SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Little White River Project, Bennett County
LIW-Lake-8-000
2020

Lake Information

Name: Little White River Project

County: Bennett

Surface Area: 160 Acres

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (day)	Sep 10, 2020	2600 seconds
frame net (std 3/4 in)	Jun 18, 2020	6 net-nights

Common Fish Species Present

Northern Pike

Largemouth Bass

Walleye

Channel Catfish

Black Crappie

Black Bullhead

Bluegill

Shorthead Redhorse

Common Carp

Yellow Perch

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
boat shocker (day)	Largemouth Bass	13	17.4	8.3	69		23		103	3
frame net (std 3/4 in)	Black Bullhead	59	9.2	4.8	76	9	0		88	1
	Black Crappie	95	14.5	5.9	61	7	48	8	97	2
	Bluegill	39	6.5	2.6	51	12	0		110	2
	Channel Catfish	26	2.3	1.4	43	22	7		76	8
	Common Carp	6	0.7	0.7	25		0		91	7
	Gizzard Shad	1	0.2	0.2	100				73	
	Largemouth Bass	1	0.2	0.2	100		0		99	
	Northern Pike	31	3.5	1.8	33	17	24	15	82	2
	Shorthead Redhorse	4	0.7	0.5	100		100		82	2
	Walleye	4	0.5	0.3	100		33		87	1
	Yellow Perch	3	0.5	0.5	100		67		89	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.

*** Methods/Species that ignore stock length**

		CPUE										
Gear	Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
AFS std frame net	Black Bullhead							2.6				2.60
	Black Crappie							32.7				32.70
	Bluegill							1.0				1.00
	Channel Catfish							0.0				0.00
	Common Carp							0.7				0.70
	Gizzard Shad							1.0				1.00
	Golden Shiner							0.0				0.00
	Green Sunfish							0.3				0.30
	Largemouth Bass							0.1				0.10
	Northern Pike							1.4				1.40
	Shorthead Redhorse							3.7				3.70
	Tadpole Madtom							0.0				0.00
	Walleye							1.1				1.10
	Yellow Perch							0.4				0.40
AFS std gill net	Black Bullhead							5.5	1.3	0.5		2.43
	Black Crappie							1.8	1.0	0.5		1.10
	Channel Catfish							3.5	2.3	0.5		2.10
	Common Carp							2.3	2.0	0.5		1.60
	Gizzard Shad							3.3	0.8	0.0		1.37
	Northern Pike							0.0	0.3	0.0		0.10
	Shorthead Redhorse							0.5	0.3	0.0		0.27
	Walleye							2.3	2.0	2.0		2.10
	Yellow Perch							0.8	0.5	0.5		0.60
boat shocker (day)	Largemouth Bass				0.0	18.0	35.0	39.0	43.9	47.2	17.4	28.64
	Walleye*				39.6	0.0	1.0	6.0	10.0	23.3	0.0	11.41
frame net (std 3/4 in)	Black Bullhead	23.3		9.1	16.8	6.9	10.7		5.8	9.5	9.2	11.41
	Black Crappie	9.8		14.9	11.0	24.0	29.0		95.6	40.3	14.5	29.89
	Bluegill	0.0		0.0	0.0	0.4	0.1		2.1	2.0	6.5	1.39
	Bullhead Catfish Family	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.00
	Channel Catfish	7.3		0.1	0.1	0.2	2.9		1.4	1.9	2.3	2.03
	Common Carp	1.2		0.1	0.4	0.2	0.9		0.5	2.9	0.7	0.86
	Gizzard Shad	0.0		0.1	0.0	0.3	0.1		0.0	0.0	0.2	0.09
	Golden Shiner	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.00
	Green Sunfish	0.5		0.0	0.4	0.0	0.3		0.1	0.0	0.0	0.16

		CPUE										
Gear	Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg
frame net (std 3/4 in)	Largemouth Bass	0.0		0.0	0.3	0.2	0.4		0.1	0.0	0.2	0.15
	Northern Pike	1.3		2.9	1.3	1.3	1.9		0.9	0.1	3.5	1.65
	Shorthead Redhorse	0.2		0.1	0.9	1.3	3.6		3.6	2.3	0.7	1.59
	Tadpole Madtom	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.00
	Walleye	0.3		0.1	0.3	0.2	0.7		0.6	1.6	0.5	0.54
	White Sucker	0.0		0.0	0.0	0.0	0.0		0.1	0.3	0.0	0.05
	Yellow Perch	0.2		0.3	0.1	0.1	0.1		0.0	0.0	0.5	0.16
std exp gill net	Black Bullhead	1.0		13.0	11.5	111.5	11.5					29.70
	Black Crappie	1.0		1.0	2.5	4.0	1.5					2.00
	Channel Catfish	3.5		2.0	1.5	7.5	2.5					3.40
	Common Carp	1.0		1.0	2.5	4.5	2.0					2.20
	Gizzard Shad	0.0		0.0	0.0	2.0	1.0					0.60
	Golden Shiner	0.0		0.0	0.0	0.0	0.0					0.00
	Northern Pike	2.5		0.5	1.5	0.5	0.0					1.00
	Shorthead Redhorse	0.5		0.5	2.5	0.0	0.5					0.80
	Walleye	3.0		2.0	5.0	6.0	3.5					3.90
	Yellow Perch	0.0		1.5	0.5	1.5	3.5					1.40

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 frame net	Black Bullhead	PSD							44			
		PSD-P							0			
		Wr							93			
	Black Crappie	PSD							33			
		PSD-P							10			
		Wr							98			
	Bluegill	PSD							0			
		PSD-P							0			
		Wr							105			
	Channel Catfish	PSD							0			
		PSD-P							0			
	Common Carp	PSD							20			
		PSD-P							20			
		Wr							88			
	Largemouth Bass	PSD							100			
		PSD-P							0			
		Wr							102			
	Northern Pike	PSD							80			
		PSD-P							10			
		Wr							93			
	Shorthead Redhorse	PSD							100			
		PSD-P							62			
		Wr							95			
	Walleye	PSD							100			
		PSD-P							50			
		Wr							90			
	Yellow Perch	PSD							67			
		PSD-P							33			
		Wr							80			
AFS std gill net	Black Bullhead	PSD							68	20	0	
		PSD-P							0	0	0	
		Wr							83	86	111	
	Black Crappie	PSD							57	75	0	

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFS std gill net	Black Crappie	PSD-P							0	0	0	
		Wr							94	90	136	
	Channel Catfish	PSD							79	78	100	
		PSD-P							29	33	100	
		Wr							97	93	119	
	Common Carp	PSD							67	63	100	
		PSD-P							0	13	0	
		Wr							85	84	84	
	Northern Pike	PSD								100		
		PSD-P								0		
		Wr								92		
	Shorthead Redhorse	PSD							100	100		
		PSD-P							50	100		
		Wr							101			
	Walleye	PSD							100	75	100	
		PSD-P							44	63	75	
		Wr							92	86	93	
	Yellow Perch	PSD							67	100	100	
		PSD-P							0	0	0	
		Wr							90	90	105	
boat shocker (day)	Largemouth Bass	PSD					72	60	44	74	74	69
		PSD-P					22	34	26	23	26	23
		Wr					110	113		113	115	103
	Walleye	PSD				70		0	0	0	40	
		PSD-P				30		0	0	0	20	
		Wr				87				91	90	
frame net (std 3/4 in)	Black Bullhead	PSD	2		2	3	10	39		48	58	76
		PSD-P	1		0	0	0	0		0	0	0
		Wr	82		84	82	88	93		97	97	88
	Black Crappie	PSD	7		53	59	66	38		43	59	61
		PSD-P	0		4	20	43	19		15	23	48
		Wr	111		104	93	96	110		98	93	97
	Bluegill	PSD					67	100		29	19	51
		PSD-P					0	0		0	0	0
		Wr					123	93		106	114	110
	Channel Catfish	PSD	45		100	100	100	40		27	27	43

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
frame net (std 3/4 in)	Channel Catfish	PSD-P	2		0	0	100	10		9	7	7
		Wr	94		92	102	123	118		85	92	76
	Common Carp	PSD	86		0	100	100	100		50	78	25
		PSD-P	0		0	100	0	17		0	30	0
		Wr	91		87	84	83	89		80	89	91
	Largemouth Bass	PSD				50	50	0		100		100
		PSD-P				0	0	0		100		0
		Wr				96	117	117		103		99
	Northern Pike	PSD	63		85	80	67	69		86	100	33
		PSD-P	50		50	30	11	0		14	100	24
		Wr	79		91	89	90	94		81	93	82
	Shorthead Redhorse	PSD	0		100	86	92	96		100	100	100
		PSD-P	0		100	43	33	24		93	100	100
		Wr	92			89	90	87		79	84	82
	Walleye	PSD	100		100	100	100	80		100	38	100
		PSD-P	0		0	100	100	60		100	31	33
		Wr	85		89	92	96	91		87	87	87
	Yellow Perch	PSD	100		100	100	0	100				100
		PSD-P	0		0	0	0	0				67
		Wr	92		92	92	92	72				89
std exp gill net	Black Bullhead	PSD	0		4	0	20	30				
		PSD-P	0		0	0	0	0				
		Wr	79		90	84	91	88				
	Black Crappie	PSD	0		50	60	75	100				
		PSD-P	0		0	0	50	33				
		Wr	119		112	95	103	104				
	Channel Catfish	PSD	86		100	67	40	60				
		PSD-P	14		0	0	20	20				
		Wr	109		103	95	100	89				
	Common Carp	PSD	50		100	40	33	25				
		PSD-P	0		0	0	0	0				
		Wr	90		87	89	86	90				
	Northern Pike	PSD	100		0	67	100					
		PSD-P	40		0	33	100					
		Wr	85		88	88	91					
	Shorthead Redhorse	PSD	100		100	80		100				
		PSD-P	100		100	0		100				

			Year									
Gear	Species	Index	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
std exp gill net	Shorthead Redhorse	Wr	87		89	86		91				
	Walleye	PSD	100		75	60	17	71				
		PSD-P	0		25	10	8	14				
		Wr	84		91	86	95	95				
	Yellow Perch	PSD			33	0	67	57				
		PSD-P			0	0	0	0				
		Wr			101	92	94	90				

Length at Capture

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

Species: Black Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	782	115 (472)	173 (110)	221 (8)	242 (87)	276 (12)	278 (95)				
2014	254	115 (94)	141 (2)	196 (79)	214 (22)	251 (52)	313 (6)				

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2016	41	197 (19)	288 (8)	345 (5)	398 (5)	401 (5)					
2015	44	201 (16)	312 (12)	370 (10)	416 (6)						

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	8		357 (3)		553 (1)	564 (2)	560 (2)				
2016	14		376 (8)	483 (4)	547 (2)						
2015	24		364 (20)	486 (2)				530 (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).

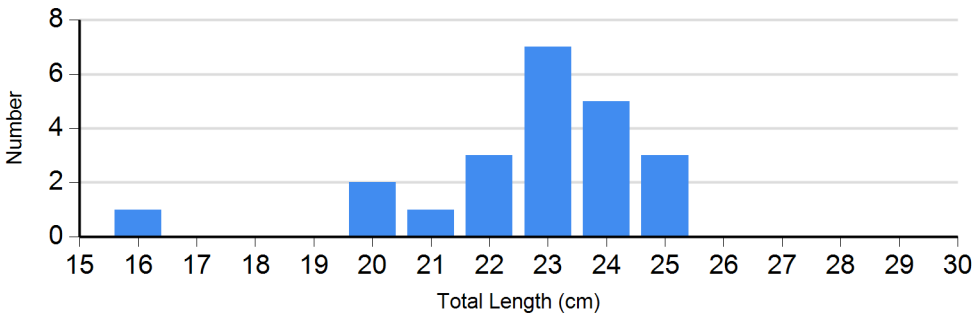
		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2016	32	88 (1.6)	14	86 (1.5)	0		0	
	2017	7	86 (2.9)	15	82 (2.2)	0		0	
	2018	4	85 (0.3)	1	87	0		0	
	2019	1	111	0		0		0	
Black Crappie Frame Net	2016	252	122 (0.6)	78	102 (0.7)	60	97 (0.7)	16	103 (1.8)
	2017	154	103 (1.1)	51	93 (0.6)	12	97 (1.2)	12	98 (2.1)
	2018	436	106 (0.8)	211	88 (0.7)	90	87 (0.5)	28	85 (0.7)
	2019	132	98 (1.1)	116	91 (0.7)	60	92 (0.8)	14	91 (1.1)
	2020	34	109 (1.4)	11	87 (1.7)	29	88 (0.8)	13	91 (1.4)
Bluegill Frame Net	2016	0		2	93 (0.0)	0		0	
	2017	7	105 (4.9)	0		0		0	
	2018	12	107 (4.3)	5	103 (4.7)	0		0	
	2019	13	117 (2.5)	3	102 (5.0)	0		0	
	2020	19	114 (2.4)	20	105 (2.0)	0		0	
Channel Catfish Gill Net	2016	4	81 (1.5)	4	94 (3.4)	2	97 (0.0)	0	
	2017	3	93 (1.9)	7	94 (1.6)	3	108 (2.1)	1	89
	2018	2	86 (6.0)	4	96 (3.4)	3	93 (5.4)	0	
	2019	0		0		1	119	0	
Common Carp Gill Net	2016	6	91 (1.0)	2	84 (0.0)	0		0	
	2017	3	87 (0.9)	6	84 (1.6)	0		0	
	2018	3	86 (5.3)	4	85 (2.7)	1	74	0	
	2019	0		1	84	0		0	
Largemouth Bass Electro Fishing	2016	14	111 (2.5)	9	116 (2.4)	12	112 (1.4)	0	

