Gardner Lake Survey Summary

Gardner Lake is a 203-acre impoundment located 3 miles West and 1 mile North of Buffalo. Primary species in Gardner include Black Crappie, Northern Pike and Walleye. Other species present include Channel Catfish, Common Carp and Yellow Perch. Gardner was stocked with Gizzard Shad as a forage species starting in 2016.

Black Crappie. Gardner had been suffering from low water and partial winterkills in recent years which may be affecting crappie numbers as only 2.8 fish per net was recorded in 2024. This matches the catch rate of last year. Maximum size in the sample were just under 12.5 inches.

Northern Pike. Eighty-nine pike were caught in this year's frame nets compared to 21 in last year's survey. Fish ranged in size from 14-33 inches.

Walleye. Walleye numbers have not been affected by the low water as gill nets sampled 11.8 walleye per net. Walleye sampled ranged in size from 12 to 27 inches. Gardner was stocked with 40,140 small fingerlings in the spring of 2024.

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Gardner, Harding County
SFG-Lake-581-000
2024

Lake Information

Name: Gardner

County: Harding

Surface Area: 196 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 02, 2024	4 net-nights
frame net (std 3/4 in)	May 09, 2024	6 net-nights

Common Fish Species Present

Channel Catfish

Black Crappie

Largemouth Bass

Walleye

Northern Pike

Common Carp

Yellow Perch

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 Crappie	3	0.3	0.4	0		0		108	
	Common Carp	18	4.5	1.9	83		0		85	2
	Northern Pike	27	6.8	2.2	44	15	4		87	1
	Walleye	47	11.8	4.2	83	8	26	10	84	1
frame net (std 3/4 in)	Black Crappie	17	1.8	0.6	64		64		98	3
	Common Carp	1	0.2	0.2	0		0		102	
	Northern Pike	89	14.8	4.3	65	7	3		97	1
	Walleye	6	1.0	0.5	100		50		93	2
	Yellow Perch	1	0.2	0.2	0		0		78	

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	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
AFS gill net (1/2 inch)*	Black Crappie					4.0						4.00
	Walleye					2.0						2.00
AFS std frame net	Black Crappie			33.0								33.00
	Northern Pike			0.2								0.20
	Yellow Perch			0.2								0.20
AFS std gill net	Black Crappie			32.5	3.3	3.5	1.8	2.3	0.0	1.3	0.3	5.63
	Channel Catfish			5.5	1.3	1.8	2.3	1.3	0.0	0.3	0.0	1.56
	Common Carp			11.0	6.5	1.8	0.0	3.3	3.0	1.8	4.5	3.99
	Gizzard Shad			0.0	0.0	28.0	11.8	0.0	0.3	0.0	0.0	5.01
	Largemouth Bass			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
	Northern Pike			2.0	0.8	1.8	2.0	1.7	3.7	3.5	6.8	2.79
	Walleye			5.0	2.8	3.3	8.3	7.3	6.3	13.3	11.8	7.26
	Yellow Perch			1.0	1.8	3.0	1.0	0.0	0.0	0.8	0.0	0.95
boat shocker (day)	Largemouth Bass	61.2			9.6				0.0	0.0		17.70
	Walleye*	0.0			16.9				37.0	37.7		22.90
frame net (std 3/4 in)	Black Crappie	24.4	138.8		17.0	10.0	35.1	3.2	4.5	1.6	1.8	26.27
	Bluegill	0.0	0.0		0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.16
	Channel Catfish	0.0	0.0		0.2	0.2	0.1	0.0	0.0	0.3	0.0	0.09
	Common Carp	0.1	0.0		0.3	0.7	0.3	1.0	0.5	0.0	0.2	0.34
	Gizzard Shad	0.0	0.0		0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.31
	Green Sunfish	0.0	0.0		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.01
	Northern Pike	0.3	0.2		1.3	0.2	0.1	9.2	1.5	0.4	14.8	3.11
	Rock Bass	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.07
	Shorthead Redhorse	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.08
	Smallmouth Bass	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.04
	Walleye	1.1	0.0		1.5	0.2	0.1	6.6	2.0	1.0	1.0	1.50
	White Sucker	0.0	0.0		0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.02
	Yellow Perch	0.3	0.2		0.0	0.0	0.4	0.2	0.0	0.1	0.2	0.16
std exp gill net	Black Crappie	7.0	11.0									9.00
	Channel Catfish	0.0	1.0									0.50
	Common Carp	4.0	10.5									7.25
	Gizzard Shad	0.0	0.0									0.00
	Largemouth Bass	0.0	2.0									1.00
	Northern Pike	4.0	20.0									12.00

		CPUE										
Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
std exp gill net	Spottail Shiner	0.0	0.0									0.00
	Walleye	2.0	7.0									4.50
	Yellow Perch	9.5	15.0									12.25

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	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std frame net	Black Crappie	PSD			96							
		PSD-P			70							
		Wr			94							
	Northern Pike	PSD			0							
		PSD-P			0							
		Wr			87							
	Yellow Perch	PSD			100							
		PSD-P			0							
		Wr			88							
AFS std gill net	Black Crappie	PSD			97	100	57	43	86		80	0
		PSD-P			63	85	57	43	71		80	0
		Wr			93	84	96	99	93		93	108
	Channel Catfish	PSD			27	40	100	100	100		100	
		PSD-P			0	20	29	33	0		100	
		Wr			89	87	88	84	80		99	
	Common Carp	PSD			64	96	71		70	89	100	83
		PSD-P			0	0	0		0	0	0	0
		Wr			87	82	84		89	84	84	85
	Largemouth Bass	PSD						0				
		PSD-P						0				
	Northern Pike	PSD			75	67	43	88	100	82	64	44
		PSD-P			25	33	0	13	40	18	0	4
		Wr			84	86	100	90	80	73	92	87
	Walleye	PSD			90	100	85	6	23	53	87	83
		PSD-P			20	82	46	0	0	26	15	26
		Wr			83	81	88	86	84	82	86	84
	Yellow Perch	PSD			0	0	25	0			33	
		PSD-P			0	0	8	0			0	
		Wr			82	98	90	94			95	
boat shocker (day)	Largemouth Bass	PSD	12			82						
		PSD-P	6			0						
		Wr	121			110						

			Year									
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
boat shocker (day)	Walleye	PSD				22				88	38	
		PSD-P				22				3	0	
		Wr				95				88	89	
frame net (std 3/4 in)	Black Crappie	PSD	66	99		94	100	95	50	100	74	64
		PSD-P	7	61		18	35	80	44	83	65	64
		Wr	101	106		88	92	87	85	86	90	98
	Channel Catfish	PSD				0	100	100			0	
		PSD-P				0	100	0			0	
		Wr				89	89	78			80	
	Common Carp	PSD	100			50	75	0	80	50		0
		PSD-P	0			0	0	0	0	0		0
		Wr	89			89	91	91	97	94		102
	Northern Pike	PSD	0	100		25	100	100	78	100	100	65
		PSD-P	0	100		0	0	0	9	33	40	3
		Wr	119	107		85	91	94	84	80	92	97
	Walleye	PSD	64			100	100	100	18	100	79	100
		PSD-P	9			78	100	100	6	100	29	50
		Wr	79			80	92	78	75	83	81	93
	Yellow Perch	PSD	0	100				0	0		0	0
		PSD-P	0	0				0	0		0	0
		Wr	98					84	142		86	78
std exp gill net	Black Crappie	PSD	21	77								
		PSD-P	0	64								
		Wr	108	102								
	Channel Catfish	PSD		0								
		PSD-P		0								
		Wr		92								
	Common Carp	PSD	88	38								
		PSD-P	0	0								
		Wr	91	91								
	Largemouth Bass	PSD		0								
		PSD-P		0								
		Wr		112								
	Northern Pike	PSD	13	18								
		PSD-P	0	5								
		Wr	86	85								

			Year									
Gear	Species	Index	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
std exp gill net	Walleye	PSD	50	86								
		PSD-P	25	7								
		Wr	76	88								
	Yellow Perch	PSD	32	30								
		PSD-P	0	0								
		Wr	106	95								

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+
2015	518		135 (149)	192 (107)	224 (94)	238 (102)	244 (67)				

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	122	211 (71)	276 (37)	305 (10)			409 (4)				

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	40	208 (6)	300 (30)	365 (2)	467 (2)						
2019	16	218 (3)	359 (2)	423 (5)	514 (1)		543 (2)		557 (1)		683 (2)
2018	8				454 (2)			526 (2)	551 (2)		667 (2)
2016	20		346 (4)	412 (4)	455 (2)	413 (4)	446 (2)			536 (4)	

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).

