SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Opitz, Day County
UJA-Lake-866-002
2016

Lake Information

Name:	Opitz	**Maximum Depth:**	23 Feet
County:	Day	**Mean Depth:**	14 Feet
Surface Area:	1,452 Acres		

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	June 07, 2016	4 net-nights
AFS std gill net	June 08, 2016	4 net-nights
AFS std gill net	June 09, 2016	4 net-nights
boat shocker (night)	September 27, 2016	3600 seconds

Common Fish Species Present

Yellow Perch

Walleye

Northern Pike

Rock Bass

Black Bullhead

Smallmouth Bass

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).

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

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

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(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).

		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	0.8	0.4	100		80		114	5
	Common Carp	0.1	0.1	100		100		111	
	Northern Pike	0.4	0.1	100		80		93	7
	Rock Bass	1.8	0.3	100		18	9	111	1
	Smallmouth Bass	0.2	0.2	100		100		98	13
	Walleye	5.6	0.5	27	5	1		82	1
	Yellow Perch	14.3	1.9	100		93	2	103	1
boat shocker (night)	Walleye	360.0	52.1	0		0		90	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.

		CPUE										
Gear	Species	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Avg
AFS std gill net	Black Bullhead										0.8	0.8
	Common Carp										0.1	0.1
	Northern Pike										0.4	0.4
	Rock Bass										1.8	1.8
	Smallmouth Bass										0.2	0.2
	Walleye										5.6	5.6
	Yellow Perch										14.3	14.3
boat shocker (night)	Walleye					283.5	167.0	144.0	75.0		360.0	205.9
frame net (std 3/4 in)	Black Bullhead	0.8	0.6		0.1		0.2	4.9	7.0			2.3
	Black Crappie	0.3	0.6		0.6	0.2	0.1	0.9	0.3			0.4
	Common Carp	1.5	0.4		0.3		0.3	0.1	0.1			0.5
	Northern Pike	0.5	0.2		0.3	0.2	0.1	0.1	0.3			0.2
	Orangespotted Sunfish						0.0					0.0
	Rock Bass	0.1			0.6	1.4	2.2	6.9	2.6			2.3
	Walleye	10.1	6.8		2.9	3.9	4.0	6.0	5.9			5.7
	Western Painted Turtle	0.0	0.0									0.0
	White Sucker	0.1					0.1					0.1
	Yellow Perch	0.1	0.4				0.7	0.1				0.3
std exp gill net	Black Bullhead		0.3					0.5	0.3	0.7		0.5
	Common Carp	0.3								0.5		0.4
	Northern Pike	0.7	0.3				0.3	1.5	1.5	0.5		0.8
	Rock Bass					0.0	0.8	1.0	1.3	0.8		0.8
	Walleye	31.7	12.5		3.4	39.7	29.0	17.7	27.7	22.5		23.0
	Yellow Perch	4.0	4.2		0.2	11.7	6.0	18.2	34.2	33.8		14.0

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.

			Year									
Gear	Species	Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
AFS std gill net	Northern Pike	PSD										100
		PSD-P										80
		Wr										93
	Walleye	PSD										27
		PSD-P										1
		Wr										82
	Yellow Perch	PSD										100
		PSD-P										93
		Wr										103
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)	Black Crappie	PSD	100	100		100	100	100	59	100		
		PSD-P	80	70		100	100	0	41	80		
		Wr	91	101		96	99	100	110	97		
	Northern Pike	PSD	100	75		67	50	100	50	100		
		PSD-P	22	25		0	25	0	0	0		
		Wr	76	77		91	87	83	82	76		
	Walleye	PSD	83	53		81	64	93	59	12		
		PSD-P	14	9		2	10	7	3	1		
		Wr	80	83		89	91	81	80	80		
	Yellow Perch	PSD	0	57				8	100			
		PSD-P	0	43				8	100			
		Wr	112	110				91	102			
std exp gill net	Northern Pike	PSD	100	100				100	89	100	100	
		PSD-P	100	50				0	0	44	67	
		Wr	83	78				83	80	81	81	
	Walleye	PSD	58	16		52	14	68	28	6	5	
		PSD-P	2	0		0	0	0	0	0	0	
		Wr	81	87		90	95	84	83	82	80	
	Yellow Perch	PSD	92	100		100	77	97	87	99	96	

			Year									
Gear	Species	Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
std exp gill net	Yellow Perch	PSD-P	67	64		100	16	56	19	62	74	
		Wr	114	120		121	116	119	113	108	108	

Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Black Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2011	3						312 (1)	346 (1)	330 (1)		

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
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)				
2008	77	202 (1)	276 (58)	356 (2)	389 (16)						
2007	347	203 (160)	337 (32)	391 (152)				536 (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+
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

