South Red Iron Survey Summary

South Red Iron, located 8.0 miles southeast of Lake City, is primarily managed as a northern pike, walleye, and yellow perch fishery; other fish species are present and also contribute to the fishery.

- **Northern pike.** At 1.8/gill net, relative abundance of northern pike was considered moderate; those sampled ranged in length from 15.7 to 26.0 inches.

- **Walleye.** Despite the stocking of more than 47,000 large fingerlings since 2010, walleye numbers have remained low. In 2018, the mean gill net CPUE was 2.2. Sampled walleyes ranged in length from 7.9 to 27.6 inches; eight year classes (2009 – 2015, and 2017), each represented by a low number of individuals, were present. Walleyes appear to grow well with mean length at capture values $\geq$18.1 inches at age 4 in surveys conducted since 2009.

- **Yellow perch**. Yellow perch were not abundant (5.5/gill net). Sampled yellow perch ranged in length from 5.1 to 7.9 inches; two year classes (2016 and 2017) were present. Those from the 2016 (age-2) cohort, which had a mean length of 6.3 inches, were the most numerous.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Red Iron South, Marshall County
UJA-Lake-917-002
2018

Lake Information

Name: Red Iron South

County: Marshall

Surface Area: 661 Acres

Maximum Depth: 15 Feet

Mean Depth: 8 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 19, 2018	8 net-nights
AFS std gill net	Jun 21, 2018	3 net-nights

Common Fish Species Present

Walleye

Smallmouth Bass

Northern Pike

Largemouth Bass

Yellow Perch

Black Bullhead

White Sucker

Bluegill

Black Crappie

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.
- 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	3.1	1.0	82	10	76	11	93	3
	Black Crappie	0.5	0.3	50		50		106	8
	Bluegill	0.5	0.2	0		0		115	8
	Common Carp	0.3	0.3	100		67		105	8
	Largemouth Bass	0.1	0.1	100		100		120	
	Northern Pike	1.8	0.5	70	17	0		86	1
	Smallmouth Bass	0.9	0.5	100		100		102	3
	Walleye	2.2	1.0	100		58	16	91	1
	White Sucker	0.8	0.4	100		100		103	3
	Yellow Perch	5.5	1.7	2		0		99	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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std gill net	Black Bullhead										3.1	3.1
	Black Crappie										0.5	0.5
	Bluegill										0.5	0.5
	Common Carp										0.3	0.3
	Largemouth Bass										0.1	0.1
	Northern Pike										1.8	1.8
	Smallmouth Bass										0.9	0.9
	Walleye										2.2	2.2
	White Sucker										0.8	0.8
	Yellow Perch										5.5	5.5
frame net (std 3/4 in)	Black Bullhead	0.4			15.9			49.9				22.1
	Black Crappie	1.0			1.3			0.5				0.9
	Bluegill	2.4			3.6			0.5				2.2
	Common Carp	0.1			0.1			0.0				0.1
	Northern Pike	0.4			1.3			0.4				0.7
	Smallmouth Bass	0.4			0.7			0.4				0.5
	Walleye	0.1			0.1			0.0				0.1
	White Sucker	0.2			0.1			0.5				0.3
	Yellow Perch	0.0			1.6			0.1				0.6
std exp gill net	Black Bullhead	0.0			26.5			96.3				40.9
	Black Crappie	0.5			1.2			1.5				1.1
	Northern Pike	6.0			12.0			3.0				7.0
	Smallmouth Bass	0.2			1.5			1.8				1.2
	Walleye	3.8			5.5			4.3				4.5
	White Sucker	4.8			6.8			2.0				4.5
	Yellow Perch	4.2			24.5			3.5				10.7

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										70
		PSD-P										0
		Wr										86
	Walleye	PSD										100
		PSD-P										58
		Wr										91
	Yellow Perch	PSD										2
		PSD-P										0
		Wr										99
std exp gill net	Northern Pike	PSD	53			49			67			
		PSD-P	8			3			17			
		Wr	90			88			79			
	Walleye	PSD	100			33			65			
		PSD-P	35			6			8			
		Wr	86			94			91			
	Yellow Perch	PSD	0			3			33			
		PSD-P	0			1			0			
		Wr	103			103			101			

