SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Swan, Turner County
VER-Lake-113-000
2023

Lake Information

Name:	Swan	**Maximum Depth:**	6 Feet
County:	Turner	**Mean Depth:**	3 Feet
Legal Description:	T97N-R53W-Sec 15-16	**OHWM Elevation:**	1,253
Surface Area:	183 Acres	**Outlet Elevation:**	1,252

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 24, 2023	3 net-nights
frame net (std 3/4 in)	May 24, 2023	5 net-nights

Common Fish Species Present

Walleye

Black Bullhead

Bigmouth Buffalo

White Sucker

Green Sunfish

Common Carp

O. Spotted X Gr. Sunfish Hybrid

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	23	7.7	4.5	0		0			
	Common Carp	2	0.7	0.6	100		100			
	White Sucker	4	1.3	0.6	100		100			
frame net (std 3/4 in)	Bigmouth Buffalo	42	8.4	5.5	0		0			
	Black Bullhead	266	49.8	7.3	84	3	0			
	Common Carp	11	2.2	1.0	100		18			
	Green Sunfish	15	3.0	1.8	0		0			
	O. Spotted X Gr. Sunfish Hybrid	4	0.0	0.0						
	White Sucker	22	4.4	1.0	100		100			

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 frame net	Bigmouth Buffalo				0.4							0.40
	Black Bullhead				1.0							1.00
	Common Carp				0.2							0.20
	Green Sunfish				0.6							0.60
	Orangespotted Sunfish				0.0							0.00
	River Carpsucker				0.6							0.60
	Shortnose Gar				0.0							0.00
	Sunfish Hybrid				1.6							1.60
	Walleye				0.6							0.60
	White Crappie				49.4							49.40
	White Sucker				0.6							0.60
AFS std gill net	Bigmouth Buffalo				0.8	2.7	1.5		14.0		7.7	5.34
	Black Bullhead				2.0	0.5	0.5		9.3		0.0	2.46
	Channel Catfish				3.3	6.5	6.8		16.3		0.0	6.58
	Common Carp				7.7	2.5	0.2		0.3		0.7	2.28
	Gizzard Shad				0.0	0.0	0.0		0.3		0.0	0.06
	Quillback				0.0	0.0	0.0		0.0		0.0	0.00
	River Carpsucker				0.0	0.0	0.3		0.3		0.0	0.12
	Shortnose Gar				0.0	0.0	0.0		0.0		0.0	0.00
	Walleye				6.0	7.0	3.2		1.8		0.0	3.60
	White Crappie				0.0	0.3	0.8		0.0		0.0	0.22
	White Sucker				0.0	0.2	0.3		2.3		1.3	0.82
frame net (std 3/4 in)	Bigmouth Buffalo	0.2	0.4	0.4		0.0	1.8		6.0		8.4	2.46
	Black Bullhead	40.4	31.8	60.6		23.0	17.4		142.4		49.8	52.20
	Black Crappie	0.0	0.0	0.2		0.0	0.0		0.0		0.0	0.03
	Bluegill	0.4	0.4	0.0		0.0	0.4		0.4		0.0	0.23
	Channel Catfish	0.4	0.0	5.2		1.4	17.0		7.0		0.0	4.43
	Common Carp	2.4	0.2	3.4		0.2	4.0		0.4		2.2	1.83
	Green Sunfish	0.4	22.8	0.4		0.4	0.0		0.0		3.0	3.86
	Northern Pike	0.0	0.0	0.0		0.0	0.0		0.0		0.0	0.00
	O. Spotted X Gr. Sunfish Hybrid	0.0	0.0	0.0		0.0	0.0		0.0		0.0	0.00
	Orangespotted Sunfish	0.0	0.0	0.0		0.0	0.0		0.0		0.0	0.00
	Quillback	0.0	0.0	0.0		0.0	0.0		0.0		0.0	0.00

		CPUE										
Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
frame net (std 3/4 in)	River Carpsucker	0.0	0.0	0.0		0.2	2.0		0.2		0.0	0.34
	Shorthead Redhorse	0.0	0.0	0.0		0.0	0.2		0.0		0.0	0.03
	Shortnose Gar	0.0	0.0	0.0		0.0	0.0		0.0		0.0	0.00
	Sunfish Hybrid	14.8	1.2	5.6		0.0	0.0		0.6		0.0	3.17
	Walleye	2.4	1.8	2.4		2.2	1.6		1.4		0.0	1.69
	White Crappie	5.0	5.0	46.2		25.2	12.4		0.0		0.0	13.40
	White Sucker	10.6	10.2	2.8		3.0	1.2		5.4		4.4	5.37
	Yellow Perch	0.0	0.0	0.0		0.0	0.0		0.2		0.0	0.03
std exp gill net	Bigmouth Buffalo	2.7	1.7	2.7								2.37
	Black Bullhead	13.7	21.7	5.3								13.57
	Channel Catfish	0.7	3.0	2.0								1.90
	Common Carp	0.3	1.7	3.0								1.67
	River Carpsucker	0.0	0.0	0.0								0.00
	Sunfish Hybrid	0.3	0.0	0.0								0.10
	Walleye	20.3	34.7	20.7								25.23
	White Crappie	0.0	0.7	1.3								0.67
	White Sucker	2.3	0.7	0.0								1.00
	Yellow Perch	0.0	4.0	0.3								1.43