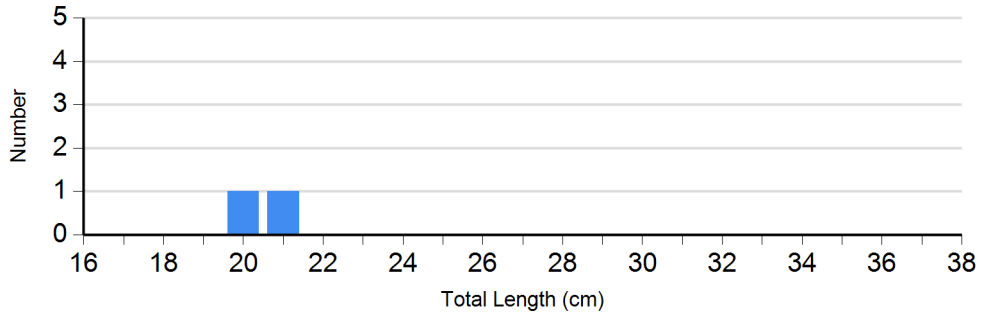
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2012	0		2	100 (7.7)	0		0	
	2013	7	118 (1.5)	3	108 (1.0)	4	103 (1.5)	3	101 (3.8)
	2014	0		1	103	4	96 (1.6)	0	
Northern Pike Gill Net	2012	0		2	83 (0.7)	0		0	
	2013	1	89	8	79 (2.5)	0		0	
	2014	0		5	79 (3.2)	3	82 (1.6)	1	86
	2015	0		1	92	2	75 (2.3)	0	
	2016	0		1	85	2	85 (10.2)	2	104 (3.5)
Walleye Gill Net	2012	56	86 (1.2)	118	83 (0.4)	0		0	
	2013	76	85 (0.5)	30	78 (0.8)	0		0	
	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	
Yellow Perch Gill Net	2012	1	112	15	123 (2.9)	20	117 (1.8)	0	
	2013	14	111 (2.5)	74	111 (0.8)	21	119 (2.3)	0	
	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)

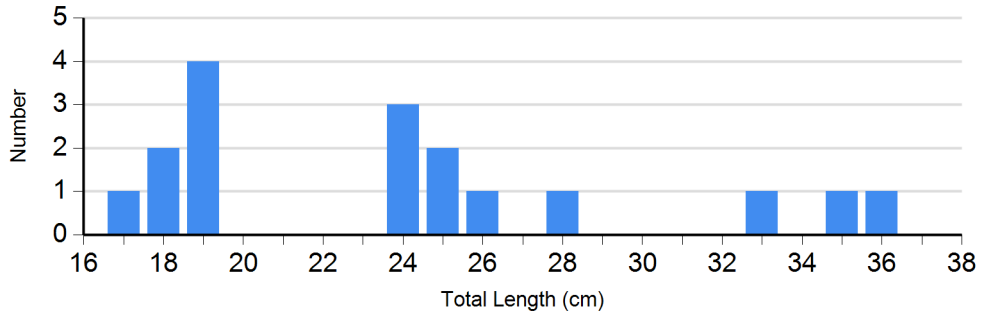
Length Frequency Distribution

Length frequency histogram of species sampled by year.

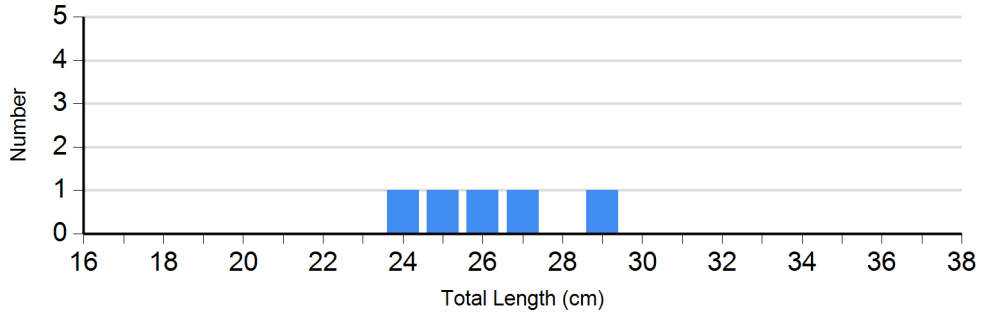
Species: Black Crappie
Gear: frame net (std 3/4 in)



