

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Island, Minnehaha County

LBS-Lake-213-800

2019

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 18, 2019	6 net-nights
frame net (std 3/4 in)	Jul 18, 2019	5 net-nights

Common Fish Species Present

Smallmouth Bass

Yellow Perch

Bluegill

Walleye

Common Carp

Northern Pike

Black Crappie

Black Bullhead

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.
- **std 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.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

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.

$$PSD = \left(\frac{\text{number of fish} \geq \text{quality length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

$$PSD - P = \left(\frac{\text{number of fish} \geq \text{preferred length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

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.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

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).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(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	Common Carp	3	0.3	0.3	50		50			
	Smallmouth Bass	4	0.3	0.3	0		0		86	2
	Walleye	3	0.5	0.3	33		33		76	5
frame net (std 3/4 in)	Yellow Perch	17	2.8	1.0	35	19	0		103	3
	Black Bullhead	1	0.2	0.3	0		0			
	Black Crappie	1	0.2	0.3	0		0		115	
	Bluegill	3	0.6	0.9	0		0		135	13
	Northern Pike	1	0.2	0.3	100		0		90	
	Smallmouth Bass	100	11.6	3.8	55	10	14	7	88	2
	Walleye	4	0.4	0.4	100		50		77	2
	Yellow Perch	6	1.2	1.5	67		17		97	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.

Gear	Species	CPUE										Avg
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
AFS std frame net	Black Bullhead								3.2			3.20
	Black Crappie								0.2			0.20
	Common Carp								0.2			0.20
	Northern Pike								0.2			0.20
	Smallmouth Bass								1.6			1.60
	Sunfish Hybrid								0.0			0.00
	Walleye								1.4			1.40
AFS std gill net	Black Bullhead								5.5	0.2	0.0	1.90
	Common Carp								1.0	0.5	0.3	0.60
	Smallmouth Bass								1.5	0.5	0.3	0.77
	Walleye								2.5	2.3	0.5	1.77
	Yellow Perch								2.2	0.2	2.8	1.73
frame net (std 3/4 in)	Black Bullhead	81.0			150.9	163.4	171.8	16.4		7.2	0.2	84.41
	Black Crappie	0.0			0.0	0.0	0.0	0.4		0.2	0.2	0.11
	Bluegill	1.8			0.9	0.6	0.4	0.4		0.2	0.6	0.70
	Common Carp	0.2			13.1	0.8	0.0	0.2		1.8	0.0	2.30
	Green Sunfish	0.5			0.2	0.0	0.2	0.0		0.0	0.0	0.13
	Muskellunge	0.0			0.1	0.0	0.0	0.0		0.0	0.0	0.01
	Northern Pike	0.0			1.0	0.2	0.4	0.2		0.2	0.2	0.31
	Smallmouth Bass	0.9			2.6	0.8	1.0	1.6		20.2	11.6	5.53
	Sunfish Hybrid	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.00
	Walleye	0.3			0.1	0.0	0.0	0.2		1.2	0.4	0.31
	White Sucker	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.00
	Yellow Perch	0.2			0.0	1.2	0.0	0.2		0.0	1.2	0.40
std exp gill net	Black Bullhead	132.0			111.7	112.0	99.0	36.3				98.20
	Common Carp	0.0			4.0	1.0	0.7	2.3				1.60
	Muskellunge	0.0			0.3	0.0	0.0	0.0				0.06
	Northern Pike	0.0			0.3	0.0	0.0	0.0				0.06
	Smallmouth Bass	1.5			0.0	0.0	0.3	0.0				0.36
	Walleye	2.3			0.7	1.7	1.3	4.0				2.00
	Yellow Perch	0.0			1.7	0.0	3.7	5.0				2.08

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.

Gear	Species	Index	Year									
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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	50
		PSD-P								100	100	50
	Smallmouth Bass	PSD								0	0	0
		PSD-P								0	0	0
		Wr								92	98	86
	Walleye	PSD								33	7	33
		PSD-P								33	7	33
		Wr								88	86	76
	Yellow Perch	PSD								92	0	35
		PSD-P								23	0	0
		Wr								99	105	103
frame net (std 3/4 in)	Black Bullhead	PSD		36		95	94	100	98		97	0
		PSD-P		0		2	0	9	18		92	0
		Wr		94		88						

Gear	Species	Index	Year									
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
frame net (std 3/4 in)	Black Crappie	PSD							100		100	0
		PSD-P							0		100	0
		Wr							96		103	115
	Bluegill	PSD		83		100	100	50	50		0	0
		PSD-P		6		33	0	50	50		0	0
		Wr		124		112	103	116	111		139	135
	Common Carp	PSD		100		95	100		100		78	
		PSD-P		0		2	75		100		78	
		Wr		117		101						
	Northern Pike	PSD				100	100	100	100		100	100
		PSD-P				30	0	0	100		0	0
		Wr				79	74	79	73		74	90
	Smallmouth Bass	PSD		11		54	50	80	63		50	55
		PSD-P		0		19	25	0	0		13	14
		Wr		93		87	83	83	81		91	88
	Walleye	PSD		33		100			100		50	100
		PSD-P		0		100			0		17	50
		Wr		85		91			84		87	77
	Yellow Perch	PSD		50			100		0			67
		PSD-P		50			0		0			17
		Wr		107			91		87			97
std exp gill net	Black Bullhead	PSD		29		89	90	98	98			
		PSD-P		0		1	0	2	11			
		Wr		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		0		0		0				
		PSD-P		0		0		0				
		Wr		99				94				
	Walleye	PSD		44		100	100	50	0			
		PSD-P		0		100	80	25	0			
		Wr		90		94	89	90	82			
	Yellow Perch	PSD				20		45	20			

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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)						

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).

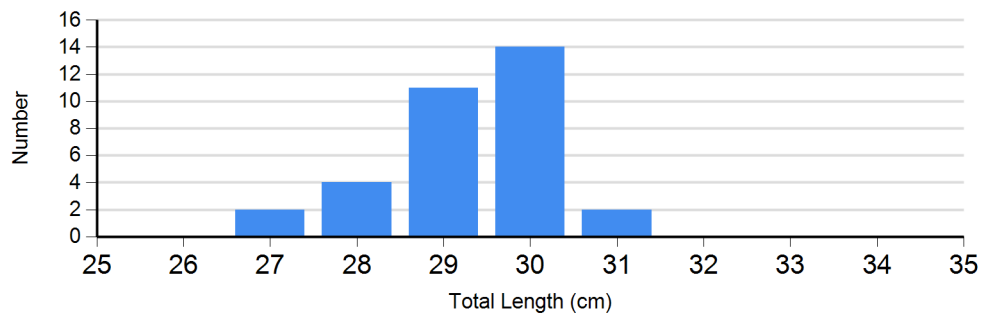
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2016	0		2	96 (2.1)	0		0	
	2017	1	105	0		0		0	
	2018	0		0		0		1	103
	2019	1	115	0		0		0	
Bluegill Frame Net	2015	1	115	0		1	117	0	
	2016	1	107	0		1	115	0	
	2018	1	139	0		0		0	
	2019	3	135 (10.1)	0		0		0	
Walleye Gill Net	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
	2019	2	79 (5.7)	0		0		1	72
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	
	2019	11	106 (3.3)	6	97 (1.8)	0		0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

