

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Cochrane, Deuel County

LQP-Lake-56-000

2024

## Lake Information

<b>Name:</b>	Cochrane	<b>Maximum Depth:</b>	24 Feet
<b>County:</b>	Deuel	<b>Mean Depth:</b>	13 Feet
		<b>OHWM Elevation:</b>	1,684
<b>Surface Area:</b>	366 Acres	<b>Outlet Elevation:</b>	1,683

## Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 11, 2024	3 net-nights
AFS std gill net	Jun 12, 2024	3 net-nights
frame net (std 3/4 in)	Jun 11, 2024	6 net-nights
frame net (std 3/4 in)	Jun 12, 2024	6 net-nights
spring night EF-LMB	Jun 11, 2024	3000 seconds

## **Common Fish Species Present**

Yellow Perch

Walleye

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

Northern Pike

Common Carp

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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	Black Bullhead	1	0.2	0.2	100		100		121	
	Black Crappie	1	0.2	0.2	0		0		108	
	Common Carp	2	0.0	0.0	0		0			
	Northern Pike	7	1.2	0.9	100		57		93	4
	Walleye	24	3.8	2.3	78	14	39	16	98	2
	Yellow Perch	593	98.8	20.7	21	2	1	1	98	1
frame net (std 3/4 in)	Black Bullhead	27	2.3	1.0	96		70	14	97	5
	Black Crappie	1	0.1	0.1	0		0		111	
	Bluegill	550	45.8	13.2	67	3	2	1	106	1
	Largemouth Bass	7	0.2	0.2	50		0			
	Northern Pike	3	0.3	0.2	100		67		90	4
	Walleye	31	1.9	0.6	70	15	57	16	90	2
	Yellow Perch	42	3.5	2.1	26	10	0		78	2
spring night EF-LMB*	Largemouth Bass	38	45.6	22.6	76	11	42	12	97	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 frame net	Black Crappie		17.6										17.60
	Bluegill		65.1										65.10
	Largemouth Bass		0.0										0.00
	Northern Pike		0.2										0.20
	Walleye		0.1										0.10
	Yellow Perch		3.9										3.90
AFS std gill net	Black Bullhead		0.0		3.2		4.8		3.5		0.2		2.34
	Black Crappie		5.2		30.3		37.0		4.2		0.2		15.38
	Bluegill		0.2		1.3		0.7		1.7		0.0		0.78
	Common Carp		0.0		0.0		0.2		0.0		0.0		0.04
	Largemouth Bass		0.2		0.7		0.5		0.0		0.0		0.28
	Northern Pike		2.0		0.3		1.3		0.5		1.2		1.06
	Walleye		10.0		6.2		2.3		11.3		3.8		6.72
Yellow Perch		36.8		47.2		16.0		40.5		98.8		47.86	
boat shocker (night, AC)	Largemouth Bass		231.0										231.00
frame net (std 3/4 in)	Black Bullhead				32.5		19.0		7.1		2.3		15.23
	Black Crappie				12.3		3.6		59.2		0.1		18.80
	Bluegill				46.7		19.9		62.0		45.8		43.60
	Common Carp				0.1		0.0		0.0		0.0		0.03
	Largemouth Bass				0.2		0.0		0.1		0.2		0.13
	Northern Pike				0.1		0.2		0.1		0.3		0.18
	Walleye				0.8		0.3		0.4		1.9		0.85
Yellow Perch				0.8		1.4		25.7		3.5		7.85	
spring night EF-LMB*	Largemouth Bass										45.6		45.60

## 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 frame net	Black Crappie	PSD		11												
		PSD-P		5												
		Wr		94												
	Bluegill	PSD		33												
		PSD-P		0												
		Wr		105												
	Largemouth Bass	PSD		0												
		PSD-P		0												
	Northern Pike	PSD		100												
		PSD-P		100												
		Wr		85												
	Walleye	PSD		0												
		PSD-P		0												
		Wr		72												
	Yellow Perch	PSD		23												
PSD-P			0													
Wr			86													
AFS std gill net	Black Bullhead	PSD					0		100		100		100		100	
		PSD-P						0		21		48			100	
		Wr						108		104		97			121	
	Black Crappie	PSD		0		1				100		24			0	
		PSD-P		0		1				0		4			0	
		Wr		107		102				103		103			108	
	Bluegill	PSD		100		38				100		0				
		PSD-P		0		0				0		0				
		Wr		82		103				106		109				
	Common Carp	PSD								100					0	
		PSD-P								100					0	
		Wr								83						
	Largemouth Bass	PSD		100			100			100						
		PSD-P		100			100			100						
		Wr		116			104			92						
	Northern Pike	PSD		100			100			100			100		100	

Gear	Species	Index	Year									
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std gill net	Northern Pike	PSD-P		75		50		13		0		57
		Wr		93		81		84		94		93
		PSD		80		95		43		71		78
	Walleye	PSD-P		10		54		36		15		39
		Wr		95		92		86		89		98
		PSD		19		11		54		20		21
	Yellow Perch	PSD-P		1		0		2		4		1
		Wr		94		103		105		94		98
boat shocker (night, AC)	Largemouth Bass	PSD		34								
		PSD-P		13								
		Wr		103								
frame net (std 3/4 in)	Black Bullhead	PSD				4		100		100		96
		PSD-P				1		7		60		70
		Wr				99		97		91		97
	Black Crappie	PSD				22		100		15		0
		PSD-P				3		5		8		0
		Wr				90		95		101		111
	Bluegill	PSD				91		99		49		67
		PSD-P				3		15		5		2
		Wr				103		109		99		106
	Common Carp	PSD				100						
		PSD-P				0						
		Wr				99						
	Largemouth Bass	PSD				50				100		50
		PSD-P				50				100		0
		Wr				90				86		
	Northern Pike	PSD				100		50		100		100
		PSD-P				0		0		100		67
		Wr				88		88		86		90
	Walleye	PSD				20		75		20		70
		PSD-P				20		75		0		57
		Wr				80		83		81		90
	Yellow Perch	PSD				11		88		8		26
		PSD-P				0		6		0		0
		Wr				91		92		87		78
	spring night EF-LMB	Largemouth Bass	PSD									76



Gear	Species	Index	Year										
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
spring night	Largemouth Bass	PSD-P											42
EF-LMB		Wr											97

## 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+
2022	710		138 (18)	182 (584)						253 (108)	

Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2024	534		112 (15)	151 (292)	166 (14)	175 (214)					
2022	744		100 (3)	145 (539)				179 (100)	233 (9)	197 (93)	
2020	239			143 (1)		188 (82)	191 (22)	191 (125)	207 (7)	208 (5)	
2018	555					160 (398)	163 (48)	185 (92)	192 (10)		194 (7)
2016	781		93 (108)	109 (343)	142 (81)	156 (115)	178 (59)	175 (58)	164 (19)		

Species: Largemouth Bass

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2024	35			245 (8)	253 (1)	331 (1)	372 (5)	384 (3)	375 (9)	417 (5)	439 (5)
2016	230			228 (155)	308 (2)	354 (27)	374 (26)	391 (10)	418 (9)		

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2024	23	253 (3)	310 (3)	420 (3)		506 (11)		553 (1)			679 (2)
2022	68			381 (51)		476 (12)				616 (3)	548 (2)
2020	14		325 (2)	340 (6)				557 (5)			691 (1)
2018	37				493 (3)	499 (26)	556 (5)		620 (1)		665 (2)
2016	64	216 (4)	314 (8)	423 (43)	505 (4)		518 (2)		588 (2)		670 (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	585		144 (82)	171 (209)	192 (283)	238 (11)					

Mean Length (expanded sample number) at capture by age

Year	N	1	2	3	4	5	6	7	8	9	10+
2022	243		138 (16)	179 (208)	243 (6)	243 (6)	255 (1)		261 (1)	262 (3)	
2020	96	134 (2)	175 (28)	196 (28)	223 (3)		214 (4)	228 (31)			
2018	285					154 (253)	211 (29)	244 (1)		215 (2)	
2016	221			179 (197)	219 (17)	214 (1)	248 (5)	293 (1)			

