Lake Kampeska Survey Summary

Lake Kampeska, located within the city limits of Watertown, is primarily managed as a smallmouth bass and walleye fishery; however, other fish species (e.g., crappie, bluegill, channel catfish, white bass, etc.) also contribute to the fishery.

In 2018, experimental gill nets and fall night electrofishing (used to monitor age-0 walleye relative abundance) were the only gears deployed at Lake Kampeska. Frame nets are included in fish sampling efforts on a rotational basis (next survey scheduled for 2020). Thus, the following summary will focus on those fish species effectively sampled in gill nets (e.g., walleye, yellow perch).

- **Channel catfish.** Although not abundant, the opportunity exists for anglers to catch channel catfish. In 2018, gill nets sampled three individuals that ranged in length from 23.2 to 24.8 inches.

- **Walleye.** Walleyes were not abundant (2.6/gill net). Sampled walleyes ranged in length from 8.7 to 15.4 inches; six year classes (2011 – 2015 and 2017), none of which were strong, were represented in the gill net catch. Growth has been slow in recent years with mean length at capture values for age-4 walleyes less than 13.5 inches in surveys conducted in 2015, 2017, and 2018.

- **White bass.** At 1.4/gill net, relative abundance was similar to that of surveys conducted in 2016 (1.8/gill net) and 2017 (1.5/gill net). Sampled white bass ranged in length from 11.0 to 14.2 inches.

- **Yellow perch**. Similar to walleyes, yellow perch numbers were low (3.3/gill net). Sampled yellow perch ranged in length from 5.1 to 11.8 inches; most (67%) exceeded 10.0 inches. Seven year classes (2007 and 2012 – 2017), each represented by few individuals (i.e., <15) were present. Since 2009, mean length at capture values for age-3 yellow perch have ranged from 7.8 to 9.8 inches; the mean length of age-3 fish was 9.8 inches in 2018.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Kampeska, Codington County
UBS-Lake-171-000
2018

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 17, 2018	4 net-nights
AFS std gill net	Jul 18, 2018	4 net-nights
AFS std gill net	Jul 19, 2018	4 net-nights
fall night EF-WAE	Oct 22, 2018	3600 seconds

Common Fish Species Present

Black Crappie

Walleye

Smallmouth Bass

White Crappie

Bigmouth Buffalo

Yellow Perch

White Bass

White Sucker

Northern Pike

Yellow Bullhead

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)
Bigmouth Buffalo	11	28	18	46	24	61	30	76	37	94
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
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Common Carp	11	28	16	41	21	53	26	66	33	84
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Gizzard Shad	7	18	11	28						
Green Sunfish	3	8	6	15	8	20	10	25	12	30
Lake Herring	5	13	8	20	11	28	14	35	17	43
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
Rock Bass	4	10	7	18	9	23	11	28	13	33
Rudd	6	15	10	25	12	30	15	38	19	48
Saugeye	9	23	14	35	18	46	22	56	27	69
Shorthead Redhorse	6	15	10	25	13	33	16	41	20	51
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
White Sucker	6	15	10	25	13	33	16	41	20	51
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	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Bigmouth Buffalo	8.3	1.7	3		1		89	1
	Black Bullhead	0.3	0.2	67		33		93	8
	Channel Catfish	0.3	0.2	100		67		112	7
	Common Carp	0.3	0.3	100		100		92	6
	Northern Pike	0.7	0.3	100		38		73	3
	Shorthead Redhorse	0.1	0.1	100		100		108	
	Smallmouth Bass	0.6	0.2	100		14		88	2
	Walleye	2.6	0.9	3		0		85	1
	White Bass	1.4	0.6	100		88		88	2
	White Crappie	0.2	0.2	100		100		97	5
	White Sucker	0.8	0.3	100		89		95	4
	Yellow Bullhead	0.6	0.4	100		100		95	5
	Yellow Perch	3.3	0.9	92		67	11	105	2
fall night EF-WAE*	Walleye	75.0	24.9					81	1

10-Year Catch Per Unit Effort by Gear and Species

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

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

*** AFS std frame nets used in 2017**

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std gill net	Bigmouth Buffalo								0.0	0.0	8.3	2.8
	Black Bullhead								0.4	0.4	0.3	0.4
	Black Crappie								0.0	0.1	0.0	0.0
	Bluegill								0.0	0.1	0.0	0.0
	Channel Catfish								1.0	0.9	0.3	0.7
	Common Carp								0.1	0.0	0.3	0.1
	Northern Pike								0.5	0.2	0.7	0.5
	Shorthead Redhorse								0.2	0.0	0.1	0.1
	Smallmouth Bass								0.8	1.3	0.6	0.9
	Walleye								4.6	2.7	2.6	3.3
	White Bass								1.8	1.5	1.4	1.6
	White Crappie								1.1	0.5	0.2	0.6
	White Sucker								0.6	0.6	0.8	0.7
	Yellow Bullhead								1.1	0.7	0.6	0.8
	Yellow Perch								5.3	5.3	3.3	4.6
fall night EF-WAE)*	Walleye	0.0	0.0	342.0	0.9	110.0	179.0	7.0	7.0	41.0	75.0	76.2
boat shocker (night, DC)	Smallmouth Bass		142.0		203.0		171.0		159.8			169.0
frame net (std 3/4 in)**	Bigmouth Buffalo	0.2	1.7	0.3	0.2	0.2	0.4			0.6		0.5
	Black Bullhead	2.4	0.0	0.1	18.2	22.7	15.5			0.7		8.7
	Black Crappie	0.4	1.2	0.5	1.2	0.6	0.5			1.2		0.8
	Bluegill	1.3	3.2	1.5	1.2	1.6	1.4			0.5		1.6
	Channel Catfish	0.0	0.0	0.2	0.1	0.2	0.0			0.1		0.1
	Common Carp	0.2	0.0	0.1	0.0	0.1	0.1			0.1		0.1
	Northern Pike	0.5	1.0	0.5	1.3	0.4	0.2			0.2		0.6
	Rock Bass	0.2	0.1	0.2	0.1	0.0	0.0			0.0		0.1
	Shorthead Redhorse	0.0	0.0	0.1	0.1	0.0	0.0			0.0		0.0
	Smallmouth Bass	0.6	2.6	1.6	4.0	1.1	0.5			0.4		1.6
	Walleye	1.1	3.4	0.5	0.5	1.0	0.6			0.1		1.1
	White Bass	10.2	7.9	3.0	8.5	7.2	3.0			3.1		6.2
	White Crappie	0.1	0.2	1.5	0.3	0.2	0.7			0.1		0.5
	White Sucker	1.2	1.6	1.0	0.8	0.5	0.5			0.0		0.8
	Yellow Bullhead	0.2	5.2	2.7	21.6	15.4	3.9			1.6		7.4
	Yellow Perch	0.0	0.4	0.1	2.9	0.0	0.1			0.1		0.6

