

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Oahe Lower, Stanley County
LLO-Lake-2952-000
2017

Lake Information

Name: Oahe Lower
County: Stanley
Surface Area: 96,580 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS gill net (1/2 inch)	August 15, 2017	18 net-nights
AFS gill net (1/2 inch)	August 16, 2017	18 net-nights
AFS gill net (1/2 inch)	August 17, 2017	18 net-nights
AFS std gill net	August 15, 2017	18 net-nights
AFS std gill net	August 16, 2017	18 net-nights
AFS std gill net	August 17, 2017	18 net-nights
boat shocker (night)	September 26, 2017	7200 seconds
boat shocker (night)	September 27, 2017	7200 seconds
boat shocker (night)	September 30, 2017	14400 seconds
boat shocker (night)	October 05, 2017	3600 seconds
suspended gill net	July 19, 2017	2 net-nights
suspended gill net	July 20, 2017	2 net-nights
suspended gill net	July 21, 2017	2 net-nights
suspended gill net	July 25, 2017	2 net-nights
suspended gill net	July 26, 2017	2 net-nights
suspended gill net	July 27, 2017	4 net-nights

Common Fish Species Present

Lake Herring

Walleye

Channel Catfish

Smallmouth Bass

White Bass

Freshwater Drum

Common Carp

Smallmouth Buffalo

Northern Pike

River Carpsucker

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).

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

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.

$$PSD = \left(\frac{\text{number of fish} \geq \text{quality length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

$$PSD - P = \left(\frac{\text{number of fish} \geq \text{preferred length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

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.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

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).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(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

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Blue Catfish	12	30	20	51	30	76	35	89	45	114
Bluegill	3	8	6	15	8	20	10	25	12	30
Bluegill X Gr. Sunfish Hybrid	3	8	6	15	8	20	10	25	12	30
Brown Bullhead	5	13	8	20	11	28	14	36	17	43
Burbot	8	20	15	38	21	53	26	67	32	82
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Common Carp	11	28	16	41	21	53	26	66	33	84
Flathead Catfish	14	35	20	51	28	71	34	86	40	102
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
Longnose Gar	16	41	27	69	36	91	45	114	55	140
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Paddlefish	16	41	26	66	33	84	41	104	51	130
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Redear Sunfish	4	10	7	18	9	23	11	28	13	33
River Carpsucker	7	18	11	28	14	36	18	46	22	56
Rock Bass	4	10	7	18	9	23	11	28	13	33
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
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
Smallmouth Buffalo	11	28	18	46	24	61	30	76	37	94
Spotted Bass	7	18	11	28	14	35	17	43	20	51
Striped Bass	12	30	20	51	30	76	35	89	45	114
Striped Bass Hybrid (wiper)	8	20	12	30	15	38	20	51	25	63
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 Perch	5	13	8	20	10	25	12	30	15	38
White Sucker	6	15	10	25	13	33	16	41	20	51
Yellow Bass	4	10	7	18	9	23	11	28	13	33
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).

Gear	Species	Abundance		Stock Density Indices			Condition		
		CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS gill net (1/2 inch)	Channel Catfish	0.0	0.0	100		0		70	
	Common Carp	0.0	0.0	100		50		79	5
	Freshwater Drum	0.0	0.0	0		0			
	Gizzard Shad	0.0	0.0	0					
	Goldeye	0.0	0.0						
	Smallmouth Bass	0.0	0.0	0		0			
	Spottail Shiner	0.0	0.0						
	Walleye	0.0	0.0	0		0		79	
	White Bass	0.0	0.0	0		0			
	White Crappie	0.0	0.0	0		0			
	Yellow Perch	0.1	0.1	0		0		125	
AFS std gill net	Bigmouth Buffalo	0.0	0.0	100		100		98	
	Channel Catfish	4.8	0.6	60	4	1		79	1
	Common Carp	0.4	0.1	65	17	15		81	3
	Freshwater Drum	0.4	0.1	84		47	18	82	4
	Gizzard Shad	0.0	0.0	0					
	Goldeye	0.0	0.0						
	Northern Pike	0.3	0.1	100		29		91	7
	River Carpsucker	0.2	0.2	100		100		101	4
	Sauger	0.0	0.0	100		0		75	
	Shorthead Redhorse	0.1	0.1	60		60		92	3
	Shortnose Gar	0.0	0.0						
	Smallmouth Bass	1.6	0.4	57	8	13	5	94	1
	Smallmouth Buffalo	0.4	0.2	0		0		81	2
	Walleye	1.4	0.3	36	8	19	7	81	1
	White Bass	0.9	0.5	100		90	7	90	2
	White Crappie	0.0	0.0	50		50		99	14
	White Sucker	0.0	0.0	100		100		98	5
	Yellow Perch	0.1	0.1	25		0		84	4
	boat shocker (night)	Walleye	29.3	11.0	0		0		
suspended gill net	Channel Catfish	0.5	0.3	100		0			
	Chinook Salmon	0.0	0.0						
	Lake Herring	234.6	83.4	100		1	0		

Gear	Species	Abundance		Stock Density Indices			Condition		
		CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
suspended gill net	Rainbow Smelt	0.0	0.0						
	Walleye	0.1	0.1	0		0			

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.

