

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Goldsmith, Brookings County
MBS-Lake-236-000
2022

Lake Information

Name:	Goldsmith	Maximum Depth:	9 Feet
County:	Brookings	Mean Depth:	6 Feet
Legal Description:	T110N-R51W-Sec 9,16		
Surface Area:	308 Acres		

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 13, 2022	6 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Saugeye

Bigmouth Buffalo

Northern Pike

White Sucker

Black Bullhead

Common Carp

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	Bigmouth Buffalo	19	2.2	0.6	69		46	23		
	Black Bullhead	3	0.5	0.3	0		0			
	Black Crappie	1	0.2	0.2	100		100		94	
	Common Carp	2	0.3	0.3	0		0			
	Northern Pike	6	1.0	0.8	67		0		75	4
	Saugeye	34	3.5	1.0	76	15	52	17	81	2
	Walleye	14	2.3	0.8	79		36	22	81	2
	White Sucker	3	0.5	0.5	67		67			
	Yellow Perch	27	4.5	3.2	70	14	26	13	96	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
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
AFS std gill net	Bigmouth Buffalo					0.0	5.5	1.2		1.8	2.2	2.14
	Black Bullhead					1.0	2.8	0.5		4.3	0.5	1.82
	Black Crappie					0.0	0.0	0.0		0.3	0.2	0.10
	Common Carp					0.2	2.3	1.0		0.5	0.3	0.86
	Northern Pike					2.0	0.8	1.5		0.8	1.0	1.22
	Saugeye					0.7	0.5	4.0		5.5	3.5	2.84
	Walleye					2.0	8.7	3.2		2.0	2.3	3.64
	White Sucker					1.7	1.5	0.7		1.5	0.5	1.18
	Yellow Perch					5.0	2.8	0.7		1.0	4.5	2.80
frame net (std 3/4 in)	Bigmouth Buffalo	6.6										6.60
	Black Bullhead	10.8										10.80
	Bluegill	0.4										0.40
	Common Carp	1.2										1.20
	Northern Pike	1.4										1.40
	Walleye	3.4										3.40
	White Bass	1.2										1.20
	White Crappie	0.6										0.60
	White Sucker	0.2										0.20
std exp gill net	Bigmouth Buffalo	0.0	0.0	0.0	0.0							0.00
	Black Bullhead	1.0	7.7	9.3	0.0							4.50
	Common Carp	0.7	0.3	0.3	0.3							0.40
	Northern Pike	3.0	1.0	1.3	2.3							1.90
	Orangespotted Sunfish	0.0	0.0	0.0	0.0							0.00
	Saugeye	0.0	0.0	0.0	0.0							0.00
	Walleye	5.3	0.0	0.0	6.3							2.90
	White Sucker	2.7	4.0	1.0	4.0							2.93
	Yellow Perch	1.3	5.0	7.0	40.3							13.40

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	Bigmouth Buffalo	PSD						12	100			100	69
		PSD-P						3	0			36	46
	Black Bullhead	PSD					0	18	100			81	0
		PSD-P					0	0	33			0	0
	Black Crappie	PSD										100	100
		PSD-P										50	100
		Wr										98	94
	Common Carp	PSD					100	79	100			100	0
		PSD-P					100	7	50			67	0
	Northern Pike	PSD					92	80	56			60	67
		PSD-P					8	20	33			0	0
		Wr					88	100	88			81	75
	Saugeye	PSD					0	100	63			91	76
		PSD-P					0	0	25			18	52
		Wr					99	93	93			90	81
	Walleye	PSD					17	96	100			100	79
		PSD-P					0	0	32			83	36
		Wr					89	93	92			84	81
	White Sucker	PSD					100	100	100			100	67
		PSD-P					80	78	75			100	67
	Yellow Perch	PSD					67	94	25			100	70
PSD-P						50	12	25			33	26	
Wr						111	99	108			103	96	
frame net (std 3/4 in)	Bigmouth Buffalo	PSD	97										
		PSD-P	67										
		Wr	119										
	Black Bullhead	PSD	48										
		PSD-P	0										
		Wr	88										
	Common Carp	PSD	100										
		PSD-P	50										
		Wr	89										
	Northern Pike	PSD	86										

Gear	Species	Index	Year									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
frame net (std 3/4 in)	Northern Pike	PSD-P	0									
		Wr	88									
	Walleye	PSD	41									
		PSD-P	12									
		Wr	100									
	White Sucker	PSD	100									
		PSD-P	100									
		Wr	97									
	std exp gill net	Bigmouth Buffalo	PSD	0	0							
PSD-P			0	0								
Black Bullhead		PSD	0	26	4							
		PSD-P	0	0	0							
		Wr	111									
Common Carp		PSD	100	100	0	100						
		PSD-P	100	100	0	100						
		Wr	80									
Northern Pike		PSD	89	0	50	86						
		PSD-P	33	0	0	29						
		Wr	97	94	77	84						
Saugeye		PSD				0						
		PSD-P				0						
Walleye		PSD	31		0	0						
		PSD-P	6		0	0						
		Wr	94			96						
White Sucker		PSD	88	92	100	83						
		PSD-P	88	33	100	58						
		Wr	97									
Yellow Perch		PSD	50	60	43	75						
		PSD-P	0	0	33	8						
		Wr	111	106	105	107						

Length at Capture

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

Species: Saugeye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2022	34	226 (18)		468 (13)	533 (1)		613 (2)				
2021	32		369 (27)	493 (1)	544 (3)	488 (1)					
2019	24	273 (9)	401 (5)	464 (10)							
2018	3		423 (3)								

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2022	14		385 (7)					594 (2)	514 (4)	610 (1)	
2021	12						548 (3)	547 (9)			
2019	18				455 (2)	487 (15)		628 (1)			
2018	52	298 (1)	411 (12)	409 (5)	452 (34)						

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	4	144 (3)		278 (1)							

Fish Condition

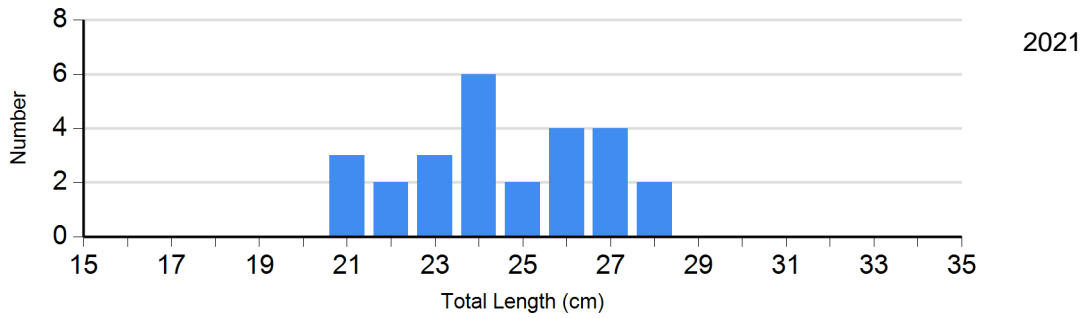
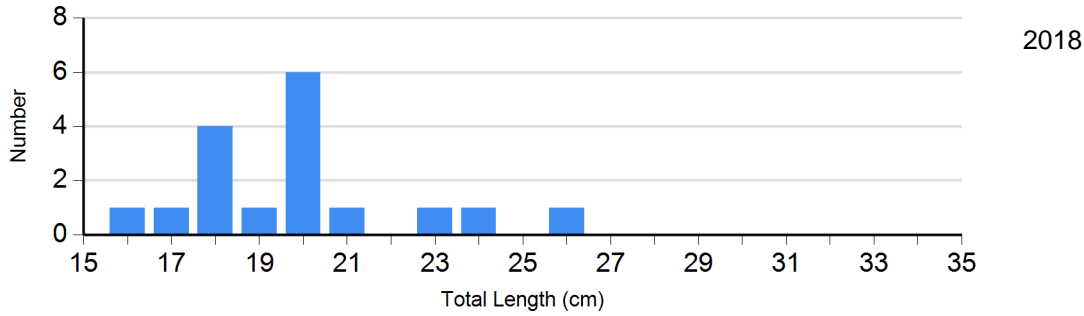
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2018	1	117	3	95 (3.0)	0		1	
	2019	4	85 (2.2)	2	90 (2.0)	2	93 (17.6)	1	
	2021	2	92 (3.8)	3	73 (3.9)	0		0	
	2022	2	67 (2.9)	4	79 (2.1)	0		0	
Saugeye Gill Net	2018	0		3	93 (3.6)	0		0	
	2019	9	96 (1.9)	9	98 (2.5)	6	83 (14.4)	0	
	2021	3	89 (4.8)	24	90 (1.0)	4	88 (2.5)	2	90 (7.0)
	2022	5	82 (1.6)	5	76 (2.3)	9	82 (2.6)	2	89 (1.9)
Walleye Gill Net	2018	2	96 (0.2)	50	93 (0.7)	0		0	
	2019	0		13	92 (1.3)	6	93 (2.0)	0	
	2021	0		2	86 (1.8)	10	84 (1.4)	0	
	2022	3	80 (0.7)	6	80 (2.0)	5	84 (3.6)	0	
Yellow Perch Gill Net	2018	1	120	14	97 (1.5)	2	102 (3.6)	0	
	2019	3	116 (4.2)	0		1	84	0	
	2021	0		4	105 (3.7)	2	100 (0.8)	0	
	2022	8	104 (2.6)	12	94 (2.0)	7	90 (2.3)	0	

