SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Pudwell, Corson County
GRA-Lake-511-000
2022

Lake Information

Name: Pudwell
County: Corson
Legal Description: T23-R23-S27
Surface Area: 70 Acres
Maximum Depth: 17 Feet
Mean Depth: 10 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 24, 2022	2 net-nights
AFS std gill net	May 25, 2022	2 net-nights
boat shocker (night)	Oct 04, 2022	3600 seconds
frame net (std 3/4 in)	May 24, 2022	5 net-nights
frame net (std 3/4 in)	May 25, 2022	5 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Northern Pike

Yellow Perch

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	Northern Pike	21	5.3	1.4	95		5		96	2
	Yellow Perch	2	0.5	0.5	0		0		112	4
boat shocker (night)	Largemouth Bass	4	3.0	3.0	100		67		132	8
frame net (std 3/4 in)	Black Crappie	21	2.1	1.7	95		90		115	2
	Northern Pike	17	1.7	0.8	82		29		93	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	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg
AFS std gill net	Black Crappie							0.0	0.3		0.0	0.10
	Largemouth Bass							0.0	0.0		0.0	0.00
	Northern Pike							1.8	3.8		5.3	3.63
	Yellow Perch							0.3	4.8		0.5	1.87
boat shocker (night)	Largemouth Bass		17.0		41.0				9.0		3.0	17.50
	Walleye*		25.0		0.0				3.0		0.0	7.00
frame net (std 3/4 in)	Black Bullhead	0.2			0.2			0.0	0.0		0.0	0.08
	Black Crappie	3.4			7.1			0.0	8.9		2.1	4.30
	Bluegill	1.0			8.8			0.0	0.0		0.0	1.96
	Largemouth Bass	0.1			0.0			0.0	0.0		0.0	0.02
	Northern Pike	0.6			2.1			1.7	1.1		1.7	1.44
	Smallmouth Bass	0.1			0.0			0.0	0.0		0.0	0.02
	Walleye	0.3			1.1			0.0	0.0		0.0	0.28
	Yellow Perch	0.0			0.6			0.6	1.7		0.0	0.58
std exp gill net	Black Crappie	0.0			1.5							0.75
	Northern Pike	3.0			7.5							5.25
	Walleye	0.5			1.5							1.00
	Yellow Perch	0.5			17.5							9.00

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	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AFS std gill net	Black Crappie	PSD								0		
		PSD-P								0		
		Wr								131		
	Largemouth Bass	PSD								0		
		PSD-P								0		
	Northern Pike	PSD							86	53		95
		PSD-P							14	7		5
		Wr							86	93		96
	Yellow Perch	PSD							0	47		0
		PSD-P							0	5		0
		Wr							106	117		112
boat shocker (night)	Largemouth Bass	PSD		65		71				0		100
		PSD-P		59		44				0		67
		Wr		119		120				123		132
frame net (std 3/4 in)	Black Crappie	PSD	100			92			0	0		95
		PSD-P	100			92			0	0		90
		Wr	101			96				121		115
	Bluegill	PSD	100			100						
		PSD-P	100			75						
		Wr	123			127						
	Largemouth Bass	PSD	100									
		PSD-P	100									
		Wr	95									
	Northern Pike	PSD	83			67			76	27		82
		PSD-P	33			5			0	9		29
		Wr	84			79			92	88		93
	Yellow Perch	PSD				50			0	88		
		PSD-P				0			0	24		
		Wr				93			105	109		
std exp gill net	Black Crappie	PSD				0						
		PSD-P				0						
		Wr				118						

			Year									
Gear	Species	Index	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
std exp gill net	Northern Pike	PSD	100			80						
		PSD-P	33			0						
		Wr	83			85						
	Yellow Perch	PSD	100			6						
		PSD-P	0			0						
		Wr	103			105						

Back-Calculated Lengths

Mean species back-calculated total length (mm) at age, standard error (SE), and sample size (N).

Species: Black Crappie

Year Class	Age	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2019	3	1	88	113	147							
2018	4	2	102 (51.8)	128 (50.3)	175 (43.5)	194 (45.6)						
2017	5	12	90 (14.3)	115 (14.7)	146 (15.7)	173 (15.1)	201 (14.6)					
2016	6	3	130 (4.6)	153 (3.3)	179 (5.5)	208 (3.8)	229 (4.5)	249 (4.9)				
Weighted Mean		18	98	123	155	182	207	249				

Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2019	3	1										
2018	4	2										
2017	5	12										
2016	6	3										
Weighted Mean		18										

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+
2022	21			161 (1)	274 (2)	271 (15)	261 (4)				
2020	89	165 (89)									
2016	71		138 (3)	165 (3)		296 (5)	308 (22)	313 (25)	315 (3)	318 (9)	347 (1)
2013	34					267 (8)	271 (14)	294 (2)	300 (3)	313 (5)	312 (2)

