SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Henry, Kingsbury County

LKT-Lake-55-003

2019

Lake Information

Name: Henry

County: Kingsbury

Legal Description: T110-R56-Sec. 13, 18, 19, 24

Surface Area: 2,539 Acres

Maximum Depth: 8 Feet

Mean Depth: 4 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 06, 2019	6 net-nights

Common Fish Species Present

Walleye

Yellow Perch

Common Carp

Black Crappie

Northern Pike

Black Bullhead

White Sucker

Bigmouth Buffalo

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	Bigmouth Buffalo	2	0.3	0.3	0		0			
	Black Bullhead	4	0.7	0.5	50		25			
	Black Crappie	12	2.0	1.7	8		8		130	4
	Common Carp	27	4.5	1.8	15		11			
	Northern Pike	9	1.5	0.6	78		11		88	4
	Walleye	54	9.0	3.0	67	9	13	7	91	2
	White Sucker	2	0.3	0.3	100		100			
	Yellow Perch	36	6.0	2.7	25	11	14	9	116	4

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	Bigmouth Buffalo								0.0	0.0	0.3	0.10
	Black Bullhead								0.2	0.0	0.7	0.30
	Black Crappie								0.0	0.2	2.0	0.73
	Common Carp								3.0	0.8	4.5	2.77
	Northern Pike								0.5	1.0	1.5	1.00
	Walleye								3.3	1.7	9.0	4.67
	White Bass								0.2	2.0	0.0	0.73
	White Sucker								0.0	0.0	0.3	0.10
	Yellow Perch								0.2	3.0	6.0	3.07
frame net (std 3/4 in)	Bigmouth Buffalo	0.4										0.40
	Black Bullhead	0.2										0.20
	Common Carp	9.4										9.40
	Northern Pike	2.0										2.00
	Walleye	2.2										2.20
	White Sucker	0.2										0.20
	Yellow Perch	0.2										0.20
std exp gill net	Bigmouth Buffalo	0.0		0.0		0.0	0.0	0.0				0.00
	Black Bullhead	0.3		74.3		7.3	6.0	1.7				17.92
	Black Crappie	0.0		1.0		3.3	2.3	0.3				1.38
	Common Carp	0.3		2.7		0.3	0.7	1.3				1.06
	Northern Pike	3.3		8.0		4.7	3.0	2.0				4.20
	Walleye	30.0		25.3		13.0	20.3	11.0				19.92
	White Bass	0.0		0.0		0.3	0.7	0.0				0.20
	White Sucker	0.0		0.0		0.0	0.0	0.0				0.00
	Yellow Perch	3.3		12.7		13.0	24.0	8.0				12.20

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	Bigmouth Buffalo	PSD										0
		PSD-P										0
	Black Bullhead	PSD								100		50
		PSD-P								100		25
	Black Crappie	PSD									100	8
		PSD-P									100	8
		Wr									93	130
	Common Carp	PSD								78	100	15
		PSD-P								17	60	11
	Northern Pike	PSD								100	83	78
		PSD-P								33	33	11
		Wr								83	81	88
	Walleye	PSD								50	80	67
		PSD-P								15	30	13
		Wr								82	89	91
	White Sucker	PSD										100
		PSD-P										100
	Yellow Perch	PSD								100	6	25
		PSD-P								100	0	14
		Wr								96	104	116
frame net (std 3/4 in)	Bigmouth Buffalo	PSD	100									
		PSD-P	0									
		Wr	86									
	Black Bullhead	PSD	100									
		PSD-P	0									
	Common Carp	PSD	96									
		PSD-P	94									
		Wr	104									
	Northern Pike	PSD	20									
		PSD-P	0									
		Wr	90									
	Walleye	PSD	27									
		PSD-P	9									

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
frame net (std 3/4 in)	Walleye	Wr	85									
	White Sucker	PSD	100									
		PSD-P	100									
		Wr	77									
	Yellow Perch	PSD	100									
		PSD-P	100									
std exp gill net	Bigmouth Buffalo	PSD					0		0			
		PSD-P					0		0			
	Black Bullhead	PSD	100		4		14	78	20			
		PSD-P	0		0		0	0	20			
		Wr	98		105							
	Black Crappie	PSD	0		33		20	29	0			
		PSD-P	0		33		20	0	0			
		Wr			112		122	106	133			
	Common Carp	PSD	100		88		100	100	75			
		PSD-P	100		63		100	50	75			
		Wr	84		91							
	Northern Pike	PSD	40		46		86	56	83			
		PSD-P	0		0		21	44	0			
		Wr	88		76		85	84	77			
	Walleye	PSD	1		26		54	61	73			
		PSD-P	0		1		5	18	12			
		Wr	87		79		88	76	84			
	Yellow Perch	PSD	20		42		36	33	42			
		PSD-P	20		37		23	10	21			
		Wr	117		107		112	98	103			

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+
2018	15	233 (5)	345 (2)	405 (4)		674 (1)			510 (2)		657 (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+
2018	17	148 (16)	248 (1)								

Fish Condition

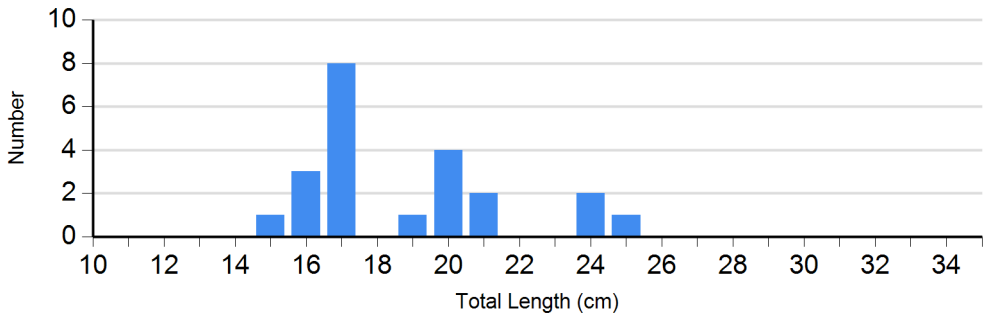
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2015	4	83 (6.0)	1	85	4	85 (3.0)	0	
	2016	1	72	5	78 (3.6)	0		0	
	2017	0		2	82 (2.8)	1	83	0	
	2018	1	98	3	81 (4.4)	2	71 (1.7)	0	
	2019	2	91 (2.0)	6	87 (4.1)	1	83	0	
Walleye Gill Net	2015	24	78 (0.6)	26	76 (2.9)	11	74 (3.1)	0	
	2016	9	88 (1.1)	20	83 (1.1)	4	83 (0.2)	0	
	2017	10	88 (2.1)	7	76 (2.0)	3	76 (2.6)	0	
	2018	2	90 (1.1)	5	90 (4.1)	1	96	2	82 (6.7)
	2019	18	87 (3.3)	29	93 (1.1)	5	94 (2.6)	2	89 (13.5)
Yellow Perch Gill Net	2015	48	98 (1.1)	17	100 (4.0)	6	94 (5.1)	1	89
	2016	14	102 (2.0)	5	107 (4.6)	4	103 (4.7)	1	103
	2017	0		0		1	96	0	
	2018	17	104 (2.4)	1	101	0		0	
	2019	27	115 (4.0)	4	113 (13.5)	4	127 (6.6)	1	116

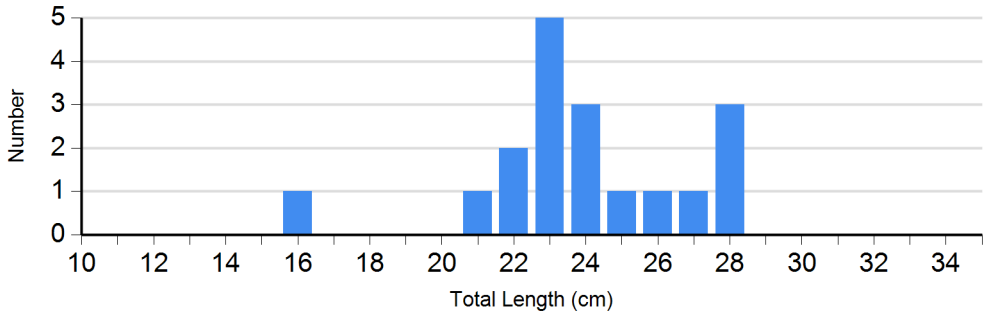
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: std exp gill net

