SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Twin, Minnehaha County

LBS-Lake-204-000

2019

Lake Information

Name: Twin

County: Minnehaha

Legal Description: T105N-R52W Sec. 16-17, 20-21

Surface Area: 304 Acres

Maximum Depth: 21 Feet

Mean Depth: 11 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 04, 2019	6 net-nights

Common Fish Species Present

Yellow Perch

Walleye

Black Bullhead

Common Carp

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 Bullhead	2	0.3	0.5	100		100			
	Common Carp	1	0.2	0.2	100		0			
	Walleye	19	2.5	1.1	100		60	21	97	2
	Yellow Perch	6	1.0	0.5	100		83		101	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.

		CPUE										
Gear	Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
AFS std gill net	Black Bullhead								25.7	9.8	0.3	11.93
	Common Carp								1.7	1.5	0.2	1.13
	Walleye								9.3	10.8	2.5	7.53
	Yellow Perch								1.5	2.7	1.0	1.73
boat shocker (night)	Walleye				65.3							65.30
fall night EF-WAE	Walleye			21.5								21.50
frame net (std 3/4 in)	Black Bullhead		10.4	542.1	98.5							217.00
	Bluegill		0.0	1.5	0.1							0.53
	Green Sunfish		0.1	0.8	0.5							0.47
	Walleye		7.2	20.4	7.9							11.83
	Yellow Perch		11.1	3.8	0.5							5.13
std exp gill net	Black Bullhead		32.3	108.5	111.3	31.3	45.0	15.0				57.23
	Bluegill		0.0	0.0	0.0	0.0	0.0	0.3				0.05
	Common Carp		0.0	0.0	0.0	0.3	0.0	0.0				0.05
	Walleye		25.0	10.0	30.7	11.3	6.3	28.3				18.60
	Yellow Perch		24.0	63.5	4.7	29.8	53.5	33.7				34.87

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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AFS std gill net	Black Bullhead	PSD								56	97	100
		PSD-P								55	47	100
	Common Carp	PSD								0	100	100
		PSD-P								0	11	0
	Walleye	PSD								88	88	100
		PSD-P								30	35	60
		Wr								94	93	97
	Yellow Perch	PSD								100	100	100
		PSD-P								78	88	83
		Wr								96	98	101
boat shocker (night)	Walleye	PSD				2						
		PSD-P				2						
		Wr				103						
fall night EF-WAE	Walleye	Wr			88							
frame net (std 3/4 in)	Black Bullhead	PSD		0	29	90						
		PSD-P		0	2	0						
		Wr		103	90	90						
	Walleye	PSD		23	52	54						
		PSD-P		0	6	6						
		Wr		84	73	84						
	Yellow Perch	PSD		71	100	80						
		PSD-P		21	74	60						
		Wr		109	98	117						
std exp gill net	Black Bullhead	PSD		18	2	94	100	100	99			
		PSD-P		3	0	1	3	70	97			
		Wr		108	97	99						
	Common Carp	PSD					0					
		PSD-P					0					
	Walleye	PSD		13	40	36	60	60	47			
		PSD-P		1	25	18	18	8	6			
		Wr		84	74	88	82	82	95			

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
std exp gill net	Yellow Perch	PSD		94	97	86	18	99	22			
		PSD-P		38	54	79	8	5	22			
		Wr		110	100	119	111	103	104			

Length at Capture

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

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	19	238 (4)		461 (4)	529 (1)	496 (3)	578 (1)			591 (1)	627 (5)
2018	68	220 (3)	360 (8)	431 (5)	465 (22)	499 (5)		534 (3)	564 (2)	542 (14)	602 (7)
2017	57	235 (1)	364 (6)	406 (18)	411 (2)		472 (4)	484 (3)	521 (14)	551 (7)	557 (2)
2016	169	283 (19)	359 (79)	402 (14)		448 (9)	472 (6)	480 (29)	508 (12)		505 (6)
2015	40	191 (15)	297 (8)	378 (1)	394 (3)	425 (1)	419 (7)	441 (3)	558 (1)		638 (1)
2014	50	237 (7)	271 (1)	355 (11)	399 (3)	397 (16)	501 (5)	533 (1)	563 (3)	595 (2)	660 (1)
2013	97	189 (4)	294 (50)	347 (5)	385 (14)	481 (7)	536 (1)	535 (11)	555 (4)	543 (1)	
2012	55	218 (35)	310 (5)	358 (9)	475 (1)		544 (3)	541 (2)			
2011	112	248 (22)	324 (78)	407 (8)	480 (2)	487 (2)					

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	6		241 (1)		314 (1)	346 (3)	346 (1)				
2015	214		228 (212)		298 (2)						
2014	119	161 (96)	261 (1)	228 (16)	294 (3)	333 (3)					
2013	14	171 (2)		274 (7)	283 (5)						
2012	127	185 (4)	248 (101)	265 (23)							

Fish Condition

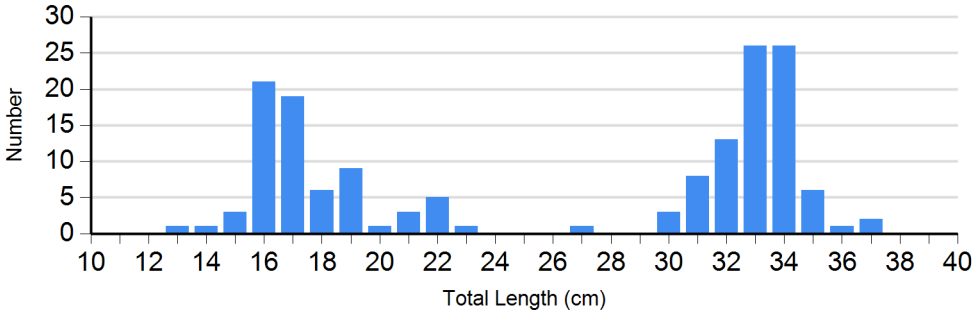
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Walleye Gill Net	2015	10	86 (2.5)	13	79 (1.6)	1	78	1	68
	2016	90	95 (0.6)	69	94 (1.0)	10	90 (2.1)	1	
	2017	7	92 (1.3)	32	94 (1.0)	17	95 (1.5)	0	
	2018	8	102 (1.9)	34	93 (1.0)	23	90 (1.5)	0	
	2019	0		6	101 (0.9)	6	97 (2.7)	3	88 (2.6)
Yellow Perch Gill Net	2015	2	97	201	103 (0.7)	11	100 (1.6)	0	
	2016	157	103 (0.7)	1		26	109 (1.6)	18	102 (2.6)
	2017	0		2	89 (9.9)	0		7	98 (1.7)
	2018	0		2	99 (2.0)	4	97 (1.8)	10	98 (1.9)
	2019	0		1	100	0		5	102 (2.6)

