SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Hwy 81 West, Kingsbury County
MBS-Lake-233-800
2018

Lake Information

Name: Hwy 81 West

County: Kingsbury

Surface Area: 1,951 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 13, 2018	10 net-nights
frame net (std 3/4 in)	Aug 13, 2018	10 net-nights

Common Fish Species Present

Muskellunge

Walleye

Yellow Perch

Black Bullhead

Yellow Bullhead

Common Carp

White Bass

Smallmouth Bass

Bluegill

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.
- 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	25	2.5	1.8	92		56	16		
	Common Carp	39	0.2	0.2	50		50			
	Smallmouth Bass	12	1.2	0.8	50	25	25		106	3
	Walleye	50	4.9	1.4	84	8	61	10	86	1
	White Bass	26	2.4	1.4	100		100		93	2
	Yellow Bullhead	4	0.4	0.2	100		100			
	Yellow Perch	174	17.4	4.9	6	3	2		96	1
frame net (std 3/4 in)	Black Bullhead	100	9.7	10.0	81	6	34	7		
	Bluegill	2	0.2	0.3	0		0		109	7
	Common Carp	272	4.8	4.2	83	8	77	9		
	Largemouth Bass	3	0.1	0.1	0		0		107	
	Northern Pike	1	0.1	0.1	100		100		80	
	Smallmouth Bass	28	2.2	0.8	77	15	68	16	104	2
	Walleye	23	2.2	1.0	86		68	16	83	1
	White Bass	21	2.1	0.8	100		95		93	1
	Yellow Bullhead	81	8.1	5.2	100		98			
	Yellow Perch	25	2.5	2.6	8		8		95	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	Black Bullhead									6.9	2.5	4.7
	Common Carp									0.3	0.2	0.3
	Smallmouth Bass									0.9	1.2	1.1
	Walleye									6.0	4.9	5.5
	White Bass									3.7	2.4	3.1
	Yellow Bullhead										0.4	0.4
	Yellow Perch									14.4	17.4	15.9
frame net (std 3/4 in)	Black Bullhead		0.6		173.6		39.8	100.4	10.9		9.7	55.8
	Black Crappie				0.1							0.1
	Bluegill		0.4		4.1						0.2	1.6
	Common Carp				1.2		3.5	0.4	0.2		4.8	2.0
	Green Sunfish		0.2		3.0			0.2				1.1
	Largemouth Bass		0.1		0.2		0.0	0.1	0.0		0.1	0.1
	Northern Pike		0.1		0.1		0.1		0.5		0.1	0.2
	Orangespotted Sunfish		0.0		0.0							0.0
	Smallmouth Bass		0.2		0.9		1.0	0.4	1.0		2.2	1.0
	Sunfish Hybrid				0.0		0.0					0.0
	Walleye		3.6		1.7		0.6	0.7	1.6		2.2	1.7
	White Bass		0.6		2.6		0.1	0.1	5.8		2.1	1.9
	White Sucker		0.1									0.1
	Yellow Bullhead		5.2		20.1		6.7	16.7	2.3		8.1	9.9
	Yellow Perch		0.9		10.1		2.8	0.6	0.1		2.5	2.8
std exp gill net	Black Bullhead		3.3		198.7		89.6	68.0	16.5			75.2
	Common Carp						0.4	0.3	0.3			0.3
	Largemouth Bass						0.0					0.0
	Muskellunge				0.3							0.3
	Northern Pike		0.3		0.3		0.4	0.7	0.3			0.4
	Smallmouth Bass		0.0				2.0	2.7	1.8			1.6
	Walleye		33.7		13.7		5.2	30.3	7.3			18.0
	White Bass		3.3		6.0		0.6	10.3	9.0			5.8
	Yellow Bullhead				1.0			0.7	0.3			0.7
	Yellow Perch		23.7		94.7		15.8	50.3	75.8			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	Black Bullhead	PSD									98	92
		PSD-P									97	56
	Common Carp	PSD									67	50
		PSD-P									67	50
	Smallmouth Bass	PSD									38	50
		PSD-P									38	25
		Wr									109	106
	Walleye	PSD									74	84
		PSD-P									48	61
		Wr									91	86
	White Bass	PSD									100	100
		PSD-P									100	100
		Wr									97	93
	Yellow Bullhead	PSD										100
		PSD-P										100
	Yellow Perch	PSD									61	6
		PSD-P									19	2
		Wr									101	96
frame net (std 3/4 in)	Black Bullhead	PSD		50		80		9	98	96		81
		PSD-P		0		6		0	44	73		34
		Wr		95		87						
	Bluegill	PSD		0		88						0
		PSD-P		0		0						0
		Wr		110		120						109
	Common Carp	PSD				75		40	100	100		83
		PSD-P				0		0	50	100		77
		Wr				108						
	Northern Pike	PSD		100		100		100		100		100
		PSD-P		100		0		0		80		100
		Wr		55		72		81		98		80
	Smallmouth Bass	PSD		100		100		90	100	70		77
		PSD-P		50		33		70	100	50		68
		Wr		114		97		109	106	87		104

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
frame net (std 3/4 in)	Walleye	PSD		25		71		67	100	81		86
		PSD-P		14		29		17	71	75		68
		Wr		91		85		92	89	75		83
	White Bass	PSD		17		100		100	100	100		100
		PSD-P		17		96		100	0	86		95
		Wr		114		84		100	97	79		93
	Yellow Bullhead	PSD		100		100		91	100	100		100
		PSD-P		98		98		90	58	100		98
		Wr		100		101						
	Yellow Perch	PSD		44		7		11	83	0		8
		PSD-P		0		4		7	0	0		8
		Wr		98		78		105	96	83		95
std exp gill net	Black Bullhead	PSD		60		48		89	84	100		
		PSD-P		20		1		1	28	88		
		Wr		97		92						
	Common Carp	PSD						100	100	100		
		PSD-P						50	0	0		
	Muskellunge	PSD				0						
		PSD-P				0						
		Wr				91						
	Northern Pike	PSD		100		100		100	100	100		
		PSD-P		0		0		100	50	100		
		Wr		65		63		87	93	81		
	Smallmouth Bass	PSD		0				0	63	57		
		PSD-P		0				0	25	57		
		Wr						110	109	114		
	Walleye	PSD		23		85		77	44	76		
		PSD-P		1		10		31	29	31		
		Wr		91		87		90	92	88		
	White Bass	PSD		90		100		100	97	100		
		PSD-P		10		94		67	81	72		
		Wr		100		91		91	100	94		
	Yellow Bullhead	PSD				100			100	100		
		PSD-P				67			100	100		
		Wr				97						
	Yellow Perch	PSD		11		57		42	90	13		
		PSD-P		0		7		24	14	10		

