Note: Curlyleaf pondweed and zebra mussels are present in Blue Dog Lake. Care should be taken by all user groups to prevent their spread. For more information regarding aquatic invasive species please visit https://sdleastwanted.sd.gov/

Blue Dog Survey Summary

Blue Dog Lake, located 0.5 miles north of Waubay, is primarily managed as a walleye fishery but other fish species (e.g., northern pike, smallmouth bass, white bass, yellow perch) are present and contribute to the fishery.

- **Walleye.** More walleyes were sampled in 2023 than in 2020. At 10.2 per gill net, relative abundance of walleyes ≥10.0 inches was high. Sampled walleyes ranged in length from 7.1 to 28.0 inches, of those that were at least 10.0 inches 68% were ≥15.0 inches and 13% were ≥20.0 inches. Twelve year classes produced between 2009 and 2022 contributed to the catch. Individuals from well represented cohorts in 2018 (age-5), 2019 (age-4), 2021 (age-2), and 2022 (age-1) accounted for more than 80% of sampled walleyes. Growth was variable with mean length at capture at age 4 from 14.0 to 17.5 inches in surveys conducted since 2014. In 2023, the mean length at capture of age-4 fish was 17.2 inches.

- **Yellow perch**. Yellow perch numbers were similar to those observed in 2020. At 11.7 per gill net, relative abundance was considered moderate to high. Sampled yellow perch ranged in length from 4.7 to 11.0 inches, of those that were at least 5.0 inches 37% were ≥8.0 inches and 11% were ≥10.0 inches. Individuals from five consecutive year classes (2018 – 2022) contributed to the catch, those from the 2021 (age-2) cohort were the most abundant and accounted for 55% of fish sampled. Yellow perch growth appears to be moderate with age-3 yellow perch having mean length at capture values from 8.9 to 9.4 inches in surveys conducted since 2014. In 2023, the mean length at capture of age-3 fish was 9.3 inches.

For more detailed results see the computer generated South Dakota Statewide Fisheries Survey for Blue Dog (Day; below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Blue Dog, Day County
UBS-Lake-411-003
2023

Lake Information

Name:	Blue Dog	**Maximum Depth:**	8 Feet
County:	Day	**Mean Depth:**	6 Feet
		OHWM Elevation:	1,801
Surface Area:	1,616 Acres	**Outlet Elevation:**	1,800

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 11, 2023	4 net-nights
AFS std gill net	Jul 12, 2023	4 net-nights
AFS std gill net	Jul 13, 2023	4 net-nights

Common Fish Species Present

Northern Pike

Walleye

Yellow Perch

White Sucker

Smallmouth Bass

Black Crappie

Common Carp

Rock Bass

White Bass

Black Bullhead

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.

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

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

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.

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

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).

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(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**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	1	0.1	0.1	100		0		85	
	Black Crappie	7	0.6	0.6	100		100		111	2
	Common Carp	3	0.3	0.2	100		100		109	10
	Northern Pike	17	1.4	0.6	82		24		81	2
	Rock Bass	4	0.3	0.3	100		25		111	6
	Smallmouth Bass	19	0.8	0.4	78		56		106	2
	Walleye	148	10.2	1.5	68	6	13	4	92	1
	White Bass	2	0.2	0.2	50		50		104	7
	White Sucker	16	1.3	0.4	100		100		104	2
	Yellow Perch	143	11.7	1.9	37	6	11	4	104	1

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**

		CPUE										
Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
AFS std gill net	Black Bullhead				0.1			0.0			0.1	0.07
	Black Crappie				0.4			0.1			0.6	0.37
	Common Carp				0.7			0.2			0.3	0.40
	Emerald Shiner				0.0			0.0			0.0	0.00
	Gizzard Shad				1.3			0.0			0.0	0.43
	Northern Pike				1.3			1.2			1.4	1.30
	Rock Bass				0.1			0.1			0.3	0.17
	Smallmouth Bass				0.0			0.0			0.8	0.27
	Walleye				9.2			7.7			10.2	9.03
	White Bass				0.9			0.7			0.2	0.60
	White Sucker				1.1			0.8			1.3	1.07
	Yellow Perch				2.1			11.5			11.7	8.43
frame net (std 3/4 in)	Black Bullhead	2.1										2.10
	Black Crappie	1.7										1.70
	Common Carp	0.1										0.10
	Northern Pike	0.5										0.50
	Rock Bass	1.9										1.90
	Smallmouth Bass	0.4										0.40
	Walleye	1.6										1.60
	White Bass	1.4										1.40
	Yellow Perch	0.6										0.60
std exp gill net	Black Crappie	0.7										0.70
	Common Carp	0.7										0.70
	Green Sunfish	0.2										0.20
	Northern Pike	1.2										1.20
	Spottail Shiner	0.0										0.00
	Walleye	17.3										17.30
	White Bass	1.5										1.50
	White Sucker	1.7										1.70
	Yellow Perch	17.8										17.80

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.

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std gill net	Northern Pike	PSD				93			29			82
		PSD-P				27			0			24
		Wr				91			81			81
	Walleye	PSD				66			33			68
		PSD-P				19			5			13
		Wr				85			84			92
	Yellow Perch	PSD				64			38			37
		PSD-P				40			15			11
		Wr				95			105			104
std exp gill net	Northern Pike	PSD	100									
		PSD-P	43									
		Wr	76									
	Walleye	PSD	23									
		PSD-P	4									
		Wr	80									
	Yellow Perch	PSD	79									
		PSD-P	36									
		Wr	98									

Length at Capture

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

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	148	201 (26)	312 (36)	390 (6)	437 (26)	468 (31)	527 (3)	511 (5)	514 (6)		661 (5)
2020	103	181 (4)	272 (30)	324 (14)	356 (29)	425 (12)	450 (3)	471 (2)	474 (1)	484 (3)	600 (5)
2017	110		274 (27)	387 (25)	445 (12)	450 (5)	481 (23)	521 (14)	569 (1)	586 (1)	681 (2)
2014	117	189 (12)	275 (5)	302 (46)	372 (45)	424 (4)	560 (1)		505 (2)		655 (2)

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	143	139 (33)	190 (79)	236 (13)	265 (16)	273 (2)					
2020	139	129 (3)	181 (98)	235 (16)	243 (7)	274 (12)	308 (1)	285 (2)			
2017	25		185 (10)	240 (6)	255 (1)		298 (4)	283 (3)	294 (1)		
2014	109	127 (4)	156 (18)	227 (34)	252 (37)	258 (11)	305 (2)	300 (3)			

Fish Condition

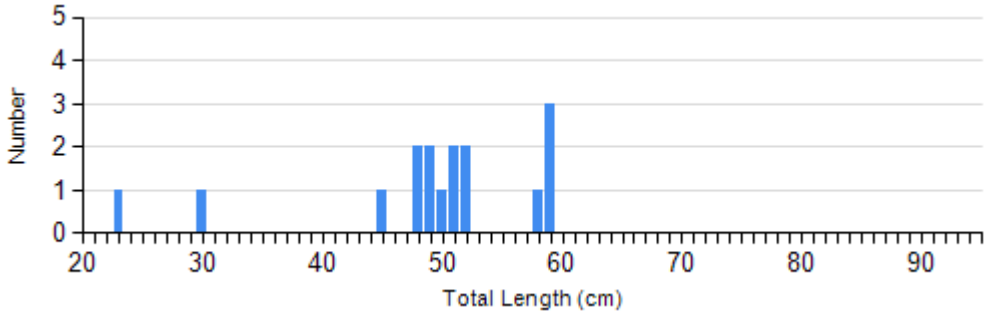
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2020	10	79 (1.9)	4	86 (6.9)	0		0	
	2023	3	81 (1.3)	10	78 (1.3)	2	92 (0.5)	2	85 (1.3)
Walleye Gill Net	2020	62	84 (0.6)	25	84 (1.3)	3	94 (1.9)	2	75 (5.5)
	2023	39	96 (0.9)	67	91 (0.6)	11	89 (1.2)	5	84 (3.1)
Yellow Perch Gill Net	2020	86	106 (0.7)	31	106 (1.3)	20	99 (1.4)	1	90
	2023	88	104 (0.7)	37	105 (1.1)	15	100 (1.5)	0	

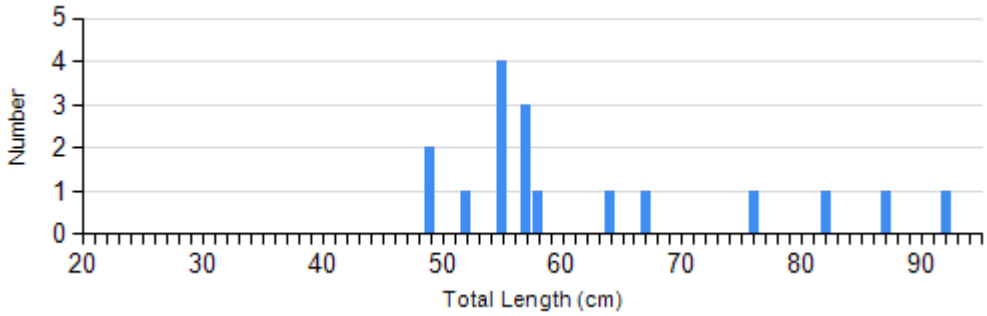
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Northern Pike
Gear: AFS std gill net