std exp gill net	Black Bullhead	0.0	0.2	0.0	3.2	8.0	1.8	2.3	2.2
	Channel Catfish	0.0	0.2	0.2	0.0	0.2	0.7	0.2	0.2
	Common Carp	0.5	0.2	0.0	0.2	0.2	0.3	0.0	0.2
	Northern Pike	1.0	0.2	1.3	2.5	2.5	0.2	1.0	1.2
	Shorthead Redhorse	0.3	0.3	0.2	0.2	0.0	0.0	0.3	0.2
	Smallmouth Bass	0.0	0.0	0.7	0.2	0.5	0.0	1.2	0.4
	Walleye	17.0	20.7	24.3	12.2	7.5	9.3	11.5	14.6
	White Bass	7.2	5.5	4.5	4.8	4.3	3.8	4.7	5.0
	White Crappie	0.2	1.0	3.2	3.2	2.5	1.3	0.3	1.7
	White Sucker	1.7	1.8	5.5	3.8	1.5	1.8	2.2	2.6
	Yellow Bullhead	0.0	0.7	0.8	6.7	2.2	1.5	0.8	1.8
	Yellow Perch	2.2	6.0	2.7	3.5	5.7	2.7	13.0	5.1

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std gill net	Walleye	PSD								18	7	3
		PSD-P								2	3	0
		Wr								79	75	85
	White Bass	PSD								48	94	100
		PSD-P								48	50	88
		Wr								86	80	88
	Yellow Perch	PSD								90	97	92
		PSD-P								40	48	67
		Wr								108	109	105
std exp gill net	Walleye	PSD	4	2	31	53	51	25	12			
		PSD-P	1	1	0	0	0	0	1			
		Wr	83	86	84	80	82	78	82			
	White Bass	PSD	100	100	100	97	100	100	96			
		PSD-P	93	100	100	76	85	87	93			
		Wr	93	94	89	84	83	81	84			
	Yellow Perch	PSD	31	75	38	81	65	88	65			
		PSD-P	8	14	13	19	18	19	41			
		Wr	112	107	104	95	107	107	109			

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+
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)
2011	150	250 (11)	325 (28)	359 (50)	384 (13)	425 (1)	392 (43)	432 (1)			498 (1)
2010	134	209 (7)	281 (56)	314 (37)	320 (3)	353 (29)				345 (2)	520 (1)
2009	138	195 (35)	276 (34)	306 (1)	327 (64)	404 (1)	456 (1)		519 (2)		

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
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)				
2011	27	106 (11)	182 (9)	197 (5)	254 (2)						
2010	39	113 (3)	178 (9)	231 (22)	257 (1)	293 (1)	293 (1)		215 (1)	282 (1)	
2009	13		184 (10)	220 (1)		230 (1)				278 (1)	

Fish Condition

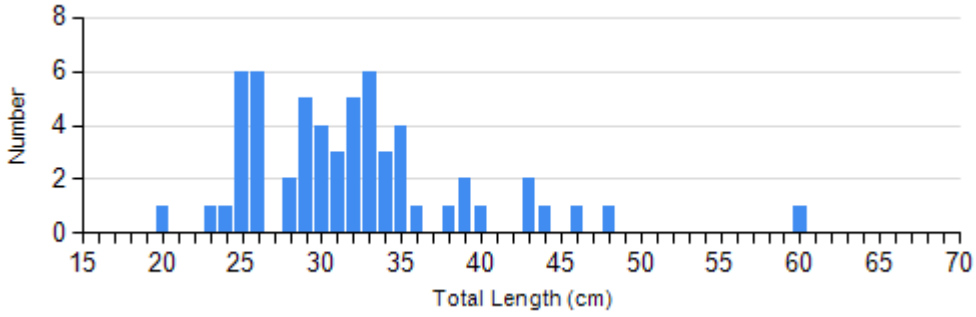
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2014	42	78 (0.6)	14	76 (1.3)	0		0	
	2015	61	83 (0.6)	7	78 (1.1)	1	88	0	
	2016	45	78 (0.6)	9	81 (1.6)	1	80	0	
	2017	28	75 (1.0)	1	74	0		1	85
	2018	30	85 (1.0)	1	91	0		0	
White Bass Gill Net	2018	0		2	93 (3.8)	15	87 (1.7)	0	
White Bass Gill Net	2014	0		3	88 (2.7)	20	80 (1.2)	0	
	2015	1	89	1	82	26	84 (1.2)	0	
	2016	11	95 (2.0)	0		10	76 (2.5)	0	
	2017	1	77	7	84 (1.1)	8	77 (2.4)	0	
Yellow Perch Gill Net	2014	2	105 (8.8)	11	108 (2.4)	3	102 (7.5)	0	
	2015	27	111 (1.5)	19	106 (1.5)	32	109 (1.5)	0	
	2016	6	107 (3.1)	32	110 (1.2)	25	105 (1.4)	0	
	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)

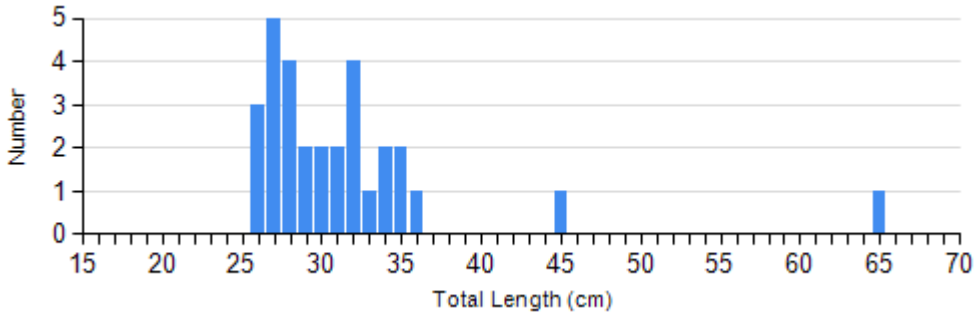
Length Frequency Distribution

Length frequency histogram of species sampled by year.