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
std exp gill net	Yellow Perch	Wr		95		79		95	98	98		

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	50	268 (4)	373 (6)	442 (7)	455 (1)	518 (2)			549 (2)	613 (18)	630 (10)
2017	54	280 (7)	382 (14)	443 (3)	462 (4)		511 (2)	616 (5)	613 (14)		650 (5)
2016	32	258 (10)	389 (3)	436 (10)		546 (1)	565 (1)	553 (5)		614 (1)	691 (1)
2015	94	260 (27)	361 (36)		471 (1)	536 (5)	546 (9)	603 (2)	542 (3)		622 (10)
2014	48	238 (27)	303 (1)	447 (3)	474 (4)	520 (11)	501 (1)		590 (1)		
2012	61	226 (25)	400 (8)	462 (24)		518 (3)		636 (1)			
2010	101	322 (78)	437 (3)	471 (20)							

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	151	160 (13)	235 (124)	264 (7)	276 (8)						
2014	79	166 (46)	227 (2)	257 (31)							
2012	284	163 (121)	232 (160)	252 (3)							

Fish Condition

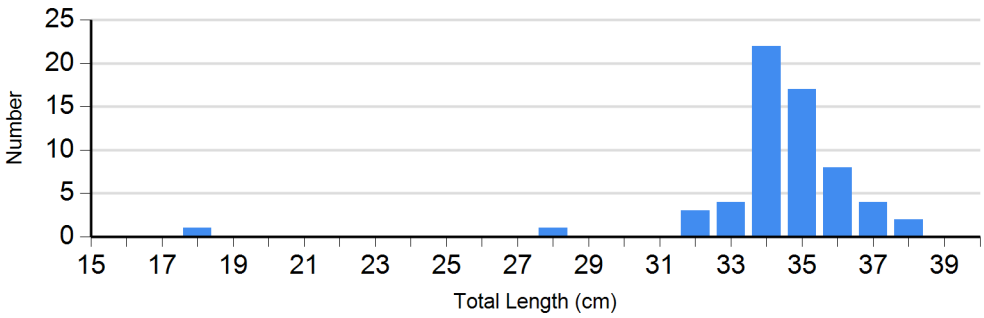
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2018	2	109 (5.1)	0		0		0	
Common Carp Gill Net	2014	0		1		1		0	
Northern Pike Gill Net	2014	0		0		2	87 (6.8)	0	
	2015	0		1	95	1	91	0	
	2016	0		0		1	81	0	
Walleye Gill Net	2014	6	87 (1.5)	12	93 (3.8)	8	90 (2.0)	0	
	2015	51	92 (0.8)	14	91 (1.9)	23	91 (1.5)	3	90 (2.6)
	2016	7	90 (1.6)	13	89 (1.1)	8	86 (1.2)	1	71
	2017	14	96 (1.4)	14	94 (1.5)	12	88 (3.6)	14	84 (1.2)
	2018	8	90 (2.2)	11	88 (1.6)	18	86 (1.4)	12	82 (1.3)
White Bass Gill Net	2018	0		0		5	90 (2.0)	19	94 (1.4)
White Bass Gill Net	2014	0		1	95	2	89 (2.6)	0	
	2015	1	100	5	126 (31.6)	8	97 (1.6)	17	95 (3.9)
	2016	0		10	94 (1.5)	7	95 (1.9)	19	93 (1.0)
	2017	0		0		21	98 (1.5)	12	95 (3.4)
Yellow Perch Gill Net	2014	46	96 (1.0)	14	100 (3.9)	19	90 (1.5)	0	
	2015	15	97 (1.5)	115	98 (0.8)	21	96 (1.7)	0	
	2016	264	99 (0.8)	9	92 (1.9)	21	91 (0.5)	9	97
	2017	51	104 (0.9)	54	102 (0.8)	25	92 (0.7)	0	
	2018	164	96 (0.8)	6	98 (0.3)	4	86	0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



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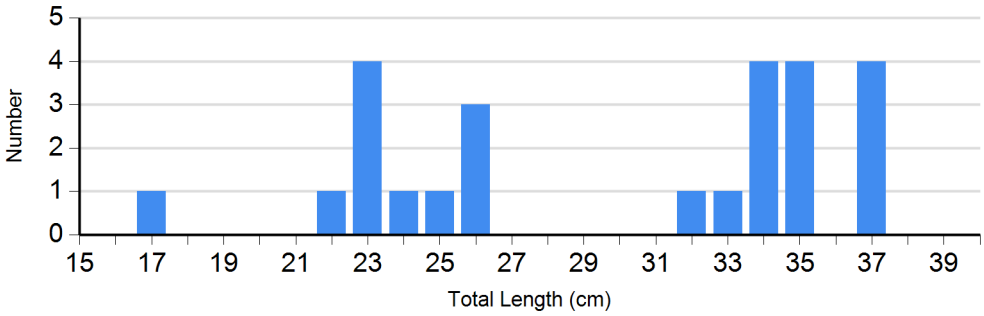

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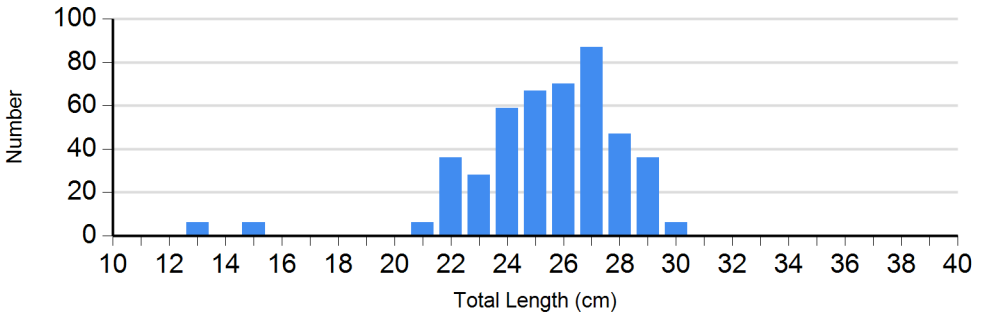
Species: Black Bullhead
Gear: std exp gill net



