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 contribute to the fishery.

- **Walleye.** Fewer walleyes were sampled in 2019 than 2018. At 5.2/gill net, relative abundance was considered moderate. Sampled walleyes ranged in length from 7.5 to 21.3 inches; most (>86%) were 12.0 to 14.0 inches and belonged to the strong 2016 year class, which coincided with a fry stocking. The 2016 cohort has experienced slow growth with a mean length at capture of 13.0 inches at age 3, the second lowest recorded since 2010.

- **Yellow perch**. Yellow perch numbers have declined in each of the last three surveys. In 2019, the mean gill net CPUE was 9.4 and suggested low to moderate relative abundance. Sampled yellow perch ranged in length from 4.7 to 13.4 inches, most (91%) were ≥8.0 inches and 66% were 10.0 inches or longer. Year classes produced in 2011, 2013, and 2016 were the most abundant comprising 76% of fish in the sample. 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 9.6 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
2019

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 18, 2019	4 net-nights
AFS std gill net	Jun 19, 2019	4 net-nights
AFS std gill net	Jun 20, 2019	4 net-nights
fall night EF-WAE	Sep 18, 2019	2400 seconds

Common Fish Species Present

Yellow Perch

Northern Pike

Walleye

Rock Bass

White Sucker

Common Carp

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	Common Carp	4	0.3	0.2	100		100		92	8
	Rock Bass	25	2.1	0.6	88	7	12	7	108	2
	Walleye	63	5.2	0.7	6	3	2		83	1
	White Sucker	3	0.3	0.2	100		100		103	7
	Yellow Perch	114	9.4	1.1	91	3	66	4	112	1
fall night EF-WAE*	Walleye	2	3.0	2.8						

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 standard frame nets used in 2017**

		CPUE										
Gear	Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
AFS std gill net	Black Bullhead							0.8	0.4	0.2	0.0	0.4
	Common Carp							0.1	0.3	0.2	0.3	0.2
	Northern Pike							0.4	0.1	0.1	0.0	0.2
	Rock Bass							1.8	2.8	2.2	2.1	2.2
	Smallmouth Bass							0.2	0.0	0.0	0.0	0.1
	Walleye							5.6	3.3	7.4	5.2	5.4
	White Sucker							0.0	0.0	0.2	0.3	0.1
	Yellow Perch							14.3	13.8	11.7	9.4	12.3
fall night EF-WAE*	Walleye		283.5	167.0	144.0	75.0	0.0	360.0	0.0	325.0	3.0	150.8
frame net (std 3/4 in)**	Black Bullhead	0.1	0.0	0.2	4.9	7.0			1.1			2.2
	Black Crappie	0.6	0.2	0.1	0.9	0.3			0.0			0.4
	Common Carp	0.3	0.0	0.3	0.1	0.1			0.3			0.2
	Northern Pike	0.3	0.2	0.1	0.1	0.3			0.1			0.2
	Orangespotted Sunfish*	0.0	0.0	0.1	0.0	0.0			0.6			0.1
	Rock Bass	0.6	1.4	2.2	6.9	2.6			0.9			2.4
	Walleye	2.9	3.9	4.0	6.0	5.9			1.5			4.0
	White Sucker	0.0	0.0	0.1	0.0	0.0			0.0			0.0
	Yellow Perch	0.0	0.0	0.7	0.1	0.0			0.0			0.1
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	3.4	39.7	29.0	17.7	27.7	22.5					23.3
	Yellow Perch	0.2	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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AFS std gill net	Walleye	PSD							27	55	11	6
		PSD-P							1	0	1	2
		Wr							82	80	82	83
	Yellow Perch	PSD							100	91	97	91
		PSD-P							93	84	59	66
		Wr							103	108	111	112
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+
2019	63	221 (2)		329 (54)		373 (2)	376 (3)	548 (1)	391 (1)		
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+
2019	114	138 (11)		244 (44)	273 (9)		300 (21)	299 (9)	307 (22)		
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

