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.

- **Channel catfish.** Channel catfish were not abundant in the 2021 gill net catch (1.8 per net). Twenty -one individuals from 11.1 to 16.9 inches were netted.

- **Smallmouth bass.** Spring electrofishing was not completed in 2021.

- **Walleye.** Fewer walleyes were sampled in 2021 than in 2019. At 3.3 per gill net, relative abundance of walleyes ≥10.0 inches was considered low. Sampled walleyes ranged in length from 8.3 to 20.0 inches; of those that were at least 10.0 inches 51% were ≥15.0 inches and 3% were ≥20.0 inches. Individuals from seven year-classes (2013, 2014, and 2016 – 2020) contributed to the catch. Fish from the 2018 (age-3) cohort, which coincided with a fry stocking, were the most numerous accounting for 60% of walleyes in the sample. Walleye growth has been variable with mean length at capture values at age 3 from 10.9 to 15.6 inches since 2012. In 2021, the mean length at capture of age-3 fish was 15.1 inches.

- **White bass.** Relative abundance of white bass has remained low (i.e., ≤2.0 per gill net) from 2016 to 2021. In 2021, 20 white bass from 6.7 to 15.0 inches were netted; most 80% were ≥12.0 inches.

- **Yellow perch**. At 2.3 per gill net, relative abundance was considered low in 2021. Sampled yellow perch ranged in length from 6.7 to 12.2 inches, most (96%) were ≥8.0 inches and 26% were ≥10.0 inches. Fish from six year-classes contributed to the catch, those from the 2018 (age-3) cohort were the most abundant accounting for 59% of yellow perch in the sample. Growth appears to be moderate with mean length at capture values at age 3 from 8.3 to 9.8 inches since 2012. In 2021, the mean length at capture at age 3 was 8.6 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
2021

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 20, 2021	4 net-nights
AFS std gill net	Jul 21, 2021	4 net-nights
AFS std gill net	Jul 22, 2021	4 net-nights
fall night EF-WAE	Sep 24, 2021	3157 seconds

Common Fish Species Present

Walleye

Smallmouth Bass

Black Crappie

White Crappie

Yellow Bullhead

Bigmouth Buffalo

Yellow Perch

Channel Catfish

White Bass

Northern Pike

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).

			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	73	6.1	1.6	81	7	5		89	1
	Black Bullhead	10	0.8	0.4	100		50	28	89	4
	Black Crappie	1	0.1	0.1	100		100		99	
	Channel Catfish	21	1.8	1.0	33	17	0		95	2
	Common Carp	1	0.1	0.1	100		100		93	
	Northern Pike	11	0.9	0.3	82		0		76	5
	Smallmouth Bass	14	1.2	0.5	71		14		85	2
	Walleye	40	3.3	0.5	51	12	3		84	1
	White Bass	20	1.7	0.5	90		80		87	1
	White Crappie	11	0.9	0.5	100		18		93	3
	Yellow Bullhead	79	6.6	2.3	100		99		97	1
	Yellow Perch	27	2.3	1.3	96		26	13	99	2

10-Year Catch Per Unit Effort by Gear and Species

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

***SDGFP standard gill nets used 2012 - 2015; avg calculated on data from 2016 – 2021; ** Includes day and night samples; *** Methods/Species that ignore stock length; ****AFS standard frame nets used in 2016 and 2017**

		CPUE										
Gear	Species	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg
AFS std gill net*	Bigmouth Buffalo	0.0	0.0	0.0	0.0	0.0	0.0	8.3	5.6		6.1	4.00
	Black Bullhead	3.2	8.0	1.8	2.3	0.4	0.4	0.3	0.0		0.8	0.38
	Black Crappie	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0		0.1	0.04
	Bluegill	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0		0.0	0.02
	Channel Catfish	0.0	0.2	0.7	0.2	1.0	0.9	0.3	0.4		1.8	0.88
	Common Carp	0.2	0.2	0.3	0.0	0.1	0.0	0.3	0.6		0.1	0.22
	Northern Pike	2.5	2.5	0.2	1.0	0.5	0.2	0.7	0.8		0.9	0.62
	Shorthead Redhorse	0.2	0.0	0.0	0.3	0.2	0.0	0.1	0.2		0.0	0.10
	Smallmouth Bass	0.2	0.5	0.0	1.2	0.8	1.3	0.6	0.0		1.2	0.78
	Walleye	12.2	7.5	9.3	11.5	4.6	2.7	2.6	4.0		3.3	3.44
	White Bass	4.8	4.3	3.8	4.7	1.8	1.5	1.4	2.0		1.7	1.68
	White Crappie	3.2	2.5	1.3	0.3	1.1	0.5	0.2	2.6		0.9	1.06
	White Sucker	3.8	1.5	1.8	2.2	0.6	0.6	0.8	0.3		0.0	0.46
	Yellow Bullhead	6.7	2.2	1.5	0.8	1.1	0.7	0.6	0.3		6.6	1.86
	Yellow Perch	3.5	5.7	2.7	13.0	5.3	5.3	3.3	4.3		2.3	4.10
boat shocker**	Smallmouth Bass	203.0		171.0		159.8			97.0			157.70
fall night EF-WAE***	Walleye	0.9	110.0	179.0	7.0	7.0	41.0	75.0	54.2		36.6	56.74
frame net (std 3/4 in)****	Bigmouth Buffalo	0.2	0.2	0.4			0.6					0.35
	Black Bullhead	18.2	22.7	15.5			0.7					14.28
	Black Crappie	1.2	0.6	0.5			1.2					0.88
	Bluegill	1.2	1.6	1.4			0.5					1.18
	Channel Catfish	0.1	0.2	0.0			0.1					0.10
	Common Carp	0.0	0.1	0.1			0.1					0.08
	Northern Pike	1.3	0.4	0.2			0.2					0.53
	Rock Bass	0.1	0.0	0.0			0.0					0.03
	Shorthead Redhorse	0.1	0.0	0.0			0.0					0.03
	Smallmouth Bass	4.0	1.1	0.5			0.4					1.50
	Walleye	0.5	1.0	0.6			0.1					0.55
	White Bass	8.5	7.2	3.0			3.1					5.45
	White Crappie	0.3	0.2	0.7			0.1					0.33
	White Sucker	0.8	0.5	0.5			0.0					0.45
	Yellow Bullhead	21.6	15.4	3.9			1.6					10.63
	Yellow Perch	2.9	0.0	0.1			0.1					0.78

