Pactola Reservoir

Pactola Reservoir is a 825 acre reservoir located 18 miles west of Rapid City. Pactola is a popular recreational and fishing lake. The primary fish species are Rainbow Trout, Lake Trout, Brown Trout, Northen Pike, Bluegill, Black Crappie, Largemouth Bass, Kokanee Salmon and Yellow Perch. There are several secondary species such as Rock Bass, White Sucker, Golden Shiner and Green Sunfish.

Rainbow Trout. Rainbow Trout are stocked into Pactola on a yearly basis. In 2024 21,254 large rainbow trout averaging 2lbs and 62,601 juvenile fish were stocked. Fisherman have success fishing the bays located near the boat ramps shortly after stocking.

Lake Trout. Pactola is home to a healthy population of Lake Trout. In the 2024 surveys we had 12 fish caught, the gill nets averaged .5 fish per net with lengths ranging from 22-31 inches.

Brown Trout. 5000 juvenile Brown Trout were stocked into Pactola in 2024. The 2024 surveys had 0.4 fish per gill net. All the Brown Trout sampled were larger than 16 inches.

Northen Pike. Pactola has a steady population of Northern Pike. In 2024 the gill net surveys had 1.4 fish per net. Fish ranged from 20-43 inches.

Bluegill. Pactola has an abundance of Bluegill. The 2024 surveys had 4.7 fish per gill net. The Bluegill ranged from 4-8 inches. With the average around 5 inches.

Black Crappie. Pactola's Black Crappie population can be found in the bays. They are often hard to find and catch.

Largemouth Bass. Pactola's bass population has avoided the surveys for several years. Fisherman report catching Largemouth Bass when targeting them.

Kokanee Salmon. Pactola has been stocked with Kokanee since 2022. In 2024 there were 72,686 juveniles stocked. The salmon haven't shown up in any of the surveys yet. And no fishermen have reported catching them yet. We are hoping to start seeing the Kokanee show up in the system later in 2025.

Yellow Perch. Yellow Perch can be found scattered within the bays of Pactola. In 2024 the surveys had 1 fish per gill net. The perch averaged 6-7 inches.

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

<u>Common Fish Species Present</u>

Lake Trout

Brown Trout

Rainbow Trout

Largemouth Bass

Bluegill

Black Crappie

Northern Pike

White Sucker

Yellow Perch

Rock Bass

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.

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

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

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 (in)	Stock (cm)	Quality (in)	Quality (cm)	Preferred (in)	Preferred (cm)	Memorable (in)	Memorable (cm)	Trophy (in)	Trophy (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								
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg	
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	

| Gear | Species | CPUE | | | | | | | | | | |
		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	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	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	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
std exp gill net	Rainbow Trout	Wr		71								
	Rock Bass	PSD		39								
		PSD-P		22								
		Wr		84								
	White Sucker	PSD		100								
		PSD-P		100								
		Wr		92								
	Yellow Perch	PSD		0								
		PSD-P		0								
		Wr		86								
suspended gill net	Bluegill	PSD									100	
		PSD-P									0	
		Wr									79	
	Brown Trout	PSD									100	
		PSD-P									100	
		Wr									81	
	Lake Trout	PSD									100	
		PSD-P									88	
		Wr									92	
	Northern Pike	PSD									100	
		PSD-P									0	
		Wr									82	
	Rock Bass	PSD									100	
		PSD-P									0	
		Wr									93	
	White Sucker	PSD									100	
		PSD-P									100	
		Wr									98	
	Yellow Perch	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	S-Q N	S-Q Wr (SE)	Q-P N	Q-P Wr (SE)	P-M N	P-M Wr (SE)	M N	M 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	76 (9.5)	1	91
	2023	0		0		2	67 (3.6)	2	86 (13.9)
	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		2	84 (8.5)	8	101 (3.3)	0	
	2023	0		1	84	7	93 (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)

| | | Length Groups | | | | | | | |
| | | S-Q | | Q-P | | P-M | | M | |
Species	Year	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	4	85 (3.9)	0		0		0	
	2023	22	82 (1.5)	2	83 (1.6)	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)
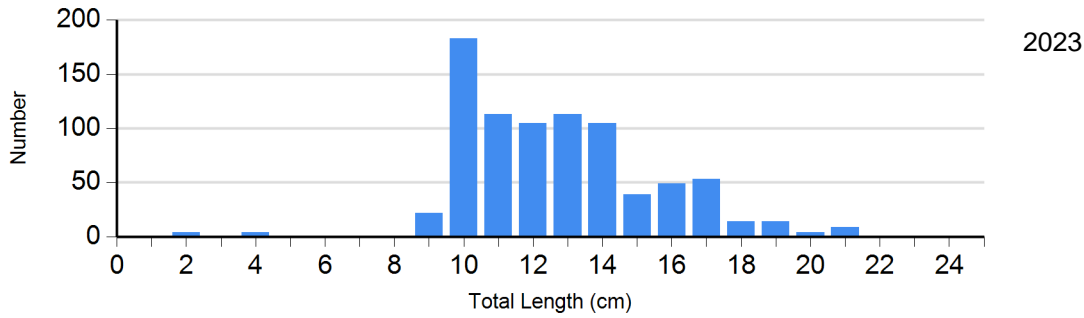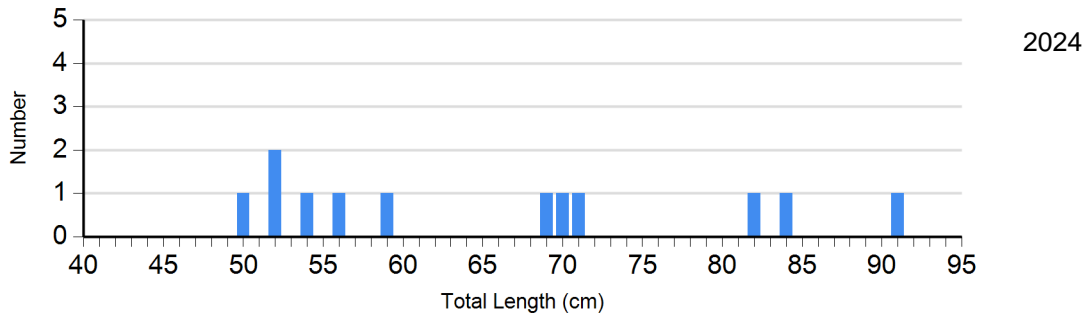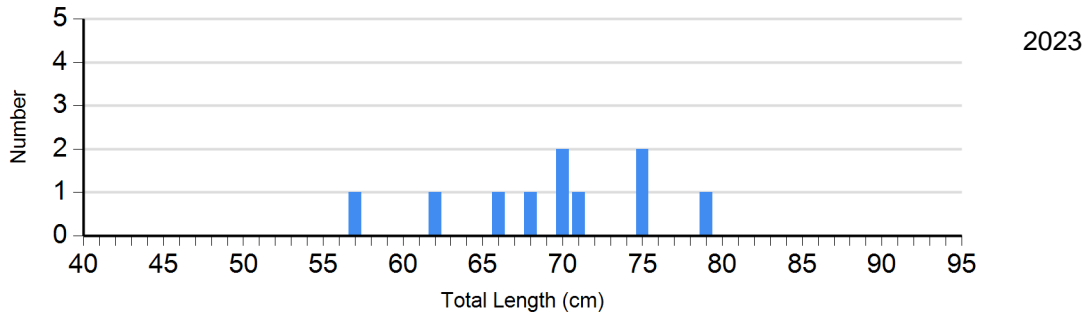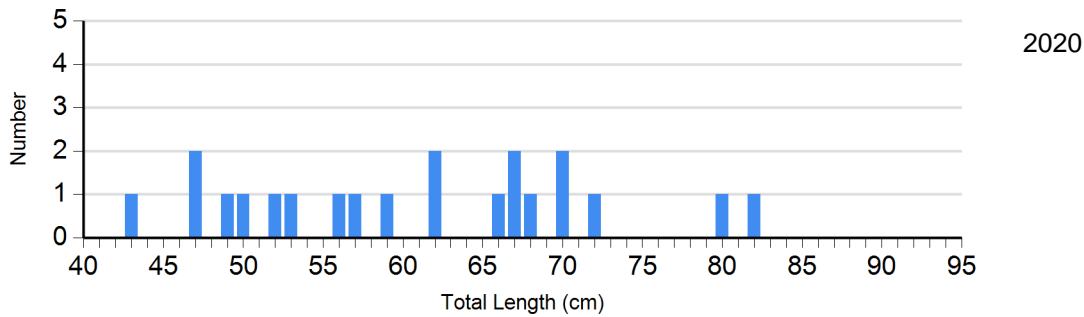
2023

