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.

- **Channel catfish.** Although not abundant, the opportunity exists for anglers to catch channel catfish. In 2019, gill nets sampled 6 individuals that ranged in length from 5.6 to 26.4 inches.

- **Smallmouth bass.** Fewer smallmouth bass were sampled by day electrofishing in 2019 (97.0/hour) than combined day and night samples in 2016 (159.8/hour). Smallmouth bass in the 2019 electrofishing catch ranged in length from 7.1 to 16.5 inches, 66% were ≥11.0 inches and 13% were 14.0 inches or longer. The proportion of the catch ≤14.0 inches was comprised of fish from 5 consecutive year classes (2013 – 2017) and each was represented by 10 or more individuals. Growth appears to be slow to moderate with mean length at capture values at age 4 from 10.0 to 12.4 inches since 2010. In 2019, the mean length at capture of age-4 fish was 11.2 inches.

- **Walleye.** More walleyes were sampled in 2019 than 2018, but relative abundance remained low to moderate (4.0/gill net). Sampled walleyes ranged in length from 7.5 to 20.9 inches, of those that were at least 10.0 inches 69% were ≥15.0 inches and 2% were 20.0 inches or longer. Individuals from eight consecutive year classes (2011 – 2018) contributed to the catch, those from the 2014 and 2018 cohorts, which coincided with fry stockings, were the most numerous accounting for more than 60% of walleyes in the sample. Walleye growth has improved. In 2019, the mean length at capture at age 5 was 16.1 inches compared to 12.8 inches in 2018 and 14.4 inches in 2016.

- **White bass.** Relative abundance of white bass has remained low (i.e., ≤2.0/gill net) from 2016 to 2019. In 2019, only 24 white bass ranging in length from 7.1 to 14.6 inches were sampled; nearly all (22 of 24) were 12.0 inches or longer.

- **Yellow perch**. Similar to white bass, yellow perch numbers have remained stable from 2016 to 2019. At 4.3/gill net, relative abundance was considered low in 2019. Sampled yellow perch ranged in length from 4.7 to 12.2 inches, of those that were at least 5.0 inches most (73%) were 10.0 inches or longer. Yellow perch from nine year classes (2009 – 2013 and 2015 – 2018) contributed to the catch, those from the 2013, 2015, and 2017 cohorts were the most abundant accounting for more than 80% of fish in the sample. Growth appears to be moderate with mean length at capture values at age 3 from 7.8 to 9.8 inches. In 2019, a single age-3 yellow perch with a mean length of 9.2 inches was sampled.

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
2019

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 16, 2019	6 net-nights
AFS std gill net	Jul 17, 2019	6 net-nights
boat shocker (day)	Jun 18, 2019	3600 seconds
fall night EF-WAE	Sep 23, 2019	3350 seconds

Common Fish Species Present

Walleye

Smallmouth Bass

White Crappie

Black Crappie

Bigmouth Buffalo

Yellow Perch

White Bass

Northern Pike

Common Carp

Channel Catfish

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	67	5.6	1.9	27	8	0		90	1
	Channel Catfish	6	0.4	0.2	100		80		114	7
	Common Carp	7	0.6	0.4	100		100		88	4
	Northern Pike	10	0.8	0.3	70		20		86	3
	Shorthead Redhorse	2	0.2	0.2	100		100		131	27
	Walleye	67	4.0	0.9	69	10	2		88	1
	White Bass	24	2.0	0.8	92		92		85	1
	White Crappie	64	2.6	1.4	6		6		112	2
	White Sucker	3	0.3	0.2	100		100		104	2
	Yellow Bullhead	4	0.3	0.3	100		100		97	4
	Yellow Perch	53	4.3	1.3	81	8	73	9	100	1
boat shocker (day)	Smallmouth Bass	97	97.0	25.1	66	7	13	5	90	1
fall night EF-WAE*	Walleye	52	54.2	43.9					86	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.

***Night sampling included prior to 2018 **Methods/Species that ignore stock length ***AFS standard frame net used in 2017**

		CPUE										
Gear	Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
AFS std gill net	Bigmouth Buffalo							0.0	0.0	8.3	5.6	3.5
	Black Bullhead							0.4	0.4	0.3	0.0	0.3
	Black Crappie							0.0	0.1	0.0	0.0	0.0
	Bluegill							0.0	0.1	0.0	0.0	0.0
	Channel Catfish							1.0	0.9	0.3	0.4	0.7
	Common Carp							0.1	0.0	0.3	0.6	0.3
	Northern Pike							0.5	0.2	0.7	0.8	0.6
	Shorthead Redhorse							0.2	0.0	0.1	0.2	0.1
	Smallmouth Bass							0.8	1.3	0.6	0.0	0.7
	Walleye							4.6	2.7	2.6	4.0	3.5
	White Bass							1.8	1.5	1.4	2.0	1.7
	White Crappie							1.1	0.5	0.2	2.6	1.1
	White Sucker							0.6	0.6	0.8	0.3	0.6
	Yellow Bullhead							1.1	0.7	0.6	0.3	0.7
	Yellow Perch							5.3	5.3	3.3	4.3	4.6
boat shocker (day)*	Smallmouth Bass	142.0		203.0		171.0		159.8			97.0	154.6
fall night EF-WAE**	Walleye	0.0	342.0	0.9	110.0	179.0	7.0	7.0	41.0	75.0	54.2	81.6
frame net (std 3/4 in)***	Bigmouth Buffalo	1.7	0.3	0.2	0.2	0.4			0.6			0.6
	Black Bullhead	0.0	0.1	18.2	22.7	15.5			0.7			9.5
	Black Crappie	1.2	0.5	1.2	0.6	0.5			1.2			0.9
	Bluegill	3.2	1.5	1.2	1.6	1.4			0.5			1.6
	Channel Catfish	0.0	0.2	0.1	0.2	0.0			0.1			0.1
	Common Carp	0.0	0.1	0.0	0.1	0.1			0.1			0.1
	Northern Pike	1.0	0.5	1.3	0.4	0.2			0.2			0.6
	Rock Bass	0.1	0.2	0.1	0.0	0.0			0.0			0.1
	Shorthead Redhorse	0.0	0.1	0.1	0.0	0.0			0.0			0.0
	Smallmouth Bass	2.6	1.6	4.0	1.1	0.5			0.4			1.7
	Walleye	3.4	0.5	0.5	1.0	0.6			0.1			1.0
	White Bass	7.9	3.0	8.5	7.2	3.0			3.1			5.5
	White Crappie	0.2	1.5	0.3	0.2	0.7			0.1			0.5
	White Sucker	1.6	1.0	0.8	0.5	0.5			0.0			0.7
	Yellow Bullhead	5.2	2.7	21.6	15.4	3.9			1.6			8.4
	Yellow Perch	0.4	0.1	2.9	0.0	0.1			0.1			0.6

std exp gill net	Black Bullhead	0.1	0.0	3.2	8.0	1.8	2.3	2.6
	Channel Catfish	0.1	0.1	0.0	0.2	0.7	0.2	0.2
	Common Carp	0.1	0.0	0.2	0.2	0.3	0.0	0.1
	Northern Pike	0.1	0.4	2.5	2.5	0.2	1.0	1.1
	Shorthead Redhorse	0.1	0.1	0.2	0.0	0.0	0.3	0.1
	Smallmouth Bass	0.0	0.2	0.2	0.5	0.0	1.2	0.4
	Walleye	6.9	8.1	12.2	7.5	9.3	11.5	9.3
	White Bass	1.8	1.5	4.8	4.3	3.8	4.7	3.5
	White Crappie	0.3	1.1	3.2	2.5	1.3	0.3	1.5
	White Sucker	0.6	1.8	3.8	1.5	1.8	2.2	2.0
	Yellow Bullhead	0.2	0.3	6.7	2.2	1.5	0.8	2.0
	Yellow Perch	2.0	0.9	3.5	5.7	2.7	13.0	4.6

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.