Gear	Species	CPUE										Avg
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
AFS gill net (1/2 inch)	Channel Catfish										0.0	0.0
	Common Carp										0.0	0.0
	Freshwater Drum										0.0	0.0
	Gizzard Shad										0.0	0.0
	Goldeye										0.0	0.0
	Smallmouth Bass										0.0	0.0
	Spottail Shiner										0.0	0.0
	Walleye										0.0	0.0
	White Bass										0.0	0.0
	White Crappie										0.0	0.0
Yellow Perch										0.1	0.1	
AFS std gill net	Bigmouth Buffalo										0.0	0.0
	Channel Catfish										4.8	4.8
	Common Carp										0.4	0.4
	Freshwater Drum										0.4	0.4
	Gizzard Shad										0.0	0.0
	Goldeye										0.0	0.0
	Northern Pike										0.3	0.3
	River Carpsucker										0.2	0.2
	Sauger										0.0	0.0
	Shorthead Redhorse										0.1	0.1
	Shortnose Gar										0.0	0.0
	Smallmouth Bass										1.6	1.6
	Smallmouth Buffalo										0.4	0.4
	Walleye										1.4	1.4
	White Bass										0.9	0.9
White Crappie										0.0	0.0	
White Sucker										0.0	0.0	
Yellow Perch										0.1	0.1	
boat shocker (night)	Walleye										29.3	29.3
std exp gill net	Bigmouth Buffalo	0.3						0.2				0.3
	Black Crappie			0.3	0.1	0.2			0.0			0.2
	Bluegill	0.2	1.6	0.5	0.1	0.1						0.5

		CPUE										
Gear	Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Avg
std exp gill net	Channel Catfish	16.0	14.7	9.3	8.4	11.7	13.4	18.1	8.3	17.3		13.0
	Chinook Salmon	0.0	0.0						0.0			0.0
	Common Carp	1.9	4.0	2.5	2.3	1.3	2.7	2.6	1.4	2.2		2.3
	Freshwater Drum	0.6	0.6	1.3	0.8	0.6	0.5	0.8	0.3	0.7		0.7
	Gizzard Shad	0.2	0.0	0.0		0.1	0.0					0.1
	Goldeye	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Lake Herring	0.2	0.1						103.4			34.6
	Northern Pike	0.2	0.4	2.7	1.7	1.9	0.3	0.6	0.5	0.8		1.0
	Rainbow Smelt	0.0	0.0						0.0			0.0
	River Carpsucker	0.9	0.4	0.7	0.5	0.8	0.6	1.6	0.1	0.1		0.6
	Sauger		0.3	0.3	0.1	0.1	0.1					0.2
	Shorthead Redhorse	0.2	0.1	1.1	1.3	0.2	1.3	0.6	0.5			0.7
	Shortnose Gar		0.0					0.0		0.0		0.0
	Smallmouth Bass	3.5	2.7	8.4	3.2	2.3	1.5	1.5	2.1	2.9		3.1
	Smallmouth Buffalo	0.3	0.2	0.2	0.3		0.4	0.4	0.5	0.4		0.3
	Spottail Shiner	0.0	0.0	0.0	0.0							0.0
	Walleye	16.2	16.2	17.3	20.1	18.2	10.7	10.7	3.0	3.9		12.9
	White Bass	1.2	0.8	0.6	0.5	0.9	0.6	0.8	0.3	0.2		0.7
	White Crappie		0.4	0.2	0.1	0.0	0.3	0.1	0.2			0.2
White Sucker	0.2	0.7	1.1	0.9	0.4	0.2	0.9	0.2	0.1		0.5	
Yellow Perch	4.3	9.9	18.1	2.9	0.4	0.5	0.8	1.8	0.8		4.4	
suspended gill net	Channel Catfish									1.0	0.5	0.8
	Chinook Salmon									0.0	0.0	0.0
	Lake Herring									174.2	234.6	204.4
	Rainbow Smelt									0.0	0.0	0.0
	Walleye									0.3	0.1	0.2
	Yellow Perch									0.0		0.0

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.

Gear	Species	Index	Year											
			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		
AFS gill net (1/2 inch)	Walleye	PSD											0	
		PSD-P											0	
		Wr											79	
	Yellow Perch	PSD											0	
		PSD-P											0	
		Wr											125	
AFS std gill net	Northern Pike	PSD											100	
		PSD-P											29	
		Wr											91	
	Walleye	PSD											36	
		PSD-P											19	
		Wr											81	
	Yellow Perch	PSD											25	
		PSD-P											0	
		Wr											84	
	boat shocker (night)	Walleye	PSD											0
			PSD-P											0
	std exp gill net	Black Crappie	PSD			60	0	100				0		
PSD-P					0	0	100				0			
Wr					114	113	77				108			
Northern Pike		PSD	50	50	41	63	88	100	100	73	100			
		PSD-P	25	0	6	7	24	50	90	27	40			
		Wr	94	88	85	85	77	78	83	88	88			
Walleye		PSD	68	90	43	51	32	21	19	59	59			
		PSD-P	18	24	18	15	7	2	1	3	36			
		Wr	89	91	90	88	76	75	87	81	83			
Yellow Perch		PSD	18	33	21	12	13	44	27	25	27			
		PSD-P	0	1	4	2	13	0	7	0	0			
		Wr	89	97	85	83	68	88	100	85	82			
suspended gill net		Walleye	PSD										33	0
			PSD-P										0	0

