SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Norden, Hamlin County
MBS-Lake-176-001
2022

Lake Information

Name: Norden

County: Hamlin

Surface Area: 733 Acres

Maximum Depth: 8 Feet

Mean Depth: 6 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 23, 2022	6 net-nights
AFS std gill net	Aug 24, 2022	6 net-nights

Common Fish Species Present

Walleye

Northern Pike

Yellow Perch

White Sucker

Bigmouth Buffalo

Channel Catfish

Black Bullhead

Common Carp

White Bass

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	15	1.0	0.9	100		58	24	93	3
	Black Bullhead	9	0.8	0.3	100		67		99	13
	Channel Catfish	11	0.9	0.5	100		100		110	4
	Common Carp	3	0.3	0.2	100		100		93	3
	Northern Pike	46	3.8	0.8	85	8	9		76	4
	Walleye	58	4.3	0.9	73	9	10	7	90	1
	White Bass	1	0.0	0.0	0		0			
	White Sucker	14	1.2	0.8	100		93		108	7
	Yellow Perch	312	26.0	5.0	93	2	32	4	107	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	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg
AFS std gill net	Bigmouth Buffalo					5.5					1.0	3.25
	Black Bullhead					0.1					0.8	0.45
	Channel Catfish					0.0					0.9	0.45
	Common Carp					9.9					0.3	5.10
	Northern Pike					2.8					3.8	3.30
	Walleye					4.6					4.3	4.45
	White Bass					0.0					0.0	0.00
	White Sucker					2.1					1.2	1.65
	Yellow Perch					4.4					26.0	15.20

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	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AFS std gill net	Bigmouth Buffalo	PSD					74					100
		PSD-P					2					58
		Wr					96					93
	Black Bullhead	PSD					100					100
		PSD-P					100					67
		Wr					92					99
	Channel Catfish	PSD										100
		PSD-P										100
		Wr										110
	Common Carp	PSD					27					100
		PSD-P					6					100
		Wr					103					93
	Northern Pike	PSD					100					85
		PSD-P					6					9
		Wr					84					76
	Walleye	PSD					15					73
		PSD-P					5					10
		Wr					97					90
	White Bass	PSD										0
		PSD-P										0
	White Sucker	PSD					100					100
		PSD-P					96					93
		Wr					109					108
	Yellow Perch	PSD					64					93
		PSD-P					36					32
		Wr					107					107

Length at Capture

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

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2022	58	254 (20)		446 (33)	545 (1)	577 (3)	633 (1)				
2017	57	220 (2)	312 (1)	357 (51)		555 (1)	555 (1)	600 (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+
2022	312	173 (9)	220 (188)	264 (81)	290 (11)	305 (13)	330 (2)	332 (8)			
2017	53	137 (10)	209 (26)		289 (15)	320 (1)			341 (1)		

Fish Condition

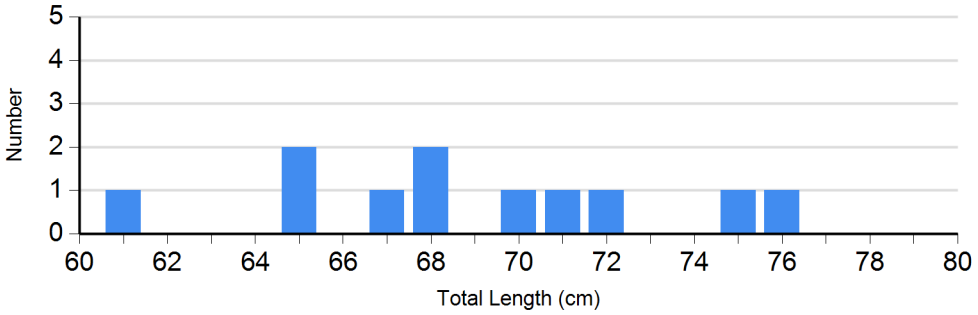
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2022	0		3	121 (27.9)	6	87 (4.2)	0	
Channel Catfish Gill Net	2022	0		0		7	107 (3.0)	4	121
Common Carp Gill Net	2022	0		0		1	97	2	91 (1.7)
Northern Pike Gill Net	2022	7	93 (20.4)	35	73 (1.3)	4	71 (3.2)	0	
Walleye Gill Net	2022	14	89 (1.0)	32	90 (0.9)	4	89 (2.4)	1	88
White Bass Gill Net	2022	0		0		0		0	
White Sucker Gill Net	2022	0		1	112	7	117 (3.5)	6	97 (10.3)
Yellow Perch Gill Net	2022	22	116 (1.5)	189	109 (0.6)	79	104 (0.9)	22	96 (1.3)

