Swan Lake Survey Summary

Swan Lake, located 5.0 miles east and 2.0 miles north of Bradley, is managed as a walleye and yellow perch fishery. Other fish species (e.g., northern pike) are present and contribute to the fishery.

- **Northern pike.** Northern pike numbers were similar to those observed in 2018. At 1.1 per gill net, relative abundance was considered low to moderate in 2021. Sampled northern pike ranged in length from 16.9 to 24.0 inches.

- **Walleye.** Walleye numbers were higher in 2021 than in 2018. At 7.2 per gill net, relative abundance was considered moderate to high. Sampled walleyes ranged in length from 7.9 to 28.0 inches, of the fish that were at least 10.0 inches 74% were ≥15.0 inches and 28% were ≥20.0 inches. Ten year classes (2006, 2009, 2010, 2011, 2013, and 2016 – 2020) were represented. Individuals from the 2018 (age-3) cohort, which coincided with a fry stocking, were the most numerous accounting for more than half (58%) of the walleyes in the sample. Walleyes appear to grow well with mean length at capture values at age 3 ranging from 14.9 to 17.1 inches since 2012. In 2021, the mean length of age-3 walleyes was 15.6 inches.

- **Yellow perch**. Yellow perch were the most abundant species in the 2021 gill net catch. At 15.2 per gill net, relative abundance was moderate to high for Swan Lake. Sampled yellow perch ranged in length from 5.1 to 11.8 inches, 10% were ≥8.0 inches and 9% were ≥10.0 inches. Individuals from three year classes (2017, 2018, and 2020) comprised the entire sample; those from the 2020 (age-1) cohort, which had a mean length at capture of 6.4 inches, were the most abundant accounting for 90% of sampled yellow perch.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Swan, Clark County
UBS-Lake-1-000
2021

Lake Information

Name: Swan

County: Clark

Surface Area: 1,795 Acres

Maximum Depth: 17 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 05, 2021	6 net-nights
AFS std gill net	Aug 06, 2021	6 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Northern Pike

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.
- 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).

			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	Black Crappie	2	0.2	0.2	100		0		124	2
	Northern Pike	13	1.1	0.5	23		0		88	3
	Walleye	89	7.2	1.3	74	7	28	7	86	1
	Yellow Perch	182	15.2	3.9	10	3	9	3	113	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.

		CPUE										
Gear	Species	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg
AFS std gill net	Black Crappie							0.0			0.2	0.10
	Northern Pike							1.2			1.1	1.15
	Walleye							3.1			7.2	5.15
	Yellow Perch							9.5			15.2	12.35
std exp gill net	Northern Pike	4.2			3.7							3.95
	Walleye	17.5			8.7							13.10
	Yellow Perch	28.0			9.8							18.90

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFS std gill net	Northern Pike	PSD							93			23
		PSD-P							14			0
		Wr							88			88
	Walleye	PSD							89			74
		PSD-P							65			28
		Wr							90			86
	Yellow Perch	PSD							16			10
		PSD-P							0			9
		Wr							108			113
std exp gill net	Northern Pike	PSD	76			82						
		PSD-P	36			27						
		Wr	89			95						
	Walleye	PSD	57			79						
		PSD-P	4			35						
		Wr	93			93						
	Yellow Perch	PSD	89			15						
		PSD-P	38			2						
		Wr	116			96						

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+
2021	89	217 (3)	336 (8)	395 (52)	489 (2)	562 (2)			578 (2)		638 (20)
2018	48	217 (11)	341 (4)	434 (4)	478 (2)	497 (3)		570 (2)	583 (5)	584 (15)	613 (2)
2015	59	181 (5)	286 (7)	379 (12)	430 (3)	489 (6)	514 (23)	543 (2)			562 (1)
2012	106	159 (1)	311 (9)	385 (89)	480 (2)	509 (1)	528 (2)		657 (1)		683 (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+
2021	182	163 (164)		281 (17)	295 (1)						
2018	116	138 (91)	211 (24)	243 (1)							
2015	61	175 (1)	167 (57)	213 (1)	253 (2)						
2012	235	104 (67)	207 (60)	254 (99)	288 (5)	331 (4)					