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	25	206 (1)		431 (3)	463 (2)	517 (6)	525 (5)	567 (3)	558 (3)	695 (2)	
2015	28	138 (2)	325 (8)	407 (11)	460 (1)	499 (5)	502 (1)				
2012	34	245 (2)	342 (22)	460 (7)	521 (3)						
2009	34	196 (11)		408 (8)	462 (6)		552 (5)		559 (2)		613 (2)

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	61		160 (59)	200 (2)							
2015	23	98 (1)	140 (14)	171 (1)	225 (2)	227 (5)					
2012	157	92 (3)	144 (107)	176 (41)	201 (6)						
2009	33	95 (6)	142 (27)								

Fish Condition

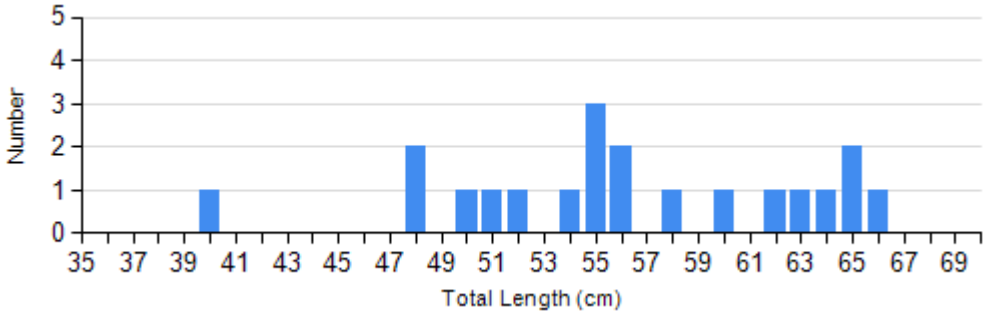
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	6	80 (1.6)	9	75 (2.5)	2	85 (10.1)	1	88
	2018	6	89 (1.3)	14	85 (1.3)	0		0	
Walleye Gill Net	2015	9	91 (1.7)	15	91 (1.3)	2	90 (4.7)	0	
	2018	0		10	90 (1.2)	12	93 (1.2)	2	84 (9.3)
Yellow Perch Gill Net	2015	14	102 (1.5)	7	99 (1.9)	0		0	
	2018	60	99 (0.7)	1	83	0		0	

Length Frequency Distribution

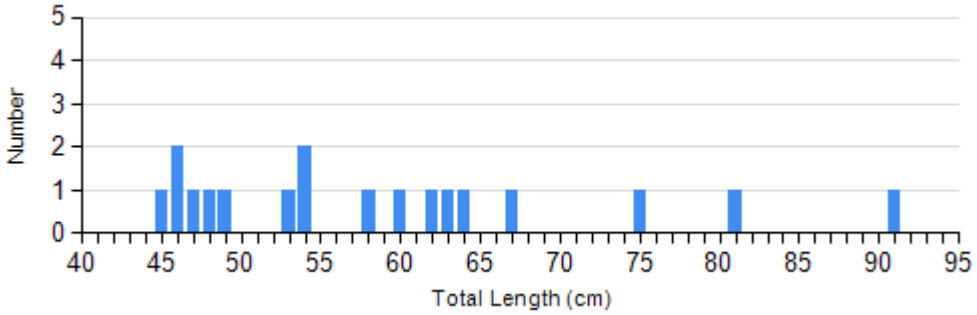
Length frequency histogram of species sampled by year.