Length Frequency Distribution

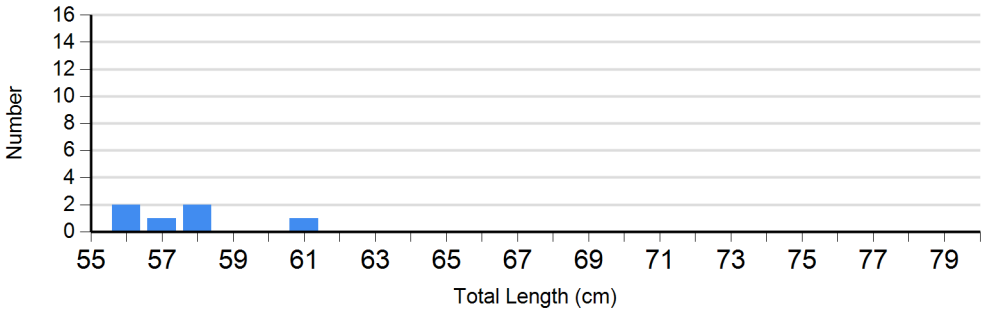
Length frequency histogram of species sampled by year.

Species: Channel Catfish
Gear: AFS std gill net



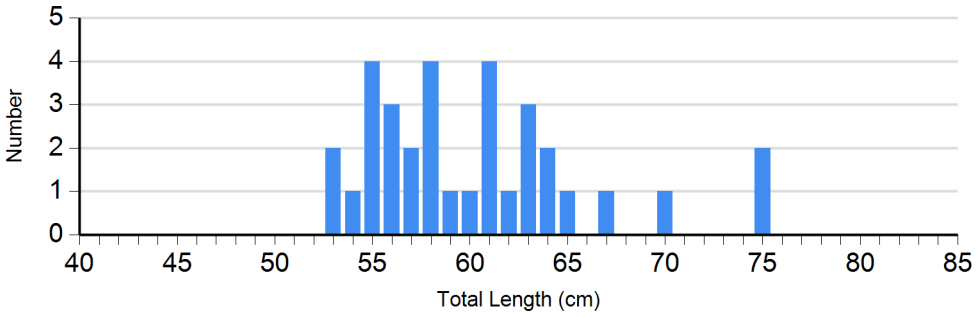
2022

Species: Common Carp
Gear: AFS std gill net