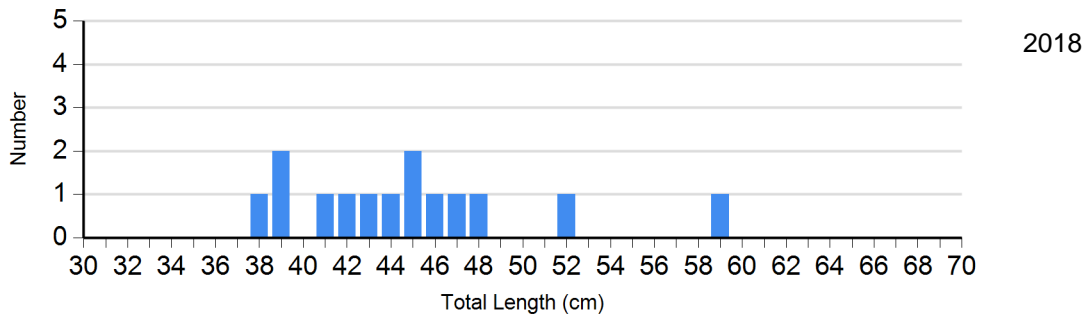
Length Frequency Distribution

Length frequency histogram of species sampled by year.

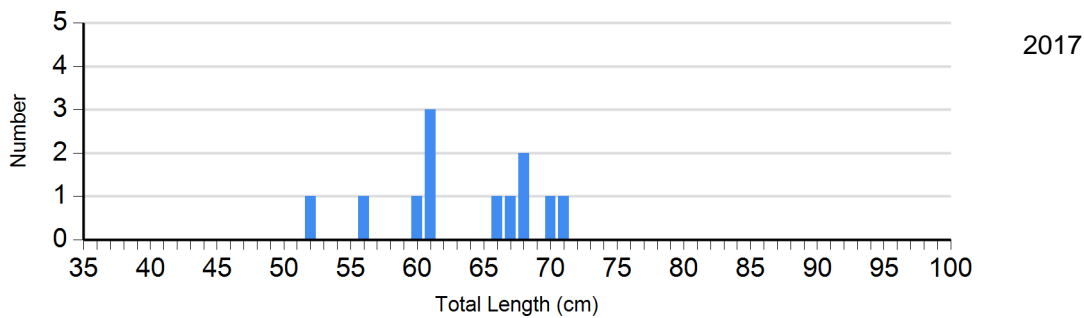
Species: Black Bullhead
Gear: AFS std gill net



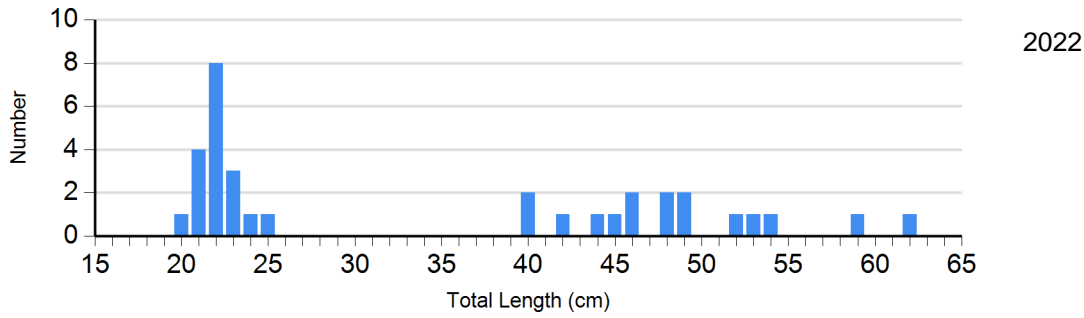
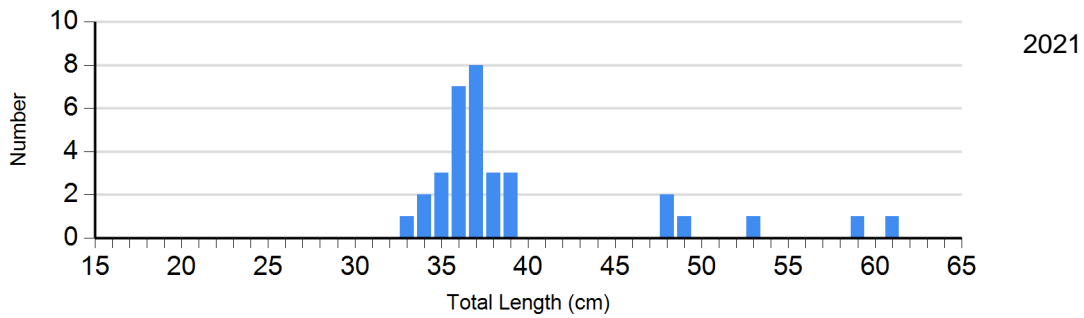
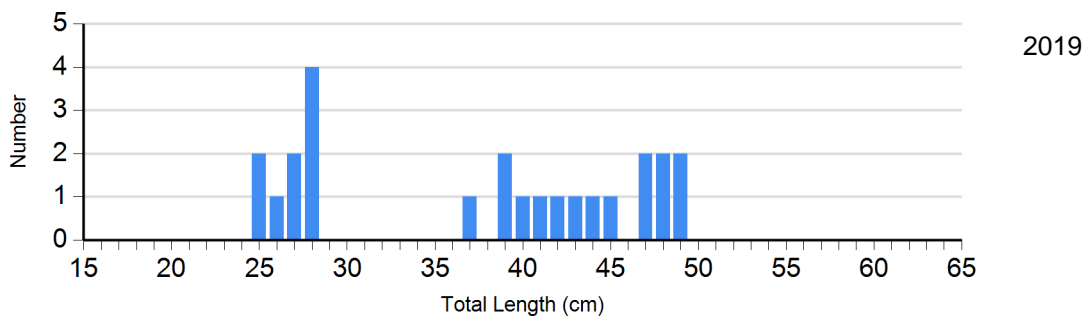
Species: Common Carp
Gear: AFS std gill net



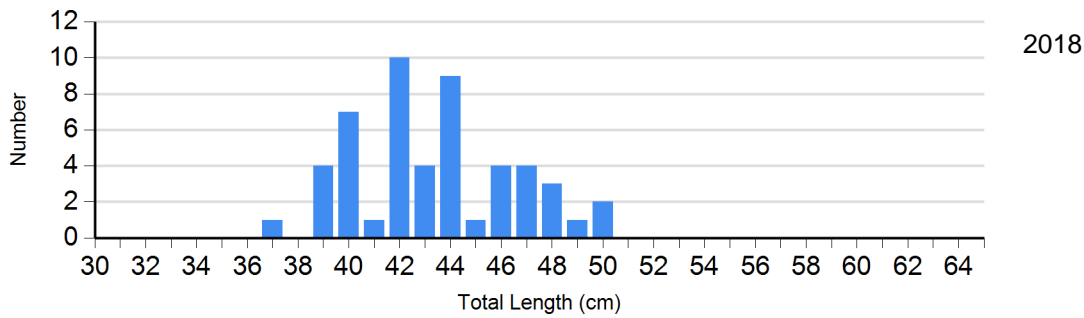
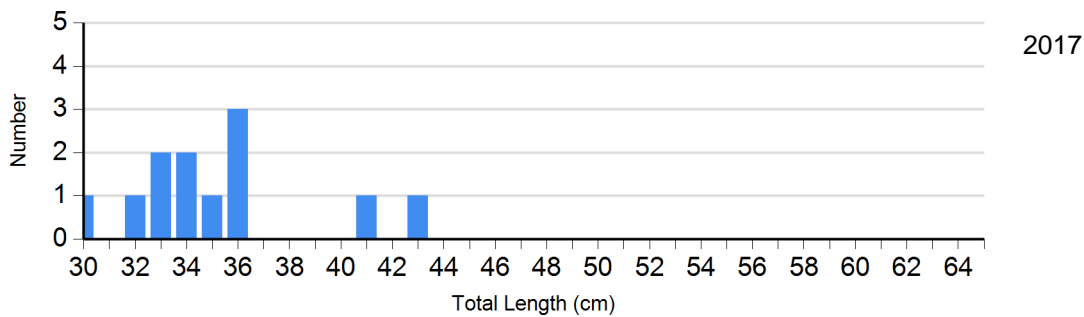
Species: Northern Pike
Gear: AFS std gill net