2012

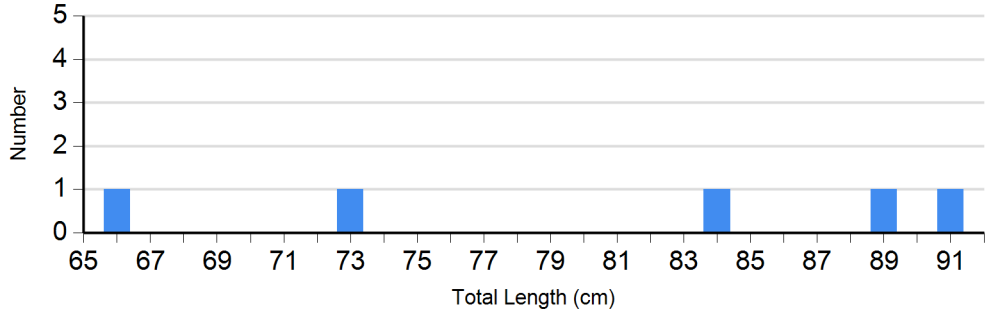


2013



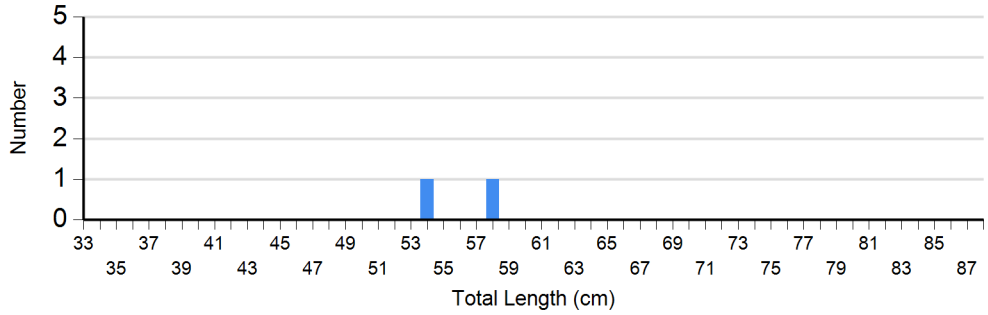
2014

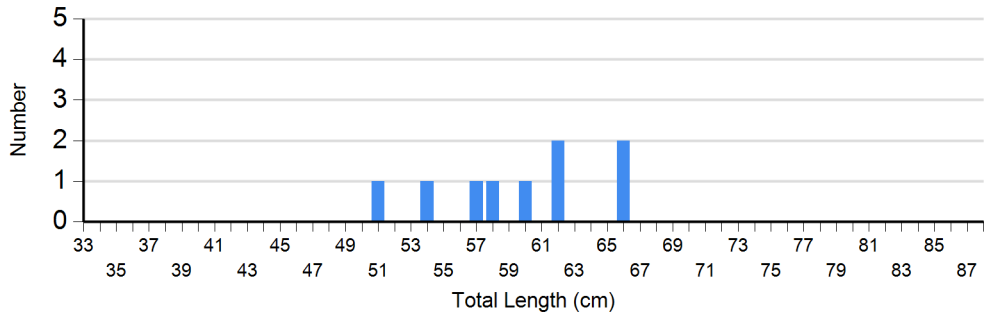
Species: Northern Pike
Gear: AFS std gill net

