551 (10)
2018	89				435 (72)			491 (18)			
2015	100	191 (41)			431 (59)						

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2021	68		177 (23)	205 (11)	227 (14)	251 (8)	255 (1)	288 (7)	315 (2)	338 (1)	
2020	42	135 (13)	144 (2)	217 (9)	237 (12)			300 (3)		299 (2)	340 (1)
2018	14						282 (4)	307 (6)	294 (4)		

## **Fish Condition**

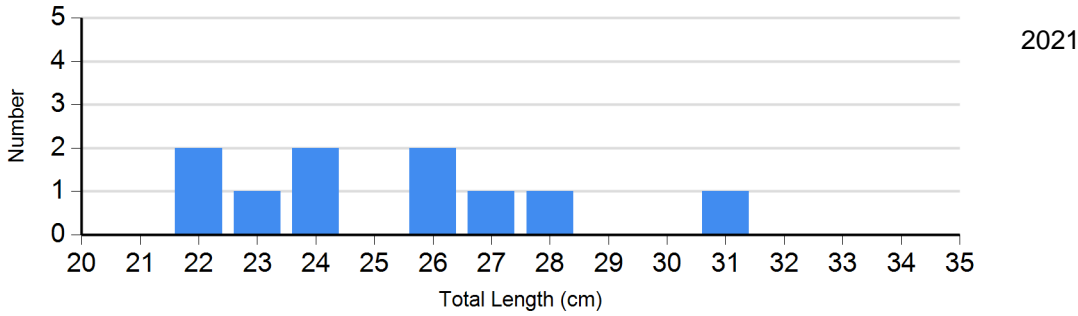
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2021	2	93 (0.7)	7	102 (3.8)	1	93	0	
Northern Pike Gill Net	2021	0		0		2	96 (4.3)	0	
Walleye Gill Net	2021	3	158 (67.1)	16	98 (1.7)	9	95 (3.3)	0	
Yellow Perch Gill Net	2020	11	111 (1.9)	19	112 (2.1)	4	120 (3.7)	3	109 (4.9)
	2021	26	97 (1.2)	25	95 (1.3)	15	91 (2.0)	2	93 (1.7)

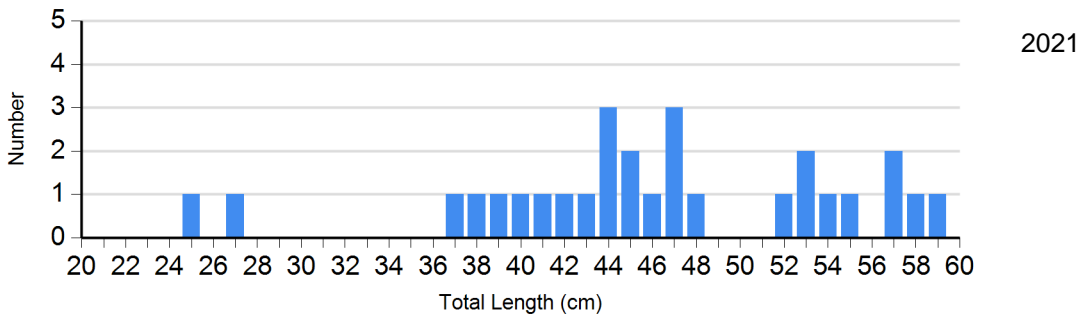
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

