Note: Zebra mussels are present in Lake Kampeska. Care should be taken by all user groups to prevent their spread. For more information regarding aquatic invasive species please visit https://sdleastwanted.sd.gov/

Lake Kampeska Survey Summary

Lake Kampeska, located within the city limits of Watertown, is primarily managed as a walleye fishery; however, a variety of other fish species (e.g., bluegill, northern pike, smallmouth bass, white bass, yellow perch, etc.) contribute to the fishery.

- **Bluegill.** Although not abundant (1.3 per frame net), opportunities exist for anglers to catch bluegill at Lake Kampeska. In 2023, frame nets sampled 23 individuals from 3.6 to 9.4 inches, most (87%) were ≥ 6.0 inches and 74% were ≥ 8.0 inches.

- **Channel catfish.** In 2023, channel catfish were the third most abundant fish species sampled by gill nets (2.3 per net), behind only walleye and yellow perch. Twenty-eight individuals from 13.4 to 22.0 inches were netted.

- **Smallmouth bass.** Spring electrofishing was not completed in 2023.

- **Walleye.** Although more walleyes were sampled in 2023 than in 2022, relative abundance of those that were at least 10.0 inches remained low (2.8 per gill net). Sampled walleyes ranged in length from 7.5 to 23.2 inches, of those that were at least 10.0 inches 21% were ≥15.0 inches and 9% were ≥20.0 inches. Individuals from seven year classes (2013, 2014, and 2018 – 2022) contributed to the catch. Fish from 2021 (age-2) cohort, which coincided with a fry stocking, were more numerous than those from other cohorts and accounted for 47% of walleyes in the sample. Since 2014, the mean length at capture of age-3 fish has ranged from 10.9 to 15.6 inches, while age-4 fish had mean length at capture values from 12.3 to 19.3 inches. In 2023, the mean length at capture of age-3 and age-4 fish was 13.0 and 14.6 inches.

- **White bass.** Relative abundance of white bass has remained low (i.e., ≤2.0 per gill net) from 2016 to 2023. In 2023, 12 white bass from 11.0 to 15.0 inches were netted; most (83%) were ≥12.0 inches.

- **Yellow perch**. Yellow perch numbers were similar to those observed in 2022. At 4.4 per gill net, relative abundance was considered low to moderate for Lake Kampeska. Sampled yellow perch ranged in length from 5.1 to 11.4 inches, most (74%) were ≥8.0 inches and 23% were ≥10.0 inches. Fish from six consecutive year classes (2017 – 2022) contributed to the catch. The 2020 (age-3) cohort was the most represented with those individuals accounting for 36% of yellow perch in the sample. Growth appears to be moderate with mean length at capture values at age 3 from 8.0 to 9.8 inches since 2014. In 2023, the mean length at capture at age 3 was 8.7 inches.

For more detailed results see the computer-generated South Dakota Statewide Fisheries Survey for Kampeska (Codington; below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Kampeska, Codington County
UBS-Lake-171-000
2023

Lake Information

Name:	Kampeska	**Maximum Depth:**	16 Feet
County:	Codington	**Mean Depth:**	7 Feet
		OHWM Elevation:	1,718
Surface Area:	4,987 Acres	**Outlet Elevation:**	1,718

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 18, 2023	4 net-nights
AFS std gill net	Jul 19, 2023	4 net-nights
AFS std gill net	Jul 20, 2023	4 net-nights
fall night EF-WAE	Sep 19, 2023	3000 seconds
frame net (std 3/4 in)	Jul 18, 2023	7 net-nights
frame net (std 3/4 in)	Jul 19, 2023	7 net-nights
frame net (std 3/4 in)	Jul 20, 2023	4 net-nights

Common Fish Species Present

Walleye

Smallmouth Bass

Black Crappie

White Crappie

Bigmouth Buffalo

Yellow Perch

Channel Catfish

Bluegill

Yellow Bullhead

White 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.
- s**td experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

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

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

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

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

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (W) compared to a length-specific standard weight (Ws) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

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

Confidence intervals (**CI**) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (**S**), quality (**Q**), preferred (**P**), memorable (**M**) and trophy (**T**). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
Walleye	10	25	15	38	20	51	25	63	30	76
White Bass	6	15	9	23	12	30	15	38	18	46
White Crappie	5	13	8	20	10	25	12	30	15	38
Yellow Bullhead	4	10	7	18	9	23	11	28	14	36
Yellow Perch	5	13	8	20	10	25	12	30	15	38

Catch Summary of Stock Length Fish

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

*** Methods/Species that ignore stock length**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Bigmouth Buffalo	18	1.5	0.8	94		0		89	2
	Channel Catfish	28	2.3	1.3	96		0		110	3
	Common Carp	3	0.3	0.2	100		100		96	2
	Northern Pike	7	0.6	0.4	100		71		71	3
	Rock Bass	1	0.1	0.1	100		100		116	
	Shorthead Redhorse	2	0.2	0.2	100		100		110	7
	Smallmouth Bass	9	0.8	0.4	78		11		92	2
	Walleye	38	2.8	0.6	21	11	9		85	2
	White Bass	12	1.0	0.3	100		83		89	2
	White Crappie	2	0.2	0.2	100		0		99	3
	White Sucker	1	0.1	0.1	100		100		94	
	Yellow Bullhead	1	0.1	0.1	100		100		97	
	Yellow Perch	53	4.4	1.6	74	9	23	9	106	1
frame net (std 3/4 in)	Bigmouth Buffalo	100	5.6	2.6	100		12	5	91	1
	Black Bullhead	2	0.1	0.1	100		100		88	3
	Bluegill	23	1.3	0.4	87		74	15	118	5
	Channel Catfish	1	0.1	0.1	100		100		112	
	Common Carp	3	0.2	0.1	100		100		92	8
	Northern Pike	9	0.5	0.2	78		44		74	5
	Rock Bass	1	0.1	0.1	100		100		116	
	Smallmouth Bass	68	2.7	1.1	45	11	16	8	97	2
	Walleye	6	0.3	0.2	50		17		83	2
	White Bass	8	0.4	0.3	100		100		86	2
	White Sucker	3	0.2	0.1	100		100		98	1
	Yellow Bullhead	21	1.2	0.4	100		100		101	3
	Yellow Perch	2	0.1	0.1	100		50		97	

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.

***SDGFP standard gill nets used 2014 - 2015; avg calculated on data from 2016 – 2023; ** Includes day and night samples; *** Methods/Species that ignore stock length; ****AFS standard frame nets used in 2017**

		CPUE										
Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
AFS std gill net*	Bigmouth Buffalo	0.0	0.0	0.0	0.0	8.3	5.6		6.1	3.6	1.5	3.59
	Black Bullhead	1.8	2.3	0.4	0.4	0.3	0.0		0.8	0.0	0.0	0.27
	Black Crappie	0.0	0.0	0.0	0.1	0.0	0.0		0.1	0.0	0.0	0.03
	Bluegill	0.0	0.0	0.0	0.1	0.0	0.0		0.0	0.1	0.0	0.03
	Channel Catfish	0.7	0.2	1.0	0.9	0.3	0.4		1.8	3.1	2.3	1.40
	Common Carp	0.3	0.0	0.1	0.0	0.3	0.6		0.1	0.0	0.3	0.20
	Northern Pike	0.2	1.0	0.5	0.2	0.7	0.8		0.9	0.6	0.6	0.61
	Rock Bass	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.1	0.1	0.03
	Shorthead Redhorse	0.0	0.3	0.2	0.0	0.1	0.2		0.0	0.0	0.2	0.10
	Smallmouth Bass	0.0	1.2	0.8	1.3	0.6	0.0		1.2	1.9	0.8	0.94
	Walleye	9.3	11.5	4.6	2.7	2.6	4.0		3.3	2.1	2.8	3.16
	White Bass	3.8	4.7	1.8	1.5	1.4	2.0		1.7	1.8	1.0	1.60
	White Crappie	1.3	0.3	1.1	0.5	0.2	2.6		0.9	0.6	0.2	0.87
	White Sucker	1.8	2.2	0.6	0.6	0.8	0.3		0.0	0.4	0.1	0.40
	Yellow Bullhead	1.5	0.8	1.1	0.7	0.6	0.3		6.6	0.3	0.1	1.39
	Yellow Perch	2.7	13.0	5.3	5.3	3.3	4.3		2.3	4.7	4.4	4.23
boat shocker**	Smallmouth Bass	171.0		159.8			97.0					142.60
fall night EF-WAE***	Walleye	179.0	7.0	7.0	41.0	75.0	54.2	0.0	36.6	0.0	126.0	52.58
frame net (std 3/4 in)****	Bigmouth Buffalo	0.4			0.6						5.6	2.20
	Black Bullhead	15.5			0.7						0.1	5.43
	Black Crappie	0.5			1.2						0.0	0.57
	Bluegill	1.4			0.5						1.3	1.07
	Channel Catfish	0.0			0.1						0.1	0.07
	Common Carp	0.1			0.1						0.2	0.13
	Northern Pike	0.2			0.2						0.5	0.30
	Rock Bass	0.0			0.0						0.1	0.03
	Smallmouth Bass	0.5			0.4						2.7	1.20
	Walleye	0.6			0.1						0.3	0.33
	White Bass	3.0			3.1						0.4	2.17
	White Crappie	0.7			0.1						0.0	0.27
	White Sucker	0.5			0.0						0.2	0.23
	Yellow Bullhead	3.9			1.6						1.2	2.23
	Yellow Perch	0.1			0.1						0.1	0.10

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.

***SDGFP standard gill nets used 2014 - 2015;**AFS standard frame nets used in 2017**

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std gill net*	Channel Catfish	PSD	75	100	100	100	100	100		33	92	96
		PSD-P	50	100	42	70	67	80		0	0	0
		Wr	101	102	101	100	112	114		95	107	110
	Walleye	PSD	25	12	18	7	3	69		51	40	21
		PSD-P	0	1	2	3	0	2		3	0	9
		Wr	78	82	79	75	85	88		84	81	85
	White Bass	PSD	100	96	48	94	100	92		90	100	100
		PSD-P	87	93	48	50	88	92		80	81	83
		Wr	81	84	86	80	88	85		87	81	89
	Yellow Perch	PSD	88	65	90	97	92	81		96	68	74
		PSD-P	19	41	40	48	67	73		26	14	23
		Wr	107	109	108	109	105	100		99	106	106
frame net (std 3/4 in)**	Bluegill	PSD	97			89						87
		PSD-P	73			78						74
		Wr	120			126						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+
2023	38	193 (2)	258 (18)	329 (8)	371 (4)	463 (2)				598 (1)	539 (3)
2022	26	222 (1)	296 (8)	376 (9)	418 (3)	446 (1)			462 (3)	466 (1)	
2021	40	217 (1)	326 (8)	384 (24)	490 (1)	474 (1)		503 (2)	466 (3)		
2019	67	211 (20)	348 (8)	396 (1)	367 (2)	410 (23)	426 (6)	446 (1)	463 (6)		
2018	38	232 (7)		324 (2)	319 (14)	325 (10)	354 (2)	367 (2)			
2017	30			276 (12)	313 (10)		359 (7)			659 (1)	
2016	58	205 (1)	260 (14)	305 (19)		365 (20)		480 (1)	608 (1)	404 (1)	432 (1)
2015	88	198 (17)	264 (35)		334 (29)	351 (2)	555 (1)	432 (2)	422 (1)	414 (1)	
2014	62	193 (5)	223 (1)	305 (39)	353 (4)	382 (2)	418 (7)	427 (3)		457 (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+
2023	53	142 (7)	198 (11)	220 (19)	232 (1)	260 (13)	293 (2)				
2022	56		184 (16)	203 (6)	241 (33)			316 (1)			
2021	27		191 (2)	219 (16)	242 (3)	282 (1)	291 (3)		299 (2)		
2019	53	120 (1)	187 (13)	234 (1)	278 (17)		294 (13)	293 (1)	304 (4)	313 (1)	304 (2)
2018	38	138 (2)	214 (2)	249 (14)	274 (4)	271 (13)	287 (3)				307 (1)
2017	58	138 (1)	215 (22)	237 (4)	264 (22)	303 (5)	289 (3)	256 (1)			
2016	63	142 (3)	187 (3)	234 (31)		274 (11)	277 (11)	279 (3)	255 (1)		
2015	78		191 (33)	242 (7)	253 (22)	261 (7)	270 (9)	296 (1)			
2014	22	119 (5)	160 (2)	219 (7)	235 (1)	255 (6)	235 (1)				

Fish Condition

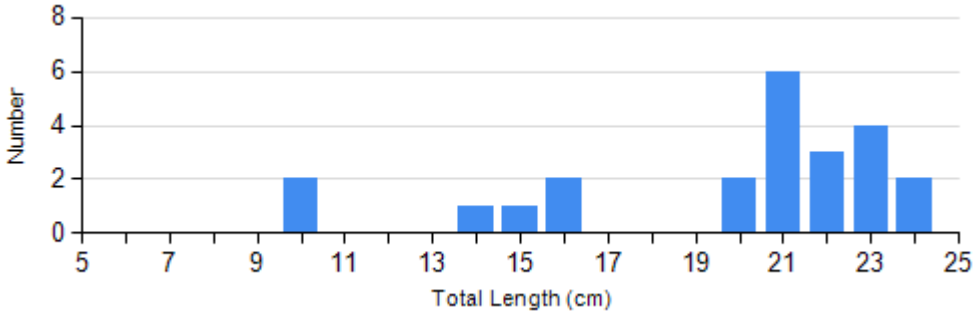
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2023	3	110 (4.5)	3	143 (4.9)	17	113 (3.3)	0	
Channel Catfish Gill Net	2019	0		1	132	4	110 (3.9)	0	
	2021	14	97 (2.1)	7	90 (3.0)	0		0	
	2022	3	103 (0.7)	34	107 (2.2)	0		0	
	2023	1	100	27	110 (2.4)	0		0	
Walleye Gill Net	2019	15	88 (2.3)	32	89 (0.9)	1	86	0	
	2021	19	84 (1.1)	19	83 (0.7)	1	84	0	
	2022	15	82 (1.5)	10	79 (1.5)	0		0	
	2023	26	86 (1.2)	4	79 (1.5)	3	80 (4.1)	0	
White Bass Gill Net	2019	2	86 (4.0)	0		22	85 (1.2)	0	
	2021	2	96 (0.2)	2	89 (2.7)	15	85 (0.9)	1	84
	2022	0		4	90 (1.8)	17	79 (1.1)	0	
	2023	0		2	94 (5.5)	9	89 (1.2)	1	80
Yellow Perch Gill Net	2019	10	106 (2.5)	4	98 (3.1)	27	99 (1.5)	11	98 (1.5)
	2021	1	115	19	101 (1.3)	5	93 (3.2)	2	87 (4.6)
	2022	18	106 (1.6)	30	108 (1.0)	7	100 (2.3)	1	90
	2023	14	105 (1.9)	27	106 (1.0)	12	106 (2.0)	0	

Length Frequency Distribution

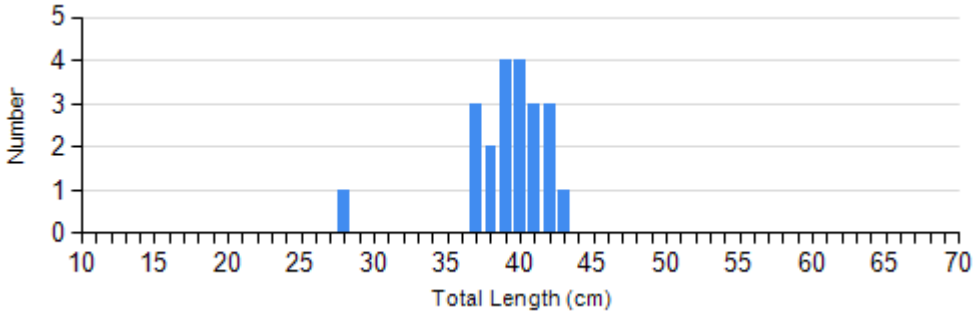
Length frequency histogram of species sampled by year.

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

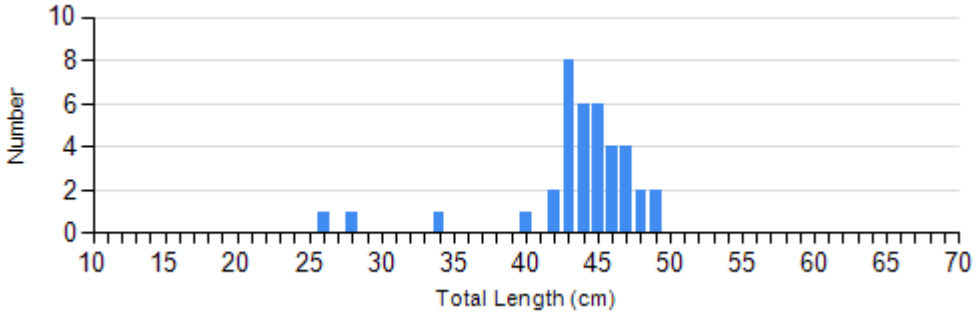


2023

Species: Channel Catfish
Gear: AFS std gill net



2021



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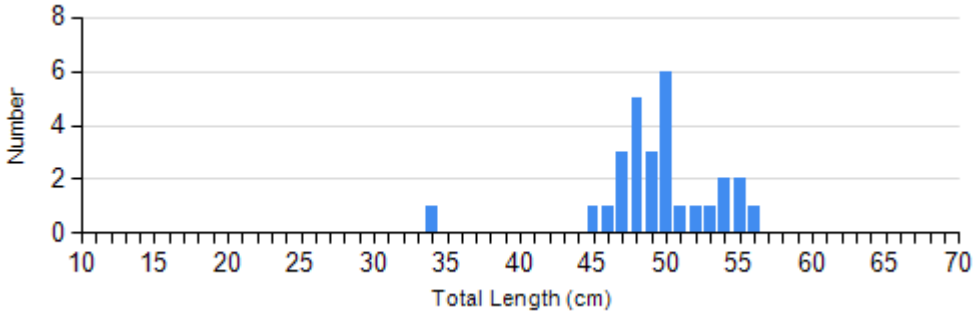
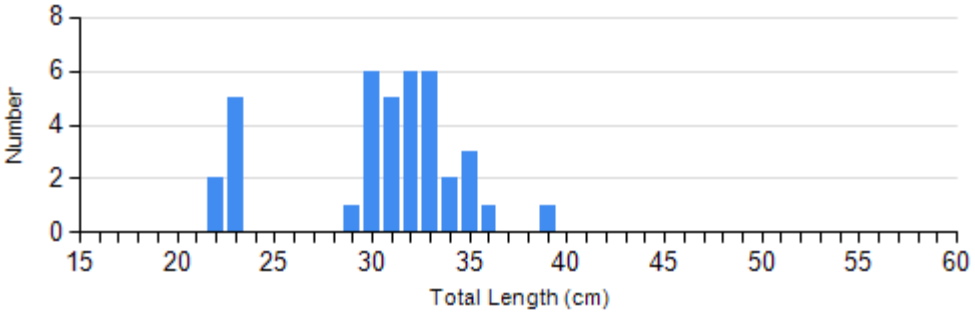


