

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Louise, Hand County

TUR-Lake-155-000

2022

## Lake Information

**Name:** Louise **Maximum Depth:** 20 Feet  
**County:** Hand **Mean Depth:** 8 Feet  
**Legal Description:** T113-R69-S4  
**Surface Area:** 163 Acres

## Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 24, 2022	2 net-nights
AFS std gill net	May 25, 2022	2 net-nights
boat shocker (night)	Oct 06, 2022	6000 seconds
frame net (std 3/4 in)	May 24, 2022	5 net-nights
frame net (std 3/4 in)	May 25, 2022	5 net-nights

## **Common Fish Species Present**

Yellow Perch

Walleye

Largemouth Bass

Bluegill

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.

$$Wr = \left( \frac{W}{Ws} \right) \times 100$$

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
AFS std gill net	Common Carp	2	0.5	0.8	50		0		
	Northern Pike	38	9.5	3.1	82	10	18	10	
boat shocker (night)	Largemouth Bass	4	1.2	1.1	100		100		129 3
frame net (std 3/4 in)	Black Bullhead	482	43.0	18.3	6	2	2	1	
	Bluegill	3	0.3	0.4	0		0		
	Common Carp	1	0.1	0.1	100		100		
	Northern Pike	3	0.3	0.2	33		0		98

## 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
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
AFS std gill net	Black Bullhead						0.0		4.8		0.0	1.60
	Bluegill						2.8		0.3		0.0	1.03
	Common Carp						0.0		0.0		0.5	0.17
	Northern Pike						0.8		8.3		9.5	6.20
	Walleye						1.0		0.0		0.0	0.33
	Yellow Perch						11.0		4.3		0.0	5.10
boat shocker (day)	Black Bullhead							5.0				5.00
	Bluegill							58.0				58.00
	Common Carp							1.0				1.00
	Largemouth Bass							1.0				1.00
	Northern Pike							7.0				7.00
	Yellow Perch							20.0				20.00
boat shocker (night)	Largemouth Bass	24.0		57.0	48.0		164.0		12.0		1.2	51.03
	Walleye*	0.0		12.0	6.0		33.0		0.0		0.0	8.50
frame net (std 3/4 in)	Black Bullhead	9.9		7.0	42.2		23.3		10.3		43.0	22.62
	Bluegill	1.5		0.3	4.5		20.5		4.4		0.3	5.25
	Common Carp	0.0		0.3	0.2		0.0		0.0		0.1	0.10
	Largemouth Bass	0.0		0.0	0.0		0.1		0.0		0.0	0.02
	Northern Pike	0.8		0.0	0.0		0.1		3.6		0.3	0.80
	Walleye	0.1		0.0	0.0		0.2		0.0		0.0	0.05
	Yellow Perch	0.1		0.2	2.5		2.2		1.3		0.0	1.05
std exp gill net	Black Bullhead	52.5		30.5	54.0							45.67
	Bluegill	0.0		0.0	0.5							0.17
	Northern Pike	1.5		0.5	1.5							1.17
	Walleye	0.0		0.0	3.0							1.00
	Yellow Perch	7.0		14.5	97.0							39.50

## 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												
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022			
AFS std gill net	Black Bullhead	PSD							0		89				
		PSD-P							0		63				
		Wr									94				
	Bluegill	PSD							9		0				
		PSD-P							0		0				
	Common Carp	PSD												50	
		PSD-P												0	
	Northern Pike	PSD								100		9		82	
		PSD-P								67		3		18	
		Wr								92		90			
	Walleye	PSD								100					
		PSD-P								50					
		Wr								90					
	Yellow Perch	PSD								45		76			
		PSD-P								0		6			
		Wr								76		95			
	boat shocker (day)	Black Bullhead	PSD									100			
			PSD-P									40			
Wr												93			
Bluegill		PSD										36			
		PSD-P										0			
		Wr										108			
Common Carp		PSD										100			
		PSD-P										0			
		Wr										105			
Largemouth Bass		PSD										100			
		PSD-P										0			
		Wr										112			
Northern Pike		PSD										0			
		PSD-P										0			
		Wr										110			
Yellow Perch		PSD										15			
		PSD-P										0			

Gear	Species	Index	Year									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
boat shocker (day)	Yellow Perch	Wr							91			
boat shocker (night)	Largemouth Bass	PSD	100		7	31		13		0		100
		PSD-P	46		7	4		2		0		100
		Wr	114		117	112		110		121		129
	Walleye	PSD			18	67		33				
		PSD-P			0	0		33				
		Wr			92	93		90				
frame net (std 3/4 in)	Black Bullhead	PSD	2		94	99		97		91		6
		PSD-P	1		0	29		73		50		2
		Wr	91		100	88		87		96		
	Bluegill	PSD	93		100	9		20		86		0
		PSD-P	47		33	9		0		9		0
		Wr	118		121	141		95		113		
	Common Carp	PSD			0	100						100
		PSD-P			0	0						100
		Wr			122	108						
	Largemouth Bass	PSD							100			
		PSD-P							0			
		Wr							51			
	Northern Pike	PSD	38						100		14	33
		PSD-P	0						0		3	0
		Wr	80						88		86	98
	Walleye	PSD	100						100			
		PSD-P	100						50			
		Wr	90						89			
Yellow Perch	PSD	0		0	52			36		69		
	PSD-P	0		0	0			0		15		
	Wr			130	90			82		105		
std exp gill net	Black Bullhead	PSD	1		93	98						
		PSD-P	0		0	28						
		Wr	96		110							
	Bluegill	PSD				0						
		PSD-P				0						
		Wr				156						
	Northern Pike	PSD	100		100	100						
		PSD-P	33		100	67						



Gear	Species	Index	Year									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
std exp gill net	Northern Pike	Wr	95		92	101						
		PSD	0			83						
		PSD-P	0			0						
	Yellow Perch	Wr				96						
		PSD	0		0	38						
		PSD-P	0		0	2						
		Wr	110		110	97						

## Length at Capture

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

Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	44		142 (6)	169 (3)	171 (10)	182 (16)	198 (8)	215 (1)			
2018	191			131 (111)	150 (72)	169 (6)	173 (1)		240 (1)		
2016	44		114 (20)	126 (20)			202 (1)	212 (2)		223 (1)	
2015	3		172 (2)	209 (1)							
2013	15		115 (1)	164 (4)	185 (3)	227 (1)	227 (1)	234 (2)	243 (1)	243 (2)	

Species: Largemouth Bass

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	97	147 (80)	196 (11)	240 (4)	268 (3)						
2018	183	180 (20)	226 (133)	300 (24)	345 (4)				487 (2)		
2016	106	184 (66)	212 (14)	295 (18)	322 (6)	411 (1)	446 (1)				
2015	61	232 (57)				441 (4)					
2013	24		335 (4)	380 (17)	393 (3)						

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	4				424 (1)	509 (2)	525 (1)				
2016	6		281 (1)		421 (5)						
2013	2		222 (2)								

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	16		155 (4)		226 (9)	265 (2)	215 (1)				
2018	44		148 (9)	182 (16)	209 (11)	236 (8)					
2016	215	114 (21)	191 (120)	201 (57)	225 (10)	253 (7)					

Mean Length (expanded sample number) at capture by age

Year	N	1	2	3	4	5	6	7	8	9	10+
2015	29	160 (25)	182 (4)								
2013	14		150 (8)	169 (2)	180 (3)		195 (1)				