Species: Northern Pike
Gear: AFS std gill net



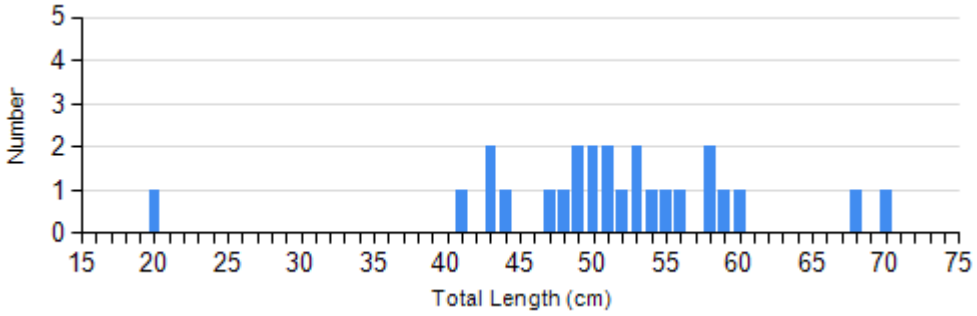
2018

Species: Northern Pike
Gear: std exp gill net



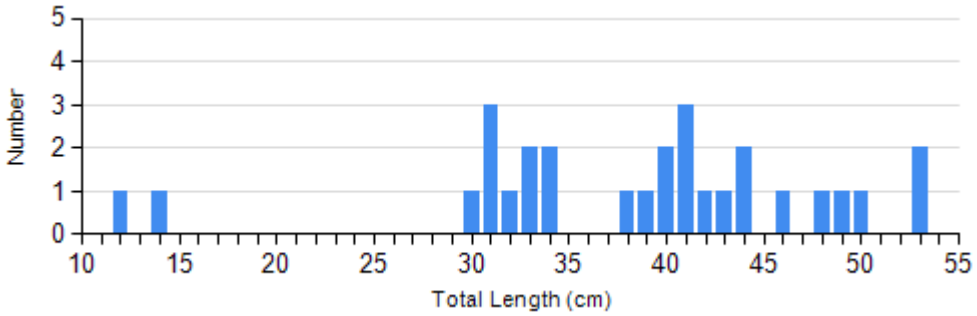
2015

Species: Walleye
Gear: AFS std gill net



