SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Opitz, Day County
UJA-Lake-866-002
2020

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
fall night EF-WAE	Sep 21, 2020	3600 seconds

Common Fish Species Present

Yellow Perch

Walleye

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

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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
AFS std frame net	Black Bullhead							1.1				1.10
	Common Carp							0.3				0.30
	Northern Pike							0.1				0.10
	Orangespotted Sunfish							0.0				0.00
	Rock Bass							0.9				0.90
	Walleye							1.5				1.50
AFS std gill net	Black Bullhead						0.8	0.4	0.2	0.0		0.35
	Common Carp						0.1	0.3	0.2	0.3		0.23
	Northern Pike						0.4	0.1	0.1	0.0		0.15
	Rock Bass						1.8	2.8	2.2	2.1		2.23
	Smallmouth Bass						0.2	0.0	0.0	0.0		0.05
	Walleye						5.6	3.3	7.4	5.2		5.38
	White Sucker						0.0	0.0	0.2	0.3		0.13
	Yellow Perch						14.3	13.8	11.7	9.4		12.30
boat shocker (night)	Walleye*	283.5	167.0	144.0	75.0		360.0					205.90
fall night EF-WAE*	Walleye								327.0	3.0		165.00
frame net (std 3/4 in)	Black Bullhead	0.0	0.2	4.9	7.0							3.03
	Black Crappie	0.2	0.1	0.9	0.3							0.38
	Common Carp	0.0	0.3	0.1	0.1							0.13
	Northern Pike	0.2	0.1	0.1	0.3							0.18
	Orangespotted Sunfish	0.0	0.0	0.0	0.0							0.00
	Rock Bass	1.4	2.2	6.9	2.6							3.28
	Walleye	3.9	4.0	6.0	5.9							4.95
	White Sucker	0.0	0.1	0.0	0.0							0.03
	Yellow Perch	0.0	0.7	0.1	0.0							0.20
std exp gill net	Black Bullhead	0.0	0.0	0.5	0.3	0.7						0.30
	Common Carp	0.0	0.0	0.0	0.0	0.5						0.10
	Northern Pike	0.0	0.3	1.5	1.5	0.5						0.76
	Rock Bass	0.0	0.8	1.0	1.3	0.8						0.78
	Walleye	39.7	29.0	17.7	27.7	22.5						27.32
	Yellow Perch	11.7	6.0	18.2	34.2	33.8						20.78

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.

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFS std frame net	Northern Pike	PSD							100			
		PSD-P							0			
		Wr							81			
	Walleye	PSD							85			
		PSD-P							8			
		Wr							69			
AFS std gill net	Northern Pike	PSD						100	100	100		
		PSD-P						80	0	0		
		Wr						93	81	70		
	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	
boat shocker (night)	Walleye	PSD	0	0	0	0		0				
		PSD-P	0	0	0	0		0				
		Wr	101	89	93	92		90				
frame net (std 3/4 in)	Northern Pike	PSD	50	100	50	100						
		PSD-P	25	0	0	0						
		Wr	87	83	82	76						
	Walleye	PSD	64	93	59	12						
		PSD-P	10	7	3	1						
		Wr	91	81	80	80						
	Yellow Perch	PSD		8	100							
		PSD-P		8	100							
		Wr		91	102							
std exp gill net	Northern Pike	PSD		100	89	100	100					
		PSD-P		0	0	44	67					
		Wr		83	80	81	81					
	Walleye	PSD	14	68	28	6	5					

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
std exp gill net	Walleye	PSD-P	0	0	0	0	0					
		Wr	95	84	83	82	80					
	Yellow Perch	PSD	77	97	87	99	96					
		PSD-P	16	56	19	62	74					
		Wr	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)			

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)

Fish Condition

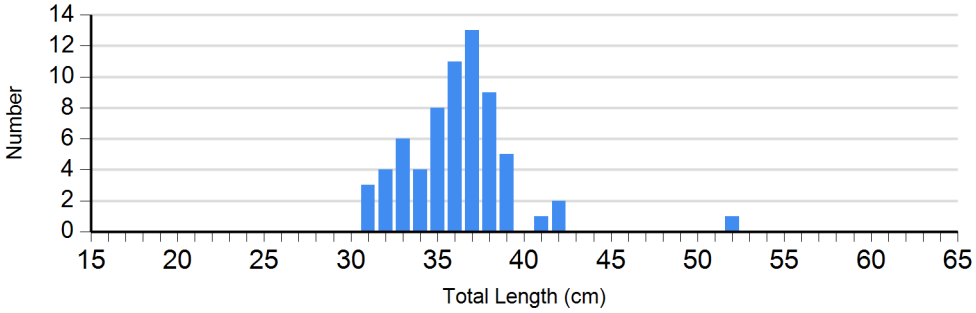
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2016	0		1	85	2	85 (10.2)	2	104 (3.5)
	2017	0		1	81	0		0	
	2018	0		1	70	0		0	
Walleye Gill Net	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	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)

