SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Kampeska, Codington County
UBS-Lake-171-000
2016

Lake Information

Name:	Kampeska	**Maximum Depth:**	16 Feet
County:	Codington	**Mean Depth:**	7 Feet
		OHWM Elevation:	1,718
Surface Area:	4,987 Acres	**Outlet Elevation:**	1,718

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	July 12, 2016	4 net-nights
AFS std gill net	July 13, 2016	4 net-nights
AFS std gill net	July 14, 2016	4 net-nights
boat shocker (night)	May 17, 2016	3610 seconds
boat shocker (night)	September 14, 2016	3600 seconds

Common Fish Species Present

Black Crappie

Walleye

Smallmouth Bass

White Crappie

Yellow Perch

White Bass

Yellow Bullhead

Channel Catfish

White Sucker

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).

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

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	0.4	0.3	100		100		90	5
	Channel Catfish	1.0	0.5	100		42	24	101	4
	Common Carp	0.1	0.1	100		100		91	
	Northern Pike	0.5	0.3	83		17		86	9
	Shorthead Redhorse	0.2	0.2	100		100		134	32
	Smallmouth Bass	0.8	0.4	33		0		88	2
	Walleye	4.6	1.1	18	8	2		79	1
	White Bass	1.8	0.9	48	17	48	17	86	3
	White Crappie	1.1	0.9	100		100		90	2
	White Sucker	0.6	0.3	100		100		102	3
	Yellow Bullhead	1.1	0.5	100		100		94	2
	Yellow Perch	5.3	1.4	90	6	40	9	108	1
boat shocker (night)	Smallmouth Bass	106.5	35.7	61	5	18	4	96	1
	Walleye	2.3	2.3	0		0		92	2

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										0.4	0.4
	Channel Catfish										1.0	1.0
	Common Carp										0.1	0.1
	Northern Pike										0.5	0.5
	Shorthead Redhorse										0.2	0.2
	Smallmouth Bass										0.8	0.8
	Walleye										4.6	4.6
	White Bass										1.8	1.8
	White Crappie										1.1	1.1
	White Sucker										0.6	0.6
	Yellow Bullhead										1.1	1.1
	Yellow Perch										5.3	5.3
boat shocker (night)	Smallmouth Bass	329.6	97.7		71.0		101.5		114.0		106.5	136.7
	Walleye	12.7	20.6			342.0	0.5	110.0	59.7	7.0	2.3	69.4
frame net (std 3/4 in)	Bigmouth Buffalo	1.3	1.6	0.2	1.7	0.3	0.2	0.2	0.4			0.7
	Black Bullhead	0.4	0.4	2.4	0.0	0.1	18.2	22.7	15.5			7.5
	Black Crappie	5.2	2.8	0.4	1.2	0.5	1.2	0.6	0.5			1.6
	Bluegill	4.2	4.0	1.3	3.2	1.5	1.2	1.6	1.4			2.3
	Channel Catfish		0.0			0.2	0.1	0.2				0.1
	Common Carp	0.4	0.3	0.2	0.0	0.1		0.1	0.1			0.2
	Northern Pike	0.6	0.3	0.5	1.0	0.5	1.3	0.4	0.2			0.6
	Rock Bass	0.0	0.0	0.2	0.1	0.2	0.1	0.0				0.1
	Shorthead Redhorse	0.2			0.0	0.1	0.1					0.1
	Smallmouth Bass	7.1	2.7	0.6	2.6	1.6	4.0	1.1	0.5			2.5
	Snapping Turtle	0.0										0.0
	Stonecat				0.0							0.0
	Walleye	1.6	2.2	1.1	3.4	0.5	0.5	1.0	0.6			1.4
	Western Painted Turtle	0.0										0.0
	White Bass	1.3	4.3	10.2	7.9	3.0	8.5	7.2	3.0			5.7
	White Crappie	0.7	0.2	0.1	0.2	1.5	0.3	0.2	0.7			0.5
	White Sucker	1.3	1.3	1.2	1.6	1.0	0.8	0.5	0.5			1.0
	Yellow Bullhead	1.3	1.4	0.2	5.2	2.7	21.6	15.4	3.9			6.5
	Yellow Perch				0.4	0.1	2.9		0.1			0.9

		CPUE										
Gear	Species	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Avg
std exp gill net	Bigmouth Buffalo		0.2									0.2
	Black Bullhead	0.3	0.2		0.1		3.2	8.0	1.8	2.3		2.3
	Channel Catfish	0.8	0.3		0.1	0.1		0.2	0.7	0.2		0.3
	Common Carp	1.0	0.5	0.2	0.1		0.2	0.2	0.3			0.4
	Northern Pike	0.2	0.5	0.3	0.1	0.4	2.5	2.5	0.2	1.0		0.9
	Shorthead Redhorse			0.1	0.1	0.1	0.2			0.3		0.2
	Smallmouth Bass	0.8	0.2			0.2	0.2	0.5		1.2		0.5
	Walleye	6.5	14.3	5.7	6.9	8.1	12.2	7.5	9.3	11.5		9.1
	White Bass	20.2	15.5	2.4	1.8	1.5	4.8	4.3	3.8	4.7		6.6
	White Crappie	2.5	0.5	0.1	0.3	1.1	3.2	2.5	1.3	0.3		1.3
	White Sucker	1.5	0.3	0.6	0.6	1.8	3.8	1.5	1.8	2.2		1.6
	Yellow Bullhead	0.2	0.2		0.2	0.3	6.7	2.2	1.5	0.8		1.5
	Yellow Perch	1.3	0.3	0.7	2.0	0.9	3.5	5.7	2.7	13.0		3.3