## **Fish Condition**

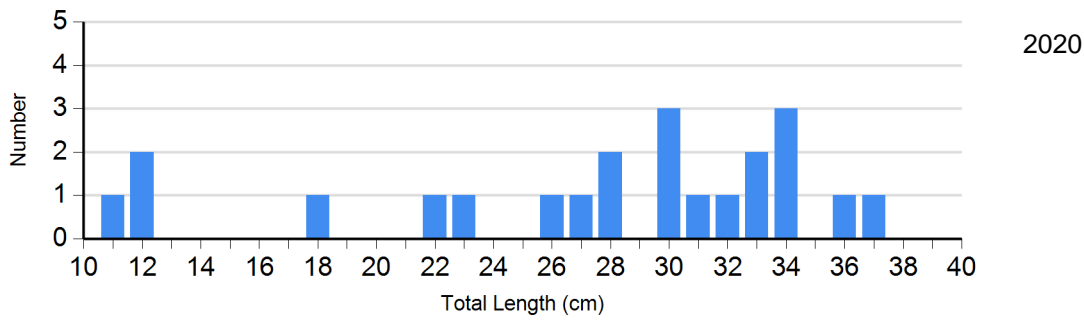
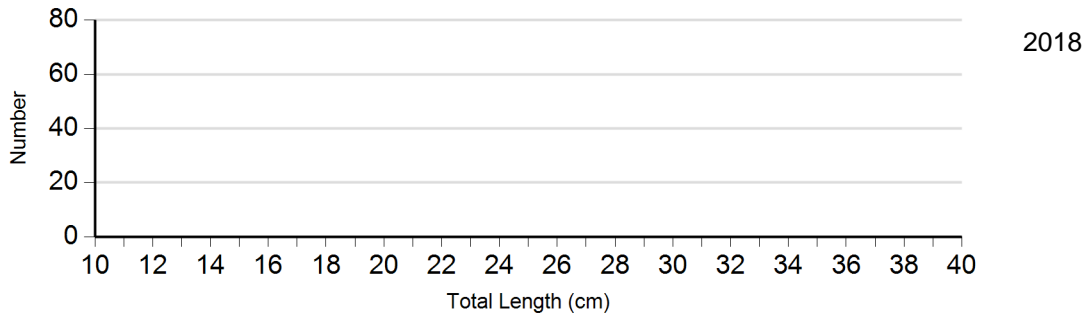
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2	76 (4.1)	5	86 (3.5)	12	100 (3.2)	0	
Bluegill Frame Net	2018	165	94 (0.9)	39	99 (2.0)	1	110	0	
	2020	6	127 (4.1)	34	111 (1.2)	4	108 (5.1)	0	
Largemouth Bass Electro Fishing	2018	143	109 (0.9)	18	114 (1.8)	3	126 (5.5)	0	
	2019	0		1	112	0		0	
	2020	12	121 (2.4)	0		0		0	
	2022	0		0		2	129 (2.2)	0	
Northern Pike Gill Net	2018	0		1	99	2	89 (3.0)	0	
	2020	30	89 (1.3)	2	95 (7.2)	1	110	0	
Walleye Gill Net	2018	0		2	88 (0.3)	2	91 (0.9)	0	
Yellow Perch Gill Net	2018	24	67 (2.3)	20	86 (4.4)	0		0	
	2020	4	103 (3.5)	12	94 (1.6)	1	81	0	

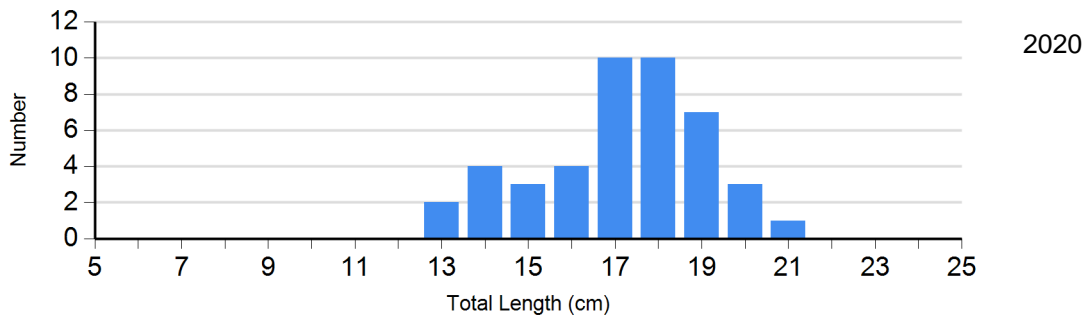
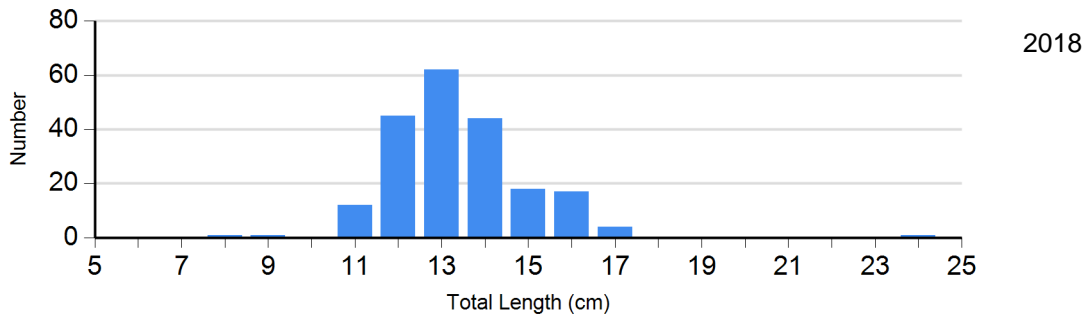
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

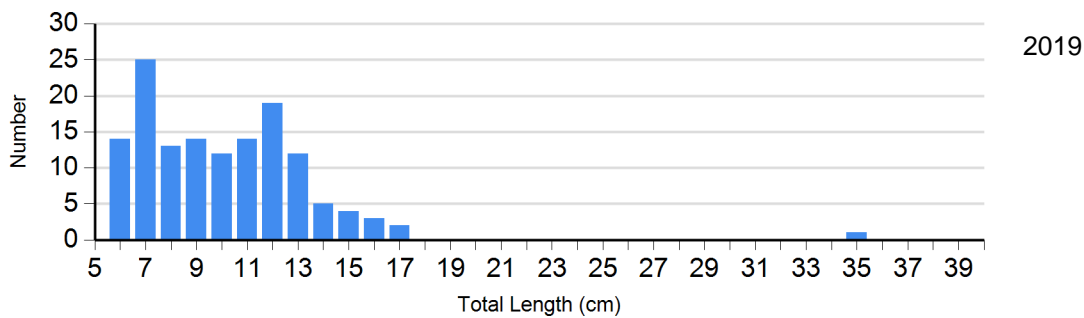
Species: Black Bullhead  
Gear: AFS std gill net



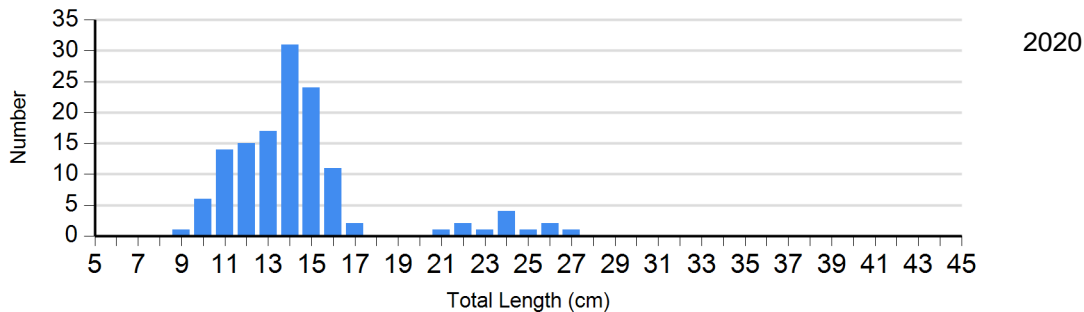
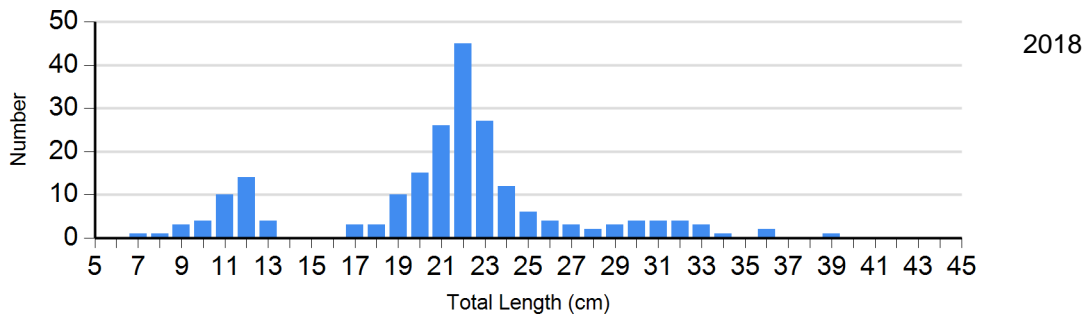
Species: Bluegill  
Gear: frame net (std 3/4 in)



