

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Mitchell, Davison County

LJA-Lake-623-000

2024

Lake Information

Name: Mitchell **Maximum Depth:** 29 Feet
County: Davison **Mean Depth:** 12 Feet
Legal Description: T103W- R60N-Sec 4-6, 9; T104N-
R60W-Sec 31-32
Surface Area: 690 Acres **Watershed Area:** 19,821.31 Sq Miles

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 12, 2024	5 net-nights
AFS std gill net	Jun 13, 2024	5 net-nights
frame net (std 3/4 in)	Jun 12, 2024	4 net-nights
frame net (std 3/4 in)	Jun 13, 2024	5 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Channel Catfish

Freshwater Drum

White Crappie

River Carpsucker

Common Carp

Smallmouth Bass

Walleye

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.
- **std 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.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

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.

$$PSD = \left(\frac{\text{number of fish} \geq \text{quality length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

$$PSD - P = \left(\frac{\text{number of fish} \geq \text{preferred length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

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.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

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).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(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**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Bigmouth Buffalo	3	0.1	0.1	0		0			
	Black Crappie	1	0.1	0.1	0		0	116		
	Bluegill	1	0.1	0.1	100		0	104		
	Channel Catfish	18	1.5	1.0	80		7	97	4	
	Common Carp	13	0.7	0.5	0		0			
	Freshwater Drum	24	2.0	0.8	85		10			
	River Carpsucker	13	1.3	1.2	100		100			
	Shorthead Redhorse	3	0.3	0.2	100		100			
	Walleye	5	0.5	0.4	100		20	93	2	
frame net (std 3/4 in)	Black Crappie	66	7.1	5.1	22	8	5	96	2	
	Bluegill	193	21.4	12.1	75	4	2	107	2	
	Channel Catfish	139	15.4	15.6	94	3	19	5	98	2
	Common Carp	6	0.7	0.5	33		33			
	Freshwater Drum	4	0.0	0.0	0		0			
	Green Sunfish	1	0.1	0.2	0		0			
	Northern Pike	1	0.1	0.2	100		100	102		
	Shorthead Redhorse	1	0.1	0.2	100		100			
	Smallmouth Bass	6	0.7	0.8	17		0	101	3	
White Crappie	18	2.0	1.1	100		89	90	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

Gear	Species	CPUE										Avg	
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
AFS std frame net	Black Crappie			20.3									20.30
	Bluegill			4.6									4.60
	Channel Catfish			2.3									2.30
	Common Carp			1.3									1.30
	Freshwater Drum			0.1									0.10
	Green Sunfish			0.1									0.10
	Northern Pike			0.1									0.10
	Orangespotted Sunfish			0.0									0.00
	Shorthead Redhorse			0.1									0.10
	Sunfish Hybrid			0.0									0.00
	White Crappie			16.9									16.90
AFS std gill net	Bigmouth Buffalo			0.1	0.0	0.1		0.4	0.1	0.1	0.1	0.1	0.13
	Black Bullhead			0.0	0.0	0.4		0.2	0.0	0.0	0.0	0.0	0.09
	Black Crappie			7.4	1.5	0.8		0.5	0.4	0.7	0.1	1.63	
	Bluegill			0.1	0.2	0.1		0.2	0.1	0.7	0.1	0.21	
	Channel Catfish			13.4	8.3	8.9		2.3	4.5	4.5	1.5	6.20	
	Common Carp			0.0	0.7	0.7		1.1	0.2	0.5	0.7	0.56	
	Flathead Catfish			0.1	0.0	0.1		0.0	0.0	0.0	0.0	0.03	
	Freshwater Drum			2.6	8.6	2.8		2.9	1.4	2.6	2.0	3.27	
	Northern Pike			0.3	0.0	0.0		1.5	1.7	0.4	0.0	0.56	
	Quillback			0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.00	
	River Carpsucker			0.0	0.0	0.6		3.4	6.7	2.4	1.3	2.06	
	Shorthead Redhorse			0.0	0.0	0.0		0.1	0.6	0.2	0.3	0.17	
	Walleye			0.3	0.3	0.4		0.2	0.2	0.6	0.5	0.36	
	White Crappie			3.0	0.8	1.5		0.7	0.0	0.3	0.0	0.90	
	White Sucker			0.0	0.0	0.0		0.7	0.0	0.3	0.0	0.14	
boat shocker (night)	Largemouth Bass		3.5				4.5	3.5				3.83	
	Smallmouth Bass		20.0				0.0	0.0				6.67	
electrofishing (flathead)	Flathead Catfish						9.3					9.30	
fall night EF-WAE*	Flathead Catfish	13.6										13.60	
	Walleye	0.2										0.20	
frame net (std 3/4 in)	Bigmouth Buffalo	0.5	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.06	
	Black Bullhead	0.0	0.1		0.0	0.0		0.0	0.0	0.0	0.0	0.01	

		CPUE										
Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
frame net (std 3/4 in)	Black Crappie	7.3	43.9		12.7	2.1		14.3	3.5	1.3	7.1	11.53
	Bluegill	4.0	2.3		16.1	3.3		26.7	2.5	20.5	21.4	12.10
	Channel Catfish	18.7	6.4		9.2	1.8		8.8	1.3	0.6	15.4	7.78
	Common Carp	1.4	1.3		0.8	0.2		0.9	0.2	0.3	0.7	0.73
	Flathead Catfish	0.3	0.0		0.5	0.2		0.2	0.0	0.0	0.0	0.15
	Freshwater Drum	0.0	0.1		0.2	0.1		0.2	0.0	0.2	0.0	0.10
	Green Sunfish	0.0	0.4		0.1	0.0		0.2	0.0	0.0	0.1	0.10
	Largemouth Bass	0.0	0.1		0.0	0.0		0.0	0.0	0.0	0.0	0.01
	Northern Pike	0.1	0.3		0.0	0.0		0.0	0.0	0.2	0.1	0.09
	Orangespotted Sunfish	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.00
	Shorthead Redhorse	0.0	0.1		0.0	0.0		0.0	0.0	0.0	0.1	0.03
	Smallmouth Bass	0.0	0.2		0.4	0.1		0.1	0.6	0.0	0.7	0.26
	Sunfish Hybrid	0.0	0.0		0.0	0.1		0.0	0.0	0.1	0.0	0.03
	Walleye	0.0	0.0		0.0	0.0		0.1	0.0	0.1	0.0	0.03
	White Crappie	0.7	15.3		21.5	4.2		13.4	3.1	0.0	2.0	7.53
	White Sucker	0.0	0.0		0.1	0.0		0.0	0.0	0.0	0.0	0.01
hoop net	Black Crappie		7.0	0.0								3.50
	Bluegill		1.3	0.0								0.65
	Channel Catfish		0.7	2.3								1.50
	Smallmouth Bass		0.7	0.0								0.35
	White Crappie		2.3	0.0								1.15
std exp gill net	Bigmouth Buffalo	0.0	1.0									0.50
	Black Crappie	14.0	5.8									9.90
	Bluegill	0.0	0.2									0.10
	Channel Catfish	18.4	22.0									20.20
	Common Carp	0.4	0.8									0.60
	Freshwater Drum	3.8	5.0									4.40
	Largemouth Bass	0.0	0.0									0.00
	Northern Pike	0.0	0.0									0.00
	Shorthead Redhorse	0.0	0.0									0.00
	Smallmouth Bass	0.2	0.0									0.10
	Walleye	0.8	0.8									0.80
	White Crappie	0.0	5.0									2.50
White Sucker	0.0	0.0									0.00	

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.

Gear	Species	Index	Year											
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
AFS std frame net	Black Crappie	PSD			100									
		PSD-P			0									
		Wr			95									
	Bluegill	PSD			85									
		PSD-P			4									
		Wr			114									
	Channel Catfish	PSD			79									
		PSD-P			4									
		Wr			95									
	Common Carp	PSD			100									
		PSD-P			40									
	White Crappie	PSD			99									
		PSD-P			0									
		Wr			100									
	AFS std gill net	Black Crappie	PSD			100	80	25		40	50	29	0	
PSD-P					2	7	13		0	0	29	0		
Wr					102	94	105		111	111	120	116		
Bluegill		PSD			100	100	0		100	100	43	100		
		PSD-P			0	0	0		50	0	29	0		
		Wr			100	121	132		118	121	113	104		
Channel Catfish		PSD			85	87	82		70	87	80	80		
		PSD-P			2	4	3		9	4	4	7		
		Wr			86	87	96		93	94	91	97		
Common Carp		PSD				86	100		64	100	100	0		
		PSD-P				43	71		18	100	80	0		
River Carpsucker		PSD							83	100	100	100	100	
		PSD-P							83	53	97	100	100	
Walleye		PSD			100	100	75		50	50	33	100		
		PSD-P			100	33	75		0	0	0	20		
		Wr			87	88	95		86	72	92	93		
White Crappie		PSD			96	50	60		43			100		
		PSD-P			0	13	0		0			100		

Gear	Species	Index	Year										
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
AFS std gill net	White Crappie	Wr			105	96	105		106		102		
boat shocker (night)	Largemouth Bass	PSD		71					100	86			
		PSD-P		71					100	43			
		Wr		105					104	102			
	Smallmouth Bass	PSD		3									
		PSD-P		3									
		Wr		97									
frame net (std 3/4 in)	Black Crappie	PSD	0	49		79	43		43	74	31	22	
		PSD-P	0	2		0	5		2	3	23	5	
		Wr	108	103		93	94		96	97	109	96	
	Bluegill	PSD	29	79		84	91		63	44	40	75	
		PSD-P	4	0		6	0		3	0	1	2	
		Wr	104	107		105	105		107	113	115	107	
	Channel Catfish	PSD	58	62		90	94		78	100	100	94	
		PSD-P	13	1		7	6		8	31	33	19	
		Wr	89	97		87	93		93	93	87	98	
	Common Carp	PSD	100	93		100	50		88	100	100	33	
		PSD-P	71	67		50	50		25	100	100	33	
		Wr											
	Largemouth Bass	PSD		100									
		PSD-P		0									
		Wr		97									
	Smallmouth Bass	PSD		100		100	100		0	17	0	17	
		PSD-P		50		50	100		0	0	0	0	
		Wr		91		95	77		106	95		101	
	Walleye	PSD							0		100		
		PSD-P							0		0		
		Wr							78		90		
	White Crappie	PSD	13	66		96	90		55	97		100	
		PSD-P	0	0		0	2		12	10		89	
		Wr	99	99		88	93		100	98		90	
hoop net	Black Crappie	PSD		71									
		PSD-P		0									
		Wr		104									
	Bluegill	PSD		50									
		PSD-P		0									
		Wr		103									

