Lake Louise Survey Summary

Lake Louise is a 163 acre prairie impoundment located northwest of Miller, South Dakota. Louise is completely surrounded by land managed by SD Game, Fish and Parks either as a Game Production Area or as a State Recreation Area with full campground facilities. Fishing access is plentiful around the lake. A concrete boat ramp, a handicap accessible dock, two recently added fishing docks (2017), and many other areas along the shoreline exist to provide fishing access.

Areas of emergent cattail and reed exist throughout the impoundment. Submergent vegetation is adequate throughout and at times very dense in the upper reaches and shallows of the impoundment. Vegetation growth extends out to about 6 to 7 feet of water depth most years. At the time of survey water levels were near full, this is not always the case on Lake Louise. Aquatic invasive flowering rush was found in areas around the lake. Dissolved oxygen, at time of survey, was more than adequate to fully support fish. No thermocline had developed, but typically does later in the summer. Water clarity was 48 inches.

Lake Louise primary fish species include Largemouth Bass, Bluegill, Yellow Perch, Walleye, Northern Pike, and Black Bullhead. Depending on water levels, each species maybe flourishing or not.

Largemouth Bass are increasing in abundance with 163.0 fish/hr electrofishing, the highest abundance in recent for stock length and greater fish. Many of these Largemouth Bass are young (3 years old and less) and is a good sign for the future, with many of these in the eight to twelve inch class. The plumpness and growth rates for Largemouth Bass are at or above average as well.

Bluegill abundance has increase in Lake Louise to 20.5 fish/net-night which is above the average of 5.3 fish/net-night. Condition or plumpness of the Bluegill is very good. The average size increased to 5.5 inches with a size range of 3 to 10 inches. Growth of Bluegill is good and near the state average for growth.

Yellow Perch abundance had a slight decrease in abundance but average size had increased to 7.5 inches. The condition had a slight decrease but is fair for a small impoundment. Growth of Yellow Perch was near the statewide average for Lake Louise.

Walleye in Lake Louise are a secondary species to provide anglers another species to catch, especially in the spring of the year. Recently walleye abundance has been low but the average size has been large. Due to a stocking of large fingerlings in the Fall 2017, abundance has increased. Many of these Walleye are now nine inches and should provide a future fishery.

Northern Pike were first seen in the 2003 survey and continue to provide a fishery since. Abundance is currently low but fish of several sizes exist. Some Northern Pike weighing in the ‘teens can be found.

Black Bullhead abundance in the 2018 survey has decreased and the average size had increased to around 11 inches. This size of Black Bullhead can be a trophy catch for a child.

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

Prepared 01-10-2019 by KDP

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Louise, Hand County
TUR-Lake-155-000
2018

Lake Information

Name: Louise

County: Hand

Legal Description: T113-R69-S4

Surface Area: 163 Acres

Maximum Depth: 20 Feet

Mean Depth: 8 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 05, 2018	2 net-nights
AFS std gill net	Jun 06, 2018	2 net-nights
boat shocker (night)	Sep 20, 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

Walleye

Largemouth Bass

Bluegill

Black Bullhead

Northern Pike

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
AFS std gill net	Black Bullhead	0.0	0.0	0		0			
	Bluegill	2.8	2.8	9		0			
	Northern Pike	0.8	0.8	100		67		92	5
	Walleye	1.0	1.6	100		50		90	1
	Yellow Perch	11.0	8.5	45	11	0		76	4
boat shocker (night)	Largemouth Bass	164.0	26.6	13	4	2		110	1
	Walleye*	33.0	15.1	33		33		90	2
frame net (std 3/4 in)	Black Bullhead	23.3	9.6	97	2	73	4	87	1
	Bluegill	20.5	10.9	20	4	0		95	1
	Largemouth Bass	0.1	0.1	100		0		51	
	Northern Pike	0.1	0.1	100		0		88	
	Walleye	0.2	0.2	100		50		89	1
	Yellow Perch	2.2	1.2	36	16	0		82	4

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 gill net	Black Bullhead										0.0	0.0
	Bluegill										2.8	2.8
	Northern Pike										0.8	0.8
	Walleye										1.0	1.0
	Yellow Perch										11.0	11.0
boat shocker (night)	Largemouth Bass	0.0	2.0	8.0	17.0	24.0		57.0	48.0		164.0	40.0
	Walleye		29.0		5.0			12.0	6.0		33.0	17.0
frame net (std 3/4 in)	Black Bullhead	10.0	10.3	3.7		9.9		7.0	42.2		23.3	15.2
	Bluegill	4.0	4.7	1.5		1.5		0.3	4.5		20.5	5.3
	Common Carp							0.3	0.2			0.3
	Largemouth Bass										0.1	0.1
	Northern Pike	0.0	0.6	0.6		0.8					0.1	0.4
	Walleye					0.1					0.2	0.2
	Yellow Perch	10.0	3.9	1.4		0.1		0.2	2.5		2.2	2.9
std exp gill net	Black Bullhead	4.0	32.0	0.0		52.5		30.5	54.0			28.8
	Bluegill								0.5			0.5
	Northern Pike		2.5	0.5		1.5		0.5	1.5			1.3
	Walleye					0.0			3.0			1.5
	Yellow Perch	4.5	4.5	15.0		7.0		14.5	97.0			23.8

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 gill net	Black Bullhead	PSD										0
		PSD-P										0
	Bluegill	PSD										9
		PSD-P										0
	Northern Pike	PSD										100
		PSD-P										67
		Wr										92
	Walleye	PSD										100
		PSD-P										50
		Wr										90
	Yellow Perch	PSD										45
		PSD-P										0
		Wr										76
boat shocker (night)	Largemouth Bass	PSD	0	100	13	47	100		7	31		13
		PSD-P	0	100	0	6	46		7	4		2
		Wr		125	124	118	114		117	112		110
	Walleye	PSD		14		80			18	67		33
		PSD-P		0		0			0	0		33
		Wr		92		103			92	93		90
frame net (std 3/4 in)	Black Bullhead	PSD	46	97	86		2		94	99		97
		PSD-P	2	1	8		1		0	29		73
		Wr	98	88	89		91		100	88		87
	Bluegill	PSD	80	100	73		93		100	9		20
		PSD-P	5	60	67		47		33	9		0
		Wr	128	124	115		118		121	141		95
	Common Carp	PSD							0	100		
		PSD-P							0	0		
		Wr							122	108		
	Largemouth Bass	PSD										100
		PSD-P										0
		Wr										51
	Northern Pike	PSD	0	0	50		38					100

		PSD-P	0	0	0	0			0
		Wr		85	91	80			88
	Walleye	PSD				100			100
		PSD-P				100			50
		Wr				90			89
	Yellow Perch	PSD	51	90	86	0	0	52	36
		PSD-P	2	3	14	0	0	0	0
		Wr	101	99	96		130	90	82
std exp gill net	Black Bullhead	PSD	25	92	0	1	93	98	
		PSD-P	0	0	0	0	0	28	
		Wr	101	104		96	110		
	Bluegill	PSD						0	
		PSD-P						0	
		Wr						156	
	Northern Pike	PSD		0	0	100	100	100	
		PSD-P		0	0	33	100	67	
		Wr		93	104	95	92	101	
	Walleye	PSD				0		83	
		PSD-P				0		0	
		Wr						96	
	Yellow Perch	PSD	56	67	50	0	0	38	
		PSD-P	0	11	0	0	0	2	
		Wr	102	100	108	110	110	97	

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
2015	3	9	47 (2.3)	81 (3.6)	122 (3.4)							
2014	4	14	50 (1.8)	96 (2.9)	130 (3.2)	148 (3)						
2013	5	2	37 (5)	85 (2.5)	141 (6.8)	152 (7)	164 (8)					
2012	6	1	34	57	105	131	144	165				
2010	8	1	63	148	170	193	208	220	230	238		
Weighted Mean		27	48	91	129	150	170	193	230	238		

