Oak Lake Survey Summary

Oak Lake, located 6 miles north and 5 miles east of White, SD, is managed as a saugeye and yellow perch fishery; other fish species (e.g., black bullhead, common carp, northern pike, and walleye) are also present.

- **Saugeye.** Saugeye abundance increased considerably in 2024 (CPUE = 16.5 fish per gill net) resulting in one of the highest catch rates in the state. Relative abundance was higher than the previous sample year (CPUE = 9.5 fish per net in 2022) and long term mean (CPUE = 9.5 fish per net). Frequent winterkill events likely cause these dramatic fluctuations in catch rates. Sampled fish ranged from 11.8 to 23.2 inches in length with a sizeable proportion (40%) measuring greater than 14 inches. Preferred length (>18 inches) saugeye also accounted for a considerable percentage (20%) of catches. This year's sample was comprised of three separate cohorts of saugeye. Age 1 fish were the most common, (77% of sample) followed by age 3 (2021 year class) saugeye (23% of sample). Growth is excellent with fish attaining an average length of 18.8 inches by age 3. Any angler targeting saugeye in the region should be sure to consider trying Oak Lake.

- **Yellow Perch**. Yellow perch abundance increased to a 10 year high in 2024 (CPUE = 18.2 fish per gill net) resulting in one of the highest catch rates in the region. Relative abundance was well above the previous sample year (2022) and long term mean (CPUE = 2.5 and 8.7 fish per net, respectively). Netted fish ranged from 5.5 to 11.0 inches in length with approximately 34% measuring greater than 8 inches. A high mean relative weight score (Wr = 101) indicates sampled yellow perch were in good condition.

For more detailed results see the computer-generated South Dakota Statewide Fisheries Survey for Oak Lake (Brookings) (below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Oak, Brookings County
LQP-Lake-68-000
2024

Lake Information

Name:	Oak	**Maximum Depth:**	6 Feet
County:	Brookings	**Mean Depth:**	4 Feet
Legal Description:	T110N- R48W-Sec 1, 12, 13; T112N-R47W-Sec 7, 18	**OHWM Elevation:**	1,802
Surface Area:	394 Acres	**Outlet Elevation:**	1,802

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 25, 2024	6 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Saugeye

Black Bullhead

Northern Pike

Common Carp

Bigmouth Buffalo

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.
- s**td 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.

$$CPUE = \frac{number\ of\ fish}{effort}$$

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.

$$PSD = \left(\frac{number\ of\ fish \geq quality\ length}{number\ of\ fish \geq stock\ length}\right) \text{x } 100$$

$$PSD - P = \left(\frac{number\ of\ fish \geq preferred\ length}{number\ of\ fish \geq stock\ length}\right) \text{x } 100$$

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.

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

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).

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(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**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Bigmouth Buffalo	2	0.3	0.3	100		0			
	Black Bullhead	19	3.2	0.9	100		100			
	Common Carp	7	0.5	0.5	33		33			
	Northern Pike	3	0.5	0.3	67		0		90	6
	Saugeye	99	16.5	4.0	40	7	20	6	93	1
	Yellow Perch	109	18.2	3.9	34	6	3		101	1

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**

		CPUE										
Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
AFS std gill net	Bigmouth Buffalo			2.5		0.0		4.0	4.8		0.3	2.32
	Black Bullhead			18.2		6.0		12.3	13.0		3.2	10.54
	Common Carp			7.0		3.8		0.3	1.0		0.5	2.52
	Northern Pike			0.0		0.2		0.0	0.0		0.5	0.14
	Saugeye			0.0		1.2		20.3	9.5		16.5	9.50
	Walleye			11.3		0.0		0.5	1.0		0.0	2.56
	White Sucker			0.2		0.0		0.0	0.0		0.0	0.04
	Yellow Perch			10.8		6.2		5.8	2.5		18.2	8.70
std exp gill net	Bigmouth Buffalo	0.0	0.3									0.15
	Black Bullhead	79.3	37.3									58.30
	Common Carp	0.7	15.7									8.20
	Northern Pike	0.3	1.0									0.65
	Walleye	2.7	58.7									30.70
	Yellow Perch	55.3	92.7									74.00

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.

			Year									
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std gill net	Bigmouth Buffalo	PSD			33				6	21		100
		PSD-P			0				6	5		0
	Black Bullhead	PSD			53		64		29	38		100
		PSD-P			6		8		4	0		100
	Common Carp	PSD			95		100		100	100		33
		PSD-P			0		39		100	75		33
	Northern Pike	PSD					100					67
		PSD-P					0					0
		Wr					80					90
	Saugeye	PSD					86		95	21		40
		PSD-P					43		10	16		20
		Wr					97		98	94		93
	Walleye	PSD			44				100	50		
		PSD-P			10				100	25		
		Wr			90				82	94		
	Yellow Perch	PSD			38		68		39	90		34
		PSD-P			2		24		0	20		3
		Wr			100		99		84	93		101
std exp gill net	Bigmouth Buffalo	PSD		100								
		PSD-P		0								
	Black Bullhead	PSD	78	54								
		PSD-P	0	4								
	Common Carp	PSD	0	0								
		PSD-P	0	0								
	Northern Pike	PSD	100	67								
		PSD-P	0	0								
		Wr	88	82								
	Walleye	PSD	100	5								
		PSD-P	0	0								
		Wr	98	91								
	Yellow Perch	PSD	17	41								
		PSD-P	0	1								

			Year									
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
std exp gill net	Yellow Perch	Wr	104	97								

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+
2024	98	341 (75)		477 (23)			593 (1)				
2022	54	244 (46)		466 (8)							
2021	81	332 (5)	420 (66)	494 (9)	457 (1)						
2019	7		370 (4)	461 (1)	532 (2)						

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2022	4		371 (3)					611 (1)			
2021	2						555 (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+
2019	37	166 (11)	217 (15)	246 (4)	262 (7)						

Fish Condition

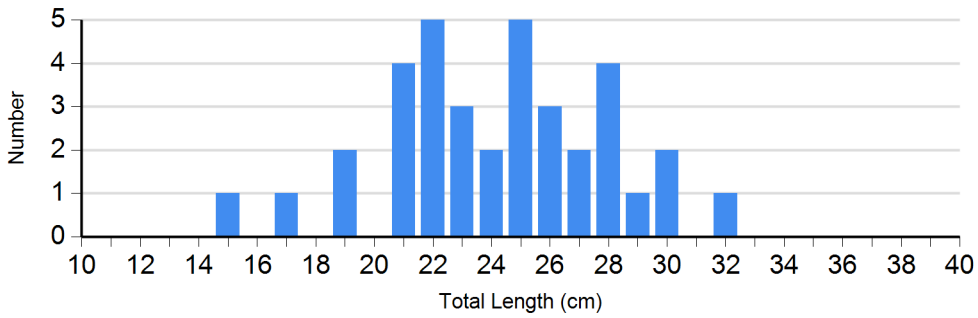
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2024	1	99	2	86 (1.2)	0		0	
Saugeye Gill Net	2021	4	105 (5.5)	69	97 (1.1)	8	99 (2.7)	0	
	2022	30	96 (1.0)	2	92 (1.5)	6	88 (1.0)	0	
	2024	59	91 (0.8)	20	94 (1.7)	18	94 (1.9)	2	95 (2.3)
Walleye Gill Net	2021	0		0		2	82 (4.2)	0	
	2022	2	97 (1.7)	1	86	1	94	0	
Yellow Perch Gill Net	2021	14	83 (1.5)	9	85 (2.3)	0		0	
	2022	1	110	7	93 (1.0)	2	85 (3.9)	0	
	2024	72	102 (1.0)	34	96 (1.4)	3	103	0	

