

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Cochrane, Deuel County

LQP-Lake-56-000

2022

Lake Information

Name:	Cochrane	Maximum Depth:	24 Feet
County:	Deuel	Mean Depth:	13 Feet
		OHWM Elevation:	1,684
Surface Area:	366 Acres	Outlet Elevation:	1,683

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 28, 2022	3 net-nights
AFS std gill net	Jun 29, 2022	3 net-nights
frame net (std 3/4 in)	Jun 28, 2022	6 net-nights
frame net (std 3/4 in)	Jun 29, 2022	6 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

Northern Pike

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	21	3.5	1.2	100		48	17	97	3
	Black Crappie	25	4.2	2.2	24	14	4		103	3
	Bluegill	10	1.7	0.8	0		0		109	4
	Northern Pike	3	0.5	0.3	100		0		94	7
	Walleye	68	11.3	1.9	71	8	15	7	89	1
	Yellow Perch	244	40.7	8.2	20	4	5	2	94	1
frame net (std 3/4 in)	Black Bullhead	85	7.1	2.2	100		60	8	91	1
	Black Crappie	706	58.8	16.4	15	2	8	1	101	1
	Bluegill	736	61.3	16.9	38	2	7	1	99	1
	Largemouth Bass	2	0.1	0.1	100		100		86	
	Northern Pike	1	0.1	0.1	100		100		86	
	Walleye	6	0.4	0.3	20		0		81	3
	Yellow Perch	309	25.8	14.9	7	2	0		87	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	
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		
AFS std frame net	Black Crappie				17.6								17.60
	Bluegill				65.1								65.10
	Largemouth Bass				0.0								0.00
	Northern Pike				0.2								0.20
	Walleye				0.1								0.10
	Yellow Perch				3.9								3.90
AFS std gill net	Black Bullhead				0.0		3.2		4.8		3.5		2.88
	Black Crappie				5.2		30.3		37.0		4.2		19.18
	Bluegill				0.2		1.3		0.7		1.7		0.98
	Common Carp				0.0		0.0		0.2		0.0		0.05
	Largemouth Bass				0.2		0.7		0.5		0.0		0.35
	Northern Pike				2.0		0.3		1.3		0.5		1.03
	Walleye				10.0		6.2		2.3		11.3		7.45
Yellow Perch				36.8		47.2		16.0		40.7		35.18	
boat shocker (night, AC)	Largemouth Bass		82.3		231.0								156.65
frame net (std 3/4 in)	Black Bullhead		0.0				32.5		19.0		7.1		14.65
	Black Crappie		1.1				12.3		3.6		58.8		18.95
	Bluegill		44.5				46.7		19.9		61.3		43.10
	Common Carp		0.0				0.1		0.0		0.0		0.03
	Largemouth Bass		0.0				0.2		0.0		0.1		0.08
	Northern Pike		0.0				0.1		0.2		0.1		0.10
	Sunfish Hybrid		0.0				0.0		0.0		0.0		0.00
	Walleye		0.0				0.8		0.3		0.4		0.38
Yellow Perch		2.9				0.8		1.4		25.8		7.73	
std exp gill net	Black Bullhead		0.3										0.30
	Black Crappie		0.3										0.30
	Bluegill		0.3										0.30
	Largemouth Bass		0.0										0.00
	Northern Pike		3.0										3.00
	Sunfish Hybrid		0.0										0.00
	Walleye		3.0										3.00
Yellow Perch		170.0										170.00	

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.

Gear	Species	Index	Year													
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022				
AFS std frame net	Black Crappie	PSD				11										
		PSD-P				5										
		Wr				94										
	Bluegill	PSD				33										
		PSD-P				0										
		Wr				105										
	Largemouth Bass	PSD				0										
		PSD-P				0										
	Northern Pike	PSD				100										
		PSD-P				100										
		Wr				85										
	Walleye	PSD				0										
		PSD-P				0										
		Wr				72										
	Yellow Perch	PSD				23										
PSD-P					0											
Wr					86											
AFS std gill net	Black Bullhead	PSD							0		100		100			
		PSD-P								0		21		48		
		Wr									108		104		97	
	Black Crappie	PSD				0				1		100		24		
		PSD-P				0					1		0		4	
		Wr				107					102		103		103	
	Bluegill	PSD				100					38		100		0	
		PSD-P				0						0		0		0
		Wr				82						103		106		109
	Largemouth Bass	PSD				100						100		100		
		PSD-P				100						100		100		
		Wr				116						104		92		
	Northern Pike	PSD				100						100		100		
		PSD-P				75						50		13		0
		Wr				93						81		84		94
	Walleye	PSD				80						95		43		71

Gear	Species	Index	Year										
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
AFS std gill net	Walleye	PSD-P				10		54		36		15	
		Wr				95		92		86		89	
	Yellow Perch	PSD				19		11		54		20	
		PSD-P				1		0		2		5	
		Wr				94		103		105		94	
boat shocker (night, AC)	Largemouth Bass	PSD		60		34							
		PSD-P		21		13							
		Wr		103		103							
frame net (std 3/4 in)	Black Bullhead	PSD						4		100		100	
		PSD-P						1		7		60	
		Wr						99		97		91	
	Black Crappie	PSD		85					22		100		15
		PSD-P		38					3		5		8
		Wr		93					90		95		101
	Bluegill	PSD		69					91		99		38
		PSD-P		4					3		15		7
		Wr		106					103		109		99
	Largemouth Bass	PSD							50				100
		PSD-P							50				100
		Wr							90				86
	Northern Pike	PSD							100		50		100
		PSD-P							0		0		100
		Wr							88		88		86
	Walleye	PSD							20		75		20
		PSD-P							20		75		0
		Wr							80		83		81
	Yellow Perch	PSD		49					11		88		7
		PSD-P		6					0		6		0
		Wr		84					91		92		87
std exp gill net	Black Bullhead	PSD		100									
		PSD-P		100									
		Wr		83									
	Black Crappie	PSD		100									
		PSD-P		100									
		Wr		99									
	Bluegill	PSD		100									

Gear	Species	Index	Year										
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
std exp gill net	Bluegill	PSD-P		0									
		Wr		106									
	Northern Pike	PSD		100									
		PSD-P		78									
		Wr		92									
	Walleye	PSD		56									
		PSD-P		0									
		Wr		90									
	Yellow Perch	PSD		34									
		PSD-P		5									
		Wr		97									

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	706		138 (18)	182 (580)						253 (108)	

Species: Bluegill

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2022	736		100 (1)	143 (595)				185 (14)	233 (11)	198 (115)	
2020	239			143 (1)		188 (82)	191 (22)	191 (125)	207 (7)	208 (5)	
2018	555					160 (398)	163 (48)	185 (92)	192 (10)		194 (7)
2016	781		93 (108)	109 (343)	142 (81)	156 (115)	178 (59)	175 (58)	164 (19)		
2014	539	47 (1)	83 (11)	105 (54)	134 (54)	156 (142)	176 (110)	179 (142)	195 (21)	211 (1)	211 (1)

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	230			228 (155)	308 (2)	354 (27)	374 (26)	391 (10)	418 (9)		
2014	85			260 (5)	264 (2)	289 (15)	303 (28)	336 (12)	358 (8)	412 (5)	426 (9)

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2022	68			381 (51)		476 (12)				616 (3)	548 (2)
2020	14		325 (2)	340 (6)				557 (5)			691 (1)
2018	37				493 (3)	499 (26)	556 (5)		620 (1)		665 (2)
2016	64	216 (4)	314 (8)	423 (43)	505 (4)		518 (2)		588 (2)		670 (1)
2014	9		356 (3)		404 (4)	421 (1)	472 (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+
2022	244		136 (10)	179 (214)	248 (7)	247 (9)	255 (2)		261 (2)	257 (5)	

Mean Length (expanded sample number) at capture by age

Year	N	1	2	3	4	5	6	7	8	9	10+
2020	96	134 (2)	175 (28)	196 (28)	223 (3)		214 (4)	228 (31)			
2018	285					154 (253)	211 (29)	244 (1)		215 (2)	
2016	221			179 (197)	219 (17)	214 (1)	248 (5)	293 (1)			
2014	544	98 (26)	160 (298)	189 (32)	197 (40)	232 (85)	237 (48)	230 (12)	224 (2)		