## Fish Condition

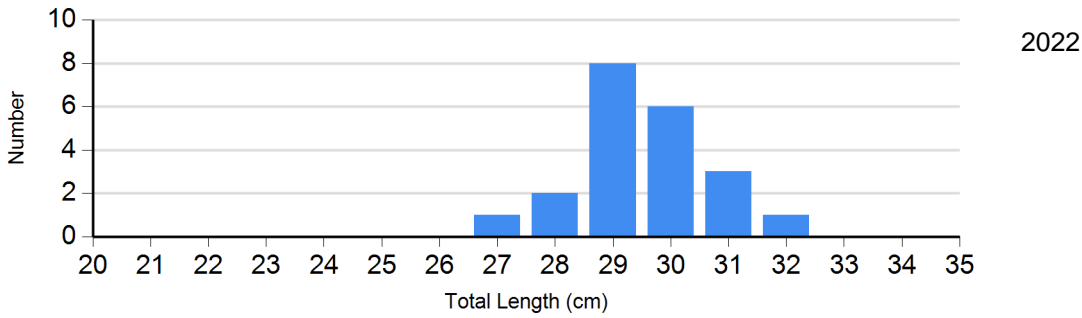
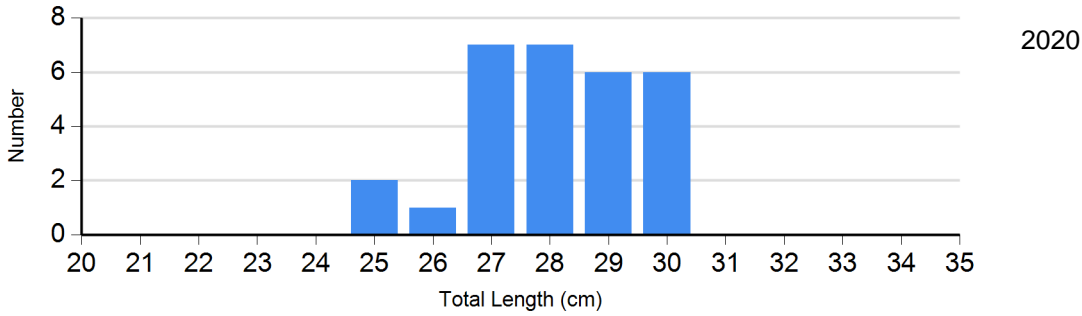
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2020	0		23	105 (1.7)	6	99 (3.5)	0	
	2022	0		11	94 (3.7)	10	100 (3.3)	0	
	2024	0		0		1	121	0	
Black Crappie Frame Net	2020	0		41	95 (0.8)	2	89 (1.6)	0	
	2022	602	104 (0.7)	50	93 (0.6)	58	84 (0.5)	0	
	2024	1	111	0		0		0	
Bluegill Frame Net	2020	2	115 (2.3)	200	109 (0.6)	37	110 (1.8)	0	
	2022	376	102 (0.7)	329	95 (0.9)	39	92 (1.8)	0	
	2024	180	111 (1.2)	357	104 (0.8)	13		0	
Common Carp Gill Net	2020	0		0		0		1	83
	2024	0		0		0		0	
Largemouth Bass Electro Fishing	2024	9	108 (2.9)	13	95 (1.4)	16	93 (1.3)	0	
Northern Pike Gill Net	2020	0		7	83 (2.8)	1	88	0	
	2022	0		3	94 (5.4)	0		0	
	2024	0		3	98 (4.5)	4	90 (2.5)	0	
Walleye Gill Net	2020	8	85 (1.0)	1	86	4	89 (3.0)	1	80
	2022	20	89 (1.2)	38	89 (0.7)	9	90 (1.5)	1	84
	2024	5	98 (2.6)	9	100 (2.2)	6	101 (2.0)	3	89 (3.6)
Yellow Perch Gill Net	2020	44	107 (0.9)	50	102 (0.9)	2	106 (3.2)	0	
	2022	195	96 (0.7)	39	84 (1.1)	9	91 (2.3)	0	
	2024	468	99 (0.7)	117	92 (0.8)	8		0	

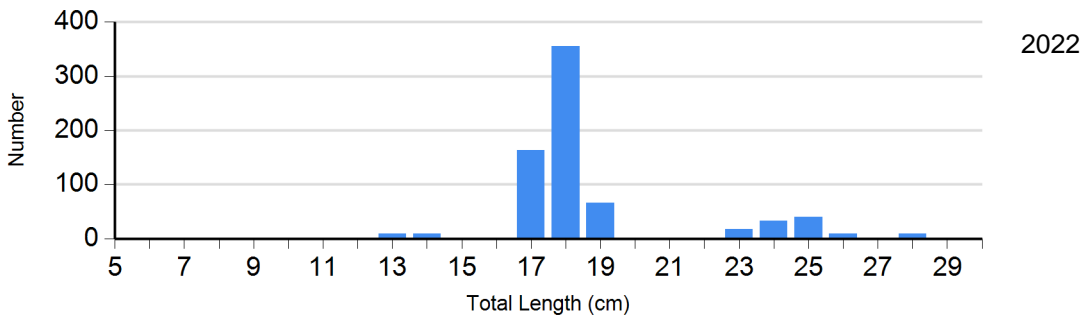
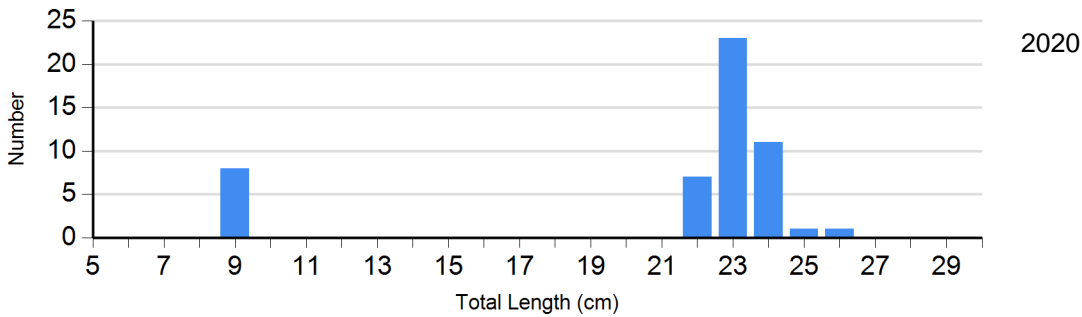
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