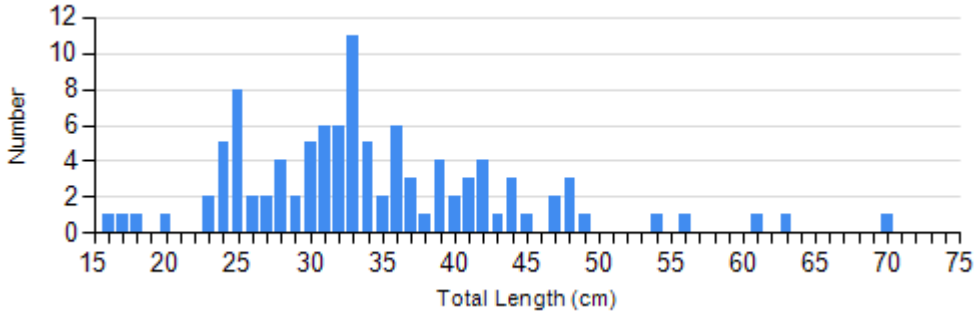


2020



2023

Species: Walleye
Gear: AFS std gill net



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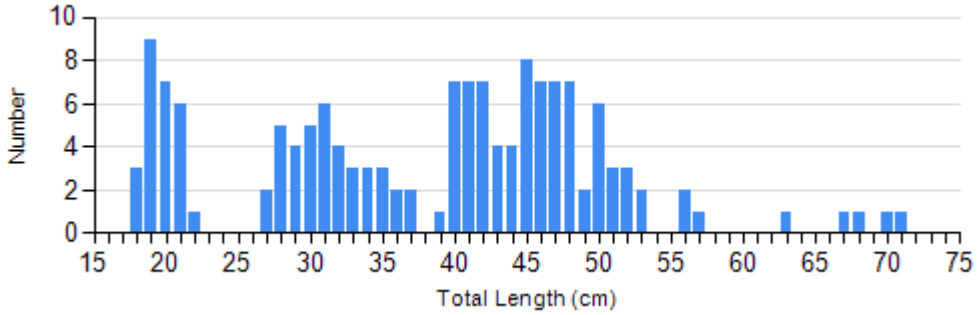
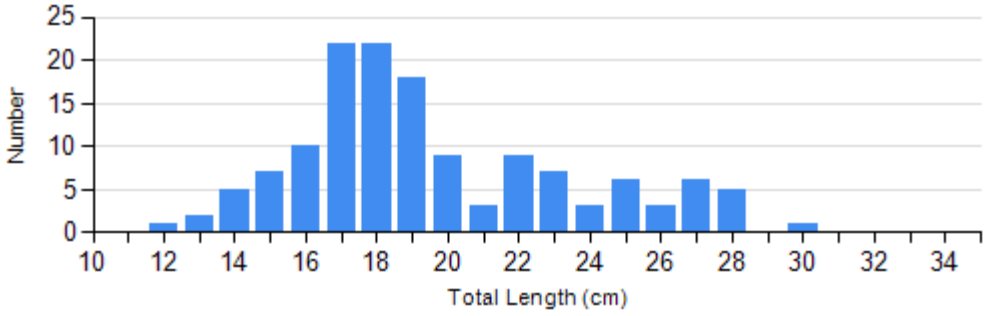
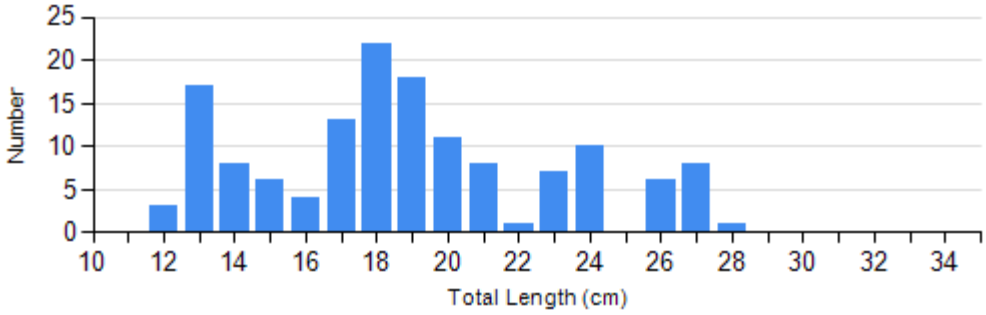


2023

Species: Yellow Perch
Gear: AFS std gill net



2020

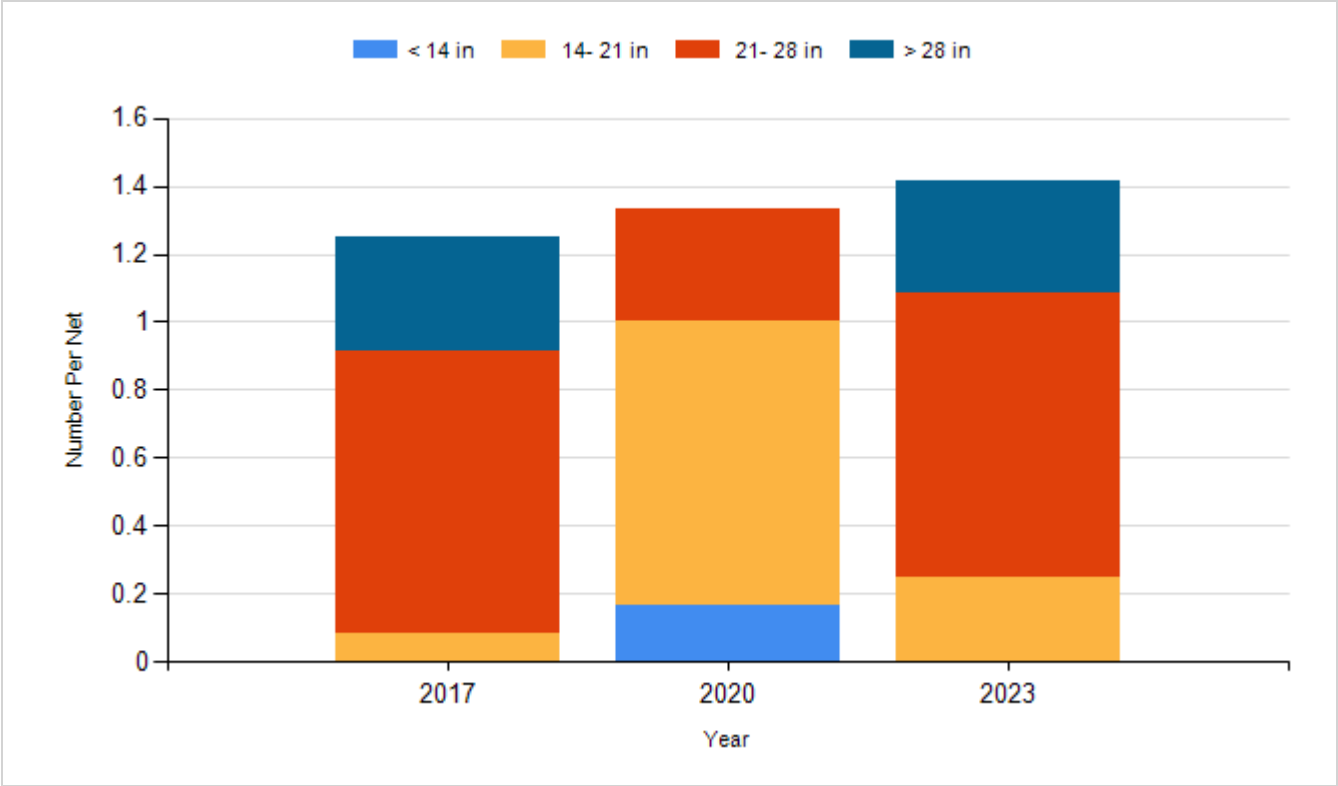


2023

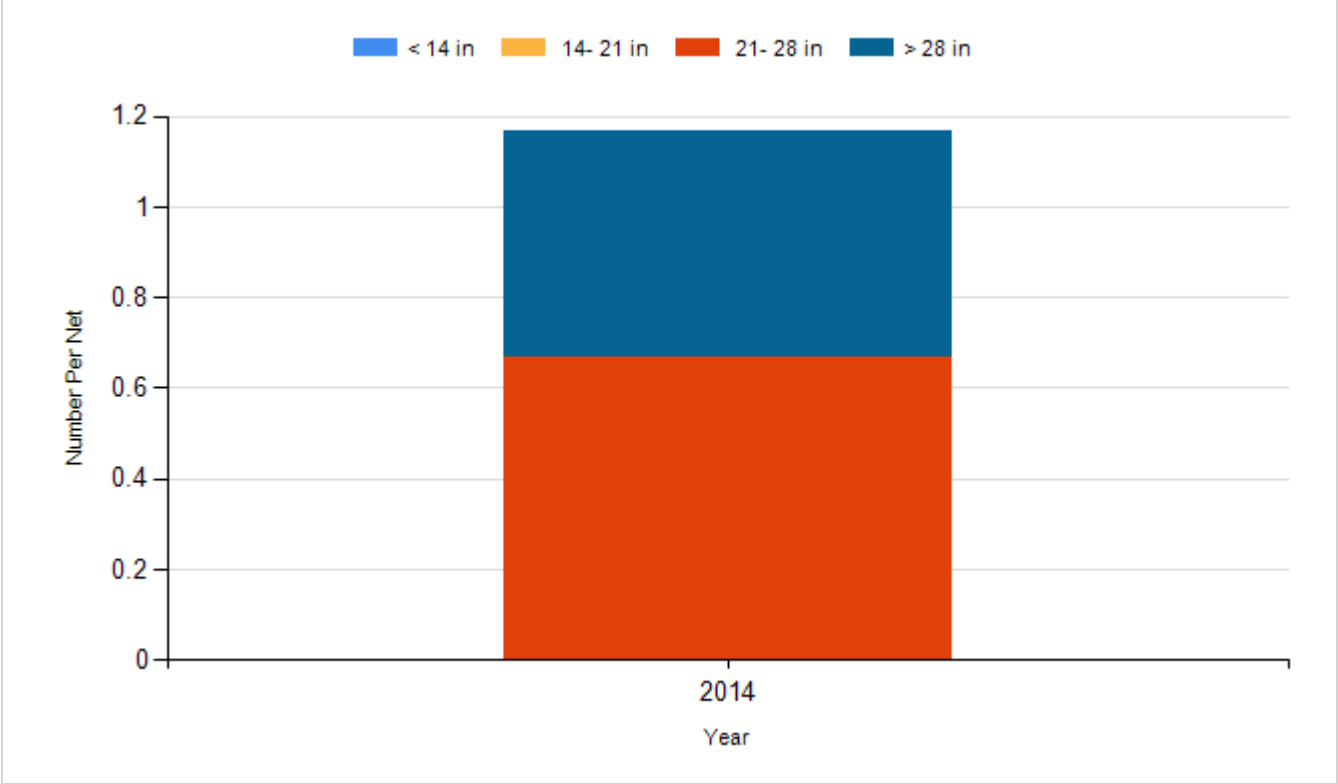
Historic Fish Sizes and Relative Abundance

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

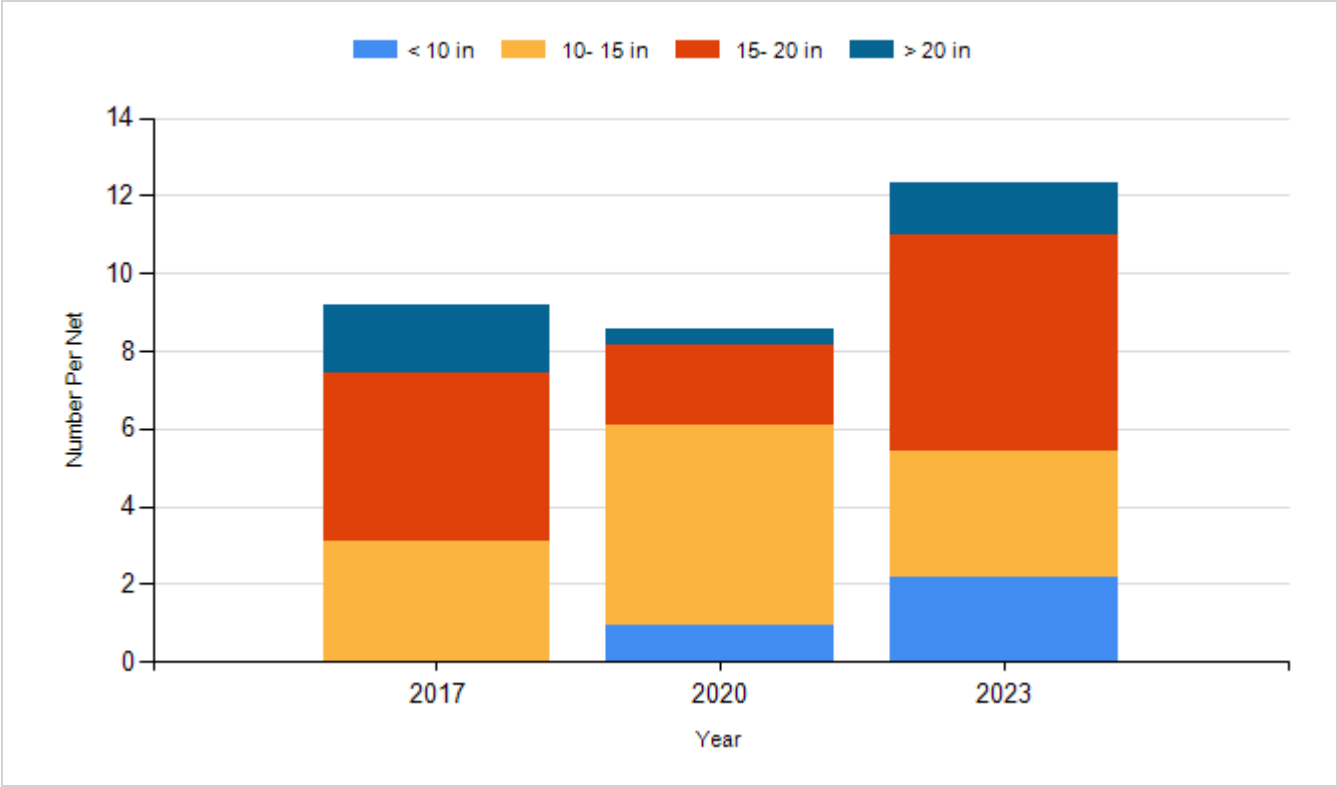
Species: Northern Pike
Gear: AFS std gill net



