

**SOUTH DAKOTA STATEWIDE FISHERIES SURVEY**  
**Little White River Project, Bennett County**  
**LIW-Lake-8-000**  
**2021**

**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)	Jul 13, 2021	6 net-nights

## **Common Fish Species Present**

Northern Pike

Largemouth Bass

Black Crappie

Channel Catfish

Walleye

Shorthead Redhorse

Bluegill

Common Carp

Green Sunfish

Golden Shiner

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## 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.

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

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**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
frame net (std 3/4 in)	Black Crappie	386	62.0	18.2	66	3	38	3	92	1
	Bluegill	5	0.8	0.5	60		0		103	6
	Channel Catfish	5	0.7	0.5	75		75		95	6
	Common Carp	4	0.7	0.3	25		25		84	2
	Golden Shiner	2	0.0	0.0						
	Green Sunfish	1	0.2	0.2	0		0		108	
	Largemouth Bass	1	0.2	0.2	0		0		108	
	Northern Pike	19	3.2	1.3	47	18	16		82	2
	Shorthead Redhorse	6	1.0	0.4	100		100		87	2
	Walleye	8	1.3	0.7	75		38		83	2

## 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

Gear	Species	CPUE										Avg	
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		
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		9.1	16.8	6.9	10.7		5.8	9.5	9.2	0.0		8.50
	Black Crappie		14.9	11.0	24.0	29.0		95.6	40.3	14.5	62.0		36.41
	Bluegill		0.0	0.0	0.4	0.1		2.1	2.0	6.5	0.8		1.49
	Channel Catfish		0.1	0.1	0.2	2.9		1.4	1.9	2.3	0.7		1.20
	Common Carp		0.1	0.4	0.2	0.9		0.5	2.9	0.7	0.7		0.80
	Gizzard Shad		0.1	0.0	0.3	0.1		0.0	0.0	0.2	0.0		0.09
	Golden Shiner		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.00
	Green Sunfish		0.0	0.4	0.0	0.3		0.1	0.0	0.0	0.2		0.13
	Largemouth Bass		0.0	0.3	0.2	0.4		0.1	0.0	0.2	0.2		0.18

		CPUE										
Gear	Species	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg
frame net (std 3/4 in)	Northern Pike		2.9	1.3	1.3	1.9		0.9	0.1	3.5	3.2	1.89
	Shorthead Redhorse		0.1	0.9	1.3	3.6		3.6	2.3	0.7	1.0	1.69
	Tadpole Madtom		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.00
	Walleye		0.1	0.3	0.2	0.7		0.6	1.6	0.5	1.3	0.66
	White Sucker		0.0	0.0	0.0	0.0		0.1	0.3	0.0	0.0	0.05
	Yellow Perch		0.3	0.1	0.1	0.1		0.0	0.0	0.5	0.0	0.14
std exp gill net	Black Bullhead		13.0	11.5	111.5	11.5						36.88
	Black Crappie		1.0	2.5	4.0	1.5						2.25
	Channel Catfish		2.0	1.5	7.5	2.5						3.38
	Common Carp		1.0	2.5	4.5	2.0						2.50
	Gizzard Shad		0.0	0.0	2.0	1.0						0.75
	Golden Shiner		0.0	0.0	0.0	0.0						0.00
	Northern Pike		0.5	1.5	0.5	0.0						0.63
	Shorthead Redhorse		0.5	2.5	0.0	0.5						0.88
	Walleye		2.0	5.0	6.0	3.5						4.13
	Yellow Perch		1.5	0.5	1.5	3.5						1.75

## 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													
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021				
AFS std frame net	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					
	Green Sunfish	PSD									50					
		PSD-P									0					
		Wr									91					
	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 Crappie	PSD								57	75	0				
		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				



Gear	Species	Index	Year									
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFS std gill net	Common Carp	PSD-P							0	13	0	
		Wr							85	84	84	
	Northern Pike	PSD								100		
		PSD-P								0		
	Shorthead Redhorse	Wr								92		
		PSD							100	100		
		PSD-P							50	100		
	Walleye	Wr							101			
		PSD							100	75	100	
PSD-P								44	63	75		
boat shocker (day)	Largemouth Bass	Wr				110	113		113	115	103	
		PSD			72	60	44	74	74	69		
		PSD-P				22	34	26	23	26	23	
	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 Crappie	Wr		104	93	96	110		98	93	97	92
		PSD		53	59	66	38		43	59	61	66
		PSD-P		4	20	43	19		15	23	48	38
	Bluegill	PSD				67	100		29	19	51	60
		PSD-P				0	0		0	0	0	0
		Wr				123	93		106	114	110	103
	Channel Catfish	PSD		100	100	100	40		27	27	43	75
		PSD-P		0	0	100	10		9	7	7	75
		Wr		92	102	123	118		85	92	76	95
	Common Carp	PSD		0	100	100	100		50	78	25	25
		PSD-P		0	100	0	17		0	30	0	25
		Wr		87	84	83	89		80	89	91	84
	Green Sunfish	PSD			0		50		0			0
		PSD-P			0		0		0			0
		Wr			112		99		133			108
	Largemouth Bass	PSD			50	50	0		100		100	0
		PSD-P			0	0	0		100		0	0
		Wr			96	117	117		103		99	108
	Northern Pike	PSD		85	80	67	69		86	100	33	47

Gear	Species	Index	Year									
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
frame net (std 3/4 in)	Northern Pike	PSD-P		50	30	11	0		14	100	24	16
		Wr		91	89	90	94		81	93	82	82
	Shorthead Redhorse	PSD		100	86	92	96		100	100	100	100
		PSD-P		100	43	33	24		93	100	100	100
		Wr			89	90	87		79	84	82	87
	Walleye	PSD		100	100	100	80		100	38	100	75
		PSD-P		0	100	100	60		100	31	33	38
		Wr		89	92	96	91		87	87	87	83
std exp gill net	Black Crappie	PSD		50	60	75	100					
		PSD-P		0	0	50	33					
		Wr		112	95	103	104					
	Channel Catfish	PSD		100	67	40	60					
		PSD-P		0	0	20	20					
		Wr		103	95	100	89					
	Common Carp	PSD		100	40	33	25					
		PSD-P		0	0	0	0					
		Wr		87	89	86	90					
	Northern Pike	PSD		0	67	100						
		PSD-P		0	33	100						
		Wr		88	88	91						
	Shorthead Redhorse	PSD		100	80		100					
		PSD-P		100	0		100					
		Wr		89	86		91					
	Walleye	PSD		75	60	17	71					
		PSD-P		25	10	8	14					
		Wr		91	86	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)				
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).

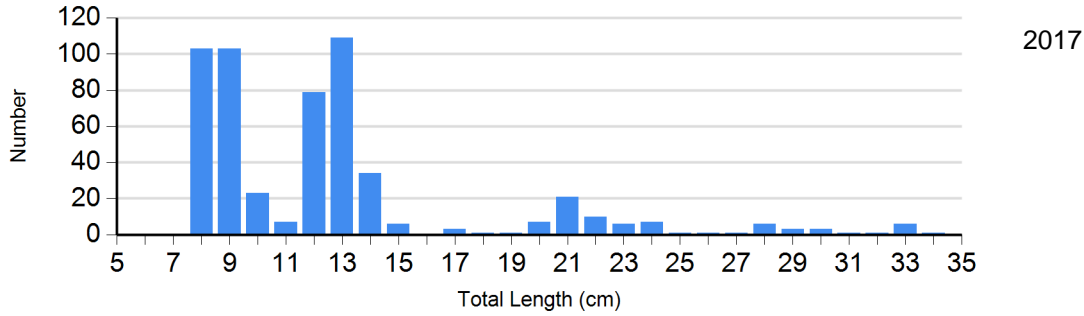
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2017	154	103 (1.1)	51	93 (0.6)	12	97 (1.2)	12	98 (2.1)
	2018	436	106 (0.8)	211	88 (0.7)	90	87 (0.5)	28	85 (0.7)
	2019	132	98 (1.1)	116	91 (0.7)	60	92 (0.8)	14	91 (1.1)
	2020	34	109 (1.4)	11	87 (1.7)	29	88 (0.8)	13	91 (1.4)
	2021	128	103 (1.2)	103	97 (0.7)	95	83 (0.8)	46	81 (1.3)
Bluegill Frame Net	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	
	2021	2	99 (5.5)	3	106 (7.0)	0		0	
Channel Catfish Gill Net	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	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	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	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