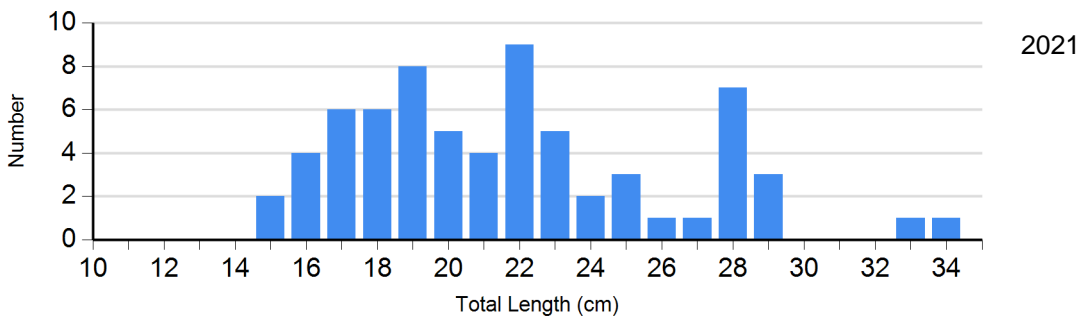
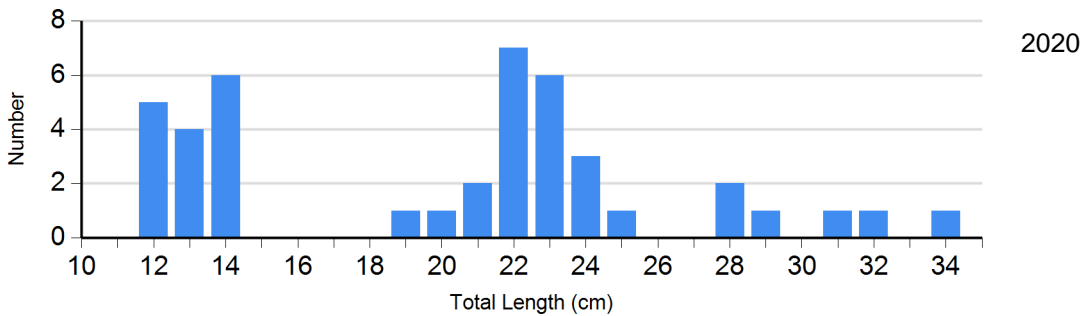
Species: Black Bullhead  
Gear: AFS std gill net



