SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Coal Springs, Perkins County
LMO-Lake-1689-000
2021

Lake Information

Name: Coal Springs

County: Perkins

Surface Area: 91 Acres

Surveys and Investigations

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

Gear	Date	Effort
frame net (std 3/4 in)	Jun 22, 2021	6 net-nights

Common Fish Species Present

Bluegill

Black Bullhead

Yellow Perch

Northern Pike

Walleye

Largemouth Bass

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
frame net (std 3/4 in)	Black Bullhead	2444	281.0	105.9	0		0		72	1
	Bluegill	185	30.8	8.0	10	3	1		116	1
	Largemouth Bass	2	0.3	0.3	0		0		101	5
	Northern Pike	9	1.5	0.8	100		56		84	3
	Walleye	3	0.5	0.3	100		0		89	3
	Yellow Perch	16	2.7	2.6	94		19		80	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**

		CPUE										
Gear	Species	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg
AFS std frame net	Black Bullhead						32.4					32.40
	Bluegill						4.0					4.00
	Northern Pike						2.4					2.40
AFS std gill net	Black Bullhead						3.5					3.50
	Northern Pike						5.8					5.80
	Walleye						0.5					0.50
	Yellow Perch						0.3					0.30
frame net (std 3/4 in)	Black Bullhead		40.3	37.6	142.3				80.8		281.0	116.40
	Bluegill		0.8	2.0	22.8				0.0		30.8	11.28
	Largemouth Bass		0.0	0.0	0.0				0.0		0.3	0.06
	Northern Pike		1.8	8.0	4.5				0.0		1.5	3.16
	Walleye		0.0	0.0	0.0				0.0		0.5	0.10
	Yellow Perch		0.3	0.6	0.4				0.0		2.7	0.80
std exp gill net	Black Bullhead		26.0	46.0	31.0							34.33
	Northern Pike		27.0	3.5	6.5							12.33
	Yellow Perch		2.0	4.5	1.0							2.50

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 frame net	Black Bullhead	PSD						43				
		PSD-P						0				
		Wr						75				
	Bluegill	PSD						38				
		PSD-P						10				
		Wr						126				
	Northern Pike	PSD						92				
		PSD-P						4				
		Wr						61				
AFS std gill net	Black Bullhead	PSD						64				
		PSD-P						0				
		Wr						86				
	Northern Pike	PSD						100				
		PSD-P						0				
		Wr						70				
	Walleye	PSD						100				
		PSD-P						100				
		Wr						106				
	Yellow Perch	PSD						0				
		PSD-P						0				
		Wr						93				
frame net (std 3/4 in)	Black Bullhead	PSD		68	100	96				0		0
		PSD-P		1	0	0				0		0
		Wr		105	89	88				100		72
	Bluegill	PSD		67	81	10						10
		PSD-P		67	75	8						1
		Wr		138	127	125						116
	Largemouth Bass	PSD										0
		PSD-P										0
		Wr										101
	Northern Pike	PSD		43	23	69						100
		PSD-P		14	0	0						56

			Year									
Gear	Species	Index	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
frame net (std 3/4 in)	Northern Pike	Wr		77	66	75						84
	Walleye	PSD										100
		PSD-P										0
		Wr										89
	Yellow Perch	PSD		100	100	100						94
		PSD-P		100	100	67						19
		Wr		102	90	87						80
std exp gill net	Black Bullhead	PSD		62	98	100						
		PSD-P		0	0	0						
		Wr		113	95	93						
	Northern Pike	PSD		20	43	92						
		PSD-P		4	0	8						
		Wr		81	70	77						
	Yellow Perch	PSD		100	78	0						
		PSD-P		100	33	0						
		Wr		113	87	90						

Length at Capture

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

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	40		106 (13)	139 (15)	168 (8)		235 (3)	261 (1)			

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	2							510 (1)	549 (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+
2014	18		200 (10)		261 (6)	289 (2)					

Fish Condition

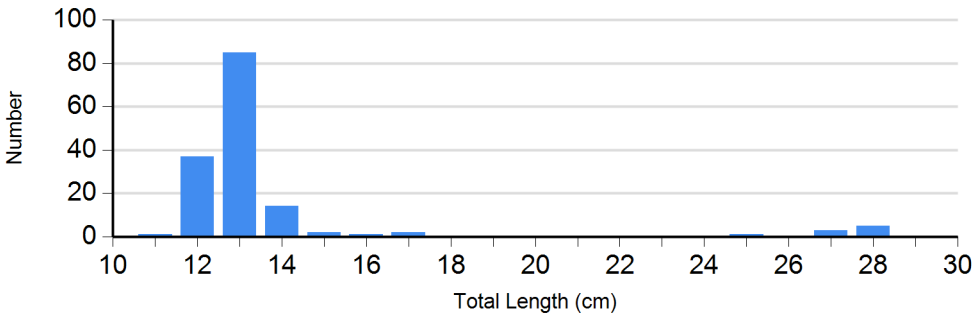
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2017	5	94 (6.2)	9	82 (4.5)	0		0	
Bluegill Frame Net	2017	25	128 (2.3)	11	118 (2.7)	2	149 (15.0)	2	117 (2.3)
	2021	166	114 (0.9)	17	121 (1.8)	2	119 (0.4)	0	
Northern Pike Gill Net	2017	0		23	70 (1.1)	0		0	
Walleye Gill Net	2017	0		0		2	106 (1.8)	0	
Yellow Perch Gill Net	2017	1	93	0		0		0	