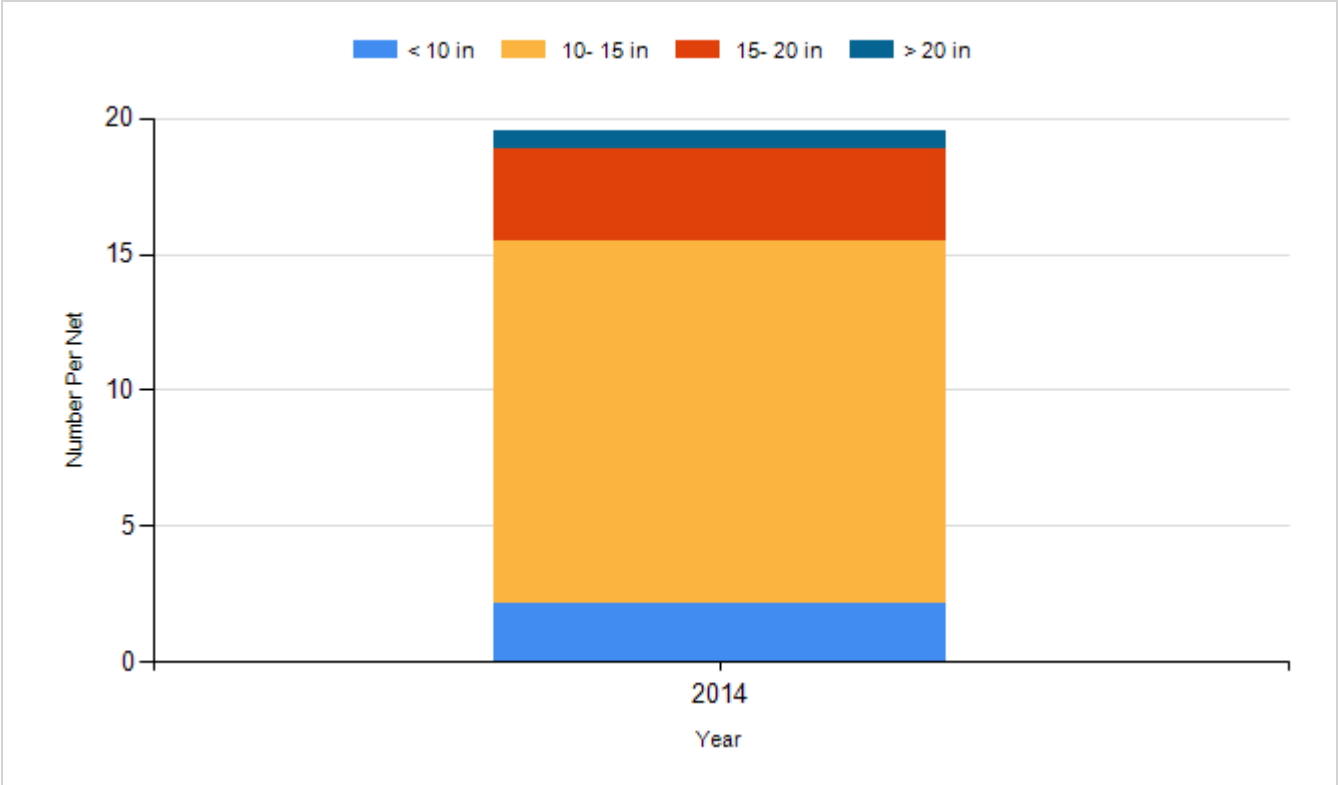
Species: Northern Pike
Gear: std exp gill net



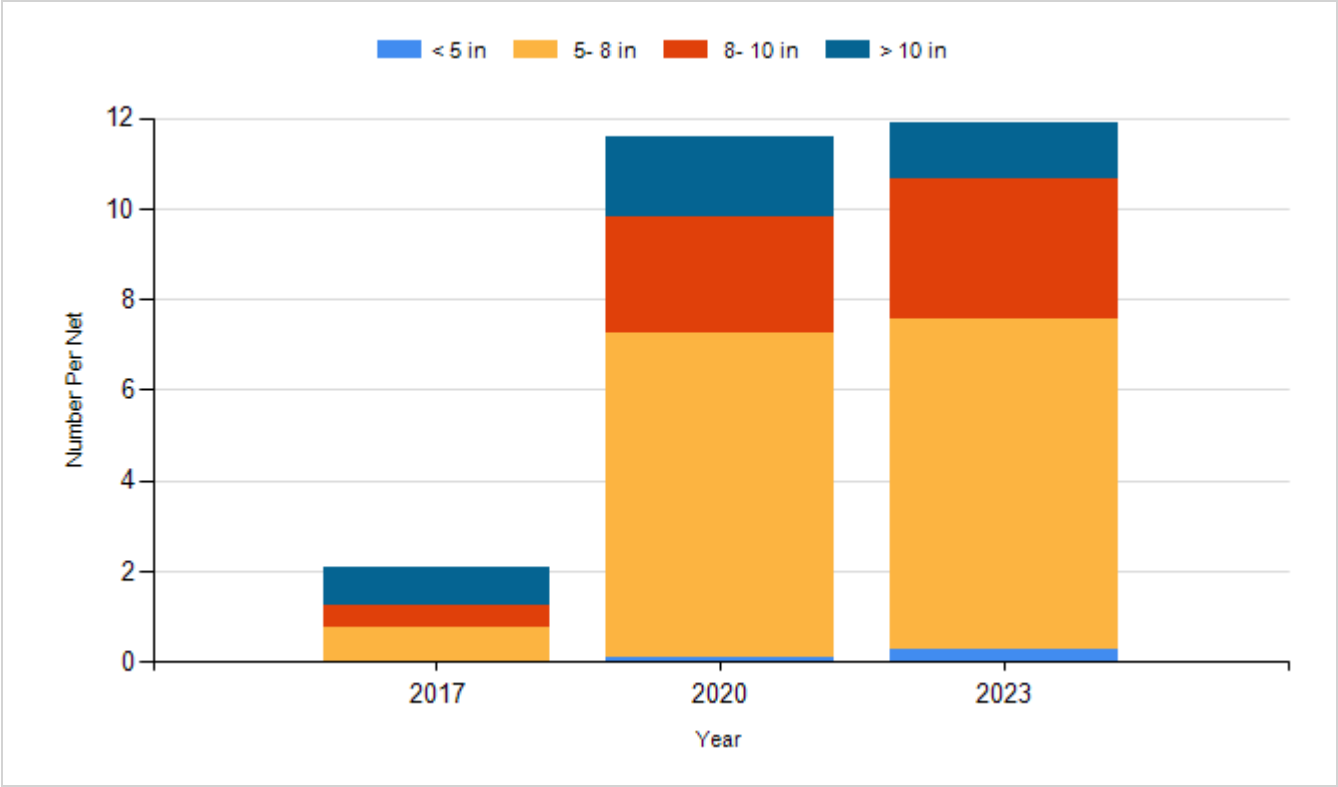
Species: Walleye
Gear: AFS std gill net



Species: Walleye
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



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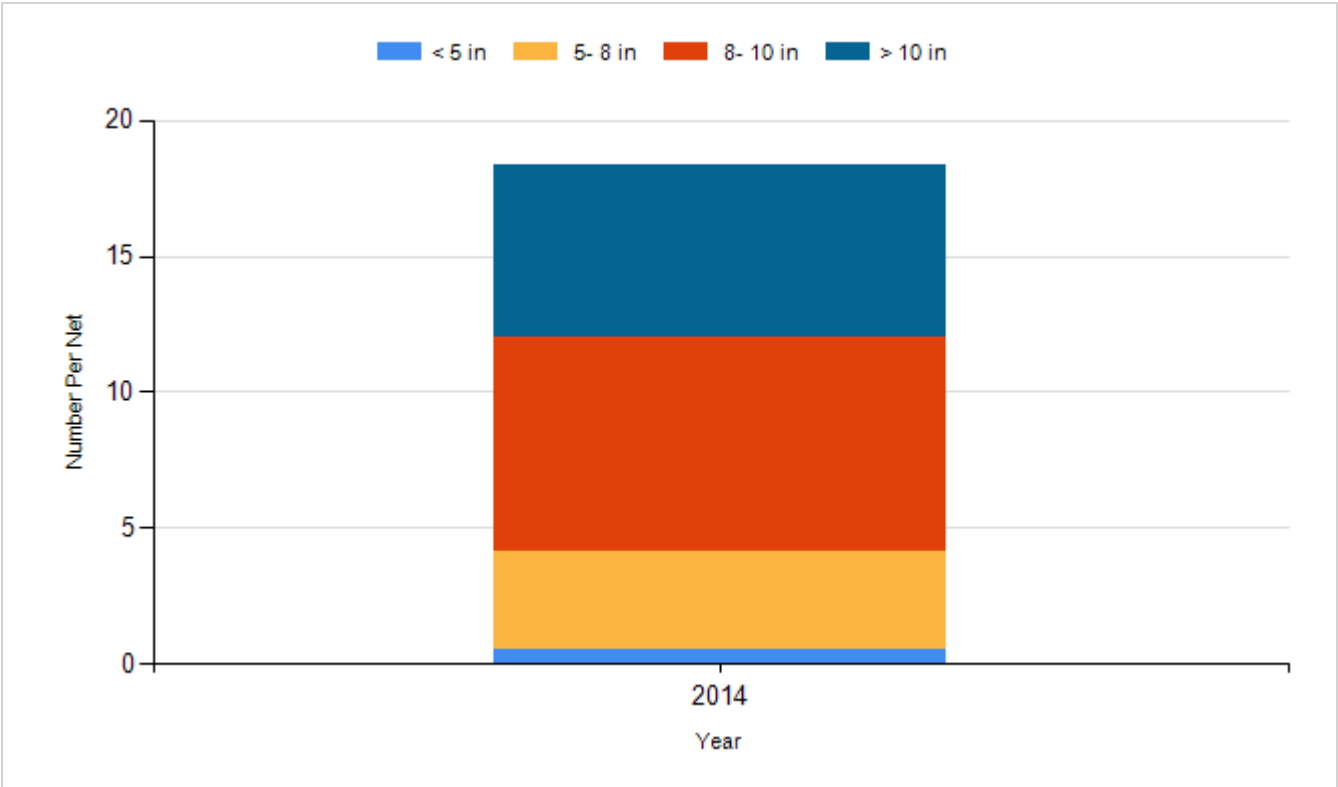

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Blue Dog, Day County
UBS-Lake-411-003
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	Walleye	148	10.2	1.5	68	6	13	4	92	1
	White Bass	2	0.2	0.2	50		50		104	7
	White Sucker	16	1.3	0.4	100		100		104	2
	Yellow Perch	143	11.7	1.9	37	6	11	4	104	1

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**

		CPUE										
Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
AFS std gill net	Black Bullhead				0.1			0.0			0.1	0.07
	Black Crappie				0.4			0.1			0.6	0.37
	Common Carp				0.7			0.2			0.3	0.40
	Emerald Shiner				0.0			0.0			0.0	0.00
	Gizzard Shad				1.3			0.0			0.0	0.43
	Northern Pike				1.3			1.2			1.4	1.30
	Rock Bass				0.1			0.1			0.3	0.17
	Smallmouth Bass				0.0			0.0			0.8	0.27
	Walleye				9.2			7.7			10.2	9.03
	White Bass				0.9			0.7			0.2	0.60
	White Sucker				1.1			0.8			1.3	1.07
	Yellow Perch				2.1			11.5			11.7	8.43
frame net (std 3/4 in)	Black Bullhead	2.1										2.10
	Black Crappie	1.7										1.70
	Common Carp	0.1										0.10
	Northern Pike	0.5										0.50
	Rock Bass	1.9										1.90
	Smallmouth Bass	0.4										0.40
	Walleye	1.6										1.60
	White Bass	1.4										1.40
	Yellow Perch	0.6										0.60
std exp gill net	Black Crappie	0.7										0.70
	Common Carp	0.7										0.70
	Green Sunfish	0.2										0.20
	Northern Pike	1.2										1.20
	Spottail Shiner	0.0										0.00
	Walleye	17.3										17.30
	White Bass	1.5										1.50
	White Sucker	1.7										1.70
	Yellow Perch	17.8										17.80

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.