***Night samples included prior to 2018**

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AFS std gill net	Walleye	PSD							18	7	3	69
		PSD-P							2	3	0	2
		Wr							79	75	85	88
	White Bass	PSD							48	94	100	92
		PSD-P							48	50	88	92
		Wr							86	80	88	85
	Yellow Perch	PSD							90	97	92	81
		PSD-P							40	48	67	73
		Wr							108	109	105	100
boat shocker (day)*	Smallmouth Bass	PSD	51		60		87		61			66
		PSD-P	4		15		15		18			13
		Wr	97		90		98		96			90
std exp gill net	Walleye	PSD	2	31	53	51	25	12				
		PSD-P	1	0	0	0	0	1				
		Wr	86	84	80	82	78	82				
	White Bass	PSD	100	100	97	100	100	96				
		PSD-P	100	100	76	85	87	93				
		Wr	94	89	84	83	81	84				
	Yellow Perch	PSD	75	38	81	65	88	65				
		PSD-P	14	13	19	18	19	41				
		Wr	107	104	95	107	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)	
2012	202		199 (2)	253 (76)	291 (73)	318 (26)	352 (8)	386 (15)	401 (2)	451 (1)	
2010	142		194 (22)	239 (26)	253 (12)	298 (66)	317 (15)	401 (1)		431 (2)	

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
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)
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)

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
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)				
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)	

Fish Condition

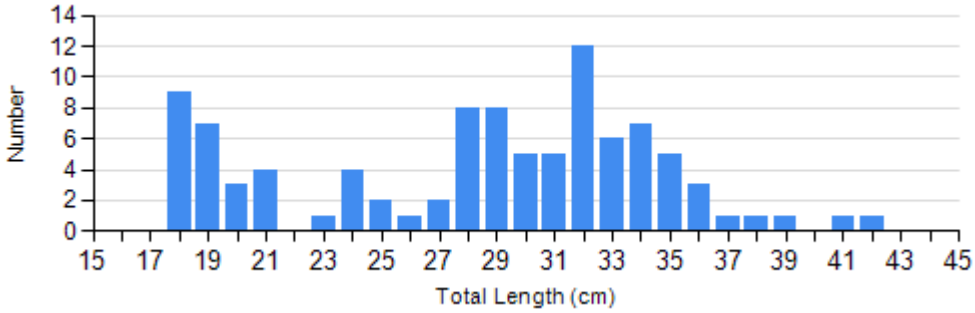
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Smallmouth Bass Electro Fishing	2016	63	97 (0.8)	69	95 (0.7)	27	94 (1.4)	1	101
	2019	33	97 (1.1)	51	86 (0.9)	13	86 (2.1)	0	
Walleye Gill Net	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	
	2019	15	88 (2.3)	32	89 (0.9)	1	86	0	
White Bass Gill Net	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	
	2018	0		2	93 (3.8)	15	87 (1.7)	0	
	2019	2	86 (4.0)	0		22	85 (1.2)	0	
Yellow Perch Gill Net	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)
	2019	10	106 (2.5)	4	98 (3.1)	27	99 (1.5)	11	98 (1.5)

Length Frequency Distribution

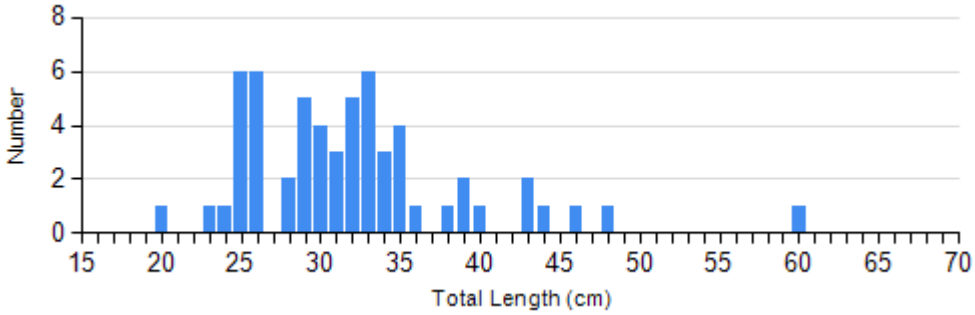
Length frequency histogram of species sampled by year.

Species: Smallmouth Bass
Gear: boat shocker (day)