Fish Condition

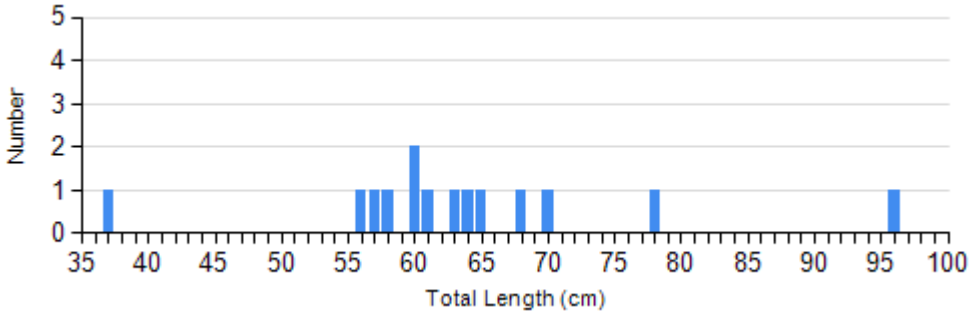
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2018	1	117	11	87 (1.6)	1	70	1	94
	2021	10	89 (2.4)	3	84 (3.9)	0		0	
Walleye Gill Net	2018	4	100 (1.5)	9	97 (1.5)	22	87 (1.4)	2	77 (4.2)
	2021	22	87 (1.2)	40	89 (0.9)	12	82 (2.3)	12	77 (1.8)
Yellow Perch Gill Net	2018	96	108 (0.8)	18	106 (1.1)	0		0	
	2021	164	114 (0.7)	2	102 (3.0)	13	105 (1.5)	3	100 (2.9)

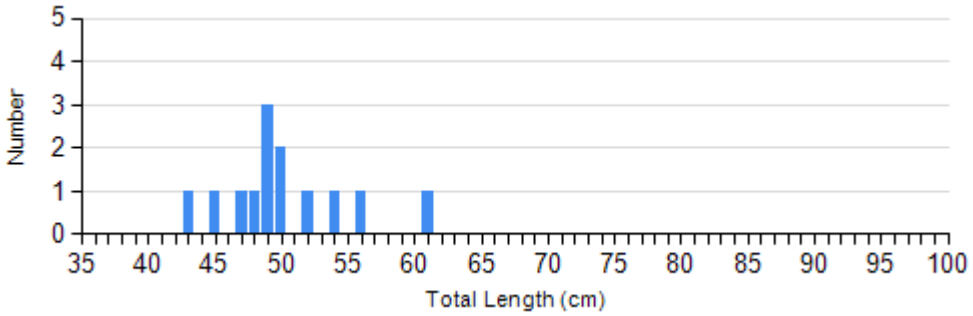
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Northern Pike
Gear: AFS std gill net