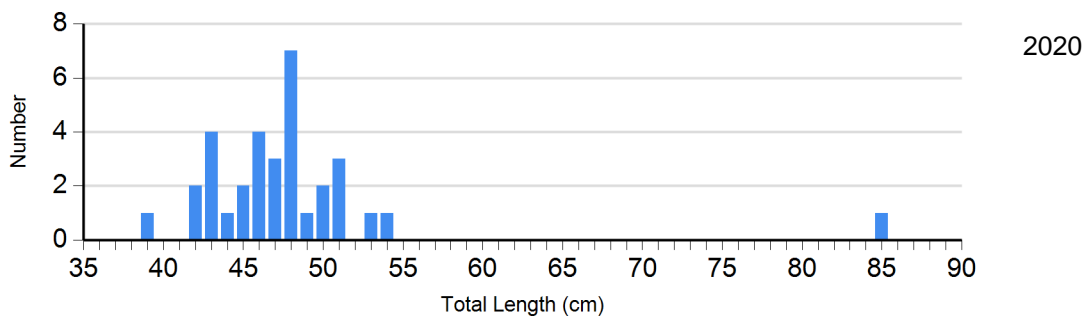
Species: Largemouth Bass  
 Gear: boat shocker (day)

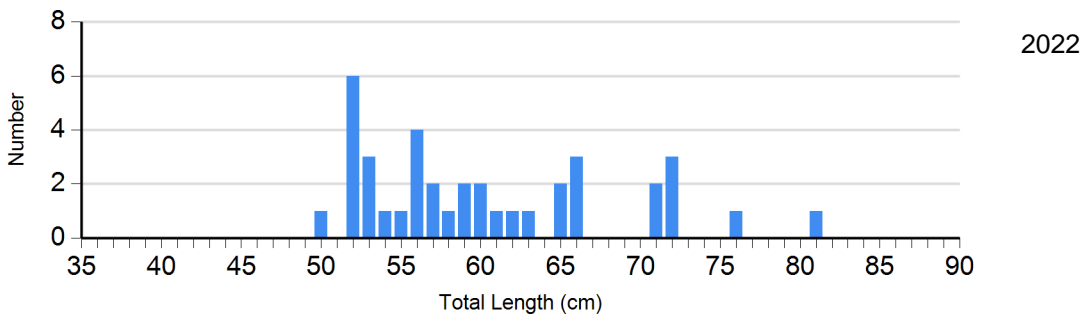


Species: Largemouth Bass  
 Gear: boat shocker (night)

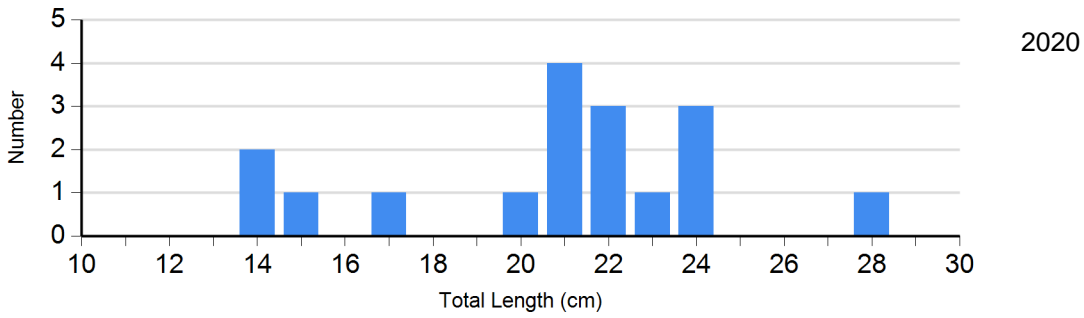
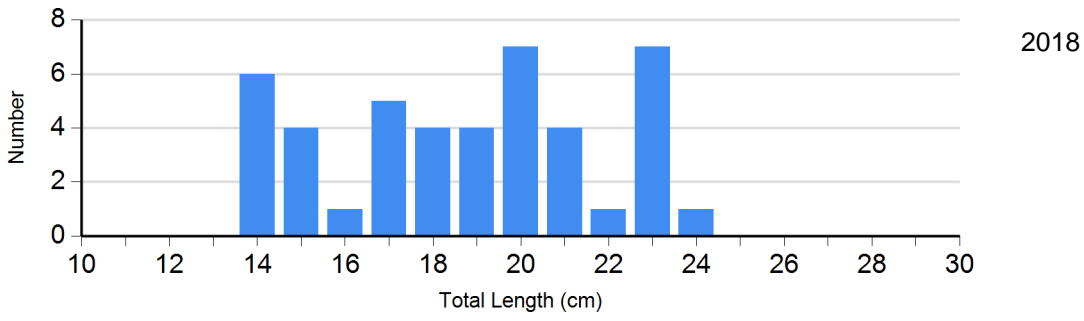


Species: Northern Pike  
 Gear: AFS std gill net





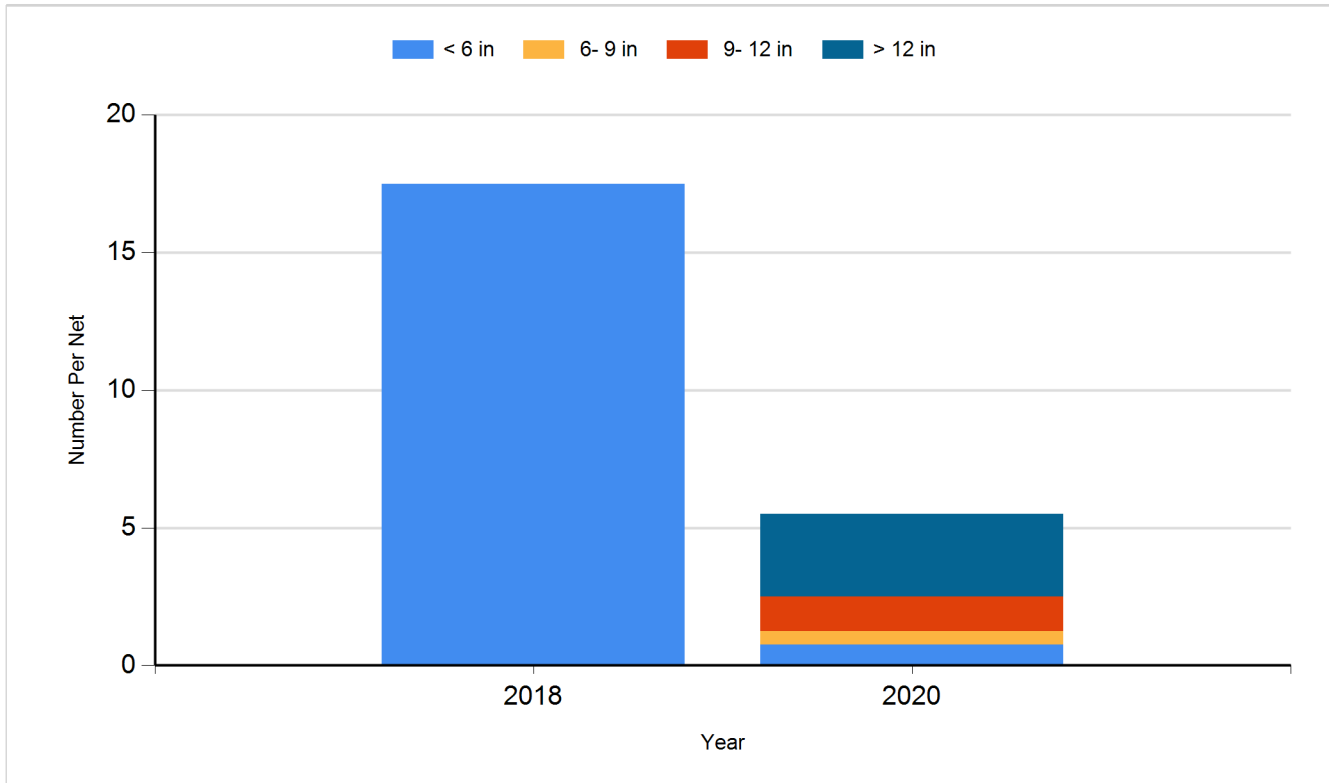
Species: Yellow Perch  
 Gear: AFS std gill net



