

Middle Lynn Survey Summary

Middle Lynn, located 6.5 miles west, 2.5 miles south, and 0.5 miles west of Roslyn, is primarily managed as a muskellunge, walleye, and yellow perch fishery; other fish species are present and contribute to the fishery.

- **Muskellunge.** Adult muskellunge, likely migrants from Lynn Lake during high water conditions, were present in Middle Lynn Lake prior to fingerling stockings in 2015 and 2017. Abundance is low and muskellunge have proven difficult to sample. In 2018, Middle Lynn Lake was used as an egg source for walleye spawning operations; both large and small frame nets were used to collect walleye broodstock and muskellunge for an extended period of time following ice out. Eight muskellunge that ranged in length from 12.3 to 27.9 inches were sampled. No muskellunge have been sampled in standard fisheries surveys conducted from 2012 - 2018.
- **Walleye.** Walleye numbers were low (1.8/gill net). Sampled walleyes ranged in length from 5.9 to 29.1 inches; 11 year classes (2003, 2006 – 2010, and 2013 – 2017), each represented by a few (i.e., <10) individuals, were present.
- **Yellow Perch.** At 3.6/gill net, yellow perch relative abundance was considered low. Sampled yellow perch ranged in length from 5.1 to 11.0 inches; three cohorts (2015 – 2017) were represented. Those from the 2016 (age-2) cohort, which had a mean length of 8.0 inches, were the most numerous.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Middle Lynn, Day County

MUD-Lake-308-001

2018

Lake Information

Name: Middle Lynn **Maximum Depth:** 24 Feet
County: Day
Surface Area: 1,037 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 01, 2018	4 net-nights
AFS std gill net	May 30, 2018	4 net-nights
AFS std gill net	May 31, 2018	4 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Northern Pike

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.
- **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).

* **Methods/Species that ignore stock length**

Gear	Species	Abundance		Stock Density Indices			Condition		
		CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	0.3	0.3	100		100		103	4
	Northern Pike	0.1	0.1	100		100		86	
	Walleye	1.8	1.0	71	16	43	17	91	3
	Yellow Perch	3.6	1.5	58	11	9		102	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.

Gear	Species	CPUE										Avg
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	Black Bullhead										0.3	0.3
	Northern Pike										0.1	0.1
	Walleye										1.8	1.8
	Yellow Perch										3.6	3.6
frame net (std 3/4 in)	Black Bullhead				11.2							11.2
	Black Crappie				0.1							0.1
	Bluegill				0.4							0.4
	Walleye				1.8							1.8
	Yellow Perch				84.3							84.3
std exp gill net	Black Bullhead				0.7			1.5				1.1
	Northern Pike				0.0			0.3				0.2
	Walleye				1.8			5.7				3.8
	Yellow Perch				177.2			11.8				94.5

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	Walleye	PSD											71
		PSD-P											43
		Wr											91
	Yellow Perch	PSD											58
		PSD-P											9
		Wr											102
std exp gill net	Walleye	PSD				55				3			
		PSD-P					0			0			
		Wr					95			89			
	Yellow Perch	PSD				31				87			
		PSD-P				10				80			
		Wr				99				94			

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	30	174 (9)	299 (5)	377 (1)	478 (1)	498 (5)			555 (2)	643 (2)	694 (5)
2015	35	140 (2)	296 (32)		458 (1)						
2012	59	200 (44)	340 (13)	375 (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	43	133 (8)	204 (30)	269 (5)							
2015	71	136 (1)	163 (8)	274 (3)	269 (44)	280 (14)					
2012	1782	101 (727)	176 (839)	239 (164)	271 (43)	267 (10)					