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2015	3	9										
2014	4	14										
2013	5	2										
2012	6	1										
2010	8	1										
Weighted Mean		27										

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	11	78 (4.3)									
2016	2	33	100 (3.5)	151 (4)								
2015	3	22	88 (3.2)	174 (5.3)	235 (5.5)							
2014	4	4	104 (4.2)	213 (7.6)	265 (9.9)	300 (7.5)						
2010	8	2	100 (25.5)	224 (95.4)	353 (33.2)	395 (14.5)	427 (10.9)	448 (7.8)	463 (6)	476 (3)		
Weighted Mean		72	93	166	248	332	427	448	463	476		

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2017	1	11										
2016	2	33										
2015	3	22										
2014	4	4										
2010	8	2										
Weighted Mean		72										

Species: Walleye

Year Class	Age	N	Mean back-calculated length (SE) at age 1	2	3	4	5	6	7	8	9	10
2017	1	17	124 (3)									
2016	2	4	123 (4.7)	144 (19.8)								
Weighted Mean		21	124	144								

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2017	1	17										
2016	2	4										
Weighted Mean		21										

Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2016	2	7	76 (2.2)	131 (2.7)								
2015	3	5	85 (3.8)	139 (10.9)	166 (7.9)							
2015	3	12	84 (2.3)	141 (4.4)	168 (4)							
2014	4	3	105 (8)	162 (19.4)	190 (17.9)	209 (14.7)						
2014	4	9	100 (2.6)	156 (2.5)	185 (2.9)	203 (2.6)						
2013	5	3	111 (2.5)	176 (2.4)	203 (1.9)	223 (.8)	236 (.5)					
2013	5	7	109 (4.5)	175 (5.1)	201 (3.5)	218 (2.5)	231 (2.6)					
Weighted Mean		46	93	151	182	211	233					

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2016	2	7										
2015	3	5										
2015	3	12										
2014	4	3										
2014	4	9										
2013	5	3										
2013	5	7										
Weighted Mean		46										

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	191			131 (111)	150 (72)	169 (6)	173 (1)		240 (1)		
2016	44		114 (20)	126 (20)			202 (1)	212 (2)		223 (1)	
2015	3		172 (2)	209 (1)							
2013	15		115 (1)	164 (4)	185 (3)	227 (1)	227 (1)	234 (2)	243 (1)	243 (2)	
2011	16	83 (5)		202 (2)		220 (4)	228 (2)	229 (3)			
2010	47		186 (9)		199 (14)	206 (22)				233 (1)	
2009	40		158 (33)	165 (2)	183 (1)	199 (2)	196 (2)				

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	183	180 (20)	226 (133)	300 (24)	345 (4)				487 (2)		
2016	106	184 (66)	212 (14)	295 (18)	322 (6)	411 (1)	446 (1)				
2015	61	232 (57)				441 (4)					
2013	24		335 (4)	380 (17)	393 (3)						
2012	29	191 (17)	314 (10)	346 (1)		440 (1)					
2011	8	277 (8)									
2010	2		405 (1)	384 (1)							

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	4				424 (1)	509 (2)	525 (1)				
2016	6		281 (1)		421 (5)						
2013	2		222 (2)								

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	44		148 (9)	182 (16)	209 (11)	236 (8)					
2016	215	114 (21)	191 (120)	201 (57)	225 (10)	253 (7)					
2015	29	160 (25)	182 (4)								
2013	14		150 (8)	169 (2)	180 (3)		195 (1)				
2011	36	98 (4)	140 (12)	204 (14)	225 (4)	232 (2)					
2010	9		195 (5)	231 (3)	260 (1)						
2009	1			236 (1)							

Fish Condition

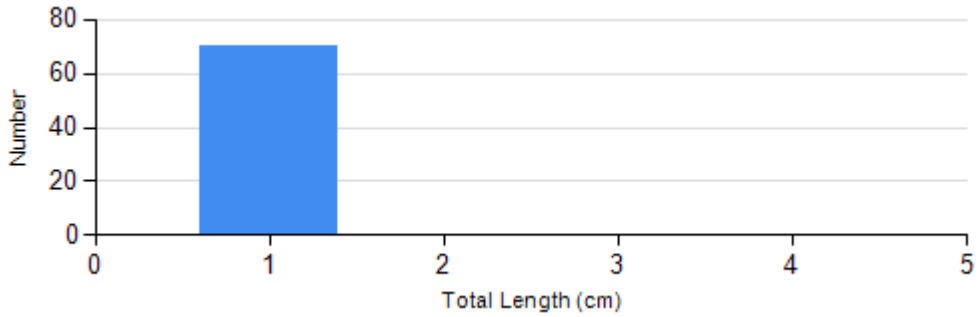
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2015	4	107 (5.7)	57	110 (1.4)	0		0	
Bluegill Frame Net	2015	0		2	125 (0.0)	1	115	0	
	2016	41	146 (14.8)	0		4	117 (3.4)	0	
	2018	165	94 (0.9)	39	99 (2.0)	1	110	0	
Largemouth Bass Electro Fishing	2015	53	117 (1.3)	0		4	118 (3.7)	0	
	2016	33	111 (1.4)	13	116 (1.9)	2	95 (3.2)	0	
	2018	143	109 (0.9)	18	114 (1.8)	3	126 (5.5)	0	
Northern Pike Gill Net	2015	0		0		1	92	0	
	2016	0		1		1	103	1	99
	2018	0		1	99	2	89 (3.0)	0	
Walleye Gill Net	2016	1		5	96	0		0	
	2018	0		2	88 (0.3)	2	91 (0.9)	0	
Yellow Perch Gill Net	2015	29	110 (1.8)	0		0		0	
	2016	120	99 (0.8)	70	95 (1.2)	4	91	0	
	2018	24	67 (2.3)	20	86 (4.4)	0		0	

Length Frequency Distribution

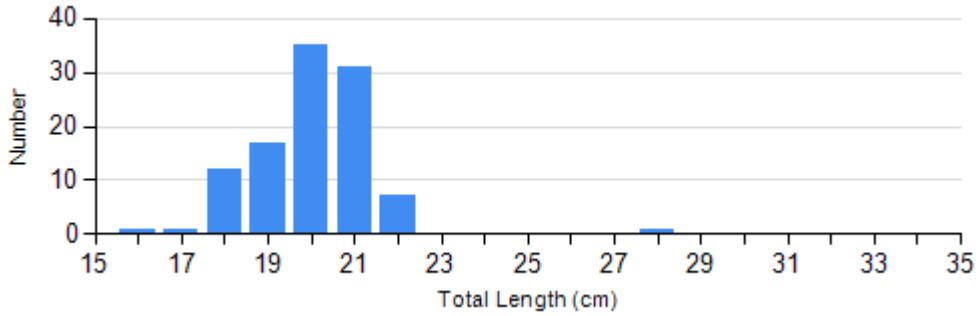
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

