SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Island, Minnehaha County
LBS-Lake-213-800
2021

Lake Information

Name: Island

County: Minnehaha

Surface Area: 458 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 22, 2021	6 net-nights
frame net (std 3/4 in)	Jul 22, 2021	5 net-nights

Common Fish Species Present

Smallmouth Bass

Bluegill

Black Bullhead

Black Crappie

Yellow Perch

Walleye

Common Carp

Green Sunfish

Northern Pike

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	Black Bullhead	41	6.8	5.1	10		0			
	Black Crappie	2	0.3	0.5	0		0		109	
	Common Carp	3	0.5	0.5	100		100			
	Smallmouth Bass	20	3.2	1.2	0		0		85	2
	Walleye	5	0.5	0.7	0		0		81	1
	Yellow Perch	8	1.3	0.7	88		50		98	3
frame net (std 3/4 in)	Black Bullhead	12	2.4	2.0	8		0			
	Black Crappie	29	5.8	2.8	52	14	3		104	2
	Bluegill	70	14.0	4.7	87	6	4		112	4
	Green Sunfish	2	0.4	0.4	50		0		91	5
	Northern Pike	1	0.2	0.3	100		0		75	
	Smallmouth Bass	200	37.0	11.2	19	4	10	3	80	1
	Sunfish Hybrid	10	0.0	0.0						
	Walleye	9	1.0	0.7	20		0		79	4
	Yellow Perch	4	0.8	0.9	100		75		97	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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg
AFS std frame net	Black Bullhead						3.2					3.20
	Black Crappie						0.2					0.20
	Common Carp						0.2					0.20
	Northern Pike						0.2					0.20
	Smallmouth Bass						1.6					1.60
	Sunfish Hybrid						0.0					0.00
	Walleye						1.4					1.40
AFS std gill net	Black Bullhead						5.5	0.2	0.0		6.8	3.13
	Black Crappie						0.0	0.0	0.0		0.3	0.08
	Common Carp						1.0	0.5	0.3		0.5	0.58
	Smallmouth Bass						1.5	0.5	0.3		3.2	1.38
	Walleye						2.5	2.3	0.5		0.5	1.45
	Yellow Perch						2.2	0.2	2.8		1.3	1.63
frame net (std 3/4 in)	Black Bullhead		150.9	163.4	171.8	16.4		7.2	0.2		2.4	73.19
	Black Crappie		0.0	0.0	0.0	0.4		0.2	0.2		5.8	0.94
	Bluegill		0.9	0.6	0.4	0.4		0.2	0.6		14.0	2.44
	Common Carp		13.1	0.8	0.0	0.2		1.8	0.0		0.0	2.27
	Green Sunfish		0.2	0.0	0.2	0.0		0.0	0.0		0.4	0.11
	Muskellunge		0.1	0.0	0.0	0.0		0.0	0.0		0.0	0.01
	Northern Pike		1.0	0.2	0.4	0.2		0.2	0.2		0.2	0.34
	Smallmouth Bass		2.6	0.8	1.0	1.6		20.2	11.6		37.0	10.69
	Sunfish Hybrid		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.00
	Walleye		0.1	0.0	0.0	0.2		1.2	0.4		1.0	0.41
	Yellow Perch		0.0	1.2	0.0	0.2		0.0	1.2		0.8	0.49
std exp gill net	Black Bullhead		111.7	112.0	99.0	36.3						89.75
	Common Carp		4.0	1.0	0.7	2.3						2.00
	Muskellunge		0.3	0.0	0.0	0.0						0.08
	Northern Pike		0.3	0.0	0.0	0.0						0.08
	Smallmouth Bass		0.0	0.0	0.3	0.0						0.08
	Walleye		0.7	1.7	1.3	4.0						1.93
	Yellow Perch		1.7	0.0	3.7	5.0						2.60

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFS std frame net	Black Bullhead	PSD						100				
		PSD-P						63				
	Black Crappie	PSD						0				
		PSD-P						0				
		Wr						105				
	Common Carp	PSD						100				
		PSD-P						100				
	Northern Pike	PSD						100				
		PSD-P						100				
		Wr						82				
	Smallmouth Bass	PSD						50				
		PSD-P						13				
		Wr						94				
	Walleye	PSD						14				
		PSD-P						0				
		Wr						87				
AFS std gill net	Black Bullhead	PSD						100	100			10
		PSD-P						48	100			0
	Black Crappie	PSD										0
		PSD-P										0
		Wr										109
	Common Carp	PSD						100	100	50		100
		PSD-P						100	100	50		100
	Smallmouth Bass	PSD						0	0	0		0
		PSD-P						0	0	0		0
		Wr						92	98	86		85
	Walleye	PSD						33	7	33		0
		PSD-P						33	7	33		0
		Wr						88	86	76		81
	Yellow Perch	PSD						92	0	35		88
		PSD-P						23	0	0		50
		Wr						99	105	103		98

			Year									
Gear	Species	Index	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
frame net (std 3/4 in)	Black Bullhead	PSD		95	94	100	98		97	0		8
		PSD-P		2	0	9	18		92	0		0
		Wr		88								
	Black Crappie	PSD					100		100	0		52
		PSD-P					0		100	0		3
		Wr					96		103	115		104
	Bluegill	PSD		100	100	50	50		0	0		87
		PSD-P		33	0	50	50		0	0		4
		Wr		112	103	116	111		139	135		112
	Common Carp	PSD		95	100		100		78			
		PSD-P		2	75		100		78			
		Wr		101								
	Green Sunfish	PSD		100		100						50
		PSD-P		0		0						0
		Wr		111		111						91
	Northern Pike	PSD		100	100	100	100		100	100		100
		PSD-P		30	0	0	100		0	0		0
		Wr		79	74	79	73		74	90		75
	Smallmouth Bass	PSD		54	50	80	63		50	55		19
		PSD-P		19	25	0	0		13	14		10
		Wr		87	83	83	81		91	88		80
	Walleye	PSD		100			100		50	100		20
		PSD-P		100			0		17	50		0
		Wr		91			84		87	77		79
	Yellow Perch	PSD			100		0			67		100
		PSD-P			0		0			17		75
		Wr			91		87			97		97
std exp gill net	Black Bullhead	PSD		89	90	98	98					
		PSD-P		1	0	2	11					
		Wr		91								
	Common Carp	PSD		100	100	100	100					
		PSD-P		0	33	50	100					
		Wr		103								
	Northern Pike	PSD		100								
		PSD-P		100								
		Wr		83								
	Smallmouth Bass	PSD		0		0						

			Year									
Gear	Species	Index	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
std exp gill net	Smallmouth Bass	PSD-P		0		0						
		Wr				94						
	Walleye	PSD		100	100	50	0					
		PSD-P		100	80	25	0					
		Wr		94	89	90	82					
	Yellow Perch	PSD		20		45	20					
		PSD-P		0		0	7					
		Wr		100		99	111					

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+
2013	2				555 (1)						644 (1)

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	4		188 (4)								

