Grass Lake Survey Summary

Grass Lake, located 1.5 miles northwest of Florence, is managed as a walleye and yellow perch fishery but other fish species (e.g., northern pike) are present and contribute to the fishery.

Sampling data collected in September 2020 was part of an abbreviated fisheries survey to assess whether the walleye population was adversely impacted by winterkill during the 2018-19 winter; three overnight gill net sets were used. Sampling time differed from the typical standard survey usually conducted in late-May to early-June.

- **Northern pike.** Northern pike were the most abundant fish species in the 2023 gill net catch. At 3.8 per net, relative abundance was considered moderate to high. Sampled northern pike ranged in length from 23.6 to 32.7 inches with more than half (59%) being ≥28.0 inches.

- **Walleye.** Walleye numbers were considerably lower than in 2018. At 3.2 per net, relative abundance was considered low. Sampled walleyes ranged in length from 15.0 to 22.8 inches, 100% were ≥15.0 inches and 18% were ≥20.0 inches. The entire sample was comprised of individuals from two year classes (2019 and 2021), both of which, coincided with stocking events. The 2021 (age-2) cohort accounted for 61% of fish in the sample, while individuals from the 2019 (age-4) cohort made up the additional 39%. The 2023 sample suggested fast walleye growth with mean length at capture values for age-2 and age-4 walleyes of 16.2 and 19.7 inches, respectively.

- **Yellow perch**. Yellow perch were not abundant (0.1 per gill net) in 2023. A single age-2 yellow perch that measured 8.9 inches was netted.

For more detailed results see the computer-generated South Dakota Statewide Fisheries Survey for Grass Lake (Codington; below)

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Grass, Codington County
UBS-Lake-106-000
2023

Lake Information

Name: Grass

County: Codington

Surface Area: 2,187 Acres

Maximum Depth: 9 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 01, 2023	4 net-nights
AFS std gill net	Jun 02, 2023	4 net-nights
AFS std gill net	May 31, 2023	4 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Northern Pike

Common Carp

White Sucker

Bigmouth Buffalo

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	1	0.1	0.1	100		0		86	
	Common Carp	27	2.3	0.8	100		85		101	2
	Northern Pike	46	3.8	0.8	100		59	11	81	1
	Walleye	38	3.2	0.6	100		18	10	93	1
	White Sucker	1	0.1	0.1	100		0		95	
	Yellow Perch	1	0.1	0.1	100		0		85	

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		1.3			0.1	0.47
	Black Bullhead					0.0		5.3			0.0	1.77
	Common Carp					2.0		0.7			2.3	1.67
	Northern Pike					1.6		4.3			3.8	3.23
	Walleye					22.3		9.7			3.2	11.73
	White Sucker					0.0		0.3			0.1	0.13
	Yellow Perch					0.6		4.0			0.1	1.57

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					100		92			100
		PSD-P					77		0			59
		Wr					87		100			81
	Walleye	PSD					99		93			100
		PSD-P					13		0			18
		Wr					90		108			93
	Yellow Perch	PSD					100		75			100
		PSD-P					80		50			0
		Wr					84		106			85

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	38		412 (23)		501 (15)						
2020	29	397 (29)									
2018	177		342 (1)	438 (46)	475 (111)	484 (4)	566 (3)	544 (5)	592 (7)		

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	1		226 (1)								
2020	9	232 (1)	255 (8)								

Fish Condition

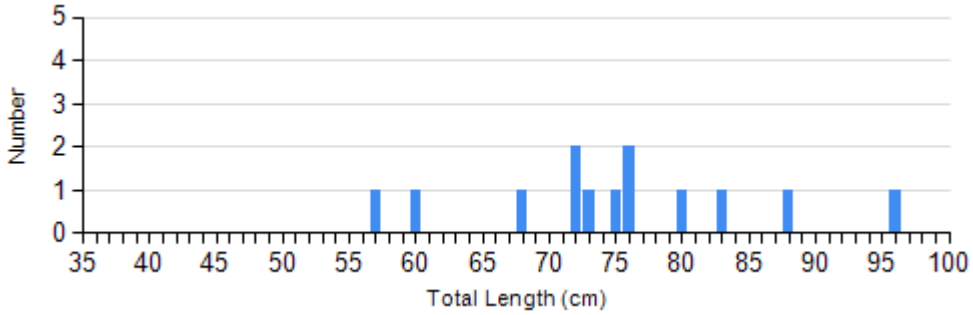
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	1	109	12	99 (1.3)	0		0	
	2023	0		19	82 (1.6)	27	80 (1.2)	0	
Walleye Gill Net	2020	2	103 (0.7)	27	109 (0.9)	0		0	
	2023	0		31	94 (1.0)	7	91 (2.0)	0	
Yellow Perch Gill Net	2020	3	108 (4.0)	3	109 (3.6)	6	103 (3.4)	0	
	2023	0		1	85	0		0	

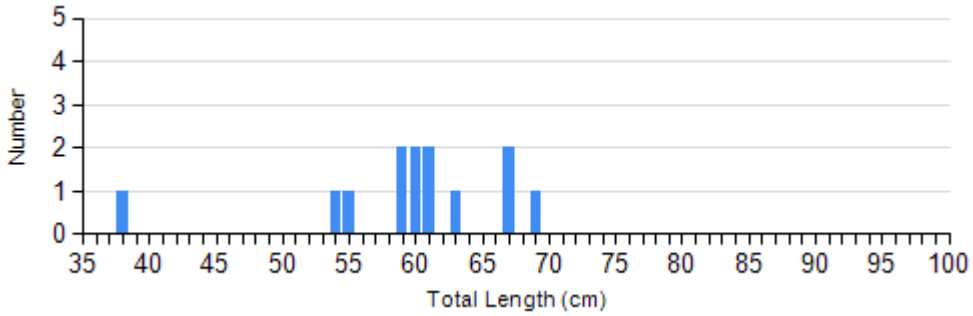
Length Frequency Distribution

Length frequency histogram of species sampled by year.

