Amsden Dam Survey Summary

Amsden Dam, located 3.5 miles south and 3.0 miles west of Andover, is managed as a panfish (i.e., black crappie and bluegill) and walleye fishery; however, a variety of other fish species (e.g., northern pike, smallmouth bass, yellow perch) are present and contribute to the fishery.

- **Black crappie**. At 5.8/frame net, relative abundance was considered low to moderate in 2020. Sampled black crappies ranged in length from 3.1 to 13.0 inches, of those that were at least 5.0 inches, 80% were ≥8.0 inches and 28% were ≥10.0. Individuals from five year classes produced between 2013 and 2019 contributed to the frame net catch, those from the 2018 (age-2) cohort were the most abundant accounting for more than 40% of black crappies sampled. Growth is good with a mean length at capture of 9.9 inches at age 3.

- **Walleye.** Walleye numbers were considerably lower in 2020 than in 2017. The 2020 gill-net catch included 10 walleyes, of those only 4 were ≥10.0 inches which resulted in a mean gill net CPUE of 0.7. The majority (8 of 10) individuals caught were from the 2019 (age-1) cohort, which had a mean length at capture of 9.3 inches.

- **Yellow perch**. Yellow perch were the second most abundant species in the 2020 gill-net catch (11.5/gill net), behind black bullhead. Those sampled ranged in length from 5.1 to 9.8 inches, most (91%) were from the 2019 (age-1) cohort, which had a mean length of 6.1 inches.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Amsden, Day County
MUD-Lake-22-000
2020

Lake Information

Name: Amsden

County: Day

Surface Area: 209 Acres

Maximum Depth: 27 Feet

Mean Depth: 9 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Sep 01, 2020	3 net-nights
AFS std gill net	Sep 02, 2020	3 net-nights
frame net (std 3/4 in)	Sep 01, 2020	6 net-nights
frame net (std 3/4 in)	Sep 02, 2020	6 net-nights

Common Fish Species Present

Walleye

Smallmouth Bass

Muskellunge

Black Crappie

Black Bullhead

Rock Bass

Yellow Perch

White Sucker

Bluegill

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).

			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	435	69.0	21.5	25	3	0		91	1
	Black Crappie	1	0.2	0.2	100		100		123	
	Bluegill	2	0.3	0.3	100		0		119	8
	Northern Pike	8	1.2	0.6	43		14		86	4
	Rock Bass	1	0.2	0.2	100		0		96	
	Smallmouth Bass	2	0.3	0.3	100		0		92	10
	Walleye	10	0.7	0.5	50		25		89	4
	White Sucker	52	8.7	3.3	94		77	9	103	2
	Yellow Perch	69	11.5	4.1	9	5	3		100	1
frame net (std 3/4 in)	Black Bullhead	560	35.7	25.6	37	3	3	1	86	1
	Black Crappie	71	5.8	1.7	80	7	28	8	107	2
	Bluegill	19	1.6	0.9	89		16		111	2
	Northern Pike	19	1.5	0.6	50	19	17		82	2
	Rock Bass	215	17.8	7.2	57	5	1		98	1
	Smallmouth Bass	28	1.3	0.6	53	21	33		88	3
	Walleye	10	0.4	0.3	0		0		82	5
	White Sucker	16	1.3	0.8	94		63	20	91	3
	Yellow Perch	31	2.5	1.4	33	13	17	11	90	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 nets used in 2017**

		CPUE										
Gear	Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
AFS std gill net	Black Bullhead							4.7			69.0	36.85
	Black Crappie							3.5			0.2	1.85
	Bluegill							0.7			0.3	0.50
	Muskellunge							0.2			0.0	0.10
	Northern Pike							0.2			1.2	0.70
	Rock Bass							0.5			0.2	0.35
	Smallmouth Bass							1.2			0.3	0.75
	Walleye							8.5			0.7	4.60
	White Sucker							2.8			8.7	5.75
	Yellow Perch							8.5			11.5	10.00
frame net (std 3/4 in)*	Black Bullhead	117.8			42.8			1.3			35.7	49.40
	Black Crappie	13.3			3.1			23.2			5.8	11.35
	Bluegill	0.0			1.3			28.2			1.6	7.78
	Common Carp	0.6			0.1			0.0			0.0	0.18
	Northern Pike	0.9			0.6			0.0			1.5	0.75
	Rock Bass	29.7			5.3			3.3			17.8	14.03
	Smallmouth Bass	3.0			2.3			0.4			1.3	1.75
	Walleye	1.0			0.5			0.1			0.4	0.50
	White Sucker	0.5			0.8			0.2			1.3	0.70
	Yellow Perch	2.8			0.9			2.0			2.5	2.05
std exp gill net	Black Bullhead	120.0			28.7							74.35
	Black Crappie	1.3			14.7							8.00
	Bluegill	1.0			0.3							0.65
	Common Carp	0.3			0.3							0.30
	Muskellunge	0.0			0.3							0.15
	Northern Pike	0.0			1.3							0.65
	Rock Bass	7.3			3.0							5.15
	Smallmouth Bass	0.3			3.7							2.00
	Walleye	12.3			14.3							13.30
	White Sucker	11.3			9.0							10.15
	Yellow Perch	19.0			49.3							34.15

