SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Island, Minnehaha County
LBS-Lake-213-800
2018

Lake Information

Name: Island

County: Minnehaha

Surface Area: 458 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 23, 2018	6 net-nights
frame net (std 3/4 in)	Jul 23, 2018	5 net-nights

Common Fish Species Present

Smallmouth Bass

Black Bullhead

Walleye

Common Carp

Yellow Perch

Northern Pike

Bluegill

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	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	1	0.2	0.2	100		100			
	Common Carp	3	0.5	0.5	100		100			
	Smallmouth Bass	4	0.5	0.5	0		0		98	4
	Walleye	15	2.3	1.1	7		7		86	1
	Yellow Perch	1	0.2	0.2	0		0		105	
frame net (std 3/4 in)	Black Bullhead	36	7.2	4.2	97		92			
	Black Crappie	1	0.2	0.3	100		100		103	
	Bluegill	1	0.2	0.3	0		0		139	
	Common Carp	10	1.8	1.3	78		78			
	Northern Pike	1	0.2	0.3	100		0		74	
	Smallmouth Bass	112	20.8	9.6	51	7	13	5	91	1
	Walleye	6	1.2	1.2	50		17		87	3

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									3.2		3.2
	Black Crappie									0.2		0.2
	Common Carp									0.2		0.2
	Northern Pike									0.2		0.2
	Smallmouth Bass									1.6		1.6
	Sunfish Hybrid									0.0		0.0
	Walleye									1.4		1.4
AFS std gill net	Black Bullhead									5.5	0.2	2.9
	Common Carp									1.0	0.5	0.8
	Smallmouth Bass									1.5	0.5	1.0
	Walleye									2.5	2.3	2.4
	Yellow Perch									2.2	0.2	1.2
frame net (std 3/4 in)	Black Bullhead	88.7		81.0		150.9	163.4	171.8	16.4		7.2	97.1
	Black Crappie	0.0							0.4		0.2	0.2
	Bluegill	9.3		1.8		0.9	0.6	0.4	0.4		0.2	1.9
	Common Carp	1.0		0.2		13.1	0.8		0.2		1.8	2.9
	Green Sunfish	0.5		0.5		0.2		0.2				0.4
	Muskellunge					0.1						0.1
	Northern Pike	0.2				1.0	0.2	0.4	0.2		0.2	0.4
	Smallmouth Bass			0.9		2.6	0.8	1.0	1.6		20.8	4.6
	Sunfish Hybrid	0.0										0.0
	Walleye	1.0		0.3		0.1			0.2		1.2	0.6
	White Sucker	0.1										0.1
	Yellow Perch			0.2			1.2		0.2			0.5
std exp gill net	Black Bullhead	4.8		132.0		111.7	112.0	99.0	36.3			82.6
	Common Carp					4.0	1.0	0.7	2.3			2.0
	Muskellunge					0.3						0.3
	Northern Pike					0.3						0.3
	Smallmouth Bass	1.5		1.5		0.0		0.3				0.8
	Walleye	6.3		2.3		0.7	1.7	1.3	4.0			2.7
	Yellow Perch					1.7		3.7	5.0			3.5

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
AFS std frame net	Black Bullhead	PSD									100	
		PSD-P									63	
	Black Crappie	PSD									0	
		PSD-P									0	
		Wr									105	
	Common Carp	PSD									100	
		PSD-P									100	
	Northern Pike	PSD									100	
		PSD-P									100	
		Wr									82	
	Smallmouth Bass	PSD									50	
		PSD-P									13	
		Wr									94	
	Walleye	PSD									14	
		PSD-P									0	
		Wr									87	
AFS std gill net	Black Bullhead	PSD									100	100
		PSD-P									48	100
	Common Carp	PSD									100	100
		PSD-P									100	100
	Smallmouth Bass	PSD									0	0
		PSD-P									0	0
		Wr									92	98
	Walleye	PSD									33	7
		PSD-P									33	7
		Wr									88	86
	Yellow Perch	PSD									92	0
		PSD-P									23	0
		Wr									99	105
frame net (std 3/4 in)	Black Bullhead	PSD	12		36		95	94	100	98		97
		PSD-P	0		0		2	0	9	18		92
		Wr	102		94		88					

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	Black Crappie	PSD	0							100		100
		PSD-P	0							0		100
		Wr								96		103
	Bluegill	PSD	23		83		100	100	50	50		0
		PSD-P	6		6		33	0	50	50		0
		Wr	121		124		112	103	116	111		139
	Common Carp	PSD	100		100		95	100		100		78
		PSD-P	70		0		2	75		100		78
		Wr	128		117		101					
	Northern Pike	PSD	0				100	100	100	100		100
		PSD-P	0				30	0	0	100		0
		Wr					79	74	79	73		74
	Smallmouth Bass	PSD			11		54	50	80	63		51
		PSD-P			0		19	25	0	0		13
		Wr			93		87	83	83	81		91
	Walleye	PSD	40		33		100			100		50
		PSD-P	10		0		100			0		17
		Wr	91		85		91			84		87
	Yellow Perch	PSD			50			100		0		
		PSD-P			50			0		0		
		Wr			107			91		87		
std exp gill net	Black Bullhead	PSD	26		29		89	90	98	98		
		PSD-P	0		0		1	0	2	11		
		Wr	112		96		91					
	Common Carp	PSD					100	100	100	100		
		PSD-P					0	33	50	100		
		Wr					103					
	Northern Pike	PSD					100					
		PSD-P					100					
		Wr					83					
	Smallmouth Bass	PSD	50		0		0		0			
		PSD-P	17		0		0		0			
		Wr	118		99				94			
	Walleye	PSD	16		44		100	100	50	0		
		PSD-P	4		0		100	80	25	0		
		Wr	94		90		94	89	90	82		
	Yellow Perch	PSD					20		45	20		

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
std exp gill net	Yellow Perch	PSD-P					0		0	7		
		Wr					100		99	111		

Length at Capture

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

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	2				555 (1)						644 (1)
2011	17	229 (10)	351 (5)		469 (2)						
2009	25	270 (5)	351 (17)	454 (2)					575 (1)		

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	4		188 (4)								

Fish Condition

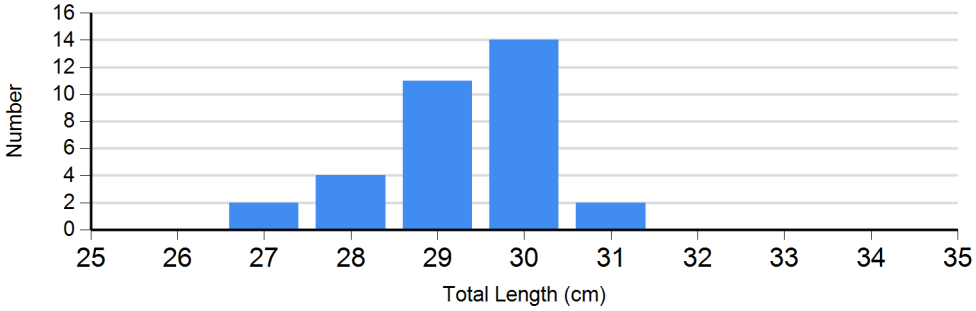
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2016	0		2	96 (2.1)	0		0	
	2017	1	105	0		0		0	
	2018	0		0		0		1	103
Bluegill Frame Net	2014	0		3	103 (2.6)	0		0	
	2015	1	115	0		1	117	0	
	2016	1	107	0		1	115	0	
	2018	1	139	0		0		0	
Walleye Gill Net	2014	0		1	85	4	90 (3.0)	0	
	2015	2	77 (0.4)	1	103	1	103	0	
	2016	12	82 (1.1)	0		0		0	
	2017	10	85 (2.6)	0		3	96 (10.3)	2	90 (2.9)
	2018	13	86 (0.9)	0		0		1	89
Yellow Perch Gill Net	2015	6	101 (4.8)	5	97 (3.0)	0		0	
	2016	12	114 (2.3)	2		1	102	0	
	2017	1	96	9	100 (1.9)	3	99 (3.8)	0	
	2018	1	105	0		0		0	

