Kettle Lake Survey Summary

Kettle Lake, located 5.0 miles west and 3 miles north of Eden, is primarily managed as a walleye and yellow perch fishery; however, a variety of other fish species (e.g., bluegill, bass and northern pike) are present and contribute to the fishery.

- **Bluegill.** With a mean CPUE of 3.8, bluegill relative abundance was substantially lower than the 2021 survey (41.7/frame net). Captured bluegill ranged from 3.5 to 6.1 inches in total length.

- **Black Crappie.** Relative abundance increased from 2021 (1.9/frame net) to 2023 (8.5/frame net). Captured black crappie ranged from 3.3 to 8.8 inches.

- **Northern pike.** At 2.1 per gill net, relative abundance was considered moderate. Sampled northern pike ranged in length from 9.6 to 28.6 inches, with 67% greater than 21.0 inches.

- **Walleye.** In 2023, the mean gill net CPUE was 3.0 and is a decrease from the 6.5 observed in 2021. Sampled walleyes ranged in length from 5.3 to 27.4 inches, with 40% greater than 15.0 inches and 16% greater than 20.0 inches. Nine year-classes contributed to the catch (2006, 2009, 2013 – 2014, 2017, 2019 – 2022). The most abundant year-classes were the 2021 (age-2) cohort coinciding with a fry stocking and the naturally produced 2022 (age-1) cohort, comprising 25% and 28%, respectively. Many age-0 walleye were captured in the gill nets and during fall electrofishing surveys, indicating abundance may increase in the next few years. Based on the 2023 sample, growth is good with a mean length at capture at age-2 of 15.6 inches.

- **Yellow Perch.** Yellow perch were the most abundant species in the 2023 gill net catch with a mean CPUE of 38.9. Sampled yellow perch ranged in length from 4.8 to 9.2 inches, with 5% greater than 8.0 inches. Two year-classes (2021 – 2022) contributed to the catch. Fish from the 2022 (age-1) cohort, which had a mean length at capture of 6.1 inches, were the most abundant accounting for 87% of yellow perch in the sample.

For more detailed results see the computer-generated South Dakota Statewide Fisheries Survey for Kettle (Marshall; below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Kettle, Marshall County
UJA-Lake-866-000
2023

Lake Information

Name:	Kettle	**Maximum Depth:**	18 Feet
County:	Marshall	**Mean Depth:**	10 Feet
Surface Area:	3,229 Acres		

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 22, 2023	4 net-nights
AFS std gill net	Aug 23, 2023	4 net-nights
AFS std gill net	Aug 24, 2023	4 net-nights
fall night EF-WAE	Sep 18, 2023	3600 seconds
frame net (std 3/4 in)	Aug 22, 2023	5 net-nights
frame net (std 3/4 in)	Aug 23, 2023	5 net-nights
frame net (std 3/4 in)	Aug 24, 2023	7 net-nights

Common Fish Species Present

Walleye

Northern Pike

Yellow Perch

Black Bullhead

Black Crappie

Bluegill

White Bass

White Sucker

Green Sunfish

Smallmouth 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.

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

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

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	Bigmouth Buffalo	6	0.0	0.0	0		0			
	Black Bullhead	66	5.1	4.7	15	7	2		95	1
	Black Crappie	9	0.8	0.6	0		0		119	3
	Common Carp	5	0.1	0.1	100		100		103	
	Largemouth Bass	2	0.0	0.0	0		0			
	Northern Pike	26	2.1	0.6	84		0		94	1
	Smallmouth Bass	4	0.3	0.3	50		50		120	1
	Walleye	36	3.0	1.2	69	12	19	10	97	2
	White Bass	23	0.8	0.5	11		0		109	4
	White Sucker	17	1.4	1.0	94		88		104	1
	Yellow Perch	468	38.9	3.5	9	2	0		98	1
frame net (std 3/4 in)	Bigmouth Buffalo	1	0.0	0.0	0		0			
	Black Bullhead	266	12.8	3.6	27	4	9	3	86	1
	Black Crappie	159	8.5	2.9	1		0		116	1
	Bluegill	64	3.8	2.3	8	5	0		113	2
	Common Carp	11	0.5	0.4	100		100			
	Green Sunfish	15	0.9	0.7	0		0		100	3
	Largemouth Bass	15	0.1	0.1	100		100		133	
	Northern Pike	17	0.5	0.3	100		13		82	3
	Smallmouth Bass	16	0.8	0.3	38		31		110	3
	Walleye	8	0.4	0.3	100		86		92	5
	White Bass	102	1.8	0.9	6		6		102	1
	White Sucker	3	0.2	0.2	100		100		98	3
	Yellow Perch	1319	77.6	21.0	6	1	1	0	89	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	Bigmouth Buffalo			0.0	0.0	0.0	0.0		0.0		0.0	0.00
	Black Bullhead			8.8	0.6	1.7	2.8		5.8		5.1	4.13
	Black Crappie			1.3	0.7	5.1	0.0		0.3		0.8	1.37
	Bluegill			0.5	0.2	0.3	0.2		0.1		0.0	0.22
	Common Carp			0.8	0.3	1.1	0.3		1.3		0.1	0.65
	Largemouth Bass			0.0	0.0	0.1	0.0		0.0		0.0	0.02
	Northern Pike			2.4	1.3	1.7	0.7		2.8		2.1	1.83
	Smallmouth Bass			0.2	0.1	0.3	0.4		0.2		0.3	0.25
	Walleye			2.6	5.1	6.1	2.0		6.5		3.0	4.22
	White Bass			0.1	0.0	0.0	0.1		0.5		0.8	0.25
	White Sucker			0.8	0.6	0.7	0.1		2.3		1.4	0.98
	Yellow Perch			19.2	12.2	27.3	14.5		28.9		38.9	23.50
fall night EF-WAE*	Walleye	2.0	75.0	38.0							37.0	38.00
frame net (std 3/4 in)	Bigmouth Buffalo	0.0							0.0		0.0	0.00
	Black Bullhead	23.7							77.3		12.8	37.93
	Black Crappie	1.9							1.9		8.5	4.10
	Bluegill	23.6							41.8		3.8	23.07
	Bluegill X Gr. Sunfish Hybrid	0.0							0.0		0.0	0.00
	Common Carp	0.1							0.5		0.5	0.37
	Green Sunfish	0.1							0.0		0.9	0.33
	Largemouth Bass	0.0							0.1		0.1	0.07
	Northern Pike	0.7							1.1		0.5	0.77
	Smallmouth Bass	0.5							0.1		0.8	0.47
	Sunfish Hybrid	0.0							2.0		0.0	0.67
	Walleye	0.1							0.3		0.4	0.27
	White Bass	0.0							0.0		1.8	0.60
	White Sucker	0.0							0.0		0.2	0.07
	Yellow Perch	36.7							15.4		77.6	43.23

std exp gill net	Black Bullhead	2.8	45.2	24.00
	Black Crappie	0.3	26.0	13.15
	Bluegill	0.5	0.2	0.35
	Common Carp	0.2	0.0	0.10
	Largemouth Bass	0.0	0.0	0.00
	Northern Pike	4.0	1.8	2.90
	Smallmouth Bass	0.2	0.0	0.10
	Walleye	2.0	6.3	4.15
	White Bass	0.0	0.0	0.00
	White Sucker	0.7	0.2	0.45
	Yellow Perch	67.2	28.8	48.00

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			97	100	85	100		79		84
		PSD-P			21	31	5	13		6		0
		Wr			86	77	90	94		89		94
	Walleye	PSD			74	90	84	92		72		69
		PSD-P			61	75	48	63		21		19
		Wr			93	88	95	102		92		97
	Yellow Perch	PSD			1	8	12	3		17		9
		PSD-P			0	0	0	0		2		0
		Wr			99	102	100	108		100		98
frame net (std 3/4 in)	Black Crappie	PSD	3							0		1
		PSD-P	0							0		0
		Wr	117							112		116
std exp gill net	Northern Pike	PSD	100	100								
		PSD-P	13	9								
		Wr	89	91								
	Walleye	PSD	83	26								
		PSD-P	50	24								
		Wr	93	98								
	Yellow Perch	PSD	5	5								
		PSD-P	0	0								
		Wr	97	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	36	288 (9)	397 (10)	473 (7)	484 (3)		597 (1)		644 (1)	605 (2)	628 (3)
2021	78	296 (21)	419 (40)	476 (1)		600 (2)	561 (1)	556 (1)			638 (12)
2019	24	336 (2)	435 (5)	507 (3)	541 (2)	550 (4)			565 (1)		614 (7)
2018	73	346 (12)	432 (21)	467 (3)	530 (12)	553 (1)	584 (1)	593 (2)	657 (1)	639 (2)	626 (18)
2017	61	302 (6)	398 (2)	492 (6)	521 (2)		535 (4)	599 (4)	625 (2)	592 (7)	620 (28)
2016	31	292 (8)	436 (3)	520 (1)		526 (3)	545 (1)	568 (2)	573 (1)		598 (12)
2015	40	311 (30)			518 (4)	514 (1)		632 (1)		557 (4)	
2014	12	307 (1)	331 (1)	467 (4)		526 (1)			565 (5)		

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	467	156 (408)	210 (59)								
2021	345	159 (277)	218 (63)	277 (4)	283 (1)						
2019	174	160 (132)	178 (41)	224 (1)							
2018	327	157 (256)	198 (66)	211 (5)							
2017	146	158 (129)	209 (17)								
2016	231	150 (170)	171 (43)	154 (18)							
2015	258	134 (227)	192 (31)								
2014	495	144 (462)	196 (23)	212 (10)							

Fish Condition

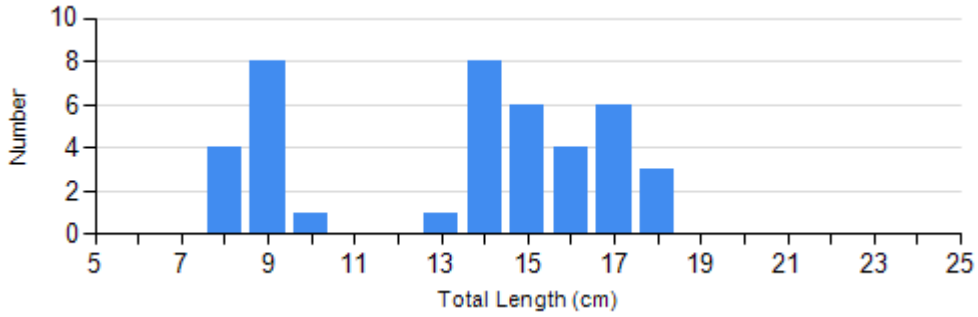
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2021	28	112 (0.8)	0		0		0	
	2023	142	117 (0.7)	2	112 (1.7)	0		0	
Northern Pike Gill Net	2019	0		7	96 (3.8)	1	86	0	
	2021	7	91 (1.4)	25	88 (1.1)	2	93 (1.6)	0	
	2023	4	99 (1.7)	21	93 (1.1)	0		0	
Walleye Gill Net	2019	2	100 (3.7)	7	102 (1.9)	13	102 (1.6)	2	98 (6.2)
	2021	22	91 (1.3)	40	92 (1.1)	9	95 (1.4)	7	96 (2.0)
	2023	11	101 (1.9)	18	97 (1.3)	3	91 (2.0)	4	91 (4.9)
Yellow Perch Gill Net	2019	168	109 (0.6)	6	99 (3.8)	0		0	
	2021	288	101 (0.6)	52	97 (0.9)	7	98 (3.0)	0	
	2023	424	98 (0.5)	43	92 (1.0)	0		0	

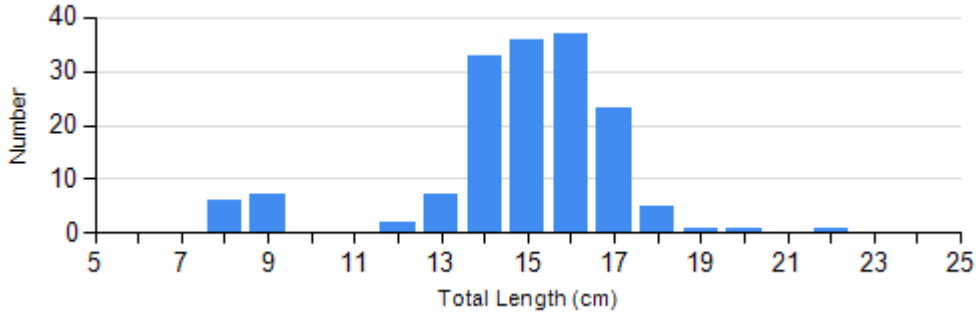
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

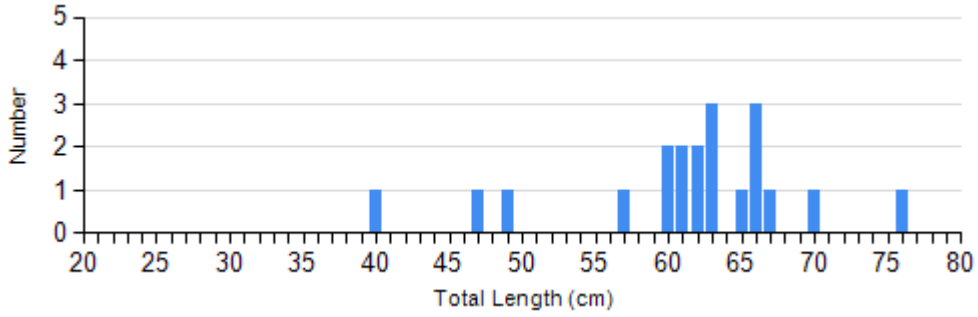


2021

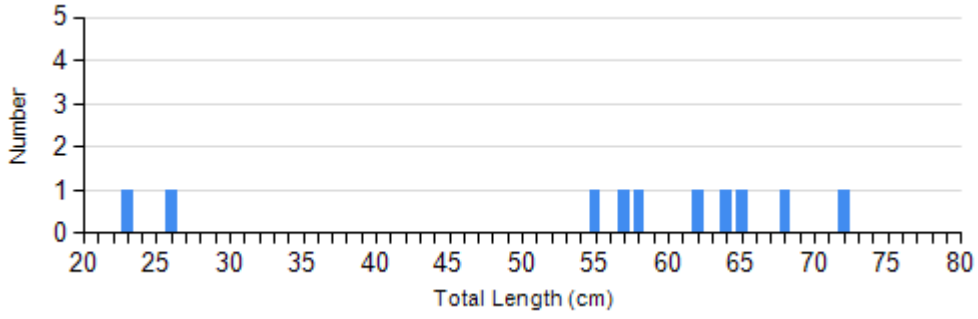


2023

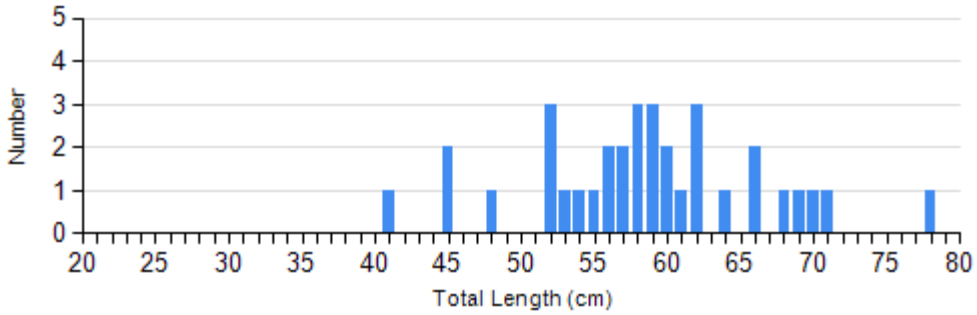
Species: Northern Pike
Gear: AFS std gill net