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 nets used in 2017**

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFS std gill net	Walleye	PSD							69			50
		PSD-P							25			25
		Wr							88			89
	Yellow Perch	PSD							61			9
		PSD-P							29			3
		Wr							97			100
frame net (std 3/4 in)*	Black Crappie	PSD	36			89			62			80
		PSD-P	30			86			25			28
		Wr	115			109			111			107
std exp gill net	Walleye	PSD	59			72						
		PSD-P	8			12						
		Wr	91			91						
	Yellow Perch	PSD	4			11						
		PSD-P	2			4						
		Wr	98			99						

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	68	162 (12)	219 (30)	251 (14)	291 (1)			310 (11)			
2017	255	155 (68)	206 (123)		270 (64)						
2014	36	149 (4)		267 (3)	293 (27)	303 (1)			362 (1)		
2011	133	175 (85)	248 (17)	277 (26)		312 (4)	338 (1)				

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	10	235 (8)		439 (1)				532 (1)			
2017	50	286 (12)	357 (3)	389 (4)	432 (9)	440 (5)	497 (8)	557 (1)	608 (3)	613 (4)	612 (1)
2014	43	312 (4)	366 (12)	430 (16)	453 (5)	503 (3)	540 (2)				671 (1)
2011	37	295 (11)	381 (12)	433 (10)	532 (1)	517 (2)					573 (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	69	156 (63)	238 (6)								
2017	51	188 (23)			251 (27)	243 (1)					
2014	153	152 (137)	220 (7)	243 (6)	274 (3)						
2011	57	180 (56)			321 (1)						

Fish Condition

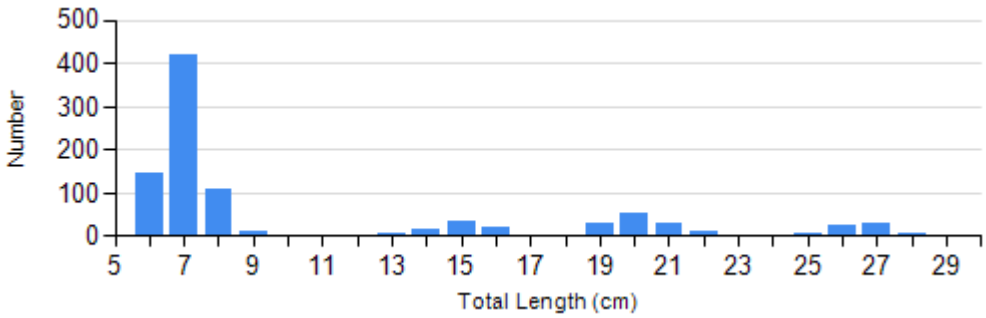
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2017	96	114 (0.9)	95	112 (0.8)	64	106 (0.9)	0	
	2020	14	112 (2.1)	36	110 (1.2)	9	106 (3.8)	10	91 (1.5)
Walleye Gill Net	2017	16	87 (1.6)	22	90 (1.1)	11	87 (1.3)	2	84 (1.7)
	2020	2	90 (6.9)	1	85	1	90	0	
Yellow Perch Gill Net	2017	20	95 (0.9)	16	100 (1.4)	15	96 (1.7)	0	
	2020	63	101 (0.8)	4	96 (1.7)	2	94 (3.0)	0	

