

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Flat Creek Dam, Perkins County
GRA-Lake-767-000
2021

Lake Information

Name: Flat Creek Dam
County: Perkins
Surface Area: 164 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 29, 2021	2 net-nights
frame net (std 3/4 in)	Jun 29, 2021	6 net-nights

Common Fish Species Present

Walleye

Northern Pike

Yellow Perch

Channel Catfish

Bluegill

Black Crappie

Common Carp

Black Bullhead

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.
- **std experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

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

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

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

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

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (**W**) compared to a length-specific standard weight (**Ws**) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

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

Confidence intervals (CI) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (S), quality (Q), preferred (P), memorable (M) and trophy (T). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
Walleye	10	25	15	38	20	51	25	63	30	76
White Bass	6	15	9	23	12	30	15	38	18	46
White Crappie	5	13	8	20	10	25	12	30	15	38
Yellow Bullhead	4	10	7	18	9	23	11	28	14	36
Yellow Perch	5	13	8	20	10	25	12	30	15	38

Catch Summary of Stock Length Fish

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

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

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition	
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr
AFS std gill net	Black Bullhead	6	3.0	9.2	17		0	82	4
	Common Carp	9	4.5	7.7	67		0	80	2
	Northern Pike	1	0.5	1.5	100		0	93	
	White Sucker	2	1.0	3.1	100		50	87	8
frame net (std 3/4 in)	Black Bullhead	5	0.7	0.7	0		0	82	4
	Black Crappie	2	0.3	0.3	0		0	108	2
	Common Carp	27	4.5	1.9	37	15	0	85	2
	Green Sunfish	1	0.2	0.2	0		0	77	
	Northern Pike	6	1.0	0.5	83		50	87	6
	Walleye	8	1.2	1.7	100		100	86	3
	White Crappie	6	0.7	1.0	75		0	98	4
	White Sucker	3	0.5	0.7	100		67	90	7

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						8.0						8.00
	Black Crappie						0.2						0.20
	Common Carp						1.3						1.30
	Northern Pike						0.1						0.10
	Smallmouth Bass						0.0						0.00
	Walleye						1.0						1.00
	White Crappie						0.9						0.90
	White Sucker						0.2						0.20
	Yellow Perch						0.1						0.10
AFS std gill net	Black Bullhead						18.8		6.5		3.0		9.43
	Channel Catfish						0.3		0.0		0.0		0.10
	Common Carp						23.0		9.5		4.5		12.33
	Northern Pike						1.3		1.0		0.5		0.93
	Walleye						1.8		0.5		0.0		0.77
	White Sucker						0.0		0.5		1.0		0.50
	Yellow Perch						0.3		0.0		0.0		0.10
frame net (std 3/4 in)	Black Bullhead	19.5	99.0	63.8	80.1				9.7		0.7		45.47
	Black Crappie	0.0	0.0	0.1	0.5				0.5		0.3		0.23
	Channel Catfish	0.3	0.0	0.0	0.0				0.0		0.0		0.05
	Common Carp	0.0	6.5	2.9	4.9				0.3		4.5		3.18
	Green Sunfish	0.0	0.0	0.1	0.0				0.3		0.2		0.10
	Northern Pike	1.0	0.8	2.6	0.5				0.2		1.0		1.02
	Walleye	2.8	1.0	0.8	1.0				1.7		1.2		1.42
	White Crappie	0.0	0.0	0.0	0.4				0.0		0.7		0.18
	White Sucker	0.0	0.3	0.0	0.1				0.0		0.5		0.15
	Yellow Perch	1.8	1.3	1.3	0.1				0.7		0.0		0.87
std exp gill net	Black Bullhead	4.0	32.0	79.0	23.5								34.63
	Common Carp	0.0	1.0	17.0	7.5								6.38
	Northern Pike	4.0	2.0	2.5	2.0								2.63
	Walleye	5.0	1.0	1.0	0.5								1.88
	White Sucker	0.0	0.0	1.0	1.0								0.50
	Yellow Perch	2.0	0.0	0.0	0.0								0.50

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.

Gear	Species	Index	Year												
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021			
AFS std frame net	Black Bullhead	PSD								0					
		PSD-P								0					
		Wr									76				
	Black Crappie	PSD									50				
		PSD-P									50				
		Wr									107				
	Common Carp	PSD									38				
		PSD-P									8				
		Wr									84				
	Northern Pike	PSD									100				
		PSD-P									0				
		Wr									77				
	Walleye	PSD									60				
		PSD-P									30				
		Wr									76				
	White Crappie	PSD									100				
		PSD-P									0				
		Wr									97				
	White Sucker	PSD									50				
		PSD-P									0				
		Wr									75				
Yellow Perch	PSD									100					
	PSD-P									0					
	Wr									88					
AFS std gill net	Black Bullhead	PSD								0		0		17	
		PSD-P								0		0		0	
		Wr									78		88		82
	Channel Catfish	PSD									100				
		PSD-P									0				
		Wr									89				
	Common Carp	PSD									12		32		67
		PSD-P									1		0		0
		Wr									85		82		80

Gear	Species	Index	Year											
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		
AFS std gill net	Northern Pike	PSD							100		100		100	
		PSD-P							60		100		0	
		Wr							81		91		93	
	Walleye	PSD								100		0		
		PSD-P								71		0		
		Wr								86		85		
	White Sucker	PSD										100		100
		PSD-P										100		50
		Wr										91		87
	Yellow Perch	PSD									0			
		PSD-P									0			
		Wr									111			
frame net (std 3/4 in)	Black Bullhead	PSD	8	5	3	0						0		0
		PSD-P	1	0	0	0						0		0
		Wr	79	87	75	77						88		82
	Black Crappie	PSD				100	100					100		0
		PSD-P				0	0					100		0
		Wr				91	98					92		108
	Channel Catfish	PSD	0											
		PSD-P	0											
		Wr	86											
	Common Carp	PSD	0	15	9	0						0		37
		PSD-P	0	0	0	0						0		0
		Wr		79	82	85						82		85
	Northern Pike	PSD	100	100	100	100						100		83
		PSD-P	50	67	81	50						100		50
		Wr	91	97	88	84								87
	Walleye	PSD	27	100	50	63						20		100
		PSD-P	0	50	50	25						10		100
		Wr	75	91	83	87						82		86
	White Crappie	PSD				100								75
		PSD-P				100								0
		Wr				100								98
	White Sucker	PSD		100		0								100
		PSD-P		0		0								67
		Wr		80		92								90
	Yellow Perch	PSD	0	0	10	0						100		

Gear	Species	Index	Year									
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
frame net (std 3/4 in)	Yellow Perch	PSD-P	0	0	0	0					0	
		Wr	88	82	76	95					92	
std exp gill net	Black Bullhead	PSD	0	3	0	0						
		PSD-P	0	0	0	0						
		Wr	84	89	82	89						
	Common Carp	PSD	0	0	0	7						
		PSD-P	0	0	0	7						
		Wr		83	82	81						
	Northern Pike	PSD	100	100	100	75						
		PSD-P	75	100	80	75						
		Wr	102	95	96	88						
	Walleye	PSD	40	100	100	0						
		PSD-P	20	0	50	0						
		Wr	85	86	93	80						
	White Sucker	PSD			50	0						
		PSD-P			0	0						
		Wr			79	85						
	Yellow Perch	PSD	0									
		PSD-P	0									
		Wr	81									

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+
2017	1					258 (1)					

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	7			423 (2)	585 (1)		585 (1)	605 (1)	613 (2)		

Species: White Crappie

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	9		200 (1)	227 (8)							

