SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Isabel, Dewey County
GRA-Lake-613-000
2021

Lake Information

Name: Isabel

County: Dewey

Legal Description: T17-R22-S16

Surface Area: 107 Acres

Maximum Depth: 25 Feet

Mean Depth: 9 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 09, 2021	2 net-nights
AFS std gill net	Jun 10, 2021	2 net-nights
frame net (std 3/4 in)	Jun 09, 2021	5 net-nights
frame net (std 3/4 in)	Jun 10, 2021	5 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Walleye

Yellow Perch

Northern Pike

Black Bullhead

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 Crappie	2	0.5	0.5	100		0		107	
	Northern Pike	10	2.5	2.2	100		80		97	2
	Walleye	2	0.5	0.8	100		50		95	5
	Yellow Perch	22	5.5	3.3	36	16	5		100	2
frame net (std 3/4 in)	Black Bullhead	5	0.5	0.4	80		0		106	8
	Black Crappie	100	10.0	4.1	59	7	3		103	1
	Bluegill	114	11.4	3.4	68	6	3		110	1
	Largemouth Bass	1	0.1	0.1	100		100		106	
	Northern Pike	5	0.5	0.3	100		40		93	4
	Sunfish Hybrid	1	0.0	0.0						
	Walleye	3	0.3	0.2	33		33		84	5
	Yellow Perch	18	1.8	0.8	17		6		96	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 gill net	Black Crappie							1.3			0.5	0.90
	Bluegill							0.3			0.0	0.15
	Northern Pike							2.0			2.5	2.25
	Walleye							0.8			0.5	0.65
	Yellow Perch							31.3			5.5	18.40
boat shocker (night)	Largemouth Bass			13.0				39.5	35.5	73.0		40.25
	Smallmouth Bass			3.0				0.0	0.0	0.0		0.75
	Walleye*			9.0				0.0	0.0	0.0		2.25
frame net (std 3/4 in)	Black Bullhead			4.8				0.0			0.5	1.77
	Black Crappie			8.0				17.4			10.0	11.80
	Bluegill			1.0				9.2			11.4	7.20
	Largemouth Bass			0.0				0.0			0.1	0.03
	Northern Pike			0.5				0.8			0.5	0.60
	Sunfish Hybrid			0.0				0.0			0.0	0.00
	Walleye			0.1				0.0			0.3	0.13
	Yellow Perch			0.7				9.8			1.8	4.10
std exp gill net	Black Bullhead			2.0								2.00
	Black Crappie			2.5								2.50
	Northern Pike			3.0								3.00
	Walleye			5.0								5.00
	Yellow Perch			5.5								5.50

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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFS std gill net	Black Crappie	PSD							80			100
		PSD-P							0			0
		Wr							98			107
	Bluegill	PSD							100			
		PSD-P							0			
		Wr							93			
	Northern Pike	PSD							100			100
		PSD-P							88			80
		Wr							91			97
	Walleye	PSD							100			100
		PSD-P							67			50
		Wr							89			95
	Yellow Perch	PSD							15			36
		PSD-P							0			5
		Wr							99			100
boat shocker (night)	Largemouth Bass	PSD			100				81	75	71	
		PSD-P			69				43	46	41	
		Wr			104				107	105	106	
	Walleye	PSD			56							
		PSD-P			11							
		Wr			85							
frame net (std 3/4 in)	Black Bullhead	PSD			100							80
		PSD-P			94							0
		Wr			92							106
	Black Crappie	PSD			85				63			59
		PSD-P			20				3			3
		Wr			97				102			103
	Bluegill	PSD			80				48			68
		PSD-P			40				0			3
		Wr			107				101			110
	Largemouth Bass	PSD										100
		PSD-P										100

			Year									
Gear	Species	Index	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
frame net (std 3/4 in)	Largemouth Bass	Wr										106
	Northern Pike	PSD			100				100			100
		PSD-P			40				50			40
		Wr			88				95			93
	Walleye	PSD			100				0			33
		PSD-P			100				0			33
		Wr			80							84
	Yellow Perch	PSD			43				12			17
		PSD-P			29				8			6
		Wr			87				91			96
std exp gill net	Black Bullhead	PSD			100							
		PSD-P			100							
		Wr			106							
	Black Crappie	PSD			100							
		PSD-P			40							
		Wr			94							
	Northern Pike	PSD			100							
		PSD-P			83							
		Wr			84							
	Walleye	PSD			90							
		PSD-P			50							
		Wr			91							
	Yellow Perch	PSD			55							
		PSD-P			0							
		Wr			91							

Length at Capture

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

Species: Black Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	178	126 (6)	145 (51)	198 (18)	203 (23)	209 (29)	219 (15)	222 (16)	222 (15)	246 (6)	241 (2)
2014	81		137 (3)	193 (11)	217 (36)	244 (19)	252 (5)	262 (6)	262 (1)		

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	92		116 (22)	134 (14)	154 (27)	186 (6)	174 (14)	182 (11)			
2014	10			126 (1)	126 (1)	172 (1)	172 (1)	186 (2)	204 (2)	211 (2)	

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2020	73	204 (8)	251 (10)	296 (5)	325 (7)	340 (6)	368 (9)	388 (1)	401 (7)	427 (9)	473 (11)
2018	71	166 (5)	194 (3)	243 (10)	292 (5)	325 (10)	342 (15)	403 (8)	385 (5)	436 (3)	439 (10)
2014	14	133 (1)				376 (5)	387 (2)	403 (5)		533 (1)	

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2014	12	232 (3)			400 (4)		543 (5)				

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	125	146 (56)	156 (29)	179 (7)	196 (22)	216 (8)	237 (3)				
2014	11			162 (4)		227 (6)	244 (1)				