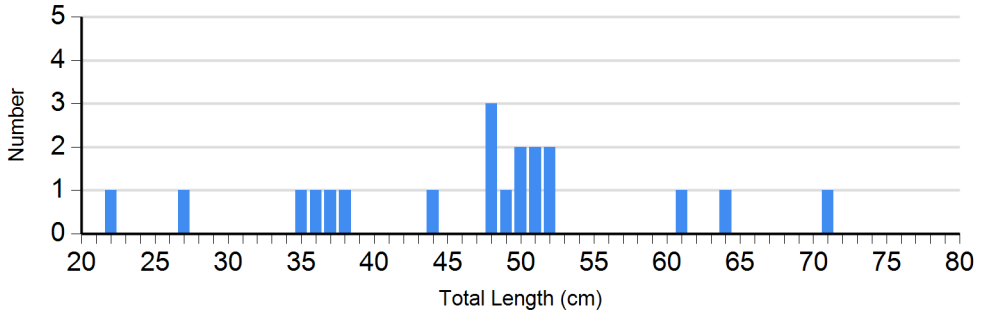


2014

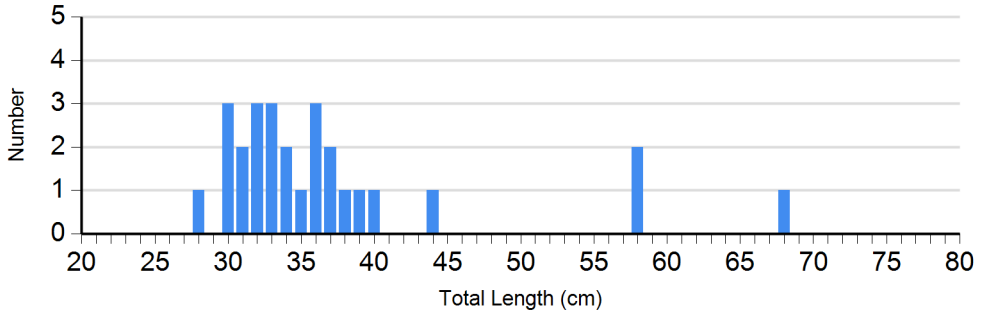


2015

Species: Common Carp
Gear: AFS std gill net

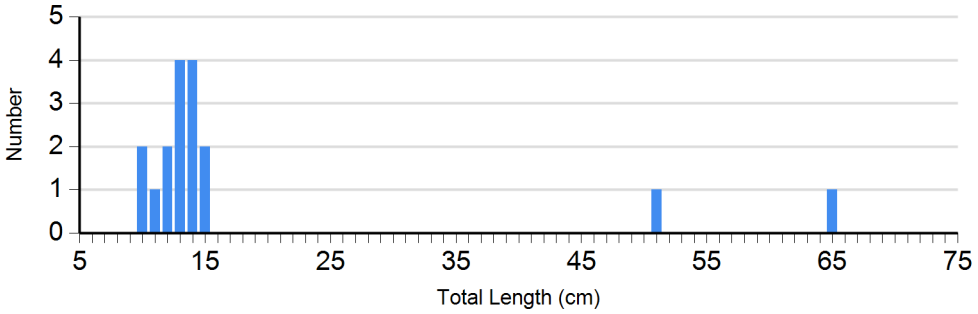


2017

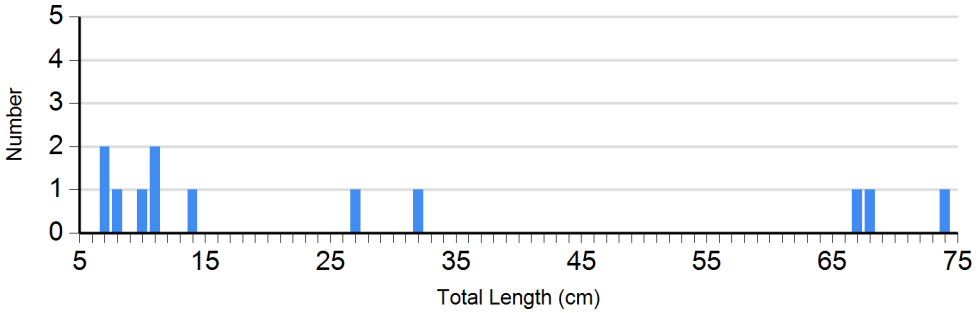


2019

Species: Common Carp
Gear: std exp gill net

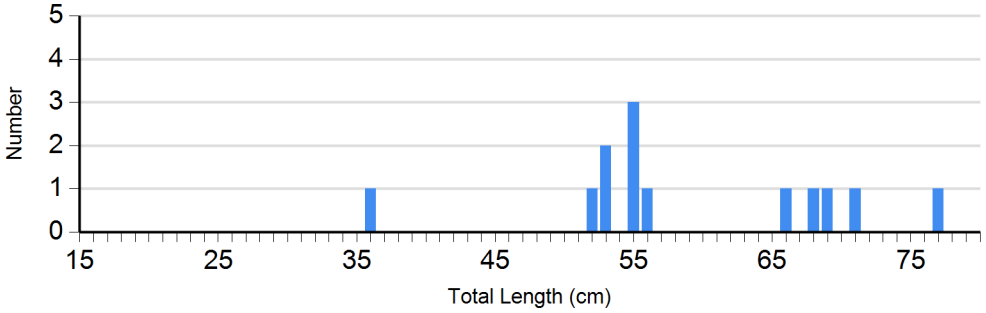


2015



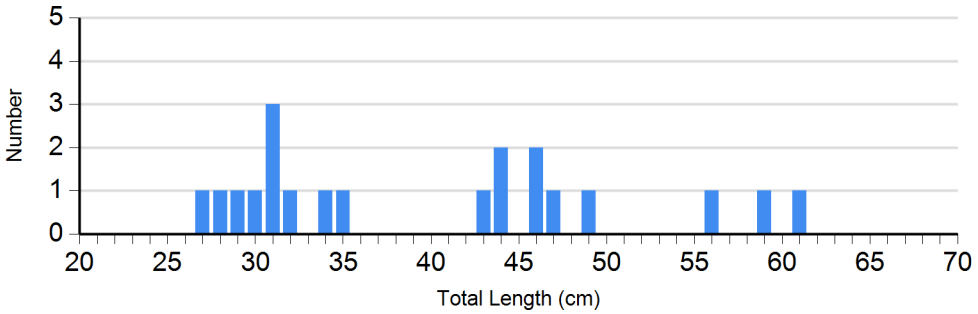
2016

Species: Northern Pike
Gear: std exp gill net

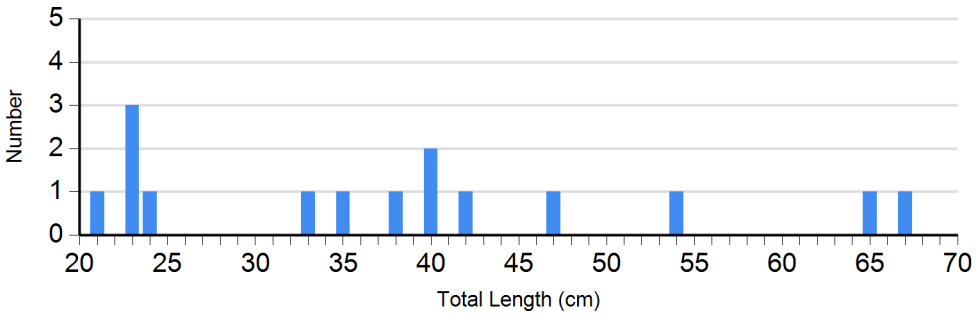


2014

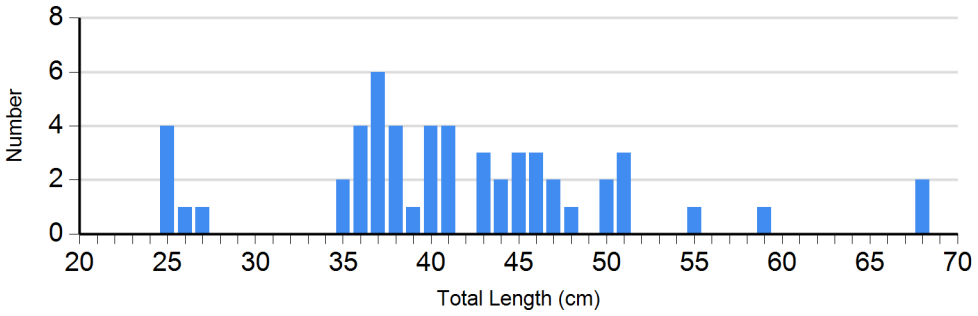
Species: Walleye
Gear: AFS std gill net



2017

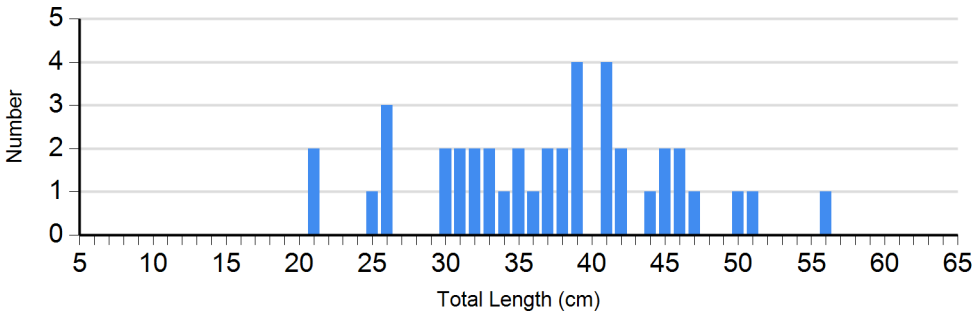


