White Lake Survey Summary

White Lake, located 6.0 miles east and 4.0 miles north of Britton, is managed as a walleye and yellow perch fishery but other fish species (e.g., northern pike, smallmouth bass) are present and contribute to the fishery.

- **Black crappie**. Black crappie numbers were similar to those observed in 2016. At 12.3/gill net, relative abundance was considered moderate. Sampled black crappies ranged in length from 3.9 to 13.0 inches, most (63%) were ≥8.0 inches and 17% exceeded 10.0 inches. Eight year classes (2010, 2011, 2013, and 2015 – 2019) contributed to the frame net catch. Individuals from the 2017 (age-3) cohort, which had a mean length at capture of 7.9 inches, were the most abundant accounting for >80% of black crappies sampled.

- **Walleye.** Walleye (includes saugeye) numbers were slightly higher in 2020 than in 2016. However, at 3.3/gill net, relative abundance remained low to moderate. Sampled walleyes ranged in length from 7.9 to 27.6 inches, of those that were at least 10.0 inches 80% were ≥15.0 inches and 60% were 20.0 inches or longer. Individuals from six year classes (2009, 2012, 2013, 2014, 2016, and 2018) contributed to the catch, each was represented by eight or fewer individuals. Although not abundant, fish from the 2016 (age-4) and 2018 (age-2) cohorts, which coincided with a saugeye stockings, were present.

- **Yellow Perch**. Fewer yellow perch were sampled in 2020 than in 2016. At 3.7/gill net, relative abundance was low. Sampled yellow perch ranged in length from 5.9 to 9.4 inches, nearly all (21 of 22) were from the 2018 (age-2) year class, which had a mean length at capture of 7.2 inches.

For more detailed results see the computer generated South Dakota Statewide Fisheries Survey for White (Marshall; below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
White, Marshall County
WWR-Lake-42-000
2020

Lake Information

Name: White

County: Marshall

Surface Area: 185 Acres

Maximum Depth: 20 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 22, 2020	3 net-nights
AFS std gill net	Jun 24, 2020	3 net-nights
frame net (std 3/4 in)	Jun 22, 2020	6 net-nights
frame net (std 3/4 in)	Jun 24, 2020	6 net-nights

Common Fish Species Present

Black Crappie

Walleye

Yellow Perch

White Sucker

Smallmouth Bass

Black Bullhead

Common Carp

Northern Pike

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)
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**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	3	0.5	0.3	67		67		93	12
	Black Crappie	1	0.2	0.2	0		0		102	
	Common Carp	5	0.8	0.7	100		40		95	5
	Northern Pike	1	0.2	0.2	0		0		90	
	Smallmouth Bass	1	0.2	0.2	0		0		85	
	Walleye	22	3.3	1.3	80		60	18	85	2
	White Sucker	23	3.8	1.0	100		87		90	2
	Yellow Perch	22	3.7	2.6	14		0		99	2
frame net (std 3/4 in)	Black Bullhead	26	2.2	0.8	81		50	15	83	3
	Black Crappie	148	12.3	3.5	63	6	17	4	90	2
	Northern Pike	7	0.2	0.2	0		0		89	11
	Smallmouth Bass	32	2.3	1.2	32	14	11		85	1
	Walleye	7	0.5	0.3	67		50		83	4
	White Sucker	7	0.6	0.3	100		86		82	3
	Yellow Perch	32	2.7	1.4	13		6		93	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.

*** AFS standard frame nets used in 2016**

		CPUE										
Gear	Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
AFS std gill net	Black Bullhead						12.0				0.5	6.25
	Black Crappie						1.0				0.2	0.60
	Common Carp						0.3				0.8	0.55
	Northern Pike						0.5				0.2	0.35
	Smallmouth Bass						0.0				0.2	0.10
	Walleye						3.0				3.3	3.15
	White Sucker						7.2				3.8	5.50
	Yellow Perch						7.8				3.7	5.75
frame net (std 3/4 in)*	Black Bullhead		114.4				9.8				2.2	42.13
	Black Crappie		166.9				12.8				12.3	64.00
	Common Carp		0.0				0.5				0.0	0.17
	Northern Pike		0.0				0.1				0.2	0.10
	Smallmouth Bass		0.0				0.0				2.3	0.77
	Walleye		0.3				0.9				0.5	0.57
	White Sucker		3.9				8.5				0.6	4.33
	Yellow Perch		2.4				2.5				2.7	2.53
std exp gill net	Black Bullhead		89.7									89.70
	Black Crappie		0.0									0.00
	Common Carp		0.3									0.30
	Northern Pike		0.7									0.70
	Walleye		5.3									5.30
	White Sucker		3.7									3.70
	Yellow Perch		17.7									17.70

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.