Gear	Species	Index	Year										
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
hoop net	Channel Catfish	PSD		50	64								
		PSD-P		0	0								
		Wr		87	93								
	Smallmouth Bass	PSD		0									
		PSD-P		0									
		Wr		100									
	White Crappie	PSD		14									
		PSD-P		0									
		Wr		101									
std exp gill net	Black Crappie	PSD	3	62									
		PSD-P	0	0									
		Wr	113	109									
	Bluegill	PSD		100									
		PSD-P		0									
		Wr		102									
	Channel Catfish	PSD	55	44									
		PSD-P	11	0									
		Wr	95	92									
	Common Carp	PSD	100	100									
		PSD-P	100	50									
		Wr											
	Smallmouth Bass	PSD	100										
		PSD-P	100										
		Wr	95										
	Walleye	PSD	75	0									
		PSD-P	0	0									
		Wr	76	93									
	White Crappie	PSD		76									
		PSD-P		0									
		Wr		105									

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+
2022	35		164 (2)	206 (19)	236 (10)	232 (3)					
2021	117		169 (26)	199 (74)	217 (17)						
2015	87		180 (87)								

Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2024	180	119 (6)	154 (95)	180 (57)	191 (20)	215 (1)	215 (1)				
2023	196	93 (23)	138 (131)	178 (42)							
2022	25		133 (15)	170 (6)	191 (4)						
2021	223		125 (87)	177 (111)	191 (19)	195 (5)	220 (2)				
2015	48		135 (24)	151 (17)	175 (4)	202 (3)					

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2022	2			388 (2)							
2018	3					448 (1)			559 (2)		
2017	2										568 (2)
2016	4		281 (2)	290 (2)							
2015	4		262 (1)	387 (1)	438 (2)						

Species: White Crappie

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2022	31			214 (24)	242 (7)						
2021	104		188 (66)	215 (28)		227 (11)					
2015	8		186 (8)								

Fish Condition

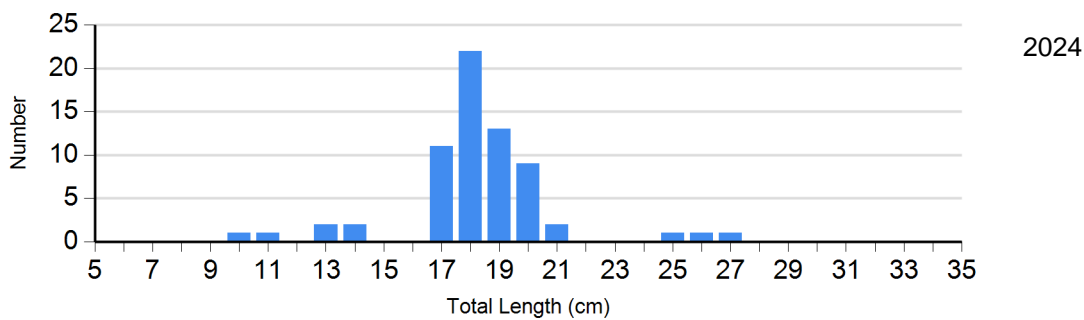
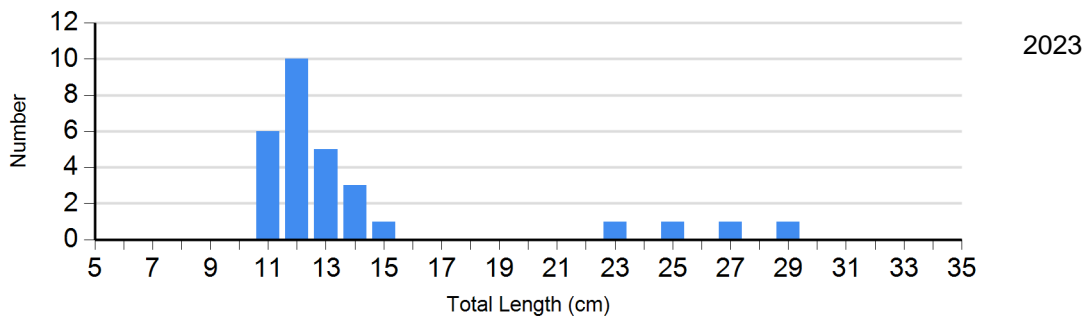
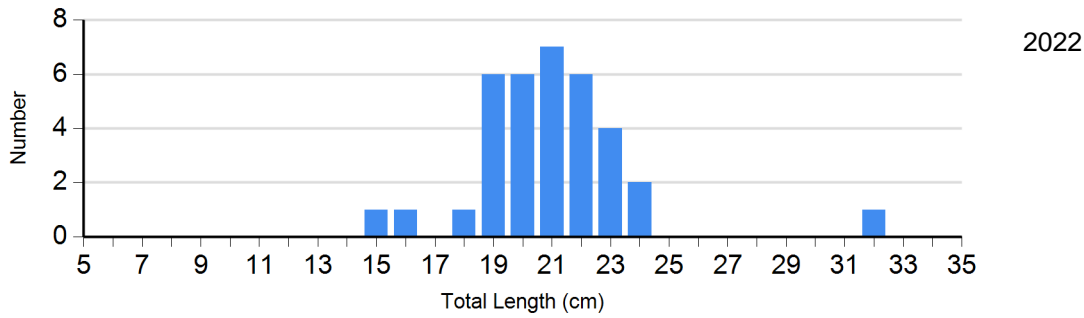
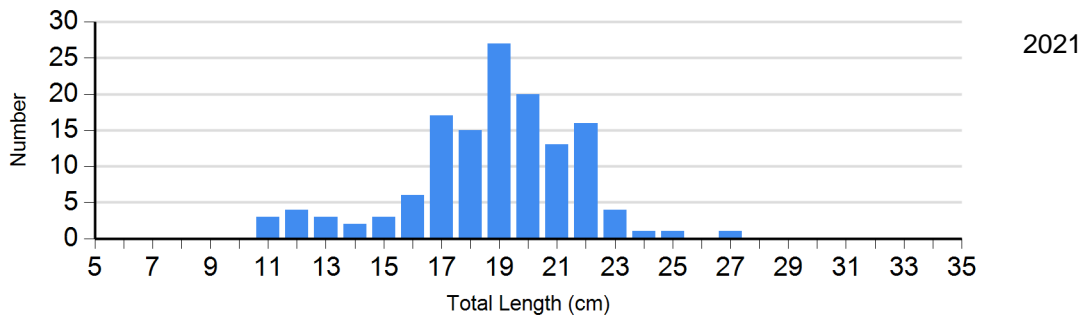
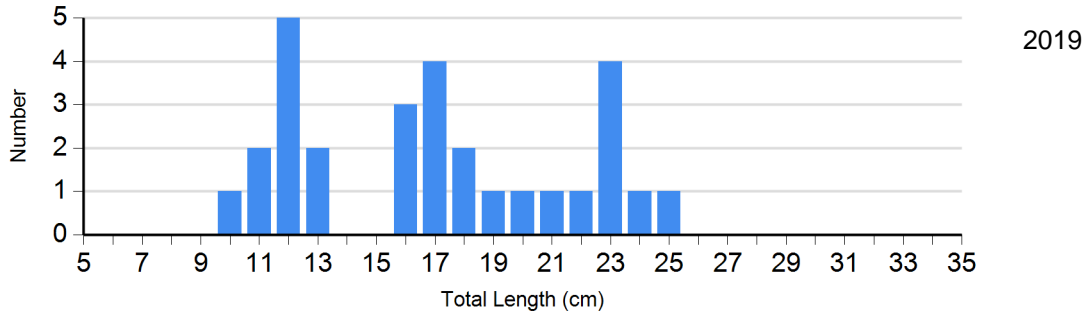
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2021	73	100 (1.2)	54	91 (1.0)	2		0	
	2022	9	103 (2.3)	25	95 (1.5)	0		1	90
	2023	9	119 (2.8)	1	95	3	84 (5.0)	0	
	2024	50	98 (1.5)	11	89 (1.4)	3	85 (3.0)	0	
Bluegill Frame Net	2021	88	101 (1.8)	145	113 (1.1)	7	107 (5.4)	0	
	2022	14	110 (2.9)	11	116 (2.0)	0		0	
	2023	122	118 (1.7)	81	109 (2.2)	2		0	
	2024	48	106 (3.1)	141	108 (1.3)	4	96 (4.2)	0	
Channel Catfish Gill Net	2021	7	89 (4.7)	14	94 (3.2)	2	102 (4.2)	0	
	2022	6	88 (4.8)	37	95 (3.4)	2	98 (4.2)	0	
	2023	9	94 (2.3)	34	91 (2.3)	2	86 (1.2)	0	
	2024	3	85 (0.8)	11	98 (3.1)	1	116	0	
Largemouth Bass Electro Fishing	2021	0		0		9	104 (1.8)	0	
	2022	1	110	3	104 (4.7)	3	98 (3.4)	0	
Walleye Gill Net	2021	1	82	1	89	0		0	
	2022	1	90	1	54	0		0	
	2023	4	93 (4.7)	2	90 (0.4)	0		0	
	2024	0		4	92 (2.0)	1	97	0	
White Crappie Frame Net	2021	55	104 (0.9)	51	93 (2.2)	8		7	
	2022	1	101	27	98 (1.0)	3	98 (2.9)	0	
	2024	0		2	95 (11.6)	8	88 (1.3)	8	91 (3.0)