Gear	Species	Index	Year										
			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
suspended gill net	Yellow Perch	PSD											0
		PSD-P											0

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+
2017	86	219 (9)	286 (7)	327 (39)	354 (13)	555 (1)	506 (7)	593 (2)	535 (7)		645 (1)
2016	84	218 (2)	264 (23)	310 (16)	390 (5)	480 (10)	530 (4)	539 (24)	514 (1)		
2015	92	211 (21)	278 (16)	343 (10)	391 (13)	458 (5)	454 (28)				
2014	211	196 (13)	273 (19)	316 (37)	317 (15)	360 (123)		463 (1)	471 (1)		750 (1)
2013	211	211 (11)	274 (45)	298 (13)	353 (137)	538 (1)	496 (3)	560 (1)	521 (1)		
2012	343	233 (18)	257 (8)	351 (285)	468 (8)	490 (4)	517 (13)	565 (3)		548 (3)	658 (3)
2011	375	153 (11)	351 (246)	435 (29)	499 (22)	508 (36)	543 (18)	533 (1)	559 (2)	568 (3)	603 (5)
2010	313	295 (174)	391 (21)	451 (20)	495 (51)	526 (30)	530 (2)	586 (1)	636 (2)	548 (3)	574 (9)
2009	290	291 (18)	384 (20)	435 (128)	490 (65)		536 (4)	553 (9)	541 (23)	590 (2)	589 (20)
2008	292	285 (7)	362 (111)	443 (95)	476 (6)	526 (13)	537 (18)	535 (19)	550 (7)	593 (5)	566 (13)

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2012	8	119 (7)		196 (1)							
2011	78	118 (3)	144 (66)	177 (4)	236 (4)	232 (1)					

Fish Condition

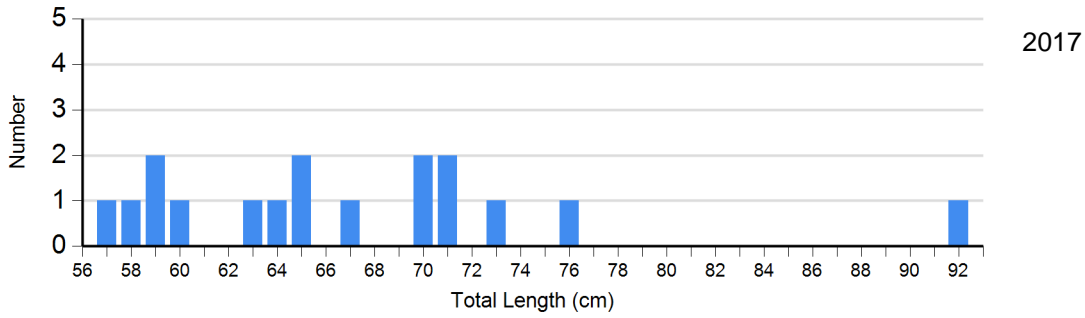
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2013	0		3	65 (8.2)	3	91 (6.7)	0	
	2014	0		1	77	6	85 (2.1)	3	81 (7.8)
	2015	3	91 (8.3)	5	87 (2.6)	2	84 (1.0)	1	91
	2016	0		9	94 (2.8)	2	71	4	79 (16.6)
	2017	0		12	89 (7.4)	4	98 (1.4)	1	95
Walleye Gill Net	2013	153	75 (0.7)	36	76 (0.9)	4	71 (2.1)	0	
	2014	157	88 (0.8)	34	87 (1.2)	1	82	1	68
	2015	29	76 (1.0)	40	84 (1.1)	2	91 (3.6)	0	
	2016	29	77 (1.0)	16	81 (2.1)	25	91 (1.6)	0	
	2017	47	78 (0.9)	13	81 (1.7)	13	91 (1.7)	1	98
Yellow Perch Gill Net	2013	5	94 (3.6)	4	80 (1.3)	0		0	
	2014	11	106 (3.9)	3	97 (2.5)	1	47	0	
	2015	33	85 (2.0)	11	83 (2.3)	0		0	
	2016	11	81 (2.1)	4	84 (5.5)	0		0	
	2017	6	86 (3.6)	2	78 (3.3)	0		0	

