2023 Lake Hurley Survey Summary

Water: Lake Hurley

County: Potter

Legal Description: T11N-R77W-S28&29

GPS: 45.090134, -100.146726

Surface Area: 97 Acres

Class: Warm Water Permanent

Maximum Depth: 29 feet

Mean Depth: 12 feet

Lake Hurley is a 97-acre impoundment on the lower portion of Cheyenne Creek, 5 miles west, 6 miles north, and 4 miles west of Gettysburg, or 2.5 miles north and 4 miles east of Whitlock Bay in west central Potter County. A township road from a county gravel road west of US HWY 83 provides access to the lake. A concrete plank ramp and dock provide boat access on the north shoreline. A vault toilet is the only other public use facility at Lake Hurley.

Primary game fish managed at Lake Hurley include Largemouth Bass, Black Crappie, Yellow Perch, Bluegill and Walleye. Northern Pike and Black Bullhead also have a historical presence. In 2022 drought conditions resulted in low water levels and the boat ramp was unusable. Runoff from snow melt refilled the impoundment during the spring of 2023. No occurrence of winterkill has been recorded. A fish consumption advisory for elevated mercury levels on Largemouth Bass over 18 inches has been issued at Lake Hurley.

Lake Hurley was surveyed on June 21-22, 2023, utilizing ¾ inch standard frame nets sets and AFS standard gill net sets. Yellow Perch, Bluegill, Black Crappie, Northern Pike, Black Bullhead and Walleye were observed during the 2023 survey. Electrofishing was not completed in 2023 to monitor Largemouth Bass, however a healthy bass population is known to be present.

- **Black Crappie:** 500 crappies were captured in 10 frame net sets during the 2023 survey. The majority were juvenile fish from the 2022 year class and under 4 inches. Several adult fish were also observed with the largest just over 10 inches. Relative condition (weight at length) was above average for all size classes.

- **Bluegill:** Catch rates were moderate with 2.9 individuals sampled per frame net. The most abundant size group was between 6 and 8 inches, with younger juvenile fish under 6 inches and larger adults over 8 inches also sampled. Condition was well above average, mainly due to female fish being prespawn at the time the lake was surveyed.

- **Yellow Perch:** During the 2023 netting efforts 7.8 adult perch were captured in each gill net set and 2.7 per frame net. Most of the fish observed were from 8 to 10 inches.

- **Other Species:** Numerous Northern Pike over 20 inches, abundant adult Black Bullhead and 5 Walleye were also documented during the 2023 fish population survey. Scheduled stockings of Walleye fingerlings occur biannually.

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Hurley, Potter County
LLO-Lake-2201-000
2023

Lake Information

Name: Hurley

County: Potter

Legal Description: T11-R77-S28

Surface Area: 97 Acres

Maximum Depth: 29 Feet

Mean Depth: 12 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 22, 2023	2 net-nights
AFS std gill net	Jun 23, 2023	2 net-nights
frame net (std 3/4 in)	Jun 22, 2023	5 net-nights
frame net (std 3/4 in)	Jun 23, 2023	5 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Largemouth Bass

Bluegill

Black Bullhead

Black Crappie

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	11	2.8	1.4	100		36		111	8
	Black Crappie	30	3.5	1.4	50	22	50	22	119	6
	Northern Pike	9	2.3	1.7	100		22		90	3
	Walleye	4	1.0	0.0	50		25		98	7
	Yellow Perch	31	7.8	4.2	90		6		108	2
frame net (std 3/4 in)	Black Bullhead	172	13.3	3.7	42	6	27	5	103	2
	Black Crappie	499	9.5	4.3	44	7	38	7	120	3
	Bluegill	29	2.9	1.1	69	13	7		134	4
	Northern Pike	13	1.3	0.5	69		23		90	2
	Walleye	1	0.1	0.1	0		0		86	
	Yellow Perch	27	2.7	1.5	56	15	11		107	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.

*** 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				59.8							59.80
	Black Crappie				10.2							10.20
	Bluegill				2.8							2.80
	Largemouth Bass				0.1							0.10
	Northern Pike				0.9							0.90
	Walleye				0.2							0.20
	Yellow Perch				1.8							1.80
AFS std gill net	Black Bullhead				38.3			1.3			2.8	14.13
	Black Crappie				5.0			0.0			3.5	2.83
	Largemouth Bass				0.5			0.0			0.0	0.17
	Northern Pike				5.5			7.8			2.3	5.20
	Walleye				1.0			0.3			1.0	0.77
	Yellow Perch				1.5			36.3			7.8	15.20
boat shocker (night)	Largemouth Bass	22.0			32.0			11.0				21.67
	Walleye*	0.0			0.0			2.0				0.67
frame net (std 3/4 in)	Black Bullhead							46.9			13.3	30.10
	Black Crappie							11.6			9.5	10.55
	Bluegill							11.8			2.9	7.35
	Largemouth Bass							0.1			0.0	0.05
	Northern Pike							1.3			1.3	1.30
	Walleye							0.0			0.1	0.05
	Yellow Perch							3.1			2.7	2.90

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				85						
	Black Crappie	PSD				0						
		PSD-P				0						
		Wr				117						
	Bluegill	PSD				86						
		PSD-P				4						
		Wr				115						
	Largemouth Bass	PSD				100						
		PSD-P				100						
		Wr				102						
	Northern Pike	PSD				67						
		PSD-P				11						
		Wr				79						
	Walleye	PSD				50						
		PSD-P				50						
		Wr				93						
	Yellow Perch	PSD				89						
		PSD-P				0						
		Wr				103						
AFS std gill net	Black Bullhead	PSD				0			100			100
		PSD-P				0			0			36
		Wr				97			100			111
	Black Crappie	PSD				0						50
		PSD-P				0						50
		Wr				110						119
	Largemouth Bass	PSD				100						
		PSD-P				50						
		Wr				101						
	Northern Pike	PSD				95			48			100
		PSD-P				14			13			22
		Wr				84			91			90

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std gill net	Walleye	PSD				100			0			50
		PSD-P				75			0			25
		Wr				82			92			98
	Yellow Perch	PSD				67			5			90
		PSD-P				0			0			6
		Wr				111			101			108
boat shocker (night)	Largemouth Bass	PSD	18			100			18			
		PSD-P	18			88			0			
		Wr	122			111			123			
	Walleye	PSD							0			
		PSD-P							0			
		Wr							95			
frame net (std 3/4 in)	Black Bullhead	PSD							84			42
		PSD-P							1			27
		Wr							101			103
	Black Crappie	PSD							93			44
		PSD-P							3			38
		Wr							103			120
	Bluegill	PSD							63			69
		PSD-P							16			7
		Wr							124			134
	Largemouth Bass	PSD							0			
		PSD-P							0			
		Wr							99			
	Northern Pike	PSD							100			69
		PSD-P							8			23
		Wr							88			90
	Walleye	PSD										0
		PSD-P										0
		Wr										86
	Yellow Perch	PSD							35			56
		PSD-P							6			11
		Wr							92			107

Back-Calculated Lengths

Mean species back-calculated total length (mm) at age, standard error (SE), and sample size (N).