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 2012 - 2015**

			Year									
Gear	Species	Index	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFS std gill net	Walleye	PSD	53	51	25	12	18	7	3	69		51
		PSD-P	0	0	0	1	2	3	0	2		3
		Wr	80	82	78	82	79	75	85	88		84
	White Bass	PSD	97	100	100	96	48	94	100	92		90
		PSD-P	76	85	87	93	48	50	88	92		80
		Wr	84	83	81	84	86	80	88	85		87
	Yellow Perch	PSD	81	65	88	65	90	97	92	81		96
		PSD-P	19	18	19	41	40	48	67	73		26
		Wr	95	107	107	109	108	109	105	100		99

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+
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)	
2013	59		248 (24)	369 (11)	401 (13)	409 (4)	447 (4)		423 (1)		414 (2)
2012	75	205 (2)	316 (11)	369 (12)	394 (25)	388 (12)	394 (2)	406 (8)		473 (1)	498 (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+
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)				
2013	35	123 (1)	183 (13)	230 (12)	244 (9)		252 (1)				
2012	21		180 (2)	211 (11)	241 (6)	251 (1)	273 (1)				

Fish Condition

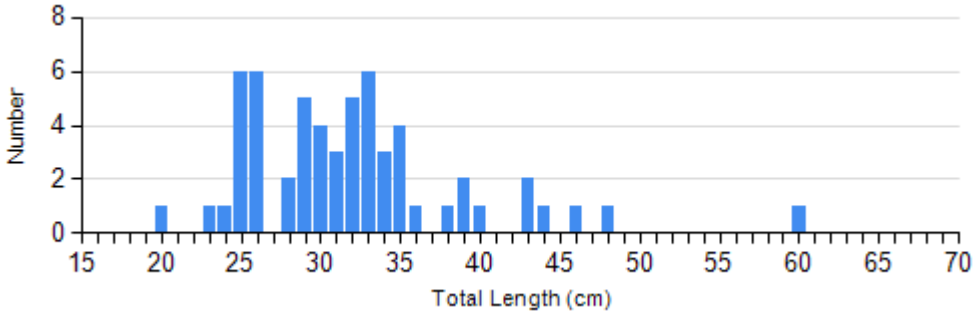
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Walleye Gill Net	2017	28	75 (1.0)	1	74	0		1	85
	2018	30	85 (1.0)	1	91	0		0	
	2019	15	88 (2.3)	32	89 (0.9)	1	86	0	
	2021	19	84 (1.1)	19	83 (0.7)	1	84	0	
White Bass Gill Net	2017	1	77	7	84 (1.1)	8	77 (2.4)	0	
	2018	0		2	93 (3.8)	15	87 (1.7)	0	
	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
Yellow Perch Gill Net	2017	2	108 (2.4)	28	107 (1.5)	24	111 (1.6)	4	104 (1.7)
	2018	3	112 (8.1)	10	104 (2.8)	24	104 (1.1)	2	107 (5.4)
	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)

Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Walleye
Gear: AFS std gill net



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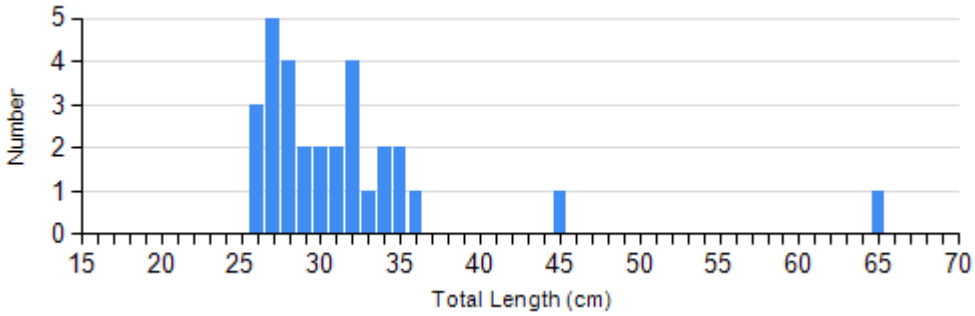

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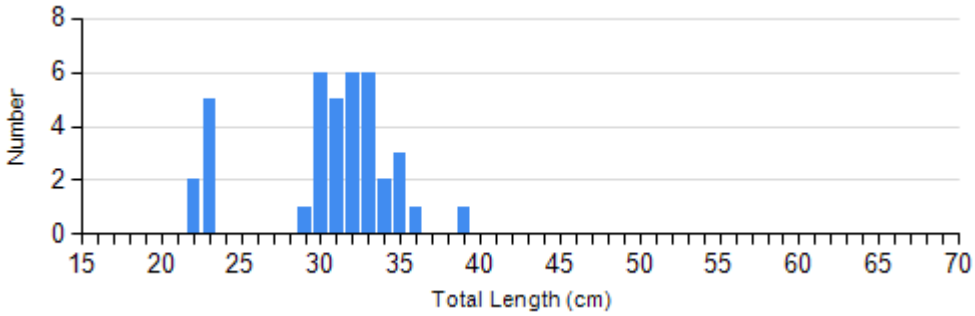

