SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Hanson, Hanson County
LJA-Lake-425-000
2018

Lake Information

Name: Hanson

County: Hanson

Legal Description: T102-R58-Sec. 21

Surface Area: 59 Acres

Maximum Depth: 15 Feet

Mean Depth: 6 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 06, 2018	6 net-nights
frame net (std 3/4 in)	Jun 06, 2018	4 net-nights

Common Fish Species Present

Walleye

Black Bullhead

Bluegill

Channel Catfish

Common Carp

Black Crappie

Green Sunfish

White Sucker

White 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	85	12.7	7.4	0		0			
	Black Crappie	1	0.2	0.2	100		0		84	
	Channel Catfish	46	7.3	3.8	2		0		95	1
	Common Carp	10	1.7	0.8	10		0			
	White Sucker	3	0.5	0.3	100		100			
frame net (std 3/4 in)	Black Bullhead	656	149.0	171.5	0		0			
	Black Crappie	5	1.3	1.0	100		100		79	2
	Bluegill	64	15.8	13.1	29	8	0		102	2
	Channel Catfish	1	0.0	0.0	0		0			
	Green Sunfish	5	1.3	1.6	20		0		84	7
	Walleye	1	0.3	0.4	100		0		82	
	White Crappie	2	0.5	0.8	100		100		83	1

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									113.0		113.0
	Black Crappie									6.6		6.6
	Bluegill									10.2		10.2
	Channel Catfish									0.0		0.0
	Common Carp									0.4		0.4
	Gizzard Shad									6.4		6.4
	Green Sunfish									2.2		2.2
	Largemouth Bass									0.2		0.2
	Walleye									1.6		1.6
	White Crappie									4.8		4.8
	White Sucker									0.4		0.4
AFS std gill net	Black Bullhead									22.0	12.7	17.4
	Black Crappie										0.2	0.2
	Channel Catfish									0.5	7.3	3.9
	Common Carp									4.0	1.7	2.9
	Gizzard Shad									3.5		3.5
	Northern Pike									1.5		1.5
	Walleye									3.5		3.5
	White Sucker									0.5	0.5	0.5
boat shocker (night)	Black Bullhead				165.6							165.6
	Black Crappie				3.6							3.6
	Bluegill				159.6							159.6
	Channel Catfish				0.6							0.6
	Common Carp				51.6							51.6
	Largemouth Bass				12.0							12.0
	Northern Pike				21.6							21.6
	White Crappie				5.4							5.4
	Yellow Perch				12.6							12.6
frame net (std 3/4 in)	Black Bullhead		38.6				30.8	70.4	42.2		149.0	66.2
	Black Crappie		4.8				1.4	4.4	4.6		1.3	3.3
	Bluegill		5.0				7.8	2.4	8.0		15.8	7.8
	Channel Catfish		0.2					0.0	0.0		0.0	0.1
	Common Carp		0.8				0.4	0.4				0.5
	Green Sunfish										1.3	1.3

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
frame net (std 3/4 in)	Northern Pike		1.0				0.4	0.6	1.4			0.9
	Walleye								0.4		0.3	0.4
	White Crappie		17.2				1.2	0.6	13.4		0.5	6.6
	White Sucker								0.2			0.2
	Yellow Perch		0.4					0.8				0.6
std exp gill net	Black Bullhead						2.0	0.0	5.3			2.4
	Black Crappie							1.3	1.0			1.2
	Bluegill						0.7					0.7
	Channel Catfish						0.3	0.7	0.3			0.4
	Common Carp						2.0	3.3	10.3			5.2
	Northern Pike						1.7	4.0	2.0			2.6
	White Crappie							0.3	1.0			0.7
	White Sucker						0.3	0.3				0.3

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									0	
		PSD-P									0	
	Black Crappie	PSD									76	
		PSD-P									9	
		Wr									85	
	Bluegill	PSD									78	
		PSD-P									0	
		Wr									93	
	Channel Catfish	PSD									0	
		PSD-P									0	
	Common Carp	PSD									50	
		PSD-P									0	
	Green Sunfish	PSD									27	
		PSD-P									0	
	Walleye	PSD									0	
		PSD-P									0	
		Wr									79	
	White Crappie	PSD									75	
		PSD-P									4	
		Wr									81	
	White Sucker	PSD									100	
		PSD-P									100	
AFS std gill net	Black Bullhead	PSD									0	0
		PSD-P									0	0
	Black Crappie	PSD										100
		PSD-P										0
		Wr										84
	Channel Catfish	PSD									0	2
		PSD-P									0	0
		Wr									99	95
	Common Carp	PSD									13	10
		PSD-P									0	0
	Walleye	PSD									29	

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std gill net	Walleye	PSD-P									0	
		Wr									84	
	White Sucker	PSD									100	100
		PSD-P									100	100
boat shocker (night)	Black Bullhead	PSD				2						
		PSD-P				0						
		Wr				92						
	Black Crappie	PSD				50						
		PSD-P				17						
		Wr				108						
	Bluegill	PSD				15						
		PSD-P				0						
		Wr				111						
	Channel Catfish	PSD				100						
		PSD-P				0						
		Wr				100						
	Common Carp	PSD				58						
		PSD-P				5						
		Wr				96						
	White Crappie	PSD				22						
		PSD-P				11						
		Wr				112						
frame net (std 3/4 in)	Black Bullhead	PSD		12				0	14	0		0
		PSD-P		0				0	0	0		0
		Wr		72								
	Black Crappie	PSD		38				14	41	9		100
		PSD-P		29				14	18	9		100
		Wr		93				87	89	96		79
	Bluegill	PSD		40				15	8	65		29
		PSD-P		0				0	0	0		0
		Wr		92				96	94	108		102
	Channel Catfish	PSD		100					0	0		0
		PSD-P		100					0	0		0
		Wr		91								
	Common Carp	PSD		75				0	50			
		PSD-P		0				0	50			

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	Common Carp	Wr		87								
	Green Sunfish	PSD										20
		PSD-P										0
		Wr										84
	Walleye	PSD								0		100
		PSD-P								0		0
		Wr								86		82
	White Crappie	PSD		16				83	67	3		100
		PSD-P		14				83	33	1		100
		Wr		86				74	86	103		83
	White Sucker	PSD								100		
		PSD-P								100		
std exp gill net	Black Bullhead	PSD						50	0	0		
		PSD-P						17	0	0		
	Black Crappie	PSD							0	0		
		PSD-P							0	0		
		Wr							83	92		
	Bluegill	PSD						50				
		PSD-P						0				
		Wr						103				
	Channel Catfish	PSD						100	100	0		
		PSD-P						0	100	0		
		Wr						88	88	85		
	Common Carp	PSD						0	30	6		
		PSD-P						0	0	0		
	White Crappie	PSD							0	0		
		PSD-P							0	0		
		Wr							91	95		
	White Sucker	PSD						0	100			
		PSD-P						0	100			

Fish Condition

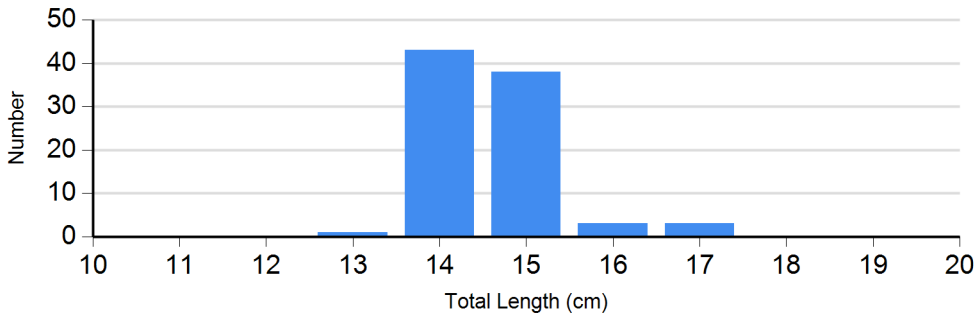
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2014	6	91 (4.4)	0		0		1	66
	2015	13	92 (1.3)	5	87 (3.4)	2	83 (1.8)	2	76 (1.7)
	2016	21	98 (1.3)	0		1	64	1	73
	2017	8	89 (1.4)	22	84 (0.9)	1	74	2	84 (0.0)
	2018	0		0		3	80 (3.1)	2	78 (1.8)
Bluegill Frame Net	2014	33	97 (2.3)	6	91 (7.3)	0		0	
	2015	11	94 (3.3)	1	92	0		0	
	2016	14	112 (2.5)	26	106 (2.1)	0		0	
	2017	11	99 (2.0)	40	91 (2.0)	0		0	
	2018	45	106 (2.0)	18	91 (1.7)	0		0	
Channel Catfish Gill Net	2014	0		1	88	0		0	
	2015	0		0		2	88 (0.5)	0	
	2016	1	85	0		0		0	
	2017	1	99	0		0		0	
	2018	43	95 (1.1)	1	95	0		0	
Walleye Gill Net	2017	5	83 (1.8)	2	86 (2.0)	0		0	
White Crappie Frame Net	2014	1	57	0		4	77 (5.6)	1	77
	2015	1	84	1	86	0		1	88
	2016	65	101 (0.9)	1	237	0		1	79
	2017	6	85 (2.9)	17	79 (1.3)	0		1	85
	2018	0		0		2	83 (0.8)	0	

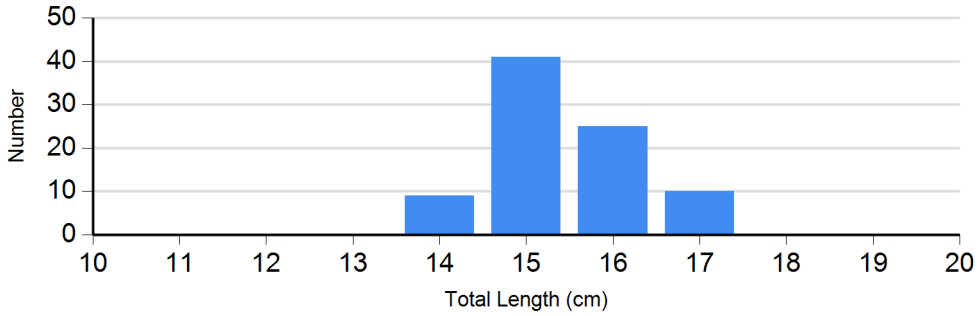
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