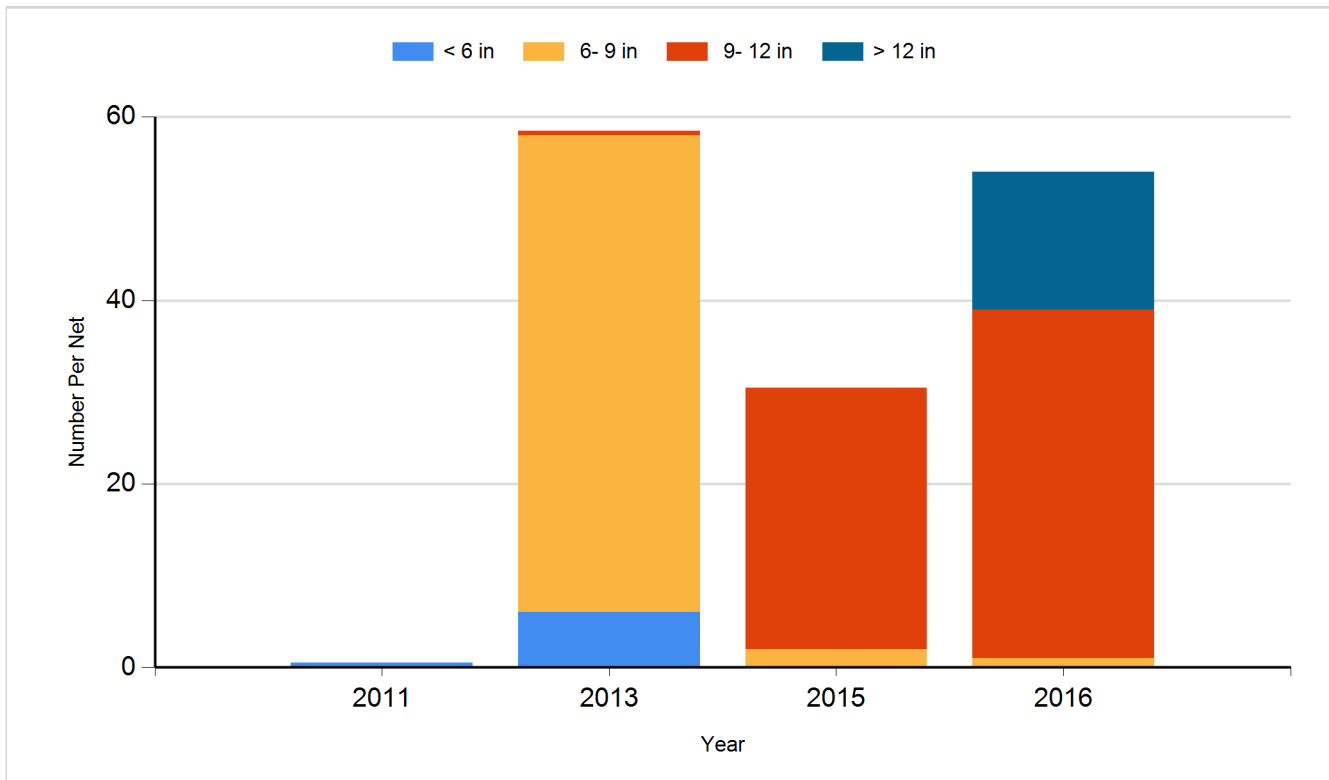
## Historic Fish Sizes and Relative Abundance