Length Frequency Distribution

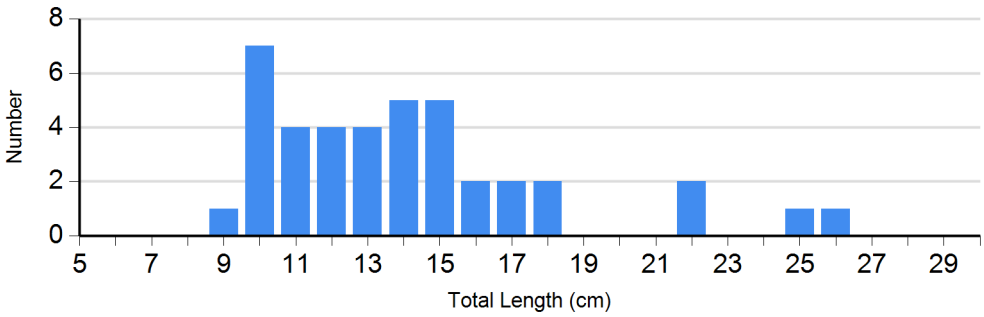
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



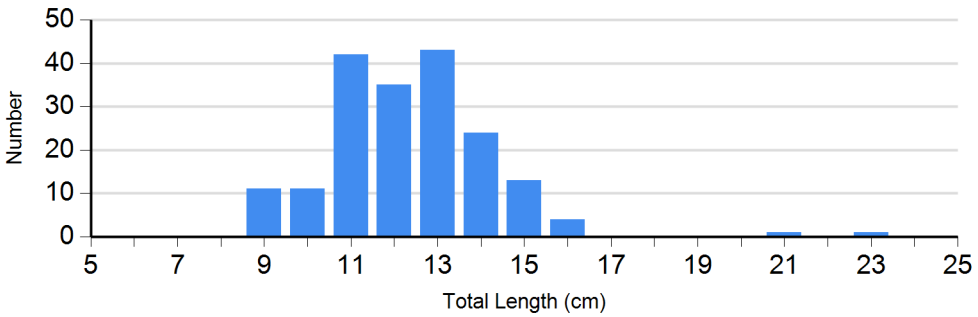
2017

Species: Bluegill
Gear: AFS std frame net



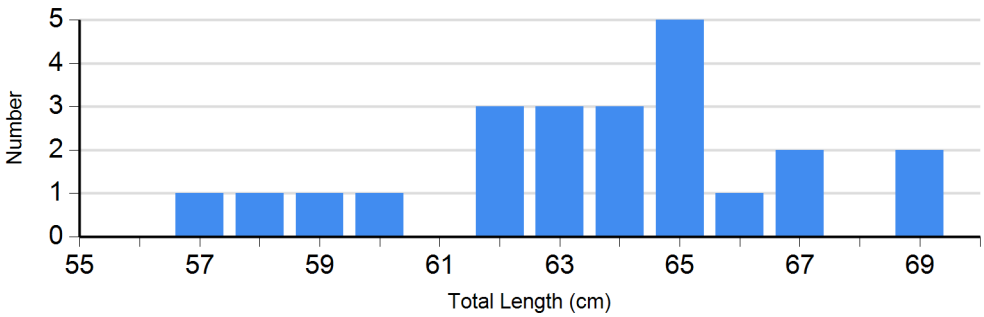