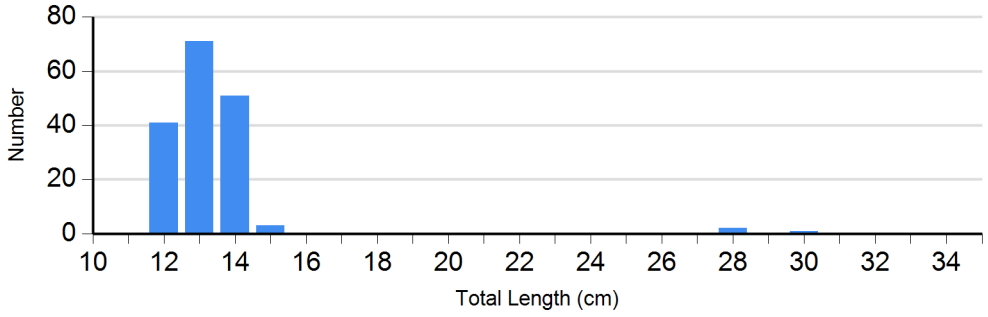


2017

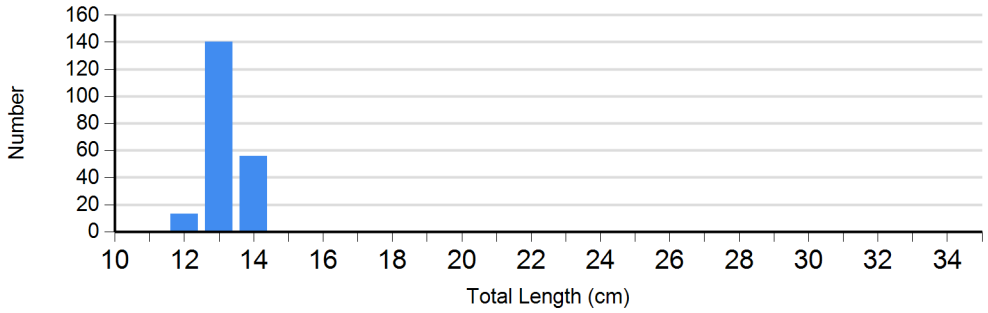


2018

Species: Black Bullhead
Gear: std exp gill net



2014



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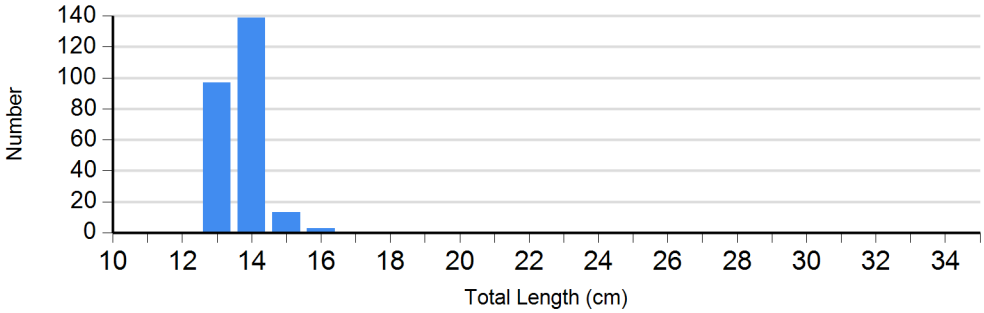
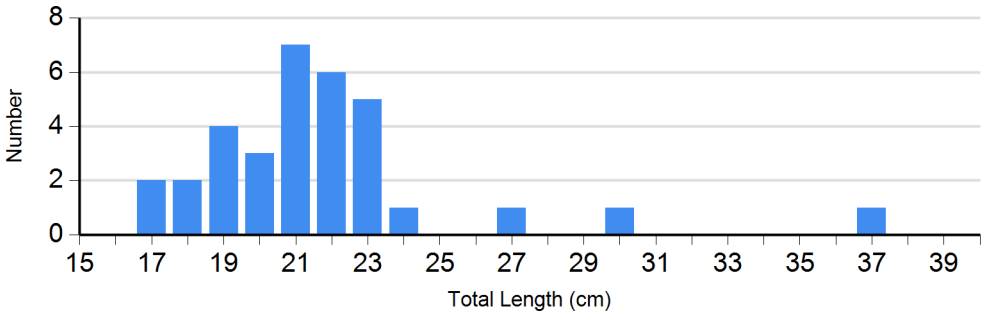


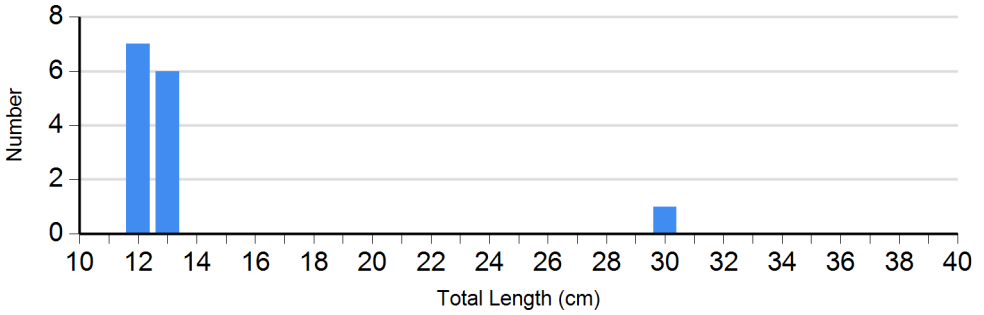
2016

Species: Black Crappie
Gear: AFS std frame net



2017

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



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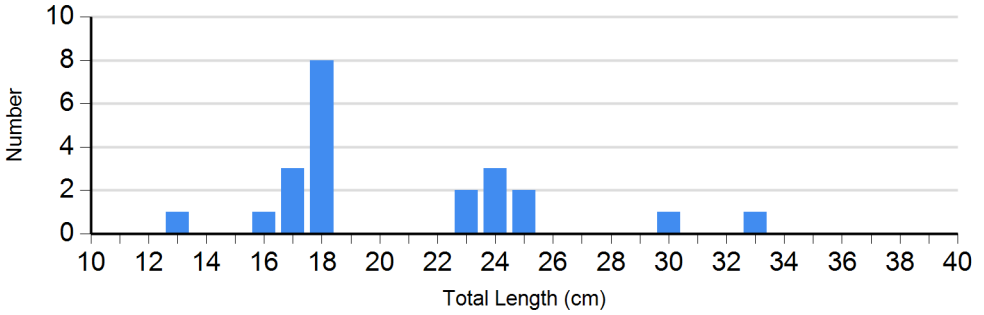

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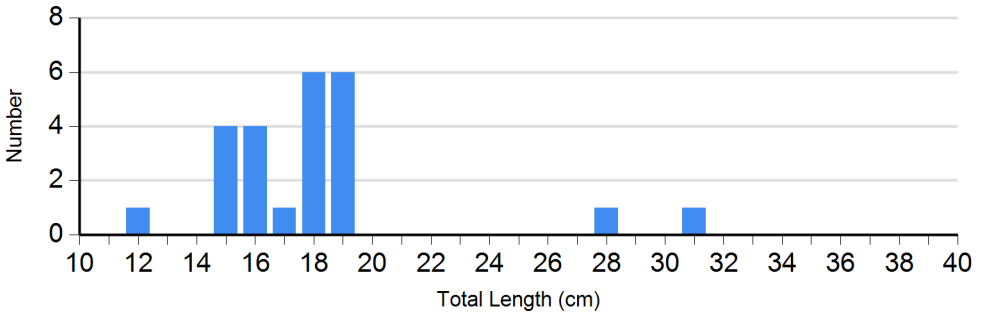
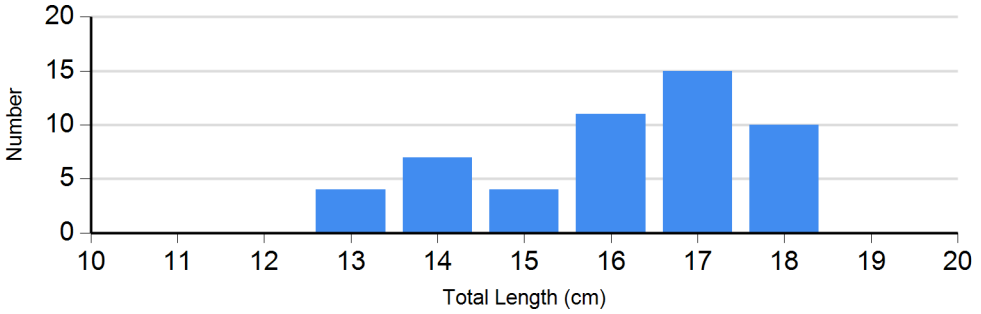