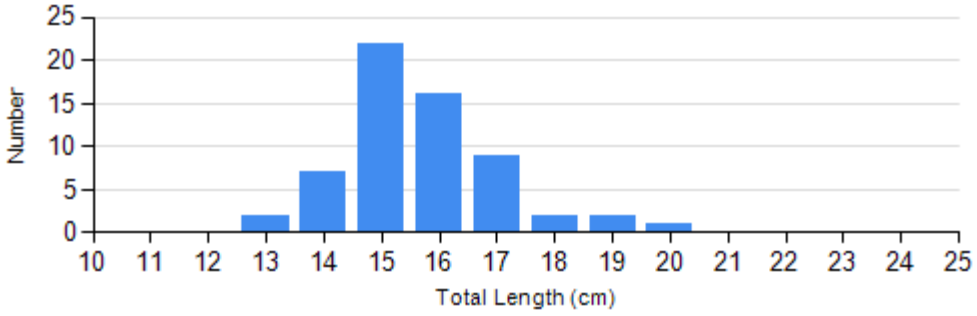
2018

Species: Walleye
Gear: std exp gill net



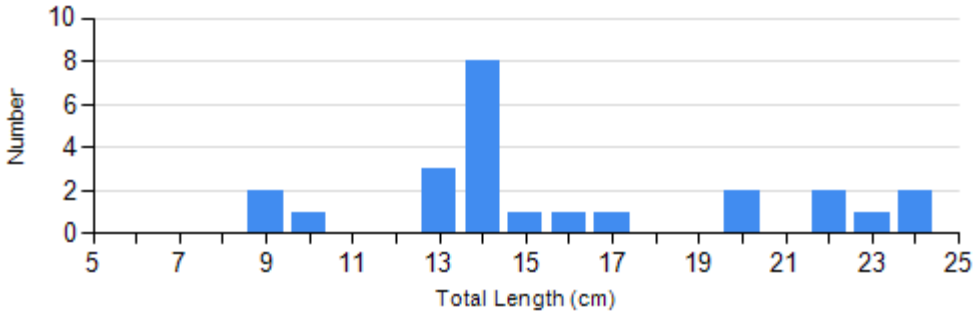
2015

Species: Yellow Perch
Gear: AFS std gill net



2018

Species: Yellow Perch
Gear: std exp gill net

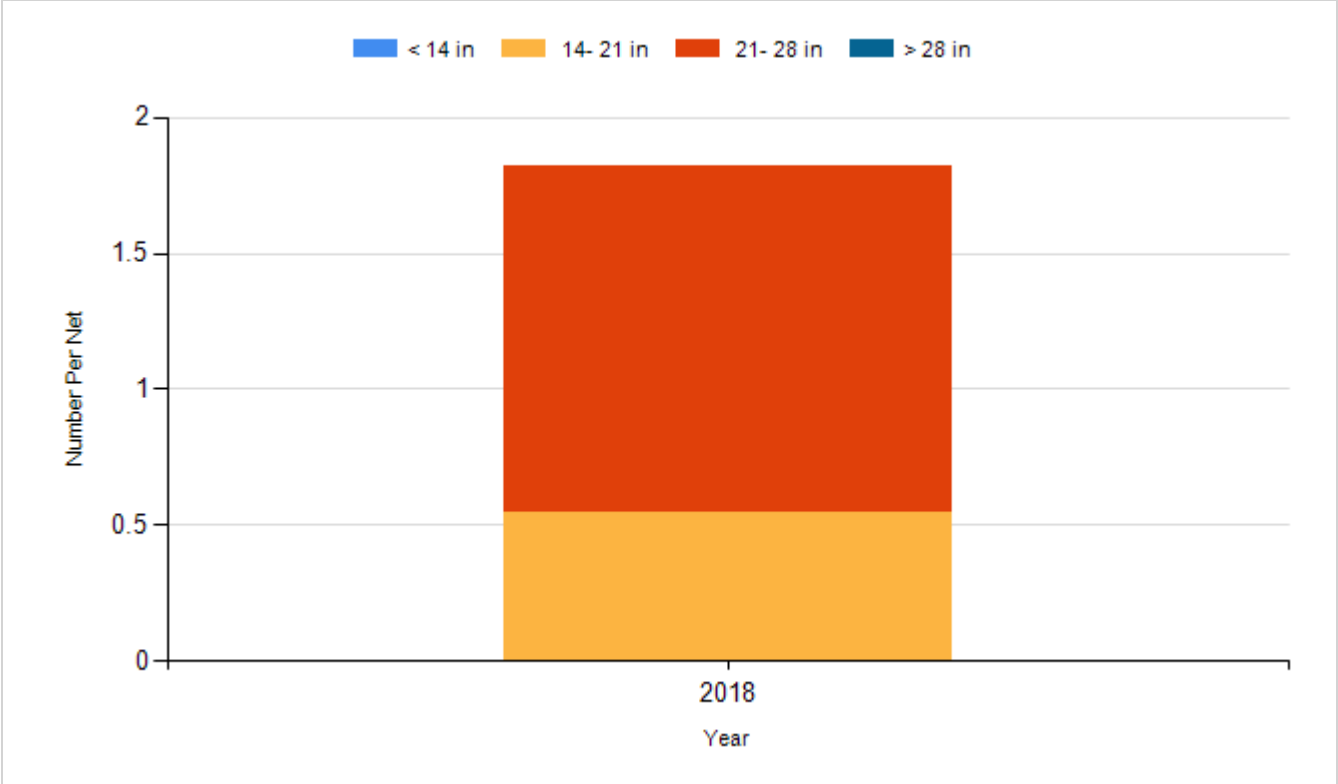