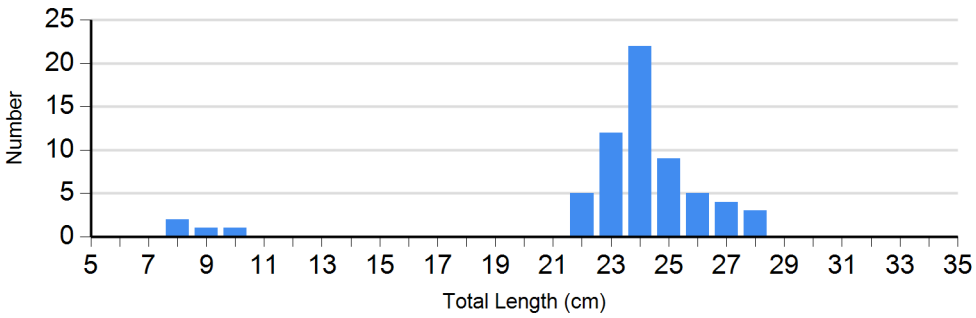
		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2020	14	109	43	86 (0.8)	221	86 (0.3)	3	76
	2021	8	91 (1.8)	1	78	6	78 (1.3)	1	81
	2022	0		3	83 (3.2)	14	87 (1.2)	1	82
	2023	6	98 (1.8)	2	105 (1.7)	15	85 (1.4)	0	
	2024	4	101 (5.2)	0		2	98 (0.6)	5	96 (3.4)
Channel Catfish Gill Net	2020	0		6	80 (2.1)	3	91 (3.7)	0	
	2021	0		4	80 (2.9)	0		0	
	2023	0		0		1	99	0	
Common Carp Gill Net	2021	3	91 (5.1)	7	88 (2.0)	0		0	
	2022	1	89	8	83 (1.8)	0		0	
	2023	0		7	84 (1.9)	0		0	
	2024	3	92 (2.7)	15	84 (1.6)	0		0	
Northern Pike Gill Net	2020	1	95	6	86 (1.5)	1	106	0	
	2021	0		3	80 (3.4)	1	82	1	
	2022	2	73 (2.6)	7	72 (1.4)	2	77 (7.3)	0	
	2023	5	93 (5.2)	9	91 (0.9)	0		0	
	2024	15	86 (1.0)	11	87 (1.3)	1	97	0	
Walleye Gill Net	2020	31	86 (1.2)	2	82 (3.3)	0		0	
	2021	17	84 (1.4)	5	84 (2.4)	0		0	
	2022	9	86 (1.5)	5	83 (1.7)	3	73 (0.8)	2	71 (3.6)
	2023	7	85 (1.3)	38	87 (0.9)	8	85 (2.4)	0	
	2024	8	81 (0.8)	27	85 (1.1)	9	86 (1.2)	3	81 (4.3)

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Yellow Perch Gill Net	2020	4	94 (2.8)	0		0		0	
	2023	2	96 (2.5)	1	94	0		0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

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



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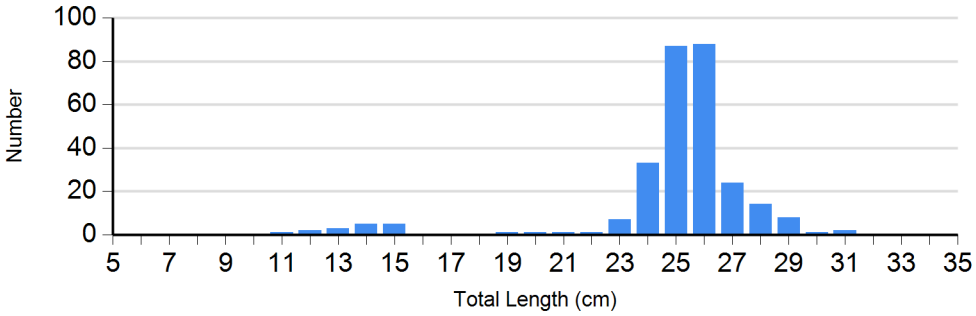

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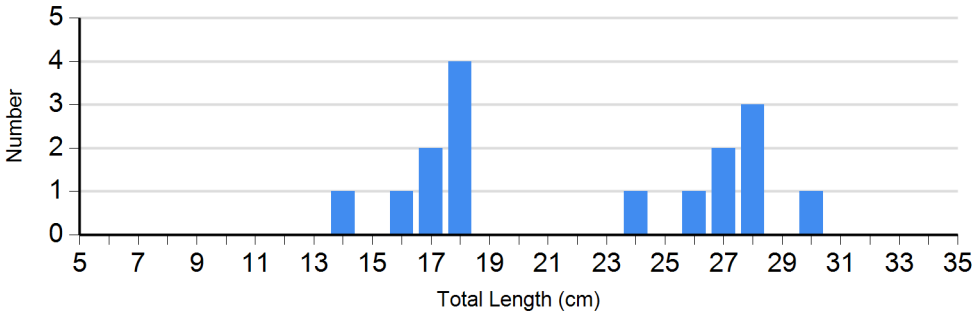

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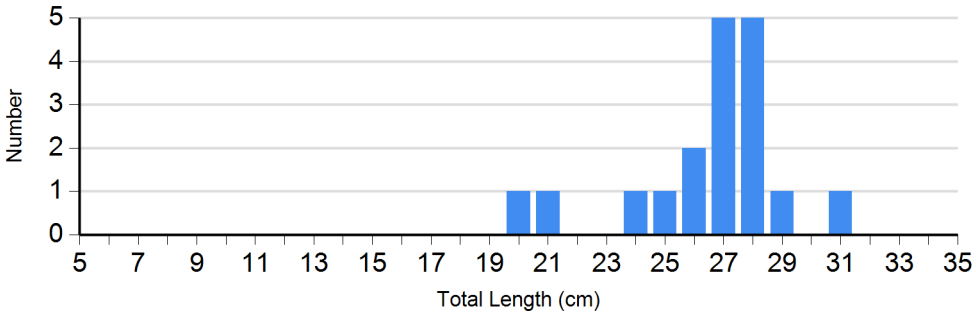

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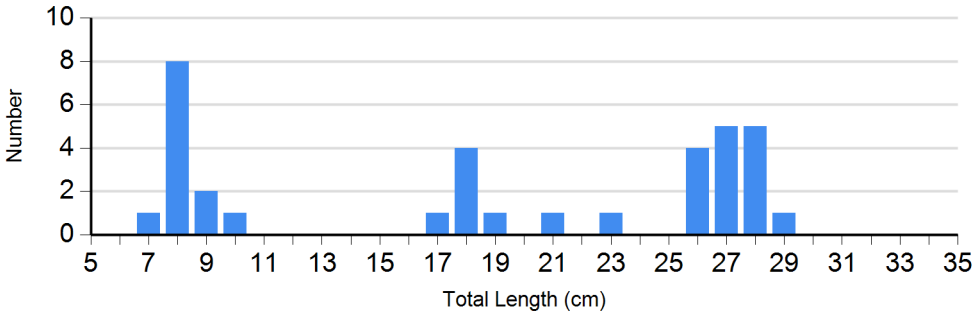

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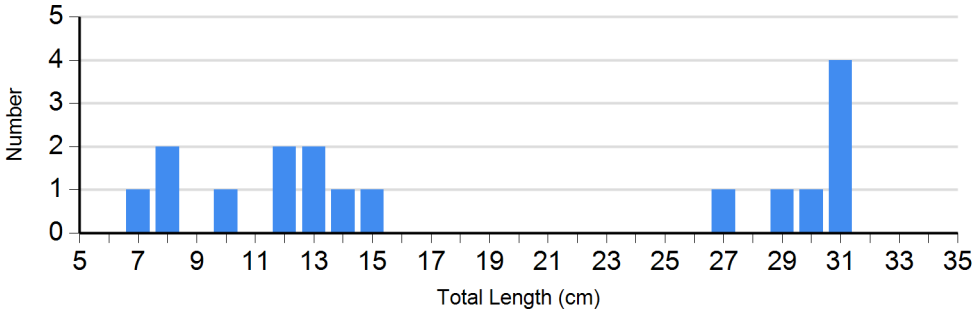

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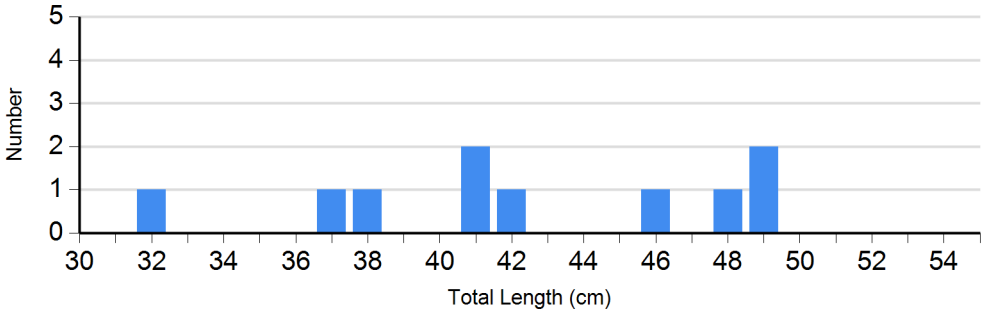
Species: Common Carp
Gear: AFS std gill net