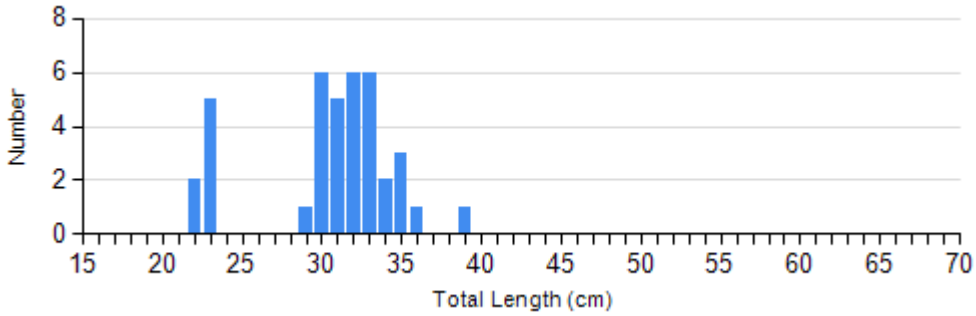
Species: Walleye
Gear: AFS std gill net



2016

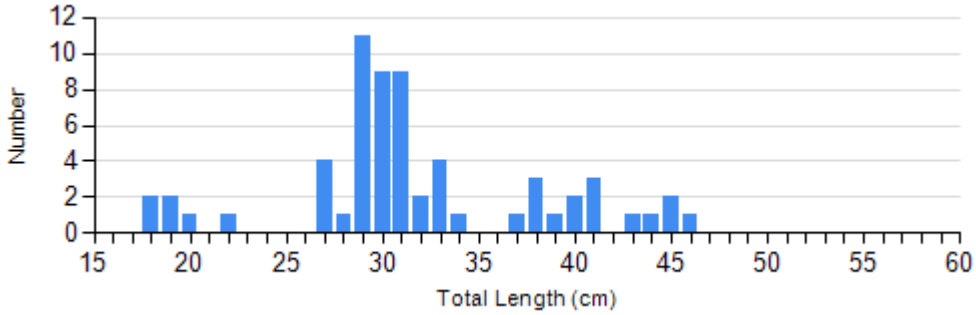


2017

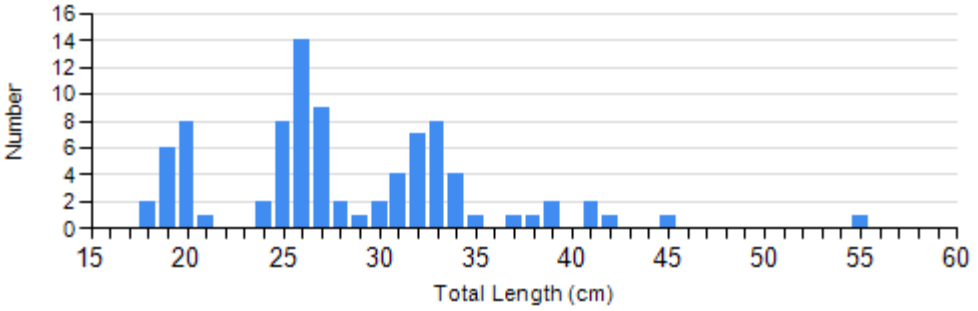


2018

Species: Walleye
Gear: std exp gill net

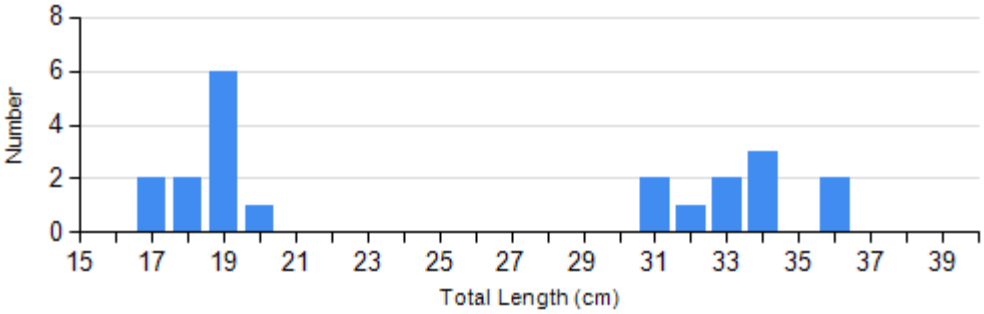


2014

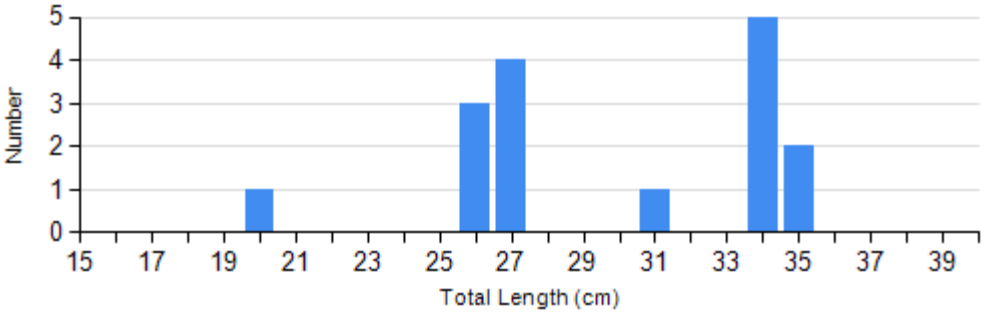


2015

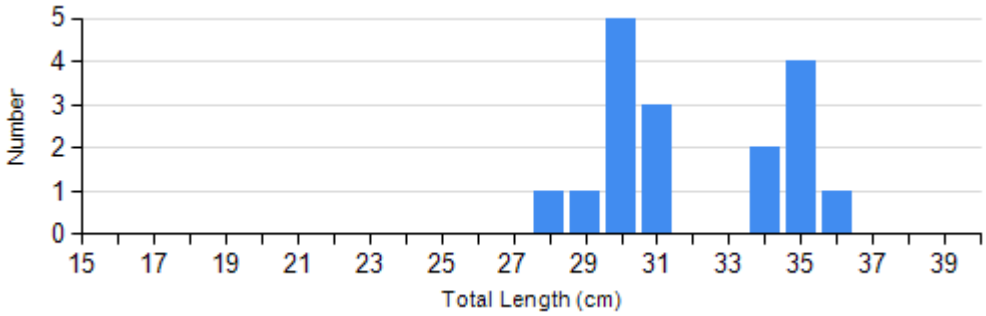
Species: White Bass
Gear: AFS std gill net



