Richland Dam Survey Summary

Richland Dam is 17.5 acre impoundment located south west of Fort Pierre, South Dakota and surrounded by the Fort Pierre National Grasslands, U.S. Department of Agriculture. Maximum depth is approximately 15 feet with an average depth of 8 feet. Richland Dam has a small concrete boat ramp for easy access for a small boat. There are three earthen fishing pods or platforms installed to help aid anglers to get past the aquatic vegetation most of the time. A small established campground with a port-i-potty exists adjacent to the impoundment. Ice fishing is also a popular on Richland Dam during the winter months. In 2018 several Mossback Artificial Fish Habitat structures were installed in Richland Dam. These structures will help attract and increase fish habitat within the pond for many years. These structures were placed in shallow and deeper water of the pond.

At time of survey, water quality was good with a thermocline established at a depth of 8 feet. No oxygen was available below this depth during the summer months, this is normal for most small impoundments. Water clarity was around 7 feet. During the 2018 survey, aquatic vegetation was in greater concentrations than usual and made survey work difficult which may have influenced net catches.

Net catches were down for all species of fish during the survey of 2018, possibly due to the dense vegetation. Bluegill abundance (5.9 fish/net) was down in net catches but they averaged 7 inches in length. They ranged in size from 4 to 8 inches. The plumpness or condition of the Bluegill was excellent at the time of survey. Bluegill growth is slower in Richland Dam than the statewide average and may be due to a typically higher density of Bluegill in the impoundment. Black Bullhead and Black Crappie were collected during survey but were low in numbers. No Yellow Perch were collected but exists in Richland Dam.

Largemouth Bass were sampled in the fall of 2018 by boat electrofishing. The catch rate was 73.5 fish/hour of fish larger than 8 inches. Combining all sizes of Largemouth Bass, a catch rate of 280 fish/hour was collected. Majority of the Largemouth Bass in 2018 were below 8 inches in length. Largemouth Bass ranged from 2 to 19 inches with the average size of 8 inches. Many of these fish were 1 year old fish but fish as old as 9 years old was seen. The growth was very similar to the statewide average for Largemouth Bass. For growth rates in Richland Dam, Largemouth Bass at the age of 5 are about 14 inches in length. The plumpness or condition of the Largemouth Bass was good showing ample food within the impoundment.

Richland Dam is a popular fishery on the Fort Pierre National Grasslands and provides a great opportunity for anglers to catch Largemouth Bass, Bluegill, and Black Crappie.

For more information, please contact South Dakota Game, Fish and Parks Ft. Pierre office – (605) 223-7700.

Prepared 01-25-2019 by KDP

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Richland Dam, Jones County
BAD-Lake-280-000
2018

Lake Information

Name: Richland Dam

County: Jones

Surface Area: 17 Acres

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (night)	Sep 24, 2018	2400 seconds
frame net (std 3/4 in)	Jun 26, 2018	4 net-nights
frame net (std 3/4 in)	Jun 27, 2018	4 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Bullhead

Black Crappie

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	6	15	9	23	12	30	15	38	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	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
boat shocker (night)	Largemouth Bass	73.5	45.6	92		29	10	103	2
frame net (std 3/4 in)	Black Bullhead	0.6	0.5	100		100		94	5
	Black Crappie	0.1	0.2	100		100		98	
	Bluegill	5.9	4.4	89	7	0		120	2
	Largemouth Bass	0.1	0.2	0		0		102	

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
boat shocker (night)	Largemouth Bass				199.5			216.0			73.5	163.0
frame net (std 3/4 in)	Black Bullhead	0.3			0.5			1.5			0.6	0.7
	Black Crappie	6.6			14.5			3.0			0.1	6.1
	Bluegill	12.5			38.0			12.3			5.9	17.2
	Largemouth Bass							0.3			0.1	0.2
	Yellow Perch	0.4			0.5							0.5