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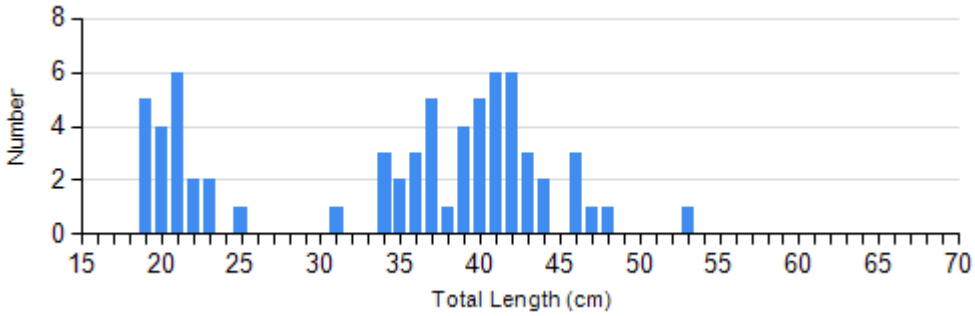

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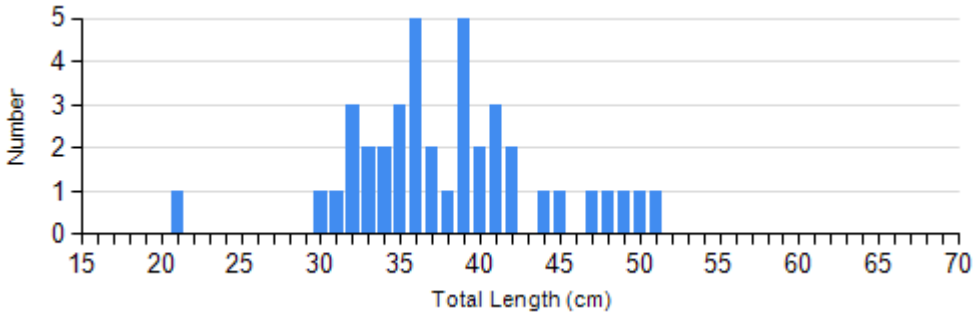
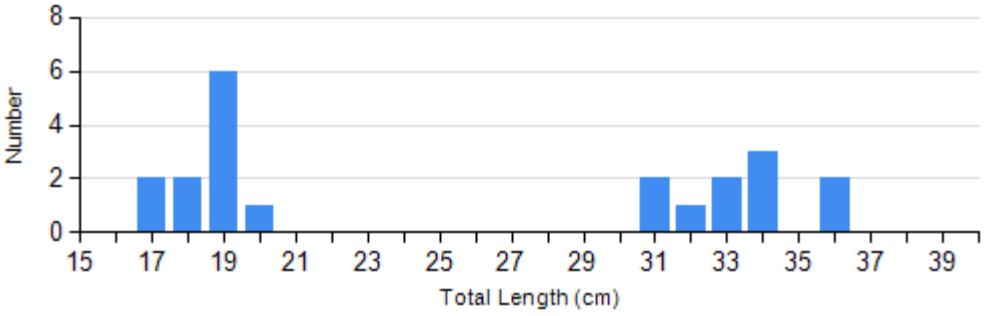


2021

Species: White Bass
Gear: AFS std gill net



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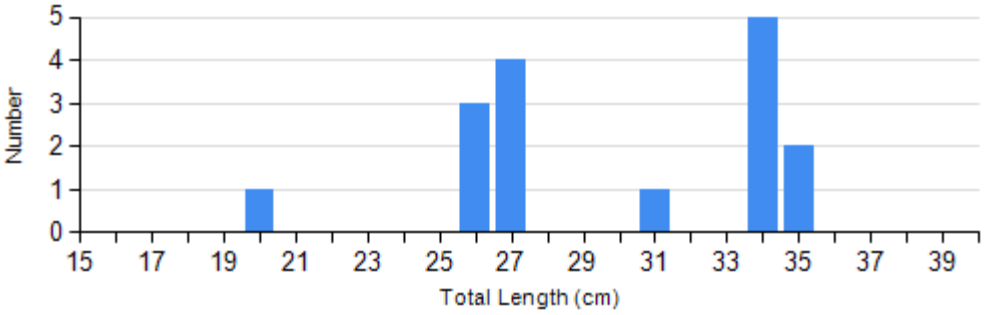

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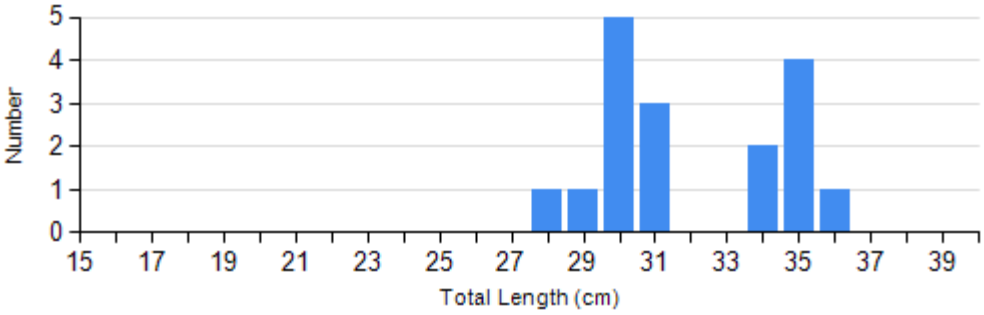