2018



2019

Species: Walleye
Gear: std exp gill net



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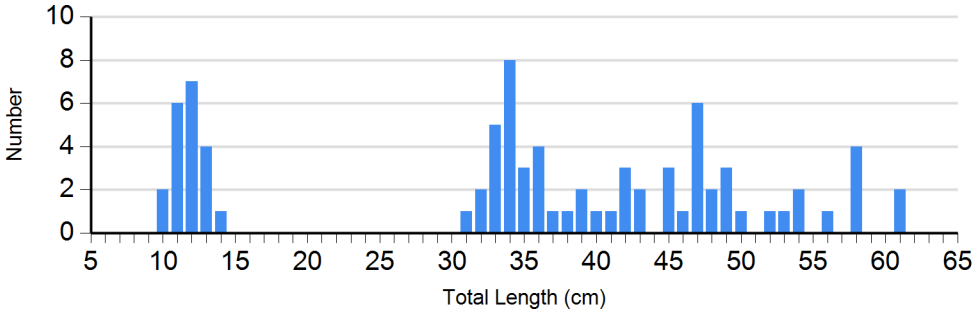

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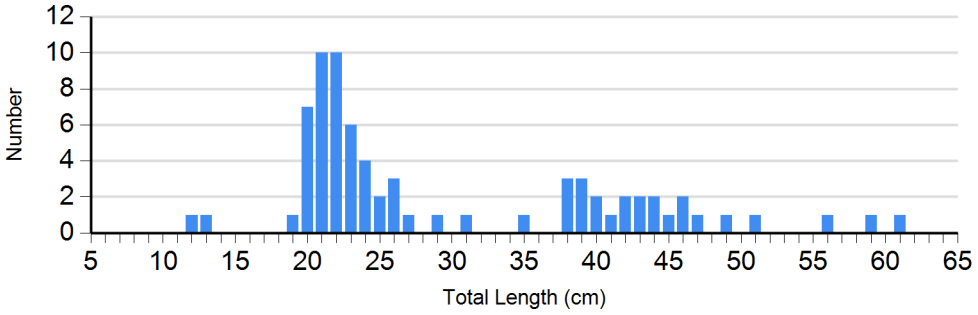
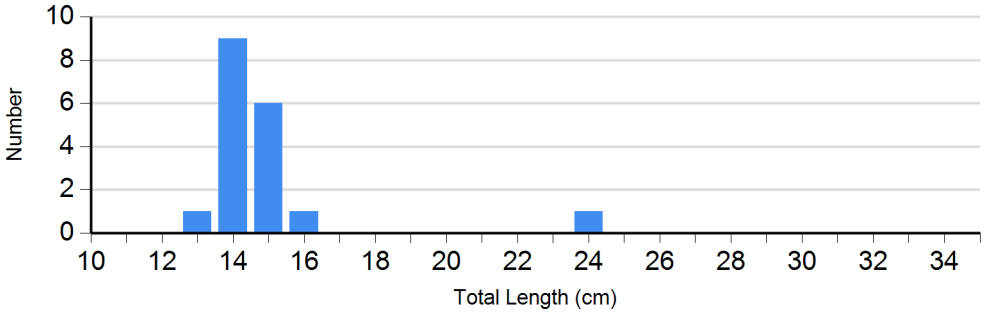
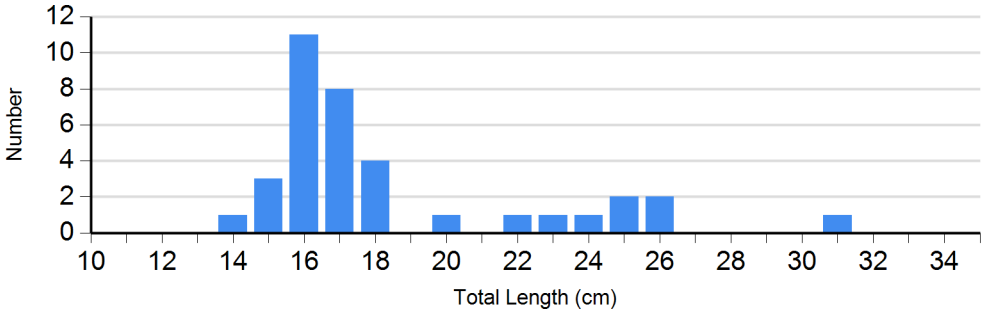


2016

Species: Yellow Perch
Gear: AFS std gill net

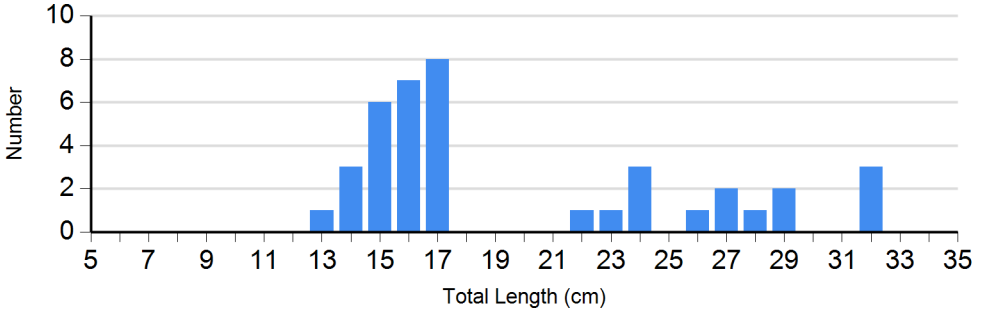


2018



2019

Species: Yellow Perch
Gear: std exp gill net



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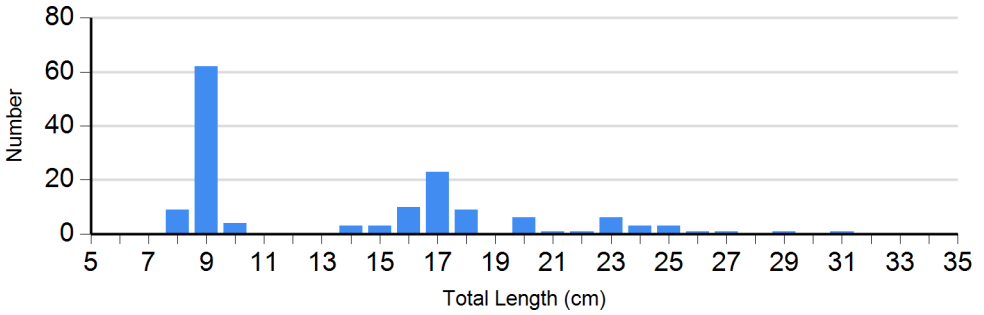