Length Frequency Distribution

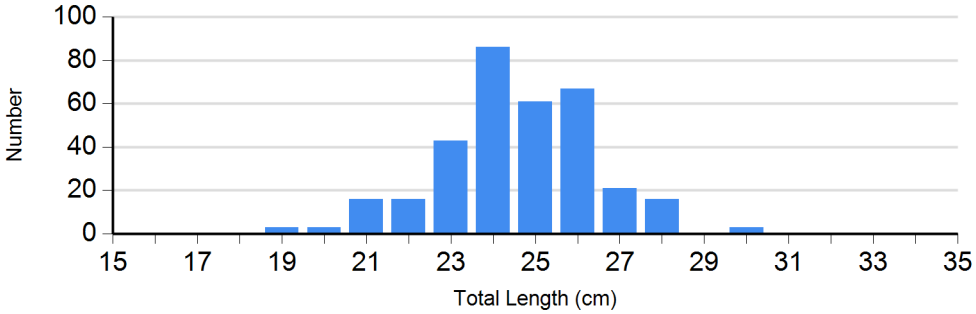
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

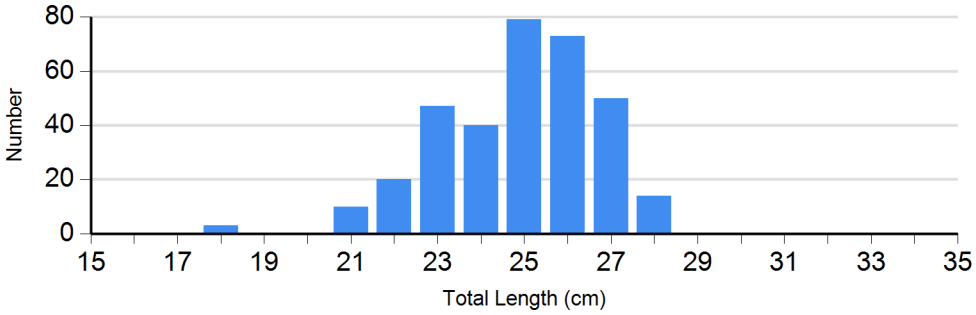


2017

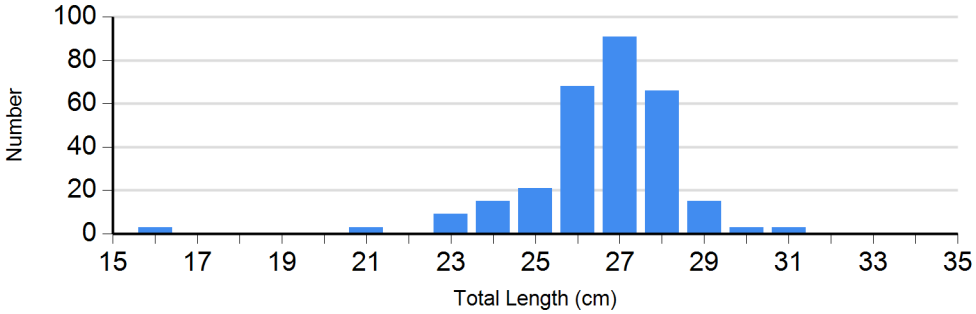
Species: Black Bullhead
Gear: std exp gill net