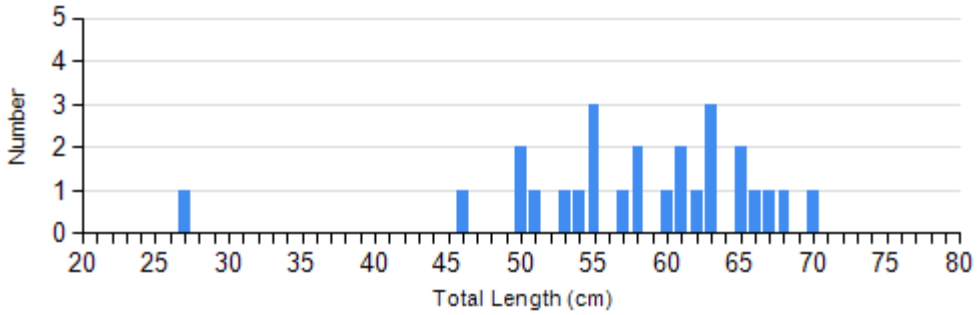
2018



2019

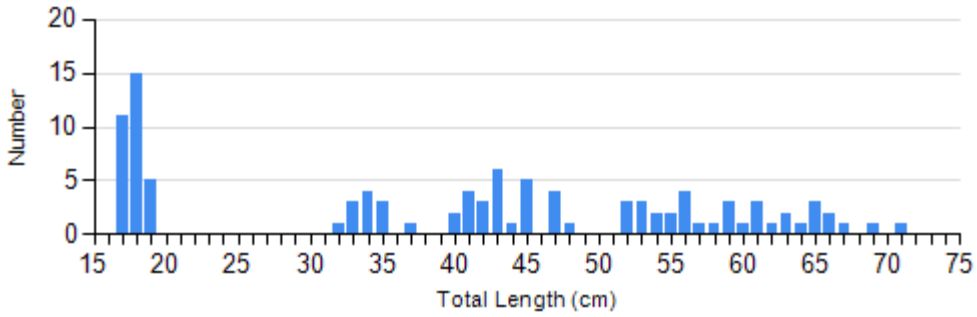


2021

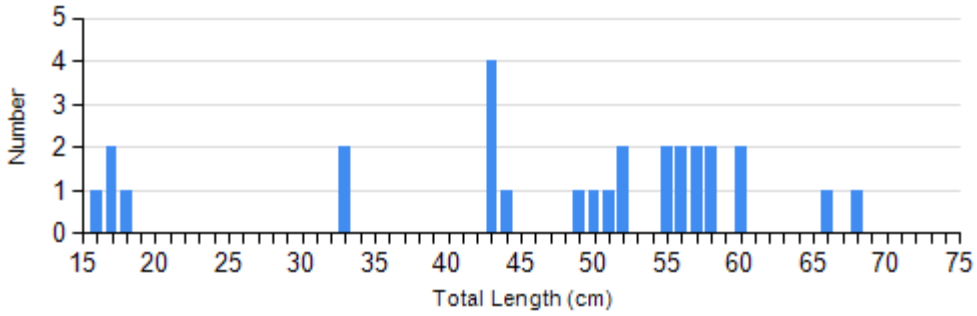


2023

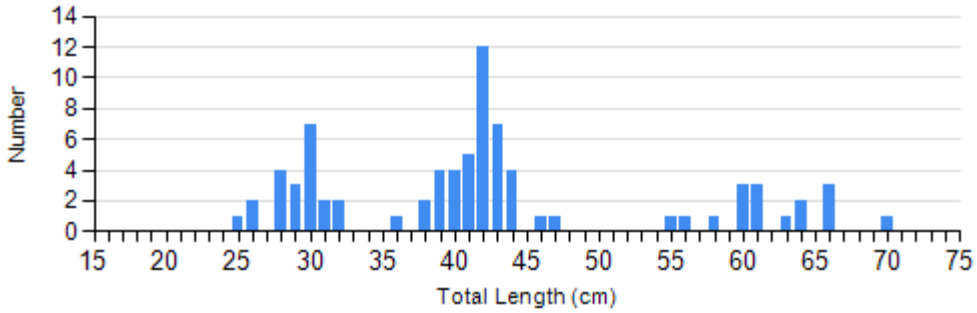
Species: Walleye
Gear: AFS std gill net



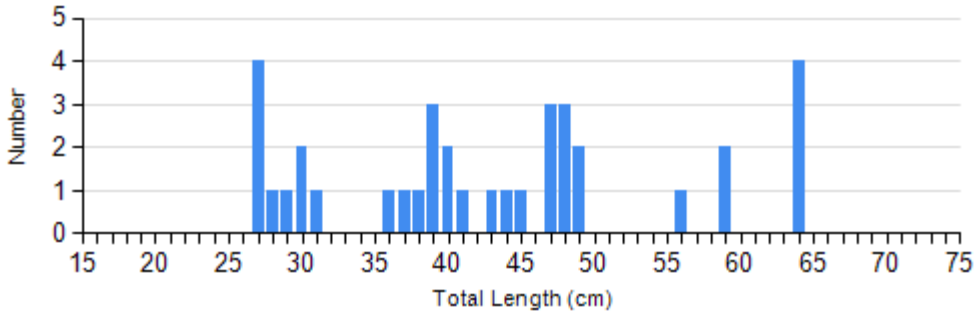
2018



2019

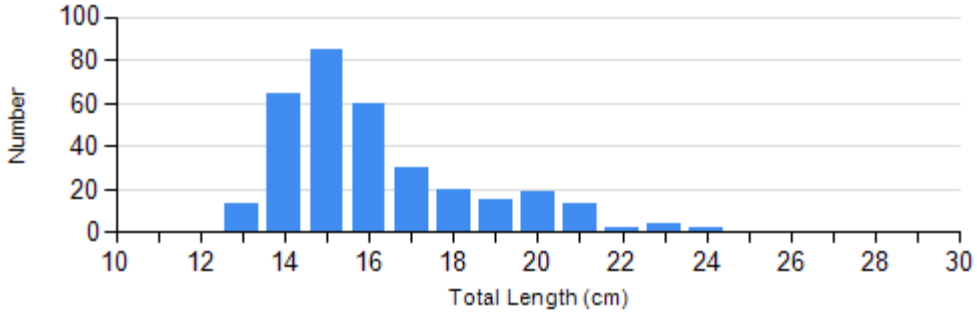


2021

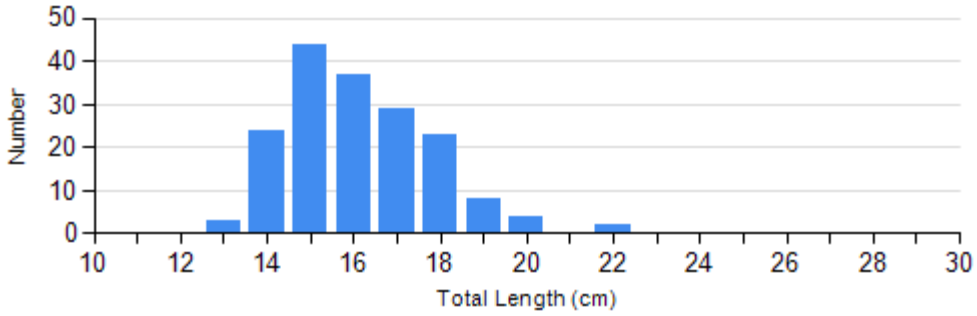


2023

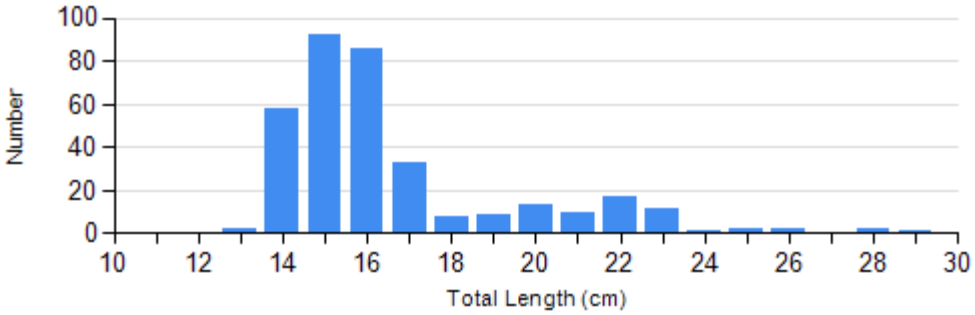
Species: Yellow Perch
Gear: AFS std gill net



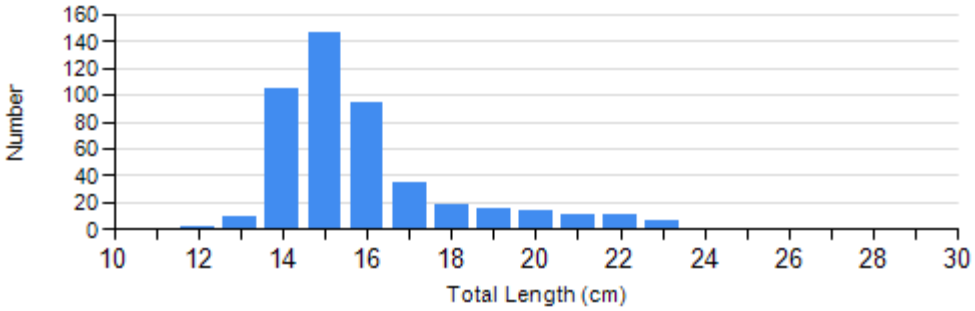
2018



2019


Number
100
80
60
40
20
0
10
12
14
16
18
20
22
24
26
28
30
Total Length (cm)

2021

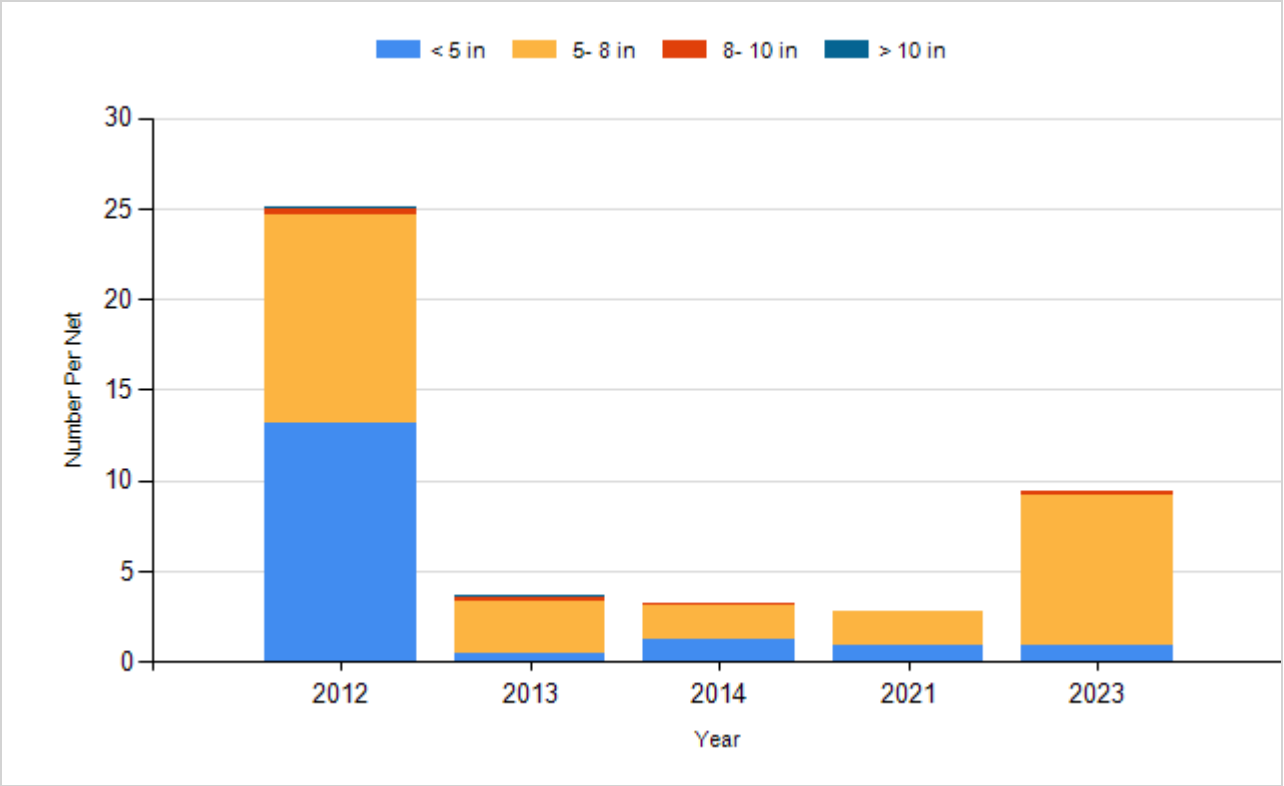

Number
160
140
120
100
80
60
40
20
0
10
12
14
16
18
20
22
24
26
28
30
Total Length (cm)

2023

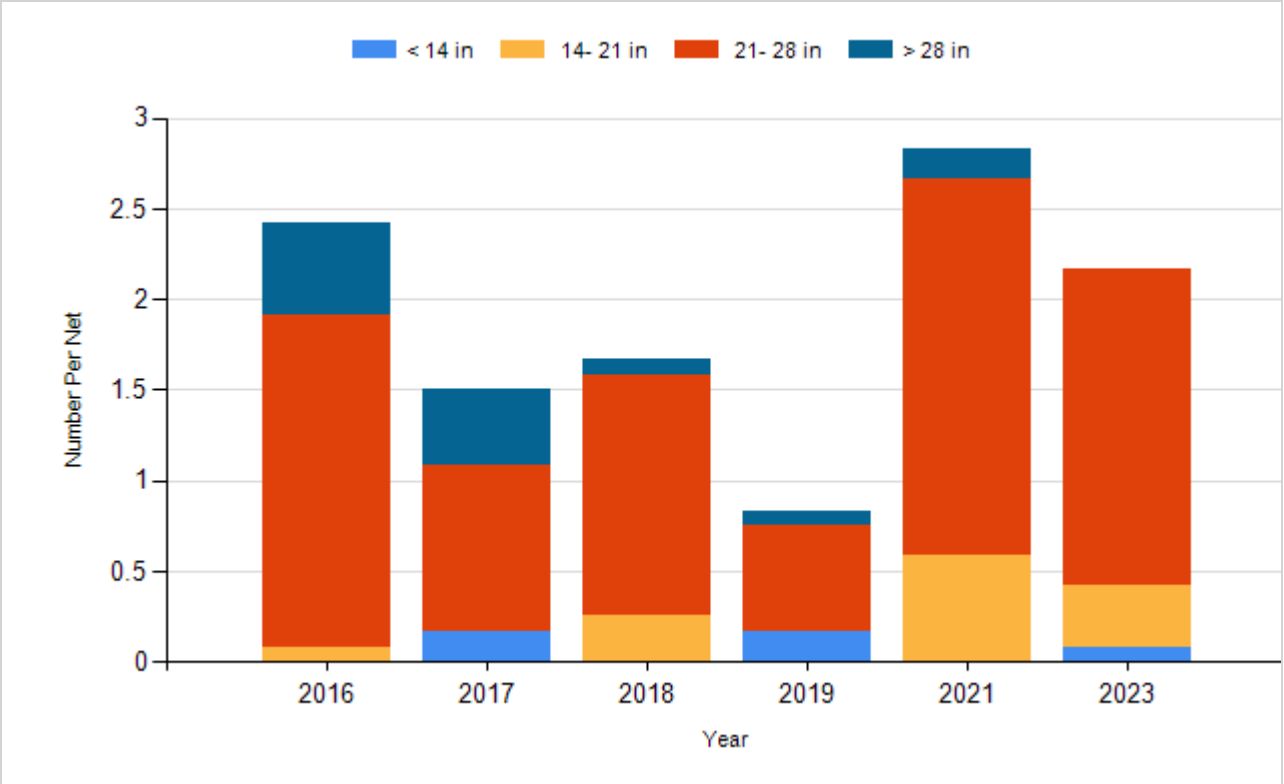
Historic Fish Sizes and Relative Abundance