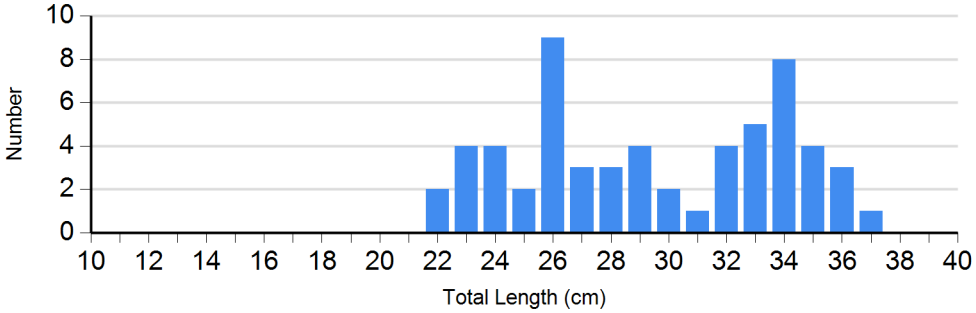
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

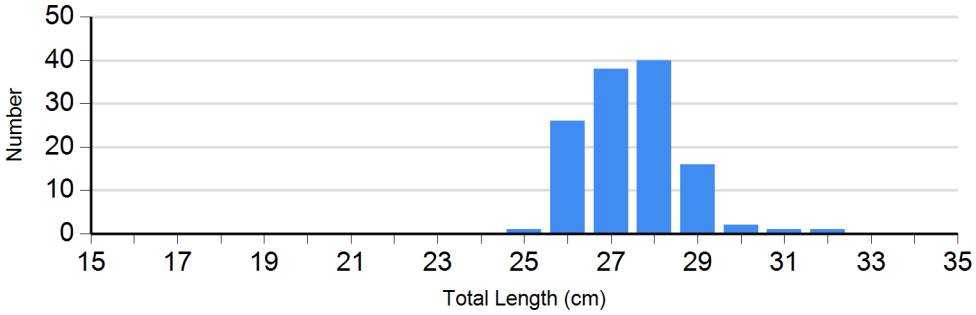


2017

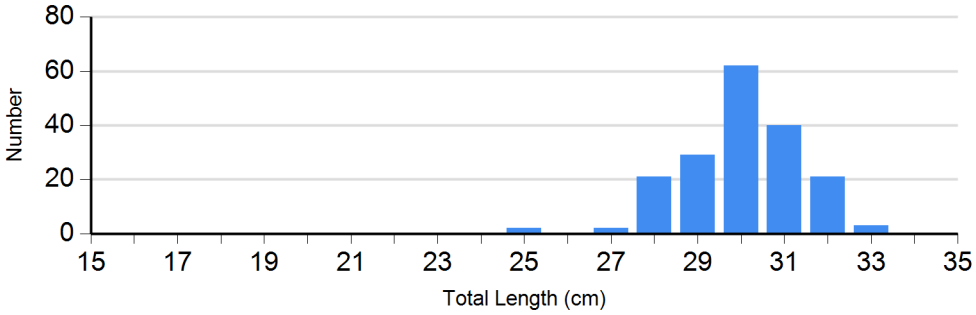


2018

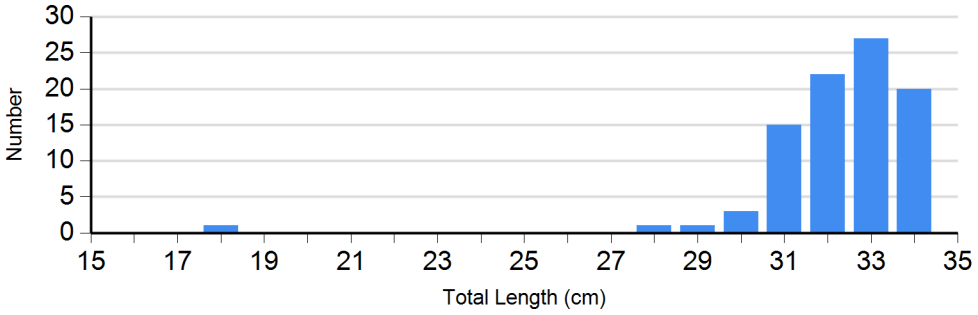
Species: Black Bullhead
Gear: std exp gill net



