SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Hwy 81 West, Kingsbury County
MBS-Lake-233-000
2022

Lake Information

Name: Hwy 81 West

County: Kingsbury

Surface Area: 1,580 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 09, 2022	6 net-nights
AFS std gill net	Aug 10, 2022	4 net-nights
frame net (std 3/4 in)	Aug 09, 2022	5 net-nights
frame net (std 3/4 in)	Aug 10, 2022	5 net-nights

Common Fish Species Present

Walleye

Muskellunge

Yellow Perch

White Bass

Bluegill

Northern Pike

Smallmouth Bass

Yellow Bullhead

Common Carp

Sunfish Hybrid

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	Common Carp	3	0.1	0.1	100		100			
	Northern Pike	4	0.4	0.3	100		25		79	6
	Walleye	27	2.6	0.8	96		38	15	86	2
	White Bass	52	5.2	3.2	100		100		95	1
	Yellow Perch	108	10.8	2.8	2		0		107	1
frame net (std 3/4 in)	Black Crappie	1	0.1	0.1	100		100		107	
	Bluegill	40	3.9	2.9	0		0		165	6
	Common Carp	13	0.3	0.2	100		100			
	Largemouth Bass	2	0.0	0.0	0		0			
	Northern Pike	11	1.1	0.7	91		9		81	4
	Smallmouth Bass	10	0.9	0.2	67		67		100	3
	Sunfish Hybrid	1	0.1	0.1	0		0		131	
	Walleye	3	0.3	0.2	67		33		84	15
	White Bass	4	0.3	0.2	100		100		91	9
	Yellow Bullhead	5	0.5	0.4	100		100			
	Yellow Perch	32	3.2	2.8	0		0		115	4

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	Common Carp									0.4	0.1	0.25
	Northern Pike									0.5	0.4	0.45
	Smallmouth Bass									1.1	0.0	0.55
	Walleye									2.8	2.6	2.70
	White Bass									7.4	5.2	6.30
	Yellow Perch									13.4	10.8	12.10
frame net (std 3/4 in)	Black Bullhead									1.1	0.0	0.55
	Black Crappie									2.0	0.1	1.05
	Bluegill									12.2	3.9	8.05
	Common Carp									2.8	0.3	1.55
	Largemouth Bass									0.0	0.0	0.00
	Muskellunge									0.2	0.0	0.10
	Northern Pike									2.9	1.1	2.00
	Smallmouth Bass									2.6	0.9	1.75
	Sunfish Hybrid									0.0	0.1	0.05
	Walleye									0.9	0.3	0.60
	White Bass									8.8	0.3	4.55
	Yellow Bullhead									2.1	0.5	1.30
	Yellow Perch									3.2	3.2	3.20

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	Common Carp	PSD									100	100
		PSD-P									75	100
	Northern Pike	PSD									20	100
		PSD-P									0	25
		Wr									91	79
	Smallmouth Bass	PSD									36	
		PSD-P									9	
		Wr									102	
	Walleye	PSD									79	96
		PSD-P									43	38
		Wr									83	86
	White Bass	PSD									92	100
		PSD-P									70	100
		Wr									94	95
	Yellow Perch	PSD									22	2
		PSD-P									13	0
		Wr									100	107
frame net (std 3/4 in)	Bluegill	PSD									3	0
		PSD-P									1	0
		Wr									138	165
	Common Carp	PSD									100	100
		PSD-P									89	100
	Muskellunge	PSD									100	
		PSD-P									100	
	Northern Pike	PSD									83	91
		PSD-P									7	9
		Wr									84	81
	Smallmouth Bass	PSD									73	67
		PSD-P									58	67
		Wr									99	100
	Walleye	PSD									100	67
		PSD-P									67	33
		Wr									80	84

			Year									
Gear	Species	Index	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
frame net (std 3/4 in)	White Bass	PSD									100	100
		PSD-P									99	100
		Wr									86	91
	Yellow Bullhead	PSD									100	100
		PSD-P									100	100
	Yellow Perch	PSD									81	0
		PSD-P									69	0
		Wr									97	115

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	27	205 (1)		408 (6)	445 (10)		492 (1)		597 (1)	615 (2)	600 (6)
2021	35	212 (7)	403 (4)	400 (12)	463 (1)		524 (1)	524 (1)	538 (3)		612 (6)

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2021	131	164 (104)	236 (10)	272 (15)	315 (1)	333 (1)					

