

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Brant, Lake County

LBS-Lake-135-001

2024

Lake Information

Name:	Brant	Maximum Depth:	14 Feet
County:	Lake	Mean Depth:	10 Feet
Legal Description:	T105N-R51W-Sec. 3, 4, 9, 10	OHWM Elevation:	1,598
Surface Area:	1,046 Acres	Outlet Elevation:	1,597

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 02, 2024	10 net-nights
AFS std gill net	Jul 03, 2024	10 net-nights
frame net (std 3/4 in)	Jul 02, 2024	5 net-nights
frame net (std 3/4 in)	Jul 03, 2024	5 net-nights

Common Fish Species Present

Walleye

Yellow Perch

Black Bullhead

Bigmouth Buffalo

White Bass

Smallmouth Bass

White Sucker

Bluegill

Northern Pike

Common Carp

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	9	0.2	0.2	50		50			
	Black Bullhead	6	0.3	0.2	100		100			
	Common Carp	8	0.4	0.3	88		75			
	Northern Pike	9	0.5	0.2	89		56		86	4
	Smallmouth Bass	11	0.5	0.2	44		11		101	4
	Walleye	63	2.0	0.4	67	11	26	11	81	2
	White Bass	35	1.8	0.5	94		77	11	87	2
	White Sucker	47	2.4	0.5	100		96			
	Yellow Perch	191	9.6	1.6	60	5	9	3	101	1
frame net (std 3/4 in)	Bigmouth Buffalo	163	16.3	6.3	99		58	5		
	Black Bullhead	169	16.9	6.0	98		83	4		
	Black Crappie	2	0.2	0.2	100		100		93	3
	Bluegill	5	0.5	0.4	100		100		140	23
	Channel Catfish	1	0.1	0.1	100		0		103	
	Common Carp	2	0.2	0.2	100		100			
	Northern Pike	4	0.4	0.4	100		25		85	2
	Smallmouth Bass	31	2.7	1.6	56	15	22	13	88	2
	Walleye	3	0.3	0.3	33		33		75	1
	White Bass	60	6.0	3.5	100		100		82	1
	White Sucker	13	1.3	0.9	100		85			
	Yellow Bullhead	1	0.1	0.1	100		100			
	Yellow Perch	1	0.1	0.1	100		0		94	

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	Bigmouth Buffalo			0.1									0.10
	Black Bullhead			16.5									16.50
	Black Crappie			9.5									9.50
	Bluegill			0.5									0.50
	Common Carp			0.1									0.10
	Smallmouth Bass			2.7									2.70
	Walleye			1.6									1.60
	White Bass			3.3									3.30
	White Sucker			2.2									2.20
	Yellow Perch			0.2									0.20
AFS std gill net	Bigmouth Buffalo			1.6	1.2	0.4		1.3	0.6	0.9	0.2		0.89
	Black Bullhead			21.0	2.8	2.5		7.7	7.5	3.0	0.3		6.40
	Black Crappie			2.0	0.2	0.0		0.0	0.2	0.1	0.0		0.36
	Bluegill			0.2	0.4	0.0		0.2	0.2	0.0	0.0		0.14
	Channel Catfish			0.0	0.3	0.0		0.2	0.1	0.2	0.0		0.11
	Common Carp			1.2	1.4	2.6		2.9	1.4	0.5	0.4		1.49
	Northern Pike			0.2	0.0	0.3		0.1	0.4	0.3	0.5		0.26
	Shorthead Redhorse			0.1	0.0	0.0		0.0	0.0	0.0	0.0		0.01
	Smallmouth Bass			0.7	4.3	0.4		0.3	0.5	0.0	0.5		0.96
	Walleye			2.7	1.8	2.0		2.6	1.0	1.4	2.0		1.93
	White Bass			4.7	3.9	4.2		5.3	5.6	2.8	1.8		4.04
	White Sucker			7.3	3.4	2.9		0.6	4.3	1.0	2.4		3.13
		Yellow Bullhead			0.0	0.0	0.0		0.0	0.0	0.1	0.0	
	Yellow Perch			6.7	4.0	4.6		4.3	1.5	2.3	9.6		4.71
fall night EF-WAE*	Walleye	30.5											30.50
frame net (std 3/4 in)	Bigmouth Buffalo	0.0	2.6		0.6	2.8		1.1	0.2	4.4	16.3		3.50
	Black Bullhead	41.7	306.8		13.3	9.7		11.6	75.6	11.1	16.9		60.84
	Black Crappie	1.3	4.7		8.5	2.9		5.5	0.5	1.5	0.2		3.14
	Bluegill	0.3	1.6		1.2	2.4		2.0	1.5	0.7	0.5		1.28
	Bluegill X Gr. Sunfish Hybrid	0.0	0.0		0.1	0.0		0.0	0.0	0.0	0.0		0.01
	Channel Catfish	0.1	0.0		0.1	0.0		0.0	0.0	0.0	0.1		0.04
	Common Carp	0.2	1.3		2.3	4.2		0.5	0.2	0.9	0.2		1.23
	Green Sunfish	0.1	0.0		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)	Northern Pike	1.4	1.6		1.3	0.9		3.6	0.8	0.6	0.4	1.33
	Smallmouth Bass	1.1	17.0		8.5	2.5		10.0	6.8	3.4	2.7	6.50
	Sunfish Hybrid	0.0	0.2		0.0	0.0		0.4	0.0	0.0	0.0	0.08
	Walleye	0.0	1.4		0.7	0.1		0.9	0.0	0.4	0.3	0.48
	White Bass	1.3	3.9		0.9	0.5		1.2	3.5	4.4	6.0	2.71
	White Sucker	4.3	1.6		4.2	5.1		14.5	8.2	3.3	1.3	5.31
	Yellow Bullhead	0.1	0.0		0.1	0.0		0.4	0.3	0.0	0.1	0.13
	Yellow Perch	0.3	1.4		0.8	0.6		0.0	0.0	0.0	0.1	0.40
std exp gill net	Bigmouth Buffalo	0.0	0.2									0.10
	Black Bullhead	21.2	34.2									27.70
	Black Crappie	0.0	1.4									0.70
	Bluegill	0.2	0.4									0.30
	Channel Catfish	0.0	1.6									0.80
	Common Carp	0.6	2.2									1.40
	Northern Pike	0.4	0.2									0.30
	Smallmouth Bass	1.6	2.8									2.20
	Spottail Shiner	0.0	0.0									0.00
	Walleye	3.0	3.8									3.40
	White Bass	1.2	3.4									2.30
	White Sucker	5.2	2.6									3.90
	Yellow Perch	4.6	18.8									11.70

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	Bigmouth Buffalo	PSD			0									
		PSD-P			0									
	Black Bullhead	PSD			66									
		PSD-P			42									
	Bluegill	PSD			40									
		PSD-P			0									
		Wr			109									
		Common Carp	PSD			100								
			PSD-P			0								
	Smallmouth Bass	PSD			19									
		PSD-P			4									
		Wr			89									
	Walleye	PSD			6									
		PSD-P			0									
		Wr			78									
	White Bass	PSD			97									
		PSD-P			82									
		Wr			86									
	White Sucker	PSD			100									
		PSD-P			95									
Yellow Perch	PSD			100										
	PSD-P			100										
	Wr			84										
AFS std gill net	Bigmouth Buffalo	PSD			25	73	50		77	83	100	50		
		PSD-P			19	18	25		0	17	29	50		
	Black Bullhead	PSD			75	84	96		95	87	100	100		
		PSD-P			22	36	24		29	28	66	100		
		Wr								94				
	Bluegill	PSD			50	100			100	100				
		PSD-P			0	100			50	50				
		Wr			92	109			119	105				
	Common Carp	PSD			100	100	88		48	86	90	88		
		PSD-P			17	38	54		45	57	80	75		

Gear	Species	Index	Year										
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
AFS std gill net	Northern Pike	PSD			100			33		0	100	100	89
		PSD-P			100			0		0	50	40	56
		Wr			109			81		83	87	84	86
	Smallmouth Bass	PSD			57	38	50			33	80		44
		PSD-P			43	15	0			0	20		11
		Wr			92	95	90			86	87		101
	Walleye	PSD			59	44	50			8	60	100	67
		PSD-P			11	25	20			8	10	30	26
		Wr			83	86	85			86	79	79	81
	White Bass	PSD			79	100	83			100	98	98	94
		PSD-P			43	89	81			83	98	91	77
		Wr			97	93	87			91	88	88	87
	White Sucker	PSD			100	97	97			100	100	100	100
		PSD-P			97	94	90			100	100	100	96
	Yellow Perch	PSD			60	97	93			98	100	17	60
PSD-P				45	44	83			67	100	15	9	
Wr				99	99	105			109	99	95	101	
frame net (std 3/4 in)	Bigmouth Buffalo	PSD		73		83	96		73	100	100	99	
		PSD-P		62		17	39		27	100	50	58	
	Black Bullhead	PSD	98	3		89	96		100	99	99	98	
		PSD-P	42	2		63	73		58	65	72	83	
	Bluegill	PSD	50	75		92	100		100	100	100	100	
		PSD-P	25	38		92	63		60	100	100	100	
		Wr	110	113		108	117		124	120	112	140	
	Common Carp	PSD	100	8		91	90		100	100	100	100	
		PSD-P	100	8		48	40		100	50	100	100	
	Northern Pike	PSD	100	100		92	11		39	63	100	100	
		PSD-P	18	31		31	0		11	50	33	25	
		Wr	76	82		84	81		73	95	79	85	
	Smallmouth Bass	PSD	31	8		16	52		32	60	65	56	
		PSD-P	8	2		5	8		4	10	38	22	
		Wr	98	101		86	88		91	91	90	88	
	Walleye	PSD	0	43		29	0		11		25	33	
		PSD-P	0	29		29	0		0		25	33	
		Wr		82		85	88		86		84	75	
	White Bass	PSD	100	97		100	100		100	100	100	100	
		PSD-P	100	59		100	100		83	97	98	100	

Gear	Species	Index	Year										
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
frame net (std 3/4 in)	White Bass	Wr	85	94		83	81		89	89	85	82	
	White Sucker	PSD	100	100		100	100		100	100	100	100	
		PSD-P	98	100		93	94		100	100	97	85	
	Yellow Perch	PSD	33	79		100	100						100
		PSD-P	33	43		75	83						0
		Wr	94	100		89	105						94
std exp gill net	Bigmouth Buffalo	PSD		0									
		PSD-P		0									
	Black Bullhead	PSD	100	33									
		PSD-P	16	15									
	Bluegill	PSD	100	50									
		PSD-P	0	50									
		Wr	107	127									
	Common Carp	PSD	100	9									
		PSD-P	100	0									
	Northern Pike	PSD	100	100									
		PSD-P	100	0									
		Wr	79	129									
	Smallmouth Bass	PSD	50	14									
		PSD-P	38	0									
		Wr	100	91									
	Walleye	PSD	67	0									
		PSD-P	40	0									
		Wr	85	85									
	White Bass	PSD	100	100									
		PSD-P	100	24									
		Wr	84	98									
	White Sucker	PSD	100	100									
		PSD-P	88	92									
	Yellow Perch	PSD	26	73									
		PSD-P	4	24									
		Wr	101	105									

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+
2024	54	189 (22)	321 (12)	464 (9)	441 (1)	477 (4)	520 (1)	560 (1)	245 (1)		658 (2)
2023	33	233 (6)	381 (1)		460 (12)	469 (6)	556 (3)	612 (2)	605 (1)	673 (1)	684 (1)
2022	13	234 (3)		379 (7)		427 (2)		572 (1)			
2021	26		276 (16)	327 (8)							646 (2)
2019	29	212 (10)	324 (7)	384 (4)	446 (4)		457 (1)				591 (3)
2018	17	270 (8)	339 (2)	383 (1)	454 (2)	443 (1)					576 (3)
2017	30	247 (11)	384 (4)	437 (10)	482 (3)			551 (2)			
2016	30	255 (15)	297 (15)								
2015	32	203 (17)	351 (6)			469 (1)	540 (5)	588 (2)	471 (1)		

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2024	183	163 (72)	228 (104)	335 (1)			323 (2)	323 (2)	323 (2)		
2021	43	171 (1)	223 (12)	271 (20)		308 (9)			315 (1)		
2019	46	151 (3)	223 (3)	274 (25)	285 (7)	304 (7)	329 (1)				
2018	36	154 (1)	243 (26)	280 (6)	294 (2)	323 (1)					
2017	67	165 (27)	248 (16)	272 (23)				335 (1)			
2016	94	179 (28)	243 (64)	293 (2)							
2015	23	165 (17)	236 (5)	296 (1)							

