

**SOUTH DAKOTA STATEWIDE FISHERIES SURVEY**  
**Flat Creek Dam, Perkins County**  
**GRA-Lake-767-000**  
**2019**

**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	May 20, 2019	2 net-nights
frame net (std 3/4 in)	May 20, 2019	6 net-nights

## **Common Fish Species Present**

Walleye

Northern Pike

Yellow Perch

Channel Catfish

Bluegill

Black Crappie

Black Bullhead

Common Carp

White Sucker

Green Sunfish

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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.

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

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	13	6.5	16.9	0		0	88	2
	Common Carp	19	9.5	1.5	32	17	0	82	2
	Northern Pike	2	1.0	3.1	100		100	91	
	Walleye	1	0.5	1.5	0		0	85	
	White Sucker	1	0.5	1.5	100		100	91	
frame net (std 3/4 in)	Black Bullhead	59	9.7	4.3	0		0	88	2
	Black Crappie	3	0.5	0.5	100		100	92	2
	Common Carp	4	0.3	0.3	0		0	82	6
	Green Sunfish	2	0.3	0.5	0		0	116	8
	Northern Pike	1	0.2	0.2	100		100		
	Walleye	15	1.7	1.2	20		10	82	2
	Yellow Perch	4	0.7	0.5	100		0	92	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.

Gear	Species	CPUE										Avg
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
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	12.65
	Channel Catfish								0.3		0.0	0.15
	Common Carp								23.0		9.5	16.25
	Northern Pike								1.3		1.0	1.15
	Walleye								1.8		0.5	1.15
	White Sucker								0.0		0.5	0.25
	Yellow Perch								0.3		0.0	0.15
frame net (std 3/4 in)	Black Bullhead	0.0		19.5	99.0	63.8	80.1				9.7	45.35
	Black Crappie	0.0		0.0	0.0	0.1	0.5				0.5	0.18
	Channel Catfish	0.0		0.3	0.0	0.0	0.0				0.0	0.05
	Common Carp	0.3		0.0	6.5	2.9	4.9				0.3	2.48
	Green Sunfish	0.0		0.0	0.0	0.1	0.0				0.3	0.07
	Northern Pike	0.0		1.0	0.8	2.6	0.5				0.2	0.85
	Walleye	2.3		2.8	1.0	0.8	1.0				1.7	1.60
	White Crappie	0.0		0.0	0.0	0.0	0.4				0.0	0.07
	White Sucker	0.0		0.0	0.3	0.0	0.1				0.0	0.07
	Yellow Perch	4.3		1.8	1.3	1.3	0.1				0.7	1.58
std exp gill net	Black Bullhead	1.0		4.0	32.0	79.0	23.5					27.90
	Common Carp	1.0		0.0	1.0	17.0	7.5					5.30
	Northern Pike	10.0		4.0	2.0	2.5	2.0					4.10
	Walleye	3.0		5.0	1.0	1.0	0.5					2.10
	White Sucker	0.0		0.0	0.0	1.0	1.0					0.40
	Yellow Perch	9.0		2.0	0.0	0.0	0.0					2.20

## 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											
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		
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 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	
		PSD-P									0		0	
		Wr									78		88	
	Channel Catfish	PSD										100		
		PSD-P										0		
		Wr										89		
	Common Carp	PSD										12		32
		PSD-P										1		0
		Wr										85		82
	Northern Pike	PSD										100		100
		PSD-P										60		100
		Wr										81		91

Gear	Species	Index	Year											
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		
AFS std gill net	Walleye	PSD									100		0	
		PSD-P									71		0	
		Wr									86		85	
	White Sucker	PSD												100
		PSD-P												100
		Wr												91
	Yellow Perch	PSD										0		
		PSD-P										0		
		Wr										111		
frame net (std 3/4 in)	Black Bullhead	PSD	0		8	5	3	0						0
		PSD-P	0		1	0	0	0						0
		Wr			79	87	75	77						88
	Black Crappie	PSD					100	100						100
		PSD-P					0	0						100
		Wr					91	98						92
	Channel Catfish	PSD			0									
		PSD-P			0									
		Wr			86									
	Common Carp	PSD	100		0	15	9	0						0
		PSD-P	0		0	0	0	0						0
		Wr				79	82	85						82
	Green Sunfish	PSD					0							0
		PSD-P					0							0
		Wr					93							116
	Northern Pike	PSD			100	100	100	100						100
		PSD-P			50	67	81	50						100
		Wr			91	97	88	84						
	Walleye	PSD	0		27	100	50	63						20
		PSD-P	0		0	50	50	25						10
		Wr	87		75	91	83	87						82
	White Sucker	PSD				100		0						
		PSD-P				0		0						
		Wr				80		92						
	Yellow Perch	PSD	12		0	0	10	0						100
		PSD-P	6		0	0	0	0						0
		Wr	92		88	82	76	95						92



Gear	Species	Index	Year									
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
std exp gill net	Black Bullhead	PSD	100		0	3	0	0				
		PSD-P	0		0	0	0	0				
		Wr			84	89	82	89				
	Common Carp	PSD	100		0	0	0	7				
		PSD-P	0		0	0	0	7				
		Wr				83	82	81				
	Northern Pike	PSD	0		100	100	100	75				
		PSD-P	0		75	100	80	75				
		Wr	103		102	95	96	88				
	Walleye	PSD	0		40	100	100	0				
		PSD-P	0		20	0	50	0				
		Wr	85		85	86	93	80				
	White Sucker	PSD					50	0				
		PSD-P					0	0				
		Wr					79	85				
	Yellow Perch	PSD	0		0							
		PSD-P	0		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)		

## **Fish Condition**

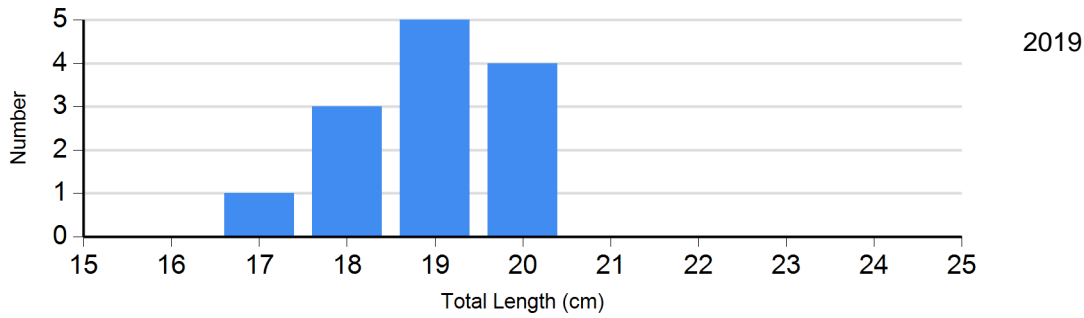
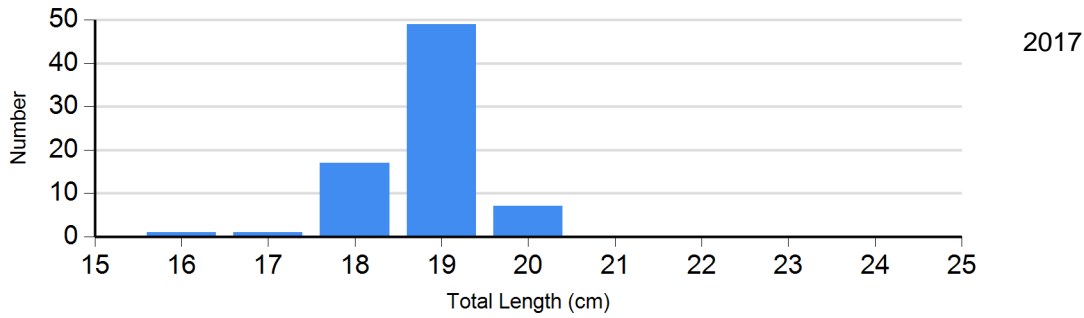
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2015	94	89 (1.1)	0		0		0	
	2017	75	78 (0.9)	0		0		0	
	2019	13	88 (1.6)	0		0		0	
Black Crappie Frame Net	2015	0		8	98 (0.7)	0		0	
	2017	1	114	0		1	100	0	
	2019	0		0		3	92 (1.2)	0	
Channel Catfish Gill Net	2017	0		1	89	0		0	
Common Carp Gill Net	2015	28	85 (0.8)	0		2	23 (0.0)	0	
	2017	81	85 (0.5)	10	84 (2.0)	1	92	0	
	2019	13	82 (1.8)	6	82 (2.1)	0		0	
Northern Pike Gill Net	2015	2	89 (0.0)	0		4	87 (3.1)	2	
	2017	0		2	82 (9.6)	3	80 (8.5)	0	
	2019	0		0		0		2	91
Walleye Gill Net	2015	2	80 (0.0)	0		0		0	
	2017	0		2	78 (1.9)	5	90 (3.0)	0	
	2019	1	85	0		0		0	
White Sucker Gill Net	2015	4	85 (1.4)	0		0		0	
	2019	0		0		1	91	0	
Yellow Perch Gill Net	2017	1	111	0		0		0	

