SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Little White River Project, Bennett County
LIW-Lake-8-000
2024

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
frame net (std 3/4 in)	Jun 18, 2024	5 net-nights

Common Fish Species Present

Walleye

Northern Pike

Largemouth Bass

Channel Catfish

Black Crappie

Black Bullhead

Bluegill

Shorthead Redhorse

Common Carp

Tadpole Madtom

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
frame net (std 3/4 in)	Black Bullhead	8	1.4	1.1	43		0		97	6
	Black Crappie	79	15.8	7.3	76	7	53	8	94	3
	Bluegill	5	1.0	0.5	40		0		118	10
	Channel Catfish	1	0.2	0.3	100		0		85	
	Common Carp	10	0.4	0.4	100		50		78	5
	Largemouth Bass	5	0.4	0.6	50		50		106	12
	Northern Pike	39	5.6	1.9	32	14	11		86	3
	Shorthead Redhorse	3	0.6	0.4	100		100		86	9
	Tadpole Madtom	1	0.0	0.0						
	Walleye	74	2.2	0.8	55		18		83	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.

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

		CPUE										
Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	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	18.0	35.0	39.0	43.9	47.2	17.4					33.42
	Walleye*	0.0	1.0	6.0	10.0	23.3	0.0					6.72
frame net (std 3/4 in)	Black Bullhead	6.9	10.7		5.8	9.5	9.2	0.0	0.2		1.4	5.46
	Black Crappie	24.0	29.0		95.6	40.3	14.5	60.8	17.8		15.8	37.23
	Bluegill	0.4	0.1		2.1	2.0	6.5	0.8	0.2		1.0	1.64
	Channel Catfish	0.2	2.9		1.4	1.9	2.3	0.7	0.4		0.2	1.25
	Common Carp	0.2	0.9		0.5	2.9	0.7	0.7	2.2		0.4	1.06
	Gizzard Shad	0.3	0.1		0.0	0.0	0.2	0.0	0.0		0.0	0.08
	Golden Shiner	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.00
	Green Sunfish	0.0	0.3		0.1	0.0	0.0	0.2	0.2		0.0	0.10
	Largemouth Bass	0.2	0.4		0.1	0.0	0.2	0.2	0.4		0.4	0.24

		CPUE										
Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
frame net (std 3/4 in)	Northern Pike	1.3	1.9		0.9	0.1	3.5	3.2	0.6		5.6	2.14
	Shorthead Redhorse	1.3	3.6		3.6	2.3	0.7	1.0	1.2		0.6	1.79
	Tadpole Madtom	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.00
	Walleye	0.2	0.7		0.6	1.6	0.5	1.3	1.6		2.2	1.09
	White Sucker	0.0	0.0		0.1	0.3	0.0	0.0	0.0		0.0	0.05
	Yellow Perch	0.1	0.1		0.0	0.0	0.5	0.0	0.0		0.0	0.09
std exp gill net	Black Bullhead	111.5	11.5									61.50
	Black Crappie	4.0	1.5									2.75
	Channel Catfish	7.5	2.5									5.00
	Common Carp	4.5	2.0									3.25
	Gizzard Shad	2.0	1.0									1.50
	Golden Shiner	0.0	0.0									0.00
	Northern Pike	0.5	0.0									0.25
	Shorthead Redhorse	0.0	0.5									0.25
	Walleye	6.0	3.5									4.75
	Yellow Perch	1.5	3.5									2.50

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	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
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							
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					
		PSD-P			0	0	0					
		Wr			94	90	136					
	Channel Catfish	PSD			79	78	100					

			Year									
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std gill net	Channel Catfish	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					
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		0	0	0	40					
		PSD-P		0	0	0	20					
		Wr				91	90					
frame net (std 3/4 in)	Black Bullhead	PSD	10	39		48	58	76		100		43
		PSD-P	0	0		0	0	0		0		0
		Wr	88	93		97	97	88		117		97
	Black Crappie	PSD	66	38		43	59	61	70	82		76
		PSD-P	43	19		15	23	48	41	45		53
		Wr	96	110		98	93	97	92	85		94
	Bluegill	PSD	67	100		29	19	51	60	0		40
		PSD-P	0	0		0	0	0	0	0		0
		Wr	123	93		106	114	110	103	142		118
	Channel Catfish	PSD	100	40		27	27	43	75	50		100
		PSD-P	100	10		9	7	7	75	0		0
		Wr	123	118		85	92	76	95	90		85
	Common Carp	PSD	100	100		50	78	25	25	64		100
		PSD-P	0	17		0	30	0	25	27		50
		Wr	83	89		80	89	91	84	81		78
	Largemouth Bass	PSD	50	0		100		100	0	100		50

			Year									
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
frame net (std 3/4 in)	Largemouth Bass	PSD-P	0	0		100		0	0	100		50
		Wr	117	117		103		99	108	94		106
	Northern Pike	PSD	67	69		86	100	33	47	67		32
		PSD-P	11	0		14	100	24	16	0		11
		Wr	90	94		81	93	82	82	83		86
	Shorthead Redhorse	PSD	92	96		100	100	100	100	100		100
		PSD-P	33	24		93	100	100	100	100		100
		Wr	90	87		79	84	82	87	86		86
	Walleye	PSD	100	80		100	38	100	75	100		55
		PSD-P	100	60		100	31	33	38	50		18
		Wr	96	91		87	87	87	83	83		83
std exp gill net	Black Bullhead	PSD	20	30								
		PSD-P	0	0								
		Wr	91	88								
	Black Crappie	PSD	75	100								
		PSD-P	50	33								
		Wr	103	104								
	Channel Catfish	PSD	40	60								
		PSD-P	20	20								
		Wr	100	89								
	Common Carp	PSD	33	25								
		PSD-P	0	0								
		Wr	86	90								
	Northern Pike	PSD	100									
		PSD-P	100									
		Wr	91									
	Shorthead Redhorse	PSD		100								
		PSD-P		100								
		Wr		91								
	Walleye	PSD	17	71								
		PSD-P	8	14								
		Wr	95	95								

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)				

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

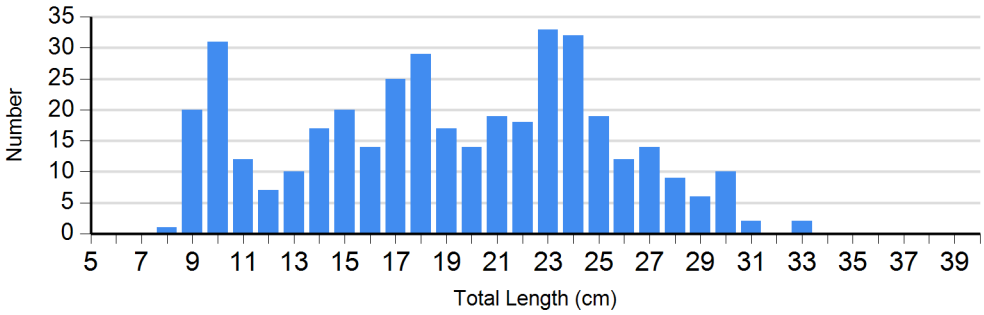
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2020	34	109 (1.4)	11	87 (1.7)	29	88 (0.8)	13	91 (1.4)
	2021	109	103 (1.1)	105	97 (0.7)	103	83 (0.8)	48	81 (1.3)
	2022	16	100 (2.7)	33	84 (1.0)	30	79 (1.0)	10	85 (1.4)
	2024	19	115 (1.9)	18	94 (0.7)	28	77 (4.6)	14	80 (0.8)
Bluegill Frame Net	2020	19	114 (2.4)	20	105 (2.0)	0		0	
	2021	2	99 (5.5)	3	106 (7.0)	0		0	
	2022	1	142	0		0		0	
	2024	3	117 (16.5)	2	119 (3.1)	0		0	
Largemouth Bass Electro Fishing	2020	4	105 (3.5)	6	104 (2.0)	3	99 (7.7)	0	

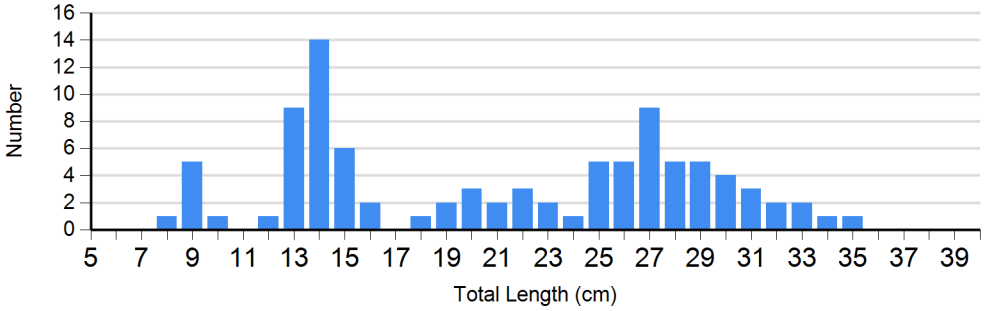
Length Frequency Distribution

Length frequency histogram of species sampled by year.