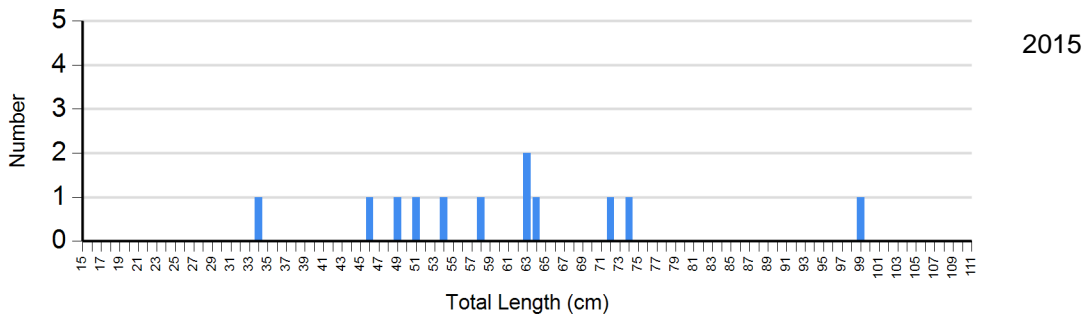
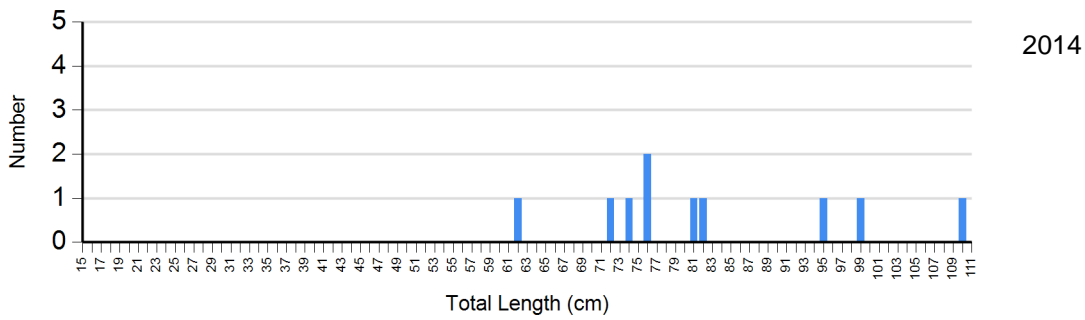
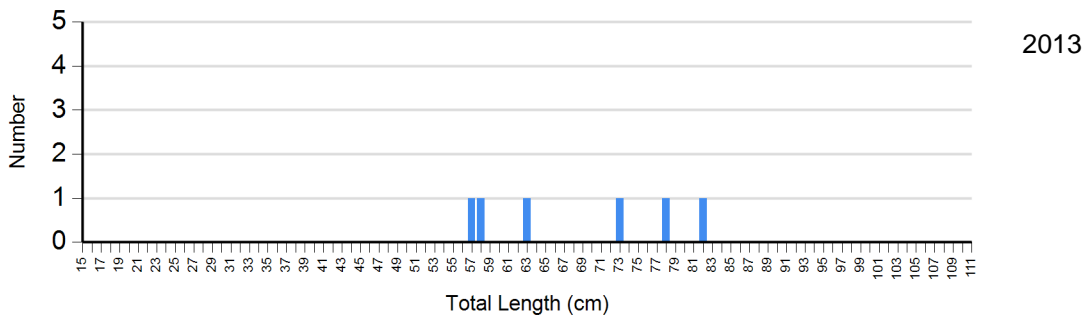
Length Frequency Distribution

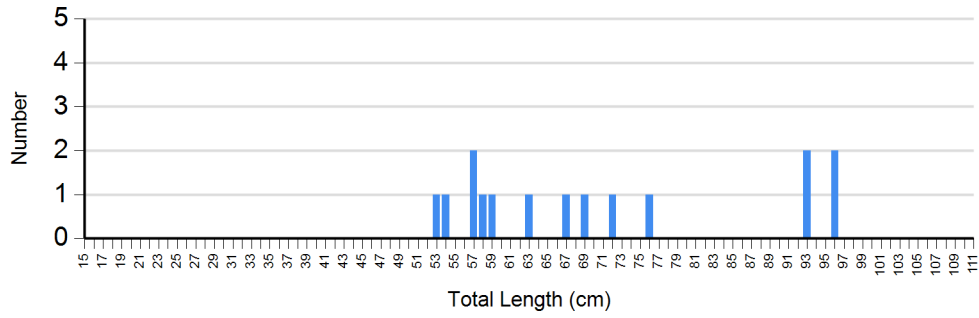
Length frequency histogram of species sampled by year.

Species: Northern Pike
Gear: AFS std gill net



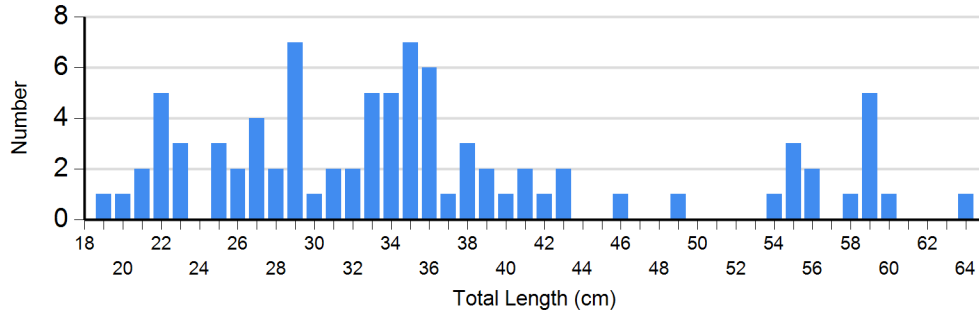
Species: Northern Pike
Gear: std exp gill net