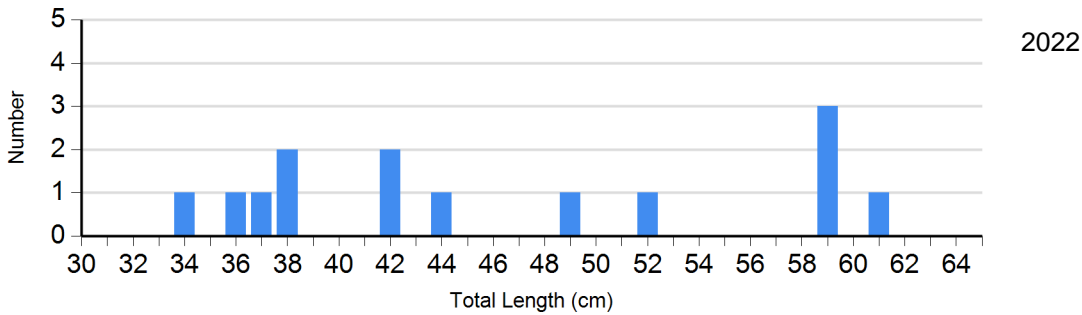
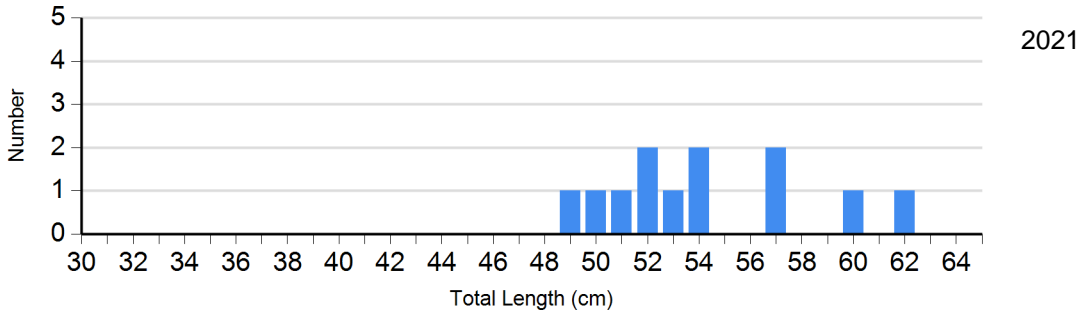
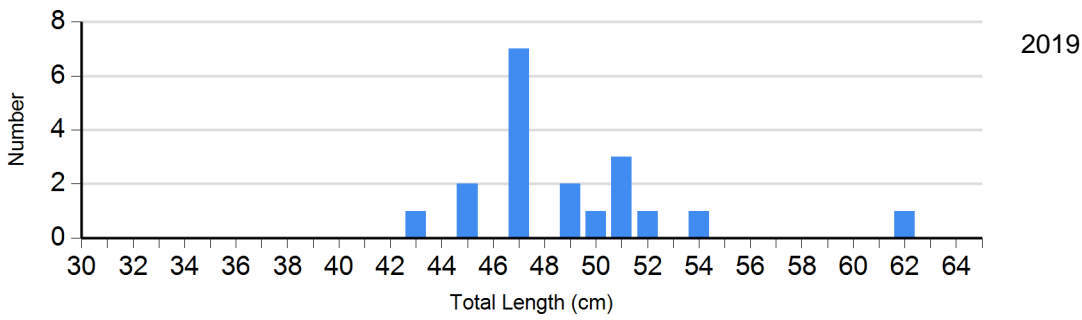


Species: Saugeye
 Gear: AFS std gill net

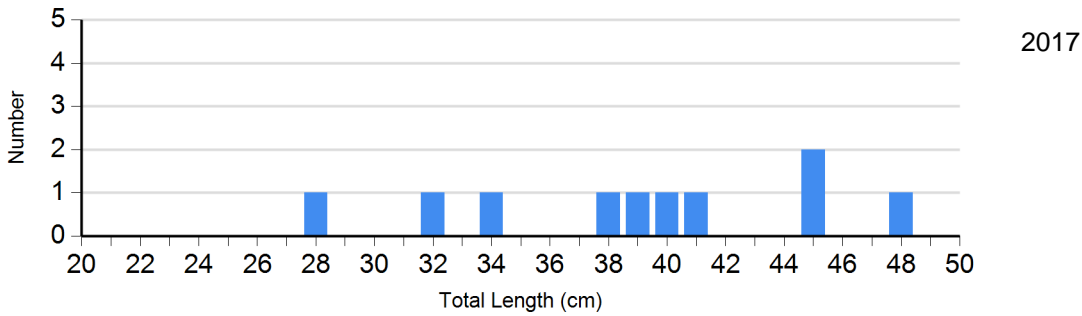


Species: Walleye
 Gear: AFS std gill net

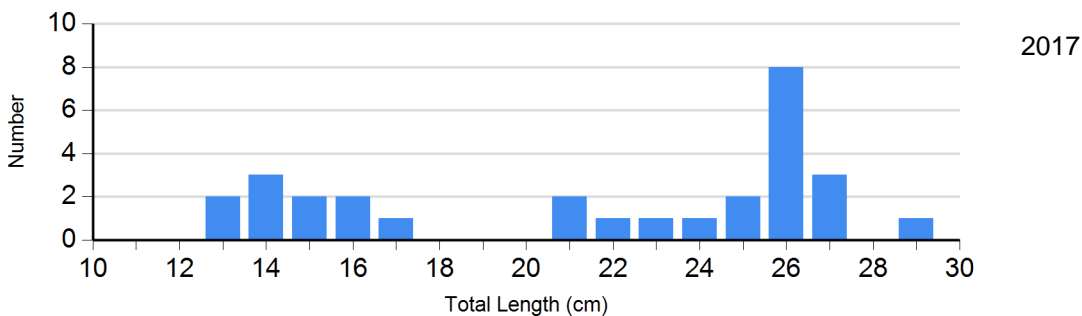


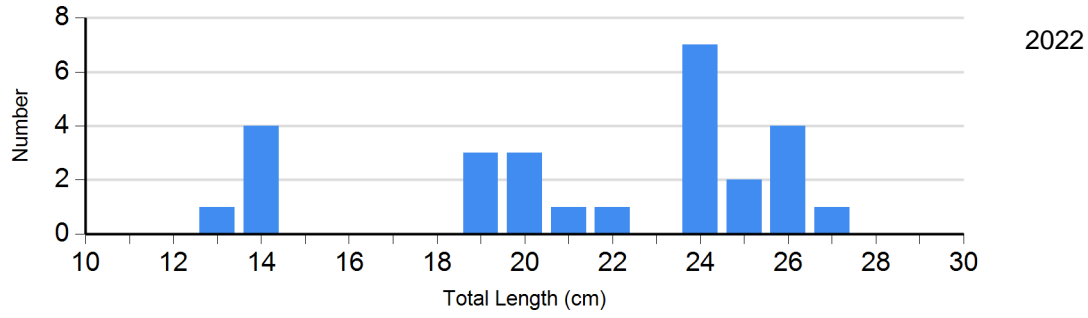
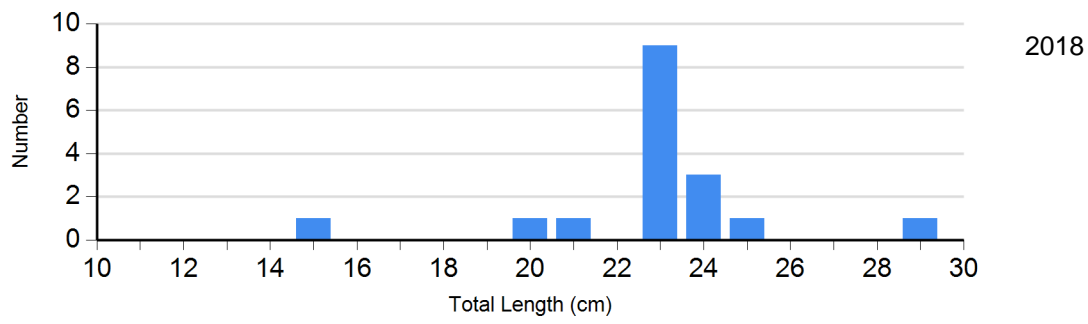