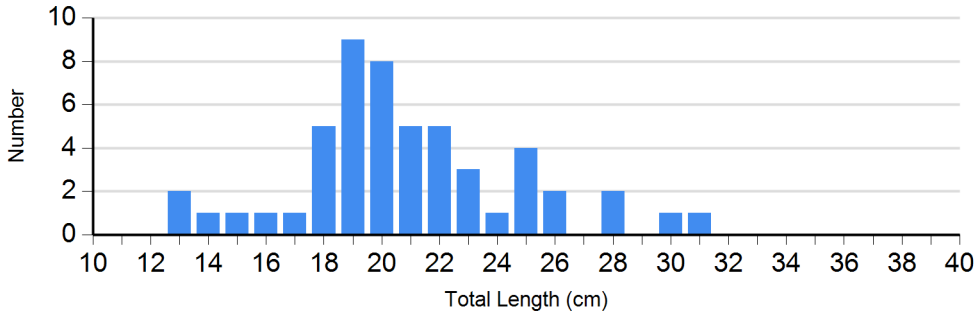
Length Frequency Distribution

Length frequency histogram of species sampled by year.

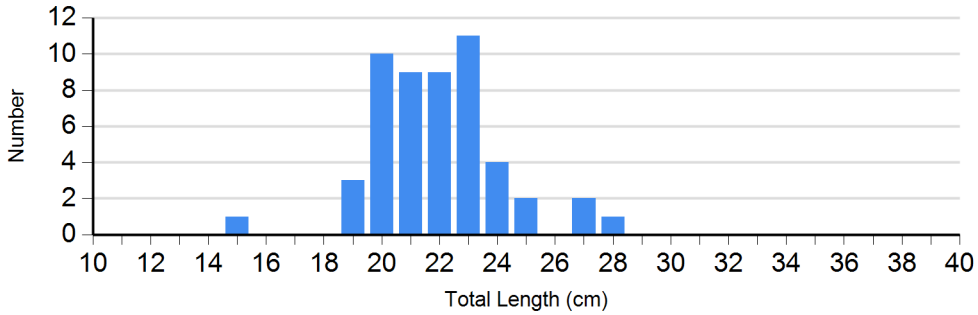
Species: Black Bullhead
Gear: AFS std gill net



