SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Menno, Hutchinson County

LJA-Lake-52-000

2018

Lake Information

Name: Menno

County: Hutchinson

Legal Description: T98N-R57W-Sec. 32

Surface Area: 39 Acres

Maximum Depth: 34 Feet

Mean Depth: 13 Feet

Surveys and Investigations

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

Gear	Date	Effort
frame net (std 3/4 in)	May 15, 2018	5 net-nights

Common Fish Species Present

Bluegill

Black Crappie

Largemouth Bass

Green Sunfish

Black Bullhead

Sunfish Hybrid

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
frame net (std 3/4 in)	Black Bullhead	1	0.2	0.3	100		100			
	Black Crappie	1	0.2	0.3	100		100		95	
	Bluegill	68	13.6	12.5	85	7	25	8	104	1
	Green Sunfish	3	0.6	0.9	100		0		156	55
	Largemouth Bass	1	0.2	0.3	100		0		100	
	Sunfish Hybrid	5	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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std frame net	Black Bullhead									0.4		0.4
	Black Crappie									0.0		0.0
	Bluegill									5.6		5.6
	Green Sunfish									0.4		0.4
	Sunfish Hybrid									0.0		0.0
AFS std gill net	Black Bullhead									3.8		3.8
	Channel Catfish									0.5		0.5
	Green Sunfish									0.3		0.3
	Largemouth Bass									1.8		1.8
	White Sucker									0.3		0.3
boat shocker (night)	Largemouth Bass	33.0		112.0		84.0	29.1	48.0	132.6			73.1
frame net (std 3/4 in)	Black Bullhead	10.4		5.0		10.8	3.0	3.2	0.8		0.2	4.8
	Black Crappie	4.3		29.4		20.6	27.0	13.3	1.9		0.2	13.8
	Bluegill	43.1		105.8		43.0	27.2	13.7	8.9		13.6	36.5
	Channel Catfish	0.1					0.2	0.1				0.1
	Green Sunfish			0.2				0.3	0.4		0.6	0.4
	Largemouth Bass	0.2		0.2		0.1	0.0	0.2	2.4		0.2	0.5
	Sunfish Hybrid	0.0		0.0					0.0		0.0	0.0
	White Sucker	1.3		0.8		1.2	0.4	0.9	0.1			0.8
	Yellow Perch	2.6		1.9		1.9	0.4	0.1				1.4

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.

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std frame net	Black Bullhead	PSD									100	
		PSD-P									100	
	Black Crappie	PSD									0	
		PSD-P									0	
	Bluegill	PSD									50	
		PSD-P									39	
		Wr									108	
	Green Sunfish	PSD									100	
		PSD-P									50	
		Wr									119	
AFS std gill net	Black Bullhead	PSD									93	
		PSD-P									73	
	Green Sunfish	PSD									100	
		PSD-P									0	
	Largemouth Bass	PSD									100	
		PSD-P									14	
		Wr									102	
boat shocker (night)	Largemouth Bass	PSD	52		68		86	100	64	7		
		PSD-P	27		37		61	69	64	5		
		Wr	107		105		100	91	94	101		
frame net (std 3/4 in)	Black Bullhead	PSD	98		96		99	100	88	88		100
		PSD-P	49		22		94	87	84	63		100
		Wr	101		93		77					
	Black Crappie	PSD	56		48		40	100	89	84		100
		PSD-P	0		3		0	18	71	68		100
		Wr	111		97		87	106	101	99		95
	Bluegill	PSD	90		66		95	100	100	98		85
		PSD-P	3		1		2	50	91	93		25
		Wr	105		89		81	120	104	112		104
	Green Sunfish	PSD			0				0	50		100
		PSD-P			0				0	0		0
		Wr			92				90	126		156

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	Largemouth Bass	PSD	50		100		100	0	0	0		100
		PSD-P	50		100		0	0	0	0		0
		Wr	103		114		105		93	109		100

Length at Capture

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

Species: Black Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	133	162 (14)	218 (6)			255 (113)					
2014	135			212 (1)	242 (134)						
2013	206	145 (2)		197 (204)							
2011	376	134 (189)	209 (129)	232 (53)	280 (6)						
2009	45	131 (6)	201 (38)	220 (1)							

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	137				202 (19)	214 (24)	215 (84)	214 (11)			
2014	136			171 (5)	188 (22)	201 (87)	202 (14)	195 (9)			
2013	430	112 (3)	140 (7)	174 (84)	168 (280)	177 (38)	184 (17)				
2011	1058	106 (10)	123 (151)	153 (580)	185 (181)	191 (112)	192 (23)				
2009	431	98 (37)	159 (45)	176 (188)	183 (156)		221 (8)				

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	82		252 (8)	291 (6)	314 (8)	382 (16)	411 (21)	442 (9)	425 (9)	467 (2)	463 (2)
2011	136		260 (45)	332 (20)	359 (12)	374 (17)	390 (21)	429 (23)			
2009	48	101 (9)	182 (10)	241 (15)	354 (2)	363 (9)	395 (3)		479 (1)		