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 frame net	Bigmouth Buffalo	PSD				100						
		PSD-P				0						
	Black Bullhead	PSD				60						
		PSD-P				0						
	Common Carp	PSD				0						
		PSD-P				0						
	Green Sunfish	PSD				33						
		PSD-P				0						
	Walleye	PSD				100						
		PSD-P				33						
		Wr				71						
	White Sucker	PSD				100						
		PSD-P				33						
AFS std gill net	Bigmouth Buffalo	PSD				60	88	78		2		0
		PSD-P				0	0	11		2		0
	Black Bullhead	PSD				42	67	33		76		
		PSD-P				0	0	0		0		
	Common Carp	PSD				87	93	100		100		100
		PSD-P				17	33	100		100		100
	Walleye	PSD				97	98	95		43		
		PSD-P				31	55	47		43		
		Wr				78	80	86		88		
	White Sucker	PSD					100	100		100		100
		PSD-P					100	50		100		100
frame net (std 3/4 in)	Bigmouth Buffalo	PSD	0	100	100			89		0		0
		PSD-P	0	0	0			22		0		0
	Black Bullhead	PSD	5	62	73		76	44		91		84
		PSD-P	0	0	0		0	0		0		0
	Common Carp	PSD	75	100	94		100	80		100		100
		PSD-P	0	0	35		0	10		0		18
	Green Sunfish	PSD	0	5	50		0					0
		PSD-P	0	0	0		0					0

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
frame net (std 3/4 in)	Green Sunfish	Wr		129	84							
	Walleye	PSD	83	100	100		91	100		86		
		PSD-P	50	11	50		73	88		86		
		Wr	88	94	85		77	92		90		
	White Sucker	PSD	100	100	100		100	100		100		100
		PSD-P	100	100	100		87	100		96		100
std exp gill net	Bigmouth Buffalo	PSD	25	40	38							
		PSD-P	0	0	25							
	Black Bullhead	PSD	2	46	31							
		PSD-P	0	0	0							
	Common Carp	PSD	100	60	78							
		PSD-P	0	0	11							
	Walleye	PSD	18	93	87							
		PSD-P	2	2	5							
		Wr	87	93	88							
	White Sucker	PSD	100	100								
		PSD-P	100	100								

Fish Condition

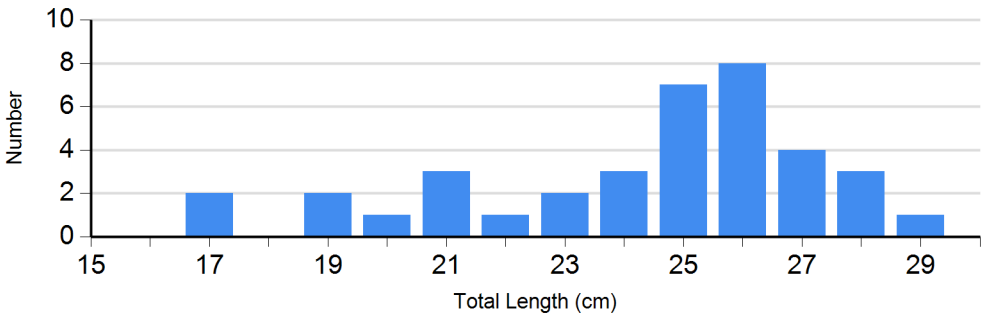
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Walleye Gill Net	2019	1	87	9	89 (1.8)	9	83 (1.8)	0	
	2021	4	90 (6.3)	0		3	86 (6.0)	0	

Length Frequency Distribution

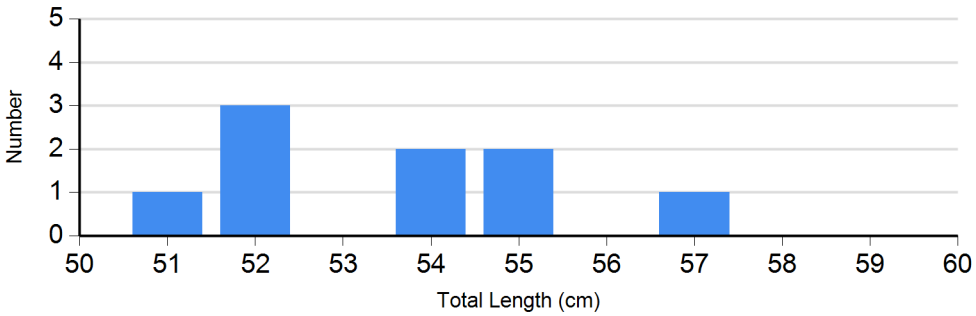
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