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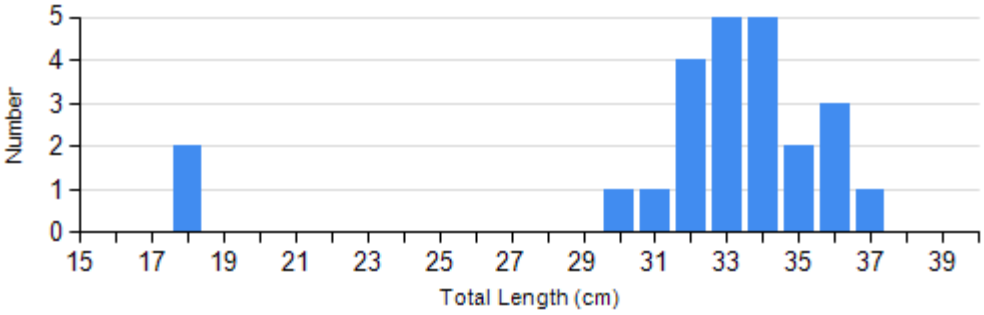

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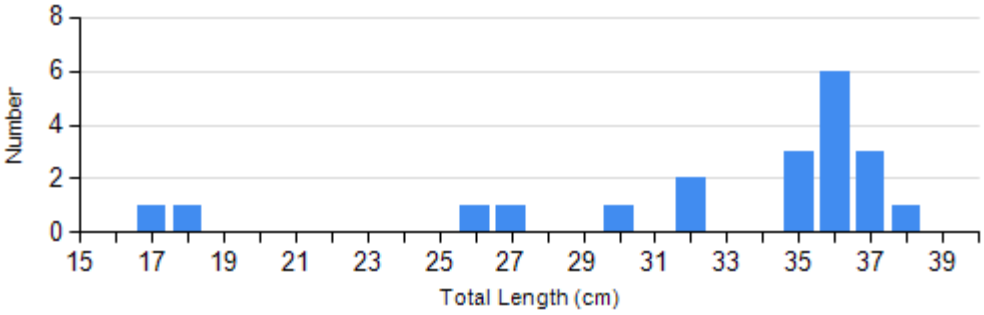
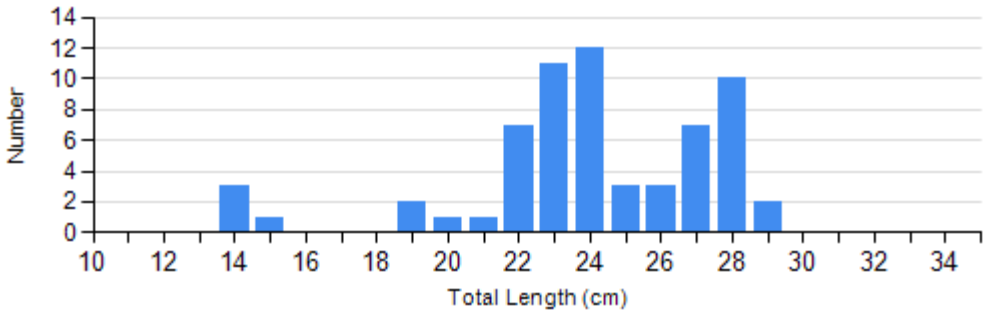


2021

Species: Yellow Perch
Gear: AFS std gill net



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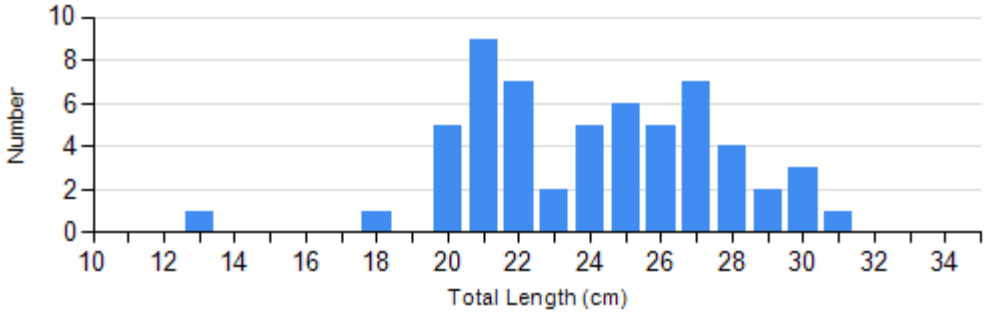

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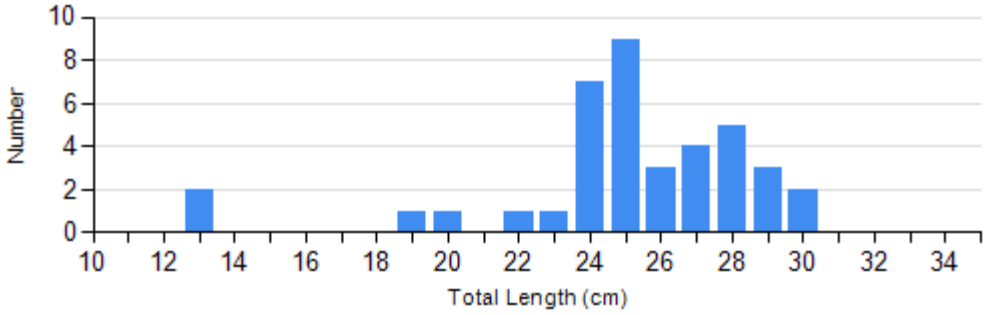