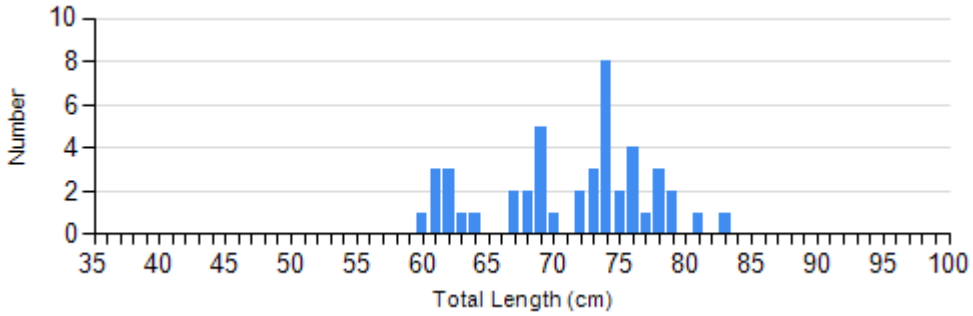
Species: Northern Pike
Gear: AFS std gill net



2018

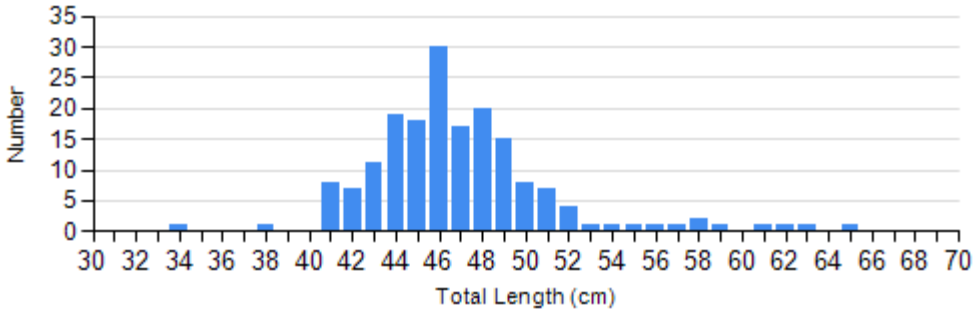


2020

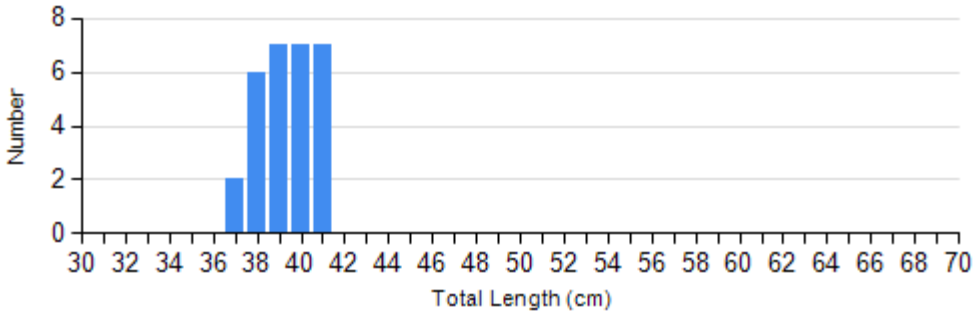


2023

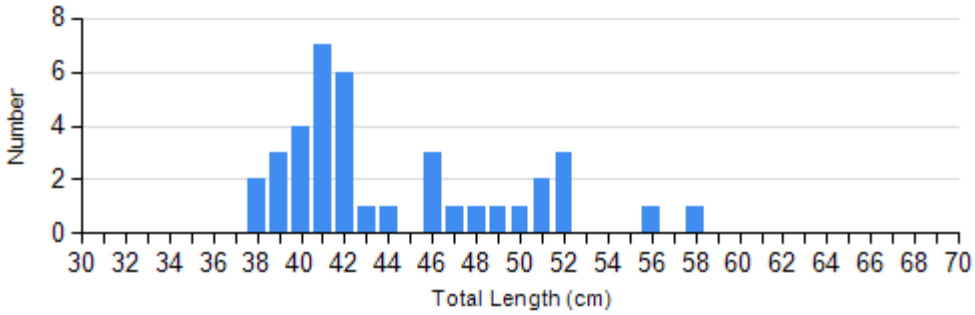
Species: Walleye