Fish Condition

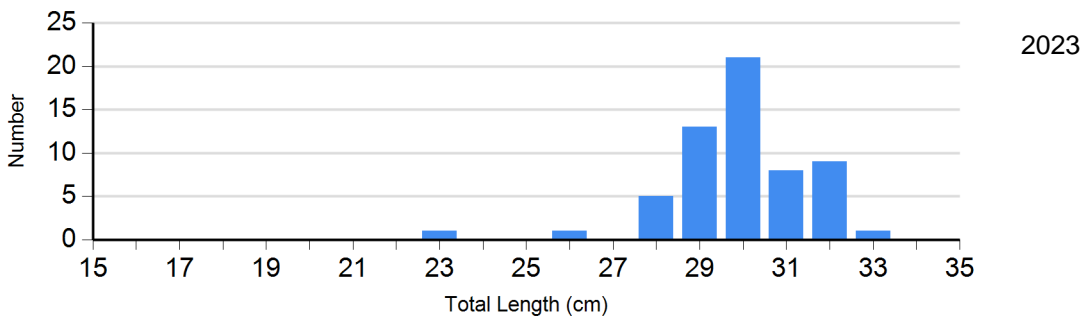
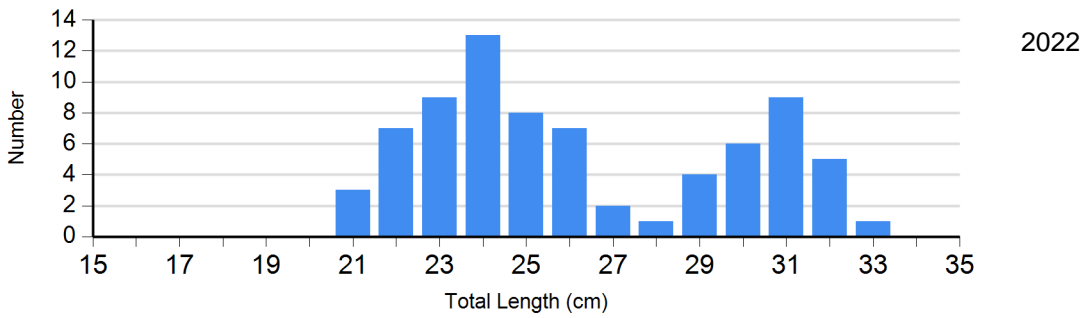
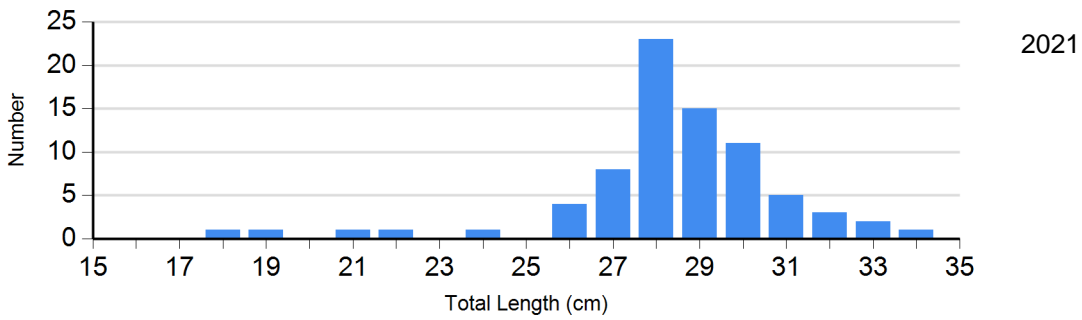
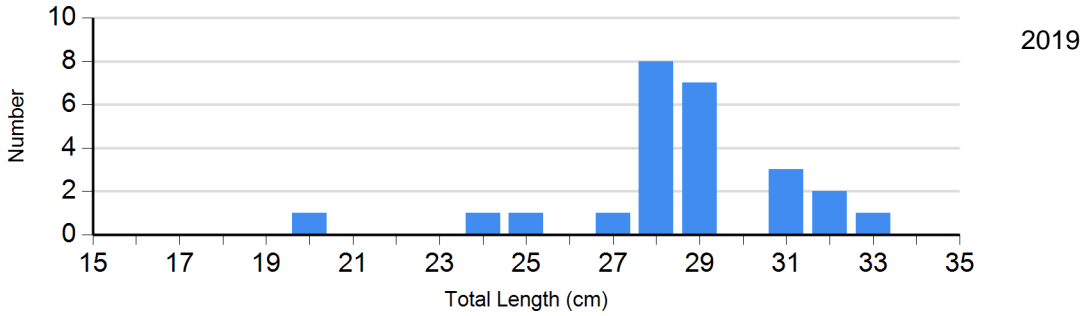
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2022	10	97	44	96 (1.0)	21	85 (2.7)	0	
Bluegill Frame Net	2021	0		8	128 (6.2)	12	121 (2.6)	0	
	2022	0		0		12	121 (1.8)	3	115 (8.4)
	2023	0		0		3	117 (8.5)	4	106 (8.7)
	2024	0		0		2	168 (42.4)	3	121 (5.1)
Northern Pike Gill Net	2021	1	83	0		0		0	
	2022	0		2	76 (2.6)	1	87	1	111
	2023	0		3	85 (1.6)	1	81	1	83
	2024	1	83	3	87 (6.4)	5	87 (3.9)	0	
Walleye Gill Net	2021	24	87 (1.2)	0		1	85	1	66
	2022	4	74 (1.6)	5	80 (1.7)	1	95	0	
	2023	0		19	78 (1.1)	5	82 (2.0)	3	79 (1.8)
	2024	13	76 (1.4)	16	84 (1.1)	7	79 (3.0)	3	97 (1.5)
White Bass Gill Net	2021	0		9	94 (1.5)	41	91 (1.3)	3	83 (6.8)
	2022	1	96	0		45	89 (0.5)	10	82 (3.9)
	2023	1	89	4	89 (1.5)	36	88 (0.8)	14	85 (1.4)
	2024	2	113 (5.5)	6	88 (2.0)	21	86 (1.2)	6	80 (1.6)
Yellow Perch Gill Net	2021	1	100	13	109 (3.6)	21	112 (1.8)	8	104 (2.8)
	2022	0		0		7	103 (2.2)	8	94 (1.5)
	2023	38	96 (1.5)	1	92	3	95 (4.6)	4	90 (3.8)
	2024	76	112 (1.6)	98	96 (0.8)	8	96	9	77 (6.3)

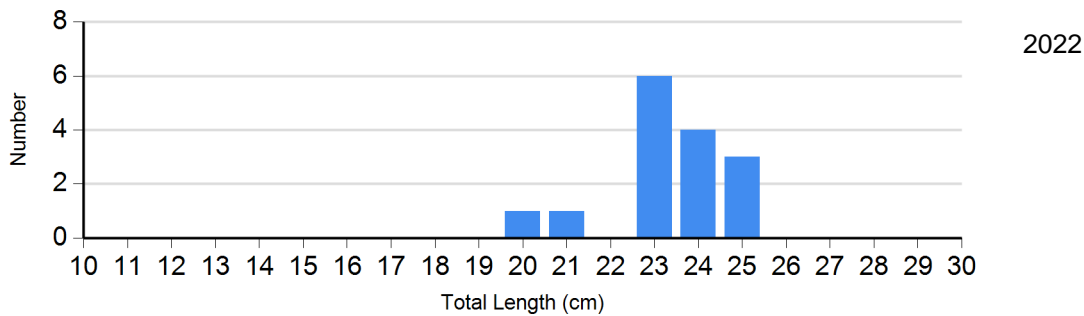
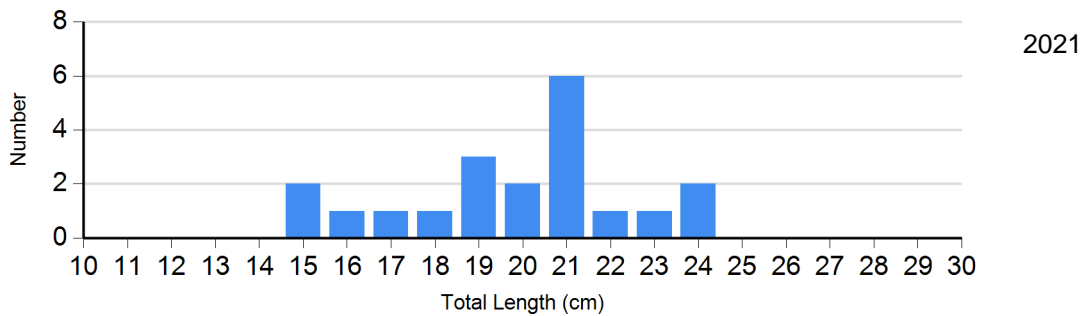
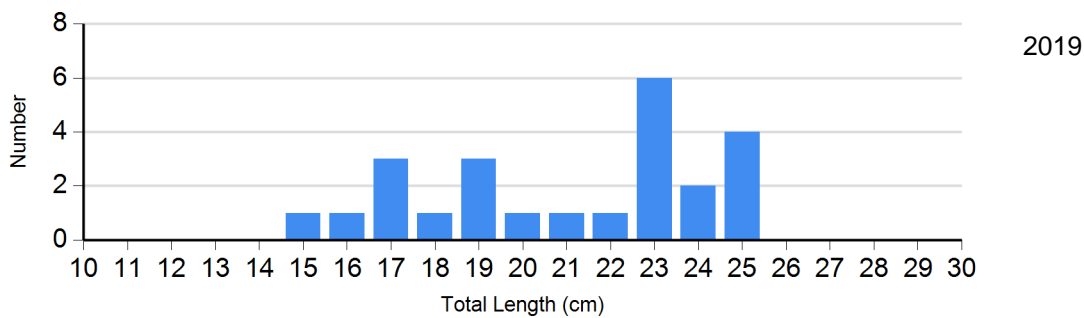
Length Frequency Distribution

Length frequency histogram of species sampled by year.

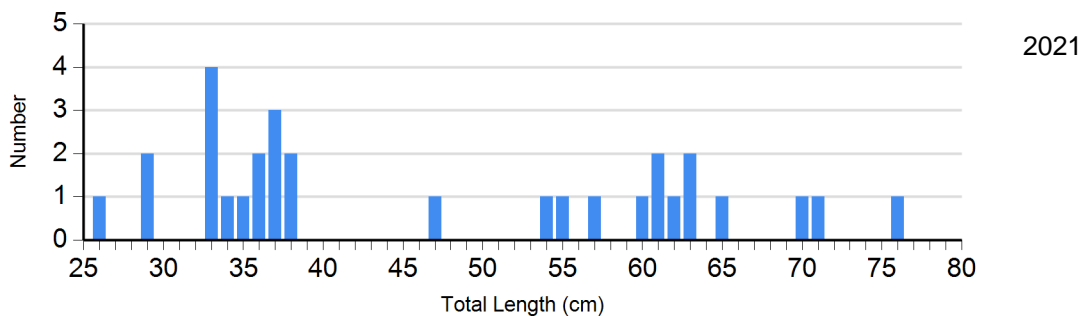
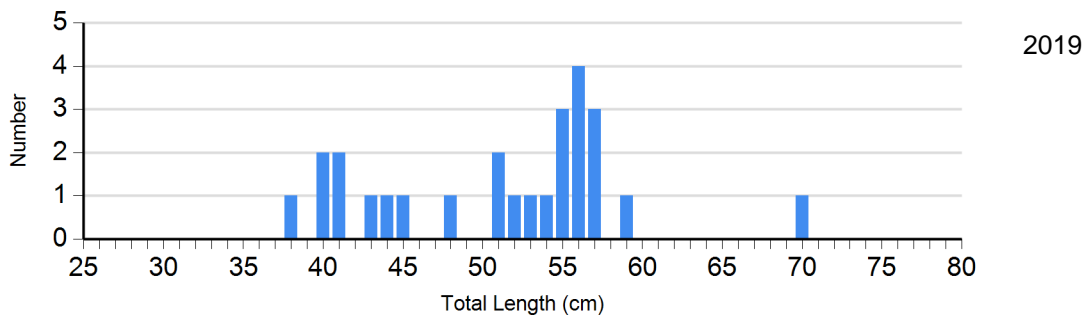
Species: Black Bullhead
Gear: AFS std gill net

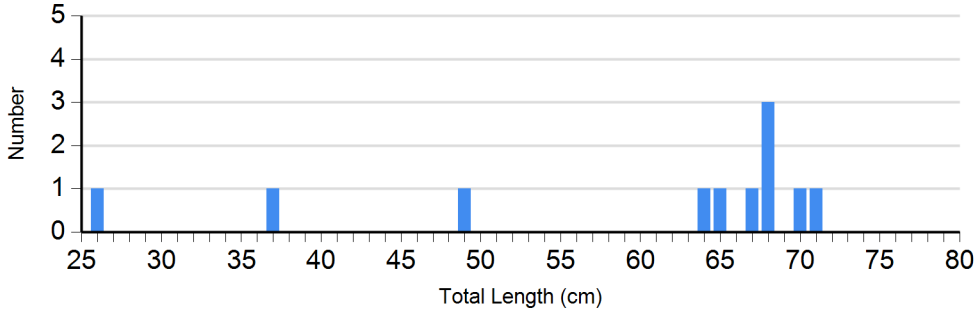
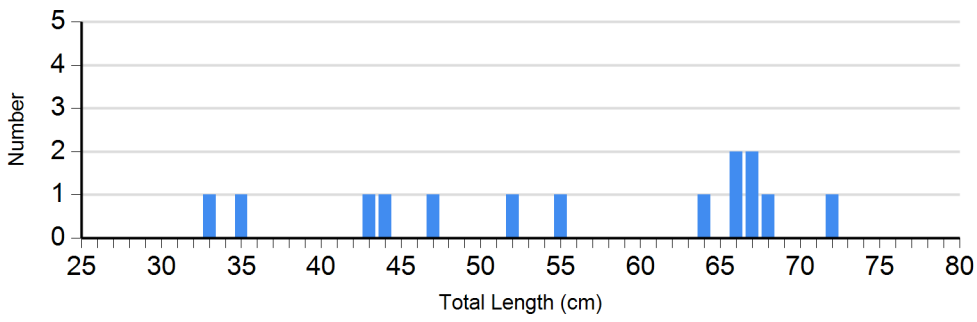


