Newell Lake Survey Summary

Newell Lake is a 183-acre impoundment located 8 miles North and 2 miles East of Newell. It is managed as a Walleye, Largemouth Bass, Northern Pike, Bluegill and Yellow Perch fishery. Recent low water and construction work on the dam, made access difficult. The last survey on Newell was in 2019. A Fall electrofishing survey was completed on October 2nd to get an idea of what the Largemouth Bass and Walleye population was like.

Largemouth Bass. Our sixty minutes of fall electrofishing captured 108 bass, of which, twenty-two were over eight inches. Bass lengths ranged from 3 to 15 inches.

Smallmouth Bass. Fourteen smallmouths were sampled in the electrofishing survey. Fish ranged in size from 6 to 16 inches.

Walleye. Only 14 walleye were sampled in the electrofishing survey. It should be noted that this was daytime electrofishing, which is the first time it's been tried on Newell Lake. Sometimes walleye hang deeper during the day and may not be as susceptible to electrofishing. Fish ranged from 13 to 25inches.

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Newell, Butte County
LBF-Lake-528-000
2023

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
boat shocker (day)	Oct 02, 2023	3600 seconds

Common Fish Species Present

Yellow Perch

Walleye

Smallmouth Bass

Northern Pike

Largemouth Bass

Bluegill

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
boat shocker (day)	Largemouth Bass	107	22.0	8.5	27	15	0		117	3
	Smallmouth Bass	13	10.0	8.8	50	28	10		105	5
	Walleye*	14	14.0	10.6	93		36	22	87	2

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	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	20.8	13.8	39.0	10.0	24.0						21.52
	Smallmouth Bass	1.0	0.0	1.0	1.0	0.0						0.60
	Walleye*	123.8	101.0	38.0	29.0	67.0						71.76
frame net (std 3/4 in)	Black Bullhead		0.0	0.0		0.4	0.0	0.0				0.08
	Bluegill		17.3	28.9		21.1	11.6	7.7				17.32
	Largemouth Bass		0.0	0.0		0.0	0.1	0.0				0.02
	Northern Pike		0.6	1.2		2.1	3.0	0.7				1.52
	Rudd		21.3	11.7		9.6	78.4	1.5				24.50
	Smallmouth Bass		0.0	0.0		0.2	0.0	0.0				0.04
	Walleye		1.0	1.1		2.0	0.6	0.0				0.94
	White Sucker		0.4	3.3		0.3	0.3	0.3				0.92
	Yellow Perch		0.0	0.2		2.3	0.3	0.5				0.66
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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	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.

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
AFS std frame net	Bluegill	PSD				33						
		PSD-P				13						
		Wr				108						
	Northern Pike	PSD				0						
		PSD-P				0						
		Wr				82						
	Smallmouth Bass	PSD				0						
		PSD-P				0						
	Walleye	PSD				67						
		PSD-P				11						
		Wr				82						
	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			
	Smallmouth Bass	PSD							100			
		PSD-P							100			
		Wr							95			
	Walleye	PSD				69	84	77	75			
		PSD-P				14	6	17	25			
		Wr				80	82	86	82			
	Yellow Perch	PSD				2	14	50	21			
		PSD-P				0	14	0	13			
		Wr				93	102	87	94			

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
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	83	71	33	80	92					
		PSD-P	78	36	10	20	67					
		Wr	111	115	117	119	110					
	Smallmouth Bass	PSD	0		0	100						
		PSD-P	0		0	0						
		Wr	119		135	117						
	Walleye	PSD	67	42	42	75	80					
		PSD-P	7	1	4	25	40					
		Wr	93	86	99	97	92					
frame net (std 3/4 in)	Bluegill	PSD		41	76		45	68	26			
		PSD-P		7	8		19	32	2			
		Wr		113	116		110	108	108			
	Largemouth Bass	PSD						100				
		PSD-P						100				
		Wr						114				
	Northern Pike	PSD		20	17		67	75	100			
		PSD-P		20	0		5	21	25			
		Wr		77	86		85	91	81			
	Smallmouth Bass	PSD					50		0			
		PSD-P					0		0			
		Wr					91					
	Walleye	PSD		75	64		65	80	0			
		PSD-P		13	9		20	40	0			
		Wr		80	80		83	86				
	Yellow Perch	PSD			0		30	100	67			
		PSD-P			0		26	50	0			
		Wr			90		93	90	88			

			Year									
Gear	Species	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
std exp gill net	Bluegill	PSD			100							
		PSD-P			0							
		Wr			125							
	Northern Pike	PSD		17	14							
		PSD-P		17	0							
		Wr		78	83							
	Walleye	PSD		75	50							
		PSD-P		13	10							
		Wr		81	84							
	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

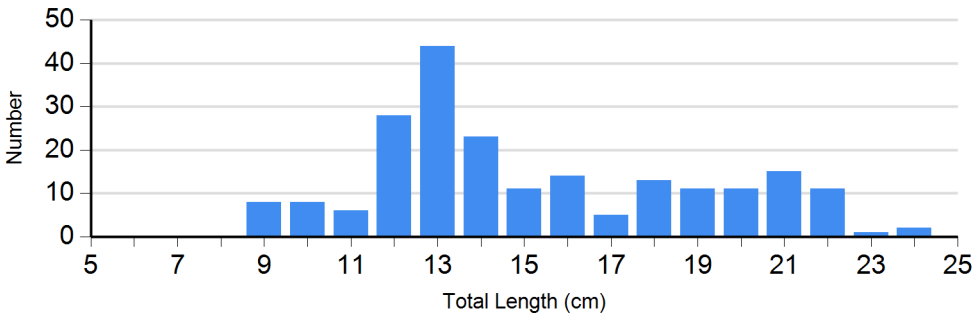
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2019	30	117 (1.9)	33	106 (2.4)	30	105 (1.3)	0	
	2020	34	107 (1.7)	11	109 (2.3)	1	99	0	
Largemouth Bass Electro Fishing	2023	16	115 (2.7)	6	125 (6.1)	0		0	
Northern Pike Gill Net	2019	1	93	1	92	0		0	
	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	2019	7	85 (1.3)	18	87 (0.9)	3	84 (2.8)	2	86 (9.2)
	2020	4	80 (1.6)	8	84 (2.3)	3	86 (6.1)	1	70
Yellow Perch Gill Net	2019	1	92	1	82	0		0	
	2020	19	97 (1.7)	2	93 (3.1)	1	82	2	77 (7.8)

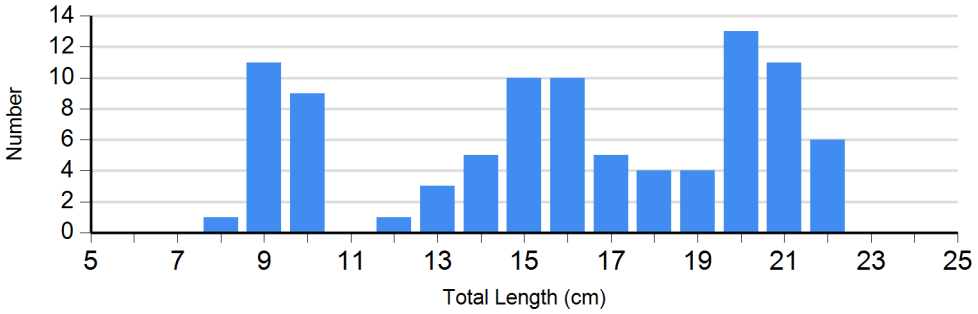
Length Frequency Distribution

Length frequency histogram of species sampled by year.