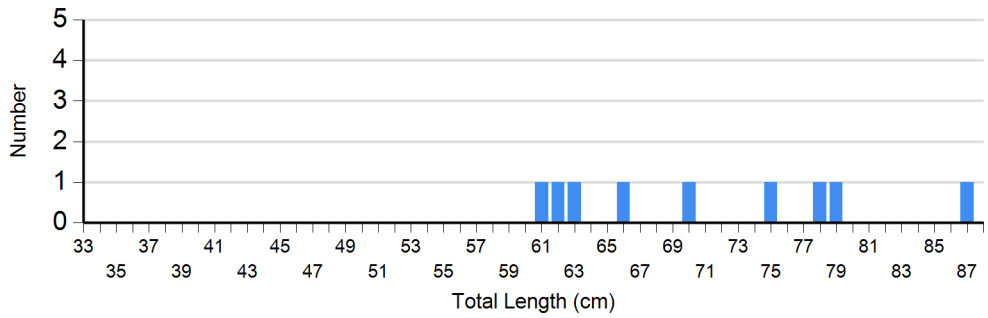


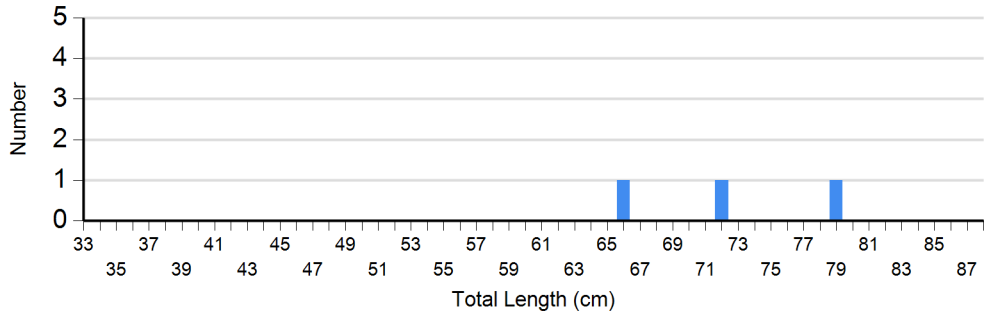
2016

Species: Northern Pike
Gear: std exp gill net

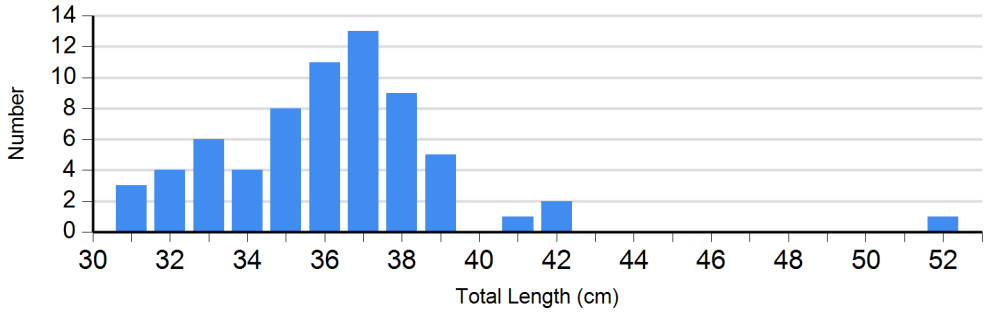






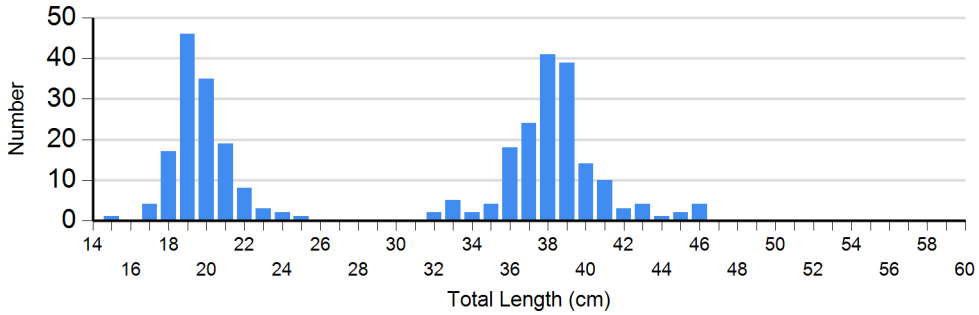


Species: Walleye
Gear: AFS std gill net

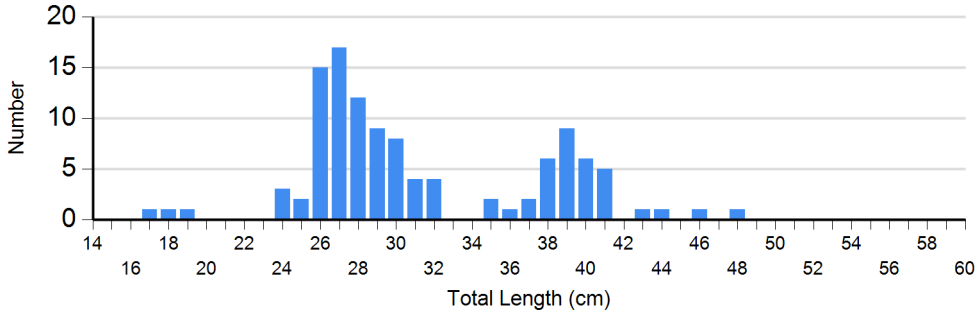


2016

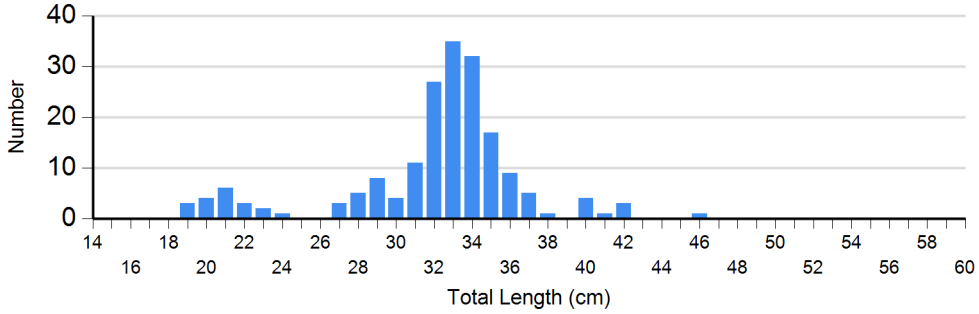
Species: Walleye
Gear: std exp gill net