Fish Condition

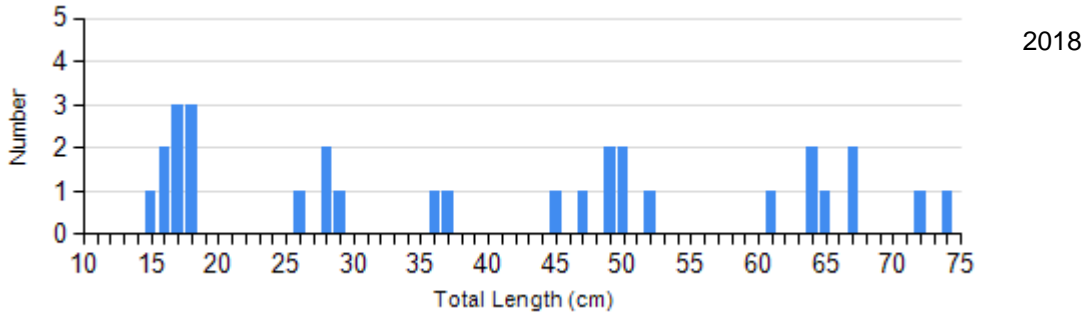
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Walleye Gill Net	2015	33	89 (1.6)	1	91	0		0	
	2018	6	99 (1.4)	6	95 (2.7)	2	85 (3.2)	7	82 (2.4)
Yellow Perch Gill Net	2015	9	100 (3.2)	5	90 (2.4)	55	93 (0.8)	2	95 (4.1)
	2018	18	106 (2.5)	21	99 (1.2)	4	95 (3.5)	0	

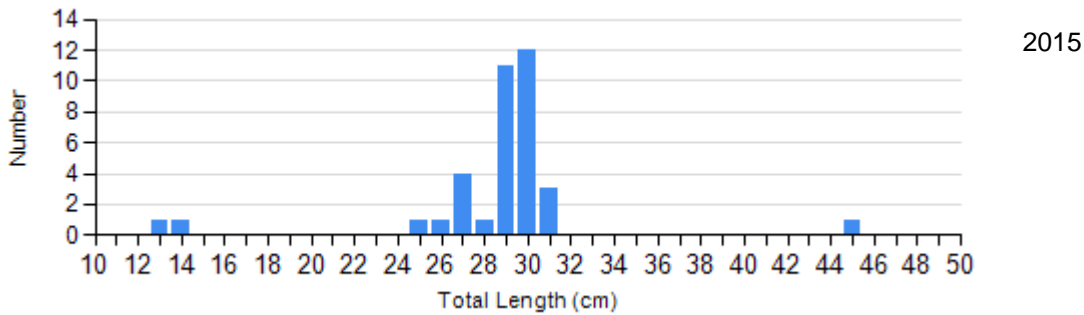
Length Frequency Distribution

Length frequency histogram of species sampled by year.