Species: Bluegill
 Gear: frame net (std 3/4 in)

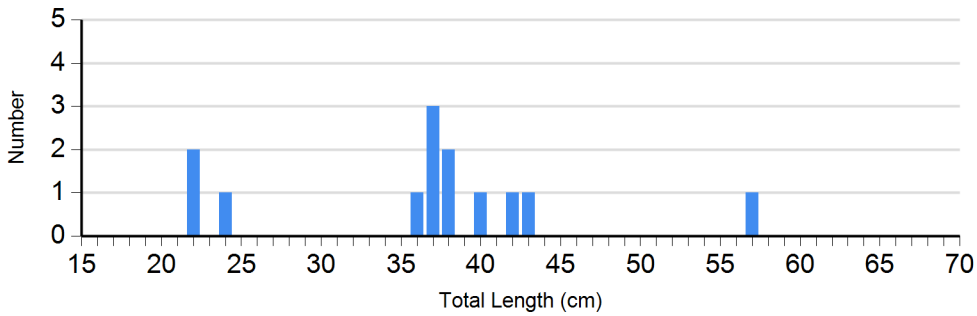
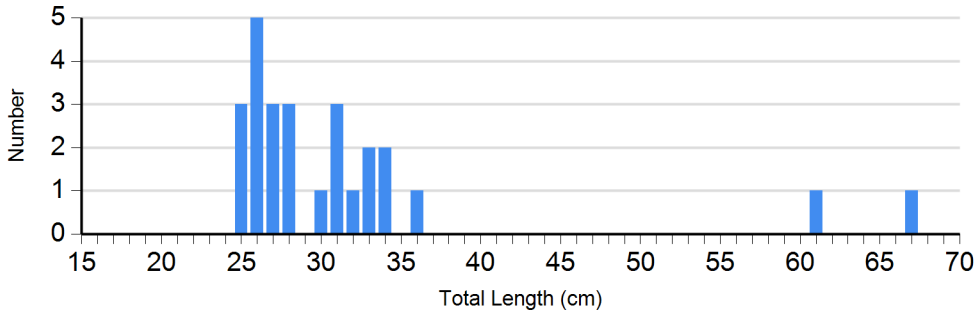
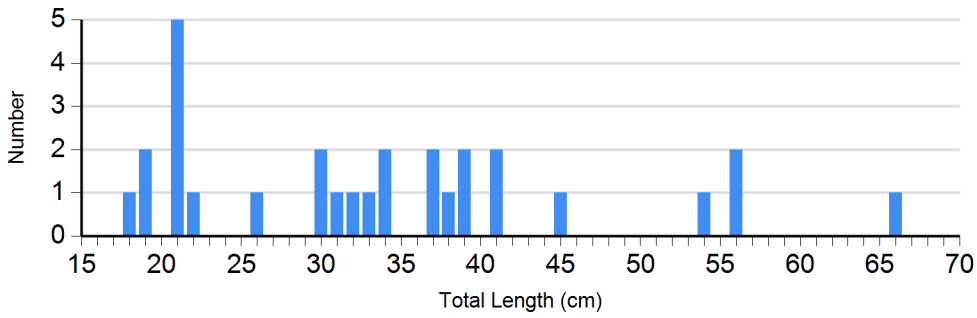


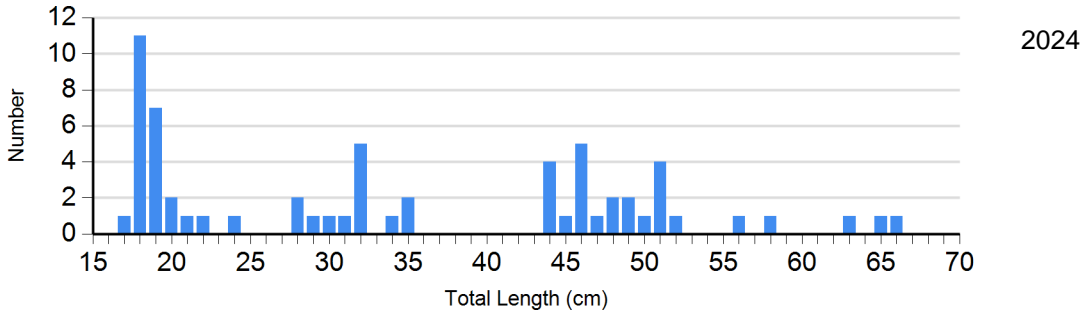
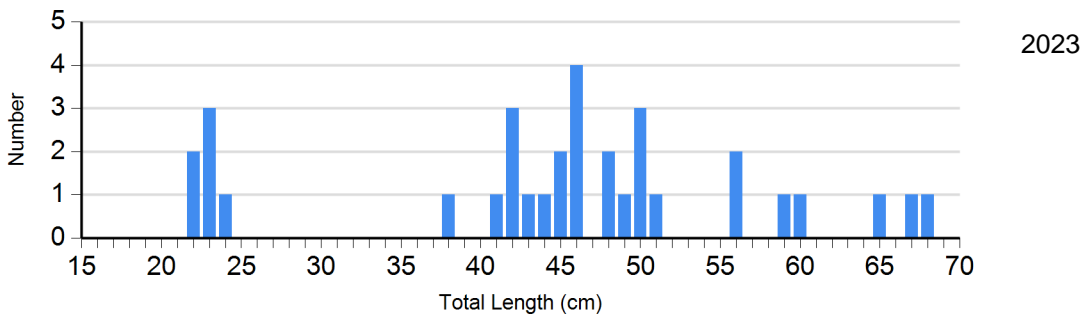
Species: Common Carp
 Gear: AFS std gill net



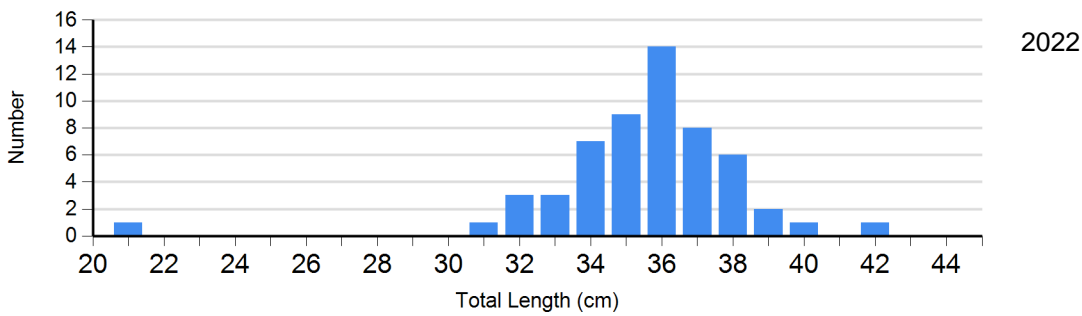
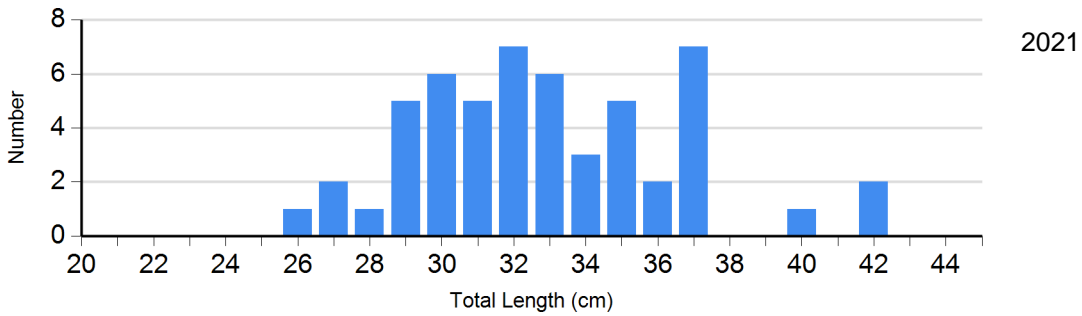
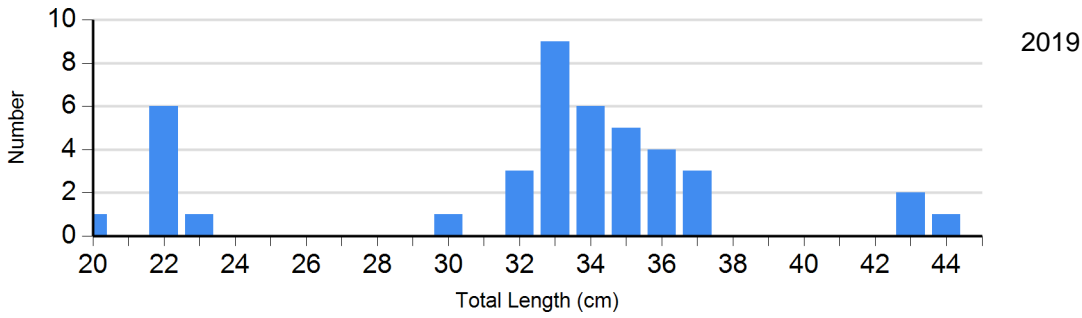


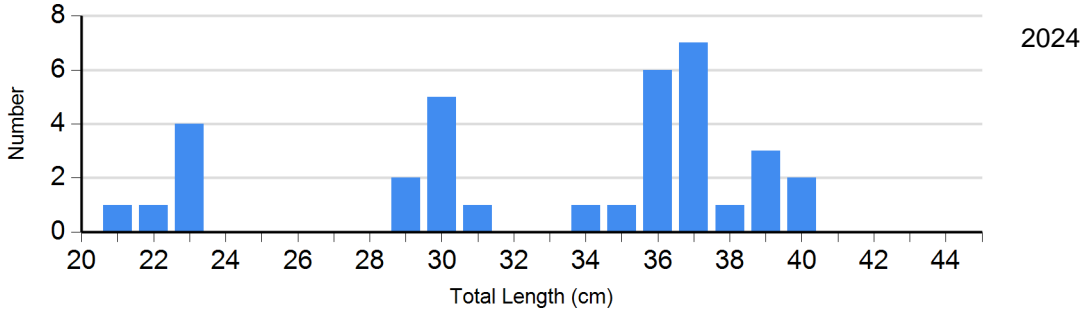
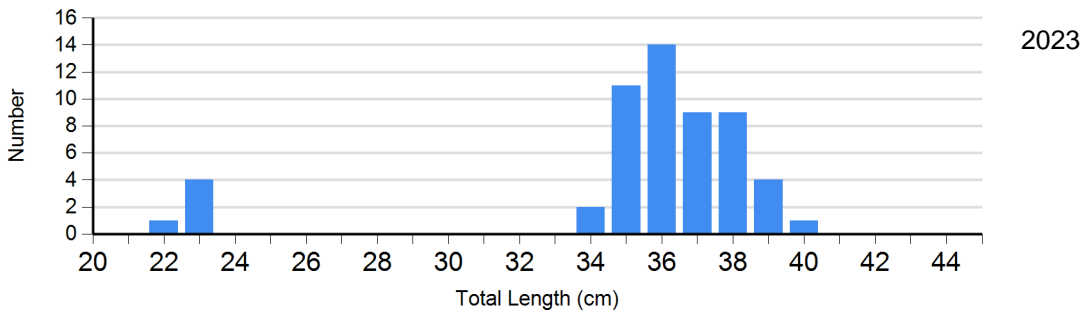
Species: Walleye
Gear: AFS std gill net