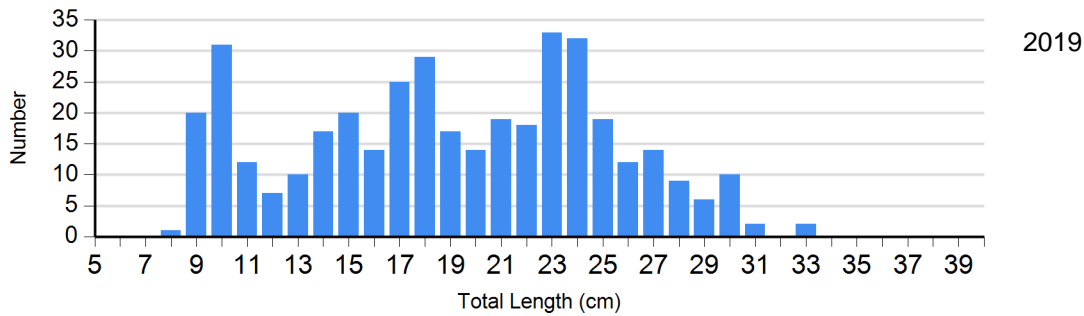
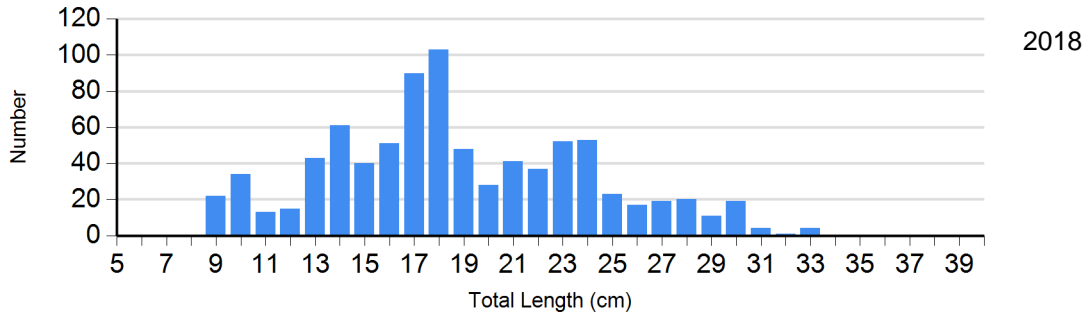
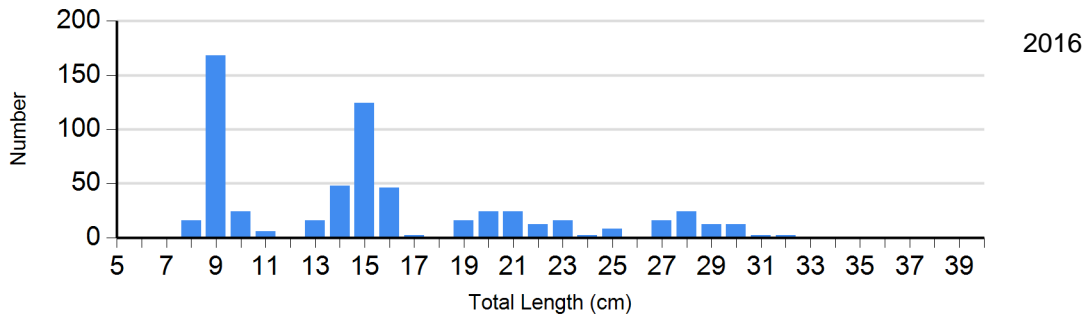
# Length Frequency Distribution

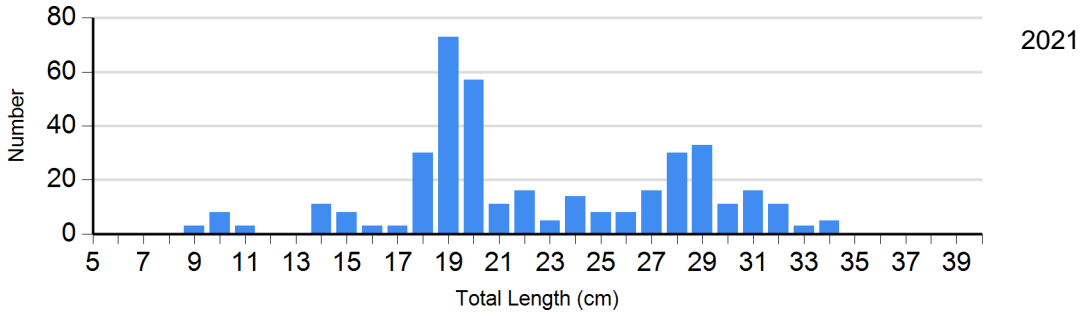
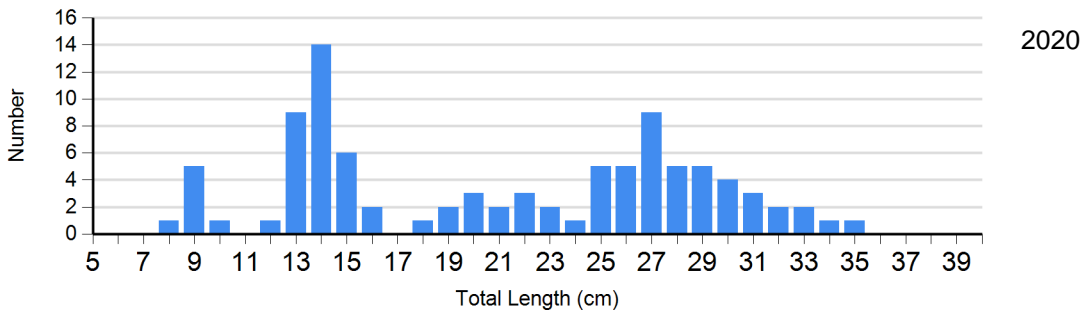
Length frequency histogram of species sampled by year.

Species: Black Crappie  
Gear: AFS std frame net

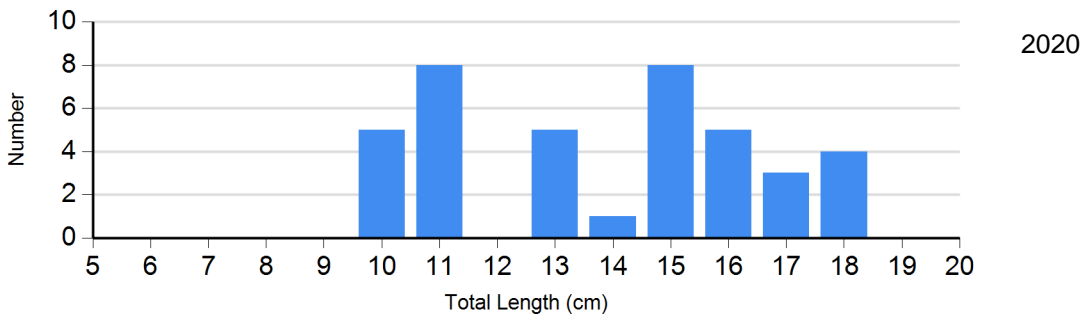
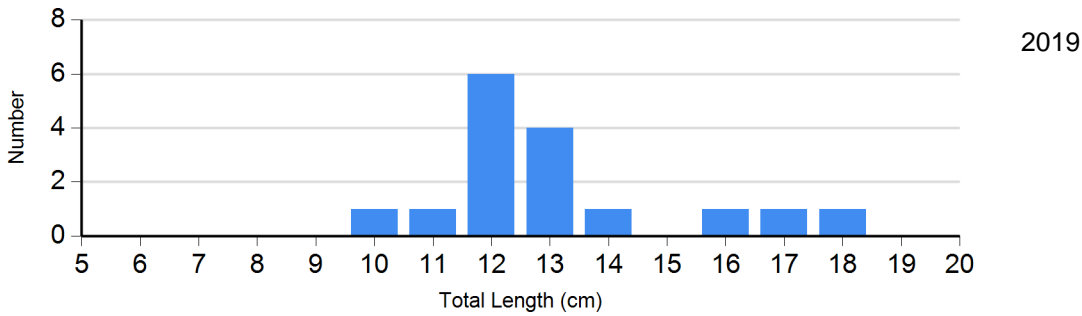
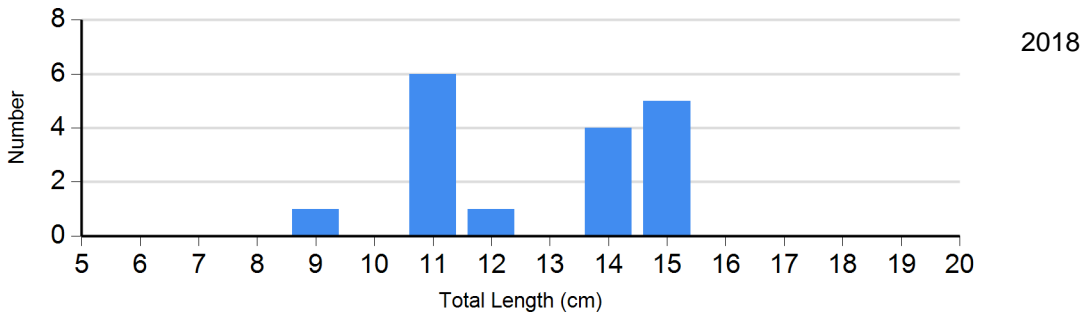


Species: Black Crappie  
Gear: frame net (std 3/4 in)