*** AFS standard frame nets used in 2016**

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFS std gill net	Walleye	PSD						61				80
		PSD-P						33				60
		Wr						78				85
	Yellow Perch	PSD						98				14
		PSD-P						23				0
		Wr						94				99
frame net (std 3/4 in)*	Black Crappie	PSD		40				99				63
		PSD-P		17				14				17
		Wr		114				99				90
std exp gill net	Black Crappie	PSD		0								
		PSD-P		0								
	Walleye	PSD		75								
		PSD-P		6								
		Wr		89								
	Yellow Perch	PSD		70								
		PSD-P		2								
		Wr		107								

Length at Capture

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

Species: Black Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	148	105 (1)	161 (2)	201 (120)	265 (10)	294 (1)		305 (10)		309 (2)	318 (2)
2016	153			229 (134)		282 (6)	292 (13)				
2012	2003		194 (1657)			290 (40)	290 (20)	312 (172)	297 (38)	309 (79)	

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	22		263 (6)		538 (2)		511 (8)	564 (4)	537 (1)		700 (1)
2016	18		271 (2)	343 (6)	382 (1)		524 (5)	603 (4)			
2012	16		333 (3)	412 (6)	459 (5)	454 (1)		520 (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+
2020	22		183 (21)	241 (1)							
2016	47		191 (2)	236 (33)		260 (8)	266 (4)				
2012	55	104 (2)	195 (24)	223 (26)	237 (3)						

Fish Condition

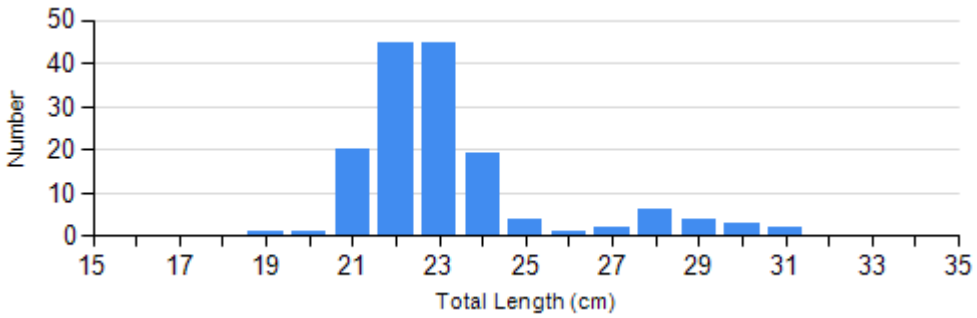
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2016	1	89	130	101 (0.5)	17	89 (1.4)	5	86 (1.3)
	2020	54	95 (3.0)	68	91 (0.6)	15	81 (1.2)	10	78 (1.8)
Walleye Gill Net	2016	7	81 (1.7)	5	72 (1.7)	4	78 (4.2)	2	84 (6.0)
	2020	4	78 (1.7)	4	84 (1.7)	11	87 (1.8)	1	88
Yellow Perch Gill Net	2016	1	91	35	95 (1.2)	11	90 (2.3)	0	
	2020	19	99 (1.9)	3	98 (2.5)	0		0	

Length Frequency Distribution

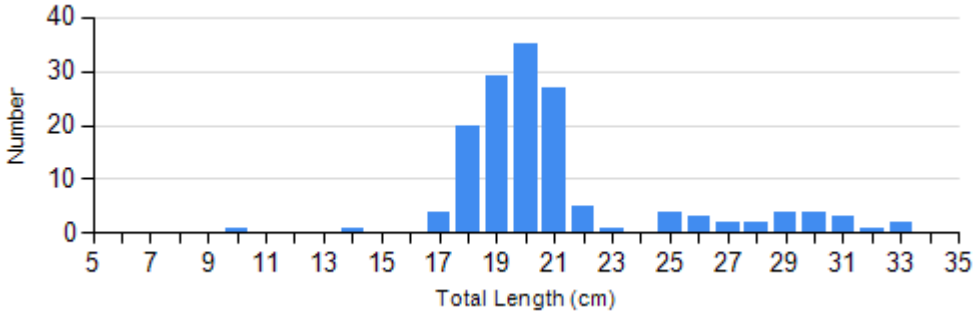
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net