Gear: AFS std gill net



2018

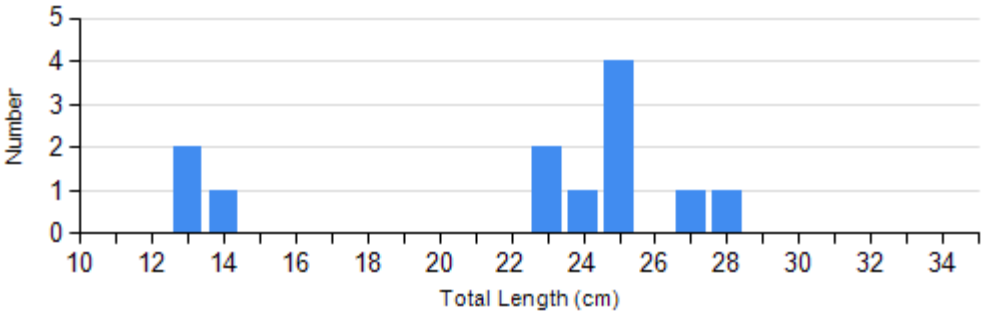


2020



2023

Species: Yellow Perch
Gear: AFS std gill net

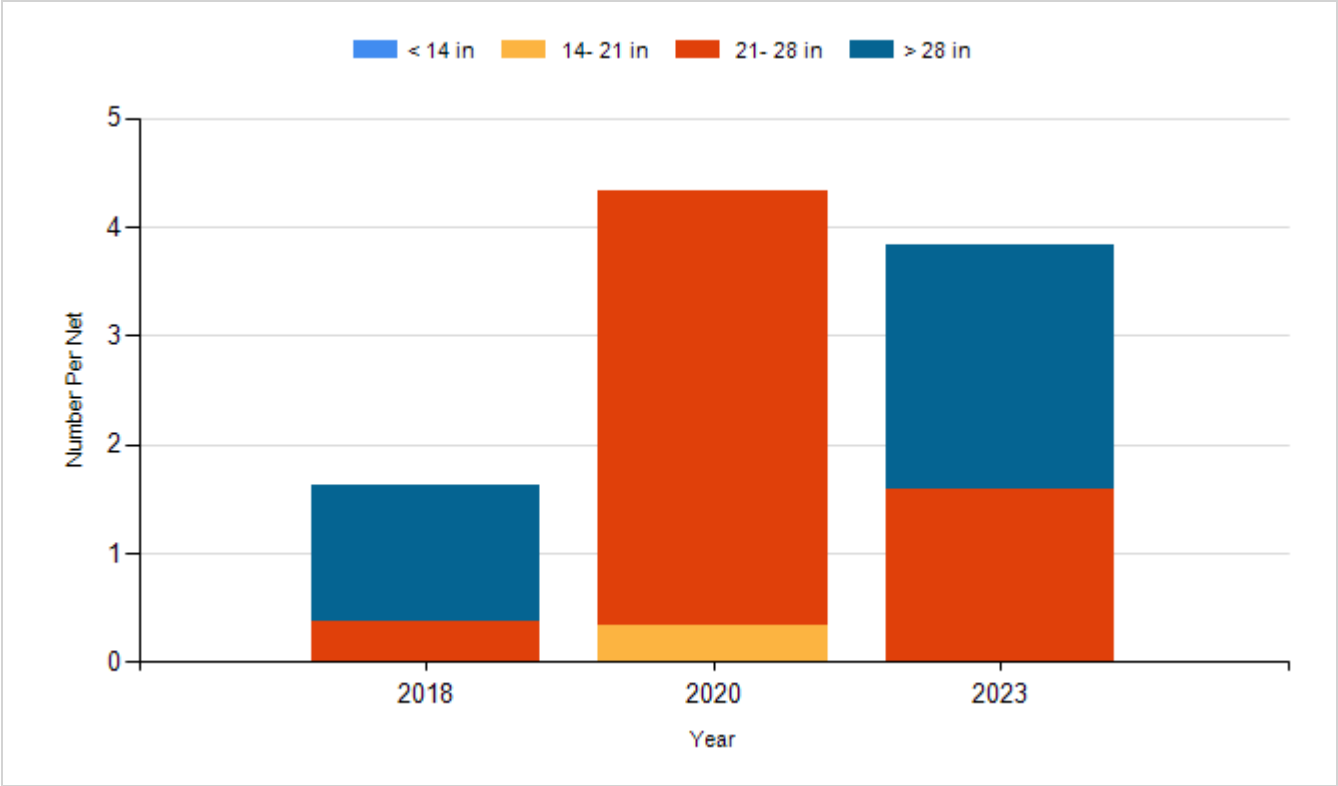


2020

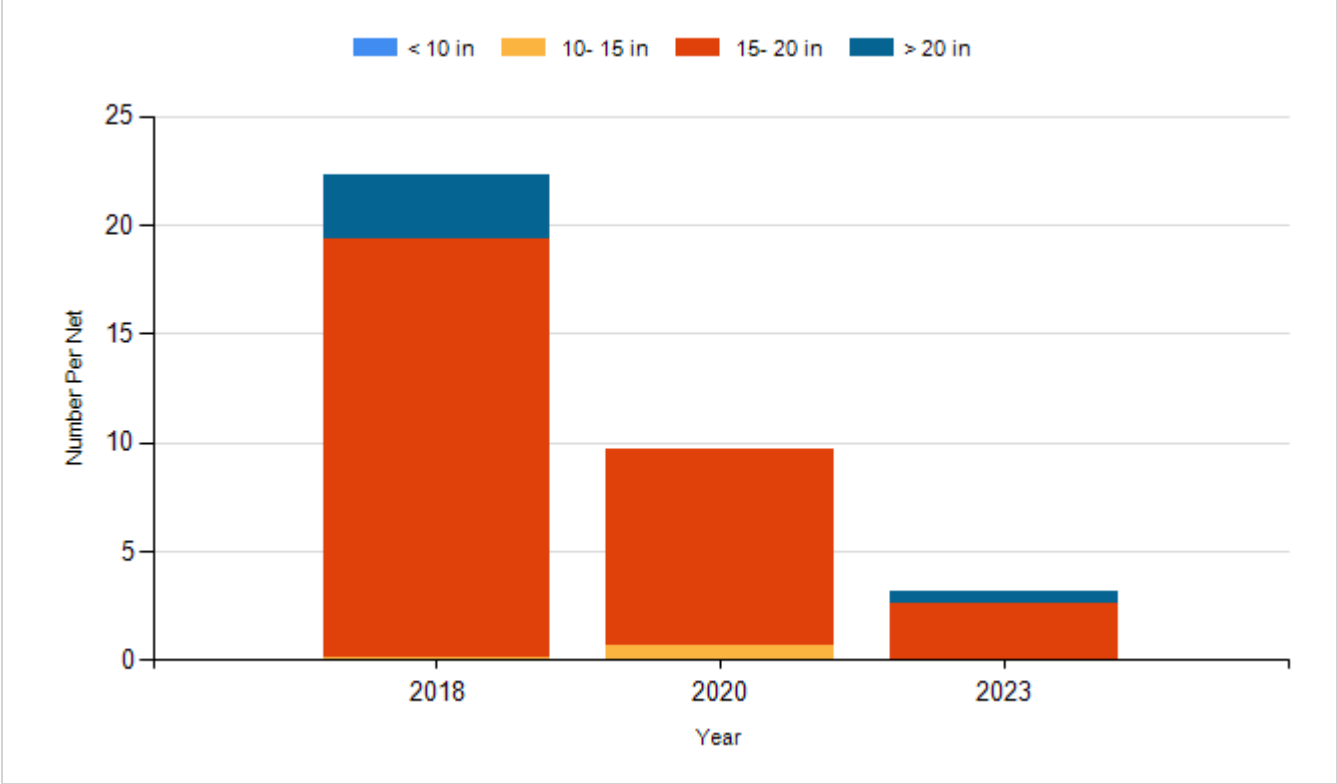
Historic Fish Sizes and Relative Abundance

