Lake Alvin Survey Summary

Lake Alvin, located 5 miles east and ½ a mile north of Harrisburg, SD, is managed as a walleye and black crappie fishery. Other fish species (e.g., bluegill, channel catfish, largemouth bass, saugeye, and white crappie) provide additional angling opportunities. Lake Alvin was partially drained in the summer of 2024 in order to repair the flood damaged spillway. Construction is expected to be complete by the spring of 2025.

- Walleye and Saugeye. Gill netting efforts produced one walleye in 2024. Relative abundance has remained quite low over the past decade despite numerous stocking events (CPUE's ranging from 0.0 to 0.5 fish per net). Fisheries personnel began stocking saugeye instead of walleye into Lake Alvin in 2023 in an attempt to improve catch rates. The walleye-sauger hybrid is more tolerant of the turbid (murky) water found in Lake Alvin. Initial results look promising with this year's gill nets yielding 1.8 saugeye per net.
- Black crappie. Black crappie abundance increased substantially in 2024 (112.8 fish per frame net) resulting in the highest catch rate in the region. Relative abundance had been decreasing since the recent high observed in 2021 (114.0 fish per net). The large drop in catch was likely the result of a fish kill which occurred late in the summer of 2021. Sampled fish ranged from 3.5 to 12.2 inches in length with 35% measuring greater than 8 inches. Preferred (>10 inches) and Memorable (>12 inches) length fish accounted for 4% and 3% of the catch, respectively.
- **Bluegill.** Frame netting efforts produced 4.3 bluegill per net in 2024, which is slightly lower than the previous year (6.9 fish per net in 2023) and below the long-term mean (20.0 fish per net). An inverse relationship between crappie and bluegill abundance has commonly been observed on southeast South Dakota impoundments. Sampled fish ranged in length from 4.3 to 7.1 inches with approximately 37% measuring less than 6 inches. Three cohorts of fish contributed to the sample (2020, 2021, 2022) but the 2022 (age 2) year class dominated catches (67% of sample). Growth was close to the statewide average for small impoundments with fish achieving a mean length at capture of 6.3 inches by age 3.

For more detailed results see the computer-generated South Dakota Statewide Fisheries Survey for Lake Alvin (below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Alvin, Lincoln County LBS-Lake-180-000 2024

Lake Information

Name: Alvin Maximum Depth: 26 Feet

County: Lincoln Mean Depth: 9 Feet

Legal Description: T100N-R49W-Sec. 33,34

Surface Area: 105 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 28, 2024	4 net-nights
frame net (std 3/4 in)	May 29, 2024	10 net-nights

Common Fish Species Present

Largemouth Bass

Channel Catfish

Bluegill

Black Crappie

Walleye

River Carpsucker

Black Bullhead

White Sucker

Common Carp

Freshwater Drum

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.

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

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.

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

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

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.

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

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).

	St	ock	Qu	ality	Preferred		Mem	orable	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		St	ock Der	sity Indic	es	Cor	ndition
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Bigmouth Buffalo	63	0.3	0.4	100		0			
	Black Bullhead	21	4.8	1.8	11		0			
	Black Crappie	8	8.0	1.2	0		0		116	8
	Channel Catfish	12	2.3	1.0	100		11		83	4
	Common Carp	15	2.5	1.7	90		10			
	Freshwater Drum	15	8.0	0.4	100		33			
	River Carpsucker	174	40.5	12.9	86	4	56	5		
	Saugeye	7	0.3	0.4	0		0		101	
	Walleye	1	0.3	0.4	100		100		91	
	White Sucker	7	1.8	8.0	86		14			
frame net (std 3/4 in)	Bigmouth Buffalo	28	0.1	0.1	100		0			
II 1 <i>)</i>	Black Bullhead	24	2.3	0.5	39	16	0			
	Black Crappie	1661	112.8	44.3	35	2	7	1	88	1
	Bluegill	43	4.3	3.6	37	11	0		114	2
	Channel Catfish	1	0.0	0.0	0		0			
	Common Carp	52	1.7	0.8	65	19	6			
	Freshwater Drum	3	0.1	0.1	100		100			
	Green Sunfish	1	0.1	0.1	0		0			
	Largemouth Bass	3	0.0	0.0	0		0			
	River Carpsucker	17	1.4	1.1	93		57	22		
	Saugeye	21	0.4	0.3	0		0		92	4
	White Sucker	40	4.0	1.1	93		55	12		