Species: White Sucker
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net

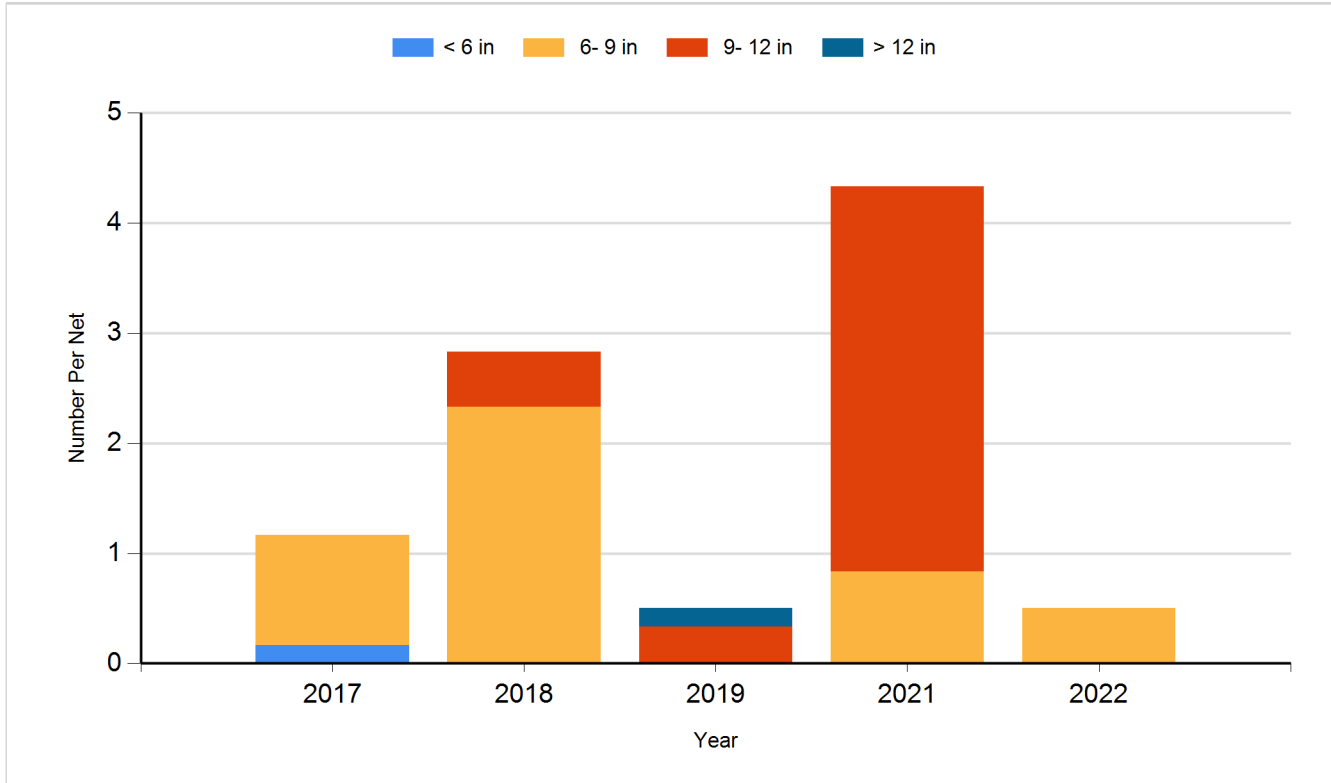




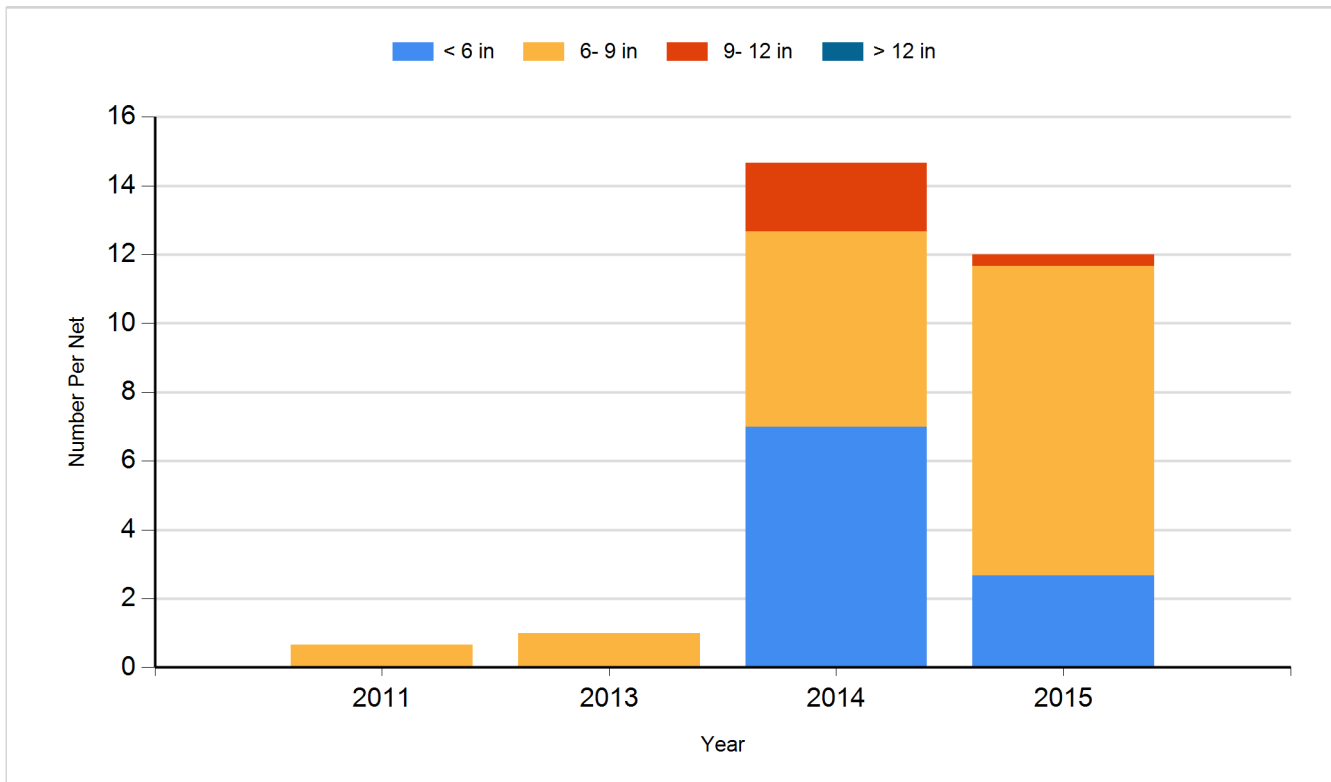
Historic Fish Sizes and Relative Abundance

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

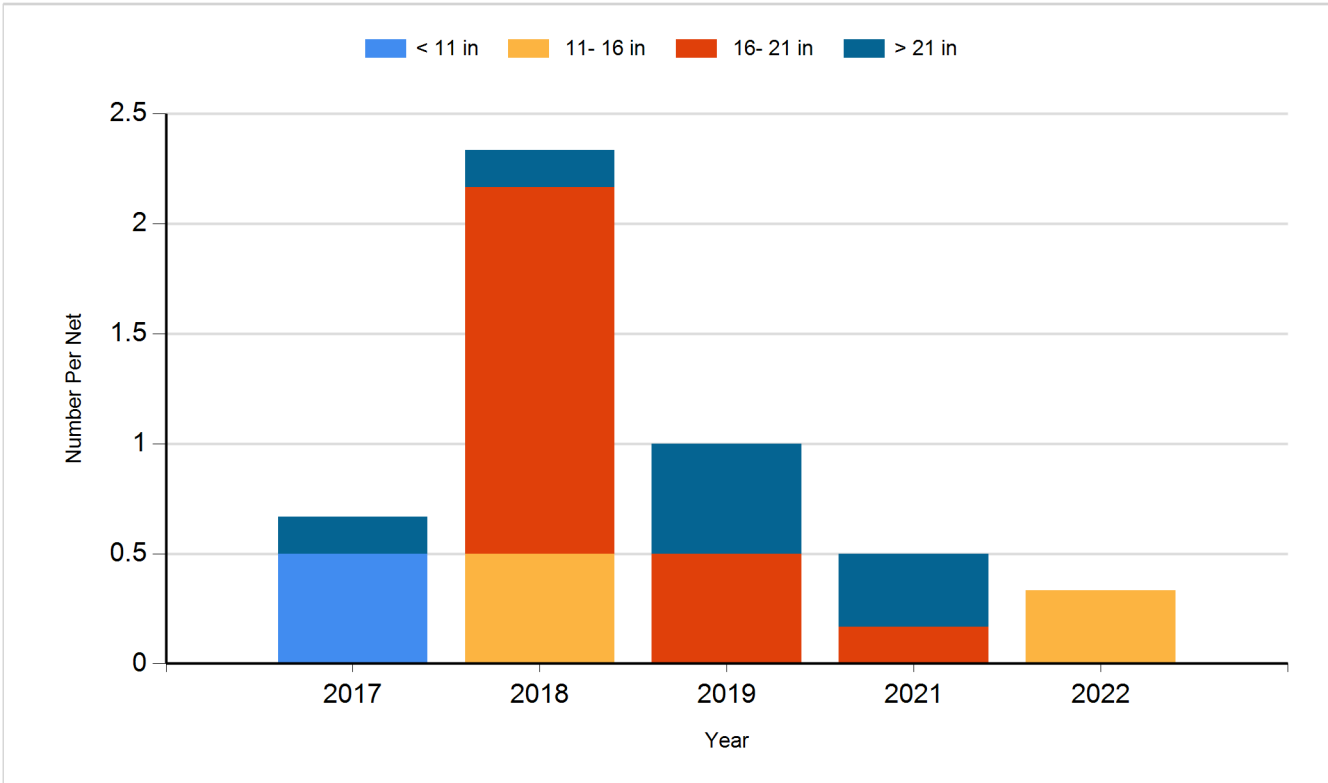
Species: Black Bullhead
Gear: AFS std gill net