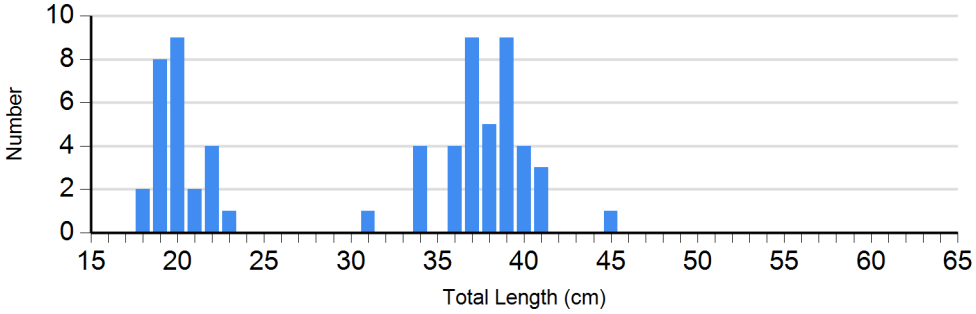
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Walleye
Gear: AFS std gill net



2016



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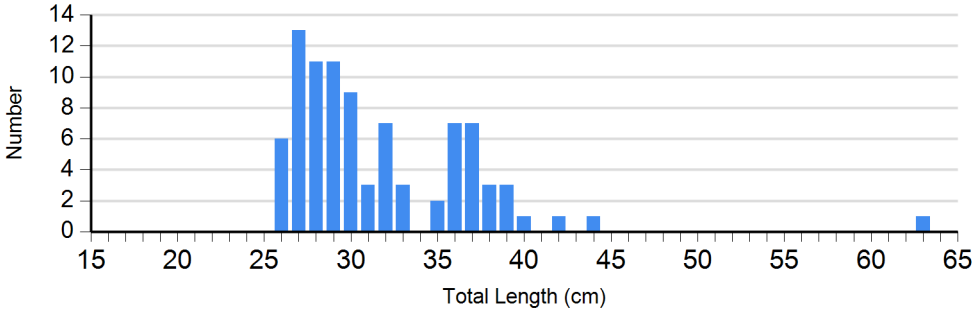

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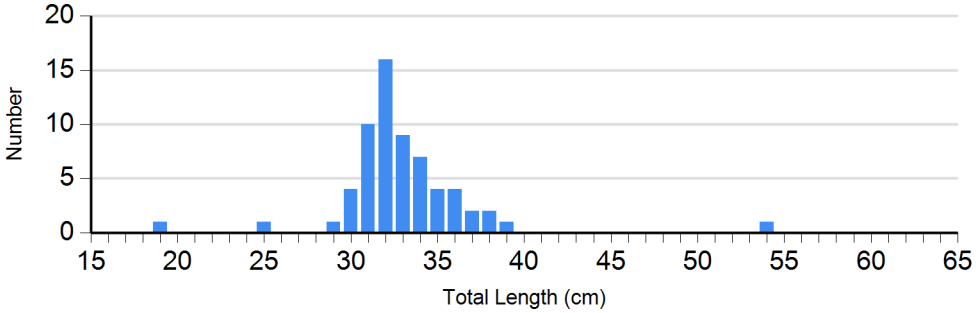
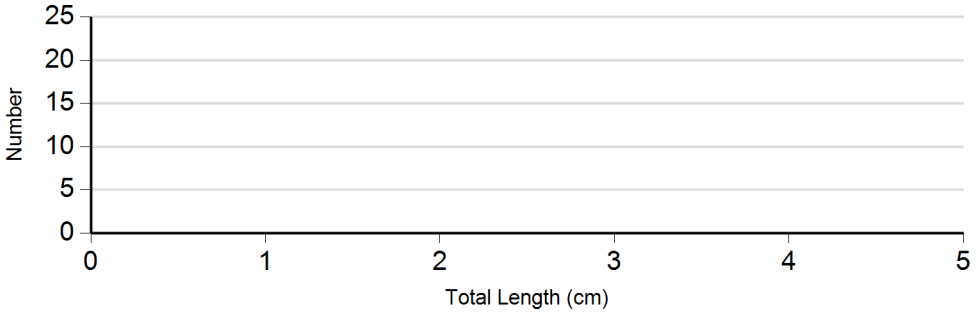