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					
2016 201	17 2	2018	2019	2020	2021	2022	2023	2024	Avg
5.7	.7								5.70
23.2	3.2								23.20
2.0	.0								2.00
0.0	.0								0.00
0.1	.1								0.10
2.7	.7								2.70
0.2	.2								0.20
0.0	.0								0.00
0.1	.1								0.10
0.2	.2								0.20
0.3	.3								0.30
0.2	.2								0.20
3.6	.6								3.60
1.3	.3								1.30
0.0	.0	0.2			0.5	0.0	0.3	0.3	0.22
9.5	.5 1	12.7			10.8	9.0	6.3	4.8	8.85
2.2	.2	0.3			2.3	3.8	0.0	0.8	1.57
0.0	.0	0.2			0.0	1.0	0.0	0.0	0.20
3.2	.2	3.0			3.3	3.3	1.7	2.3	2.80
0.0	.0	2.0			0.8	0.5	3.3	2.5	1.52
1.2	.2	2.2			0.0	1.3	0.7	0.8	1.03
16.7	6.7	0.7			0.0	2.3	0.0	0.0	3.28
0.2	.2	0.0			0.0	0.0	0.0	0.0	0.03
4.3	.3 1	12.3			20.8	10.8	15.7	40.5	17.40
0.0	.0	0.0			0.0	0.0	0.0	0.3	0.05
0.3	.3	0.3			0.5	0.3	0.0	0.3	0.28
0.0	.0	0.2			0.0	0.0	0.0	0.0	0.03
0.5	.5	0.2			8.0	0.0	0.0	0.0	1.45
1.0	.0	3.0			12.8	10.0	4.3	1.8	5.48
0.2	.2	1.5			0.0	0.0	0.0	0.0	0.28
0.1		0.0			0.2	0.4	0.7	0.1	0.23
321.9	6	59.2			9.8	19.8	14.5	2.3	81.51
17.2		6.9			114.0	13.0	7.9	112.8	43.96
49.0		1.8			10.6	7.2	6.9	4.3	20.04
					1.8	19.0 1.8 10.6		19.0 1.8 10.6 7.2 6.9	19.0 1.8 10.6 7.2 6.9 4.3

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							CPUE					
Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
frame net (std	Channel Catfish	1.0	1.6		0.1			0.0	0.6	0.0	0.0	0.47
3/4 in)	Common Carp	0.1	0.2		0.3			0.2	0.0	2.5	1.7	0.71
	Freshwater Drum	0.0	0.2		0.0			0.0	0.0	0.0	0.1	0.04
	Gizzard Shad	0.0	2.1		0.0			0.4	0.0	0.0	0.0	0.36
	Golden Shiner	0.0	0.0		0.0			0.0	0.0	0.0	0.0	0.00
	Green Sunfish	1.5	0.8		0.0			0.2	0.4	0.9	0.1	0.56
	Largemouth Bass	0.0	0.0		0.2			0.0	0.0	0.0	0.0	0.03
	Northern Pike	0.1	0.0		0.1			0.0	0.0	0.0	0.0	0.03
	Orangespotted Sunfish	0.0	0.0		0.0			0.0	0.0	0.0	0.0	0.00
	Pumpkinseed	0.0	0.1		0.0			0.0	0.0	0.0	0.0	0.01
	River Carpsucker	0.2	0.9		0.1			0.2	0.0	3.7	1.4	0.93
	Saugeye	0.0	0.0		0.0			0.0	0.0	0.0	0.4	0.06
	Sunfish Hybrid	2.2	2.2		0.1			0.2	1.8	0.0	0.0	0.93
	Walleye	0.0	0.0		0.0			0.2	0.0	0.1	0.0	0.04
	White Crappie	3.6	3.3		2.3			112.8	0.0	0.0	0.0	17.43
	White Sucker	3.1	12.9		3.6			11.2	2.6	9.9	4.0	6.76
	Yellow Bullhead	0.0	0.0		0.0			0.4	0.4	0.0	0.0	0.11
	Yellow Perch	0.0	0.1		1.3			0.0	0.2	0.0	0.0	0.23
hoop net	Black Bullhead		28.0									28.00
	Black Crappie		0.7									0.70
	Bluegill		0.3									0.30
	Common Carp		1.7									1.70
spring day EF*	Largemouth Bass							6.0				6.00
std exp gill net	Black Bullhead	142.3	83.0									112.6 5
	Black Crappie	1.0	2.0									1.50
	Channel Catfish	12.7	4.3									8.50
	Common Carp	6.3	0.0									3.15
	Freshwater Drum	0.7	3.0									1.85
	Gizzard Shad	0.3	11.3									5.80
	Largemouth Bass	0.0	0.3									0.15
	Northern Pike	0.0	0.0									0.00
	River Carpsucker	1.3	10.3									5.80
	Walleye	0.3	0.0									0.15
	White Crappie	0.0	0.7									0.35
	White Sucker	4.0	6.0									5.00

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.