Fish Condition

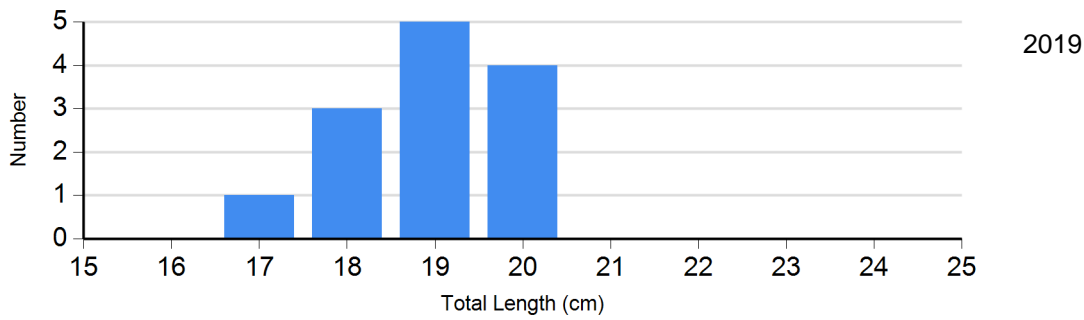
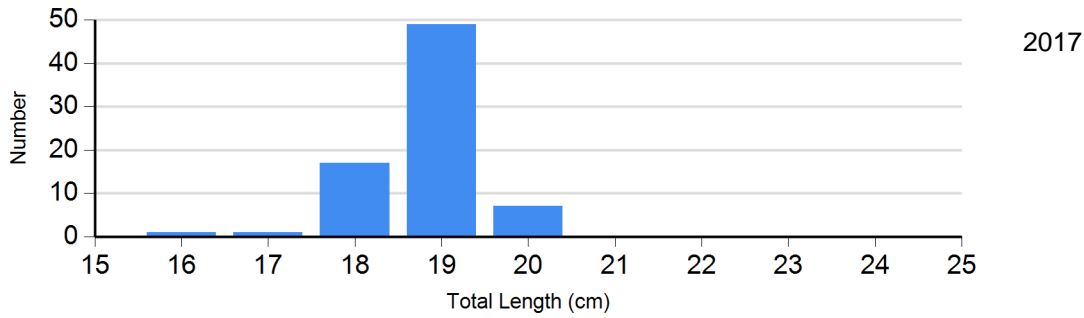
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2017	75	78 (0.9)	0		0		0	
	2019	13	88 (1.6)	0		0		0	
	2021	5	82 (3.8)	1	83	0		0	
Black Crappie Frame Net	2017	1	114	0		1	100	0	
	2019	0		0		3	92 (1.2)	0	
	2021	2	108 (1.1)	0		0		0	
Channel Catfish Gill Net	2017	0		1	89	0		0	
Common Carp Gill Net	2017	81	85 (0.5)	10	84 (2.0)	1	92	0	
	2019	13	82 (1.8)	6	82 (2.1)	0		0	
	2021	3	76 (4.4)	6	81 (1.8)	0		0	
Northern Pike Gill Net	2017	0		2	82 (9.6)	3	80 (8.5)	0	
	2019	0		0		0		2	91
	2021	0		1	93	0		0	
Walleye Gill Net	2017	0		2	78 (1.9)	5	90 (3.0)	0	
	2019	1	85	0		0		0	
White Crappie Frame Net	2017	0		9	97 (2.1)	0		0	
	2021	1	106	3	95 (2.8)	0		0	
White Sucker Gill Net	2019	0		0		1	91	0	
	2021	0		1	81	0		1	94
Yellow Perch Gill Net	2017	1	111	0		0		0	

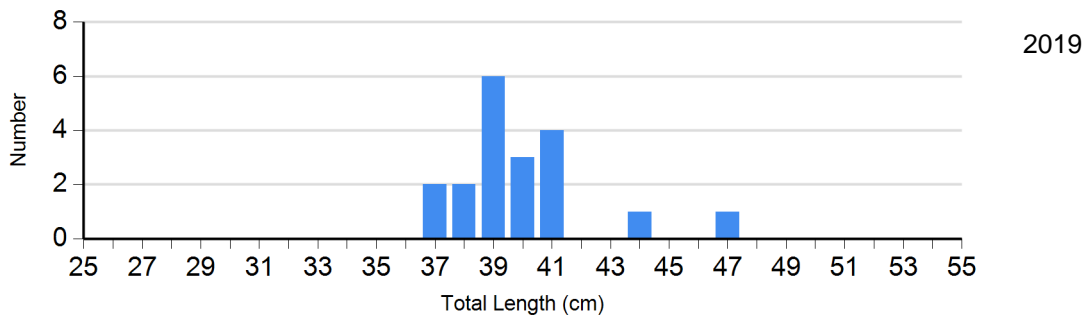
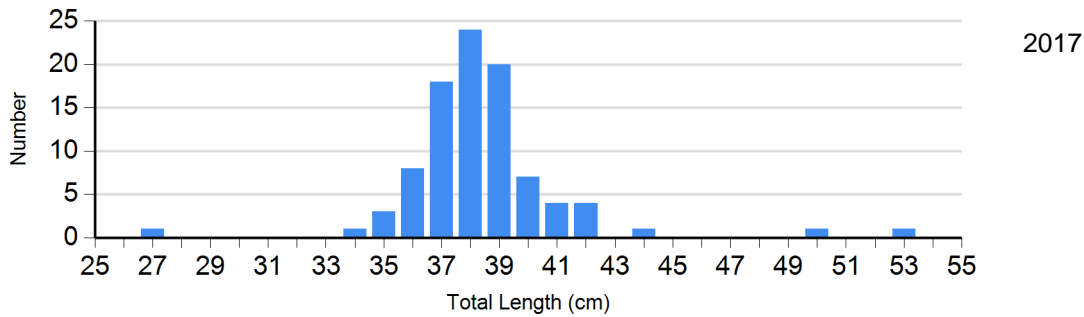
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



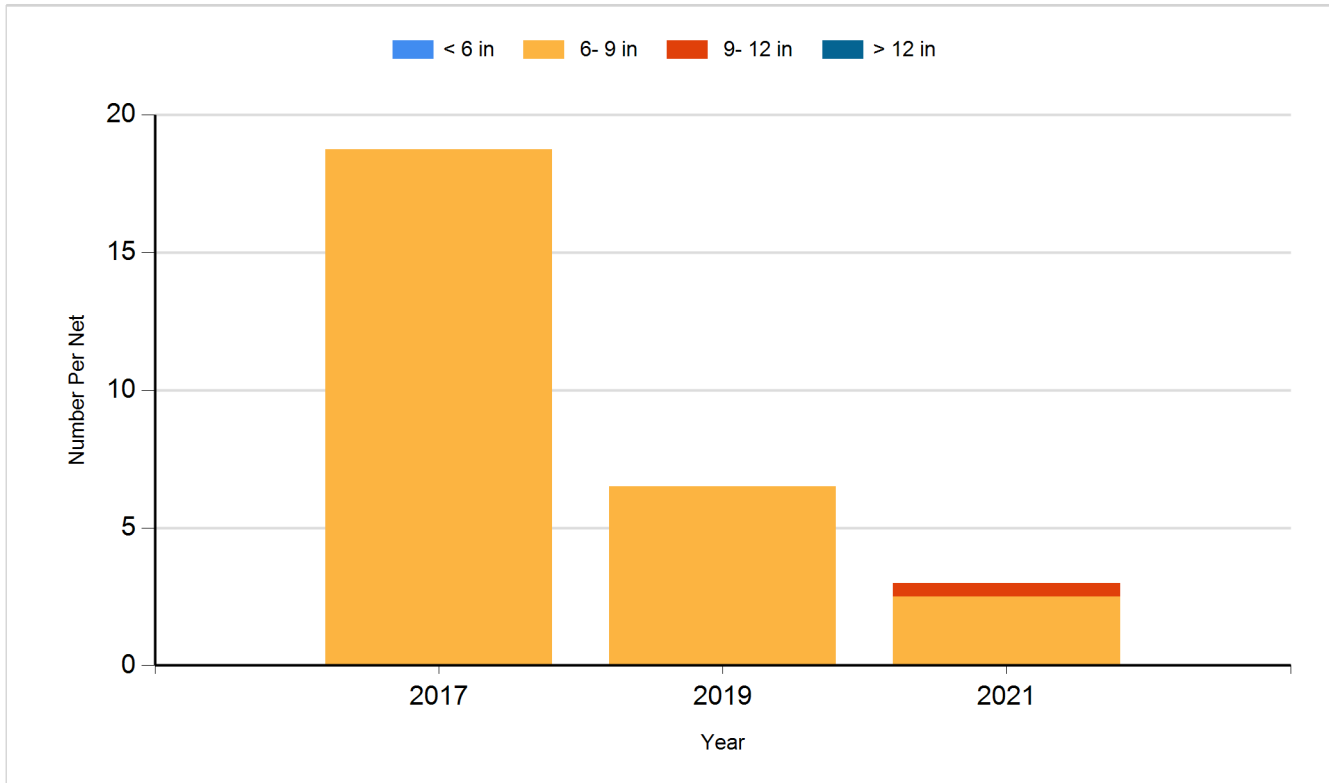
Species: Common Carp
Gear: AFS std gill net



