

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Newell, Butte County

LBF-Lake-528-000

2024

Lake Information

Name: Newell
County: Butte
Surface Area: 154 Acres

Surveys and Investigations

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

Gear	Date	Effort
frame net (std 3/4 in)	Jul 01, 2024	2 net-nights
frame net (std 3/4 in)	Jul 02, 2024	2 net-nights

Common Fish Species Present

Yellow Perch

Northern Pike

Largemouth Bass

Bluegill

Walleye

Smallmouth Bass

Rudd

White Sucker

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.
- **std 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.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

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.

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

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

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.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

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).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(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**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
frame net (std 3/4 in)	Bluegill	2	0.5	0.5	100		100	105	15	
	Northern Pike	14	3.5	2.5	86		21	84	2	
	Rudd	33	8.3	6.9	100		100			
	Smallmouth Bass	1	0.3	0.4	100		100	108		
	Walleye	28	7.0	3.3	100		75	13	80	1
	White Sucker	4	1.0	0.9	100		100		89	3

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

Gear	Species	CPUE										Avg	
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
AFS std frame net	Bluegill			2.4									2.40
	Northern Pike			0.2									0.20
	Rudd			3.0									3.00
	Smallmouth Bass			0.0									0.00
	Walleye			0.9									0.90
	White Sucker			0.7									0.70
	Yellow Perch			0.4									0.40
AFS std gill net	Bluegill			0.5	1.3	0.8	0.0						0.65
	Gizzard Shad			0.3	0.0	1.3	0.0						0.40
	Largemouth Bass			0.0	0.0	0.0	0.3						0.08
	Northern Pike			4.5	2.8	0.5	6.3						3.53
	Rudd			11.3	0.5	0.8	6.5						4.78
	Smallmouth Bass			0.0	0.0	0.0	0.3						0.08
	Walleye			8.8	7.8	7.5	4.0						7.03
	White Sucker			1.5	0.5	0.5	0.8						0.83
Yellow Perch			10.5	5.5	0.5	6.0						5.63	
boat shocker (day)	Largemouth Bass									22.0			22.00
	Smallmouth Bass									10.0			10.00
	Walleye*									14.0			14.00
boat shocker (night)	Largemouth Bass	13.8	39.0	10.0	24.0								21.70
	Smallmouth Bass	0.0	1.0	1.0	0.0								0.50
	Walleye*	101.0	38.0	29.0	67.0								58.75
frame net (std 3/4 in)	Black Bullhead	0.0	0.0		0.4	0.0	0.0				0.0		0.07
	Bluegill	17.3	28.9		21.1	11.6	7.7				0.5		14.52
	Largemouth Bass	0.0	0.0		0.0	0.1	0.0				0.0		0.02
	Northern Pike	0.6	1.2		2.1	3.0	0.7				3.5		1.85
	Rudd	21.3	11.7		9.6	78.4	1.5				8.3		21.80
	Smallmouth Bass	0.0	0.0		0.2	0.0	0.0				0.3		0.08
	Walleye	1.0	1.1		2.0	0.6	0.0				7.0		1.95
	White Sucker	0.4	3.3		0.3	0.3	0.3				1.0		0.93
Yellow Perch	0.0	0.2		2.3	0.3	0.5				0.0		0.55	
std exp gill net	Bluegill	0.0	1.0										0.50
	Gizzard Shad	0.0	0.0										0.00
	Northern Pike	3.0	3.5										3.25

CPUE

Gear	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg
std exp gill net	Rudd	25.5	18.5									22.00
	Walleye	4.0	20.0									12.00
	White Sucker	3.5	1.5									2.50
	Yellow Perch	3.5	11.5									7.50

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.

Gear	Species	Index	Year												
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024			
AFS std frame net	Bluegill	PSD			33										
		PSD-P			13										
		Wr			108										
	Northern Pike	PSD			0										
		PSD-P			0										
		Wr			82										
	Rudd	PSD			97										
		PSD-P			53										
	Smallmouth Bass	PSD			0										
		PSD-P			0										
	Walleye	PSD			67										
		PSD-P			11										
		Wr			82										
	White Sucker	PSD			100										
		PSD-P			100										
		Wr			95										
	Yellow Perch	PSD			25										
		PSD-P			0										
Wr				92											
AFS std gill net	Bluegill	PSD			50	60	33								
		PSD-P			0	20	0								
		Wr			113	106	106								
	Largemouth Bass	PSD									100				
		PSD-P									0				
		Wr									105				
	Northern Pike	PSD			39	55	50	84							
		PSD-P			6	0	0	12							
		Wr			87	80	92	79							
	Rudd	PSD			100	100	100	62							
		PSD-P			67	100	67	50							
	Smallmouth Bass	PSD									100				
		PSD-P									100				
		Wr									95				

Gear	Species	Index	Year									
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AFS std gill net	Walleye	PSD			69	84	77	75				
		PSD-P			14	6	17	25				
		Wr			80	82	86	82				
	White Sucker	PSD			100	100	100	100				
		PSD-P			83	100	100	100				
		Wr			100	100	108	108				
	Yellow Perch	PSD			2	14	50	21				
		PSD-P			0	14	0	13				
		Wr			93	102	87	94				
boat shocker (day)	Largemouth Bass	PSD									27	
		PSD-P									0	
		Wr									117	
	Smallmouth Bass	PSD										50
		PSD-P										10
		Wr										105
	Walleye	PSD										93
		PSD-P										36
		Wr										87
boat shocker (night)	Largemouth Bass	PSD	71	33	80	92						
		PSD-P	36	10	20	67						
		Wr	115	117	119	110						
	Smallmouth Bass	PSD		0	100							
		PSD-P		0	0							
		Wr		135	117							
	Walleye	PSD	42	42	75	80						
		PSD-P	1	4	25	40						
		Wr	86	99	97	92						
frame net (std 3/4 in)	Bluegill	PSD	41	76		45	68	26				100
		PSD-P	7	8		19	32	2				100
		Wr	113	116		110	108	108				105
	Largemouth Bass	PSD					100					
		PSD-P					100					
		Wr					114					
	Northern Pike	PSD	20	17		67	75	100				86
		PSD-P	20	0		5	21	25				21
		Wr	77	86		85	91	81				84

Gear	Species	Index	Year											
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
frame net (std 3/4 in)	Rudd	PSD	98	77		100	100	100						100
		PSD-P	65	62		77	84	78						100
	Smallmouth Bass	PSD				50		0						100
		PSD-P				0		0						100
		Wr				91								108
	Walleye	PSD	75	64		65	80	0						100
		PSD-P	13	9		20	40	0						75
		Wr	80	80		83	86							80
	White Sucker	PSD	100	100		100	100	100						100
		PSD-P	100	100		100	100	100						100
		Wr	89	94		87	92	88						89
	Yellow Perch	PSD		0		30	100	67						
		PSD-P		0		26	50	0						
		Wr		90		93	90	88						
	std exp gill net	Bluegill	PSD		100									
PSD-P				0										
Wr				125										
Northern Pike		PSD	17	14										
		PSD-P	17	0										
		Wr	78	83										
Rudd		PSD	78	81										
		PSD-P	27	57										
Walleye		PSD	75	50										
		PSD-P	13	10										
		Wr	81	84										
White Sucker		PSD	100	100										
		PSD-P	100	100										
		Wr	99	94										
Yellow Perch		PSD	0	52										
	PSD-P	0	0											
	Wr	98	98											

Length at Capture

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

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	18	219 (10)		349 (8)							

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	18		250 (5)	332 (2)	400 (3)	451 (2)	488 (1)	507 (3)	535 (1)		664 (1)
2019	31	169 (2)	318 (6)	376 (1)	441 (8)	481 (8)	494 (1)		595 (1)	566 (1)	617 (3)
2018	30		290 (1)	372 (8)	408 (7)	456 (6)	445 (2)	452 (1)	428 (1)	507 (4)	596 (1)
2017	36	221 (1)	306 (3)	371 (10)	400 (10)	455 (2)		512 (5)	449 (2)	533 (2)	517 (1)
2016	84	212 (4)	282 (10)	346 (28)	380 (12)	410 (2)	456 (6)	454 (14)	489 (8)		
2015	16			364 (4)	421 (2)		457 (6)	401 (2)	551 (2)		

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).