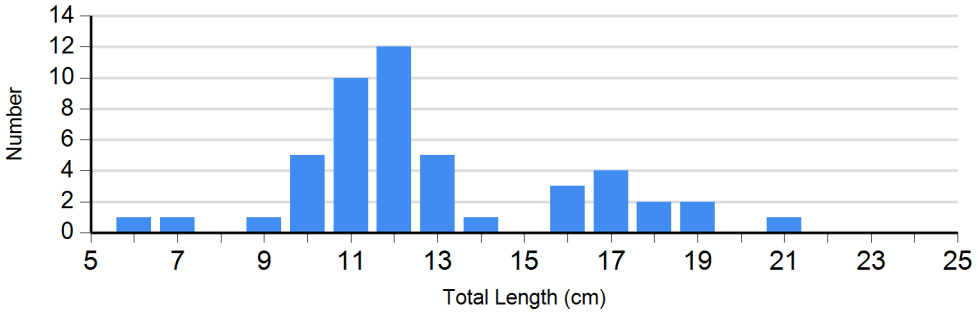
Species: Bluegill
Gear: frame net (std 3/4 in)



2018

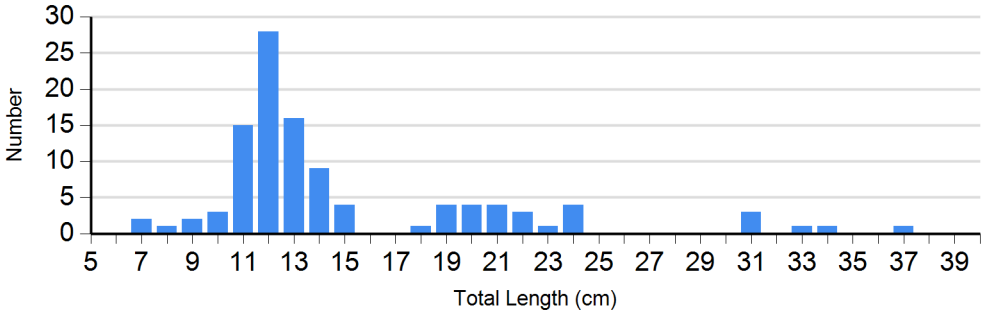


2019



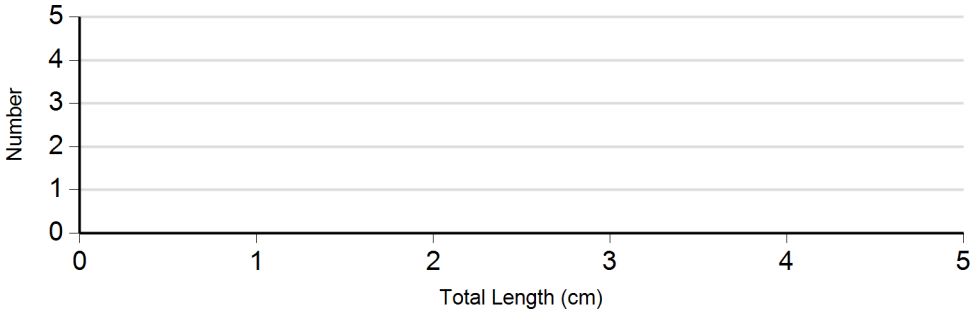
2020

Species: Largemouth Bass
Gear: boat shocker (day)



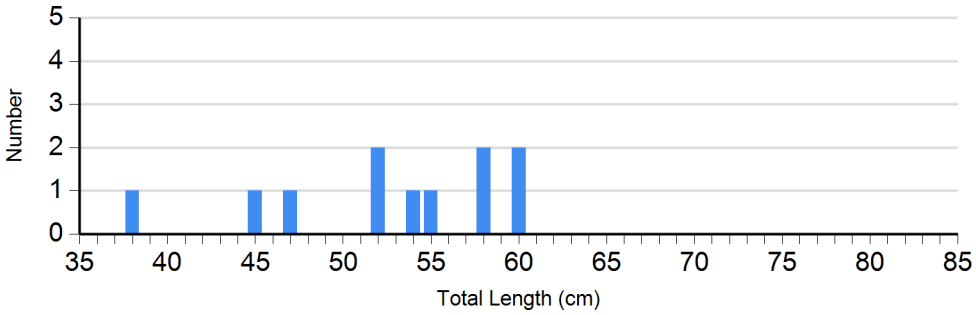
2023

Species: Largemouth Bass
Gear: boat shocker (night)



2018

Species: Northern Pike
Gear: AFS std gill net



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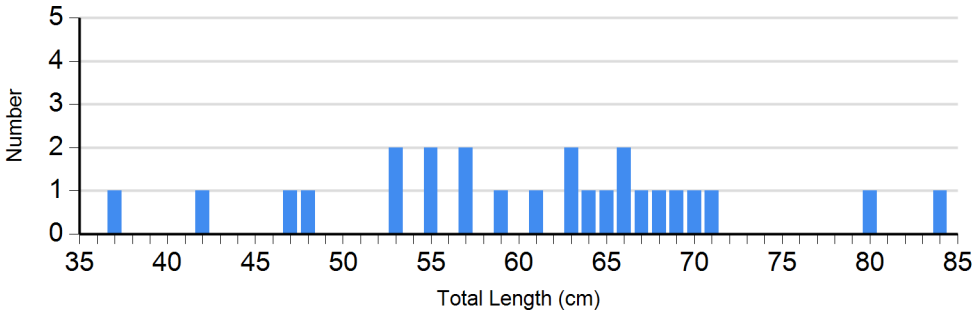
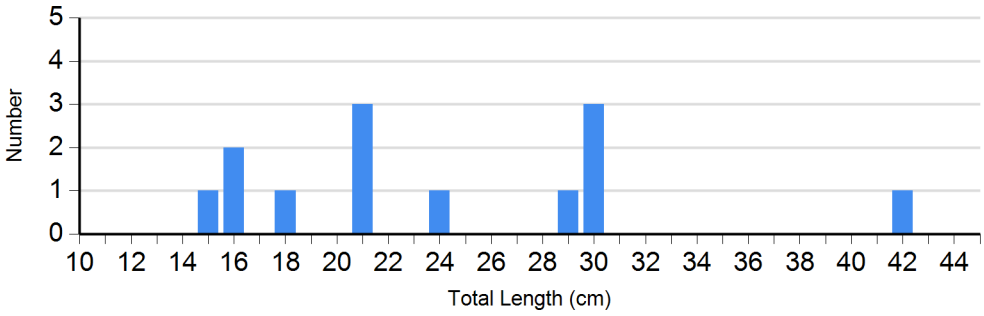


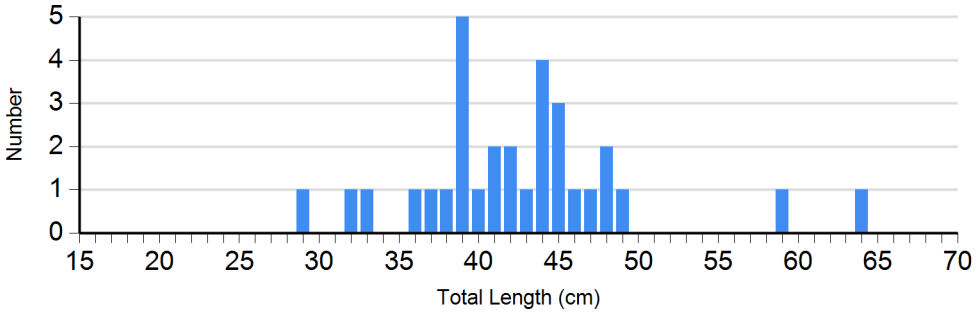
2020

Species: Smallmouth Bass
Gear: boat shocker (day)



