

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Bitter, Day County

UBS-Lake-409-000

2025

Lake Information

Name: Bitter **Maximum Depth:** 32 Feet
County: Day
Surface Area: 17,194 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 19, 2025	6 net-nights
AFS std gill net	Aug 20, 2025	6 net-nights
AFS std gill net	Aug 21, 2025	4 net-nights
fall night EF-WAE	Sep 23, 2025	1800 seconds

Common Fish Species Present

Walleye

Northern Pike

Yellow Perch

White Bass

Common Carp

White Sucker

Rock Bass

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	Common Carp	4	0.2	0.1	67		67		108	5
	Northern Pike	7	0.4	0.2	100		71		81	4
	Rock Bass	1	0.1	0.1	0		0		119	
	Walleye	290	17.4	2.4	18	3	5	2	93	1
	White Bass	33	2.1	0.8	100		100		106	1
	White Sucker	1	0.1	0.1	100		100		89	
	Yellow Perch	81	5.1	1.4	36	8	15	6	118	1

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
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
AFS std gill net	Black Bullhead						0.1	0.6	0.0	0.0	0.0	0.14
	Black Crappie						0.3	0.1	0.0	0.0	0.0	0.08
	Common Carp						1.3	1.6	0.5	0.6	0.2	0.84
	Northern Pike						0.4	1.4	1.3	1.0	0.4	0.90
	Rock Bass						1.9	0.4	0.3	0.1	0.1	0.56
	Walleye						10.3	7.8	14.8	17.2	17.4	13.50
	White Bass						6.6	5.1	5.3	1.3	2.1	4.08
	White Sucker						0.0	0.1	0.0	0.0	0.1	0.04
	Yellow Perch						16.1	8.6	4.7	4.6	5.1	7.82
fall night EF-WAE*	Walleye						415.0	70.0	105.0	59.0	60.0	141.80

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									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
AFS std gill net	Common Carp	PSD						100	96	100	100	67
		PSD-P						45	76	100	100	67
		Wr						112	109	109	102	108
	Northern Pike	PSD						100	100	100	100	100
		PSD-P						29	17	40	56	71
		Wr						91	80	79	76	81
	Rock Bass	PSD						74	43	80	0	0
		PSD-P						16	14	40	0	0
		Wr						117	117	115	130	119
	Walleye	PSD						89	74	38	11	18
		PSD-P						13	19	14	6	5
		Wr						96	88	87	90	93
	White Bass	PSD						84	100	100	100	100
		PSD-P						73	88	98	100	100
		Wr						113	105	103	107	106
	White Sucker	PSD							100			100
		PSD-P							100			100
		Wr							115			89
	Yellow Perch	PSD						47	27	40	27	36
		PSD-P						33	11	9	12	15
		Wr						114	117	116	119	118

Length at Capture

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

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2025	290	237 (20)	301 (36)	343 (17)	361 (200)		592 (2)	474 (3)	591 (2)	646 (2)	646 (7)
2024	290	244 (23)	275 (8)	326 (231)		509 (4)	494 (9)	508 (3)	552 (1)	590 (1)	581 (10)
2023	265	209 (22)	285 (154)	396 (8)	450 (13)	472 (20)	482 (12)	523 (10)	503 (1)	586 (3)	619 (20)
2022	234	233 (133)	348 (9)	420 (11)	460 (18)	467 (36)	498 (10)		570 (5)		589 (12)
2021	165	315 (14)	398 (27)	443 (53)	455 (45)	527 (5)	475 (2)	525 (7)	563 (1)	596 (1)	615 (9)

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2025	81	154 (48)	230 (21)	237 (7)	281 (5)						
2024	73	160 (52)	222 (6)	252 (12)	249 (2)		303 (1)				
2023	75	163 (43)	233 (25)	240 (6)	293 (1)						
2022	137	169 (94)	226 (36)	296 (1)	303 (6)						
2021	257	177 (153)	253 (49)	281 (50)	304 (4)	304 (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).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Common Carp Gill Net	2021	0		11	114 (2.6)	5	111 (3.2)	4	111 (5.9)
	2022	1	119	5	115 (4.3)	18	107 (1.8)	1	116
	2023	0		0		3	106 (2.1)	5	110 (9.2)
	2024	0		0		2	105 (2.2)	7	101 (2.2)
	2025	1	111	0		2	106 (5.9)	0	
Northern Pike Gill Net	2021	0		5	92 (1.3)	2	87 (1.6)	0	
	2022	0		19	80 (1.5)	3	81 (0.4)	1	
	2023	0		12	80 (1.7)	8	78 (1.3)	0	
	2024	0		7	77 (2.3)	8	75 (3.1)	1	80
	2025	0		2	81 (3.4)	4	77 (2.5)	1	97
Walleye Gill Net	2021	18	89 (1.4)	125	97 (0.6)	18	97 (1.7)	4	92 (2.5)
	2022	32	88 (1.5)	69	87 (0.7)	18	90 (1.5)	6	96 (2.0)
	2023	148	89 (0.4)	55	84 (0.7)	21	83 (1.7)	13	87 (2.1)
	2024	244	91 (0.4)	15	85 (1.3)	13	80 (1.5)	3	82 (3.1)
	2025	227	94 (0.4)	38	91 (0.8)	7	86 (2.1)	6	84 (5.3)
White Bass Gill Net	2021	17	118 (1.4)	12	109 (1.5)	24	113 (2.2)	53	113 (1.1)
	2022	0		10	108 (2.1)	19	105 (1.6)	52	105 (1.4)
	2023	0		2	185 (77.8)	30	104 (0.8)	53	99 (1.1)
	2024	0		0		7	108 (1.9)	13	106 (1.8)
	2025	0		0		8	108 (1.9)	25	106 (1.1)
White Sucker Gill Net	2022	0		0		0		1	115
	2025	0		0		0		1	89
Yellow Perch Gill Net	2021	137	116 (0.8)	34	116 (1.8)	80	111 (0.7)	6	107 (2.8)