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										83
		PSD-P										17
		Wr										86
	Walleye	PSD										18
		PSD-P										2
		Wr										79
	Yellow Perch	PSD										90
		PSD-P										40
		Wr										108
boat shocker (night)	Walleye	PSD	0	0			0	0	0	0	0	0
		PSD-P	0	0			0	0	0	0	0	0
		Wr	96	100			87	74	93	89	91	92
frame net (std 3/4 in)	Black Crappie	PSD	70	100	100	84	100	79	83	91		
		PSD-P	23	36	100	44	67	50	17	55		
		Wr	108	100	93	101	97	101	104	100		
	Northern Pike	PSD	83	100	78	100	67	40	75	60		
		PSD-P	50	67	33	55	56	0	25	40		
		Wr	85	76	80	85	81	66	74	56		
	Walleye	PSD	41	6	14	11	11	20	36	17		
		PSD-P	15	6	0	4	0	0	0	0		
		Wr	81	78	83	81	99	76	80	76		
	Yellow Perch	PSD				89	50	93		100		
		PSD-P				56	0	53		50		
		Wr				99	95			97		
std exp gill net	Northern Pike	PSD	100	100	67	100	75	27	60	100	17	
		PSD-P	100	0	17	0	0	0	7	0	0	
		Wr	85	77	79	81	82	71	79	70	83	
	Walleye	PSD	41	5	4	2	31	53	51	25	12	
		PSD-P	3	0	1	1	0	0	0	0	1	
		Wr	85	80	83	86	84	80	82	78	82	
	Yellow Perch	PSD	88	50	31	75	38	81	65	88	65	

			Year									
Gear	Species	Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
std exp gill net	Yellow Perch	PSD-P	50	50	8	14	13	19	18	19	41	
		Wr	112	106	112	107	104	95	107	107	109	

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+
2016	58	205 (1)	260 (14)	305 (19)		365 (20)		480 (1)	608 (1)	404 (1)	432 (1)
2015	88	198 (17)	264 (35)		334 (29)	351 (2)	555 (1)	432 (2)	422 (1)	414 (1)	
2014	62	193 (5)	223 (1)	305 (39)	353 (4)	382 (2)	418 (7)	427 (3)		457 (1)	
2013	59		248 (24)	369 (11)	401 (13)	409 (4)	447 (4)		423 (1)		414 (2)
2012	75	205 (2)	316 (11)	369 (12)	394 (25)	388 (12)	394 (2)	406 (8)		473 (1)	498 (1)
2011	150	250 (11)	325 (28)	359 (50)	384 (13)	425 (1)	392 (43)	432 (1)			498 (1)
2010	134	209 (7)	281 (56)	314 (37)	320 (3)	353 (29)				345 (2)	520 (1)
2009	138	195 (35)	276 (34)	306 (1)	327 (64)	404 (1)	456 (1)		519 (2)		
2008	94	191 (8)	263 (11)	286 (70)				406 (4)	412 (1)		
2007	93	208 (1)	247 (75)		415 (6)		411 (6)		473 (3)		467 (2)

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	63	142 (3)	187 (3)	234 (31)		274 (11)	277 (11)	279 (3)	255 (1)		
2015	78		191 (33)	242 (7)	253 (22)	261 (7)	270 (9)	296 (1)			
2014	22	119 (5)	160 (2)	219 (7)	235 (1)	255 (6)	235 (1)				
2013	35	123 (1)	183 (13)	230 (12)	244 (9)		252 (1)				
2012	21		180 (2)	211 (11)	241 (6)	251 (1)	273 (1)				
2011	27	106 (11)	182 (9)	197 (5)	254 (2)						
2010	39	113 (3)	178 (9)	231 (22)	257 (1)	293 (1)	293 (1)		215 (1)	282 (1)	
2009	13		184 (10)	220 (1)		230 (1)				278 (1)	
2008	1		189 (1)								

Fish Condition

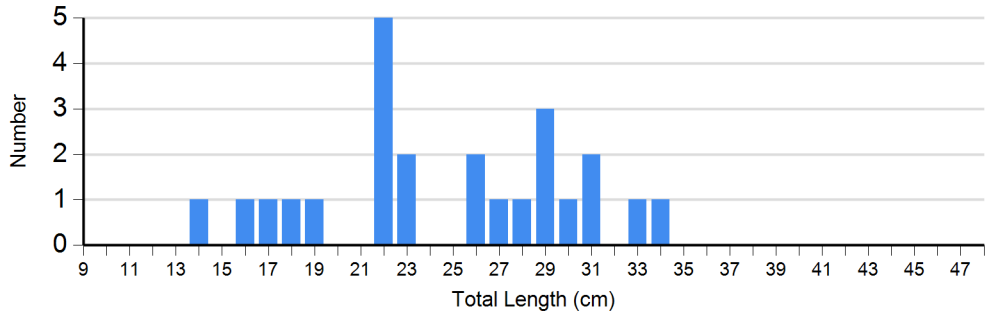
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	5	110 (3.4)	7	110 (1.0)	7	97 (2.1)	5	84 (5.7)
	2013	2	120	8	102 (2.4)	2	102 (8.8)	0	
	2014	1	115	4	96 (4.0)	5	100 (4.8)	1	101
Northern Pike Gill Net	2012	11	70 (2.1)	4	74 (4.2)	0		0	
	2013	6	82 (2.8)	8	77 (3.0)	1	73	0	
	2014	0		1	70	0		0	
	2015	5	84 (3.1)	1	78	0		0	
	2016	1	112	4	77 (3.8)	0		1	98
Walleye Gill Net	2012	34	81 (1.1)	39	79 (0.8)	0		0	
	2013	22	83 (1.2)	23	81 (0.7)	0		0	
	2014	42	78 (0.6)	14	76 (1.3)	0		0	
	2015	61	83 (0.6)	7	78 (1.1)	1	88	0	
	2016	45	78 (0.6)	9	81 (1.6)	1	80	0	
Yellow Perch Gill Net	2012	4	100 (2.0)	13	95 (1.7)	4	88 (1.5)	0	
	2013	12	105 (1.9)	16	111 (2.2)	6	102 (2.7)	0	
	2014	2	105 (8.8)	11	108 (2.4)	3	102 (7.5)	0	
	2015	27	111 (1.5)	19	106 (1.5)	32	109 (1.5)	0	
	2016	6	107 (3.1)	32	110 (1.2)	25	105 (1.4)	0	