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Largemouth Bass Electro Fishing	2018	10	110 (1.6)	20	114 (1.8)	9	116 (2.4)	0	
	2019	12	115 (2.4)	22	115 (1.5)	12	116 (2.4)	0	
	2020	4	105 (3.5)	6	104 (2.0)	3	99 (7.7)	0	
Northern Pike Gill Net	2018	0		1	92	0		0	
Walleye Gill Net	2016	4	92 (0.3)	8	98 (2.6)	2	91 (0.0)	0	
	2017	0		5	91 (1.0)	4	94 (2.6)	0	
	2018	2	91 (4.2)	1	88	5	84 (1.2)	0	
	2019	0		1	98	2	93 (0.6)	1	90
Yellow Perch Gill Net	2016	6	95 (0.6)	8	86 (1.5)	0		0	
	2017	1	92	2	89 (6.9)	0		0	
	2018	0		2	90 (1.6)	0		0	
	2019	0		1	105	0		0	

Length Frequency Distribution

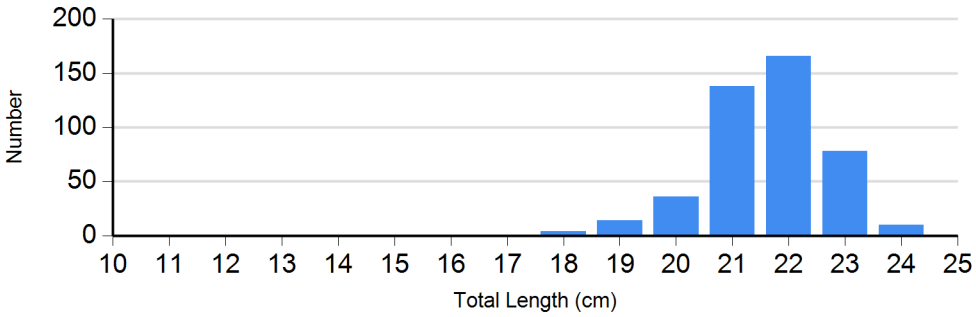
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

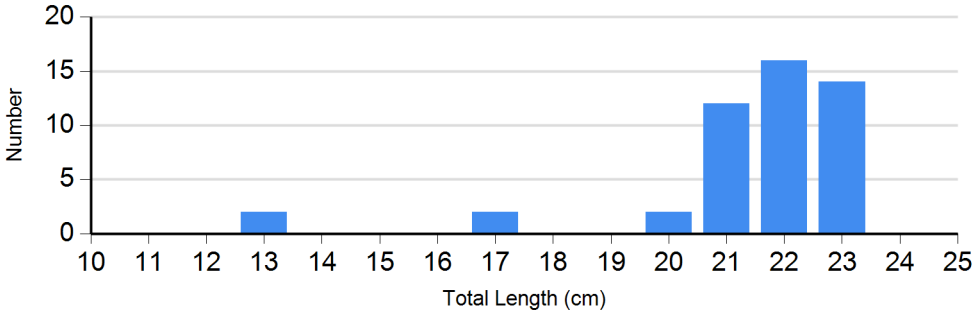


2017

Species: Black Bullhead
Gear: std exp gill net

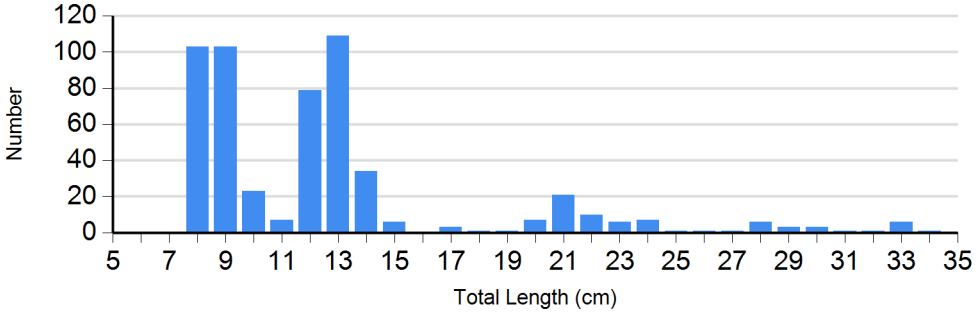


2015



2016

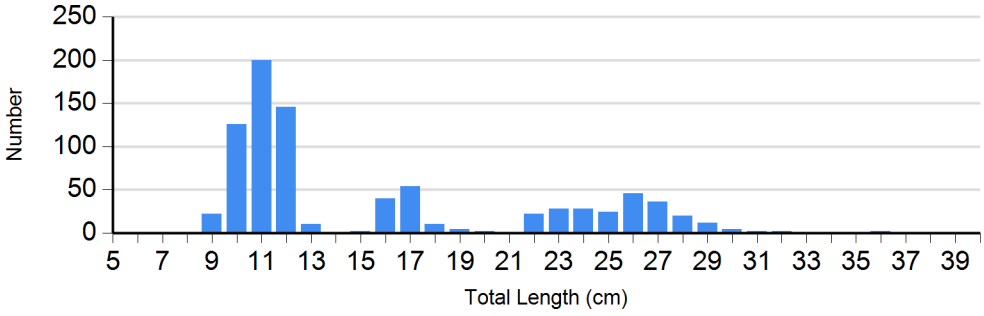
Species: Black Crappie
Gear: AFS std frame net



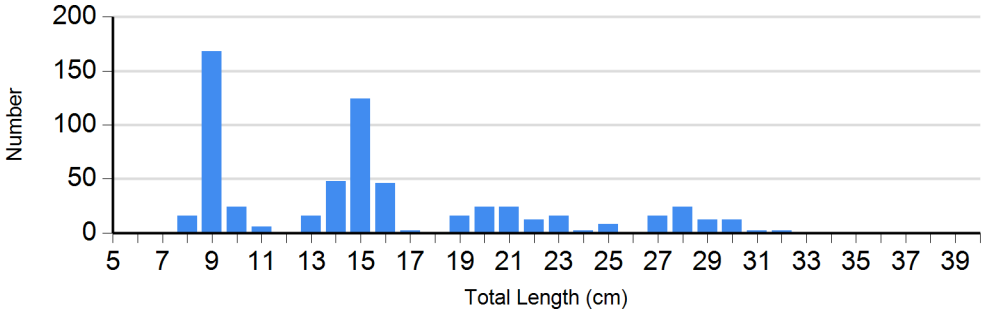
2017

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

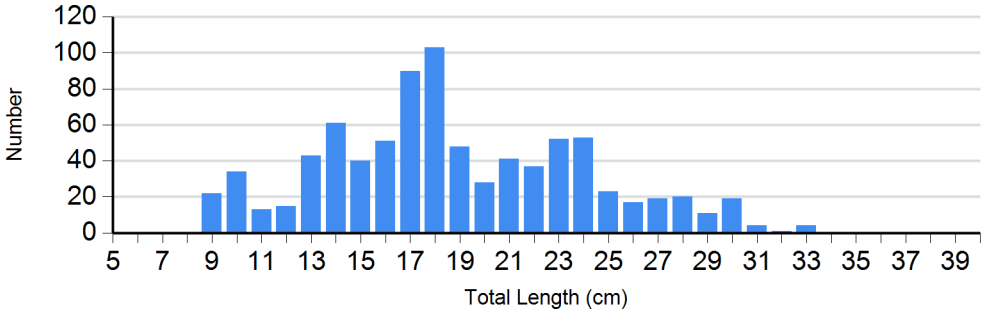
2015



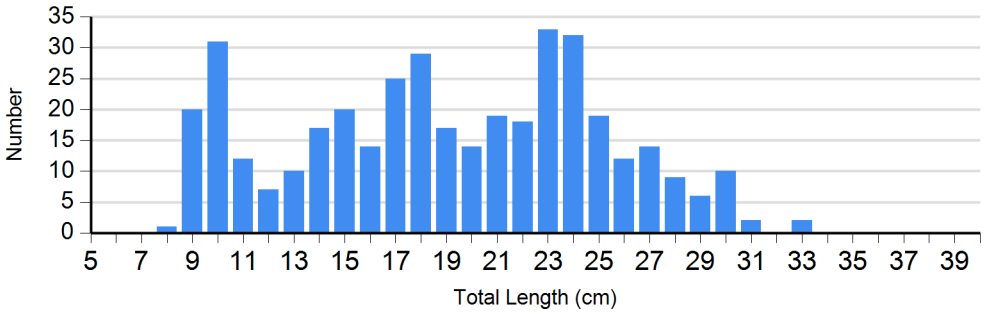
2016



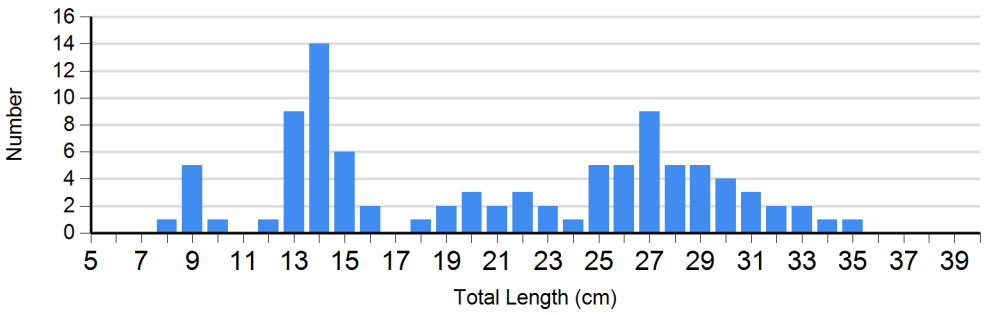
2018



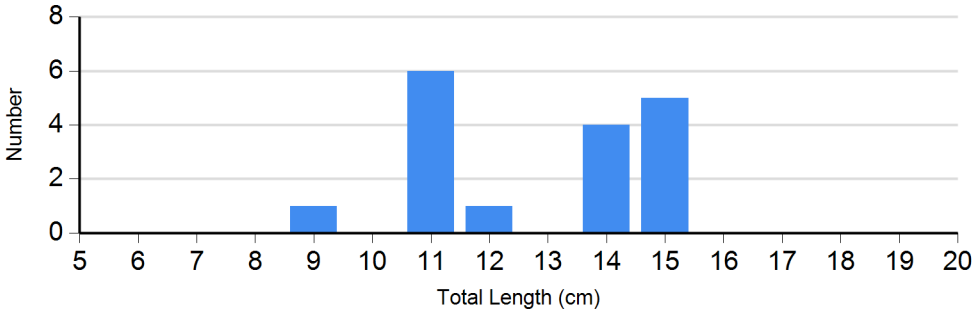
2019



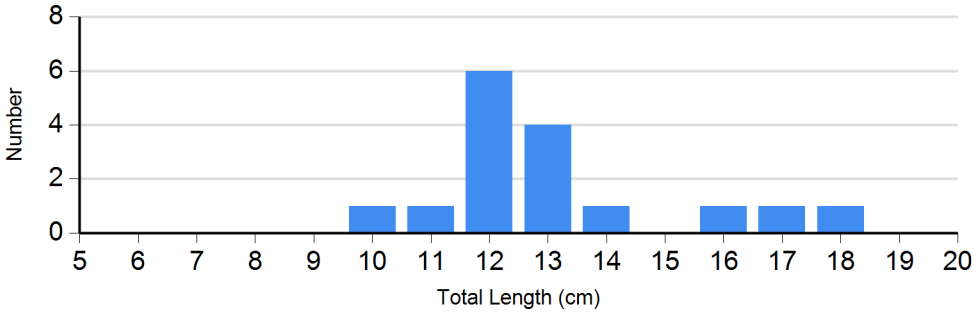
2020



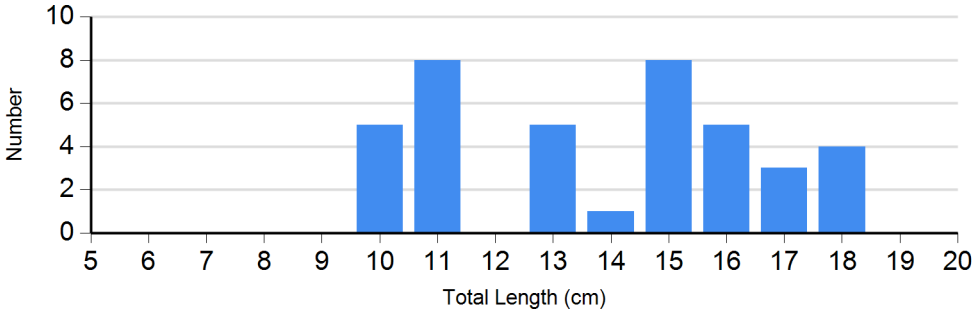
Species: Bluegill
Gear: frame net (std 3/4 in)