Fish Condition

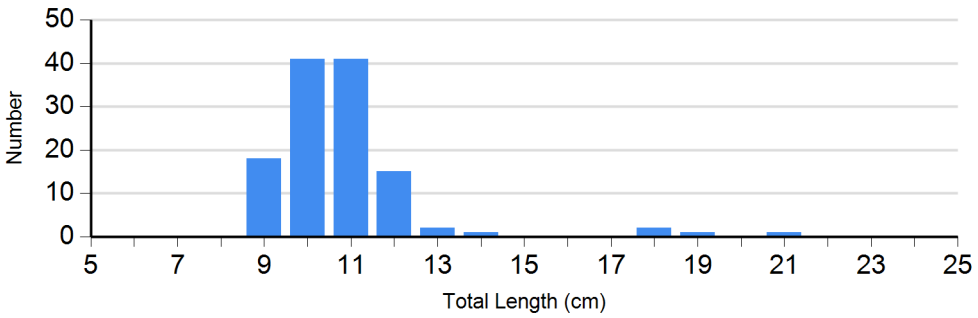
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2021	118	139 (1.9)	3	124 (9.2)	1	123	0	
	2022	39	165 (4.6)	0		0		0	
Northern Pike Gill Net	2021	4	92 (3.2)	1	86	0		0	
	2022	0		3	83 (4.3)	1	70	0	
Walleye Gill Net	2021	6	90 (3.1)	10	89 (1.6)	10	75 (2.4)	2	74 (0.5)
	2022	1	83	15	88 (1.4)	7	85 (4.8)	3	75 (7.2)
White Bass Gill Net	2021	6	98 (4.1)	16	94 (1.9)	34	96 (0.7)	18	86 (0.9)
	2022	0		0		38	97 (1.3)	14	90 (1.4)
Yellow Perch Gill Net	2021	104	100 (0.7)	13	103 (3.5)	15	98 (1.9)	2	91 (0.1)
	2022	106	107 (0.8)	2		0		0	

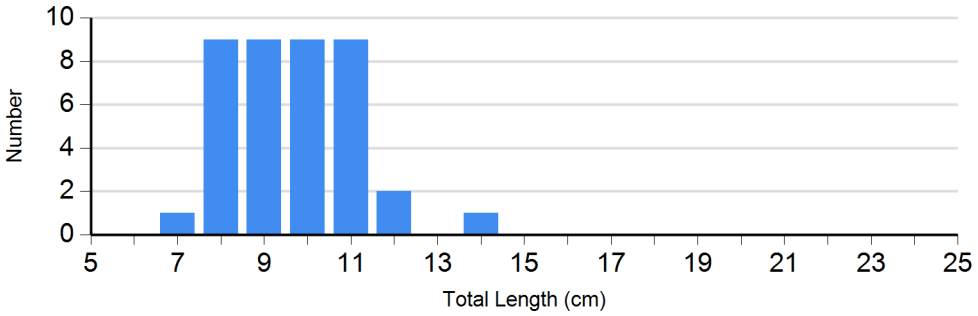
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

