

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Sorum Dam, Perkins County
UMO-Lake-25-000
2020

Lake Information

Name: Sorum Dam
County: Perkins
Surface Area: 110 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 26, 2020	2 net-nights
frame net (std 3/4 in)	Jun 26, 2020	5 net-nights

Common Fish Species Present

Walleye

Largemouth Bass

Yellow Perch

Black Crappie

Black Bullhead

White Sucker

Green Sunfish

Gizzard Shad

Golden Shiner

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.
- **std 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.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

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.

$$PSD = \left(\frac{\text{number of fish} \geq \text{quality length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

$$PSD - P = \left(\frac{\text{number of fish} \geq \text{preferred length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

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.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

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).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(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**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	55	26.0	55.4	13	7	0	100	2	
	Gizzard Shad	1	0.5	1.5	100			91		
	Walleye	24	11.0	15.4	0		0	88	1	
	White Sucker	17	8.5	4.6	41	20	35	19	105	3
	Yellow Perch	31	15.5	1.5	13		6		113	2
frame net (std 3/4 in)	Black Bullhead	805	17.2	9.9	29	7	0			
	Black Crappie	20	1.0	0.7	60		40	112	14	
	Golden Shiner	7	0.0	0.0						
	Green Sunfish	5	1.0	1.2	0		0	124	12	
	Walleye	62	9.6	2.5	0		0	85	1	
	White Sucker	100	20.0	13.3	0		0			
	Yellow Perch	109	21.6	19.7	2		2	102	1	

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

Gear	Species	CPUE										Avg
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
AFS std gill net	Black Bullhead										26.0	26.00
	Gizzard Shad										0.5	0.50
	Walleye										11.0	11.00
	White Sucker										8.5	8.50
	Yellow Perch										15.5	15.50
boat shocker (night)	Largemouth Bass				10.8		148.5					79.65
	Walleye*				2.4		0.0					1.20
boat shocker (night, AC)	Largemouth Bass	32.9										32.90
	Walleye*	39.2										39.20
frame net (std 3/4 in)	Black Bullhead	209.8	21.4		36.1	68.6	170.2				17.2	87.22
	Black Crappie	5.0	18.4		25.0	10.6	3.4				1.0	10.57
	Golden Shiner	0.0	0.0		0.0	0.0	0.0				0.0	0.00
	Green Sunfish	83.8	12.6		2.0	4.1	0.2				1.0	17.28
	Largemouth Bass	0.0	1.2		0.1	0.0	0.0				0.0	0.22
	Northern Pike	0.0	0.0		0.0	0.6	4.4				0.0	0.83
	Walleye	1.3	5.4		0.1	0.0	0.0				9.6	2.73
	White Sucker	0.0	0.0		0.0	0.0	0.0				20.0	3.33
	Yellow Perch	250.0	22.0		52.1	55.0	27.8				21.6	71.42
std exp gill net	Black Bullhead	187.5	39.5		9.0	74.0	227.0					107.4 0
	Black Crappie	0.5	0.0		0.0	0.5	1.0					0.40
	Golden Shiner	0.0	0.0		0.0	0.0	0.0					0.00
	Green Sunfish	1.0	0.0		0.0	0.5	0.0					0.30
	Northern Pike	0.0	0.0		0.0	6.5	2.5					1.80
	Walleye	3.0	2.0		0.0	0.5	3.0					1.70
	Yellow Perch	44.5	121.0		35.5	69.5	28.0					59.70

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.

Gear	Species	Index	Year											
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
AFS std gill net	Black Bullhead	PSD												13
		PSD-P												0
		Wr												100
	Gizzard Shad	PSD												100
		Wr												91
	Walleye	PSD												0
		PSD-P												0
		Wr												88
	White Sucker	PSD												41
		PSD-P												35
		Wr												105
	Yellow Perch	PSD												13
		PSD-P												6
		Wr												113
	boat shocker (night)	Largemouth Bass	PSD				78		4					
PSD-P						0		2						
Wr						127		113						
Walleye		PSD				100								
		PSD-P				0								
		Wr				96								
boat shocker (night, AC)	Largemouth Bass	PSD	88											
		PSD-P	0											
		Wr	125											
	Walleye	PSD	14											
		PSD-P	0											
		Wr	90											
frame net (std 3/4 in)	Black Bullhead	PSD	5	9		94	89	85					29	
		PSD-P	0	0		0	0	0					0	
		Wr	92	87		88	91							
	Black Crappie	PSD	0	65		80	100	94					60	
		PSD-P	0	0		0	17	82					40	
		Wr	108	105		109	100	99					112	

Gear	Species	Index	Year											
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
frame net (std 3/4 in)	Green Sunfish	PSD	34	81		44	98	100						0
		PSD-P	0	0		6	0	0						0
		Wr	97	96		98	115	110						124
	Largemouth Bass	PSD		100		100	0							
		PSD-P		0		0	0							
		Wr		105		101								
	Walleye	PSD	0	37		0								0
		PSD-P	0	0		0								0
		Wr	91	82		87								85
	White Sucker	PSD												0
		PSD-P												0
	Yellow Perch	PSD	57	62		86	95	84						2
		PSD-P	0	0		0	9	12						2
		Wr	92	89		88	88	82						102
	std exp gill net	Black Bullhead	PSD	4	1		50	87	84					
PSD-P			0	0		0	0	0						
Wr			107	106		109	94	95						
Black Crappie		PSD	0				100	0						
		PSD-P	0				0	0						
		Wr	110				99	109						
Green Sunfish		PSD	50				100							
		PSD-P	0				0							
		Wr	100				107							
Walleye		PSD	0	0			100	17						
		PSD-P	0	0			0	17						
		Wr	95	83			102	96						
Yellow Perch		PSD	22	28		68	81	57						
		PSD-P	1	0		0	3	7						
		Wr	95	93		93	91	87						

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+
2015	107	114 (1)			237 (67)	242 (31)	255 (9)				

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	100		230 (100)								

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2016	6		334 (5)				511 (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	71					207 (71)					

Fish Condition

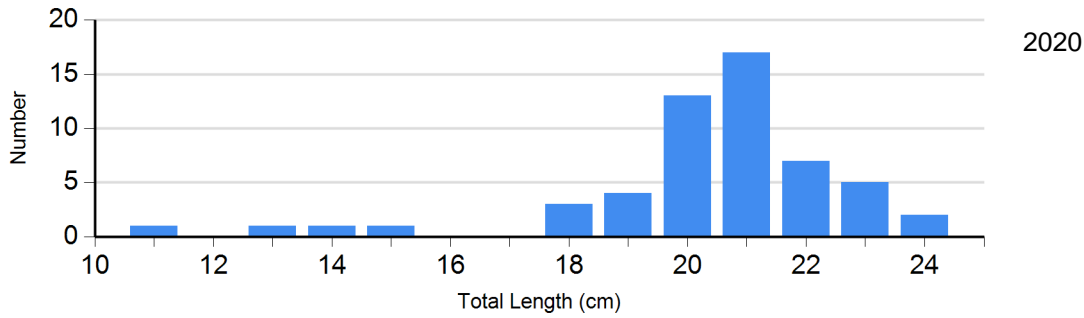
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2016	72	99 (1.1)	382	93 (0.9)	0		0	
	2020	45	100 (1.3)	7	101 (5.0)	0		0	
Black Crappie Frame Net	2016	1	106	2	104 (0.5)	14	98 (1.4)	0	
	2020	2	126 (2.8)	1		2	83	0	
Largemouth Bass Electro Fishing	2016	95	113 (0.8)	2	113 (5.2)	2	116 (1.3)	0	
Walleye Gill Net	2016	5	96 (1.7)	0		1	95	0	
	2020	22	88 (0.9)	0		0		0	
White Sucker Gill Net	2020	10	99 (1.5)	1	129	5	114 (1.8)	1	105
Yellow Perch Gill Net	2016	24	93 (1.5)	28	83 (1.5)	4	84 (4.7)	0	
	2020	27	116 (1.1)	2	104 (0.9)	2	90 (5.5)	0	

