

**SOUTH DAKOTA STATEWIDE FISHERIES SURVEY**  
**Pactola Reservoir, Pennington County**  
**RAP-Lake-1-000**  
**2024**

**Lake Information**

**Name:** Pactola Reservoir  
**County:** Pennington  
**Surface Area:** 825 Acres

**Surveys and Investigations**

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

Gear	Date	Effort
AFS std gill net	Jul 16, 2024	8 net-nights
AFS std gill net	Jul 17, 2024	8 net-nights
AFS std gill net	Jul 18, 2024	8 net-nights
boat shocker (day)	May 20, 2024	3600 seconds

## **Common Fish Species Present**

Lake Trout

Brown Trout

Rainbow Trout

Largemouth Bass

Bluegill

Black Crappie

Northern Pike

White Sucker

Yellow Perch

Rock Bass

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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	CI-80
AFS std gill net	Bluegill	112	4.7	1.9	68	6	0		95	2
	Brown Trout	9	0.4	0.2	100		100		90	5
	Golden Shiner	8	0.0	0.0						
	Lake Trout	12	0.5	0.3	100		50	25	89	4
	Largemouth Bass	1	0.0	0.1	0		0		112	
	Northern Pike	34	1.4	0.4	76	11	29	12	94	5
	Rainbow Smelt	3	0.0	0.0						
	Rainbow Trout	10	0.4	0.3	100		40		83	3
	Rock Bass	12	0.5	0.2	50	25	42	24	101	4
	White Sucker	29	1.2	0.4	100		97		97	2
	Yellow Perch	24	1.0	0.5	4		4		92	7
boat shocker (day)	Black Crappie	2	2.0	3.0	100		50			
	Largemouth Bass	5	5.0	4.2	60		20			

## 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
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
AFS std gill net	Bluegill				0.1		4.0		0.0	2.8	4.7	2.32
	Brown Trout				1.0		0.2		0.3	0.3	0.4	0.44
	Golden Shiner				0.0		0.0		0.0	0.0	0.0	0.00
	Lake Trout				2.7		0.9		1.3	0.6	0.5	1.20
	Largemouth Bass				0.0		0.1		0.0	0.0	0.0	0.02
	Northern Pike				0.3		0.9		0.3	1.3	1.4	0.84
	Rainbow Smelt				0.0		0.0		0.0	0.0	0.0	0.00
	Rainbow Trout				0.3		0.2		0.3	0.0	0.4	0.24
	Rock Bass				0.0		1.3		0.0	0.8	0.5	0.52
	White Sucker				0.8		0.9		0.3	1.2	1.2	0.88
Yellow Perch				0.2		0.8		0.0	1.5	1.0	0.70	
boat shocker (day)	Black Crappie										2.0	2.00
	Largemouth Bass										5.0	5.00
frame net (std 3/4 in)	Black Crappie		0.3		0.0					0.0		0.10
	Bluegill		61.5		24.6					102.9		63.00
	Bluegill X Gr. Sunfish Hybrid		7.3		2.5					0.0		3.27
	Green Sunfish		0.0		0.0					0.6		0.20
	Largemouth Bass		0.1		0.1					0.0		0.07
	Northern Pike		0.4		0.4					0.4		0.40
	Rainbow Trout		0.0		0.4					0.0		0.13
	Rock Bass		22.1		22.5					15.8		20.13
	Rudd		0.0		0.3					0.0		0.10
	White Sucker		0.0		0.0					0.1		0.03
Yellow Perch		0.4		0.3					2.4		1.03	
std exp gill net	Bluegill		4.0									4.00
	Brown Trout		1.1									1.10
	Lake Trout		3.0									3.00
	Northern Pike		0.5									0.50
	Rainbow Smelt		0.0									0.00
	Rainbow Trout		0.2									0.20
	Rock Bass		1.5									1.50
	Rudd		0.0									0.00
White Sucker		0.2									0.20	

CPUE

Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
std exp gill net	Yellow Perch		0.2									0.20
suspended gill net*	Bluegill									0.1		0.10
	Brown Trout									0.4		0.40
	Lake Trout									1.0		1.00
	Northern Pike									0.3		0.30
	Rock Bass									0.1		0.10
	White Sucker									0.1		0.10
	Yellow Perch									0.5		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												
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024			
AFS std gill net	Bluegill	PSD				100		72				64	68		
		PSD-P				0		2				2	0		
		Wr				92		86					92	95	
	Brown Trout	PSD				91		100				0	100	100	
		PSD-P				22		75				0	100	100	
		Wr				79		75				88	77	90	
	Lake Trout	PSD				88		81				100	100	100	
		PSD-P				17		43				80	80	50	
		Wr				83		92				96	97	89	
	Largemouth Bass	PSD										0		0	
		PSD-P										0		0	
		Wr										107		112	
	Northern Pike	PSD				71		77				100	65	76	
		PSD-P				29		14				0	25	29	
		Wr				92		92				95	90	94	
	Rainbow Trout	PSD				71		100				100		100	
		PSD-P				0		0				0		40	
		Wr				81		80				88		83	
	Rock Bass	PSD										77		69	50
		PSD-P										57		54	42
		Wr										87		83	101
White Sucker	PSD				100		100				100	100	100		
	PSD-P				100		100				100	95	97		
	Wr				100		92				102	96	97		
Yellow Perch	PSD				20		50					8	4		
	PSD-P				0		5					0	4		
	Wr				87		85					82	92		
boat shocker (day)	Black Crappie	PSD												100	
		PSD-P												50	
	Largemouth Bass	PSD												60	
		PSD-P												20	
frame net (std 3/4 in)	Black Crappie	PSD				100									



Gear	Species	Index	Year										
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
frame net (std 3/4 in)	Black Crappie	PSD-P		0									
		Wr		79									
	Bluegill	PSD		34		90						22	
		PSD-P		0		11						2	
		Wr		98		97						92	
	Largemouth Bass	PSD		0		0							
		PSD-P		0		0							
		Wr		96		107							
	Northern Pike	PSD		0		67						33	
		PSD-P		0		0						0	
		Wr		84		105						86	
	Rainbow Trout	PSD				33							
		PSD-P				0							
		Wr				70							
	Rock Bass	PSD		45		48						38	
		PSD-P		7		15						14	
		Wr		89		105						91	
	White Sucker	PSD										100	
		PSD-P										100	
		Wr										102	
	Yellow Perch	PSD		100		100						32	
PSD-P			0		0						11		
Wr			84		81						86		
std exp gill net	Bluegill	PSD		52									
		PSD-P		0									
		Wr		93									
	Brown Trout	PSD		23									
		PSD-P		0									
		Wr		76									
	Lake Trout	PSD		17									
		PSD-P		6									
		Wr		89									
	Northern Pike	PSD		67									
		PSD-P		50									
		Wr		109									
	Rainbow Trout	PSD		0									
		PSD-P		0									

Gear	Species	Index	Year											
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
std exp gill net	Rainbow Trout	Wr		71										
		PSD		39										
		PSD-P		22										
	White Sucker	Wr		84										
		PSD		100										
		PSD-P		100										
	Yellow Perch	Wr		92										
		PSD		0										
		PSD-P		0										
	suspended gill net	Bluegill	Wr											
PSD											100			
PSD-P											0			
Brown Trout		Wr											79	
		PSD											100	
		PSD-P											100	
Lake Trout		Wr												81
		PSD												100
		PSD-P												88
Northern Pike		Wr												92
		PSD												100
		PSD-P												0
Rock Bass		Wr												82
		PSD												100
		PSD-P												0
White Sucker		Wr												93
		PSD												100
		PSD-P												100
Yellow Perch	Wr												98	
	PSD												0	
	PSD-P												0	
		Wr											85	

## Length at Capture

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

Species: Lake Trout

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	53				384 (1)	398 (1)	513 (8)	544 (14)	551 (12)	573 (8)	617 (10)

## **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).

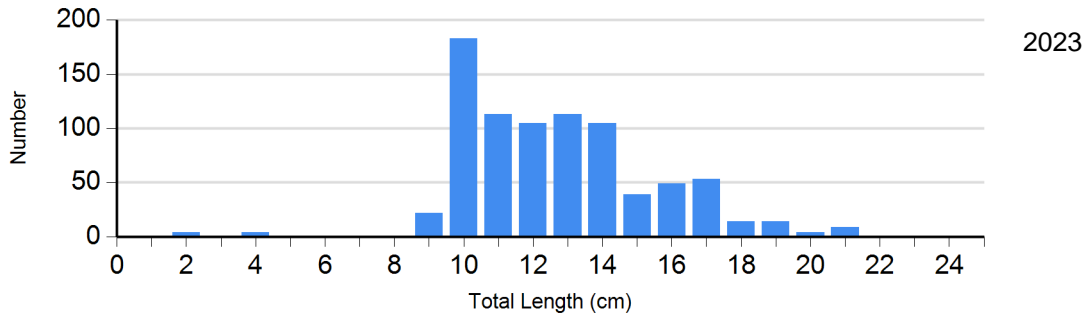
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2023	641	94 (0.7)	169	87 (1.0)	13	91	0	
Brown Trout Gill Net	2020	0		1	73	3	76 (2.3)	0	
	2022	1	88	0		0		0	
	2023	0		0		2	67 (3.6)	2	86 (13.9)
	2023	0		0		2	76 (9.5)	1	91
	2024	0		0		4	91 (6.4)	5	88 (5.1)
Lake Trout Gill Net	2020	4	89 (1.4)	8	86 (2.3)	7	97 (4.2)	2	108 (0.4)
	2022	0		1	118	2	93 (8.9)	2	87 (15.4)
	2023	0		1	84	7	93 (3.3)	0	
	2023	0		2	84 (8.5)	8	101 (3.3)	0	
	2024	0		6	90 (3.9)	3	96 (5.1)	3	78 (10.2)
Northern Pike Gill Net	2020	5	96 (11.1)	14	90 (3.1)	2	94 (0.7)	1	100
	2022	0		1	95	0		0	
	2023	0		2	82 (3.8)	0		0	
	2023	7	84 (3.0)	8	94 (2.2)	4	91 (3.2)	1	
	2024	8	101 (11.5)	16	92 (1.9)	7	87 (13.6)	3	97 (5.0)
Rainbow Trout Gill Net	2020	0		4	80 (3.0)	0		0	
	2022	0		1	88	0		0	
	2024	0		6	81 (3.7)	4	85 (2.2)	0	
White Sucker Gill Net	2020	0		0		3	95 (3.7)	19	92 (2.2)
	2022	0		0		0		1	102
	2023	0		0		0		1	98
	2023	0		1	104	0		18	95 (2.4)

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
White Sucker Gill Net	2024	0		1	100	0		28	97 (1.6)
Yellow Perch Gill Net	2020	10	87 (2.2)	9	84 (3.5)	1	80	0	
	2023	22	82 (1.5)	2	83 (1.6)	0		0	
	2023	4	85 (3.9)	0		0		0	
	2024	22	96 (3.4)	0		0		1	3