2023

Species: Walleye
Gear: AFS std gill net



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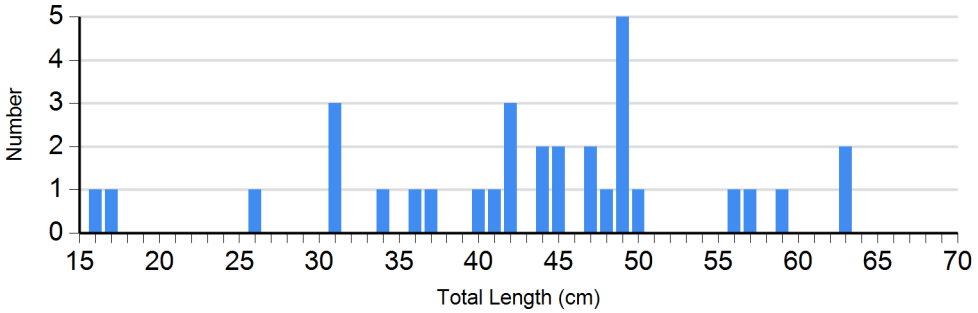
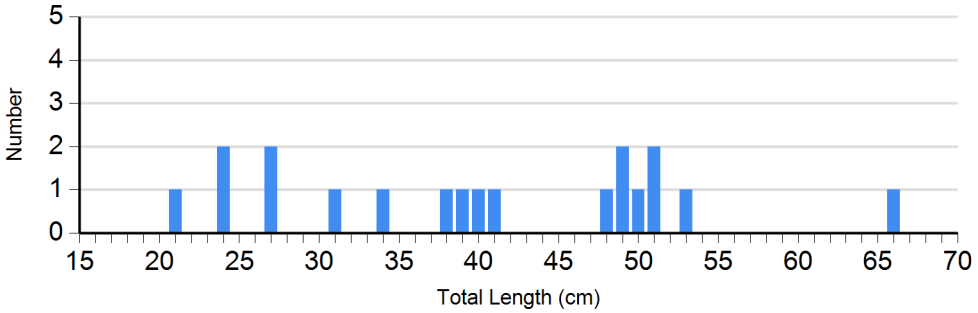
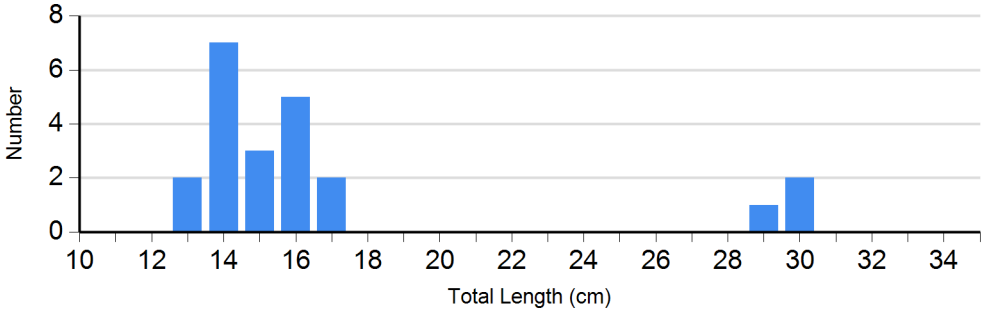


2019



2020

Species: Yellow Perch
Gear: AFS std gill net



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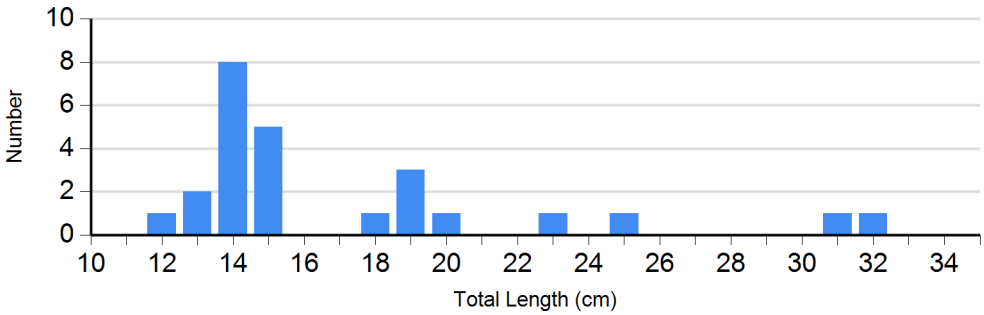
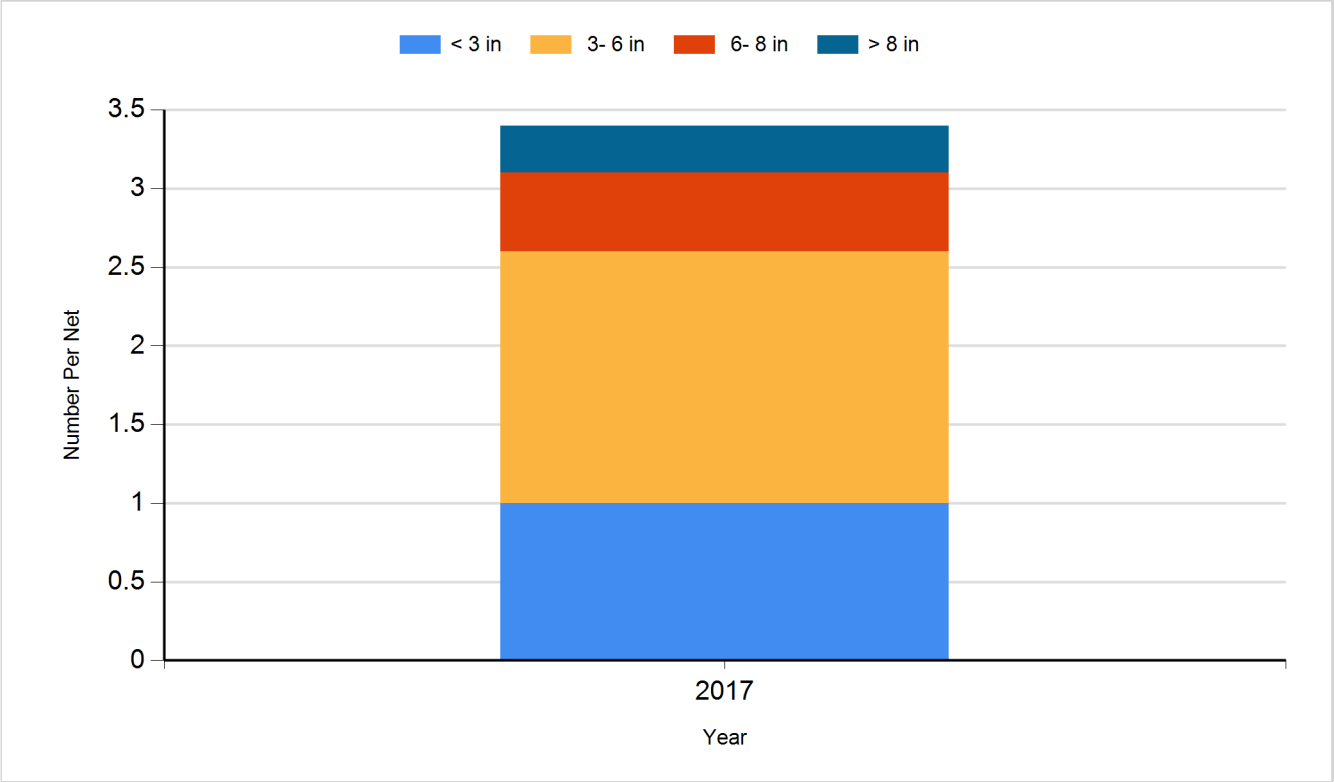