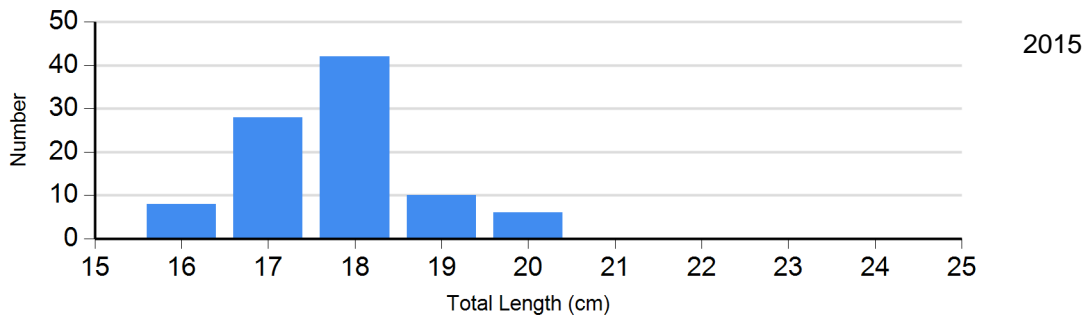
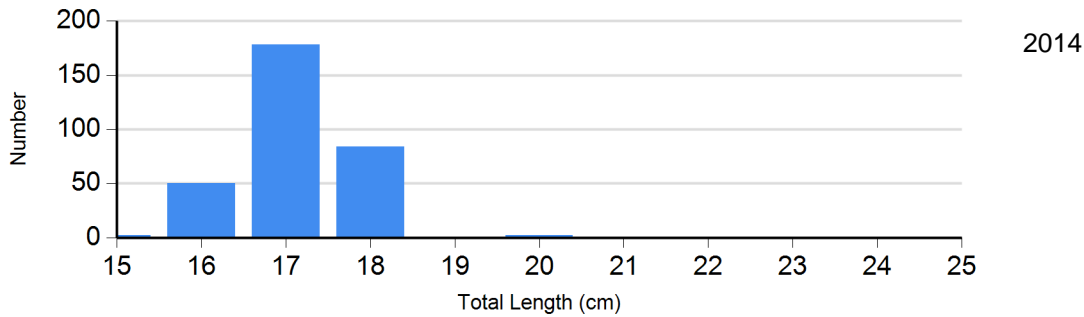
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

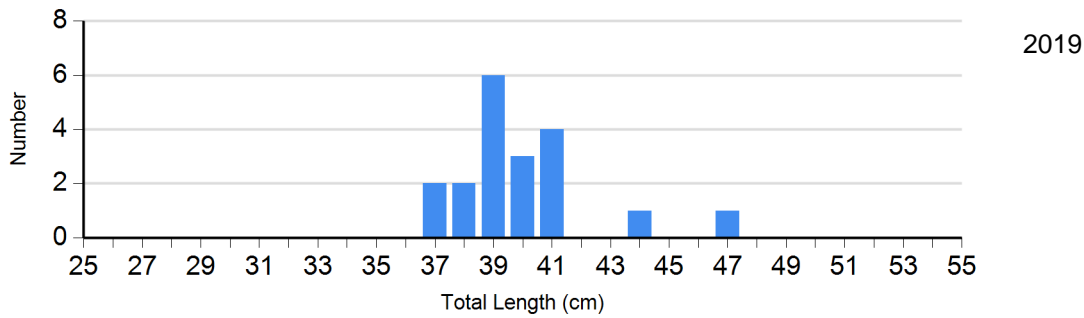
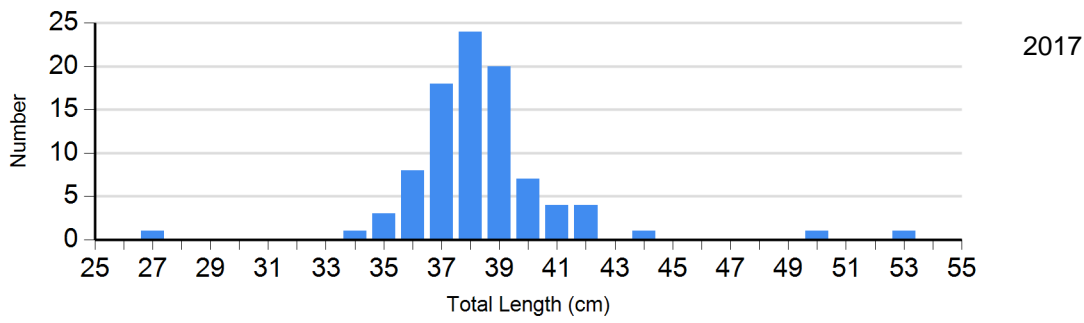
Species: Black Bullhead  
Gear: AFS std gill net



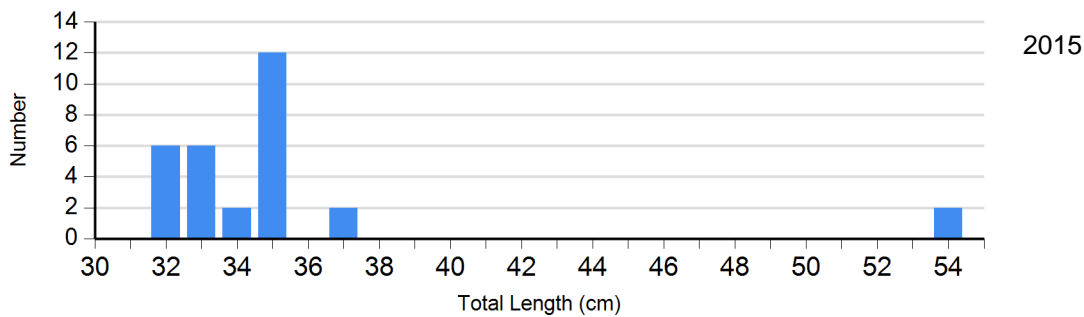
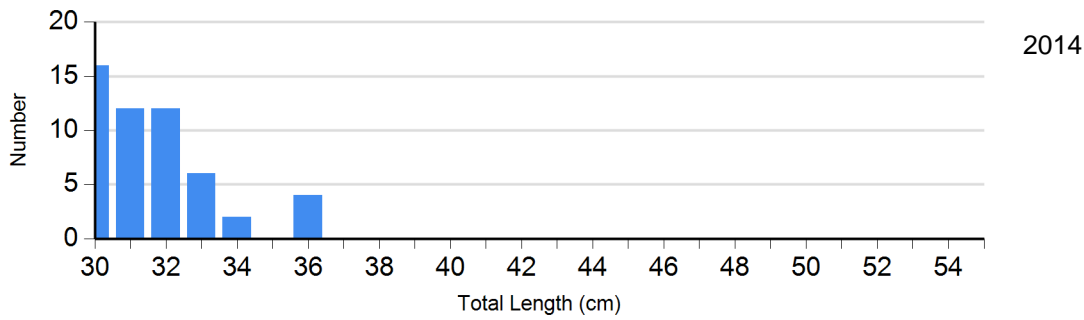
Species: Black Bullhead  
Gear: std exp gill net



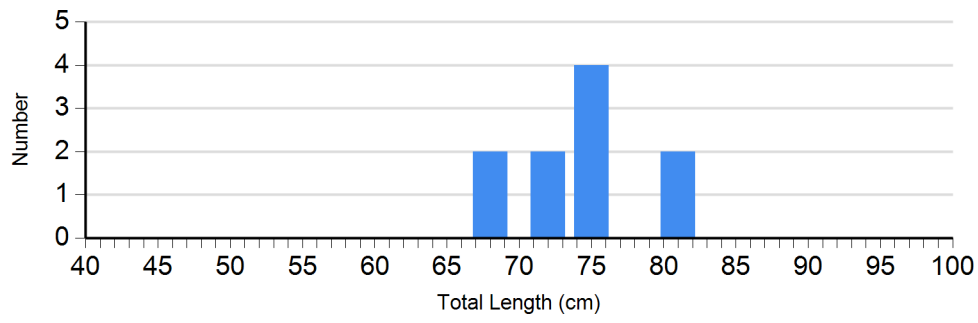
Species: Common Carp  
Gear: AFS std gill net



