

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Island South, Minnehaha County
LBS-Lake-213-001
2022

Lake Information

Name: Island South
County: Minnehaha
Surface Area: 125 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 21, 2022	4 net-nights

Common Fish Species Present

Black Bullhead

Walleye

Common Carp

Northern Pike

Channel Catfish

Yellow Perch

White Sucker

Smallmouth Bass

Black Crappie

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	63	15.5	5.9	5	3	2			
	Black Crappie	1	0.3	0.3	100		0	102		
	Channel Catfish	7	1.8	1.9	100		0	96	7	
	Common Carp	21	5.3	1.2	95		14	8		
	Northern Pike	7	1.8	0.3	100		43	22	76	4
	Smallmouth Bass	1	0.3	0.4	100		100		88	
	Walleye	35	8.8	2.5	100		40	8	89	1
	White Sucker	2	0.5	0.5	100		100			
	Yellow Perch	3	0.8	0.5	0		0		93	7

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 frame net	Black Bullhead					7.6							7.60
	Black Crappie					2.4							2.40
	Bluegill					3.0							3.00
	Common Carp					3.0							3.00
	Golden Shiner					0.0							0.00
	Northern Pike					1.0							1.00
	Smallmouth Bass					0.2							0.20
	Walleye					1.6							1.60
	Yellow Perch					1.6							1.60
AFS std gill net	Black Bullhead					5.3	5.0	2.3			15.5		7.03
	Black Crappie					0.3	1.3	2.0			0.3		0.98
	Channel Catfish					0.0	0.0	0.0			1.8		0.45
	Common Carp					22.0	4.0	5.5			5.3		9.20
	Northern Pike					0.8	0.3	0.0			1.8		0.73
	Smallmouth Bass					0.0	0.0	0.0			0.3		0.08
	Walleye					6.3	13.3	15.3			8.8		10.93
	White Sucker					0.3	0.0	0.0			0.5		0.20
	Yellow Perch					2.8	2.5	4.0			0.8		2.53
frame net (std 3/4 in)	Black Bullhead	205.8					4.3	2.6					70.90
	Black Crappie	0.2					7.3	19.0					8.83
	Bluegill	0.4					1.5	1.6					1.17
	Common Carp	0.6					2.0	0.8					1.13
	Green Sunfish	0.0					0.0	0.2					0.07
	Northern Pike	1.4					1.3	0.2					0.97
	Sunfish Hybrid	0.2					0.0	0.0					0.07
	Walleye	0.8					0.5	3.0					1.43
	White Sucker	0.0					0.3	0.0					0.10
Yellow Perch	0.6					1.3	1.4					1.10	
std exp gill net	Black Bullhead	156.7	151.7	101.3	58.0								116.93
	Black Crappie	1.7	0.0	0.0	1.0								0.68
	Common Carp	0.0	1.7	5.3	2.7								2.43
	Golden Shiner	0.0	0.0	0.0	0.0								0.00
	Northern Pike	1.3	7.3	9.0	1.3								4.73

CPUE

Gear	Species	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg
std exp gill net	Walleye	2.0	0.7	2.3	4.7							2.43
	White Sucker	0.3	0.0	0.0	0.3							0.15
	Yellow Perch	6.0	0.3	6.0	7.7							5.00

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 frame net	Black Bullhead	PSD					79								
		PSD-P					16								
		Wr					102								
	Black Crappie	PSD					100								
		PSD-P					25								
		Wr					102								
	Common Carp	PSD					87								
		PSD-P					87								
		Wr					102								
	Northern Pike	PSD					80								
		PSD-P					60								
		Wr					79								
	Smallmouth Bass	PSD					100								
		PSD-P					100								
		Wr					114								
	Walleye	PSD					63								
		PSD-P					0								
		Wr					96								
Yellow Perch	PSD					38									
	PSD-P					13									
	Wr					97									
AFS std gill net	Black Bullhead	PSD					95	95	100					5	
		PSD-P					19	15	0					2	
	Black Crappie	PSD					100	20	25					100	
		PSD-P					0	0	0					0	
		Wr							116	120				102	
	Channel Catfish	PSD												100	
		PSD-P												0	
		Wr												96	
	Common Carp	PSD					11	100	68					95	
		PSD-P					10	6	5					14	
		Wr					81	80						76	
	Northern Pike	PSD					100	100						100	
		PSD-P					0	100						43	
		Wr					81	80						76	
	Smallmouth Bass	PSD												100	

Gear	Species	Index	Year										
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
AFS std gill net	Smallmouth Bass	PSD-P											100
		Wr											88
		PSD					60	92	43				100
	Walleye	PSD-P					36	19	10				40
		Wr					84	92	92				89
		PSD					100						100
	White Sucker	PSD-P					100						100
		PSD					73	50	75				0
	Yellow Perch	PSD-P					18	10	6				0
		Wr					93	99	103				93
		PSD											
	frame net (std 3/4 in)	Black Bullhead	PSD	17					82	92			
PSD-P			1					24	23				
Wr			82										
Black Crappie		PSD	100						7	42			
		PSD-P	100						3	5			
		Wr	117						115	125			
Common Carp		PSD	100						100	75			
		PSD-P	33						75	75			
		Wr	110										
Northern Pike		PSD	57						100	100			
		PSD-P	0						60	100			
		Wr	103						75	96			
Walleye		PSD	100						100	93			
		PSD-P	100						0	87			
		Wr	101						90	90			
White Sucker		PSD							100				
		PSD-P							100				
Yellow Perch		PSD	67						0	71			
		PSD-P	0						0	29			
		Wr	74						100	98			
std exp gill net		Black Bullhead	PSD	4	32	27	86						
			PSD-P	0	1	0	0						
			Wr	98									
		Black Crappie	PSD	0	0	0	33						
	PSD-P		0	0	0	0							
	Wr		127			93							

Gear	Species	Index	Year											
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		
std exp gill net	Common Carp	PSD		100	13	75								
		PSD-P		40	0	13								
		Wr		106										
	Northern Pike	PSD	75	91	100	100								
		PSD-P	25	5	15	50								
		Wr	87	85	89	80								
	Walleye	PSD	83	100	100	57								
		PSD-P	33	50	86	36								
		Wr	92	86	96	83								
	White Sucker	PSD	100			100								
		PSD-P	100			100								
		Wr	100											
	Yellow Perch	PSD	6	0	0	22								
		PSD-P	6	0	0	0								
		Wr	106	92	92	88								

Fish Condition

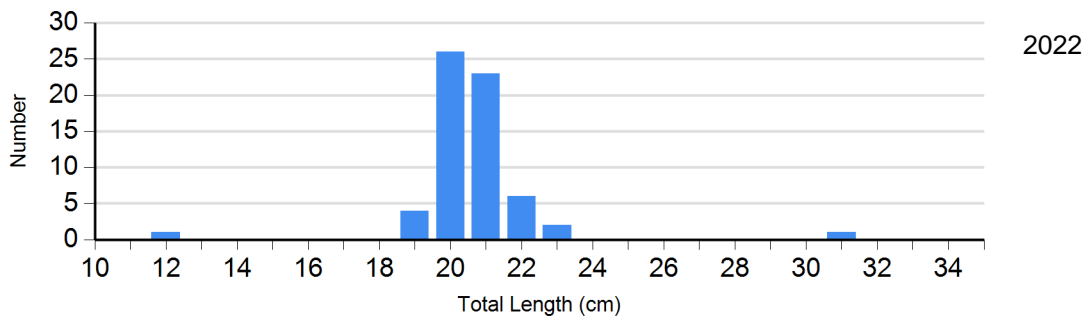
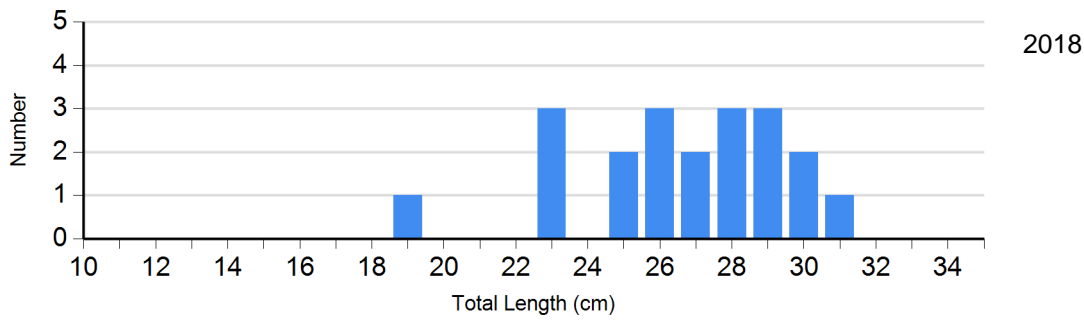
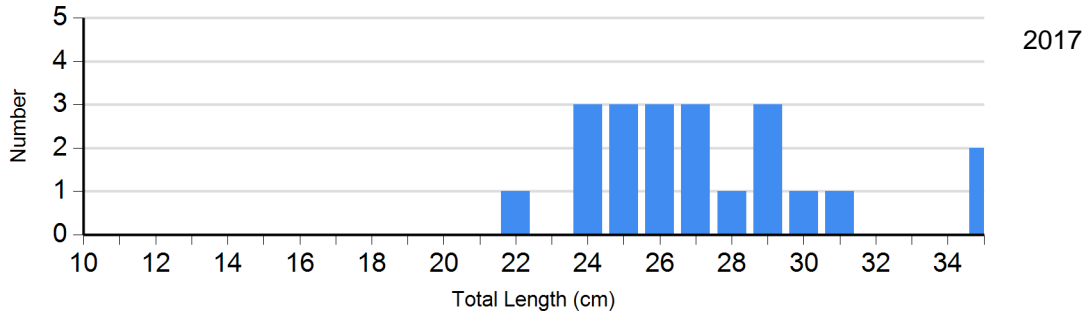
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2018	27	116 (1.8)	1	112	0		1	94
	2019	55	134 (1.3)	35	117 (2.5)	1		4	98 (6.4)
Channel Catfish Gill Net	2022	0		7	96 (5.4)	0		0	
Northern Pike Gill Net	2018	0		0		1	80	0	
	2022	0		4	73 (5.0)	3	79 (3.9)	0	
Walleye Gill Net	2018	4	99 (2.8)	39	93 (1.0)	6	89 (2.7)	4	88 (2.3)
	2019	35	93 (0.8)	20	90 (1.2)	5	88 (0.4)	1	90
	2022	0		21	90 (1.6)	12	88 (1.4)	2	82 (2.8)
Yellow Perch Gill Net	2018	5	105 (5.9)	4	97 (2.2)	1	82	0	
	2019	4	113 (5.9)	11	99 (1.9)	1	103	0	
	2022	3	93 (5.8)	0		0		0	