Fish Condition

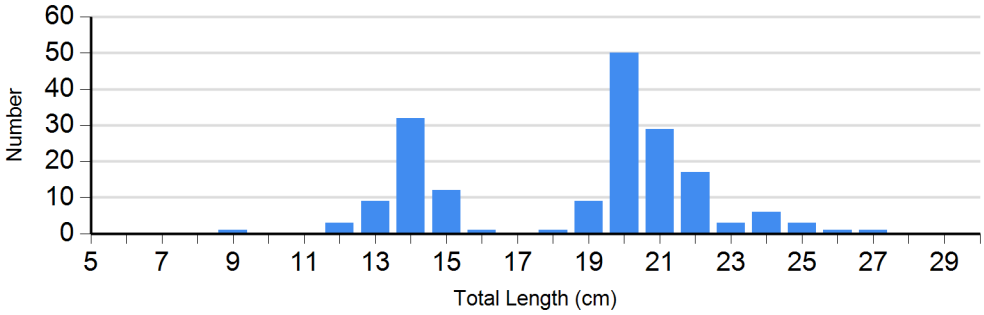
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2018	64	110 (0.9)	105	99 (0.7)	5	86 (1.0)	0	
	2021	41	109 (0.8)	56	99 (0.8)	3	92 (1.3)	0	
Bluegill Frame Net	2018	48	104 (0.9)	44	99 (1.1)	0		0	
	2021	36	112 (1.2)	75	109 (0.8)	3	104 (3.2)	0	
Largemouth Bass Electro Fishing	2018	15	105 (1.7)	30	105 (1.4)	34	109 (1.6)	0	
	2019	18	103 (3.2)	20	107 (3.1)	30	105 (1.5)	3	108 (6.1)
	2020	21	106 (2.1)	22	104 (2.2)	29	107 (3.8)	1	114
Northern Pike Gill Net	2018	0		1	80	4	92 (3.4)	3	92 (3.1)
	2021	0		2	95 (0.4)	7	99 (2.7)	1	94
Walleye Gill Net	2018	0		1	82	1	89	1	96
	2021	0		1	91	1	99	0	
Yellow Perch Gill Net	2018	106	100 (2.0)	19	92 (1.1)	0		0	
	2021	14	102 (1.6)	7	100 (1.9)	1	83	0	

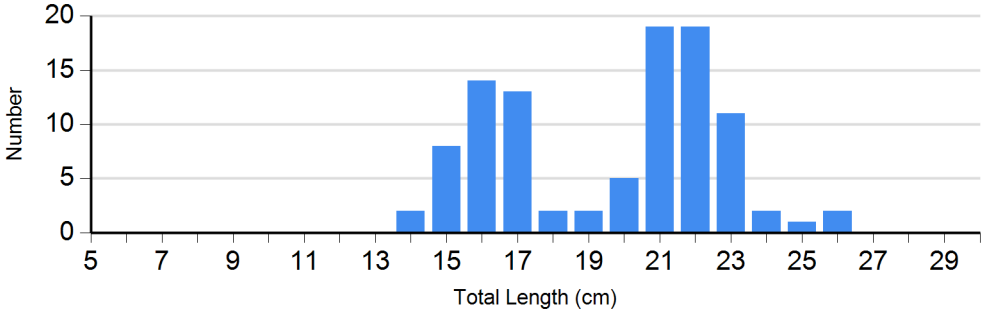
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