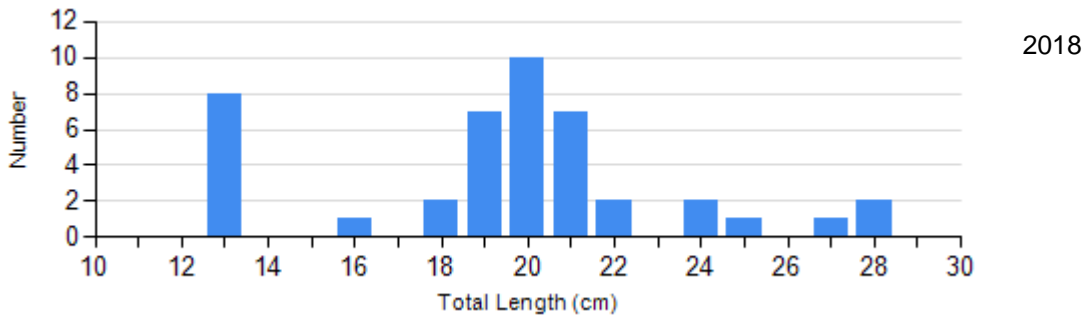
Species: Walleye
Gear: AFS std gill net



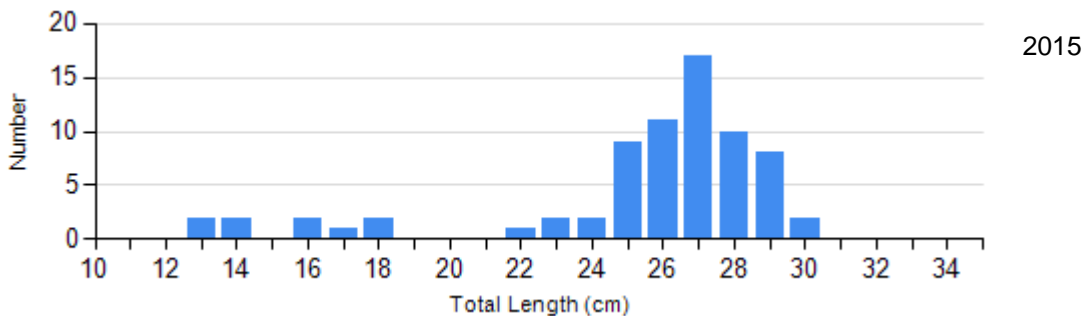
Species: Walleye
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



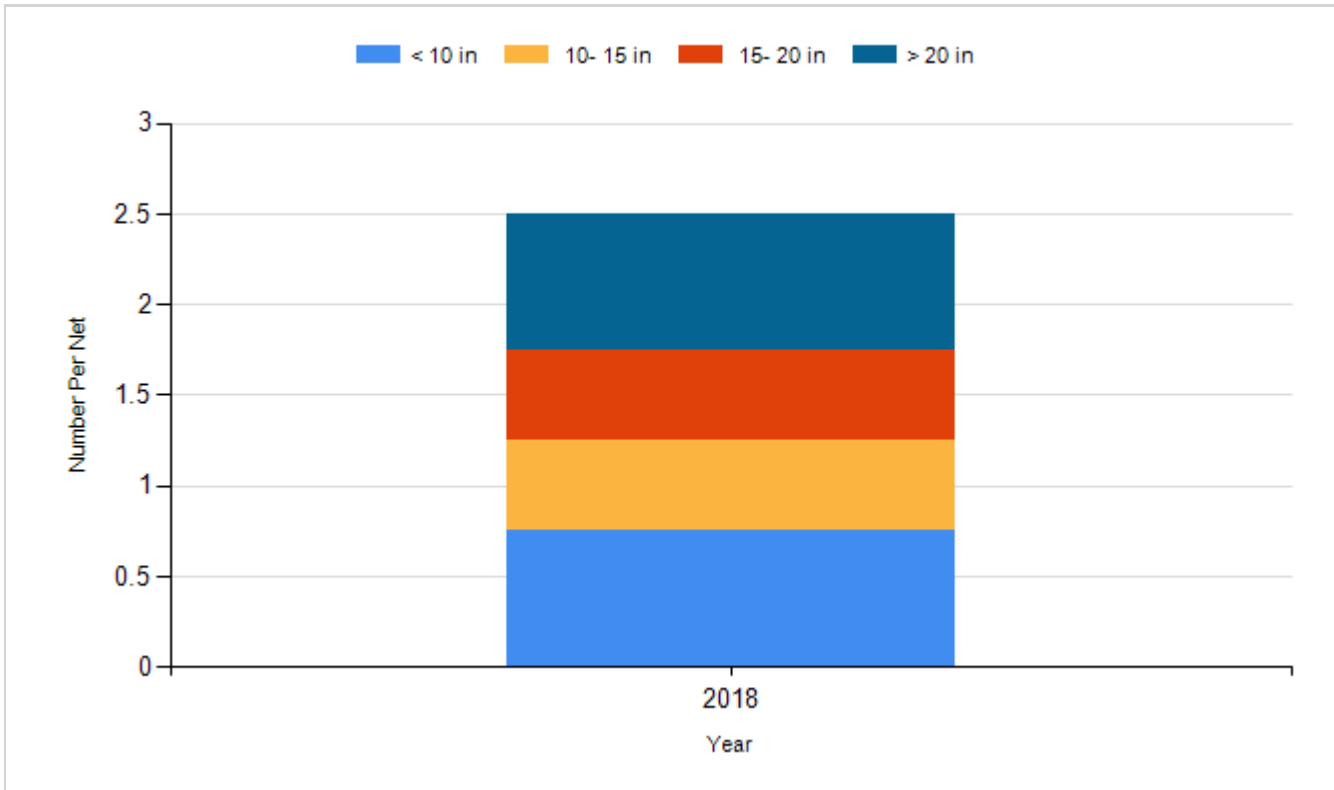
Species: Yellow Perch
Gear: std exp gill net