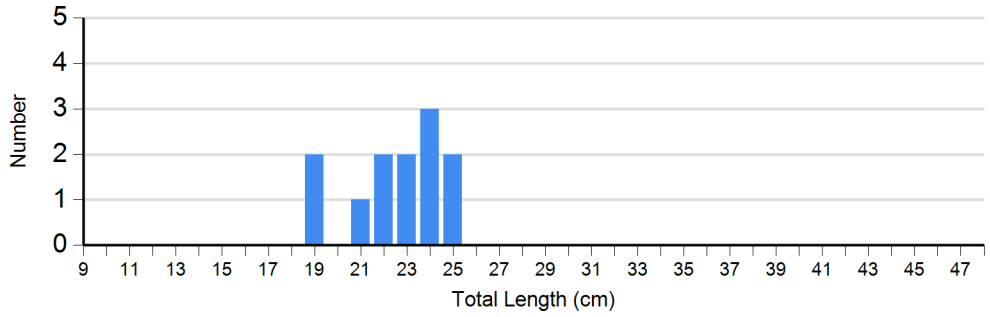
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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



2012



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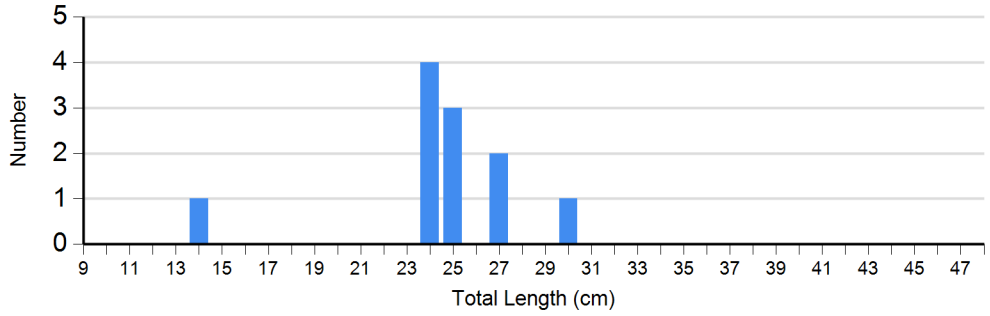
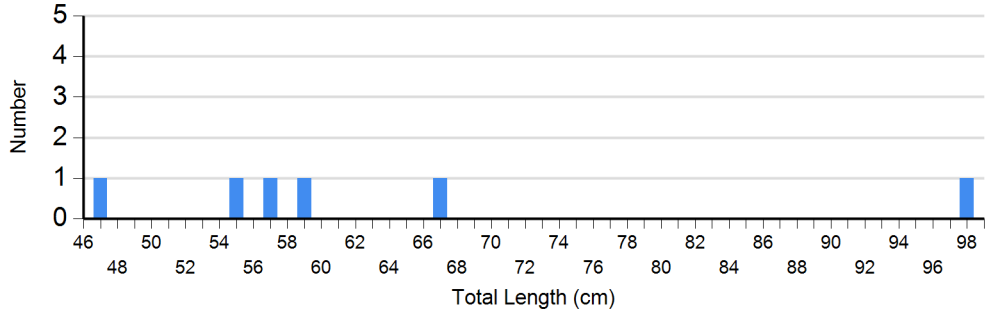


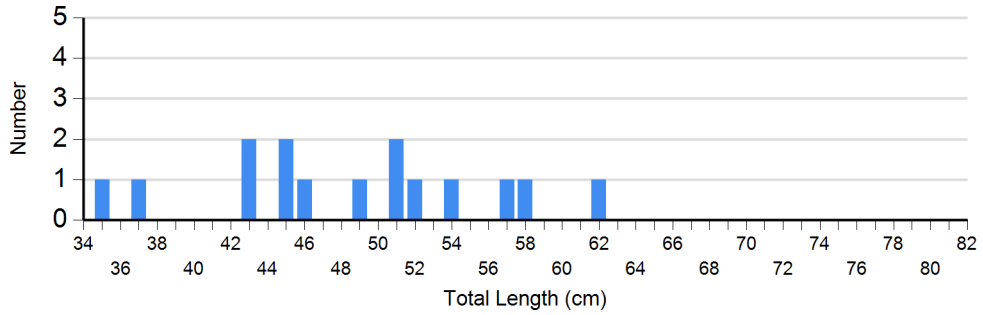
2014

Species: Northern Pike
Gear: AFS std gill net



2016

Species: Northern Pike
Gear: std exp gill net



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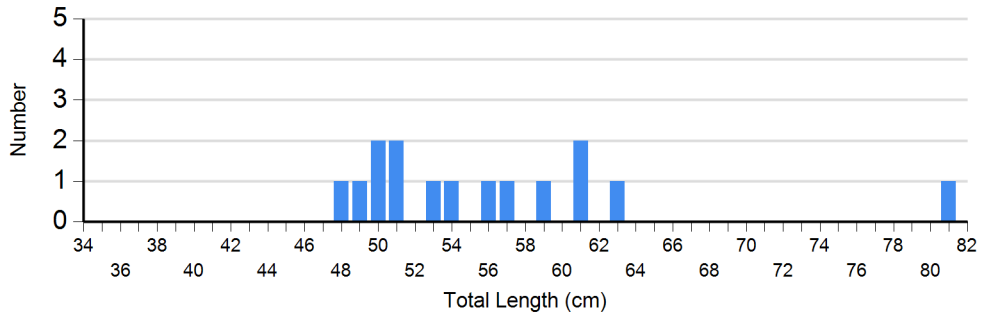