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

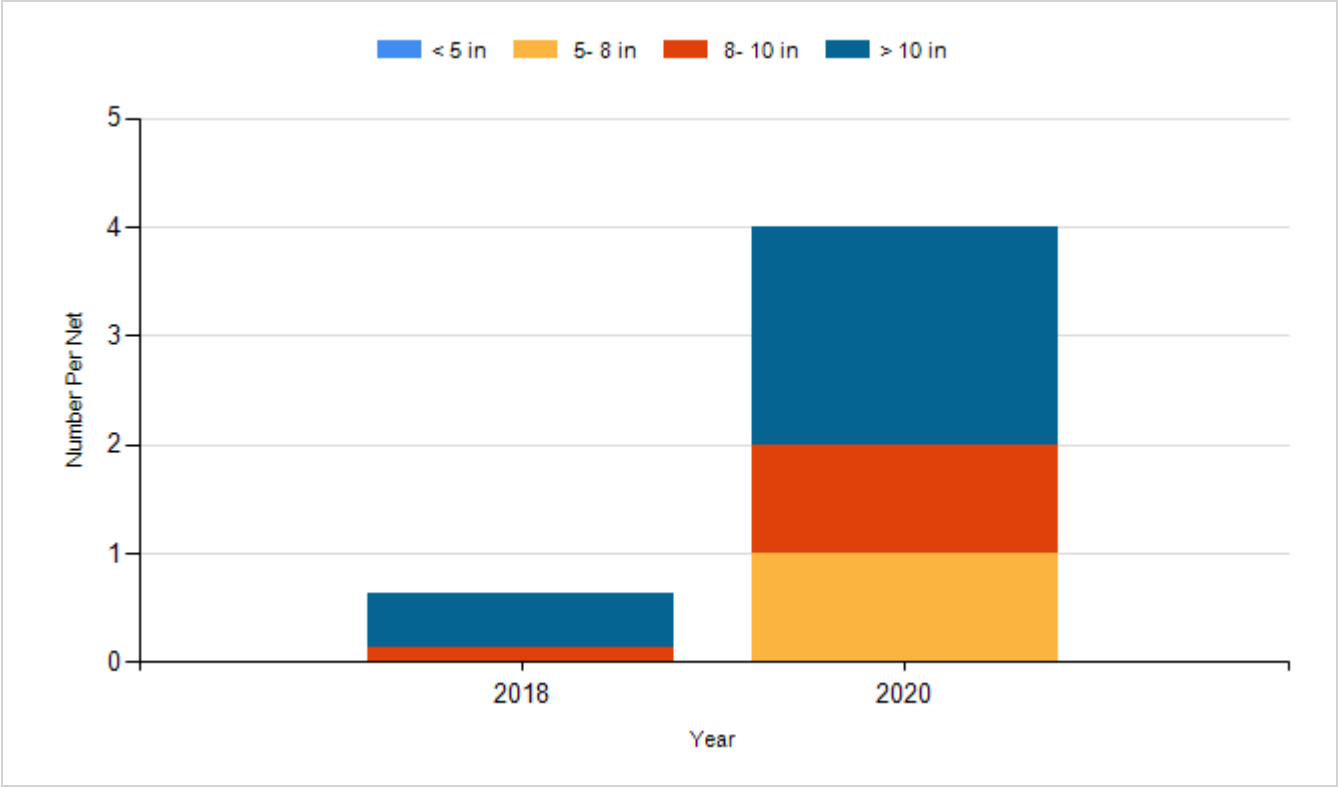
Species: Northern Pike
Gear: AFS std gill net



Species: Walleye
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net



Fish Stocking

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

Year	Species	Size	Number
2012	Walleye	Fry	1,000,000
2014	Walleye	Fry	1,110,000
2019	Walleye	Small Fingerling	156,275
2021	Walleye	Fry	1,100,000
2022	Walleye	Fry	700,000

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Grass, Codington County
UBS-Lake-106-000
2023

Lake Information

Name: Grass

County: Codington

Surface Area: 2,187 Acres

Maximum Depth: 9 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 01, 2023	4 net-nights
AFS std gill net	Jun 02, 2023	4 net-nights
AFS std gill net	May 31, 2023	4 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Northern Pike

Common Carp

White Sucker

Bigmouth Buffalo

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	1	0.1	0.1	100		0		86	
	Common Carp	27	2.3	0.8	100		85		101	2
	Northern Pike	46	3.8	0.8	100		59	11	81	1
	Walleye	38	3.2	0.6	100		18	10	93	1
	White Sucker	1	0.1	0.1	100		0		95	
	Yellow Perch	1	0.1	0.1	100		0		85	

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		1.3			0.1	0.47
	Black Bullhead					0.0		5.3			0.0	1.77
	Common Carp					2.0		0.7			2.3	1.67
	Northern Pike					1.6		4.3			3.8	3.23
	Walleye					22.3		9.7			3.2	11.73
	White Sucker					0.0		0.3			0.1	0.13
	Yellow Perch					0.6		4.0			0.1	1.57

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	Bigmouth Buffalo	PSD							0			100
		PSD-P							0			0
		Wr							104			86
	Common Carp	PSD					100		50			100
		PSD-P					31		0			85
		Wr					97		113			101
	Northern Pike	PSD					100		92			100
		PSD-P					77		0			59
		Wr					87		100			81
	Walleye	PSD					99		93			100
		PSD-P					13		0			18
		Wr					90		108			93
	White Sucker	PSD							100			100
		PSD-P							0			0
		Wr							108			95
	Yellow Perch	PSD					100		75			100
		PSD-P					80		50			0
		Wr					84		106			85

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	38		412 (23)		501 (15)						
2020	29	397 (29)									
2018	177		342 (1)	438 (46)	475 (111)	484 (4)	566 (3)	544 (5)	592 (7)		

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	1		226 (1)								
2020	9	232 (1)	255 (8)								

Fish Condition

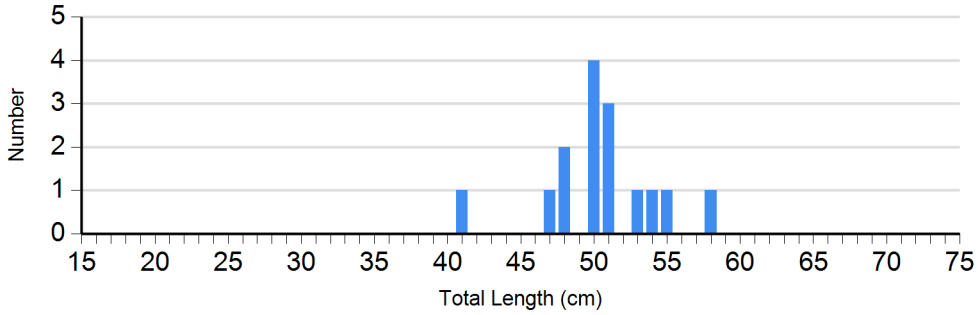
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Common Carp Gill Net	2020	1	109	1	117	0		0	
	2023	0		4	99 (3.1)	19	101 (2.0)	4	106 (2.6)
Northern Pike Gill Net	2020	1	109	12	99 (1.3)	0		0	
	2023	0		19	82 (1.6)	27	80 (1.2)	0	
Walleye Gill Net	2020	2	103 (0.7)	27	109 (0.9)	0		0	
	2023	0		31	94 (1.0)	7	91 (2.0)	0	
White Sucker Gill Net	2020	0		1	108	0		0	
	2023	0		1	95	0		0	
Yellow Perch Gill Net	2020	3	108 (4.0)	3	109 (3.6)	6	103 (3.4)	0	
	2023	0		1	85	0		0	

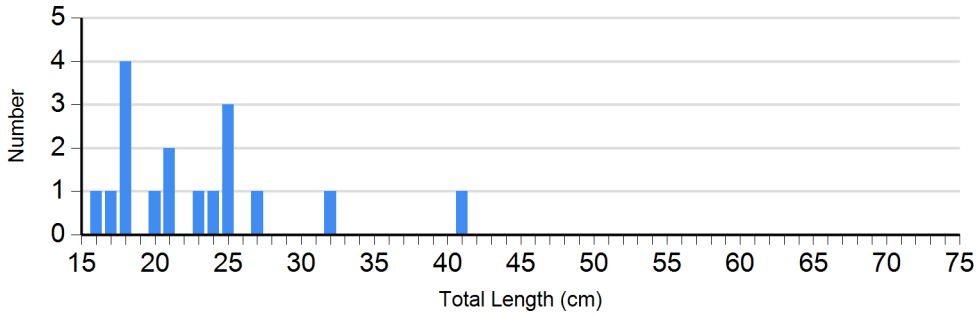
Length Frequency Distribution

Length frequency histogram of species sampled by year.

