SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
New Underwood Dam, Pennington County
MCE-Lake-8-000
2022

Lake Information

Name: New Underwood Dam

County: Pennington

Surface Area: 18 Acres

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (day)	Aug 26, 2022	1051 seconds
frame net (std 3/4 in)	Jul 14, 2022	4 net-nights

Common Fish Species Present

Largemouth Bass

Yellow Perch

Channel Catfish

Bluegill

Black Crappie

Northern Pike

Black Bullhead

White Sucker

Golden Shiner

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 (day)	Largemouth Bass	18	61.5	14.8	50	19	39	19	106	4
frame net (std 3/4 in)	Black Bullhead	3	0.8	0.8	100		0		129	59
	Black Crappie	1010	252.5	103.0	4	1	1	0	93	1
	Bluegill	1343	335.8	219.4	17	1	1	0	89	1
	Channel Catfish	3	0.8	0.8	33		0		85	4
	Golden Shiner	28	0.0	0.0						
	Largemouth Bass	5	1.3	0.8	100		80		95	5
	Northern Pike	3	0.8	0.8	0		0		87	7
	White Sucker	1	0.3	0.4	100		100		89	
	Yellow Perch	15	3.8	1.4	27		7		75	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	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg
AFS std frame net	Black Bullhead					0.5						0.50
	Black Crappie					13.8						13.80
	Bluegill					62.8						62.80
	Golden Shiner					0.0						0.00
	Green Sunfish					0.3						0.30
	Yellow Perch					1.3						1.30
boat shocker (day)	Largemouth Bass									162.0	61.5	111.75
boat shocker (night)	Largemouth Bass		205.1				102.0	144.0				150.37
frame net (std 3/4 in)	Black Bullhead	23.3		2.3			1.7	2.7		5.3	0.8	6.02
	Black Crappie	3.3		1.3			1.7	15.3		50.5	252.5	54.10
	Bluegill	149.3		67.0			24.3	21.7		162.5	335.8	126.77
	Channel Catfish	0.0		0.5			0.0	0.0		0.0	0.8	0.22
	Golden Shiner	0.0		0.0			0.0	0.0		0.0	0.0	0.00
	Green Sunfish	0.0		0.8			0.0	17.7		0.0	0.0	3.08
	Largemouth Bass	0.0		0.5			0.0	0.0		0.3	1.3	0.35
	Northern Pike	0.0		0.0			0.0	0.0		0.0	0.8	0.13
	White Sucker	0.3		0.3			0.0	0.0		0.0	0.3	0.15
	Yellow Perch	14.0		55.3			4.0	3.0		9.5	3.8	14.93

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	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AFS std frame net	Black Bullhead	PSD					100					
		PSD-P					100					
		Wr					89					
	Black Crappie	PSD					44					
		PSD-P					7					
		Wr					96					
	Bluegill	PSD					59					
		PSD-P					8					
		Wr					99					
	Yellow Perch	PSD					60					
		PSD-P					20					
		Wr					82					
boat shocker (day)	Largemouth Bass	PSD									41	50
		PSD-P									34	39
		Wr									94	106
boat shocker (night)	Largemouth Bass	PSD		16				41	36			
		PSD-P		11				12	11			
		Wr		95				96	100			
frame net (std 3/4 in)	Black Bullhead	PSD	99		100			100	100		90	100
		PSD-P	14		89			60	63		10	0
		Wr	112		93			99	102		107	129
	Black Crappie	PSD	70		100			40	83		4	4
		PSD-P	0		0			0	9		1	1
		Wr	98		99			101	97		94	93
	Bluegill	PSD	96		91			86	97		21	17
		PSD-P	6		1			3	3		1	1
		Wr	115		106			106	108		104	89
	Channel Catfish	PSD			50							33
		PSD-P			50							0
		Wr			83							85
	Largemouth Bass	PSD			100						0	100
		PSD-P			100						0	80

			Year									
Gear	Species	Index	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
frame net (std 3/4 in)	Largemouth Bass	Wr			103						85	95
	Northern Pike	PSD										0
		PSD-P										0
		Wr										87
	White Sucker	PSD	100		100							100
		PSD-P	100		0							100
		Wr	98		83							89
	Yellow Perch	PSD	55		41			75	89		34	27
		PSD-P	0		0			0	0		3	7
		Wr	90		95			100	97		83	75

Length at Capture

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

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	248	94 (1)	132 (94)	158 (51)	188 (72)	192 (22)	202 (8)				

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2014	296		205 (15)	195 (49)	222 (120)	269 (73)	323 (35)	441 (4)			