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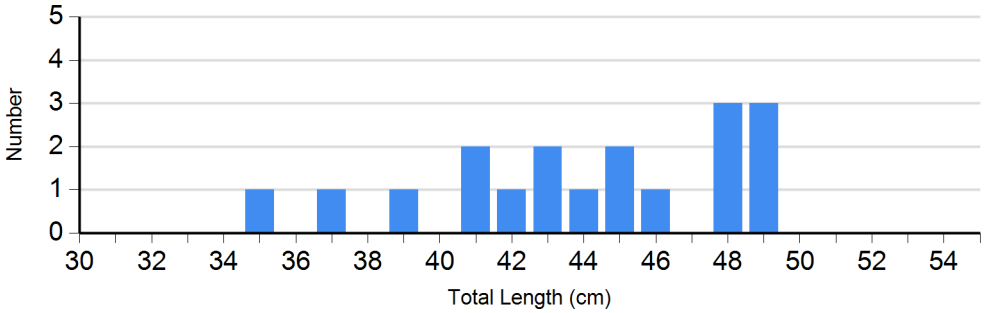
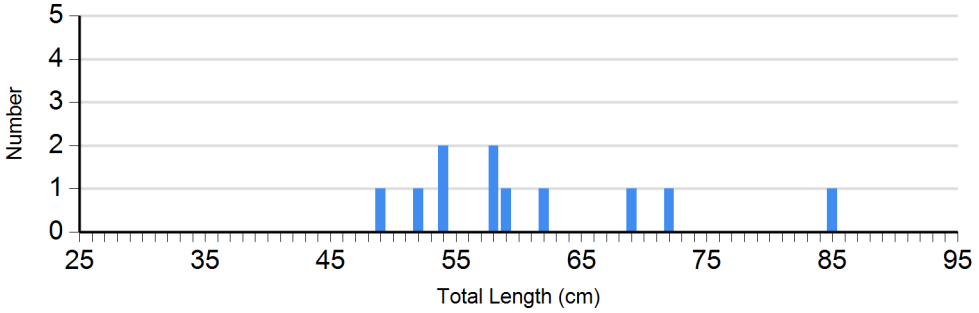


2024

Species: Northern Pike
Gear: AFS std gill net



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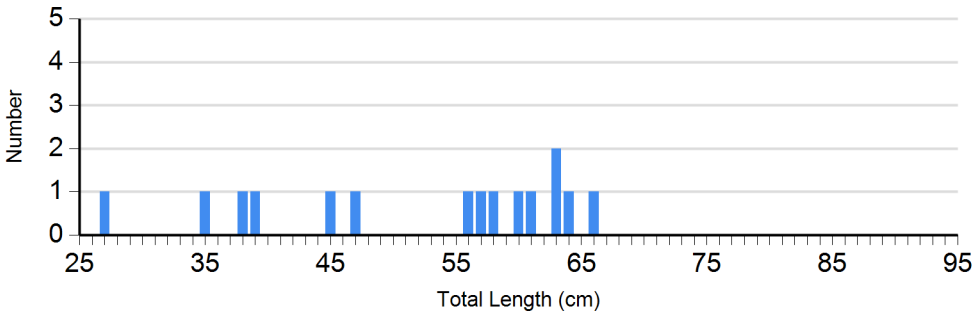

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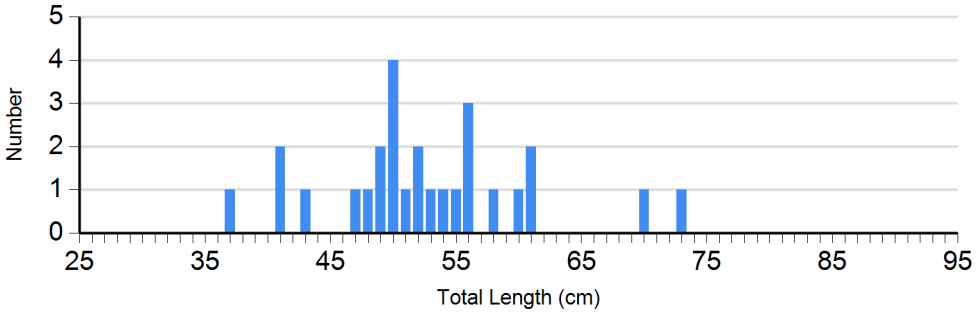
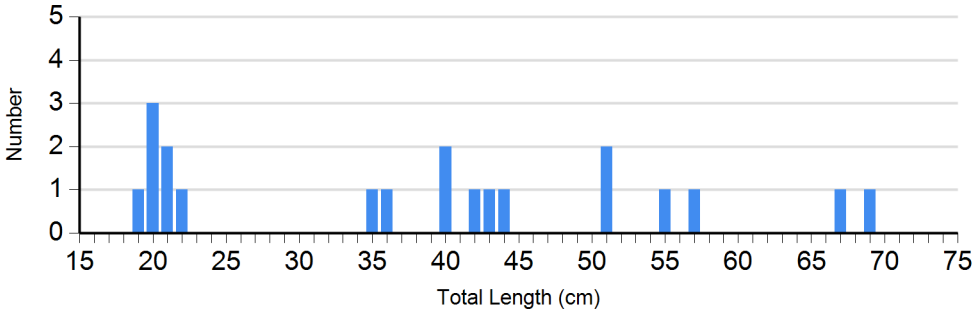
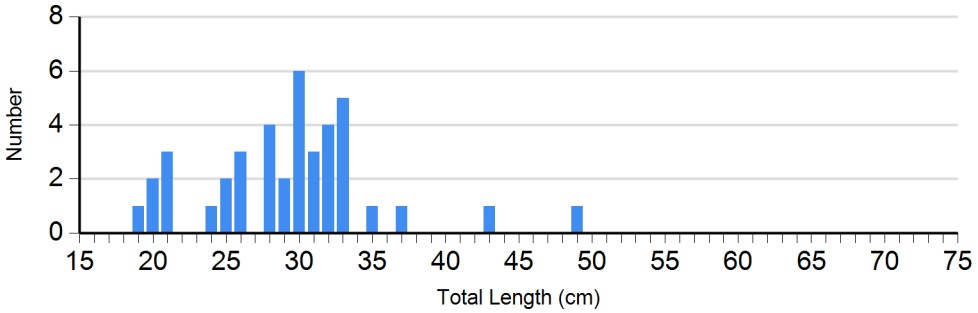