2018

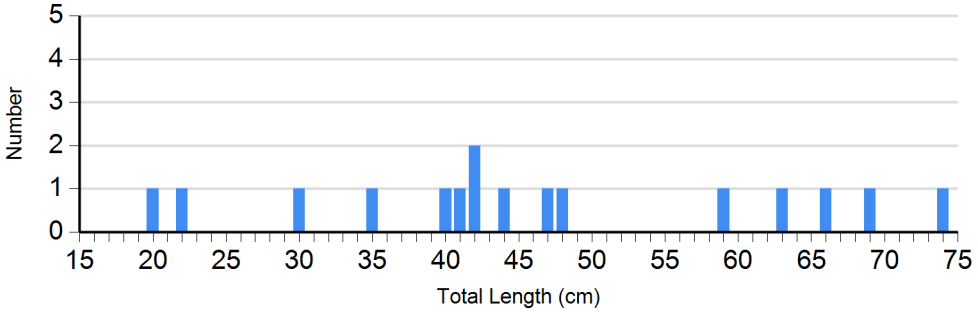


2019

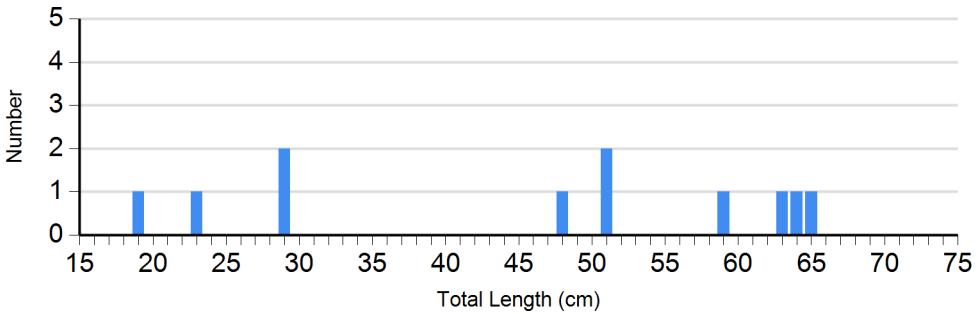


2020

Species: Channel Catfish
Gear: AFS std gill net

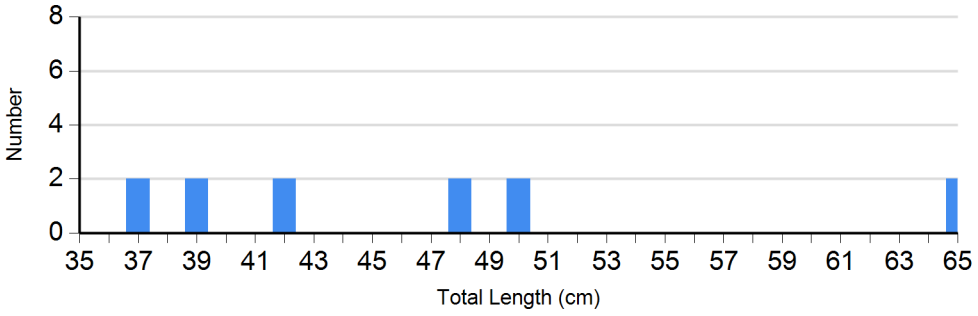


2017

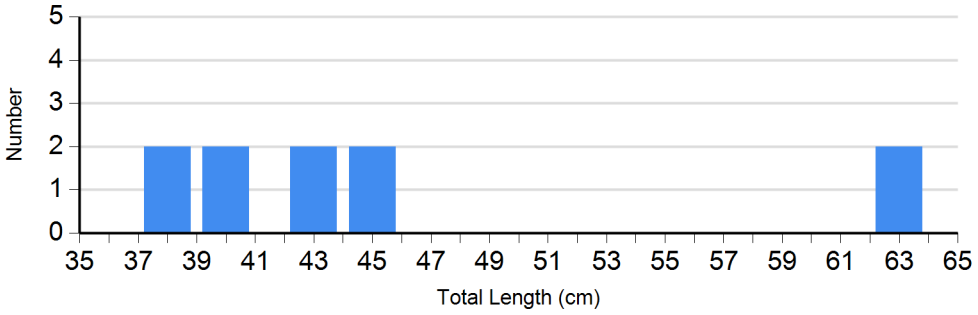


2018

Species: Channel Catfish
Gear: std exp gill net

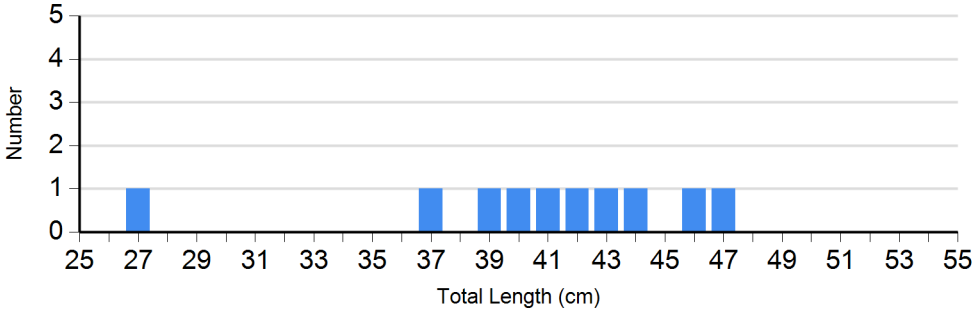


2015



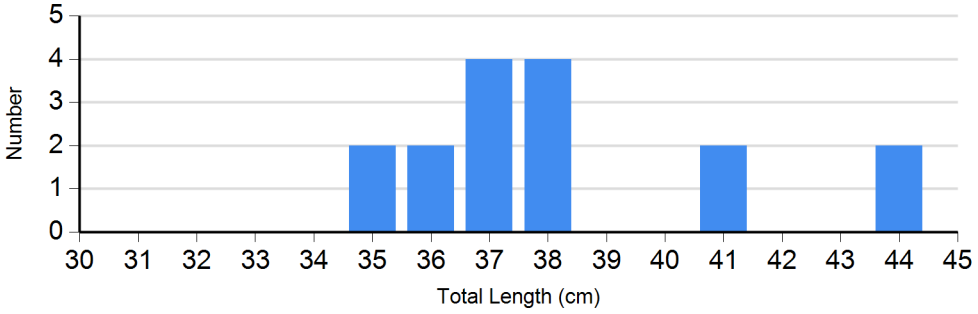
2016

Species: Common Carp
Gear: AFS std gill net



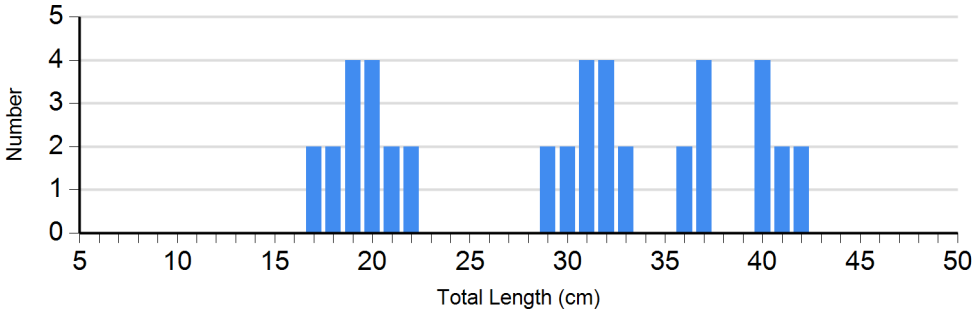
2017

Species: Common Carp
Gear: std exp gill net

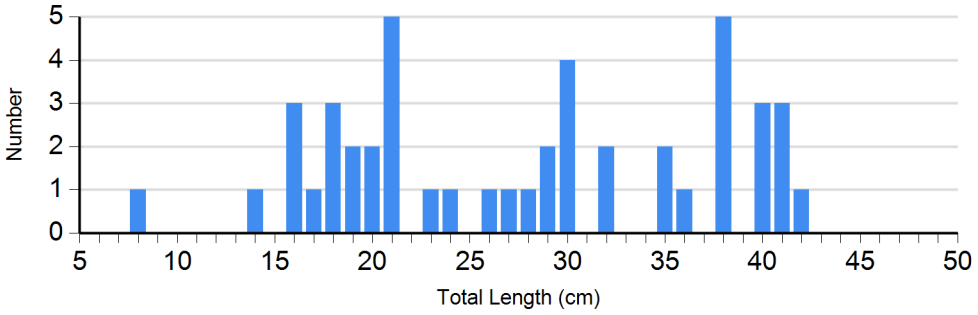


2015

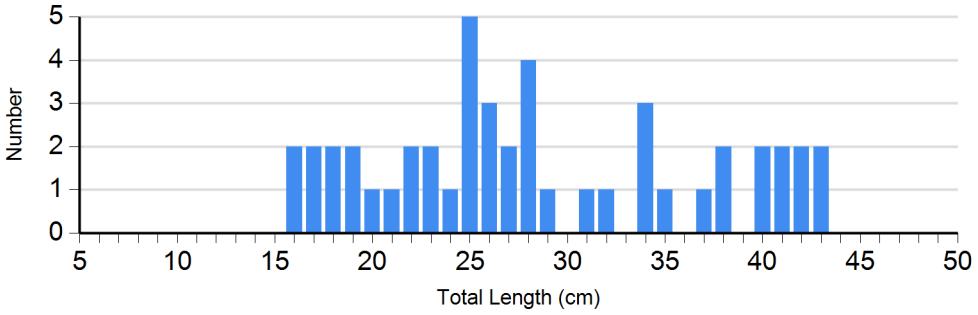
Species: Largemouth Bass
Gear: boat shocker (day)