Length Frequency Distribution

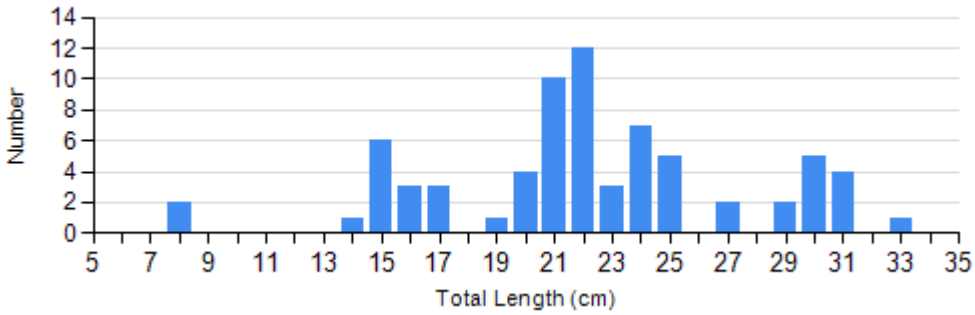
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net



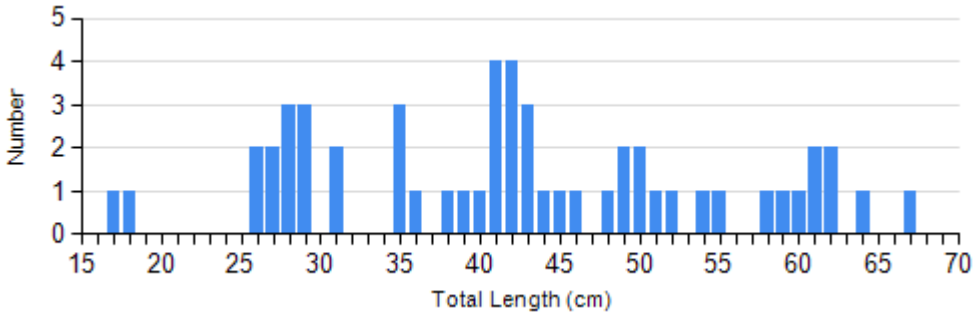
2017