2017

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



2021

Species: Northern Pike
Gear: AFS std gill net

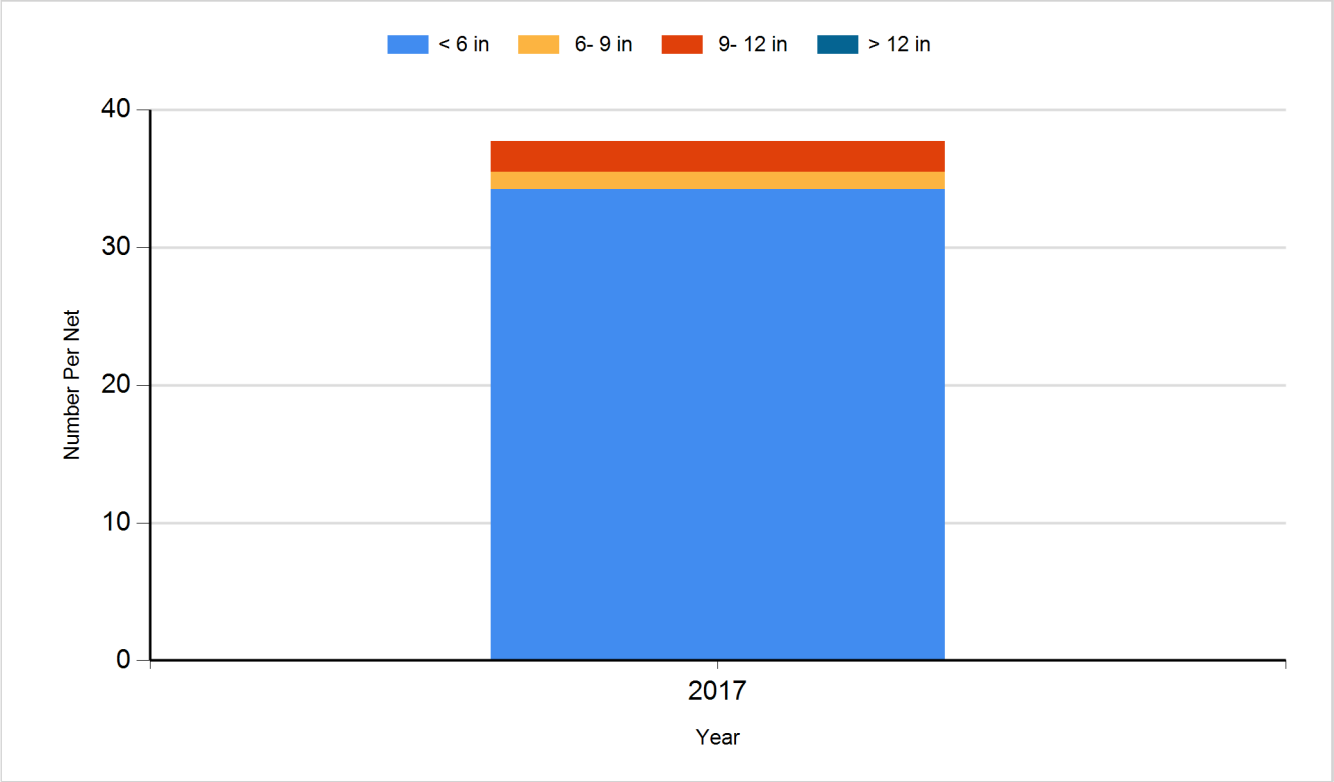


2017

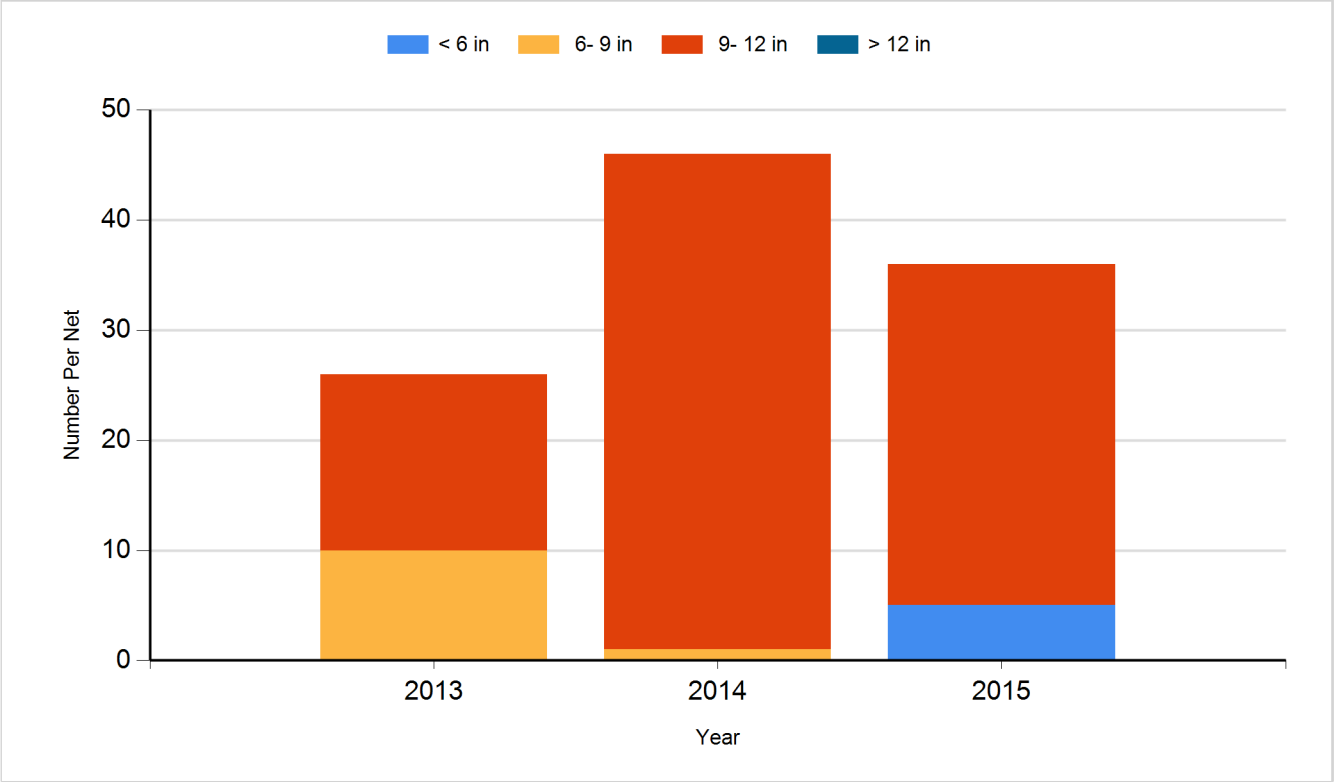
Historic Fish Sizes and Relative Abundance

