SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Whitewood, Kingsbury County
LKT-Lake-55-800
2018

Lake Information

Name: Whitewood

County: Kingsbury

Legal Description: T110N- R54W-Sec. 2, 3, 9-21; T110N- R53W-Sec.18-19

Surface Area: 5,815 Acres

Maximum Depth: 7 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, 2018	8 net-nights

Common Fish Species Present

Walleye

Yellow Perch

Black Bullhead

Common Carp

White Sucker

Northern Pike

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	232	0.0	0.0	0		0			
	Black Bullhead	99	12.4	1.6	93	4	0			
	Common Carp	66	6.3	1.4	86	8	16	8		
	Northern Pike	5	0.6	0.5	40		20		88	3
	Walleye	59	5.6	1.4	29	10	9		89	1
	White Sucker	8	1.0	0.7	100		100			
	Yellow Perch	150	18.8	8.8	41	6	14	4	100	2

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std gill net	Bigmouth Buffalo										0.0	0.0
	Black Bullhead									13.8	12.4	13.1
	Common Carp									19.2	6.3	12.8
	Northern Pike									2.0	0.6	1.3
	Walleye									4.7	5.6	5.2
	White Sucker									2.3	1.0	1.7
	Yellow Perch									21.0	18.8	19.9
frame net (std 3/4 in)	Bigmouth Buffalo				0.8							0.8
	Black Bullhead		50.2		67.2							58.7
	Black Crappie		0.2		4.2							2.2
	Common Carp		14.0		14.2							14.1
	Northern Pike		1.0		29.8							15.4
	Walleye		0.2		78.4							39.3
	White Sucker		4.4		14.2							9.3
	Yellow Perch		0.6		2.8							1.7
std exp gill net	Bigmouth Buffalo			0.0	2.0							1.0
	Black Bullhead		0.3	6.0	22.0		34.3	17.0	25.7			17.6
	Common Carp		0.3	5.7	20.7		2.0	3.0	13.7			7.6
	Northern Pike		1.3	0.3	0.3		6.3	10.3	3.7			3.7
	Walleye			2.7	43.0		33.7	22.7	11.3			22.7
	White Sucker			3.7	22.0		8.0	7.3	3.3			8.9
	Yellow Perch		3.0	7.0	120.0		33.7	79.0	69.7			52.1

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std gill net	Bigmouth Buffalo	PSD										0
		PSD-P										0
	Black Bullhead	PSD									90	93
		PSD-P									0	0
	Common Carp	PSD									65	86
		PSD-P									8	16
	Northern Pike	PSD									83	40
		PSD-P									8	20
		Wr									85	88
	Walleye	PSD									100	29
		PSD-P									57	9
		Wr									98	89
	White Sucker	PSD									100	100
		PSD-P									100	100
	Yellow Perch	PSD									94	41
		PSD-P									66	14
		Wr									95	100
frame net (std 3/4 in)	Bigmouth Buffalo	PSD				75						
		PSD-P				0						
		Wr				83						
	Black Bullhead	PSD		10		18						
		PSD-P		0		0						
		Wr		108		84						
	Common Carp	PSD		84		85						
		PSD-P		60		48						
		Wr		82		91						
	Northern Pike	PSD		40		30						
		PSD-P		0		0						
		Wr		96		80						
	Walleye	PSD		100		0						
		PSD-P		100		0						
		Wr		81		88						
	White Sucker	PSD		95		97						

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	White Sucker	PSD-P		68		66						
		Wr		95		94						
	Yellow Perch	PSD		0		50						
		PSD-P		0		7						
		Wr		106		98						
std exp gill net	Bigmouth Buffalo	PSD			0	0						
		PSD-P			0	0						
		Wr				95						
	Black Bullhead	PSD		0	6	33		20	20	61		
		PSD-P		0	0	0		0	0	0		
		Wr		113		76						
	Common Carp	PSD		0	6	10		100	78	39		
		PSD-P		0	6	2		17	44	15		
		Wr		92		89						
	Northern Pike	PSD		0	100	0		11	32	64		
		PSD-P		0	0	0		0	0	0		
		Wr		99		83		90	89	81		
	Walleye	PSD			25	0		97	87	94		
		PSD-P			0	0		1	12	24		
		Wr				88		104	99	92		
	White Sucker	PSD			100	76		88	100	100		
		PSD-P			0	3		88	36	100		
		Wr				85						
	Yellow Perch	PSD		78	57	20		80	64	75		
		PSD-P		44	0	2		74	5	8		
		Wr		104		97		105	97	88		

Fish Condition

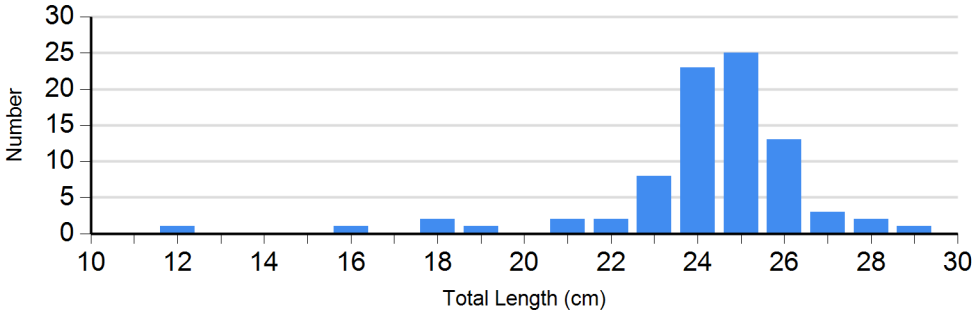
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2014	17	90 (1.9)	2	93 (5.2)	0		0	
	2015	21	91 (3.0)	10	86 (3.7)	0		0	
	2016	4	84 (1.3)	7	79 (1.9)	0		0	
	2017	2	90 (5.1)	9	84 (2.2)	1	88	0	
	2018	3	88 (0.4)	1	96	1	82	0	
Walleye Gill Net	2014	3	105 (6.7)	97	104 (1.1)	1		0	
	2015	9	92 (3.5)	51	100 (0.7)	8	98 (2.1)	0	
	2016	2	88 (1.7)	24	94 (1.1)	8	86 (2.3)	0	
	2017	0		12	102 (2.5)	16	94 (3.3)	0	
	2018	32	90 (0.9)	9	88 (2.3)	4	85 (4.9)	0	
Yellow Perch Gill Net	2014	20	96 (3.0)	6	114 (1.1)	73	106 (0.9)	2	103 (5.2)
	2015	85	96 (1.2)	141	97 (0.6)	3	108	8	92 (0.0)
	2016	52	88 (1.5)	141	88 (0.7)	16	90 (1.7)	0	
	2017	7	95 (3.9)	36	96 (2.6)	81	95 (1.0)	2	
	2018	88	107 (1.5)	41	93 (1.1)	21	87 (1.4)	0	

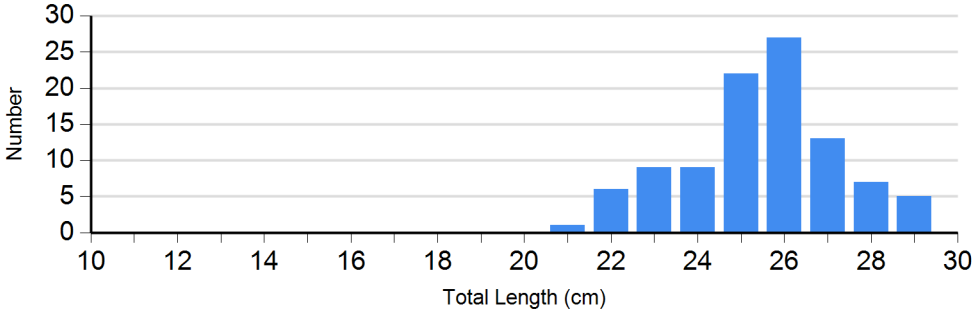
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