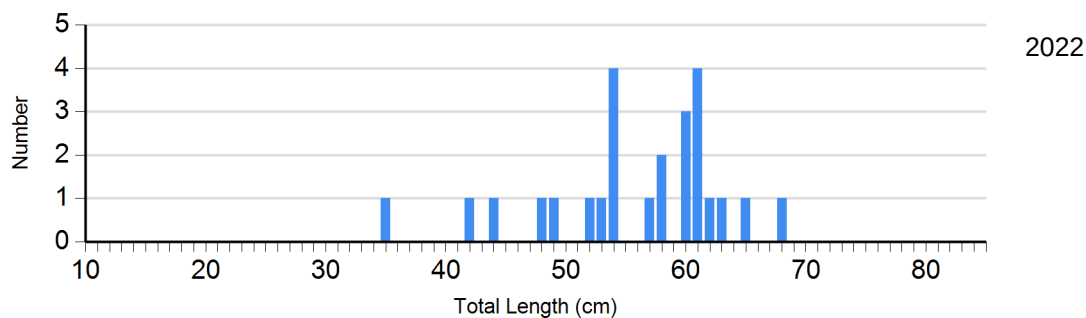
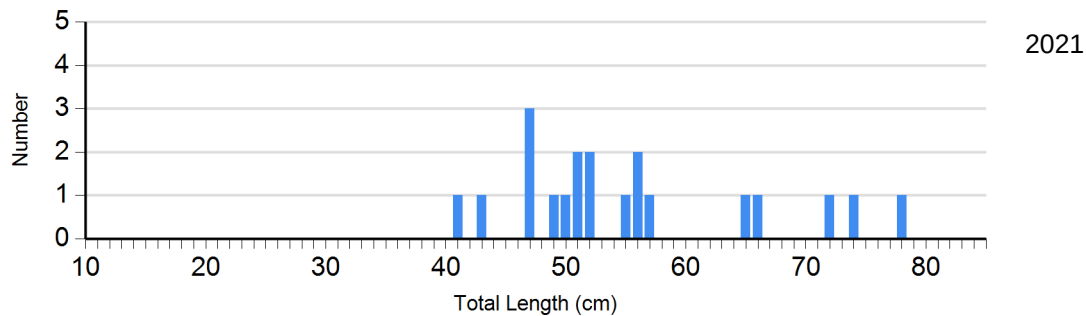
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Yellow Perch Gill Net	2022	100	118 (1.0)	22	119 (2.2)	11	103 (2.8)	4	108 (4.6)
	2023	45	116 (1.4)	23	117 (1.4)	7	110 (2.1)	0	
	2024	54	121 (1.3)	11	119 (2.4)	6	115 (3.1)	3	101 (6.3)
	2025	52	117 (1.1)	17	121 (1.6)	11	115 (2.5)	1	105

Length Frequency Distribution

Length frequency histogram of species sampled by year.

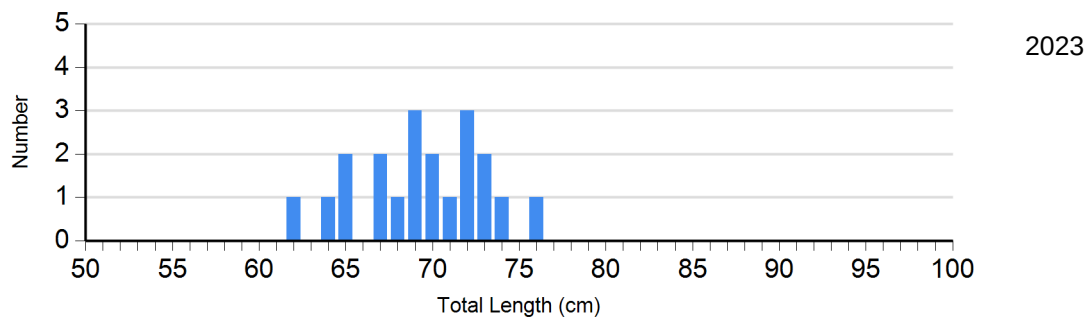
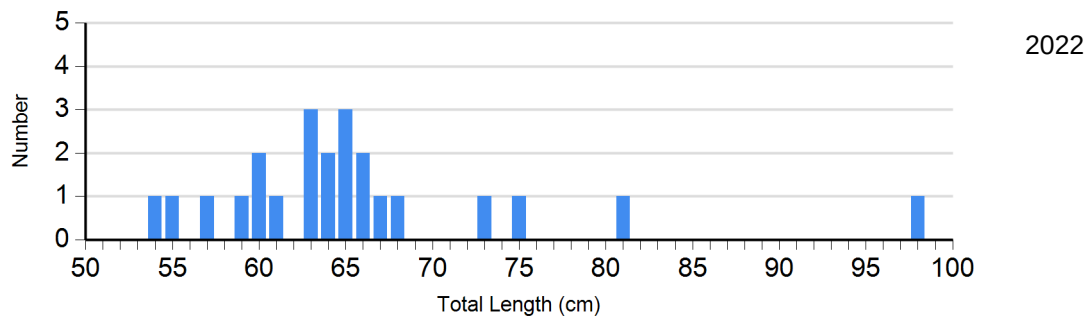
Species: Common Carp