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std gill net	Black Bullhead	PSD				100						100
		PSD-P				100						0
		Wr				74						85
	Black Crappie	PSD				60			0			100
		PSD-P				60			0			100
		Wr				107			115			111
	Common Carp	PSD				88			100			100
		PSD-P				75			100			100
		Wr				95			102			109
	Northern Pike	PSD				93			29			82
		PSD-P				27			0			24
		Wr				91			81			81
	Rock Bass	PSD				100			100			100
		PSD-P				0			0			25
		Wr				99			107			111
	Smallmouth Bass	PSD							0			78
		PSD-P							0			56
		Wr										106
	Walleye	PSD				66			33			68
		PSD-P				19			5			13
		Wr				85			84			92
	White Bass	PSD				91			100			50
		PSD-P				36			75			50
		Wr				91			95			104
	White Sucker	PSD				100			100			100
		PSD-P				100			100			100
		Wr				98			100			104
	Yellow Perch	PSD				64			38			37
		PSD-P				40			15			11
		Wr				95			105			104
frame net (std 3/4 in)	Black Bullhead	PSD	100									
		PSD-P	92									
		Wr	82									

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
frame net (std 3/4 in)	Black Crappie	PSD	100									
		PSD-P	87									
		Wr	104									
	Common Carp	PSD	100									
		PSD-P	100									
	Northern Pike	PSD	44									
		PSD-P	33									
		Wr	75									
	Rock Bass	PSD	85									
		PSD-P	9									
		Wr	109									
	Smallmouth Bass	PSD	71									
		PSD-P	57									
		Wr	106									
	Walleye	PSD	54									
		PSD-P	46									
		Wr	81									
	White Bass	PSD	100									
		PSD-P	100									
		Wr	93									
	Yellow Perch	PSD	90									
		PSD-P	40									
		Wr	99									
std exp gill net	Black Crappie	PSD	100									
		PSD-P	75									
		Wr	110									
	Common Carp	PSD	100									
		PSD-P	50									
		Wr	90									
	Northern Pike	PSD	100									
		PSD-P	43									
		Wr	76									
	Walleye	PSD	23									
		PSD-P	4									
		Wr	80									
	White Bass	PSD	100									
		PSD-P	100									

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
std exp gill net	White Bass	Wr	90									
	White Sucker	PSD	100									
		PSD-P	100									
		Wr	98									
	Yellow Perch	PSD	79									
		PSD-P	36									
		Wr	98									

Length at Capture

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

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	148	201 (26)	312 (36)	390 (6)	437 (26)	468 (31)	527 (3)	511 (5)	514 (6)		661 (5)
2020	103	181 (4)	272 (30)	324 (14)	356 (29)	425 (12)	450 (3)	471 (2)	474 (1)	484 (3)	600 (5)
2017	110		274 (27)	387 (25)	445 (12)	450 (5)	481 (23)	521 (14)	569 (1)	586 (1)	681 (2)
2014	117	189 (12)	275 (5)	302 (46)	372 (45)	424 (4)	560 (1)		505 (2)		655 (2)

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	143	139 (33)	190 (79)	236 (13)	265 (16)	273 (2)					
2020	139	129 (3)	181 (98)	235 (16)	243 (7)	274 (12)	308 (1)	285 (2)			
2017	25		185 (10)	240 (6)	255 (1)		298 (4)	283 (3)	294 (1)		
2014	109	127 (4)	156 (18)	227 (34)	252 (37)	258 (11)	305 (2)	300 (3)			

Fish Condition

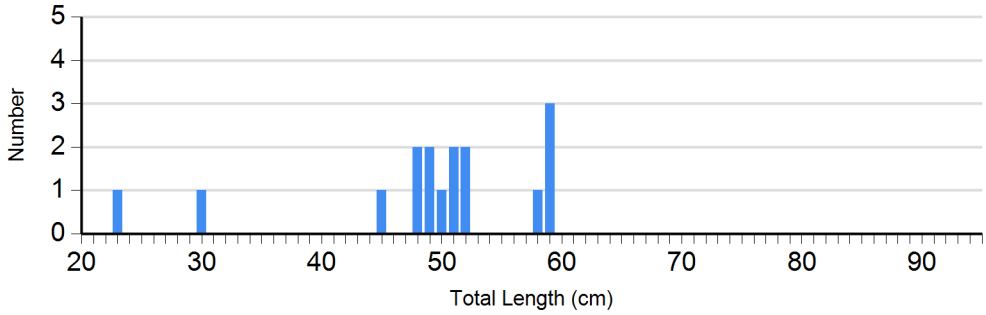
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2023	0		1	85	0		0	
Common Carp Gill Net	2020	0		0		1	96	1	108
	2023	0		0		2	101 (3.2)	1	124
Northern Pike Gill Net	2020	10	79 (1.9)	4	86 (6.9)	0		0	
	2023	3	81 (1.3)	10	78 (1.3)	2	92 (0.5)	2	85 (1.3)
Walleye Gill Net	2020	62	84 (0.6)	25	84 (1.3)	3	94 (1.9)	2	75 (5.5)
	2023	39	96 (0.9)	67	91 (0.6)	11	89 (1.2)	5	84 (3.1)
White Bass Gill Net	2020	0		2	100 (1.1)	4	93 (0.9)	2	94 (6.2)
	2023	1	99	0		0		1	110
White Sucker Gill Net	2020	0		0		2	110 (4.5)	7	97 (3.1)
	2023	0		0		2	104 (2.8)	14	105 (1.7)
Yellow Perch Gill Net	2020	86	106 (0.7)	31	106 (1.3)	20	99 (1.4)	1	90
	2023	88	104 (0.7)	37	105 (1.1)	15	100 (1.5)	0	

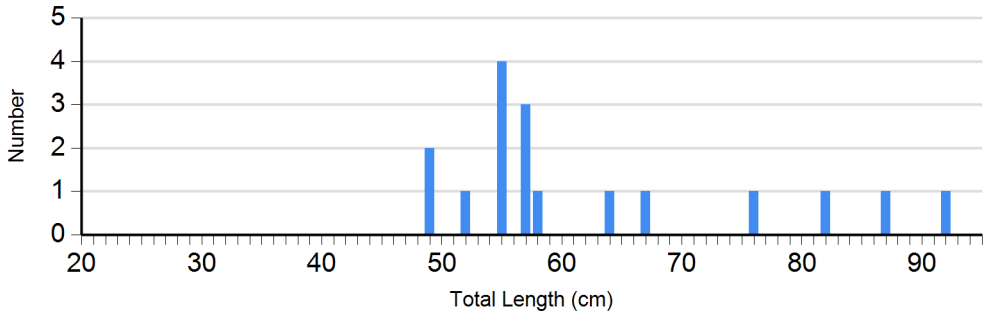
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Northern Pike
Gear: AFS std gill net