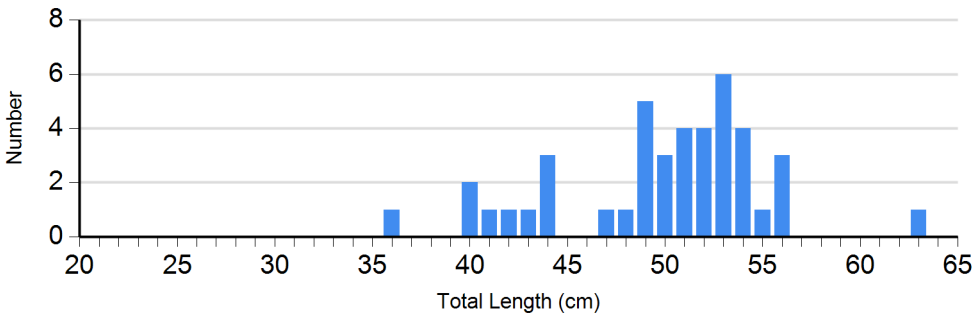
2021

Species: Common Carp
Gear: AFS std gill net

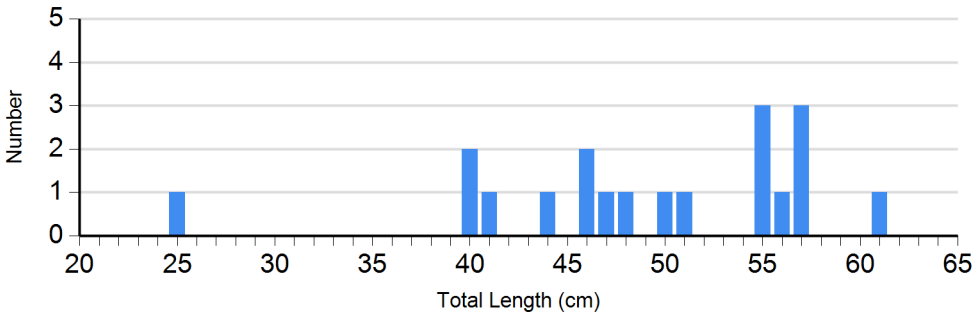


2018

Species: Walleye