2014

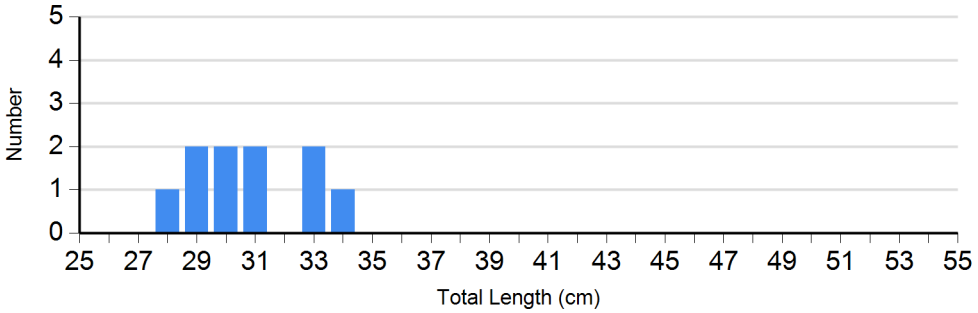


2015



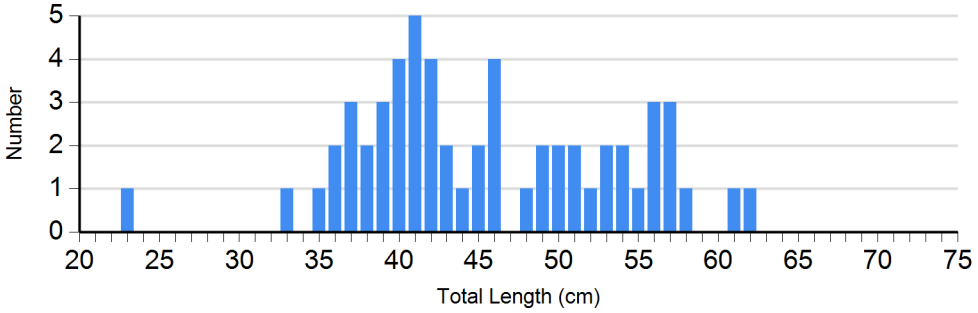
2016

Species: Common Carp
Gear: AFS std gill net

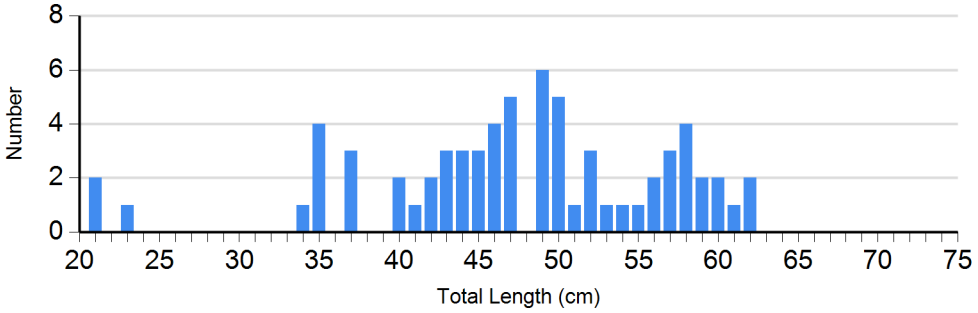


2017

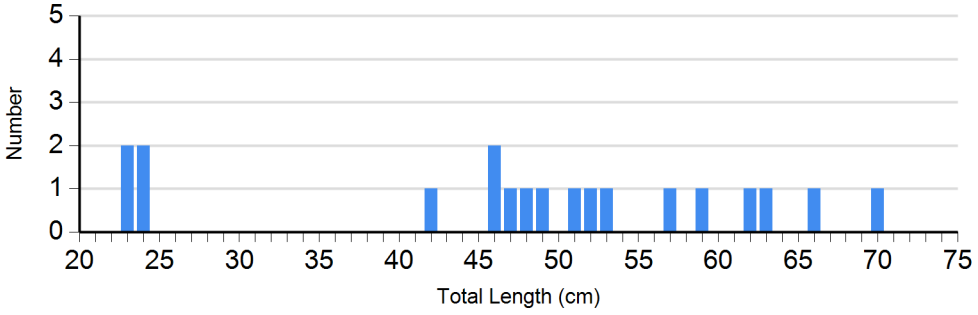
Species: Walleye
Gear: AFS std gill net



2017

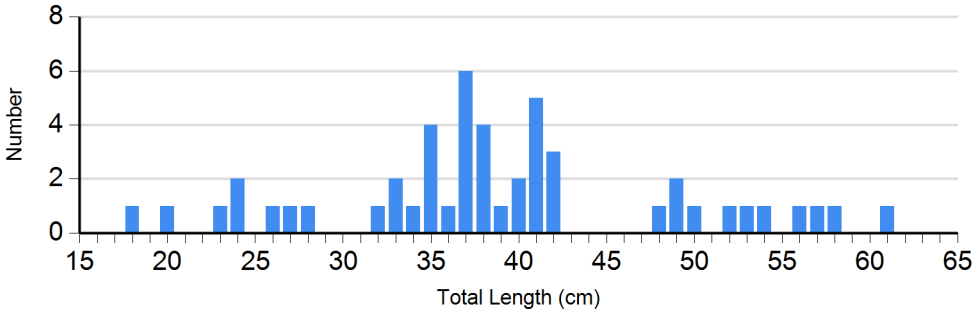


2018



2019

Species: Walleye
Gear: std exp gill net



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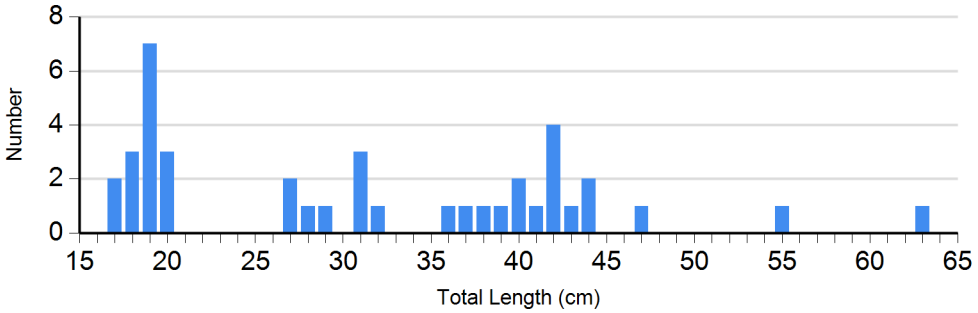