2016

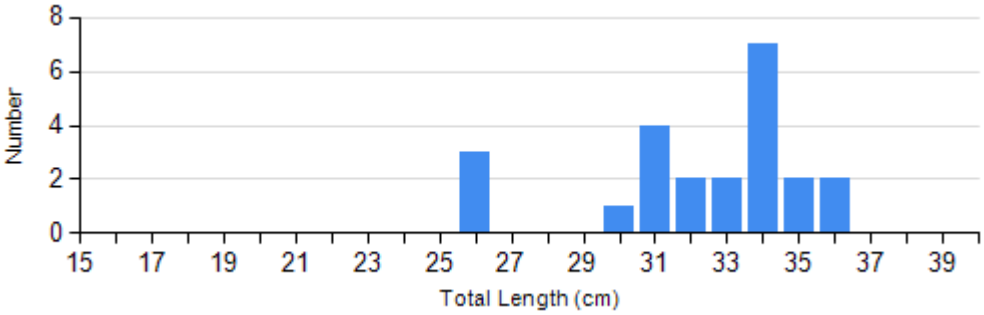


2017

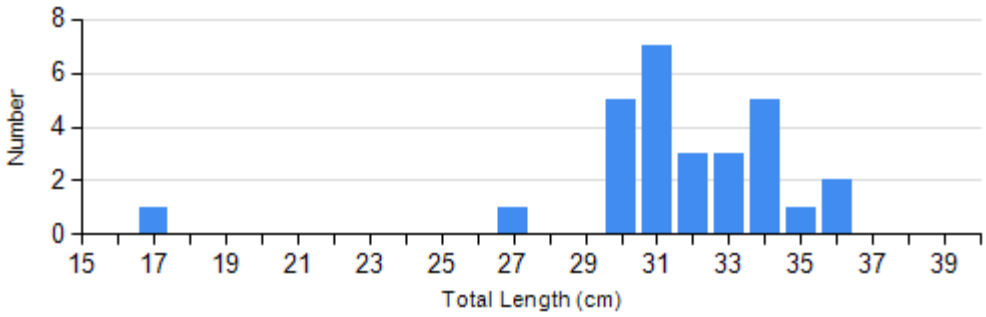


2018

Species: White Bass
Gear: std exp gill net

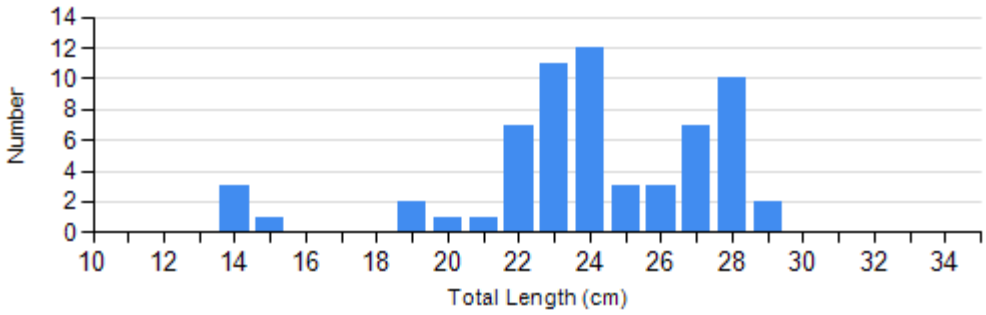


2014

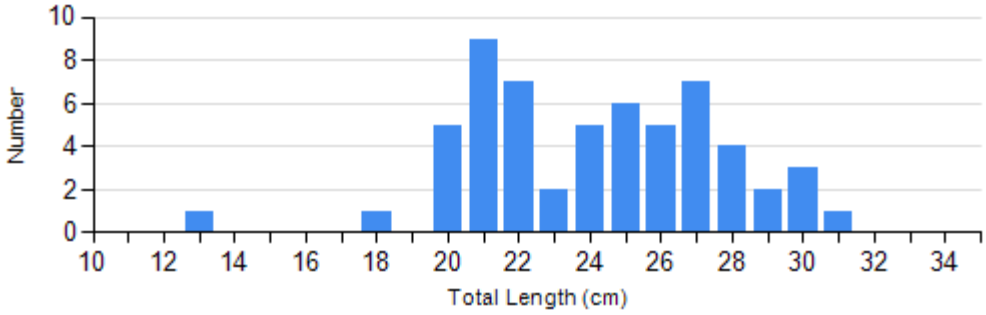


2015

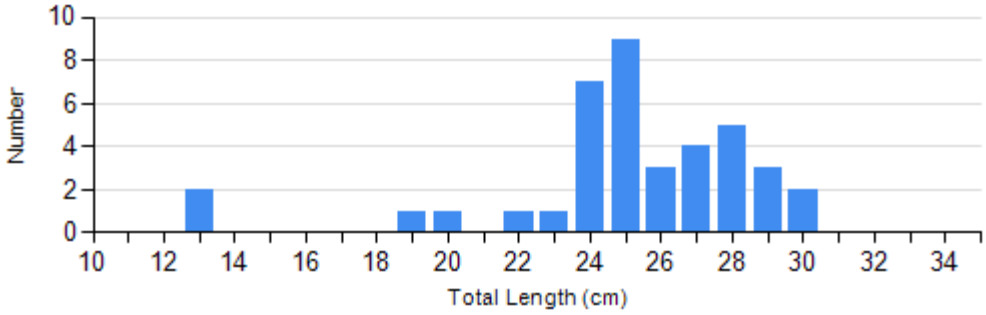
Species: Yellow Perch