Fish Condition

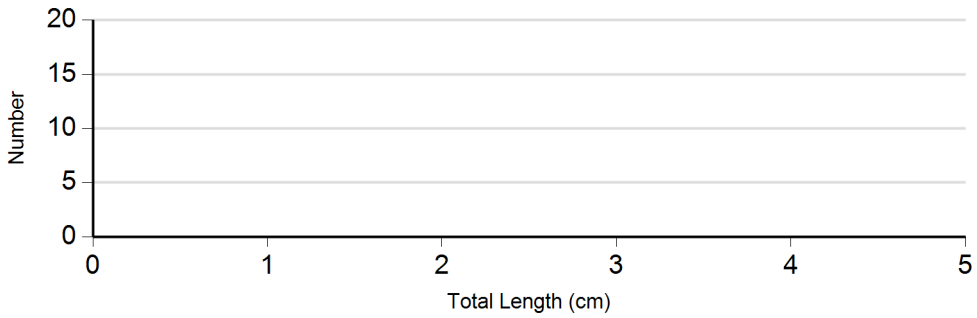
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2018	3	101 (1.6)	2	101 (2.7)	0		0	
	2019	8	103 (1.0)	34	96 (0.8)	4	90 (1.4)	0	
	2021	193	97 (0.8)	7	76 (1.7)	2	83	0	
	2022	967	94 (0.4)	36	71 (1.4)	7	76	0	
Bluegill Frame Net	2018	10	112 (3.8)	61	106 (1.2)	2	73 (0.0)	0	
	2019	2	107	61	108 (0.9)	2	95	0	
	2021	515	109 (1.2)	129	94 (1.2)	6	92	0	
	2022	1113	91 (0.5)	221	86 (1.8)	9	79	0	
Largemouth Bass Electro Fishing	2018	20	97 (1.3)	10	96 (1.4)	4	91 (1.9)	0	
	2019	23	101 (1.2)	9	98 (2.1)	4	95 (2.9)	0	
	2021	17	91 (0.7)	2	97 (5.9)	10	99 (1.6)	0	
	2022	9	99 (2.1)	2	119 (8.4)	7	112 (4.4)	0	

Length Frequency Distribution

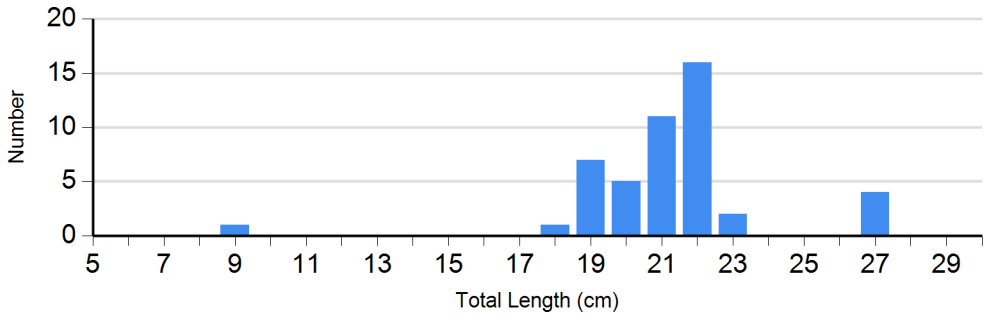
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net

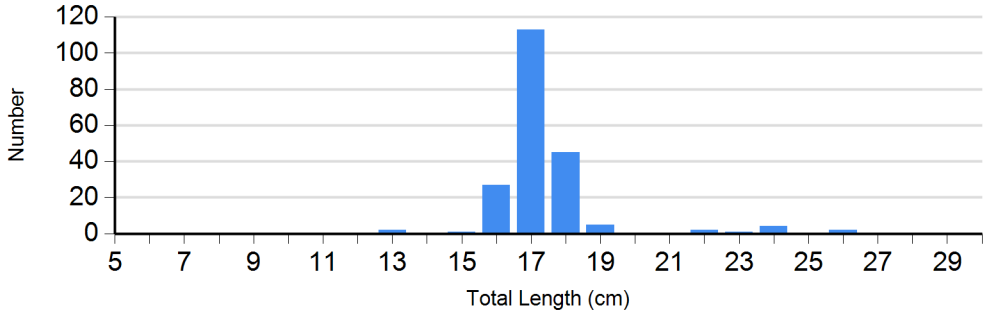


2017

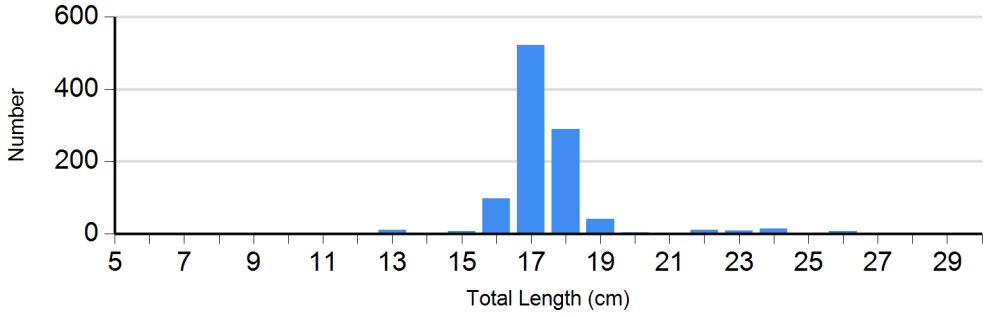
Species: Black Crappie
Gear: frame net (std 3/4 in)