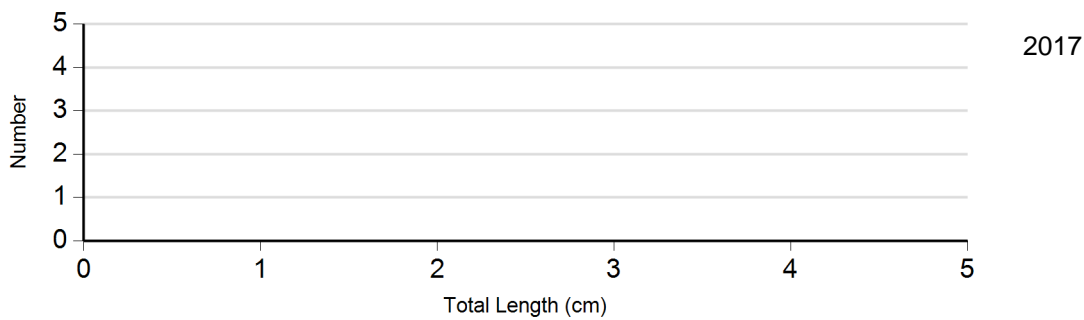
Length Frequency Distribution

Length frequency histogram of species sampled by year.

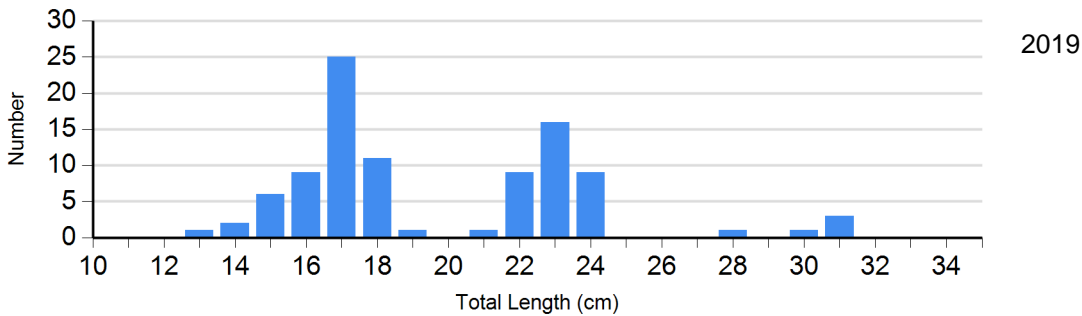
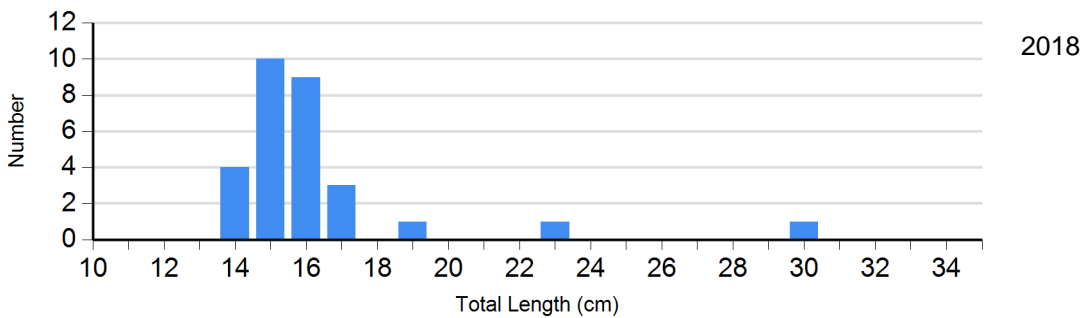
Species: Black Bullhead
Gear: AFS std gill net



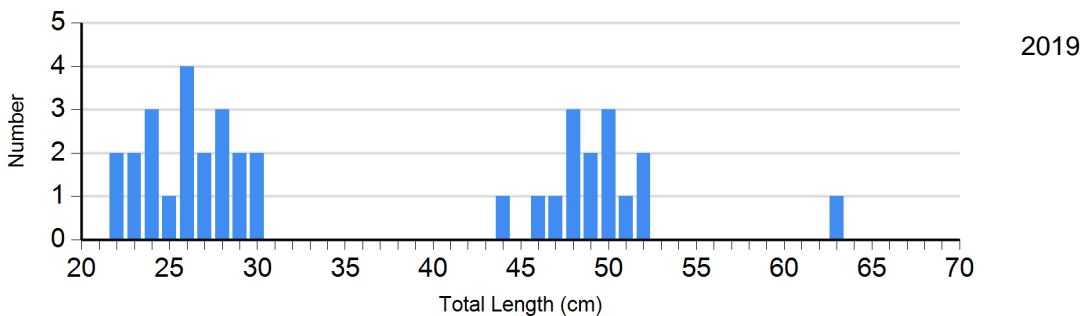
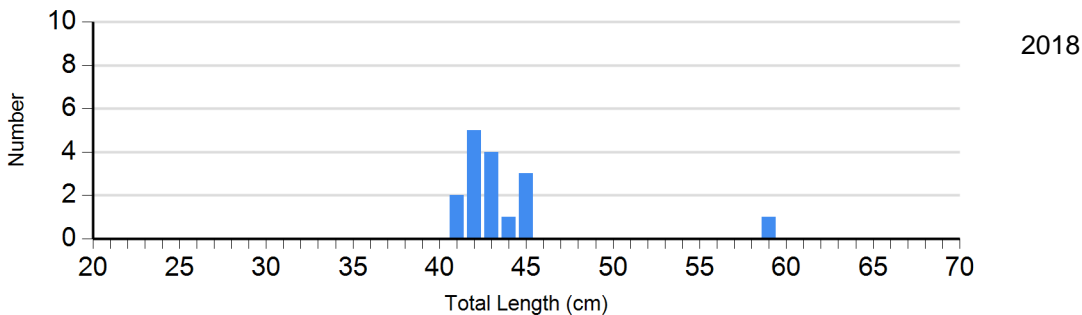
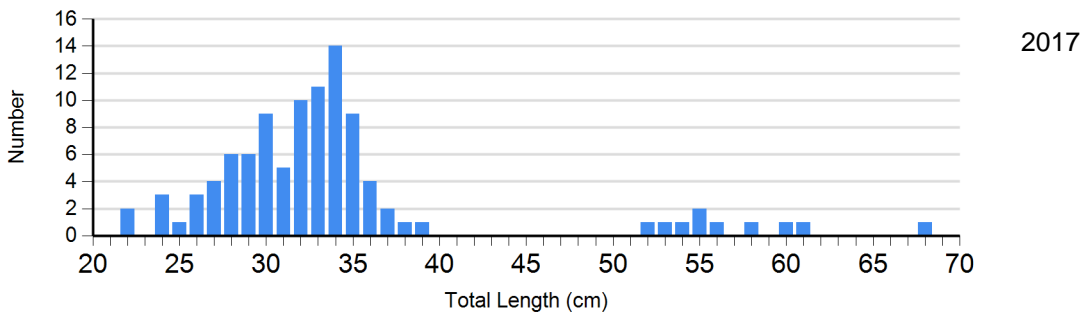
Species: Black Crappie
Gear: AFS std frame net

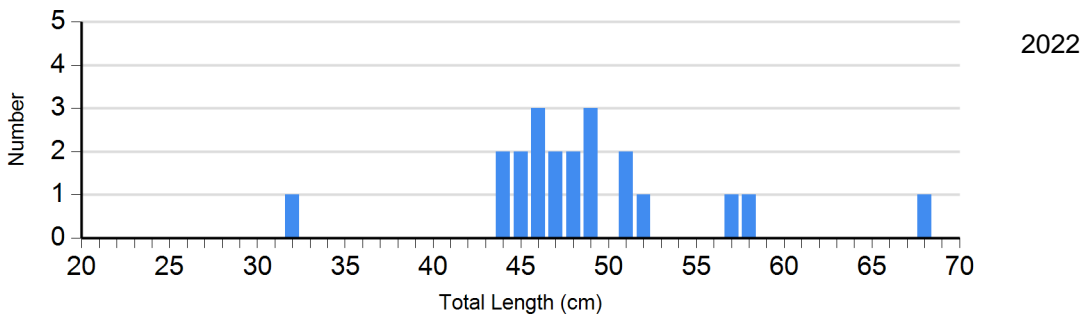


Species: Black Crappie
 Gear: frame net (std 3/4 in)