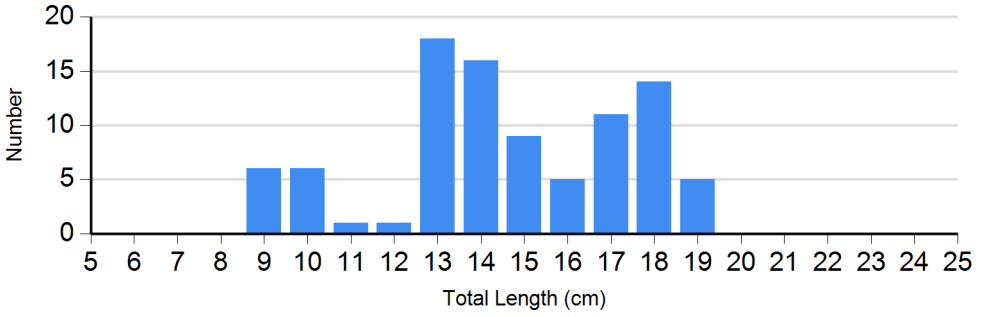


2018

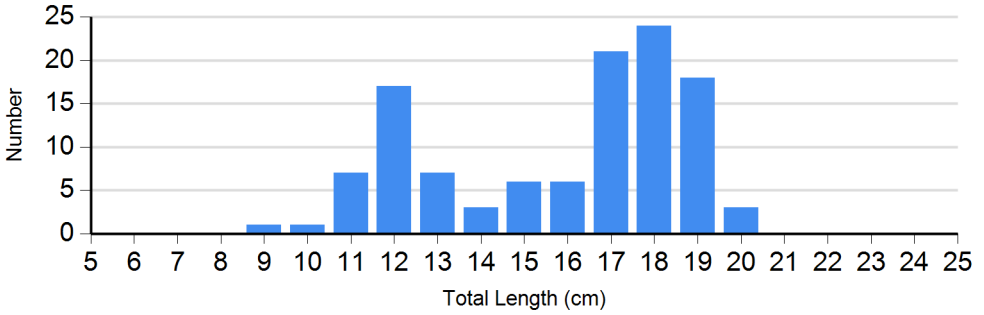


2021

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

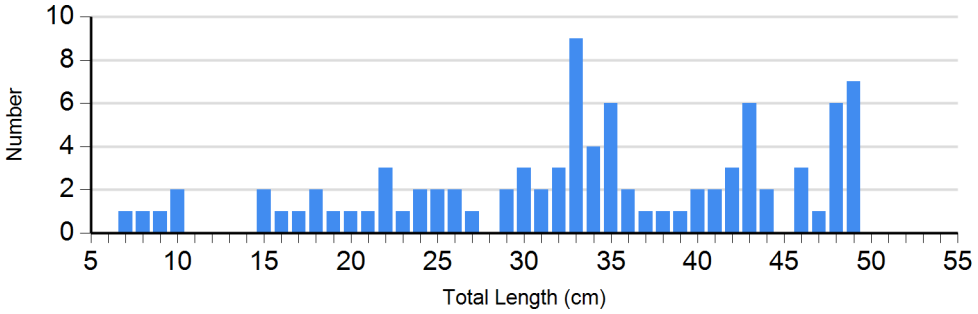


2018

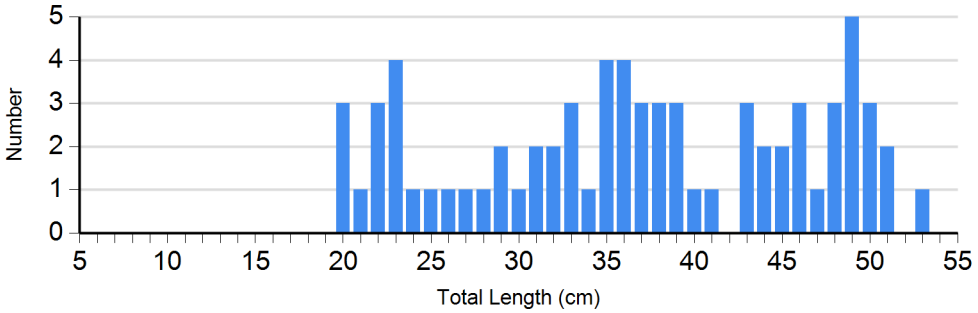


2021

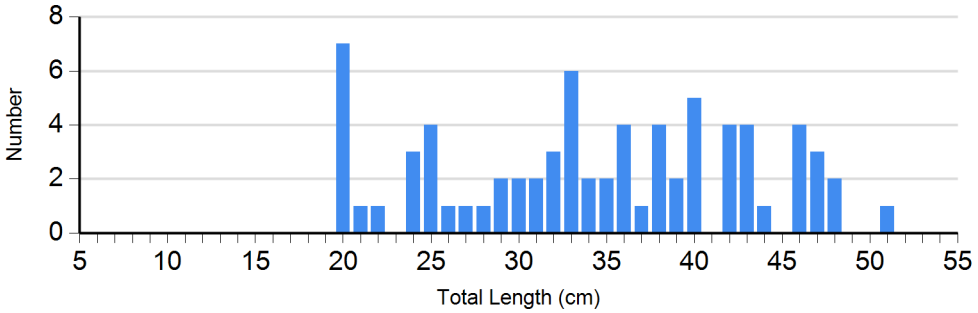
Species: Largemouth Bass
Gear: boat shocker (night)