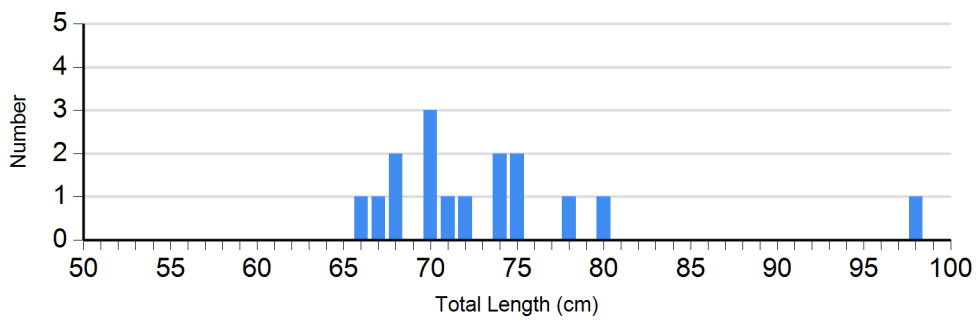
Gear: AFS std gill net



Species: Northern Pike

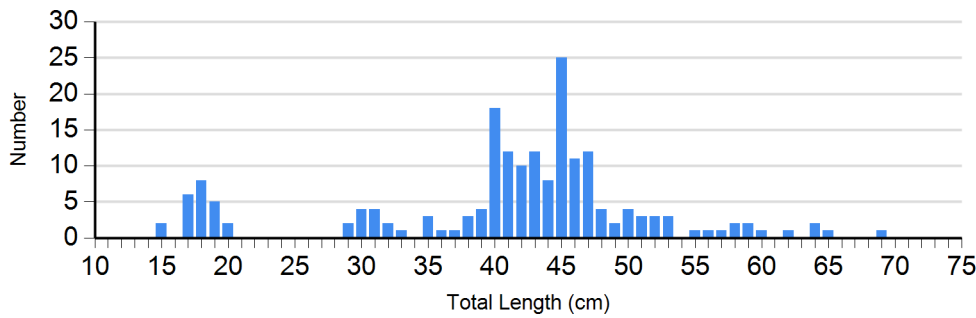
Gear: AFS std gill net



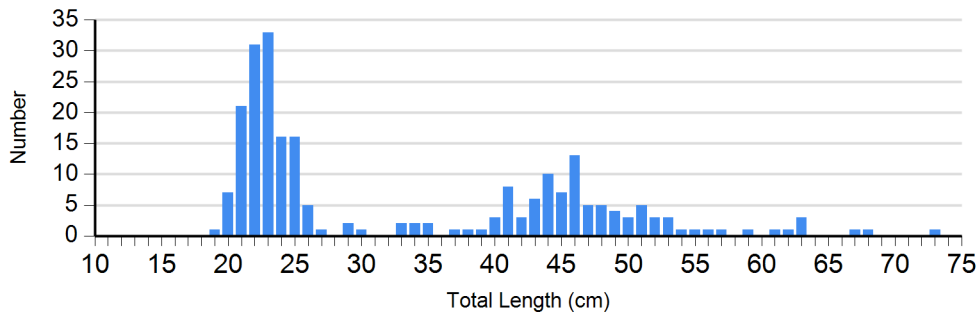


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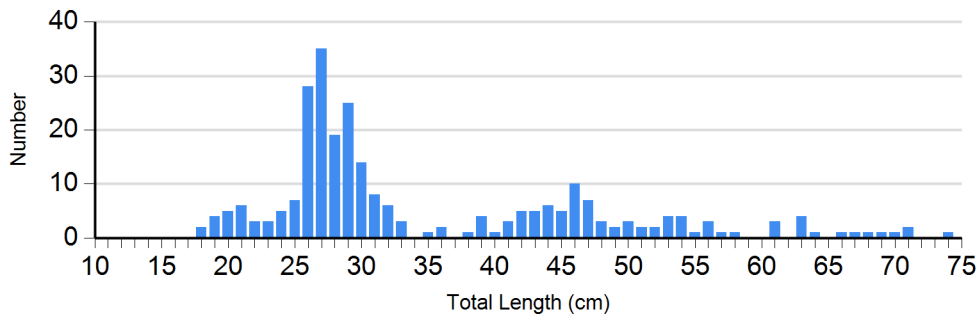
Species: Walleye
Gear: AFS std gill net