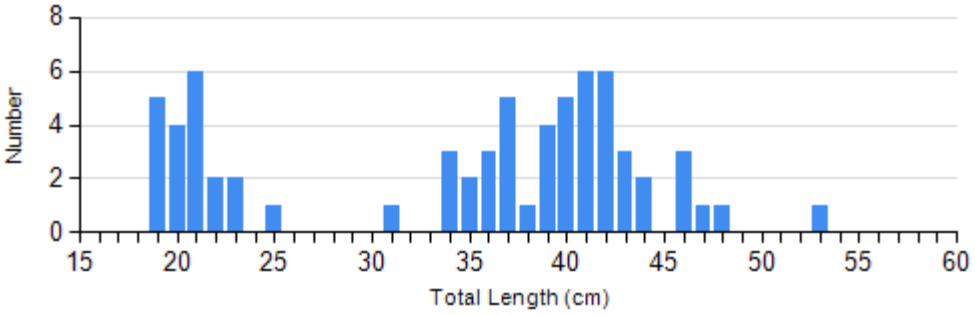
2023

Species: Walleye
Gear: AFS std gill net

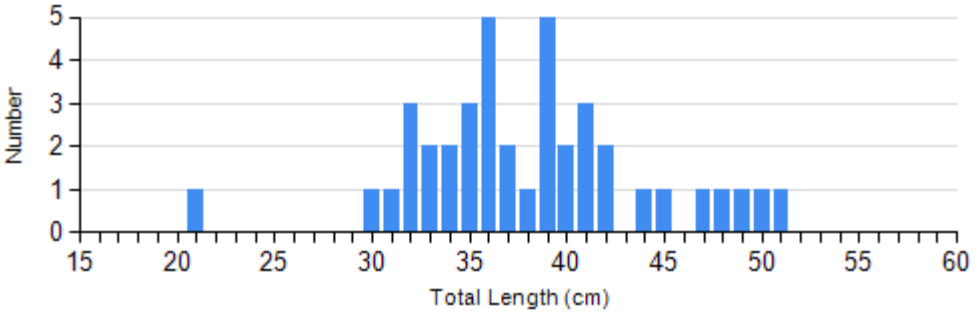
2018



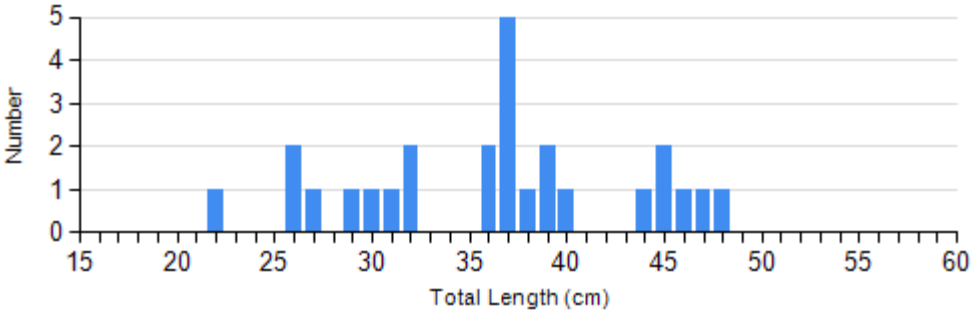
2019



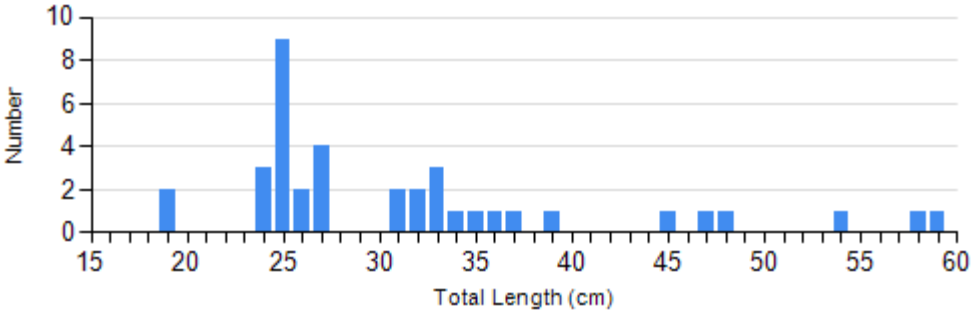
2021



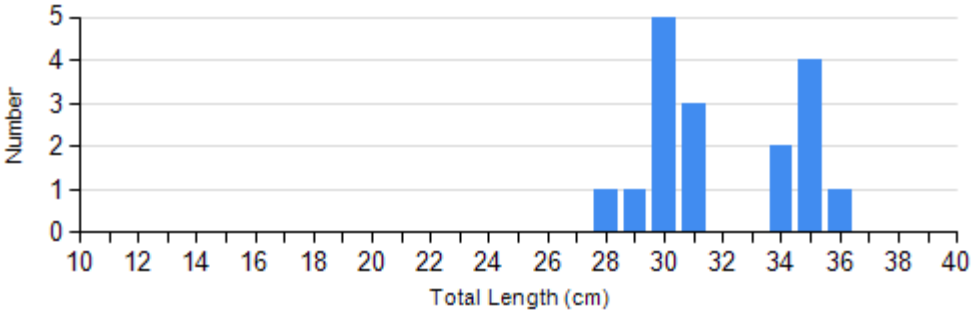
2022



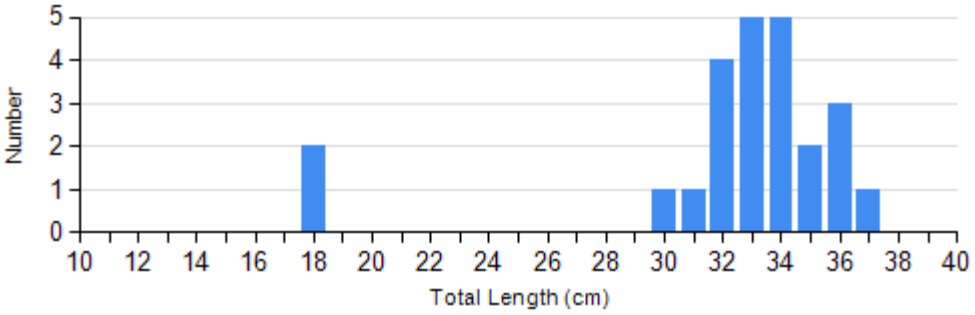
2023



Species: White Bass
Gear: AFS std gill net



2018



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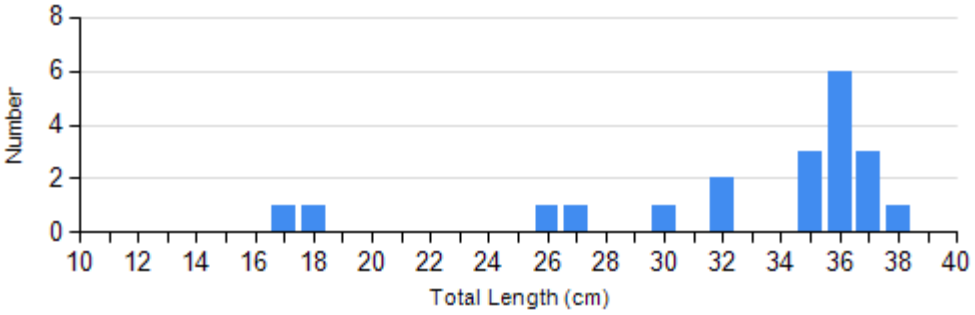
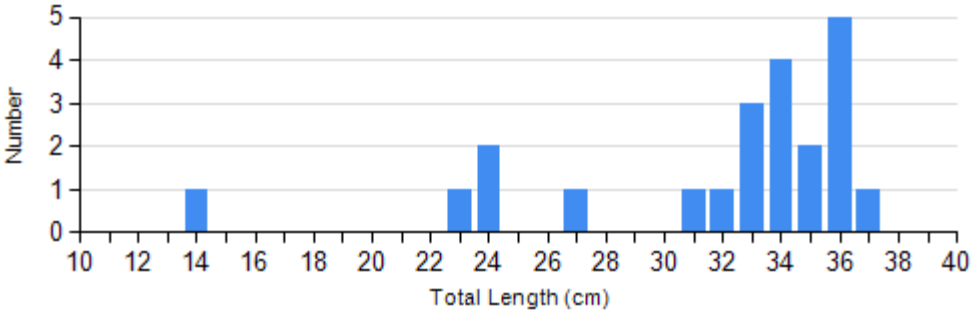
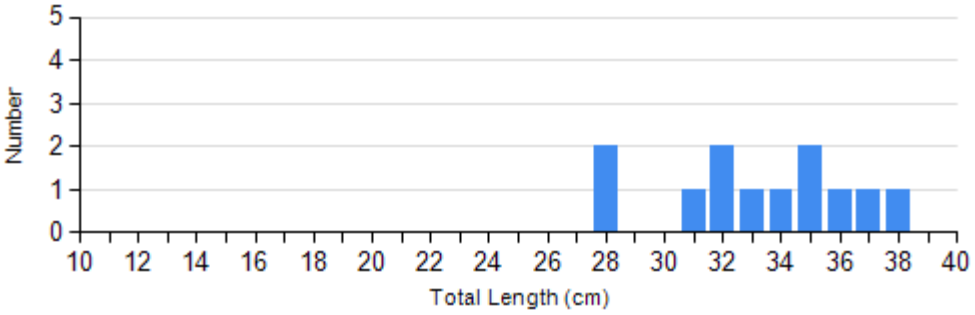


2021

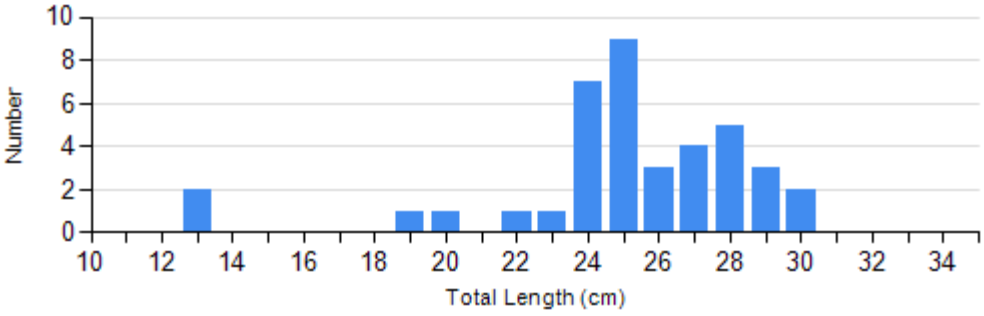


2022



2023

Species: Yellow Perch
Gear: AFS std gill net



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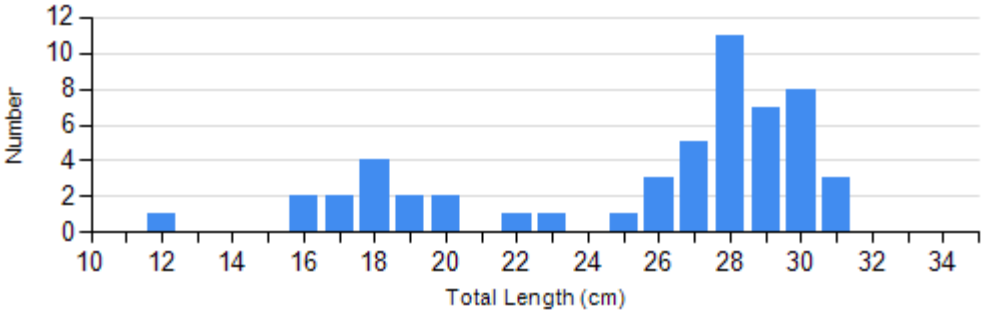

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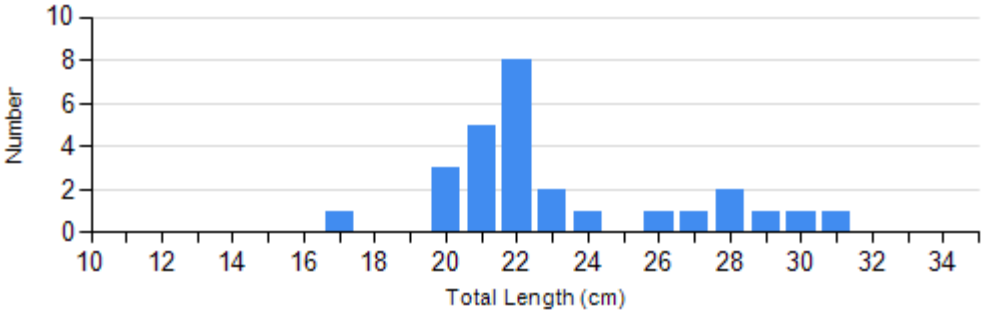
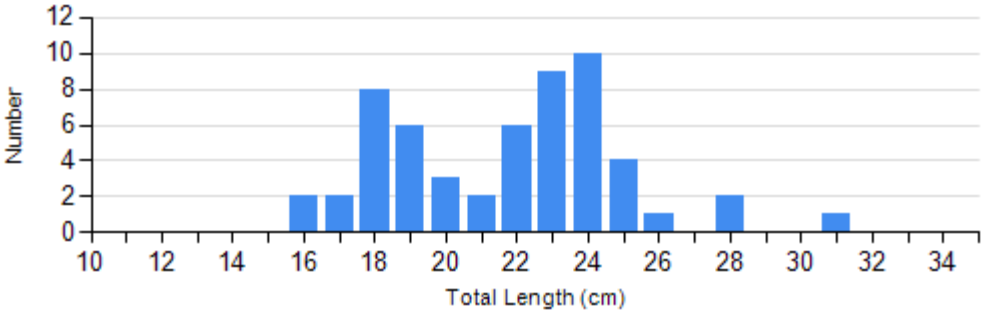
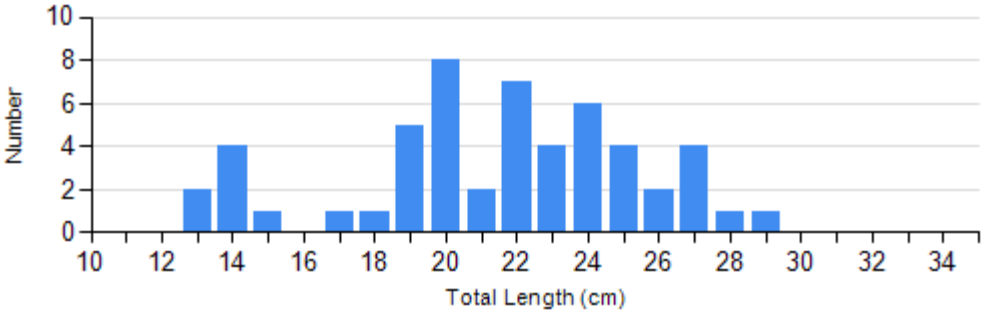


2021



2022

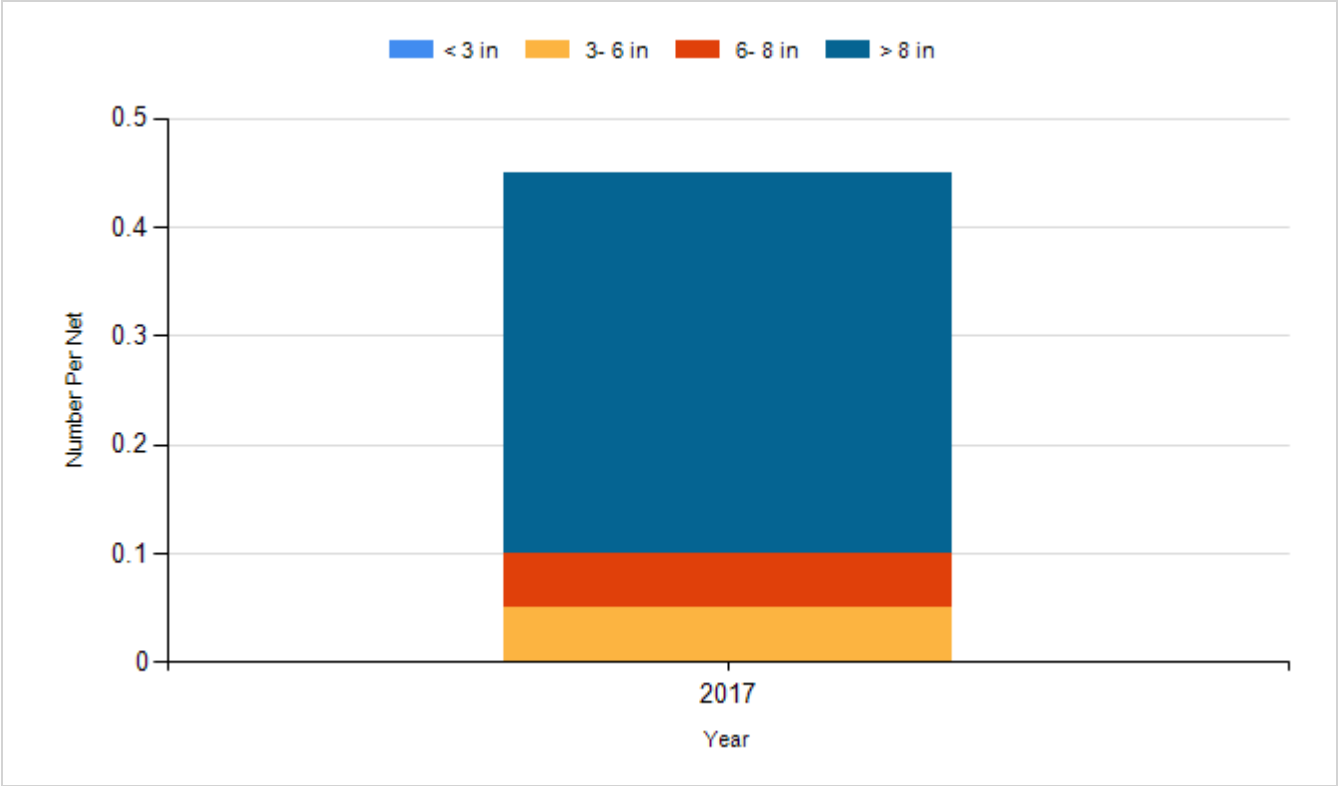


2023

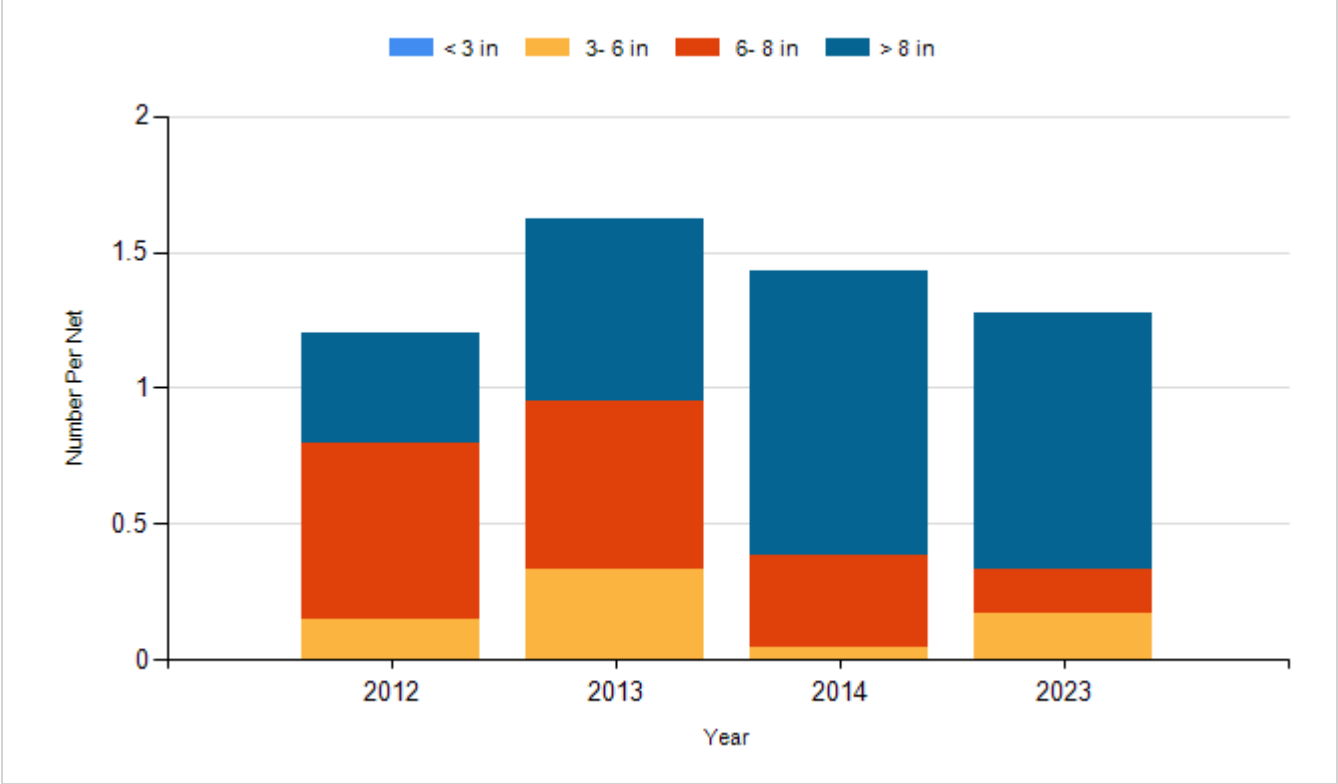
Historic Fish Sizes and Relative Abundance