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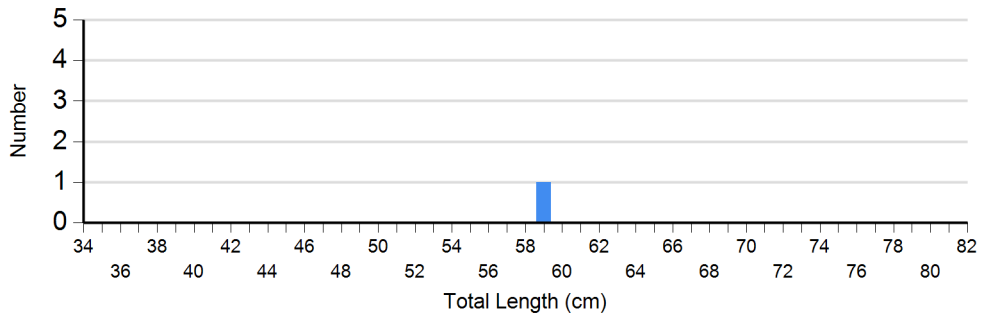

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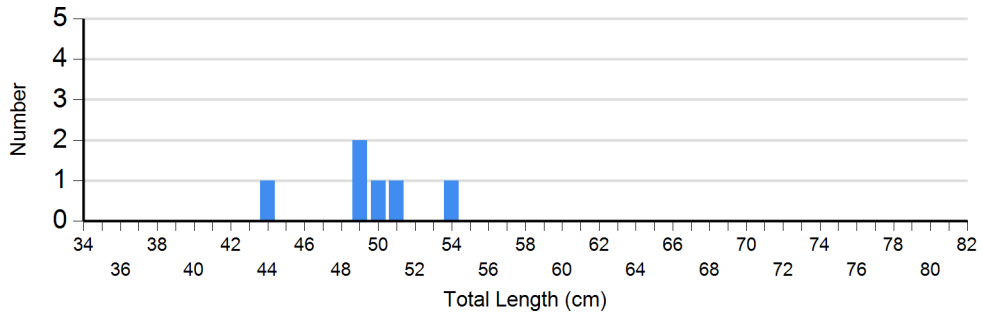
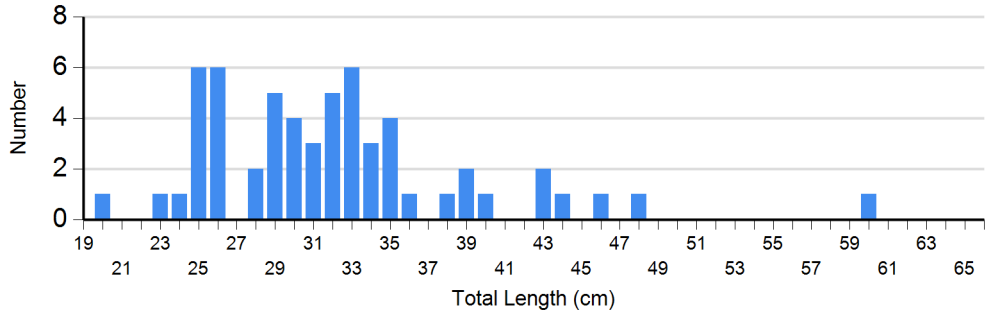