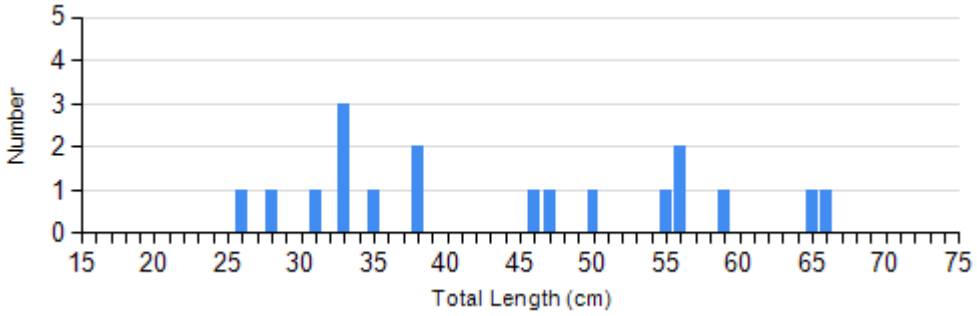
2016

Species: Black Crappie
Gear: frame net (std 3/4 in)

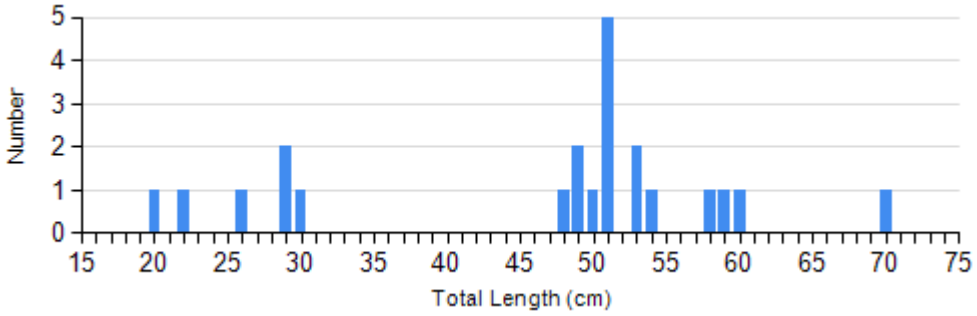


2020

Species: Walleye
