

Grass Lake Survey Summary

Grass Lake, located 1.5 miles northwest of Florence, is managed as a walleye and yellow perch fishery but other fish species (e.g., northern pike) also contribute.

- **Northern pike.** Northern pike numbers were much lower in 2018 than 2013 but their relative abundance was still considered moderate at 1.6/gill net. Sampled northern pike ranged in length from 22.4 to 37.8 inches.
- **Walleye.** Walleye numbers have been high (>20.0/gill net) in each of the last two surveys (2013 and 2018). In 2018, sampled walleyes ranged in length from 13.4 to 25.6 inches; most (>90%) were 16.1 to 20.1 inches owing to strong year classes produced in 2014 and 2015. Walleyes from the 2014 cohort, which coincided with a fry stocking, comprised 63% of the sample; while those from the naturally-produced 2015 cohort accounted for 26%. Walleye growth appears to be good with mean length at capture values >16.0 inches at age-3 in each of the last two surveys (2013 and 2018).
- **Yellow Perch.** Yellow perch were not abundant (0.6/gill net); five individuals that ranged in length from 9.4 to 13.0 inches were sampled.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Grass, Codington County

UBS-Lake-106-000

2018

Lake Information

Name: Grass **Maximum Depth:** 9 Feet
County: Codington
Surface Area: 2,187 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 23, 2018	4 net-nights
AFS std gill net	May 24, 2018	4 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Northern Pike

Common Carp

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.

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

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)
Bigmouth Buffalo	11	28	18	46	24	61	30	76	37	94
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
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Common Carp	11	28	16	41	21	53	26	66	33	84
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Gizzard Shad	7	18	11	28						
Green Sunfish	3	8	6	15	8	20	10	25	12	30
Lake Herring	5	13	8	20	11	28	14	35	17	43
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
Rock Bass	4	10	7	18	9	23	11	28	13	33
Rudd	6	15	10	25	12	30	15	38	19	48
Saugeye	9	23	14	35	18	46	22	56	27	69
Shorthead Redhorse	6	15	10	25	13	33	16	41	20	51
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
White Sucker	6	15	10	25	13	33	16	41	20	51
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).

Gear	Species	Abundance		Stock Density Indices			Condition		
		CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Common Carp	2.0	1.6	100		31		97	2
	Northern Pike	1.6	0.4	100		77		87	2
	Walleye	22.3	4.1	99		13	4	90	1
	Yellow Perch	0.6	0.4	100		80		84	5

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.

Gear	Species	CPUE										Avg
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	Common Carp										2.0	2.0
	Northern Pike										1.6	1.6
	Walleye										22.3	22.3
	Yellow Perch										0.6	0.6
std exp gill net	Black Bullhead					1.5						1.5
	Common Carp					0.3						0.3
	Northern Pike					8.5						8.5
	Walleye					26.5						26.5
	White Sucker					0.5						0.5
	Yellow Perch					0.8						0.8

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										
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	Northern Pike	PSD											100
		PSD-P											77
		Wr											87
	Walleye	PSD											99
		PSD-P											13
		Wr											90
	Yellow Perch	PSD											100
		PSD-P											80
		Wr											84
std exp gill net	Northern Pike	PSD						85					
		PSD-P						21					
		Wr						81					
	Walleye	PSD							88				
		PSD-P							0				
		Wr							89				
	Yellow Perch	PSD							33				
		PSD-P							33				
		Wr							91				

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+
2018	177		342 (1)	438 (46)	475 (111)	484 (4)	566 (3)	544 (5)	592 (7)		
2013	110	181 (4)	312 (11)	427 (95)							

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	7	107 (5)	188 (1)	277 (1)							