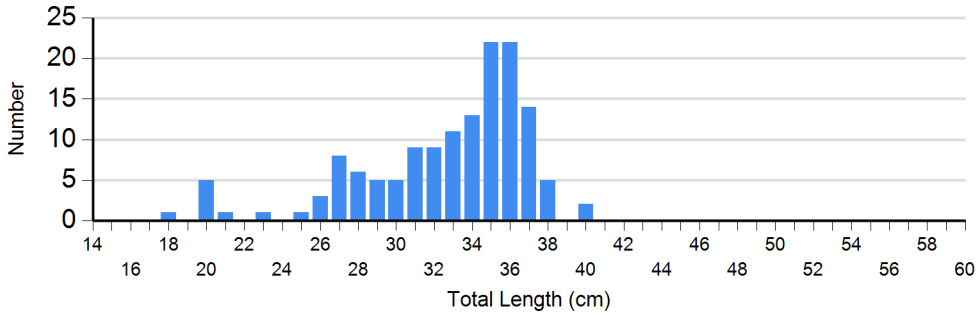
2012



2013

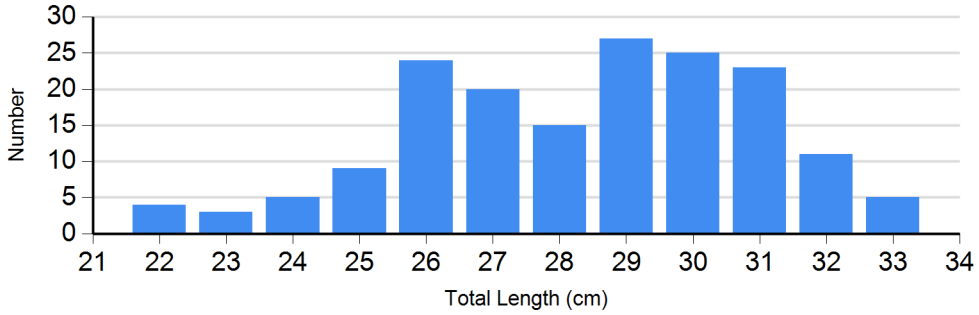


2014



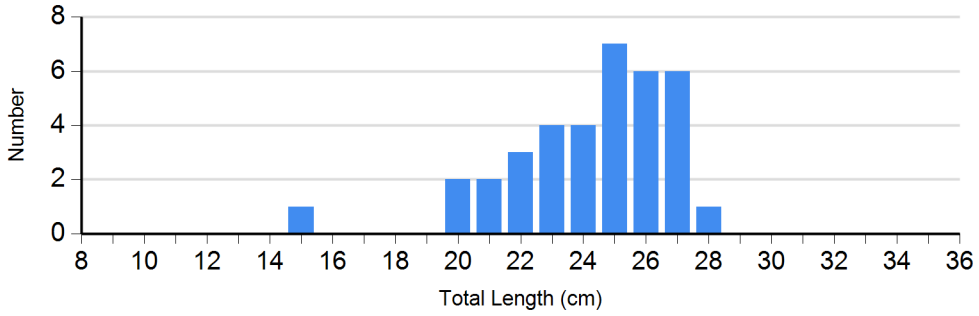
2015

Species: Yellow Perch
Gear: AFS std gill net



2016

Species: Yellow Perch
Gear: std exp gill net



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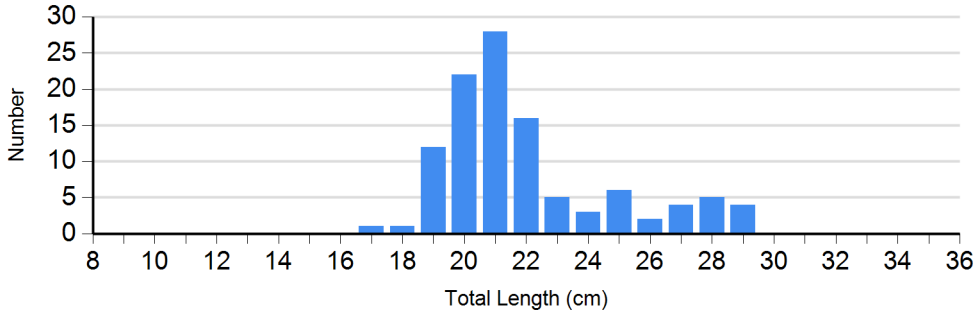
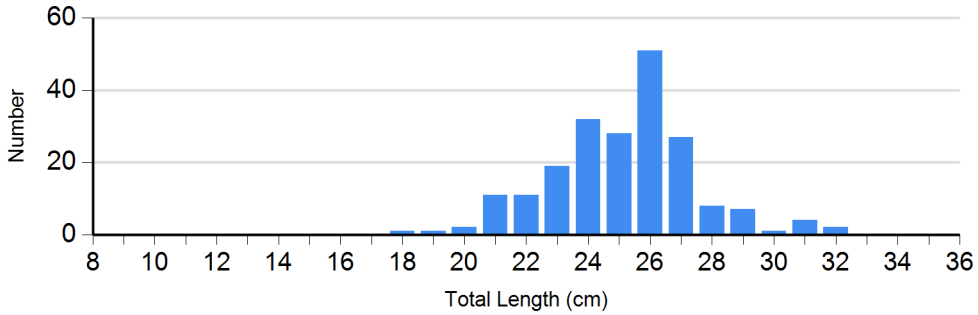
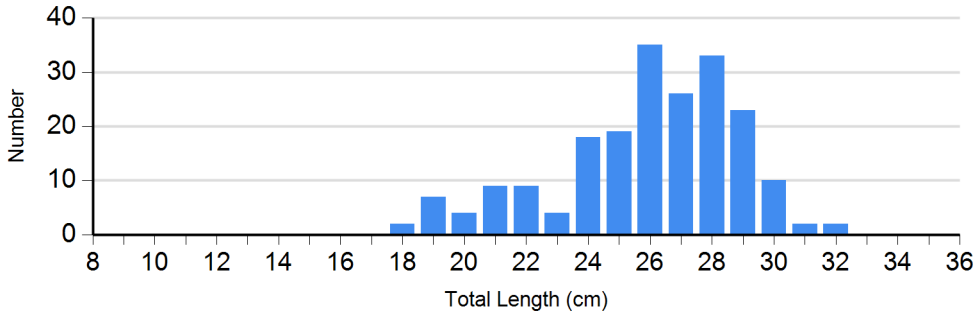