Fish Condition

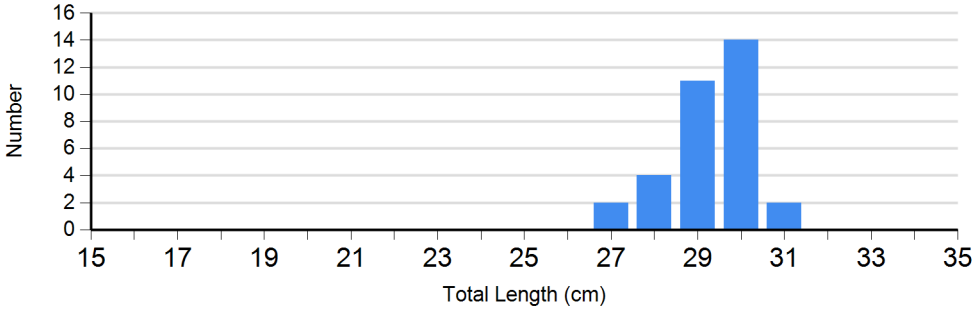
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2017	1	105	0		0		0	
	2018	0		0		0		1	103
	2019	1	115	0		0		0	
	2021	14	106 (1.6)	14	103 (2.0)	1	94	0	
Bluegill Frame Net	2018	1	139	0		0		0	
	2019	3	135 (10.1)	0		0		0	
	2021	9	139 (18.4)	58	108 (1.9)	3	107 (2.8)	0	
Walleye Gill Net	2017	10	85 (2.6)	0		3	96 (10.3)	2	90 (2.9)
	2018	13	86 (0.9)	0		0		1	89
	2019	2	79 (5.7)	0		0		1	72
	2021	3	81 (1.1)	0		0		0	
Yellow Perch Gill Net	2017	1	96	9	100 (1.9)	3	99 (3.8)	0	
	2018	1	105	0		0		0	
	2019	11	106 (3.3)	6	97 (1.8)	0		0	
	2021	1	105	3	95 (4.8)	4	98 (2.8)	0	

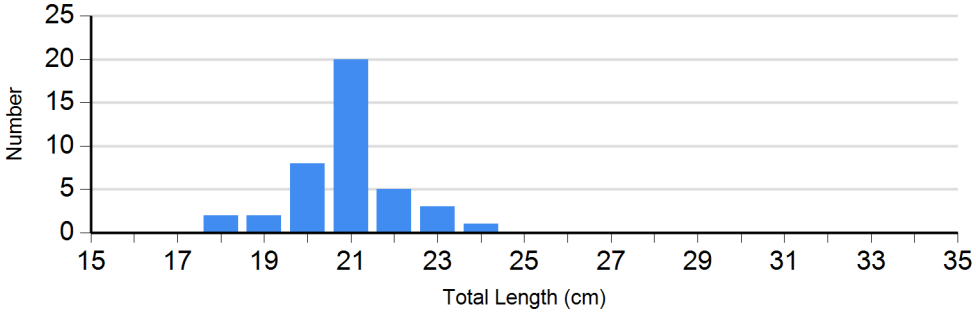
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