Gear: AFS std gill net



2018

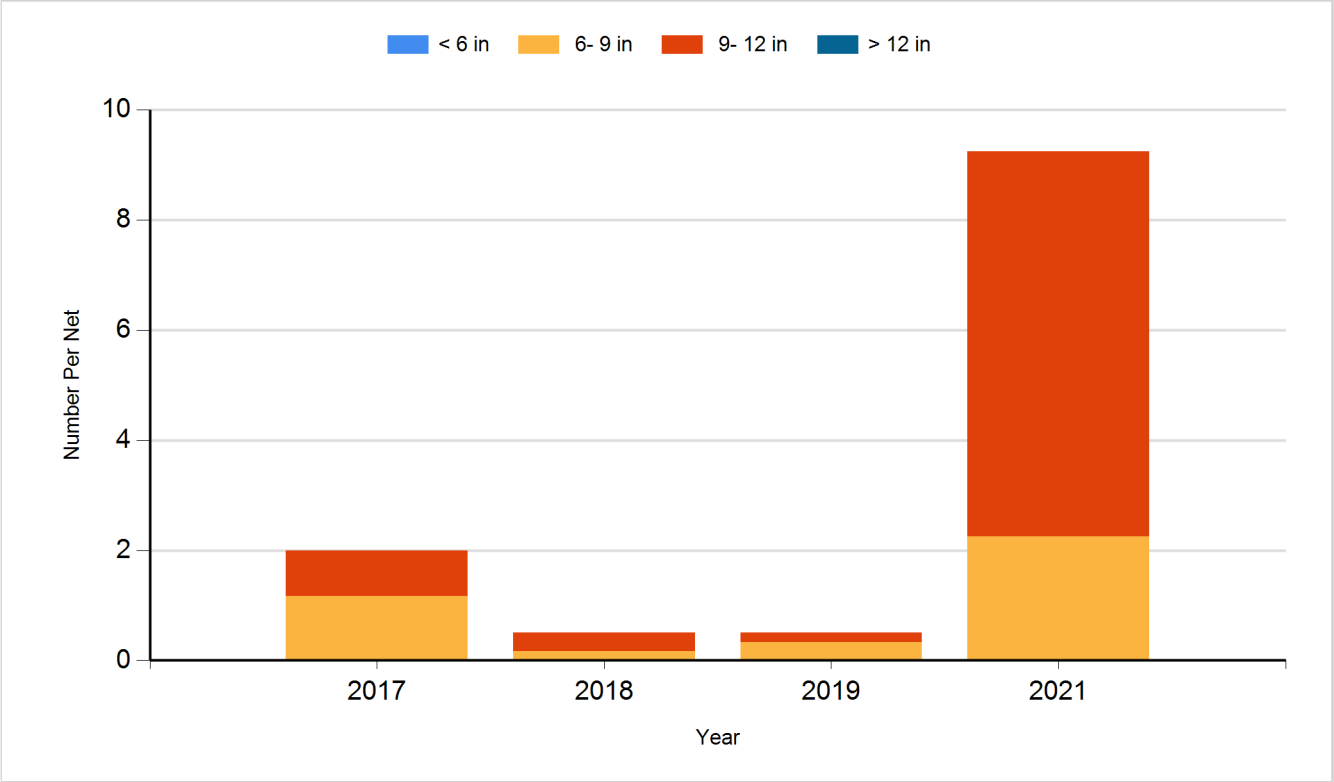


2019

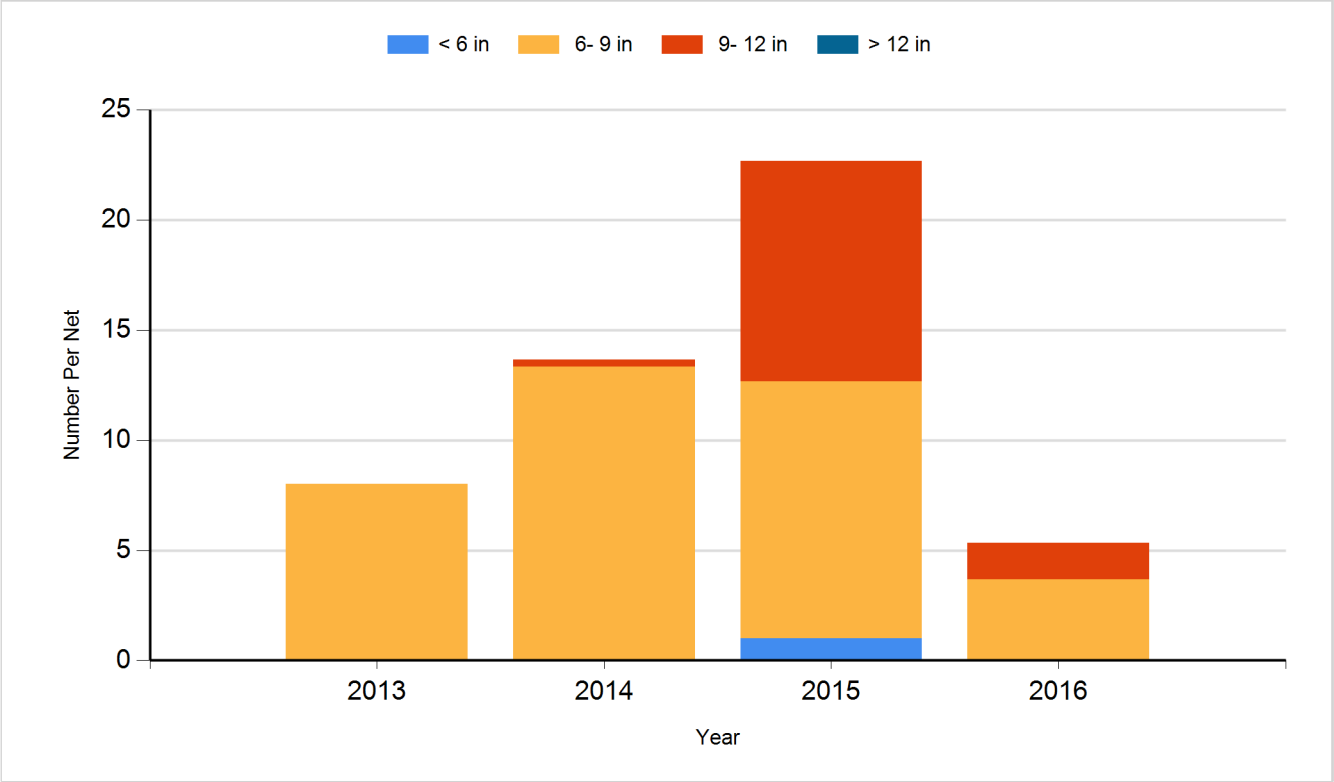
Historic Fish Sizes and Relative Abundance