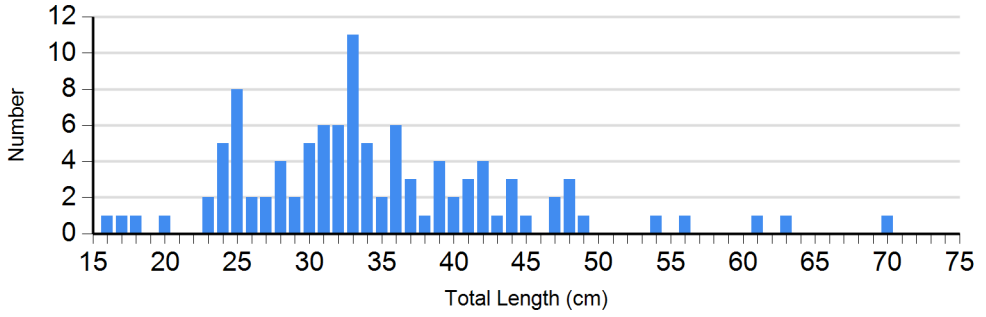


2020

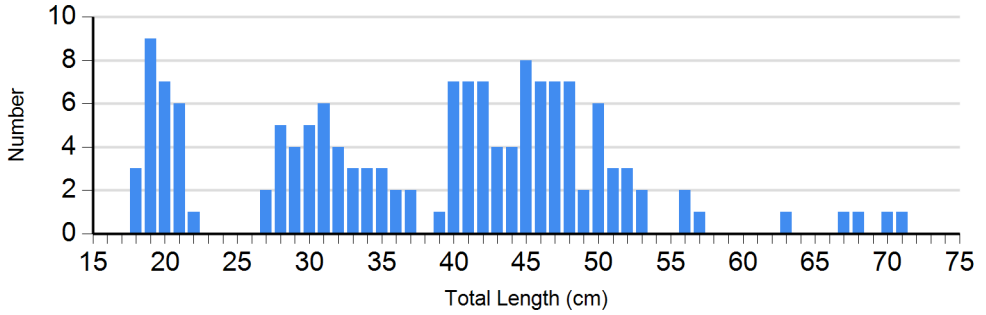


2023

Species: Walleye
Gear: AFS std gill net

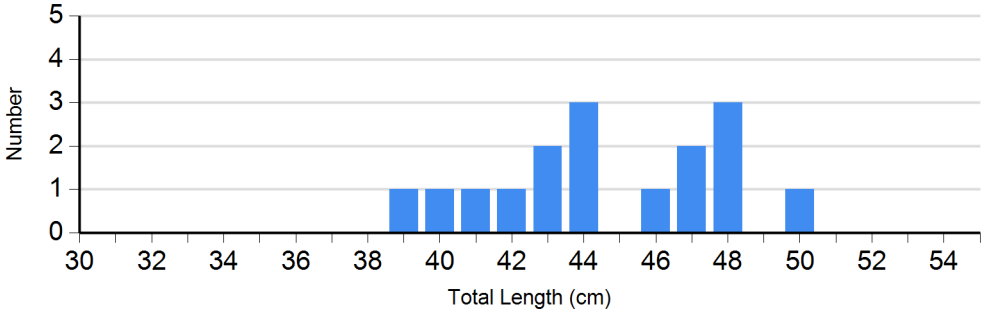


2020



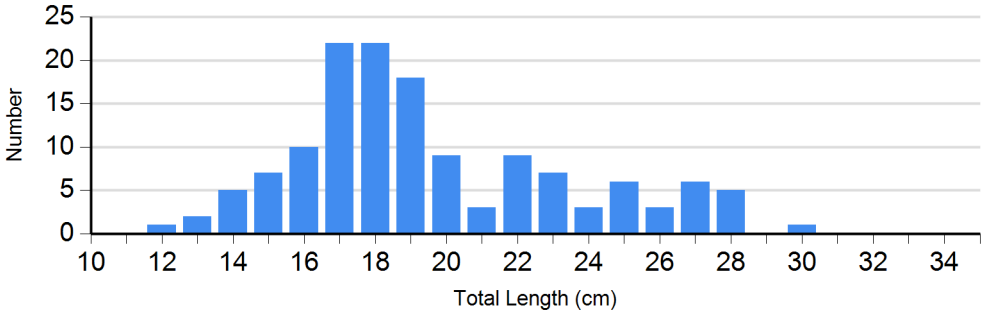
2023

Species: White Sucker
Gear: AFS std gill net

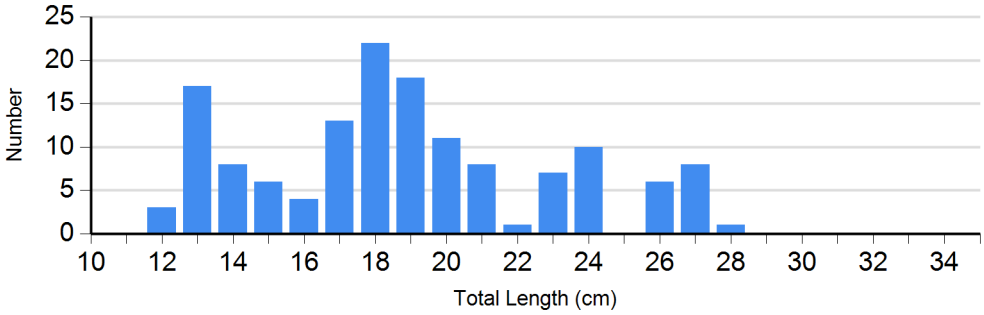


2023

Species: Yellow Perch
Gear: AFS std gill net



2020

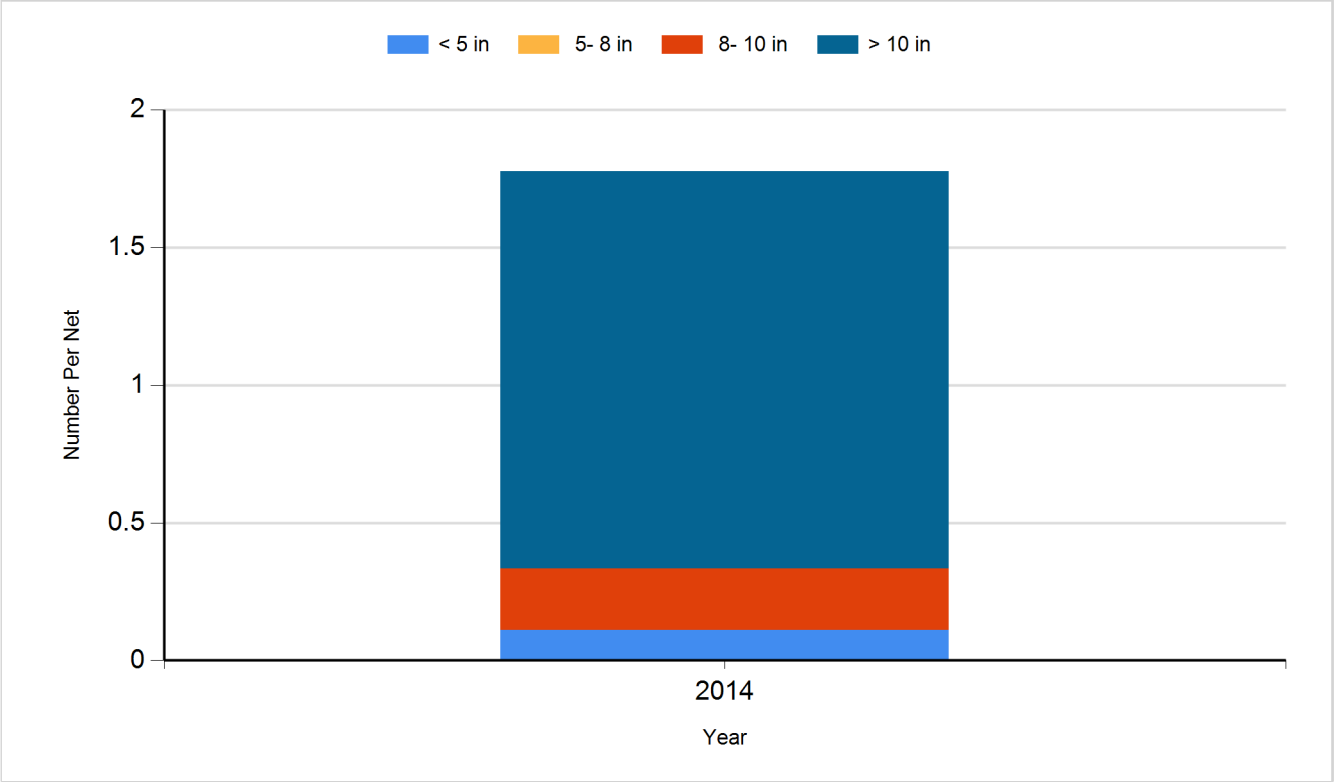


2023

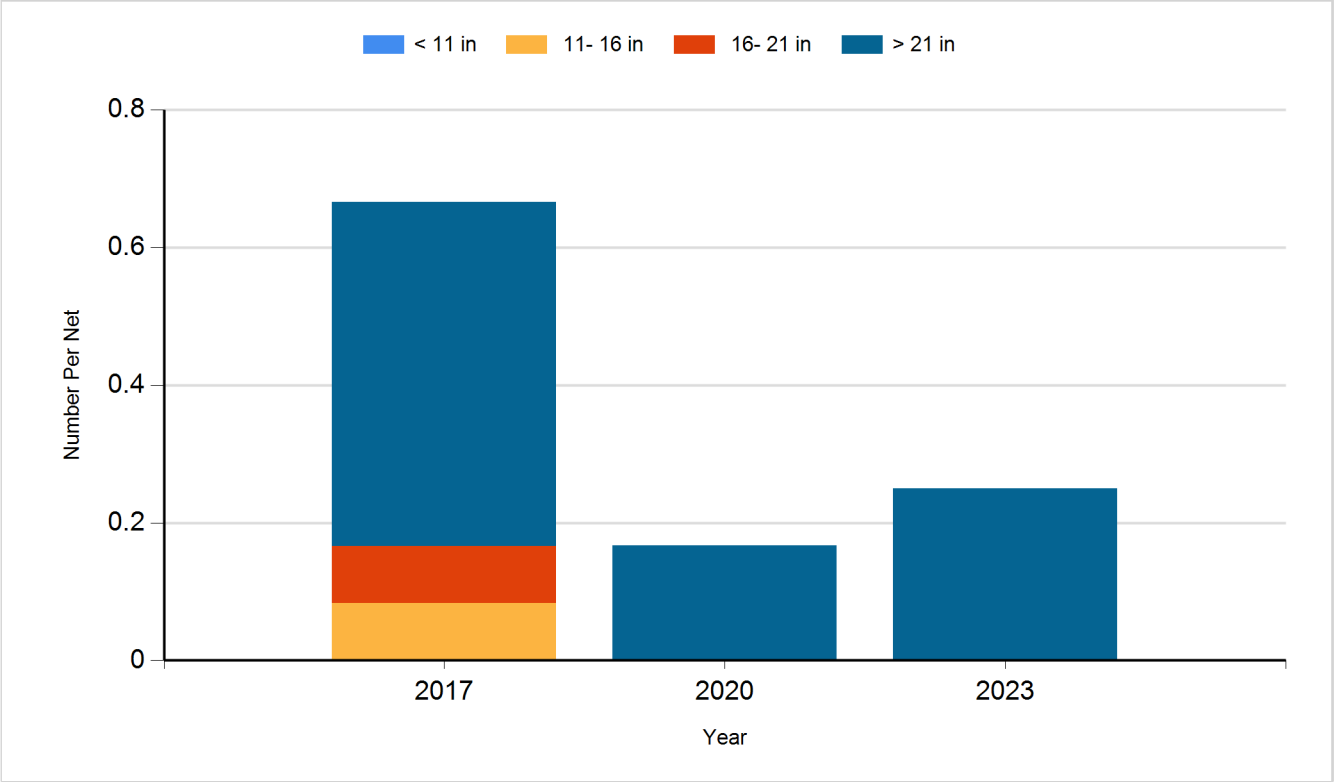
Historic Fish Sizes and Relative Abundance

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

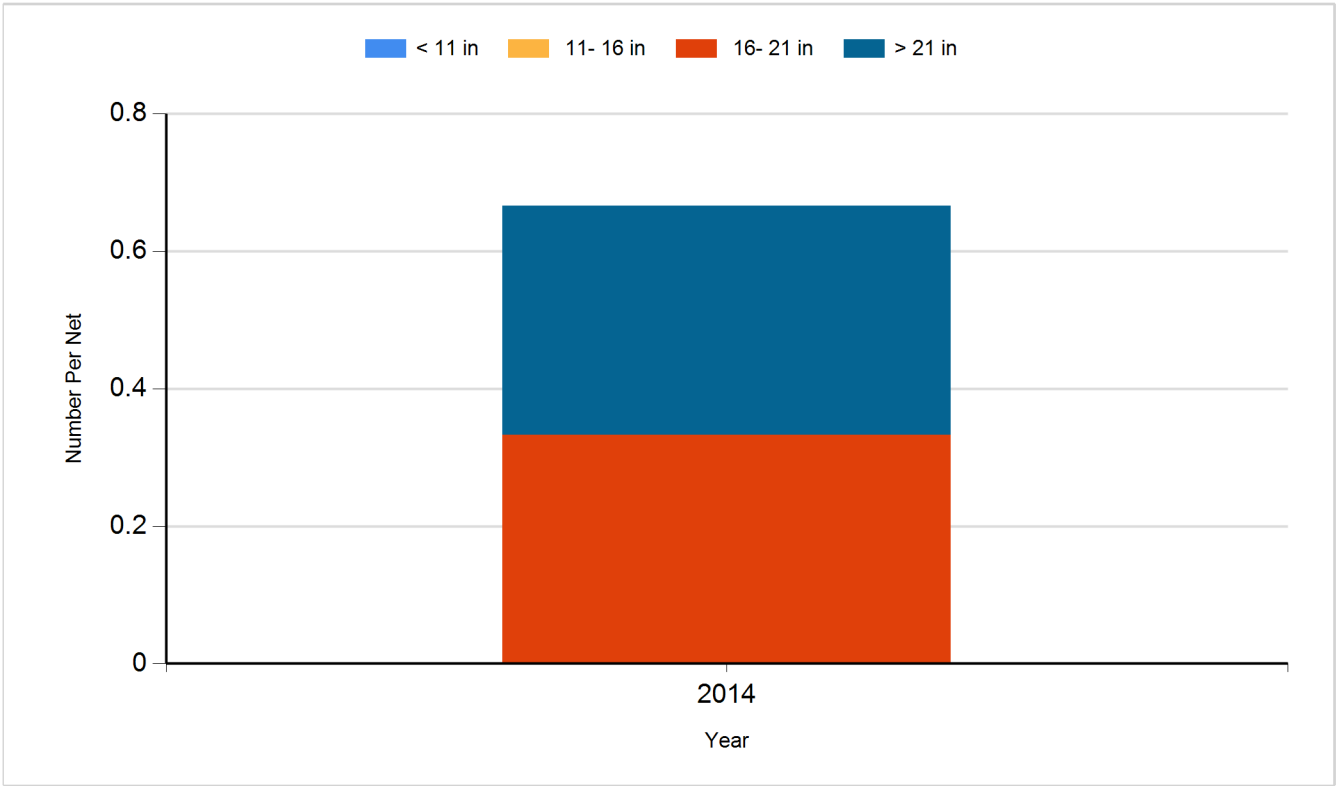
Species: Black Crappie
Gear: frame net (std 3/4 in)