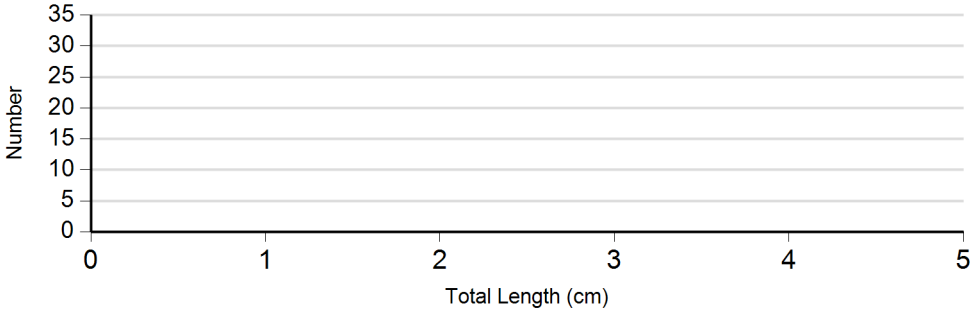


2017



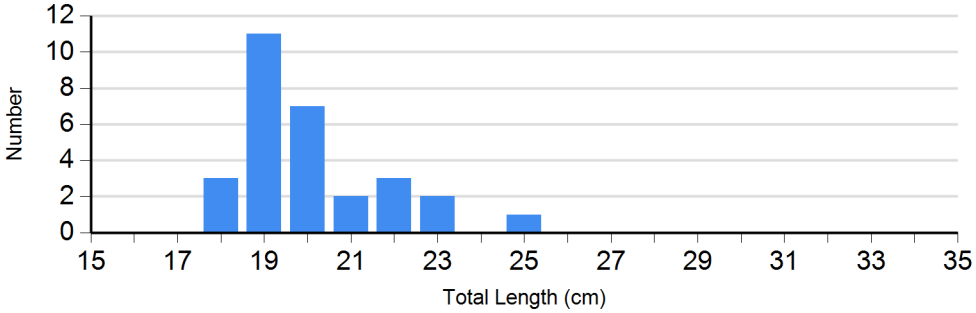
2021

Species: Black Bullhead
Gear: std exp gill net



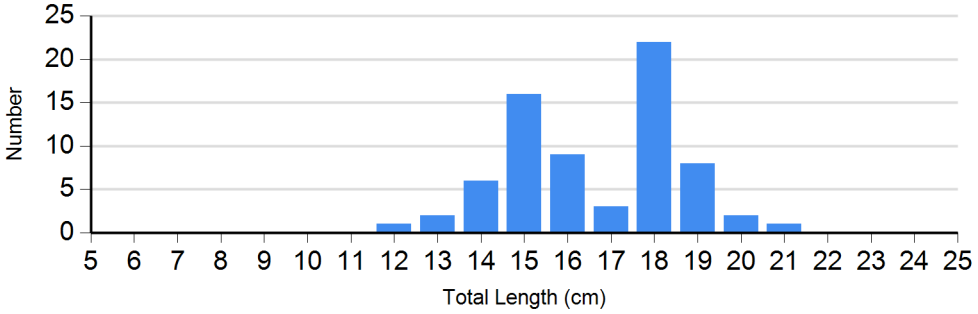
2016

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



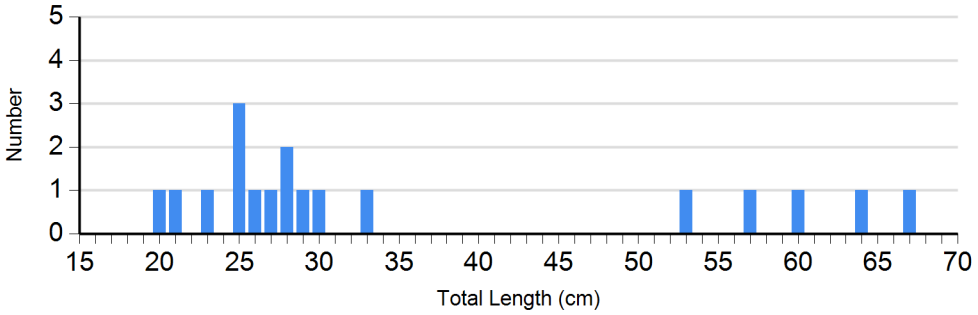
2021

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

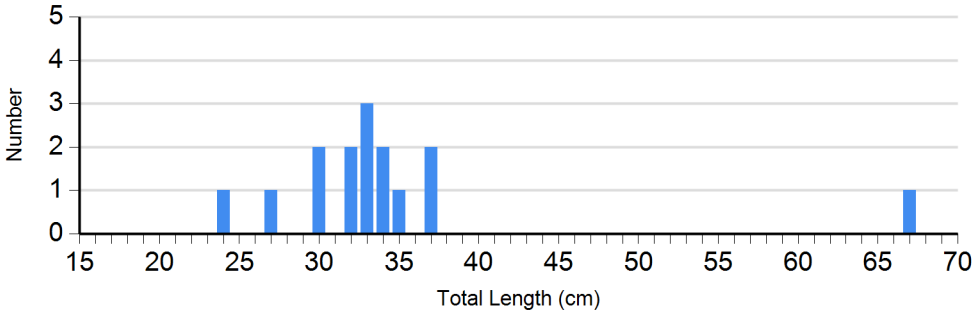


2021

Species: Walleye
Gear: AFS std gill net

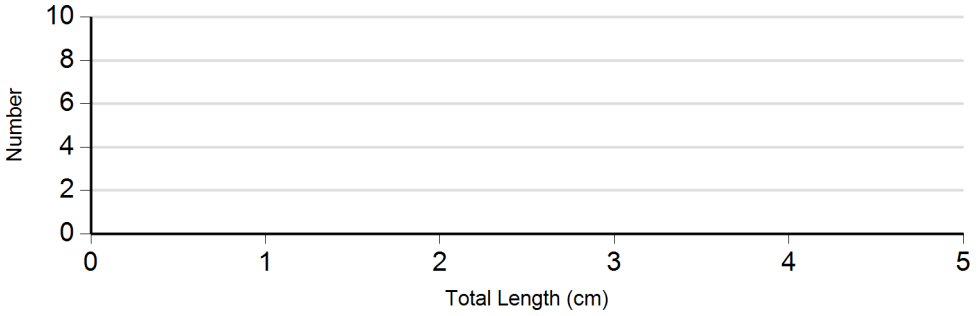


2017



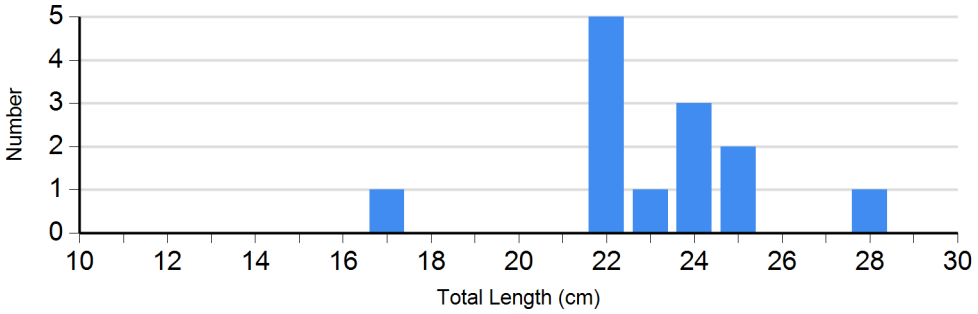