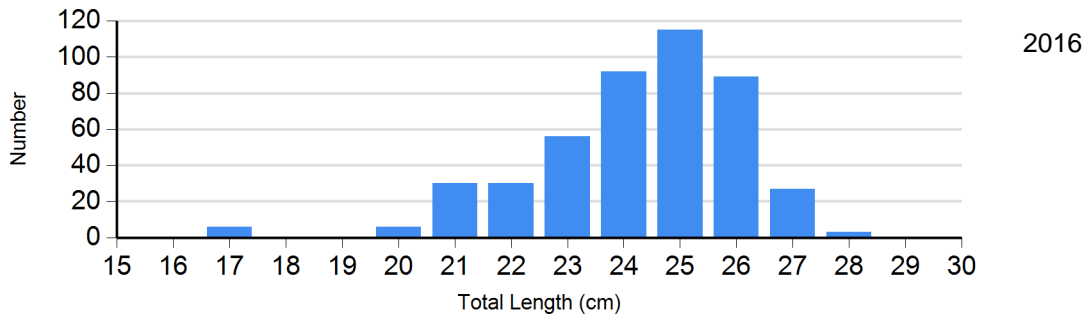
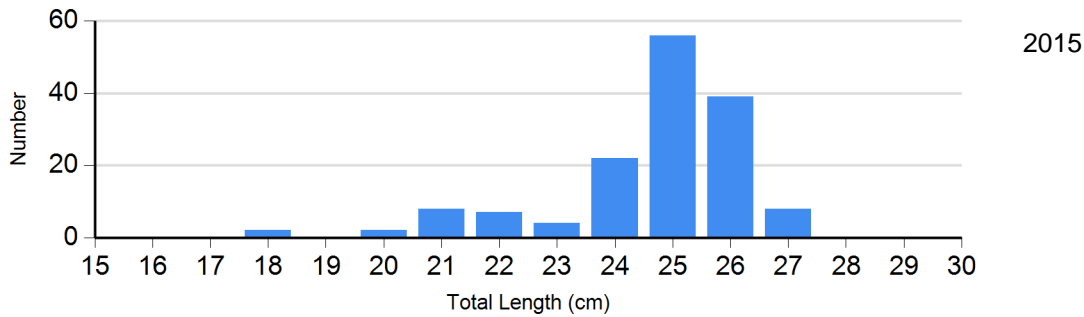
Length Frequency Distribution

Length frequency histogram of species sampled by year.

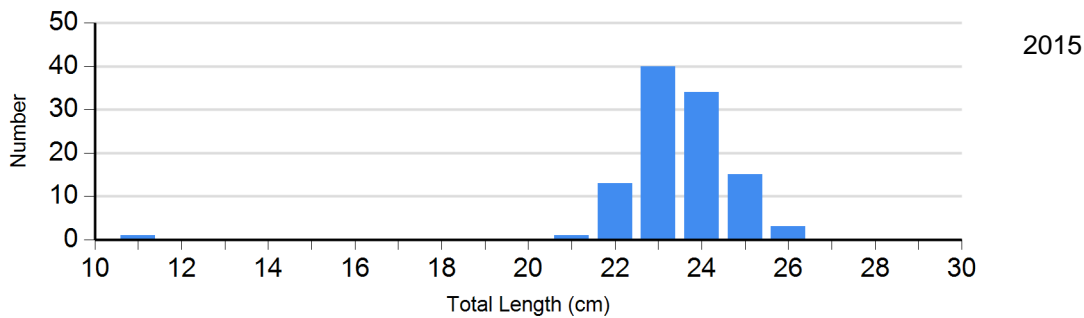
Species: Black Bullhead
Gear: AFS std gill net

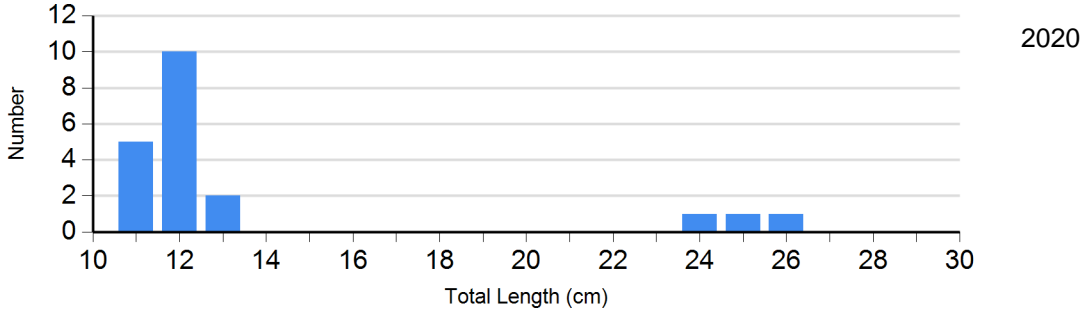
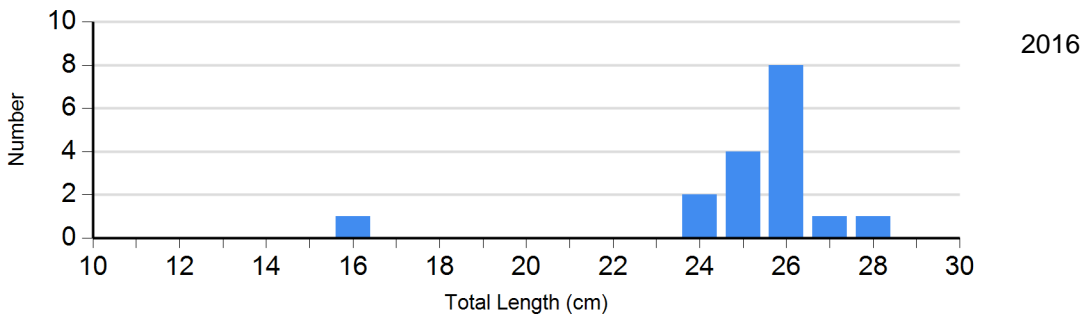