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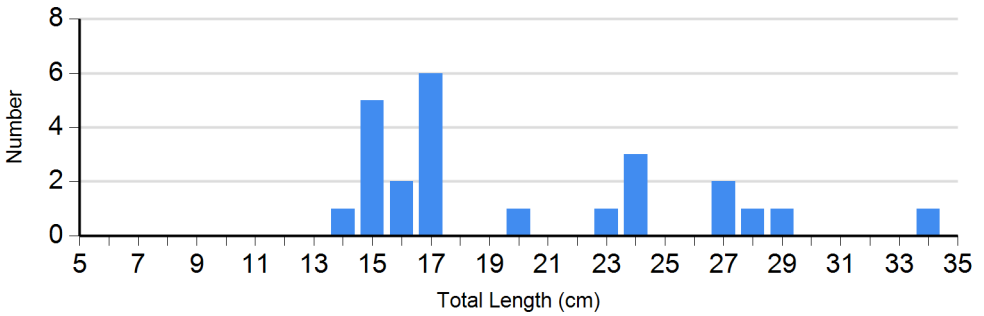
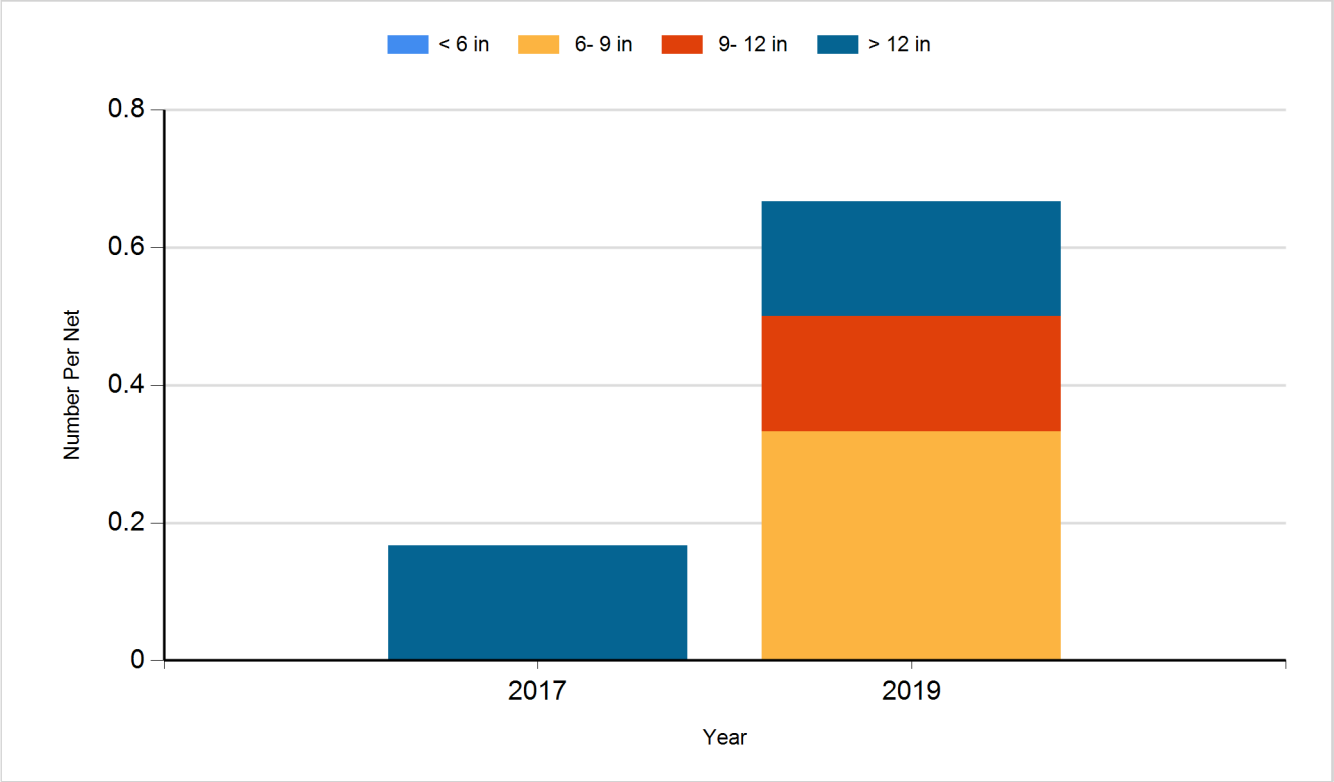


2016

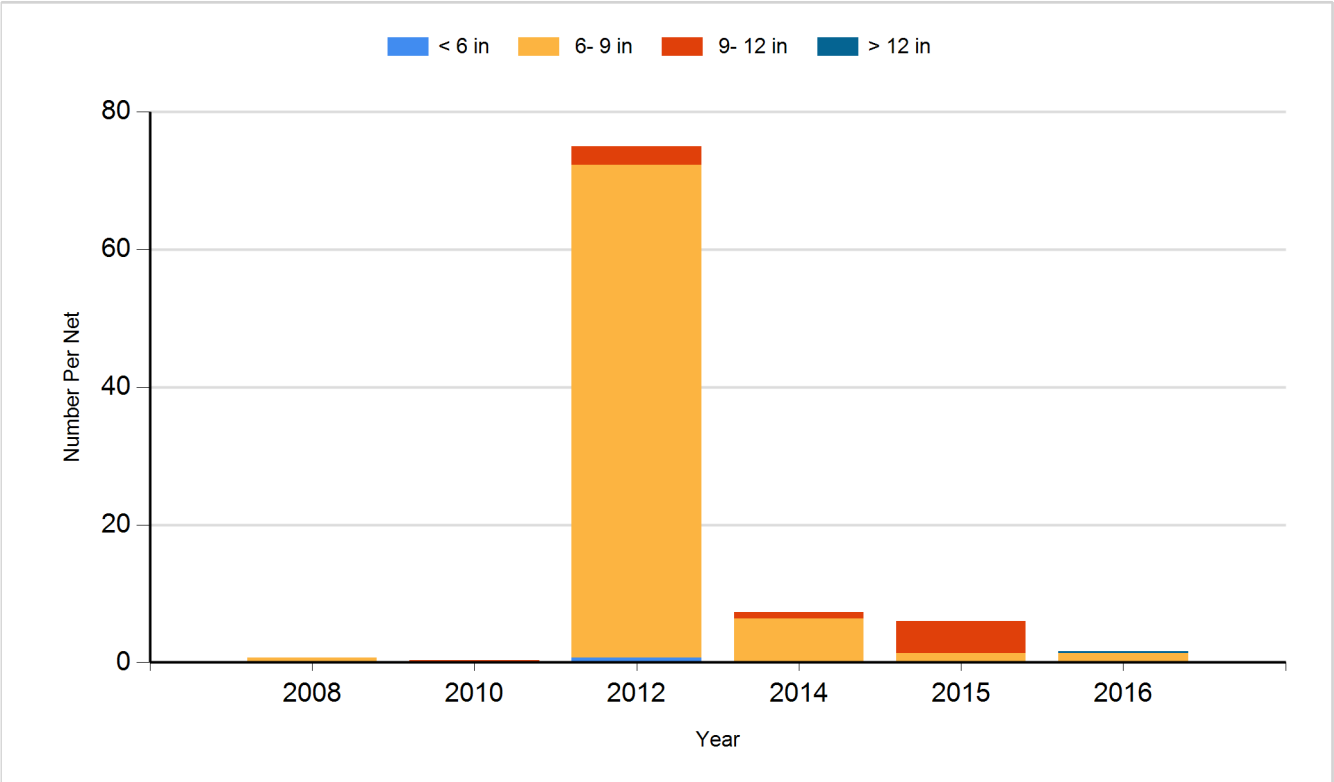
Historic Fish Sizes and Relative Abundance

