

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Molstad, Walworth County
ULO-Lake-370-000
2018

Lake Information

Name:	Molstad	Maximum Depth:	20 Feet
County:	Walworth	Mean Depth:	8 Feet
Legal Description:	T124-R78-S8		
Surface Area:	97 Acres		

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Oct 18, 2018	3600 seconds
boat shocker (night)	Sep 27, 2018	3600 seconds
frame net (std 3/4 in)	Jun 05, 2018	5 net-nights
frame net (std 3/4 in)	Jun 06, 2018	5 net-nights

Common Fish Species Present

Yellow Perch

Largemouth Bass

Bluegill

Black Bullhead

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).

A statewide effort to help make netting efforts comparable to all waters sampled across the state, occurred in 2017, with a switch to American Fisheries Society gill nets. Past gill netting efforts were completed with different style/types of nets and are not comparable side by side.

- **AFS std gill net** – 80 ft experimental gill net containing eight panels (10 ft each) of varying monofilament meshes of 0.75, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25 and 2.50 inches.
- **std experimental gill net for non-Missouri River waters** - 150 ft experimental gill net containing six panels (25 ft each) of varying monofilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.
- **std experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

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

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)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
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
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).

* **Methods/Species that ignore stock length**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
boat shocker (night)	Largemouth Bass	59	28.0	7.3	88	7	9	6	100	1
frame net (std 3/4 in)	Black Bullhead	1	0.1	0.1	100		100		102	
	Bluegill	570	57.0	23.4	38	3	9	2	126	1
	Largemouth Bass	1	0.1	0.1	100		0		88	
	Yellow Perch	13	1.3	0.7	100		92		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.

Gear	Species	CPUE										Avg
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
boat shocker (night)	Largemouth Bass		3.0		108.0			129.0			28.0	67.0
frame net (std 3/4 in)	Black Bullhead										0.1	0.1
	Bluegill				0.1			10.0			57.0	22.4
	Largemouth Bass				1.6			0.3			0.1	0.7
	Yellow Perch		6.2		3.2			8.4			1.3	4.8
std exp gill net	Largemouth Bass				18.5							18.5
	Yellow Perch				50.0							50.0

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										
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
boat shocker (night)	Largemouth Bass	PSD		67		8				30			88
		PSD-P		0		3			6			9	
		Wr		115		108			104			100	
frame net (std 3/4 in)	Black Bullhead	PSD											100
		PSD-P											100
		Wr											102
	Bluegill	PSD				100				91			38
		PSD-P				0				11			9
		Wr				134				128			126
	Largemouth Bass	PSD				6				67			100
		PSD-P				0				67			0
		Wr				115				123			88
	Yellow Perch	PSD		5		47				90			100
		PSD-P		0		22				18			92
		Wr		96		107				105			92
std exp gill net	Largemouth Bass	PSD				3							
		PSD-P				0							
		Wr				126							
	Yellow Perch	PSD				86							
		PSD-P				47							
		Wr				111							

Back-Calculated Lengths

Mean species back-calculated total length (mm) at age, standard error (SE), and sample size (N).

Species: Bluegill

Year Class	Age	N	Mean back-calculated length (SE) at age											
			1	2	3	4	5	6	7	8	9	10		
2017	1	3	74 (7)											
2016	2	11	70 (1.8)	107 (3.8)										
2015	3	14	75 (2.2)	104 (2.8)	130 (2.7)									
2014	4	1	69	97	132	164								
2013	5	1	87	110	136	160	179							
2012	6	3	89 (3.7)	112 (3.7)	134 (1.8)	153 (2.7)	167 (1.3)	181 (3.2)						
2011	7	8	83 (4.4)	108 (2.9)	128 (2.8)	143 (2.9)	159 (2.5)	174 (2.6)	189 (3.1)					
2009	9	1	77	100	118	150	168	182	188	199	214			
Weighted Mean		42	76	106	130	148	163	176	189	199	214			
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20		
2017	1	3												
2016	2	11												
2015	3	14												
2014	4	1												
2013	5	1												
2012	6	3												
2011	7	8												
2009	9	1												
Weighted Mean		42												

Species: Largemouth Bass

Year Class	Age	N	Mean back-calculated length (SE) at age											
			1	2	3	4	5	6	7	8	9	10		
2016	2	10	106 (4.3)	168 (4.9)										
2014	4	7	115 (3.8)	176 (5.5)	236 (5.7)	279 (5.9)								
2013	5	12	127 (3.6)	186 (4)	231 (4.5)	271 (5.3)	308 (5.2)							
2012	6	1	110	161	220	251	282	310						
2010	8	2	117 (3)	169 (11.8)	210 (17.7)	260 (30.8)	292 (36.2)	330 (33.7)	368 (31.2)	400 (26.4)				
Weighted Mean		32	117	176	230	272	304	323	368	400				

