Hazeldon Lake Survey Summary

Hazeldon Lake, located 2.0 miles east and 0.5 miles north of Roslyn, is managed as a walleye and yellow perch fishery but other fish species (e.g., northern pike) are present and may contribute to the fishery.

- **Walleye.** Walleyes sampled in the 2020 gill-net catch ranged in length from 7.1 to 28.0 inches, nearly half (49%) were <10.0 inches. The relative abundance of walleyes >10.0 inches was considered low to moderate (3.8/gill net), 52% were >15.0 inches and 20% were >20.0 inches. Five year classes (2010, 2013, 2015, 2017, and 2019) were represented in the gill net catch, nearly all (4 of 5) coincided with fry stockings. Fish from the 2019 (age-1) cohort were the most abundant accounting for 56% of walleyes sampled and the high proportion of individuals <10.0 inches. Meanwhile, those from the 2017 (age-3) year class made up an additional 31% of the catch. Walleyes in Hazeldon Lake appear to grow well with mean length at capture values at age 3 from 13.6 to 18.4 inches since 2011. In 2020, the mean length of age-3 walleyes was 14.9 inches.

- **Yellow perch**. Yellow perch were the most abundant species in the 2020 gill-net catch. At 51.3/gill net, relative abundance was high. Sampled yellow perch ranged in length from 4.3 to 13.0 inches, 67% were >8.0 inches and 10% were >10.0 inches. Individuals from nine consecutive year classes (2011 – 2019) contributed to the catch, those from the 2018 (age-2) cohort were the most abundant accounting for 68% of fish in the sample. The 2018 year class has experienced moderate to fast growth to age 2 with a mean length at capture of 8.5 inches.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Hazeldon, Day County
UJA-Lake-866-004
2020

Lake Information

Name: Hazeldon   **Maximum Depth:**   19 Feet

County: Day

Surface Area: 884 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 07, 2020	6 net-nights
AFS std gill net	Jul 08, 2020	6 net-nights

Common Fish Species Present

Black Crappie

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.

- 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.

$$PSD = \left(\frac{number\ of\ fish \geq quality\ length}{number\ of\ fish \geq stock\ length}\right) \times 100$$

$$PSD - P = \left(\frac{number\ of\ fish \geq preferred\ length}{number\ of\ fish \geq stock\ length}\right) \times 100$$

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 (in)	Stock (cm)	Quality (in)	Quality (cm)	Preferred (in)	Preferred (cm)	Memorable (in)	Memorable (cm)	Trophy (in)	Trophy (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).
* Methods/Species that ignore stock length

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices				Condition	
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	1	0.1	0.1	100		0		108	
	Northern Pike	2	0.2	0.2	50		0		101	2
	Walleye	90	3.8	1.1	52	11	20	9	96	1
	Yellow Perch	621	51.3	12.2	67	3	10	2	115	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.

Gear	Species	\CPUE 2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
AFS std gill net	Black Bullhead							0.0			0.1	0.05
	Common Carp							0.9			0.0	0.45
	Northern Pike							0.7			0.2	0.45
	Walleye							2.8			3.8	3.30
	Yellow Perch							2.5			51.3	26.90
frame net (std 3/4 in)	Black Bullhead		0.7		0.9							0.80
	Black Crappie		0.1		0.1							0.10
	Common Carp		40.7		9.8							25.25
	Green Sunfish		2.1		0.2							1.15
	Northern Pike		0.3		0.4							0.35
	Orangespotted Sunfish		0.0		0.0							0.00
	Smallmouth Bass		0.0		0.0							0.00
	Walleye		1.2		0.8							1.00
	White Sucker		0.0		0.0							0.00
	Yellow Perch		8.4		0.5							4.45
std exp gill net	Black Bullhead	0.1	0.0		0.0							0.03
	Common Carp	0.0	14.8		0.5							5.10
	Northern Pike	0.2	0.0		2.0							0.73
	Walleye	1.8	7.5		2.0							3.77
	Yellow Perch	5.0	44.8		40.0							29.93

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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFS std gill net	Walleye	PSD							39			52
		PSD-P							21			20
		Wr							81			96
	Yellow Perch	PSD							87			67
		PSD-P							47			10
		Wr							112			115
std exp gill net	Walleye	PSD	97	38		33						
		PSD-P	50	16		17						
		Wr	103	95		89						
	Yellow Perch	PSD	8	9		40						
		PSD-P	0	2		3						
		Wr	102	106		106						

Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Walleye

Year	N	\<Mean Length (expanded sample number) at capture by age\>									
		1	2	3	4	5	6	7	8	9	10+
2020	90	222 (50)		378 (28)		491 (7)		575 (4)			710 (1)
2017	33		285 (6)	362 (1)	368 (18)	455 (1)	559 (1)	540 (1)		641 (1)	645 (4)
2014	25	180 (7)	240 (12)	347 (4)			606 (1)				686 (1)
2012	84	243 (67)	401 (1)	468 (6)	500 (5)		631 (1)				637 (4)
2011	33	240 (1)	390 (4)	453 (10)	525 (2)	512 (2)	544 (6)				613 (8)

Species: Yellow Perch

| Year	N	\<Mean Length (expanded sample number) at capture by age\>									
		1	2	3	4	5	6	7	8	9	10+
2020	621	149 (133)	215 (424)	245 (21)	286 (17)	283 (5)	293 (9)	307 (6)	315 (7)	313 (2)	
2017	30		200 (4)	214 (3)	242 (14)	268 (4)	275 (5)				
2014	273	107 (33)	173 (122)	216 (116)	294 (2)						
2012	836	116 (744)	181 (61)	196 (31)							
2011	245	102 (156)	173 (87)	223 (2)							

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)
Walleye Gill Net	2017	20	81 (0.9)	6	84 (1.8)	3	82 (4.1)	4	78 (3.9)
	2020	22	96 (0.9)	15	95 (1.1)	8	97 (1.7)	1	95
Yellow Perch Gill Net	2017	4	118 (6.2)	12	112 (3.1)	13	111 (2.1)	1	95
	2020	204	115 (0.9)	349	116 (0.6)	46	114 (1.5)	17	106 (1.9)

Length Frequency Distribution

Length frequency histogram of species sampled by year.
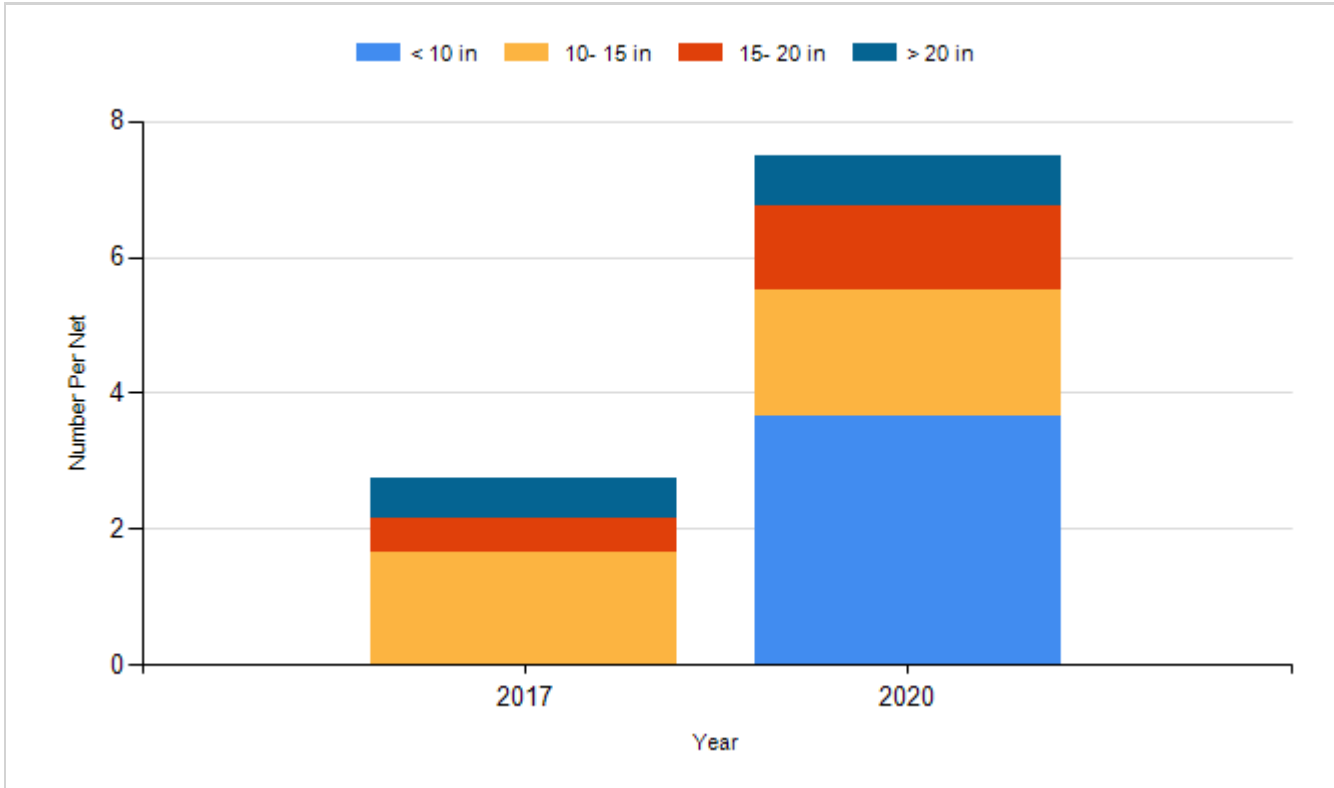
Species: Walleye
Gear: AFS std gill net