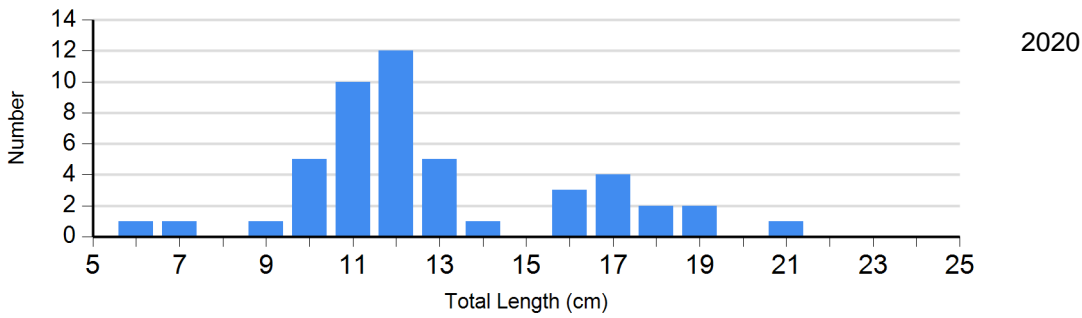
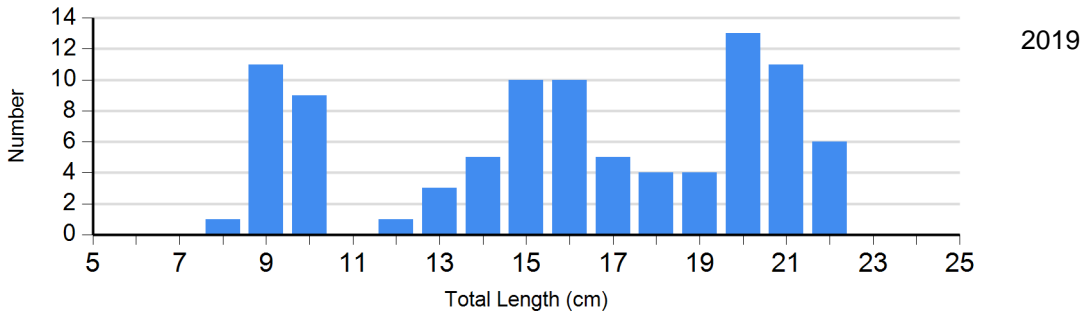
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2020	34	107 (1.7)	11	109 (2.3)	1	99	0	
	2024	0		0		2	105 (11.6)	0	
Largemouth Bass Electro Fishing	2023	16	115 (2.7)	6	125 (6.1)	0		0	
Northern Pike Gill Net	2020	4	80 (2.1)	18	78 (1.3)	3	85 (5.6)	0	
Smallmouth Bass Electro Fishing	2023	5	107 (4.7)	4	98 (5.3)	1	124	0	
Walleye Gill Net	2020	4	80 (1.6)	8	84 (2.3)	3	86 (6.1)	1	70
White Sucker Gill Net	2020	0		0		0		3	108 (4.8)
Yellow Perch Gill Net	2020	19	97 (1.7)	2	93 (3.1)	1	82	2	77 (7.8)

Length Frequency Distribution

Length frequency histogram of species sampled by year.

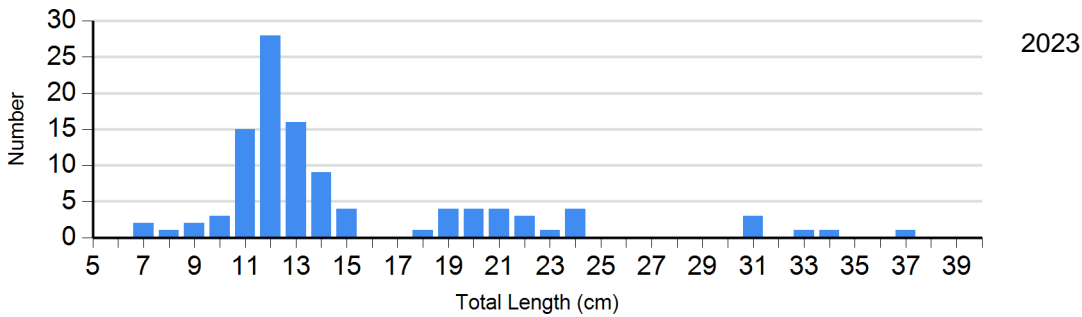
Species: Bluegill

Gear: frame net (std 3/4 in)



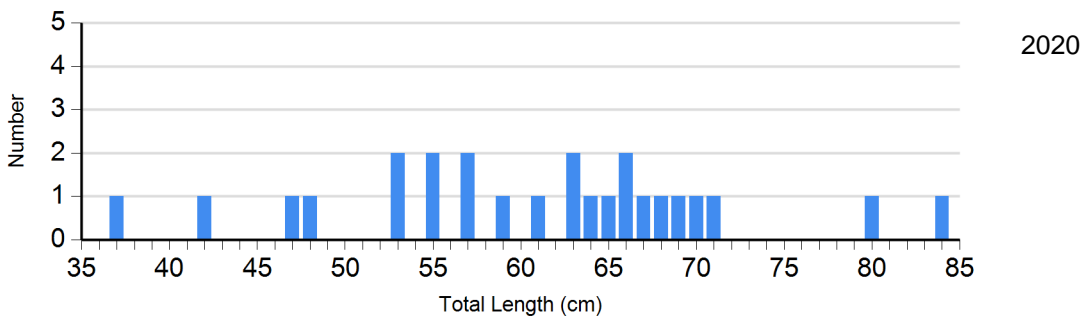
Species: Largemouth Bass

Gear: boat shocker (day)

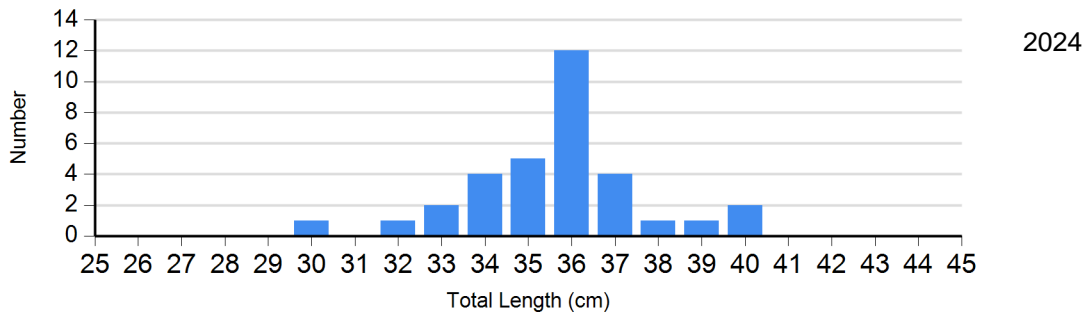
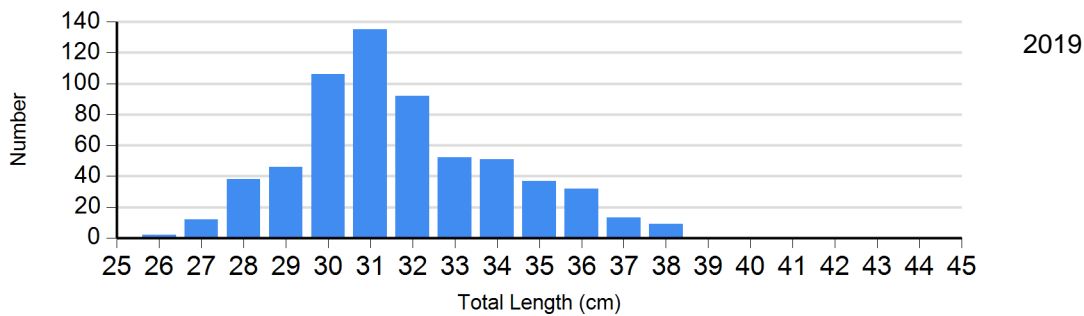


Species: Northern Pike

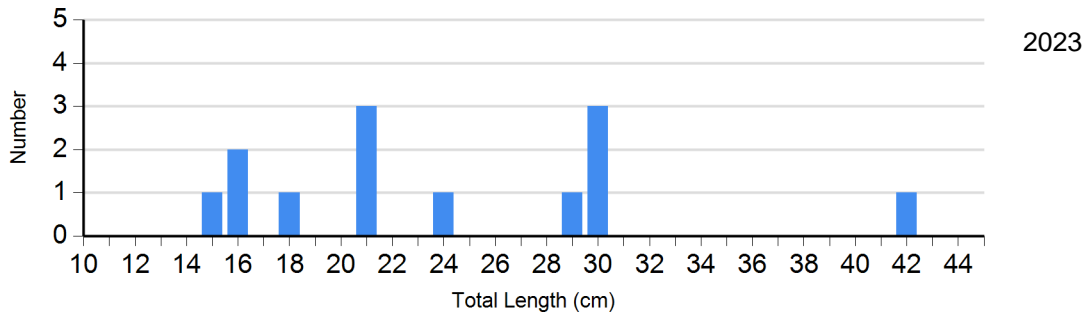
Gear: AFS std gill net



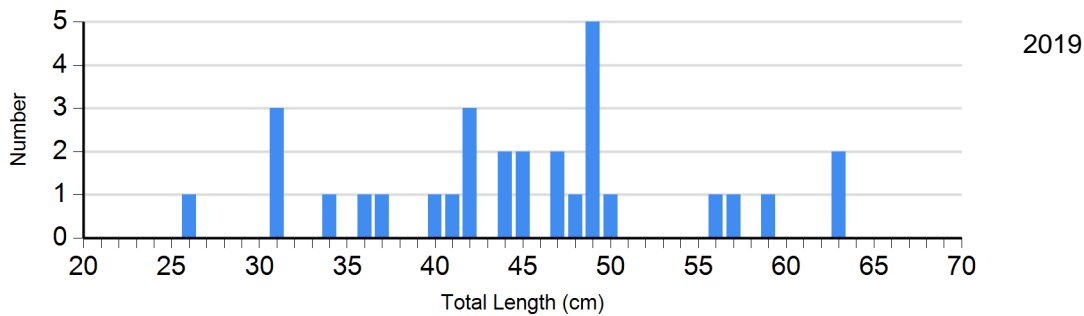
Species: Rudd
Gear: frame net (std 3/4 in)