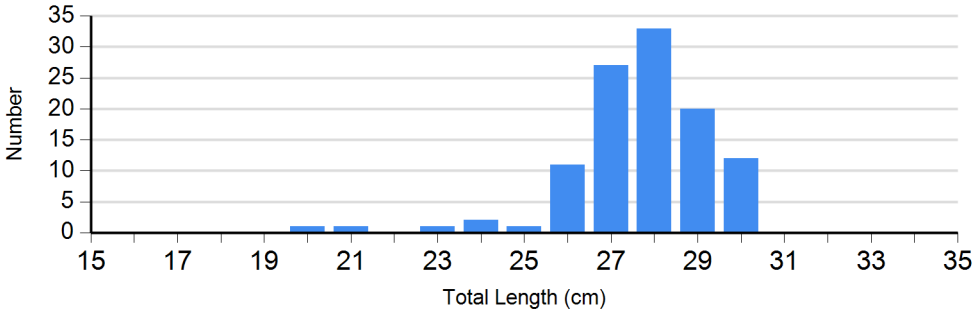
2013



2014

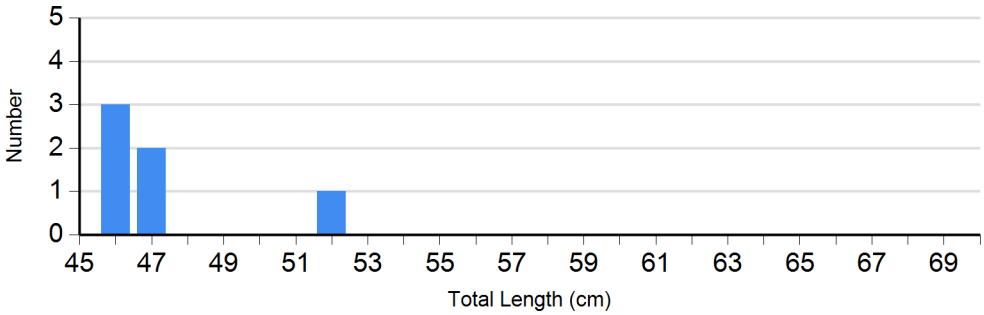


2015



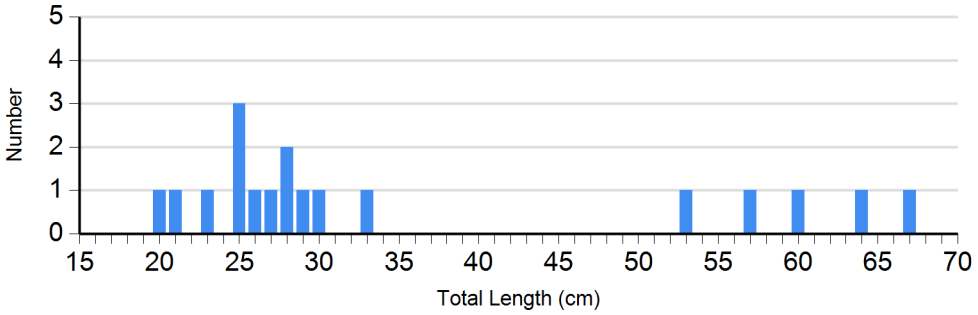
2016

Species: Common Carp
Gear: std exp gill net

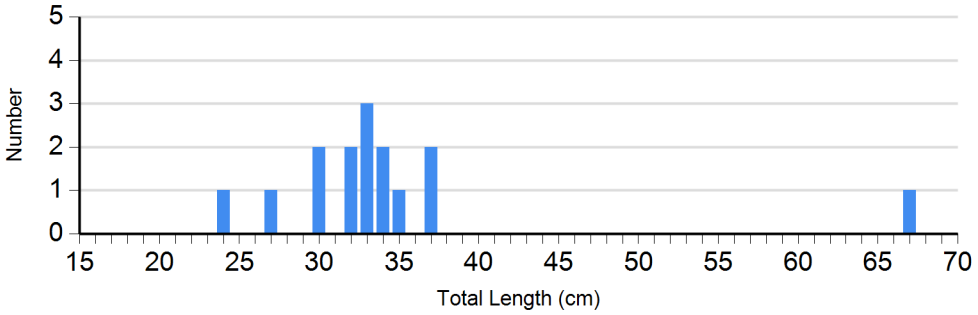


2013

Species: Walleye
Gear: AFS std gill net

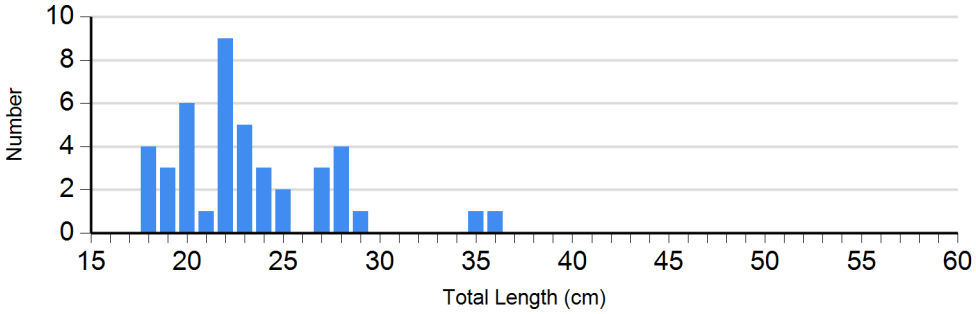


2017



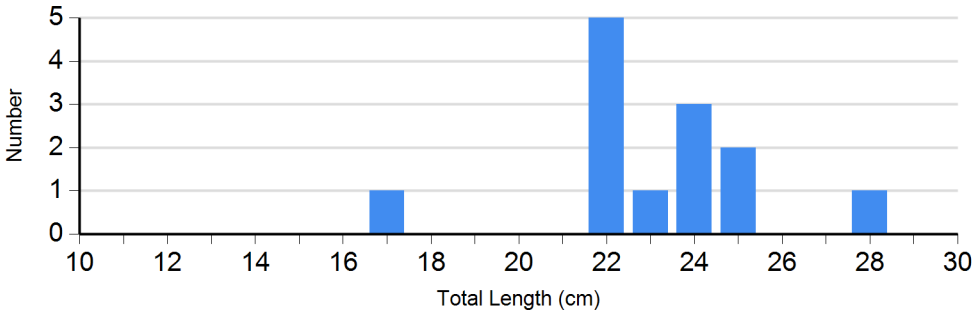
2018

Species: Walleye
Gear: std exp gill net



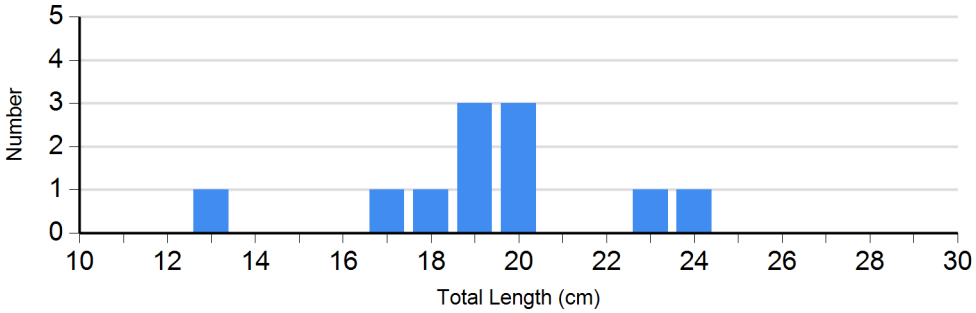