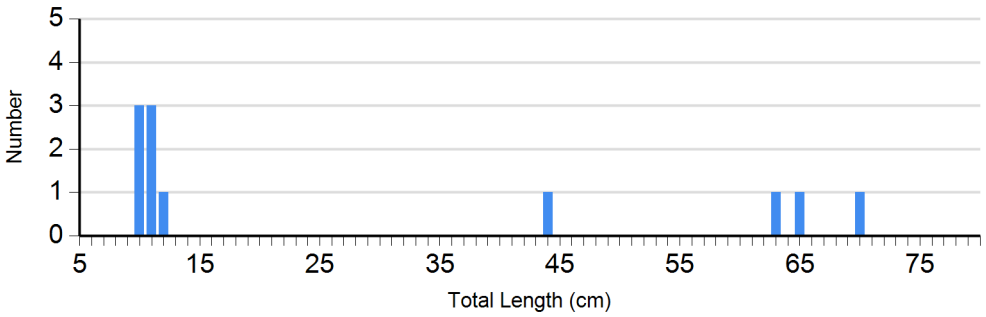


2021



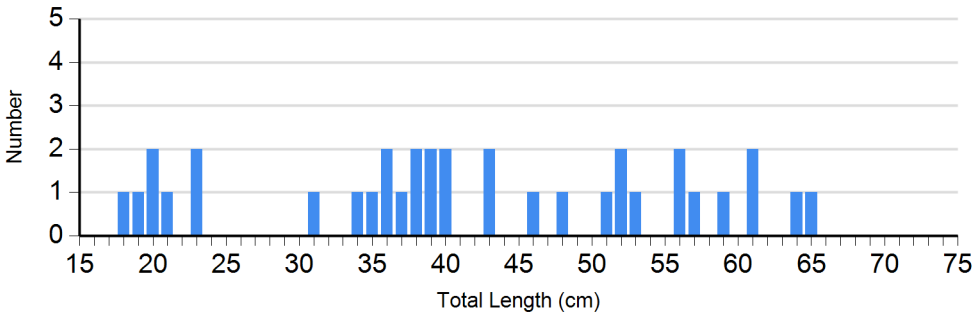
2022

Species: Common Carp
Gear: AFS std gill net

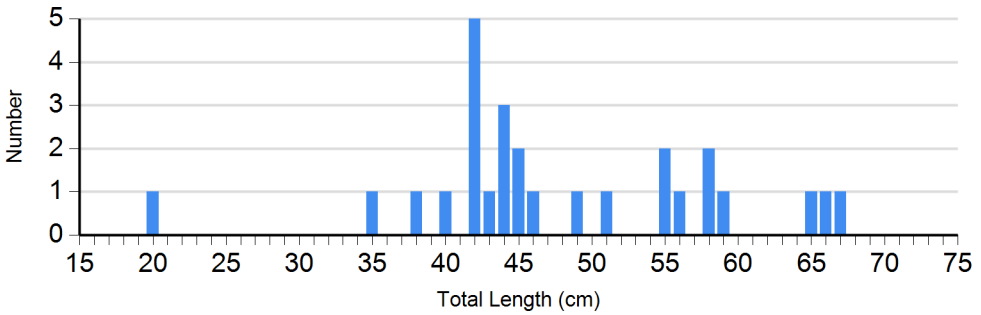


2021

Species: Walleye
Gear: AFS std gill net

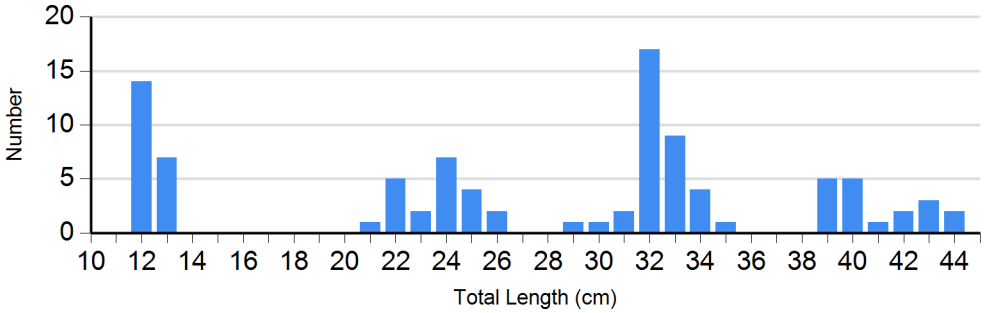