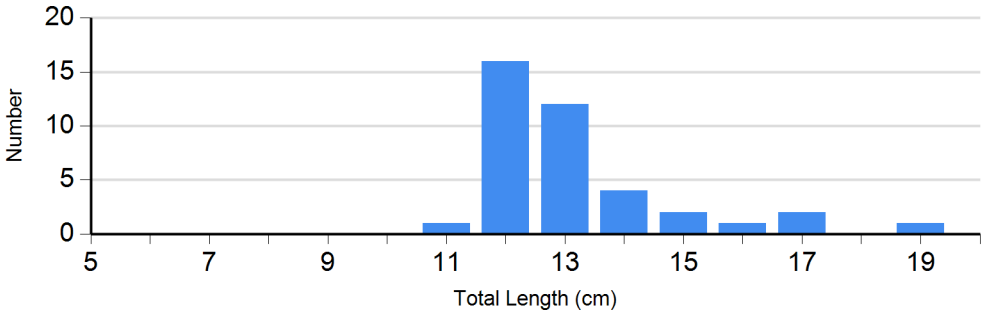
2016

Species: Bluegill
Gear: AFS std frame net

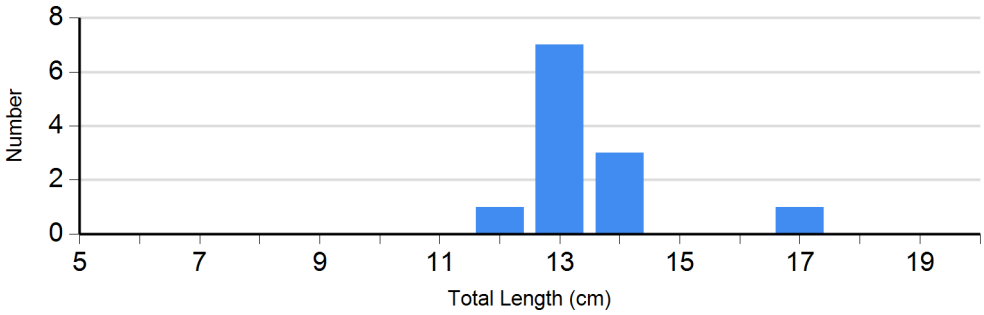


2017

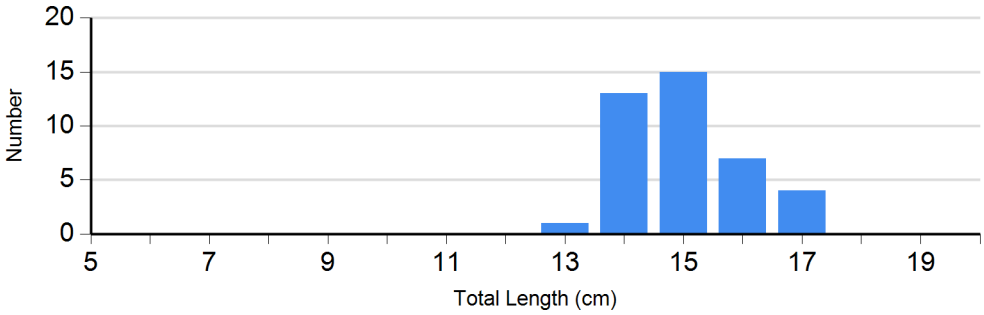
Species: Bluegill
Gear: frame net (std 3/4 in)



2014



2015



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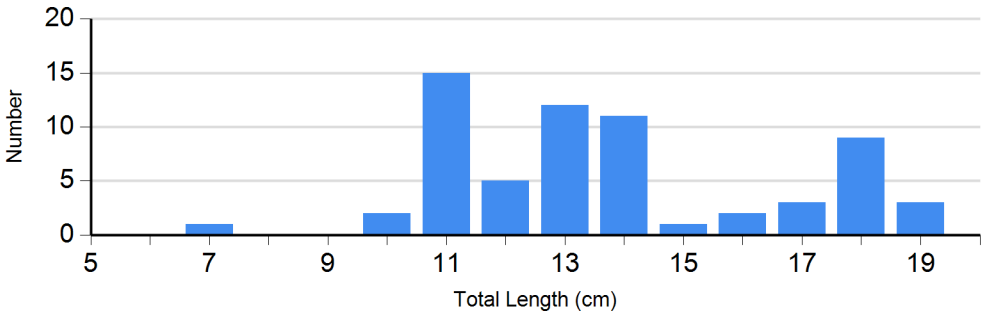
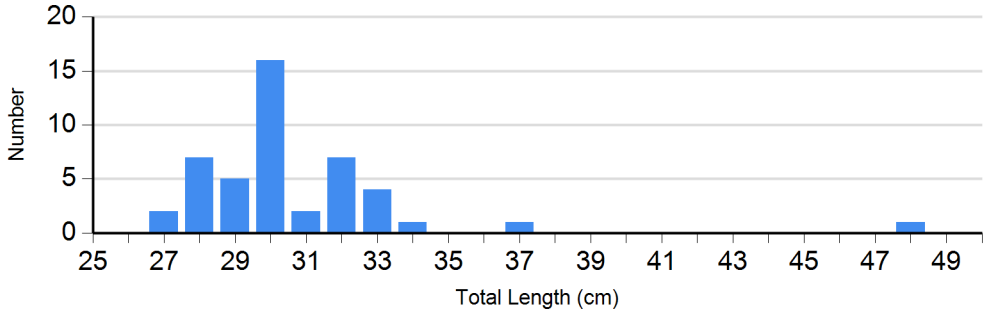