2019

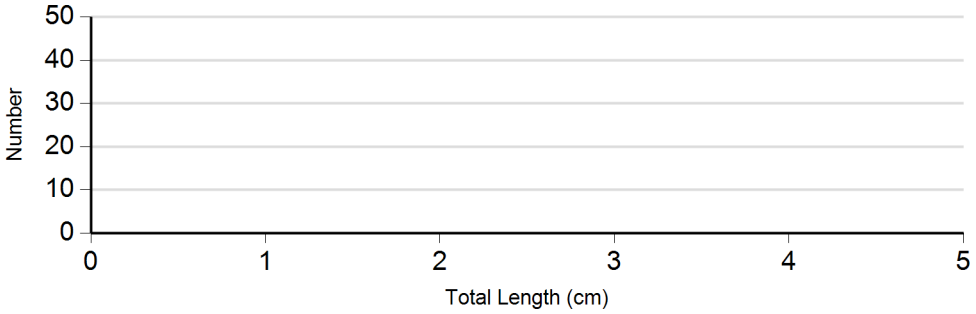


2021



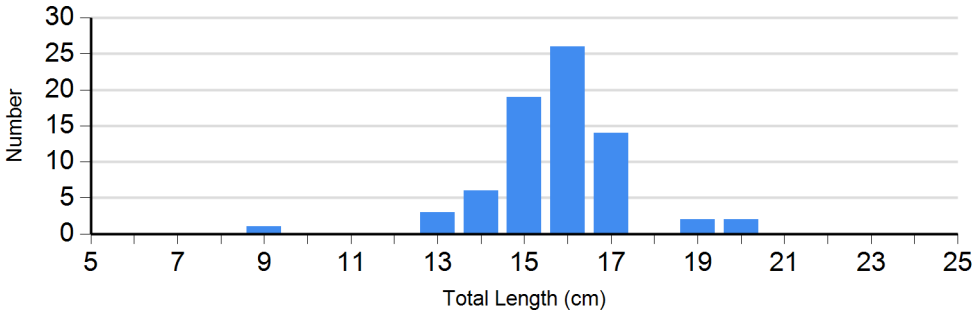
2022

Species: Bluegill
Gear: AFS std frame net

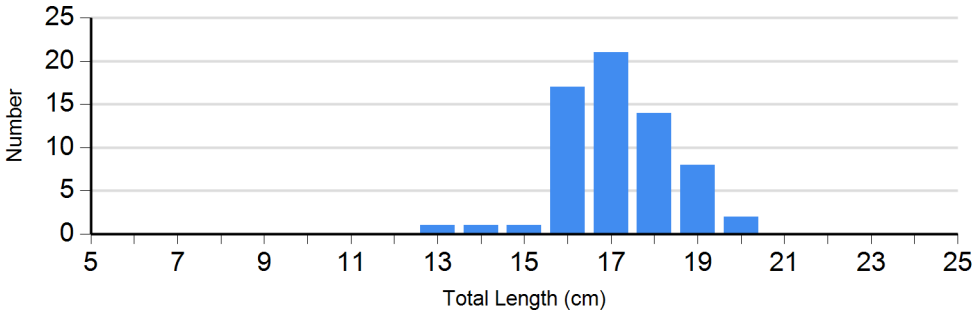


2017

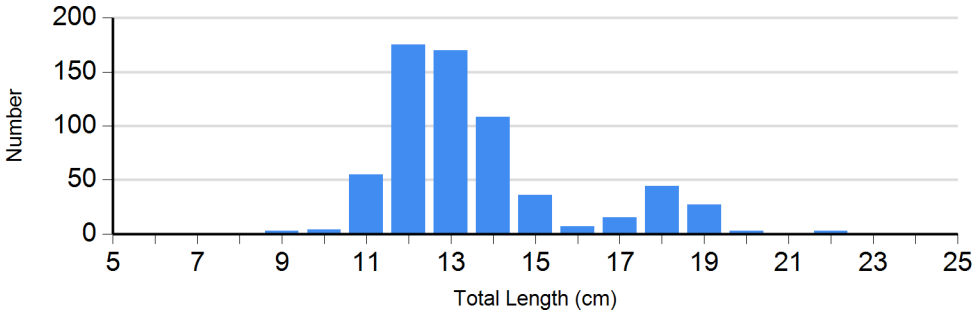
Species: Bluegill
Gear: frame net (std 3/4 in)



