SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Enemy Swim, Day County
UBS-Lake-196-000
2015

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
boat shocker (night)	August 31, 2015	3600 seconds
frame net (std 3/4 in)	July 21, 2015	8 net-nights
frame net (std 3/4 in)	July 22, 2015	8 net-nights
frame net (std 3/4 in)	July 23, 2015	8 net-nights
std exp gill net	July 21, 2015	2 net-nights
std exp gill net	July 22, 2015	2 net-nights
std exp gill net	July 23, 2015	2 net-nights

Common Fish Species Present

Bluegill

Black Crappie

Largemouth Bass

Walleye

Smallmouth Bass

Yellow Perch

Rock Bass

White Bass

White Sucker

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).

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

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
boat shocker (night)	Walleye	20.0	15.8	0		0		98	3
frame net (std 3/4 in)	Black Bullhead	0.2	0.1	100		100		84	7
	Black Crappie	0.3	0.1	100		100		98	3
	Bluegill	26.1	8.7	42	3	21	2	105	1
	Northern Pike	0.6	0.2	64	22	0		81	2
	Pumpkinseed	1.5	1.0	17	10	6		102	3
	Rock Bass	6.4	2.0	25	5	5	3	105	1
	Smallmouth Bass	2.0	0.6	33	10	14	8	97	2
	Walleye	0.8	0.3	58	18	21		80	3
	Western Painted Turtle	0.0	0.0						
	White Bass	0.3	0.2	100		100		85	2
	White Sucker	0.2	0.1	100		100		92	2
	Yellow Perch	0.3	0.2	0		0		88	5
std exp gill net	Black Crappie	1.3	0.5	100		100		101	4
	Bluegill	15.5	4.5	94	4	73	7	113	1
	Common Carp	0.2	0.2	100		100		94	
	Northern Pike	0.2	0.2	0		0		87	
	Pumpkinseed	0.3	0.5	100		0		117	3
	Rock Bass	0.7	0.5	75		25		108	5
	Smallmouth Bass	1.5	1.4	56		0		94	3
	Walleye	8.7	2.0	10	7	2		83	2
	White Bass	2.0	0.9	100		100		89	2
	White Sucker	1.8	1.1	100		100		101	2
	Yellow Perch	0.0	0.0	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.

		CPUE										
Gear	Species	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Avg
boat shocker (night)	Smallmouth Bass	158.0	79.9	83.9	61.8	53.5		149.5		54.7		91.6
	Walleye	32.0	47.3	52.6	5.1	17.4	31.0	1.5	116.0	2.7	20.0	32.6
boat shocker (night, AC	Largemouth Bass	202.3		102.2	81.7	112.1		67.2		224.3		131.6
frame net (std 3/4 in)	Black Bullhead	1.0	0.4	0.1	0.1	0.1	0.5	0.3	0.2	0.7	0.2	0.4
	Black Crappie	2.3	0.7	0.0	0.2	1.3	8.3	2.1	5.7	1.2	0.3	2.2
	Bluegill	56.0	81.5	65.3	56.8	57.3	90.2	53.8	54.2	31.5	26.1	57.3
	Common Carp		0.0	0.1	0.0		0.1	0.0				0.0
	Largemouth Bass	0.0	0.0	0.0				0.0				0.0
	Northern Pike	0.1	0.3	0.3	0.1	0.3	0.3	0.3	0.4	0.3	0.6	0.3
	Pumpkinseed	1.7	0.0	0.5	0.3	1.7	2.3	0.6	2.1	0.4	1.5	1.1
	Rock Bass	14.0	8.2	11.5	8.3	5.3	12.7	8.2	3.8	5.3	6.4	8.4
	Smallmouth Bass	6.3	1.2	2.7	1.8	1.9	14.9	4.6	3.4	3.3	2.0	4.2
	Sunfish Hybrid				0.0							0.0
	Walleye	0.3	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	0.3	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	4.4	3.3	0.0	1.6	5.1	7.4	0.9	1.1	0.5	0.3	2.5
std exp gill net	Black Crappie	2.8	1.5	0.3	0.0	0.7	0.7	4.0	8.5	3.5	1.3	2.3
	Bluegill	8.7	5.8	0.5	0.9	1.3	0.8	54.8	41.8	10.3	15.5	14.0
	Common Carp	1.2	1.8	0.2	0.2	0.1	0.1	1.2		0.2	0.2	0.6
	Northern Pike	1.2	0.5	1.2	0.7	0.4	0.9	3.7	1.0	1.7	0.2	1.2
	Pumpkinseed							0.2	0.3	0.2	0.3	0.3
	Rock Bass	2.3	14.0	2.0	1.1	0.4	0.1	0.7	2.7	2.0	0.7	2.6
	Smallmouth Bass	1.2	1.8	2.2	1.4	0.2	0.5	2.7	2.3	5.3	1.5	1.9
	Walleye	13.5	14.7	3.0	1.6	1.9	3.6	7.5	8.7	8.5	8.7	7.2
	White Bass	0.7	1.5	2.5	0.9	0.1	0.6	8.0	5.8	1.3	2.0	2.3
	White Sucker	4.0	1.7	3.5	1.5	2.6	1.1	1.5	2.2	4.7	1.8	2.5
	Yellow Perch	19.8	14.3	4.5	13.5	37.4	50.7	34.0	9.7	1.7	0.0	18.6