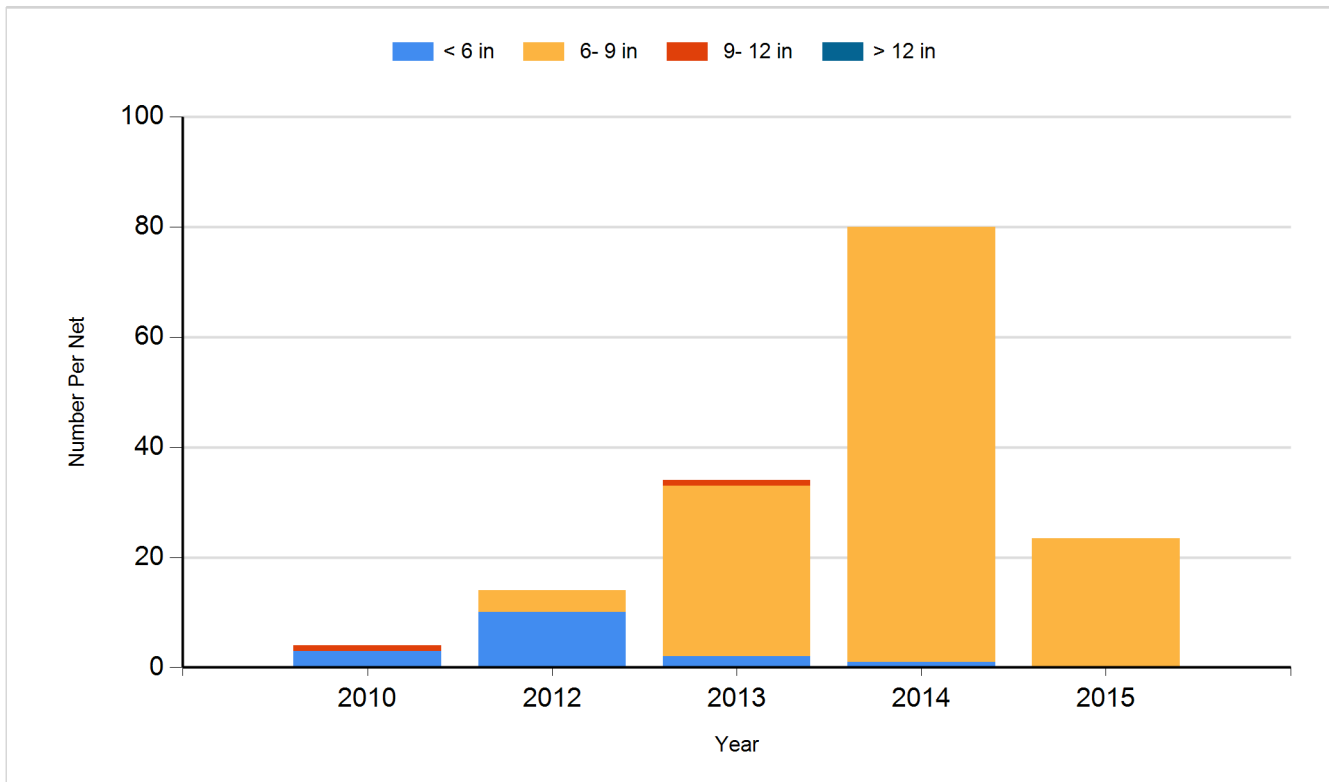
Historic Fish Sizes and Relative Abundance

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

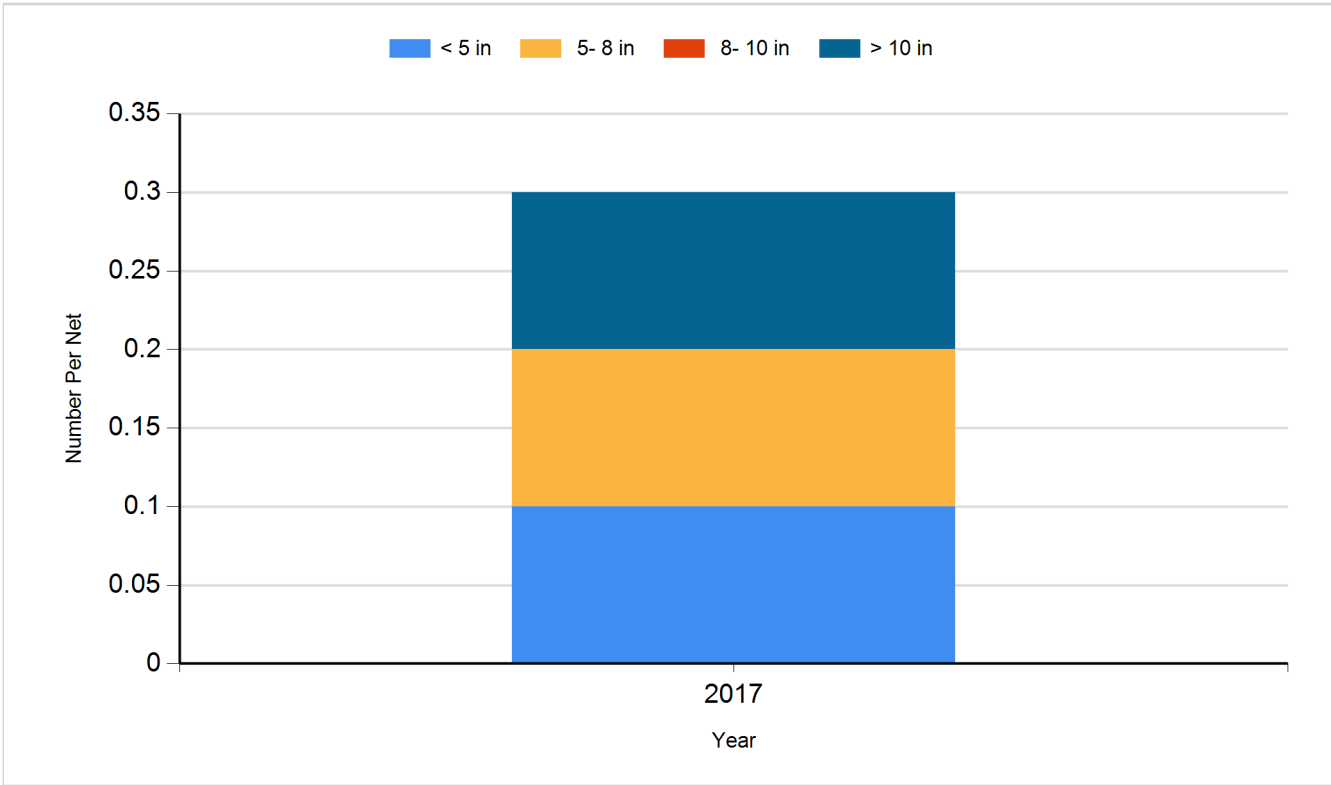
Species: Black Bullhead
Gear: AFS std gill net



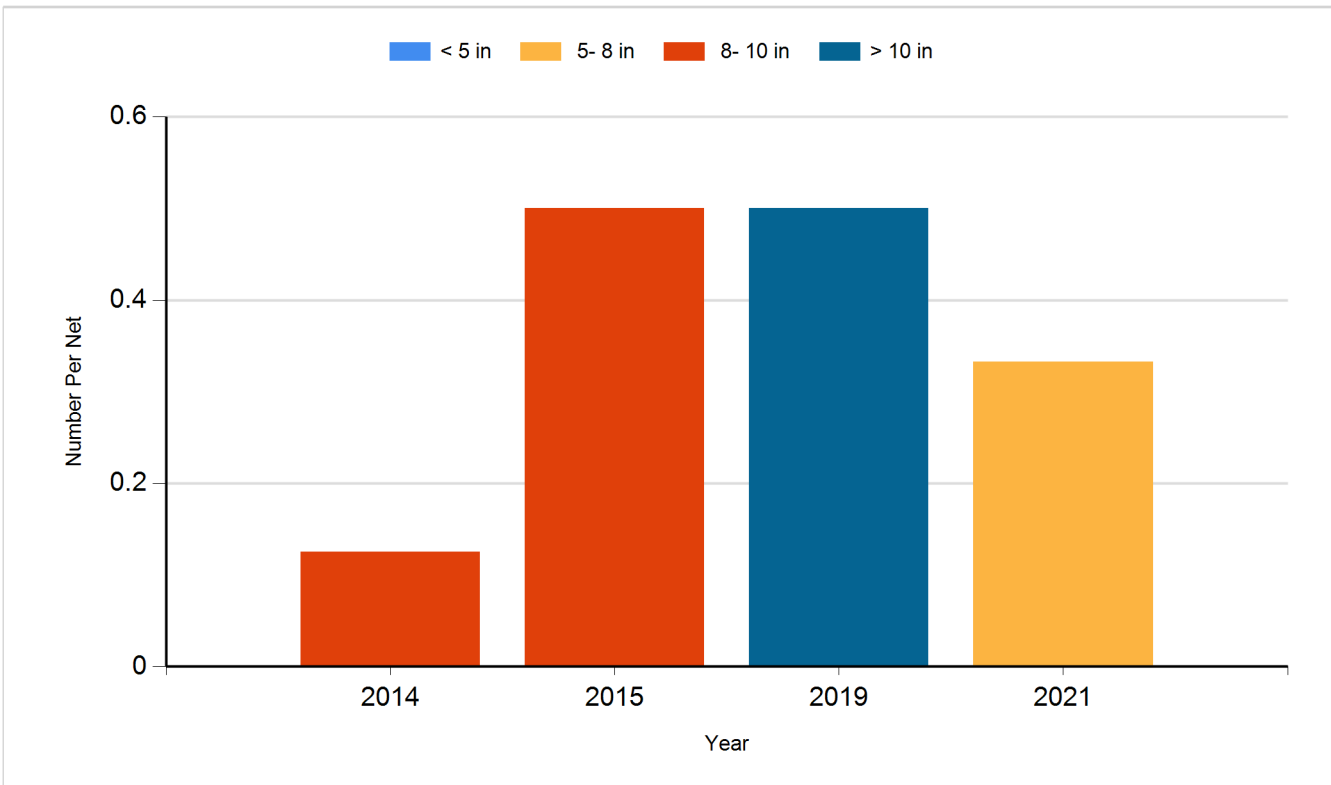
Species: Black Bullhead
Gear: std exp gill net