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2016	89	75 (1)		193 (27)	220 (32)	229 (21)	241 (2)	275 (1)	273 (4)	267 (1)	
2013	10				240 (1)	250 (5)	265 (2)	280 (3)			

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2016	54	182 (15)	248 (2)	304 (19)		390 (1)		473 (1)	447 (5)	446 (7)	469 (4)
2014	39	168 (26)	219 (2)	345 (1)				435 (5)	443 (1)	453 (3)	475 (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+
2020	19	133 (4)	175 (3)	205 (10)		241 (1)	266 (1)				
2016	48	93 (12)	140 (11)	174 (23)	220 (2)						

Fish Condition

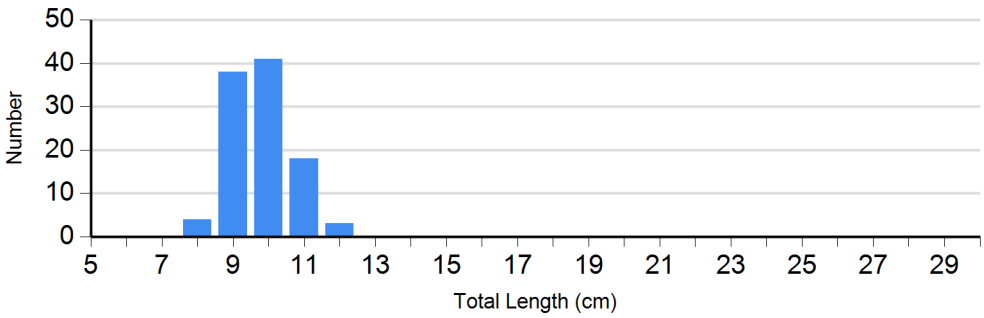
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2019	0		0		0		0	
	2020	89	121 (0.8)	0		0		0	
	2022	1	121	1	130	19	114 (1.0)	0	
Largemouth Bass Electro Fishing	2020	9	123 (1.8)	0		0		0	
	2022	0		1	143	2	126 (2.1)	0	
Northern Pike Gill Net	2019	1	98	5	88 (1.9)	0		1	68
	2020	7	93 (2.3)	7	94 (2.7)	1	75	0	
	2022	1	99	19	96 (1.5)	1	87	0	
Yellow Perch Gill Net	2019	1	106	0		0		0	
	2020	10	122 (3.2)	8	112 (2.7)	1	105	0	
	2022	2	112 (3.0)	0		0		0	

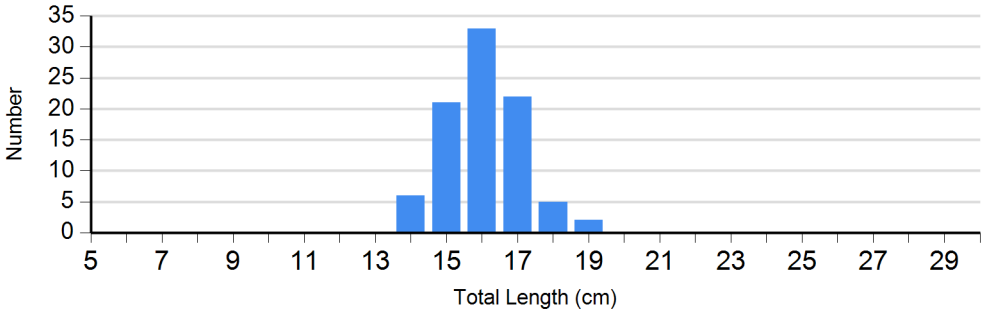
Length Frequency Distribution

Length frequency histogram of species sampled by year.

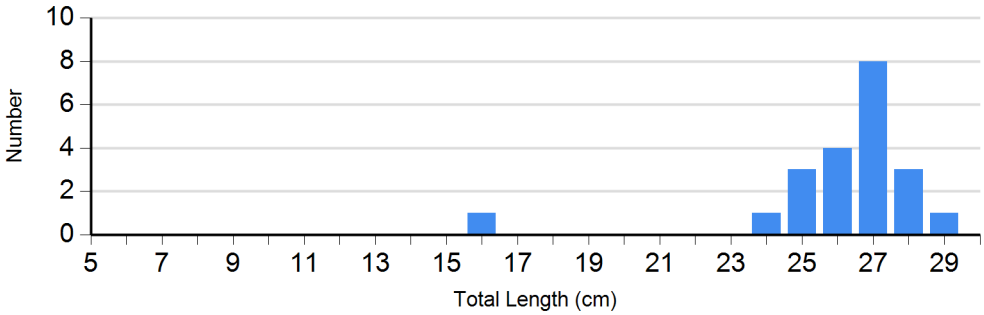
Species: Black Crappie
Gear: frame net (std 3/4 in)