Fish Condition

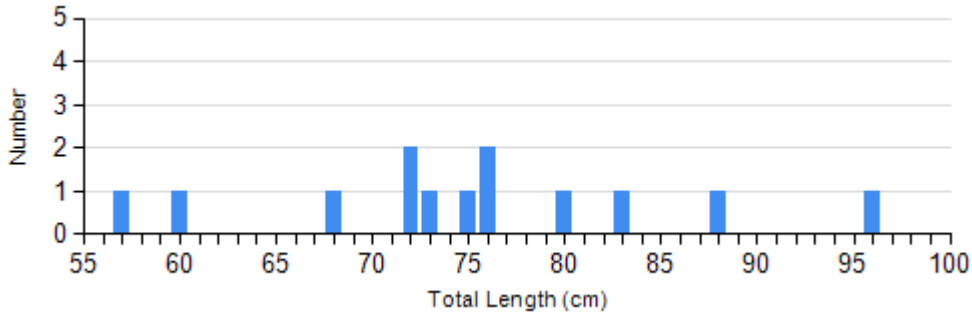
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	0		3	88 (1.9)	8	88 (2.5)	2	82 (2.5)
Walleye Gill Net	2018	1	87	154	90 (0.5)	21	88 (1.5)	2	80 (13.0)
Yellow Perch Gill Net	2018	0		1	84	2	88 (9.5)	2	79 (1.0)

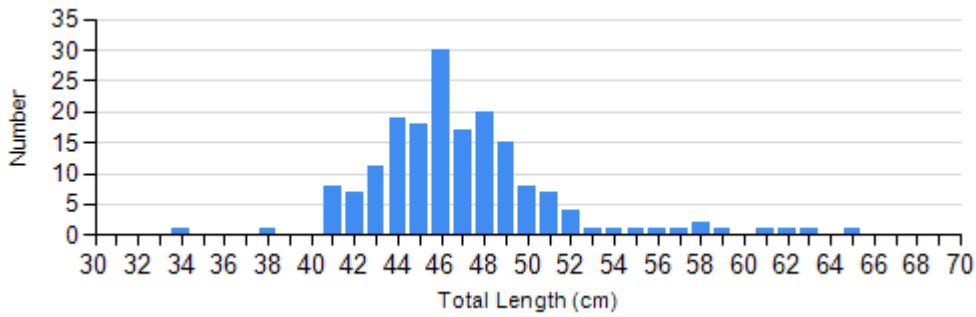
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Northern Pike
Gear: AFS std gill net