Species: Common Carp  
Gear: std exp gill net



Species: Northern Pike  
Gear: std exp gill net



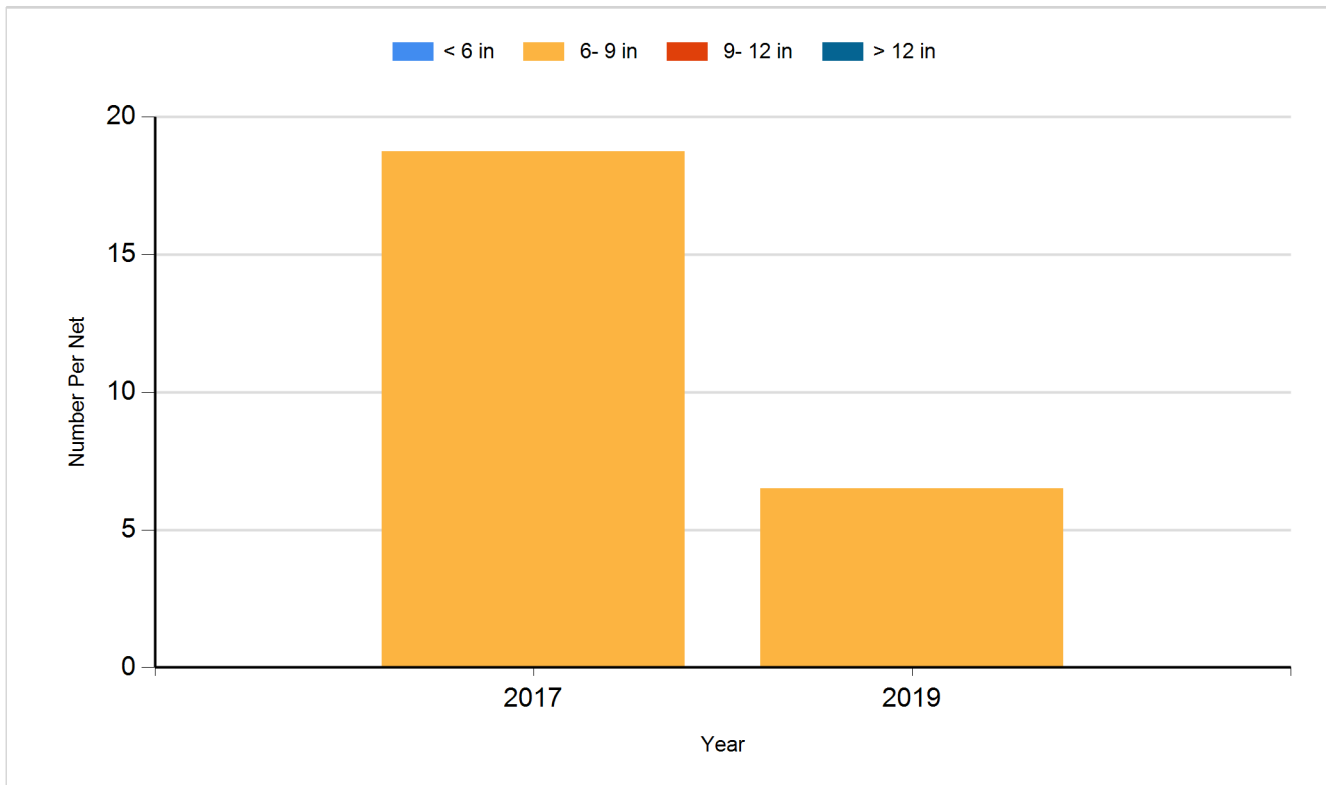
2014

## Historic Fish Sizes and Relative Abundance

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

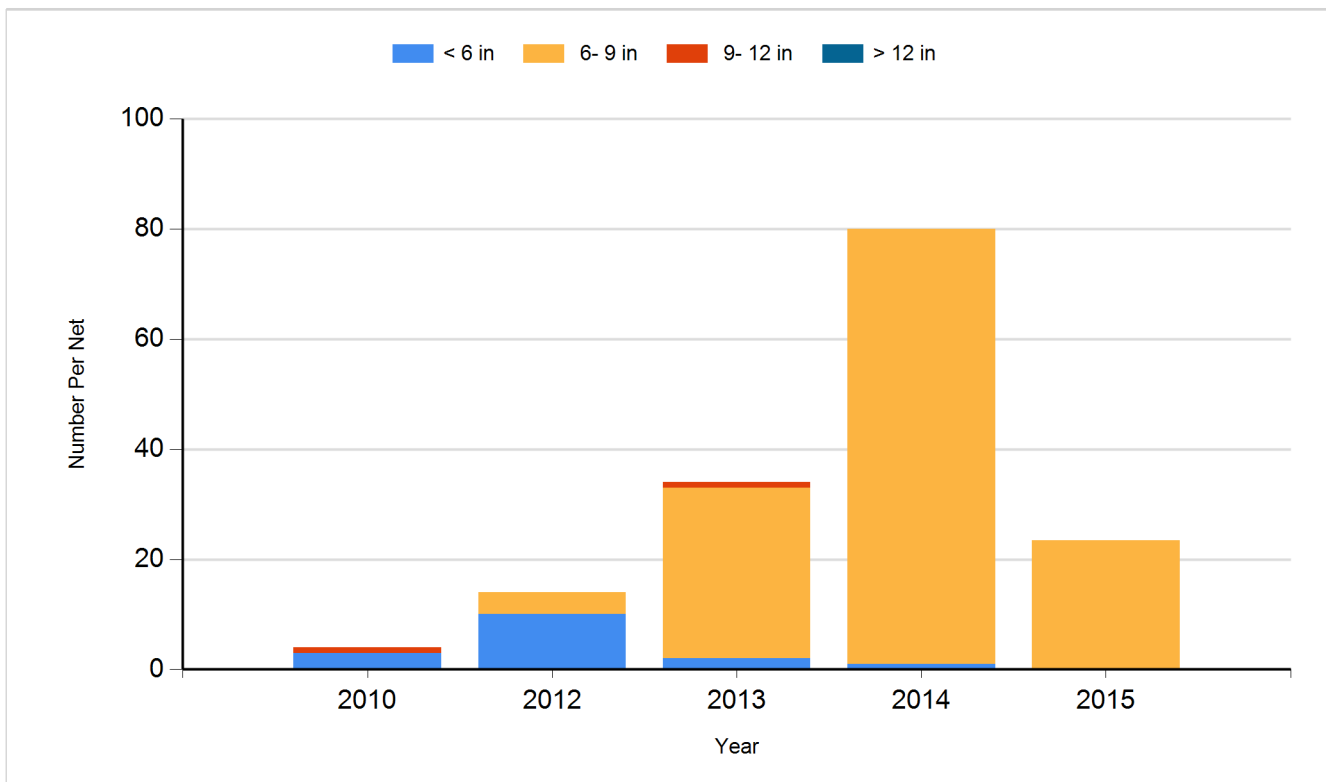
Species: Black Bullhead