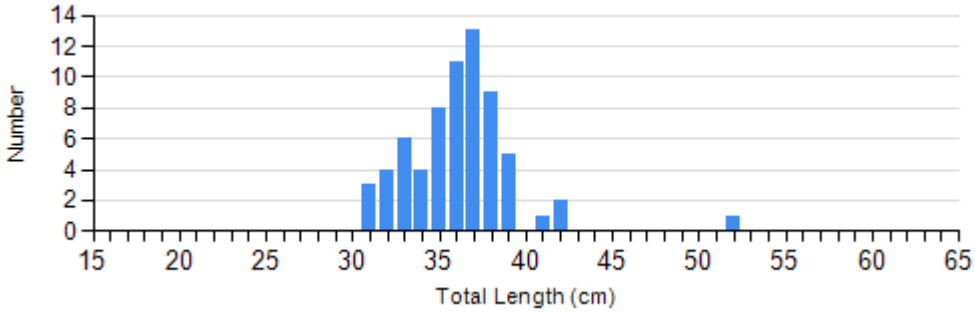
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	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
	2019	58	83 (0.7)	3	82 (4.3)	1	97	0	
Yellow Perch Gill Net	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)
	2019	10	114 (1.5)	28	120 (1.1)	44	112 (1.1)	31	105 (1.3)

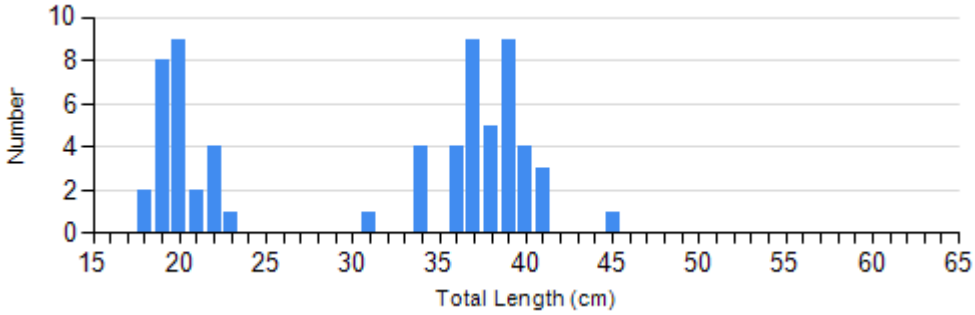
Length Frequency Distribution

Length frequency histogram of species sampled by year.

