2023 Rahn Lake (Tripp County)

Rahn Lake is located 18 miles south of Winner, SD. It is an 18-acre impoundment with a mean depth of 6 feet and maximum depth of 16 feet. Access locations at Rahn Lake consist of a concrete plank boat ramp and a managed trail along the western shore with various maintained shore fishing accesses. It is managed as a multi-species fishery consisting of Black Crappie, Bluegill and Largemouth Bass. Northern Pike are also present. Sampling occurs every three years, consisting of frame nets targeting all species and fall electrofishing targeting Largemouth Bass. Fall electrofishing additionally assessed Saugeye stocked in 2023. This fishery experienced a winterkill in 2022/2023. Stocking in the spring and summer of 2023 occurred to help reestablish fish populations.

- **Black Crappie:** The catch rate of Black Crappie in 2023 was 0.8 fish per frame net. All Black Crappie sampled were 8 inches or longer and condition was good with a relative weight (Wr) of 108*.

- **Bluegill:** The catch rate of Bluegill in 2023 was 0.5 fish per frame net. Of the Bluegill sampled, 25% were 6 inches or larger. Bluegill condition was good with a relative weight (Wr) of 115*.

- **Largemouth Bass:** The catch rate of Largemouth Bass in 2023 was 3.0 fish per hour of electrofishing. Of the Largemouth Bass sampled, no fish sampled were greater then 12 inches in length. Largemouth Bass condition was good with a relative weight (Wr) of 136*.

In 2023, 300 adult Black Crappie, 100 adult Bluegill, 9,000 fry Largemouth Bass, 100 adult Northern Pike and 5,236 juvenile Saugeye were stocked in response to the winterkill.

* 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.

Created 1/29/2024 BV

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Rahn, Tripp County
KYP-Lake-122-000
2023

Lake Information

Name: Rahn

County: Tripp

Legal Description: T96-R76-S28

Surface Area: 18 Acres

Maximum Depth: 16 Feet

Mean Depth: 6 Feet

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Oct 09, 2023	3600 seconds
fall night EF-WAE	Oct 09, 2023	3600 seconds
frame net (std 3/4 in)	Jun 26, 2023	8 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

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
boat shocker (night)	Largemouth Bass	30	3.0	3.0	0		0		136	3
frame net (std 3/4 in)	Black Bullhead	59	5.0	2.1	43	12	0		110	3
	Black Crappie	6	0.8	1.1	100		0		108	3
	Bluegill	4	0.5	0.4	25		0		115	8
	Northern Pike	9	1.1	0.8	44		0		85	3

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.

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

		CPUE										
Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
AFS std frame net	Black Bullhead				16.6							16.60
	Black Crappie				2.8							2.80
	Bluegill				6.0							6.00
	Green Sunfish				0.2							0.20
	Largemouth Bass				0.1							0.10
	Northern Pike				0.4							0.40
	Yellow Perch				2.8							2.80
boat shocker (night)	Largemouth Bass	25.2		19.0	24.0	13.5	24.5	30.0			3.0	19.89
frame net (std 3/4 in)	Black Bullhead							98.1			5.0	51.55
	Black Crappie							5.7			0.8	3.25
	Bluegill							22.4			0.5	11.45
	Green Sunfish							0.3			0.0	0.15
	Northern Pike							2.9			1.1	2.00
	Yellow Perch							1.1			0.0	0.55

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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std frame net	Black Bullhead	PSD				0						
		PSD-P				0						
		Wr				84						
	Black Crappie	PSD				21						
		PSD-P				4						
		Wr				88						
	Bluegill	PSD				35						
		PSD-P				2						
		Wr				94						
	Largemouth Bass	PSD				100						
		PSD-P				0						
		Wr				104						
	Northern Pike	PSD				50						
		PSD-P				25						
		Wr				85						
boat shocker (night)	Largemouth Bass	PSD	100		71	79	81	88	57			0
		PSD-P	71		13	63	44	61	35			0
		Wr	114		109	115	117	120	112			136
frame net (std 3/4 in)	Black Bullhead	PSD							10			43
		PSD-P							0			0
		Wr							90			110
	Black Crappie	PSD							28			100
		PSD-P							0			0
		Wr							99			108
	Bluegill	PSD							80			25
		PSD-P							0			0
		Wr							92			115
	Northern Pike	PSD							34			44
		PSD-P							3			0
		Wr							87			85