2020

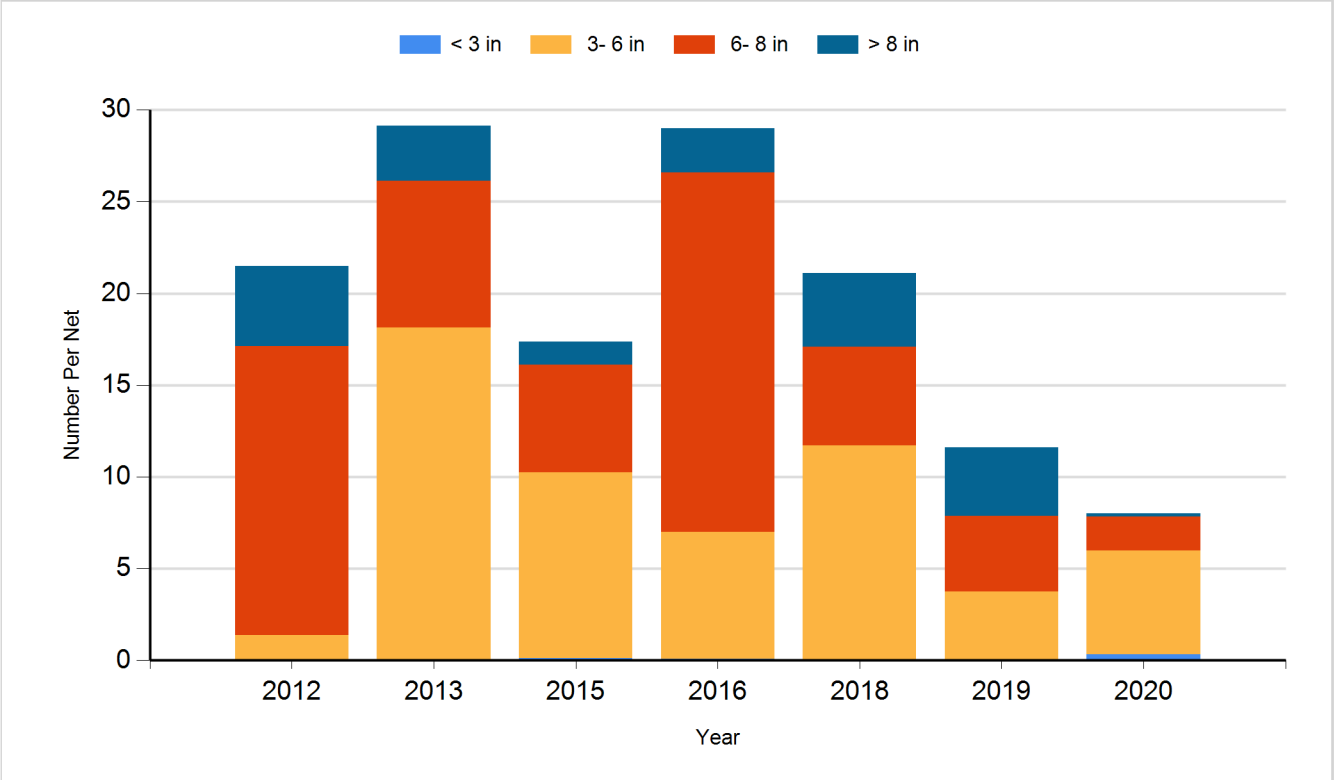
Historic Fish Sizes and Relative Abundance

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

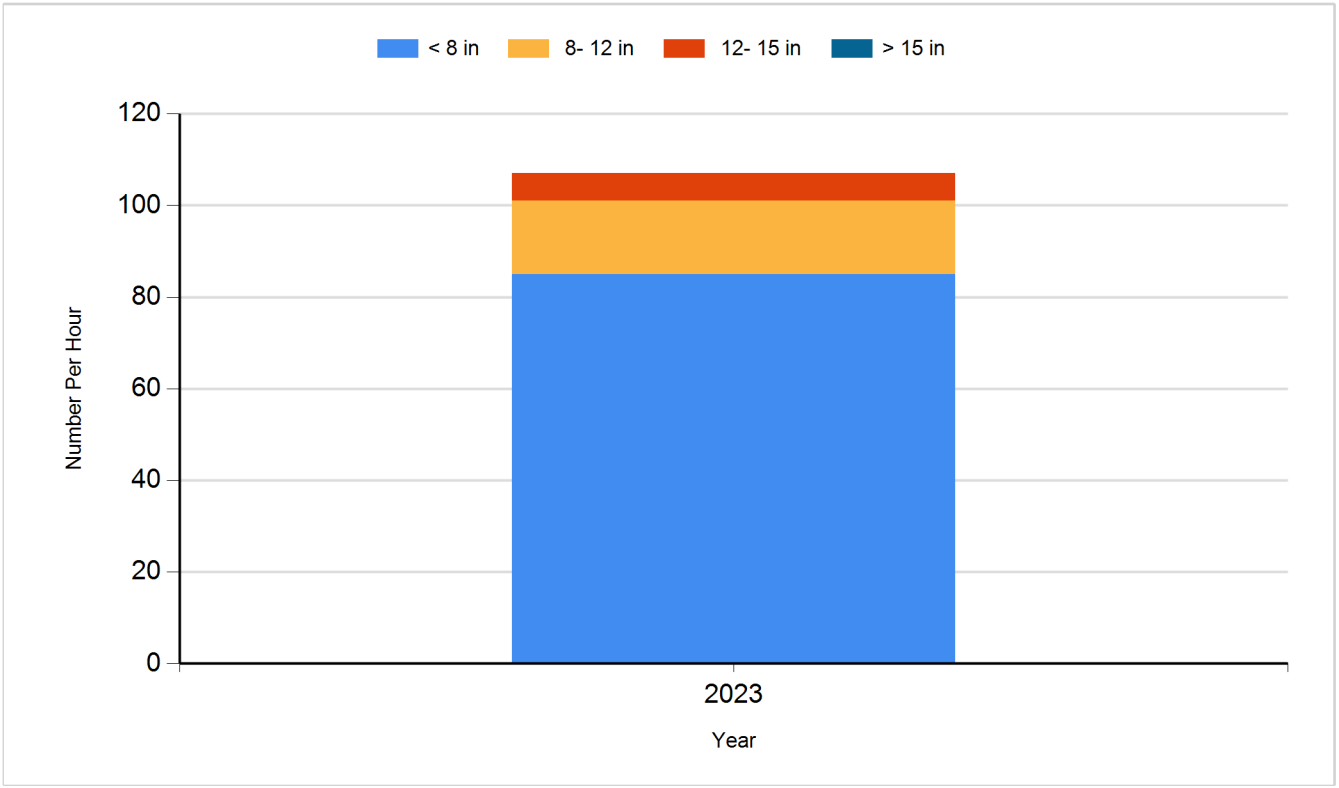
Species: Bluegill
Gear: AFS std frame net