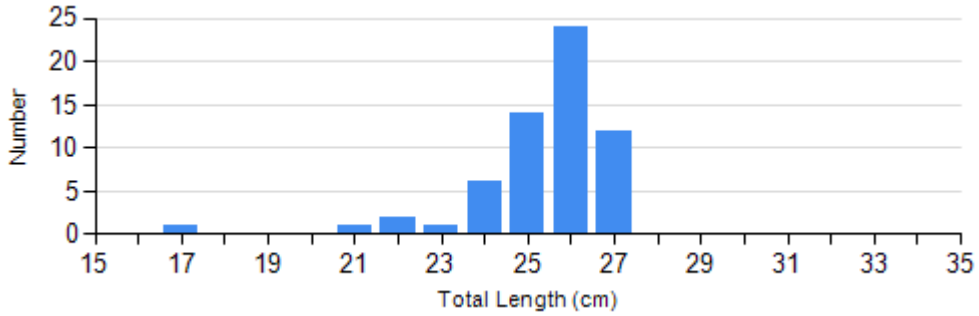


2018

Species: Black Bullhead
Gear: std exp gill net



2013



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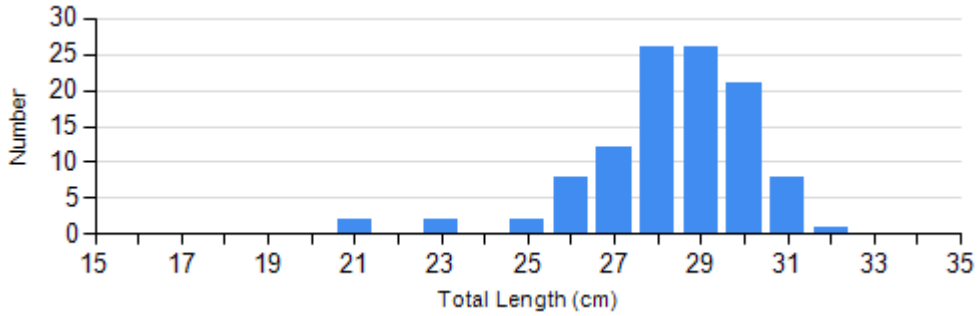
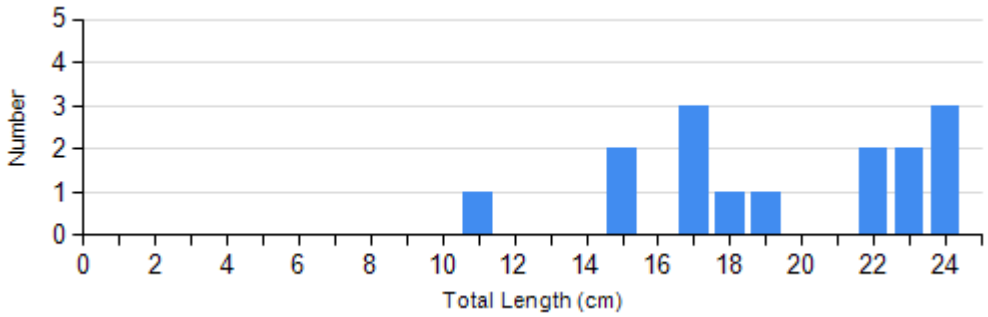
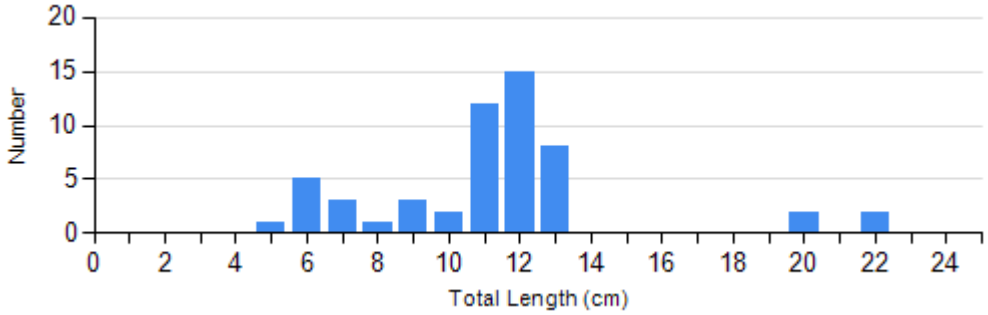


2016

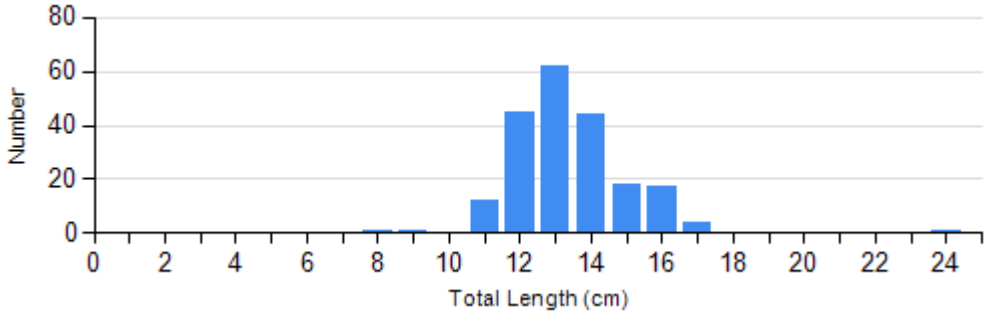
Species: Bluegill
Gear: frame net (std 3/4 in)



2013

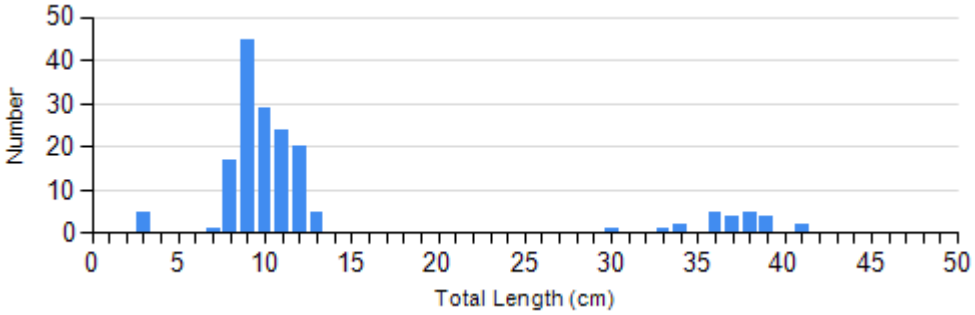


2016

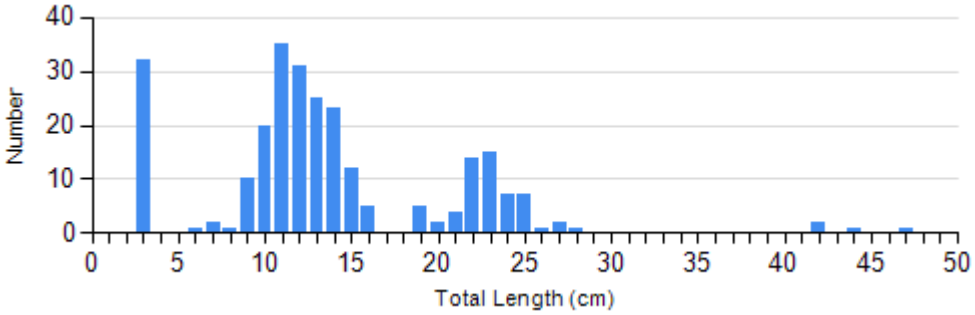


2018

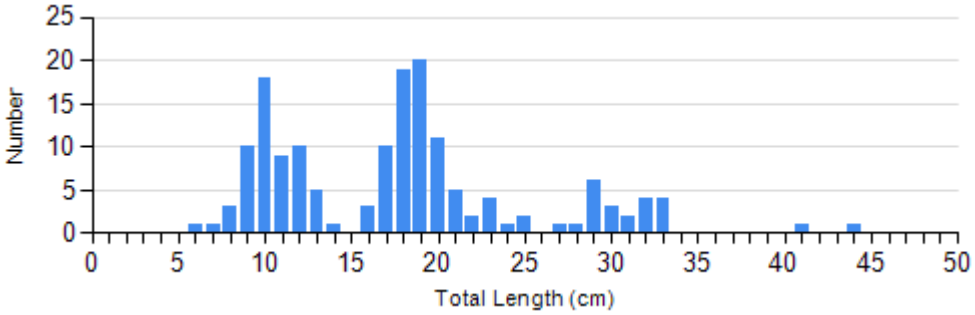
Species: Largemouth Bass
Gear: boat shocker (night)



