Minnewasta Lake Survey Summary

Minnewasta Lake, located 4.0 miles north and 2.0 miles west of Waubay, is managed as a northern pike, walleye, and yellow perch fishery; other fish species are present and contribute to the fishery.

In three of the last four surveys, gill net catches have been low and there is some question as to how well these net catches represent at-large fish populations in Minnewasta, based on the fishery the lake has provided in recent years. Nonetheless, fisheries surveys represent the only information available to assess fish populations.

- **Northern pike.** At 0.8/gill net, relative abundance was considered low; 10 northern pike ranging in length from 20.9 to 36.6 inches were sampled.

- **Walleye.** Walleyes were not abundant (2.8/gill net). Sampled walleyes ranged in length from 6.7 to 24.8 inches; six year classes (2010, 2012, and 2014 – 2017) were represented. Since 2009, growth has been variable with the mean length of age-4 walleyes ranging from 12.5 to 17.9 inches.

- **Yellow Perch**. Similar to walleyes, yellow perch numbers were low (3.1/gill net). Sampled yellow perch ranged in length from 5.1 to 13.4 inches with most being >8.0 inches; nine year classes (2007, 2009 – 2013, and 2015 – 2017) were represented. Yellow perch appear to be growing well reaching 9.6 inches at age 3 in 2018.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Minnewasta, Day County
UBS-Lake-411-705
2018

Lake Information

Name: Minnewasta

County: Day

Surface Area: 606 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 05, 2018	8 net-nights
AFS std gill net	Jun 07, 2018	4 net-nights

Common Fish Species Present

Yellow Perch

Walleye

White Sucker

Northern Pike

Common Carp

Rock Bass

White Bass

Black Crappie

Black Bullhead

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)
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).

		Abundance		Stock Density Indices				Condition	
Gear	Species	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	0.1	0.1	100		100		86	
	Black Crappie	0.1	0.1	100		0		102	
	Common Carp	0.4	0.4	100		80		99	7
	Northern Pike	0.8	0.3	100		30		77	4
	Rock Bass	0.2	0.2	50		0		112	3
	Walleye	2.8	1.1	38	13	9		90	1
	White Bass	0.1	0.1	100		100		98	
	White Sucker	0.9	0.4	100		100		99	2
	Yellow Perch	3.1	1.1	92		62	12	110	2

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std gill net	Black Bullhead										0.1	0.1
	Black Crappie										0.1	0.1
	Common Carp										0.4	0.4
	Northern Pike										0.8	0.8
	Rock Bass										0.2	0.2
	Walleye										2.8	2.8
	White Bass										0.1	0.1
	White Sucker										0.9	0.9
	Yellow Perch										3.1	3.1
frame net (std 3/4 in)	Black Bullhead	1.3			13.2							7.3
	Black Crappie	0.0			3.4							1.7
	Common Carp	0.2			0.1							0.2
	Northern Pike	0.2			0.5							0.4
	Orangespotted Sunfish	0.0			0.0							0.0
	Rock Bass	0.0			0.2							0.1
	Smallmouth Bass	0.0			0.1							0.1
	Walleye	0.3			5.6							3.0
	White Bass	0.1			2.8							1.5
	White Sucker	0.5			0.5							0.5
	Yellow Perch	0.1			0.4							0.3
std exp gill net	Black Bullhead	0.2			3.0			1.7				1.6
	Black Crappie	0.0			0.2			0.0				0.1
	Common Carp	0.3			0.2			0.0				0.2
	Northern Pike	0.0			2.8			0.2				1.0
	Orangespotted Sunfish	0.2			0.0			0.0				0.1
	Spottail Shiner	0.2			0.0			0.0				0.1
	Walleye	3.3			24.0			0.8				9.4
	White Bass	0.2			0.0			0.0				0.1
	White Sucker	0.7			1.7			1.2				1.2
	Yellow Perch	3.2			4.8			1.7				3.2

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std gill net	Northern Pike	PSD										100
		PSD-P										30
		Wr										77
	Walleye	PSD										38
		PSD-P										9
		Wr										90
	Yellow Perch	PSD										92
		PSD-P										62
		Wr										110
std exp gill net	Northern Pike	PSD				88			0			
		PSD-P				18			0			
		Wr				86			72			
	Walleye	PSD	45			13			40			
		PSD-P	5			2			0			
		Wr	95			90			82			
	Yellow Perch	PSD	71			97			100			
		PSD-P	6			76			80			
		Wr	104			112			103			