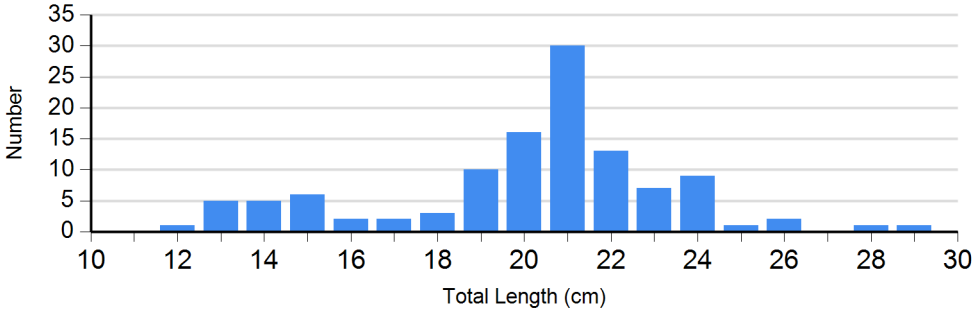


2017

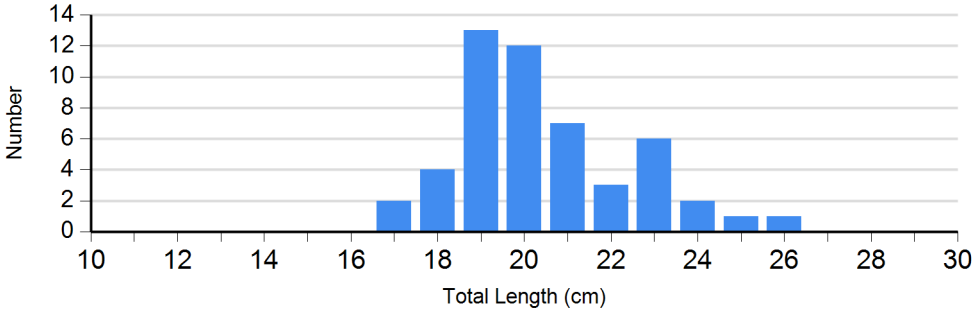


2018

Species: Black Bullhead
Gear: std exp gill net



2014



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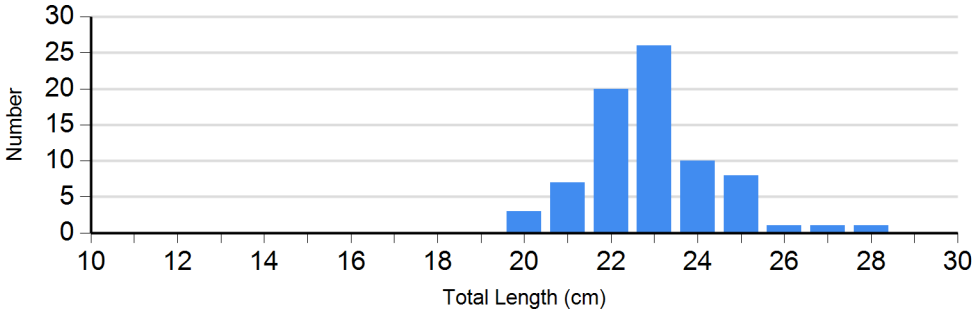
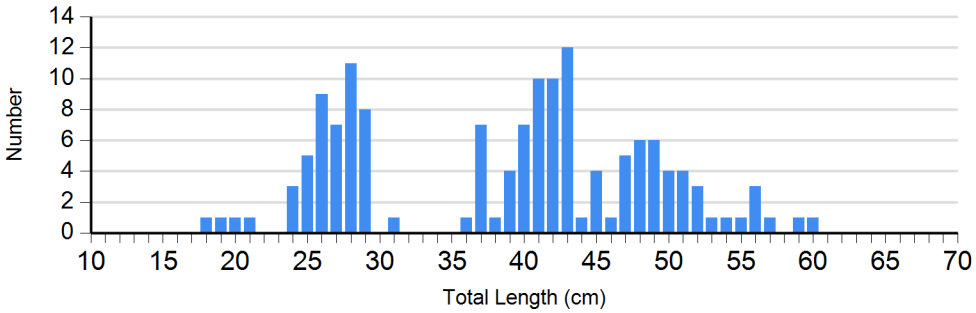
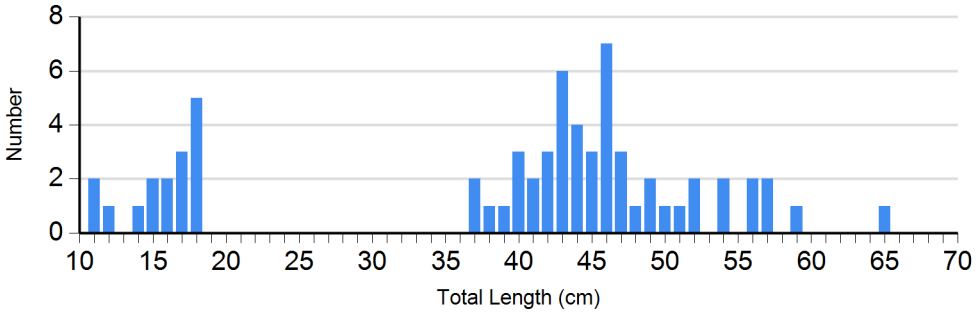


2016

Species: Common Carp
Gear: AFS std gill net

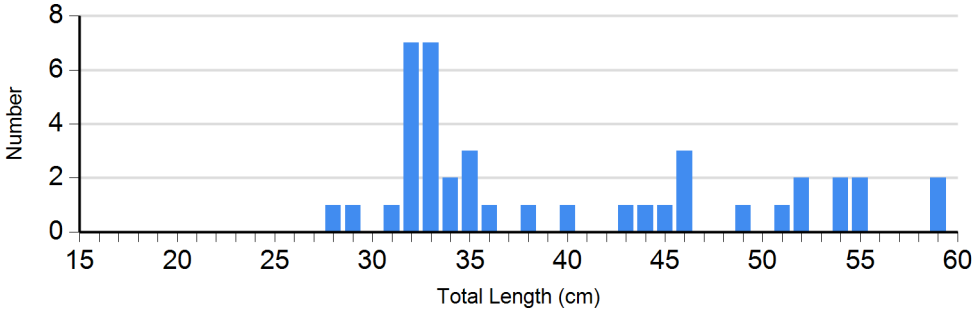


2017



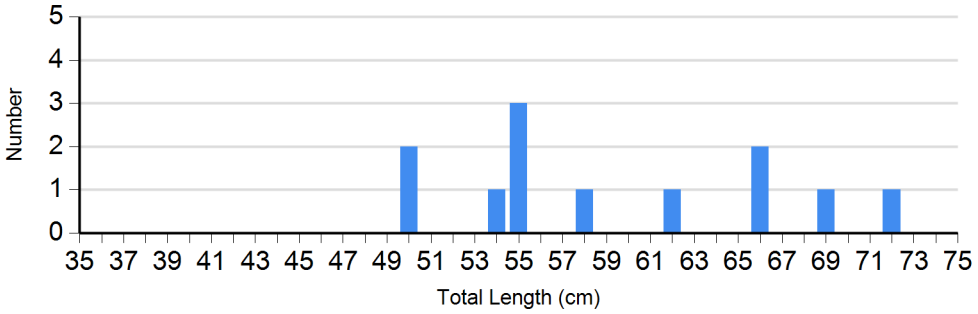
2018

Species: Common Carp
Gear: std exp gill net



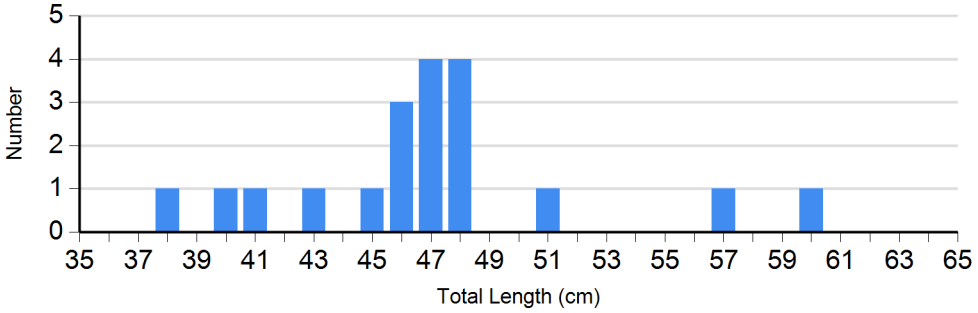
2016

Species: Northern Pike
Gear: AFS std gill net



2017

Species: Northern Pike
Gear: std exp gill net



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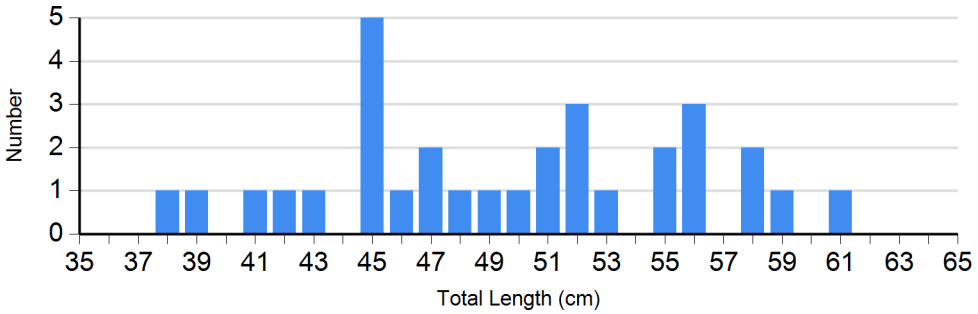