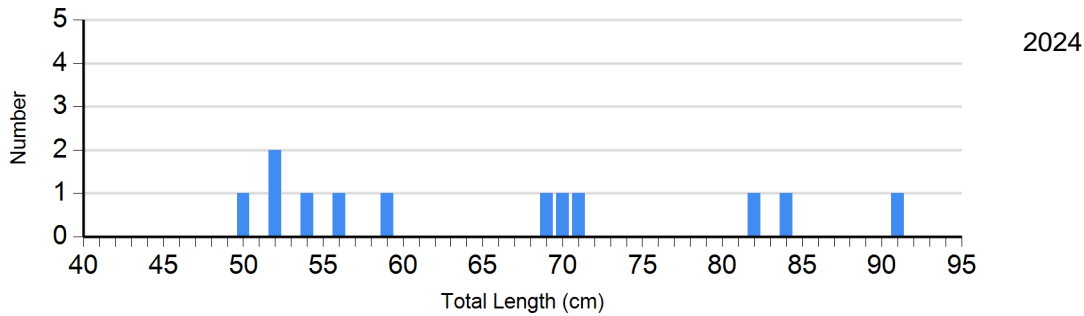
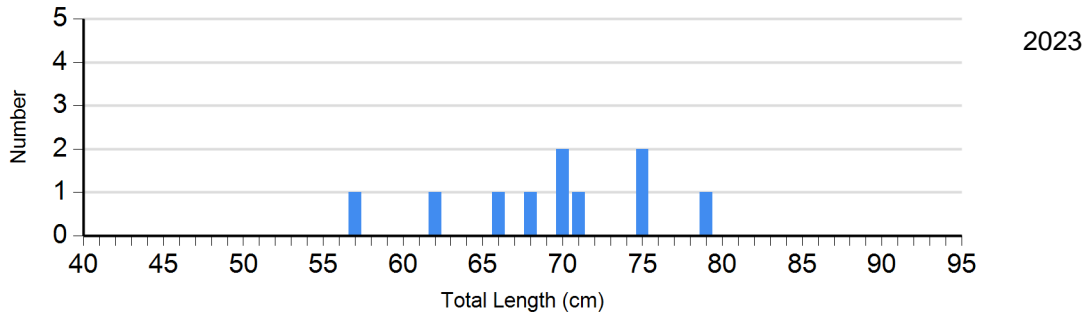
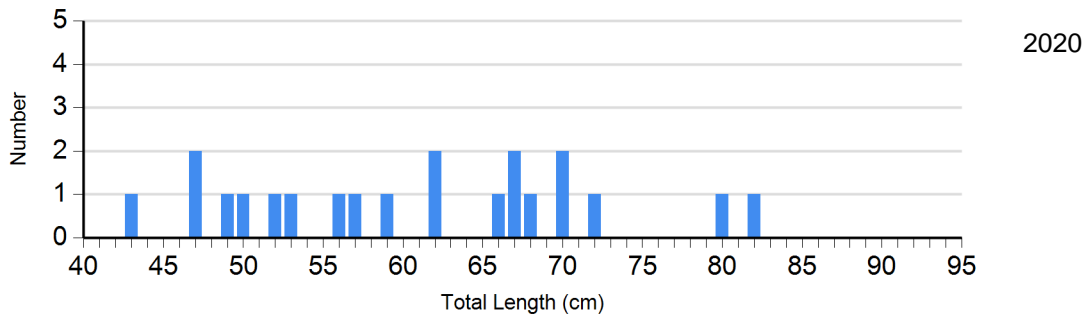
# Length Frequency Distribution

Length frequency histogram of species sampled by year.

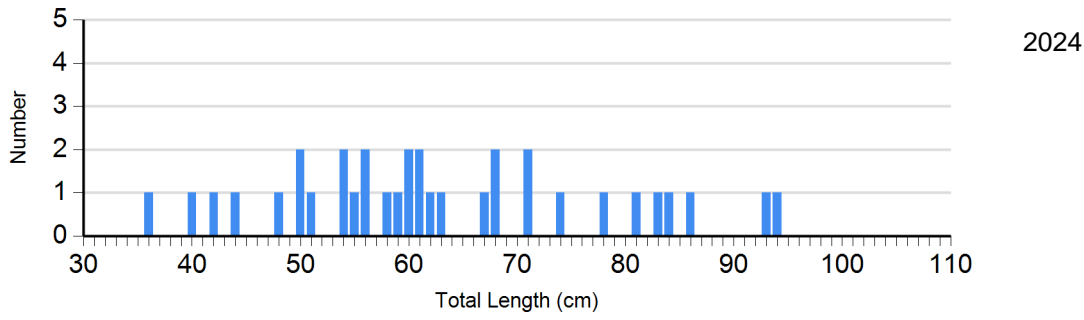
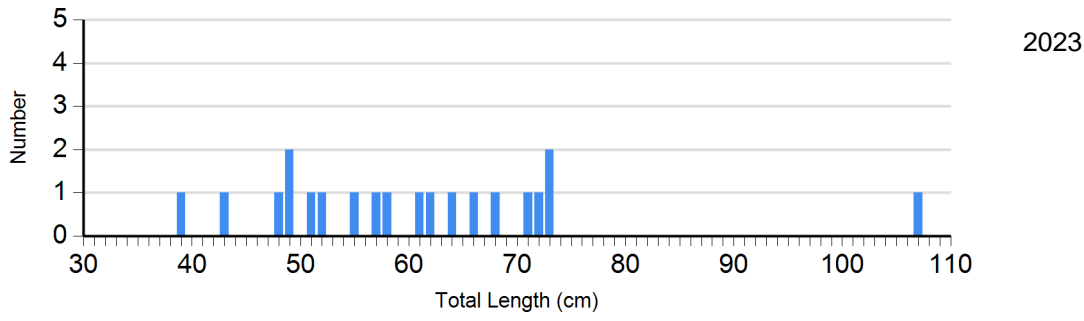
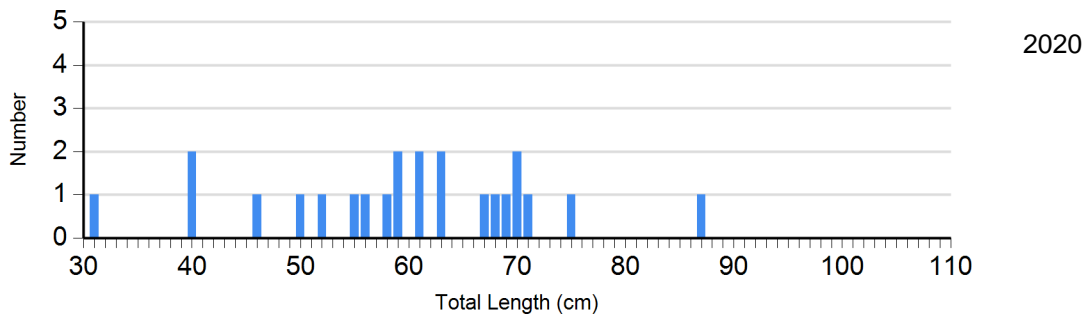
Species: Bluegill  
Gear: frame net (std 3/4 in)



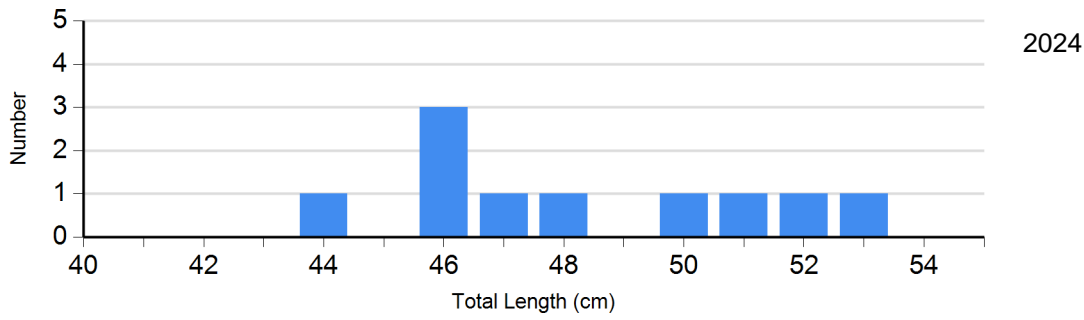
Species: Lake Trout  
Gear: AFS std gill net



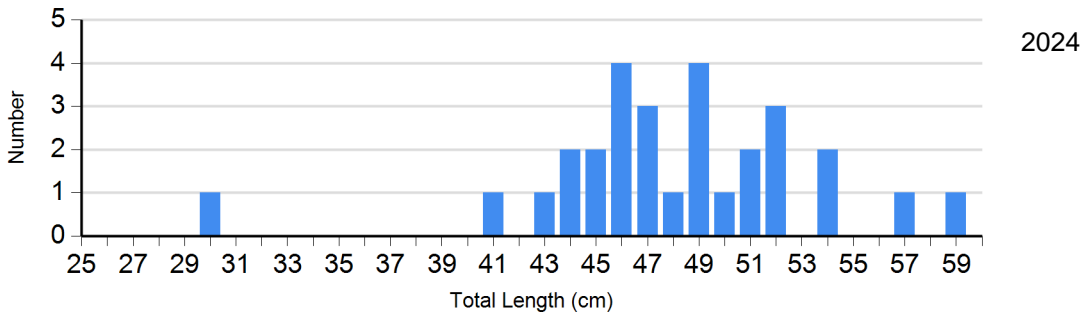
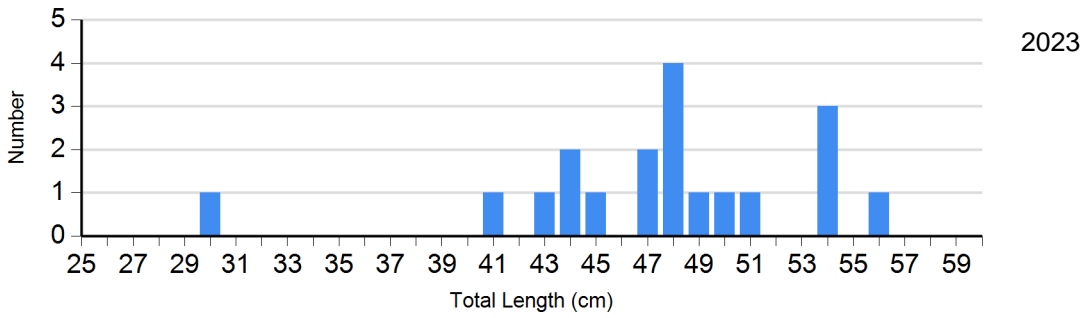
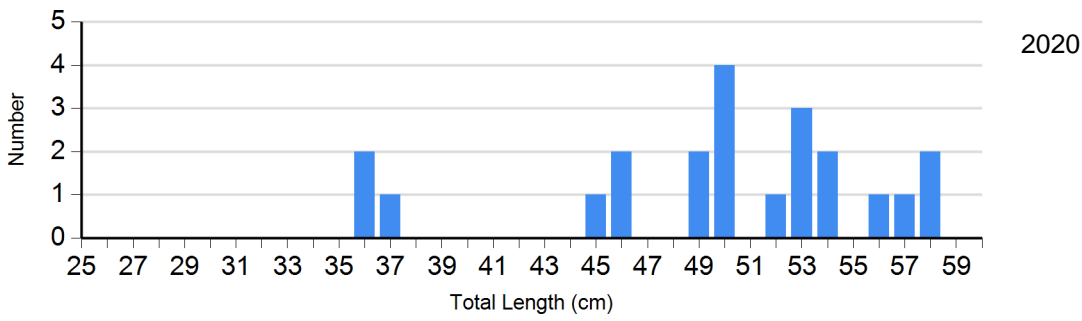
Species: Northern Pike  
Gear: AFS std gill net



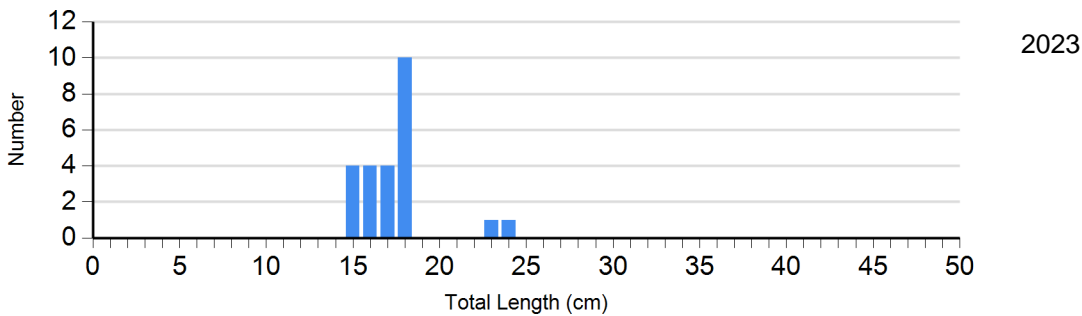
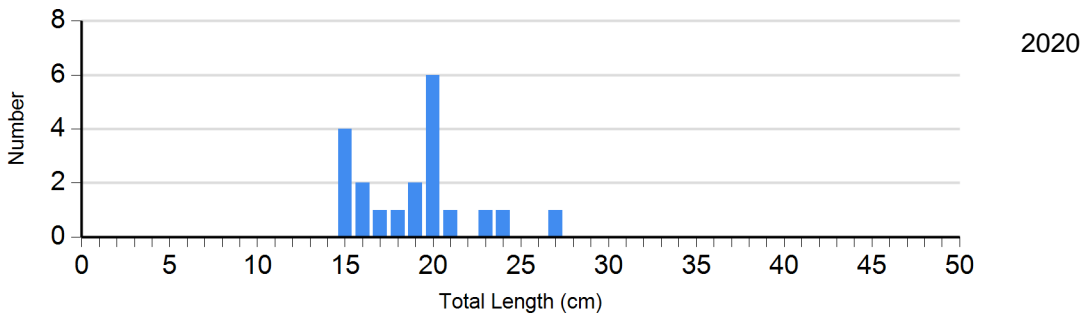
Species: Rainbow Trout  
Gear: AFS std gill net