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

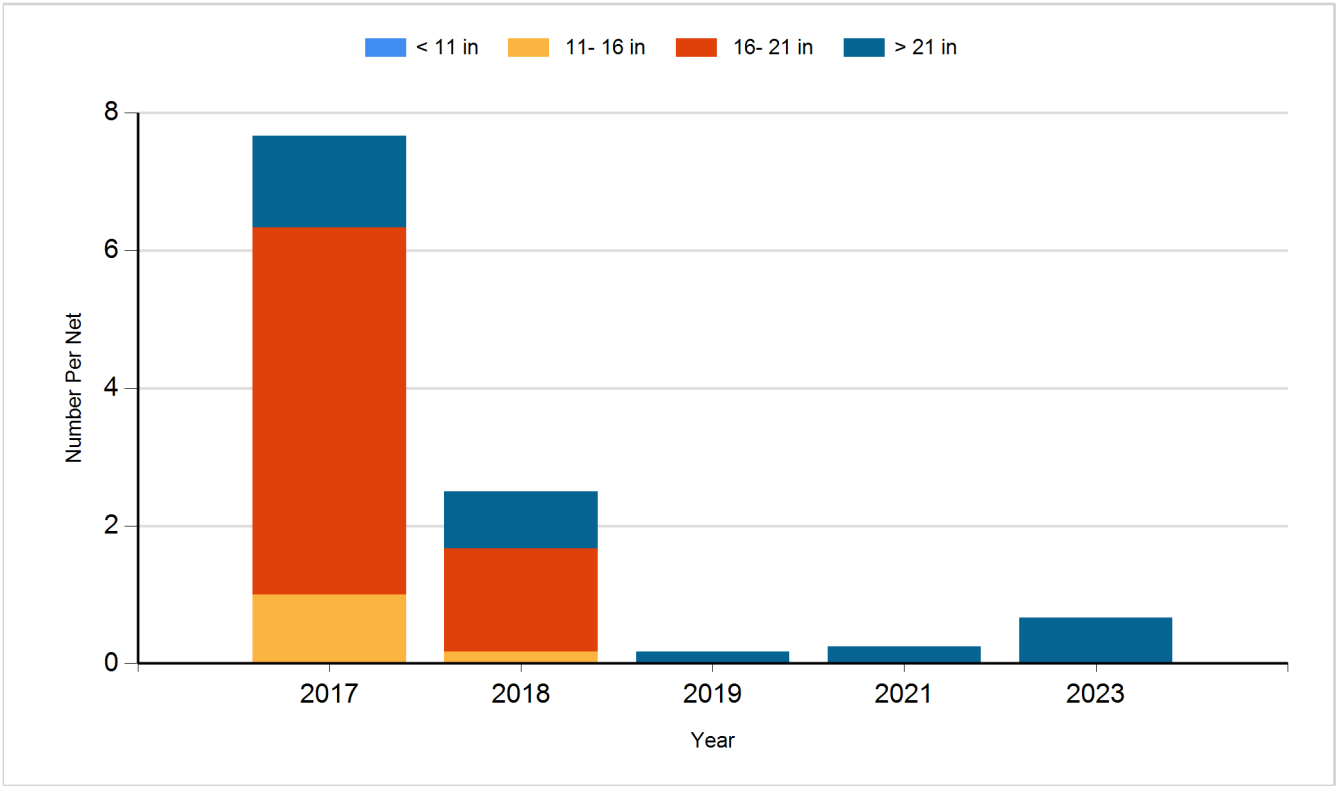
Species: Black Bullhead
Gear: AFS std gill net



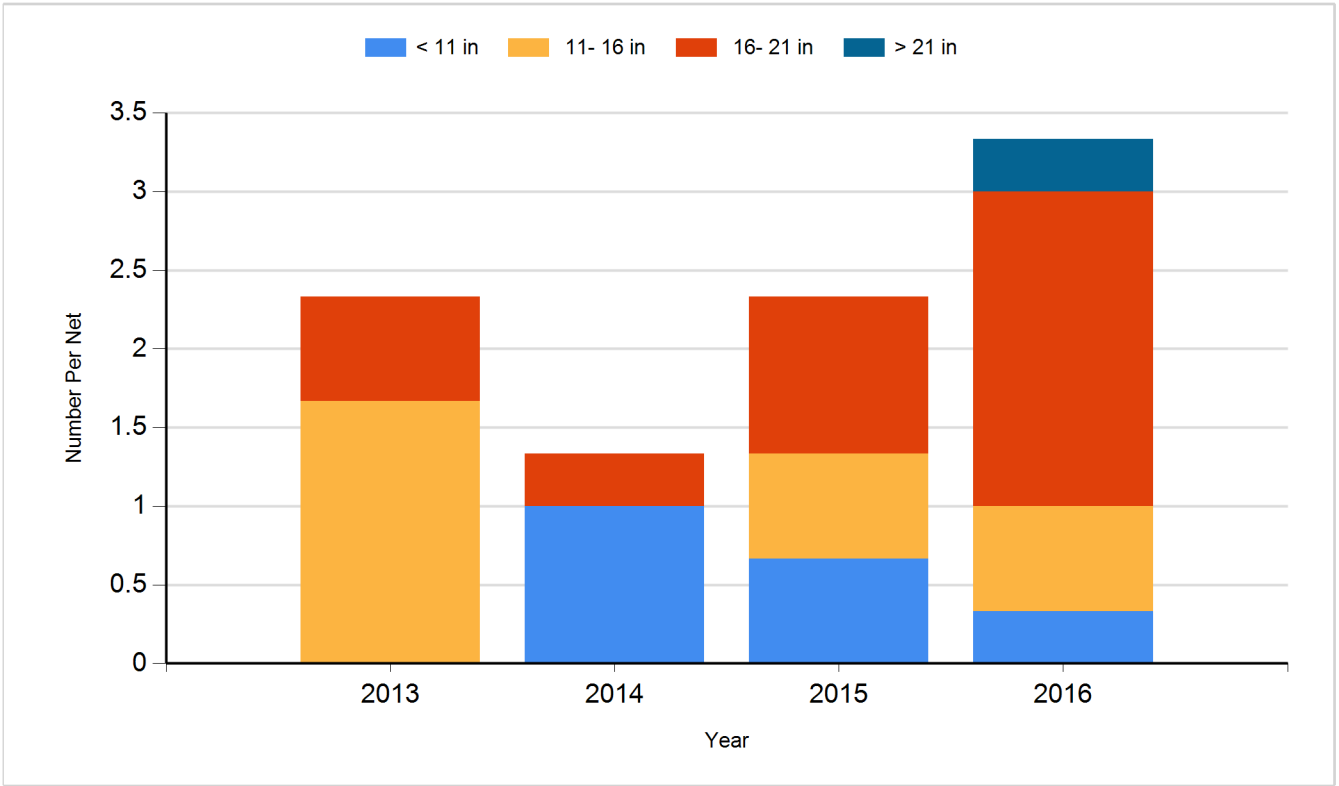
Species: Black Bullhead
Gear: std exp gill net