Species: Black Bullhead
Gear: std exp gill net

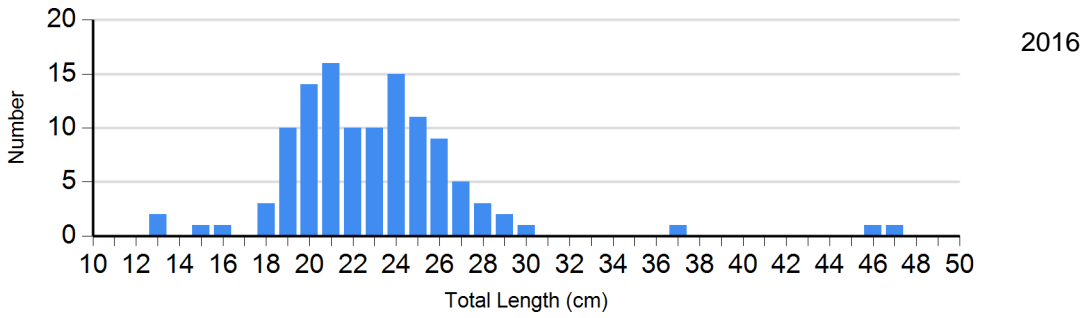


Species: Black Crappie
Gear: frame net (std 3/4 in)

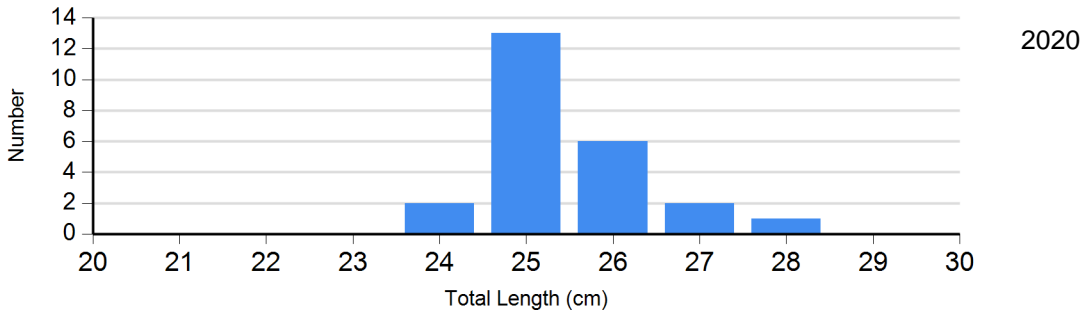




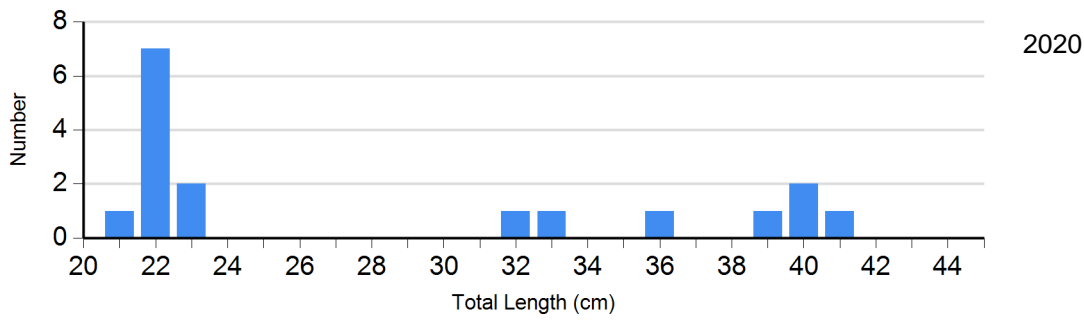
Species: Largemouth Bass
 Gear: boat shocker (night)



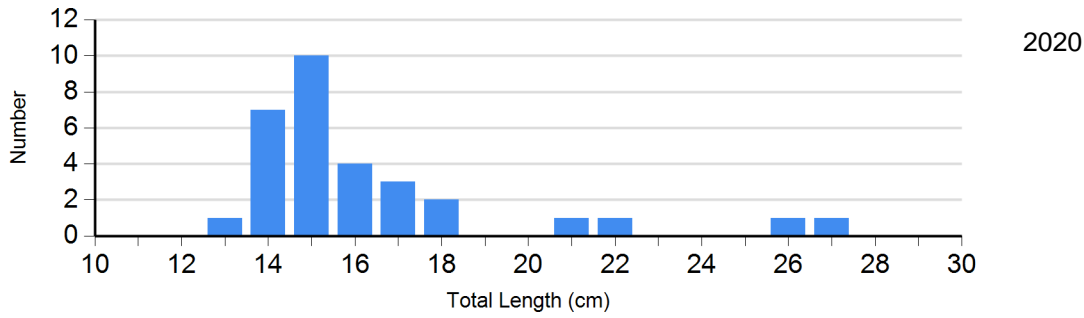
Species: Walleye
 Gear: AFS std gill net



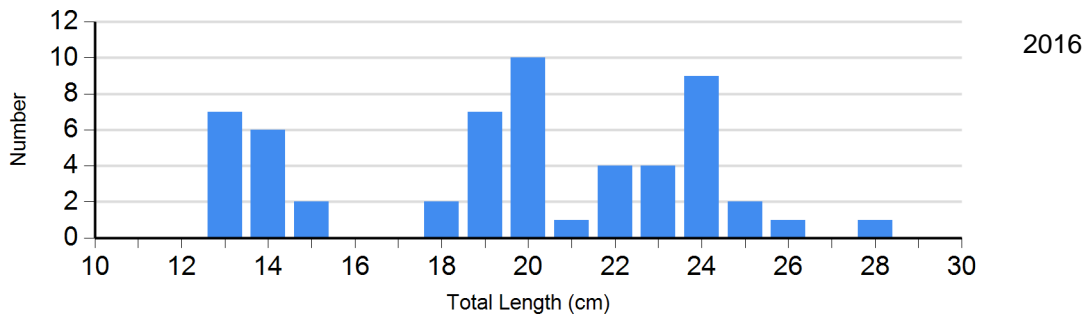
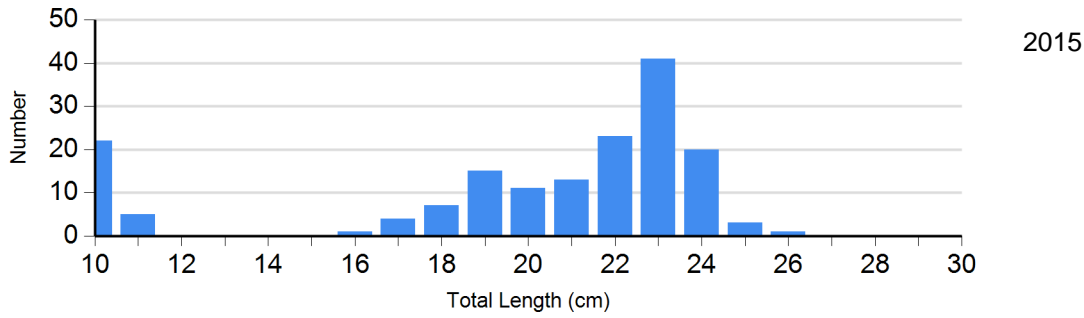
Species: White Sucker
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net



