Lake Louise Survey Summary

Lake Louise is a 163-acre prairie impoundment located northwest of Miller, South Dakota. Louise is 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. Adjacent to the handicap dock and submerged are several commercially made plastic trees to help attract fish within casting distance of the dock.

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 at full pool, 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.

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. Reports of a winterkill (winter of 2018-19) and summer kill (2019) are common during years of increased vegetation growth and extreme temperature swings. All of these recent events have only been minor in severity.

- **Largemouth Bass:** The largemouth bass population continues to fluctuate. Only small largemouth bass were collected during the fall electrofishing survey in 2020. Many of these fish were age-1 (born in2019) with only a few larger, older largemouth bass collected. Larger fish are present as shown in the 2018 survey and anglers do catch larger fish. For some unknown reason, only a few larger fish were collected during the fall electrofishing survey in 2020. The plumpness and growth rates for largemouth bass are at or above average as well. Largemouth bass at the of age-3 averaged 9.5 inches in length.

- **Bluegill:** Bluegill abundance collected by frame nets averaged 4.4 fish/net-night in 2020 which was near the average of 5.5 fish/net-night. Condition or plumpness of the bluegill is very good. The average size increased to 7 inches with size ranging from 4.5 to 8.5 inches. Growth of bluegill was good and near the state average for growth with age-5 fish averaging 7.2 inches.

- **Yellow Perch:** Yellow perch abundance had a slight decrease in abundance, but average size had increased to 8.5 inches. Fish collected ranged in length from 5.5 to 11.5 inches. Plumpness was good especially for a small impoundment such as Lake Louise. Growth of yellow perch was near the statewide average for Lake Louise. Age-4 yellow perch averaged around 9 inches in length. Smaller, younger fish are in the population indicating production for future years.

- **Walleye:** 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. No natural reproduction of walleye occurs; thus, stocking is needed to maintain the population. During survey in 2020, no walleye were collected but a few were seen but not captured during fall electrofishing. Plans are to continue stocking.

- **Black Bullhead:** Black bullhead abundance in the 2020 survey has remained stable and low in population density. The average size was around 9 inches with fish ranging in size from 3 to 15 inches. This size of black bullhead can be a trophy catch for a child.

- **Northern Pike:** Northern pike were first seen in the 2003 survey and continues to provide a fishery since. Abundance has greatly increased from 0.8 fish/net (2018) to 8.3 fish/net (2020). The high spring water helped to allow an increase in the abundance. Northern pike ranging from 10 to 34 inches were collected with the average size at time of survey around 18 inches. Some northern pike weighing in the ‘teens can be found

- **Other Species:** Common carp were recently discovered in the lake during the 2015 survey. Common carp were collected in the 2016, 2018, and 2019 surveys as well. During the 2020 survey no common carp were collected or seen during survey

For more detailed results see the computer-generated South Dakota Statewide Fisheries Survey for Lake Louise below. Please contact South Dakota Game, Fish and Parks Ft. Pierre office – (605) 223-7705 for additional information.

Prepared 03-01-2021 by KDP

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Louise, Hand County
TUR-Lake-155-000
2020

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 09, 2020	2 net-nights
AFS std gill net	Jun 10, 2020	2 net-nights
boat shocker (night)	Sep 21, 2020	3600 seconds
frame net (std 3/4 in)	Jun 09, 2020	5 net-nights
frame net (std 3/4 in)	Jun 10, 2020	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	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
AFS std gill net	Black Bullhead	22	4.8	1.7	89		63	18	94	4
	Bluegill	1	0.3	0.4	0		0			
	Northern Pike	33	8.3	1.4	9		3		90	2
	Yellow Perch	17	4.3	2.7	76		6		95	2
boat shocker (night)	Largemouth Bass	133	12.0	10.5	0		0		121	3
frame net (std 3/4 in)	Black Bullhead	164	10.3	3.2	91	4	50	7	96	3
	Bluegill	44	4.4	3.6	86	8	9		113	2
	Northern Pike	40	3.6	1.2	14	9	3		86	1
	Yellow Perch	13	1.3	0.6	69		15		105	17

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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
AFS std gill net	Black Bullhead								0.0		4.8	2.40
	Bluegill								2.8		0.3	1.55
	Northern Pike								0.8		8.3	4.55
	Walleye								1.0		0.0	0.50
	Yellow Perch								11.0		4.3	7.65
boat shocker (day)	Black Bullhead									5.0		5.00
	Bluegill									58.0		58.00
	Common Carp									1.0		1.00
	Largemouth Bass									1.0		1.00
	Northern Pike									7.0		7.00
	Yellow Perch									20.0		20.00
boat shocker (night)	Largemouth Bass	8.0	17.0	24.0		57.0	48.0		164.0		12.0	47.14
	Walleye	0.0	5.0	0.0		12.0	6.0		33.0		0.0	8.00
frame net (std 3/4 in)	Black Bullhead	3.7		9.9		7.0	42.2		23.3		10.3	16.07
	Bluegill	1.5		1.5		0.3	4.5		20.5		4.4	5.45
	Common Carp	0.0		0.0		0.3	0.2		0.0		0.0	0.08
	Largemouth Bass	0.0		0.0		0.0	0.0		0.1		0.0	0.02
	Northern Pike	0.6		0.8		0.0	0.0		0.1		3.6	0.85
	Walleye	0.0		0.1		0.0	0.0		0.2		0.0	0.05
	Yellow Perch	1.4		0.1		0.2	2.5		2.2		1.3	1.28
std exp gill net	Black Bullhead	0.0		52.5		30.5	54.0					34.25
	Bluegill	0.0		0.0		0.0	0.5					0.13
	Northern Pike	0.5		1.5		0.5	1.5					1.00
	Walleye	0.0		0.0		0.0	3.0					0.75
	Yellow Perch	15.0		7.0		14.5	97.0					33.38

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
AFS std gill net	Black Bullhead	PSD								0		89
		PSD-P								0		63
		Wr										94
	Bluegill	PSD								9		0
		PSD-P								0		0
	Northern Pike	PSD								100		9
		PSD-P								67		3
		Wr								92		90
	Walleye	PSD								100		
		PSD-P								50		
		Wr								90		
	Yellow Perch	PSD								45		76
		PSD-P								0		6
		Wr								76		95
boat shocker (night)	Largemouth Bass	PSD	13	47	100		7	31		13		0
		PSD-P	0	6	46		7	4		2		0
		Wr	124	118	114		117	112		110		121
	Walleye	PSD		80			18	67		33		
		PSD-P		0			0	0		33		
		Wr		103			92	93		90		
frame net (std 3/4 in)	Black Bullhead	PSD	86		2		94	99		97		91
		PSD-P	8		1		0	29		73		50
		Wr	89		91		100	88		87		96
	Bluegill	PSD	73		93		100	9		20		86
		PSD-P	67		47		33	9		0		9
		Wr	115		118		121	141		95		113
	Common Carp	PSD					0	100				
		PSD-P					0	0				
		Wr					122	108				
	Largemouth Bass	PSD								100		
		PSD-P								0		
		Wr								51		

	Northern Pike	PSD	50	38			100	14
		PSD-P	0	0			0	3
		Wr	91	80			88	86
	Walleye	PSD		100			100	
		PSD-P		100			50	
		Wr		90			89	
	Yellow Perch	PSD	86	0	0	52	36	69
		PSD-P	14	0	0	0	0	15
		Wr	96		130	90	82	105
std exp gill net	Black Bullhead	PSD	0	1	93	98		
		PSD-P	0	0	0	28		
		Wr		96	110			
	Bluegill	PSD				0		
		PSD-P				0		
		Wr				156		
	Northern Pike	PSD	0	100	100	100		
		PSD-P	0	33	100	67		
		Wr	104	95	92	101		
	Walleye	PSD		0		83		
		PSD-P		0		0		
		Wr				96		
	Yellow Perch	PSD	50	0	0	38		
		PSD-P	0	0	0	2		
		Wr	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
2018	2	6	54 (1.2)	125 (1.2)								
2017	3	3	42 (1.3)	97 (12.6)	158 (7.1)							
2016	4	8	44 (1.6)	85 (5.7)	127 (6.4)	158 (5.5)						
2015	5	12	43 (2.2)	87 (5.2)	128 (3.8)	155 (3)	176 (2.2)					
2014	6	7	48 (2.7)	98 (5)	143 (2.8)	162 (2.7)	180 (2.9)	192 (2.1)				
2013	7	1	47	75	110	144	188	200	211			
Weighted Mean		37	46	95	133	157	178	193	211			