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	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
boat shocker (night)	Walleye	PSD	0	0	0	0	0	0	0	0	0	0
		PSD-P	0	0	0	0	0	0	0	0	0	0
		Wr	90	101	92	86	90	97	78	95	89	98
frame net (std 3/4 in)	Black Crappie	PSD	64	56	0	20	23	84	84	99	100	100
		PSD-P	53	39	0	20	16	5	57	46	93	100
		Wr	98	94		107	102	104	96	100	95	98
	Northern Pike	PSD	100	100	100	67	71	83	67	80	50	64
		PSD-P	0	29	14	33	0	0	0	40	13	0
		Wr	88	85	79	84	87	89	72	82	81	81
	Walleye	PSD	50	63	80	100	100	7	28	29	44	58
		PSD-P	17	38	20	100	100	0	0	12	17	21
		Wr	77	86	85	91	85	78	80	82	83	80
	Yellow Perch	PSD	2	1	0	0	2	3	9	8	33	0
		PSD-P	0	0	0	0	0	0	0	0	0	0
		Wr	92	79	76	82	86	73	88	85	81	88
std exp gill net	Black Crappie	PSD	100	67	100	0	0	50	83	100	100	100
		PSD-P	88	56	100	0	0	0	50	65	90	100
		Wr	101	110	97		108	114	106	104	101	101
	Northern Pike	PSD	100	100	100	67	75	53	59	100	70	0
		PSD-P	14	33	43	8	13	12	0	50	10	0
		Wr	88	82	87	91	91	92	91	84	82	87
	Walleye	PSD	57	63	61	96	56	14	18	21	16	10
		PSD-P	7	14	17	18	9	5	9	17	4	2
		Wr	87	89	88	91	92	85	81	80	82	83
	Yellow Perch	PSD	24	8	4	0	0	1	3	2	10	0
		PSD-P	5	1	4	0	0	0	0	0	0	0
		Wr	97	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+
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)
2006	92	198 (10)	254 (6)	336 (12)	378 (28)	410 (17)	420 (2)	465 (6)	433 (1)	484 (1)	522 (9)

Species: Yellow Perch

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

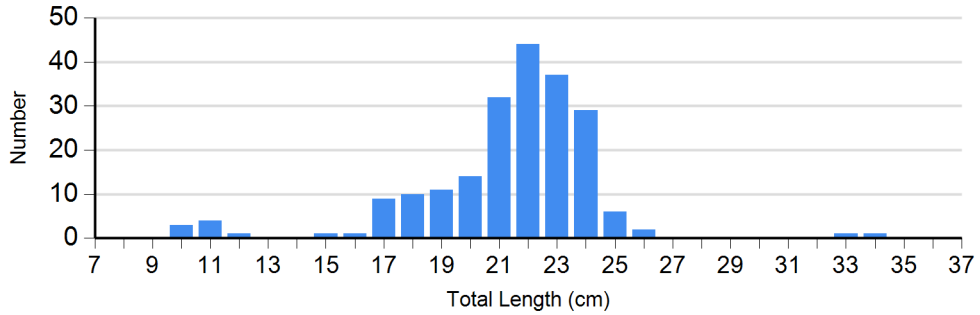
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2011	32	107 (1.7)	156	104 (0.7)	8	95 (3.1)	2	84 (1.9)
	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	
Northern Pike Gill Net	2011	8	95 (1.3)	7	90 (3.0)	2	90 (0.2)	0	
	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	
Walleye Gill Net	2011	56	85 (0.7)	6	91 (1.5)	2	90 (3.0)	1	89
	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
Yellow Perch Gill Net	2011	908	93 (0.4)	5	88 (2.3)	0		0	
	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	

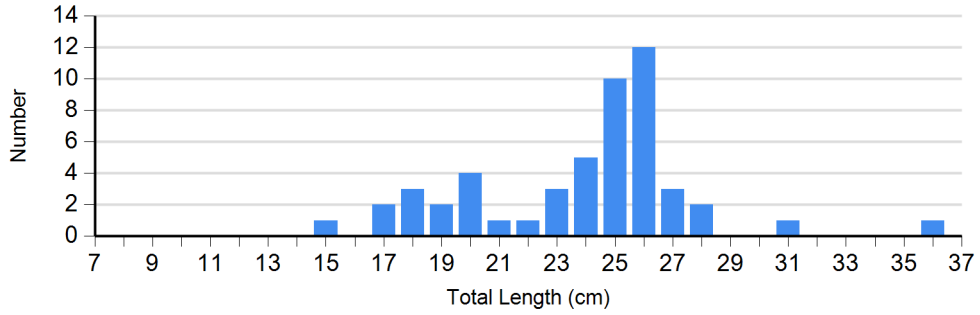
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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



2011



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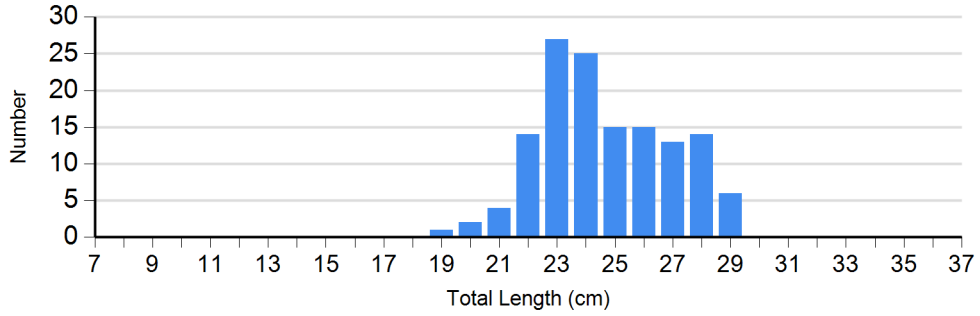

