

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Enemy Swim, Day County

UBS-Lake-196-000

2016

Lake Information

Name:	Enemy Swim	Maximum Depth:	26 Feet
County:	Day	Mean Depth:	16 Feet
		OHWM Elevation:	1,854
Surface Area:	2,186 Acres	Outlet Elevation:	1,854

Surveys and Investigations

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

Gear	Date	Effort
AFS std frame net	July 26, 2016	8 net-nights
AFS std frame net	July 27, 2016	8 net-nights
AFS std frame net	July 28, 2016	8 net-nights
AFS std gill net	July 26, 2016	4 net-nights
AFS std gill net	July 27, 2016	4 net-nights
AFS std gill net	July 28, 2016	4 net-nights
boat shocker (night)	May 26, 2016	3600 seconds
boat shocker (night)	September 07, 2016	3540 seconds

Common Fish Species Present

Bluegill

Black Crappie

Largemouth Bass

Walleye

Smallmouth Bass

Yellow Perch

White Bass

White Sucker

Northern Pike

Pumpkinseed

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 std frame net	Black Bullhead	0.1	0.1	67		67		75	8
	Black Crappie	2.6	1.2	37	9	34	9	94	1
	Bluegill	62.7	27.7	43	2	18	1	104	1
	Common Carp	0.2	0.1	100		100		71	5
	Largemouth Bass	0.0	0.1	100		100		109	
	Northern Pike	0.5	0.2	64		9		83	4
	Pumpkinseed	1.1	0.8	27	14	8		105	3
	Rock Bass	0.8	0.3	55	18	10		105	2
	Smallmouth Bass	0.6	0.3	29		14		99	2
	Walleye	1.0	0.3	30	15	0		86	3
	White Bass	0.3	0.2	100		100		86	3
	White Sucker	0.1	0.1	100		100		80	8
	Yellow Perch	1.4	0.9	6		0		82	2
AFS std gill net	Black Bullhead	0.1	0.1	100		0		88	
	Black Crappie	0.8	0.6	90		80		98	3
	Bluegill	3.8	1.9	71	10	38	11	110	1
	Common Carp	0.8	0.3	100		100		84	3
	Largemouth Bass	0.1	0.1	100		0		121	
	Northern Pike	1.2	0.3	71		7		85	2
	Pumpkinseed	0.3	0.3	50		0		110	5
	Rock Bass	0.2	0.2	50		50		100	15
	Smallmouth Bass	2.4	0.8	69	13	24	13	94	1
	Walleye	7.2	1.8	52	8	1		86	1
	White Bass	7.6	2.8	100		100		89	1
	White Sucker	2.2	0.6	100		100		98	3
	Yellow Perch	4.9	1.6	7		0		95	1
boat shocker (night)	Smallmouth Bass	57.3	18.3	50	8	10	5	92	1
	Walleye	12.8	7.7	0		0		96	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.

Gear	Species	CPUE										Avg
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
AFS std frame net	Black Bullhead										0.1	0.1
	Black Crappie										2.6	2.6
	Bluegill										62.7	62.7
	Common Carp										0.2	0.2
	Largemouth Bass										0.0	0.0
	Northern Pike										0.5	0.5
	Pumpkinseed										1.1	1.1
	Rock Bass										0.8	0.8
	Smallmouth Bass										0.6	0.6
	Walleye										1.0	1.0
	White Bass										0.3	0.3
	White Sucker										0.1	0.1
Yellow Perch										1.4	1.4	
AFS std gill net	Black Bullhead										0.1	0.1
	Black Crappie										0.8	0.8
	Bluegill										3.8	3.8
	Common Carp										0.8	0.8
	Largemouth Bass										0.1	0.1
	Northern Pike										1.2	1.2
	Pumpkinseed										0.3	0.3
	Rock Bass										0.2	0.2
	Smallmouth Bass										2.4	2.4
	Walleye										7.2	7.2
	White Bass										7.6	7.6
	White Sucker										2.2	2.2
Yellow Perch										4.9	4.9	
boat shocker (night)	Smallmouth Bass	79.9	83.9	61.8	53.5		149.5		54.7		57.3	77.2
	Walleye	47.3	52.6	5.1	17.4	31.0	1.5	116.0	2.7	20.0	12.8	30.6
boat shocker (night, AC)	Largemouth Bass		102.2	81.7	112.1		67.2		224.3			117.5
frame net (std 3/4 in)	Black Bullhead	0.4	0.1	0.1	0.1	0.5	0.3	0.2	0.7	0.2		0.3
	Black Crappie	0.7	0.0	0.2	1.3	8.3	2.1	5.7	1.2	0.3		2.2
	Bluegill	81.5	65.3	56.8	57.3	90.2	53.8	54.2	31.5	26.1		57.4
	Common Carp	0.0	0.1	0.0		0.1	0.0					0.0

Gear	Species	CPUE										Avg
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
frame net (std 3/4 in)	Largemouth Bass	0.0	0.0				0.0					0.0
	Northern Pike	0.3	0.3	0.1	0.3	0.3	0.3	0.4	0.3	0.6		0.3
	Pumpkinseed	0.0	0.5	0.3	1.7	2.3	0.6	2.1	0.4	1.5		1.0
	Rock Bass	8.2	11.5	8.3	5.3	12.7	8.2	3.8	5.3	6.4		7.7
	Smallmouth Bass	1.2	2.7	1.8	1.9	14.9	4.6	3.4	3.3	2.0		4.0
	Sunfish Hybrid			0.0								0.0
	Walleye	0.3	0.4	0.1	0.0	0.6	1.2	0.7	0.8	0.8		0.5
	Western Painted Turtle	0.0								0.0		0.0
	White Bass	0.5	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.3		0.2
	White Sucker	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.0	0.2		0.1
	Yellow Perch	3.3	0.0	1.6	5.1	7.4	0.9	1.1	0.5	0.3		2.2
std exp gill net	Black Crappie	1.5	0.3	0.0	0.7	0.7	4.0	8.5	3.5	1.3		2.3
	Bluegill	5.8	0.5	0.9	1.3	0.8	54.8	41.8	10.3	15.5		14.6
	Common Carp	1.8	0.2	0.2	0.1	0.1	1.2		0.2	0.2		0.5
	Northern Pike	0.5	1.2	0.7	0.4	0.9	3.7	1.0	1.7	0.2		1.1
	Pumpkinseed						0.2	0.3	0.2	0.3		0.3
	Rock Bass	14.0	2.0	1.1	0.4	0.1	0.7	2.7	2.0	0.7		2.6
	Smallmouth Bass	1.8	2.2	1.4	0.2	0.5	2.7	2.3	5.3	1.5		2.0
	Walleye	14.7	3.0	1.6	1.9	3.6	7.5	8.7	8.5	8.7		6.5
	White Bass	1.5	2.5	0.9	0.1	0.6	8.0	5.8	1.3	2.0		2.5
	White Sucker	1.7	3.5	1.5	2.6	1.1	1.5	2.2	4.7	1.8		2.3
Yellow Perch	14.3	4.5	13.5	37.4	50.7	34.0	9.7	1.7	0.0		18.4	

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.