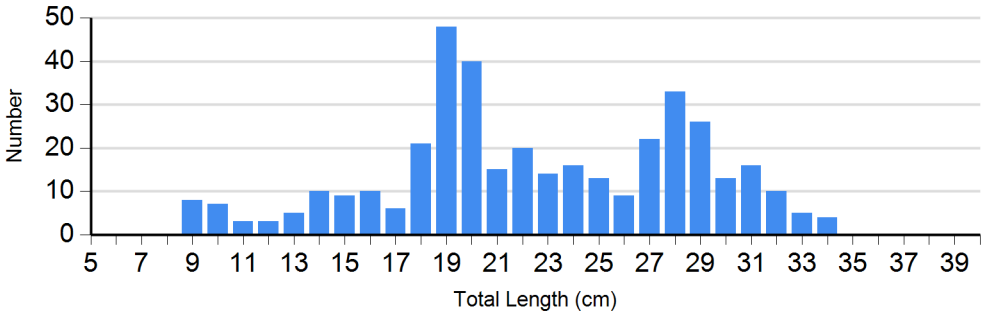
Species: Black Crappie
Gear: frame net (std 3/4 in)



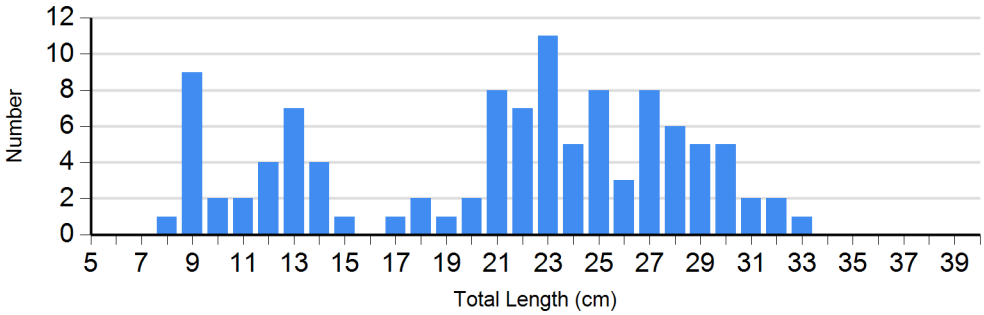
2019



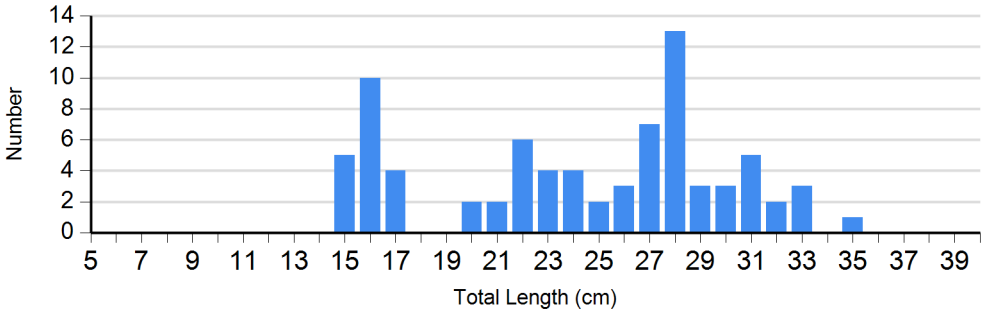
2020



2021



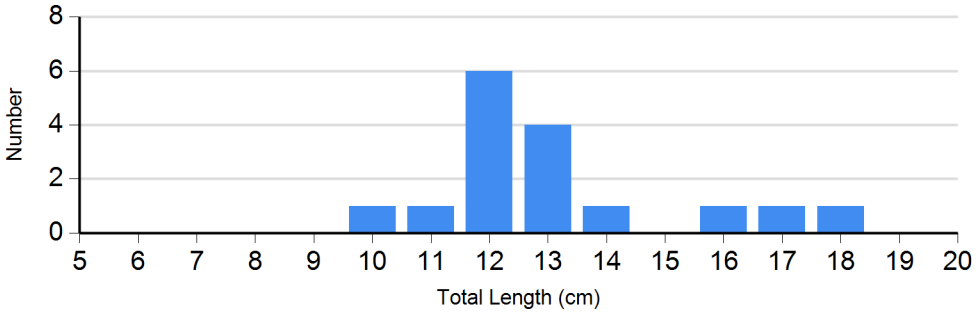
2022



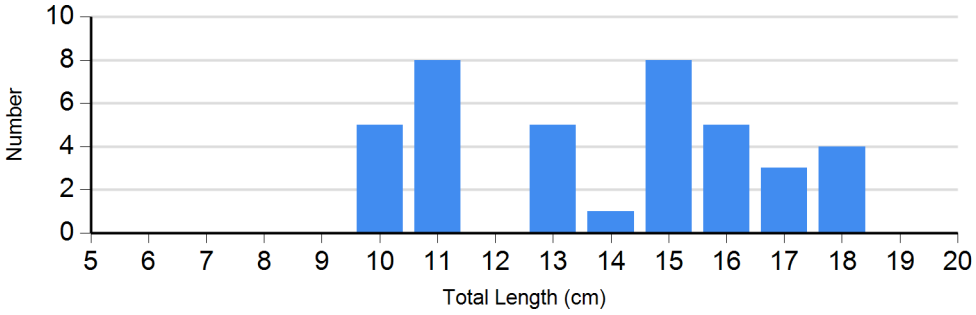
2024

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

2019

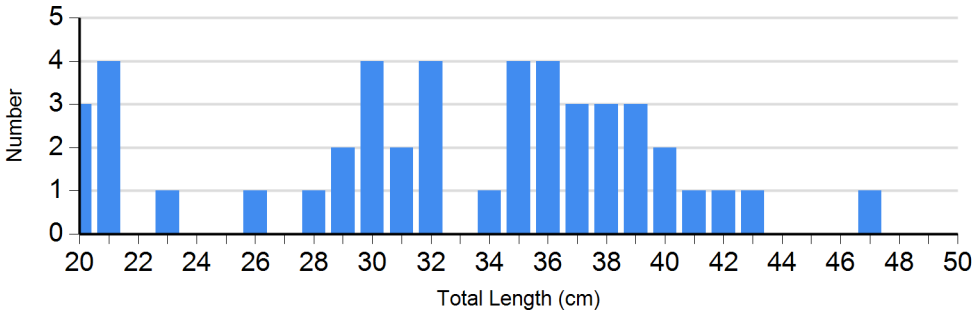


2020

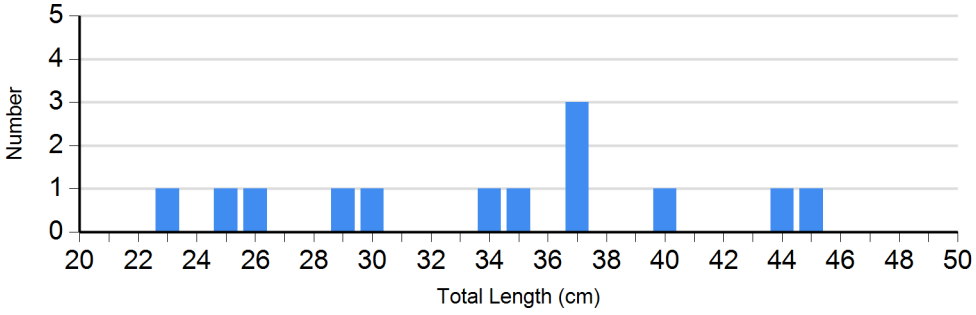


Species: Largemouth Bass
Gear: boat shocker (day)