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

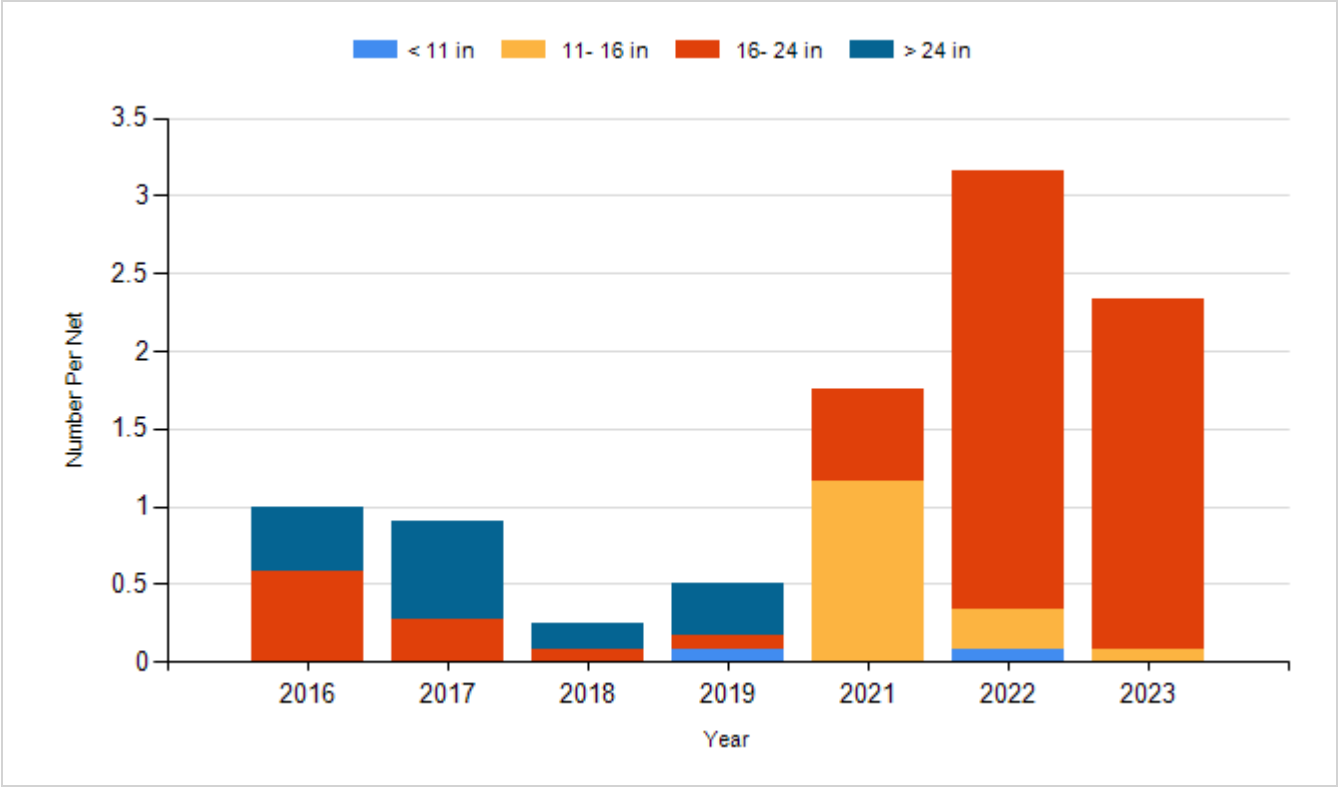
Species: Bluegill
Gear: AFS std frame net



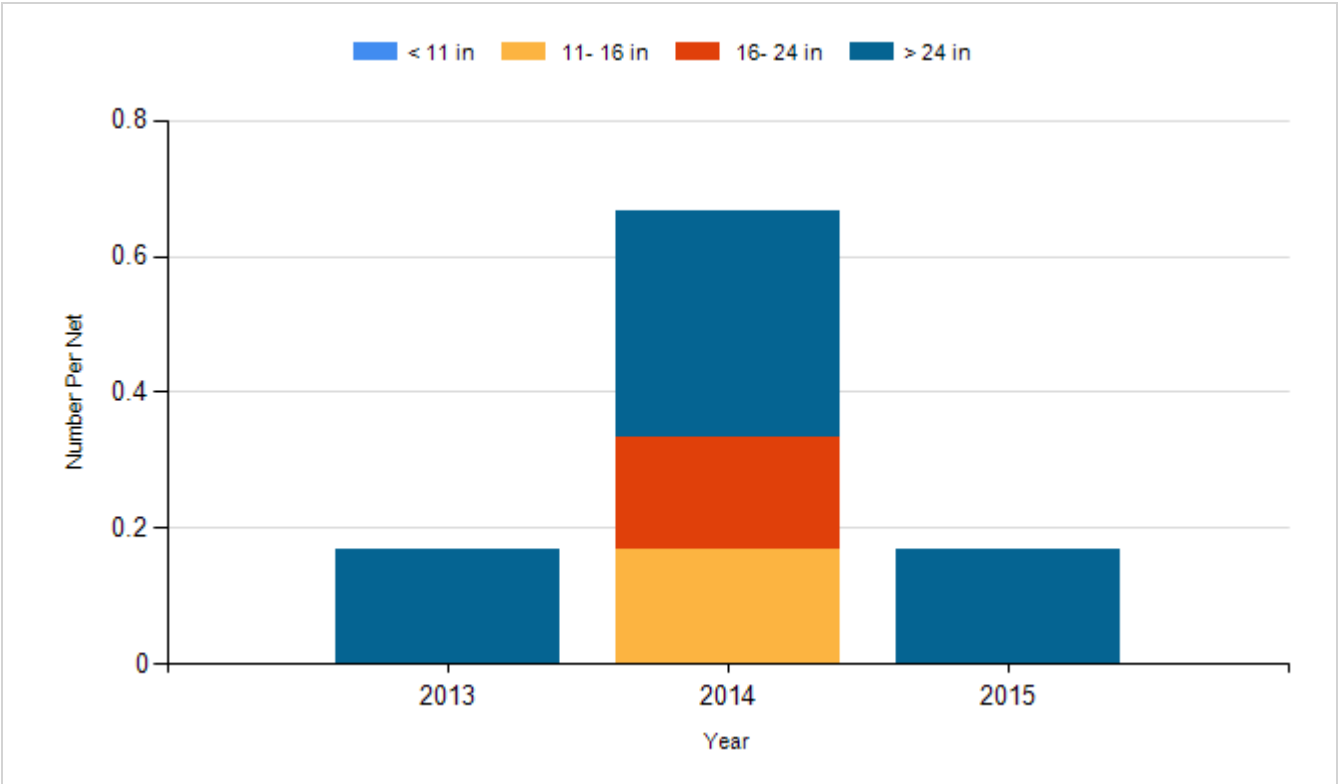
Species: Bluegill
Gear: frame net (std 3/4 in)



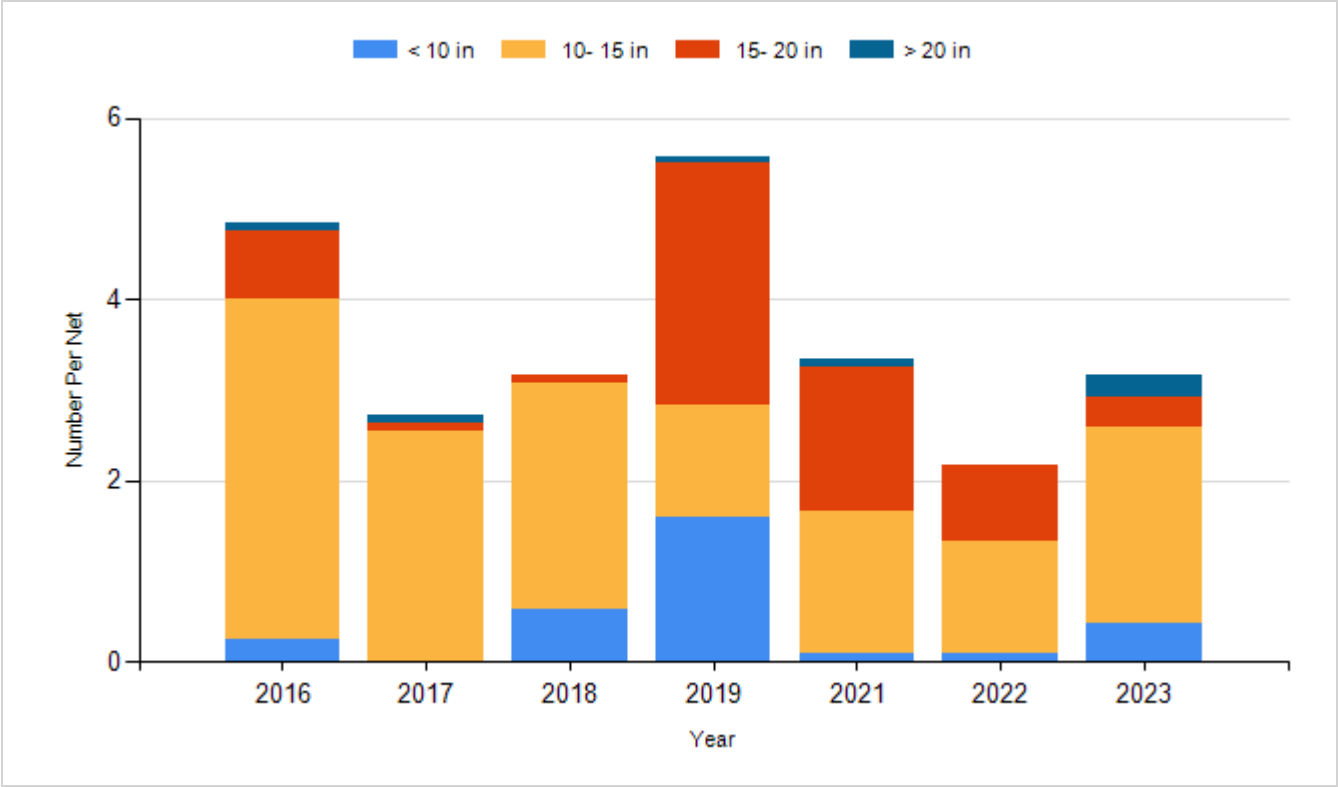
Species: Channel Catfish
Gear: AFS std gill net



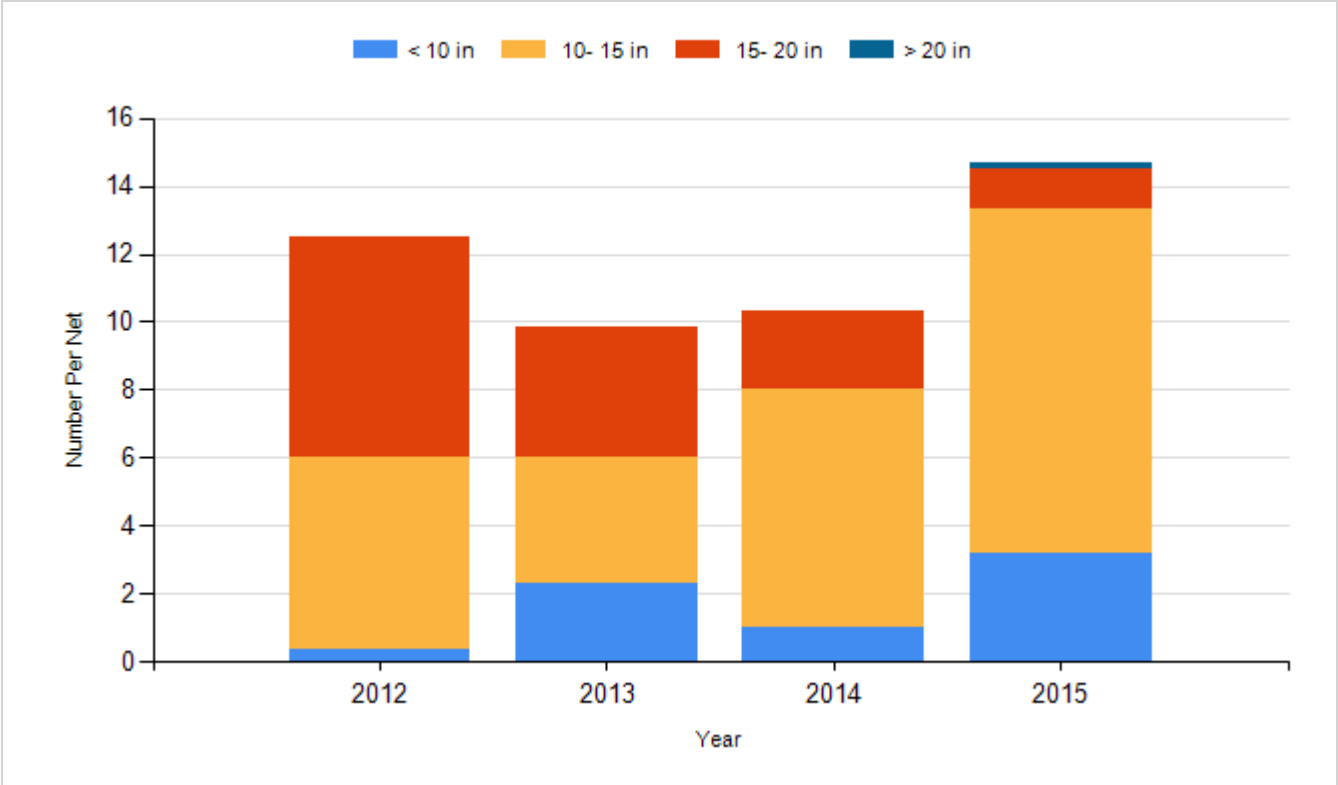
Species: Channel Catfish
Gear: std exp gill net