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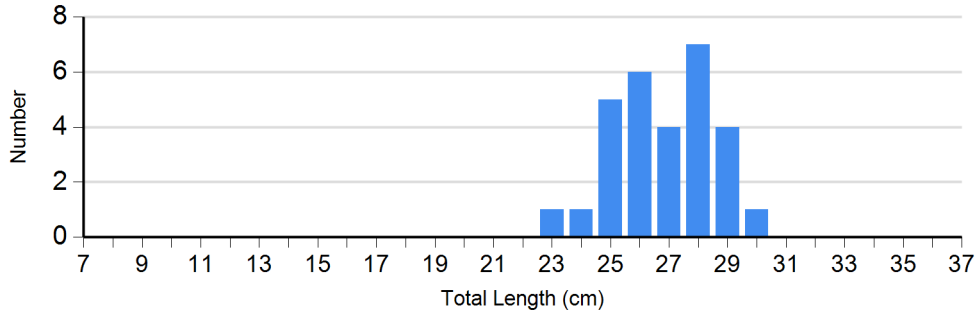

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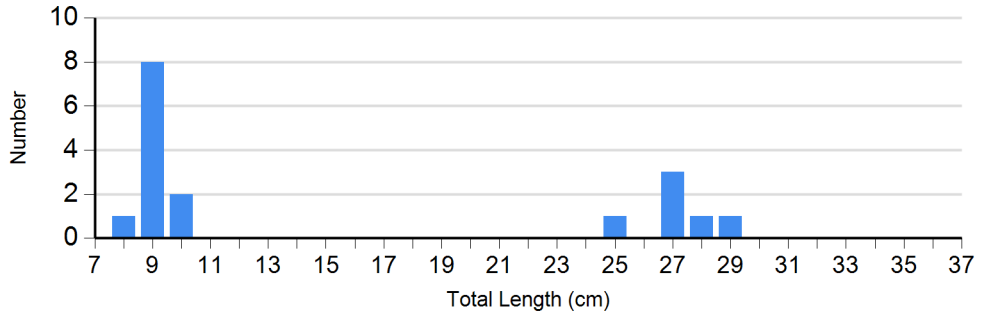

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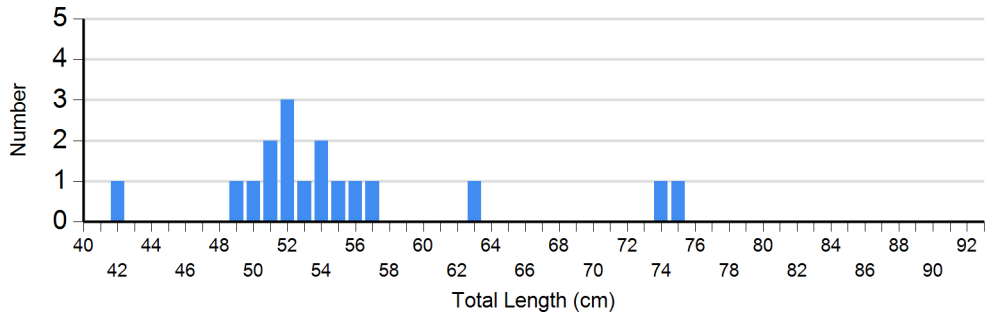
Species: Northern Pike
Gear: std exp gill net



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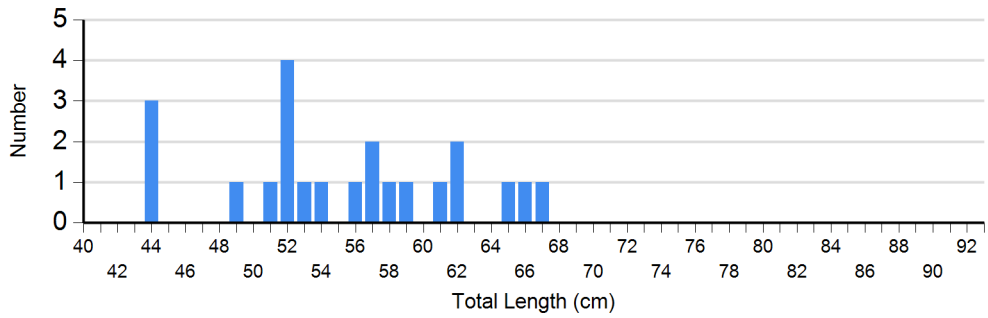

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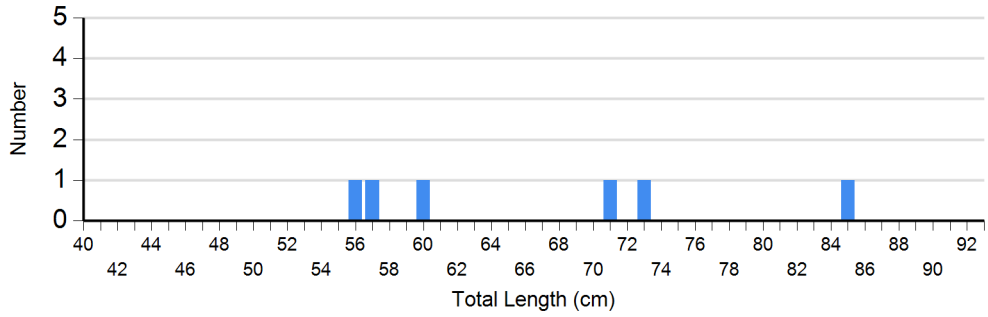