							Ye	ar				
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std frame	Black Bullhead	PSD			0							
net		PSD-P			0							
	Black Crappie	PSD			84							
		PSD-P			8							
		Wr			92							
	Bluegill	PSD			60							
		PSD-P			0							
		Wr			94							
	Channel Catfish	PSD			0							
		PSD-P			0							
	Common Carp	PSD			100							
		PSD-P			0							
	River Carpsucker	PSD			100							
		PSD-P			100							
	Walleye	PSD			0							
		PSD-P			0							
		Wr			85							
	White Sucker	PSD			100							
		PSD-P			85							
AFS std gill net	Black Bullhead	PSD			0	0			60	78	16	11
		PSD-P			0	0			0	0	0	0
	Black Crappie	PSD			69	100			11	13		0
		PSD-P			15	50			0	0		0
		Wr			87	96			126	116		116
	Bluegill	PSD				100				25		
		PSD-P				0				0		
		Wr				93				107		
	Channel Catfish	PSD			47	61			85	62	60	100
		PSD-P			5	17			15	0	0	11
		Wr			95	93			88	96	82	83
	Common Carp	PSD				50			100	100	10	90
		PSD-P				17			0	50	10	10
	River Carpsucker	PSD			100	100			100	95	100	86
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							Ye	ar				
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std gill net	River Carpsucker	PSD-P			100	91			66	77	81	56
	Walleye	PSD			50	100			0	100		100
		PSD-P			50	0			0	0		100
		Wr			92	87			91	95		91
	White Sucker	PSD			83	83			94	80	92	86
		PSD-P			83	56			33	48	54	14
frame net (std	Black Bullhead	PSD	2	0		0			65	93	77	39
3/4 in)		PSD-P	0	0		0			0	0	1	0
	Black Crappie	PSD	8	12		100			32	29	62	35
		PSD-P	0	2		78			6	0	22	7
		Wr	100	95		93			113	105	96	88
	Bluegill	PSD	34	51		44			51	39	41	37
		PSD-P	0	0		0			0	0	0	0
		Wr	94	97		105			100	104	107	114
	Channel Catfish	PSD	20	44		100				33		0
		PSD-P	0	0		0				0		0
		Wr	82	103		88				106		
	Common Carp	PSD	0	50		0			100		8	65
		PSD-P	0	50		0			100		4	6
	Largemouth Bass	PSD				100						0
		PSD-P				50						0
		Wr				89						
	River Carpsucker	PSD	100	100		100			100		100	93
		PSD-P	50	100		100			100		89	57
	Walleye	PSD		0		0			0		100	
		PSD-P		0		0			0		100	
		Wr							76		80	
	White Sucker	PSD	97	100		94			98	92	94	93
		PSD-P	65	77		75			39	54	79	55
hoop net	Black Bullhead	PSD		0								
		PSD-P		0								
	Black Crappie	PSD		0								
		PSD-P		0								
		Wr		95								
	Bluegill	PSD		0								
		PSD-P		0								

				Year								
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
hoop net	Bluegill	Wr		95								
	Common Carp	PSD		100								
		PSD-P		100								
spring day EF	Largemouth Bass	PSD							83			
		PSD-P							17			
		Wr							104			
std exp gill net	Black Bullhead	PSD	0	0								
		PSD-P	0	0								
	Black Crappie	PSD	0	17								
		PSD-P	0	0								
		Wr		99								
	Channel Catfish	PSD	84	69								
		PSD-P	0	0								
		Wr	85	89								
	Common Carp	PSD	5									
		PSD-P	5									
	Largemouth Bass	PSD		0								
		PSD-P		0								
		Wr		101								
	River Carpsucker	PSD	100	94								
		PSD-P	75	68								
	Walleye	PSD	100									
		PSD-P	0									
		Wr	93									
	White Sucker	PSD	100	94								
		PSD-P	33	39								

Length at Capture

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

Species: Black Crappie

Year	N	1	2	3	4	5	6	7	8	9	10+
								- '			10+
2023	84	109 (5)	180 (27)	217 (20)	257 (28)	293 (4)					
2022	65	(3)	162	194	211	(4)					
2022	00		(19)	(30)	(16)						
2021	464		156	195	222						
			(171)	(264)	(29)						
2018	72	96	209	229	262	268		281			
2017	235	(3) 90	(4) 184	(6) 215	(32) 234	(26) 252	251	(1)			
2017	233	(3)	(33)	(86)	(80)	(31)	(2)				
2016	172	, ,	162	193	258	254	, ,				
			(85)	(81)	(5)	(2)					
2015	409	124	176	224							
Cassiss. D	1	(70)	(316)	(23)							
Species: B	luegiii										
								er) at capti			
Year	N	1	2	3	4	5	6	7	8	9	10+
2024	43		140	161	186						
2023	69		(29) 120	(13) 158	(1) 170	193					
2023	09		(38)	(24)	(4)	(3)					
2022	38	79	132	167	180	174					
		(3)	(21)	(10)	(3)	(1)					
2021	50		116	153	162						
2018	18		(21) 115	(28) 147	(2) 152	155					
2010	10		(3)	(3)	(6)	(5)					
2017	22	72	124	149	158	170	174				
		(2)	(6)	(2)	(7)	(3)	(2)				
2015	605		136	155	172	177					
	7-11		(378)	(154)	(59)	(15)					
Species: W	aneye										
								er) at capti			
Year	N	11	2	3	4	5	6	7	8	9	10+
2024	1				511						
2040	0			407	(1)						
2018	2			427 (2)							