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
boat shocker (night)	Largemouth Bass	PSD				64			32			92
		PSD-P				35			25			29
		Wr				105			95			103
frame net (std 3/4 in)	Black Bullhead	PSD	100			100			92			100
		PSD-P	100			75			92			100
		Wr	105			117			100			94
	Black Crappie	PSD	2			23			83			100
		PSD-P	0			2			21			100
		Wr	96			94			86			98
	Bluegill	PSD	92			70			52			89
		PSD-P	1			1			26			0
		Wr	94			96			103			120
	Largemouth Bass	PSD							0			0
		PSD-P							0			0
		Wr							105			102
	Yellow Perch	PSD	33			75						
		PSD-P	0			0						
		Wr	77			78						

Back-Calculated Lengths

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

Species: Black Crappie

Year Class	Age	N	Mean back-calculated length (SE) at age 1	2	3	4	5	6	7	8	9	10
2014	4	1	93	136	173	228						
Weighted Mean		1	93	136	173	228						

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2014	4	1										
Weighted Mean		1										

Species: Bluegill

Year Class	Age	N	Mean back-calculated length (SE) at age 1	2	3	4	5	6	7	8	9	10
2016	2	2	40 (2.6)	78 (5.7)								
2015	3	5	38 (3.1)	71 (6.7)	115 (3.6)							
2014	4	9	39 (1.3)	64 (5.4)	102 (5.6)	142 (4.7)						
2013	5	6	39 (2.1)	71 (2.4)	109 (4.1)	141 (3.5)	167 (4.5)					
2012	6	4	42 (3.3)	80 (3.3)	112 (2.9)	145 (1.9)	161 (3.1)	172 (4.1)				
Weighted Mean		26	39	71	108	142	165	172				

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2016	2	2										
2015	3	5										
2014	4	9										
2013	5	6										
2012	6	4										
Weighted Mean		26										

Species: Largemouth Bass

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2017	1	32	89 (2.5)									
2016	2	4	91 (6)	163 (27.8)								
2015	3	2	85 (21.6)	169 (75.3)	247 (64.2)							
2014	4	9	86 (4.7)	178 (7.7)	256 (4.9)	296 (7.4)						
2013	5	9	90 (6.8)	183 (9.9)	242 (10.1)	285 (3.9)	315 (4.4)					
2012	6	4	91 (8.7)	178 (18.9)	252 (19.3)	326 (16.6)	366 (21.2)	386 (20.7)				
2011	7	5	71 (6)	182 (8.5)	283 (15.1)	347 (12.3)	378 (6.5)	403 (4.7)	425 (2.1)			
2010	8	1	56	131	221	306	356	371	400	423		
2009	9	1	142	216	306	352	396	428	445	465	476	
Weighted Mean		67	88	177	256	308	347	396	424	444	476	

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2017	1	32										
2016	2	4										
2015	3	2										
2014	4	9										
2013	5	9										
2012	6	4										
2011	7	5										
2010	8	1										
2009	9	1										
Weighted Mean		67										

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+
2018	1				258 (1)						
2015	25		142 (5)				237 (13)	254 (3)	254 (1)	243 (1)	264 (1)
2012	115		138 (3)	164 (48)	181 (35)		204 (7)	205 (10)	214 (9)	224 (3)	275 (1)
2009	54			139 (26)	153 (27)		205 (1)				

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	47		118 (2)	151 (5)	168 (11)	182 (18)	180 (10)				
2015	102		96 (50)	169 (8)	181 (7)		199 (9)	204 (27)	213 (1)		
2012	300			128 (66)	162 (215)	189 (18)			204 (2)		
2009	100		96 (5)		161 (5)	171 (77)	173 (12)	200 (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	161	138 (111)	206 (5)	293 (2)	348 (13)	353 (15)	393 (7)	442 (6)	443 (1)	483 (2)	
2015	80	165 (9)	231 (44)	279 (7)	386 (1)	387 (7)	406 (6)	428 (2)	472 (4)		
2012	133	221 (25)	277 (13)	310 (43)	381 (12)	413 (12)	439 (5)	456 (14)	486 (7)	538 (1)	509 (3)