Species: Largemouth Bass

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2020	0	2										
2019	1	10	94 (3.8)									
2018	2	6	100 (6.9)	169 (10.4)								
2017	3	4	93 (4)	152 (9.6)	211 (4.6)							
2016	4	3	85 (6.2)	146 (15.4)	190 (14.9)	232 (8)						
Weighted Mean		25	94	158	202	232						

Species: Yellow Perch

Year Class	Age	N	Mean back-calculated length (SE) at age								
			1	2	3	4	5	6	7	8	9	10
2018	2	1	74	141								
2017	3	4	81 (3.5)	134 (5.5)	166 (9)							
2016	4	4	82 (1.4)	133 (5.5)	183 (8.2)	211 (8.2)						
2015	5	1	72	134	166	209	235					
2014	6	1	79	130	165	199	247	264				
2013	7	1	76	117	151	183	226	246	257			
Weighted Mean		12	79	133	171	205	236	255	257			

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+
2020	44		142 (6)	169 (3)	171 (10)	182 (16)	198 (8)	215 (1)			
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)			

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	97	147 (80)	196 (11)	240 (4)	268 (3)						
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)									

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+
2020	16		155 (4)		226 (9)	265 (2)	215 (1)				
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)					

Fish Condition

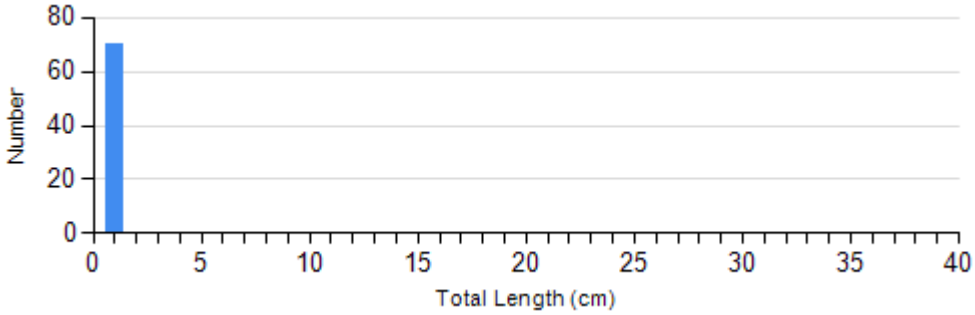
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2020	2	76 (4.1)	5	86 (3.5)	12	100 (3.2)	0	
Bluegill Frame Net	2016	41	146 (14.8)	0		4	117 (3.4)	0	
	2018	165	94 (0.9)	39	99 (2.0)	1	110	0	
	2020	6	127 (4.1)	34	111 (1.2)	4	108 (5.1)	0	
Largemouth Bass Electro Fishing	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	
	2020	12	121 (2.4)	0		0		0	
Northern Pike Gill Net	2016	0		1		1	103	1	99
	2018	0		1	99	2	89 (3.0)	0	
	2020	30	89 (1.3)	2	95 (7.2)	1	110	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	2016	120	99 (0.8)	70	95 (1.2)	4	91	0	
	2018	24	67 (2.3)	20	86 (4.4)	0		0	
	2020	4	103 (3.5)	12	94 (1.6)	1	81	0	

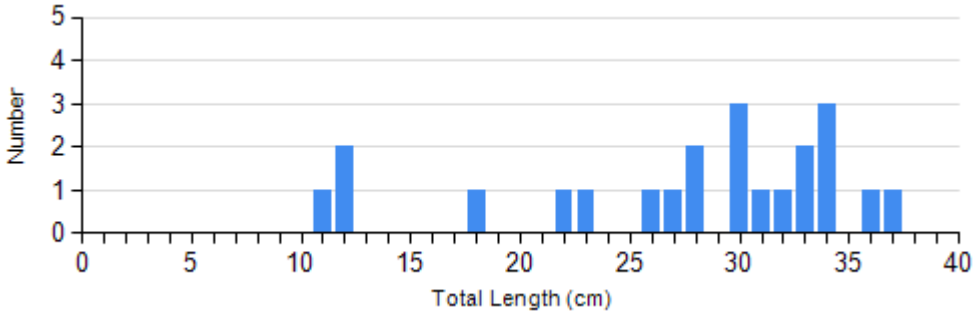
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