Gear: AFS std gill net

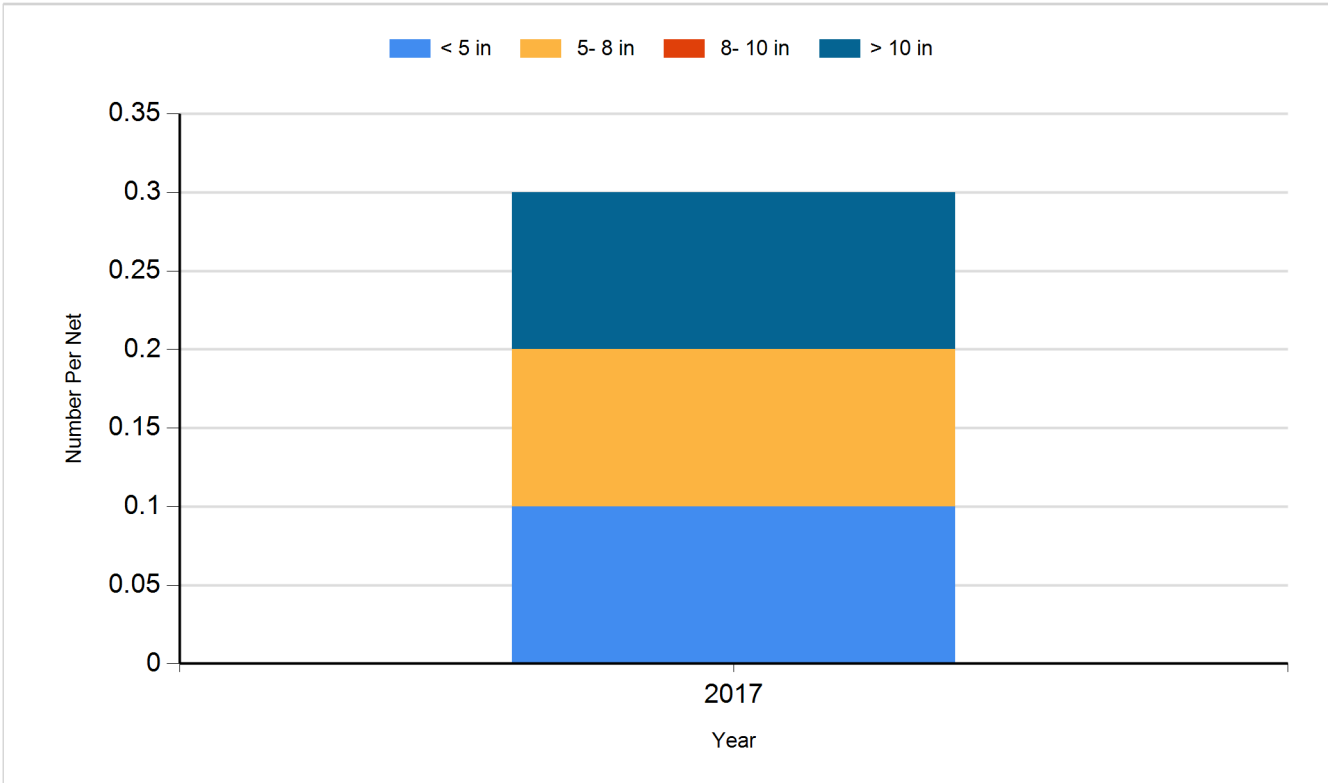


Species: Black Bullhead

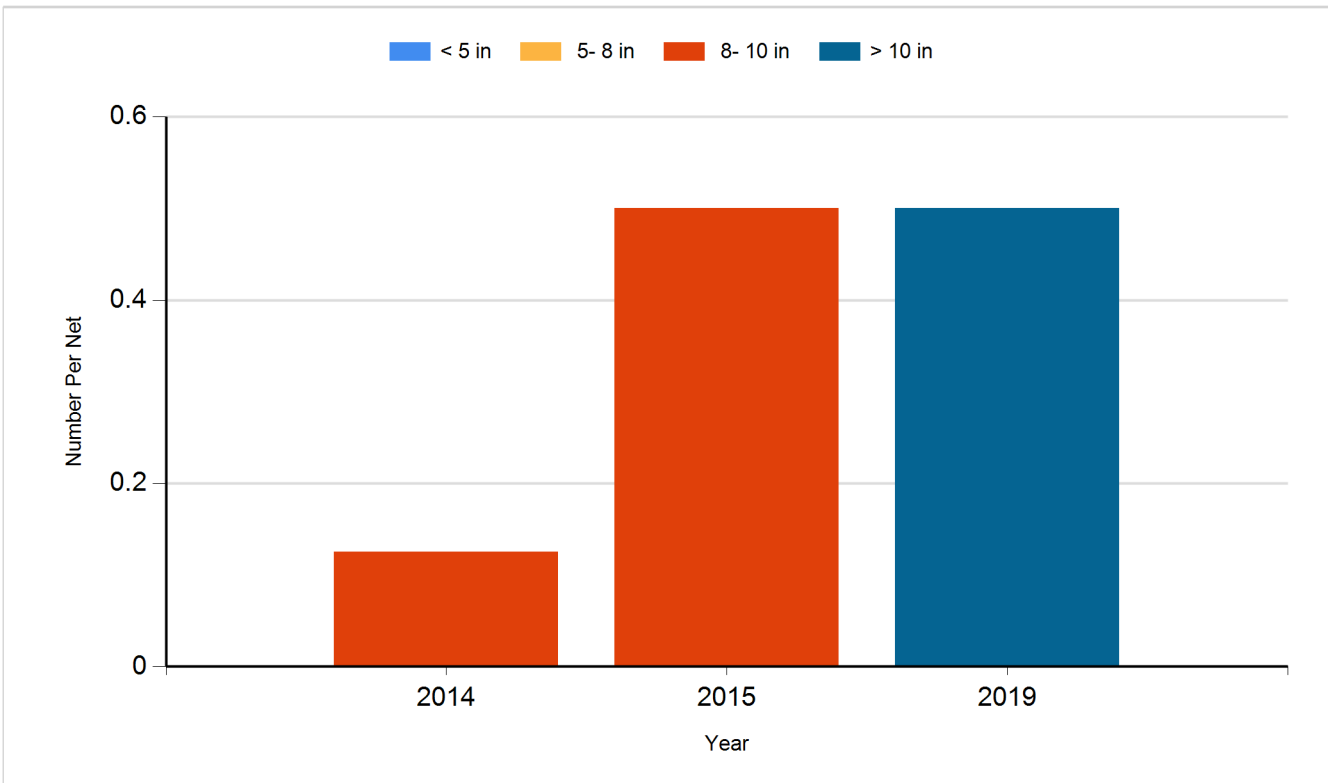
Gear: std exp gill net



Species: Black Crappie  
Gear: AFS std frame net

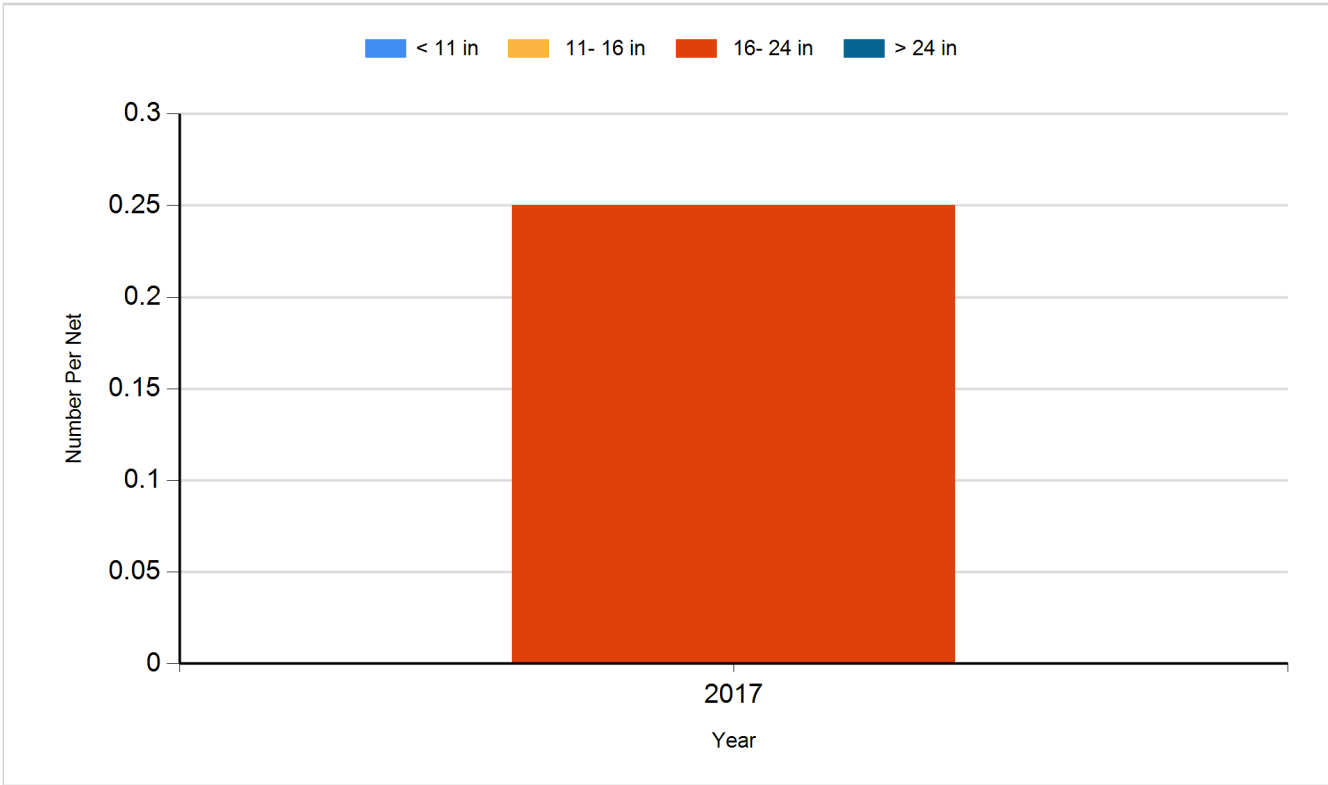


Species: Black Crappie  
Gear: frame net (std 3/4 in)

