SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Molstad, Walworth County
ULO-Lake-370-000
2020

Lake Information

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

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Oct 06, 2020	3600 seconds
boat shocker (night)	Sep 23, 2020	3600 seconds

Common Fish Species Present

Yellow Perch

Largemouth Bass

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.
- s**td 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.

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

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)
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**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
boat shocker (night)	Largemouth Bass	105	52.5	11.5	78	6	67	7	109	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.

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

		CPUE										
Gear	Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
boat shocker (night)	Largemouth Bass		108.0			129.0			28.0	36.5	52.5	70.80
frame net (std 3/4 in)	Black Bullhead		0.0			0.0			0.1			0.03
	Bluegill		0.1			10.0			57.0			22.37
	Largemouth Bass		1.6			0.3			0.1			0.67
	Yellow Perch		3.2			8.4			1.3			4.30
std exp gill net	Largemouth Bass		18.5									18.50
	Yellow Perch		50.0									50.00

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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
boat shocker (night)	Largemouth Bass	PSD		8			30			88	85	78
		PSD-P		3			6			9	55	67
		Wr		108			104			100	103	109
frame net (std 3/4 in)	Largemouth Bass	PSD		6			67			100		
		PSD-P		0			67			0		
		Wr		115			123			88		
	Yellow Perch	PSD		47			90			100		
		PSD-P		22			18			92		
		Wr		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: Largemouth Bass

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2018	2	14	122 (2.6)	191 (4.2)								
2017	3	3	124 (8.7)	213 (2.6)	281 (6.3)							
2016	4	1	124	203	246	298						
2015	5	1	172	223	283	311	334					
2014	6	1	117	172	214	271	320	359				
2013	7	14	128 (4.5)	171 (5.5)	215 (6.8)	255 (6.1)	294 (5.3)	335 (5)	379 (4.9)			
2012	8	9	126 (4.1)	171 (6.1)	206 (4.3)	241 (6.1)	285 (4.2)	316 (3)	346 (4)	381 (3.4)		
2010	10	1	191	225	272	303	333	369	409	438	469	478
Weighted Mean		44	128	183	224	256	295	330	368	387	469	478

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2018	2	14										
2017	3	3										
2016	4	1										
2015	5	1										
2014	6	1										
2013	7	14										
2012	8	9										
2010	10	1										
Weighted Mean		44										

Length at Capture

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

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	101		214 (23)	306 (3)	314 (3)	350 (2)	377 (2)	403 (41)	400 (26)		485 (1)
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)				

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

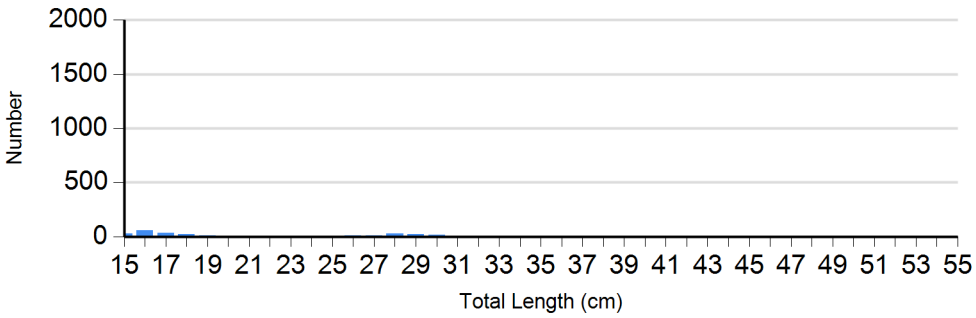
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Largemouth Bass Electro Fishing	2018	7	106 (1.7)	44	99 (1.0)	5	100 (3.4)	0	
	2019	11	115 (2.4)	22	104 (1.4)	40	99 (1.1)	0	
	2020	23	109 (1.2)	12	113 (0.8)	70	108 (0.8)	0	

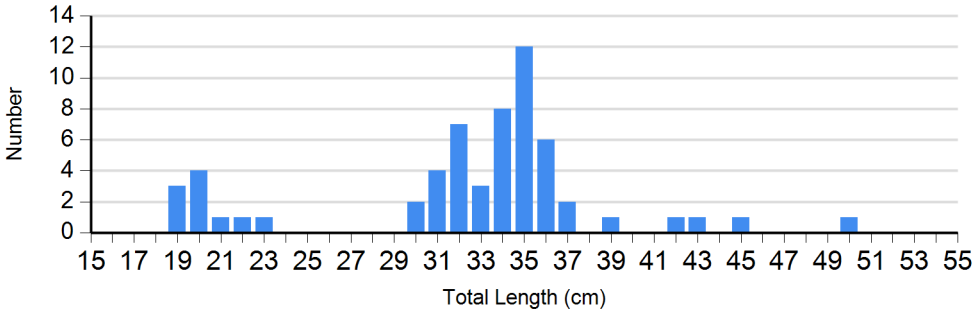
Length Frequency Distribution

Length frequency histogram of species sampled by year.