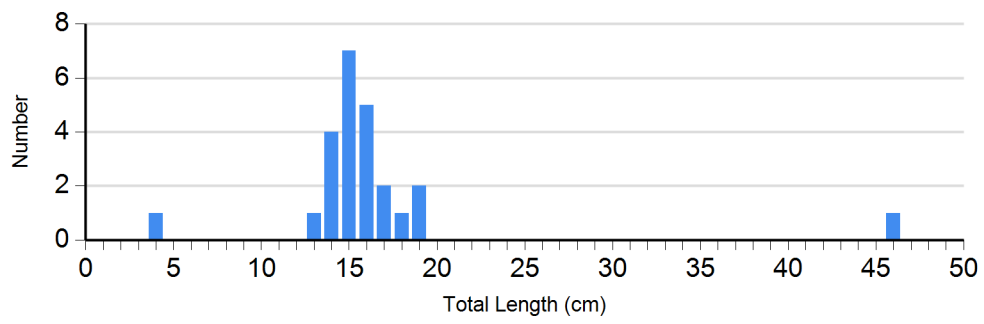
Species: White Sucker  
 Gear: AFS std gill net



Species: Yellow Perch  
 Gear: AFS std gill net





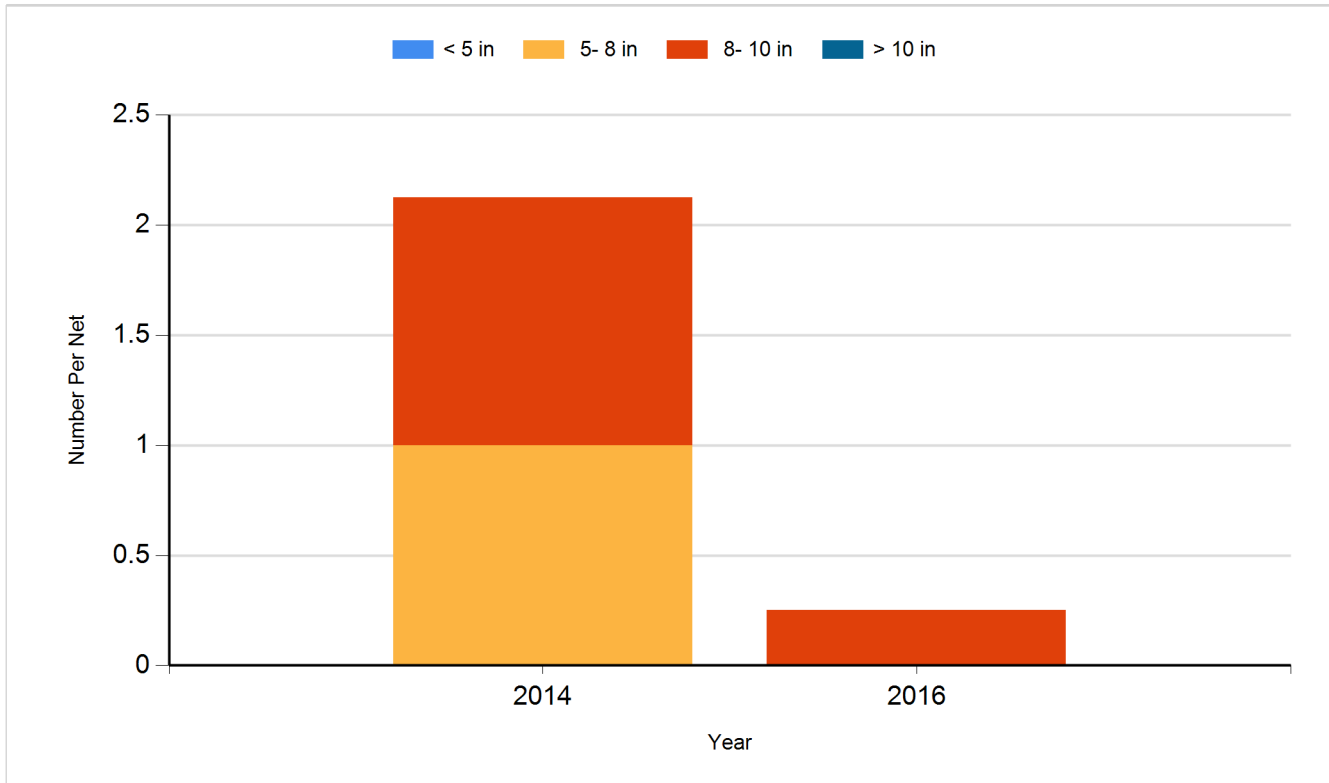


2024

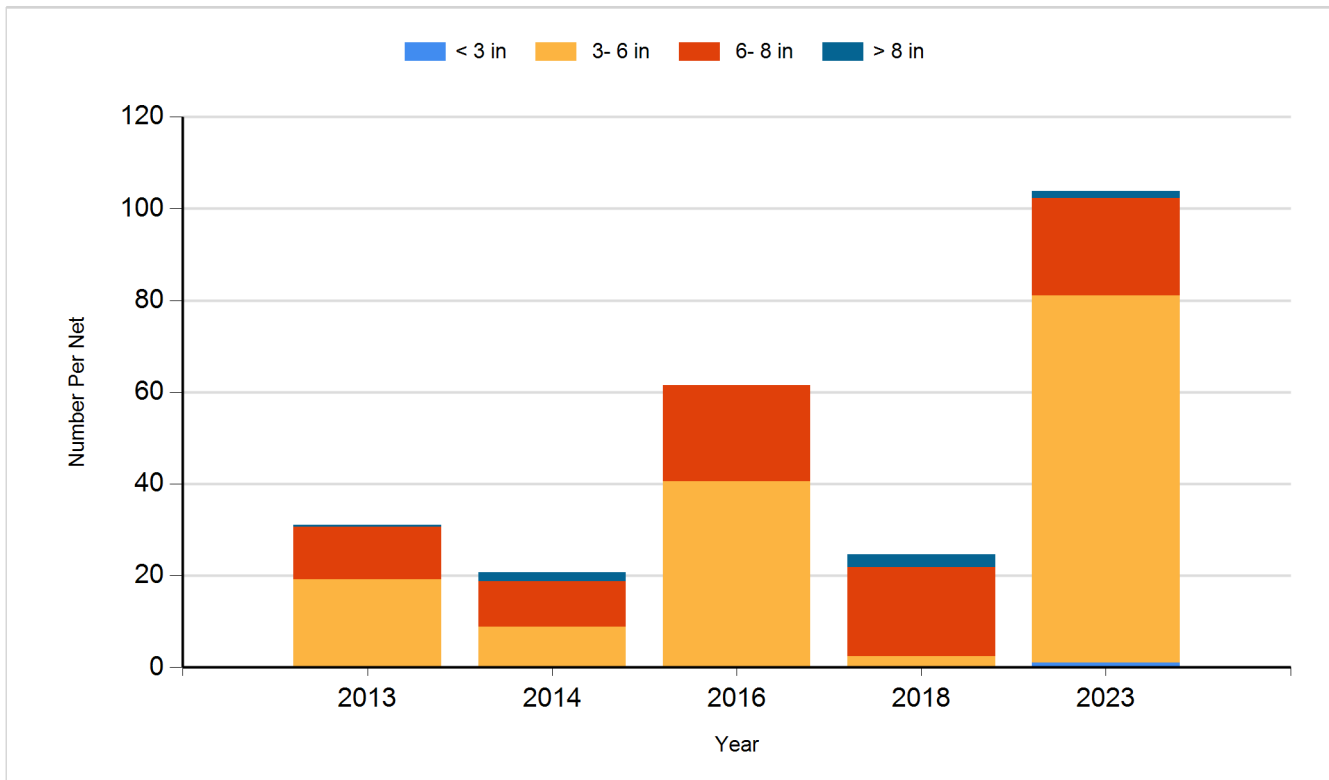
## Historic Fish Sizes and Relative Abundance

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

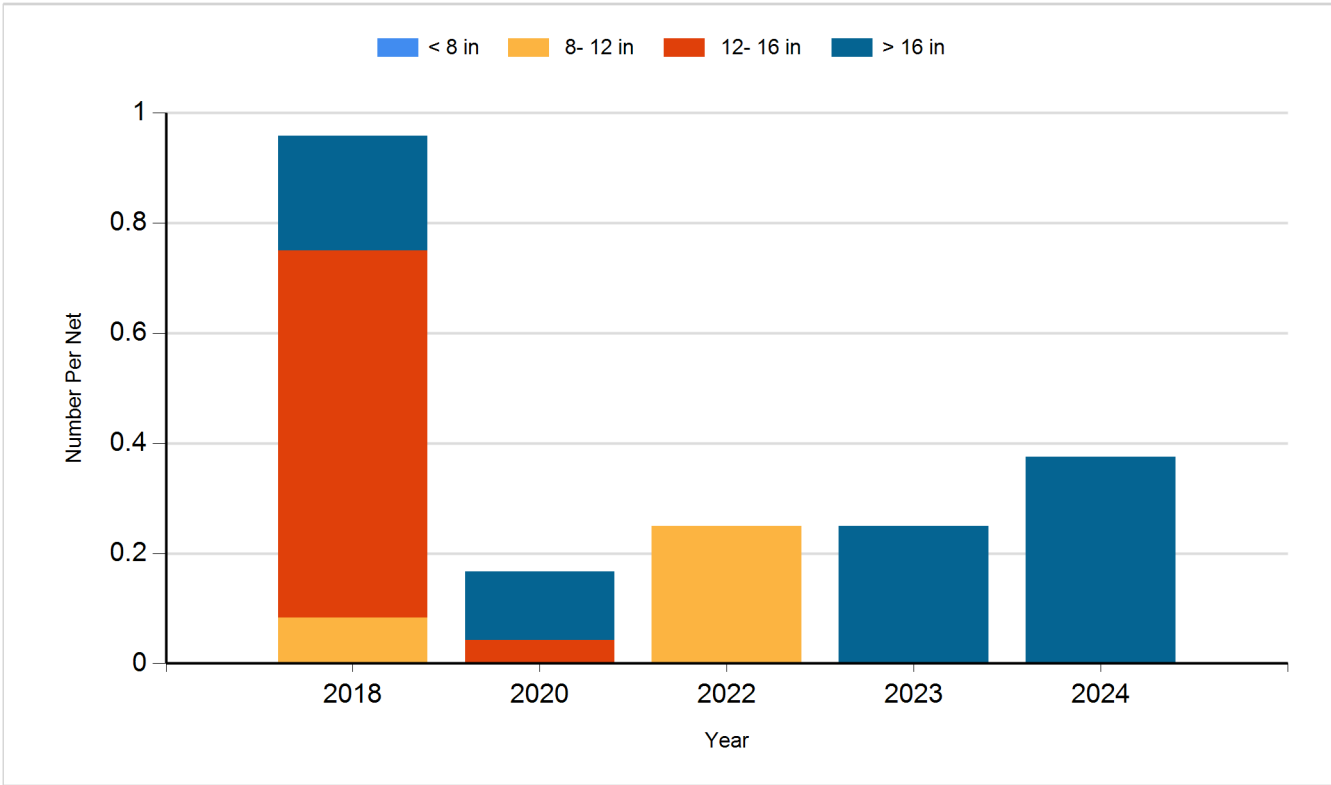
Species: Black Crappie  
Gear: frame net (std 3/4 in)