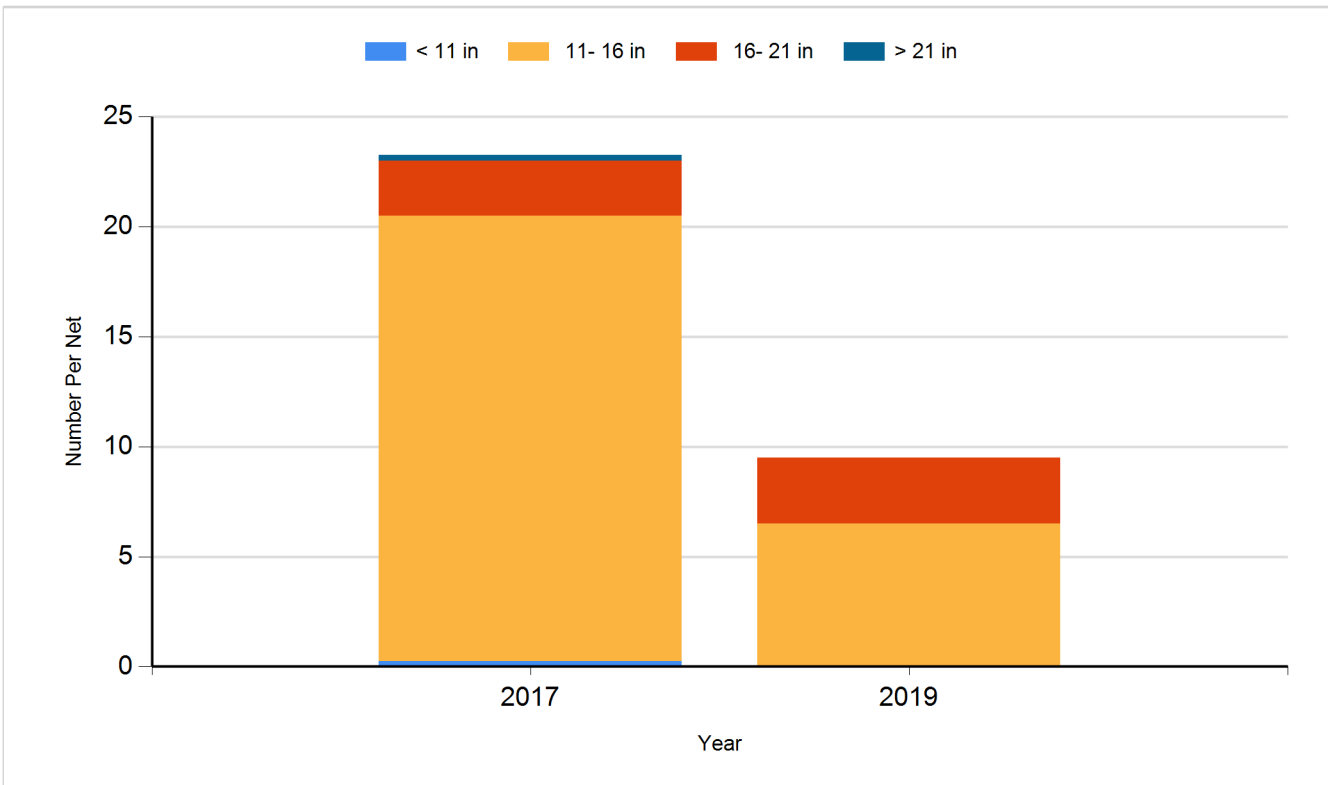




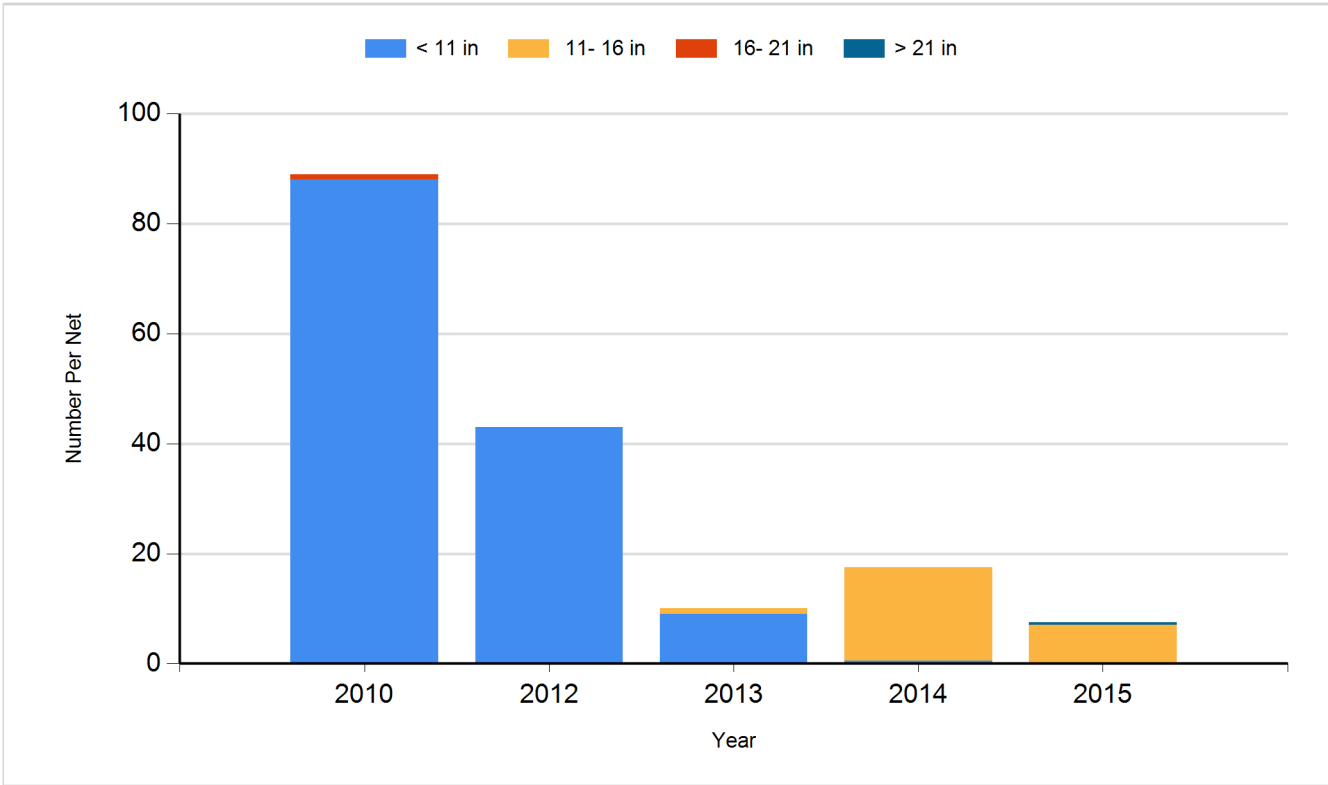
Species: Channel Catfish  
Gear: AFS std gill net