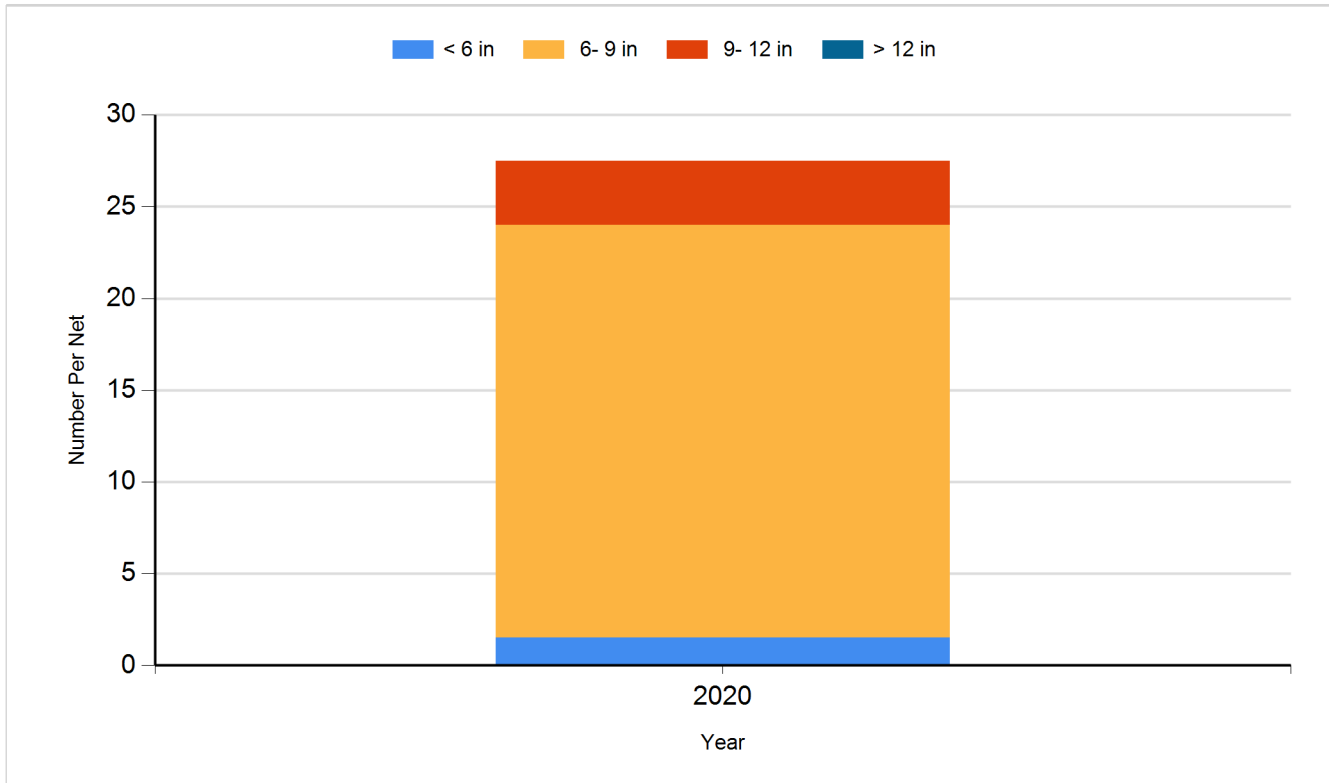
Species: Yellow Perch
Gear: std exp gill net



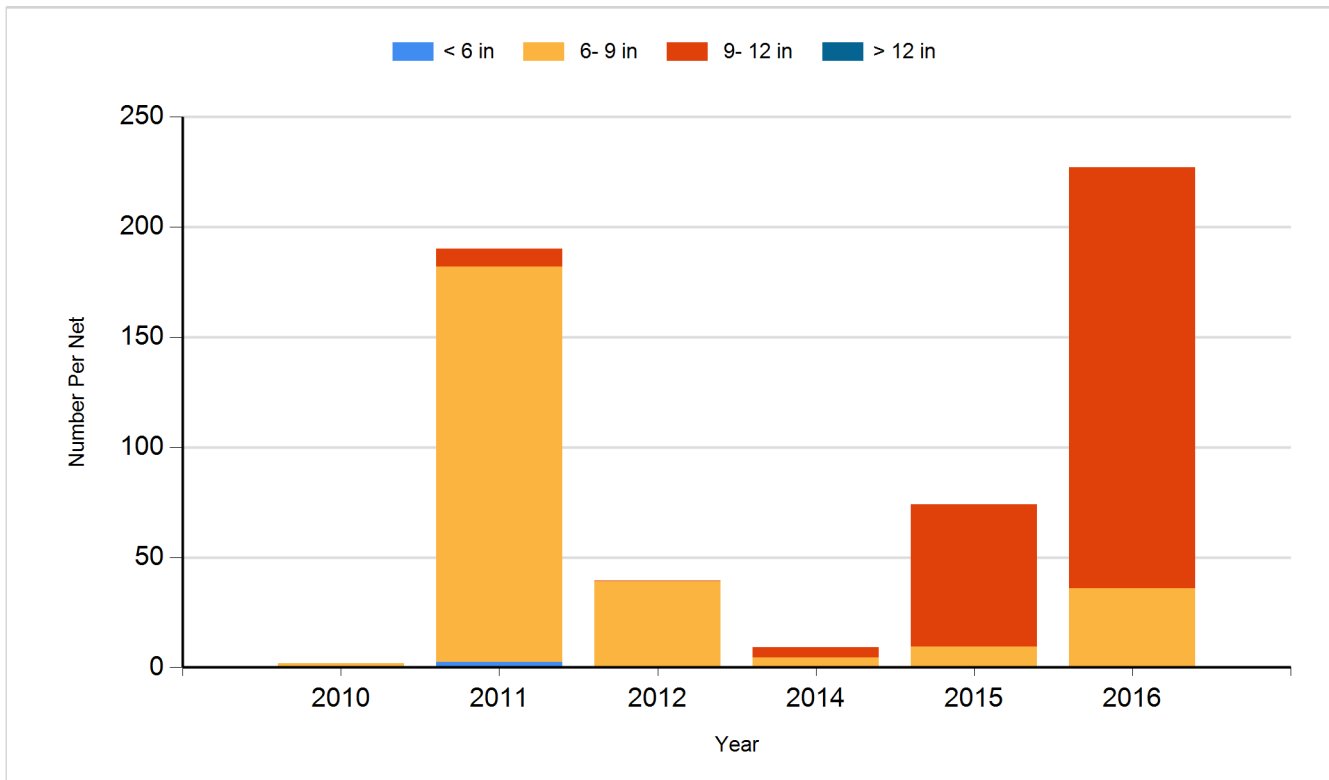
Historic Fish Sizes and Relative Abundance