Fish Condition

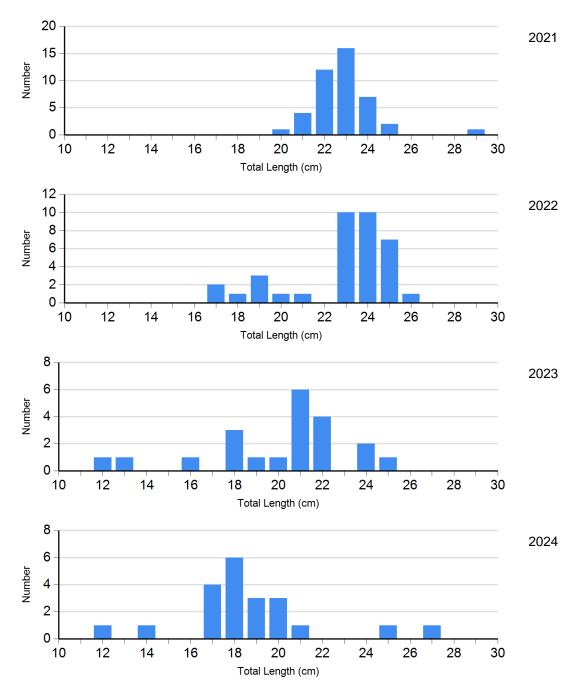
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

					Length	Group	S		
			S-Q		Q-P		P-M		М
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2021	389	116 (1.5)	144	101 (0.8)	24	90	13	
	2022	46	109 (1.2)	19	98 (1.5)	0		0	
	2023	30	101 (1.1)	32	94 (1.2)	11	92 (1.4)	6	88 (3.1)
	2024	736	88 (1.2)	311		50		31	
Bluegill Frame Net	2021	26	99 (3.5)	27	101 (1.4)	0		0	
	2022	22	104 (2.1)	14	103 (1.8)	0		0	
	2023	41	110 (2.4)	28	103 (1.6)	0		0	
	2024	27	116 (2.0)	16	112 (3.6)	0		0	
Channel Catfish Gill Net	2021	2	76	9	86 (2.0)	2	98 (16.6)	0	
	2022	5	94 (3.1)	8	98 (3.7)	0		0	
	2023	2	75 (0.7)	3	87 (5.0)	0		0	
	2024	0		8	83 (3.6)	0		1	89
Largemouth Bass Electro Fishing	2021	1	96	4	106 (4.2)	1	105	0	
Walleye Gill Net	2021	2	91 (6.8)	0		0		0	
	2022	0		1	95	0		0	
	2024	0		0		1	91	0	

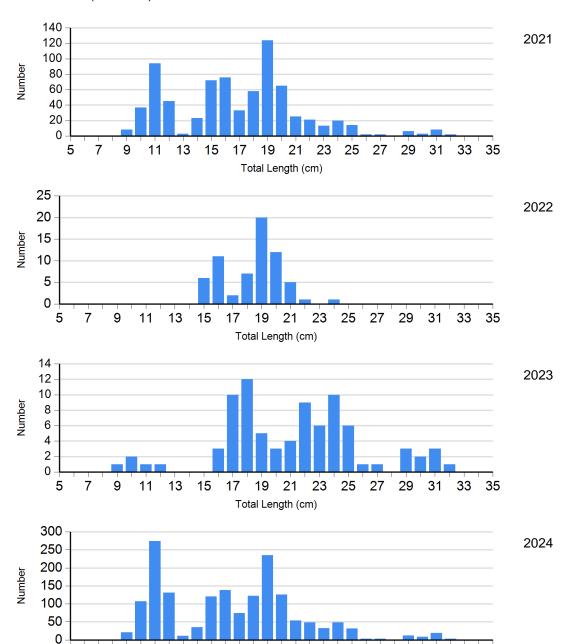
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead Gear: AFS std gill net



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



Species: Bluegill

Gear: frame net (std 3/4 in)

5

9

11

13

15

17

19 21

Total Length (cm)