Species: Black Crappie

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2022	1	15	93 (1.8)									
2021	2	4	93 (7.8)	116 (5.5)								
2020	3	1	86	110	131							
2017	6	2	116 (16.2)	160 (27.7)	187 (24.9)	210 (20.4)	233 (20.3)	252 (21.4)				
2016	7	2	103 (.3)	141 (3.6)	182 (2.9)	226 (5)	247 (14.2)	262 (10.2)	282 (.7)			
2016	7	6	117 (3.6)	152 (5.6)	185 (3.7)	211 (3.3)	235 (4.5)	252 (4.9)	266 (4.9)			
Weighted Mean		30	100	139	180	214	237	254	270			

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2022	1	15										
2021	2	4										
2020	3	1										
2017	6	2										
2016	7	2										
2016	7	6										
Weighted Mean		30										

Species: Bluegill

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2022	1	9	75 (3.3)									
2021	2	1	118	153								
2020	3	3	79 (4.6)	111 (2.8)	146 (.8)							
2019	4	8	84 (4.7)	113 (5.4)	141 (5.1)	164 (7.6)						
2018	5	6	74 (4.5)	105 (4.9)	130 (7)	149 (7.4)	164 (6.6)					
2017	6	1	88	113	135	154	168	176				
2016	7	1	105	132	147	156	172	186	199			
Weighted Mean		29	81	113	138	157	166	181	199			

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2022	1	9										
2021	2	1										
2020	3	3										
2019	4	8										
2018	5	6										
2017	6	1										
2016	7	1										
Weighted Mean		29										

Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2021	2	3	107 (5.9)	130 (7.5)								
2021	2	11	112 (1.7)	140 (2.2)								
2020	3	1	139	190	216							
2020	3	4	114 (6.2)	153 (6)	197 (3.6)							
2019	4	5	122 (5)	162 (4.8)	192 (4.6)	212 (5)						
2019	4	8	115 (7.1)	147 (6.5)	182 (4.4)	211 (4.6)						
2017	6	1	124	164	196	215	235	251				
2017	6	1	141	162	184	208	231	244				
2016	7	2	89 (5.4)	117 (11.4)	147 (18.2)	169 (25.7)	187 (31.6)	207 (31.7)	229 (41.4)			
2016	7	2	110 (10.3)	132 (11.5)	159 (6.5)	186 (3.3)	207 (.7)	222 (5.3)	238 (2.5)			
Weighted Mean		38	114	146	184	204	209	226	234			

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2021	2	3										
2021	2	11										
2020	3	1										
2020	3	4										
2019	4	5										
2019	4	8										
2017	6	1										
2017	6	1										
2016	7	2										
2016	7	2										
Weighted Mean		38										

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+
2023	499	113 (390)	129 (61)	142 (6)			260 (11)	277 (31)			
2020	115		144 (3)	166 (4)	203 (3)	232 (24)	235 (63)	245 (17)	252 (1)		
2017	103	94 (1)		162 (102)							

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	29	94 (9)	163 (1)	164 (3)	177 (8)	177 (6)	183 (1)	204 (1)			
2020	118	108 (8)	133 (25)	148 (19)	168 (31)	179 (4)	187 (14)	217 (4)	222 (4)	227 (6)	232 (4)
2017	28		122 (4)	166 (5)	170 (15)	180 (2)	185 (1)				294 (1)

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	11	233 (5)	253 (5)	318 (1)							
2017	32			364 (3)	389 (9)	421 (6)	454 (2)	480 (2)	476 (4)	506 (4)	512 (2)
2014	68	200 (58)	240 (2)			418 (2)			470 (4)	480 (2)	

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	1				360 (1)						
2017	4			446 (1)		521 (1)		628 (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+
2023	31		148 (3)	225 (8)	231 (17)		271 (1)	232 (3)			
2020	145	137 (2)	149 (82)	166 (31)	192 (28)	226 (2)					
2017	5			204 (4)	216 (1)						

Fish Condition

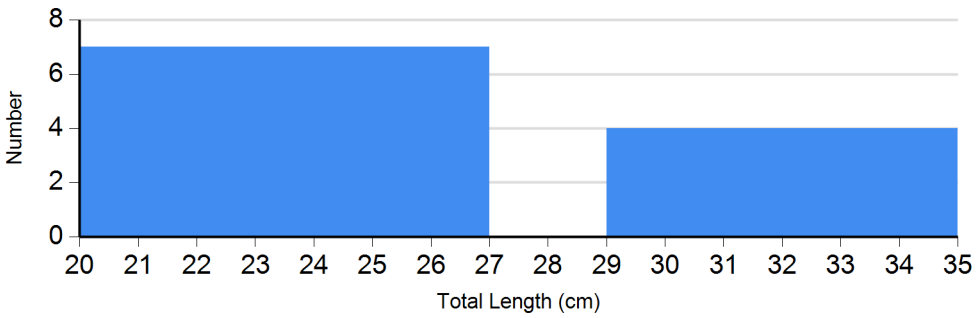
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2020	0		5	100 (11.2)	0		0	
	2023	0		7	119 (5.5)	4	95	0	
Black Crappie Frame Net	2020	8	119 (1.7)	104	101 (0.6)	4	100 (0.2)	0	
	2023	53	131 (2.4)	6	110	36	107 (1.7)	0	
Bluegill Frame Net	2020	44	127 (1.7)	55	126 (1.1)	19	116 (2.6)	0	
	2023	9	133 (2.3)	18	138 (3.0)	2	101 (35.8)	0	
Largemouth Bass Electro Fishing	2020	9	124 (3.5)	2	119 (0.4)	0		0	
Northern Pike Gill Net	2020	16	89 (1.3)	11	93 (4.8)	2	91 (8.2)	2	86 (1.7)
	2023	0		7	89 (2.1)	2	93 (6.3)	0	
Walleye Gill Net	2020	1	92	0		0		0	
	2023	2	94 (10.0)	1	106	1	100	0	
Yellow Perch Gill Net	2020	138	102 (0.8)	7	93 (3.2)	0		0	
	2023	3	122 (5.0)	26	108 (1.4)	2	95 (6.3)	0	