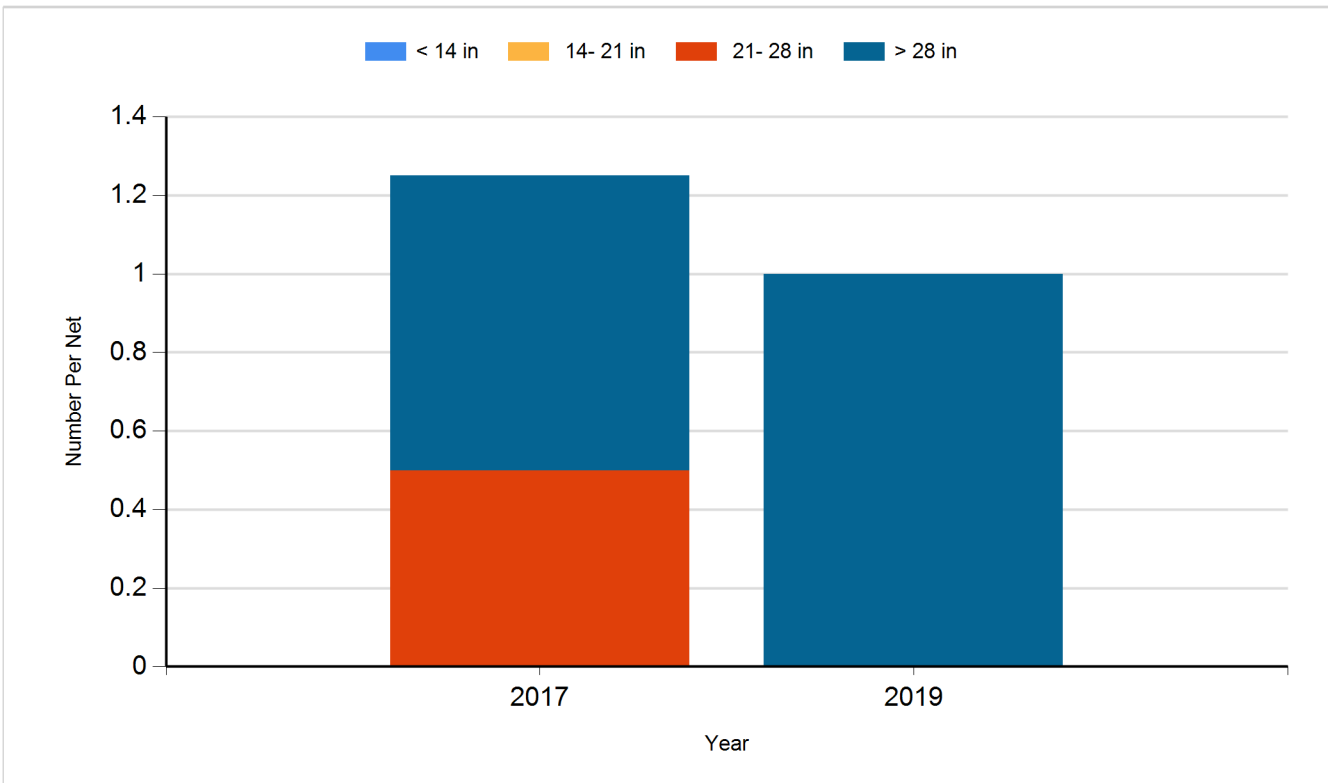
Species: Common Carp  
Gear: AFS std gill net



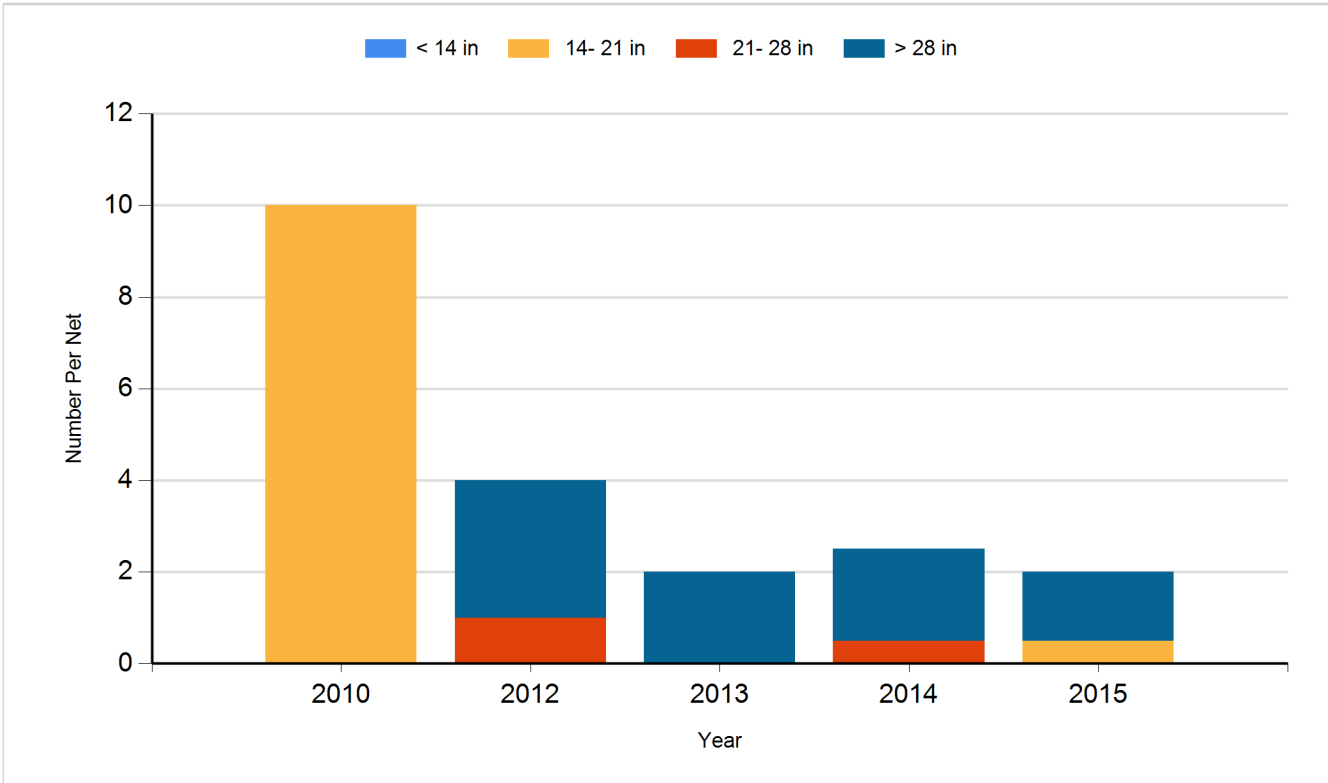
Species: Common Carp  
Gear: std exp gill net



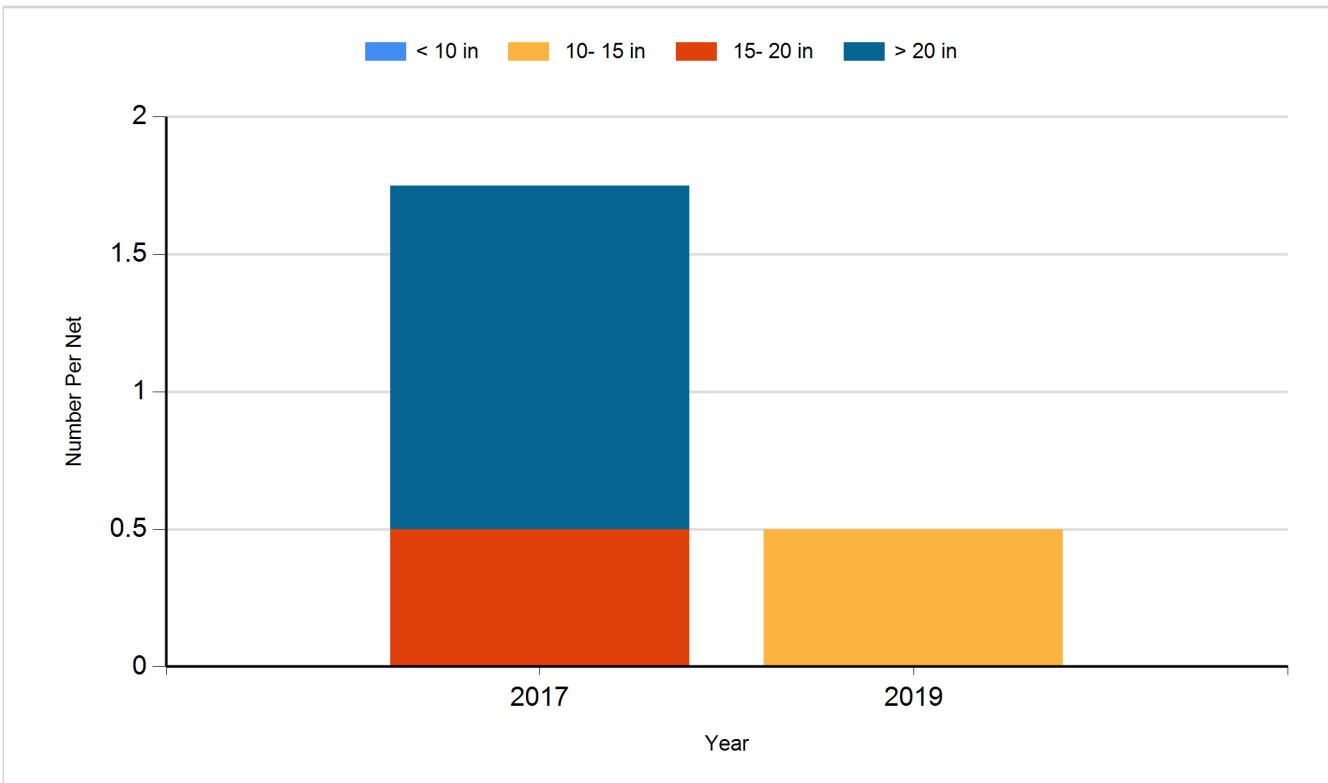
Species: Northern Pike  
Gear: AFS std gill net