Fish Condition

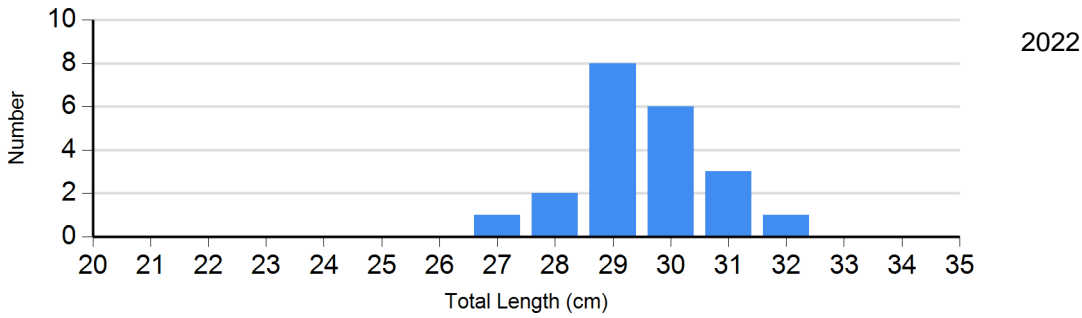
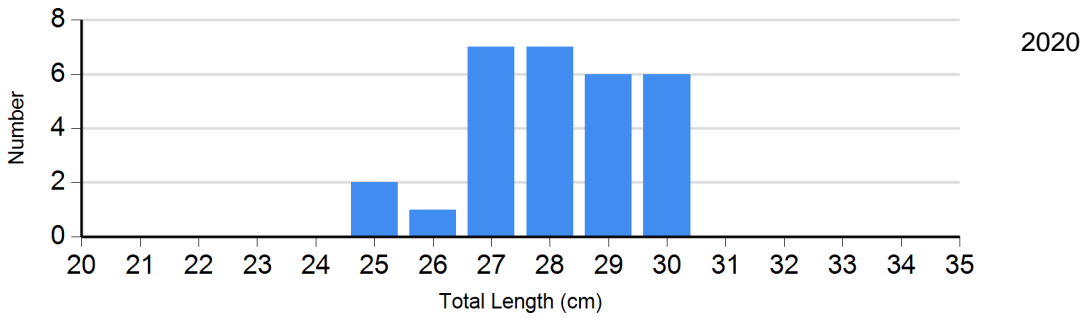
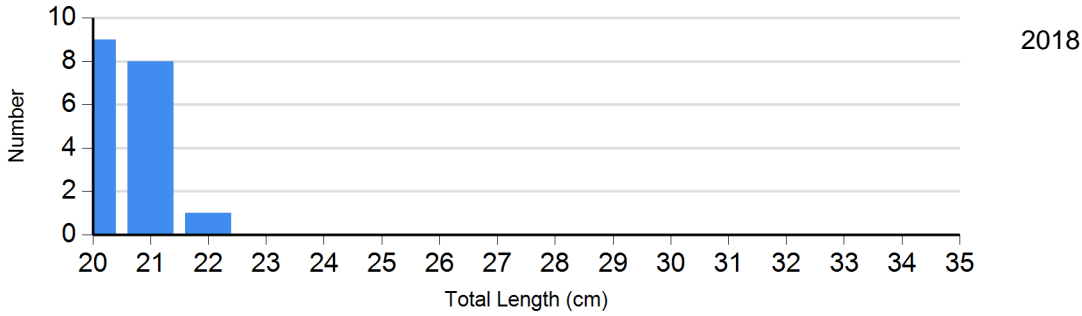
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2018	19	108 (1.9)	0		0		0	
	2020	0		23	105 (1.7)	6	99 (3.5)	0	
	2022	0		11	94 (3.7)	10	100 (3.3)	0	
Black Crappie Frame Net	2018	115	91 (0.7)	29	86 (1.4)	4	68 (1.1)	0	
	2020	0		41	95 (0.8)	2	89 (1.6)	0	
	2022	598	104 (0.7)	50	93 (0.6)	58	84 (0.5)	0	
Bluegill Frame Net	2018	51	100 (2.3)	492	103 (0.9)	17	111 (3.3)	0	
	2020	2	115 (2.3)	200	109 (0.6)	37	110 (1.8)	0	
	2022	457	102 (0.7)	228	95 (1.0)	51	92 (1.7)	0	
Northern Pike Gill Net	2018	0		1	83	1	78	0	
	2020	0		7	83 (2.8)	1	88	0	
	2022	0		3	94 (5.4)	0		0	
Walleye Gill Net	2018	2	82 (3.4)	15	95 (1.1)	18	90 (1.1)	2	85 (7.0)
	2020	8	85 (1.0)	1	86	4	89 (3.0)	1	80
	2022	20	89 (1.2)	38	89 (0.7)	9	90 (1.5)	1	84
Yellow Perch Gill Net	2018	252	103 (0.5)	31	96 (1.6)	0		0	
	2020	44	107 (0.9)	50	102 (0.9)	2	106 (3.2)	0	
	2022	196	96 (0.7)	37	84 (1.1)	11	91 (2.1)	0	

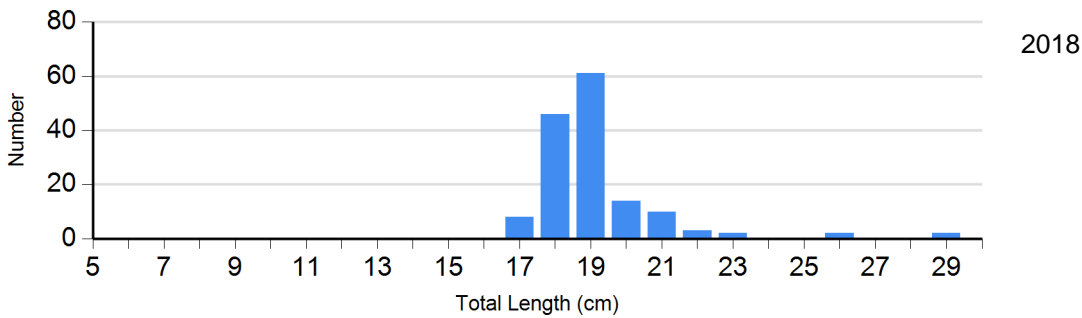
Length Frequency Distribution

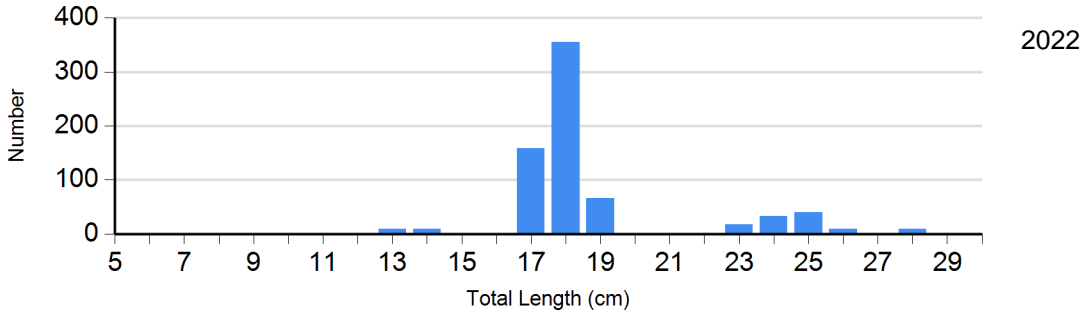
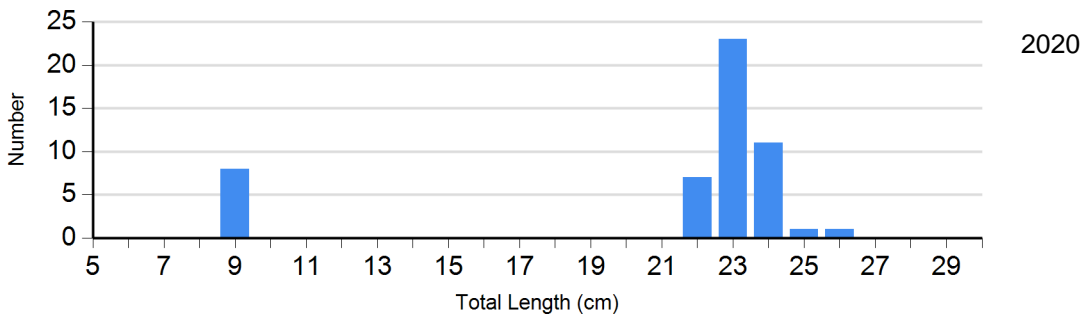
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