23

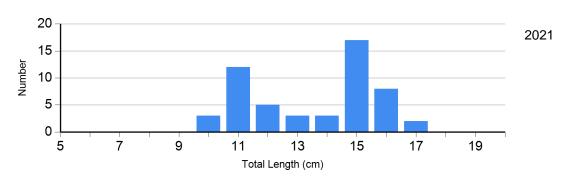
25

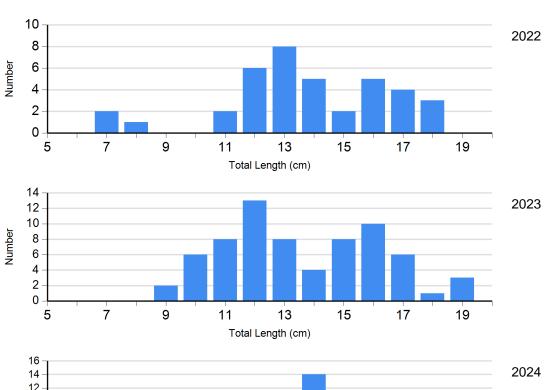
27

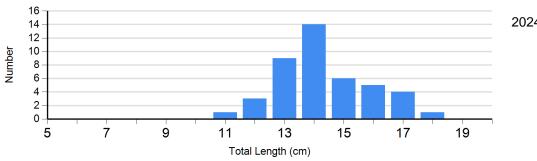
29

31

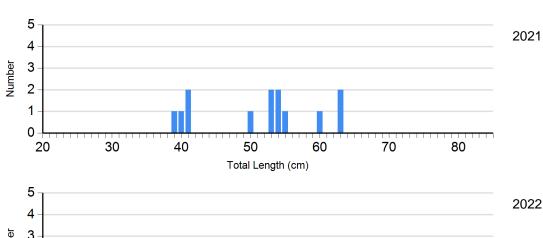
33

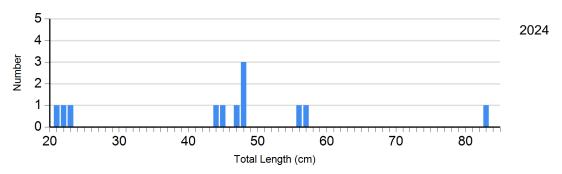




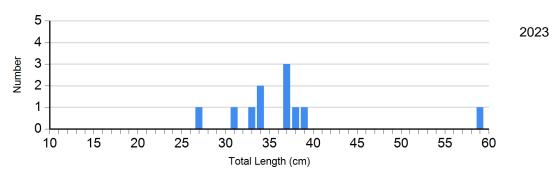


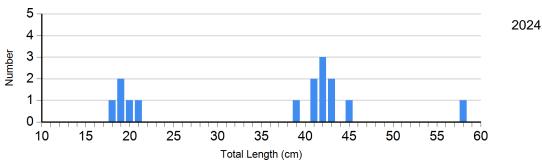
Species: Channel Catfish Gear: AFS std gill net



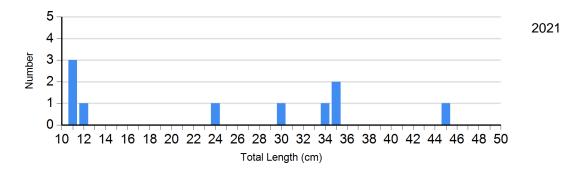


Species: Common Carp Gear: AFS std gill net

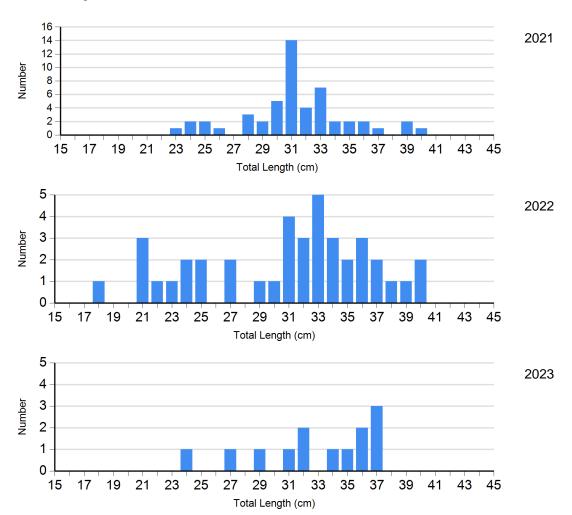




Species: Largemouth Bass Gear: spring day EF



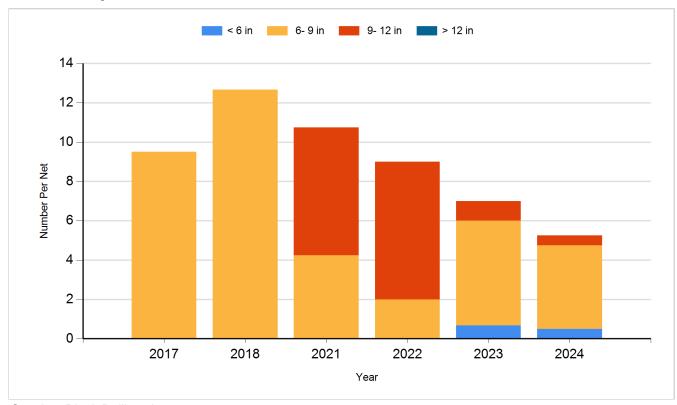
Species: White Sucker Gear: AFS std gill net