Length Frequency Distribution

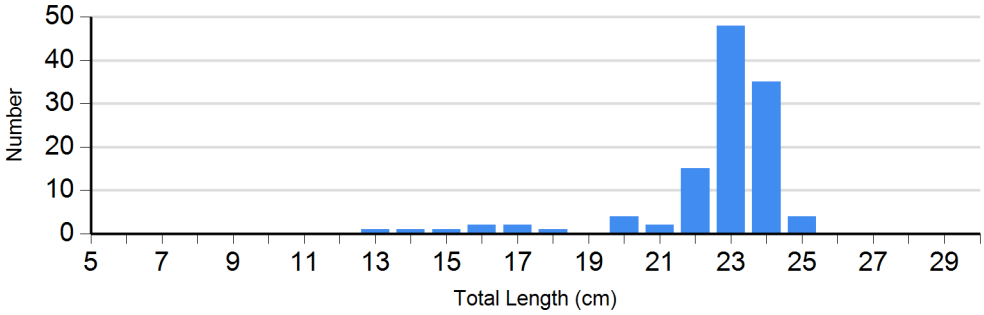
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

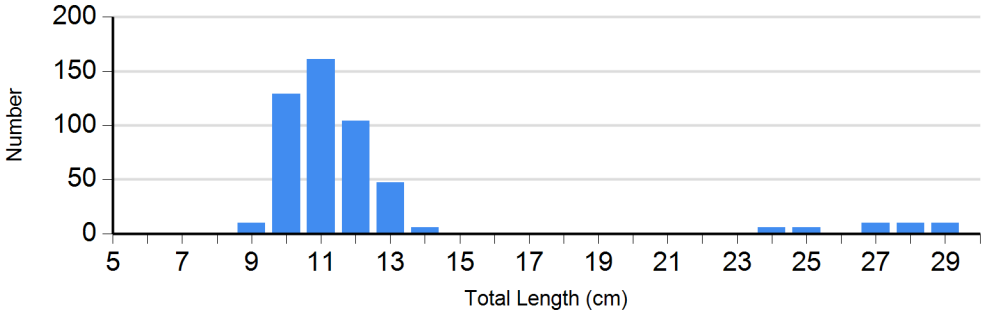


2023

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

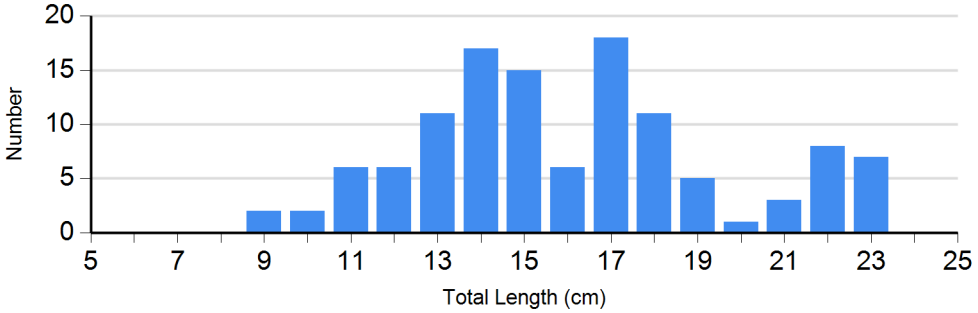


2020



2023

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



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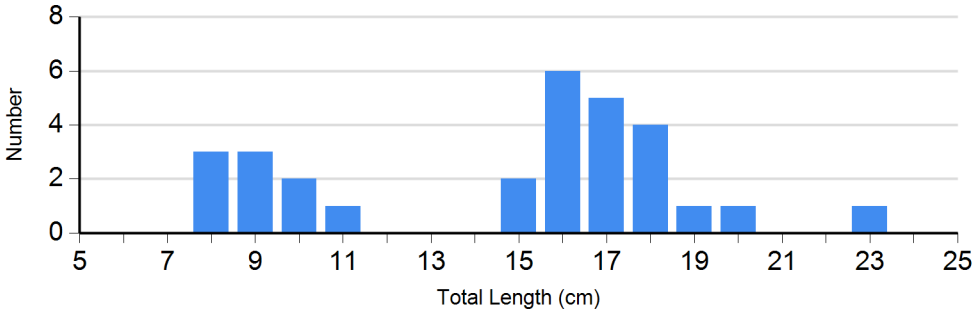
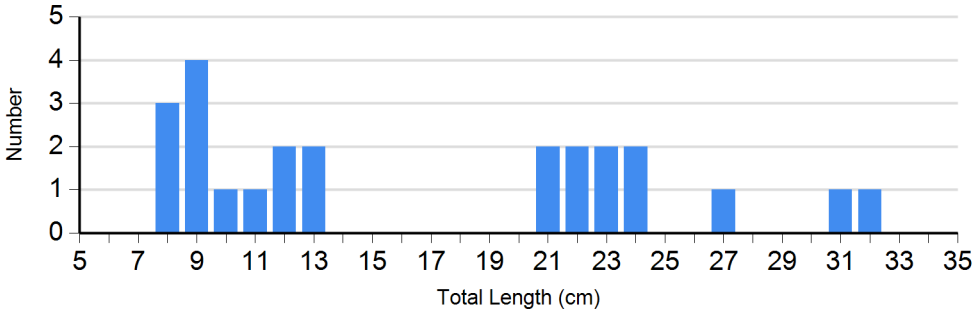


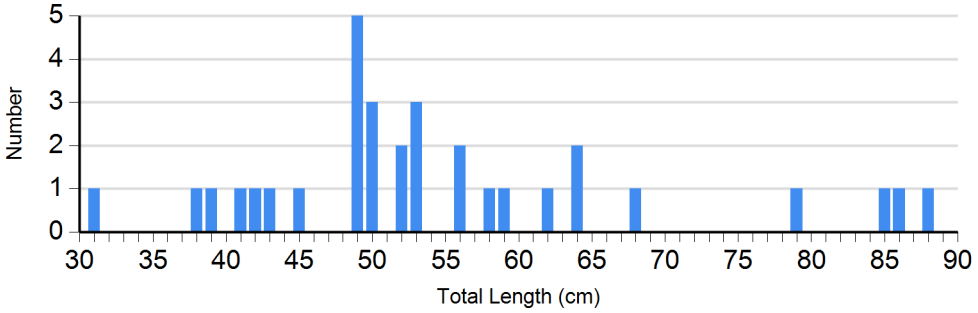
2023

Species: Largemouth Bass
Gear: boat shocker (night)