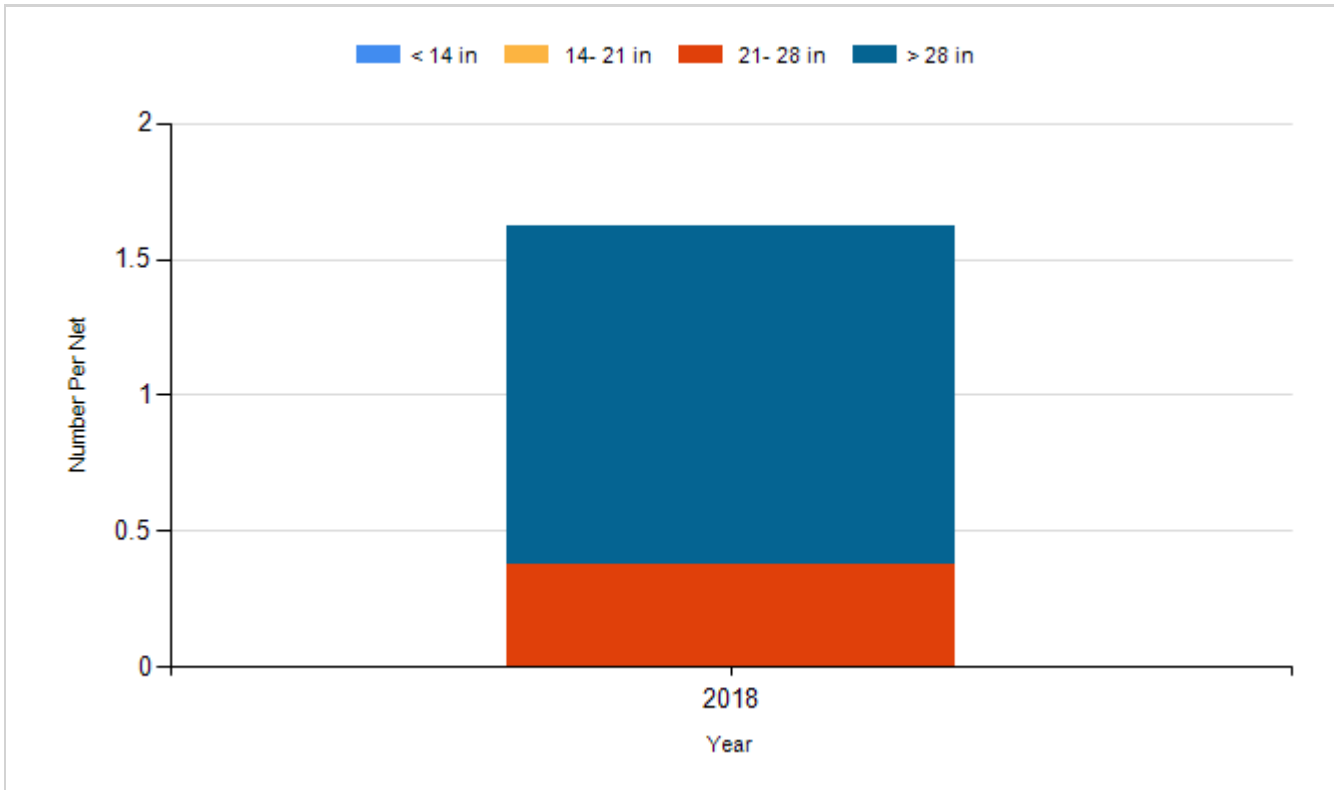
Species: Walleye
Gear: AFS std gill net



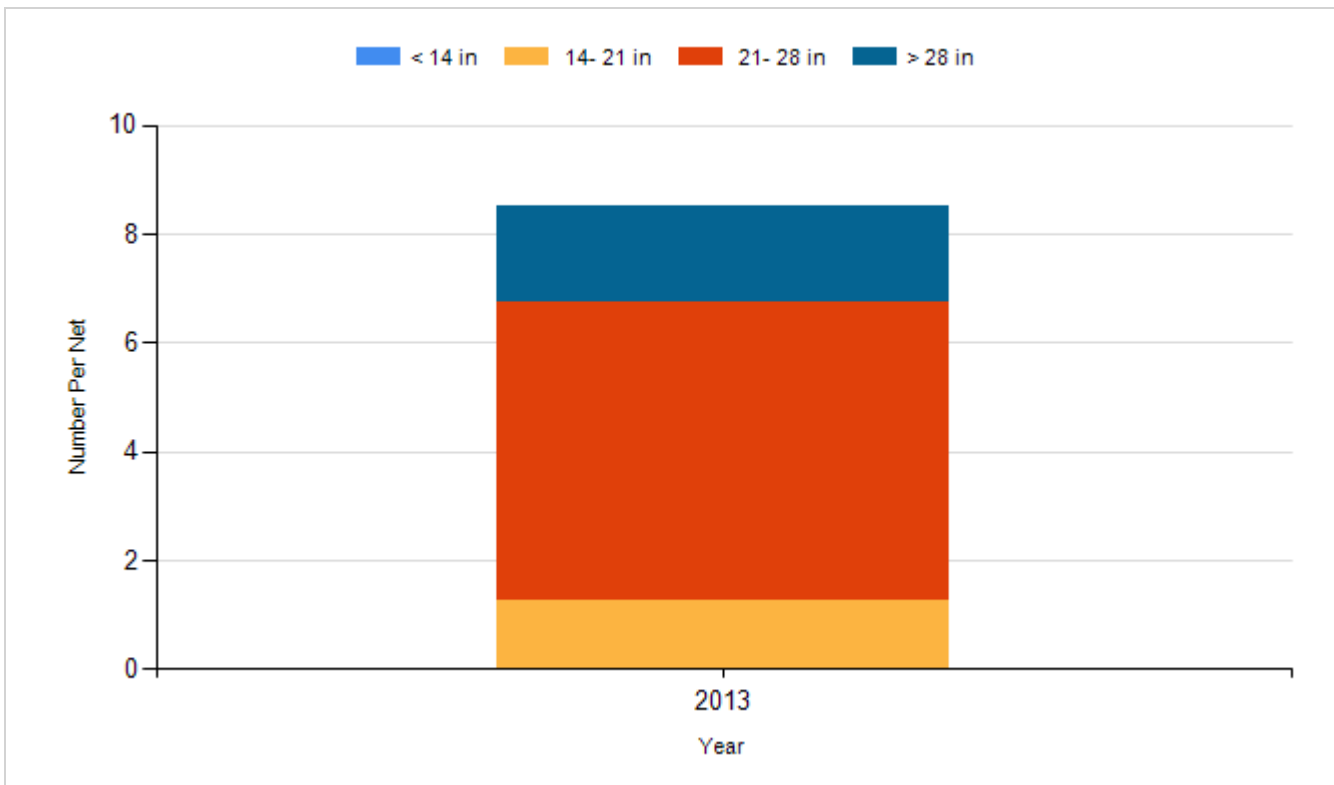
Historic Fish Sizes and Relative Abundance