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

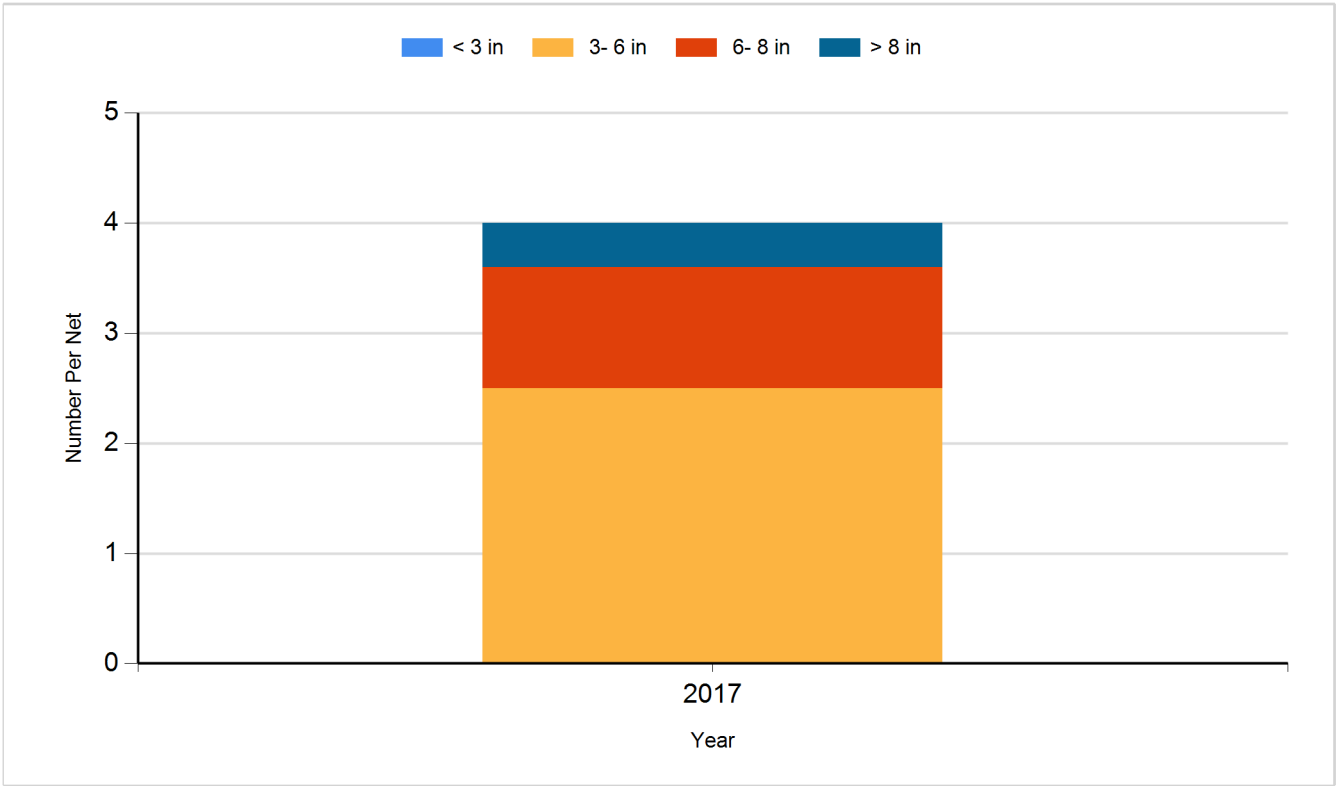
Species: Black Bullhead
Gear: AFS std gill net