2018

Species: Walleye
Gear: std exp gill net

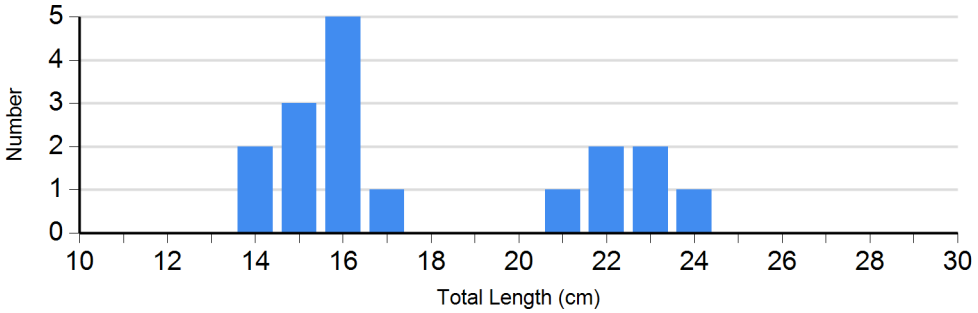


2016

Species: Yellow Perch
Gear: AFS std gill net

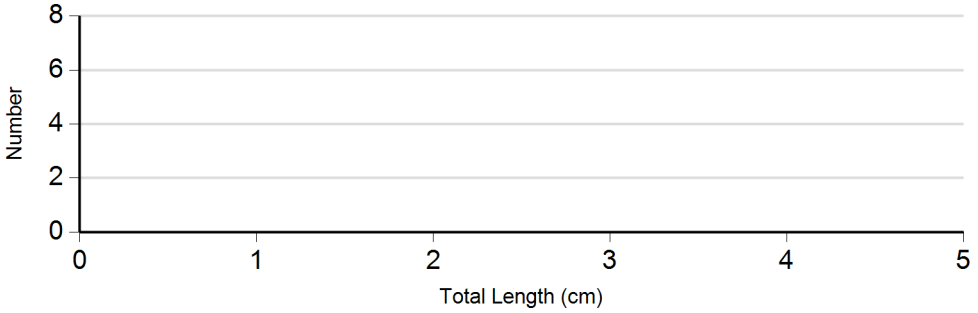


2017



2019

Species: Yellow Perch
Gear: std exp gill net

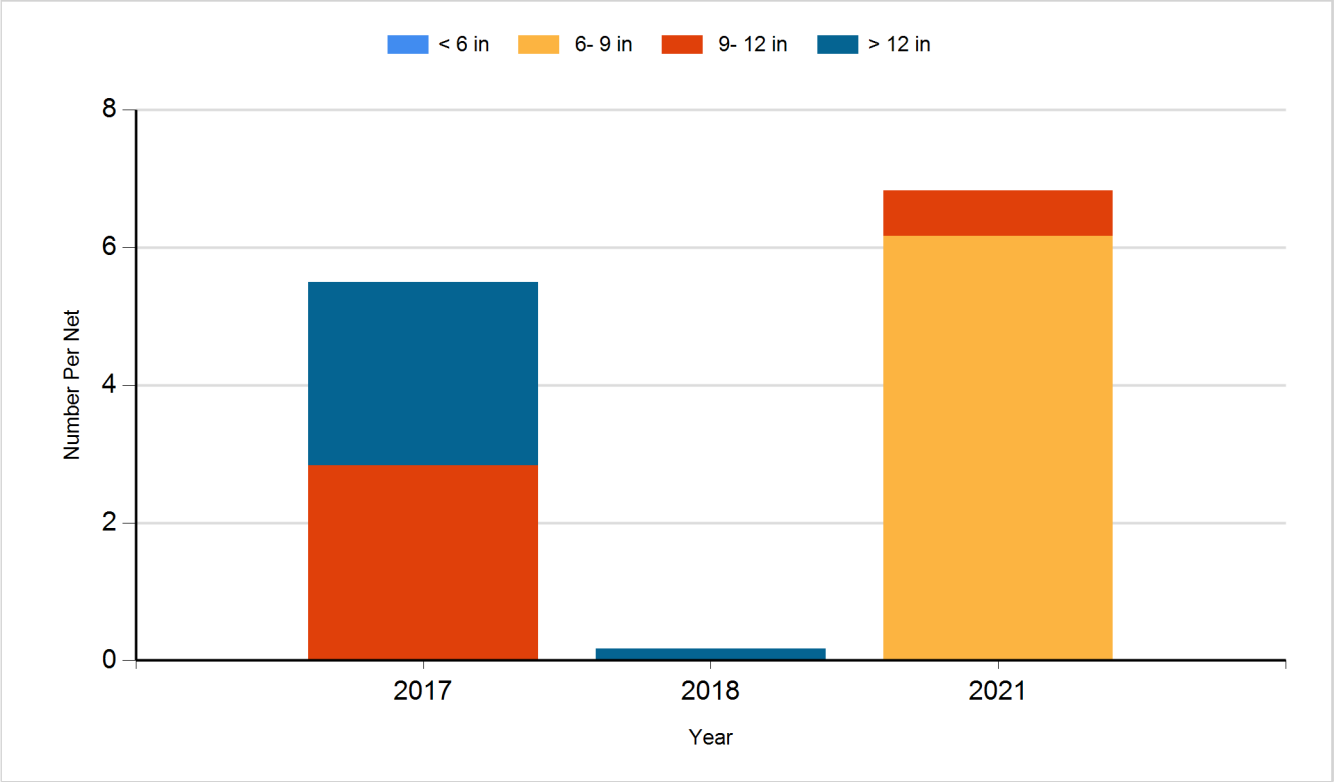


2016

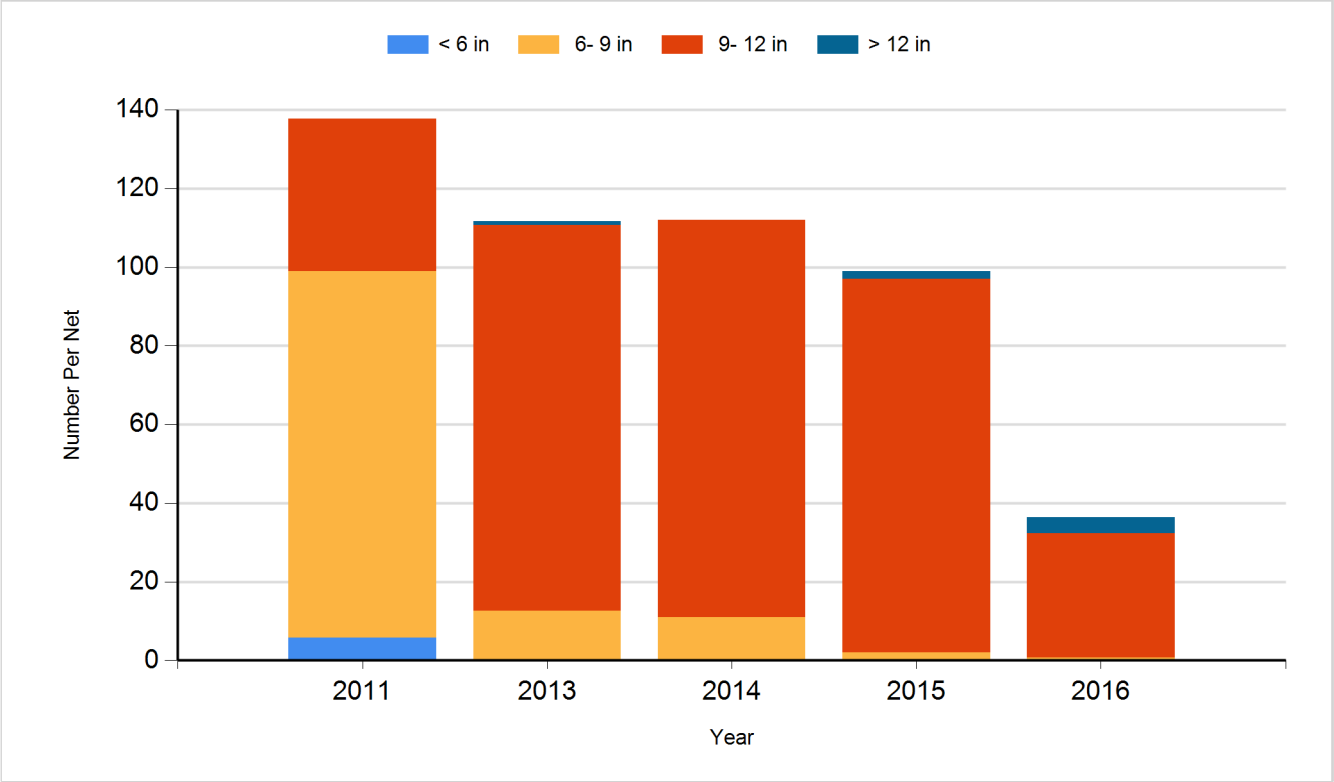
Historic Fish Sizes and Relative Abundance

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

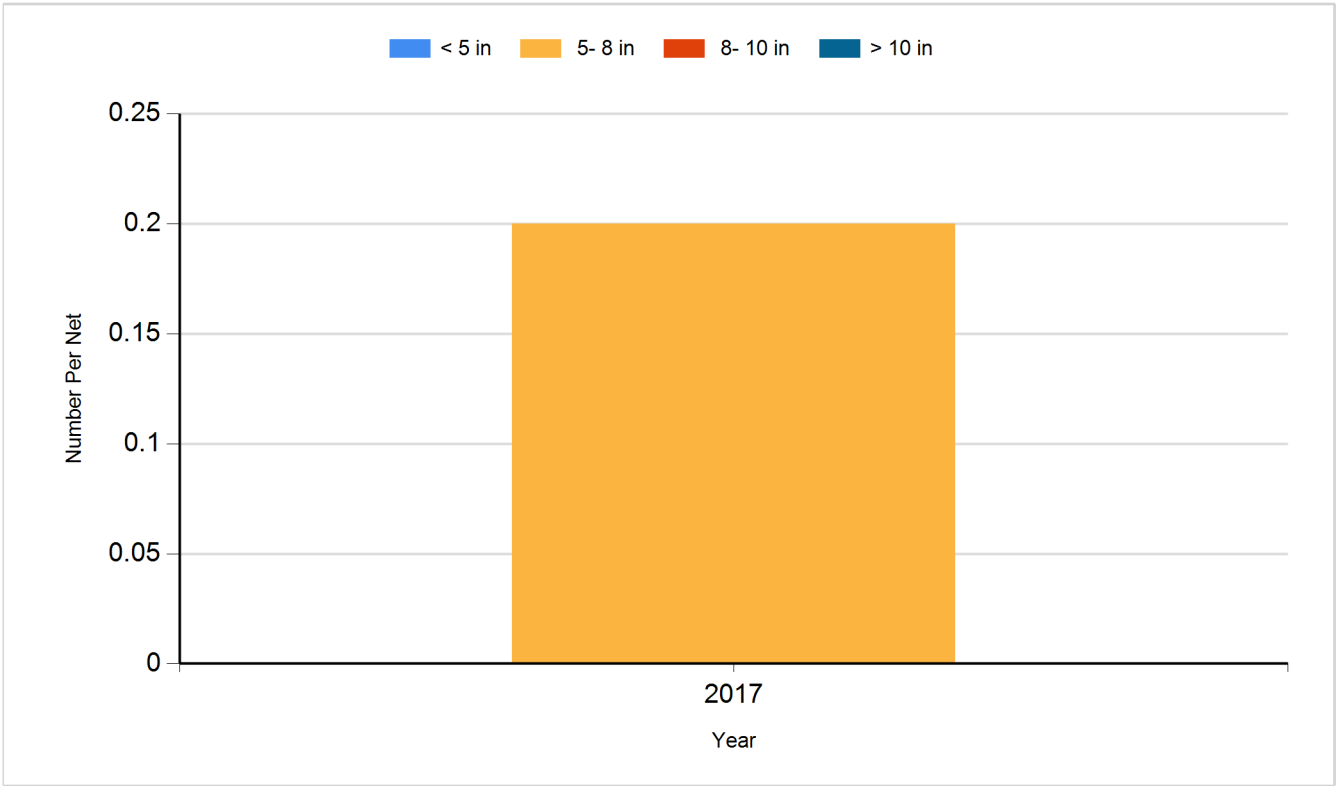
Species: Black Bullhead
Gear: AFS std gill net