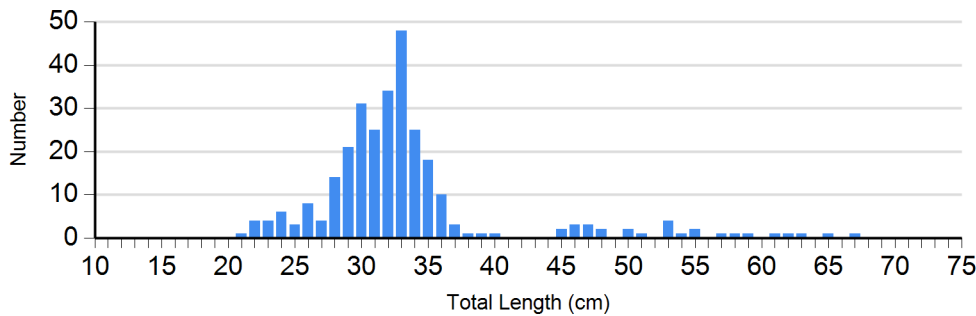
2021



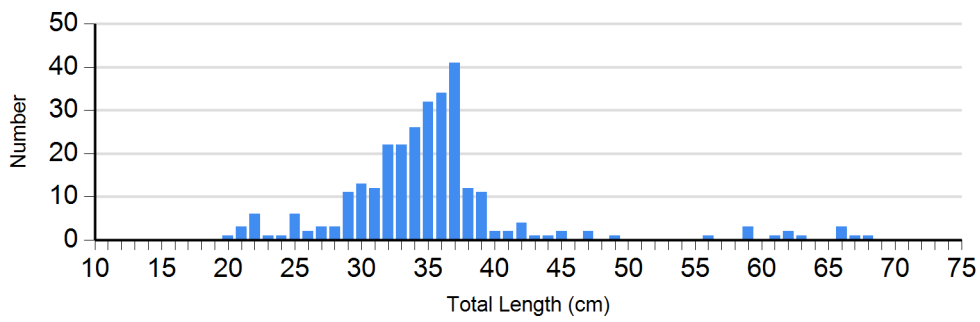
2022



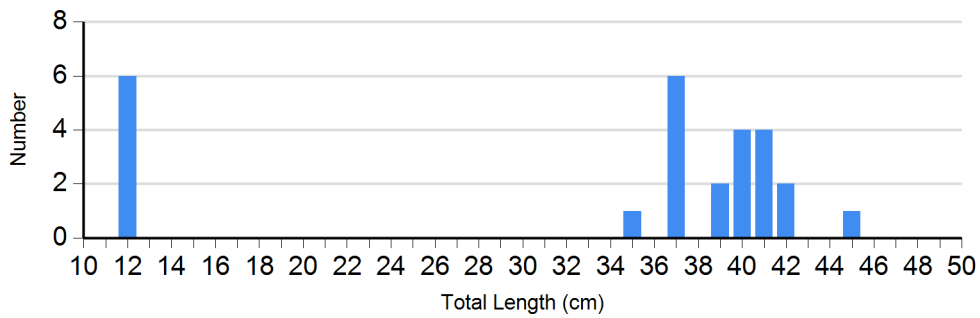
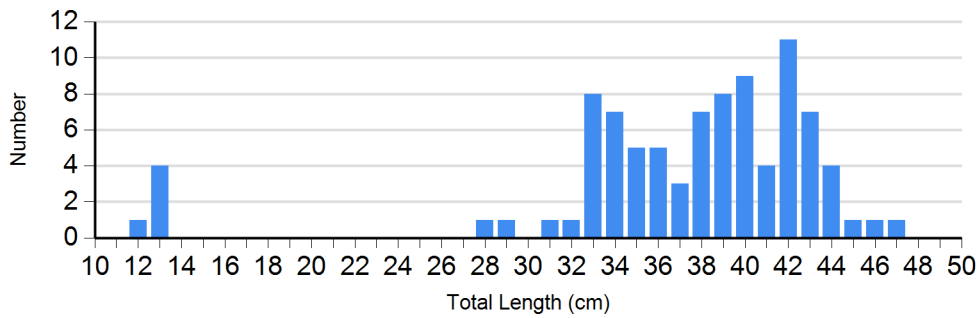
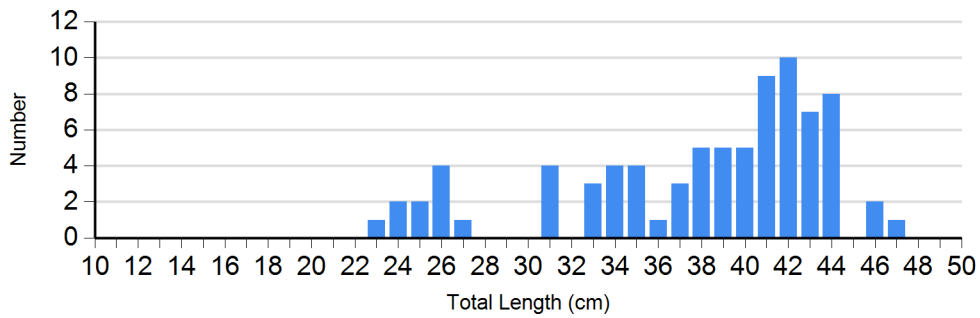
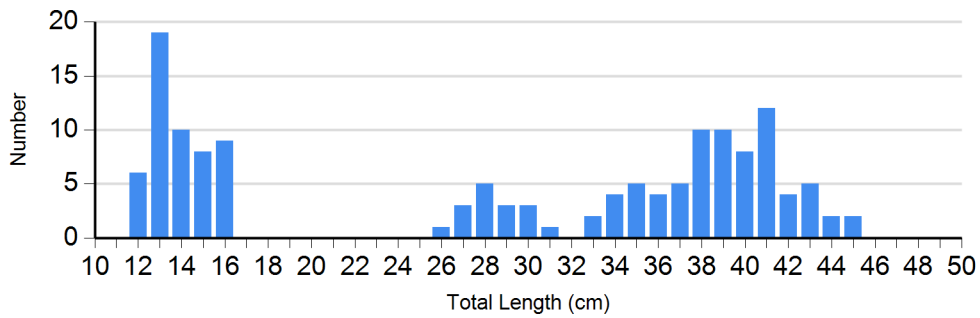
2023