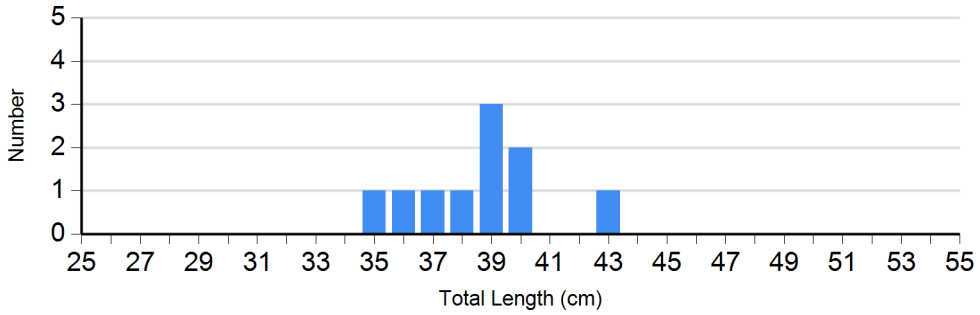
2018

Species: Channel Catfish
Gear: AFS std gill net



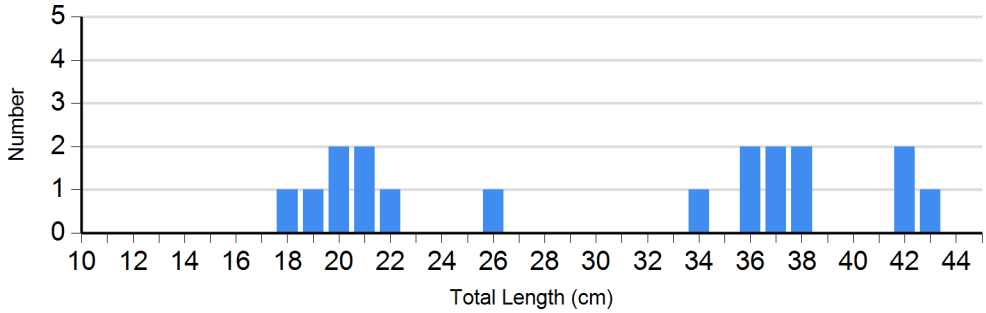
2018

Species: Common Carp
Gear: AFS std gill net

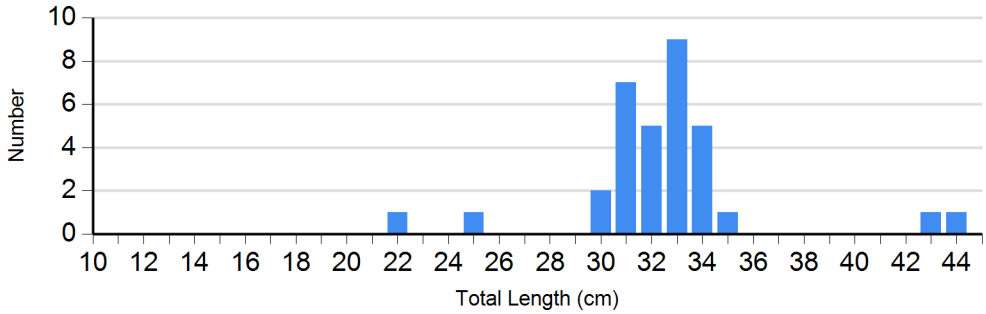


2018

Species: Common Carp
Gear: std exp gill net

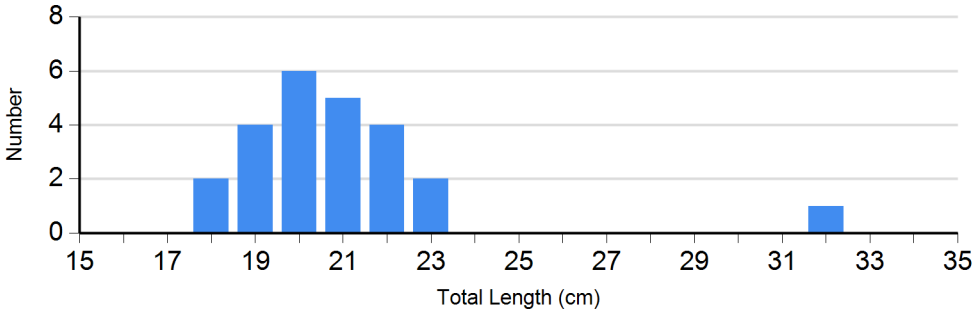


2015



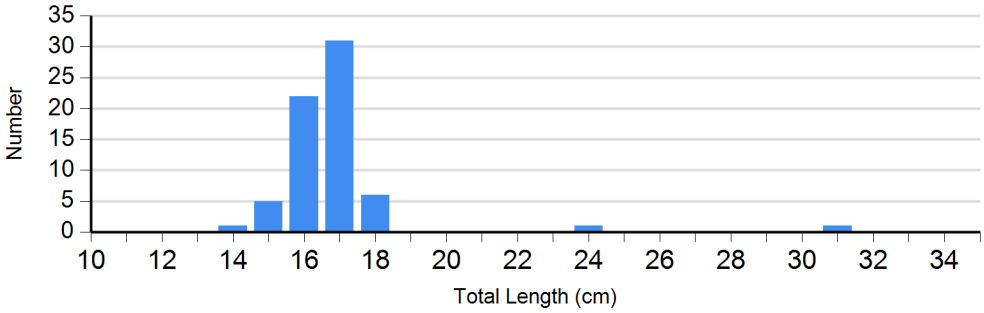
2016

Species: White Crappie
Gear: AFS std frame net



2017

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

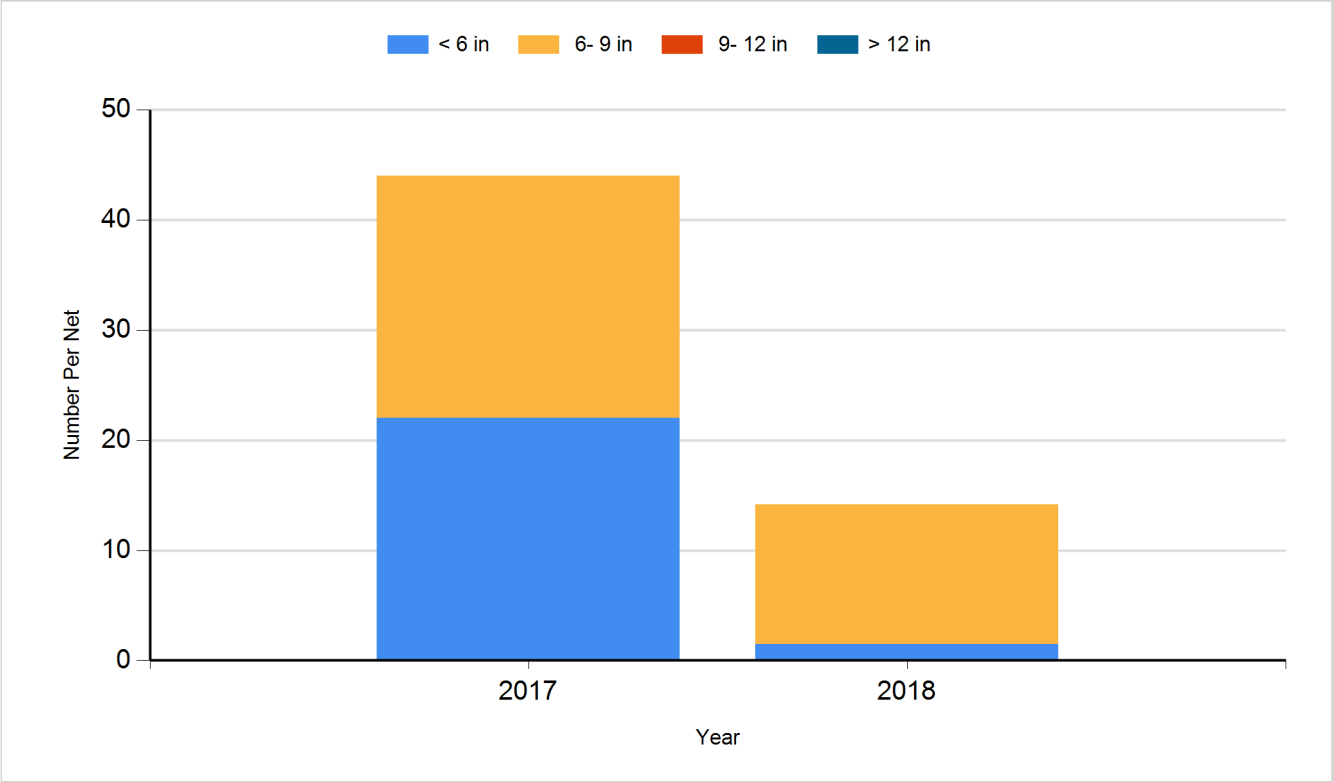


2016

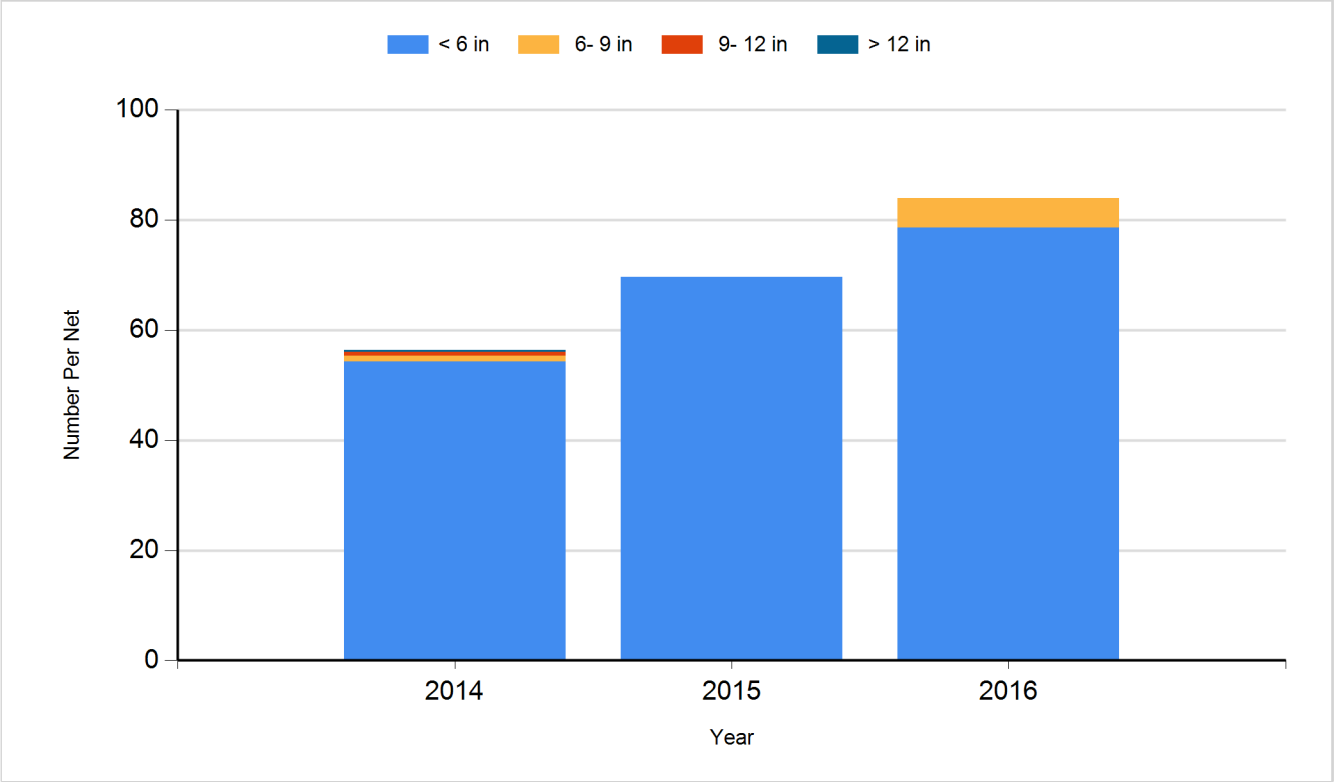
Historic Fish Sizes and Relative Abundance

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

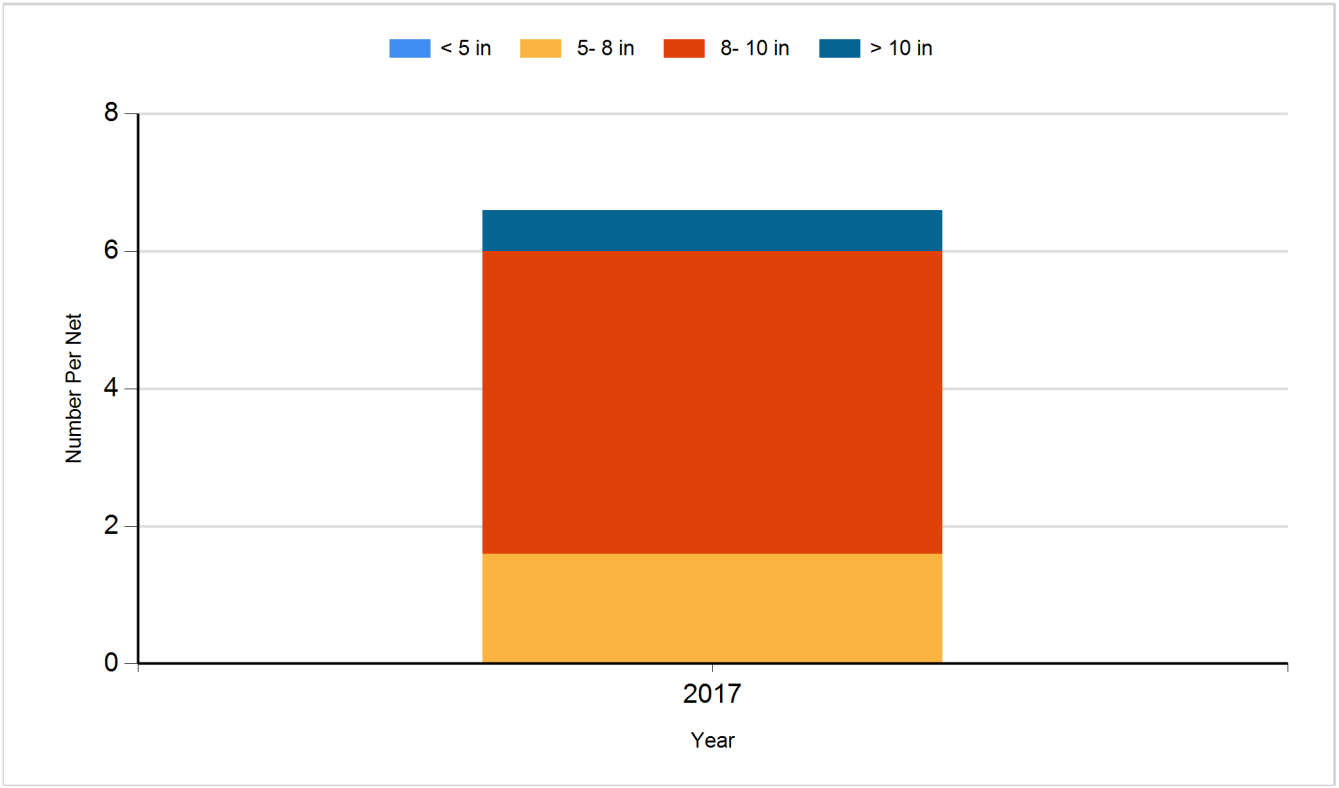
Species: Black Bullhead
Gear: AFS std gill net