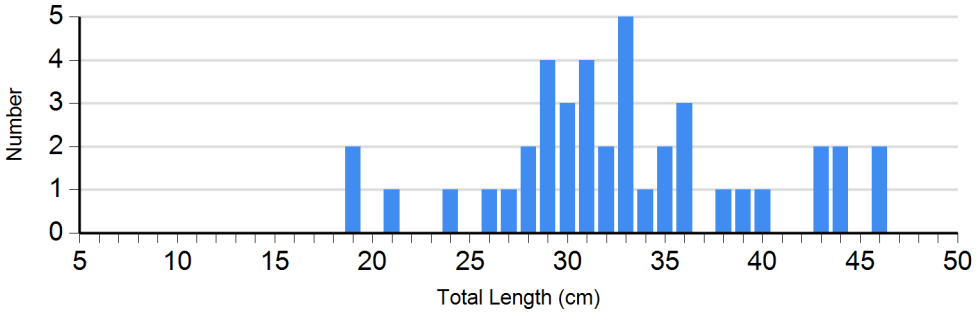
2015



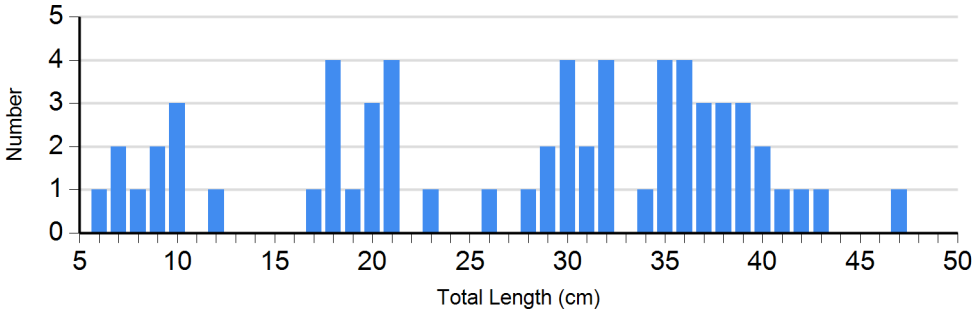
2016



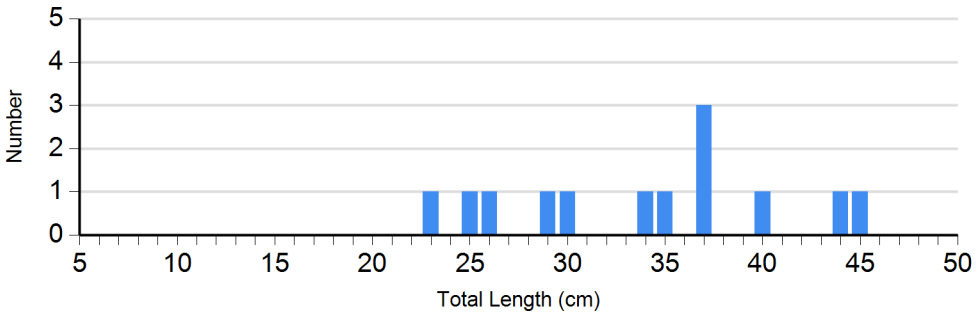
2017



2018

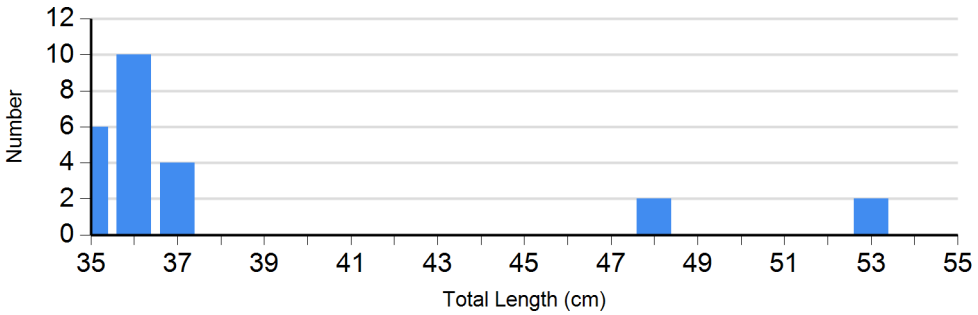


2019

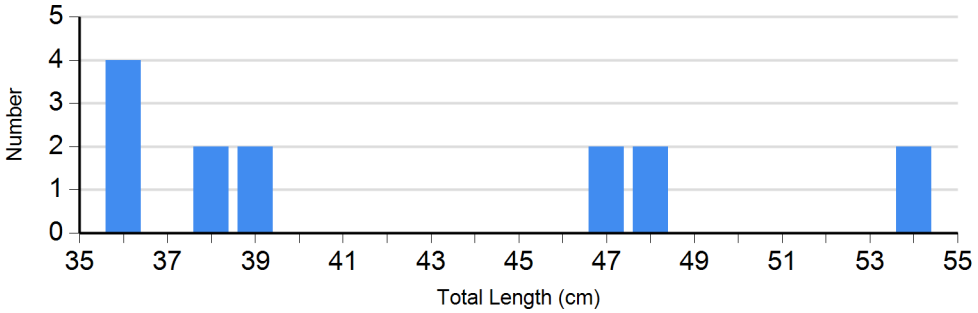


2020

Species: Walleye
Gear: std exp gill net

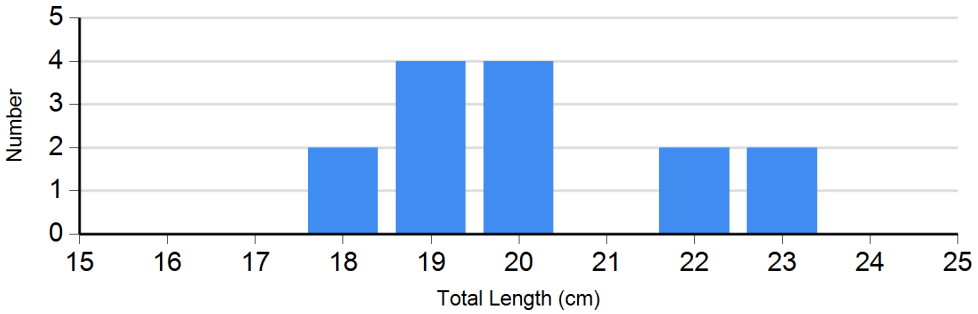


2015



2016

Species: Yellow Perch
Gear: std exp gill net

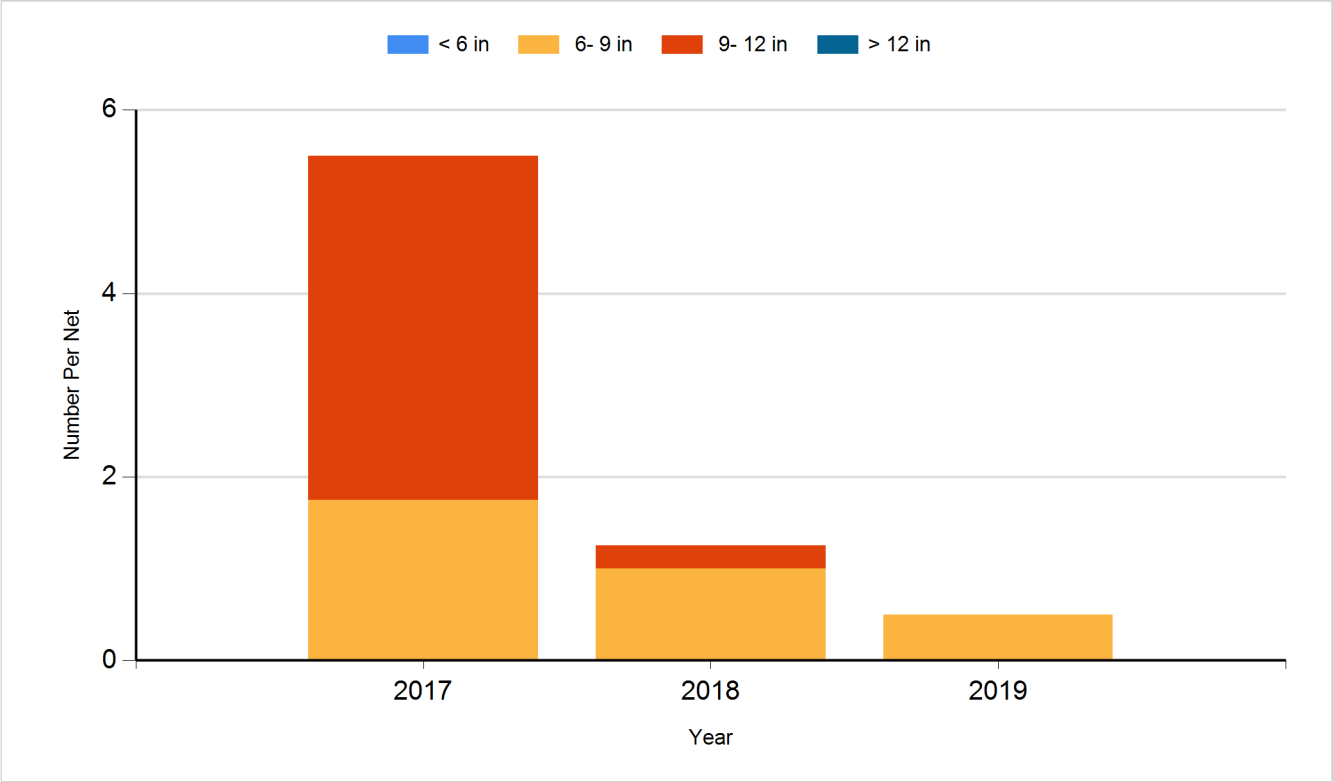


2016

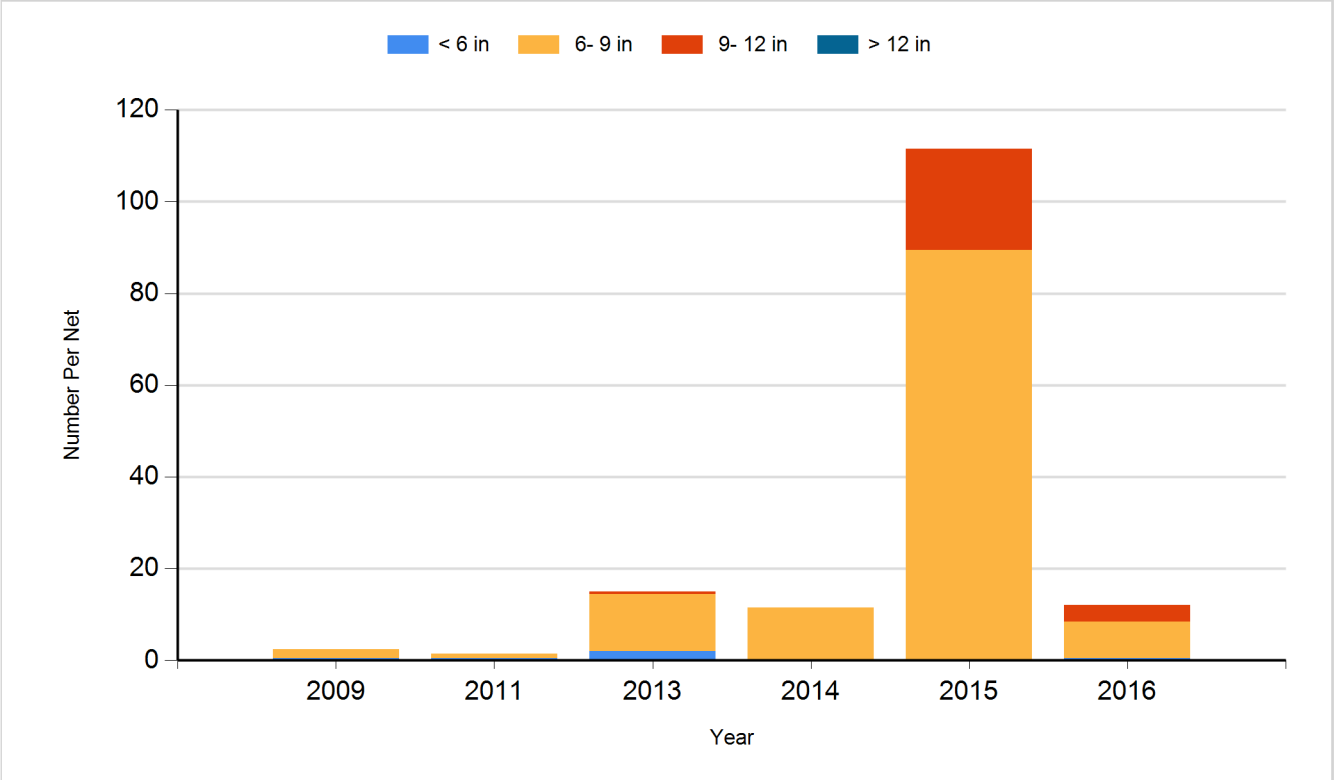
Historic Fish Sizes and Relative Abundance