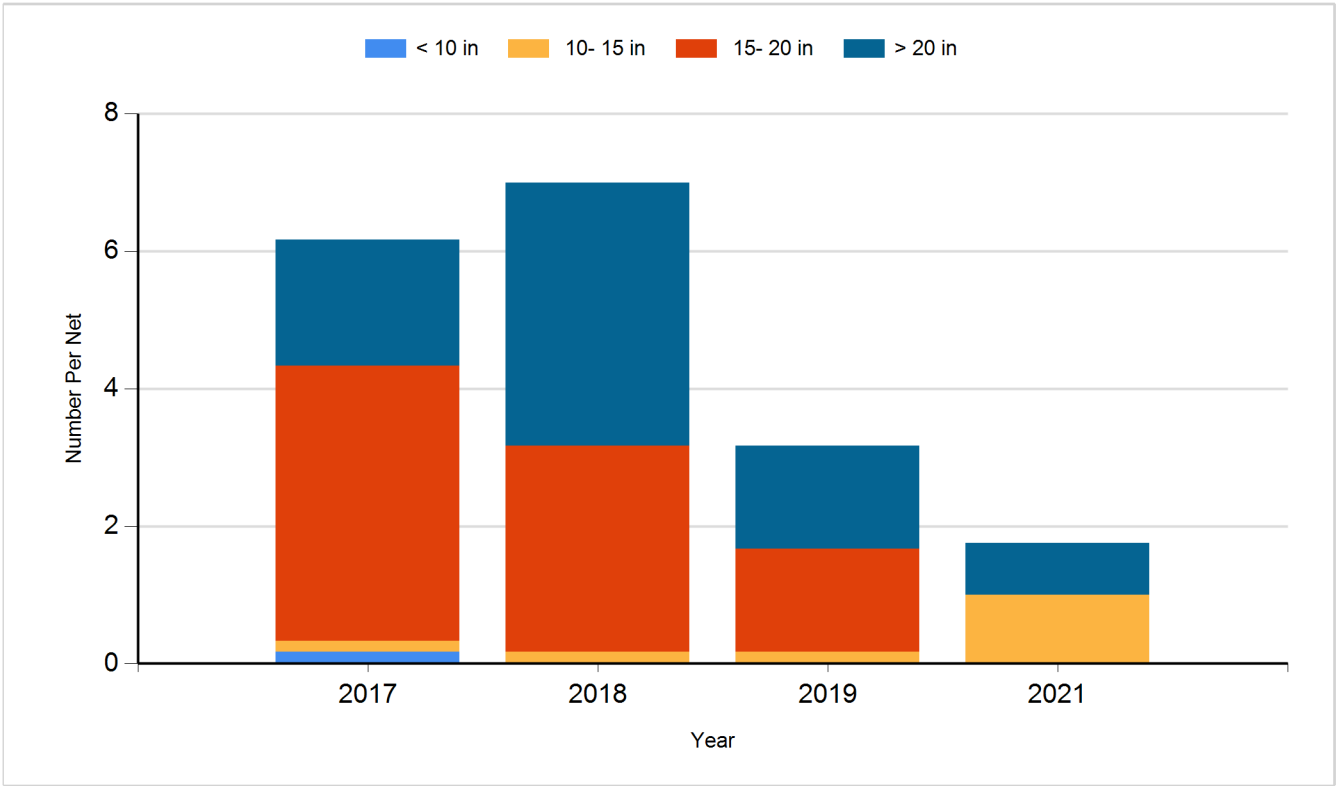
Species: Common Carp
Gear: AFS std gill net