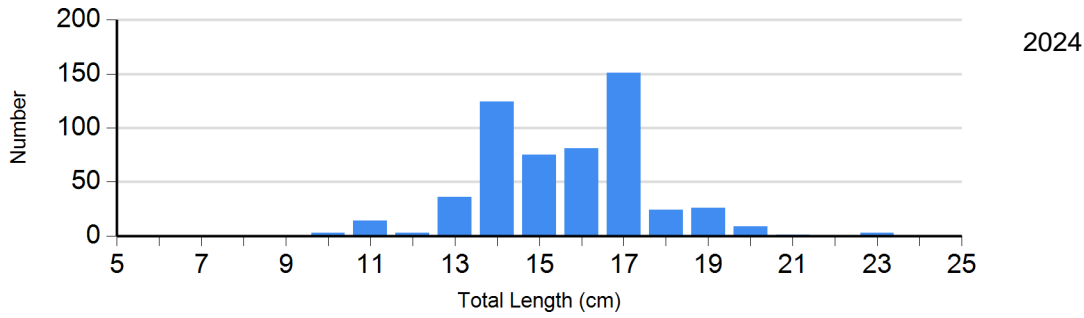
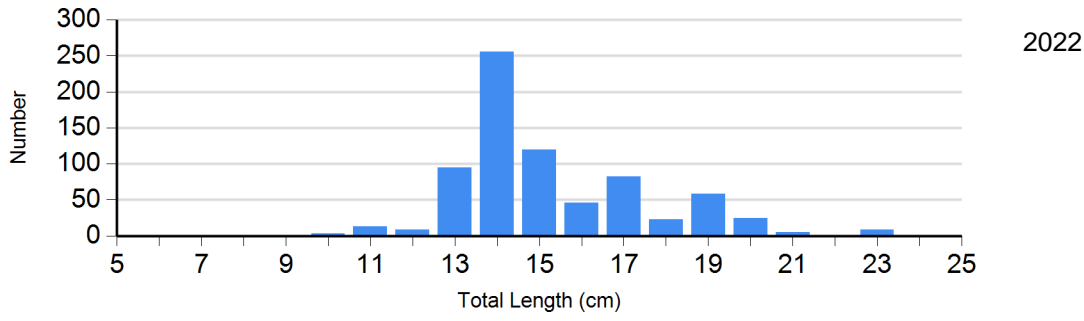
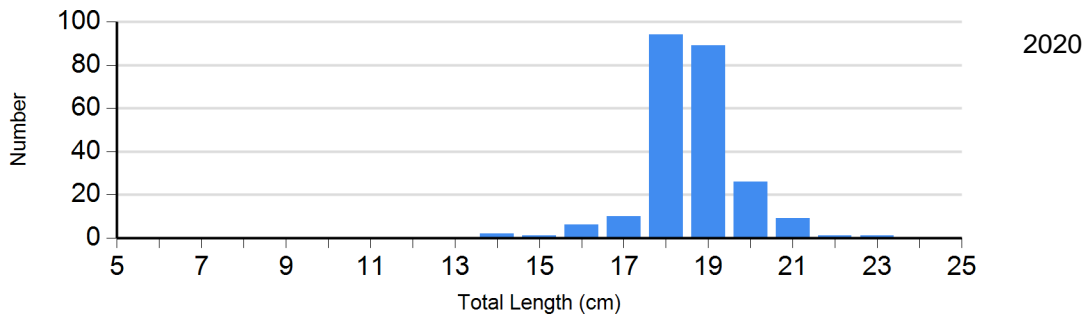
Species: Black Bullhead  
Gear: AFS std gill net



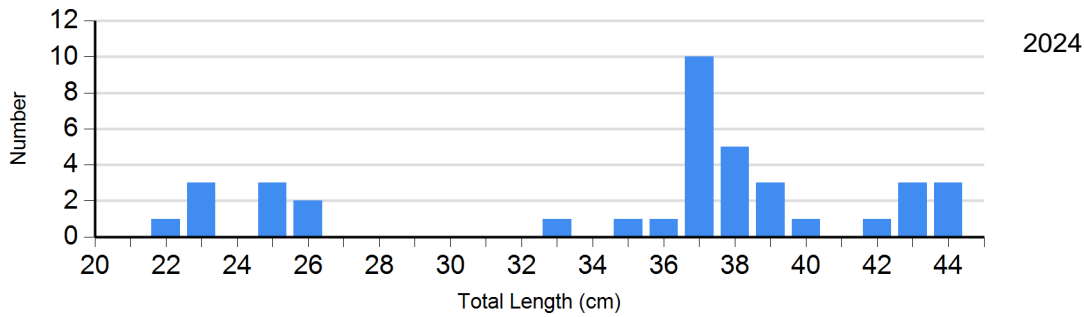
Species: Black Crappie  
Gear: frame net (std 3/4 in)



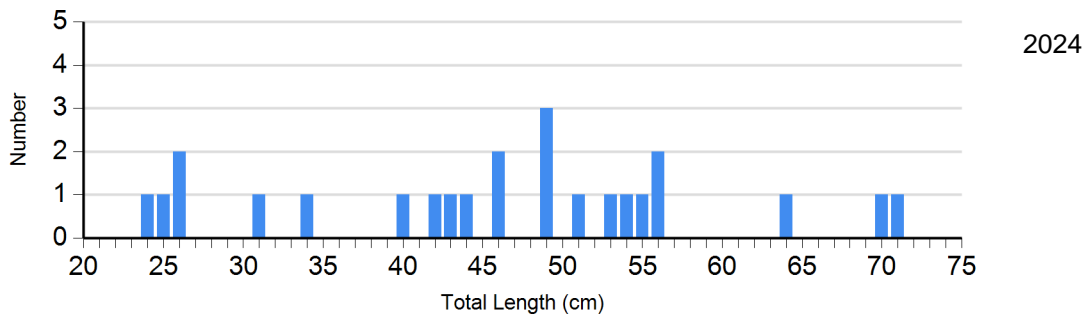
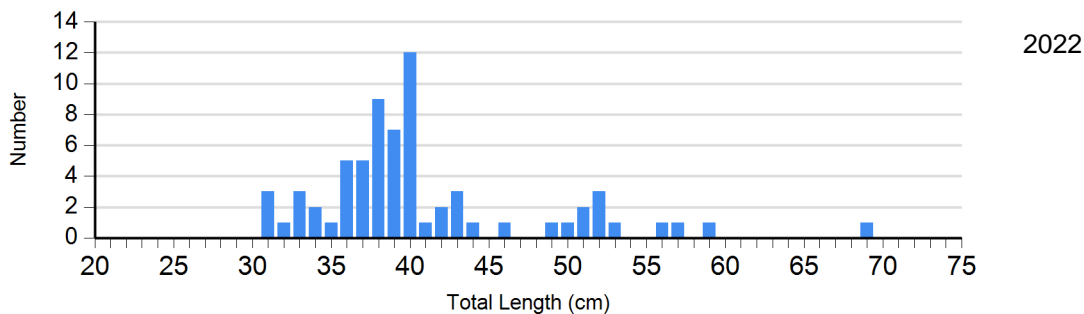
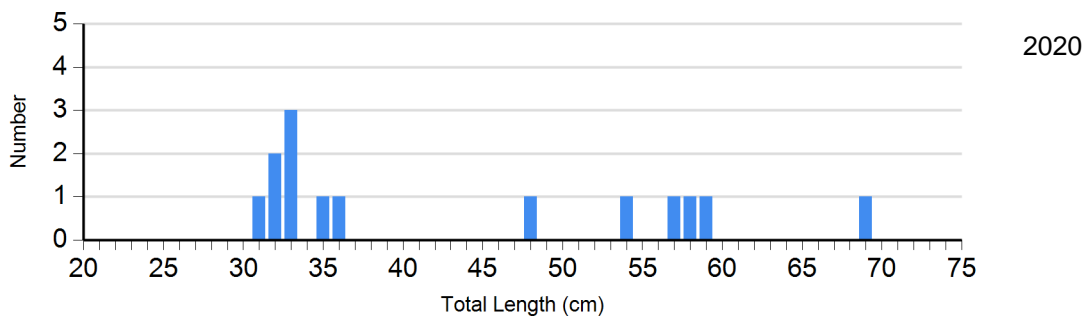
Species: Bluegill  
Gear: frame net (std 3/4 in)



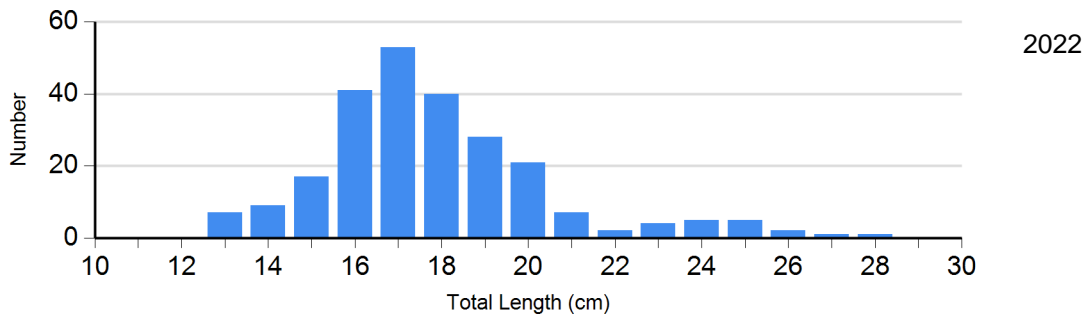
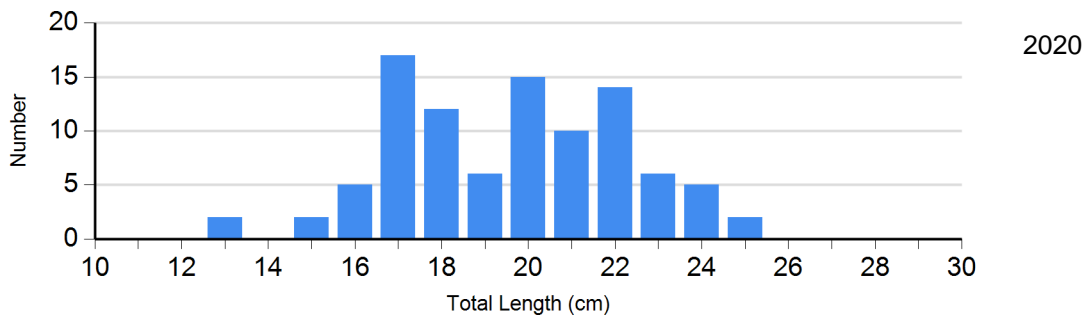
Species: Largemouth Bass  
Gear: spring night EF-LMB