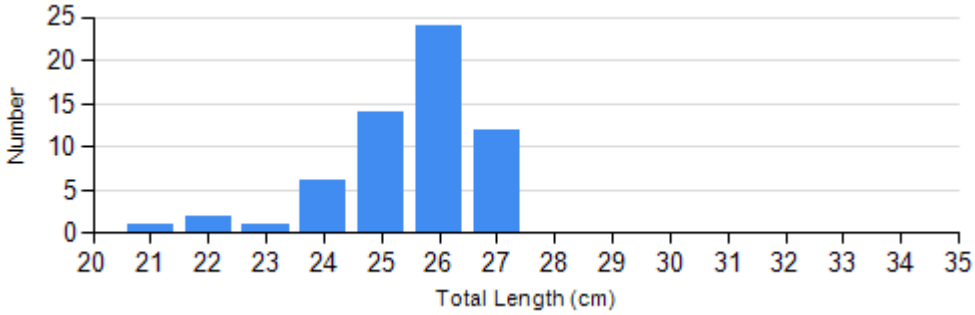


2018

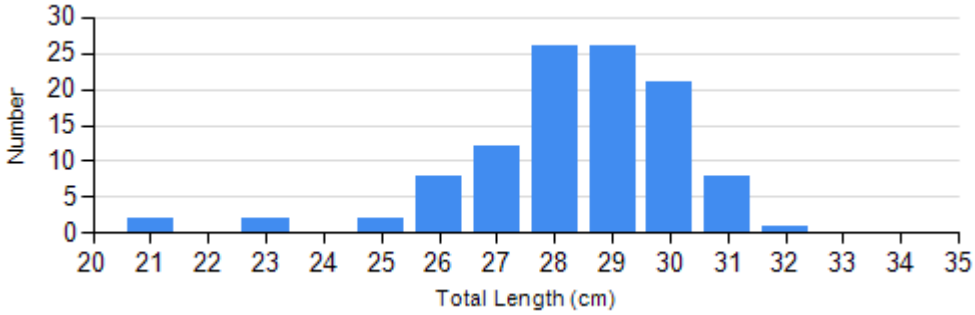


2020

Species: Black Bullhead
Gear: std exp gill net

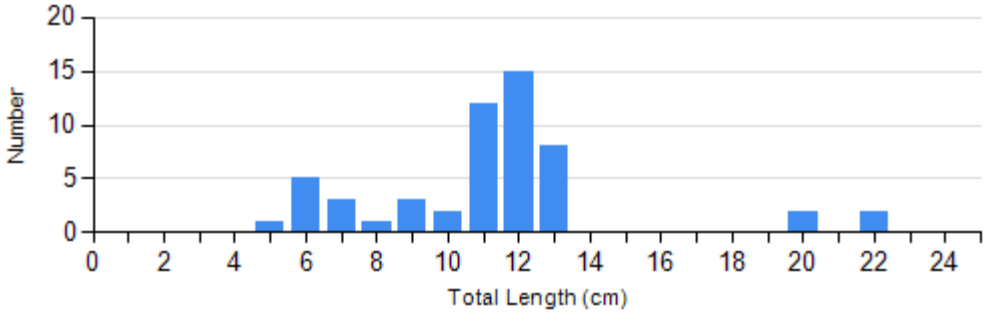


2015

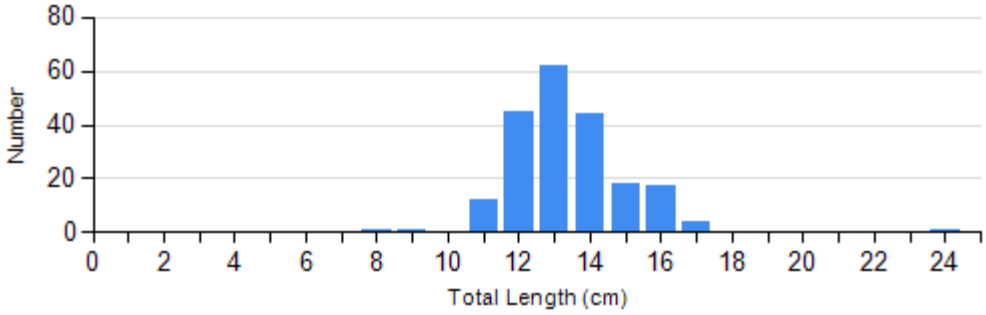


2016

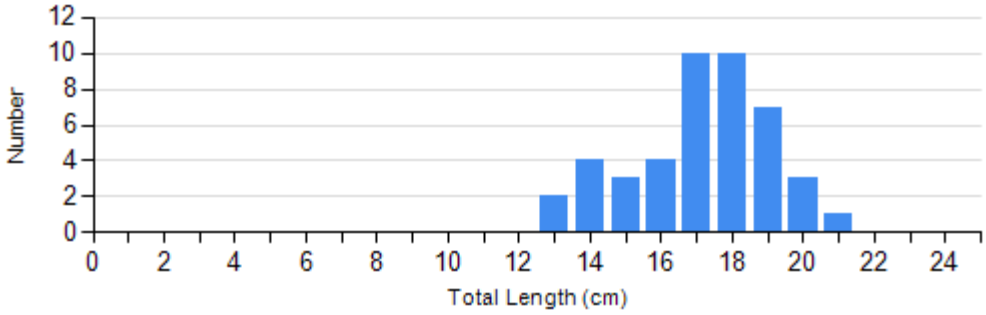
Species: Bluegill
Gear: frame net (std 3/4 in)



2016

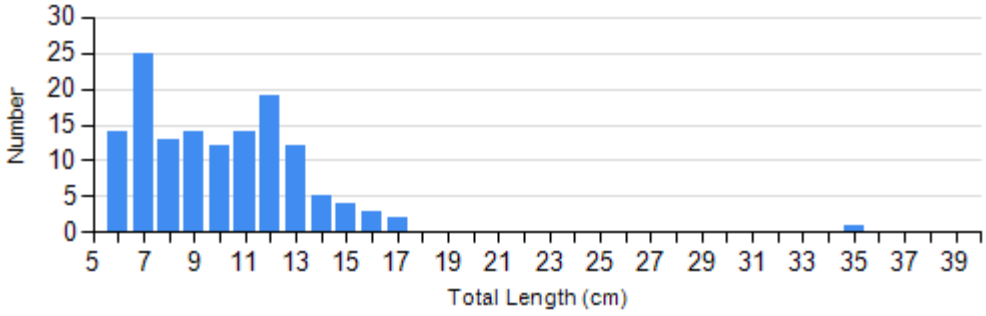


2018



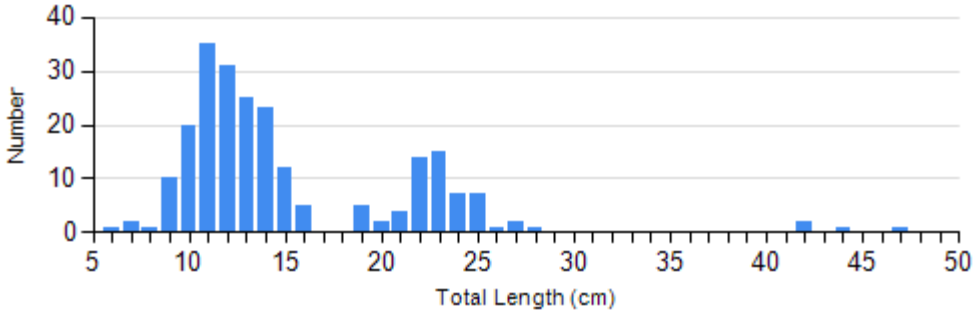
2020

Species: Largemouth Bass
Gear: boat shocker (day)

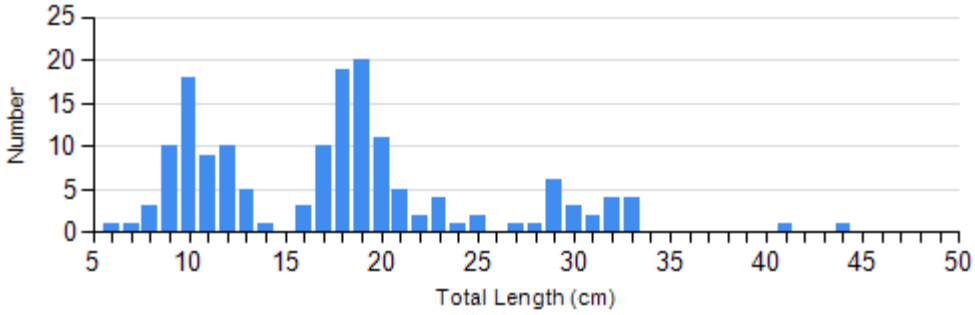


2019

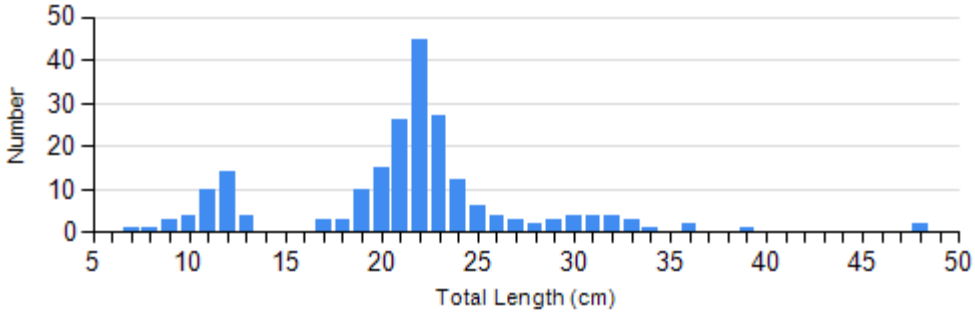
Species: Largemouth Bass
Gear: boat shocker (night)