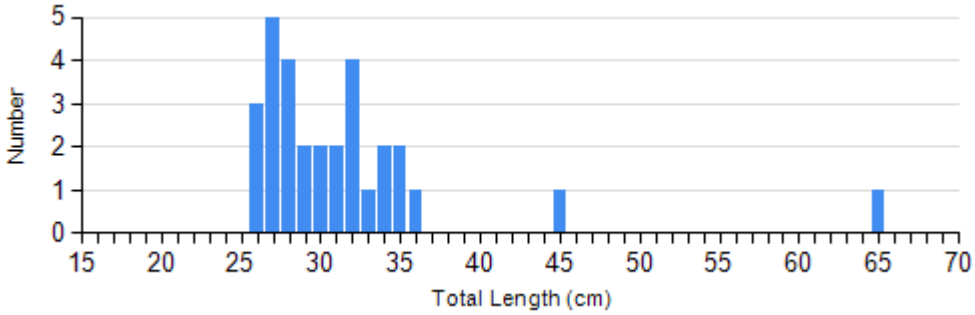


2019

Species: Walleye
Gear: AFS std gill net



2016



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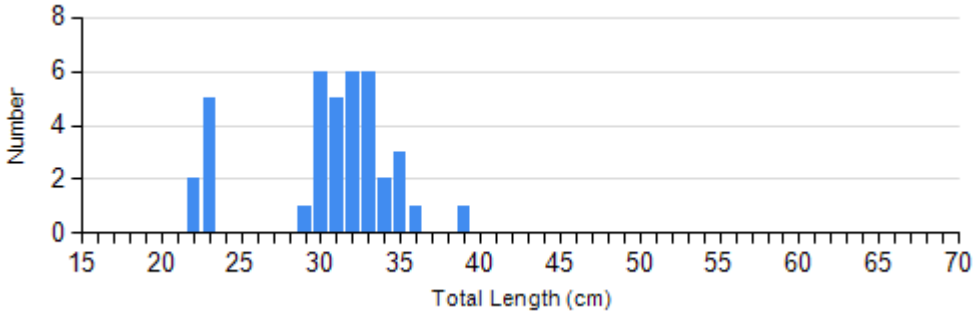
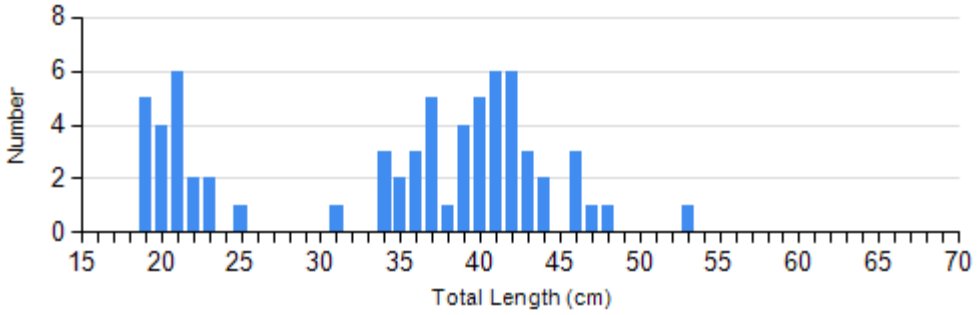
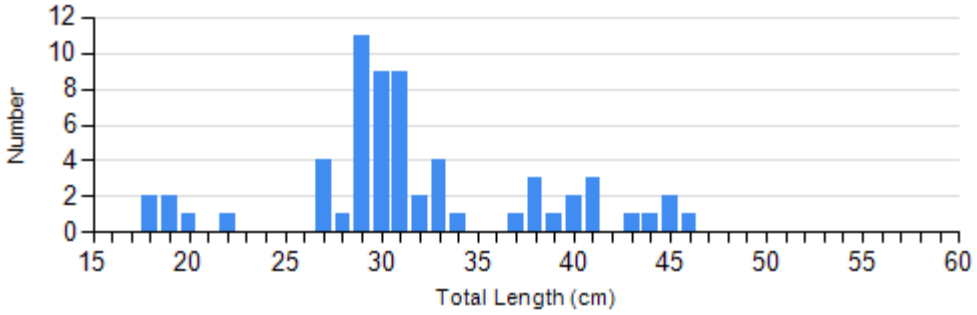


2018

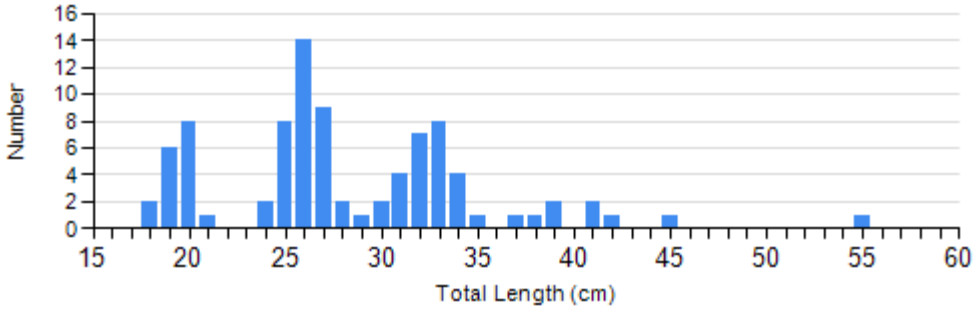


2019

Species: Walleye
Gear: std exp gill net

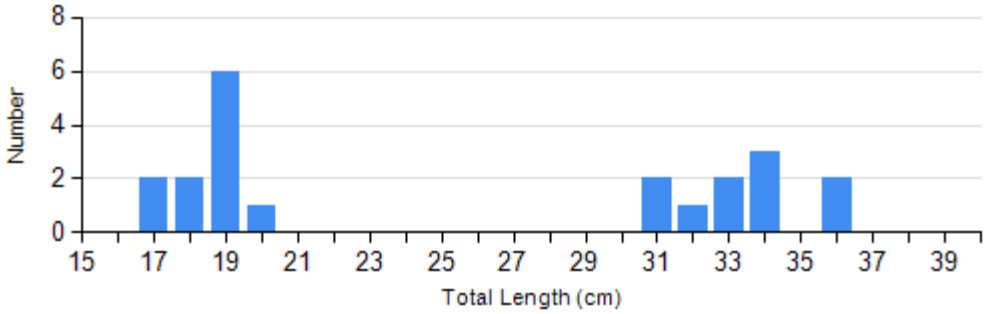


2014

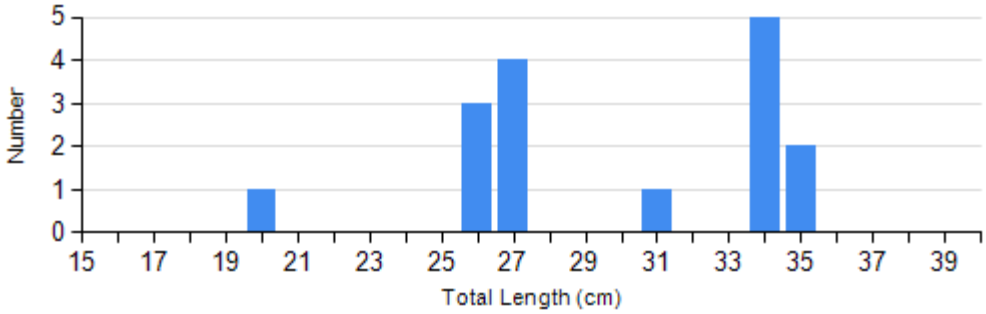


2015

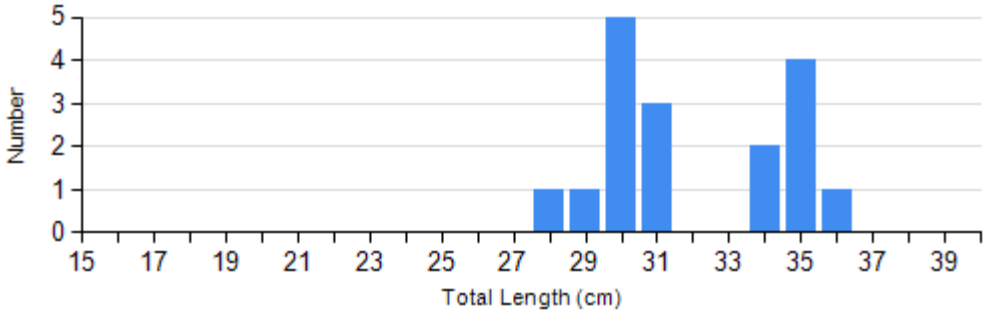
Species: White Bass
Gear: AFS std gill net