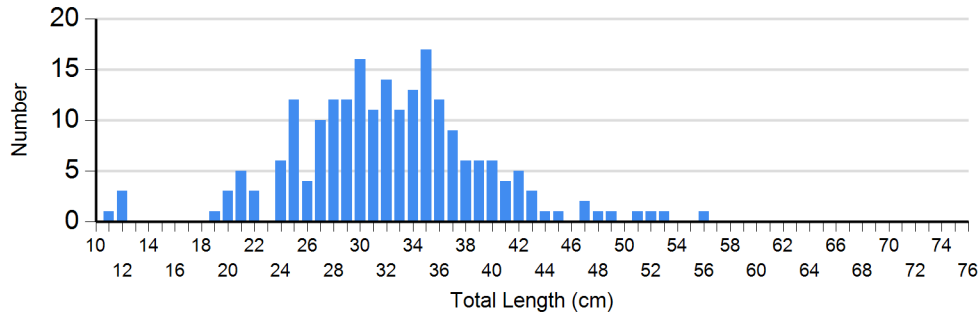
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Species: Walleye
Gear: AFS std gill net

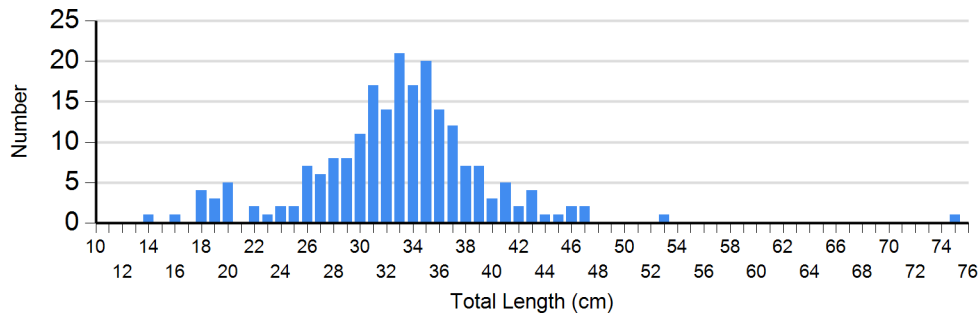


2017

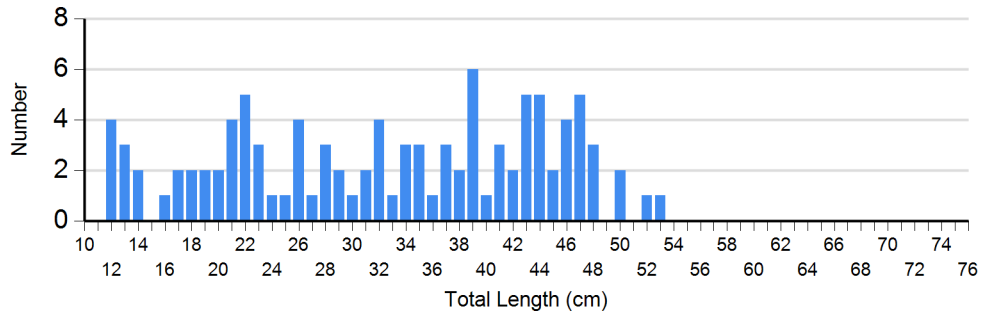
Species: Walleye
Gear: std exp gill net



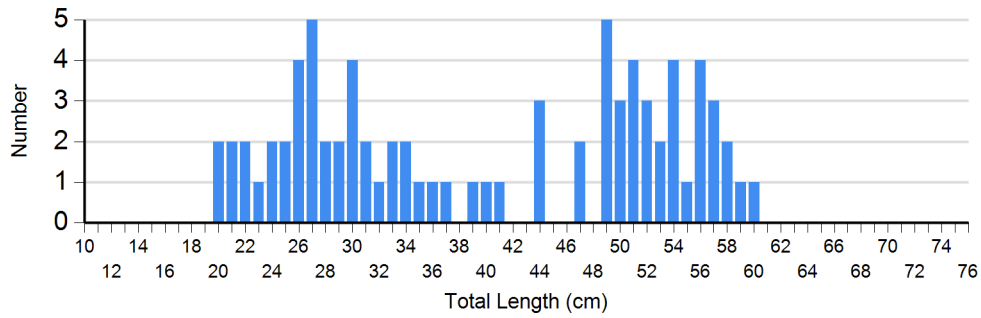
2013