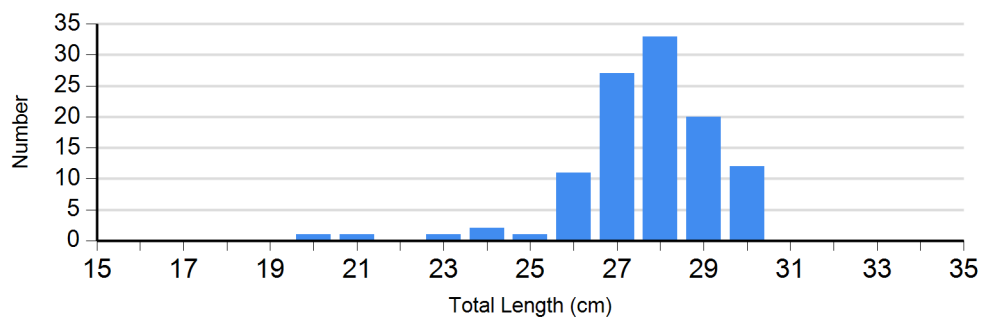
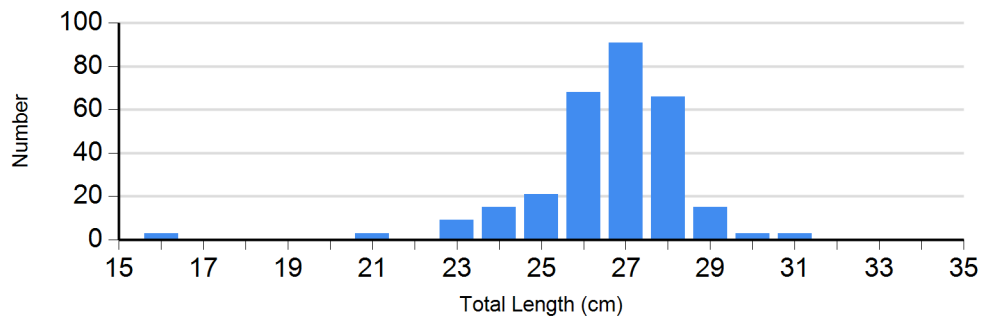
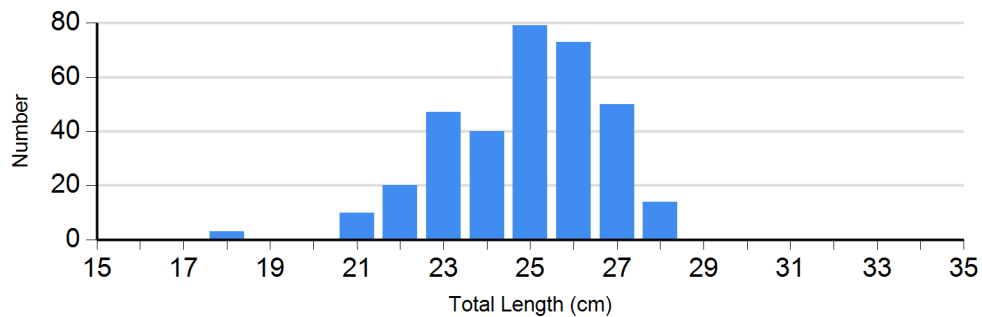
Species: Black Bullhead

Gear: AFS std gill net

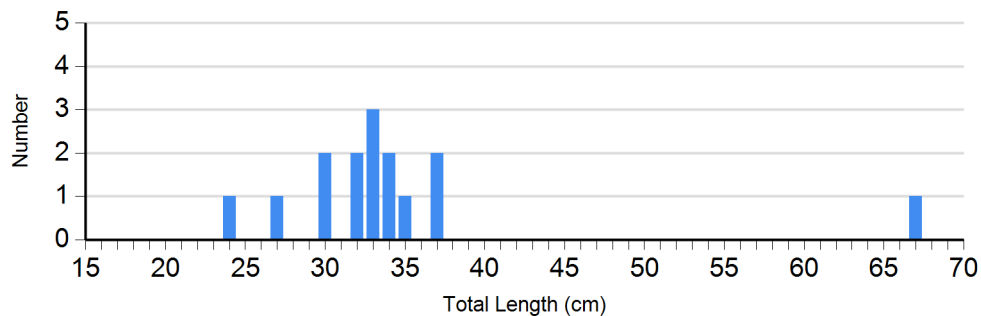
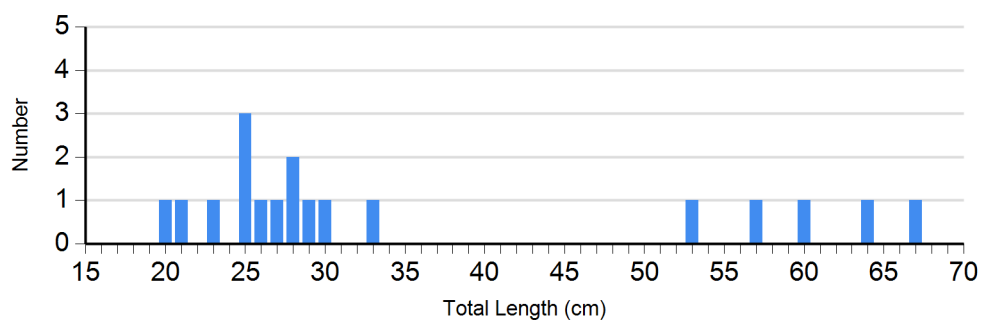