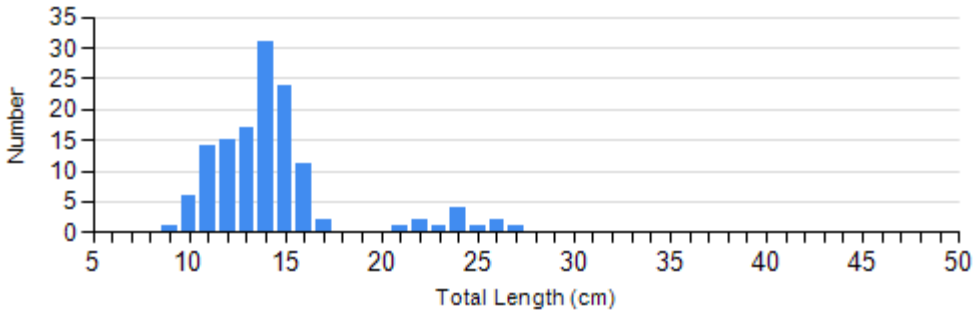
2015



2016

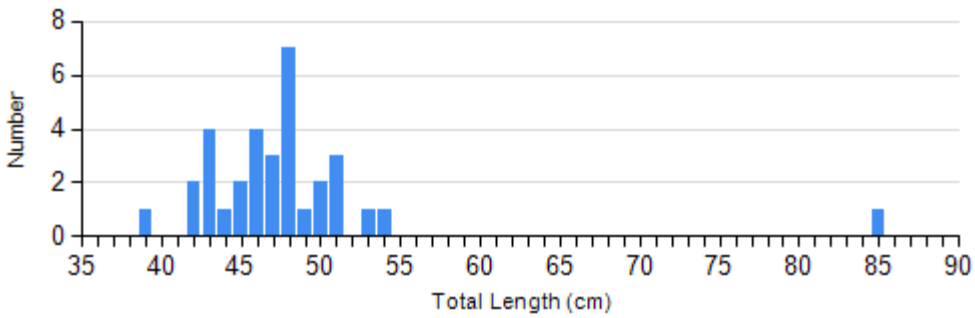


2018



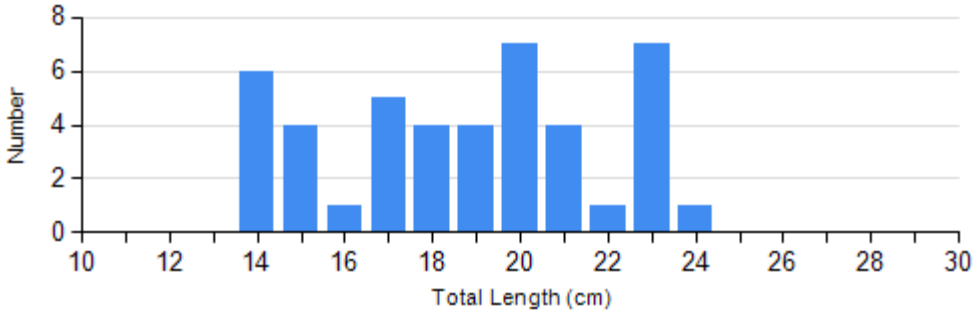
2020

Species: Northern Pike
Gear: AFS std gill net

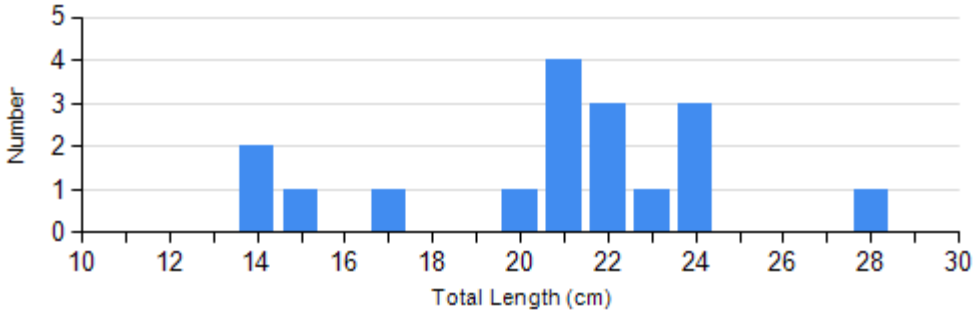


2020

Species: Yellow Perch
Gear: AFS std gill net

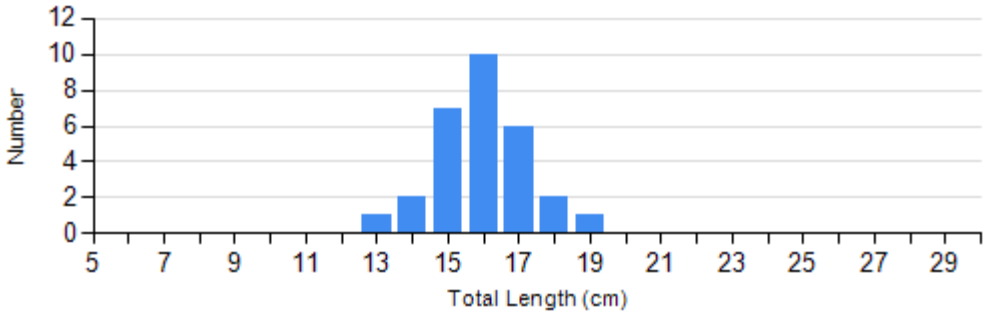


2018