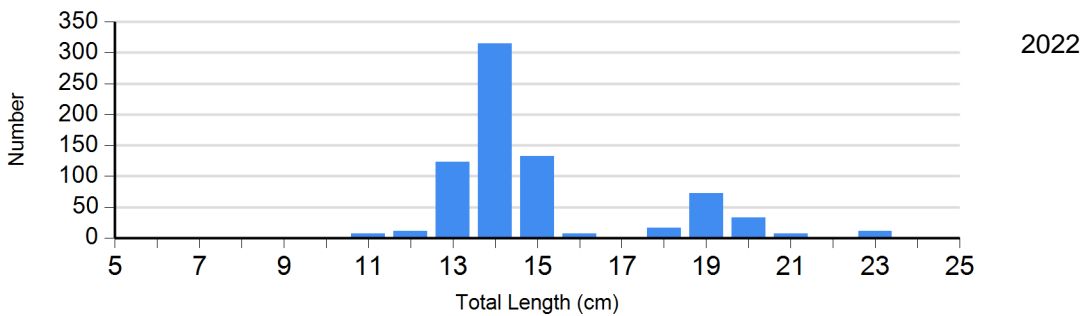
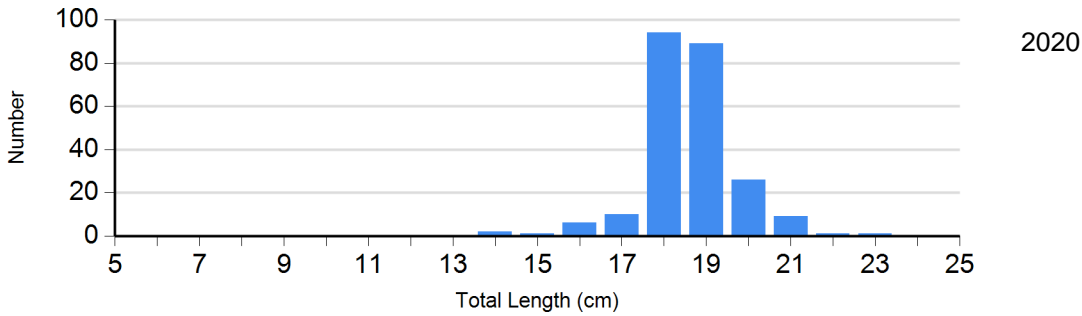
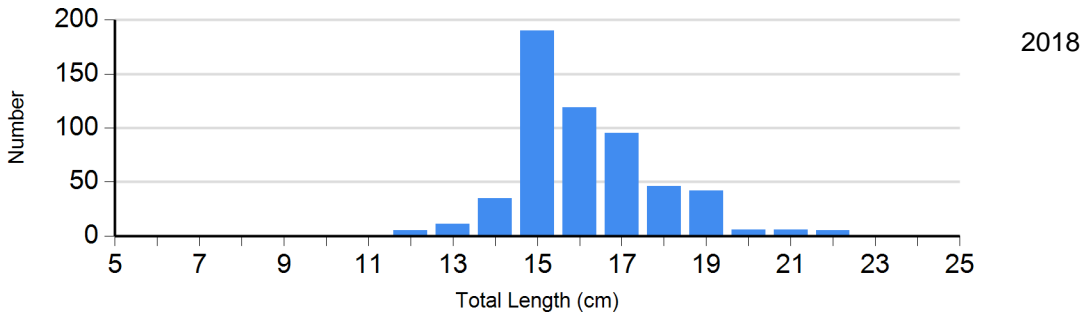


Species: Black Crappie
Gear: frame net (std 3/4 in)

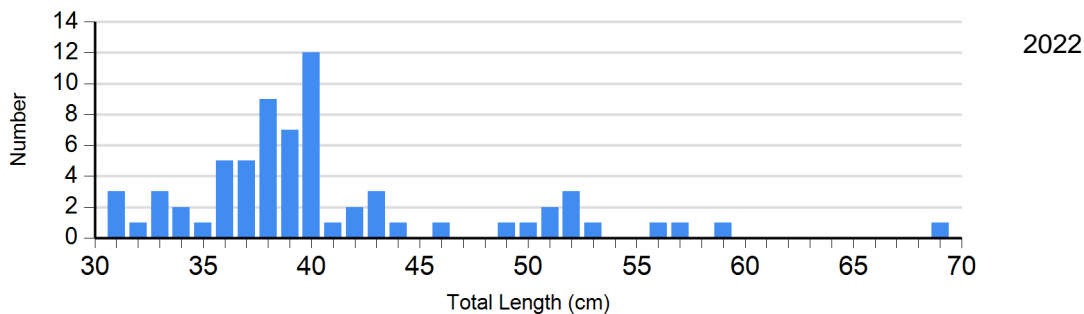
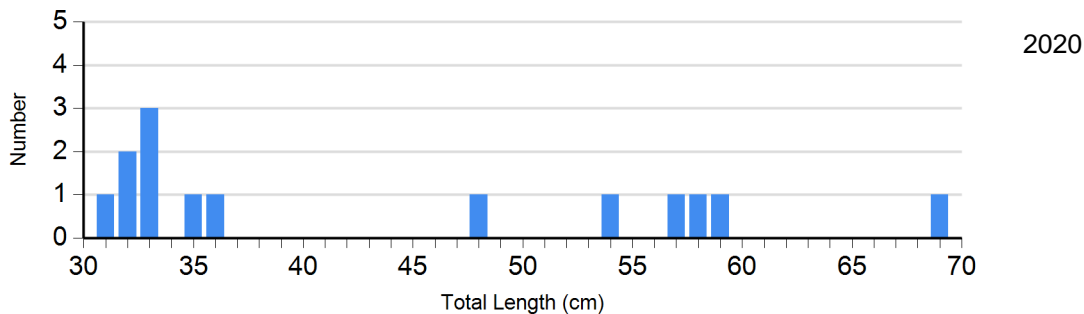
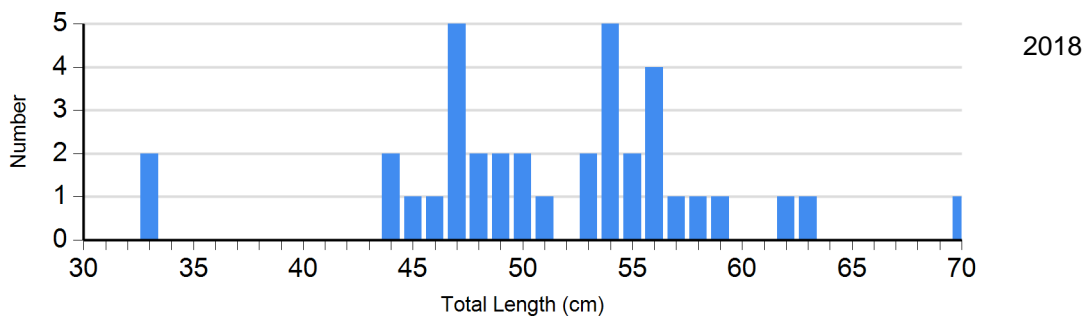




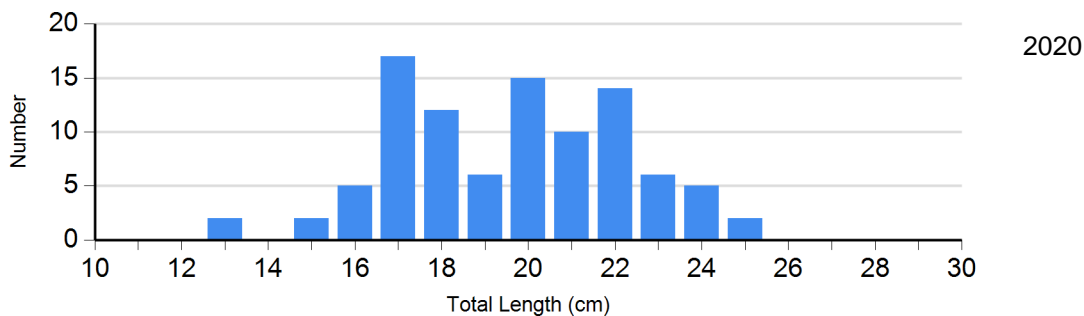
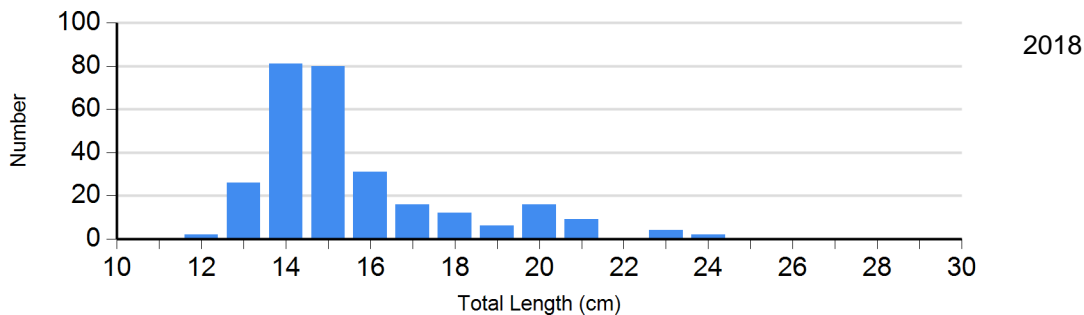
Species: Bluegill
 Gear: frame net (std 3/4 in)