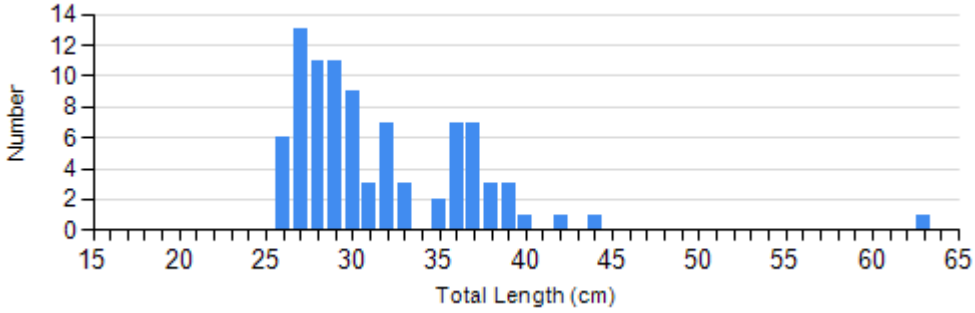
Species: Walleye
Gear: AFS std gill net



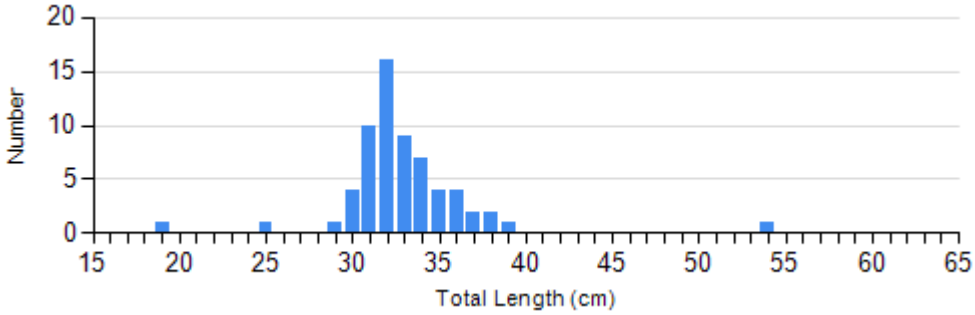
2016



2017

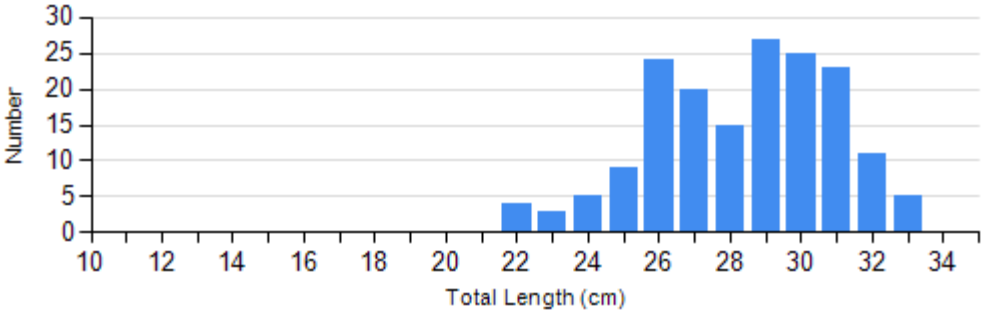


2018

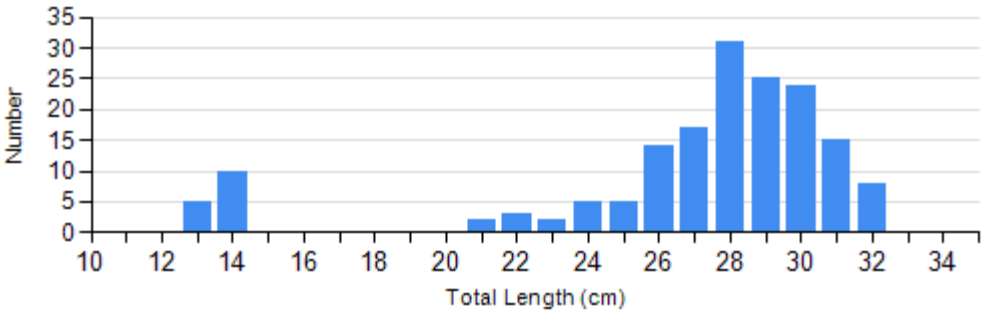


2019

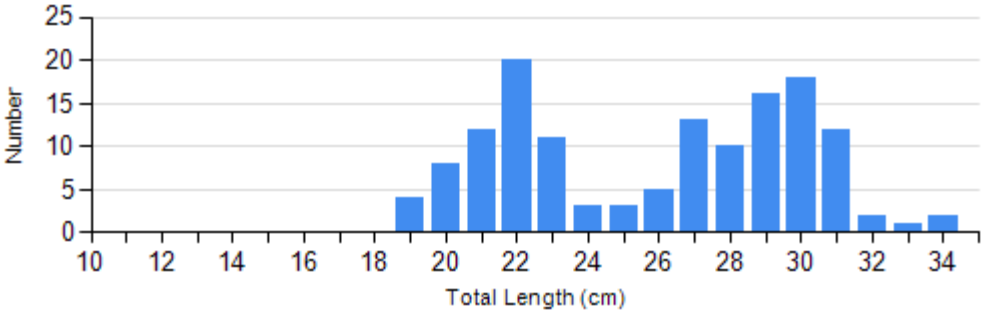
Species: Yellow Perch
Gear: AFS std gill net