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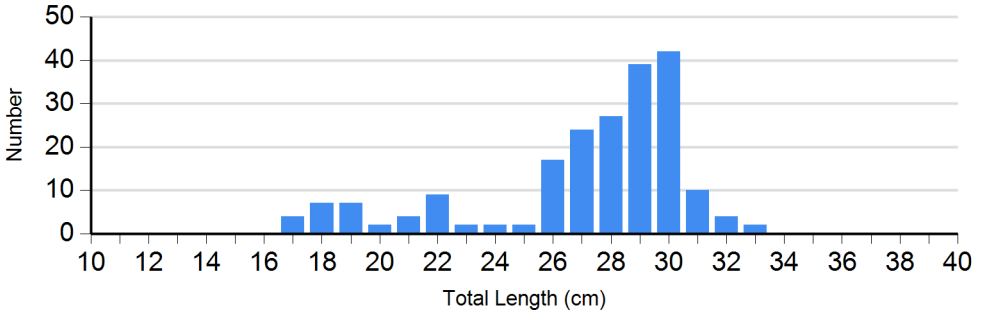

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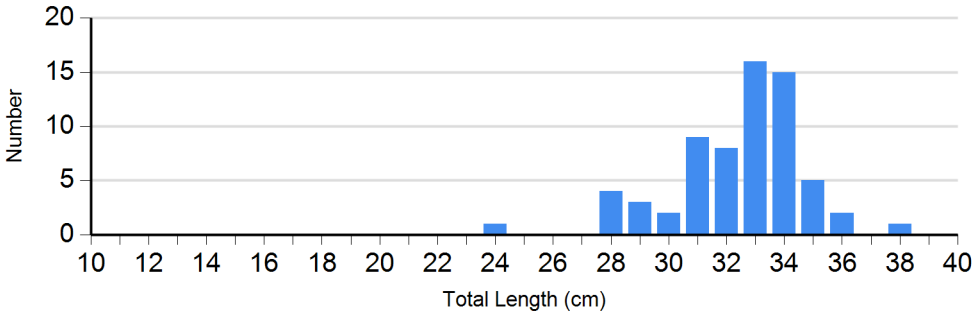
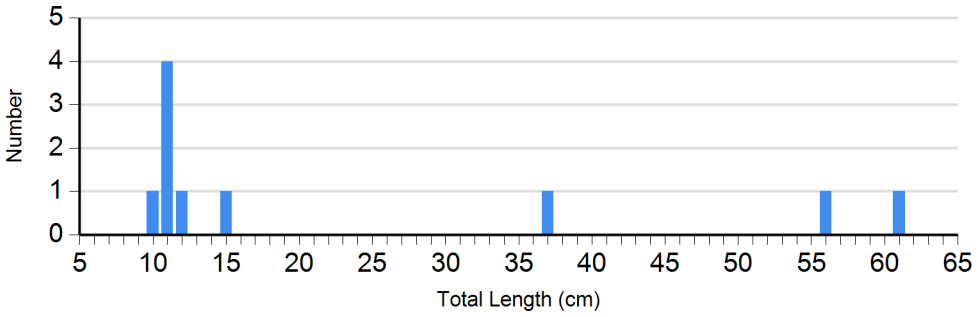


2016

Species: Common Carp
Gear: AFS std gill net



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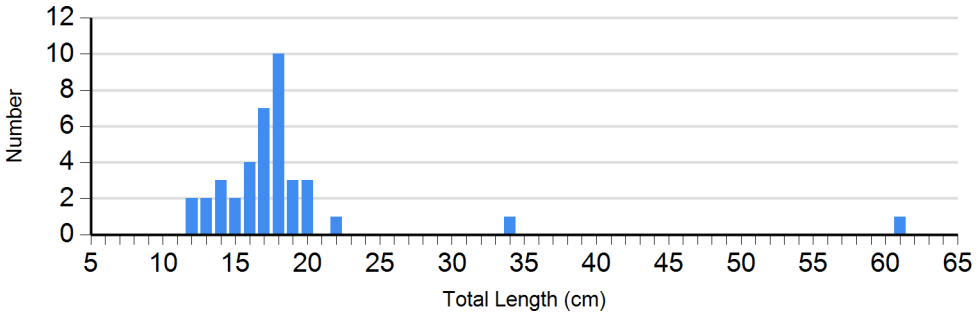
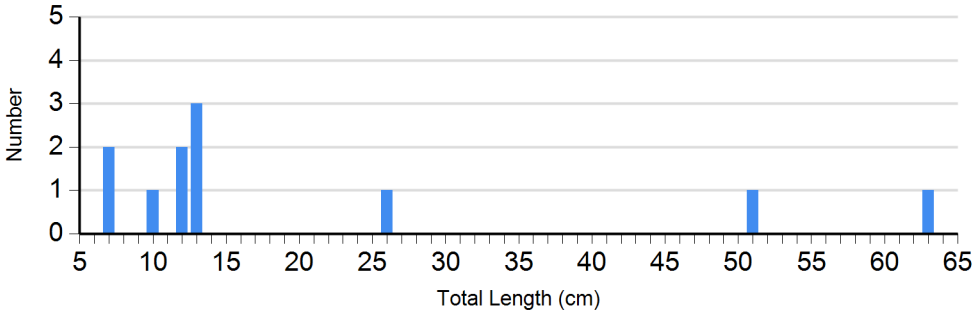


2018

Species: Common Carp
Gear: std exp gill net



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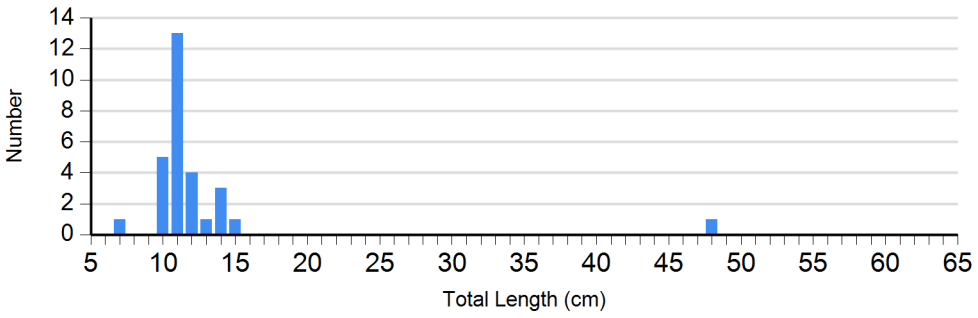
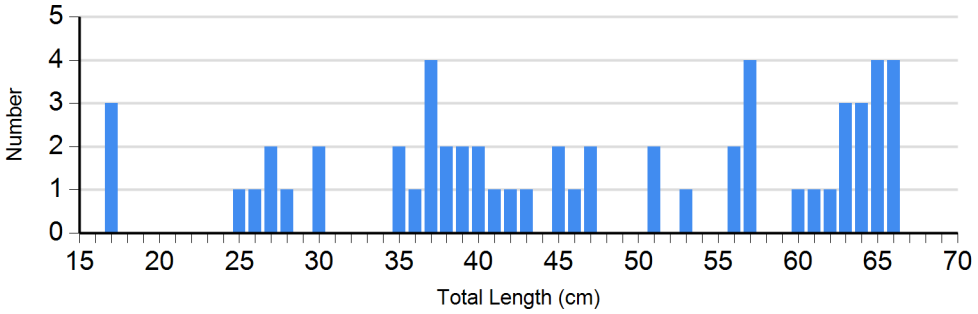