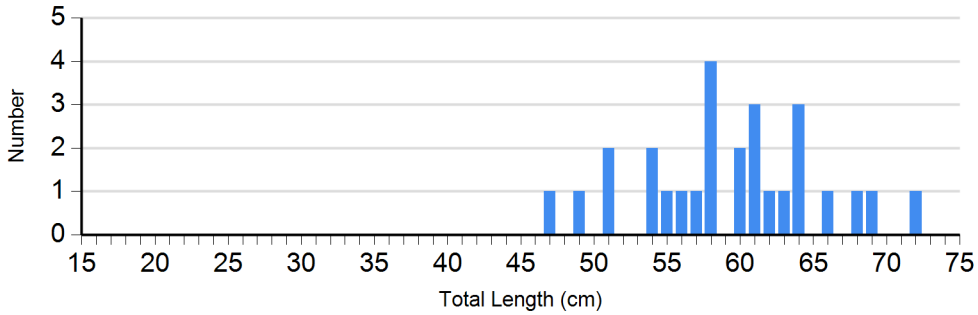
Species: Common Carp
Gear: AFS std gill net



2018

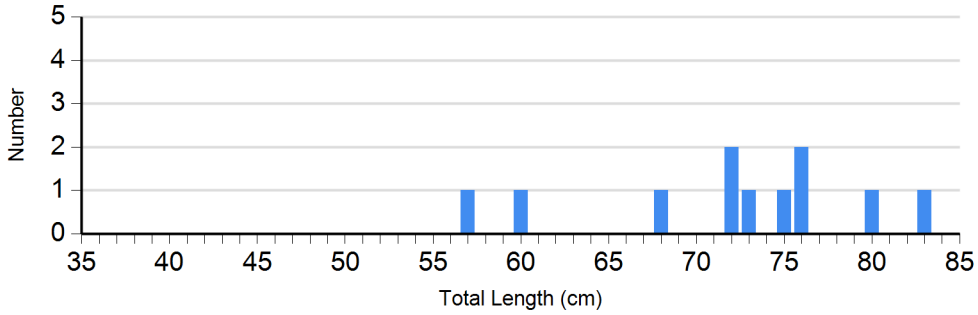


2020

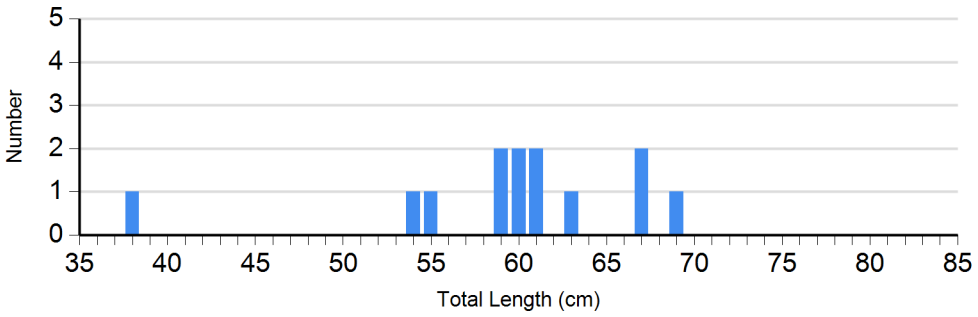


2023

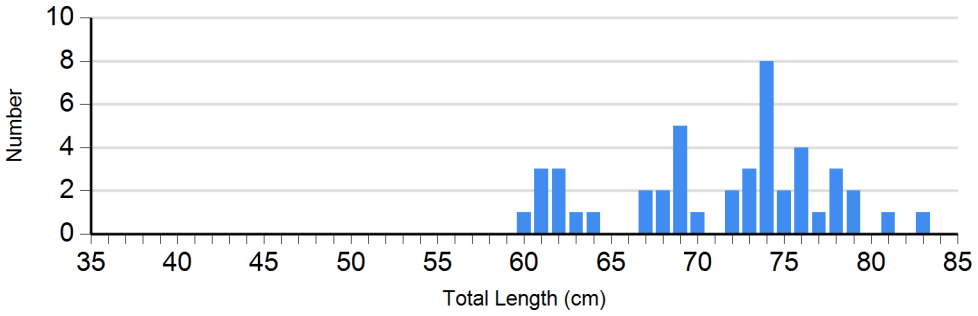
Species: Northern Pike
Gear: AFS std gill net