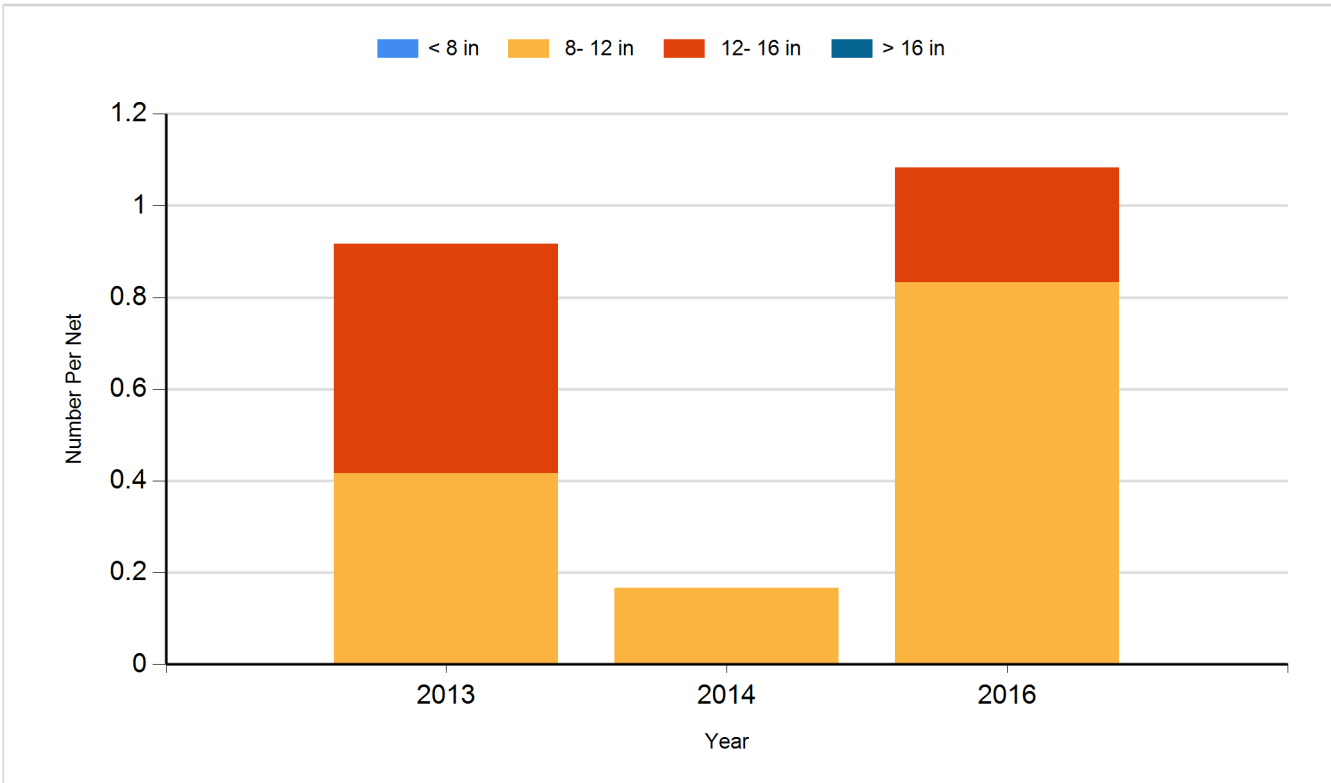
Species: Bluegill  
Gear: frame net (std 3/4 in)



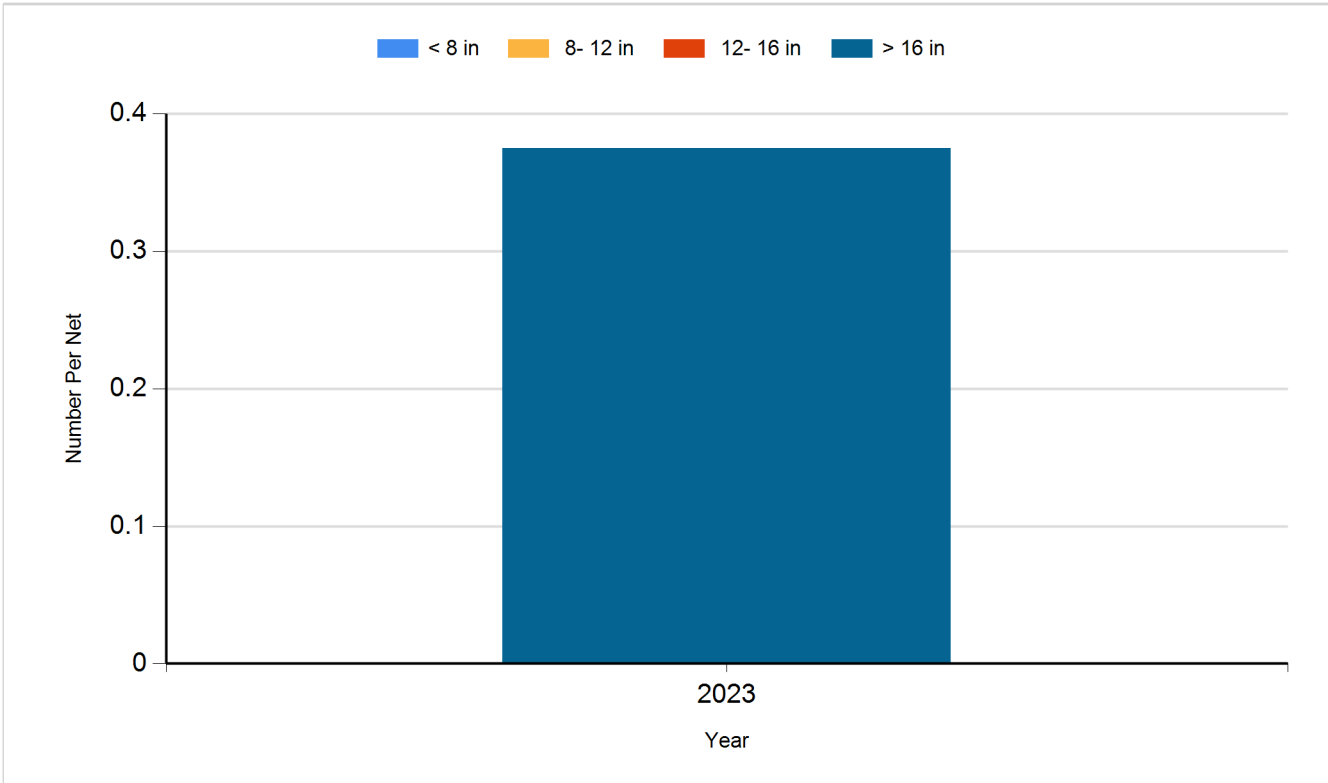
Species: Brown Trout  
Gear: AFS std gill net



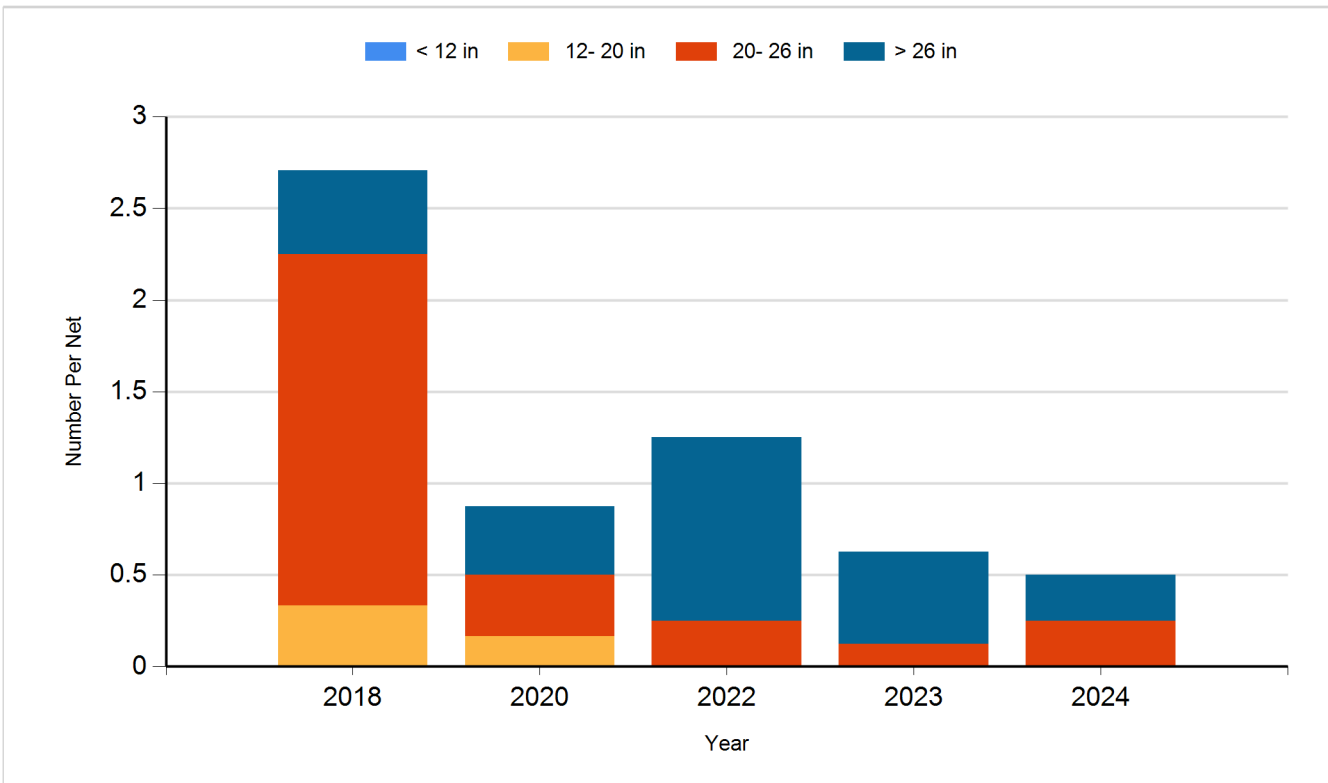
Species: Brown Trout  
Gear: std exp gill net



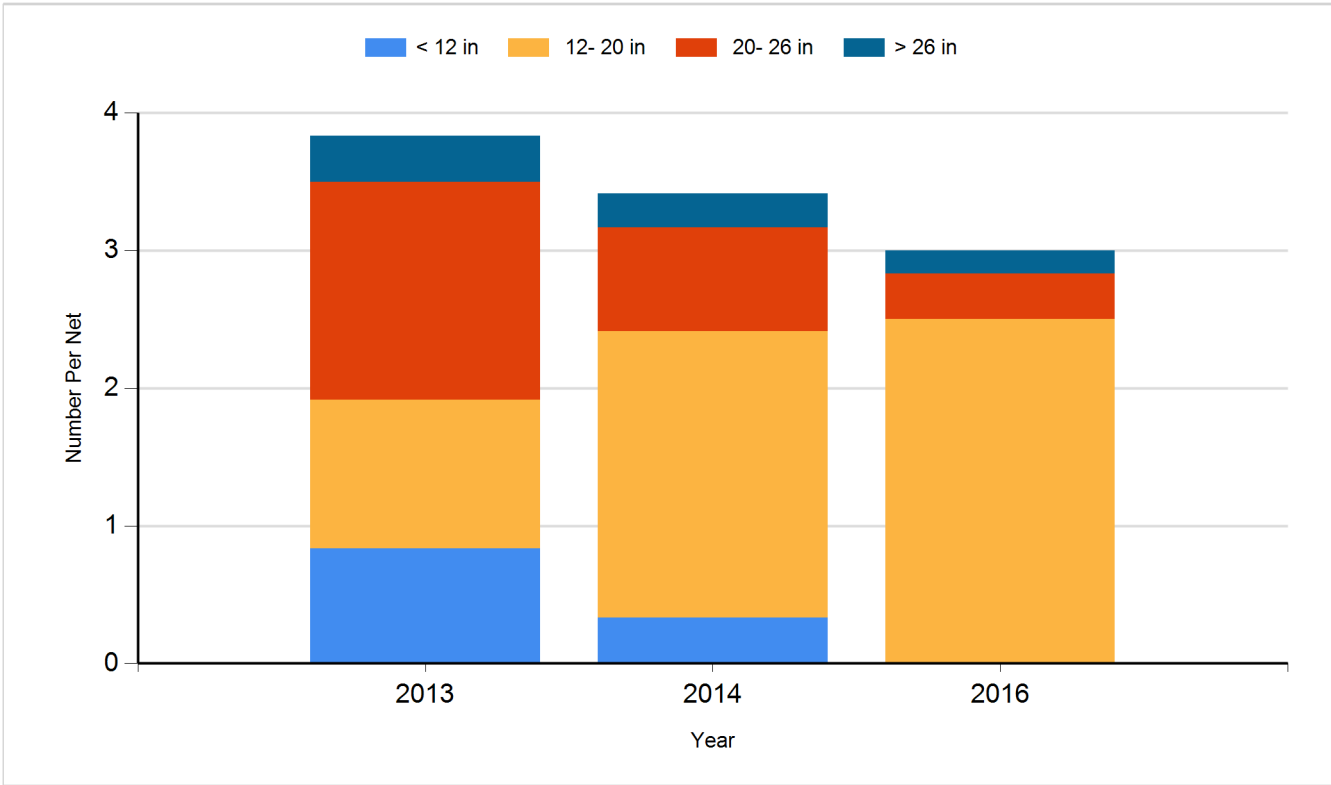
Species: Brown Trout  
Gear: suspended gill net