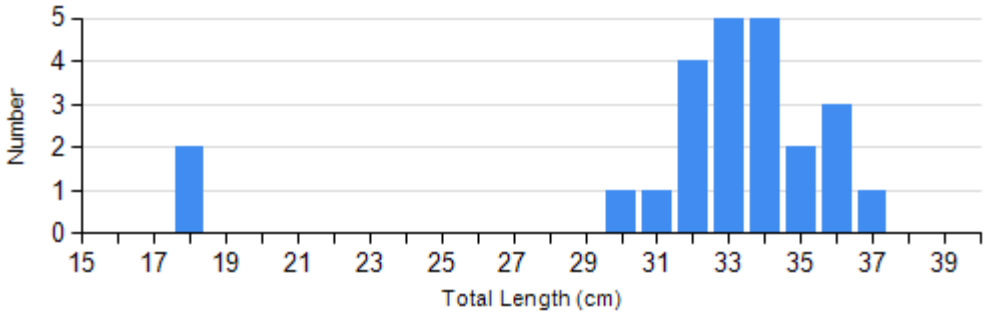
2016



2017

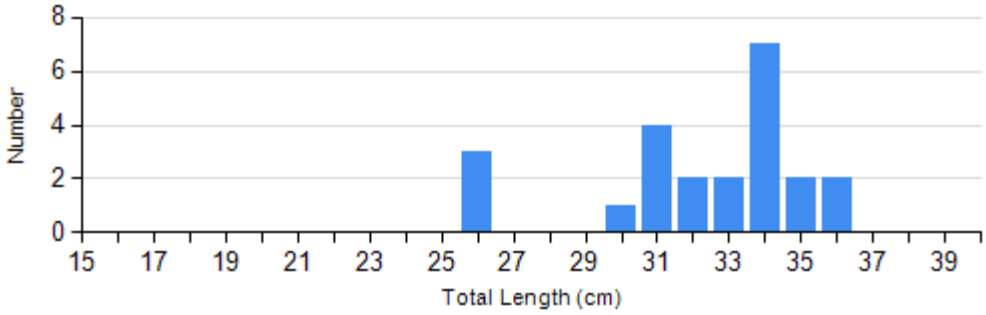


2018

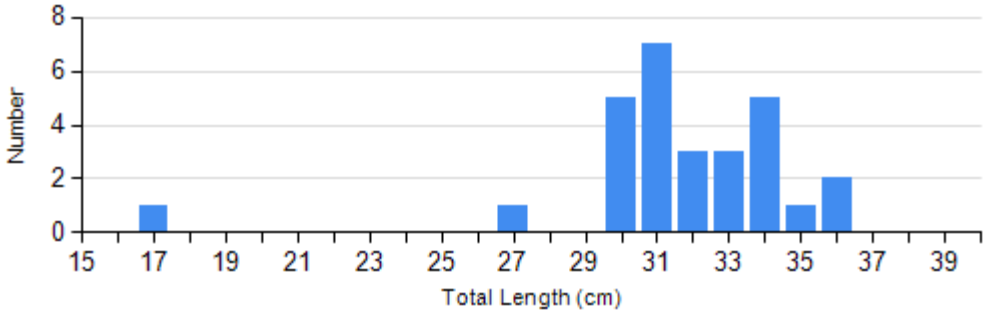


2019

Species: White Bass
Gear: std exp gill net

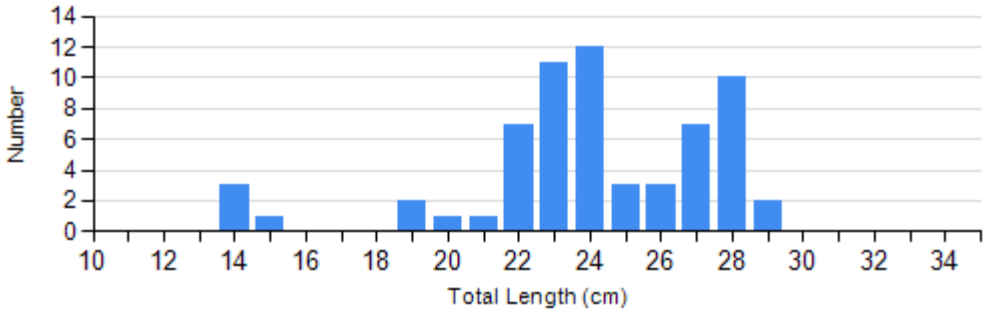


2014

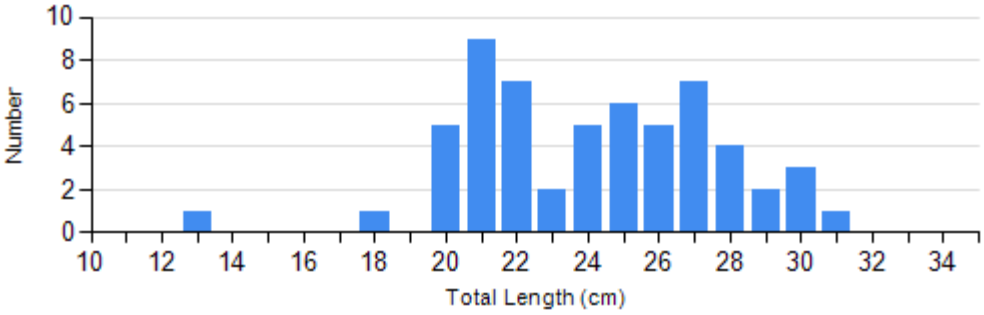


2015

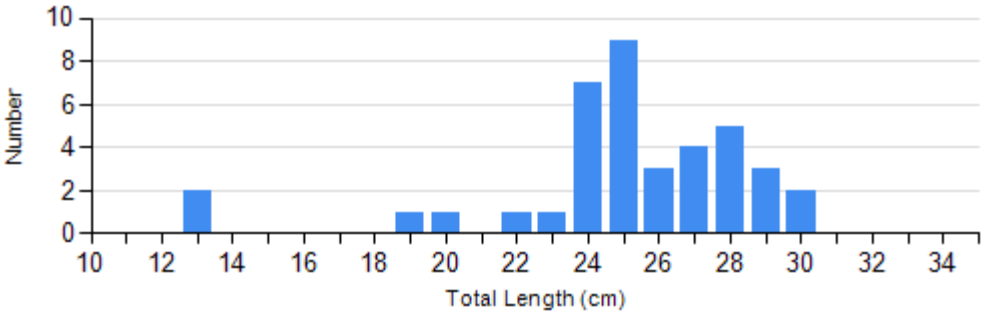
Species: Yellow Perch
Gear: AFS std gill net