Species: Lake Trout
Gear: AFS std gill net

2020

2023

2024

Species: Northern Pike
Gear: AFS std gill net

2020

2023

2024

Species: Rainbow Trout
Gear: AFS std gill net

2024

Species: White Sucker
Gear: AFS std gill net

2020

2023

2024

Species: Yellow Perch
Gear: AFS std gill net

2020

2023
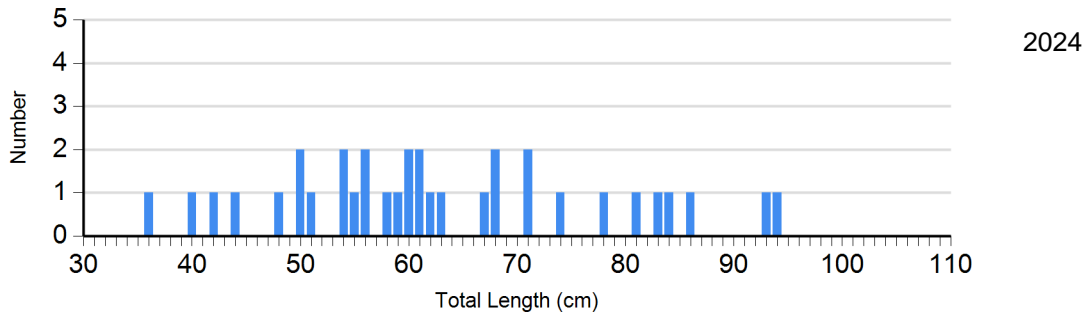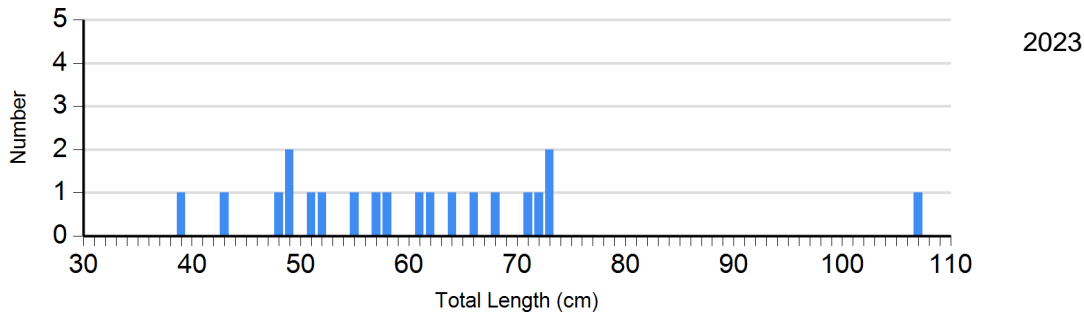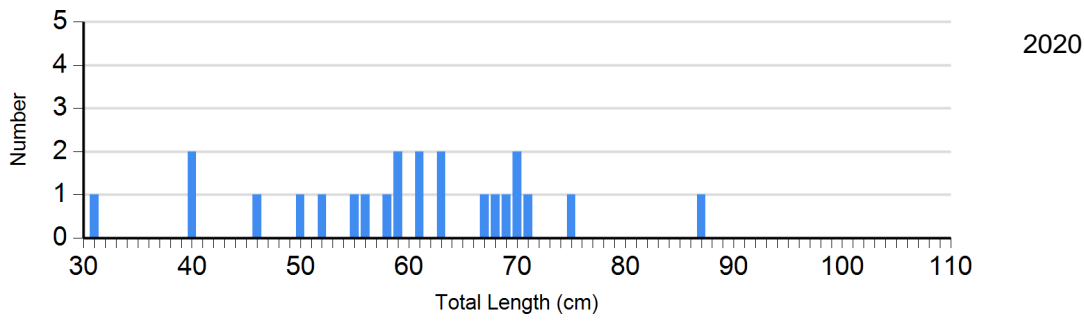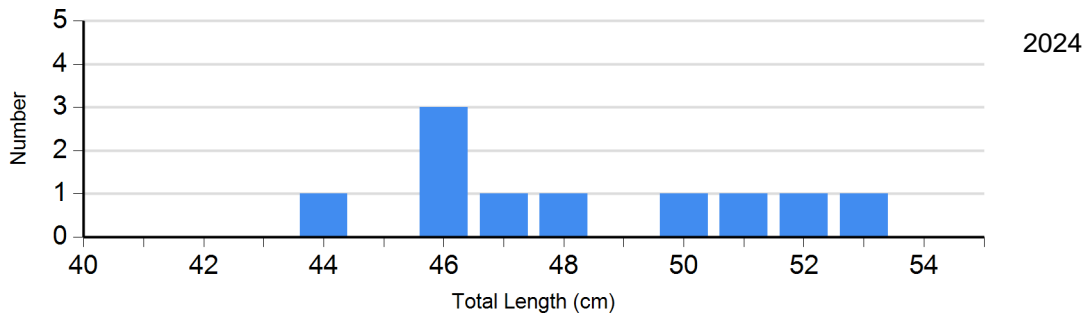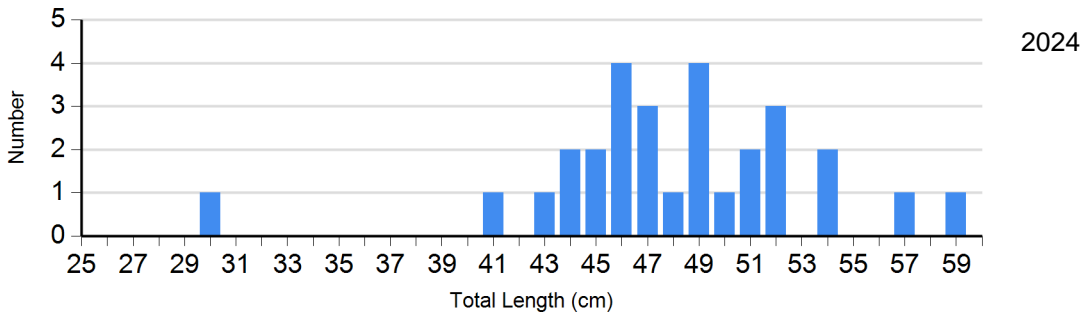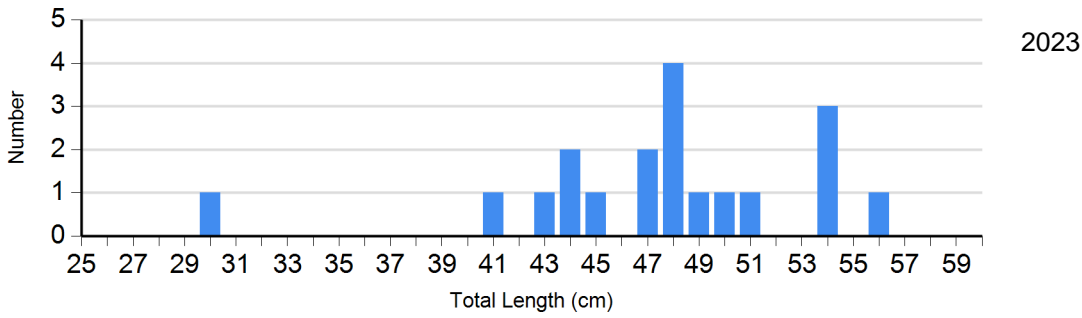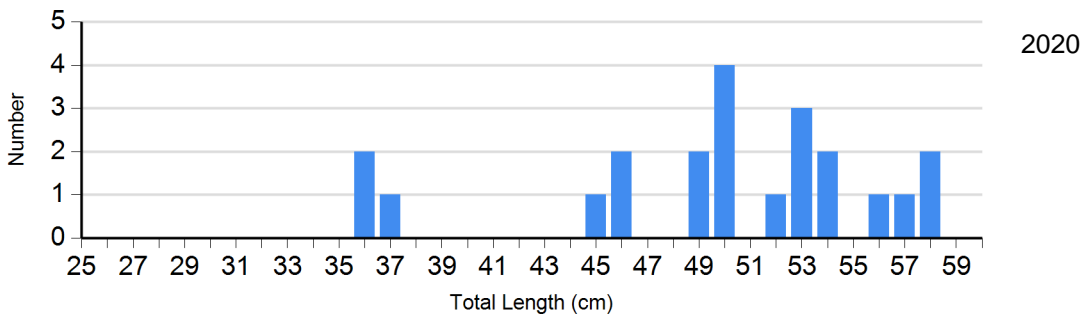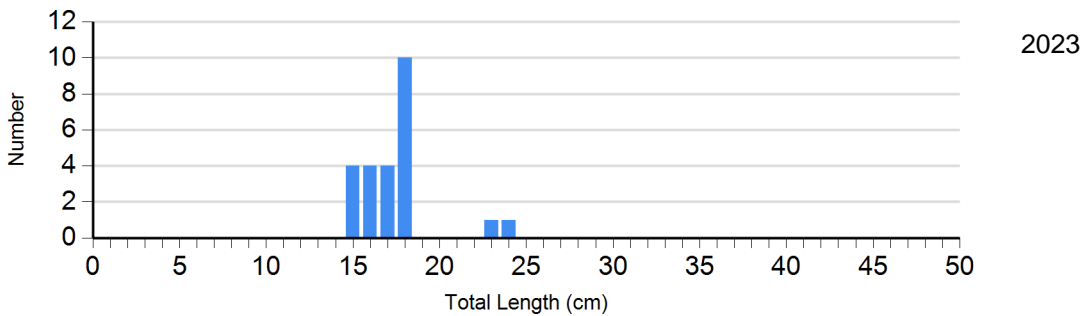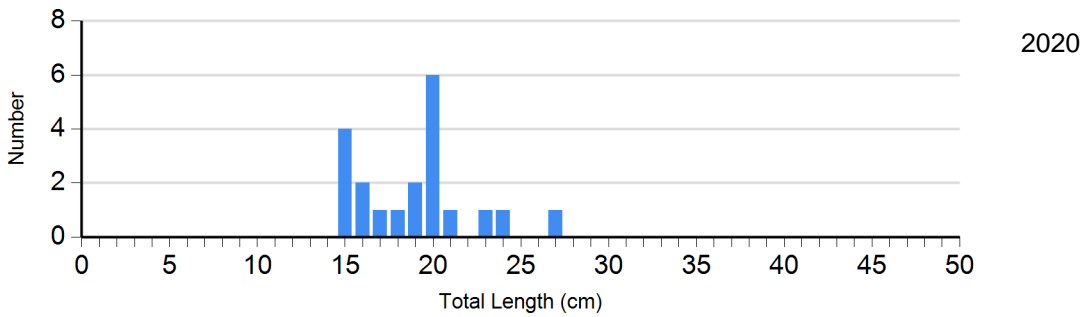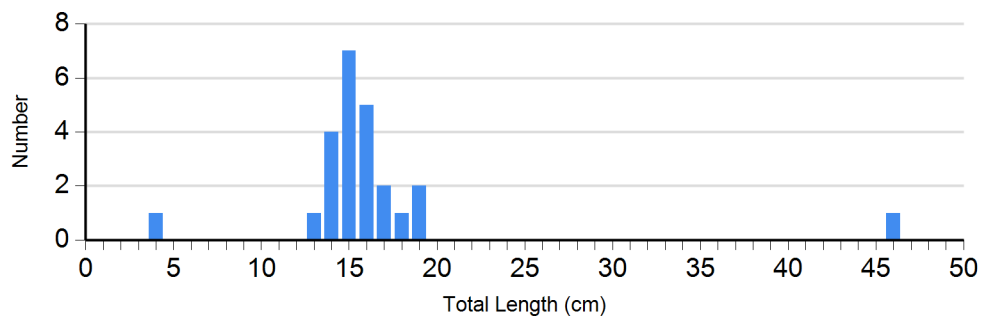
2024