Gear: AFS std gill net

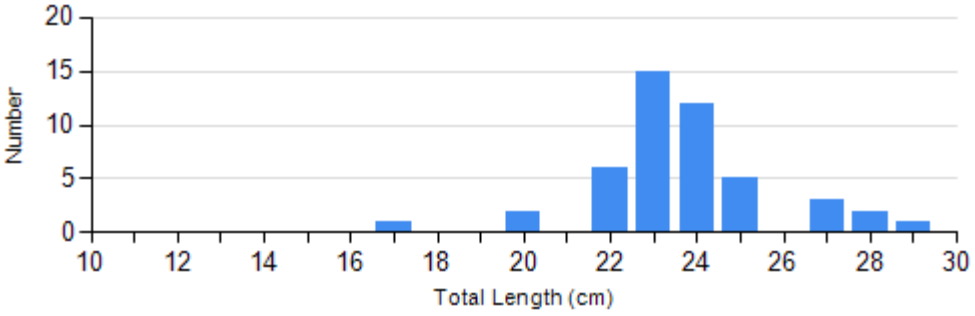


2016

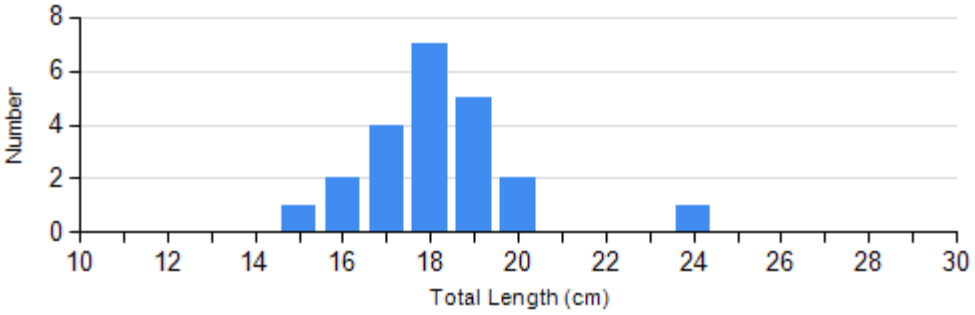


2020

Species: Yellow Perch