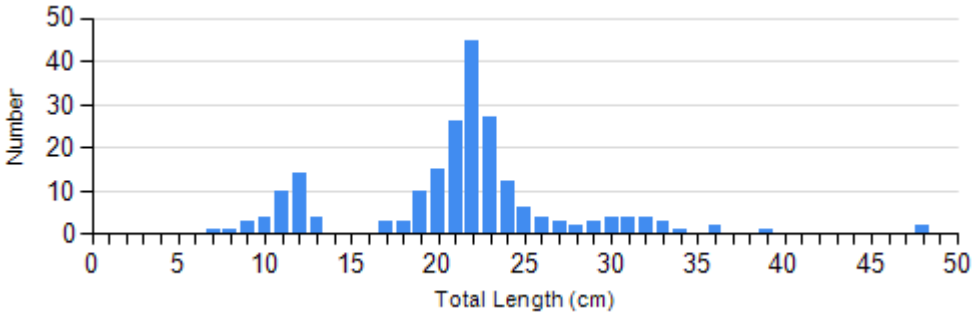
2013



2015

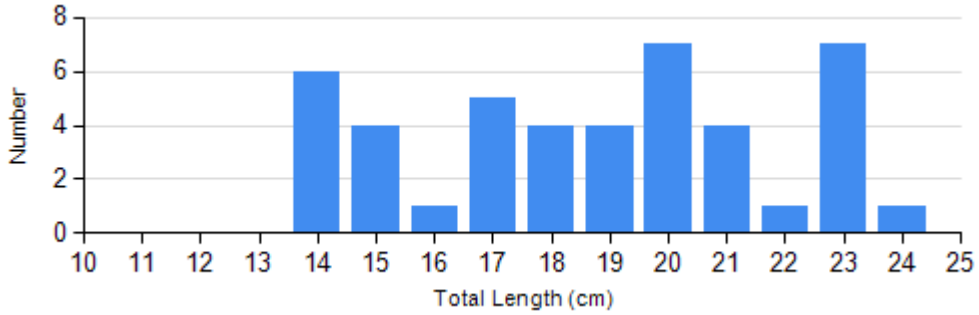


2016



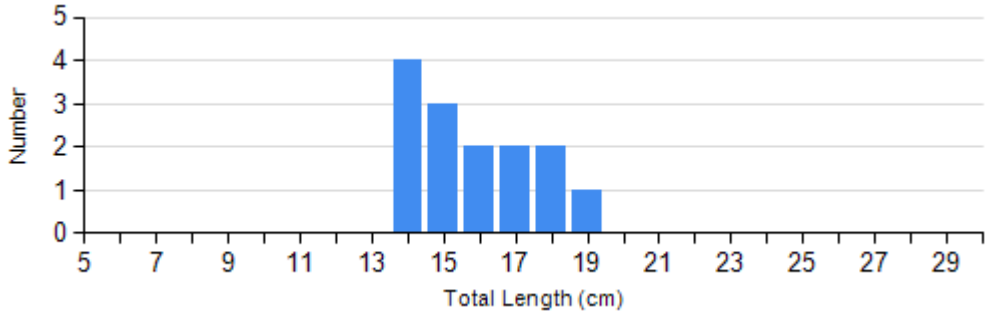
2018

Species: Yellow Perch
Gear: AFS std gill net

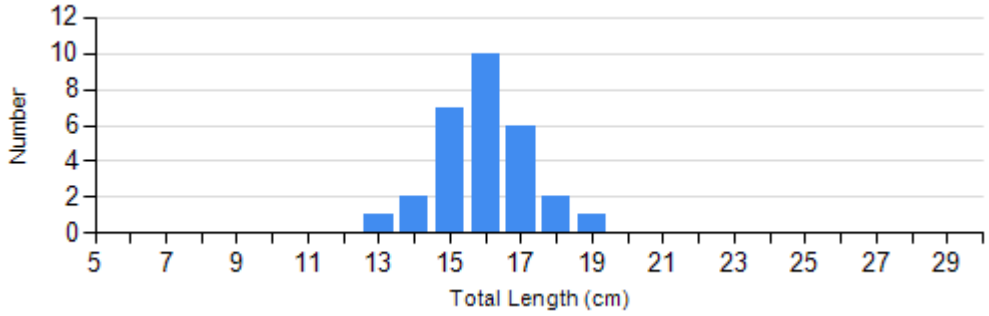


2018

Species: Yellow Perch
Gear: std exp gill net



2013



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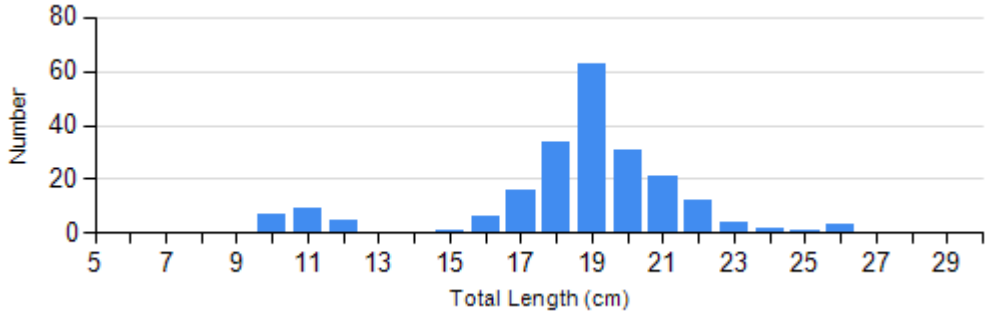
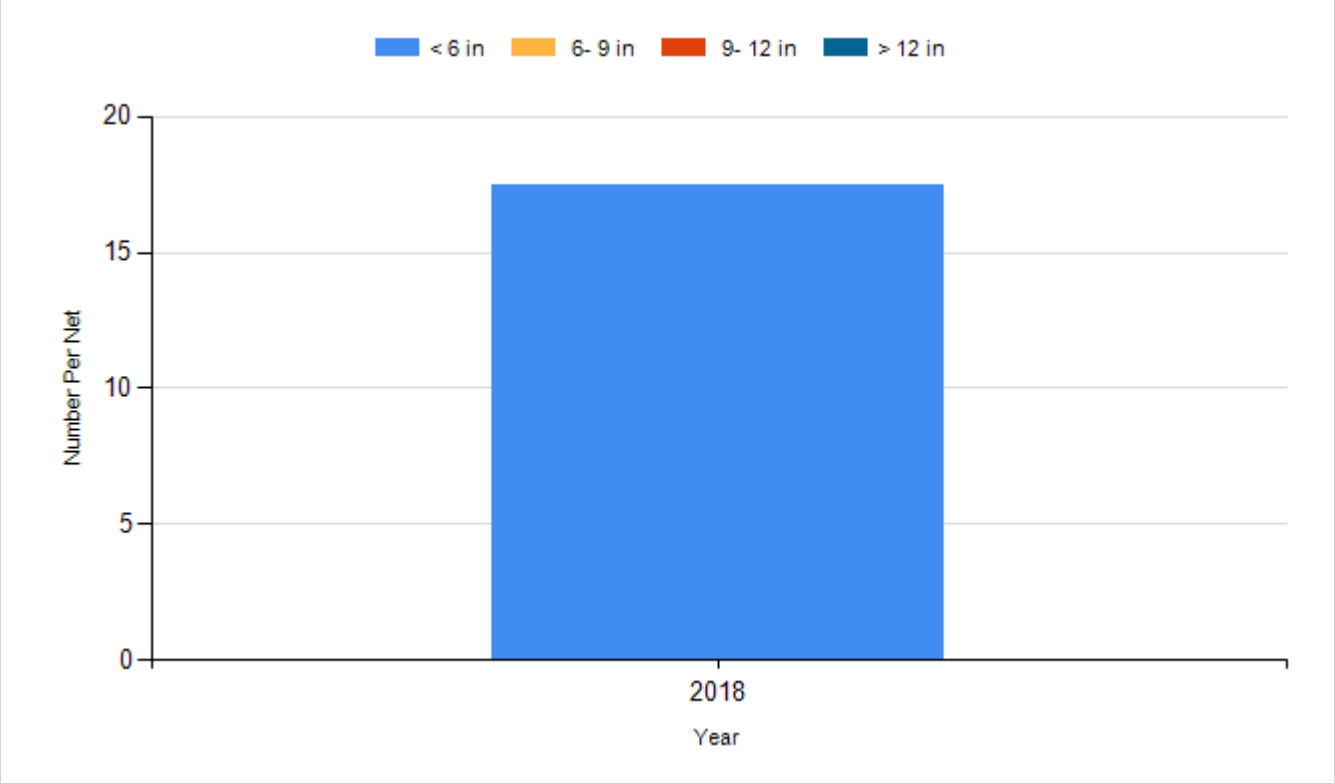