2019

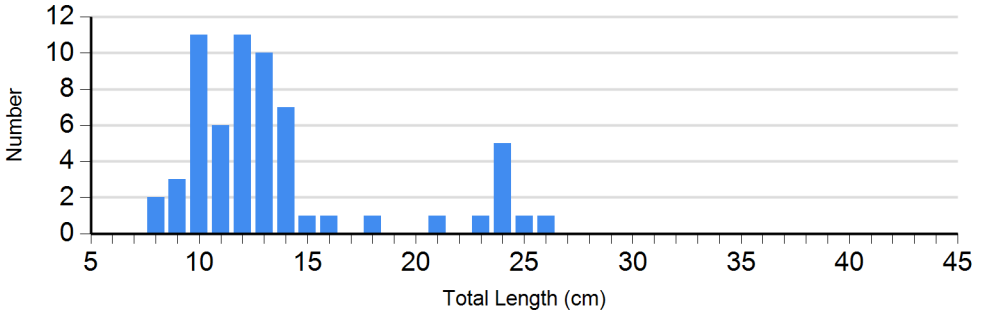


2020



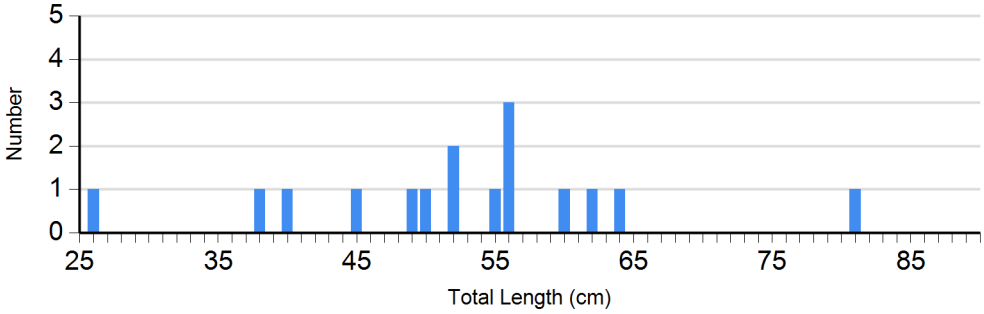
2022

Species: Largemouth Bass
Gear: boat shocker (night)