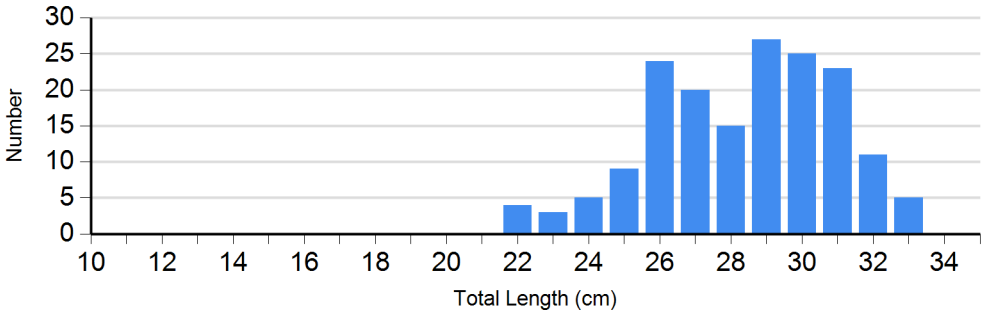
2019

Species: Walleye
Gear: std exp gill net



2015

Species: Yellow Perch
Gear: AFS std gill net



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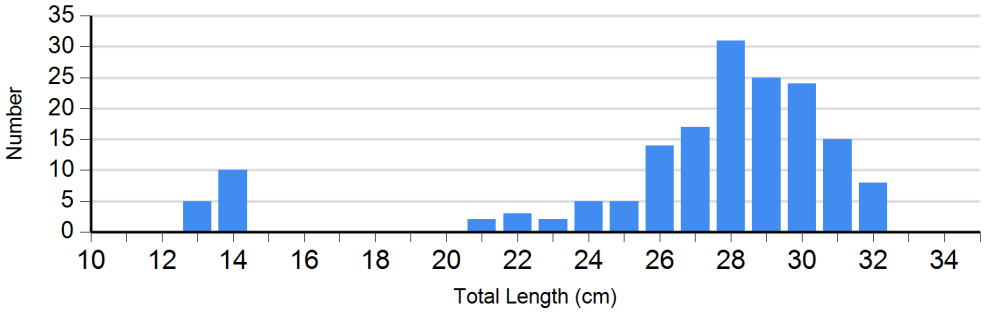

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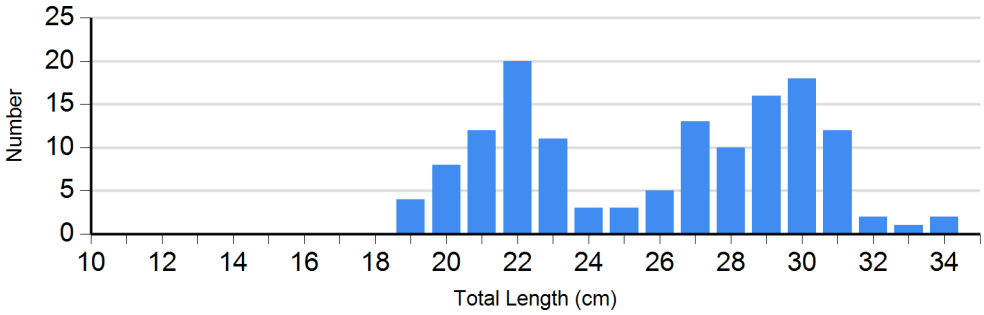