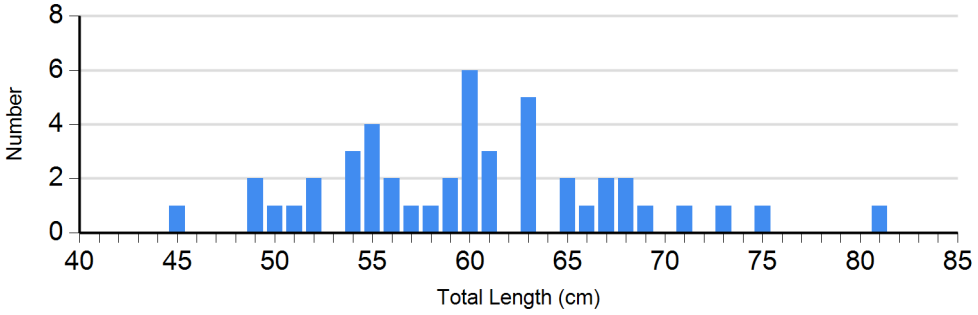


2017

Species: Northern Pike
Gear: AFS std gill net

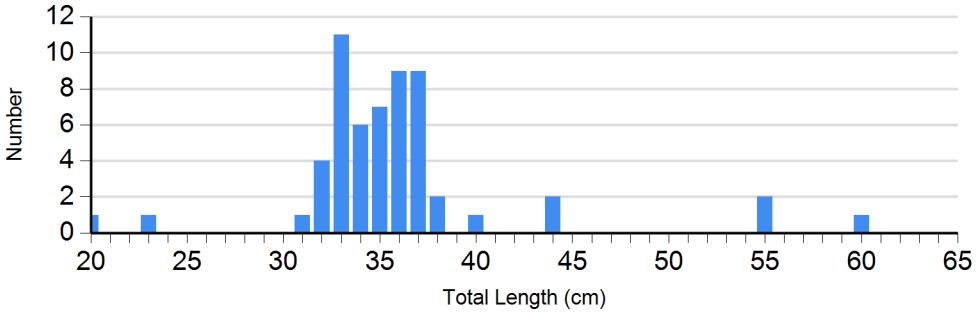


2017

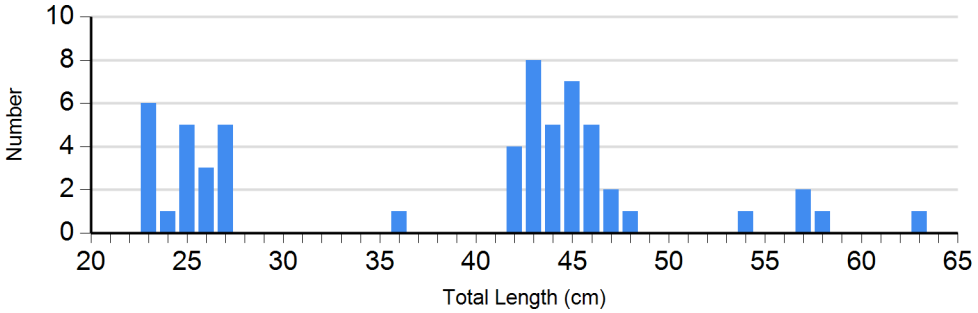


2022

Species: Walleye
Gear: AFS std gill net

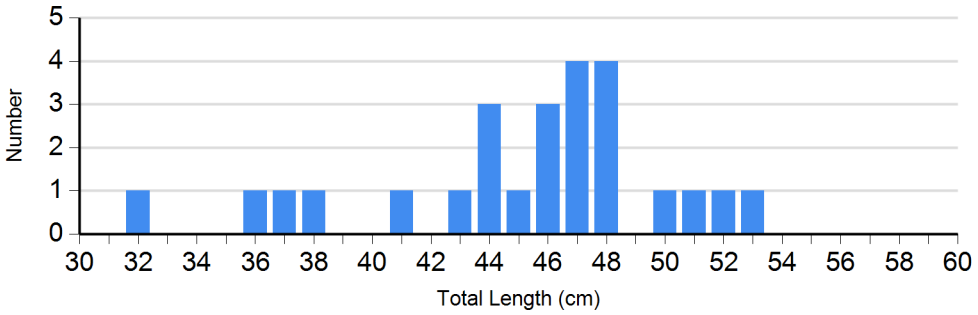