2018

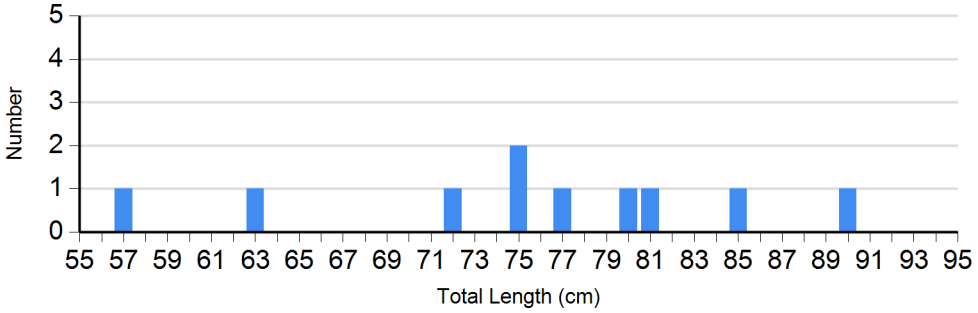


2019



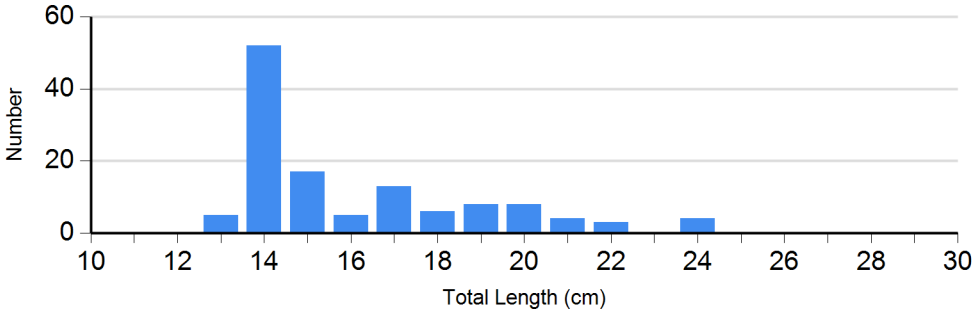
2020

Species: Northern Pike
Gear: AFS std gill net

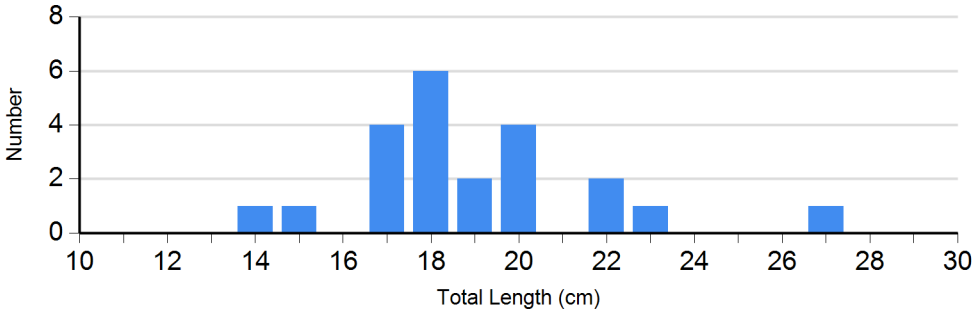


2021

Species: Yellow Perch
Gear: AFS std gill net



2018

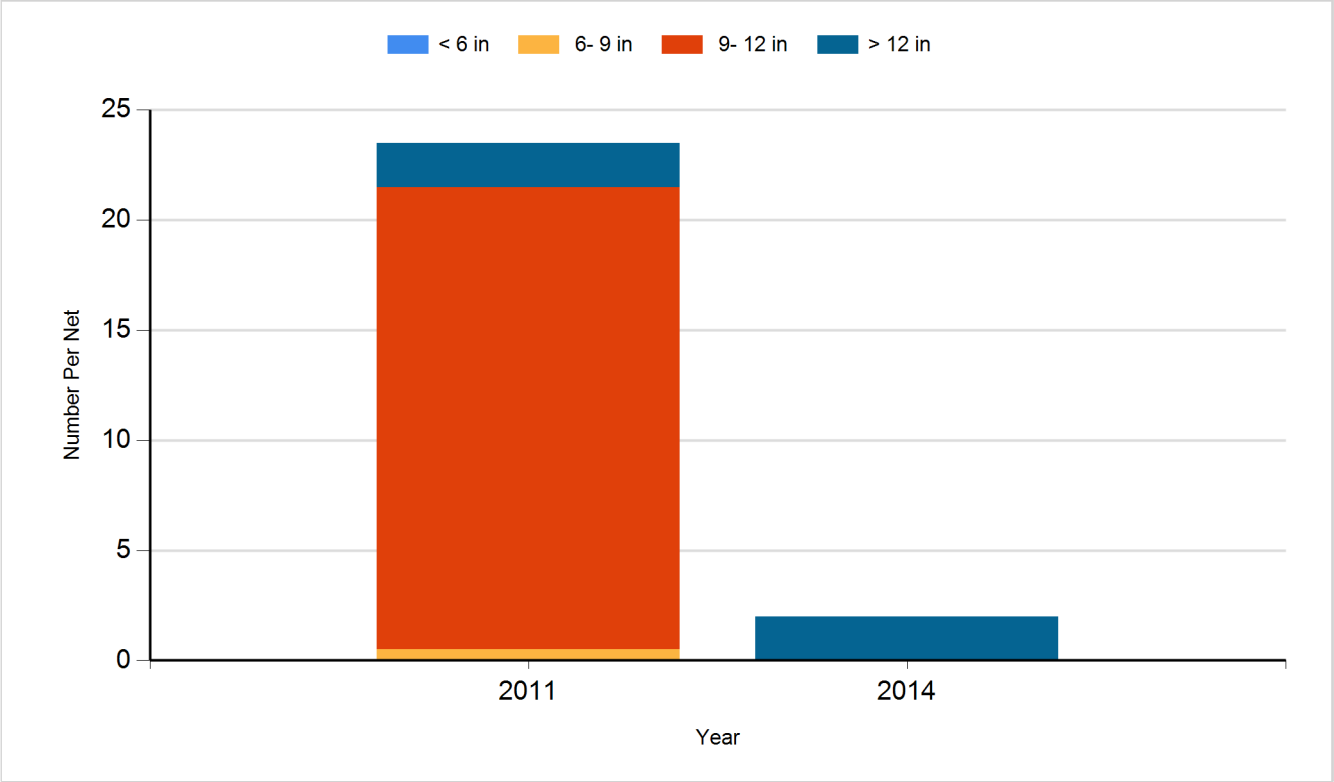


2021

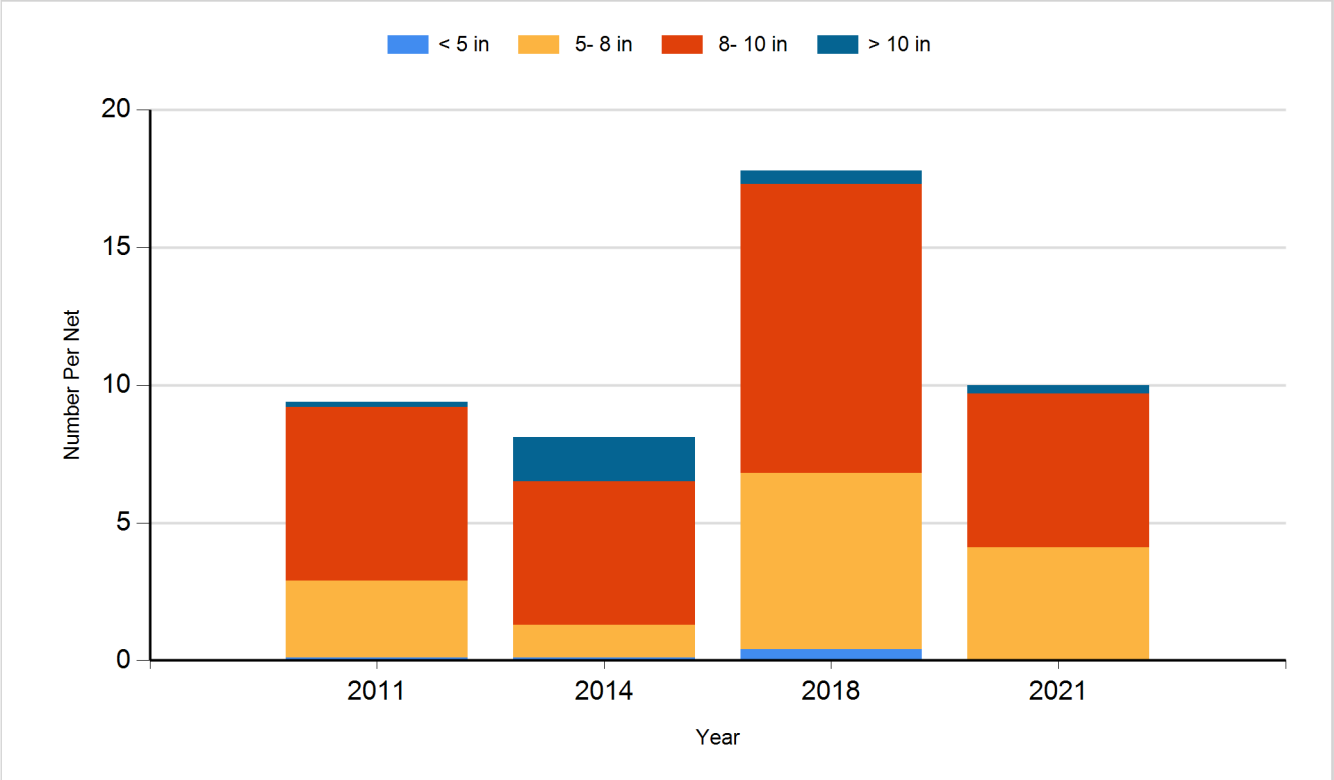
Historic Fish Sizes and Relative Abundance

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

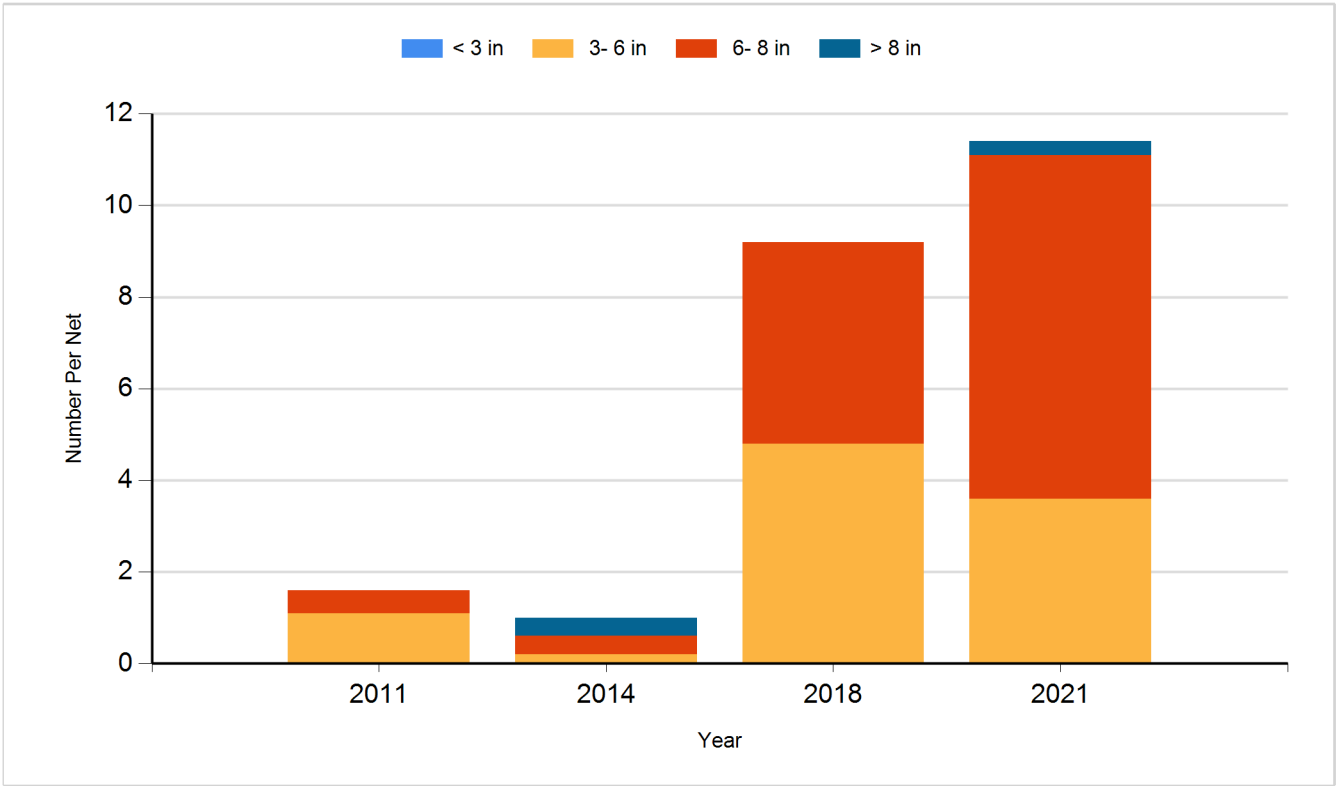
Species: Black Bullhead
Gear: std exp gill net