2018

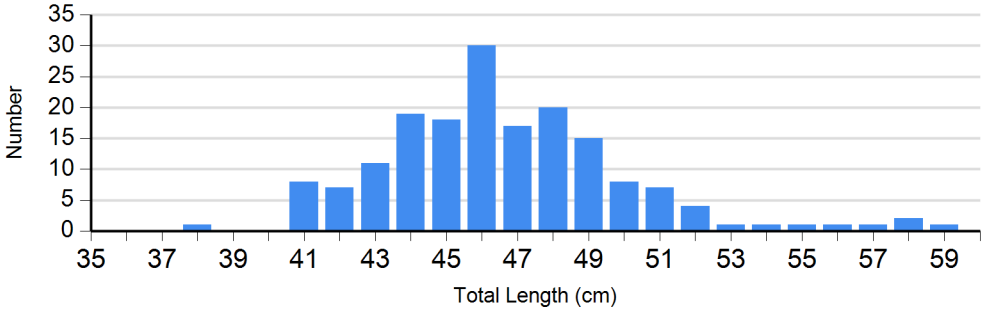


2020



2023

Species: Walleye
Gear: AFS std gill net



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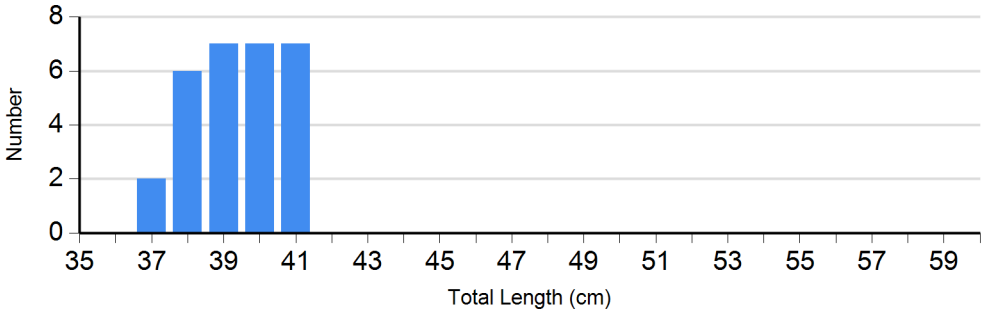
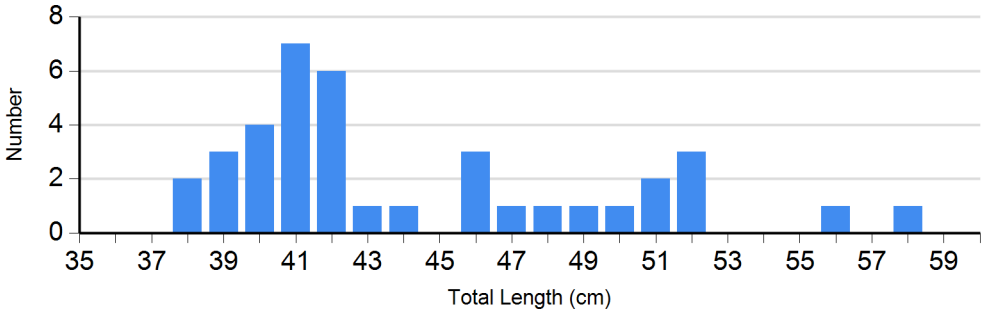
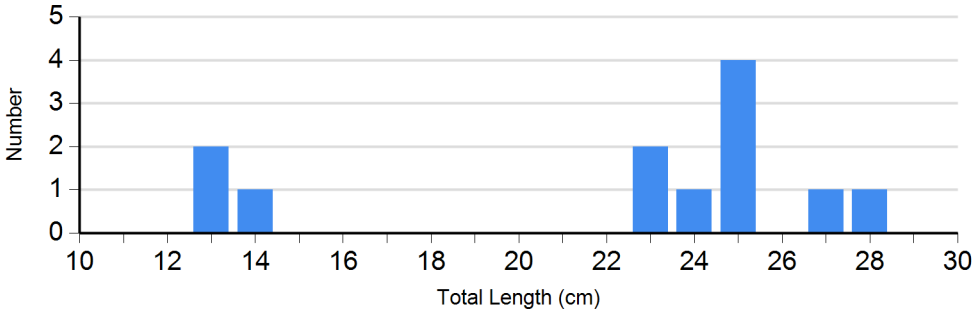