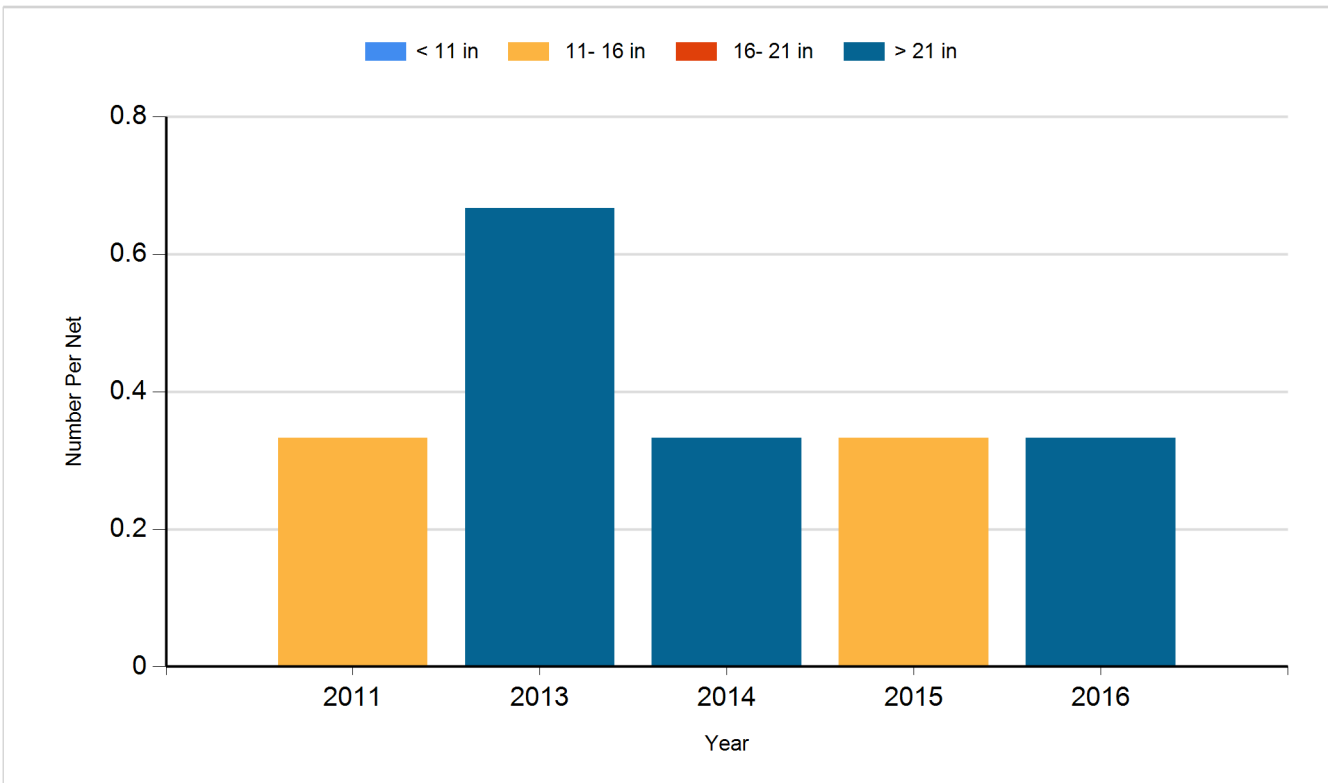
Species: Black Bullhead
Gear: std exp gill net



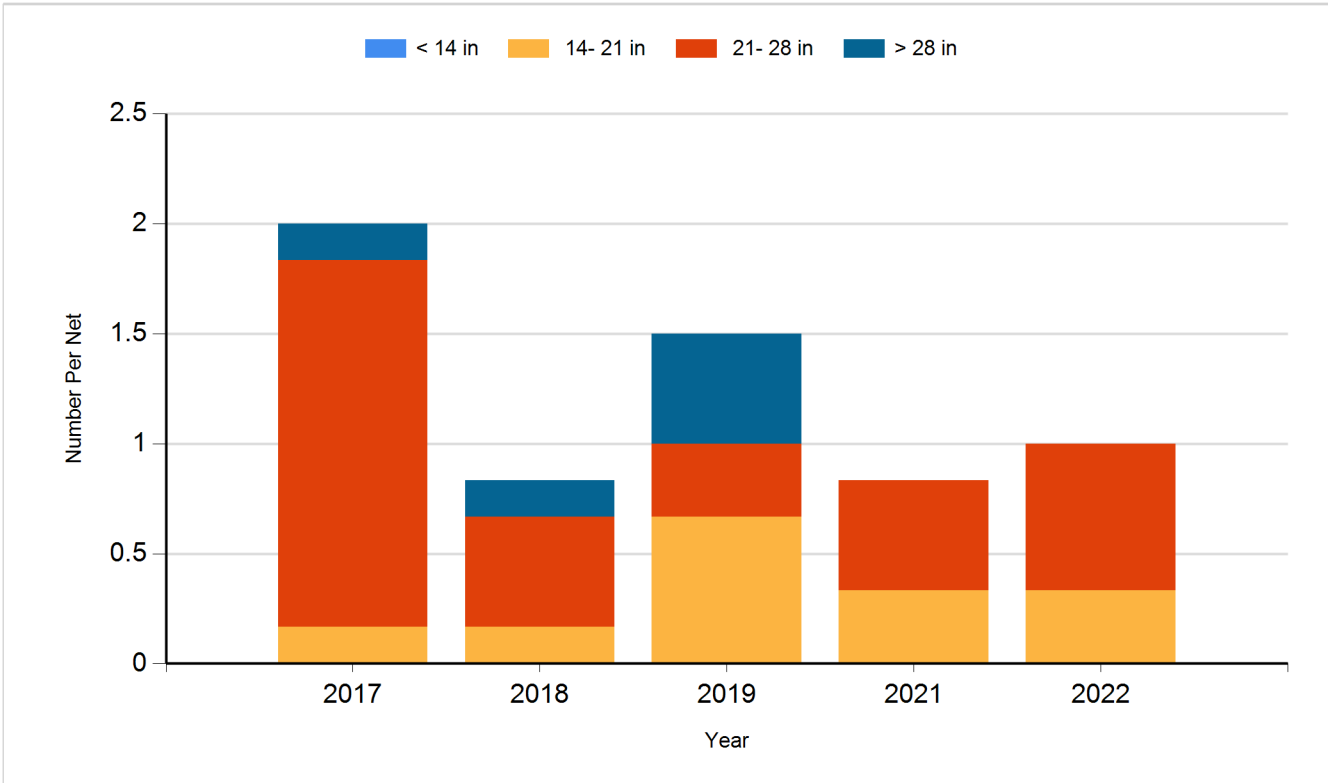
Species: Common Carp
Gear: AFS std gill net



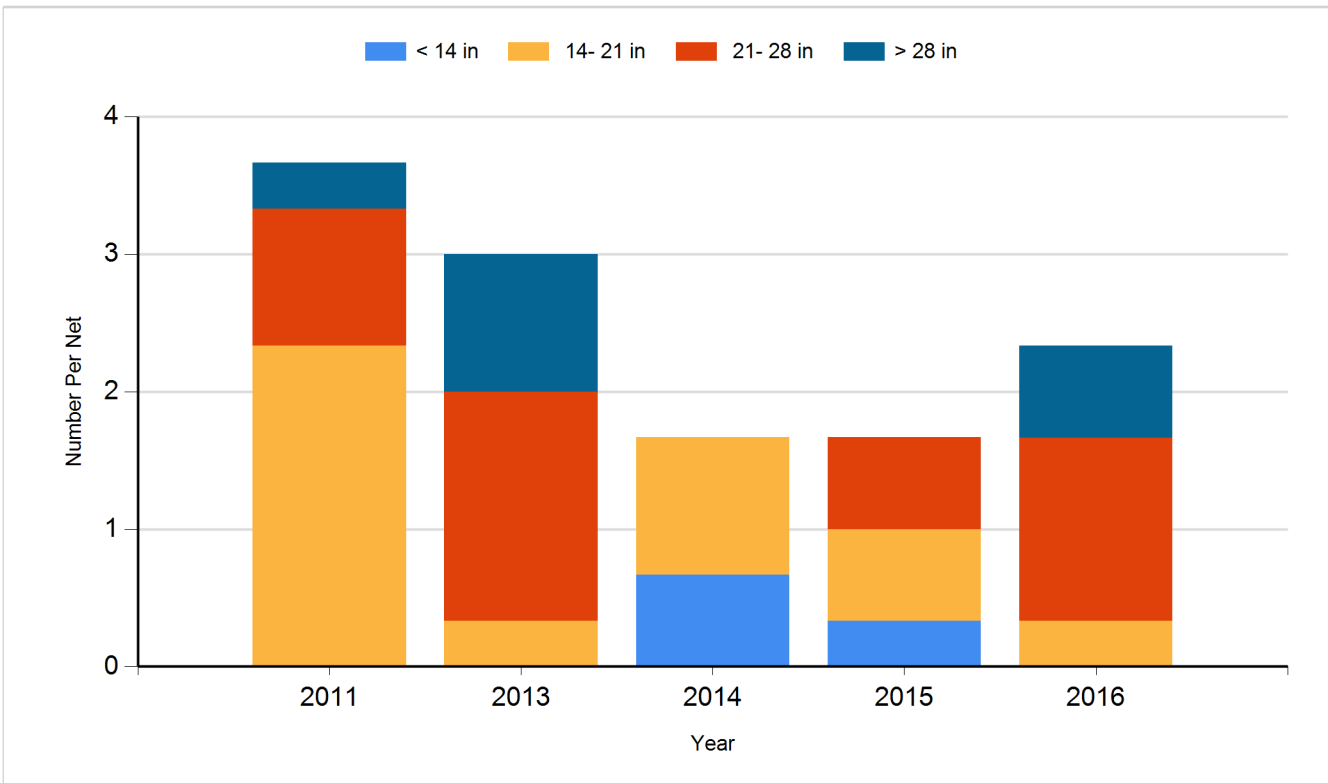
Species: Common Carp
Gear: std exp gill net