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	38	196 (4)	285 (11)	341 (7)	380 (11)		454 (1)		539 (4)		
2015	5				317 (3)	389 (2)					
2012	147	193 (3)	317 (126)	443 (3)	454 (12)	493 (1)		571 (2)			
2009	22	202 (2)	318 (10)	375 (1)	428 (7)	442 (1)					662 (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+
2018	37	133 (2)	209 (6)	245 (10)		289 (2)	289 (4)	293 (8)	294 (3)	334 (1)	340 (1)
2015	10			215 (1)	283 (7)		317 (2)				
2012	43	101 (14)	212 (4)	259 (8)	299 (11)	306 (5)		339 (1)			
2009	17	112 (1)	210 (16)								

Fish Condition

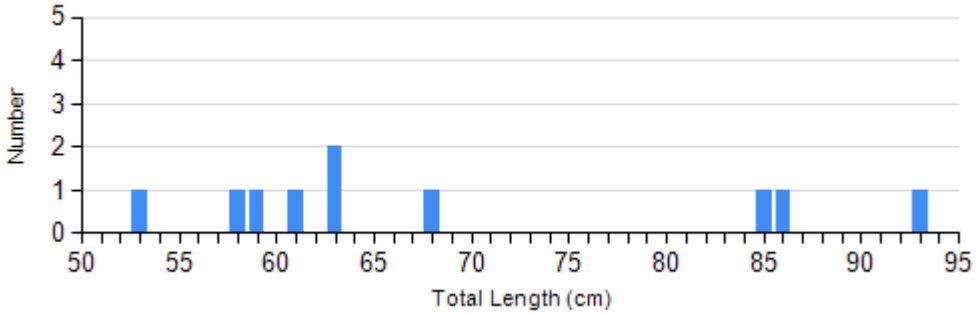
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2015	1	72	0		0		0	
	2018	0		7	74 (3.2)	1	79	2	86 (2.8)
Walleye Gill Net	2015	3	86 (0.5)	2	77 (0.2)	0		0	
	2018	21	90 (1.3)	10	90 (1.6)	2	85 (3.0)	1	91
Yellow Perch Gill Net	2015	0		2	110 (1.6)	5	98 (2.5)	3	106 (6.7)
	2018	3	117 (0.6)	11	115 (2.7)	14	108 (2.1)	9	104 (2.6)

Length Frequency Distribution

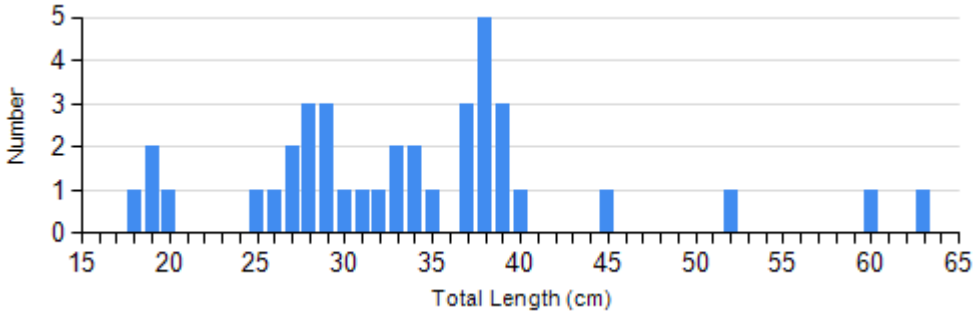
Length frequency histogram of species sampled by year.