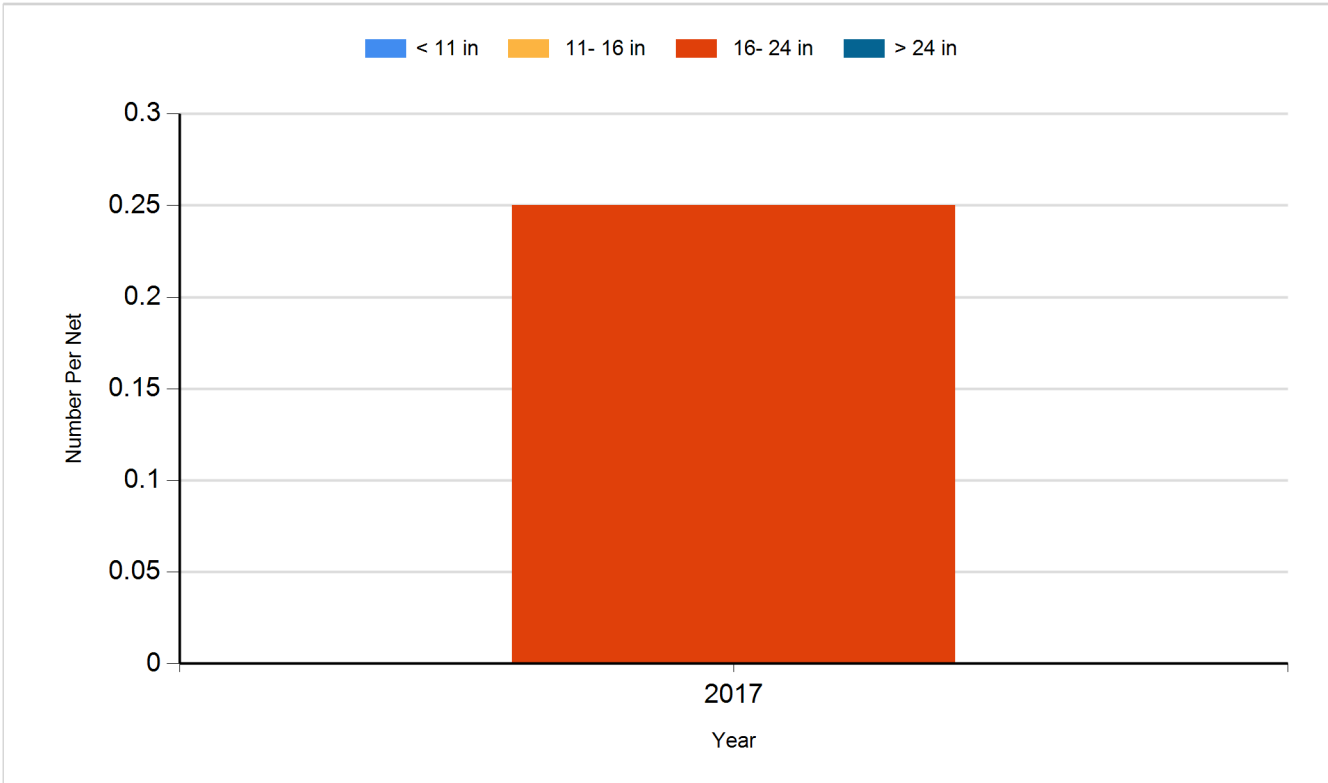
Species: Black Crappie
Gear: AFS std frame net



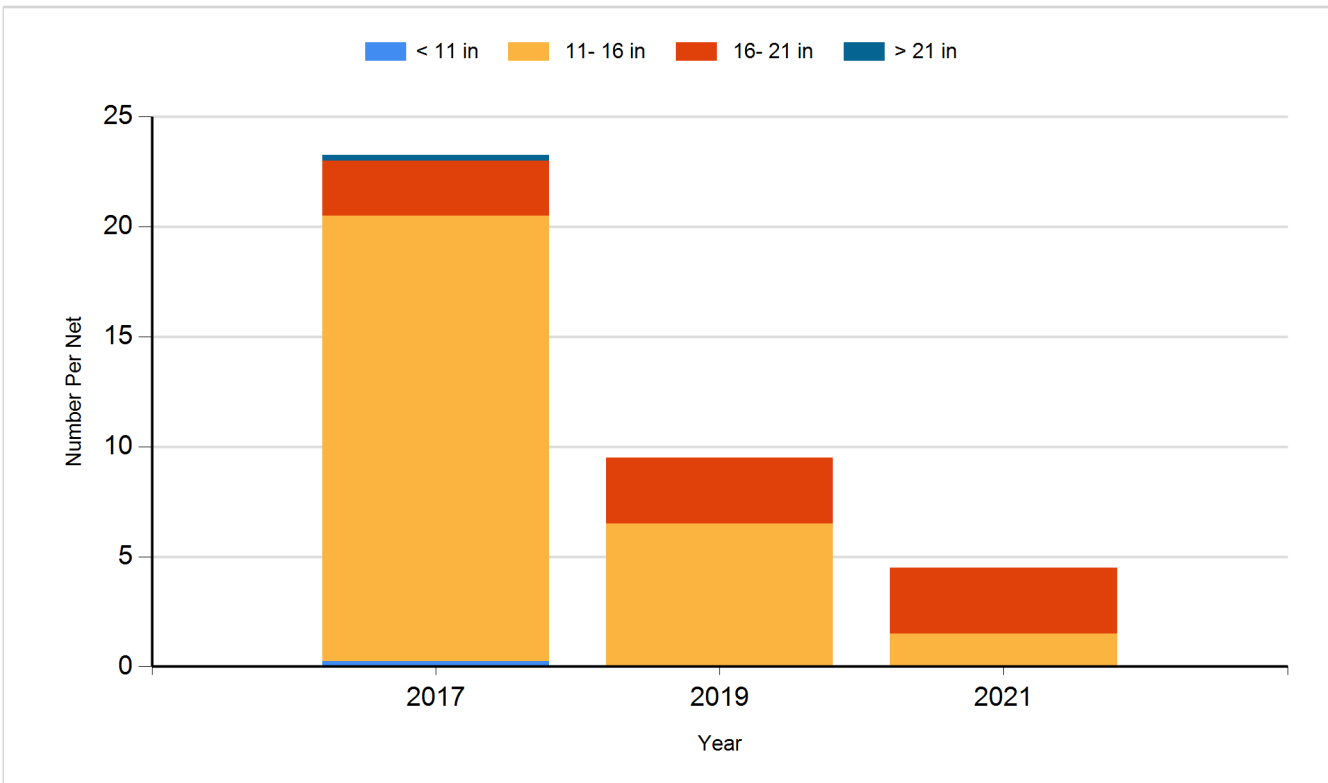
Species: Black Crappie
Gear: frame net (std 3/4 in)



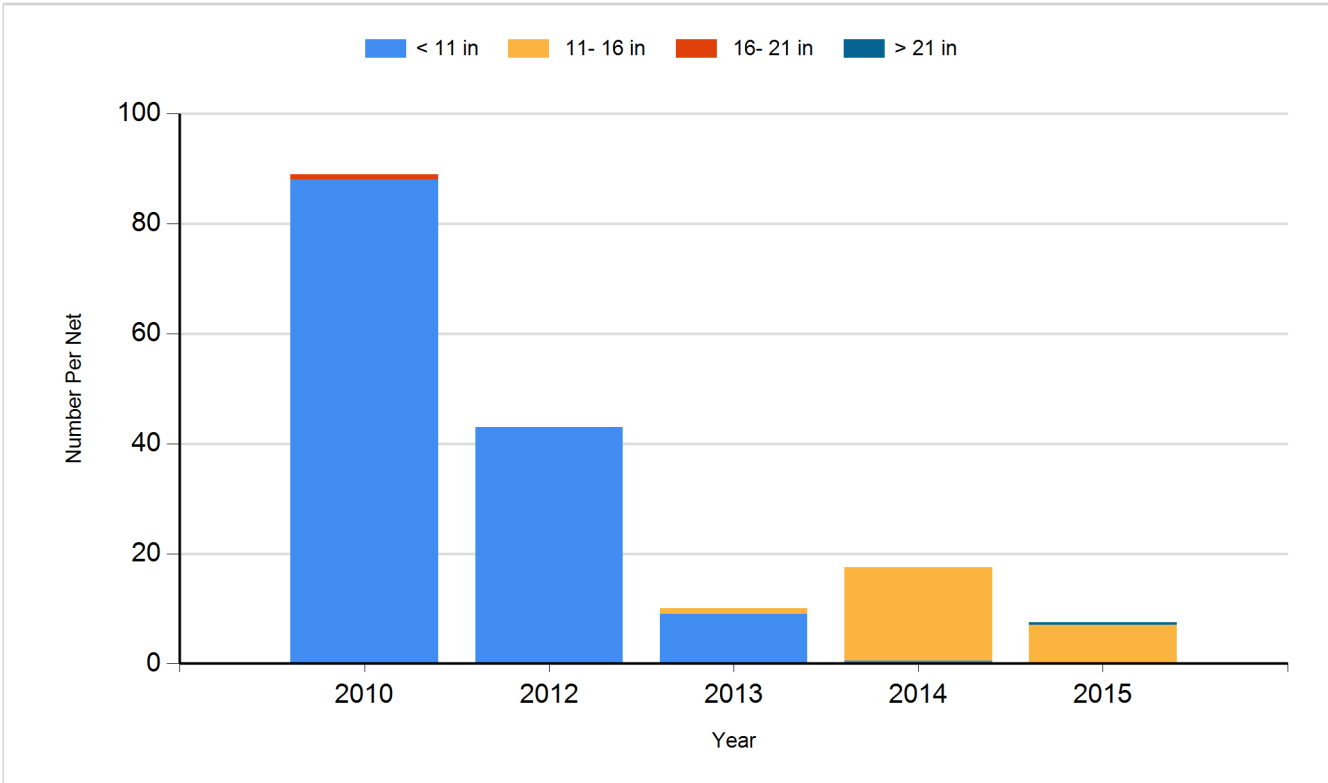
Species: Channel Catfish
Gear: AFS std gill net