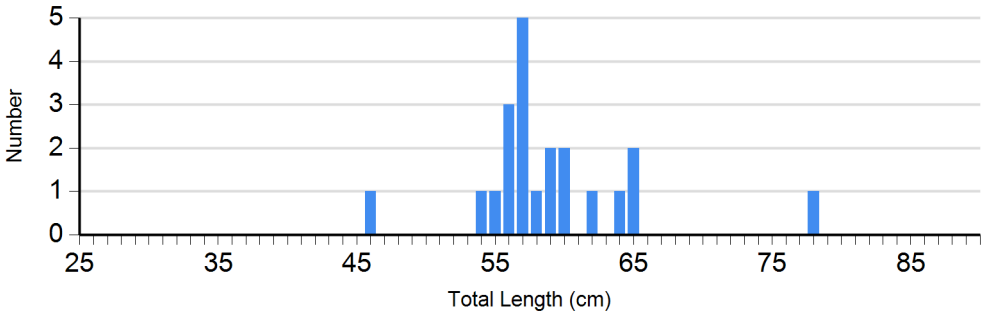


2020

Species: Northern Pike
Gear: AFS std gill net

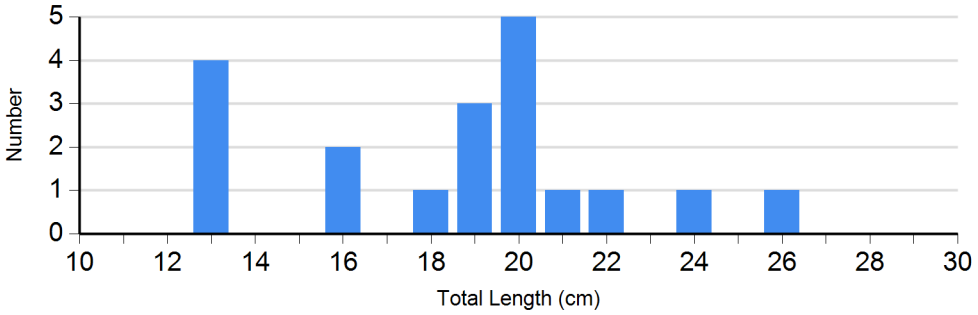


2020



2022

Species: Yellow Perch
Gear: AFS std gill net

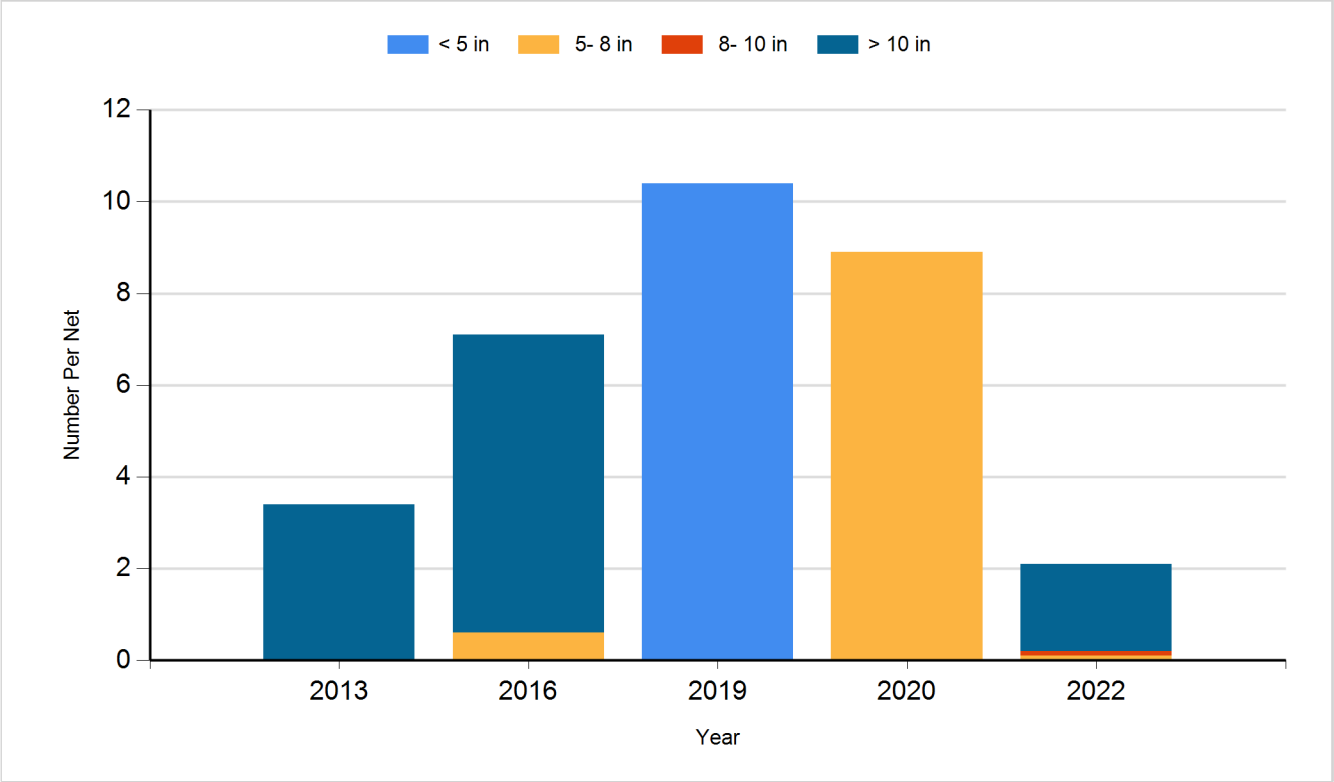


2020

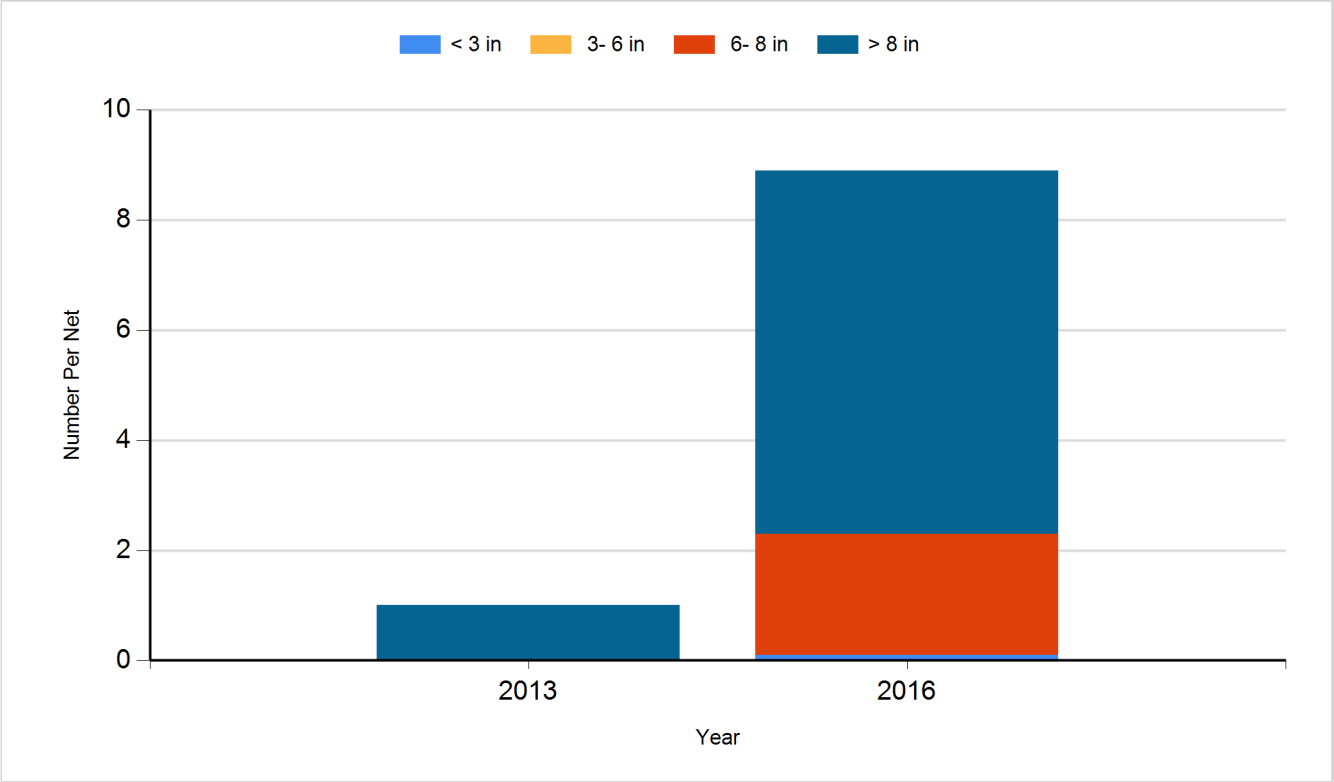
Historic Fish Sizes and Relative Abundance