Fish Condition

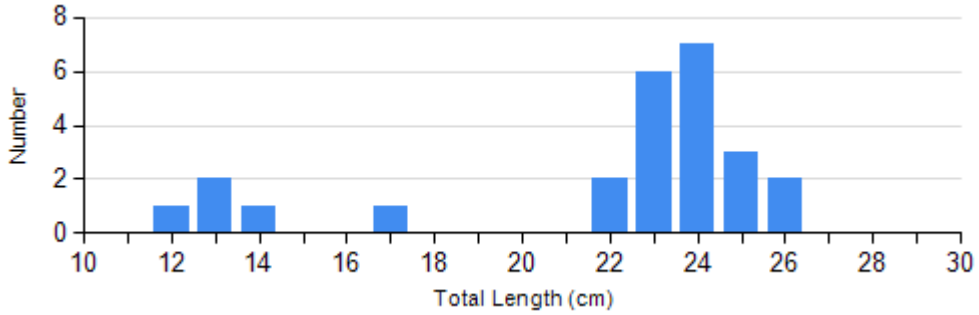
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2015	4	92 (4.3)	15	86 (1.4)	5	80 (2.0)	0	
	2018	0		0		1	98	0	
Bluegill Frame Net	2015	47	116 (3.9)	26	91 (4.1)	25	90 (1.3)	0	
	2018	5	136 (5.5)	42	118 (1.6)	0		0	
Largemouth Bass Electro Fishing	2015	49	93 (1.3)	5	96 (2.3)	18	98 (1.7)	0	
	2018	4	115 (1.5)	31	106 (1.1)	14	94 (2.0)	0	

Length Frequency Distribution

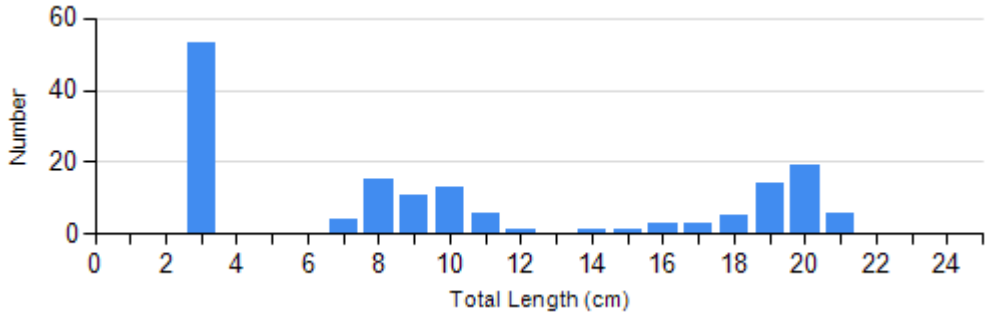
Length frequency histogram of species sampled by year.