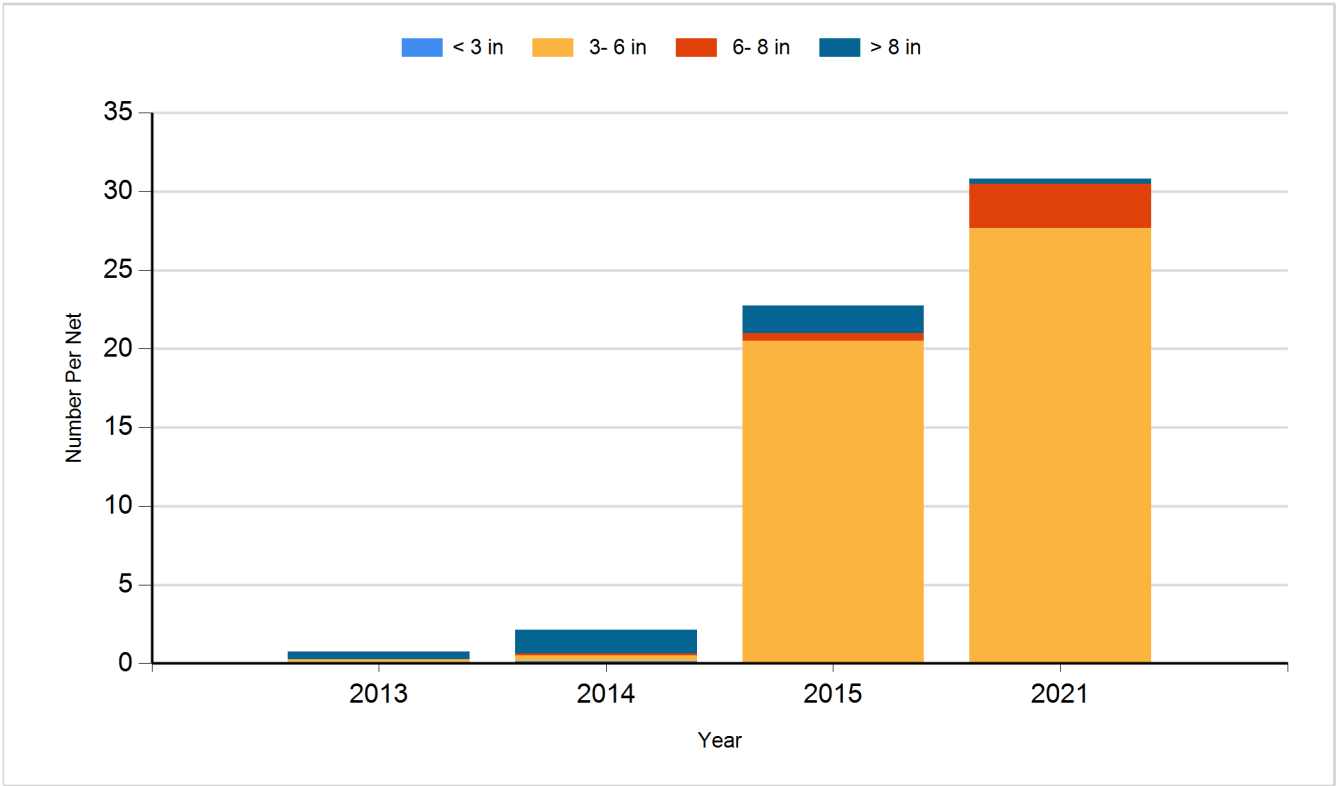
Species: Black Bullhead
Gear: std exp gill net



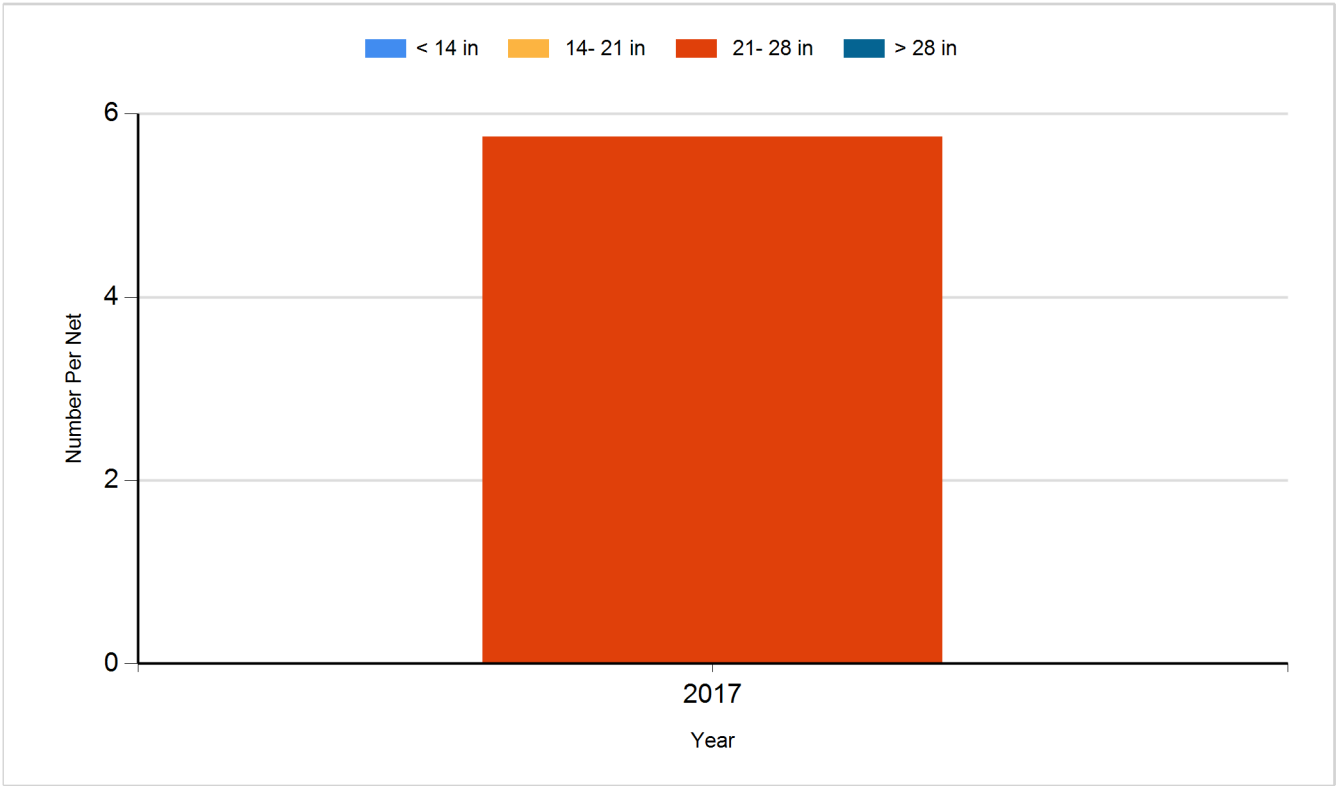
Species: Bluegill
Gear: AFS std frame net