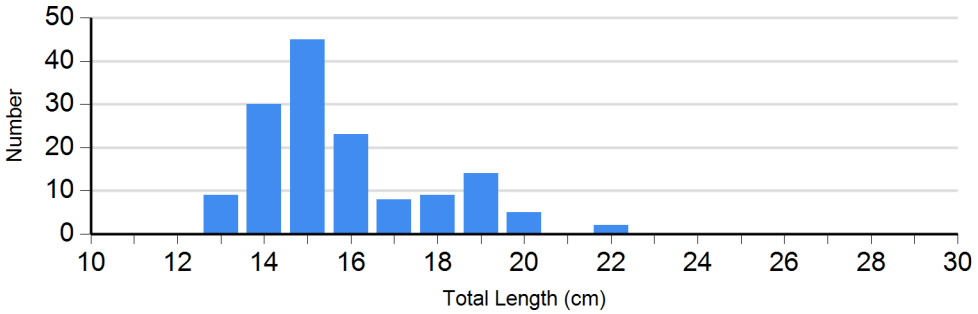
2020

Species: Northern Pike
Gear: AFS std gill net

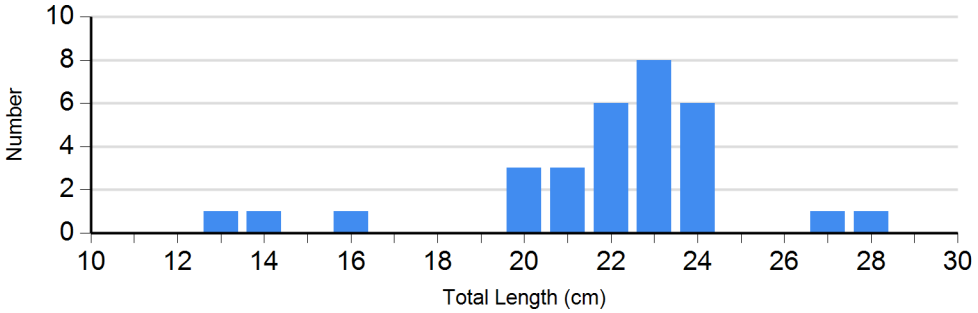


2020

Species: Yellow Perch
Gear: AFS std gill net



2020

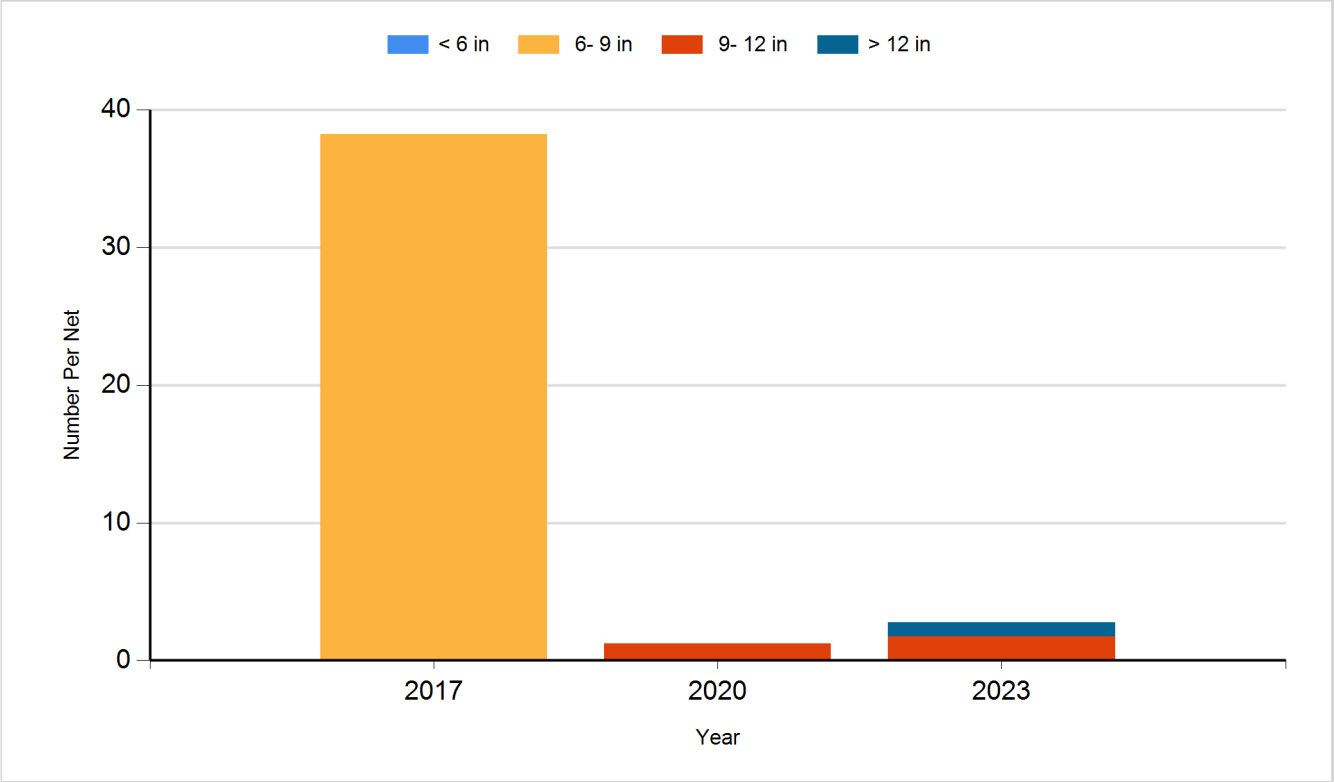