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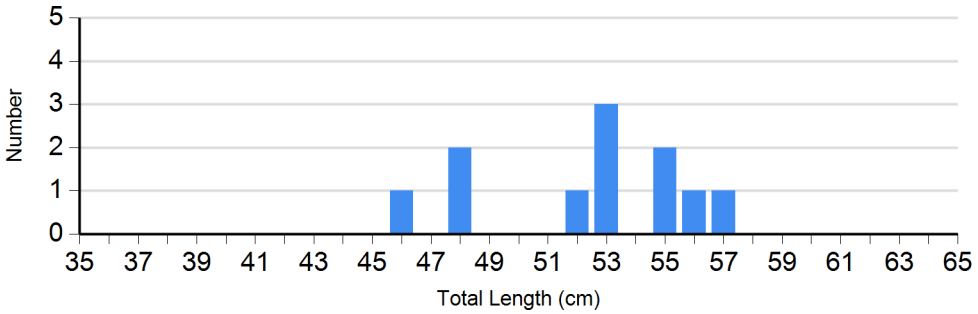
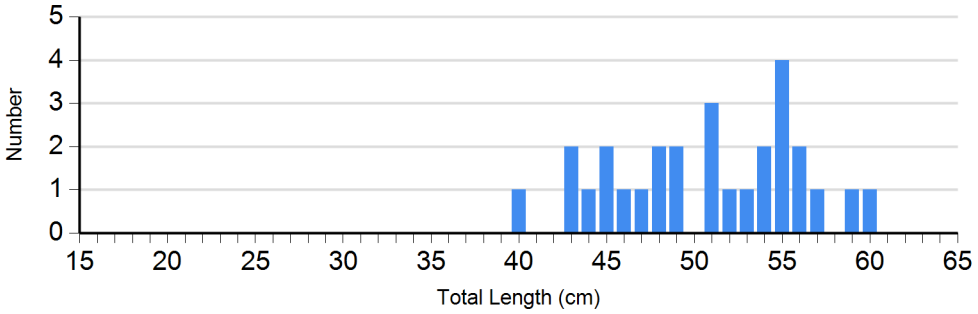


2016

Species: Walleye
Gear: AFS std gill net

2017



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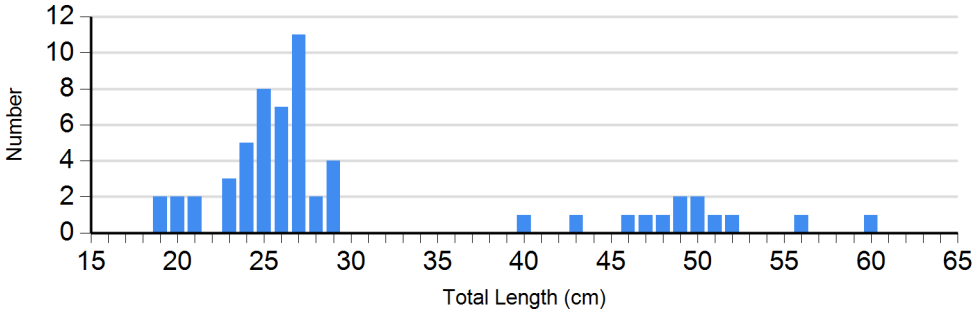
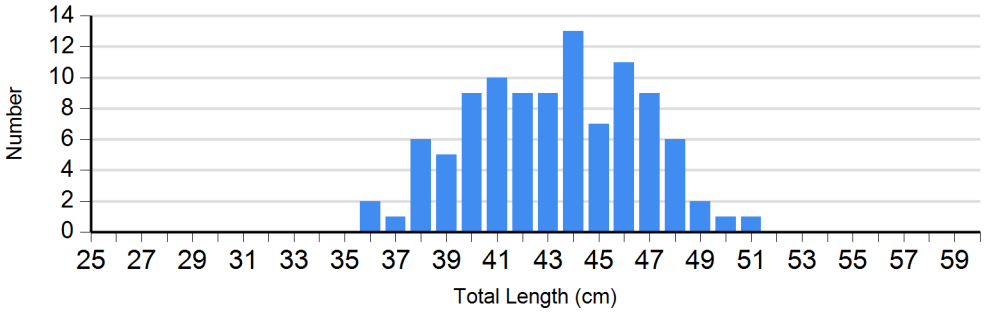


Species: Walleye
Gear: std exp gill net

2014



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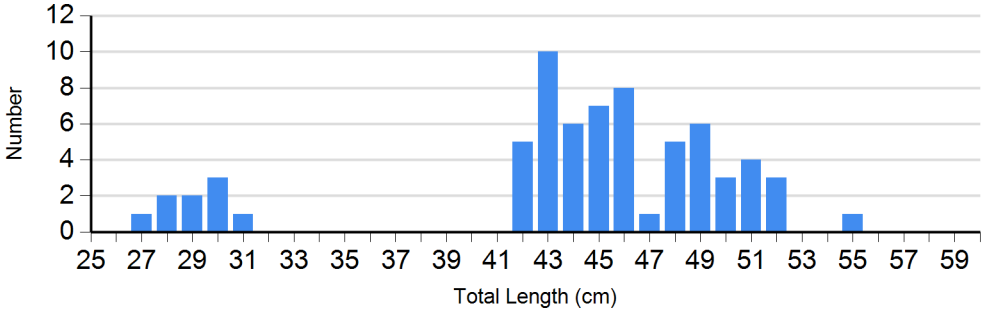
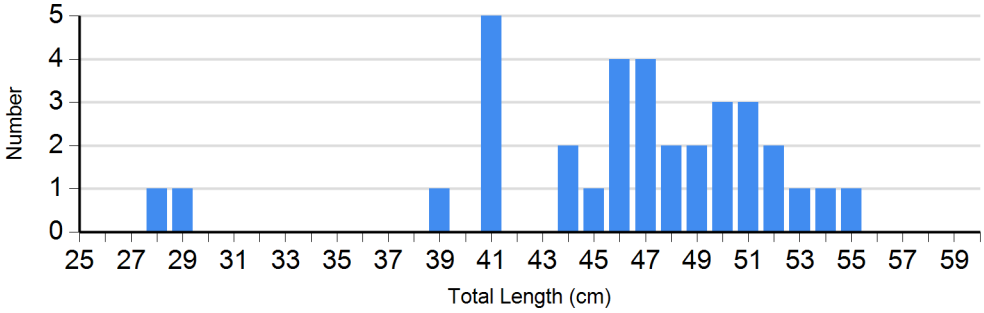
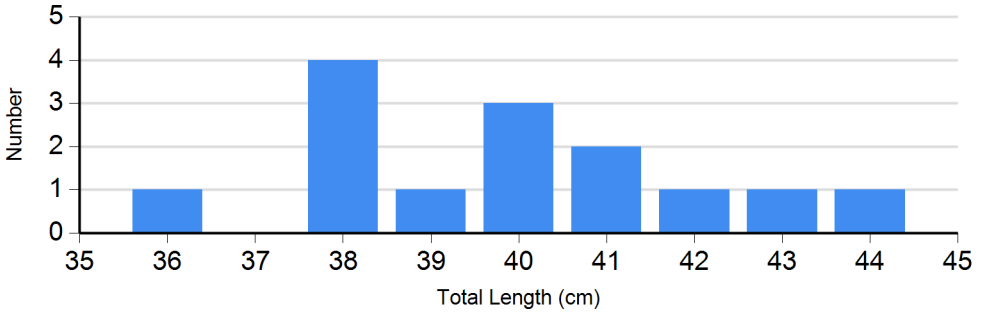


2016

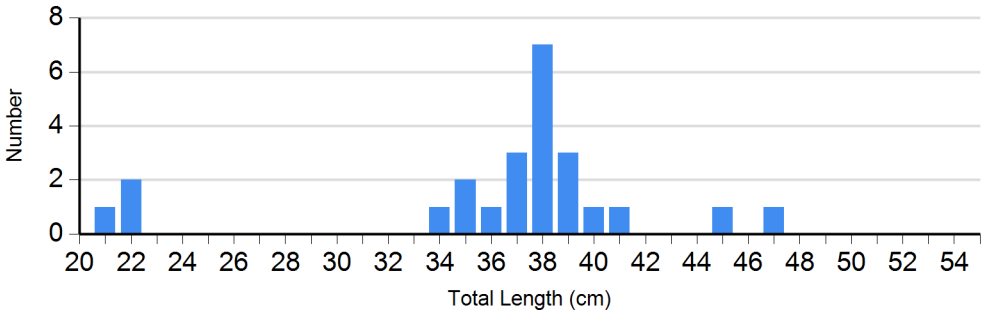


Species: White Sucker
Gear: AFS std gill net



2017

Species: White Sucker
Gear: std exp gill net



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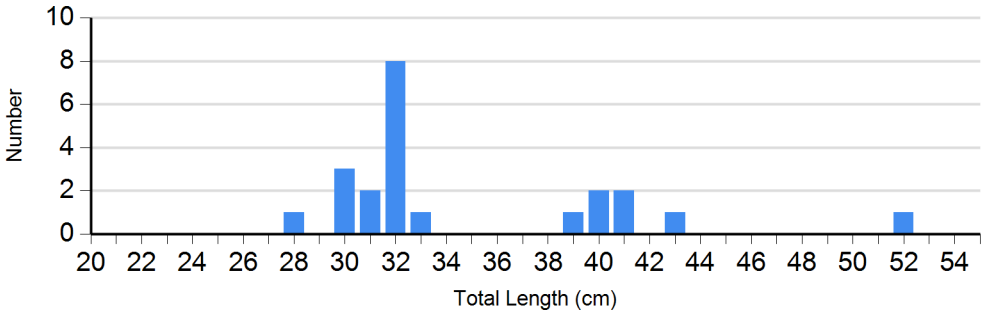