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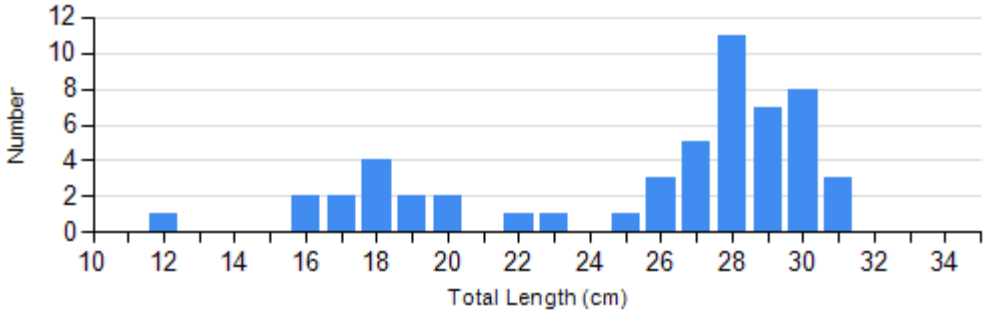

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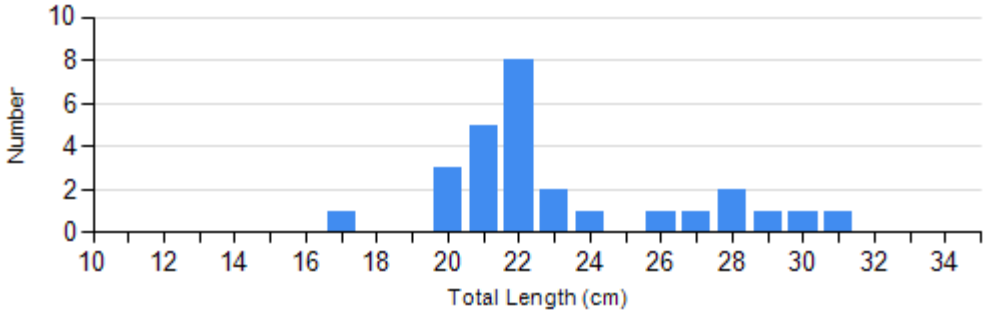
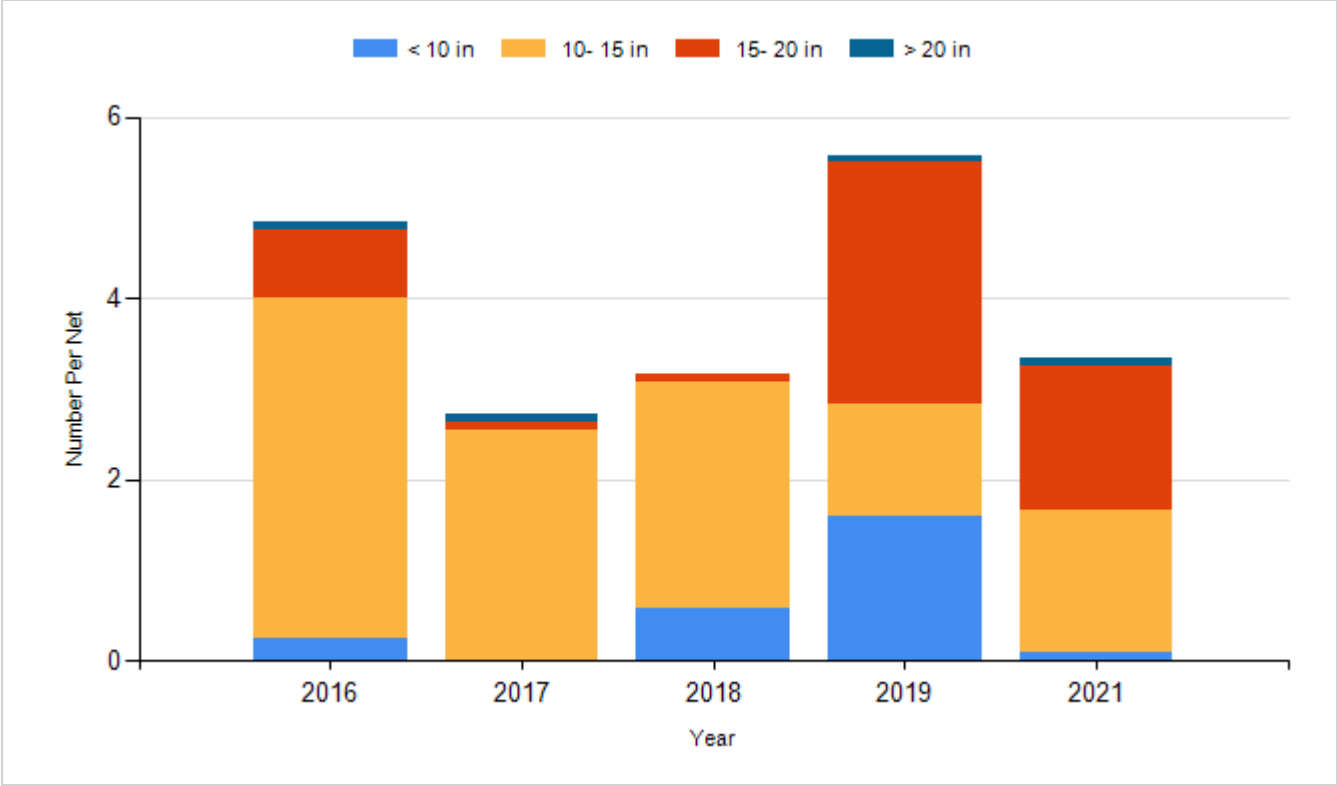