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

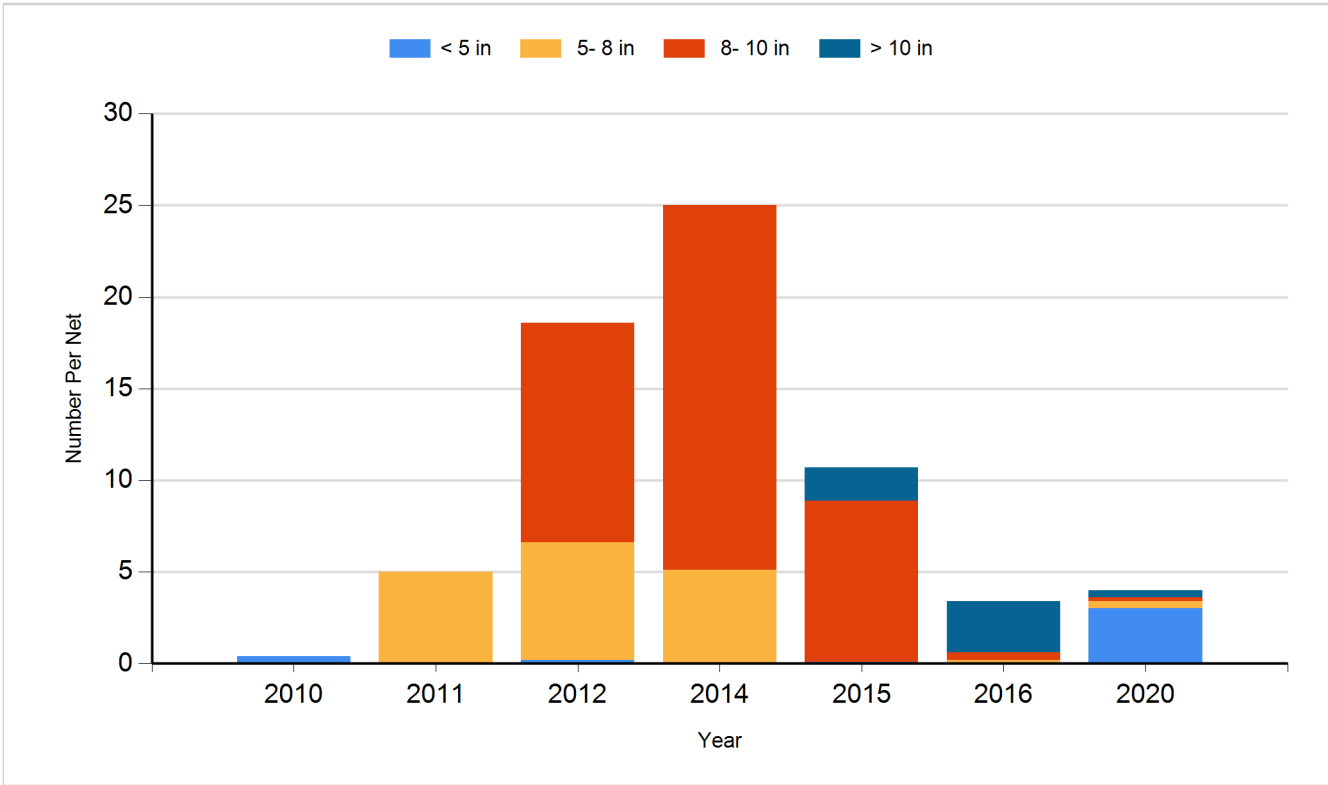
Species: Black Bullhead
Gear: AFS std gill net



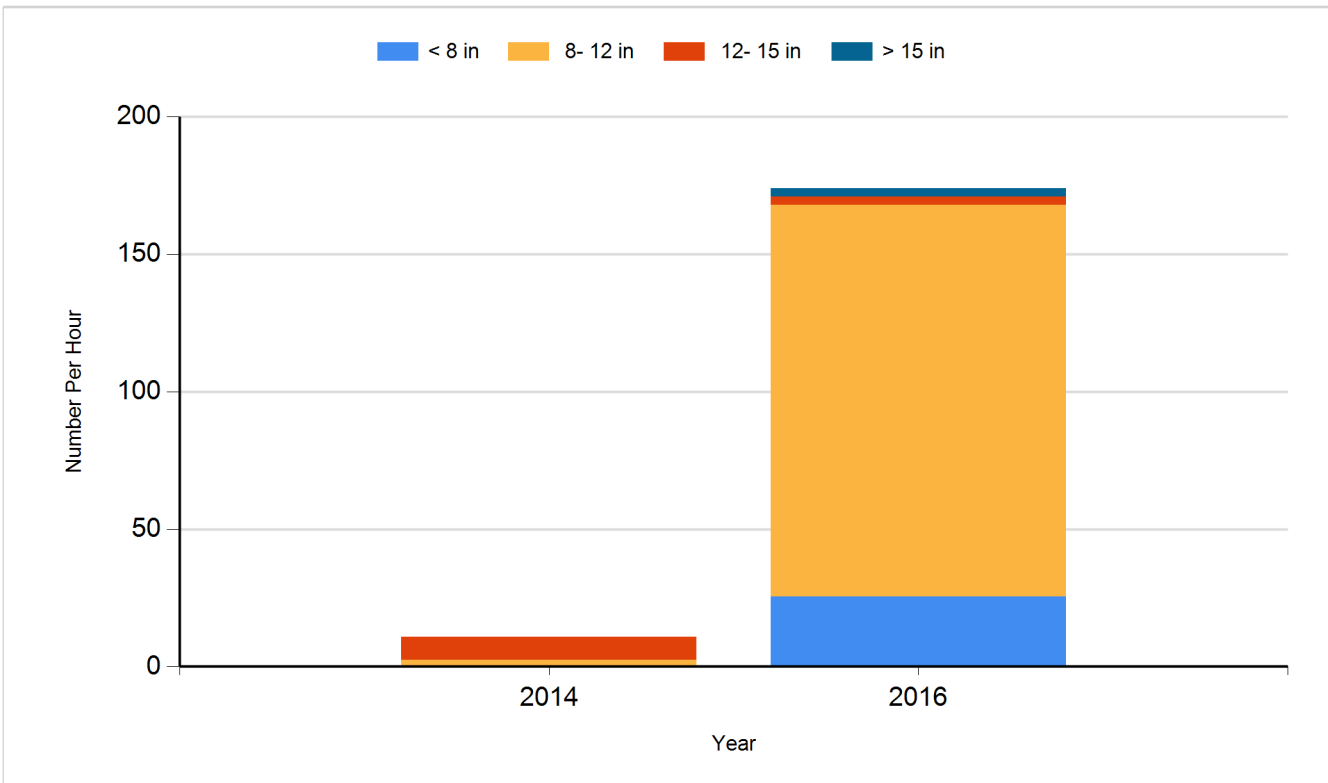
Species: Black Bullhead
Gear: std exp gill net