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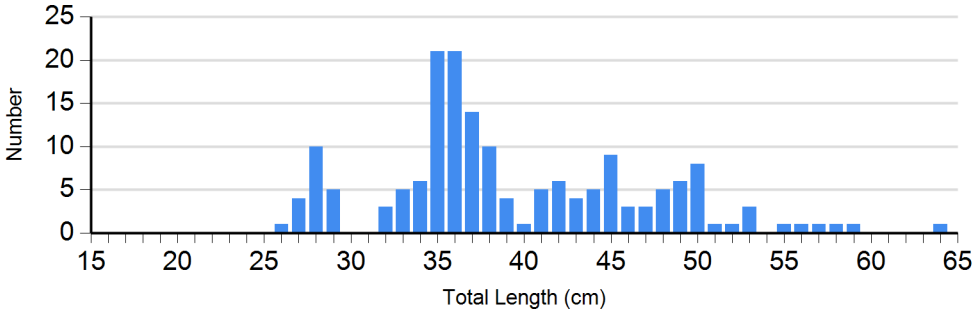
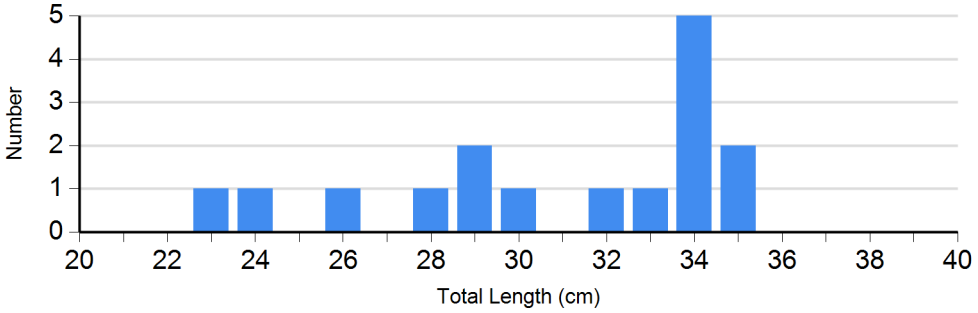


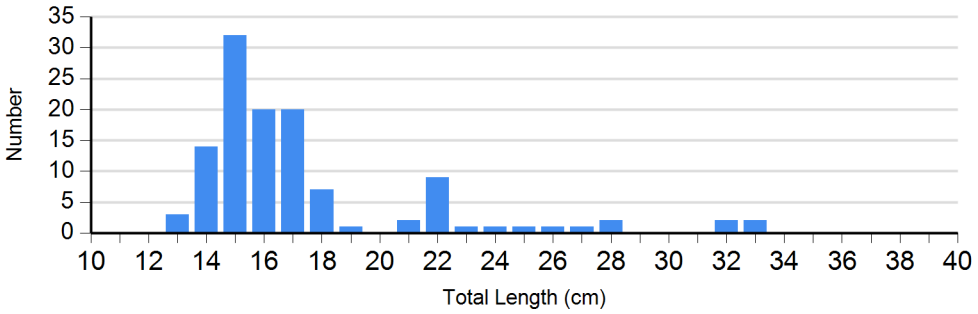
2016

Species: Yellow Perch
Gear: AFS std gill net



2018

Species: Yellow Perch
Gear: std exp gill net



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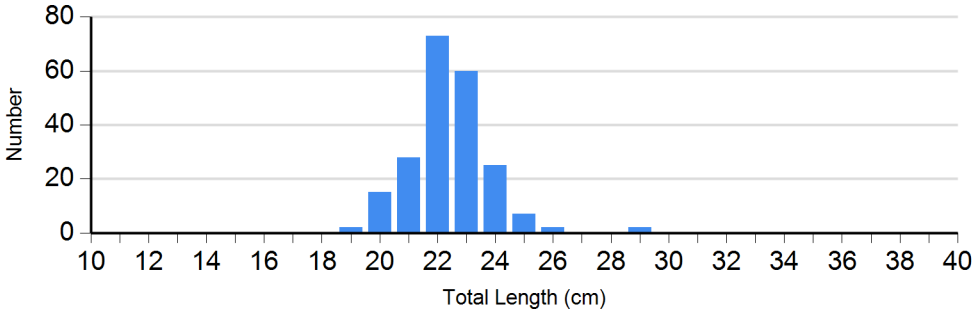