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

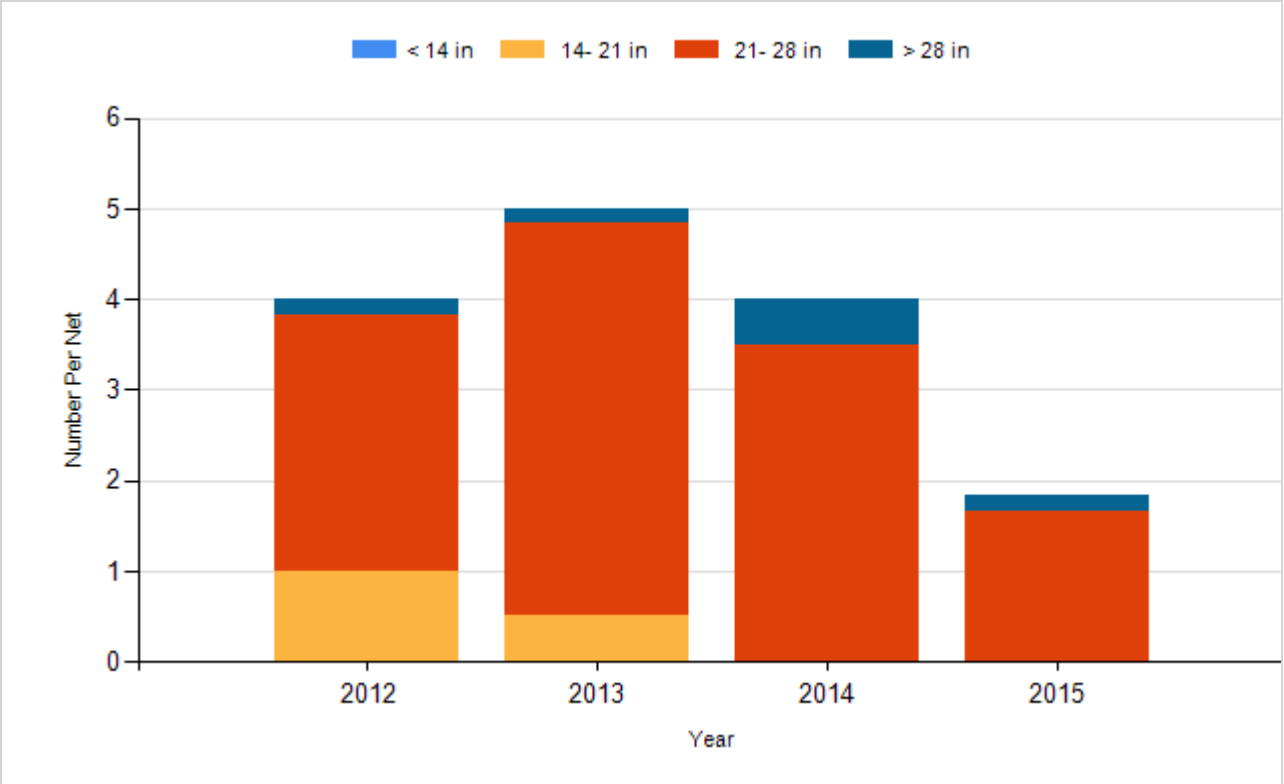
Species: Black Crappie
Gear: frame net (std 3/4 in)



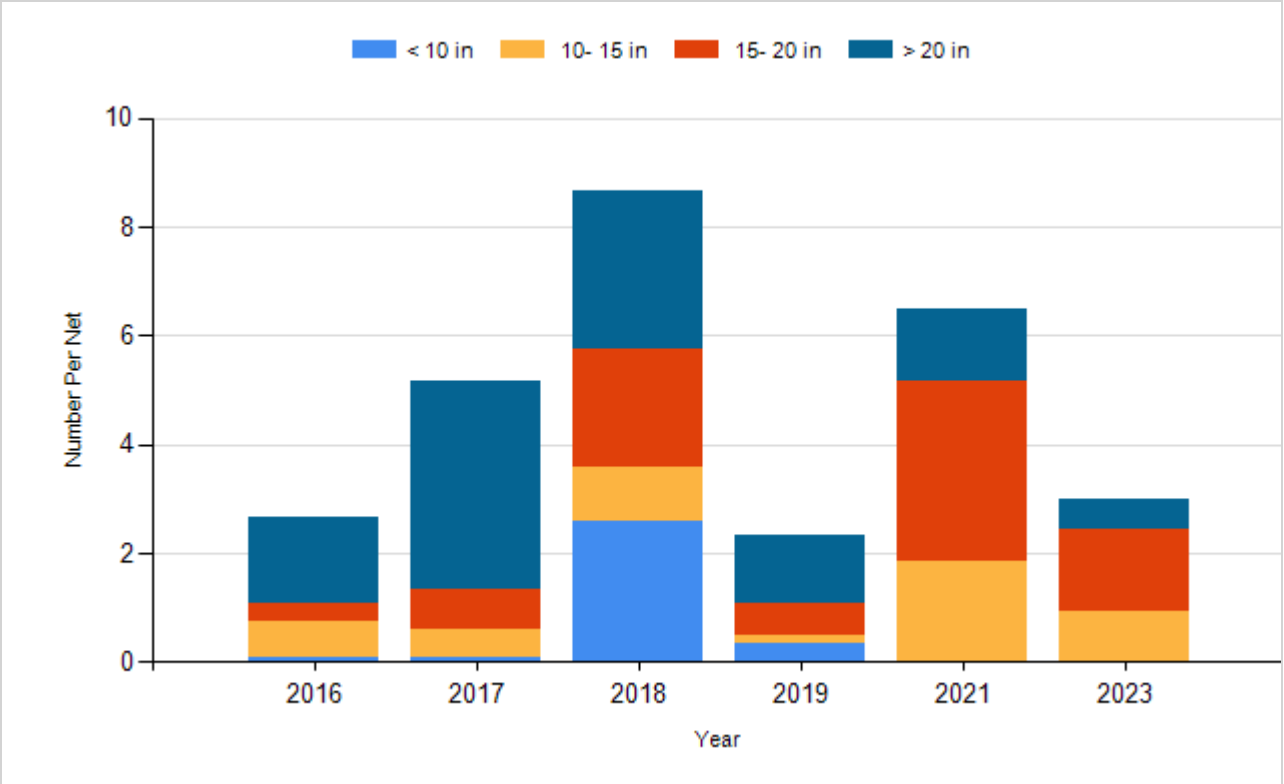
Species: Northern Pike
Gear: AFS std gill net



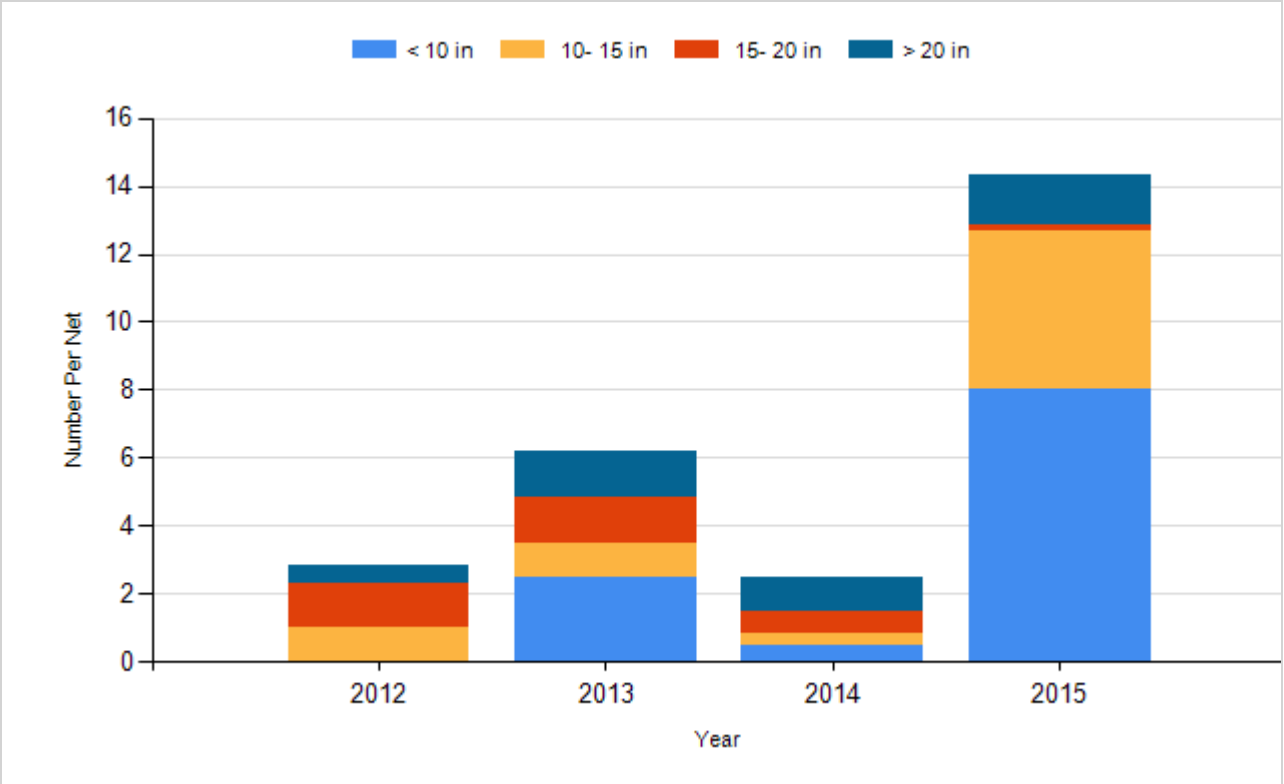
Species: Northern Pike
Gear: std exp gill net



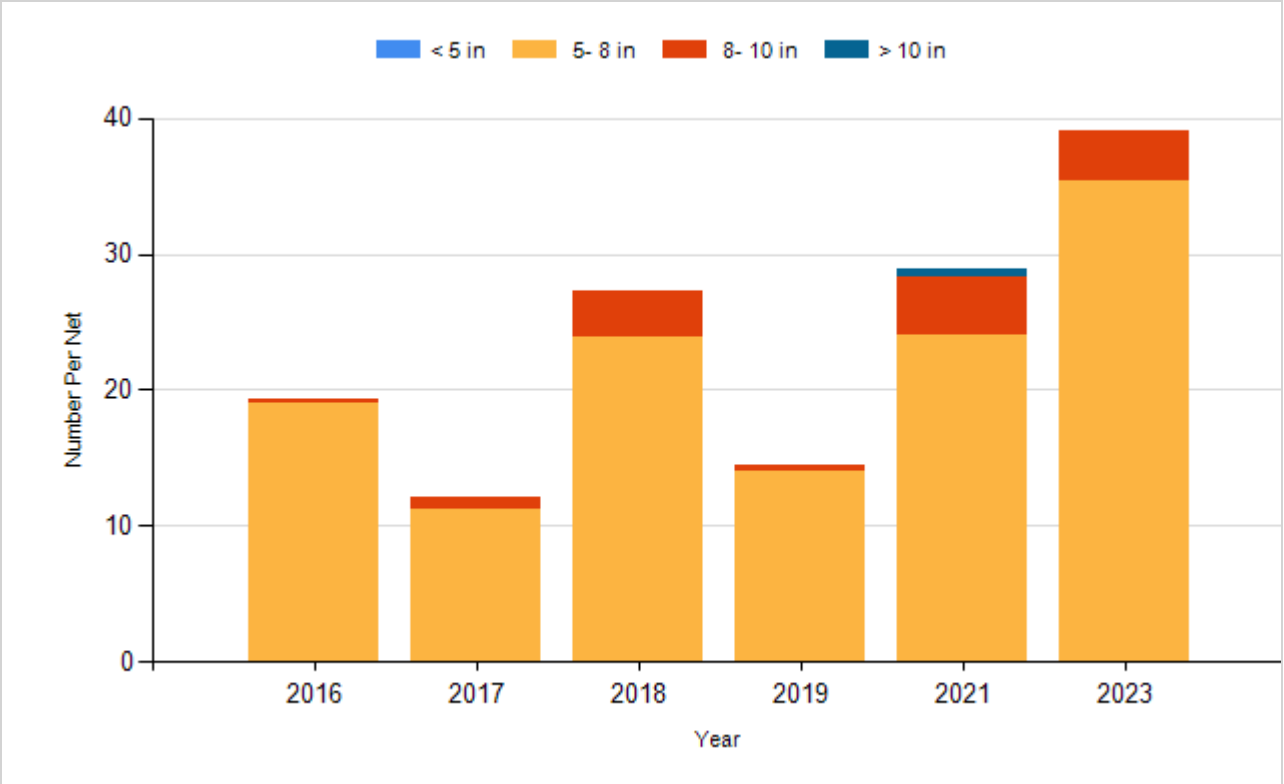
Species: Walleye
Gear: AFS std gill net



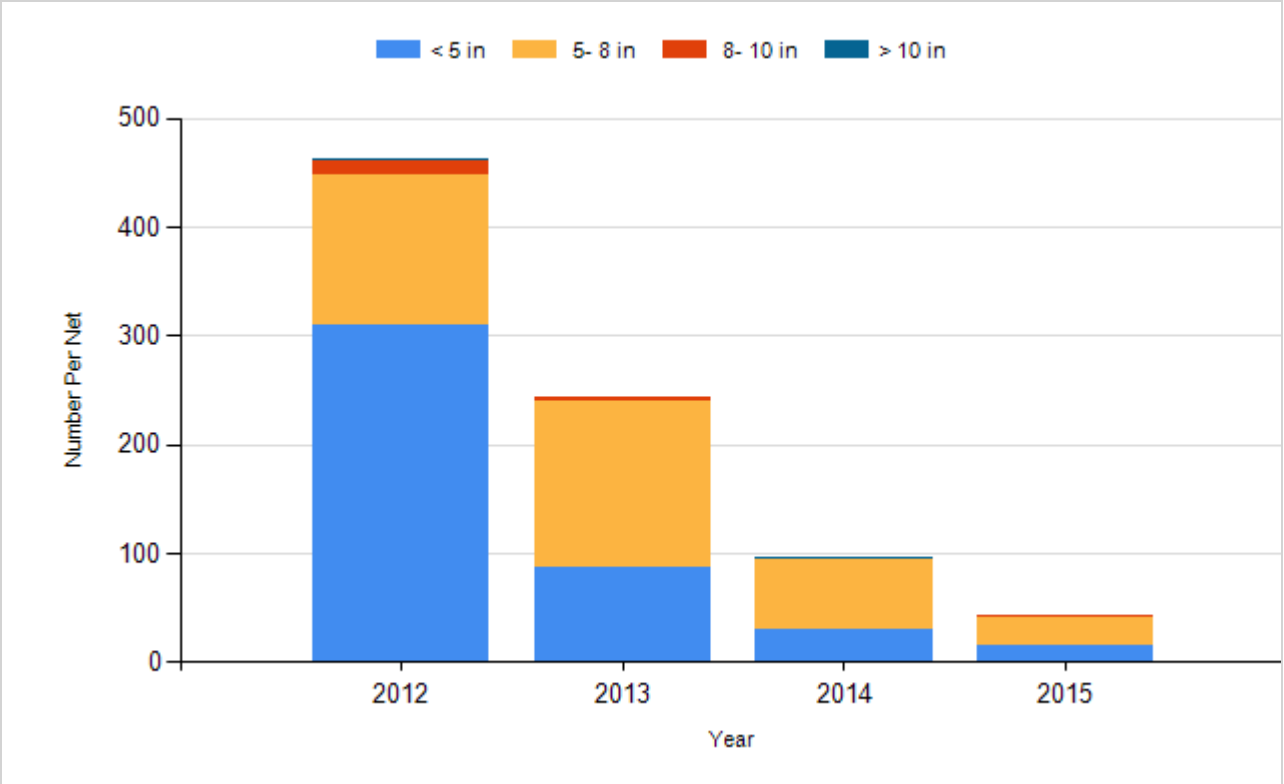
Species: Walleye
Gear: std exp gill net



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
2013	Walleye	Fry	1,350,000
2014	Walleye	Large Fingerling	5,165
2015	Walleye	Small Fingerling	270,120
2018	Walleye	Fry	1,350,000
2021	Walleye	Fry	1,400,000
2023	Walleye	Juvenile	189,635

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Kettle, Marshall County
UJA-Lake-866-000
2023

Lake Information

Name: Kettle
County: Marshall
Surface Area: 3,229 Acres
Maximum Depth: 18 Feet
Mean Depth: 10 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 22, 2023	4 net-nights
AFS std gill net	Aug 23, 2023	4 net-nights
AFS std gill net	Aug 24, 2023	4 net-nights
fall night EF-WAE	Sep 18, 2023	3600 seconds
frame net (std 3/4 in)	Aug 22, 2023	5 net-nights
frame net (std 3/4 in)	Aug 23, 2023	5 net-nights
frame net (std 3/4 in)	Aug 24, 2023	7 net-nights

Common Fish Species Present

Walleye

Northern Pike

Yellow Perch

Black Bullhead

Black Crappie

Bluegill

White Bass

White Sucker

Green Sunfish

Smallmouth 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.