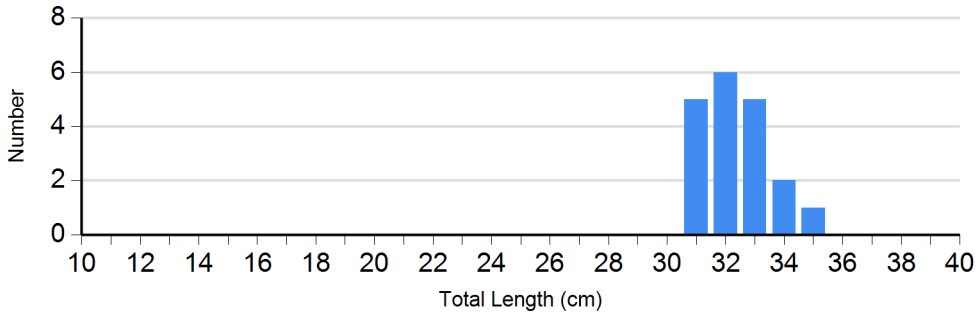
2019



2021

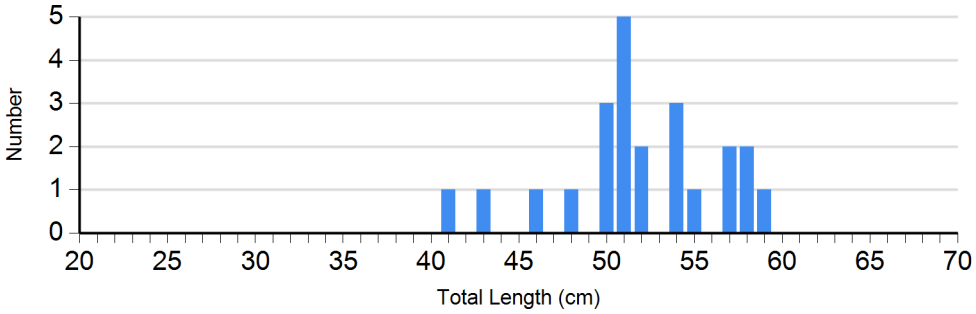


2022



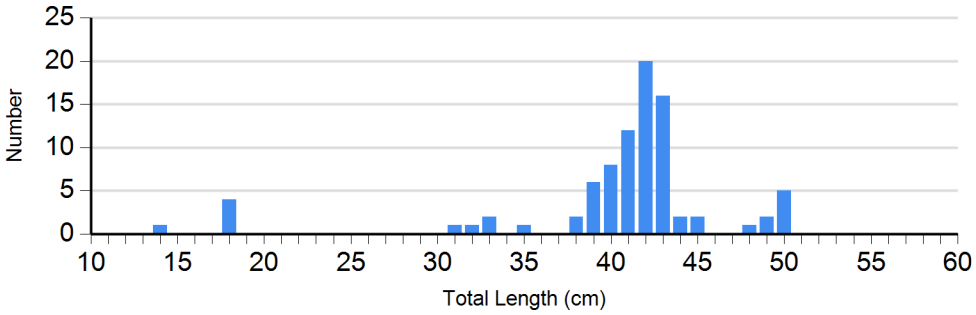
2024

Species: Common Carp
Gear: AFS std gill net

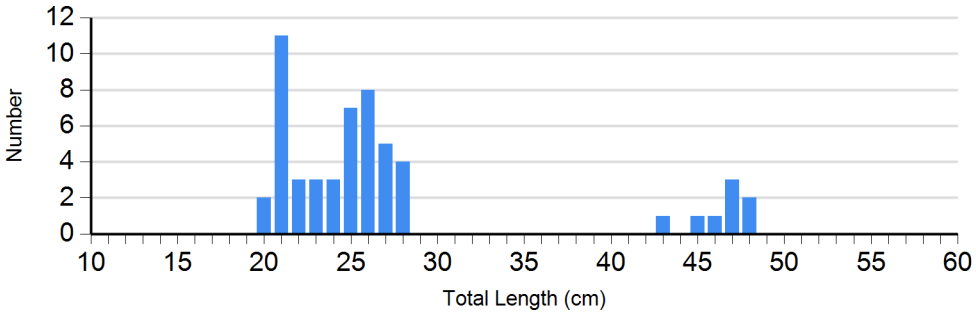


2019

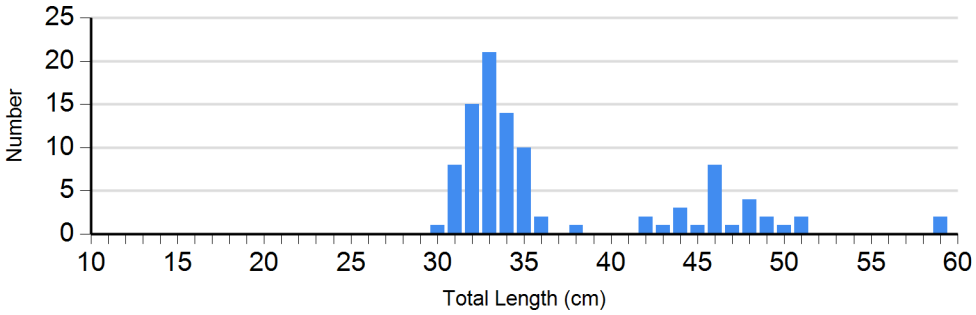
Species: Saugeye
Gear: AFS std gill net



2021

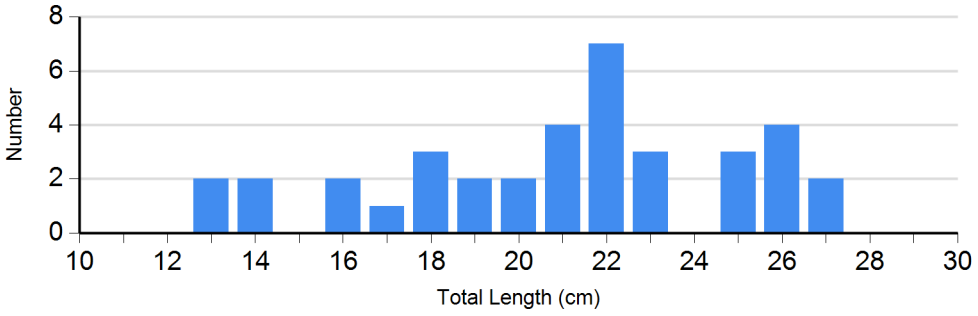


2022

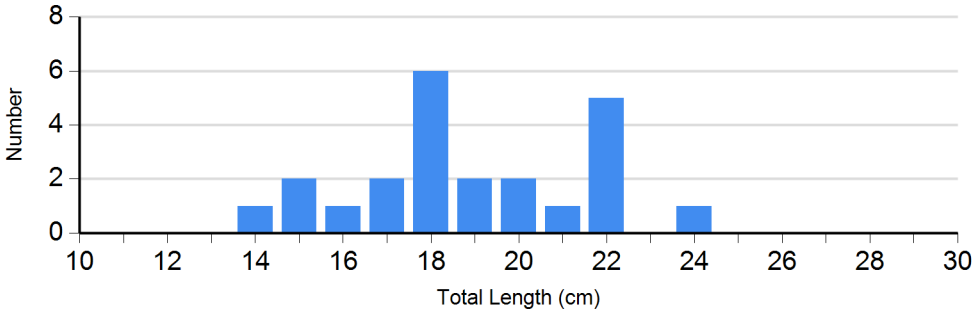


2024

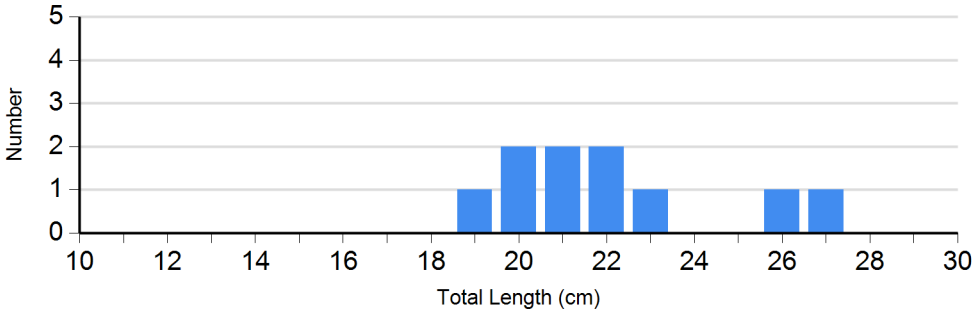
Species: Yellow Perch
Gear: AFS std gill net