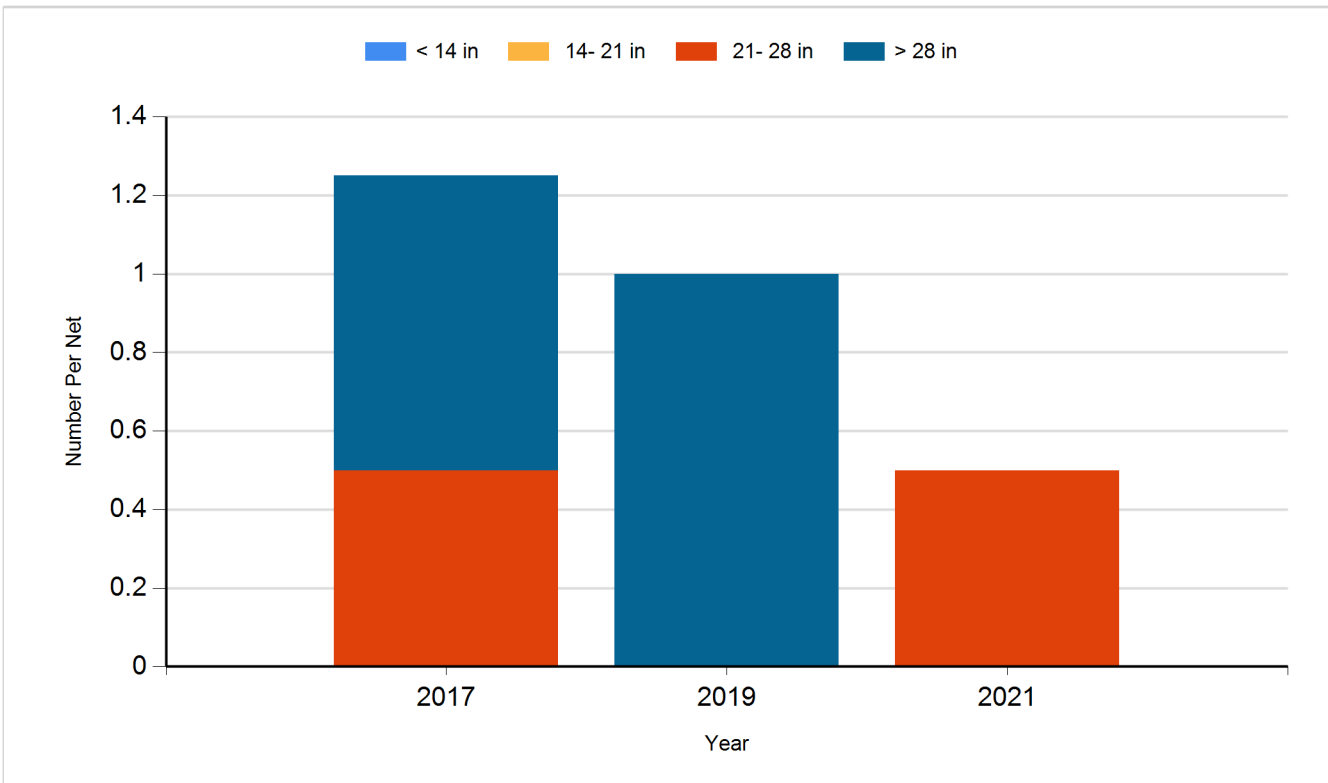
Species: Common Carp
Gear: AFS std gill net



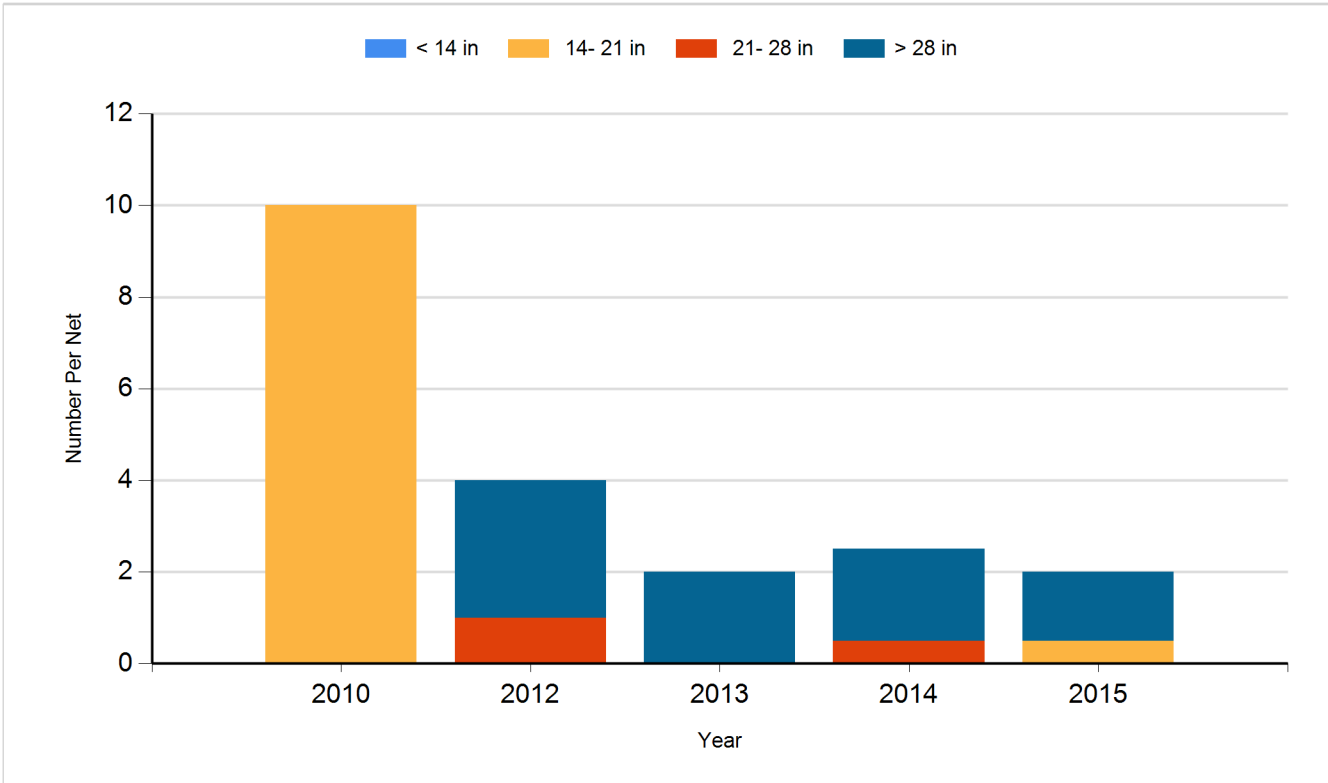
Species: Common Carp
Gear: std exp gill net