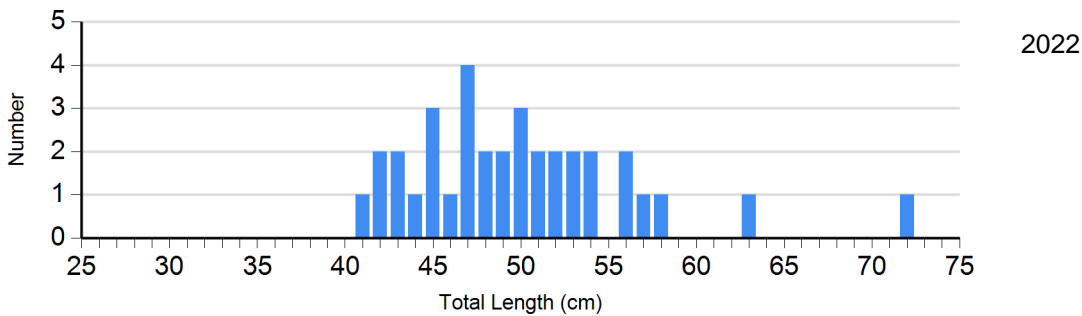
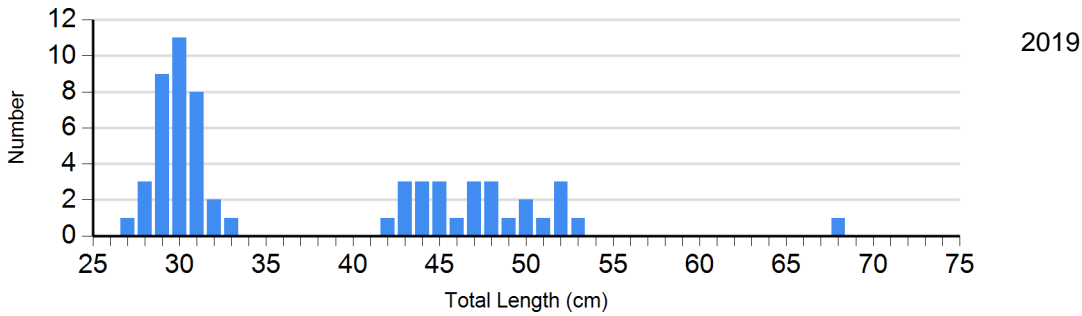
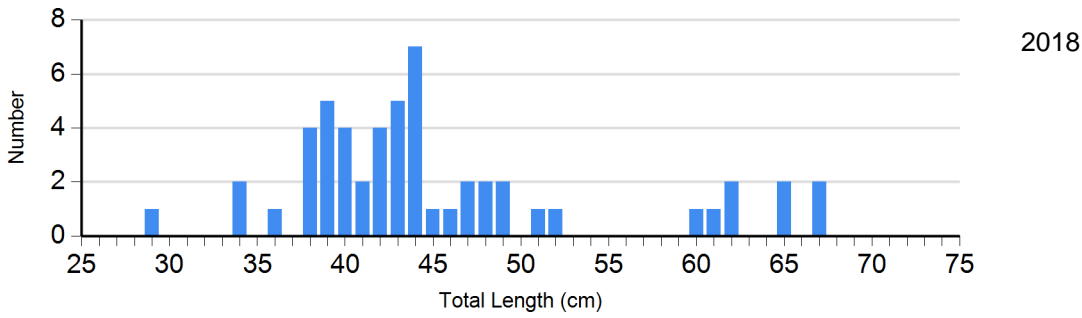
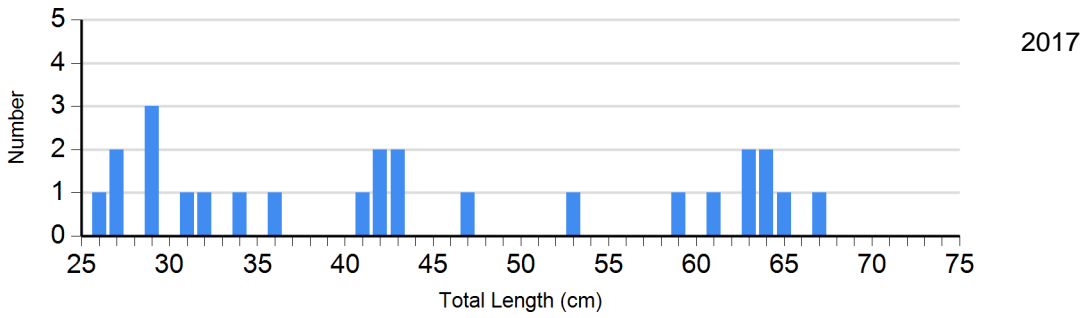


Species: Common Carp
 Gear: AFS std gill net

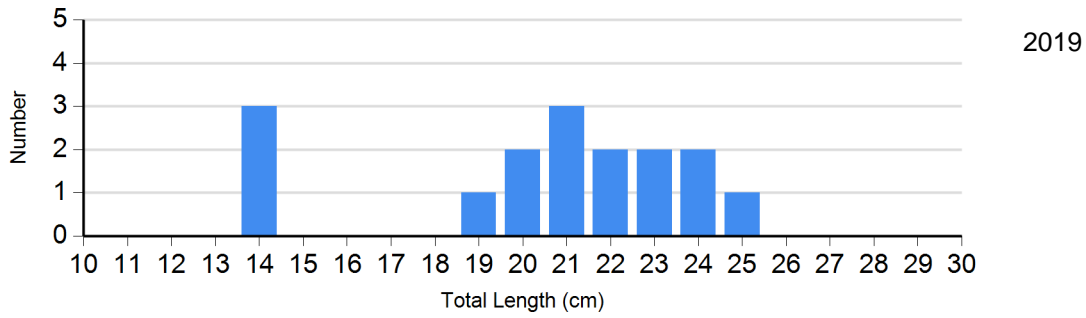
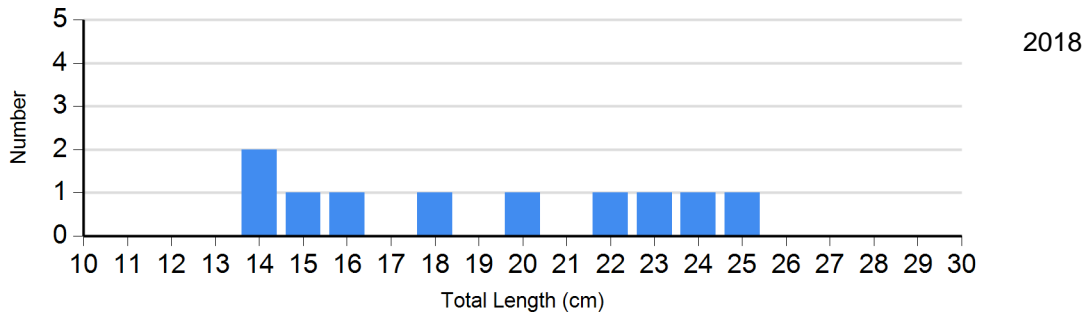
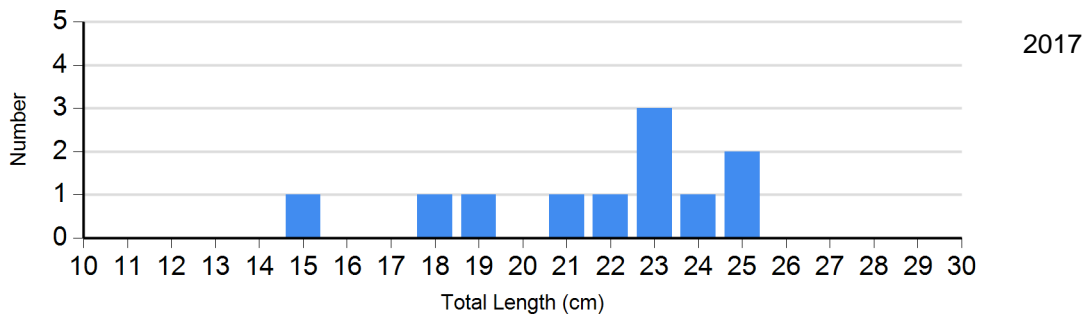




Species: Walleye
Gear: AFS std gill net



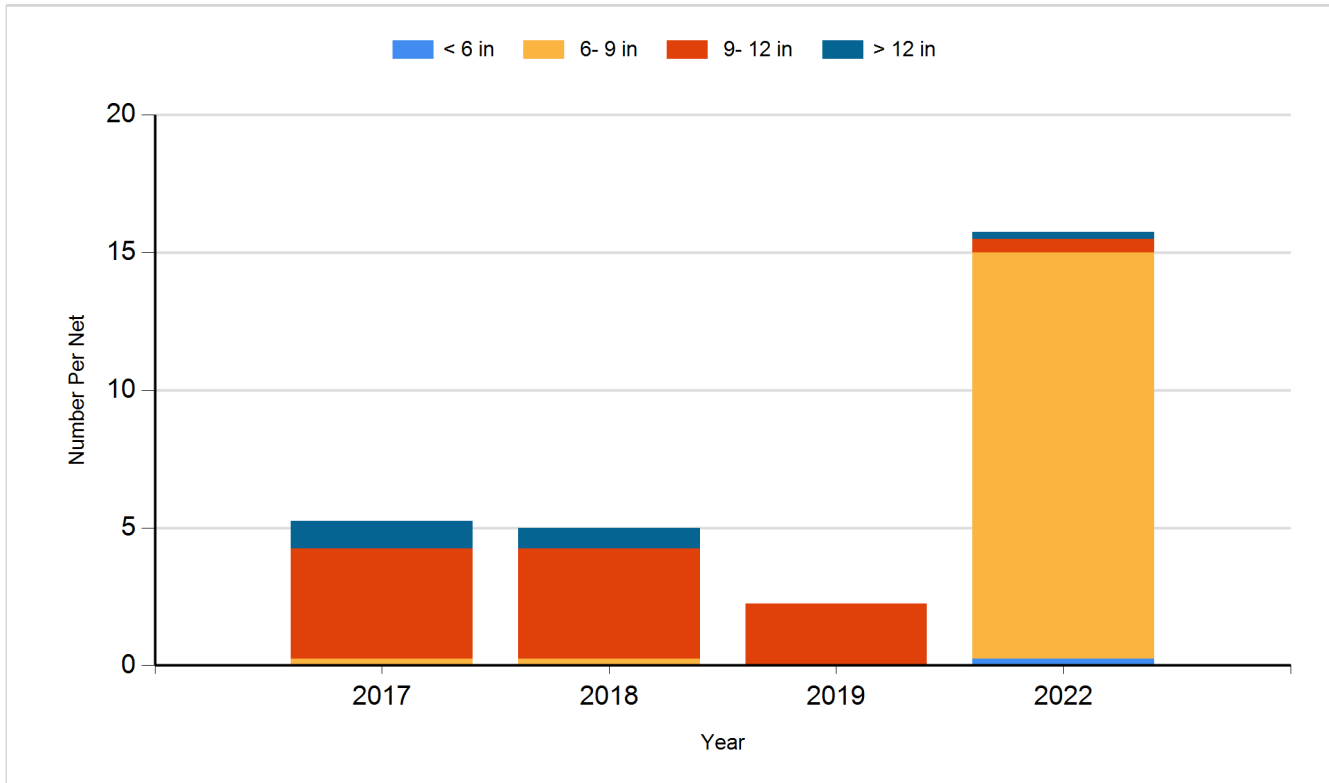
Species: Yellow Perch
Gear: AFS std gill net