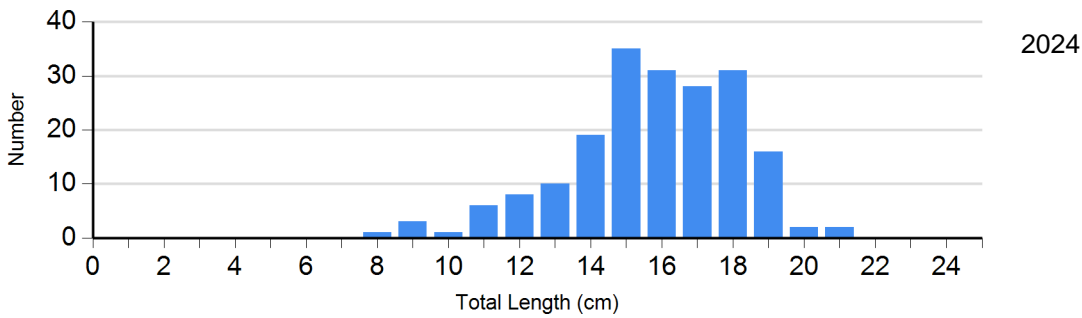
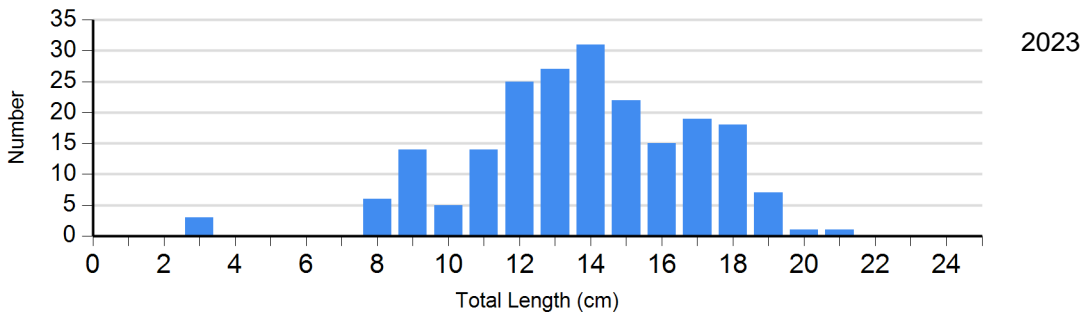
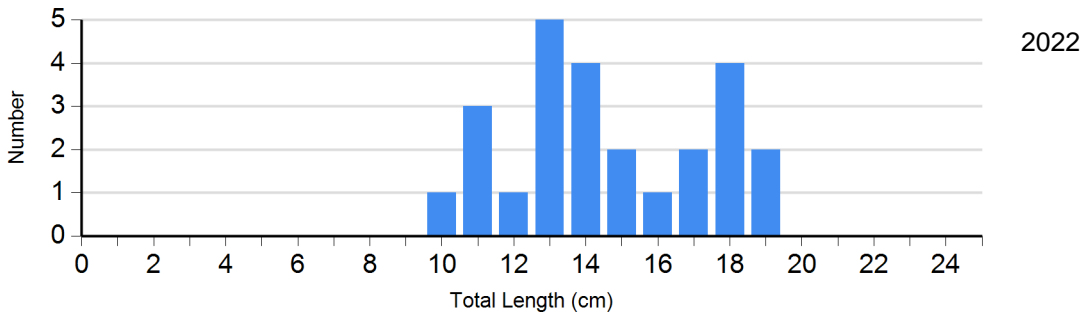
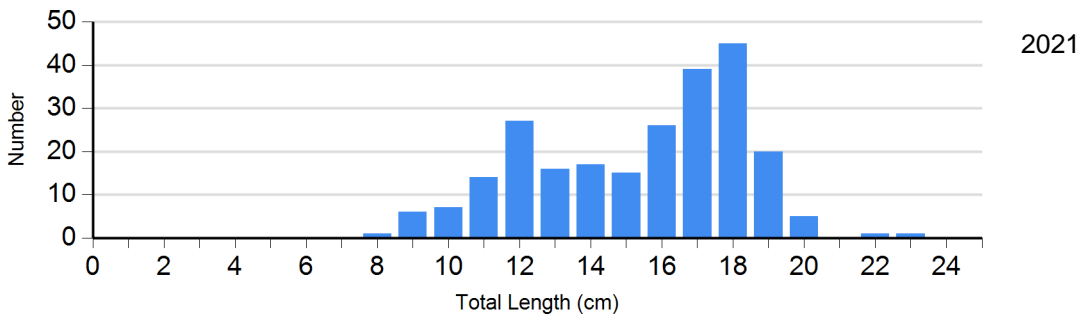
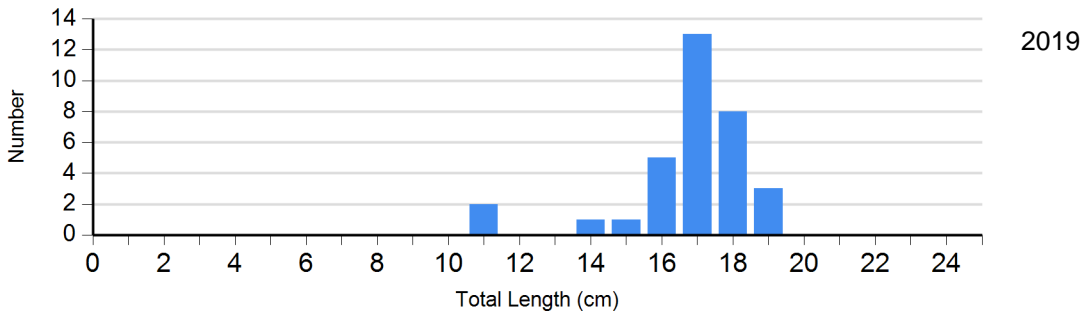
Length Frequency Distribution

Length frequency histogram of species sampled by year.

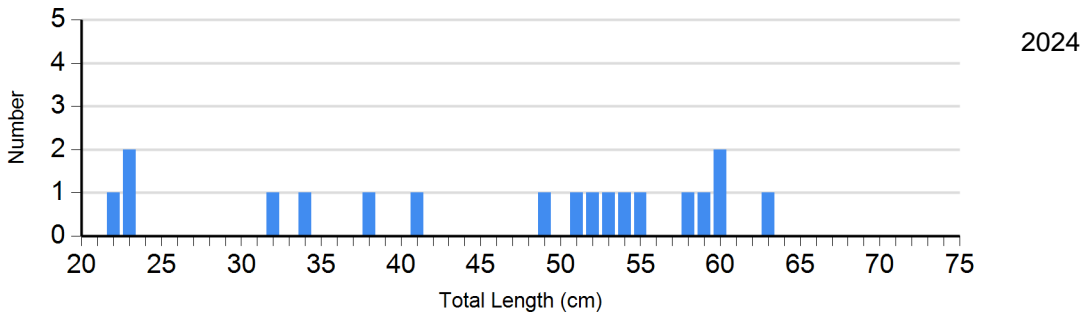
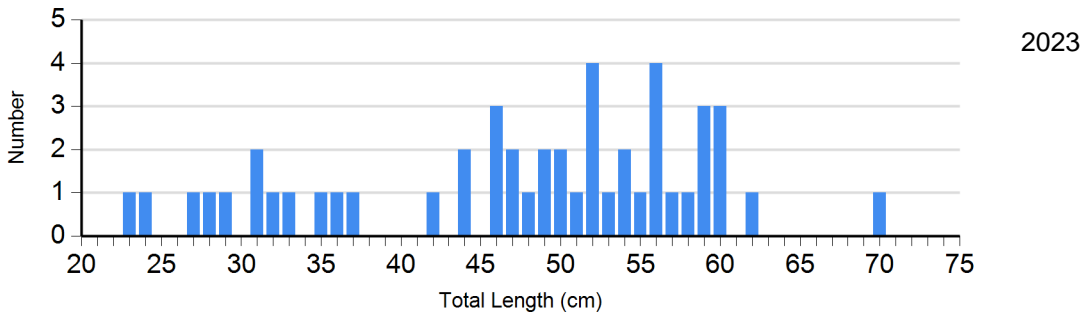
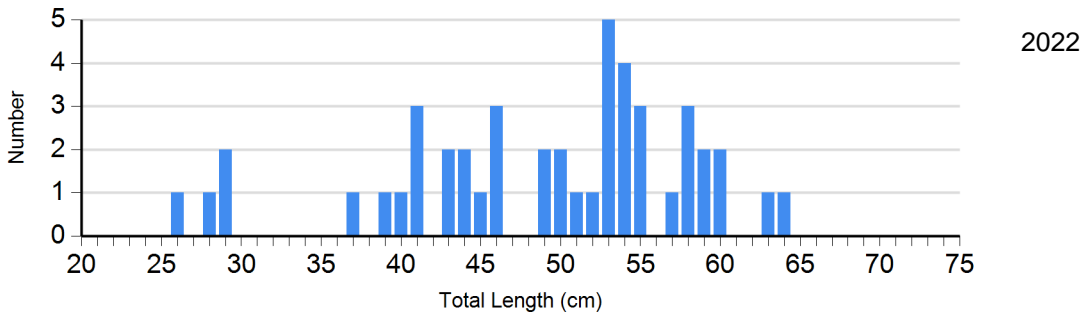
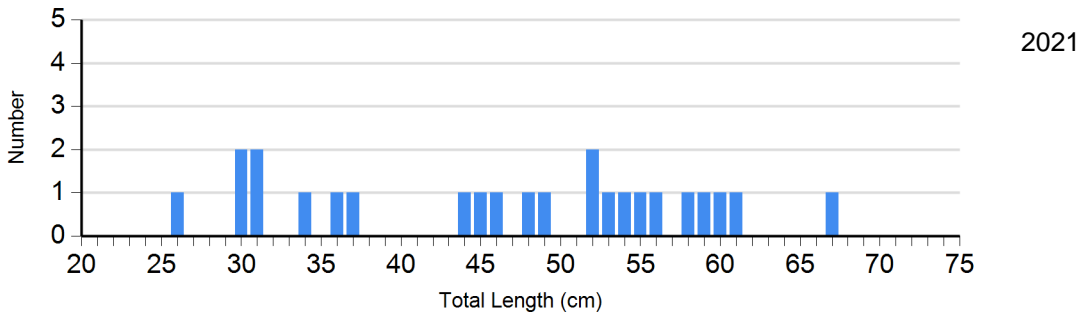
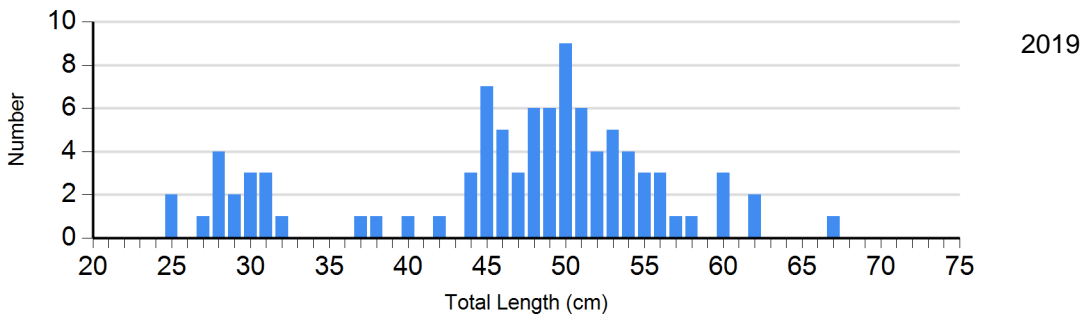
Species: Black Crappie
Gear: frame net (std 3/4 in)