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

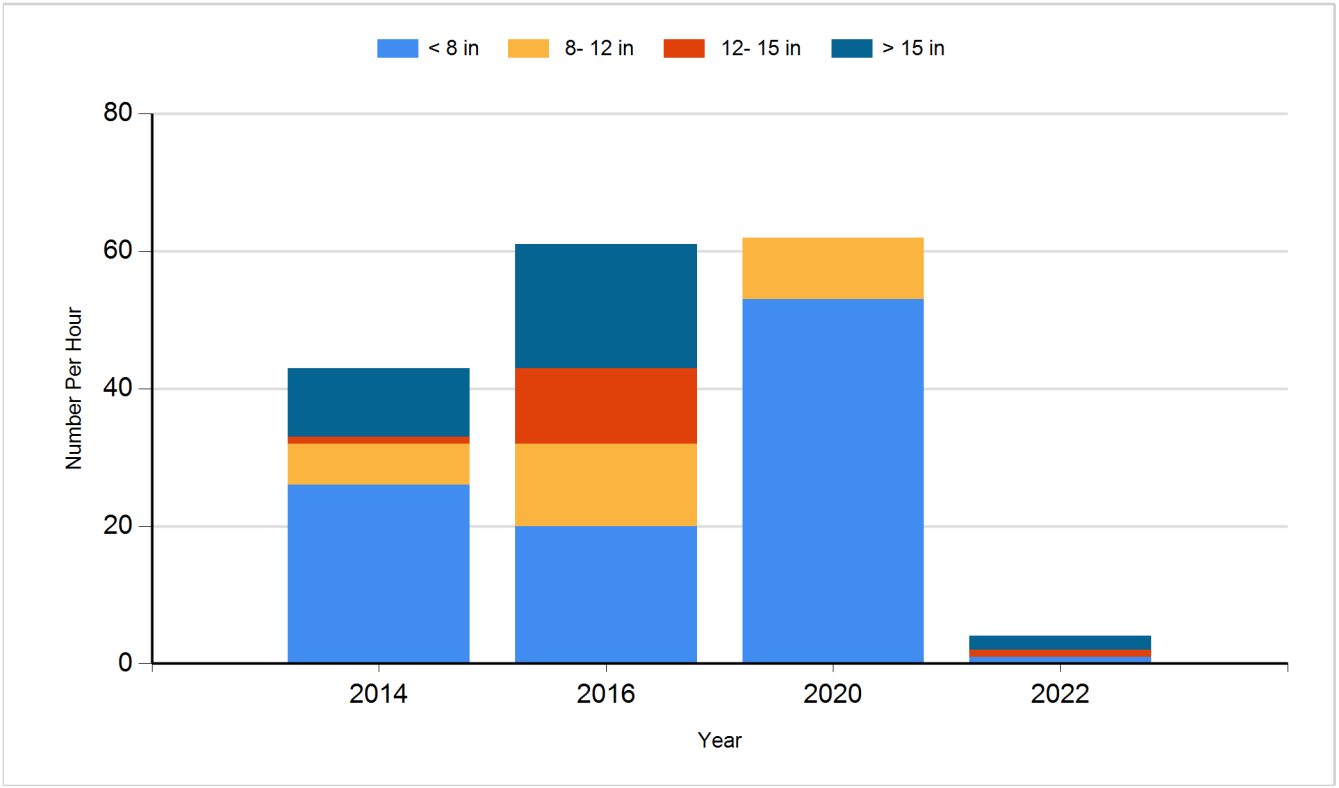
Species: Black Crappie
Gear: frame net (std 3/4 in)