Gear: AFS std gill net



2016

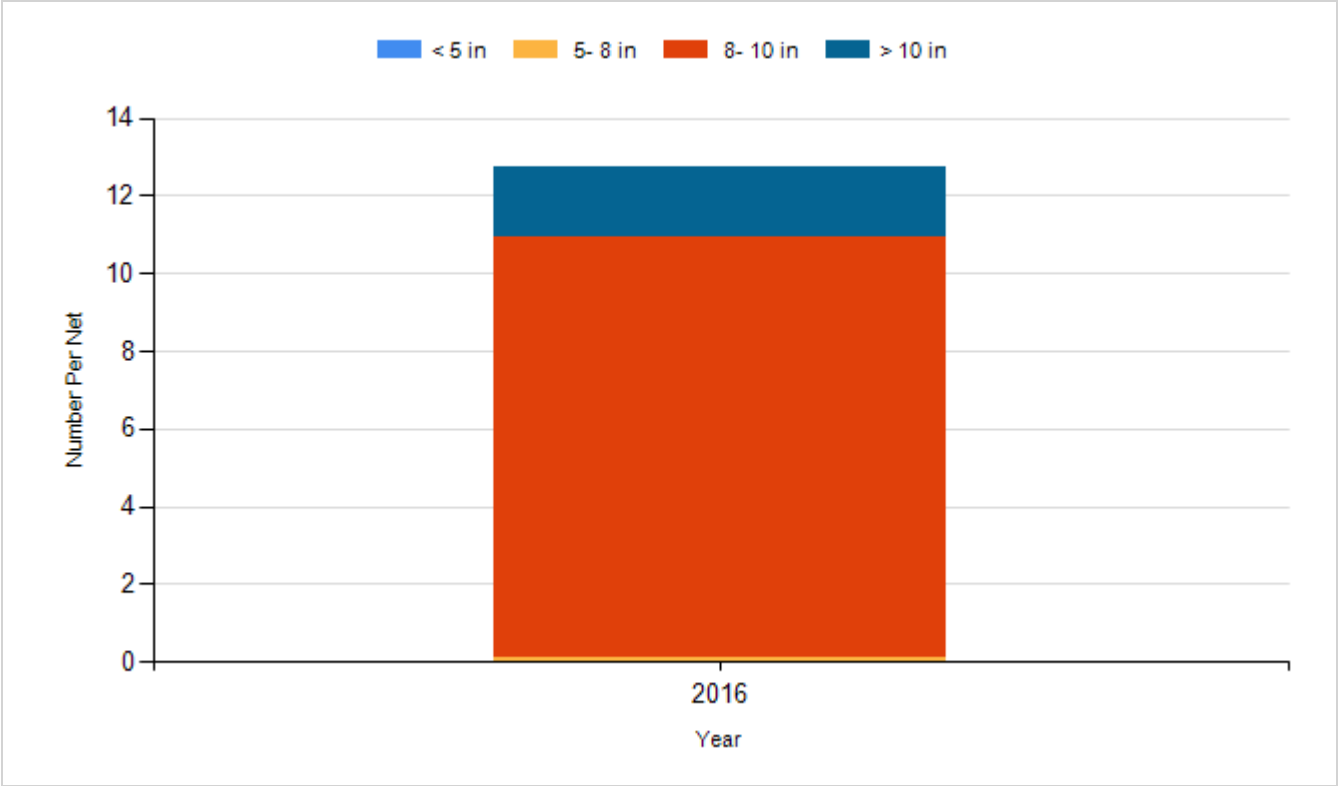


2020

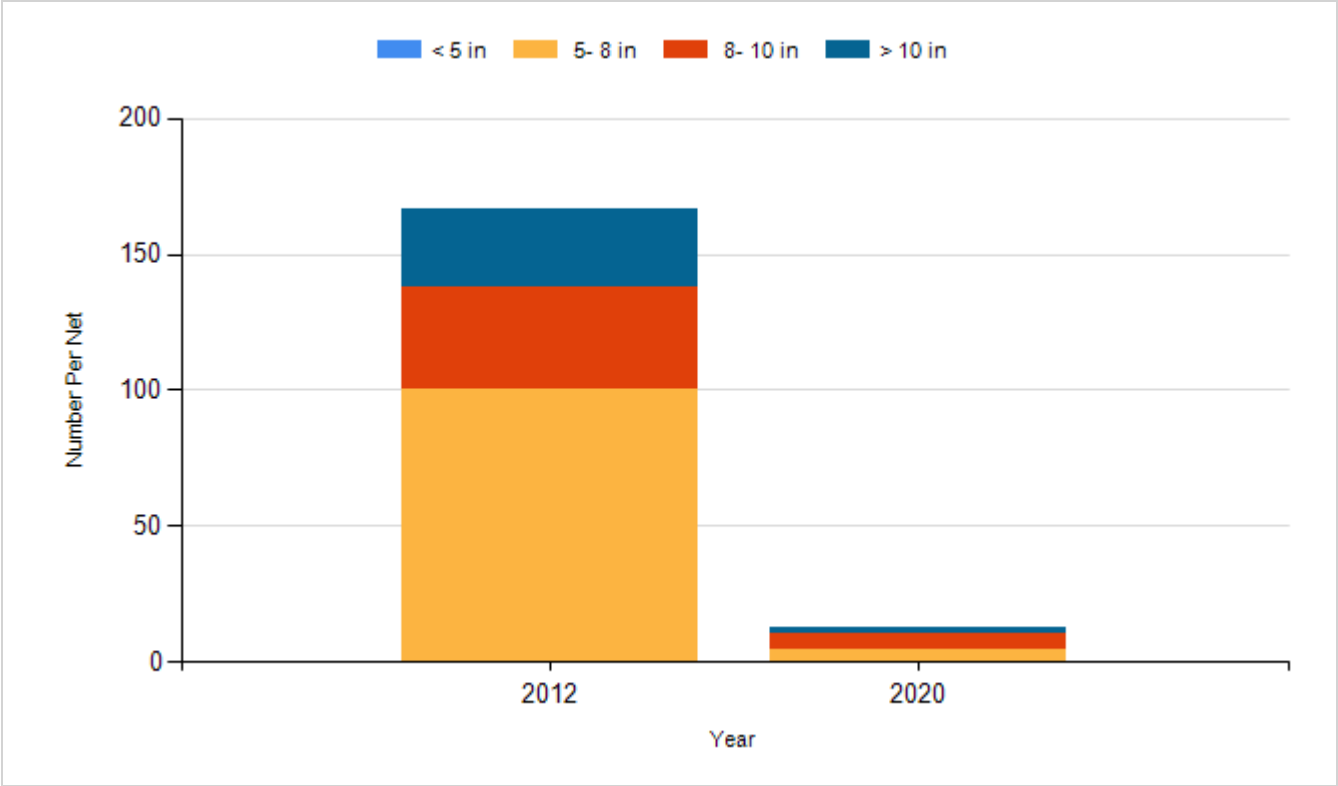
Historic Fish Sizes and Relative Abundance