Gear	Species	Index	Year										
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
AFS std frame net	Black Crappie	PSD											37
		PSD-P											34
		Wr											94
	Northern Pike	PSD											64
		PSD-P											9
		Wr											83
	Walleye	PSD											30
		PSD-P											0
		Wr											86
Yellow Perch	PSD											6	
	PSD-P											0	
	Wr											82	
AFS std gill net	Black Crappie	PSD											90
		PSD-P											80
		Wr											98
	Northern Pike	PSD											71
		PSD-P											7
		Wr											85
	Walleye	PSD											52
		PSD-P											1
		Wr											86
Yellow Perch	PSD											7	
	PSD-P											0	
	Wr											95	
boat shocker (night)	Walleye	PSD	0	0	0	0	0	0	0	0	0	0	0
		PSD-P	0	0	0	0	0	0	0	0	0	0	0
		Wr	101	92	86	90	97	78	95	89	98	96	
frame net (std 3/4 in)	Black Crappie	PSD	56	0	20	23	84	84	99	100	100		
		PSD-P	39	0	20	16	5	57	46	93	100		
		Wr	94		107	102	104	96	100	95	98		
	Northern Pike	PSD	100	100	67	71	83	67	80	50	64		

Gear	Species	Index	Year										
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
frame net (std 3/4 in)	Northern Pike	PSD-P	29	14	33	0	0	0	40	13	0		
		Wr	85	79	84	87	89	72	82	81	81		
	Walleye	PSD	63	80	100	100	7	28	29	44	58		
		PSD-P	38	20	100	100	0	0	12	17	21		
		Wr	86	85	91	85	78	80	82	83	80		
		Yellow Perch	PSD	1	0	0	2	3	9	8	33	0	
	PSD-P		0	0	0	0	0	0	0	0	0		
	Wr		79	76	82	86	73	88	85	81	88		
	std exp gill net	Black Crappie	PSD	67	100	0	0	50	83	100	100	100	
			PSD-P	56	100	0	0	0	50	65	90	100	
			Wr	110	97		108	114	106	104	101	101	
		Northern Pike	PSD	100	100	67	75	53	59	100	70	0	
PSD-P			33	43	8	13	12	0	50	10	0		
Wr			82	87	91	91	92	91	84	82	87		
Walleye		PSD	63	61	96	56	14	18	21	16	10		
		PSD-P	14	17	18	9	5	9	17	4	2		
		Wr	89	88	91	92	85	81	80	82	83		
Yellow Perch		PSD	8	4	0	0	1	3	2	10	0		
		PSD-P	1	4	0	0	0	0	0	0	0		
		Wr	94	101	98	99	93	94	92	92			

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	88	248 (2)	281 (4)	331 (11)	366 (1)	381 (28)	398 (7)	386 (36)			625 (1)
2015	54		256 (6)		329 (7)	360 (3)	354 (37)				681 (1)
2014	55	187 (4)		278 (4)		356 (45)					584 (2)
2013	56		224 (6)	288 (10)	334 (30)			559 (1)	565 (1)	559 (1)	581 (7)
2012	48	167 (3)	264 (1)	320 (40)				552 (1)		636 (1)	544 (2)
2011	73	209 (3)	298 (61)	399 (1)	481 (2)		478 (2)			536 (2)	580 (2)
2010	85	210 (52)	311 (13)	402 (1)	446 (3)	445 (4)			478 (3)	494 (3)	525 (6)
2009	29	198 (1)	311 (1)	411 (1)	426 (4)		471 (6)	484 (8)	468 (3)	483 (2)	615 (3)
2008	20	176 (2)	259 (1)	356 (8)			485 (1)	465 (3)	421 (1)	531 (2)	634 (2)
2007	88	180 (1)	273 (26)	328 (6)	407 (7)	431 (16)	448 (11)	498 (5)	526 (7)	503 (3)	528 (5)

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	59	136 (1)	147 (40)	171 (13)	199 (2)		222 (1)	205 (1)	240 (1)		
2015	11	100 (10)	97 (1)								
2014	19	97 (7)	110 (2)		155 (1)	184 (3)	195 (6)				
2013	70	97 (11)	112 (1)	142 (2)	158 (21)	169 (32)	169 (4)				
2012	215	102 (2)	112 (7)	144 (20)	165 (168)	187 (18)					
2011	1606		109 (683)	150 (813)	169 (113)						
2010	1826	96 (25)	120 (1517)	164 (277)	199 (7)						
2009	914	102 (243)	125 (637)	124 (35)	222 (1)						