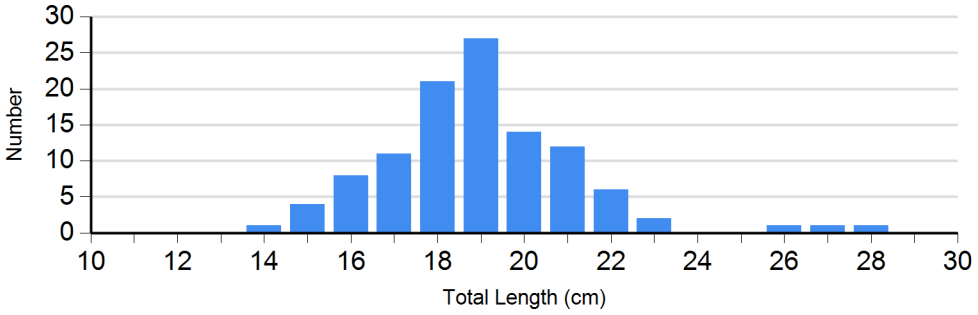
2019



2021



2022

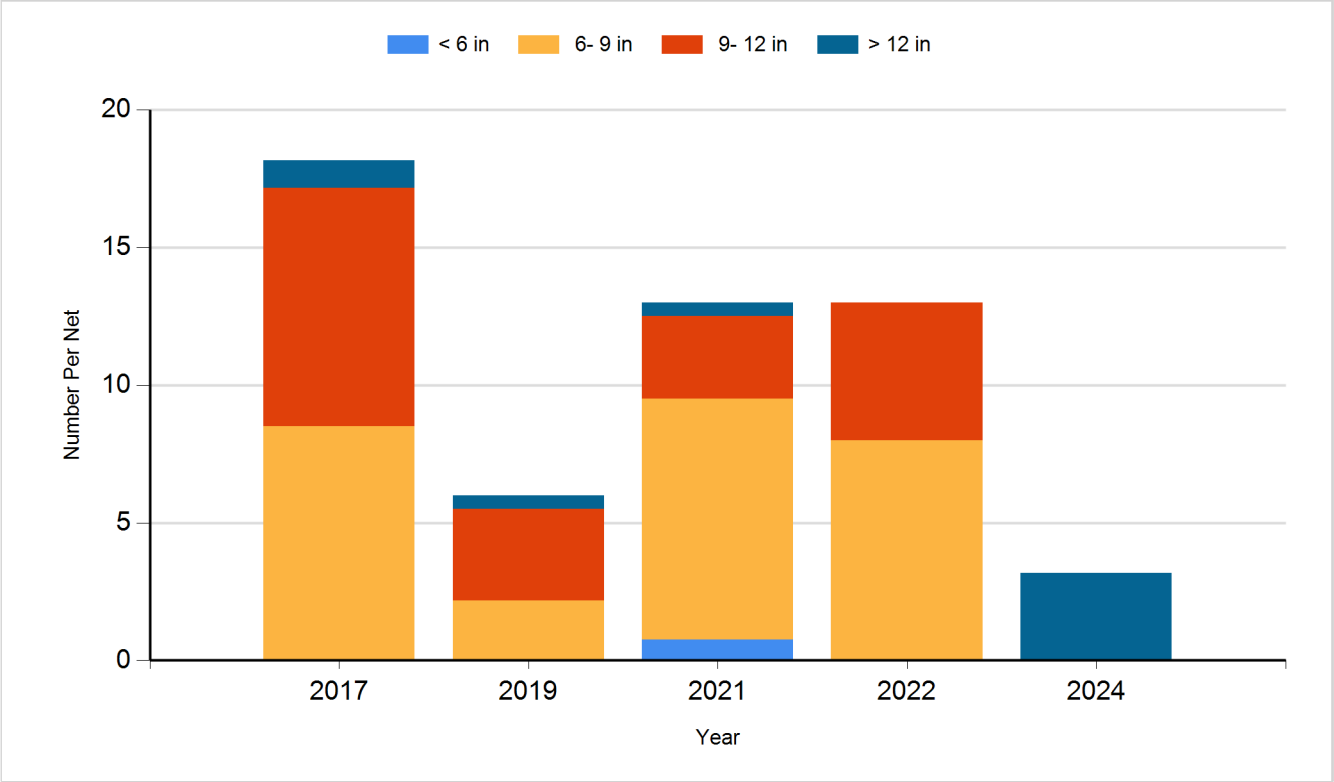


2024

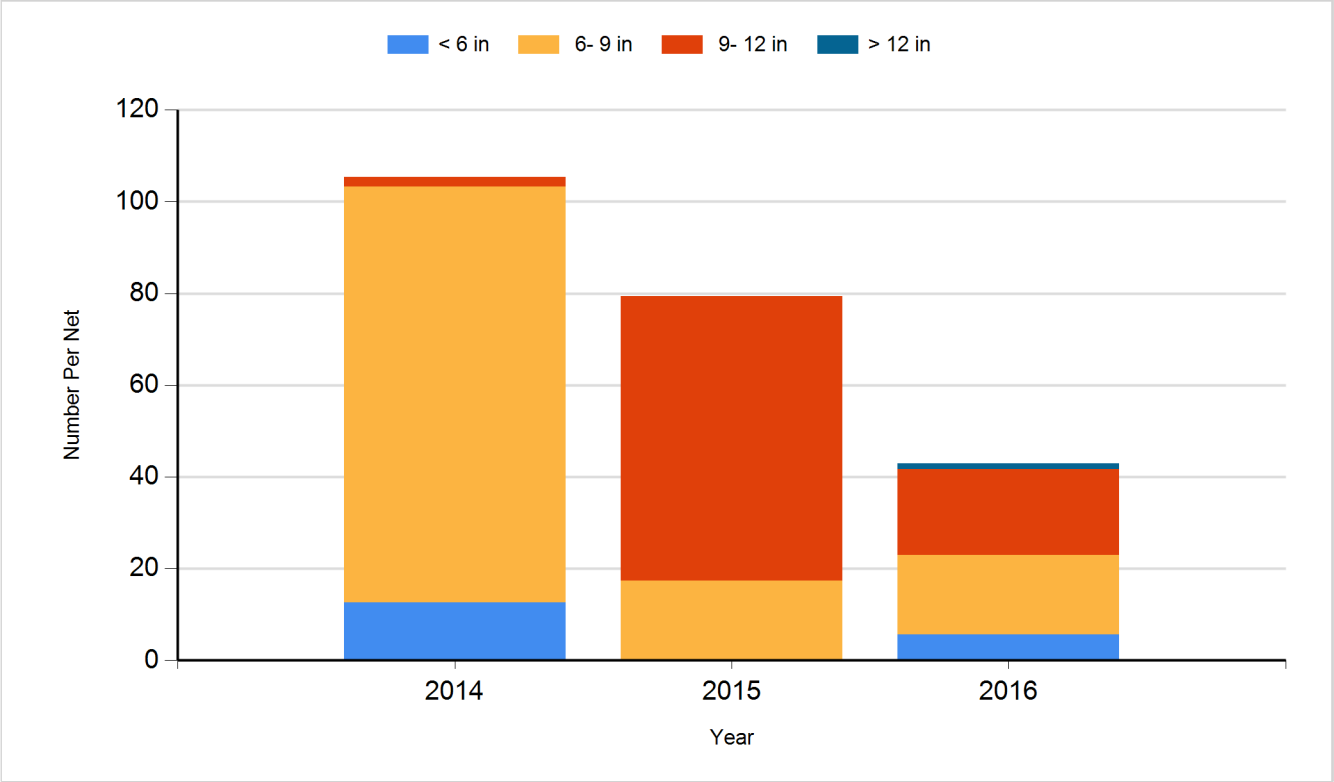
Historic Fish Sizes and Relative Abundance

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

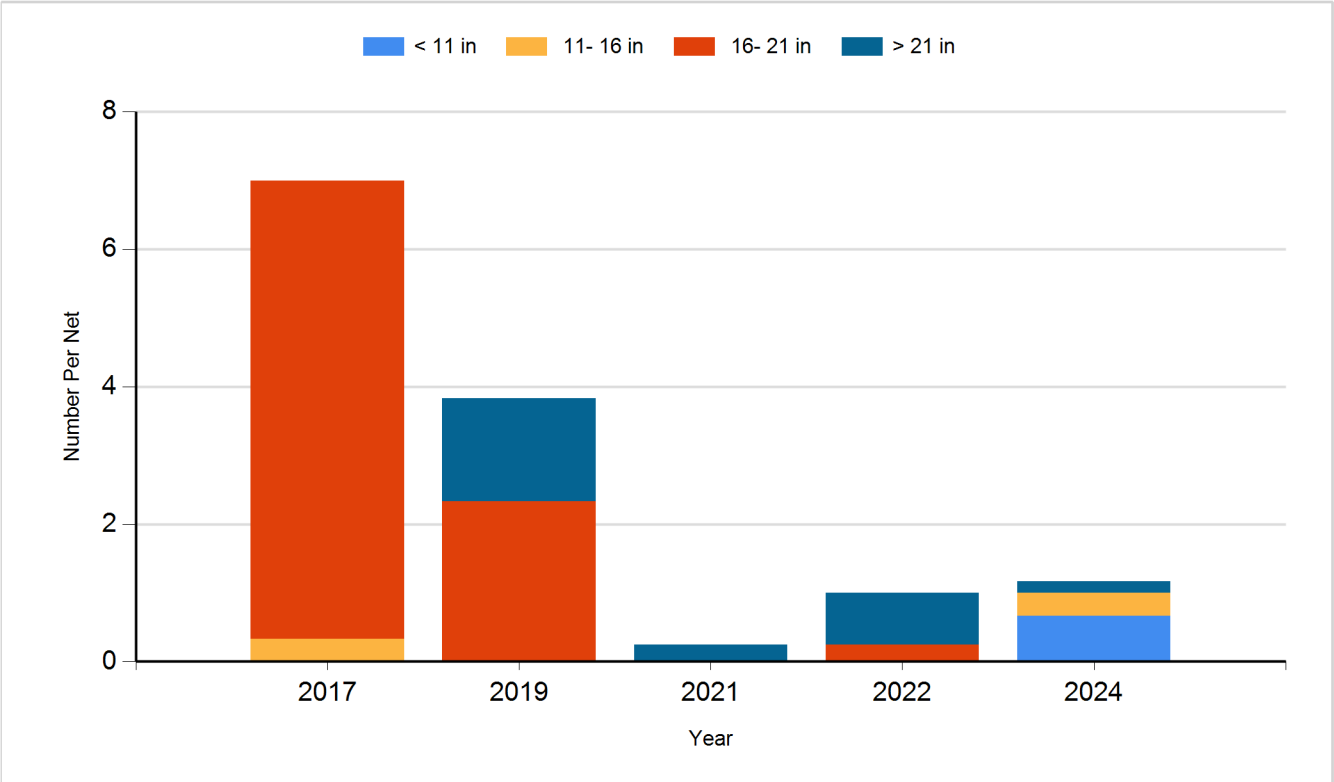
Species: Black Bullhead
Gear: AFS std gill net