Year Class	Age	N	Mean back-calculated length (SE) at age											
			11	12	13	14	15	16	17	18	19	20		
2016	2	10												
2014	4	7												
2013	5	12												
2012	6	1												
2010	8	2												
Weighted Mean		32												

Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age											
			1	2	3	4	5	6	7	8	9	10		
2013	5	13	121 (2.4)	186 (4.3)	227 (6.6)	260 (8.1)	285 (8.9)							
Weighted Mean		13	121	186	227	260	285							

Year Class	Age	N	Mean back-calculated length (SE) at age											
			11	12	13	14	15	16	17	18	19	20		
2013	5	13												
Weighted Mean		13												

Length at Capture

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

Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	570	87 (15)	127 (90)	146 (357)	179 (4)	184 (6)	191 (25)	199 (70)		220 (4)	
2015	100	105 (2)	154 (15)	174 (62)	204 (11)	192 (8)	195 (1)				

Species: Largemouth Bass

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	56		206 (10)		322 (14)	352 (28)	344 (3)		439 (2)		
2015	293	170 (172)	286 (80)	300 (28)	285 (5)	439 (6)	424 (1)	455 (1)			
2012	44	219 (37)	280 (6)				438 (1)				
2010	3	234 (1)				343 (1)	375 (1)				

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	100	150 (13)	233 (24)	263 (55)	258 (9)						

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).

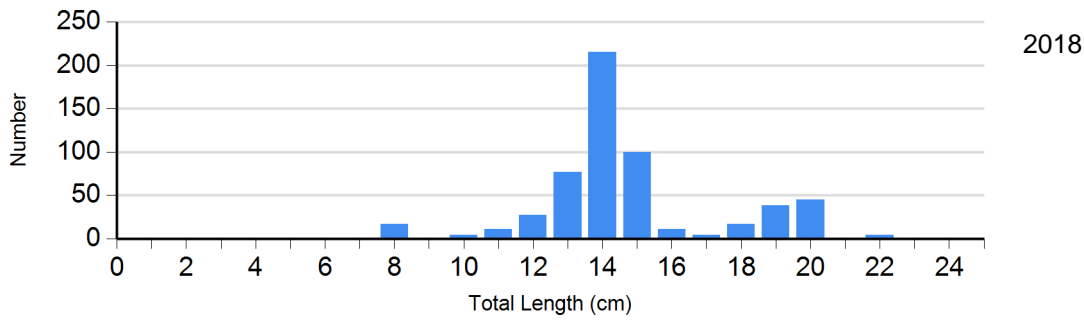
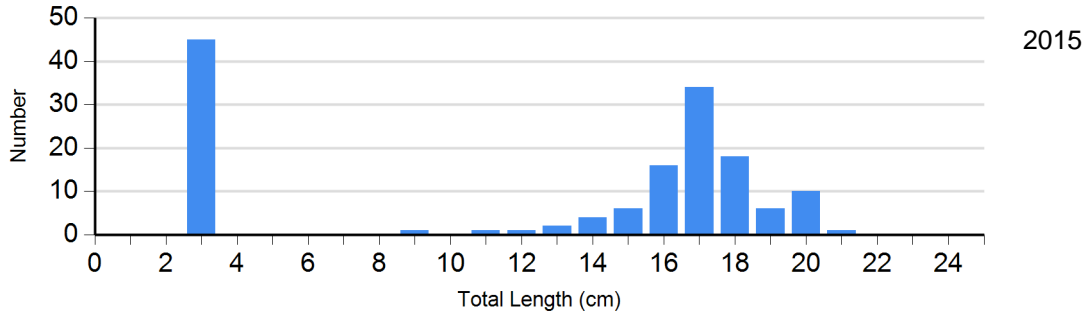
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2015	9	131 (4.5)	80	129 (1.6)	11	123 (6.0)	0	
	2018	351	128 (1.0)	170	125 (1.3)	49	118 (1.9)	0	
Largemouth Bass Electro Fishing	2015	90	102 (0.7)	31	106 (1.6)	8	112 (3.0)	0	
	2018	7	106 (1.7)	44	99 (1.0)	5	100 (3.4)	0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