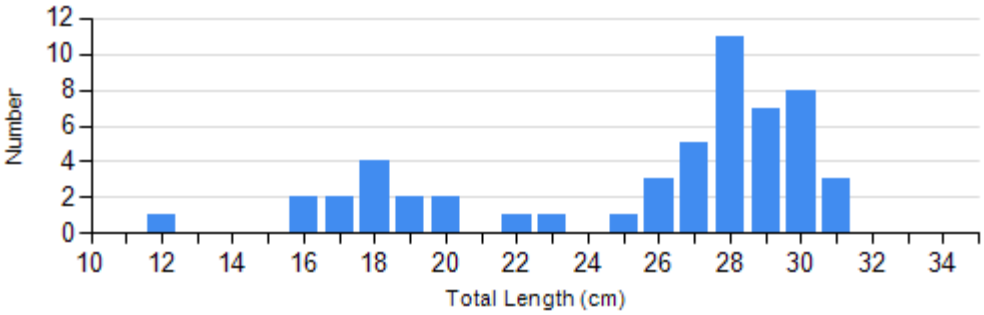
2016



2017

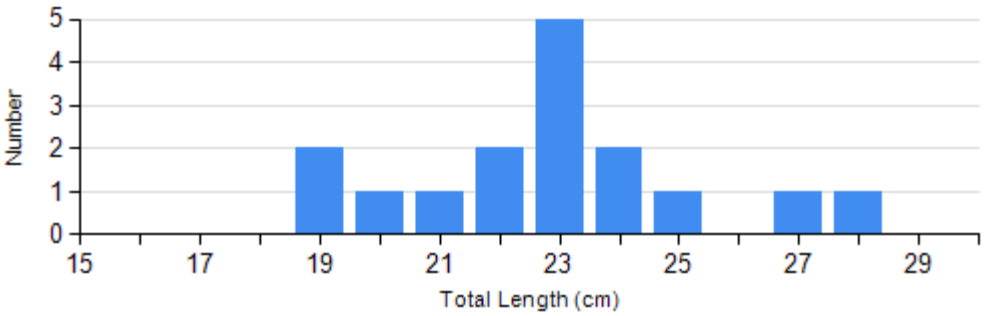


2018

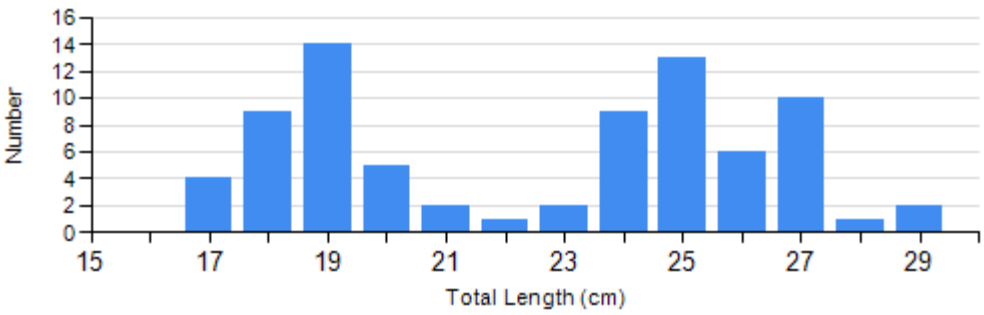


2019

Species: Yellow Perch
Gear: std exp gill net



2014

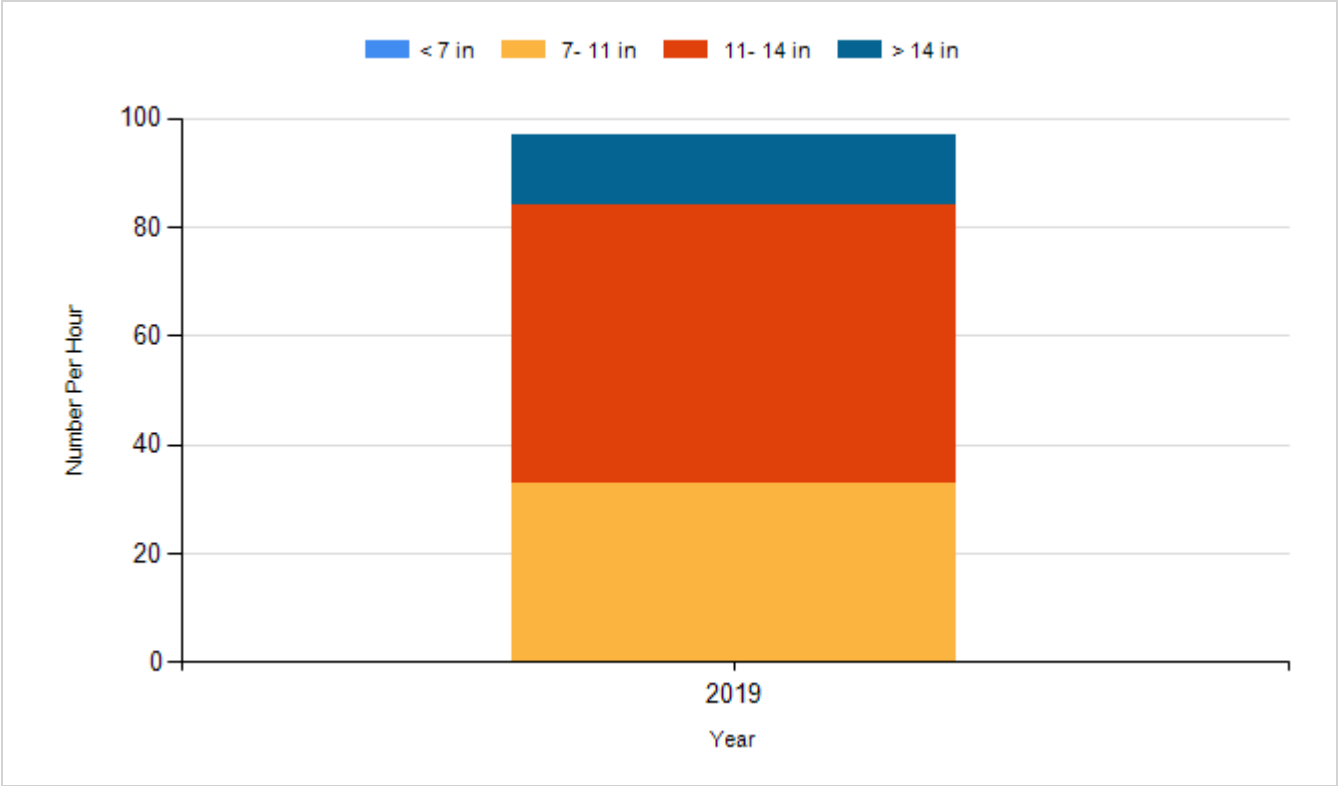