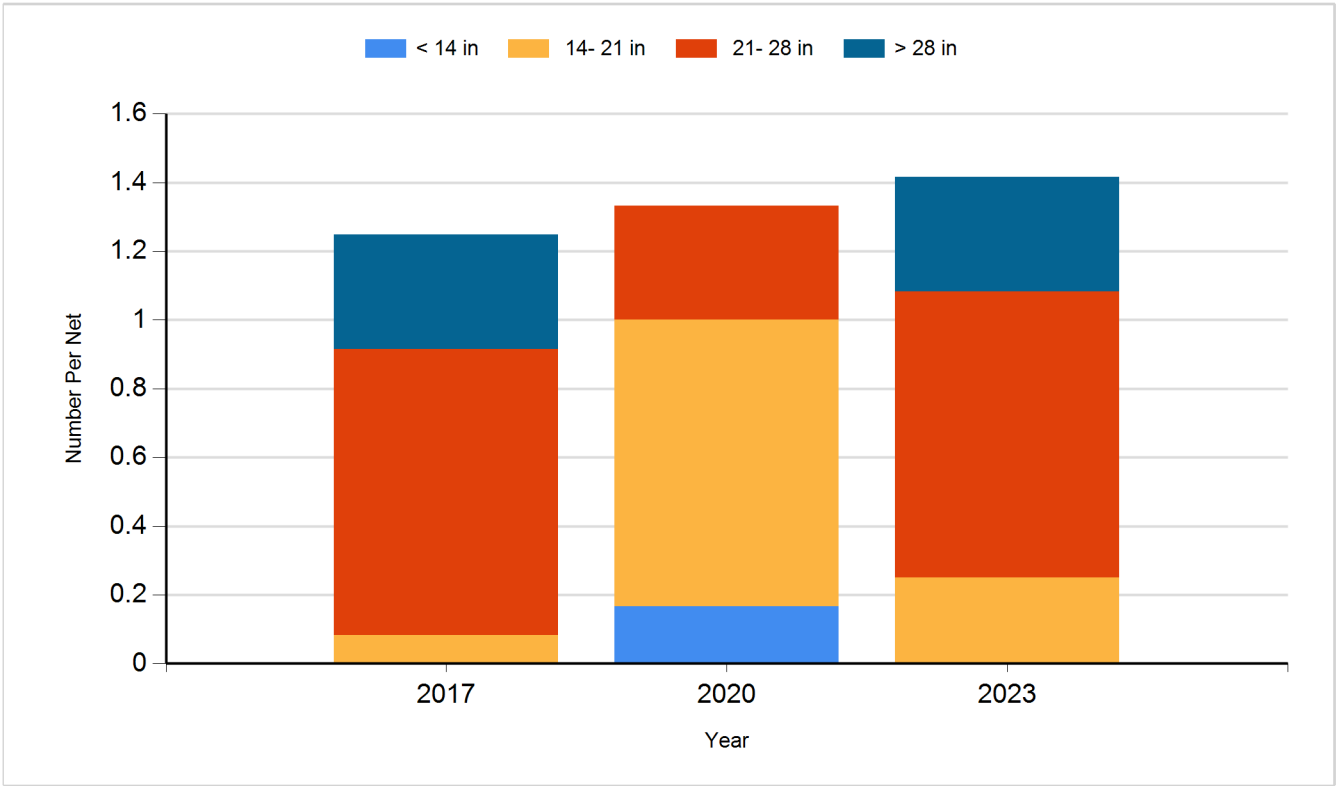
Species: Common Carp
Gear: AFS std gill net



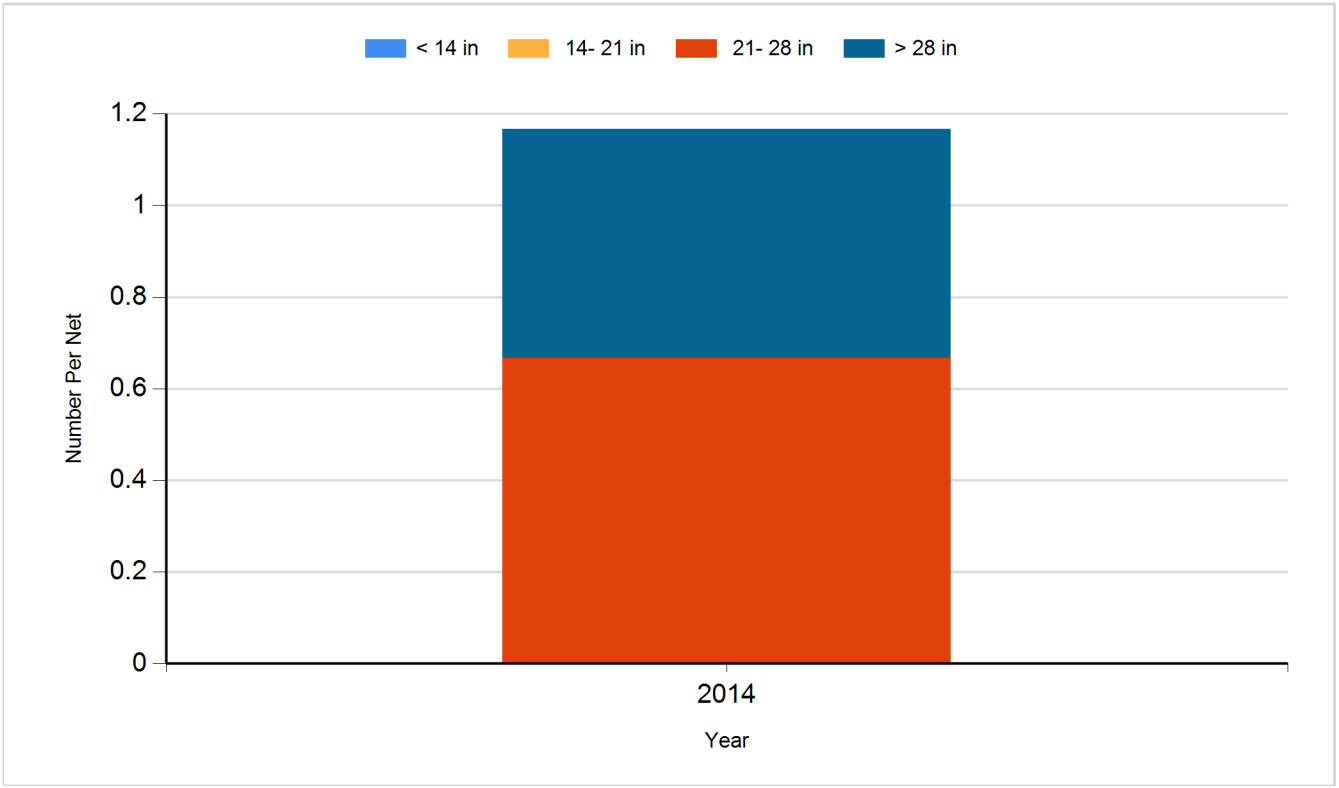
Species: Common Carp
Gear: std exp gill net



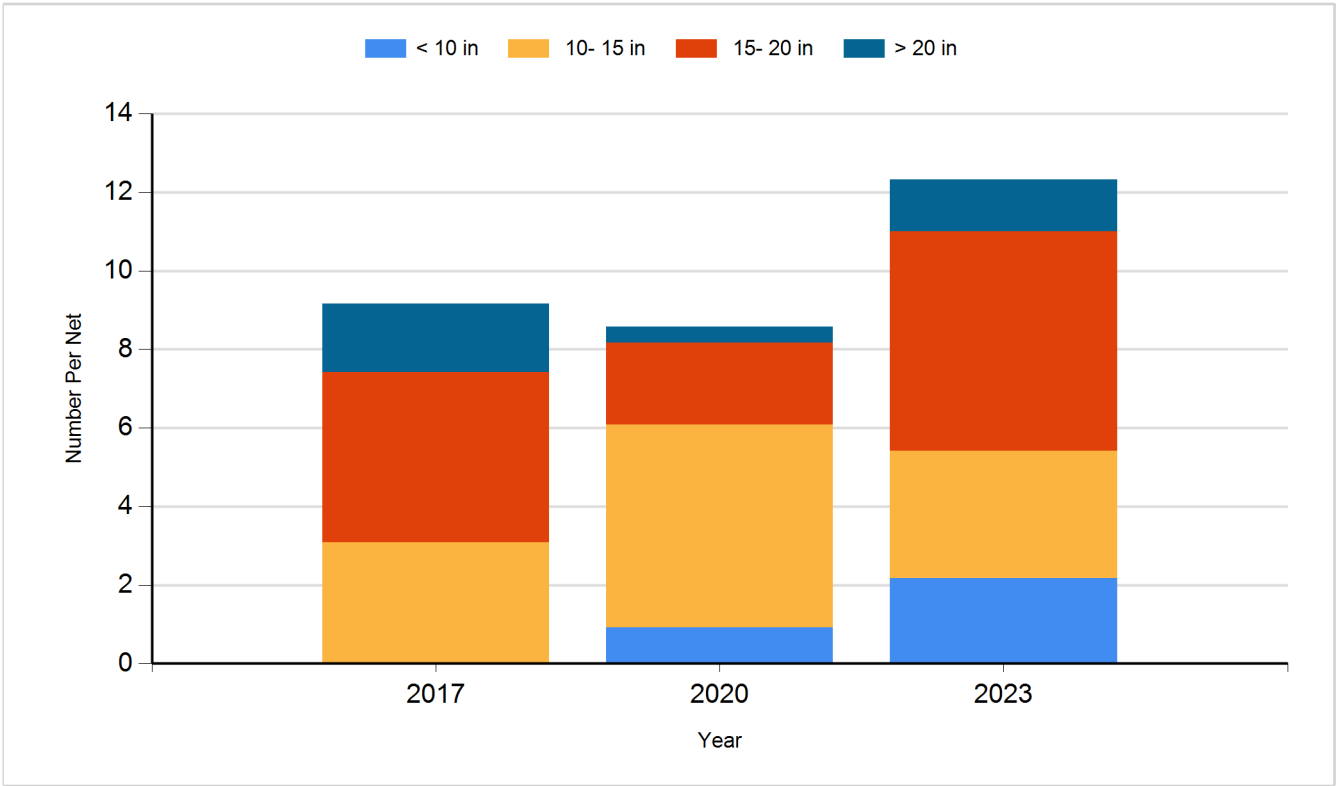
Species: Northern Pike
Gear: AFS std gill net