Fish Condition

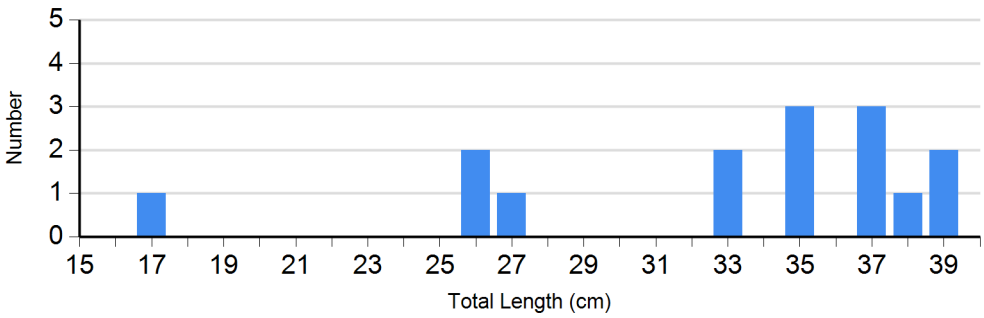
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2014	0		111	106 (0.6)	24	105 (0.4)	0	
	2015	15	110 (2.1)	24	100 (1.3)	94	98 (0.5)	0	
	2016	3	112 (1.4)	3	109 (2.9)	13	94 (1.5)	0	
	2018	0		0		1	95	0	
Bluegill Frame Net	2014	0		68	120 (1.0)	68	121 (1.1)	0	
	2015	0		13	108 (2.0)	124	103 (0.6)	0	
	2016	2	123	4	123 (3.3)	83	111 (0.8)	0	
	2017	14	102 (1.7)	3	123 (0.6)	9	112 (2.5)	2	112 (2.0)
	2018	10	96 (2.0)	41	104 (1.3)	14	108 (2.2)	3	107 (6.4)
Largemouth Bass Electro Fishing	2014	0		11	91 (2.7)	25	90 (1.7)	0	
	2015	23	94 (0.7)	0		41	95 (1.7)	0	
	2016	205	102 (1.0)	4	100 (1.5)	12	95 (1.5)	0	

Length Frequency Distribution

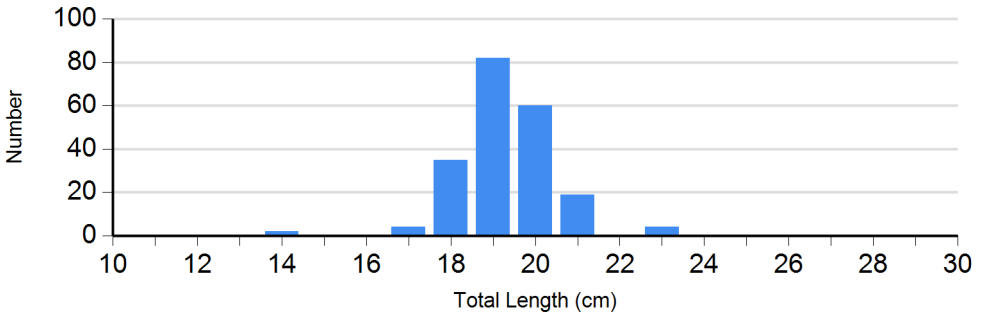
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

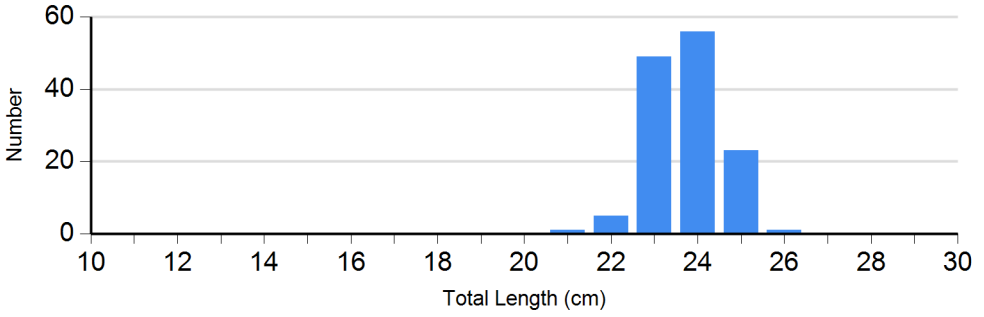


2017

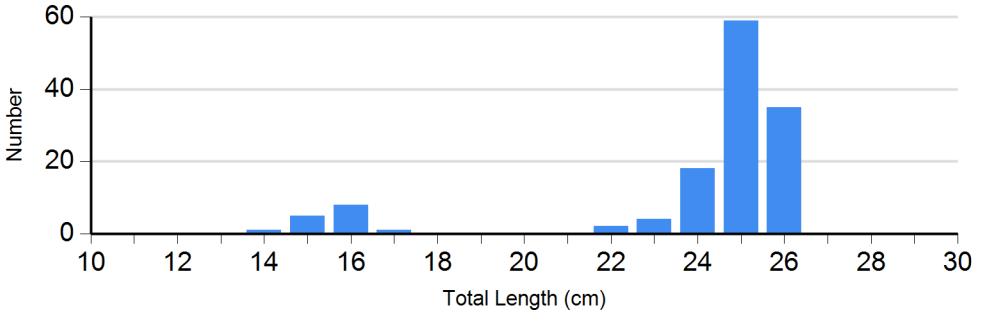
Species: Black Crappie
Gear: frame net (std 3/4 in)