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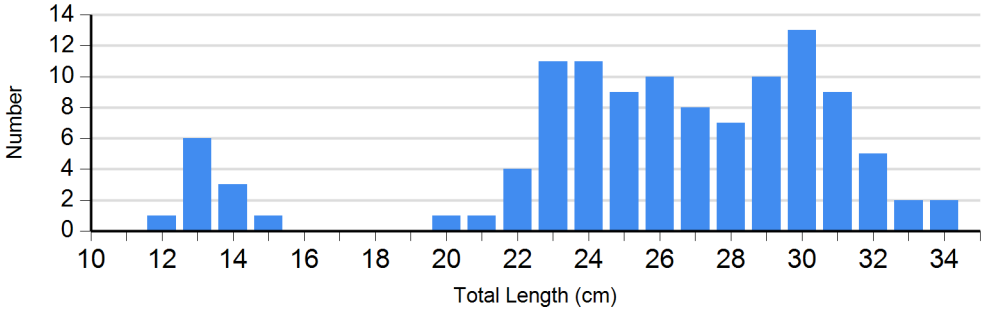
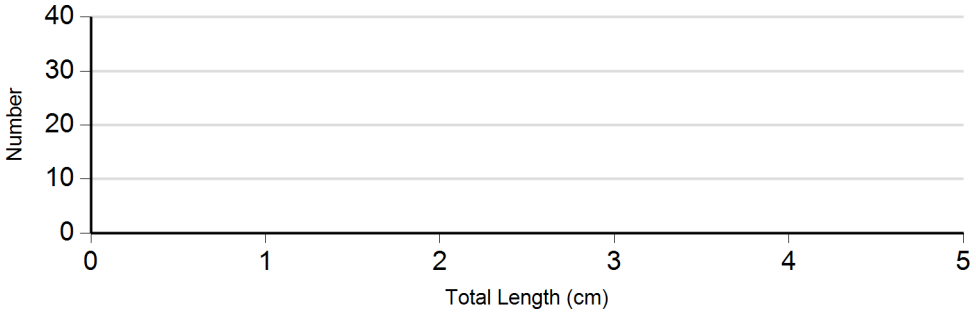