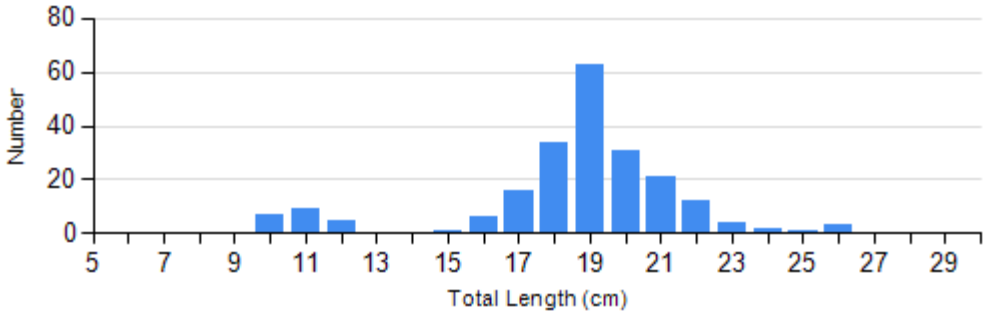


2020

Species: Yellow Perch
Gear: std exp gill net



2015

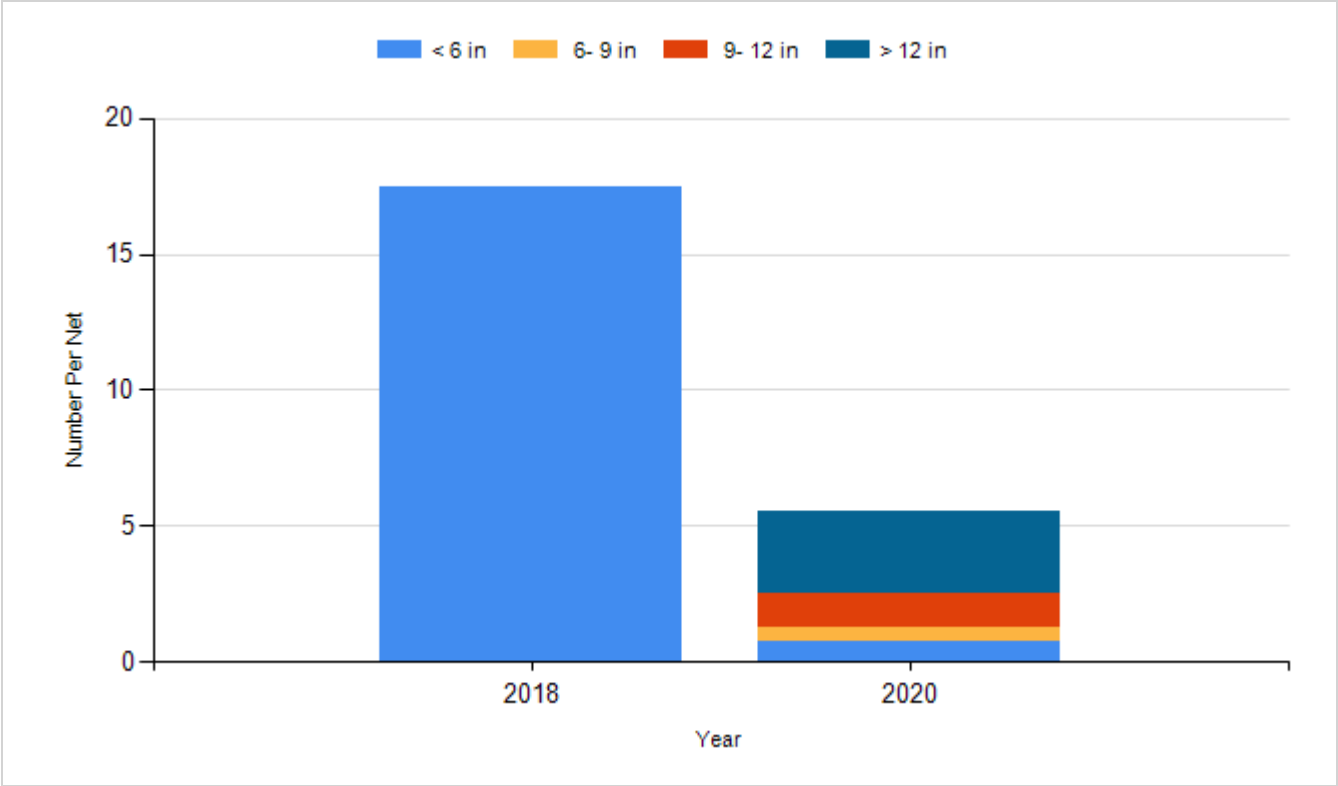


2016

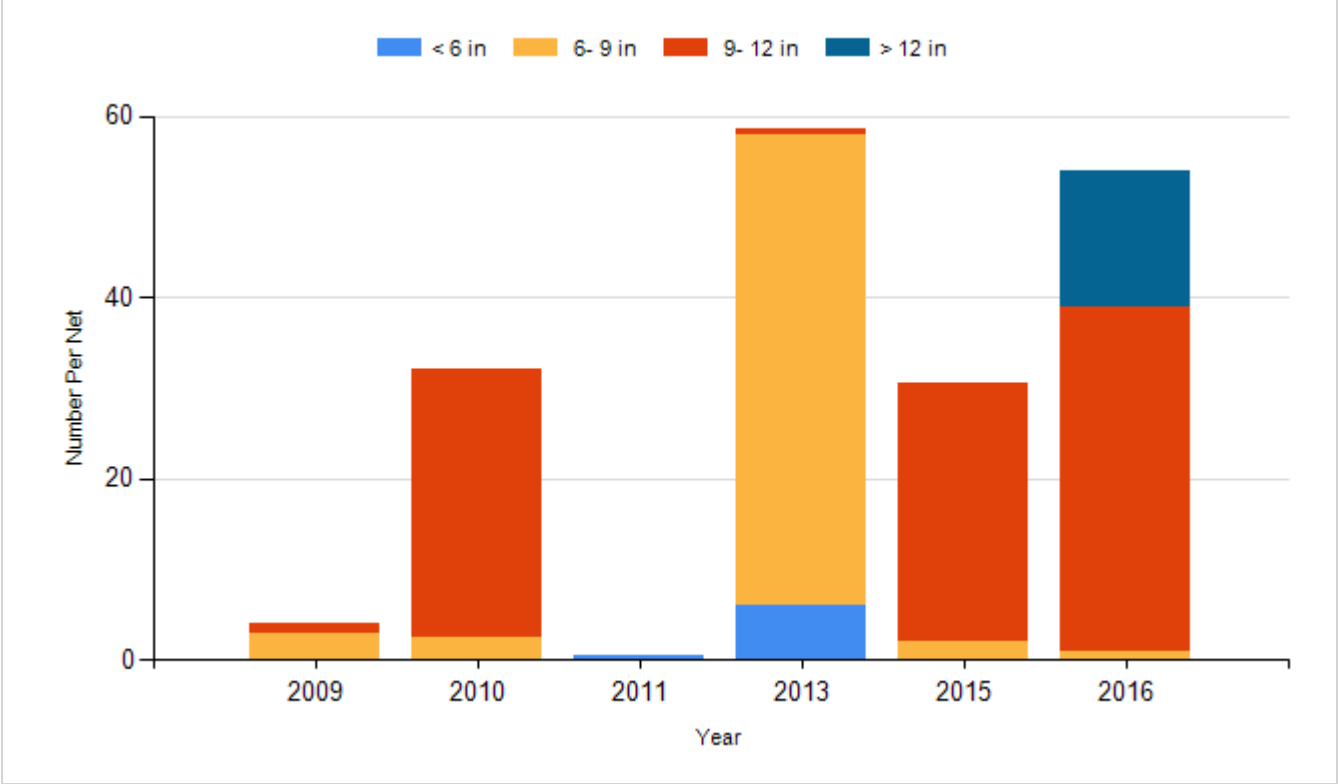
Historic Fish Sizes and Relative Abundance

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

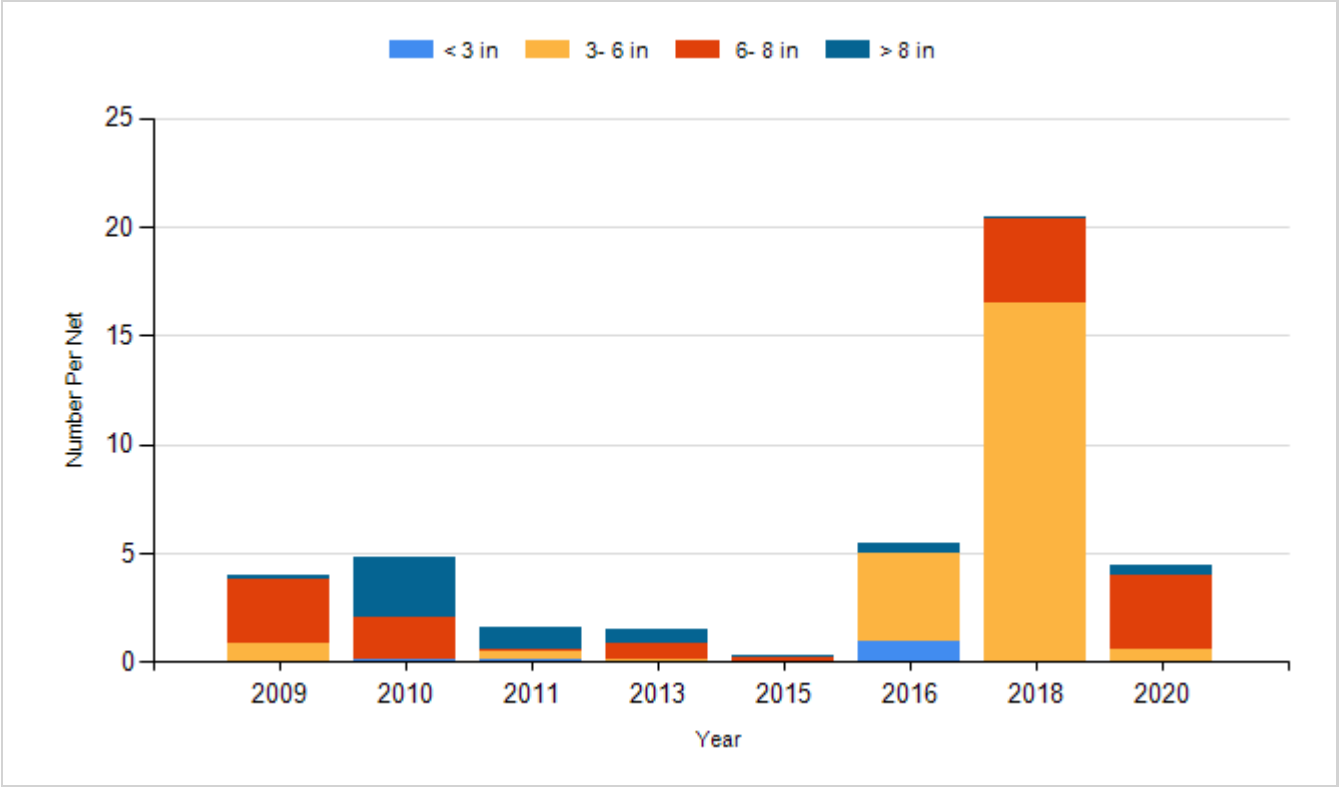
Species: Black Bullhead
Gear: AFS std gill net



