Opitz Lake Survey Summary

Opitz Lake, located 5.0 miles west and 1.0 mile south of Eden, is managed as a walleye and yellow perch fishery but other fish species (e.g., northern pike, rock bass) are present and also contribute to the fishery.

- **Walleye.** Walleye numbers increased in 2018 when compared to 2017. At 7.4/gill net, relative abundance was considered moderate to high. Sampled walleyes ranged in length from 10.2 to 24.8 inches; most (>70%) were 10.0 to 13.0 inches and belonged to the strong 2016 year class, which coincided with a fry stocking. A smaller but noticeable node in the length frequency was apparent from 13.7 to 15.7 inches as four cohorts (2011 – 2014) each represented by a relatively low number of individuals were present. Since 2010, walleye growth has been variable; mean length at capture values for age-4 walleyes have ranged from 14.0 to 15.8 inches. In 2018, the mean length of age-4 walleyes was 14.3 inches, but few were sampled.

- **Yellow perch**. Slightly fewer yellow perch were sampled in 2018 than surveys conducted in 2016 and 2017. However at 11.7/gill net, relative abundance remained moderate. Sampled yellow perch ranged in length from 7.5 to 13.4 inches; peaks in the length frequency were apparent from 7.5 – 9.0 inches and 10.6 – 12.2 inches as several relatively-well represented year classes (2011 – 2013 and 2016) were present. Growth appears to be good with mean length at capture values exceeding 9.0 inches at age 3 from 2010 – 2018. In 2018, the mean length at capture of age-3 fish was 10.5 inches.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Opitz, Day County
UJA-Lake-866-002
2018

Lake Information

Name: Opitz

County: Day

Surface Area: 1,452 Acres

Maximum Depth: 23 Feet

Mean Depth: 14 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 26, 2018	4 net-nights
AFS std gill net	Jun 27, 2018	4 net-nights
AFS std gill net	Jun 28, 2018	4 net-nights
fall night EF-WAE	Oct 17, 2018	3600 seconds

Common Fish Species Present

Yellow Perch

Northern Pike

Walleye

Rock Bass

White Sucker

Common Carp

Black 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	Black Bullhead	0.2	0.2	100		100		106	14
	Common Carp	0.2	0.2	100		100		97	9
	Northern Pike	0.1	0.1	100		0		70	
	Rock Bass	2.2	0.6	69	10	19	8	110	2
	Walleye	7.4	0.6	11	3	1		82	1
	White Sucker	0.2	0.2	100		100		94	1
	Yellow Perch	11.7	1.6	97	2	59	4	111	1
fall night EF-WAE*	Walleye	325.0	154.4					77	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**

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std frame net	Black Bullhead									1.1		1.1
	Common Carp									0.3		0.3
	Northern Pike									0.1		0.1
	Orangespotted Sunfish*									0.6		0.6
	Rock Bass									0.9		0.9
	Walleye									1.5		1.5
AFS std gill net	Black Bullhead								0.8	0.4	0.2	0.5
	Common Carp								0.1	0.3	0.2	0.2
	Northern Pike								0.4	0.1	0.1	0.2
	Rock Bass								1.8	2.8	2.2	2.3
	Smallmouth Bass								0.2	0.0	0.0	0.1
	Walleye								5.6	3.3	7.4	5.4
	White Sucker								0.0	0.0	0.2	0.1
	Yellow Perch								14.3	13.8	11.7	13.3
fall night EF-WAE*	Walleye			283.5	167.0	144.0	75.0	0.0	360.0	0.0	325.0	169.3
frame net (std 3/4 in)	Black Bullhead		0.1	0.0	0.2	4.9	7.0					2.4
	Black Crappie		0.6	0.2	0.1	0.9	0.3					0.4
	Common Carp		0.3	0.0	0.3	0.1	0.1					0.2
	Northern Pike		0.3	0.2	0.1	0.1	0.3					0.2
	Orangespotted Sunfish*		0.0	0.0	0.1	0.0	0.0					0.0
	Rock Bass		0.6	1.4	2.2	6.9	2.6					2.7
	Walleye		2.9	3.9	4.0	6.0	5.9					4.5
	White Sucker		0.0	0.0	0.1	0.0	0.0					0.0
	Yellow Perch		0.0	0.0	0.7	0.1	0.0					0.2
std exp gill net	Black Bullhead		0.0	0.0	0.0	0.5	0.3	0.7				0.3
	Common Carp		0.0	0.0	0.0	0.0	0.0	0.5				0.1
	Northern Pike		0.0	0.0	0.3	1.5	1.5	0.5				0.6
	Rock Bass		0.0	0.0	0.8	1.0	1.3	0.8				0.7
	Walleye		10.2	39.7	29.0	17.7	27.7	22.5				24.5
	Yellow Perch		0.5	11.7	6.0	18.2	34.2	33.8				17.4