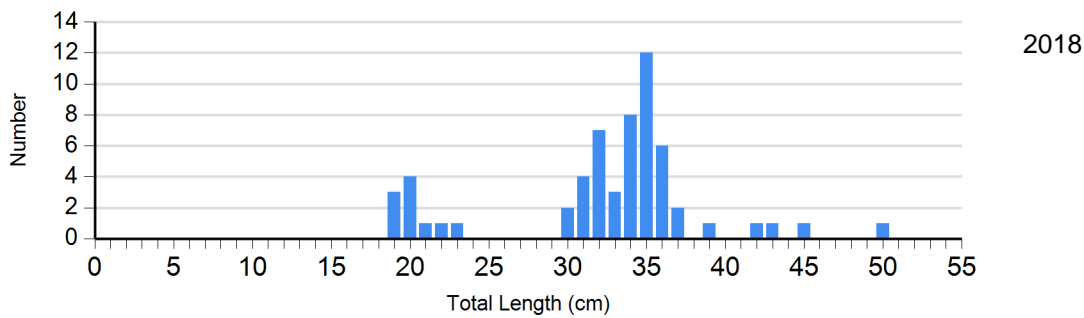
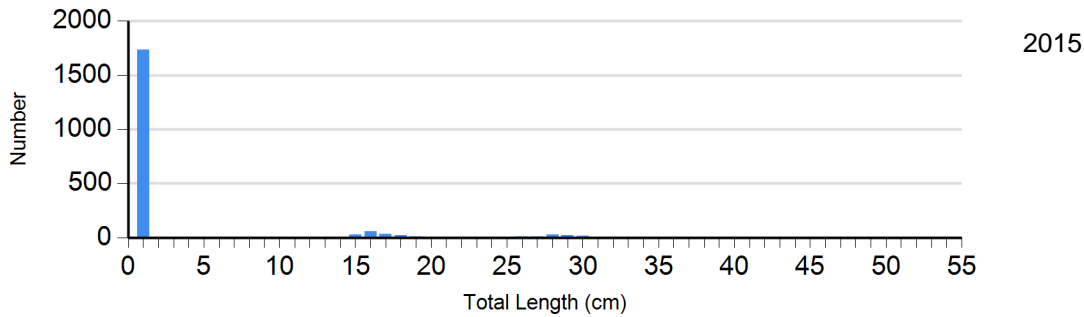
Species: Bluegill

Gear: frame net (std 3/4 in)



Species: Largemouth Bass

Gear: boat shocker (night)