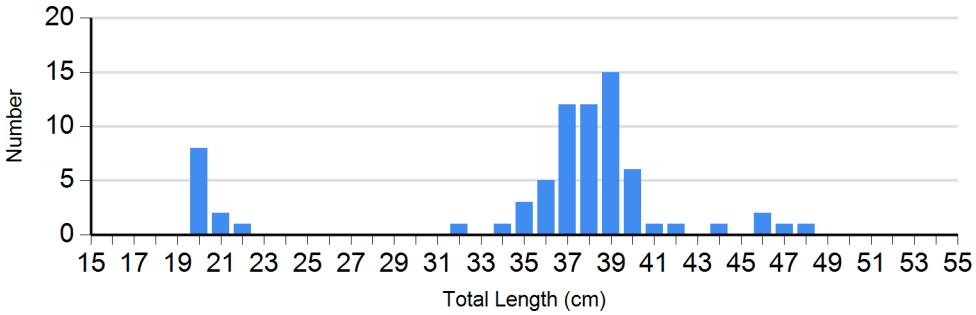
Species: Largemouth Bass
Gear: boat shocker (night)



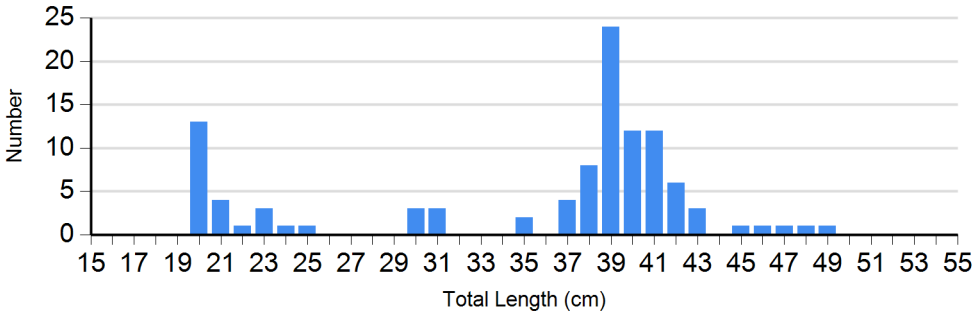
2015



2018



2019

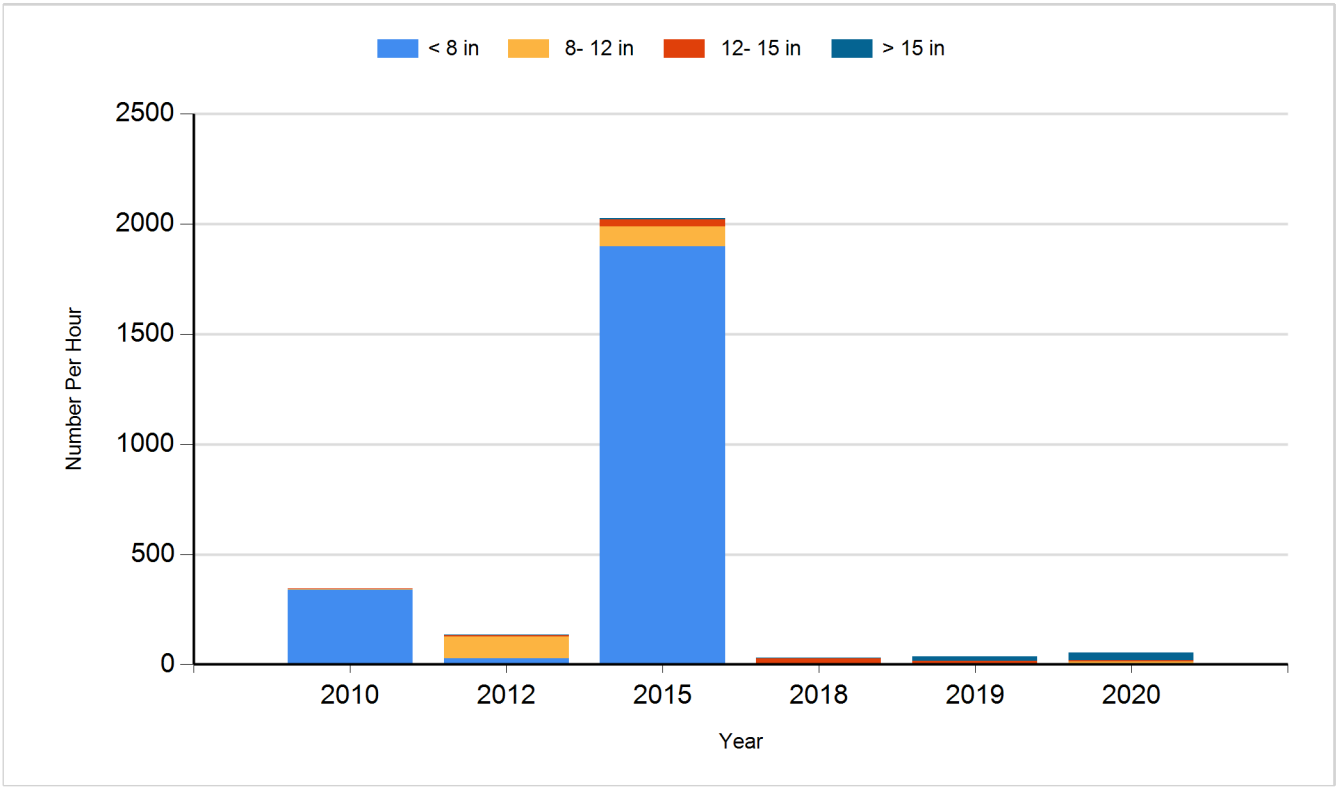