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)
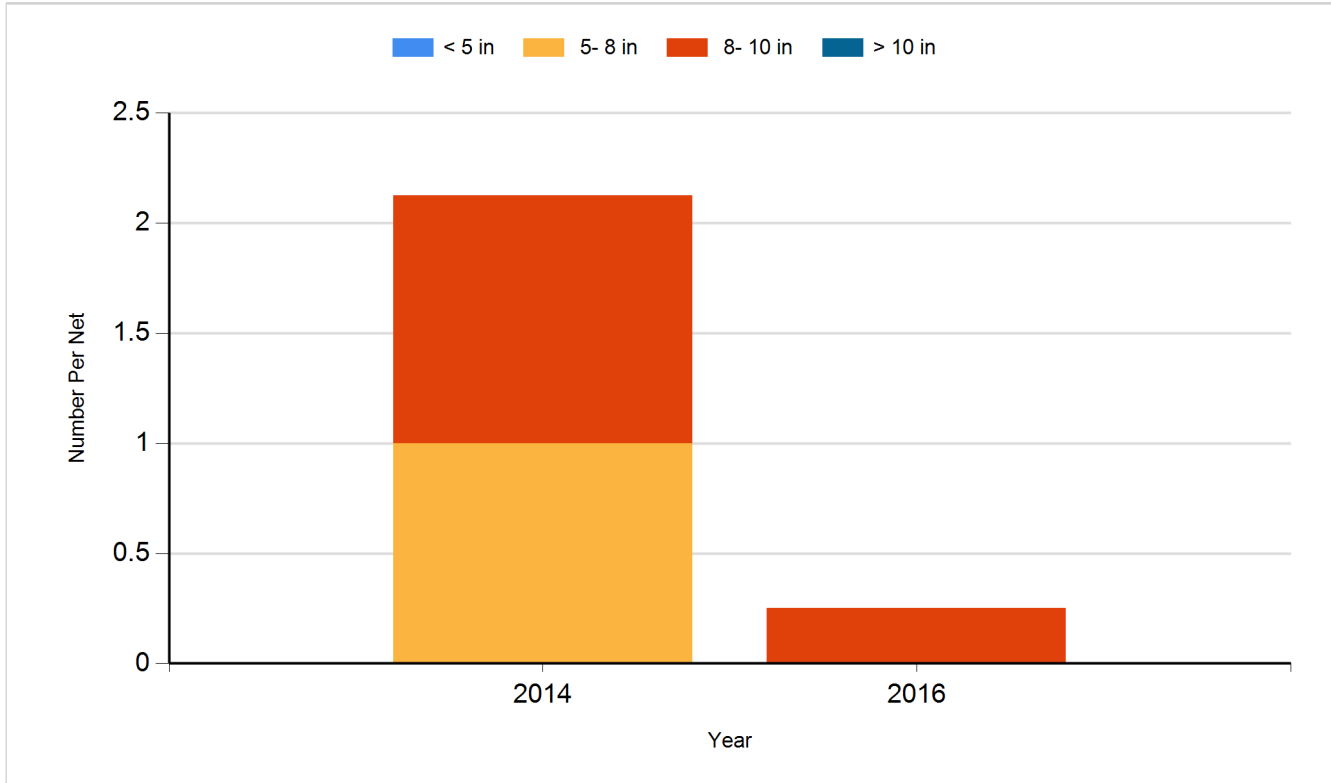
Species: Bluegill
Gear: frame net (std 3/4 in)
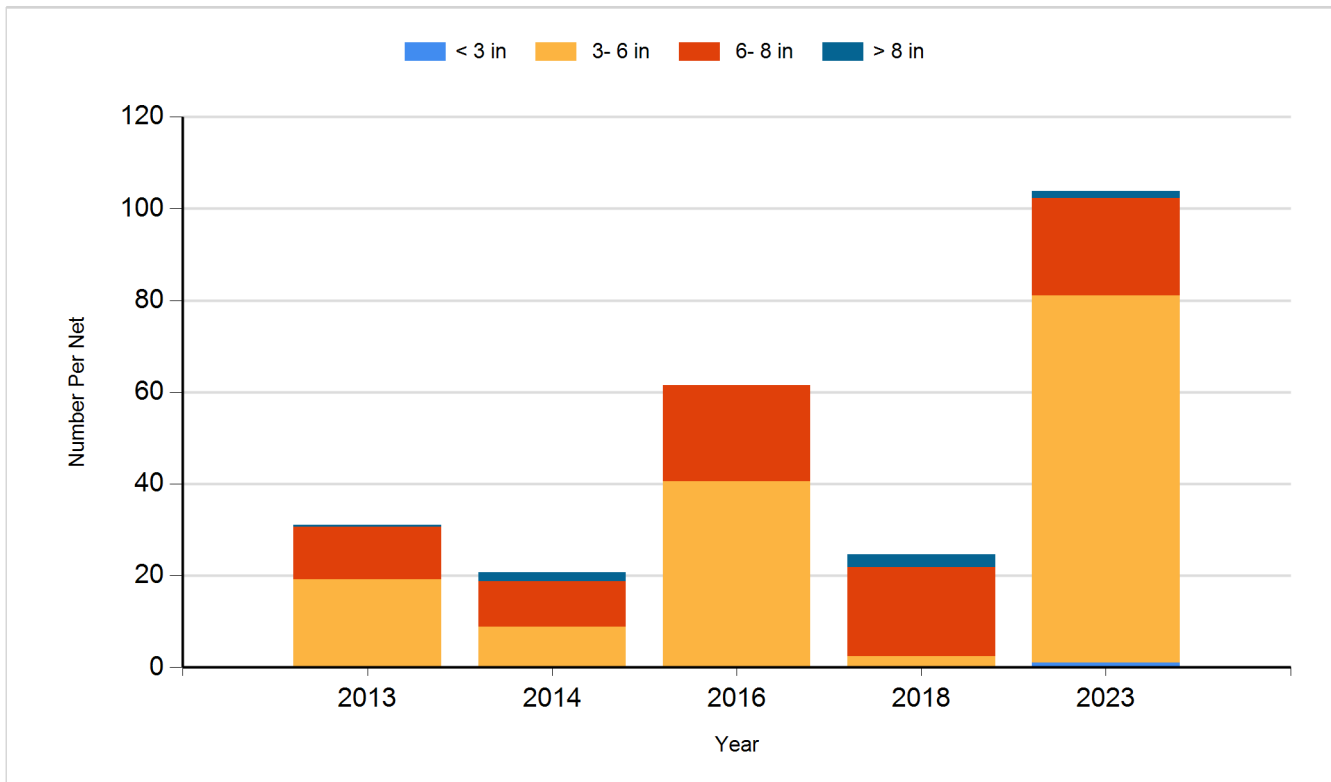
Species: Brown Trout
Gear: AFS std gill net
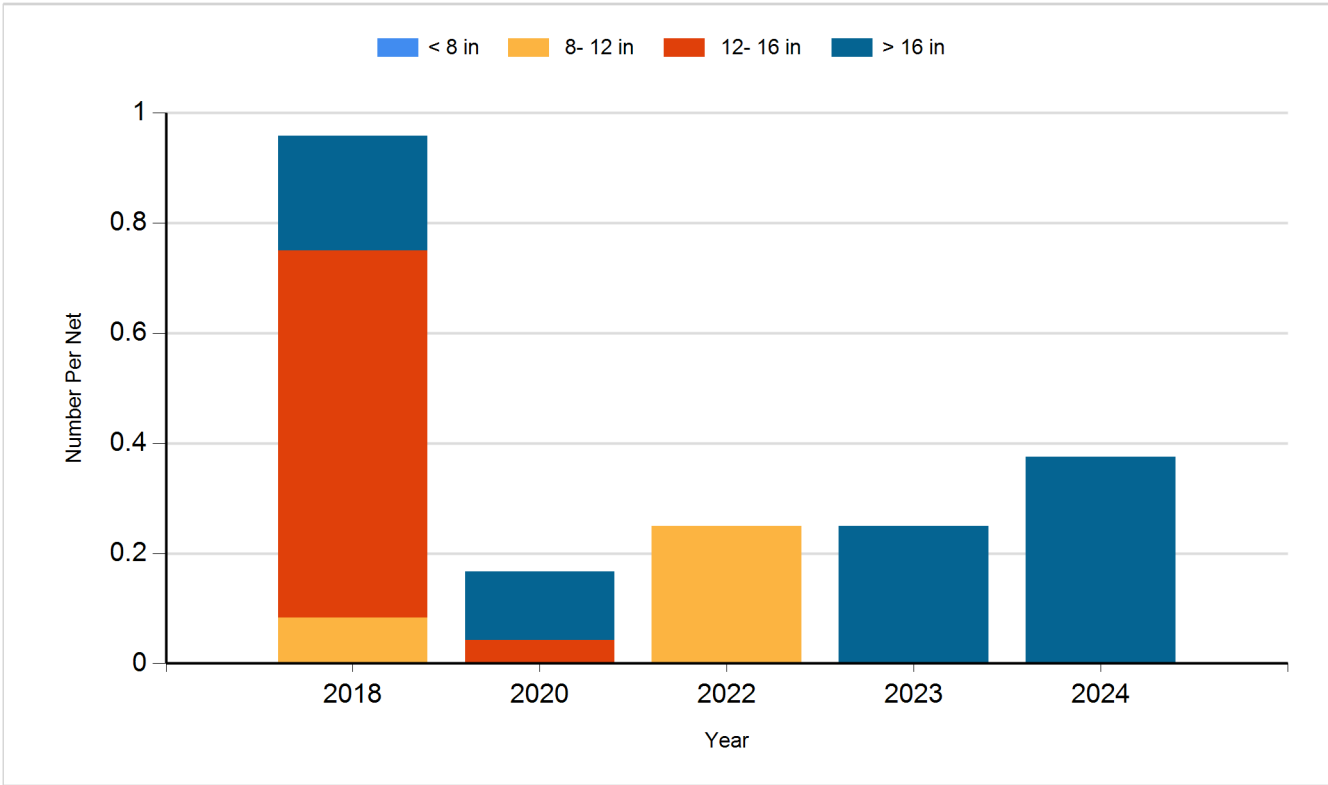
Species: Brown Trout
Gear: std exp gill net
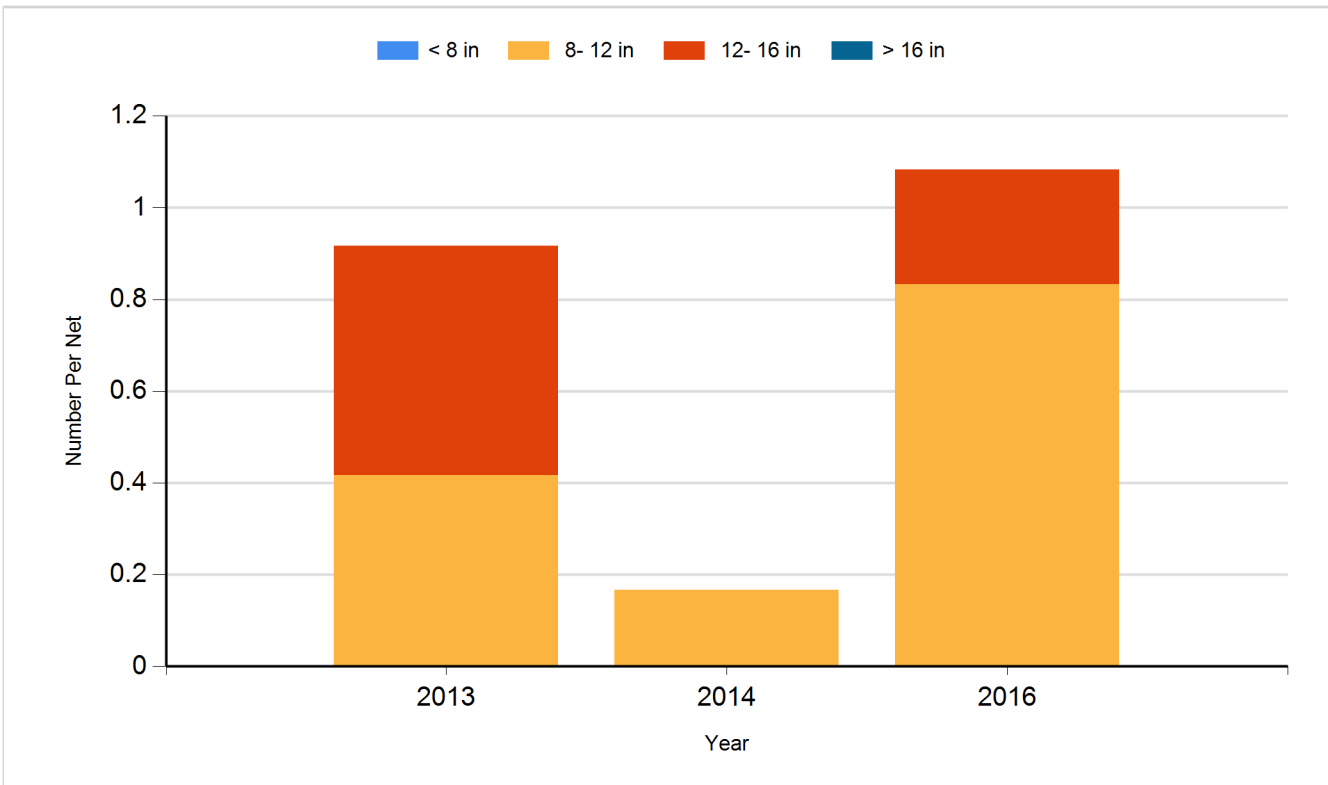
Species: Brown Trout
Gear: suspended gill net
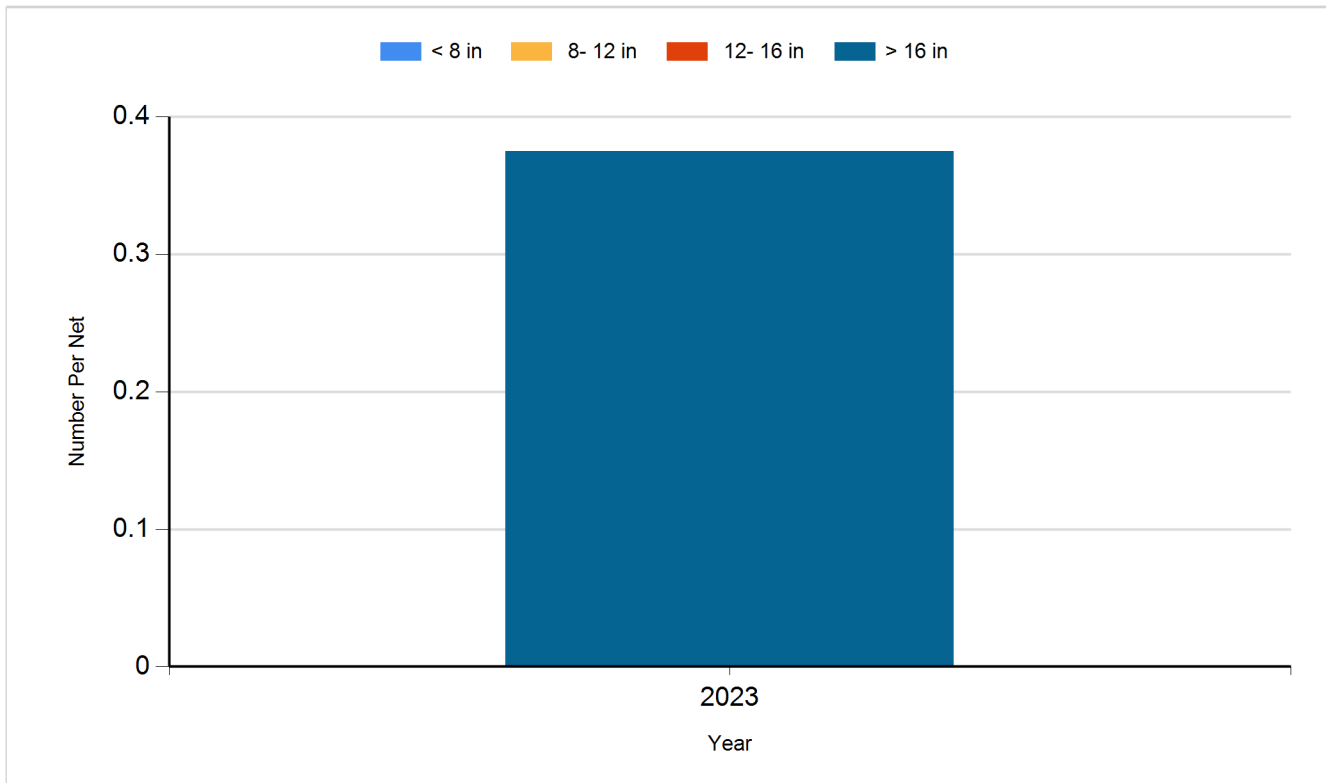