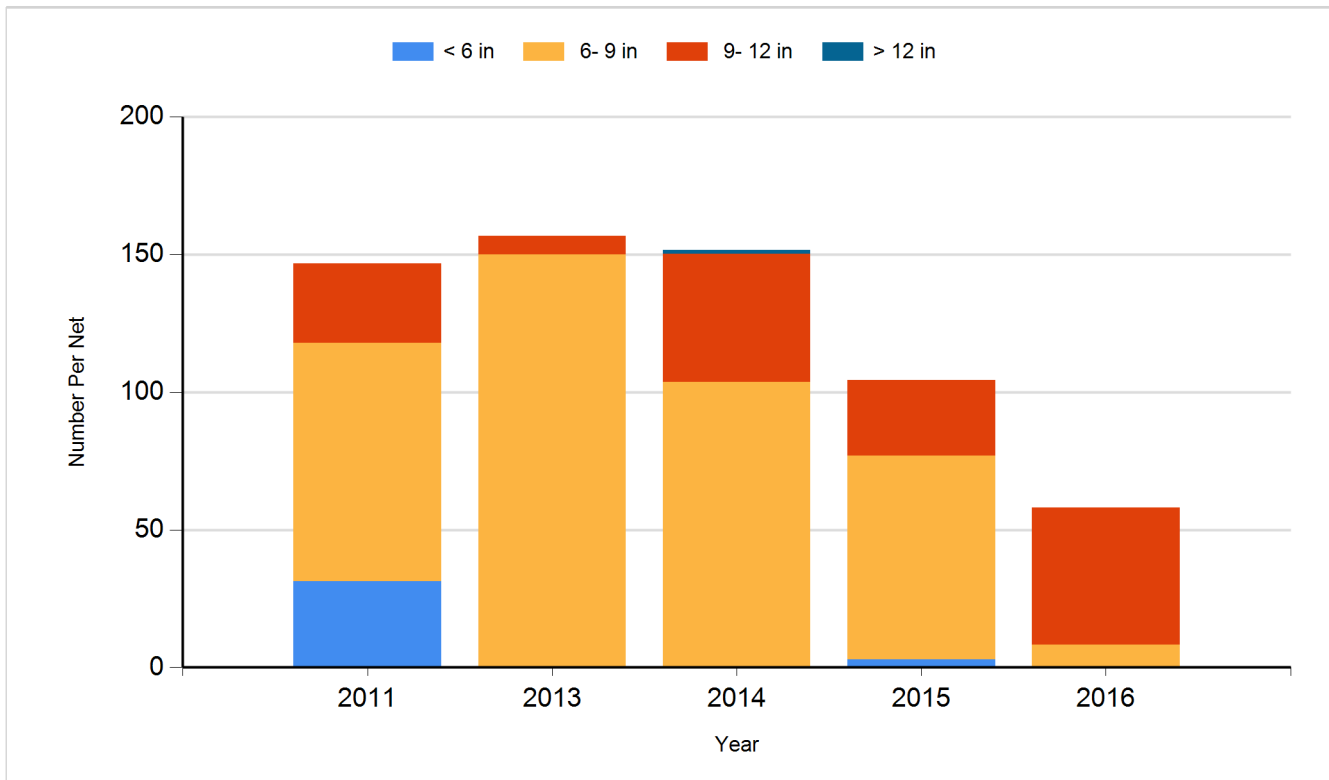
Historic Fish Sizes and Relative Abundance

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

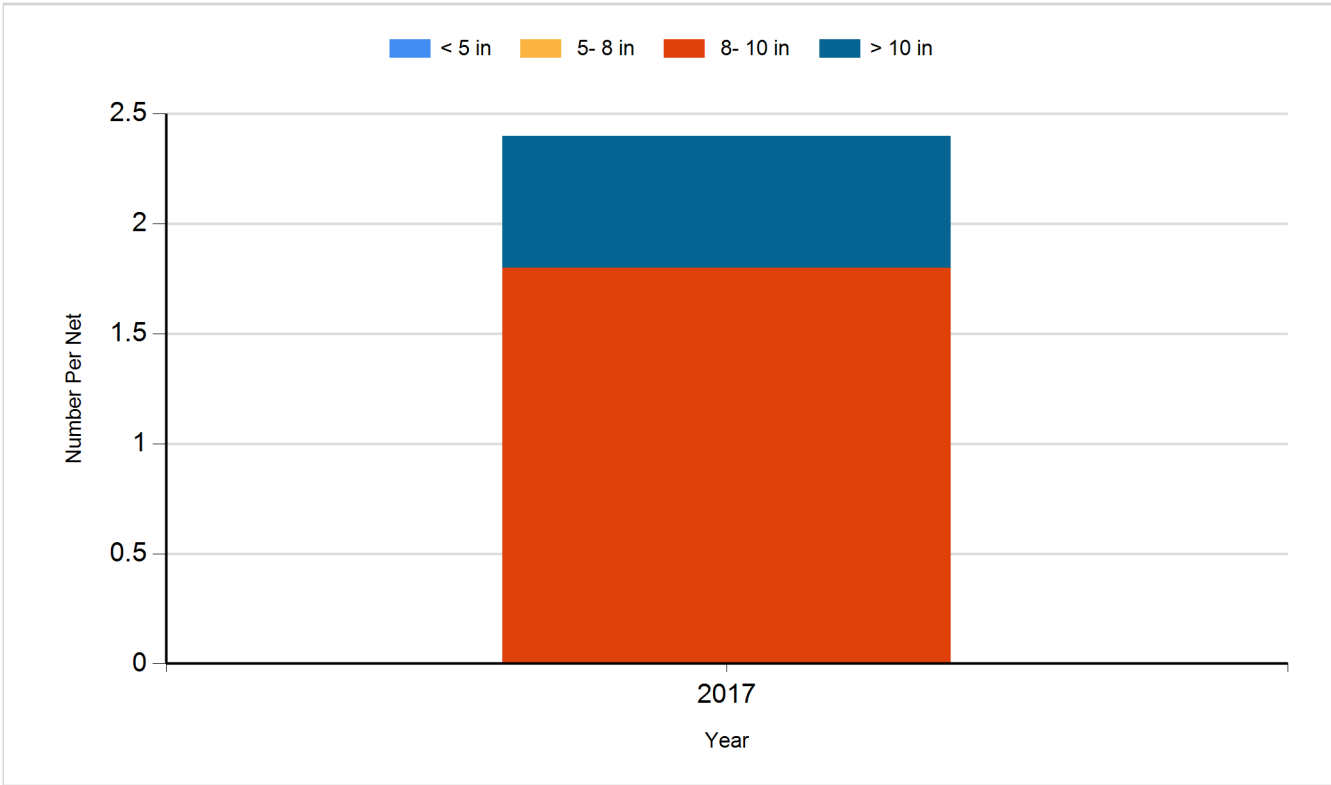
Species: Black Bullhead
Gear: AFS std gill net



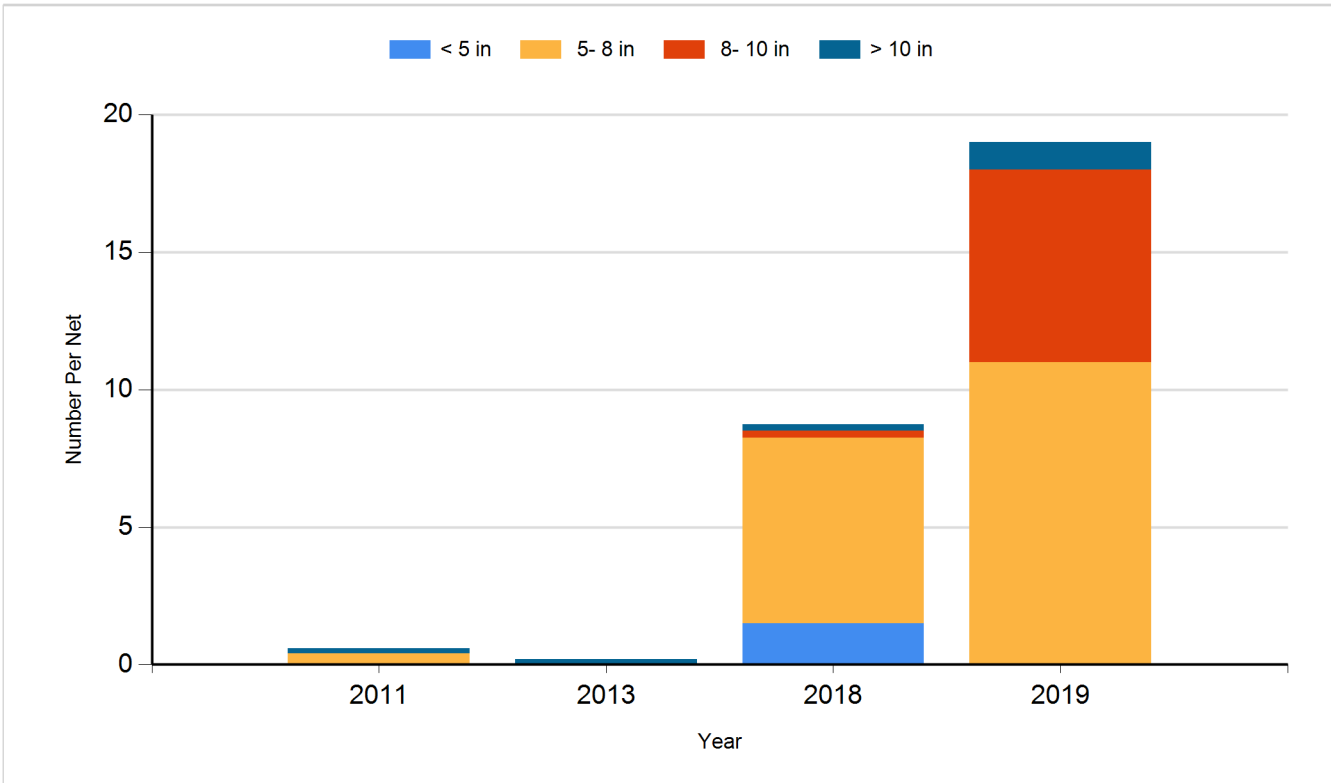
Species: Black Bullhead
Gear: std exp gill net