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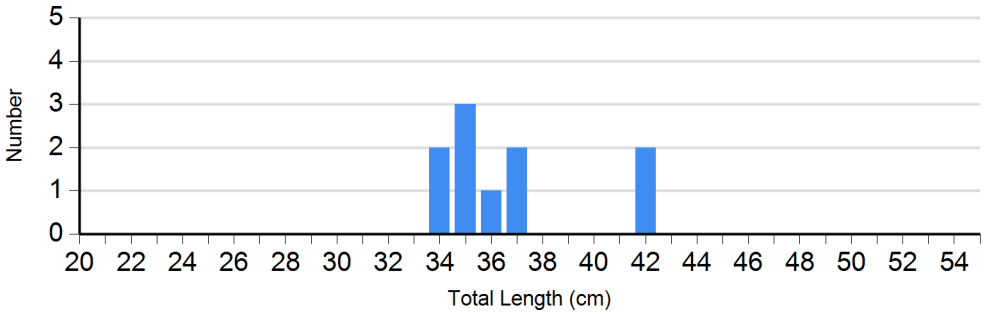
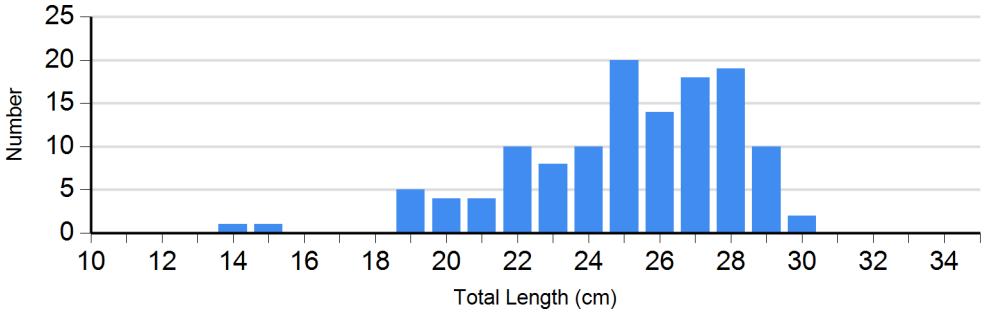