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

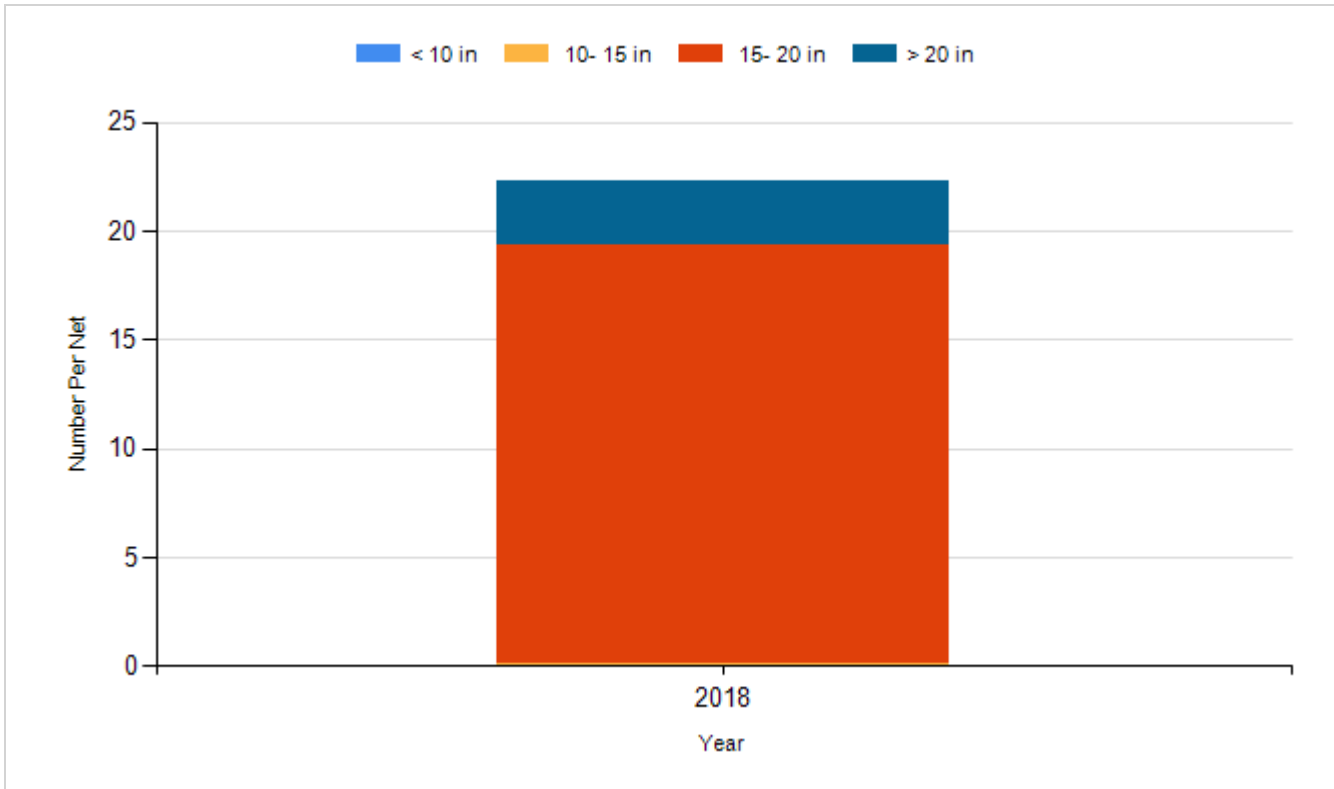
Species: Northern Pike
Gear: AFS std gill net