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

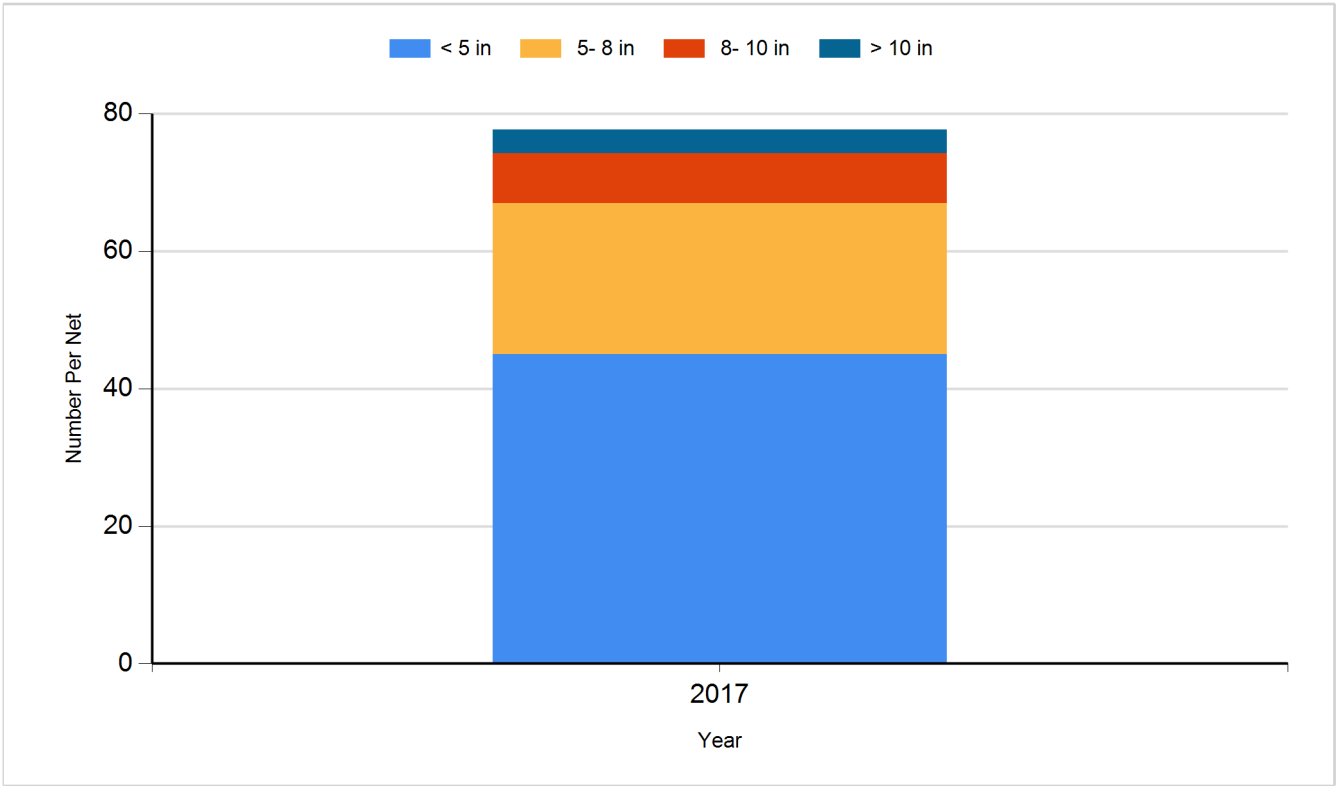
Species: Black Bullhead
Gear: AFS std gill net



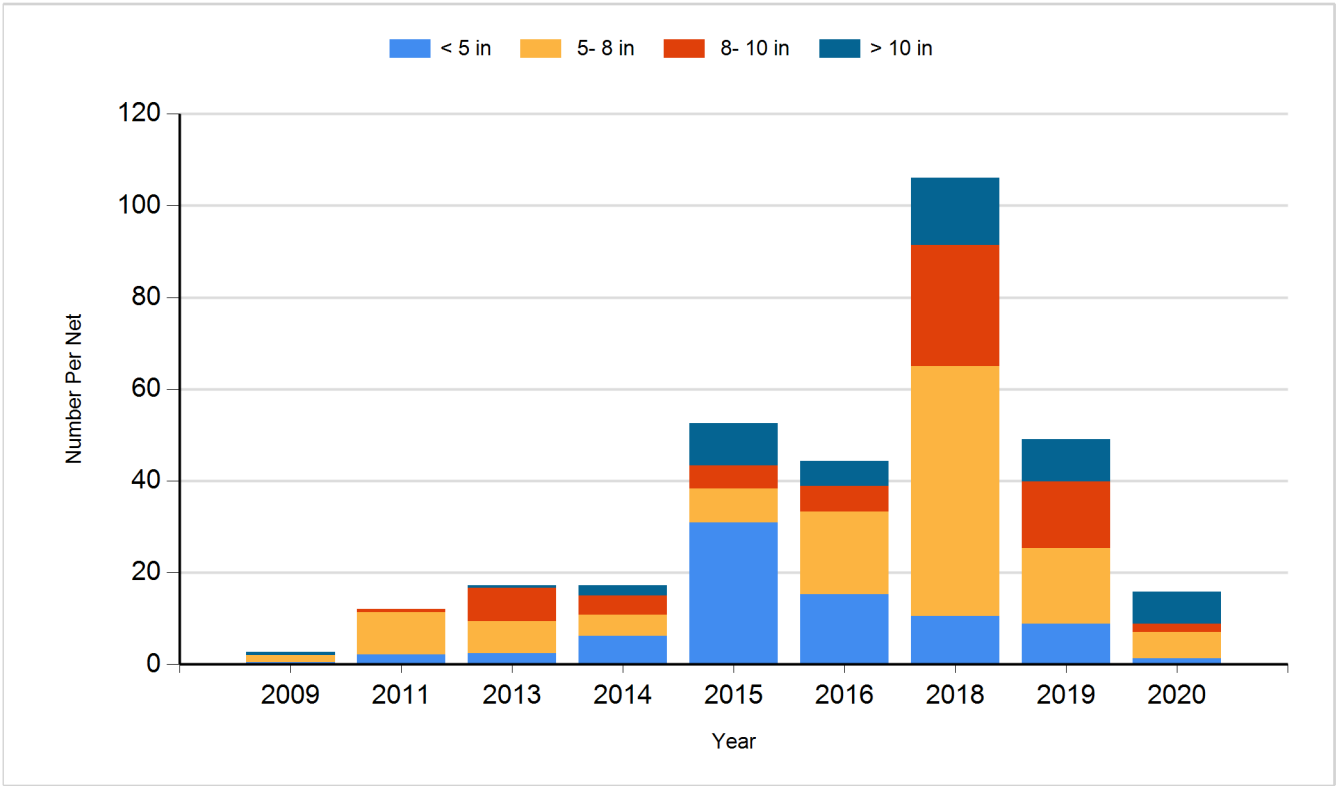
Species: Black Bullhead
Gear: std exp gill net



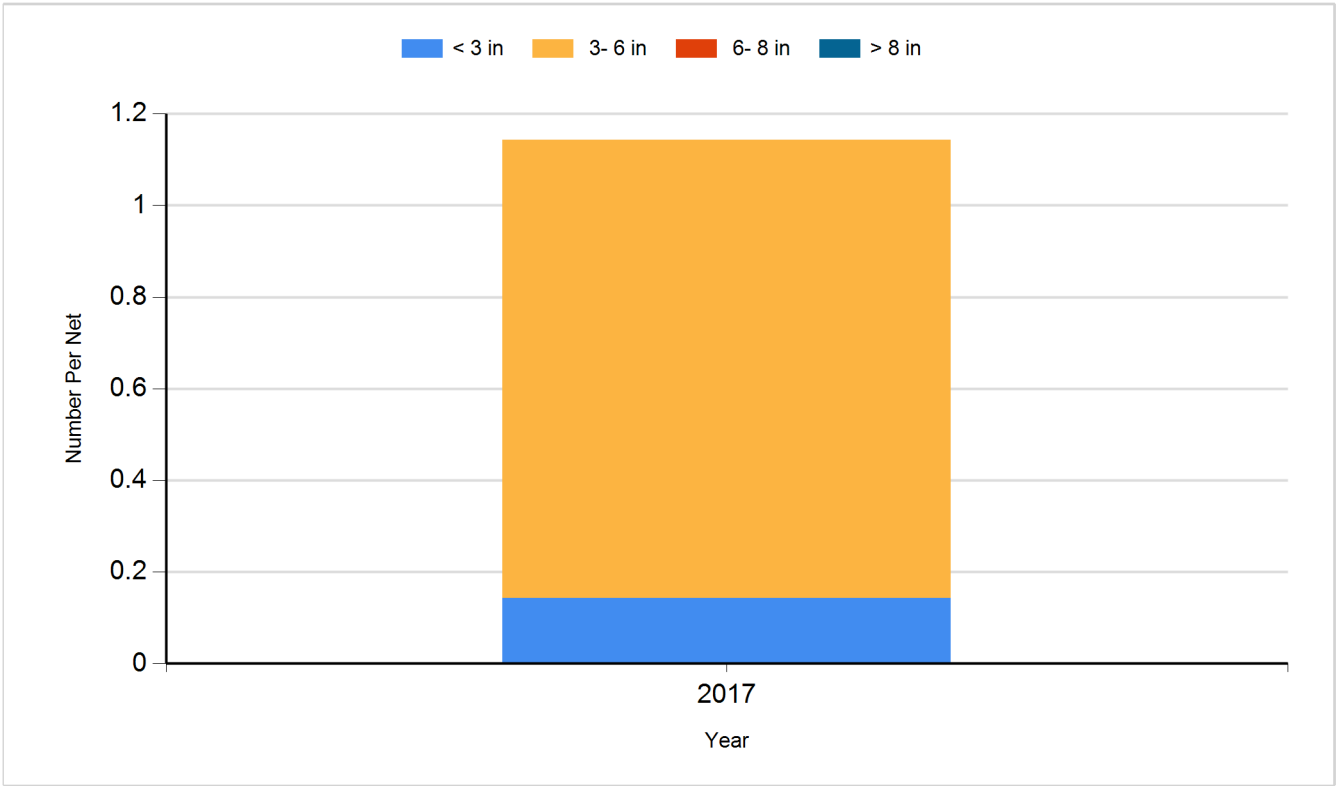
Species: Black Crappie
Gear: AFS std frame net



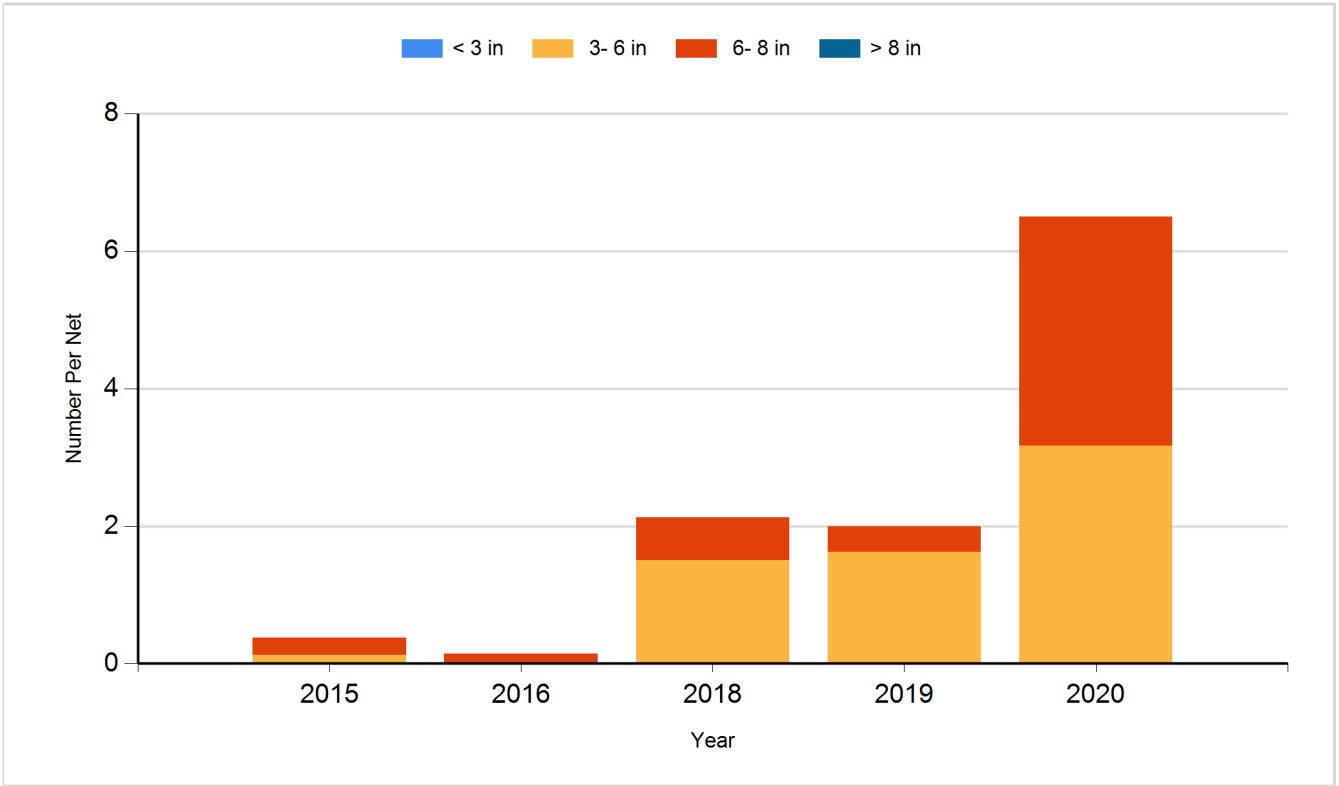
Species: Black Crappie
Gear: frame net (std 3/4 in)