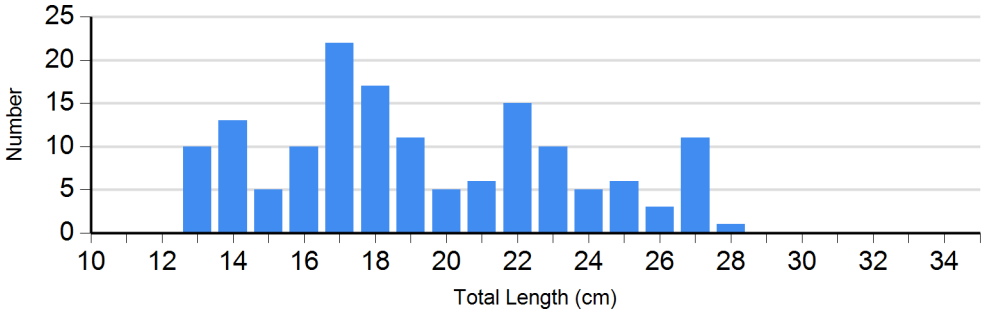
2016

Species: Yellow Perch
Gear: AFS std gill net

2017

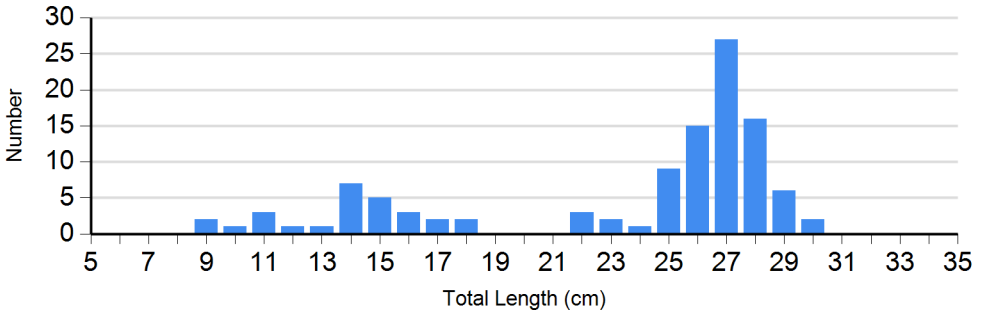


2018

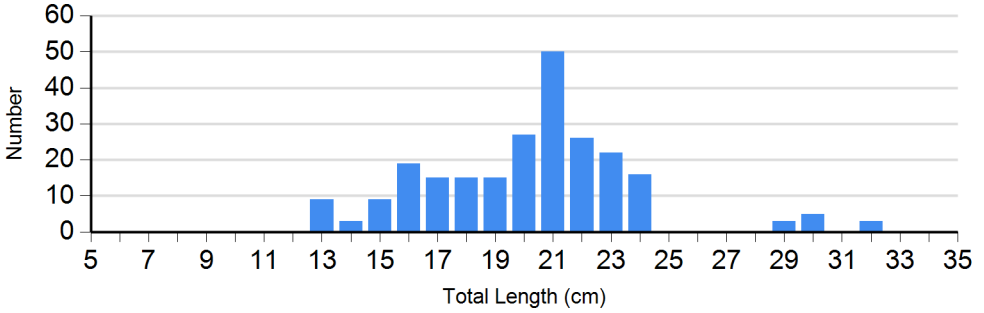


Species: Yellow Perch
Gear: std exp gill net

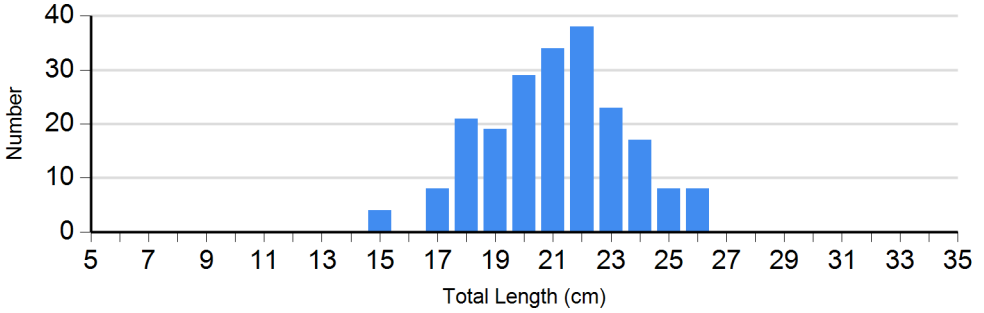
2014



2015



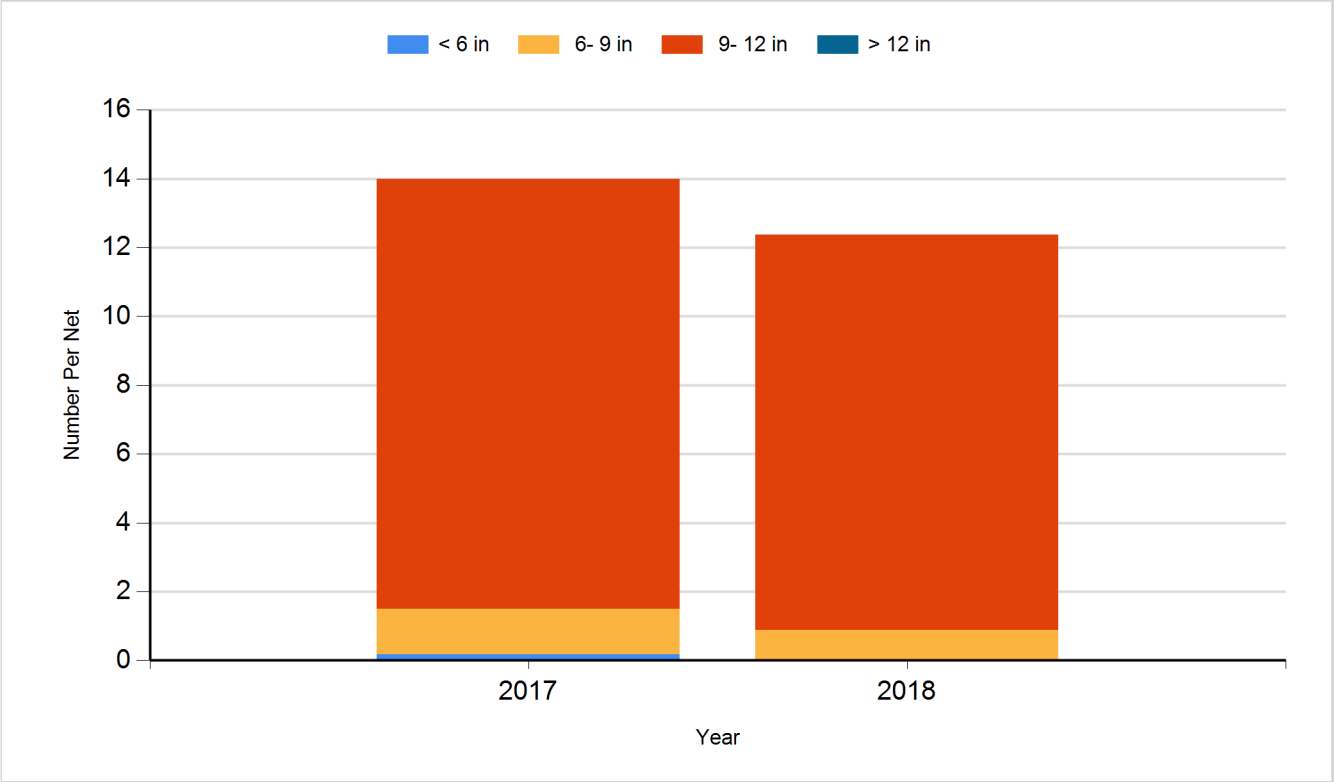
2016



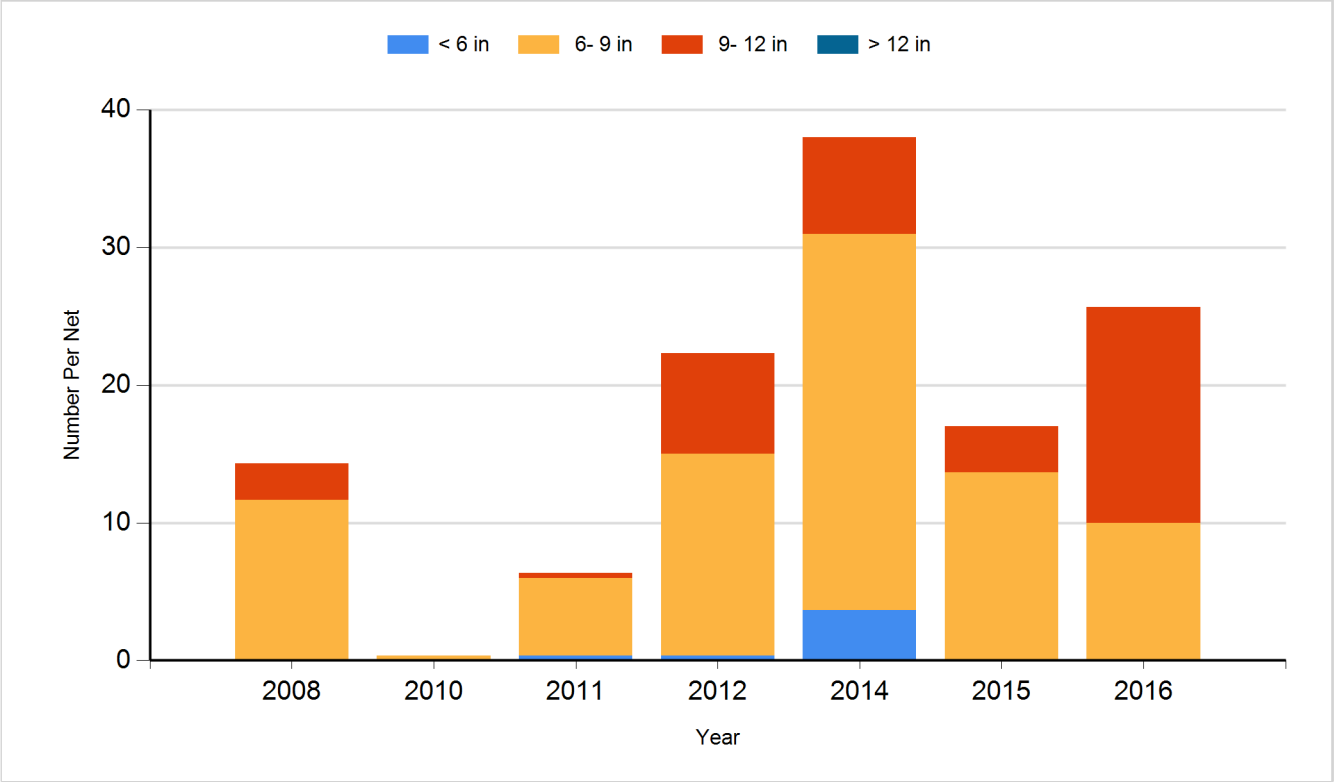
Historic Fish Sizes and Relative Abundance

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

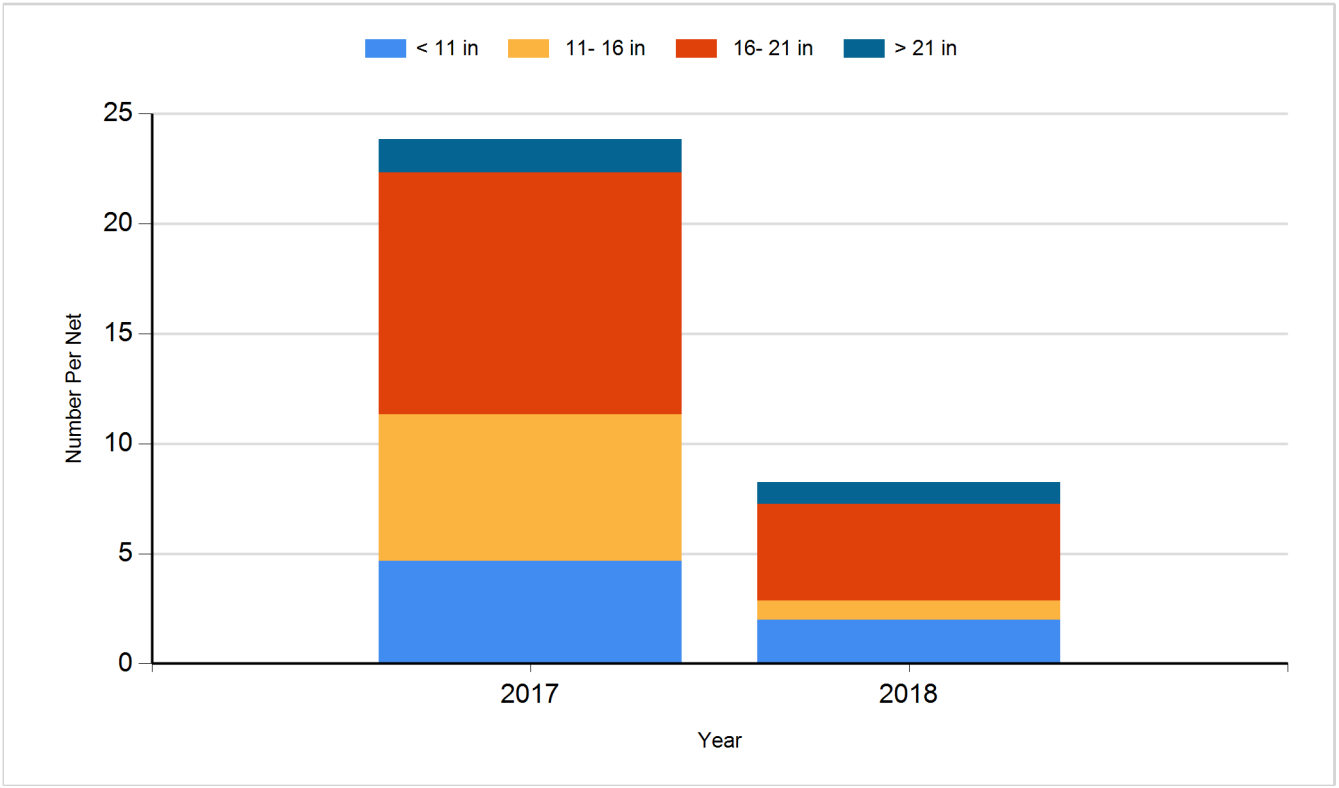
Species: Black Bullhead
Gear: AFS std gill net