Fish Condition

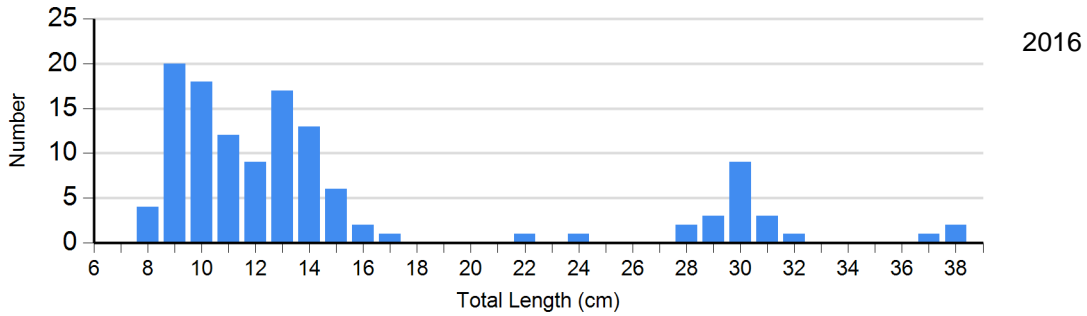
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2012	8	97 (4.1)	14	97 (1.8)	27	95 (0.8)	2	87 (2.8)
	2013	1	115	72	104 (0.6)	63	96 (0.6)	0	
	2014	0		2	106	26	95 (1.0)	1	83
	2015	0		0		6	98 (2.3)	0	
	2016	39	97 (0.9)	2	104 (4.7)	5	90 (2.2)	16	86 (2.3)
Northern Pike Gill Net	2012	9	89 (2.1)	13	93 (1.3)	0		0	
	2013	0		3	81 (1.4)	3	86 (2.6)	0	
	2014	3	82 (0.6)	6	83 (3.9)	1	77	0	
	2015	1	87	0		0		0	
	2016	4	89 (2.3)	9	83 (1.8)	1	88	0	
Walleye Gill Net	2012	37	80 (0.7)	4	80 (1.0)	3	89 (1.2)	1	87
	2013	41	81 (1.1)	2	81 (5.8)	7	76 (3.6)	2	76 (2.8)
	2014	43	82 (0.8)	6	78 (1.1)	2	78 (8.5)	0	
	2015	47	83 (1.5)	4	79 (0.6)	0		1	74
	2016	41	87 (0.8)	44	85 (0.9)	1	80	0	
Yellow Perch Gill Net	2012	197	94 (0.4)	7	85 (2.2)	0		0	
	2013	57	92 (0.8)	1	85	0		0	
	2014	9	92 (2.2)	1	87	0		0	
	2015	0		0		0		0	
	2016	55	95 (0.9)	4	90 (3.3)	0		0	

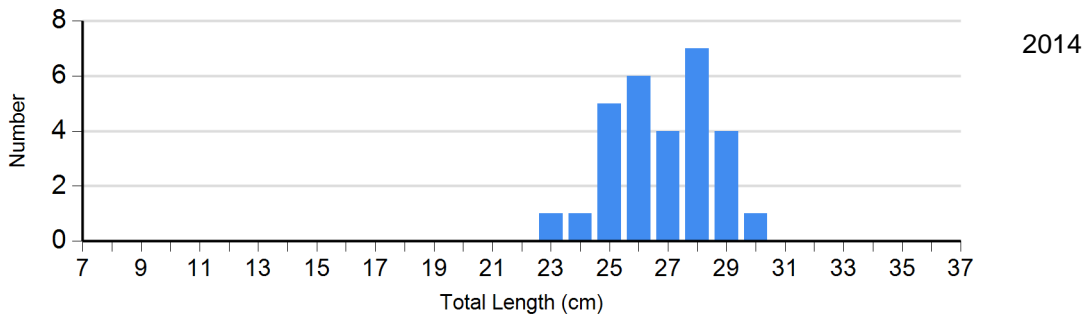
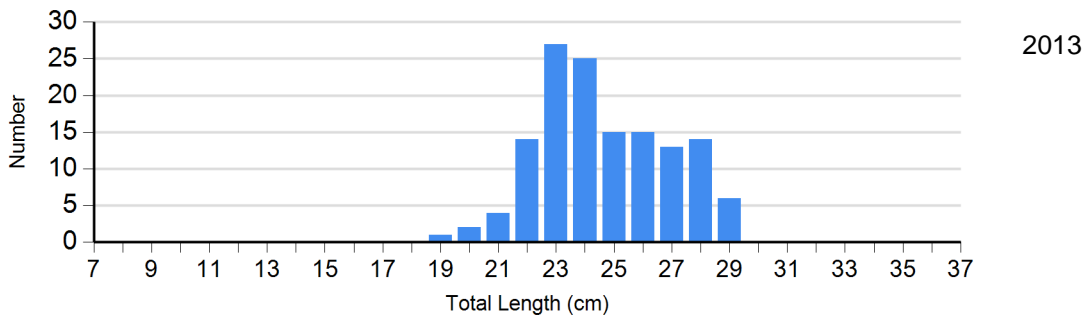
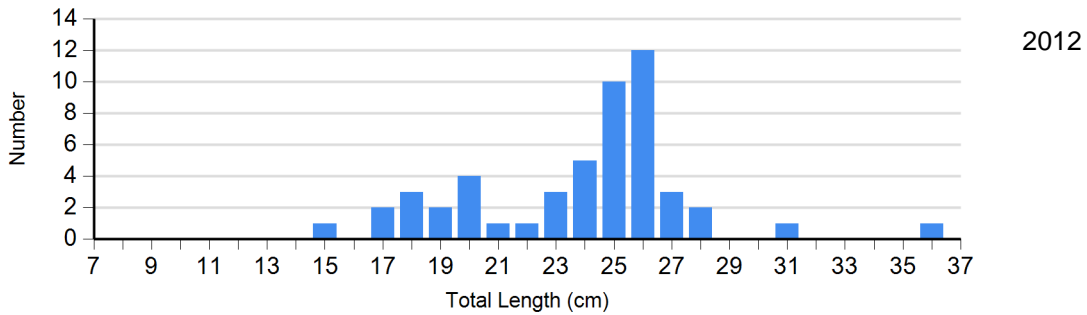
Length Frequency Distribution

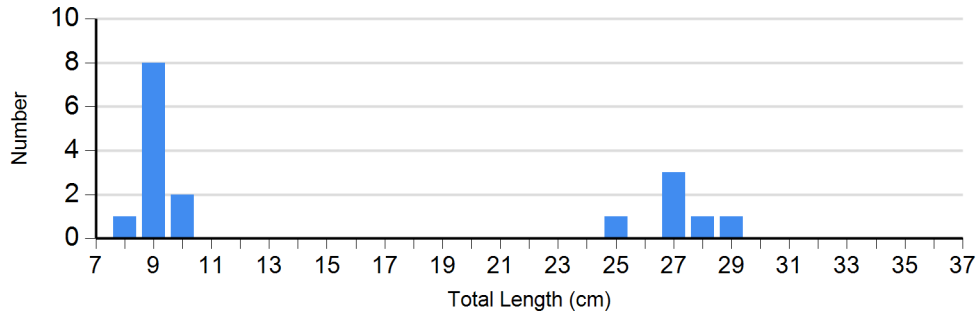
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: AFS std frame net