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

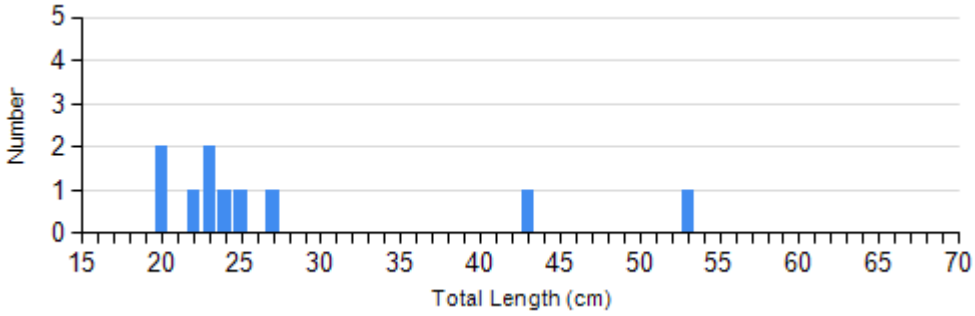


2020

Species: Walleye
Gear: AFS std gill net

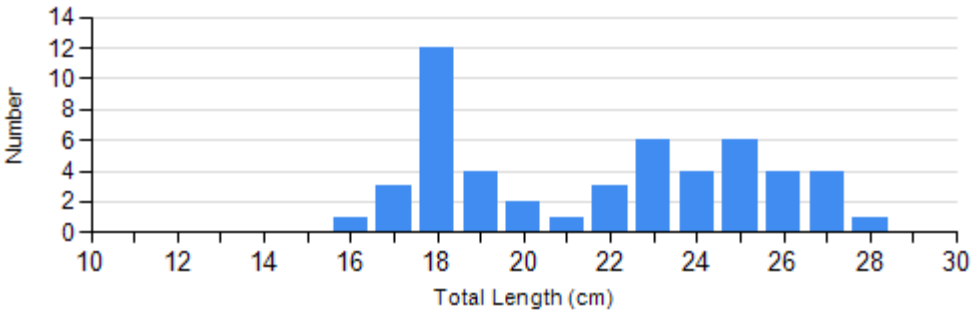


2017

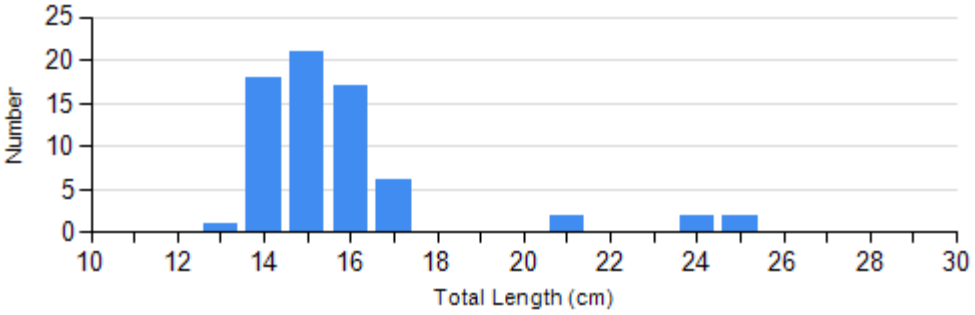