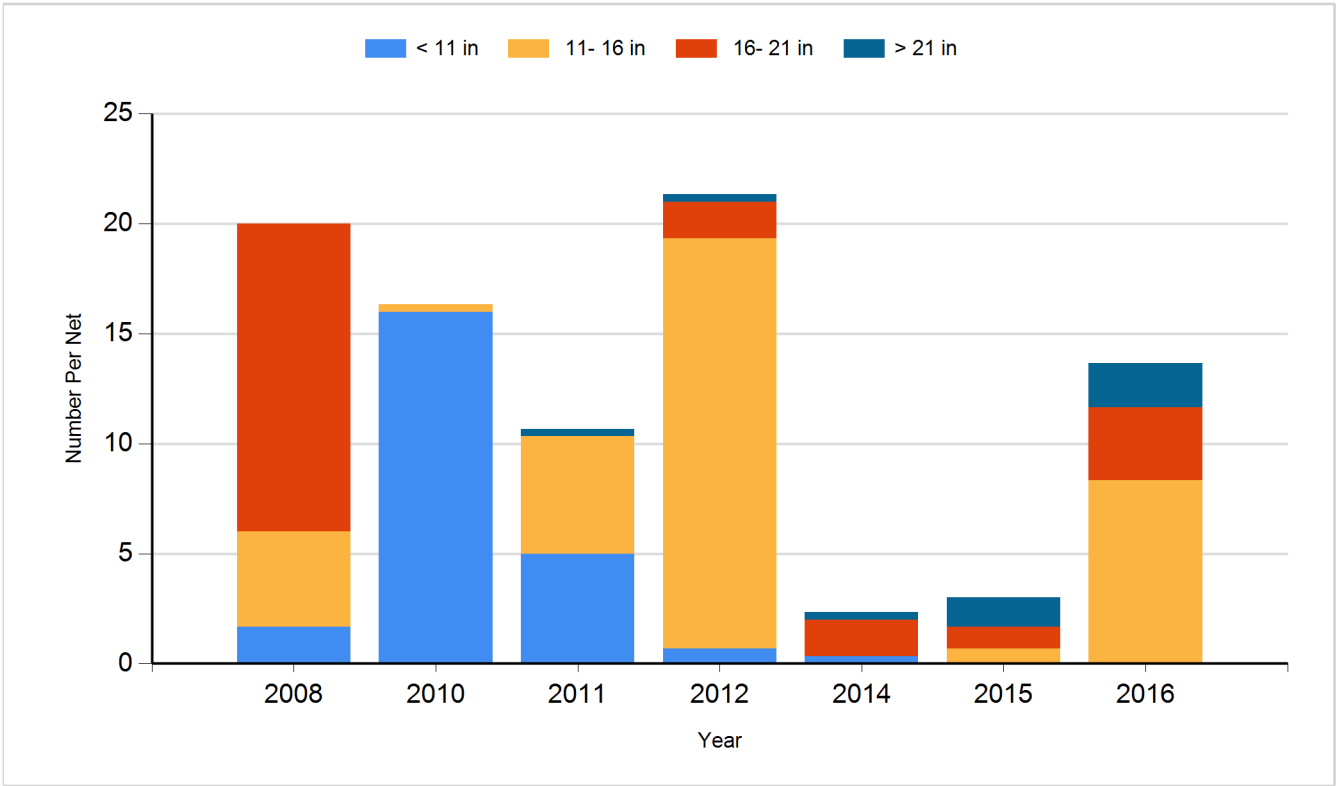
Species: Black Bullhead
Gear: std exp gill net



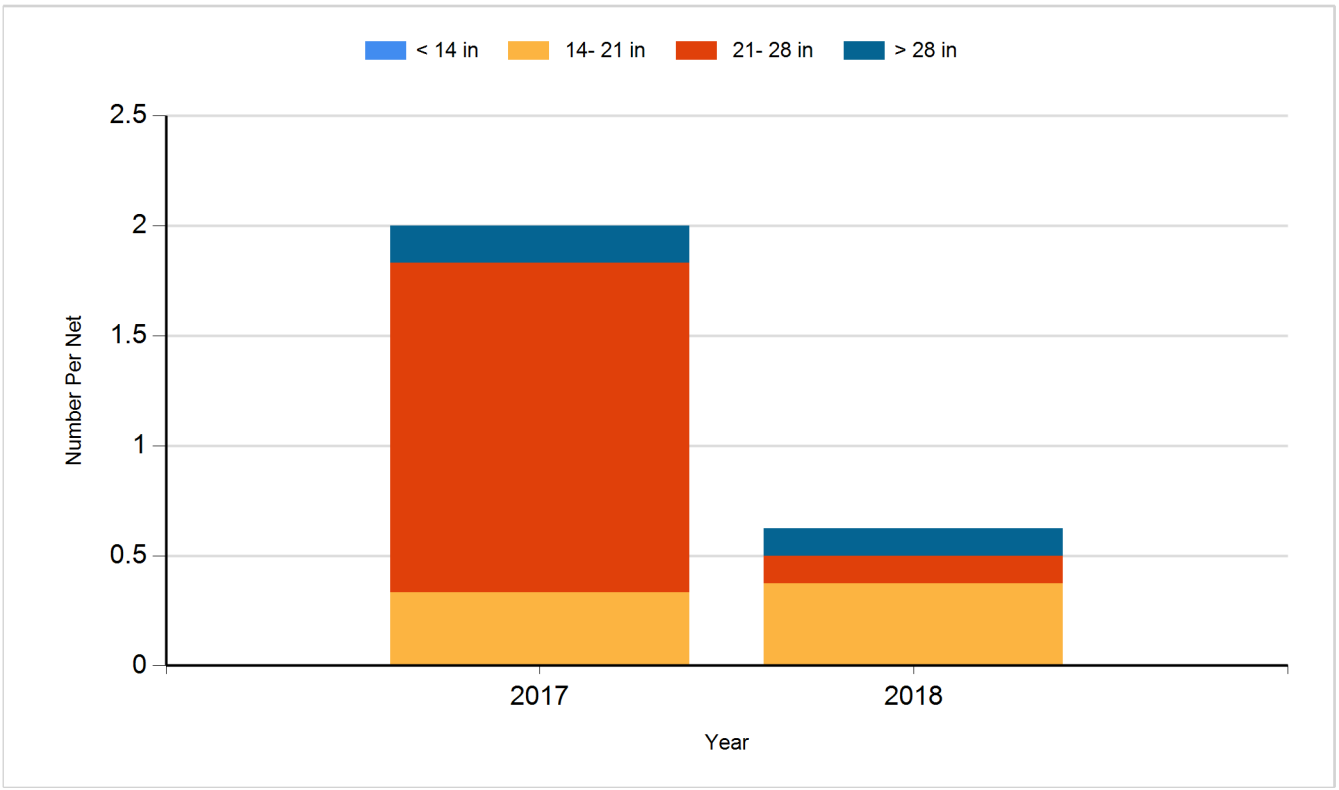
Species: Common Carp
Gear: AFS std gill net



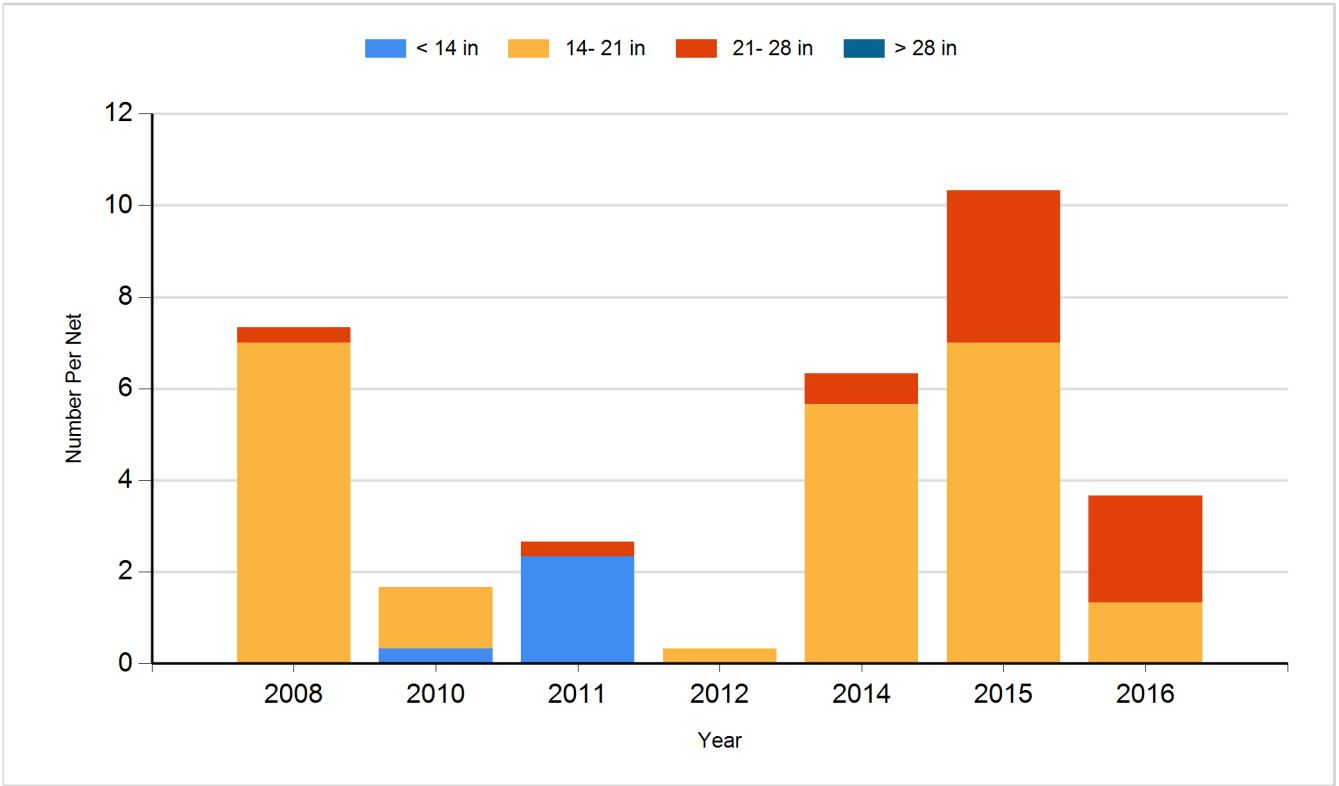
Species: Common Carp
Gear: std exp gill net