2023

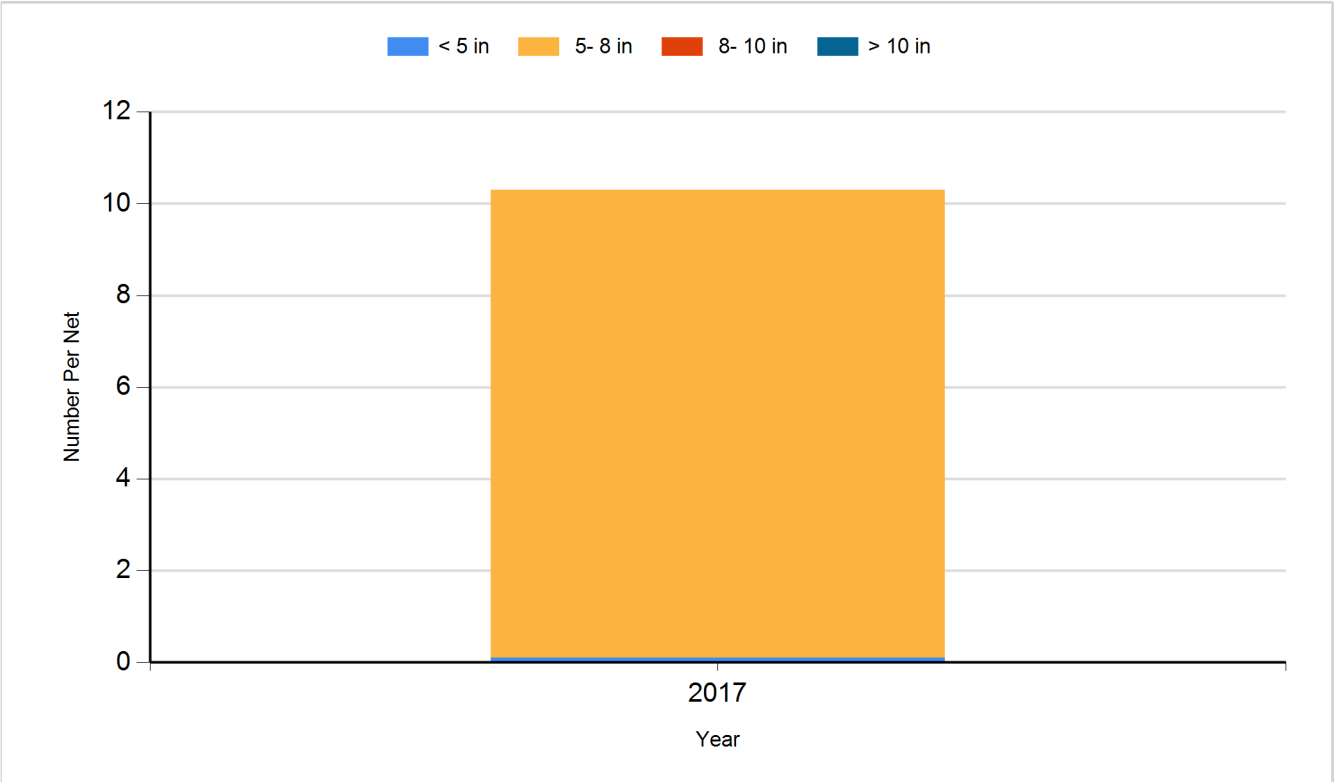
Historic Fish Sizes and Relative Abundance

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

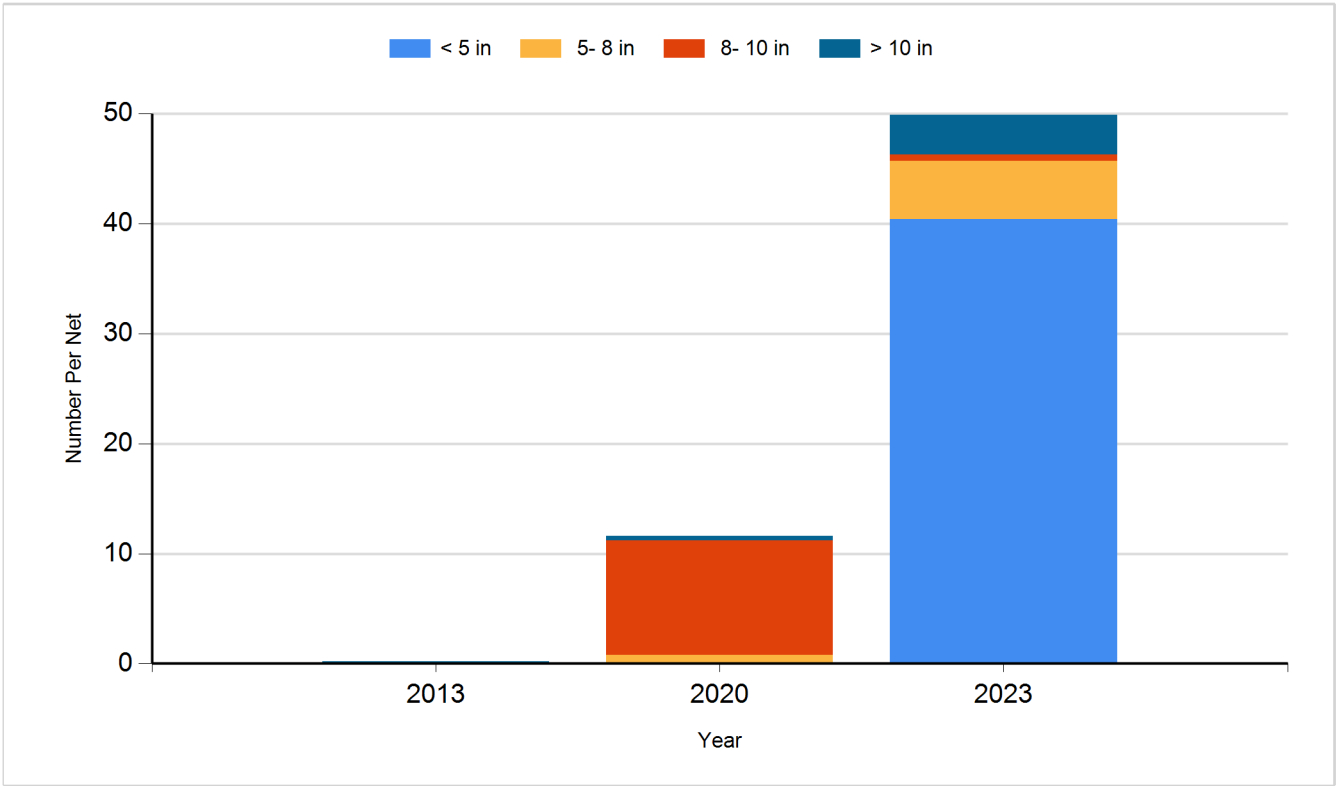
Species: Black Bullhead
Gear: AFS std gill net