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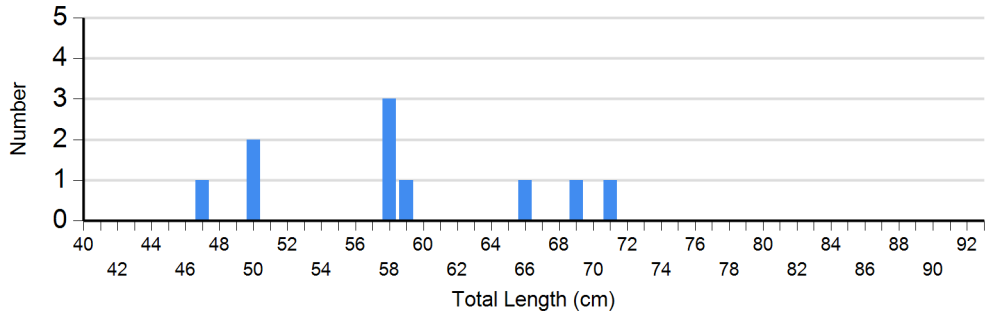
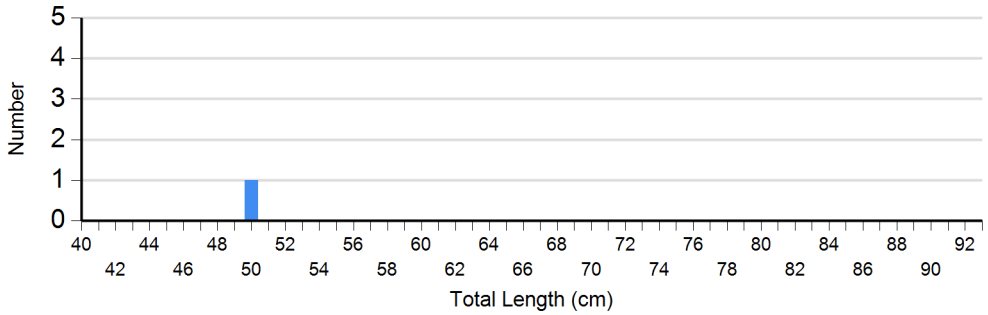
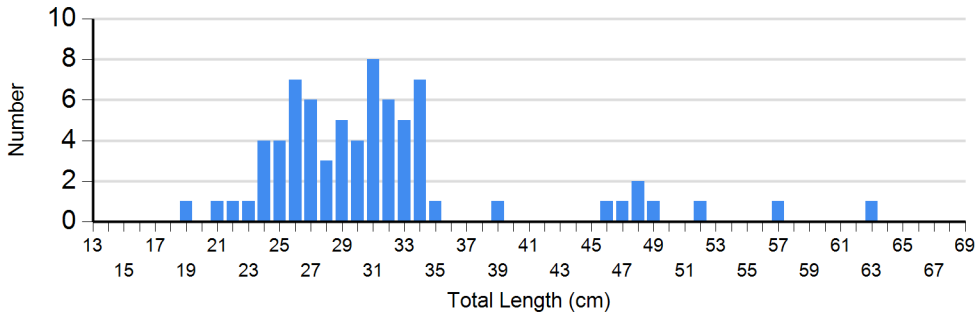


2014

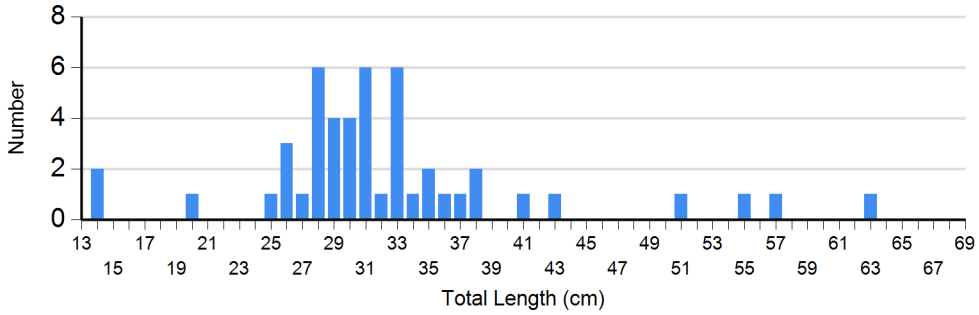


2015

Species: Walleye
Gear: std exp gill net



2011



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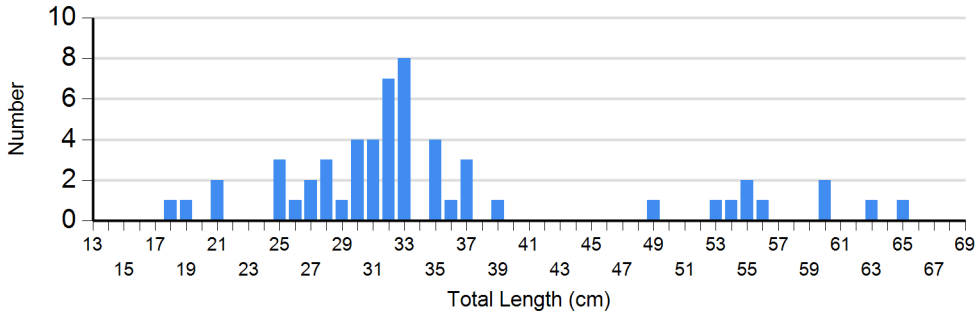