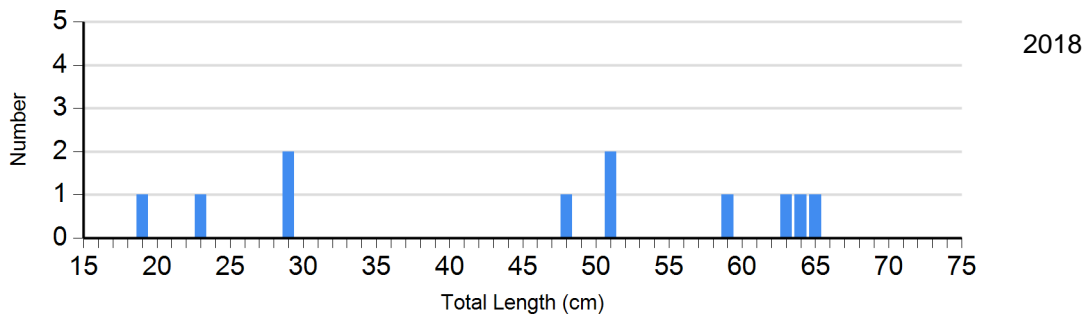
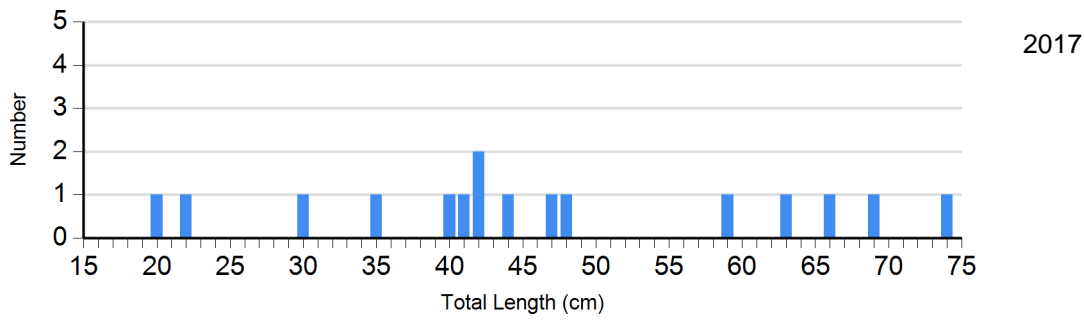


Species: Bluegill  
 Gear: frame net (std 3/4 in)

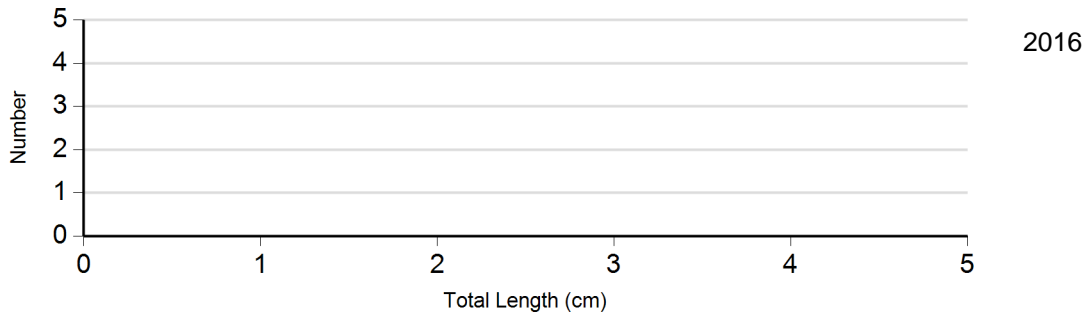




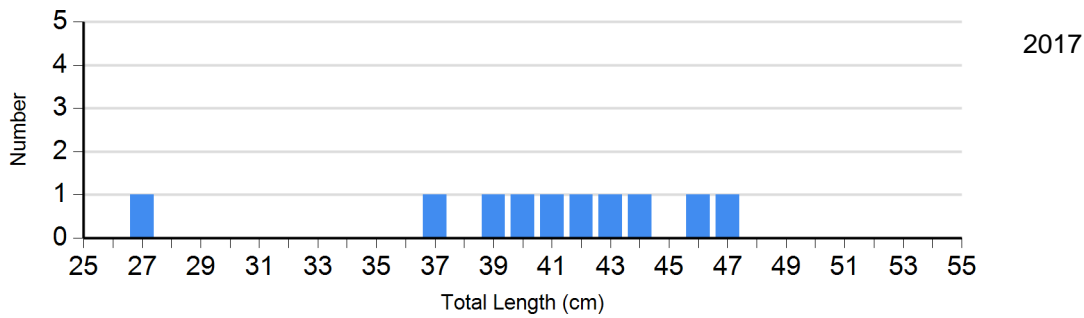
Species: Channel Catfish  
Gear: AFS std gill net



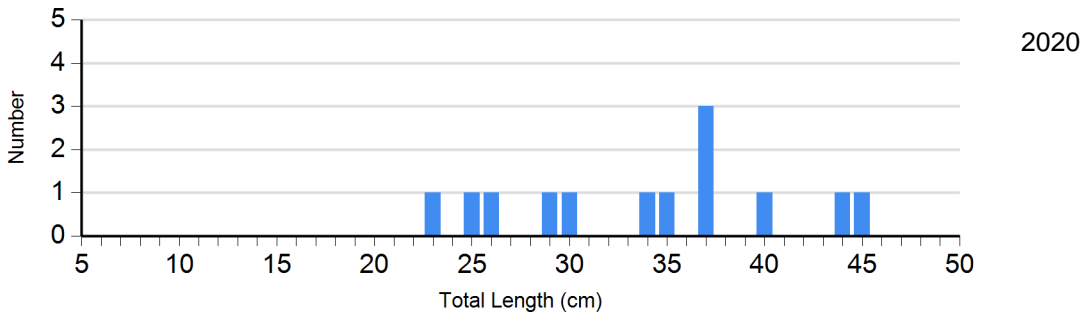
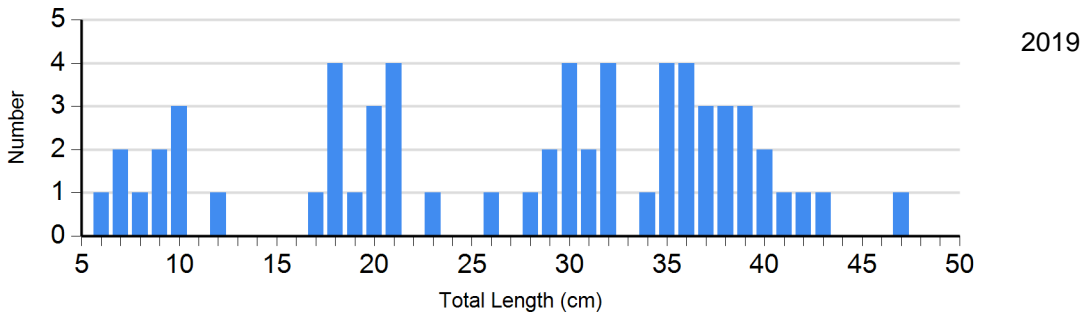
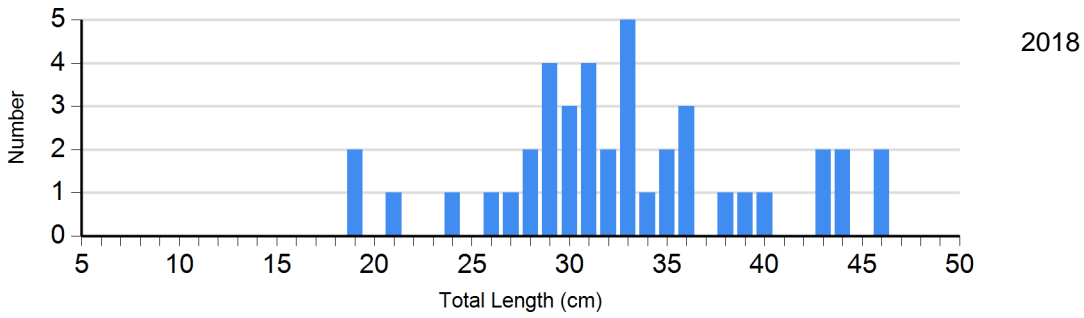
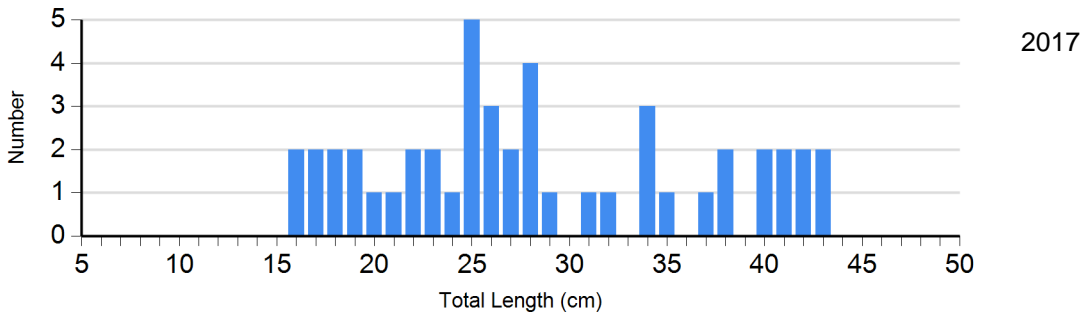
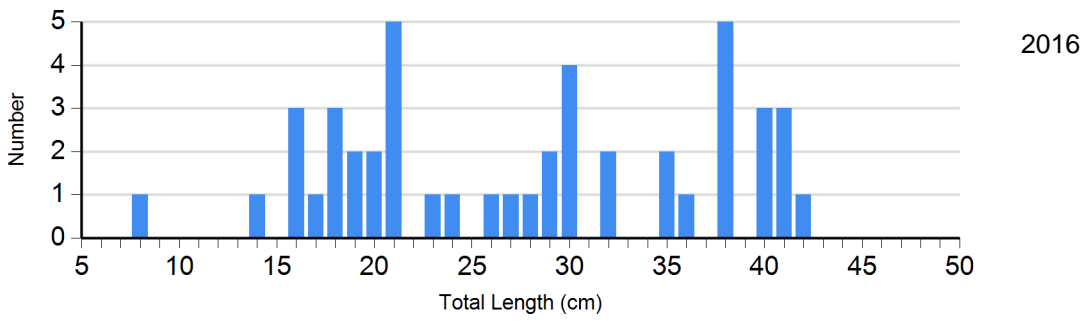
Species: Channel Catfish  
Gear: std exp gill net