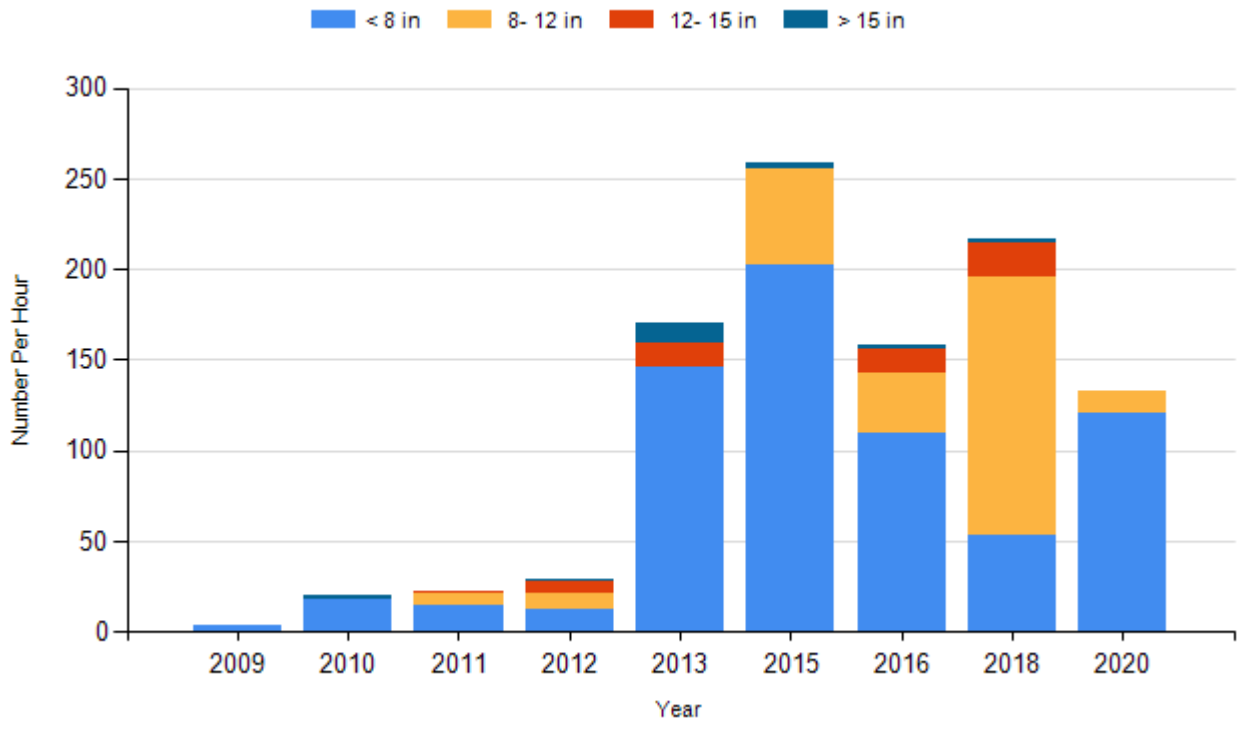
Species: Black Bullhead
Gear: std exp gill net



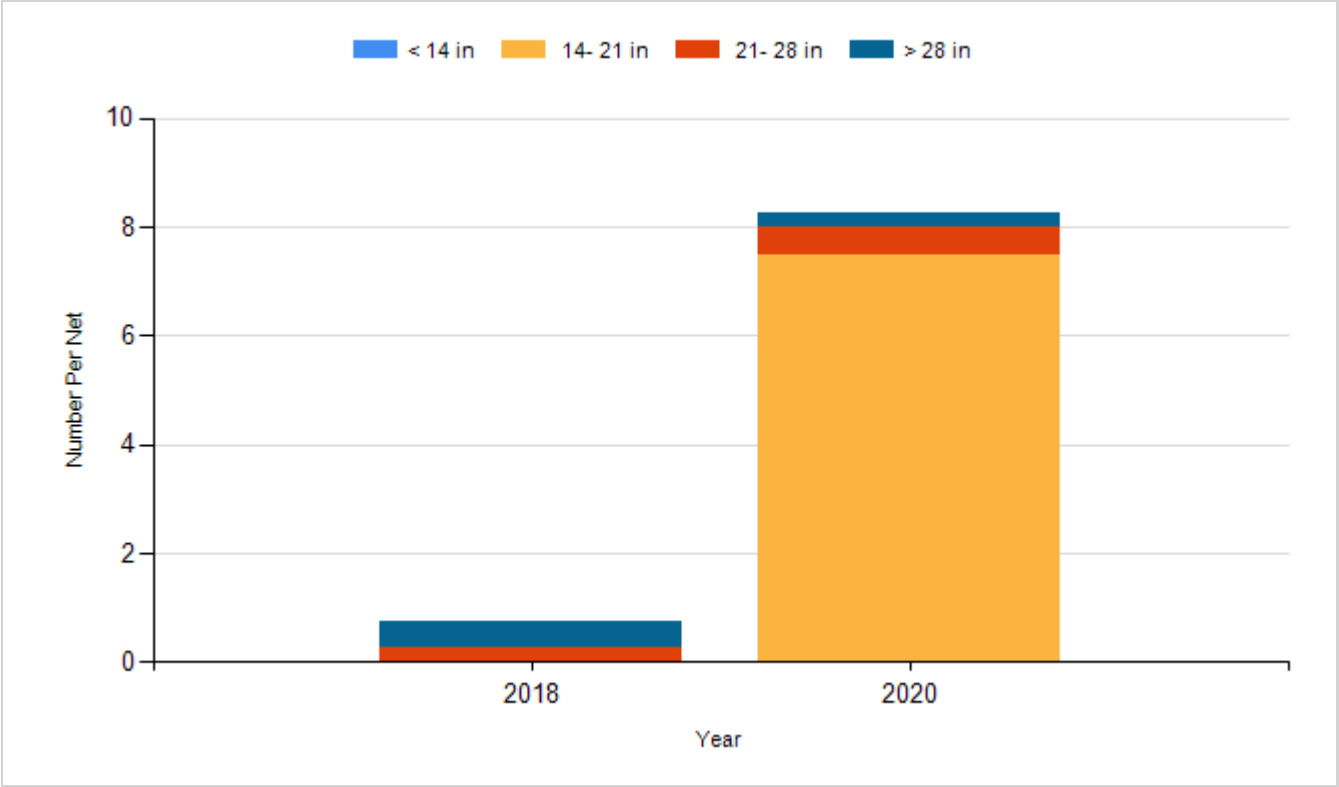
Species: Bluegill
Gear: frame net (std 3/4 in)