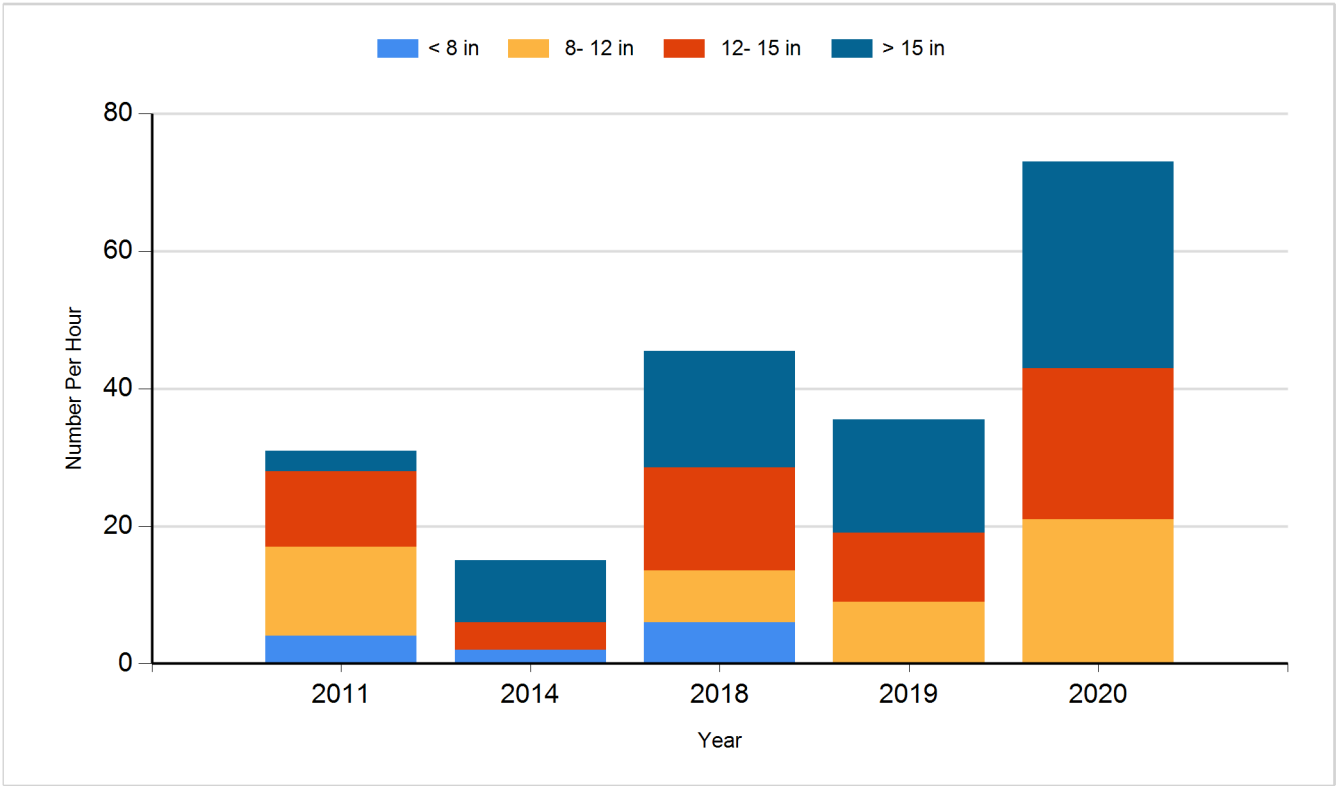
Species: Black Crappie
Gear: frame net (std 3/4 in)