2017

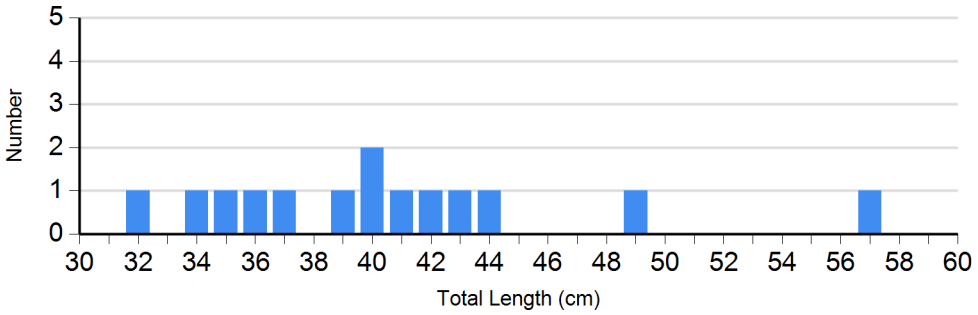


2022

Species: White Sucker
Gear: AFS std gill net

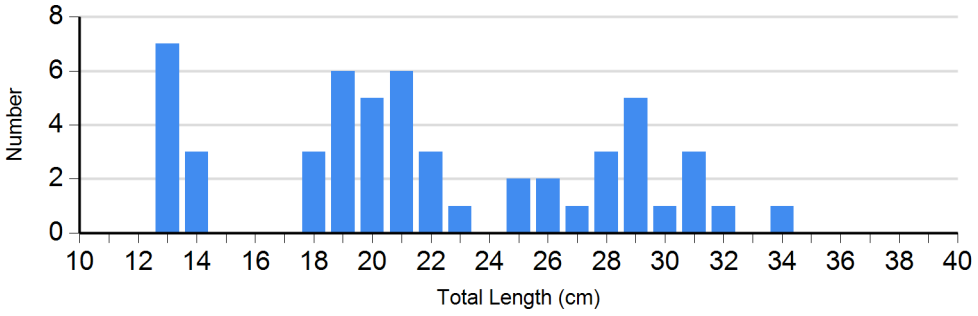


2017

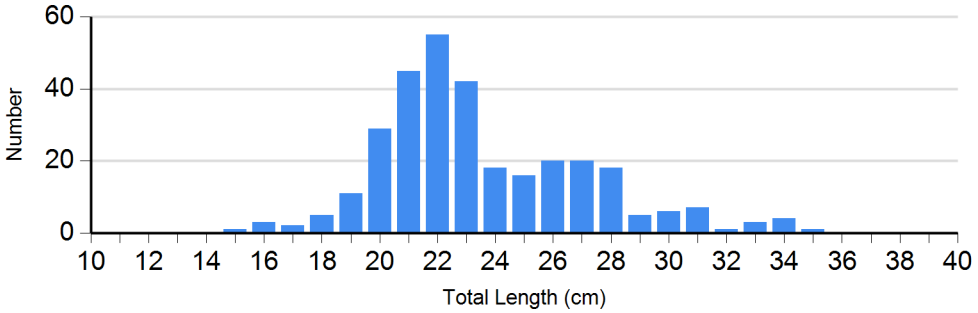


2022

Species: Yellow Perch
Gear: AFS std gill net



2017