Species: Walleye  
Gear: AFS std gill net



Species: Yellow Perch  
Gear: AFS std gill net

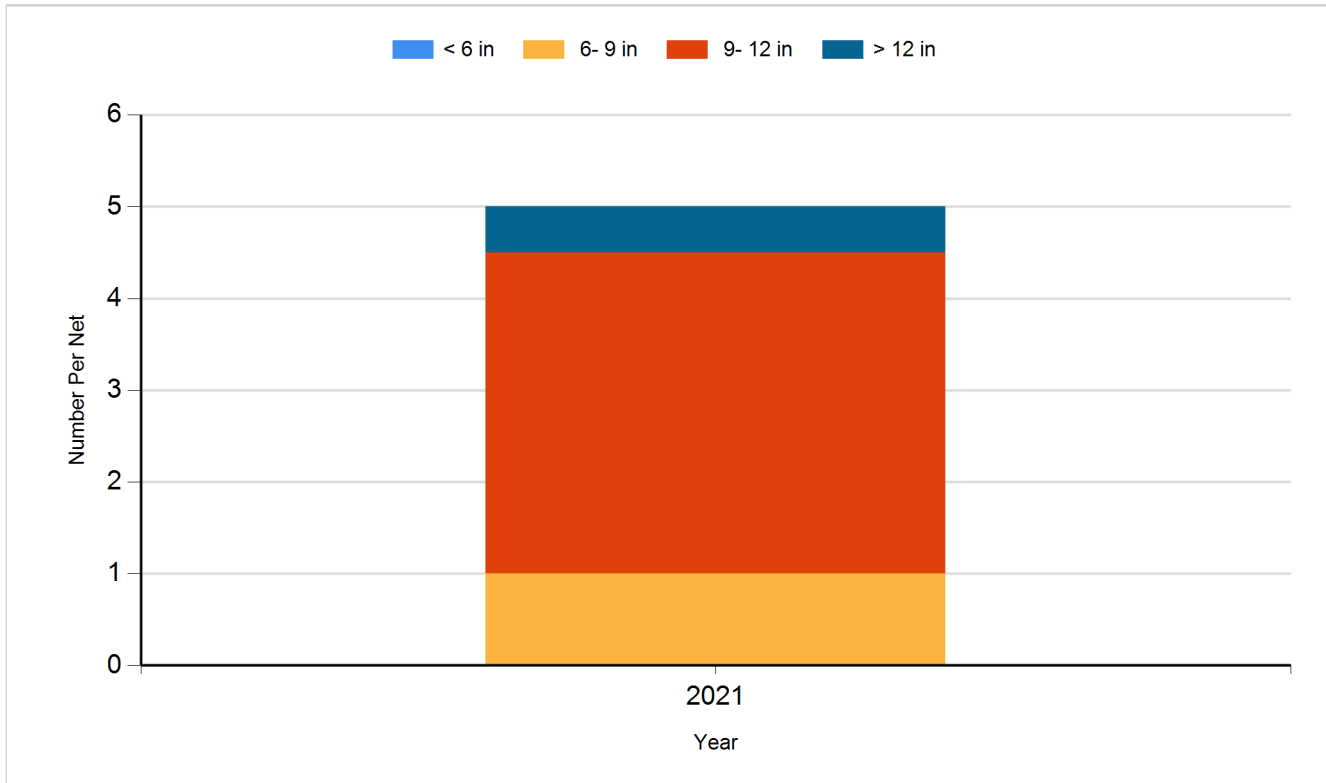


## Historic Fish Sizes and Relative Abundance