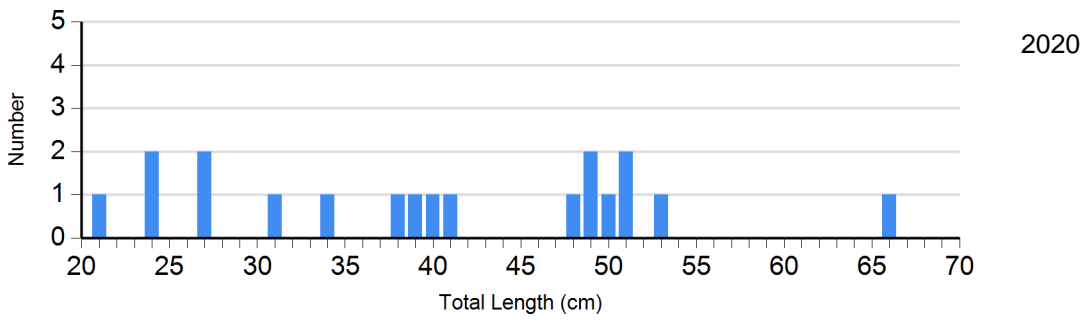


Species: Smallmouth Bass
Gear: boat shocker (day)

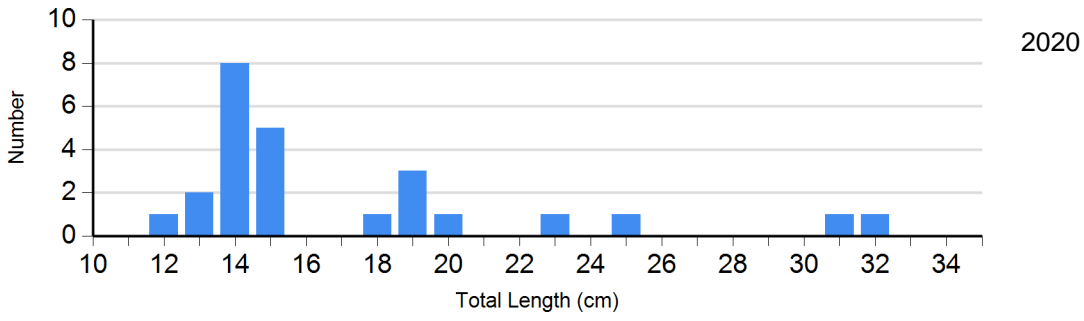


Species: Walleye
Gear: AFS std gill net





Species: Yellow Perch
 Gear: AFS std gill net

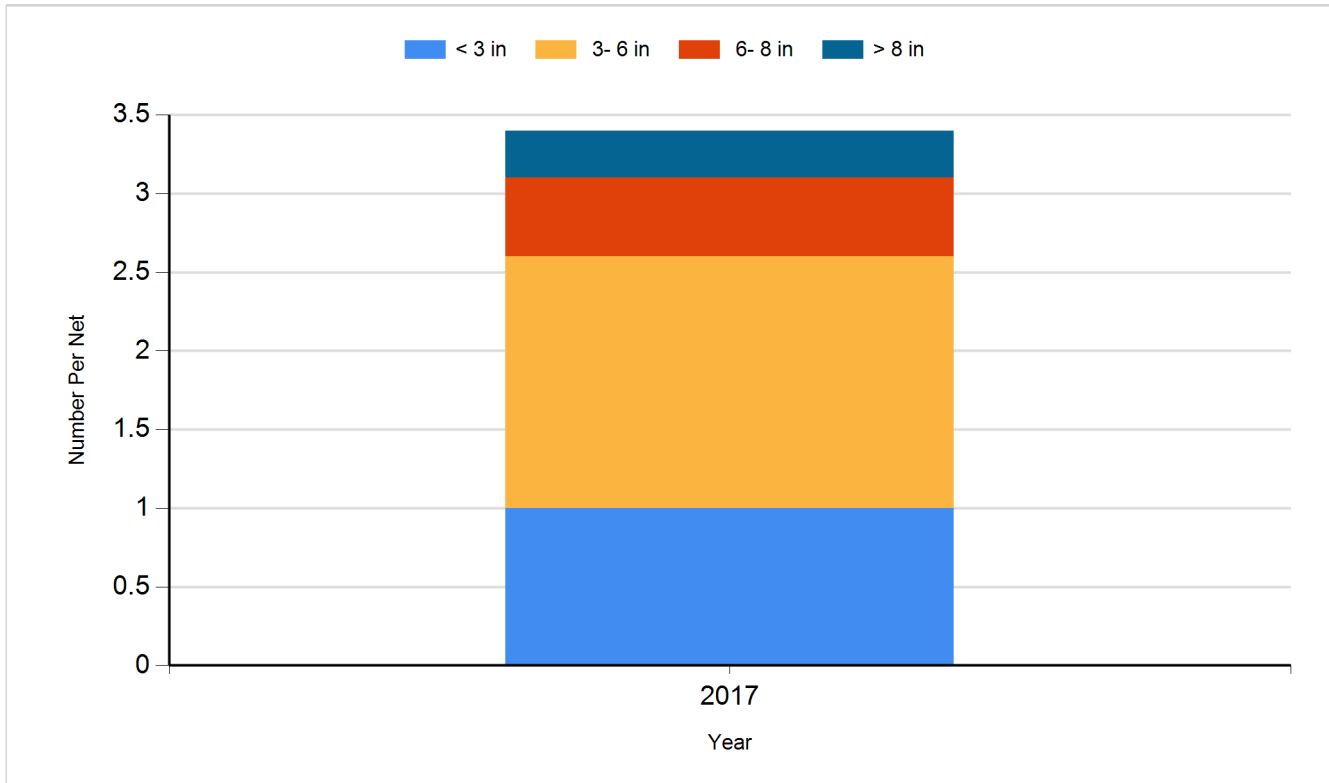


Historic Fish Sizes and Relative Abundance