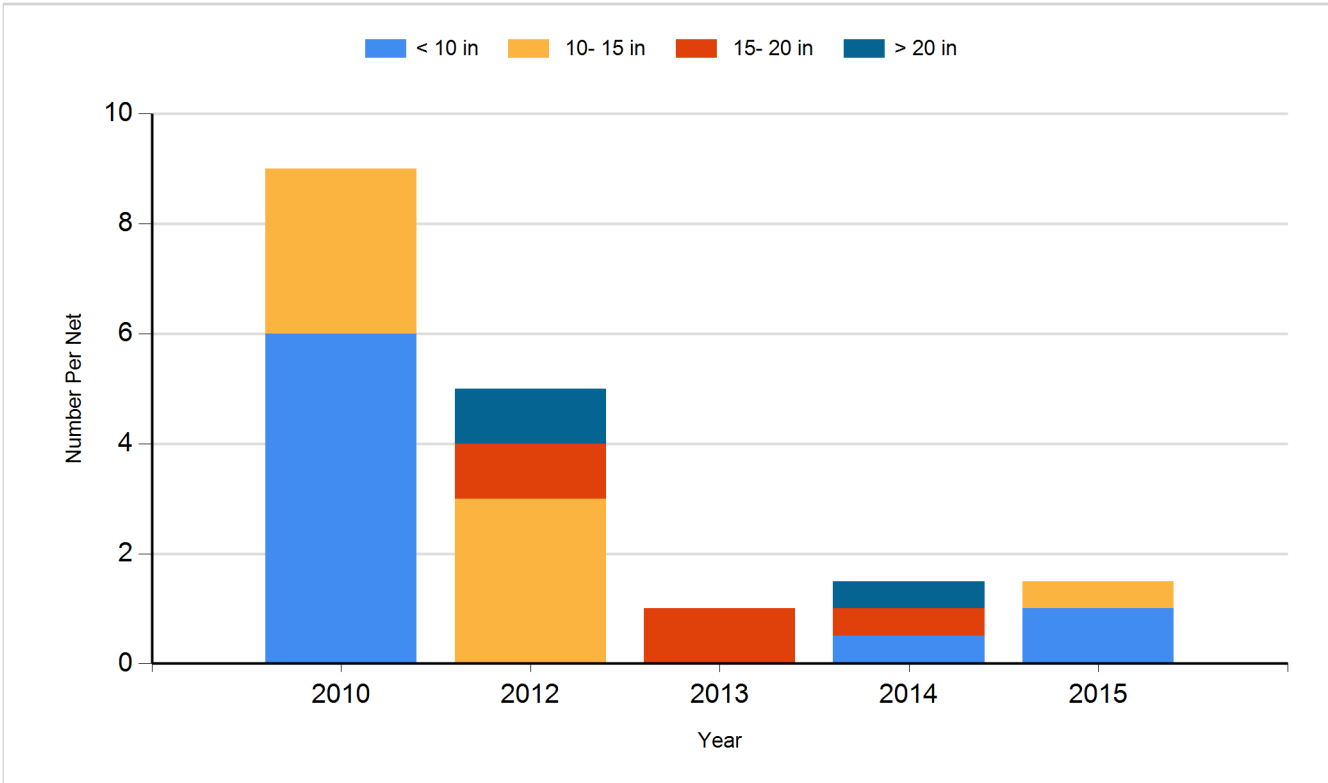
Species: Northern Pike  
Gear: std exp gill net



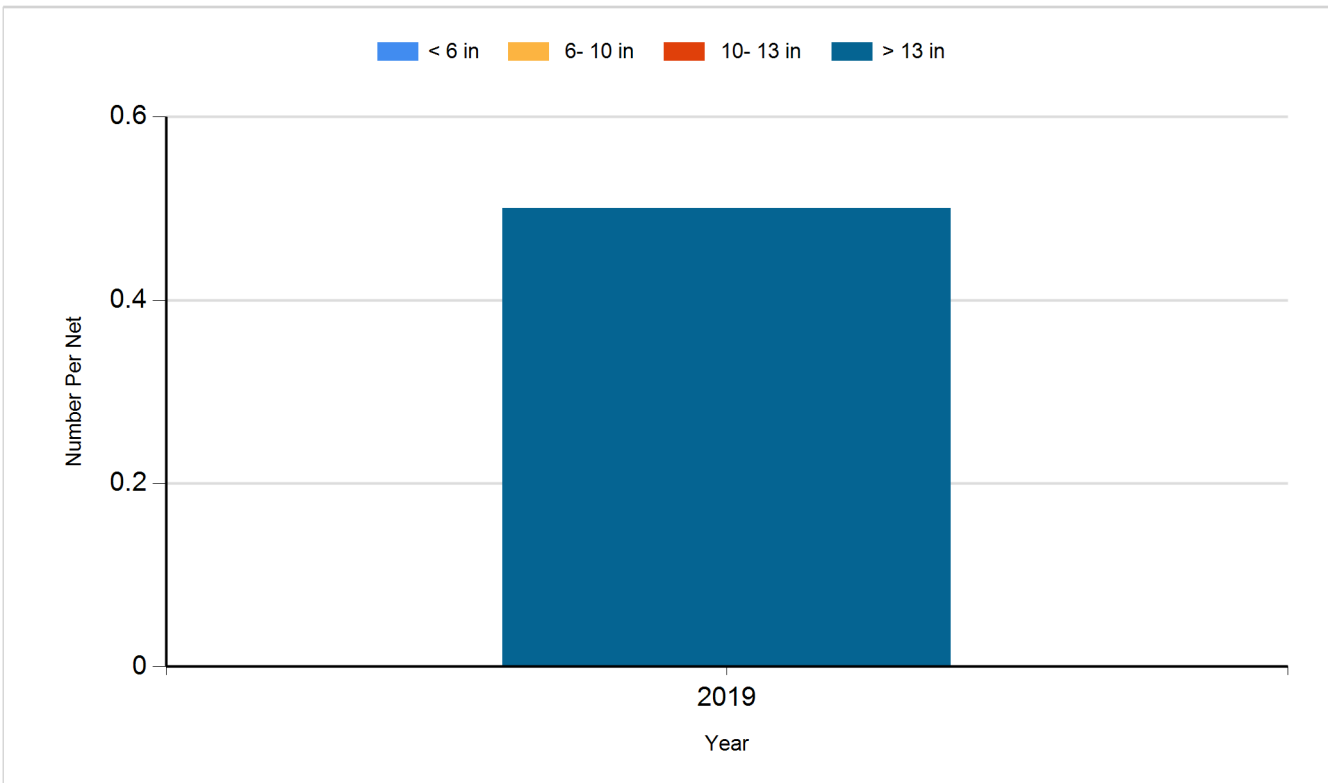
Species: Walleye  
Gear: AFS std gill net



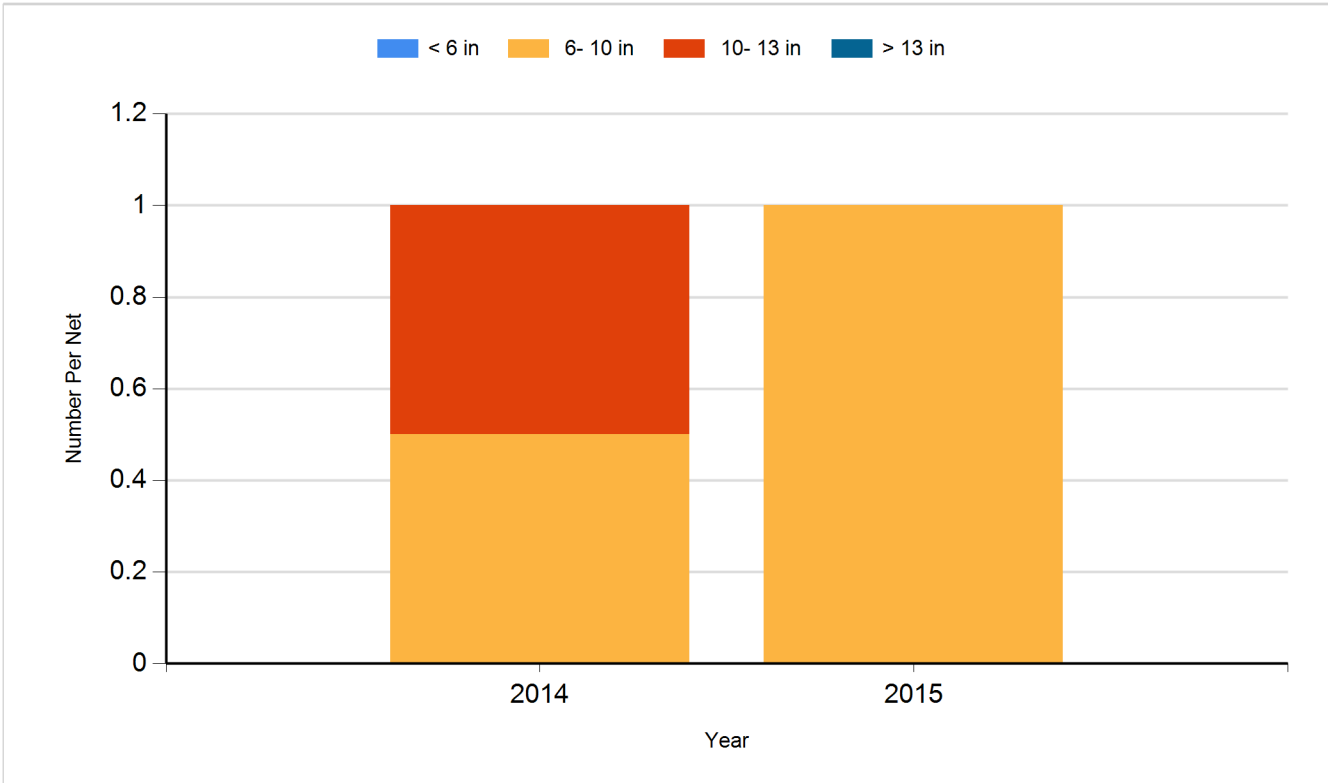
Species: Walleye  
Gear: std exp gill net