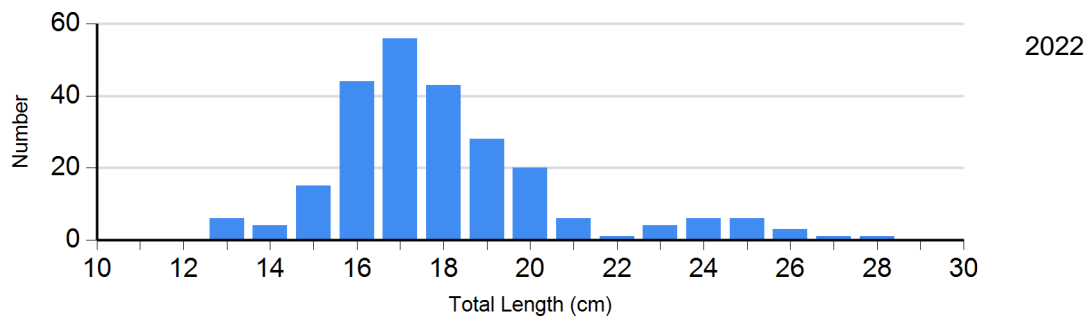


Species: Walleye
 Gear: AFS std gill net



Species: Yellow Perch
 Gear: AFS std gill net

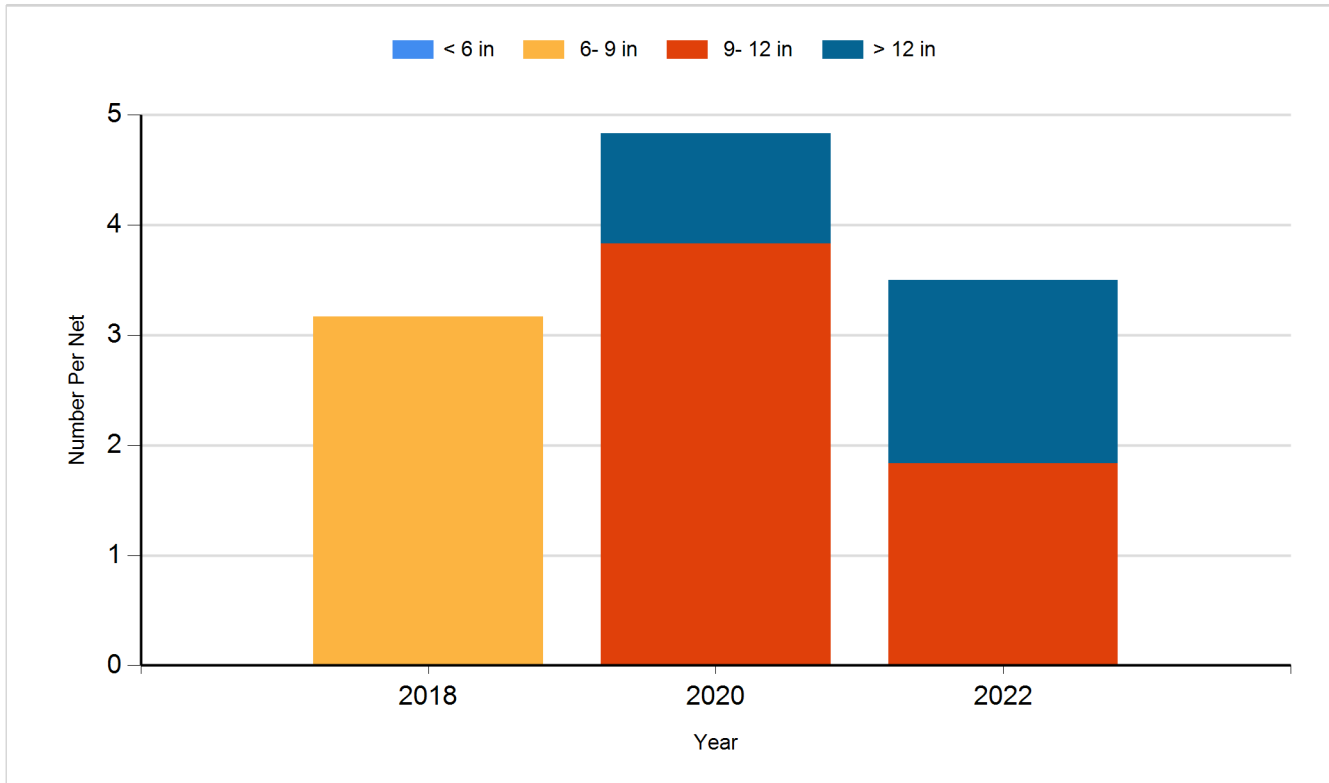




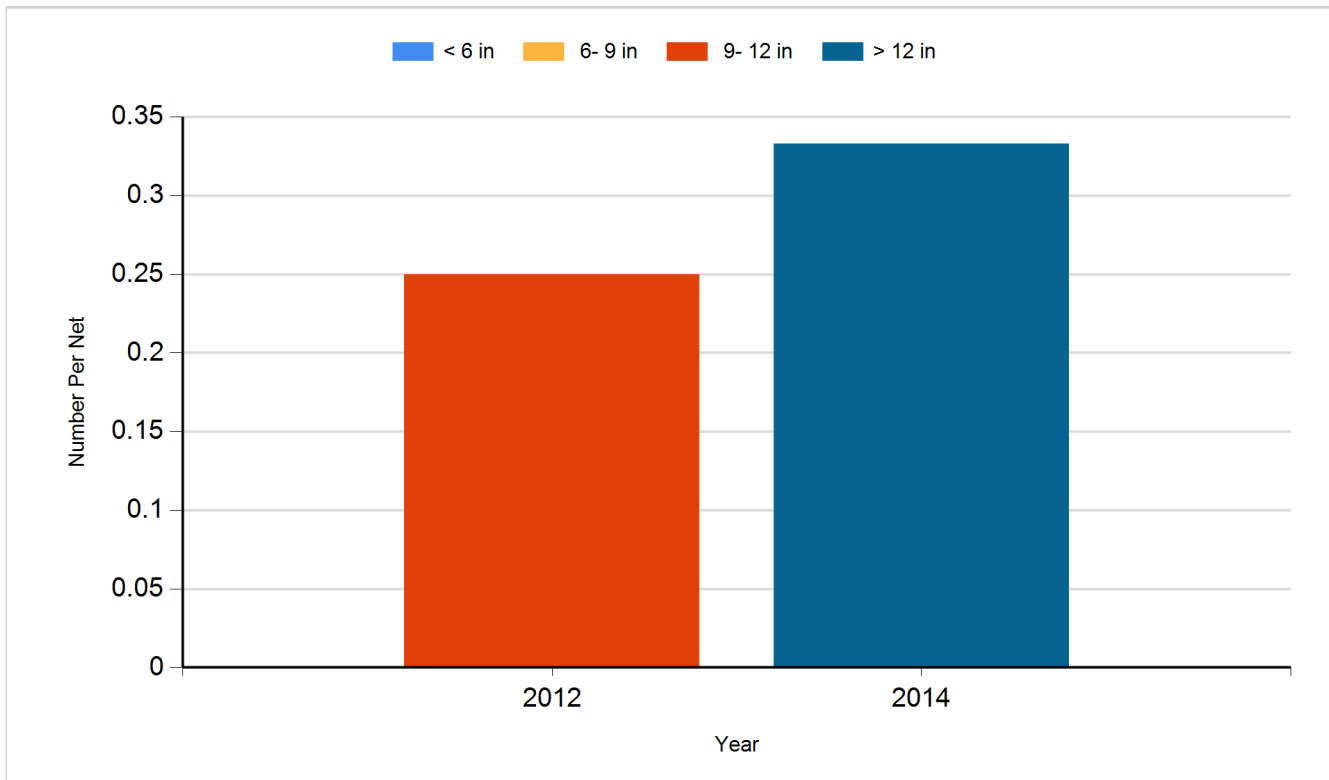
Historic Fish Sizes and Relative Abundance

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

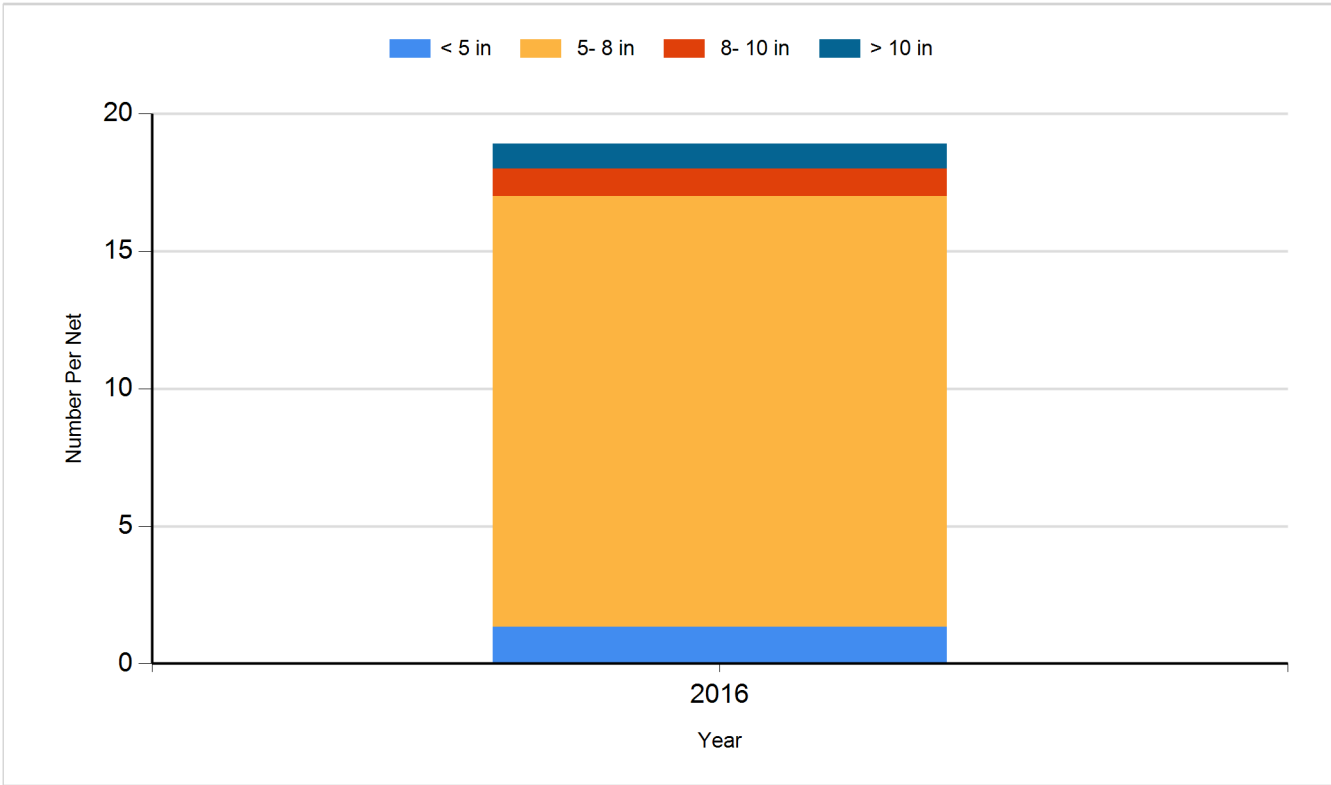
Species: Black Bullhead
Gear: AFS std gill net