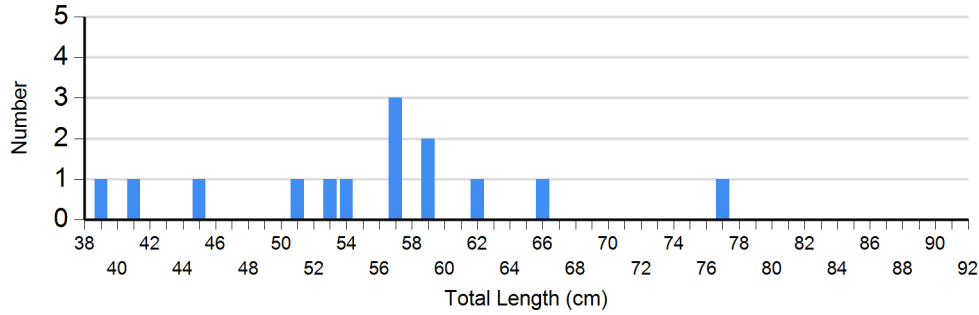
Species: Black Crappie
Gear: frame net (std 3/4 in)





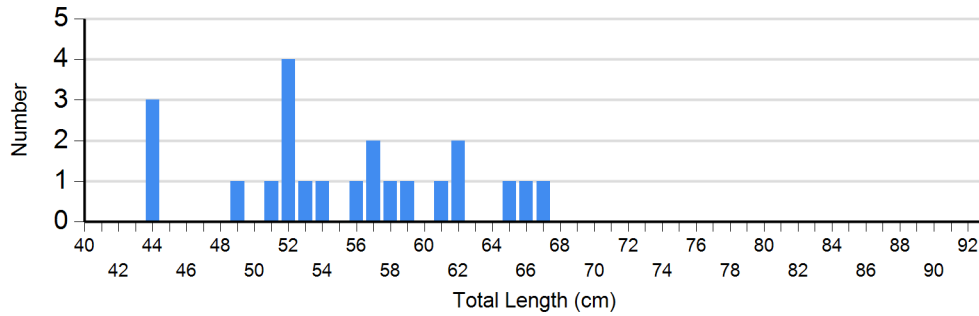
2015

Species: Northern Pike
Gear: AFS std gill net

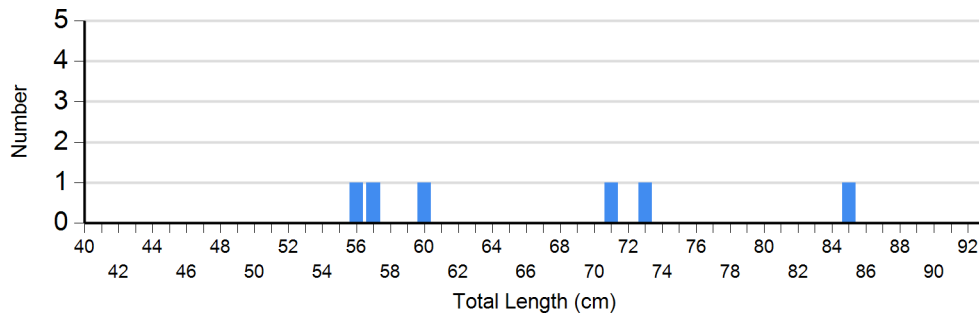


2016

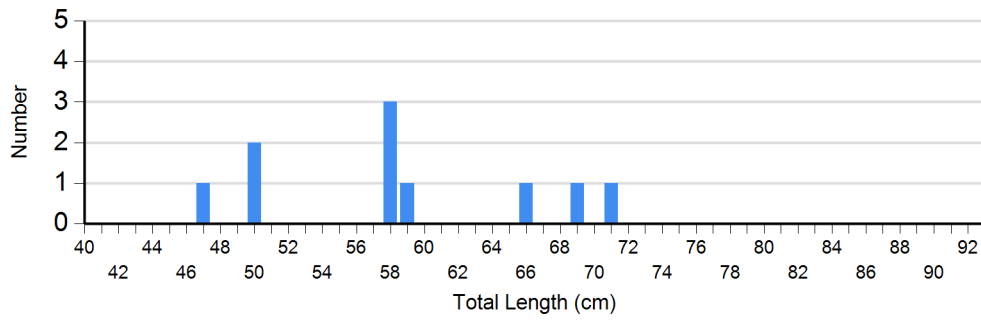
Species: Northern Pike
Gear: std exp gill net