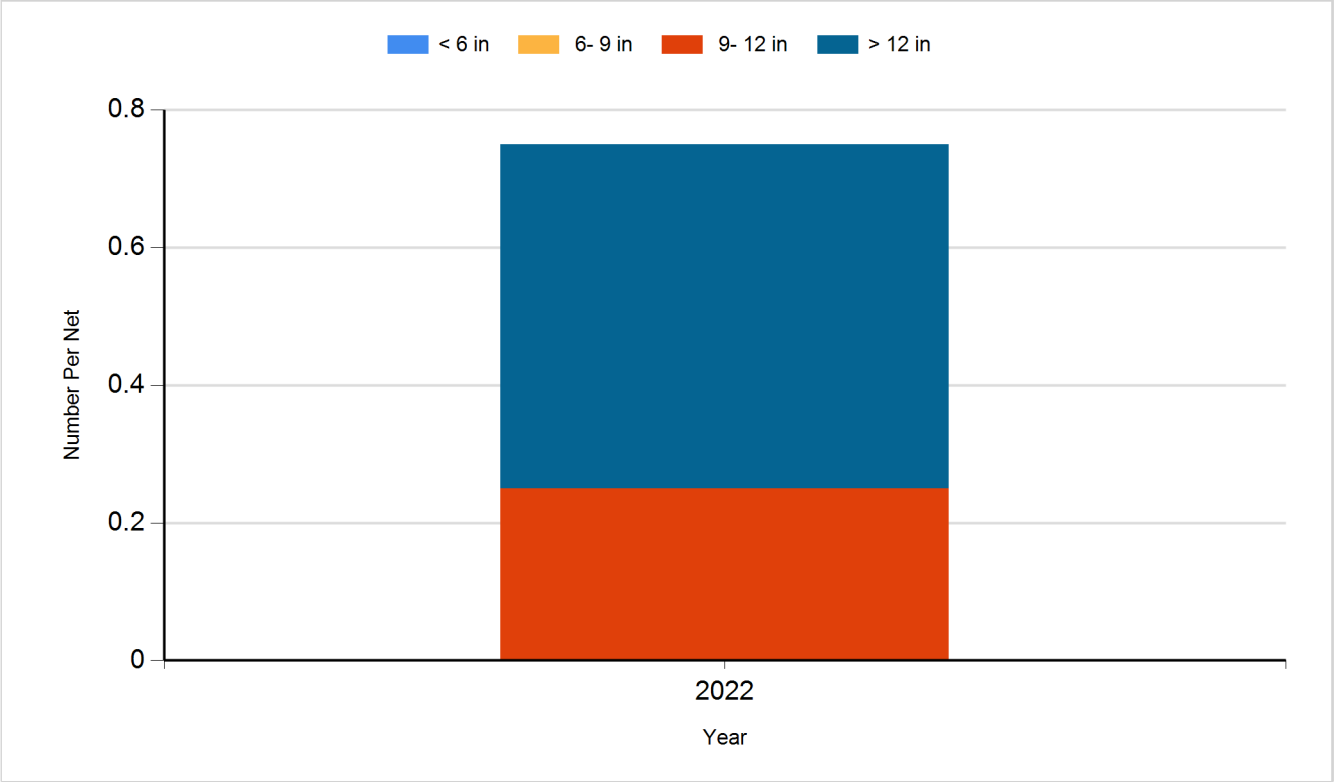


2022

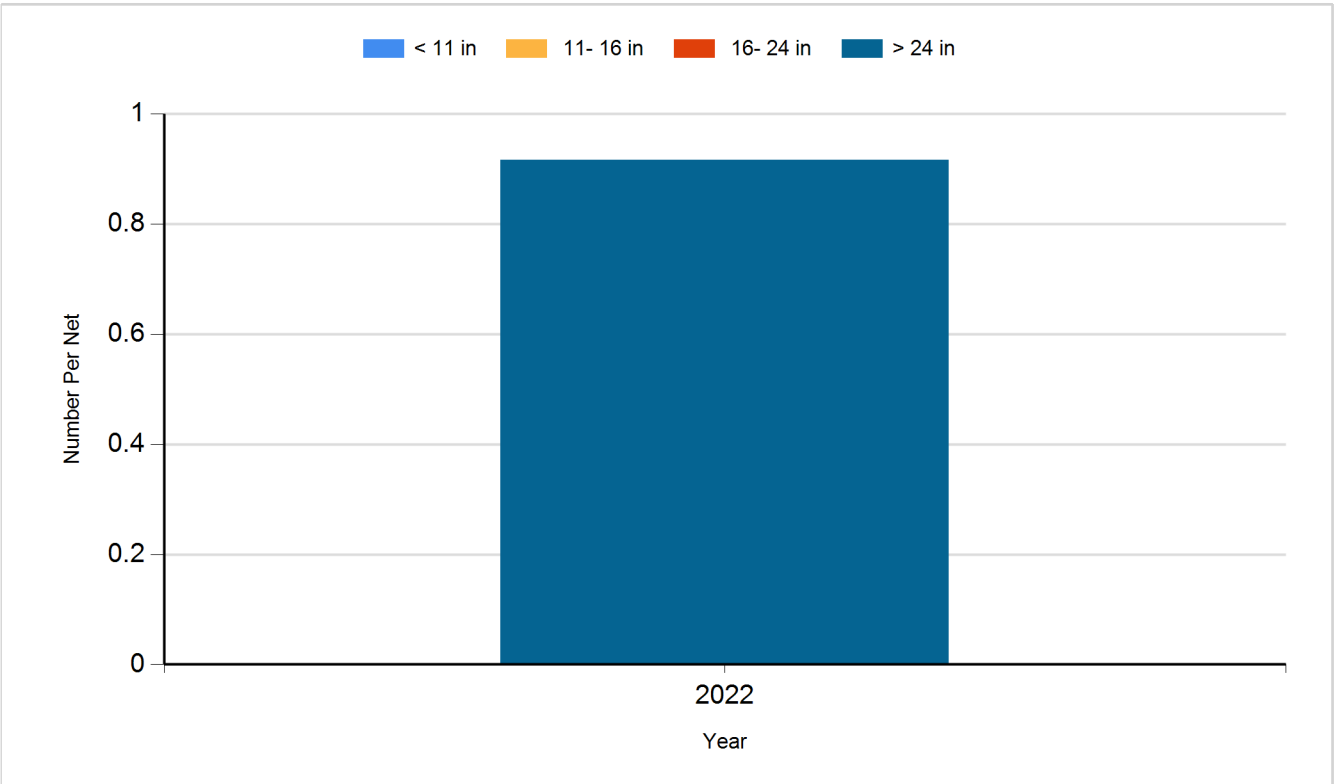
Historic Fish Sizes and Relative Abundance

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

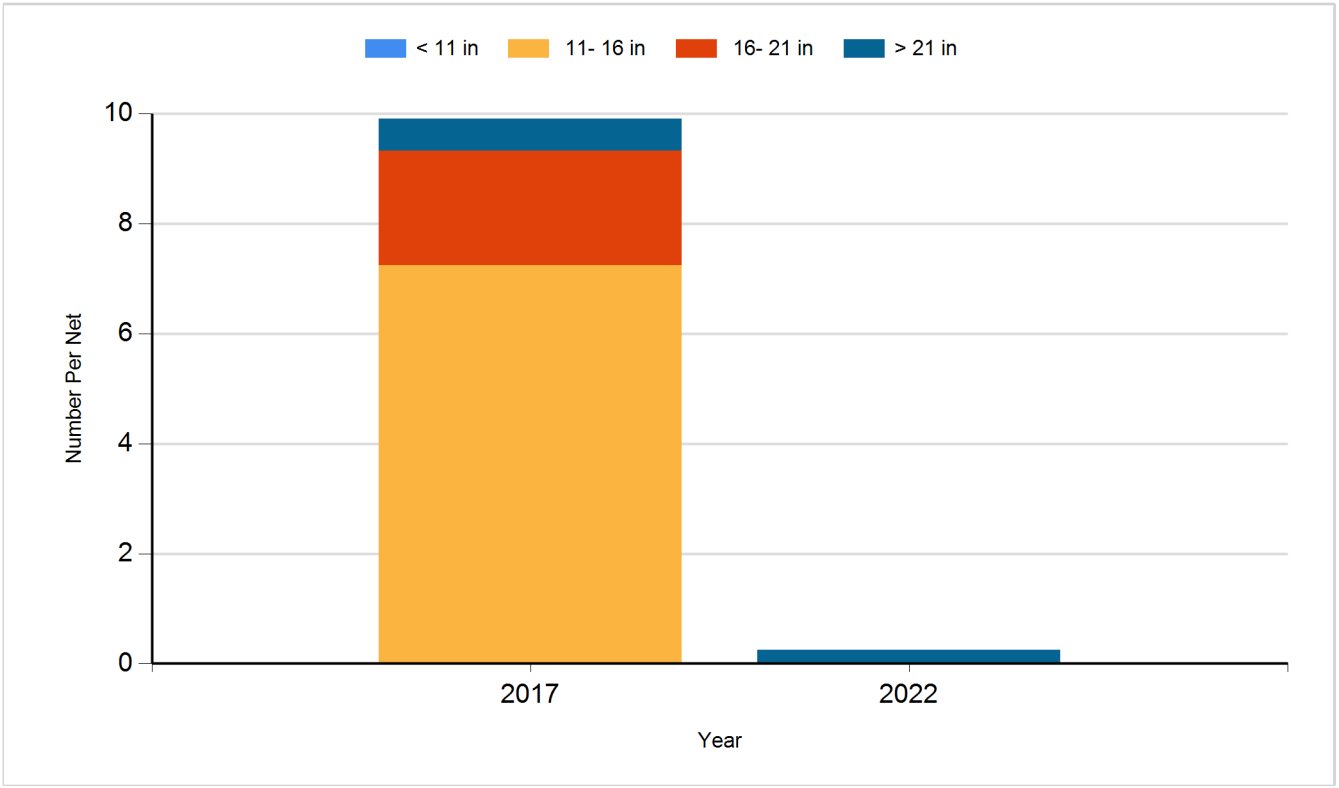
Species: Black Bullhead
Gear: AFS std gill net