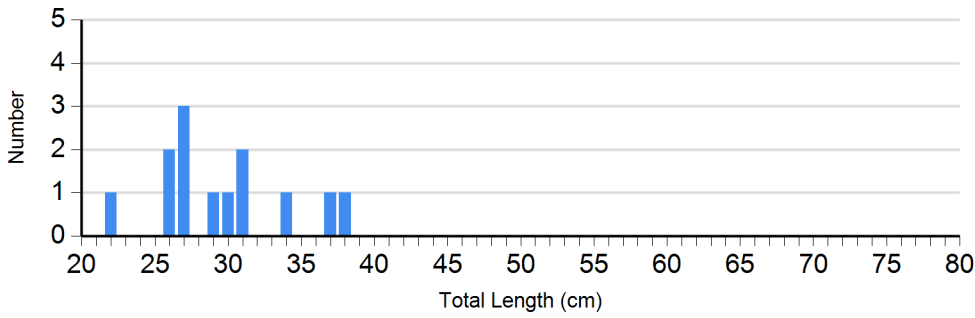
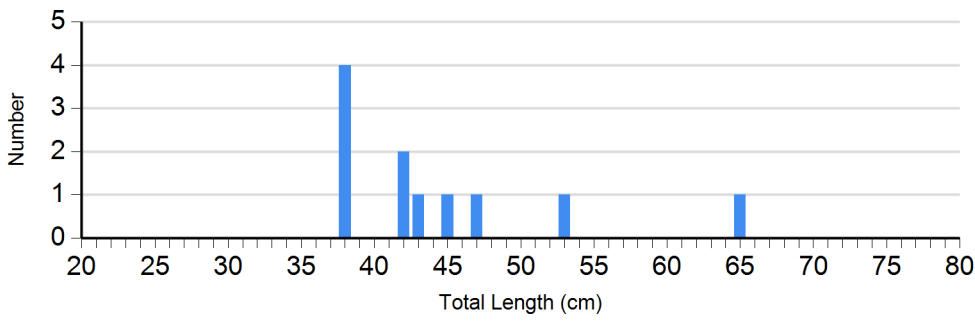
Species: Bluegill
Gear: frame net (std 3/4 in)



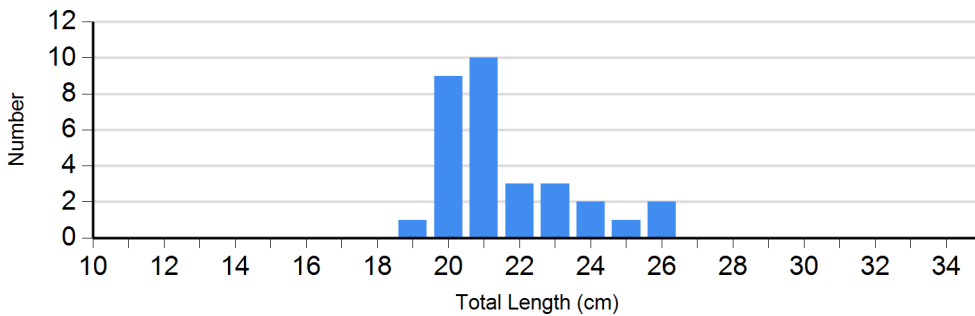
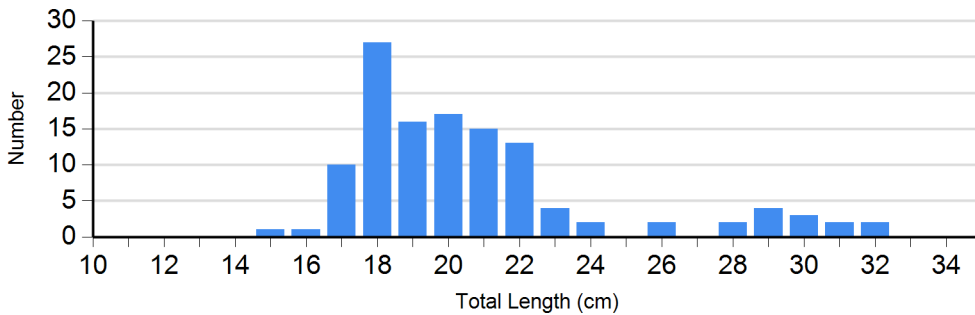
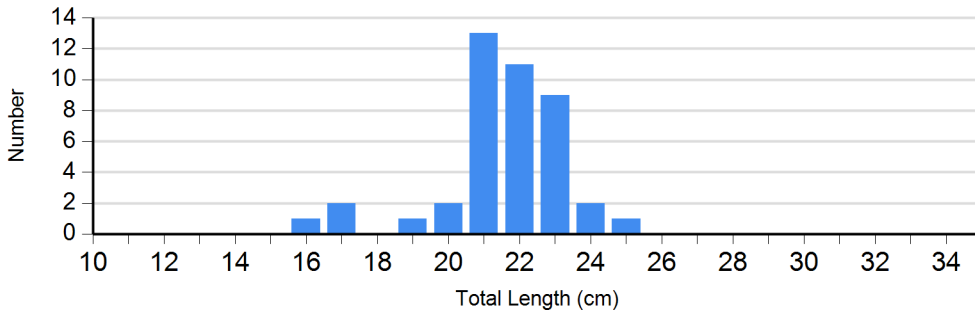
Species: Channel Catfish
Gear: AFS std gill net