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

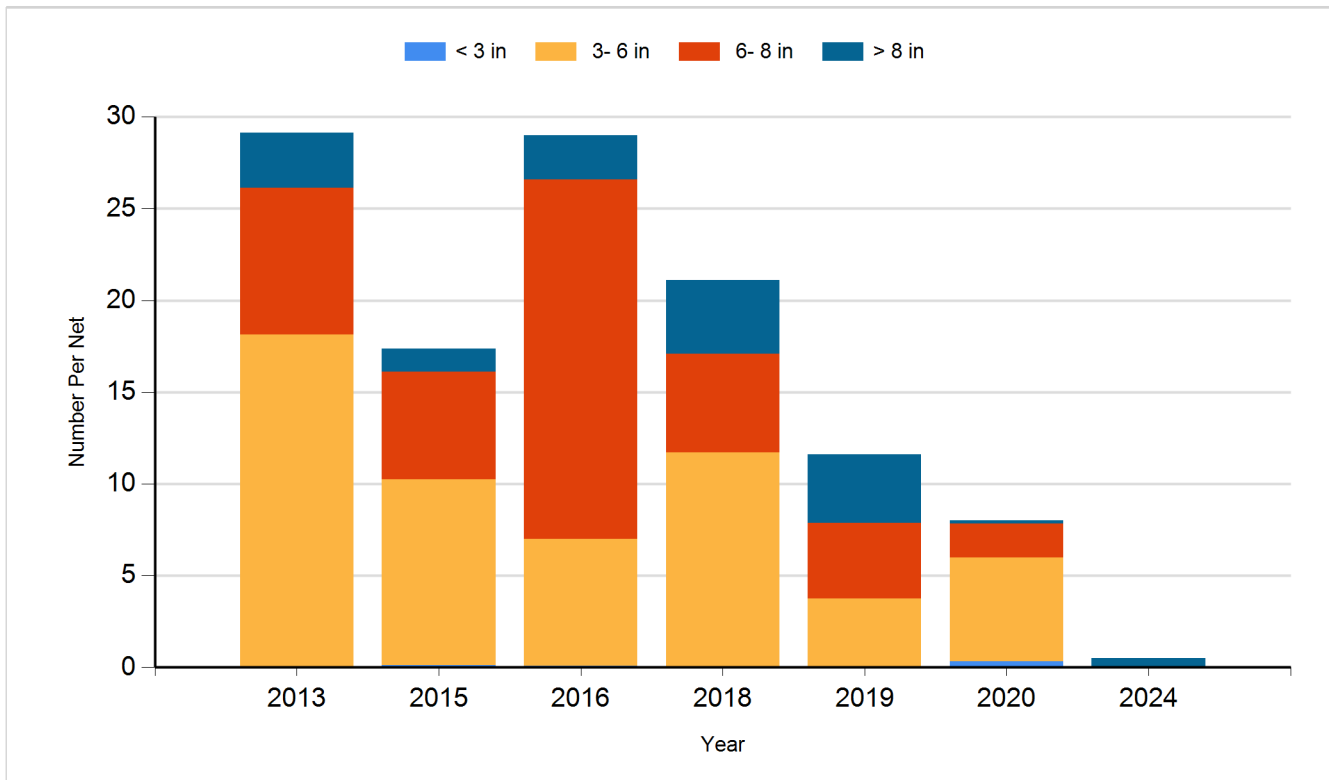
Species: Bluegill

Gear: AFS std frame net

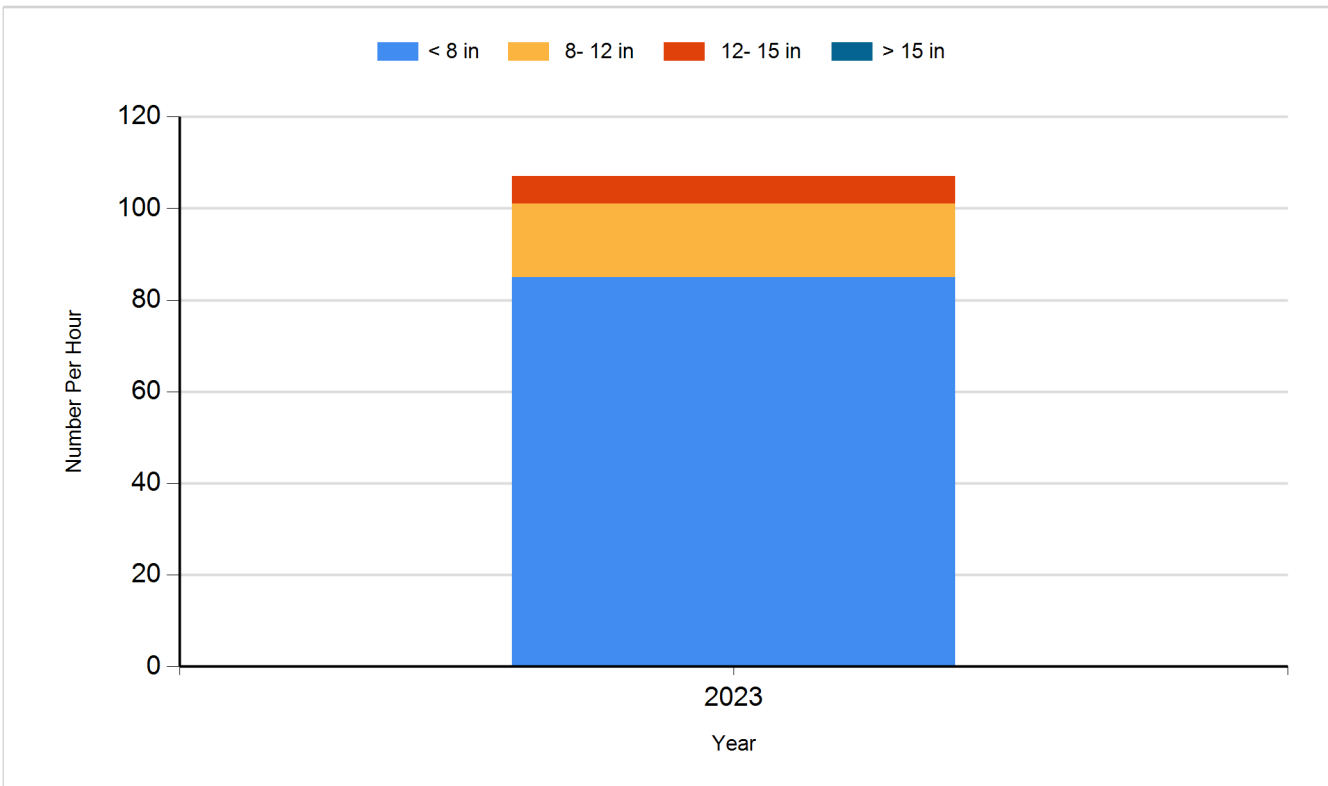


Species: Bluegill

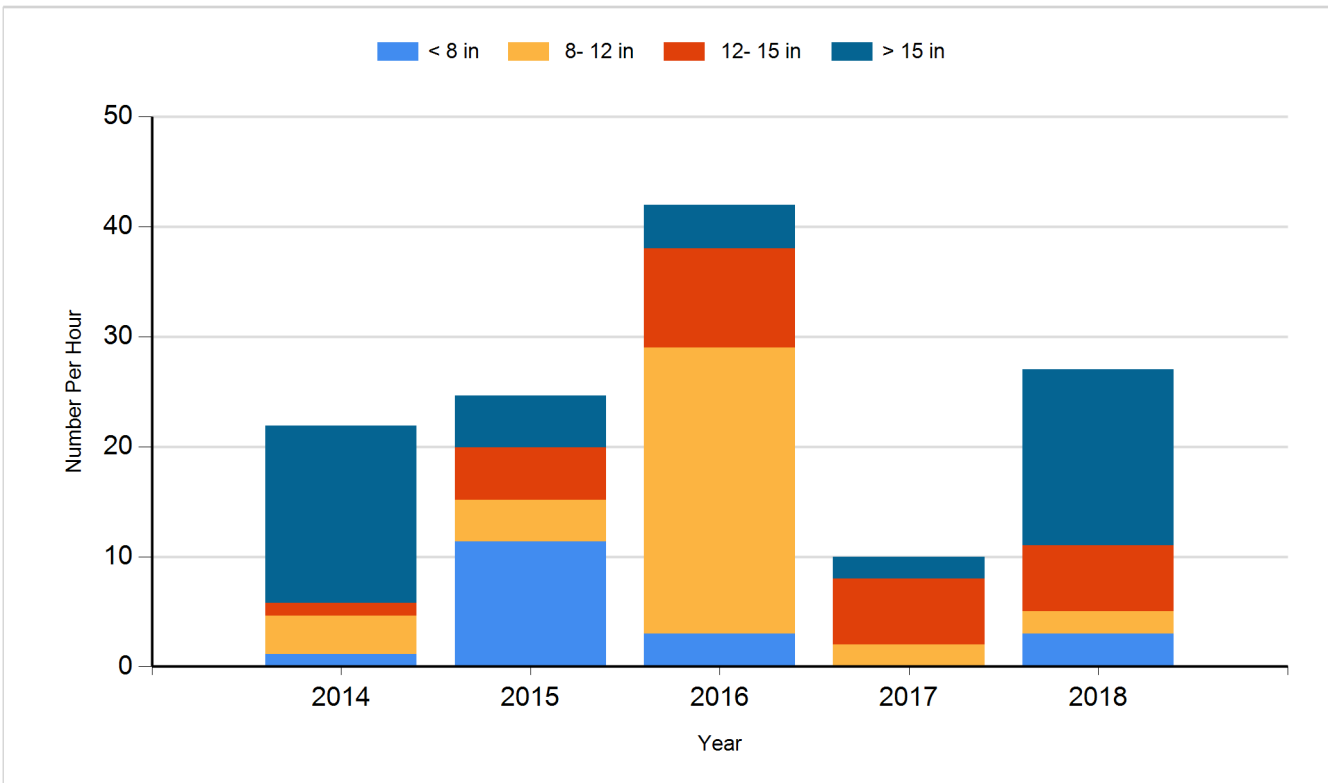
Gear: frame net (std 3/4 in)



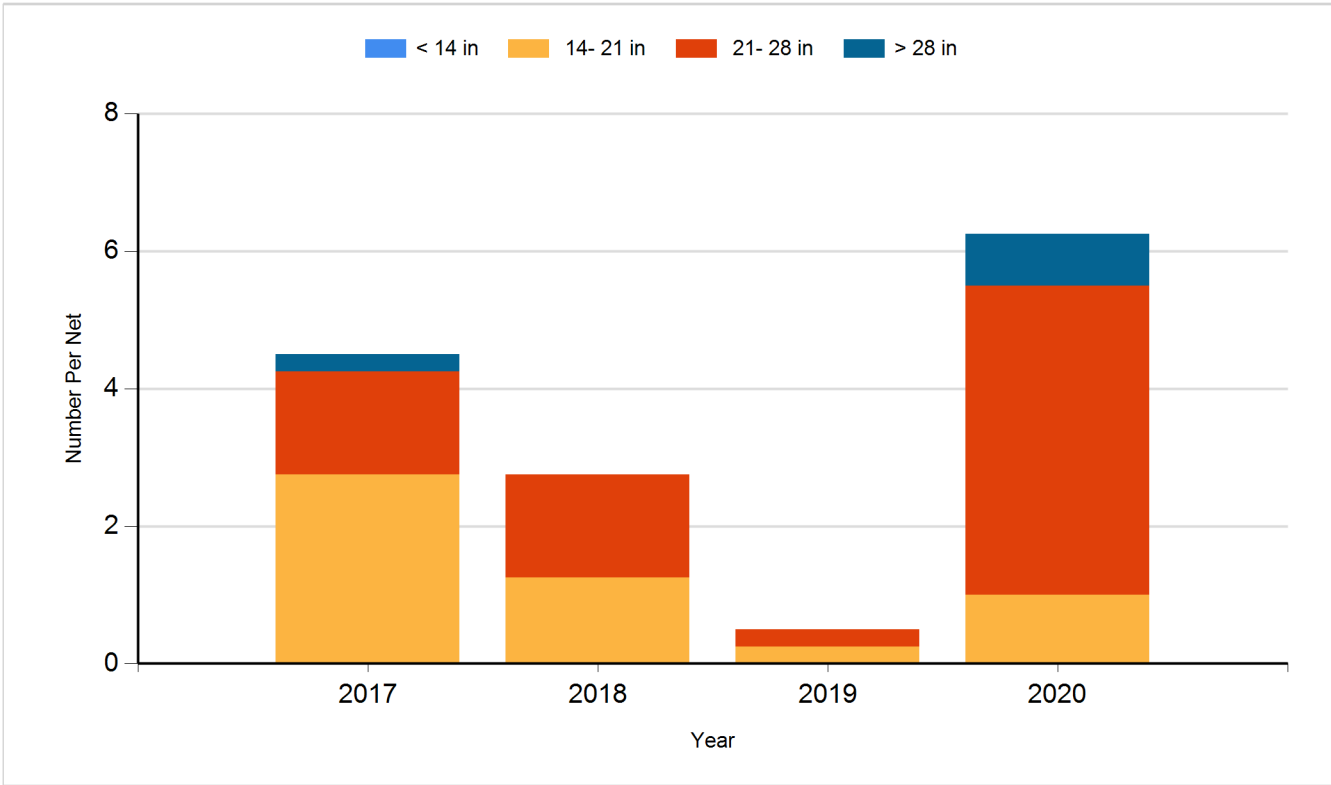
Species: Largemouth Bass
Gear: boat shocker (day)