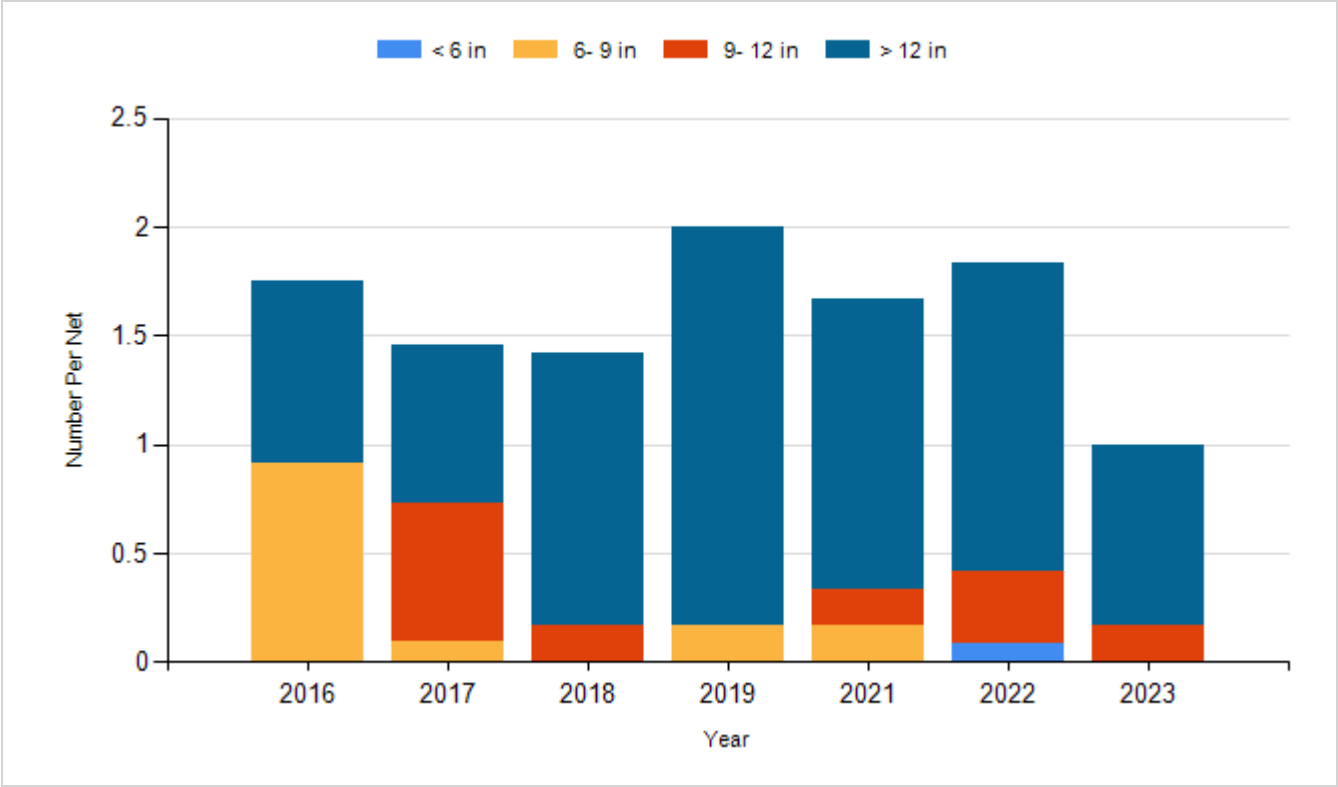
Species: Walleye
Gear: AFS std gill net



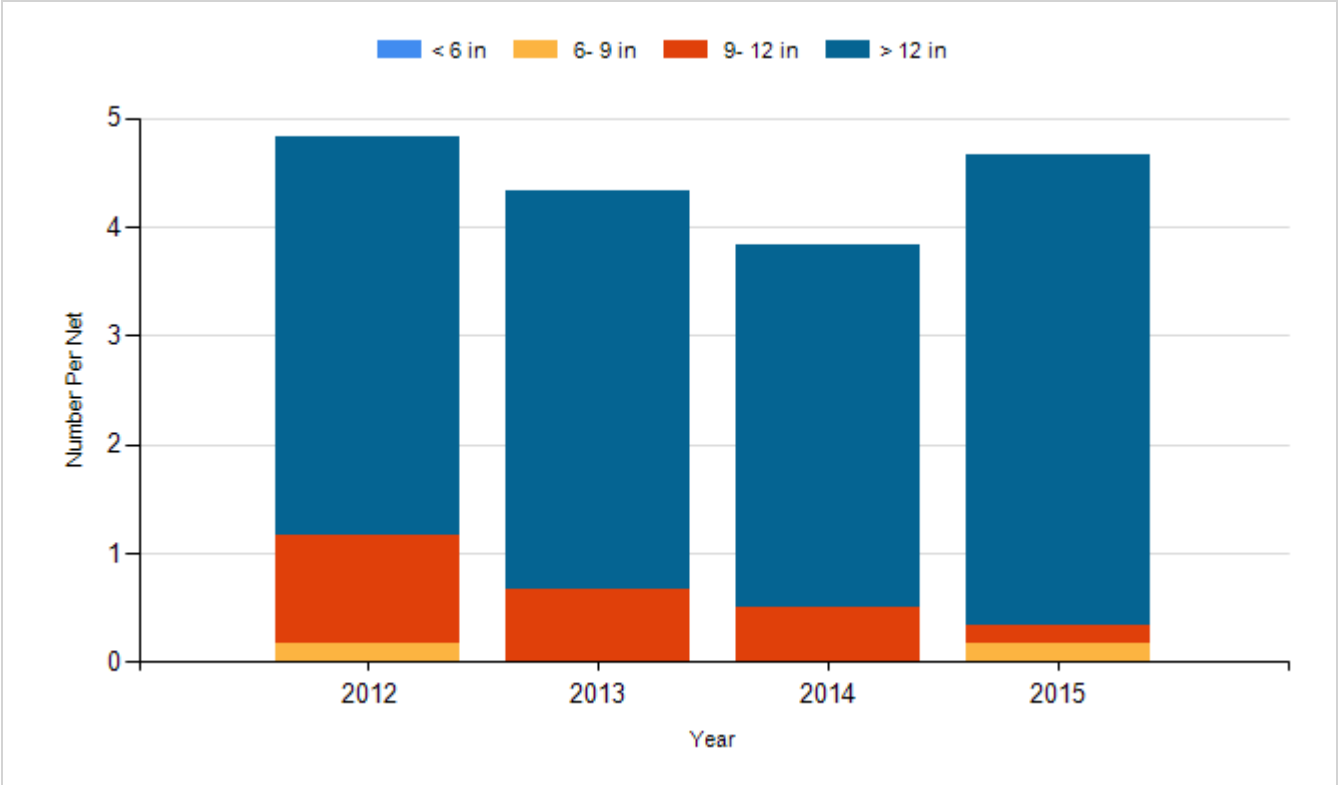
Species: Walleye
Gear: std exp gill net



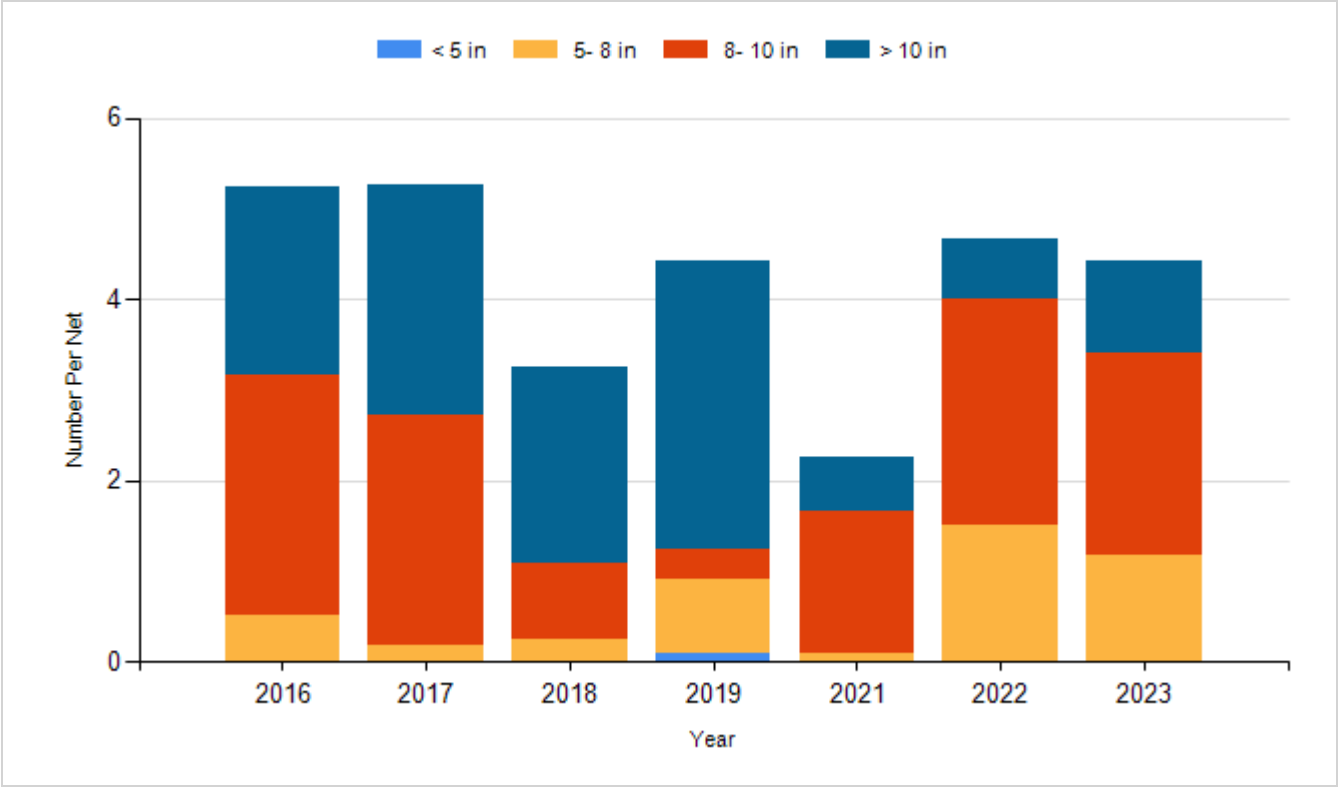
Species: White Bass
Gear: AFS std gill net



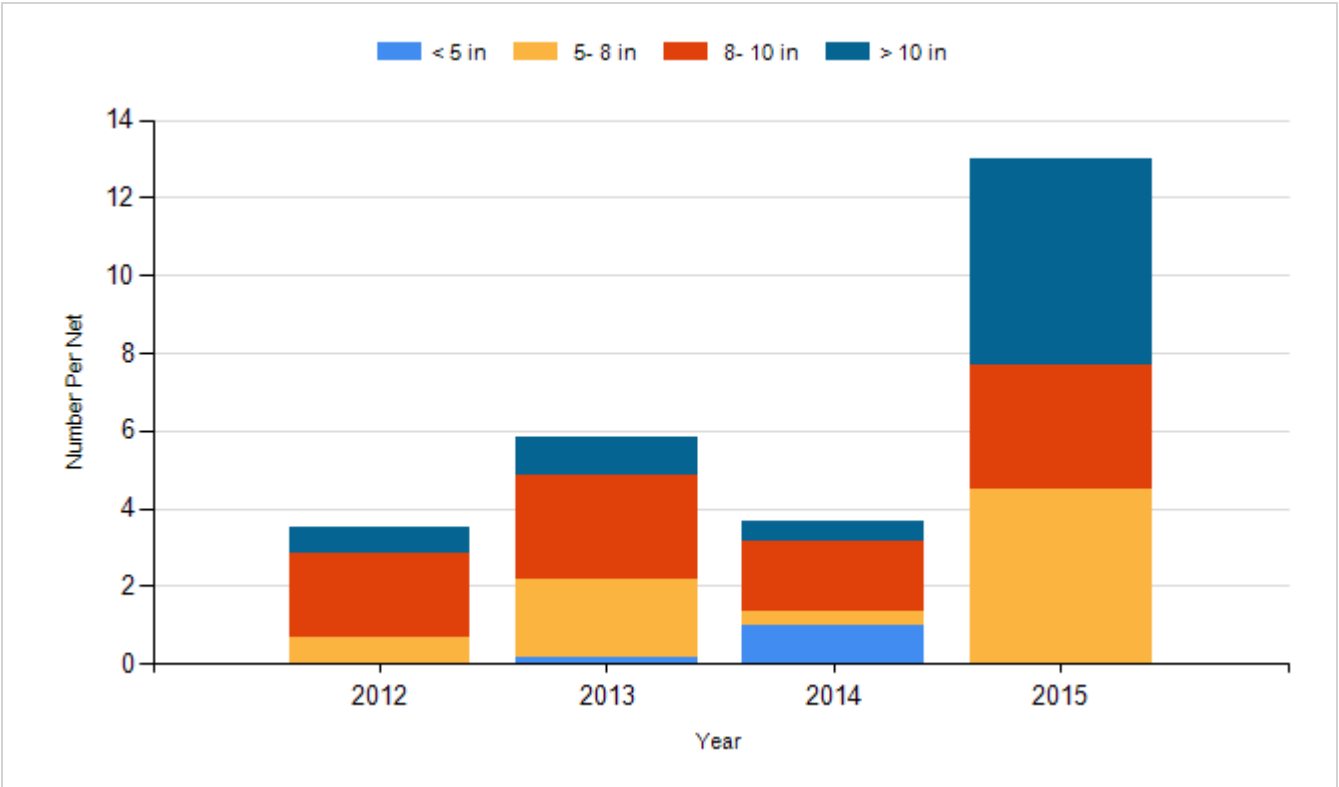
Species: White Bass
Gear: std exp gill net



Species: 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	Fry	2,400,000
2014	Walleye	Fry	2,500,000
2016	Walleye	Fry	2,400,000
2017	Walleye	Fry	2,400,000
2018	Walleye	Fry	2,400,000
2019	Walleye	Fry	2,400,000
2021	Walleye	Fry	2,400,000
2022	Walleye	Fry	2,500,000
2023	Walleye	Fry	5,100,000

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Kampeska, Codington County
UBS-Lake-171-000
2023

Lake Information

Name:	Kampeska	**Maximum Depth:**	16 Feet
County:	Codington	**Mean Depth:**	7 Feet
		OHWM Elevation:	1,718
Surface Area:	4,987 Acres	**Outlet Elevation:**	1,718

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 18, 2023	4 net-nights
AFS std gill net	Jul 19, 2023	4 net-nights
AFS std gill net	Jul 20, 2023	4 net-nights
fall night EF-WAE	Sep 19, 2023	3000 seconds
frame net (std 3/4 in)	Jul 18, 2023	7 net-nights
frame net (std 3/4 in)	Jul 19, 2023	7 net-nights
frame net (std 3/4 in)	Jul 20, 2023	4 net-nights

Common Fish Species Present

Walleye

Smallmouth Bass

Black Crappie

White Crappie

Bigmouth Buffalo

Yellow Perch

Channel Catfish

Bluegill

Yellow Bullhead

White 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.
- s**td experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

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

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

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

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

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (W) compared to a length-specific standard weight (Ws) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

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

Confidence intervals (**CI**) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (**S**), quality (**Q**), preferred (**P**), memorable (**M**) and trophy (**T**). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
Walleye	10	25	15	38	20	51	25	63	30	76
White Bass	6	15	9	23	12	30	15	38	18	46
White Crappie	5	13	8	20	10	25	12	30	15	38
Yellow Bullhead	4	10	7	18	9	23	11	28	14	36
Yellow Perch	5	13	8	20	10	25	12	30	15	38

Catch Summary of Stock Length Fish

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

*** Methods/Species that ignore stock length**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Bigmouth Buffalo	18	1.5	0.8	94		0		89	2
	Channel Catfish	28	2.3	1.3	96		0		110	3
	Common Carp	3	0.3	0.2	100		100		96	2
	Northern Pike	7	0.6	0.4	100		71		71	3
	Rock Bass	1	0.1	0.1	100		100		116	
	Shorthead Redhorse	2	0.2	0.2	100		100		110	7
	Smallmouth Bass	9	0.8	0.4	78		11		92	2
	Walleye	38	2.8	0.6	21	11	9		85	2
	White Bass	12	1.0	0.3	100		83		89	2
	White Crappie	2	0.2	0.2	100		0		99	3
	White Sucker	1	0.1	0.1	100		100		94	
	Yellow Bullhead	1	0.1	0.1	100		100		97	
	Yellow Perch	53	4.4	1.6	74	9	23	9	106	1
frame net (std 3/4 in)	Bigmouth Buffalo	100	5.6	2.6	100		12	5	91	1
	Black Bullhead	2	0.1	0.1	100		100		88	3
	Bluegill	23	1.3	0.4	87		74	15	118	5
	Channel Catfish	1	0.1	0.1	100		100		112	
	Common Carp	3	0.2	0.1	100		100		92	8
	Northern Pike	9	0.5	0.2	78		44		74	5
	Rock Bass	1	0.1	0.1	100		100		116	
	Smallmouth Bass	68	2.7	1.1	45	11	16	8	97	2
	Walleye	6	0.3	0.2	50		17		83	2
	White Bass	8	0.4	0.3	100		100		86	2
	White Sucker	3	0.2	0.1	100		100		98	1
	Yellow Bullhead	21	1.2	0.4	100		100		101	3
	Yellow Perch	2	0.1	0.1	100		50		97	

10-Year Catch Per Unit Effort by Gear and Species

Catch per unit effort (CPUE) and average (Avg) of species across 10 years using different gear types.

*** Methods/Species that ignore stock length**

		CPUE										
Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
AFS std frame net	Bigmouth Buffalo				0.6							0.60
	Black Bullhead				0.7							0.70
	Black Crappie				1.2							1.20
	Bluegill				0.5							0.50
	Channel Catfish				0.1							0.10
	Common Carp				0.1							0.10
	Northern Pike				0.2							0.20
	Smallmouth Bass				0.4							0.40
	Walleye				0.1							0.10
	White Bass				3.1							3.10
	White Crappie				0.1							0.10
	Yellow Bullhead				1.6							1.60
	Yellow Perch				0.1							0.10
AFS std gill net	Bigmouth Buffalo			0.0	0.0	8.3	5.6		6.1	3.6	1.5	3.59
	Black Bullhead			0.4	0.4	0.3	0.0		0.8	0.0	0.0	0.27
	Black Crappie			0.0	0.1	0.0	0.0		0.1	0.0	0.0	0.03
	Bluegill			0.0	0.1	0.0	0.0		0.0	0.1	0.0	0.03
	Channel Catfish			1.0	0.9	0.3	0.4		1.8	3.1	2.3	1.40
	Common Carp			0.1	0.0	0.3	0.6		0.1	0.0	0.3	0.20
	Northern Pike			0.5	0.2	0.7	0.8		0.9	0.6	0.6	0.61
	Rock Bass			0.0	0.0	0.0	0.0		0.0	0.1	0.1	0.03
	Shorthead Redhorse			0.2	0.0	0.1	0.2		0.0	0.0	0.2	0.10
	Smallmouth Bass			0.8	1.3	0.6	0.0		1.2	1.9	0.8	0.94
	Walleye			4.6	2.7	2.6	4.0		3.3	2.1	2.8	3.16
	White Bass			1.8	1.5	1.4	2.0		1.7	1.8	1.0	1.60
	White Crappie			1.1	0.5	0.2	2.6		0.9	0.6	0.2	0.87
	White Sucker			0.6	0.6	0.8	0.3		0.0	0.4	0.1	0.40
	Yellow Bullhead			1.1	0.7	0.6	0.3		6.6	0.3	0.1	1.39
	Yellow Perch			5.3	5.3	3.3	4.3		2.3	4.7	4.4	4.23
boat shocker (day)	Smallmouth Bass						97.0					97.00
boat shocker (night)	Walleye*	179.0	7.0	7.0	41.0							58.50
boat shocker (night, DC)	Smallmouth Bass	171.0		159.8								165.40

		CPUE										
Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
fall night EF-WAE*	Walleye					75.0	54.2		36.6		126.0	72.95
frame net (std 3/4 in)	Bigmouth Buffalo	0.4									5.6	3.00
	Black Bullhead	15.5									0.1	7.80
	Black Crappie	0.5									0.0	0.25
	Bluegill	1.4									1.3	1.35
	Channel Catfish	0.0									0.1	0.05
	Common Carp	0.1									0.2	0.15
	Northern Pike	0.2									0.5	0.35
	Rock Bass	0.0									0.1	0.05
	Shorthead Redhorse	0.0									0.0	0.00
	Smallmouth Bass	0.5									2.7	1.60
	Walleye	0.6									0.3	0.45
	White Bass	3.0									0.4	1.70
	White Crappie	0.7									0.0	0.35
	White Sucker	0.5									0.2	0.35
	Yellow Bullhead	3.9									1.2	2.55
	Yellow Perch	0.1									0.1	0.10
std exp gill net	Black Bullhead	1.8	2.3									2.05
	Channel Catfish	0.7	0.2									0.45
	Common Carp	0.3	0.0									0.15
	Northern Pike	0.2	1.0									0.60
	Shorthead Redhorse	0.0	0.3									0.15
	Smallmouth Bass	0.0	1.2									0.60
	Walleye	9.3	11.5									10.40
	White Bass	3.8	4.7									4.25
	White Crappie	1.3	0.3									0.80
	White Sucker	1.8	2.2									2.00
	Yellow Bullhead	1.5	0.8									1.15
	Yellow Perch	2.7	13.0									7.85

10-Year Size Structure and Condition Statistics by Gear and Species

Species proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) collected by different gear types across 10 years.