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	57			153 (32)	161 (8)	212 (16)	231 (1)				
2017	27		142 (1)	194 (26)							

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	224	102 (1)		150 (64)	163 (140)	176 (19)					
2017	59		116 (9)	136 (34)	178 (11)	190 (5)					

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	71	160 (3)	172 (15)	255 (20)	322 (12)	358 (8)	409 (9)	459 (6)			
2018	27	125 (1)	235 (1)	298 (8)	319 (7)	397 (1)	430 (6)	449 (2)	479 (2)		

Fish Condition

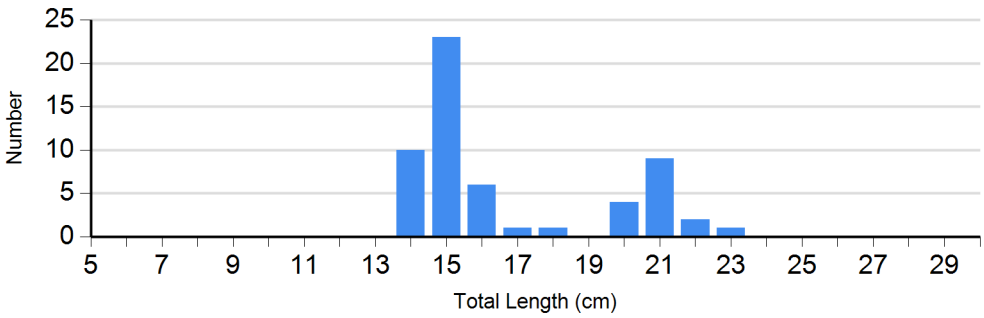
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2020	41	105 (4.2)	16	84 (1.6)	0		0	
	2023	0		6	108 (2.2)	0		0	
Bluegill Frame Net	2020	44	96 (1.6)	180	91 (0.9)	0		0	
	2023	3	116 (8.9)	1	111	0		0	
Largemouth Bass Electro Fishing	2019	6	123 (3.3)	13	123 (1.3)	27	118 (2.7)	3	124 (2.1)
	2020	26	112 (2.5)	13	107 (2.6)	20	114 (2.2)	1	113
	2023	3	136 (1.9)	0		0		0	

Length Frequency Distribution

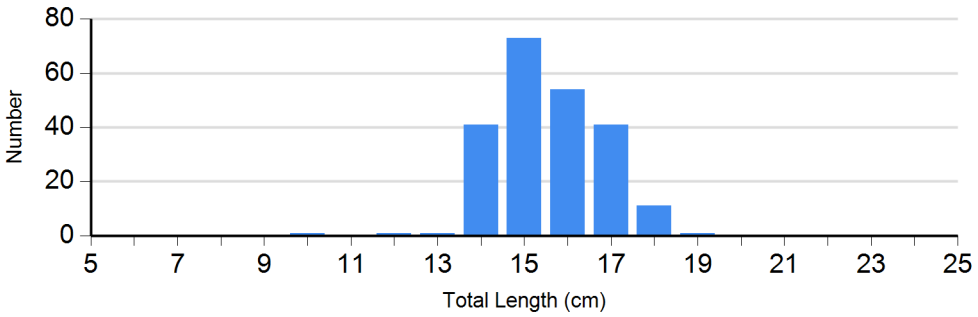
Length frequency histogram of species sampled by year.