2019

Species: Yellow Perch
Gear: std exp gill net

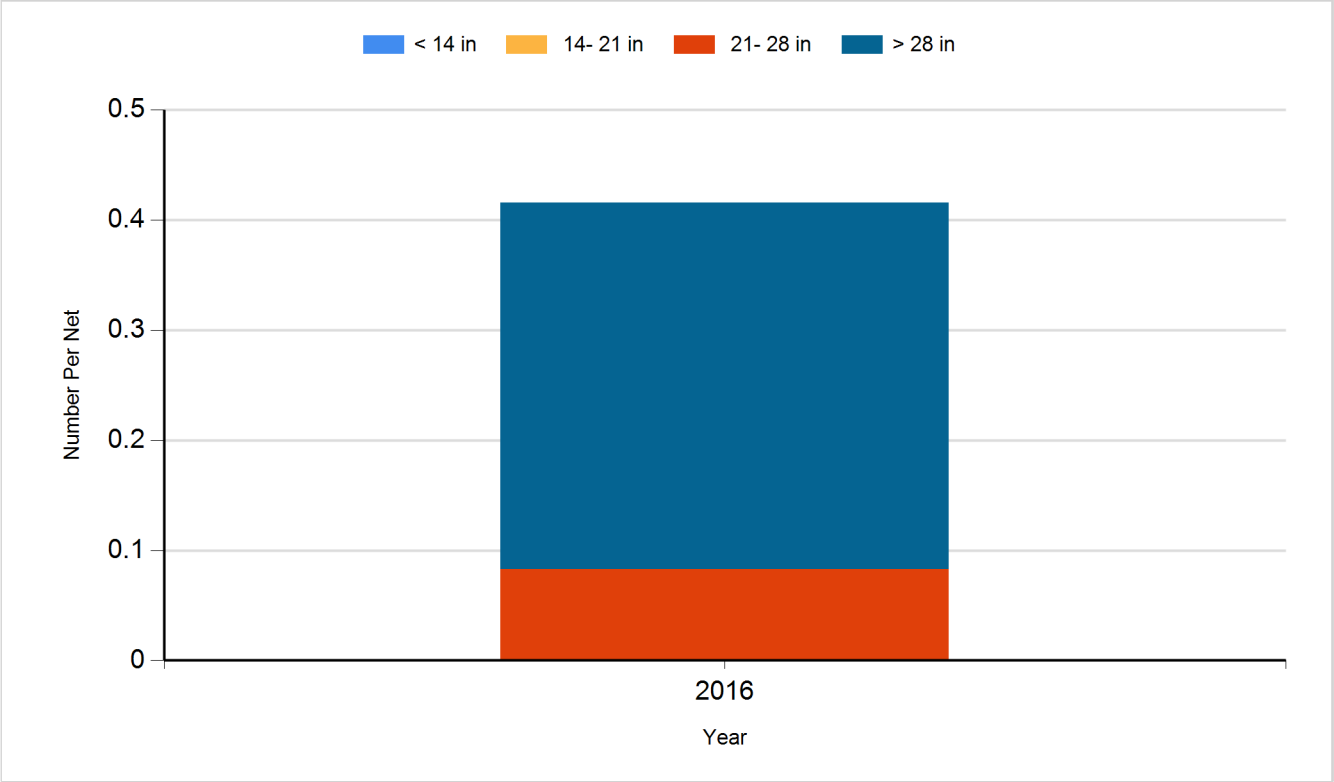


2015

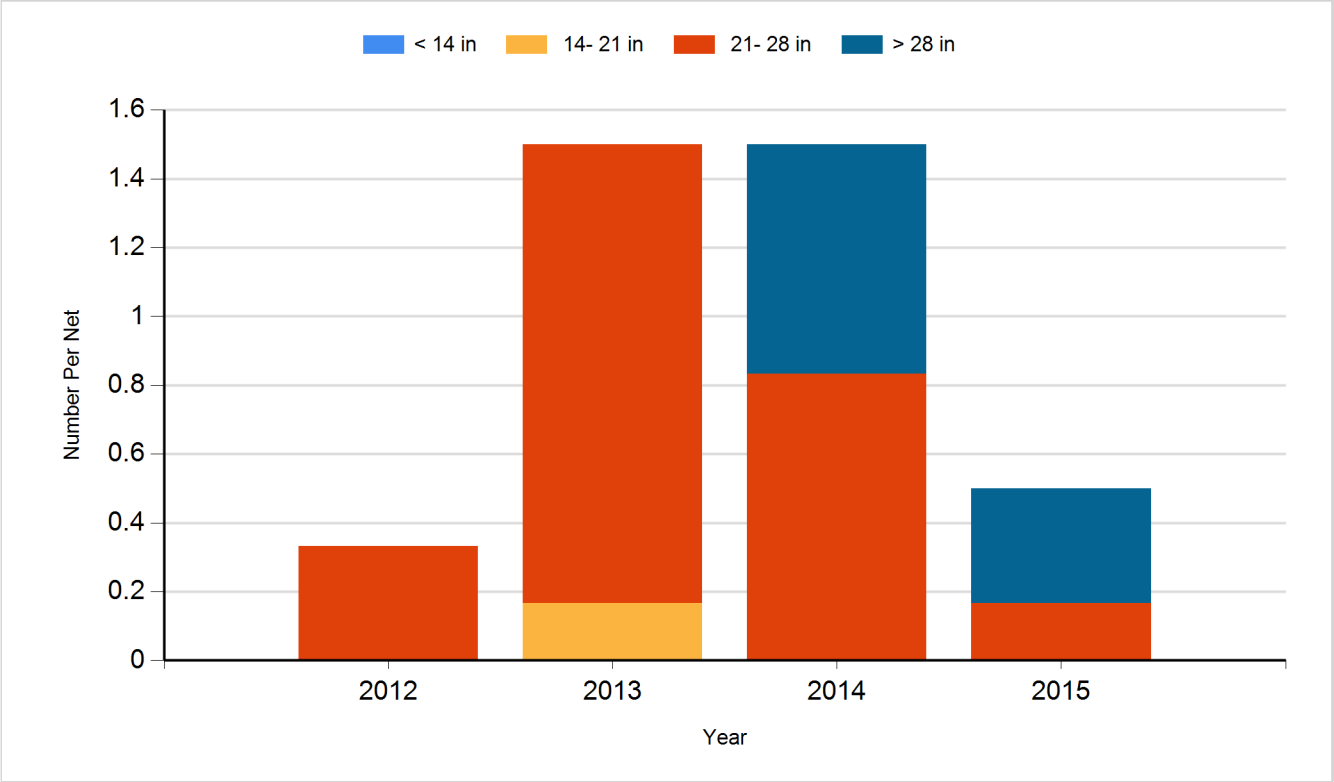
Historic Fish Sizes and Relative Abundance