2013


Number
60
40
20
0
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
Total Length (cm)

2014

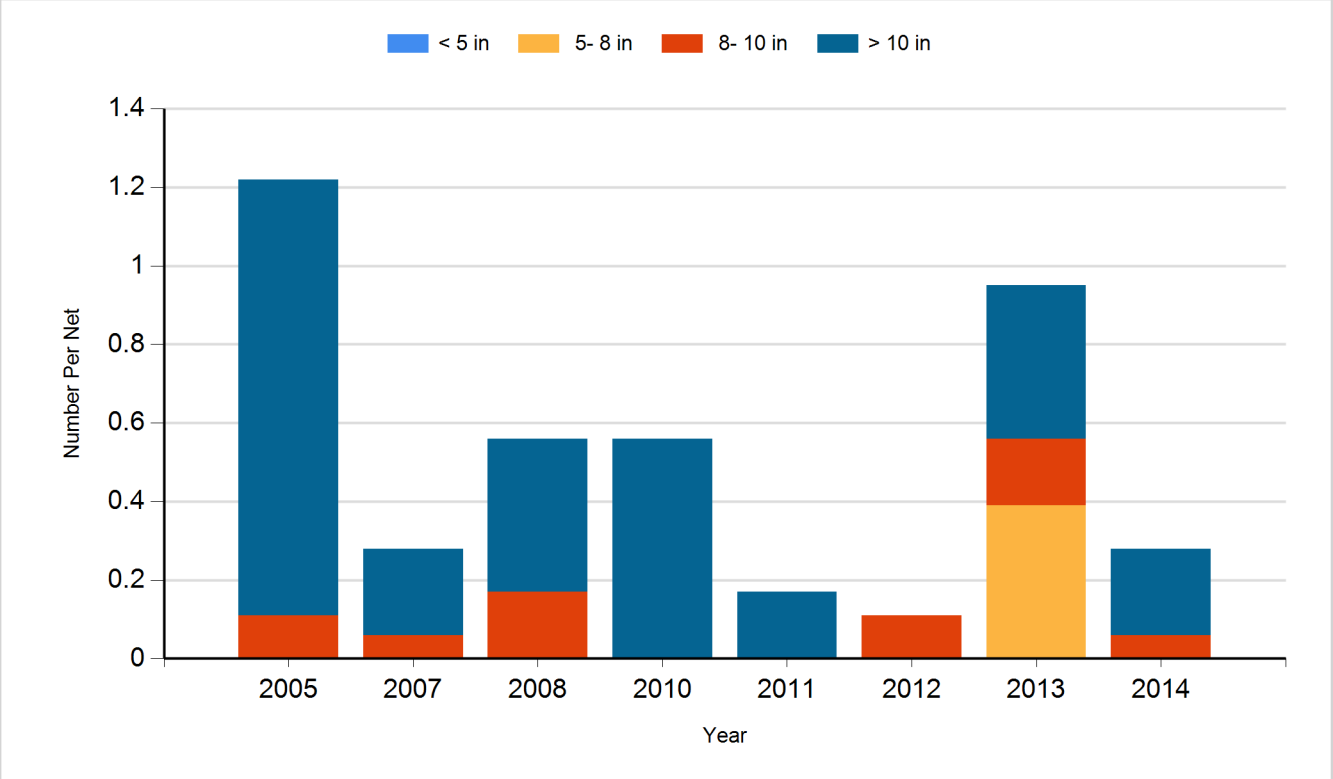

Number
40
30
20
10
0
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
Total Length (cm)