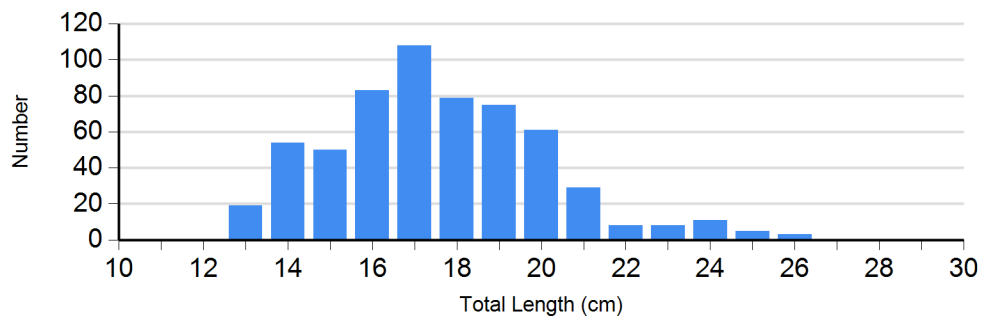


Species: Walleye  
 Gear: AFS std gill net



Species: Yellow Perch  
 Gear: AFS std gill net



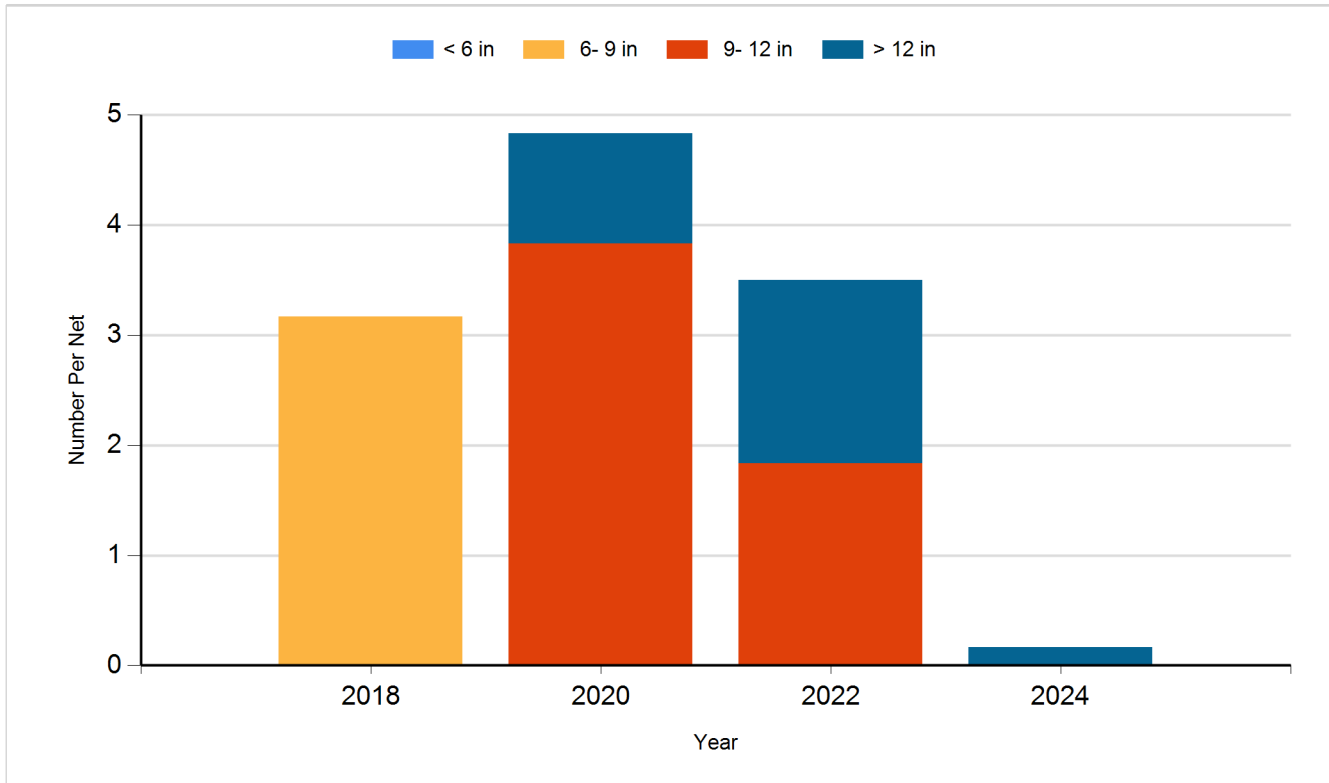




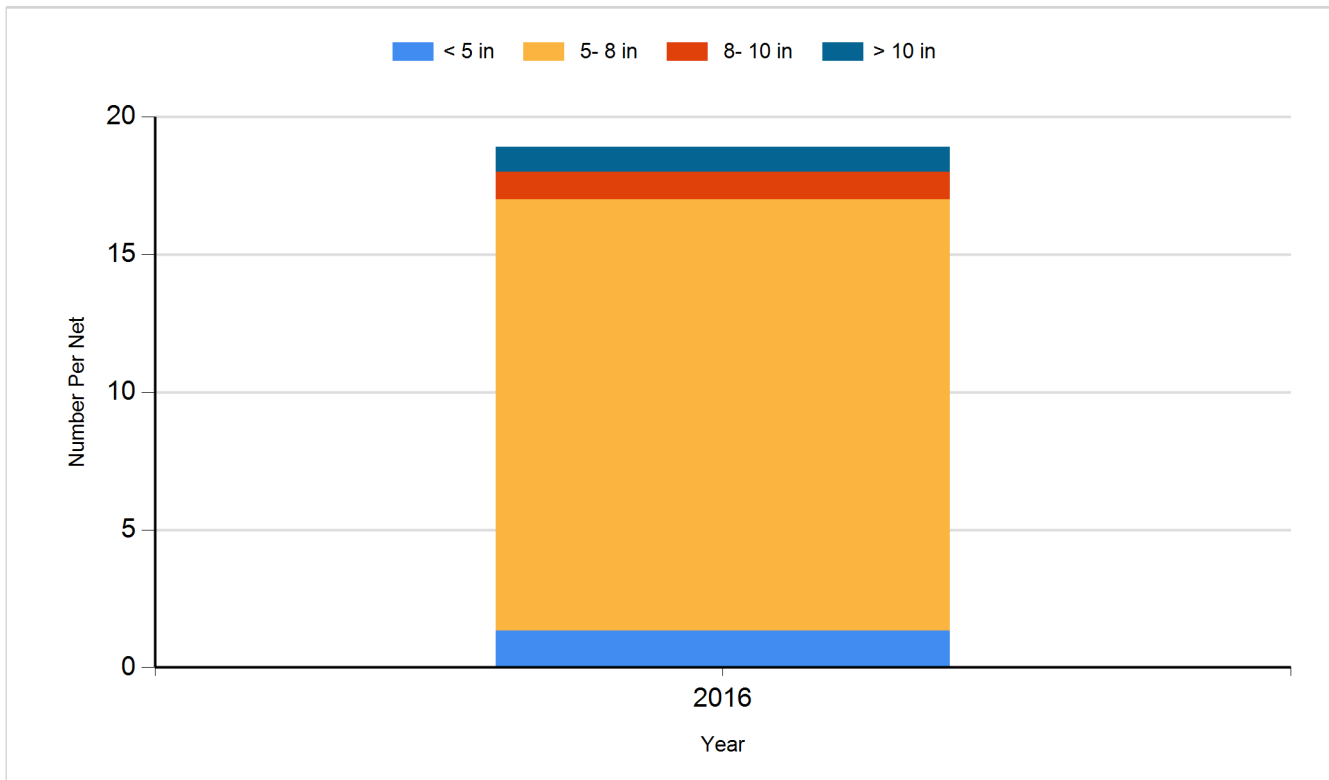
## Historic Fish Sizes and Relative Abundance