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



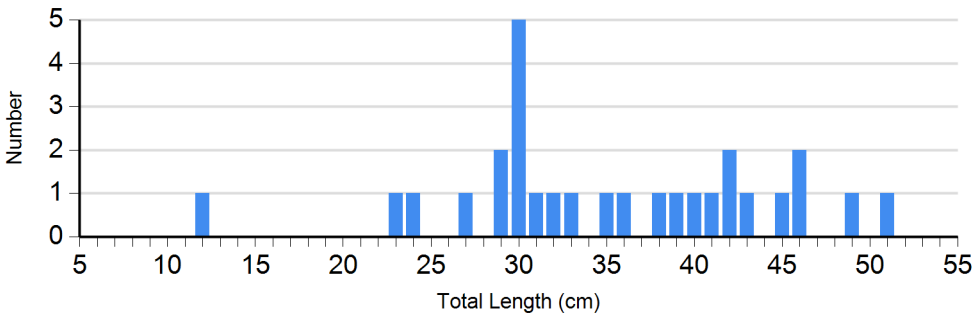
2020

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

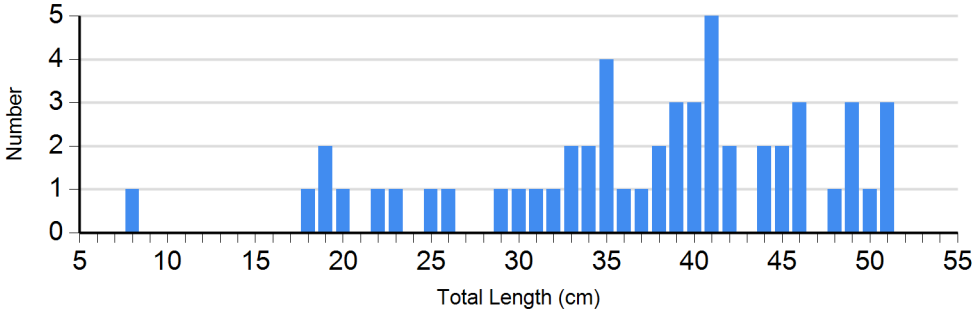


2020

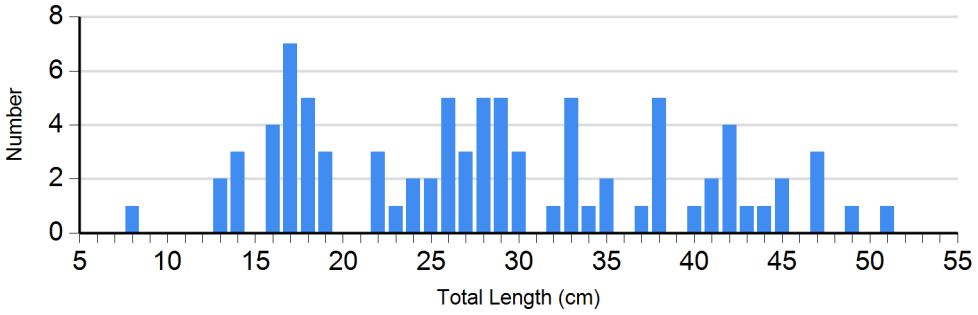
Species: Largemouth Bass
Gear: boat shocker (night)