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

Species: Black Bullhead  
Gear: AFS std gill net

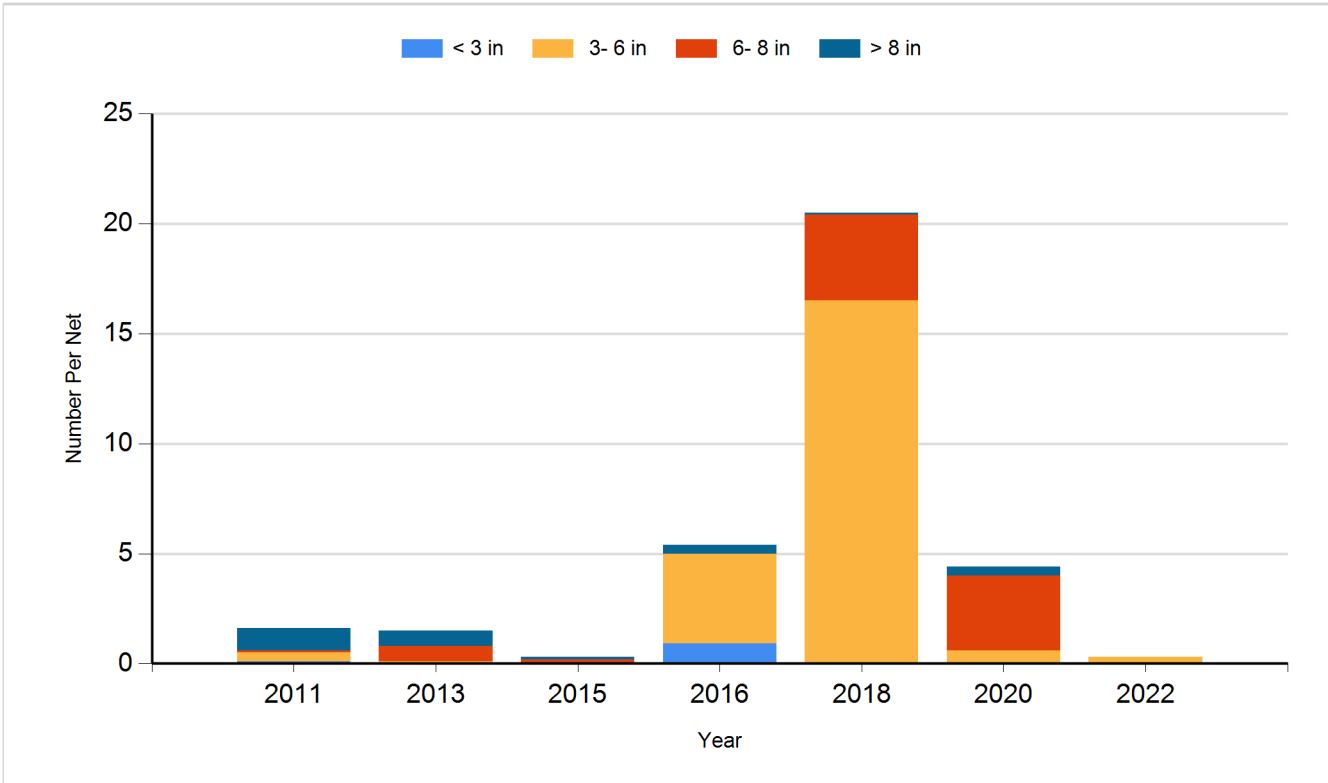


Species: Black Bullhead  
Gear: std exp gill net

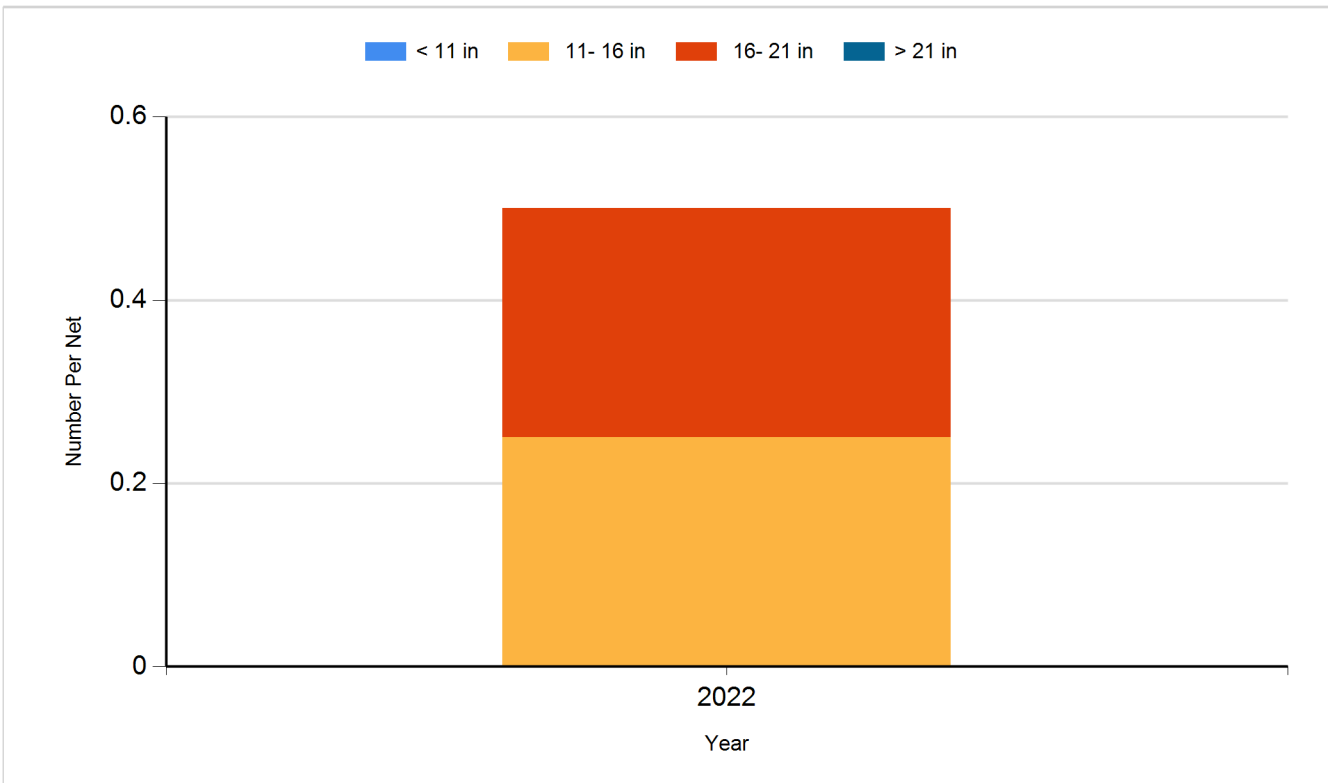




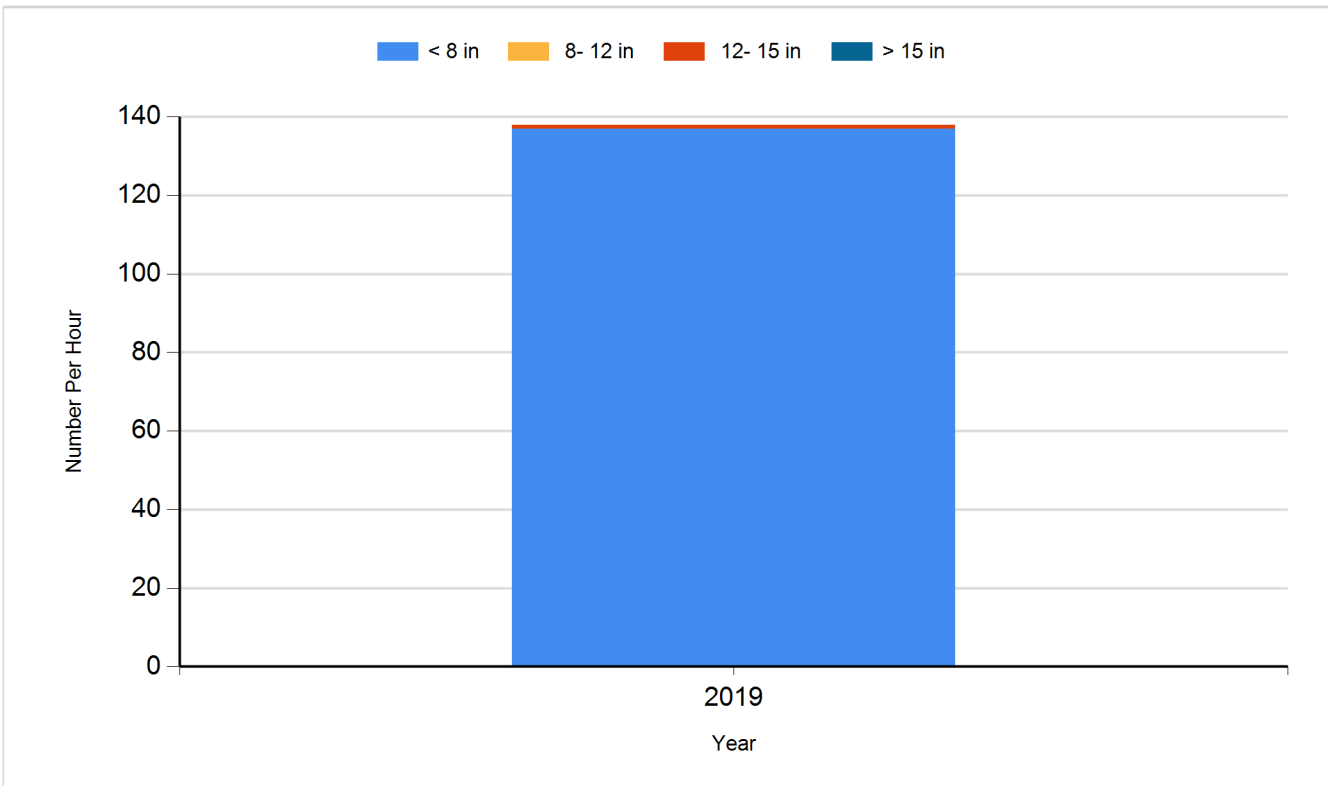
Species: Bluegill  
Gear: frame net (std 3/4 in)