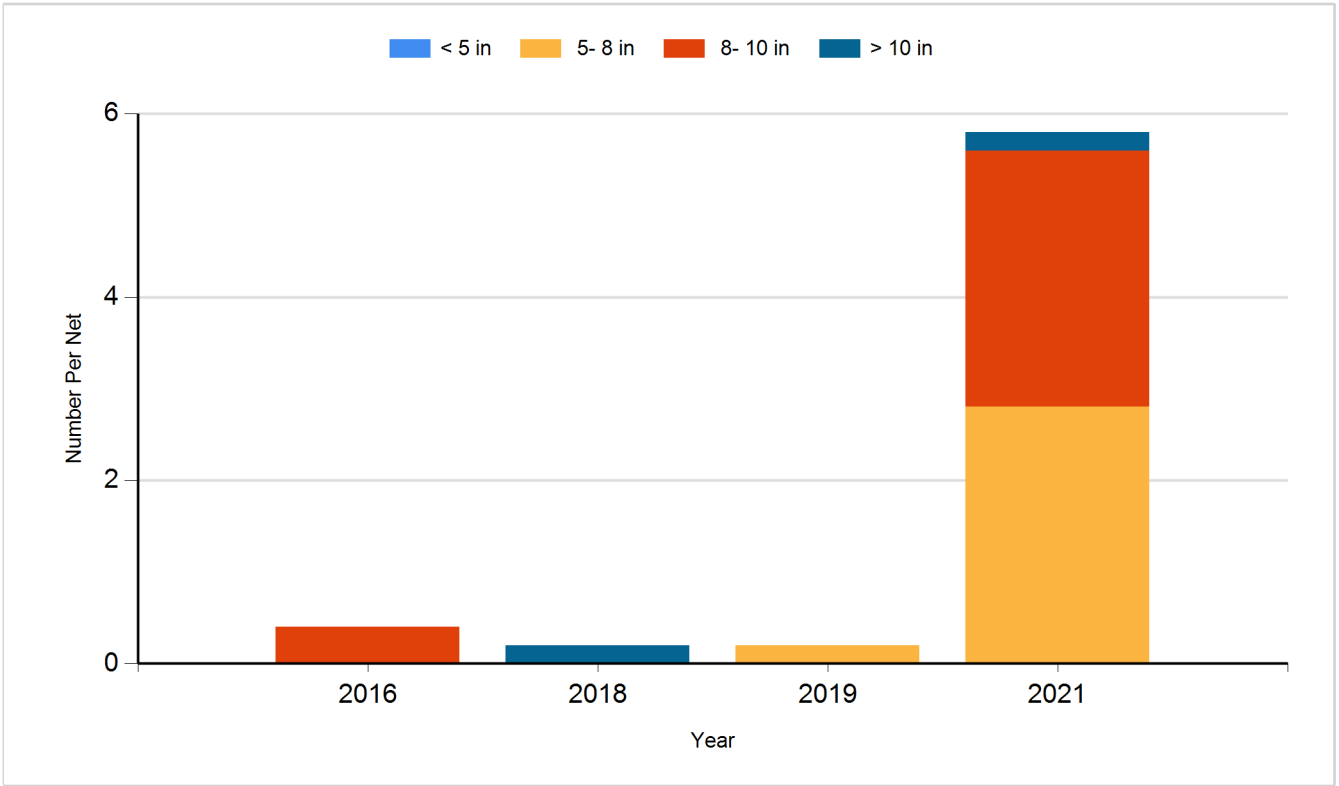
Species: Black Bullhead
Gear: std exp gill net



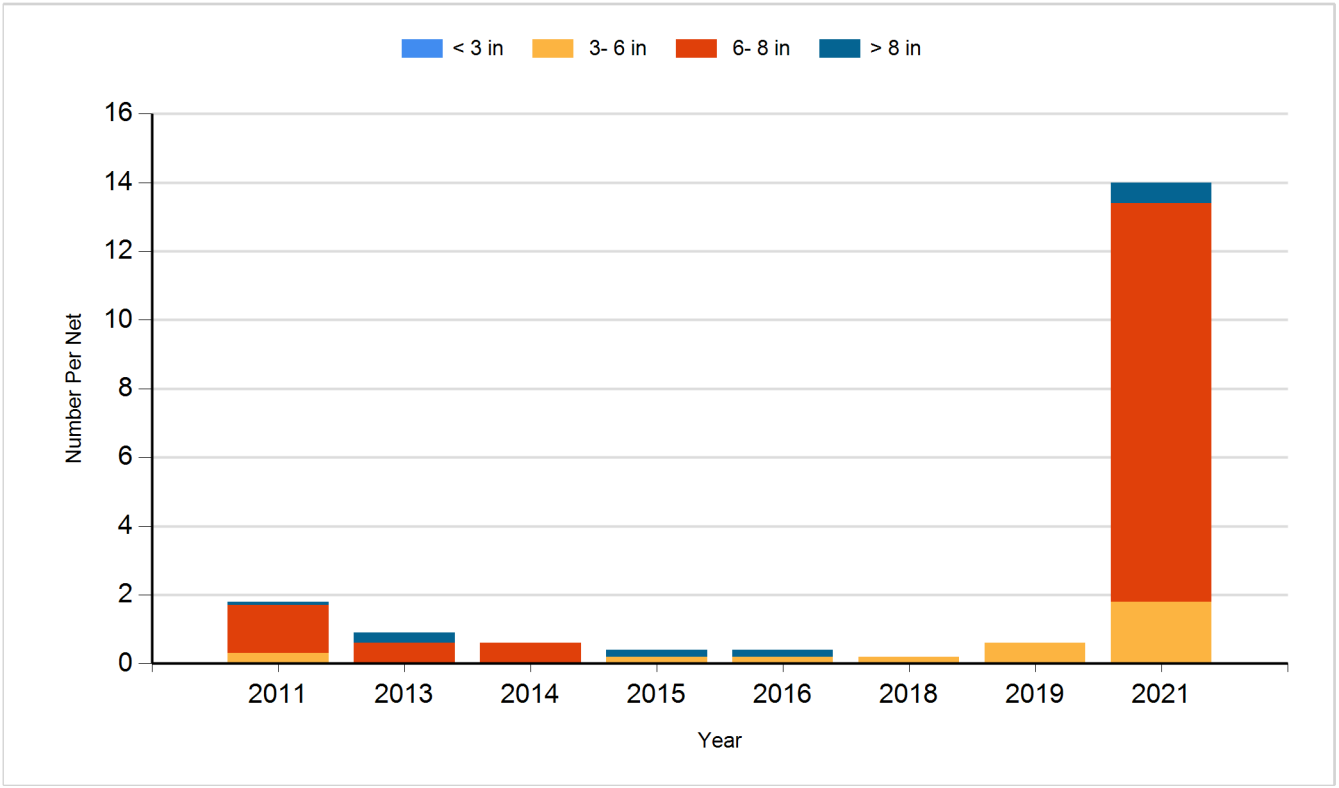
Species: Black Crappie
Gear: AFS std frame net



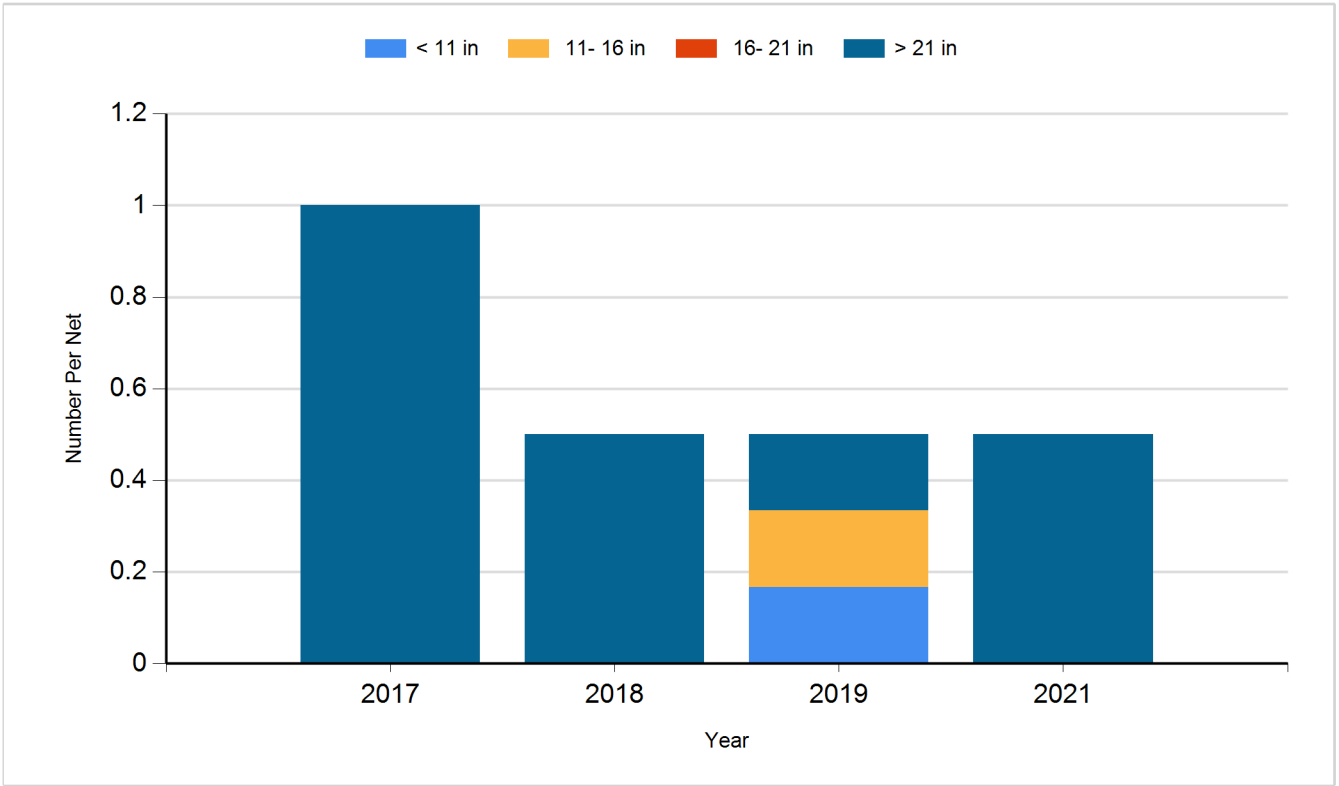
Species: Black Crappie
Gear: frame net (std 3/4 in)