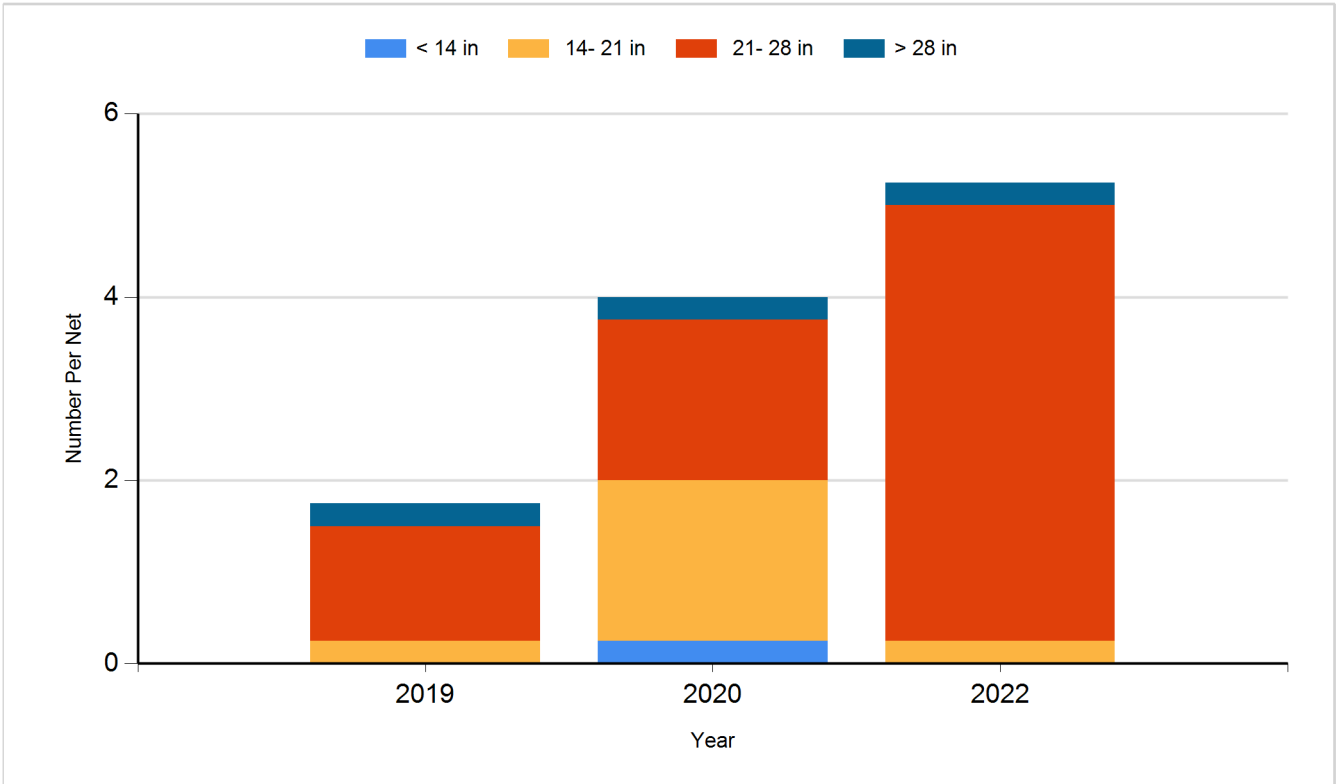
Species: Bluegill
Gear: frame net (std 3/4 in)