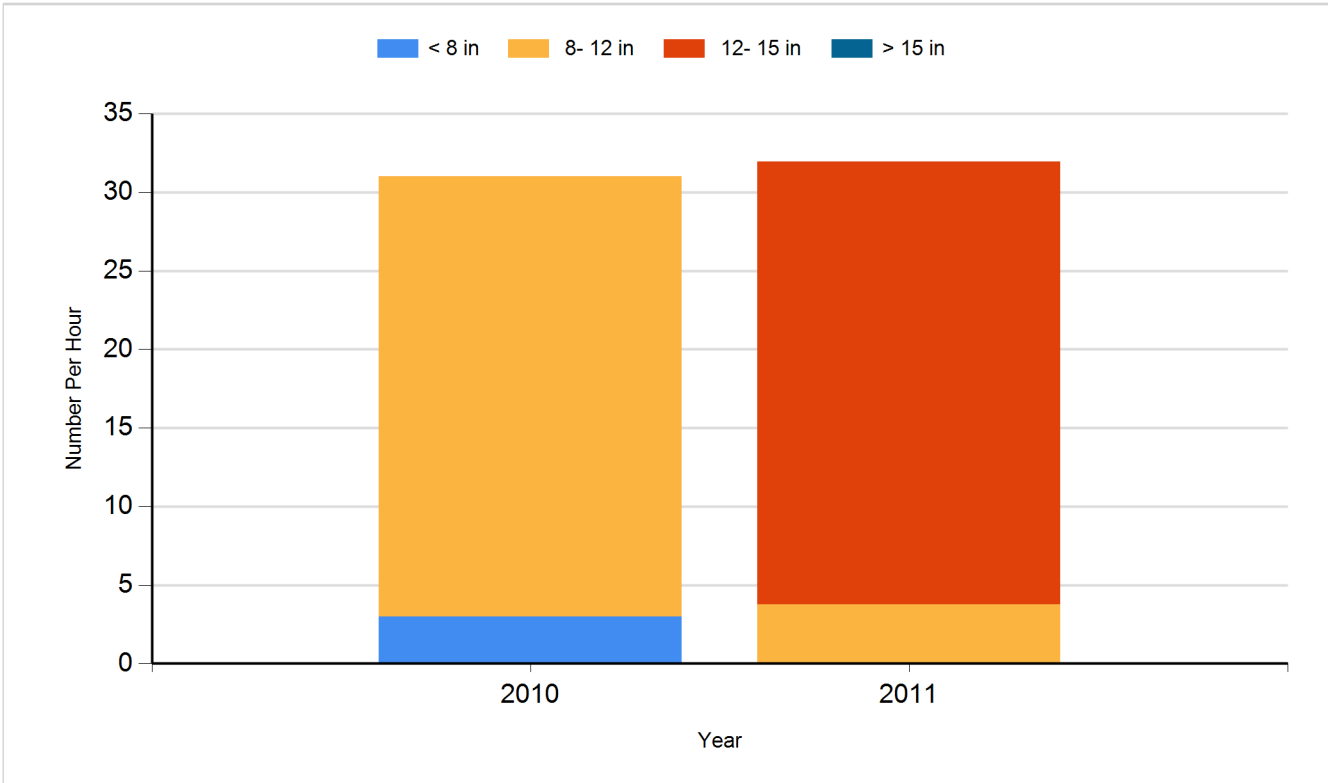
Species: Black Crappie
Gear: frame net (std 3/4 in)



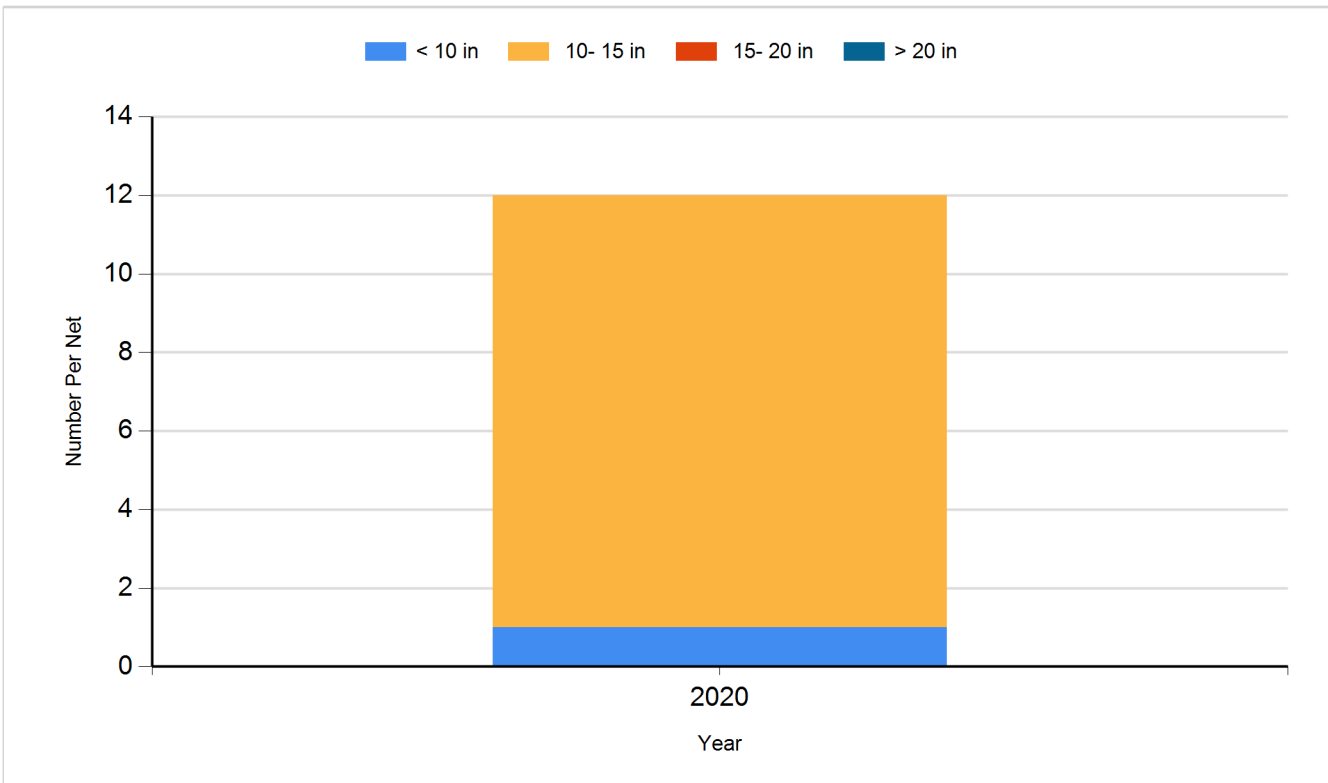
Species: Largemouth Bass
Gear: boat shocker (night)