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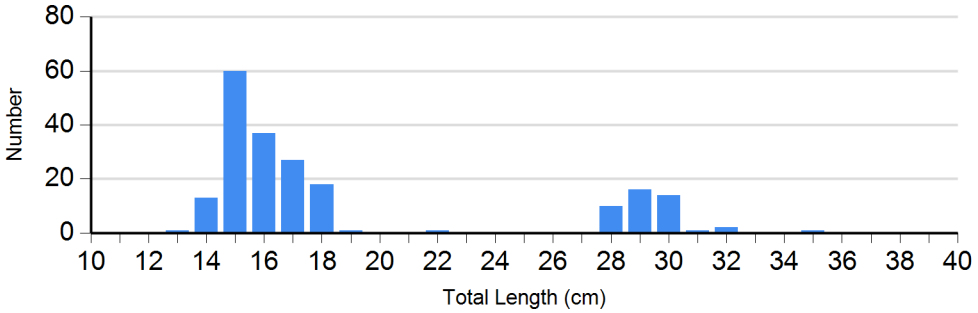
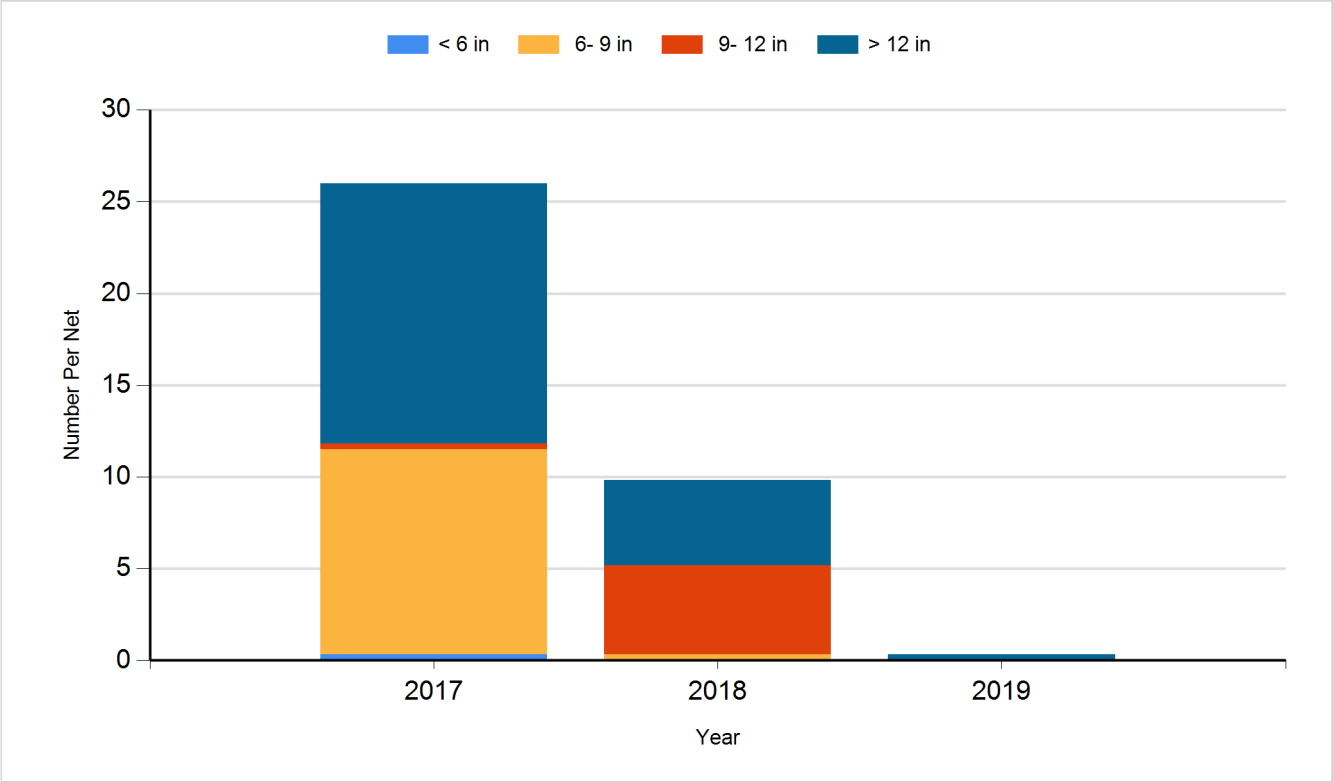


2016

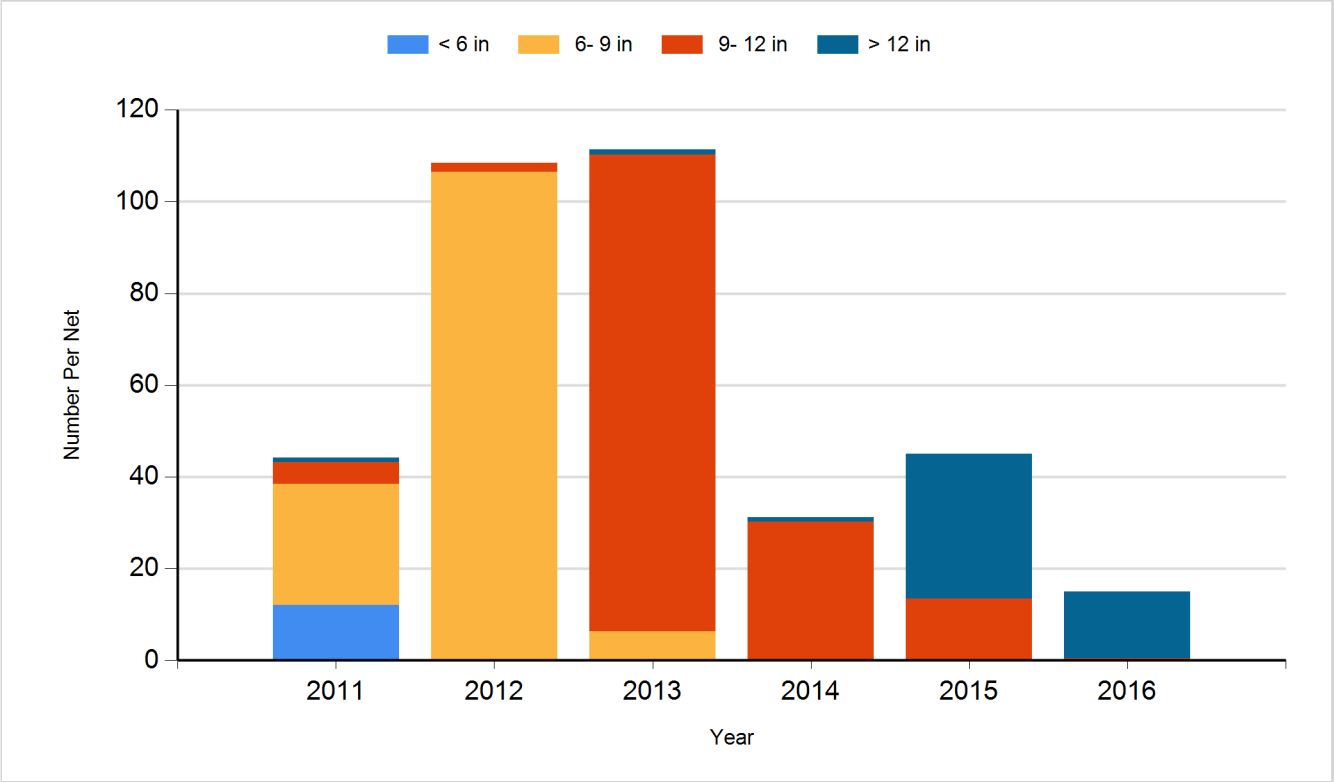
Historic Fish Sizes and Relative Abundance