2019



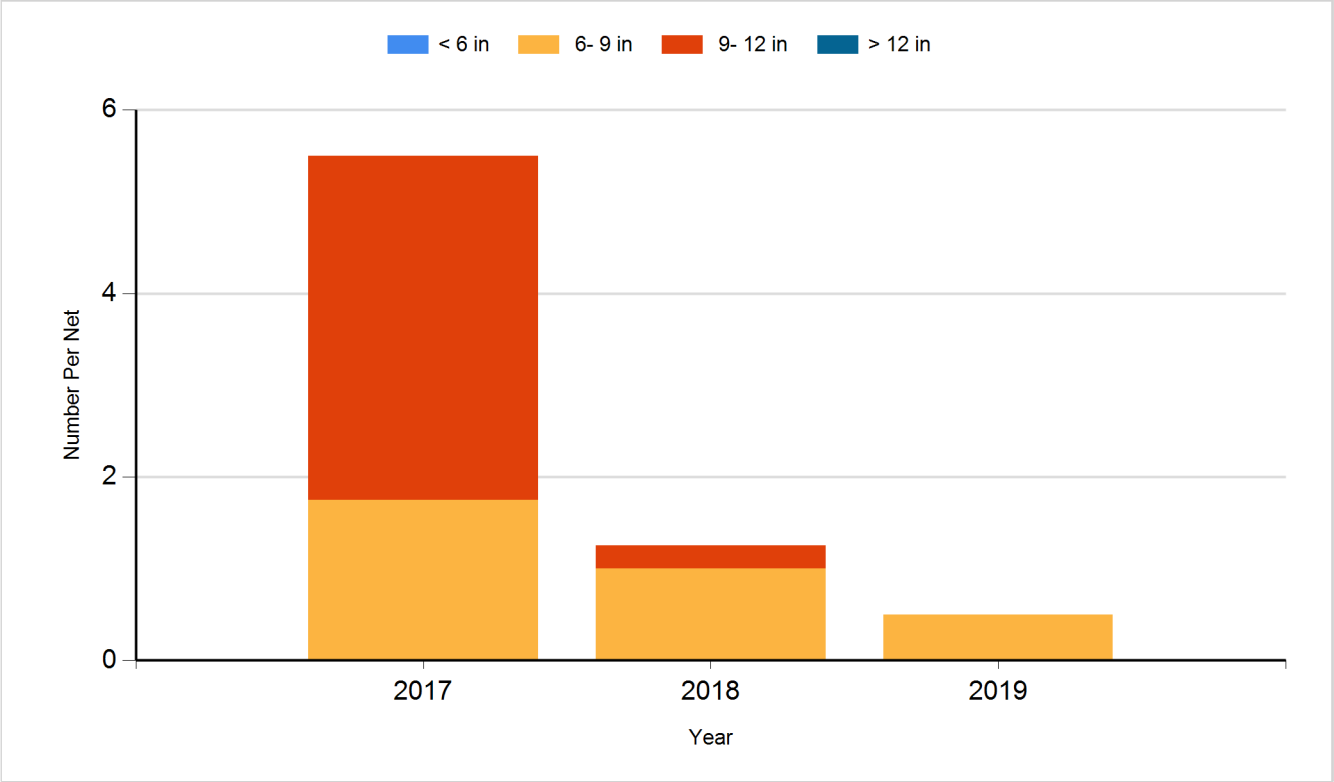
2020



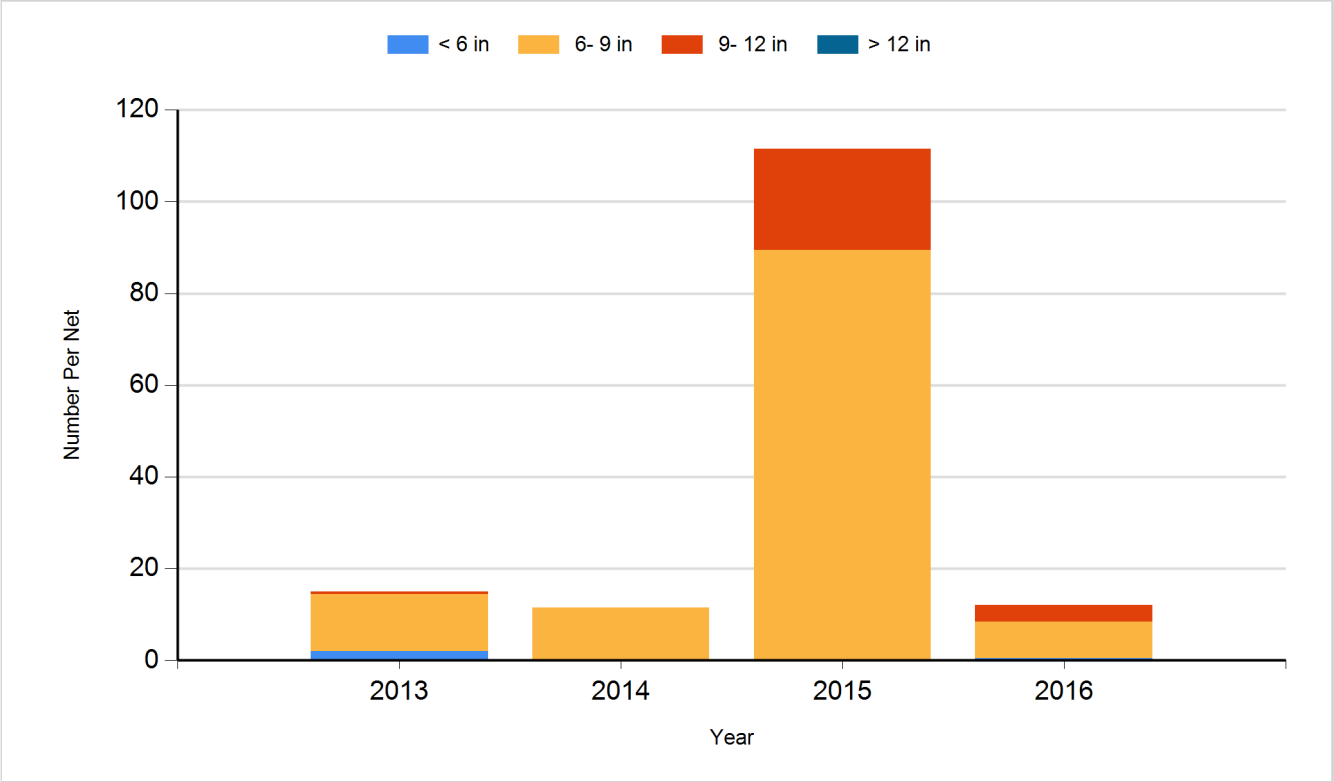
Historic Fish Sizes and Relative Abundance

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

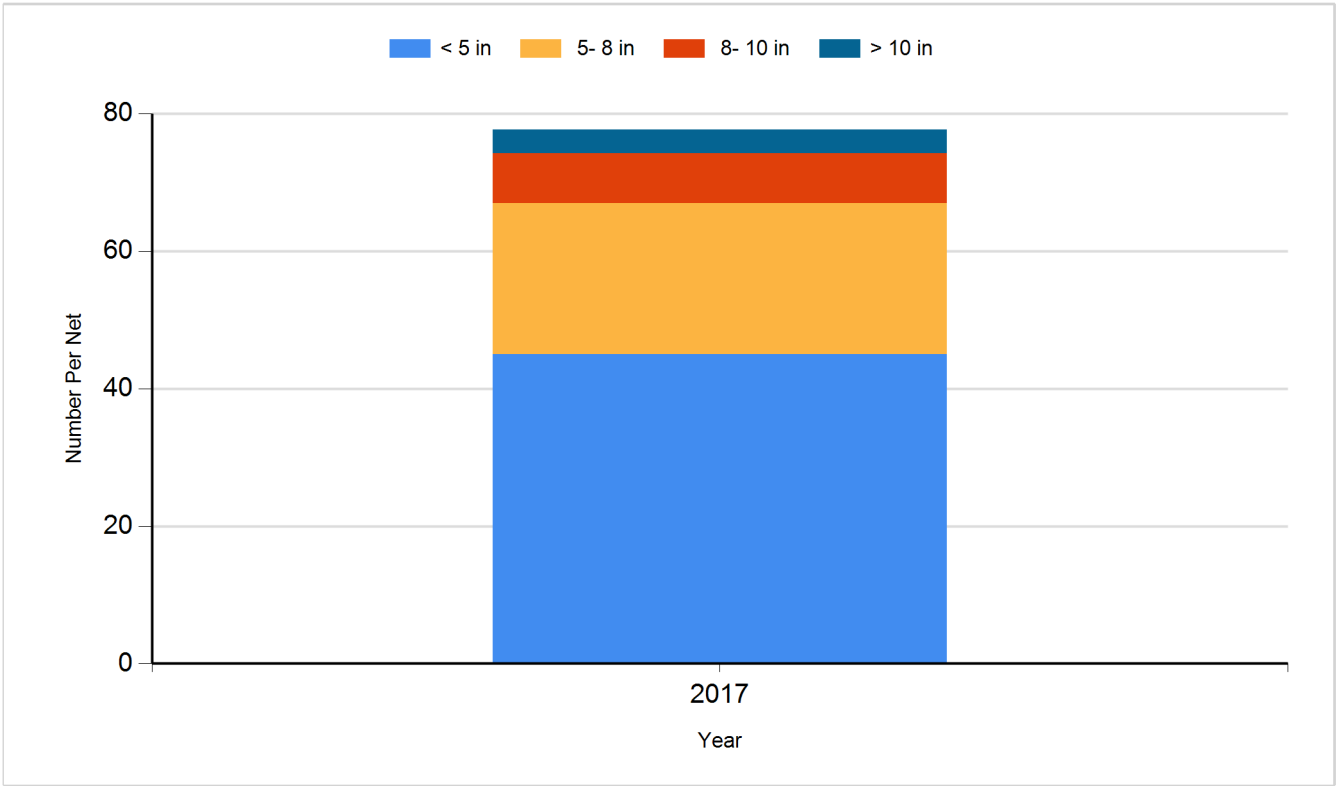
Species: Black Bullhead
Gear: AFS std gill net