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								27	55	11
		PSD-P								1	0	1
		Wr								82	80	82
	Yellow Perch	PSD								100	91	97
		PSD-P								93	84	59
		Wr								103	108	111
std exp gill net	Walleye	PSD		52	14	68	28	6	5			
		PSD-P		0	0	0	0	0	0			
		Wr		90	95	84	83	82	80			
	Yellow Perch	PSD		100	77	97	87	99	96			
		PSD-P		100	16	56	19	62	74			
		Wr		121	116	119	113	108	108			

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	89		293 (63)		365 (5)	372 (7)	398 (2)	386 (10)			630 (1)
2017	66	205 (26)	317 (1)	355 (2)	385 (19)	384 (3)	386 (15)		405 (1)		
2016	67		320 (6)	349 (21)	374 (10)	380 (30)		520 (1)			
2015	143	201 (7)	276 (24)	324 (24)	356 (88)	395 (2)					
2014	185	212 (17)	288 (23)	339 (136)		420 (8)			425 (1)		
2013	112	185 (3)	283 (74)	356 (1)	396 (31)			453 (2)		485 (1)	
2012	309	201 (135)	320 (8)	386 (152)	404 (3)	465 (1)	436 (7)	465 (2)	457 (1)		
2011	239	225 (1)	330 (207)	414 (2)	402 (1)	441 (27)		435 (1)			
2010	147	203 (86)	328 (5)	376 (9)	387 (44)		406 (3)				

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	140		220 (56)	267 (12)		294 (34)	297 (20)	303 (18)	342 (1)		
2017	166	141 (15)	231 (10)		272 (38)	289 (11)	298 (90)		325 (2)		
2016	171			254 (37)	277 (23)	300 (90)	309 (10)	305 (11)			
2015	203		197 (14)	229 (28)	274 (149)	278 (11)	325 (1)				
2014	205		213 (16)	254 (148)		278 (41)					
2013	109		211 (82)	249 (4)	265 (22)	257 (1)					
2012	36	150 (1)	203 (1)	249 (32)	275 (1)	275 (1)					
2011	70		205 (51)	235 (11)	274 (5)		290 (2)				351 (1)
2010	4	92 (1)		263 (2)						300 (1)	

Fish Condition

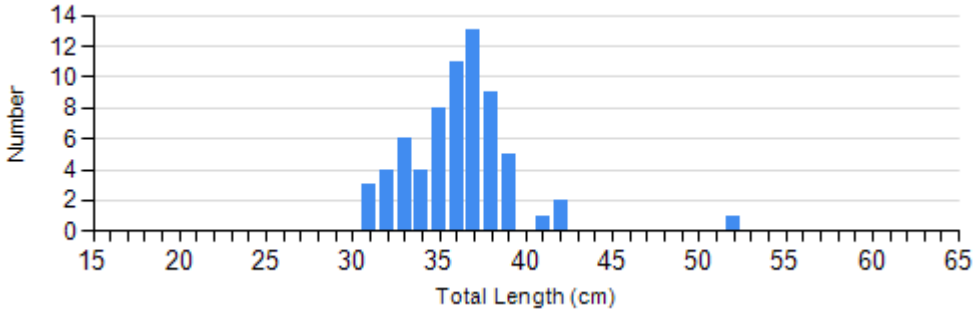
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	156	82 (0.3)	10	83 (2.2)	0		0	
	2015	128	81 (0.5)	7	75 (1.8)	0		0	
	2016	49	83 (0.8)	17	80 (1.3)	1	72	0	
	2017	18	83 (1.2)	22	78 (0.9)	0		0	
	2018	79	82 (0.6)	9	78 (1.1)	0		1	82
Yellow Perch Gill Net	2014	2	112 (13.8)	75	111 (0.8)	121	107 (0.7)	7	106 (2.5)
	2015	9	114 (2.6)	44	111 (1.3)	136	107 (0.7)	14	102 (1.2)
	2016	0		12	110 (3.3)	95	105 (0.9)	64	99 (0.8)
	2017	15	111 (1.4)	12	119 (2.1)	92	110 (0.8)	47	101 (1.1)
	2018	4	120 (4.2)	54	117 (1.1)	47	109 (1.0)	35	102 (1.0)