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

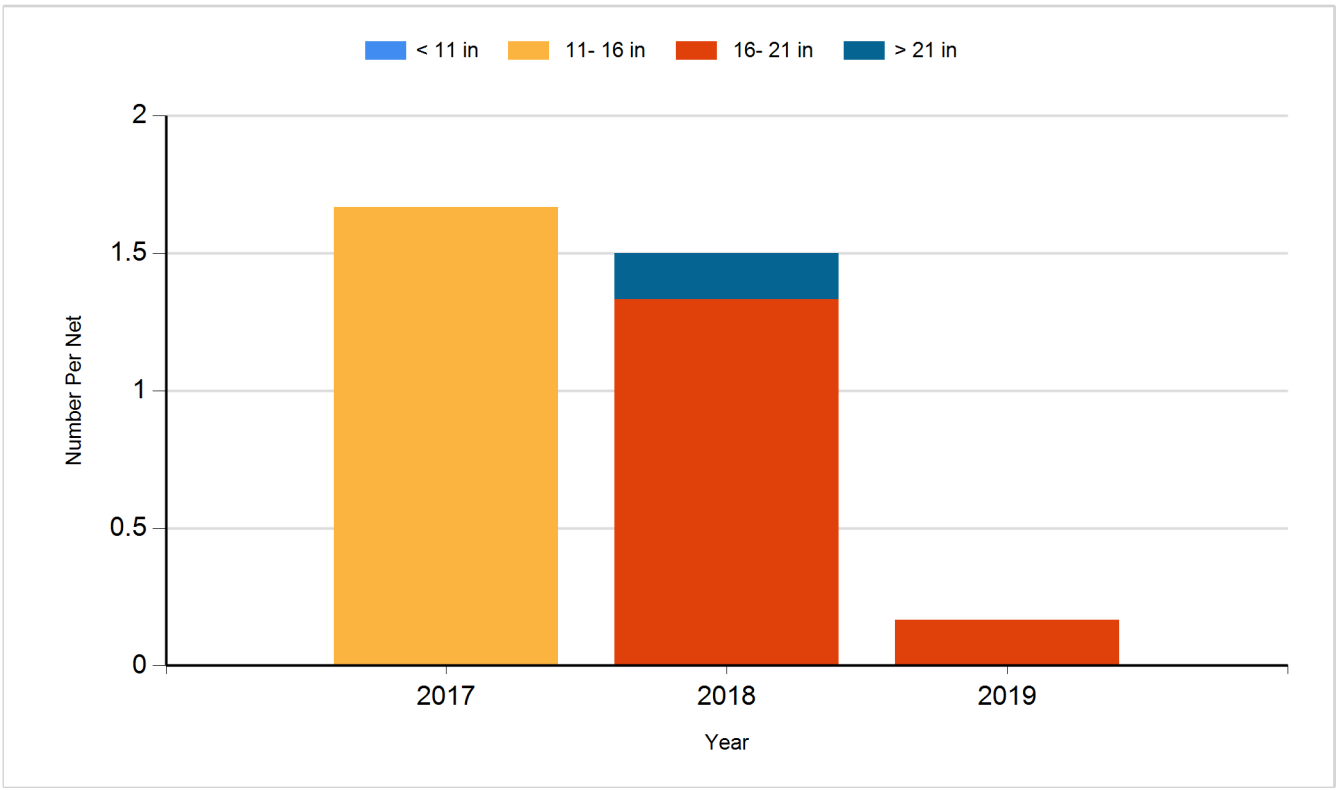
Species: Black Bullhead
Gear: AFS std gill net



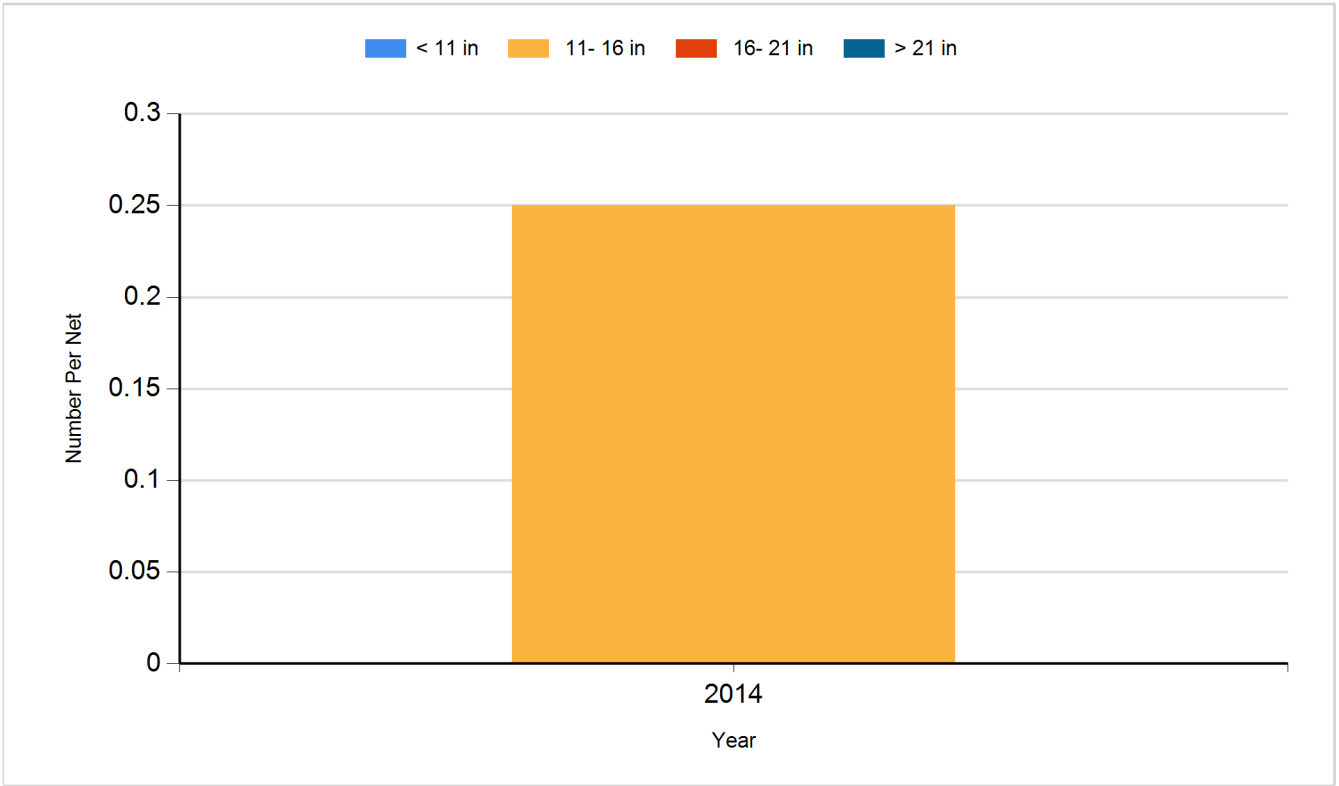
Species: Black Bullhead
Gear: std exp gill net