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

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

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	Bigmouth Buffalo	6	0.0	0.0	0		0			
	Black Bullhead	66	5.1	4.7	15	7	2		95	1
	Black Crappie	9	0.8	0.6	0		0		119	3
	Common Carp	5	0.1	0.1	100		100		103	
	Largemouth Bass	2	0.0	0.0	0		0			
	Northern Pike	26	2.1	0.6	84		0		94	1
	Smallmouth Bass	4	0.3	0.3	50		50		120	1
	Walleye	36	3.0	1.2	69	12	19	10	97	2
	White Bass	23	0.8	0.5	11		0		109	4
	White Sucker	17	1.4	1.0	94		88		104	1
	Yellow Perch	468	38.9	3.5	9	2	0		98	1
frame net (std 3/4 in)	Bigmouth Buffalo	1	0.0	0.0	0		0			
	Black Bullhead	266	12.8	3.6	27	4	9	3	86	1
	Black Crappie	159	8.5	2.9	1		0		116	1
	Bluegill	64	3.8	2.3	8	5	0		113	2
	Common Carp	11	0.5	0.4	100		100			
	Green Sunfish	15	0.9	0.7	0		0		100	3
	Largemouth Bass	15	0.1	0.1	100		100		133	
	Northern Pike	17	0.5	0.3	100		13		82	3
	Smallmouth Bass	16	0.8	0.3	38		31		110	3
	Walleye	8	0.4	0.3	100		86		92	5
	White Bass	102	1.8	0.9	6		6		102	1
	White Sucker	3	0.2	0.2	100		100		98	3
	Yellow Perch	1319	77.6	21.0	6	1	1	0	89	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	Bigmouth Buffalo			0.0	0.0	0.0	0.0		0.0		0.0	0.00
	Black Bullhead			8.8	0.6	1.7	2.8		5.8		5.1	4.13
	Black Crappie			1.3	0.7	5.1	0.0		0.3		0.8	1.37
	Bluegill			0.5	0.2	0.3	0.2		0.1		0.0	0.22
	Common Carp			0.8	0.3	1.1	0.3		1.3		0.1	0.65
	Largemouth Bass			0.0	0.0	0.1	0.0		0.0		0.0	0.02
	Northern Pike			2.4	1.3	1.7	0.7		2.8		2.1	1.83
	Smallmouth Bass			0.2	0.1	0.3	0.4		0.2		0.3	0.25
	Walleye			2.6	5.1	6.1	2.0		6.5		3.0	4.22
	White Bass			0.1	0.0	0.0	0.1		0.5		0.8	0.25
	White Sucker			0.8	0.6	0.7	0.1		2.3		1.4	0.98
	Yellow Perch			19.2	12.2	27.3	14.5		28.9		38.9	23.50
boat shocker (night)	Walleye*	2.0	75.0	38.0								38.33
fall night EF-WAE*	Walleye										37.0	37.00
frame net (std 3/4 in)	Bigmouth Buffalo	0.0							0.0		0.0	0.00
	Black Bullhead	23.7							77.3		12.8	37.93
	Black Crappie	1.9							1.9		8.5	4.10
	Bluegill	23.6							41.8		3.8	23.07
	Bluegill X Gr. Sunfish Hybrid	0.0							0.0		0.0	0.00
	Common Carp	0.1							0.5		0.5	0.37
	Green Sunfish	0.1							0.0		0.9	0.33
	Largemouth Bass	0.0							0.1		0.1	0.07
	Northern Pike	0.7							1.1		0.5	0.77
	Smallmouth Bass	0.5							0.1		0.8	0.47
	Sunfish Hybrid	0.0							2.0		0.0	0.67
	Walleye	0.1							0.3		0.4	0.27
	White Bass	0.0							0.0		1.8	0.60
	White Sucker	0.0							0.0		0.2	0.07
	Yellow Perch	36.7							15.4		77.6	43.23
std exp gill net	Black Bullhead	2.8	45.2									24.00
	Black Crappie	0.3	26.0									13.15
	Bluegill	0.5	0.2									0.35

		CPUE										
Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
std exp gill net	Common Carp	0.2	0.0									0.10
	Largemouth Bass	0.0	0.0									0.00
	Northern Pike	4.0	1.8									2.90
	Smallmouth Bass	0.2	0.0									0.10
	Walleye	2.0	6.3									4.15
	White Bass	0.0	0.0									0.00
	White Sucker	0.7	0.2									0.45
	Yellow Perch	67.2	28.8									48.00

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			82	86	80	26		50		15
		PSD-P			35	86	70	15		6		2
		Wr			100	104	97	103		97		95
	Black Crappie	PSD			7	0	3			25		0
		PSD-P			7	0	0			25		0
		Wr			118	129	123			118		119
	Bluegill	PSD			0	0	50	0		0		
		PSD-P			0	0	0	0		0		
		Wr			116	124	124	123		112		
	Northern Pike	PSD			97	100	85	100		79		84
		PSD-P			21	31	5	13		6		0
		Wr			86	77	90	94		89		94
	Smallmouth Bass	PSD			100	100	50	60		0		50
		PSD-P			100	100	50	40		0		50
		Wr			113	117	122	121		109		120
	Walleye	PSD			74	90	84	92		72		69
		PSD-P			61	75	48	63		21		19
		Wr			93	88	95	102		92		97
	White Bass	PSD			100	0	0	100		100		11
		PSD-P			100	0	0	100		67		0
		Wr			104			101		102		109
	White Sucker	PSD			100	100	88	100		96		94
		PSD-P			100	100	88	100		89		88
		Wr			105	107	98	99		108		104
	Yellow Perch	PSD			1	8	12	3		17		9
		PSD-P			0	0	0	0		2		0
		Wr			99	102	100	108		100		98
boat shocker (night)	Walleye	PSD	0	0	0							
		PSD-P	0	0	0							
		Wr		97	100							
frame net (std 3/4 in)	Black Bullhead	PSD	24							31		27
		PSD-P	6							8		9

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
frame net (std 3/4 in)	Black Bullhead	Wr	88							84		86
	Black Crappie	PSD	3							0		1
		PSD-P	0							0		0
		Wr	117							112		116
	Bluegill	PSD	0							2		8
		PSD-P	0							0		0
		Wr	110							102		113
	Green Sunfish	PSD	0									0
		PSD-P	0									0
		Wr	101									100
	Northern Pike	PSD	92							88		100
		PSD-P	8							19		13
		Wr	84							87		82
	Smallmouth Bass	PSD	44							100		38
		PSD-P	44							0		31
		Wr	119							120		110
	Walleye	PSD	100							100		100
		PSD-P	100							25		86
		Wr								89		92
	White Bass	PSD	0									6
		PSD-P	0									6
		Wr										102
	White Sucker	PSD								0		100
		PSD-P								0		100
		Wr										98
	Yellow Perch	PSD	1							7		6
		PSD-P	0							1		1
		Wr	86							88		89
std exp gill net	Black Bullhead	PSD	24	28								
		PSD-P	6	2								
		Wr	100	103								
	Black Crappie	PSD	0	0								
		PSD-P	0	0								
		Wr	123	119								
	Bluegill	PSD	0	0								
		PSD-P	0	0								
		Wr	114	127								

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
std exp gill net	Northern Pike	PSD	100	100								
		PSD-P	13	9								
		Wr	89	91								
	Smallmouth Bass	PSD	0									
		PSD-P	0									
		Wr	120									
	Walleye	PSD	83	26								
		PSD-P	50	24								
		Wr	93	98								
	White Bass	PSD	0									
		PSD-P	0									
	White Sucker	PSD	100	0								
		PSD-P	100	0								
		Wr	103	94								
	Yellow Perch	PSD	5	5								
		PSD-P	0	0								
		Wr	97	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	36	288 (9)	397 (10)	473 (7)	484 (3)		597 (1)		644 (1)	605 (2)	628 (3)
2021	78	296 (21)	419 (40)	476 (1)		600 (2)	561 (1)	556 (1)			638 (12)
2019	24	336 (2)	435 (5)	507 (3)	541 (2)	550 (4)			565 (1)		614 (7)
2018	73	346 (12)	432 (21)	467 (3)	530 (12)	553 (1)	584 (1)	593 (2)	657 (1)	639 (2)	626 (18)
2017	61	302 (6)	398 (2)	492 (6)	521 (2)		535 (4)	599 (4)	625 (2)	592 (7)	620 (28)
2016	31	292 (8)	436 (3)	520 (1)		526 (3)	545 (1)	568 (2)	573 (1)		598 (12)
2015	40	311 (30)			518 (4)	514 (1)		632 (1)		557 (4)	
2014	12	307 (1)	331 (1)	467 (4)		526 (1)			565 (5)		

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	467	156 (408)	210 (59)								
2021	345	159 (277)	218 (63)	277 (4)	283 (1)						
2019	174	160 (132)	178 (41)	224 (1)							
2018	327	157 (256)	198 (66)	211 (5)							
2017	146	158 (129)	209 (17)								
2016	231	150 (170)	171 (43)	154 (18)							
2015	258	134 (227)	192 (31)								
2014	495	144 (462)	196 (23)	212 (10)							

Fish Condition

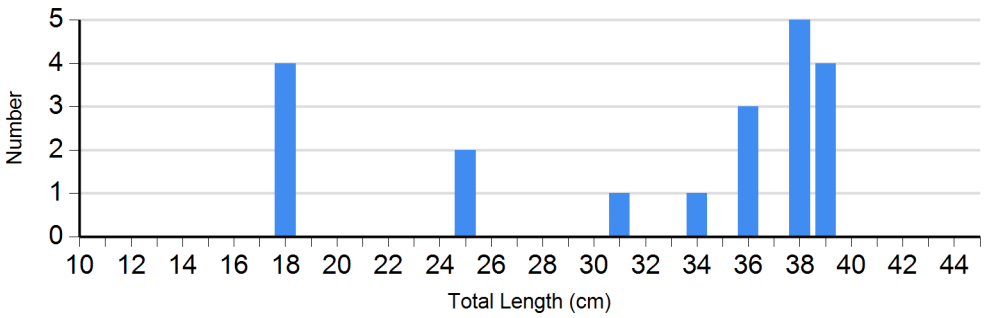
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2019	25	102 (1.5)	4	104 (3.6)	2	111 (4.3)	3	108 (5.7)
	2021	35	98 (1.1)	31	97 (1.2)	3	91 (6.4)	1	97
	2023	52	95 (1.1)	8	94 (3.8)	1	103	0	
Black Crappie Frame Net	2021	28	112 (0.8)	0		0		0	
	2023	142	117 (0.7)	2	112 (1.7)	0		0	
Bluegill Frame Net	2021	616	102 (0.7)	11		0		0	
	2023	59	112 (1.2)	5	121 (2.4)	0		0	
Northern Pike Gill Net	2019	0		7	96 (3.8)	1	86	0	
	2021	7	91 (1.4)	25	88 (1.1)	2	93 (1.6)	0	
	2023	4	99 (1.7)	21	93 (1.1)	0		0	
Walleye Gill Net	2019	2	100 (3.7)	7	102 (1.9)	13	102 (1.6)	2	98 (6.2)
	2021	22	91 (1.3)	40	92 (1.1)	9	95 (1.4)	7	96 (2.0)
	2023	11	101 (1.9)	18	97 (1.3)	3	91 (2.0)	4	91 (4.9)
White Bass Gill Net	2019	0		0		1	101	0	
	2021	0		2	101 (1.8)	2	100 (7.4)	2	106 (5.1)
	2023	8	111 (2.8)	1	95	0		0	
White Sucker Gill Net	2019	0		0		0		1	99
	2021	1	90	2	92	23	109 (1.4)	2	108 (7.2)
	2023	1	97	1	102	0		15	105 (0.9)
Yellow Perch Gill Net	2019	168	109 (0.6)	6	99 (3.8)	0		0	
	2021	288	101 (0.6)	52	97 (0.9)	7	98 (3.0)	0	
	2023	424	98 (0.5)	43	92 (1.0)	0		0	

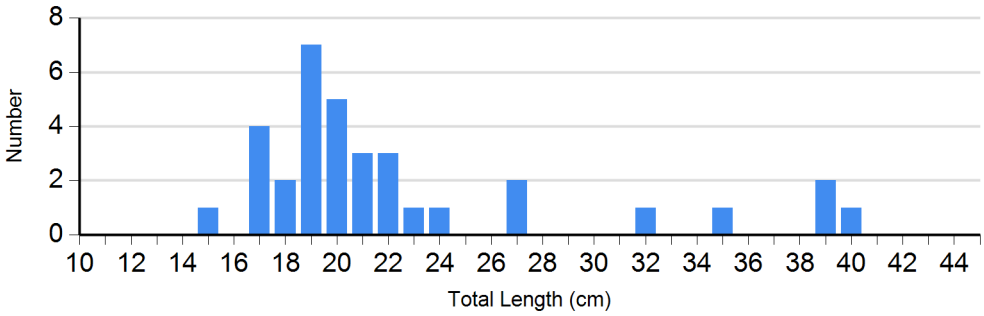
Length Frequency Distribution

Length frequency histogram of species sampled by year.

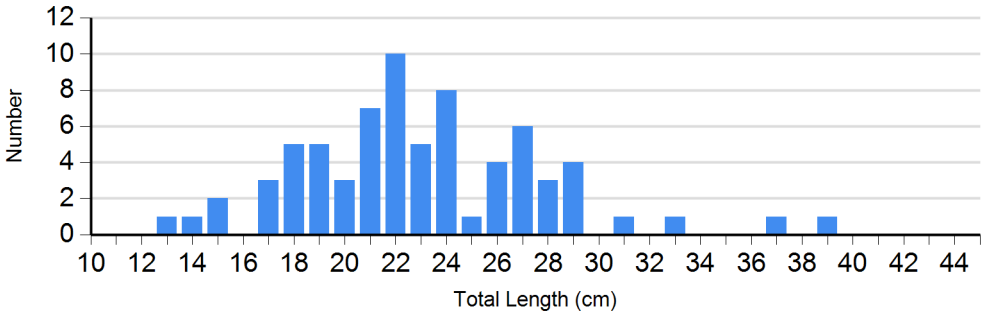
Species: Black Bullhead
Gear: AFS std gill net



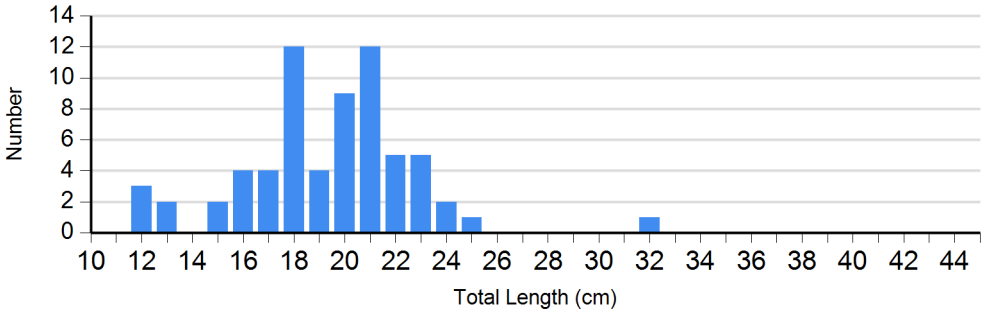
2018



2019

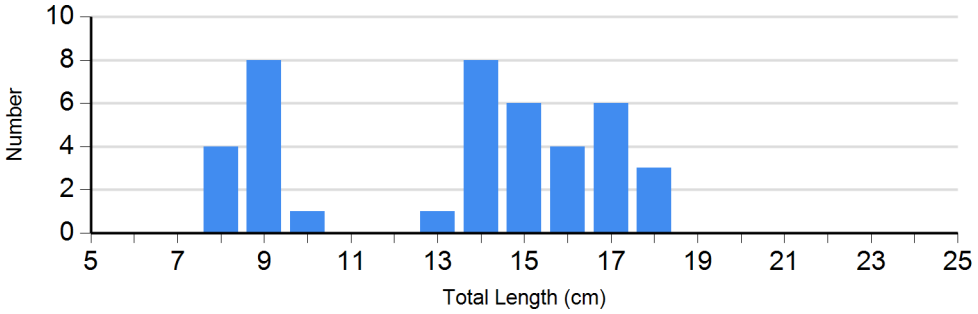


2021



2023

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



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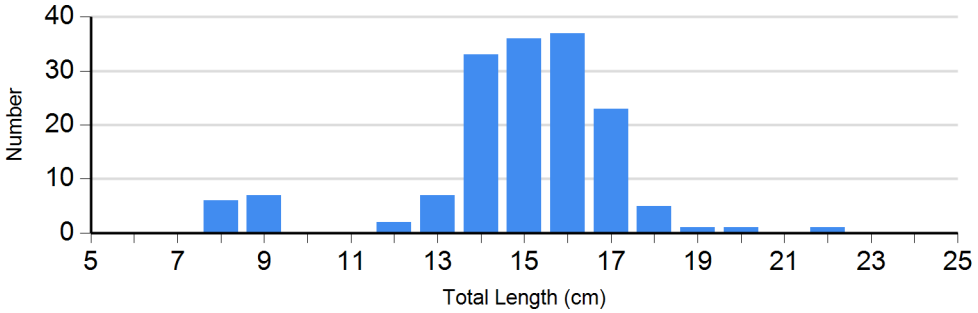
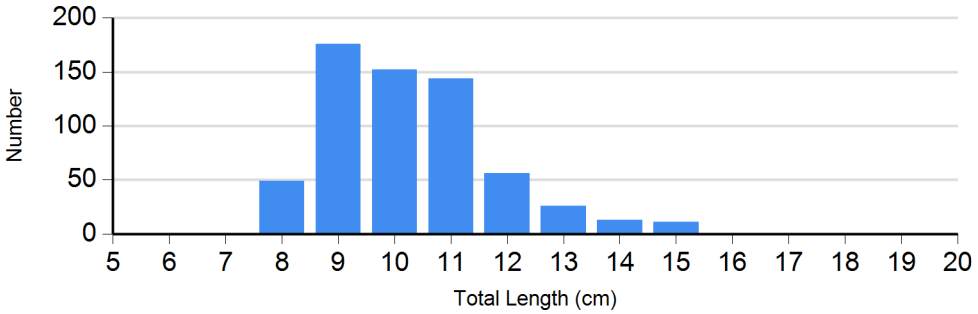