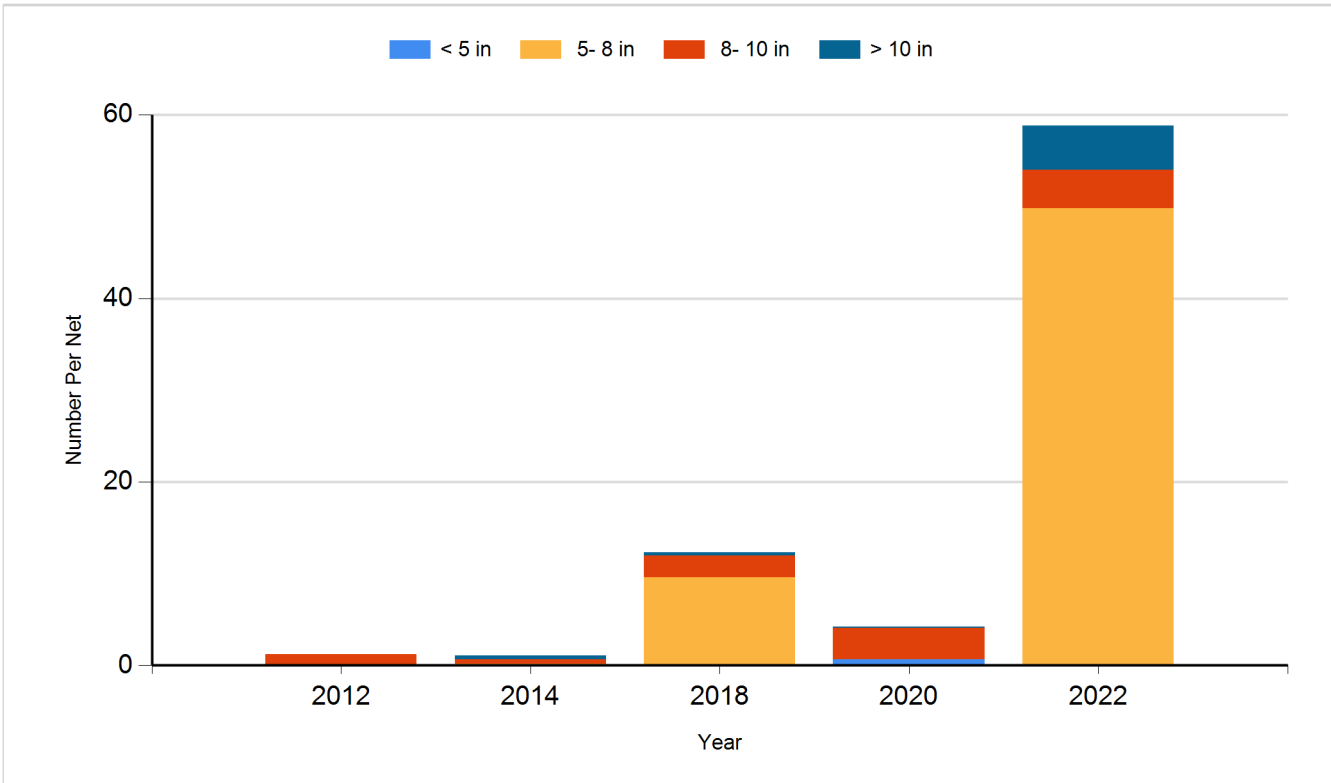
Species: Black Bullhead
Gear: std exp gill net



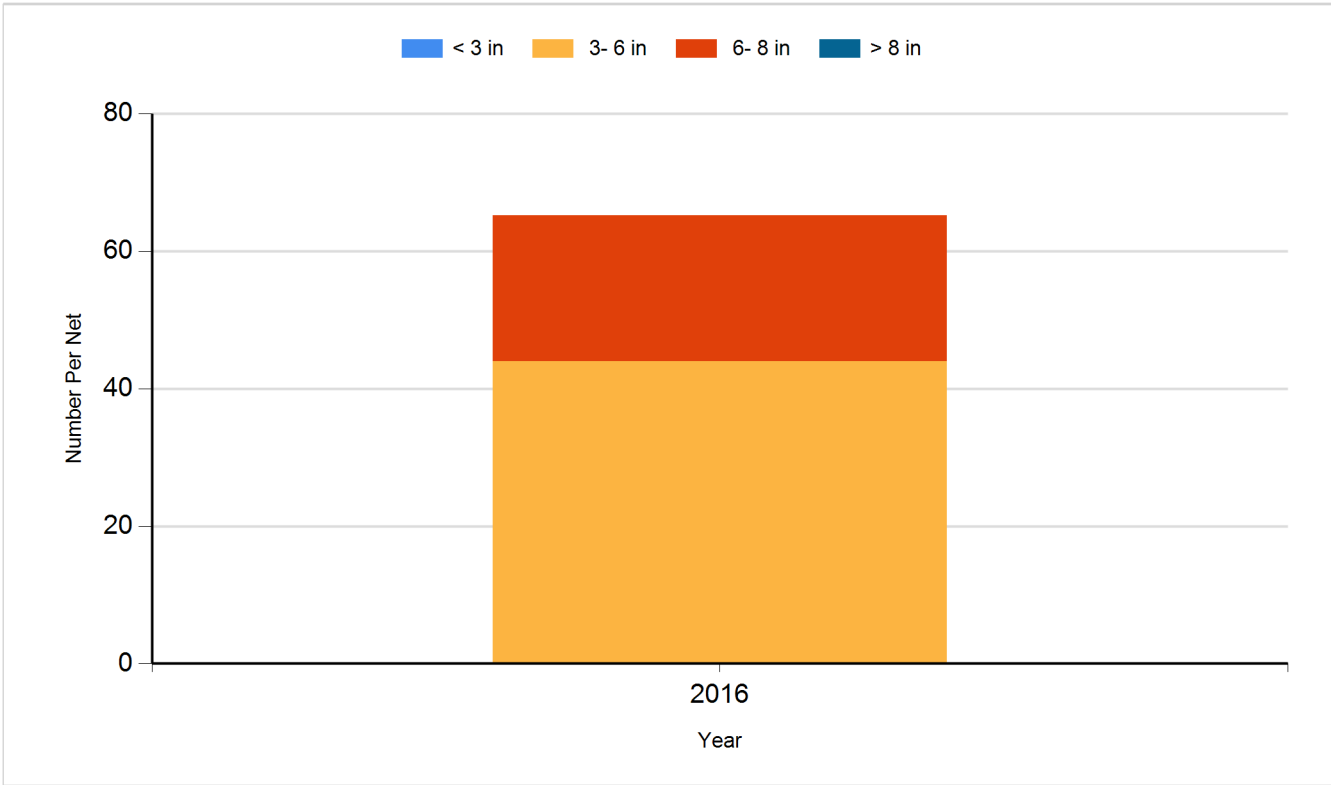
Species: Black Crappie
Gear: AFS std frame net