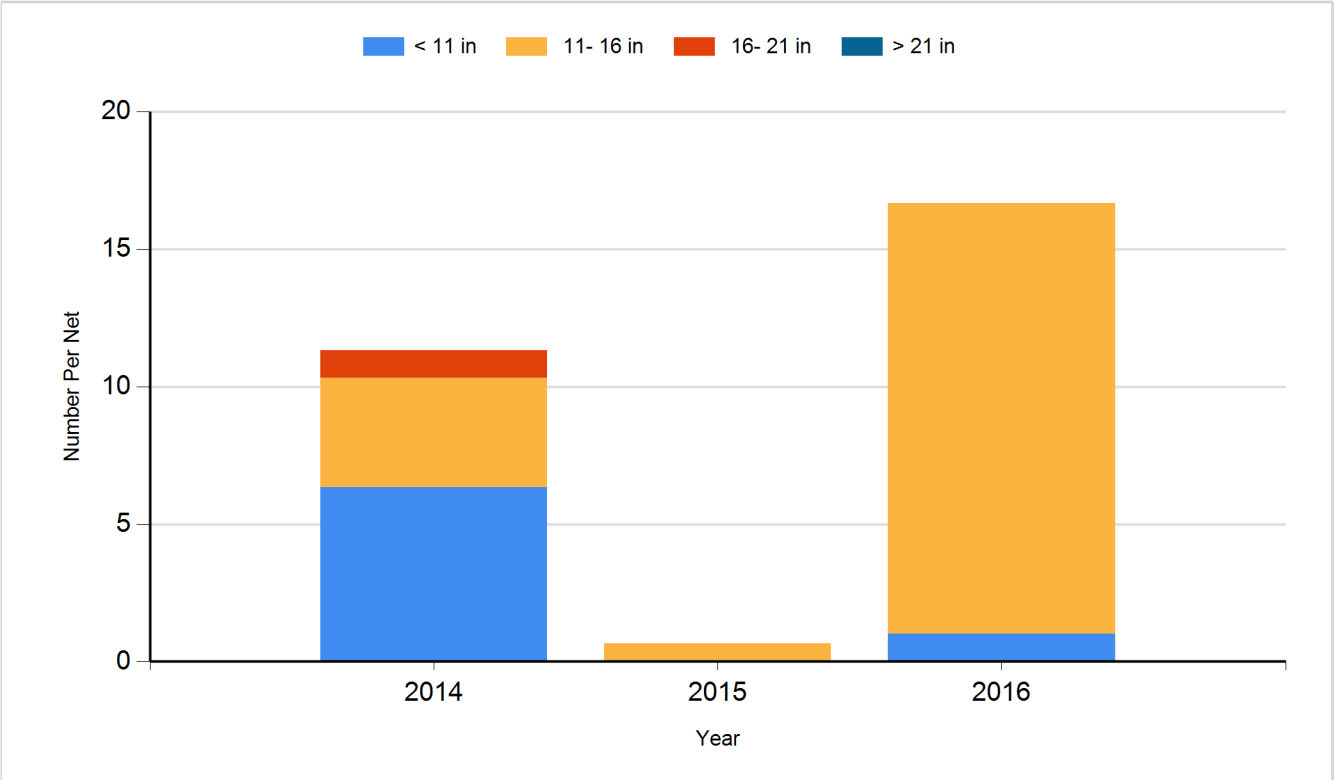
Species: Black Bullhead
Gear: std exp gill net



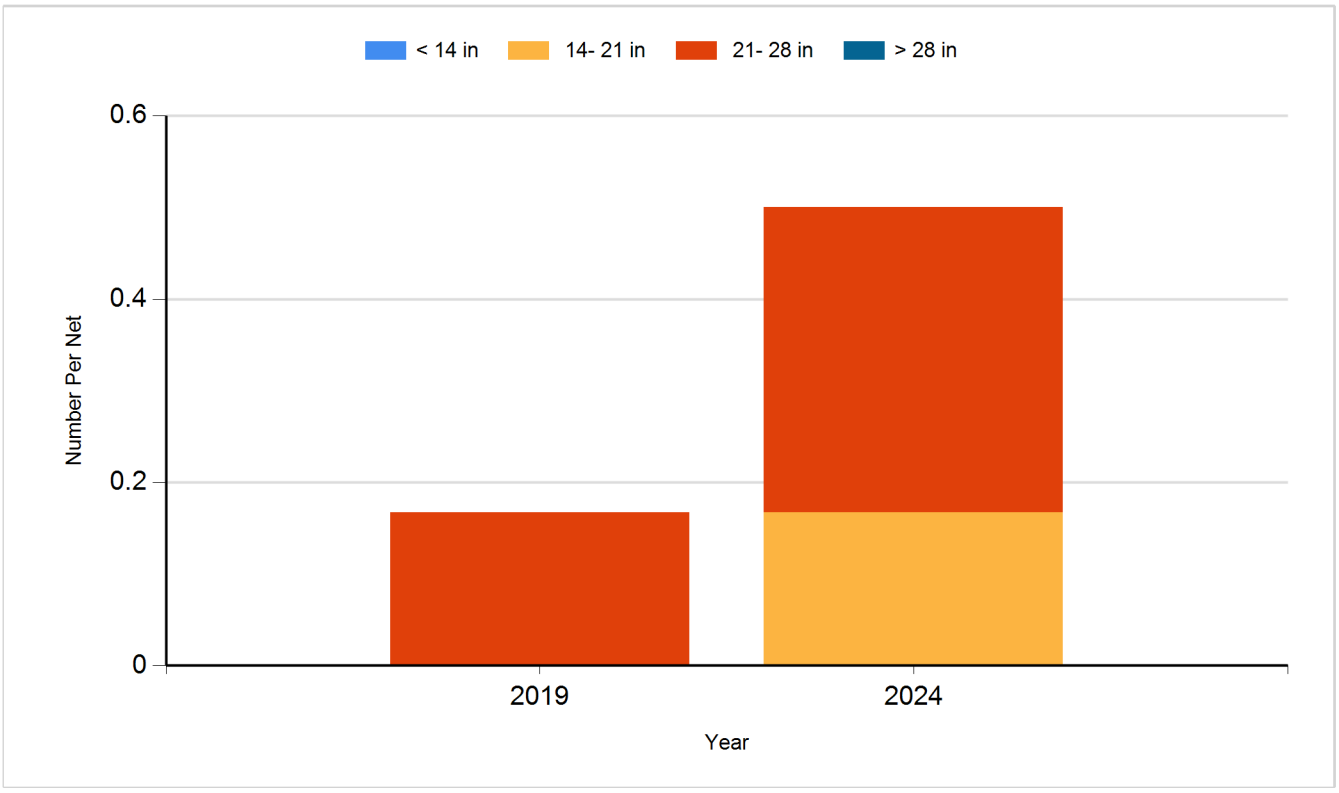
Species: Common Carp
Gear: AFS std gill net