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

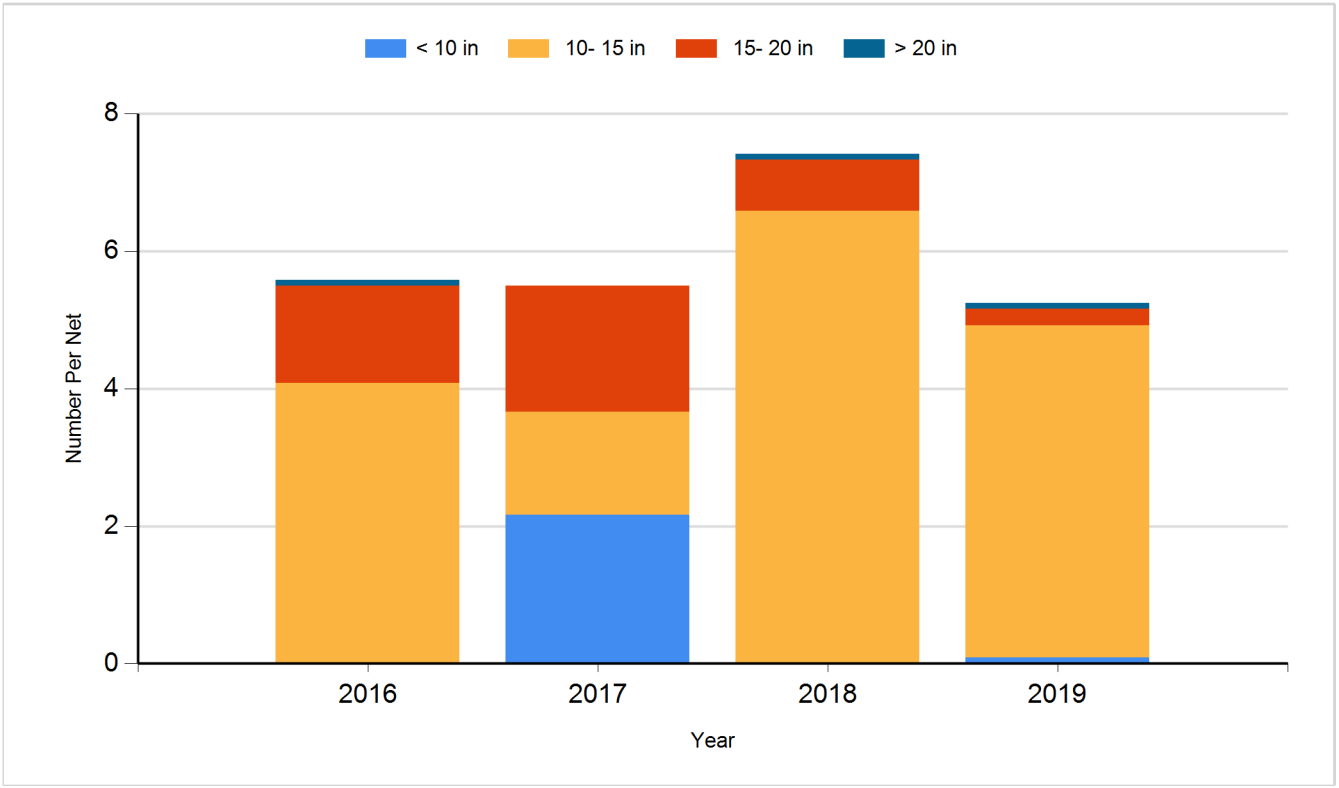
Species: Northern Pike
Gear: AFS std gill net