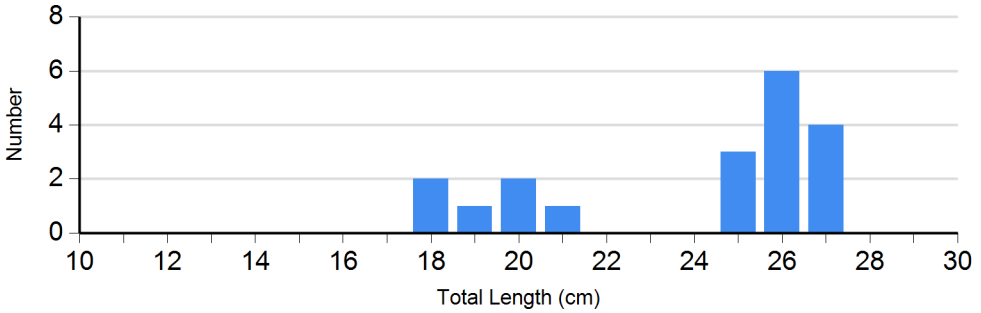
2013



2014

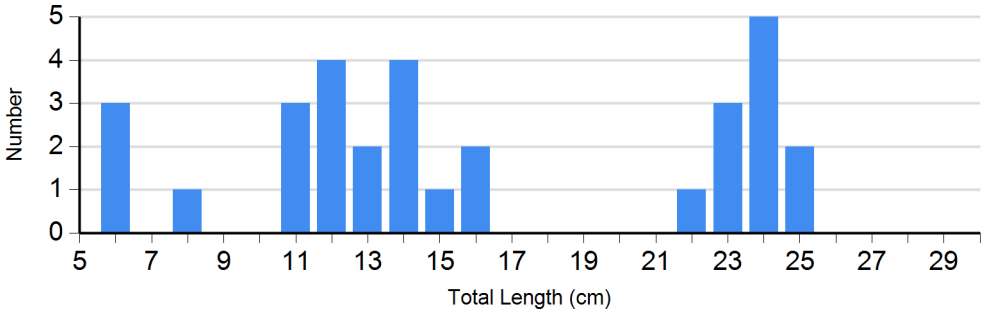


2015



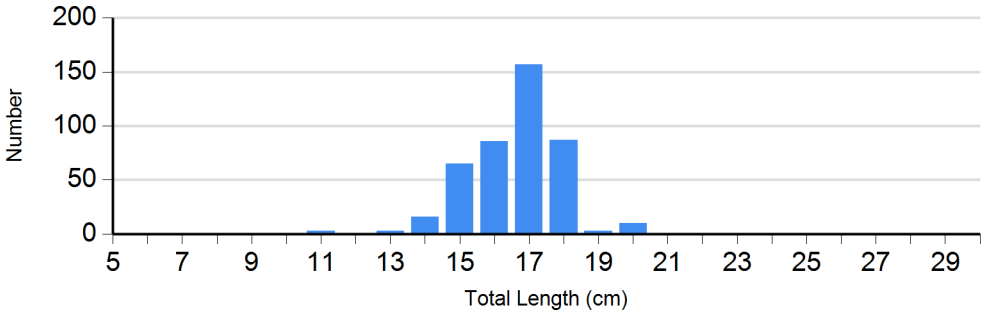
2016

Species: Bluegill
Gear: AFS std frame net

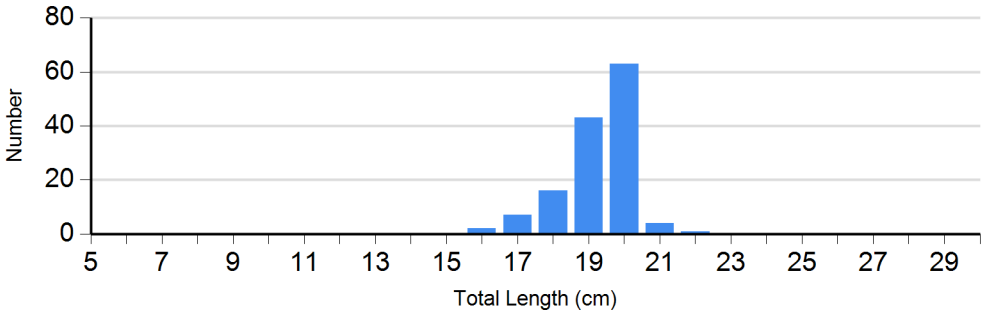


2017

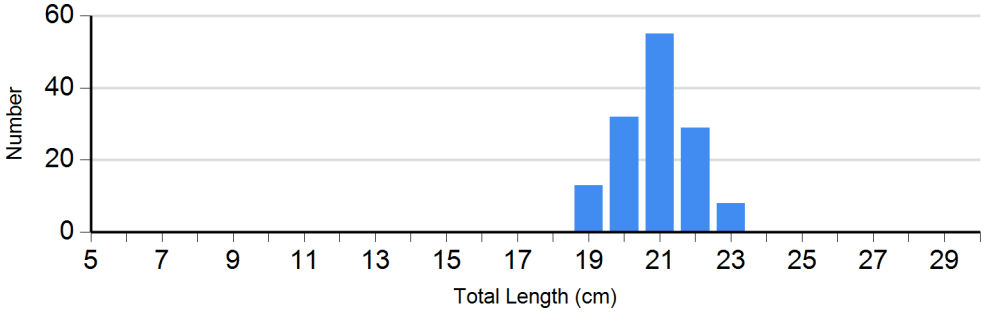
Species: Bluegill
Gear: frame net (std 3/4 in)