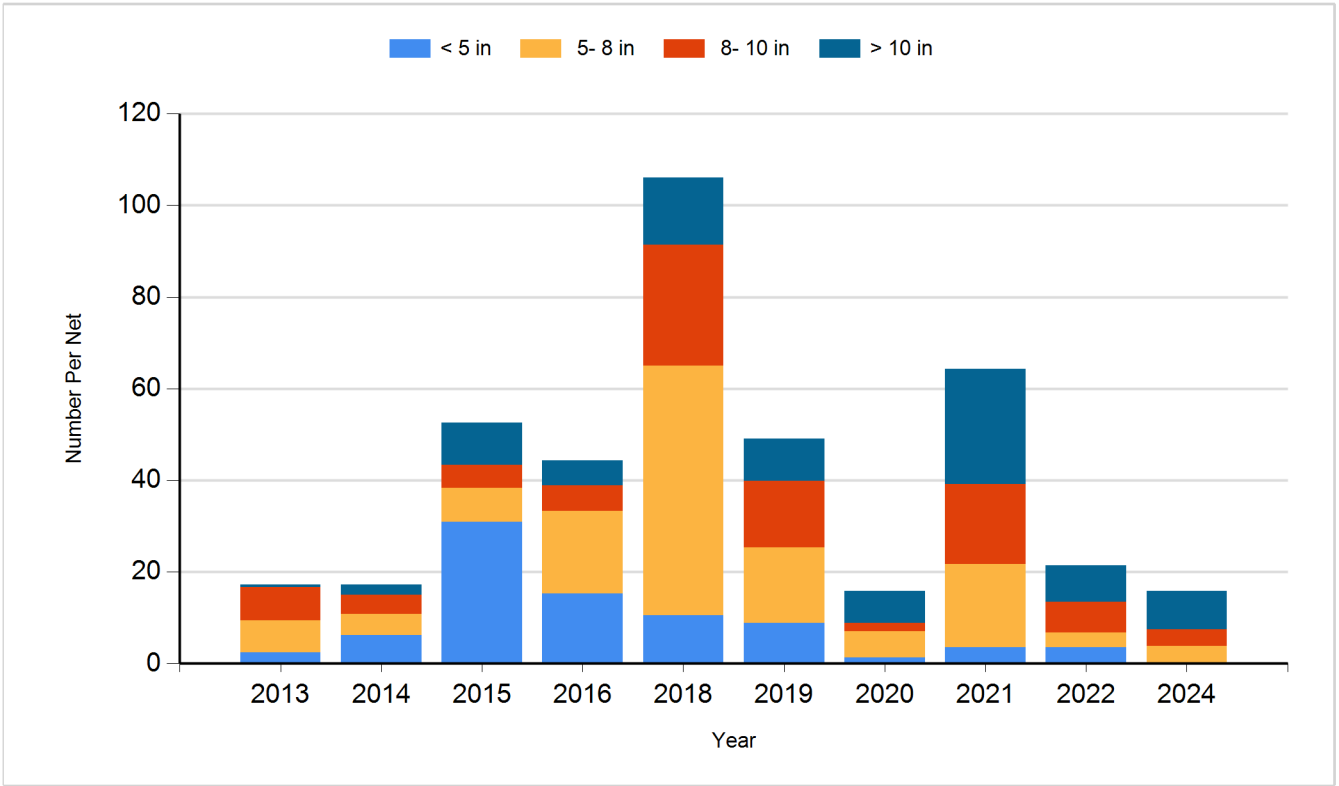
Species: Black Bullhead
Gear: std exp gill net



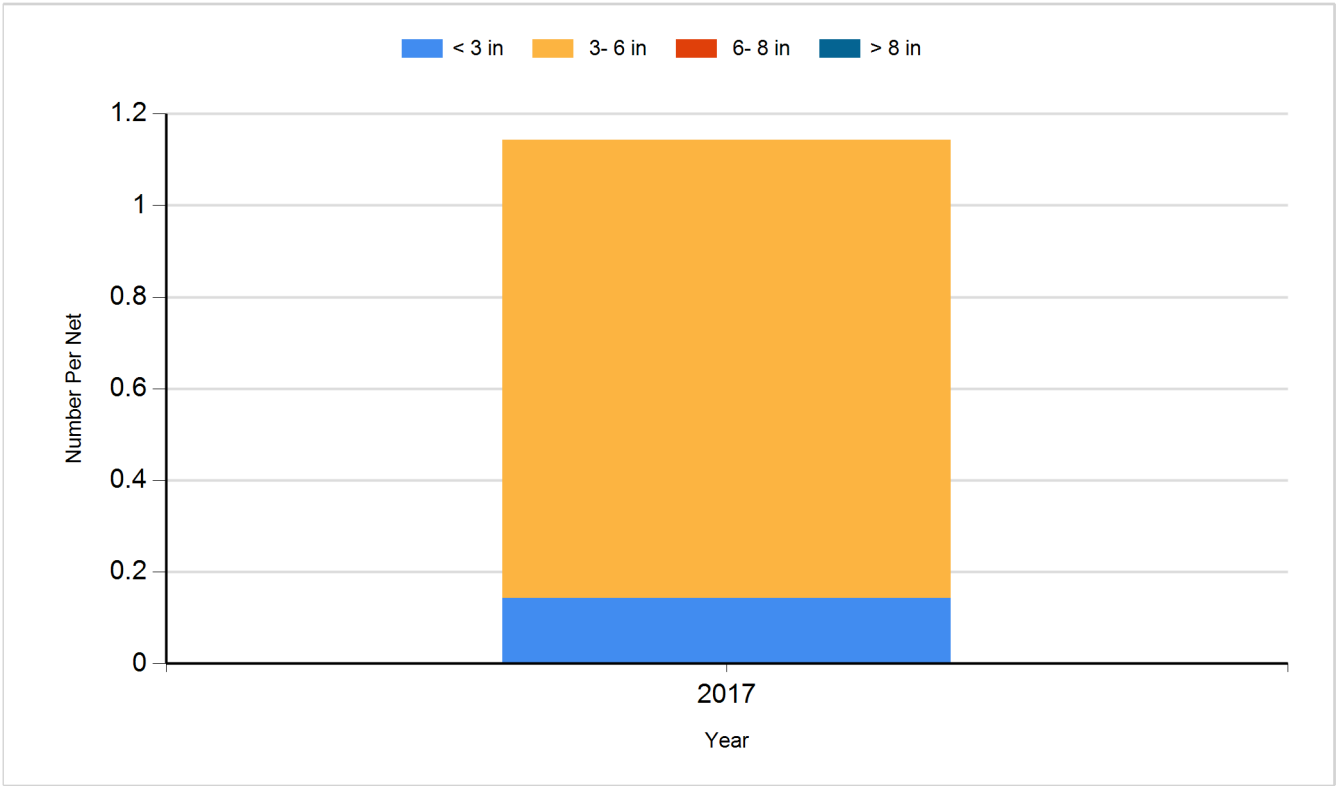
Species: Black Crappie
Gear: AFS std frame net