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

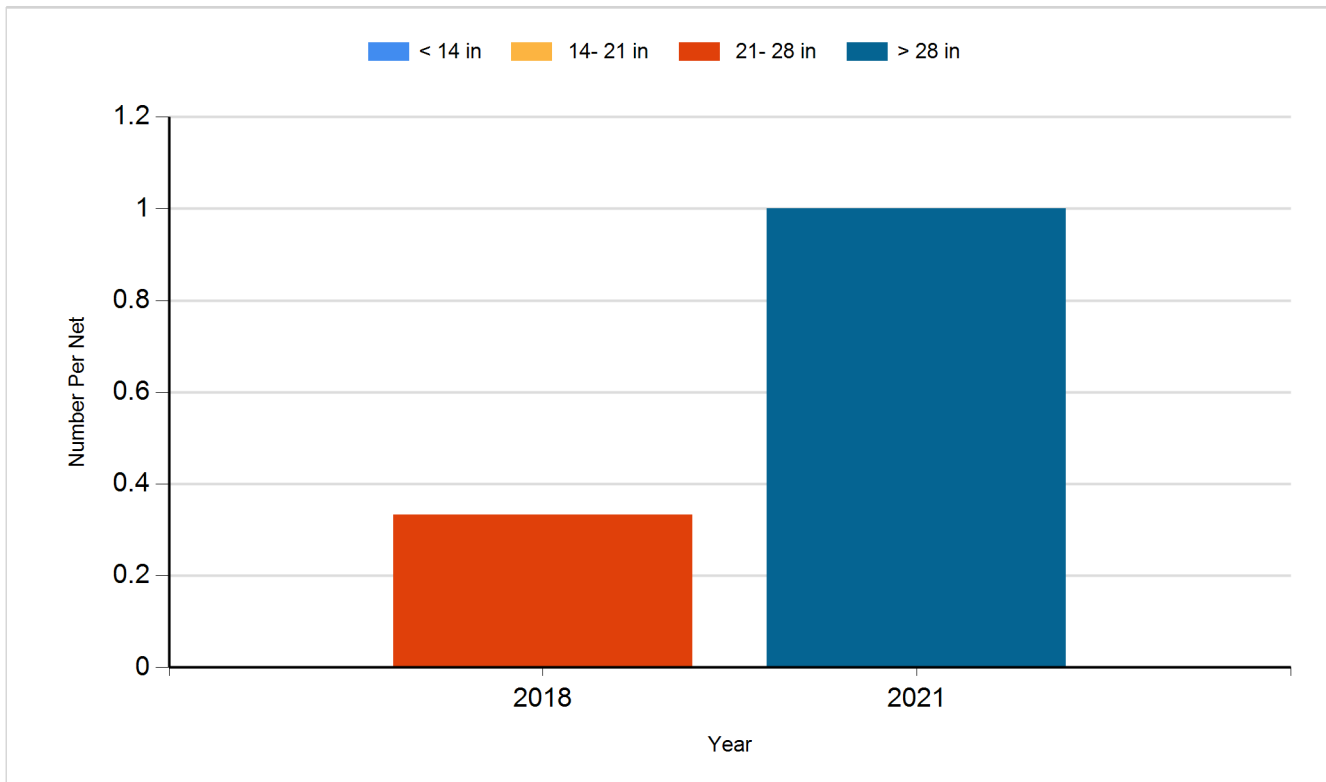
Species: Black Bullhead

Gear: AFS std gill net

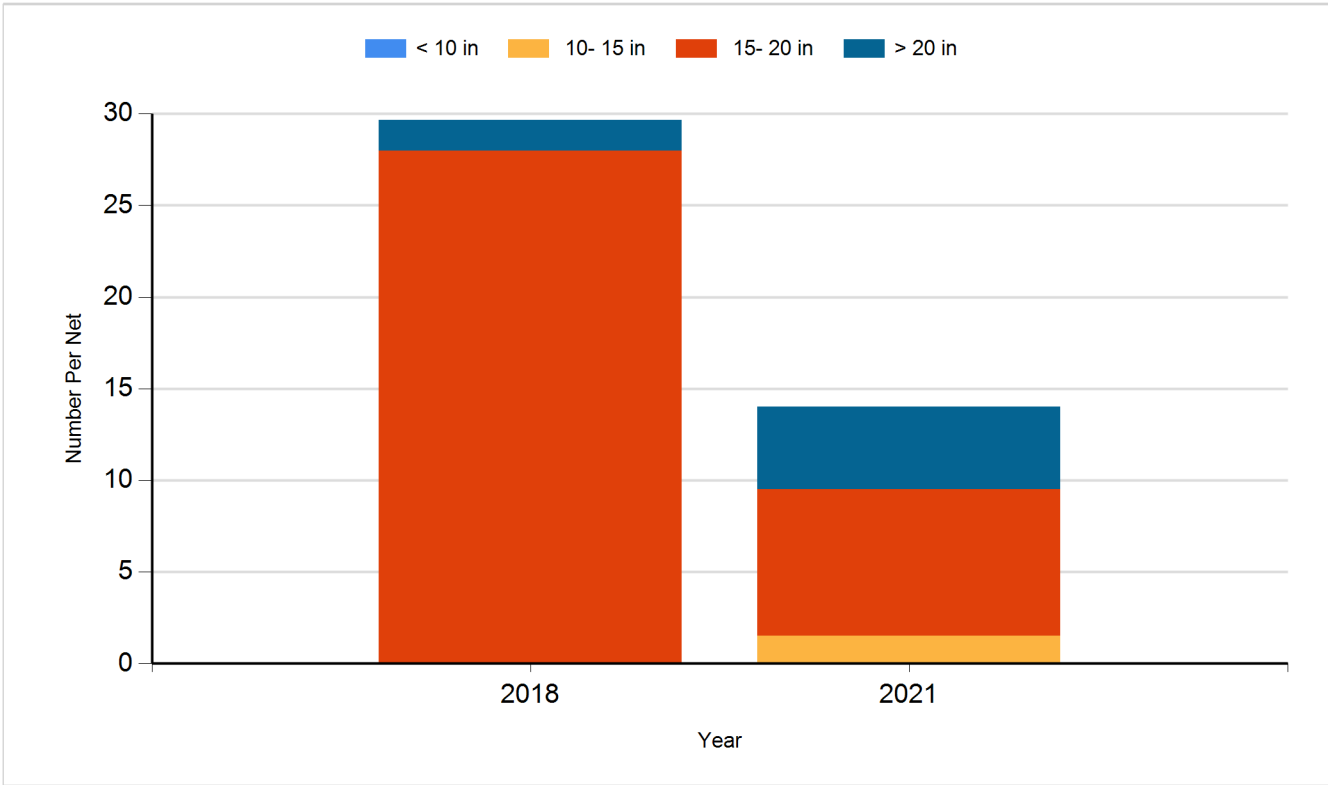