2017

2020

Species: Yellow Perch
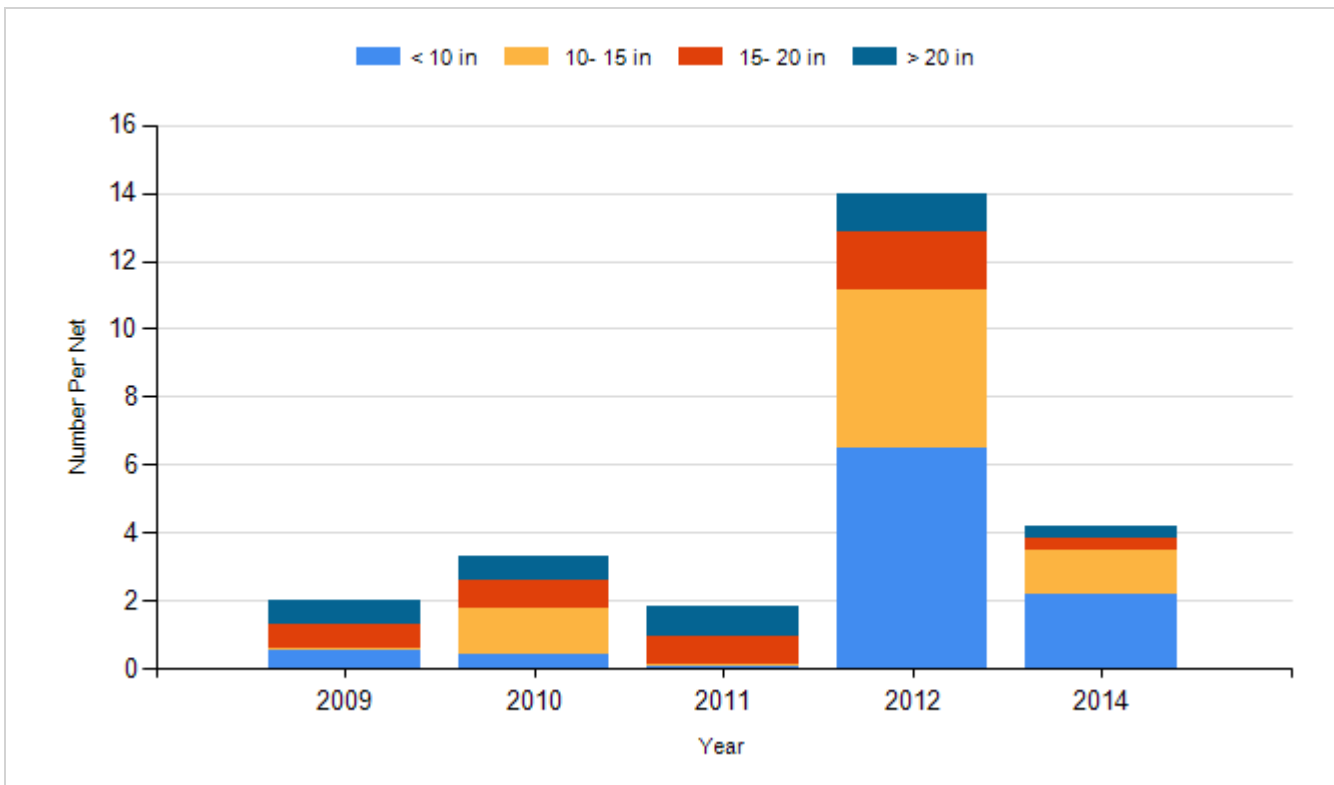Gear: AFS std gill net