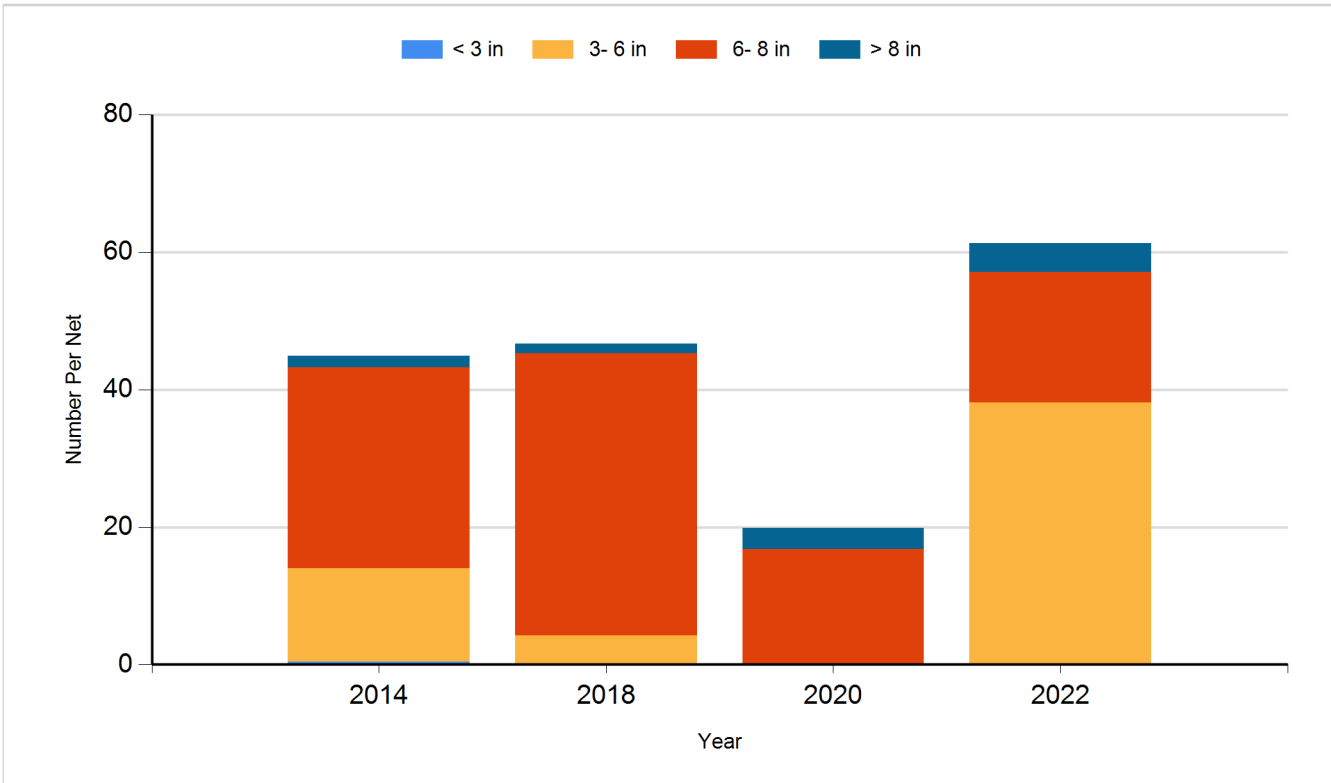
Species: Black Crappie
Gear: frame net (std 3/4 in)



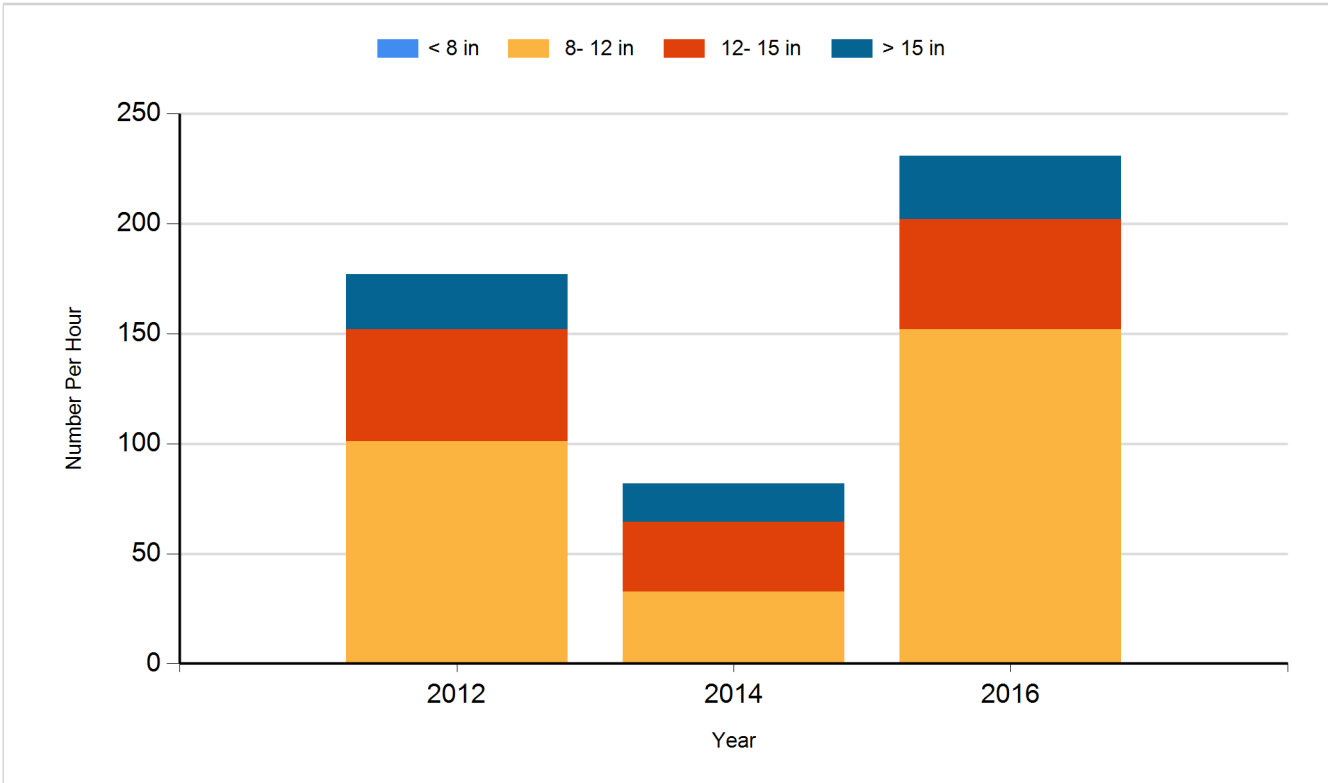
Species: Bluegill
Gear: AFS std frame net



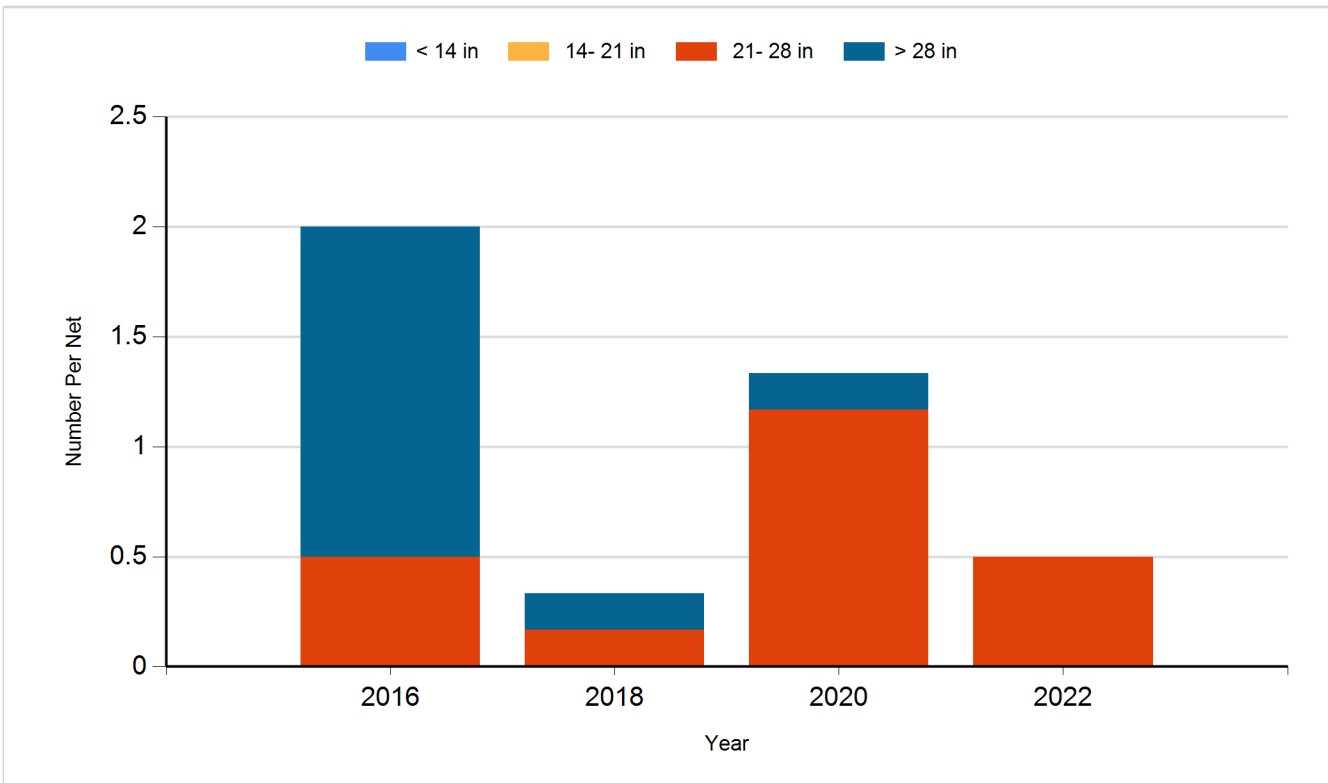
Species: Bluegill
Gear: frame net (std 3/4 in)