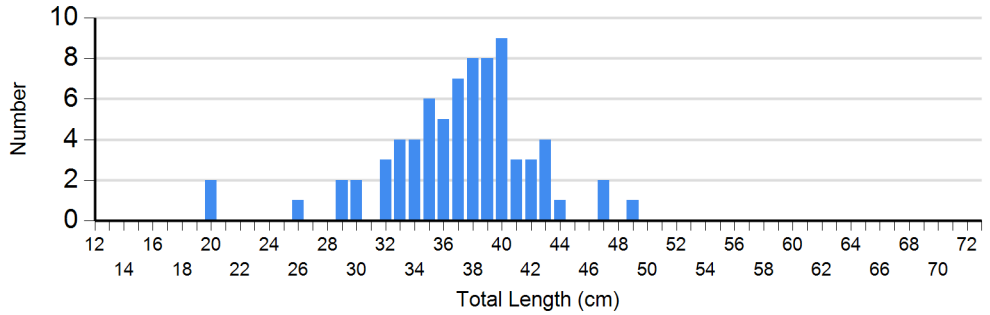
2015

Species: Walleye
Gear: AFS std gill net

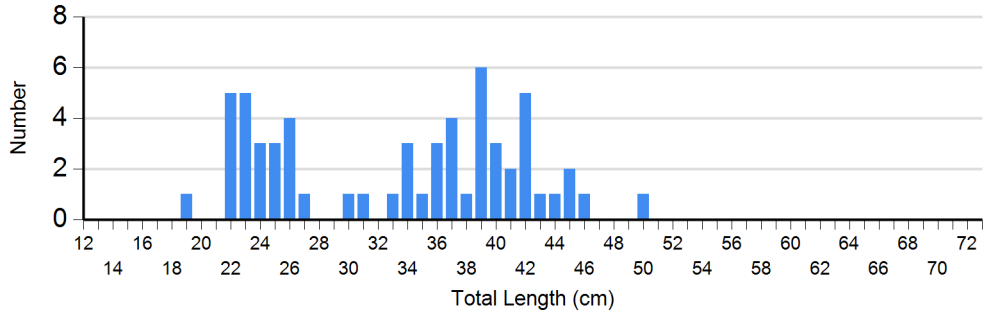


2016

Species: Walleye
Gear: std exp gill net



2012



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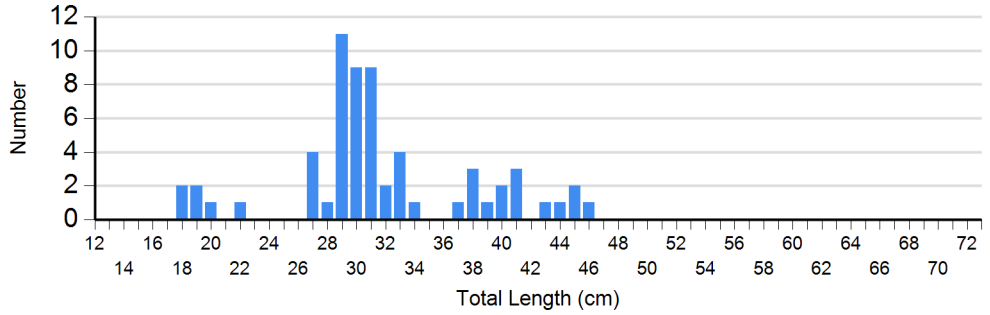
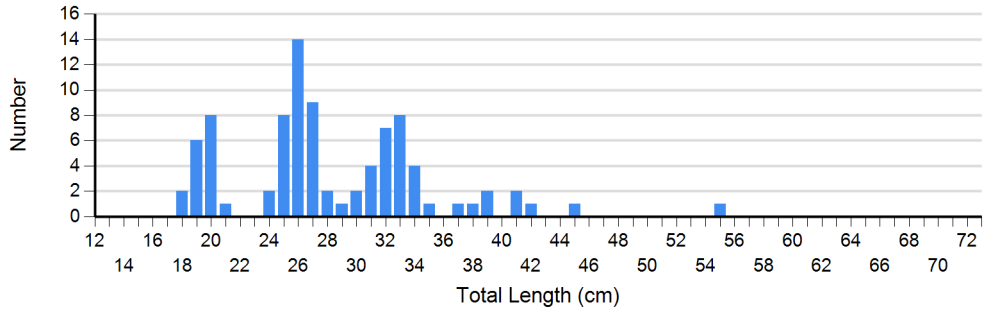
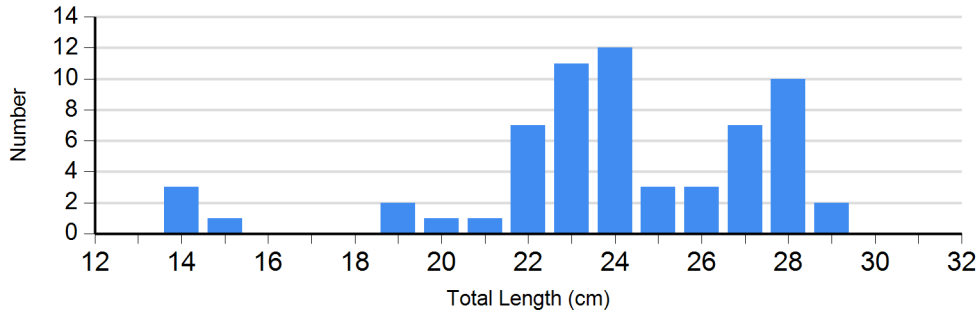


