Dakotah Lake Survey Summary

Dakotah Lake is 9-acre reservoir in Hand County, South Dakota and located approximately 5 miles west and 5 miles south of Miller. The artificial lake was created in 1936 when the Civilian Conservation Corps constructed an earthen dam on the upper end of Ree Creek. The Boy Scouts of America owned the impoundment and surrounding land from the time the lake was developed until the late 1980's. Ownership of the lake and 160 acres of surrounding land was acquired by the South Dakota Department of Game, Fish and Parks in 1990. The area is currently managed as a Lake Access and Game Production Area. The Wildlife Division of the Game, Fish and Parks conducts fisheries management activities at Dakotah Lake.

Fishing access includes a steep concrete boat ramp for small boats and public shoreline access of approximately 75% of the shoreline. Shoreline access is difficult due to the topography of the land surrounding the lake and the brush and tree growth. Ice fishing access is fair unless snow depth is too great during the winter months. The dirt trail leading to the lake can become difficult to travel in wet time periods throughout the year.

Dakotah Lake was sampled by frame nets and electrofishing in 2019. Largemouth Bass, Bluegill and Black Bullhead were collected during these surveys.

- **Bluegill:** Only four bluegill were captured during summer survey in 2019. A possible winterkill may have occurred from the winter of 2018-19. Approximately 200 prespawn bluegill were stocked into Dakotah Lake to rebuild the population. During the fall electrofishing survey numerous small bluegill were seen.
- **Largemouth Bass:** Fall electrofishing yielded 65 largemouth bass indicating a full winterkill did not occur as previously thought. Majority of the fish collected were produced in 2019 (age-0) and were less than 5 inches in length. This indicates a strong year-class for future years of fishing. A few larger largemouth bass were collected 7 to 16 inches indicating a low population of adult fish currently in Dakotah Lake (4.0 fish/hr electrofishing). The plumpness (condition) of the fish was good indicating an adequate forage.
- **Black Bullhead:** A few black bullhead were collected during summer survey in 2019. Sizes were large with average length around 12 inches collected. The bullhead population is currently low in abundance and is of desirable size by anglers.

For more detailed results see the computer-generated South Dakota Statewide Fisheries Survey for Dakotah Lake below. Please contact South Dakota Game, Fish and Parks Ft. Pierre office – (605) 223-7700 for additional information.

Prepared 02-13-2020 by KDP

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Dakotah, Hand County
TUR-Lake-14-000
2019

Lake Information

Name: Dakotah

County: Hand

Legal Description: T112-R69-S35

Surface Area: 9 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 (day)	Sep 18, 2019	1560 seconds
frame net (std 3/4 in)	May 29, 2019	5 net-nights
frame net (std 3/4 in)	May 30, 2019	5 net-nights

Common Fish Species Present

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.
- 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 (day)	Largemouth Bass	65	4.0	7.5	100		50		117	1
frame net (std 3/4 in)	Black Bullhead	45	4.2	2.4	76	10	48	12	93	3
	Bluegill	4	0.4	0.6	0		0		125	10

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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
boat shocker (day)	Largemouth Bass										4.0	4.00
boat shocker (night)	Largemouth Bass	15.0			63.0			111.0				63.00
frame net (std 3/4 in)	Black Bullhead	9.6			5.5			3.0			4.2	5.58
	Bluegill	10.0			4.7			1.1			0.4	4.05
	Largemouth Bass	0.0			0.0			0.0			0.0	0.00
std exp gill net	Black Bullhead							1.0				1.00

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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
boat shocker (day)	Largemouth Bass	PSD										100
		PSD-P										50
		Wr										117
boat shocker (night)	Largemouth Bass	PSD	40			100			3			
		PSD-P	20			5			3			
		Wr	118			109			99			
frame net (std 3/4 in)	Black Bullhead	PSD	44			96			70			76
		PSD-P	32			51			53			48
		Wr	87			101						93
	Bluegill	PSD	8			11			45			0
		PSD-P	0			2			0			0
		Wr	110			128						125
	Largemouth Bass	PSD	0						0			
		PSD-P	0						0			
std exp gill net	Black Bullhead	PSD							0			
		PSD-P							0			

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	2	3	65 (.8)	106 (7)								
2016	3	1	59	113	125							
Weighted Mean		4	64	108	125							

Species: Largemouth Bass

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2019	0	11										
2018	1	3	95 (11)									
2013	6	2	71 (8.8)	120 (2)	216 (33.4)	272 (24.5)	320 (5.4)	366 (16.1)				
Weighted Mean		16	85	120	216	272	320	366				