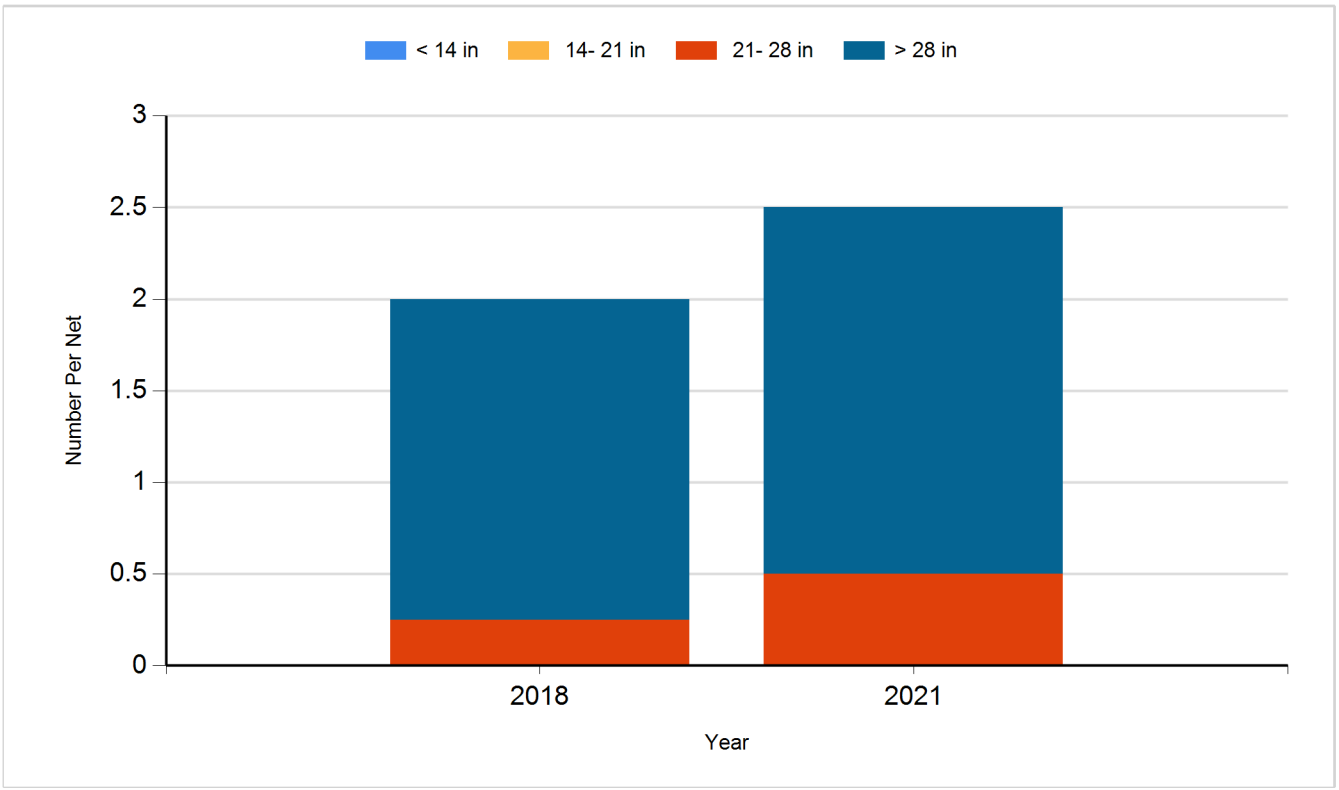
Species: Bluegill
Gear: frame net (std 3/4 in)



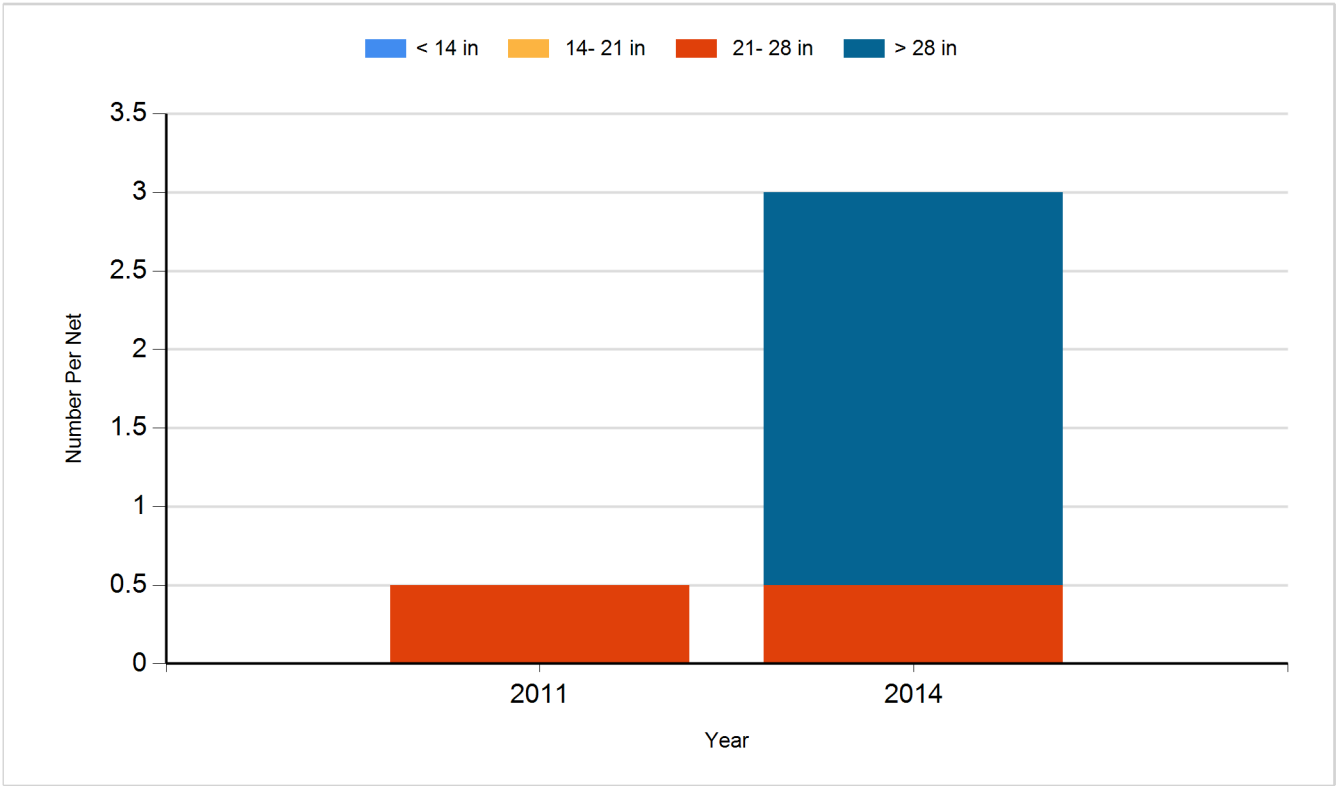
Species: Largemouth Bass
Gear: boat shocker (night)