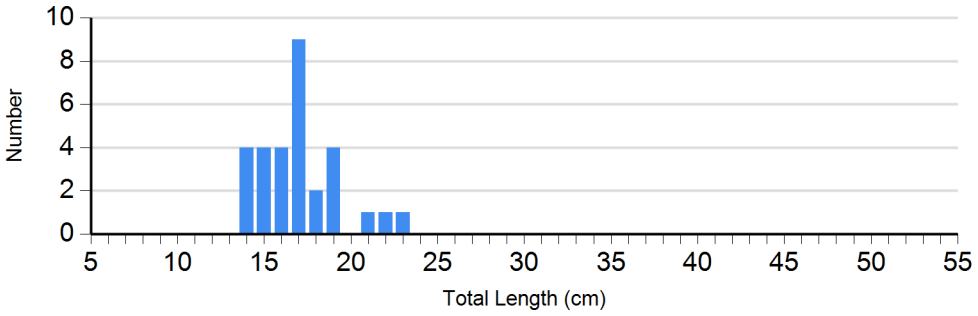
2018



2019



2020

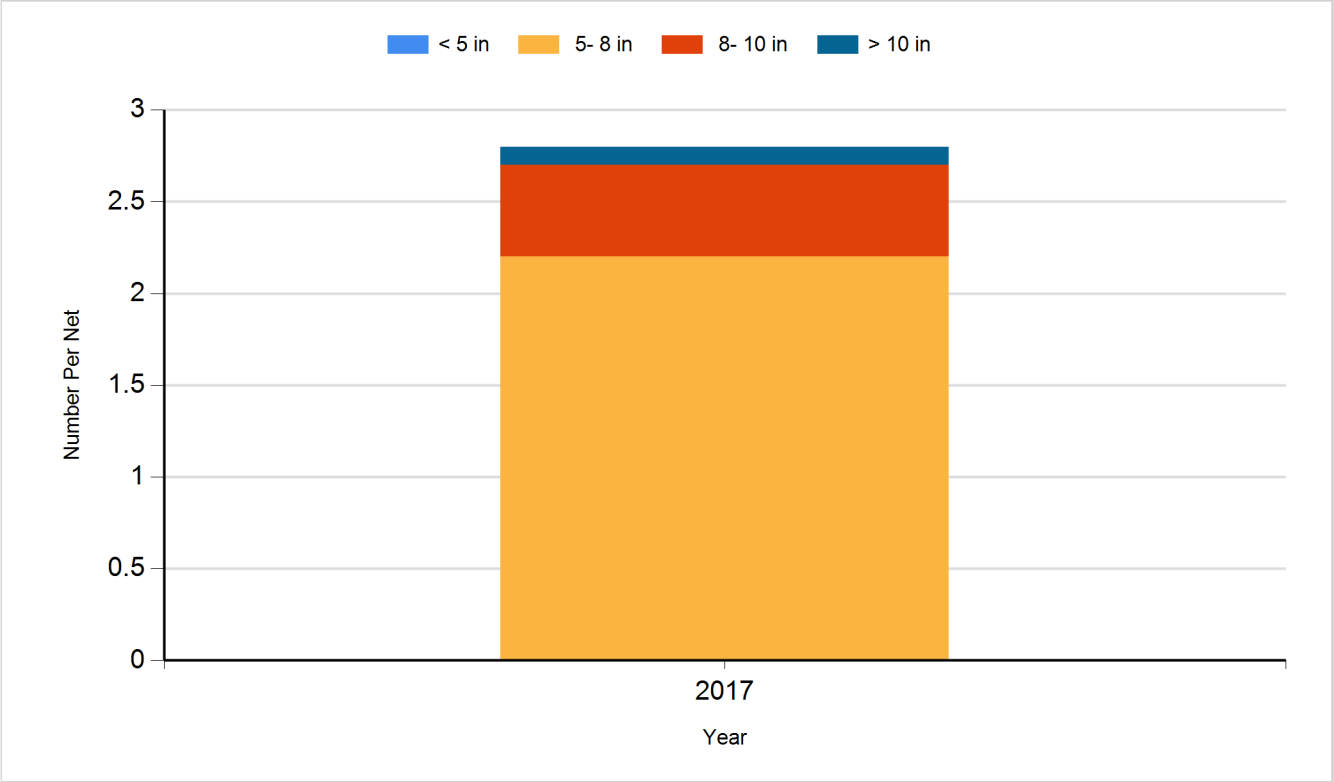


2023

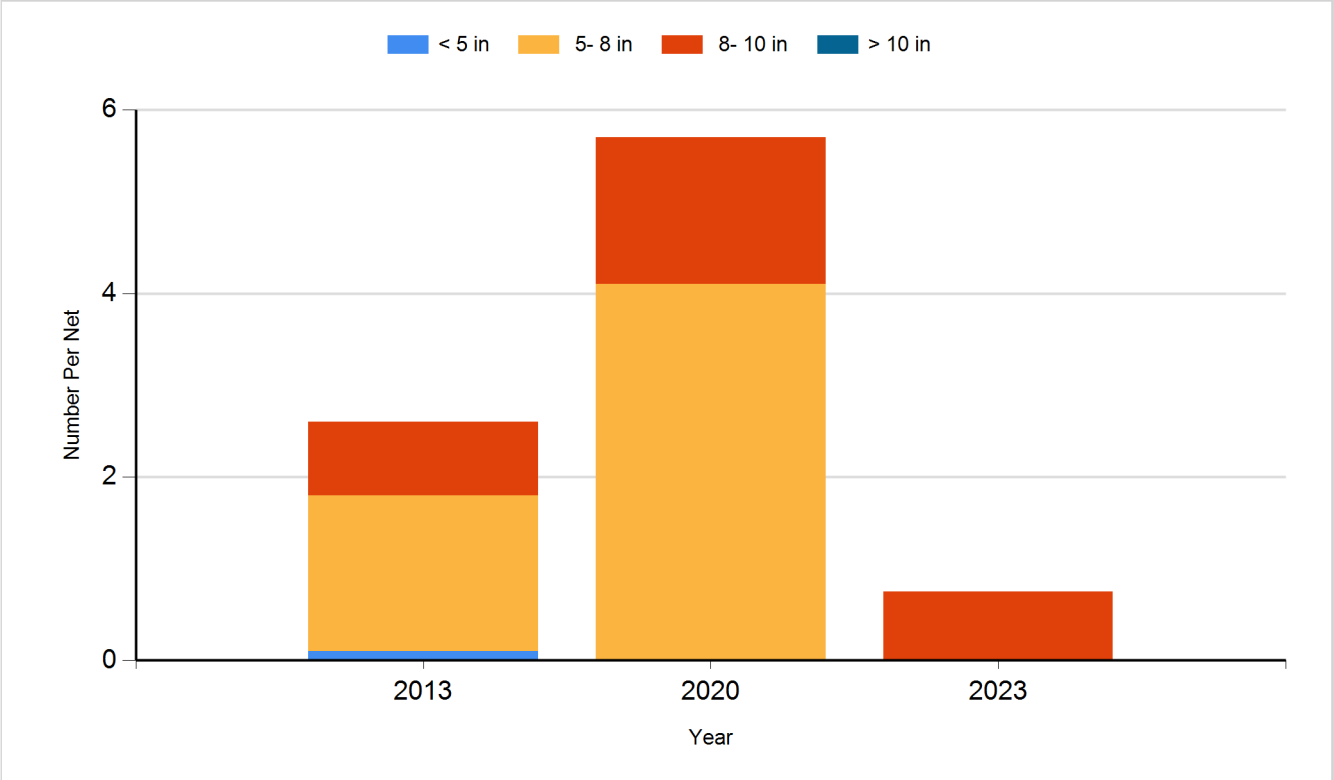