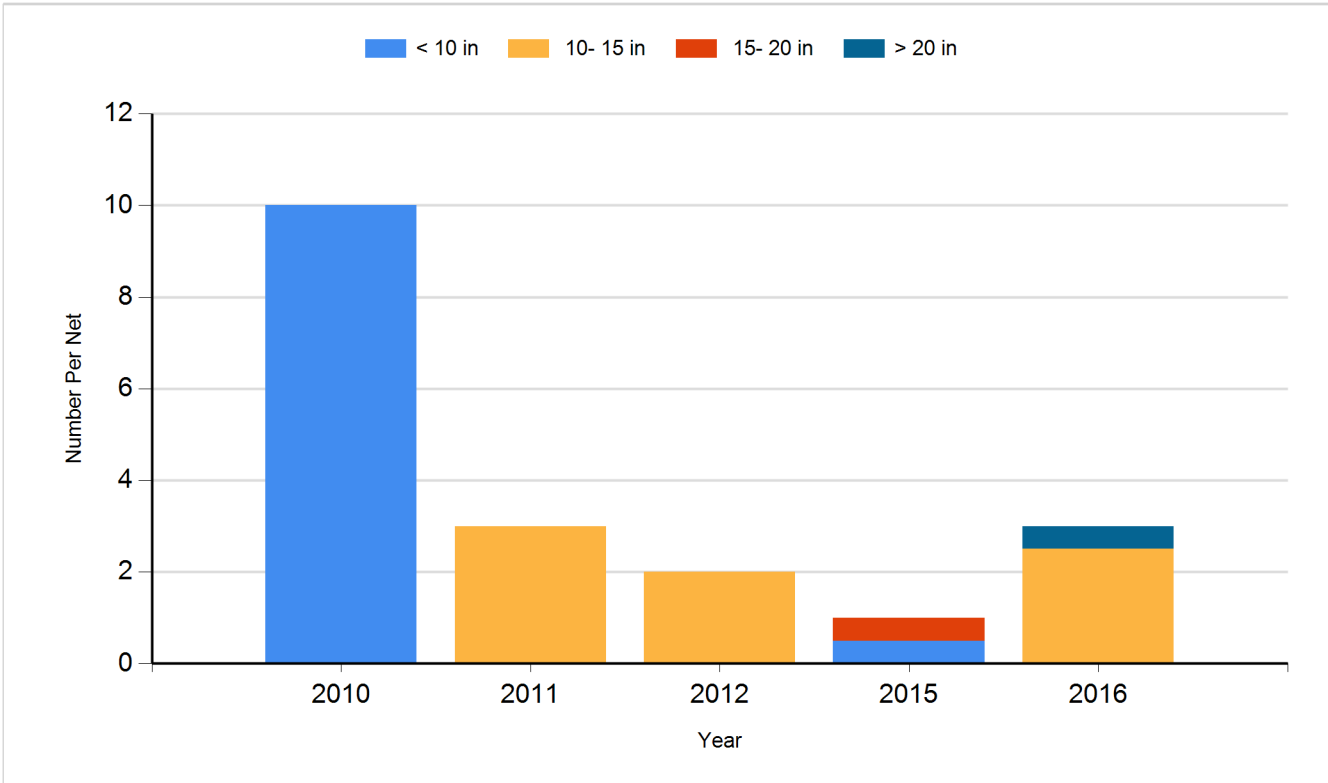
Species: Largemouth Bass
Gear: boat shocker (night, AC)