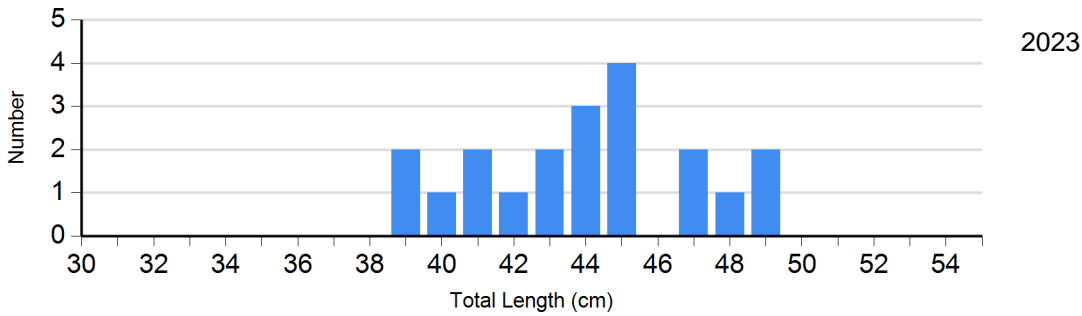
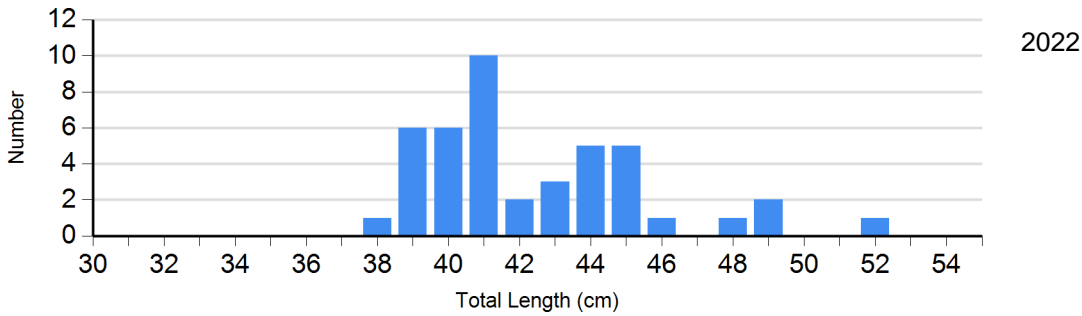
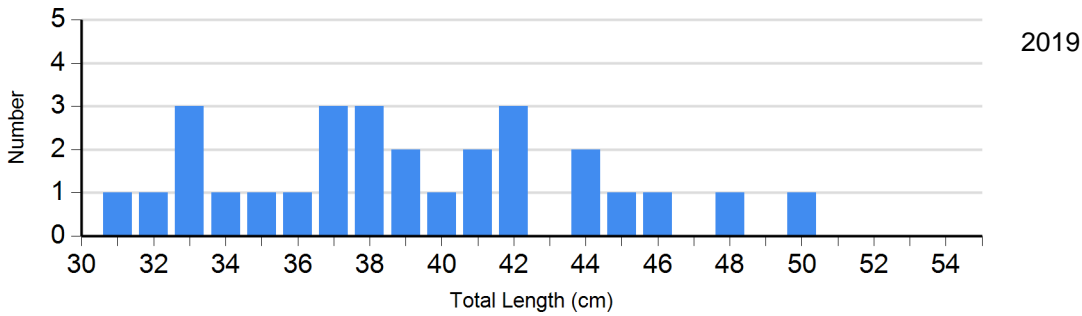


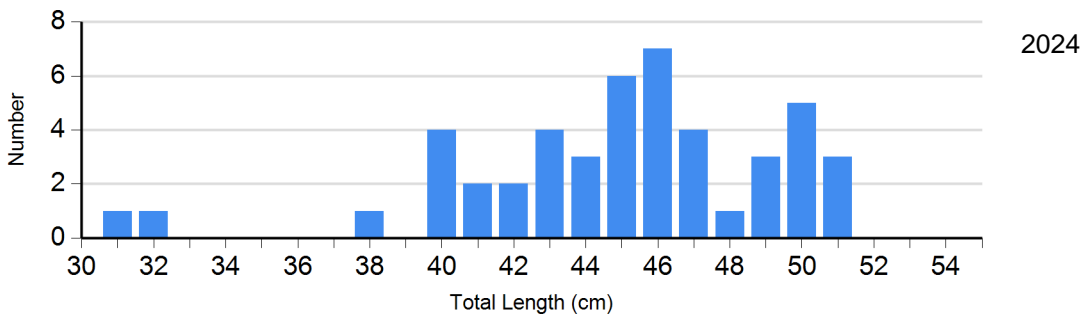
Species: White Bass
 Gear: AFS std gill net



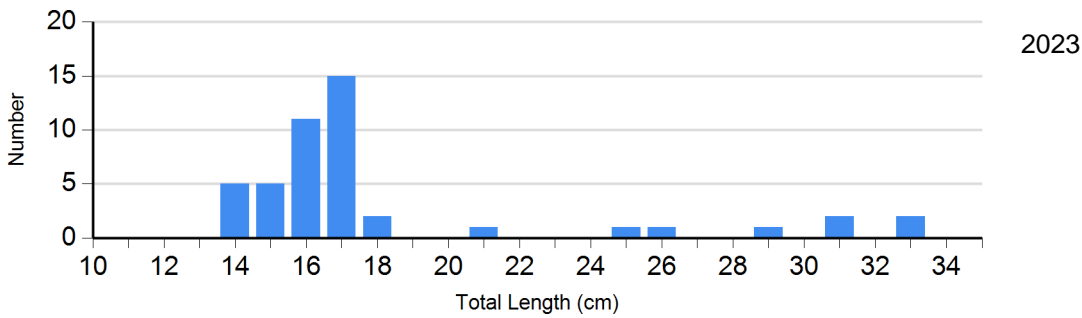
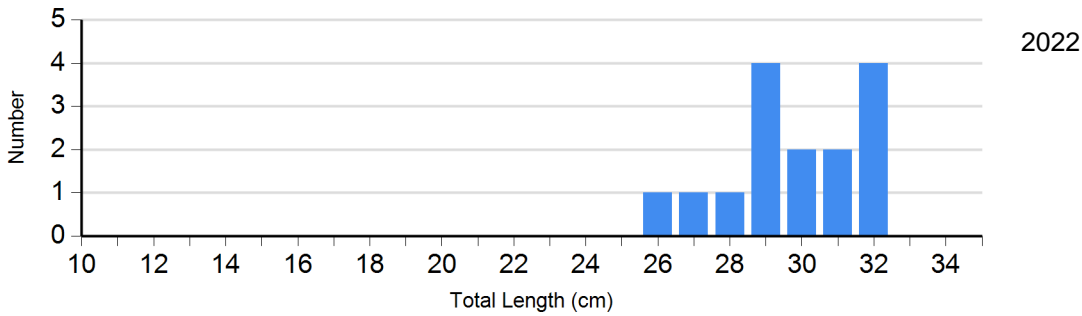
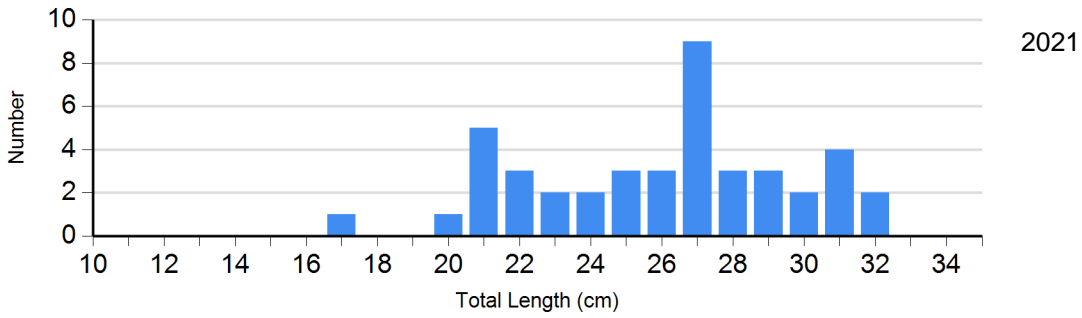
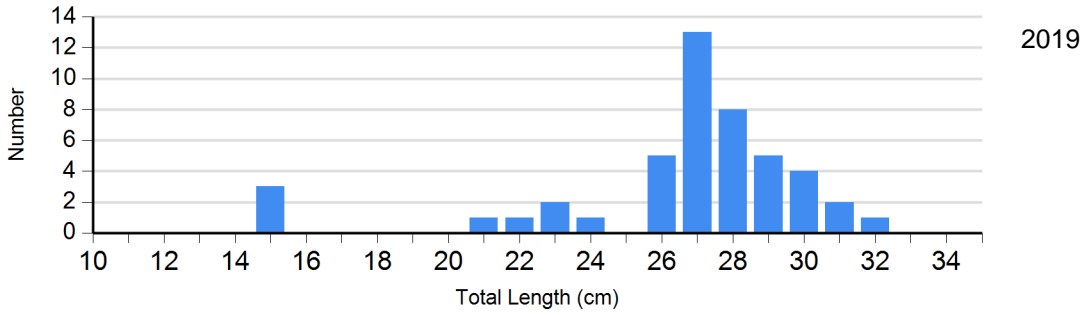


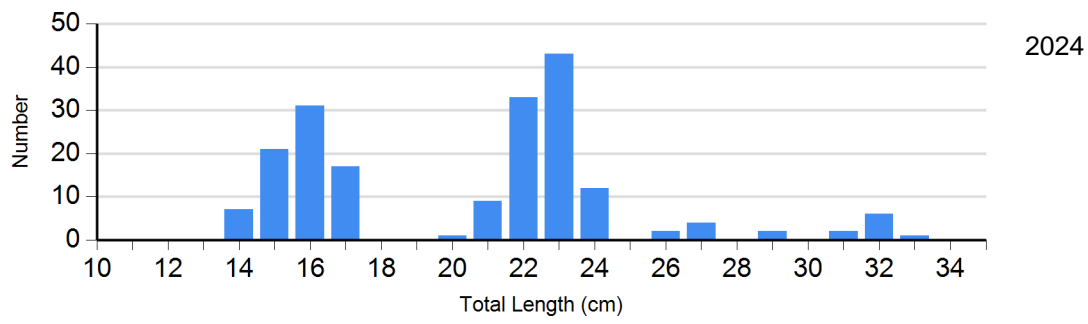
Species: White Sucker
 Gear: AFS std gill net