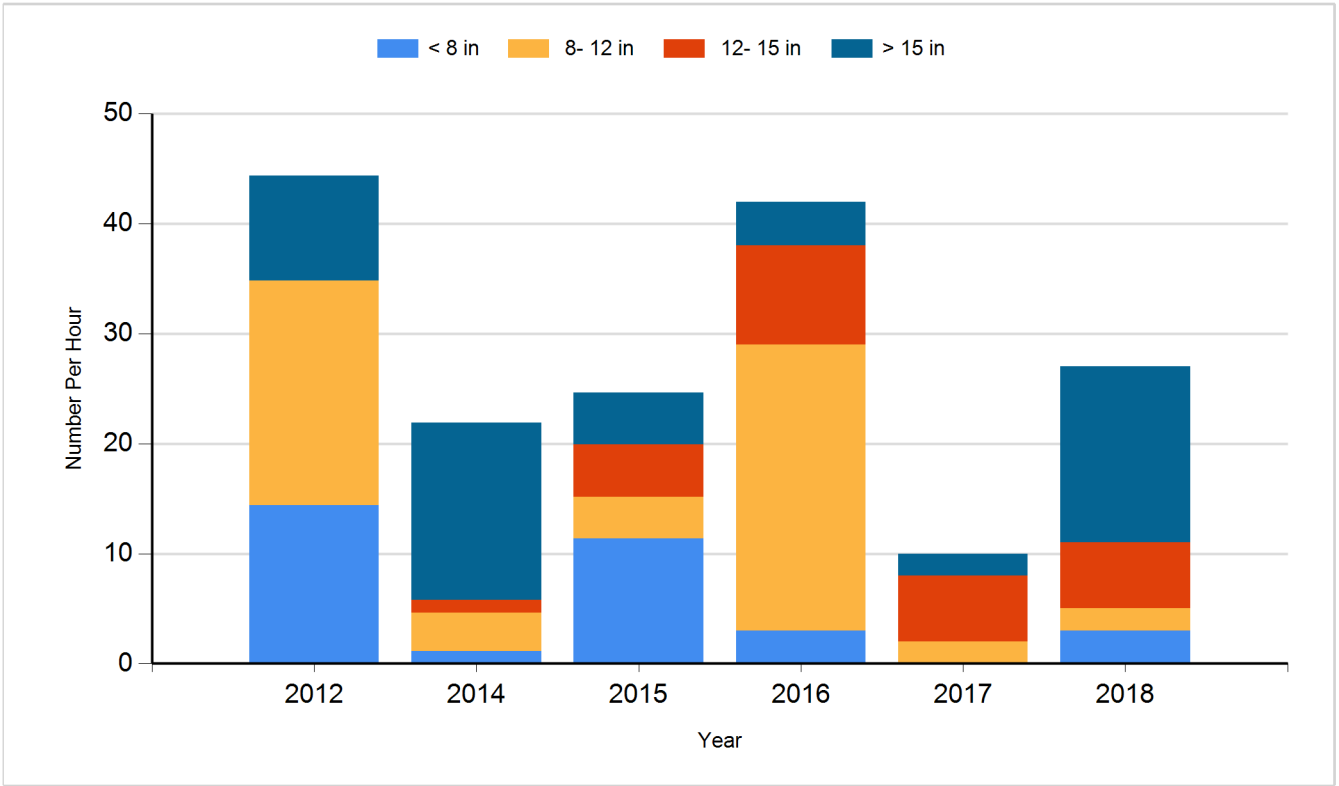
Species: Bluegill
Gear: frame net (std 3/4 in)



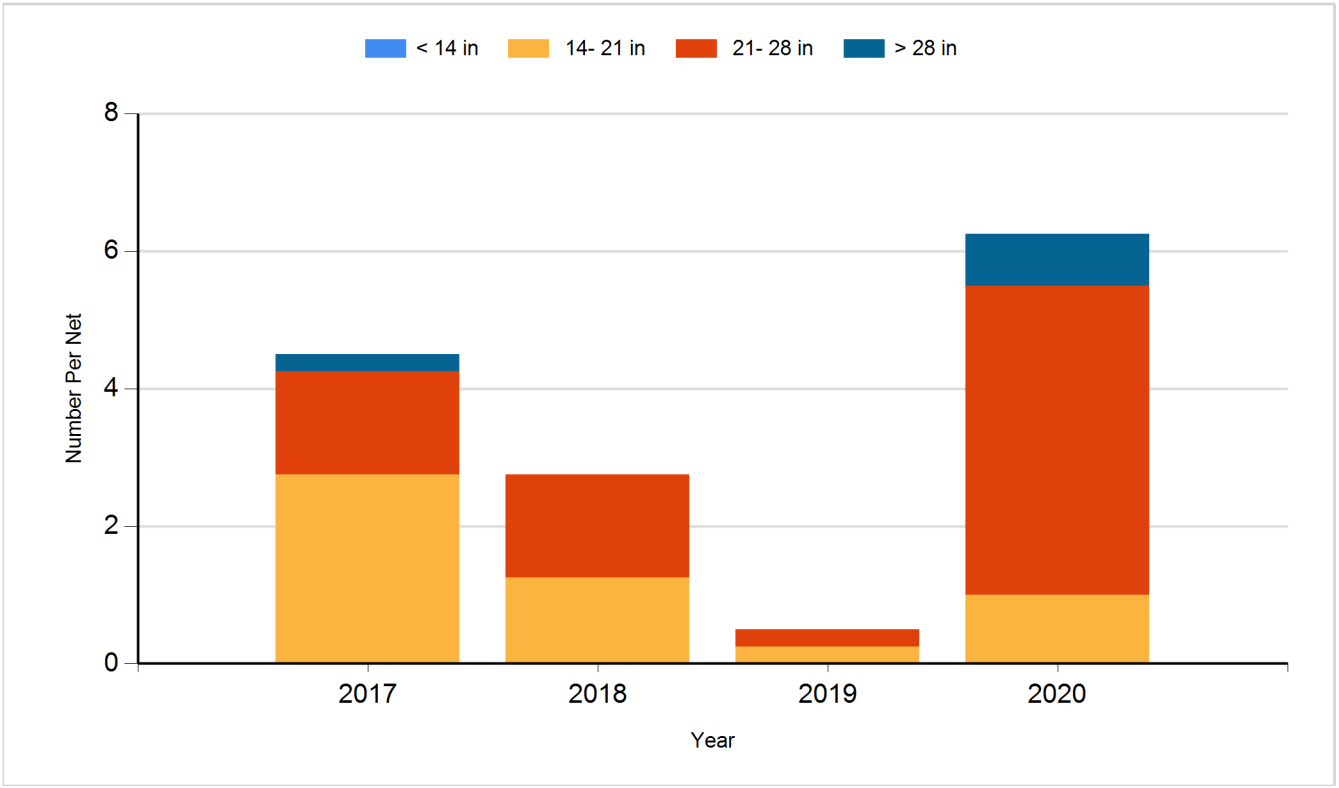
Species: Largemouth Bass
Gear: boat shocker (day)