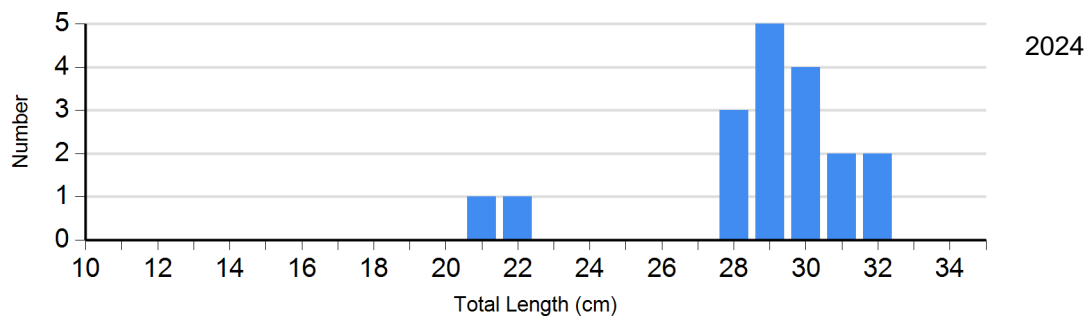


Species: Common Carp
 Gear: AFS std gill net



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

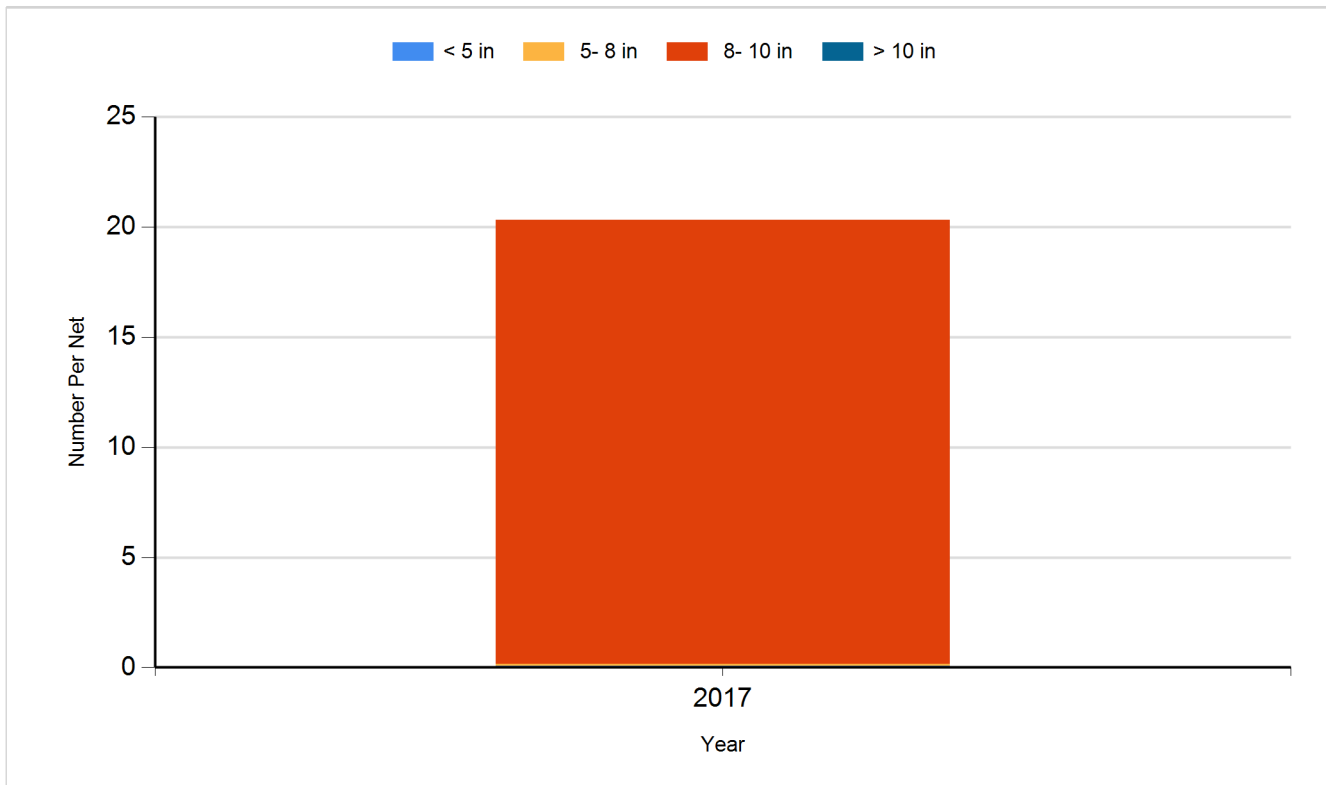




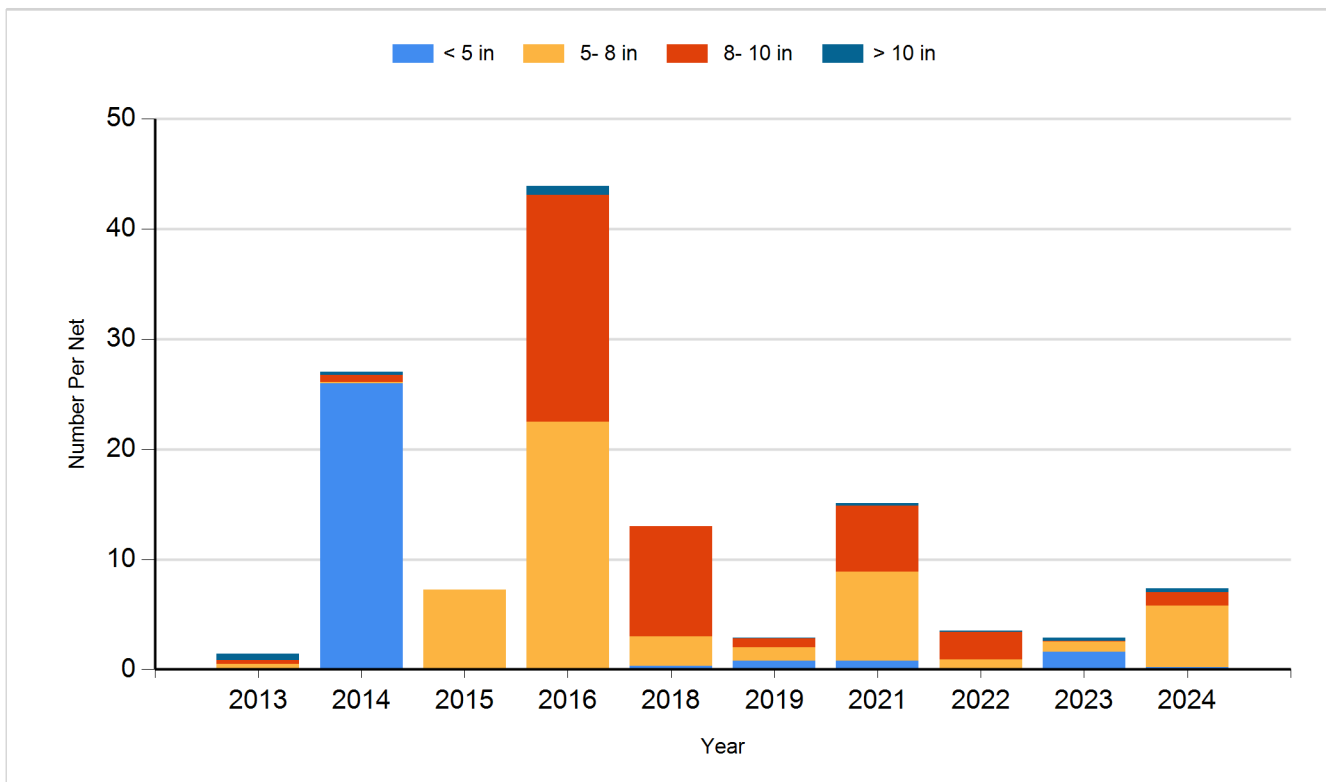
Historic Fish Sizes and Relative Abundance

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

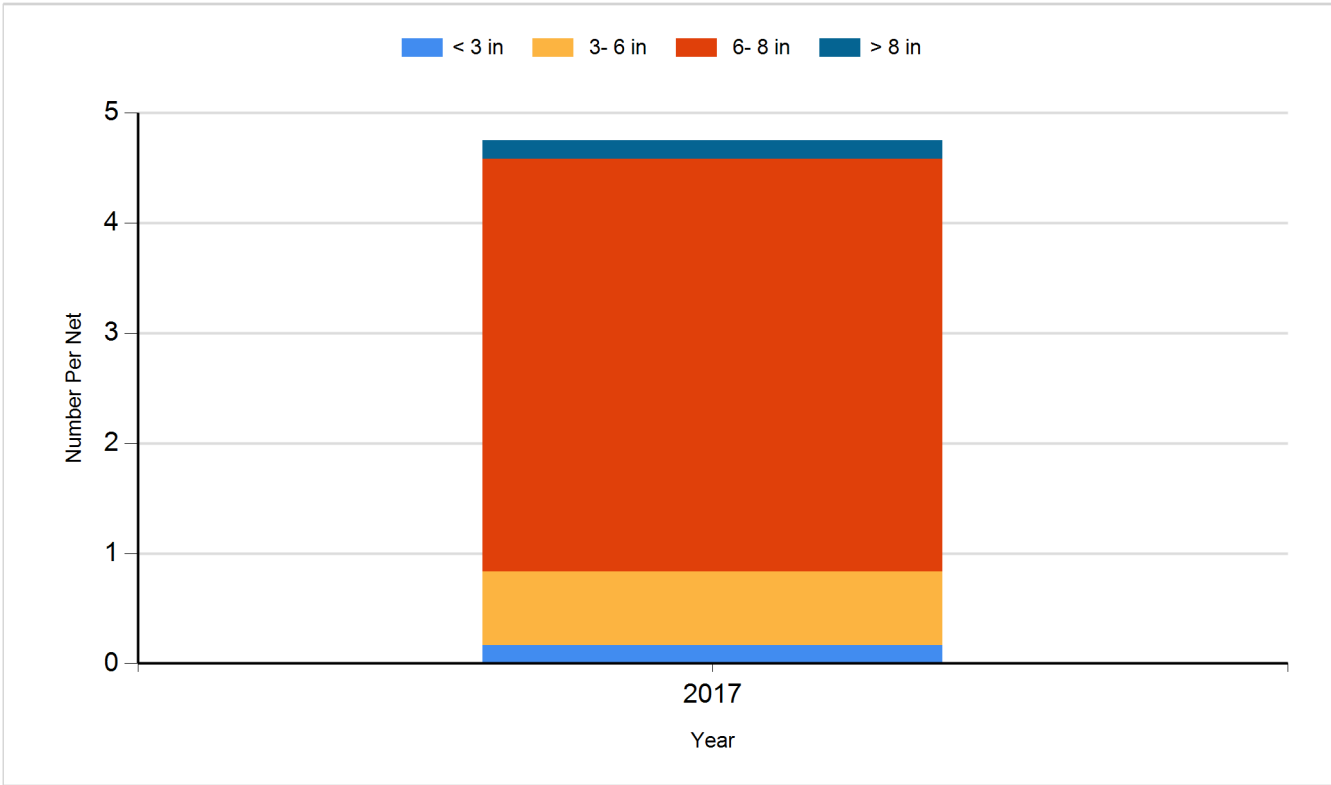
Species: Black Crappie
Gear: AFS std frame net



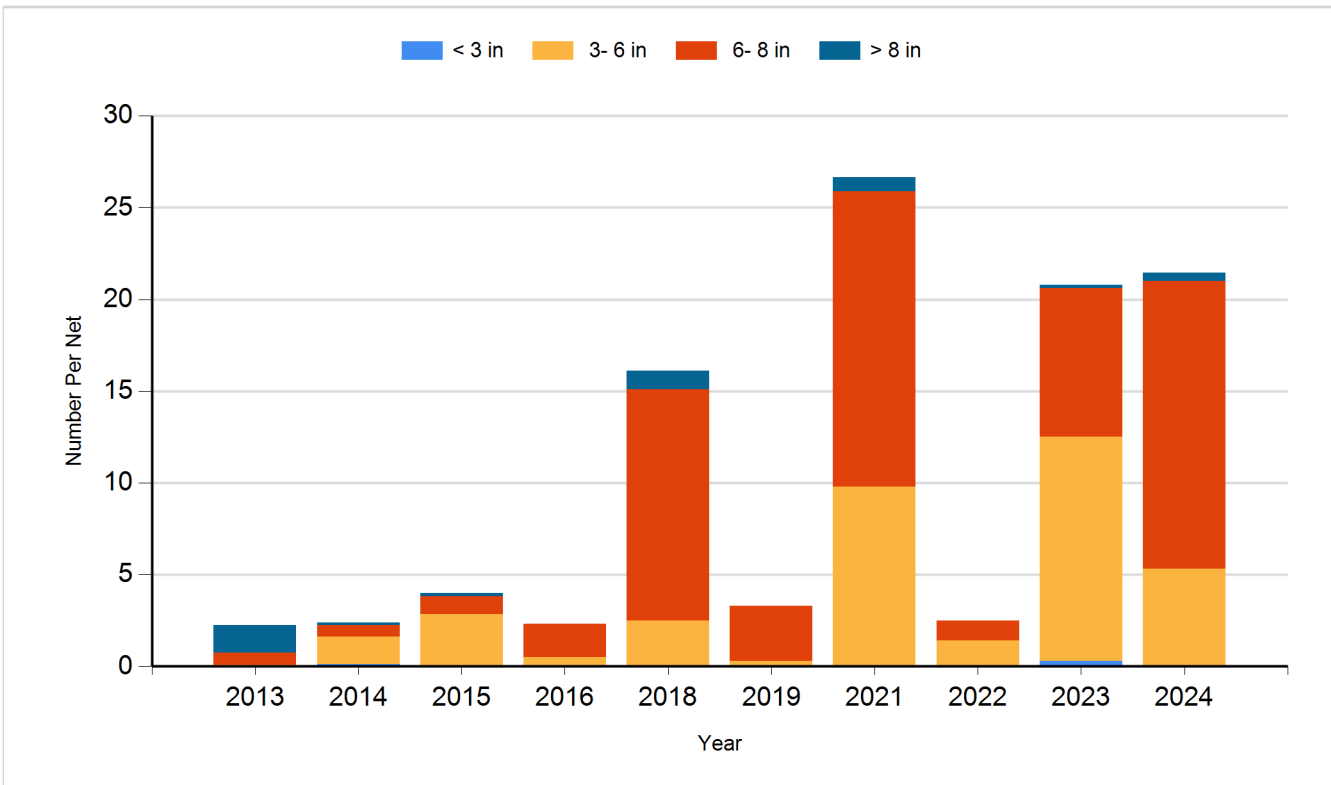
Species: Black Crappie
Gear: frame net (std 3/4 in)



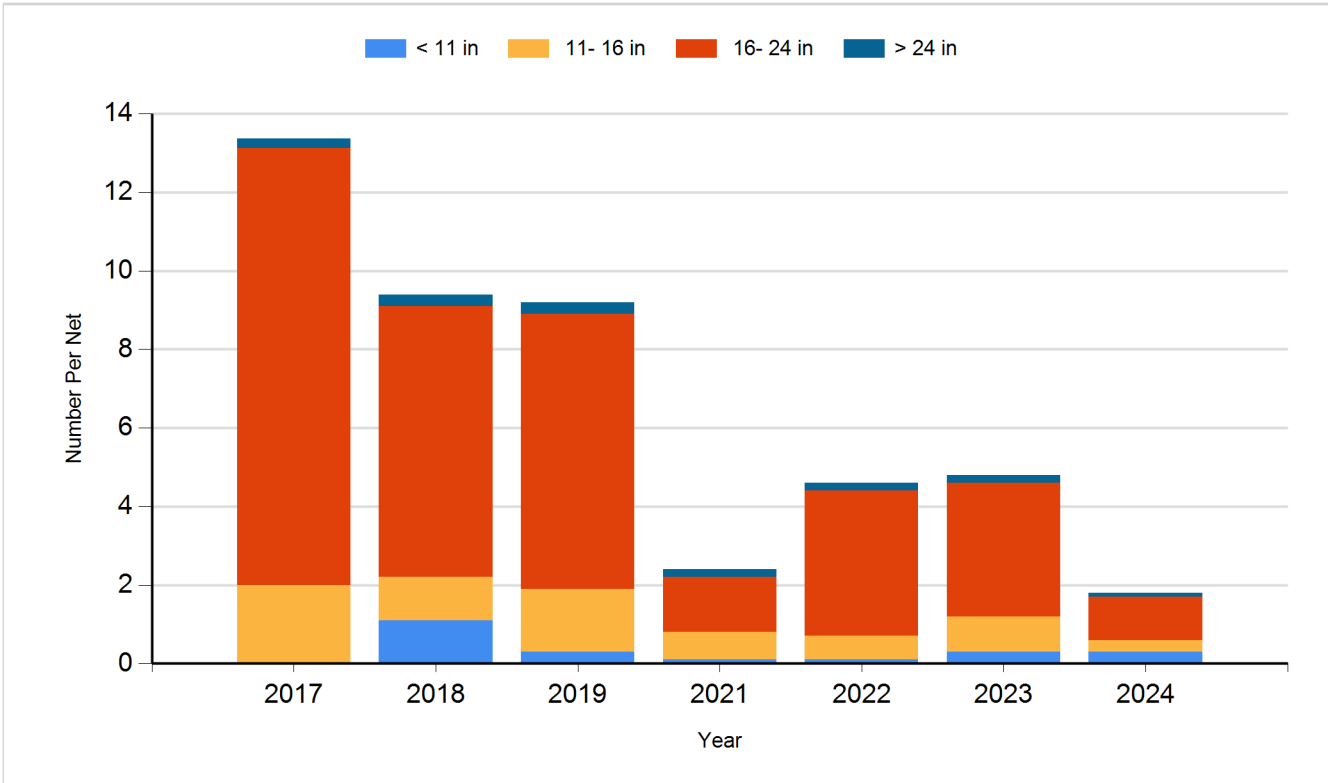
Species: Bluegill
Gear: AFS std frame net