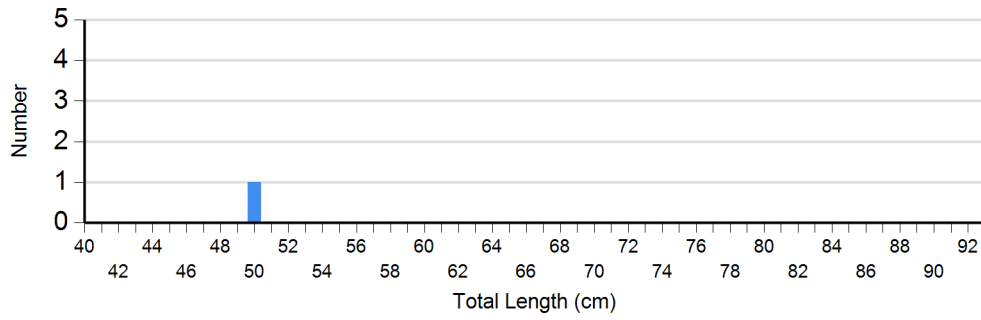
2012



2013

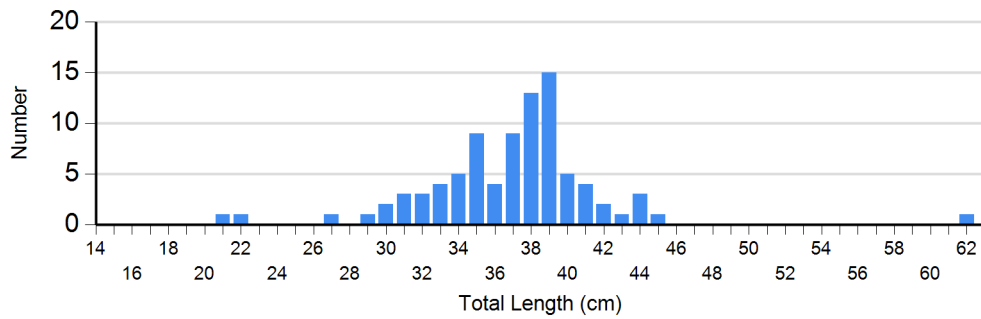


2014



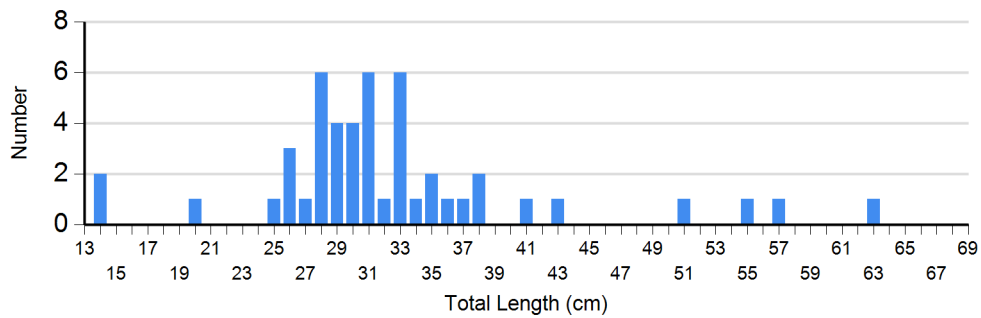
2015

Species: Walleye
Gear: AFS std gill net

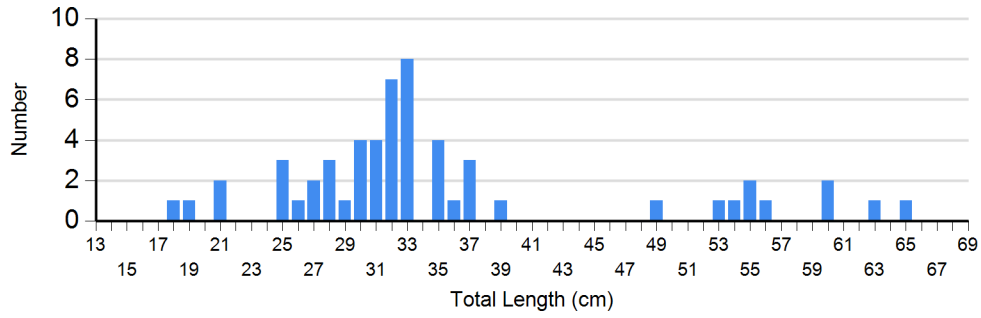


2016

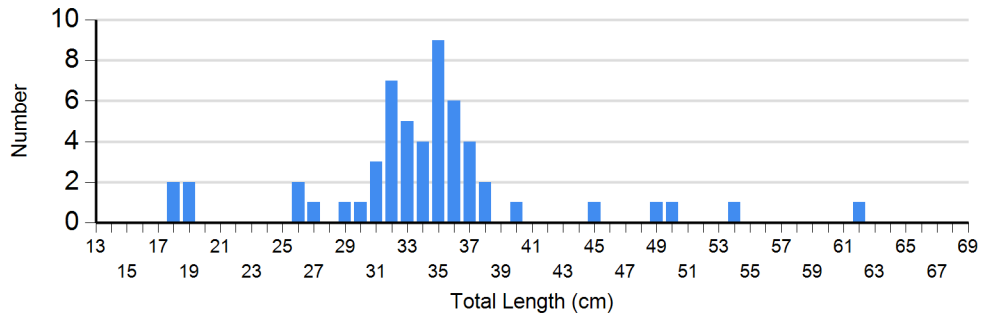
Species: Walleye