2020



2023

Species: Yellow Perch
Gear: AFS std gill net

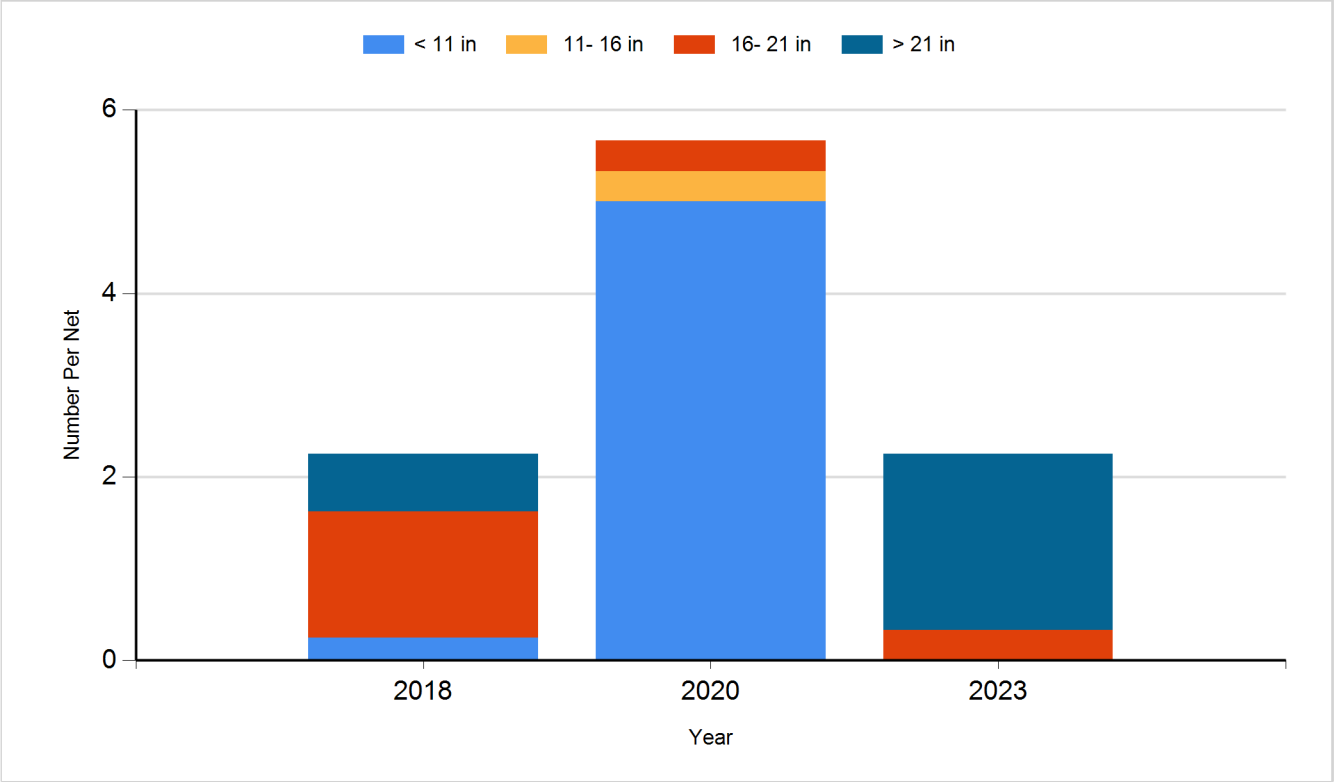


2020

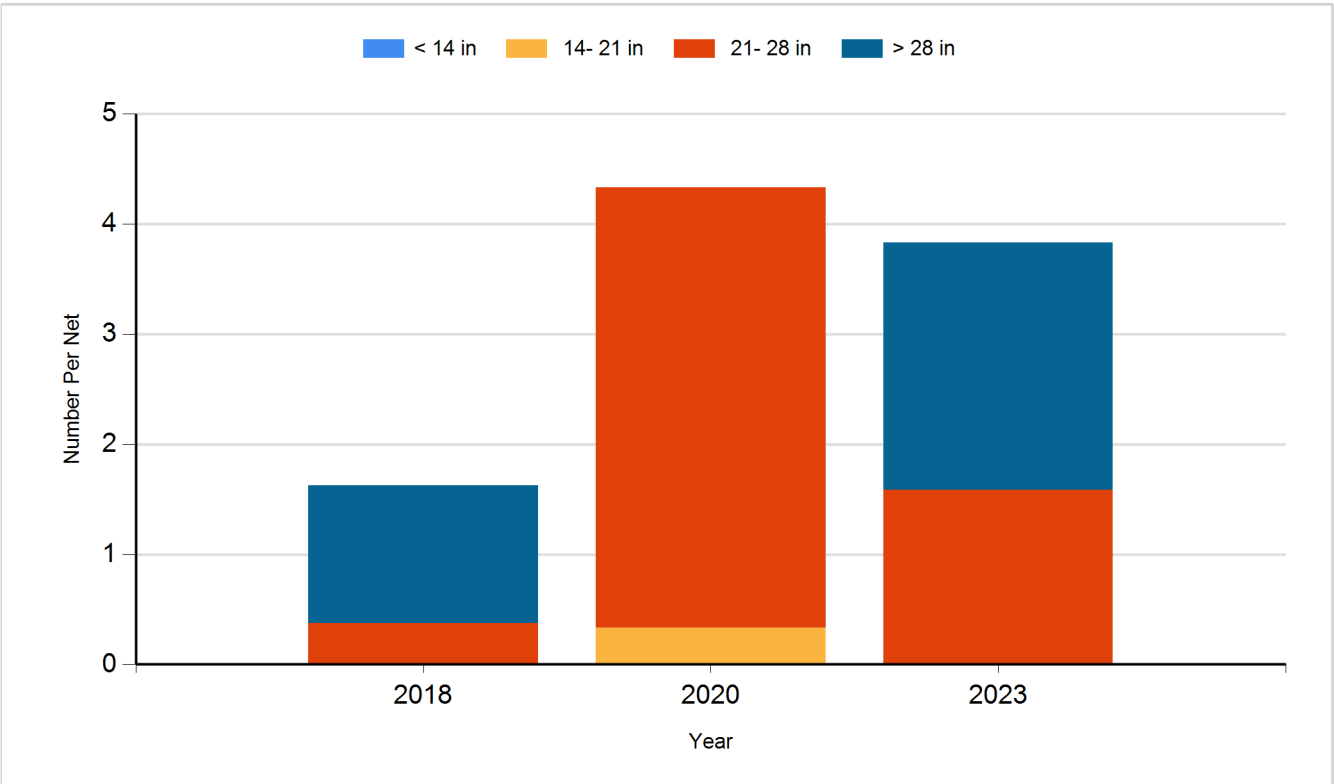
Historic Fish Sizes and Relative Abundance

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

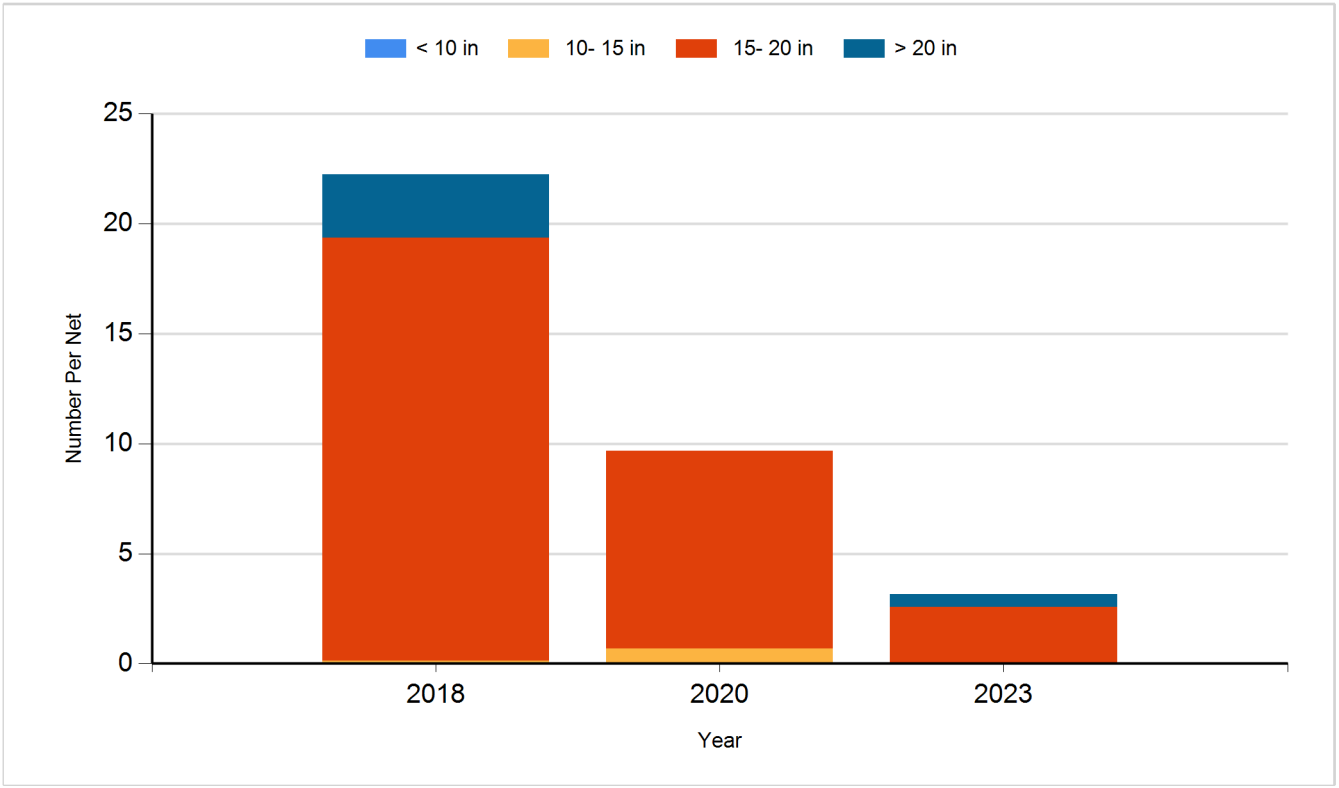
Species: Common Carp
Gear: AFS std gill net