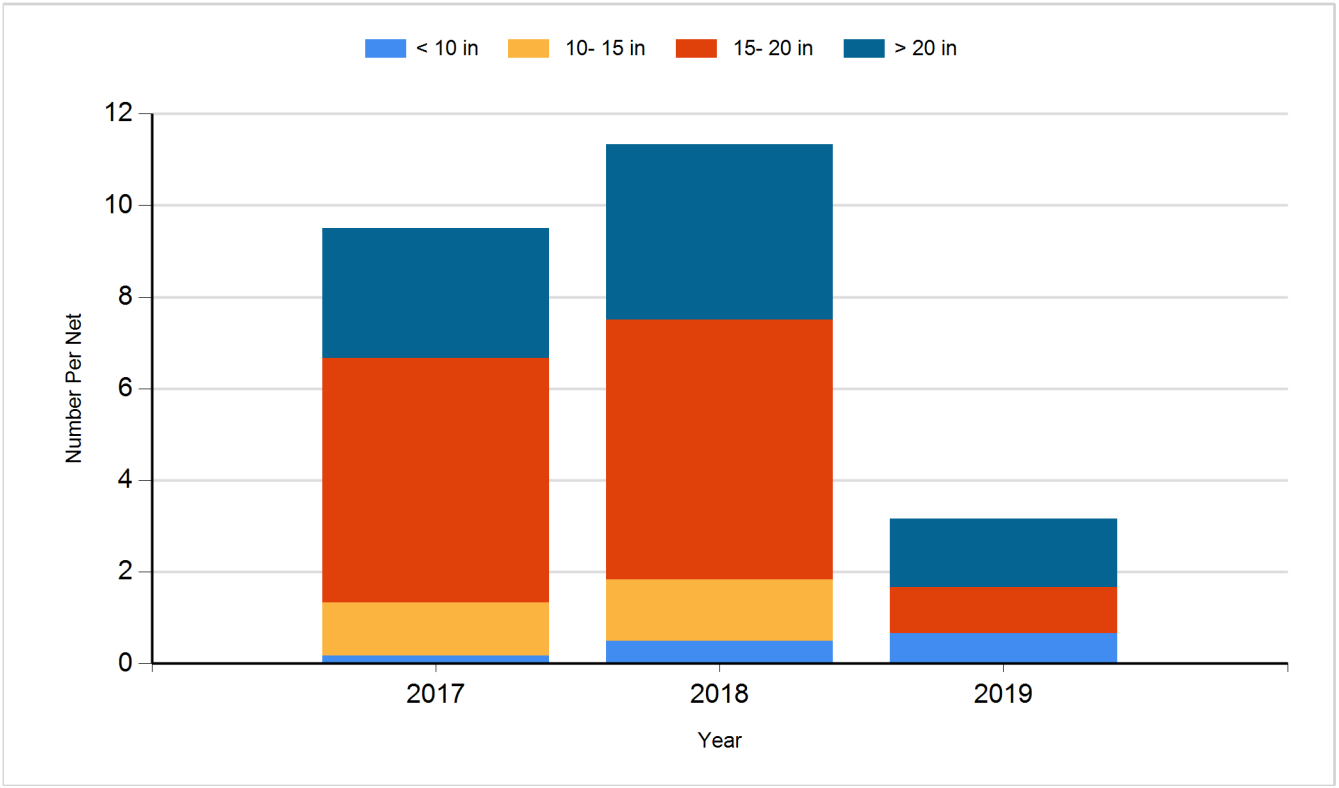
Species: Common Carp
Gear: AFS std gill net