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std frame net	Bigmouth Buffalo	PSD				100						
		PSD-P				100						
	Black Crappie	PSD				65						
		PSD-P				17						
		Wr				104						
	Bluegill	PSD				89						
		PSD-P				78						
		Wr				126						
	Channel Catfish	PSD				100						
		PSD-P				100						
	Smallmouth Bass	PSD				57						
		PSD-P				0						
		Wr				93						
	Walleye	PSD				0						
		PSD-P				0						
		Wr				76						
	White Bass	PSD				100						
		PSD-P				87						
		Wr				79						
	White Crappie	PSD				100						
		PSD-P				100						
		Wr				82						
	Yellow Bullhead	PSD				100						
		PSD-P				100						
		Wr				98						
	Yellow Perch	PSD				100						
		PSD-P				0						
		Wr				86						
AFS std gill net	Bigmouth Buffalo	PSD					3	27		81	77	94
		PSD-P					1	0		5	2	0
		Wr					89	90		89	87	89
	Black Crappie	PSD				100				100		
		PSD-P				100				100		

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std gill net	Black Crappie	Wr				73				99		
	Bluegill	PSD				100					100	
		PSD-P				100					0	
		Wr				104					117	
	Channel Catfish	PSD			100	100	100	100		33	92	96
		PSD-P			42	70	67	80		0	0	0
		Wr			101	100	112	114		95	107	110
	Smallmouth Bass	PSD			33	57	100			71	74	78
		PSD-P			0	21	14			14	9	11
		Wr			88	90	88			85	86	92
	Walleye	PSD			18	7	3	69		51	40	21
		PSD-P			2	3	0	2		3	0	9
		Wr			79	75	85	88		84	81	85
	White Bass	PSD			48	94	100	92		90	100	100
		PSD-P			48	50	88	92		80	81	83
		Wr			86	80	88	85		87	81	89
	White Crappie	PSD			100	100	100	6		100	100	100
		PSD-P			100	100	100	6		18	14	0
		Wr			90	91	97	112		93	94	99
	Yellow Bullhead	PSD			100	100	100	100		100	100	100
		PSD-P			100	100	100	100		99	100	100
		Wr			94	100	95	97		97	98	97
	Yellow Perch	PSD			90	97	92	81		96	68	74
		PSD-P			40	48	67	73		26	14	23
		Wr			108	109	105	100		99	106	106
boat shocker (day)	Smallmouth Bass	PSD						66				
		PSD-P						13				
		Wr						90				
boat shocker (night)	Walleye	PSD	0	0	0	0						
		PSD-P	0	0	0	0						
		Wr	89	91	92	90						
boat shocker (night, DC)	Smallmouth Bass	PSD	87		61							
		PSD-P	15		18							
		Wr	98		96							
frame net (std 3/4 in)	Bigmouth Buffalo	PSD	100									100
		PSD-P	56									12

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
frame net (std 3/4 in)	Bigmouth Buffalo	Wr										91
	Black Crappie	PSD	91									
		PSD-P	55									
		Wr	100									
	Bluegill	PSD	97									87
		PSD-P	73									74
		Wr	120									118
	Channel Catfish	PSD										100
		PSD-P										100
		Wr										112
	Smallmouth Bass	PSD	64									45
		PSD-P	9									16
		Wr	91									97
	Walleye	PSD	17									50
		PSD-P	0									17
		Wr	76									83
	White Bass	PSD	100									100
		PSD-P	97									100
		Wr	78									86
	White Crappie	PSD	100									
		PSD-P	67									
		Wr	91									
	Yellow Bullhead	PSD	100									100
		PSD-P	96									100
		Wr	94									101
	Yellow Perch	PSD	100									100
		PSD-P	50									50
		Wr	97									97
std exp gill net	Channel Catfish	PSD	75	100								
		PSD-P	50	100								
		Wr	101	102								
	Smallmouth Bass	PSD		71								
		PSD-P		14								
		Wr		89								
	Walleye	PSD	25	12								
		PSD-P	0	1								
		Wr	78	82								

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
std exp gill net	White Bass	PSD	100	96								
		PSD-P	87	93								
		Wr	81	84								
	White Crappie	PSD	100	100								
		PSD-P	38	50								
		Wr	97	94								
	Yellow Bullhead	PSD	100	100								
		PSD-P	100	100								
		Wr	94	111								
	Yellow Perch	PSD	88	65								
		PSD-P	19	41								
		Wr	107	109								

Length at Capture

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

Species: Smallmouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	91		196 (20)	248 (10)	284 (24)	333 (28)	339 (10)	384 (1)			
2016	160		196 (5)	256 (45)	278 (24)	310 (32)	337 (26)	341 (20)	386 (2)	414 (5)	
2014	171			279 (41)	315 (51)	322 (28)	318 (29)	363 (7)	361 (6)	414 (8)	

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	38	193 (2)	258 (18)	329 (8)	371 (4)	463 (2)				598 (1)	539 (3)
2022	26	222 (1)	296 (8)	376 (9)	418 (3)	446 (1)			462 (3)	466 (1)	
2021	40	217 (1)	326 (8)	384 (24)	490 (1)	474 (1)		503 (2)	466 (3)		
2019	67	211 (20)	348 (8)	396 (1)	367 (2)	410 (23)	426 (6)	446 (1)	463 (6)		
2018	38	232 (7)		324 (2)	319 (14)	325 (10)	354 (2)	367 (2)			
2017	30			276 (12)	313 (10)		359 (7)			659 (1)	
2016	58	205 (1)	260 (14)	305 (19)		365 (20)		480 (1)	608 (1)	404 (1)	432 (1)
2015	88	198 (17)	264 (35)		334 (29)	351 (2)	555 (1)	432 (2)	422 (1)	414 (1)	
2014	62	193 (5)	223 (1)	305 (39)	353 (4)	382 (2)	418 (7)	427 (3)		457 (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+
2023	53	142 (7)	198 (11)	220 (19)	232 (1)	260 (13)	293 (2)				
2022	56		184 (16)	203 (6)	241 (33)			316 (1)			
2021	27		191 (2)	219 (16)	242 (3)	282 (1)	291 (3)		299 (2)		
2019	53	120 (1)	187 (13)	234 (1)	278 (17)		294 (13)	293 (1)	304 (4)	313 (1)	304 (2)
2018	38	138 (2)	214 (2)	249 (14)	274 (4)	271 (13)	287 (3)				307 (1)
2017	58	138 (1)	215 (22)	237 (4)	264 (22)	303 (5)	289 (3)	256 (1)			
2016	63	142 (3)	187 (3)	234 (31)		274 (11)	277 (11)	279 (3)	255 (1)		

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	78		191 (33)	242 (7)	253 (22)	261 (7)	270 (9)	296 (1)			
2014	22	119 (5)	160 (2)	219 (7)	235 (1)	255 (6)	235 (1)				

Fish Condition

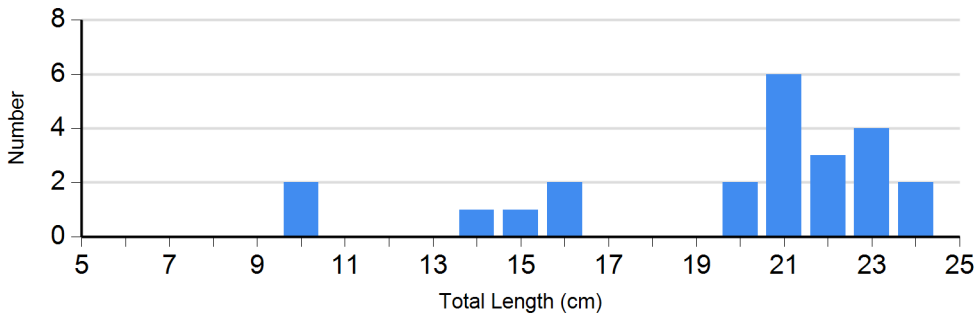
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2023	3	110 (4.5)	3	143 (4.9)	17	113 (3.3)	0	
Channel Catfish Gill Net	2019	0		1	132	4	110 (3.9)	0	
	2021	14	97 (2.1)	7	90 (3.0)	0		0	
	2022	3	103 (0.7)	34	107 (2.2)	0		0	
	2023	1	100	27	110 (2.4)	0		0	
Smallmouth Bass Electro Fishing	2019	33	97 (1.1)	51	86 (0.9)	13	86 (2.1)	0	
Walleye Gill Net	2019	15	88 (2.3)	32	89 (0.9)	1	86	0	
	2021	19	84 (1.1)	19	83 (0.7)	1	84	0	
	2022	15	82 (1.5)	10	79 (1.5)	0		0	
	2023	26	86 (1.2)	4	79 (1.5)	3	80 (4.1)	0	
White Bass Gill Net	2019	2	86 (4.0)	0		22	85 (1.2)	0	
	2021	2	96 (0.2)	2	89 (2.7)	15	85 (0.9)	1	84
	2022	0		4	90 (1.8)	17	79 (1.1)	0	
	2023	0		2	94 (5.5)	9	89 (1.2)	1	80
Yellow Perch Gill Net	2019	10	106 (2.5)	4	98 (3.1)	27	99 (1.5)	11	98 (1.5)
	2021	1	115	19	101 (1.3)	5	93 (3.2)	2	87 (4.6)
	2022	18	106 (1.6)	30	108 (1.0)	7	100 (2.3)	1	90
	2023	14	105 (1.9)	27	106 (1.0)	12	106 (2.0)	0	

Length Frequency Distribution

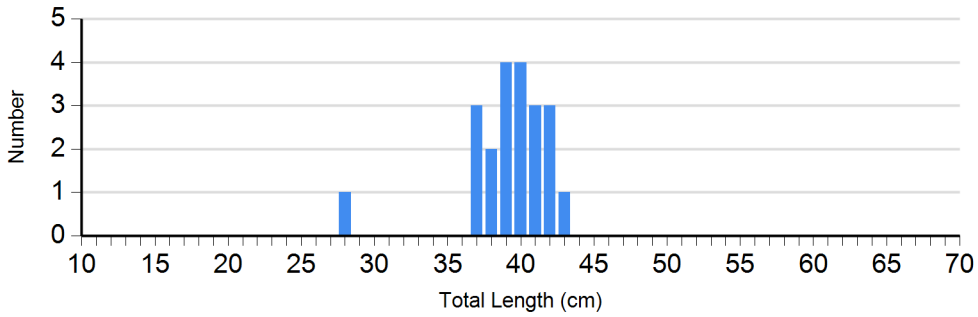
Length frequency histogram of species sampled by year.

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

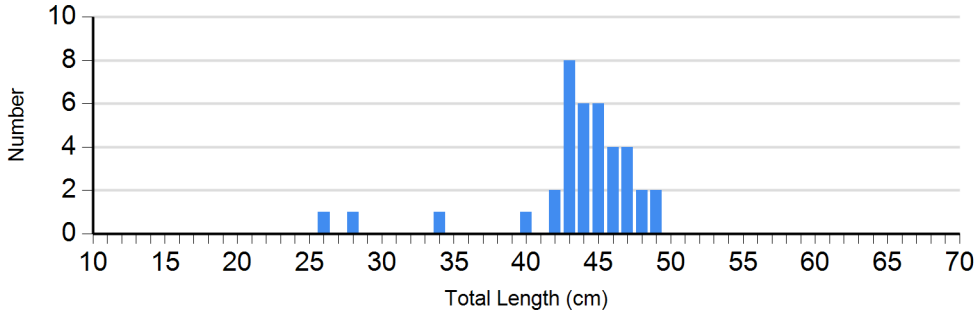


2023

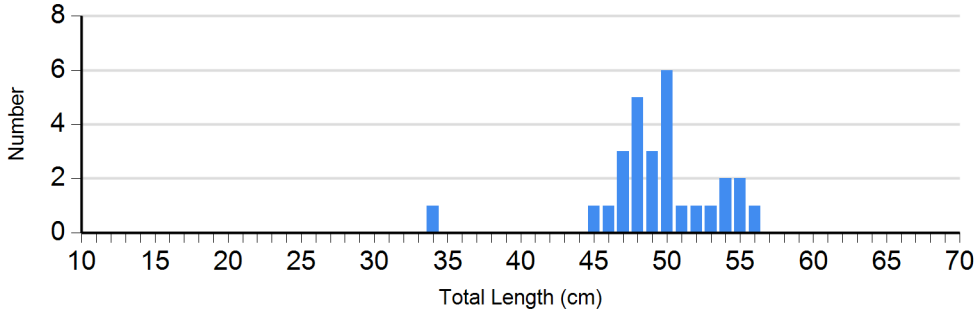
Species: Channel Catfish
Gear: AFS std gill net



2021

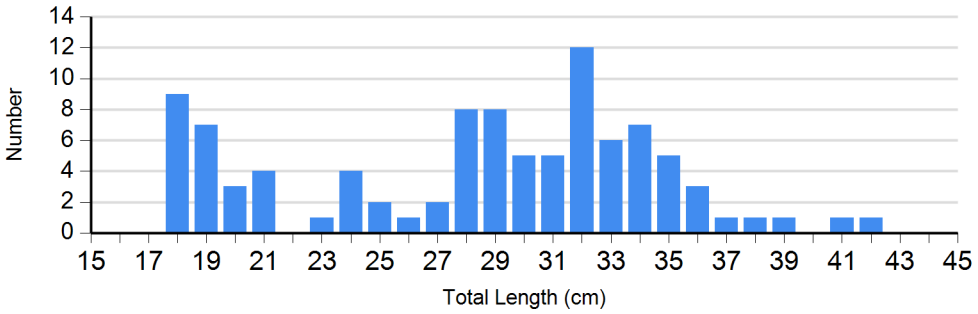


2022



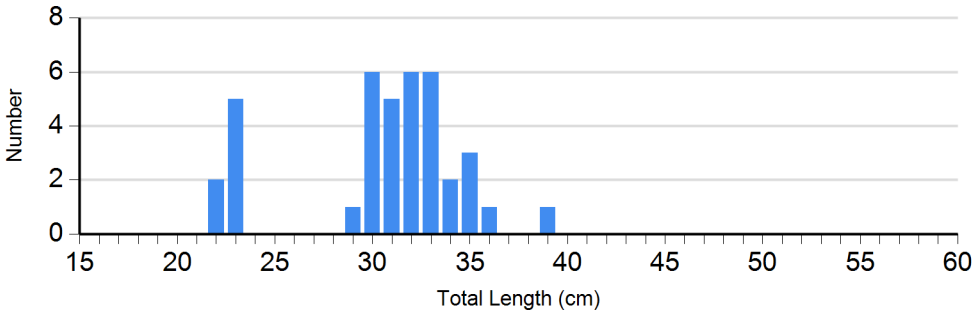
2023

Species: Smallmouth Bass
Gear: boat shocker (day)



2019

Species: Walleye
Gear: AFS std gill net



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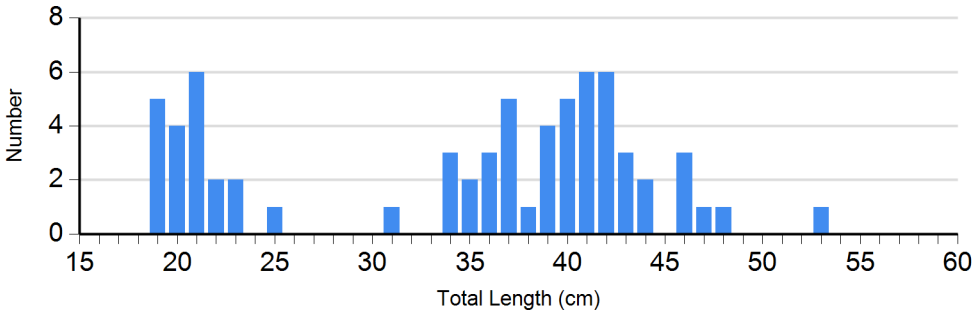
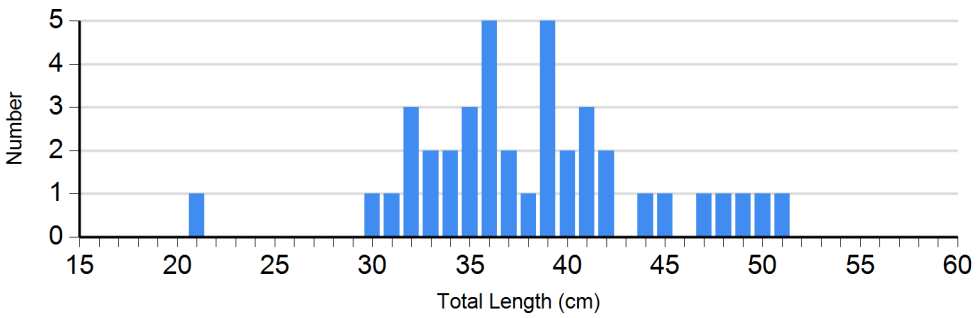


2019



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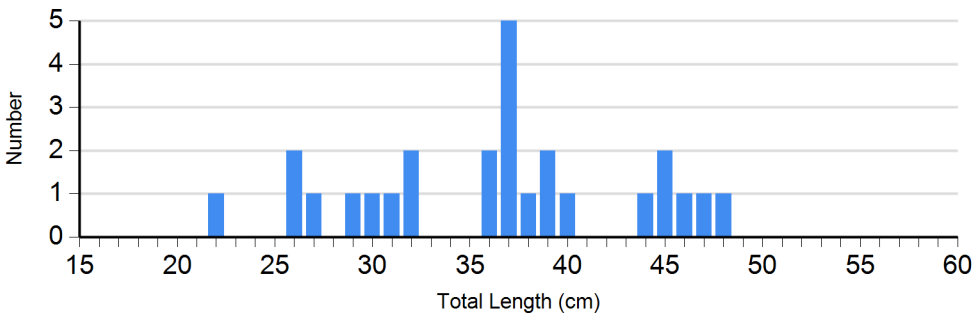

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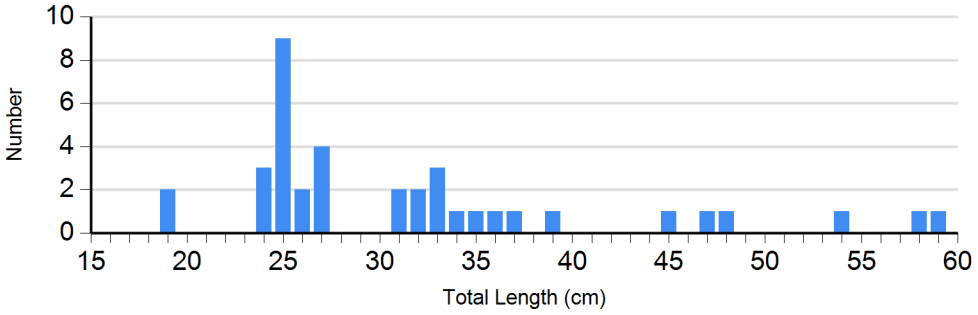
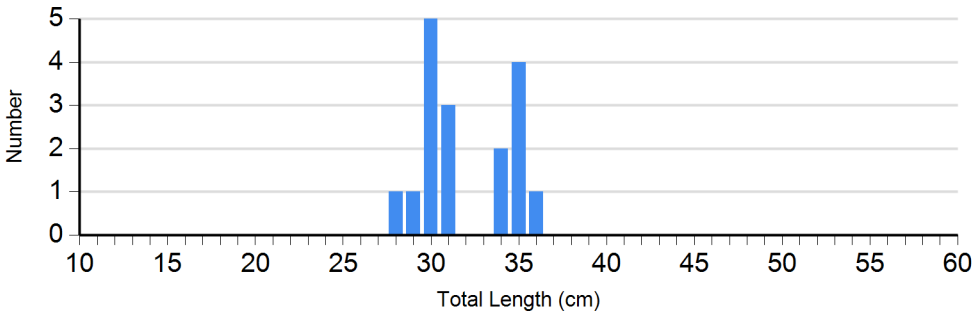
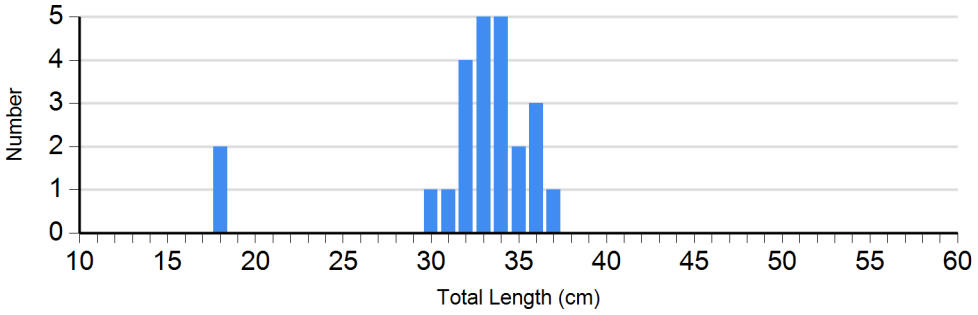


2023

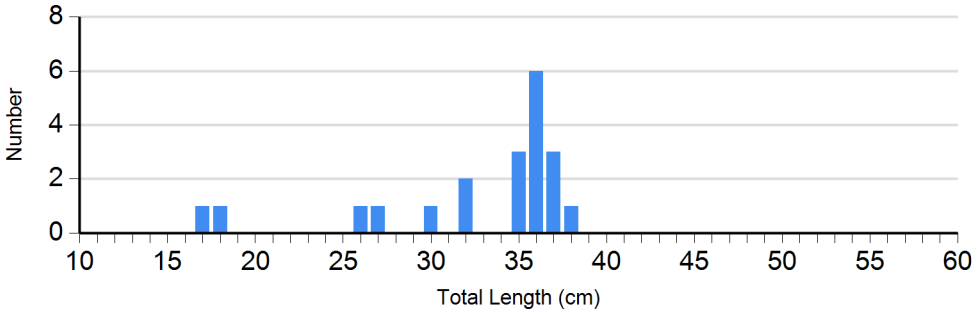
Species: White Bass
Gear: AFS std gill net