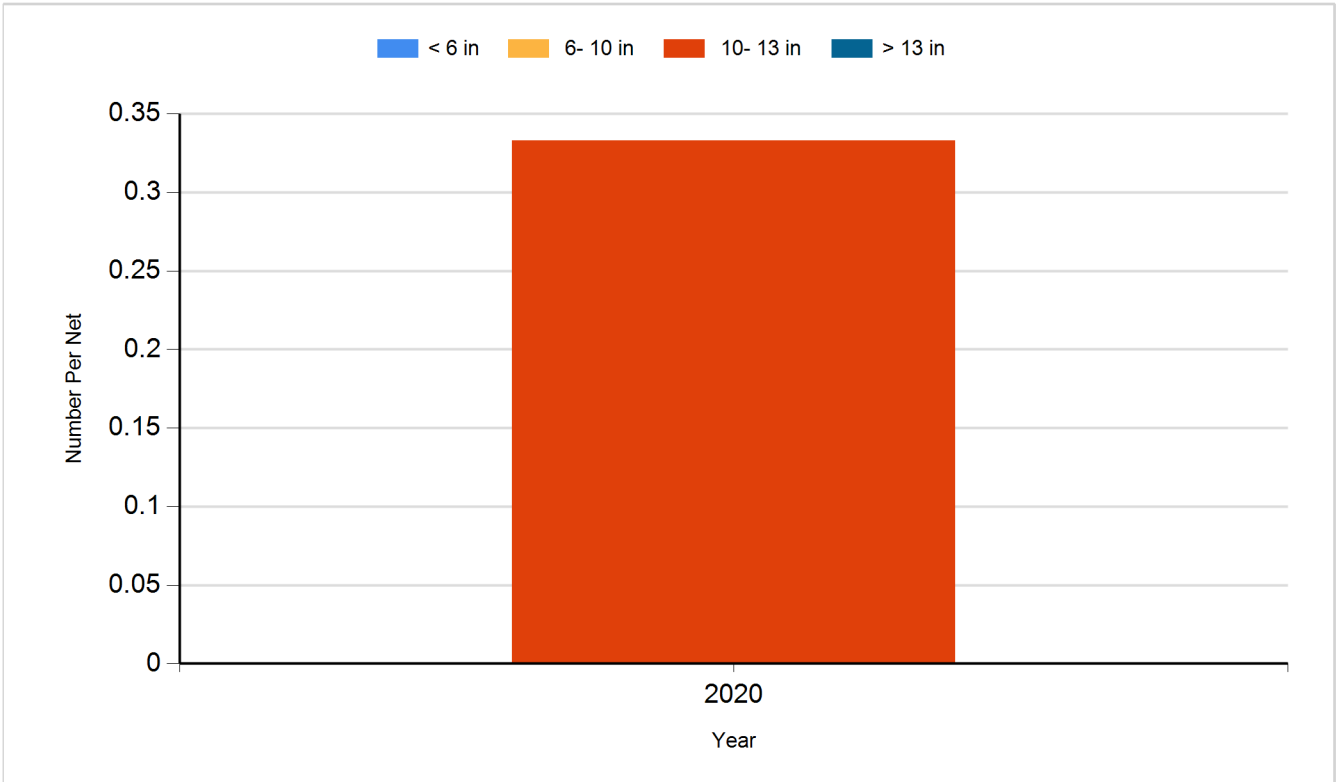
Species: Northern Pike
Gear: AFS std gill net



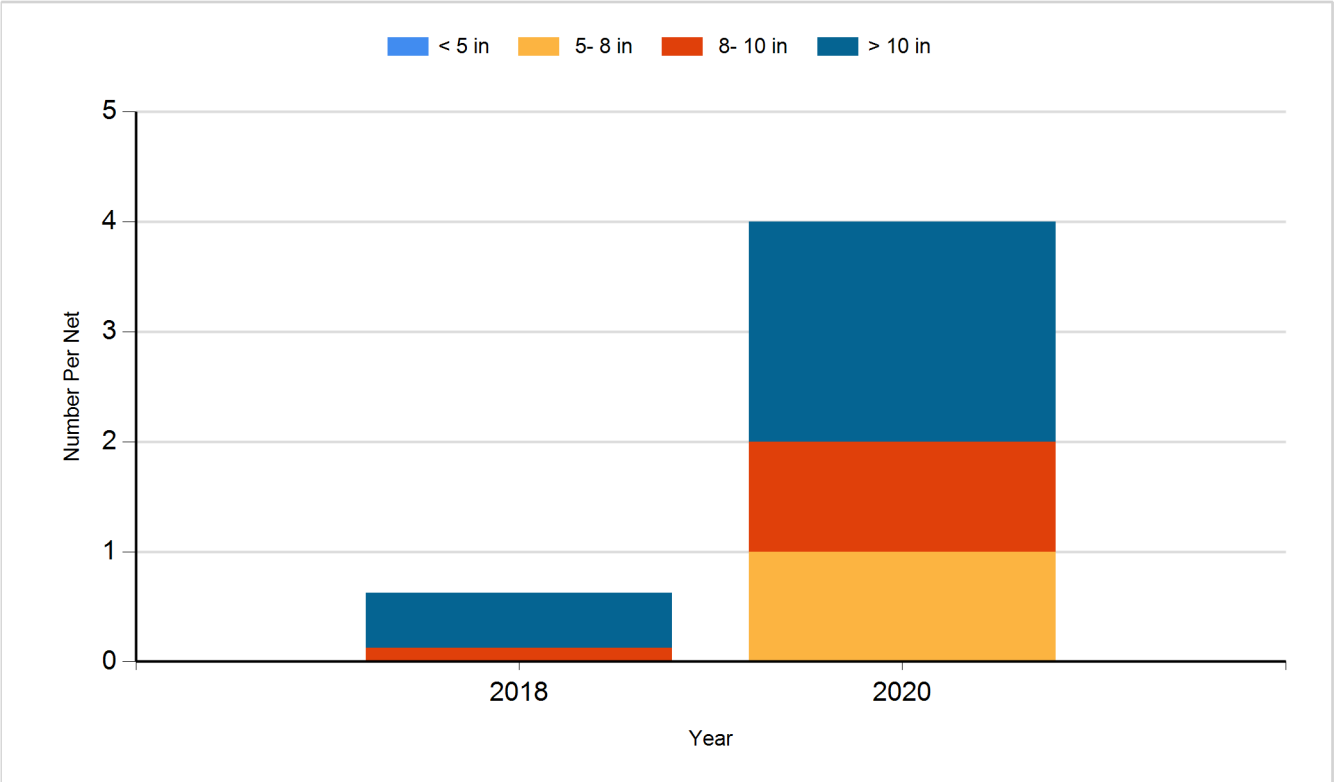
Species: Walleye
Gear: AFS std gill net



Species: White Sucker
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net



Fish Stocking

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

Year	Species	Size	Number
2012	Walleye	Fry	1,000,000
2014	Walleye	Fry	1,110,000
2019	Walleye	Small Fingerling	156,275
2021	Walleye	Fry	1,100,000
2022	Walleye	Fry	700,000