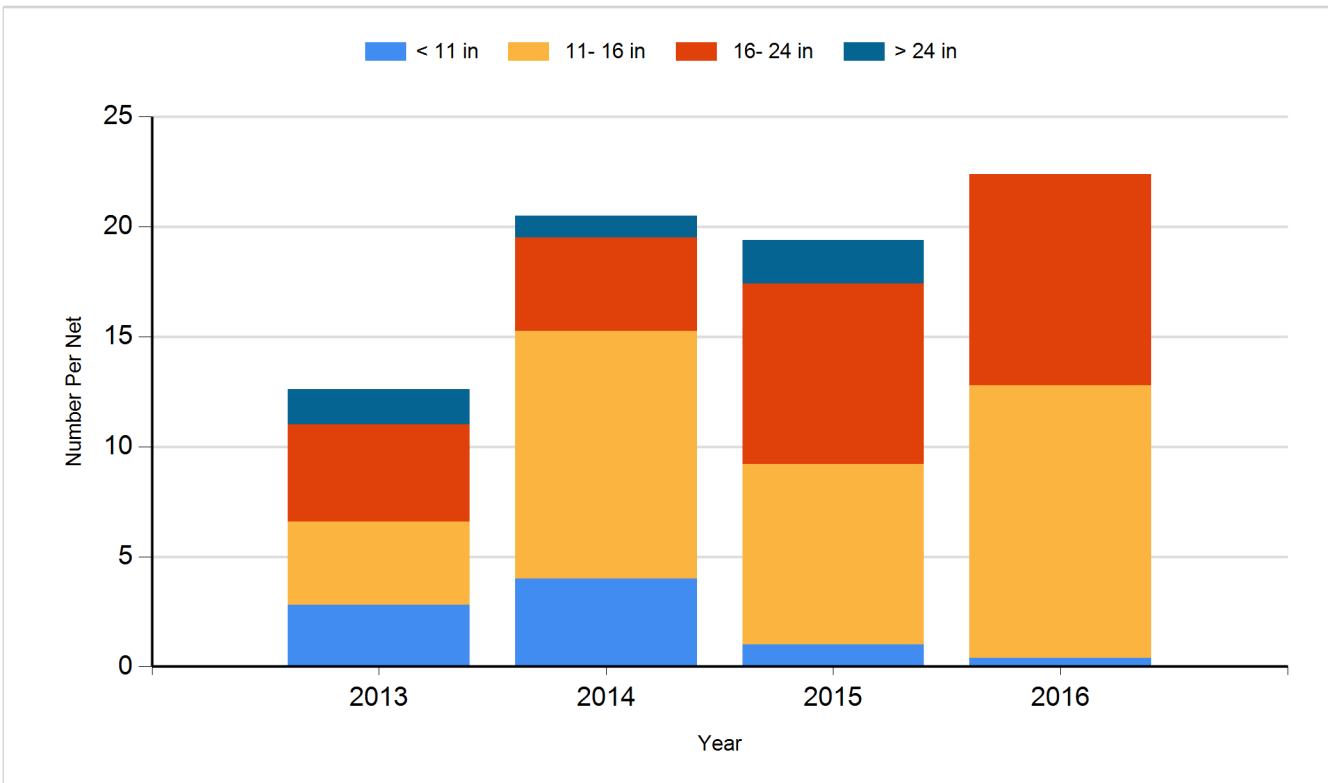
Species: Bluegill
Gear: frame net (std 3/4 in)



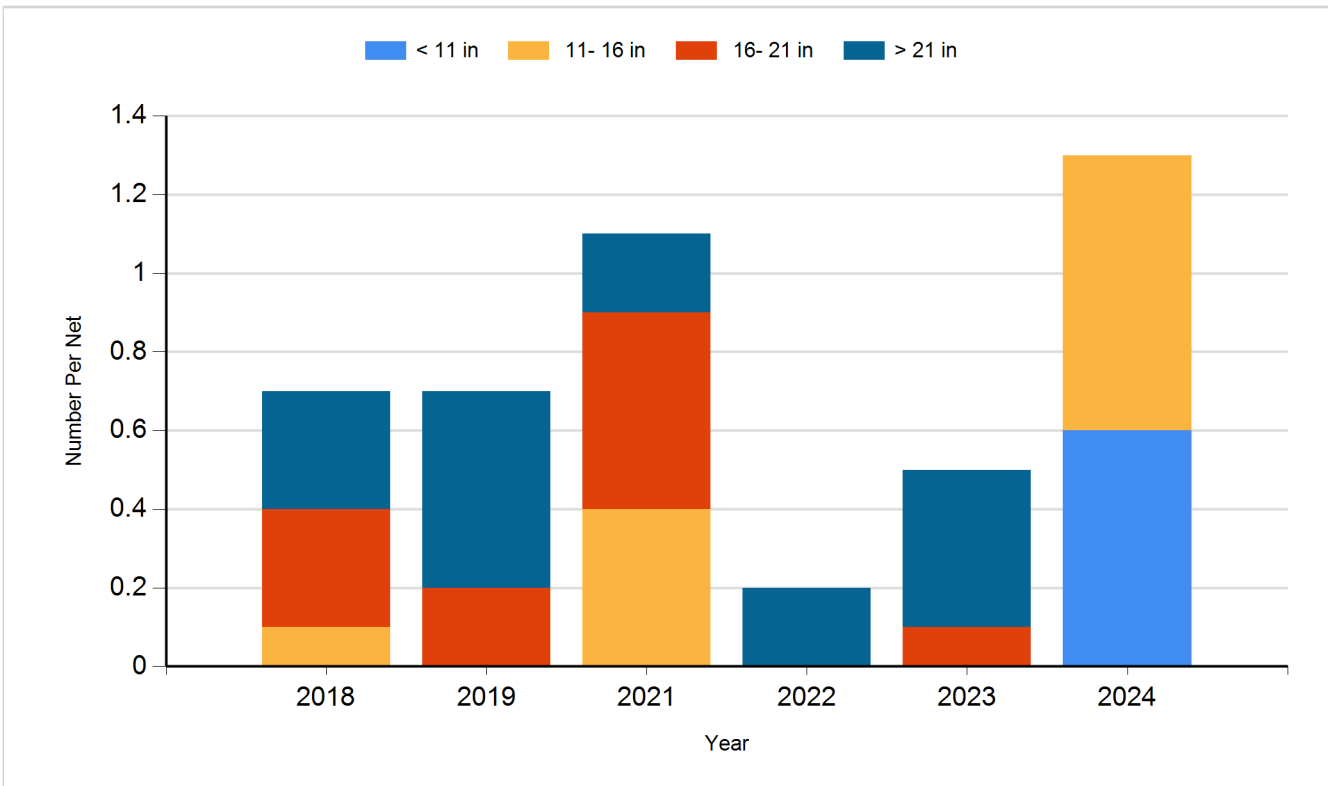
Species: Channel Catfish
Gear: AFS std gill net



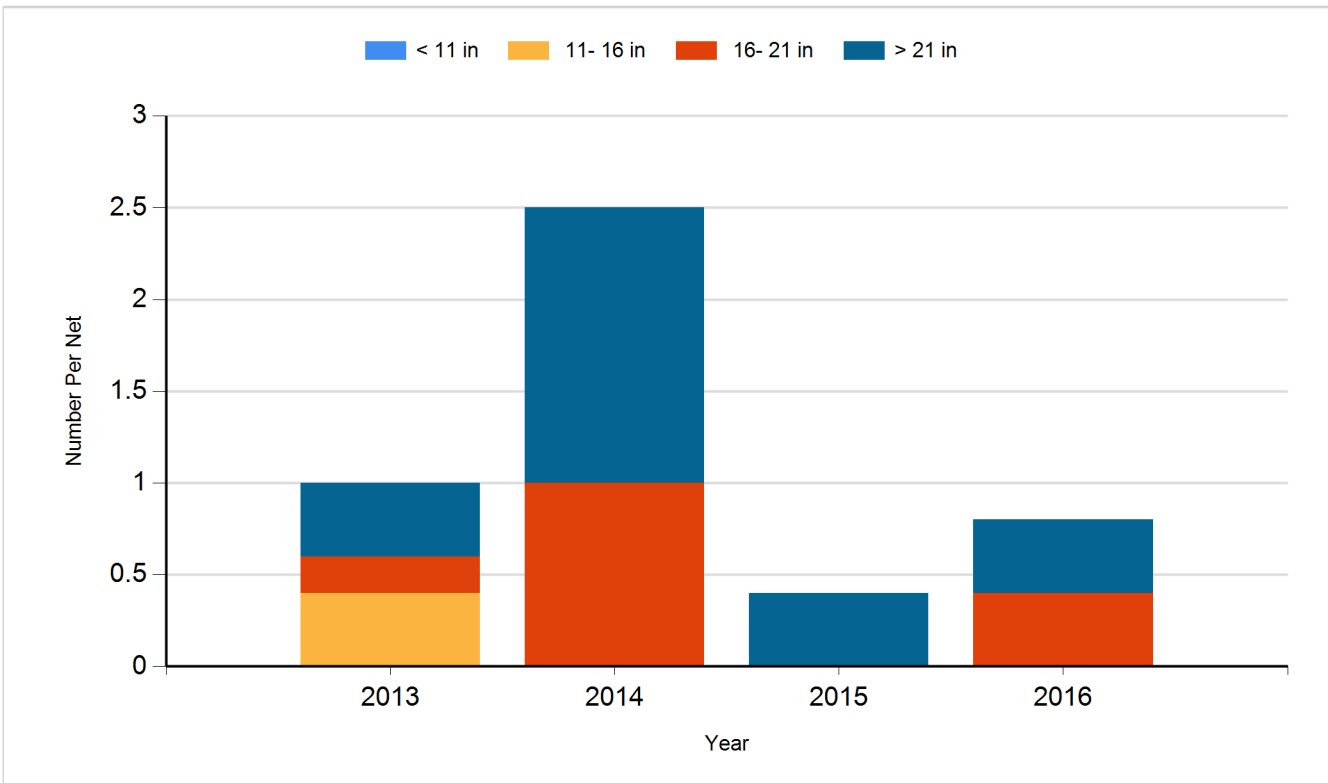
Species: Channel Catfish
Gear: std exp gill net