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+
2019	4		109 (3)	124 (1)							
2013	47		100 (25)	112 (12)	139 (7)	175 (2)		219 (1)			
2010	100		130 (31)	133 (60)	148 (6)	161 (3)					

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	5	188 (3)					382 (2)				
2016	43	166 (2)	224 (34)	249 (6)			464 (1)				
2013	21			344 (7)	362 (13)	342 (1)					
2010	100	154 (85)	169 (12)	309 (2)			493 (1)				

Fish Condition

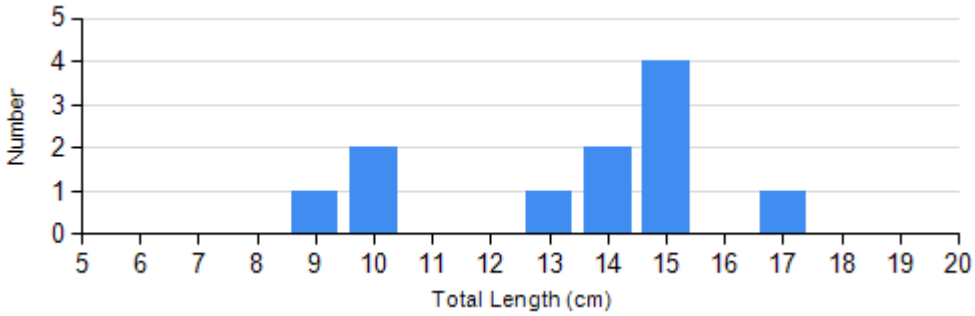
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2019	4	125 (7.9)	0		0		0	
Largemouth Bass Electro Fishing	2016	36	99 (1.5)	0		1	92	0	
	2019	0		1	117	1	116	0	

Length Frequency Distribution

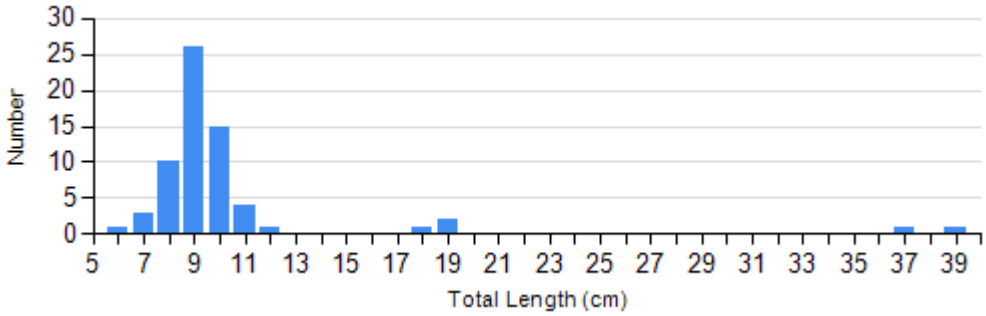
Length frequency histogram of species sampled by year.

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



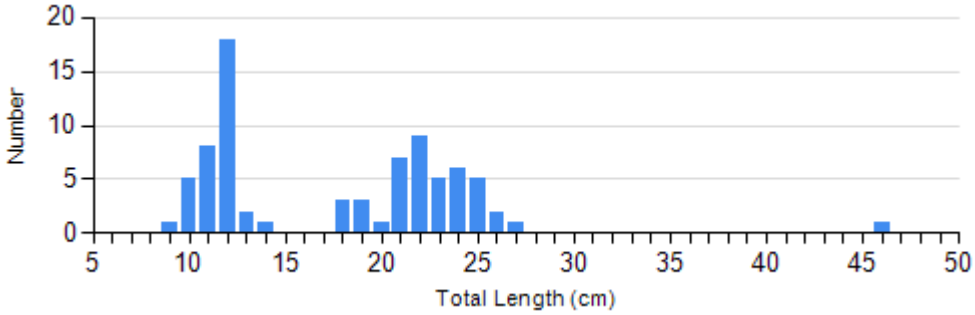
2016

Species: Largemouth Bass
Gear: boat shocker (day)



2019

Species: Largemouth Bass
Gear: boat shocker (night)