2021

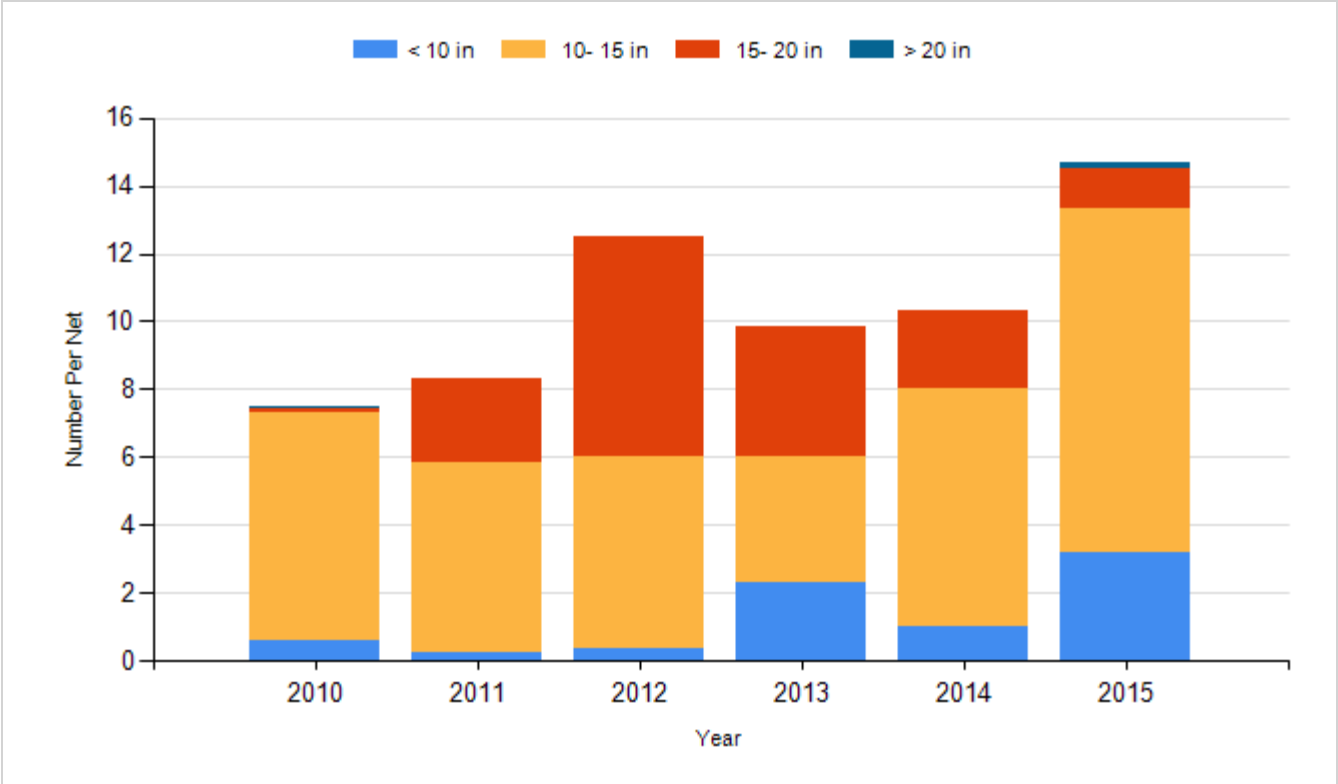
Historic Fish Sizes and Relative Abundance