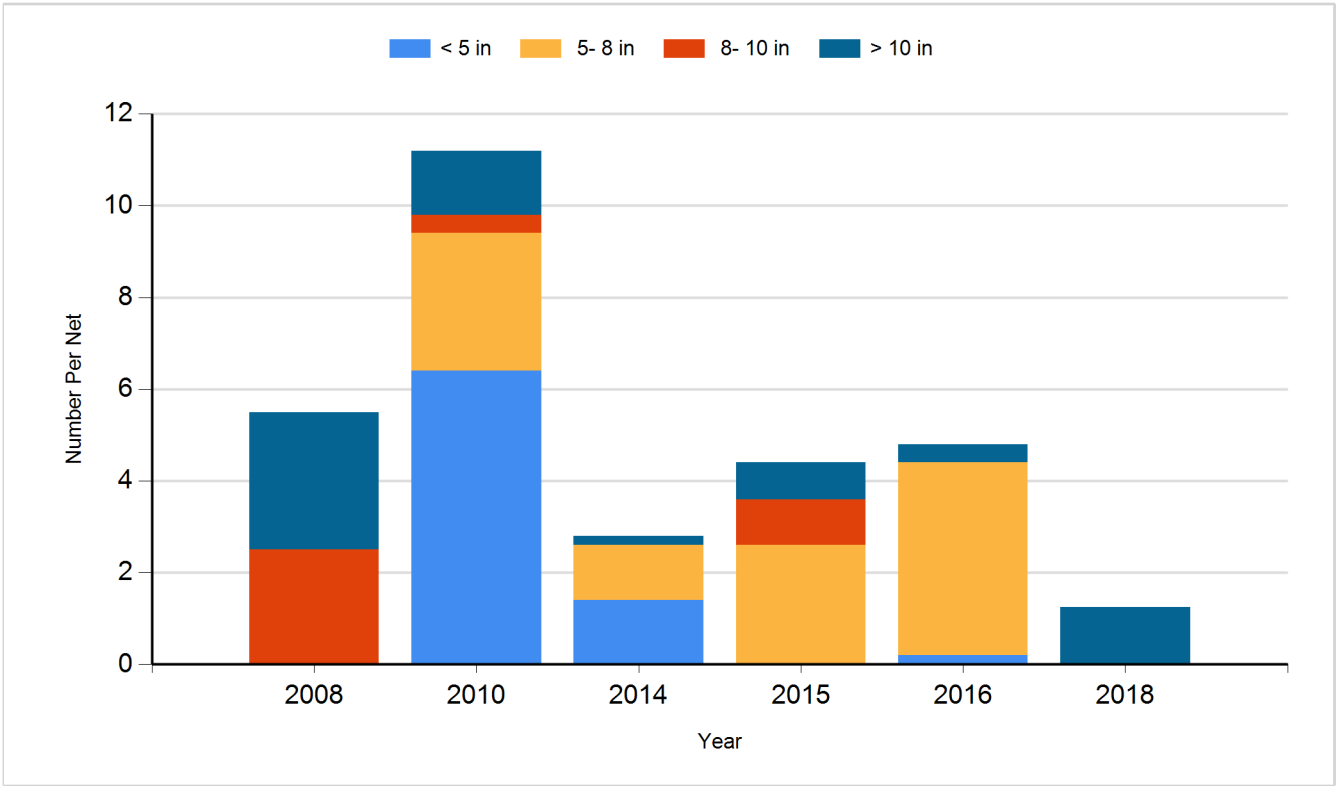
Species: Black Bullhead
Gear: std exp gill net



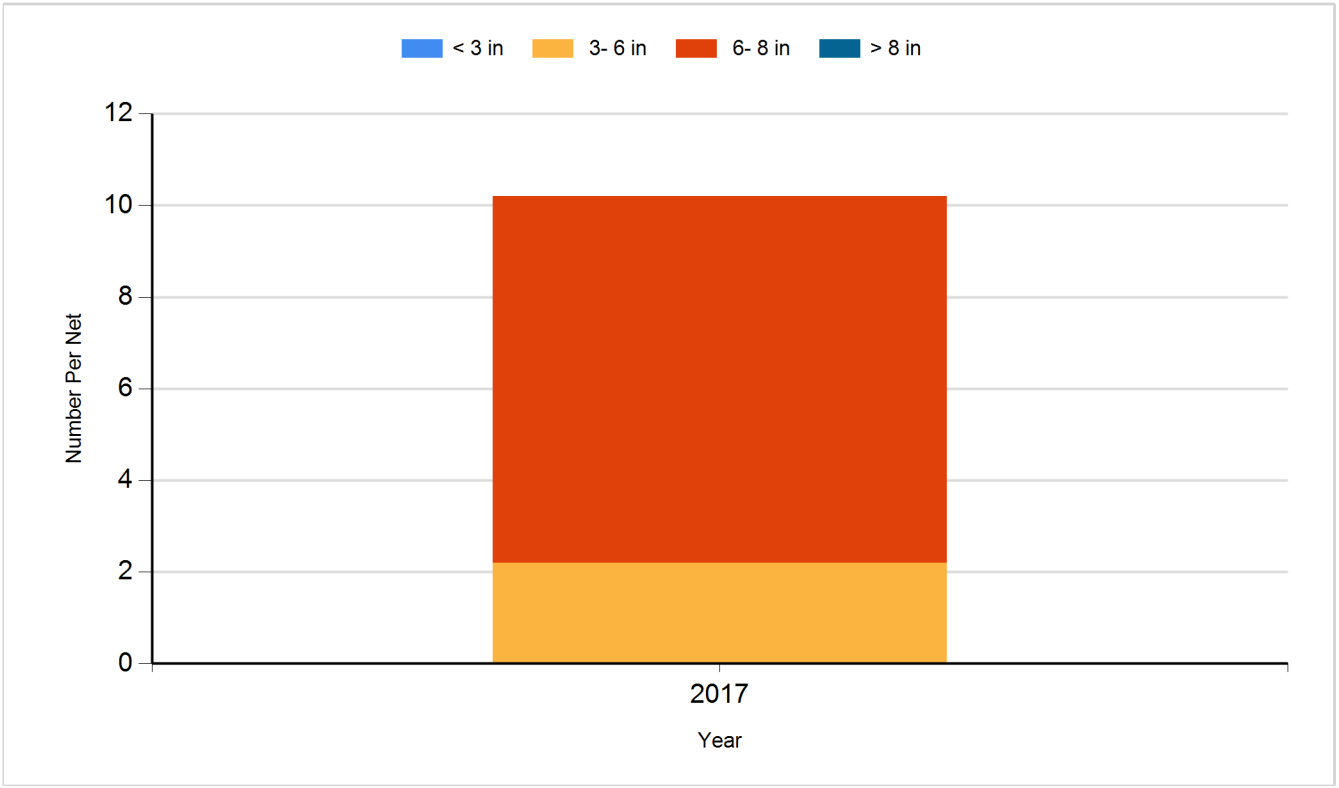
Species: Black Crappie
Gear: AFS std frame net



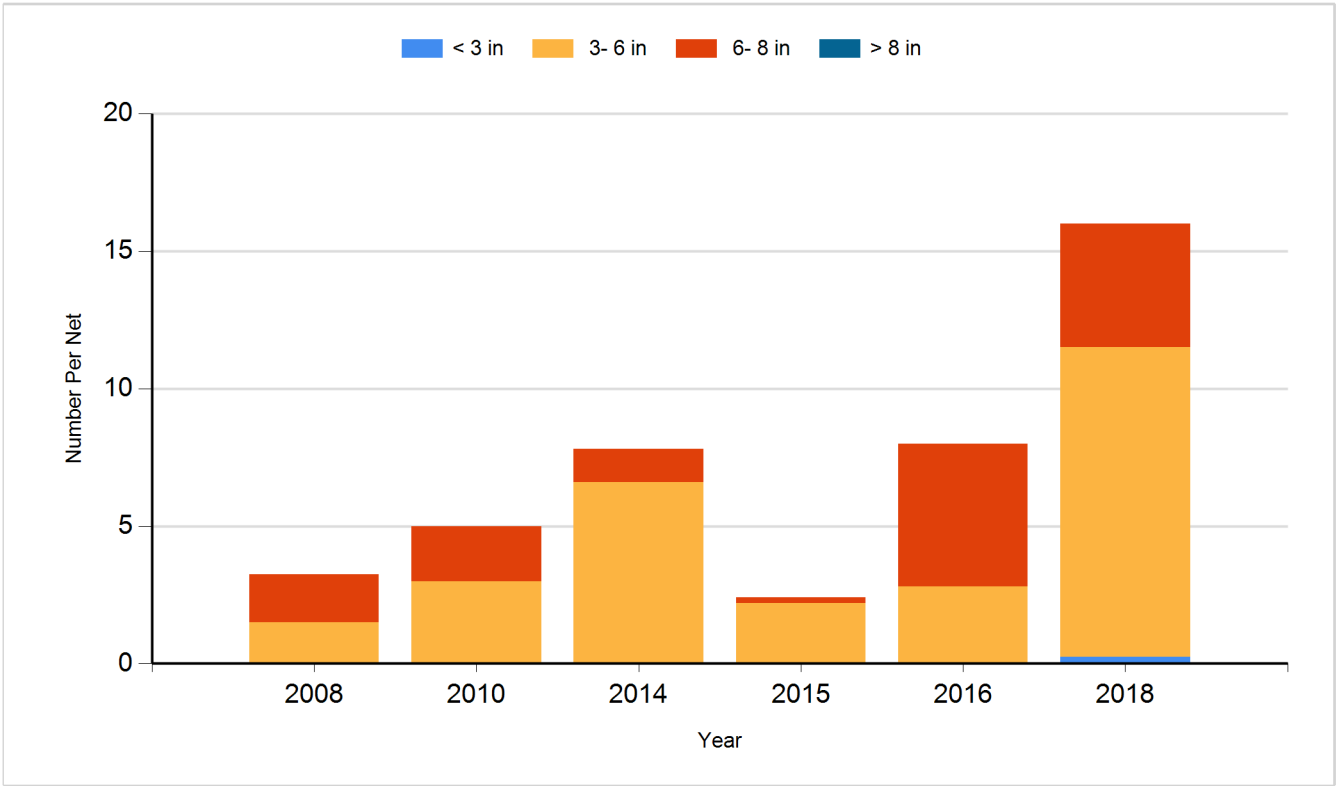
Species: Black Crappie
Gear: frame net (std 3/4 in)