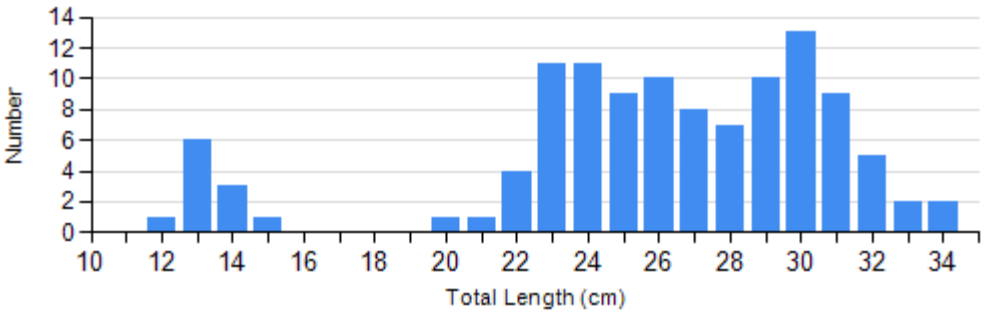
2016



2017



2018

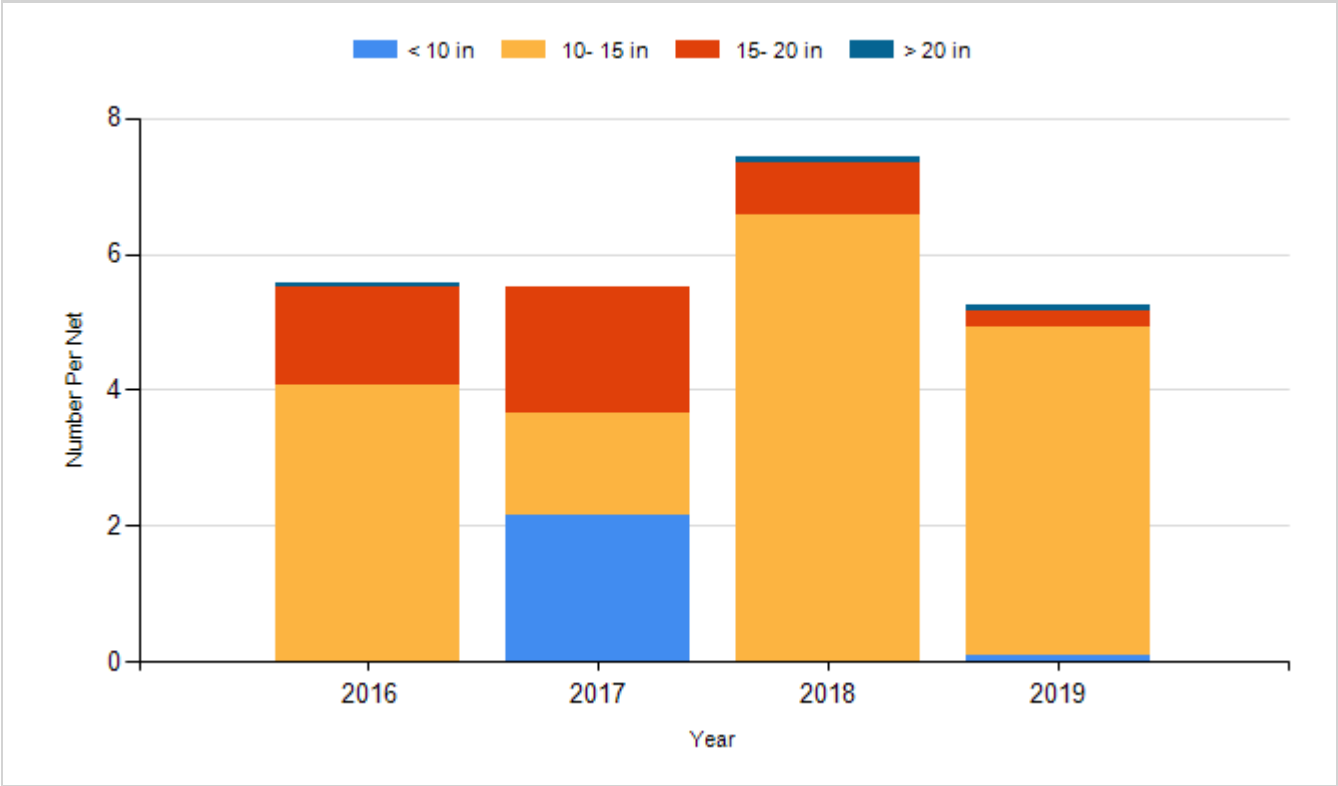