2017

2020
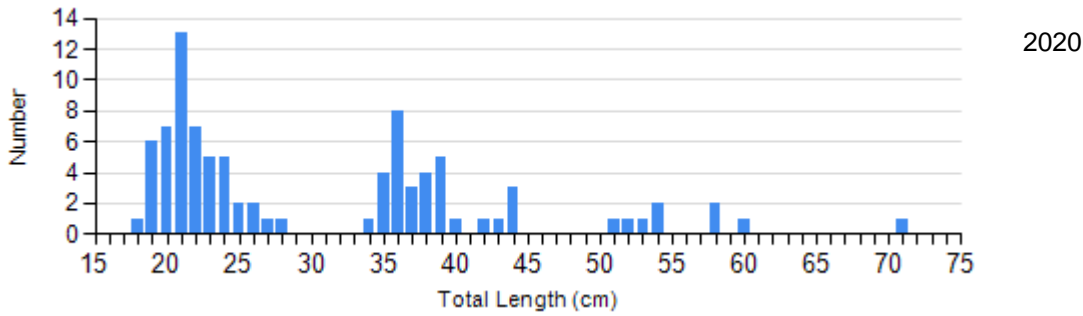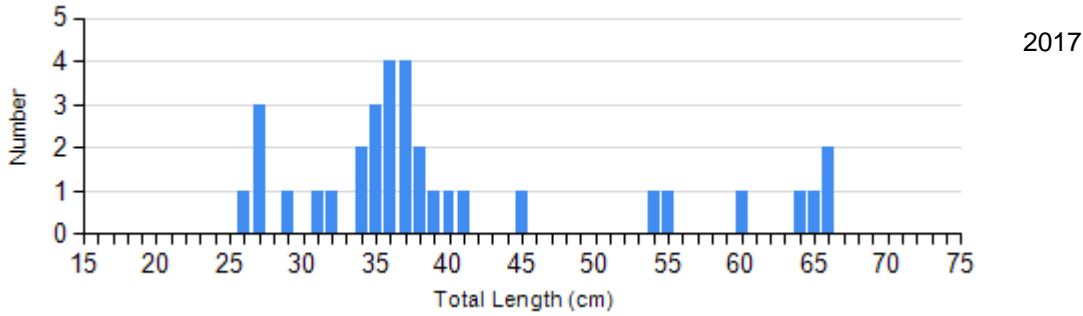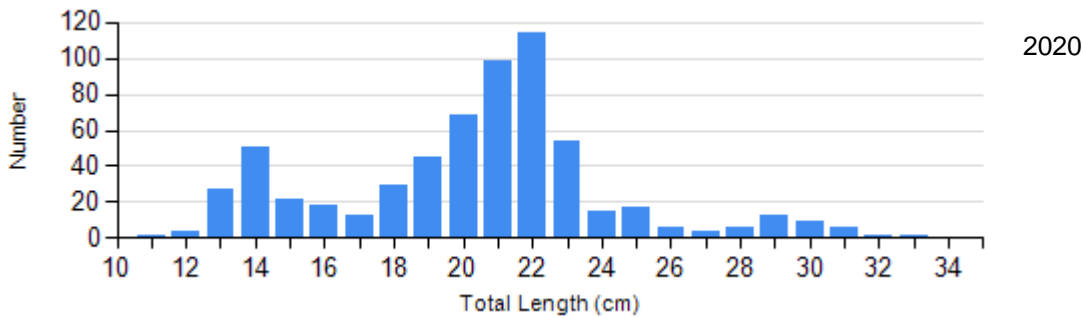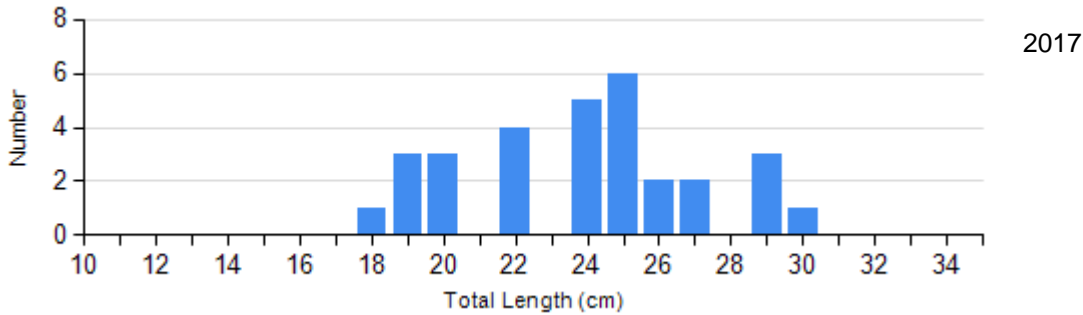