2016

Species: Yellow Perch
Gear: AFS std gill net

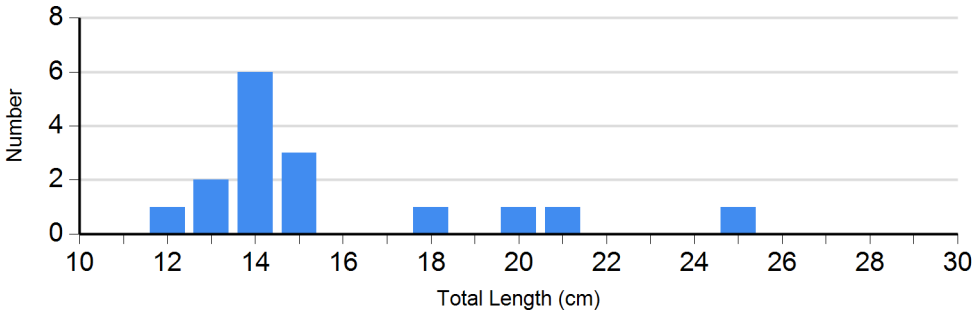


2017

Species: Yellow Perch
Gear: std exp gill net



2015

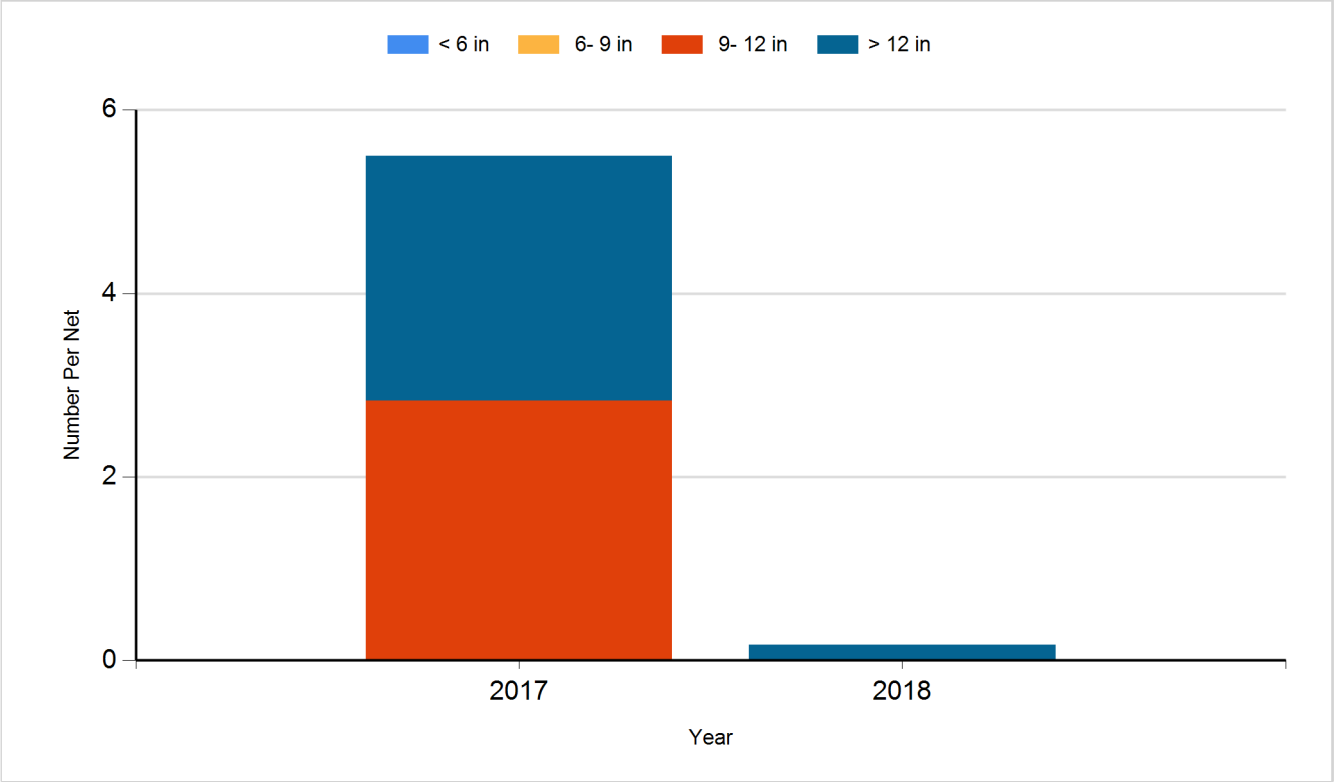


2016

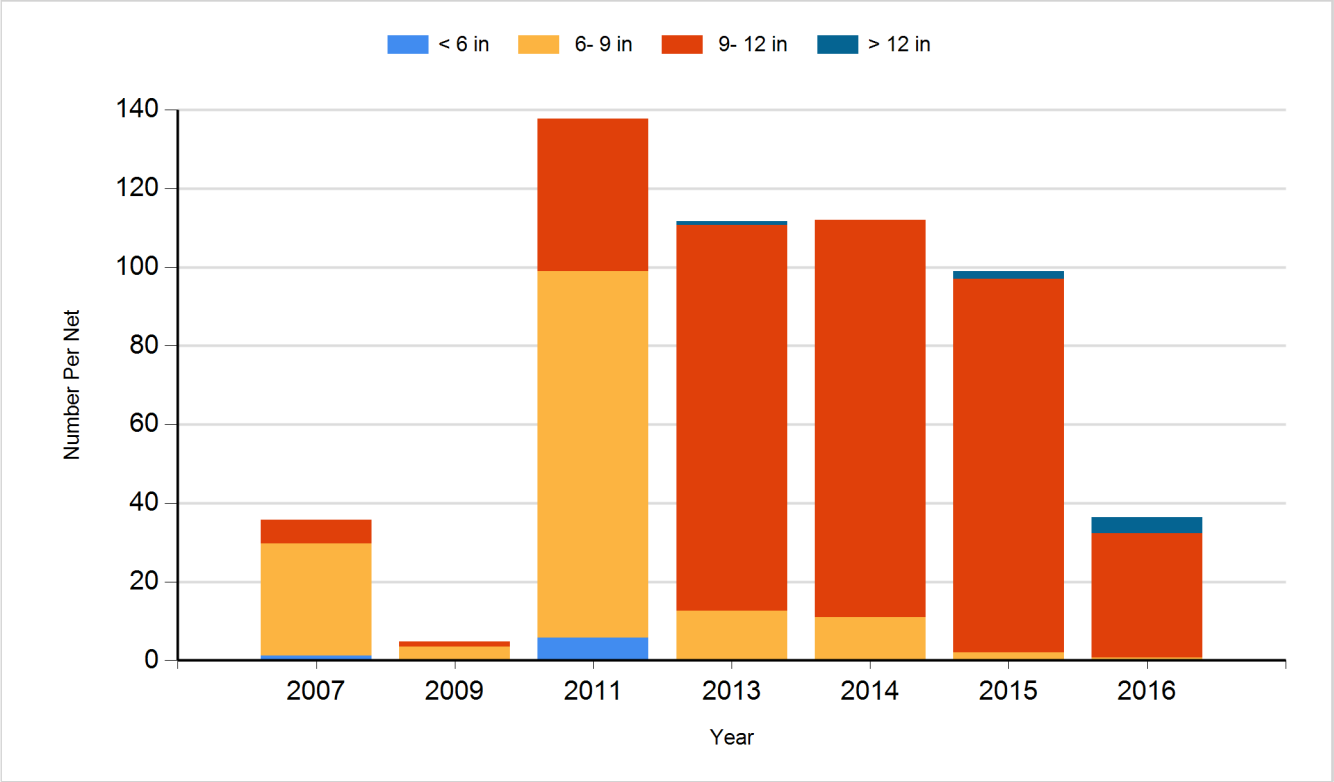
Historic Fish Sizes and Relative Abundance

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

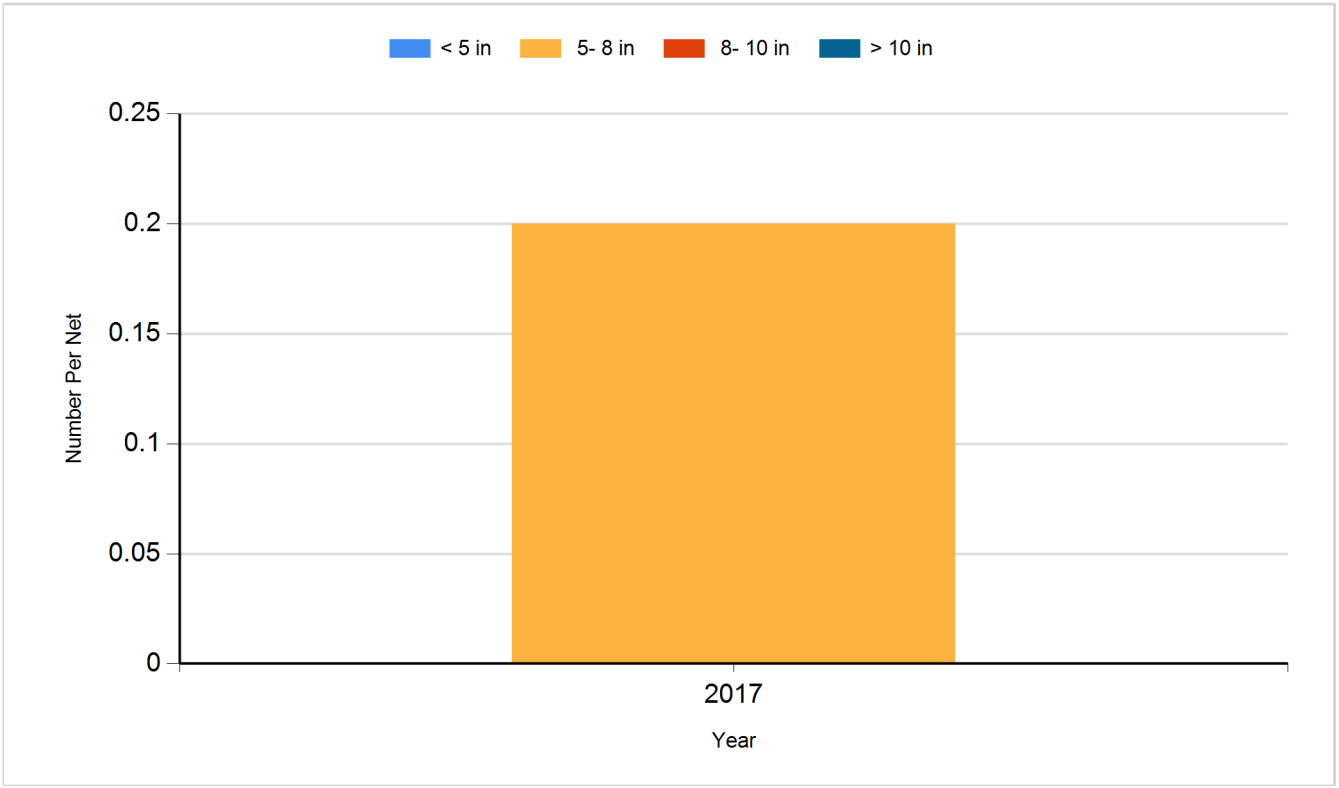
Species: Black Bullhead
Gear: AFS std gill net