2016

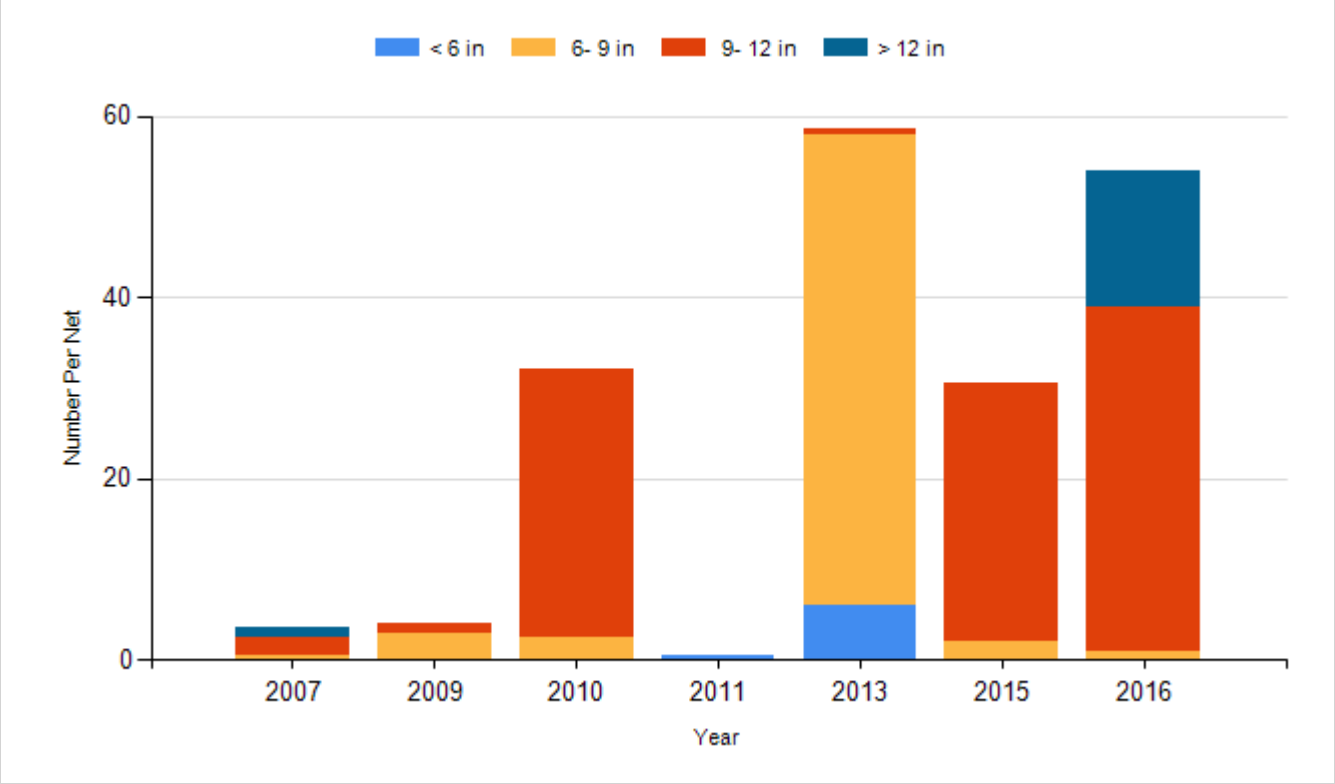
Historic Fish Sizes and Relative Abundance

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

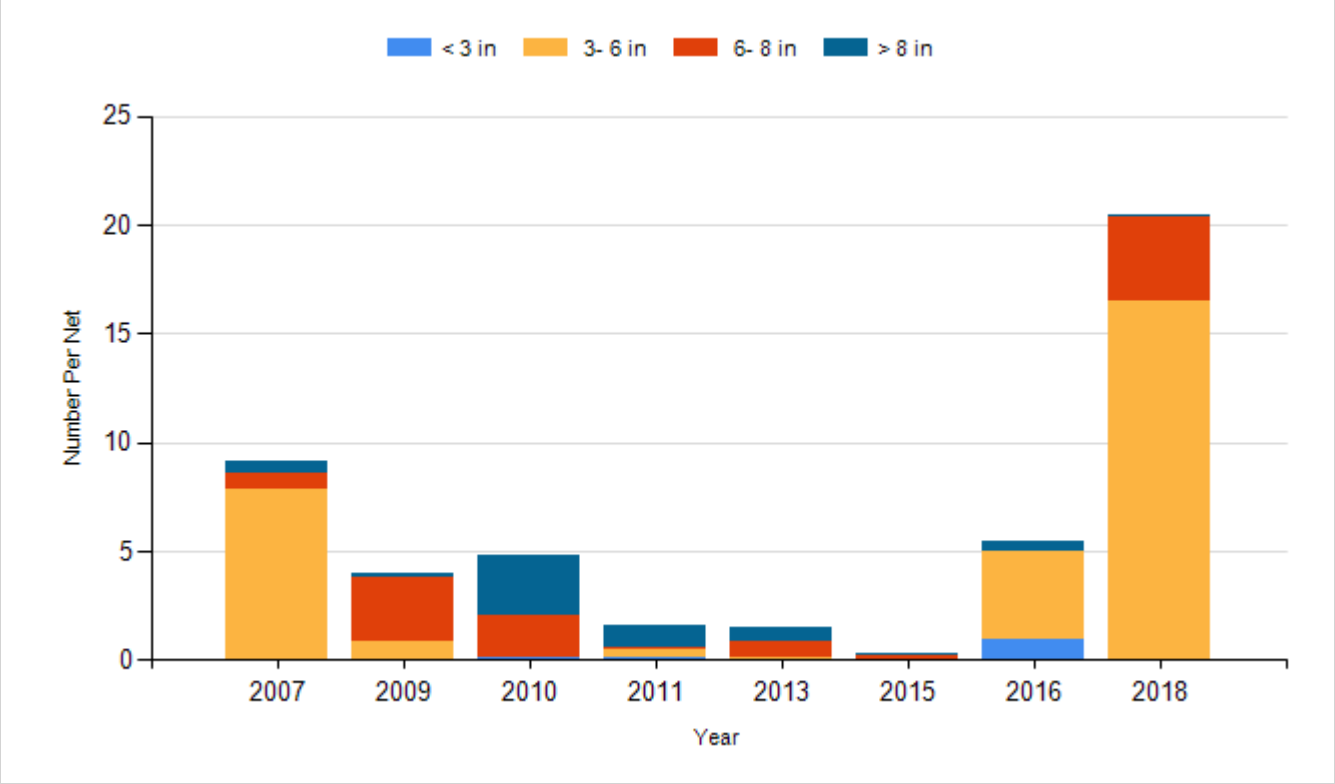
Species: Black Bullhead
Gear: AFS std gill net