Species: Lake Trout
Gear: AFS std gill net
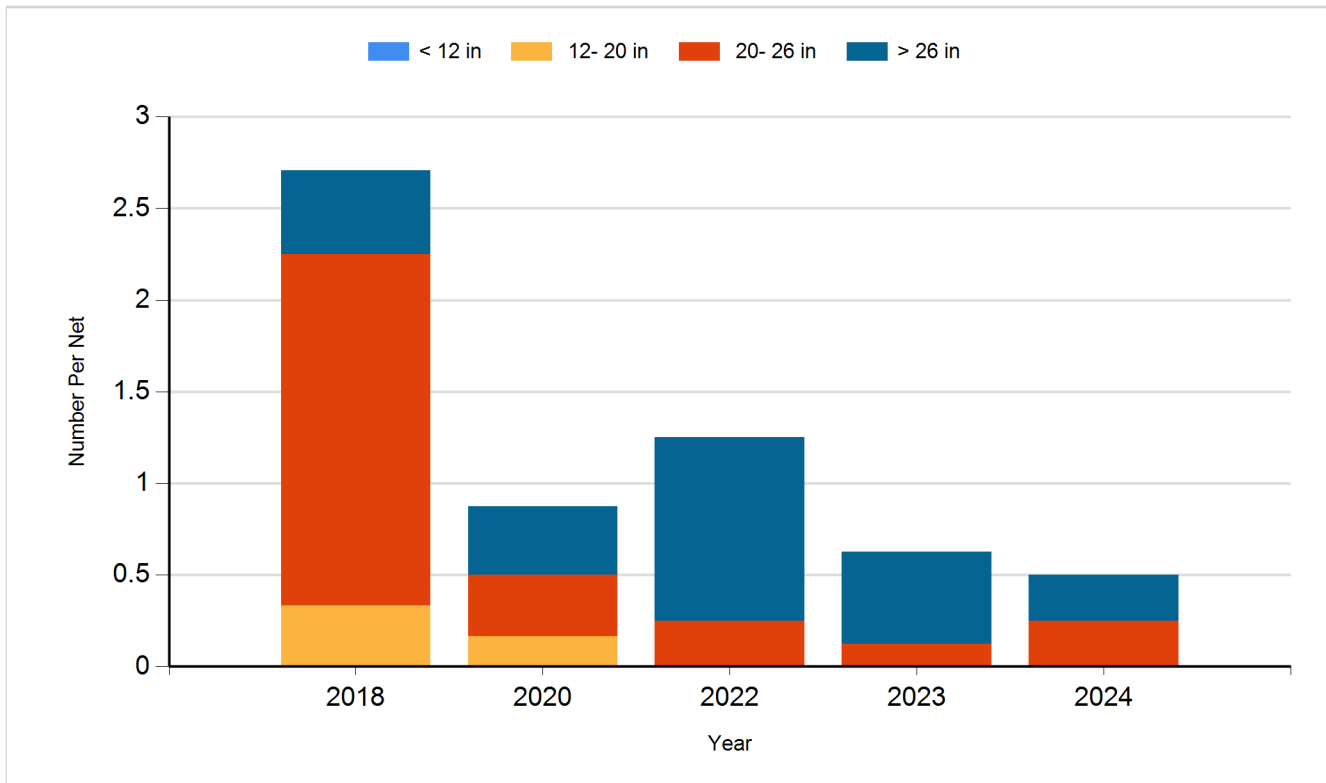
Species: Lake Trout
Gear: std exp gill net
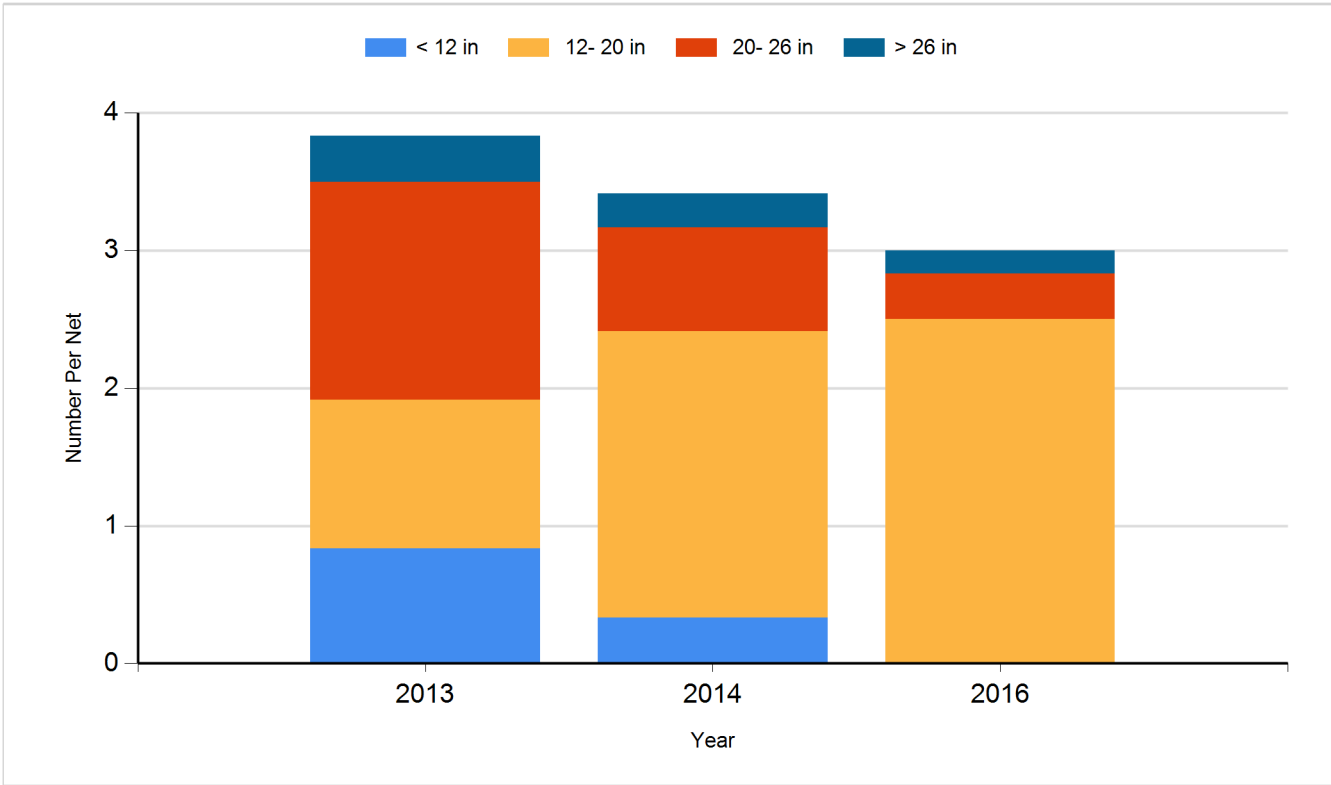
Species: Lake Trout
Gear: suspended gill net
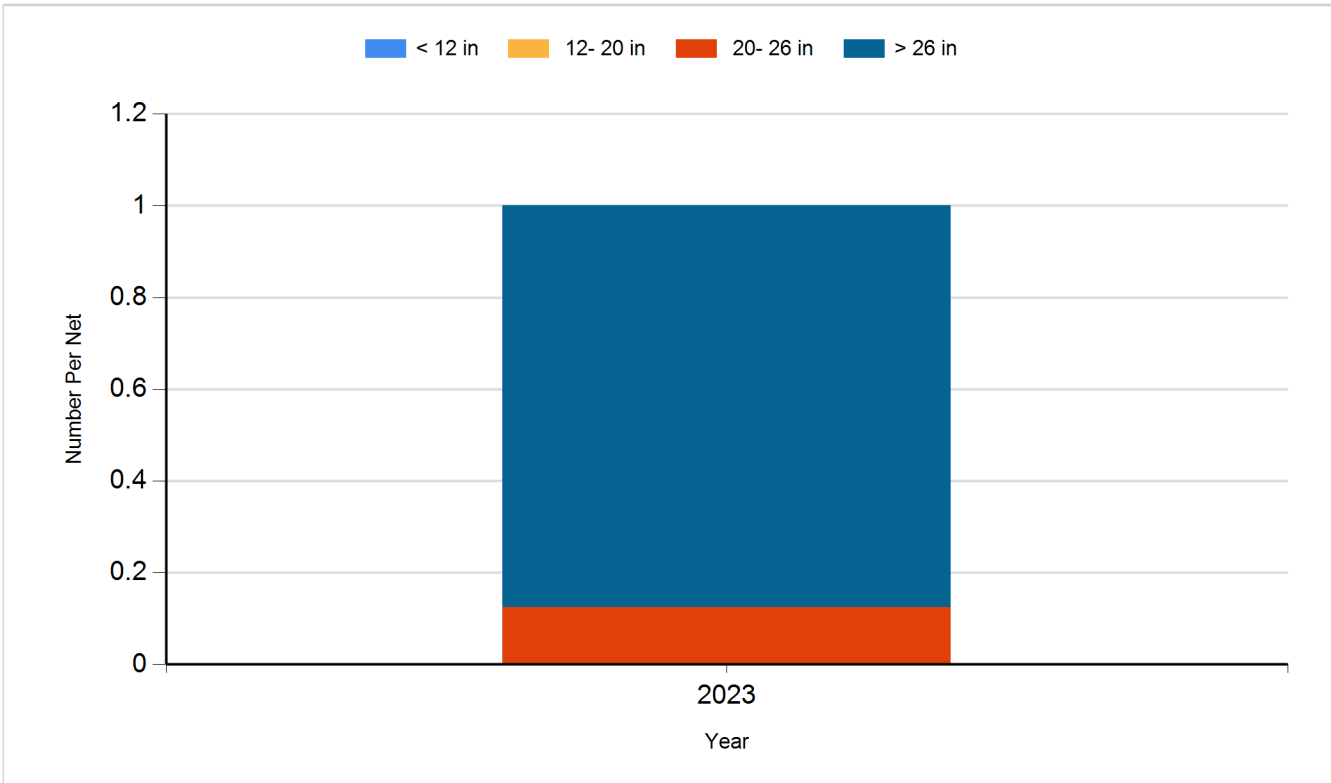
Species: Largemouth Bass
Gear: boat shocker (day)
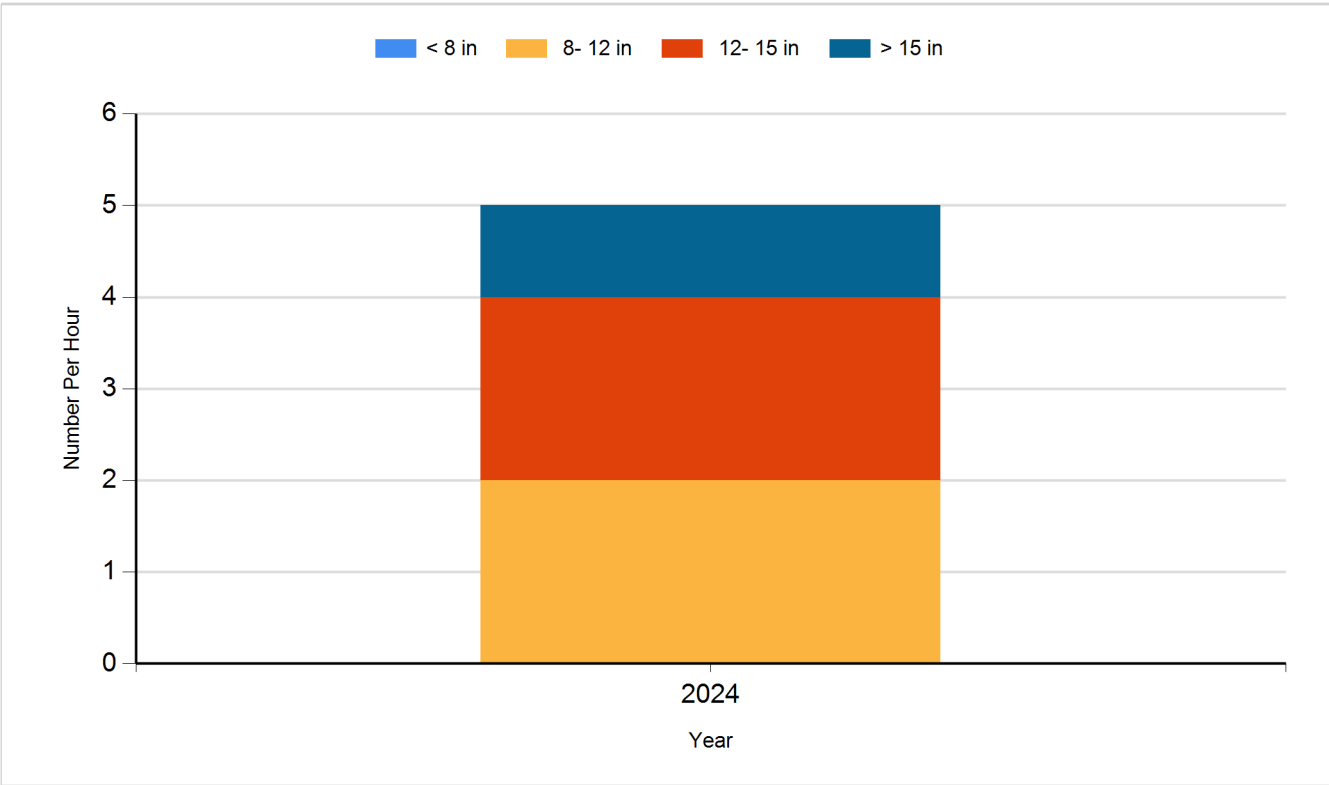
Species: Northern Pike
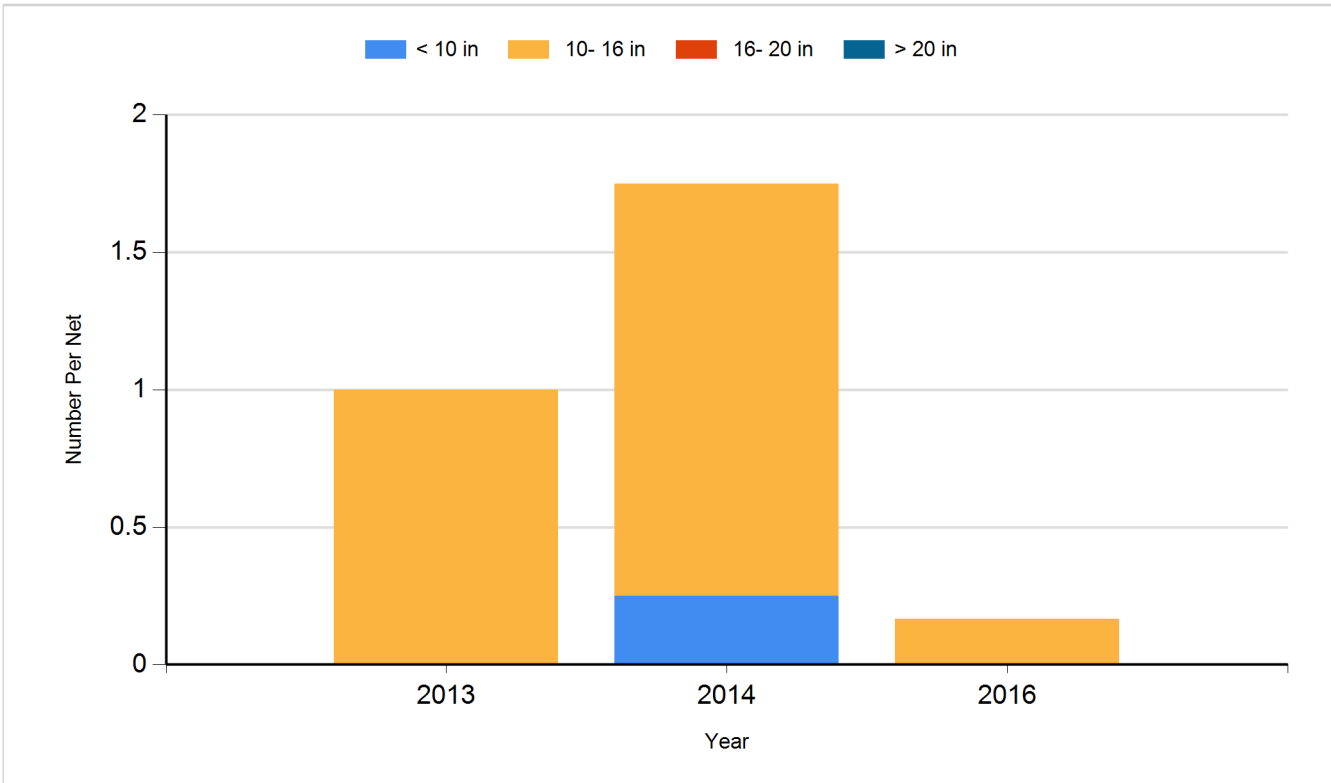Gear: AFS std gill net
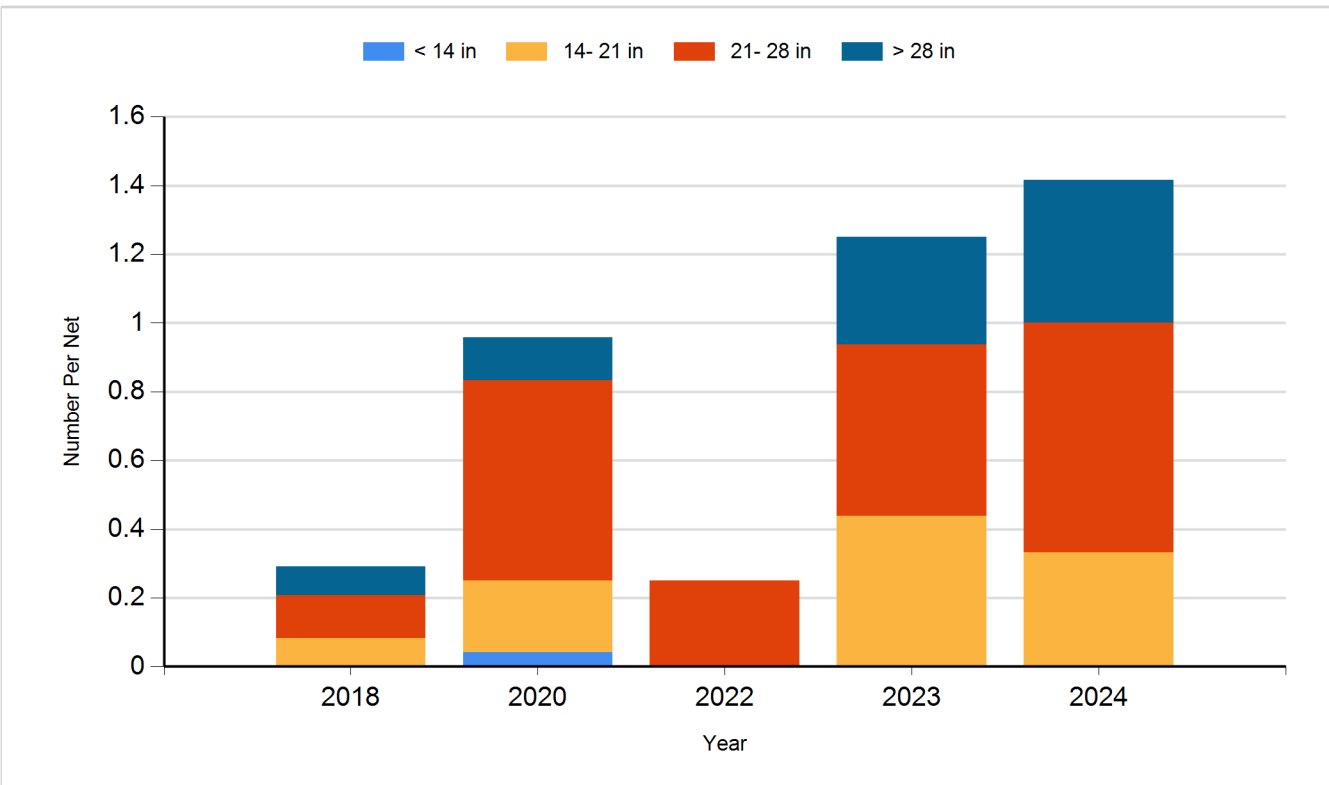