Gear: AFS std gill net



2016

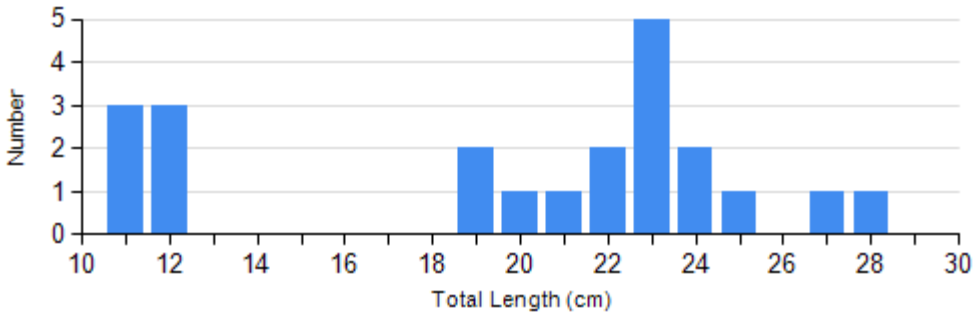


2017

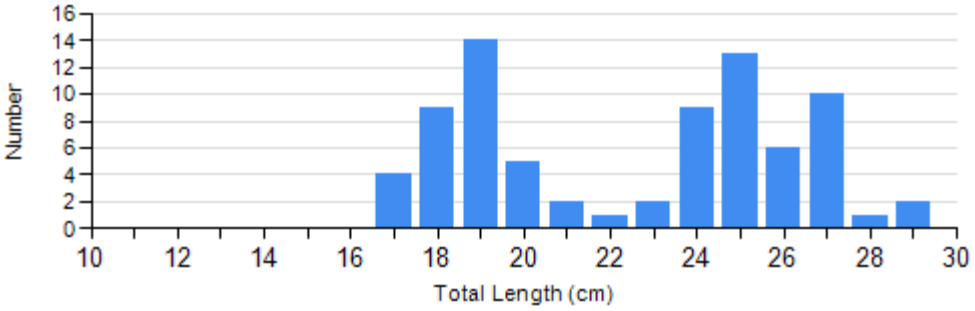


2018

Species: Yellow Perch
Gear: std exp gill net



2014

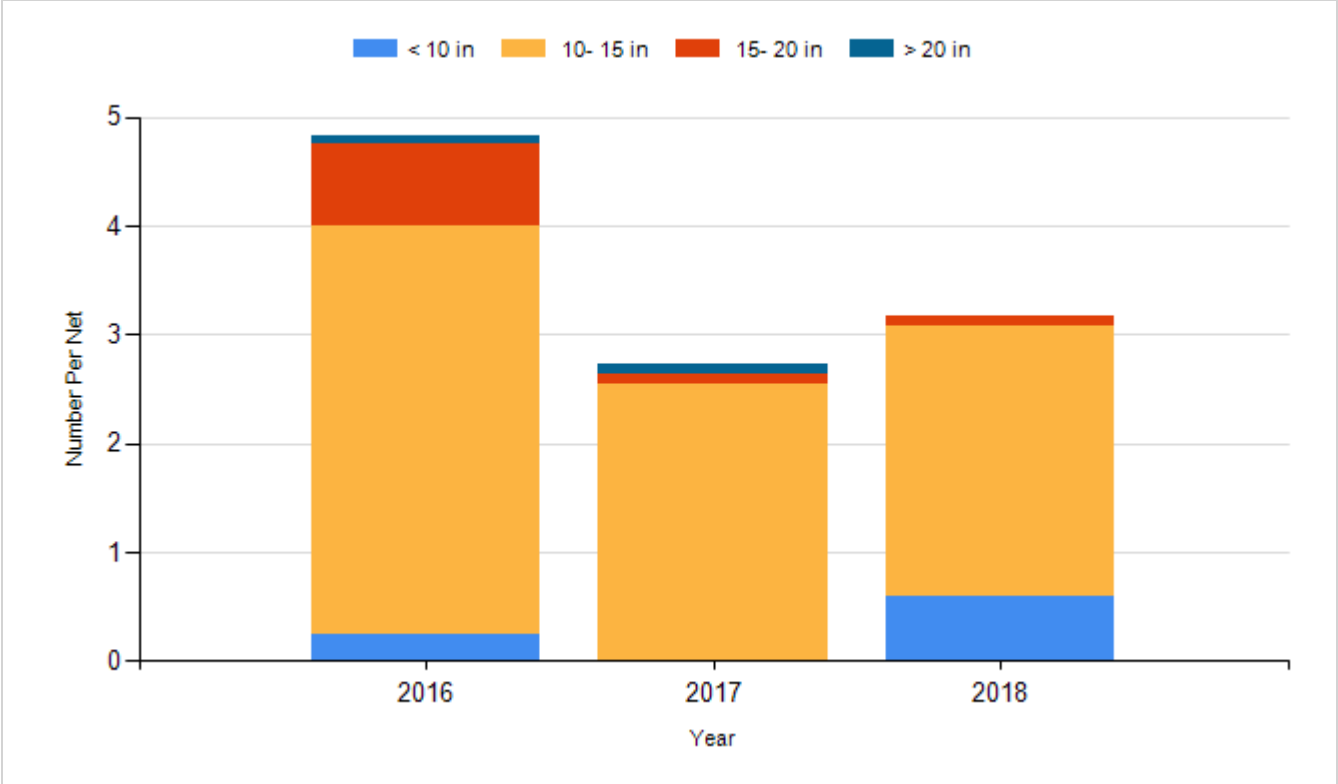

Number
16
14
12
10
8
6
4
2
0
10
12
14
16
18
20
22
24
26
28
30
Total Length (cm)