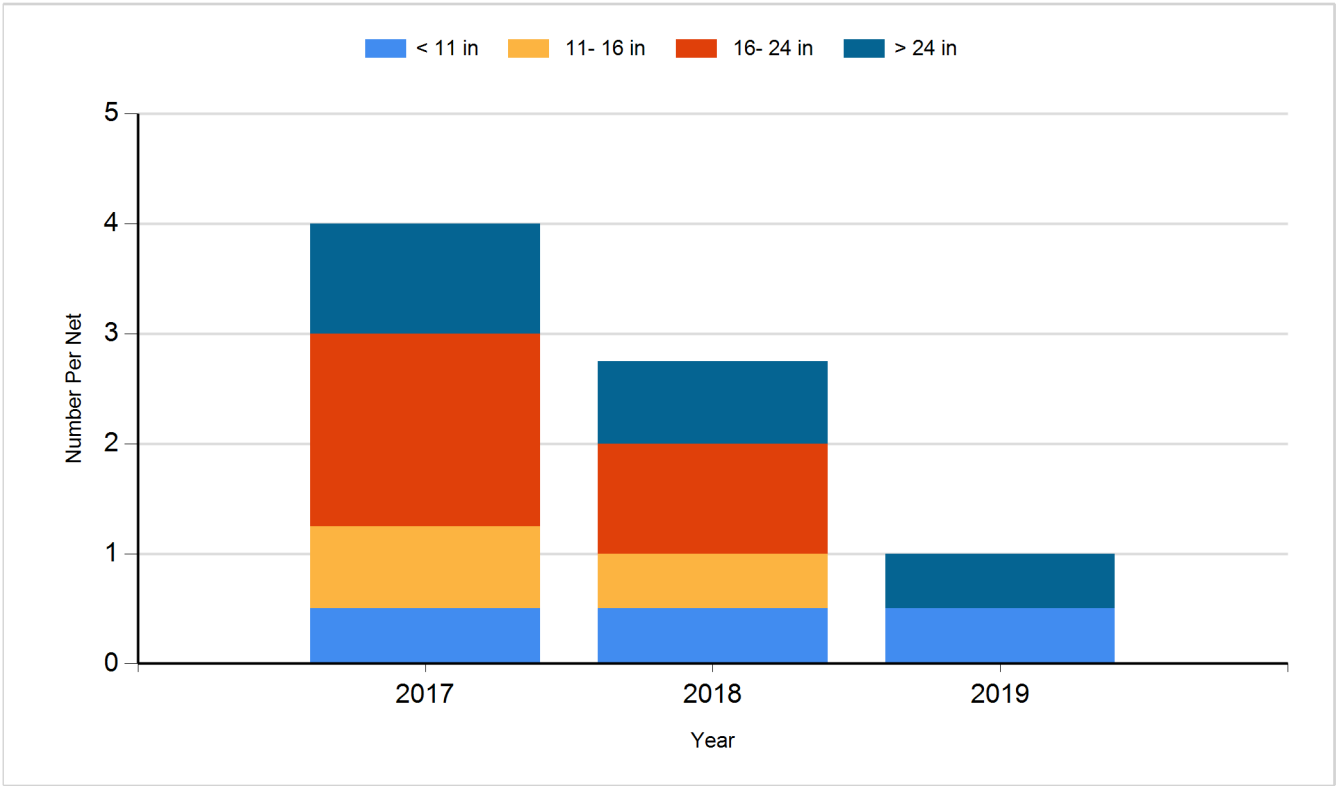
Species: Bluegill
Gear: AFS std frame net



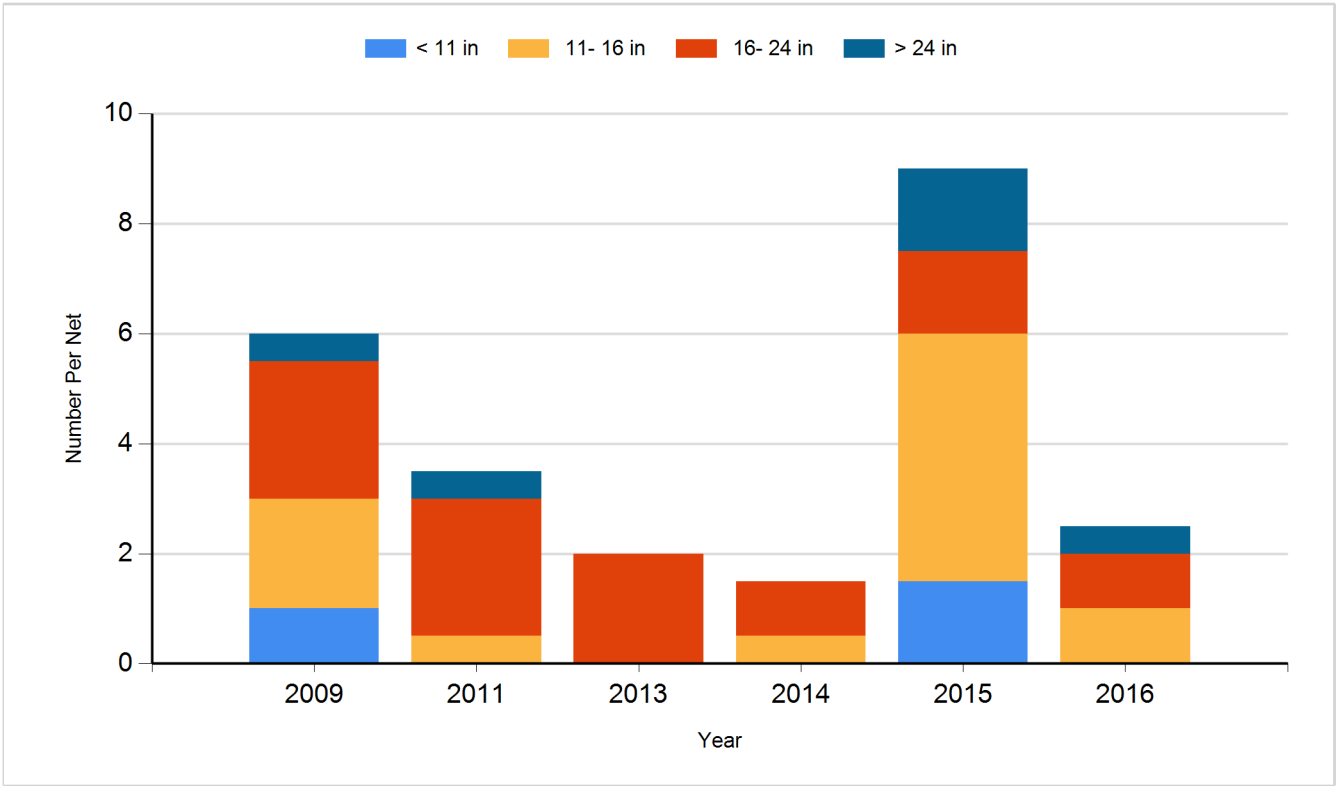
Species: Bluegill
Gear: frame net (std 3/4 in)



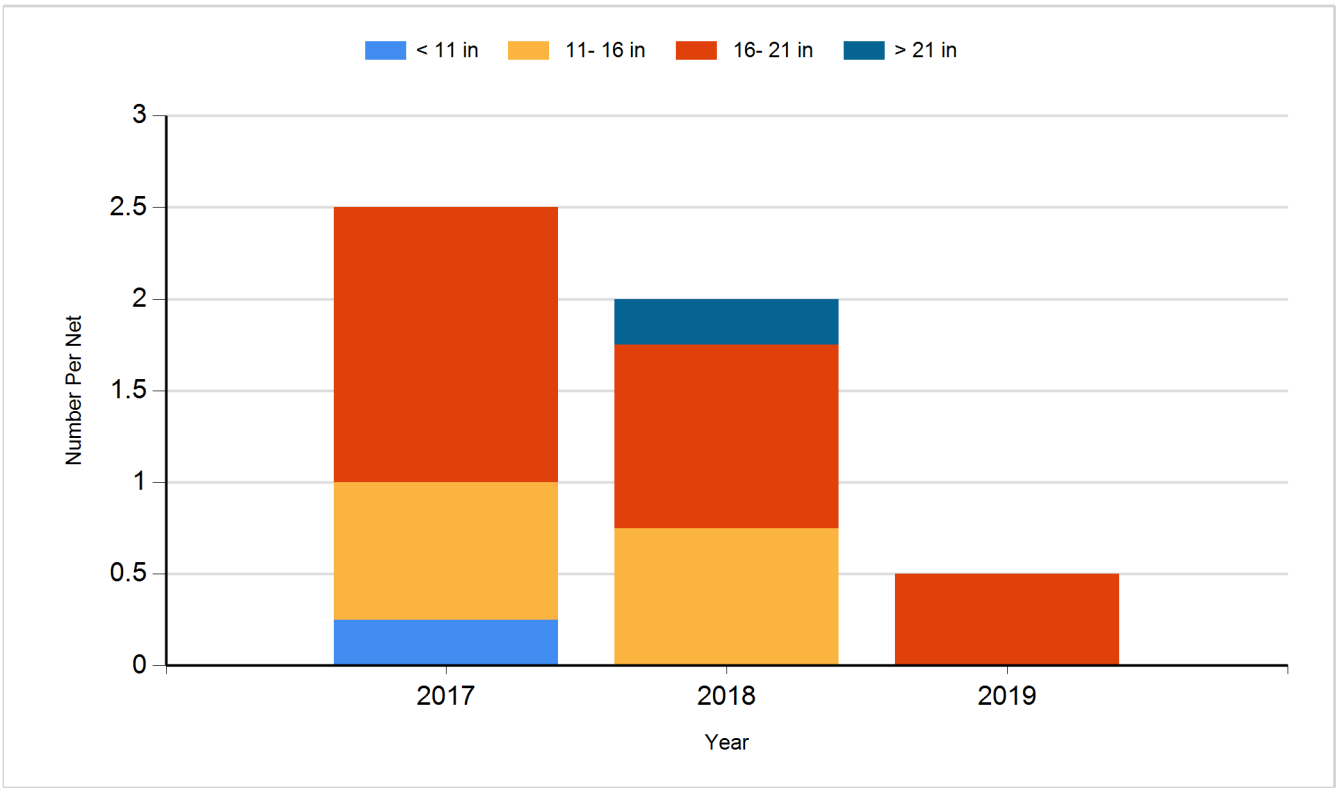
Species: Channel Catfish
Gear: AFS std gill net



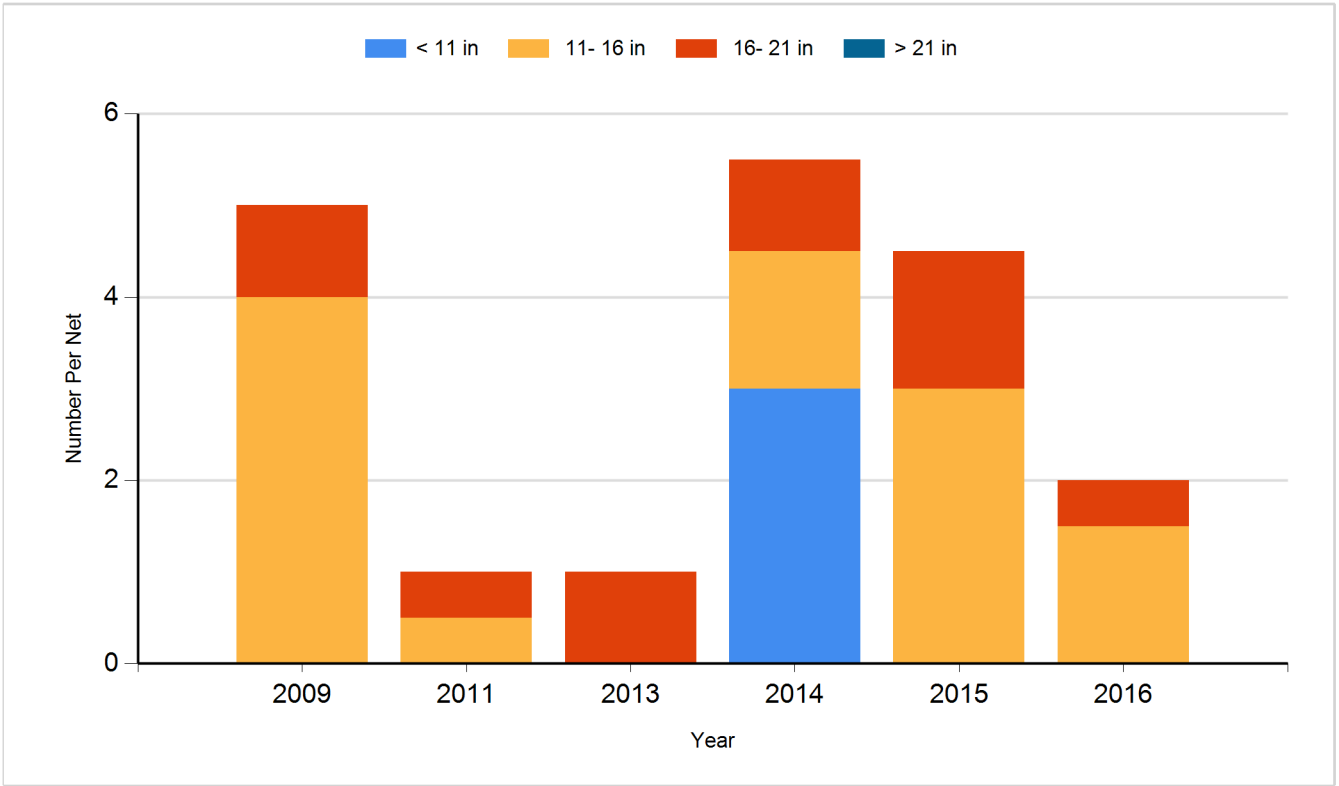
Species: Channel Catfish
Gear: std exp gill net