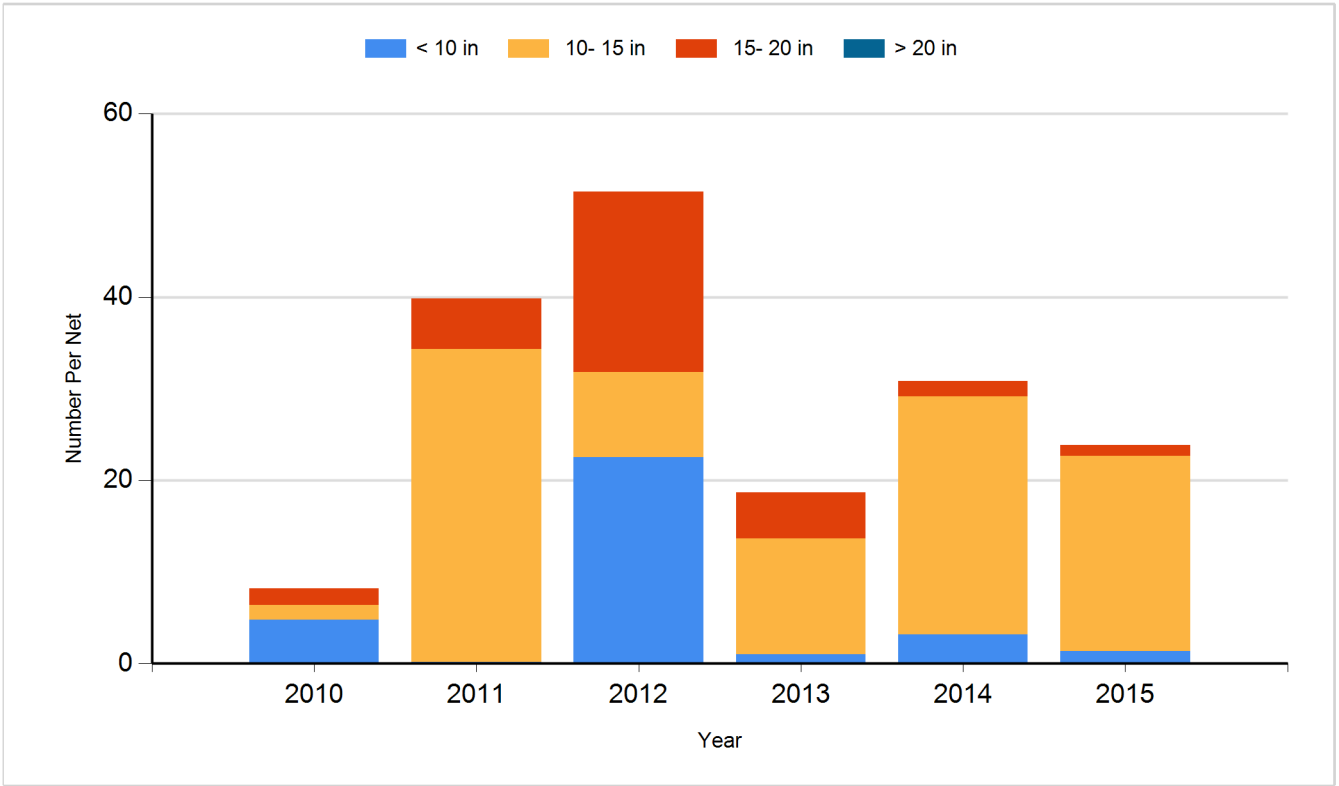
Species: Northern Pike
Gear: std exp gill net