Species: Yellow Perch
Gear: AFS std gill net

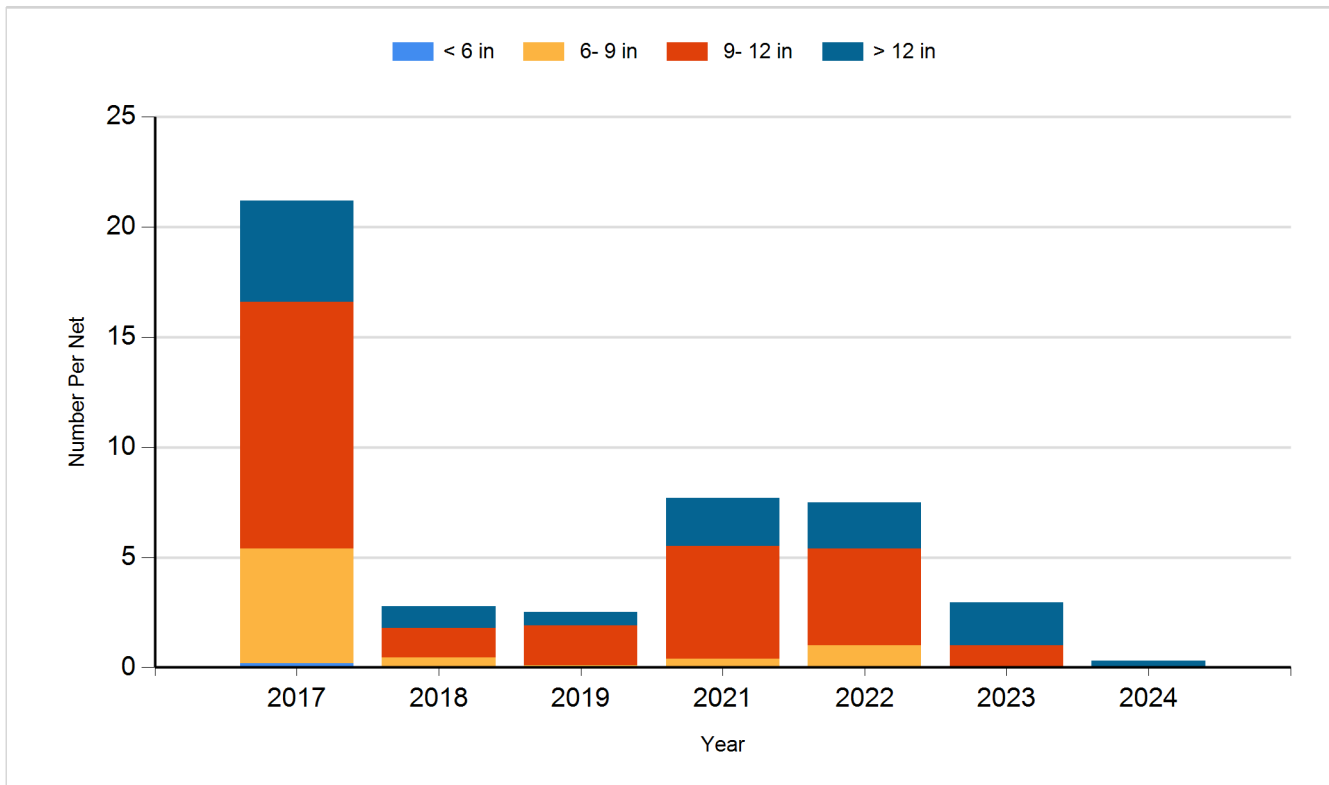




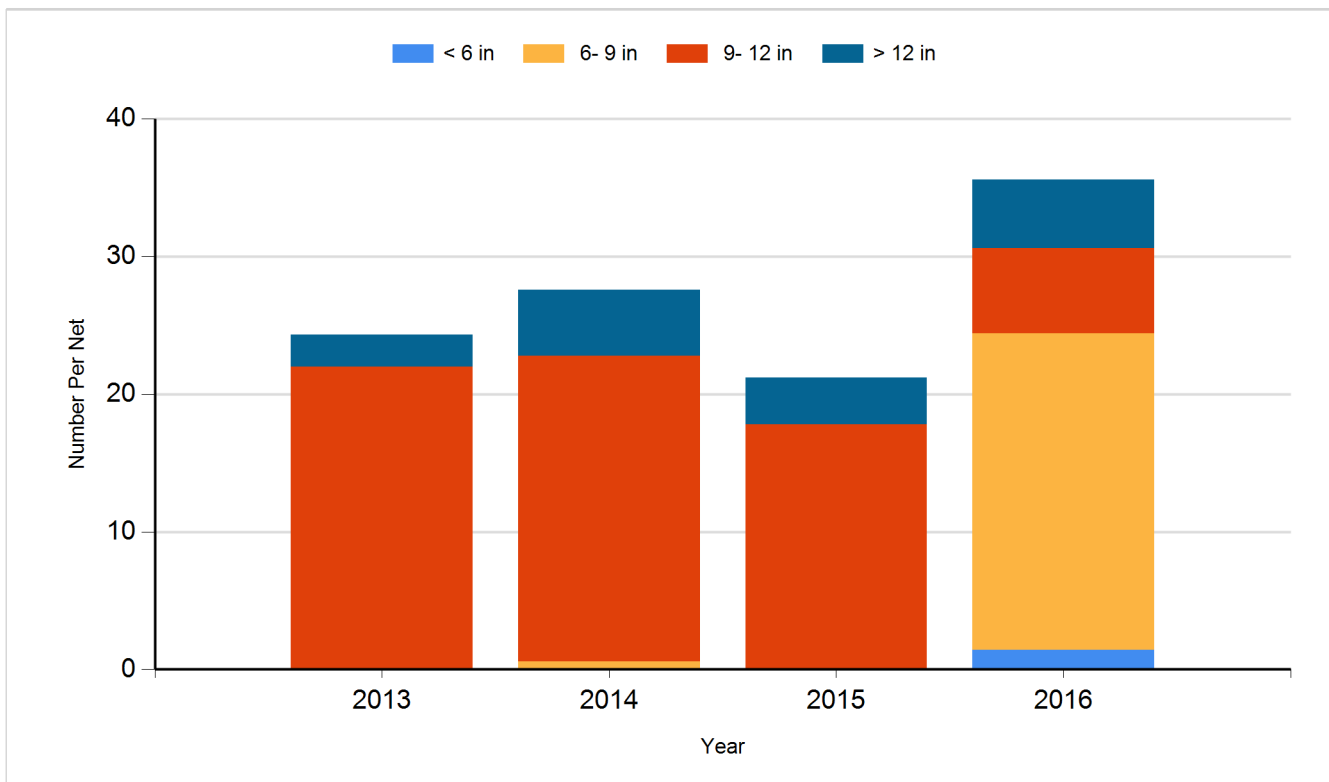
Historic Fish Sizes and Relative Abundance

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

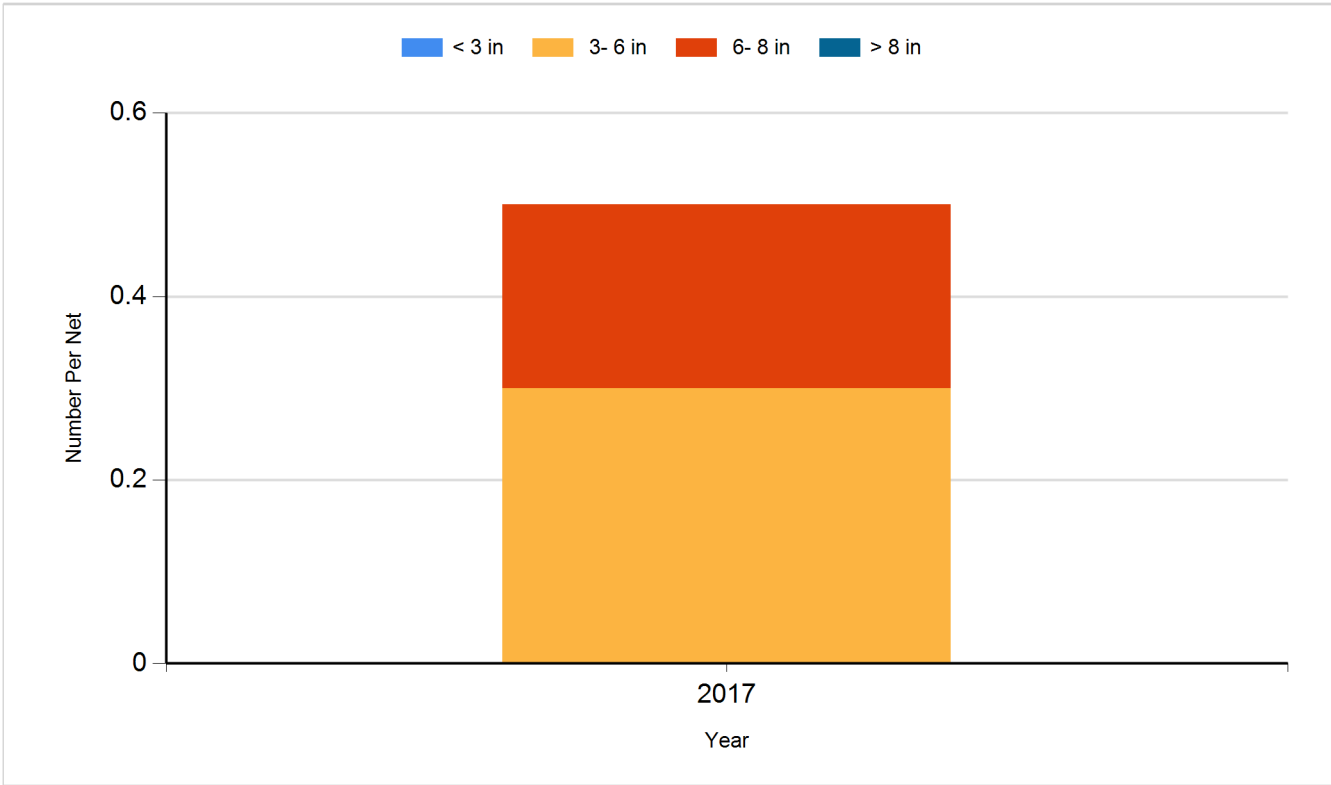
Species: Black Bullhead
Gear: AFS std gill net



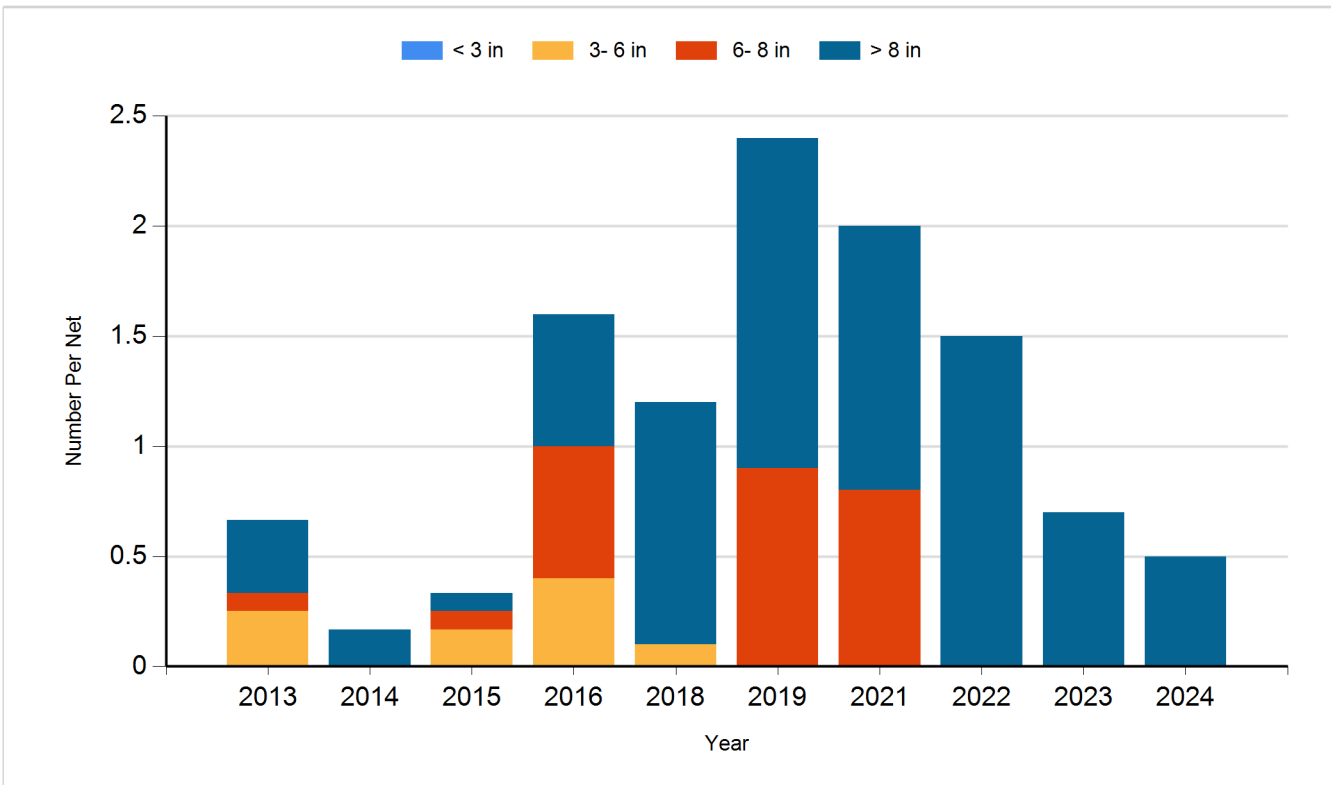
Species: Black Bullhead
Gear: std exp gill net



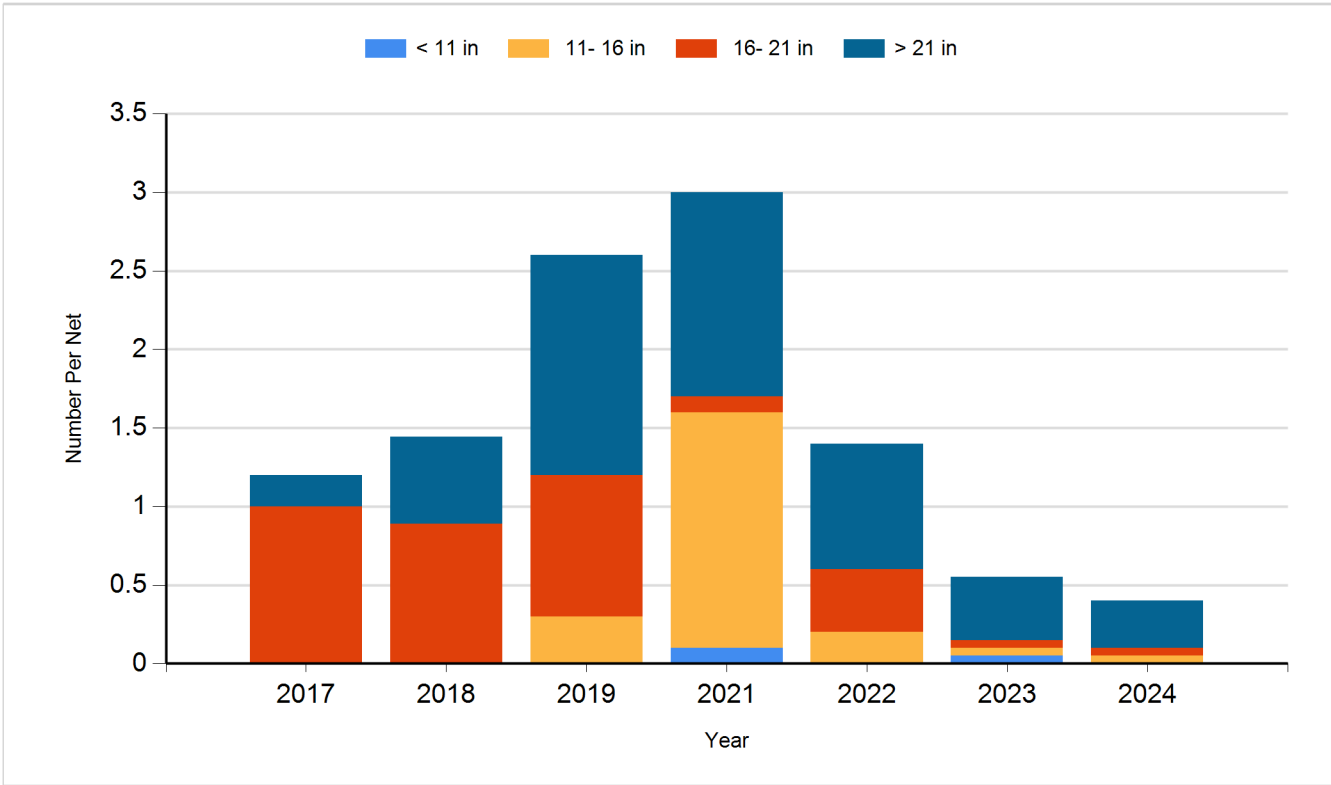
Species: Bluegill
Gear: AFS std frame net