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

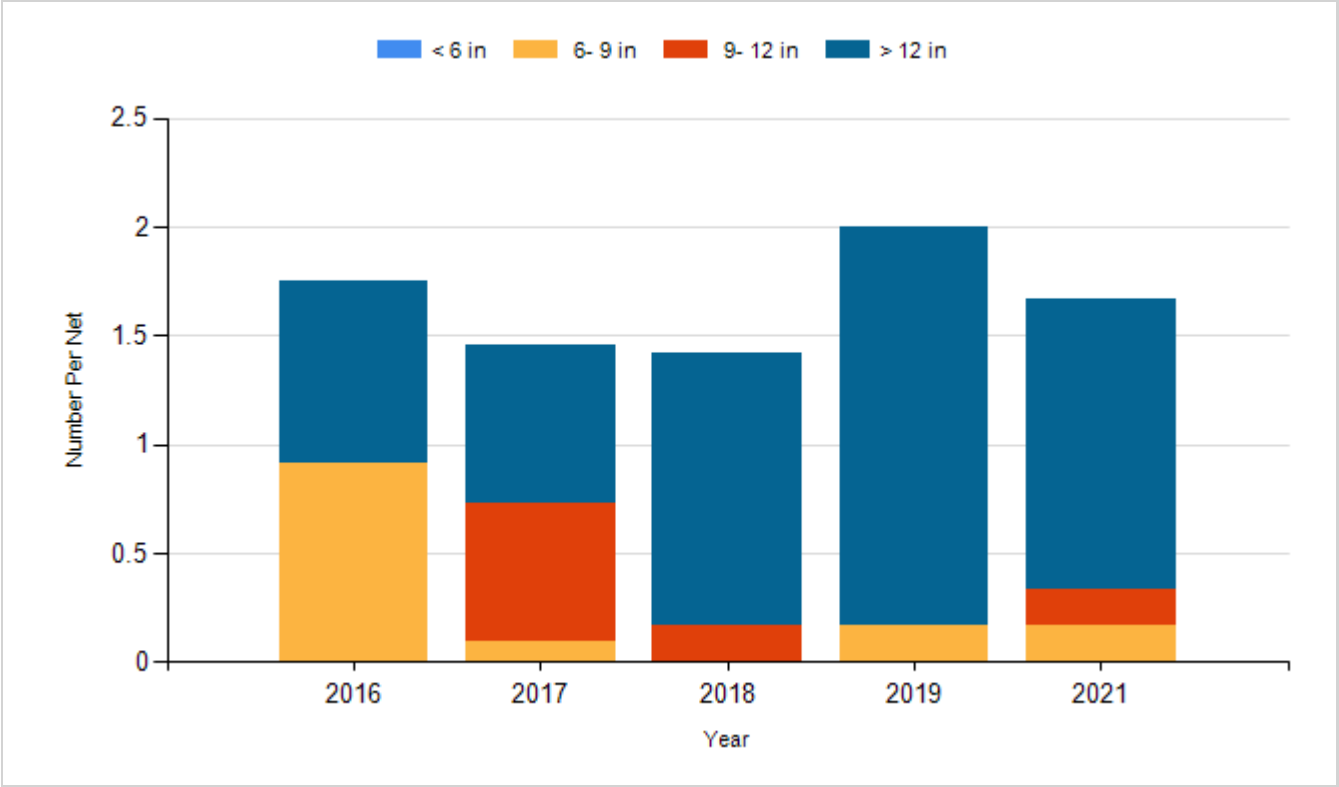
Species: Walleye
Gear: AFS std gill net



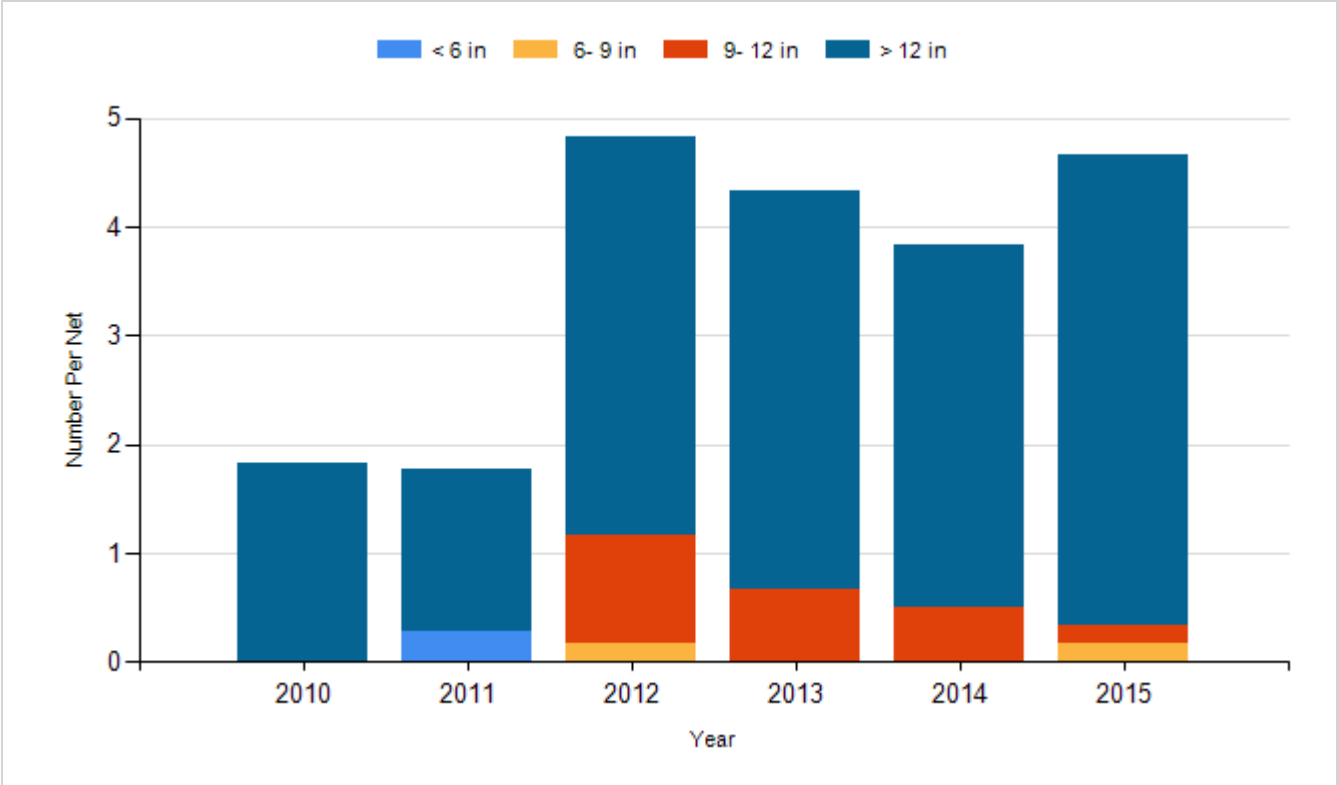
Species: Walleye
Gear: std exp gill net