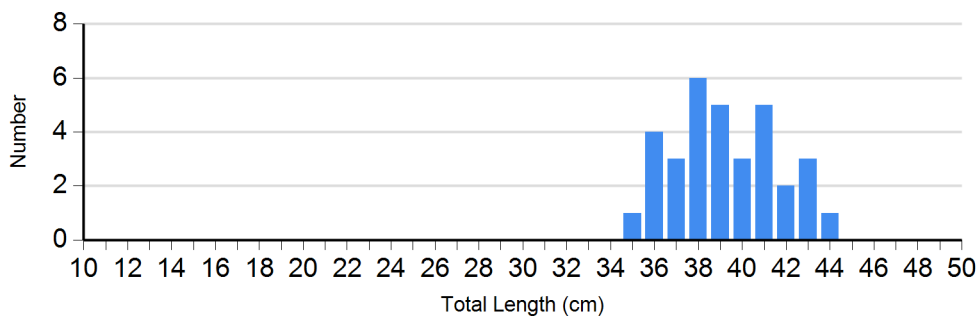


2024

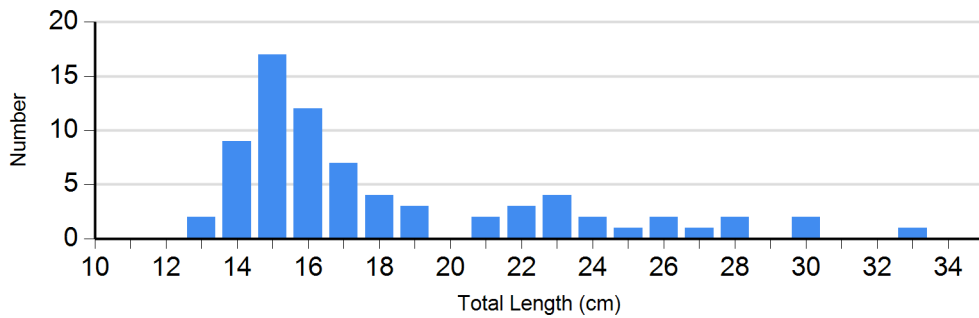
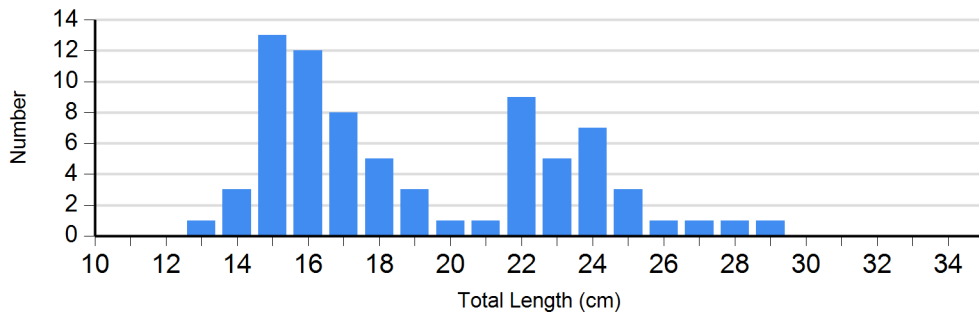
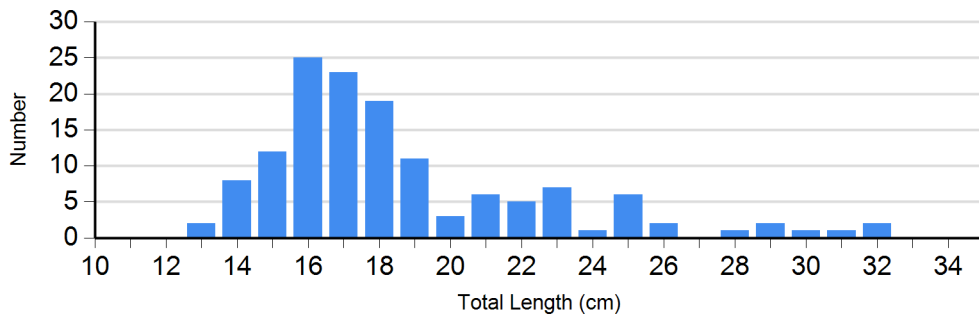
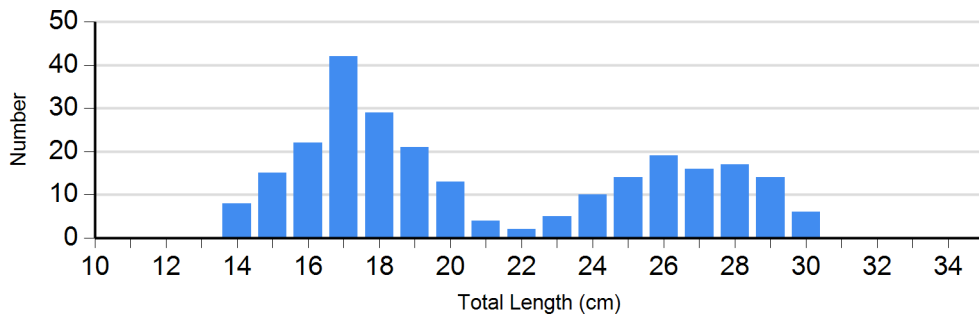