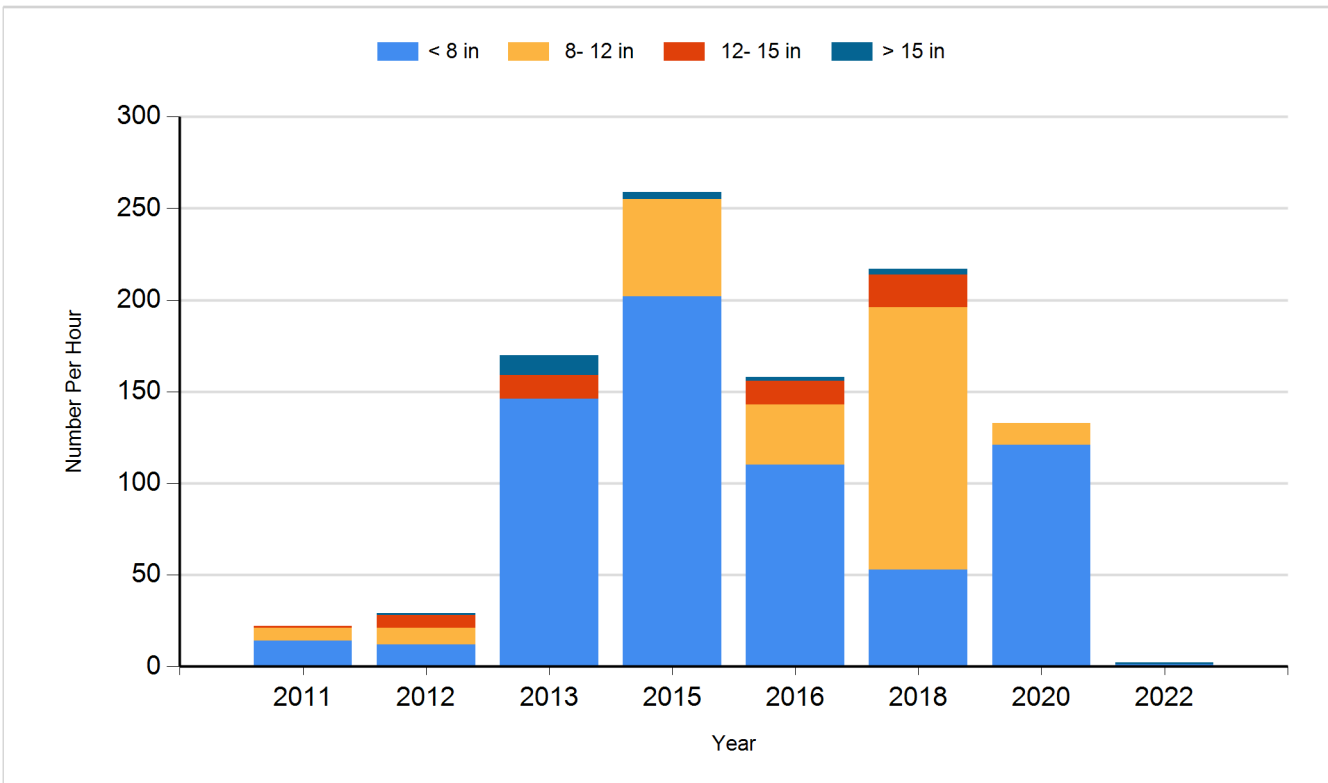
Species: Common Carp  
Gear: AFS std gill net



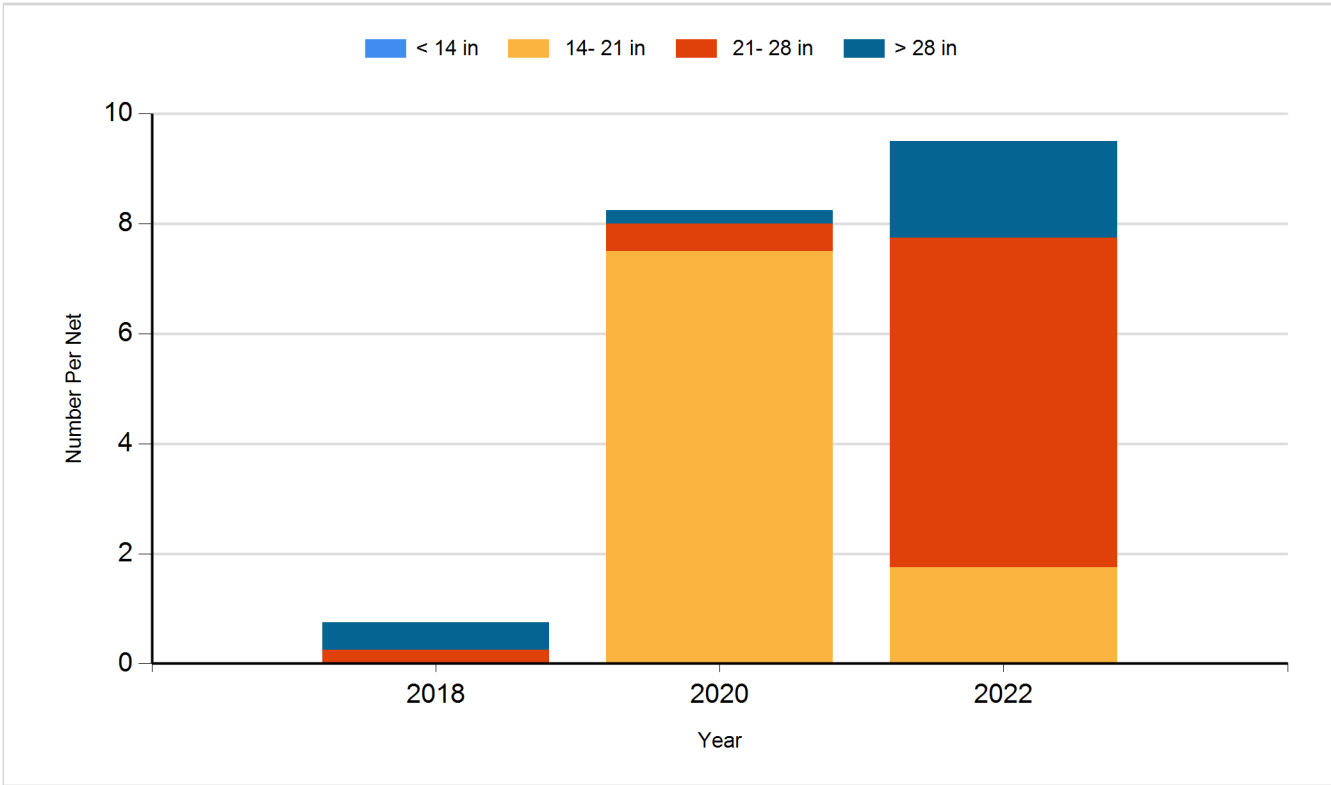
Species: Largemouth Bass  
Gear: boat shocker (day)



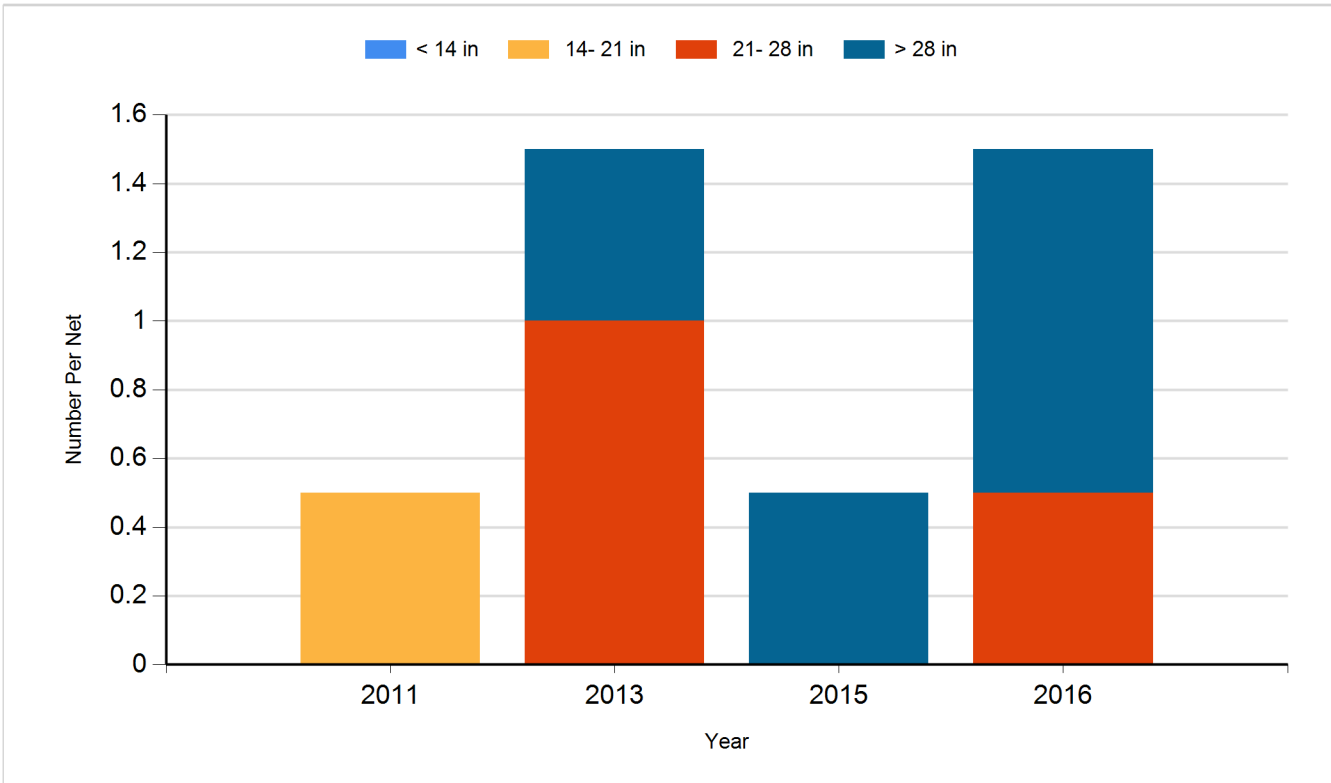
Species: Largemouth Bass  
Gear: boat shocker (night)