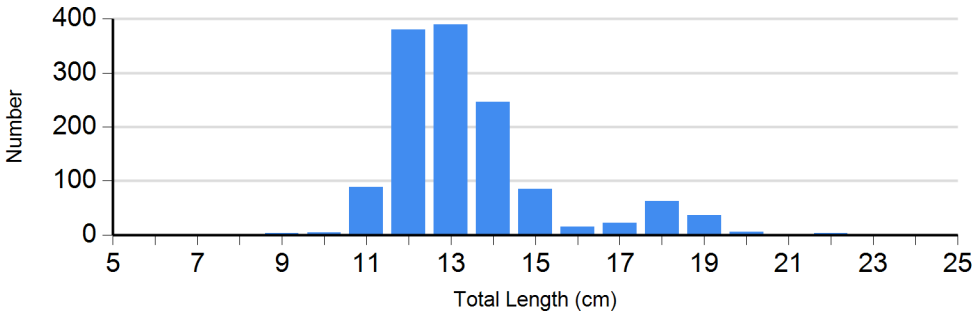
2018



2019



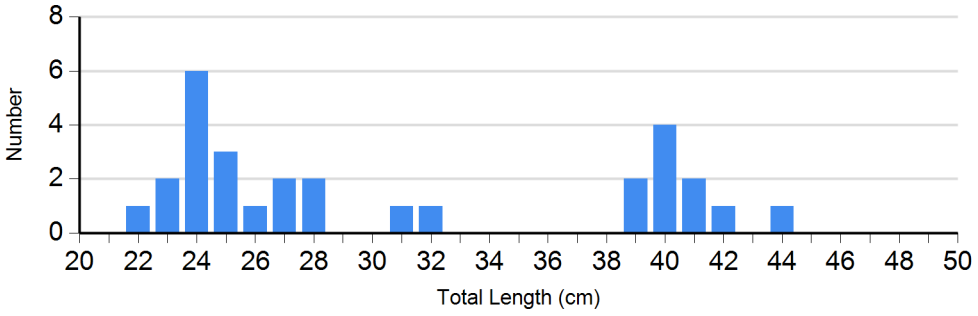
2021



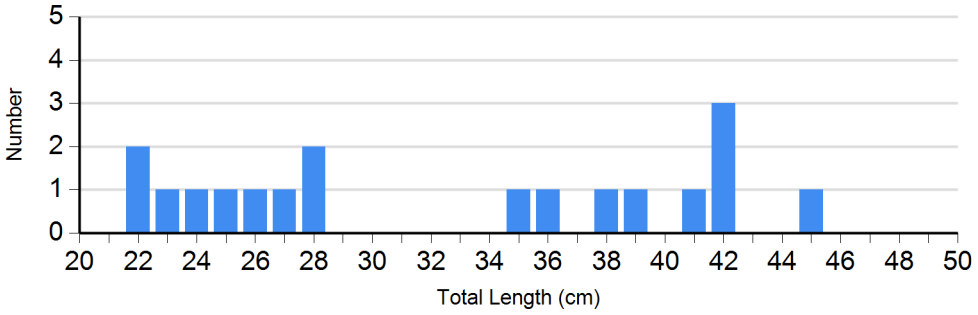
2022

Species: Largemouth Bass
Gear: boat shocker (day)

2021

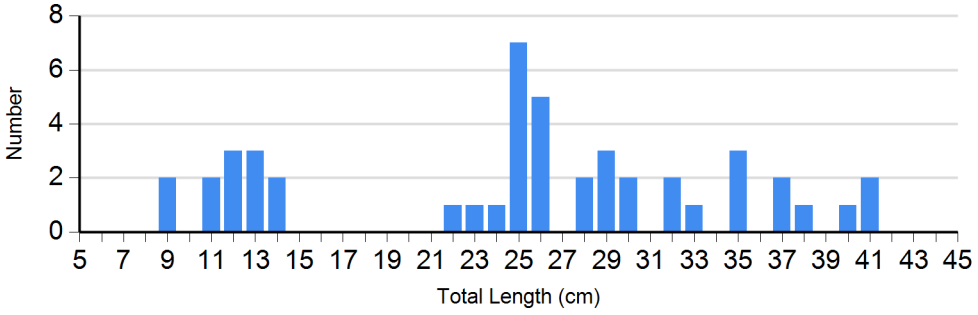


2022

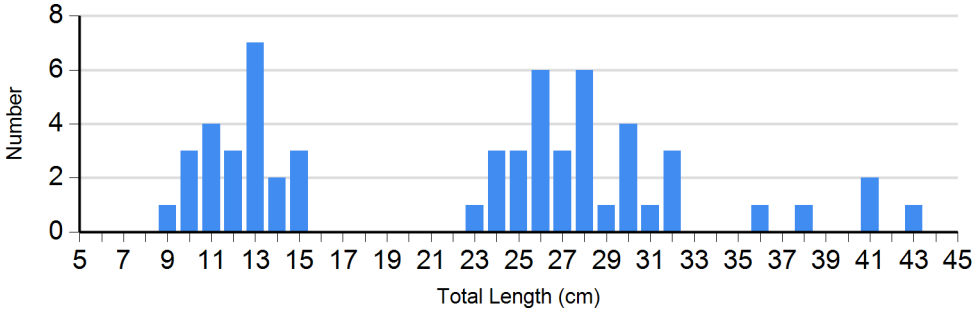


Species: Largemouth Bass
Gear: boat shocker (night)