2024

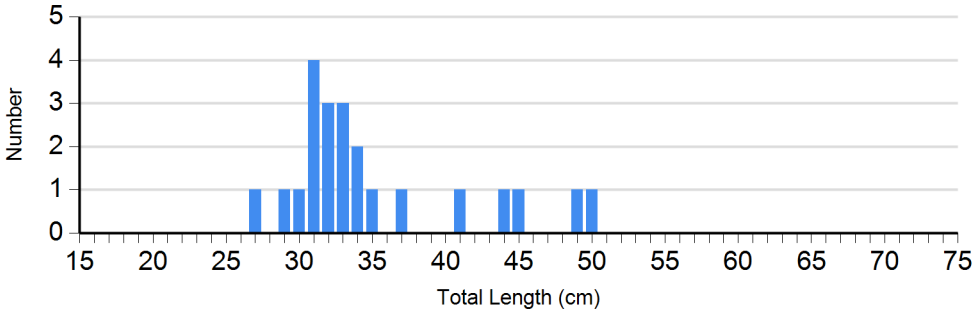
Species: Walleye
Gear: AFS std gill net



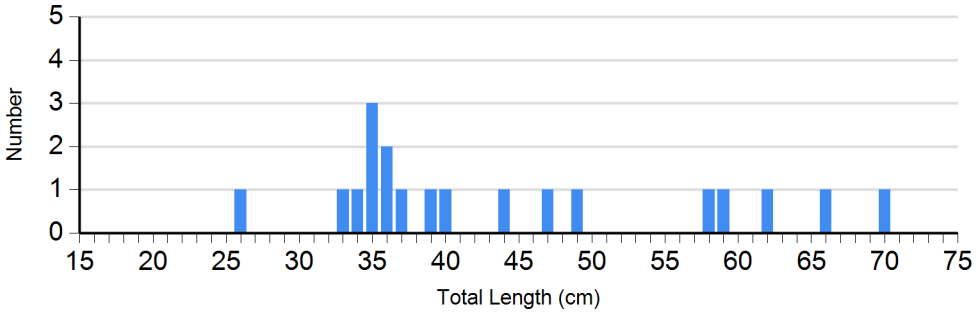
2019



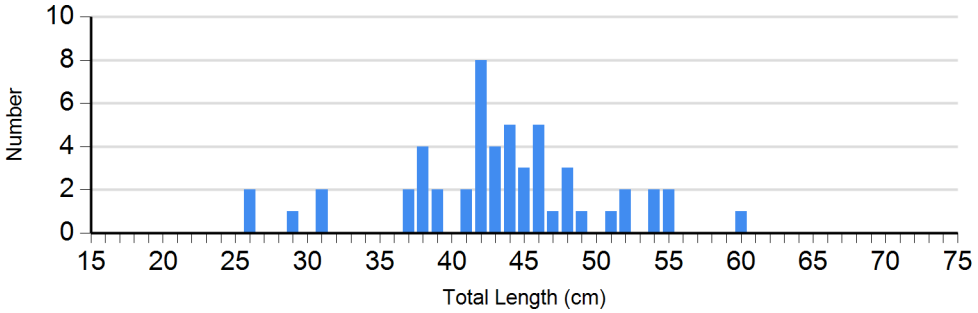
2020



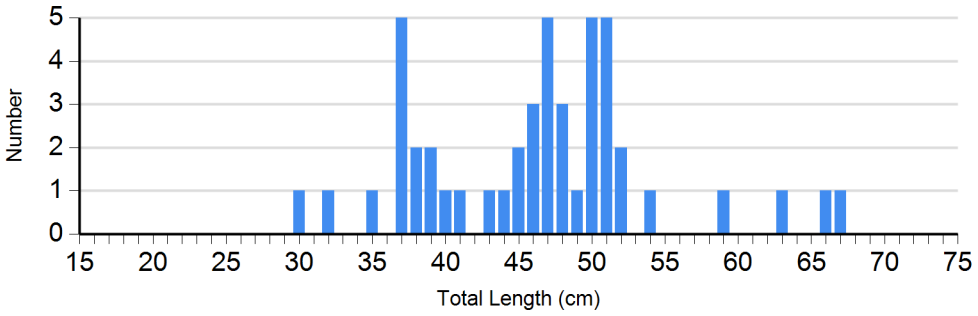
2021



2022

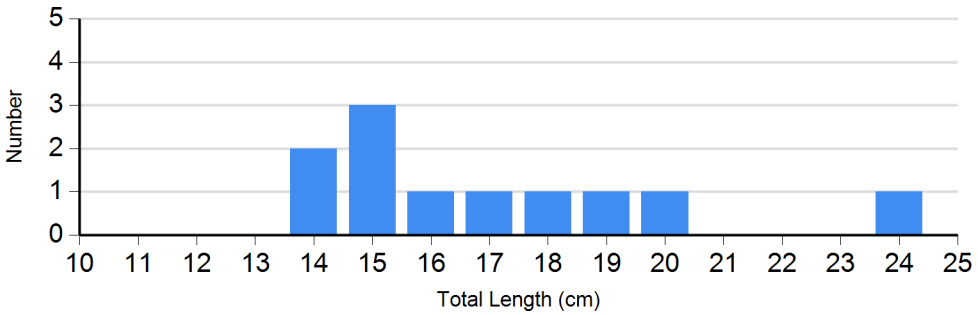


2023



2024

Species: Yellow Perch
Gear: AFS std gill net

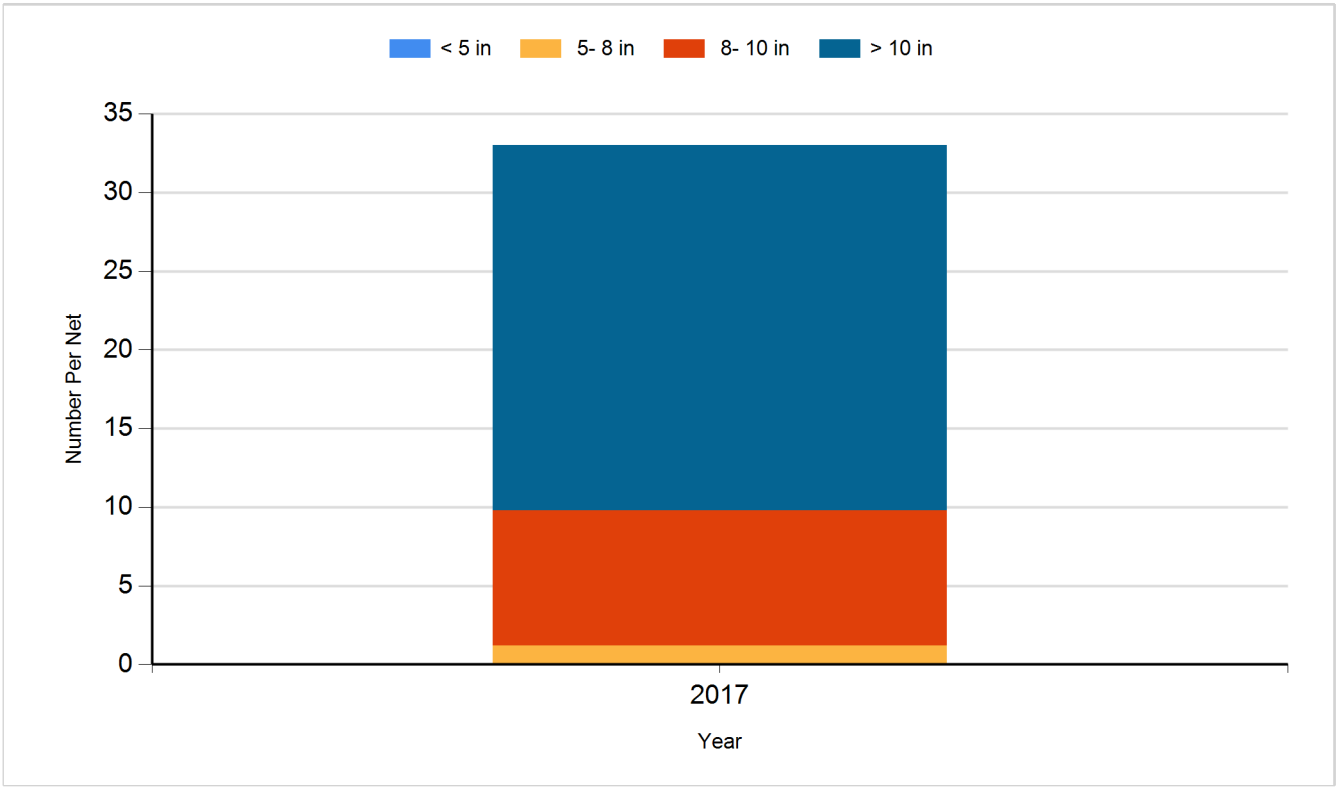


2019

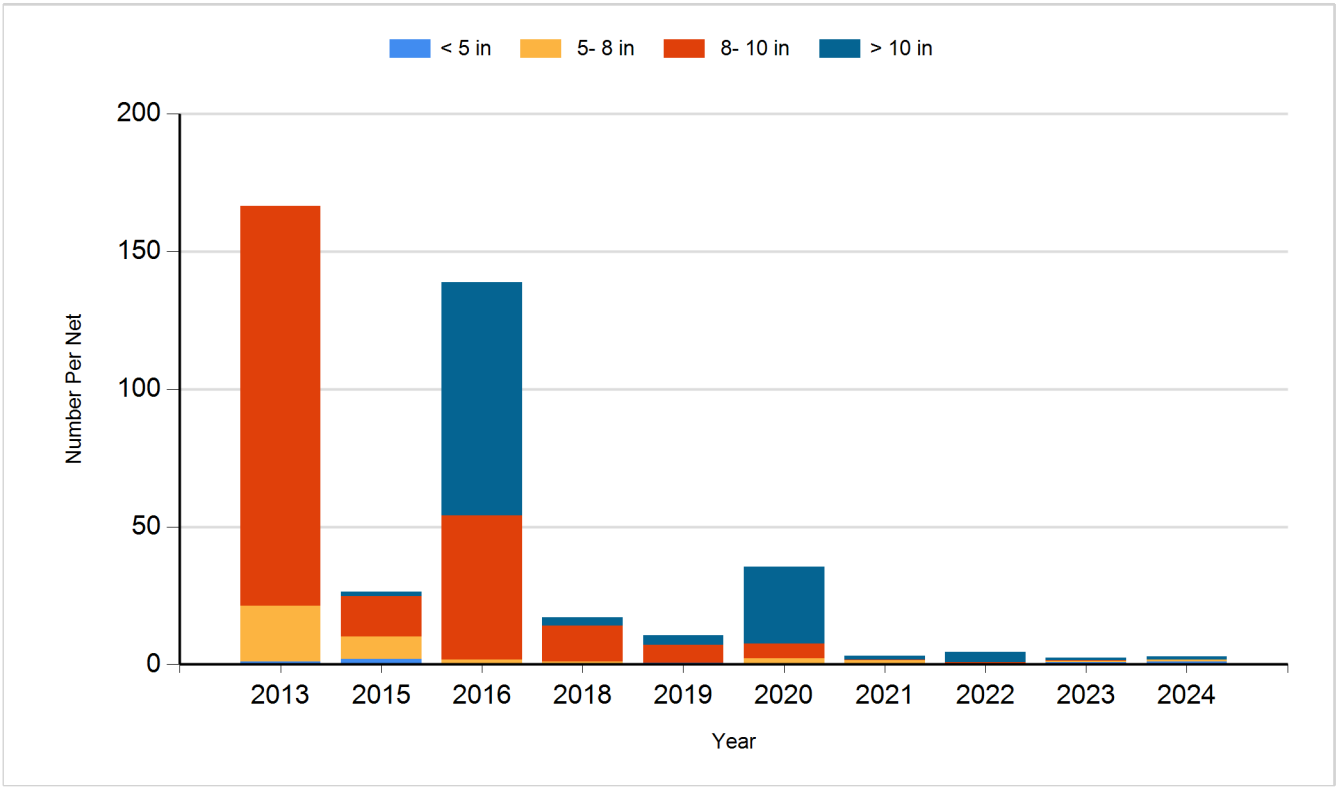
Historic Fish Sizes and Relative Abundance