Species: Northern Pike

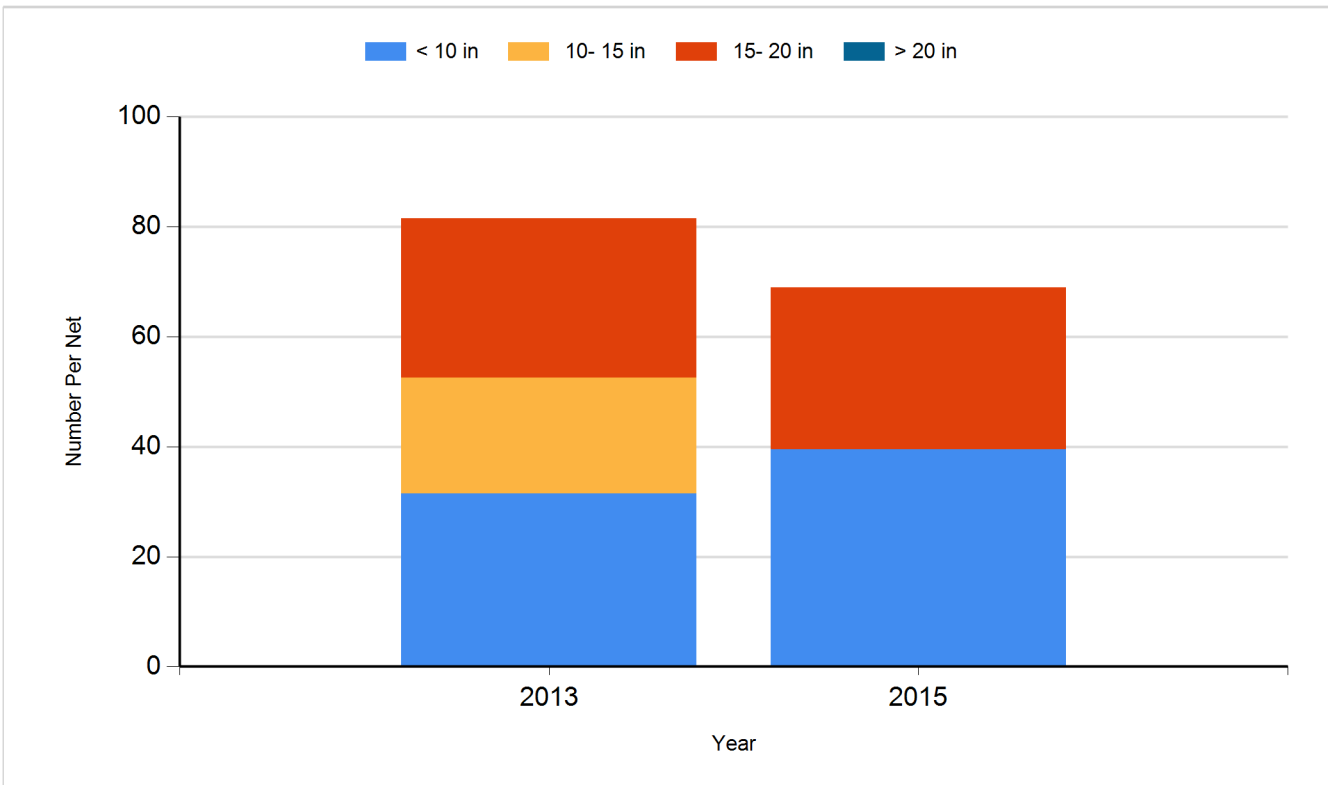
Gear: AFS std gill net



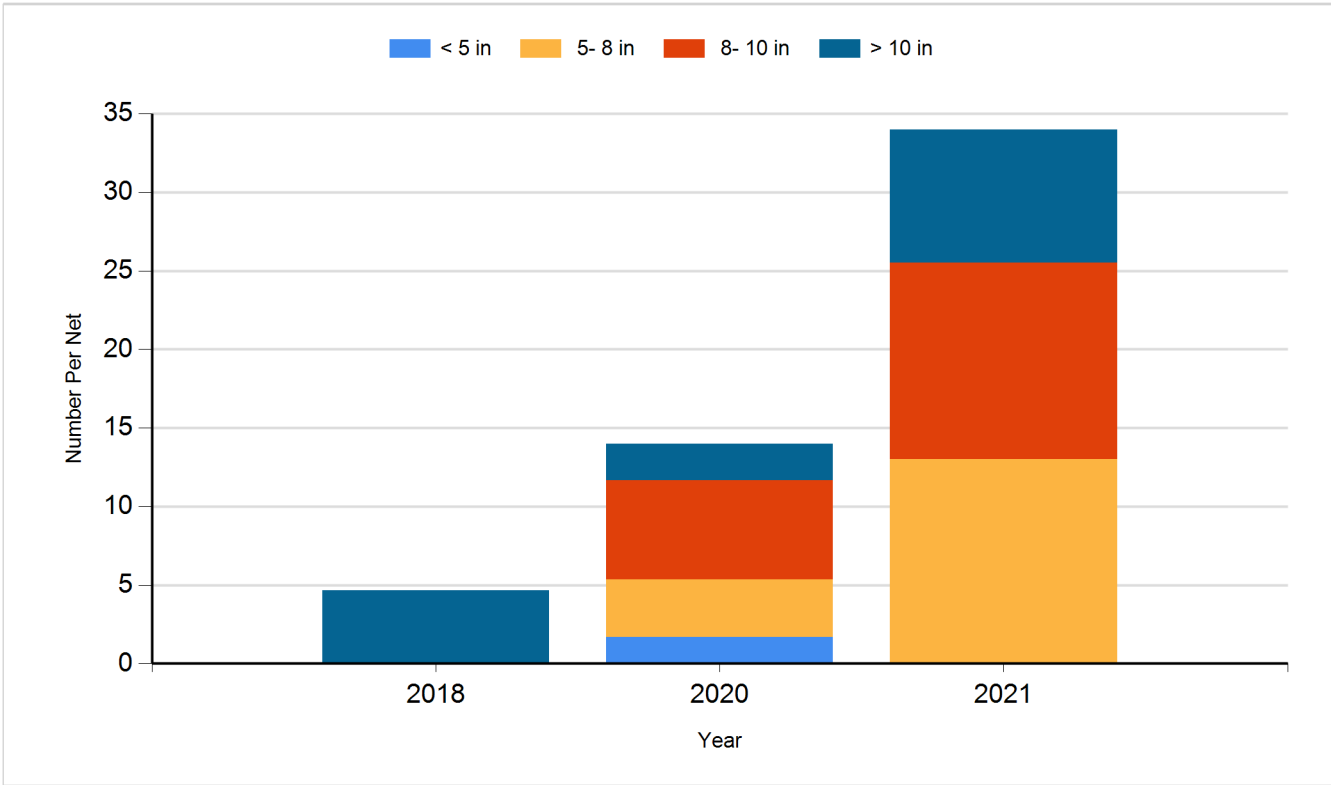
Species: Walleye  
Gear: AFS std gill net



Species: Walleye  
Gear: std exp 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	750,000
2015	Yellow Perch	Fingerling	6,600
2018	Walleye	Fry	720,000
2021	Walleye	Fry	400,000
2023	Walleye	Fry	400,000