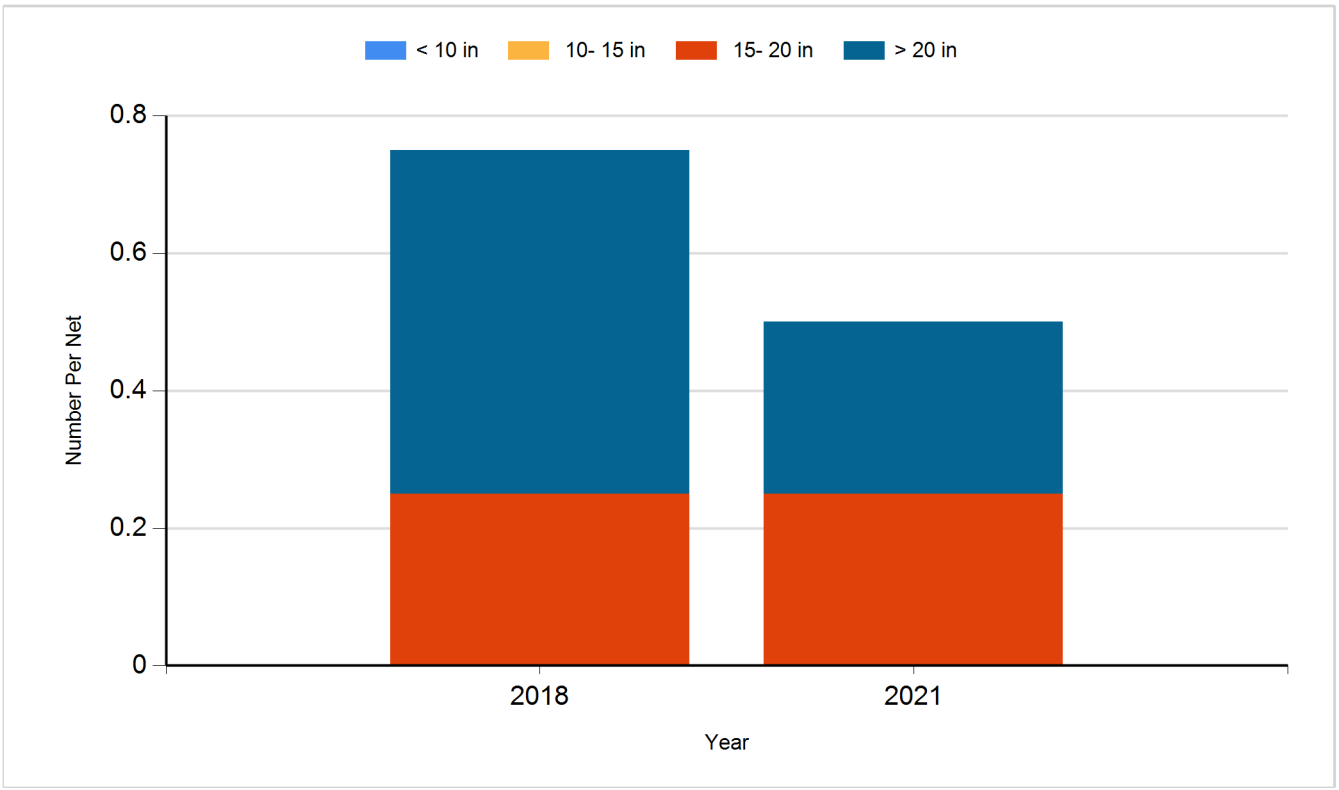
Species: Northern Pike
Gear: AFS std gill net



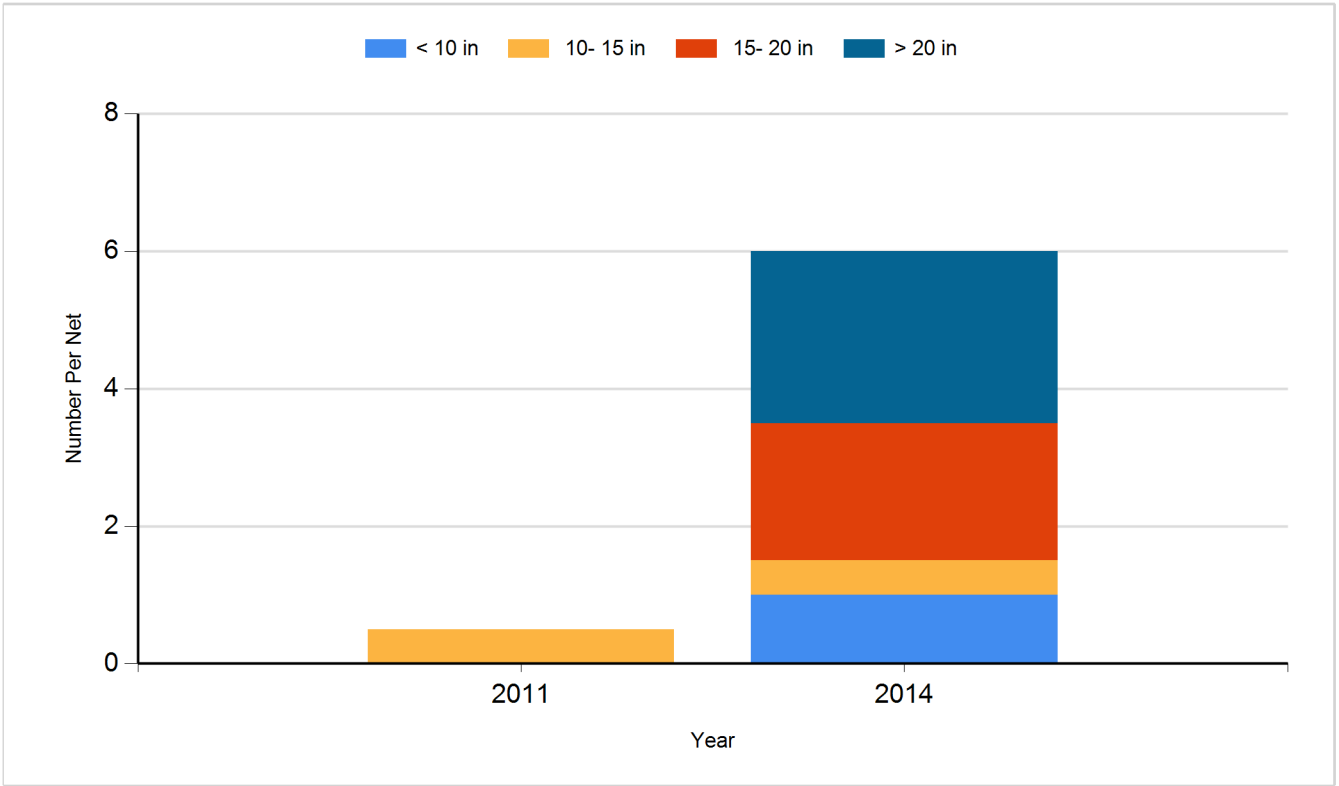
Species: Northern Pike
Gear: std exp gill net