2015

Species: Walleye
Gear: AFS std gill net



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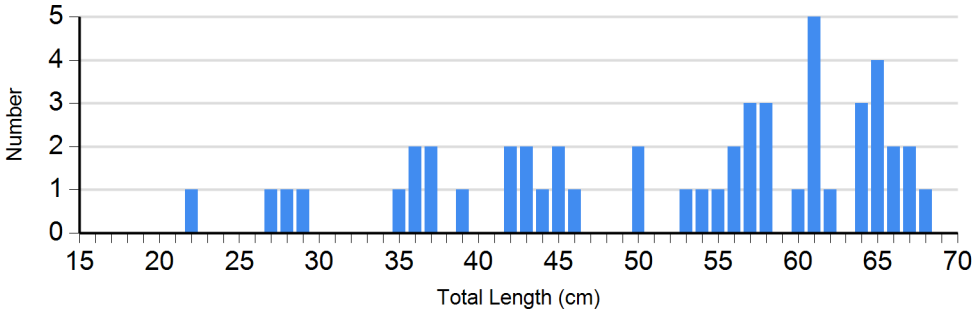

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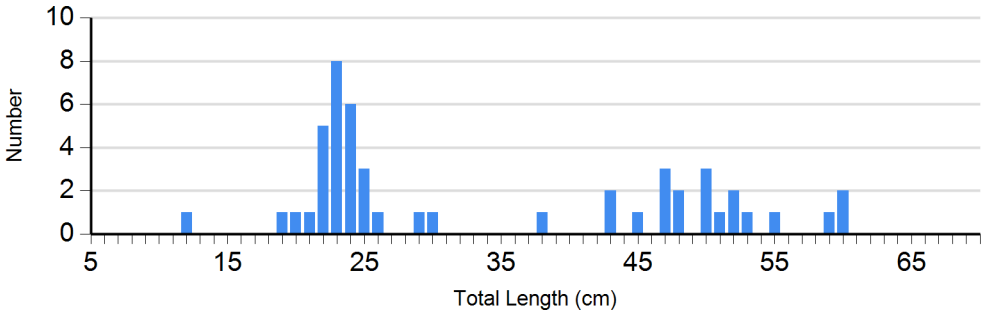
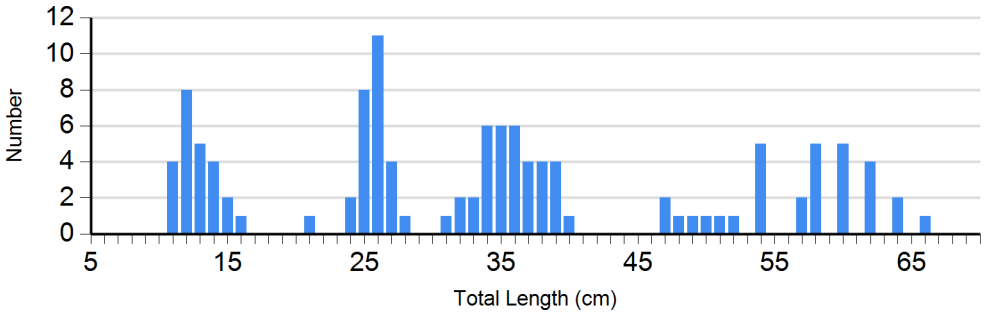
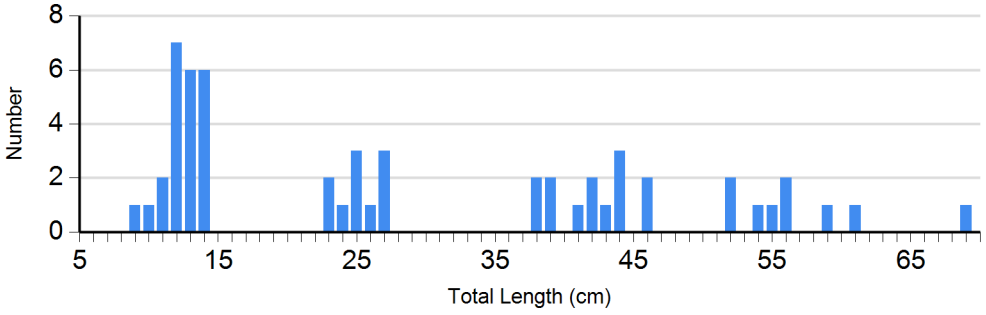
Species: Walleye
Gear: std exp gill net