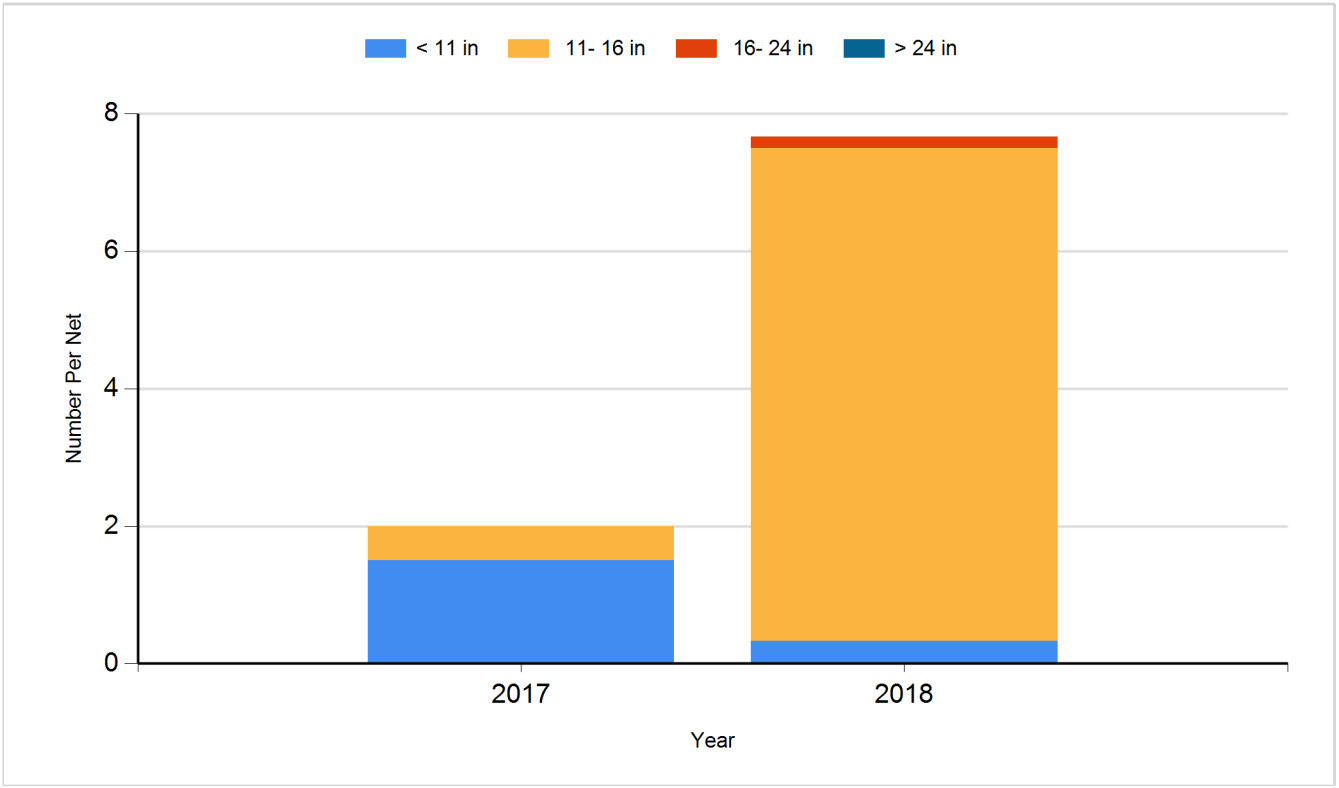
Species: Bluegill
Gear: AFS std frame net



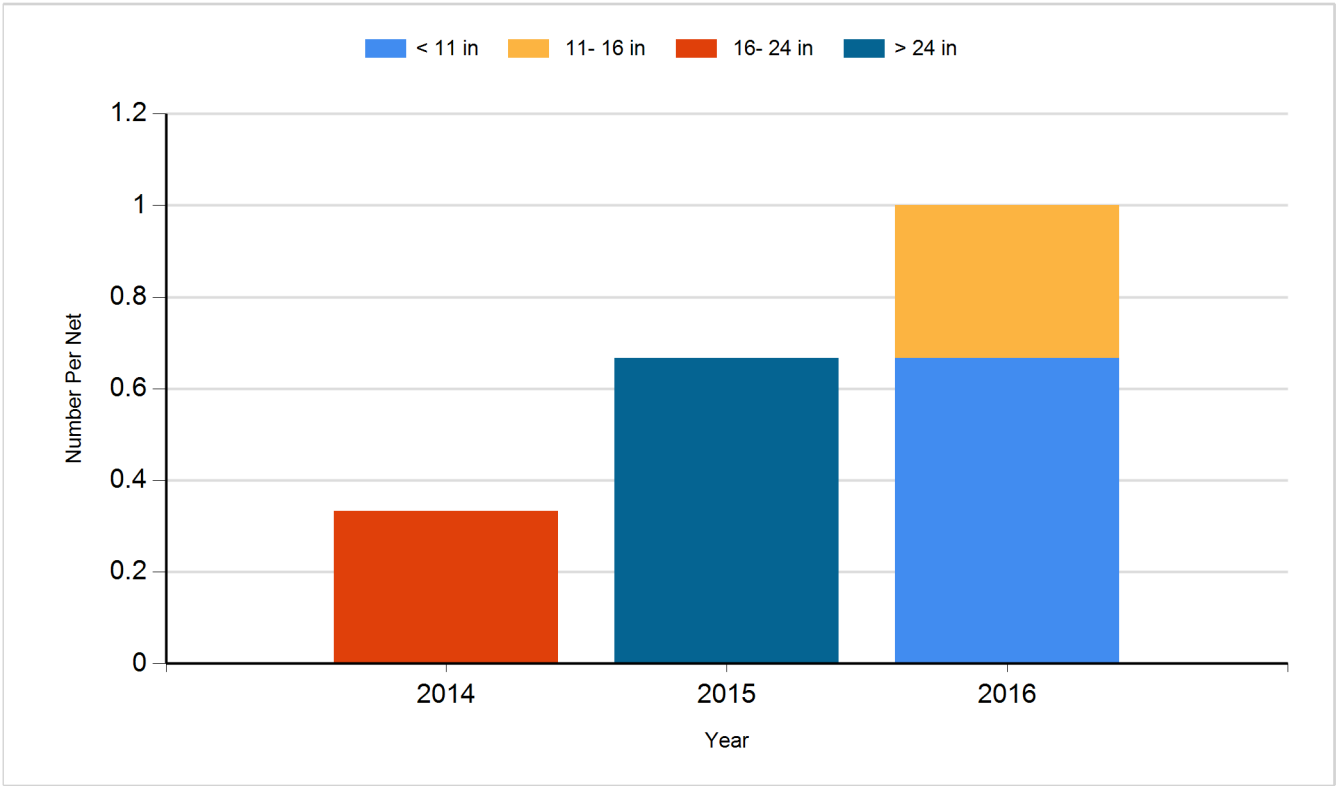
Species: Bluegill
Gear: frame net (std 3/4 in)



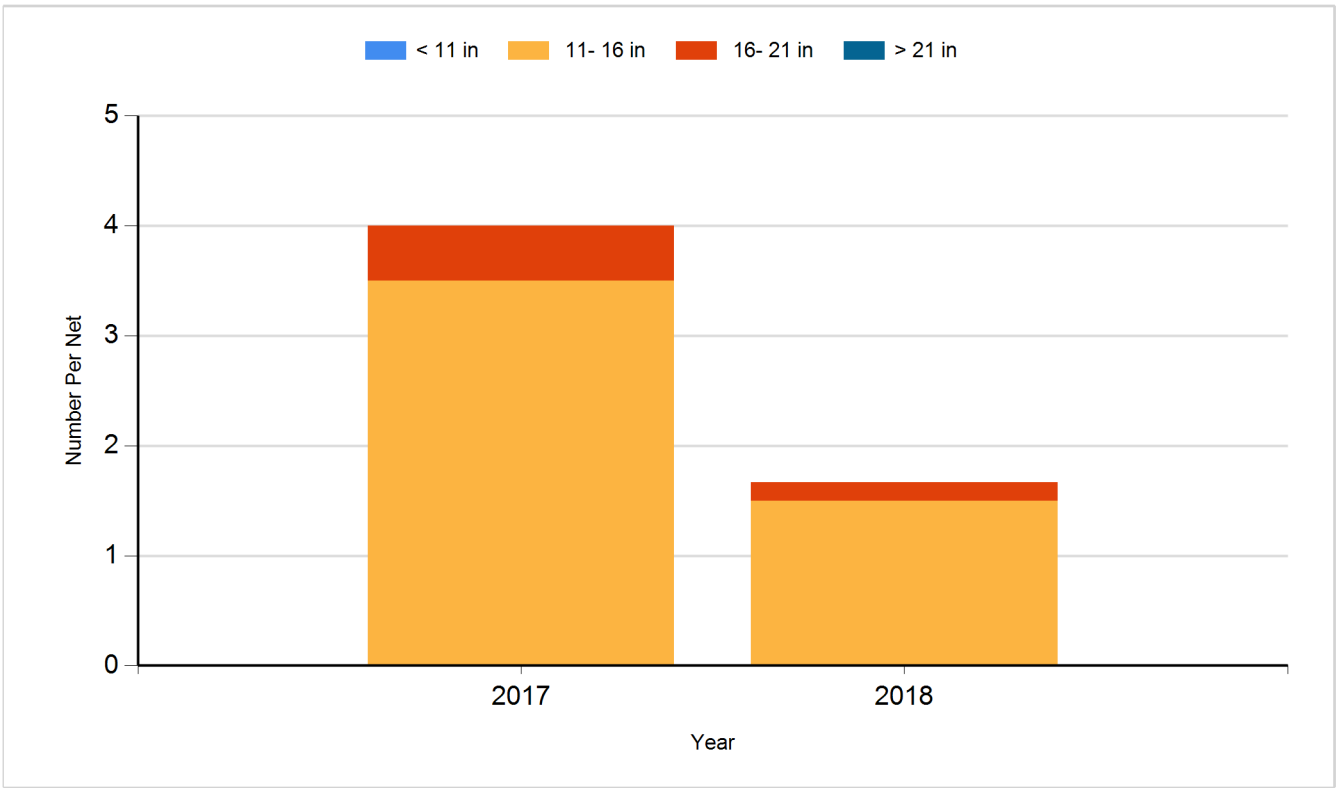
Species: Channel Catfish
Gear: AFS std gill net