Species: Northern Pike
Gear: std exp gill net
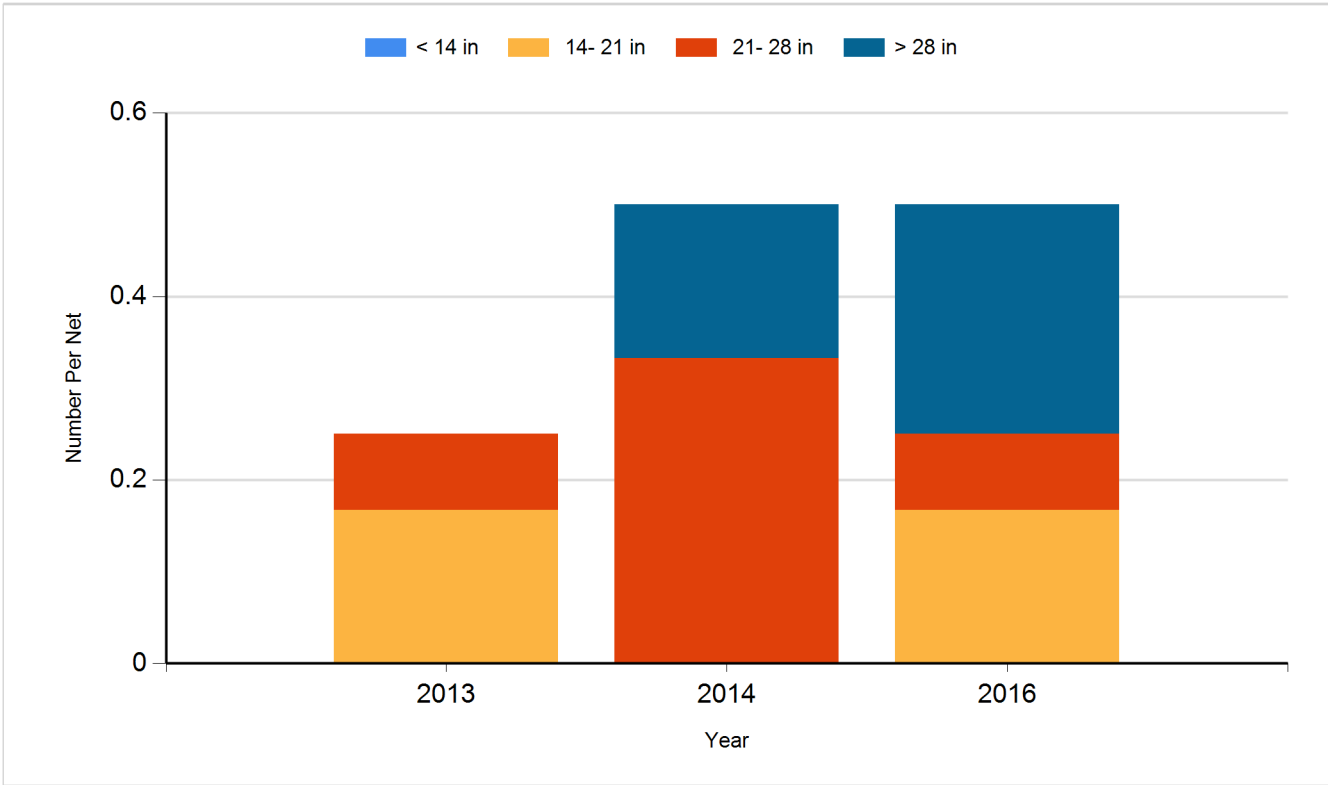
Species: Northern Pike
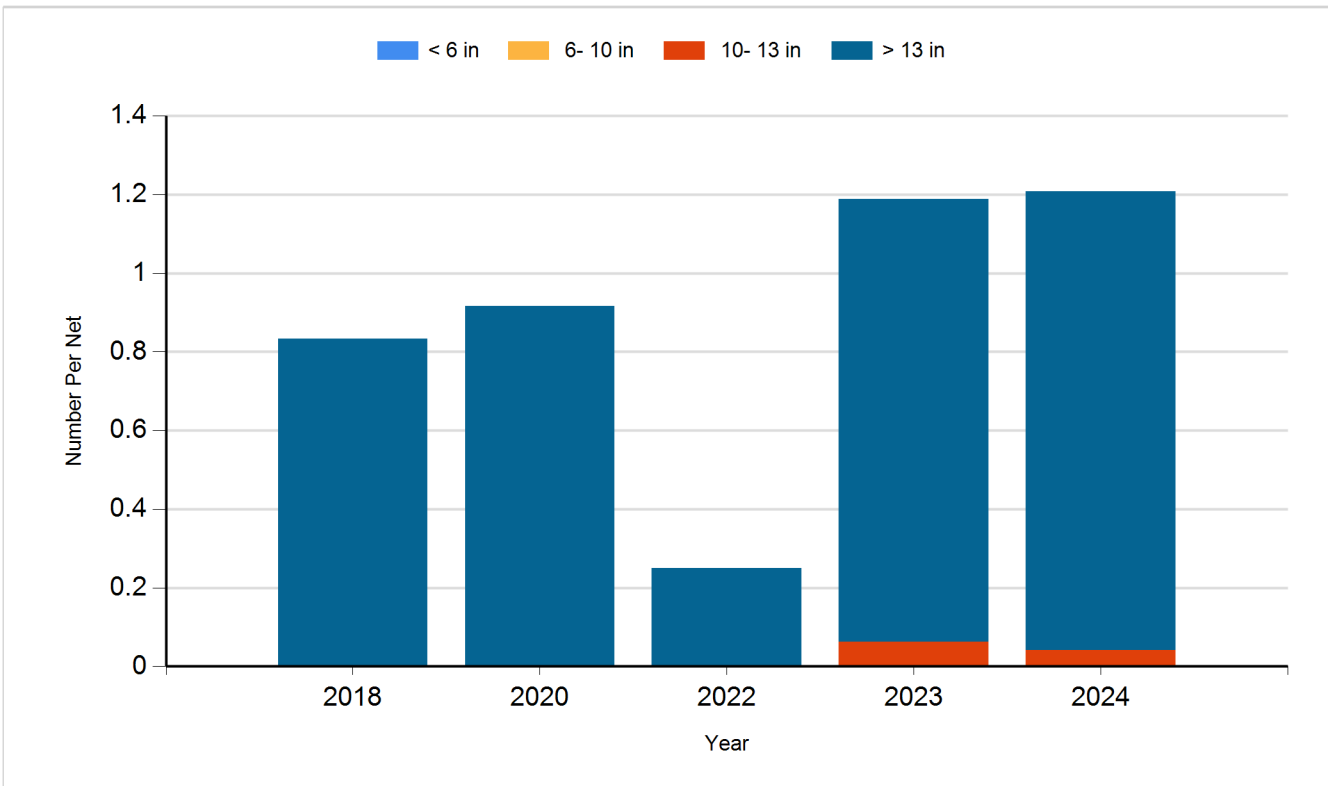Gear: suspended gill net
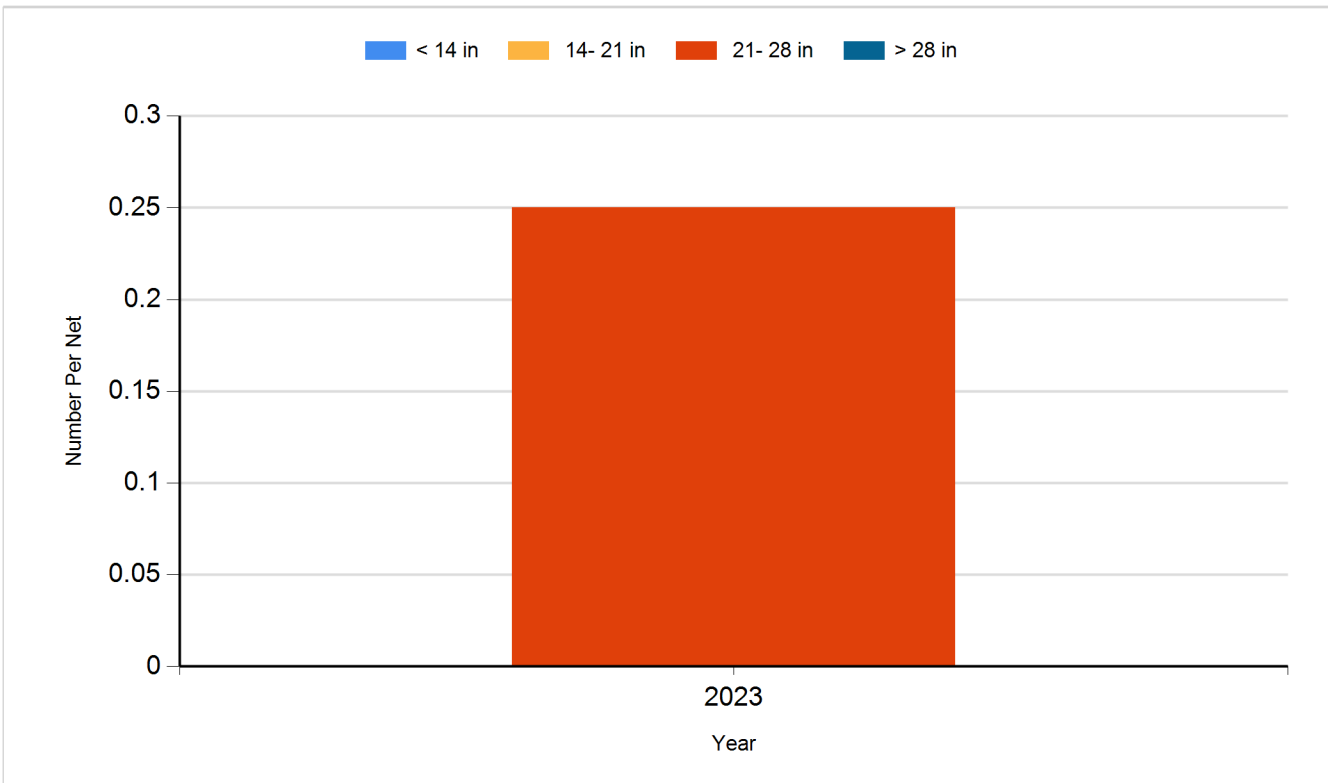
Species: Rainbow Trout
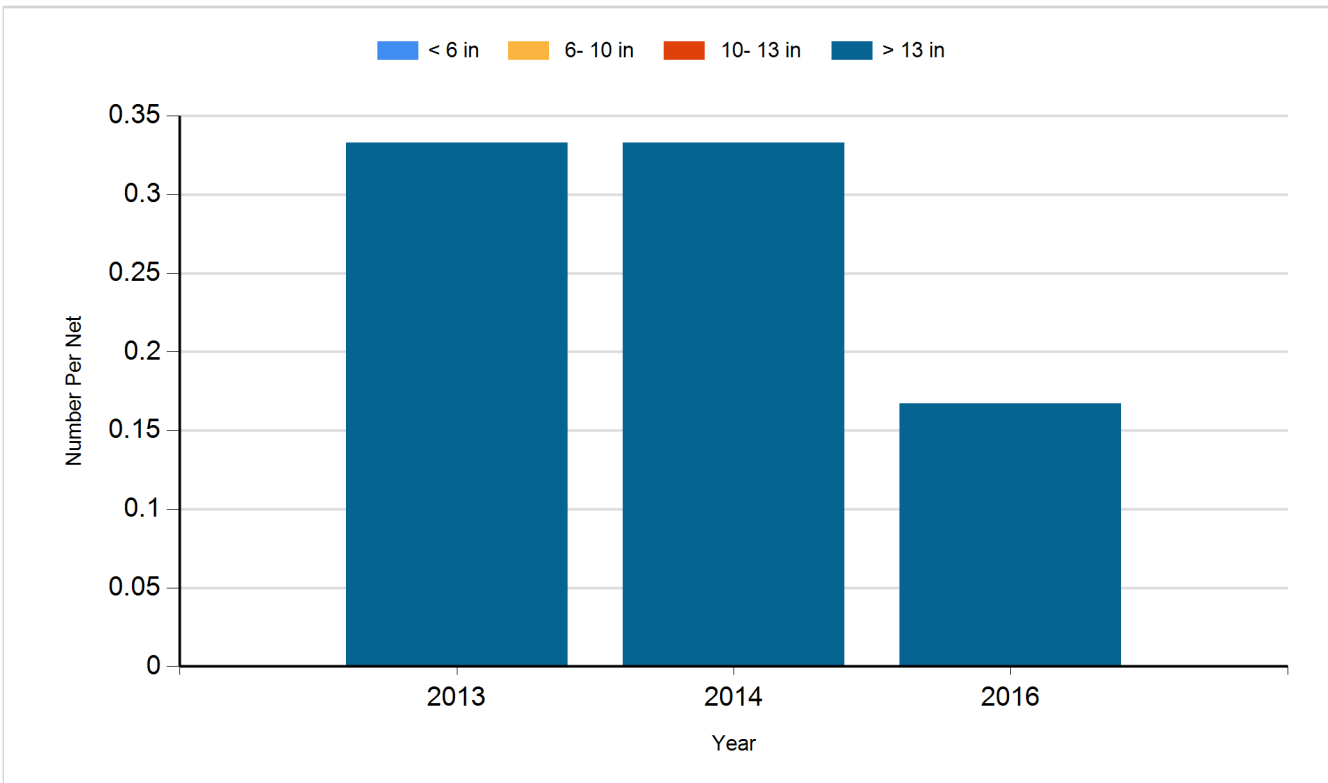Gear: AFS std gill net
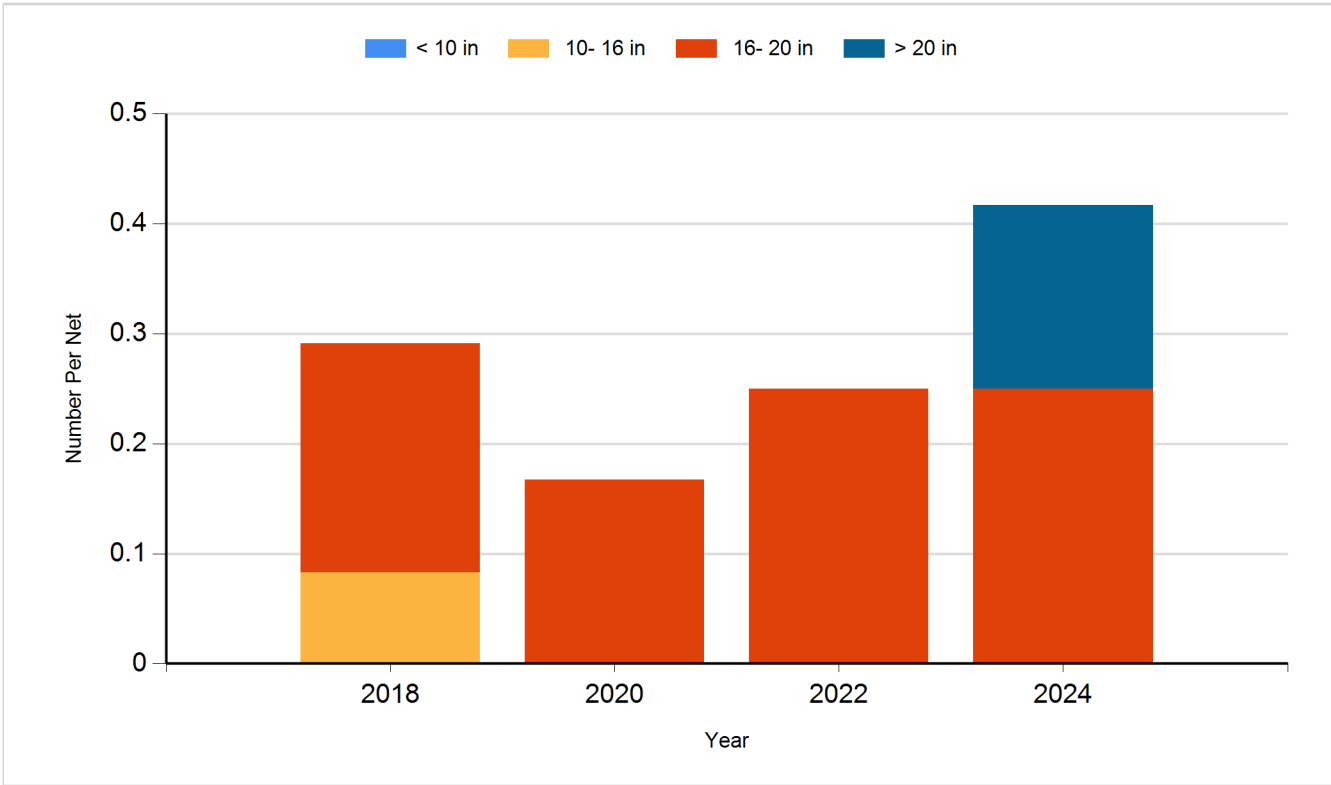
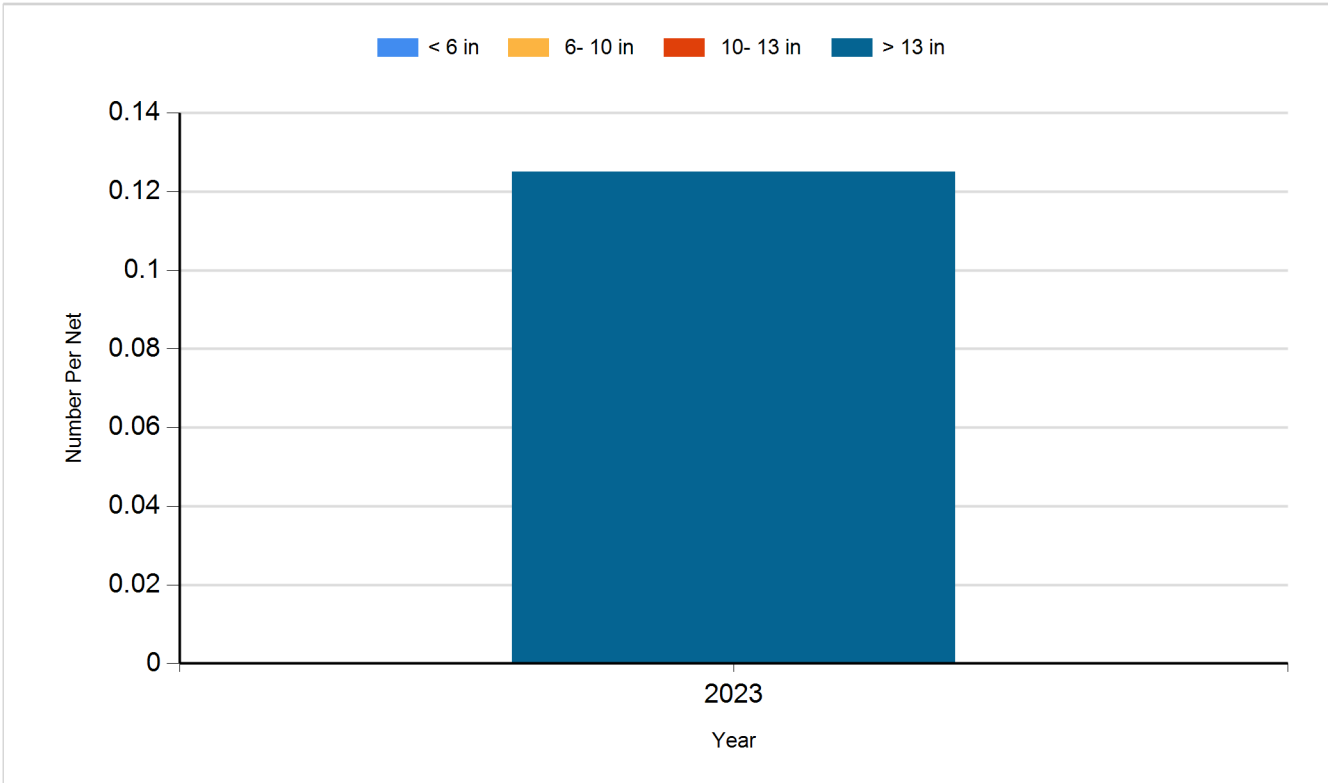Species: Rainbow Trout
Gear: std exp gill net