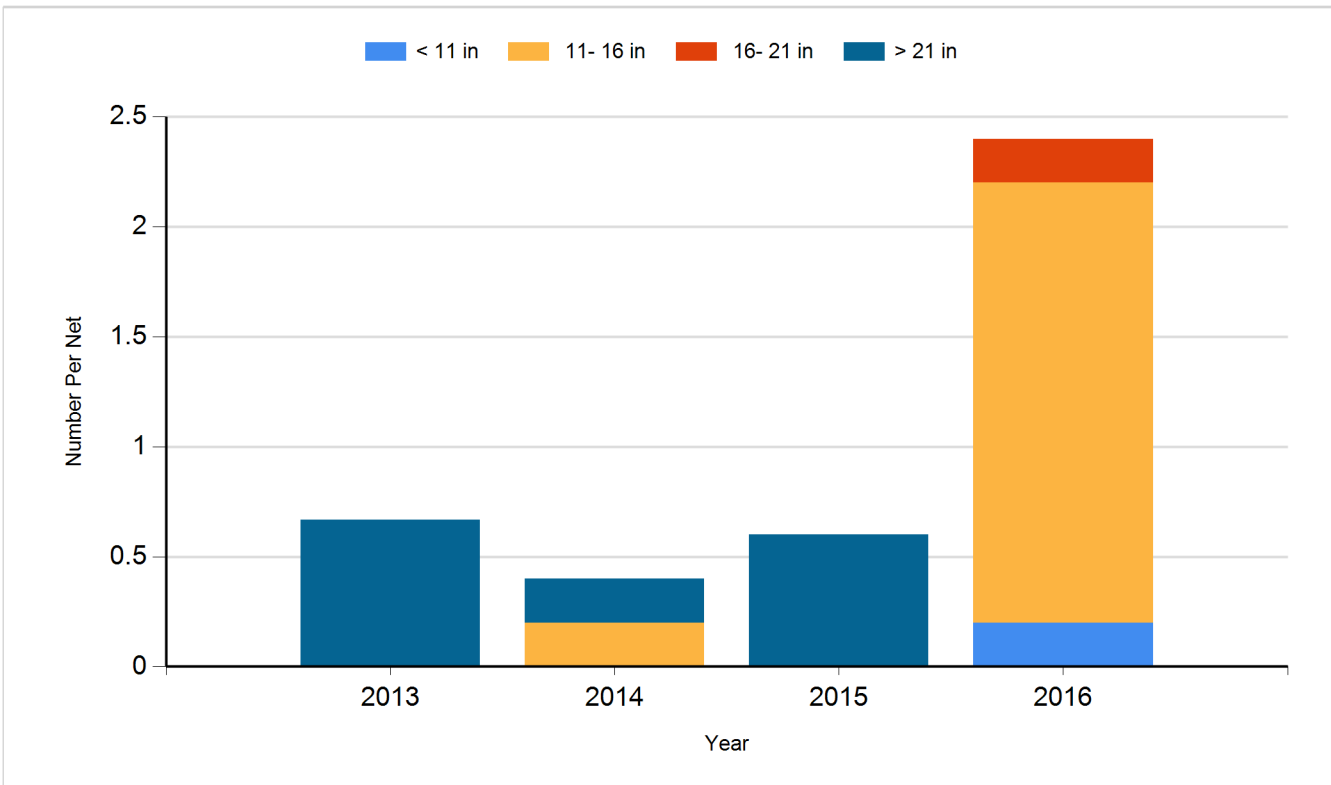
Species: Bluegill
Gear: frame net (std 3/4 in)



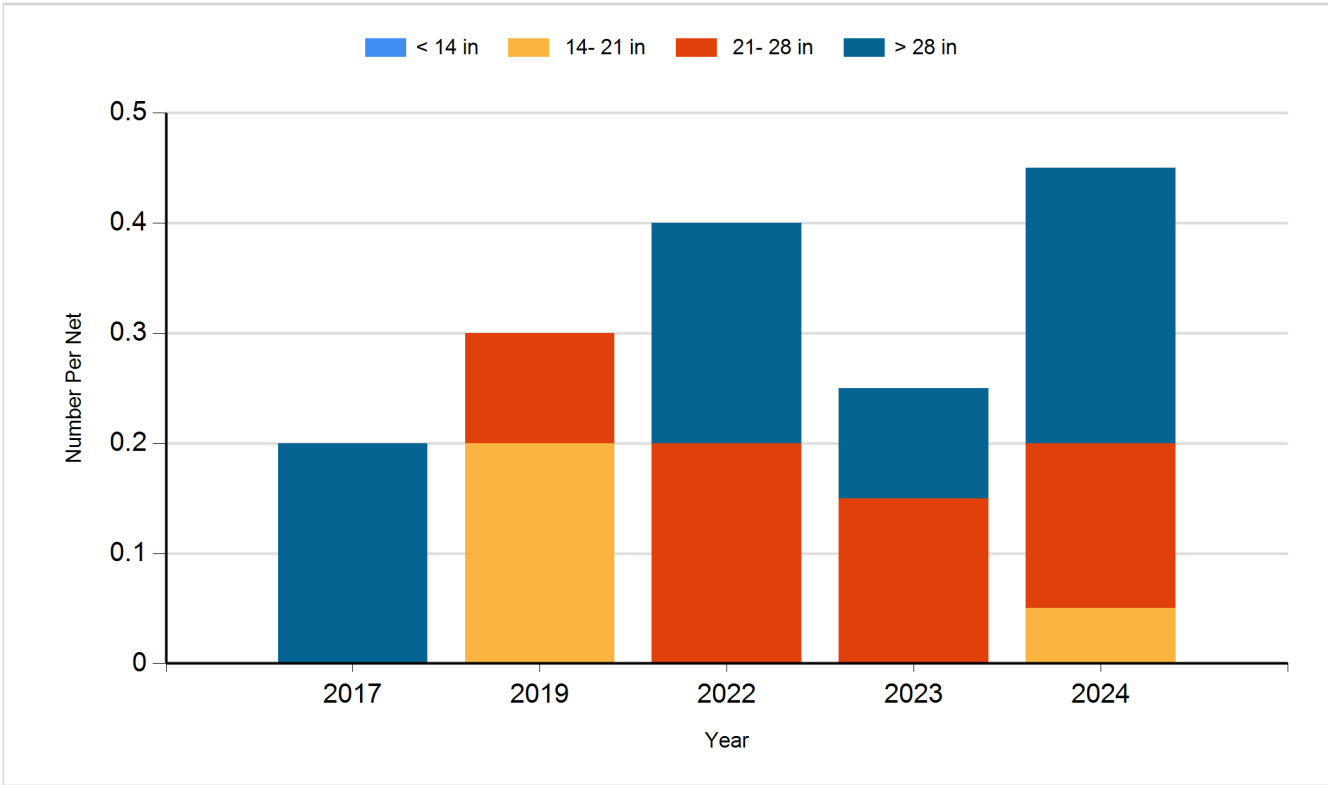
Species: Common Carp
Gear: AFS std gill net



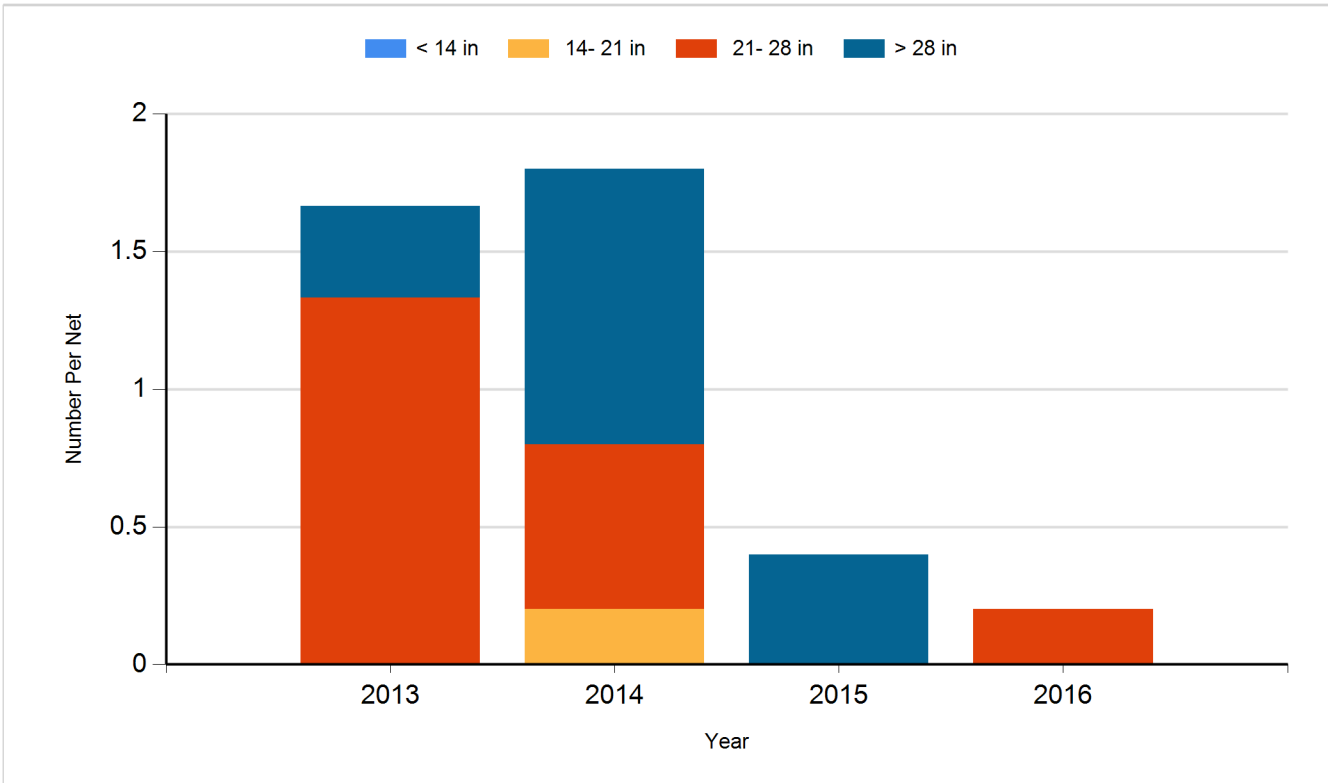
Species: Common Carp
Gear: std exp gill net