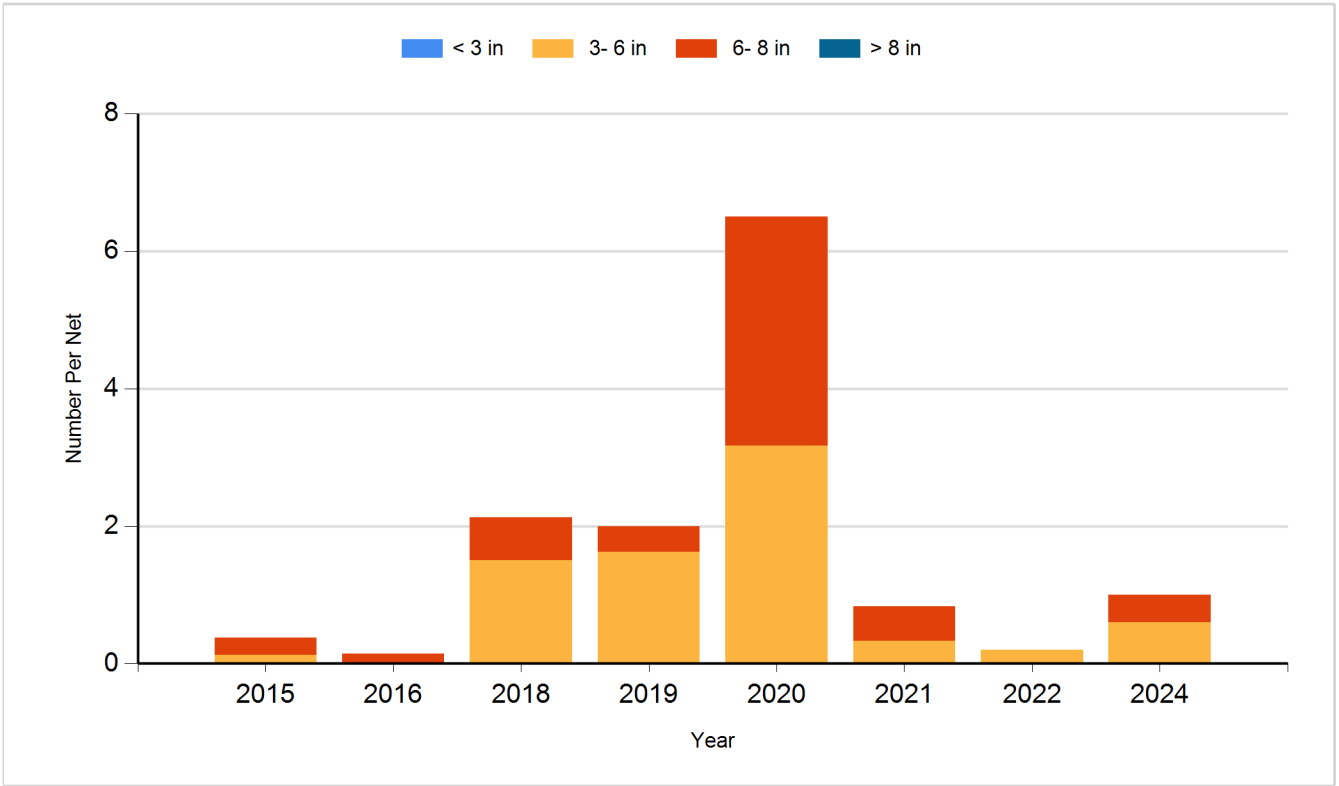
Species: Black Crappie
Gear: frame net (std 3/4 in)



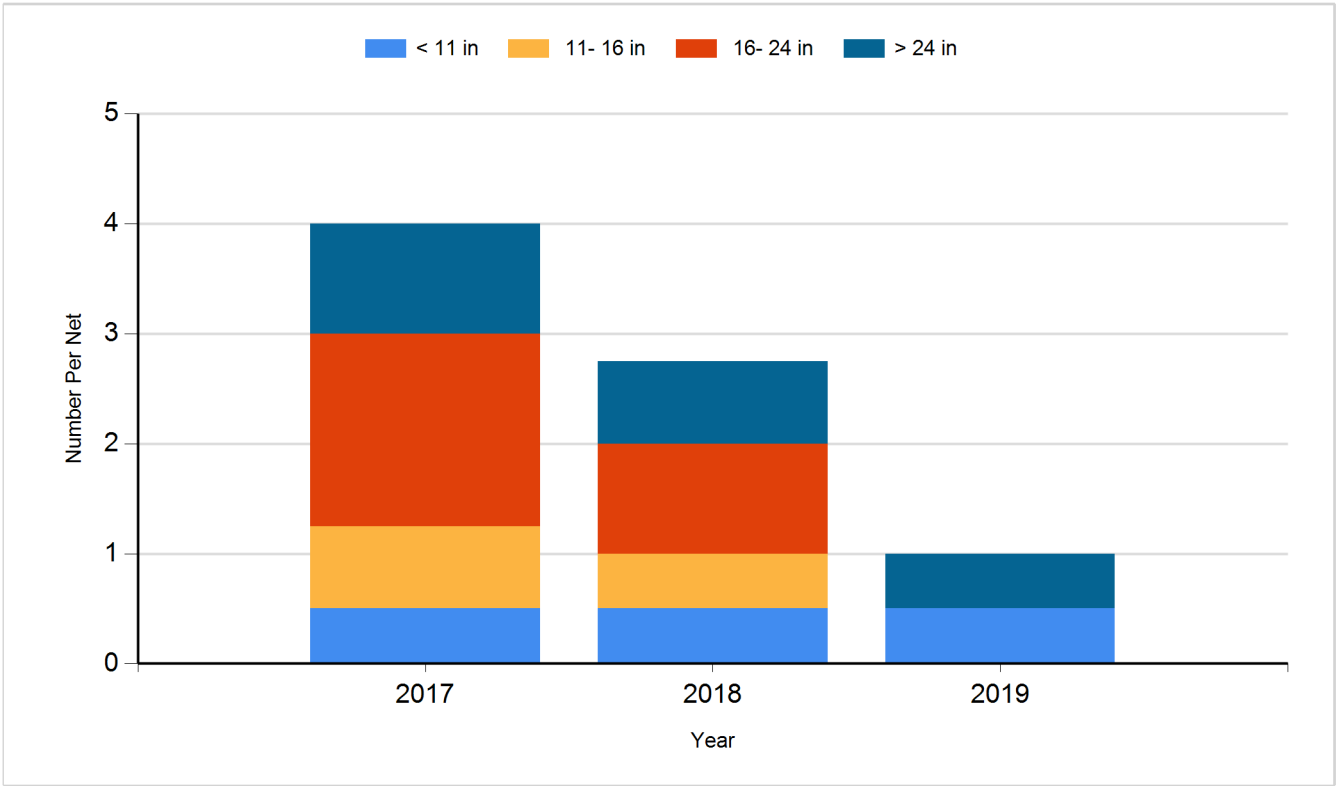
Species: Bluegill
Gear: AFS std frame net



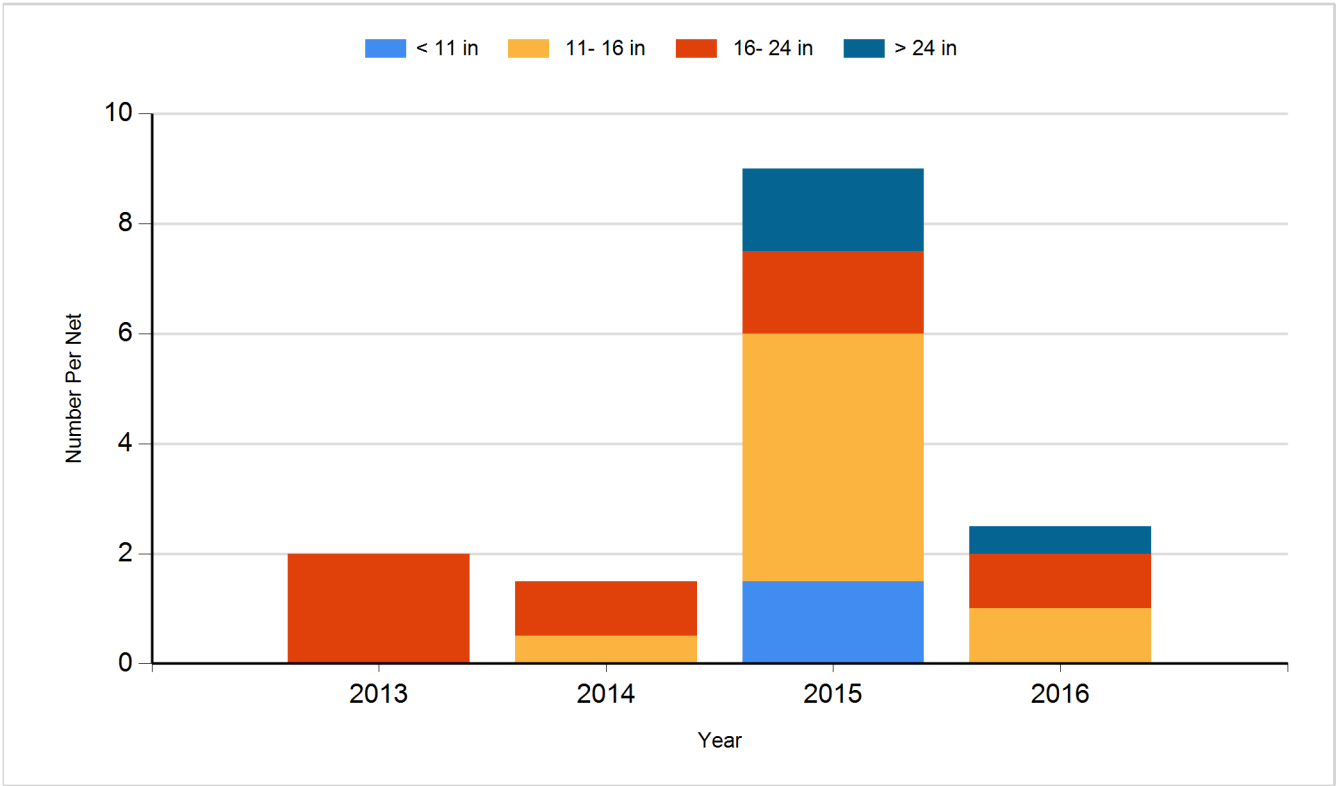
Species: Bluegill
Gear: frame net (std 3/4 in)