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

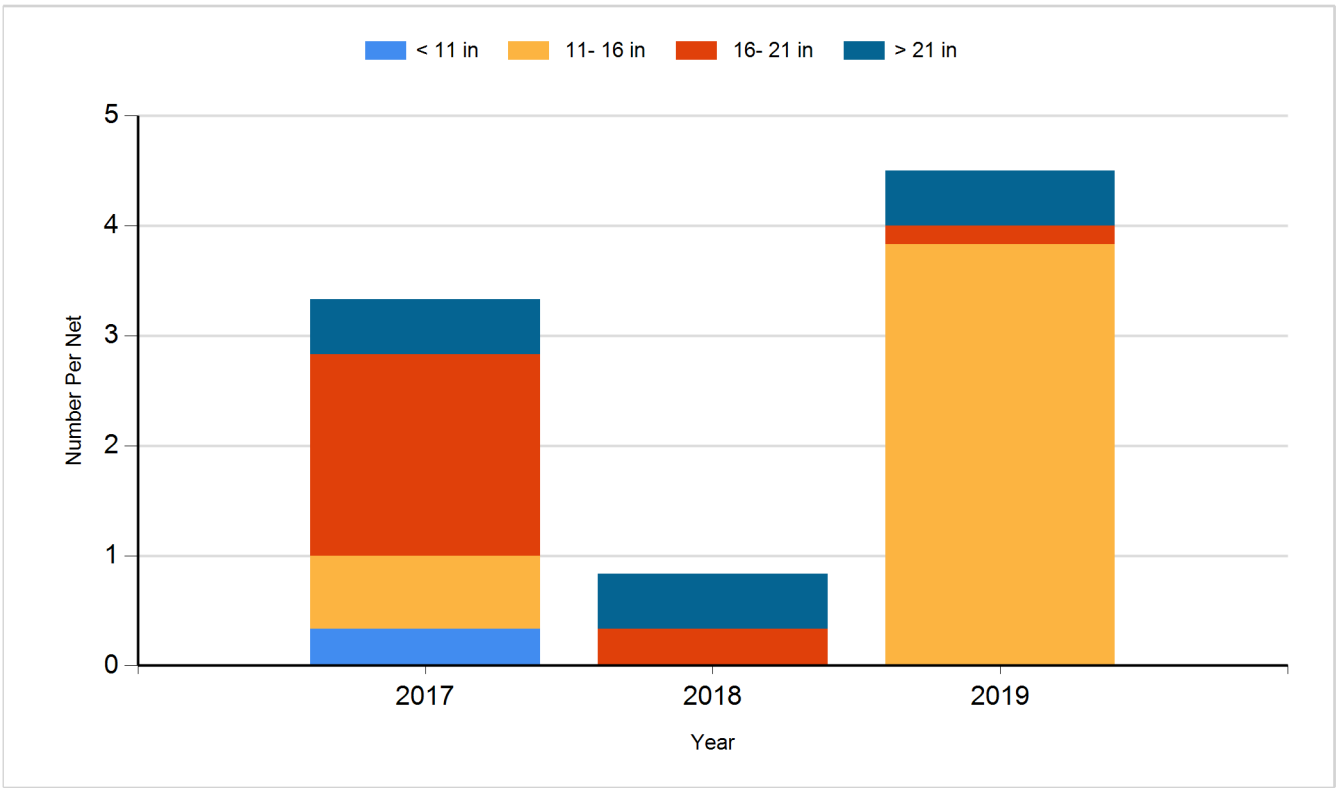
Species: Black Bullhead
Gear: AFS std gill net



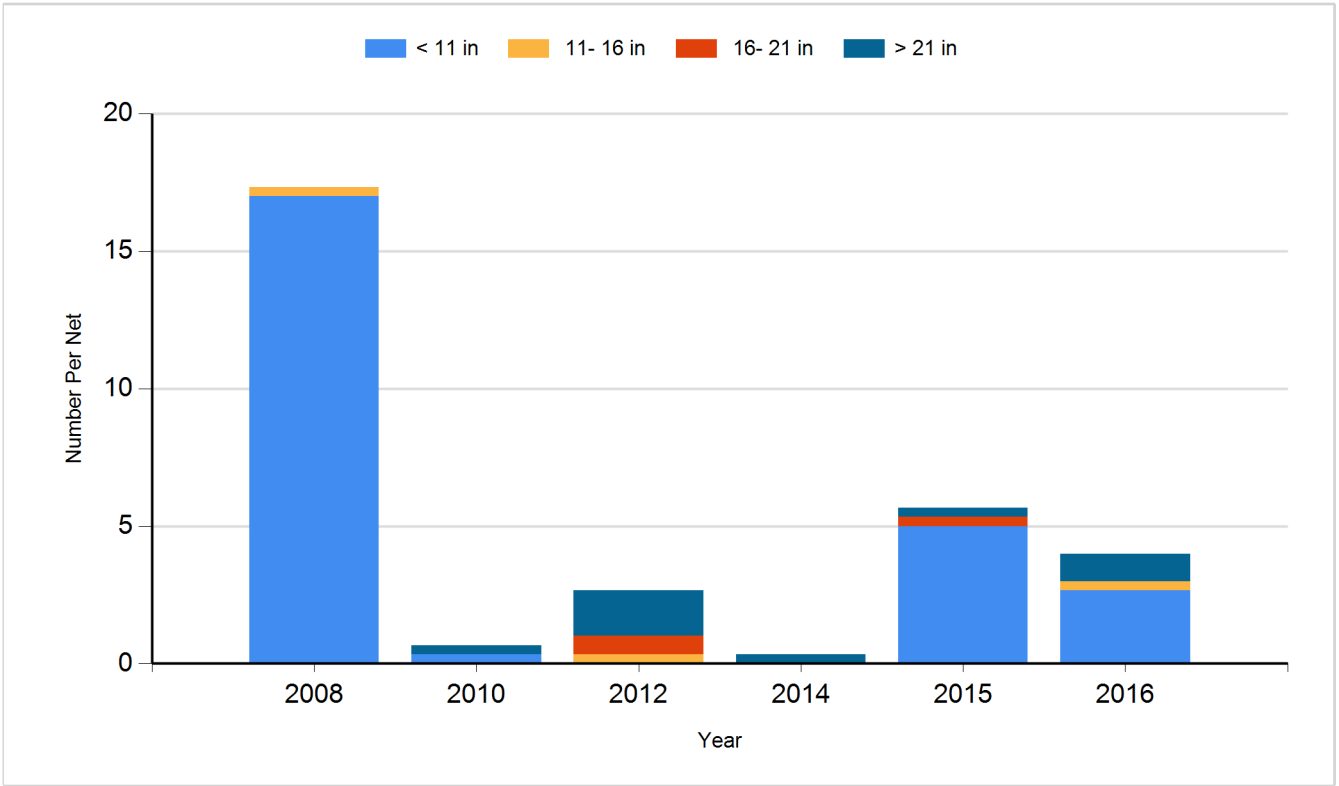
Species: Black Bullhead
Gear: std exp gill net