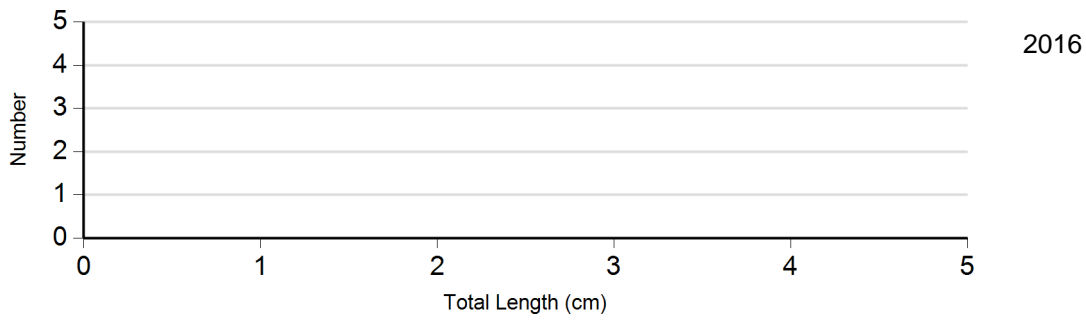
Species: Common Carp  
Gear: AFS std gill net



Species: Largemouth Bass  
 Gear: boat shocker (day)



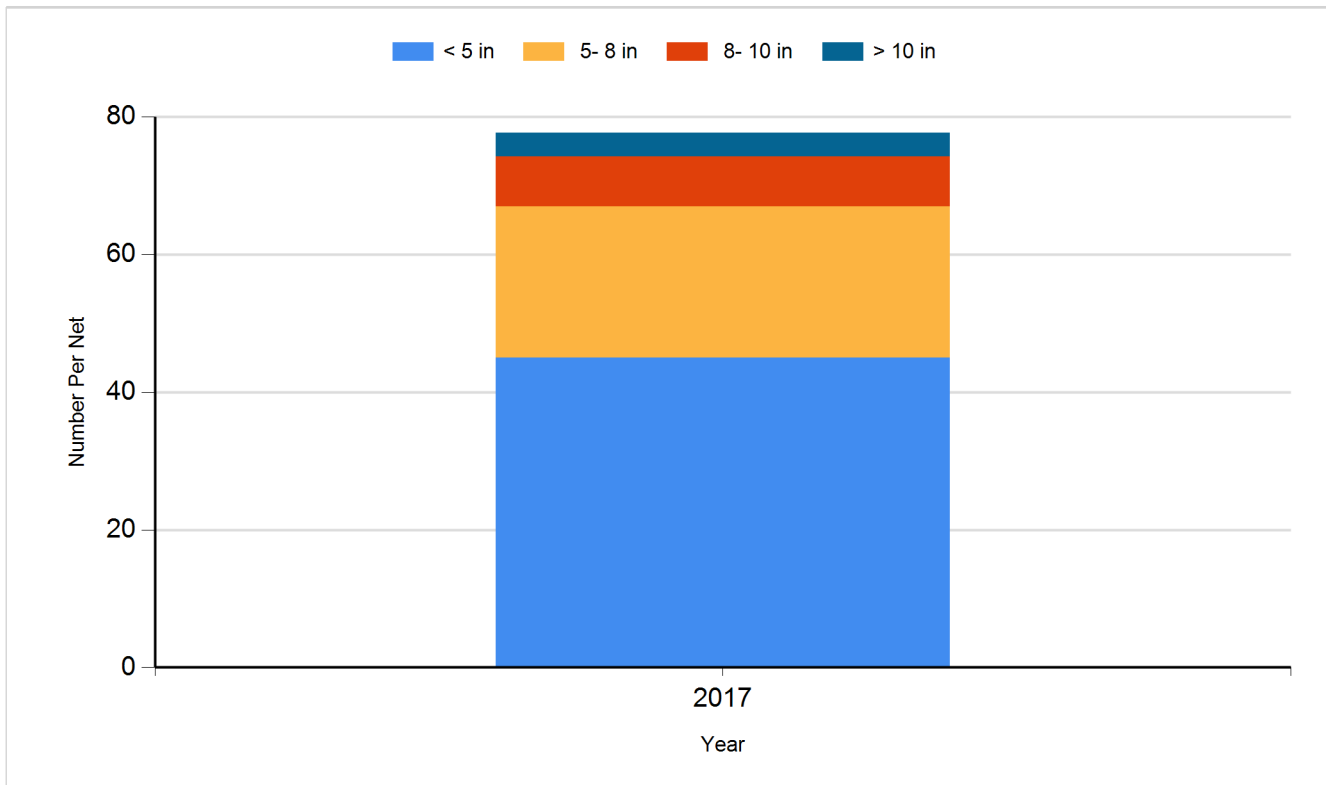
Species: Walleye  
Gear: std exp gill net



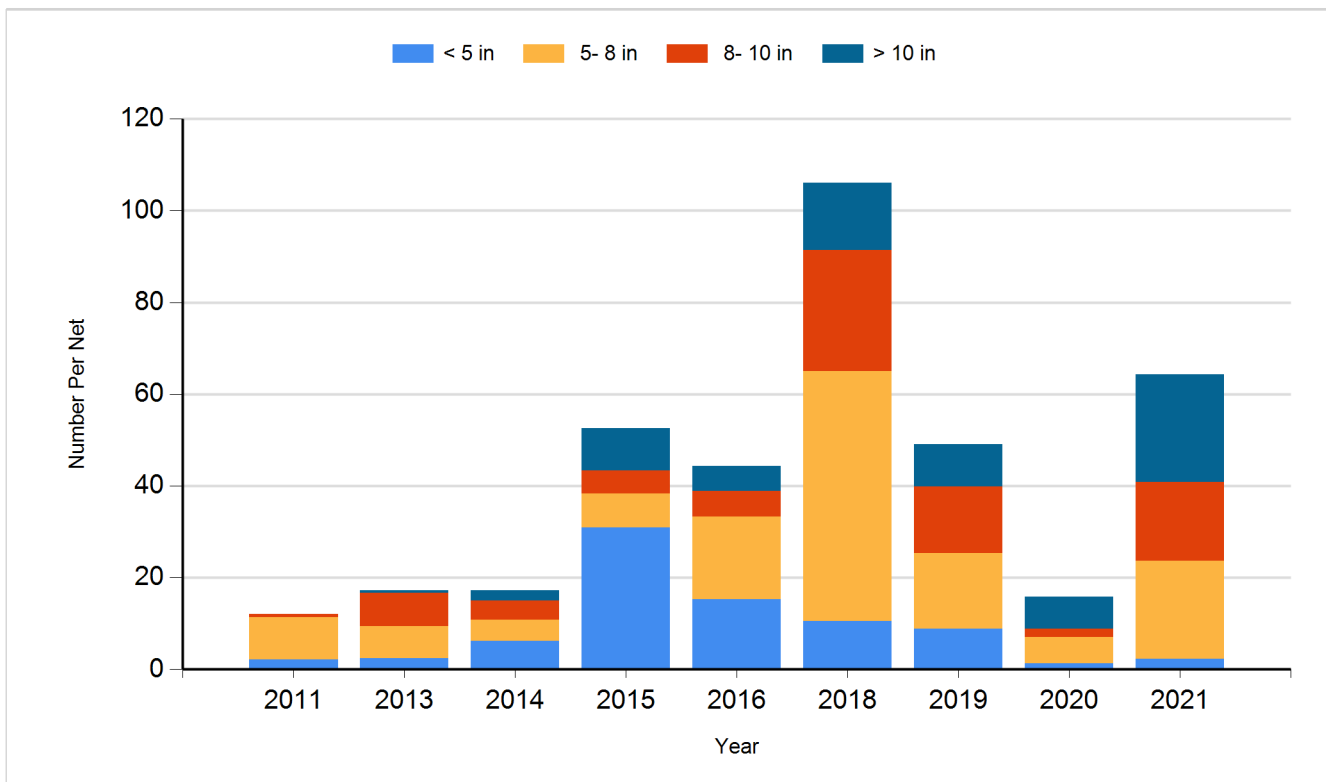
## Historic Fish Sizes and Relative Abundance