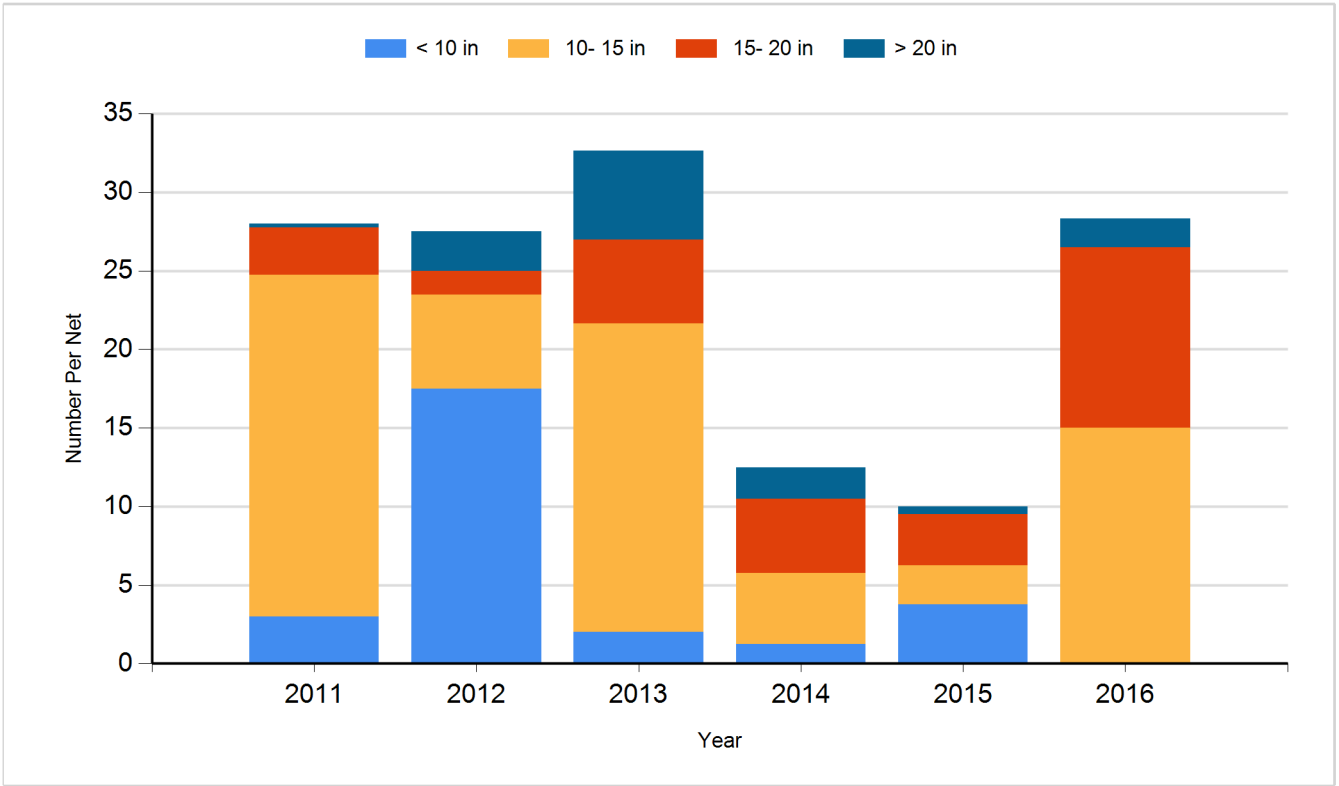
Species: Common Carp
Gear: std exp gill net



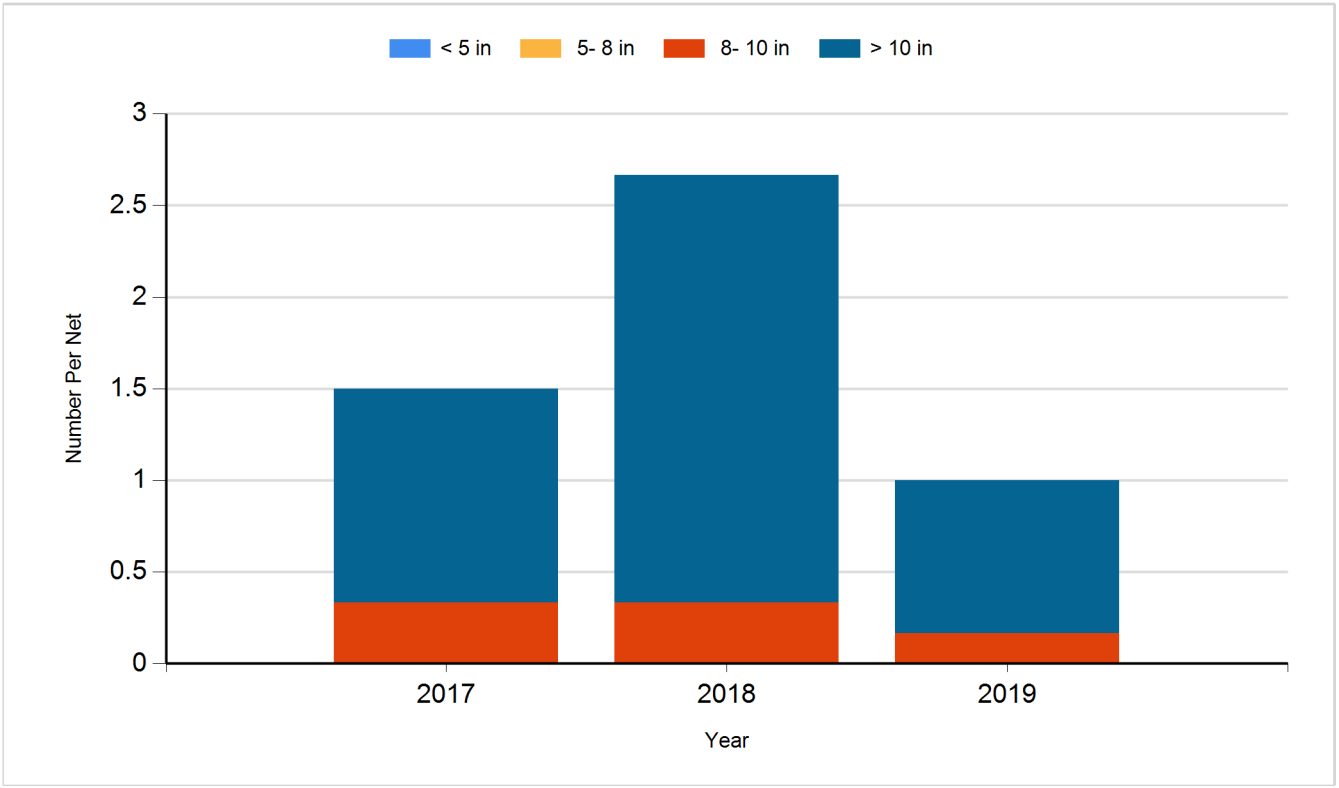
Species: Walleye
Gear: AFS std gill net



Species: Walleye
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



Species: Yellow Perch
Gear: std exp gill net