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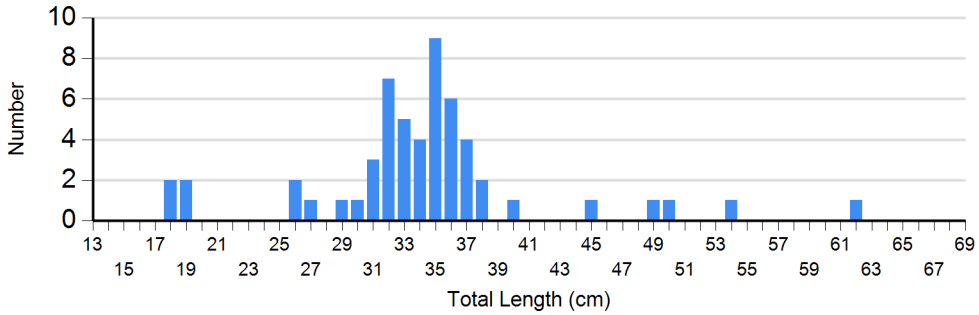

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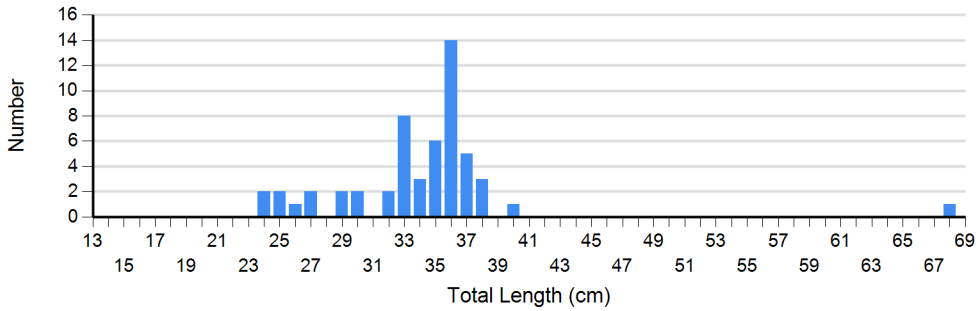
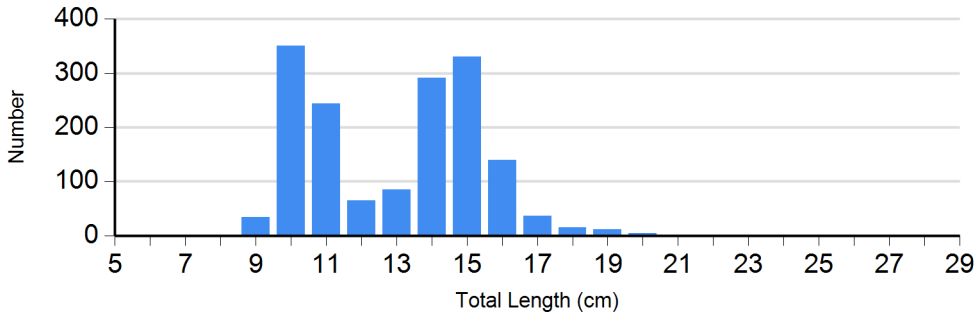


2015

Species: Yellow Perch
Gear: std exp gill net



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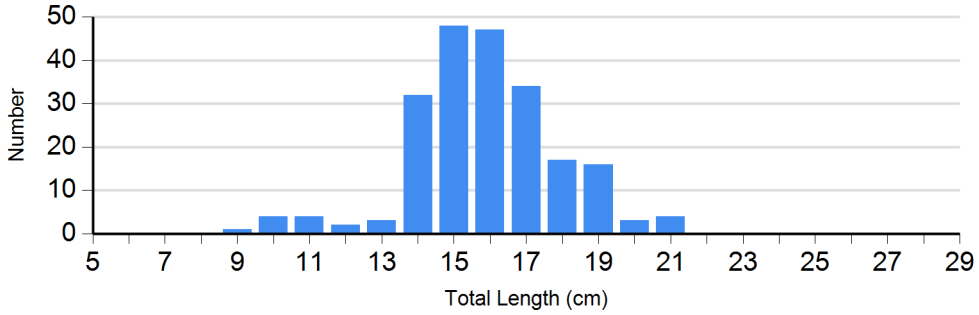

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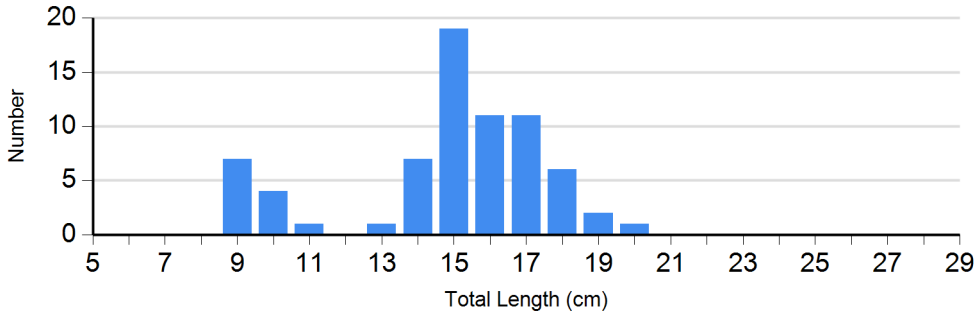