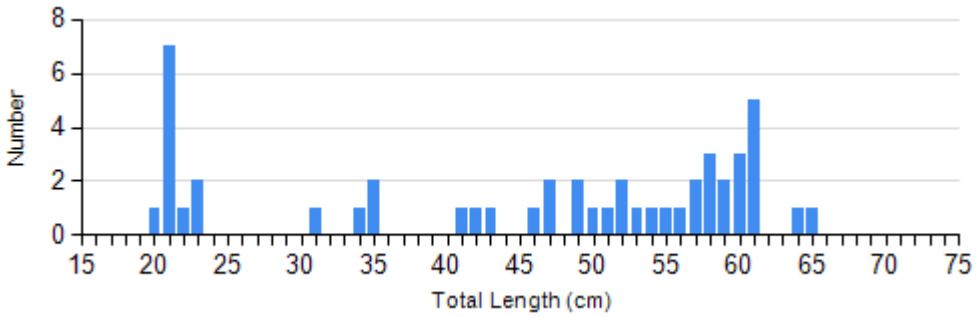


2018



2021

Species: Walleye
Gear: AFS std gill net



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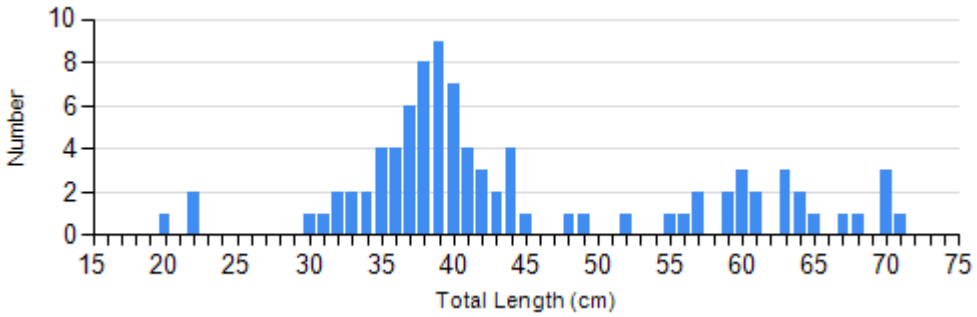
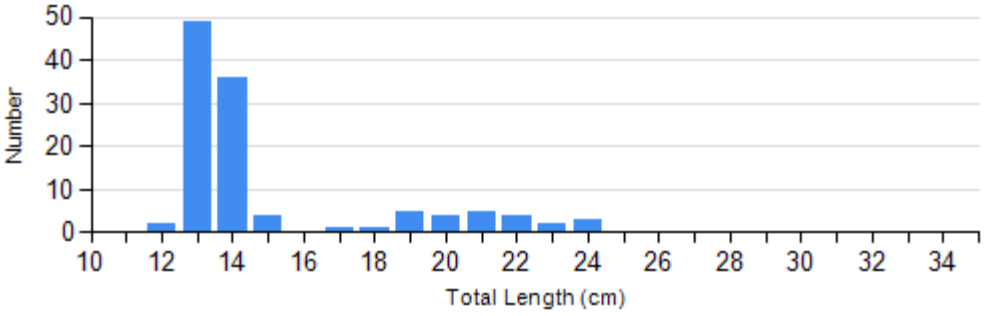
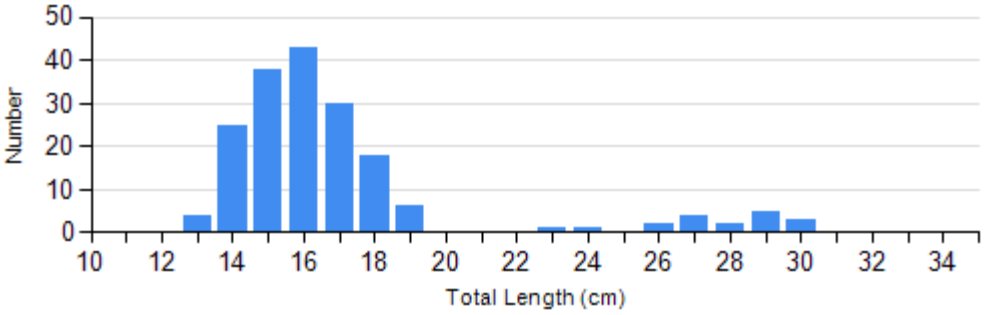