2021

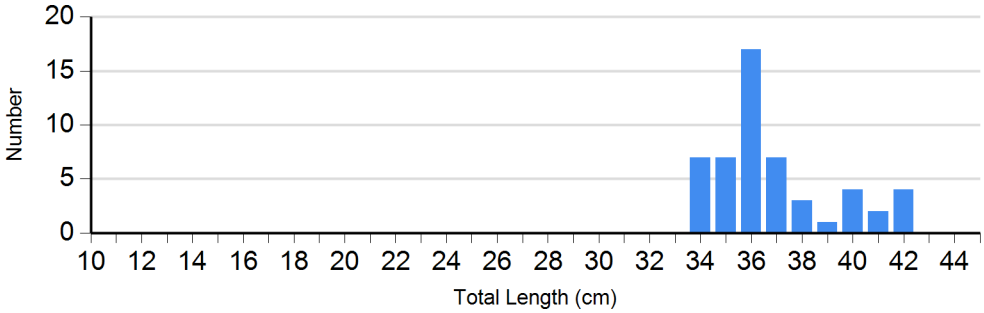


2022

Species: White Bass
Gear: AFS std gill net

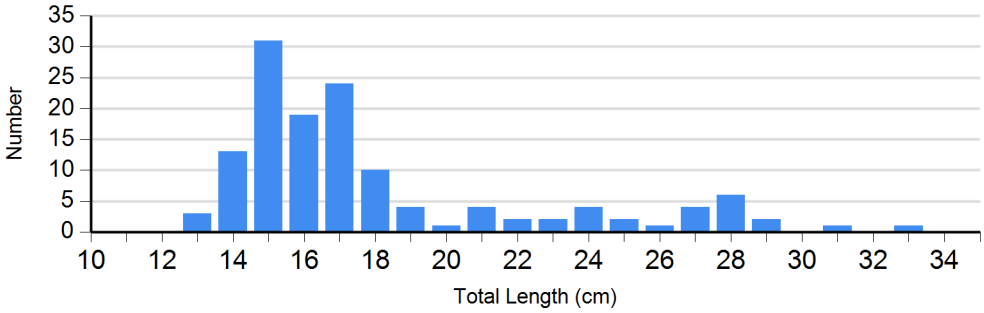


2021

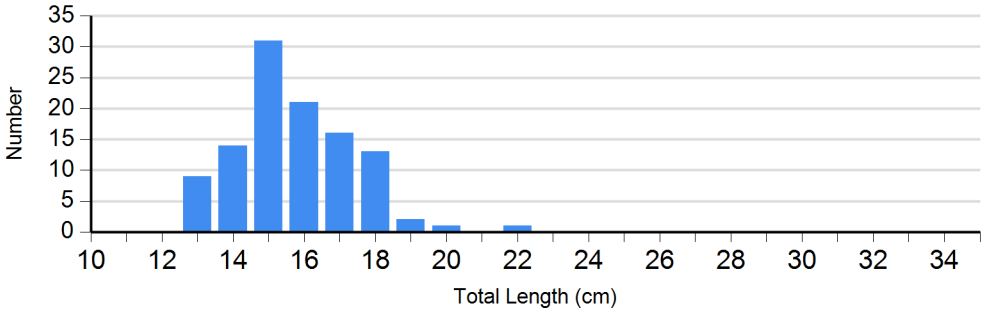


2022

Species: Yellow Perch
Gear: AFS std gill net



2021