2015

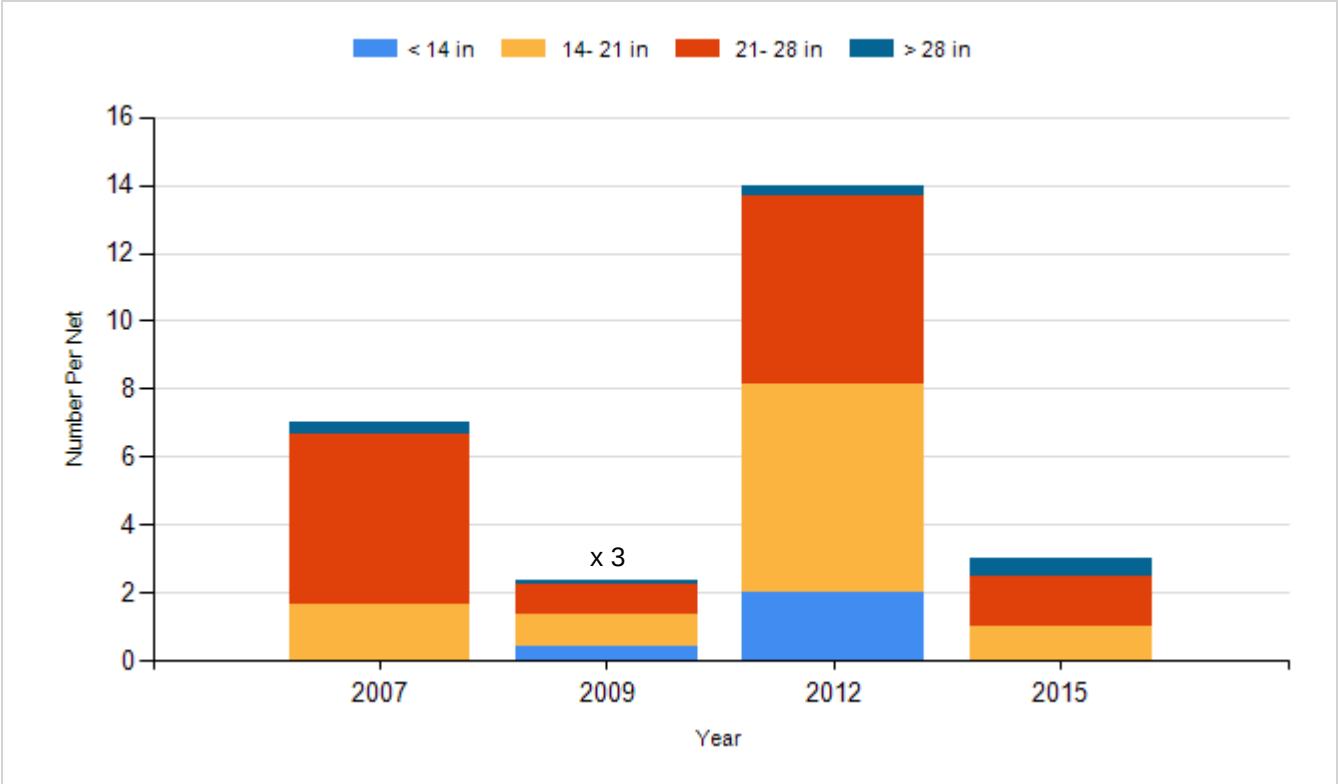
Historic Fish Sizes and Relative Abundance

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

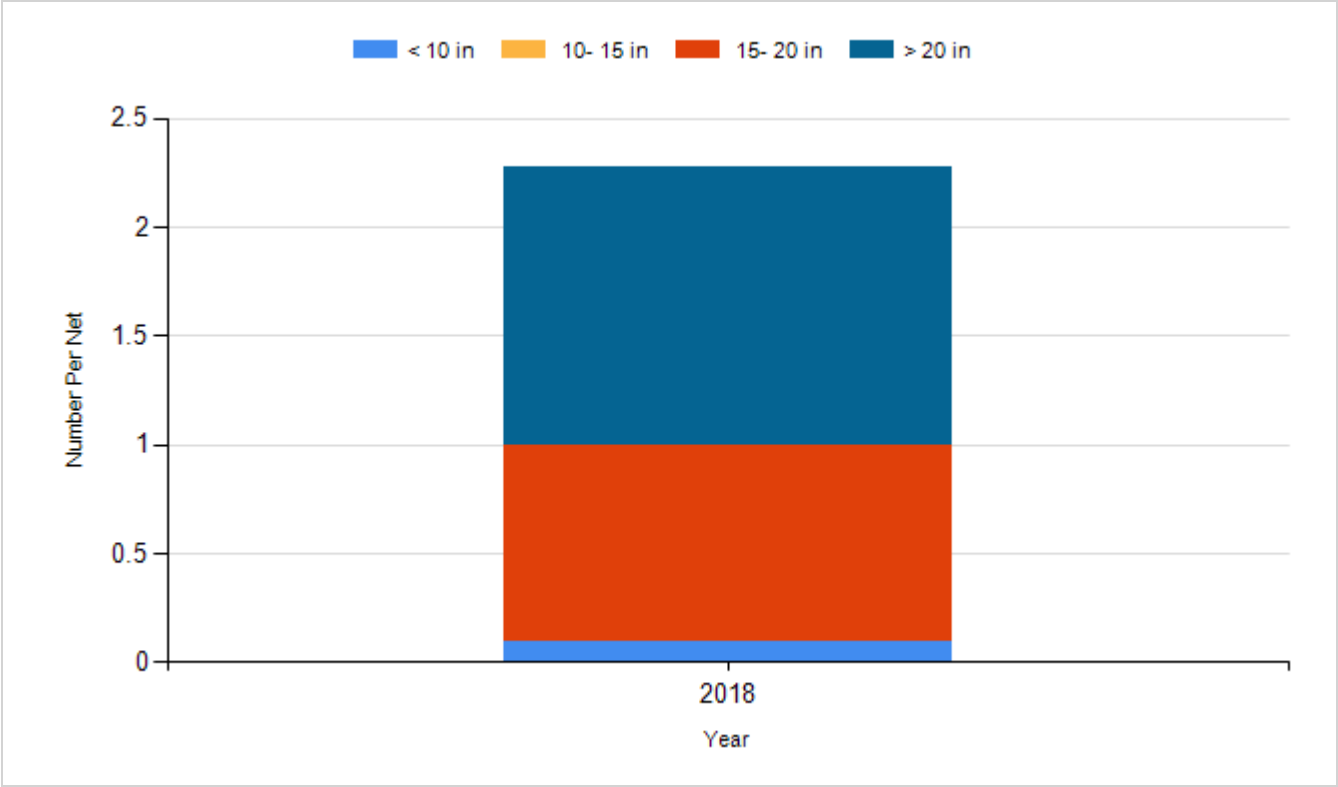
Species: Northern Pike
Gear: AFS std gill net