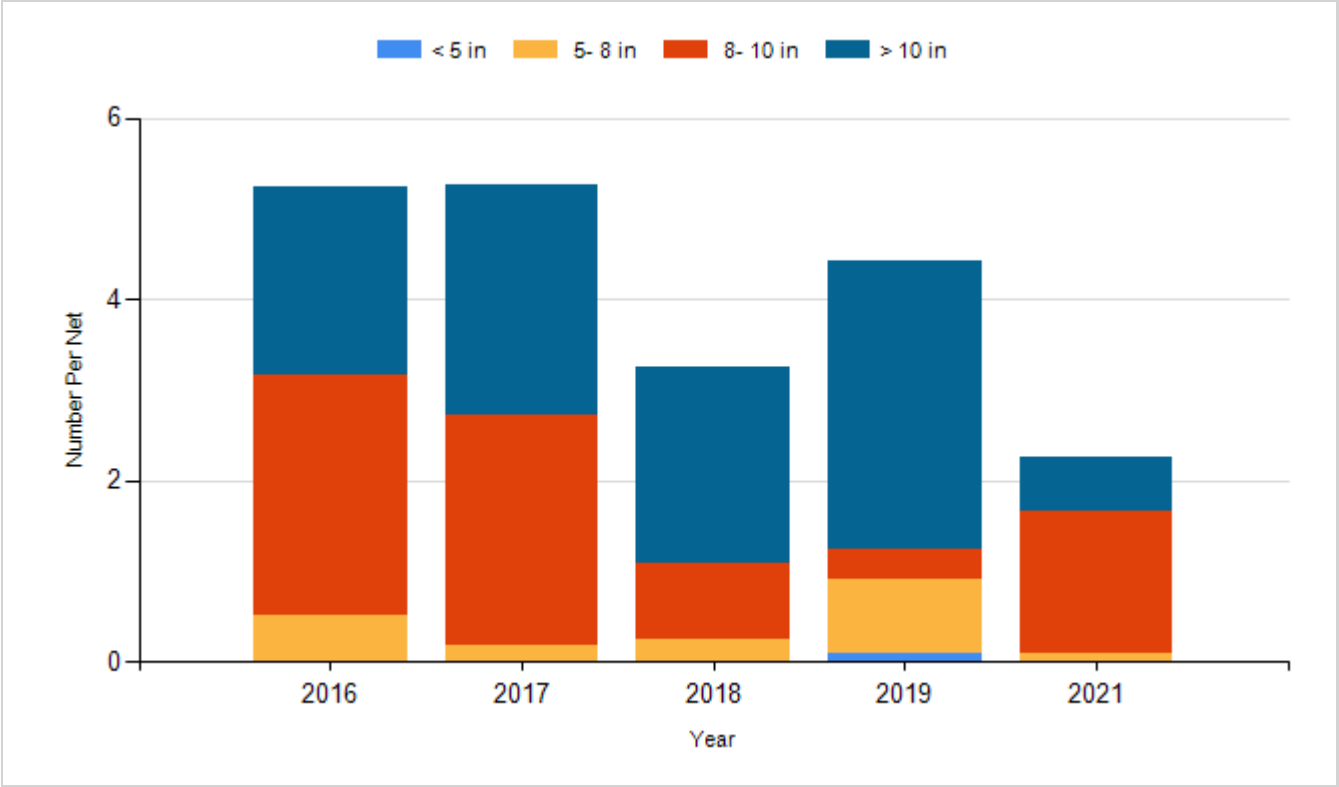
Species: White Bass
Gear: AFS std gill net



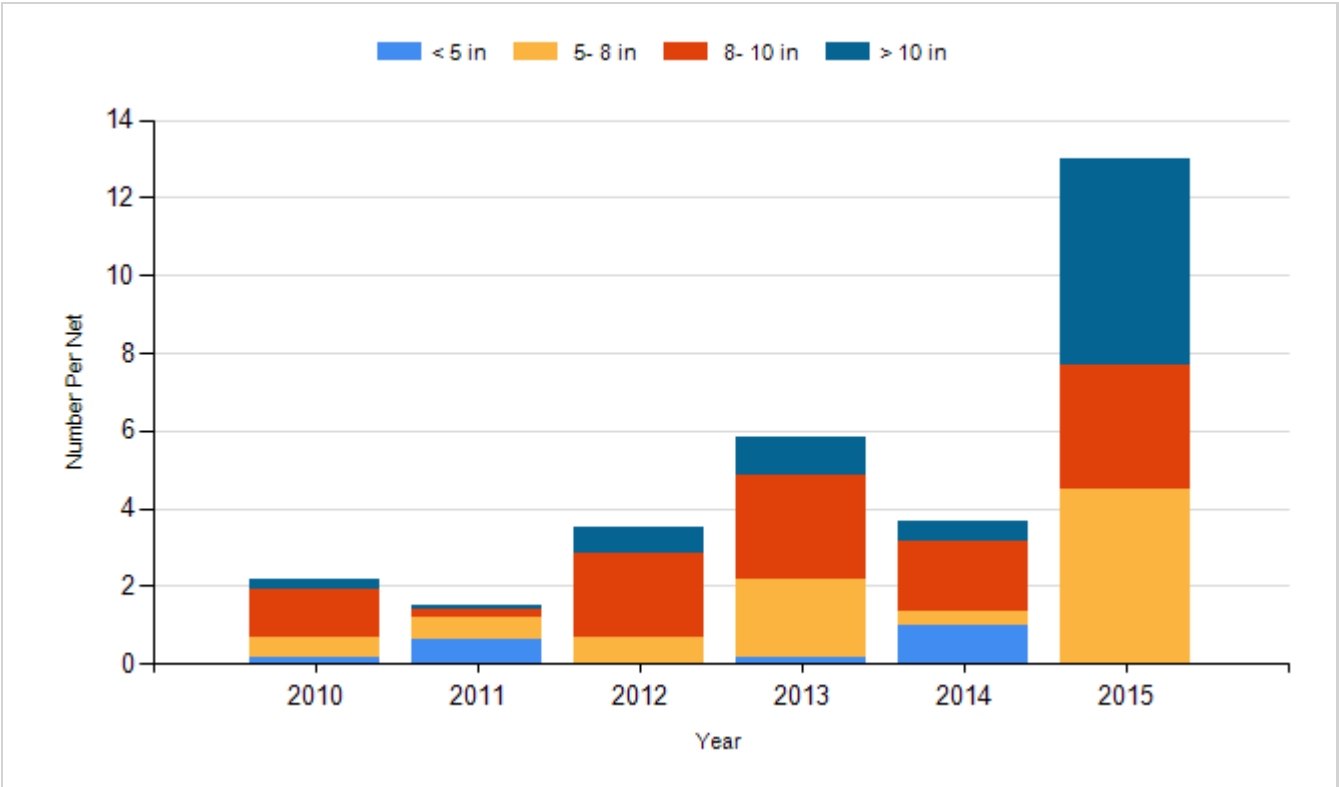
Species: White Bass
Gear: std exp gill net



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