2018



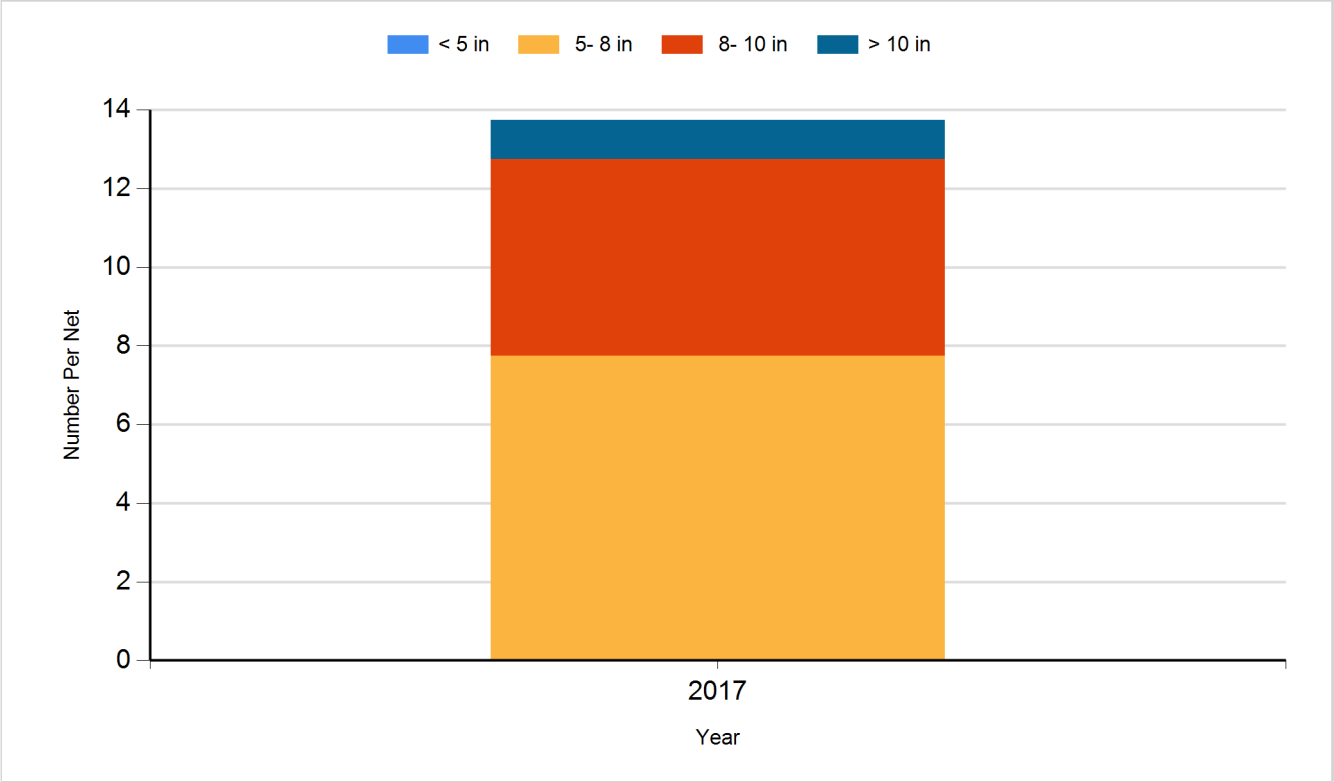
2019



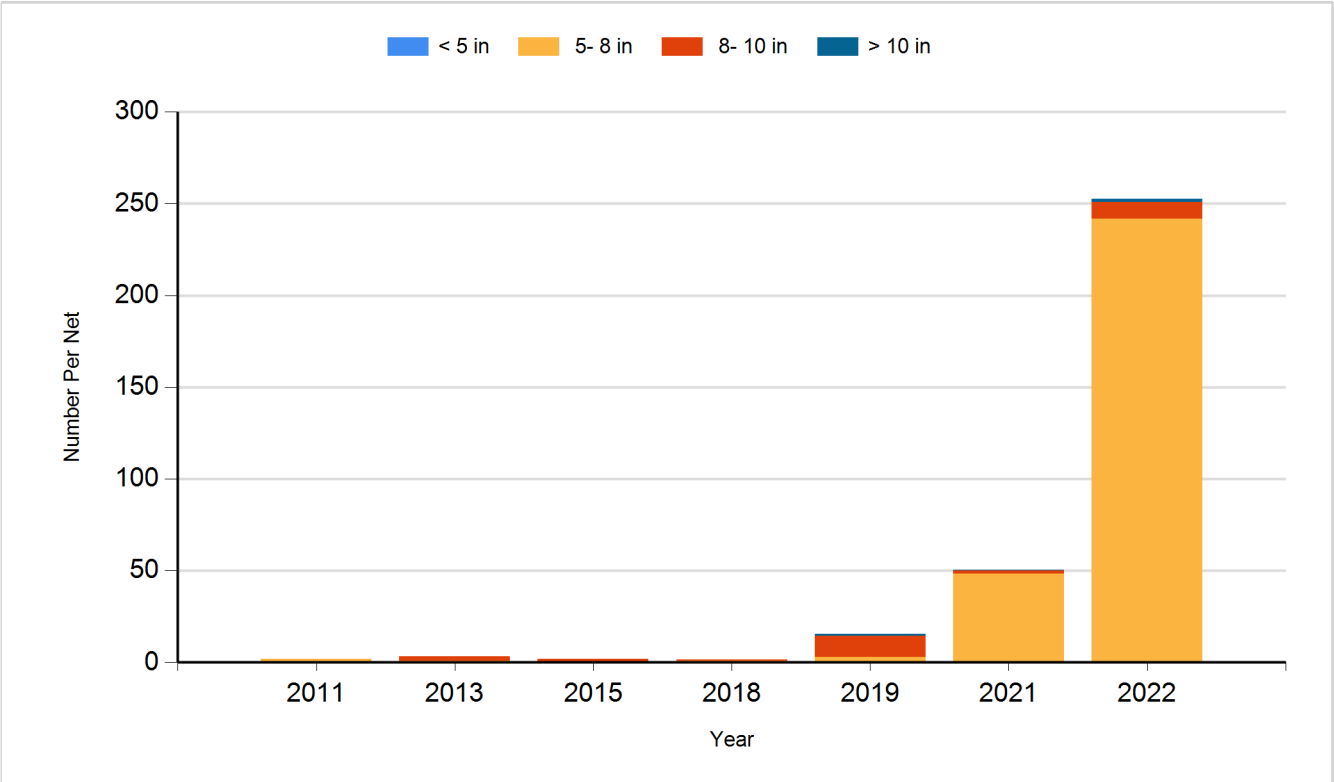
Historic Fish Sizes and Relative Abundance