2020

Species: Yellow Perch
Gear: AFS std gill net



2017

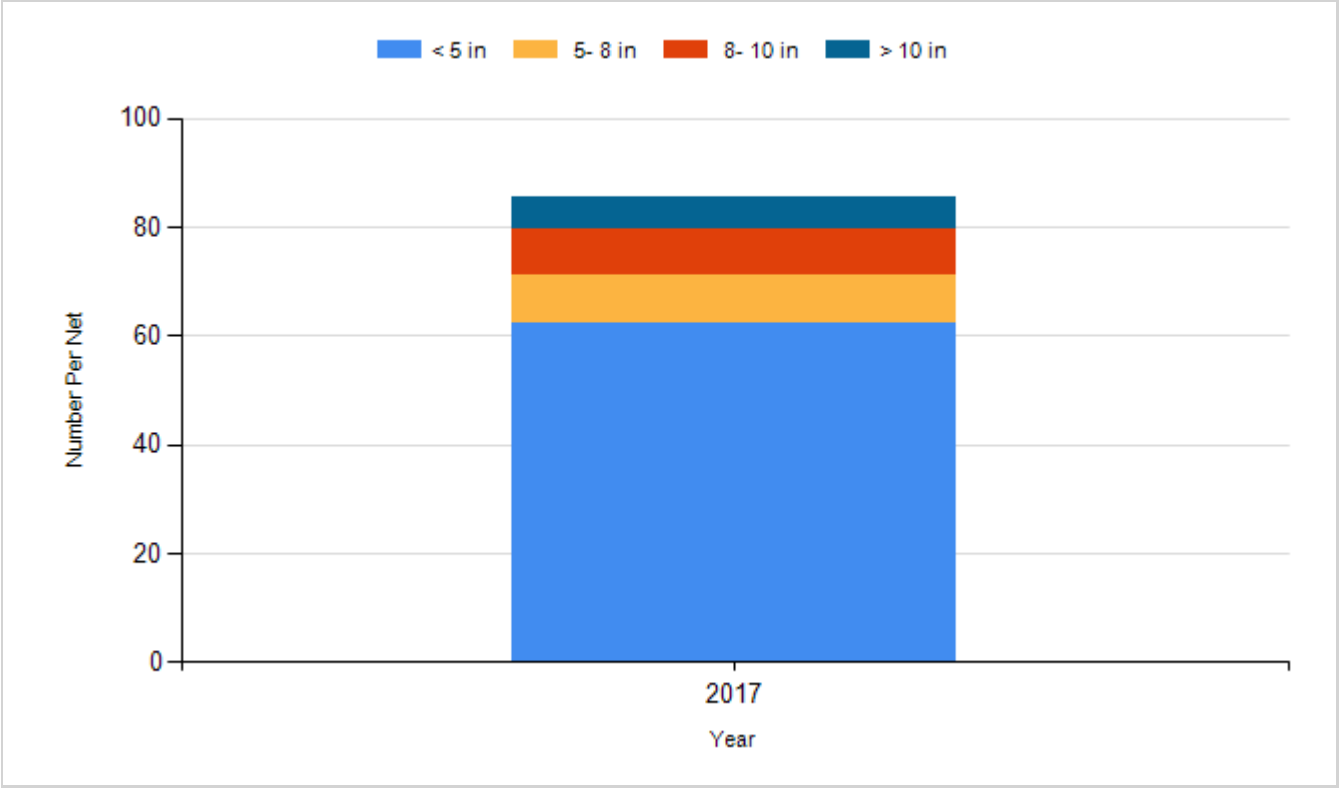


2020

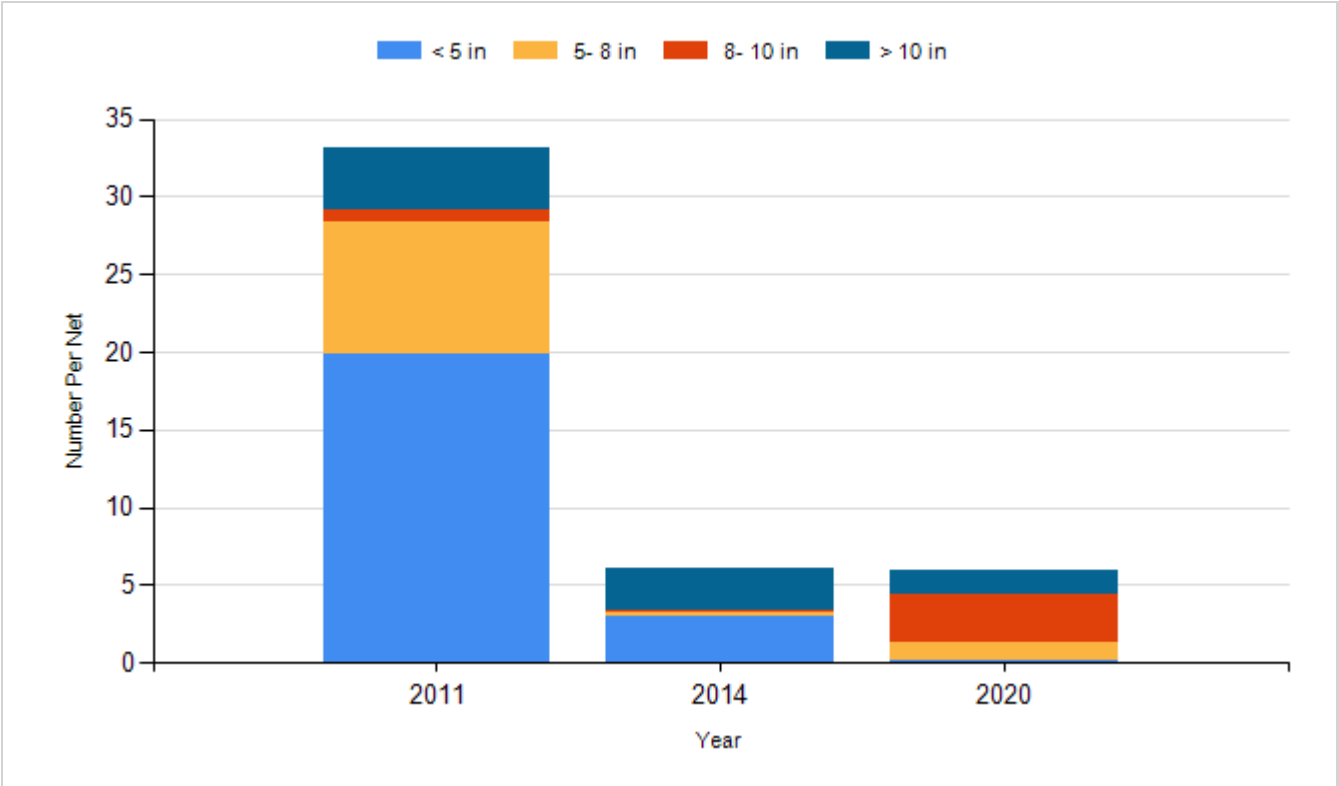
Historic Fish Sizes and Relative Abundance