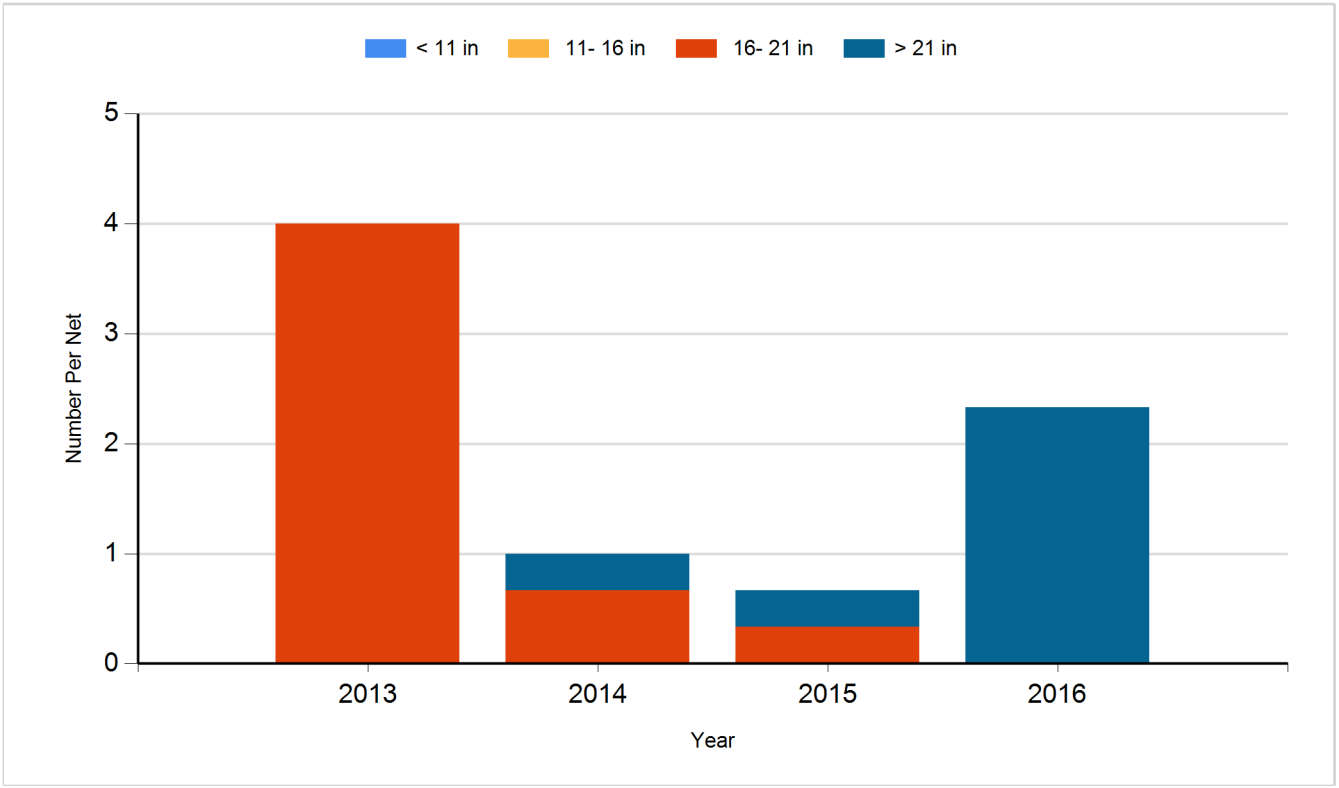
Species: Bluegill
Gear: frame net (std 3/4 in)



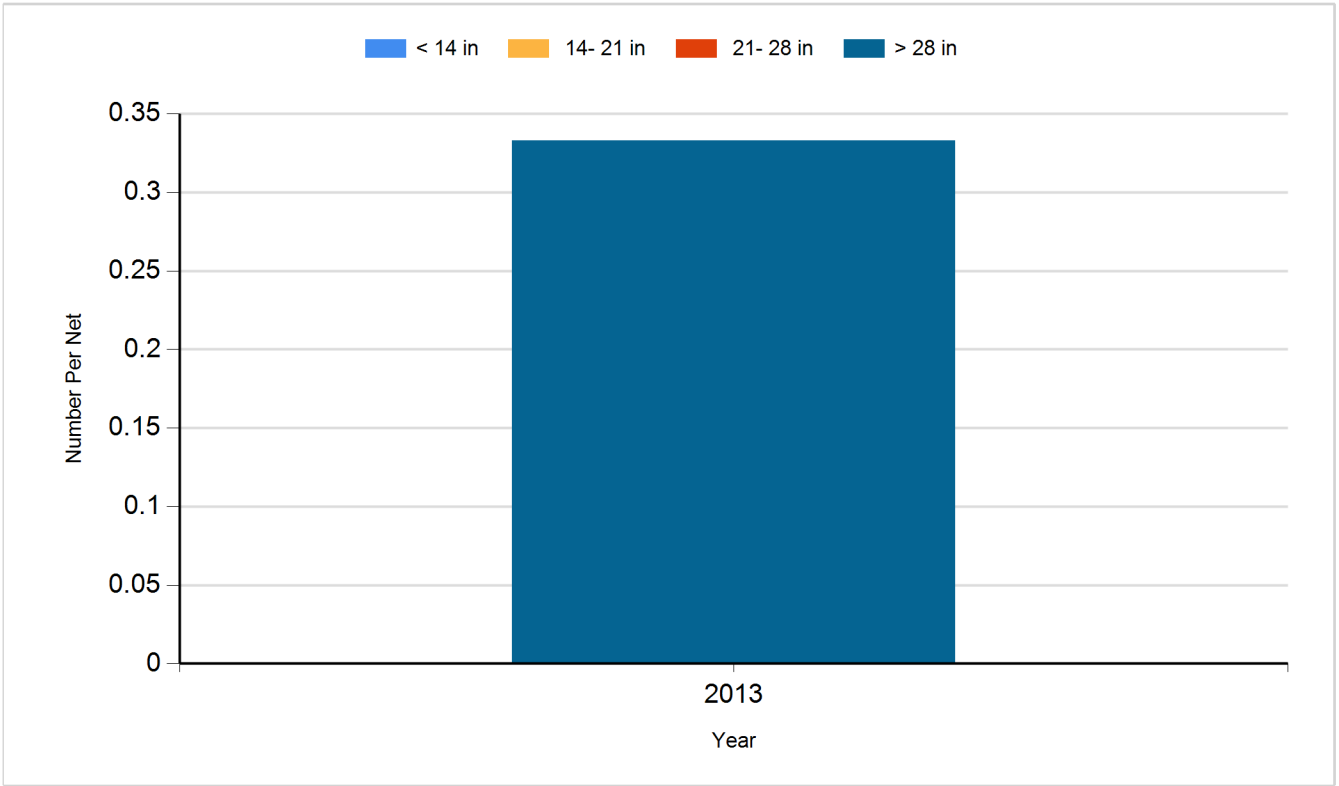
Species: Common Carp
Gear: AFS std gill net