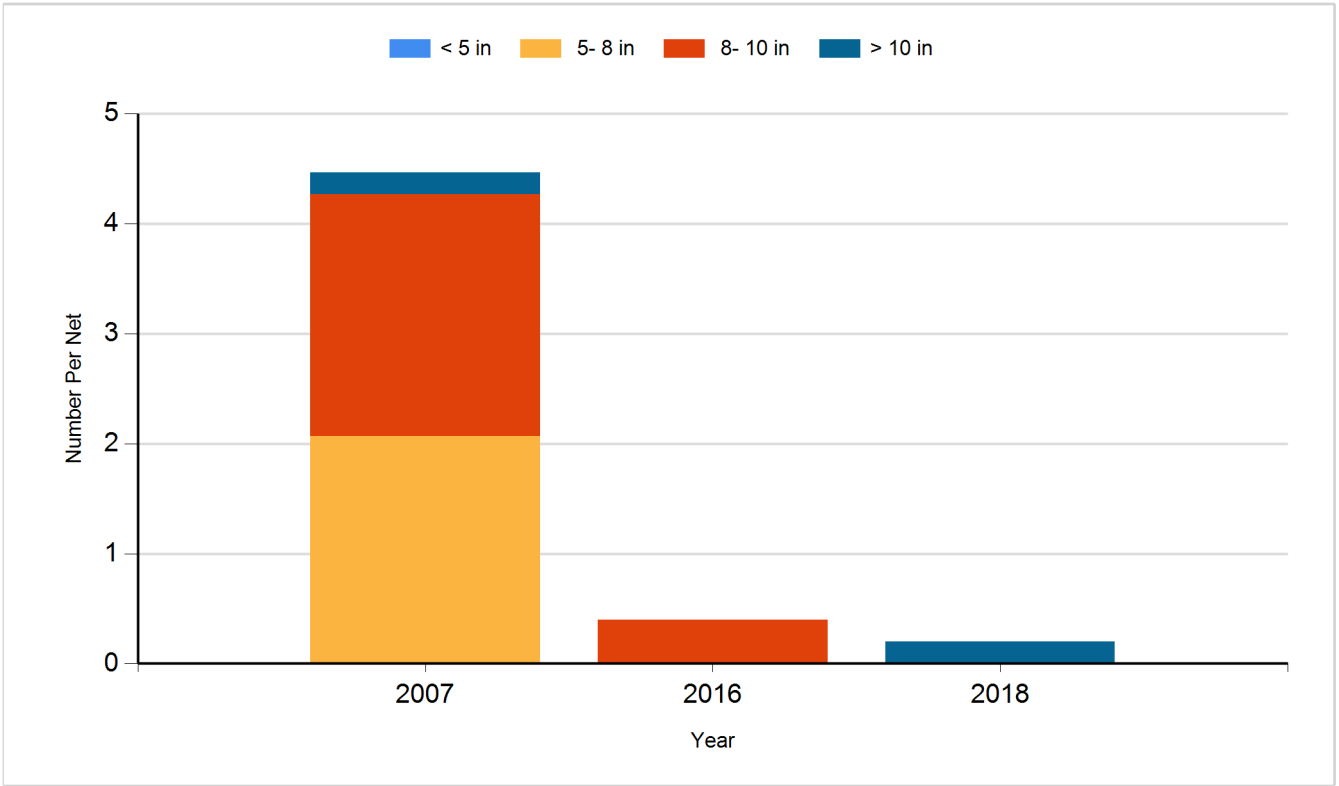
Species: Black Bullhead
Gear: std exp gill net



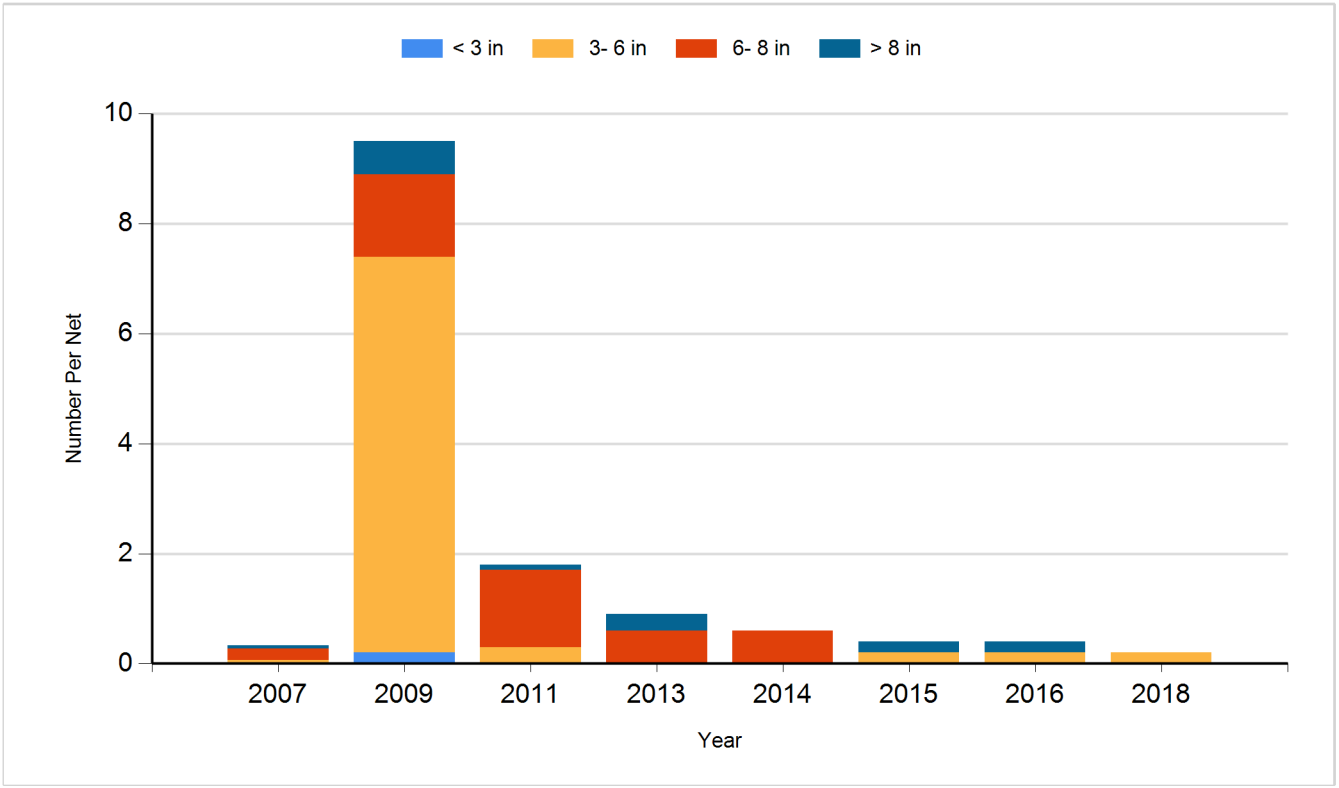
Species: Black Crappie
Gear: AFS std frame net



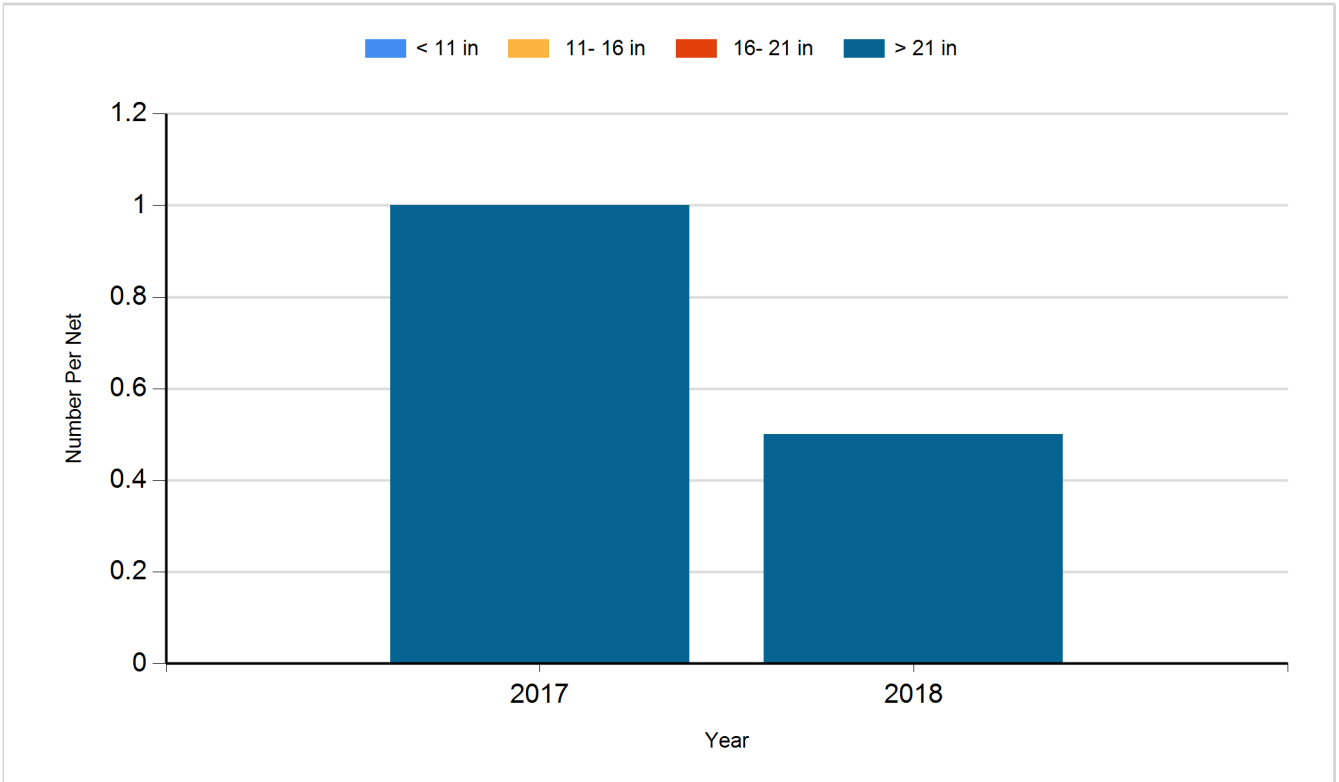
Species: Black Crappie
Gear: frame net (std 3/4 in)