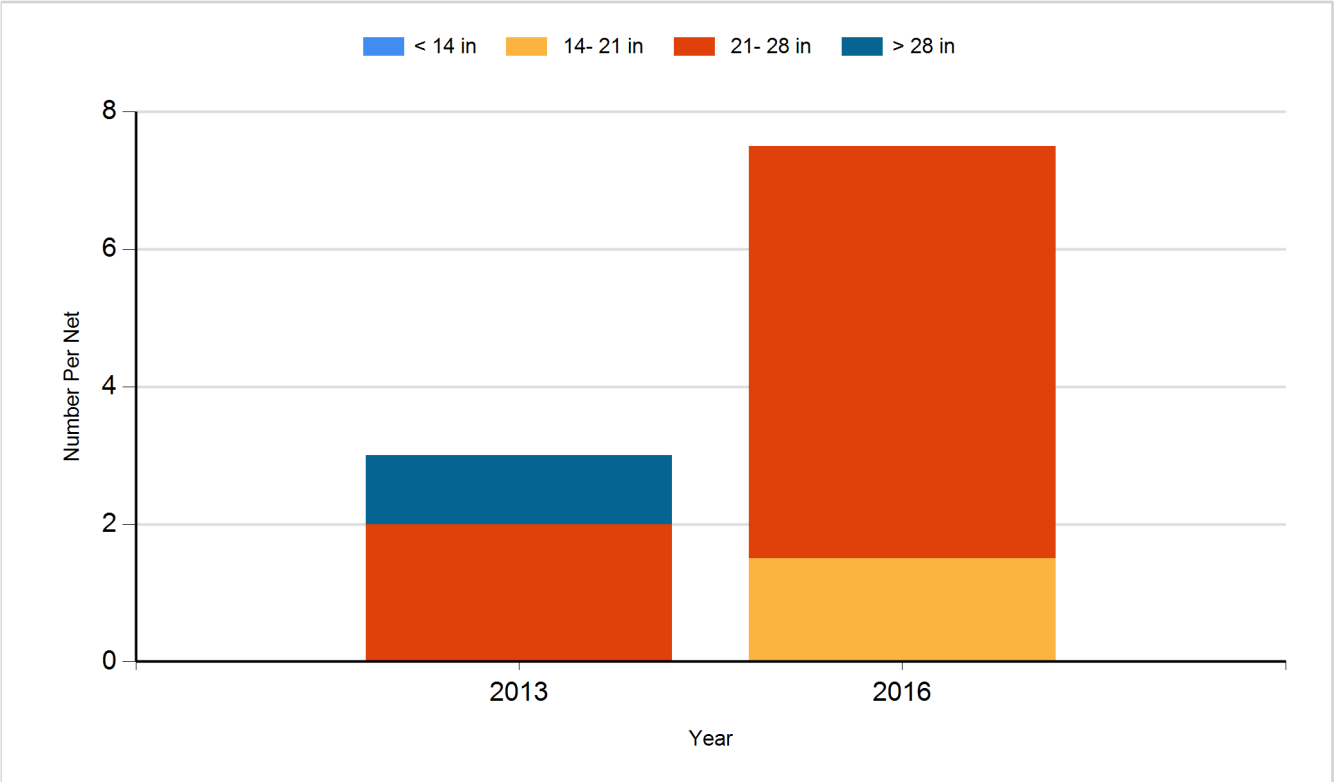
Species: Largemouth Bass
Gear: boat shocker (night)



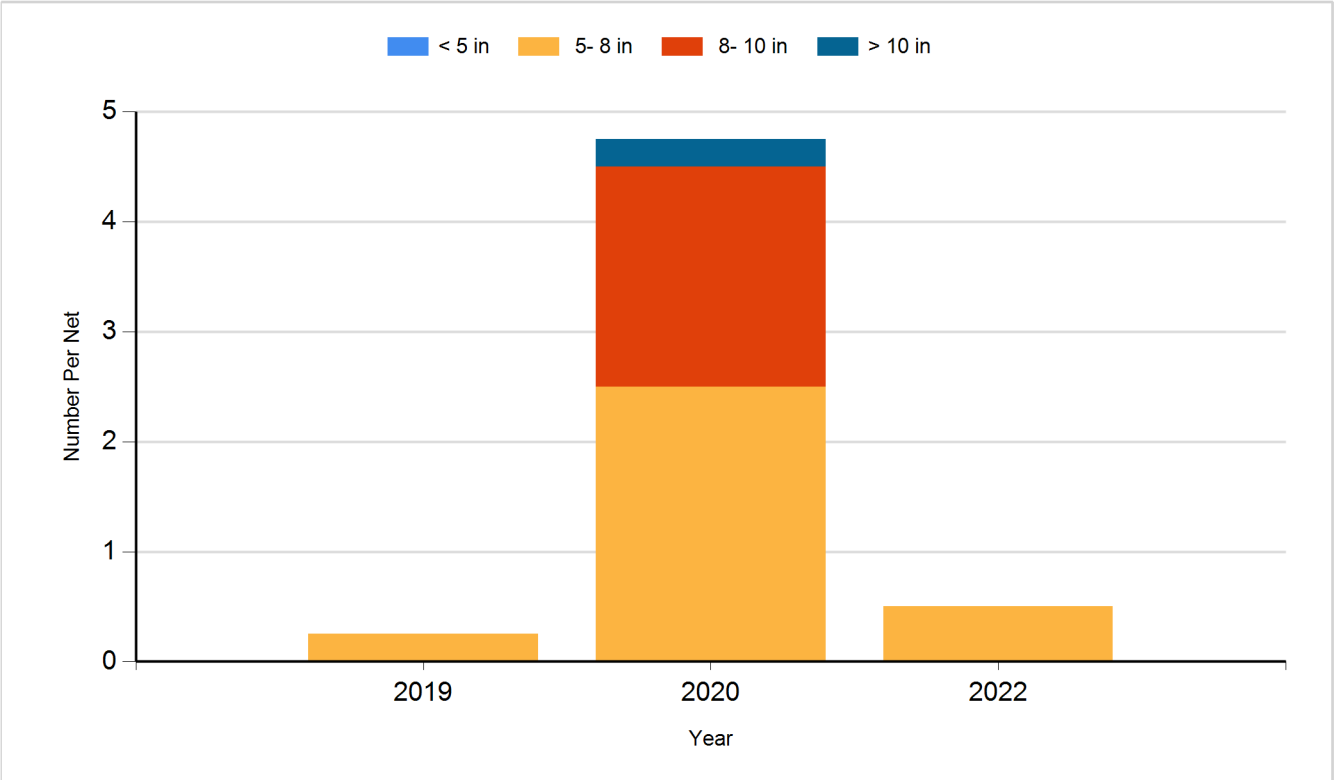
Species: Northern Pike
Gear: AFS std gill net