2023

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



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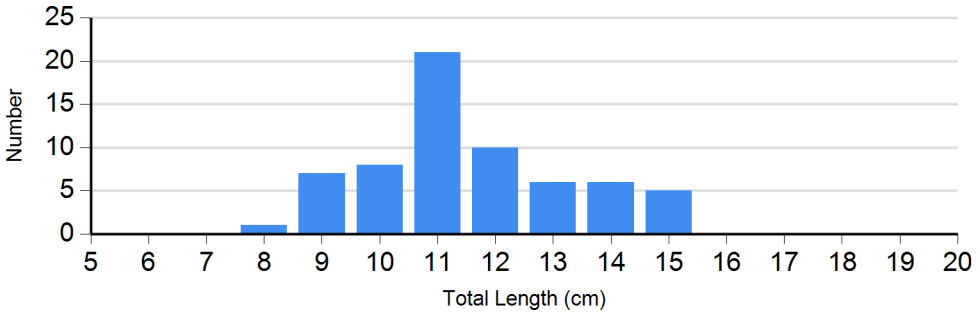
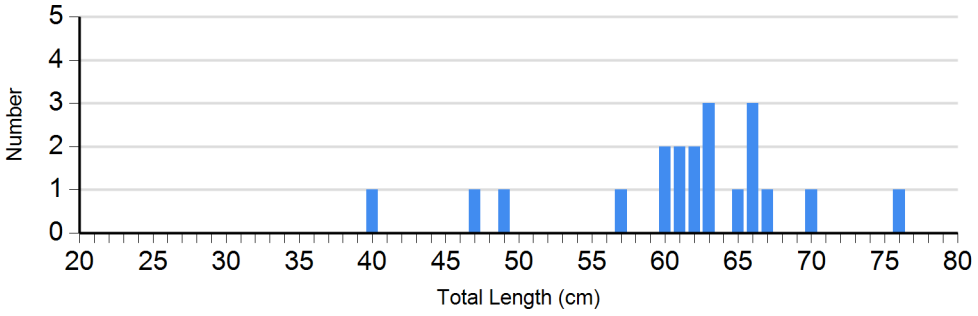
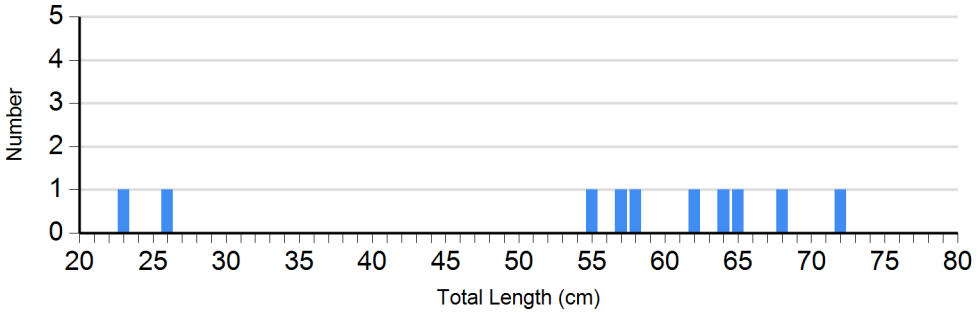


2023

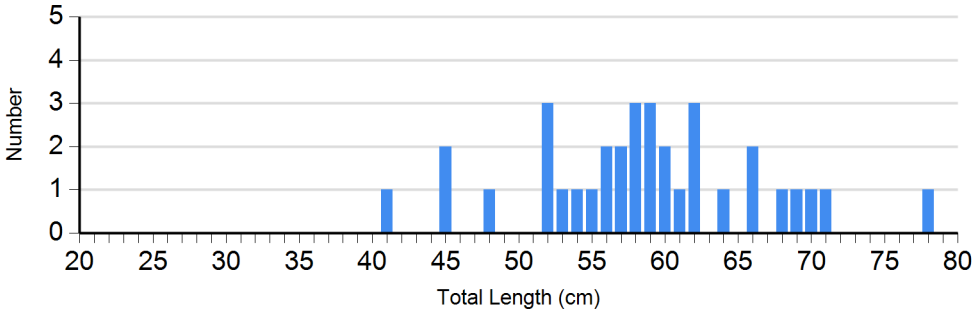
Species: Northern Pike
Gear: AFS std gill net



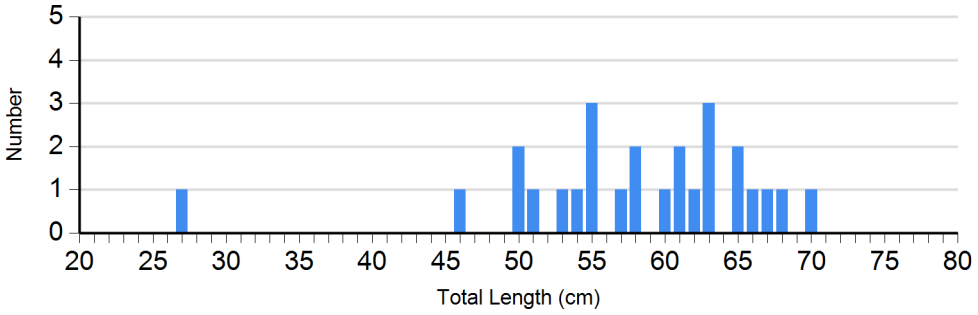
2018



2019

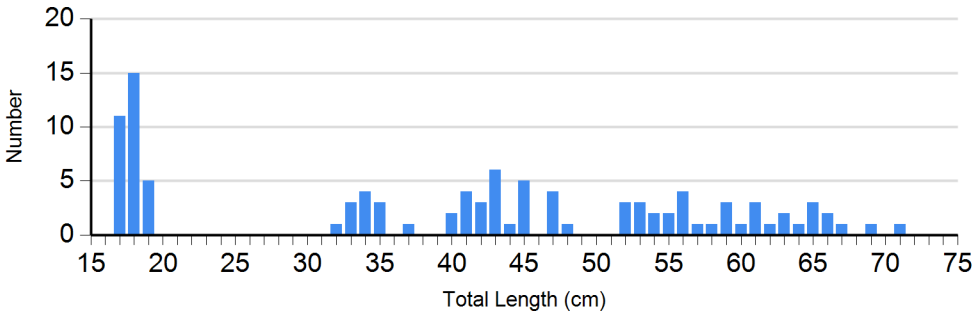


2021



2023

Species: Walleye
Gear: AFS std gill net



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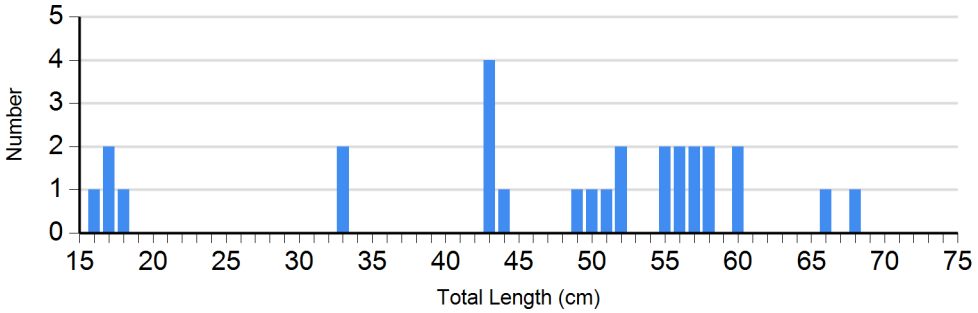
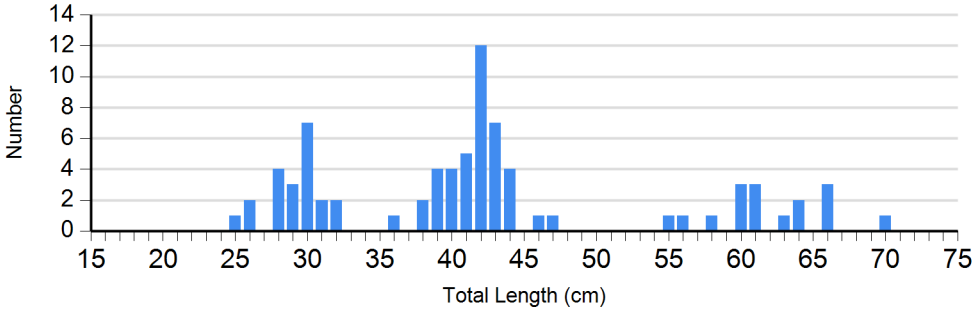
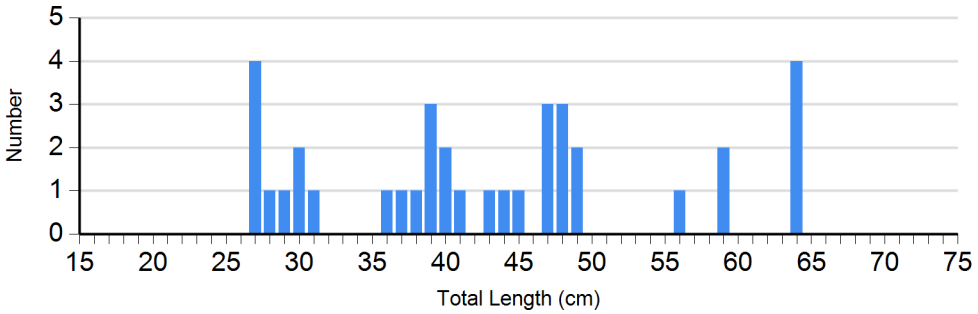


2019

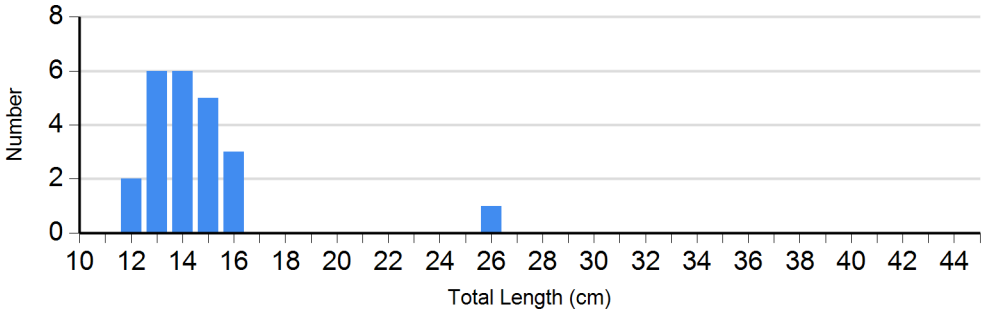


2021



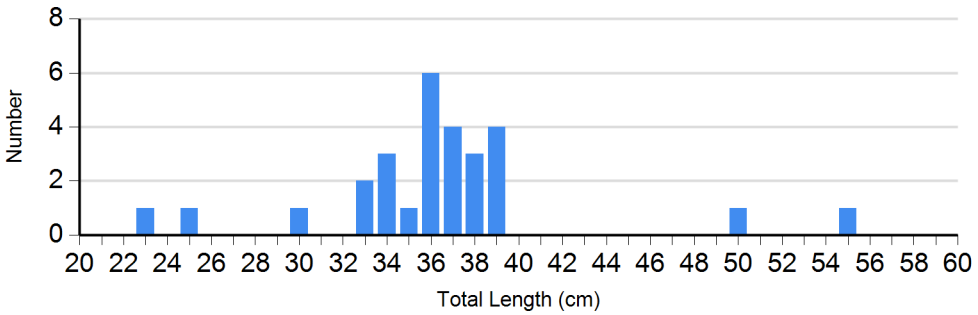
2023

Species: White Bass
Gear: AFS std gill net

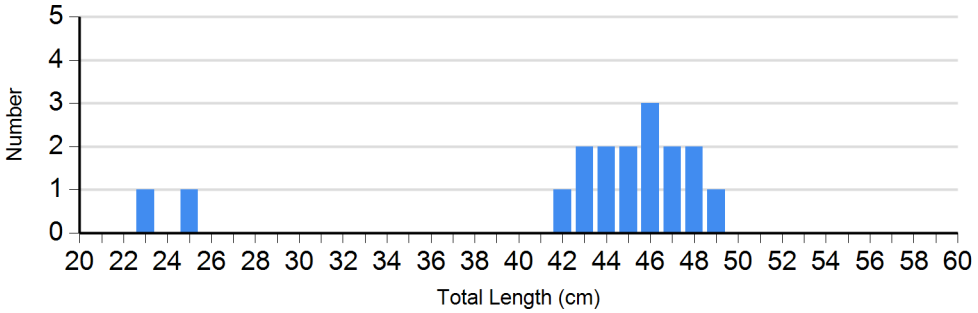


2023

Species: White Sucker
Gear: AFS std gill net

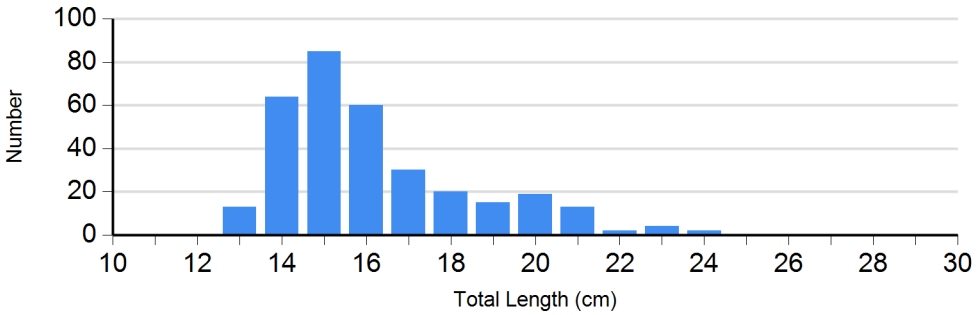


2021



2023

Species: Yellow Perch
Gear: AFS std gill net



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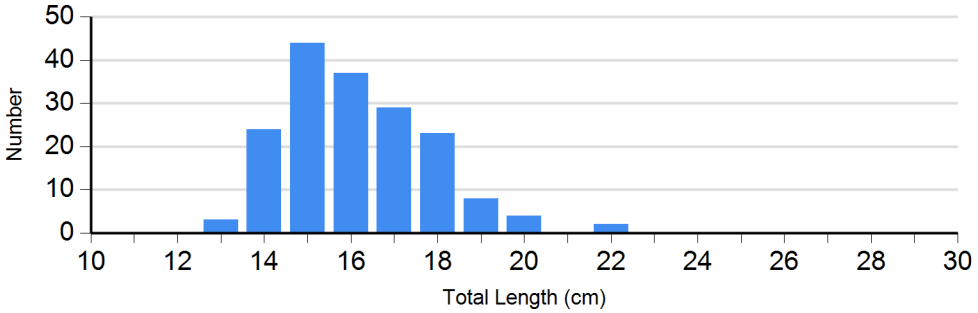