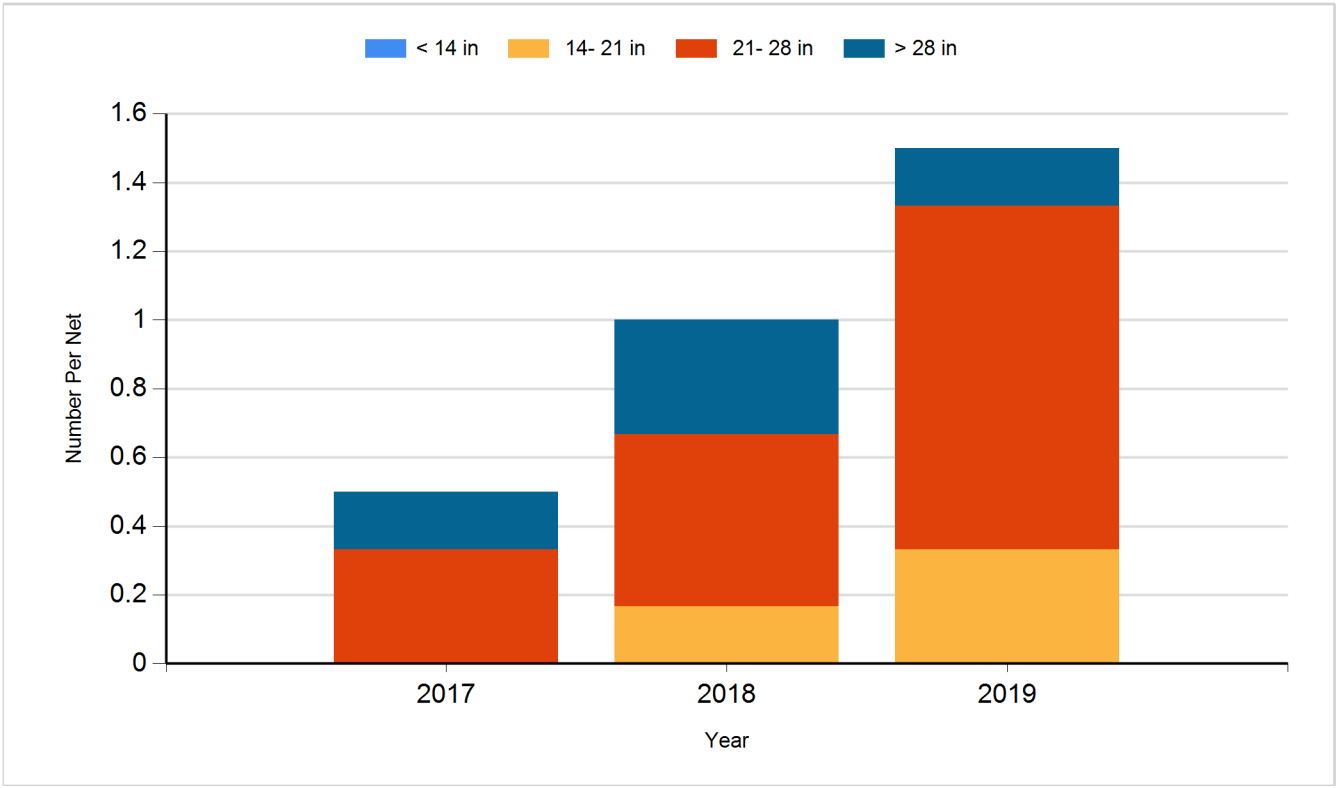
Species: Common Carp
Gear: AFS std gill net



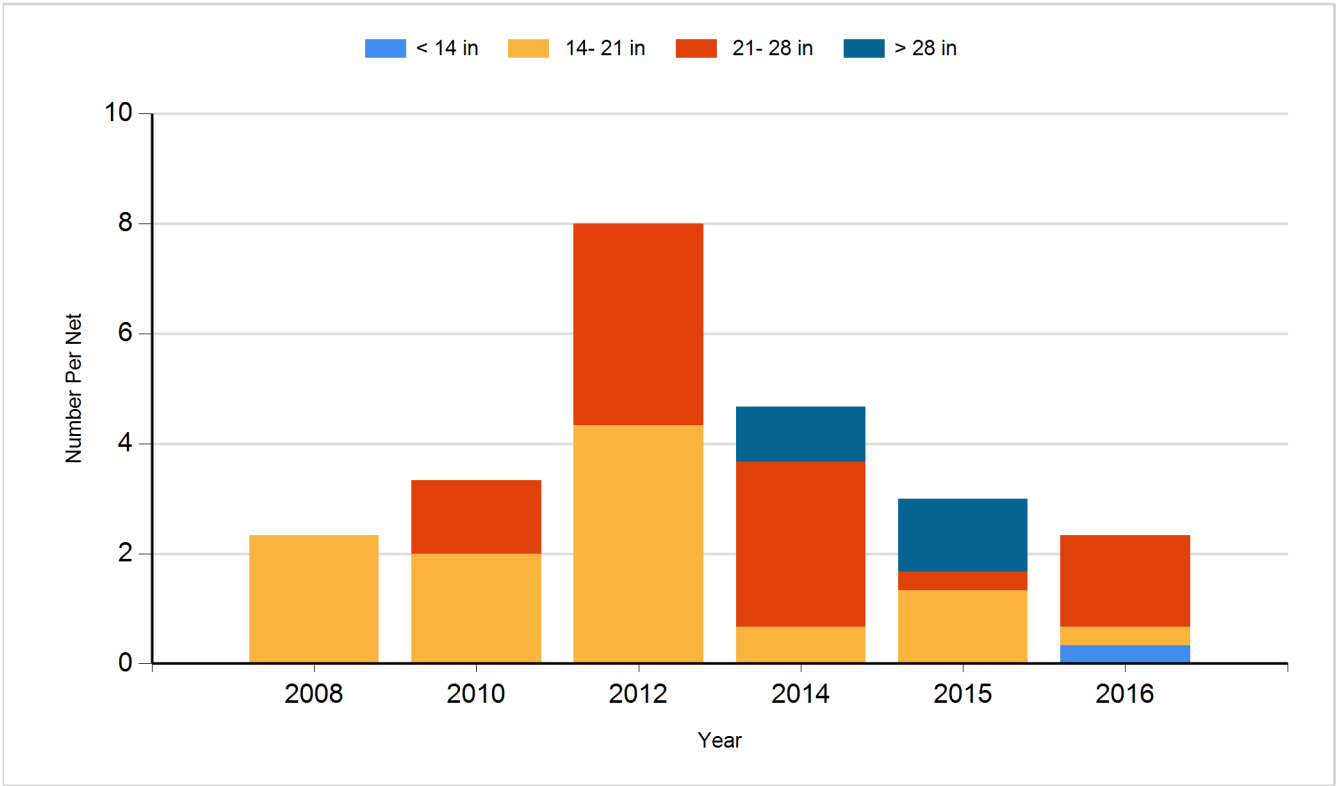
Species: Common Carp
Gear: std exp gill net