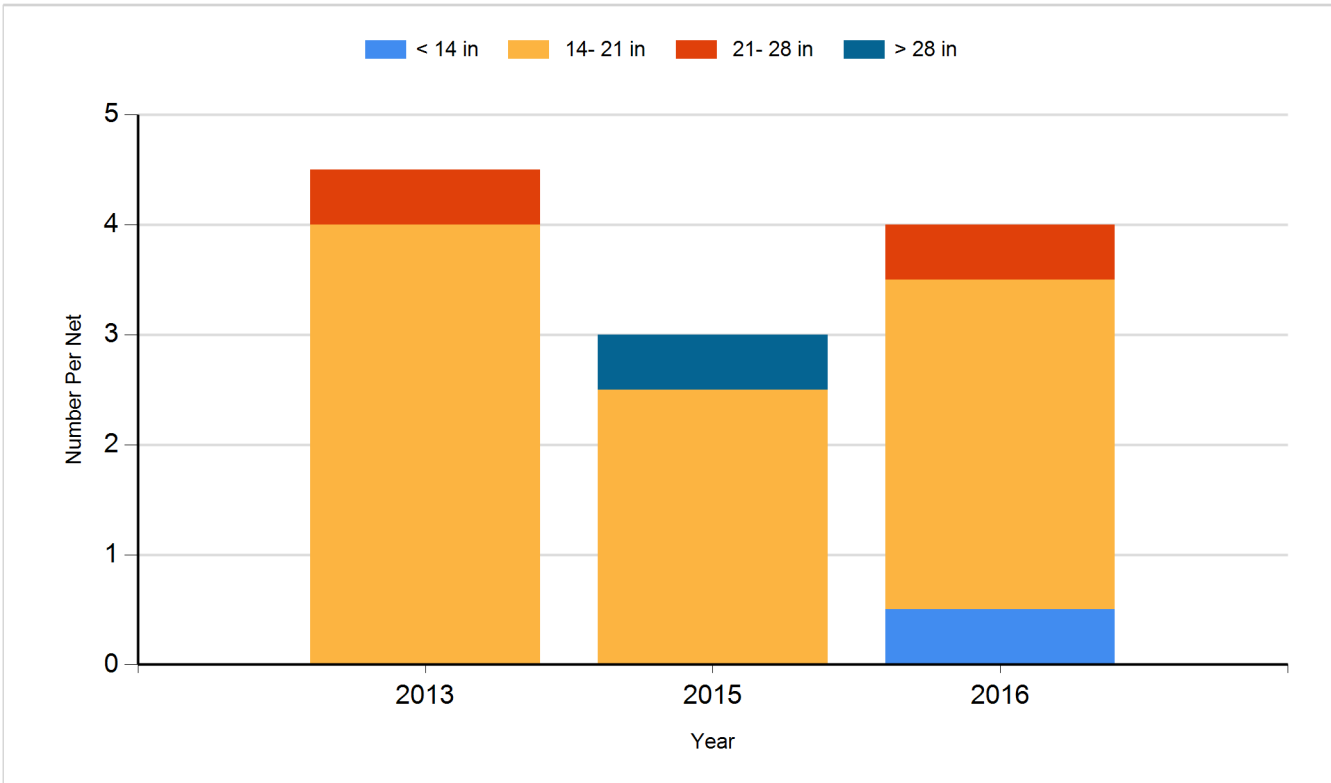
Species: Largemouth Bass
Gear: boat shocker (night)



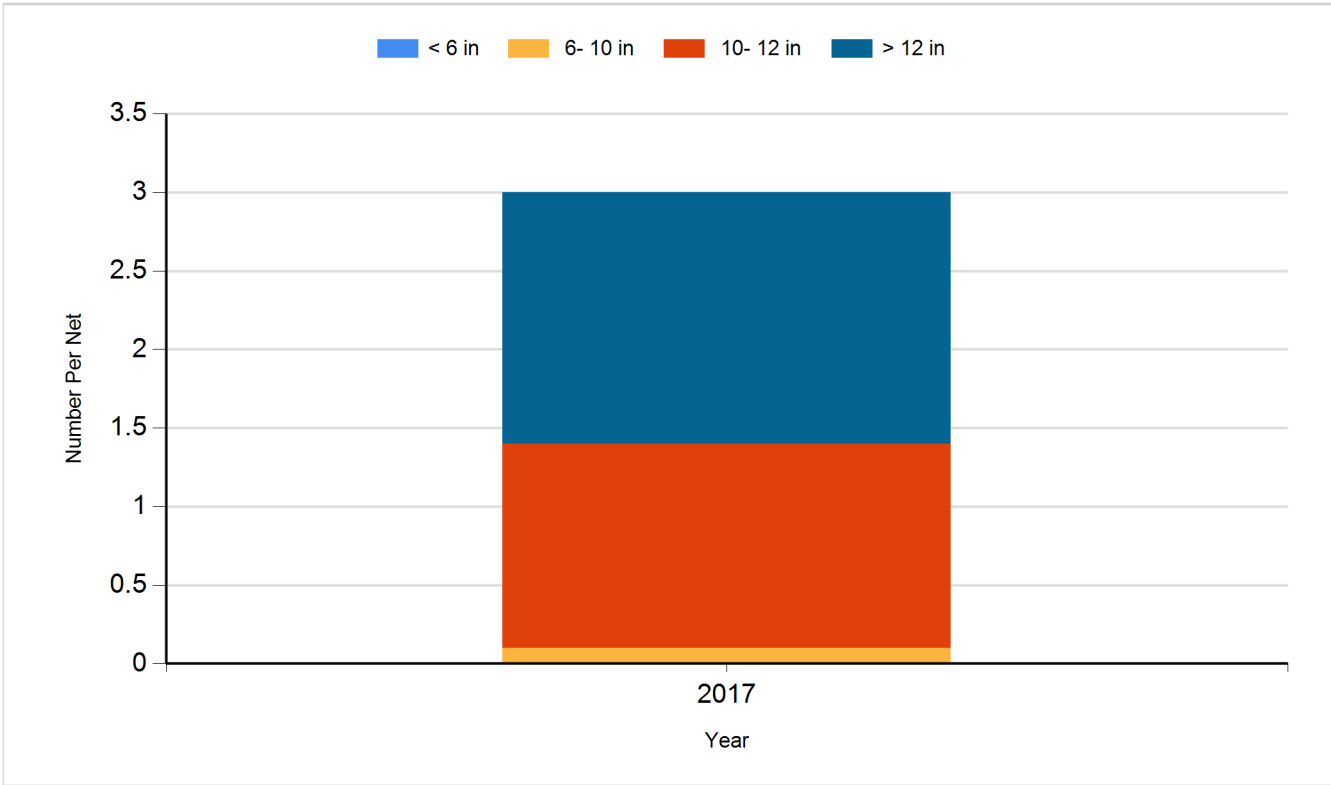
Species: Northern Pike
Gear: AFS std gill net



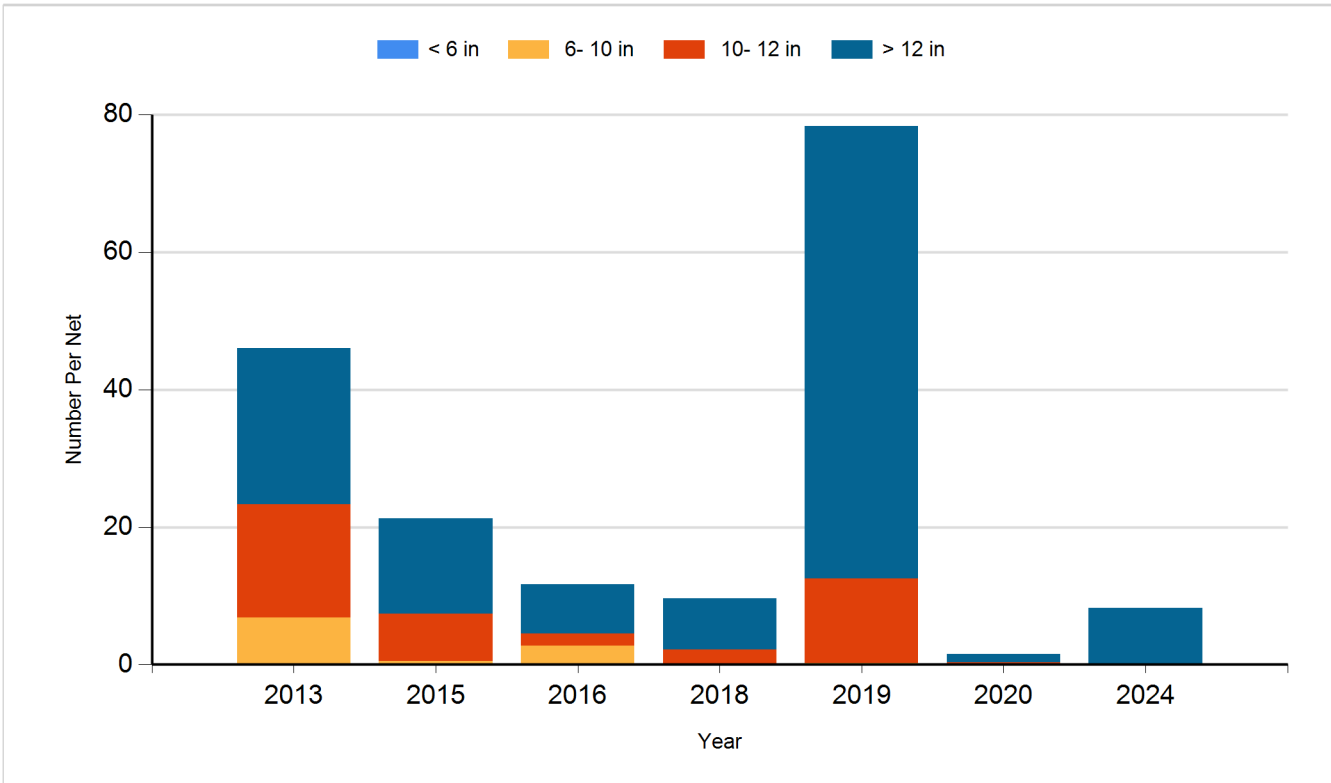
Species: Northern Pike
Gear: std exp gill net