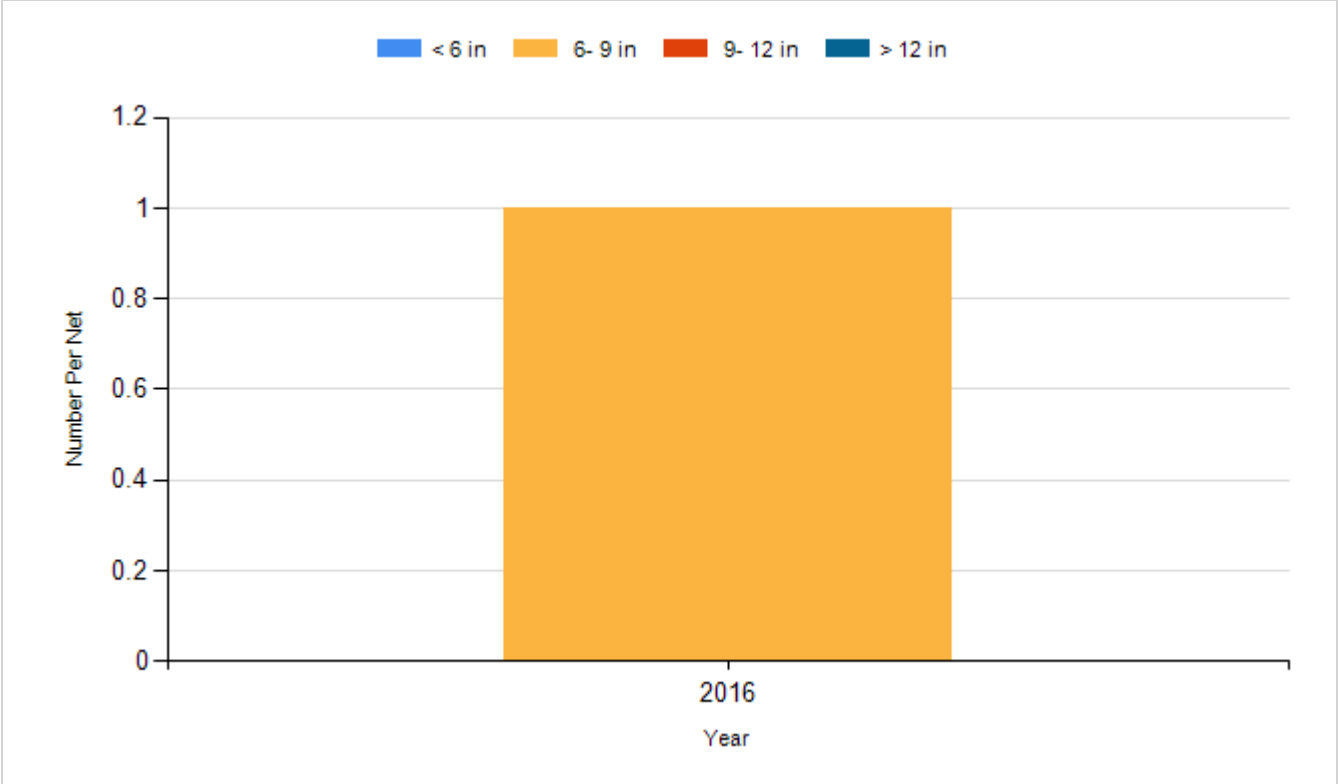


2016

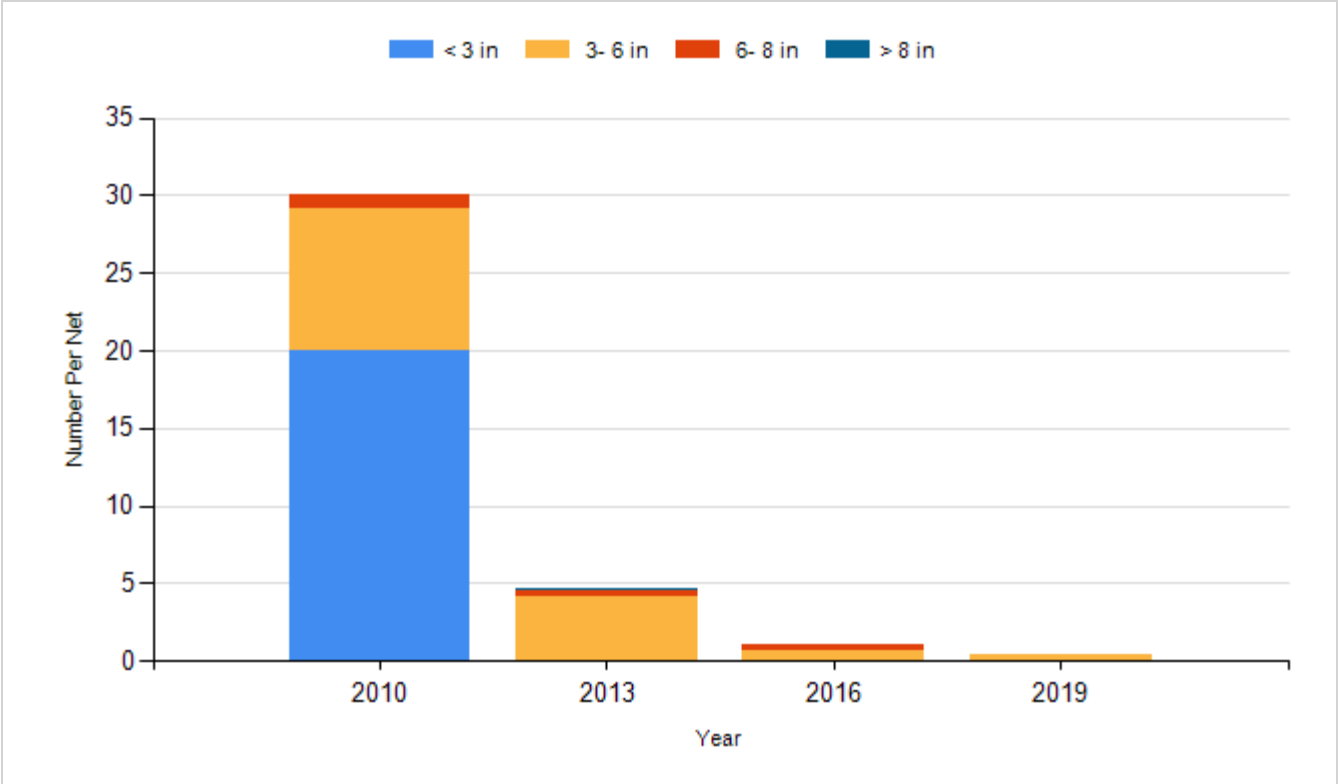
Historic Fish Sizes and Relative Abundance