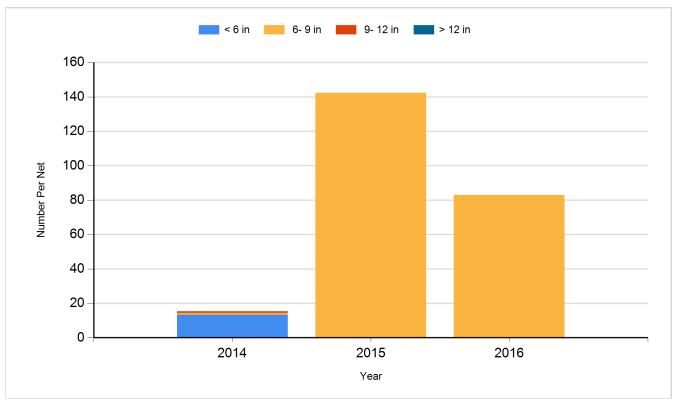
Historic Fish Sizes and Relative Abundance

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

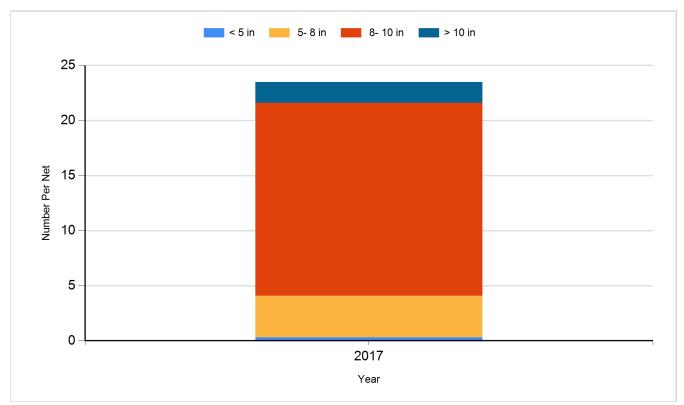
Species: Black Bullhead Gear: AFS std gill net



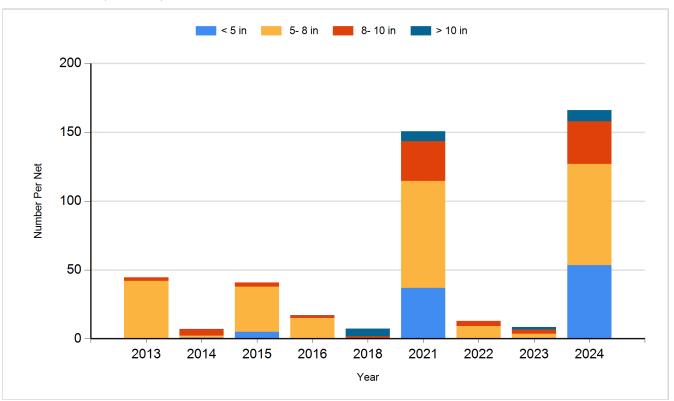
Species: Black Bullhead Gear: std exp gill net



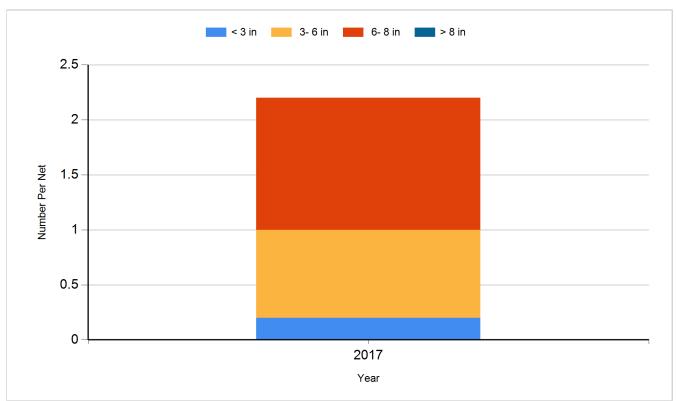
Species: Black Crappie Gear: AFS std frame net