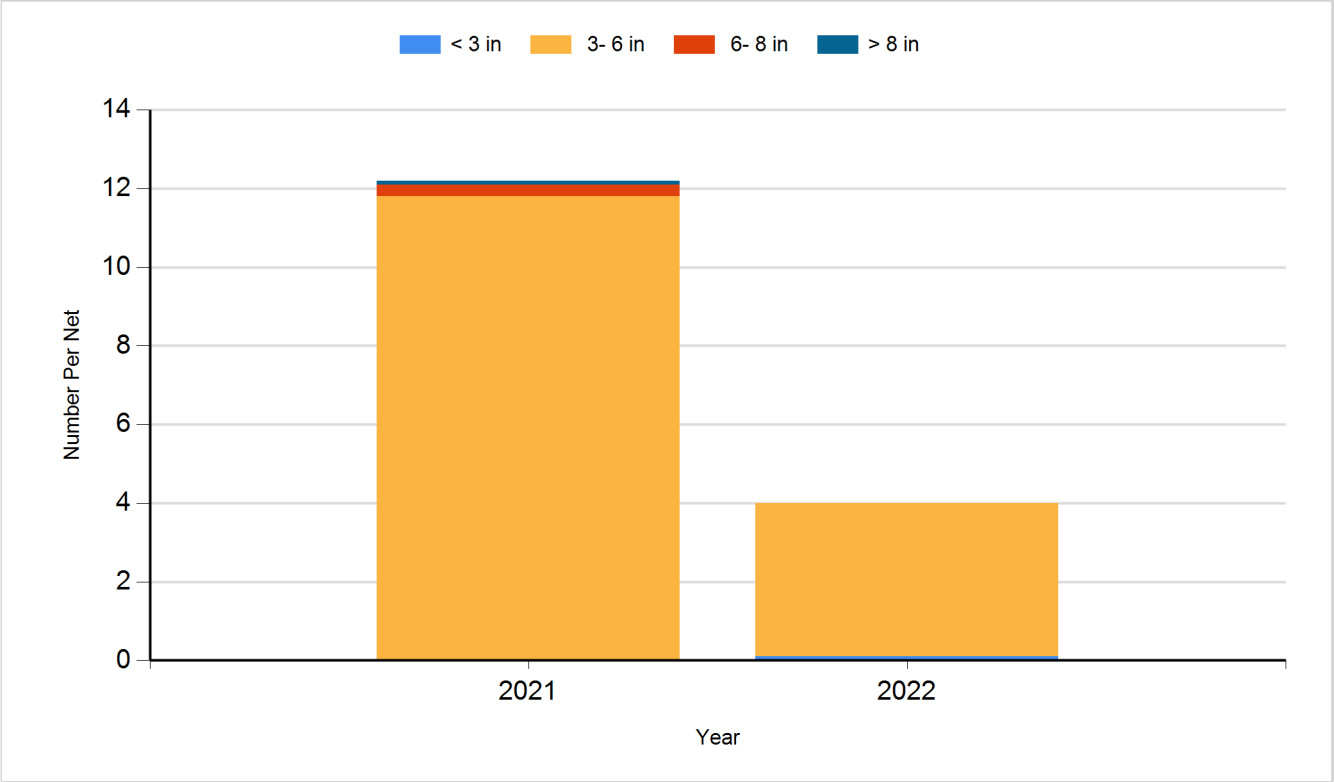


2022

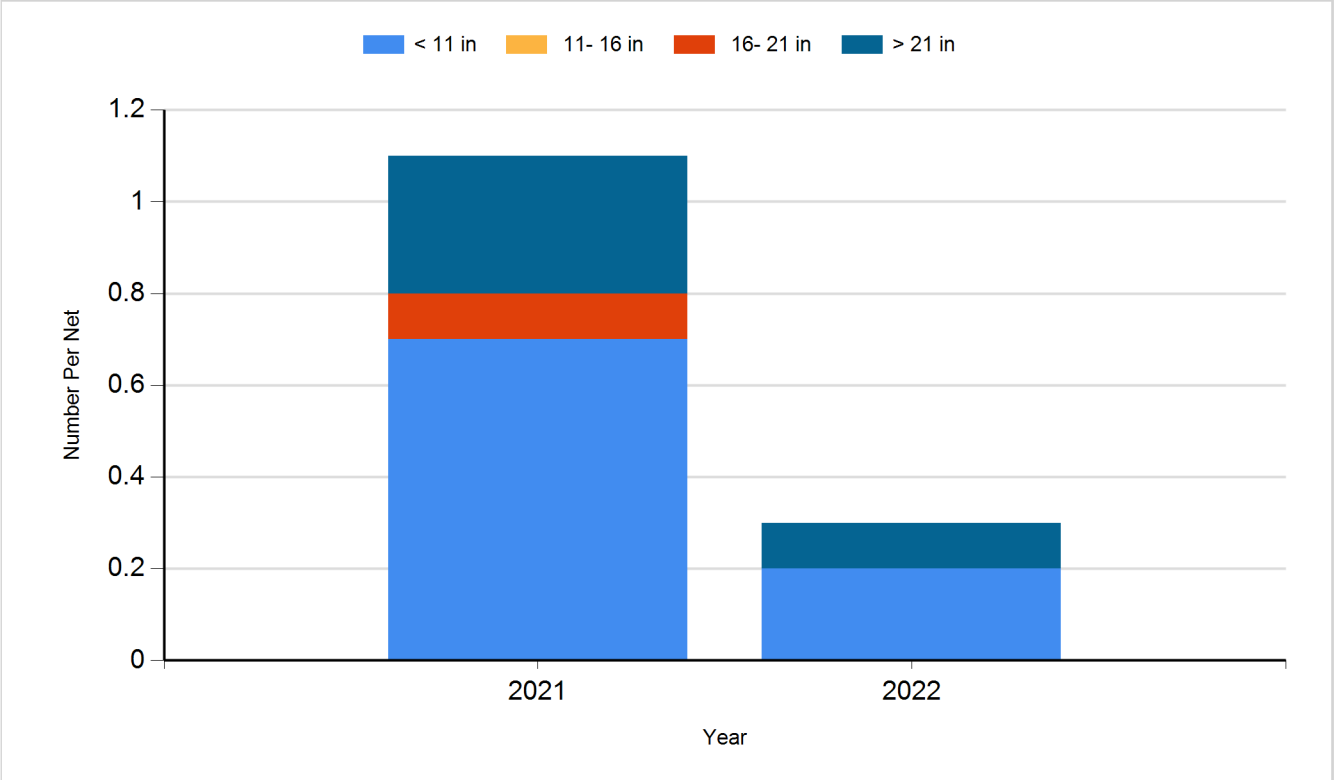
Historic Fish Sizes and Relative Abundance

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

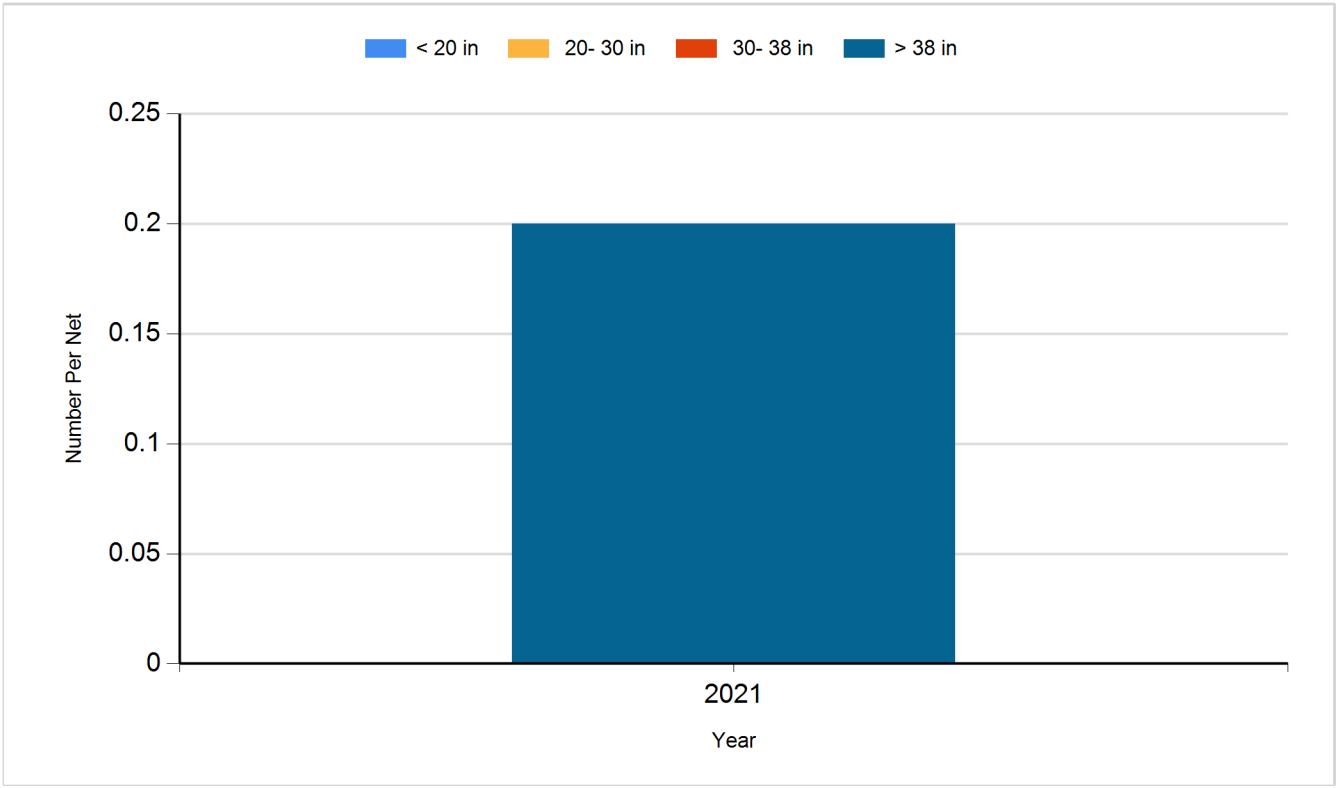
Species: Bluegill
Gear: frame net (std 3/4 in)