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

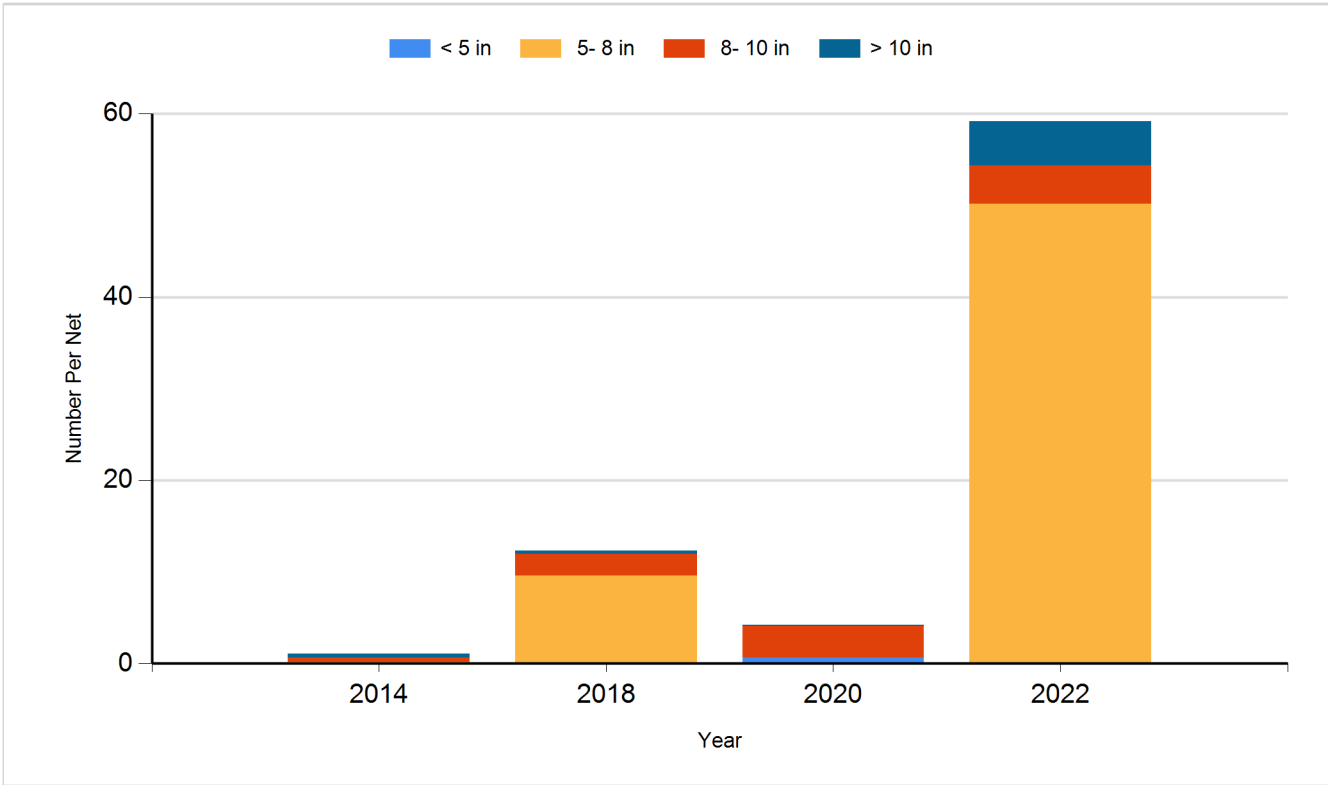
Species: Black Bullhead  
Gear: AFS std gill net



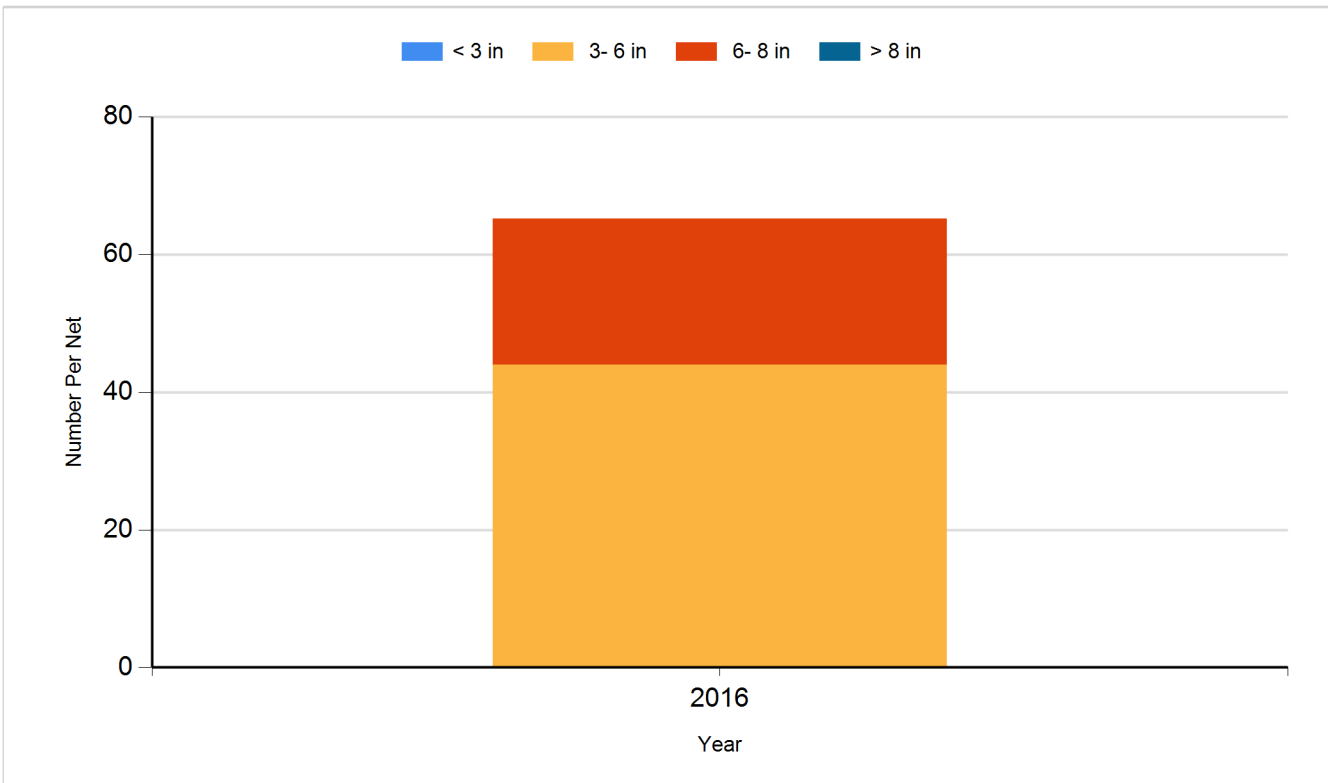
Species: Black Crappie  
Gear: AFS std frame net