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

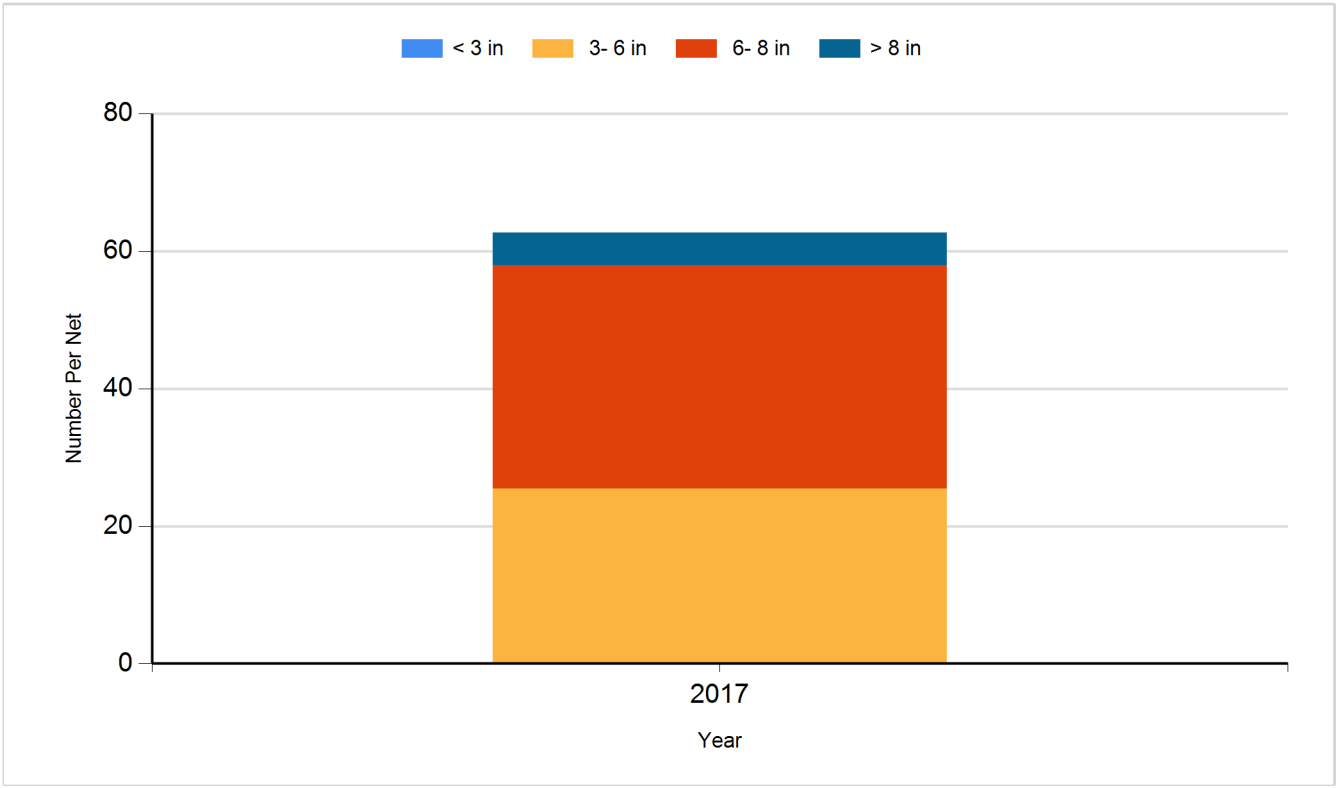
Species: Black Crappie
Gear: AFS std frame net