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

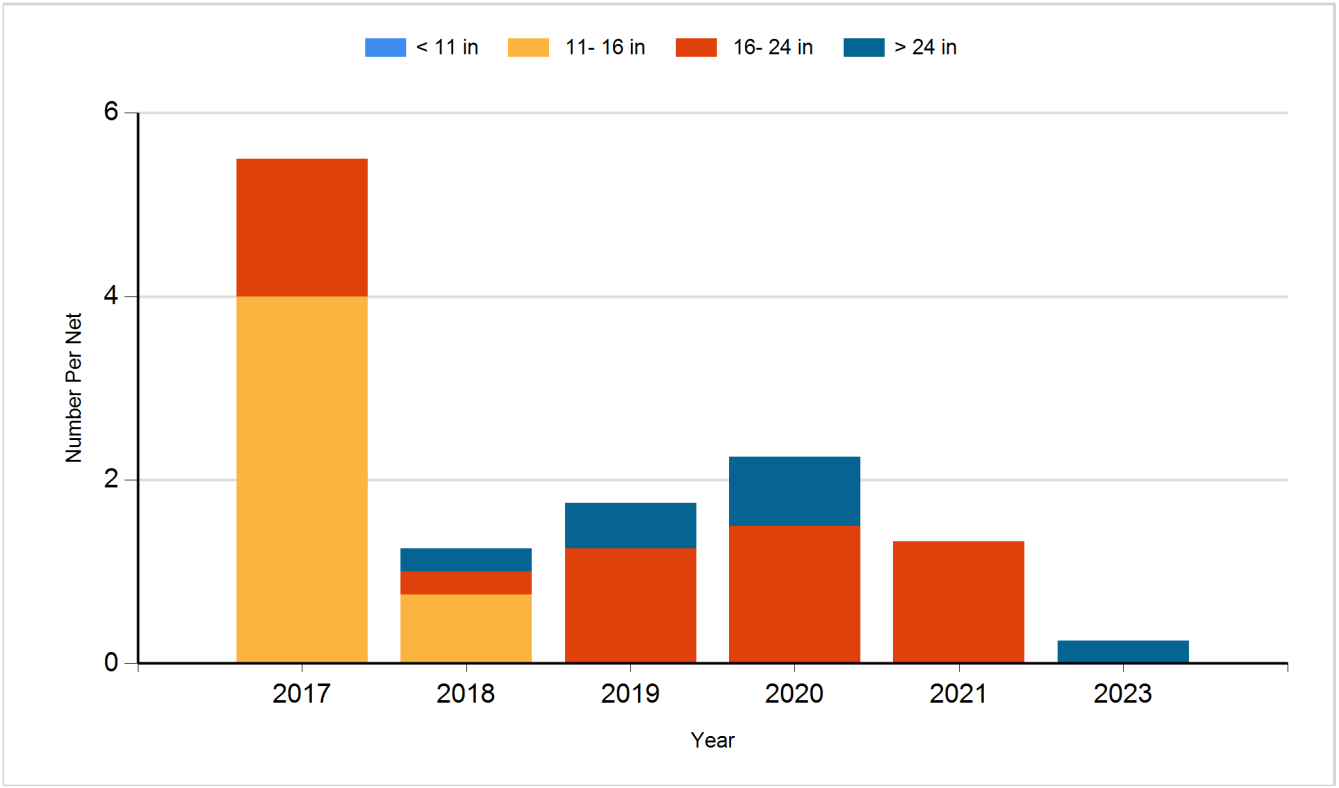
Species: Black Crappie
Gear: AFS std frame net



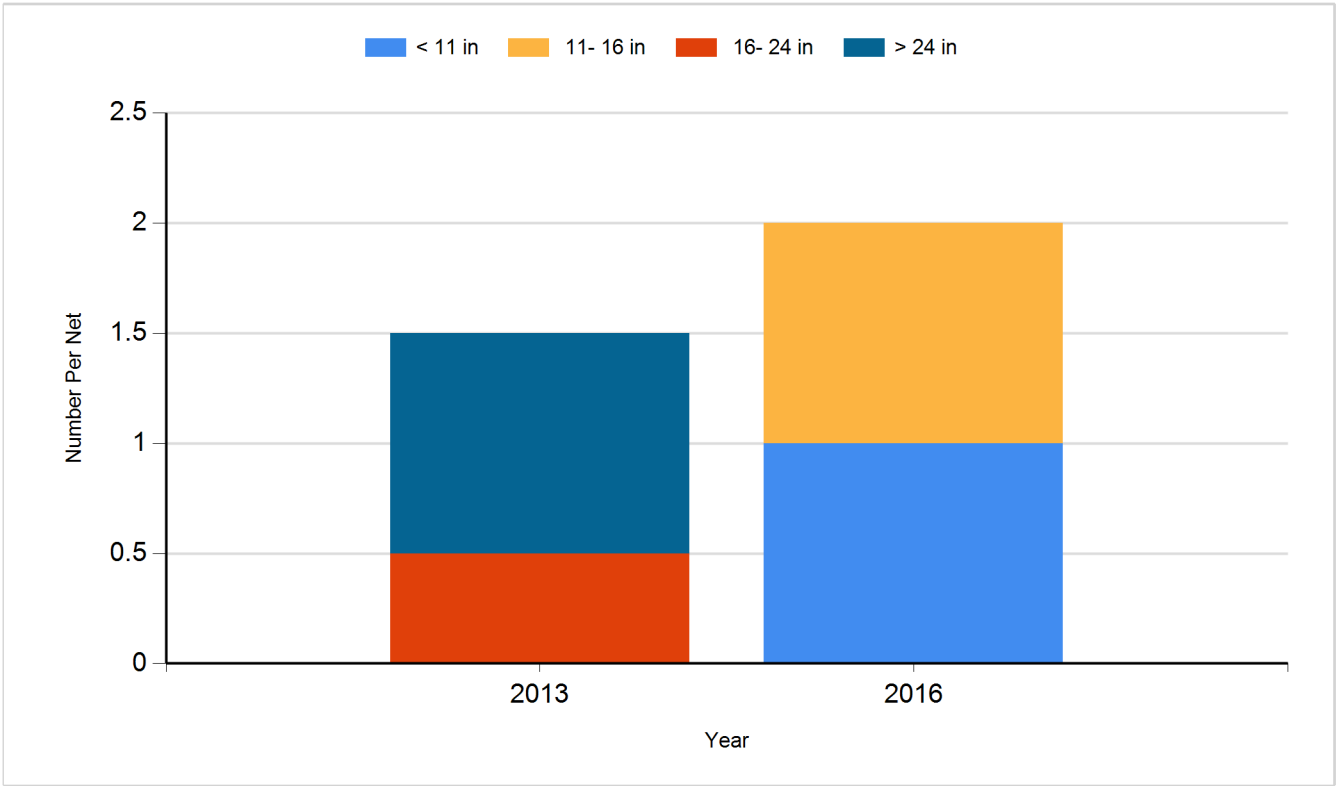
Species: Black Crappie
Gear: frame net (std 3/4 in)



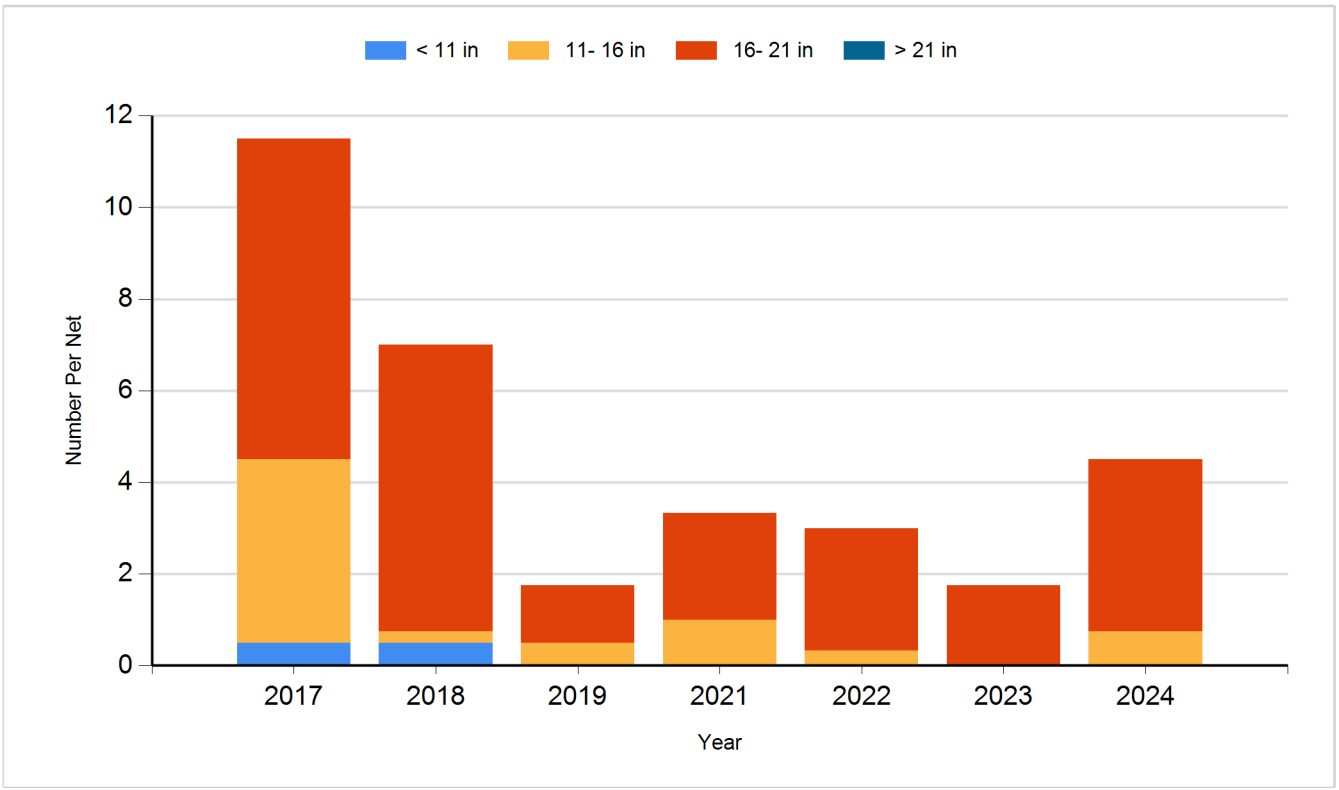
Species: Channel Catfish
Gear: AFS std gill net