Historic Fish Sizes and Relative Abundance

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

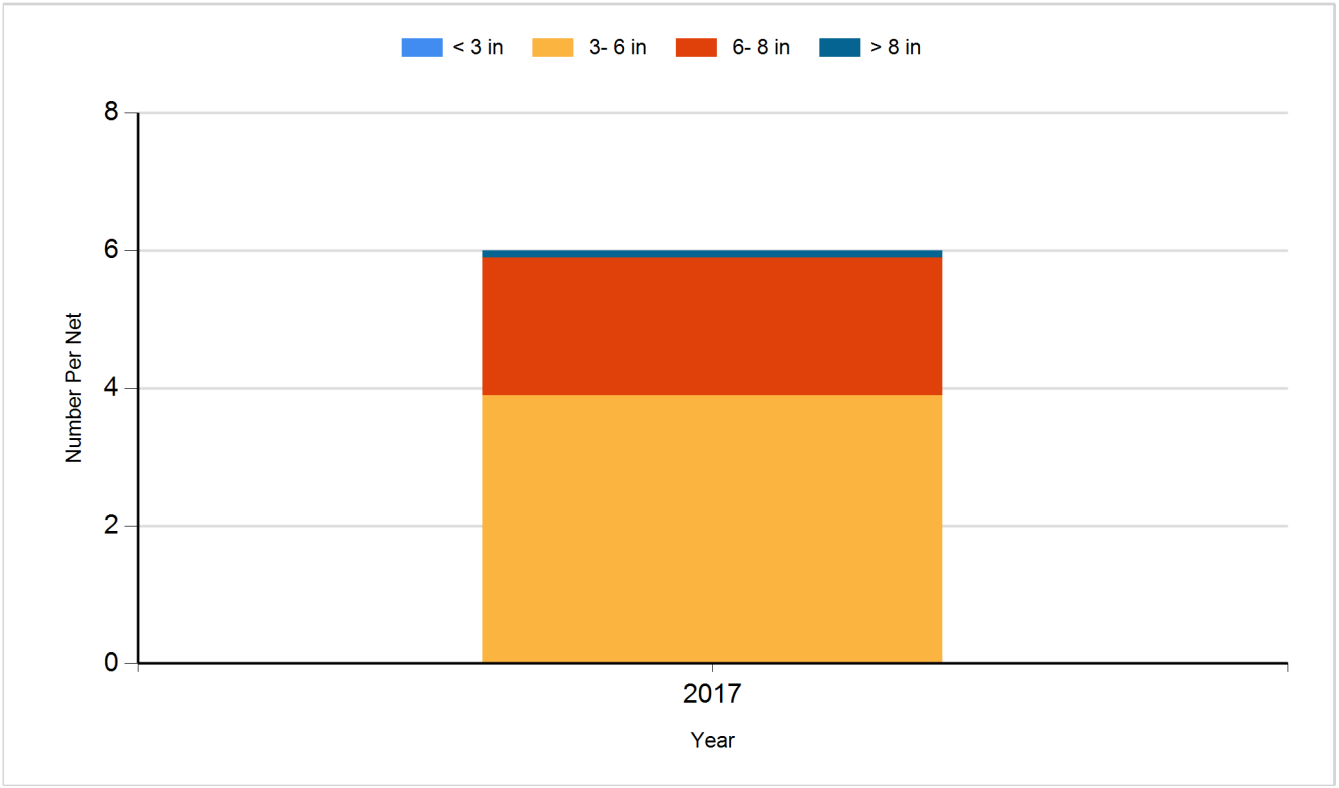
Species: Black Crappie
Gear: AFS std frame net