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

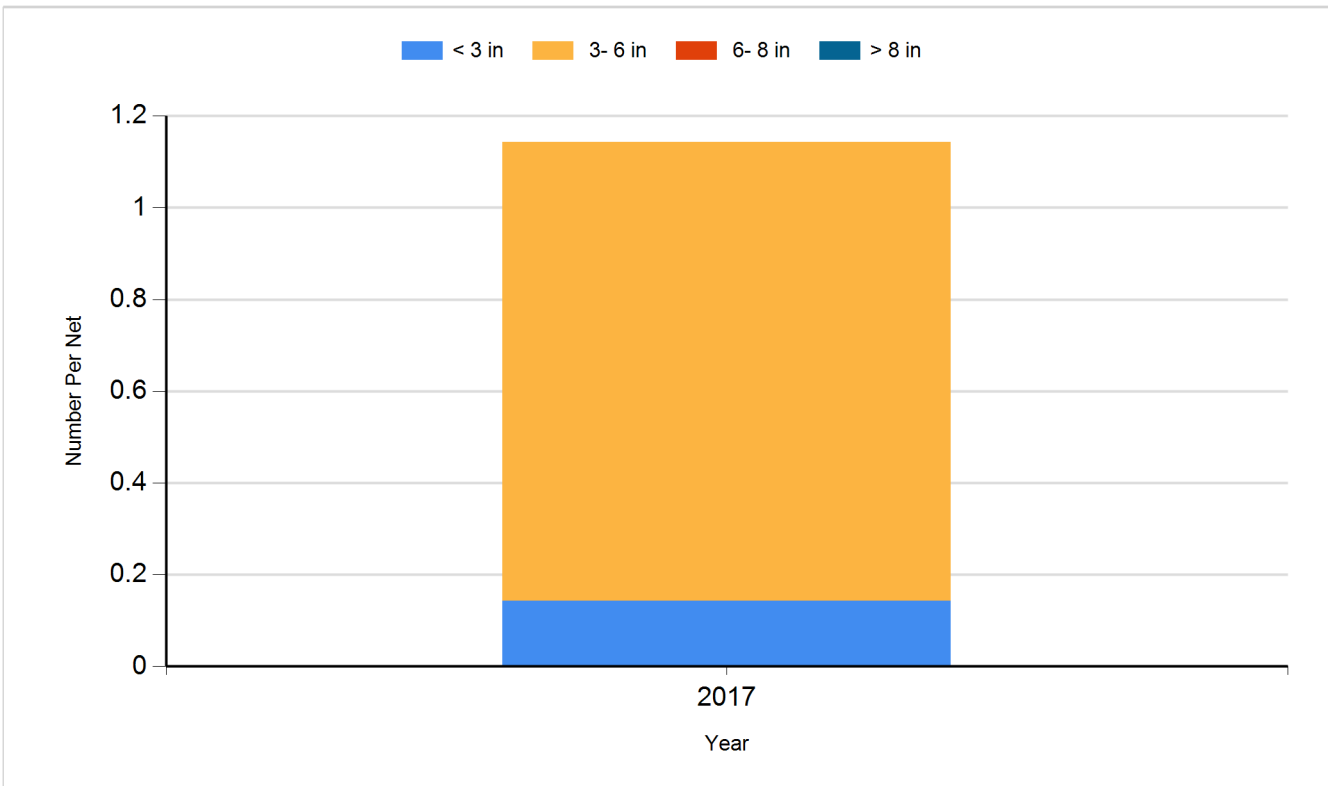
Species: Black Crappie  
Gear: AFS std frame net



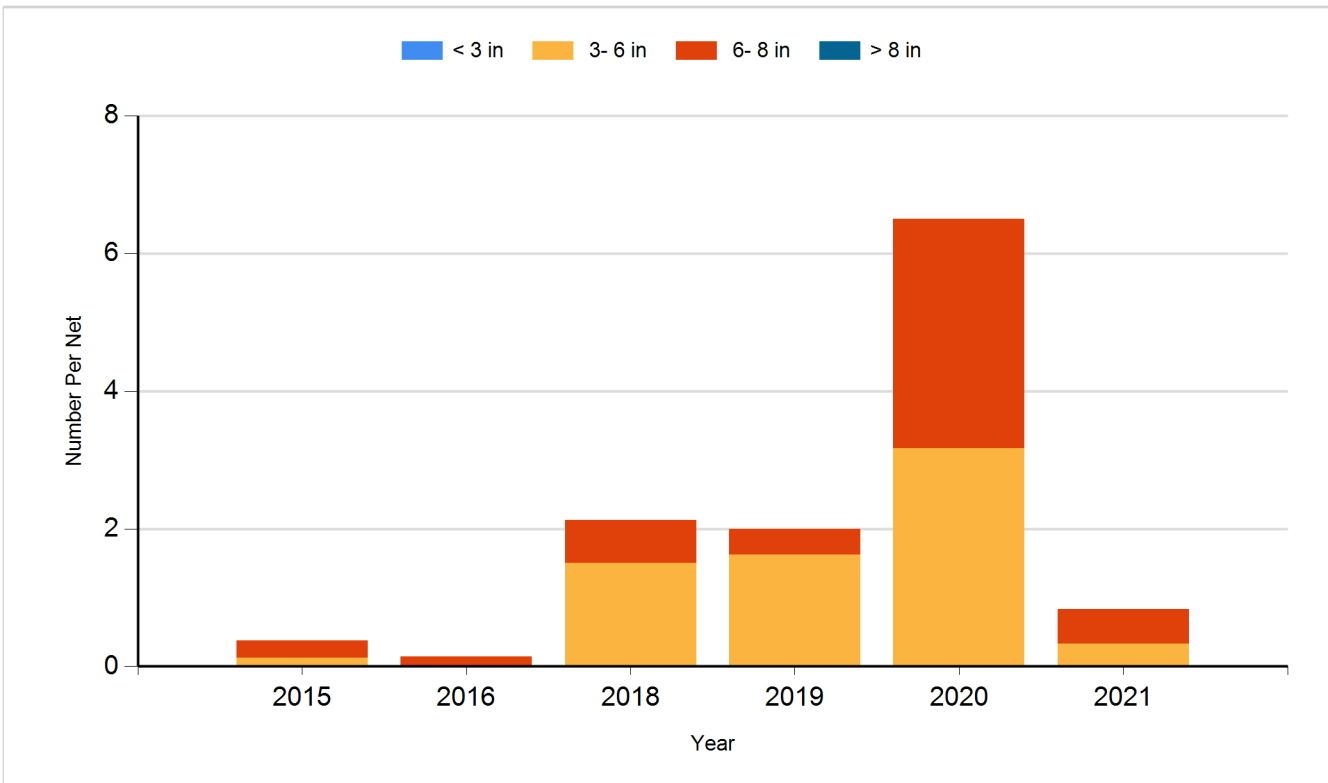
Species: Black Crappie  
Gear: frame net (std 3/4 in)



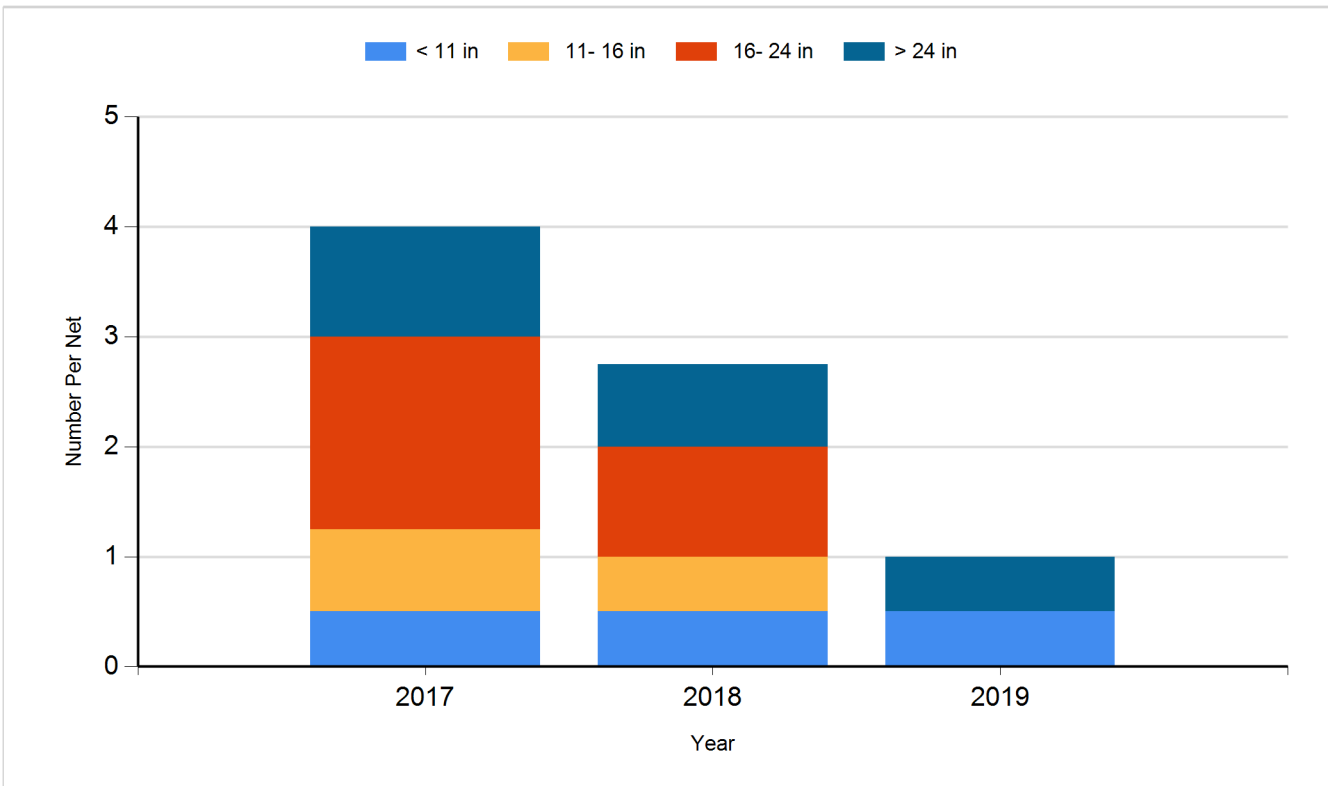
Species: Bluegill  
Gear: AFS std frame net