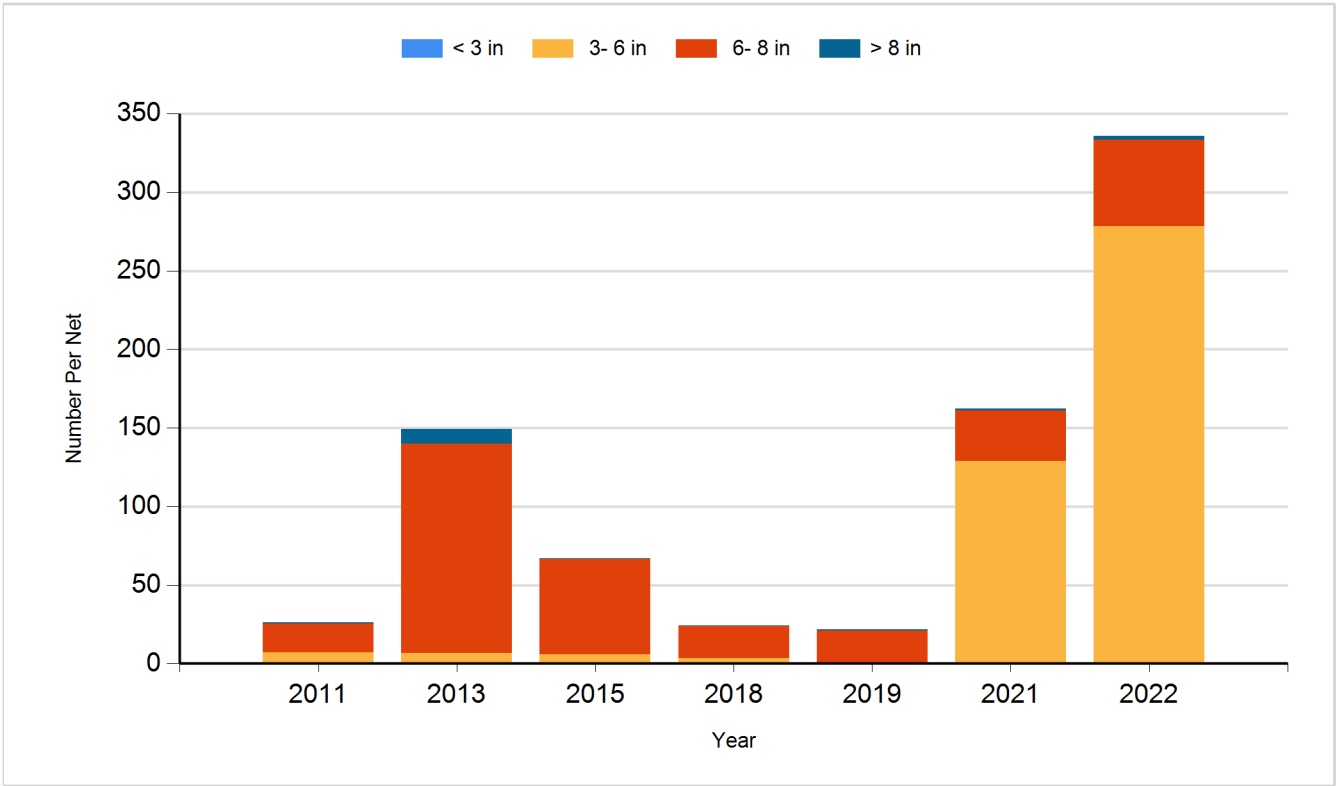
Species: Black Crappie
Gear: frame net (std 3/4 in)



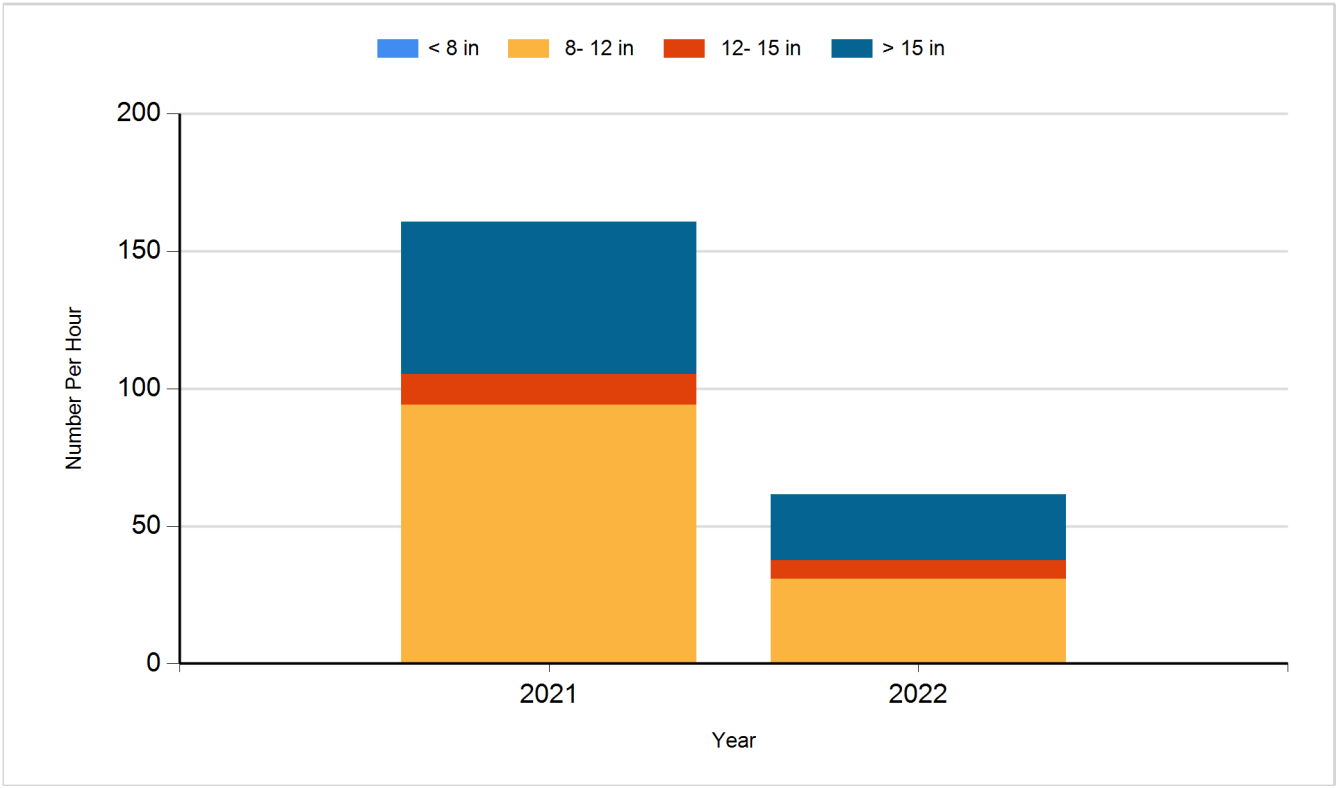
Species: Bluegill
Gear: AFS std frame net