2014



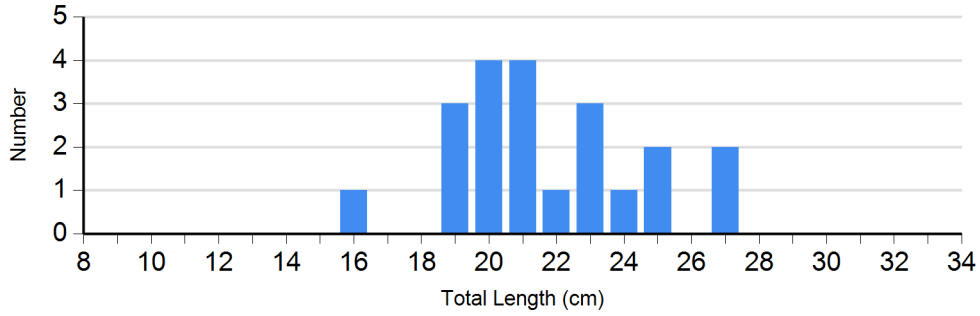
2015

Species: Yellow Perch
Gear: AFS std gill net

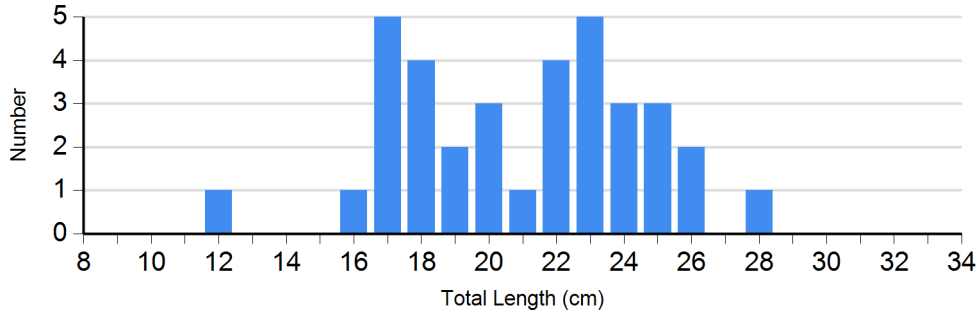


2016

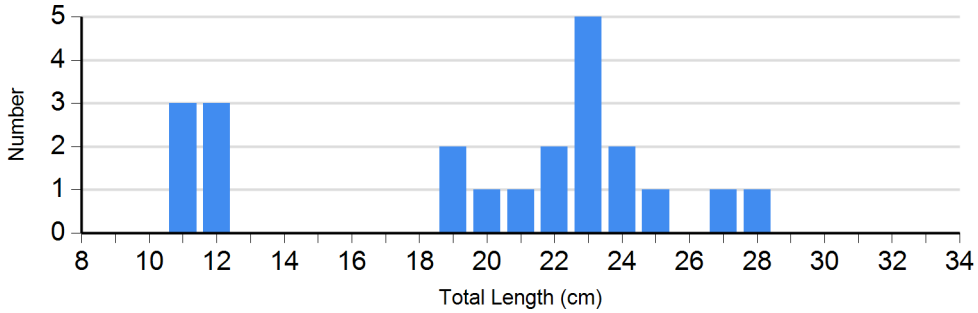
Species: Yellow Perch
Gear: std exp gill net



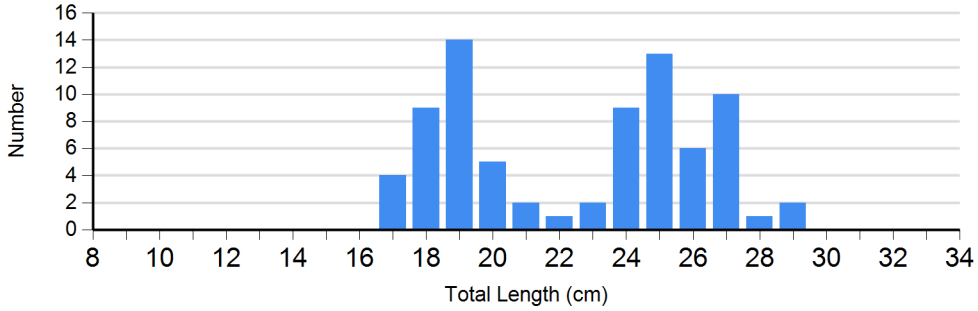
2012



2013


Number
0
1
2
3
4
5
8
10
12
14
16
18
20
22
24
26
28
30
32
34
Total Length (cm)

2014


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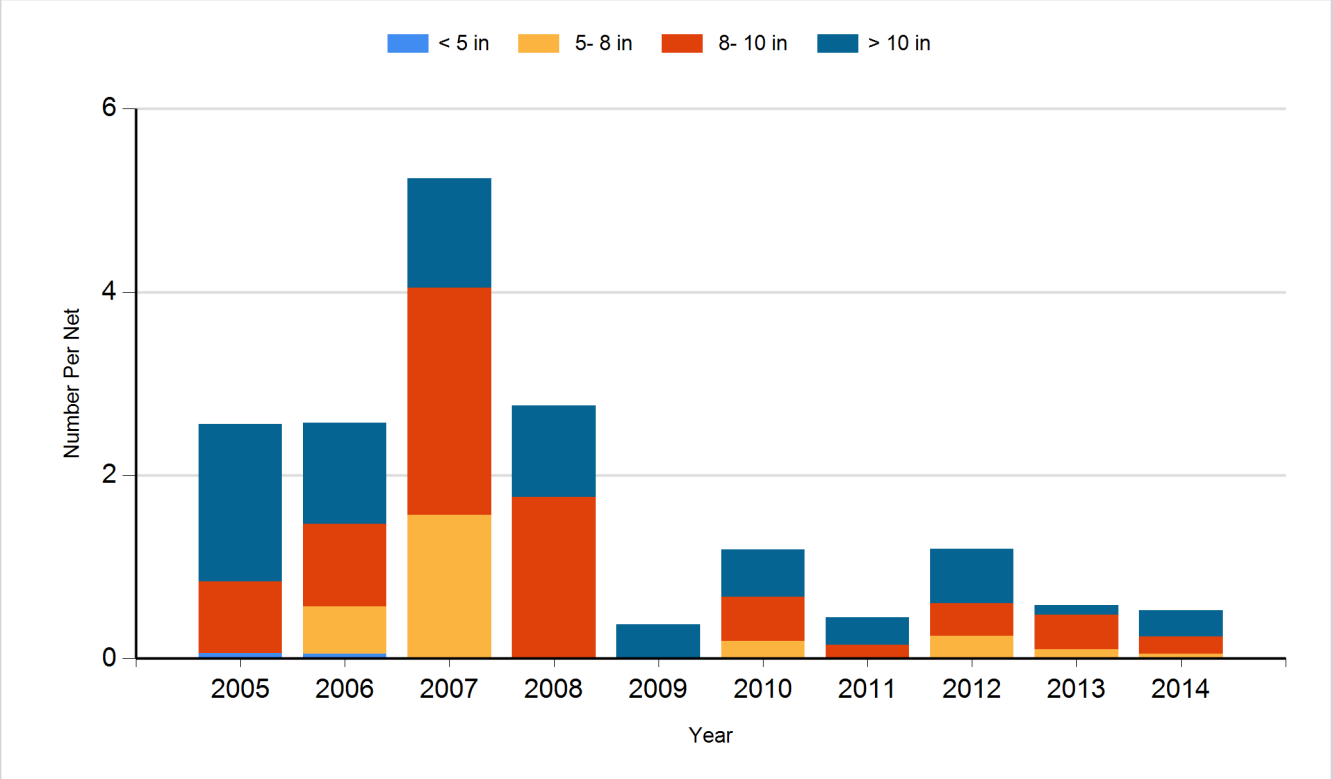
12
14
16
8
10
12
14
16
18
20
22
24
26
28
30
32
34
Total Length (cm)