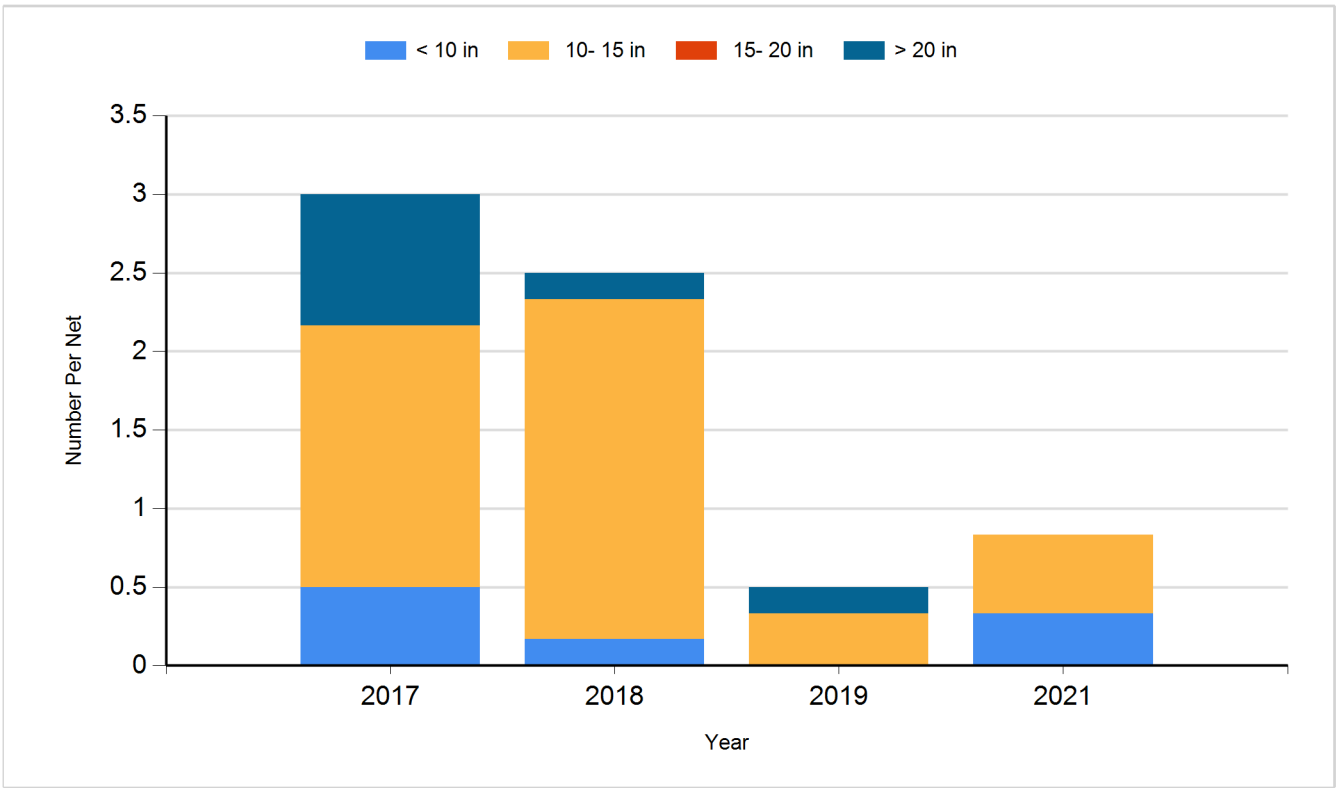
Species: Common Carp
Gear: std exp gill net



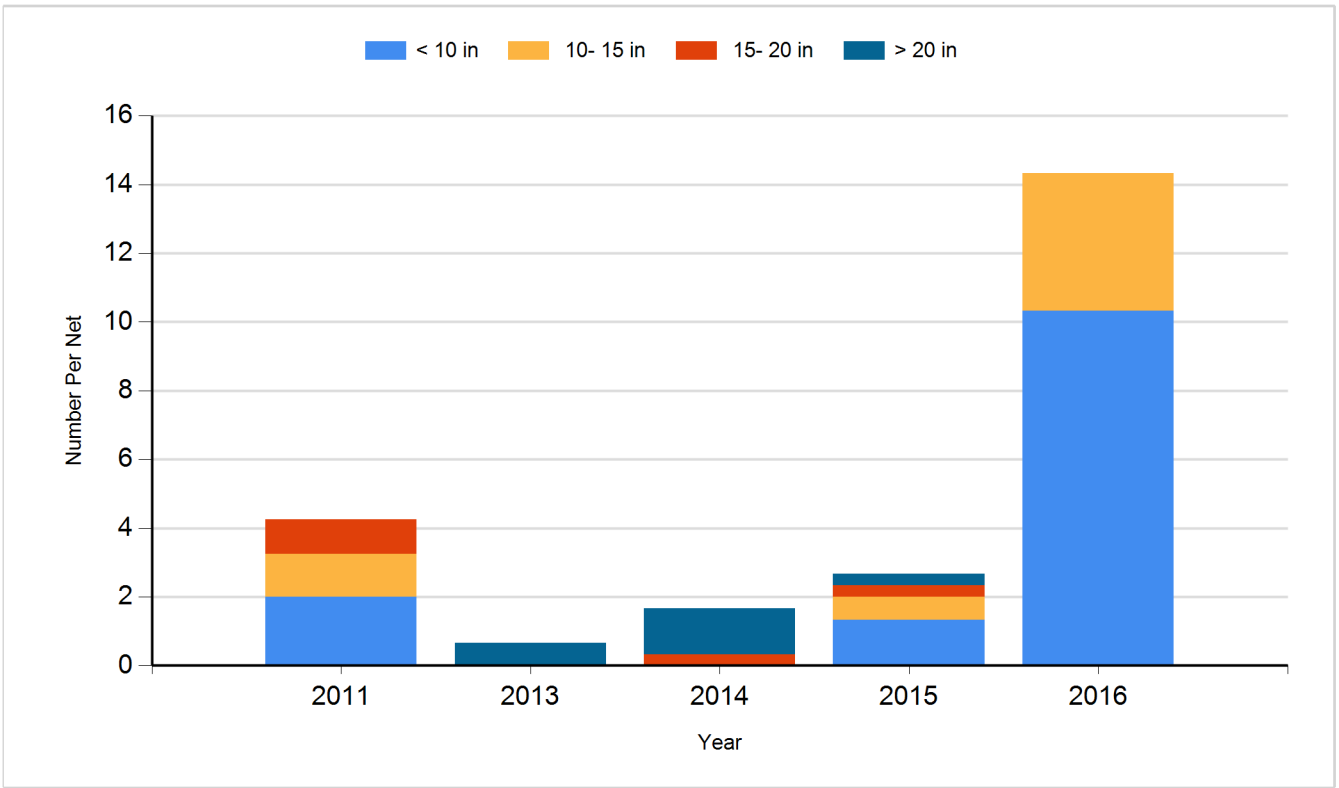
Species: Northern Pike
Gear: std exp gill net