2015

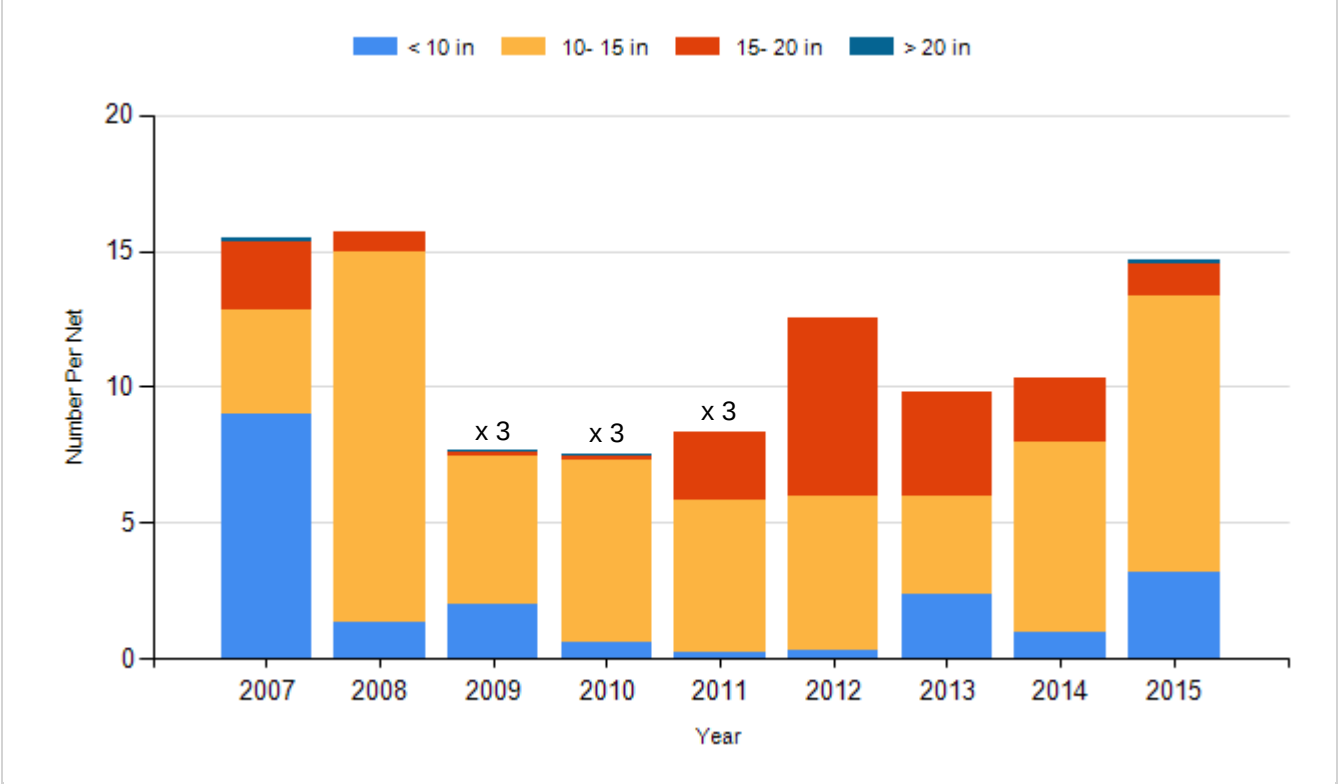
Historic Fish Sizes and Relative Abundance