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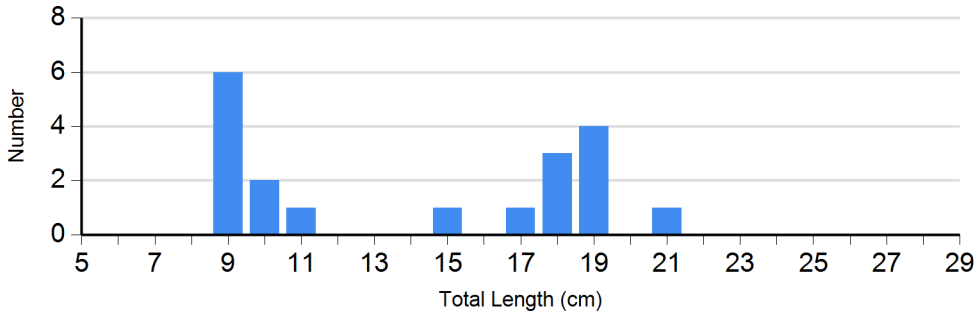
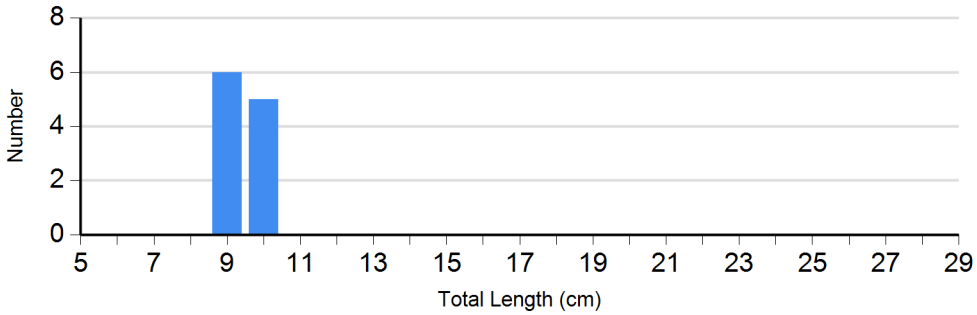