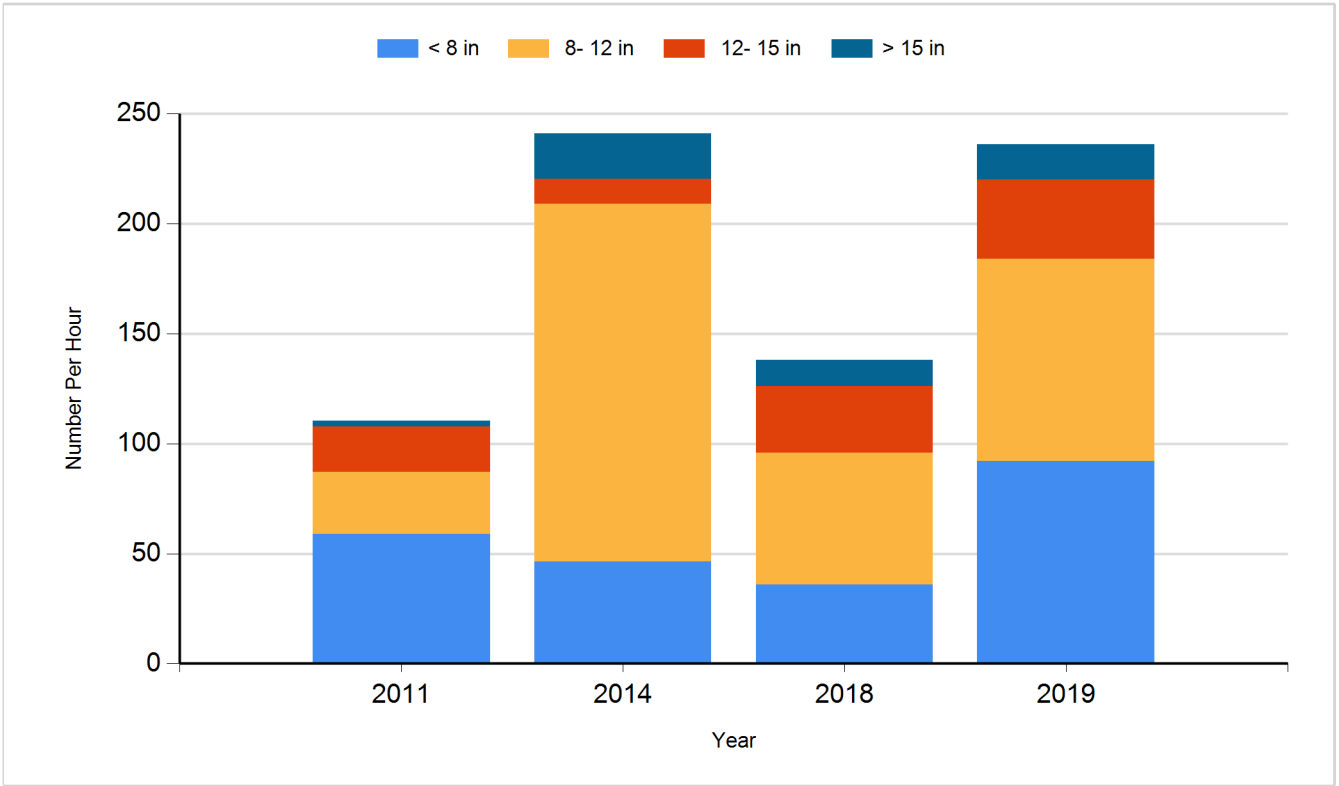
Species: Bluegill
Gear: frame net (std 3/4 in)



Species: Largemouth Bass
Gear: boat shocker (day)



Species: Largemouth Bass
Gear: boat shocker (night)



Fish Stocking

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

Year	Species	Size	Number
2011	Channel Catfish	Adult	200
2012	Largemouth Bass	Fingerling	1,500
2014	Channel Catfish	Adult	143
2014	Yellow Perch	Adult	325
2015	Channel Catfish	Adult	100
2016	Channel Catfish	Adult	200
2017	Channel Catfish	Adult	137
2018	Channel Catfish	Adult	219
2018	Largemouth Bass	Juvenile	272
2019	Channel Catfish	Adult	200
2020	Yellow Perch	Adult	600
2021	Channel Catfish	Adult	300
2022	Channel Catfish	Juvenile	40