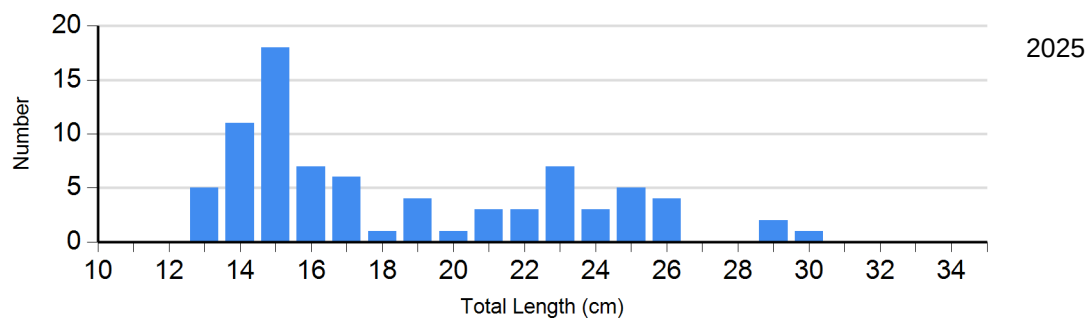
Species: White Bass
Gear: AFS std gill net





Species: Yellow Perch
Gear: AFS std gill net