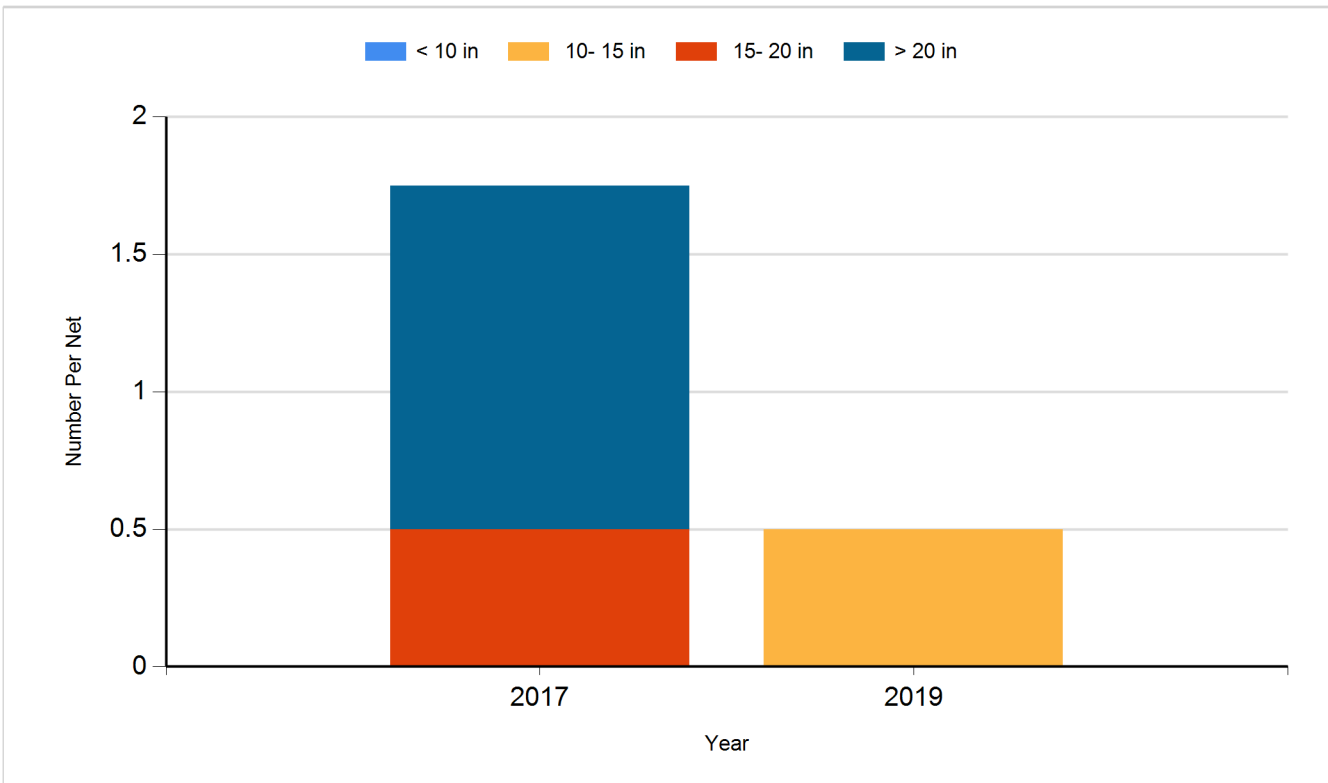
Species: Northern Pike
Gear: AFS std gill net



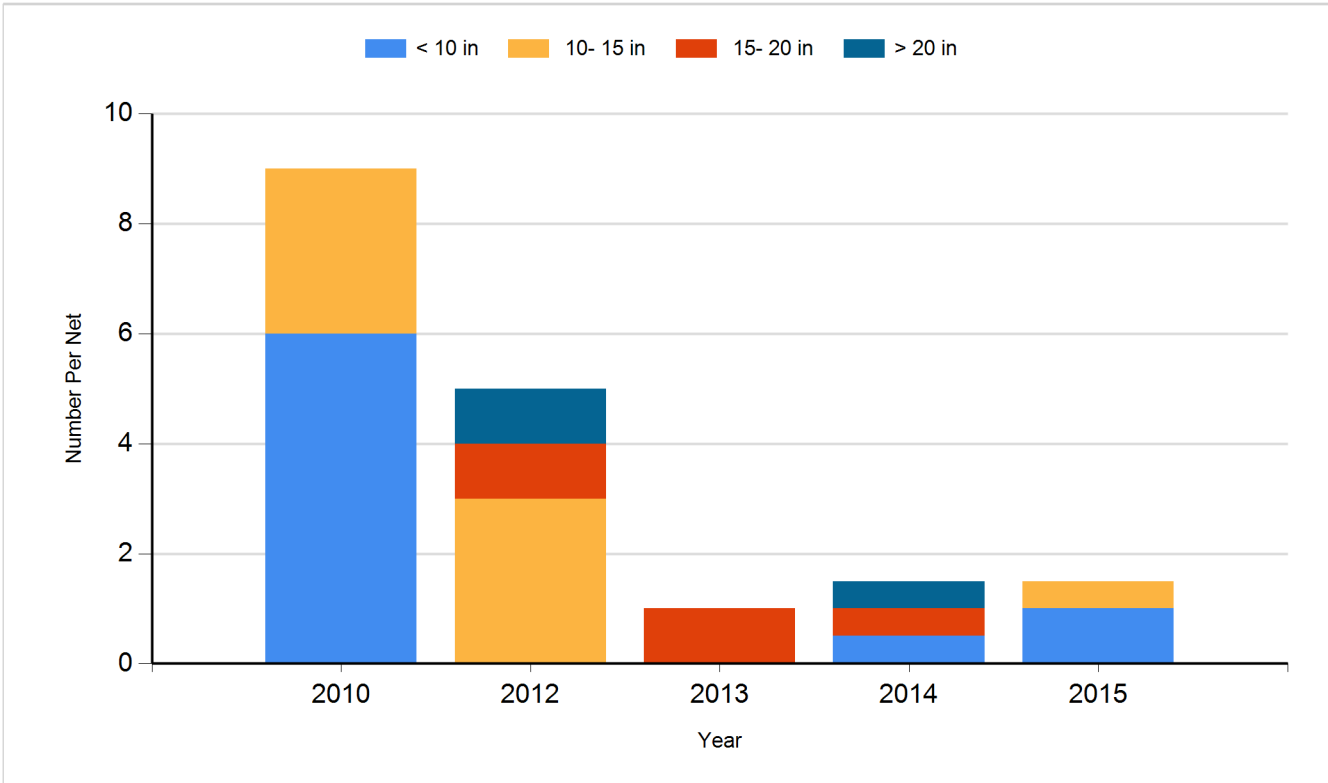
Species: Northern Pike
Gear: std exp gill net