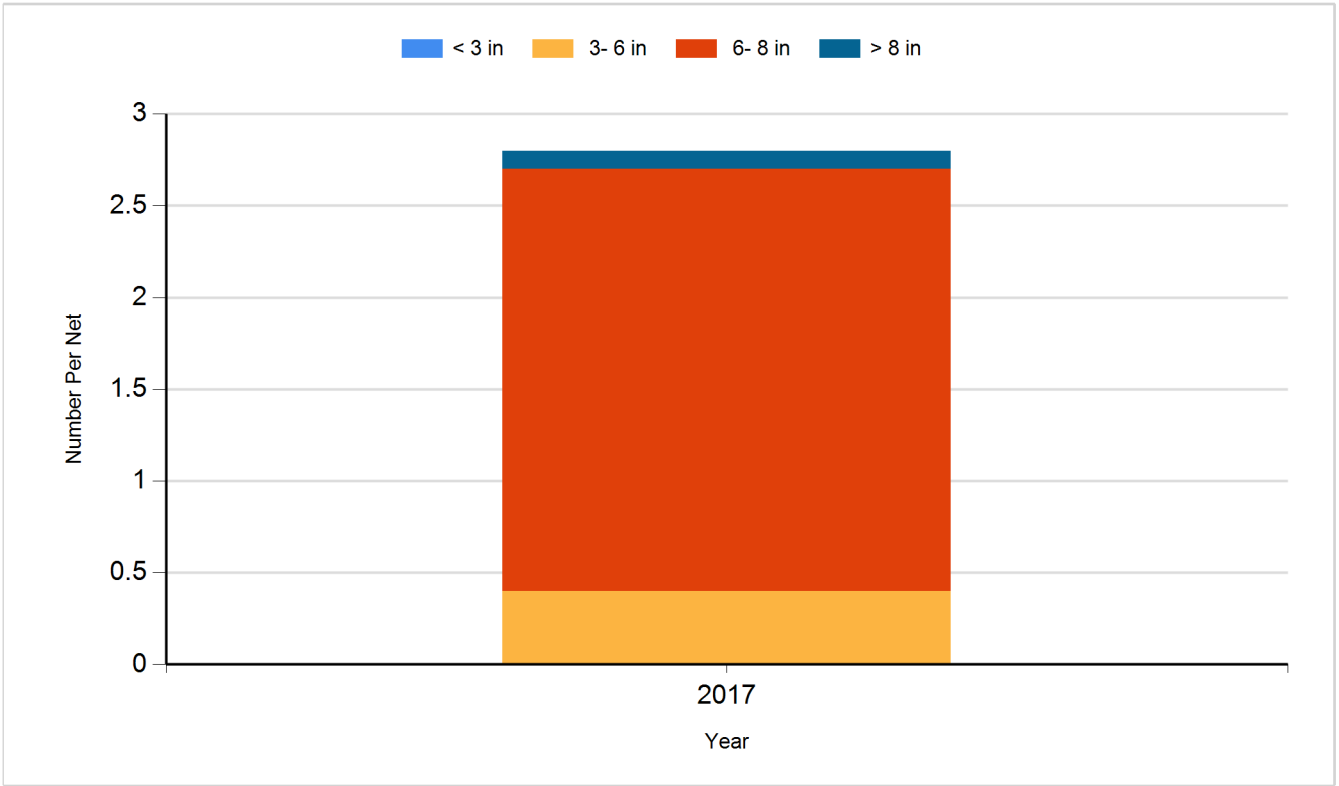
Species: Black Crappie
Gear: AFS std frame net



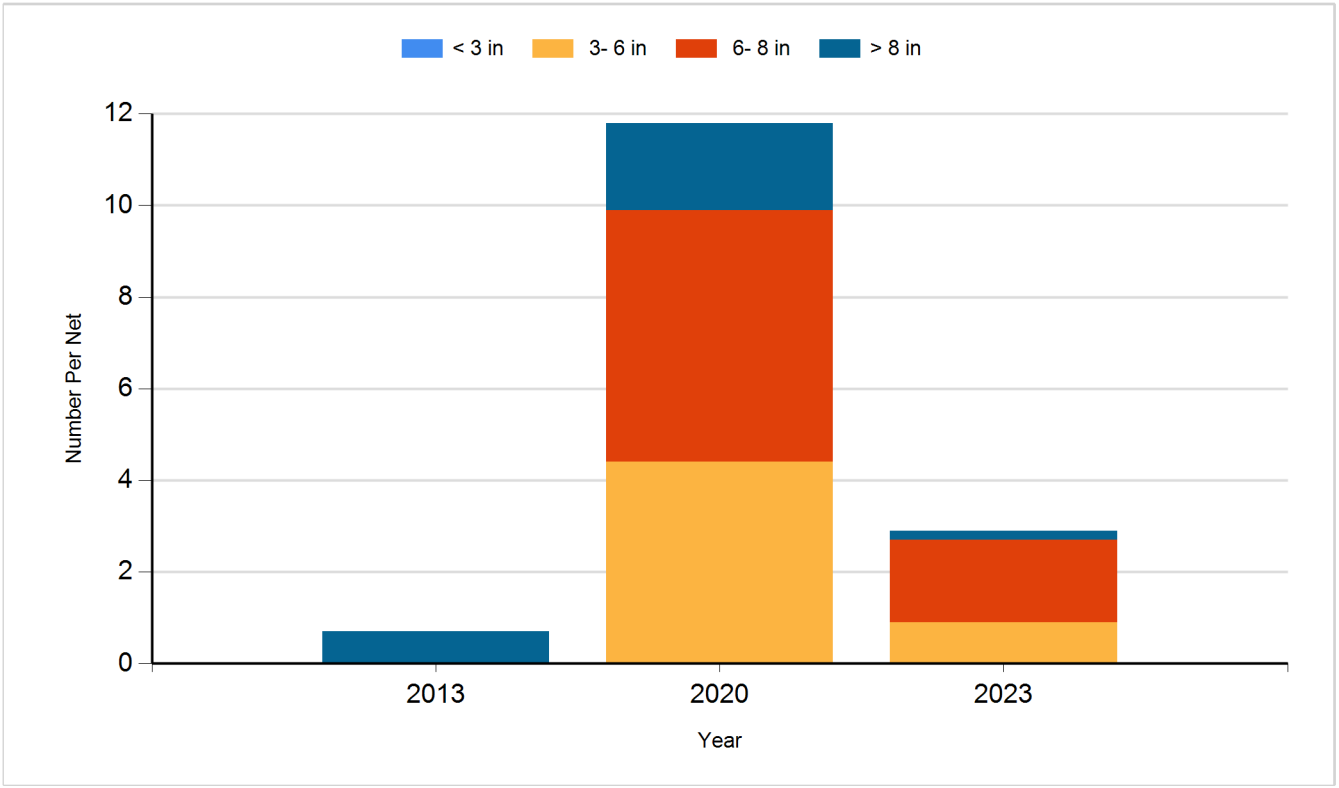
Species: Black Crappie
Gear: frame net (std 3/4 in)