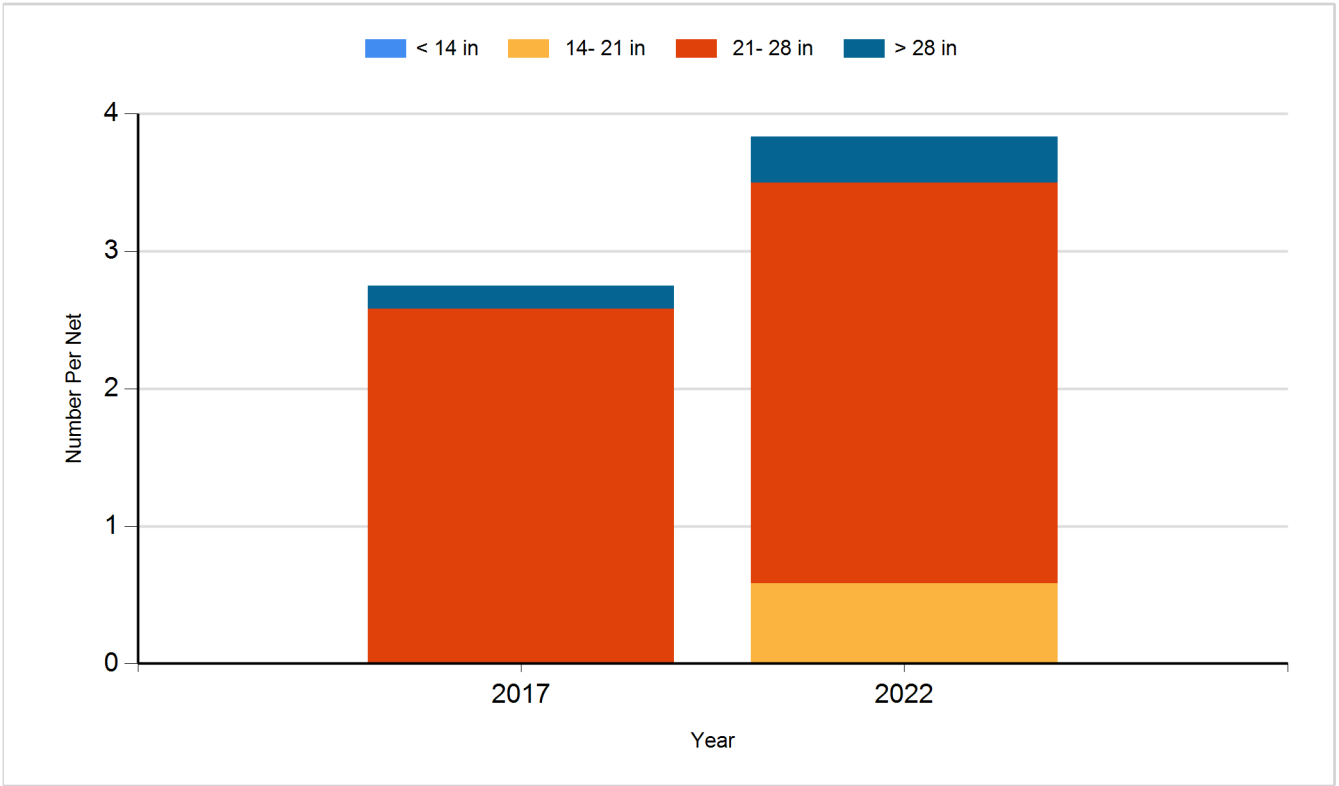
Species: Channel Catfish
Gear: AFS std gill net