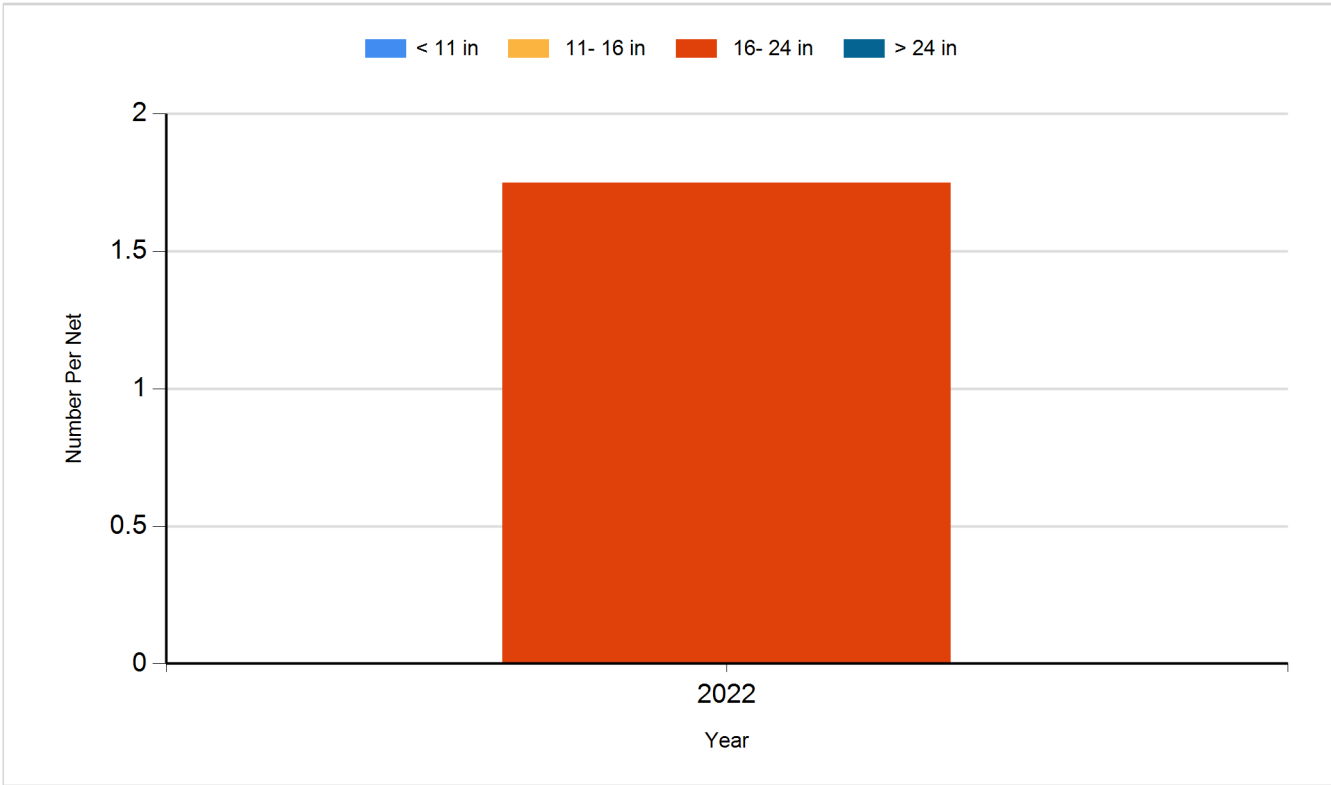
Species: Black Crappie
Gear: AFS std frame net



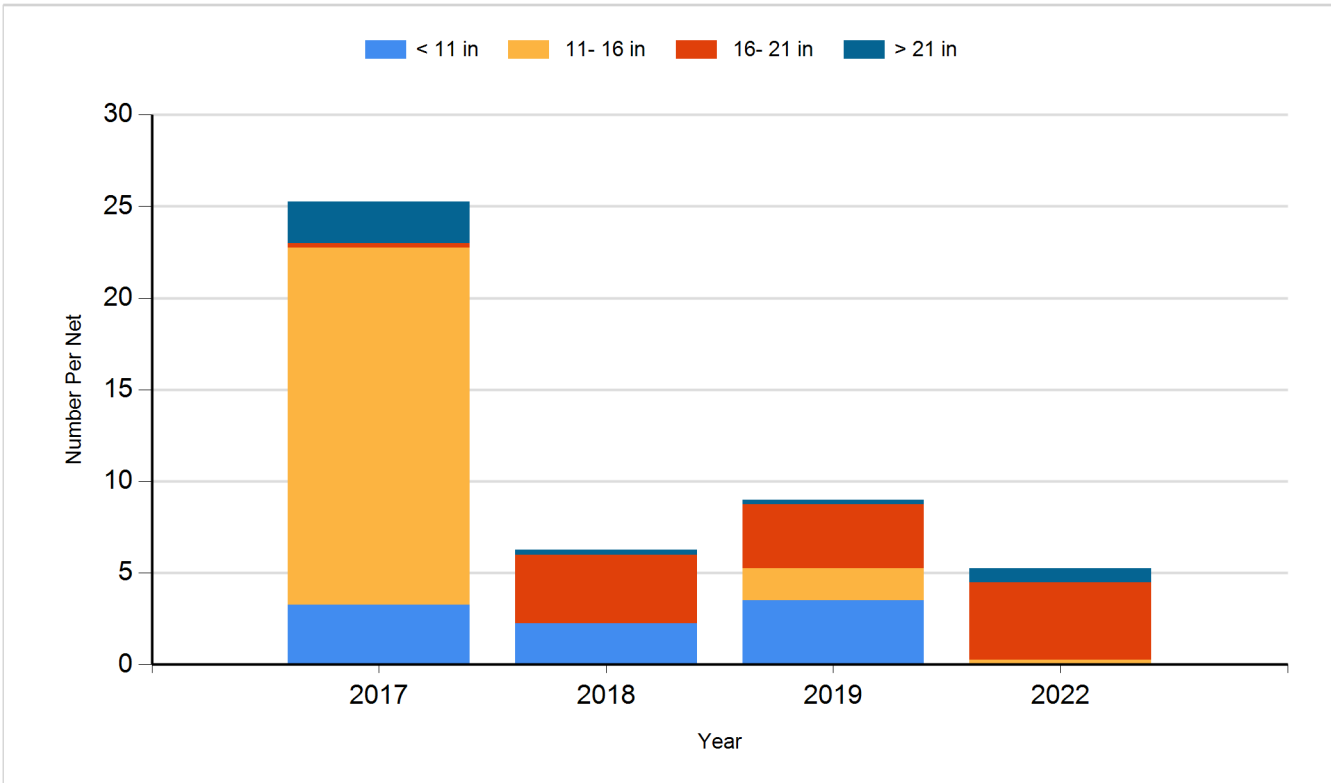
Species: Black Crappie
Gear: frame net (std 3/4 in)



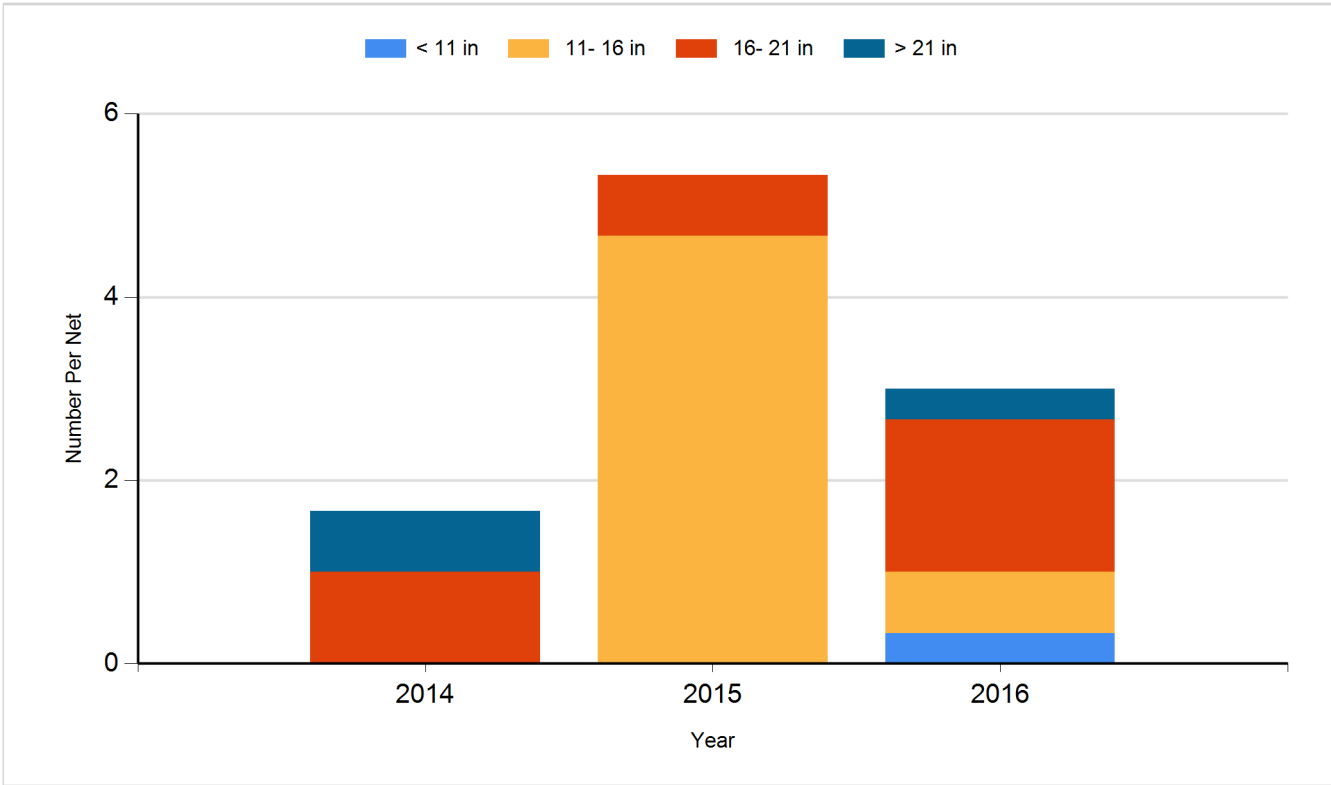
Species: Channel Catfish
Gear: AFS std gill net