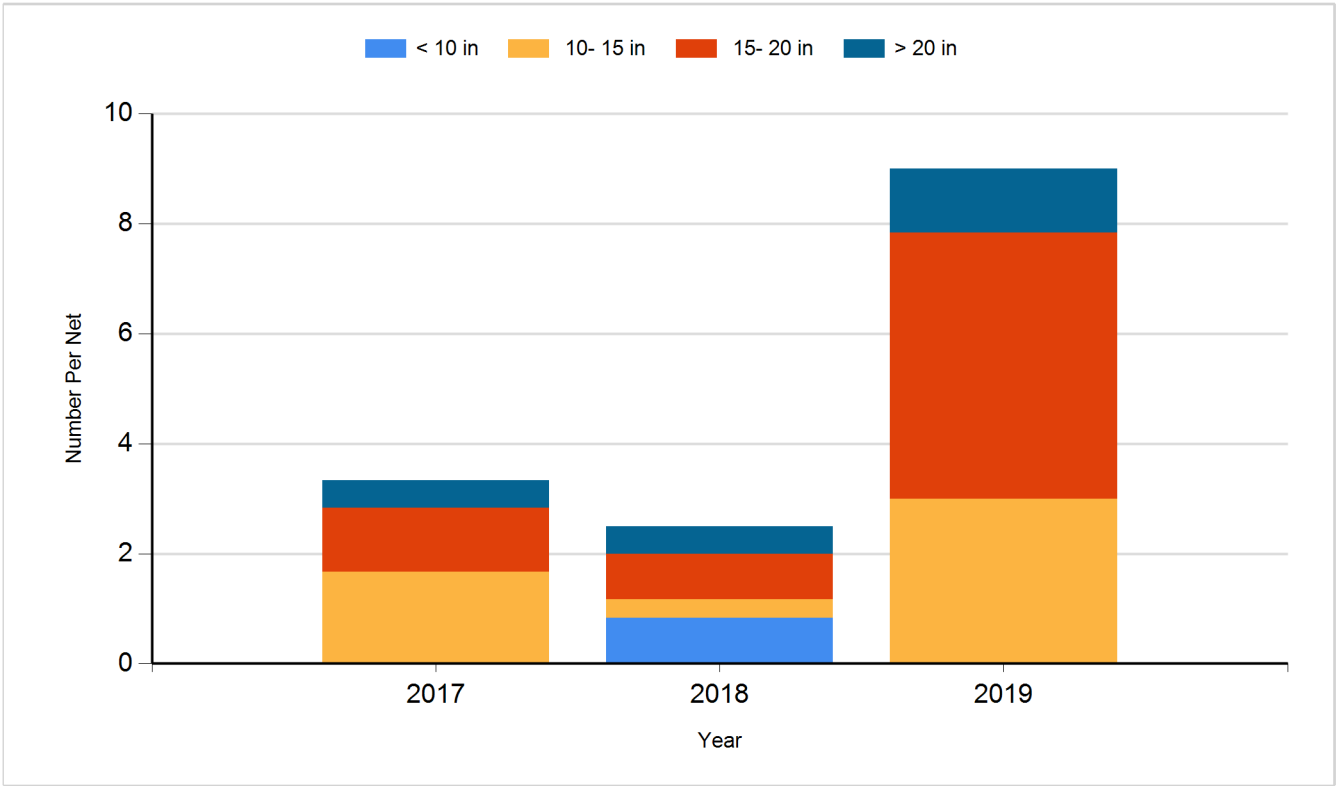
Species: Northern Pike
Gear: AFS std gill net



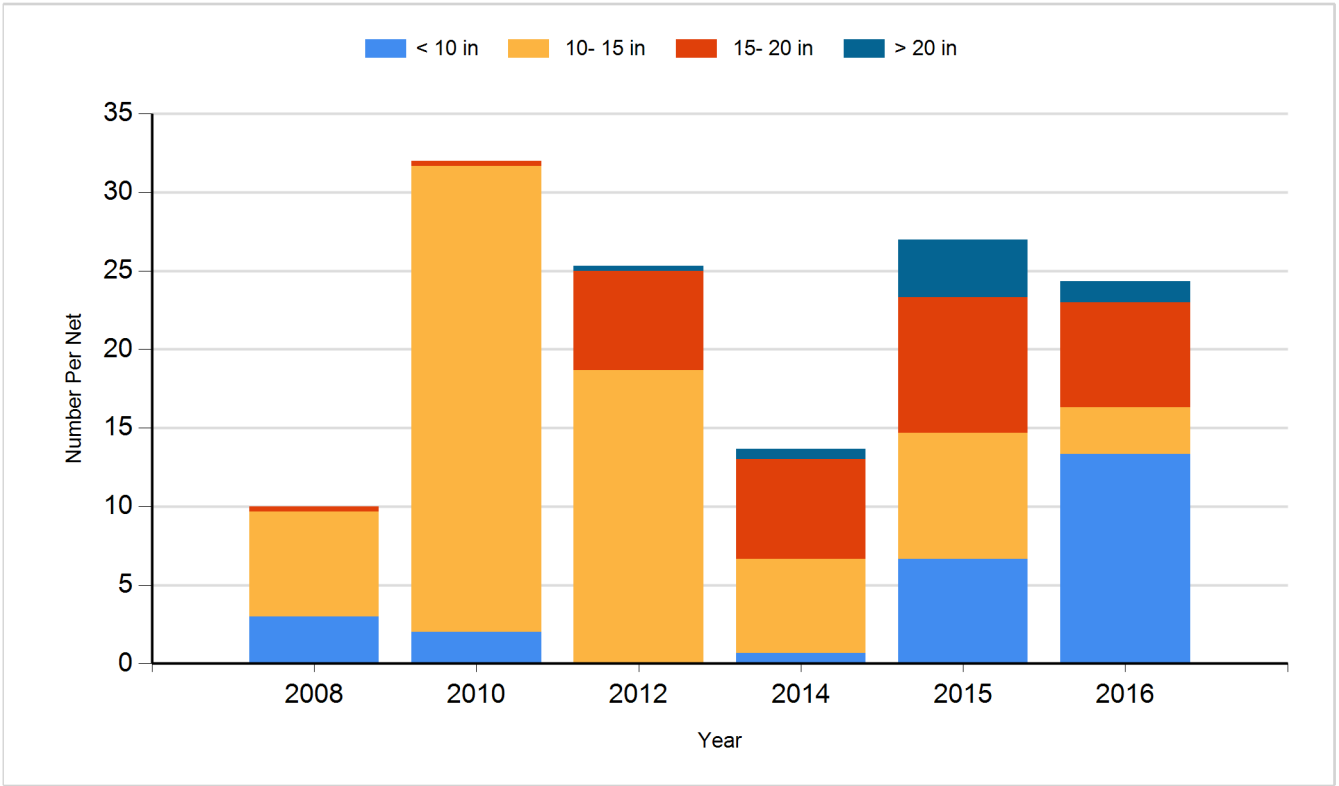
Species: Northern Pike
Gear: std exp gill net