Species: Black Bullhead

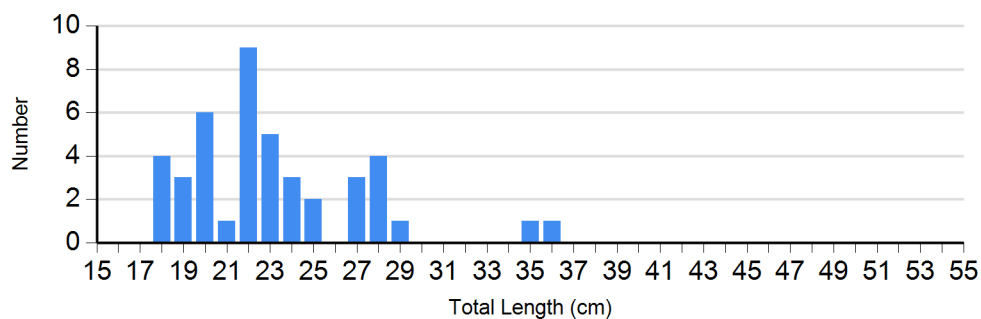
Gear: std exp gill net



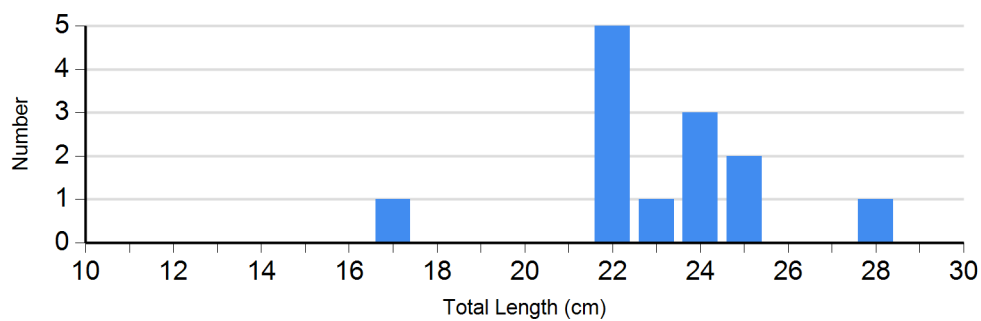
Species: Walleye
Gear: AFS std gill net

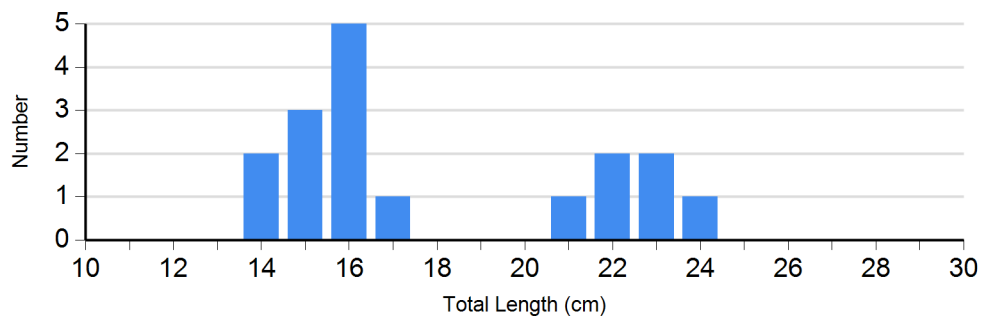


Species: Walleye
Gear: std exp gill net

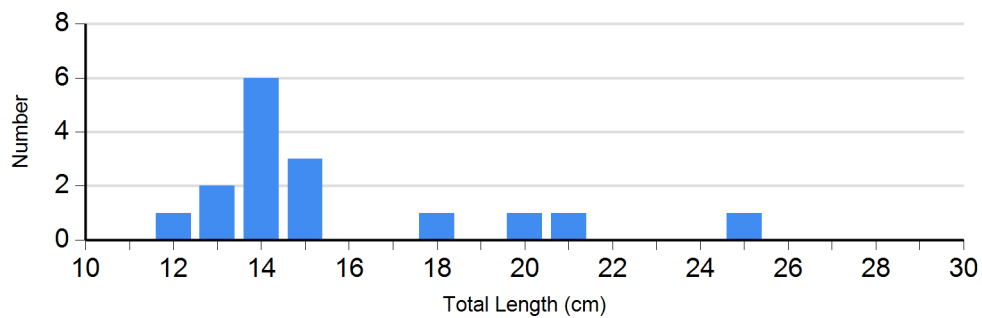
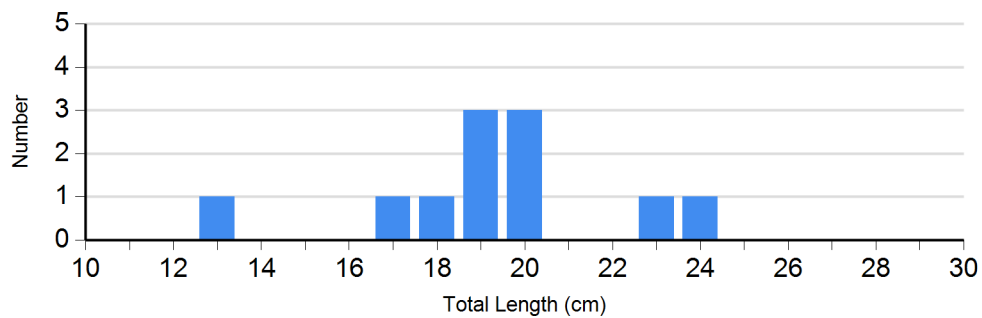