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

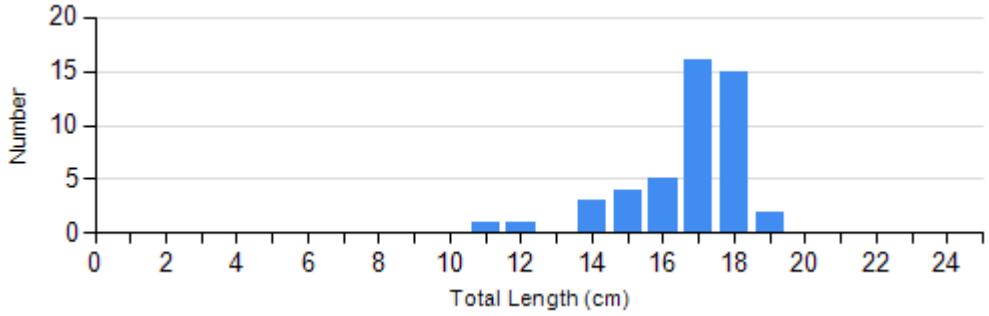


2015

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

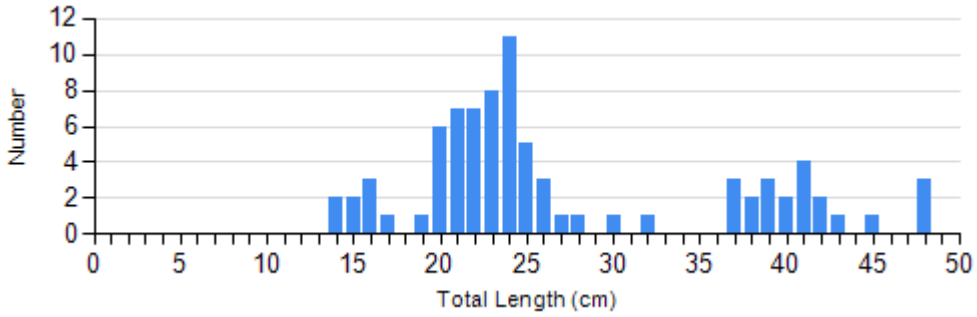


2015

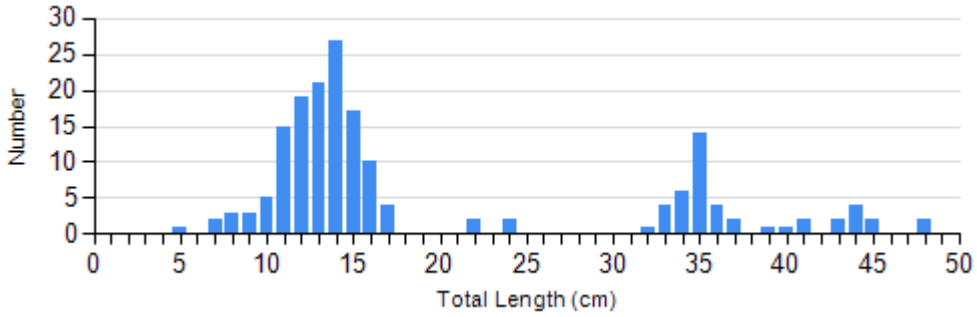


2018

Species: Largemouth Bass
Gear: boat shocker (night)