2014

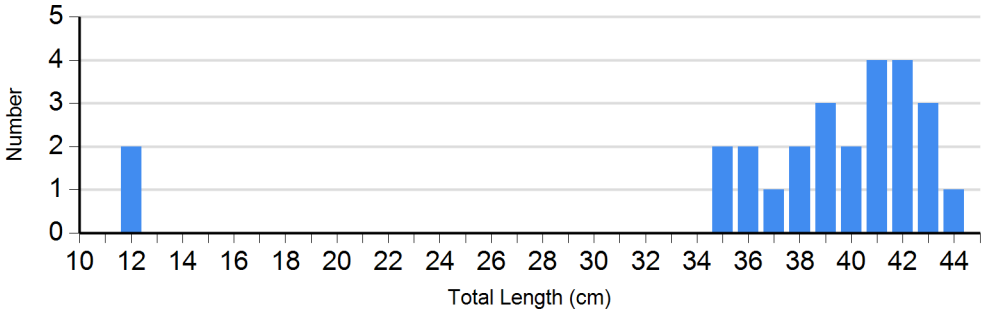


2015



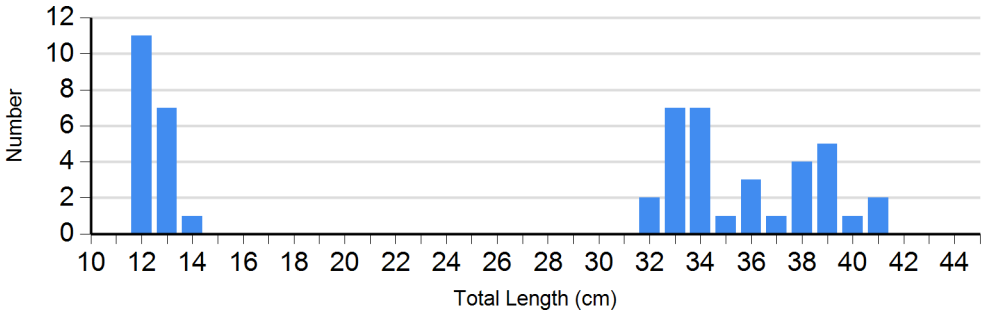
2016

Species: White Bass
Gear: AFS std gill net



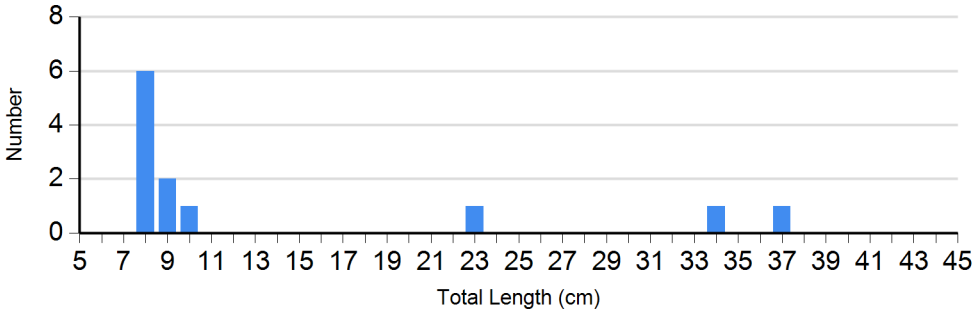
2018

Species: White Bass
Gear: AFS std gill net

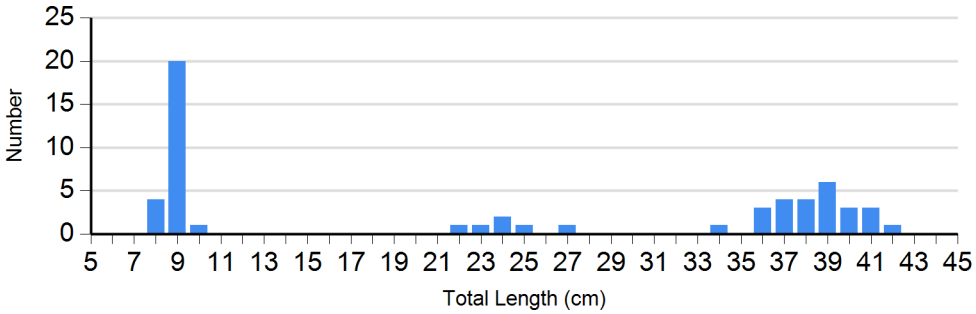


2017

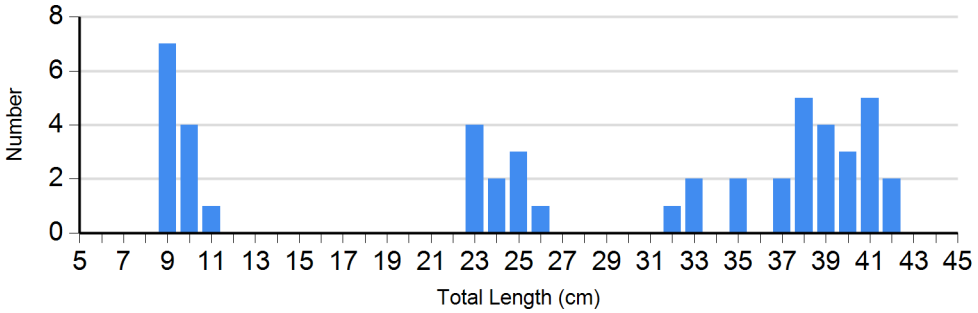
Species: White Bass
Gear: std exp gill net