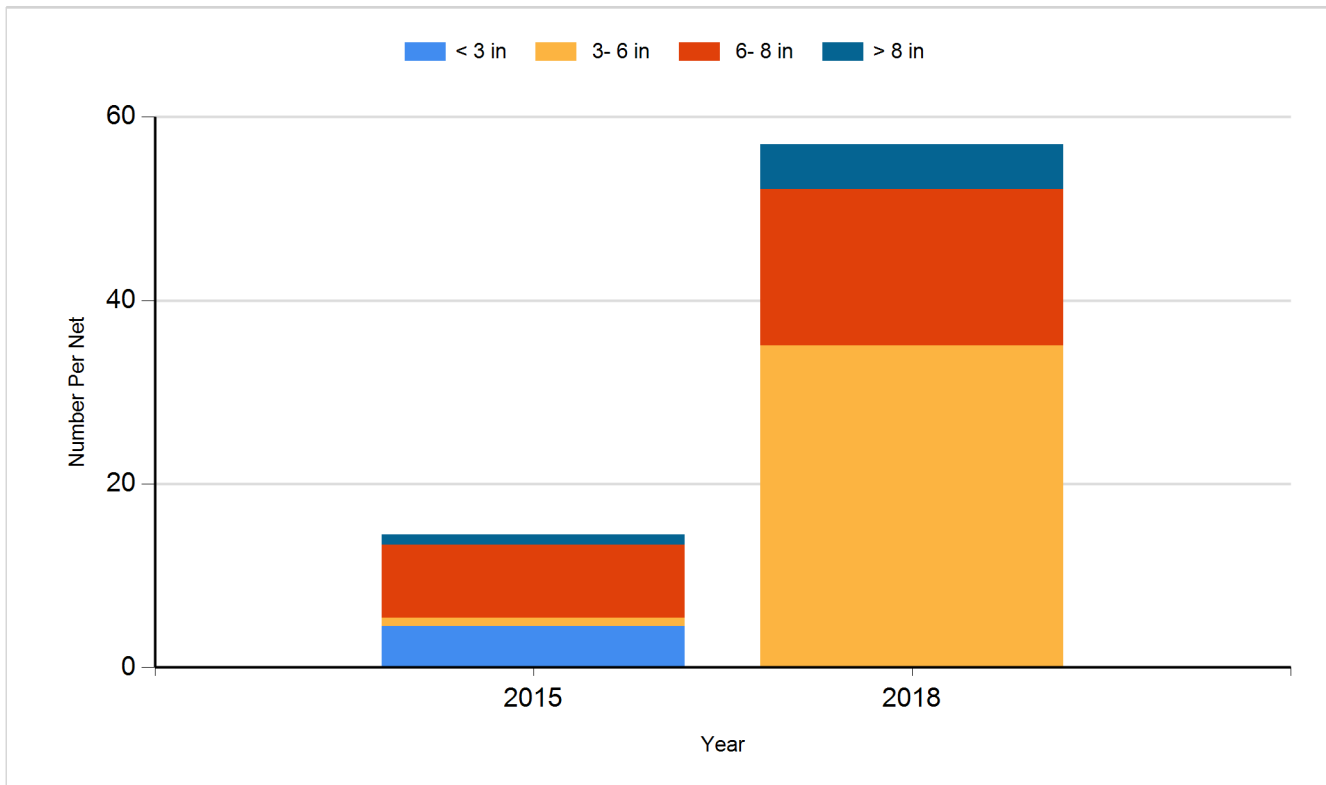


Historic Fish Sizes and Relative Abundance

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

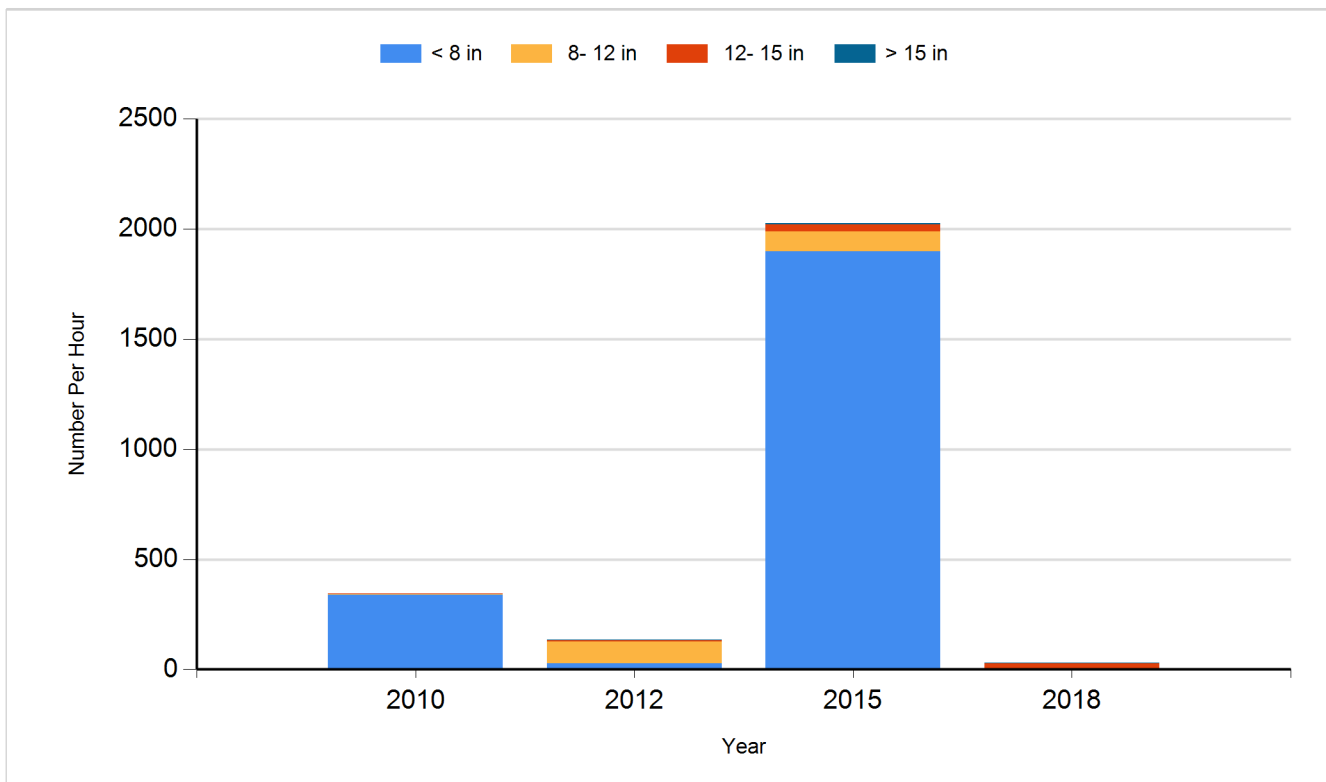
Species: Bluegill

Gear: frame net (std 3/4 in)