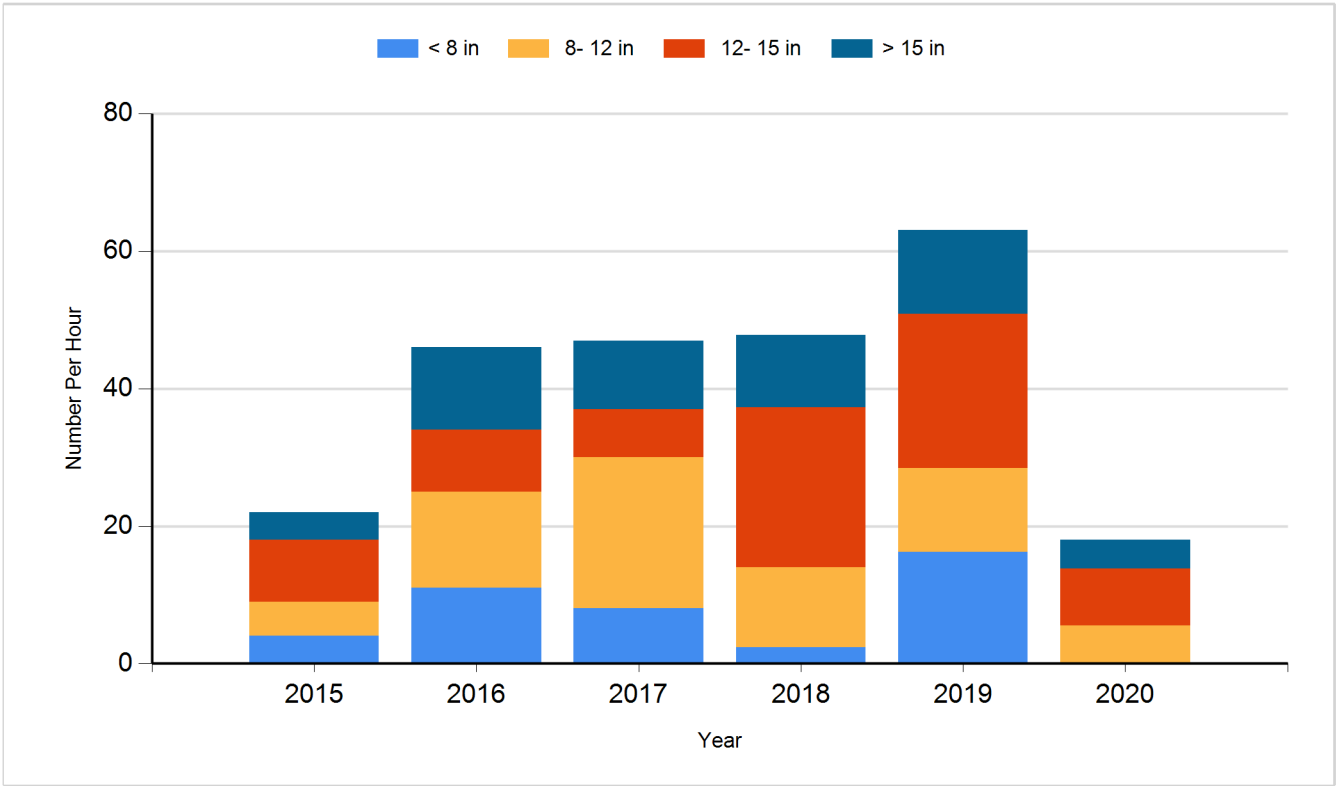
Species: Common Carp
Gear: AFS std gill net



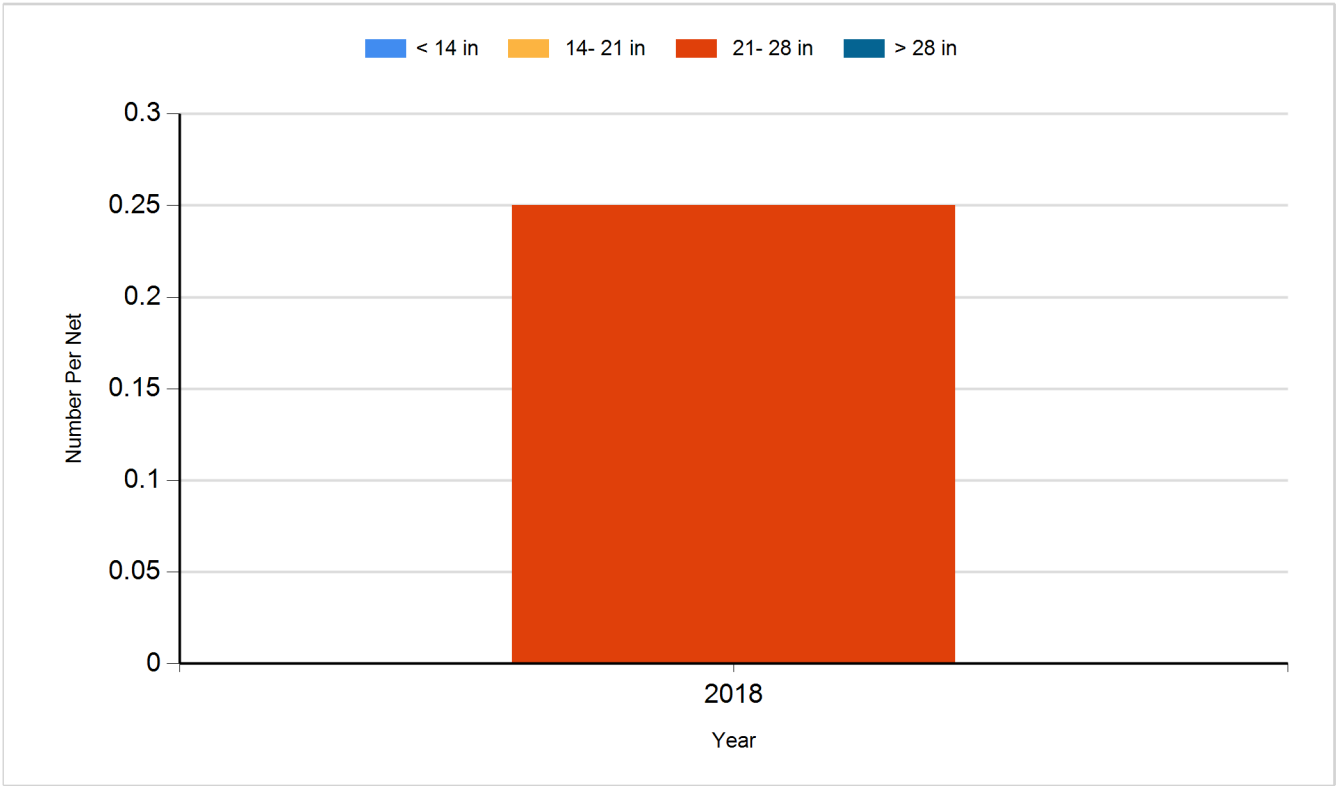
Species: Common Carp
Gear: std exp gill net



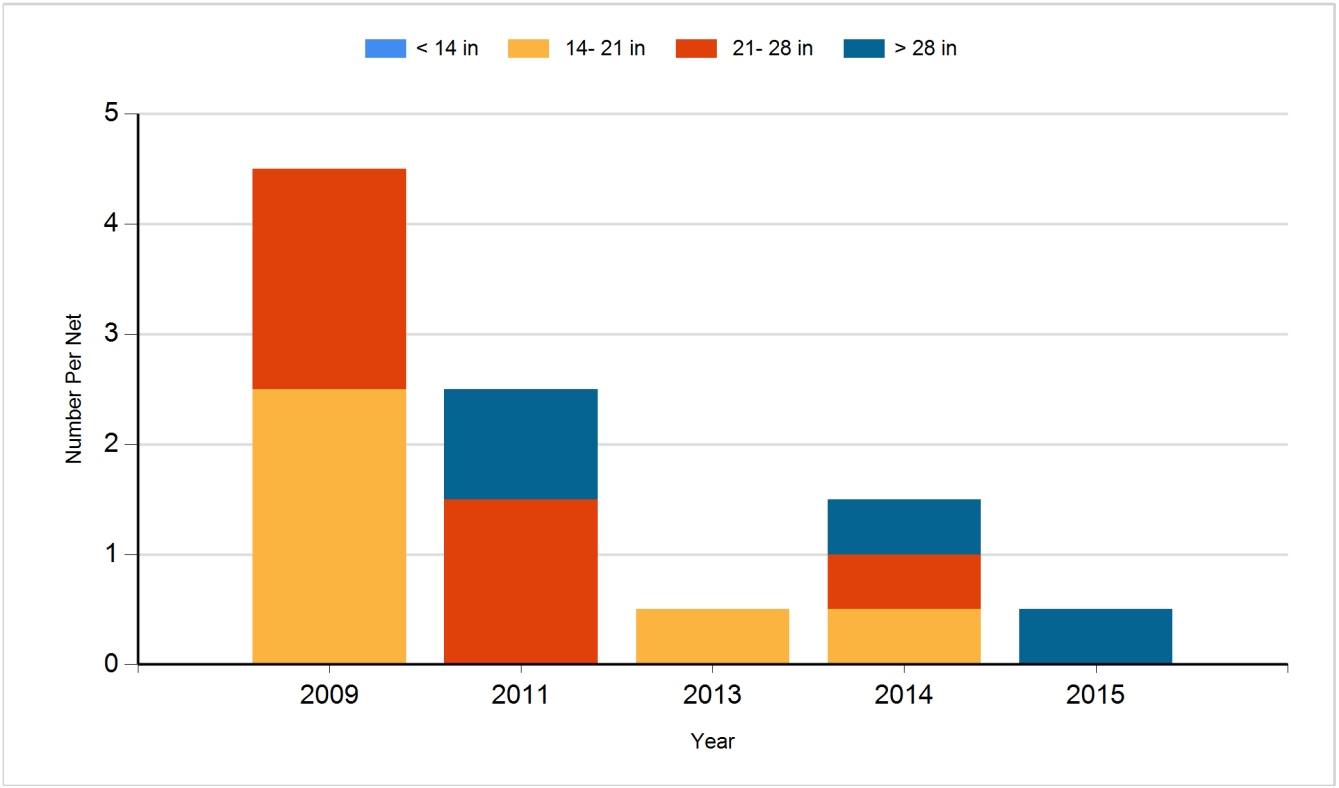
Species: Largemouth Bass
Gear: boat shocker (day)