Gear: std exp gill net



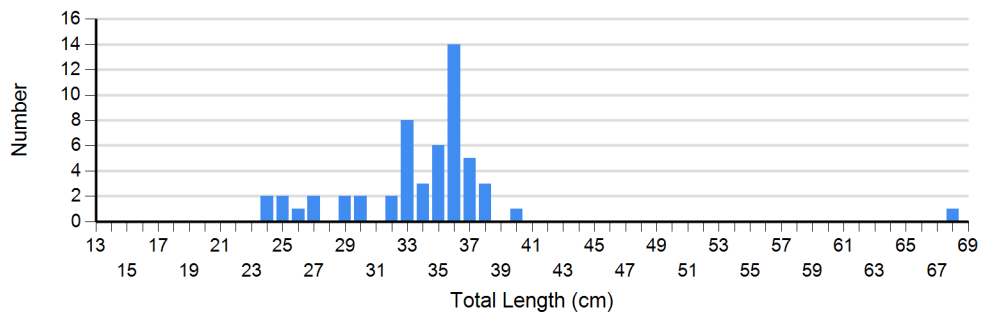
2012



2013

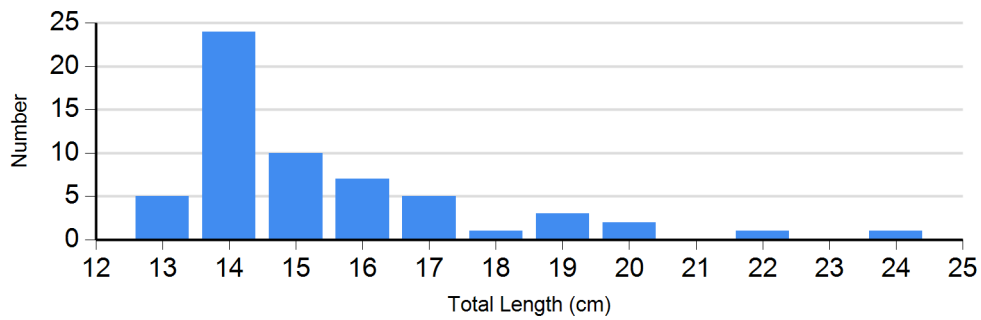


2014



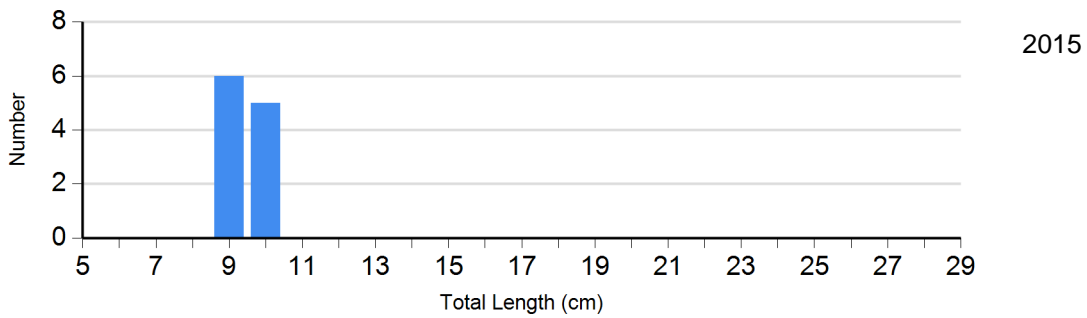
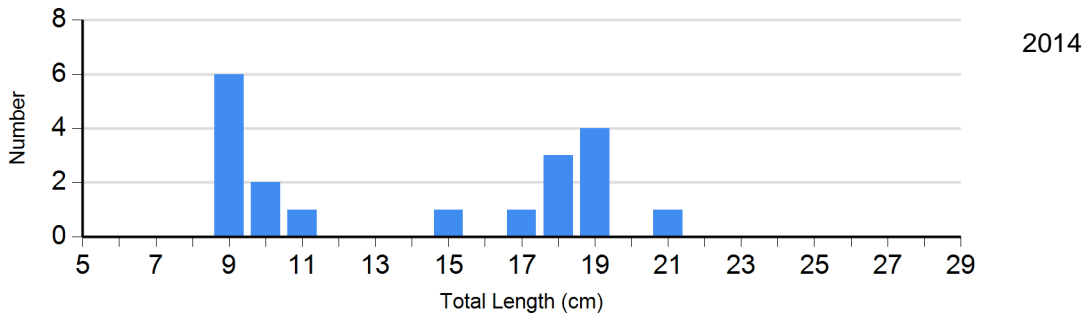
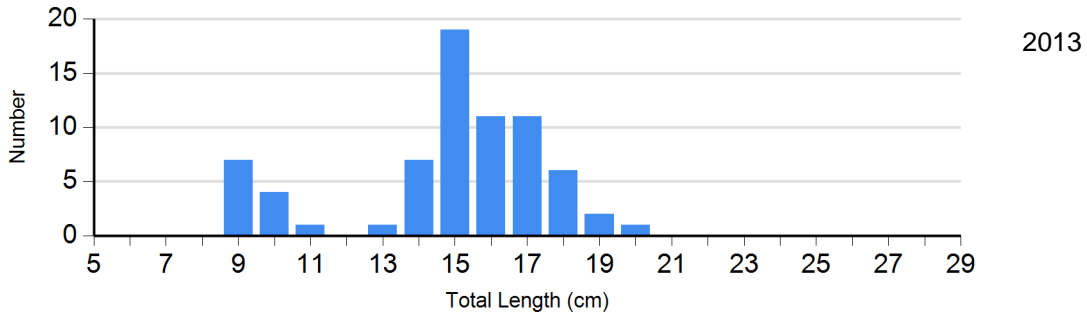
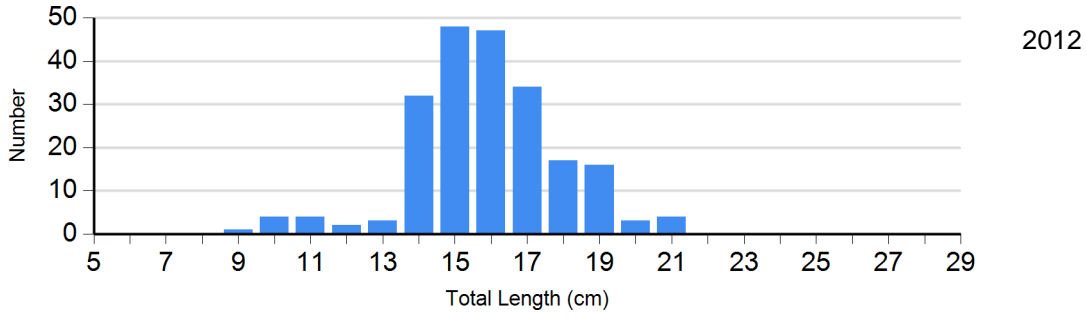
2015