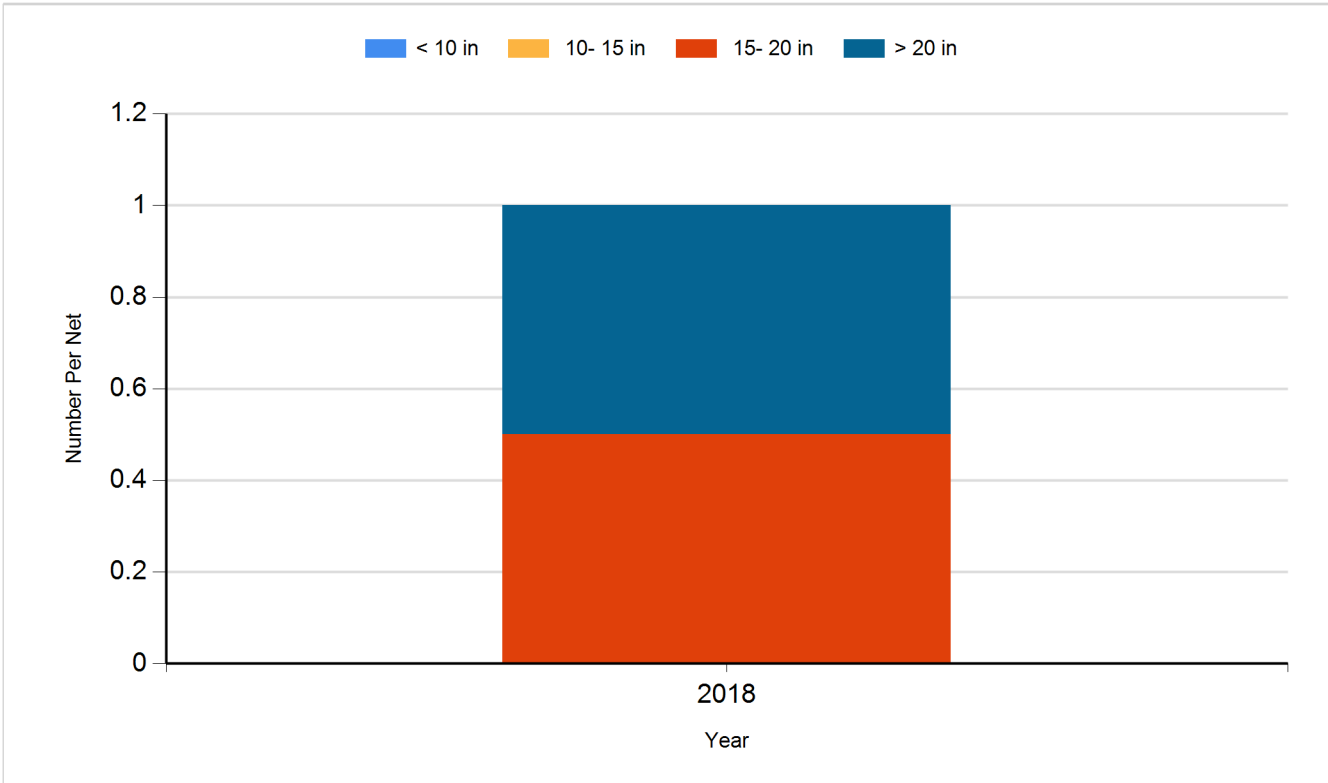
Species: Northern Pike  
Gear: AFS std gill net



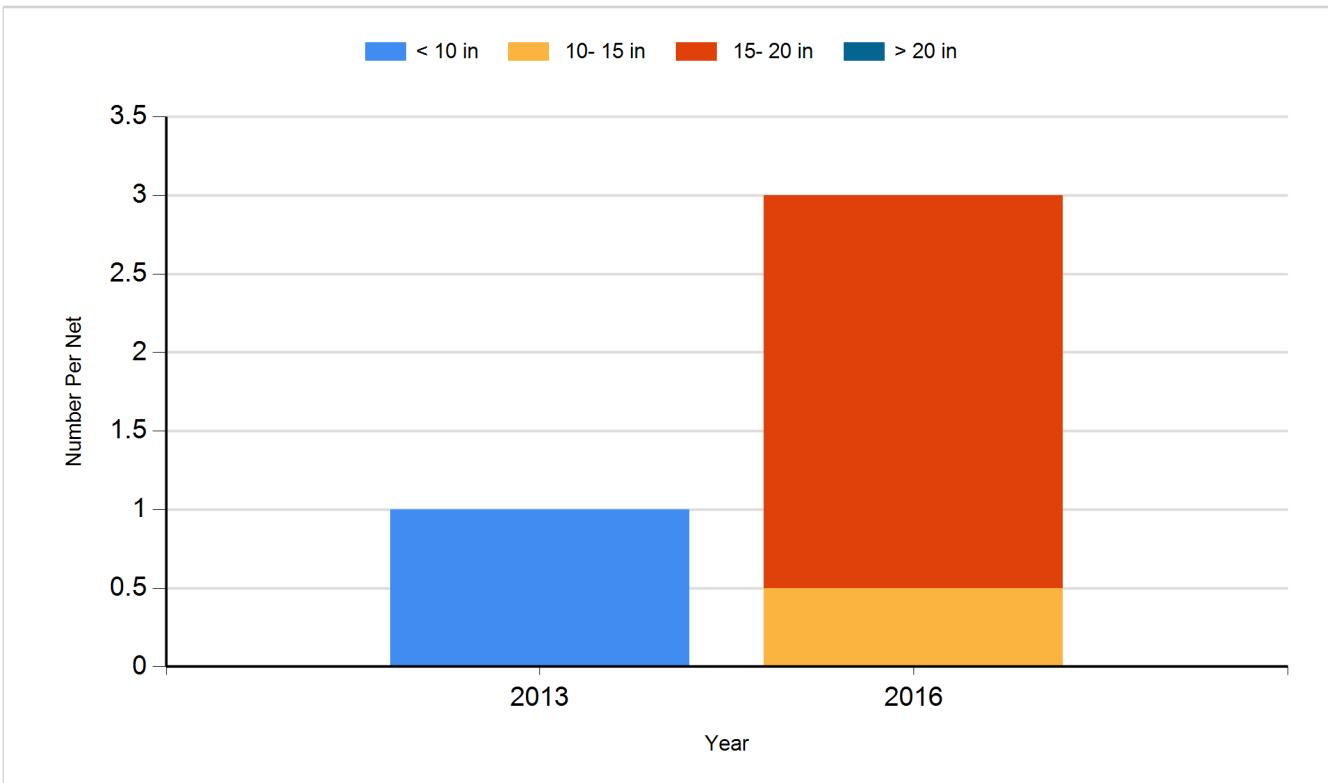
Species: Northern Pike  
Gear: std exp gill net