2013



2014



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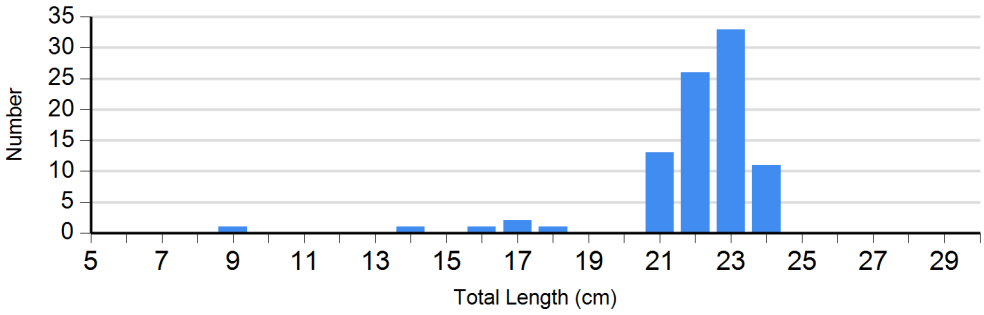
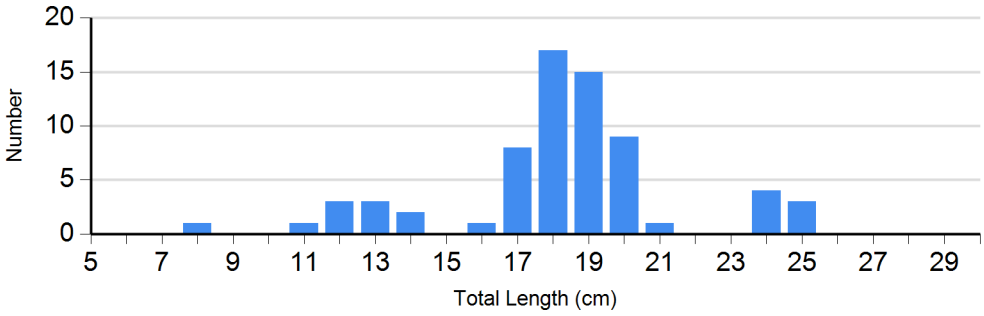
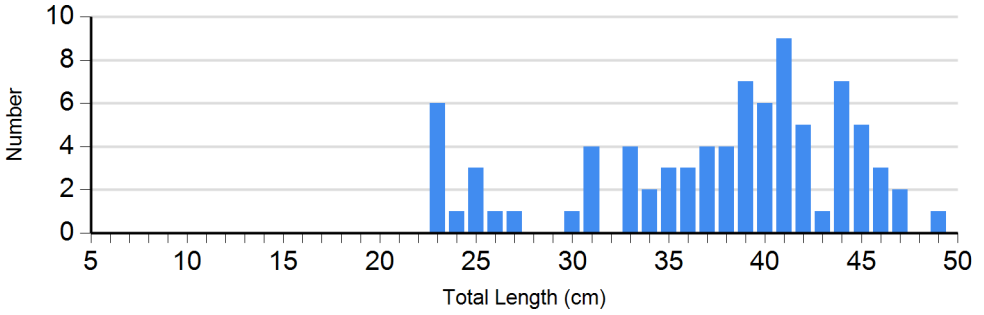


2016

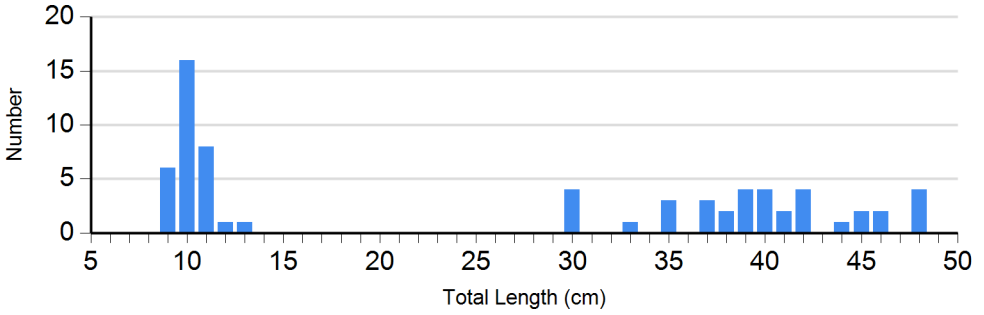


2018

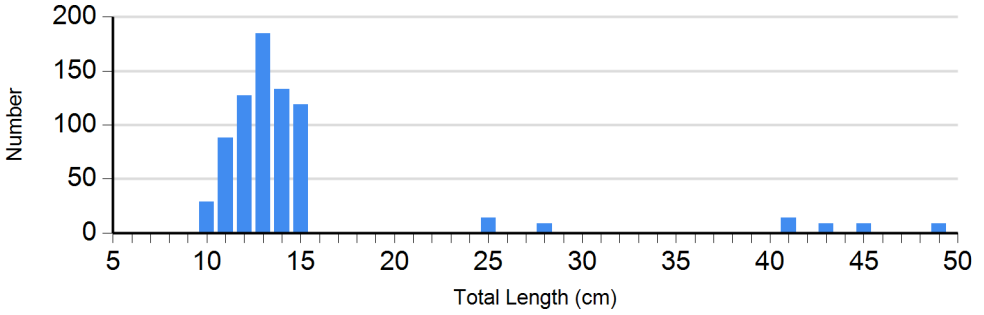
Species: Largemouth Bass
Gear: boat shocker (night)