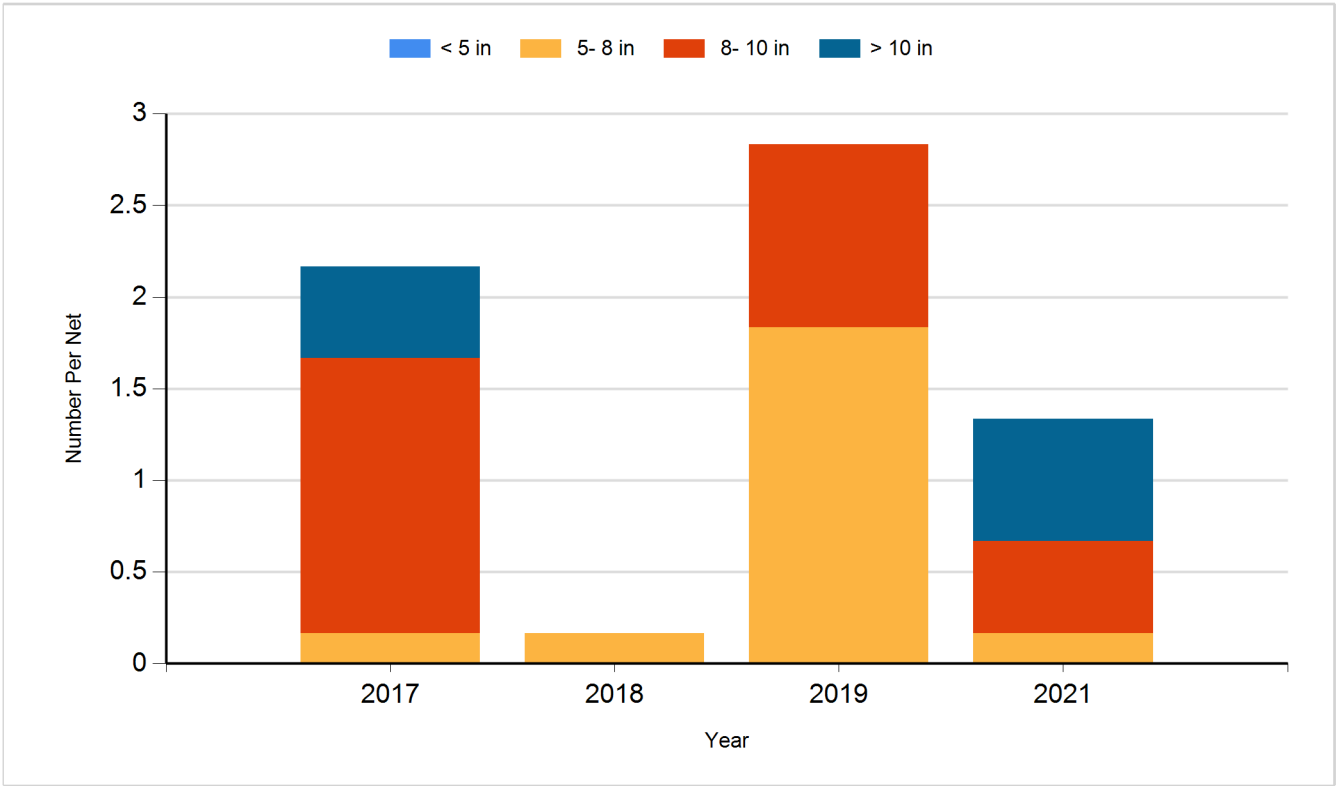
Species: Walleye
Gear: AFS std gill net



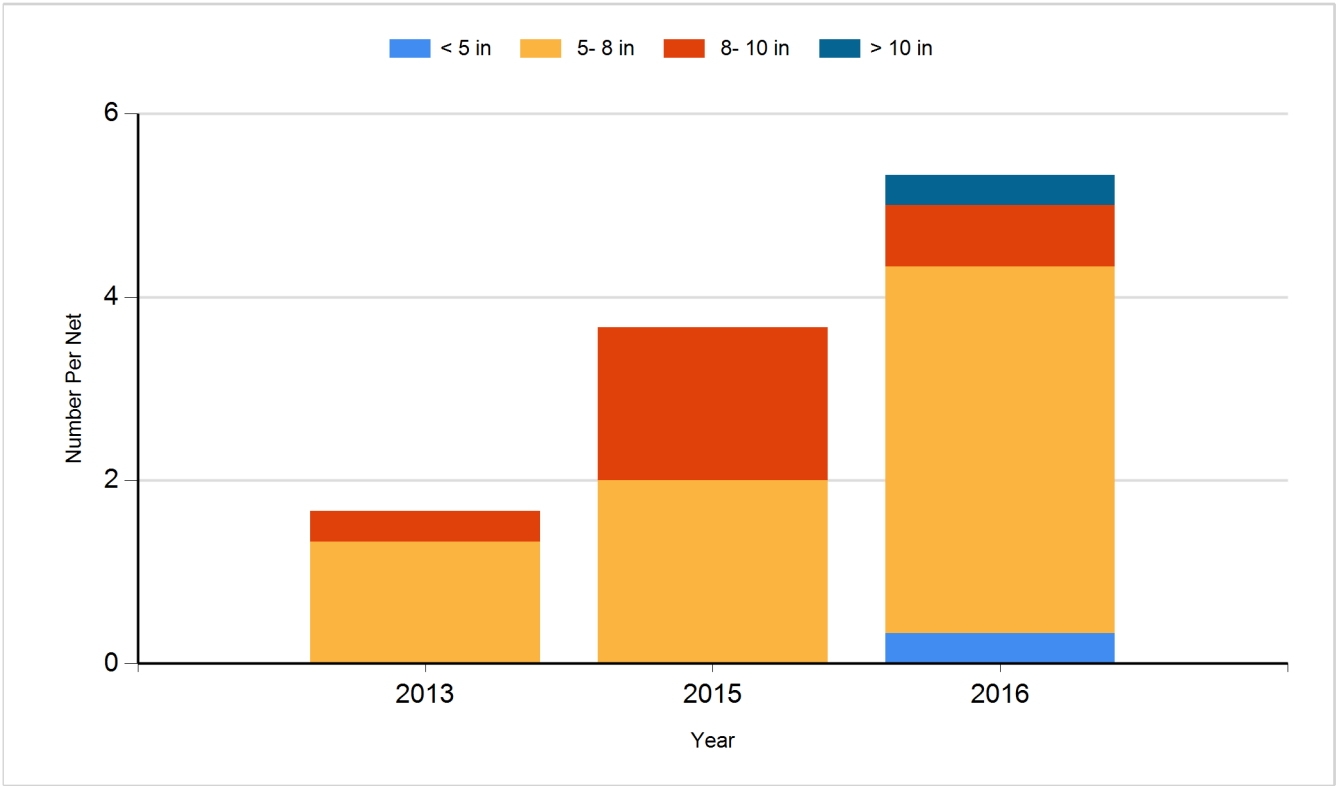
Species: Walleye
Gear: std exp gill net



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
2010	Muskellunge	Adult	11
2010	Walleye	Small Fingerling	44,070
2011	Muskellunge	Fingerling	272
2011	Yellow Perch	Fingerling	10,058
2012	Muskellunge	Adult	4
2012	Walleye	Small Fingerling	43,860
2012	Yellow Perch	Adult	2,746
2012	Yellow Perch	Egg	34,020,000
2012	Yellow Perch	Juvenile	7,350
2014	Muskellunge	Large Fingerling	441
2014	Walleye	Small Fingerling	30,800
2015	Walleye	Juvenile	1,399
2015	Walleye	Small Fingerling	31,218
2016	Muskellunge	Large Fingerling	400
2016	Walleye	Small Fingerling	32,130
2018	Walleye	Small Fingerling	31,920
2019	Walleye	Small Fingerling	30,600
2020	Muskellunge	Juvenile	373
2021	Walleye	Adult	1,725
2021	Walleye	Fingerling	31,340