2014

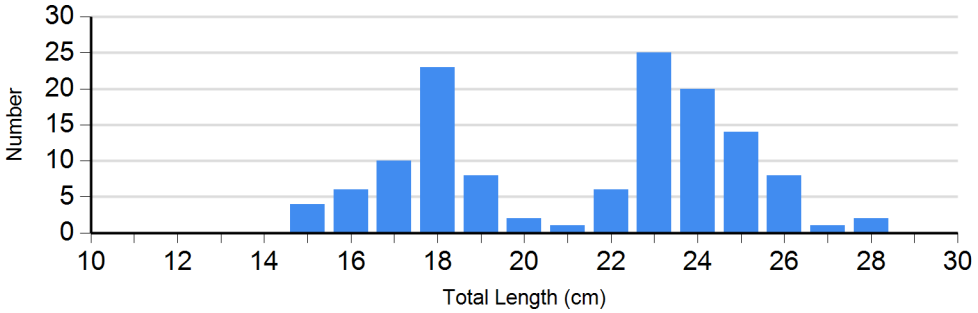


2015

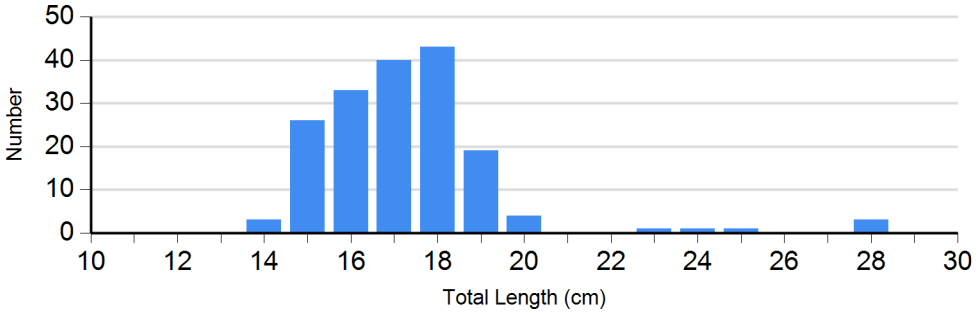


2016

Species: Yellow Perch
Gear: AFS std gill net

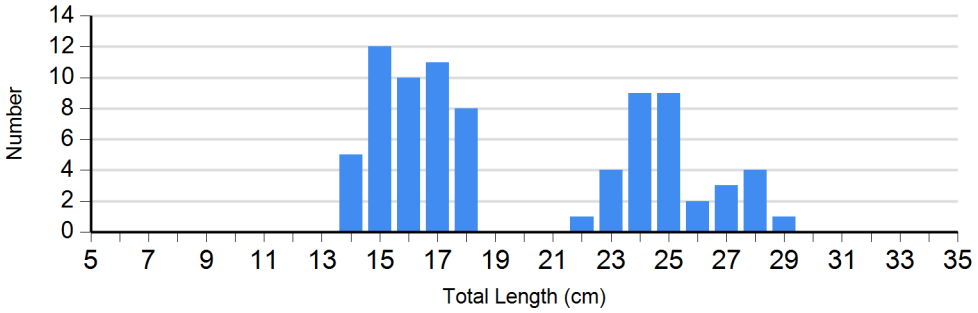


2017

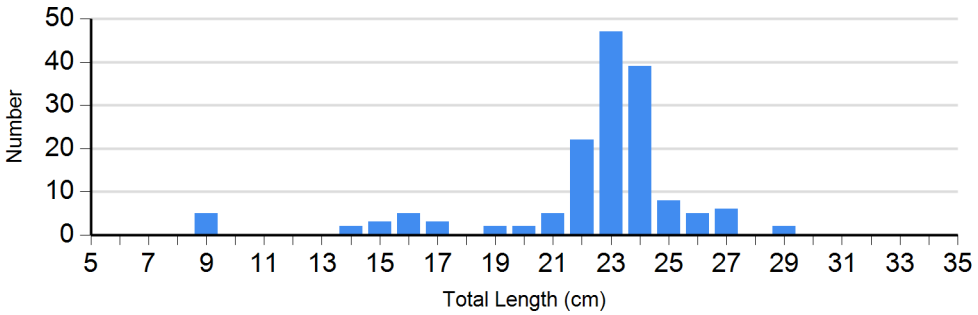


2018

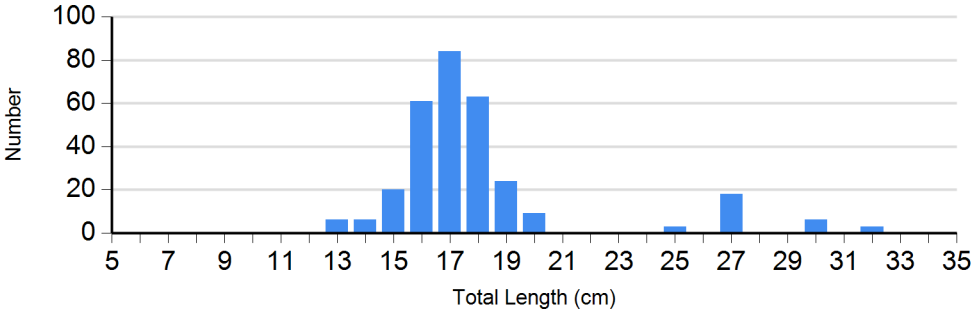
Species: Yellow Perch
Gear: std exp gill net



2014



2015

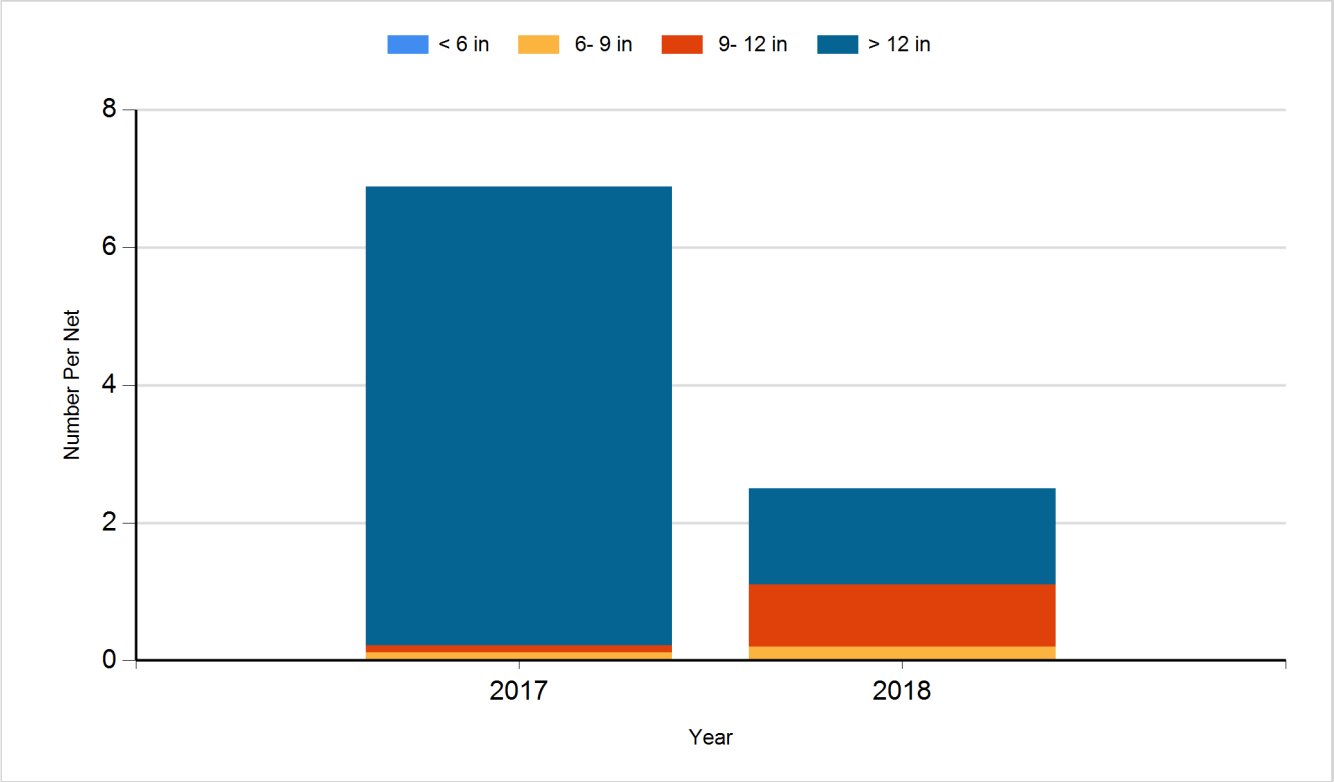

100
80
60
40
20
0
Number
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
Total Length (cm)