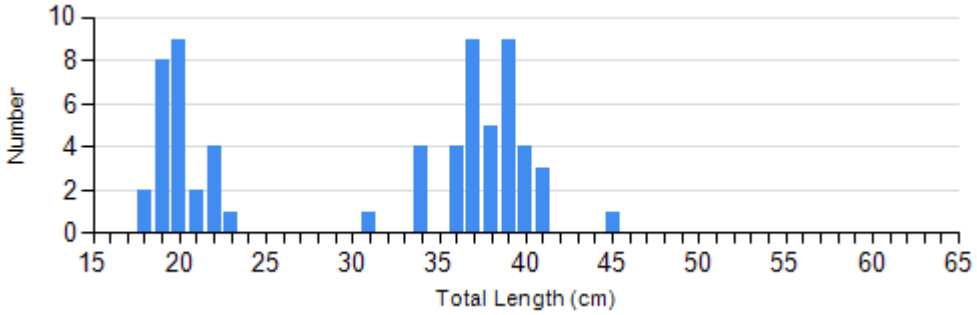
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Walleye
Gear: AFS std gill net



2016



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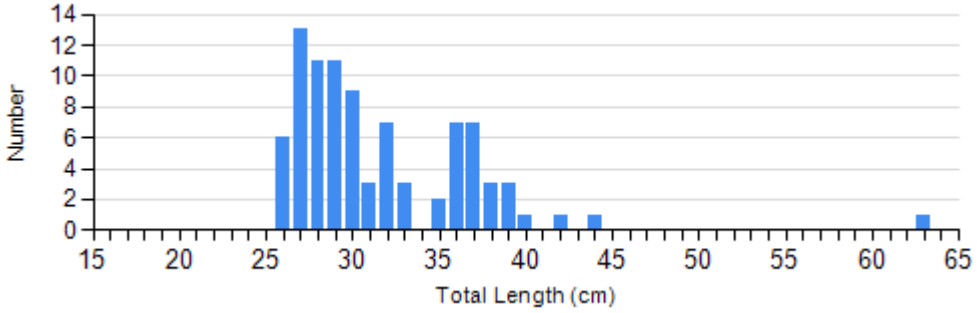
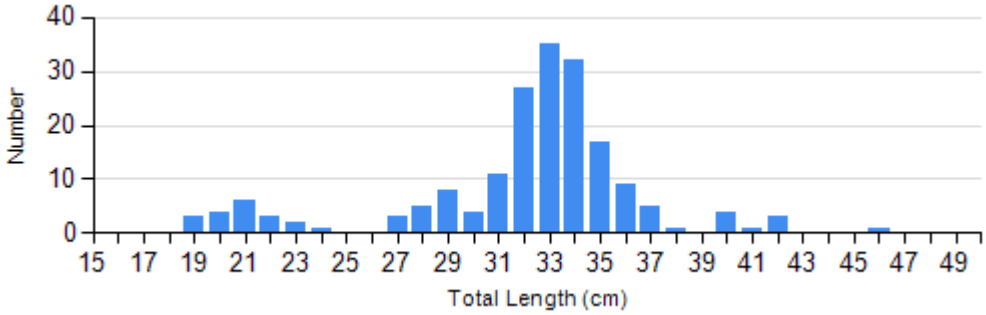
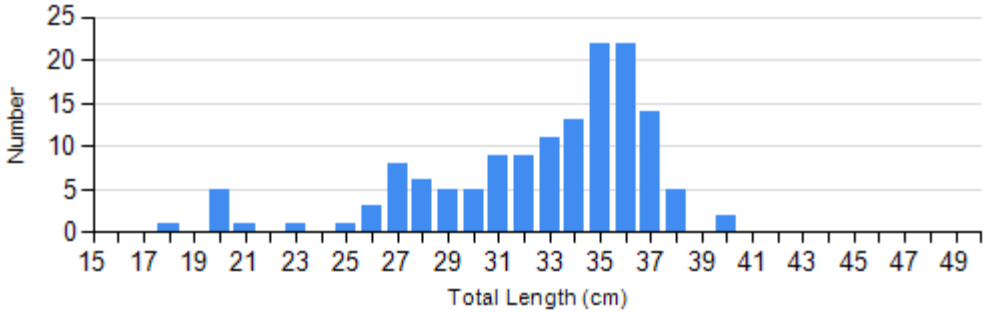