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

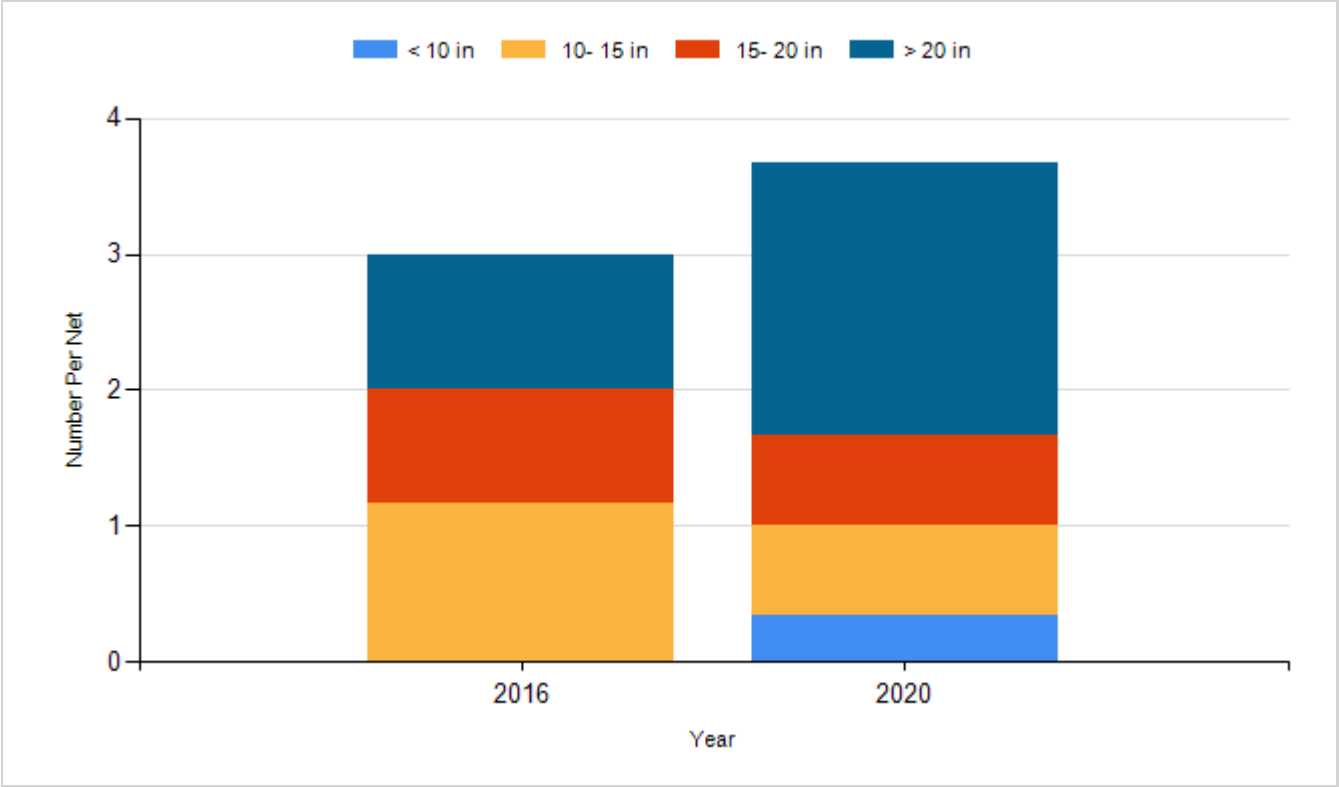
Species: Black Crappie
Gear: AFS std frame net



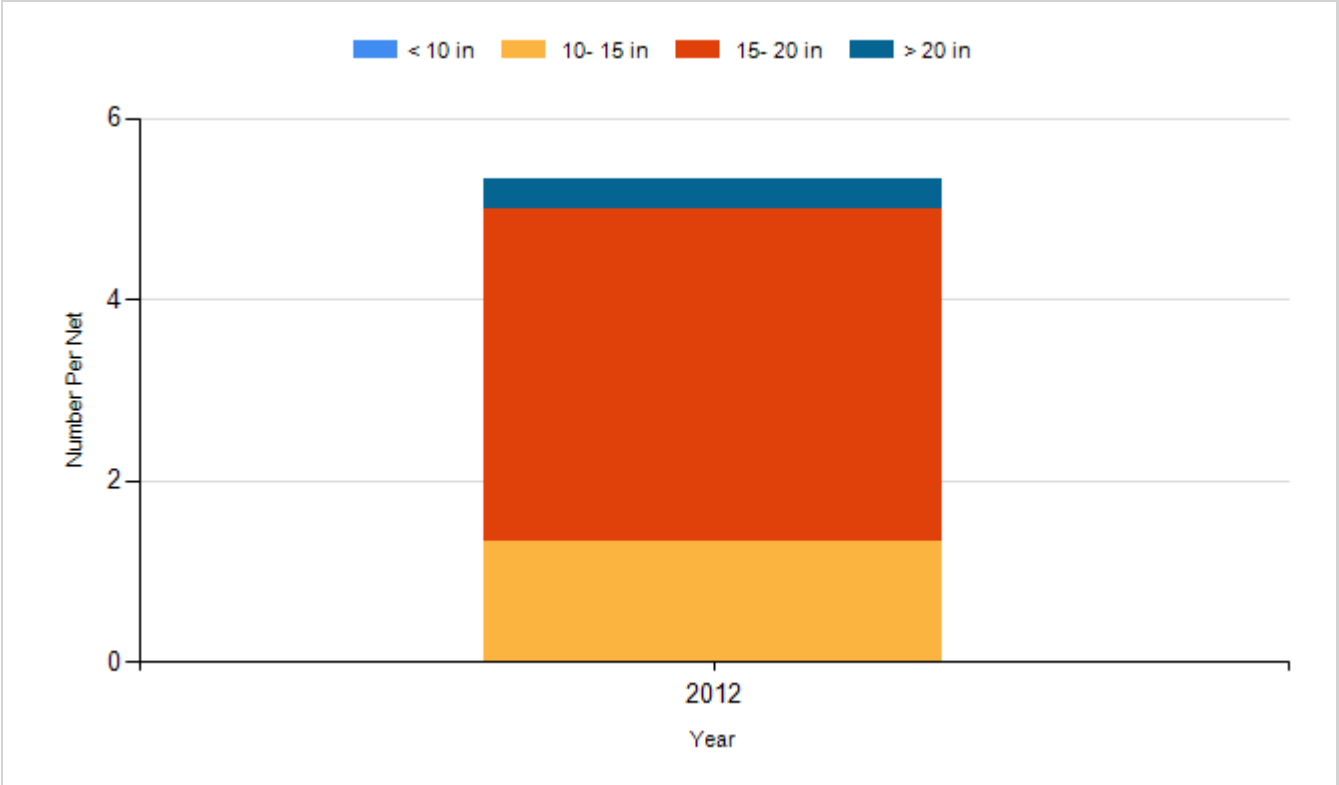
Species: Black Crappie
Gear: frame net (std 3/4 in)