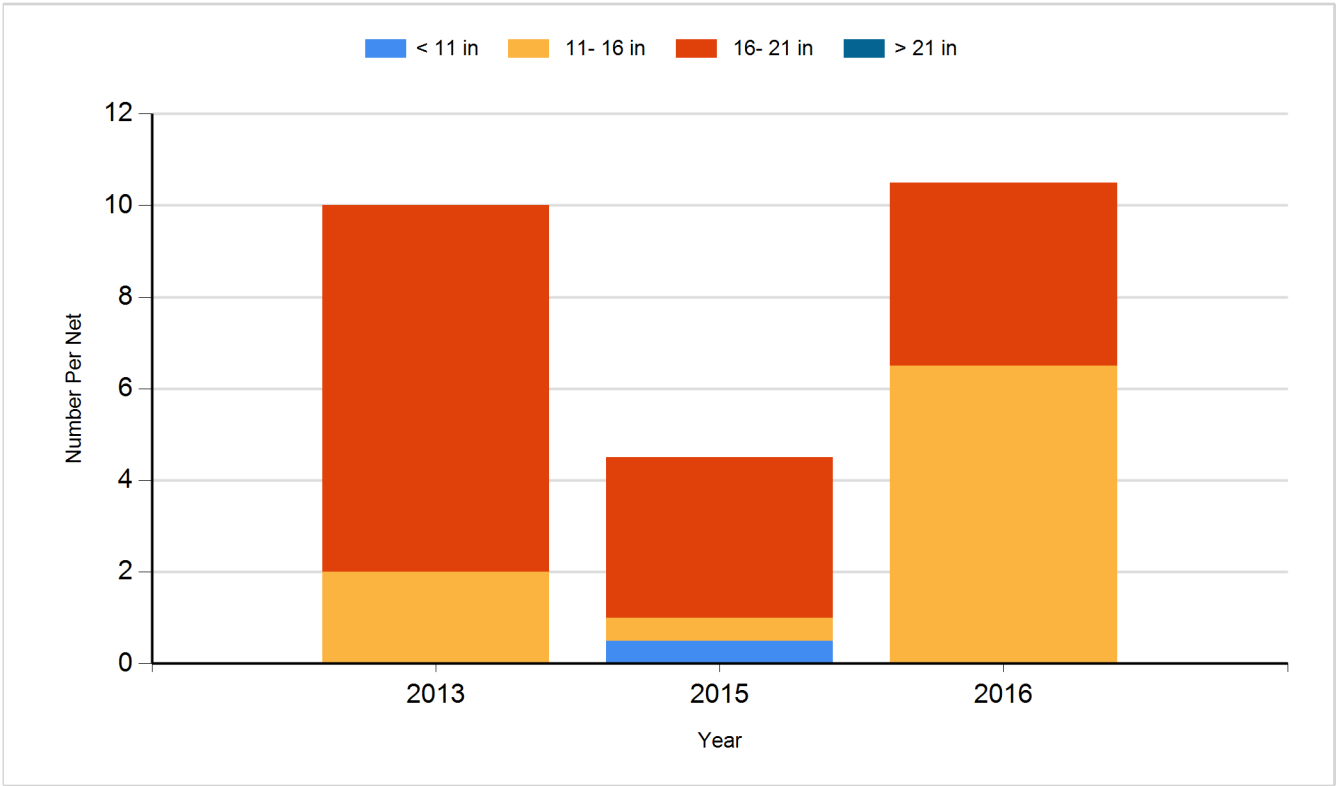
Species: Channel Catfish
Gear: std exp gill net



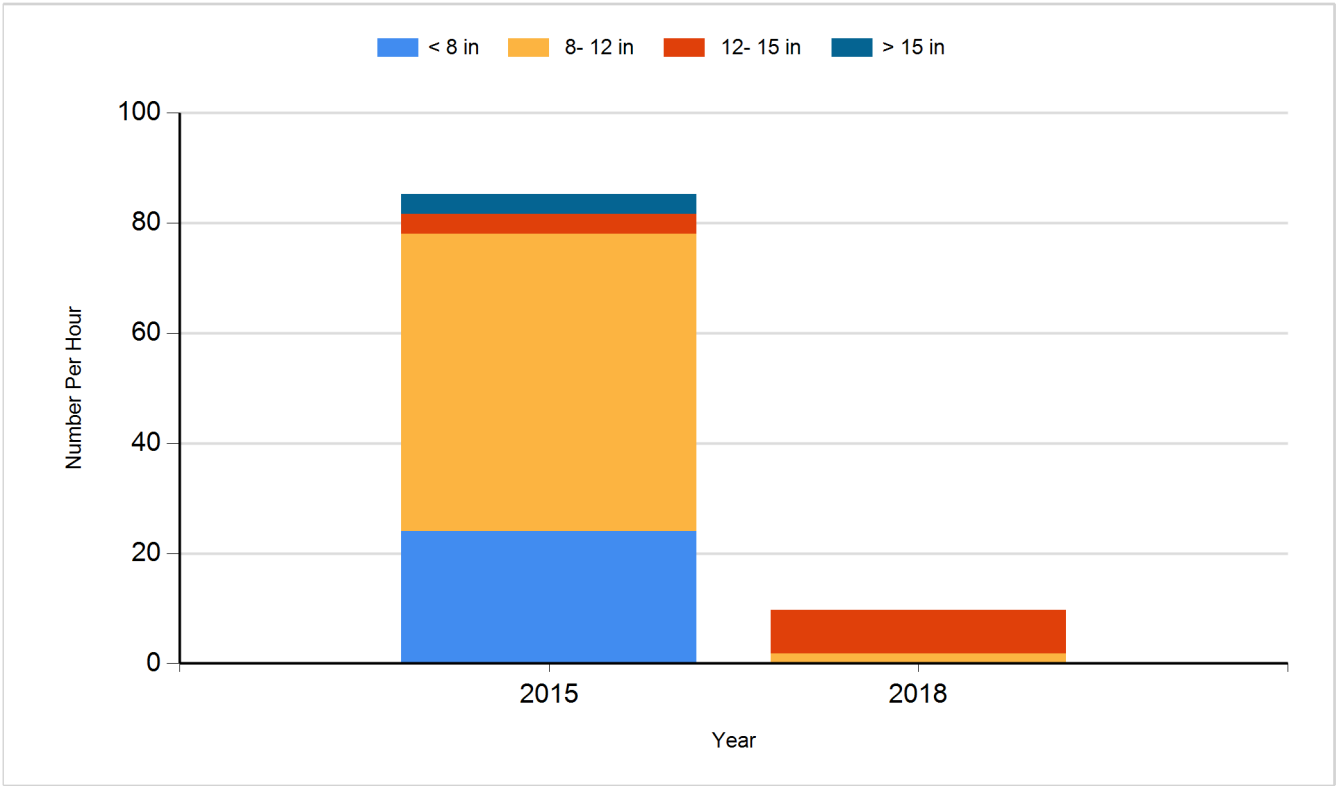
Species: Common Carp
Gear: AFS std gill net



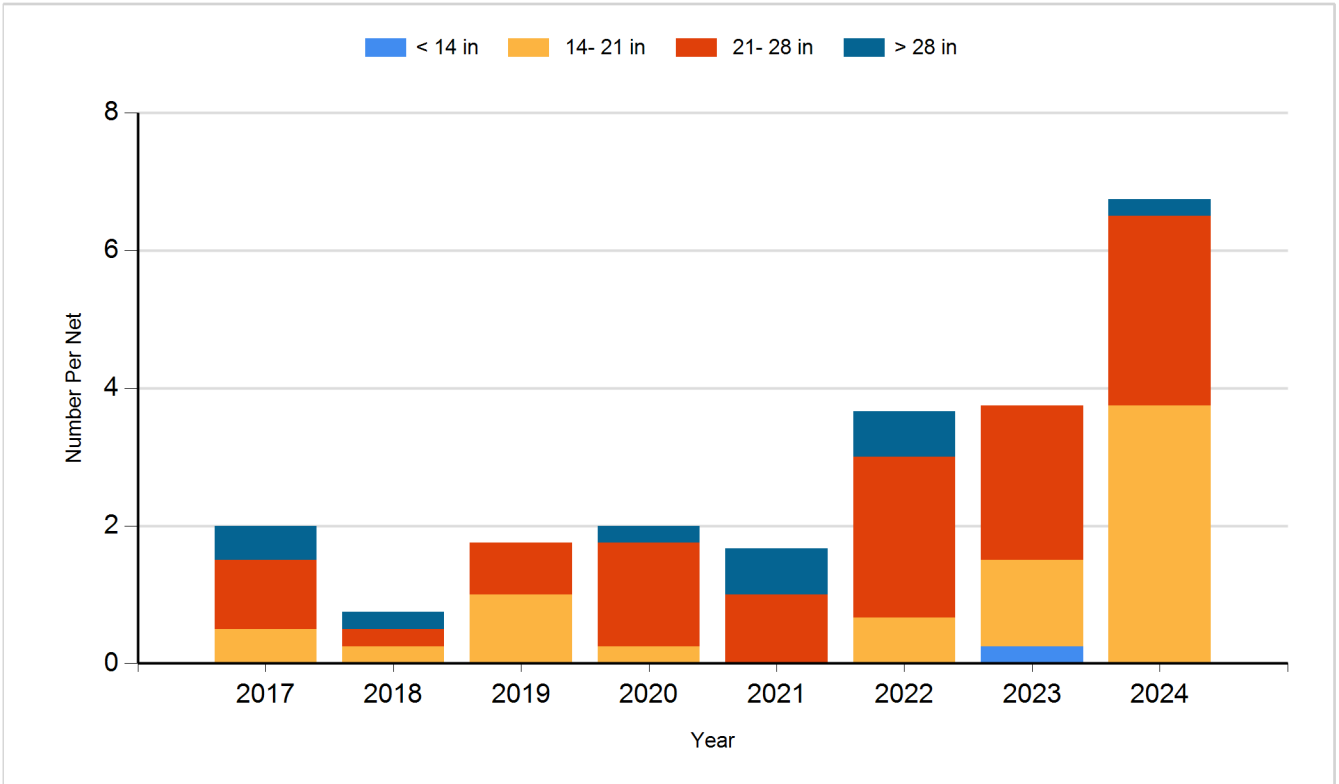
Species: Common Carp
Gear: std exp gill net