2019

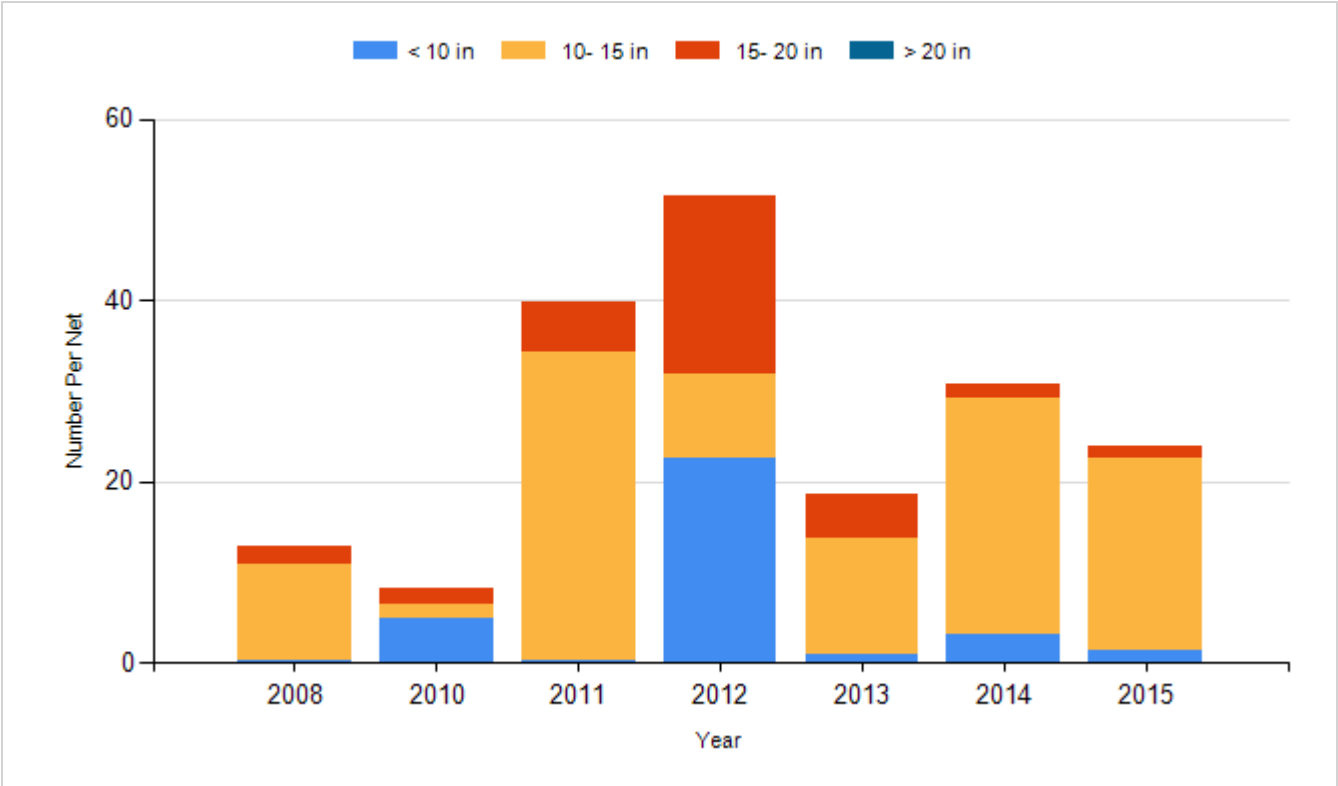
Historic Fish Sizes and Relative Abundance