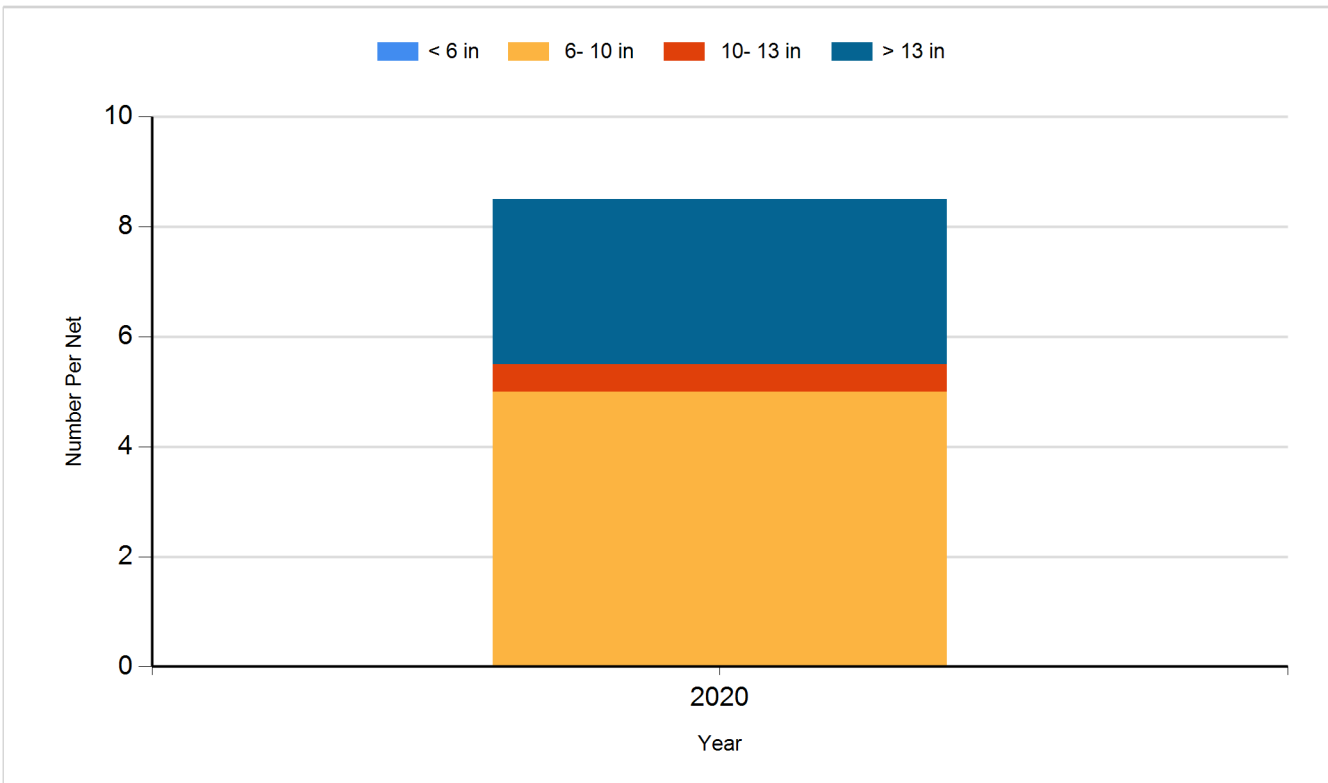
Species: Walleye
Gear: AFS std gill net



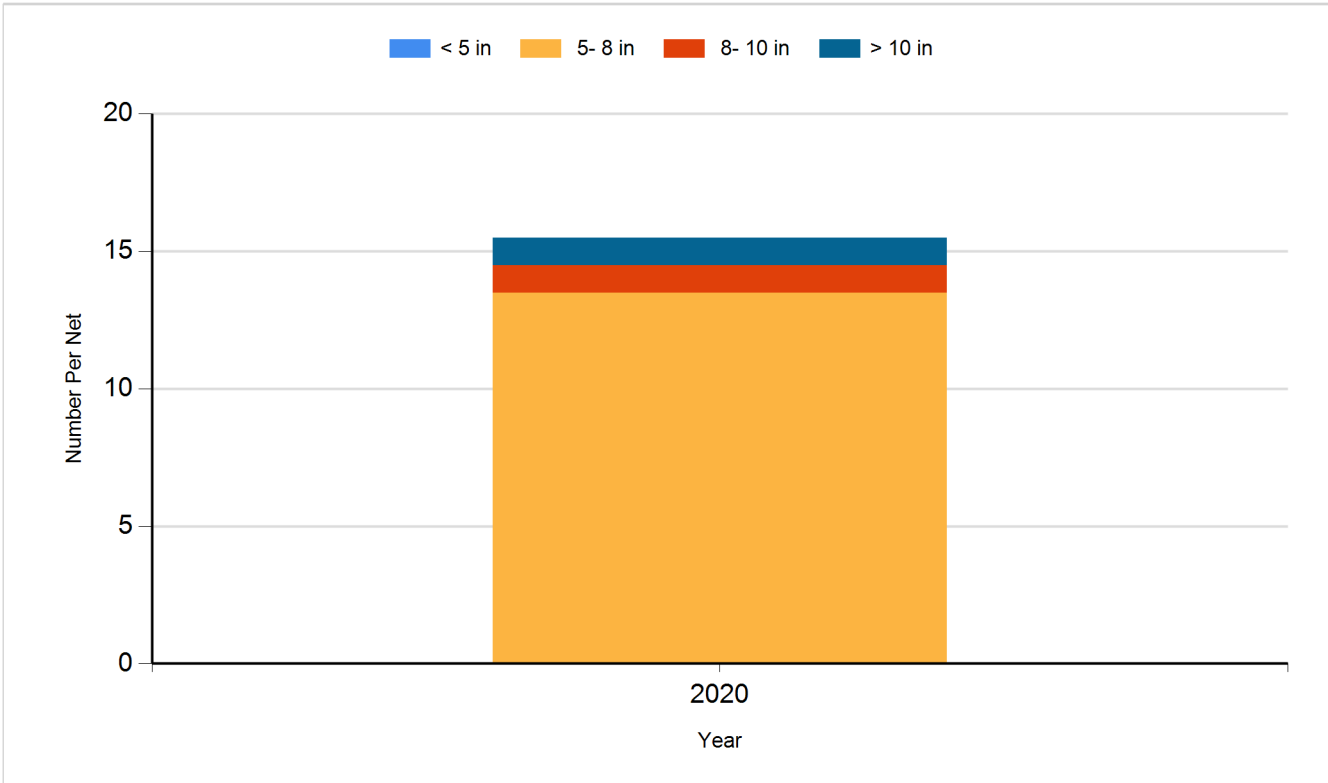
Species: Walleye
Gear: std exp gill net



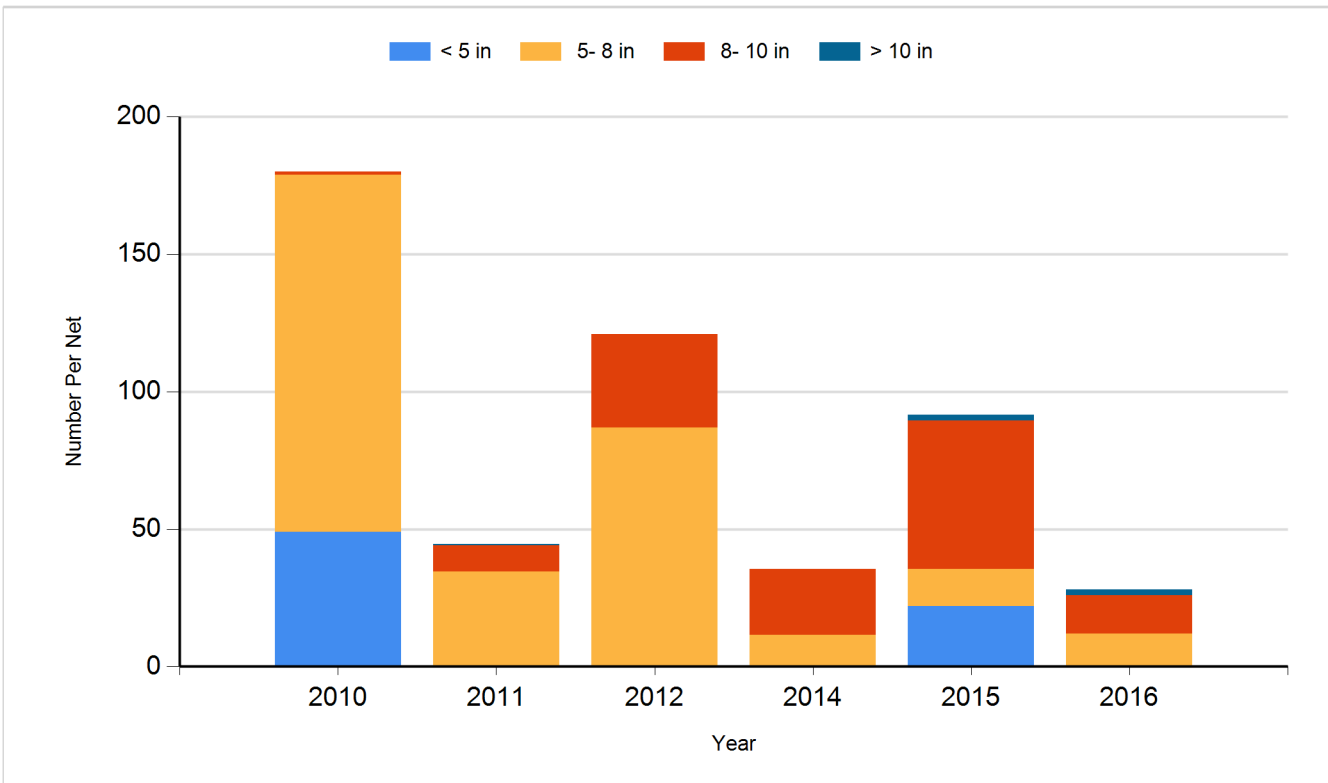
Species: White Sucker
Gear: AFS std gill net



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
2009	Black Crappie	Adult	200
2009	Largemouth Bass	Fingerling	7,320
2009	Walleye	Fingerling	43,800
2009	Yellow Perch	Adult	550
2010	Golden Shiner	Adult	250
2010	Walleye	Small Fingerling	9,000
2010	Yellow Perch	Adult	490
2012	Largemouth Bass	Adult	240
2012	Largemouth Bass	Fingerling	20,150
2014	Walleye	Large Fingerling	1,593
2015	Largemouth Bass	Juvenile	870
2019	Walleye	Small Fingerling	19,890
2019	Yellow Perch	Adult	350
2020	Black Crappie	Adult	170
2020	Gizzard Shad	Adult	62
2020	Largemouth Bass	Small Fingerling	10,950