2015

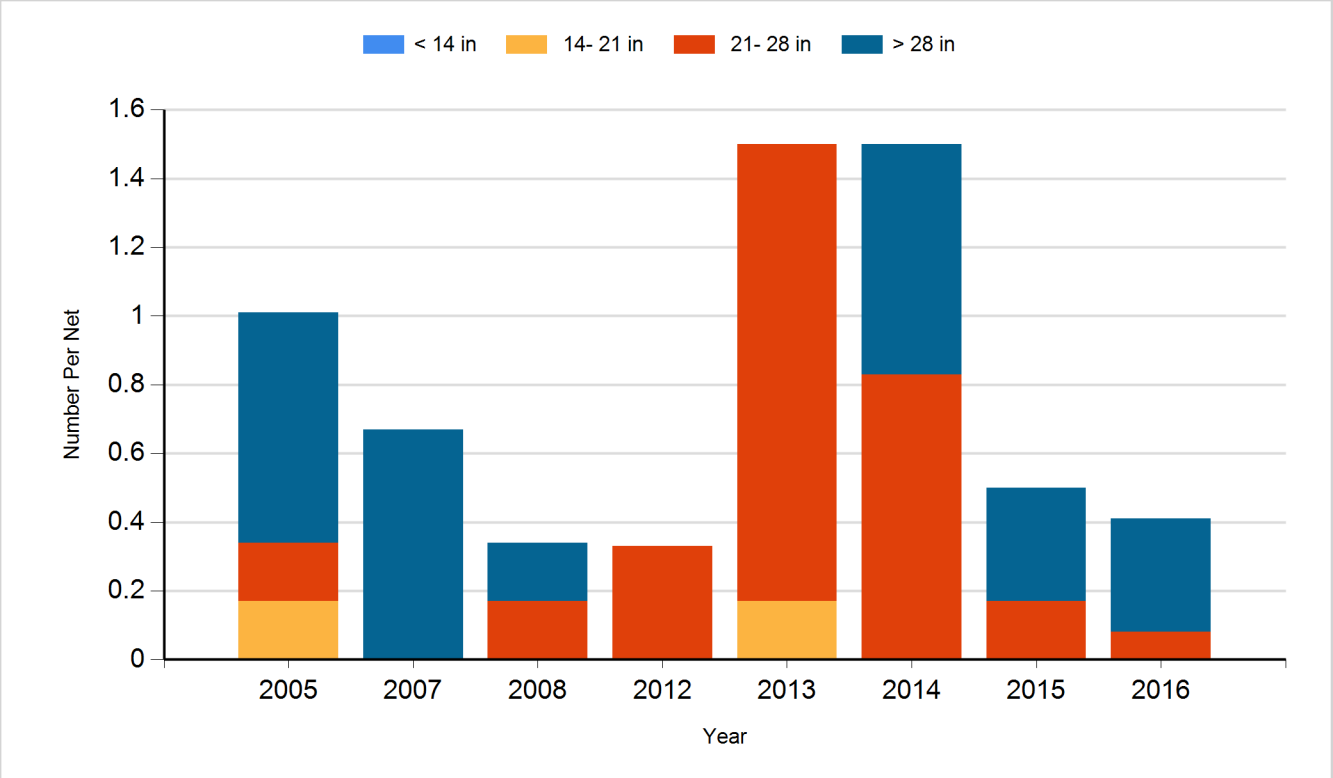
Historic Fish Sizes and Relative Abundance