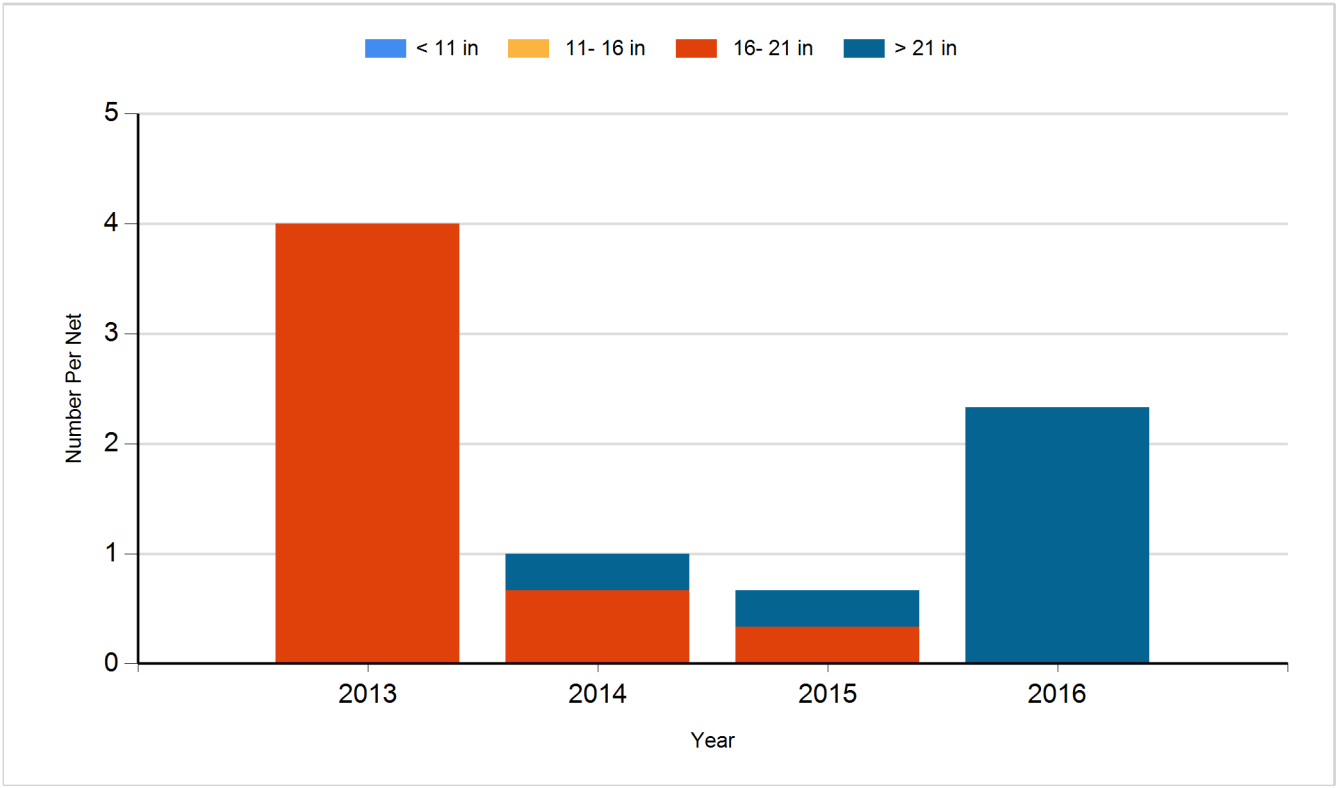
Species: Bluegill
Gear: frame net (std 3/4 in)



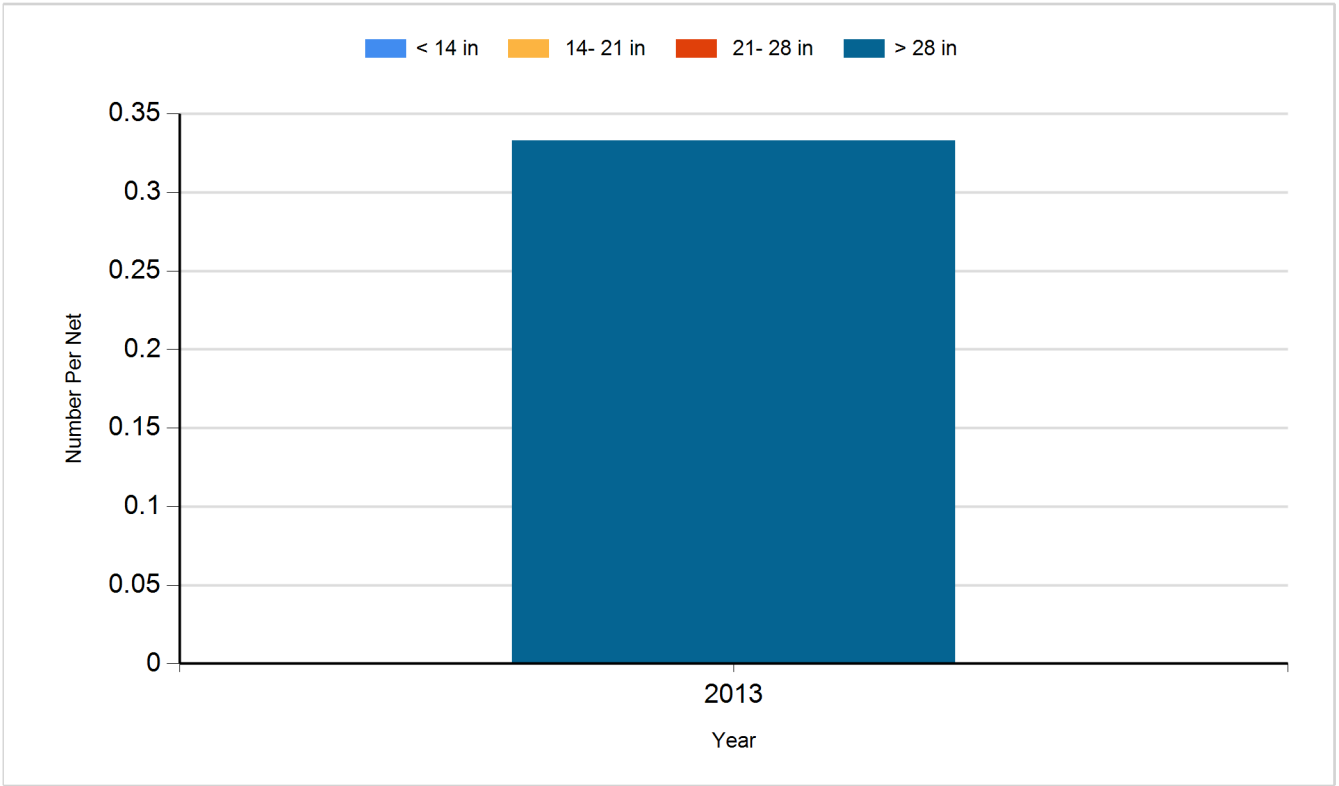
Species: Common Carp
Gear: AFS std gill net