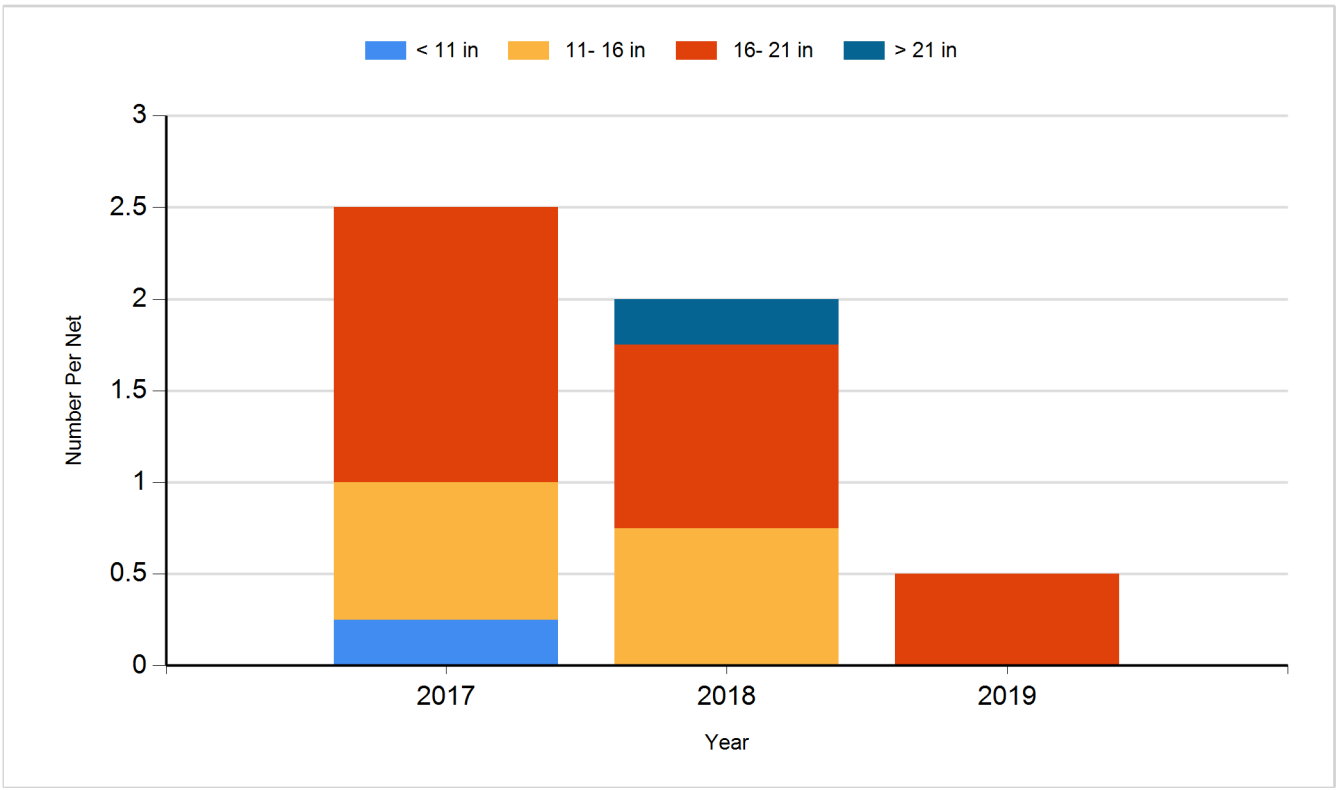
Species: Channel Catfish
Gear: AFS std gill net



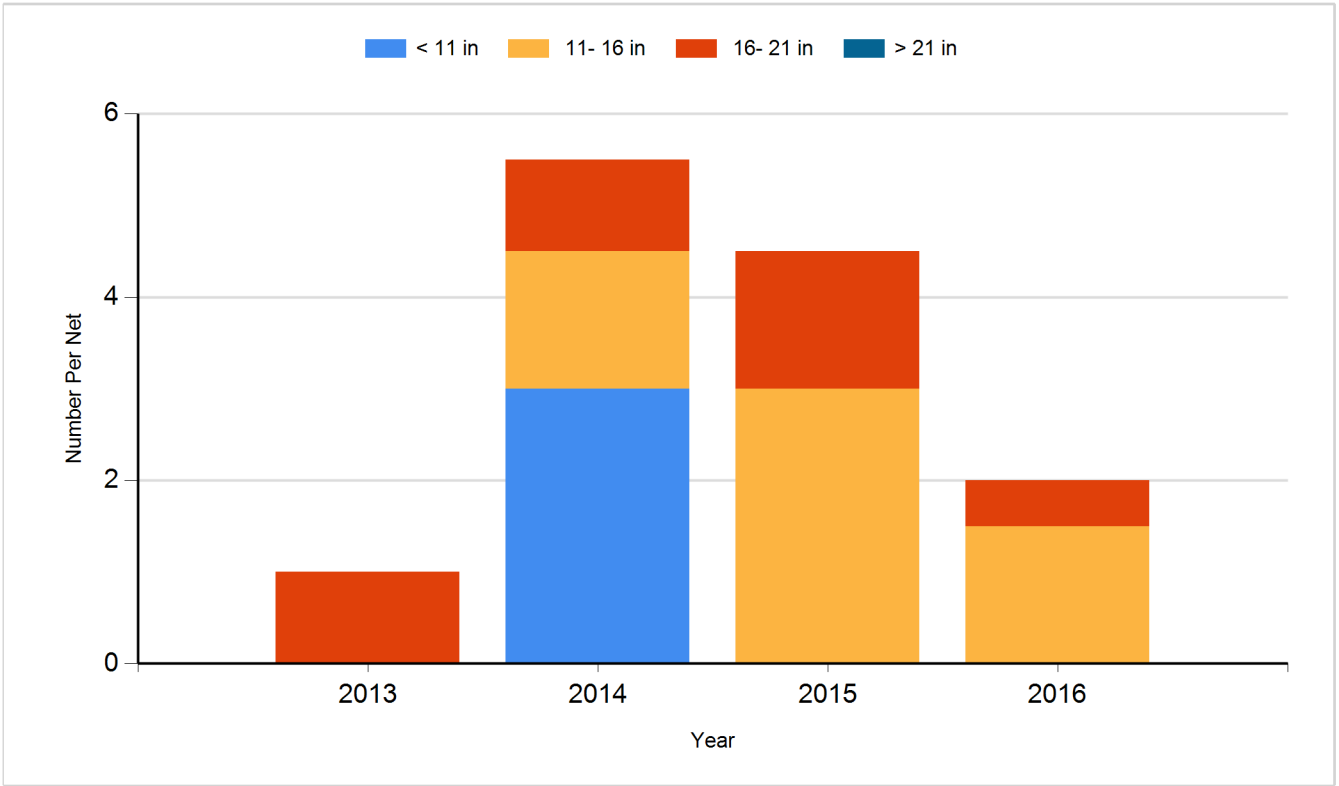
Species: Channel Catfish
Gear: std exp gill net