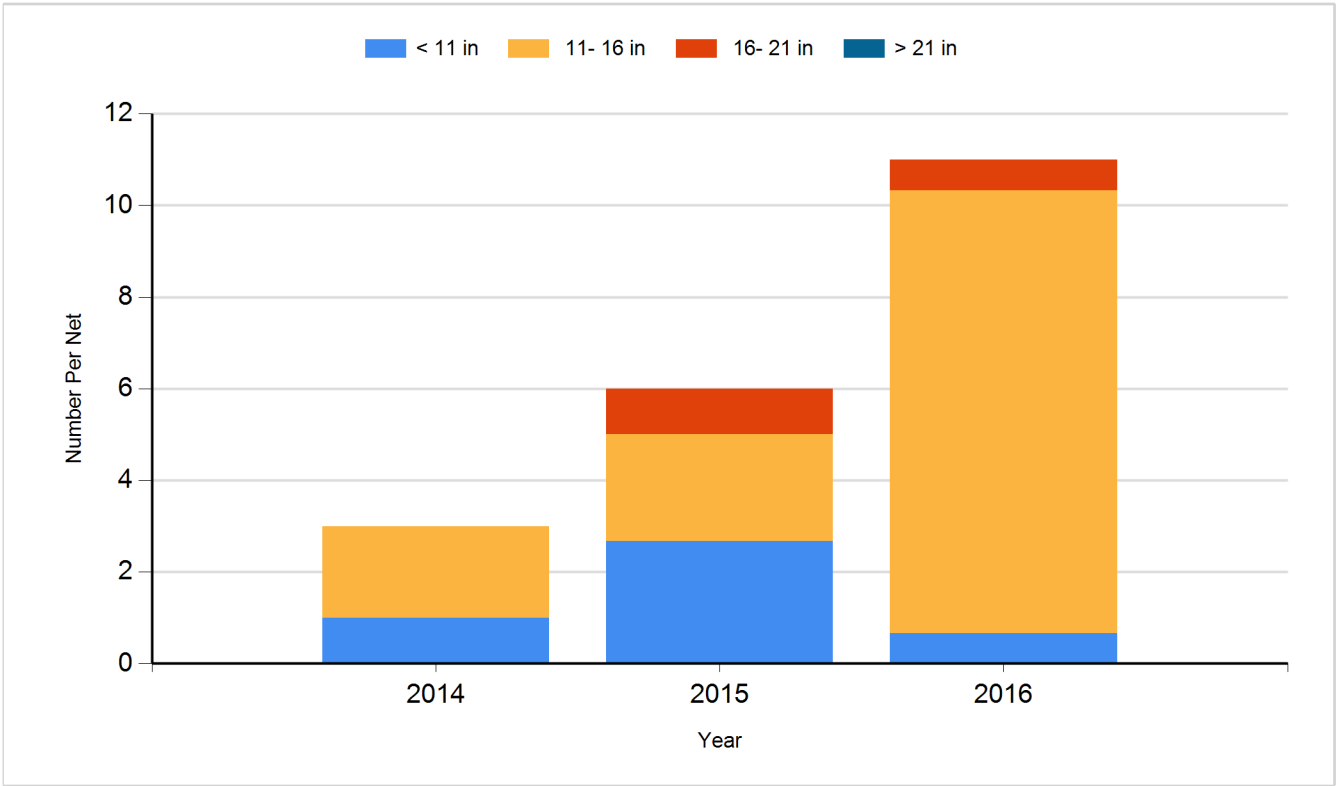
Species: Channel Catfish
Gear: std exp gill net



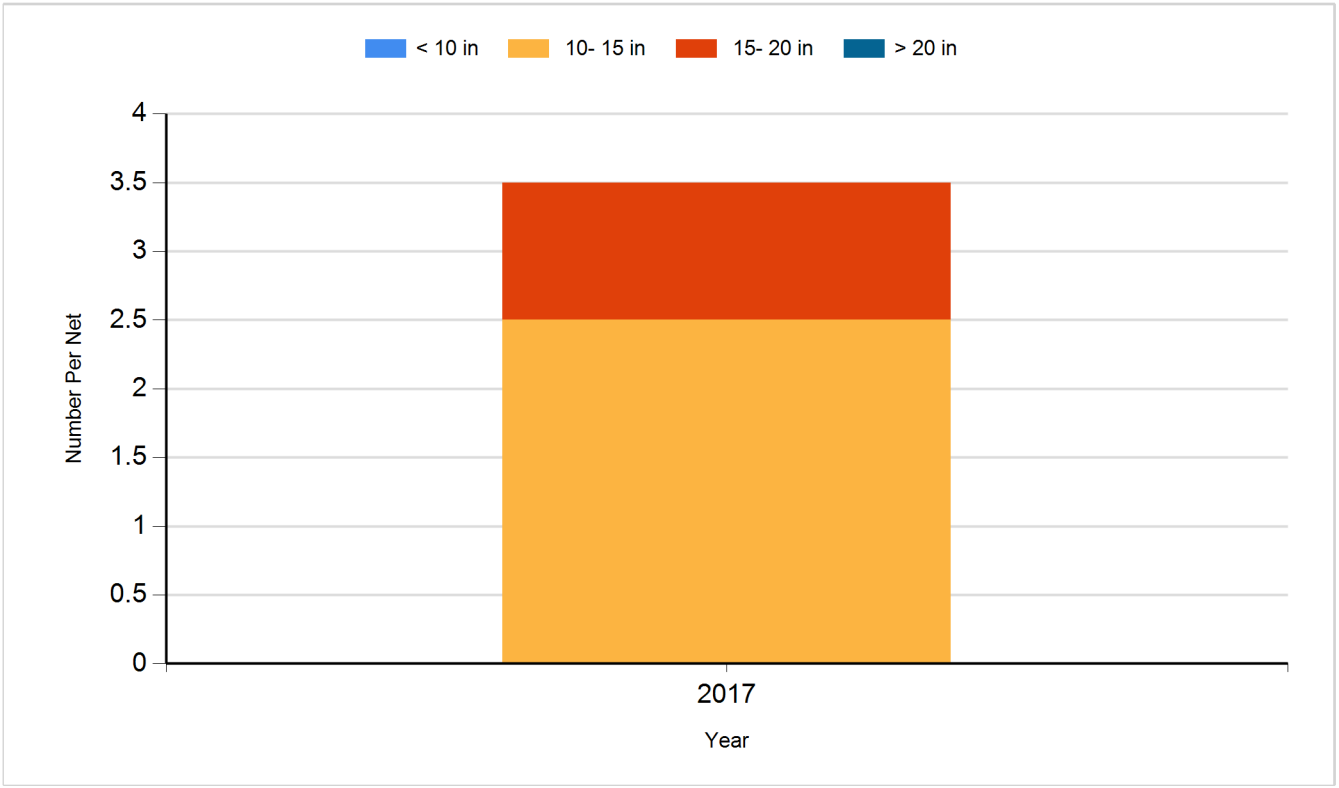
Species: Common Carp
Gear: AFS std gill net



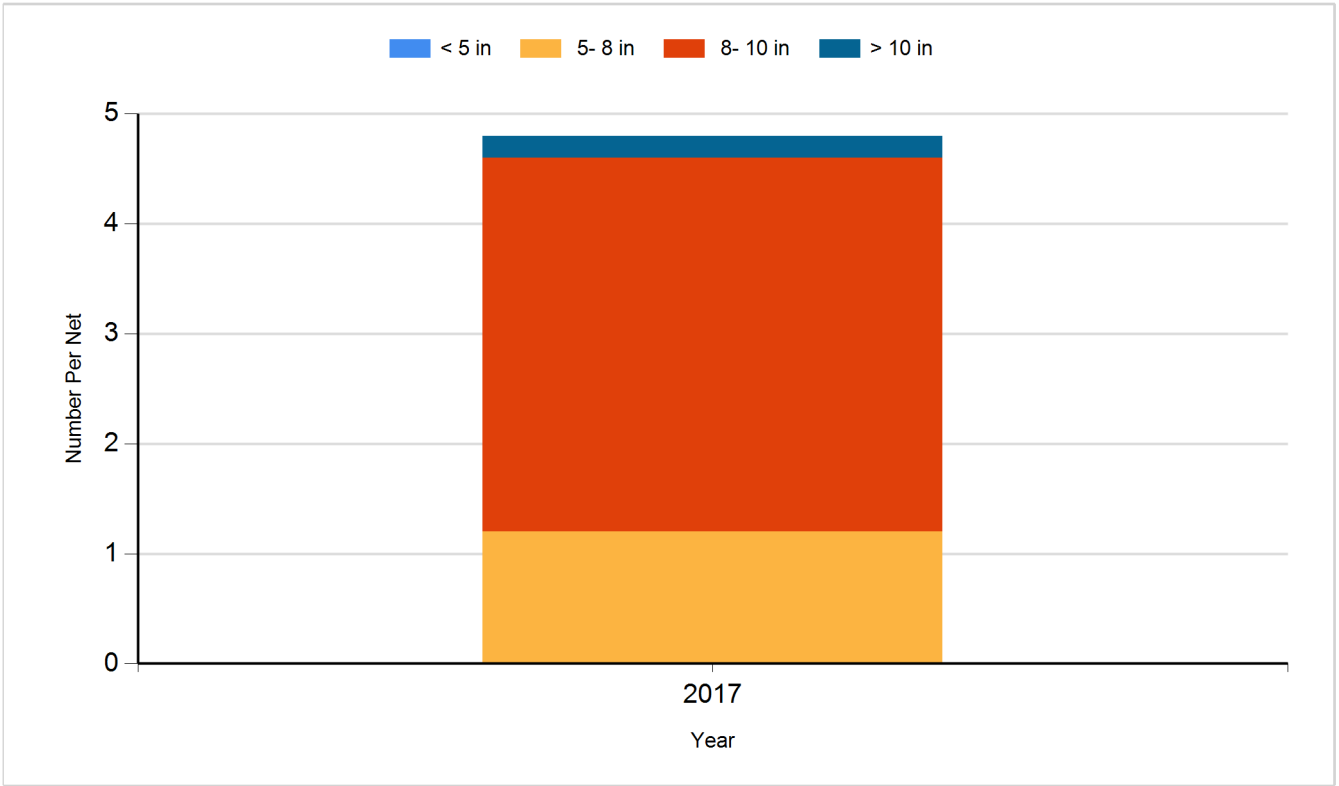
Species: Common Carp
Gear: std exp gill net