2014

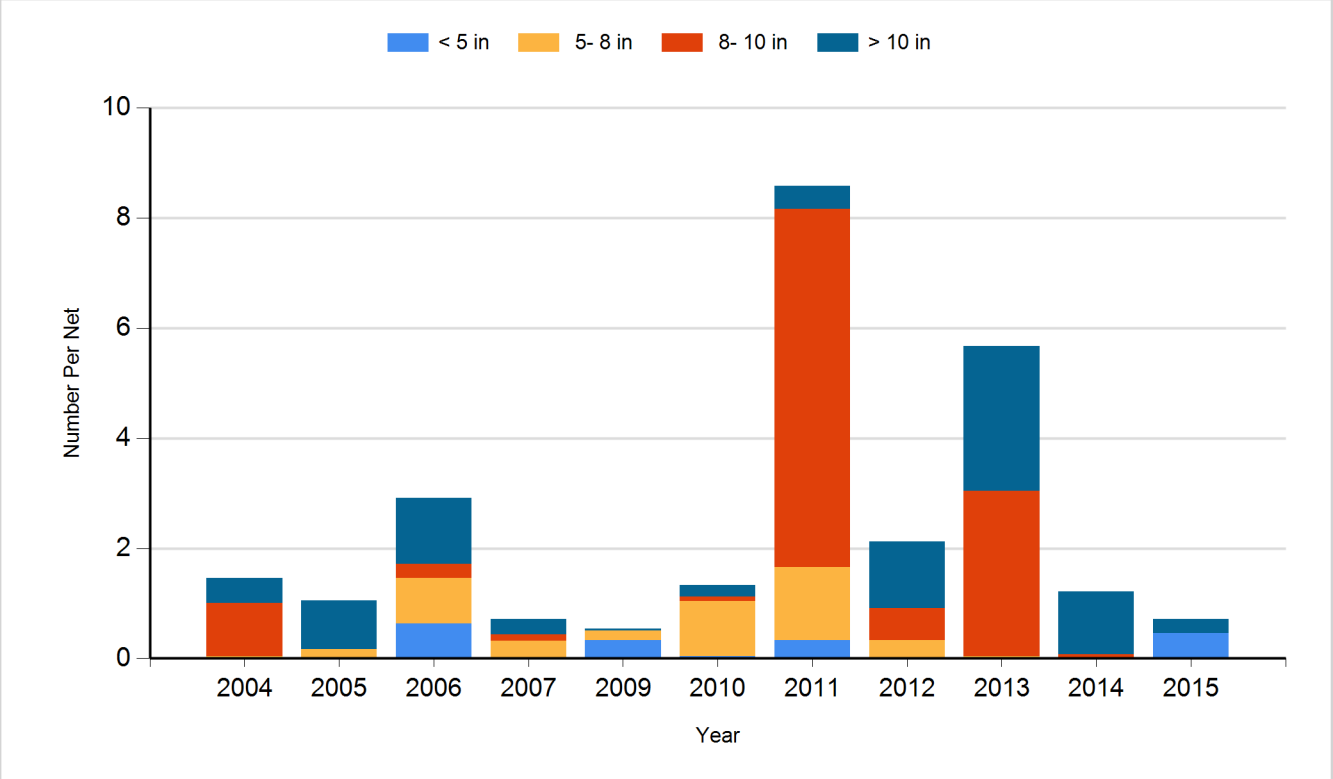


2015

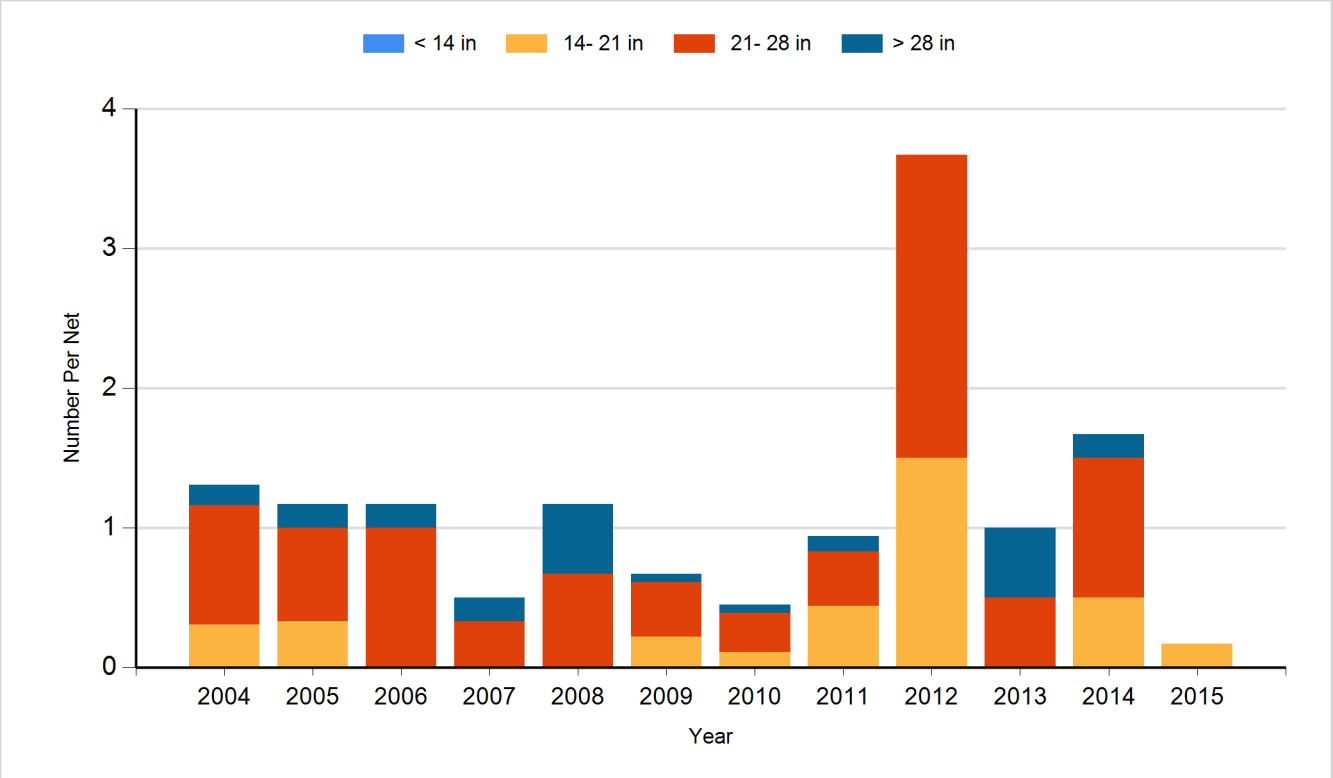
Historic Fish Sizes and Relative Abundance