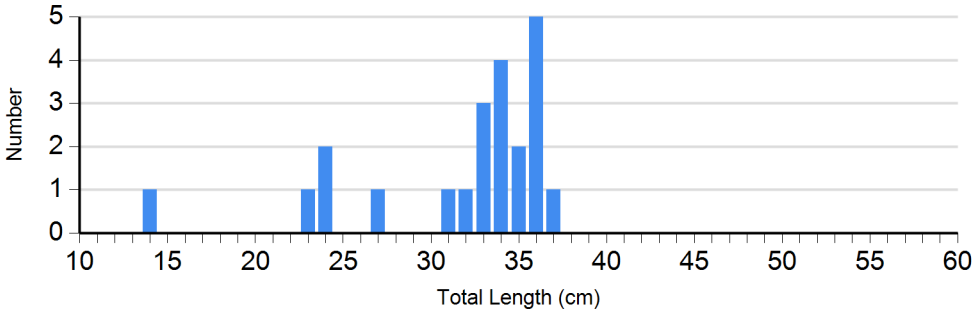
2018



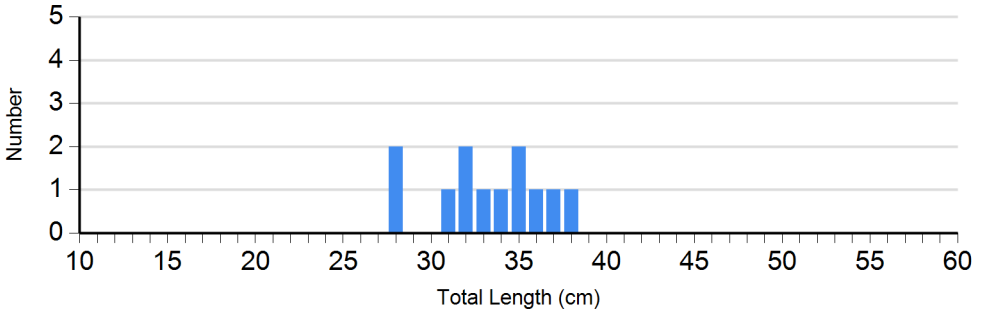
2019



2021

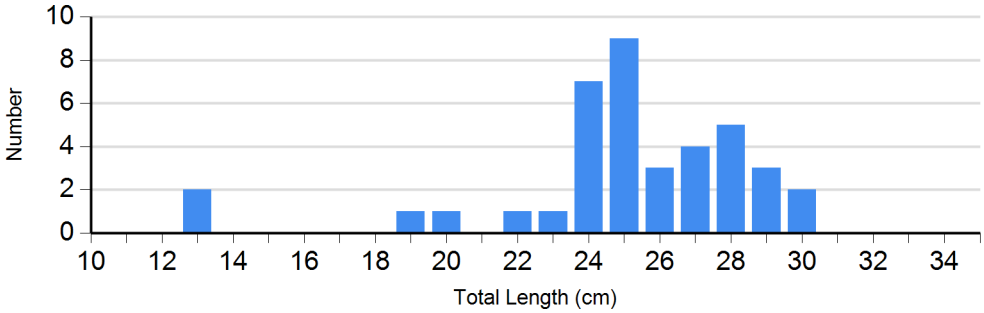


2022



2023

Species: Yellow Perch
Gear: AFS std gill net



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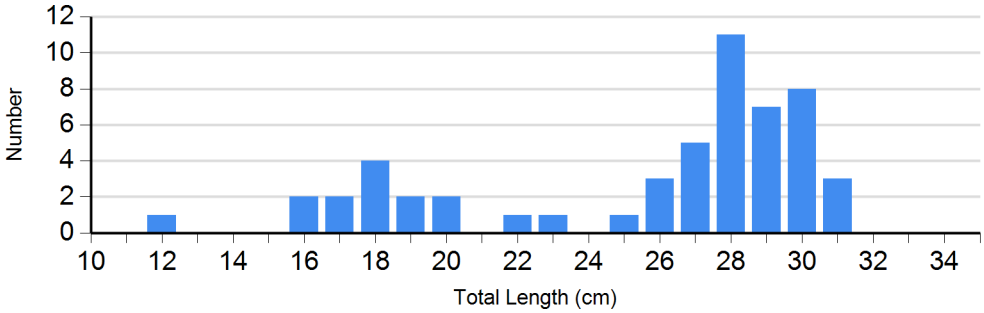
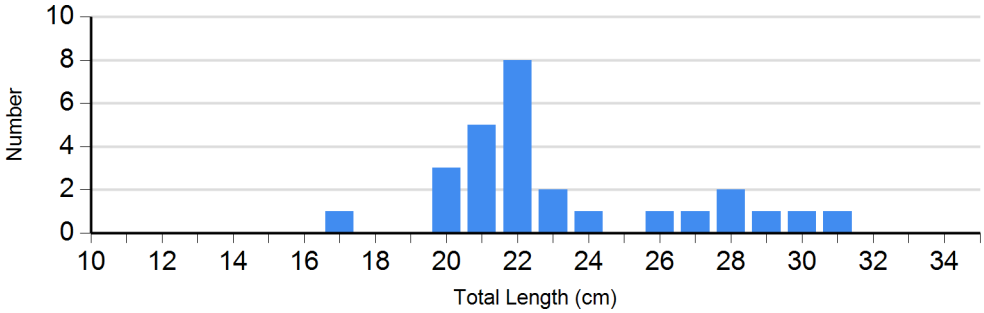
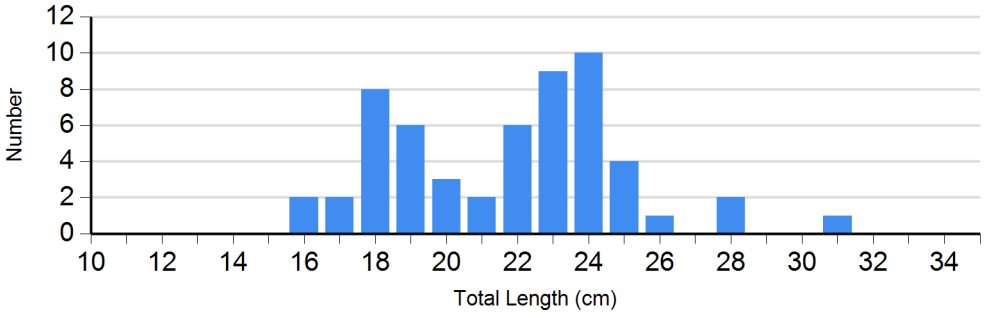


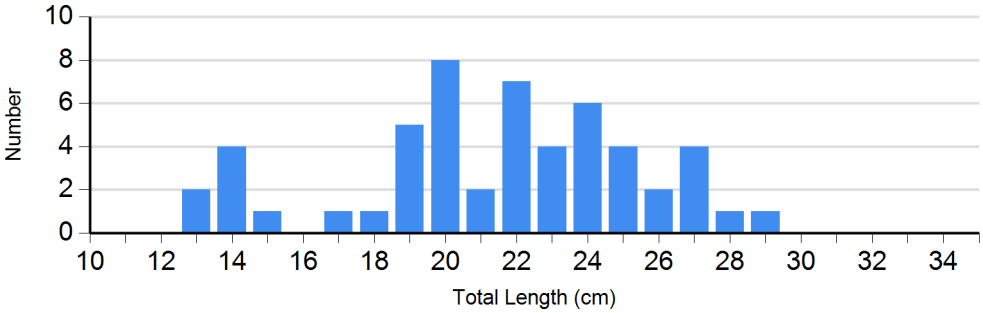
2019



2021



2022

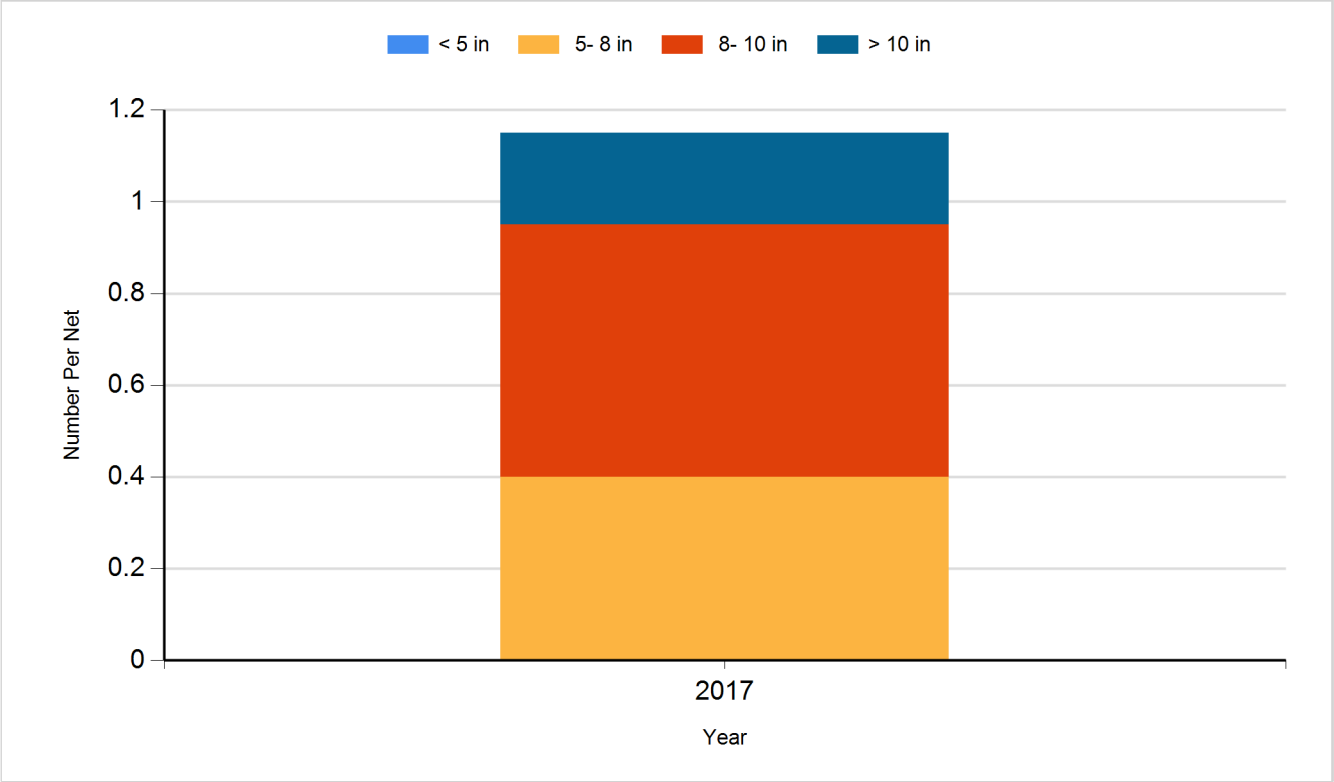

10
8
6
4
2
0
Number
10
12
14
16
18
20
22
24
26
28
30
32
34
Total Length (cm)

2023

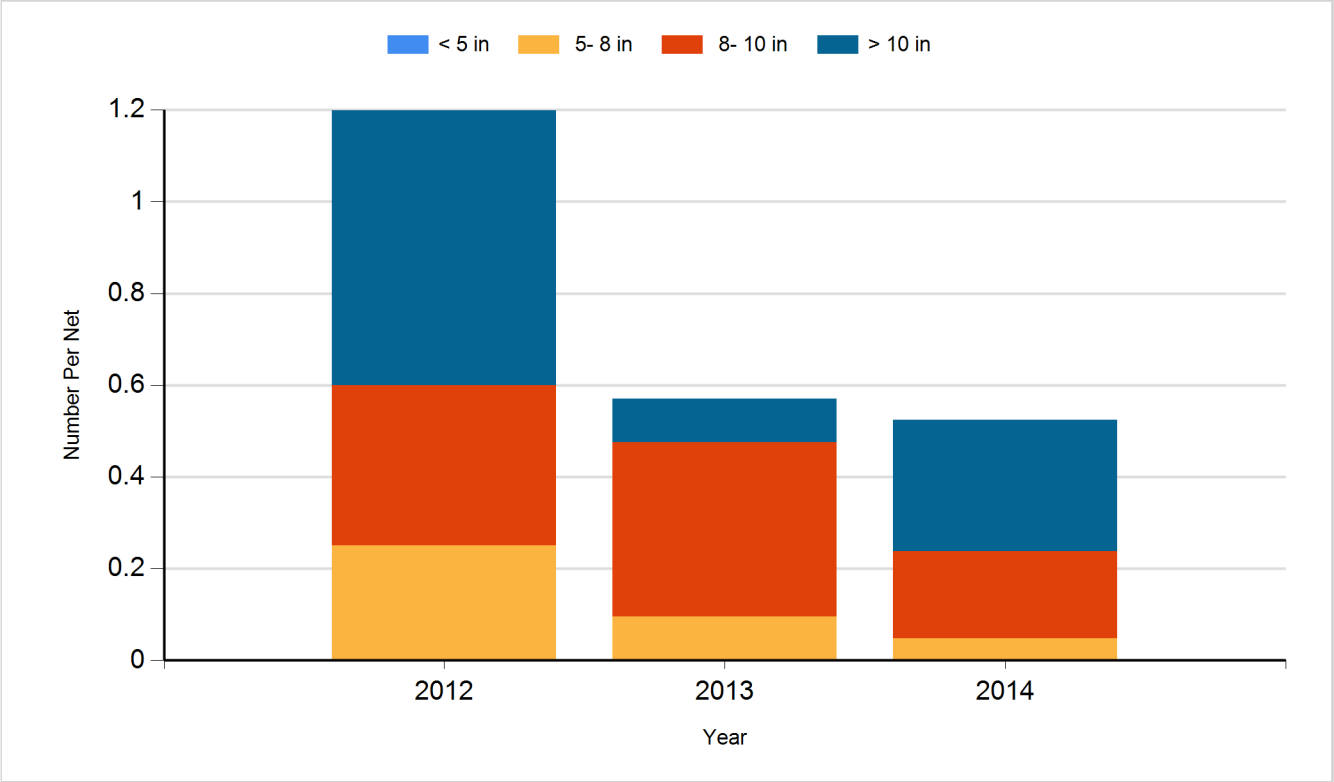
Historic Fish Sizes and Relative Abundance

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

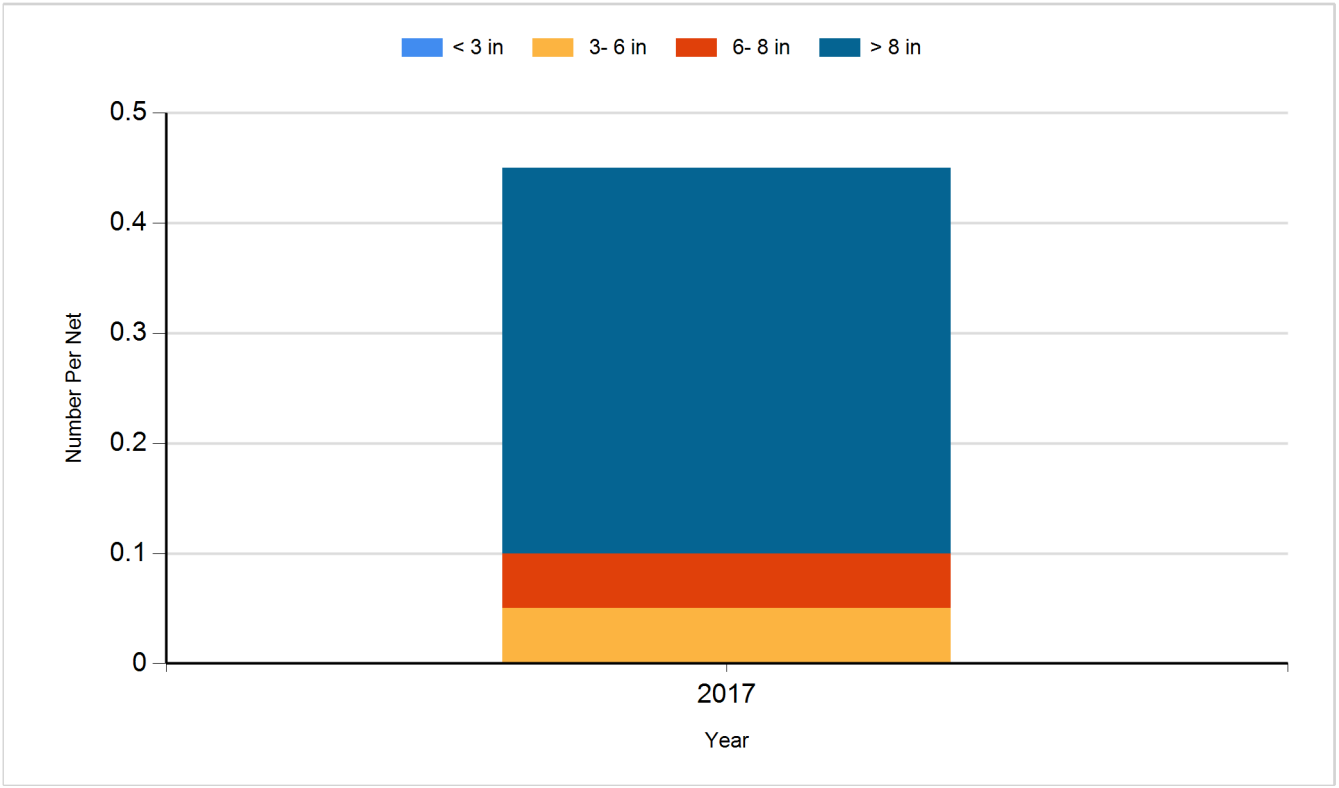
Species: Black Crappie
Gear: AFS std frame net



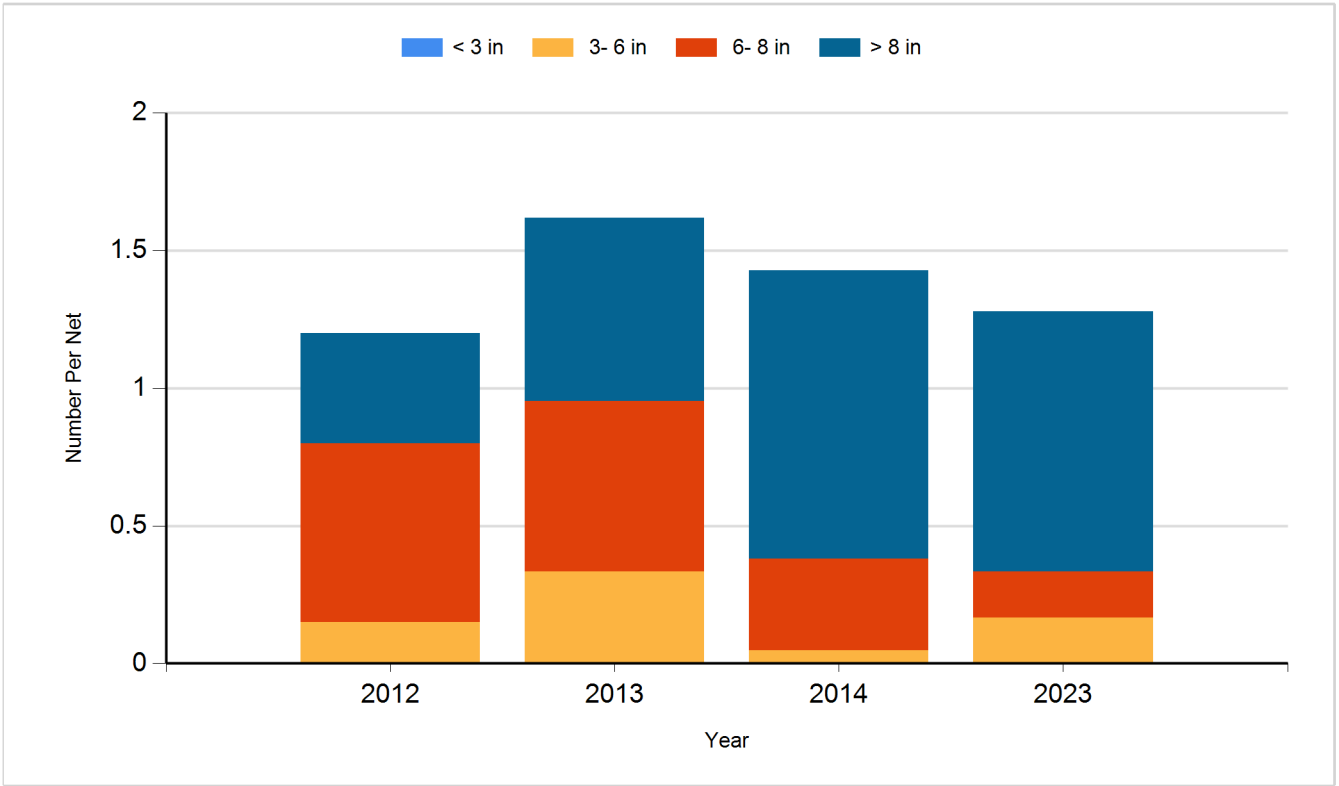
Species: Black Crappie
Gear: frame net (std 3/4 in)