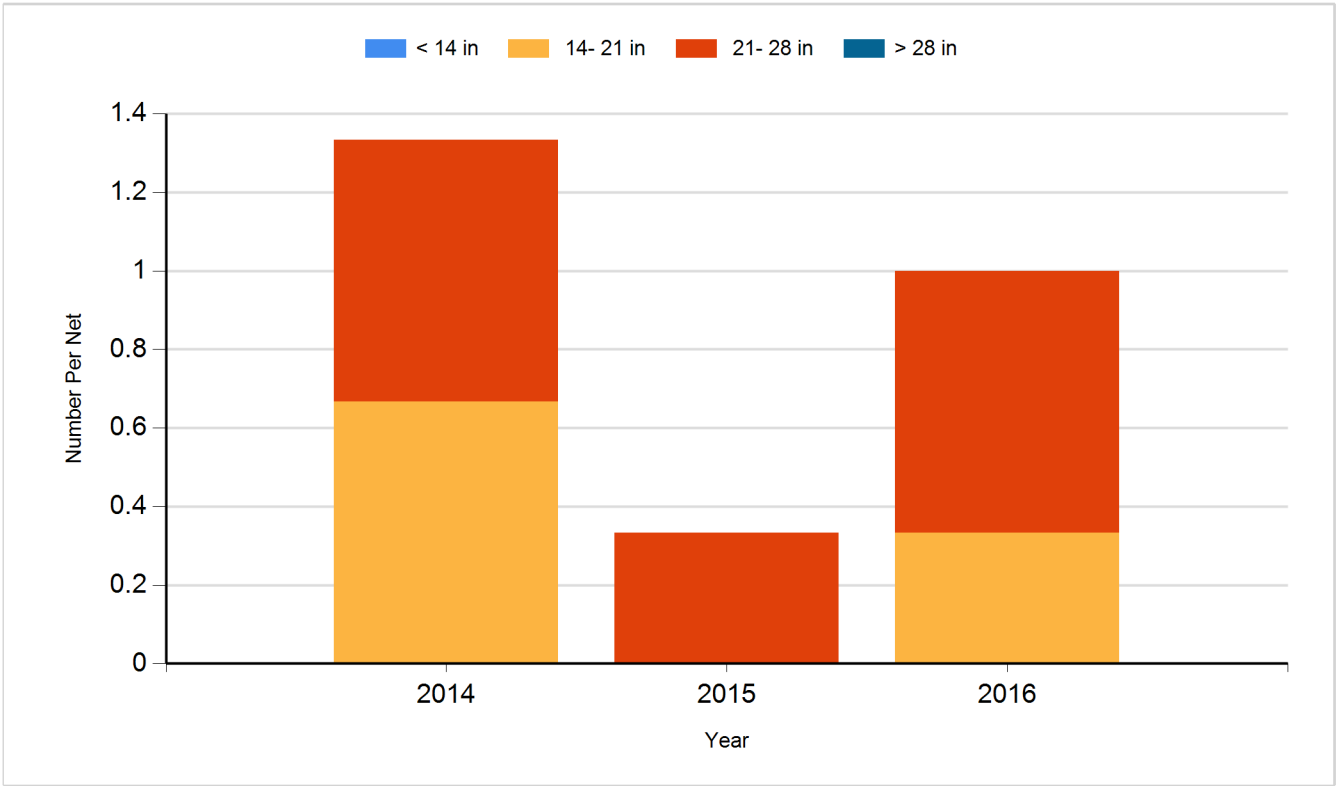
Species: Common Carp
Gear: std exp gill net



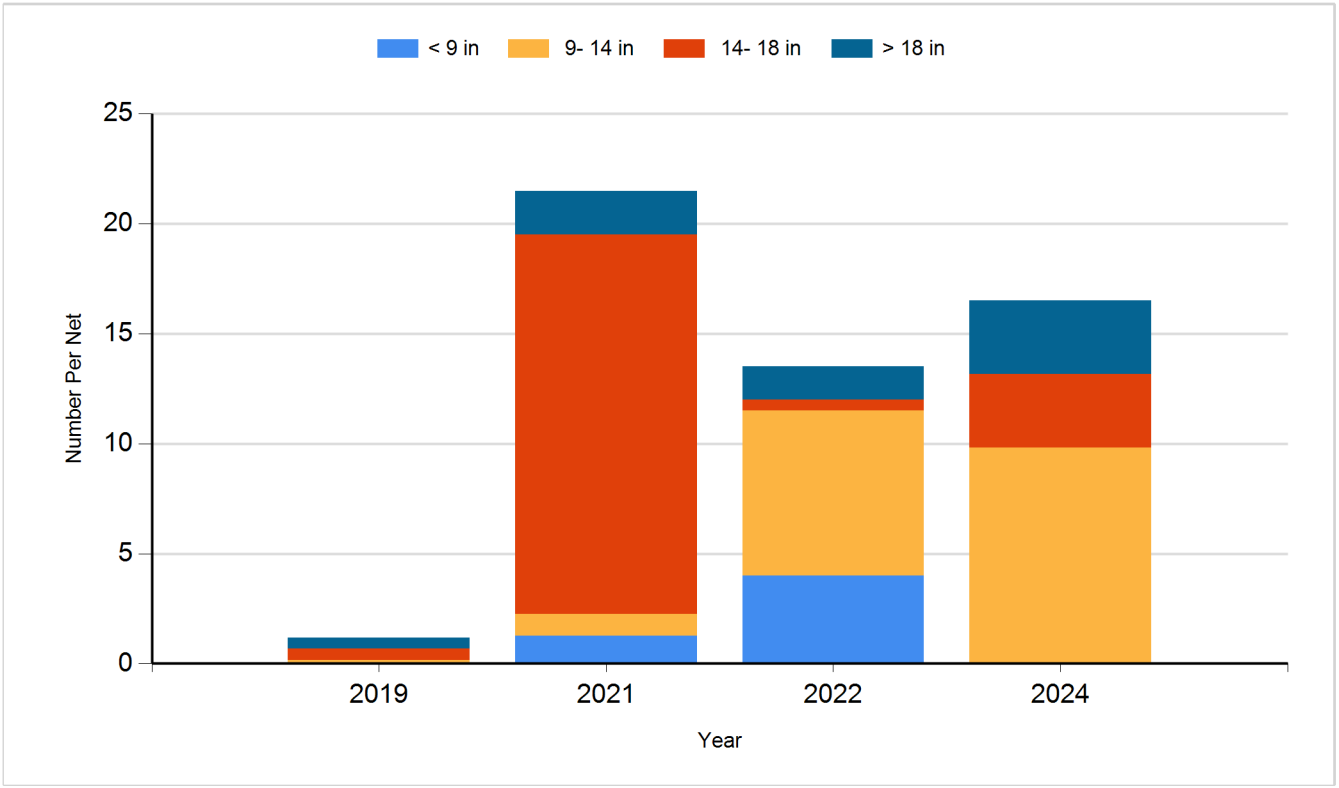
Species: Northern Pike
Gear: AFS std gill net