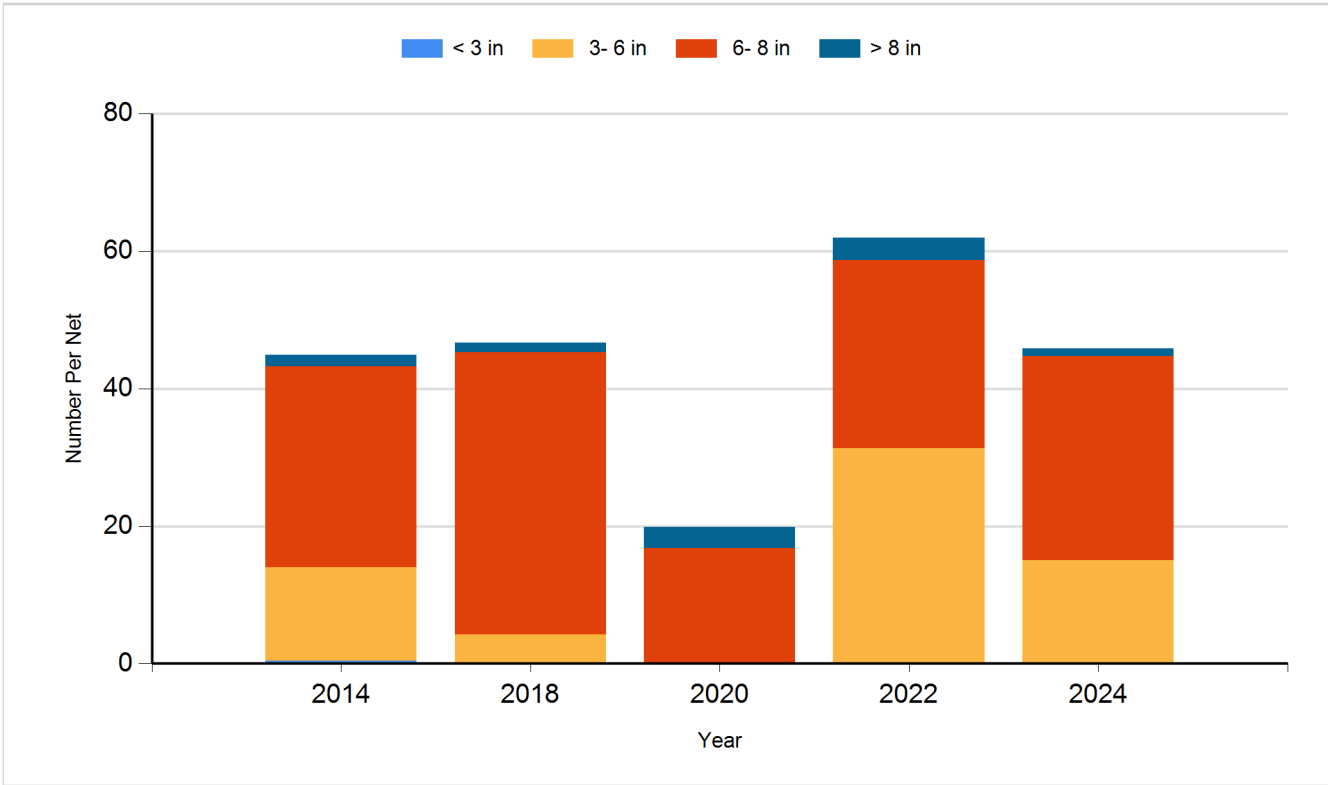
Species: Black Crappie  
Gear: frame net (std 3/4 in)



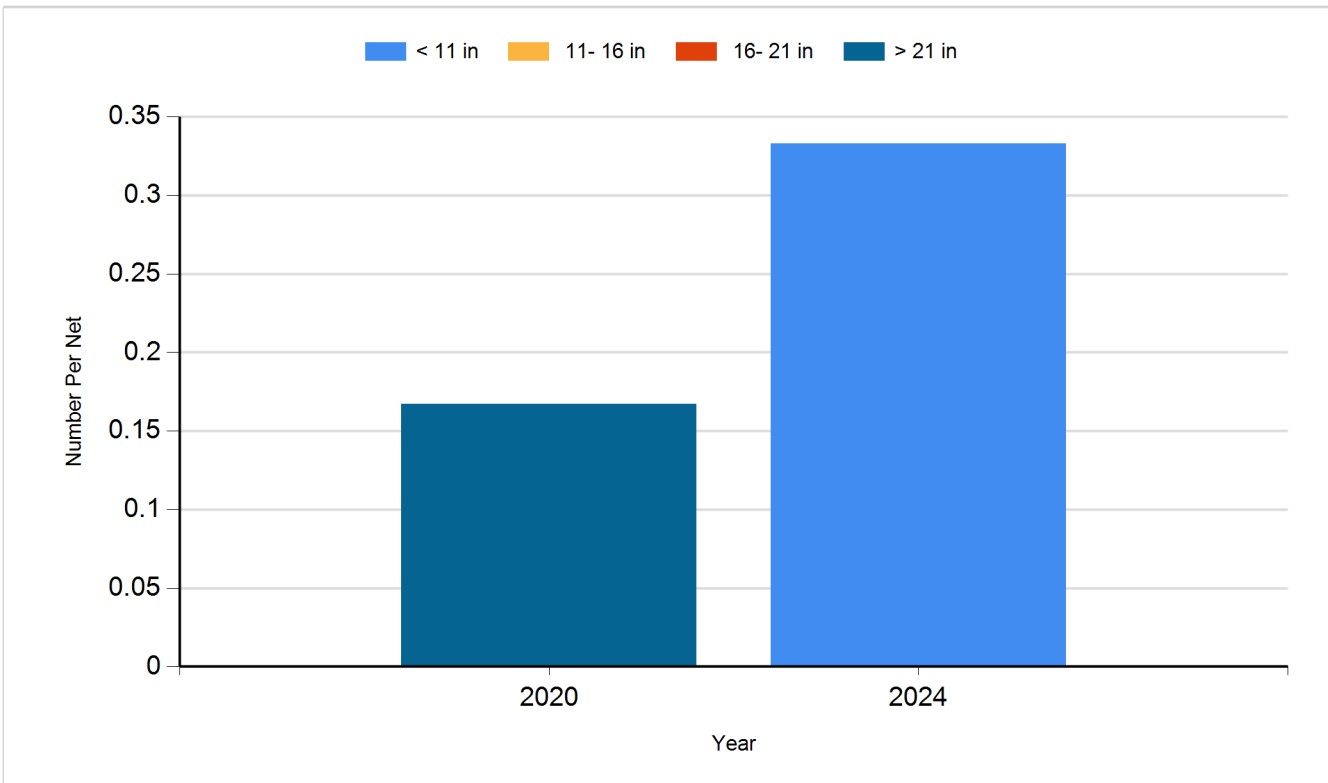
Species: Bluegill  
Gear: AFS std frame net