2015

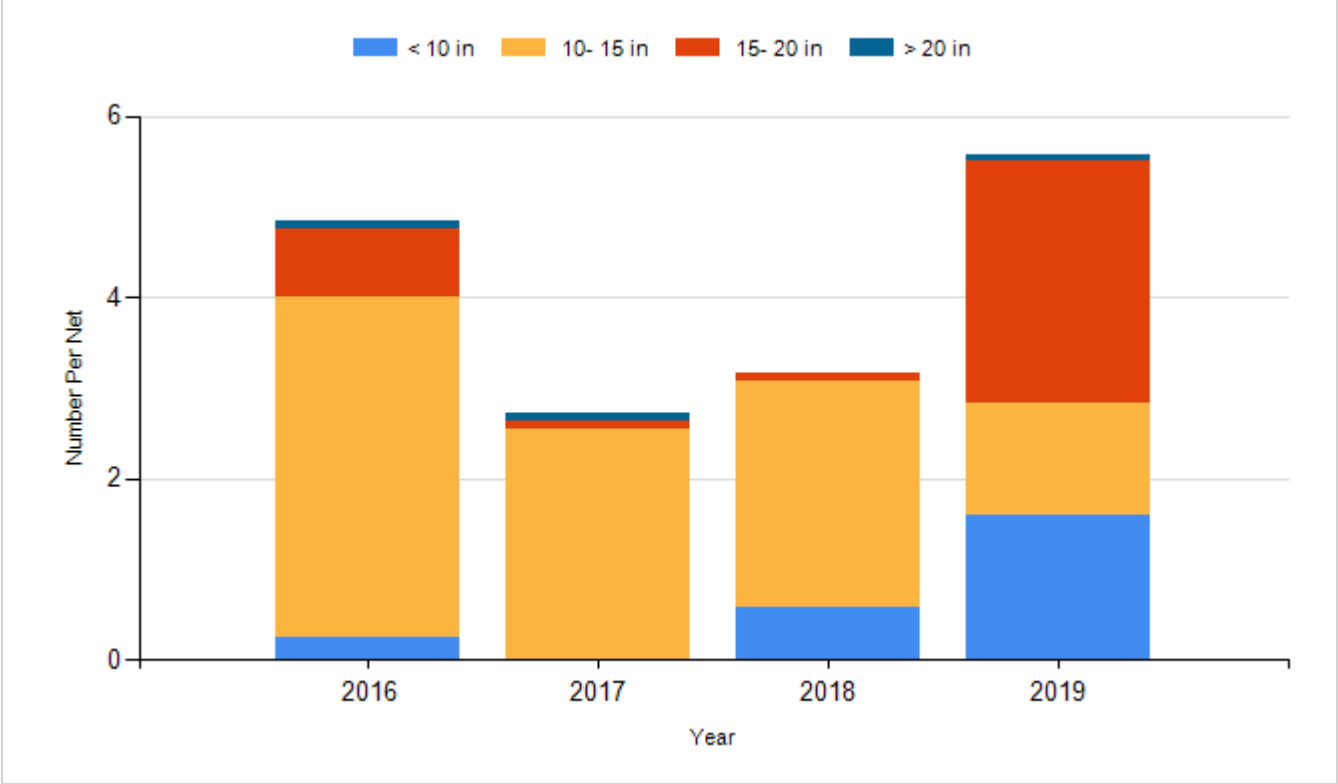
Historic Fish Sizes and Relative Abundance

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

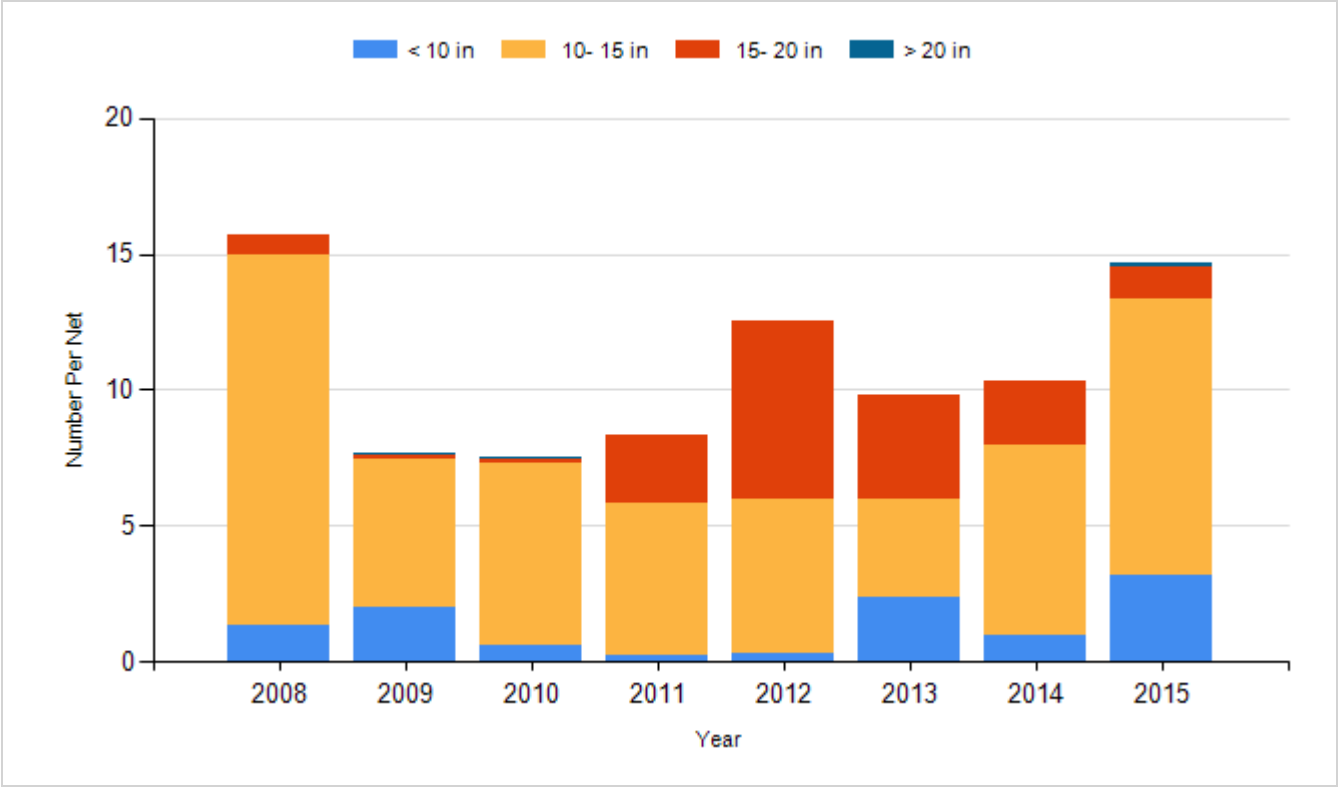
Species: Smallmouth Bass
Gear: boat shocker (day)