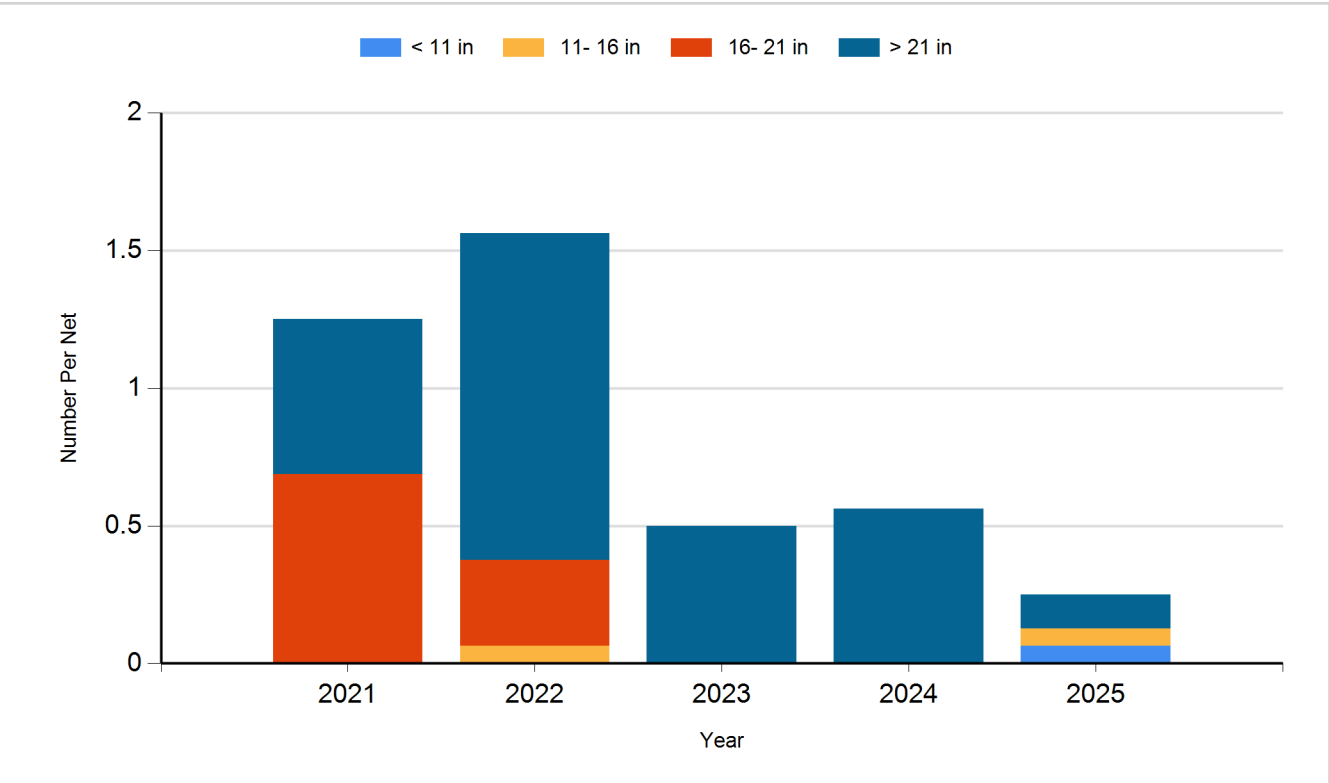




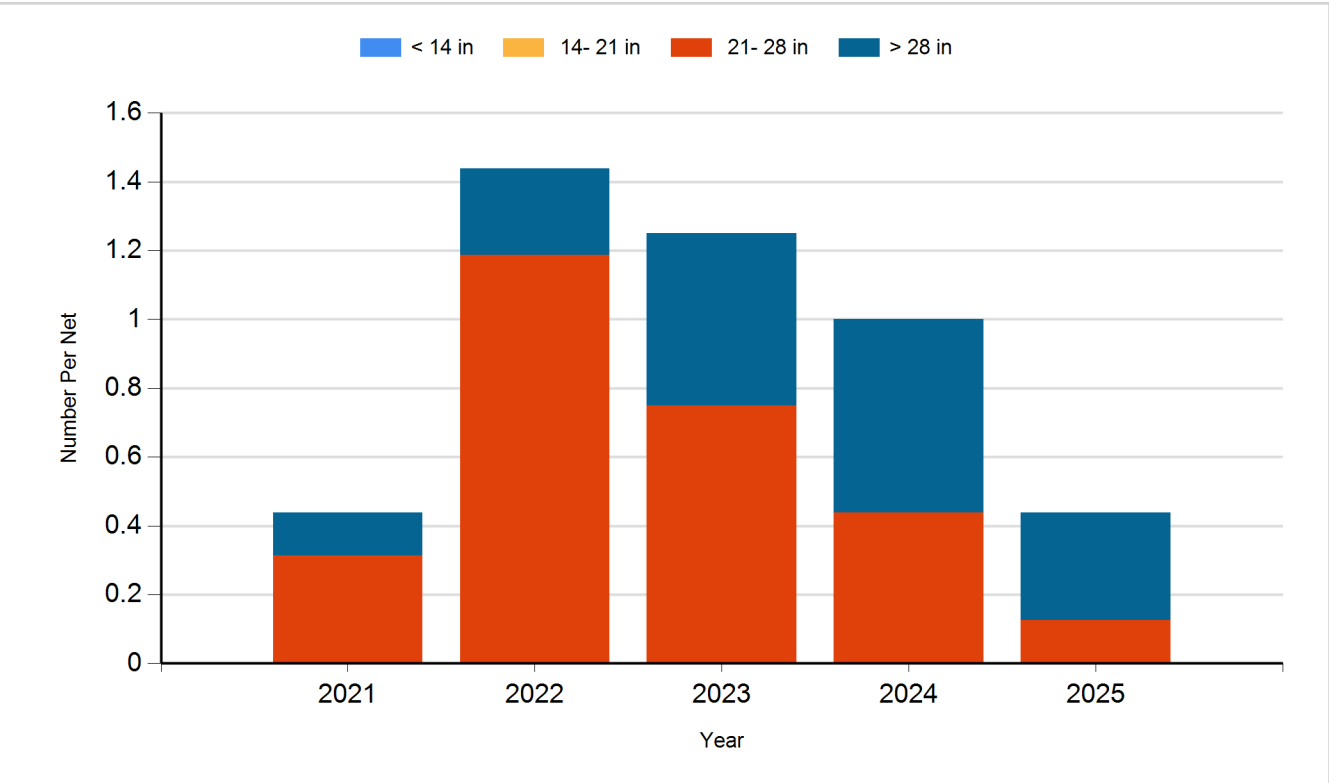
Historic Fish Sizes and Relative Abundance