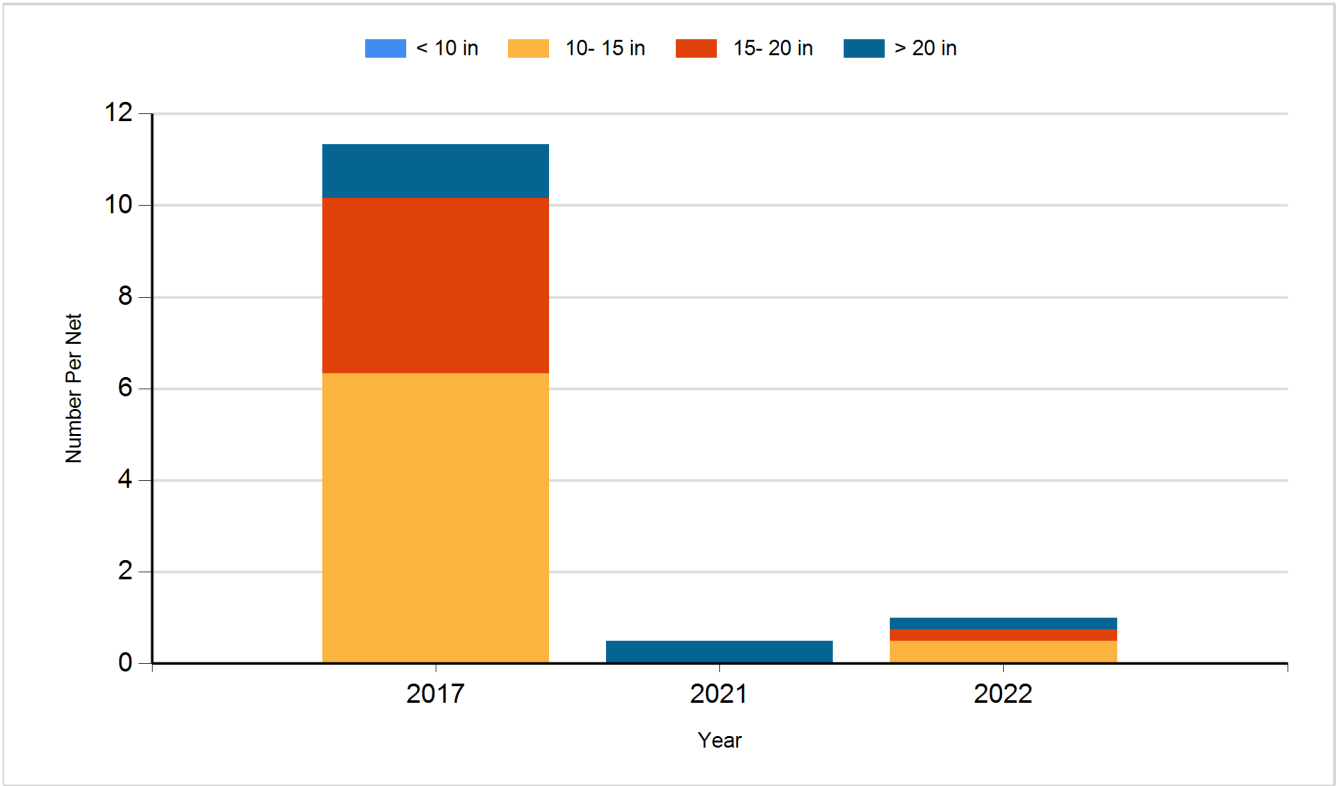
Species: Northern Pike
Gear: std exp gill net