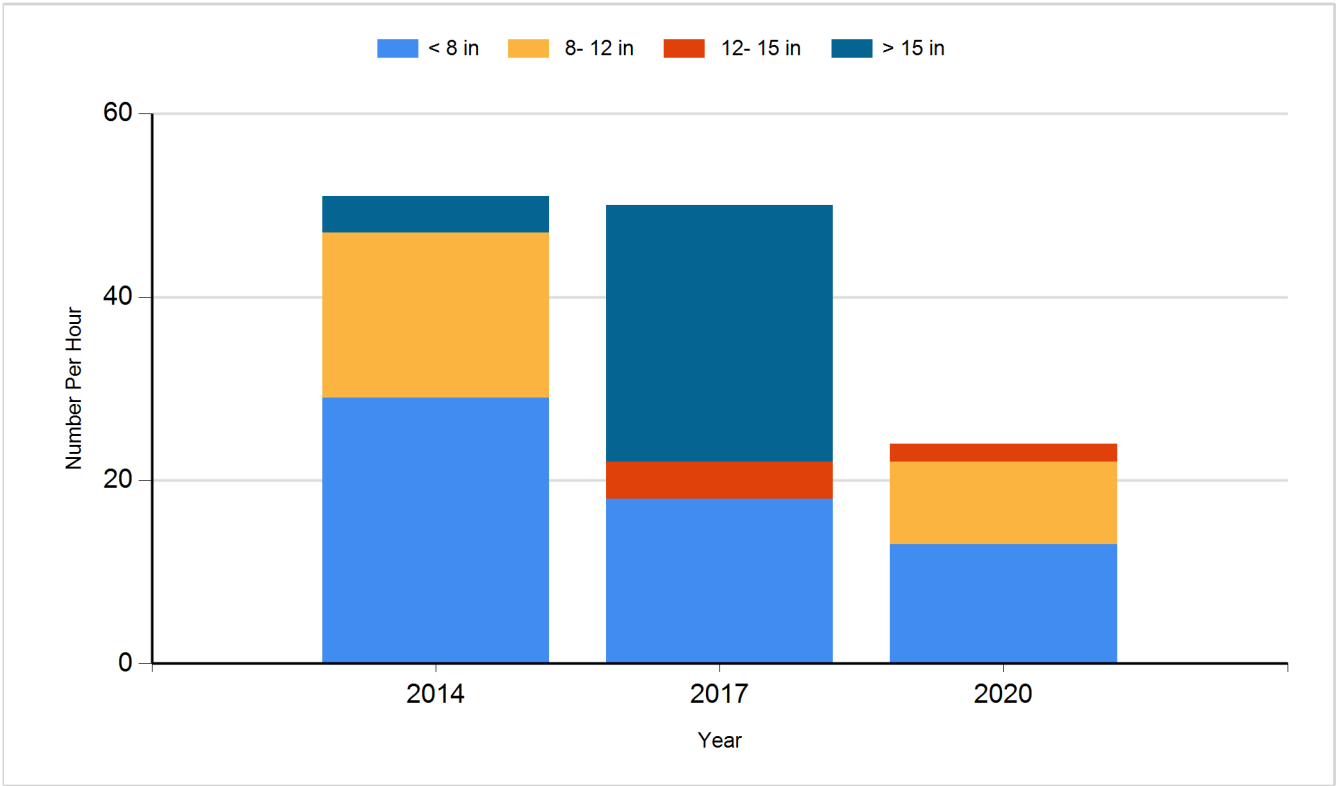
Species: Bluegill
Gear: AFS std frame net



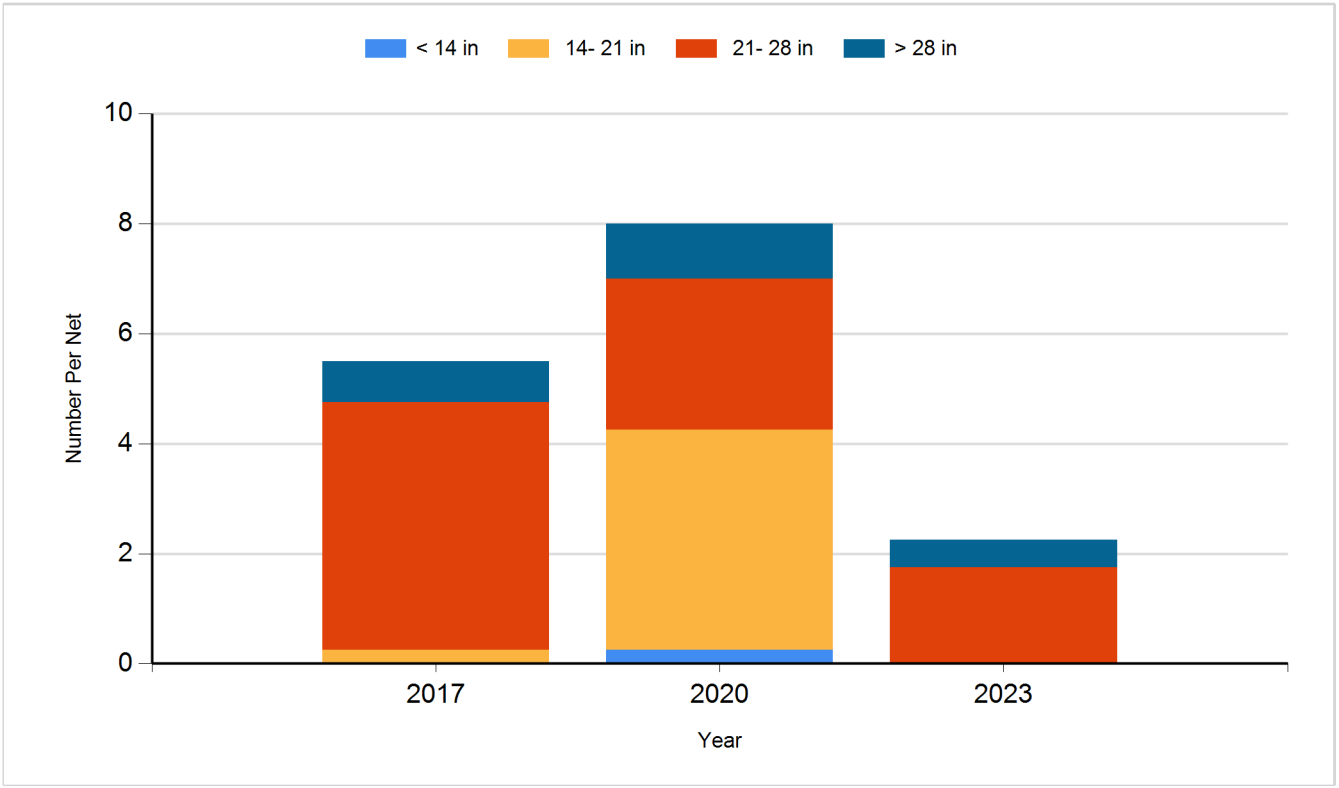
Species: Bluegill
Gear: frame net (std 3/4 in)