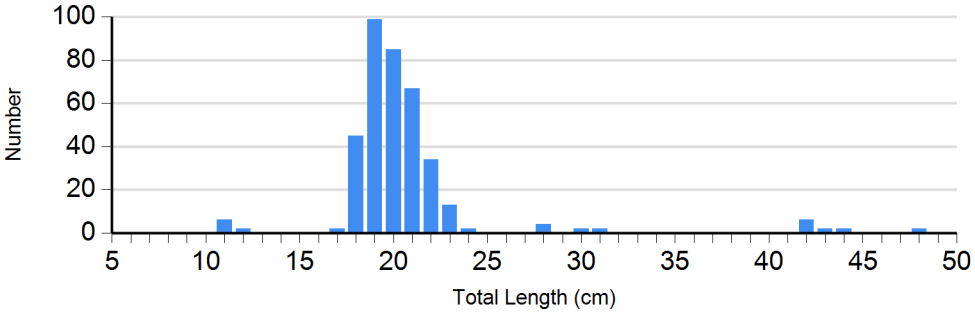
2013



2014



2015

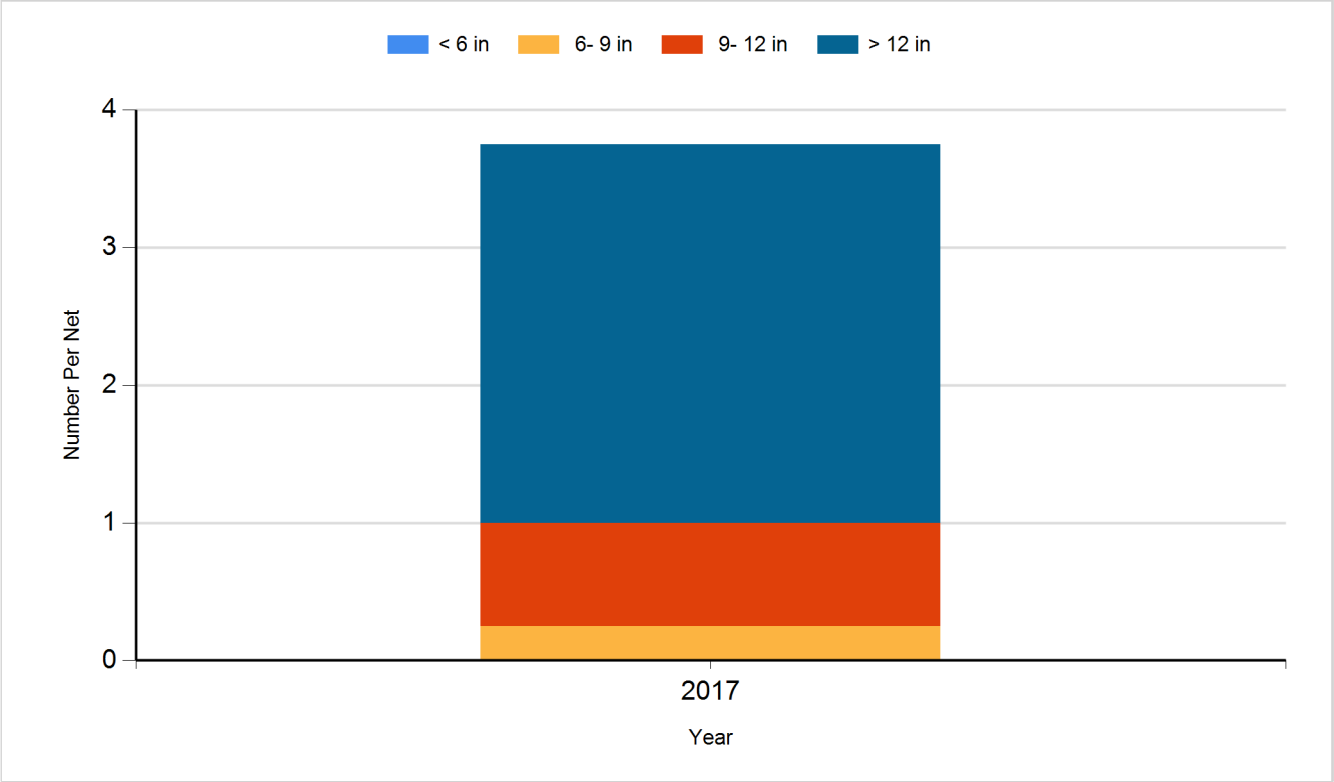

100
80
60
40
20
0
Number
5
10
15
20
25
30
35
40
45
50
Total Length (cm)