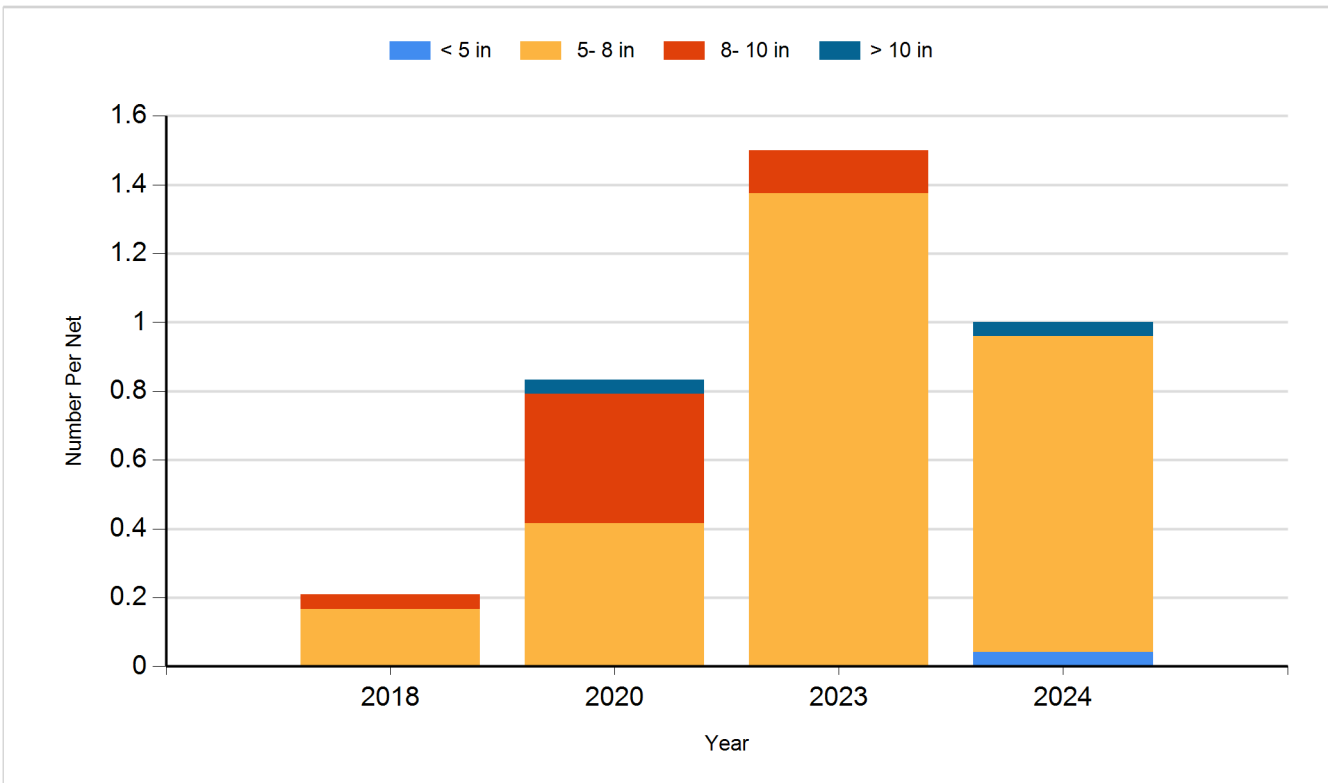Species: White Sucker
Gear: AFS std gill net