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

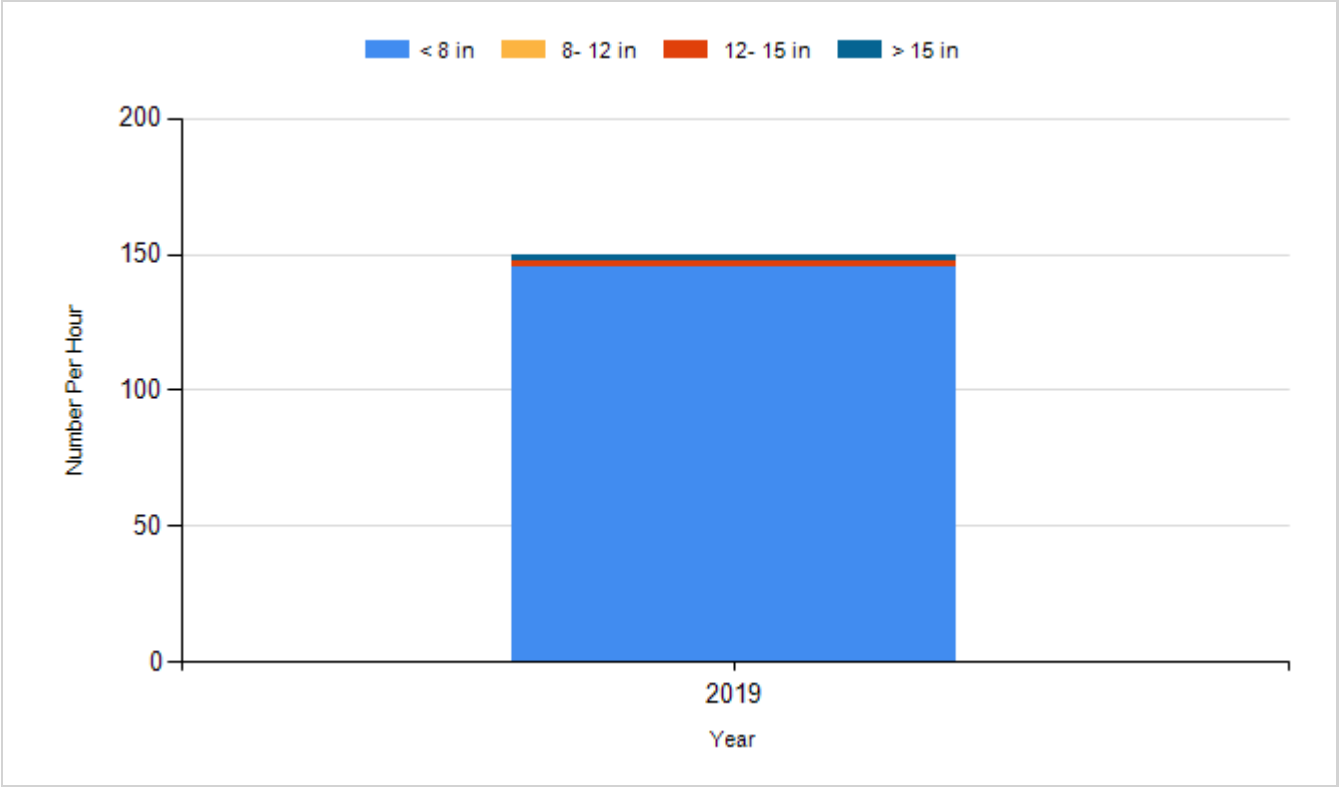
Species: Black Bullhead
Gear: std exp gill net