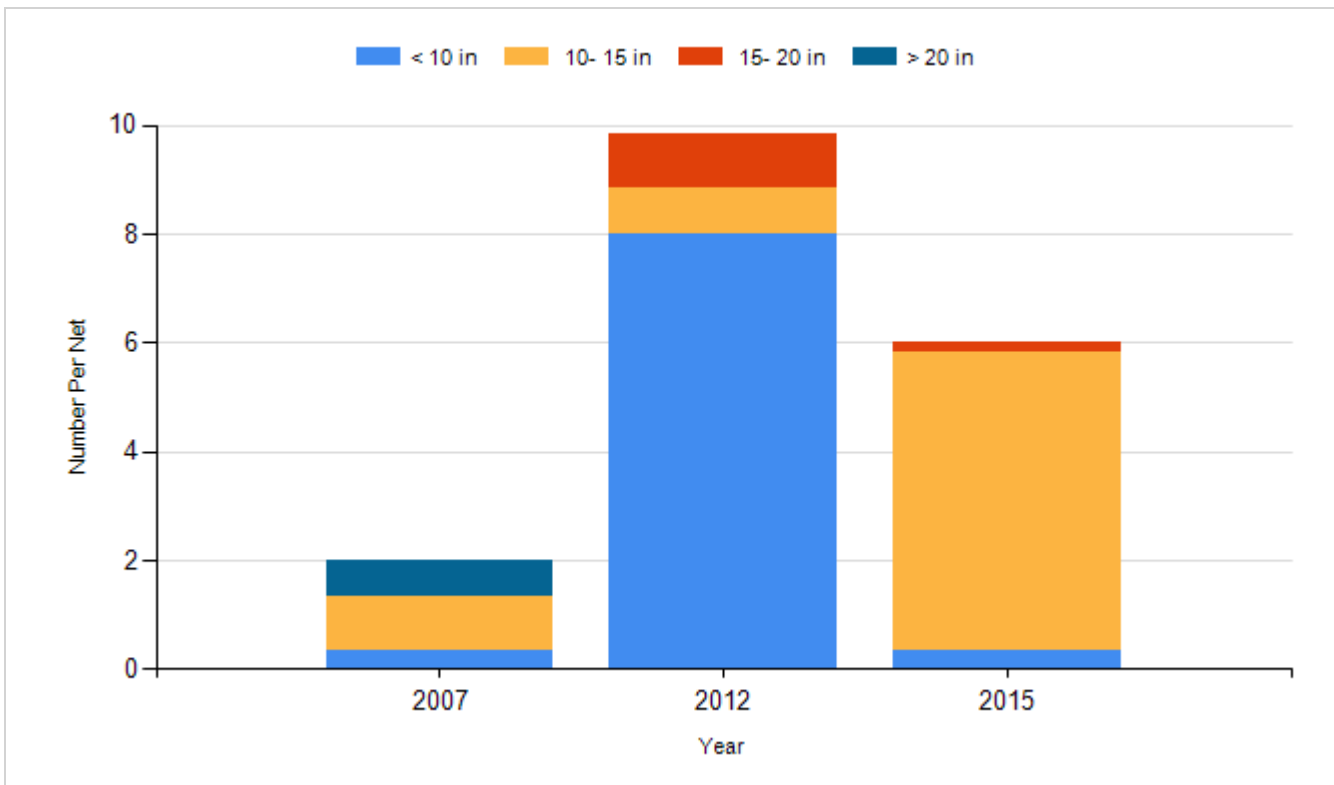
Historic Fish Sizes and Relative Abundance