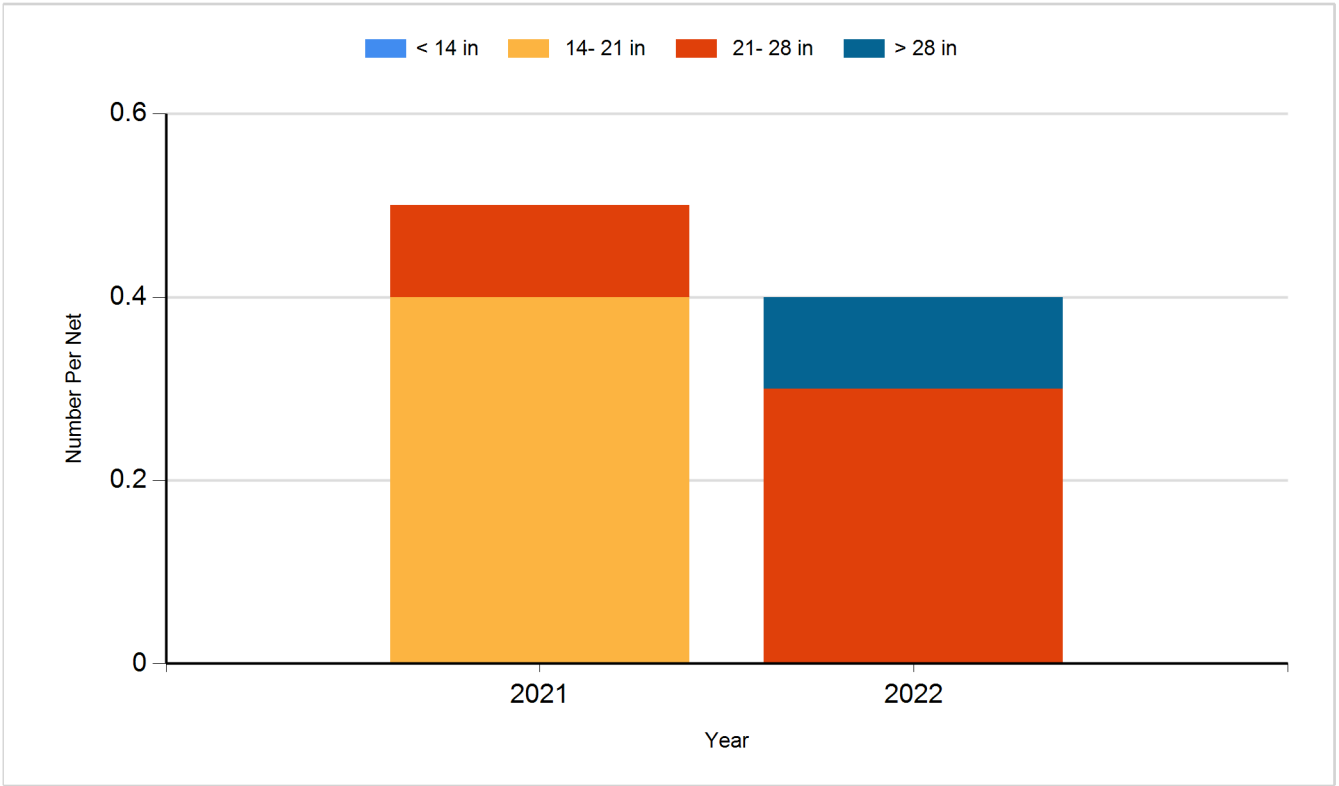
Species: Common Carp
Gear: AFS std gill net