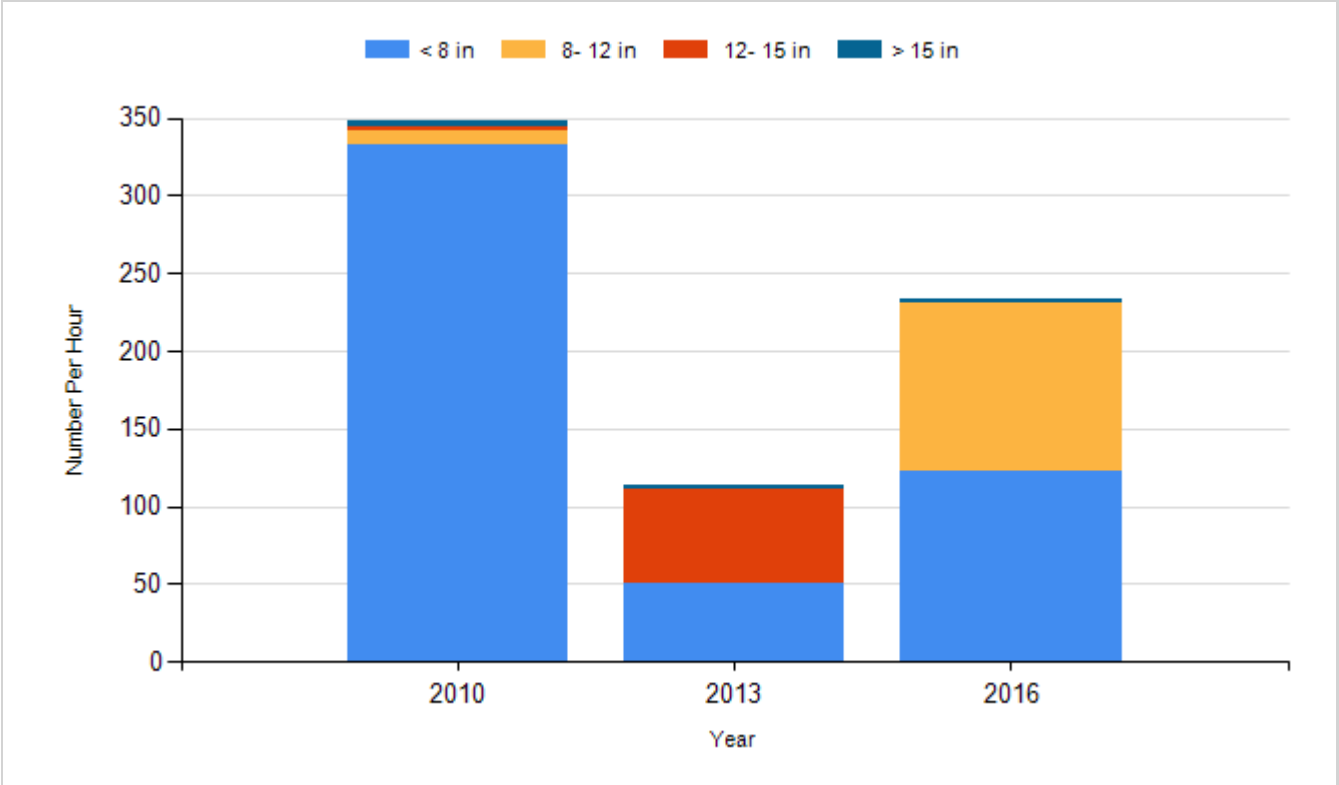
Species: Bluegill
Gear: frame net (std 3/4 in)



Species: Largemouth Bass
Gear: boat shocker (day)



Species: Largemouth Bass
Gear: boat shocker (night)



Fish Stocking

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

Year	Species	Size	Number
2019	Bluegill	Adult	204