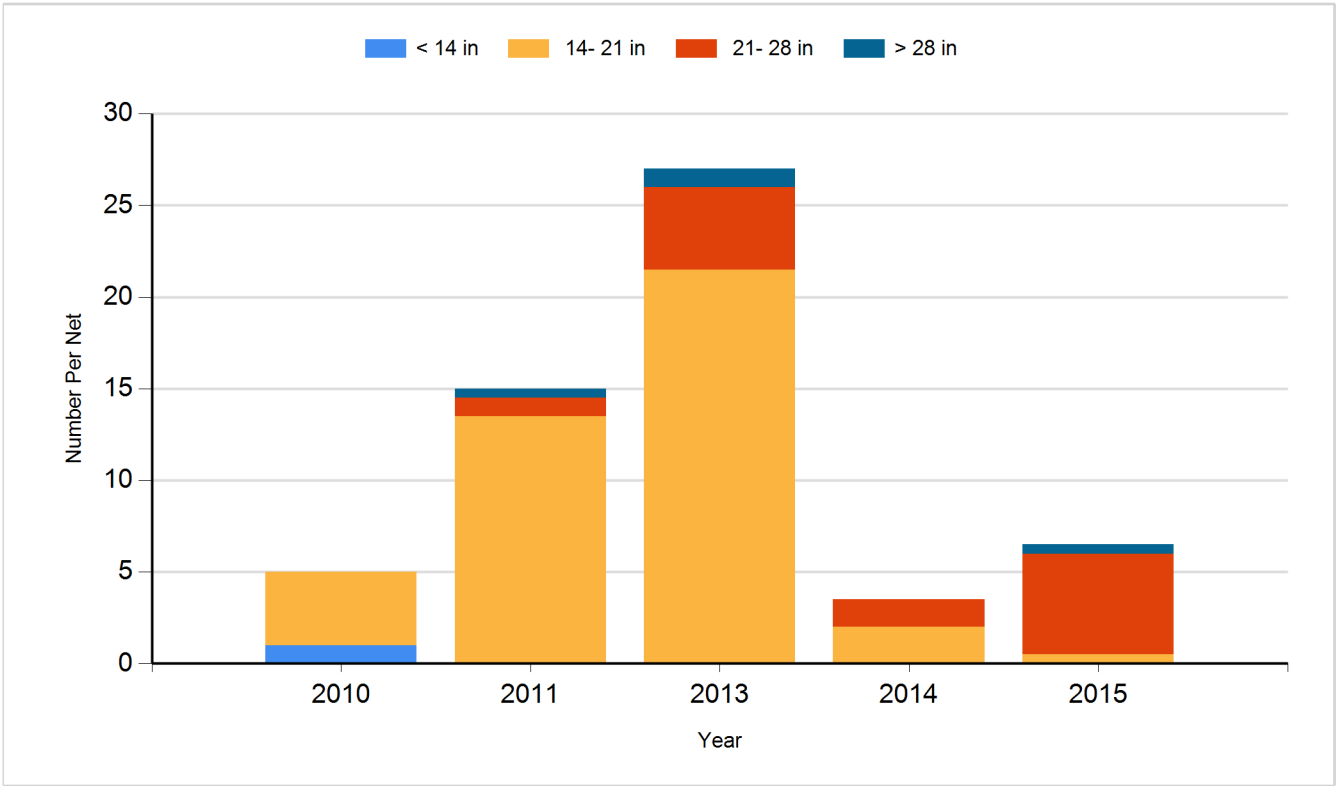
Species: Bluegill
Gear: frame net (std 3/4 in)