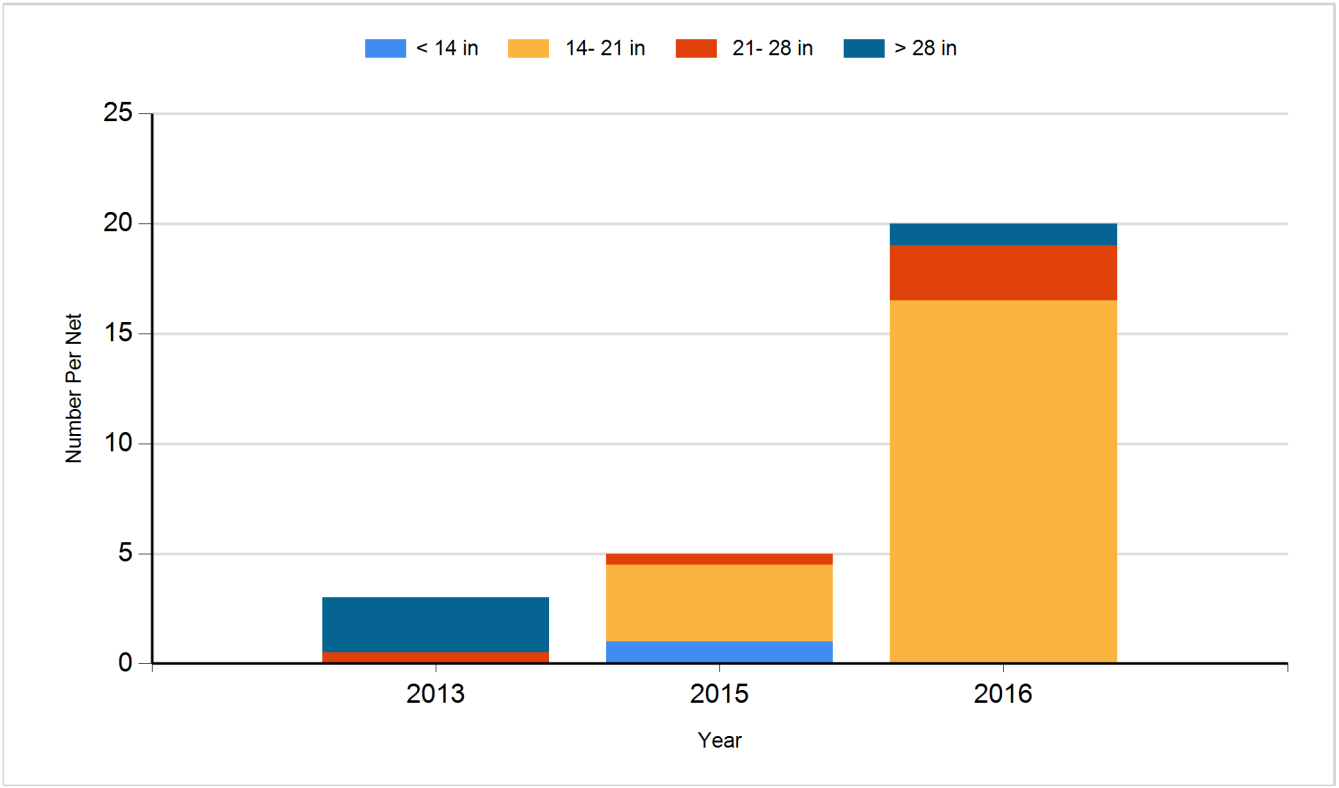
Species: Largemouth Bass
Gear: boat shocker (day)



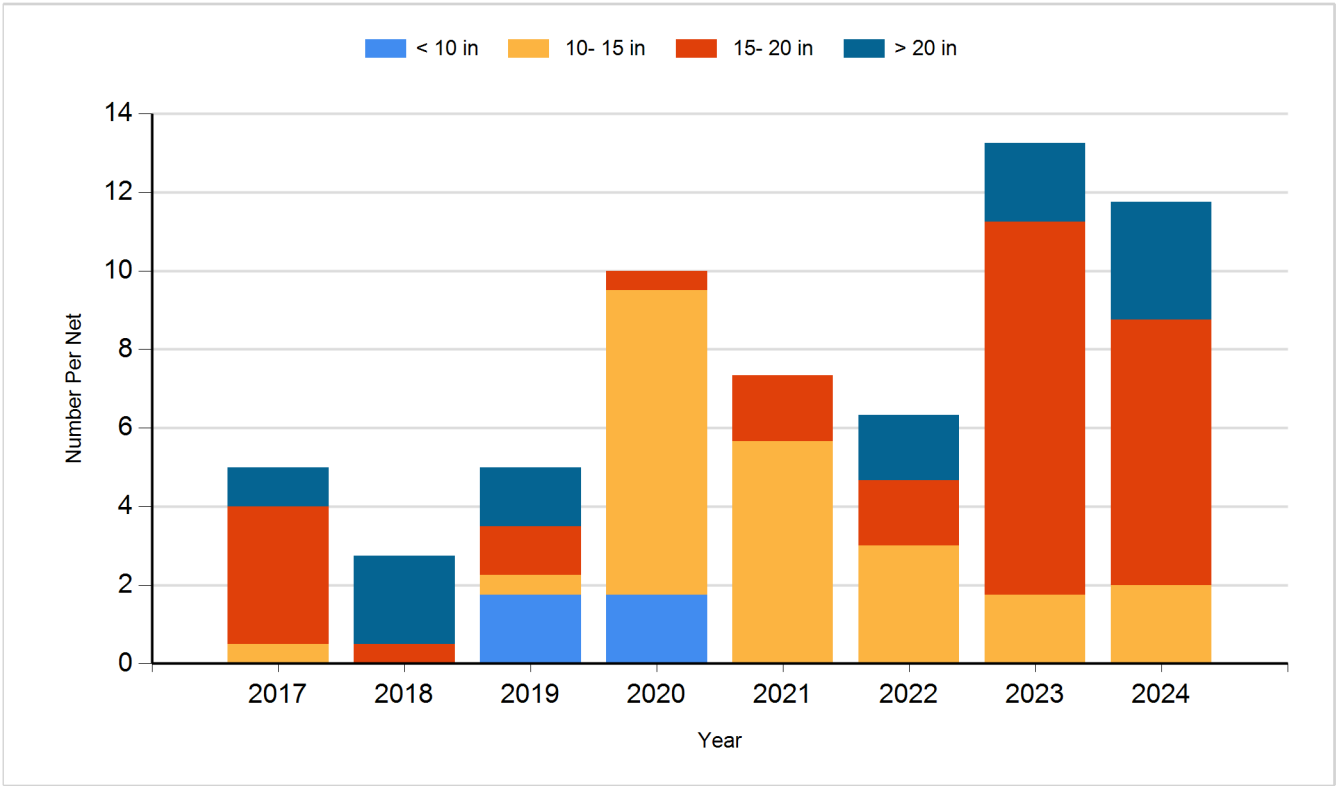
Species: Northern Pike
Gear: AFS std gill net