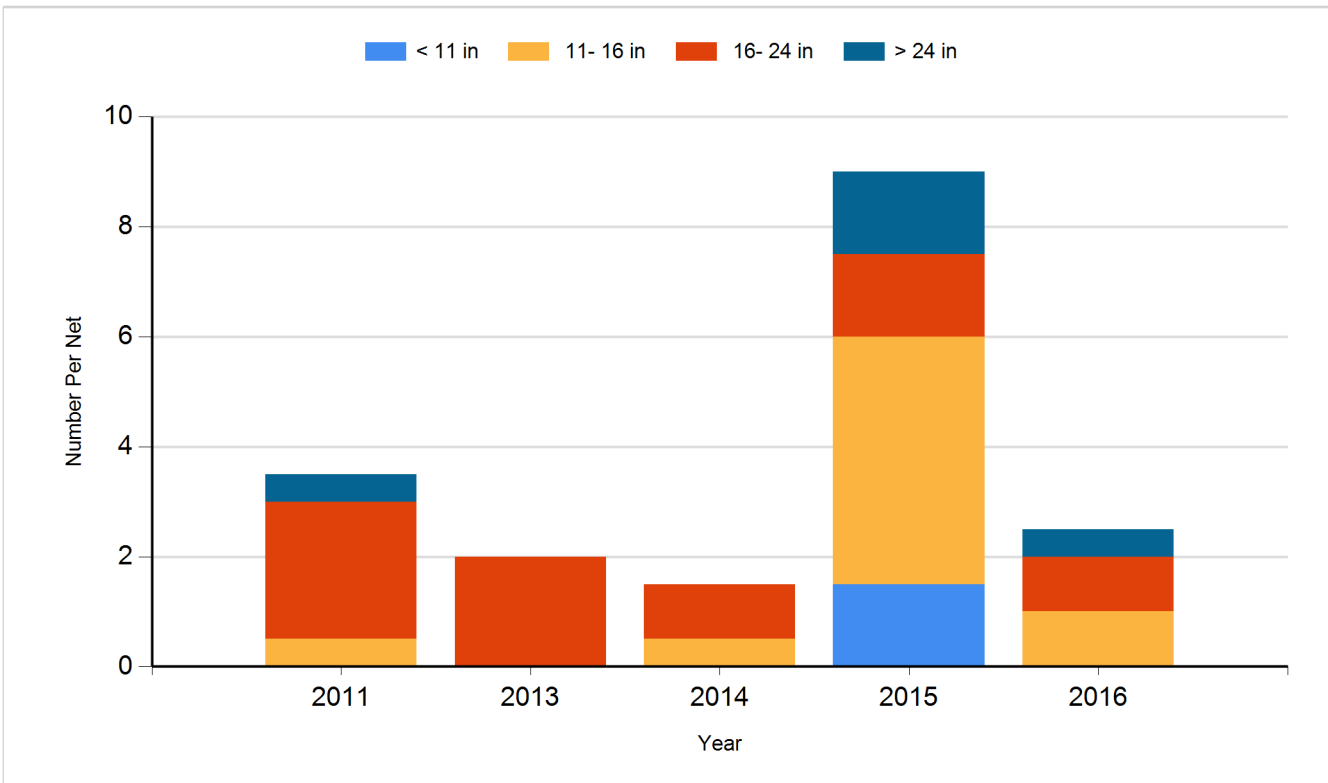
Species: Bluegill  
Gear: frame net (std 3/4 in)



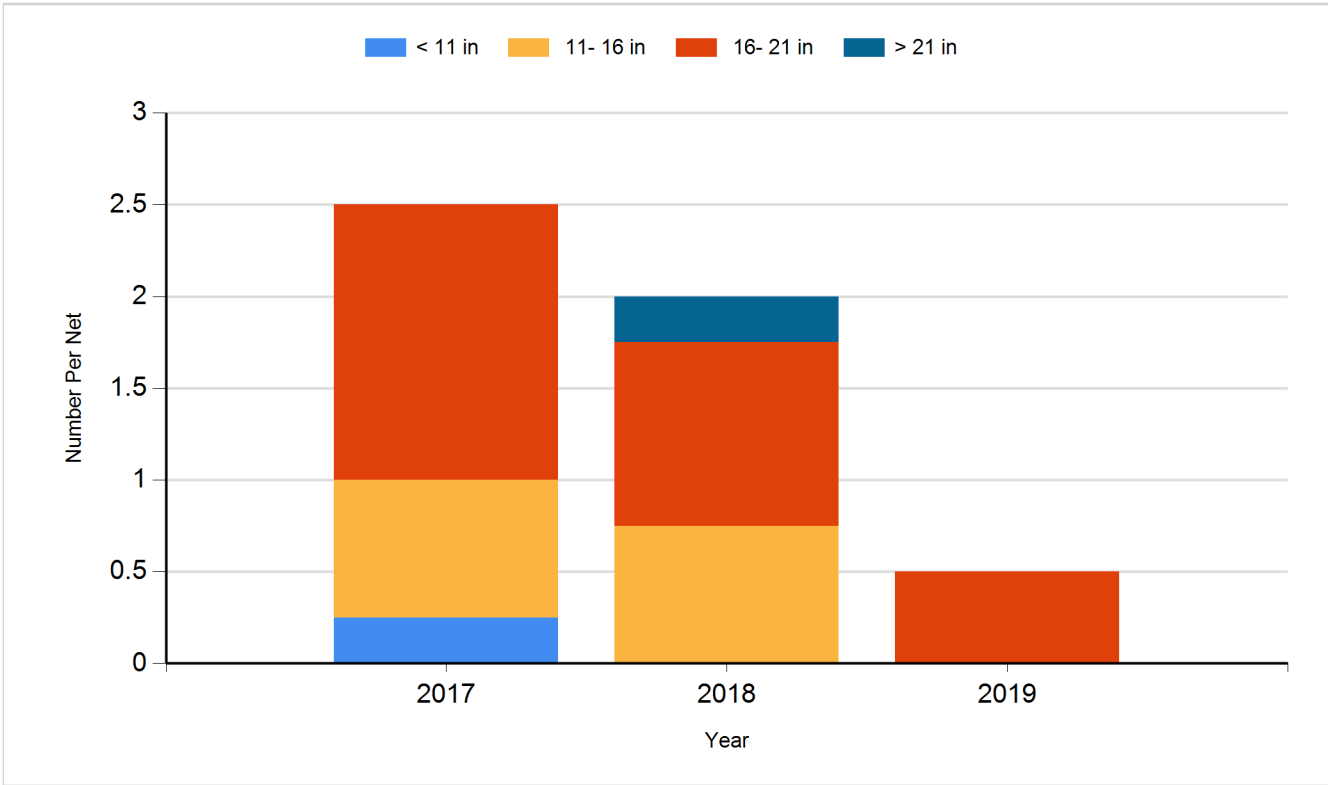
Species: Channel Catfish  
Gear: AFS std gill net



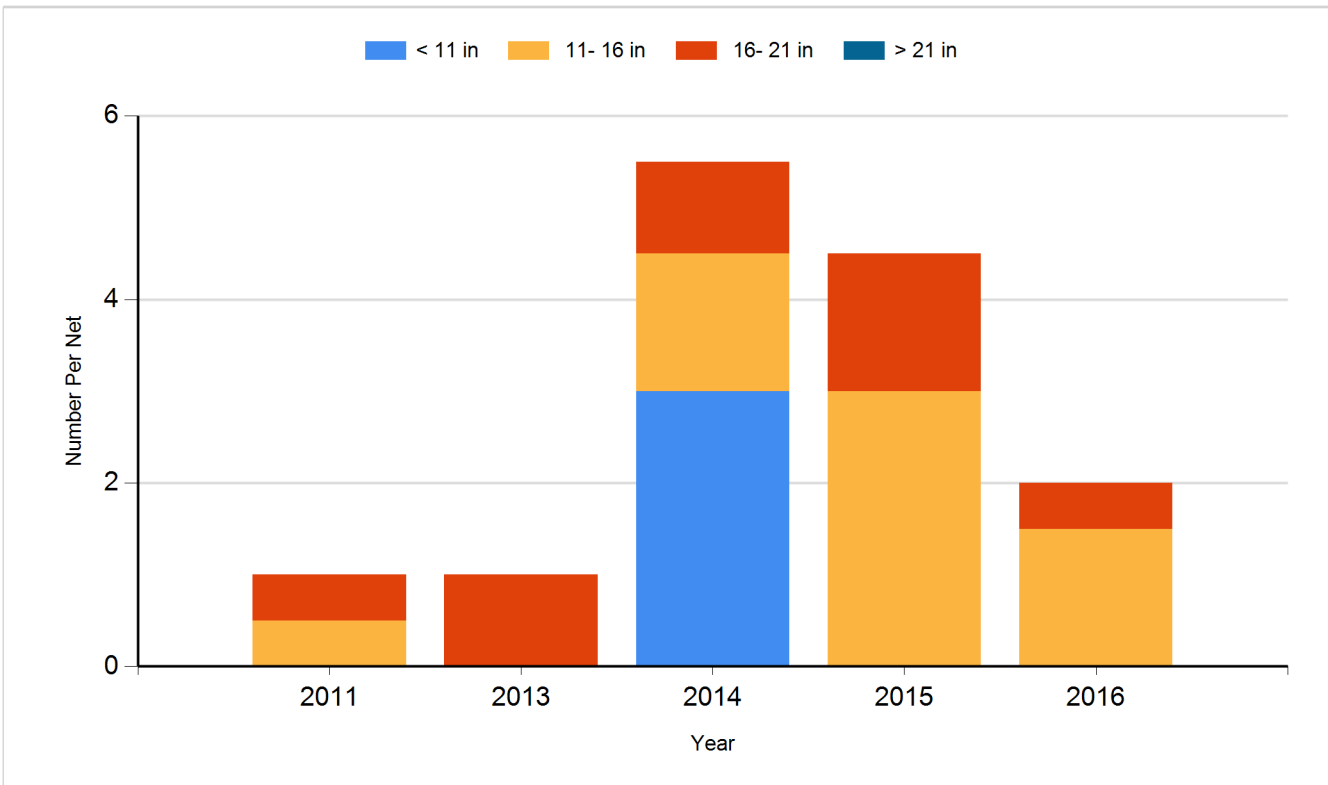
Species: Channel Catfish  
Gear: std exp gill net