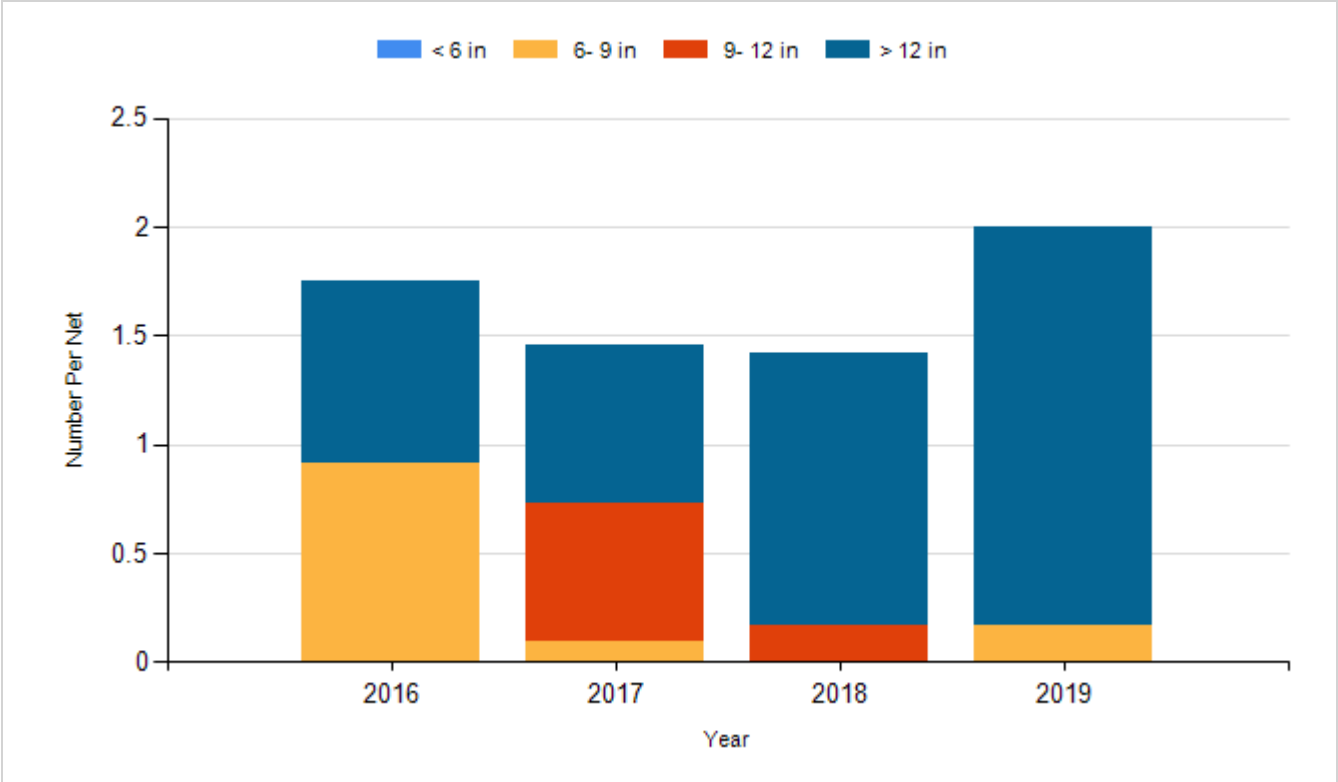
Species: Walleye
Gear: AFS std gill net



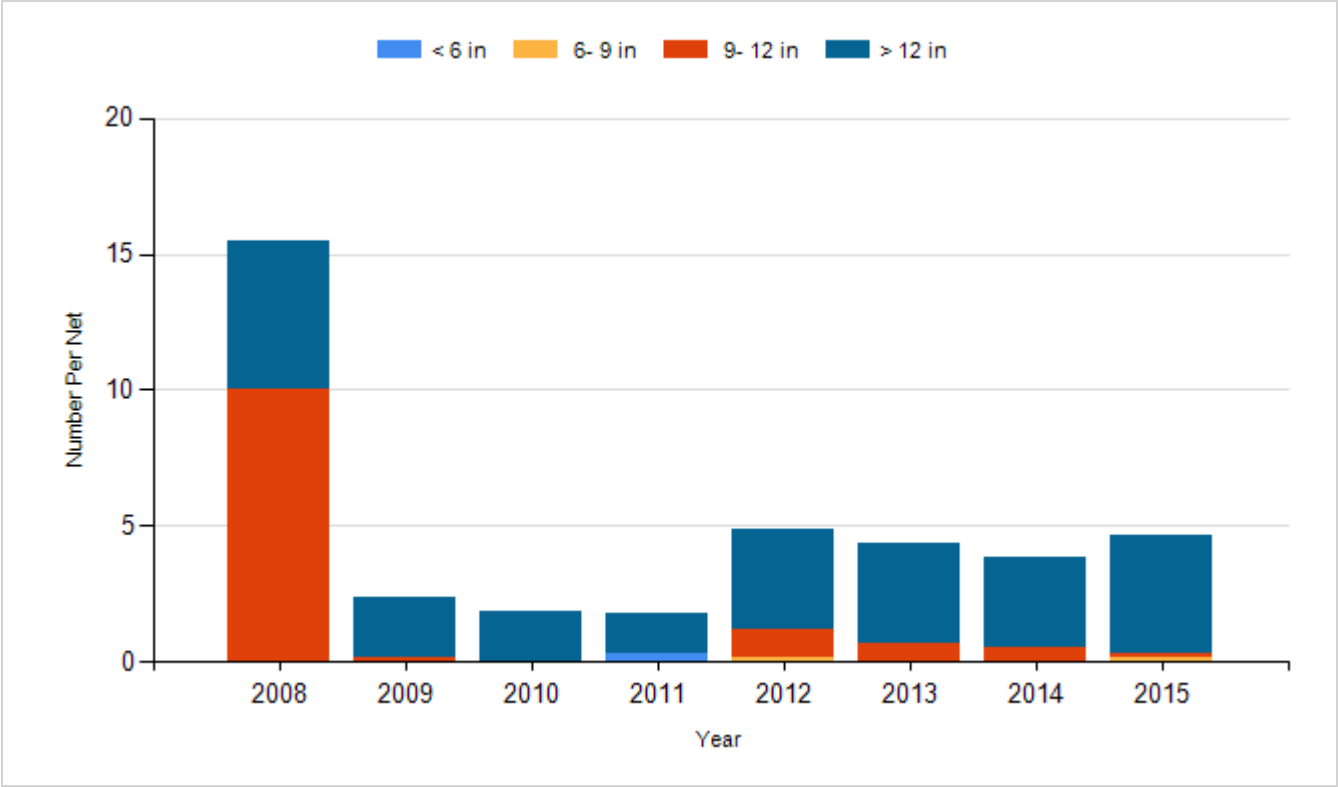
Species: Walleye
Gear: std exp gill net



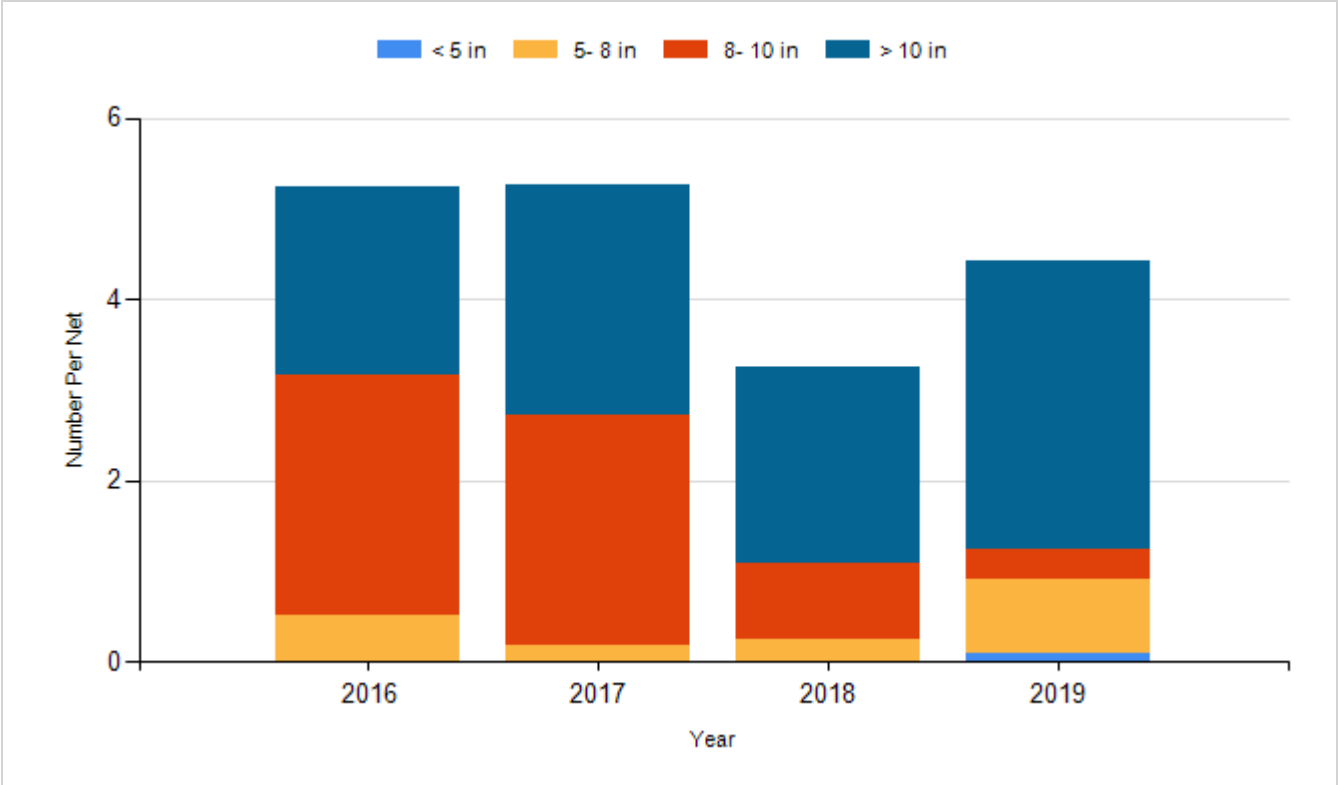