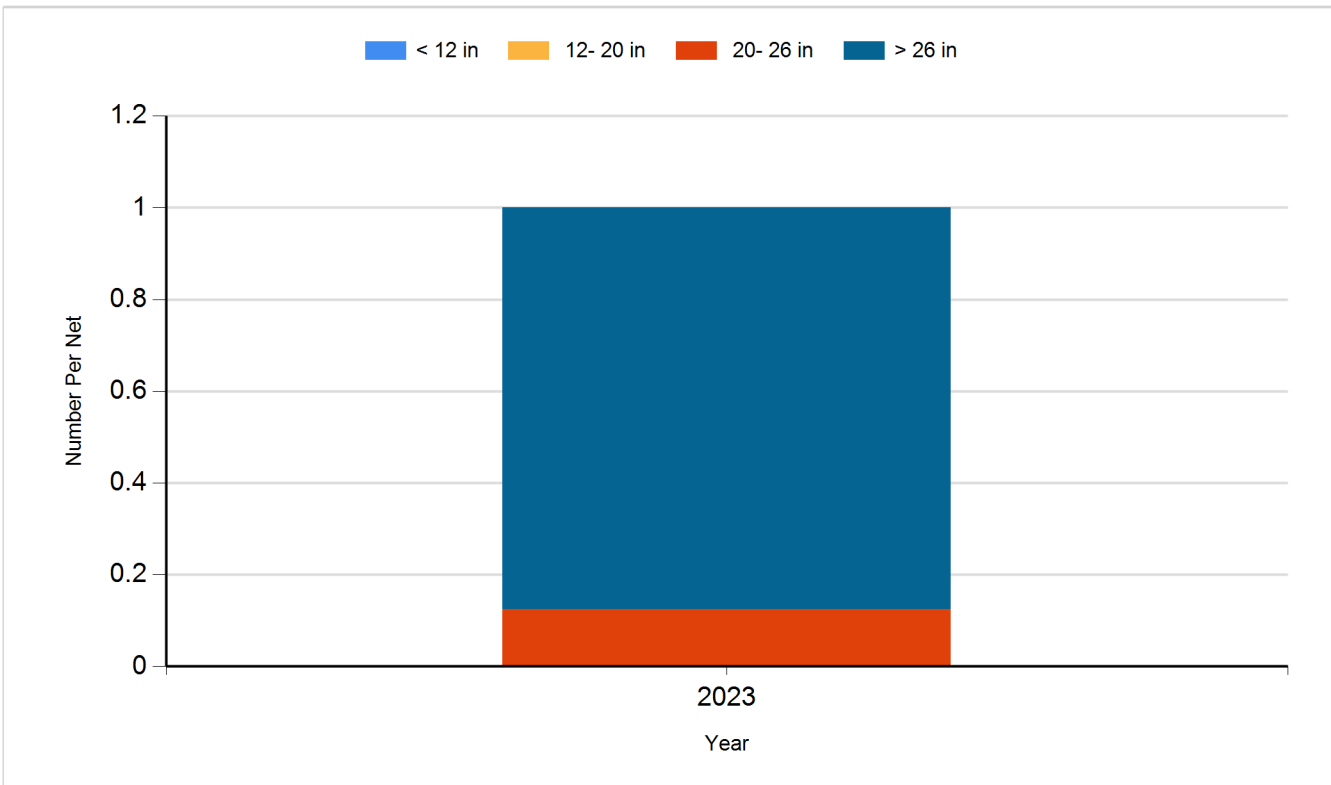
Species: Lake Trout  
Gear: AFS std gill net



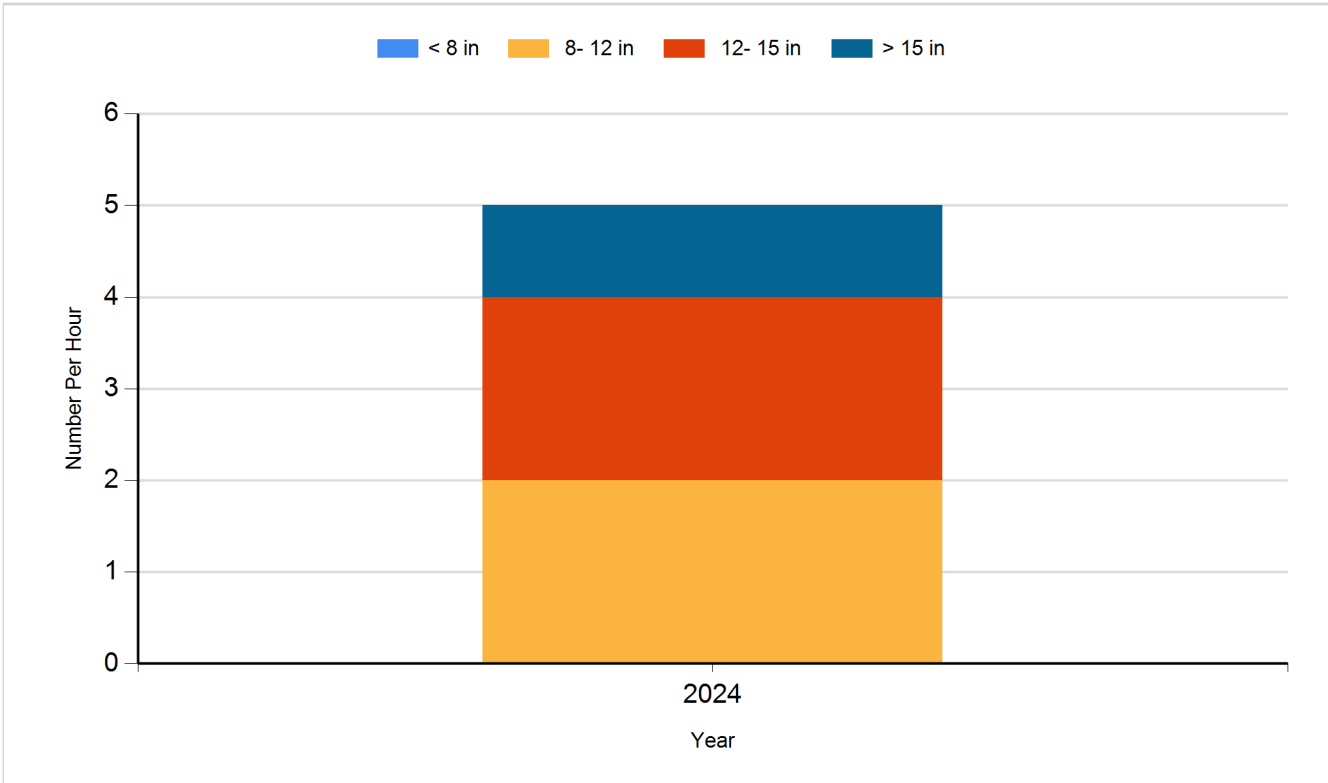
Species: Lake Trout  
Gear: std exp gill net



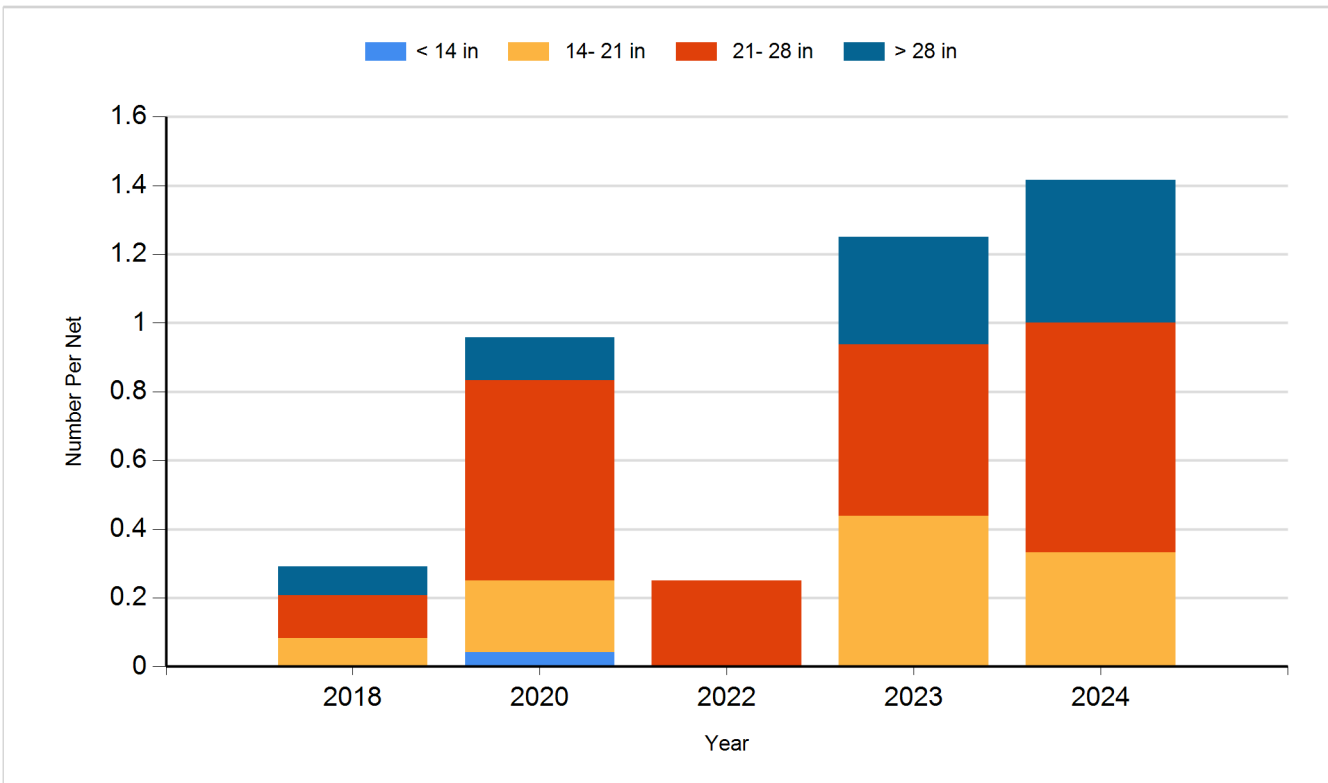
Species: Lake Trout  
Gear: suspended gill net