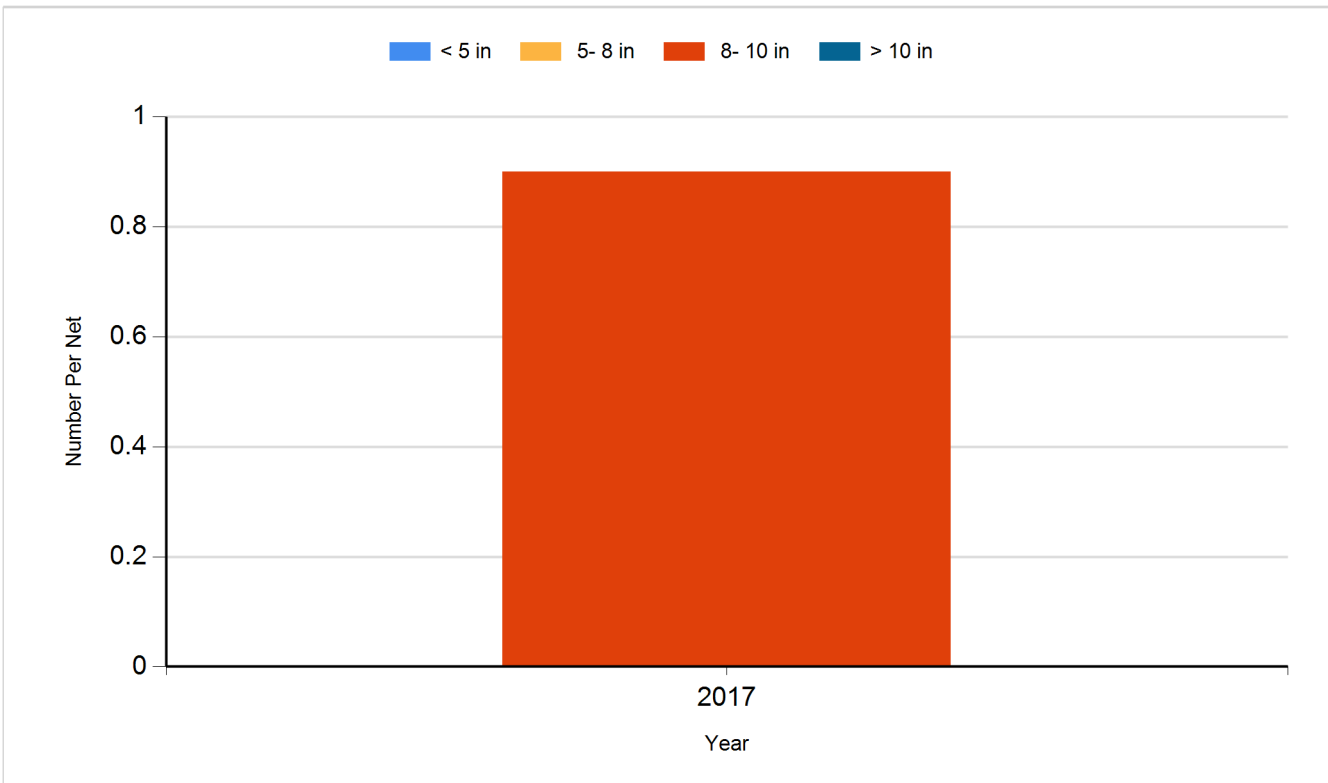
Species: Walleye
Gear: AFS std gill net



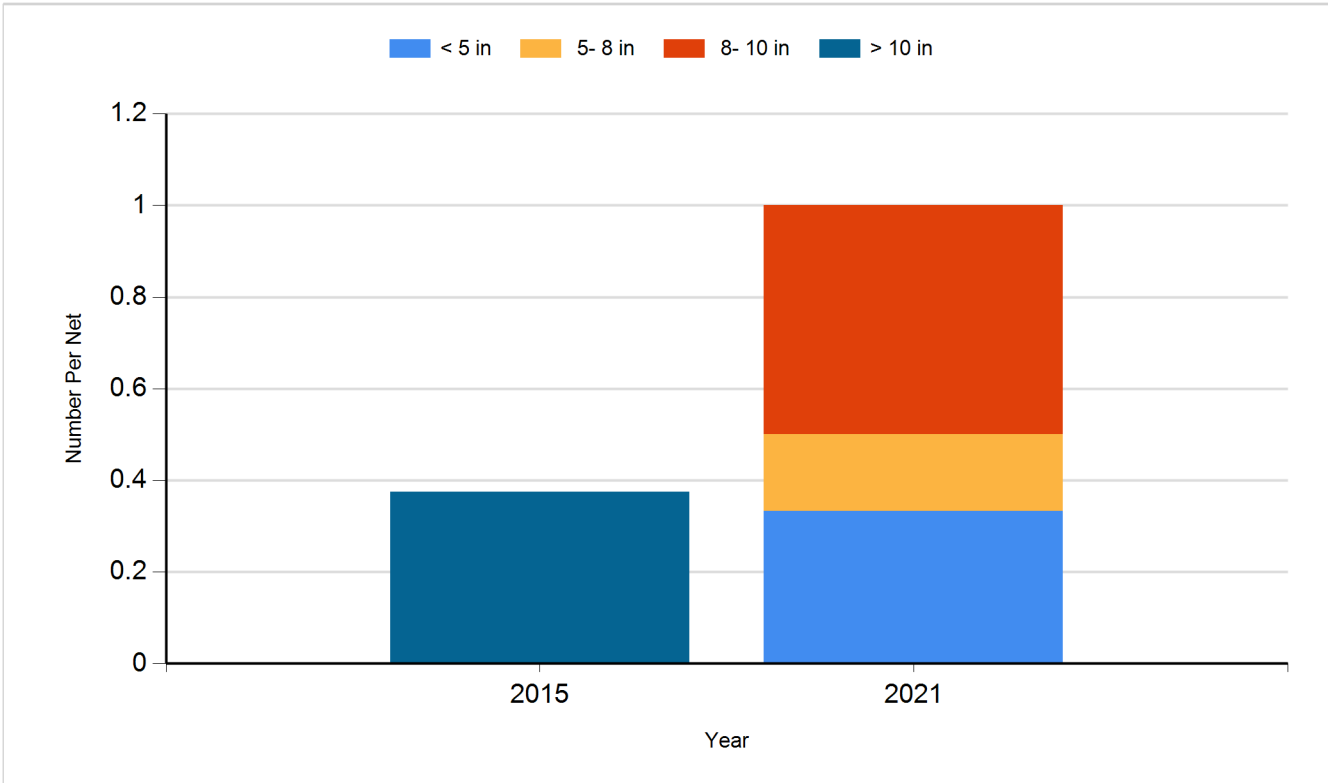
Species: Walleye
Gear: std exp gill net



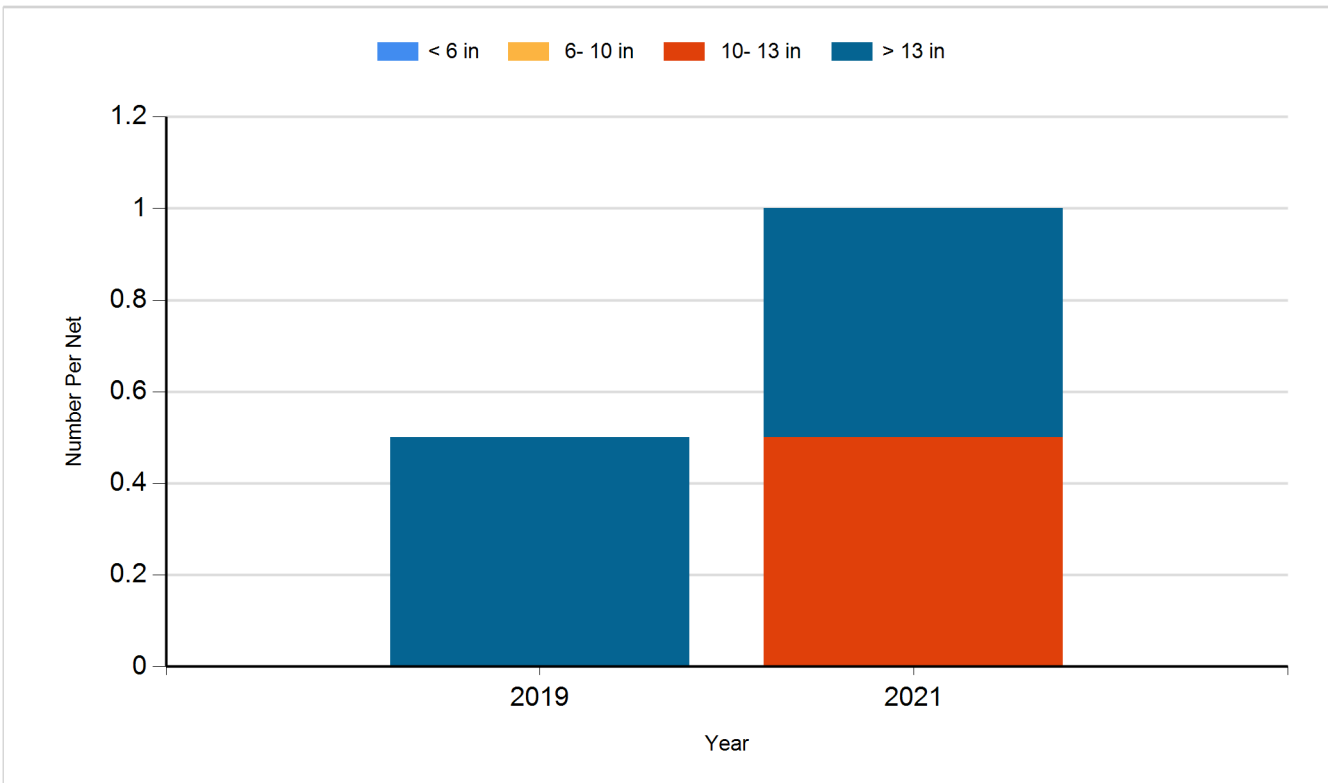
Species: White Crappie
Gear: AFS std frame net



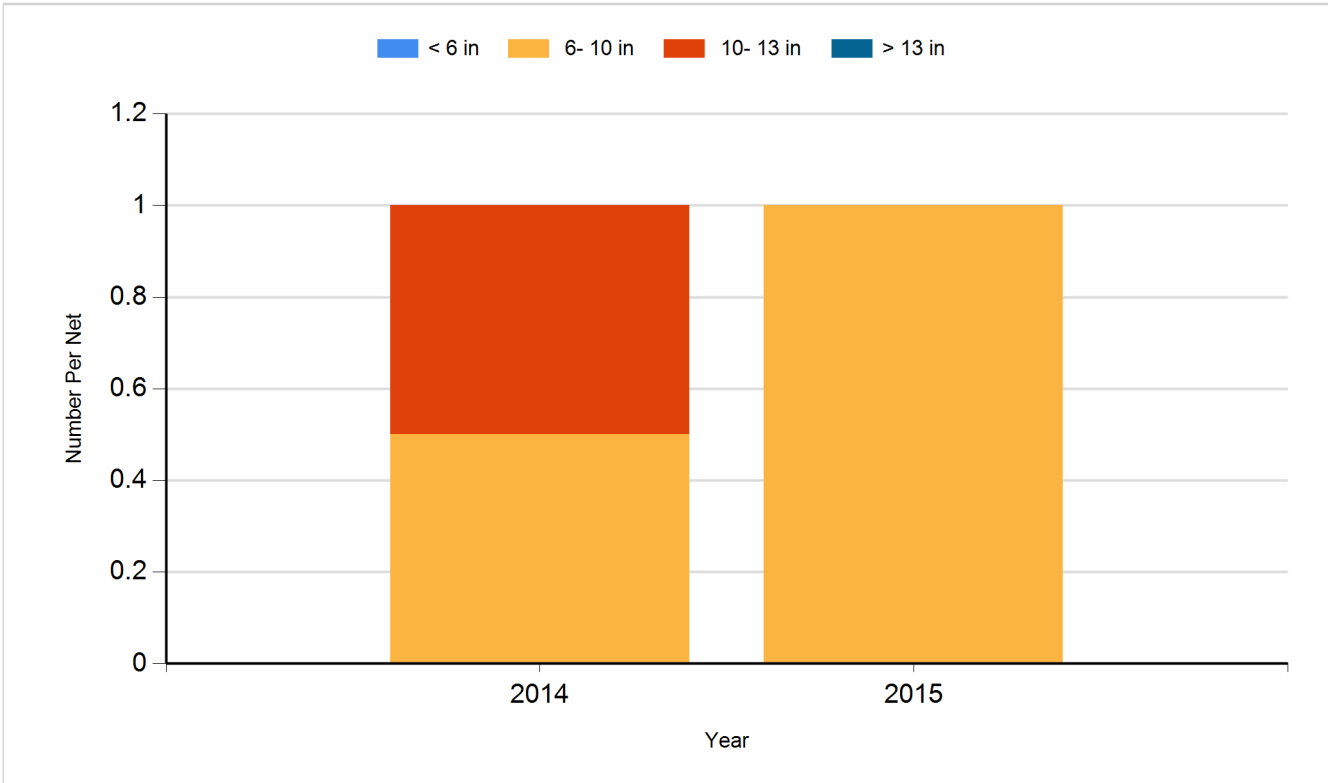
Species: White Crappie
Gear: frame net (std 3/4 in)