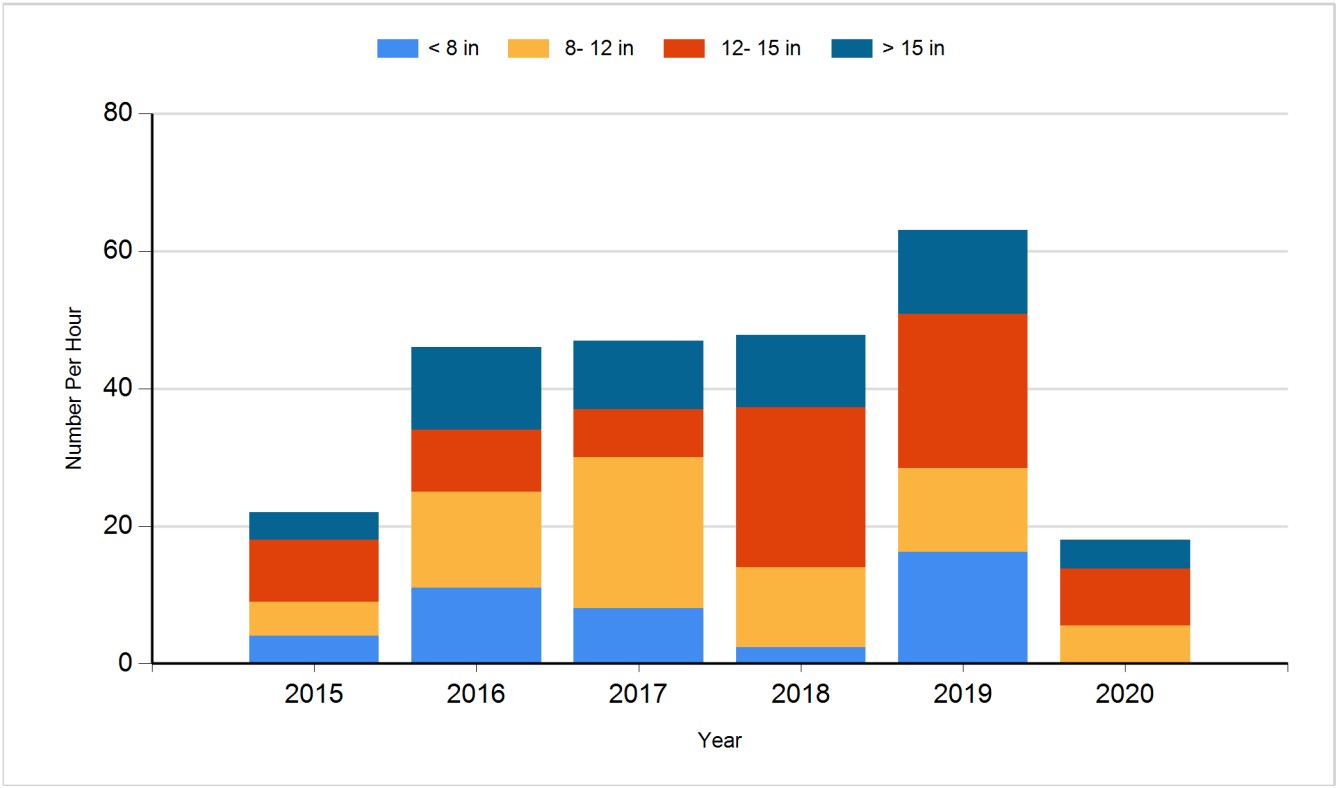
Species: Common Carp
Gear: AFS std gill net



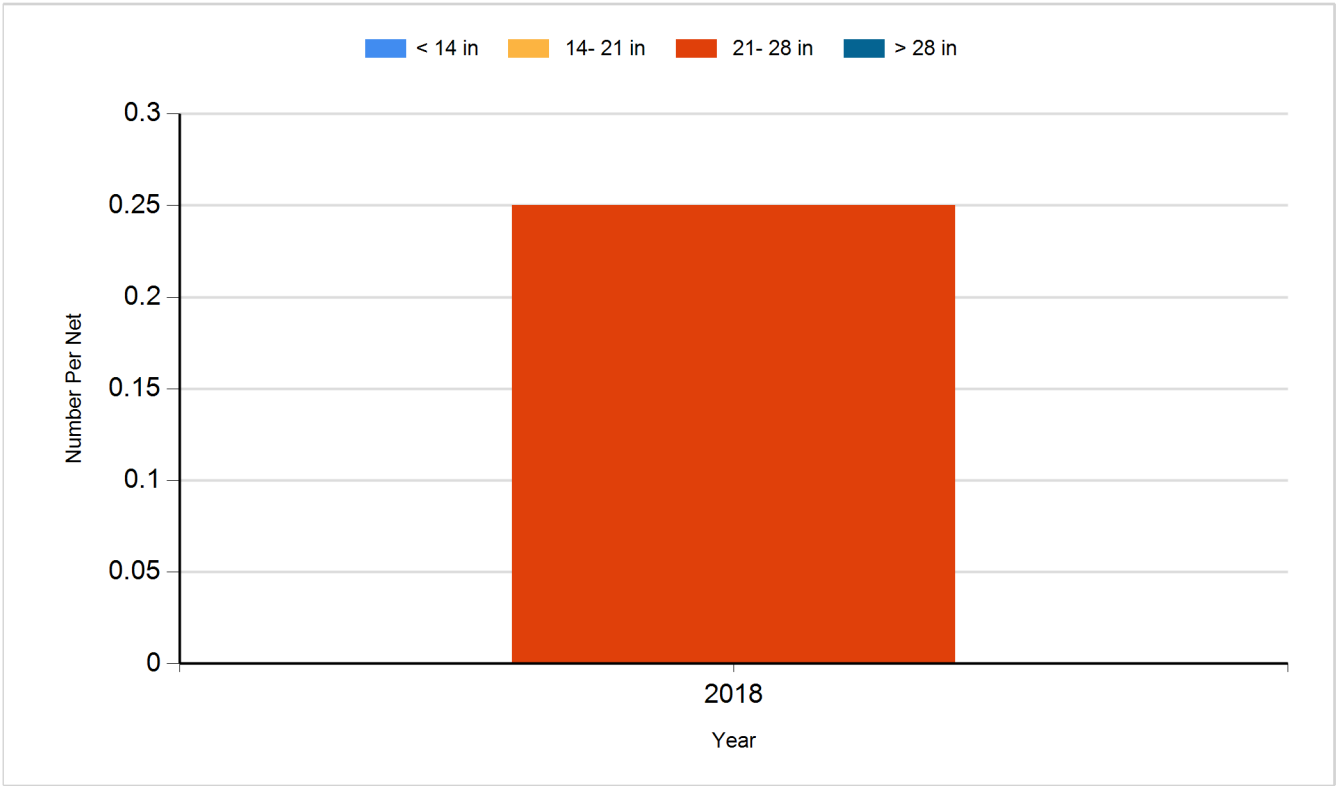
Species: Common Carp
Gear: std exp gill net



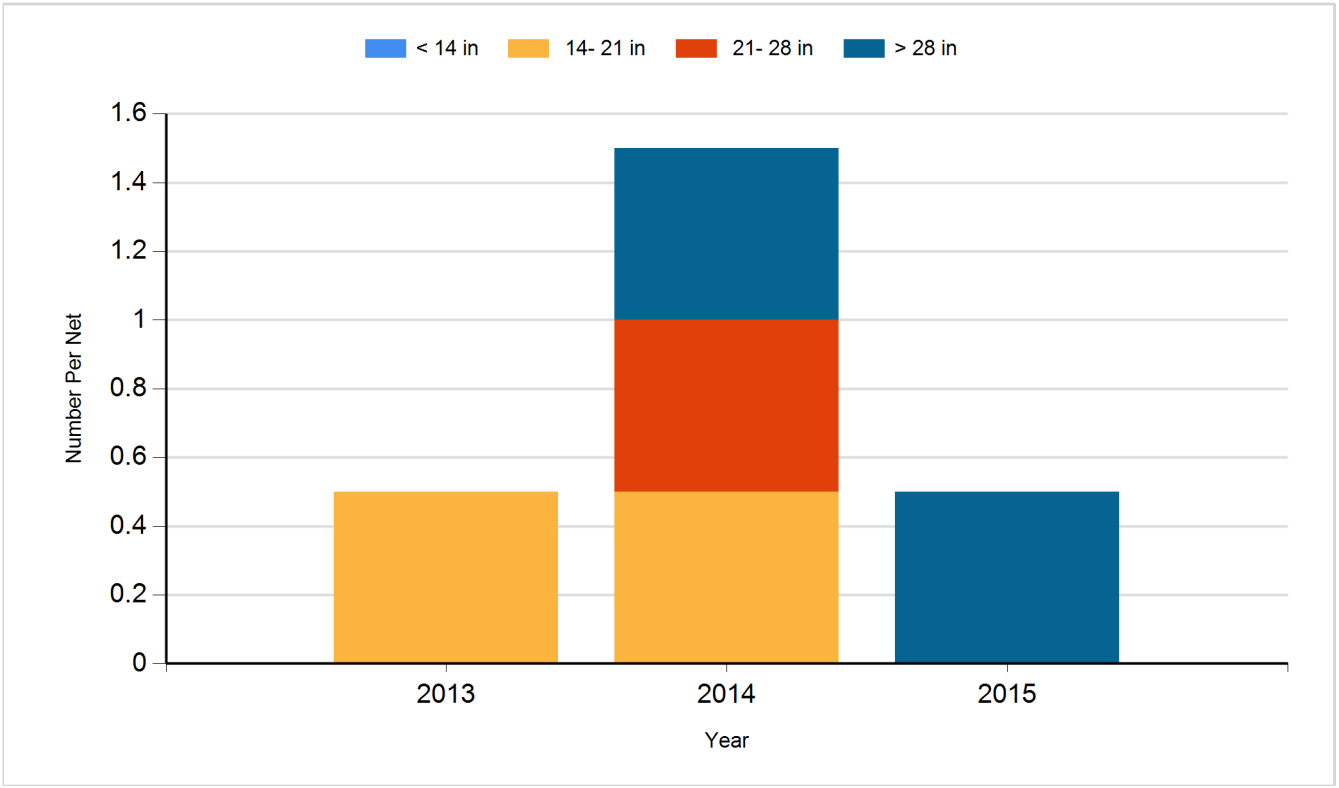
Species: Largemouth Bass
Gear: boat shocker (day)