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

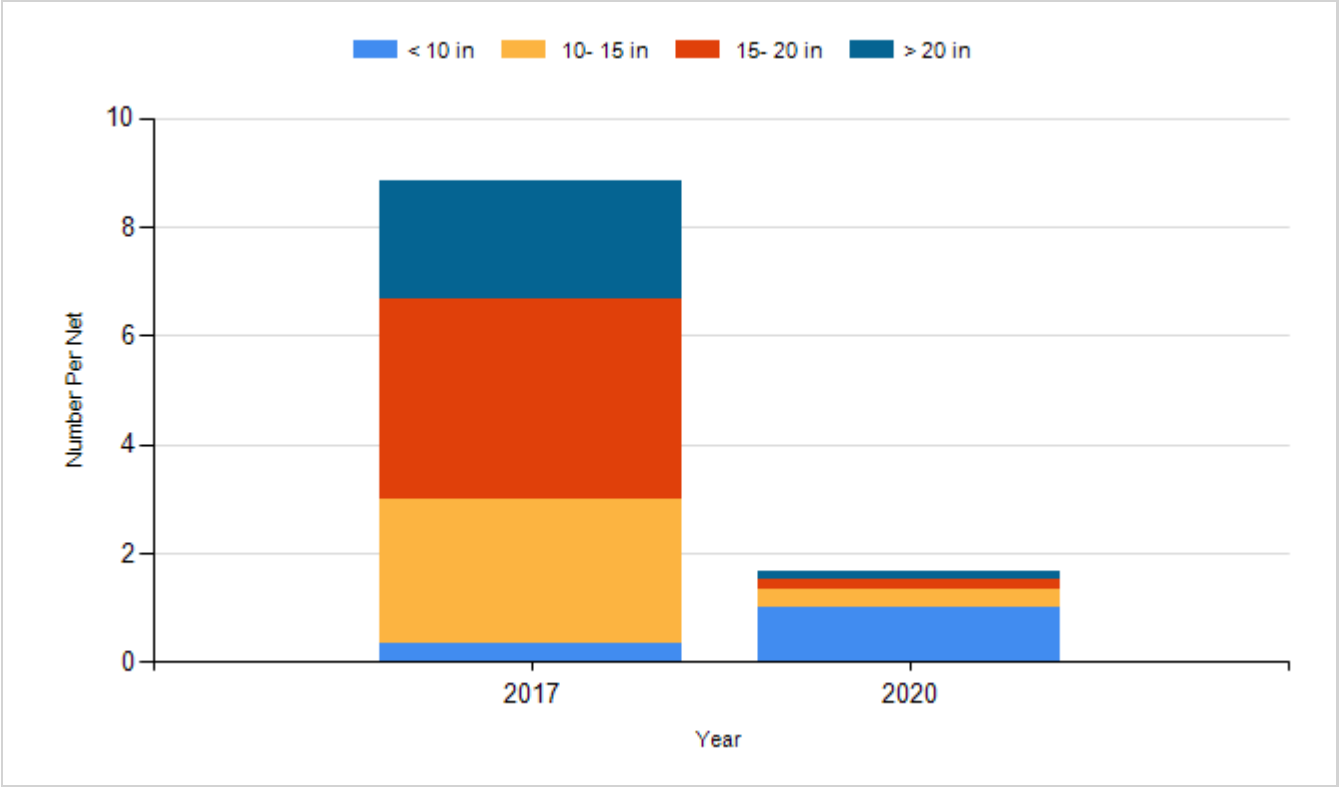
Species: Black Crappie
Gear: AFS std frame net



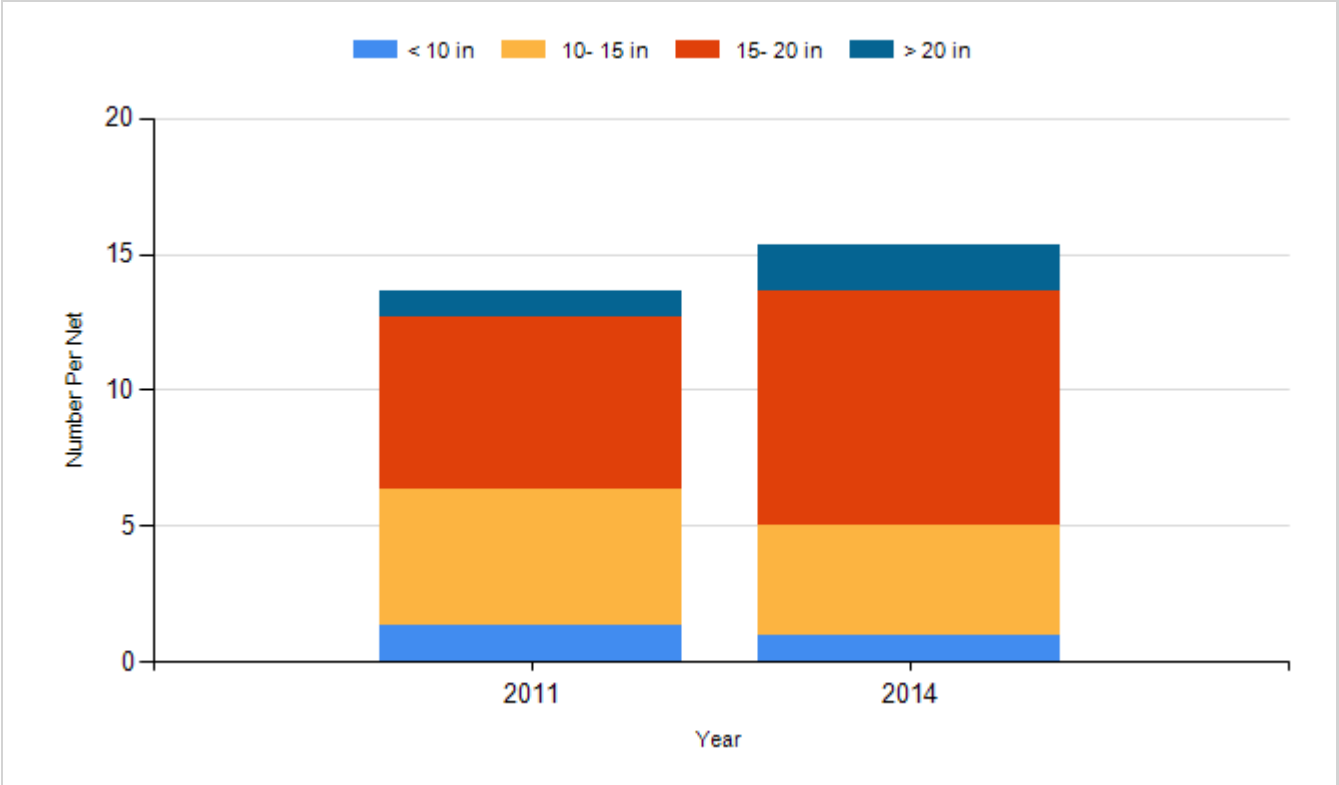
Species: Black Crappie
Gear: frame net (std 3/4 in)