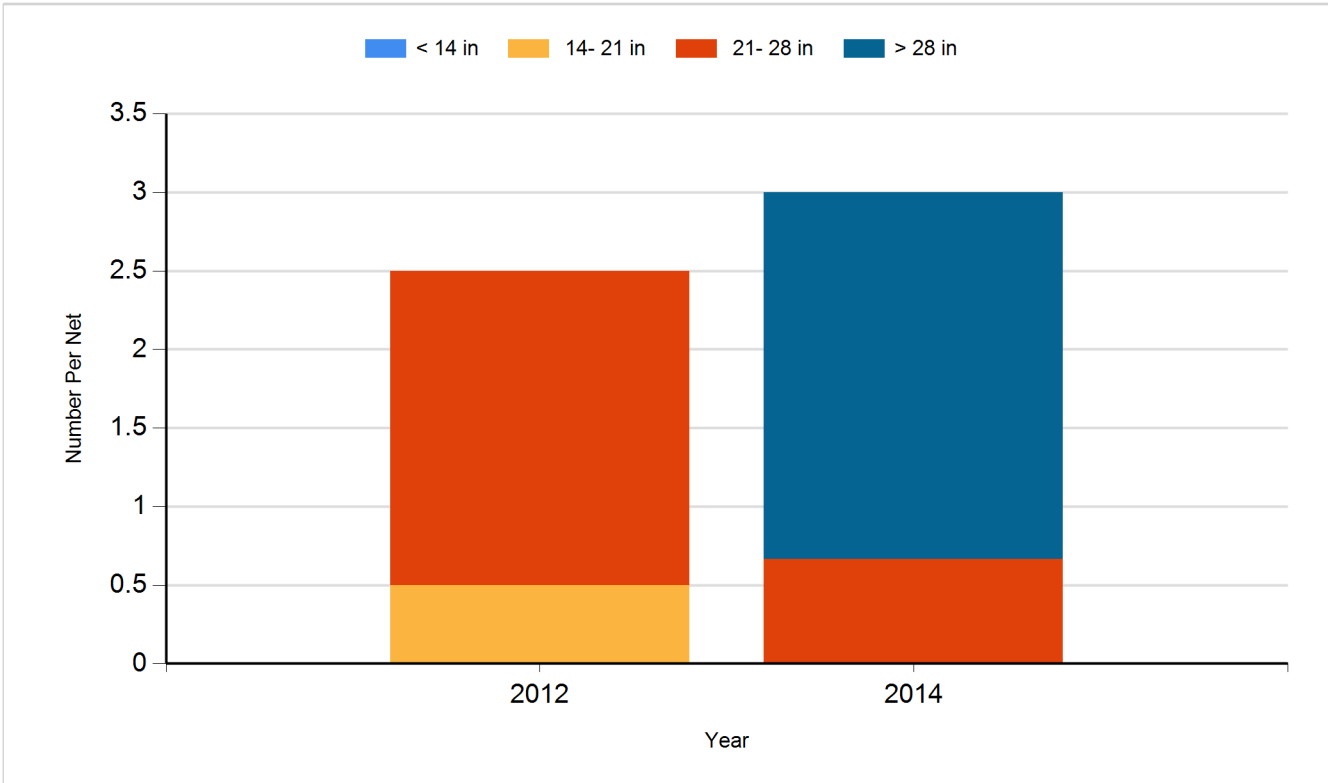
Species: Largemouth Bass
Gear: boat shocker (night, AC)



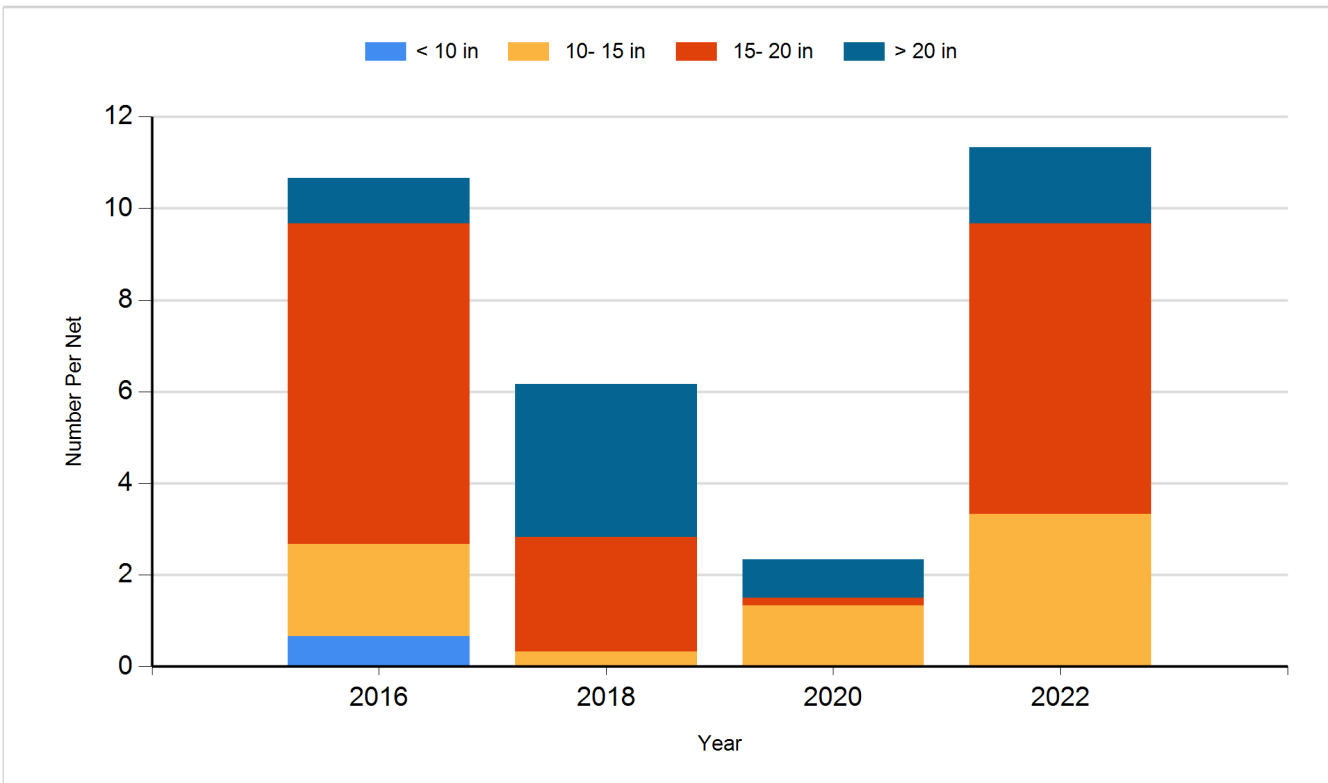
Species: Northern Pike
Gear: AFS std gill net



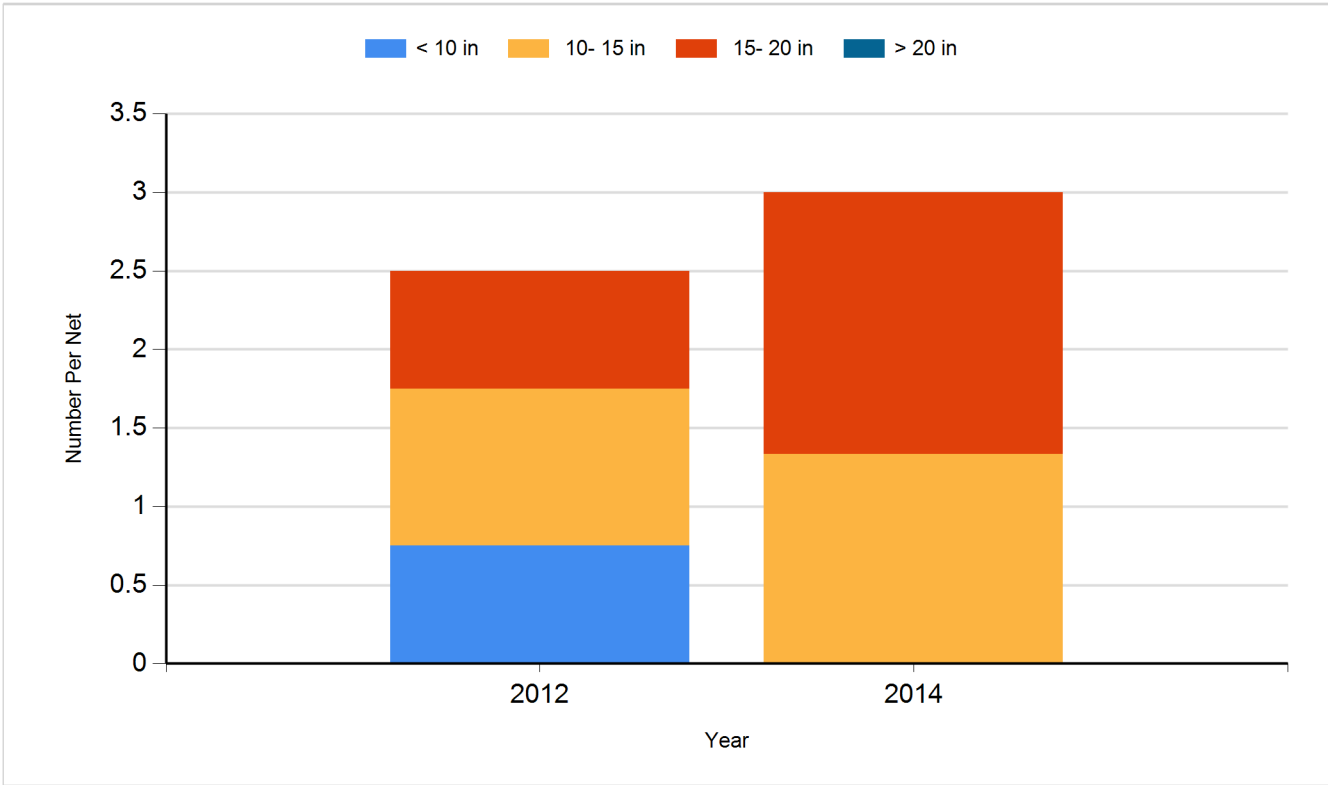
Species: Northern Pike
Gear: std exp gill net