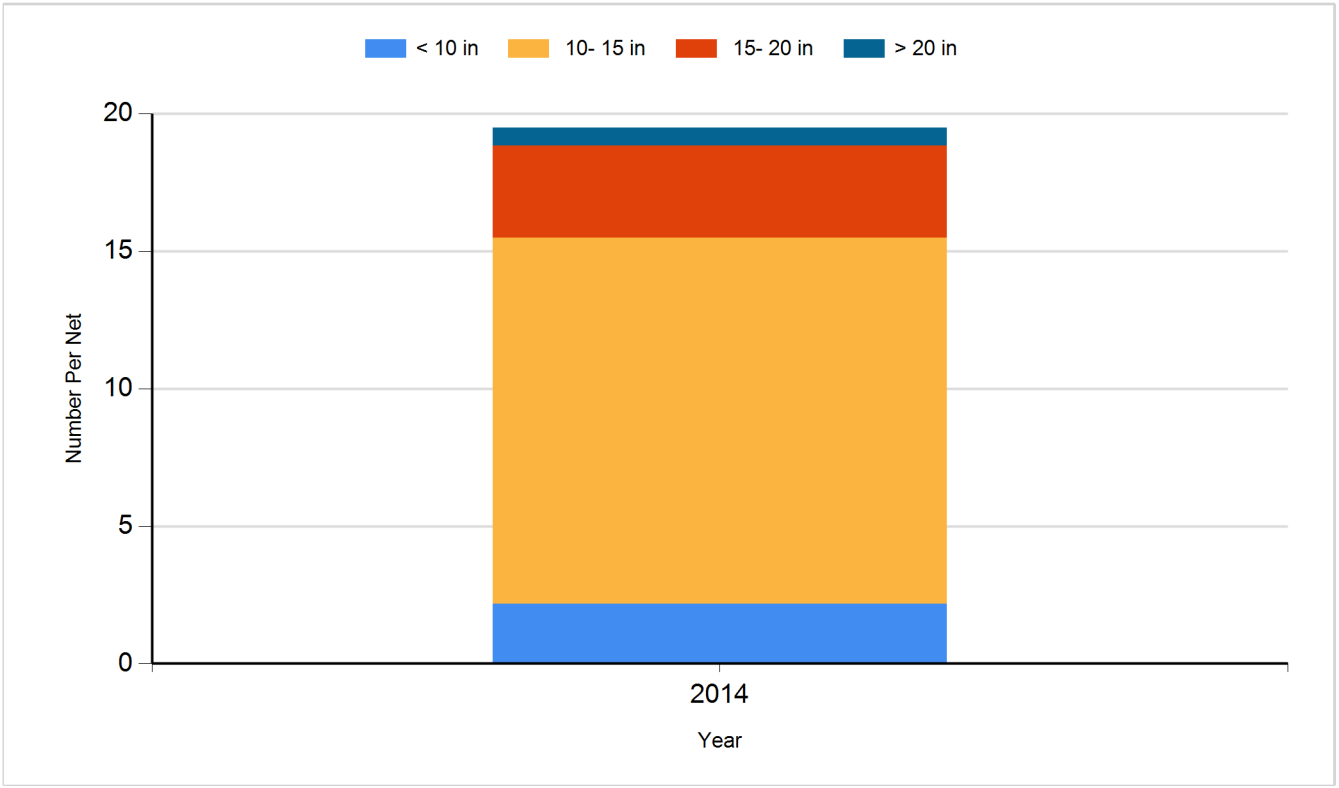
Species: Northern Pike
Gear: std exp gill net



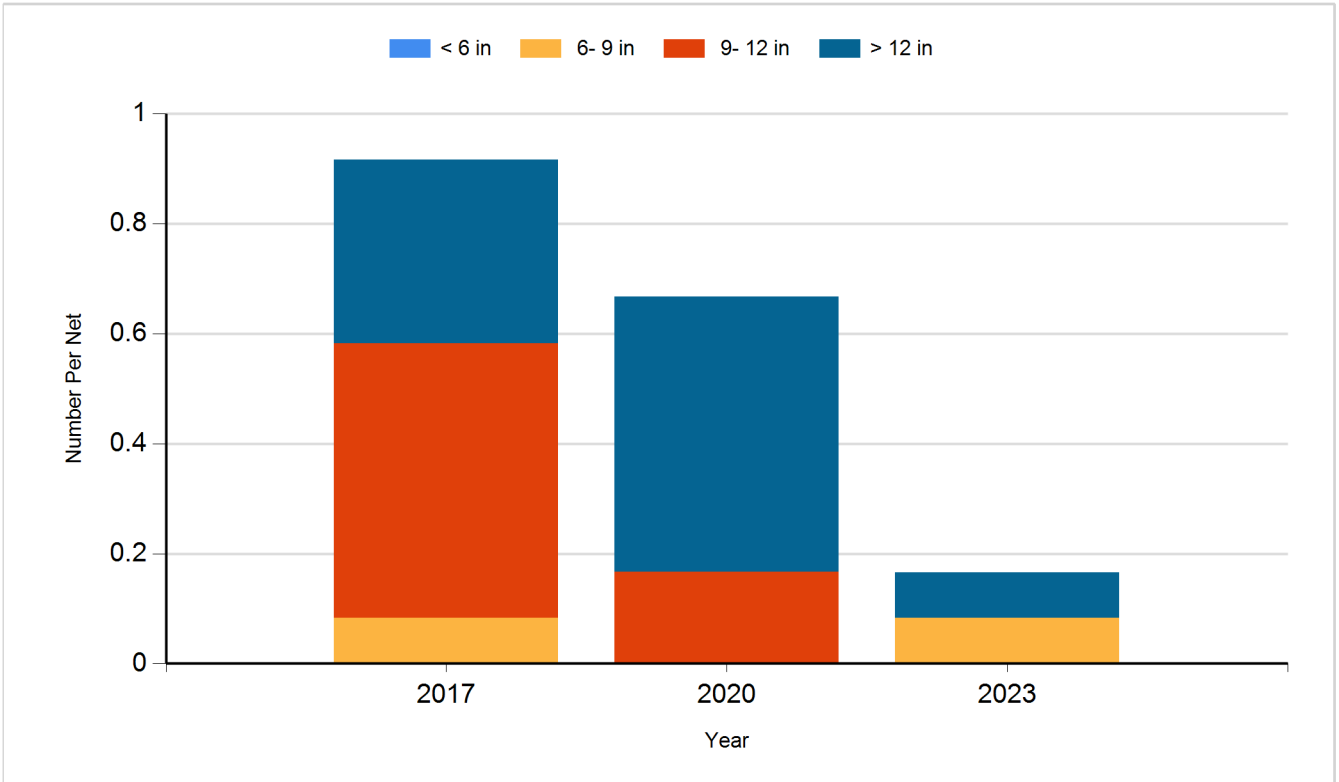
Species: Walleye
Gear: AFS std gill net



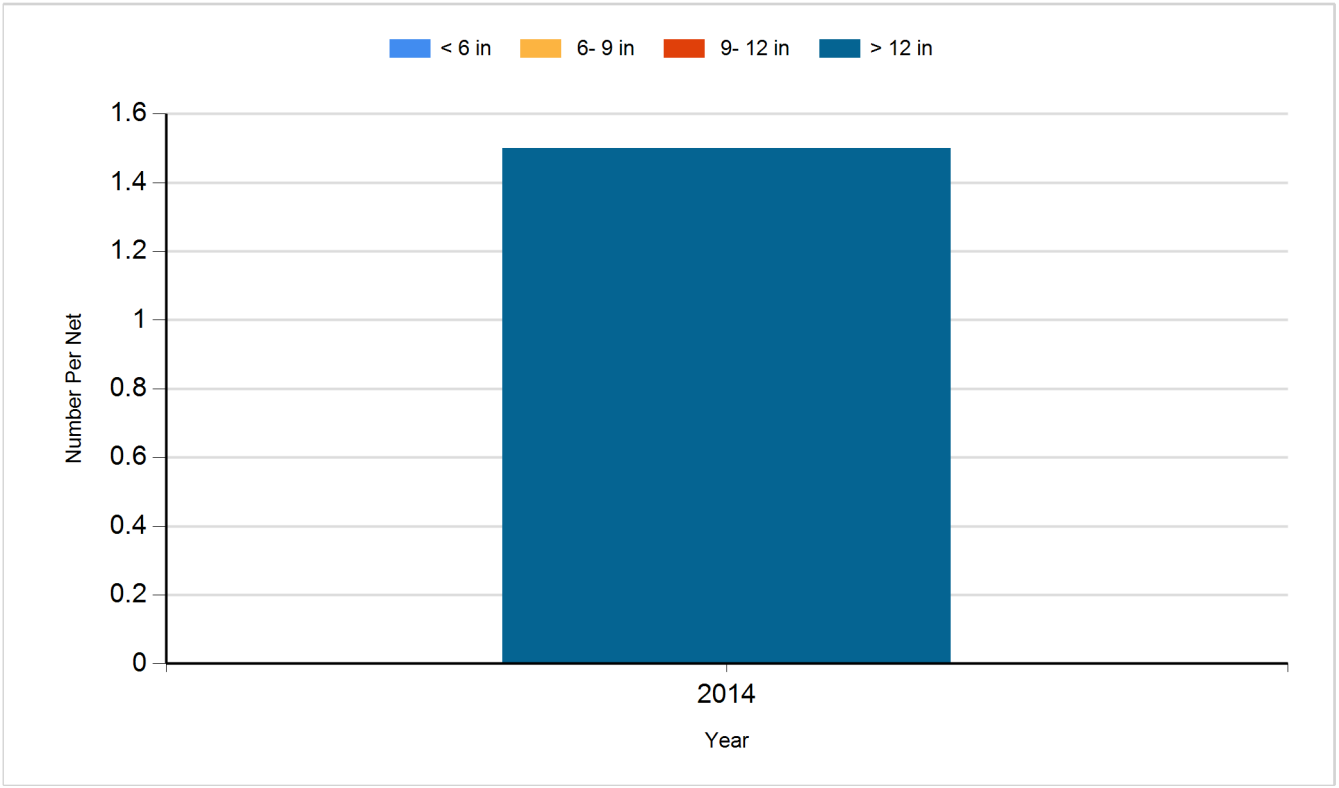
Species: Walleye
Gear: std exp gill net



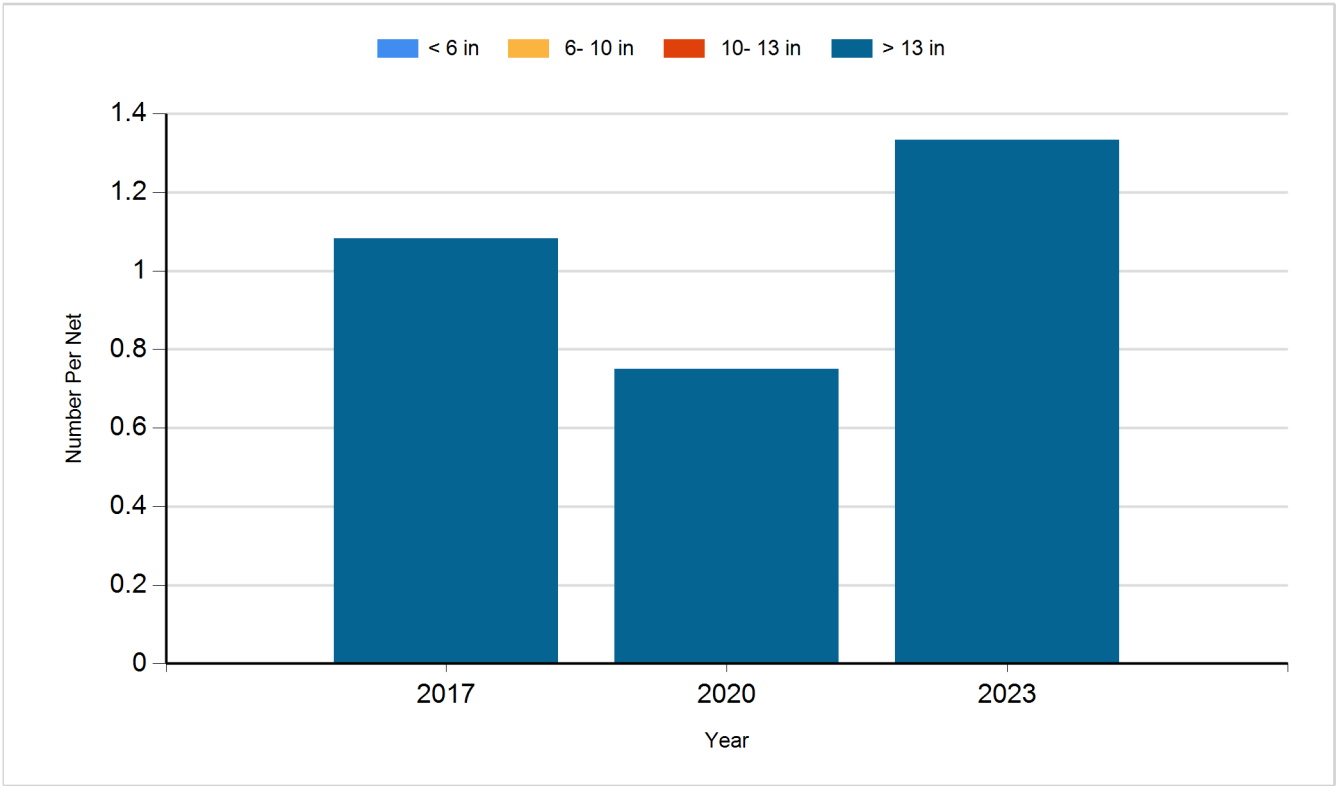
Species: White Bass
Gear: AFS std gill net