Species: Northern Pike
Gear: AFS std gill net



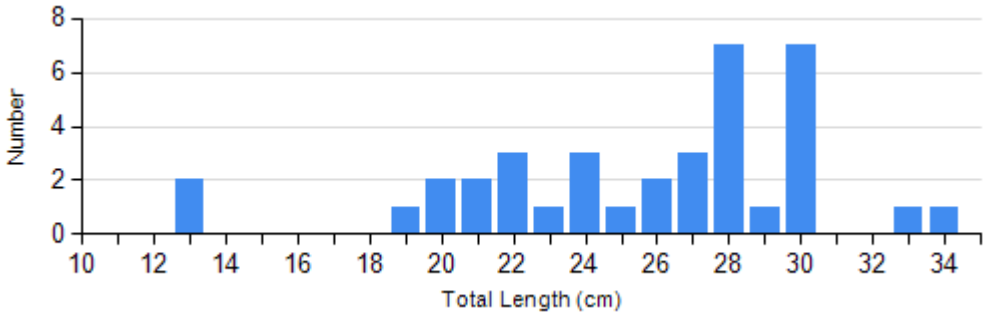
2018

Species: Walleye
Gear: AFS std gill net



2018

Species: Yellow Perch
Gear: AFS std gill net

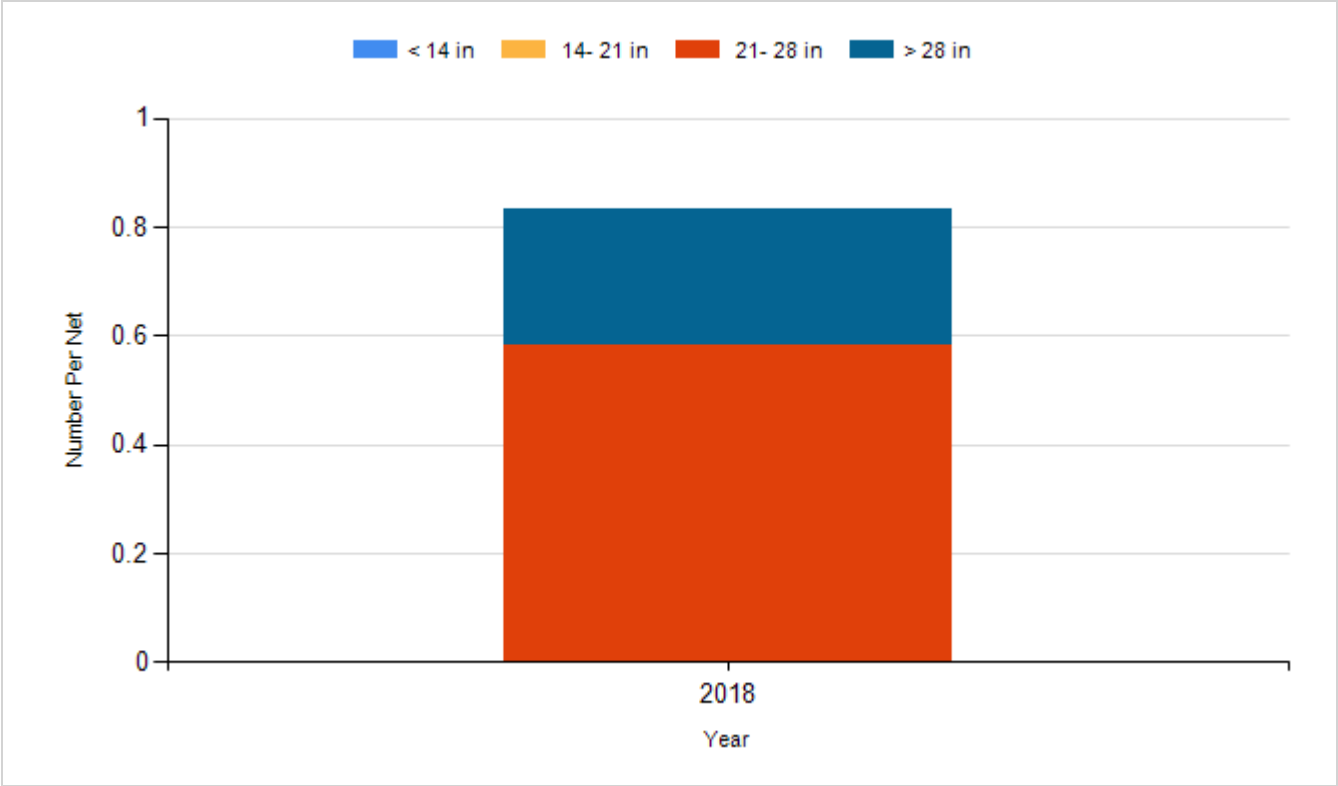


2018

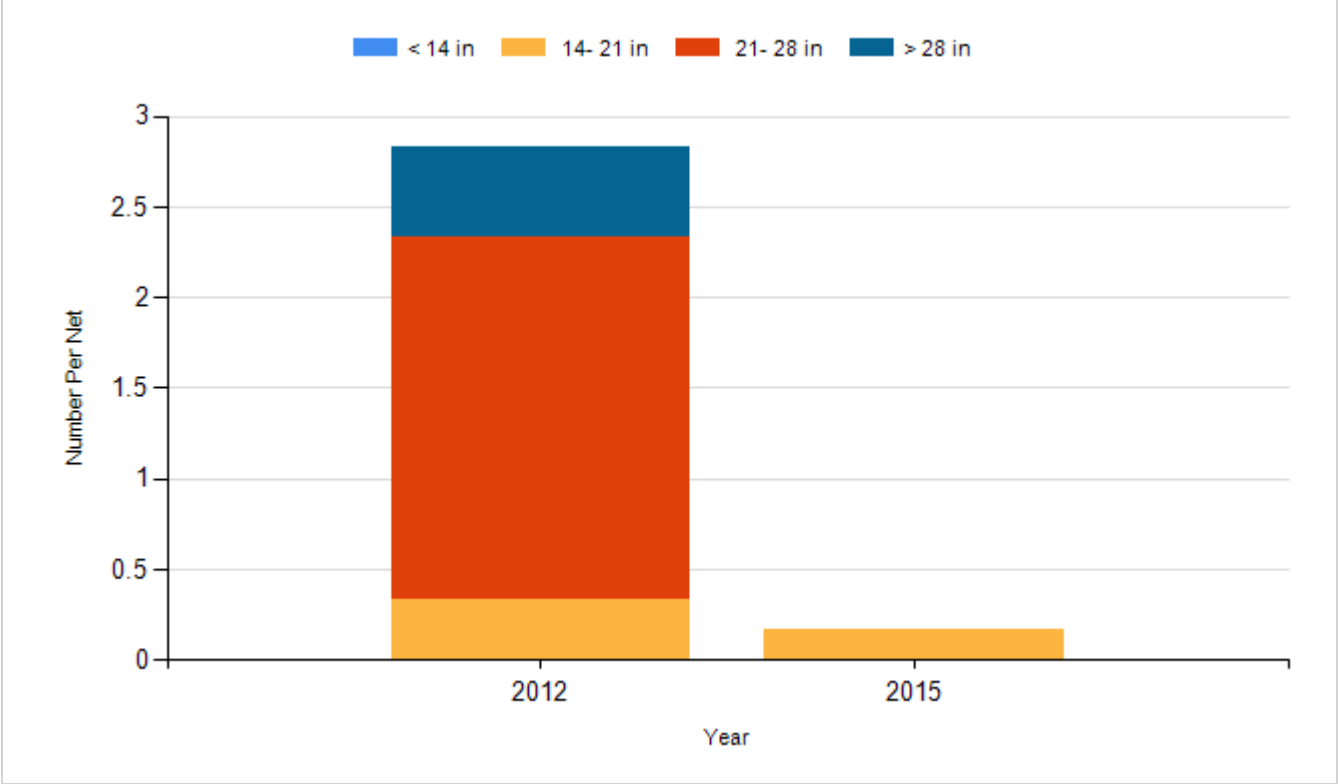
Historic Fish Sizes and Relative Abundance