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

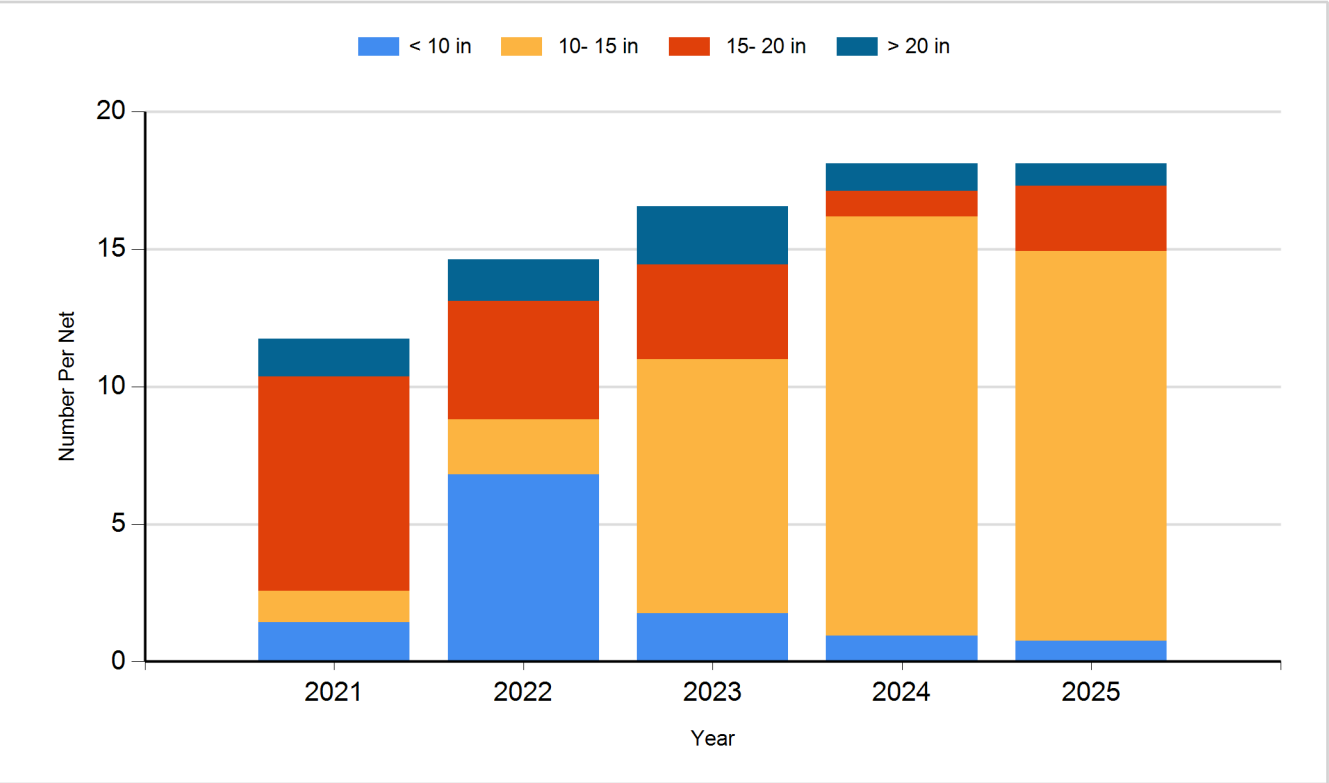
Species: Common Carp
Gear: AFS std gill net



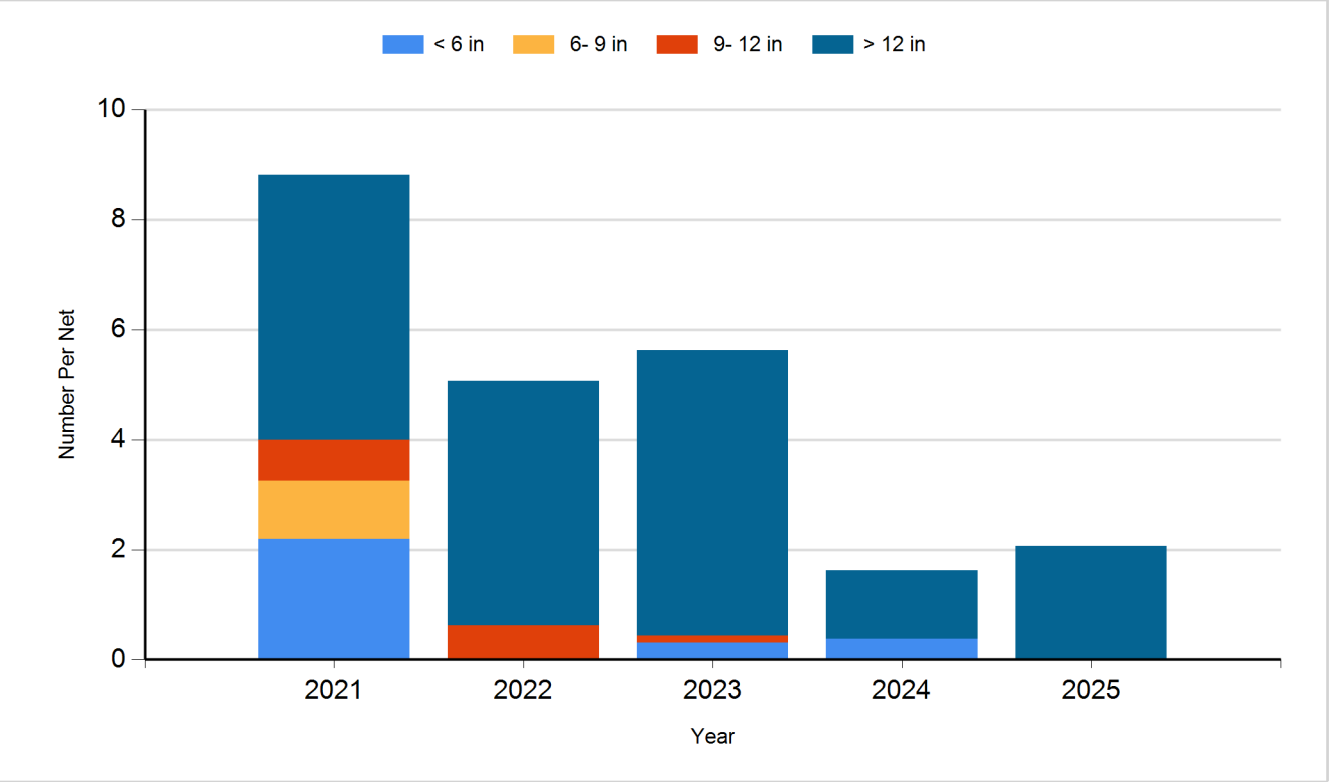
Species: Northern Pike
Gear: AFS std gill net



Species: Walleye
Gear: AFS std gill net



Species: White Bass
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net