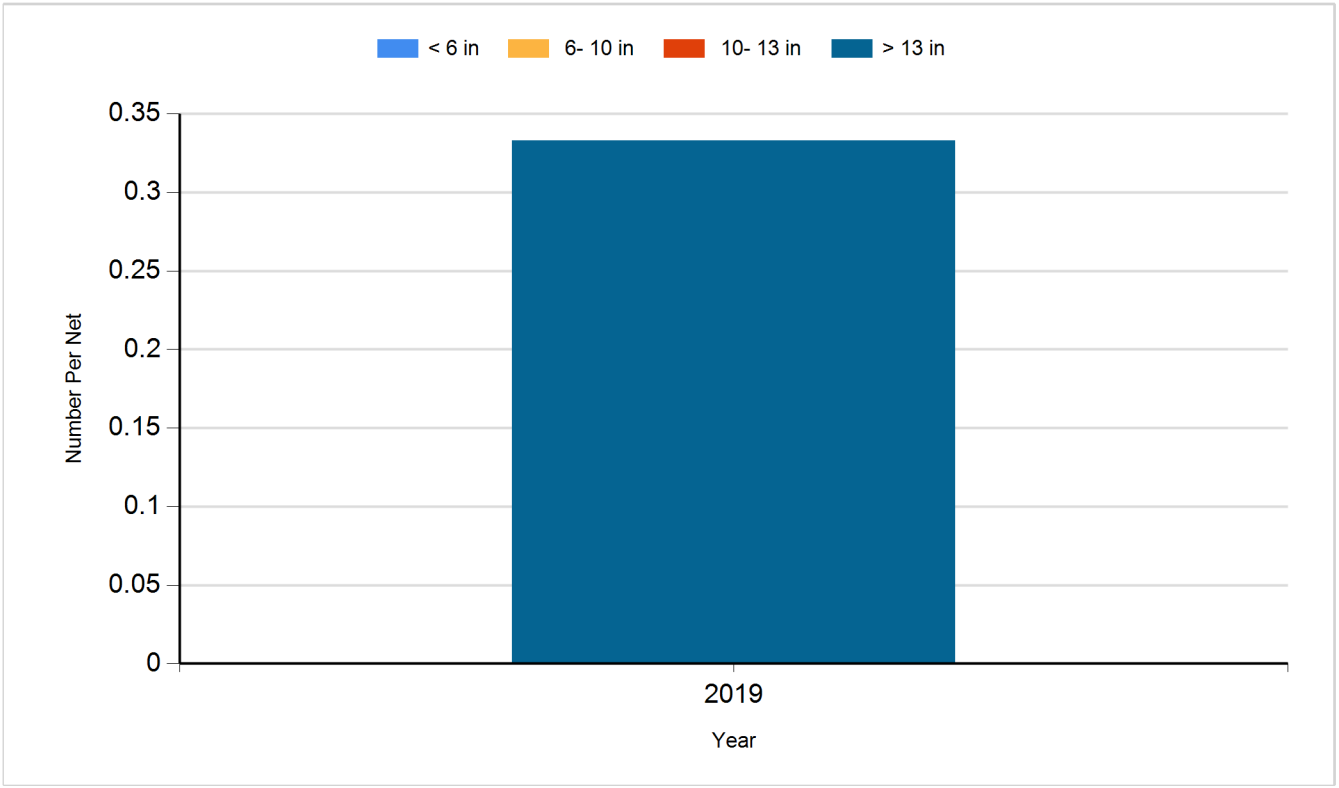
Species: Walleye
Gear: AFS std gill net



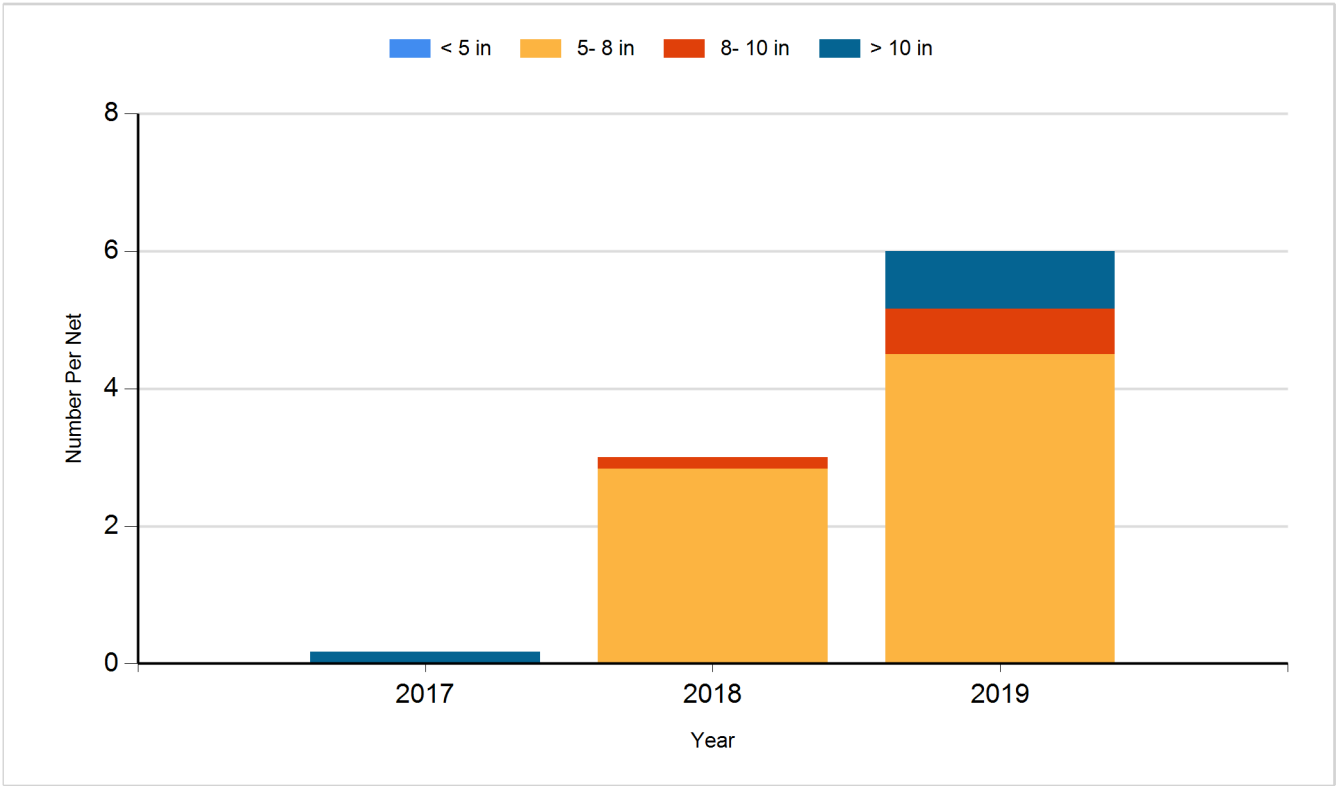
Species: Walleye
Gear: std exp gill net



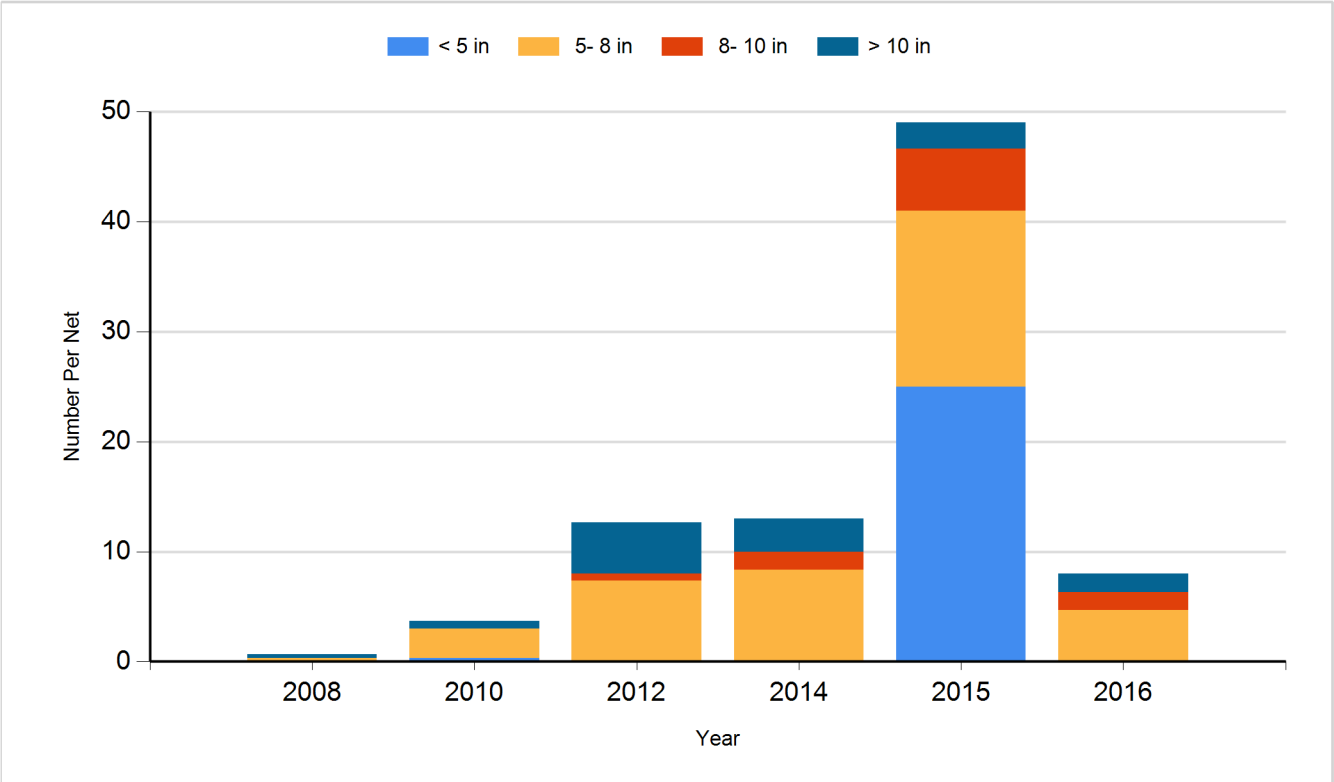
Species: White Sucker
Gear: AFS std gill net



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
2008	Walleye	Fry	2,400,000
2010	Walleye	Fry	2,350,000
2012	Walleye	Fry	1,200,000
2013	Walleye	Fry	1,161,000
2014	Walleye	Fry	1,160,000
2015	Walleye	Fry	1,200,000
2018	Walleye	Fry	1,200,000
2019	Walleye	Fry	1,200,000