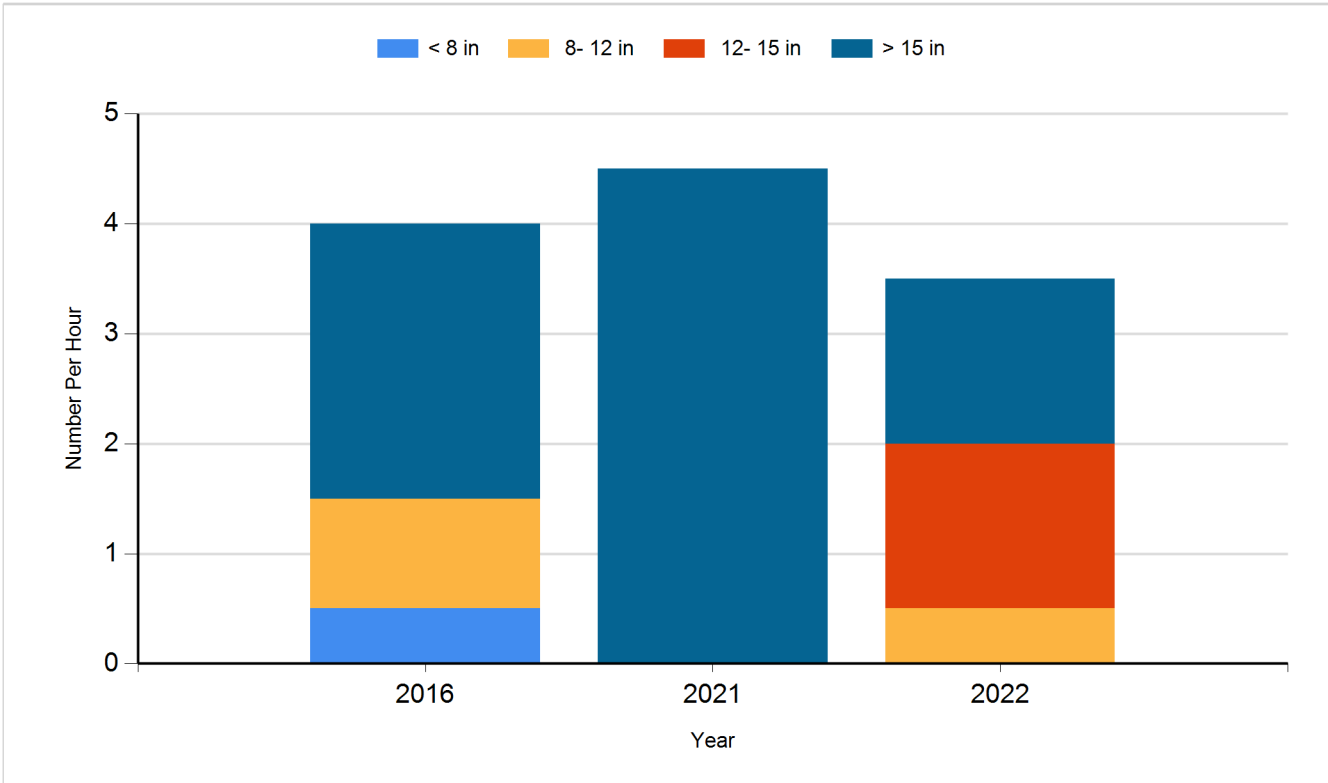
Species: Common Carp
Gear: AFS std gill net



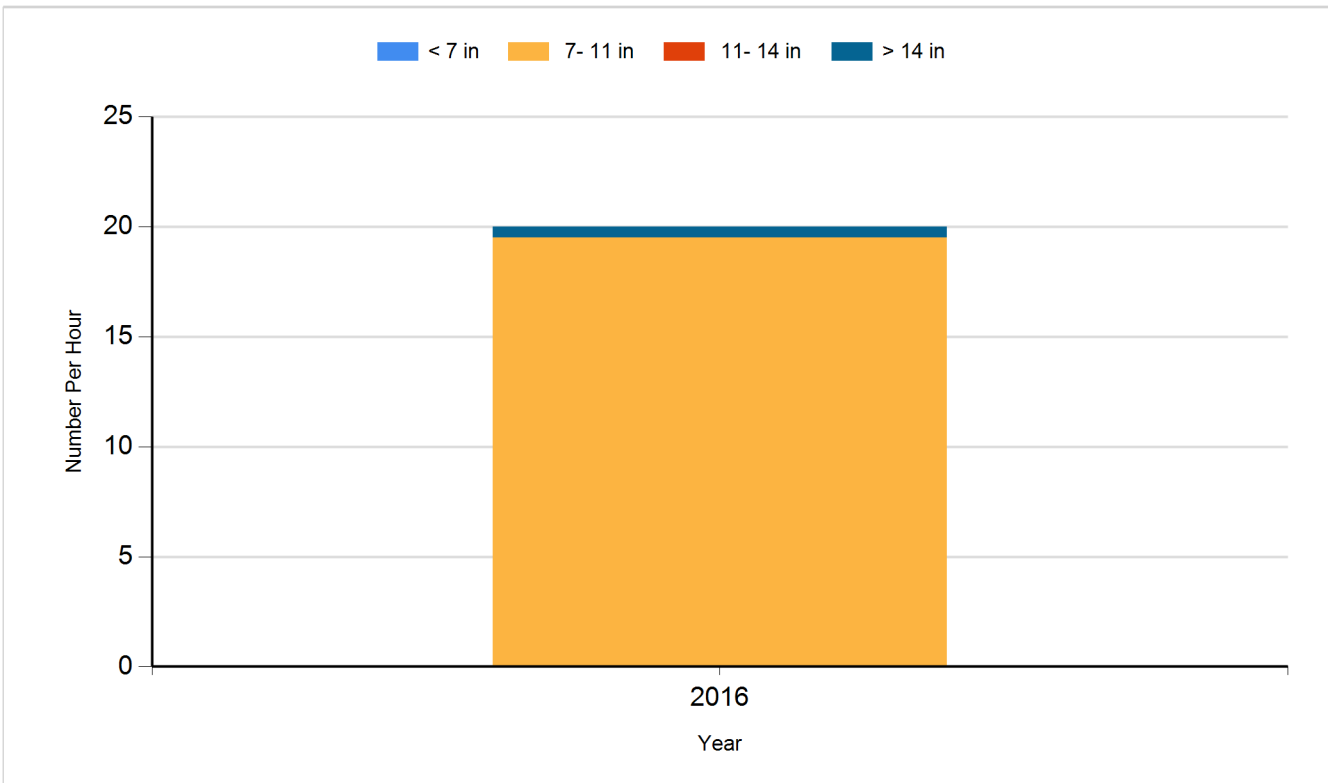
Species: Common Carp
Gear: std exp gill net



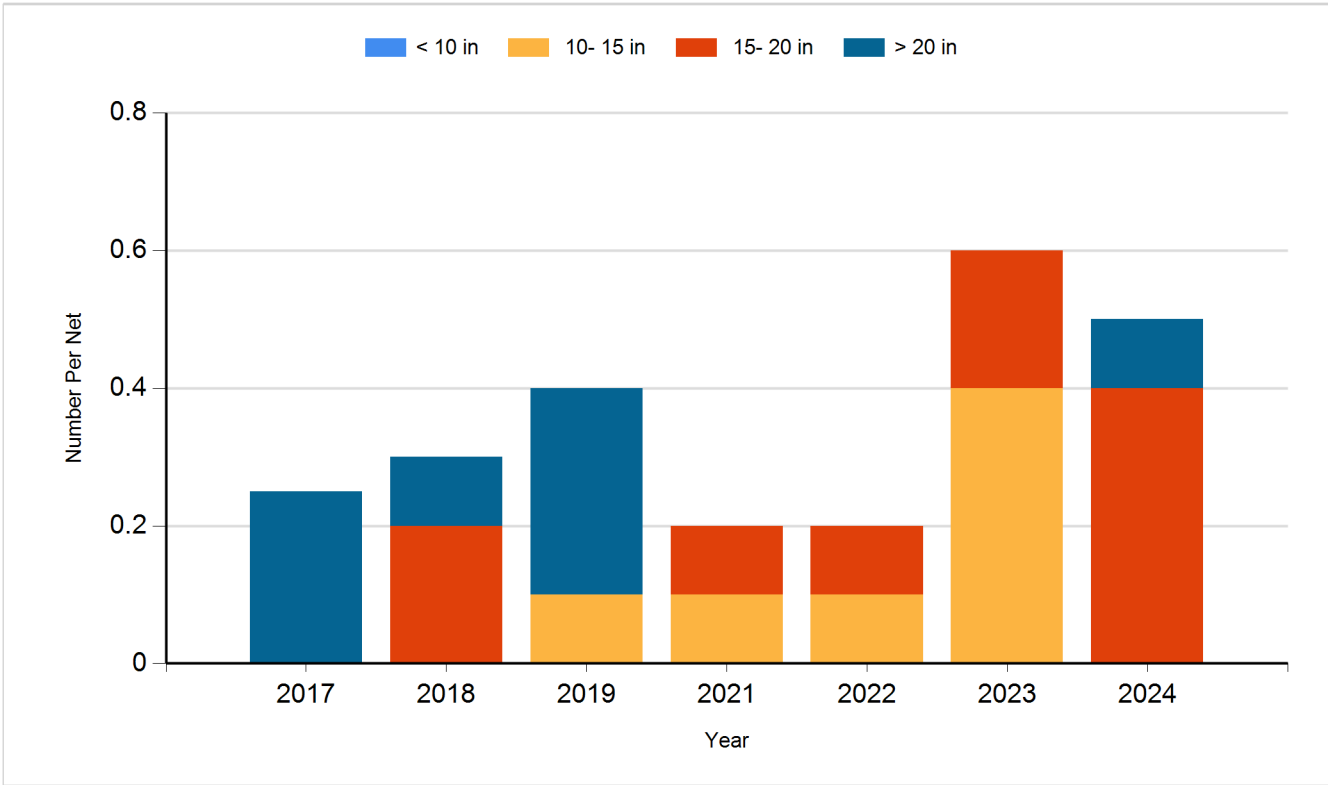
Species: Largemouth Bass
Gear: boat shocker (night)