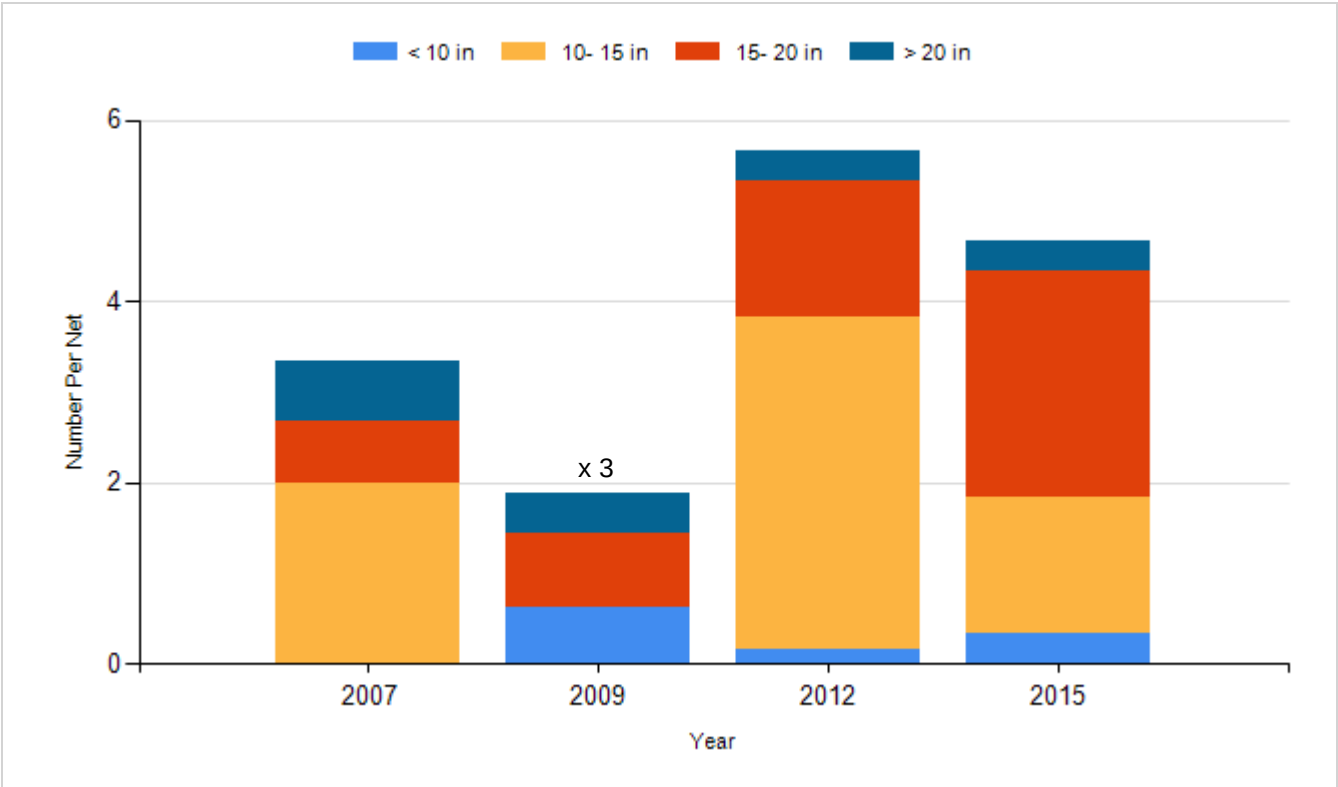
Species: Northern Pike
Gear: std exp gill net