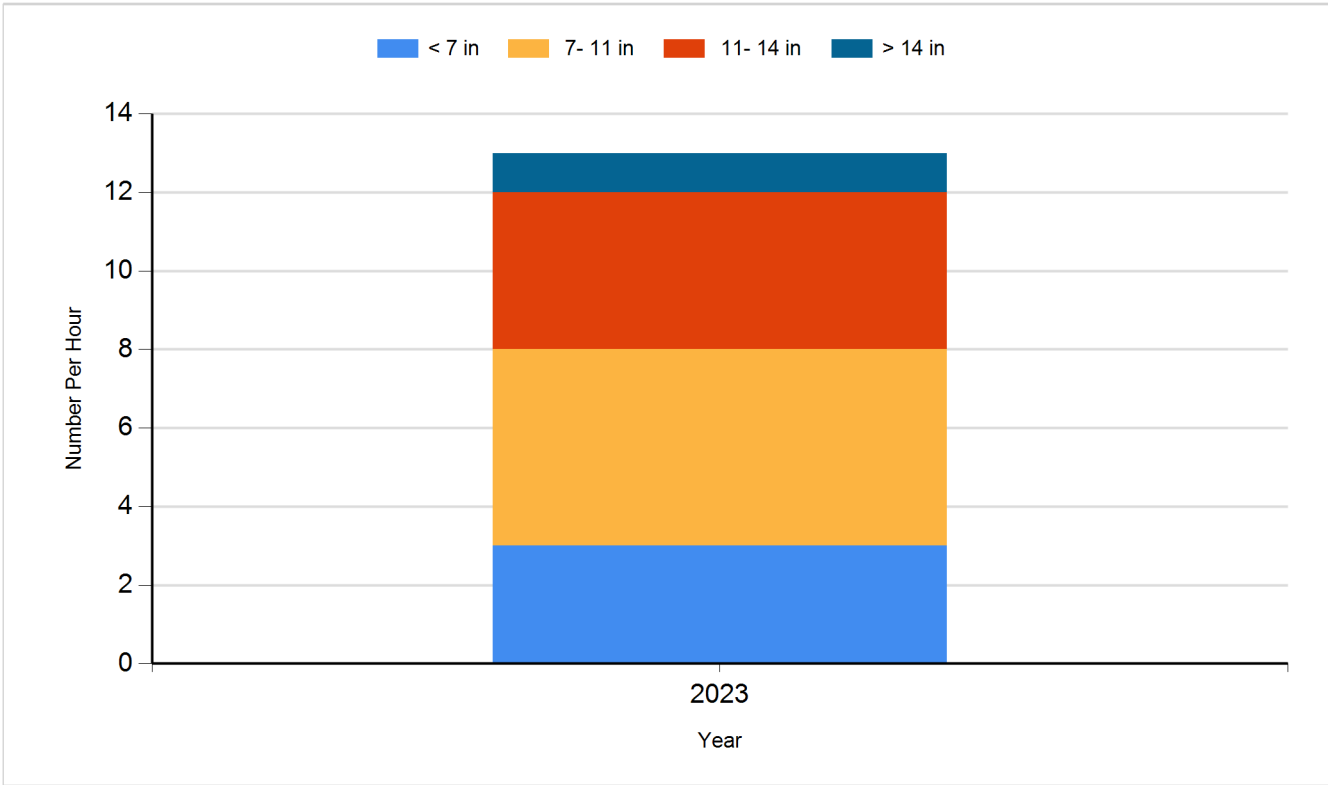
Species: Rudd
Gear: AFS std frame net



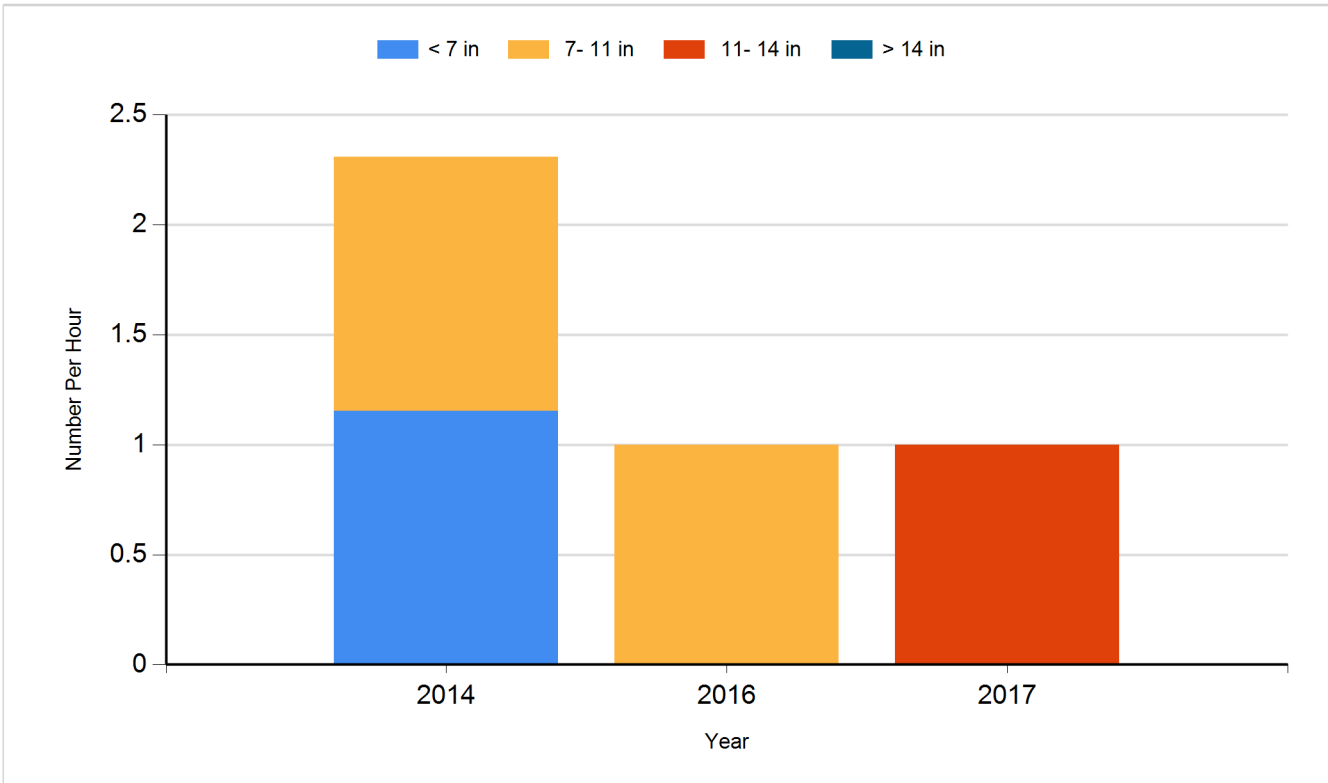
Species: Rudd
Gear: frame net (std 3/4 in)



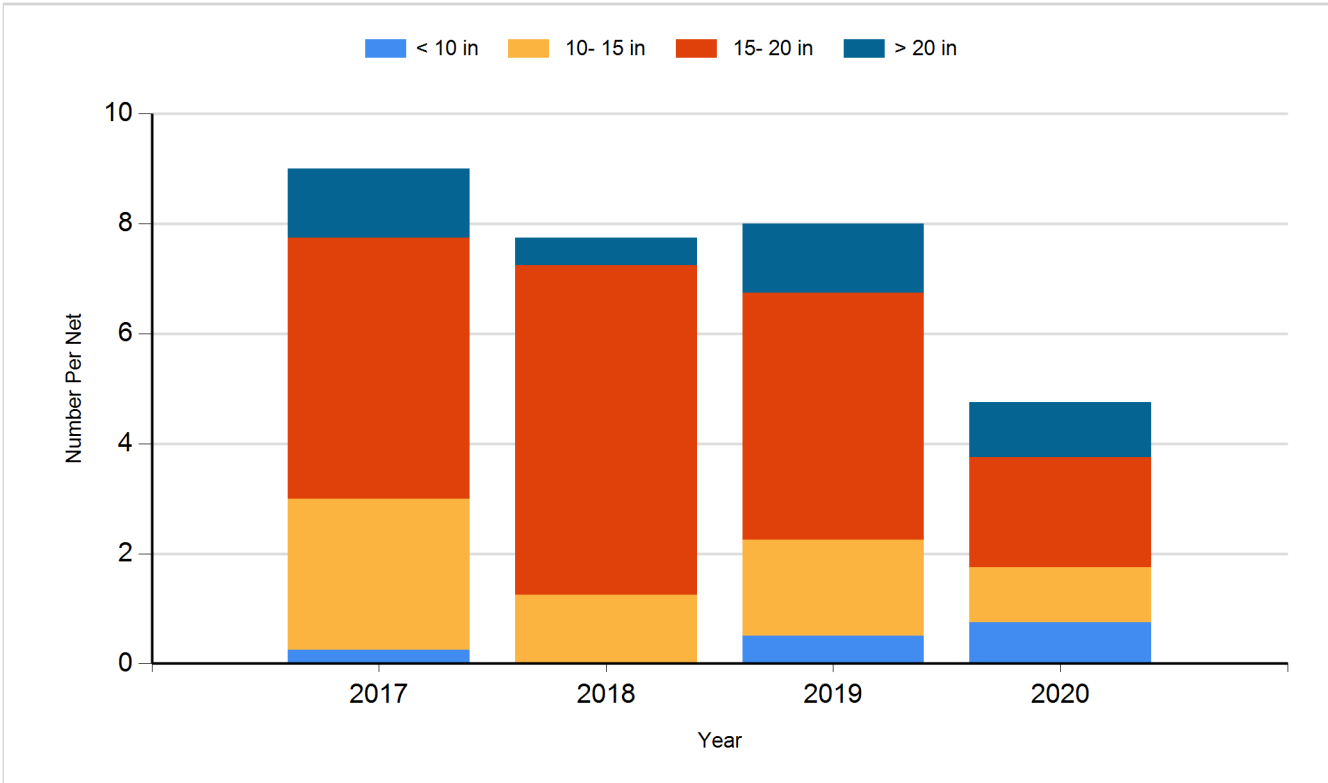
Species: Smallmouth Bass
Gear: boat shocker (day)