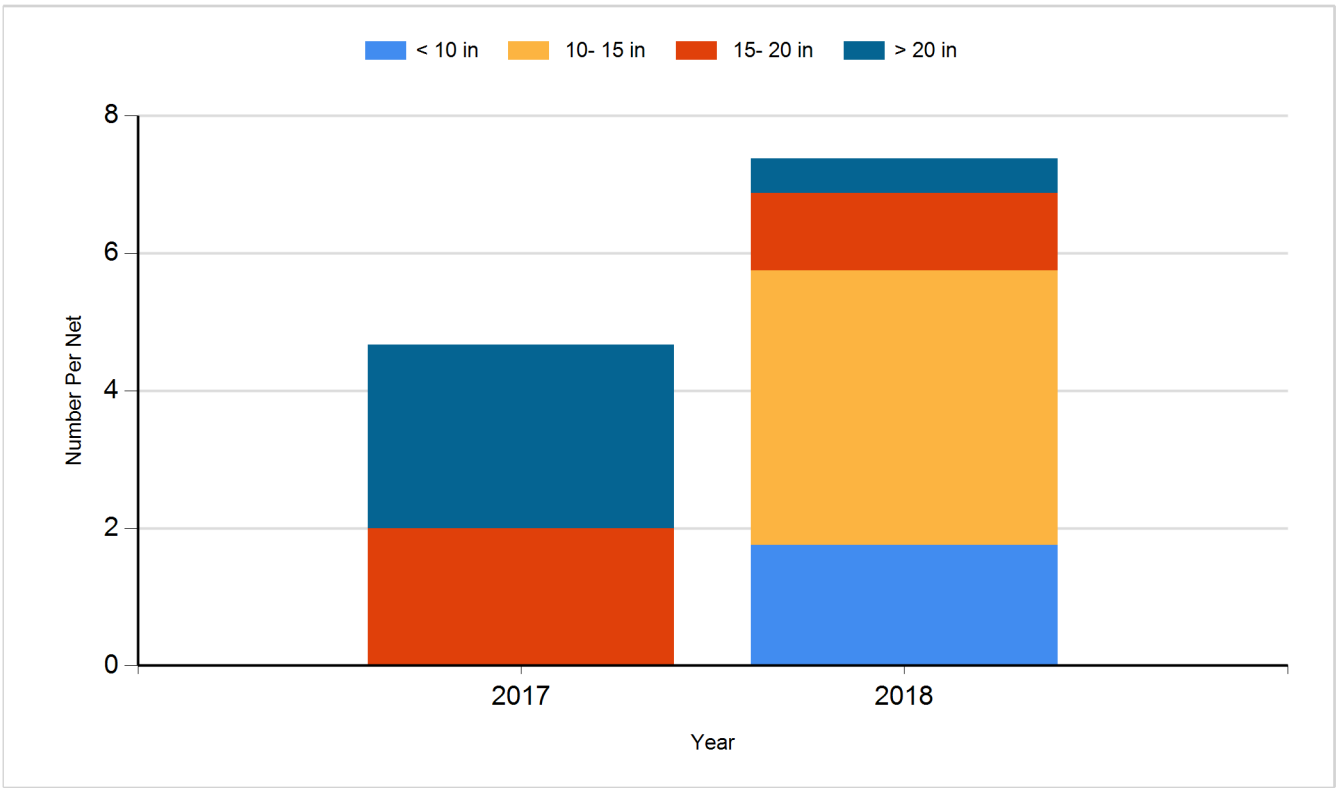
Species: Northern Pike
Gear: AFS std gill net



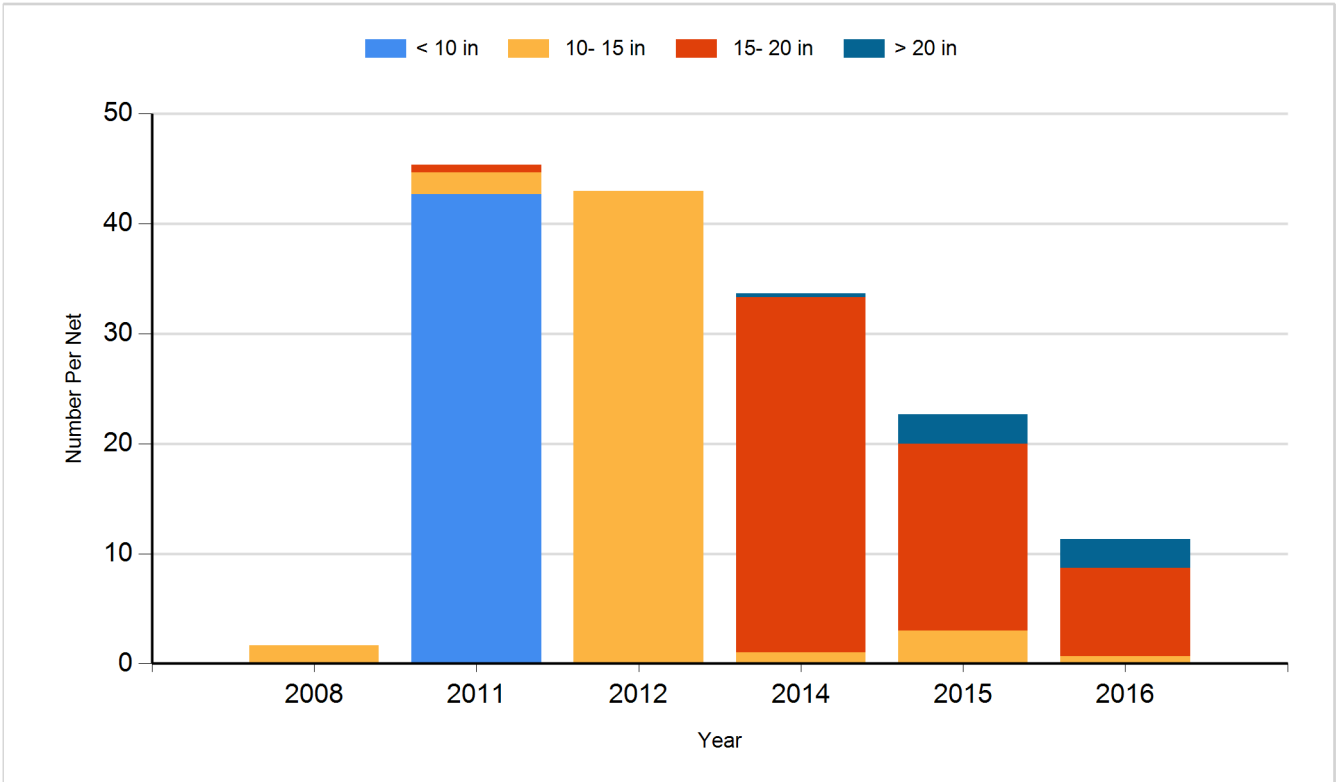
Species: Northern Pike
Gear: std exp gill net