Species: White Bass
Gear: AFS std gill net



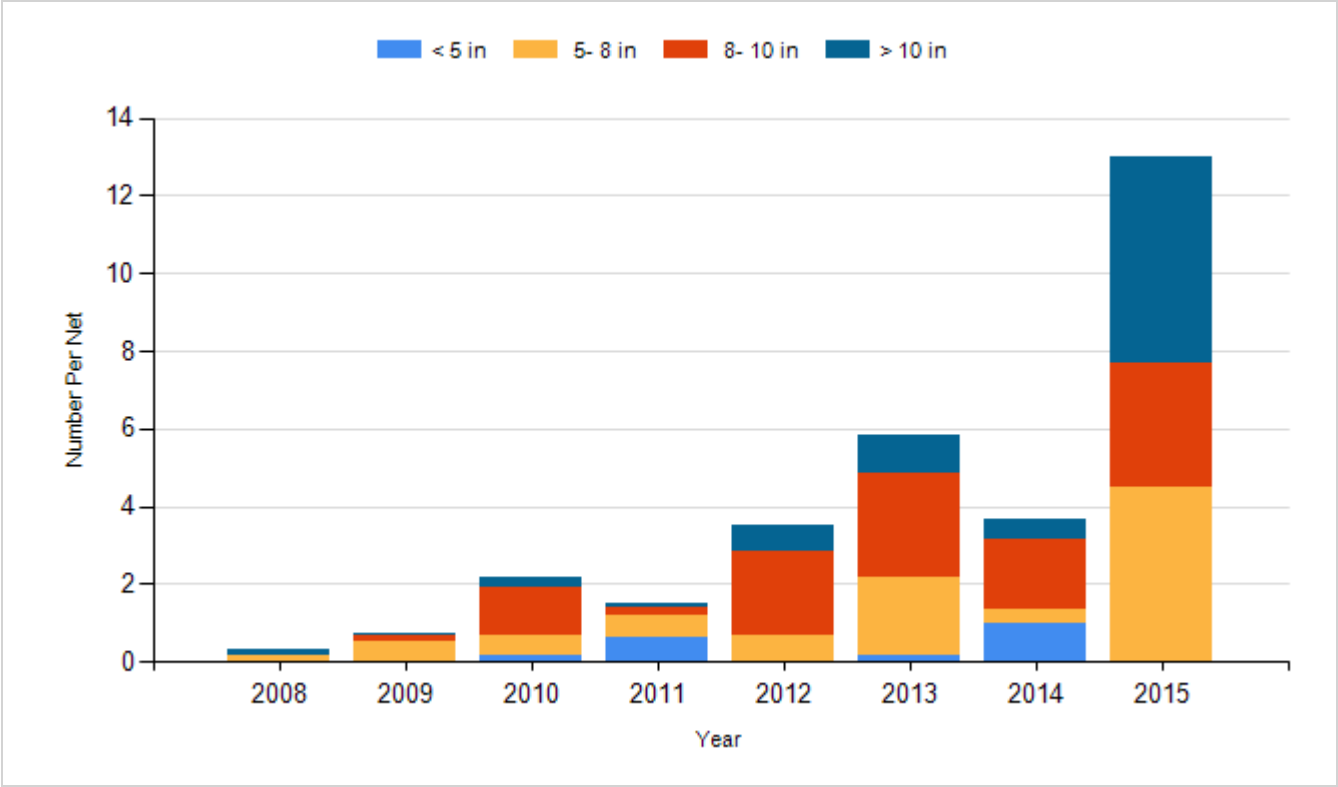
Species: White Bass
Gear: std exp gill net



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
2019	Walleye	Fry	2,400,000