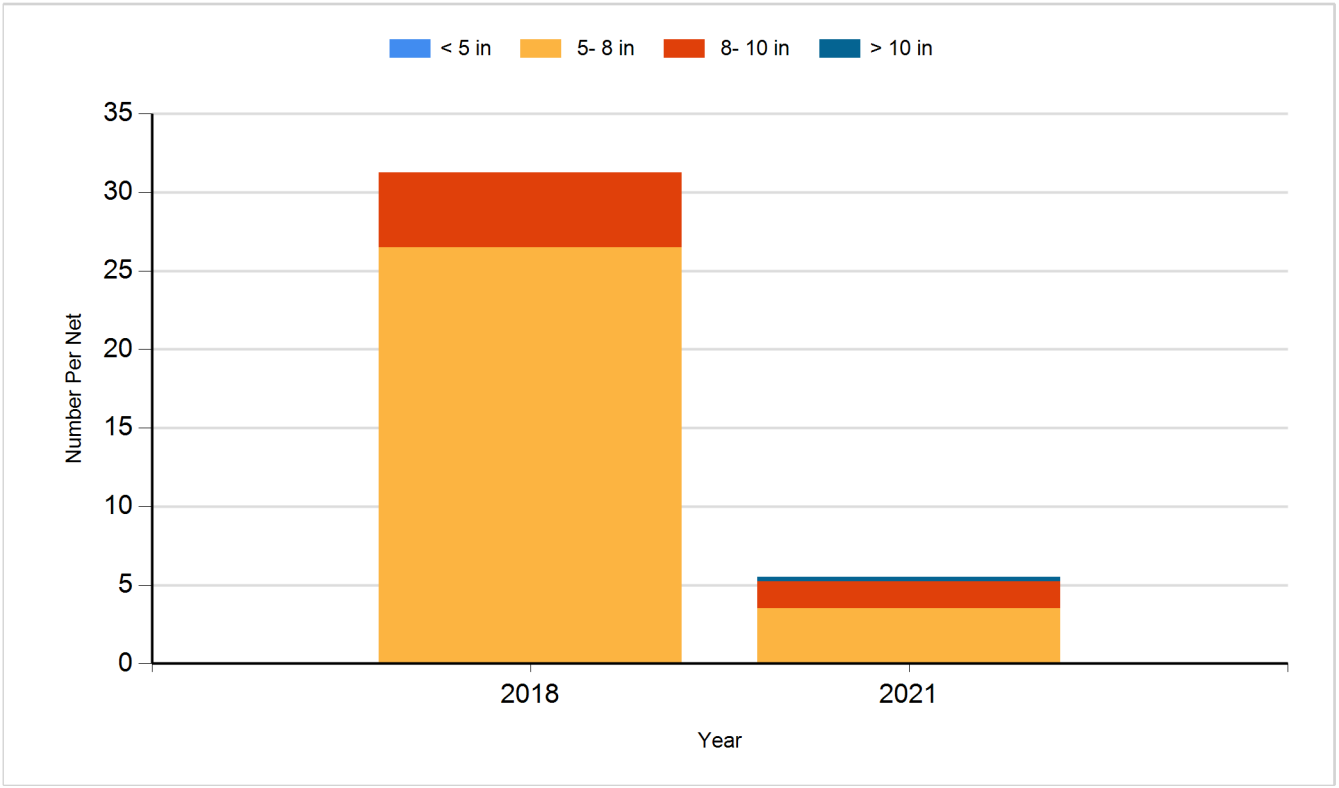
Species: Walleye
Gear: AFS std gill net



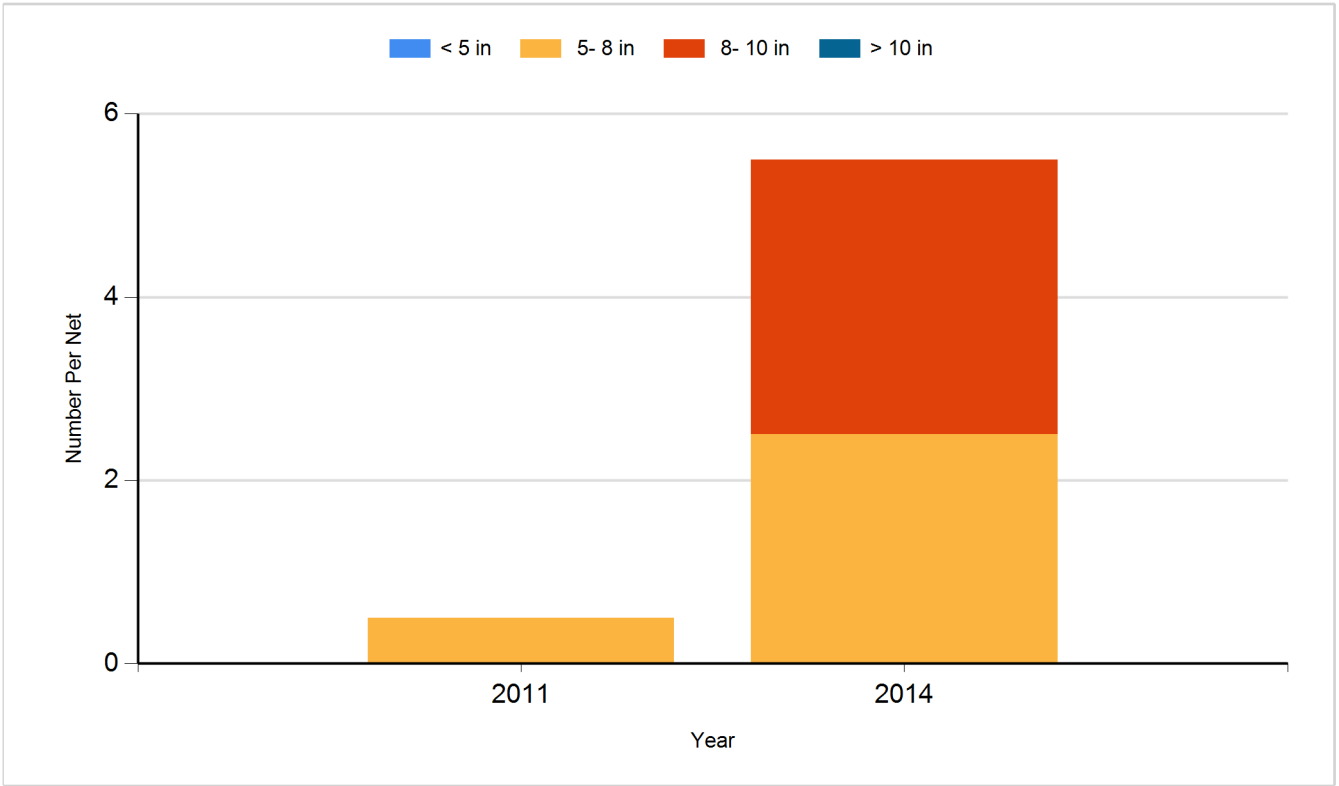
Species: Walleye
Gear: std exp gill net



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	Walleye	Small Fingerling	8,100
2013	Walleye	Large Fingerling	688
2015	Walleye	Large Fingerling	540
2017	Walleye	Large Fingerling	2,800
2019	Walleye	Large Fingerling	2,868
2021	Walleye	Juvenile	1,800