Species: Yellow Perch
Gear: AFS std gill net





Species: Yellow Perch
Gear: std exp gill net

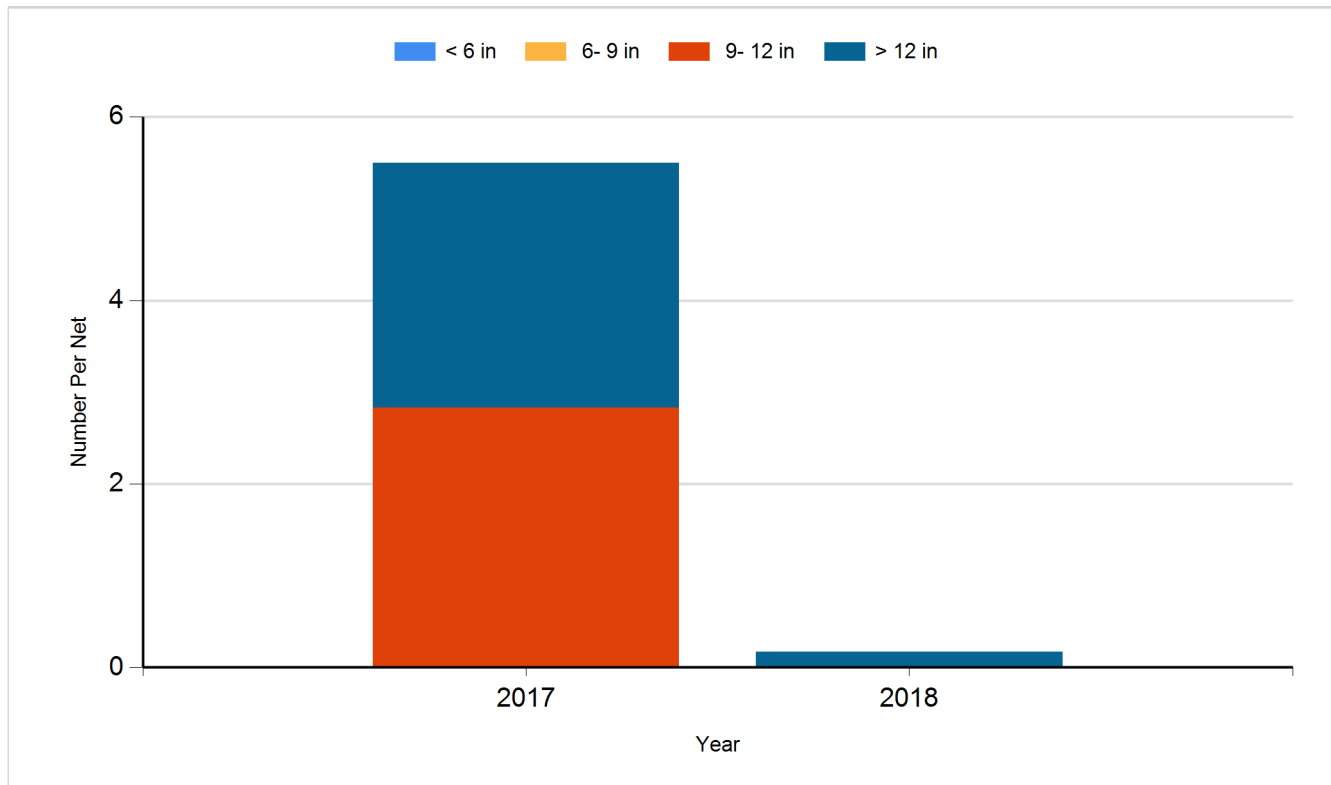


Historic Fish Sizes and Relative Abundance

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

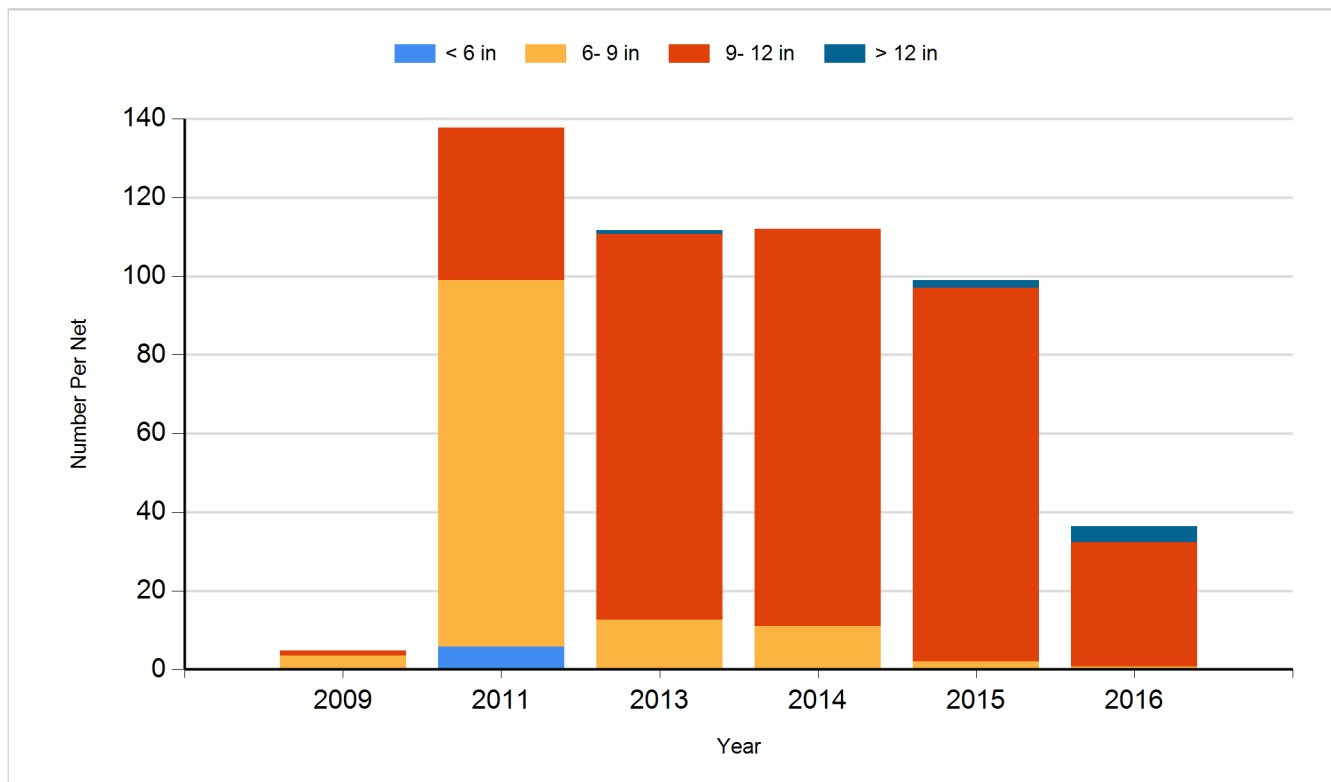
Species: Black Bullhead

Gear: AFS std gill net