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

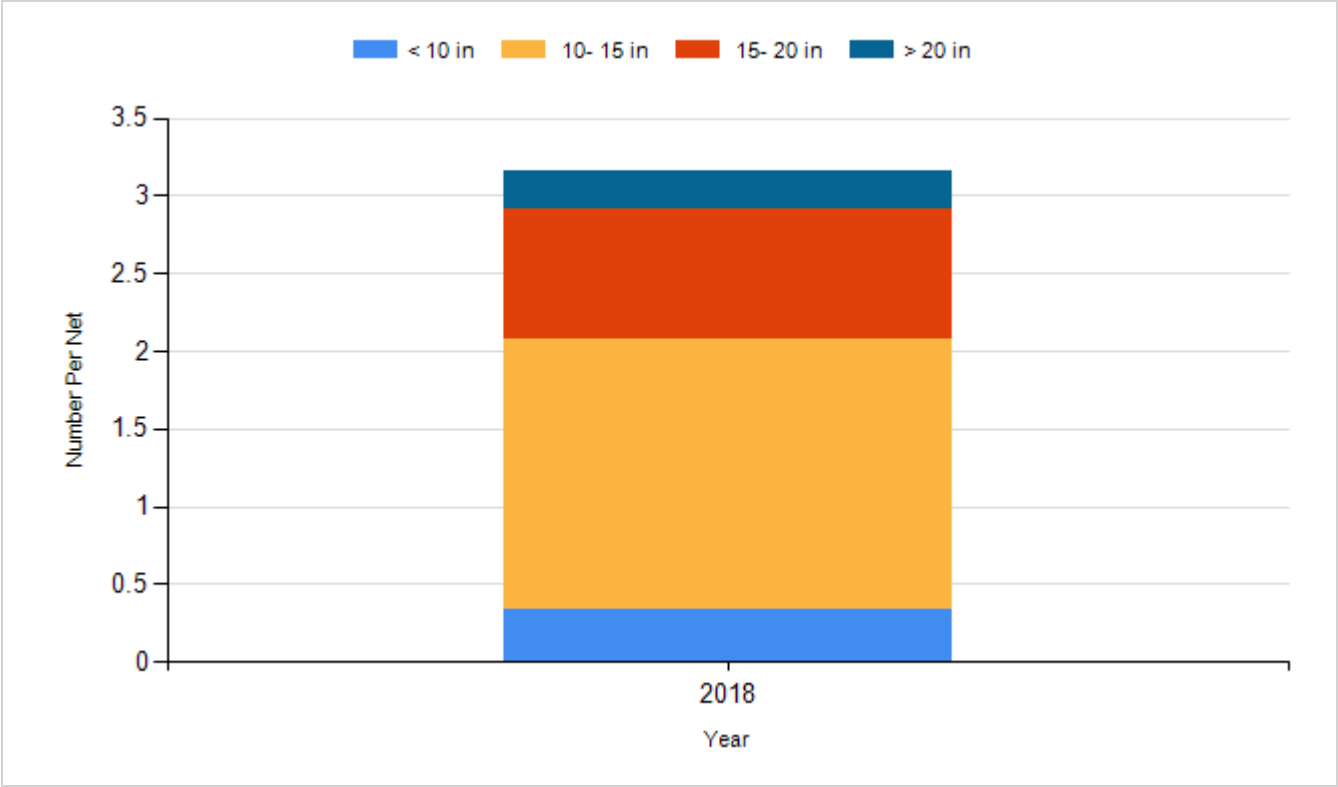
Species: Northern Pike
Gear: AFS std gill net



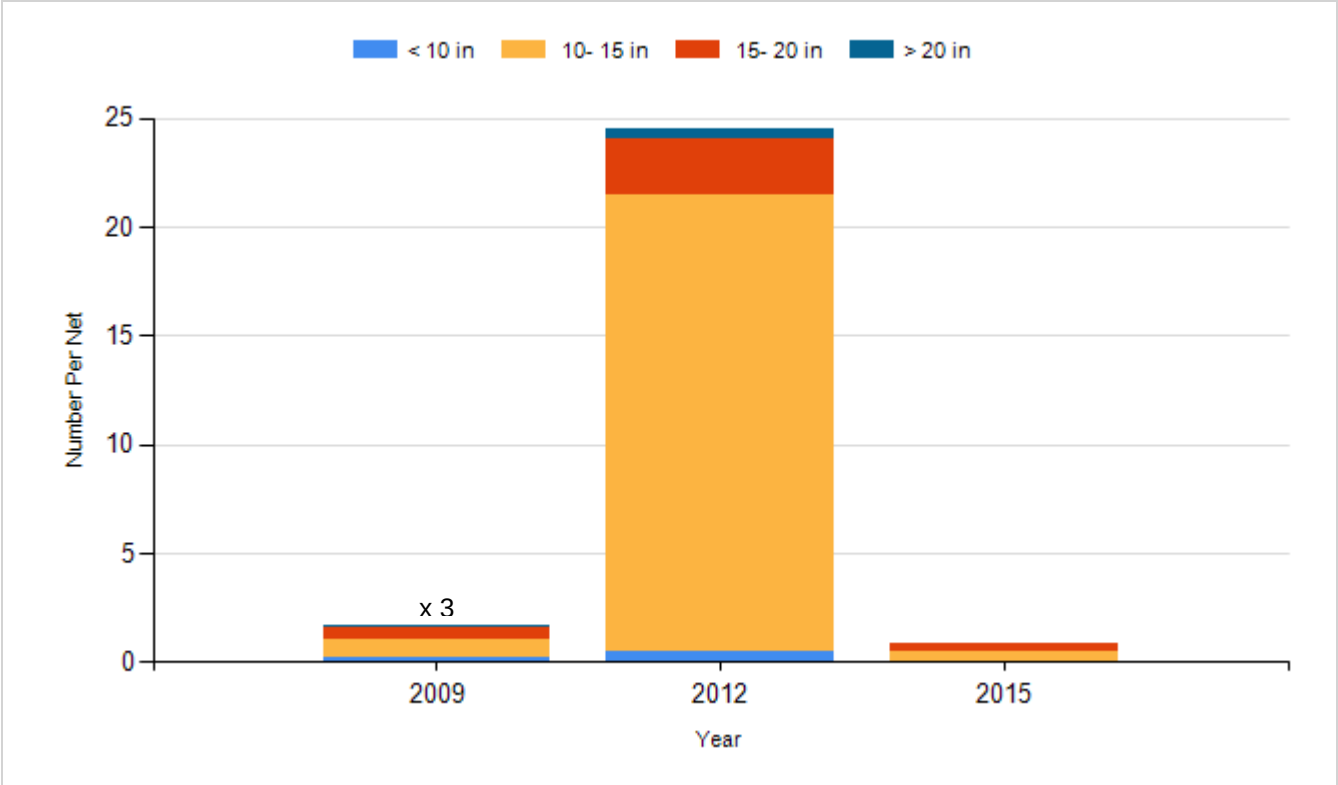
Species: Northern Pike
Gear: std exp gill net