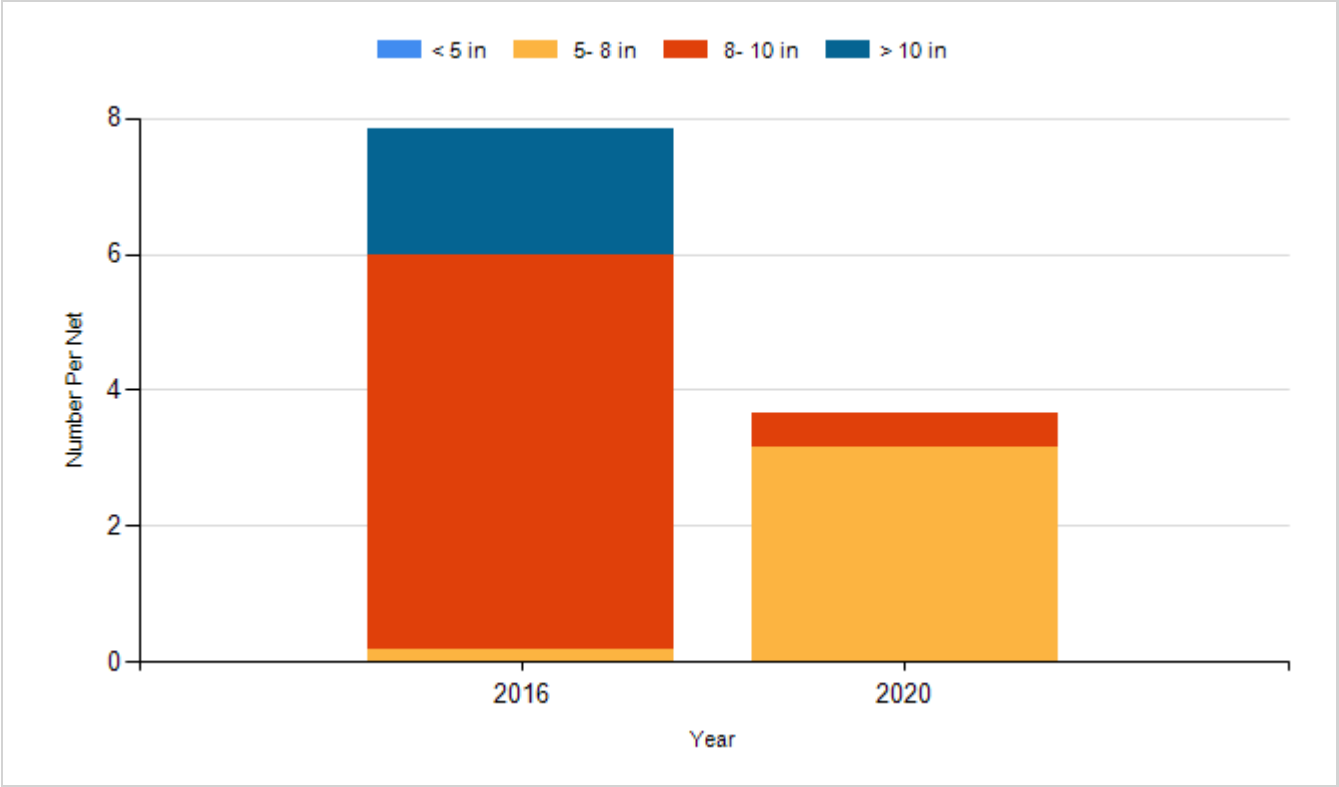
Species: Walleye
Gear: AFS std gill net



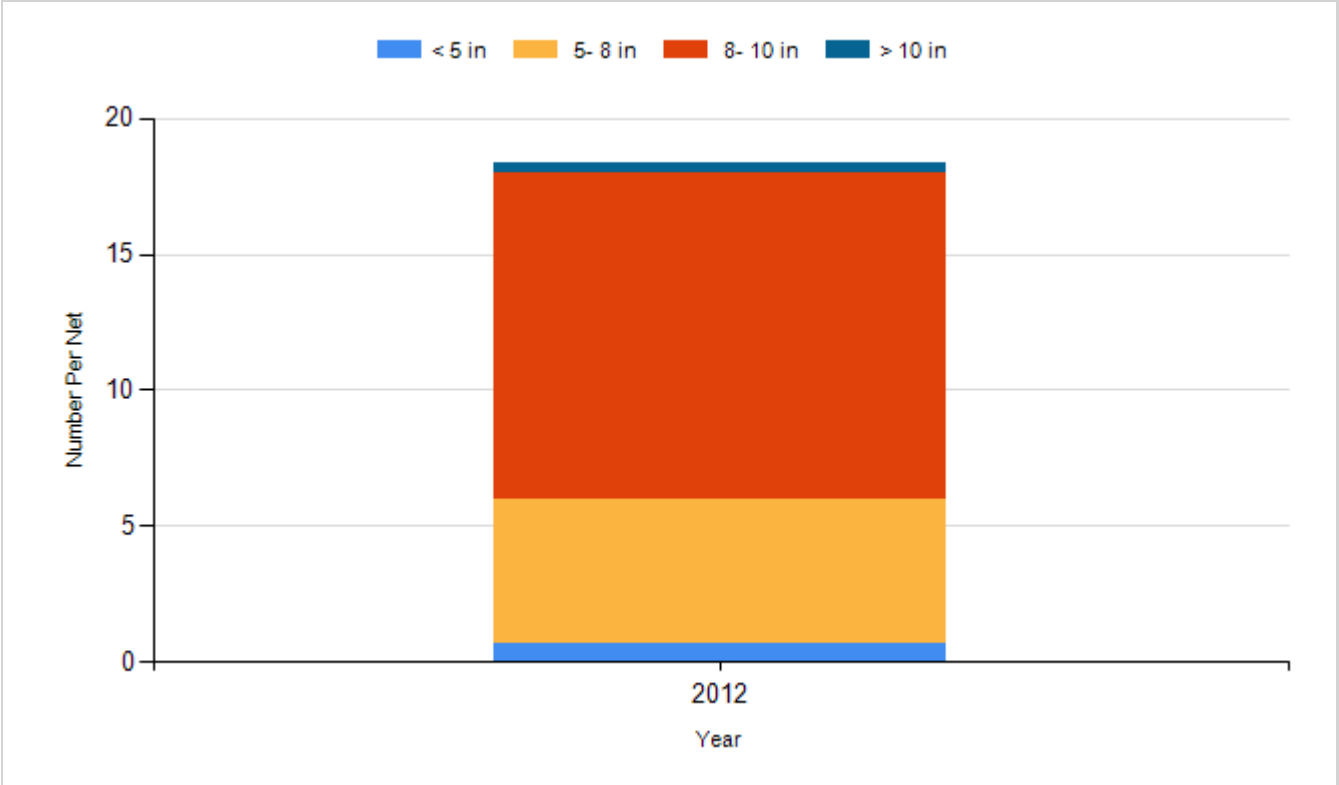
Species: Walleye
Gear: std exp gill net



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	Small Fingerling	23,540
2012	Walleye	Fry	200,000
2014	Walleye	Fry	100,000
2016	Saugeye	Small Fingerling	9,680
2018	Saugeye	Fry	95,000