2015

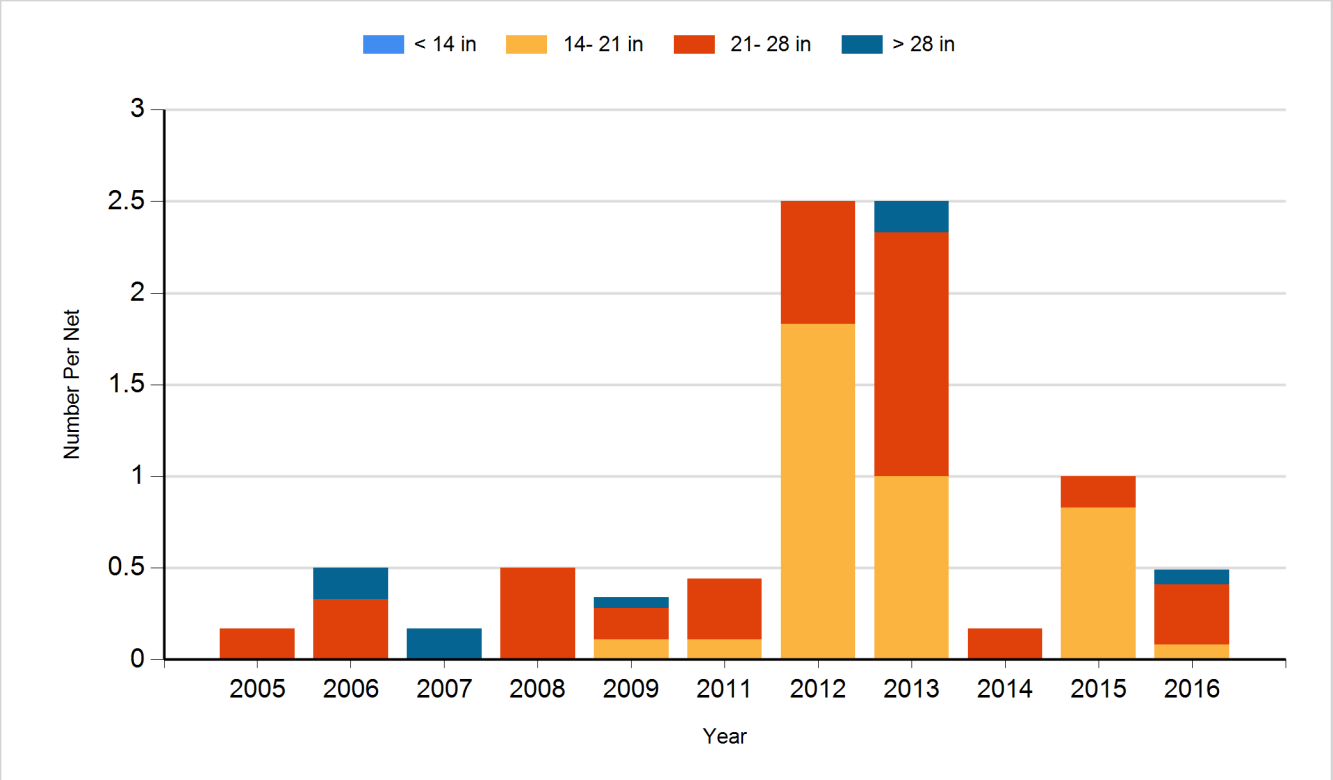
Historic Fish Sizes and Relative Abundance