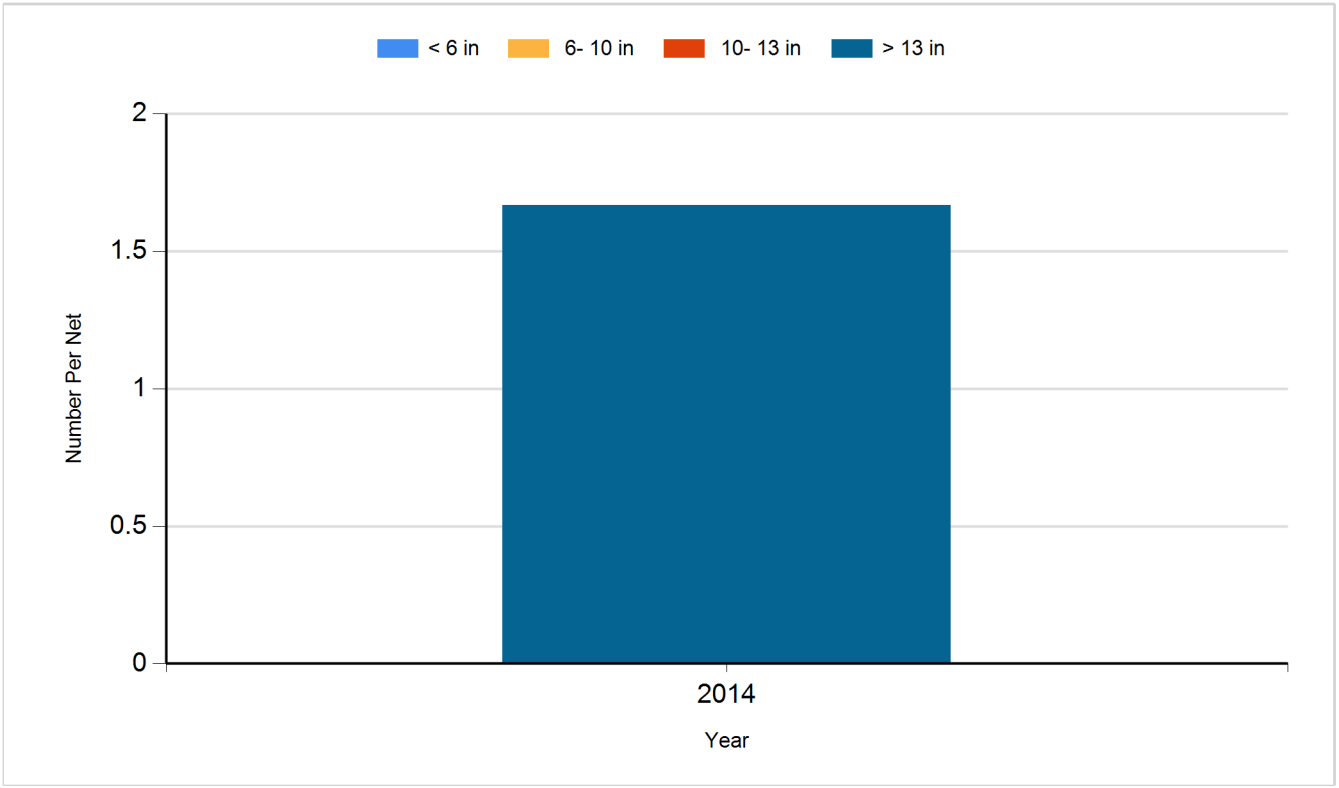
Species: White Bass
Gear: std exp gill net



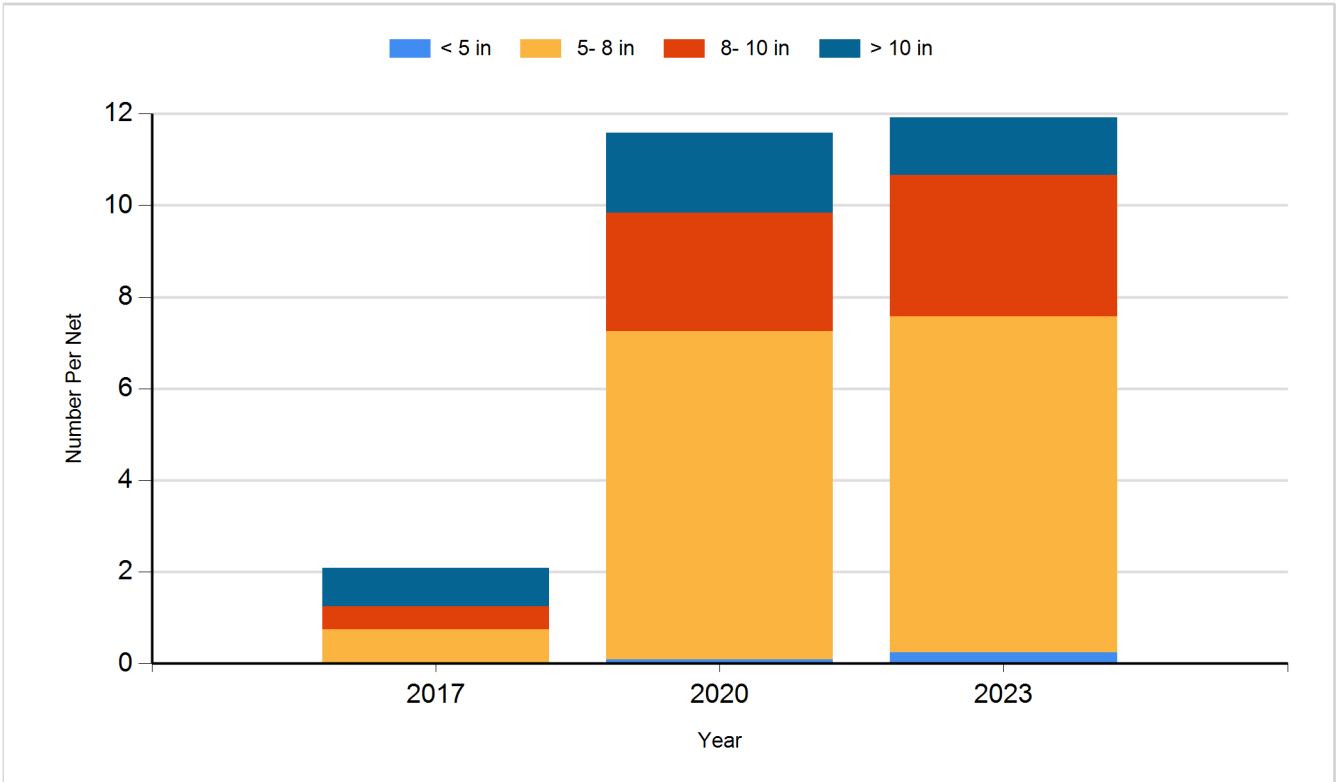
Species: White Sucker
Gear: AFS std gill net



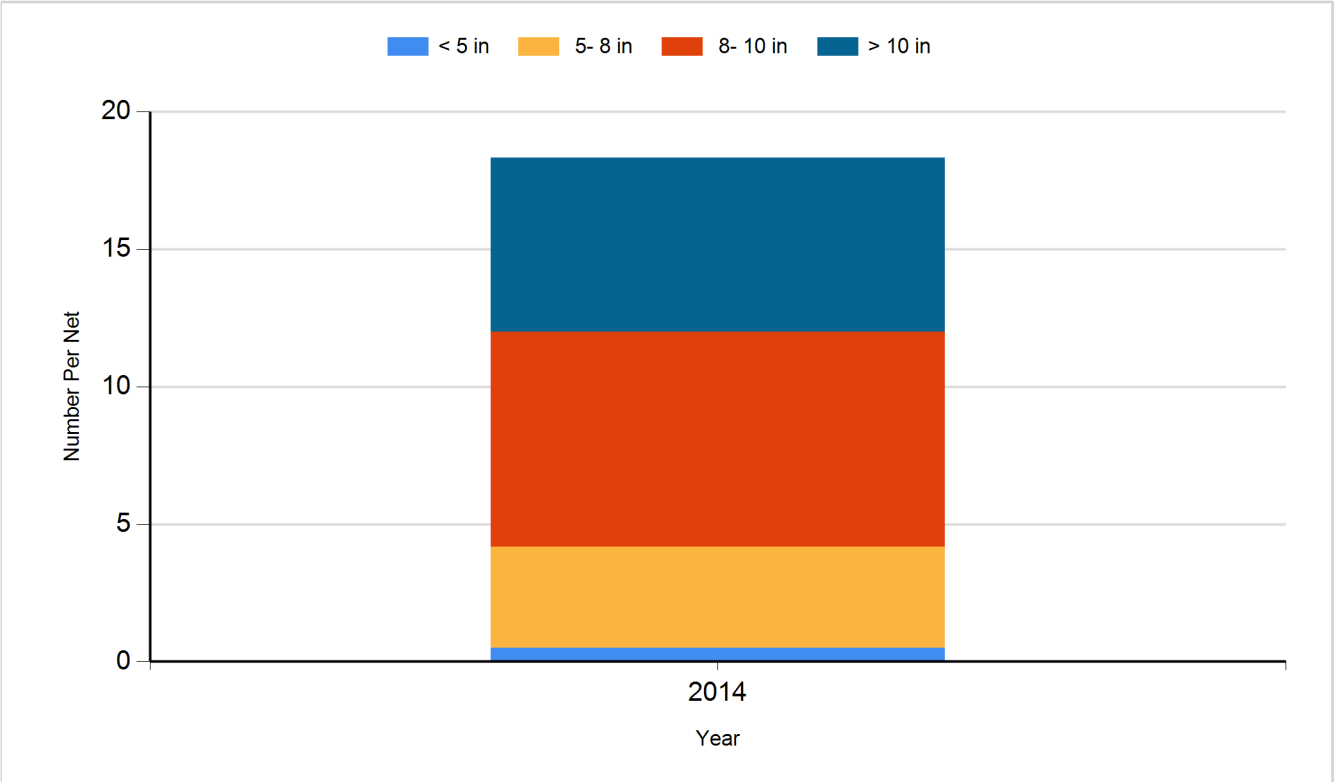
Species: White Sucker
Gear: std exp gill net



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
2017	Walleye	Fingerling	22,500
2019	Walleye	Small Fingerling	61,225
2021	Rainbow Trout (Arlee)	Juvenile	20,000
2021	Rainbow Trout (Shasta)	Juvenile	5,818
2021	Walleye	Fry	500,000
2022	Bluegill	Juvenile	5,700
2023	Saugeye	Juvenile	33,880