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

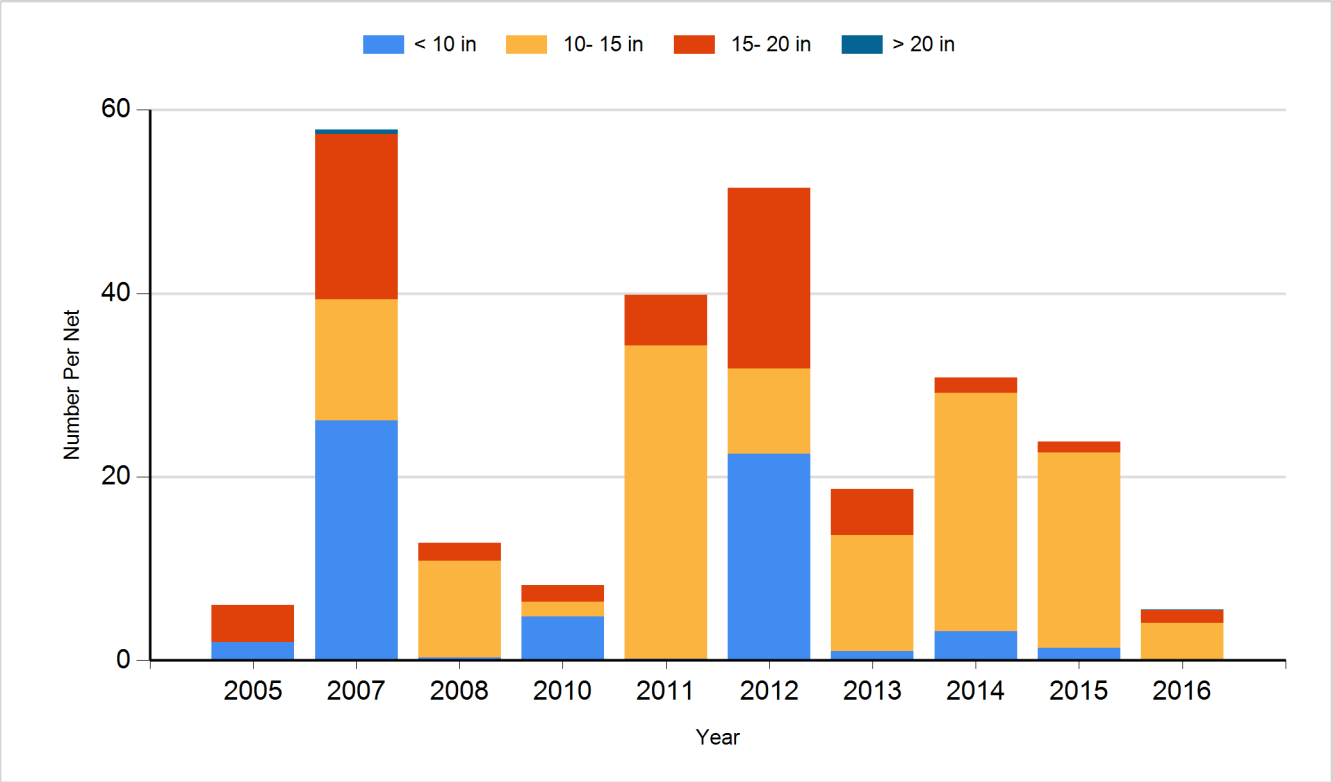
Species: Black Crappie
Gear: Frame Net



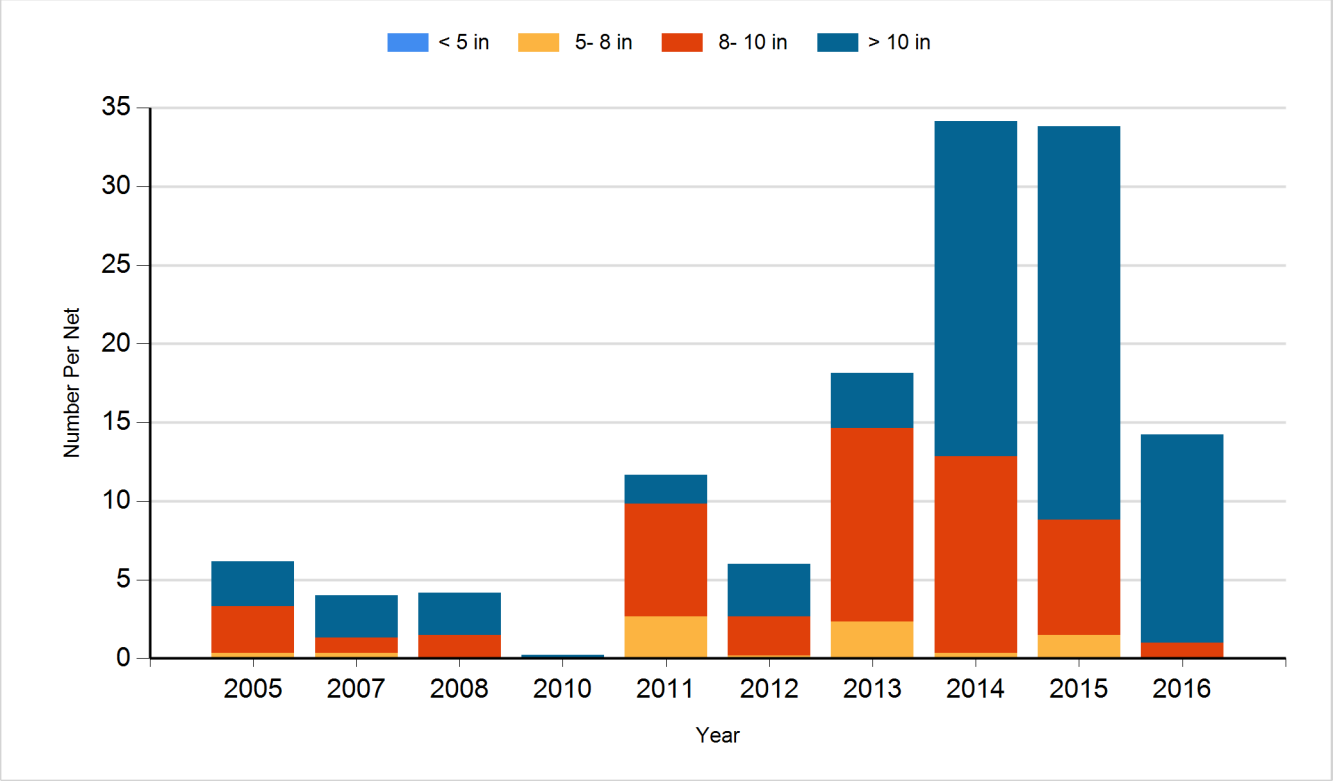
Species: Northern Pike
Gear: Gill Net



Species: Walleye
Gear: Gill Net



Species: Yellow Perch
Gear: Gill Net



Fish Stocking

Number of fish stocked by year, species, and size.

Year	Species	Size	Number
2006	Walleye	Fry	1,500,000
2009	Walleye	Fry	750,000
2011	Walleye	Fry	900,000
2016	Walleye	Fry	700,000