2014

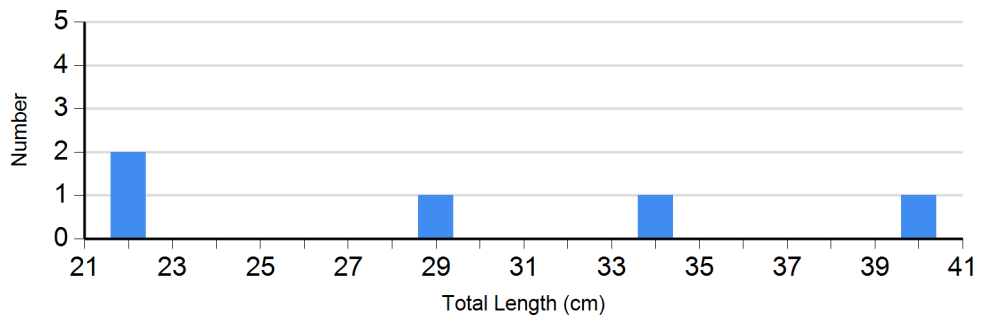


2015

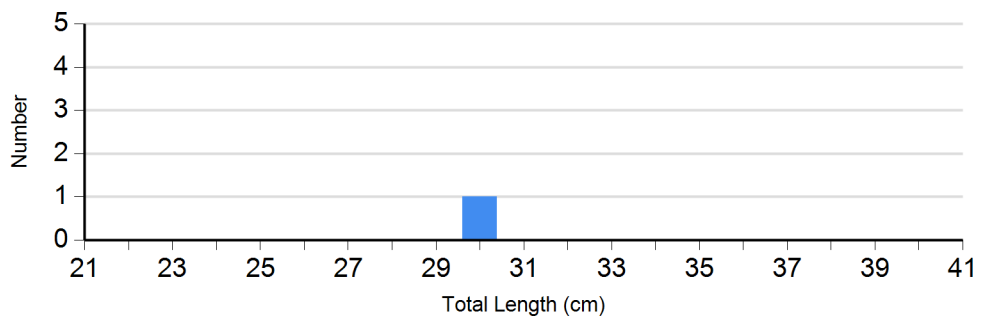


2016

Species: Walleye
Gear: suspended gill net

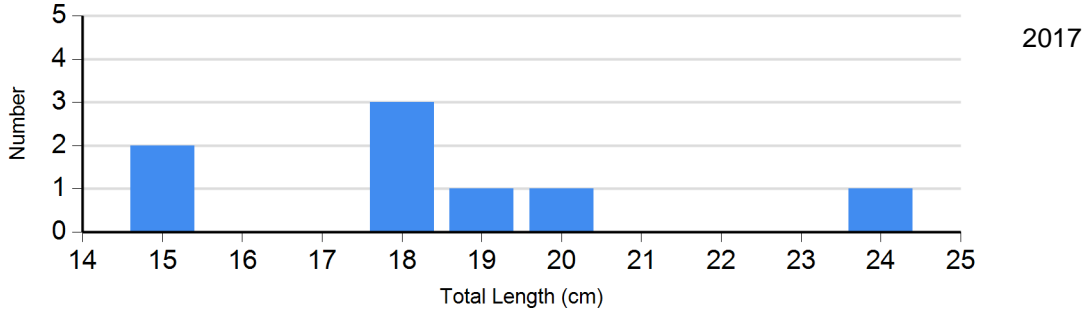


2016

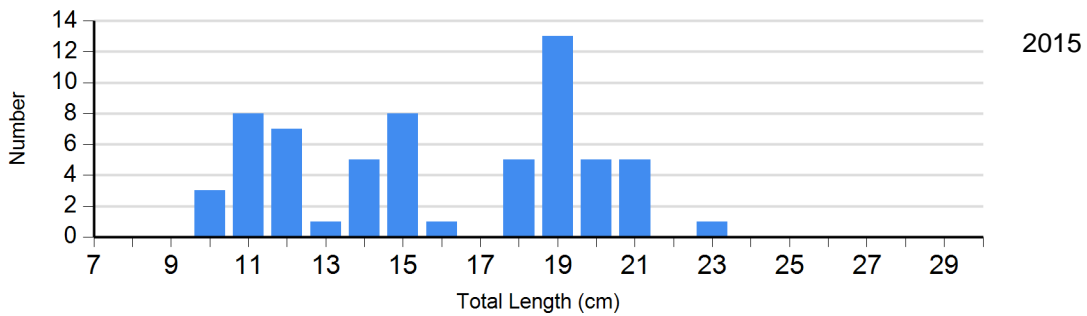
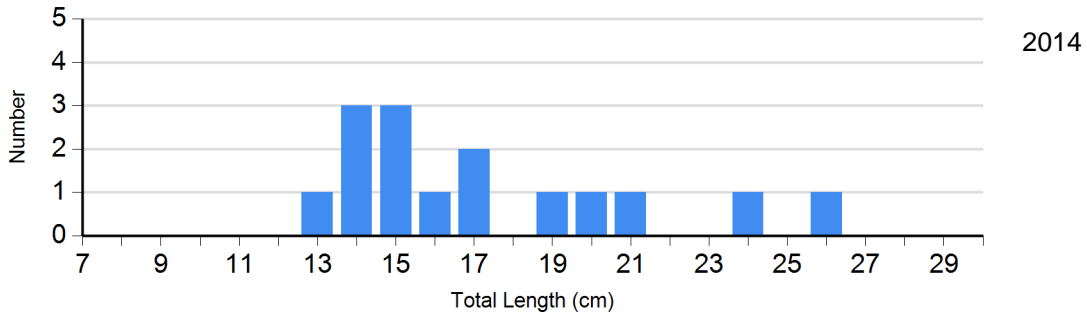
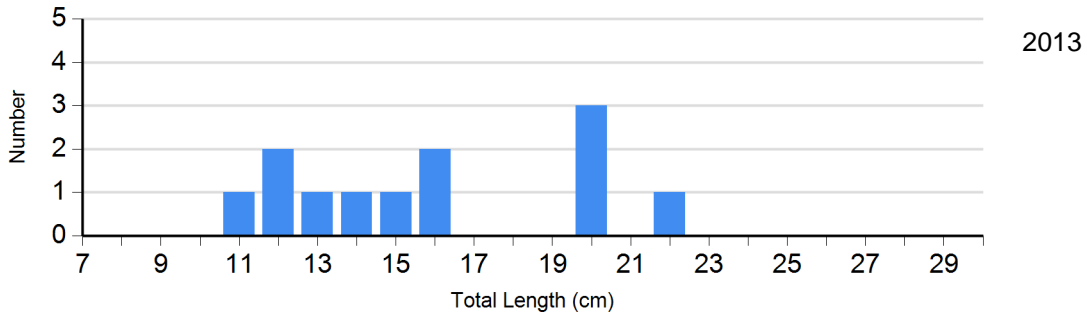