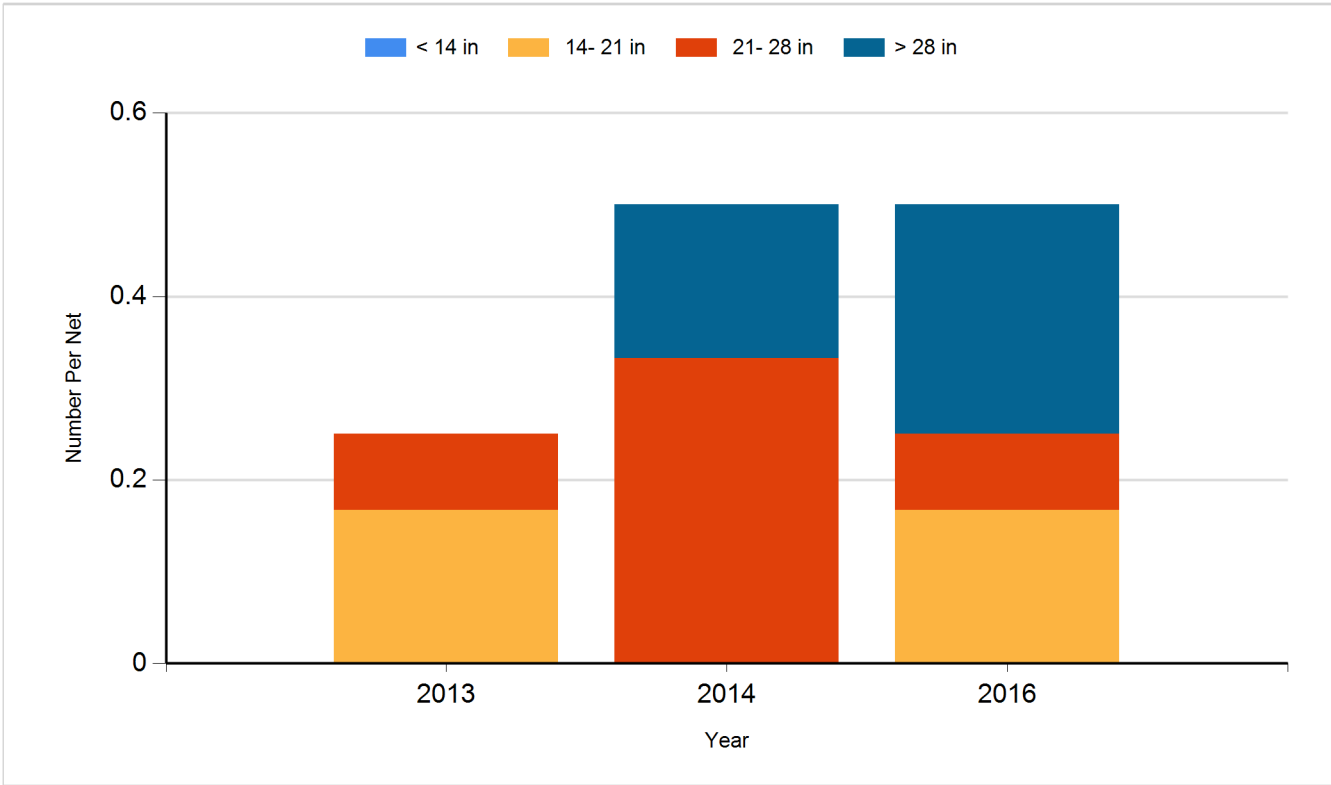
Species: Largemouth Bass  
Gear: boat shocker (day)



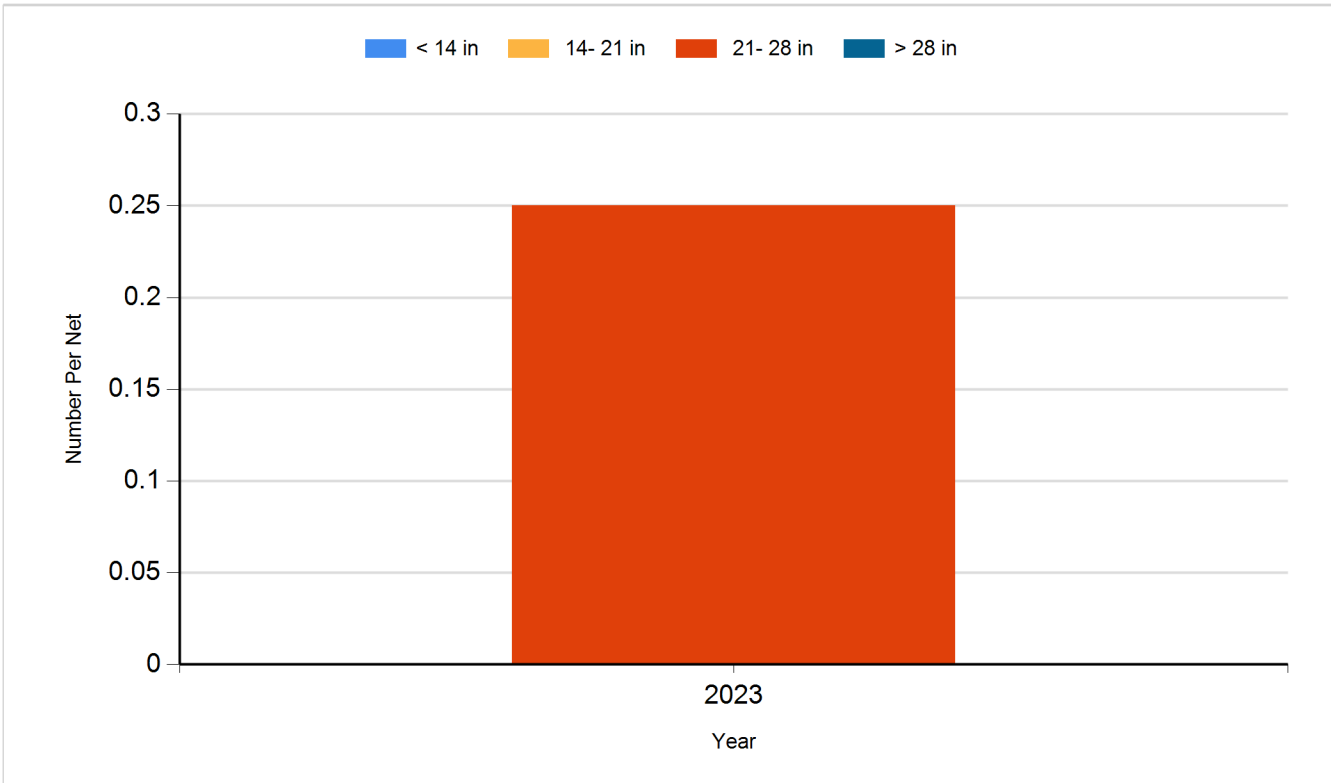
Species: Northern Pike  
Gear: AFS std gill net



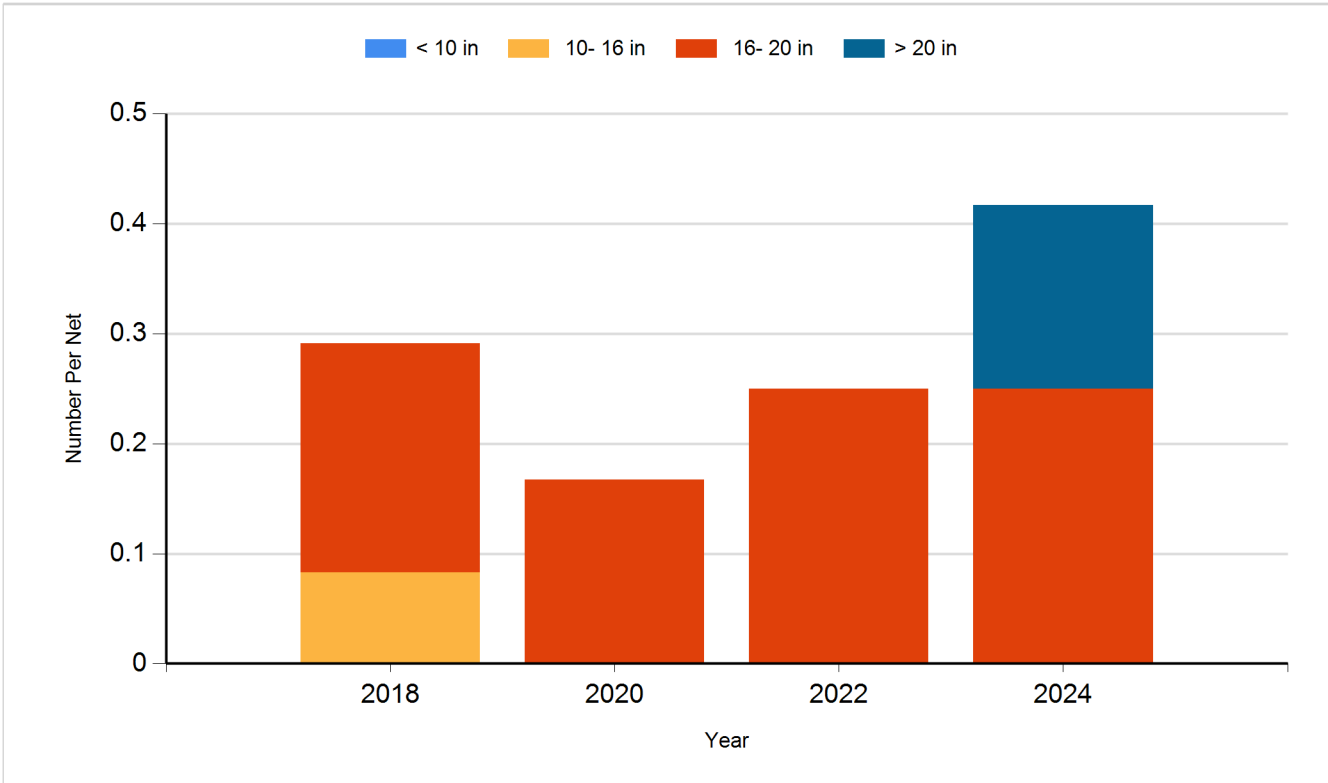
Species: Northern Pike  
Gear: std exp gill net



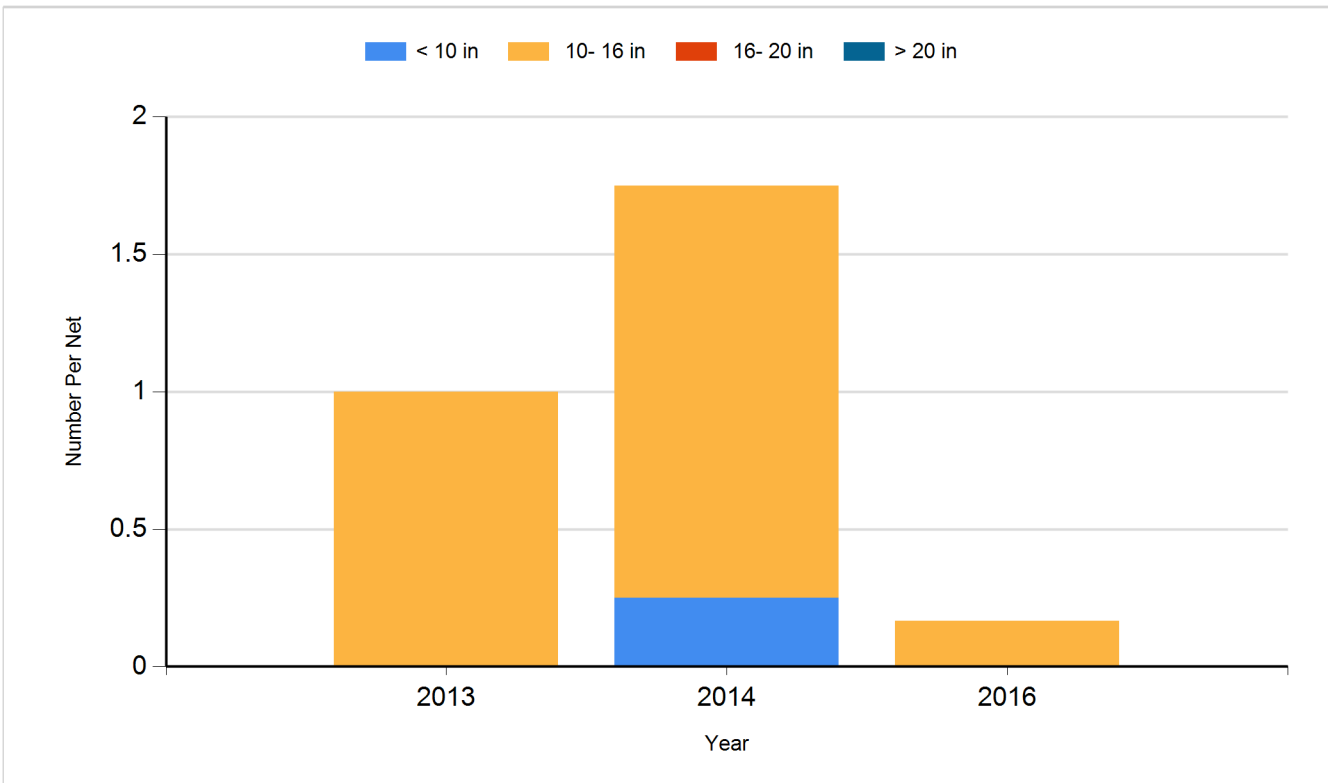
Species: Northern Pike  
Gear: suspended gill net