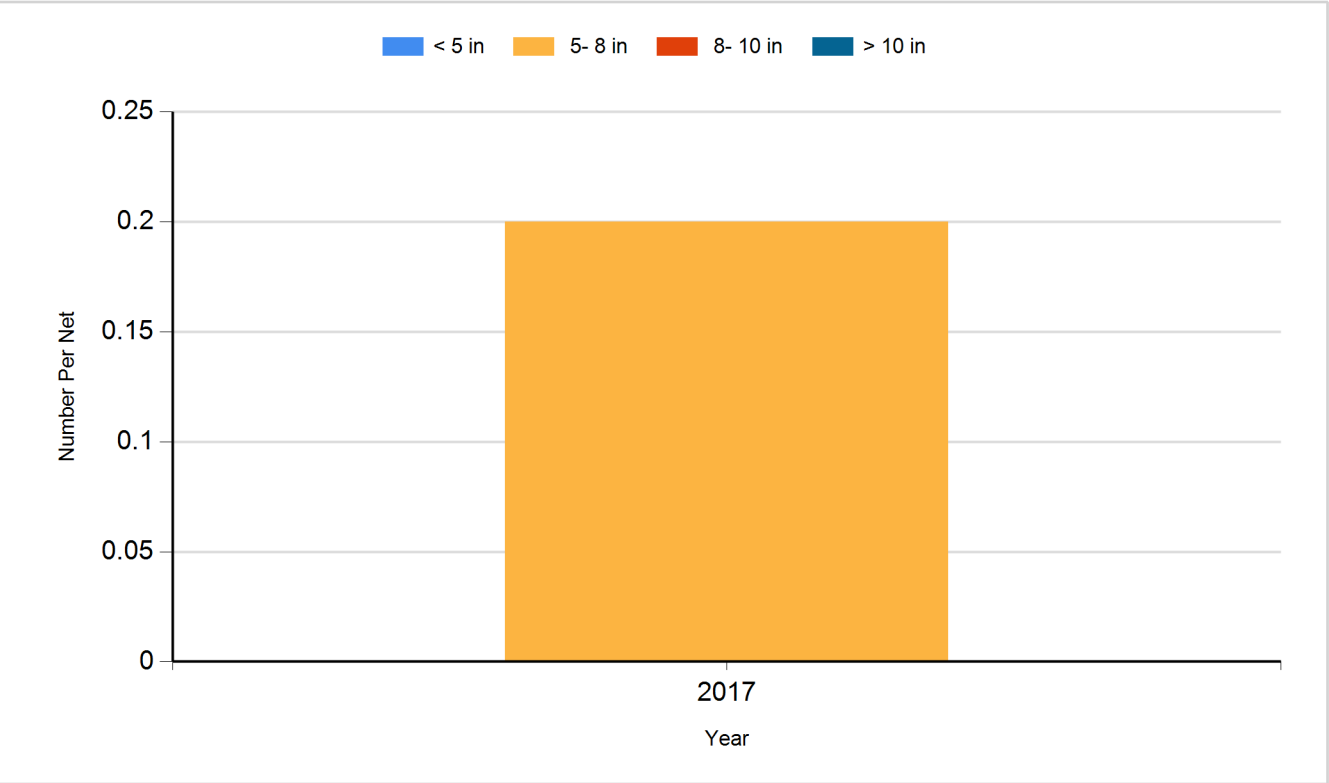


Species: Black Bullhead

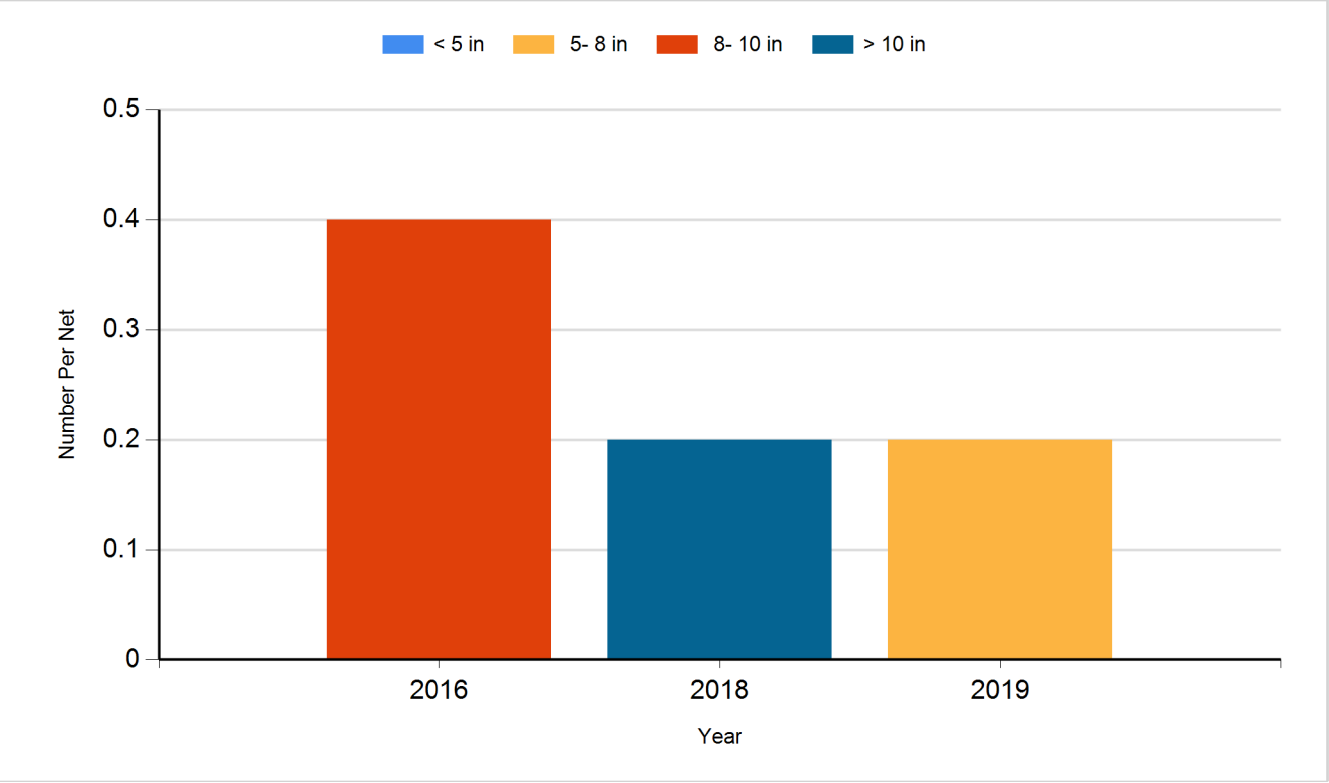
Gear: std exp gill net



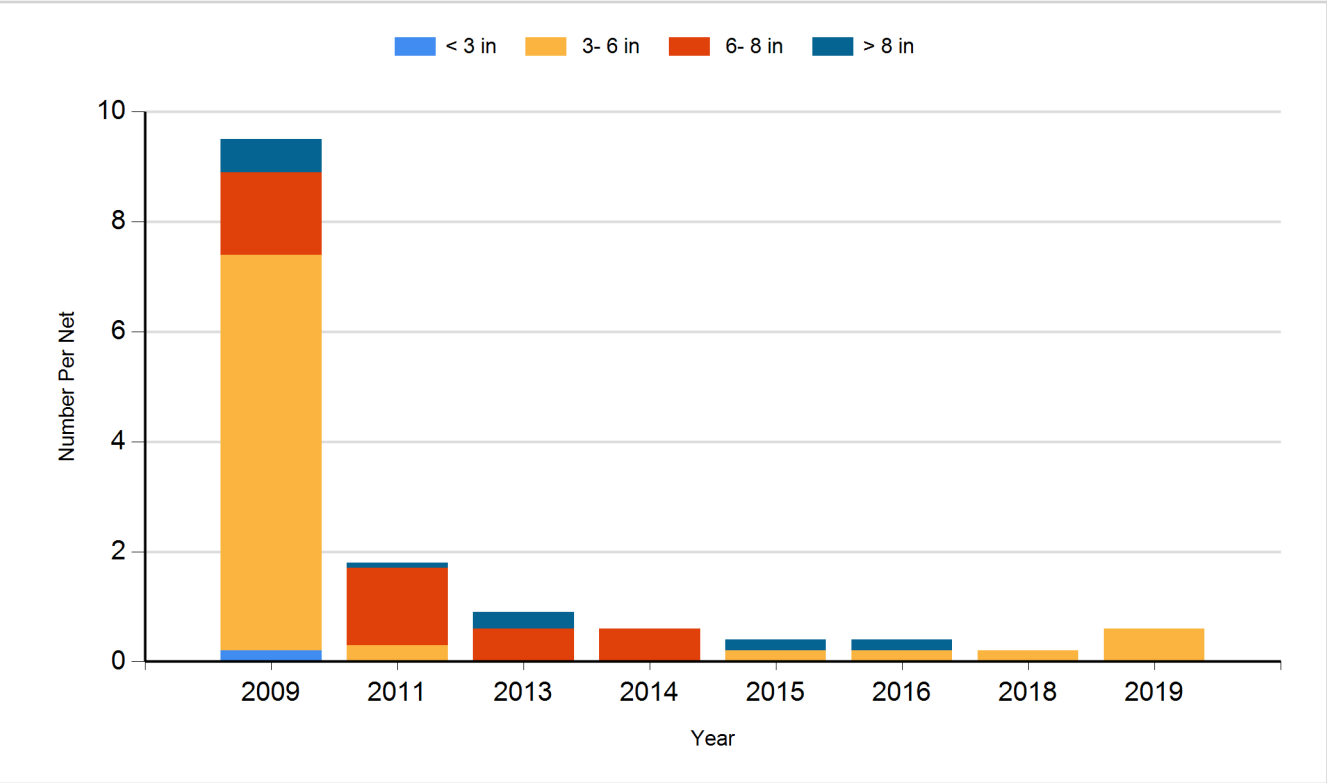
Species: Black Crappie
Gear: AFS std frame net



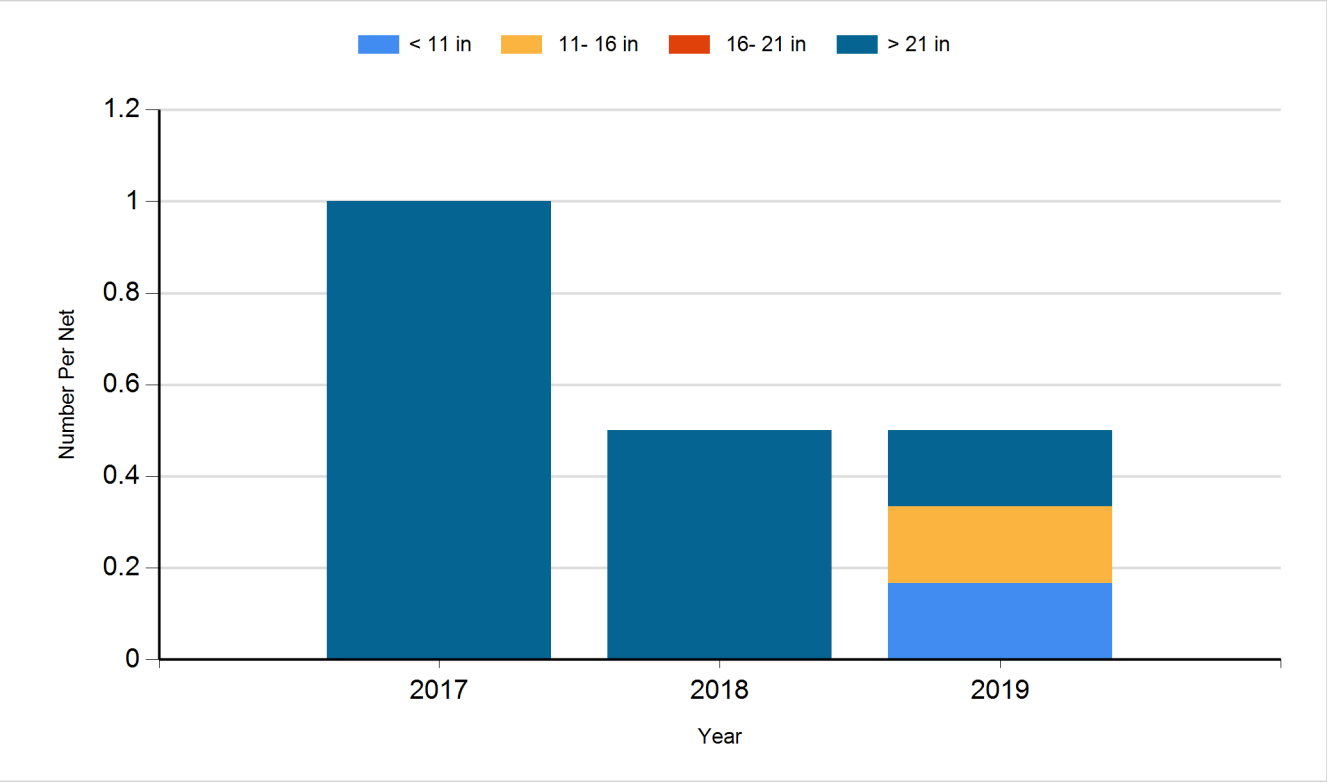
Species: Black Crappie
Gear: frame net (std 3/4 in)