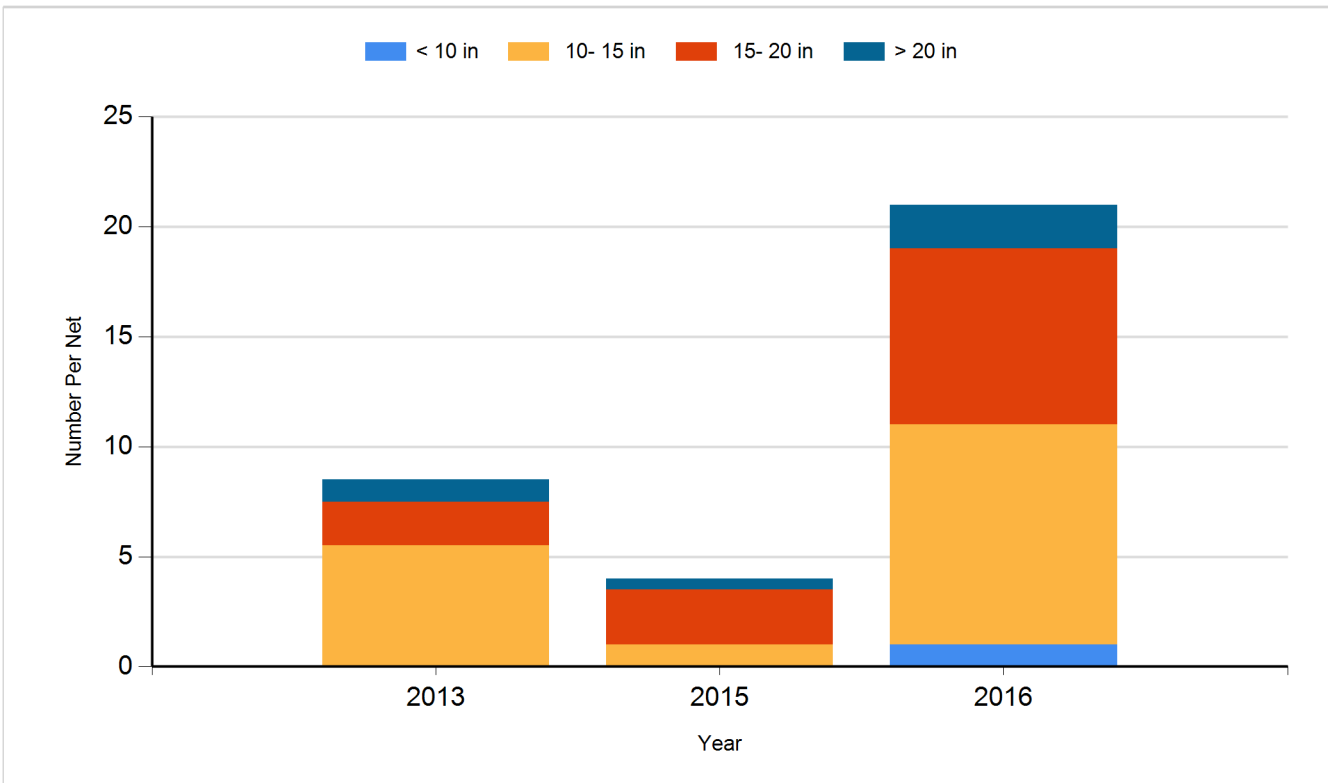
Species: Smallmouth Bass
Gear: boat shocker (night)