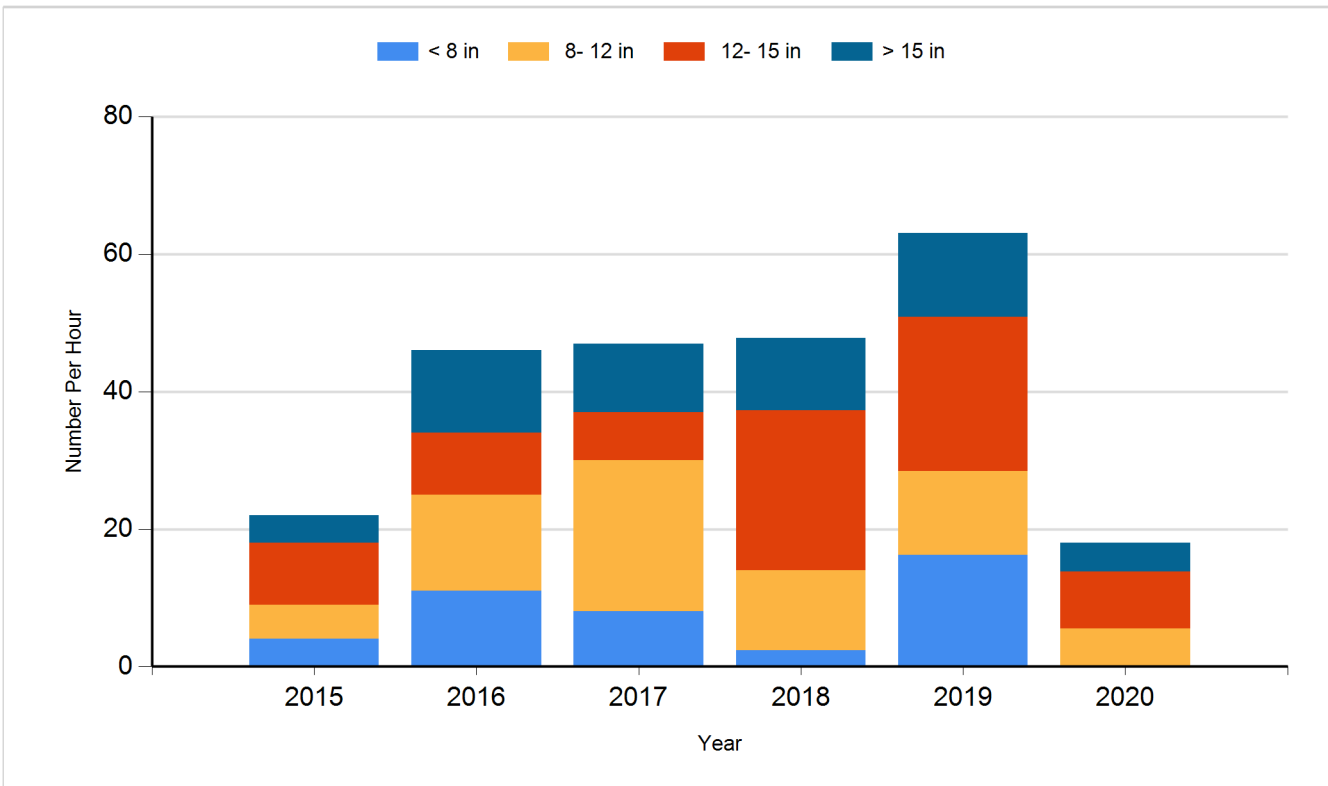
Species: Common Carp  
Gear: AFS std gill net



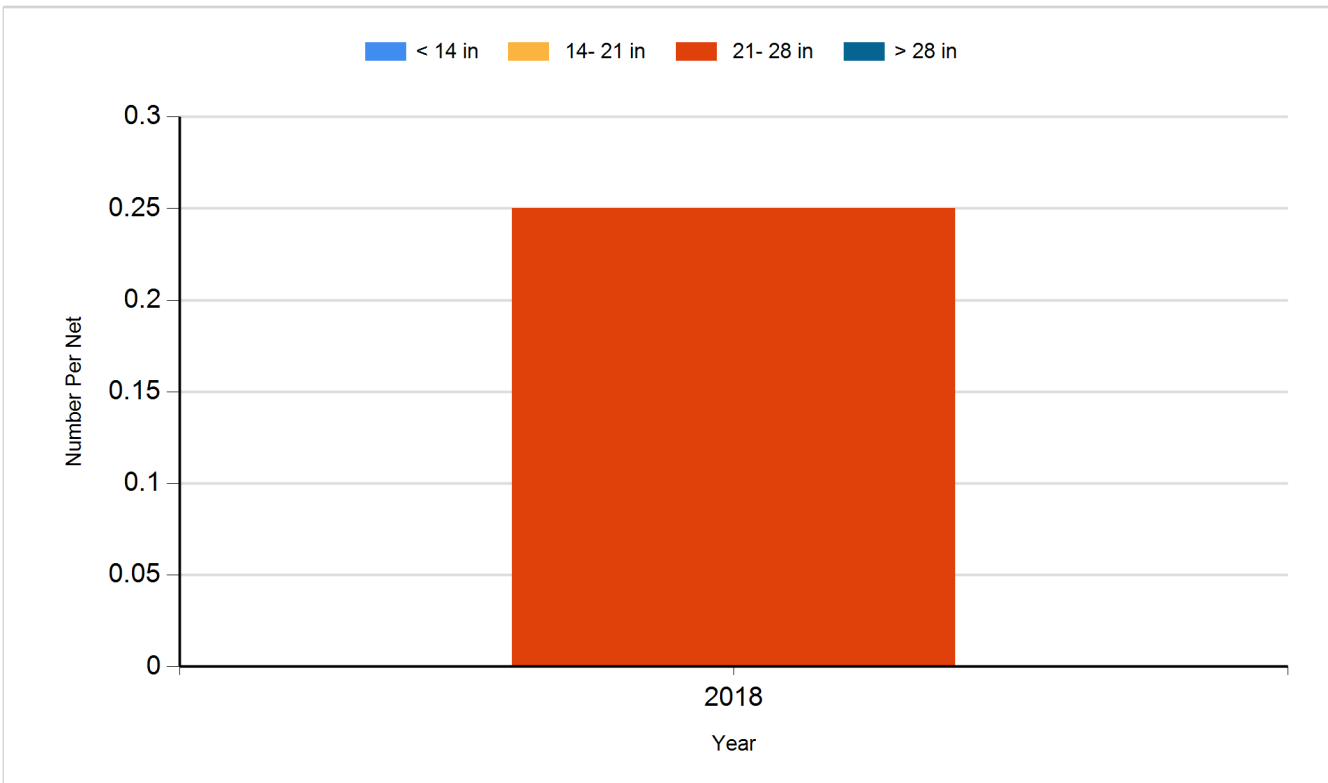
Species: Common Carp  
Gear: std exp gill net



Species: Largemouth Bass  
Gear: boat shocker (day)