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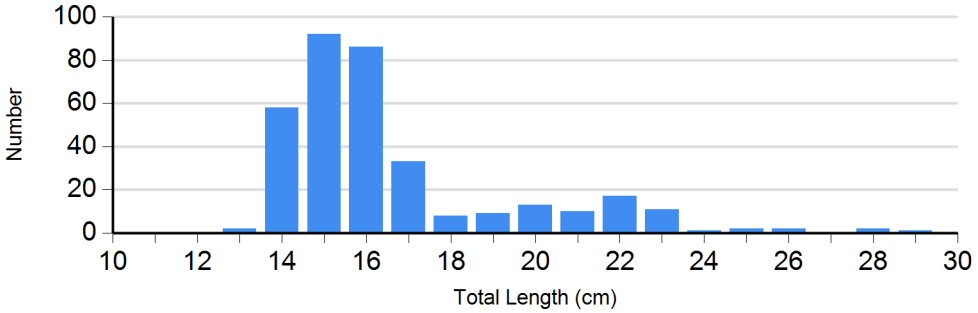
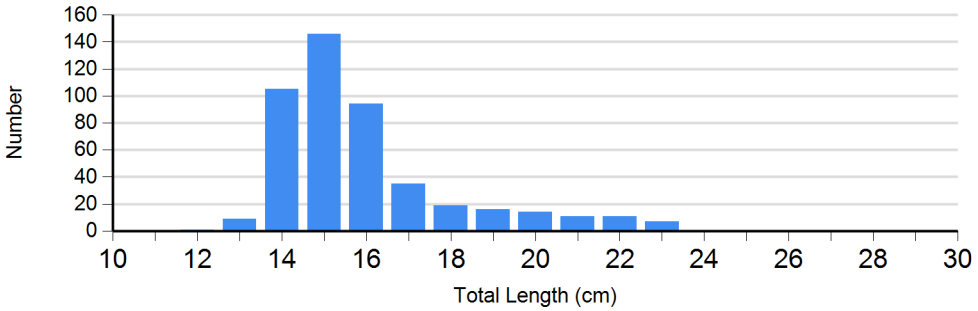


2021

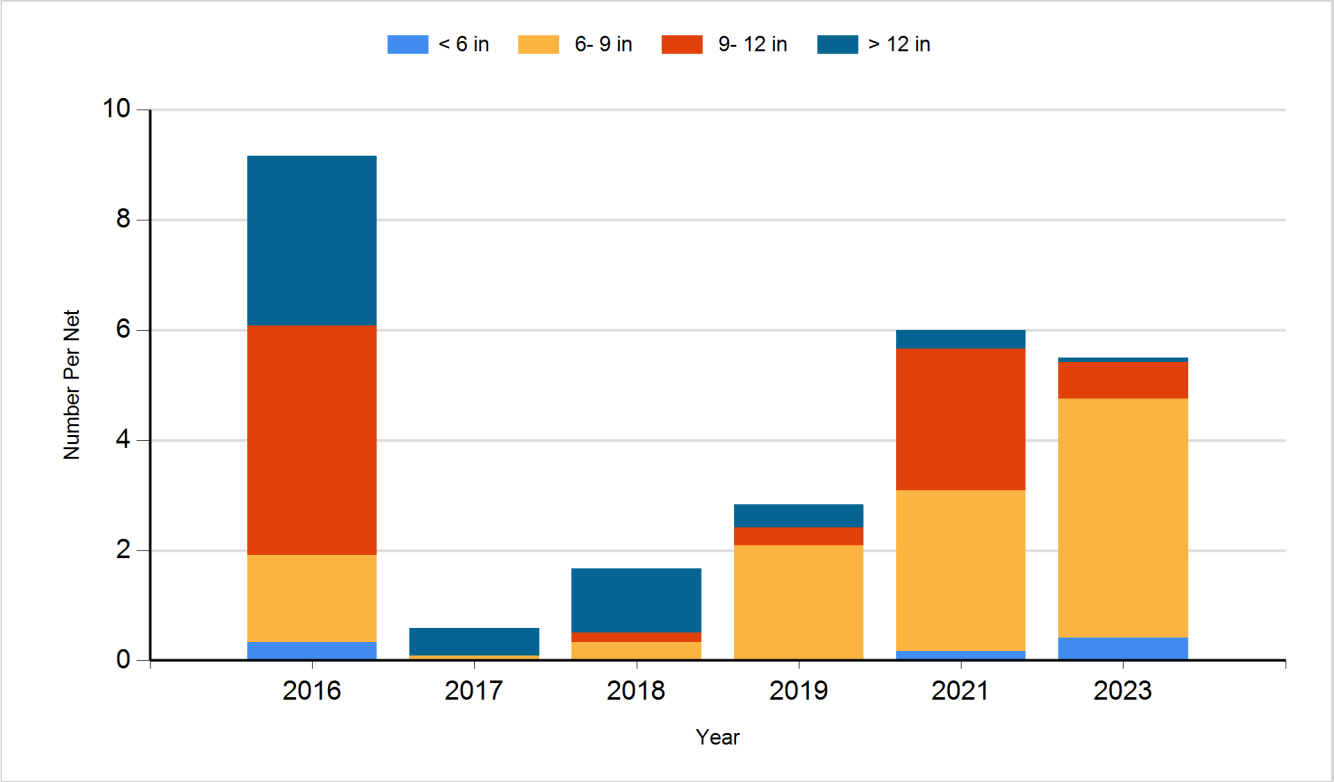


2023

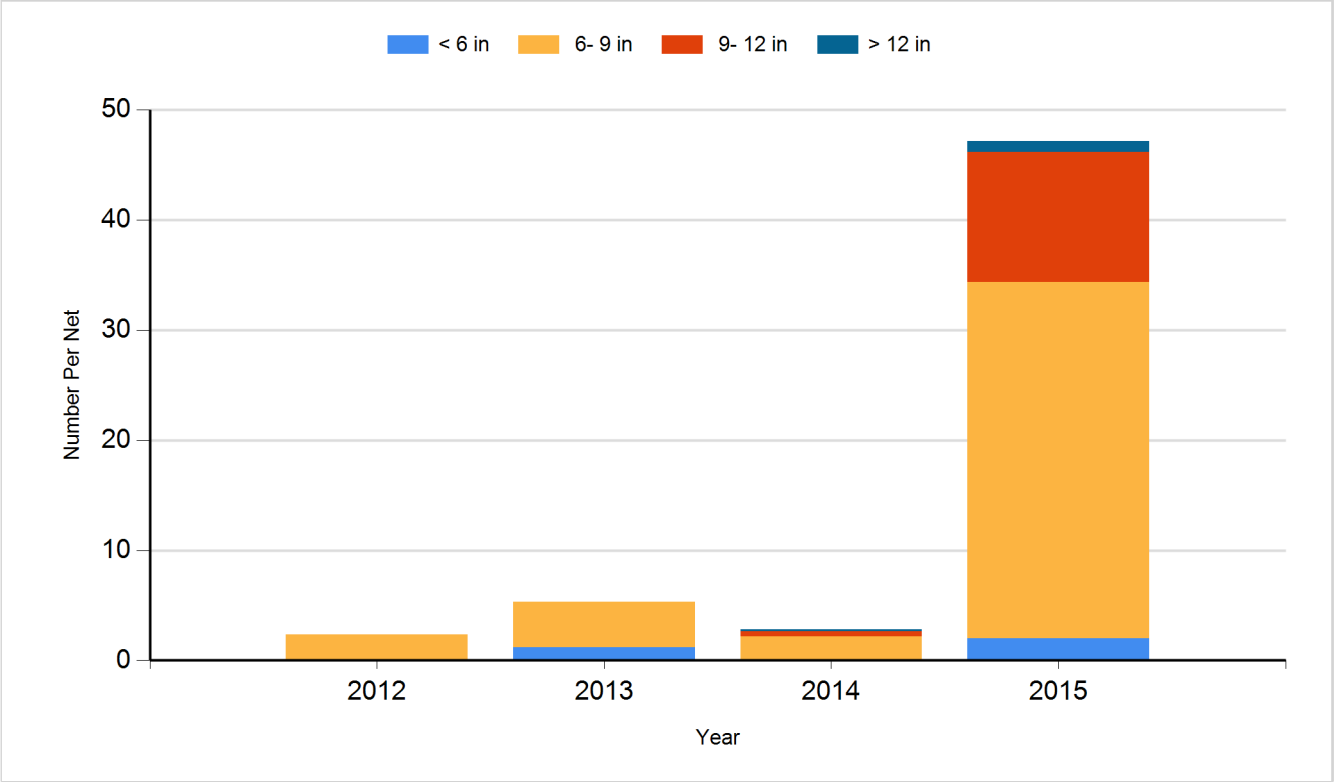
Historic Fish Sizes and Relative Abundance

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

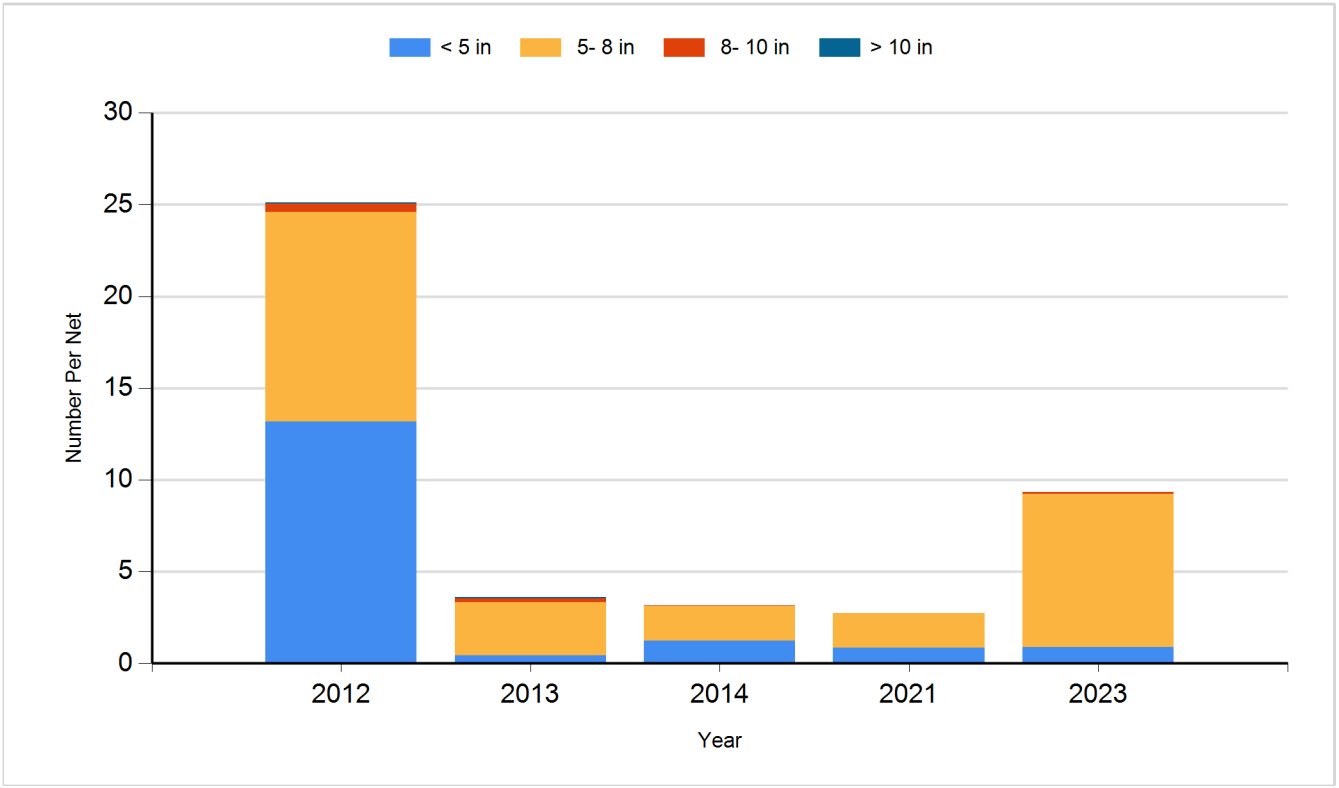
Species: Black Bullhead
Gear: AFS std gill net



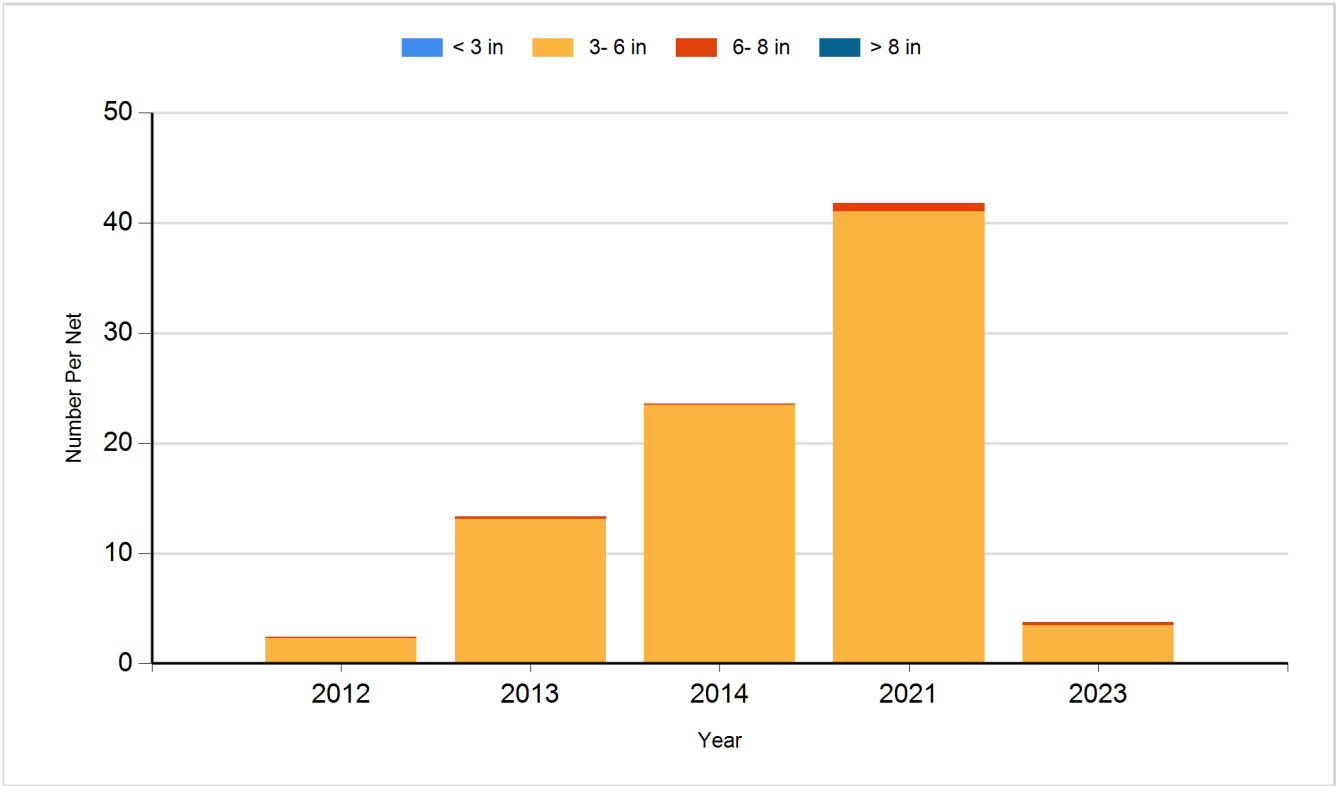
Species: Black Bullhead
Gear: std exp gill net