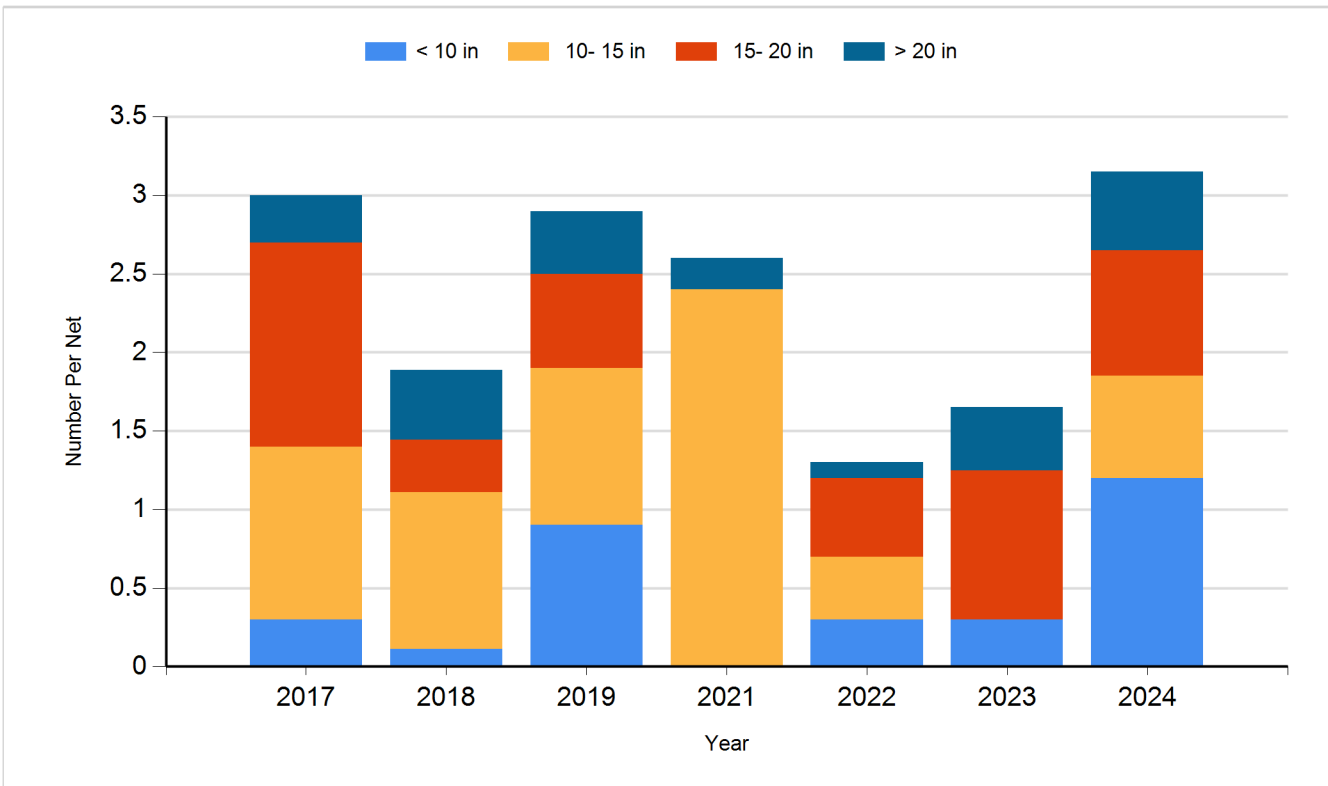
Species: Northern Pike
Gear: AFS std gill net



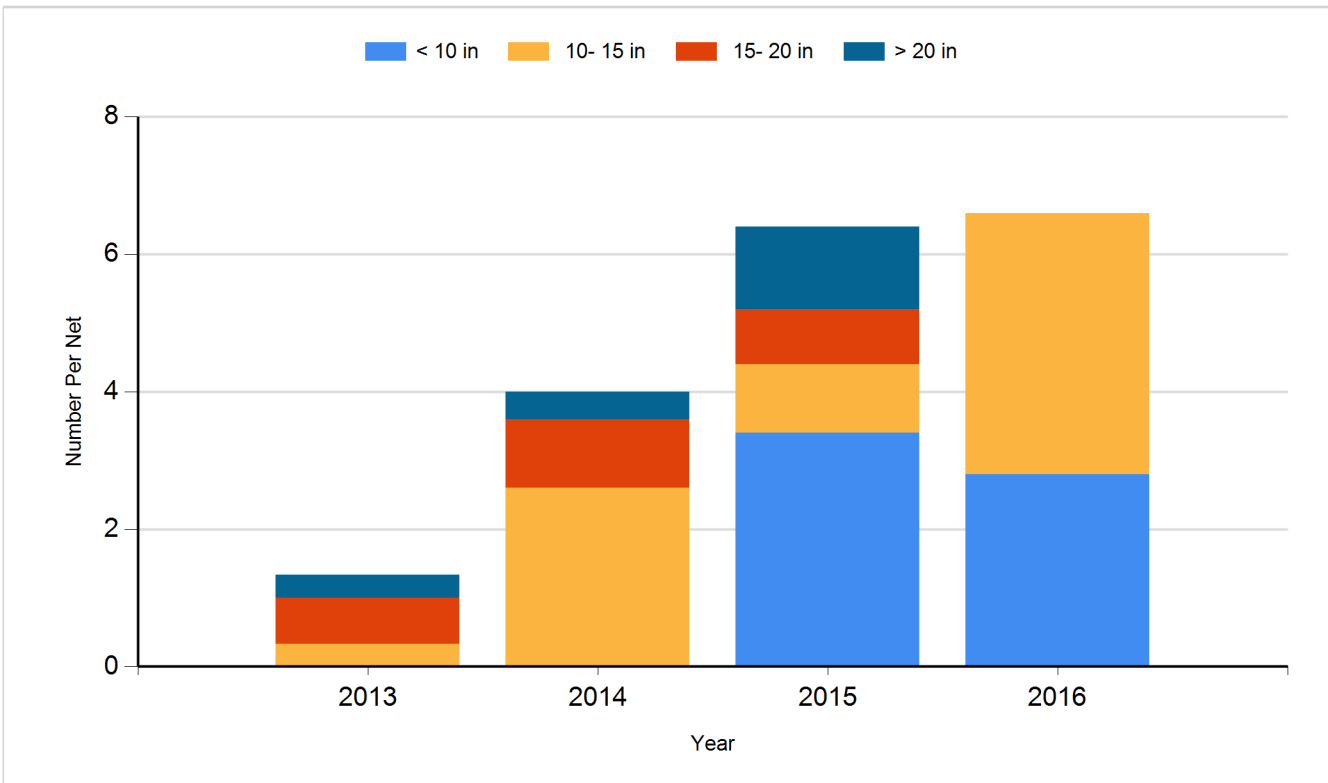
Species: Northern Pike
Gear: std exp gill net