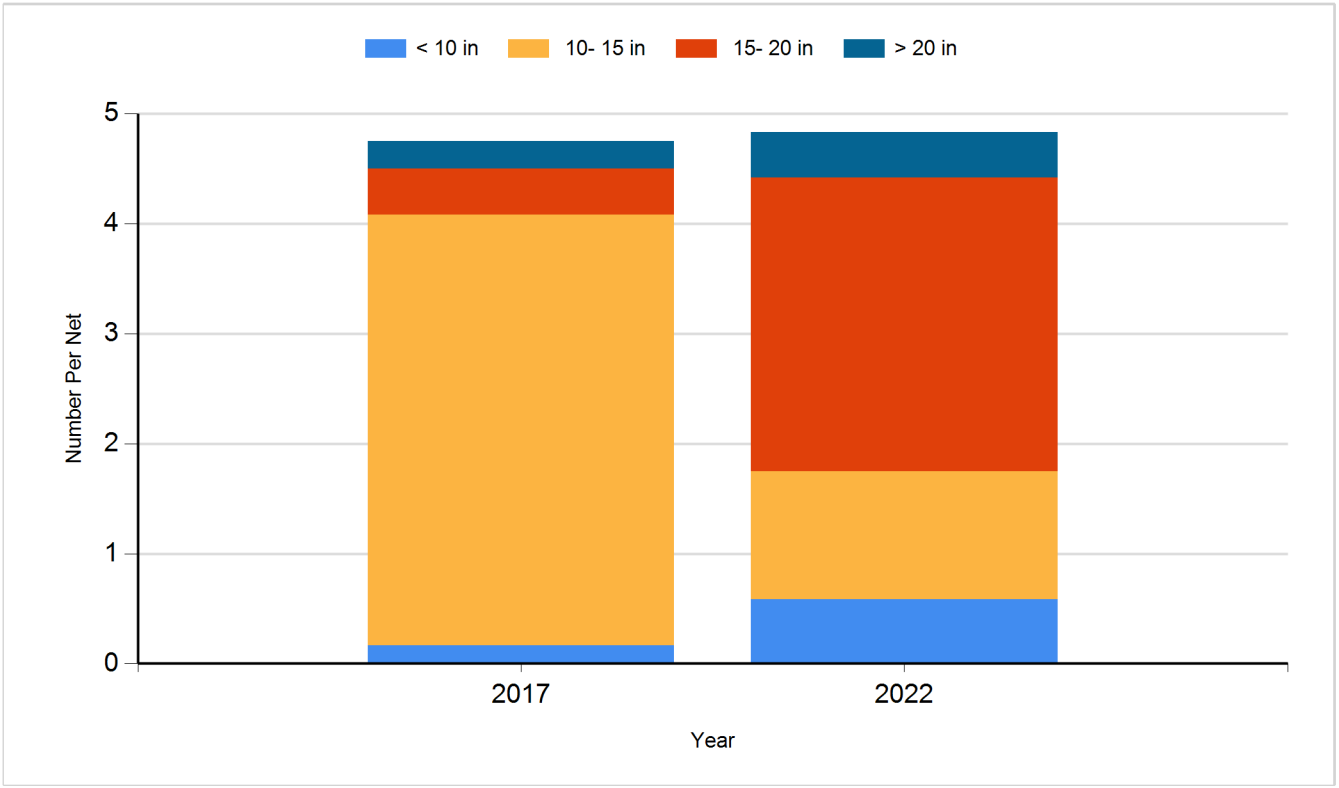
Species: Common Carp
Gear: AFS std gill net



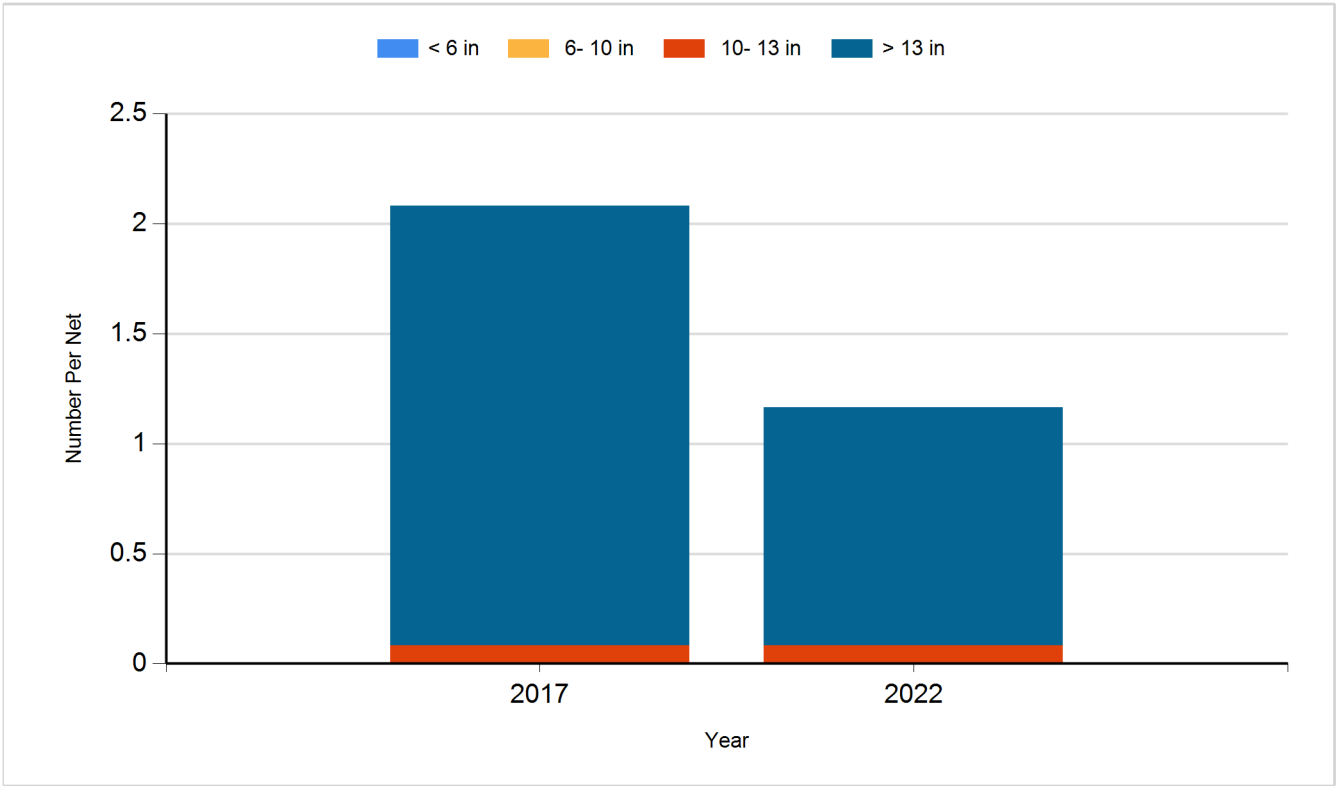
Species: Northern Pike
Gear: AFS std gill net