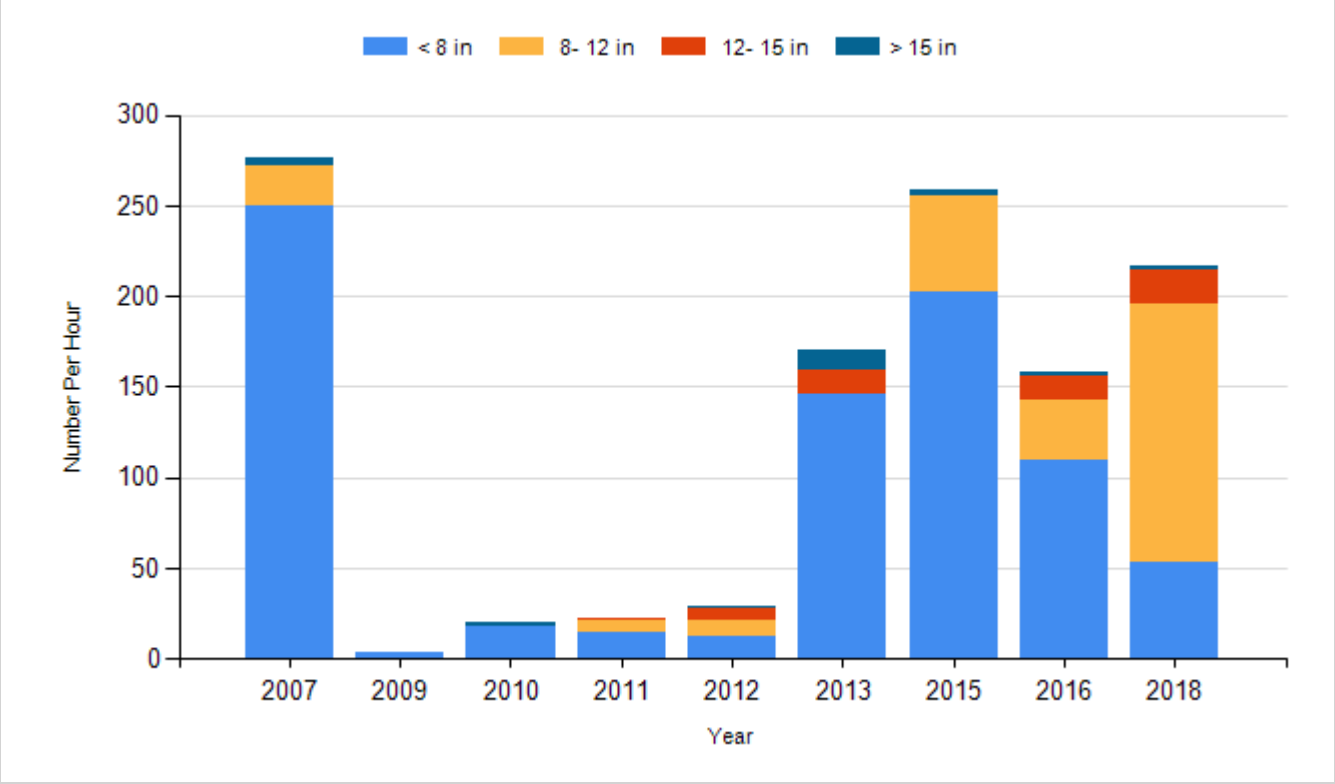
Species: Black Bullhead
Gear: std exp gill net



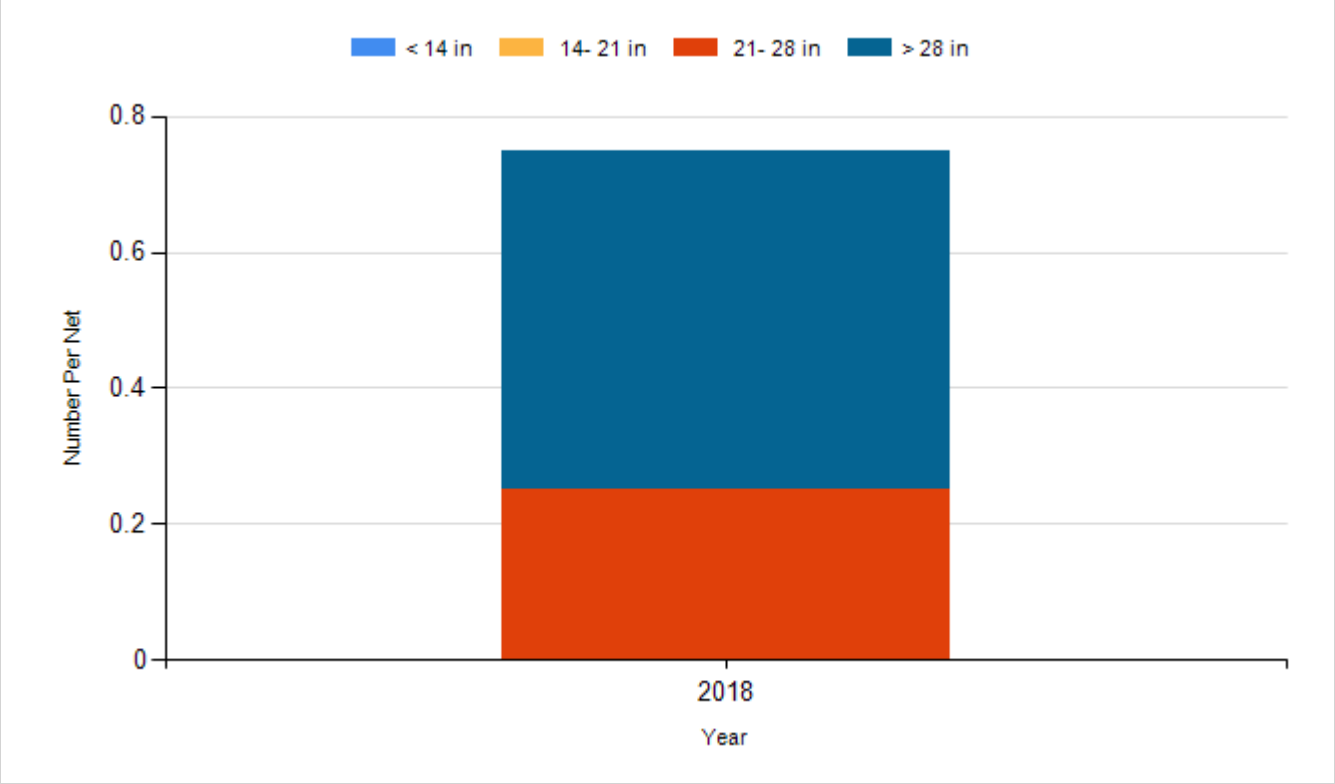
Species: Bluegill
Gear: frame net (std 3/4 in)