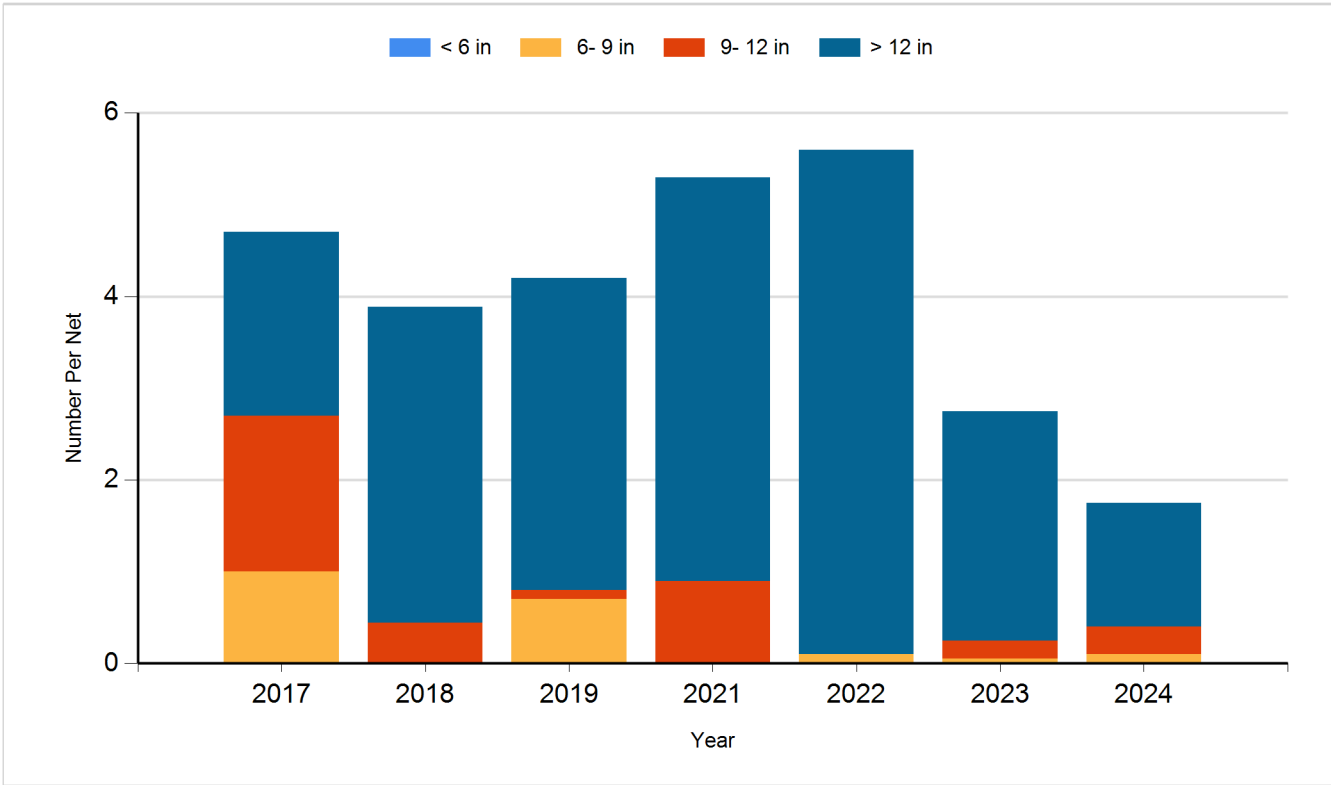
Species: Walleye
Gear: AFS std gill net



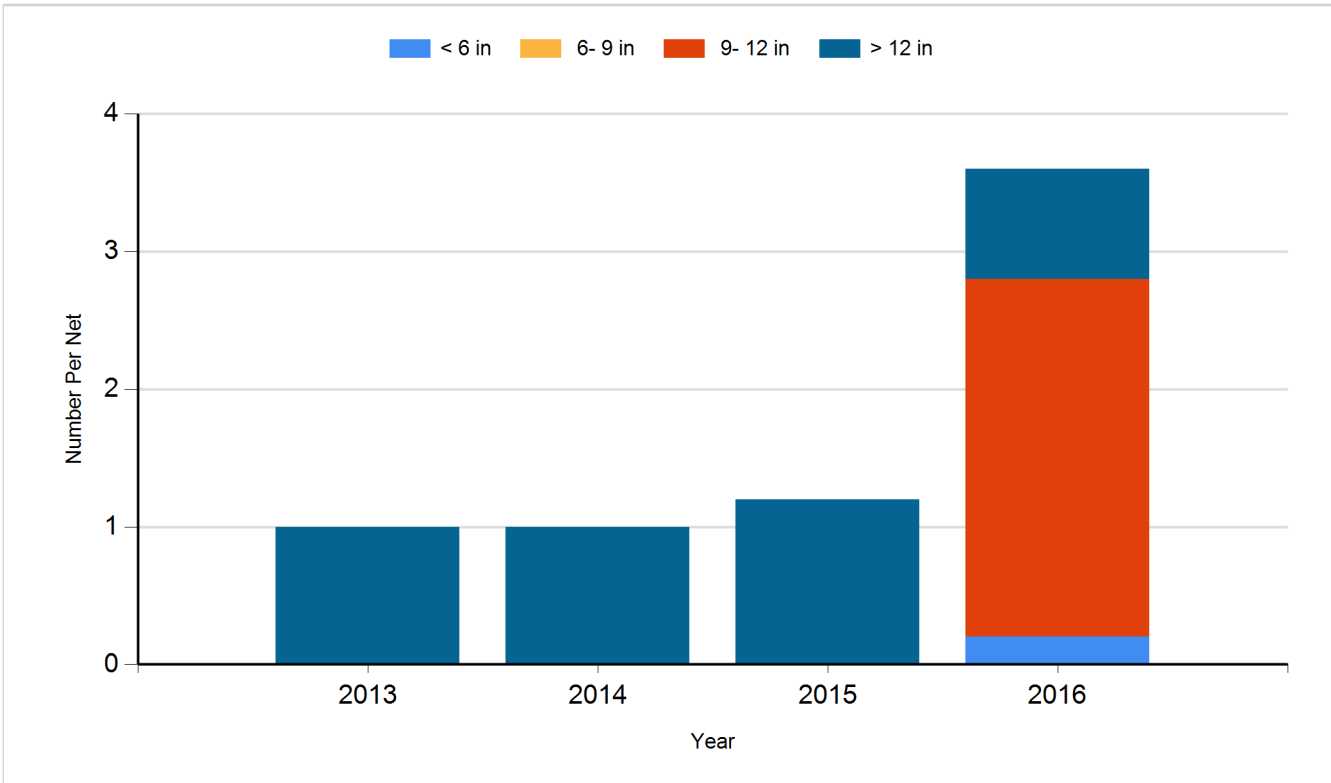
Species: Walleye
Gear: std exp gill net



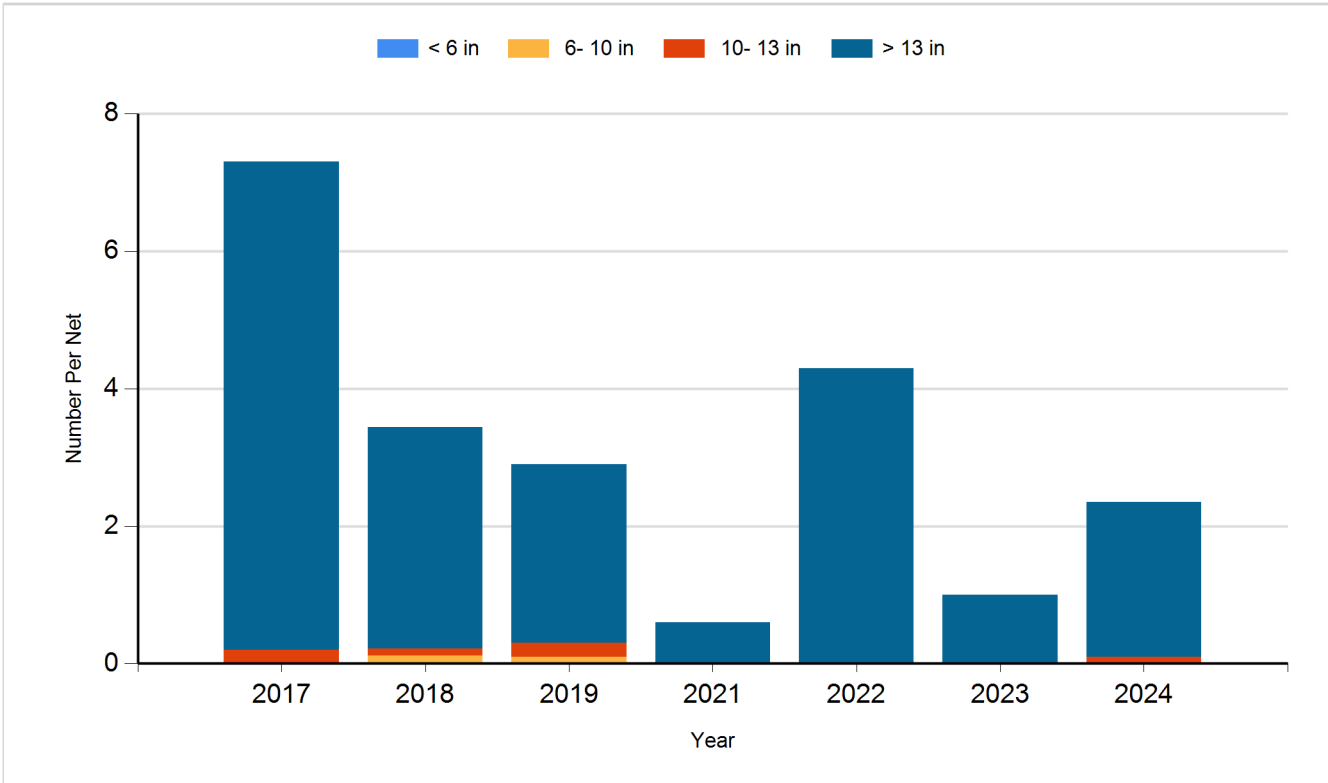
Species: White Bass
Gear: AFS std gill net



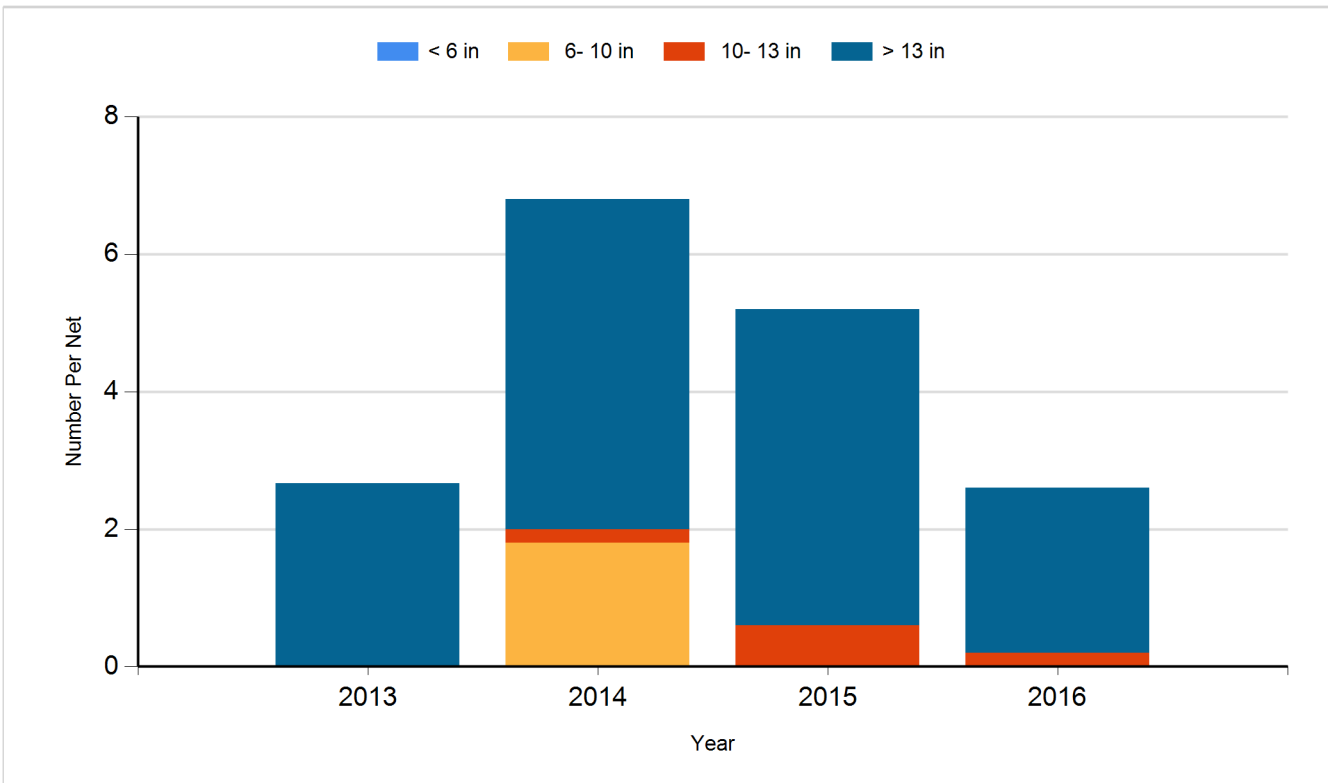
Species: White Bass
Gear: std exp gill net



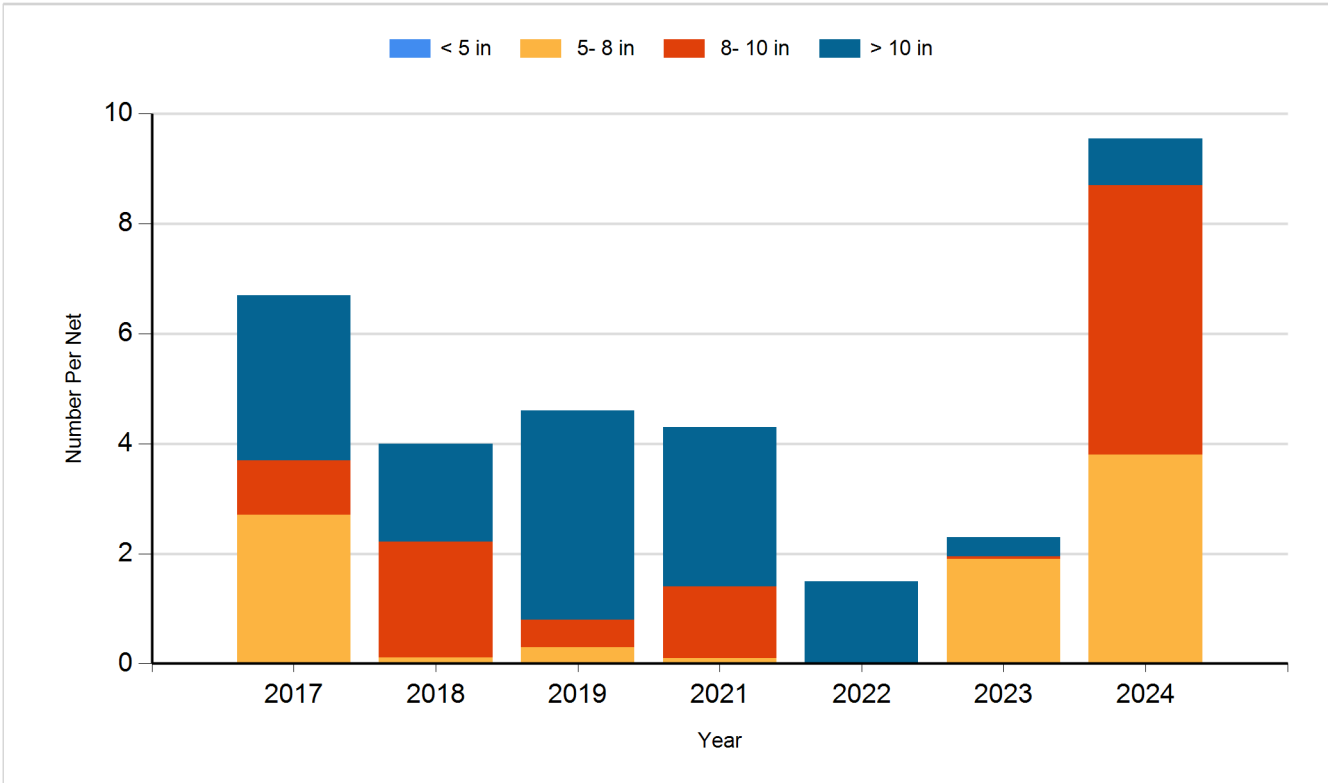
Species: White Sucker
Gear: AFS std gill net



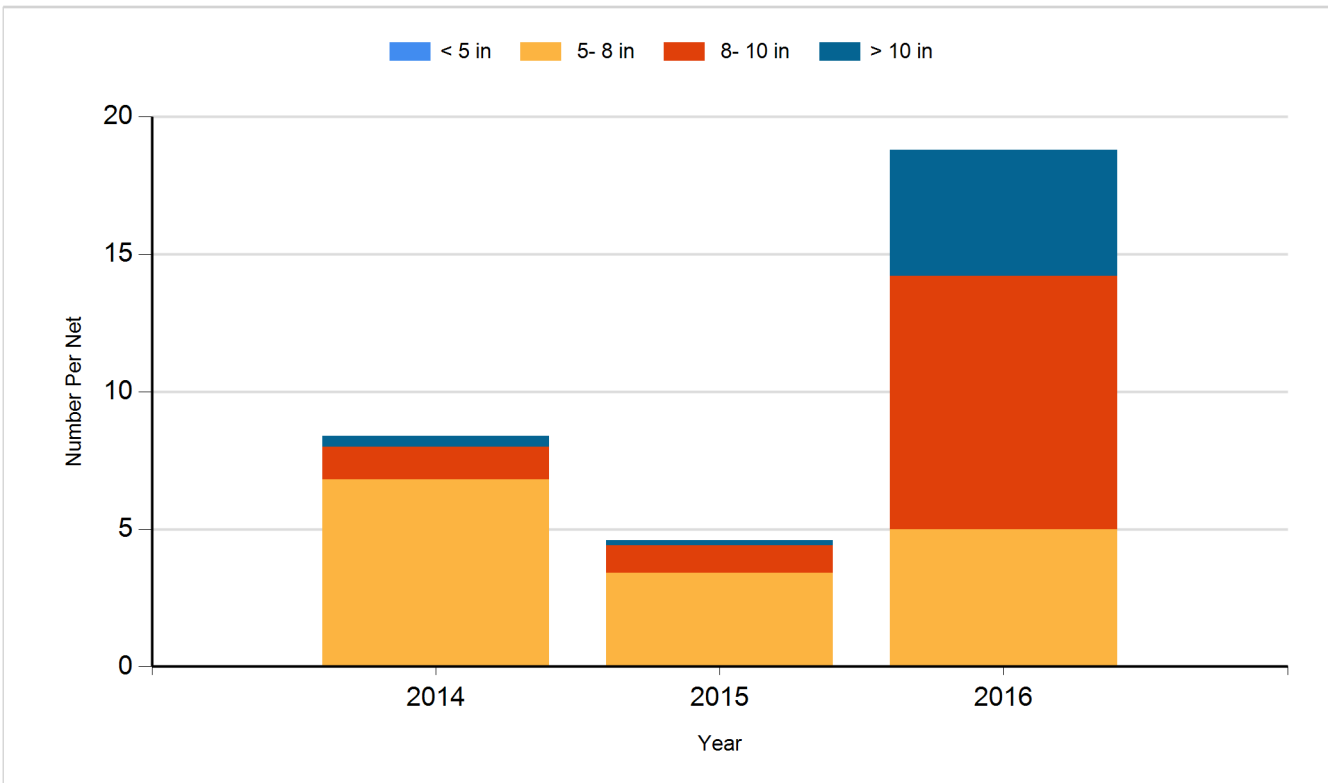
Species: White Sucker
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



Species: Yellow Perch
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2013	Walleye	Small Fingerling	102,660
2014	Walleye	Small Fingerling	103,600
2014	Yellow Perch	Small Fingerling	499,000
2015	Walleye	Small Fingerling	68,320
2017	Walleye	Small Fingerling	70,490
2018	Walleye	Small Fingerling	72,900
2019	Walleye	Small Fingerling	73,030
2021	Walleye	Juvenile	73,920
2023	Walleye	Fry	1,200,000
2024	Walleye	Juvenile	109,465