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

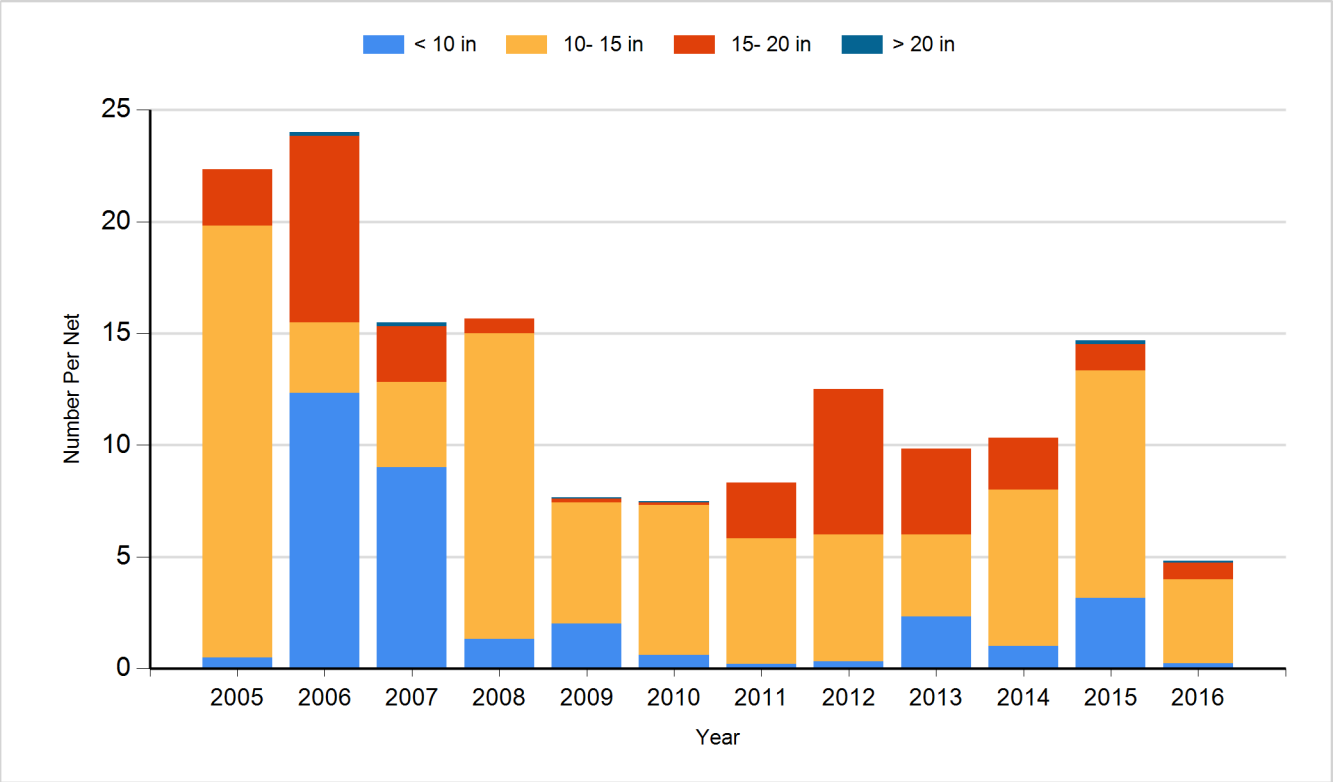
Species: Black Crappie
Gear: Frame Net



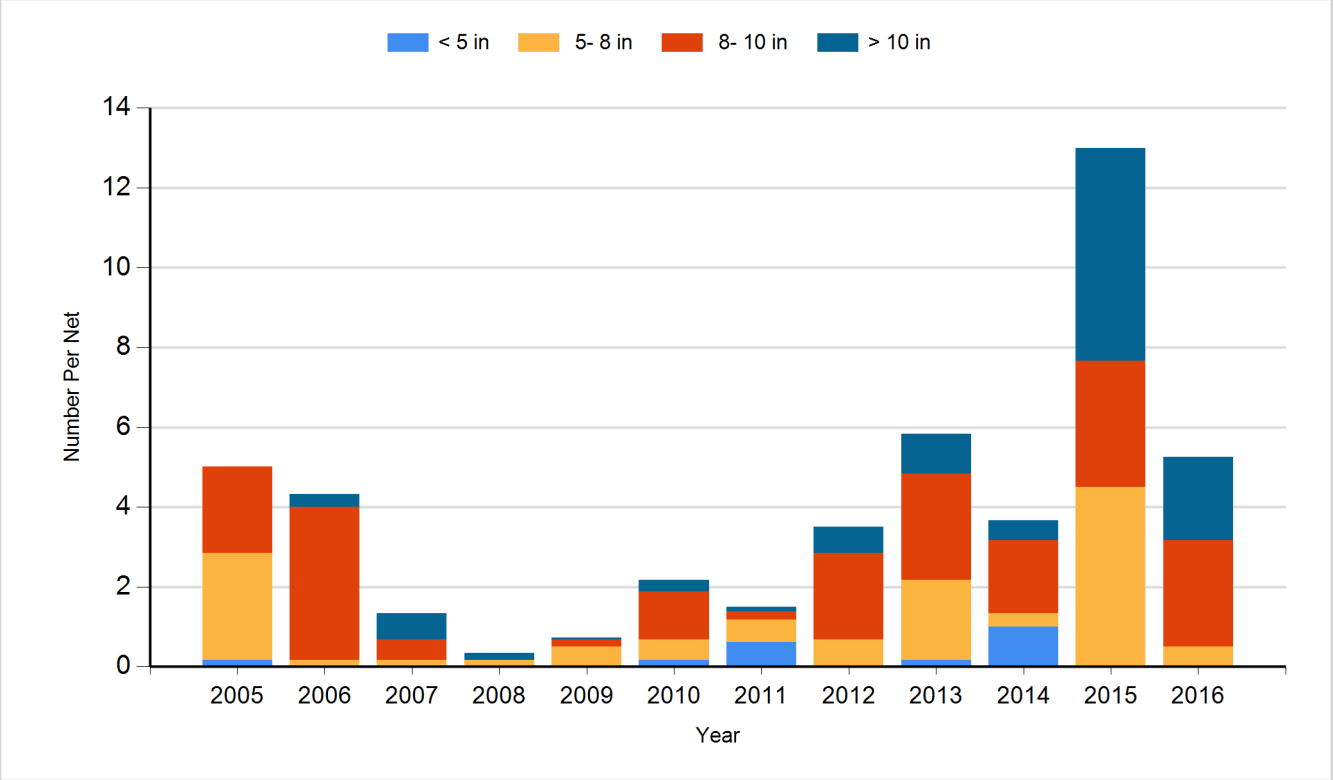
Species: Northern Pike
Gear: Gill Net



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
2005	Walleye	Fry	2,300,000
2008	Walleye	Fry	2,500,000
2009	Walleye	Fry	2,500,000
2013	Walleye	Fry	2,400,000
2014	Walleye	Fry	2,500,000
2016	Walleye	Fry	2,400,000