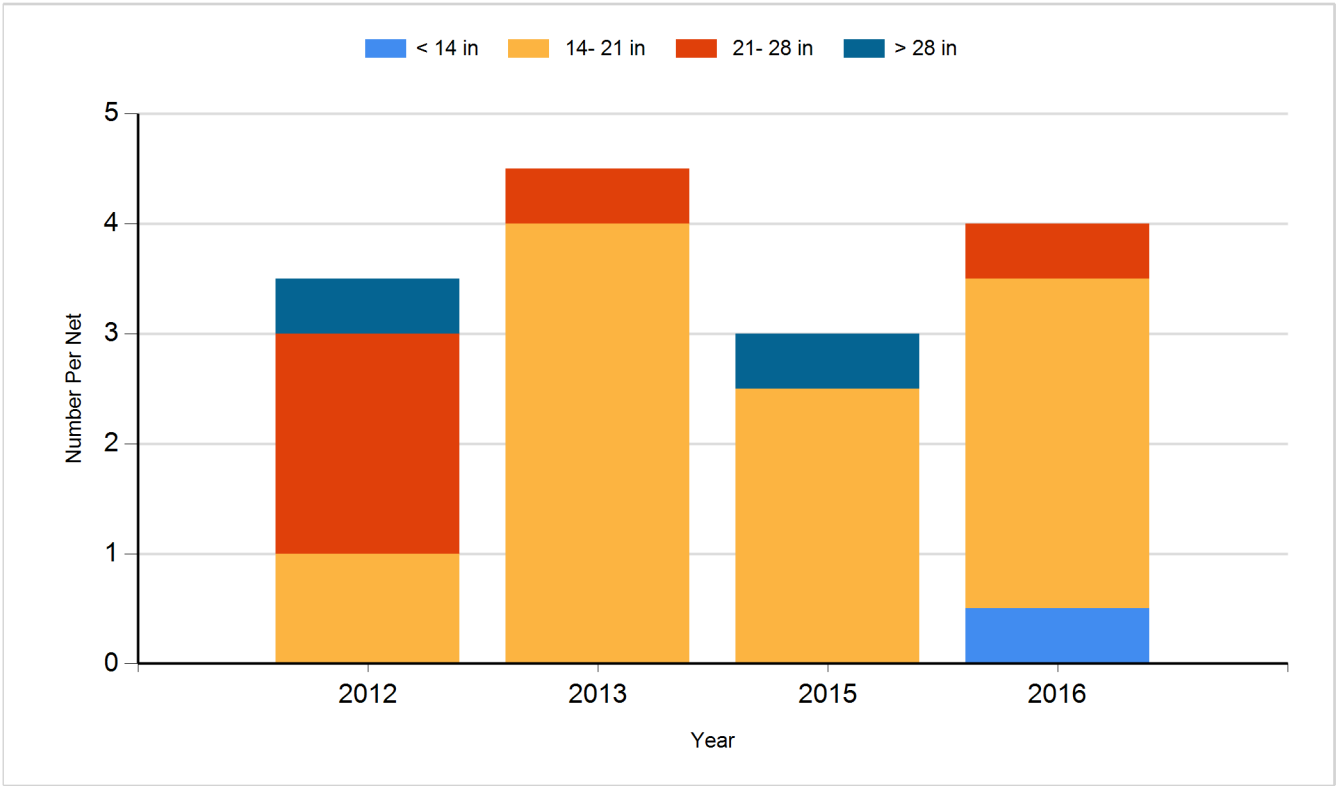
Species: Largemouth Bass
Gear: boat shocker (night)



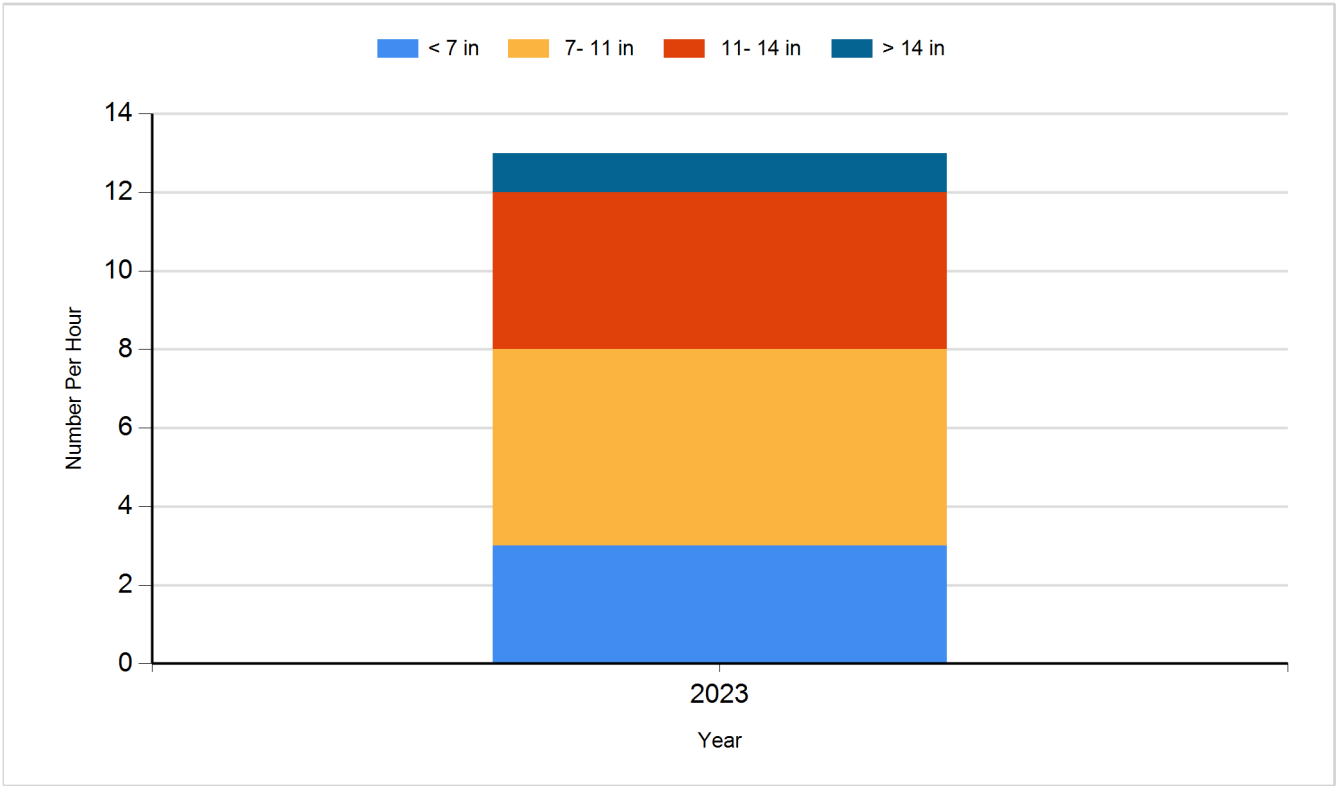
Species: Northern Pike
Gear: AFS std gill net



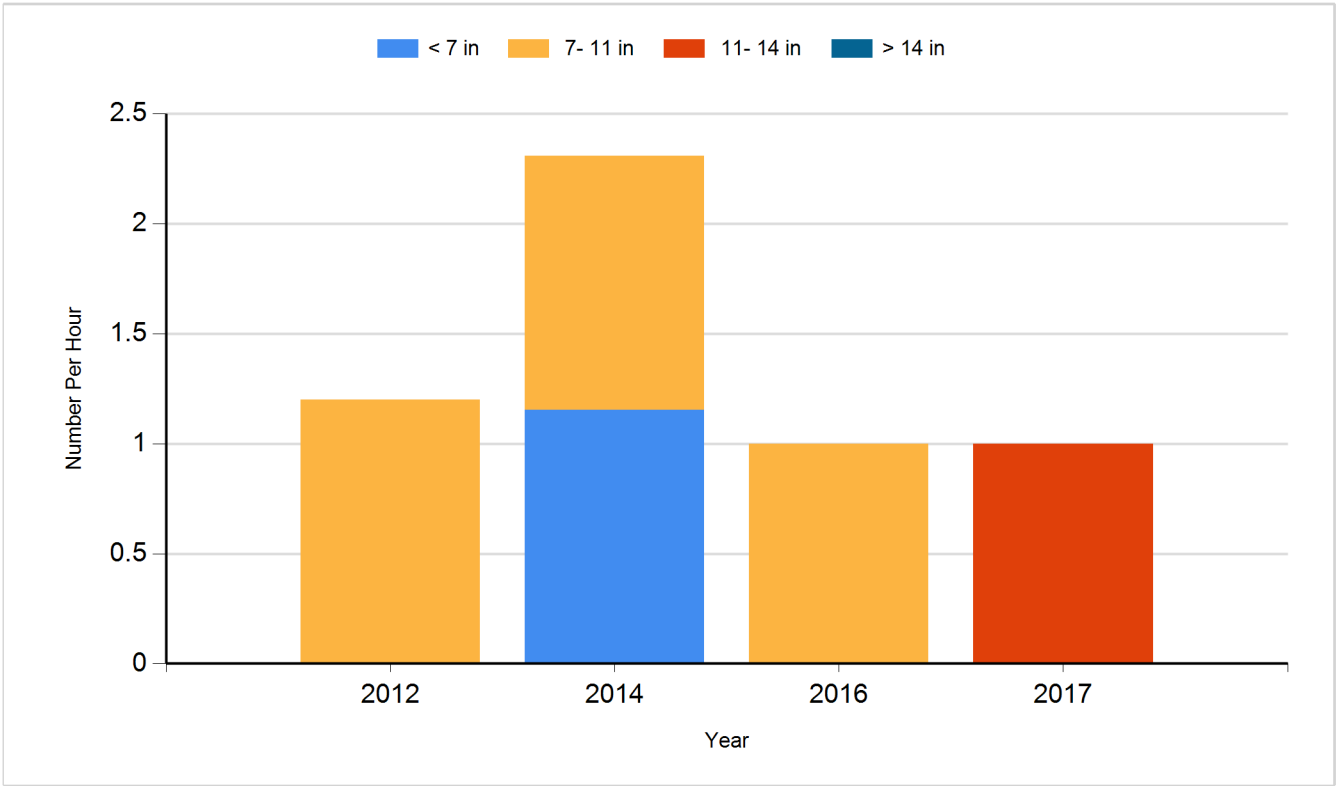
Species: Northern Pike
Gear: std exp gill net