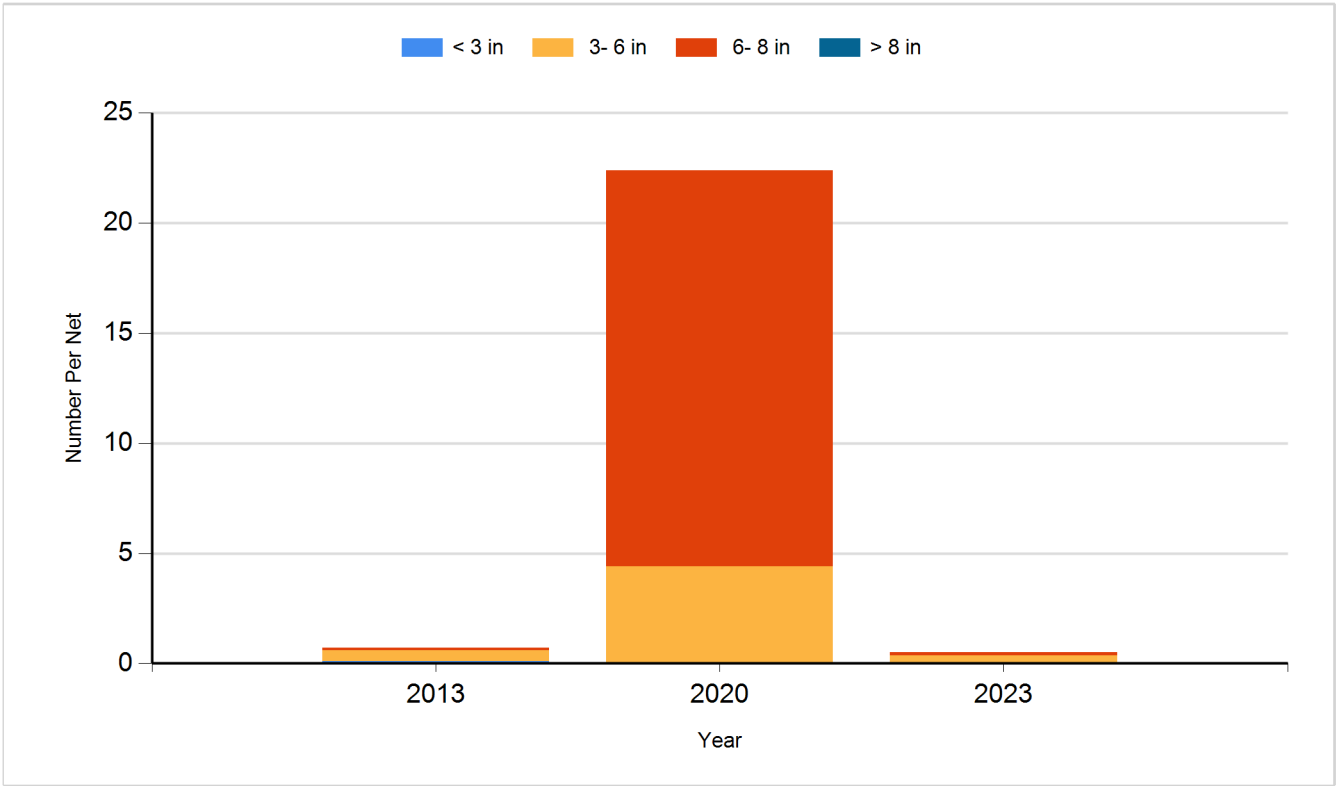
Species: Black Crappie
Gear: frame net (std 3/4 in)