2016

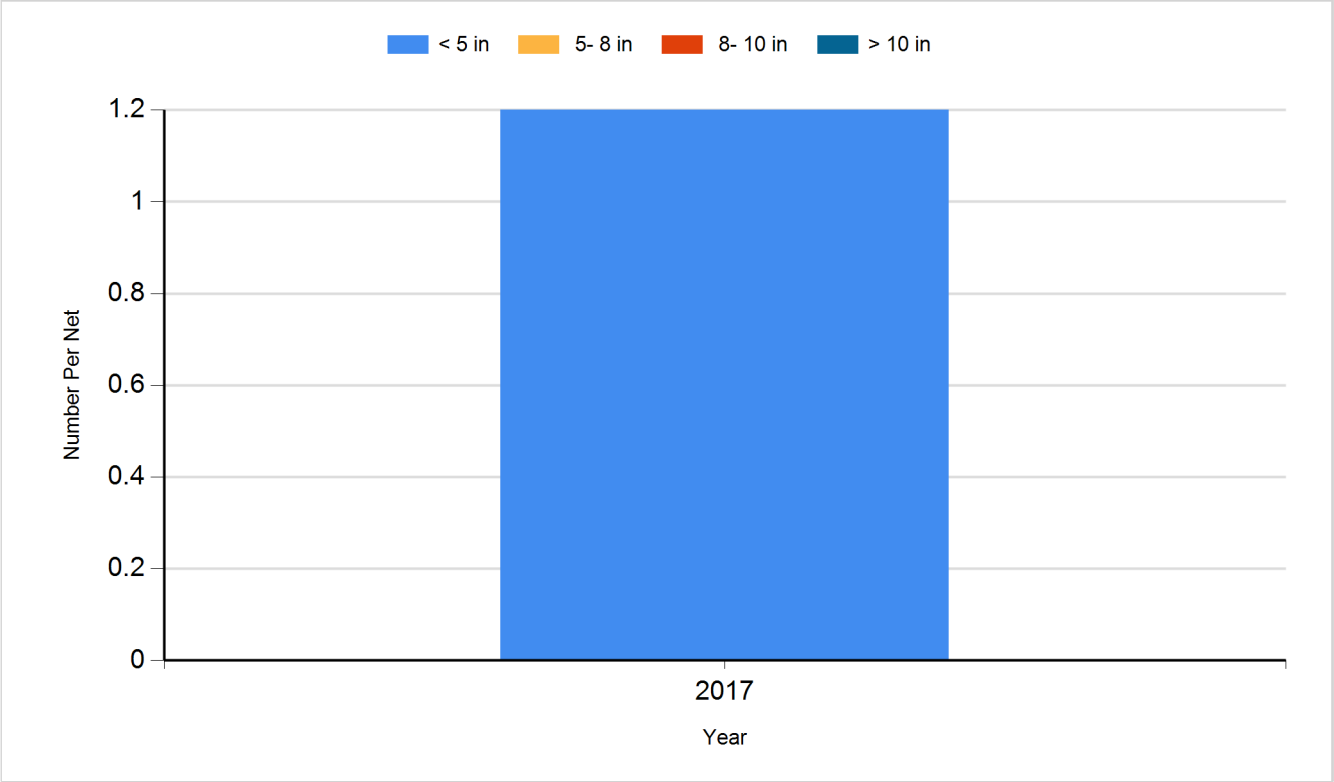
Historic Fish Sizes and Relative Abundance

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

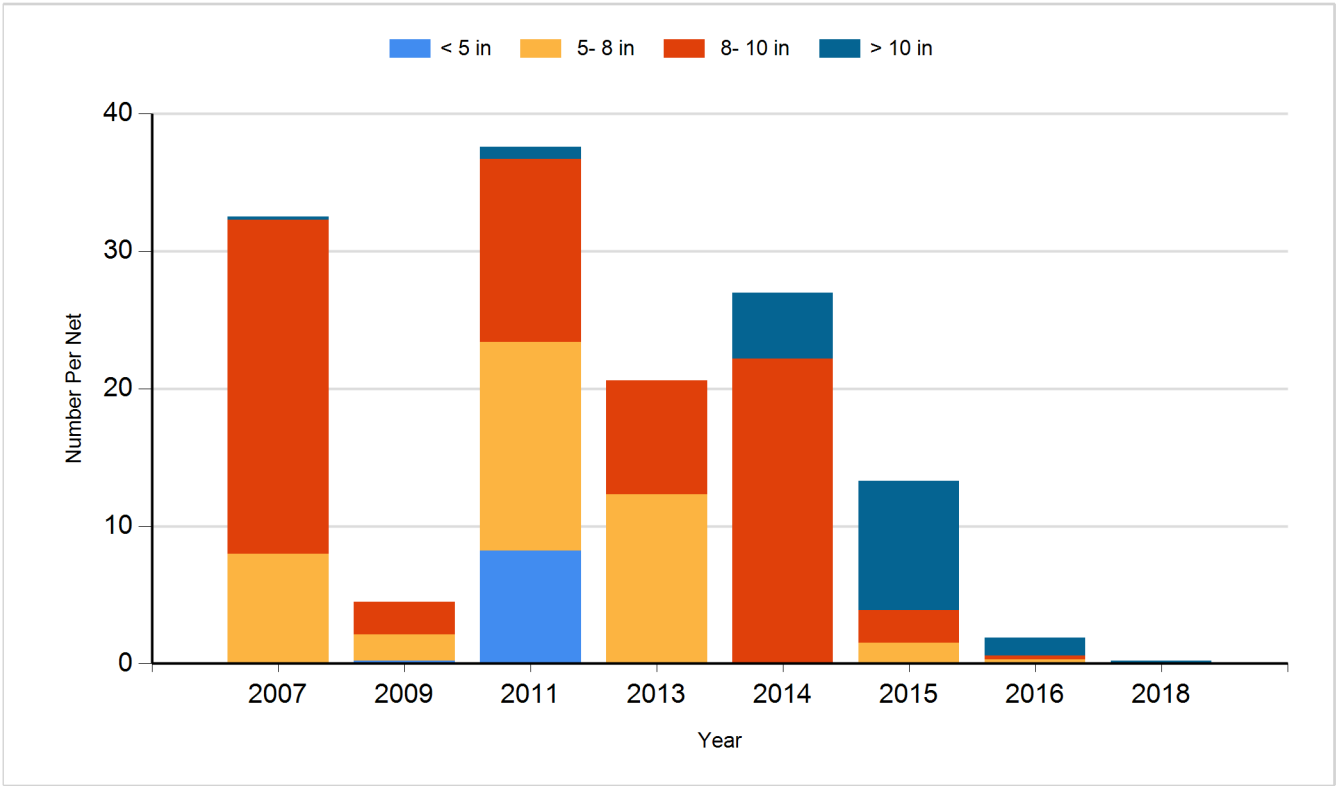
Species: Black Bullhead
Gear: AFS std gill net