2021

Species: Yellow Perch
Gear: AFS std gill net



2018

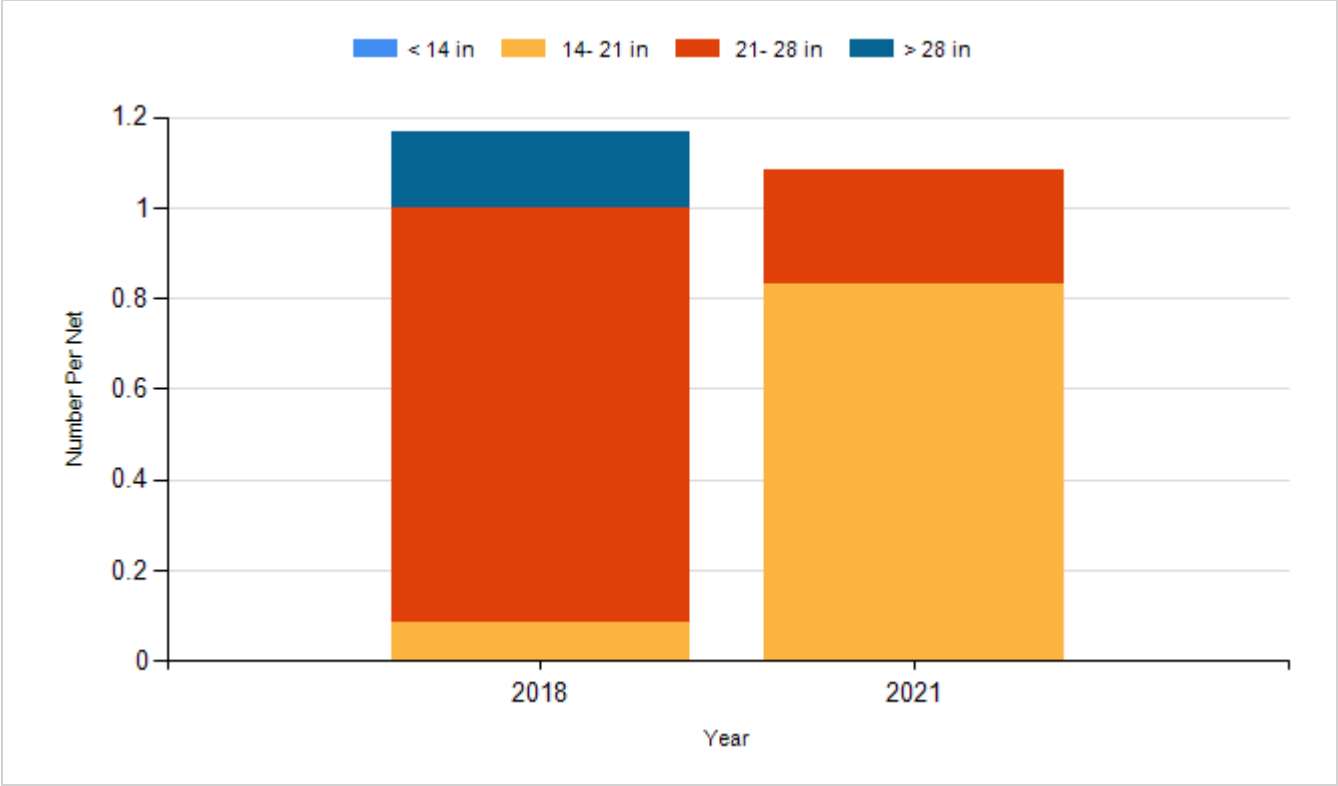


2021

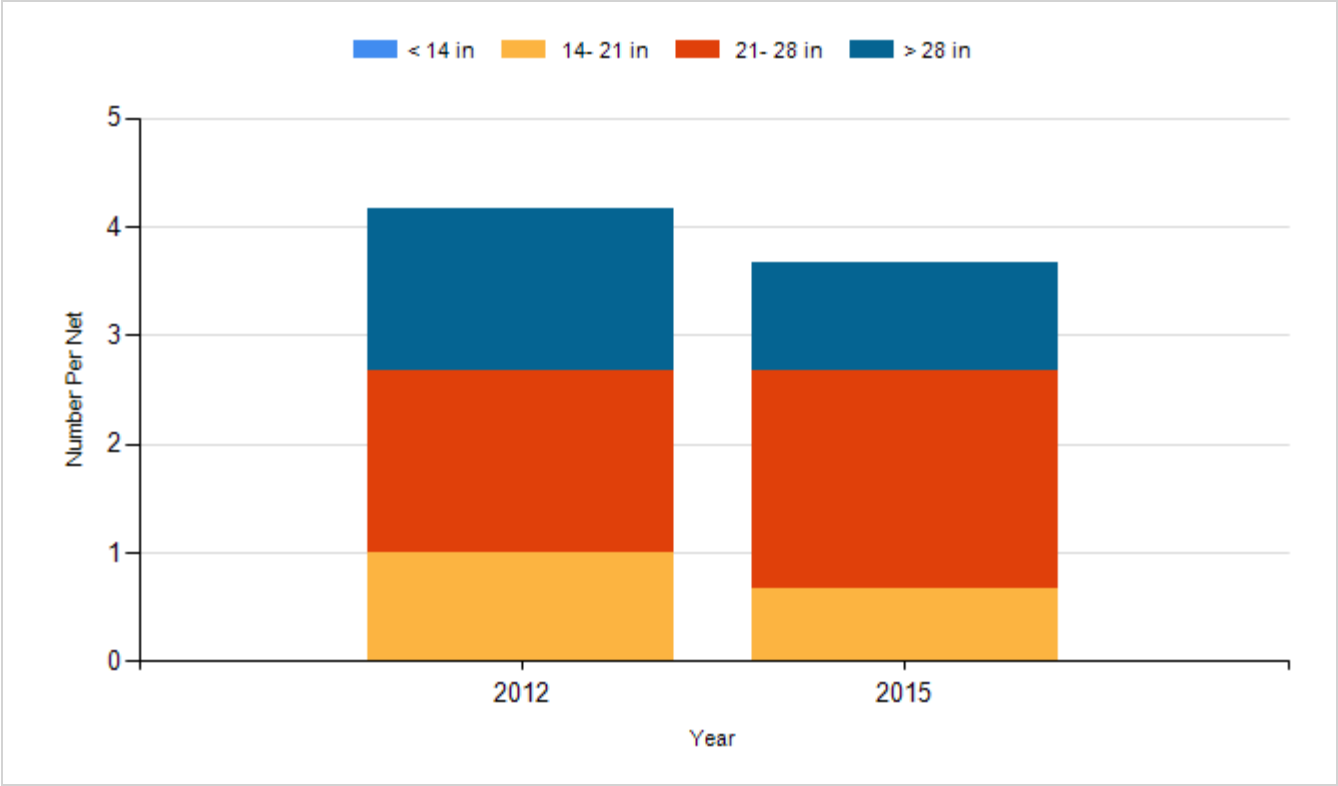