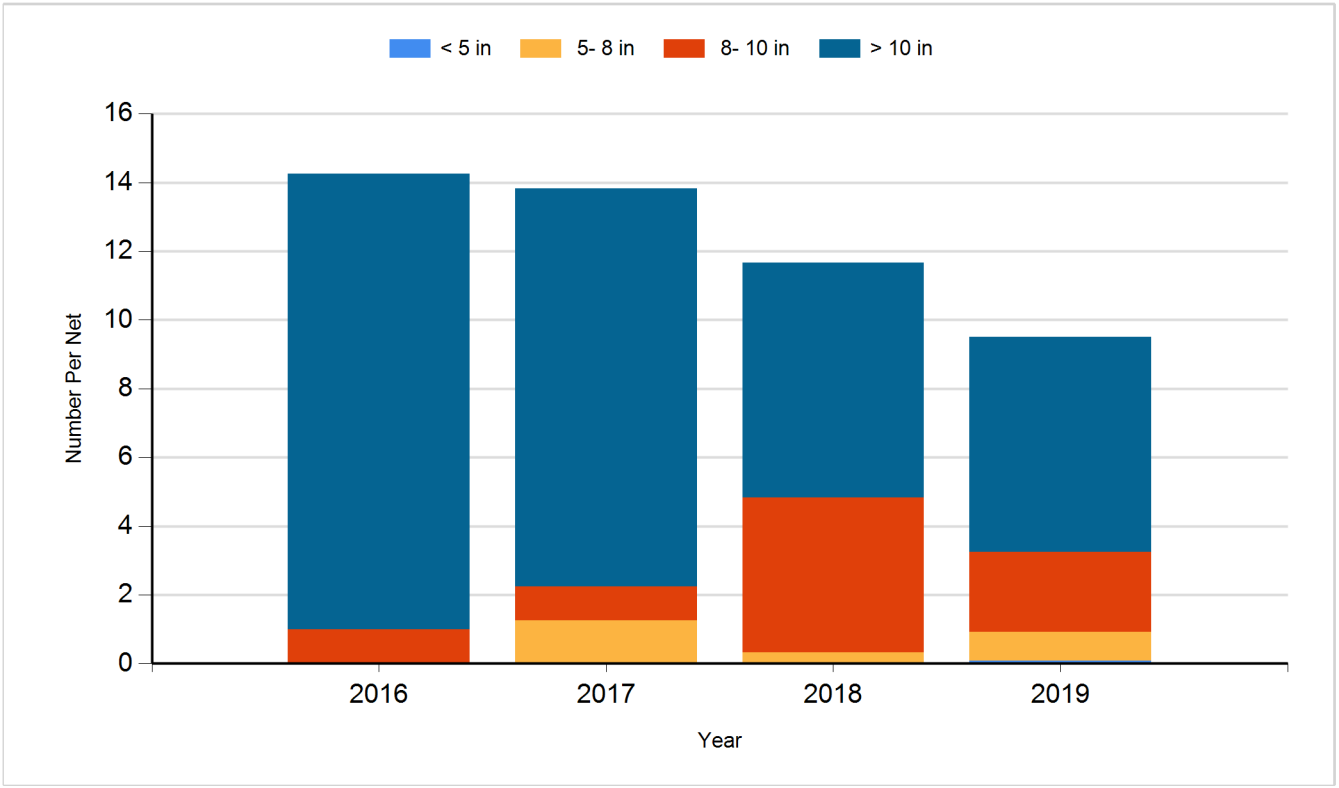
Species: Walleye
Gear: AFS std gill net



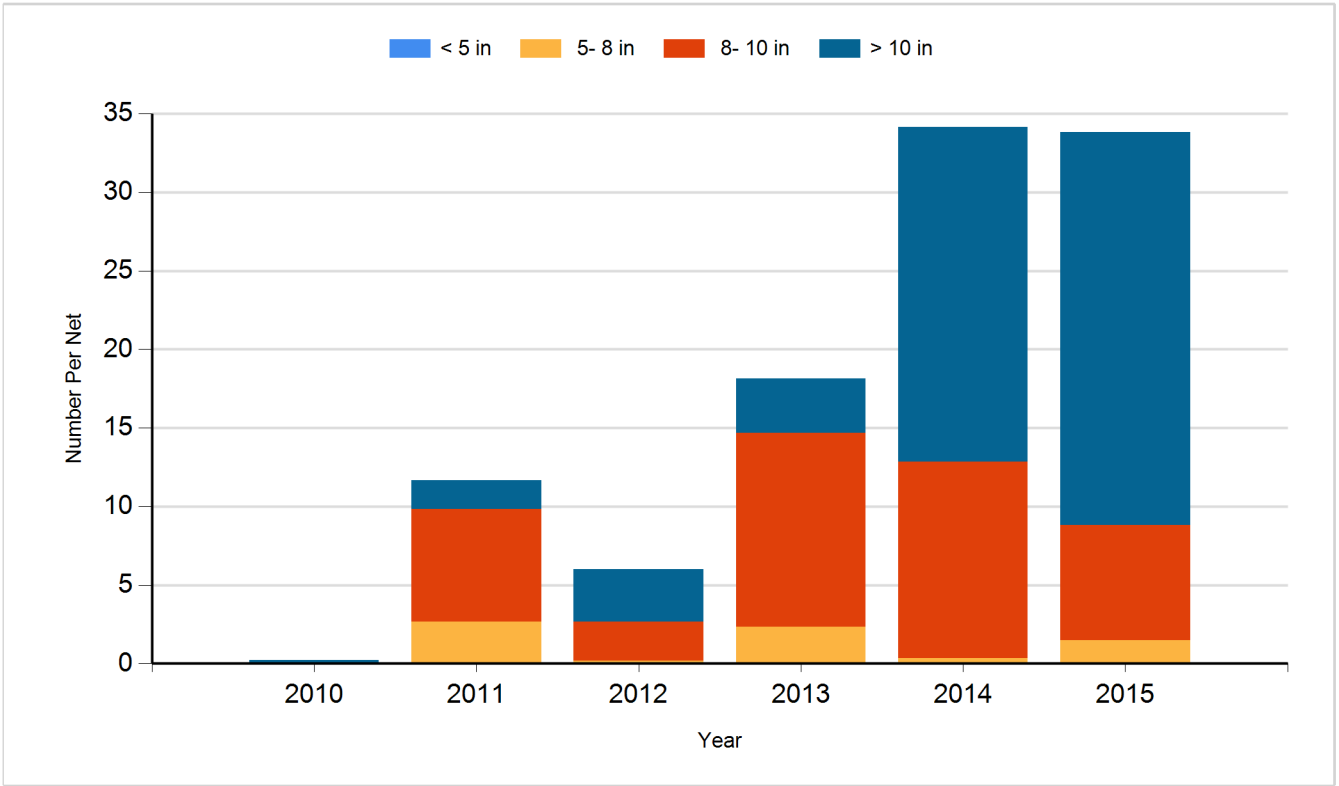
Species: Walleye
Gear: std exp gill net



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