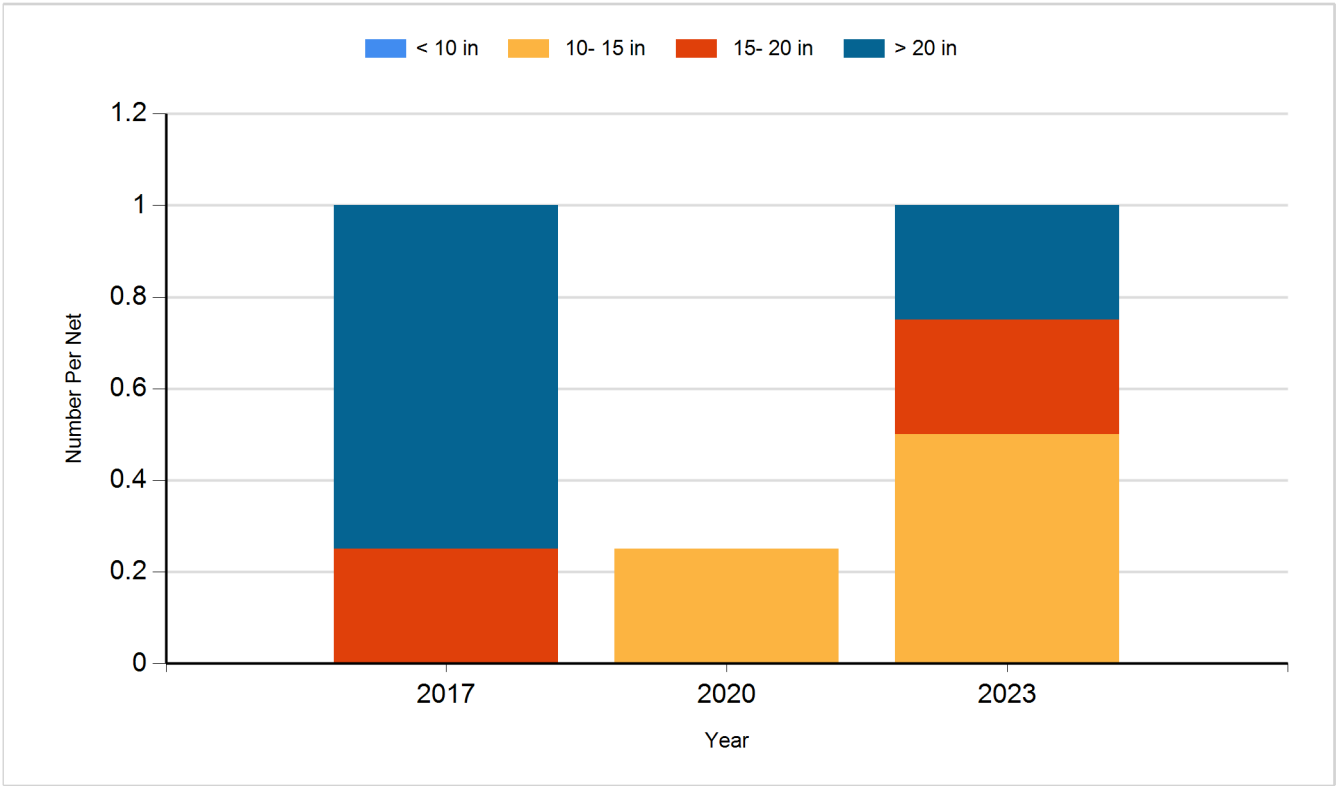
Species: Largemouth Bass
Gear: boat shocker (night)



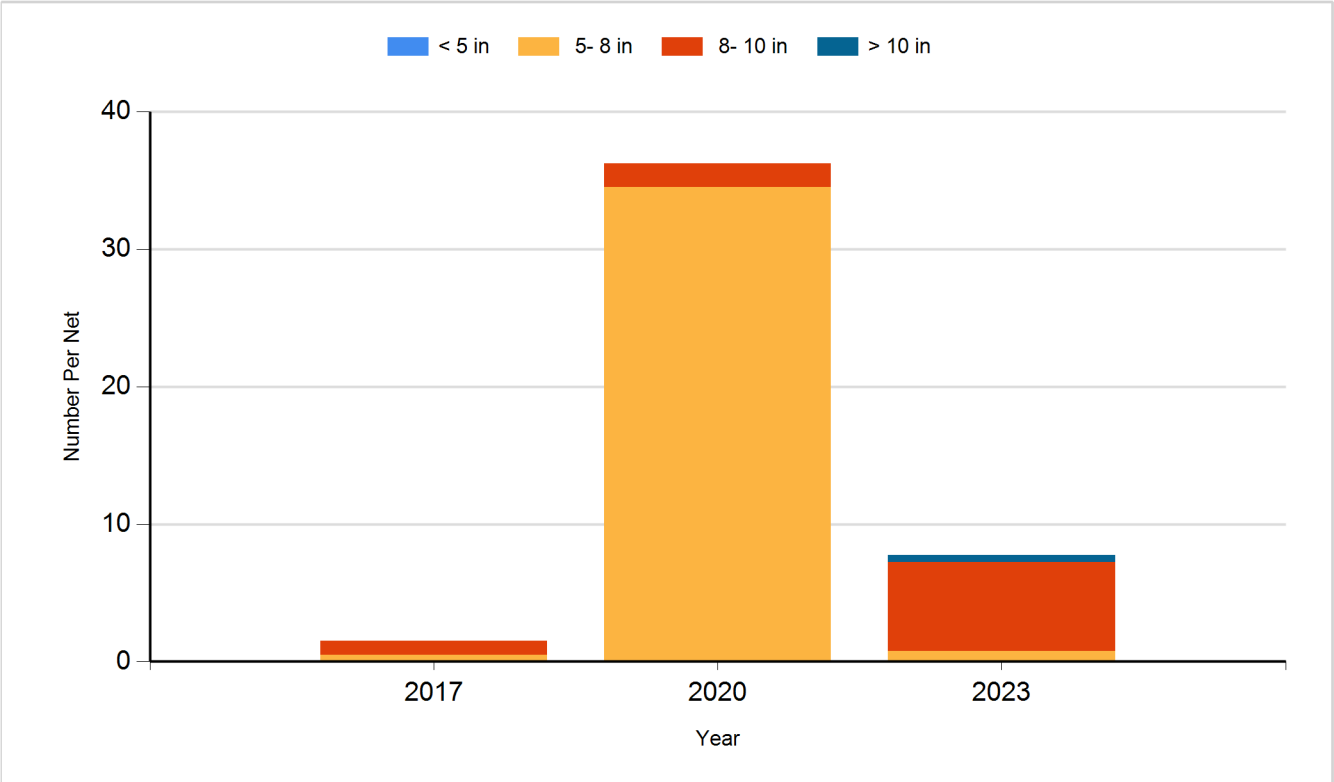
Species: Northern Pike
Gear: AFS std gill net



Species: Walleye
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net



Fish Stocking

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

Year	Species	Size	Number
2012	Walleye	Large Fingerling	980
2013	Largemouth Bass	Large Fingerling	1,960
2014	Walleye	Large Fingerling	807
2016	Largemouth Bass	Adult	225
2017	Walleye	Large Fingerling	3,000
2019	Walleye	Large Fingerling	2,625
2021	Walleye	Juvenile	1,800
2023	Walleye	Juvenile	2,002