Historic Fish Sizes and Relative Abundance

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

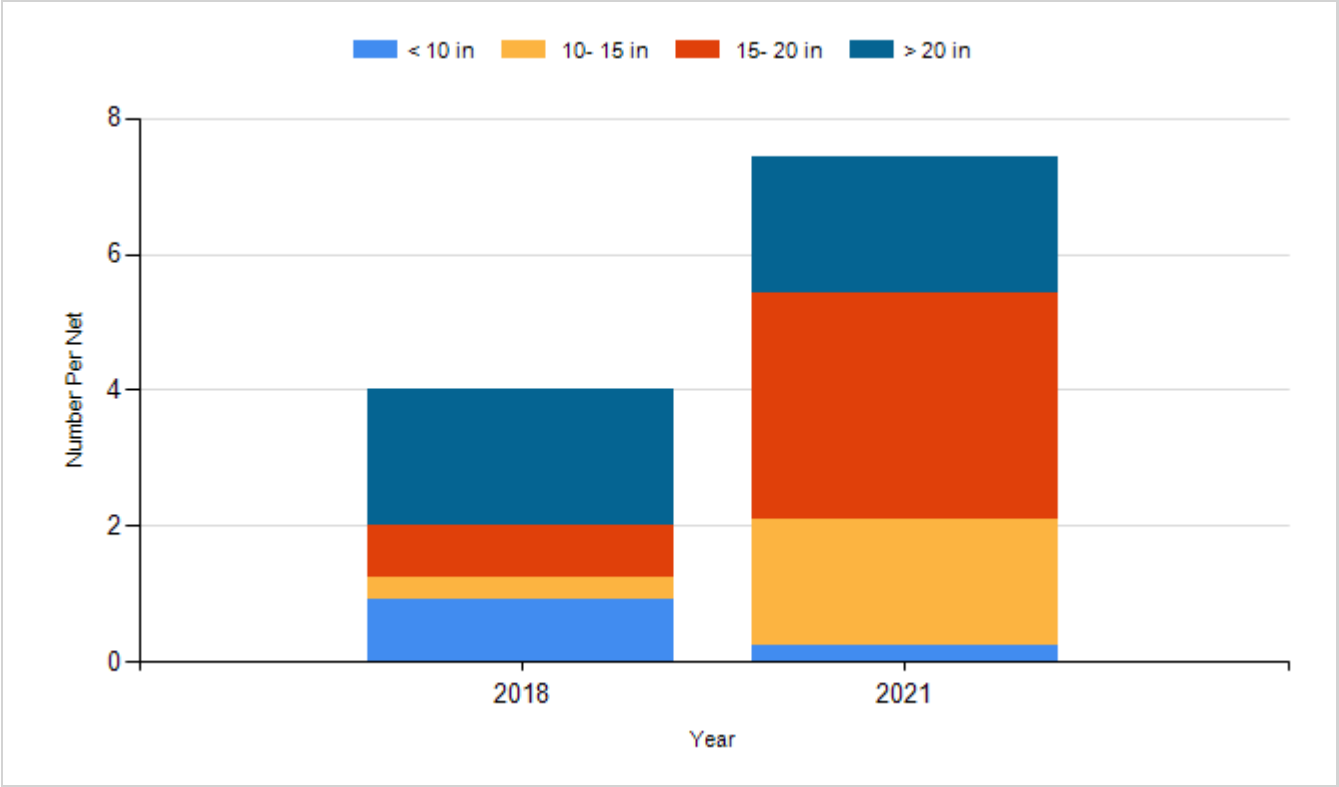
Species: Northern Pike
Gear: AFS std gill net