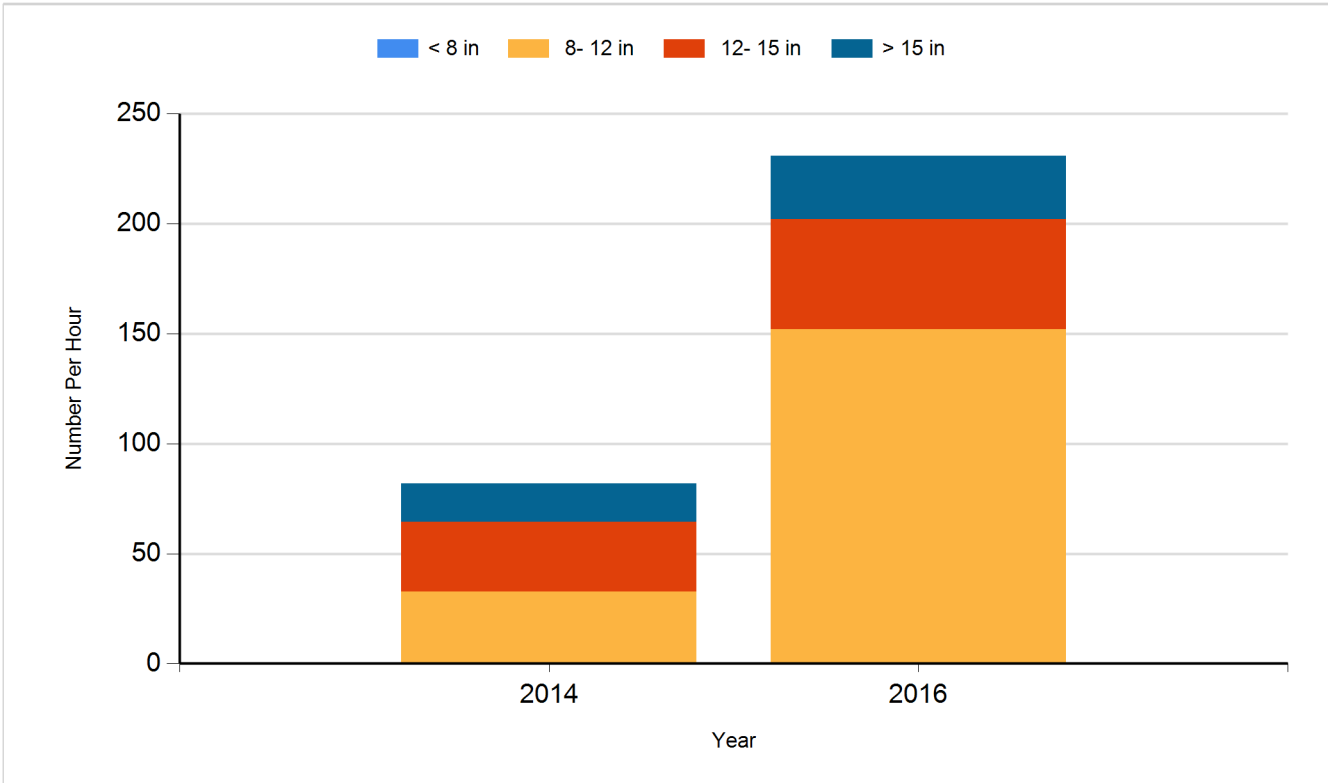
Species: Bluegill  
Gear: frame net (std 3/4 in)



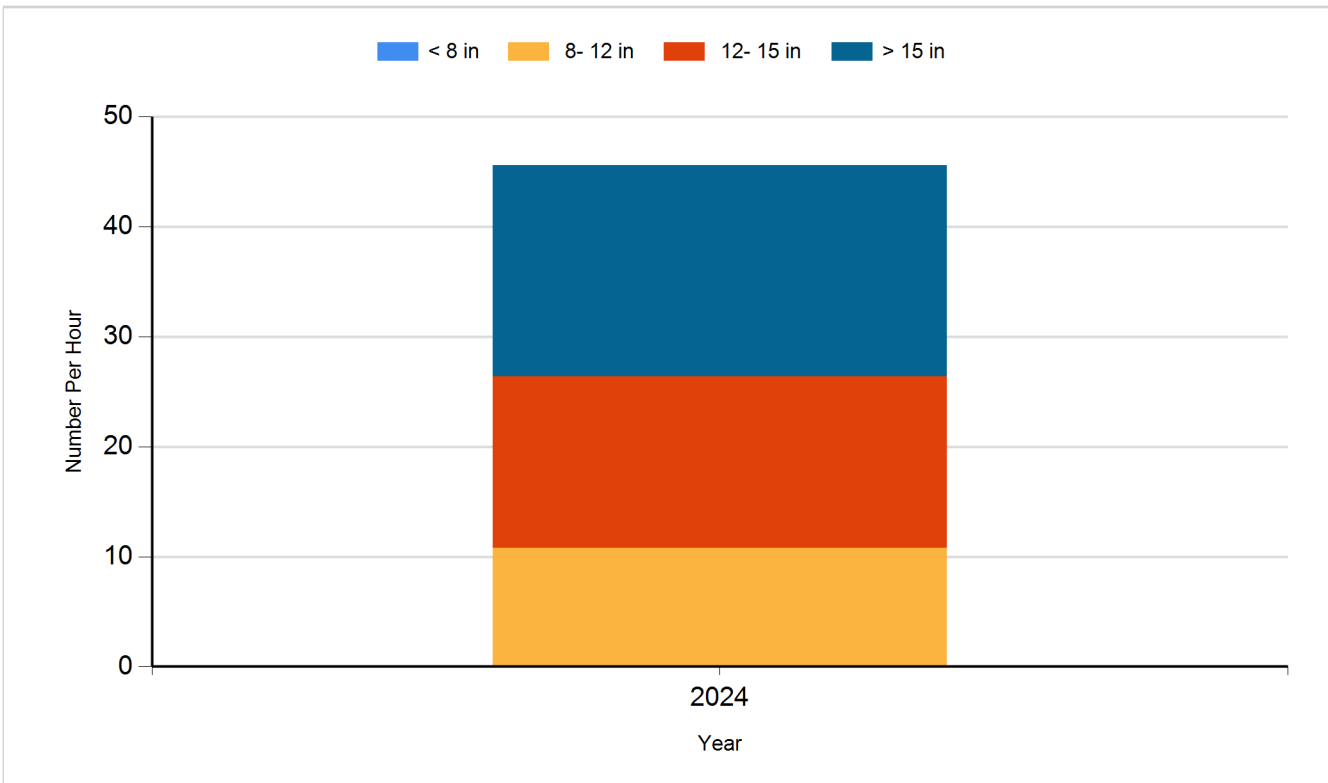
Species: Common Carp  
Gear: AFS std gill net



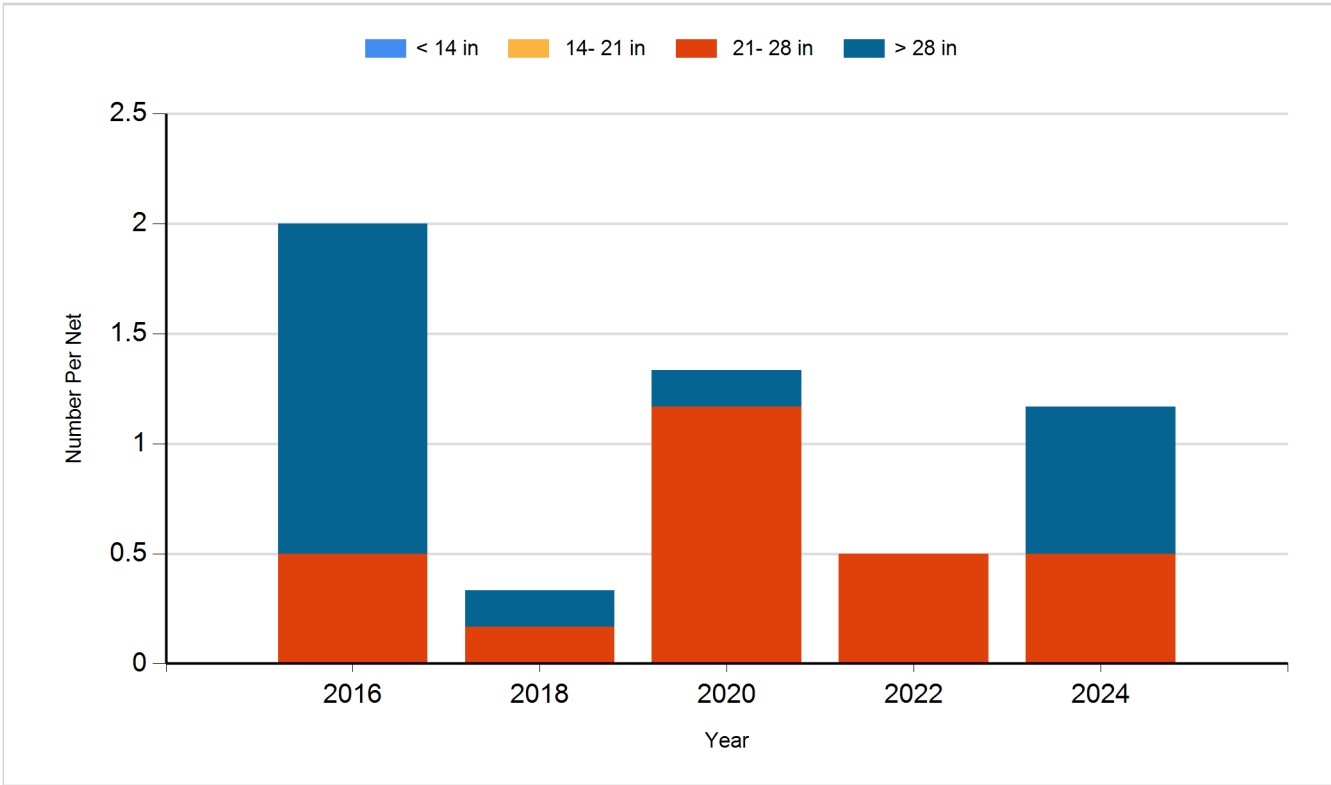
Species: Largemouth Bass  
Gear: boat shocker (night, AC)