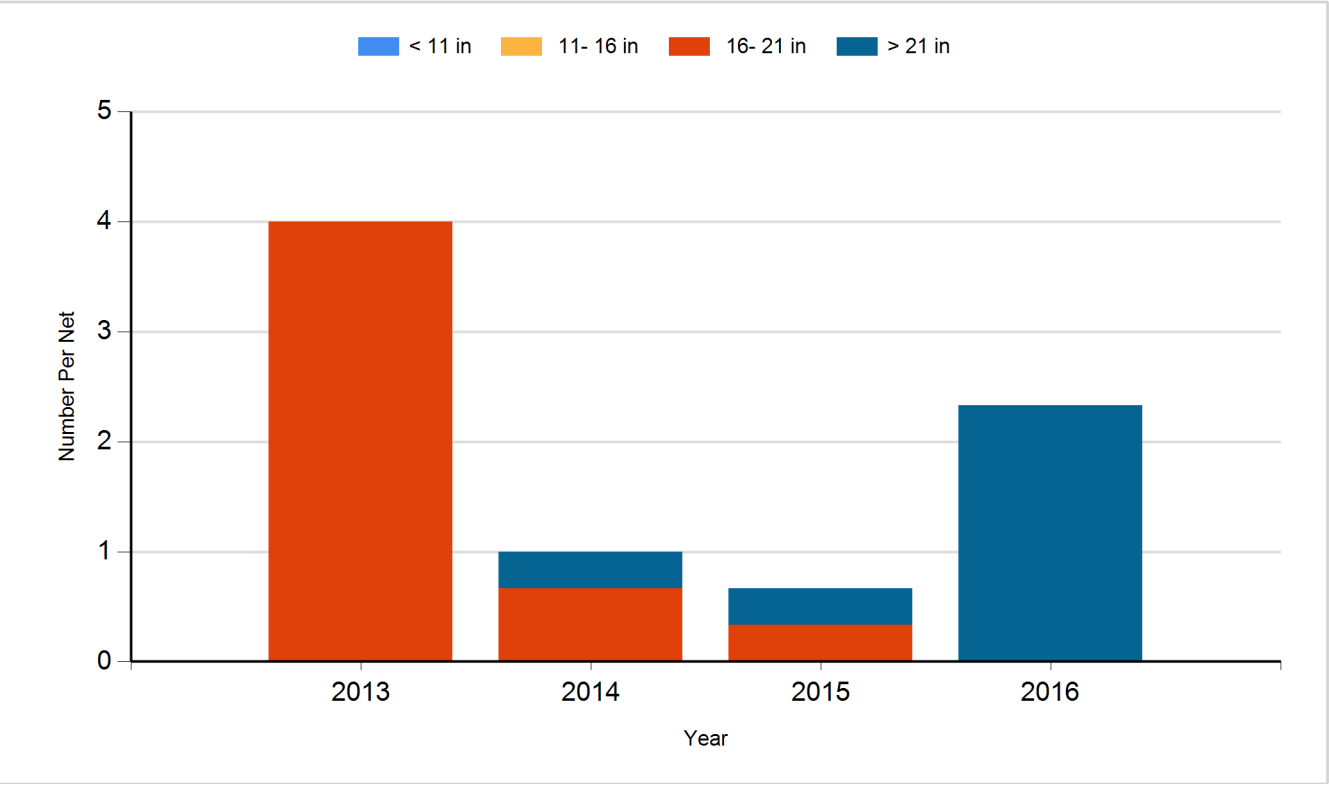
Species: Bluegill
Gear: frame net (std 3/4 in)



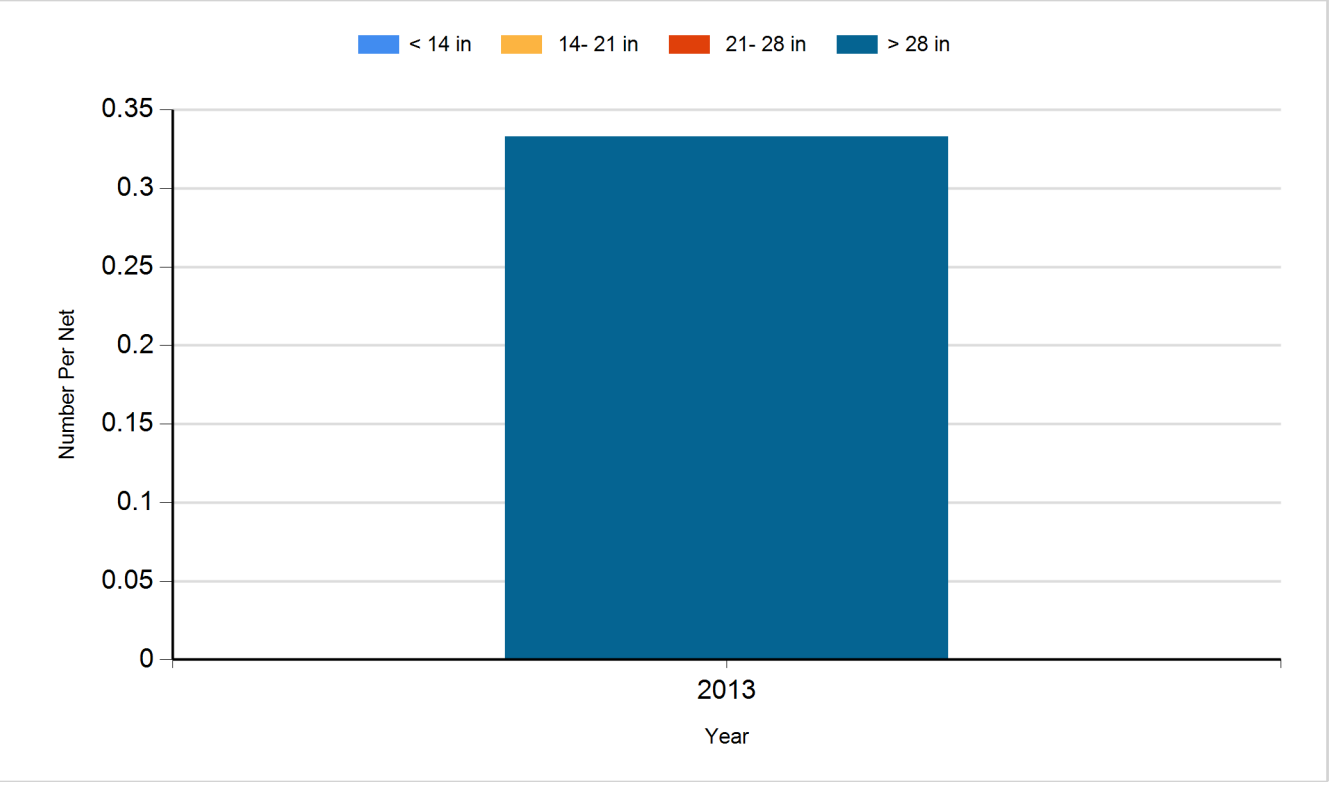
Species: Common Carp
Gear: AFS std gill net