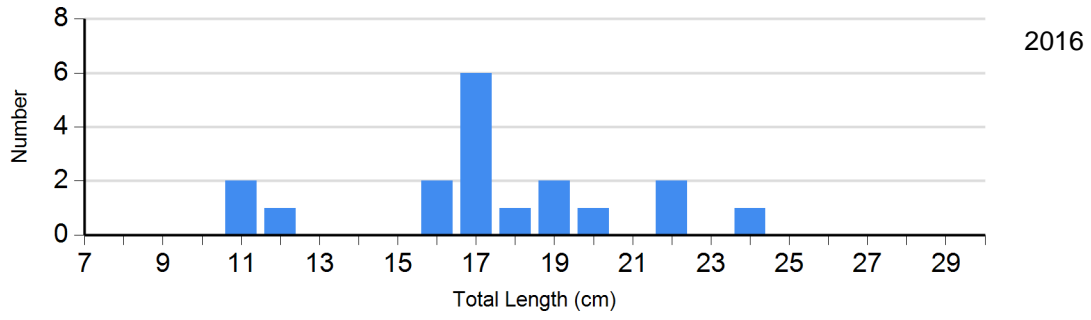
2017

Species: Yellow Perch
Gear: AFS std gill net

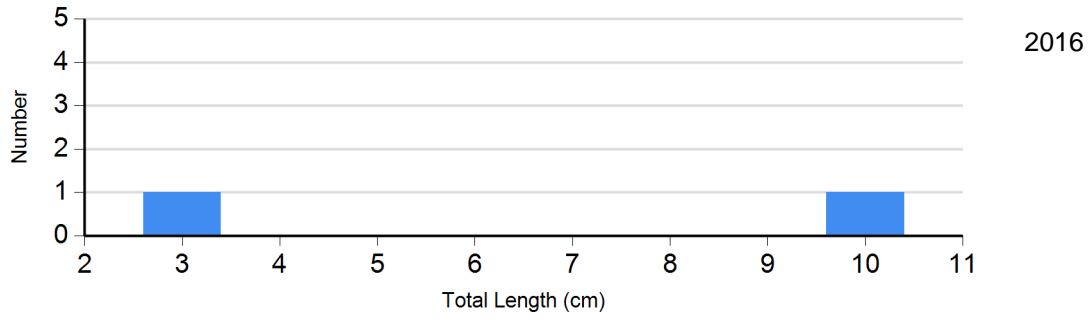


Species: Yellow Perch
Gear: std exp gill net





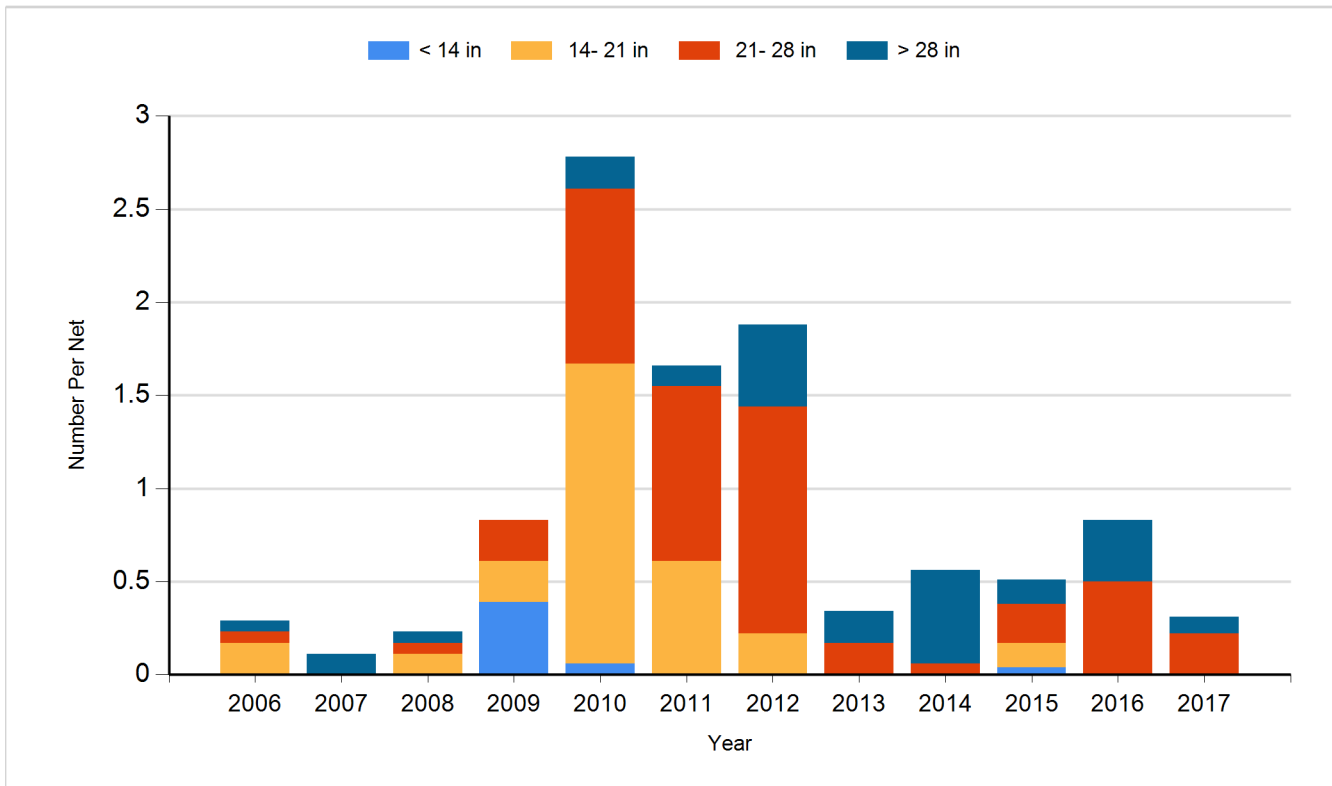
Species: Yellow Perch
 Gear: suspended gill net