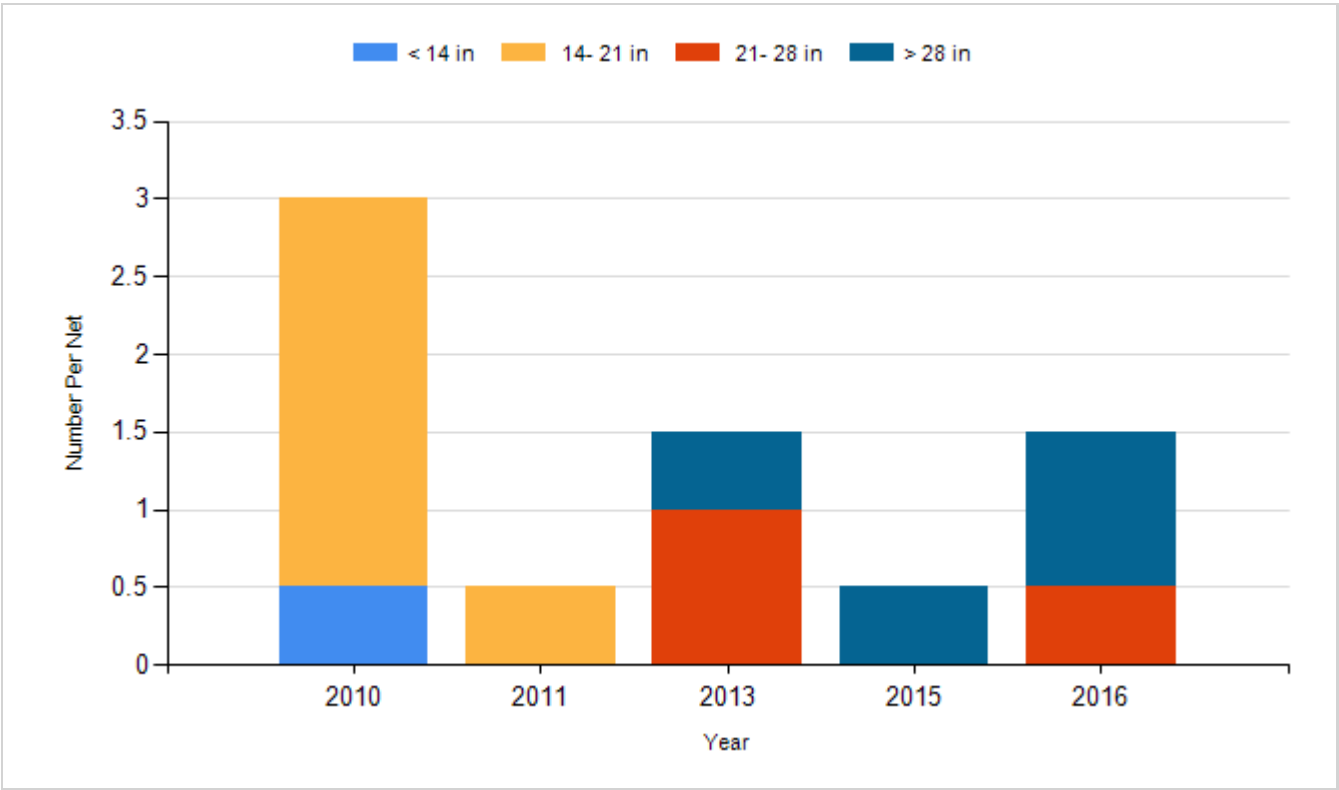
Species: Largemouth Bass
Gear: boat shocker (night)



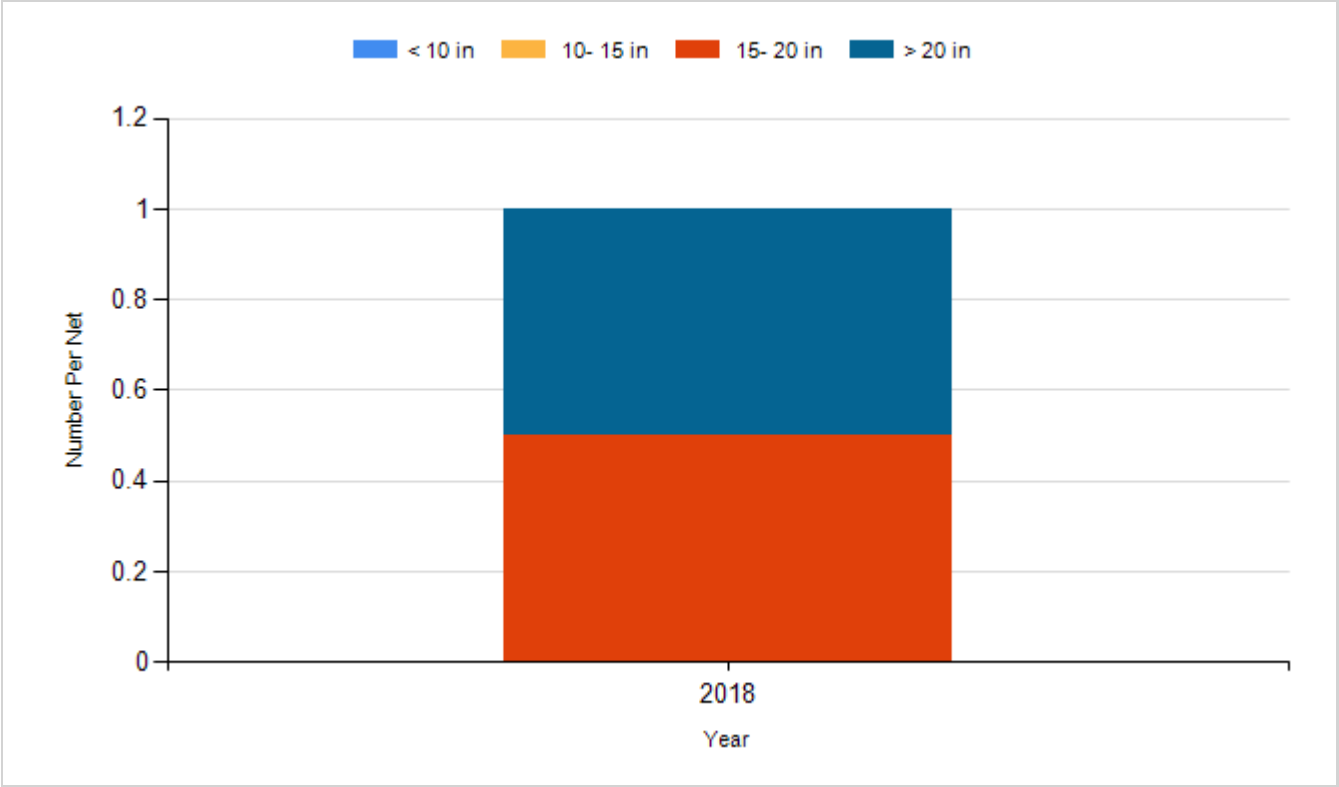
Species: Northern Pike
Gear: AFS std gill net



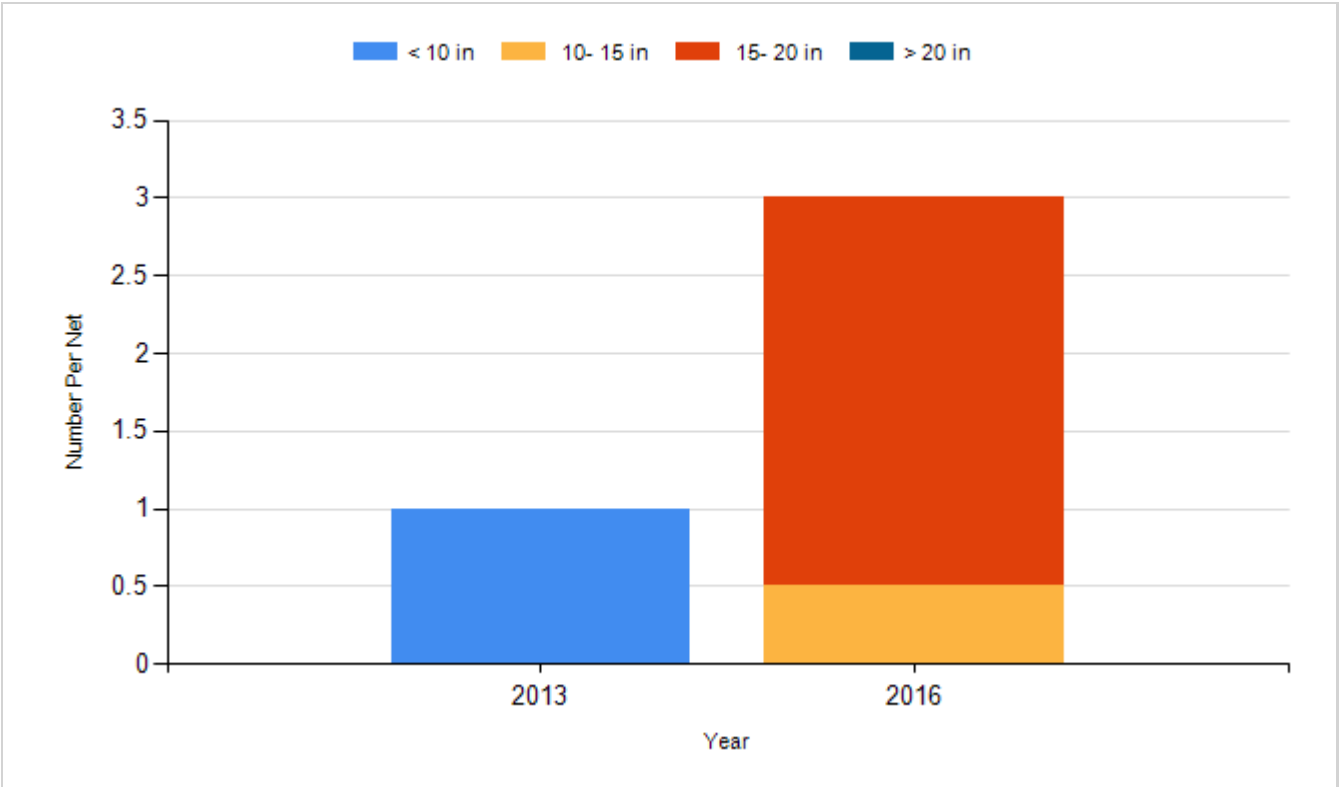
Species: Northern Pike
Gear: std exp gill net