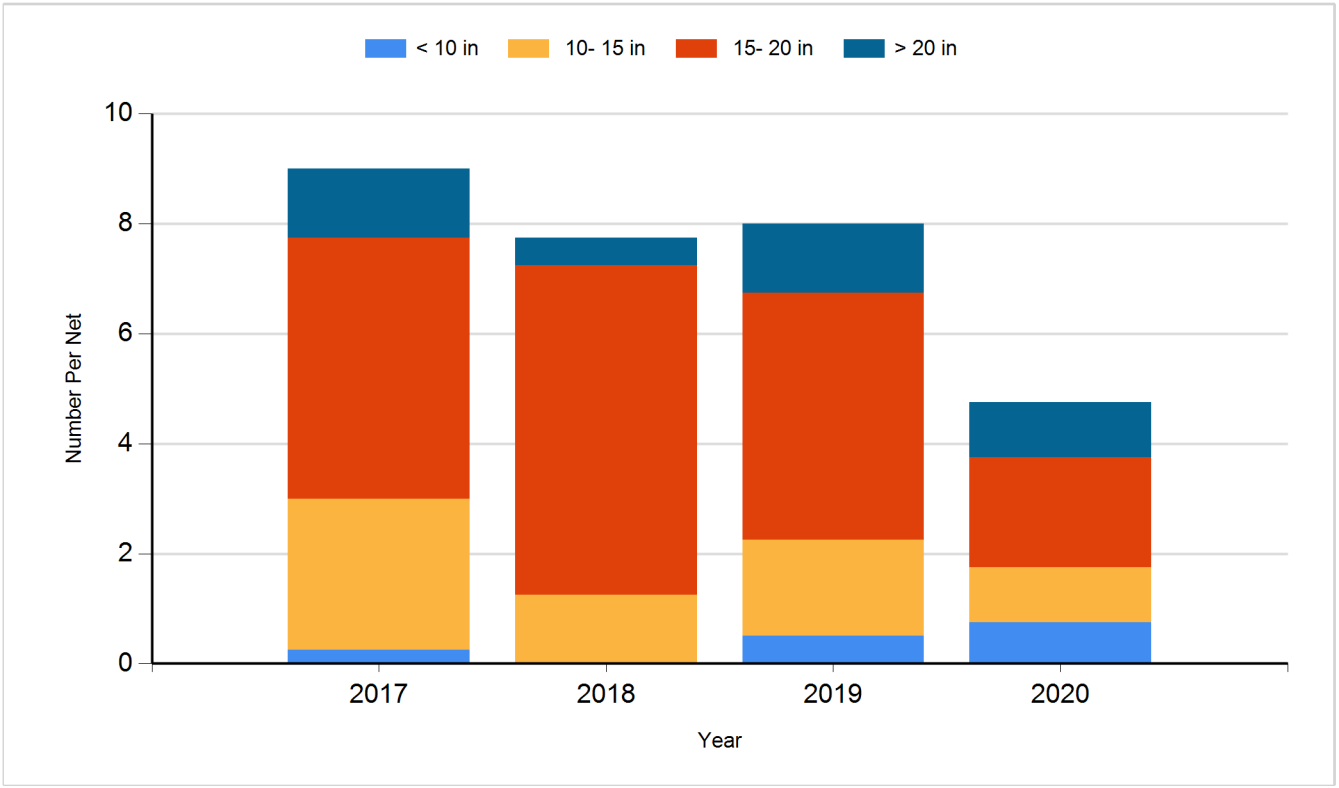
Species: Smallmouth Bass
Gear: boat shocker (day)



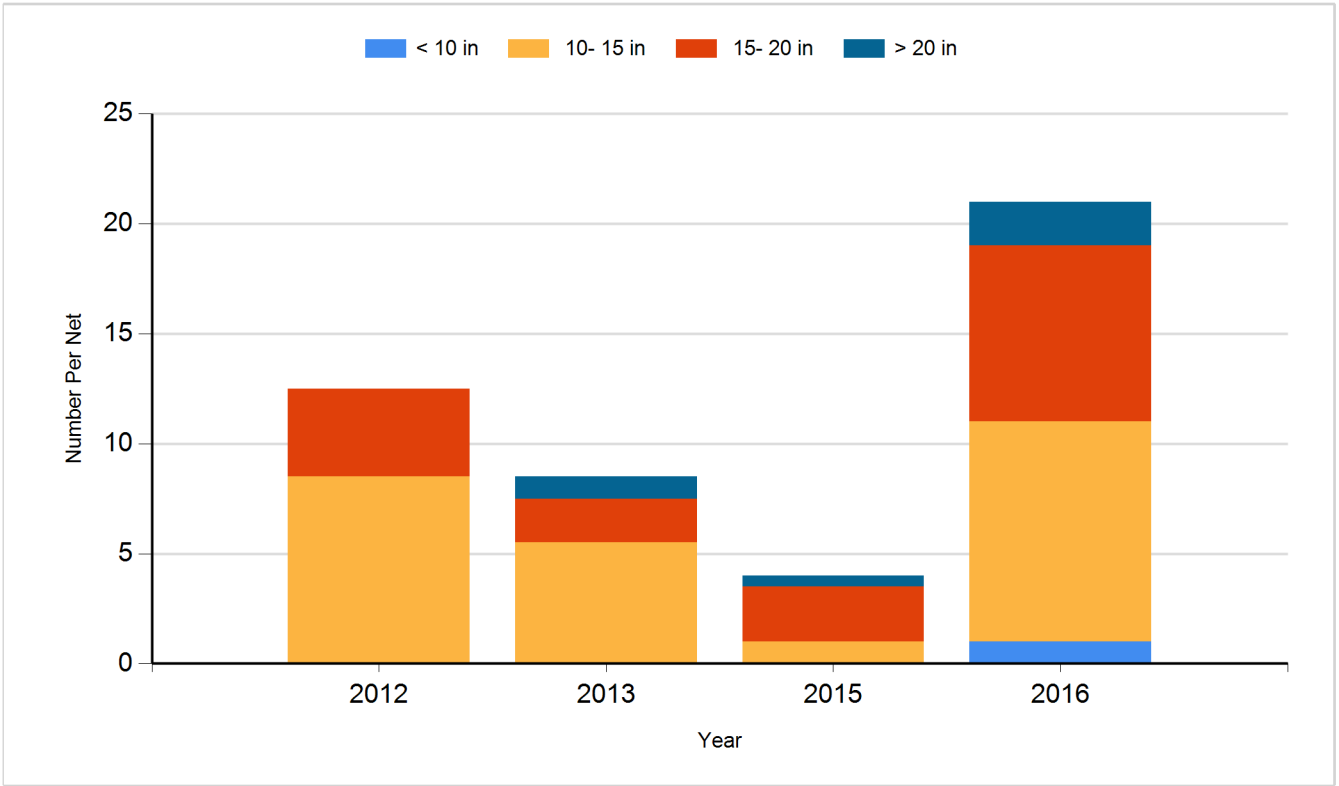
Species: Smallmouth Bass
Gear: boat shocker (night)