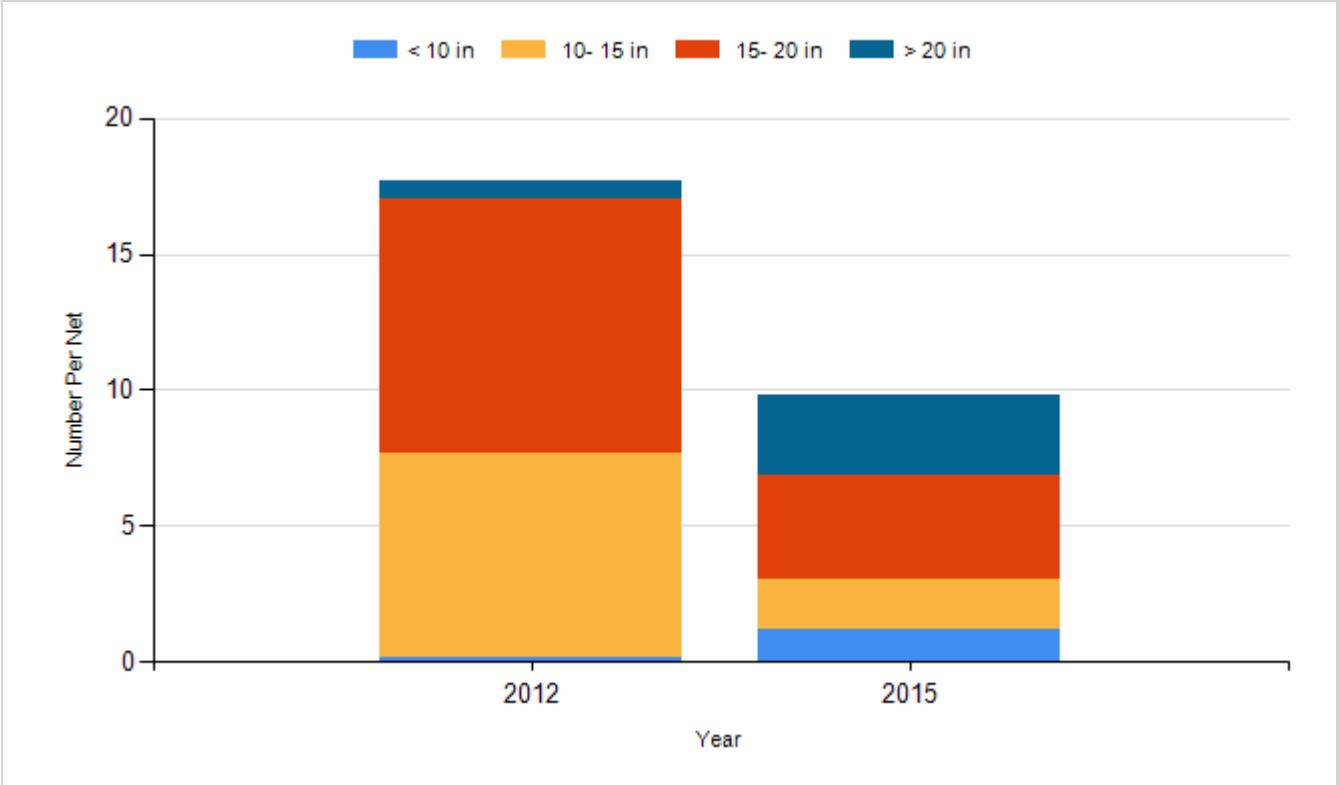
Species: Northern Pike
Gear: std exp gill net