2020

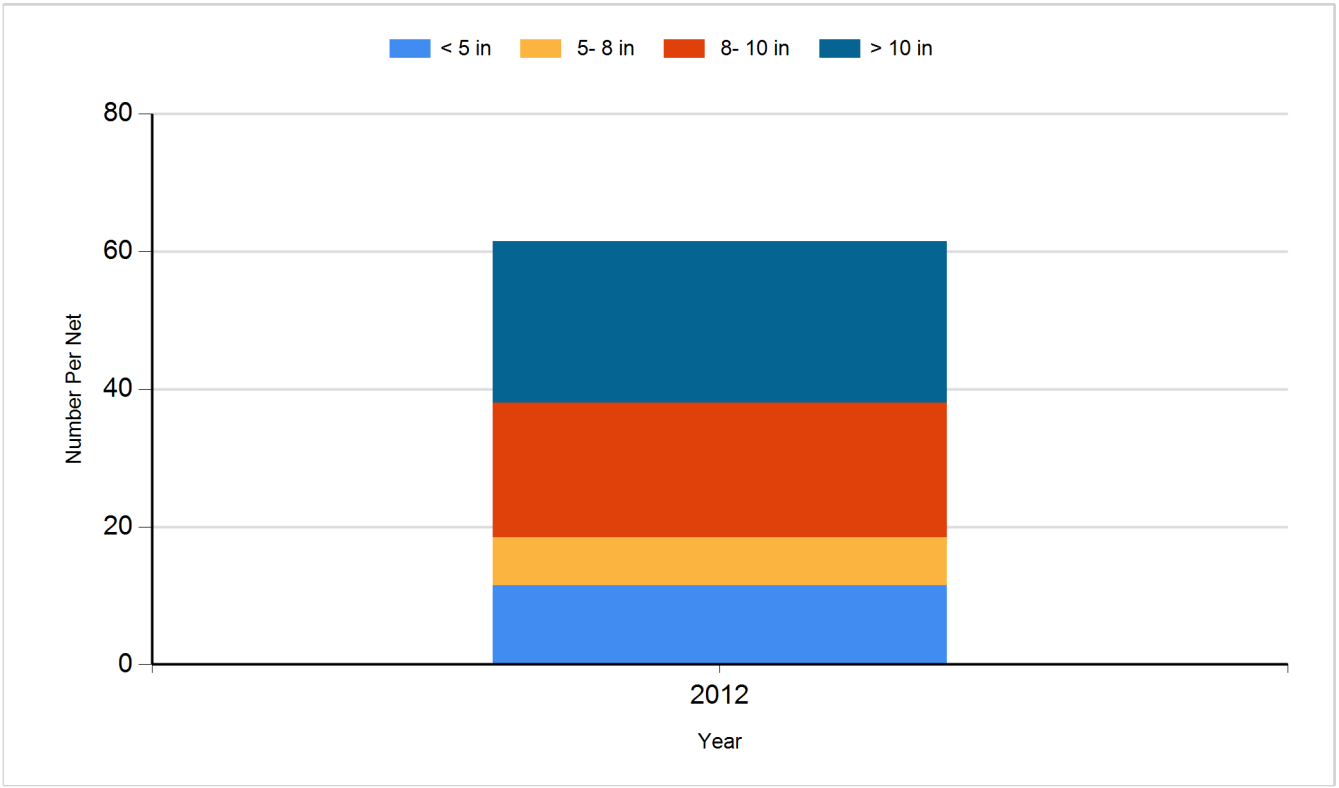
Historic Fish Sizes and Relative Abundance

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

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