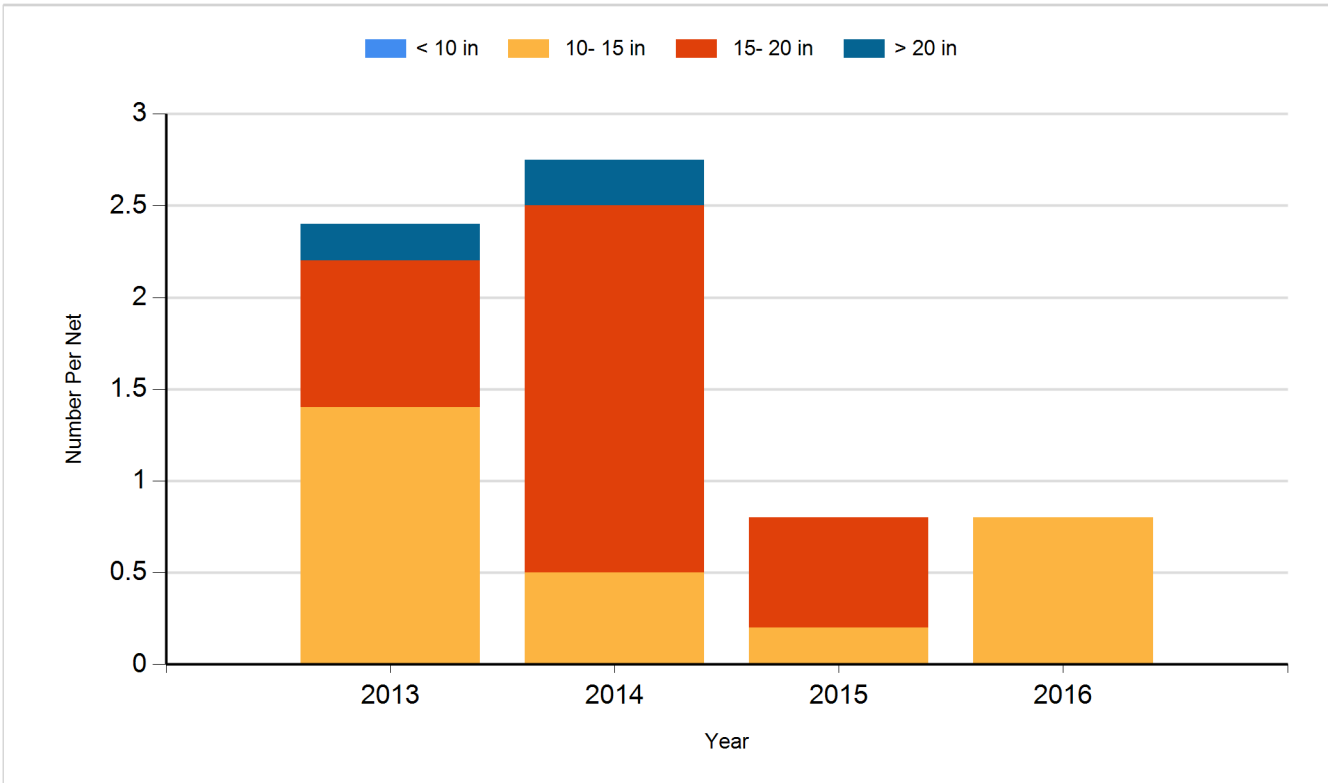
Species: Smallmouth Bass
Gear: boat shocker (night)



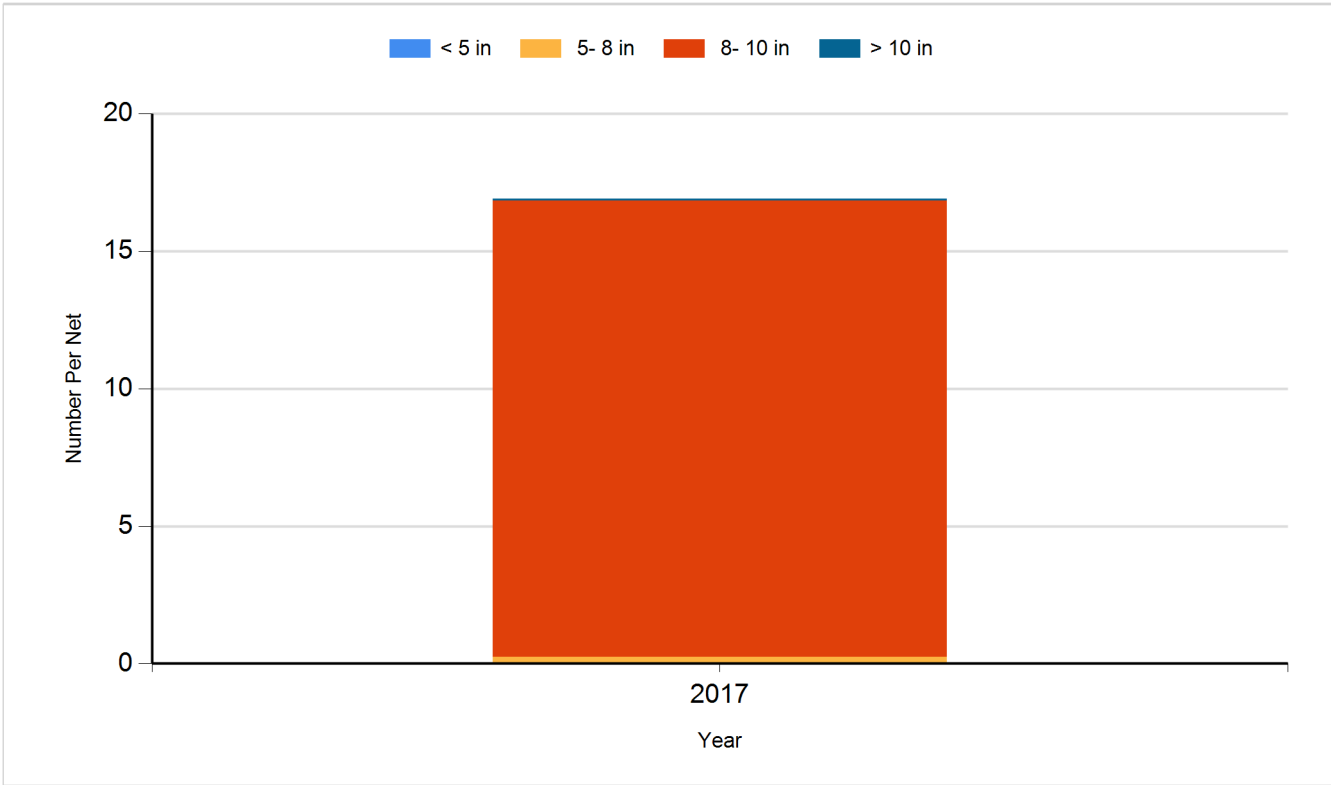
Species: Walleye
Gear: AFS std gill net



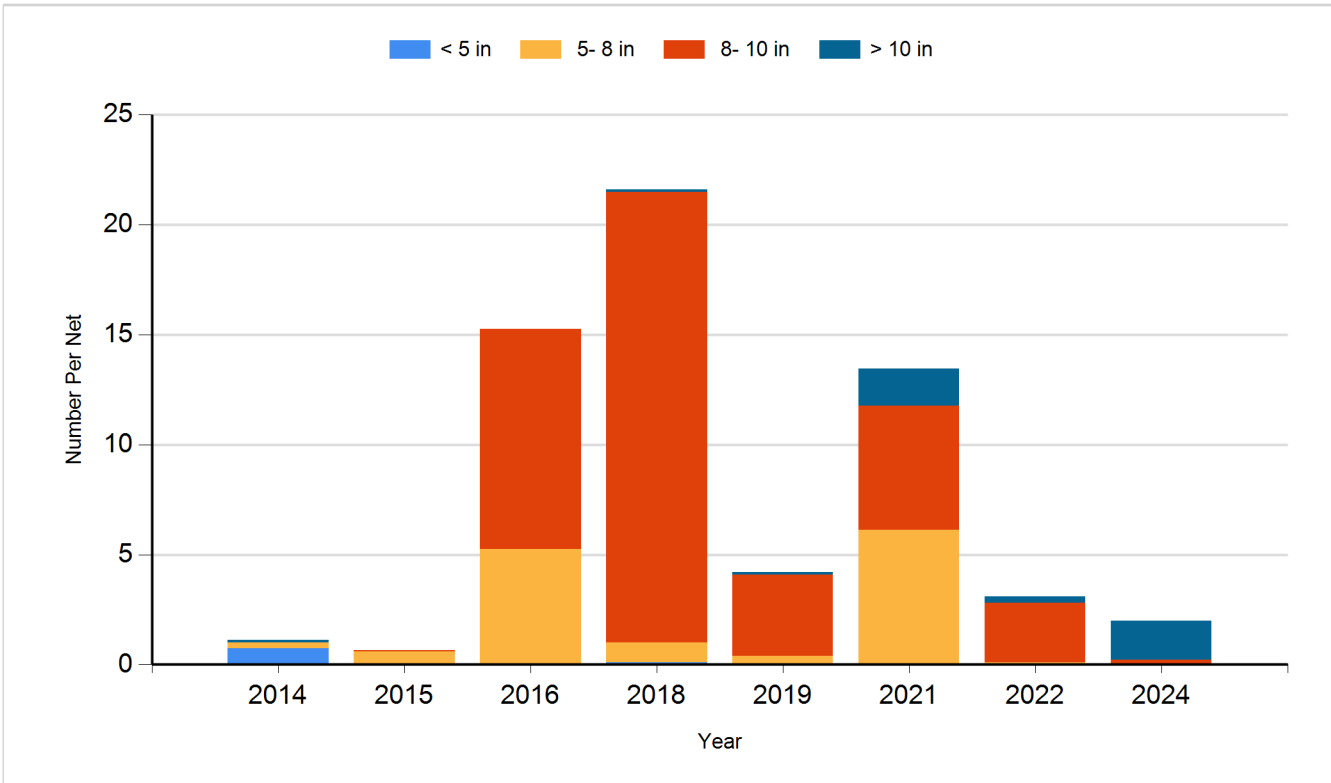
Species: Walleye
Gear: std exp gill net



Species: White Crappie
Gear: AFS std frame net



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



Fish Stocking

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

Year	Species	Size	Number
2013	Walleye	Small Fingerling	32,080
2015	Walleye	Small Fingerling	52,698
2016	Walleye	Small Fingerling	48,020
2017	Walleye	Fingerling	59,000
2018	Walleye	Small	47,040
2019	Walleye	Small Fingerling	51,000
2021	Walleye	Juvenile	59,570
2022	Largemouth Bass	Juvenile	40,000
2024	Saugeye	Fry	400,000
2024	Saugeye	Juvenile	56,463