Species: Rainbow Trout  
Gear: AFS std gill net

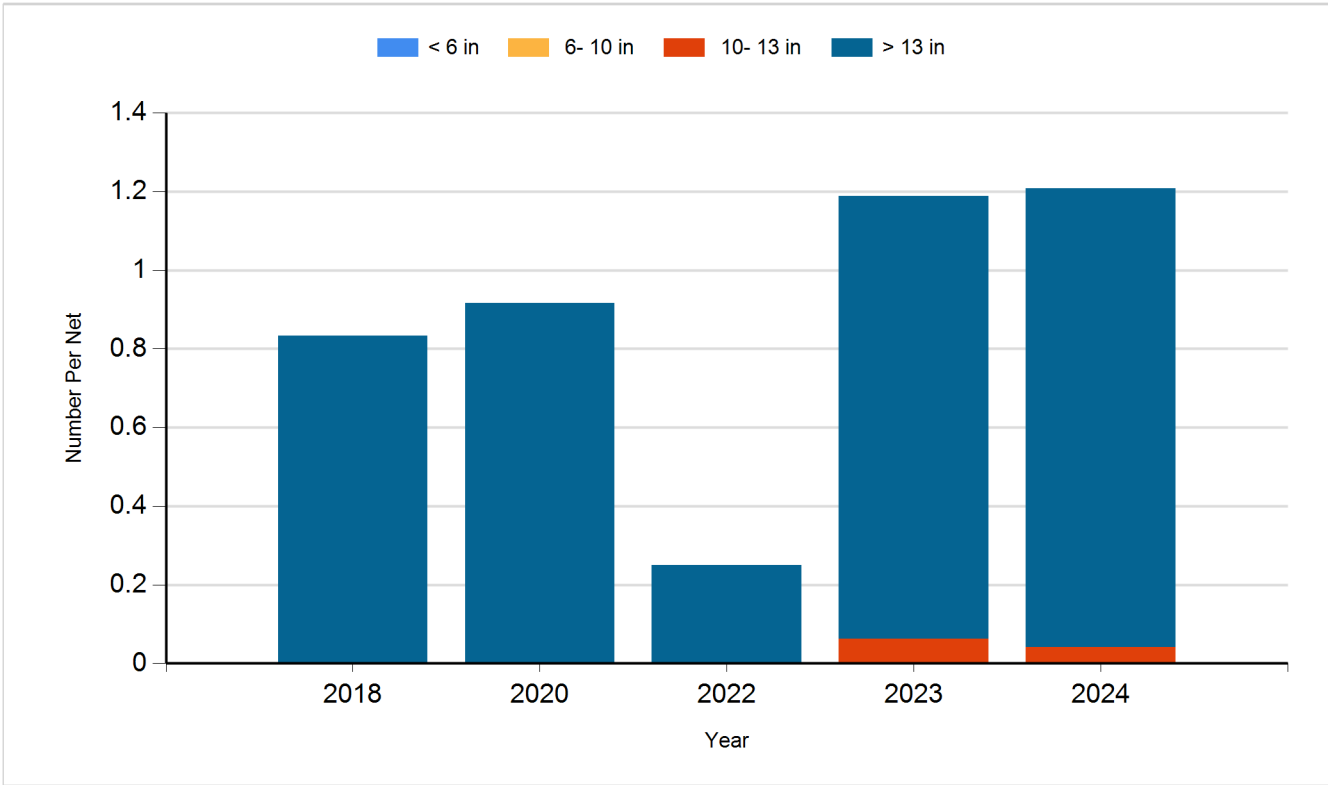


Species: Rainbow Trout  
Gear: std exp gill net

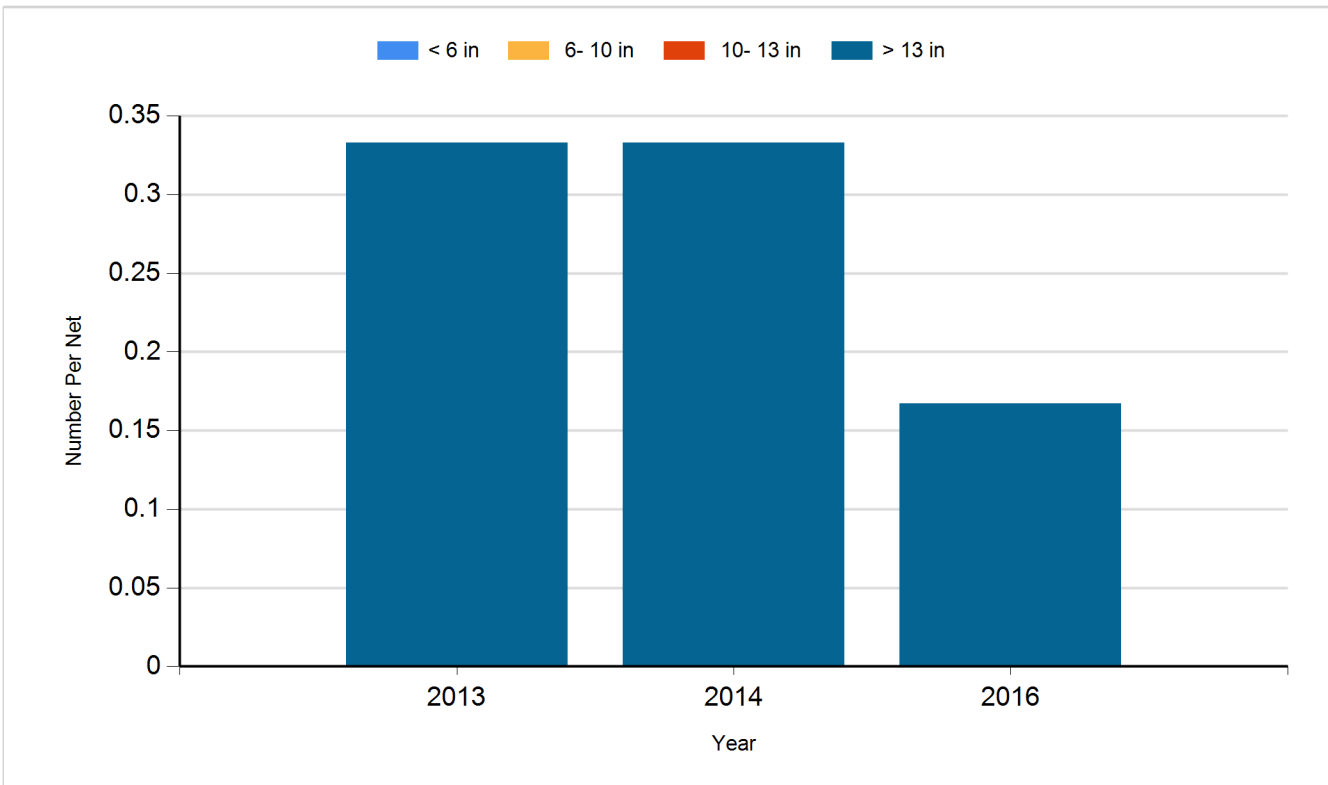




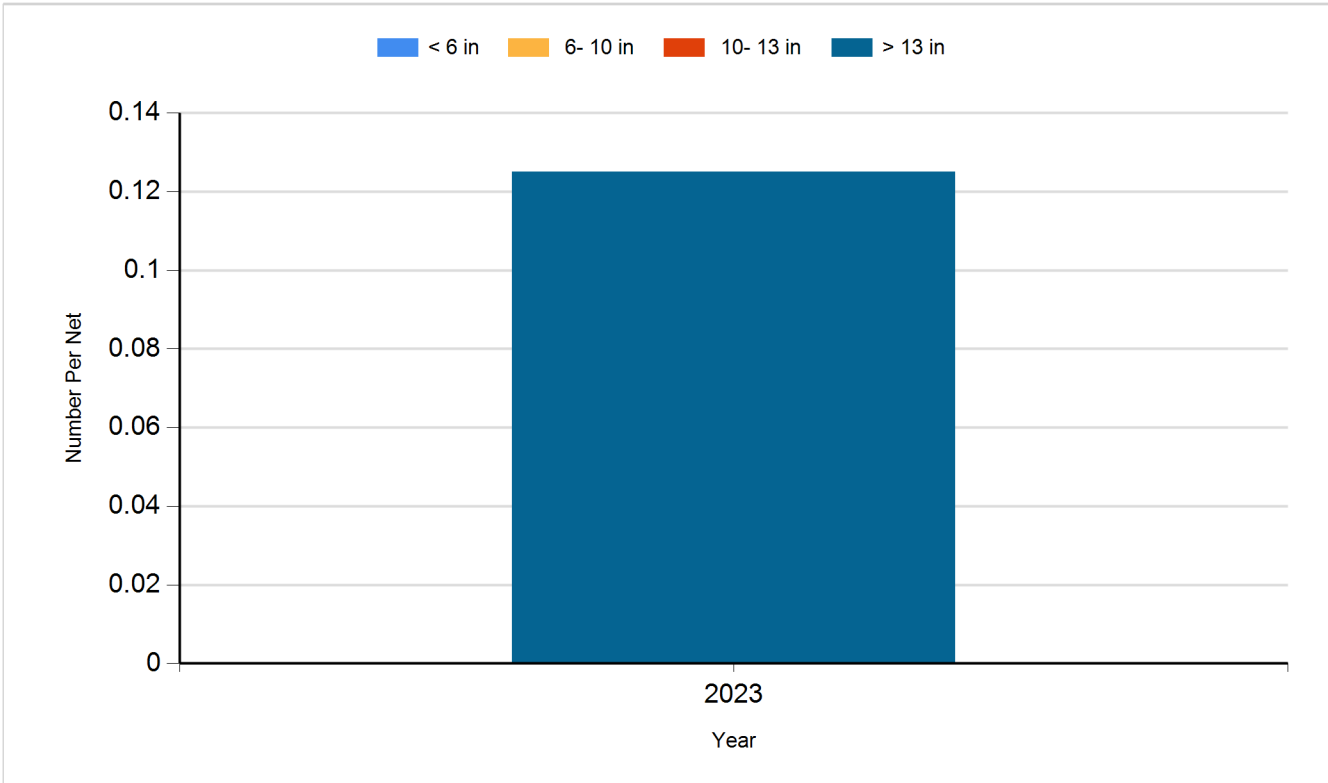
Species: White Sucker  
Gear: AFS std gill net



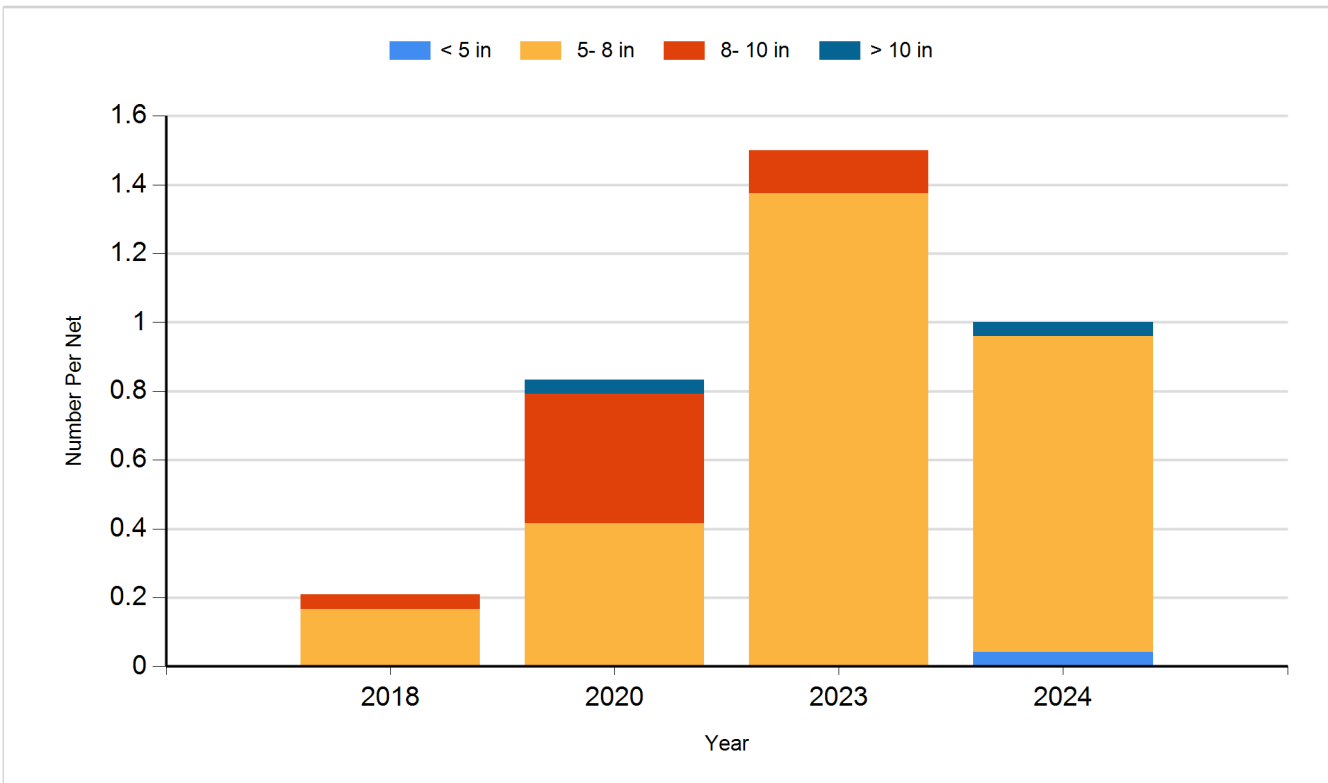
Species: White Sucker  
Gear: std exp gill net