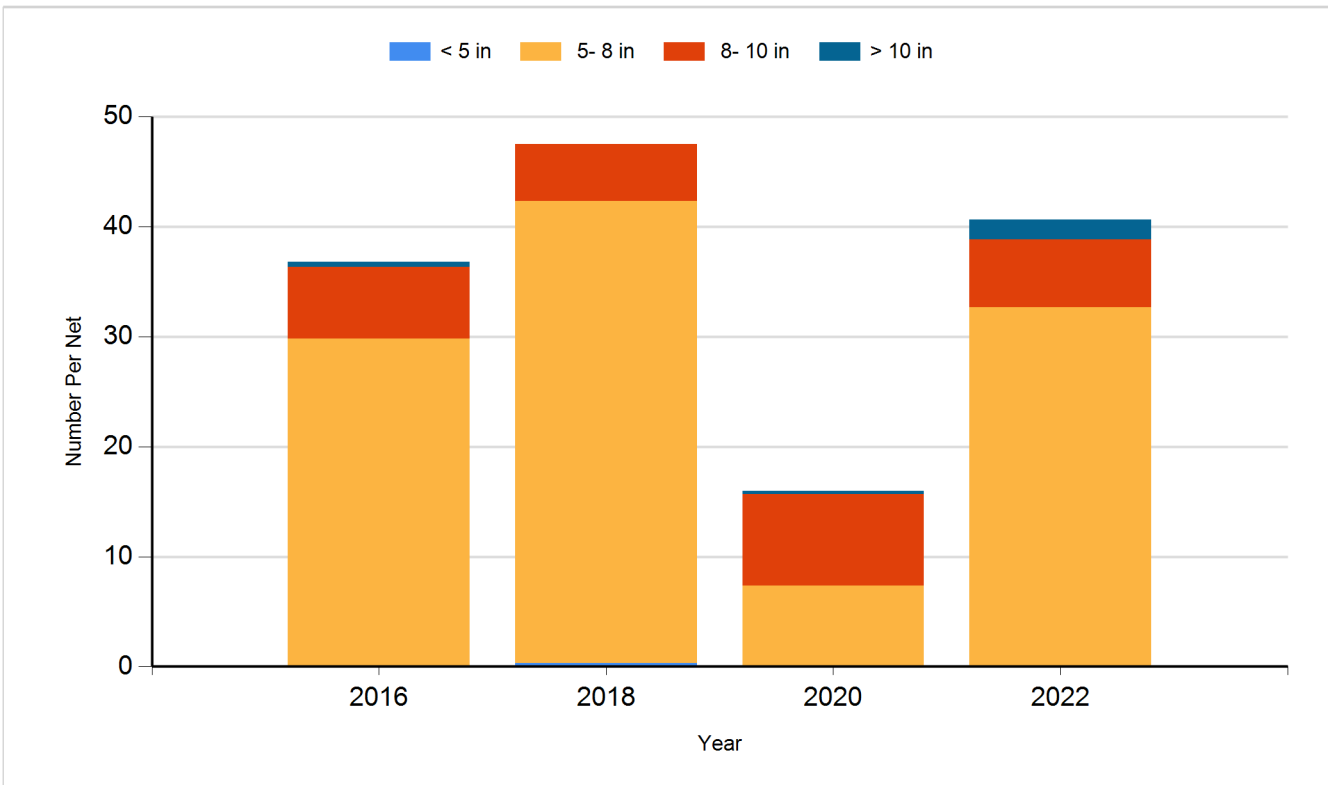
Species: Walleye
Gear: AFS std gill net



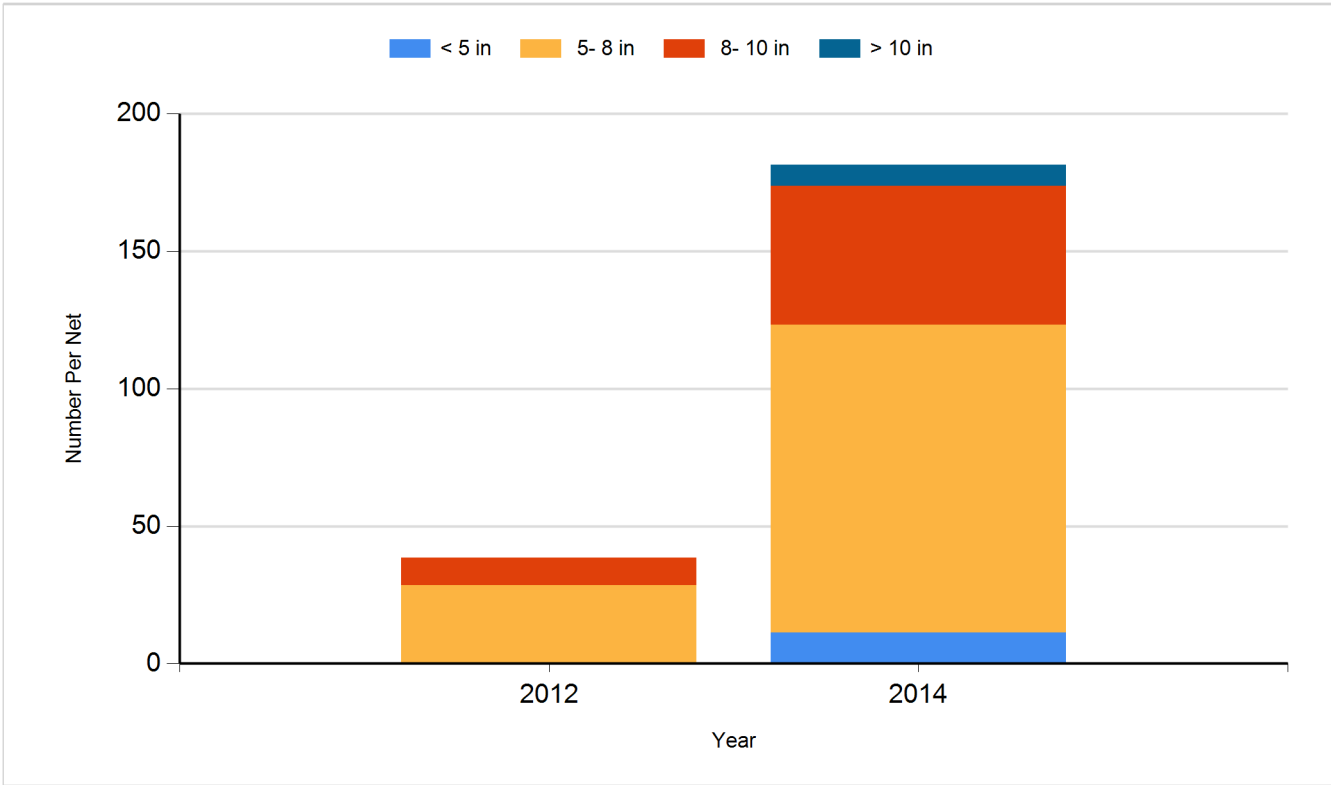
Species: Walleye
Gear: std exp gill net



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
2012	Walleye	Large Fingerling	3,725
2013	Walleye	Large Fingerling	11,132
2015	Walleye	Large Fingerling	4,026
2017	Walleye	Large Fingerling	16,000
2019	Walleye	Large Fingerling	8,700
2021	Walleye	Juvenile	4,467
2022	Walleye	Juvenile	9,150