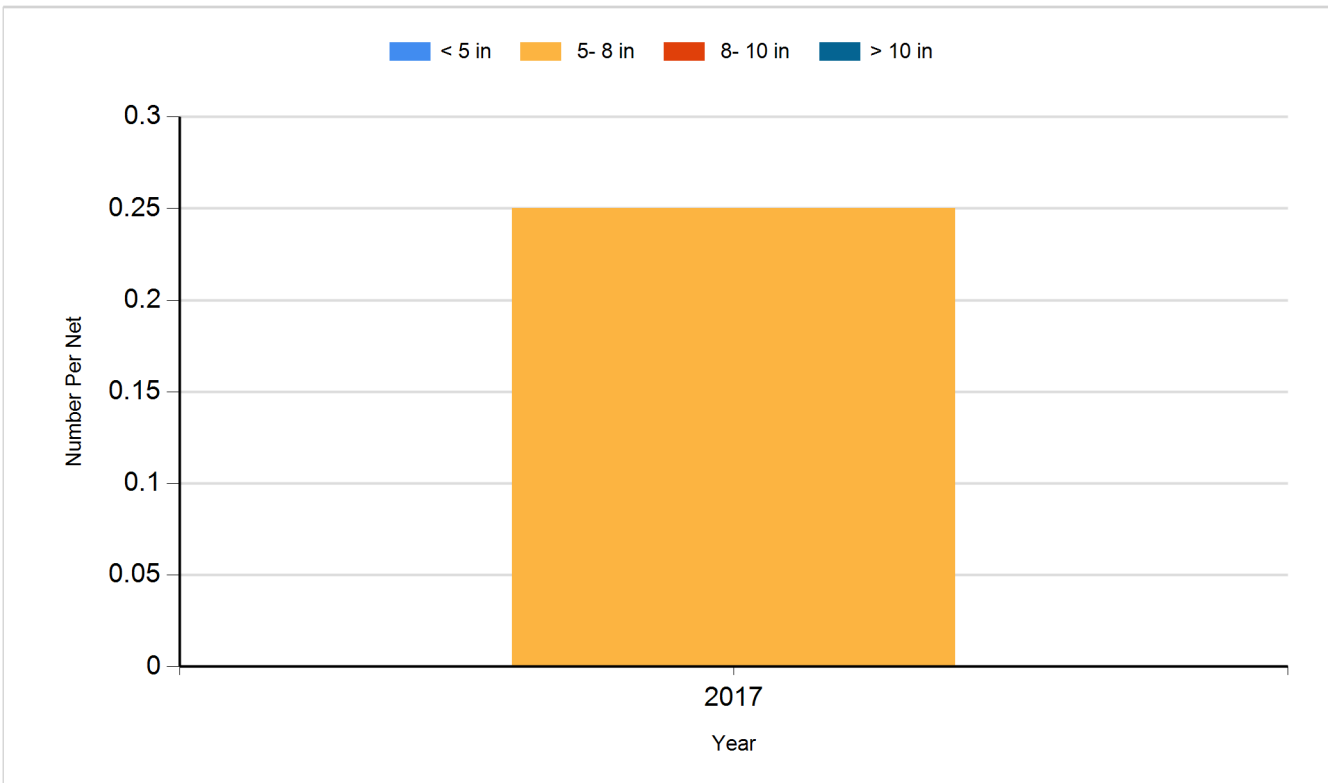
Species: White Sucker  
Gear: AFS std gill net



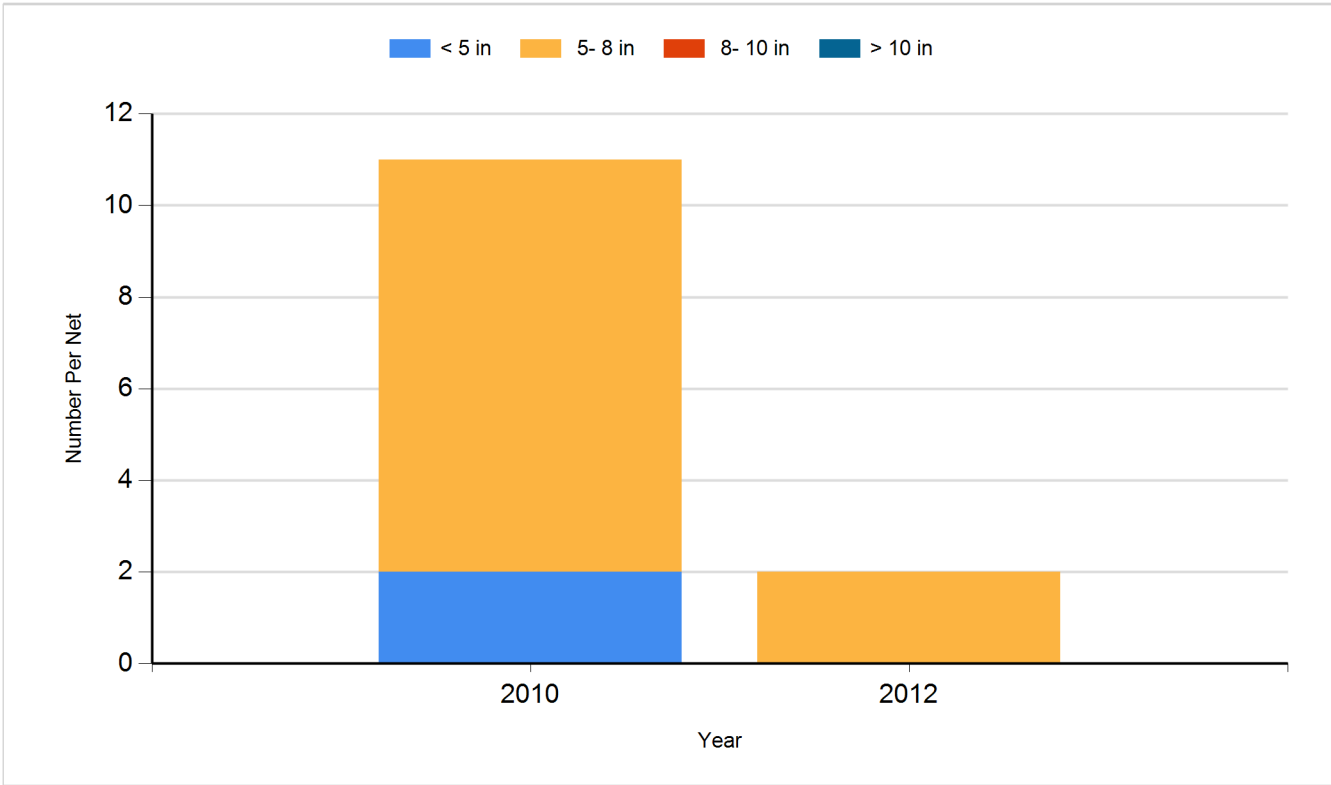
Species: White Sucker  
Gear: std exp gill net



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
2009	Largemouth Bass	Fingerling	1,000
2009	Walleye	Fingerling	46,625
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