Species: White Sucker
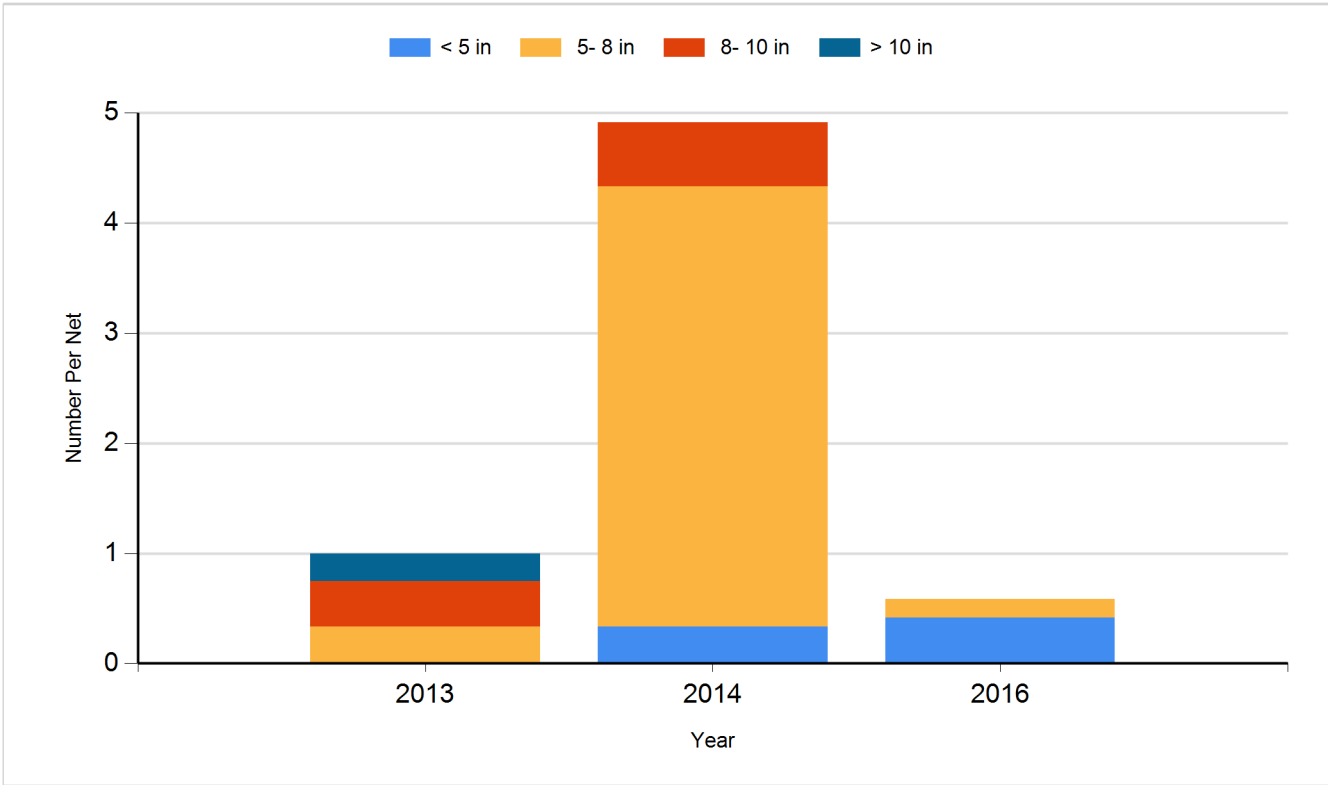Gear: std exp gill net