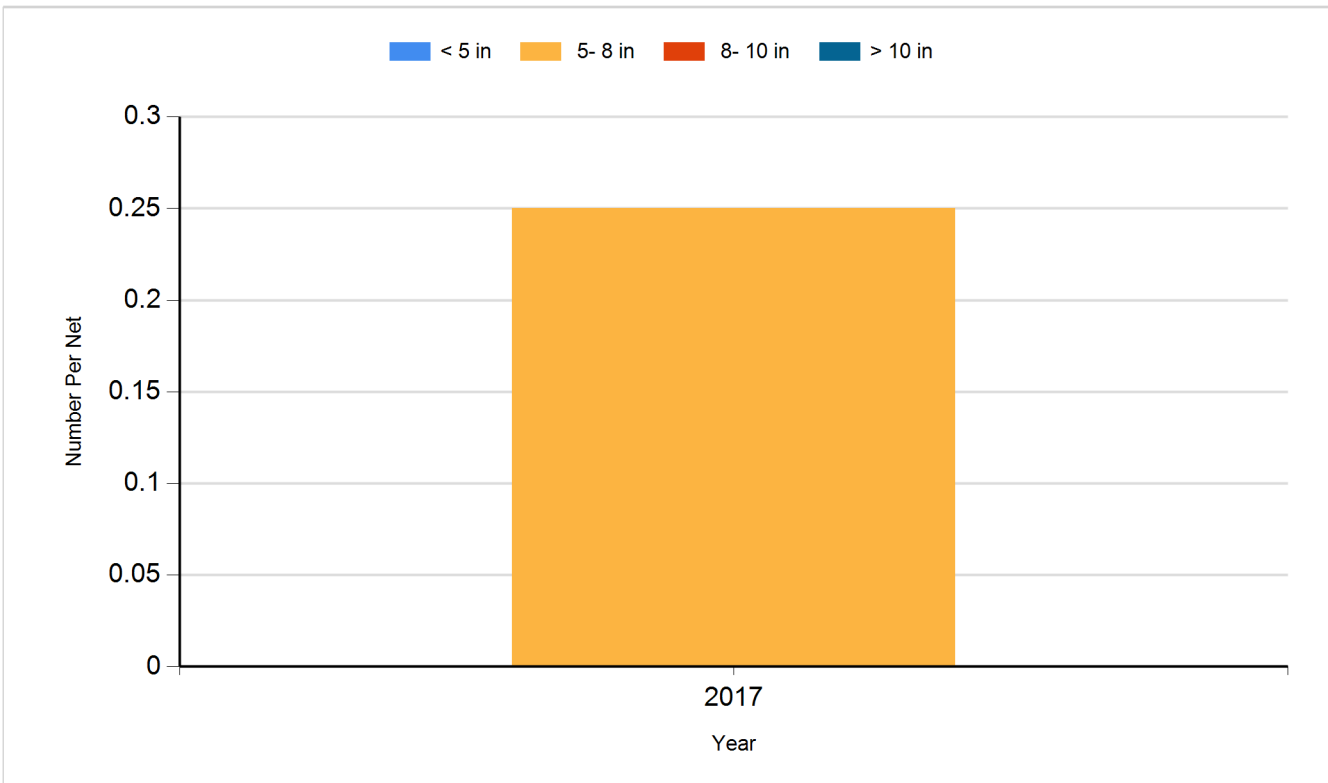
Species: White Sucker
Gear: AFS std gill net



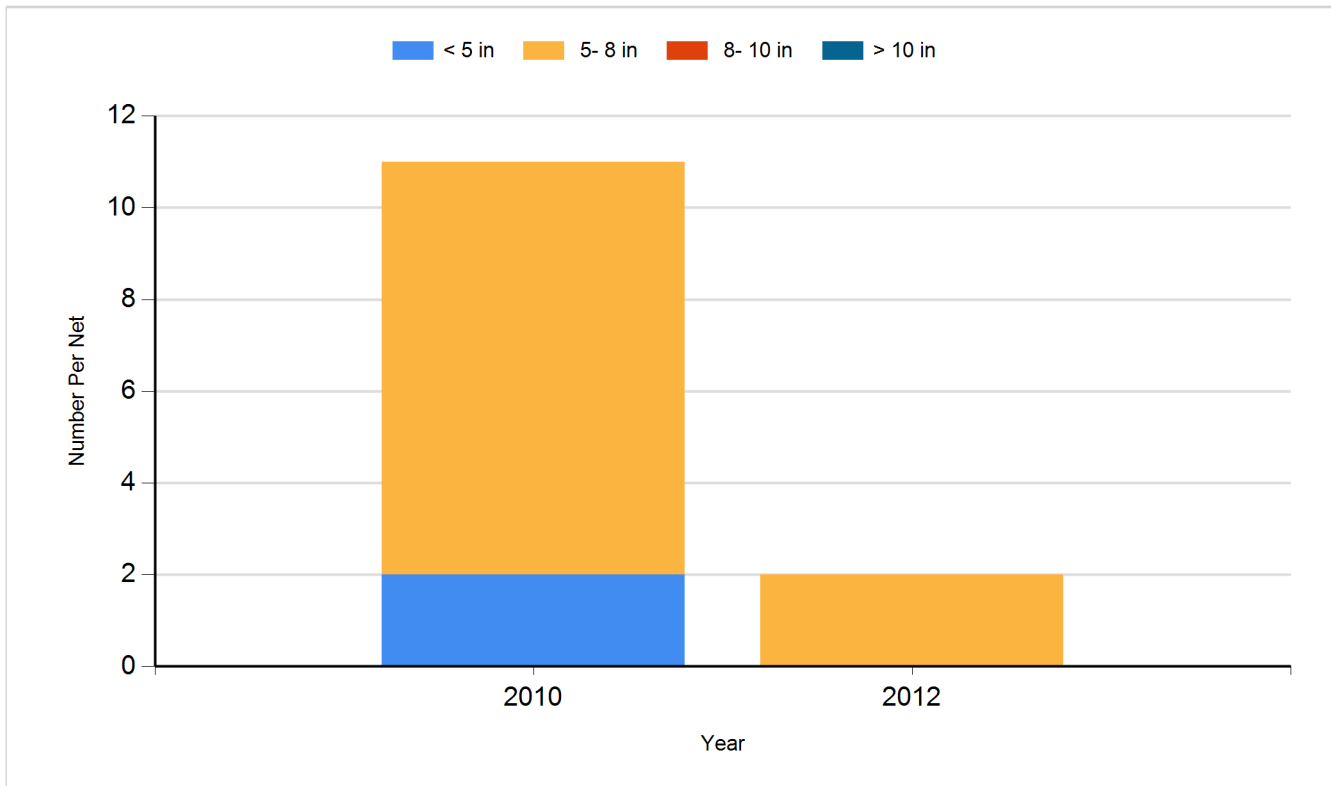
Species: White Sucker
Gear: std exp gill net



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
2010	Largemouth Bass	Fingerling	1,000
2010	Northern Pike	Fry	191,200
2010	Walleye	Fingerling	20,000
2010	Yellow Perch	Adult	680
2011	Largemouth Bass	Fingerling	7,800
2011	Northern Pike	Fry	30,000
2011	Walleye	Small Fingerling	13,930
2012	Largemouth Bass	Fingerling	14,460
2013	Walleye	Large Fingerling	4,000
2014	Largemouth Bass	Adult	100
2014	Walleye	Small Fingerling	19,800
2016	Walleye	Fingerling	25,500
2017	Walleye	Small Fingerling	29,700
2018	Walleye	Small Fingerling	29,600
2019	Walleye	Small Fingerling	30,600
2021	Walleye	Juvenile	30,000