2018

Species: Walleye
Gear: std exp gill net

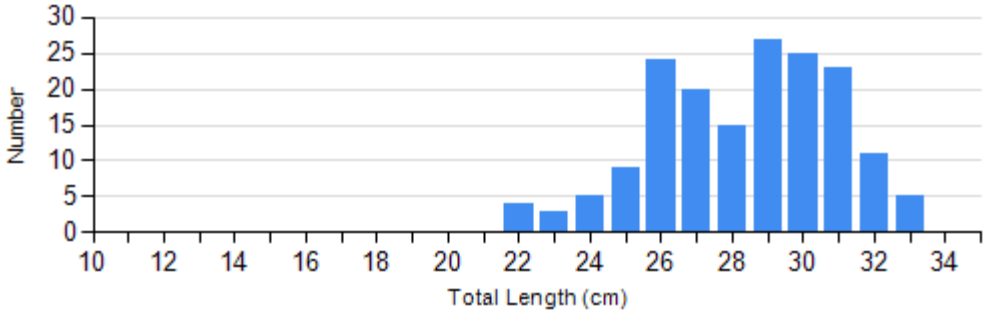


2014

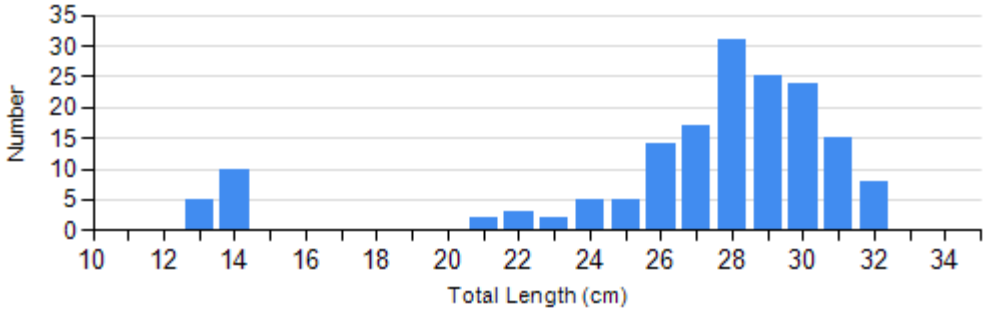


2015

Species: Yellow Perch
Gear: AFS std gill net



2016



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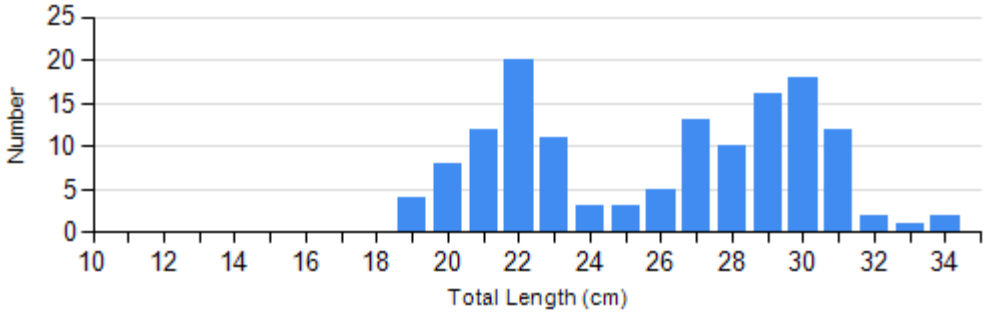
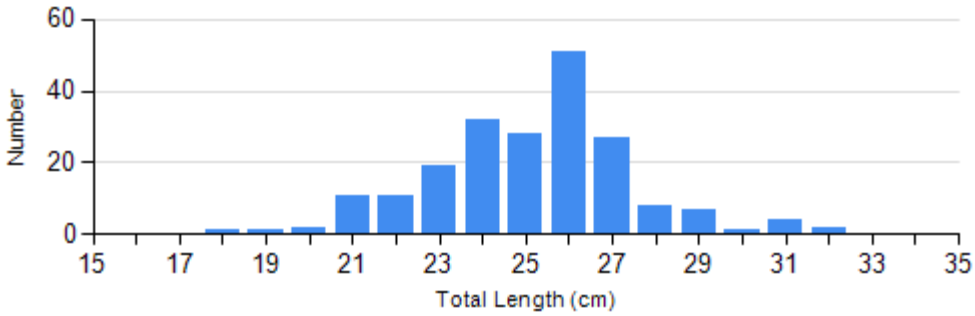
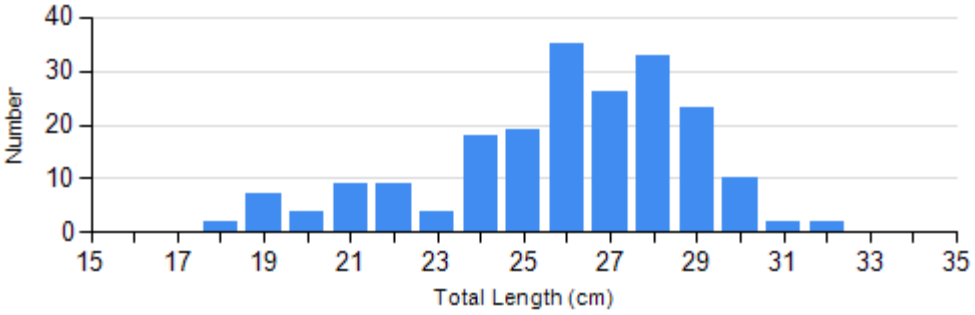