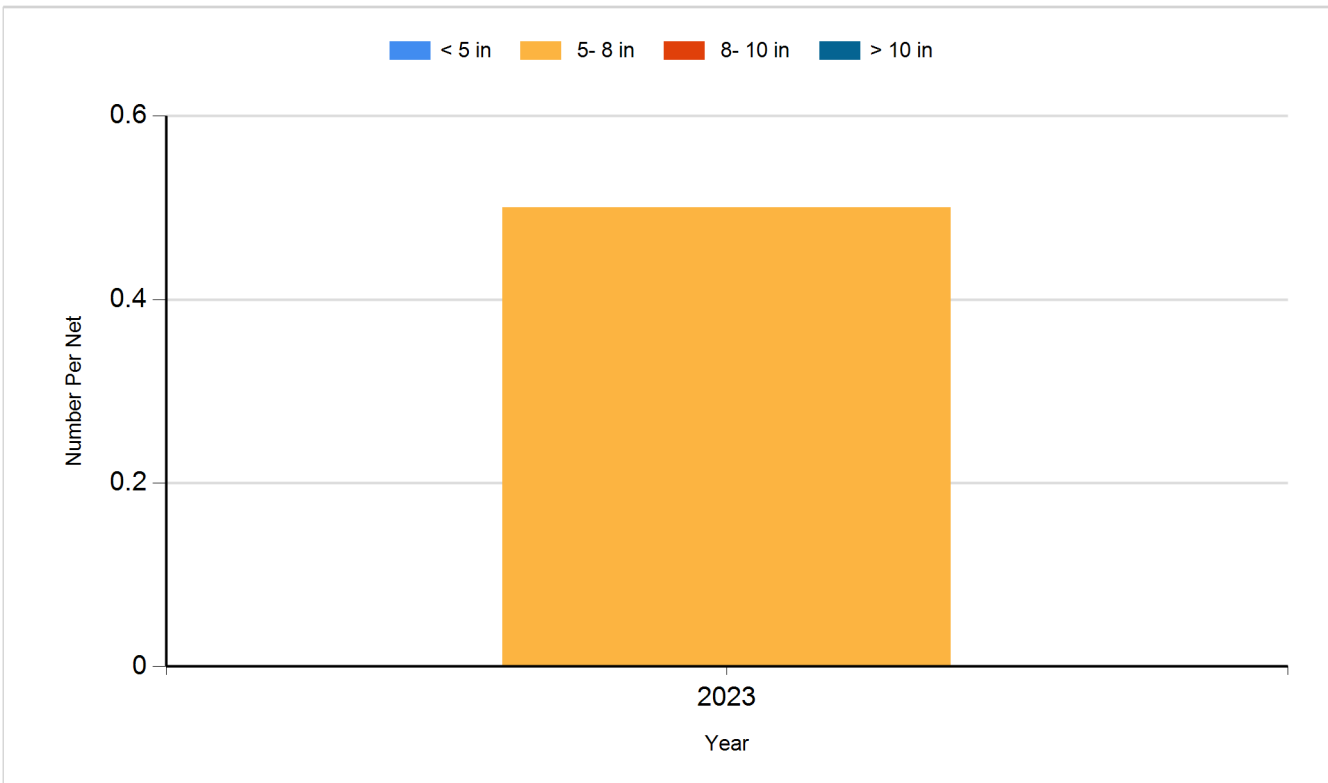Species: White Sucker
Gear: suspended gill net

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

Year	Species	Stage	Number
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