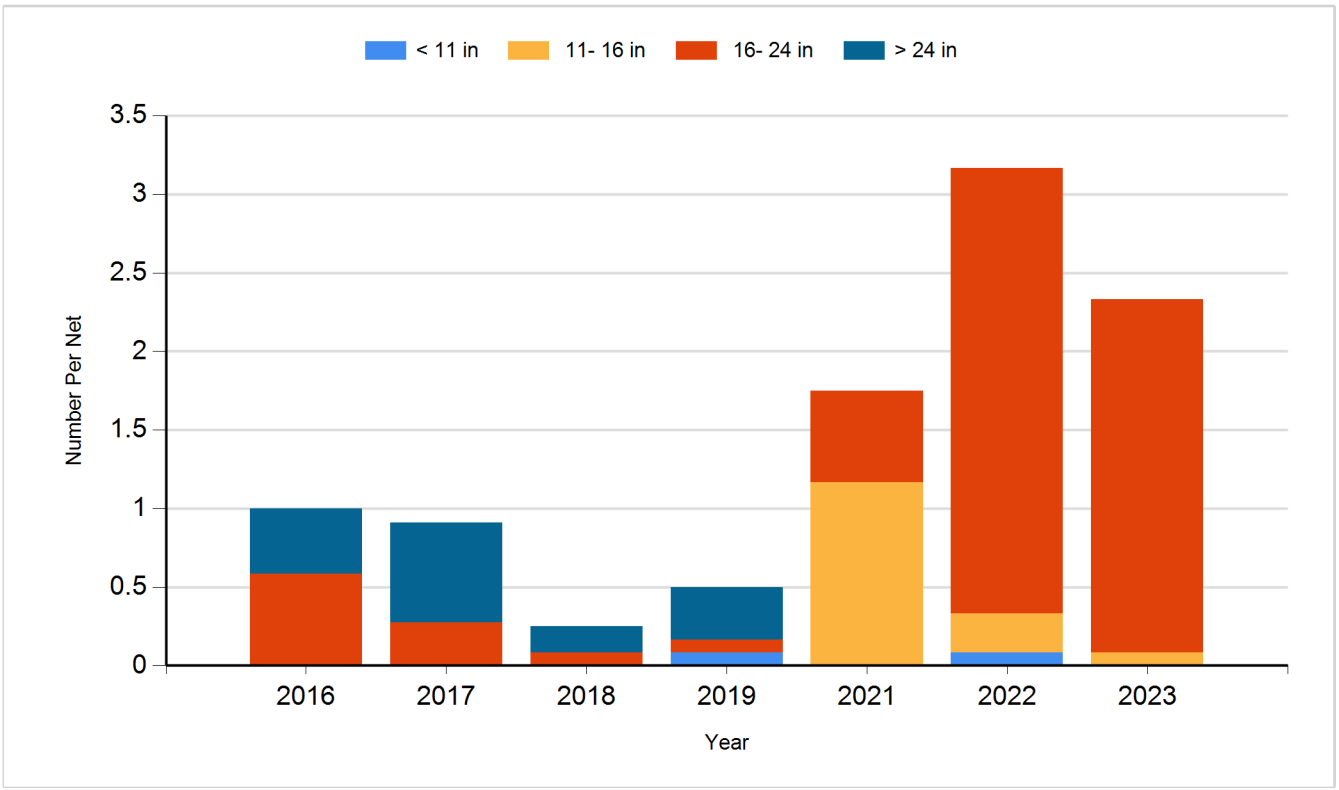
Species: Bluegill
Gear: AFS std frame net



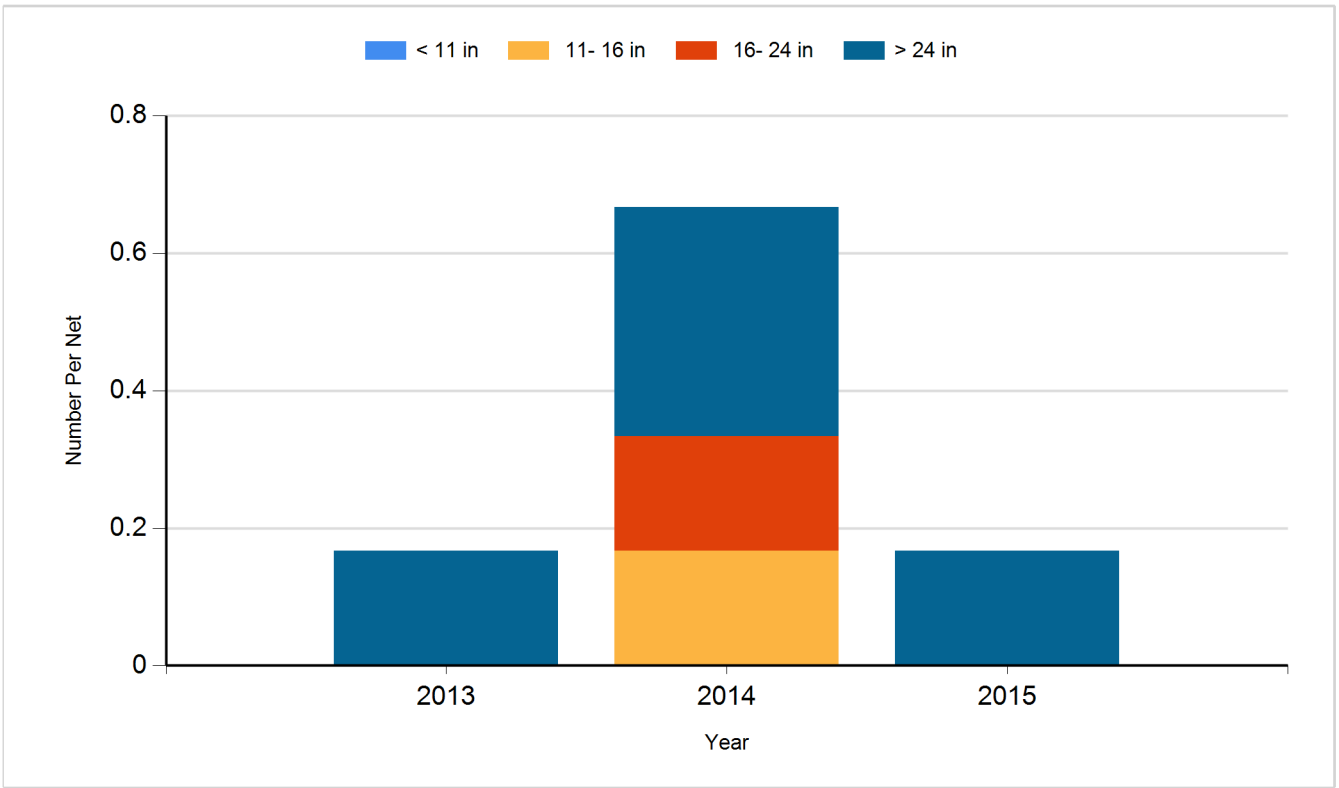
Species: Bluegill
Gear: frame net (std 3/4 in)



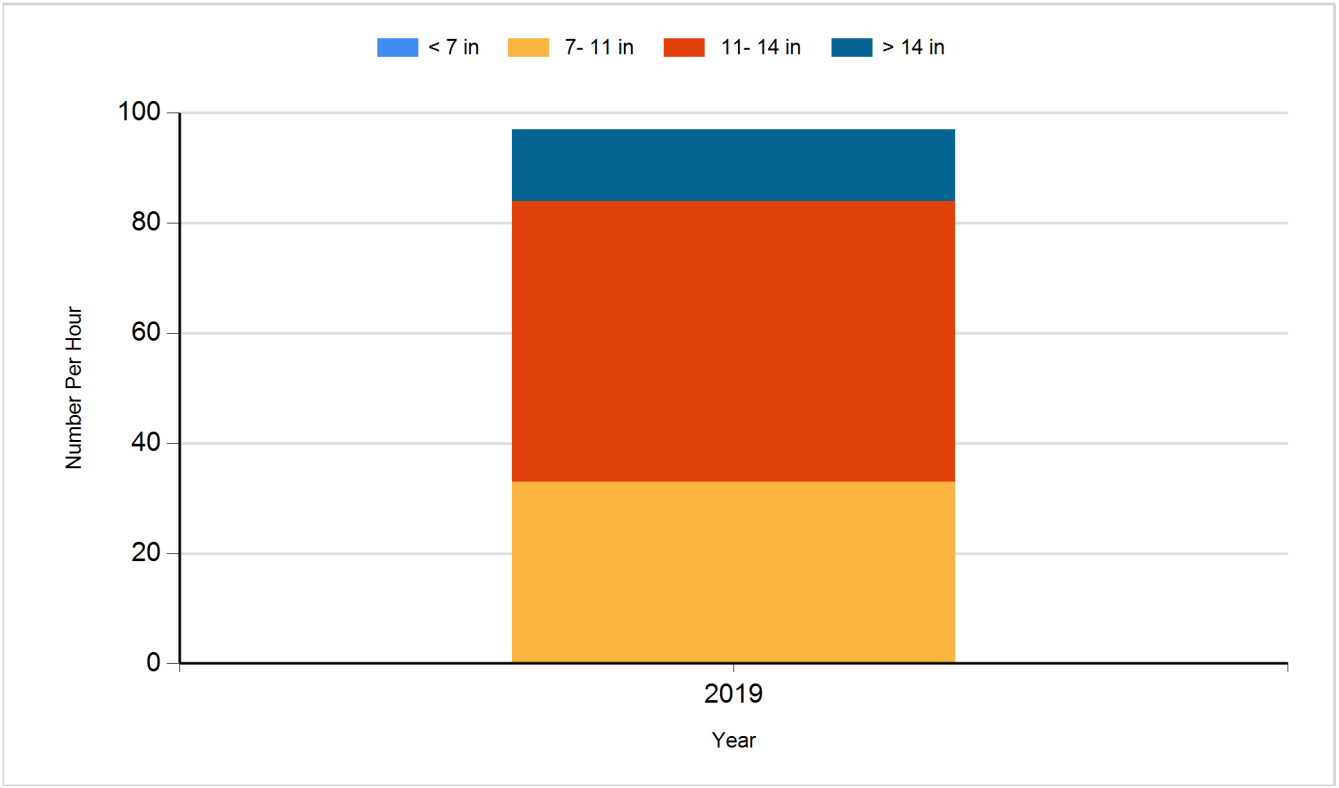
Species: Channel Catfish
Gear: AFS std gill net



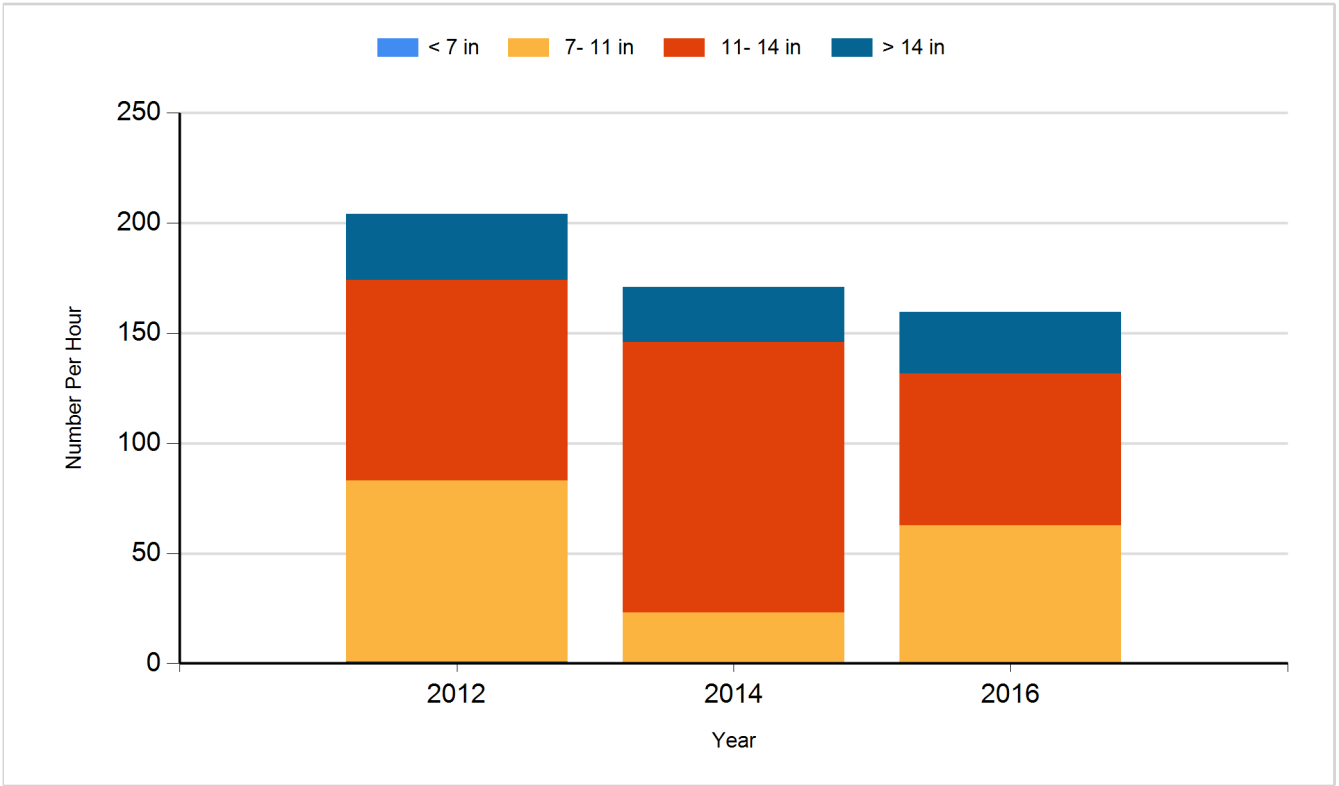
Species: Channel Catfish
Gear: std exp gill net



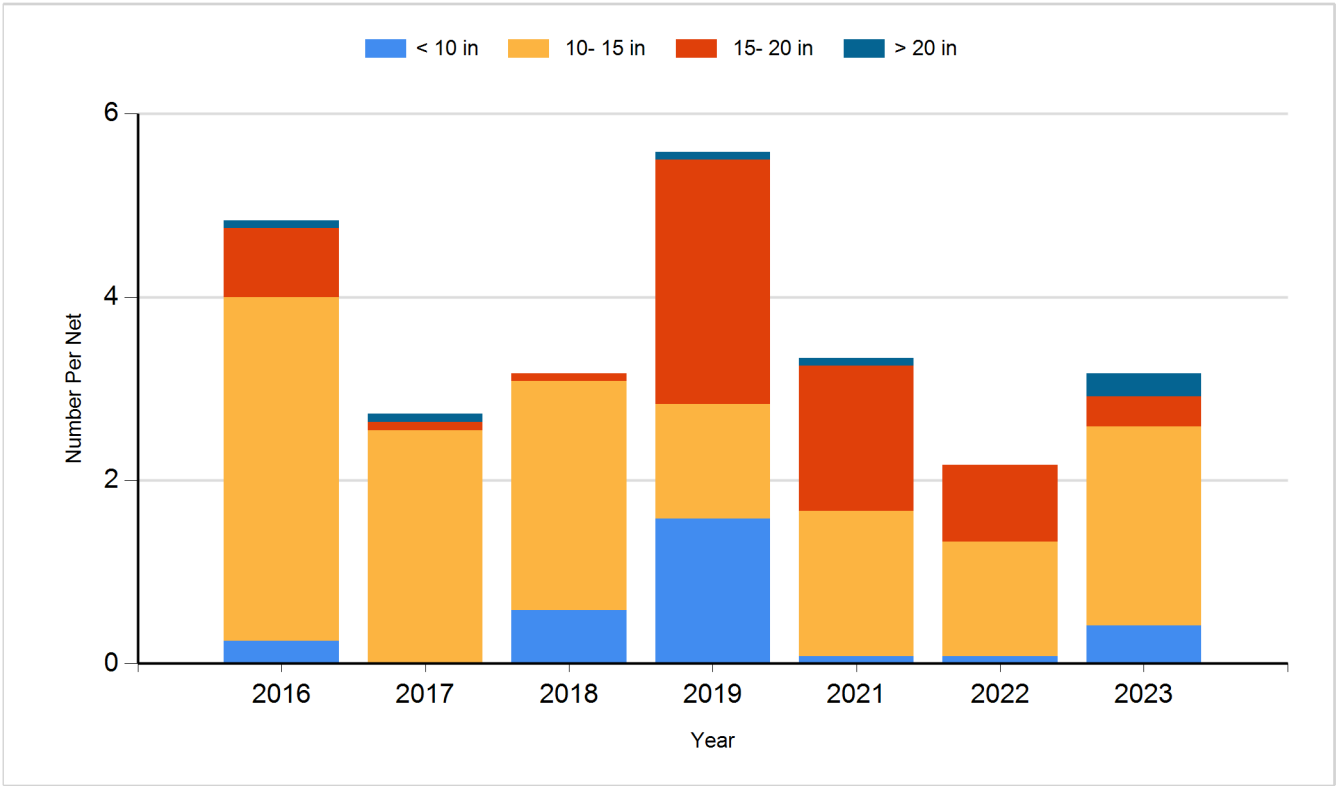
Species: Smallmouth Bass
Gear: boat shocker (day)