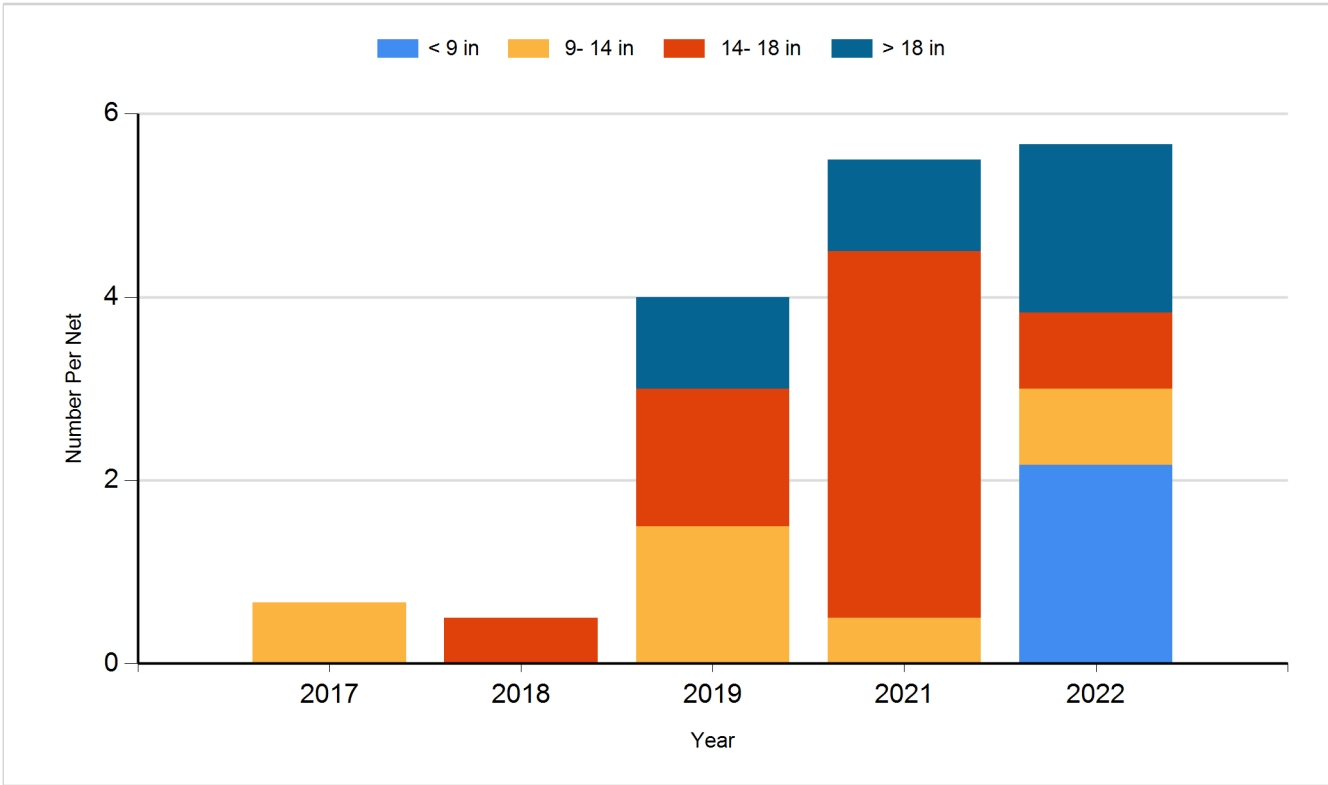
Species: Northern Pike
Gear: AFS std gill net



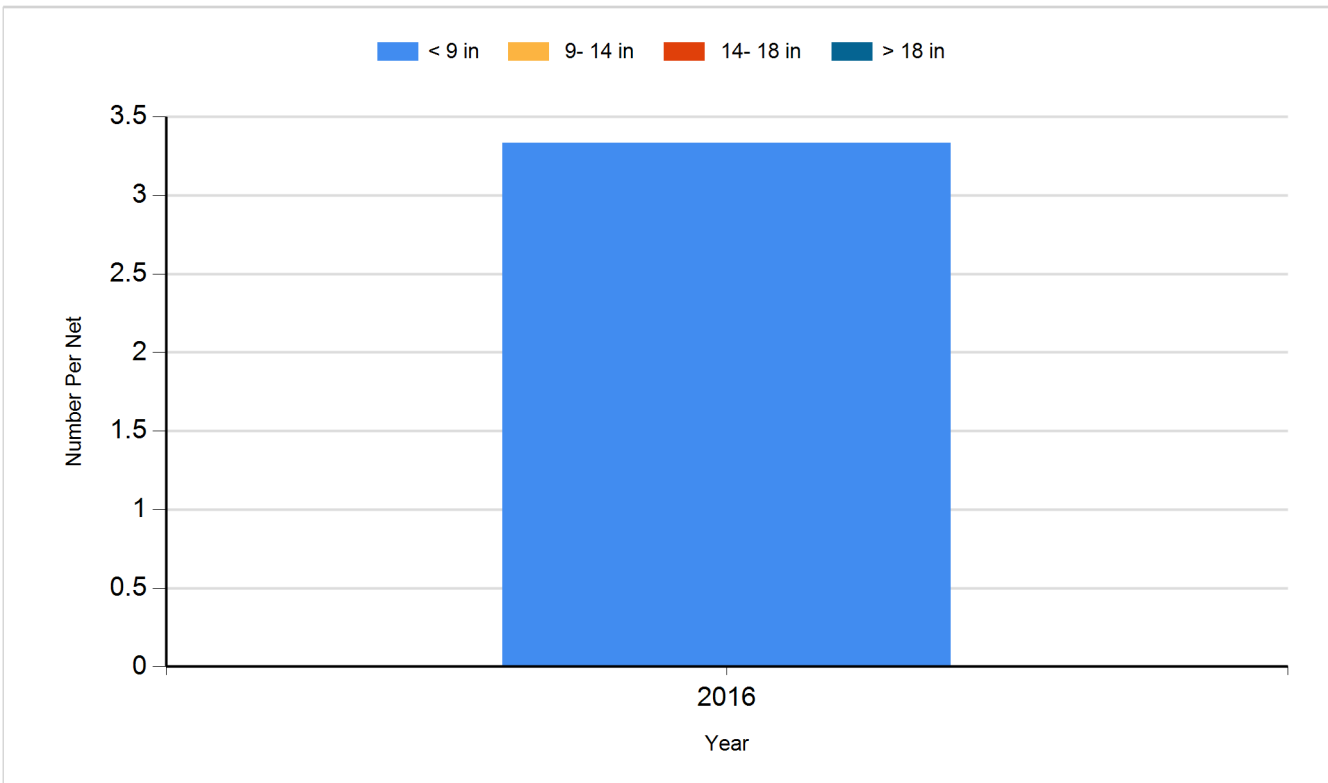
Species: Northern Pike
Gear: std exp gill net