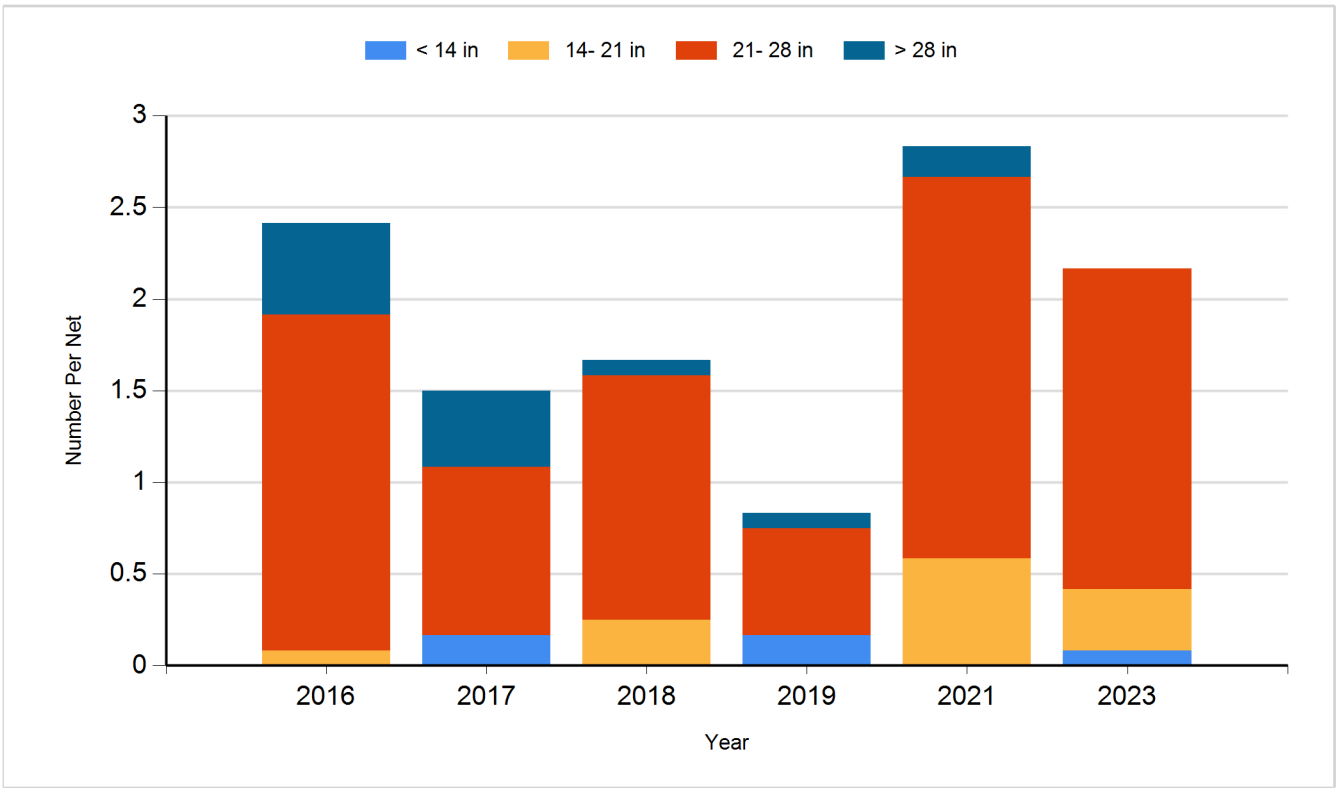
Species: Black Crappie
Gear: frame net (std 3/4 in)



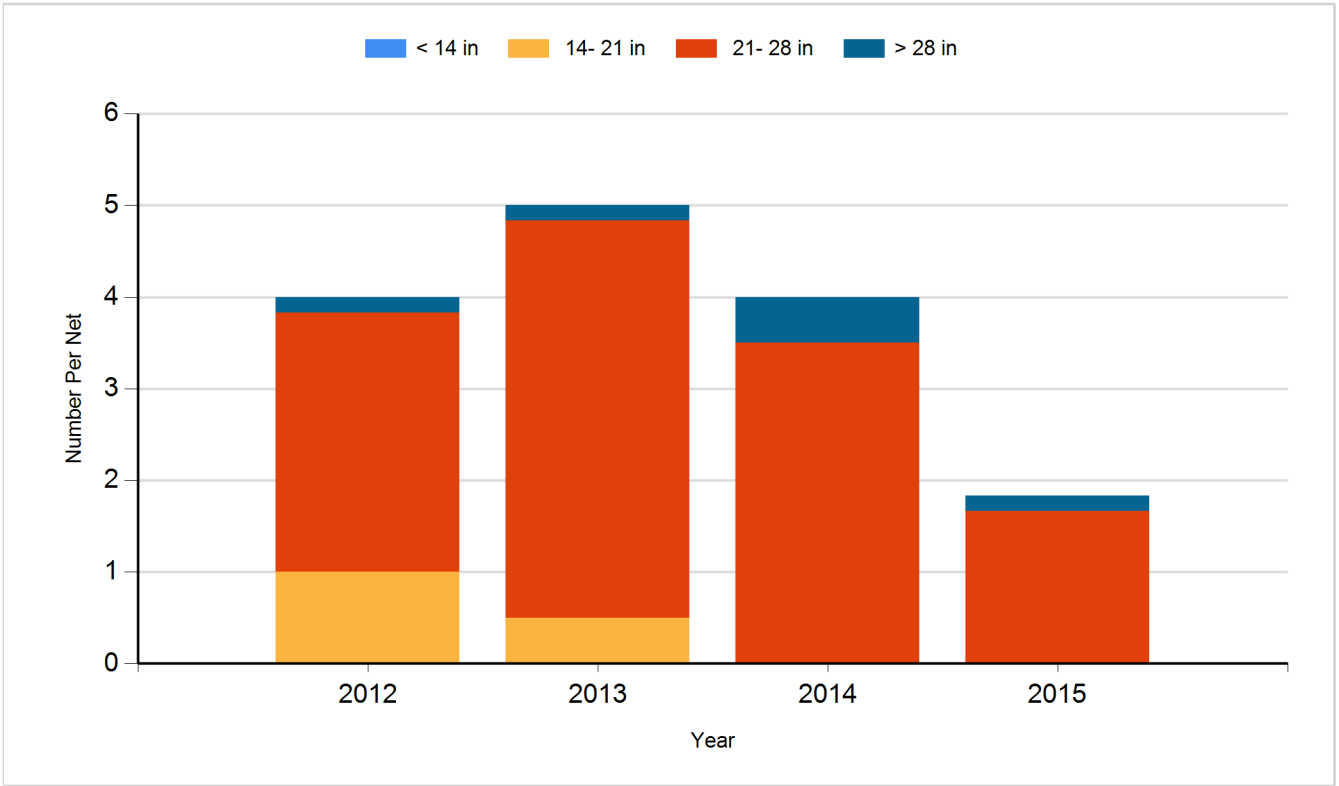
Species: Bluegill
Gear: frame net (std 3/4 in)



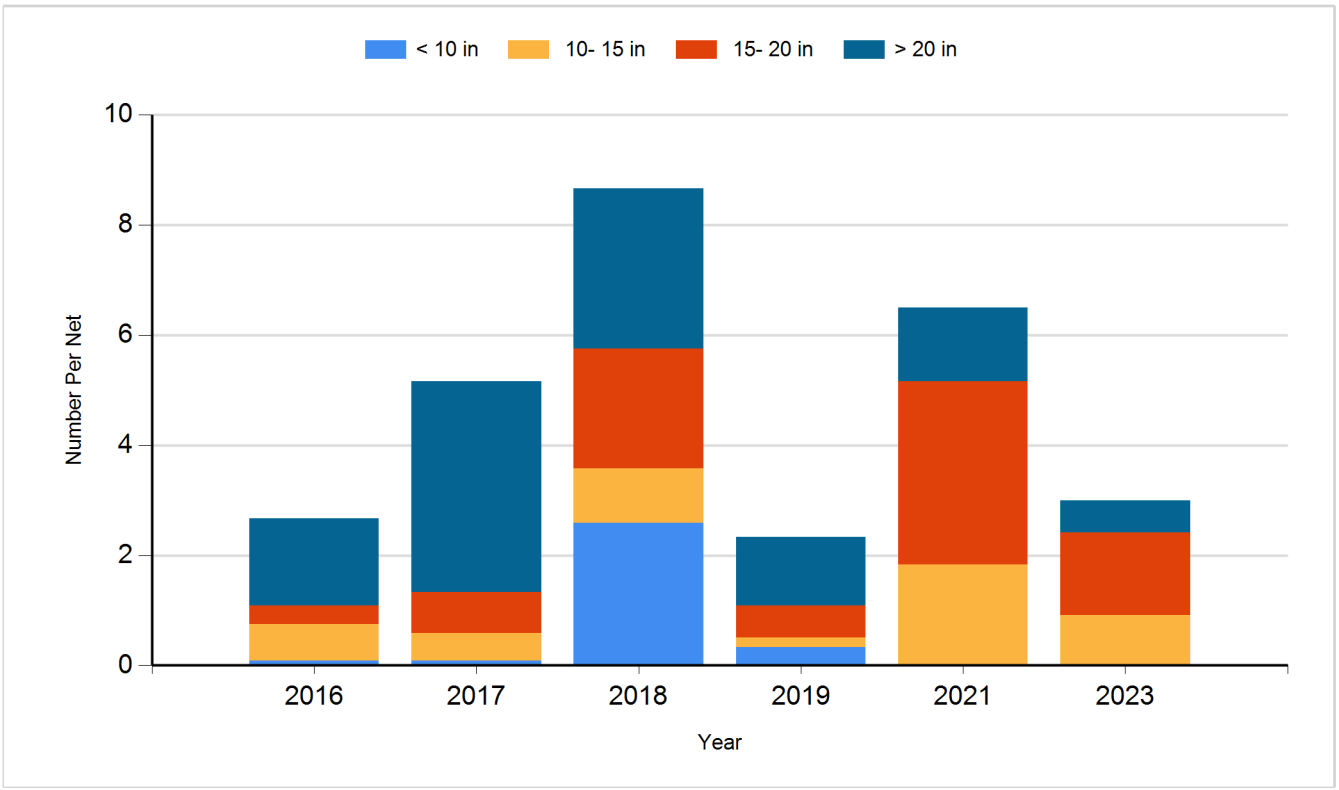
Species: Northern Pike
Gear: AFS std gill net



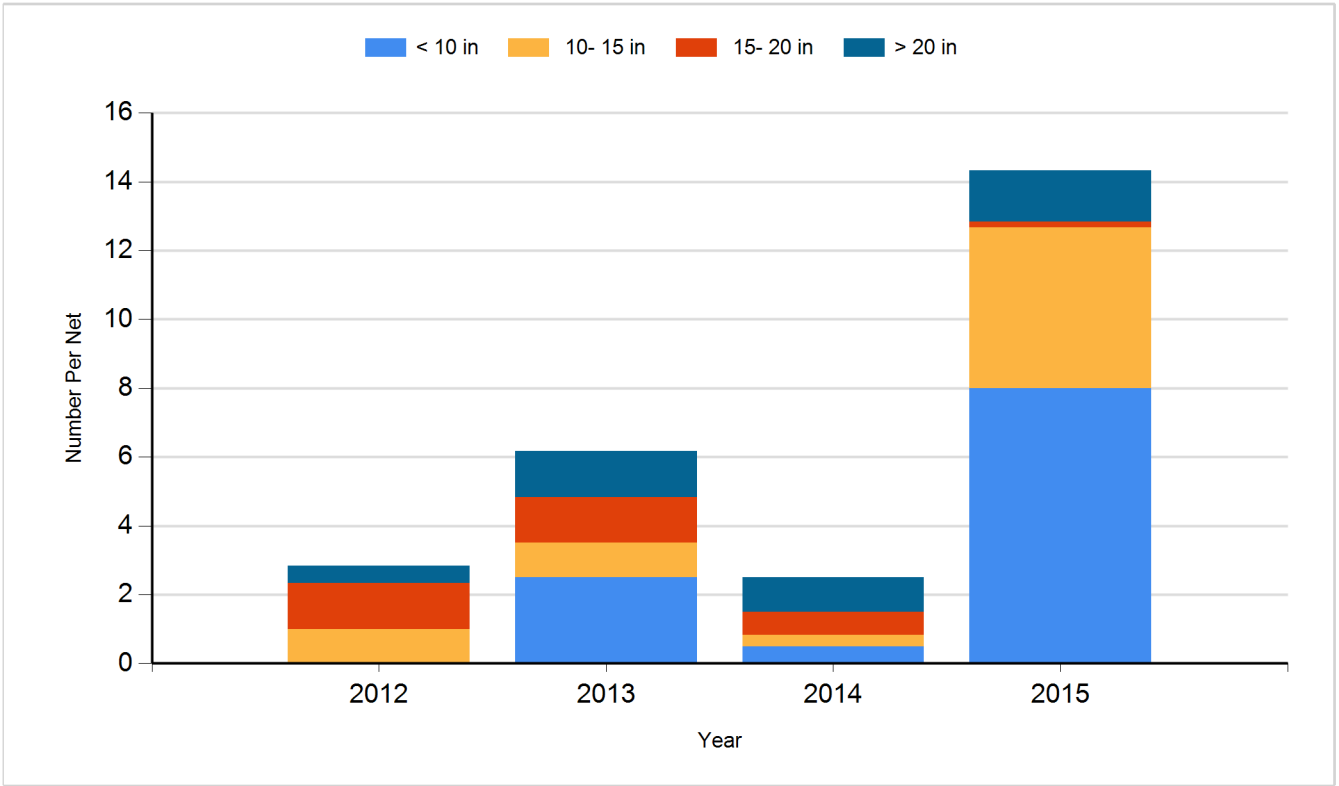
Species: Northern Pike
Gear: std exp gill net