2016

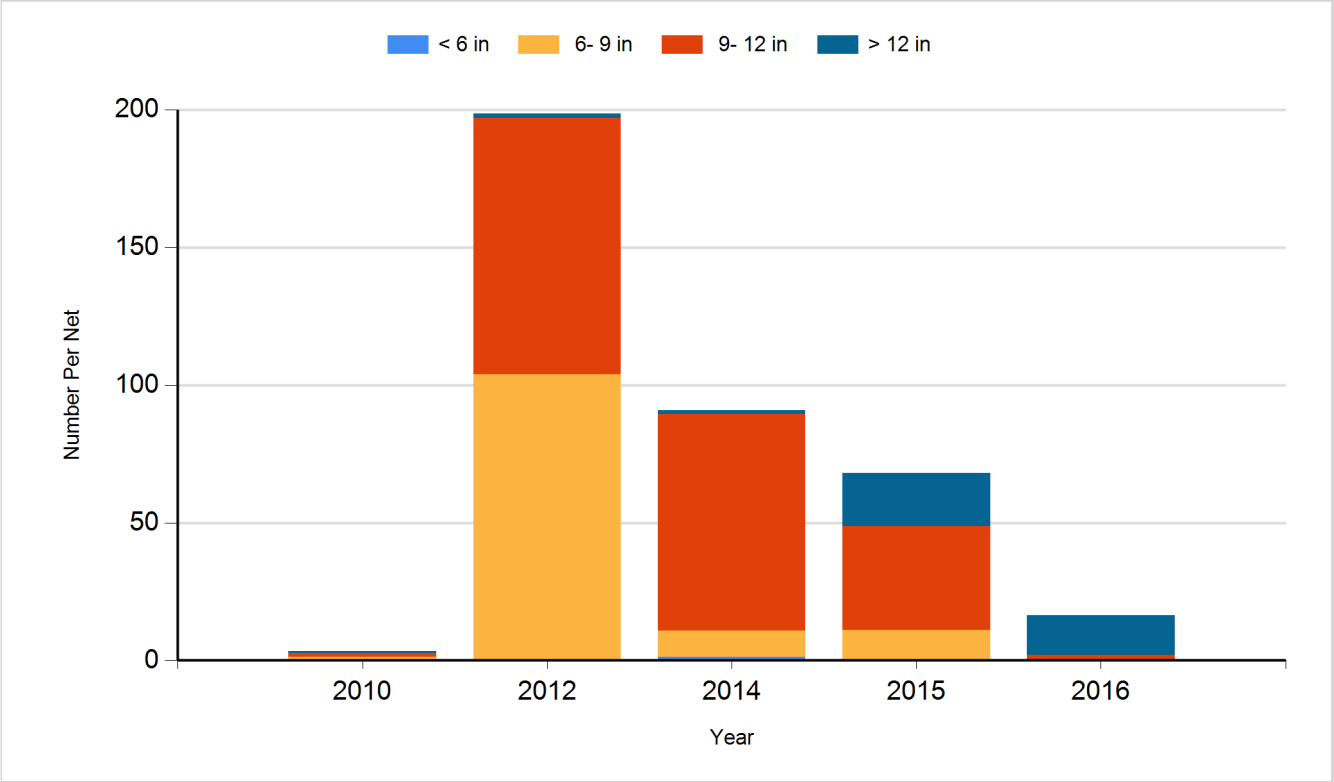
Historic Fish Sizes and Relative Abundance

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

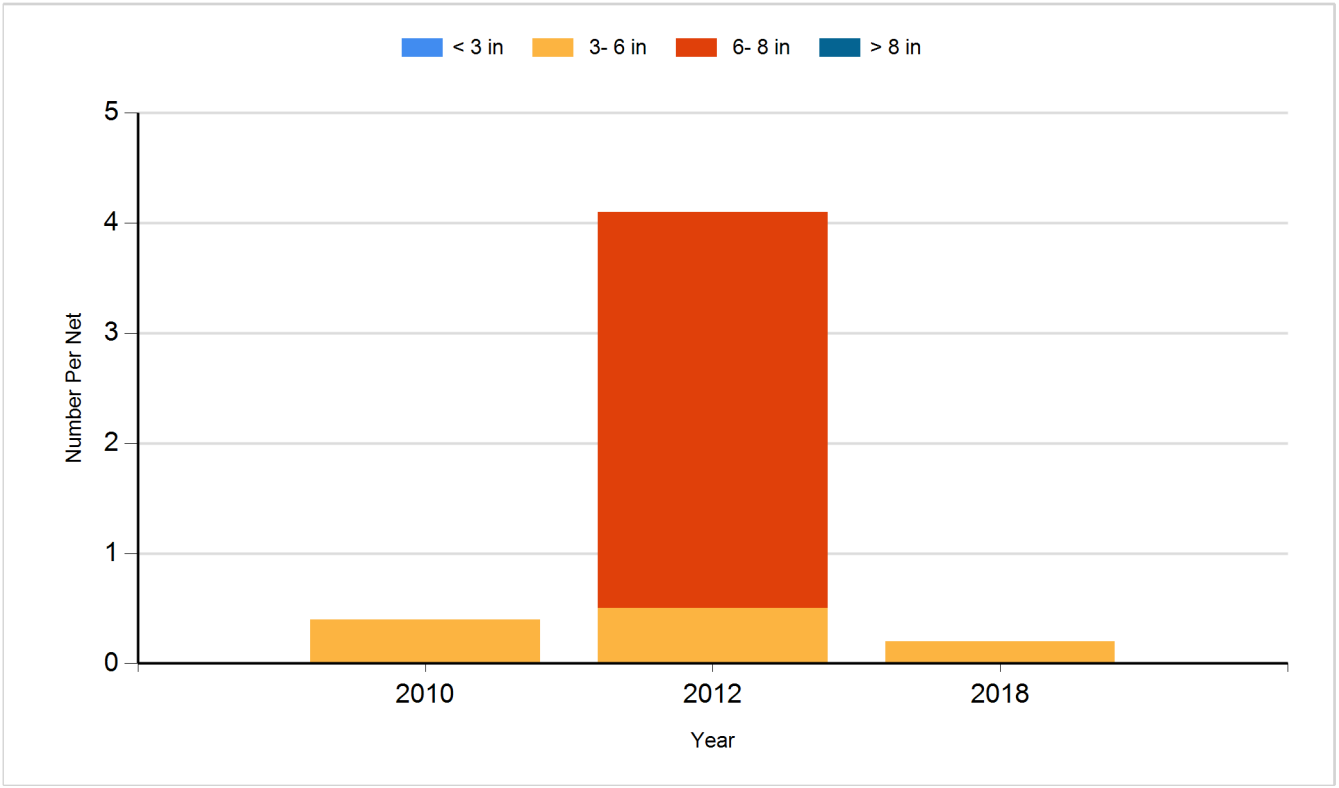
Species: Black Bullhead
Gear: AFS std gill net