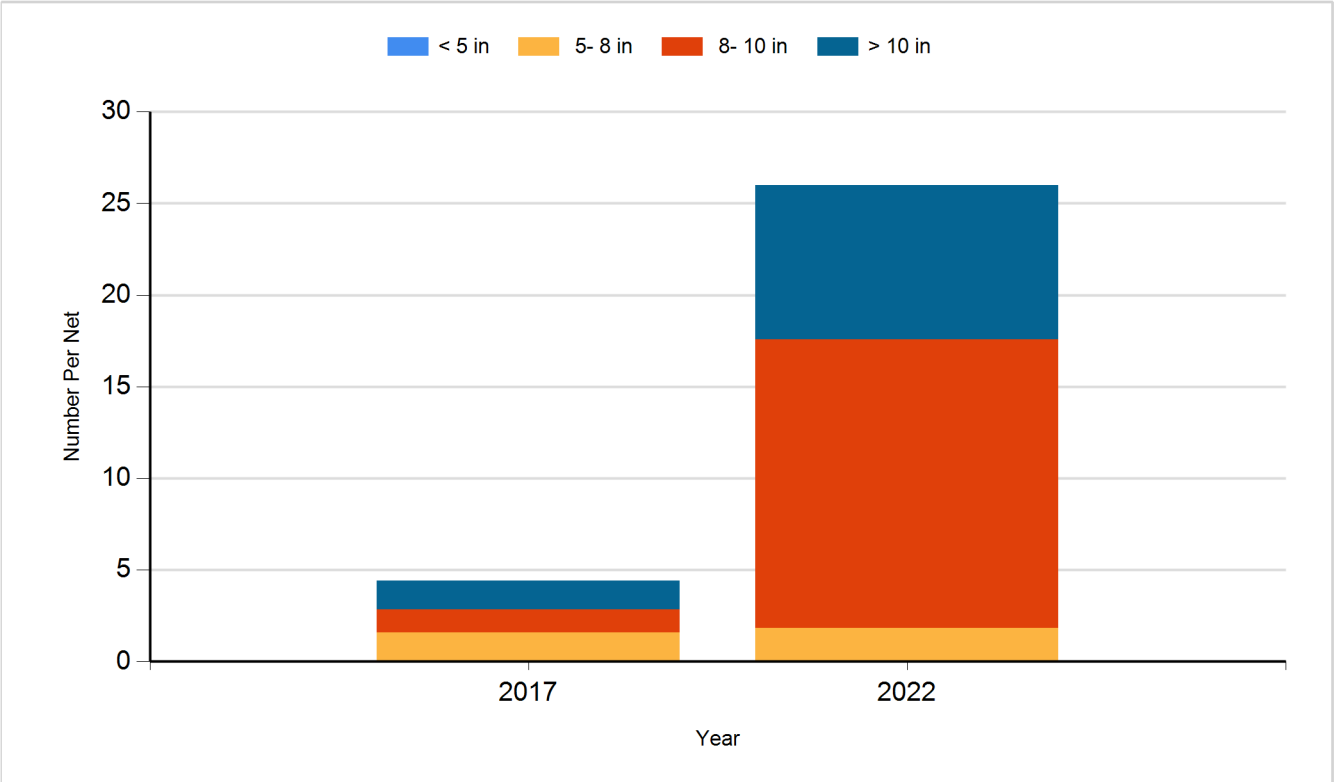
Species: Walleye
Gear: AFS std gill net



Species: White Sucker
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net



Fish Stocking

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

Year	Species	Size	Number
2012	Walleye	Fry	375,000
2014	Walleye	Fry	400,000
2017	Walleye	Small Fingerling	74,340
2019	Walleye	Small Fingerling	57,750
2021	Walleye	Fry	400,000