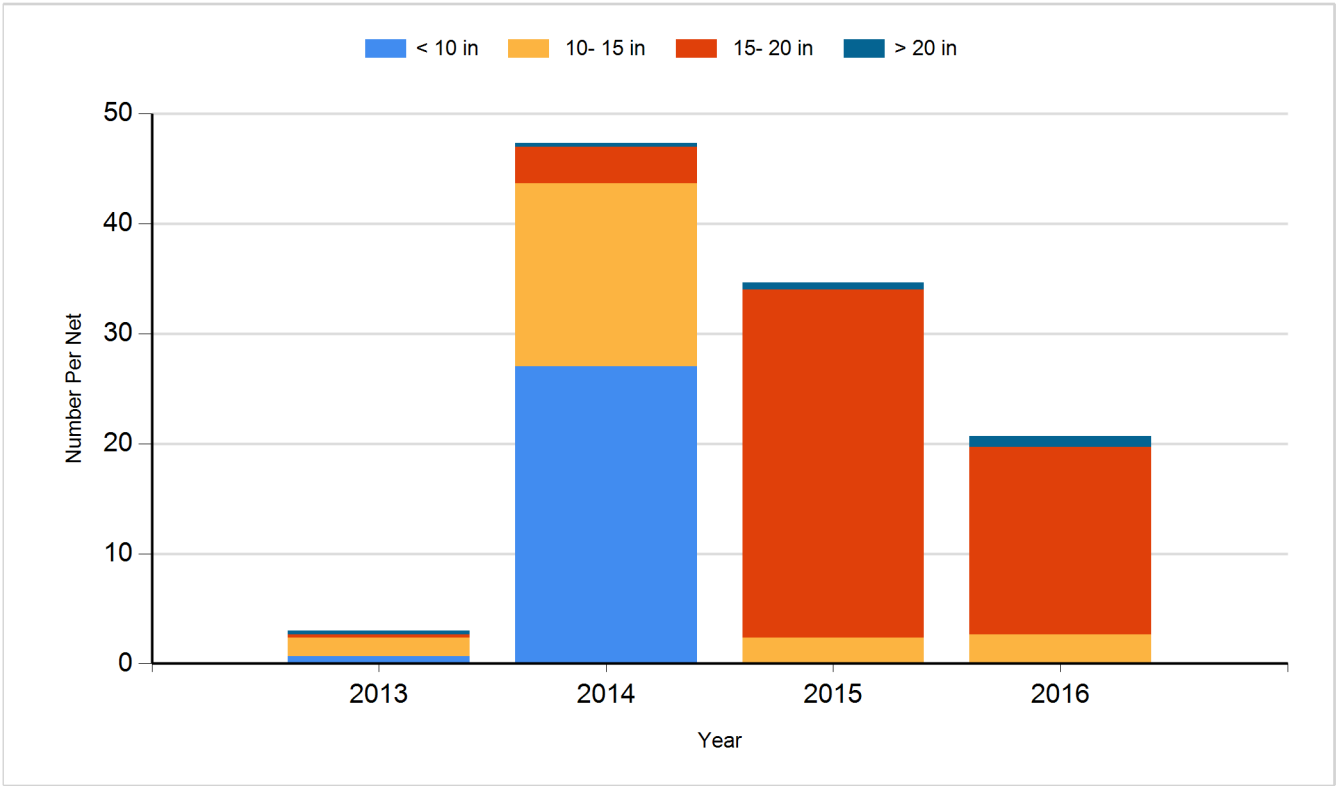
Species: Common Carp
Gear: std exp gill net