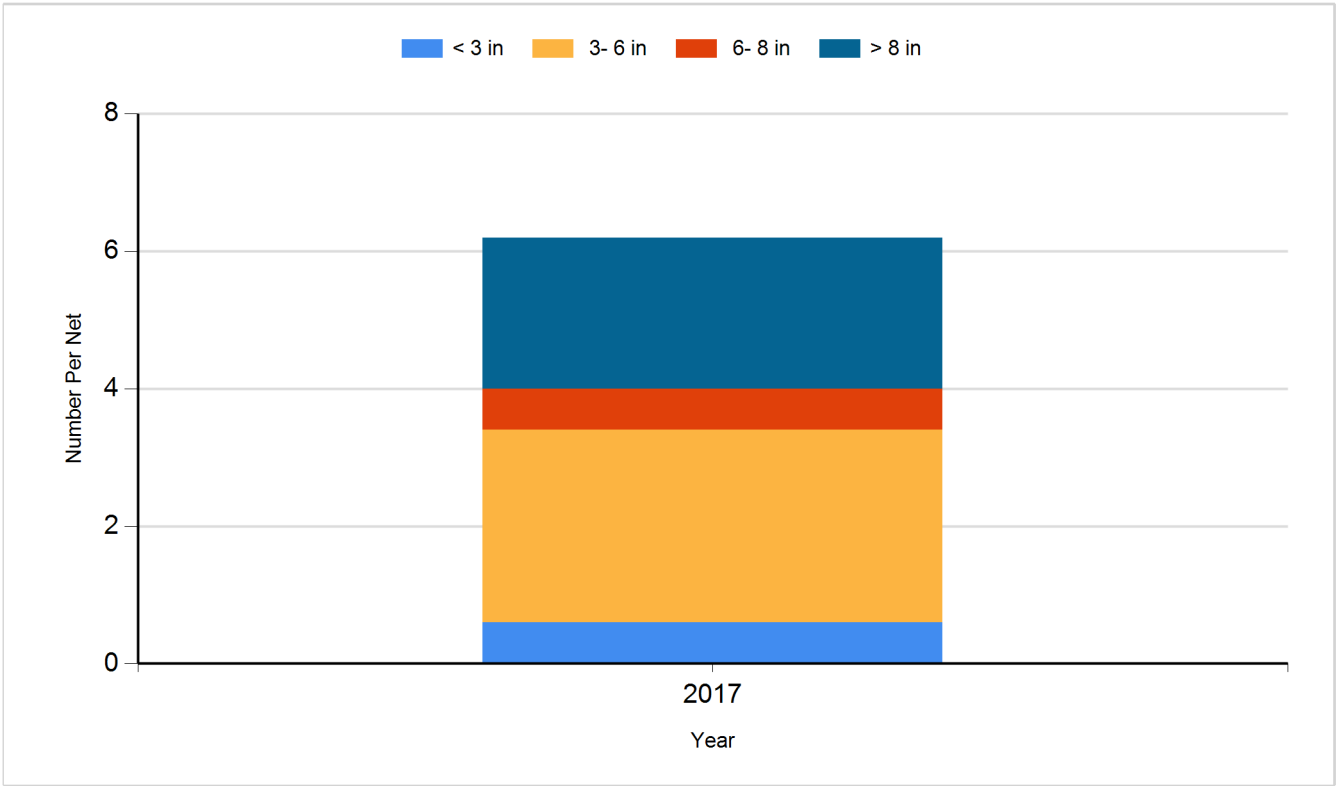
Species: Black Crappie
Gear: AFS std frame net