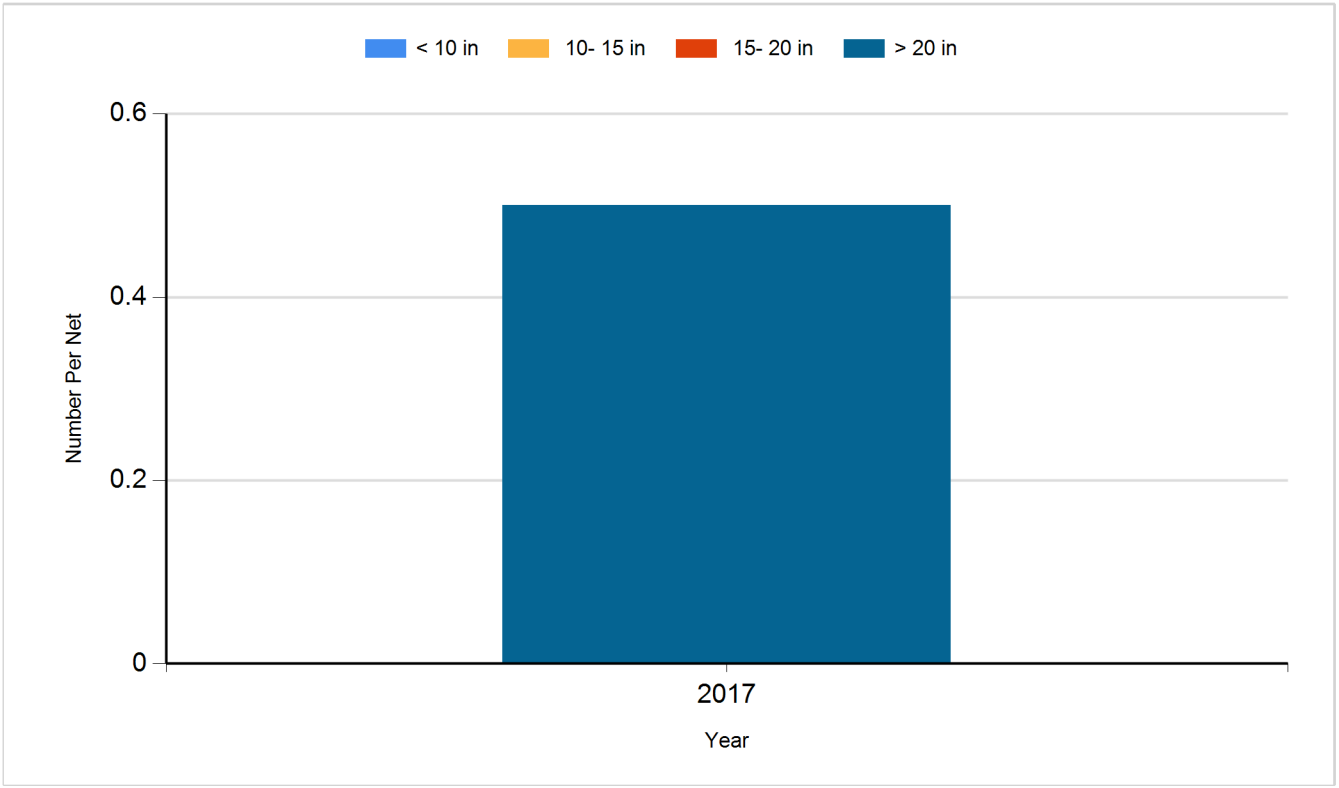
Species: Northern Pike
Gear: AFS std gill net



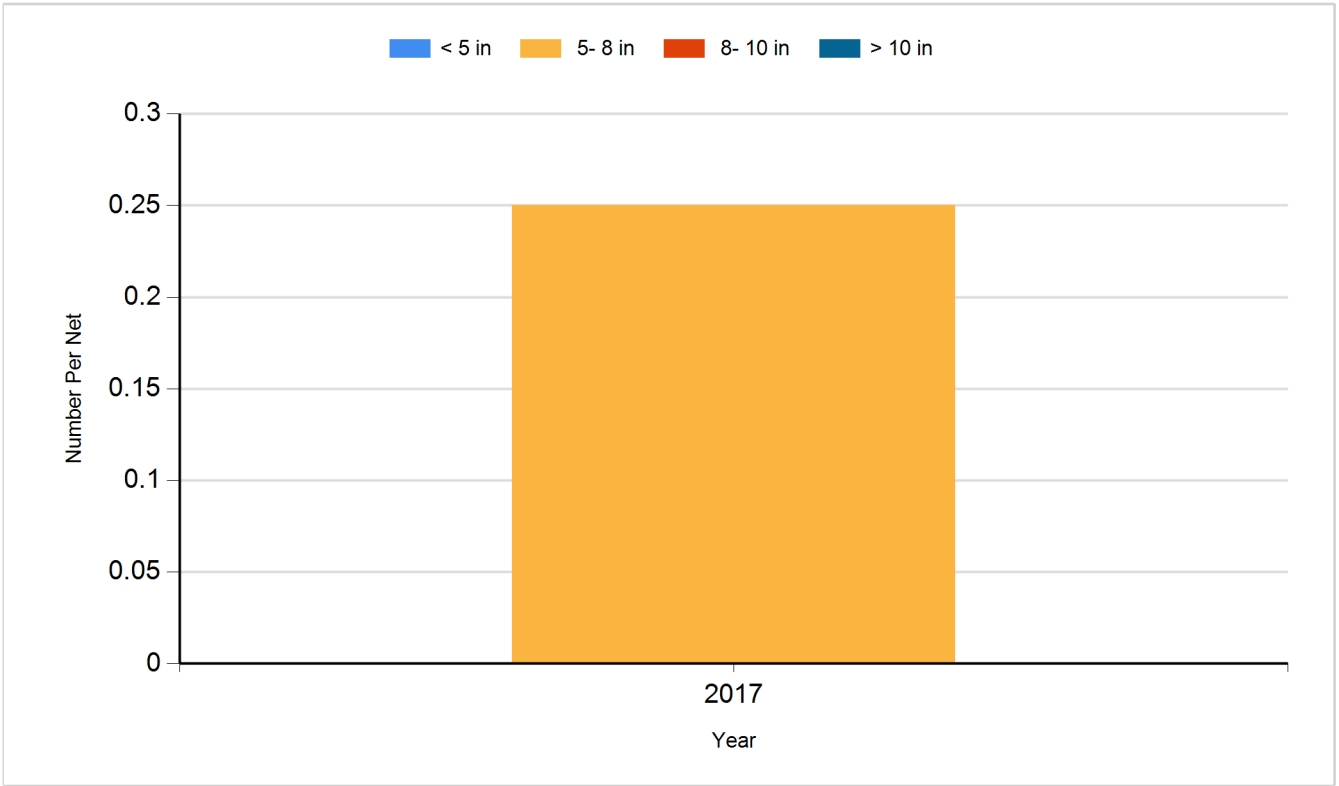
Species: Northern Pike
Gear: std exp gill net