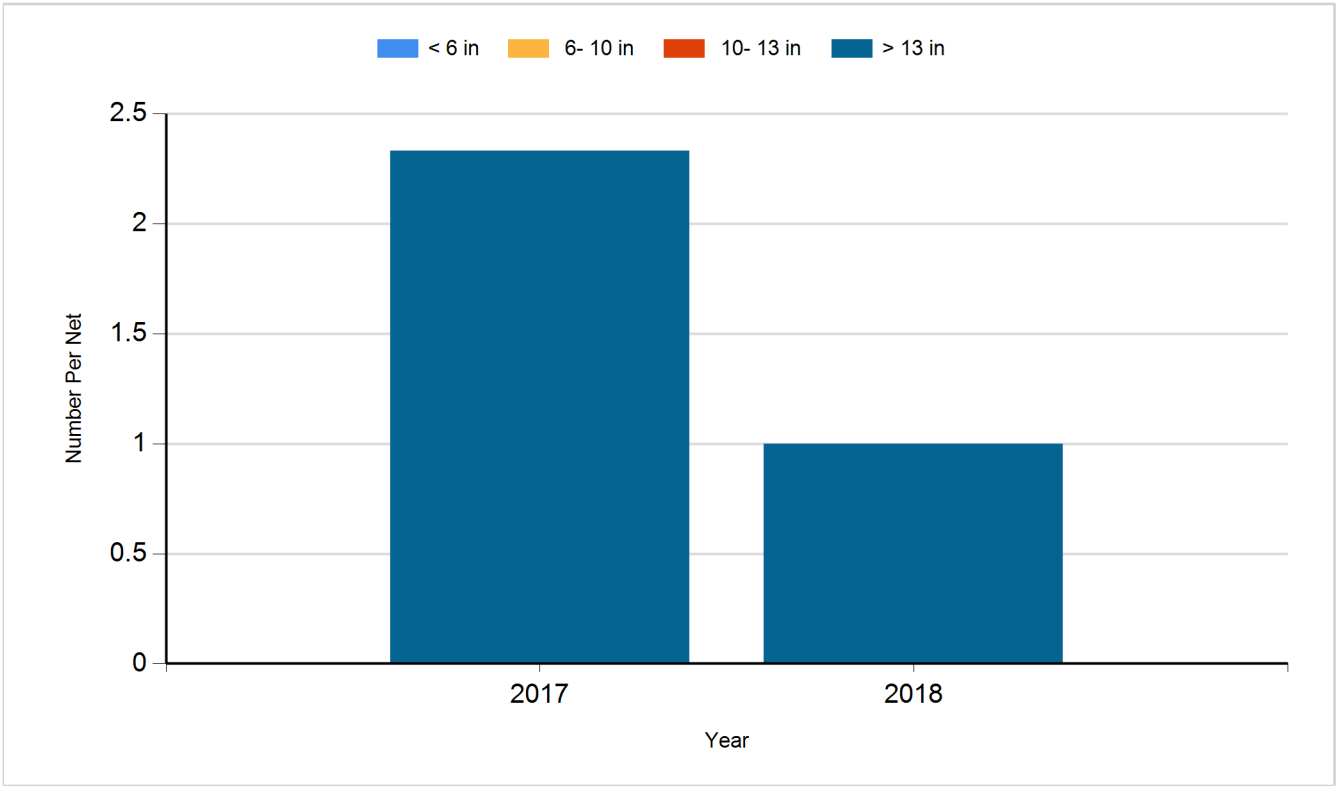
Species: Walleye
Gear: AFS std gill net



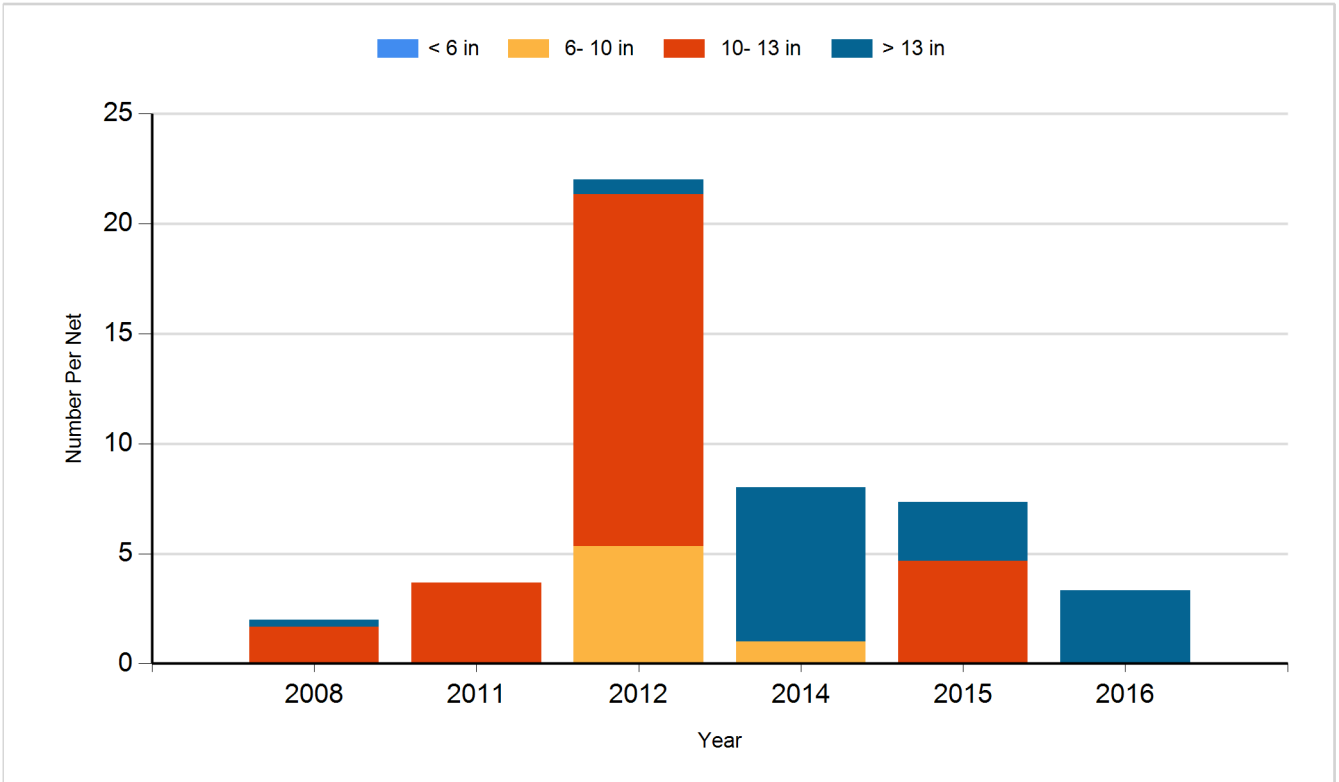
Species: Walleye
Gear: std exp gill net



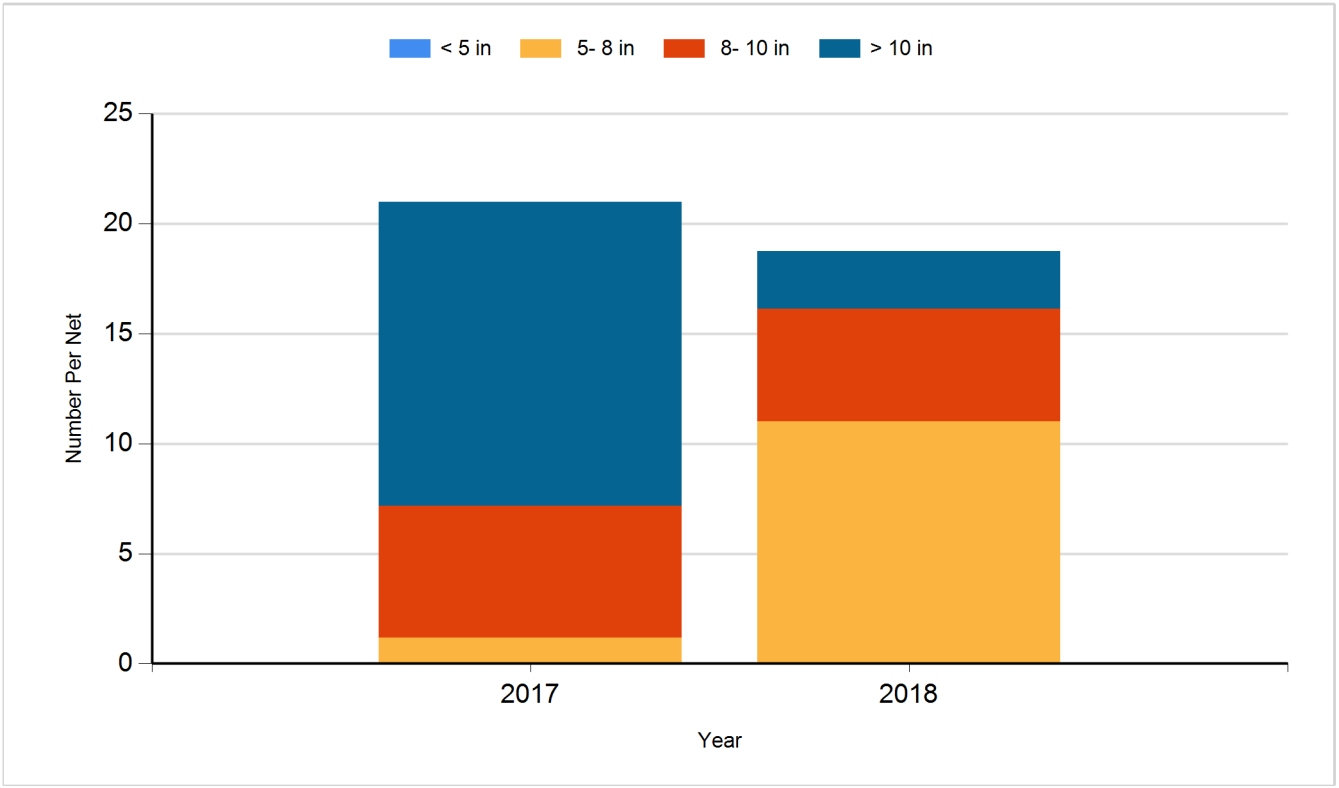
Species: White Sucker
Gear: AFS std gill net



Species: White Sucker
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



Species: Yellow Perch
Gear: std exp gill net