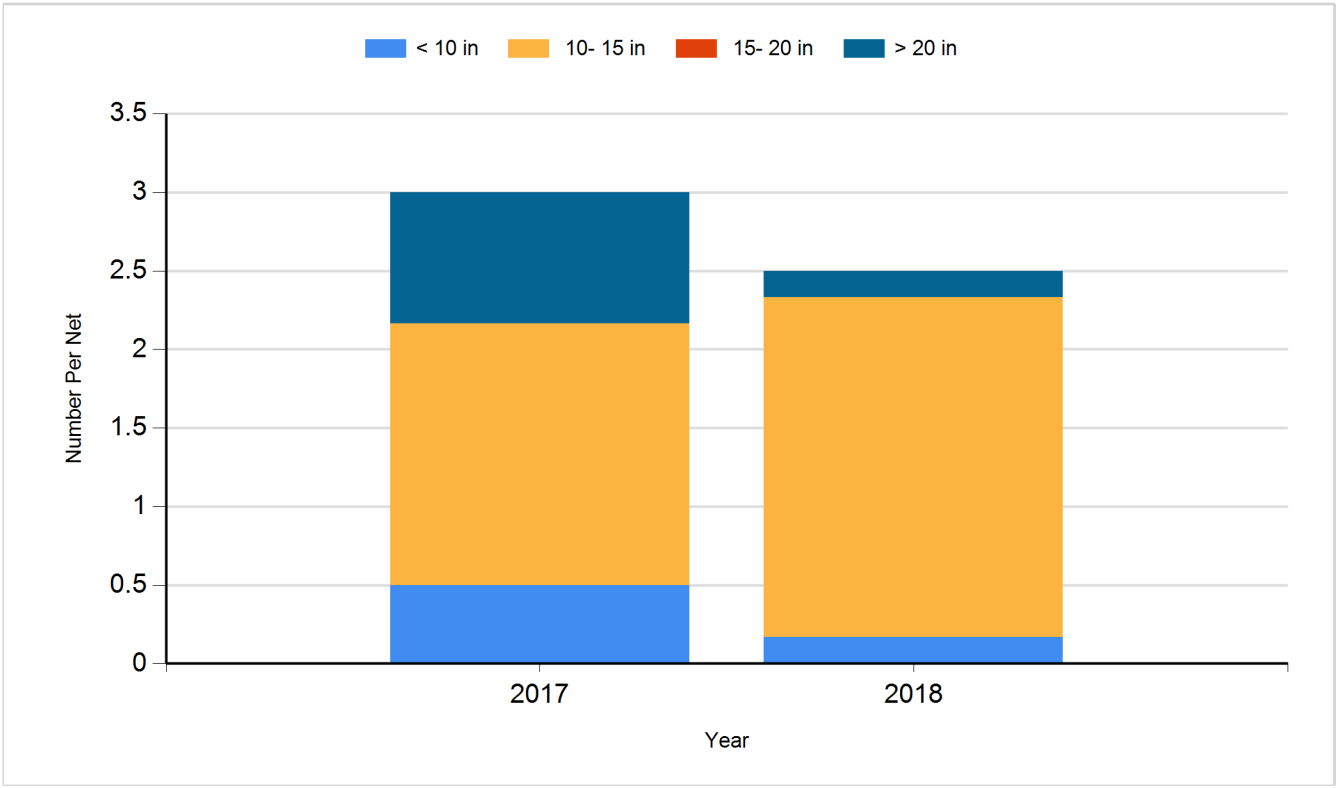
Species: Common Carp
Gear: std exp gill net



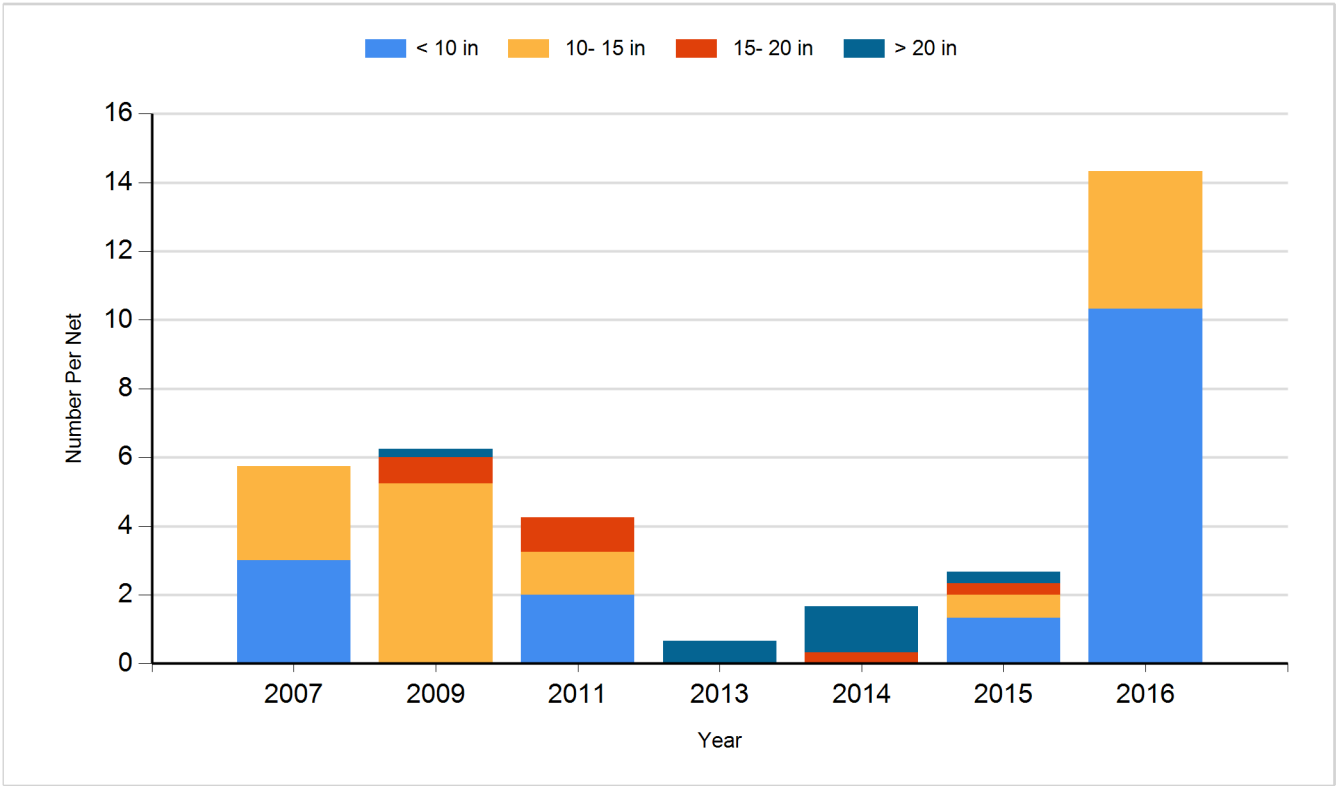
Species: Northern Pike
Gear: std exp gill net