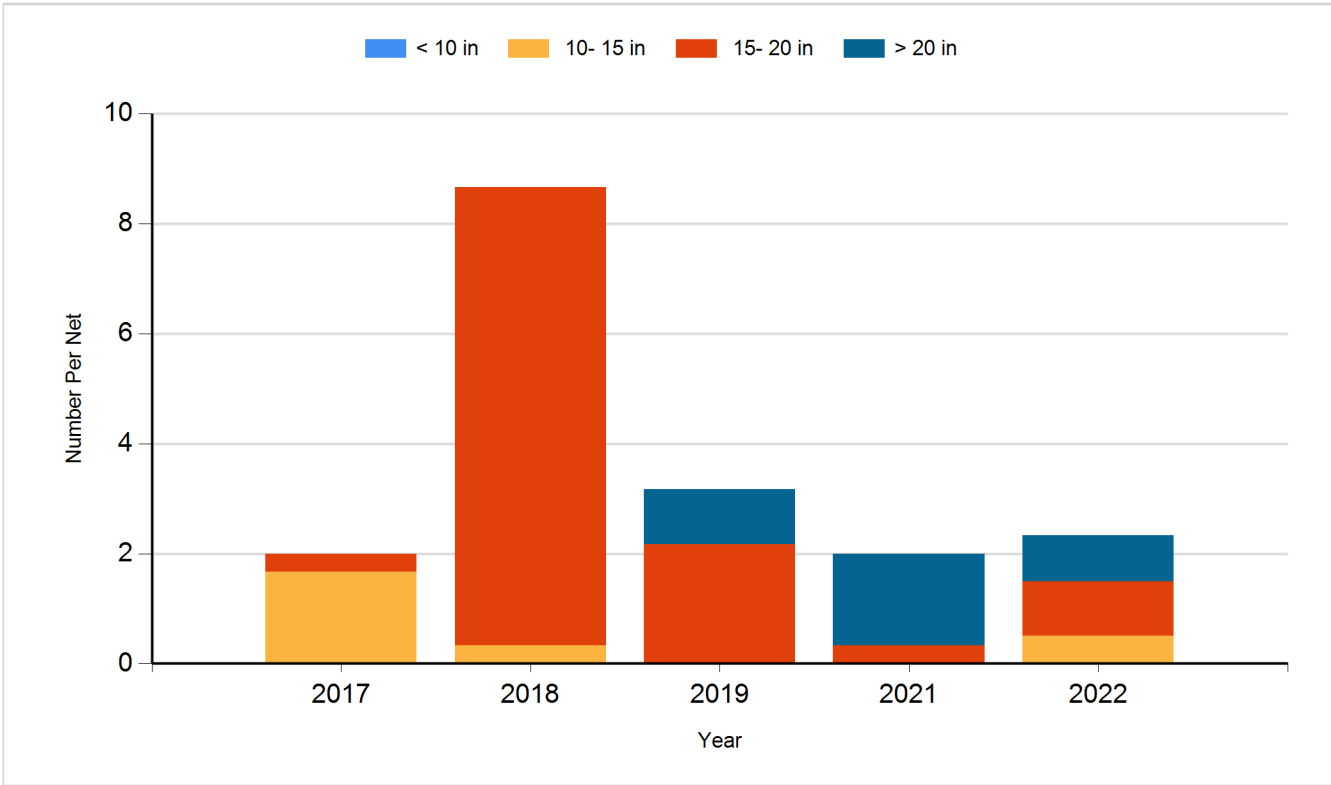
Species: Saugeye
Gear: AFS std gill net



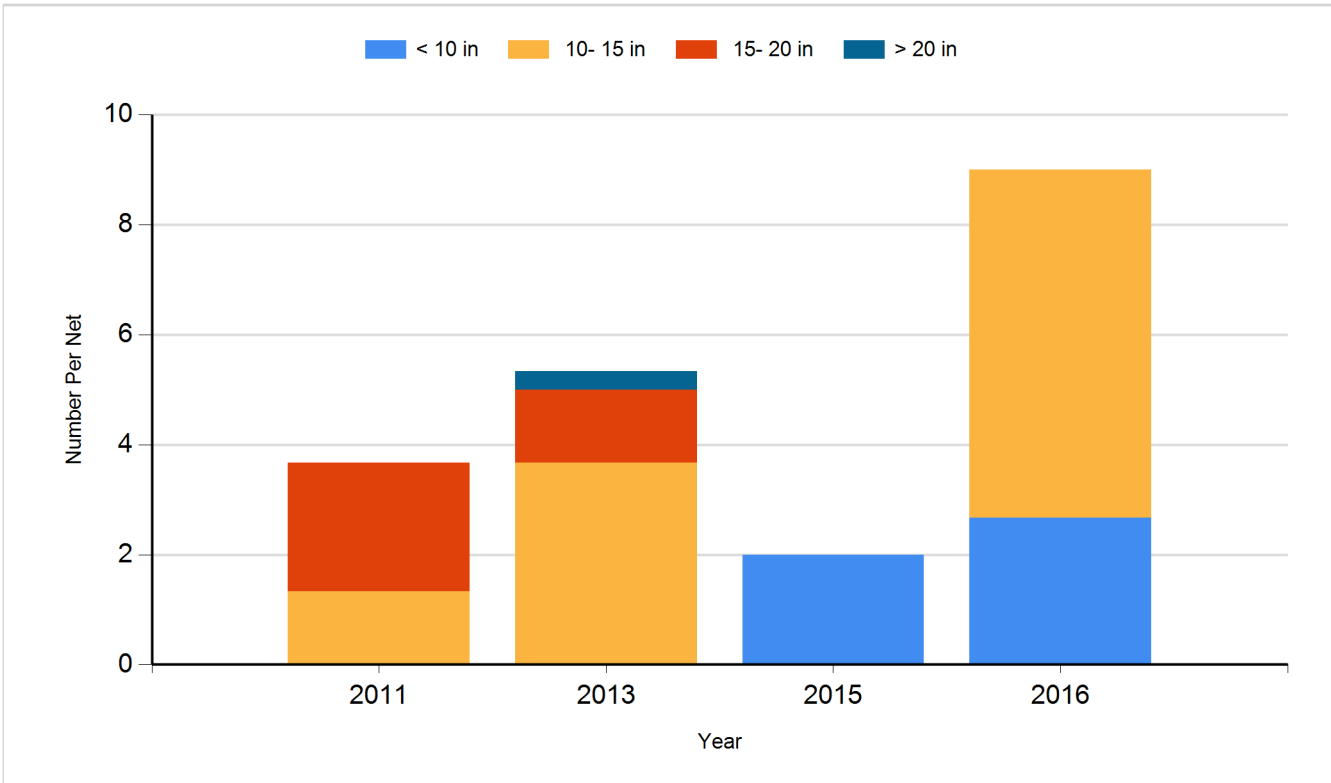
Species: Saugeye
Gear: std exp gill net



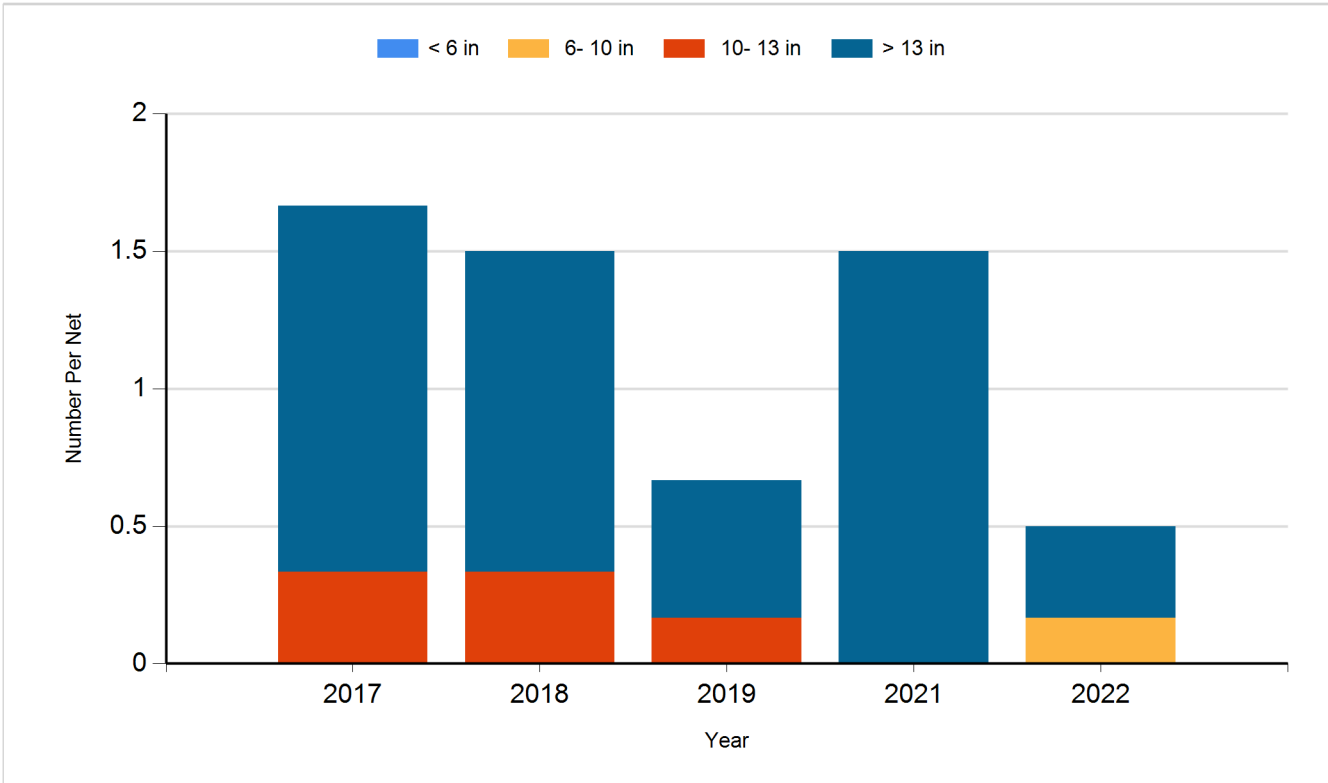
Species: Walleye
Gear: AFS std gill net



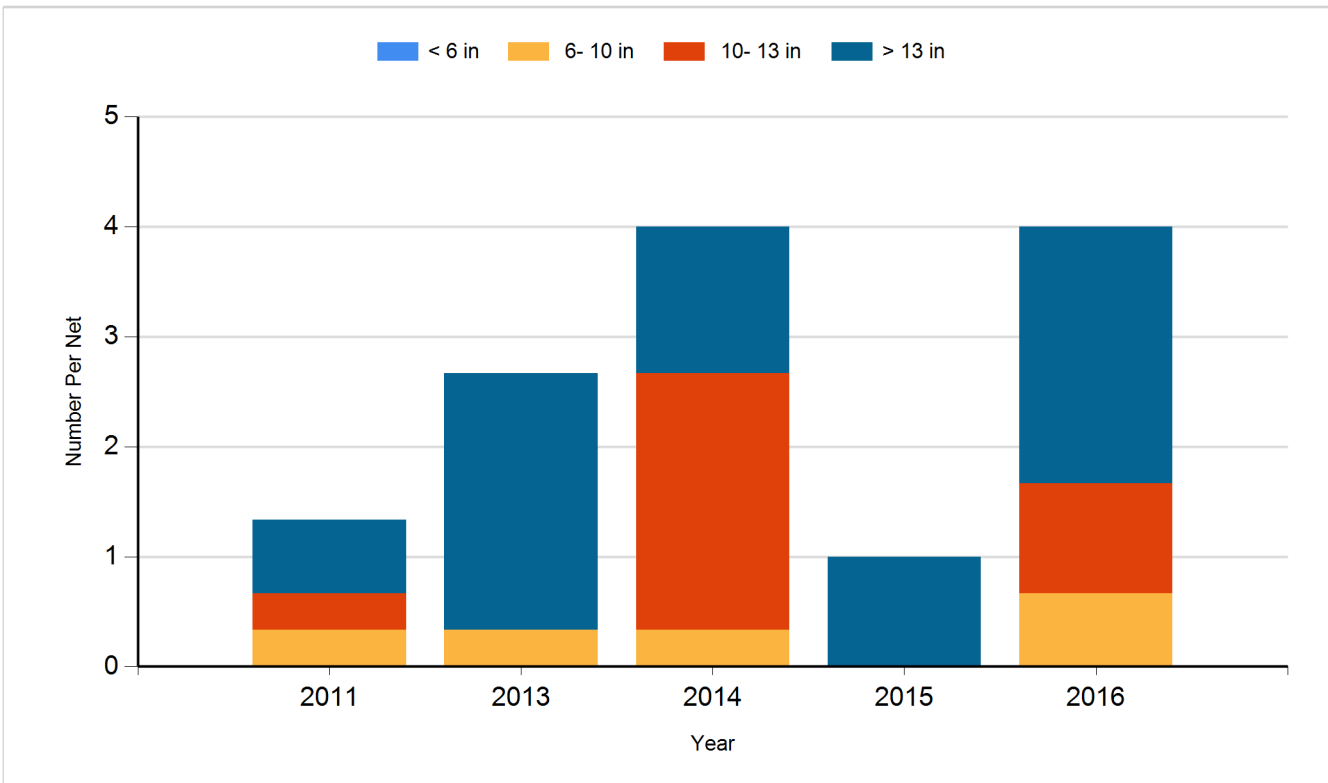
Species: Walleye
Gear: std exp gill net



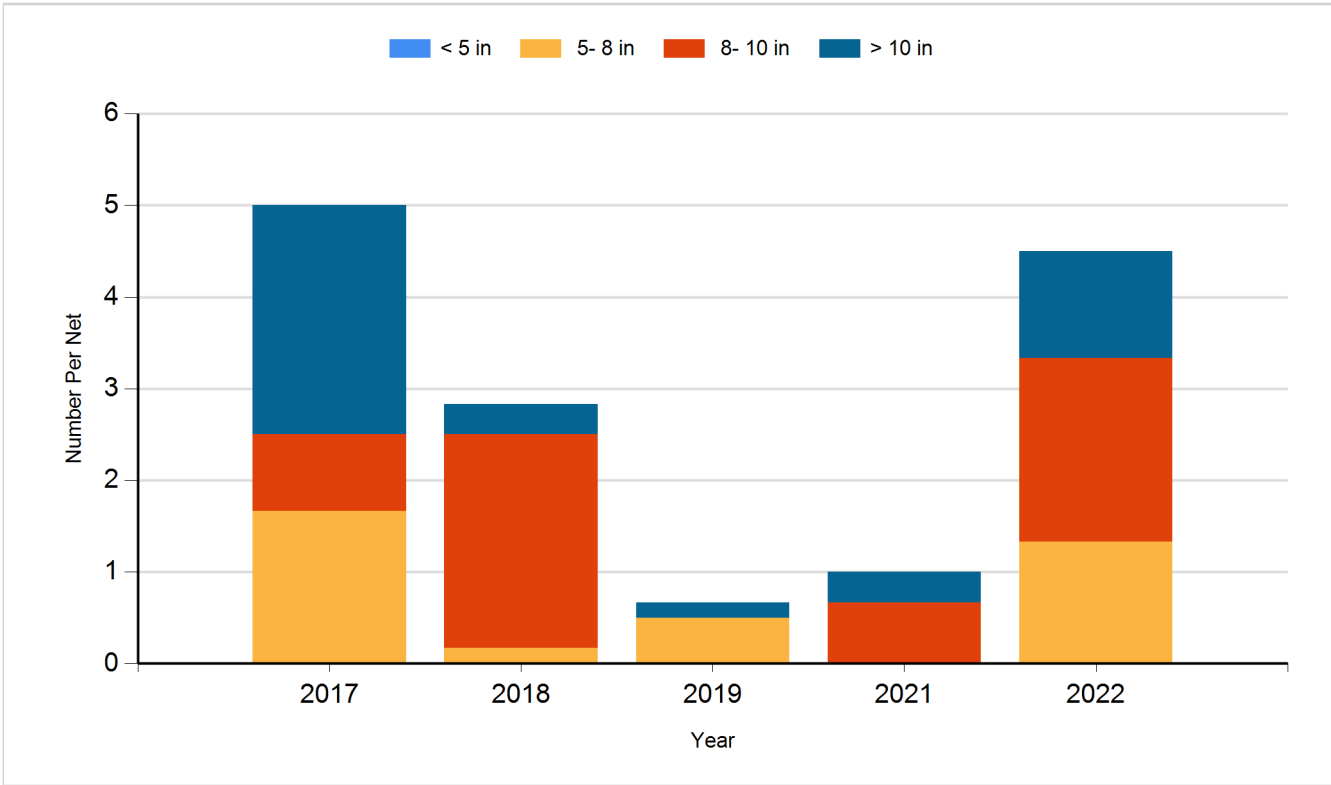
Species: White Sucker
Gear: AFS std gill net



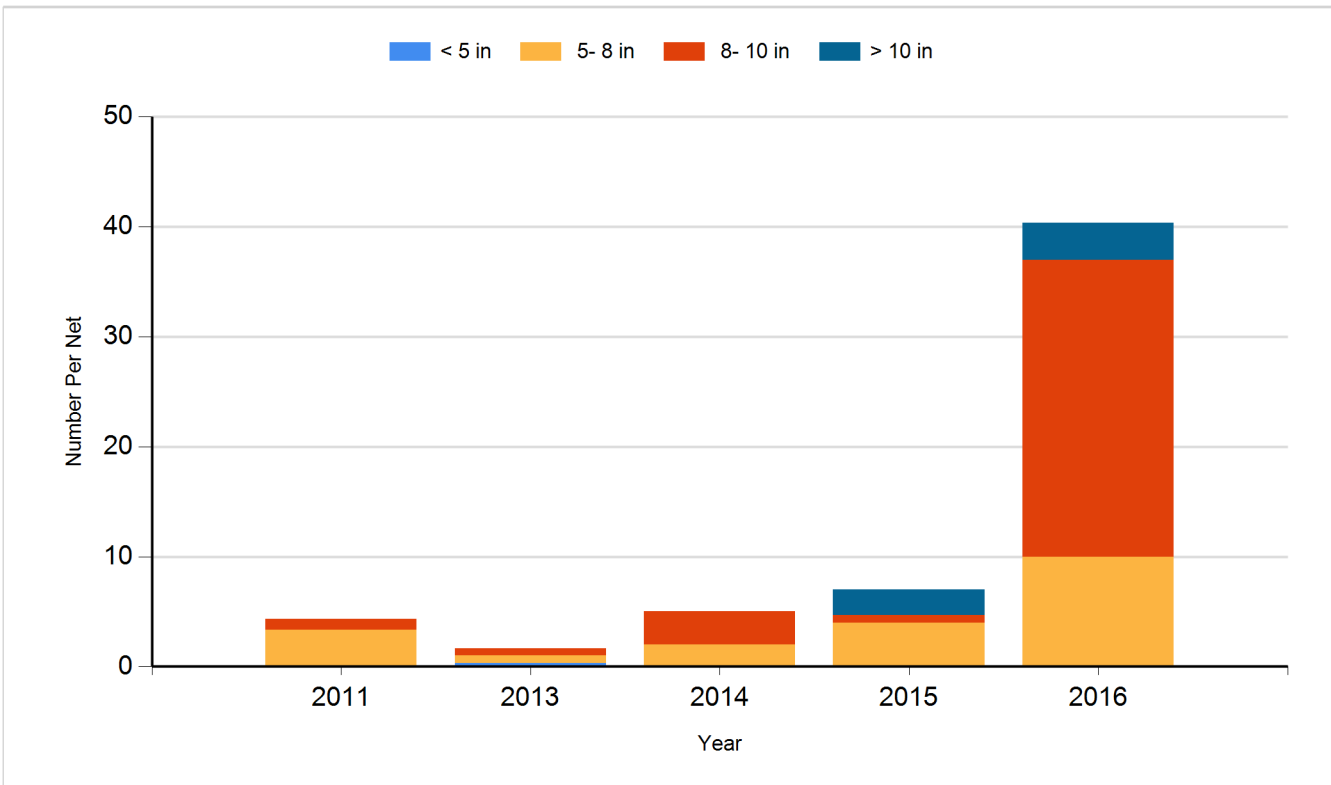
Species: White Sucker
Gear: std exp gill net



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	172
2011	Yellow Perch	Adult	2,280
2011	Yellow Perch	Small Fingerling	145,920
2012	Walleye	Juvenile	1,350
2014	Walleye	Fry	300,000
2015	Walleye	Small Fingerling	20,480
2016	Saugeye	Small Fingerling	31,030
2018	Saugeye	Small Fingerling	20,550
2019	Saugeye	Small Fingerling	21,120
2021	Saugeye	Fry	400,000
2021	Saugeye	Juvenile	25,830