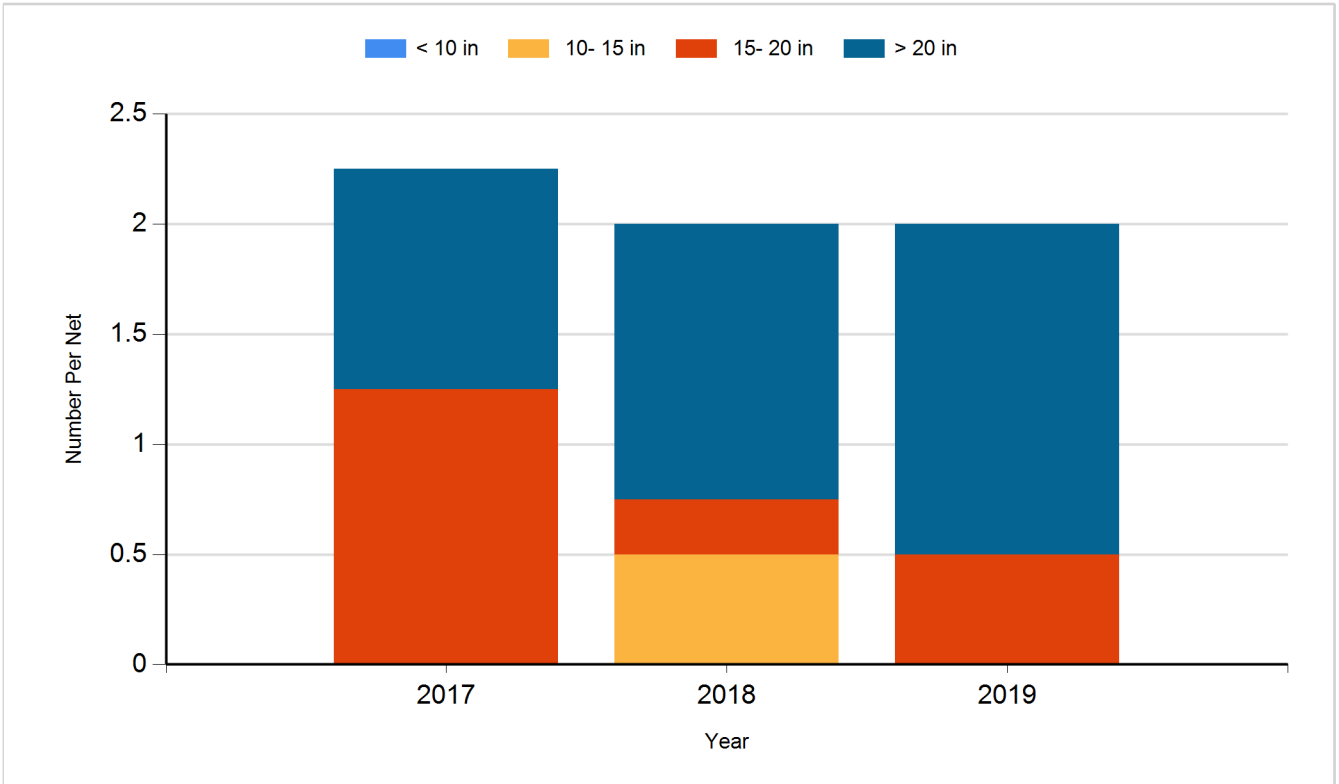
Species: Northern Pike
Gear: AFS std gill net



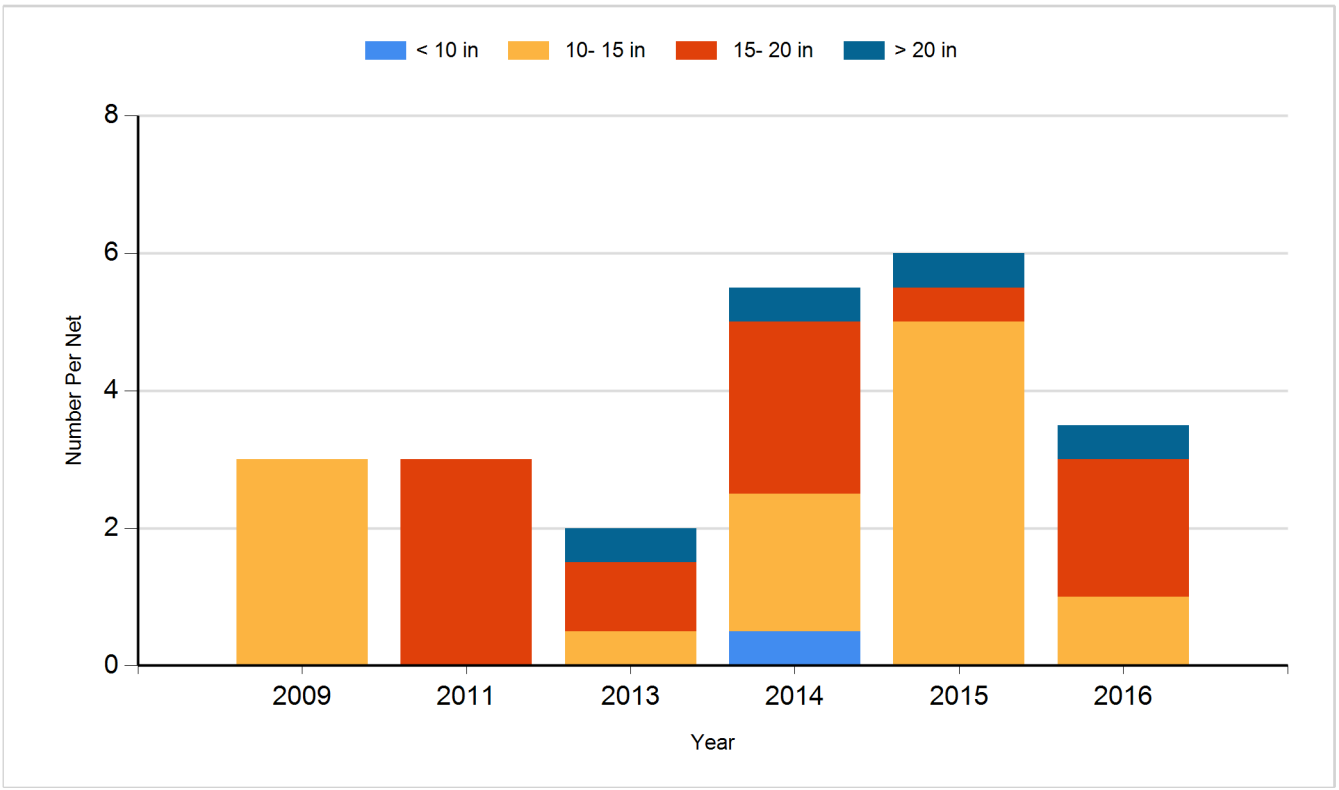
Species: Northern Pike
Gear: std exp gill net



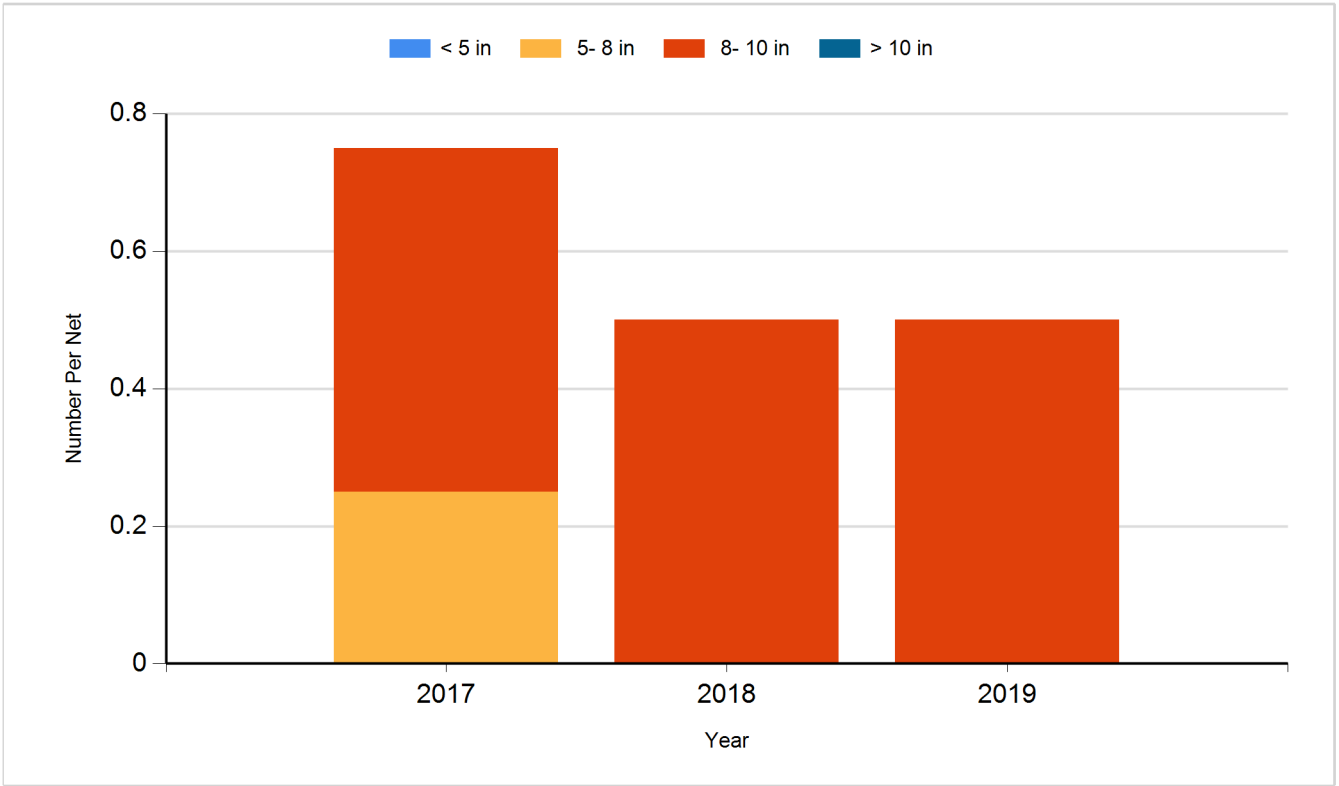
Species: Walleye
Gear: AFS std gill net



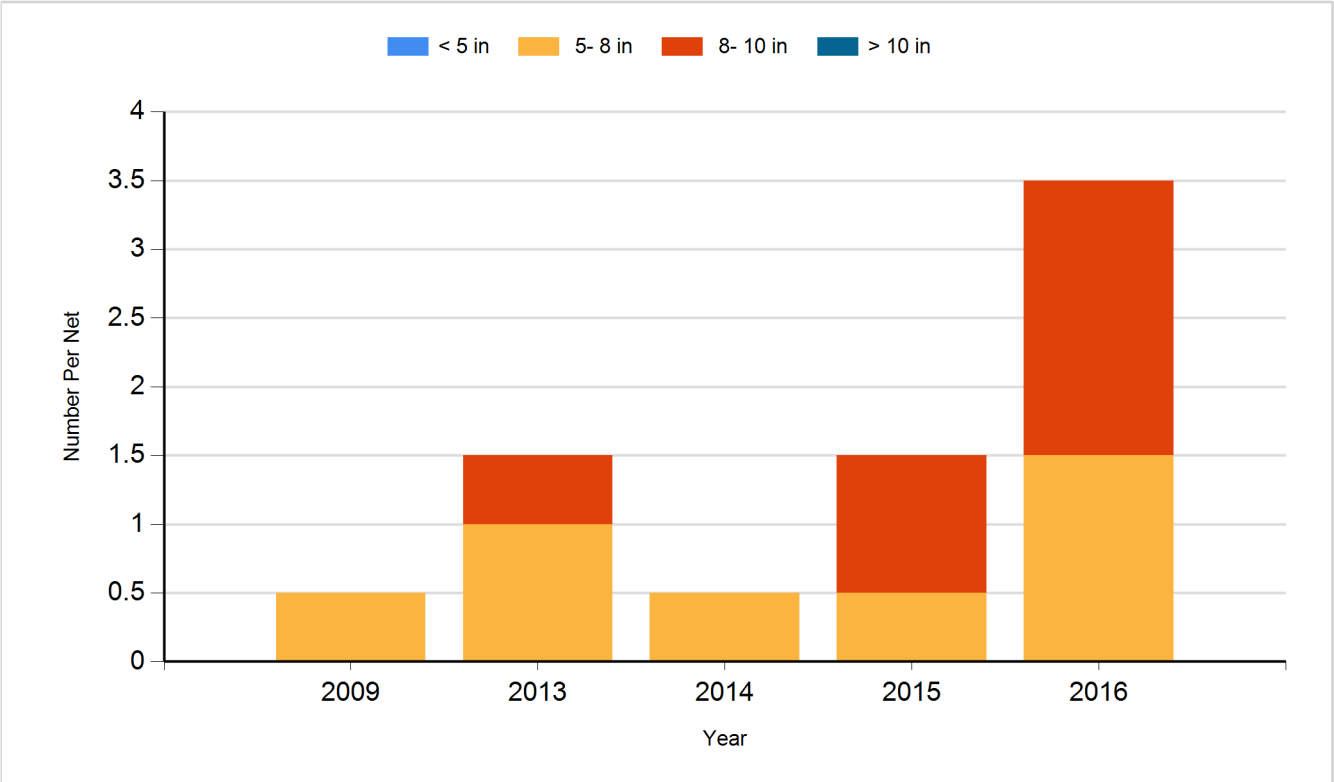
Species: Walleye
Gear: std exp gill net



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
2009	Largemouth Bass	Fingerling	20,000
2012	Gizzard Shad	Adult	25
2012	Largemouth Bass	Fingerling	4,500
2012	Walleye	Fingerling	20,304
2013	Gizzard Shad	Adult	32
2013	Walleye	Fingerling	22,626
2014	Gizzard Shad	Adult	30
2014	Walleye	Fingerling	20,000
2016	Walleye	Fingerling	25,500
2017	Walleye	Small Fingerling	49,500
2018	Walleye	Small Fingerling	40,000
2019	Walleye	Small Fingerling	32,130