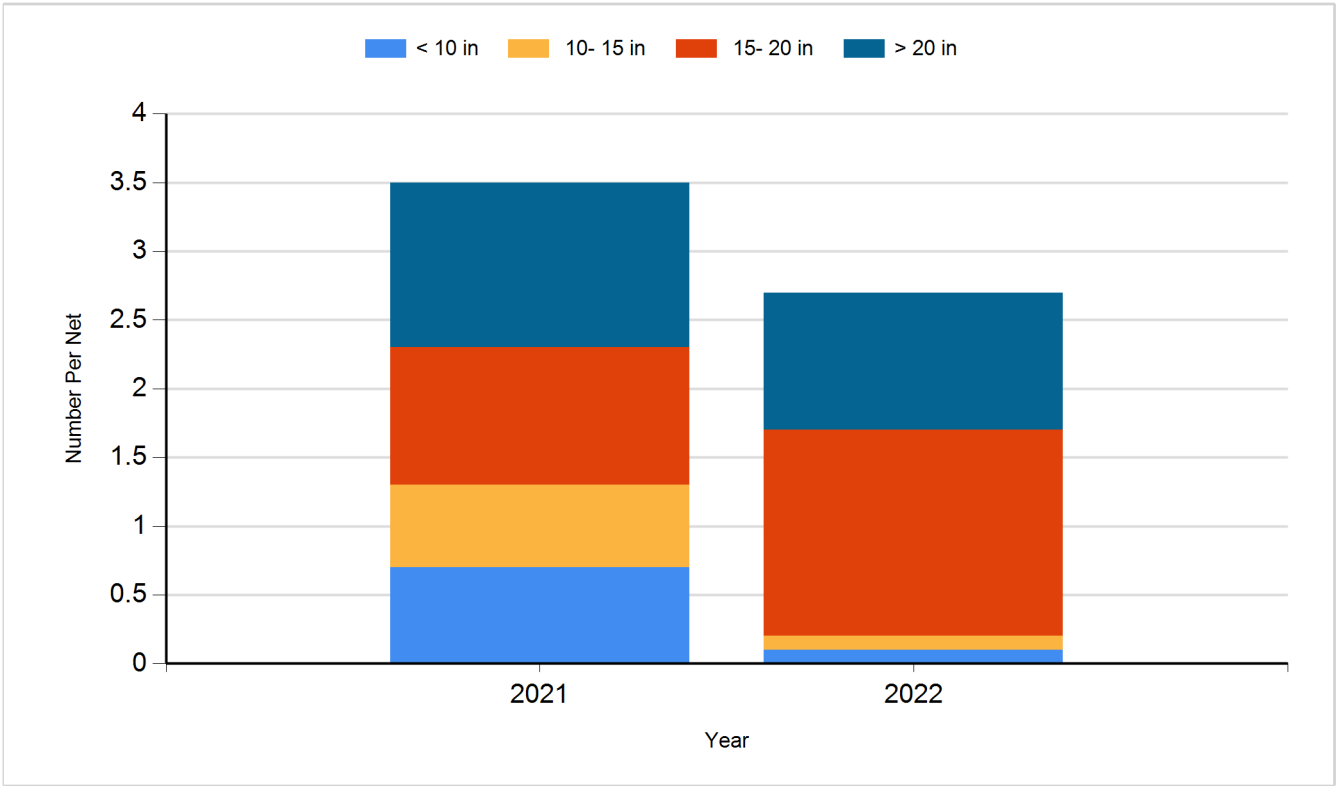
Species: Muskellunge
Gear: frame net (std 3/4 in)



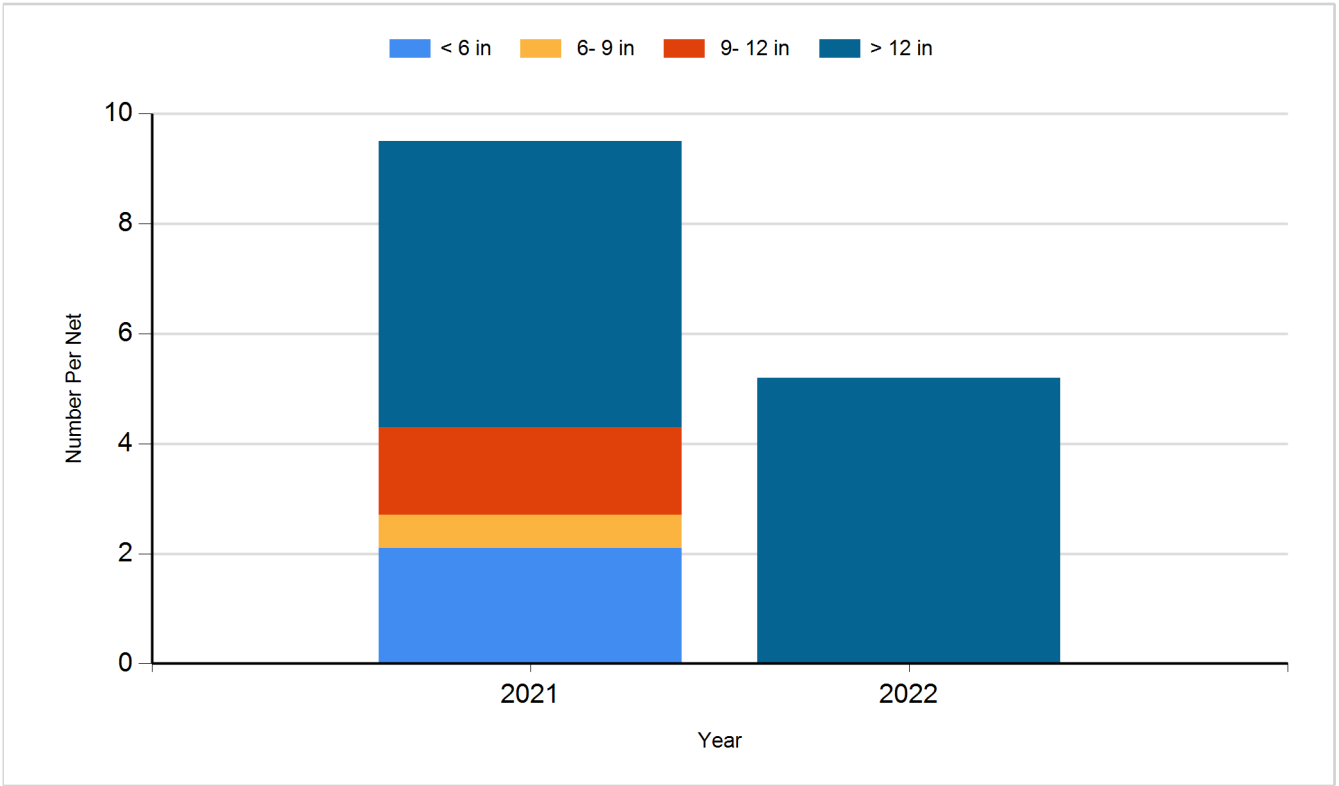
Species: Northern Pike
Gear: AFS std gill net