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

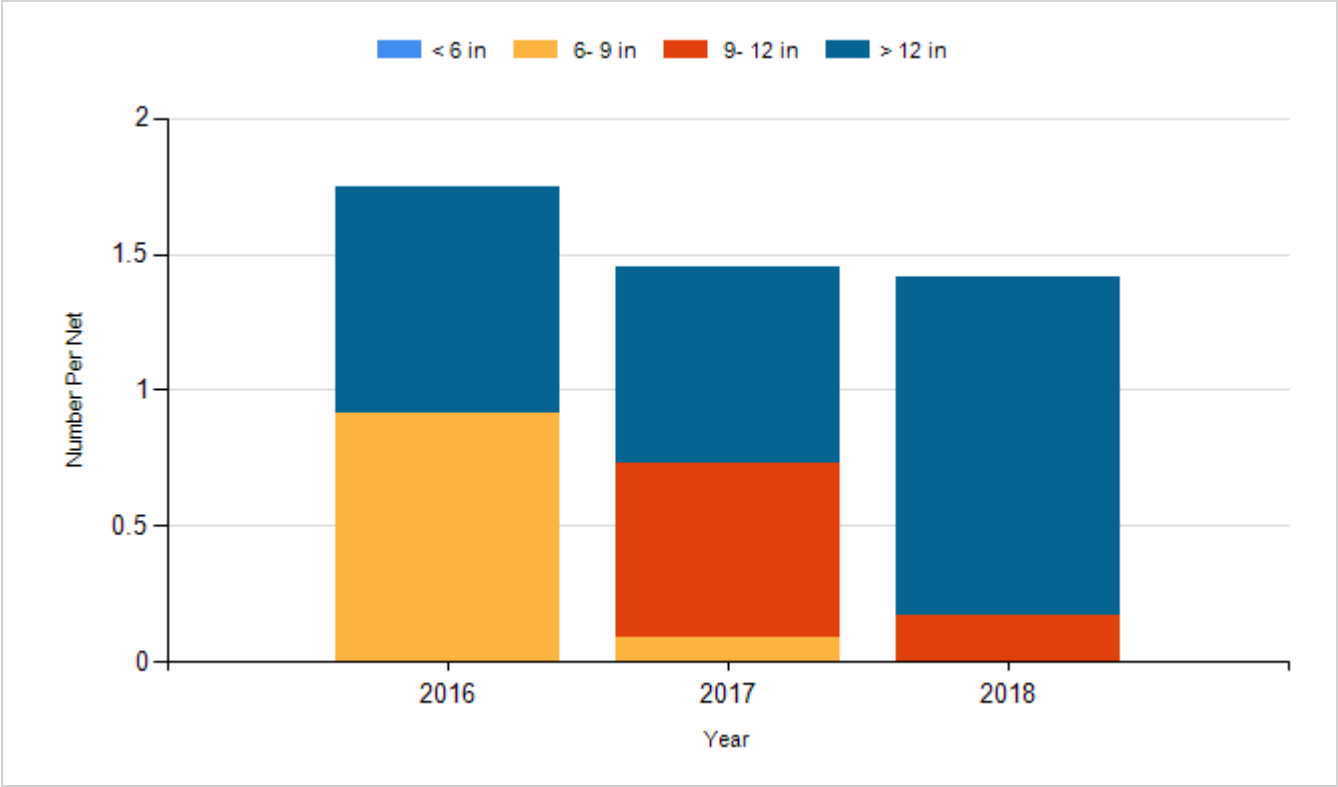
Species: Walleye
Gear: AFS std gill net



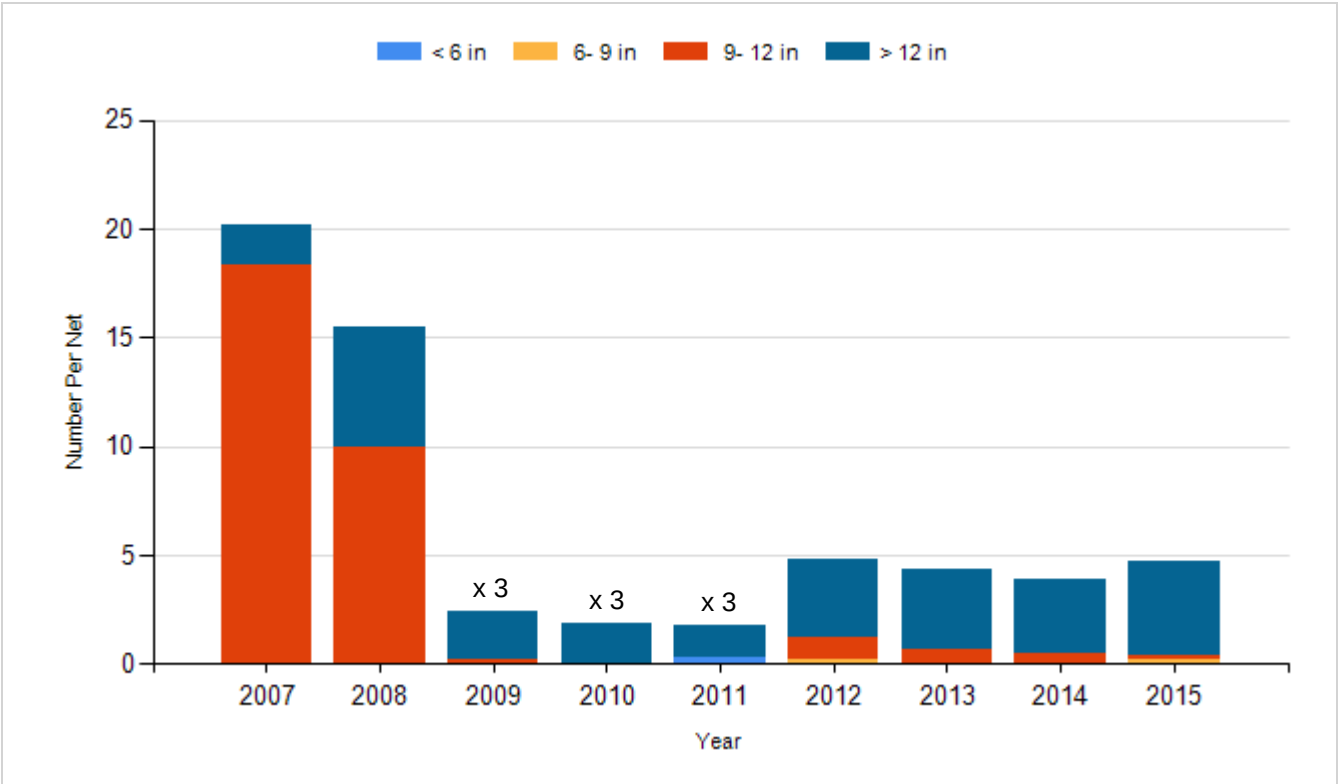
Species: Walleye
Gear: std exp gill net



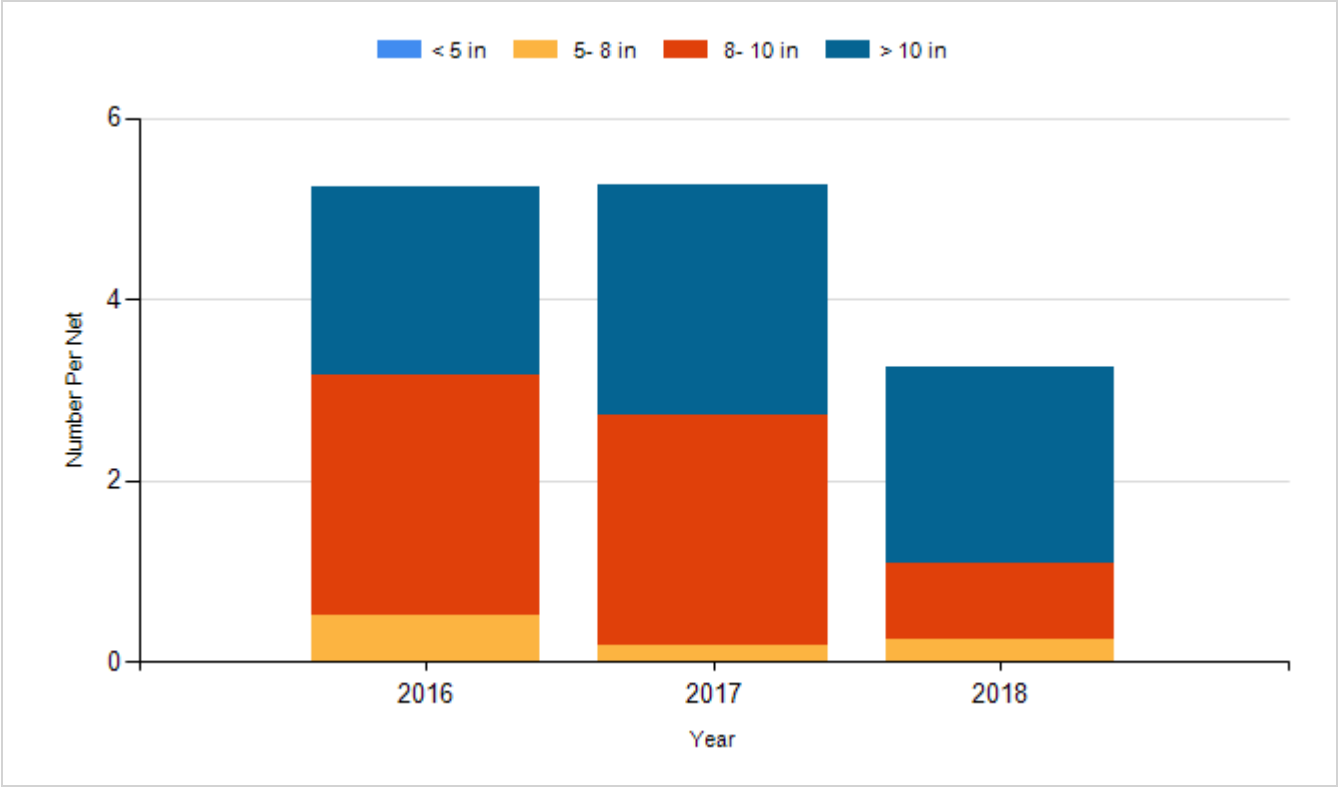
Species: White Bass