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

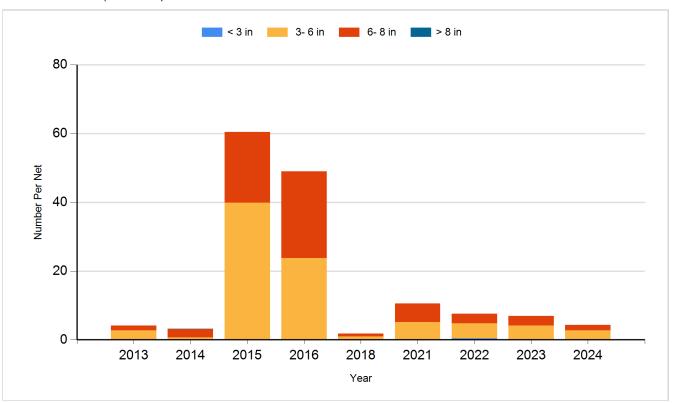


Species: Bluegill Gear: AFS std frame net

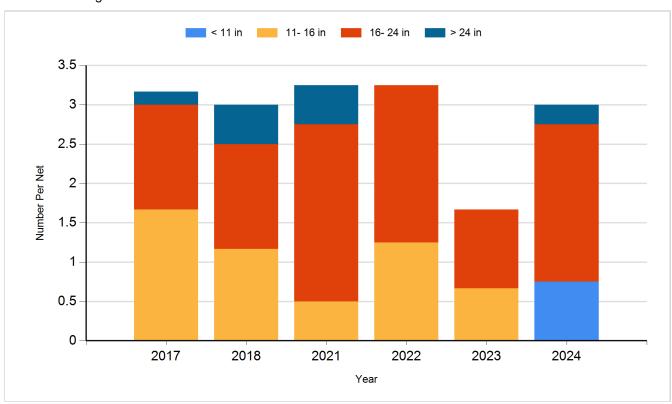


Species: Bluegill

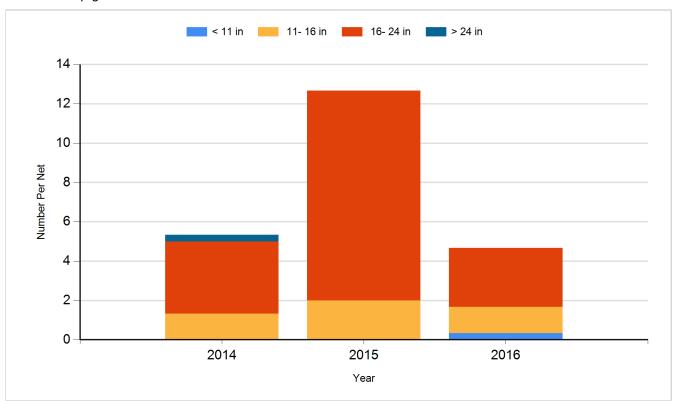
Gear: frame net (std 3/4 in)



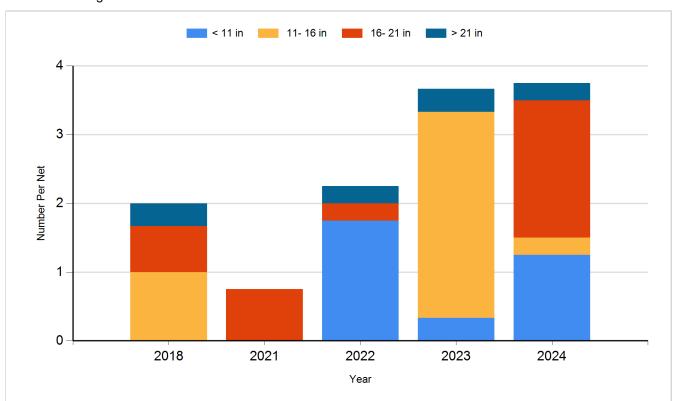
Species: Channel Catfish Gear: AFS std gill net



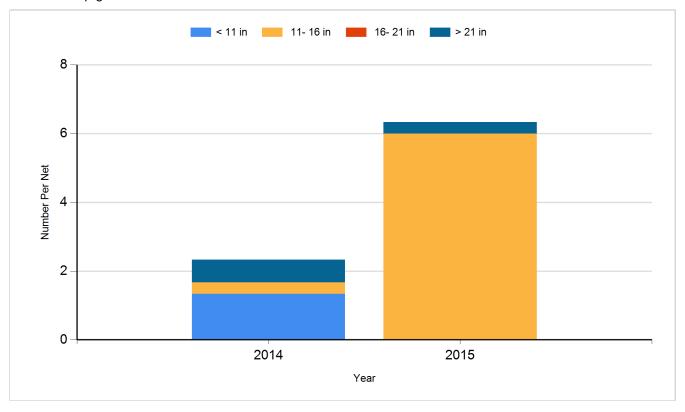
Species: Channel Catfish Gear: std exp gill net



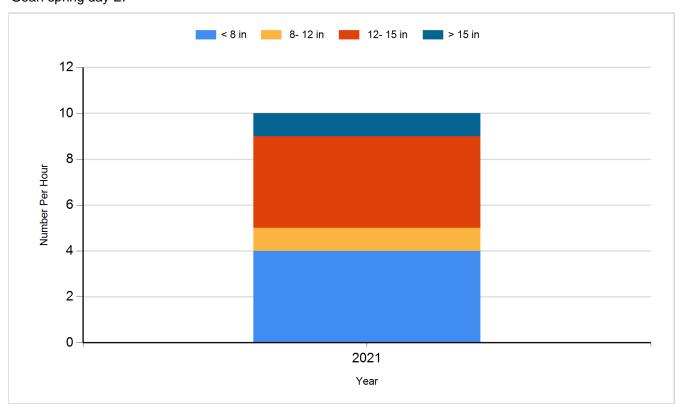
Species: Common Carp Gear: AFS std gill net