2015

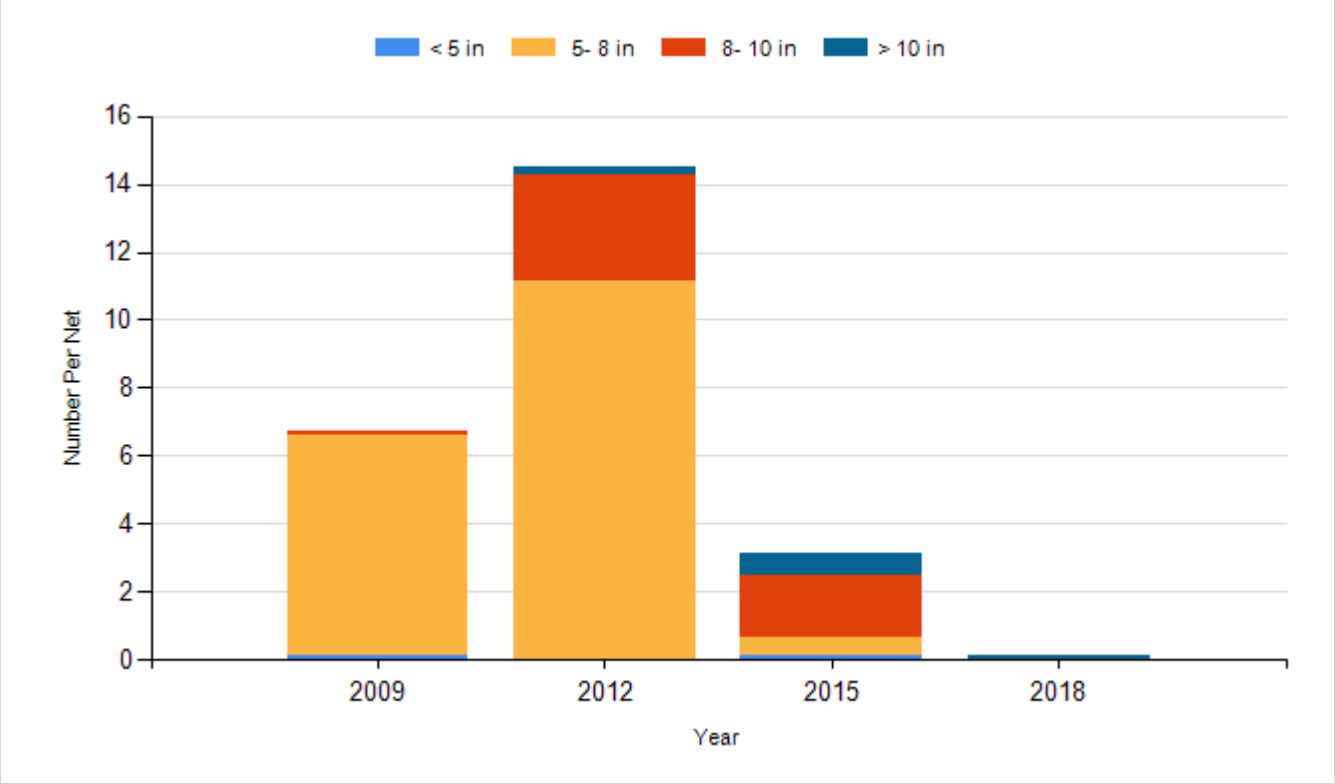


2018

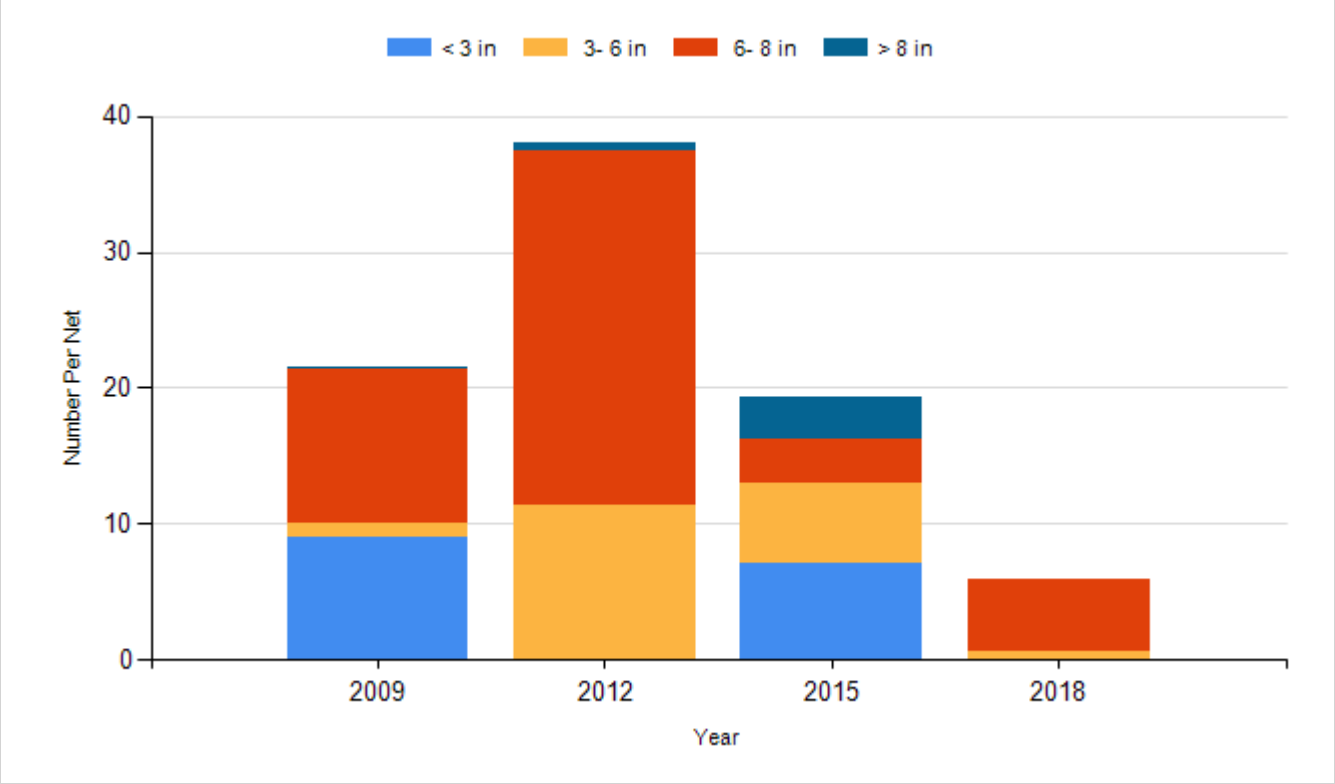
Historic Fish Sizes and Relative Abundance

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

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



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



Species: Largemouth Bass
Gear: boat shocker (night)