2018

Species: Yellow Perch
Gear: std exp gill net



2014

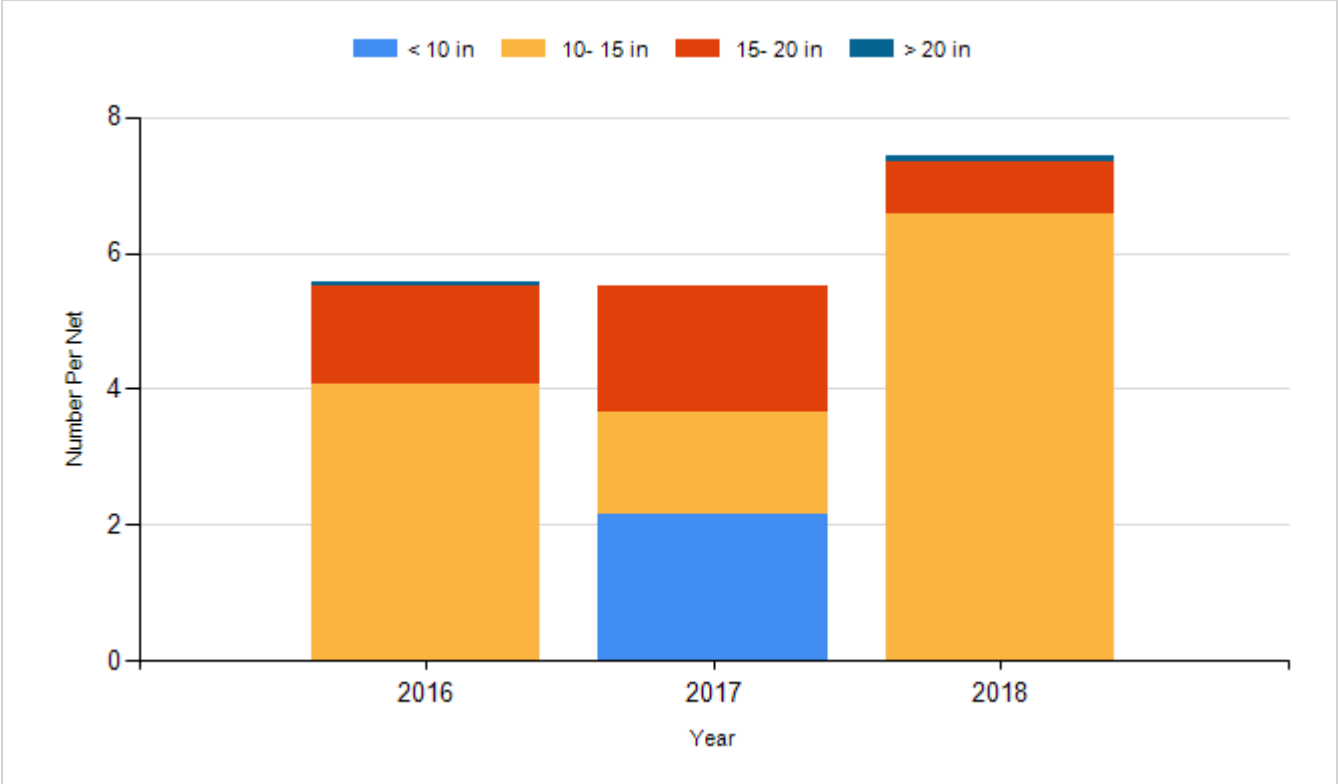

40
30
20
10
0
Number
15
17
19