Gear: AFS std gill net



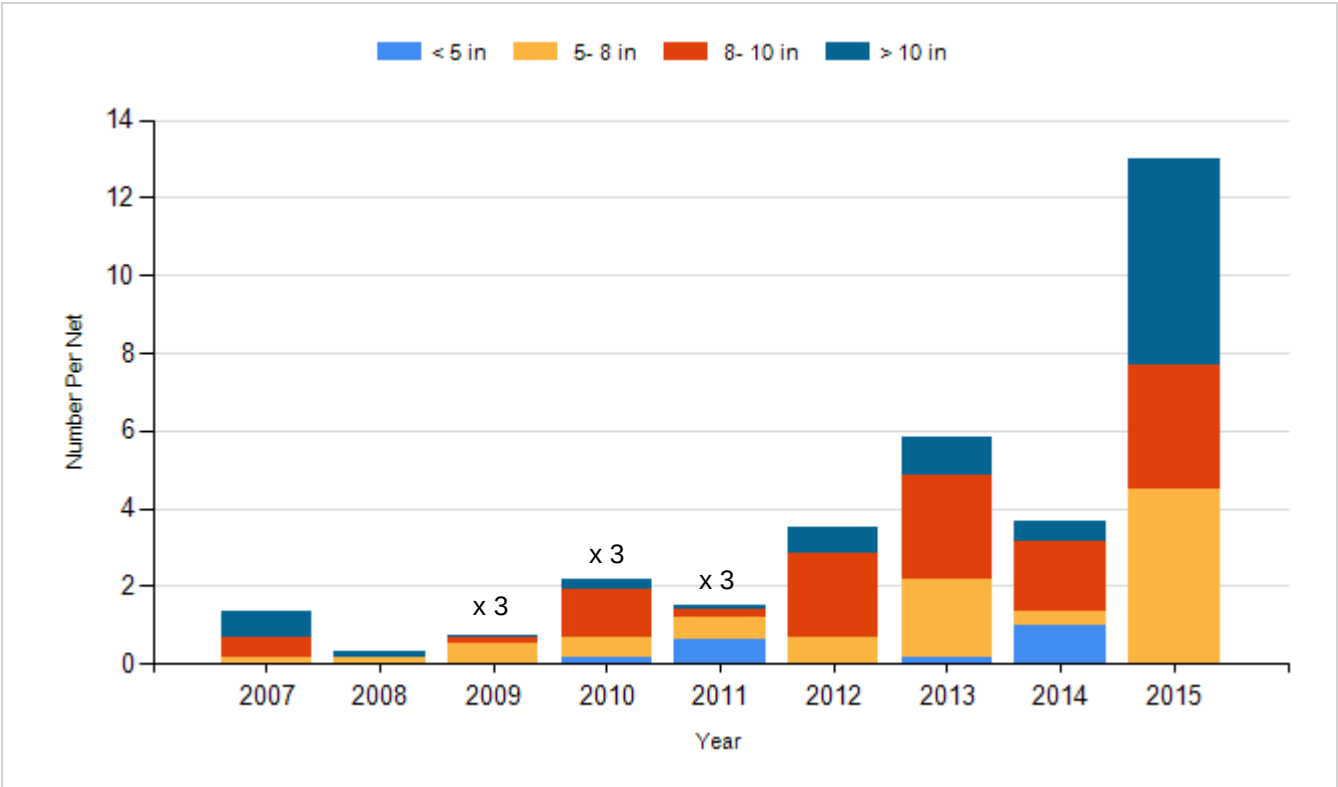
Species: White Bass
Gear: std exp gill net



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
2008	Walleye	Fry	2,500,000
2009	Walleye	Fry	2,500,000
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