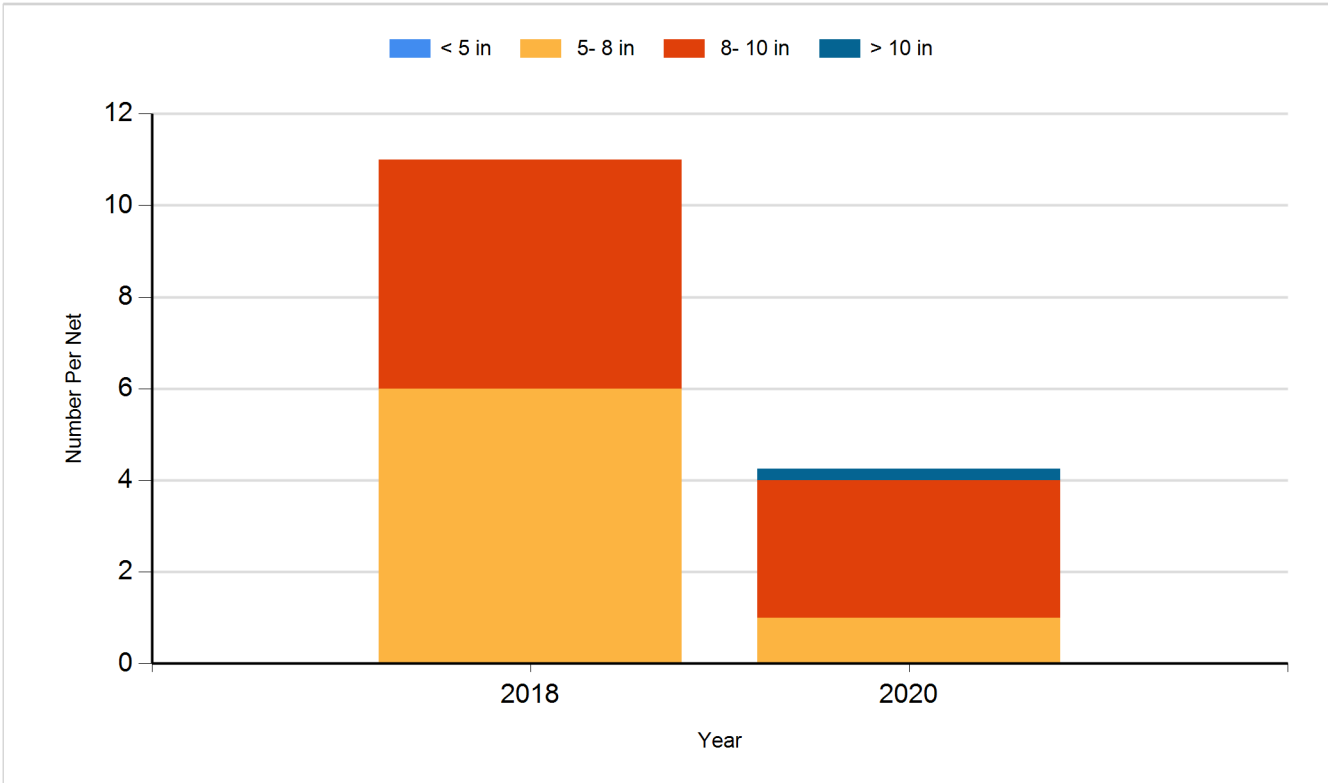
Species: Walleye  
Gear: AFS std gill net



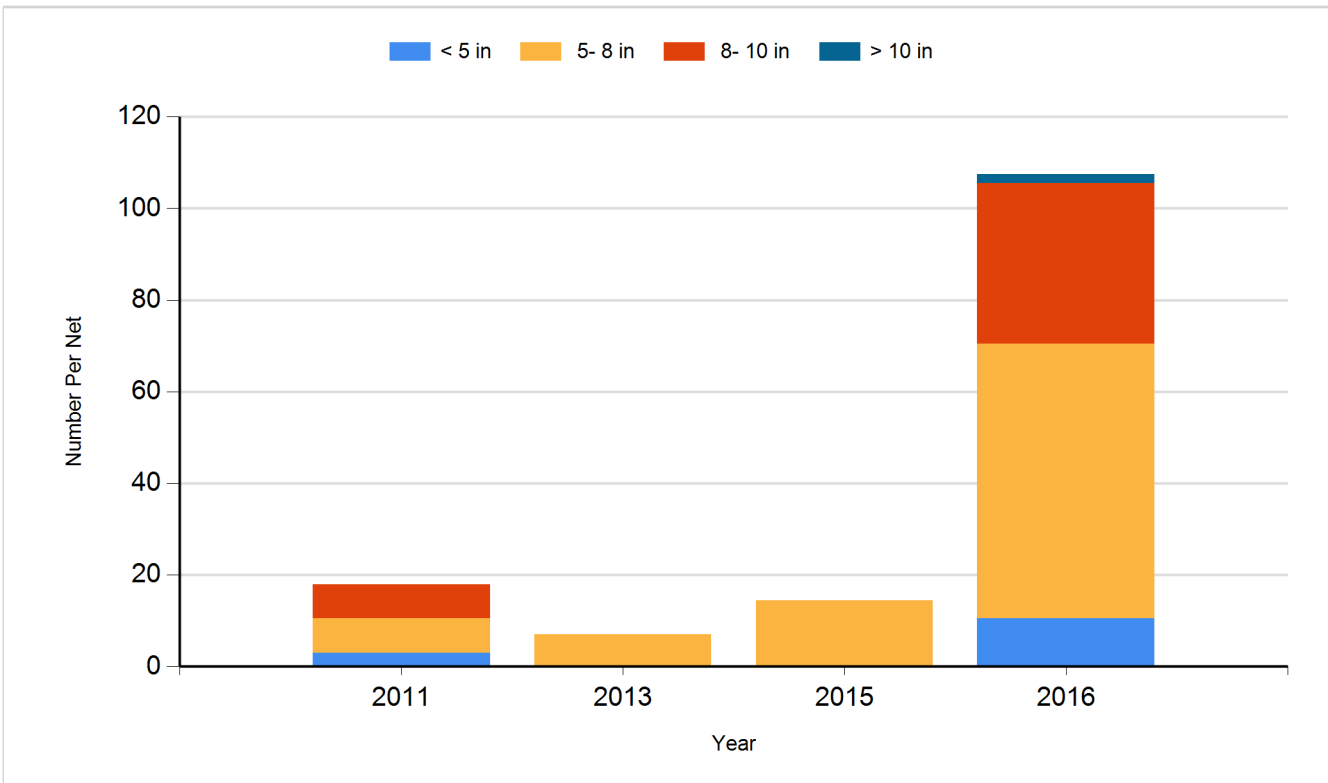
Species: Walleye  
Gear: std exp gill net



Species: Yellow Perch  
Gear: AFS std gill net



Species: Yellow Perch  
Gear: std exp gill net



## **Fish Stocking**

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

Year	Species	Size	Number
2012	Largemouth Bass	Fingerling	5,640
2012	Walleye	Large Fingerling	1,630
2014	Walleye	Large Fingerling	1,613
2017	Walleye	Large Fingerling	2,200
2021	Walleye	Juvenile	840
2022	Bluegill	Adult	407
2022	Largemouth Bass	Adult	65
2022	Walleye	Fingerling	50,410
2022	Walleye	Fry	100,000