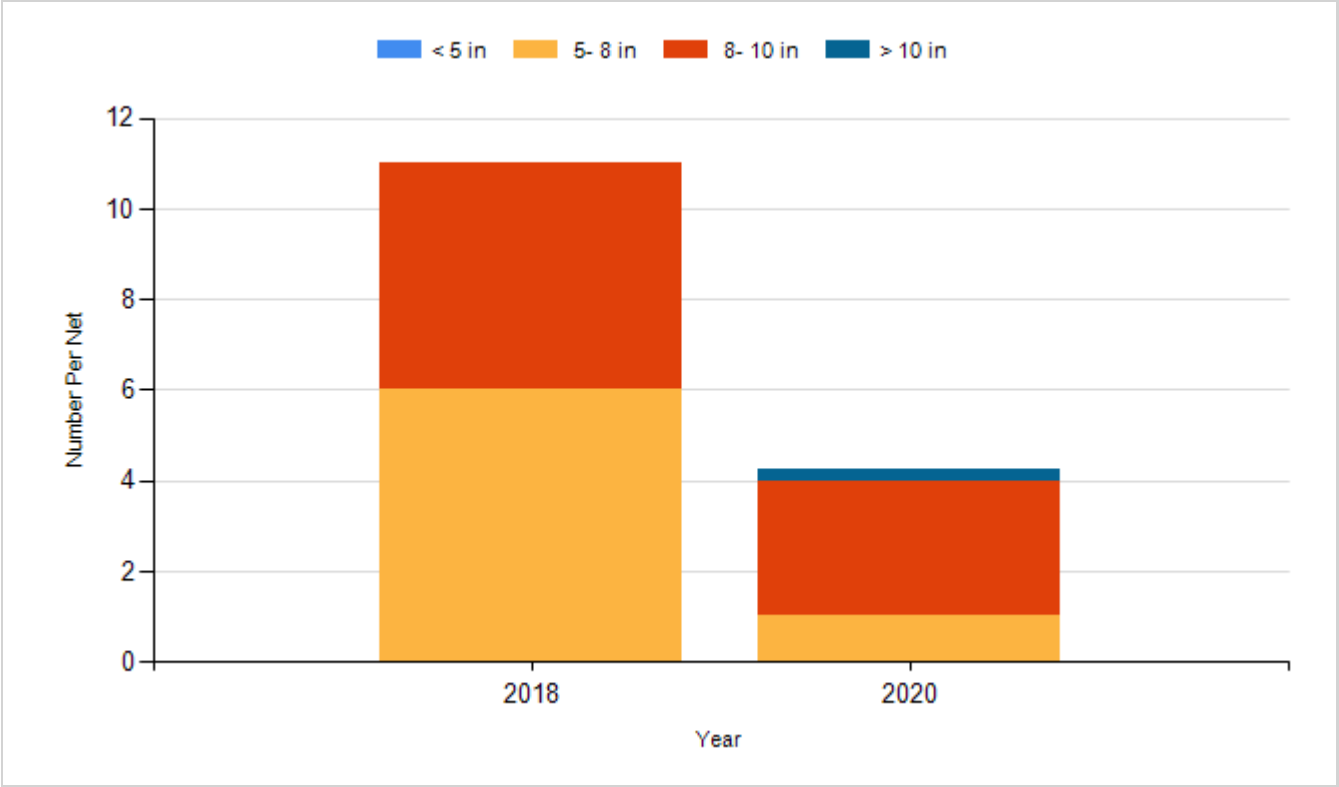
Species: Walleye
Gear: AFS std gill net



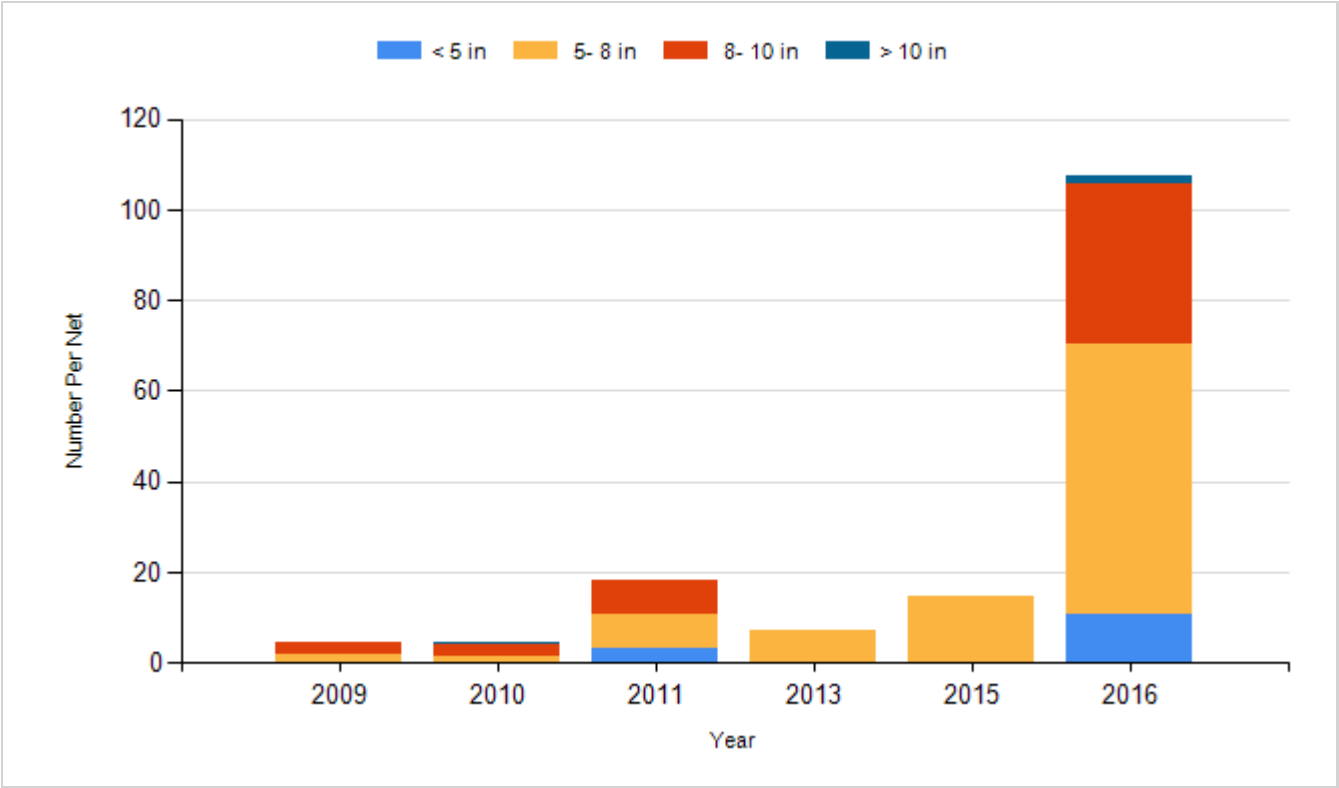
Species: Walleye
Gear: std exp gill net



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