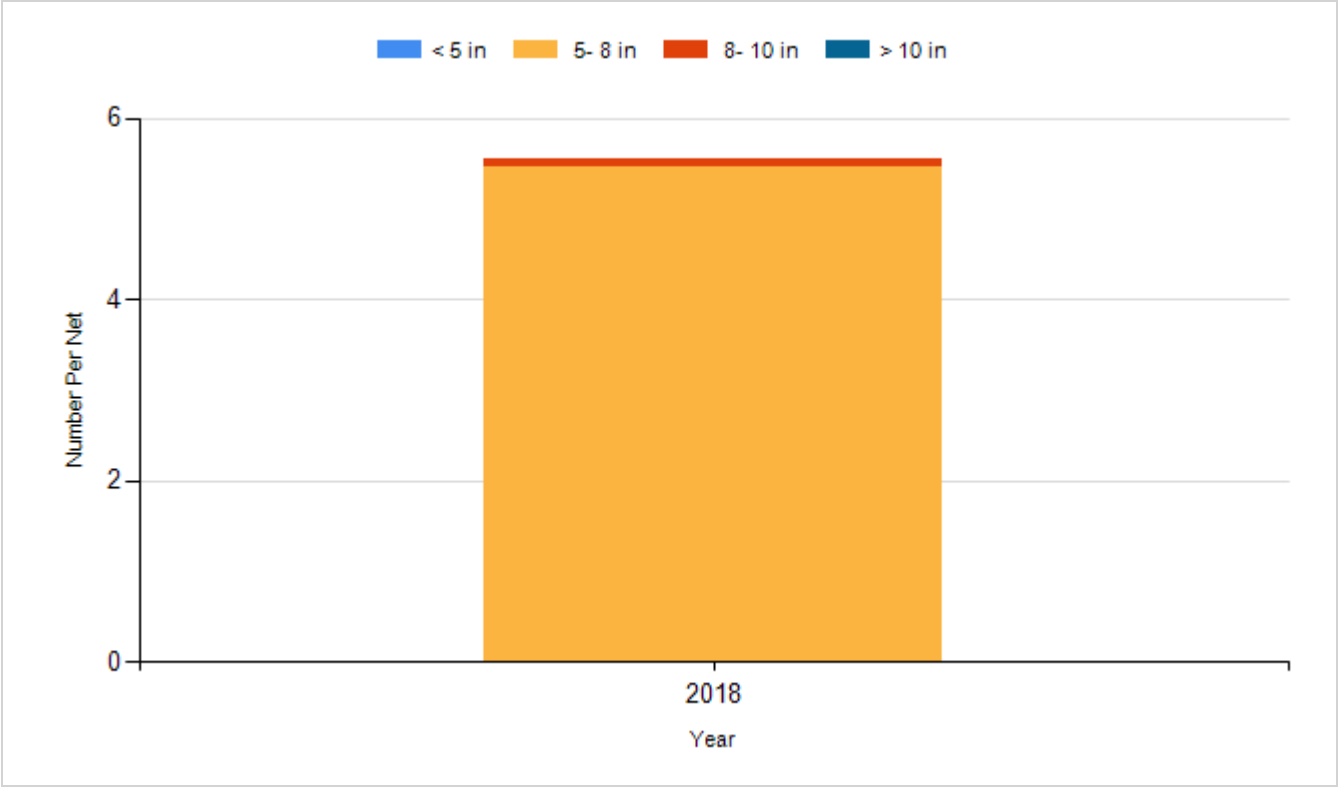
Species: Walleye
Gear: AFS std gill net



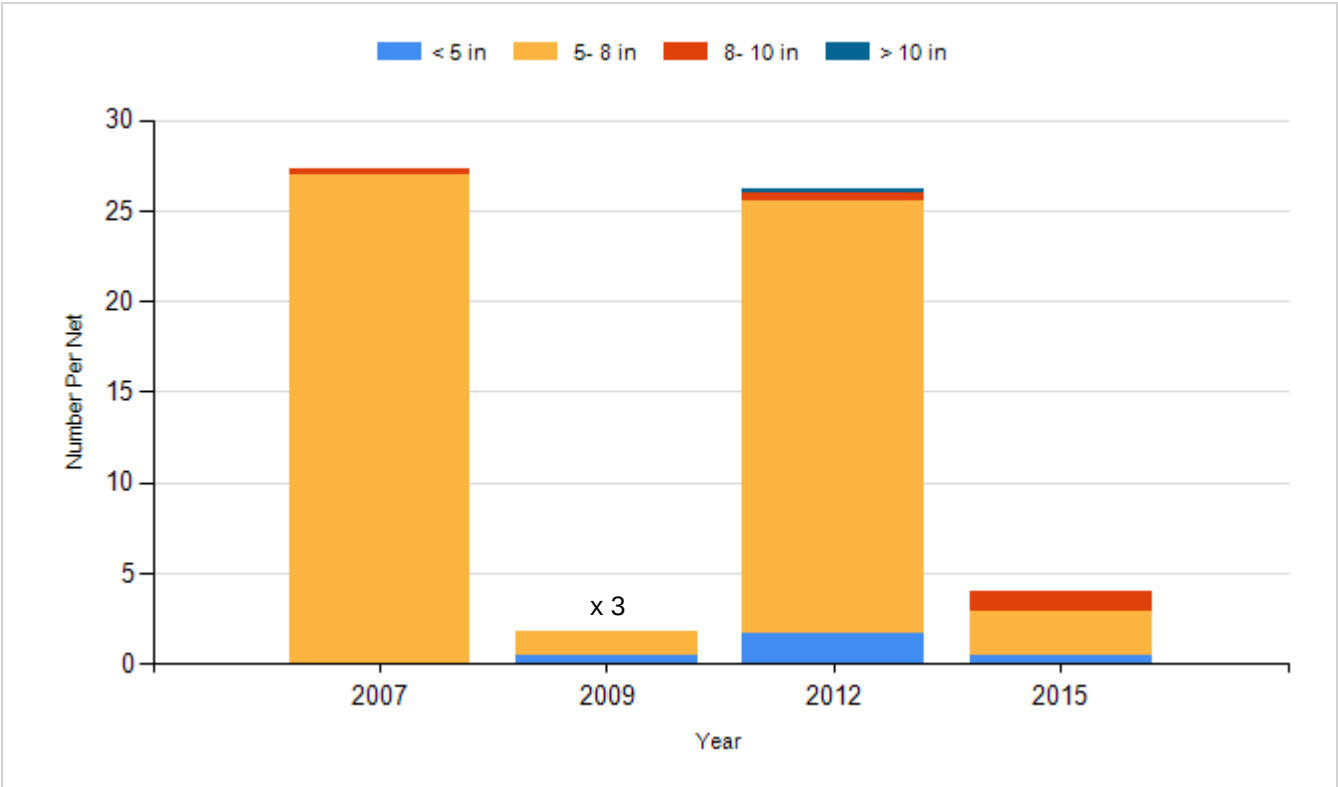
Species: Walleye
Gear: std exp gill net



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
2008	Walleye	Large Fingerling	12,638
2010	Walleye	Large Fingerling	16,687
2012	Walleye	Large Fingerling	7,380
2014	Walleye	Large Fingerling	11,224
2017	Walleye	Fry	300,000