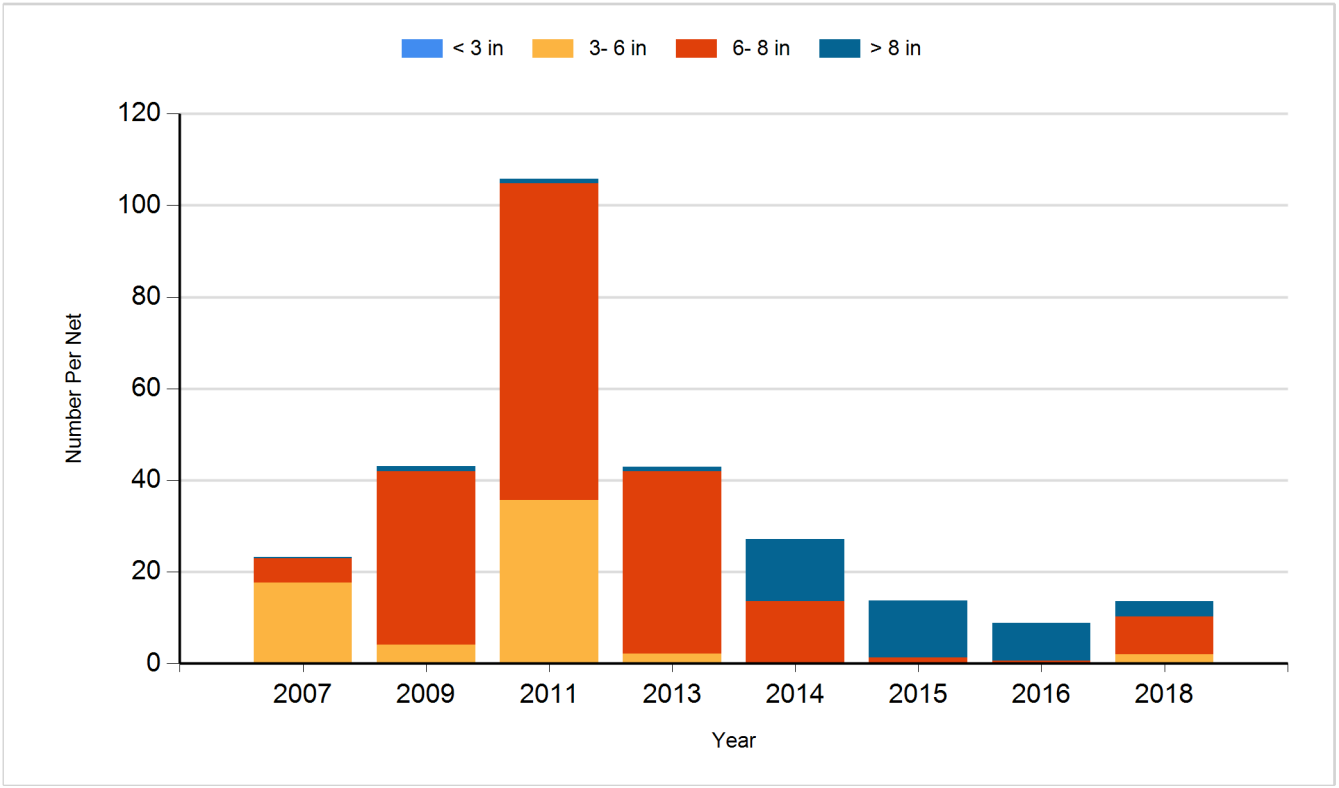
Species: Black Crappie
Gear: frame net (std 3/4 in)



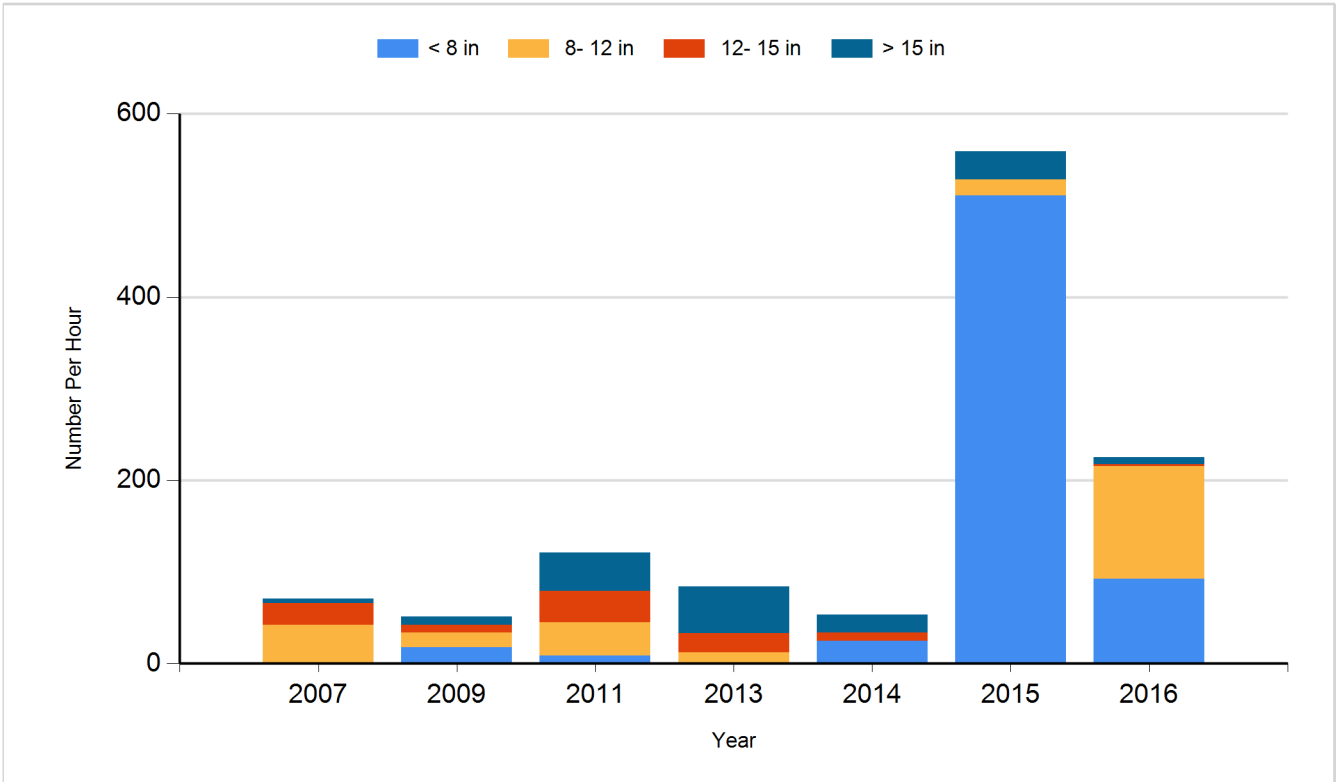
Species: Bluegill
Gear: AFS std frame net



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



Species: Largemouth Bass
Gear: boat shocker (night)



Fish Stocking

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

Year	Species	Size	Number
2013	Channel Catfish	Large Fingerling	4,950