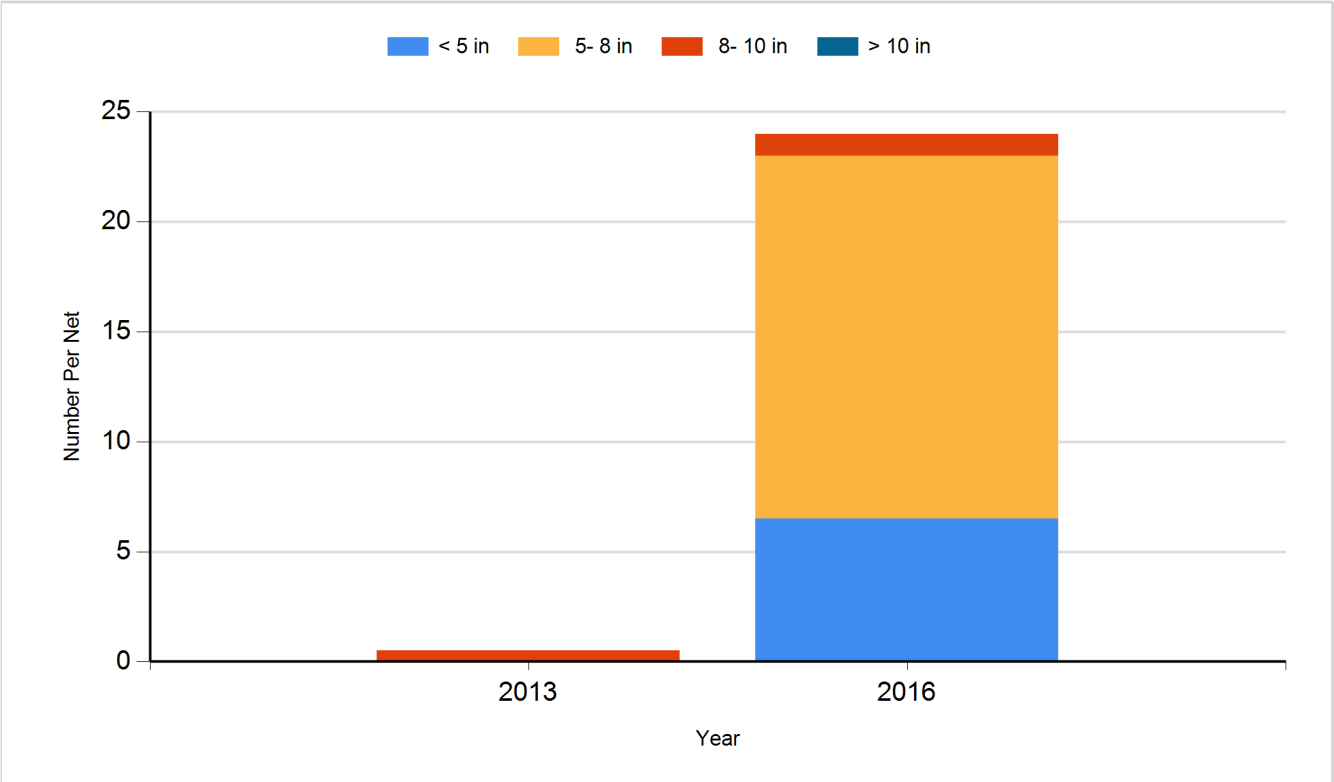
Species: Northern Pike
Gear: std exp gill net



Species: 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	Walleye	Large Fingerling	920
2015	Walleye	Large Fingerling	1,890
2017	Walleye	Large Fingerling	4,480
2019	Bluegill	Adult	48
2019	Largemouth Bass	Adult	149
2019	Largemouth Bass	Juvenile	105
2019	Walleye	Large Fingerling	3,396
2019	Yellow Perch	Adult	17
2020	Largemouth Bass	Juvenile	112
2021	Black Crappie	Adult	250
2021	Walleye	Juvenile	1,000
2022	Bluegill	Adult	100
2022	Largemouth Bass	Juvenile	1,000
2022	Walleye	Juvenile	1,750