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

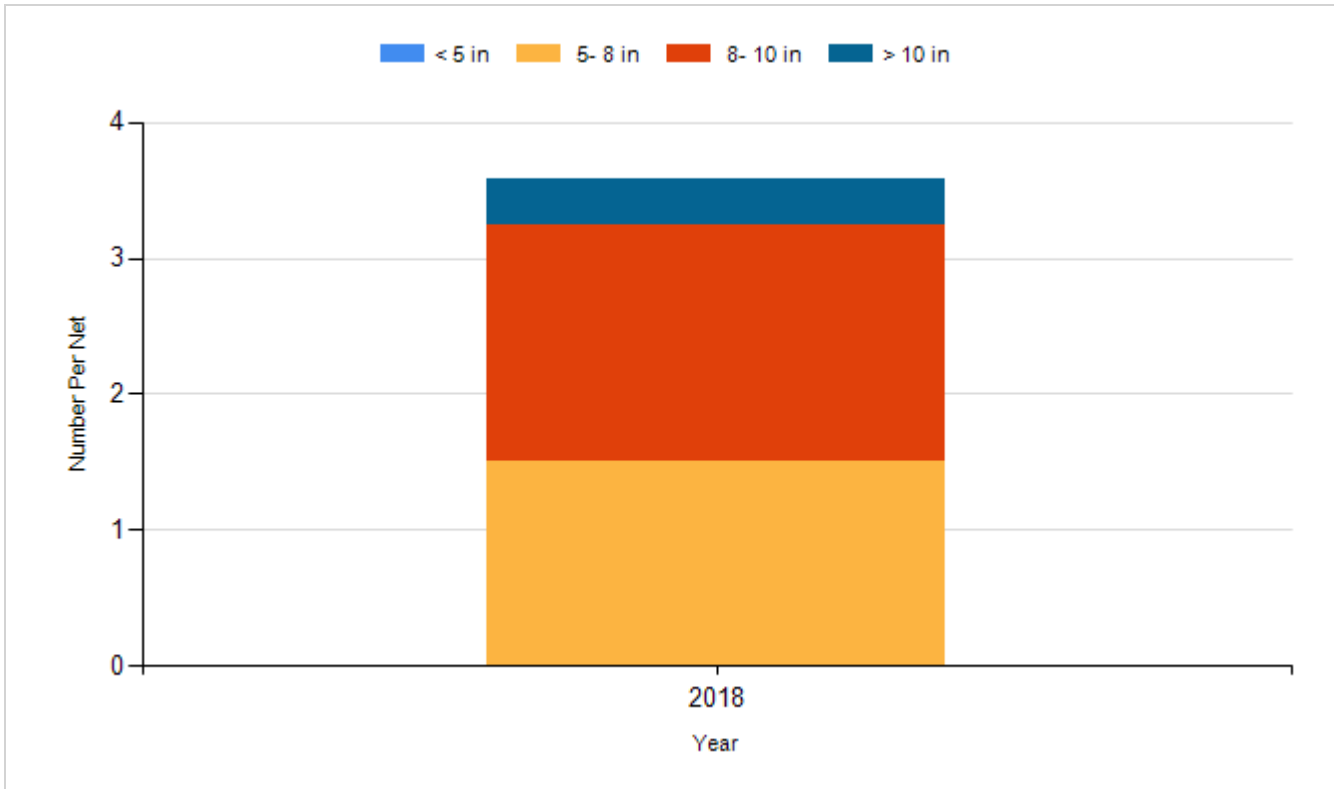
Species: Walleye
Gear: AFS std gill net



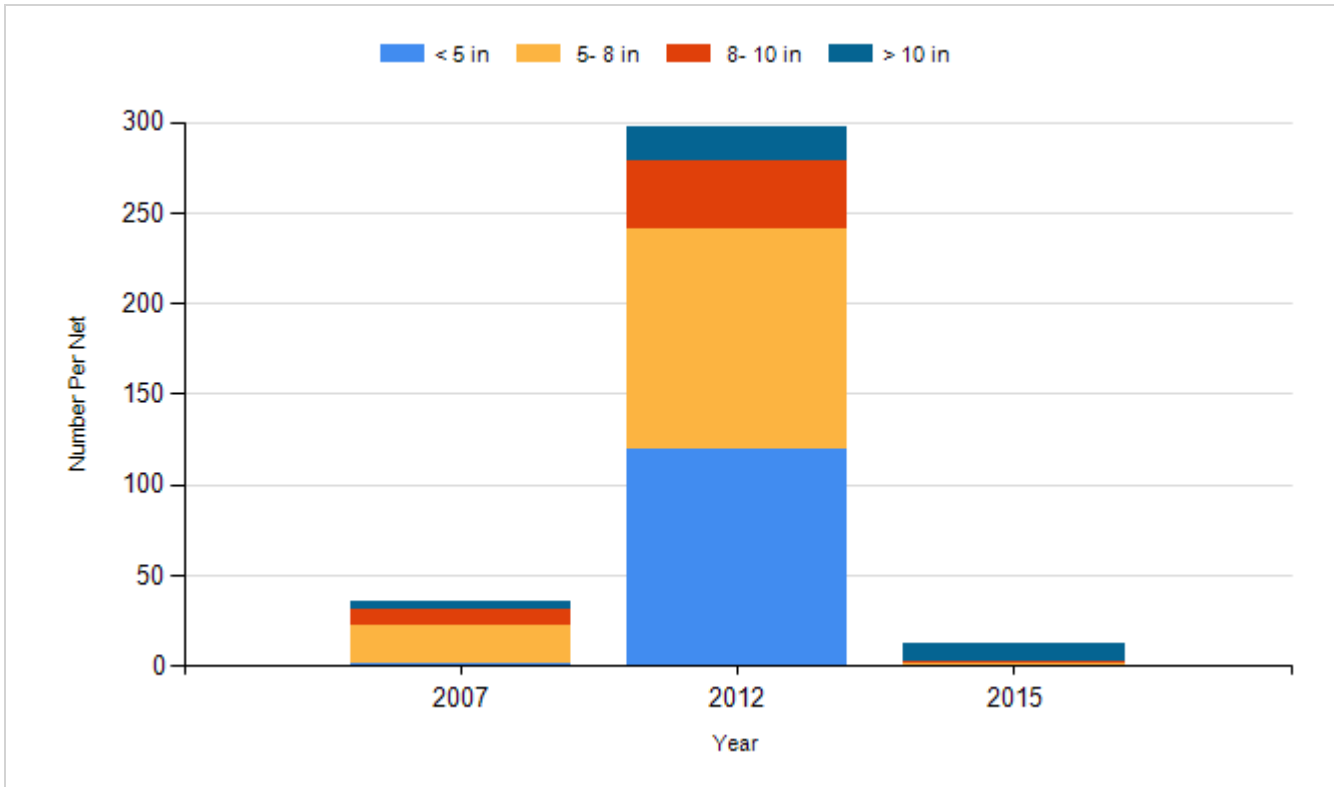
Species: Walleye
Gear: std exp gill net



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	Gizzard Shad	Adult	117
2008	Walleye	Fry	700,000
2008	Yellow Perch	Fry	701,000
2009	Gizzard Shad	Adult	125
2009	Walleye	Fry	700,000
2009	Yellow Perch	Fry	703,000
2010	Walleye	Fry	700,000
2013	Walleye	Fry	375,000
2015	Muskellunge	Large Fingerling	1,054
2015	Walleye	Fry	370,000
2017	Muskellunge	Large Fingerling	1,542
2017	Walleye	Small Fingerling	99,120