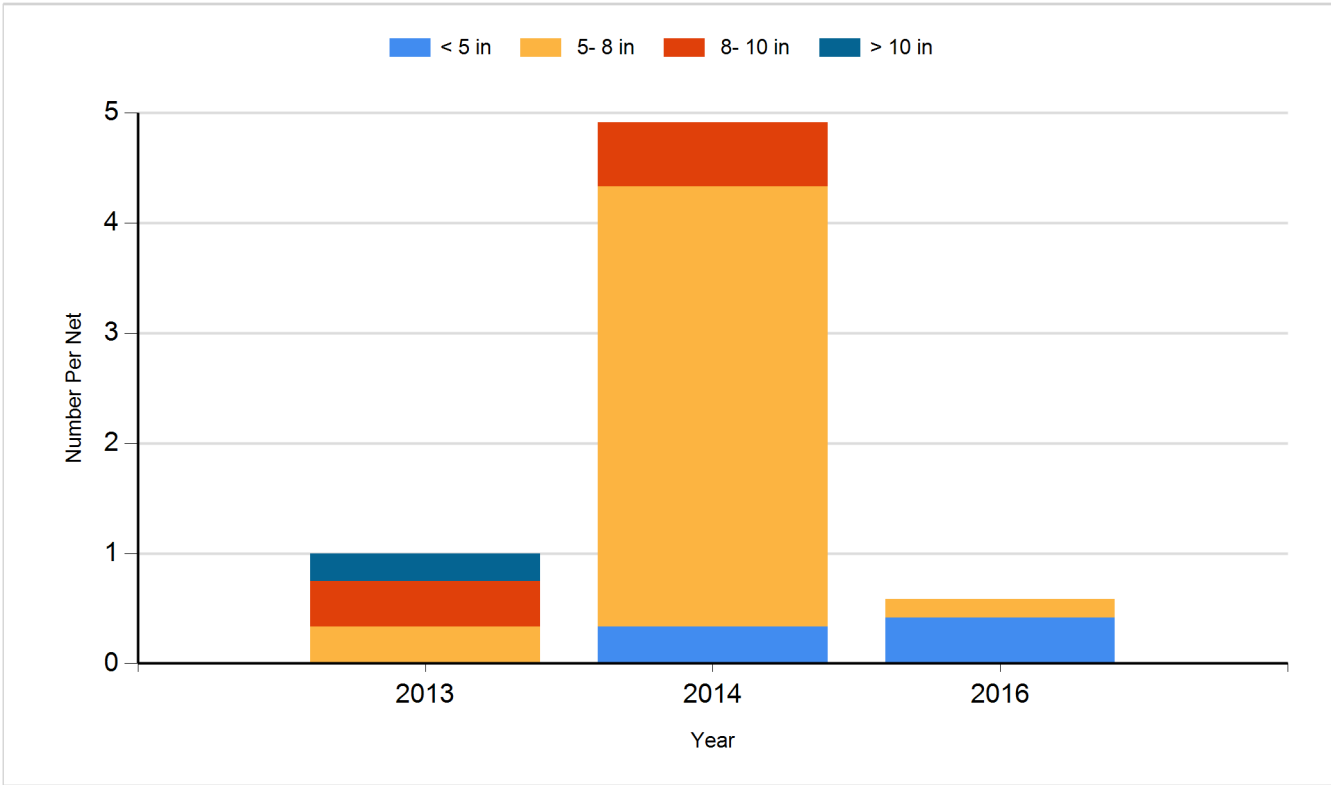
Species: White Sucker  
Gear: suspended gill net



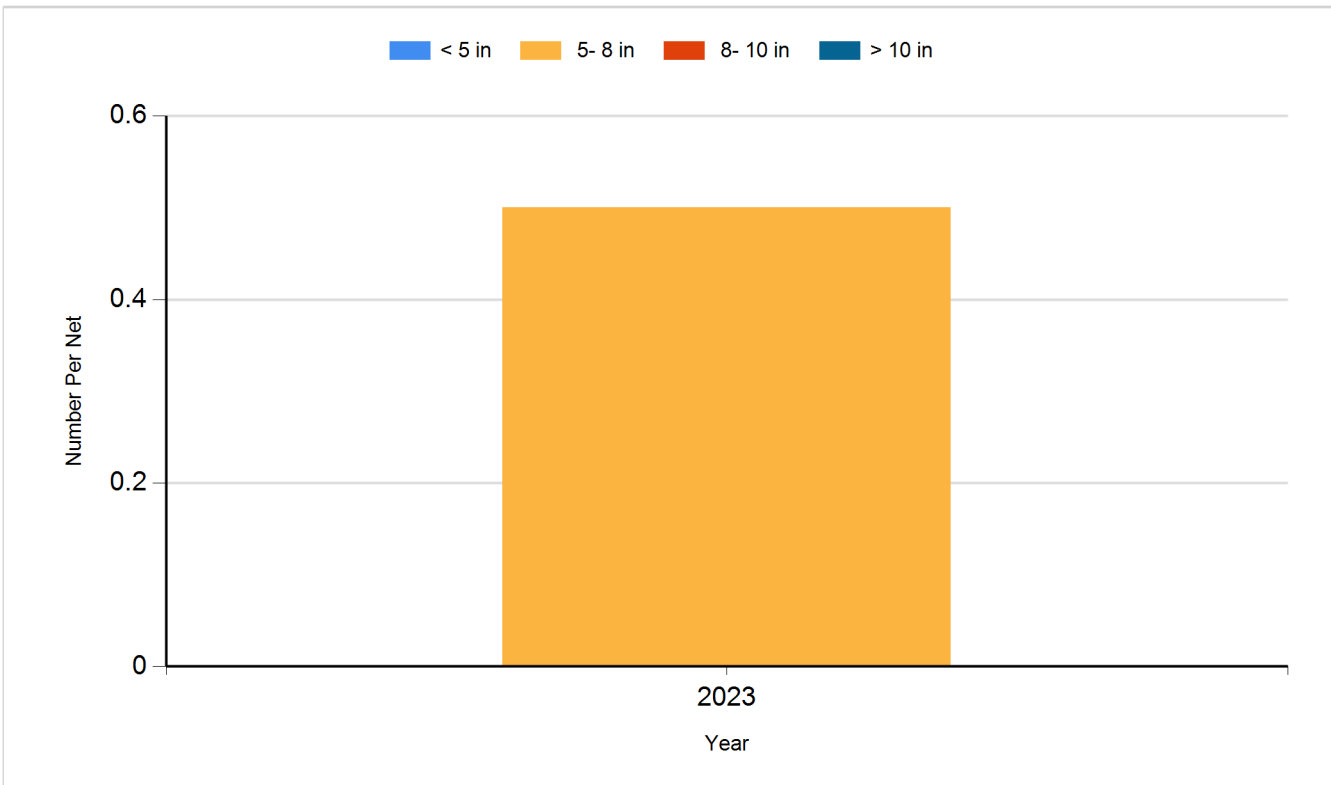
Species: Yellow Perch  
Gear: AFS std gill net



Species: Yellow Perch  
Gear: std exp gill net



Species: Yellow Perch  
Gear: suspended gill net



## **Fish Stocking**

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

Year	Species	Size	Number
2013	Rainbow Trout (McConaugRainbow Trout	Catchable 11"	12,324
2013	Rainbow Trout (Shasta)	Catchable 11"	17,400
2013	Rainbow Trout (Shasta)	Catchable 15"	129
2014	Rainbow Trout (Erwin x Arlee)	Catchable 11"	880
2014	Rainbow Trout (Erwin x Arlee)	Catchable 15"	354
2014	Rainbow Trout (McConaugRainbow Trout	Catchable 11"	699
2014	Rainbow Trout (Shasta)	Catchable	1,369
2014	Rainbow Trout (Shasta)	Catchable 11"	26,950
2015	Brown Trout	Fingerling	4,000
2015	Lake Trout	Adult	97
2015	Rainbow Trout (Erwin x Arlee)	Catchable 11"	1,356
2015	Rainbow Trout (Erwin x Arlee)	Catchable 15"	206
2015	Rainbow Trout (Erwin x Arlee)	Fingerling	15,236
2015	Rainbow Trout (Shasta)	Catchable 11"	28,727
2016	Brown Trout (Plymouth Rock)	Catchable 11"	8,000
2016	Rainbow Trout (Ennis)	Catchable 11"	9,482
2016	Rainbow Trout (Ennis)	Catchable 15"	3,079
2016	Rainbow Trout (Shasta)	Catchable 11"	9,816
2017	Brown Trout (Plymouth Rock)	Catchable	10,346
2017	Rainbow Trout (Erwin x Arlee)	Catchable 15"	12,337
2017	Rainbow Trout (Shasta)	Catchable 15"	11,415
2018	Brown Trout (Plymouth Rock)	Catchable	3,009
2018	Rainbow Trout (Erwin x Arlee)	Catchable	4,924
2018	Rainbow Trout (Erwin x Arlee)	Catchable 15"	2,622
2018	Rainbow Trout (Erwin x Arlee)	Fingerling	28,579
2018	Rainbow Trout (Shasta)	Catchable	5,131
2018	Rainbow Trout (Shasta)	Catchable 11"	2,800
2018	Rainbow Trout (Shasta)	Catchable 15"	9,694
2018	Rainbow Trout (Shasta)	Juvenile	2,800
2019	Brown Trout	Catchable	4,033
2019	Brown Trout	Fingerling	16,960
2019	Brown Trout	Juvenile	8,760
2019	Rainbow Trout (Erwin x Arlee)	Catchable 15"	2,043
2019	Rainbow Trout (Erwin x Arlee)	Juvenile	59,910
2019	Rainbow Trout (Shasta)	Catchable 11"	1,600

2019	Rainbow Trout (Shasta)	Catchable 15"	15,952
2019	Rainbow Trout (Shasta)	Fingerling	62,165
2020	Rainbow Trout (Arlee)	Catchable 15"	10,585
2020	Rainbow Trout (Gerrard)	Adult	6,322
2020	Rainbow Trout (Shasta)	Adult	13,108
2020	Rainbow Trout (Shasta)	Catchable 11"	1,414
2021	Rainbow Trout (Arlee)	Adult	27,762
2021	Rainbow Trout (Gerrard)	Adult	2,657
2021	Rainbow Trout (Shasta)	Adult	7,215
2021	Rainbow Trout (Shasta)	Juvenile	20,985
2022	Kokanee Salmon	Juvenile	25,903
2022	Rainbow Trout (Arlee)	Adult	19,946
2022	Rainbow Trout (Gerrard)	Adult	2,207
2022	Rainbow Trout (Gerrard)	Juvenile	4,166
2022	Rainbow Trout (Shasta)	Adult	2,706
2022	Rainbow Trout (Trout Lodge)	Juvenile	15,912
2023	Brown Trout	Adult	5,000
2023	Kokanee Salmon	Juvenile	50,522
2023	Rainbow Trout		145,126
2023	Rainbow Trout	Adult	19,674
2024	Brown Trout	Adult	66
2024	Brown Trout	Juvenile	5,000
2024	Kokanee Salmon	Juvenile	72,686
2024	Rainbow Trout	Adult	21,286
2024	Rainbow Trout	Juvenile	62,601

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