Species: Yellow Perch
Gear: AFS std gill net



2016

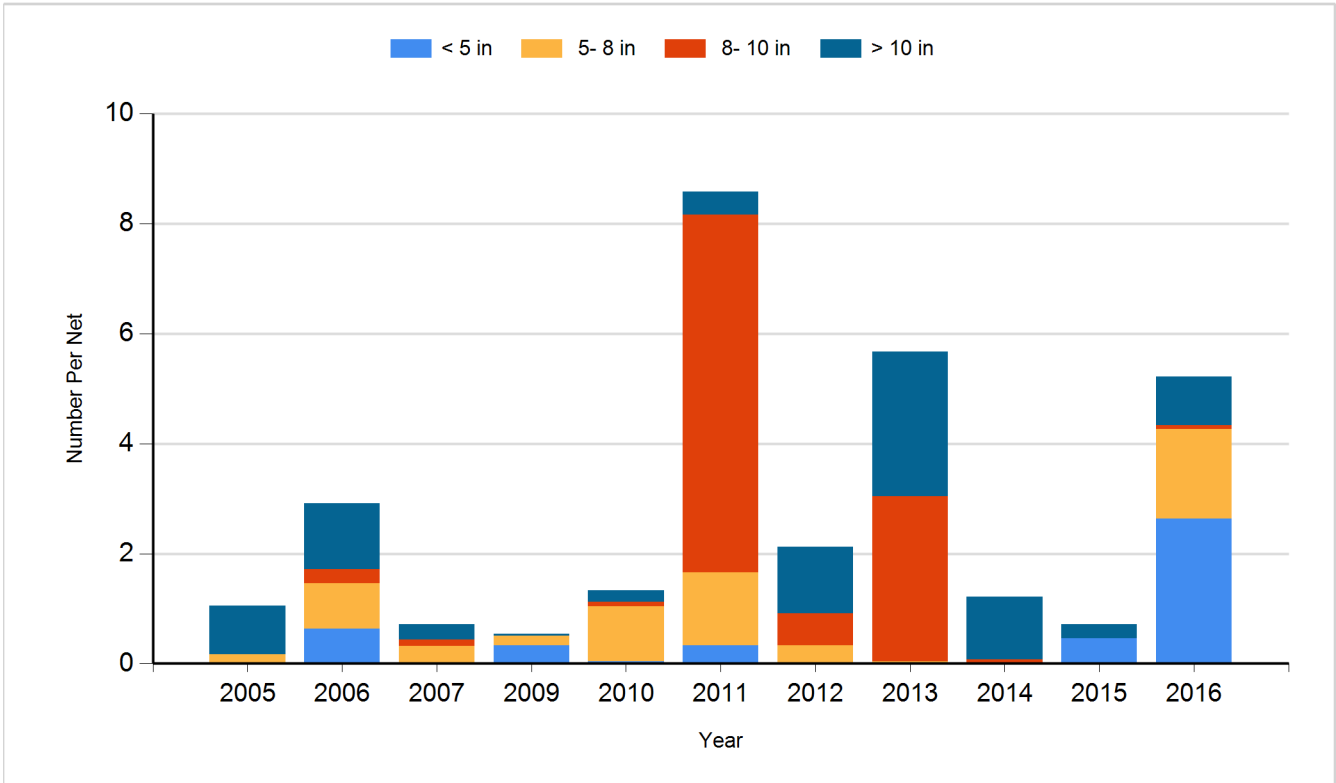
Species: Yellow Perch
Gear: std exp gill net



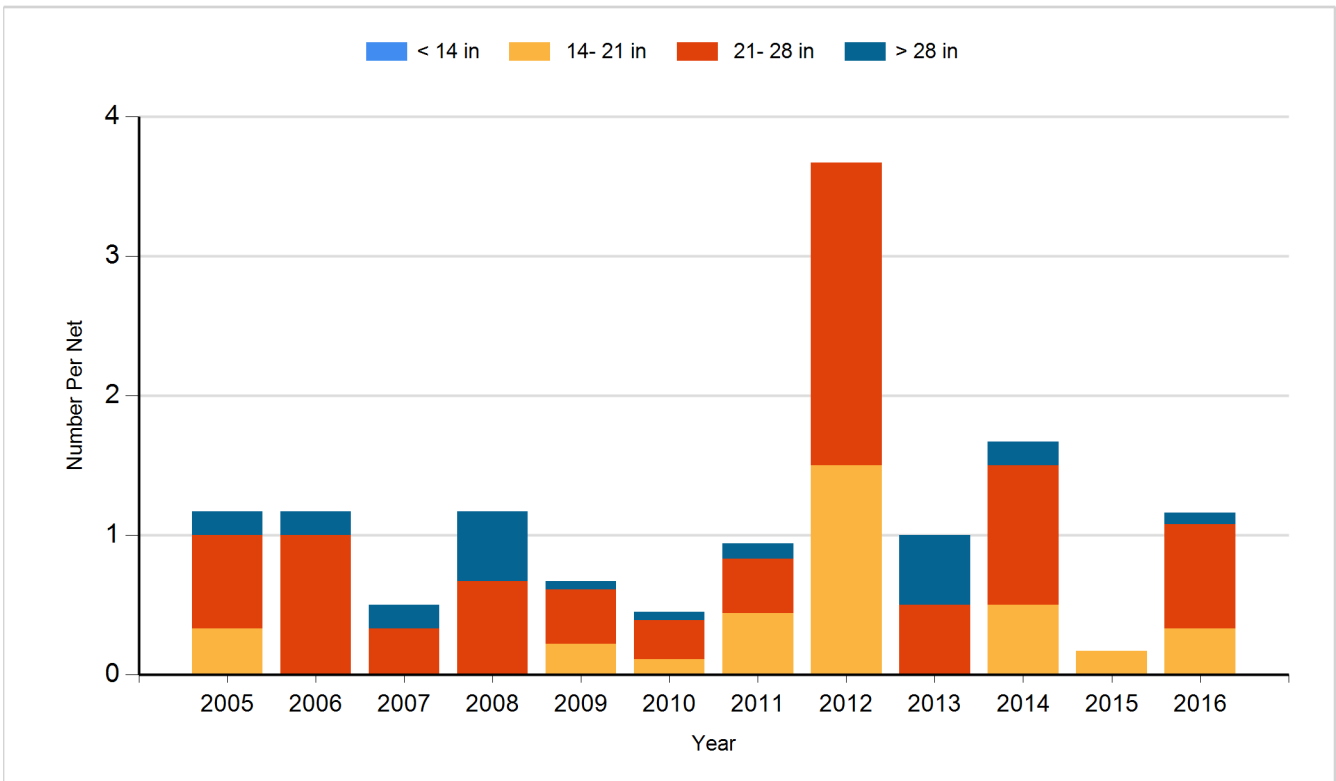
Historic Fish Sizes and Relative Abundance