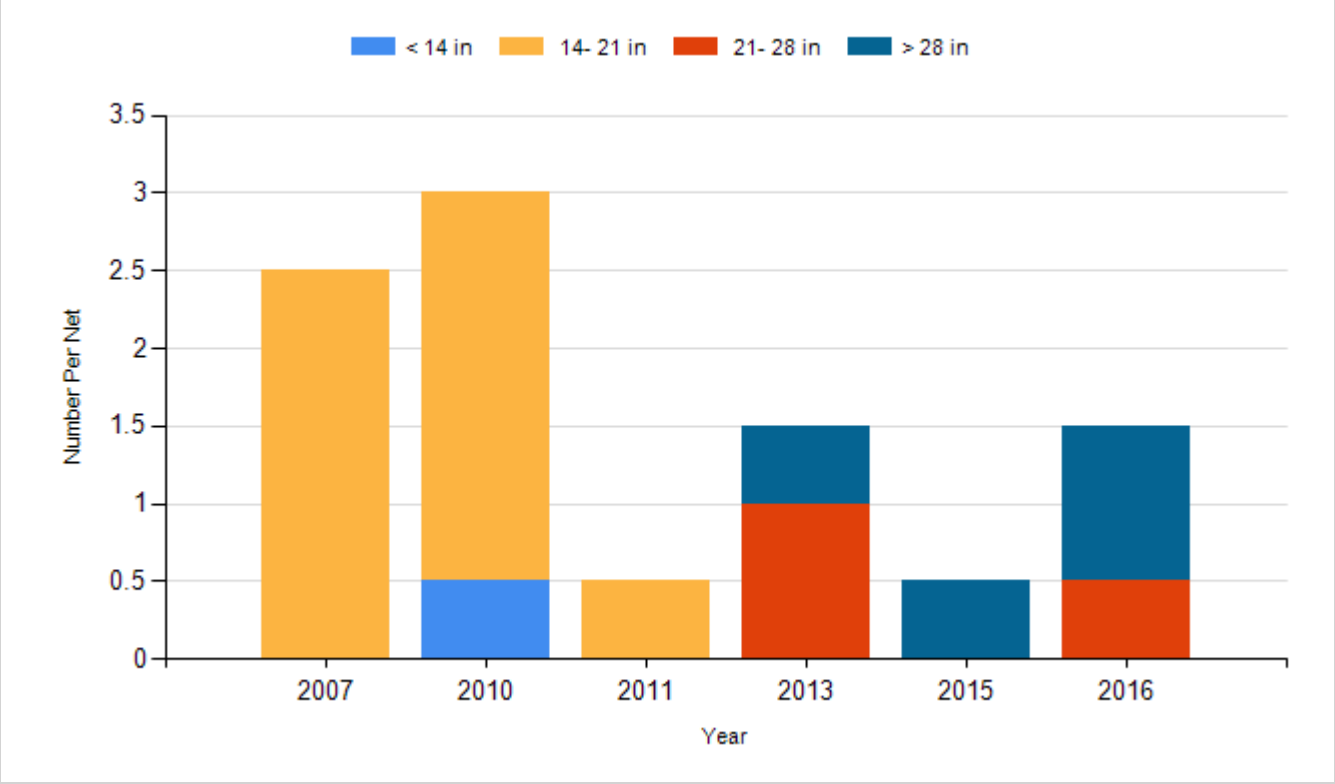
Species: Largemouth Bass
Gear: boat shocker (night)



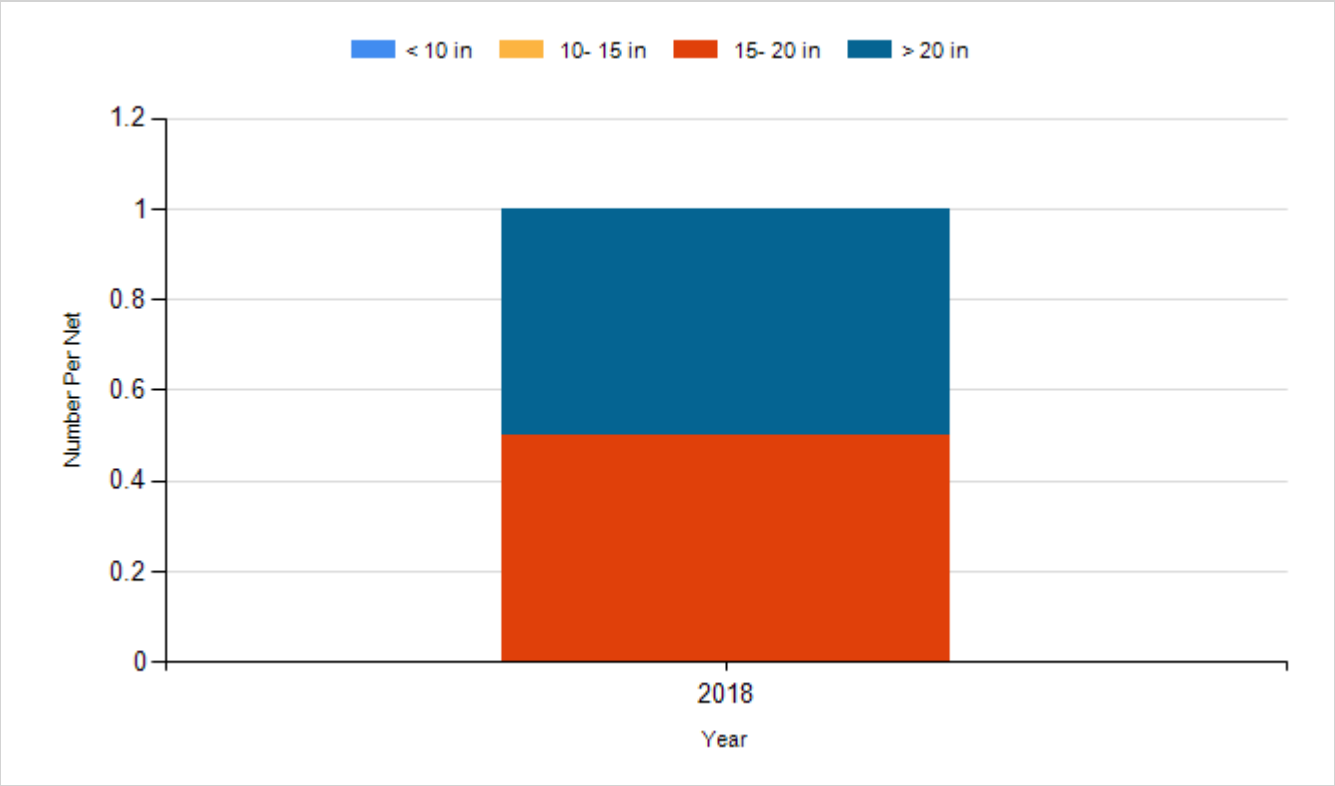
Species: Northern Pike
Gear: AFS std gill net



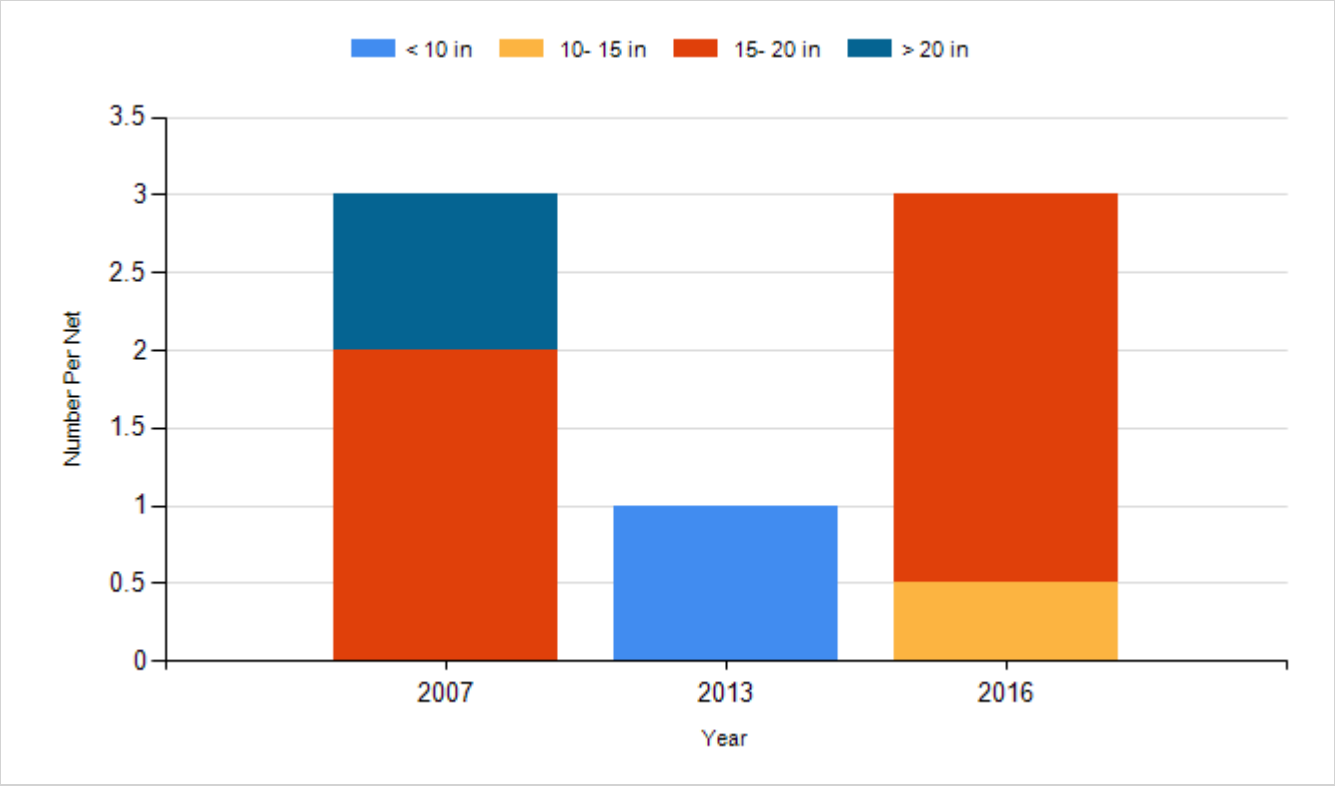
Species: Northern Pike
Gear: std exp gill net