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

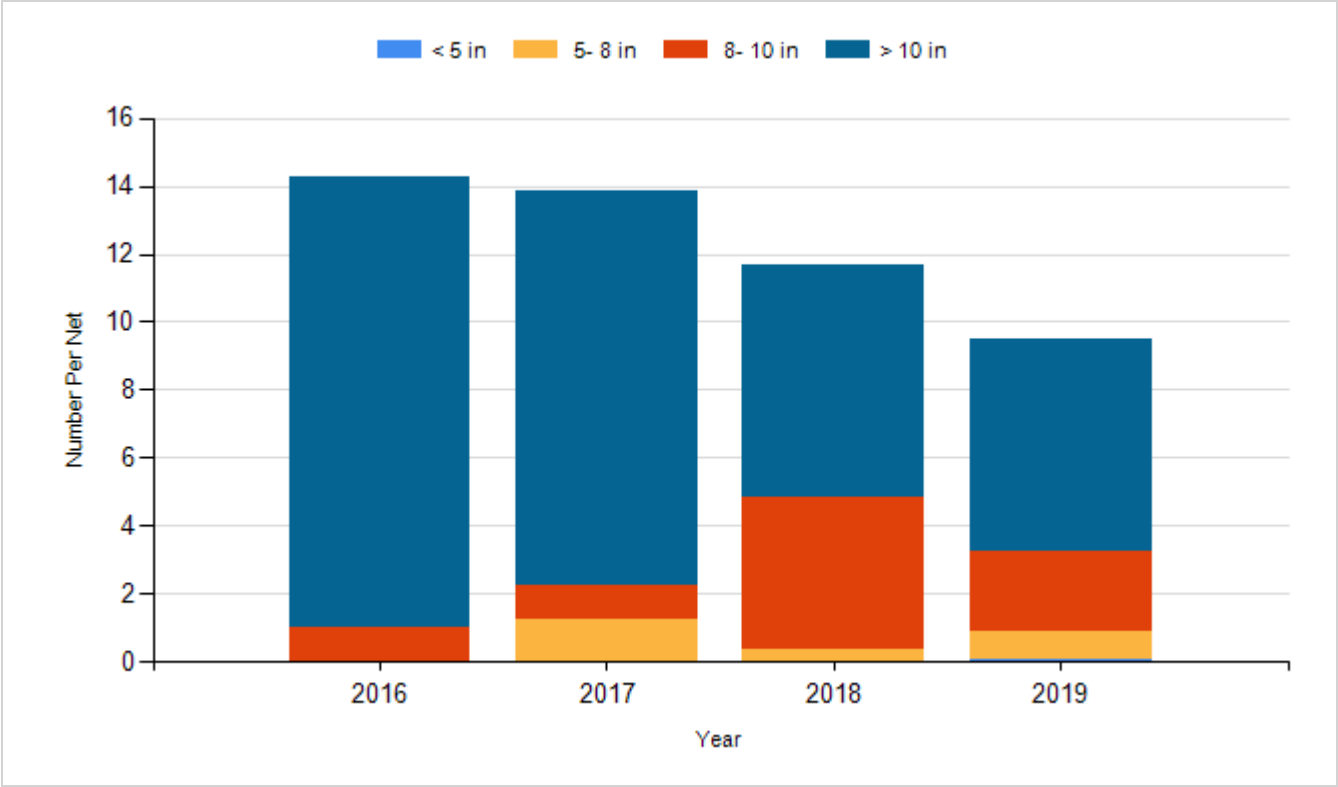
Species: Walleye
Gear: AFS std gill net