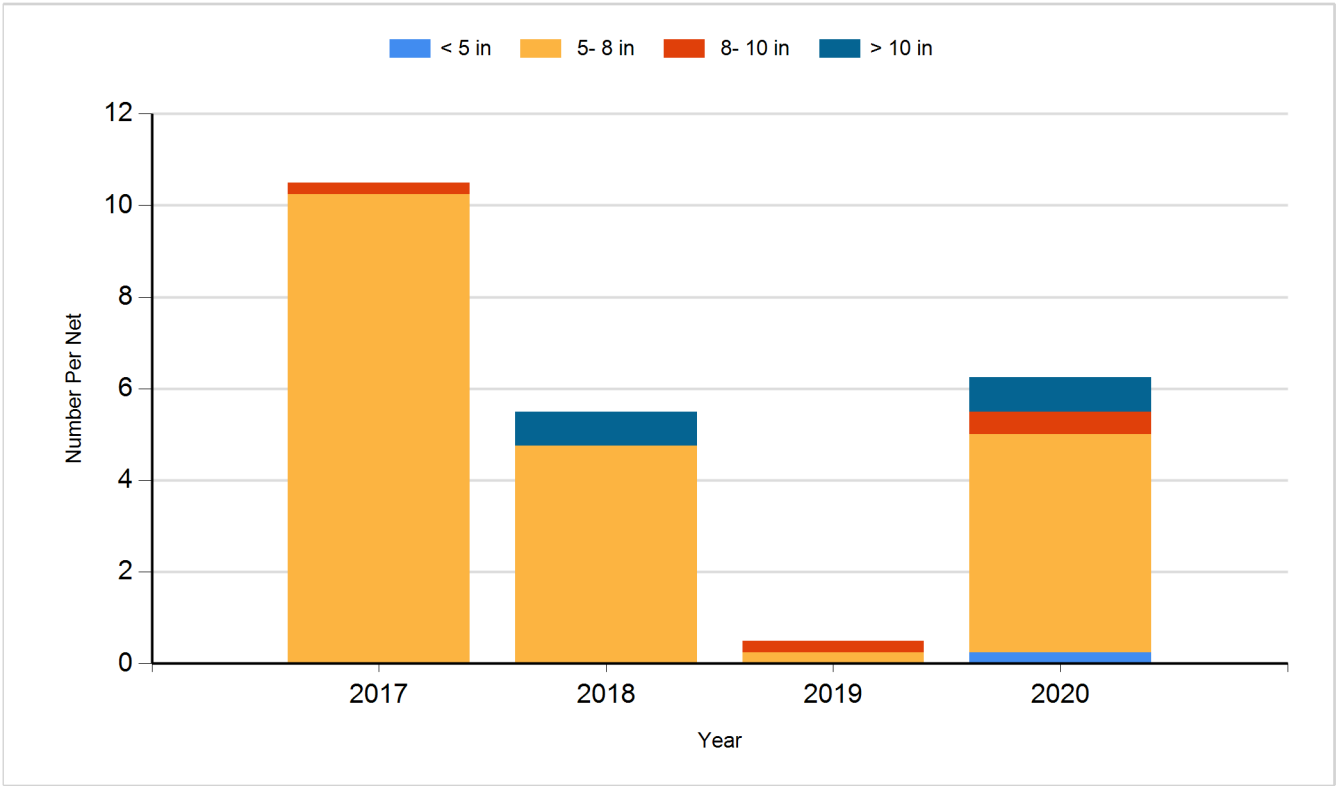
Species: Walleye
Gear: AFS std gill net



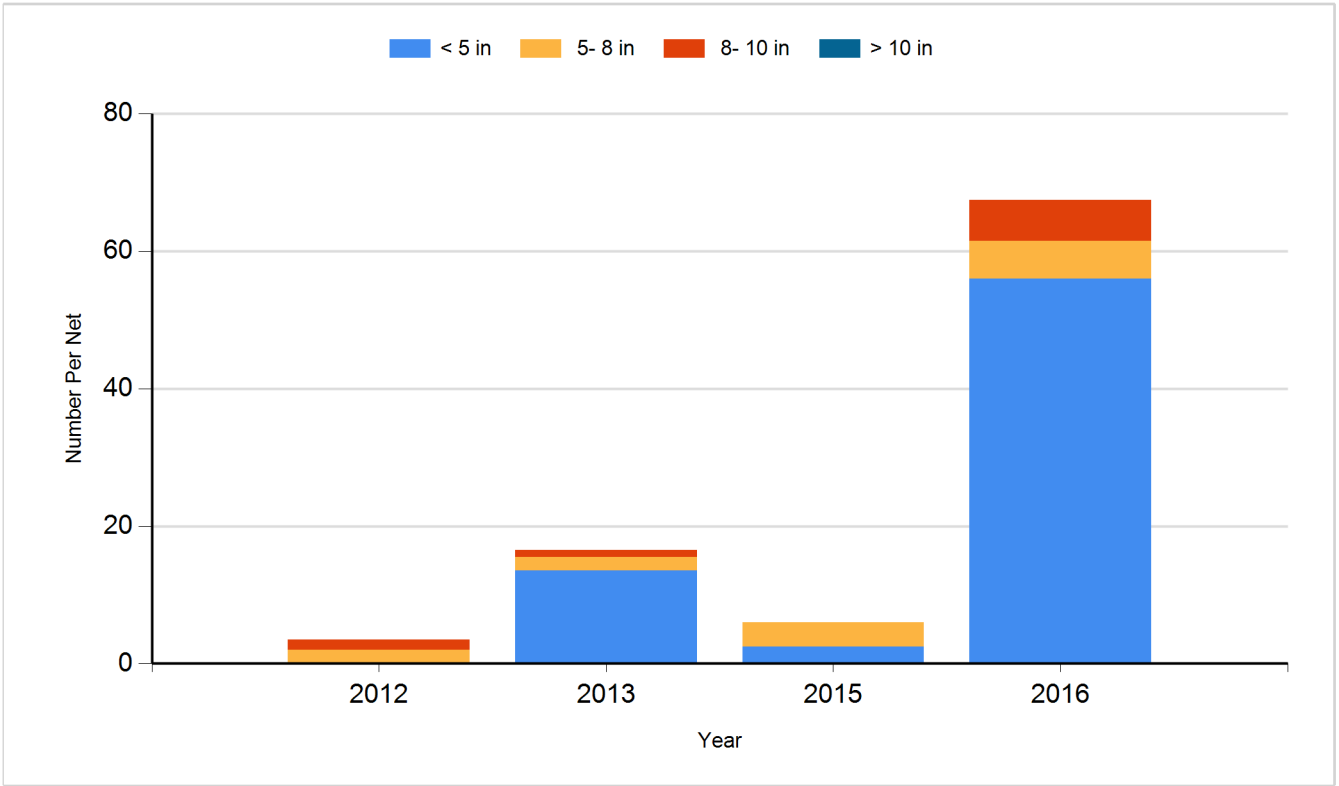
Species: Walleye
Gear: std exp gill net



Species: 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
2012	Largemouth Bass	Adult	540
2012	Largemouth Bass	Fingerling	9,120
2012	Smallmouth Bass	Fingerling	5,130
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