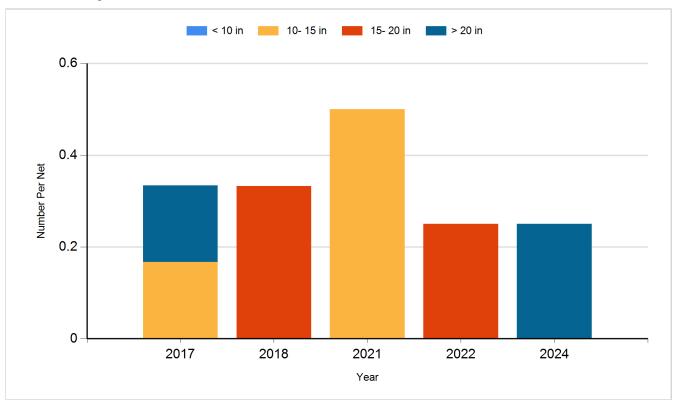
Species: Common Carp Gear: std exp gill net



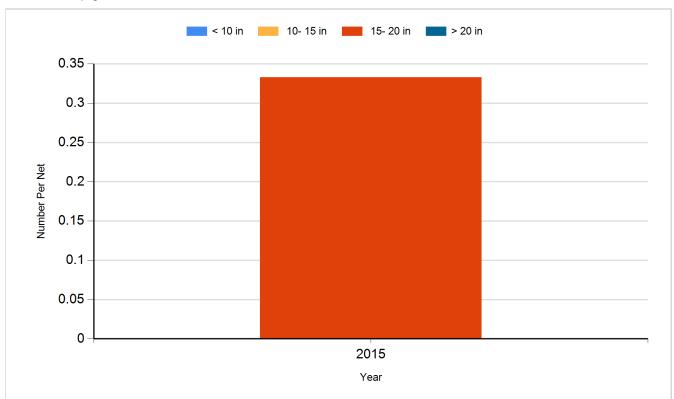
Species: Largemouth Bass Gear: spring day EF



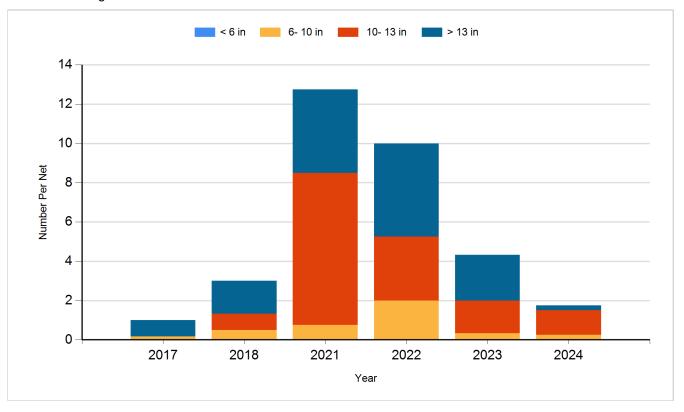
Species: Walleye Gear: AFS std gill net



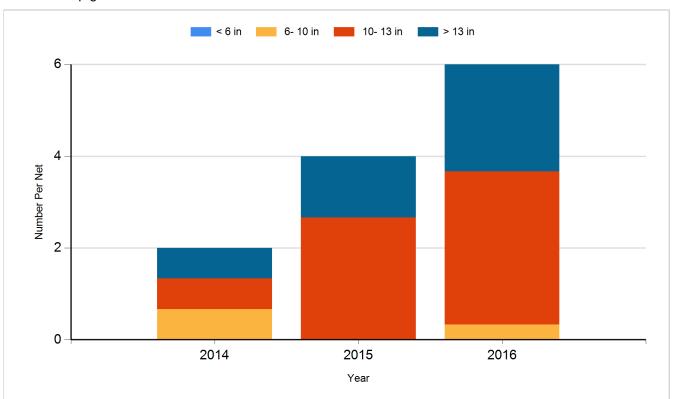
Species: Walleye Gear: std exp gill net



Species: White Sucker Gear: AFS std gill net



Species: White Sucker Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2013	Largemouth Bass	Large Fingerling	1,056
2013	Walleye	Adult	300
2014	Walleye	Fry	90,000
2015	Gizzard Shad	Adult	50
2015	Walleye	Small Fingerling	7,560
2016	Walleye	Juvenile	889
2017	Walleye	Juvenile	1,152
2017	Yellow Perch	Adult	5,525
2017	Yellow Perch	Small Fingerling	54,860
2018	Gizzard Shad	Adult	60
2019	Walleye	Small Fingerling	8,400
2021	Walleye	Fingerling	7,600
2023	Saugeye	Juvenile	11,968
2024	Gizzard Shad	Adult	52