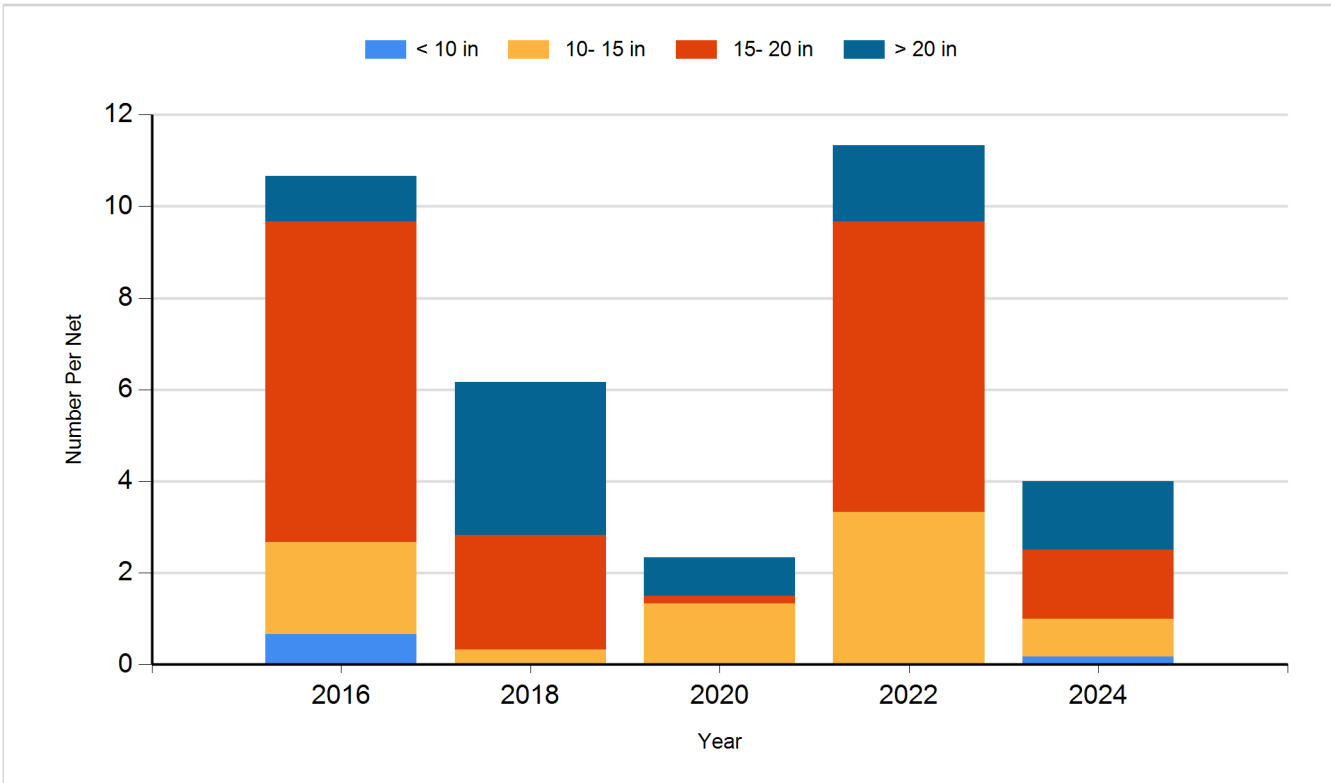
Species: Largemouth Bass  
Gear: spring night EF-LMB



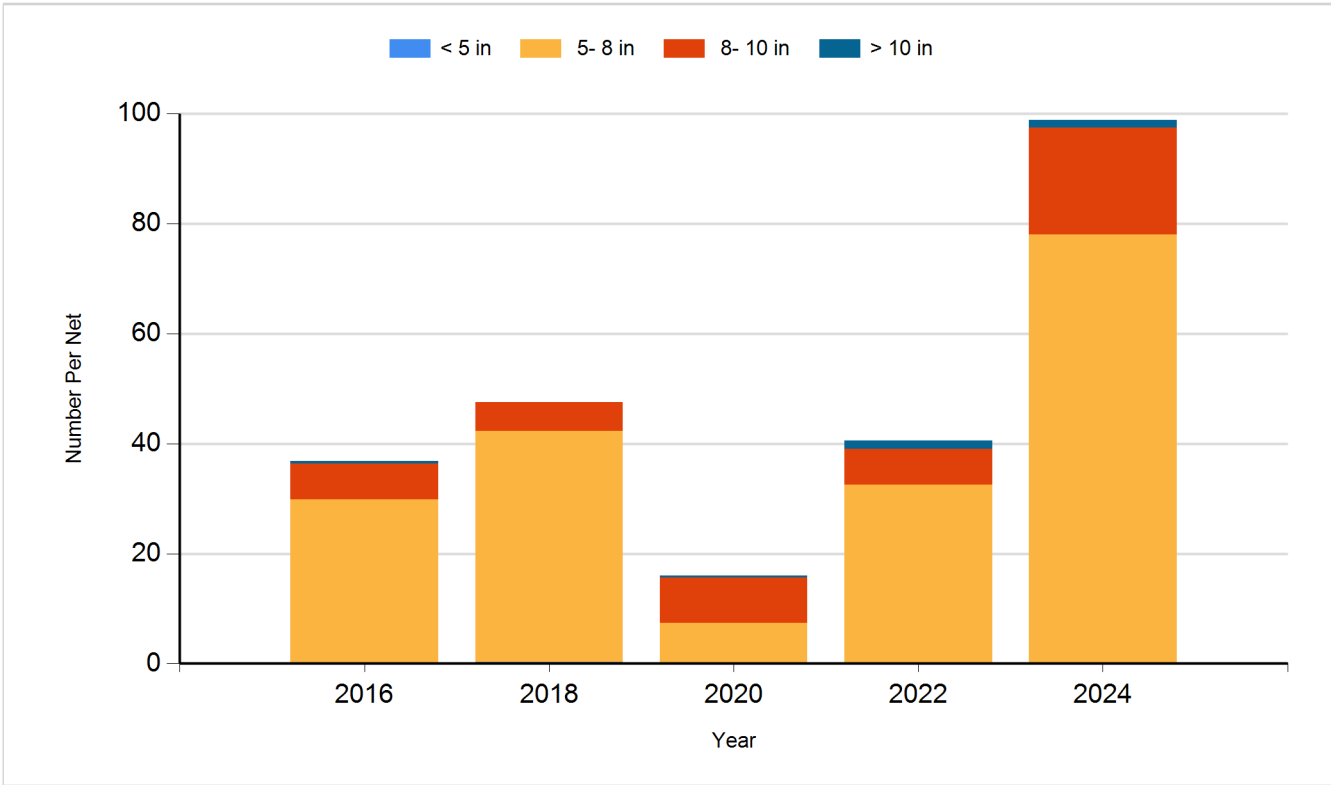
Species: Northern Pike  
Gear: AFS std gill net



Species: Walleye  
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
2013	Walleye	Large Fingerling	11,132
2015	Walleye	Large Fingerling	4,026
2017	Walleye	Large Fingerling	16,000
2019	Walleye	Large Fingerling	8,700
2021	Walleye	Juvenile	4,467
2022	Walleye	Juvenile	9,150