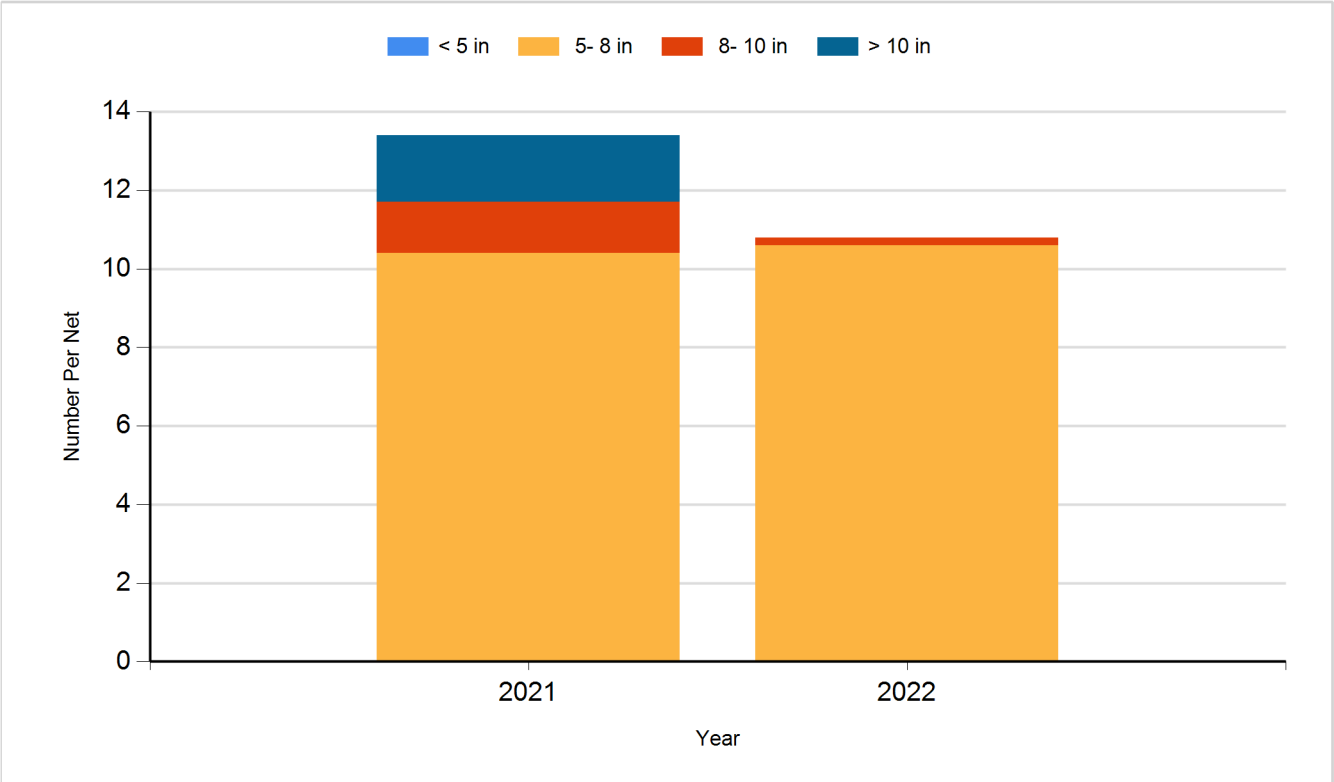
Species: Walleye
Gear: AFS std gill net



Species: White Bass
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
2022	Muskellunge	Juvenile	1,356