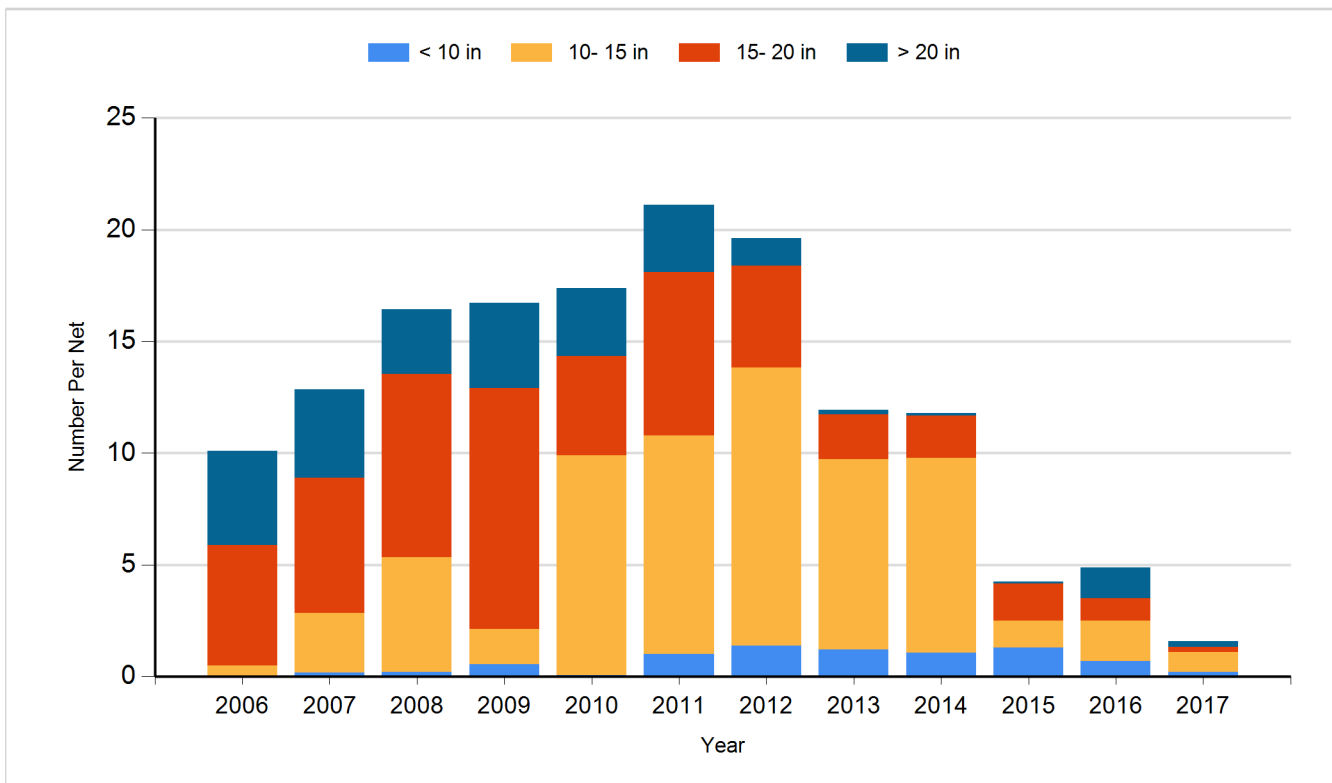
Historic Fish Sizes and Relative Abundance

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

Species: Northern Pike
Gear: Gill Net



Species: Walleye
Gear: Gill Net



Species: Yellow Perch
Gear: Gill Net