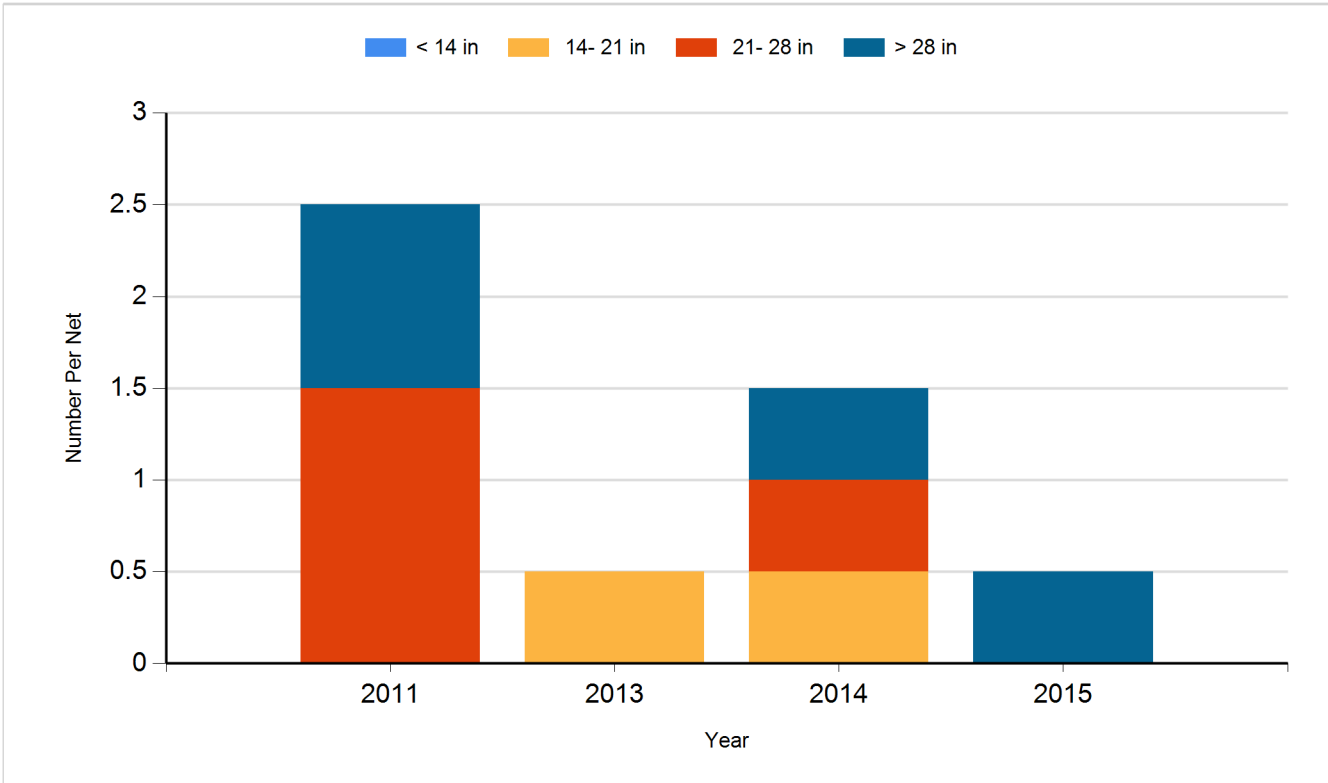


Species: Northern Pike  
Gear: AFS std gill net

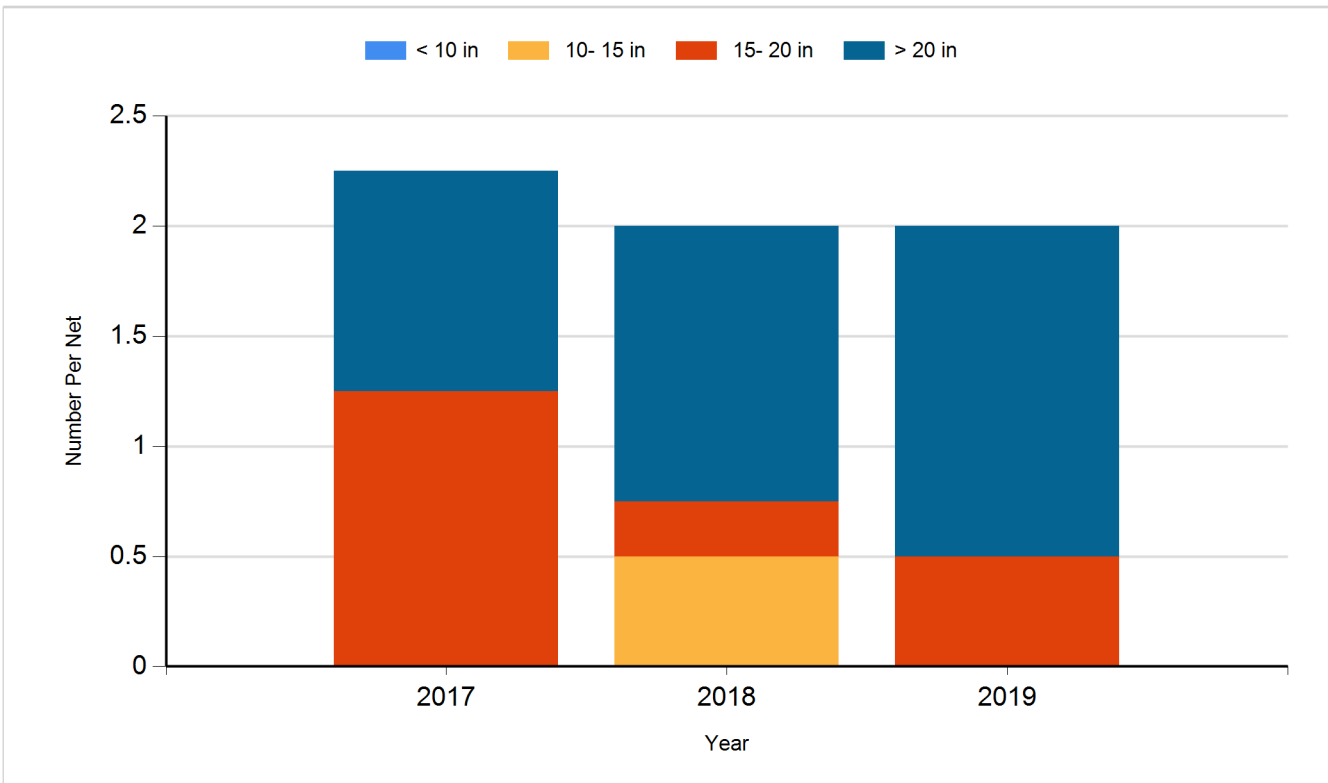




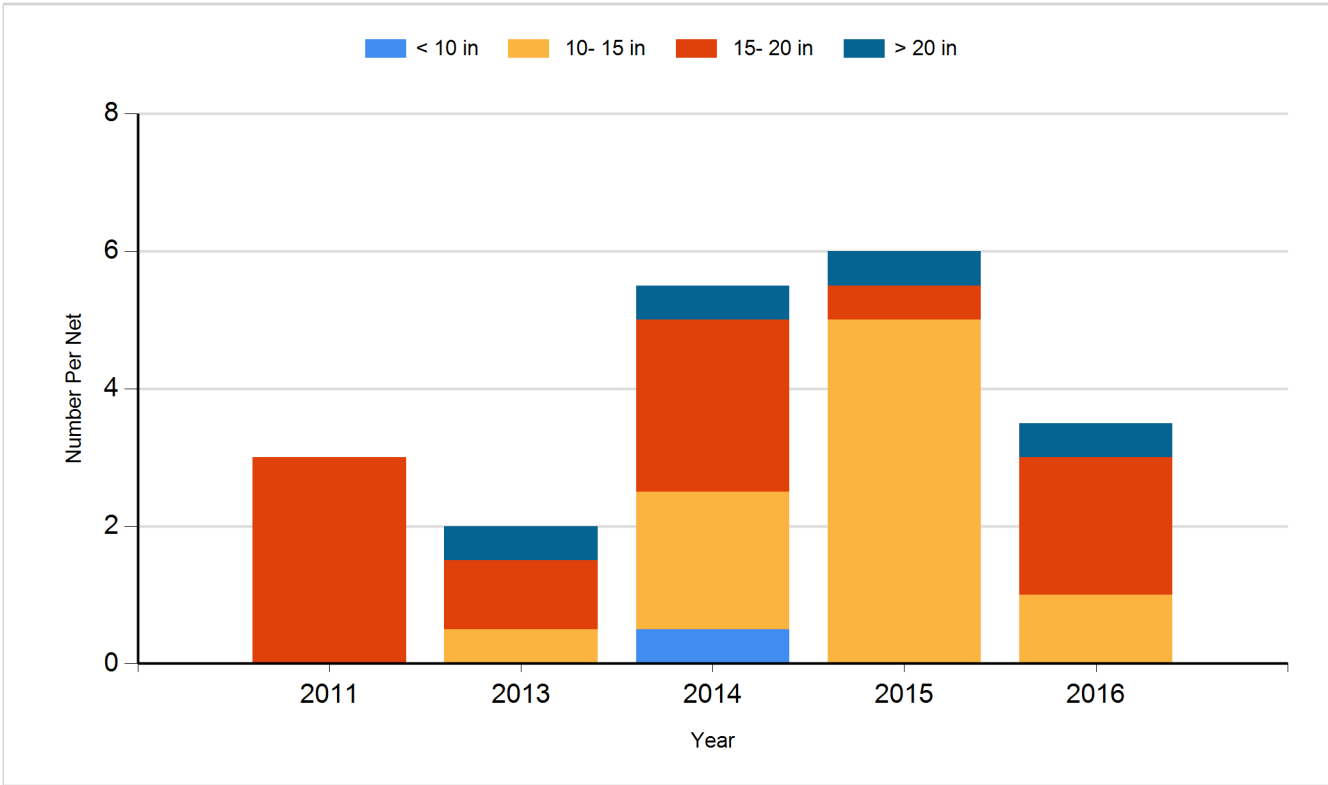
Species: Northern Pike  
Gear: std exp gill net



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.

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Year	Species	Size	Number
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
2021	Walleye	Small Fingerling	40,000

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