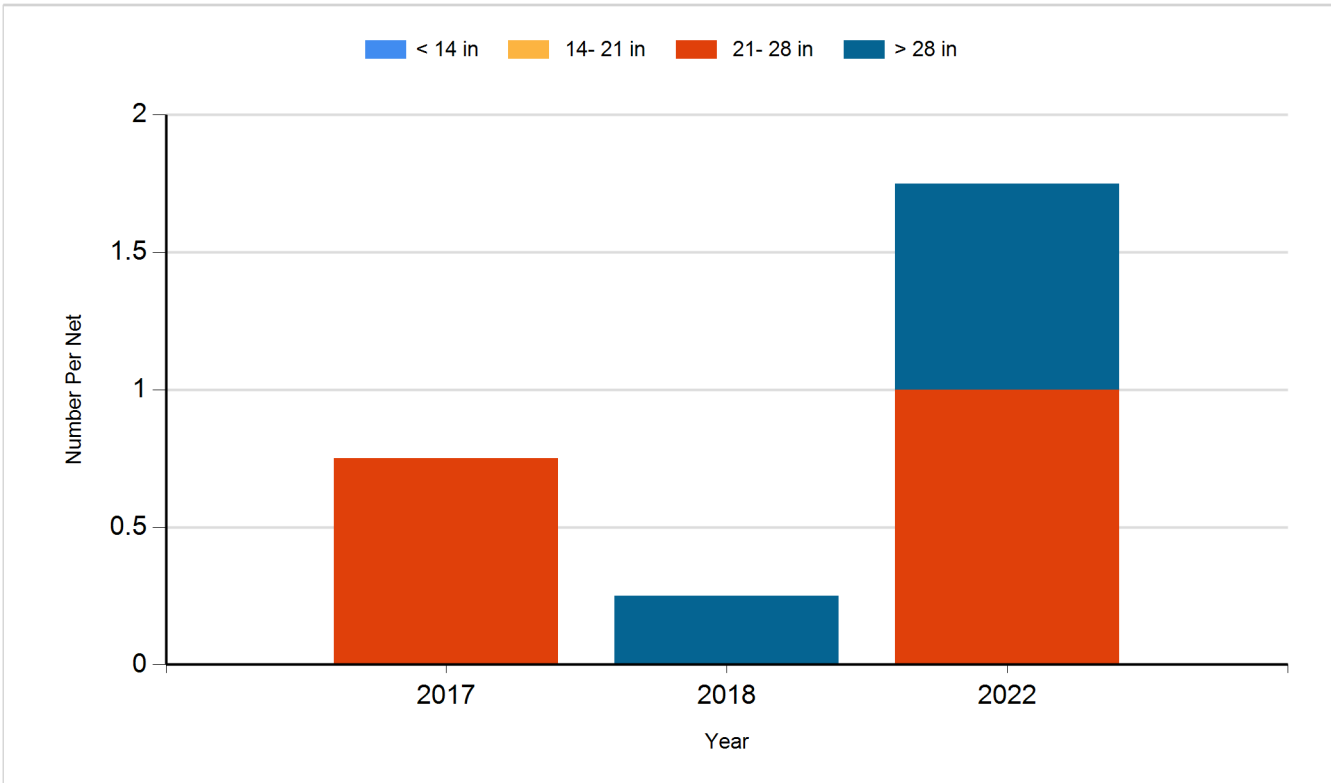
Species: Common Carp
Gear: AFS std gill net



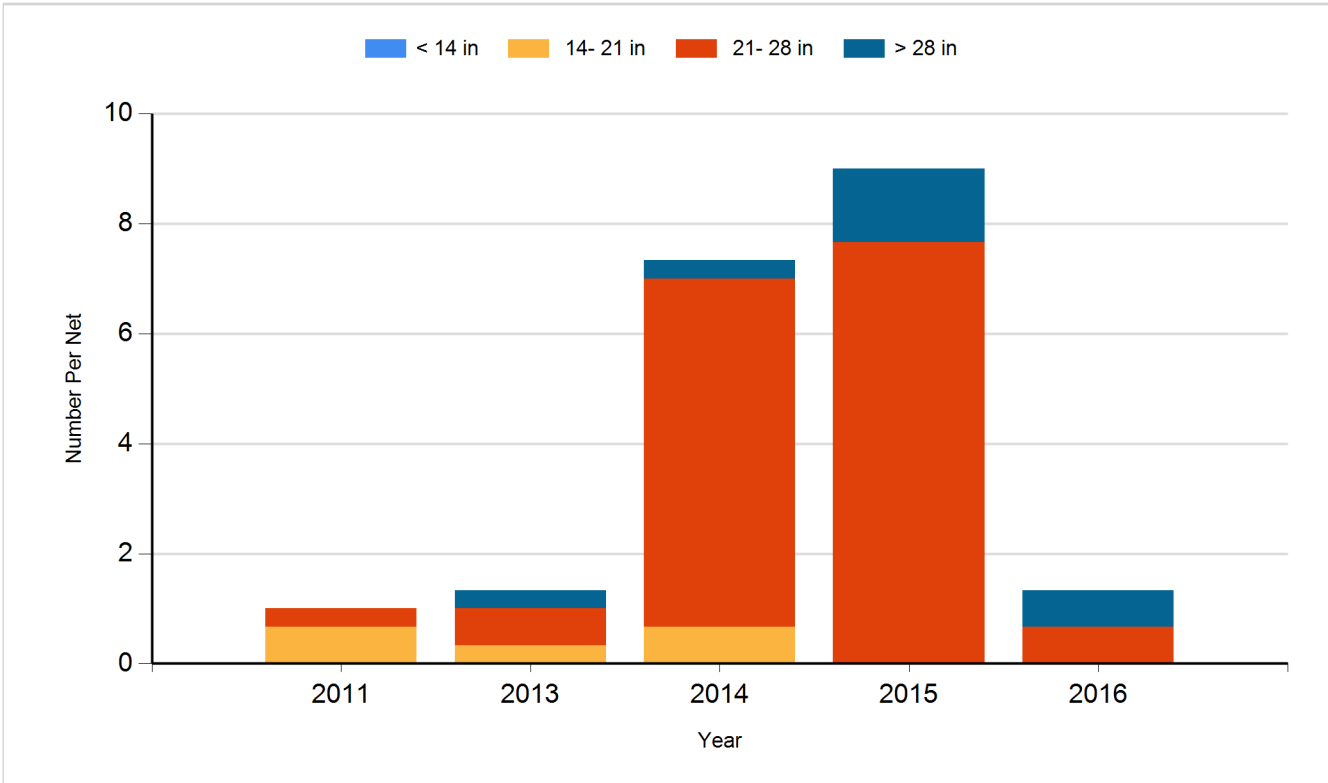
Species: Common Carp
Gear: std exp gill net