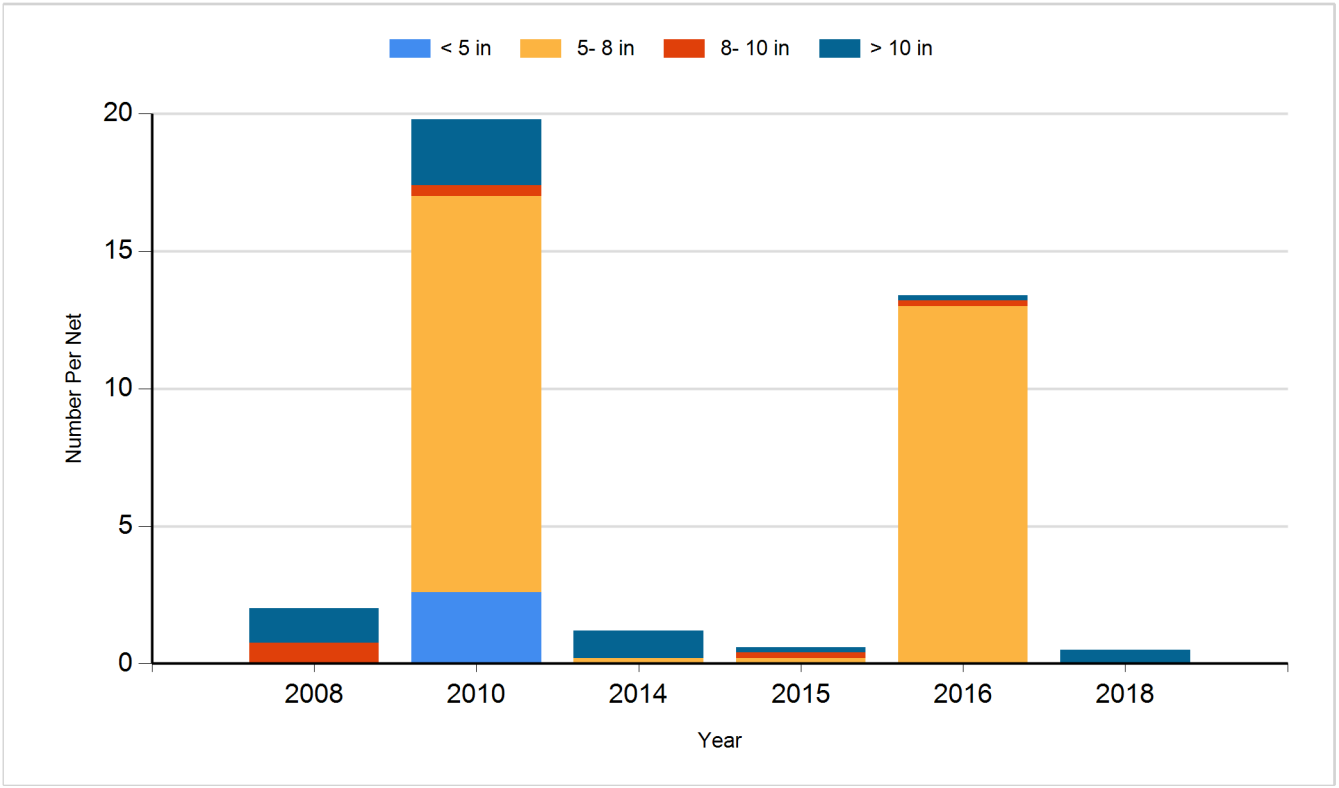
Species: Walleye
Gear: AFS std gill net



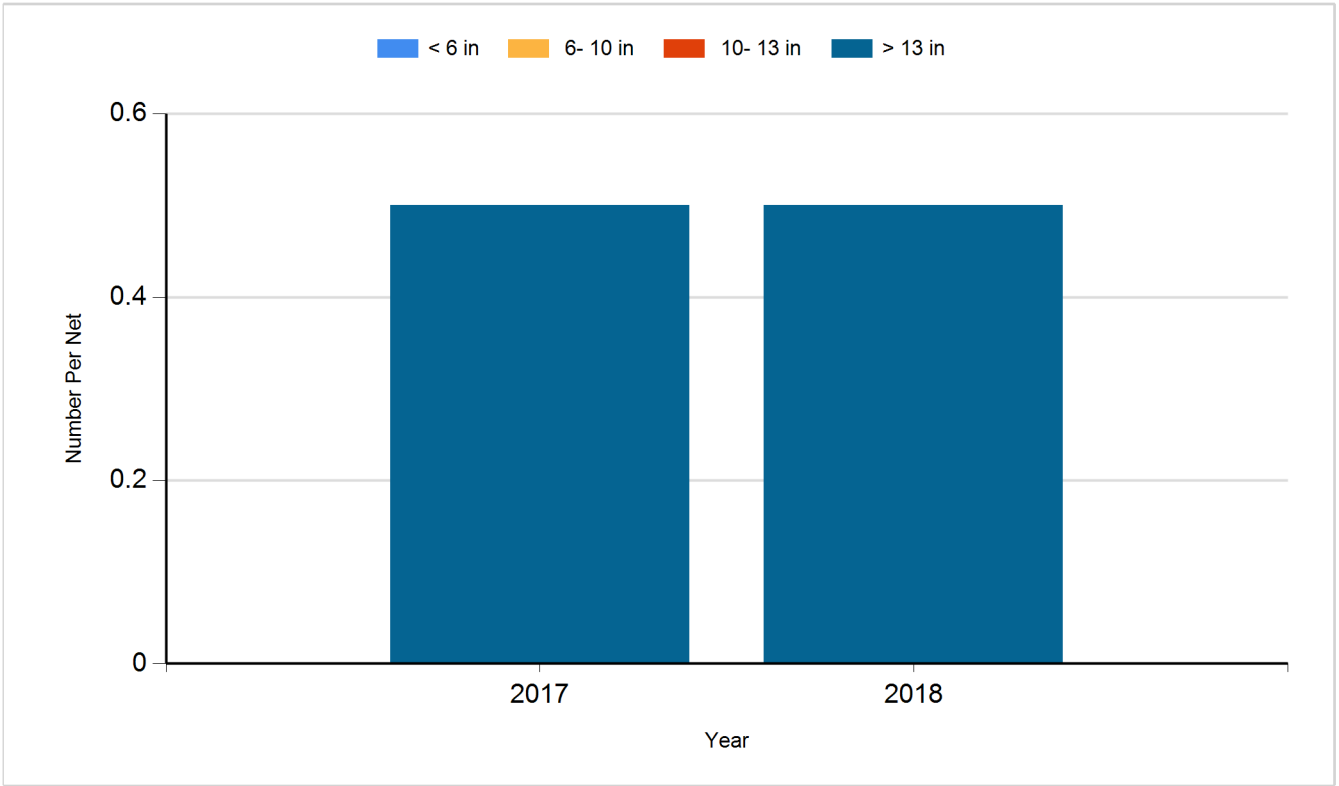
Species: White Crappie
Gear: AFS std frame net



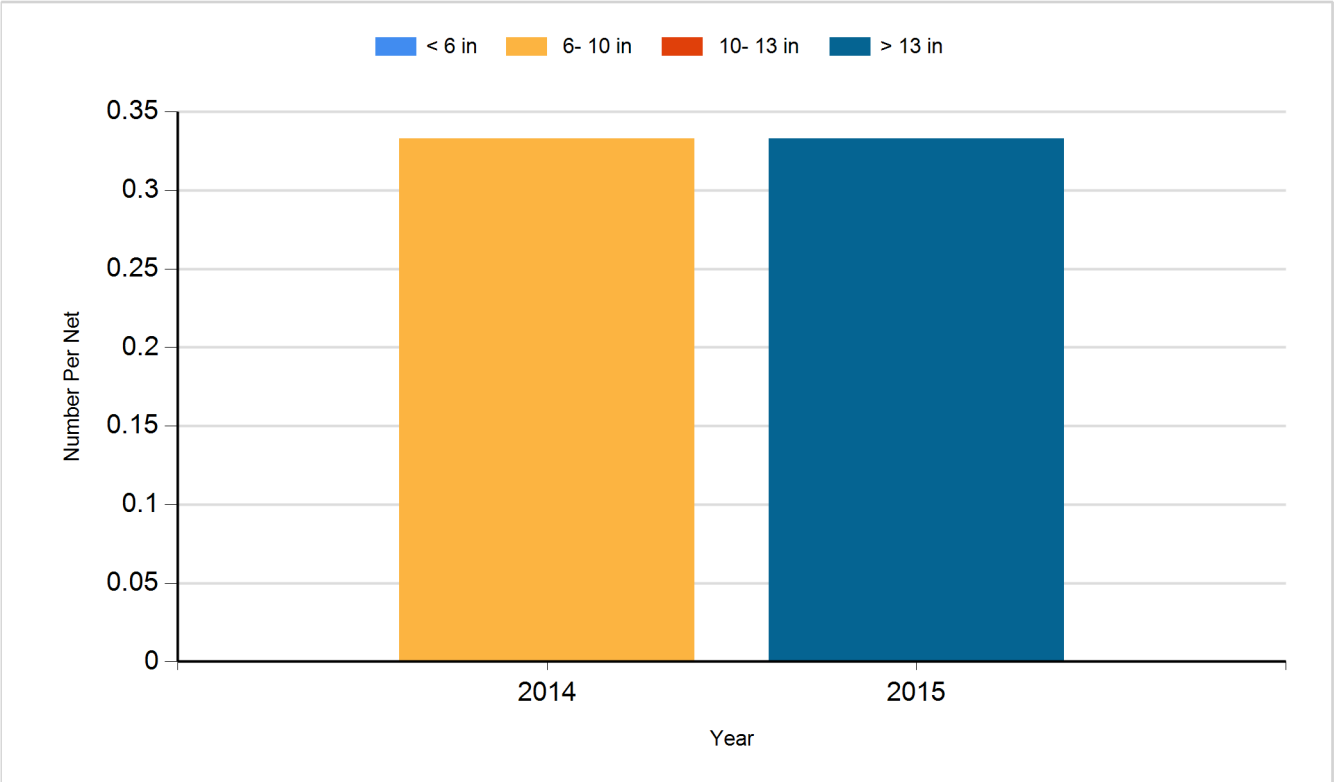
Species: White Crappie
Gear: frame net (std 3/4 in)



Species: White Sucker
Gear: AFS std gill net



Species: White Sucker
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2008	Bluegill	Fingerling	22,900
2008	Largemouth Bass	Fingerling	6,560
2014	Walleye	Fry	55,000
2015	Walleye	Small Fingerling	3,840
2016	Gizzard Shad	Adult	130
2016	Walleye	Juvenile	505