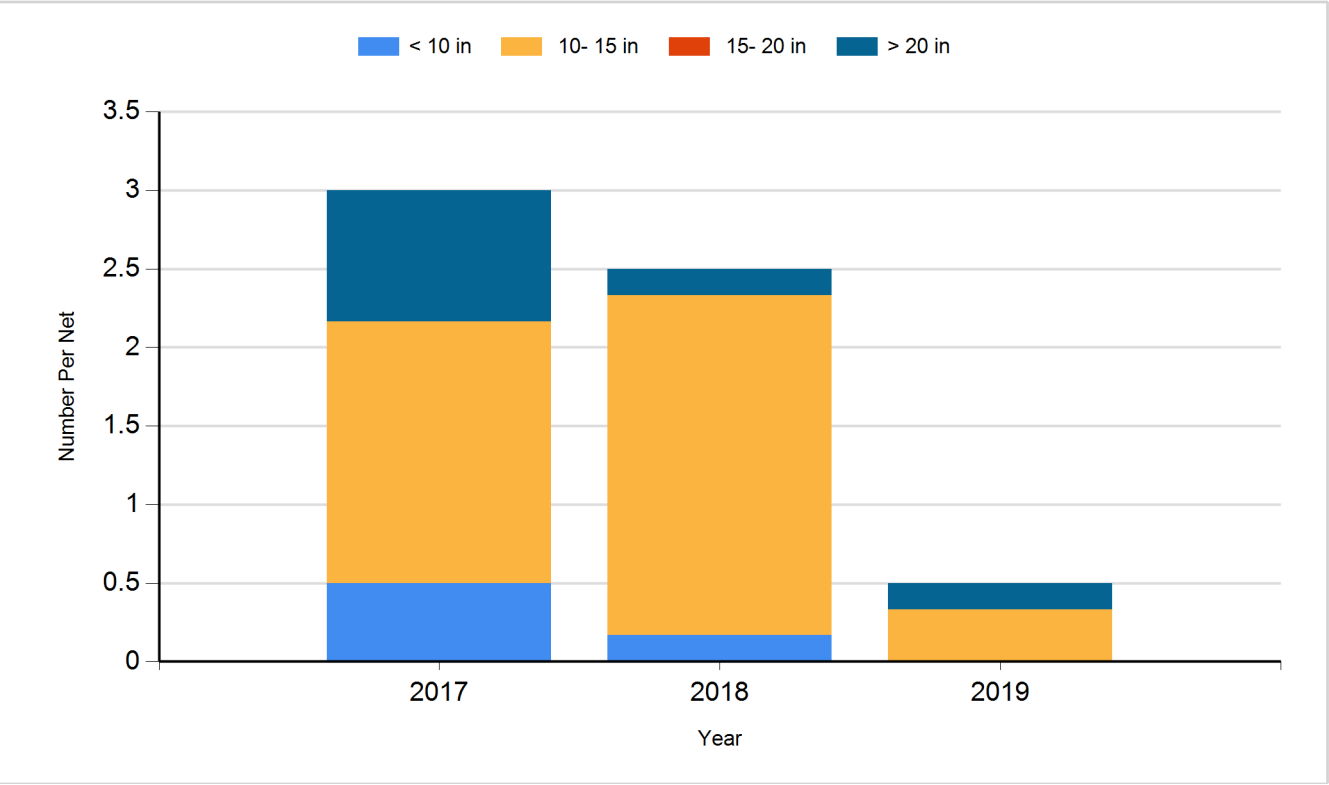
Species: Common Carp
Gear: std exp gill net



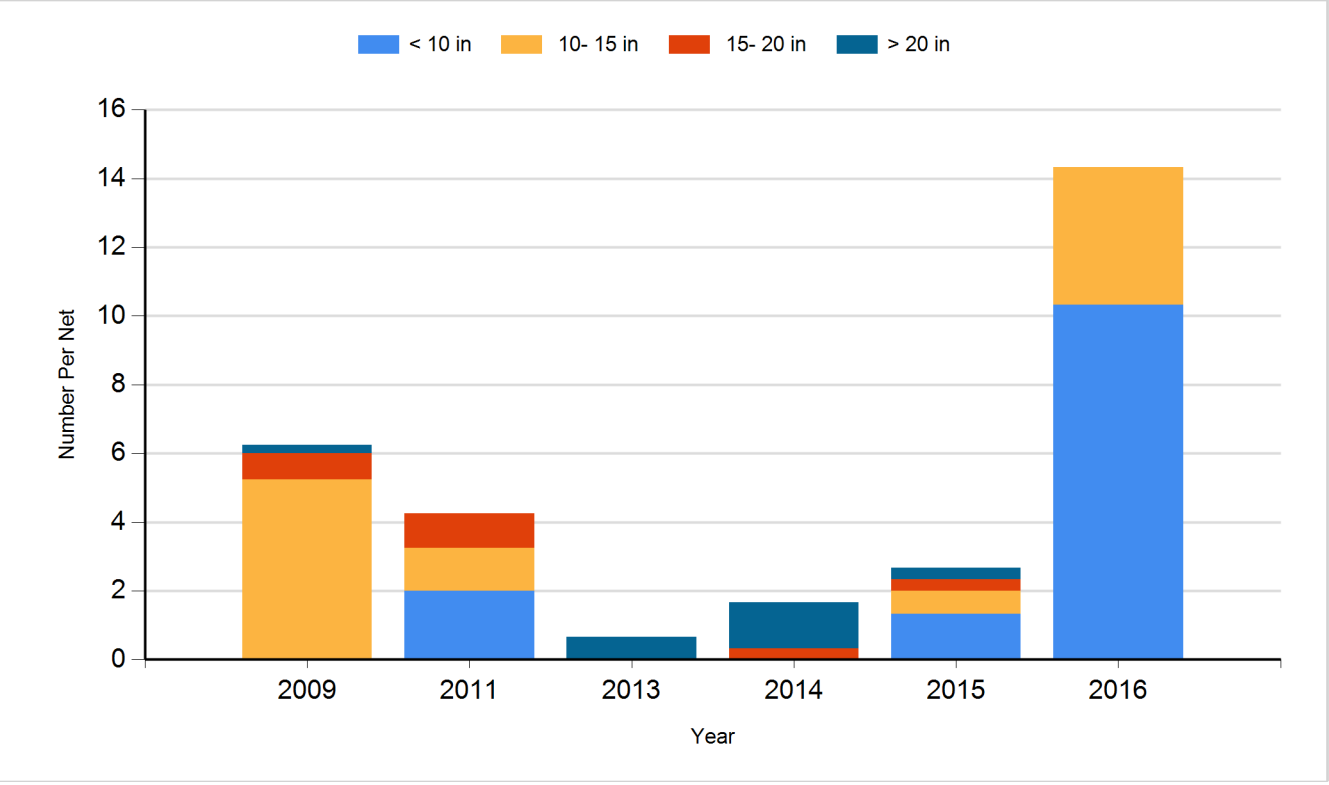
Species: Northern Pike
Gear: std exp gill net