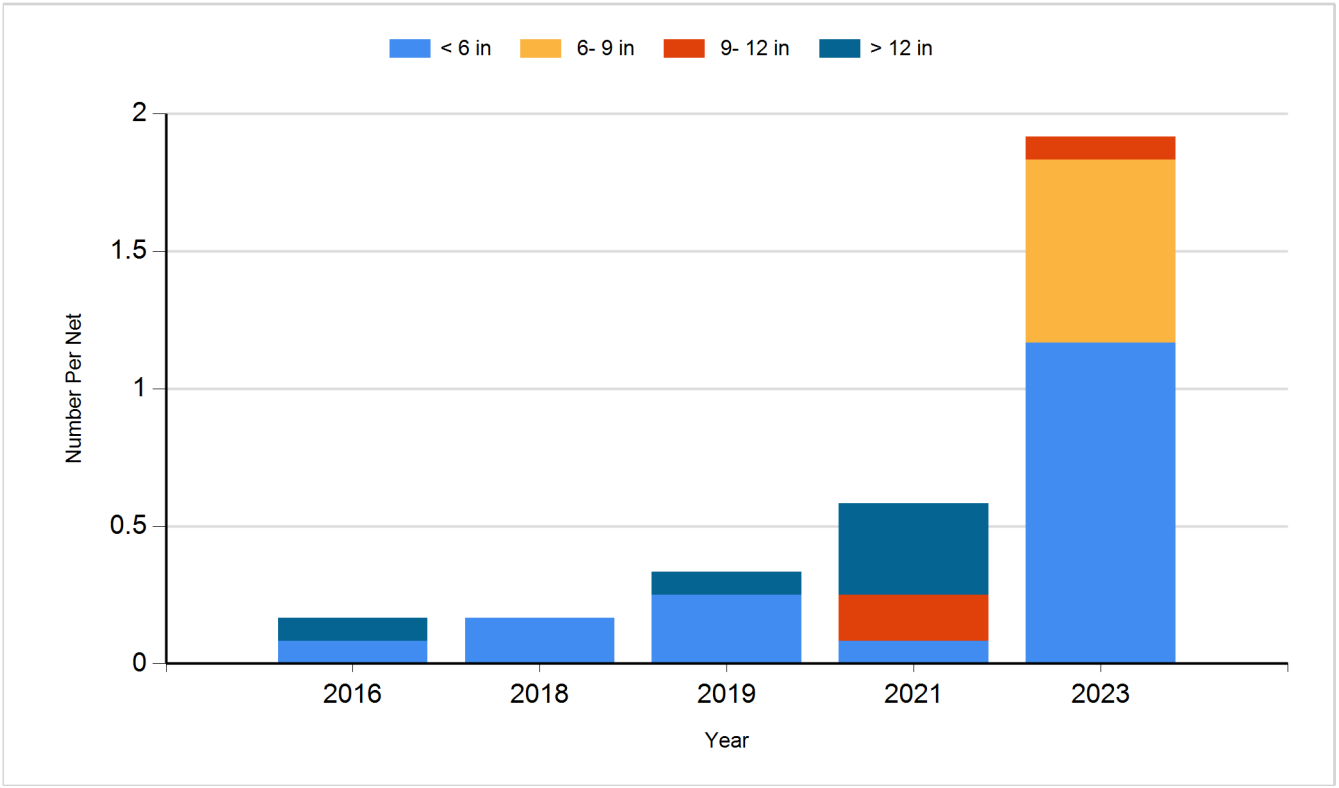
Species: Walleye
Gear: AFS std gill net



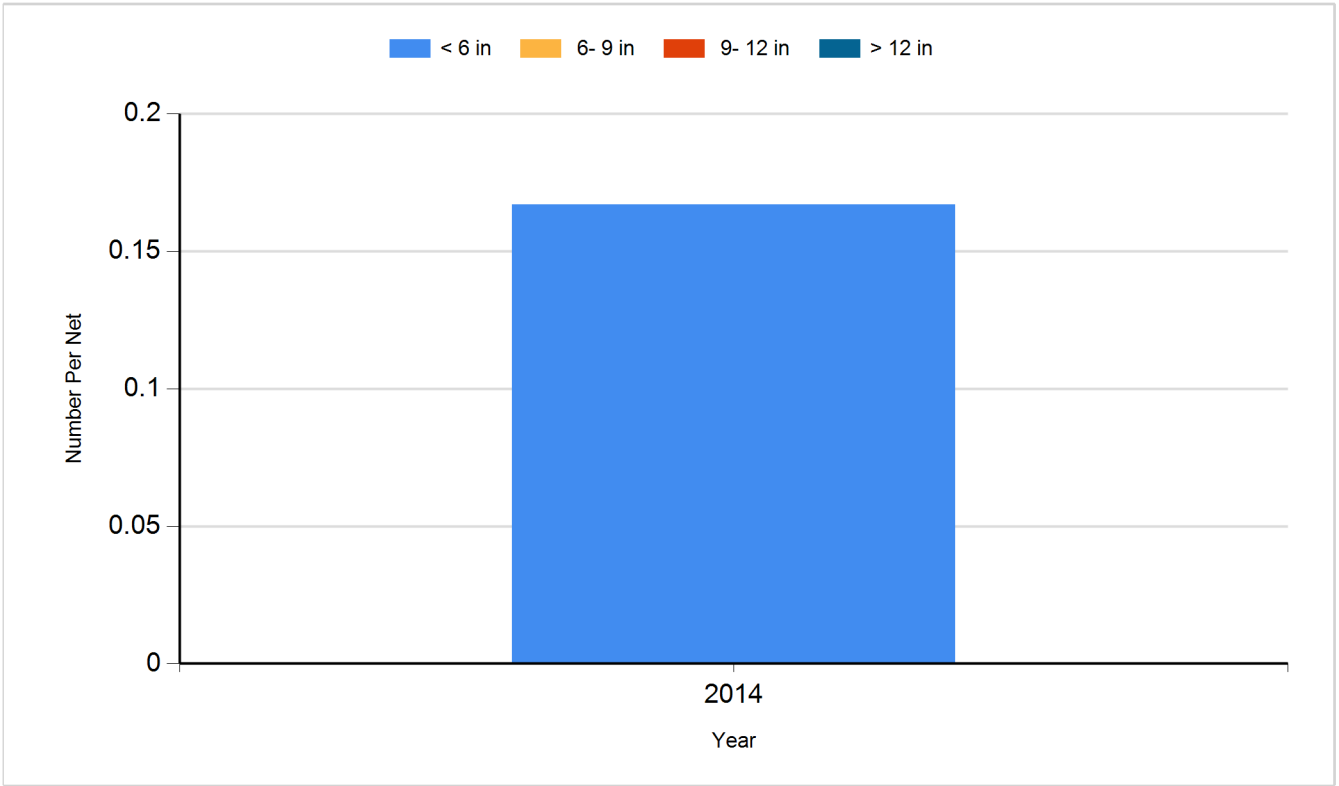
Species: Walleye
Gear: std exp gill net



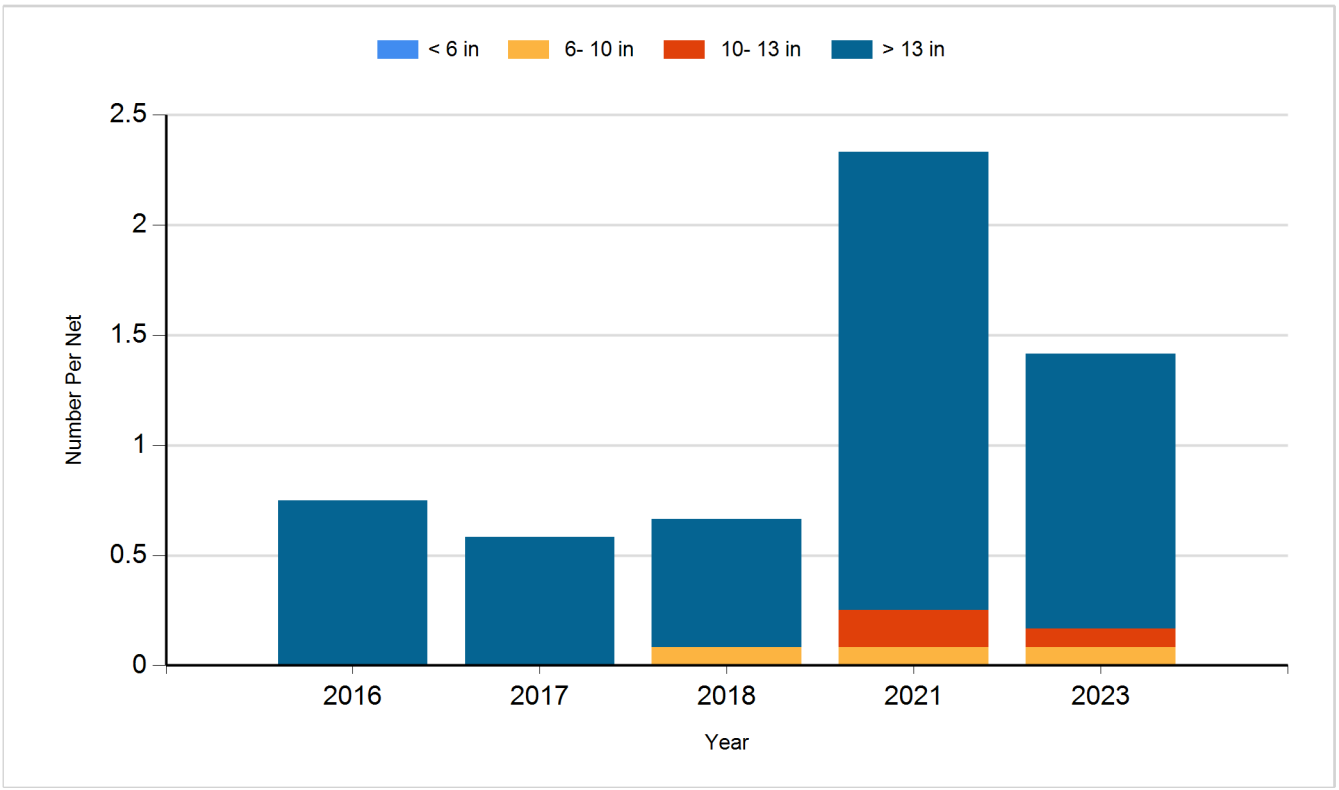
Species: White Bass
Gear: AFS std gill net



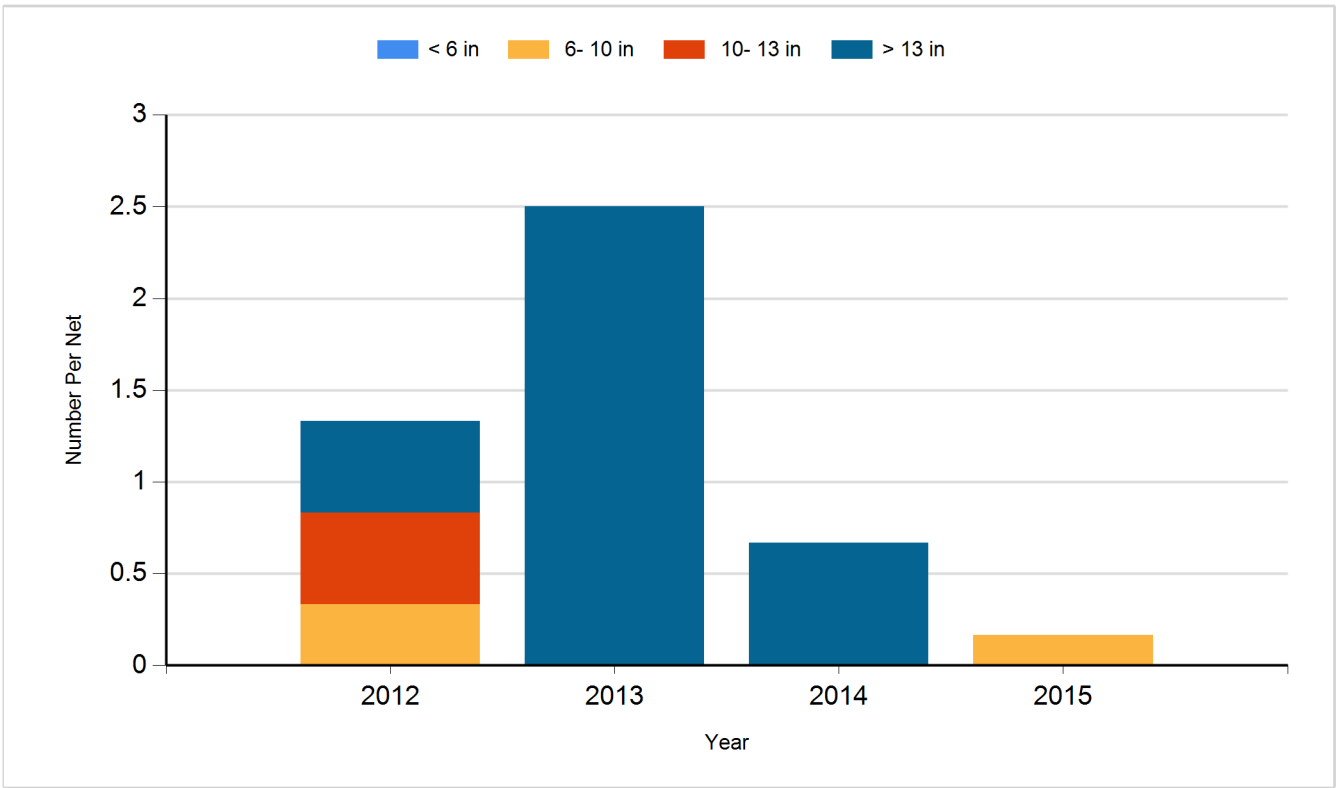
Species: White Bass
Gear: std exp gill net



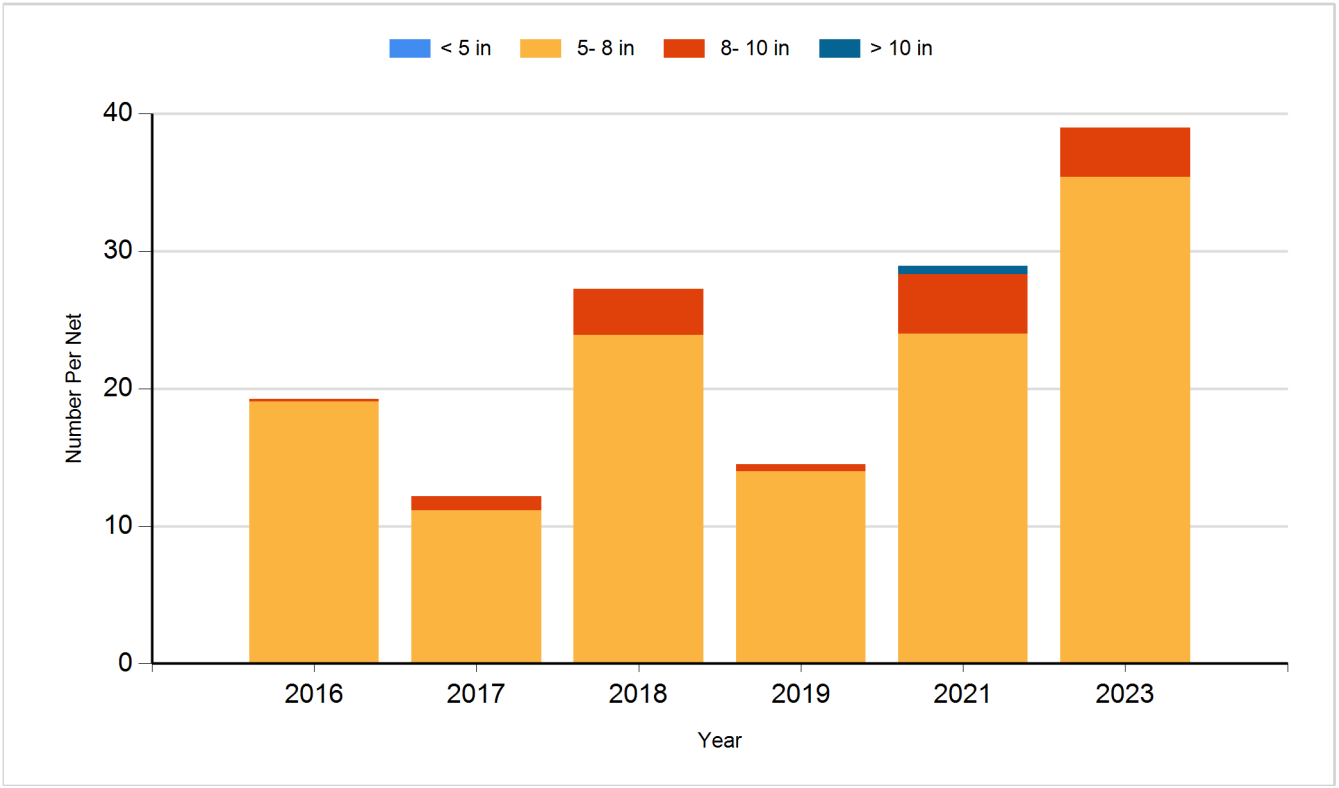
Species: White Sucker
Gear: AFS std gill net



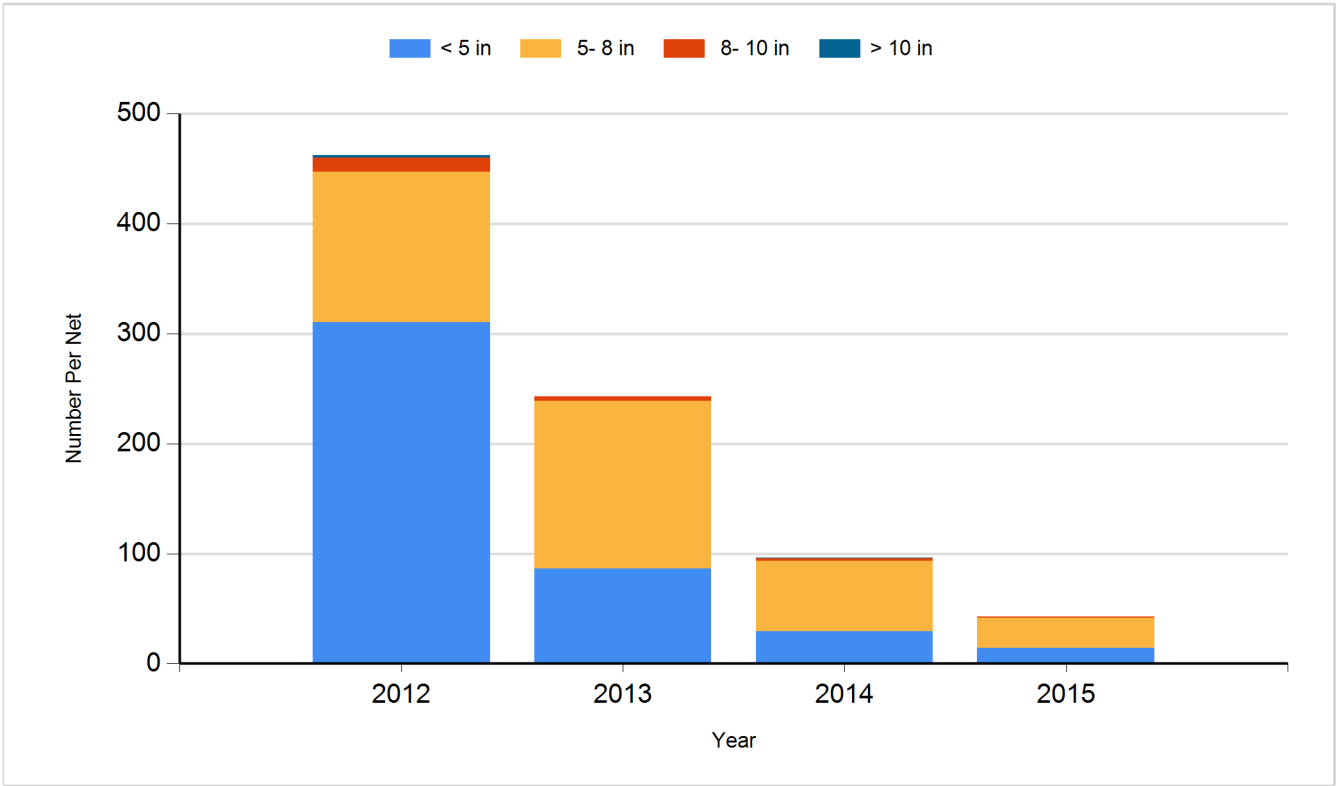
Species: White Sucker
Gear: std exp gill net



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
2013	Walleye	Fry	1,350,000
2014	Walleye	Large Fingerling	5,165
2015	Walleye	Small Fingerling	270,120
2018	Walleye	Fry	1,350,000
2021	Walleye	Fry	1,400,000
2023	Walleye	Juvenile	189,635