Historic Fish Sizes and Relative Abundance
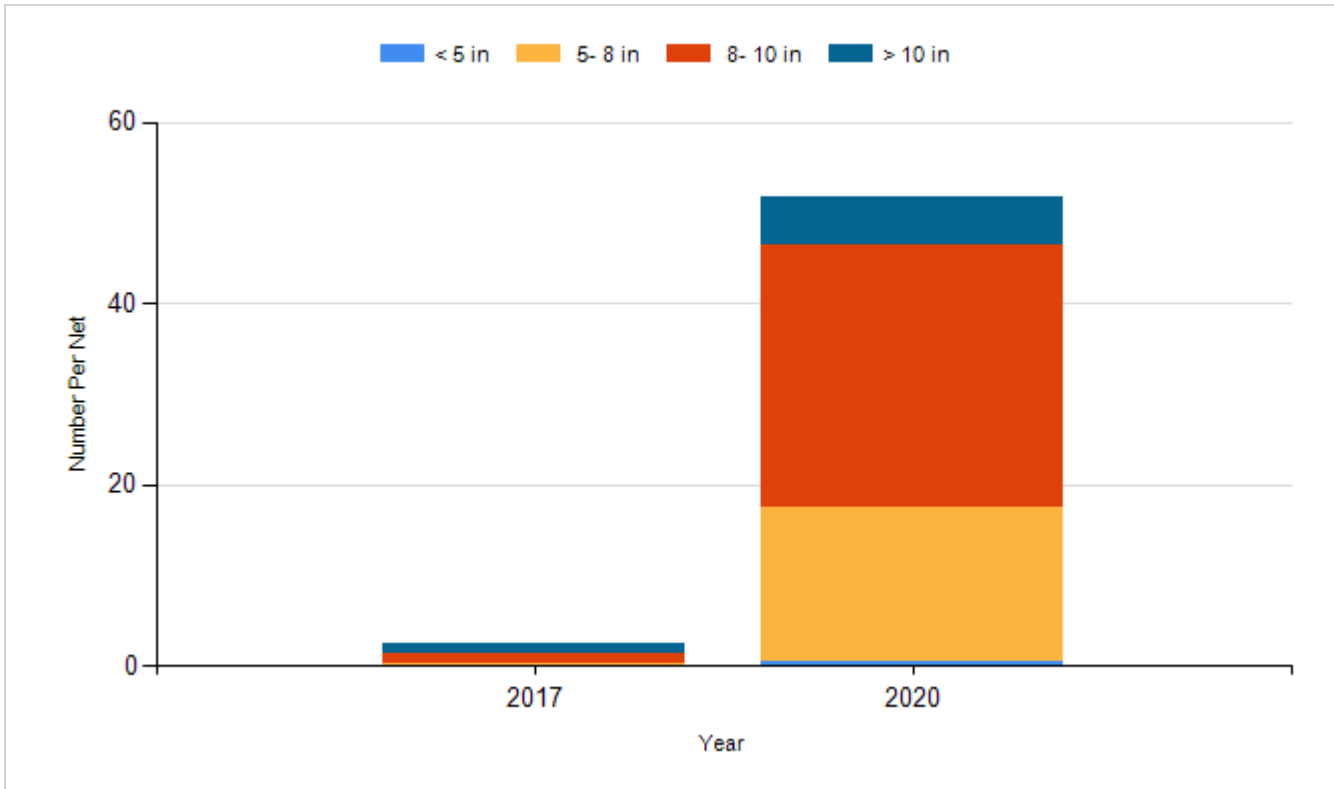
Size distribution per net by color for species sampled by year.
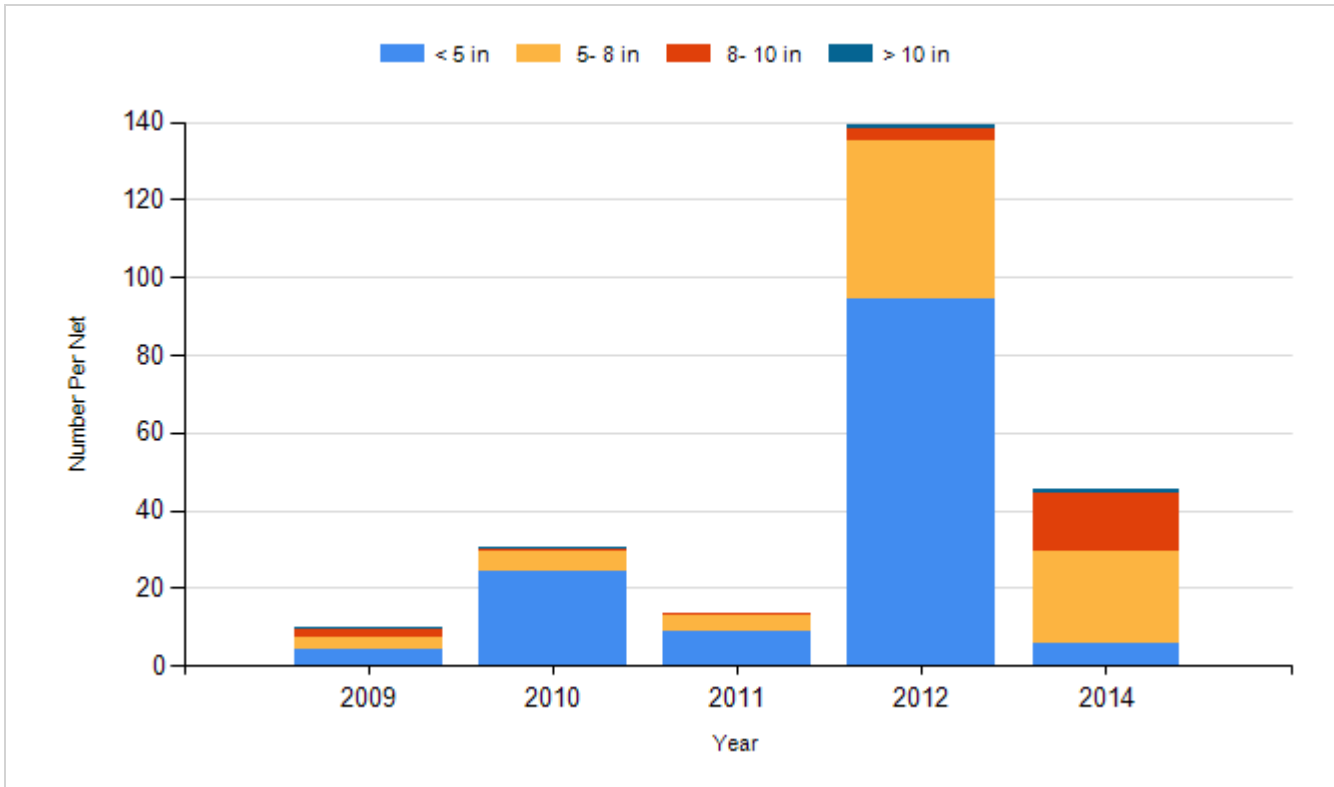
Species: Walleye
Gear: AFS std gill net

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
2011	Walleye	Fry	600,000
2013	Walleye	Fry	600,000
2015	Walleye	Fry	600,000
2017	Walleye	Fry	600,000
2019	Walleye	Fry	600,000