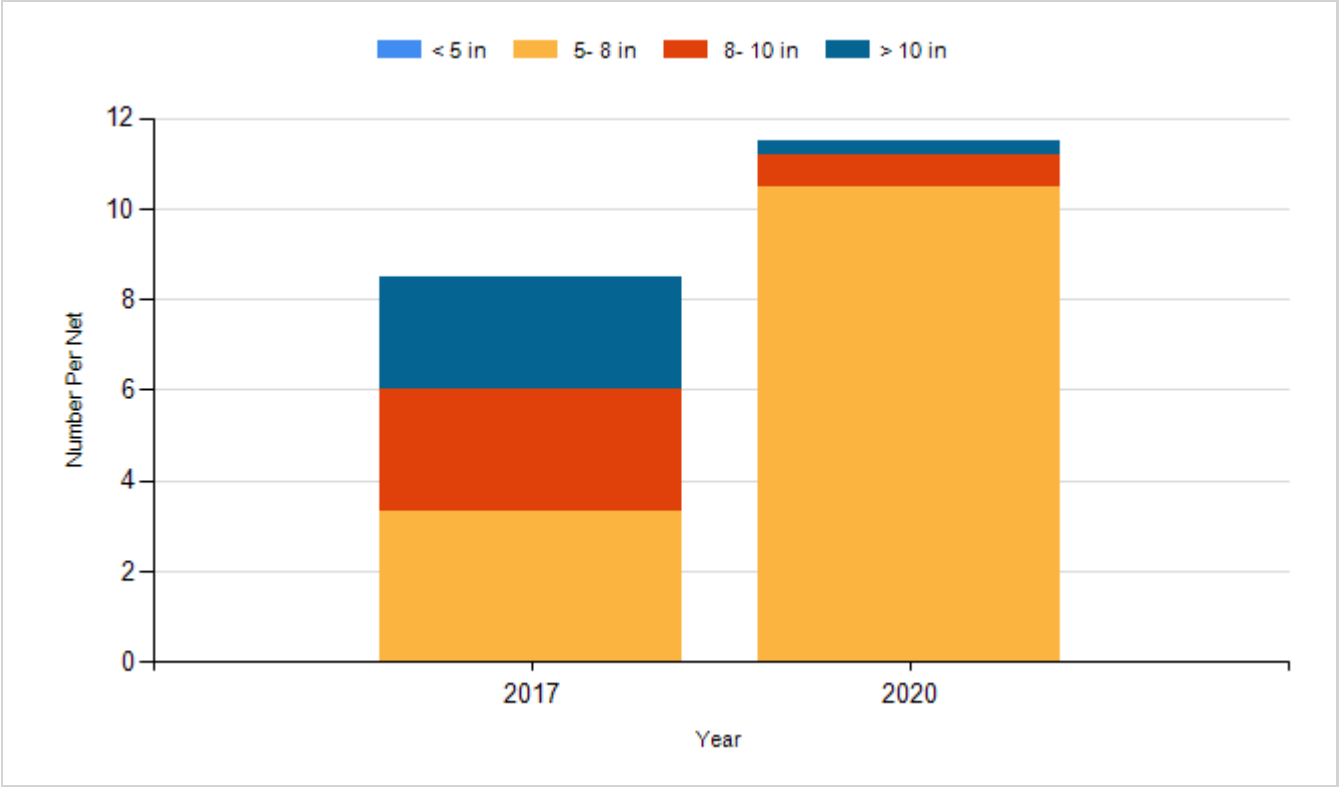
Species: Walleye
Gear: AFS std gill net



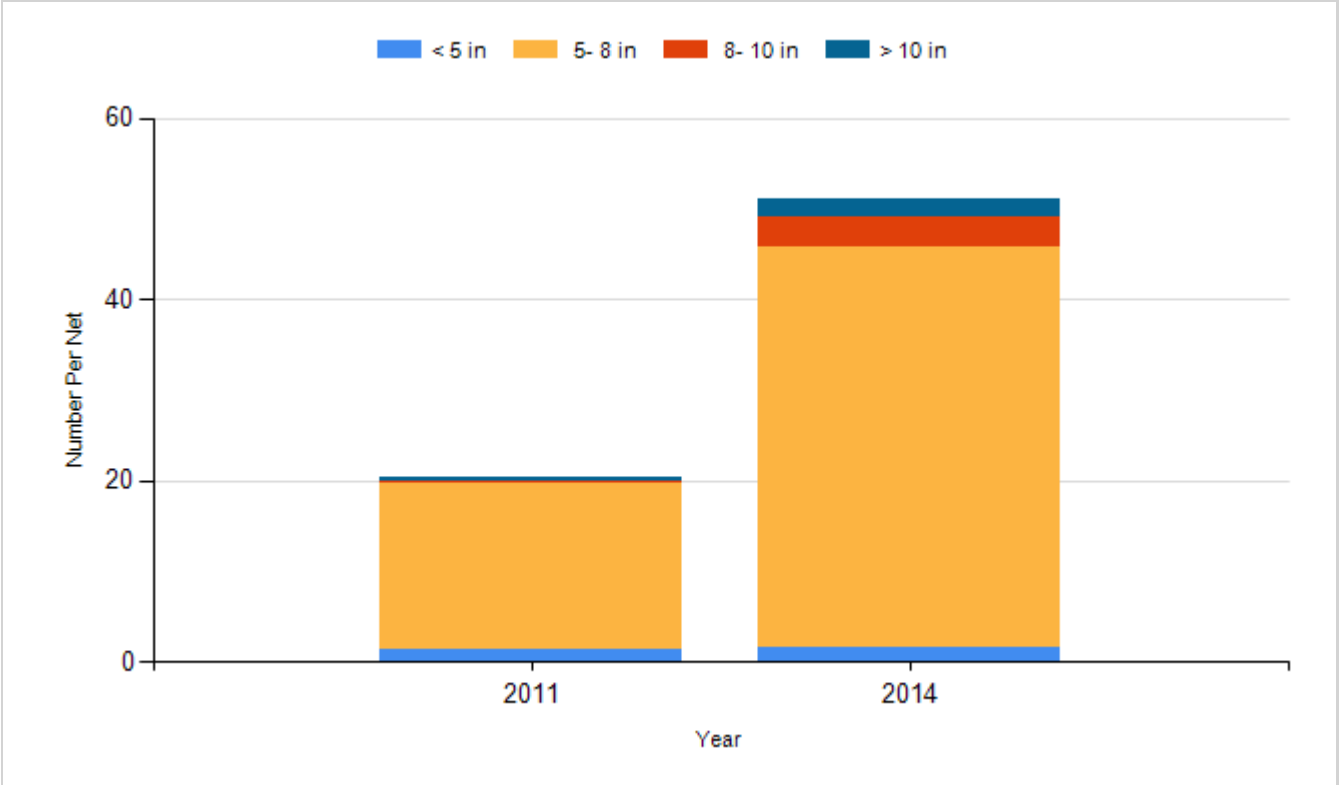
Species: Walleye
Gear: std exp gill net



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	Muskellunge	Large Fingerling	500
2012	Muskellunge	Large Fingerling	509
2012	Walleye	Small Fingerling	23,370
2014	Muskellunge	Large Fingerling	505
2014	Walleye	Fry	120,000
2016	Walleye	Fry	120,000
2018	Walleye	Fry	120,000