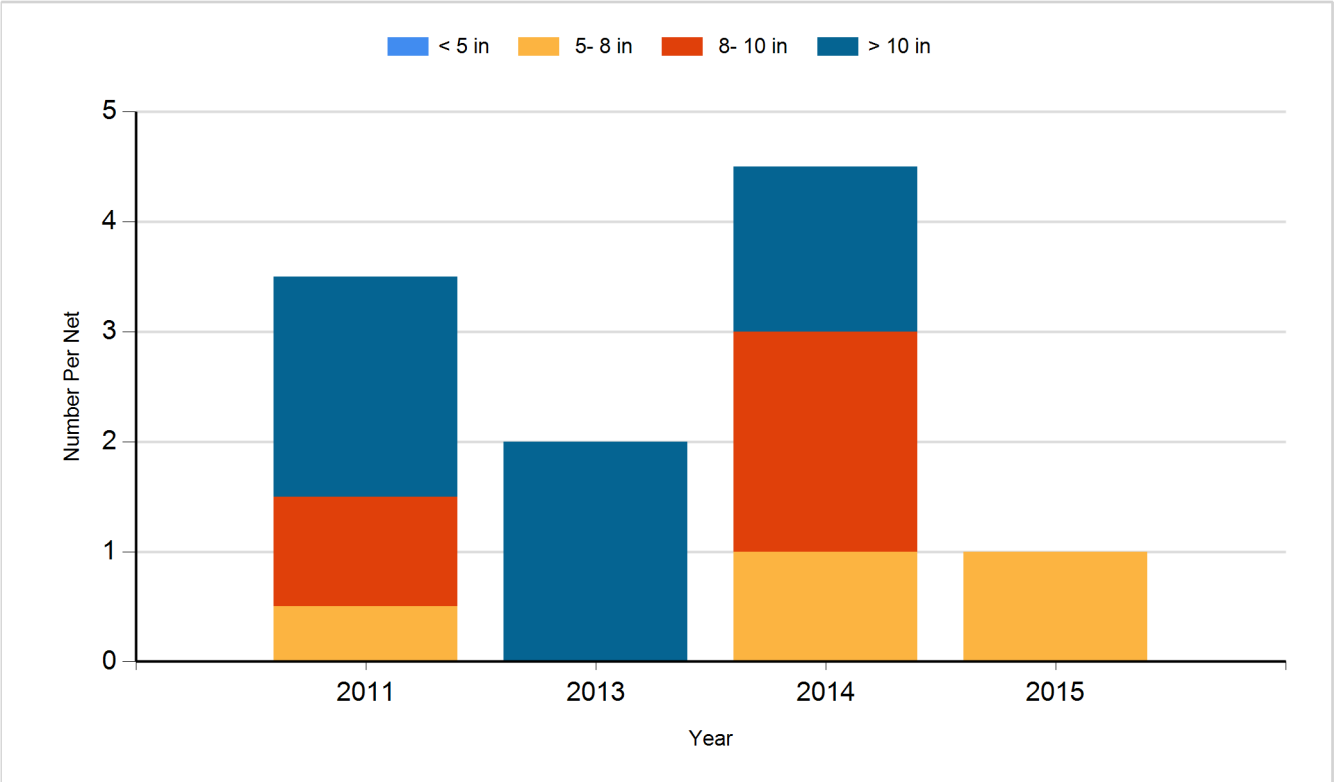
Species: Walleye
Gear: AFS std gill net



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	Largemouth Bass	Fingerling	5,000
2010	Walleye	Small Fingerling	8,200
2011	Bluegill	Adult	125
2011	Golden Shiner	Adult	60
2011	Yellow Perch	Adult	585
2012	Bluegill	Adult	470
2012	Largemouth Bass	Adult	150
2012	Yellow Perch	Adult	572
2014	Walleye	Fingerling	20,000
2014	Walleye	Large Fingerling	1,592
2019	Bluegill	Adult	60
2019	Largemouth Bass	Fingerling	1,500
2021	Black Crappie	Adult	100
2021	Bluegill	Juvenile	200
2021	Largemouth Bass	Small Fingerling	2,500
2021	Northern Pike	Adult	30
2021	Yellow Perch	Adult	1,100