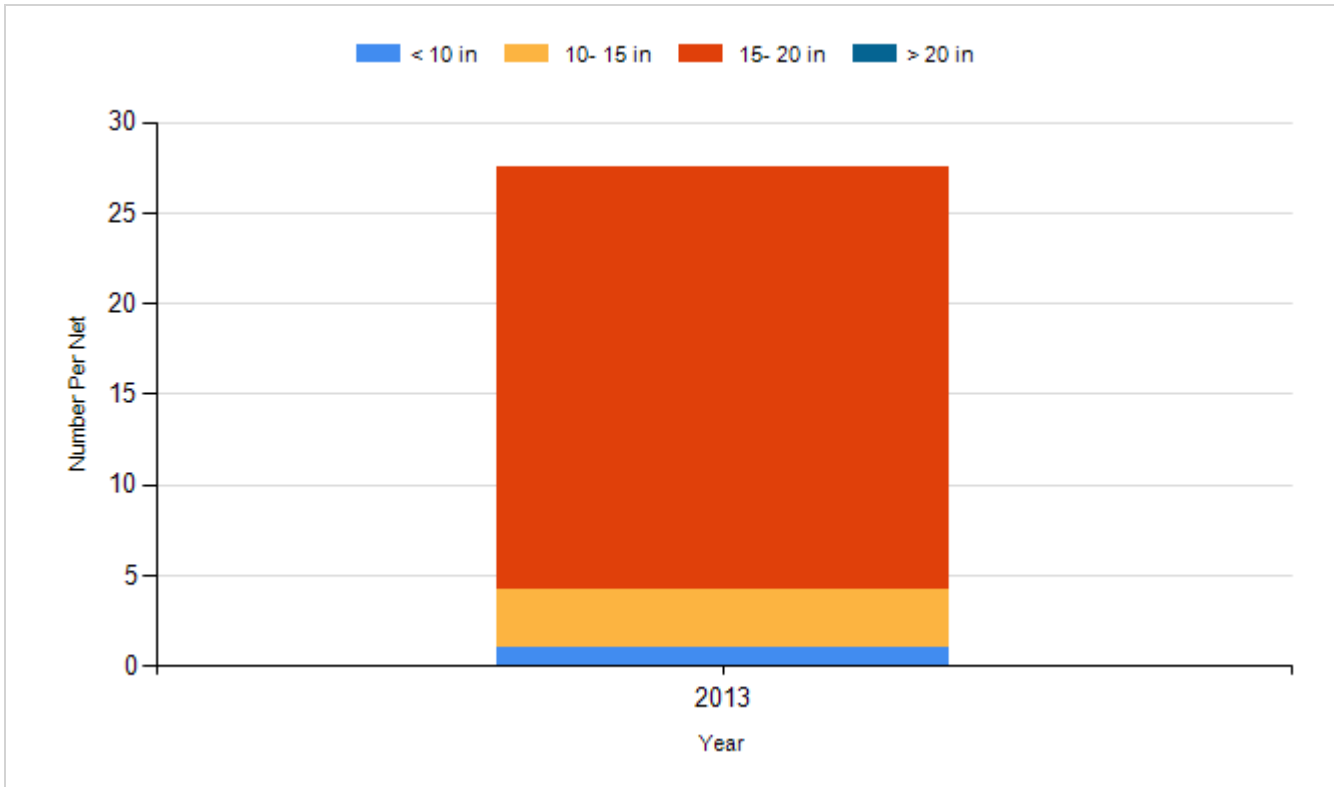
Species: Northern Pike
Gear: std exp gill net