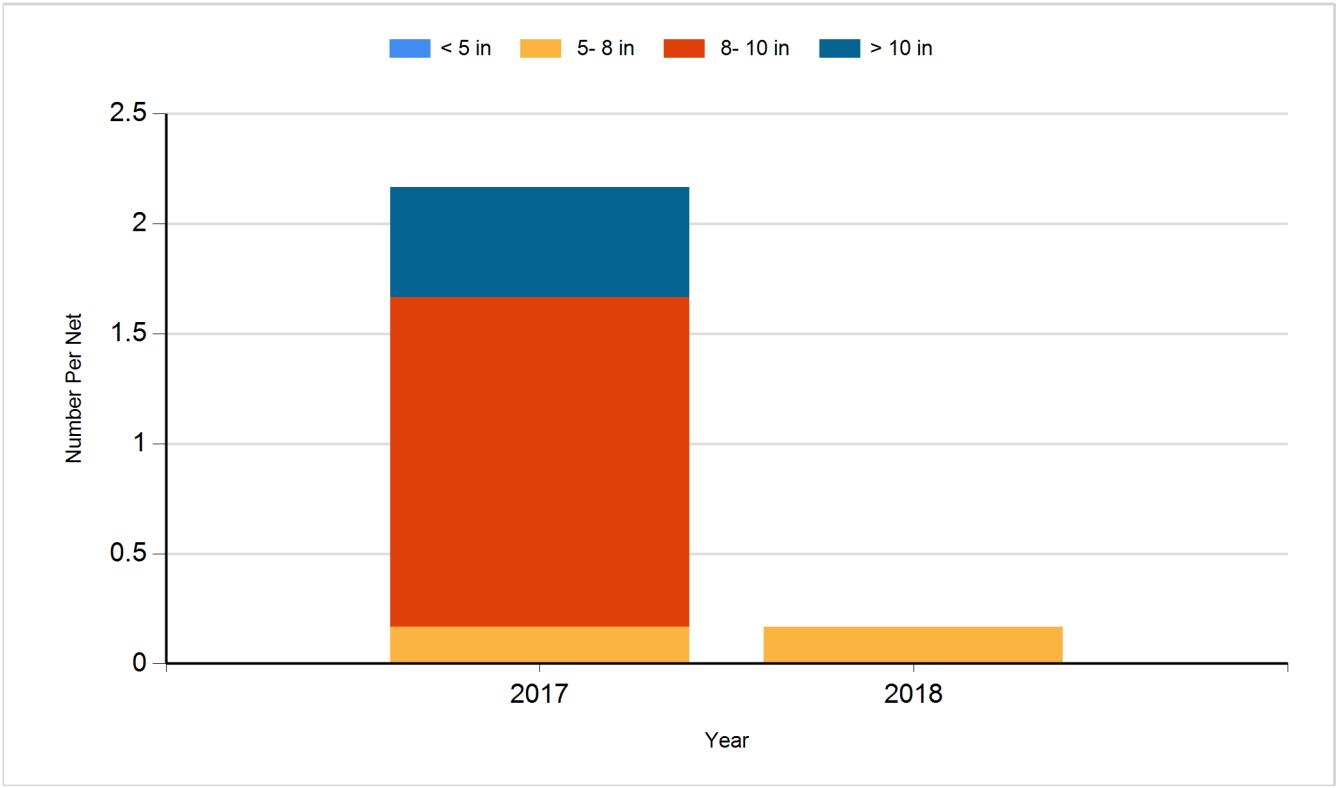
Species: Walleye
Gear: AFS std gill net



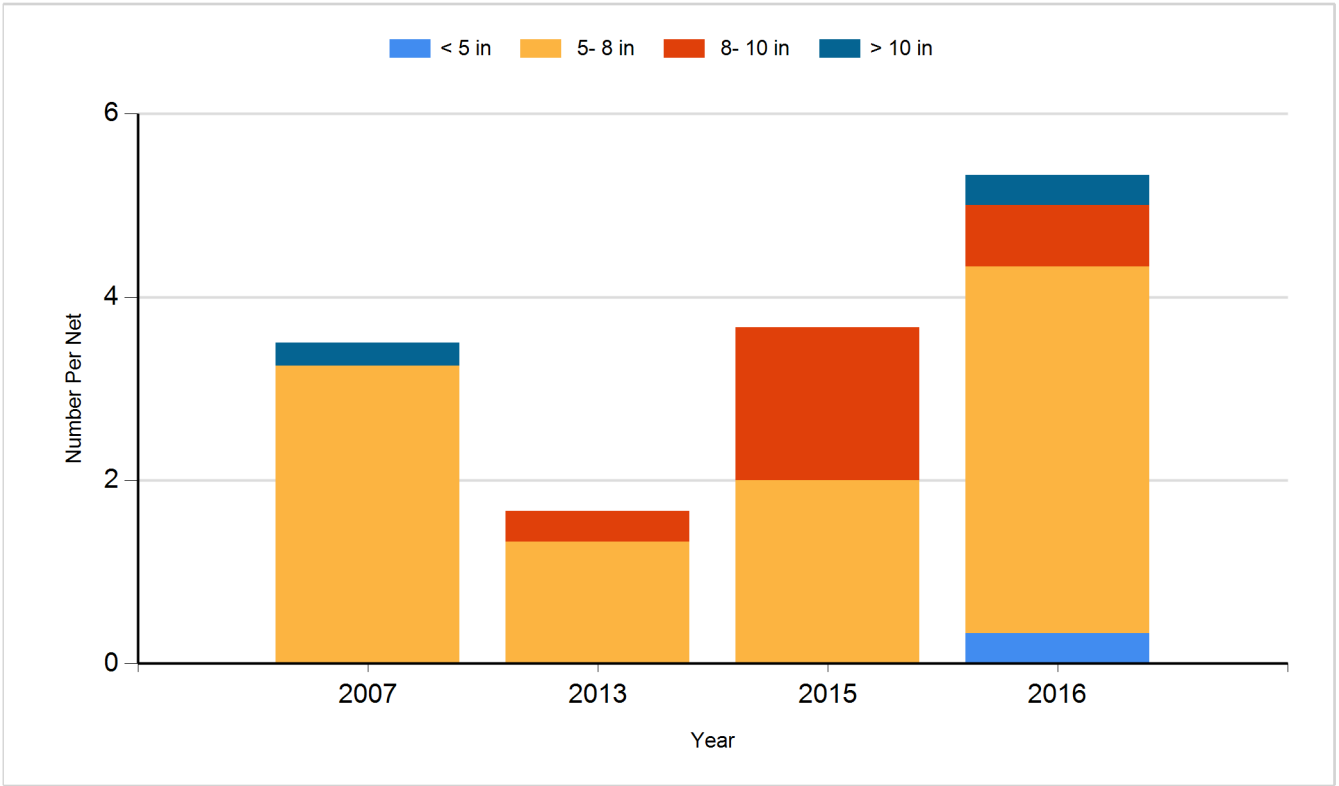
Species: Walleye
Gear: std exp gill net



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
2007	Smallmouth Bass	Adult	164
2007	Walleye	Large Fingerling	3,224
2007	Yellow Perch	Juvenile	3,420
2008	Smallmouth Bass	Adult	185
2008	Smallmouth Bass	Juvenile	28
2009	Muskellunge	Adult	64
2009	Muskellunge	Juvenile	68
2009	Walleye	Large Fingerling	8,748
2009	Yellow Perch	Adult	310
2009	Yellow Perch	Fingerling	620
2010	Muskellunge	Adult	11
2010	Walleye	Small Fingerling	44,070
2011	Muskellunge	Fingerling	272
2011	Yellow Perch	Fingerling	10,058
2012	Muskellunge	Adult	4
2012	Walleye	Small Fingerling	43,860
2012	Yellow Perch	Adult	2,746
2012	Yellow Perch	Egg	34,020,000
2012	Yellow Perch	Juvenile	7,350
2014	Muskellunge	Large Fingerling	441
2014	Walleye	Small Fingerling	30,800
2015	Walleye	Juvenile	1,399
2015	Walleye	Small Fingerling	31,218
2016	Muskellunge	Large Fingerling	400
2016	Walleye	Small Fingerling	32,130
2018	Walleye	Small Fingerling	31,920