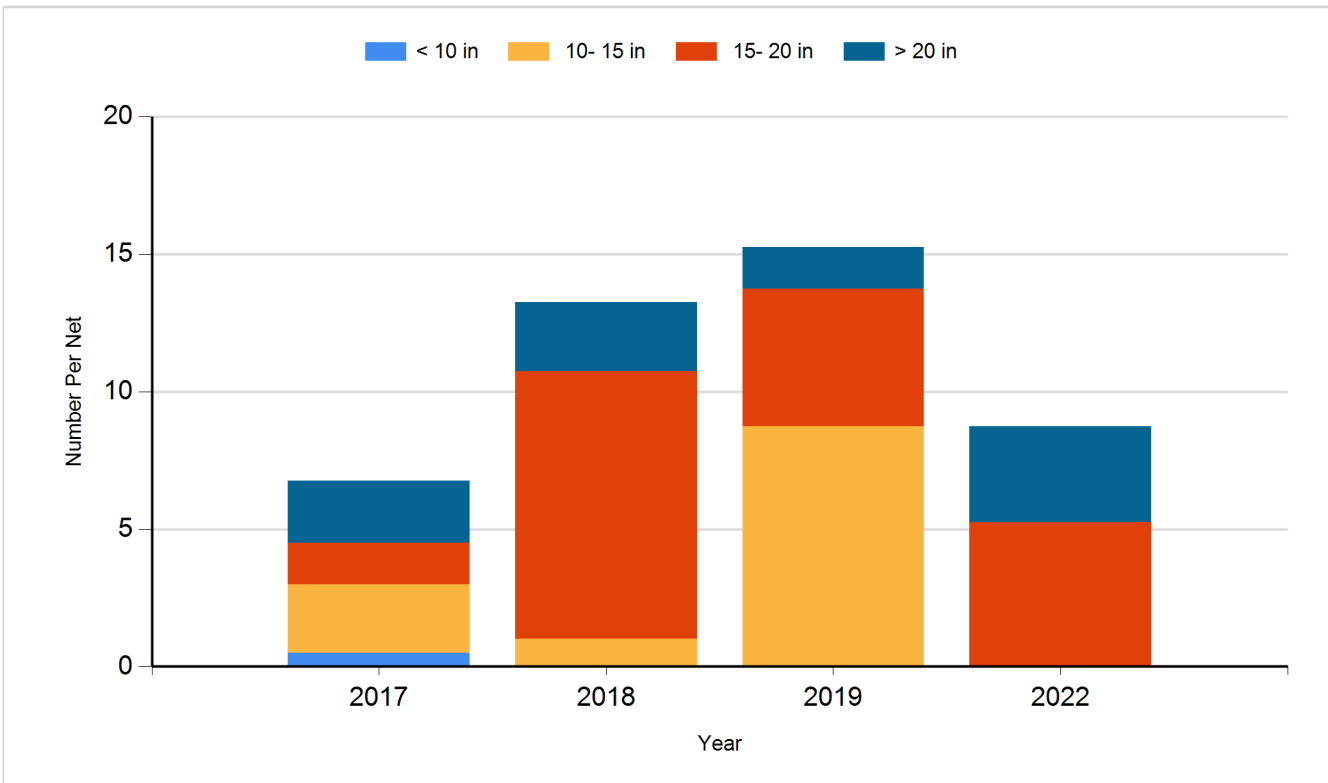
Species: Northern Pike
Gear: AFS std gill net



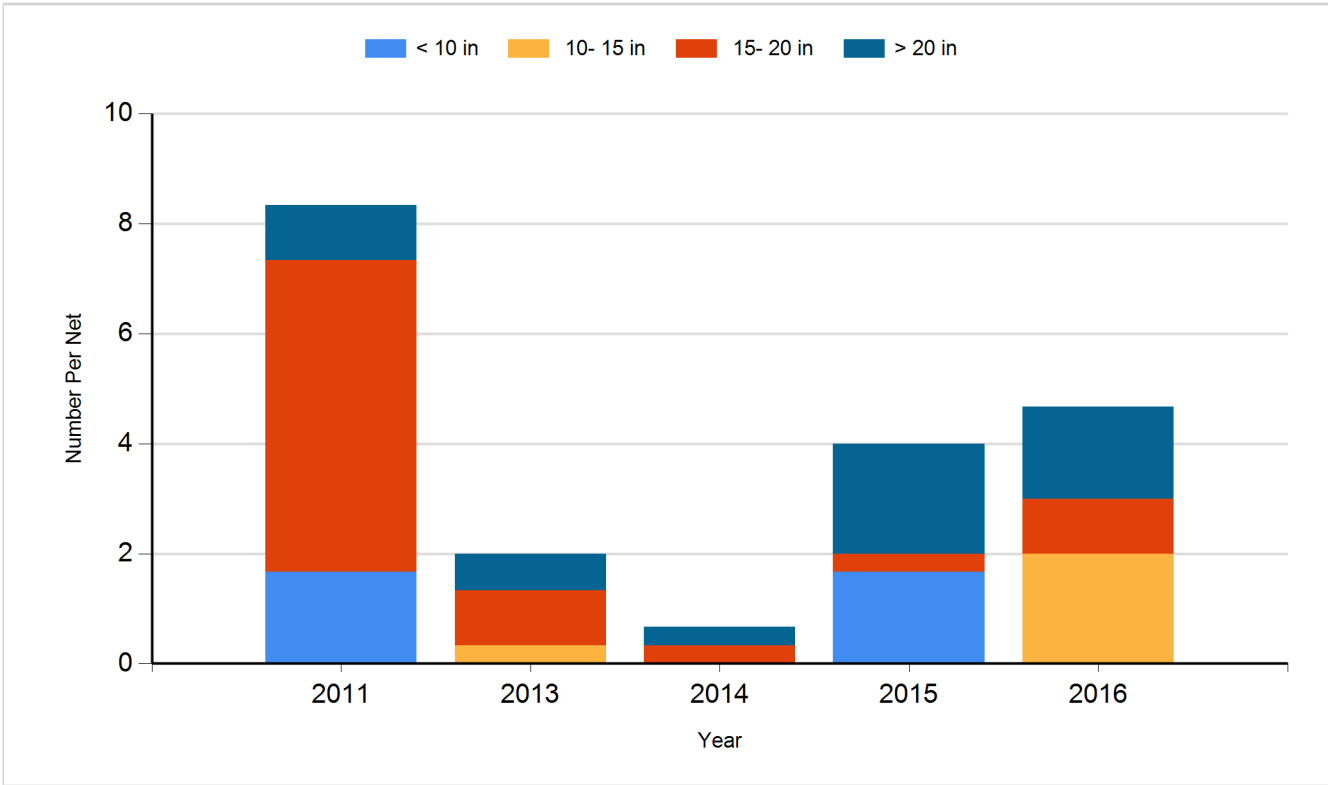
Species: Northern Pike
Gear: std exp gill net