21
23
25
27
29
31
33
35
Total Length (cm)

2015

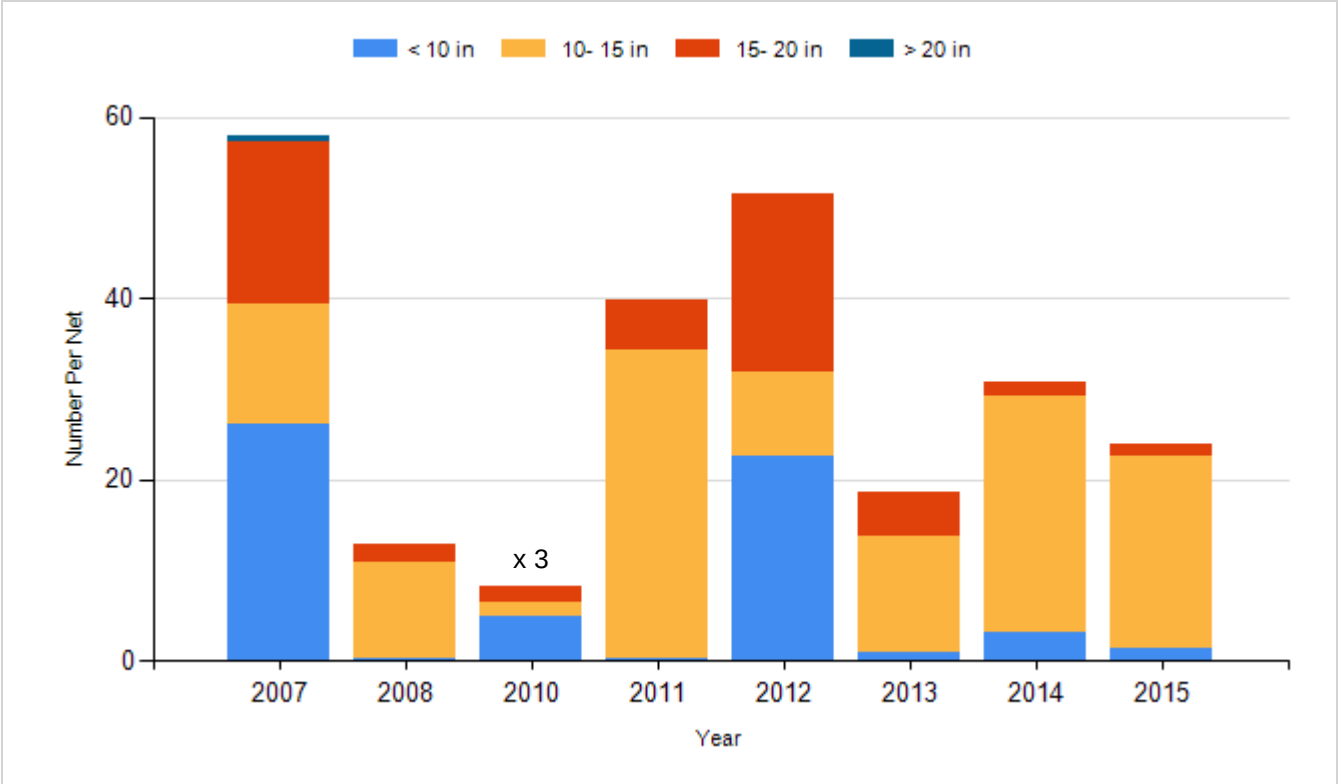
Historic Fish Sizes and Relative Abundance