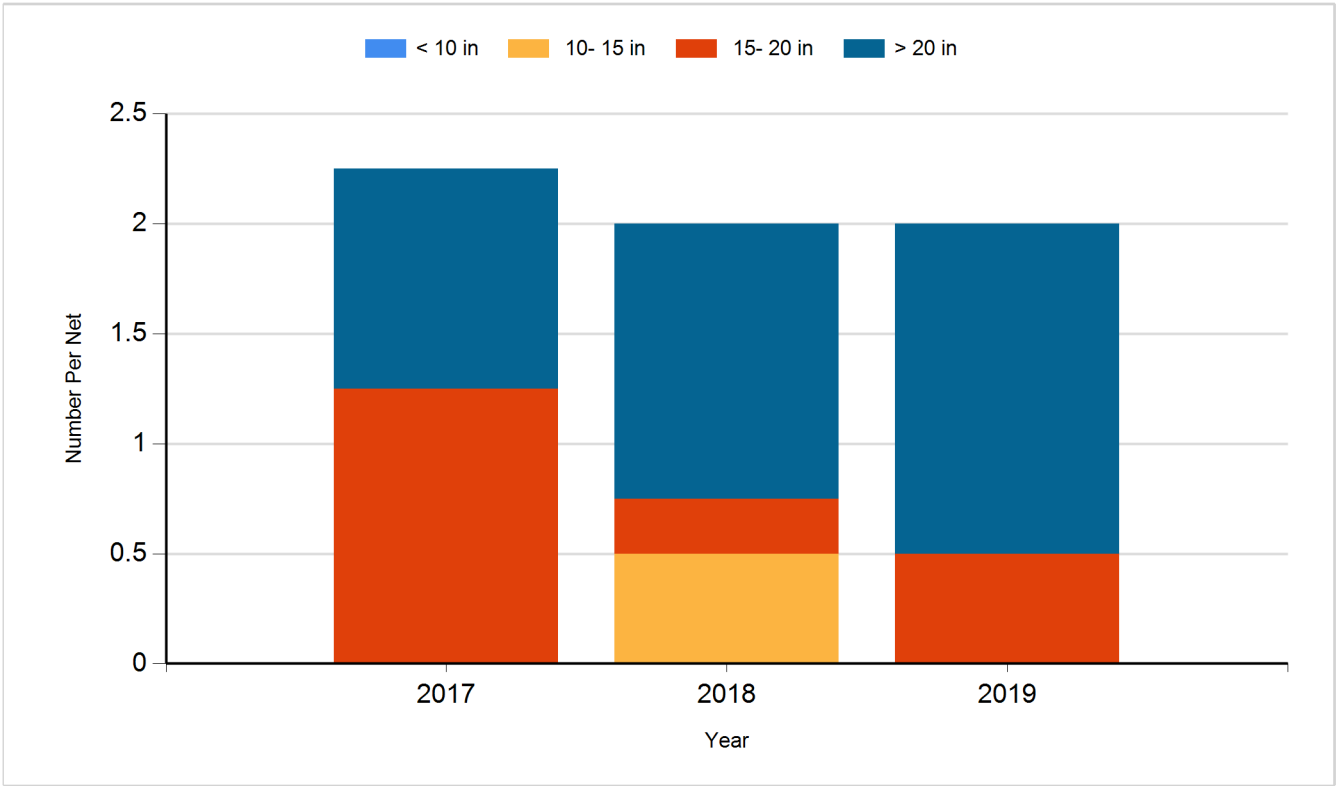
Species: Northern Pike
Gear: AFS std gill net



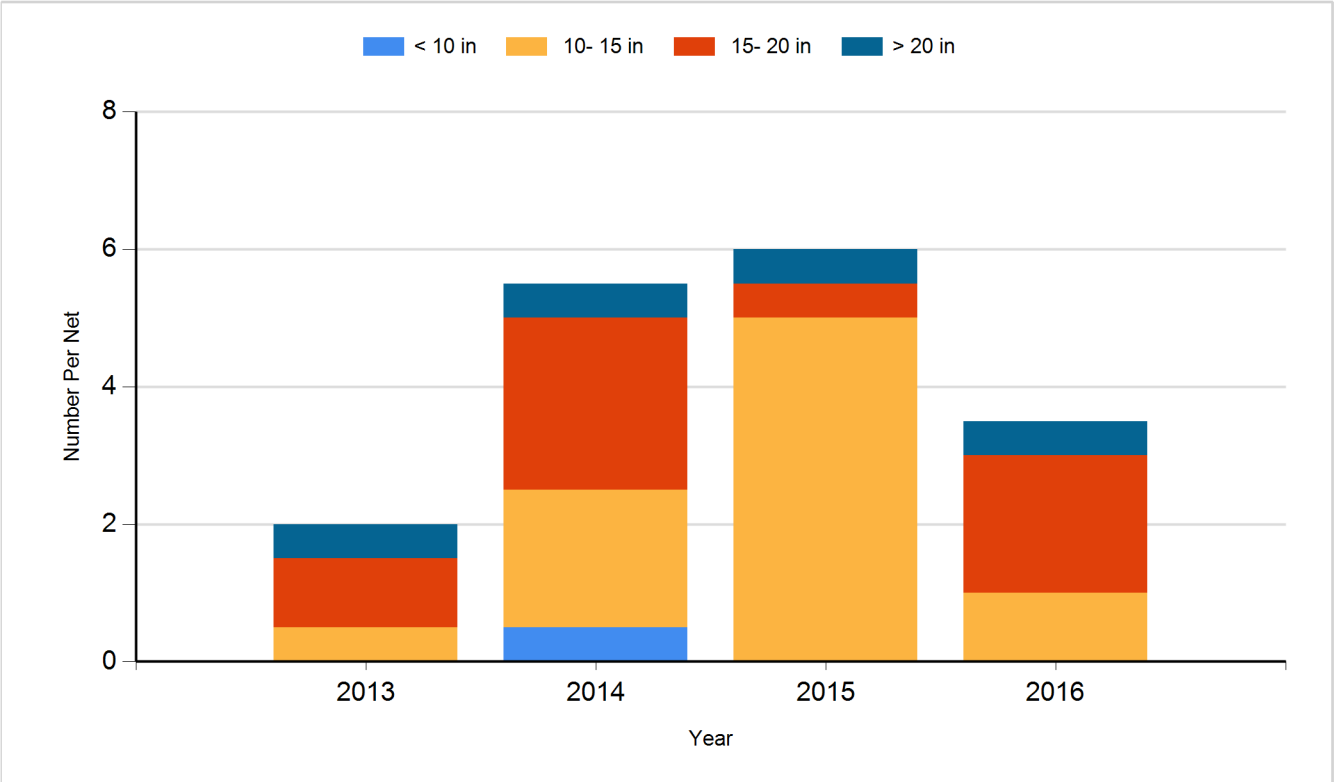
Species: Northern Pike
Gear: std exp gill net



Species: Walleye
Gear: AFS std gill net



Species: Walleye
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
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
2021	Walleye	Small Fingerling	40,000
2022	Walleye	Juvenile	50,050
2023	Walleye	Juvenile	40,600
2024	Walleye	Juvenile	30,000