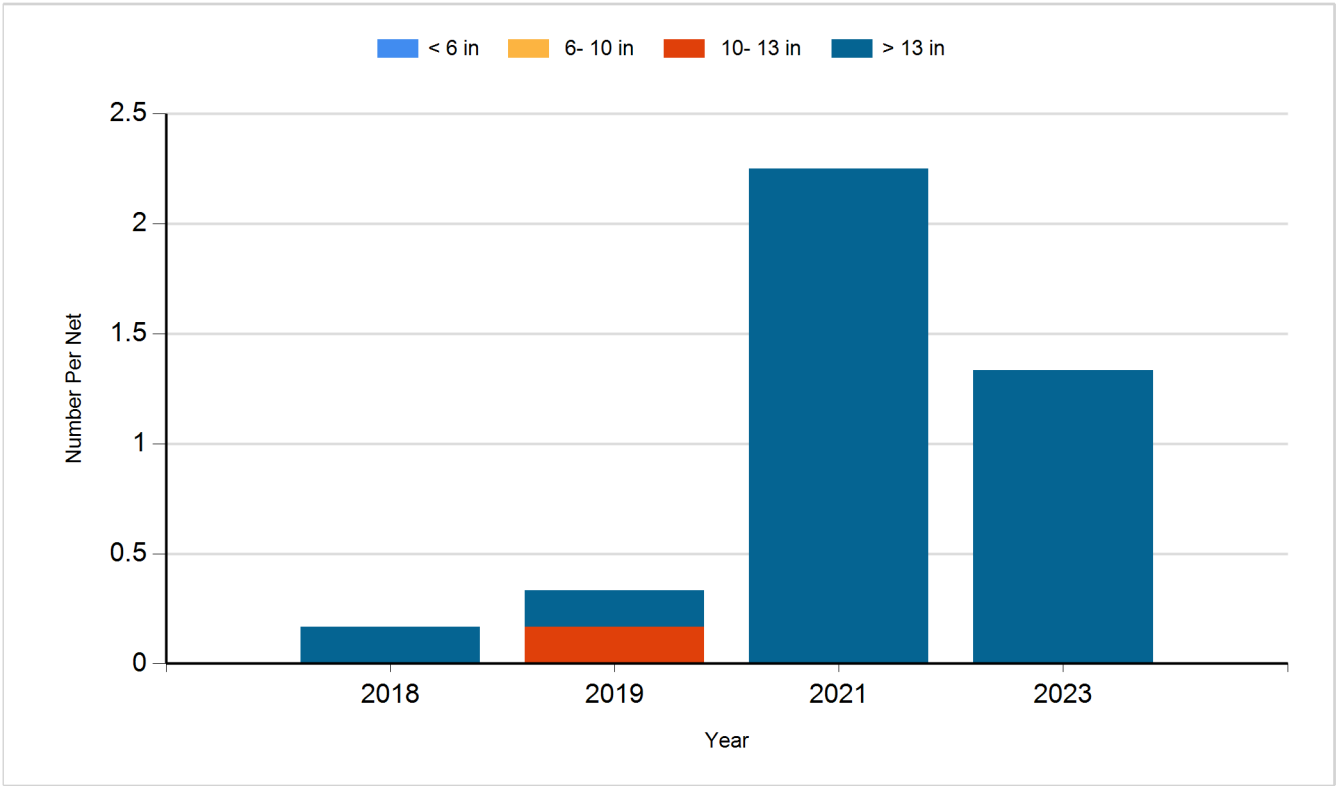
Species: Walleye
Gear: AFS std gill net



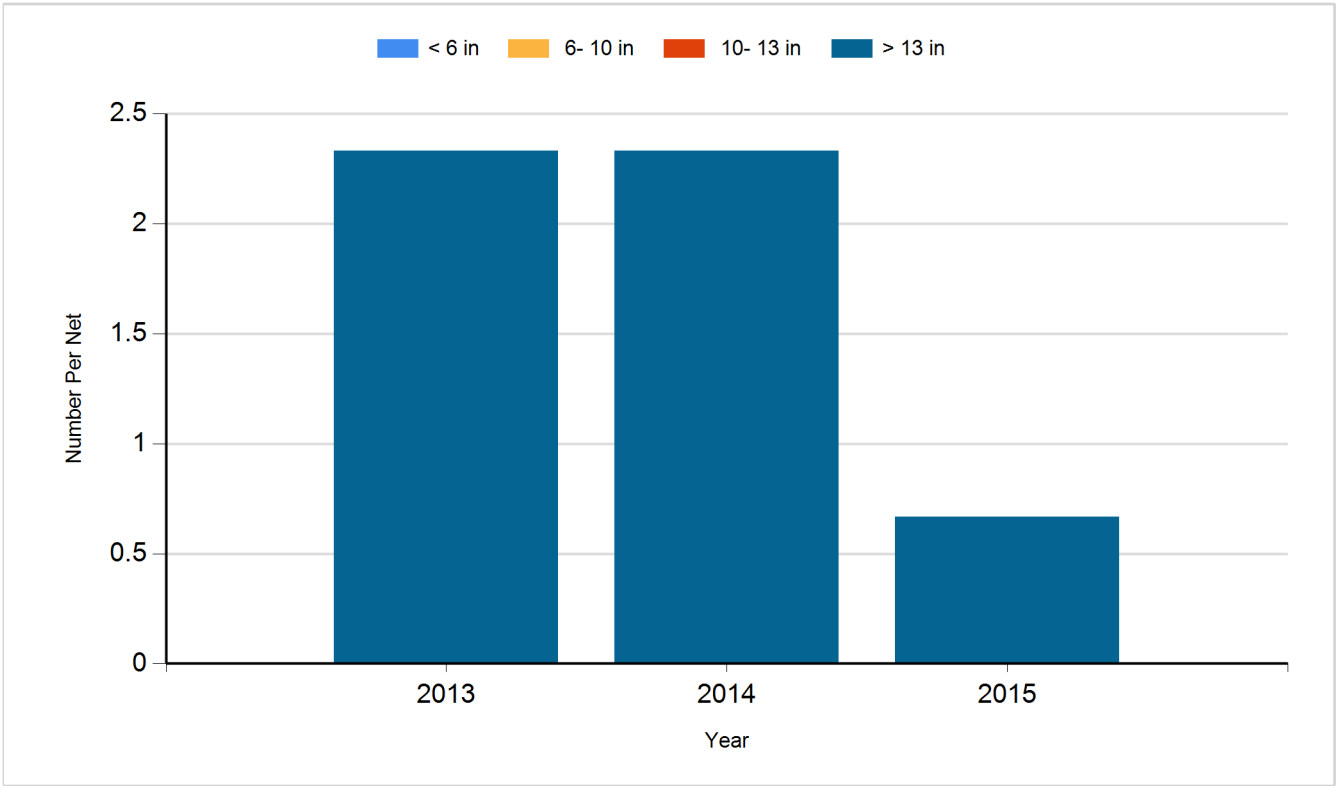
Species: Walleye
Gear: std exp gill net



Species: White Sucker
Gear: AFS std gill net



Species: White Sucker
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2012	Walleye	Fingerling	36,750
2013	Walleye	Small Fingerling	20,000
2014	Walleye	Fry	232,000
2019	Walleye	Small Fingerling	15,030
2021	Walleye	Fingerling	15,200
2023	Channel Catfish	Juvenile	3,465
2023	Walleye	Fry	400,000