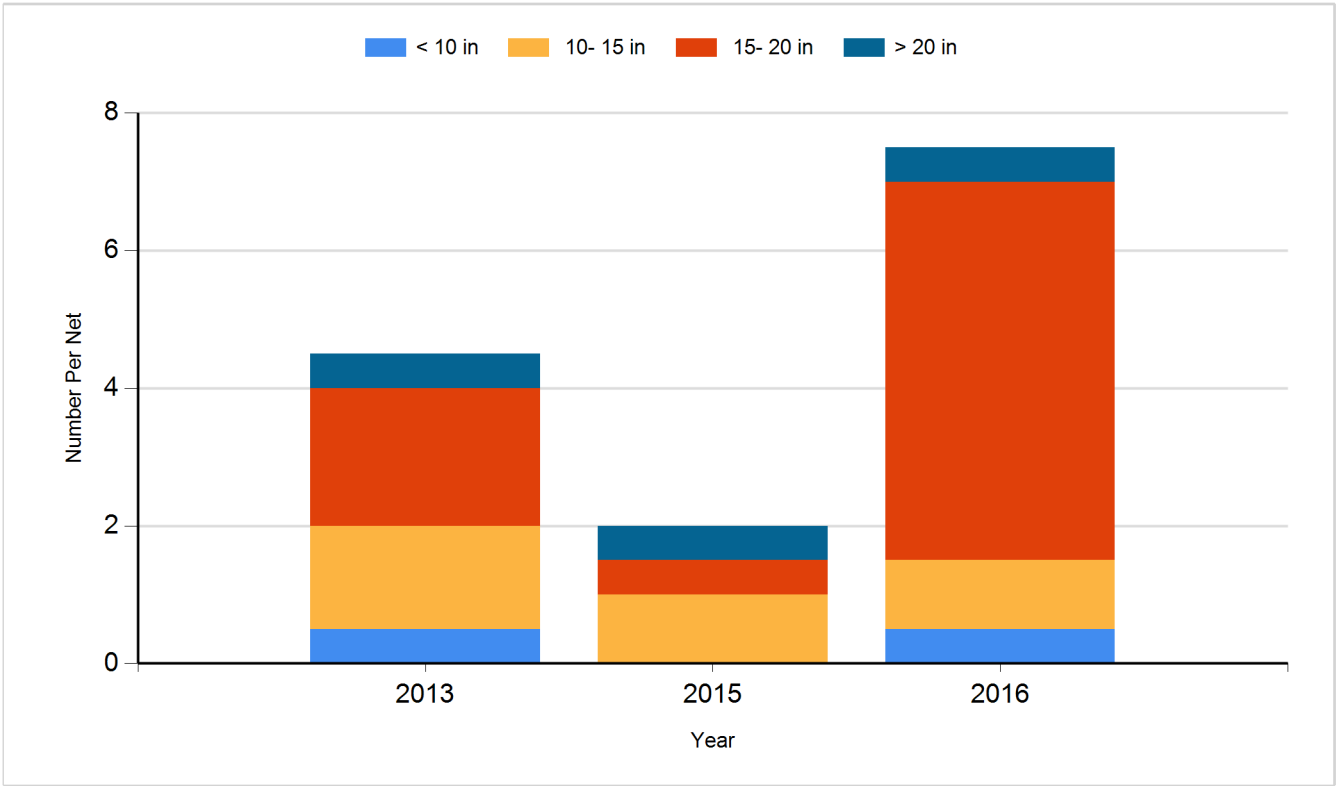
Species: Northern Pike
Gear: std exp gill net



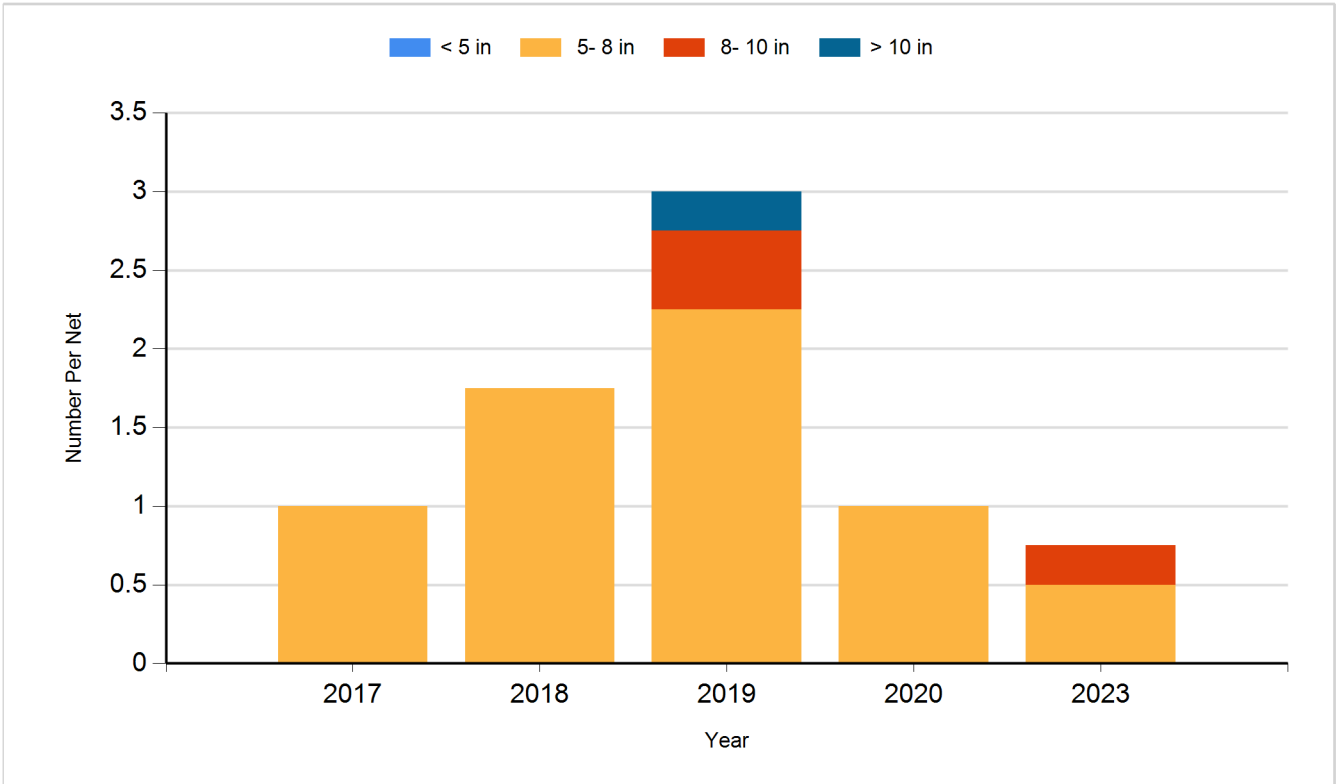
Species: Walleye
Gear: AFS std gill net



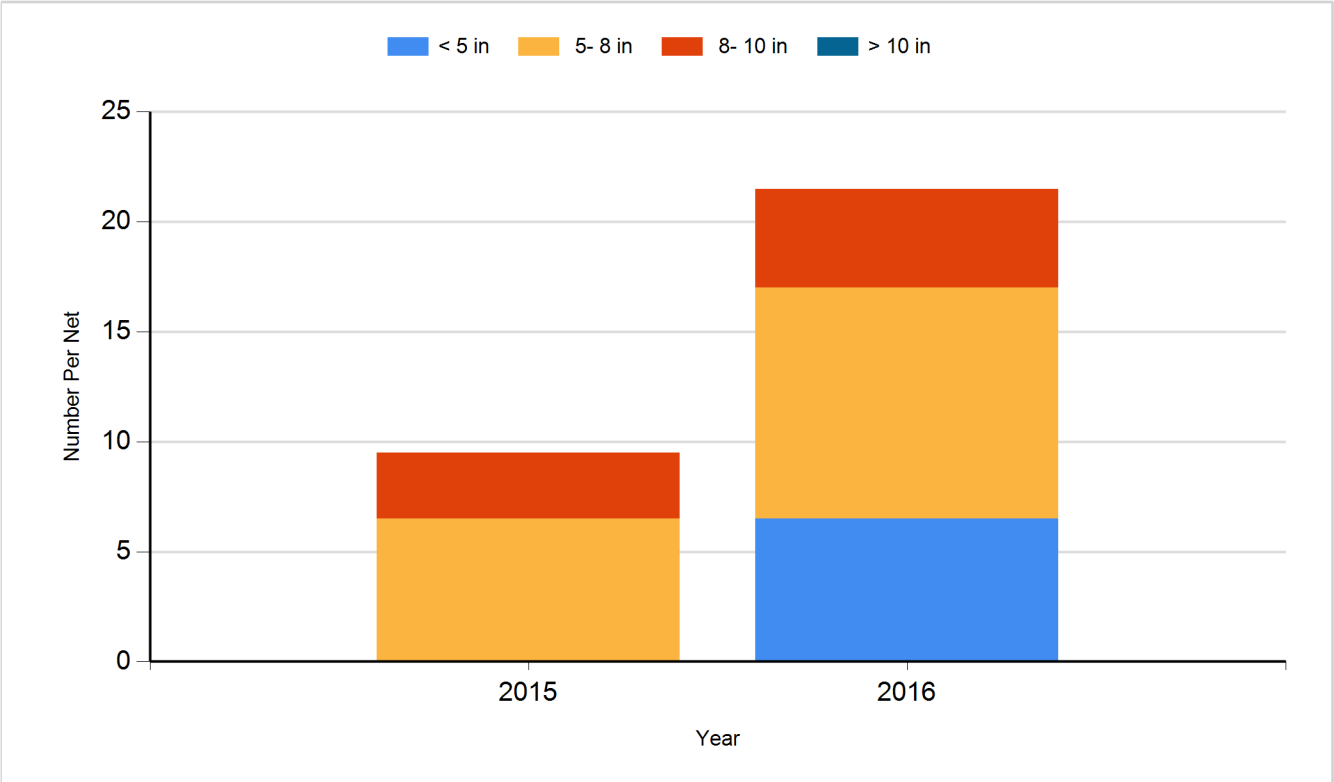
Species: Walleye
Gear: std exp gill net



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
2014	Channel Catfish	Adult	150
2014	Walleye	Fingerling	30,000
2014	Yellow Perch	Adult	800
2016	Gizzard Shad	Adult	33
2016	Walleye	Fingerling	25,500
2017	Gizzard Shad	Adult	125
2017	Walleye	Small Fingerling	30,800
2018	Gizzard Shad	Adult	44
2018	Walleye	Small Fingerling	29,600
2019	Gizzard Shad	Adult	65
2019	Walleye	Small Fingerling	30,600
2021	Gizzard Shad	Adult	20
2021	Walleye	Juvenile	30,000
2022	Gizzard Shad	Adult	21
2022	Walleye	Juvenile	32,160
2023	Walleye	Juvenile	31,001
2024	Walleye	Juvenile	40,140
2024	Yellow Perch	Adult	700