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

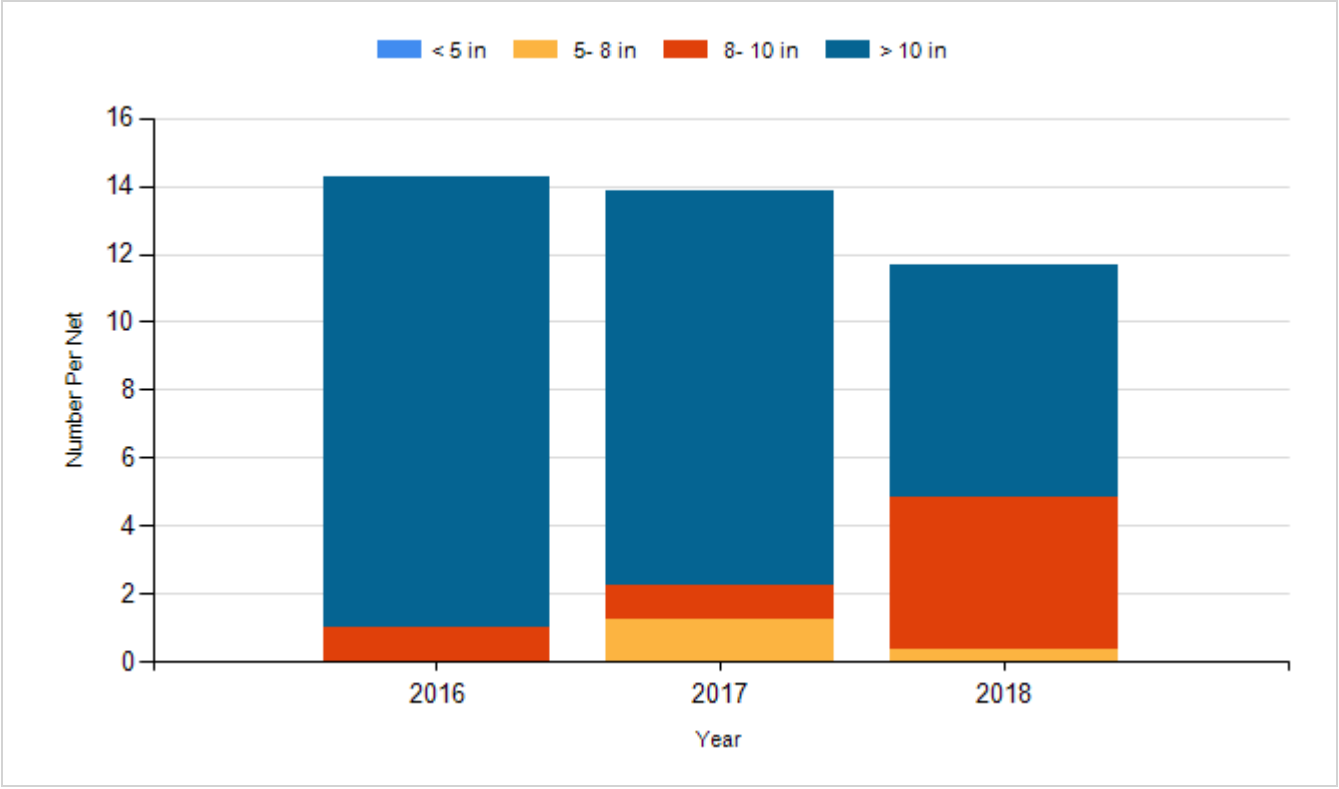
Species: Walleye
Gear: AFS std gill net



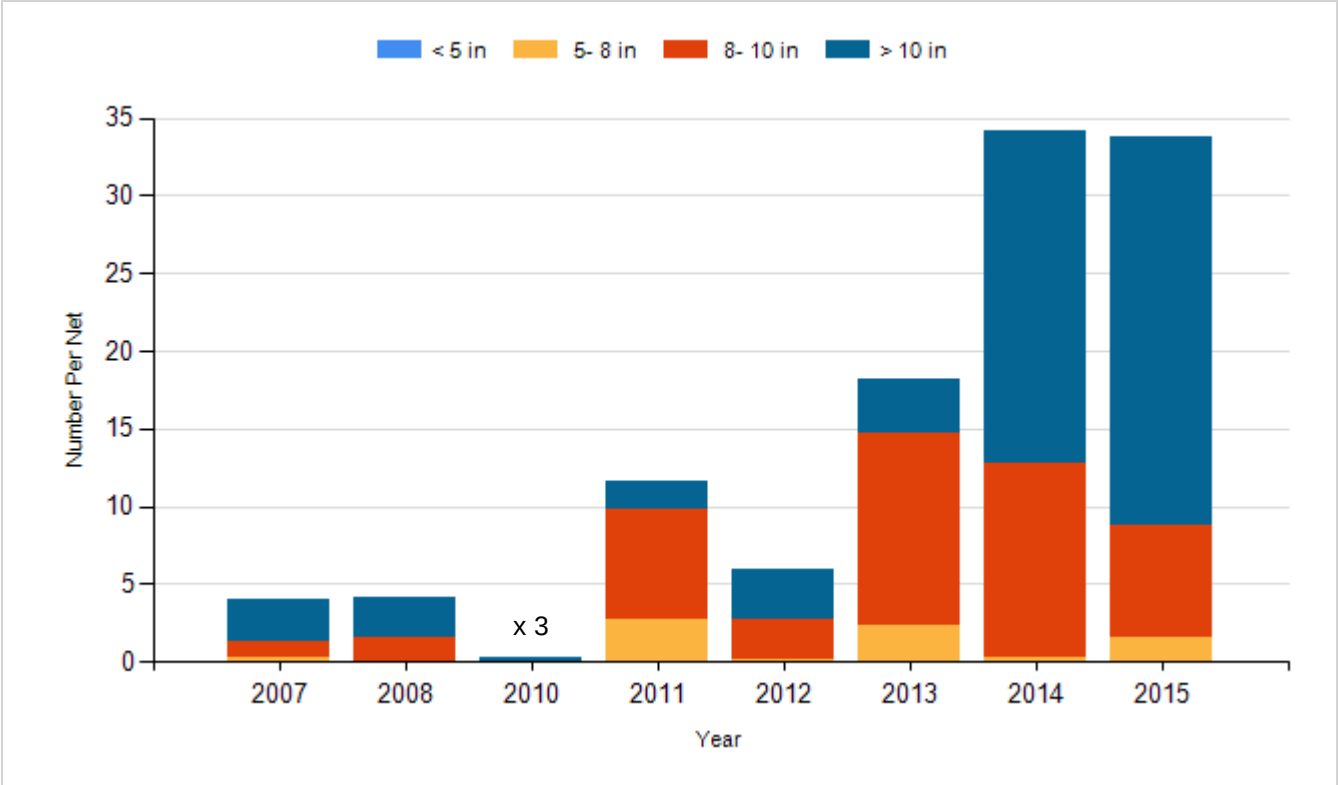
Species: Walleye
Gear: std exp gill net



Species: 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
2009	Walleye	Fry	750,000
2011	Walleye	Fry	900,000
2016	Walleye	Fry	700,000
2018	Walleye	Fry	710,000