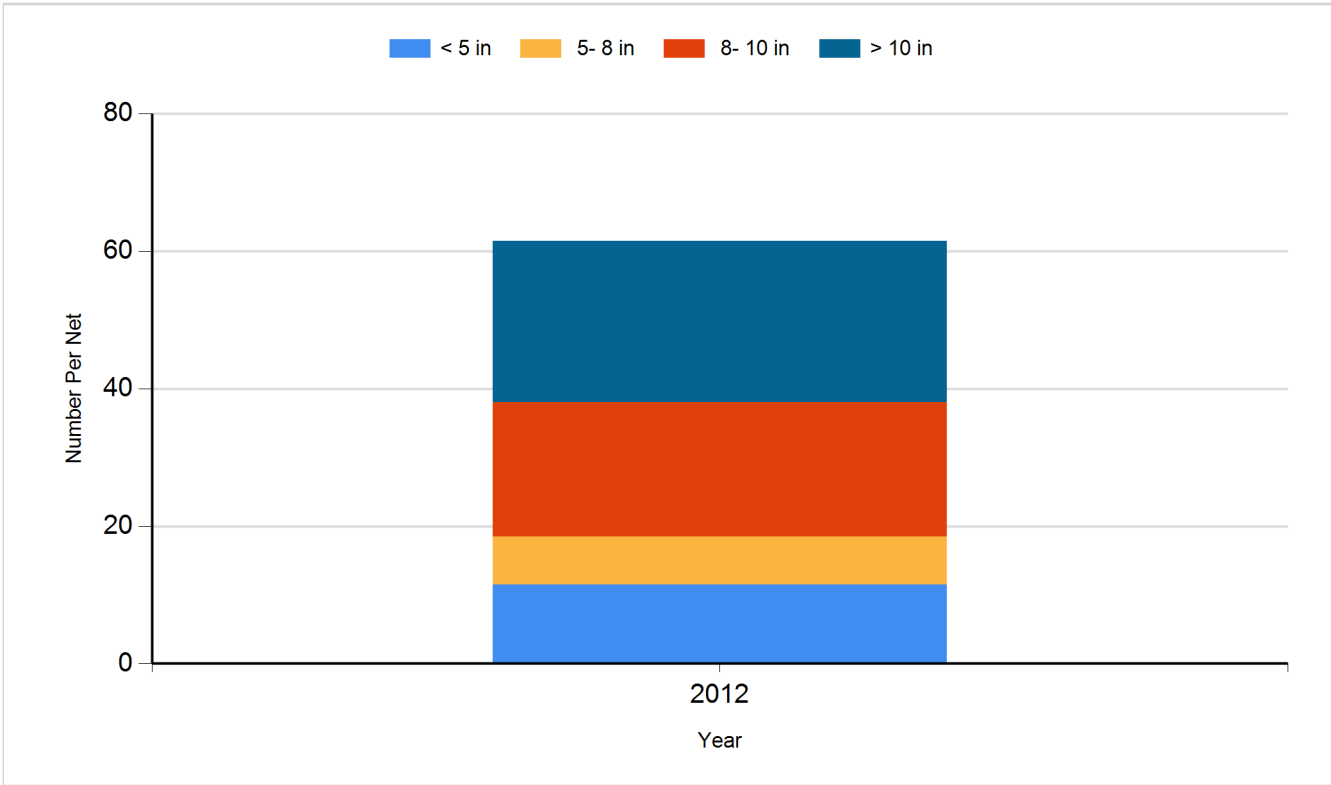


Species: Largemouth Bass

Gear: boat shocker (night)



Species: Yellow Perch
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2009	Largemouth Bass	Adult	25
2009	Largemouth Bass	Fingerling	10,080
2009	Largemouth Bass	Juvenile	228
2009	Yellow Perch	Adult	550
2009	Yellow Perch	Juvenile	600
2011	Yellow Perch	Adult	430
2012	Yellow Perch	Adult	300
2014	Bluegill	Adult	150
2015	Bluegill	Adult	150
2015	Yellow Perch	Fingerling	3,240