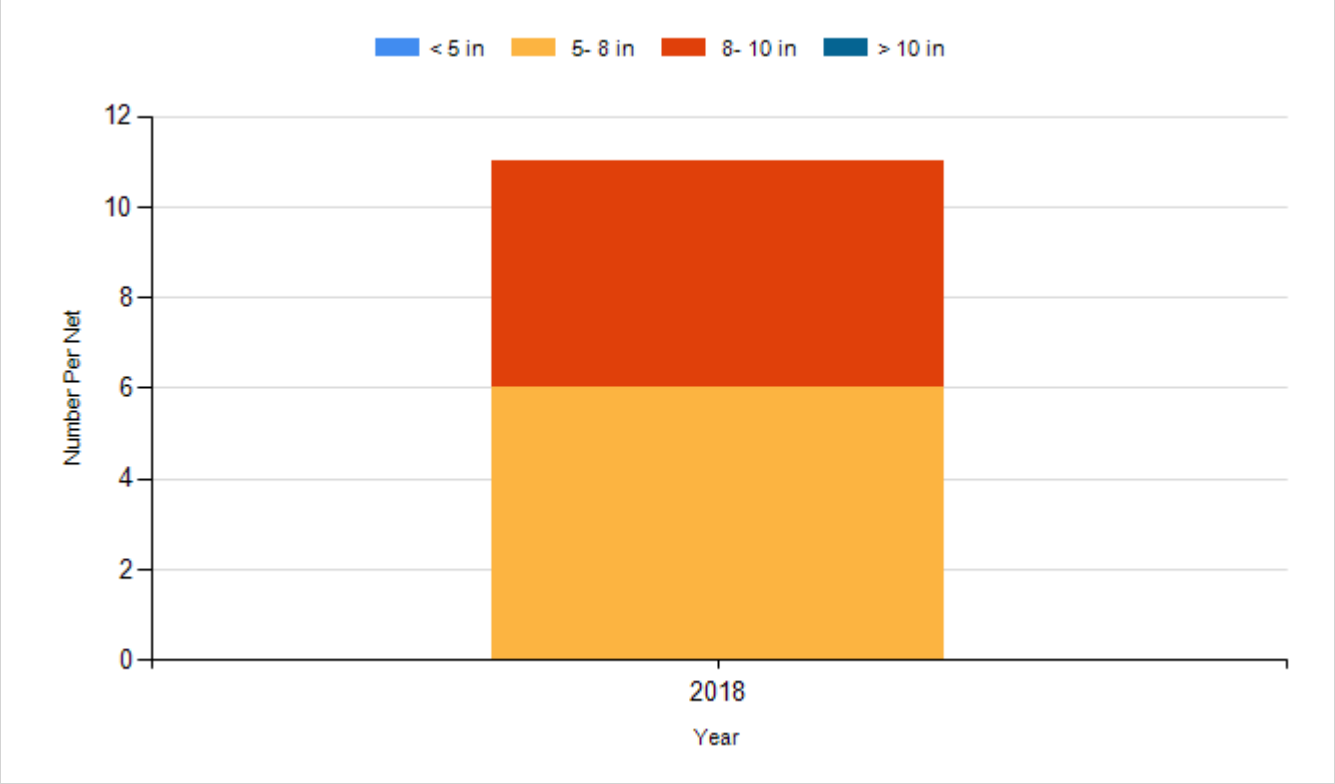
Species: Walleye
Gear: AFS std gill net



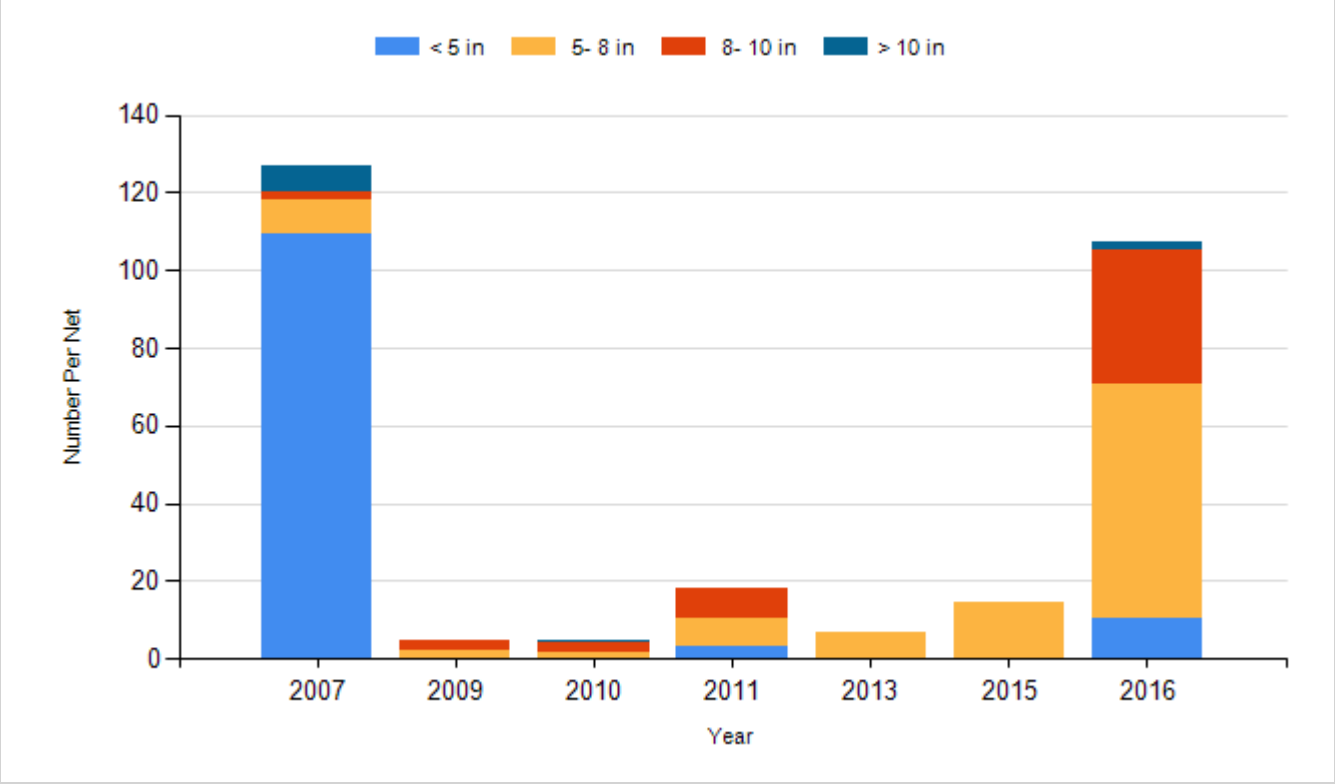
Species: Walleye
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



Species: Yellow Perch
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2010	Walleye	Small Fingerling	23,360
2012	Largemouth Bass	Fingerling	5,640
2012	Walleye	Large Fingerling	1,630
2014	Walleye	Large Fingerling	1,613
2017	Walleye	Large Fingerling	2,200