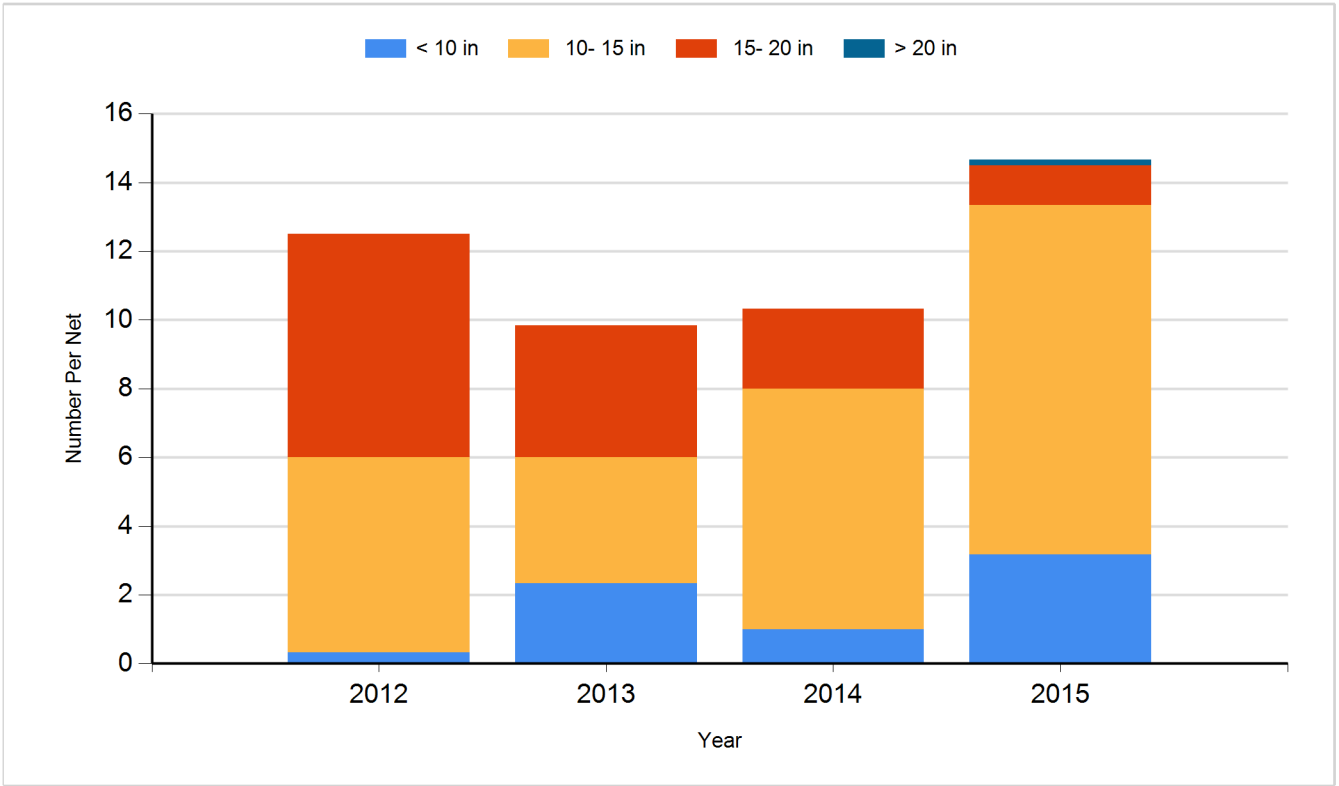
Species: Smallmouth Bass
Gear: boat shocker (night, DC)



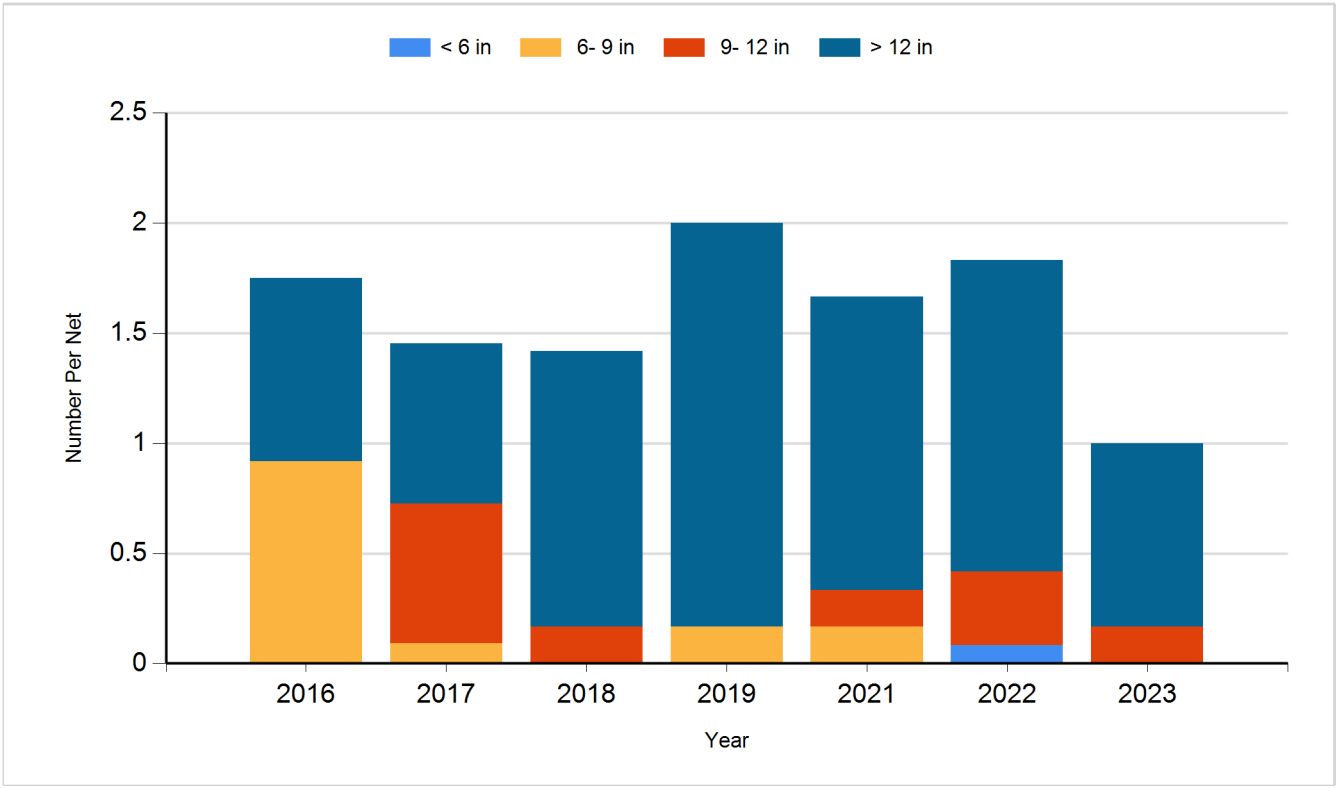
Species: Walleye
Gear: AFS std gill net



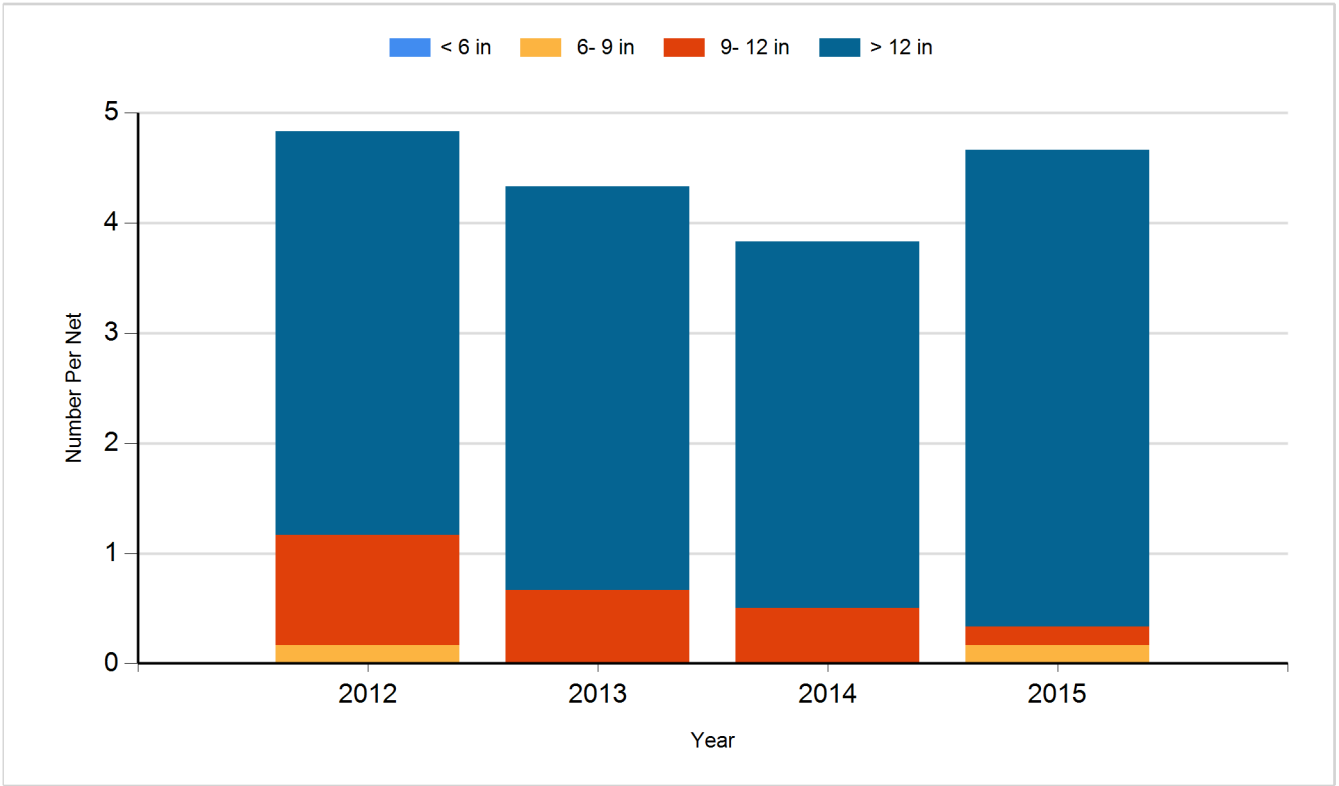
Species: Walleye
Gear: std exp gill net



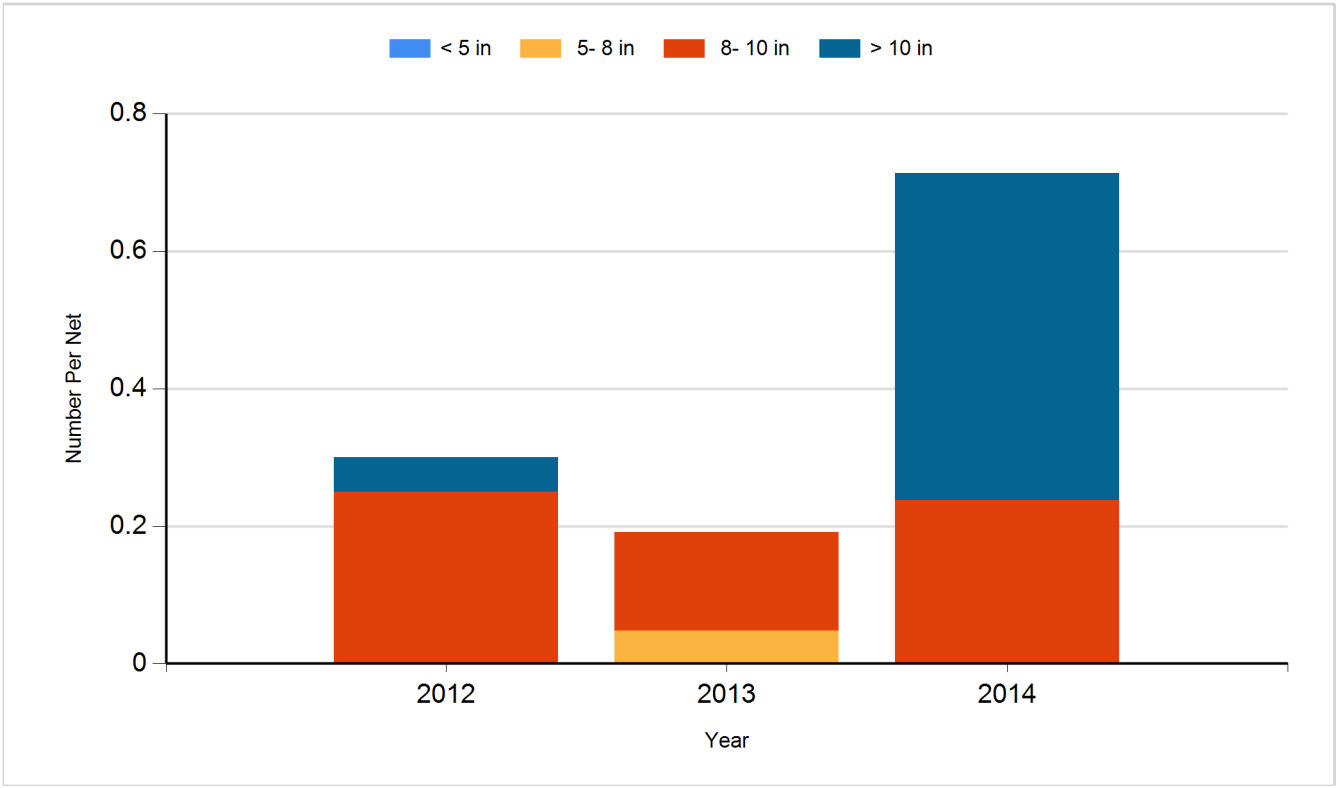
Species: White Bass
Gear: AFS std gill net



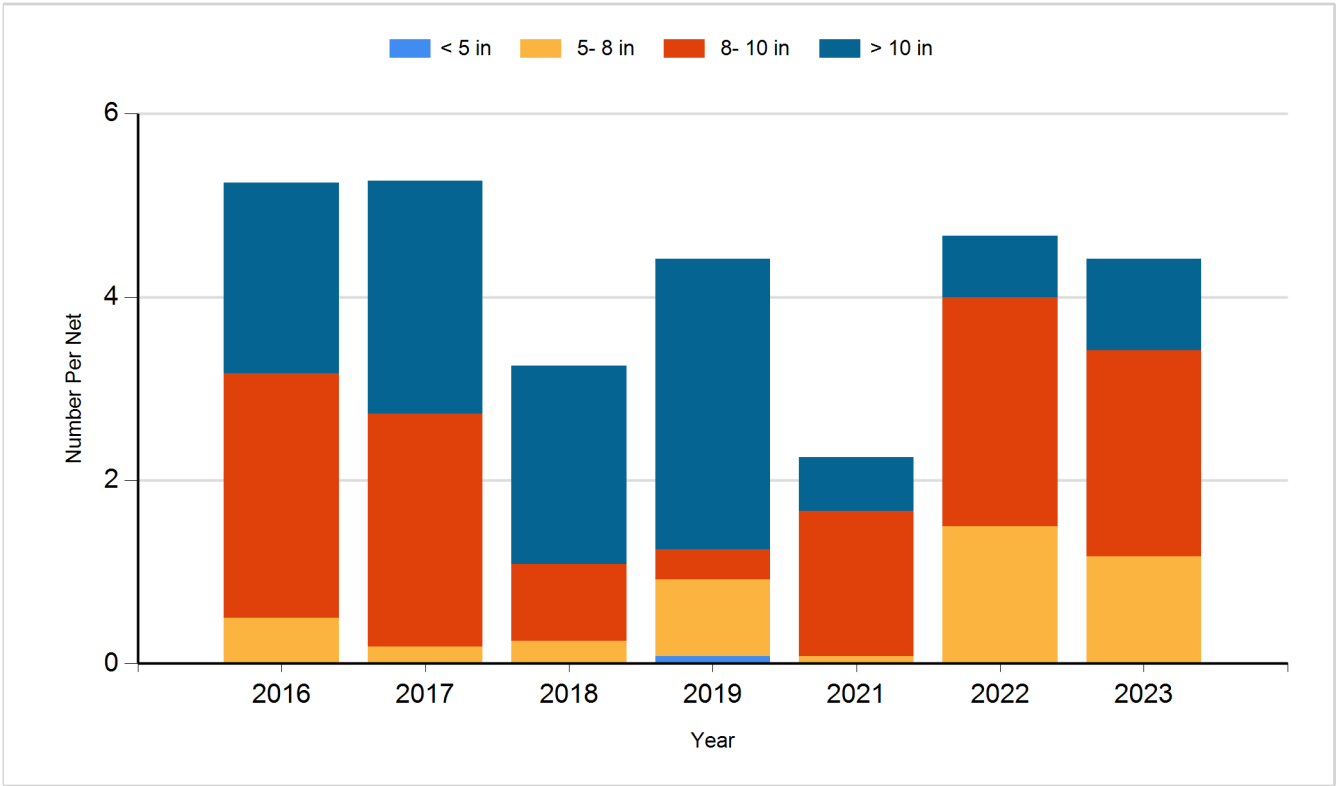
Species: White Bass
Gear: std exp gill net



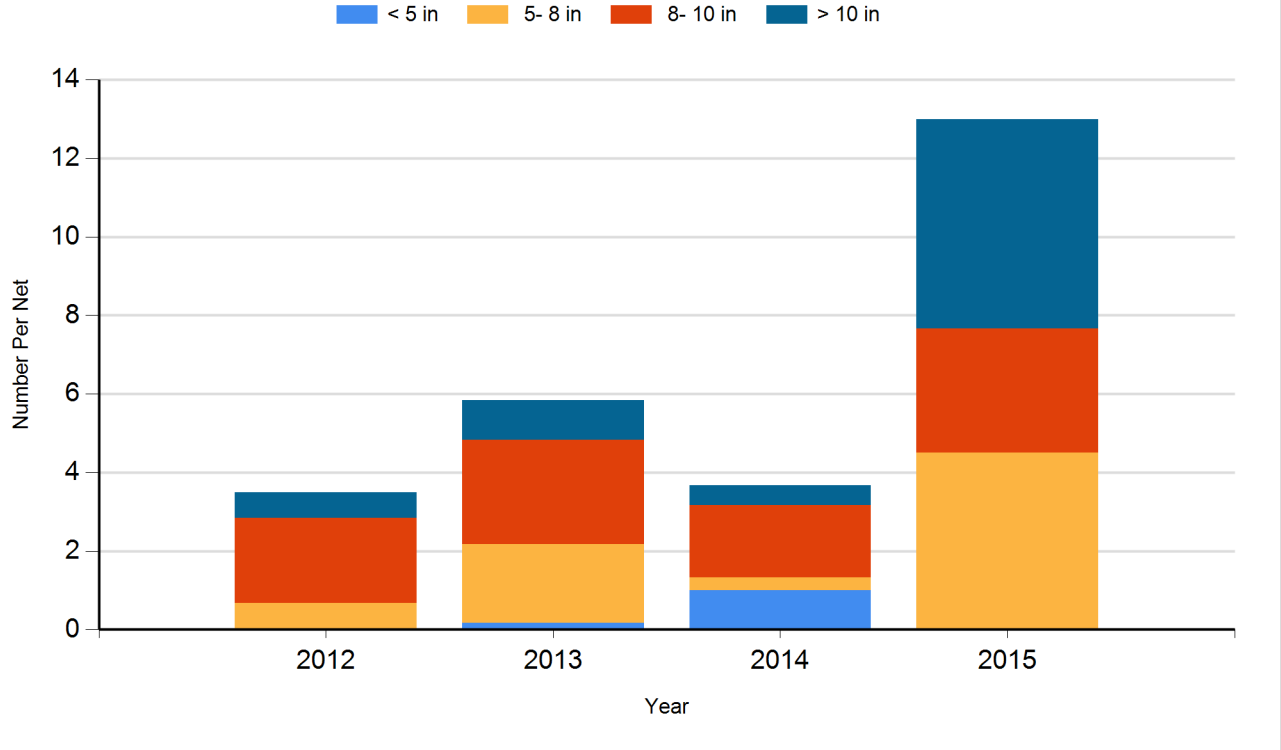
Species: White Crappie
Gear: frame net (std 3/4 in)



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	Fry	2,400,000
2014	Walleye	Fry	2,500,000
2016	Walleye	Fry	2,400,000
2017	Walleye	Fry	2,400,000
2018	Walleye	Fry	2,400,000
2019	Walleye		2,400,000
2021	Walleye	Fry	2,400,000
2022	Walleye	Fry	2,500,000
2023	Walleye	Fry	5,100,000