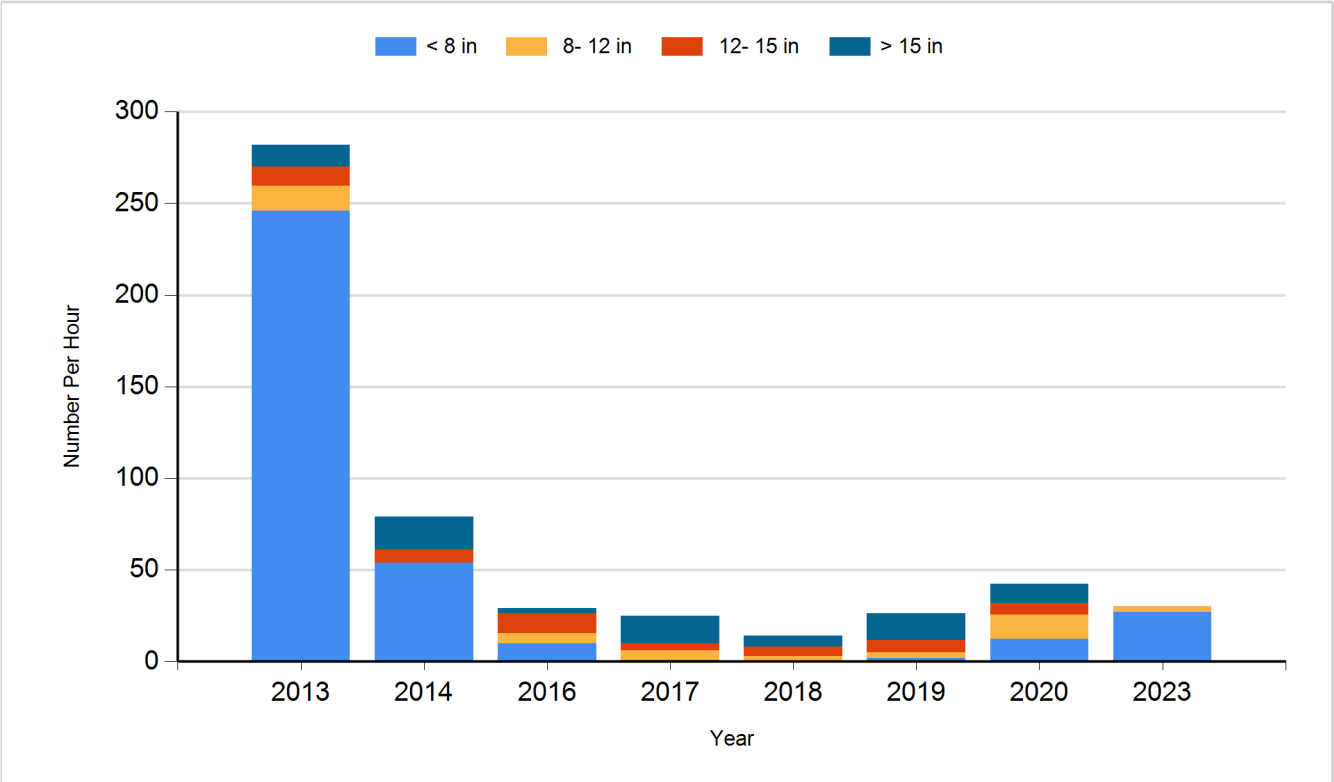
Species: Bluegill
Gear: AFS std frame net



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



Species: Largemouth Bass
Gear: boat shocker (night)



Fish Stocking

Number of fish stocked by year, species, and size.

Year	Species	Size	Number
2012	Largemouth Bass	Juvenile	100
2013	Largemouth Bass	Large Fingerling	648
2023	Black Crappie	Adult	300
2023	Bluegill	Adult	100
2023	Largemouth Bass	Fry	9,000
2023	Northern Pike	Adult	100
2023	Saugeye	Juvenile	5,236