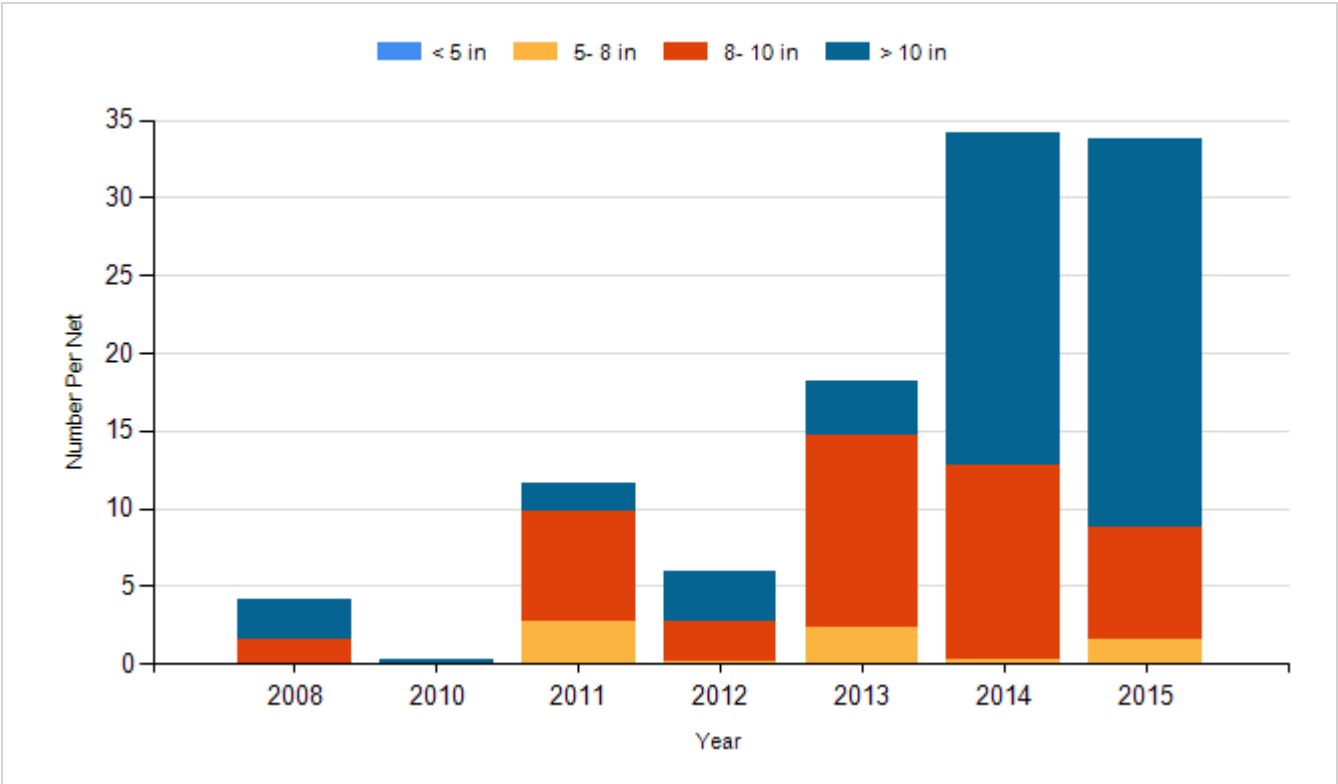
Species: Walleye
Gear: std exp gill net



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