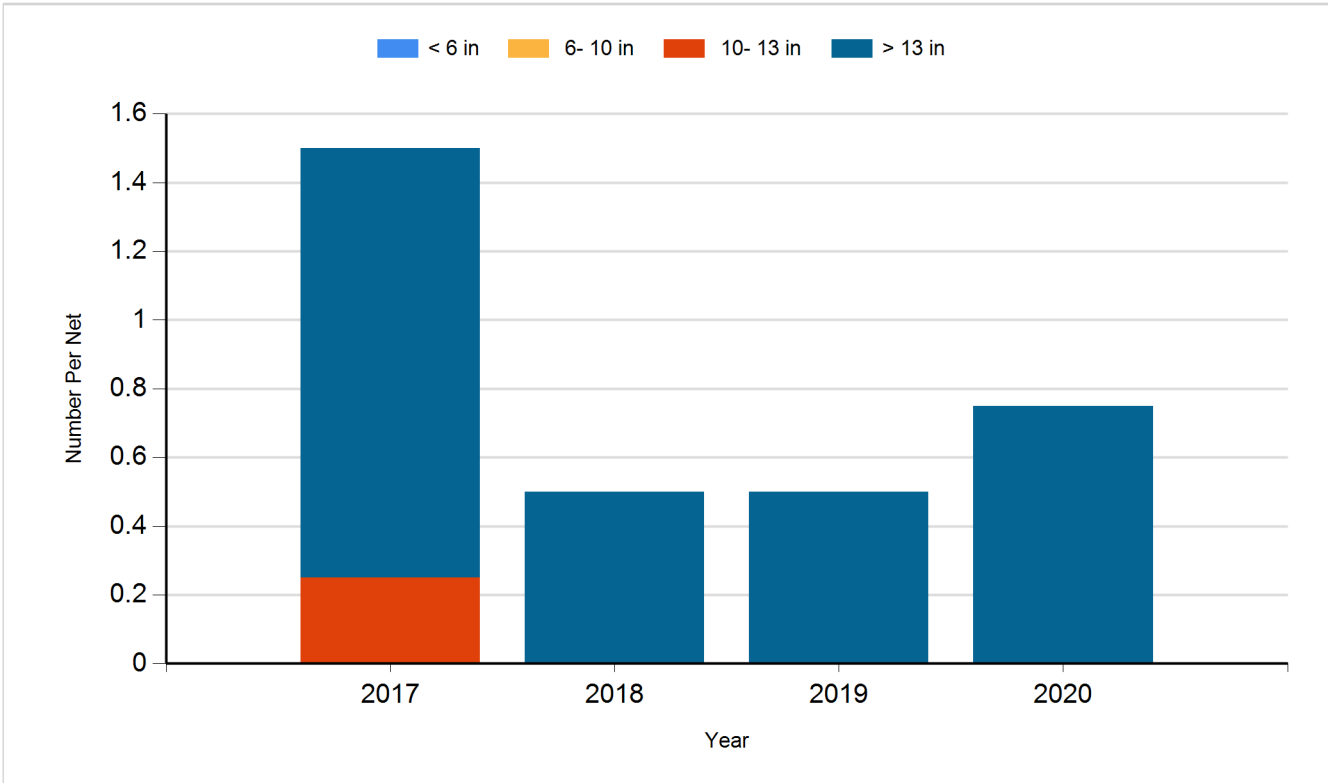
Species: Walleye
Gear: AFS std gill net



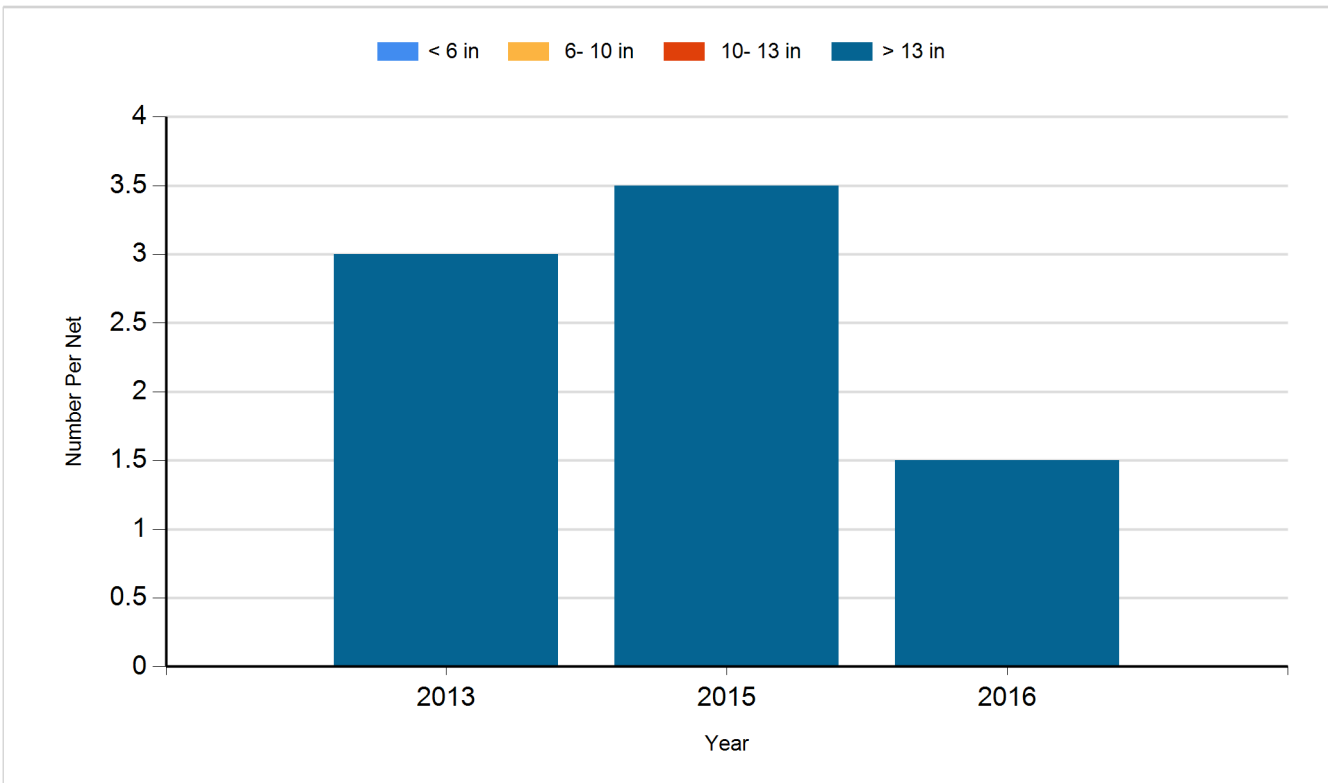
Species: Walleye
Gear: std exp gill net



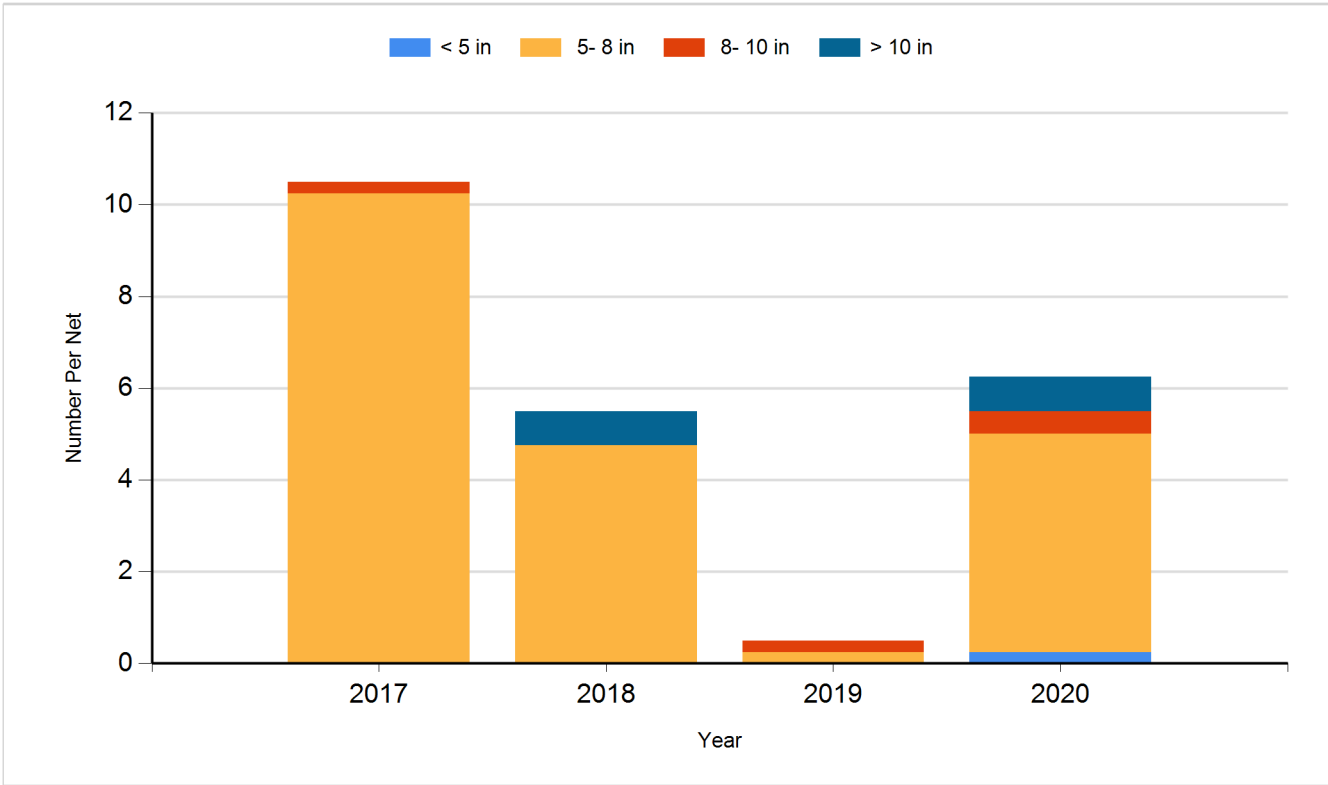
Species: White Sucker
Gear: AFS std gill net



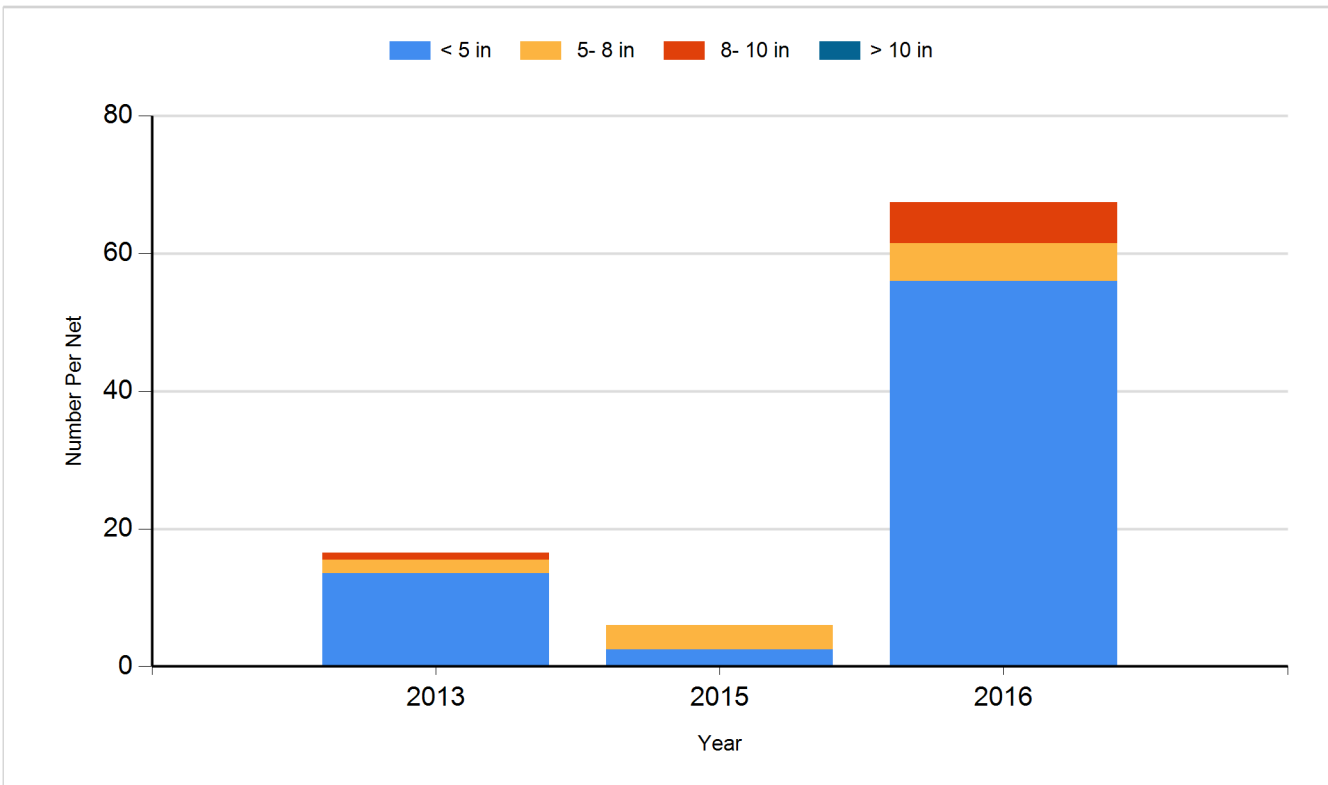
Species: White Sucker
Gear: std exp gill net



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	Largemouth Bass	Fingerling	11,970
2014	Largemouth Bass	Juvenile	750
2015	Largemouth Bass	Adult	230
2015	Largemouth Bass	Fingerling	3,690
2016	Gizzard Shad	Adult	37
2016	Largemouth Bass	Adult	424
2017	Gizzard Shad	Adult	125
2018	Gizzard Shad	Adult	76
2019	Gizzard Shad	Adult	61
2024	Walleye	Fry	368,500
2024	Yellow Perch	Adult	700