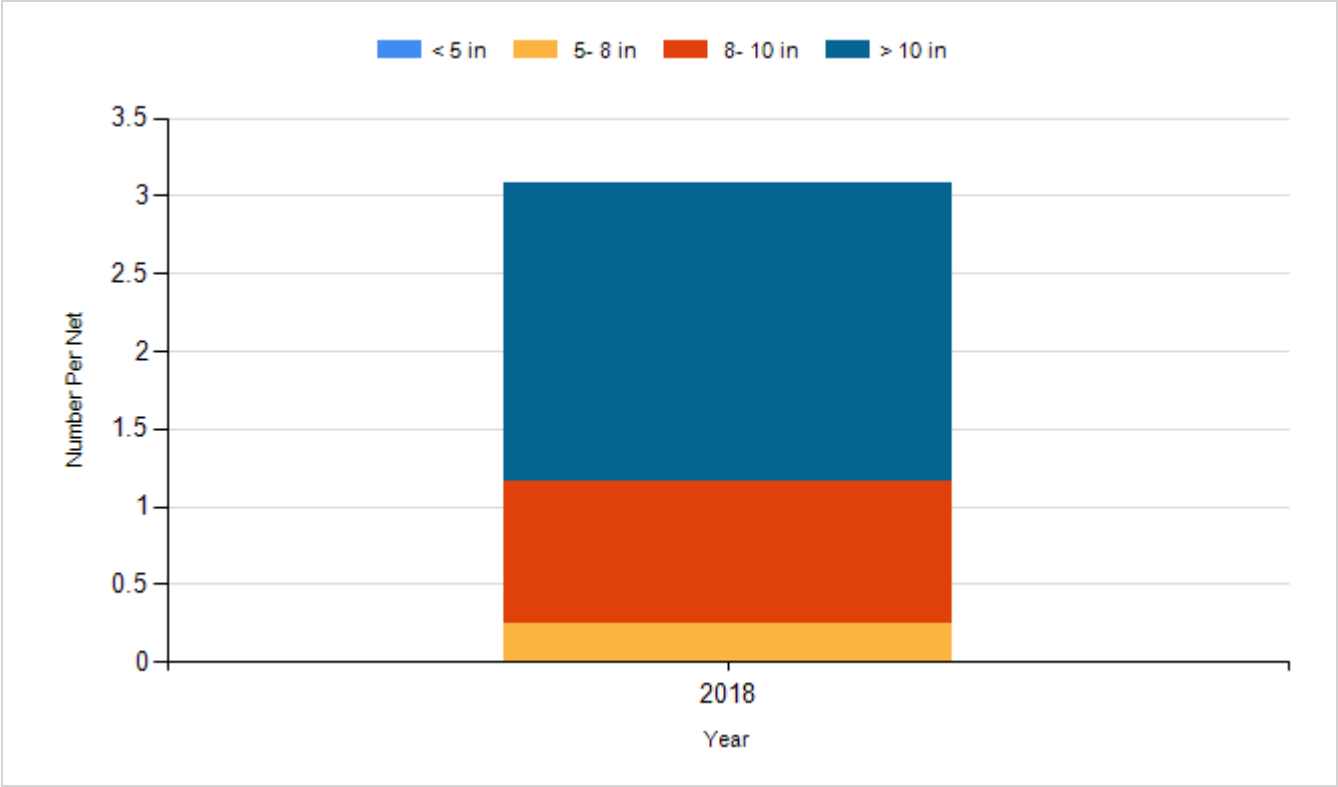
Species: Walleye
Gear: AFS std gill net



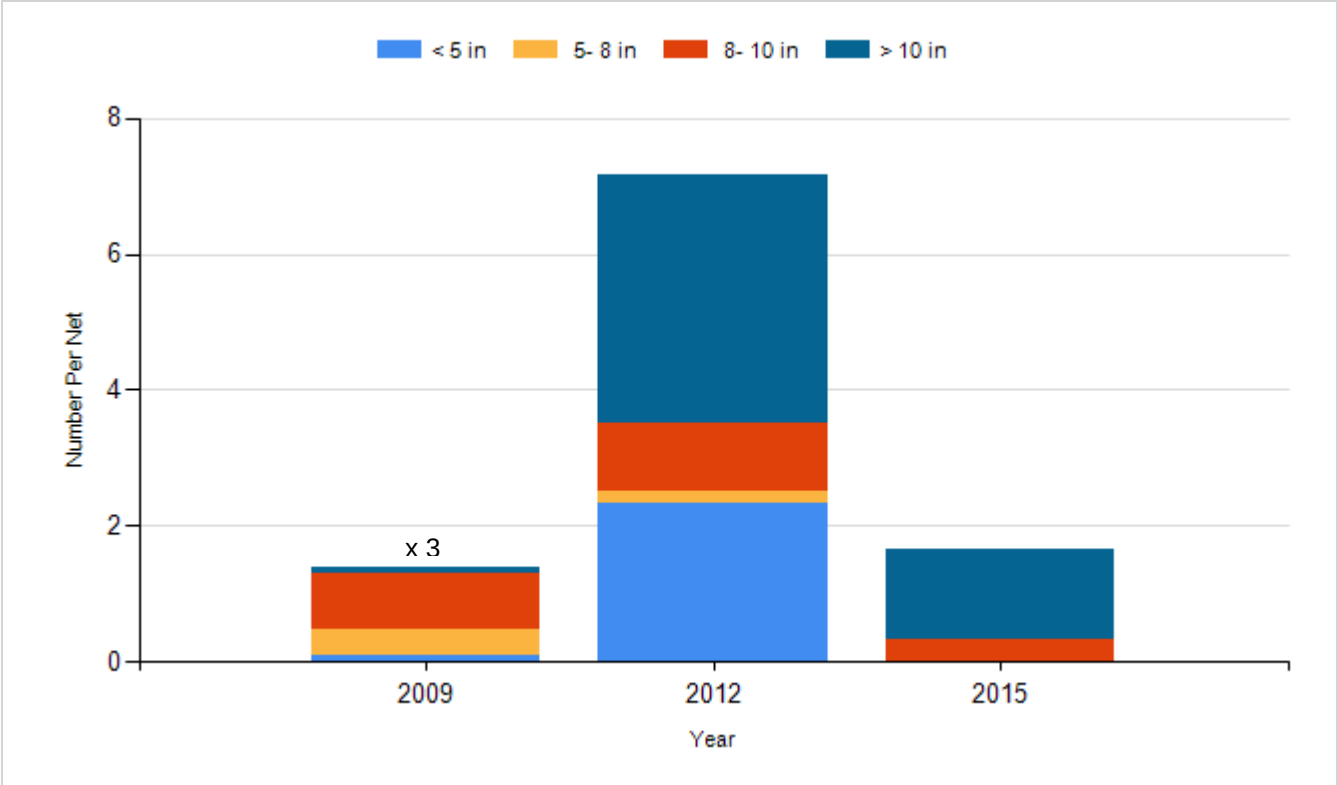
Species: Walleye
Gear: std exp gill net



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
2009	Walleye	Fry	350,000
	Yellow Perch	Fingerling	9,690
2011	Walleye	Fry	300,000
2013	Walleye	Fry	300,000
2014	Walleye	Fry	300,000
2015	Walleye	Fry	300,000
2016	Yellow Perch	Fingerling	10,980
2017	Walleye	Fry	300,000
	Yellow Perch	Fry	200,000
2018	Yellow Perch	Fingerling	26,750