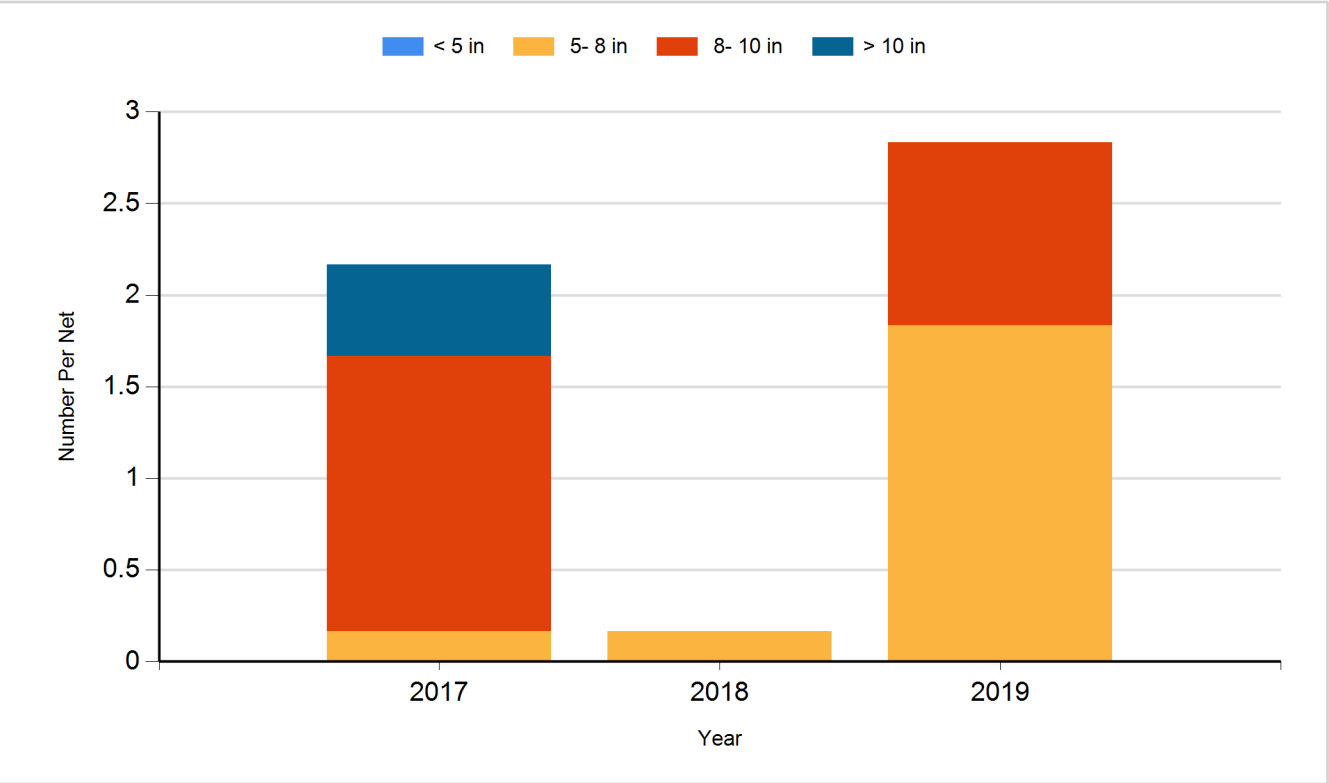
Species: Walleye
Gear: AFS std gill net



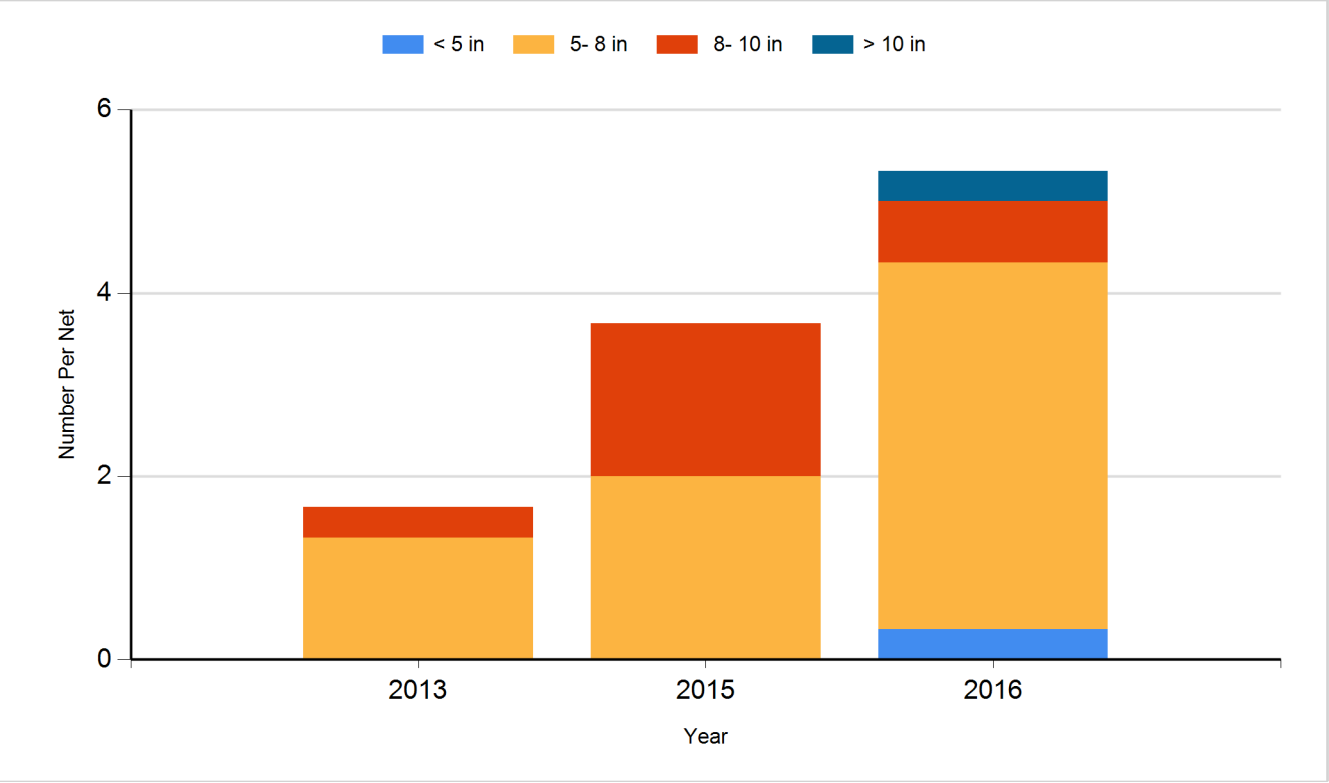
Species: Walleye
Gear: std exp gill net



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
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
2019	Walleye	Small Fingerling	30,600