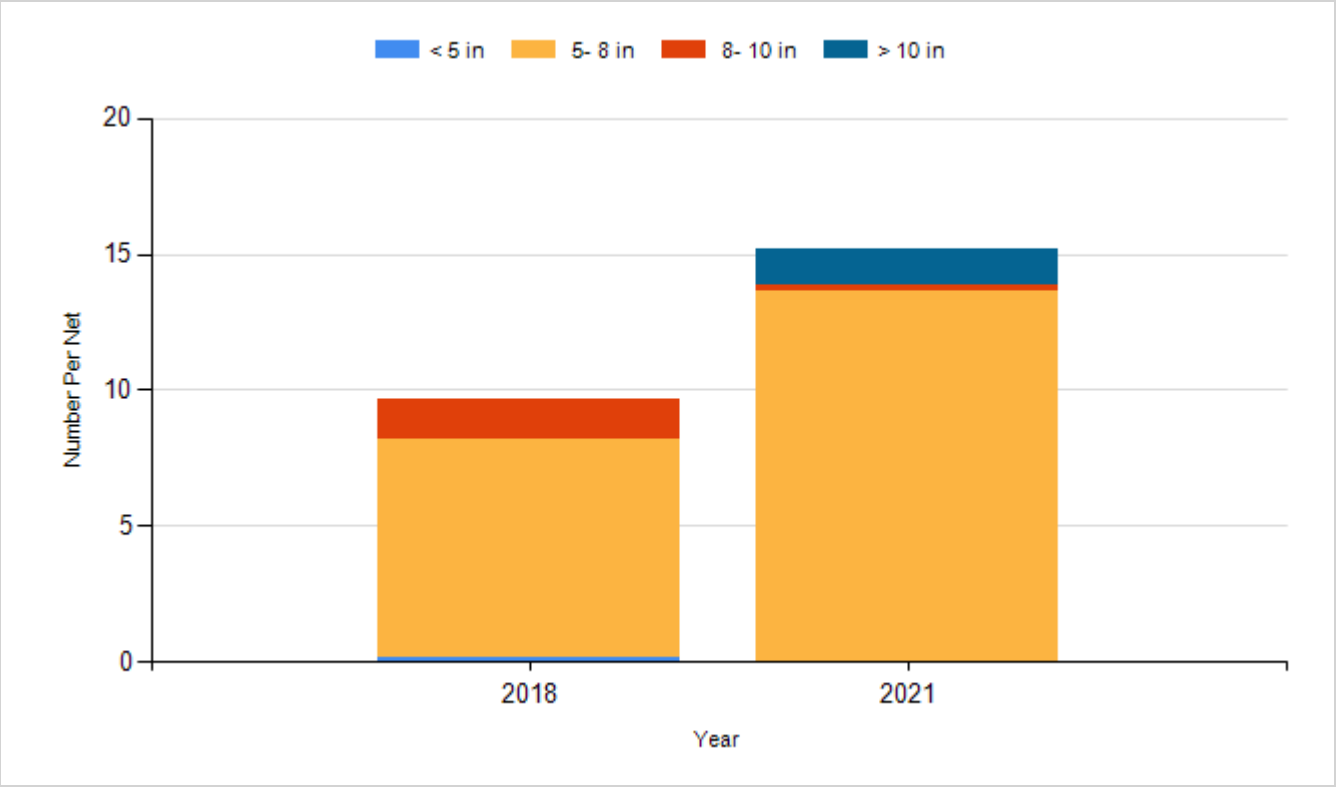
Species: Walleye
Gear: AFS std gill net



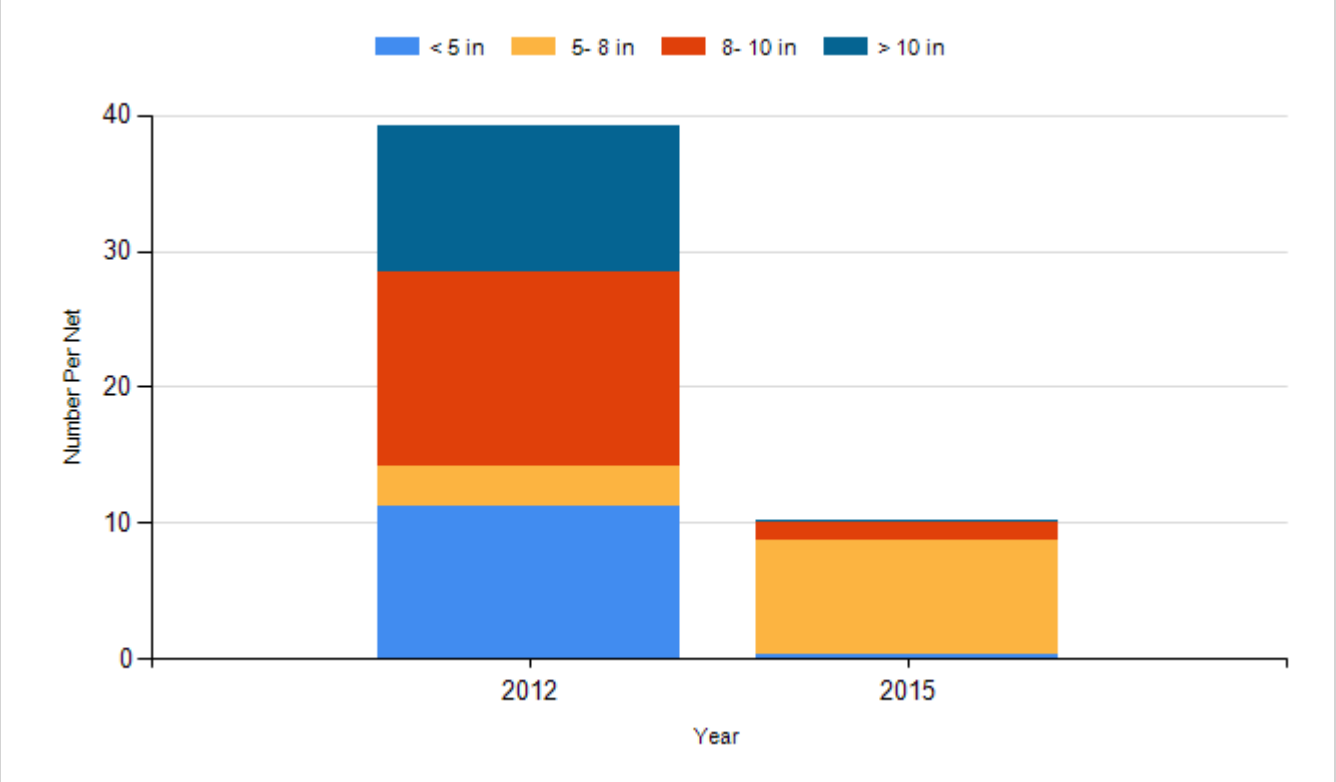
Species: Walleye
Gear: std exp gill net



Species: 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	Fry	1,000,000
2013	Walleye	Fry	750,000
2015	Walleye	Fry	750,000
2018	Walleye	Fry	750,000
2021	Walleye	Fry	800,000