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

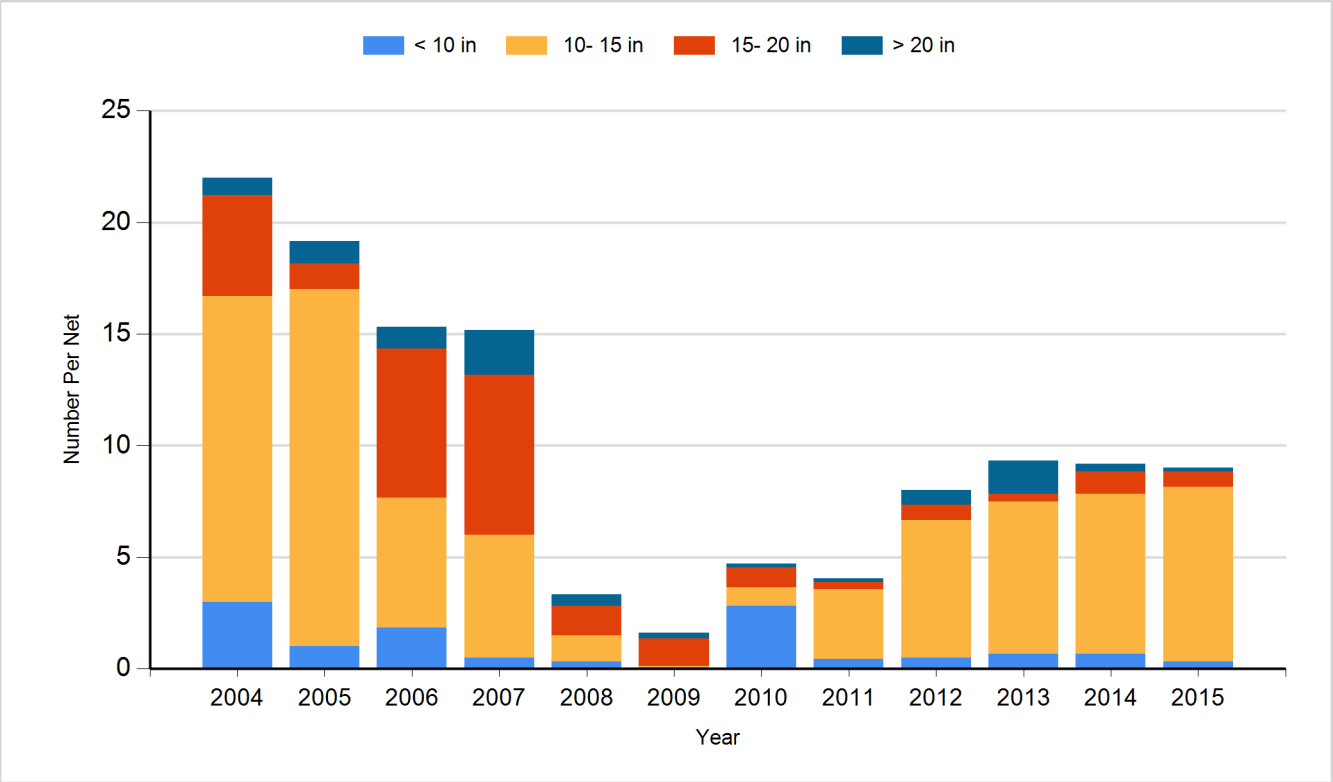
Species: Black Crappie
Gear: Frame Net



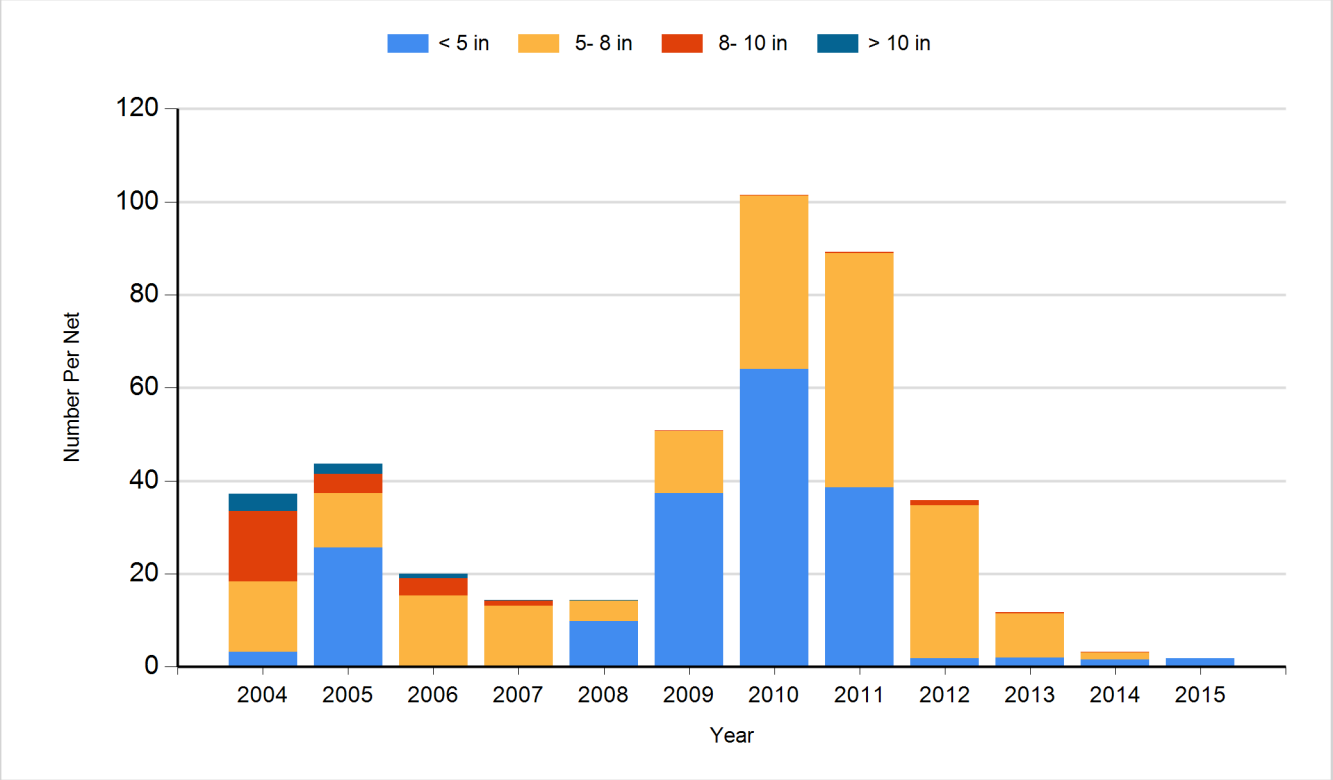
Species: Northern Pike
Gear: Gill Net



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	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