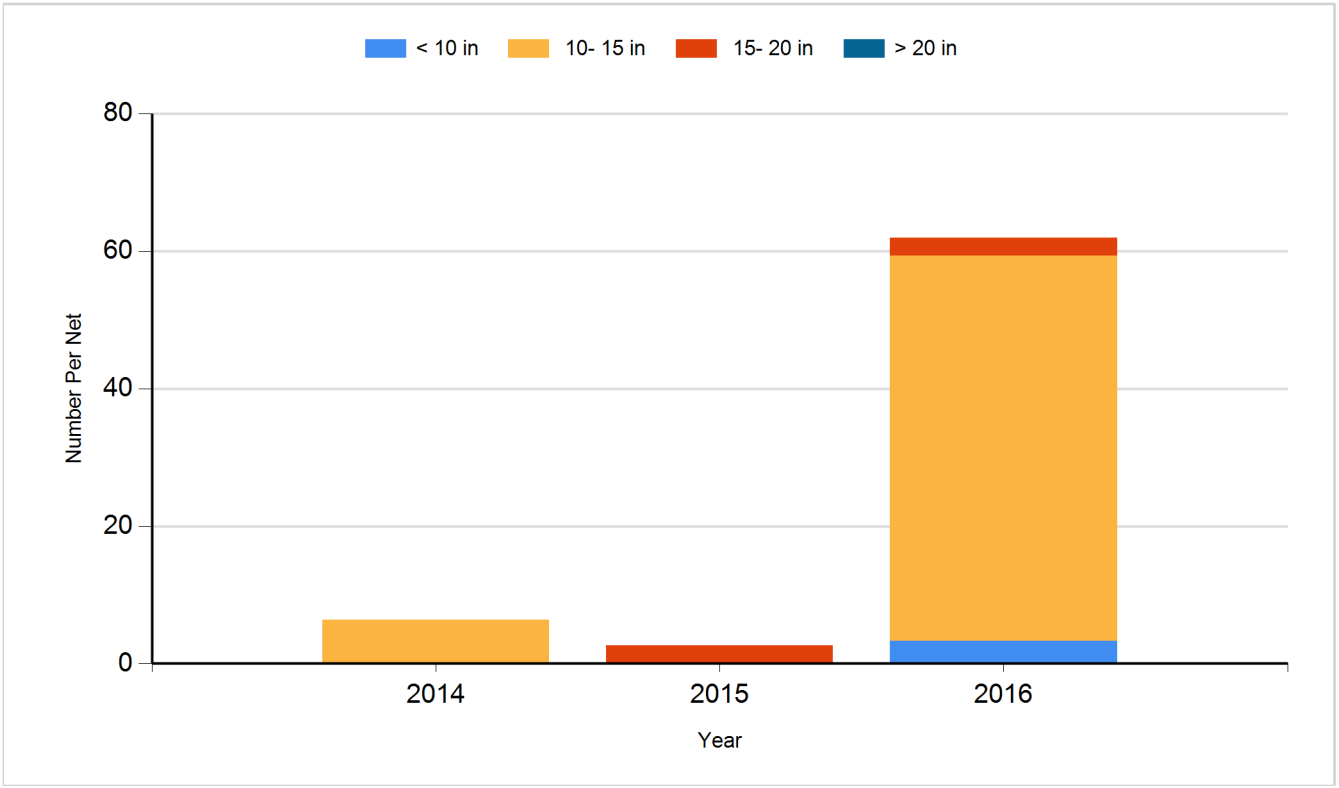
Species: Saugeye
Gear: AFS std gill net



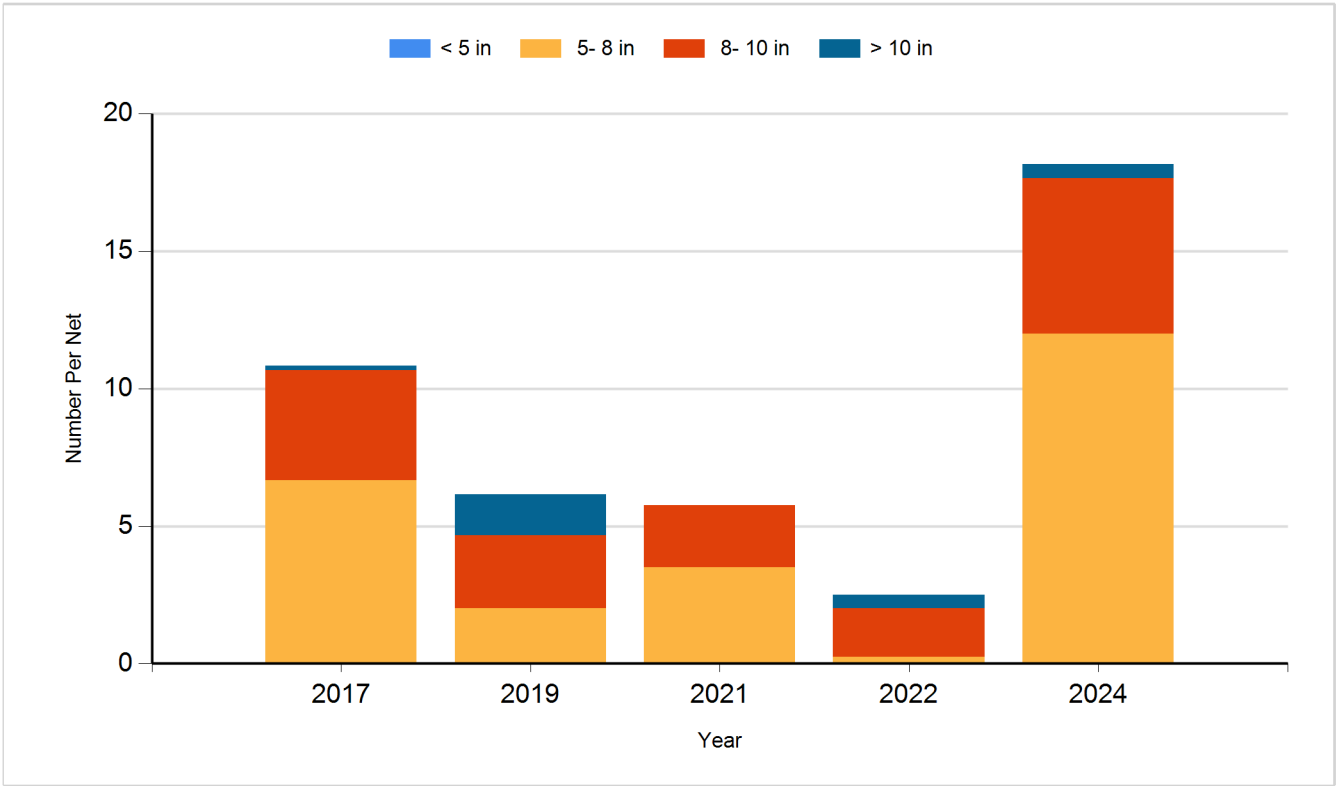
Species: Walleye
Gear: AFS std gill net



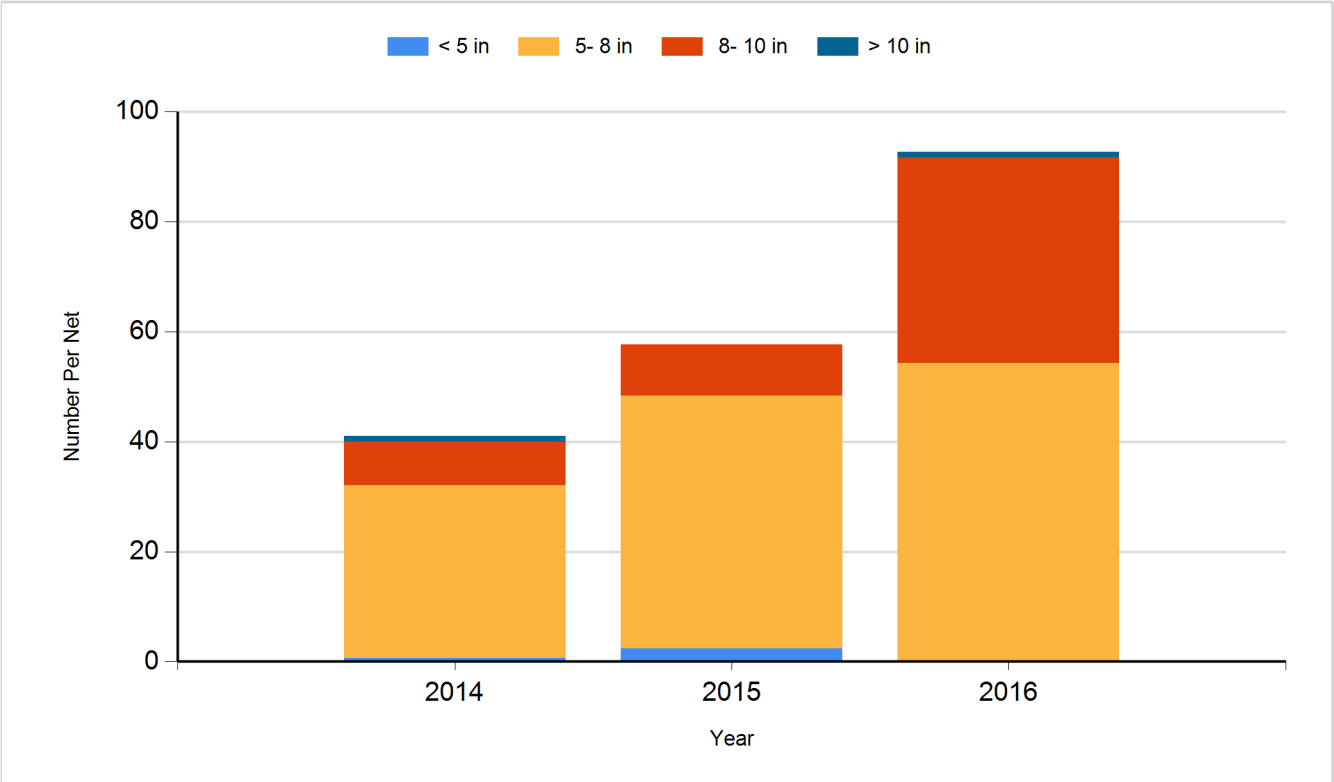
Species: Walleye
Gear: std exp gill net



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
2013	Walleye	Small Fingerling	39,930
2013	Yellow Perch	Fry	1,440,000
2013	Yellow Perch	Small Fingerling	5,170
2014	Walleye	Fry	400,000
2014	Yellow Perch	Small Fingerling	5,700
2015	Walleye	Small Fingerling	28,160
2016	Saugeye	Small Fingerling	28,000
2018	Saugeye	Small Fingerling	27,400
2019	Saugeye	Small Fingerling	28,000
2021	Saugeye	Fry	400,000
2021	Saugeye	Juvenile	35,670
2023	Saugeye	Fry	350,000