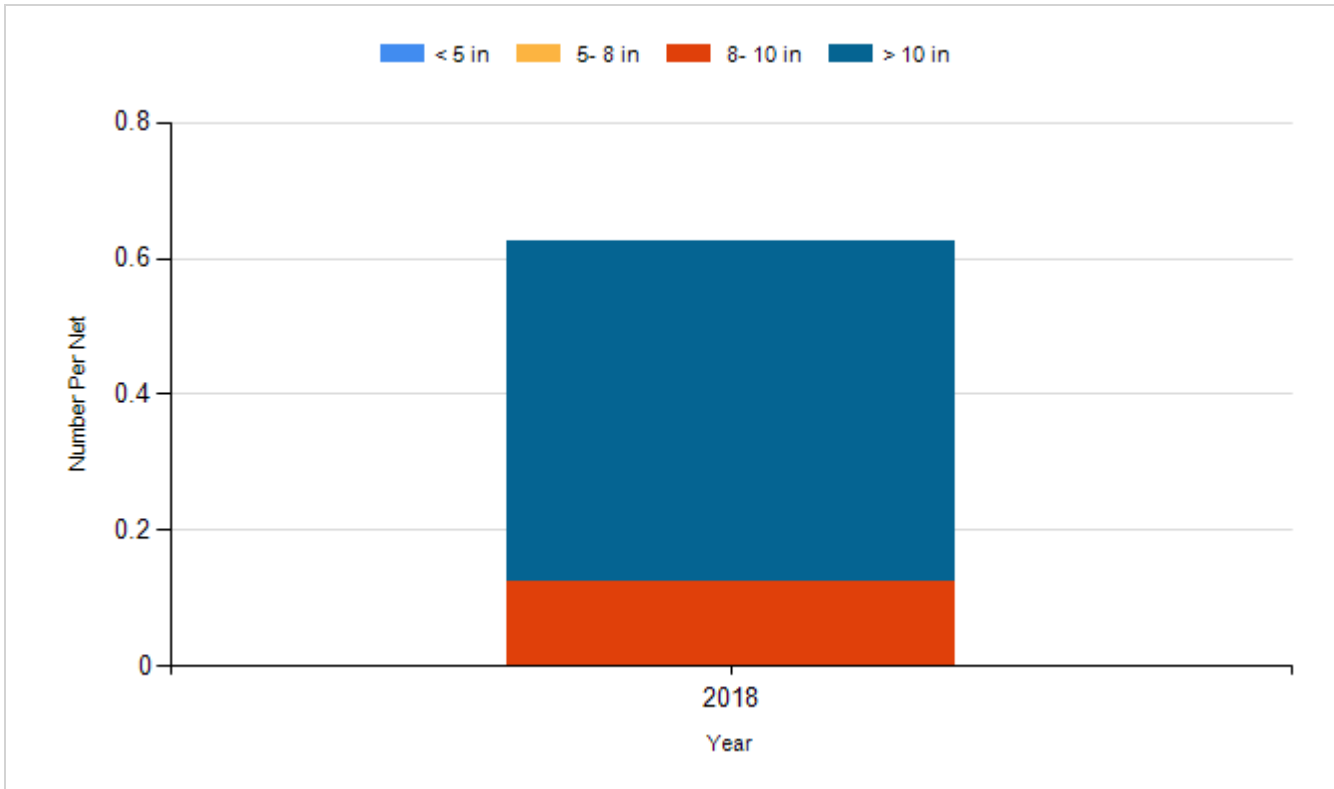
Species: Walleye
Gear: AFS std gill net



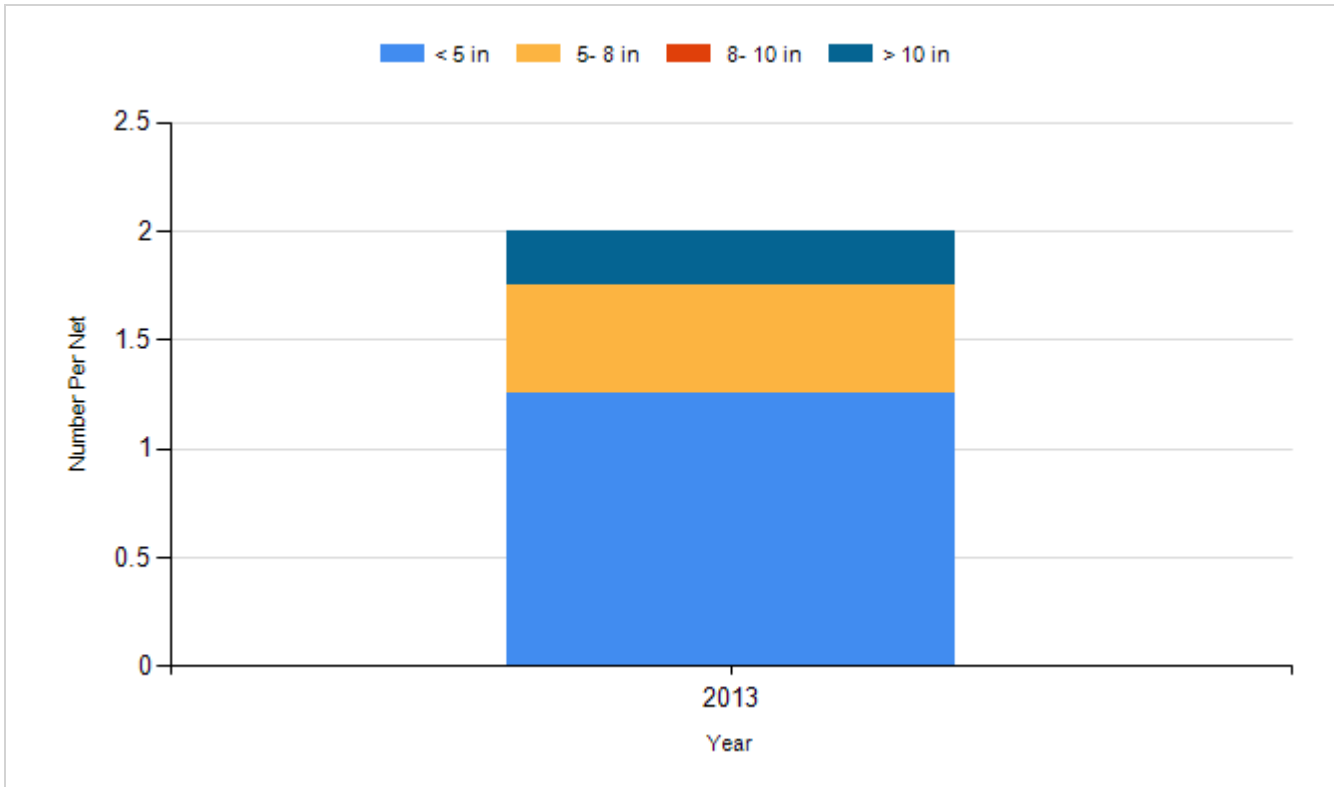
Species: Walleye
Gear: std exp gill net



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
2010	Walleye	Fry	2,000,000
2011	Walleye	Small Fingerling	193,500
2011	Yellow Perch	Adult	3,145
2012	Walleye	Fry	1,000,000
2014	Walleye	Fry	1,110,000