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

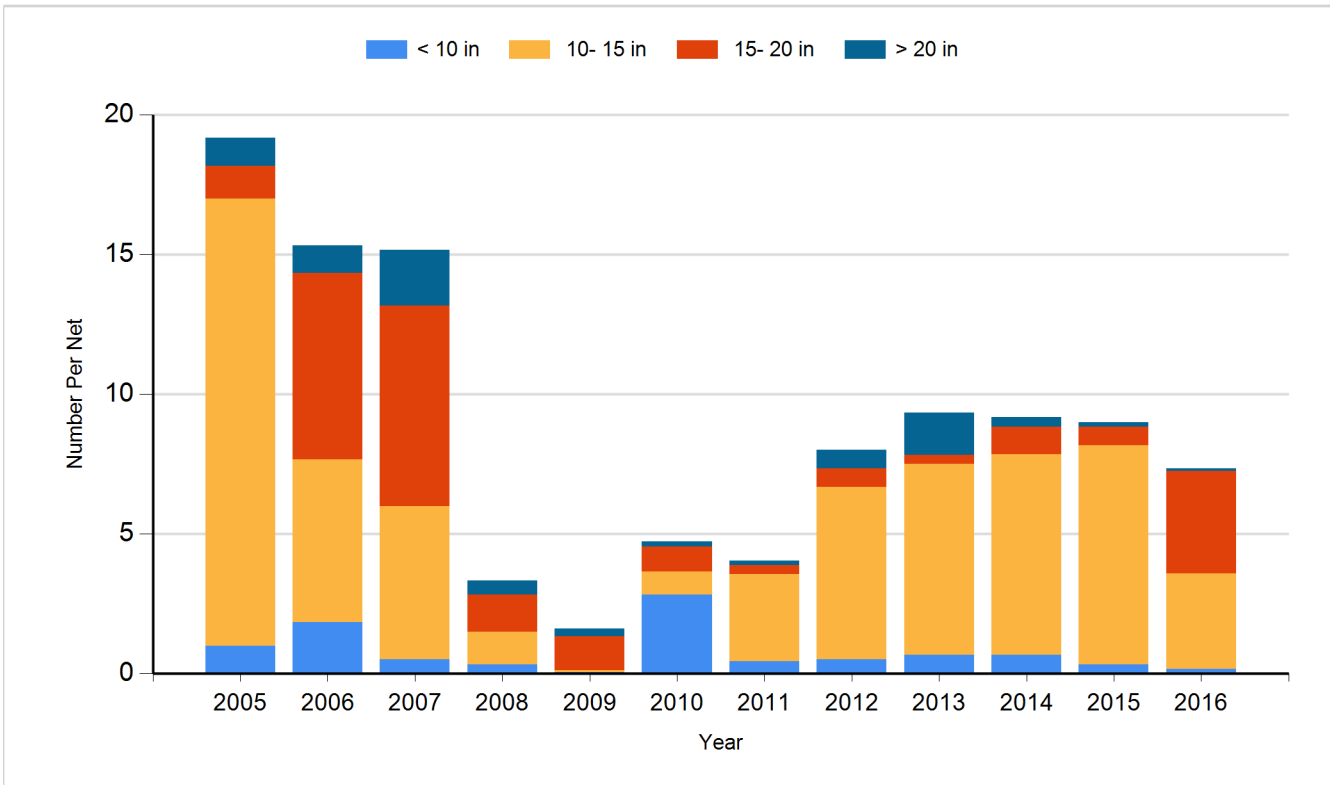
Species: Black Crappie
Gear: Frame Net



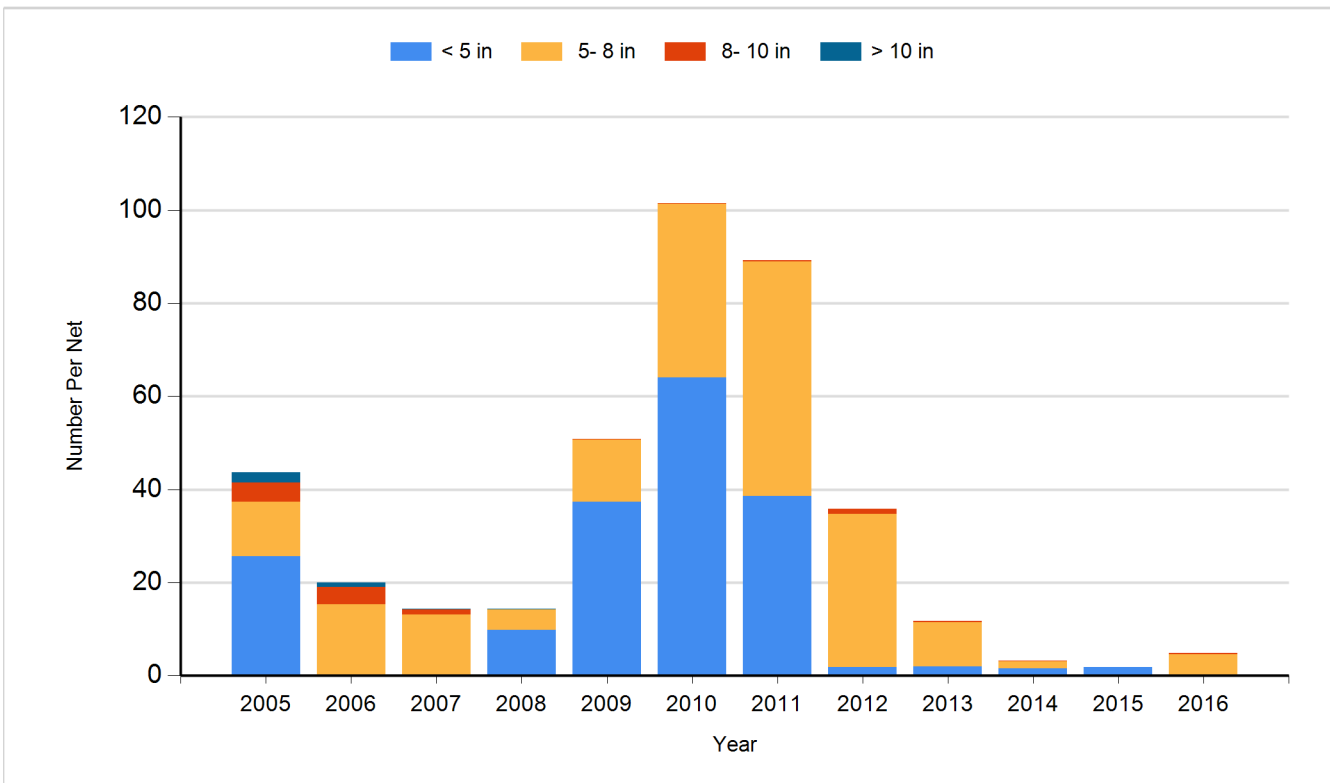
Species: Northern Pike
Gear: Gill Net



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	Fingerling	57,791
2006	Largemouth Bass	Fry	116,460
2009	Walleye	Large Fingerling	14,949
2011	Walleye	Large Fingerling	38,634
2011	Walleye	Small Fingerling	235,640
2013	Walleye	Small Fingerling	217,450
2015	Walleye	Large Fingerling	13,264