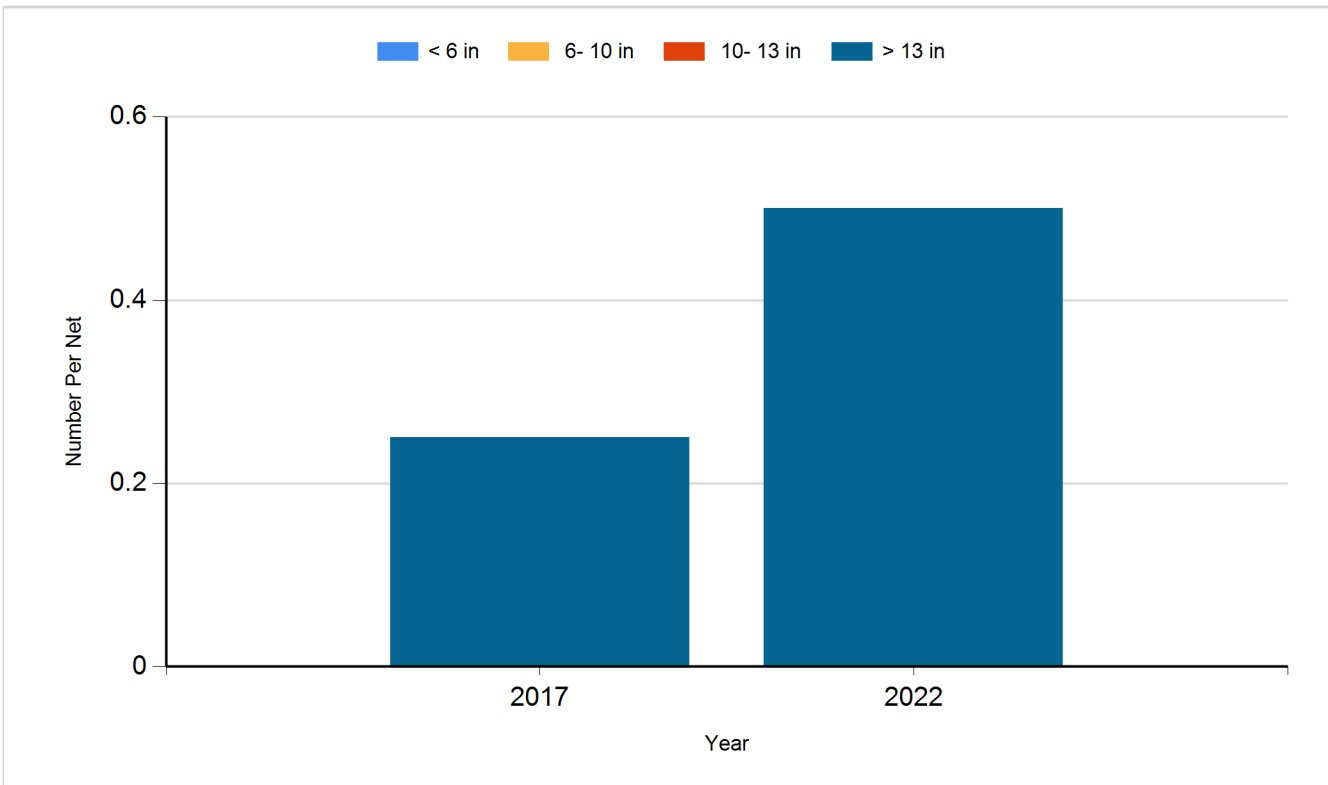
Species: Walleye
Gear: AFS std gill net



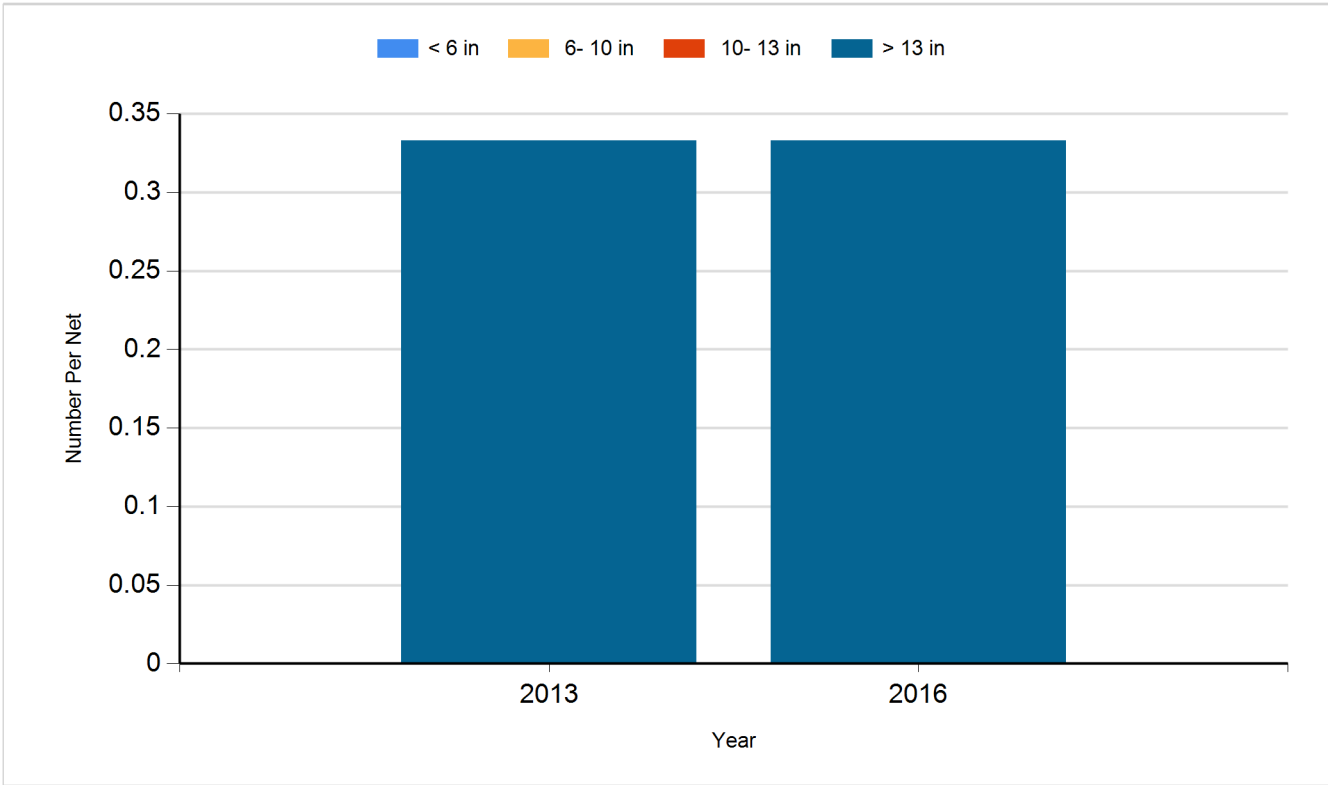
Species: Walleye
Gear: std exp gill net



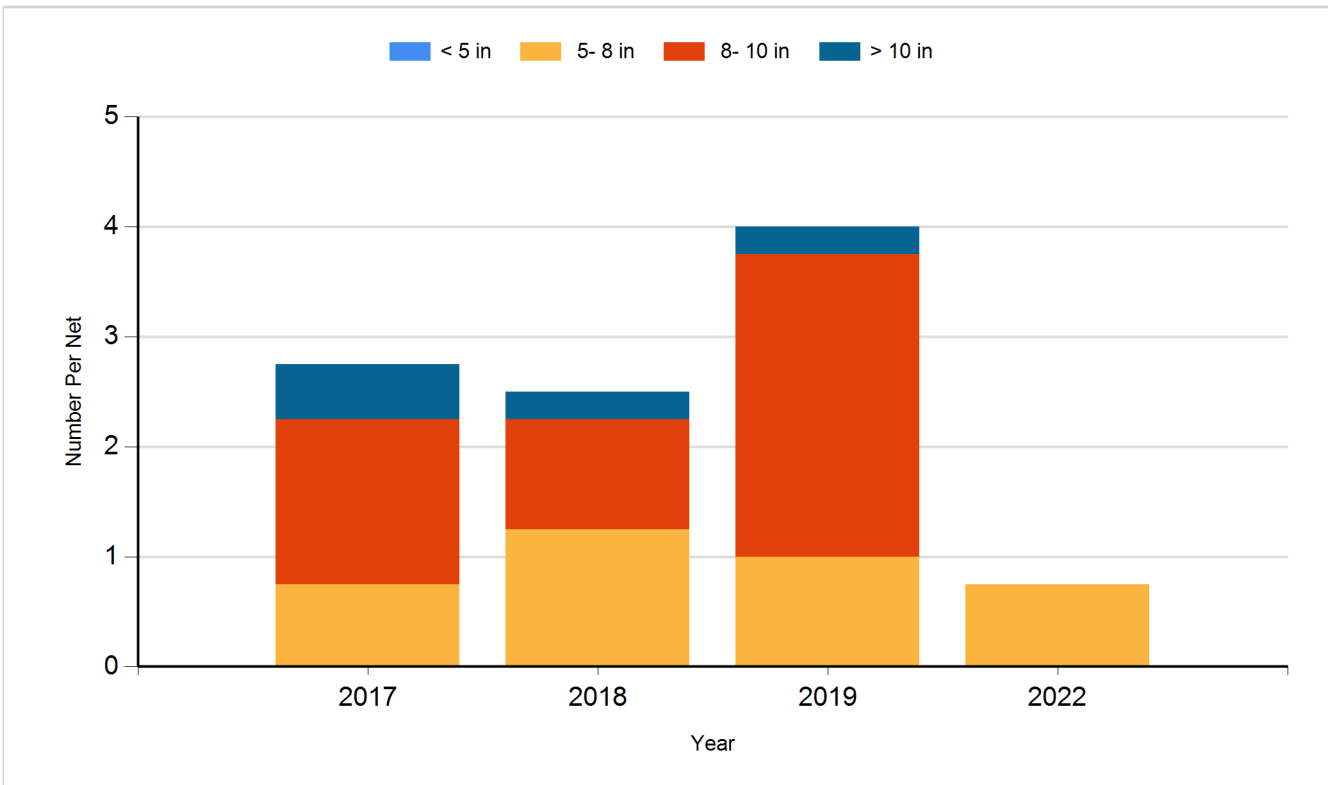
Species: White Sucker
Gear: AFS std gill net



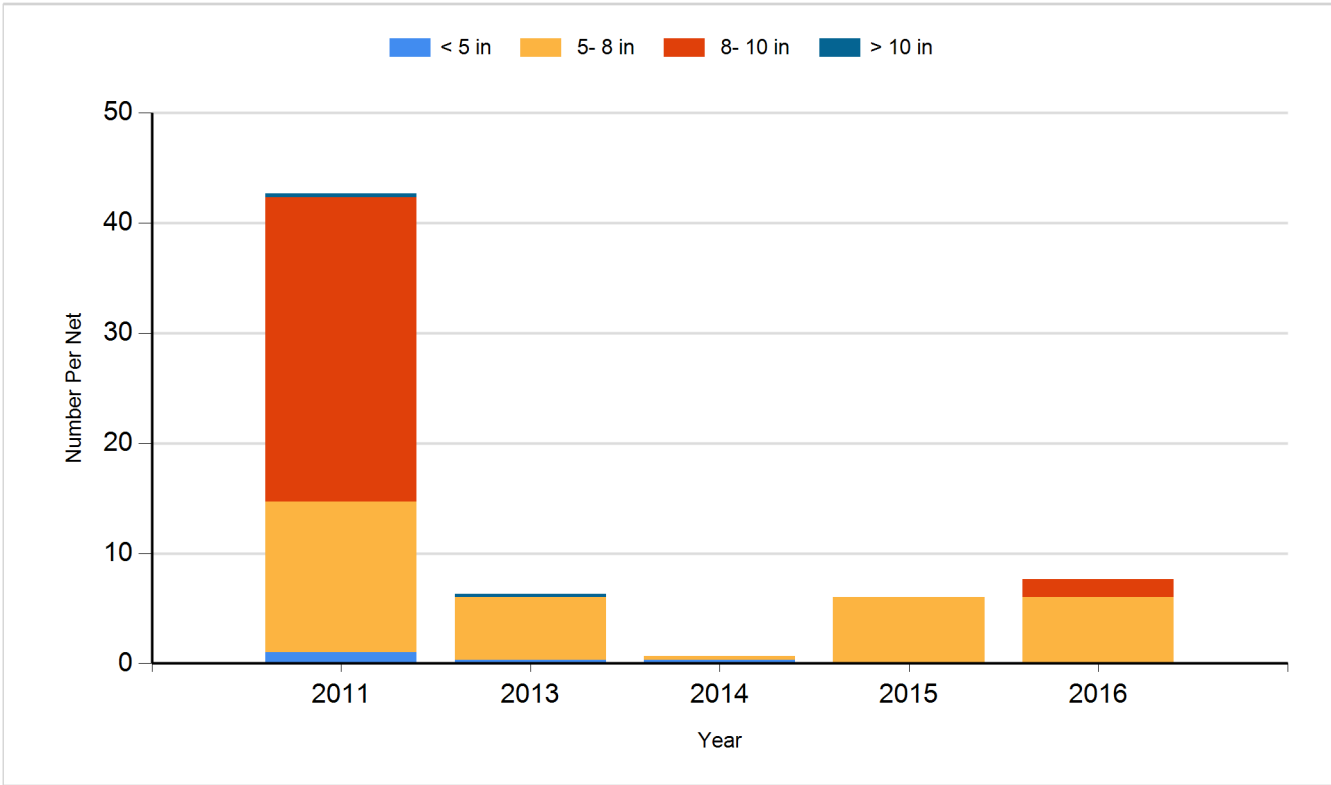
Species: White Sucker
Gear: std exp gill net



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
2011	Walleye	Large Fingerling	478
2011	Yellow Perch	Small Fingerling	75,400
2013	Yellow Perch	Small Fingerling	138,250
2014	Walleye	Small Fingerling	14,300
2015	Walleye	Juvenile	666
2015	Walleye	Small Fingerling	5,082
2016	Walleye	Juvenile	703
2016	Walleye	Small Fingerling	5,670
2016	Yellow Perch	Adult	10,187
2017	Yellow Perch	Adult	3,362
2018	Yellow Perch	Adult	3,313
2020	Yellow Perch	Adult	1,454
2021	Walleye	Adult	1,074