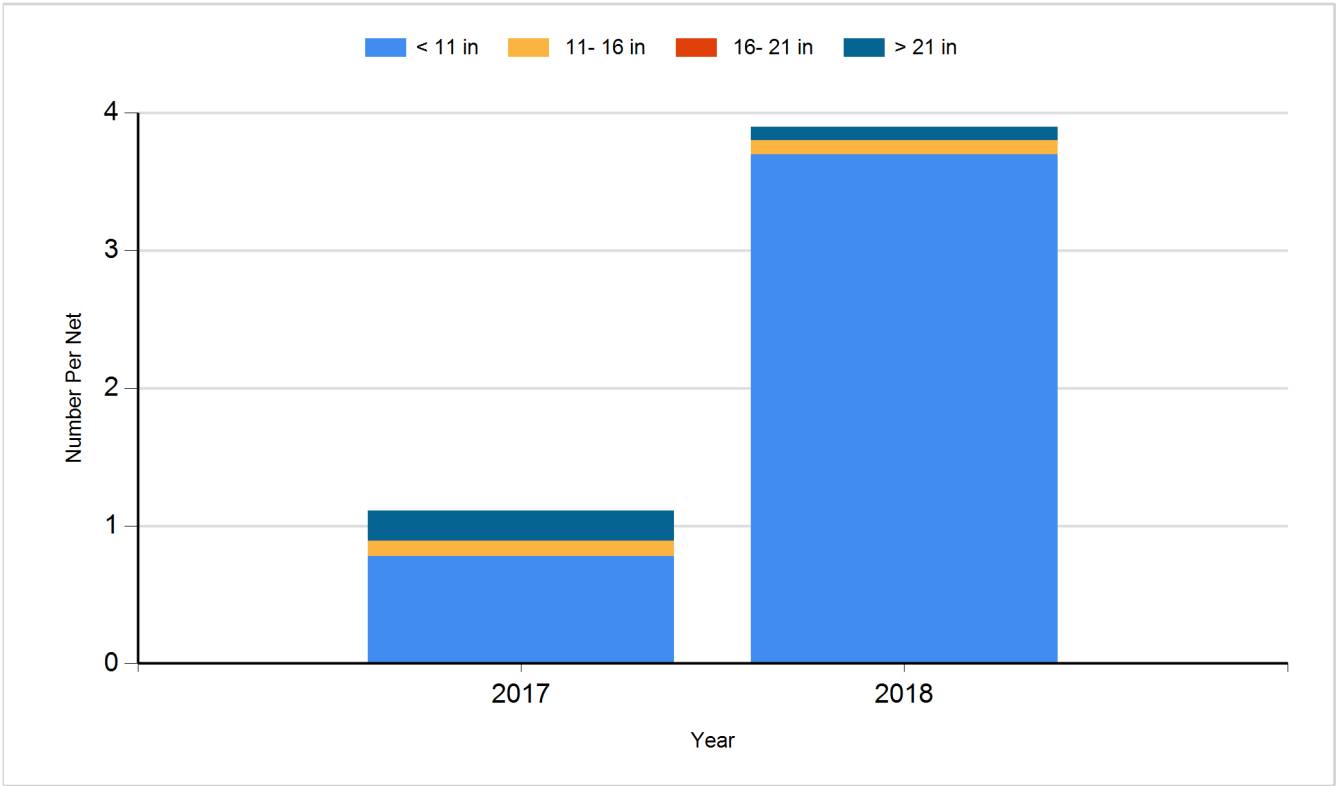
Species: Black Bullhead
Gear: std exp gill net



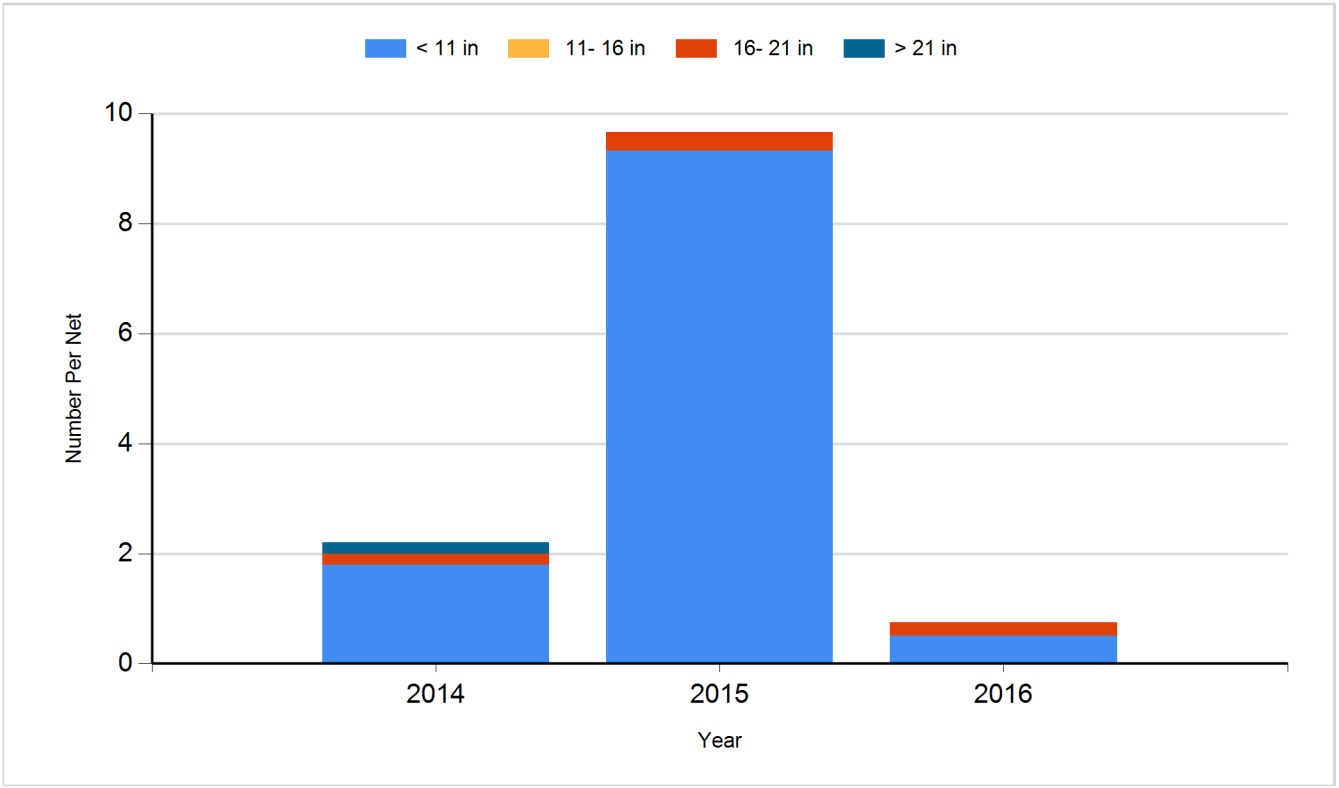
Species: Bluegill
Gear: frame net (std 3/4 in)



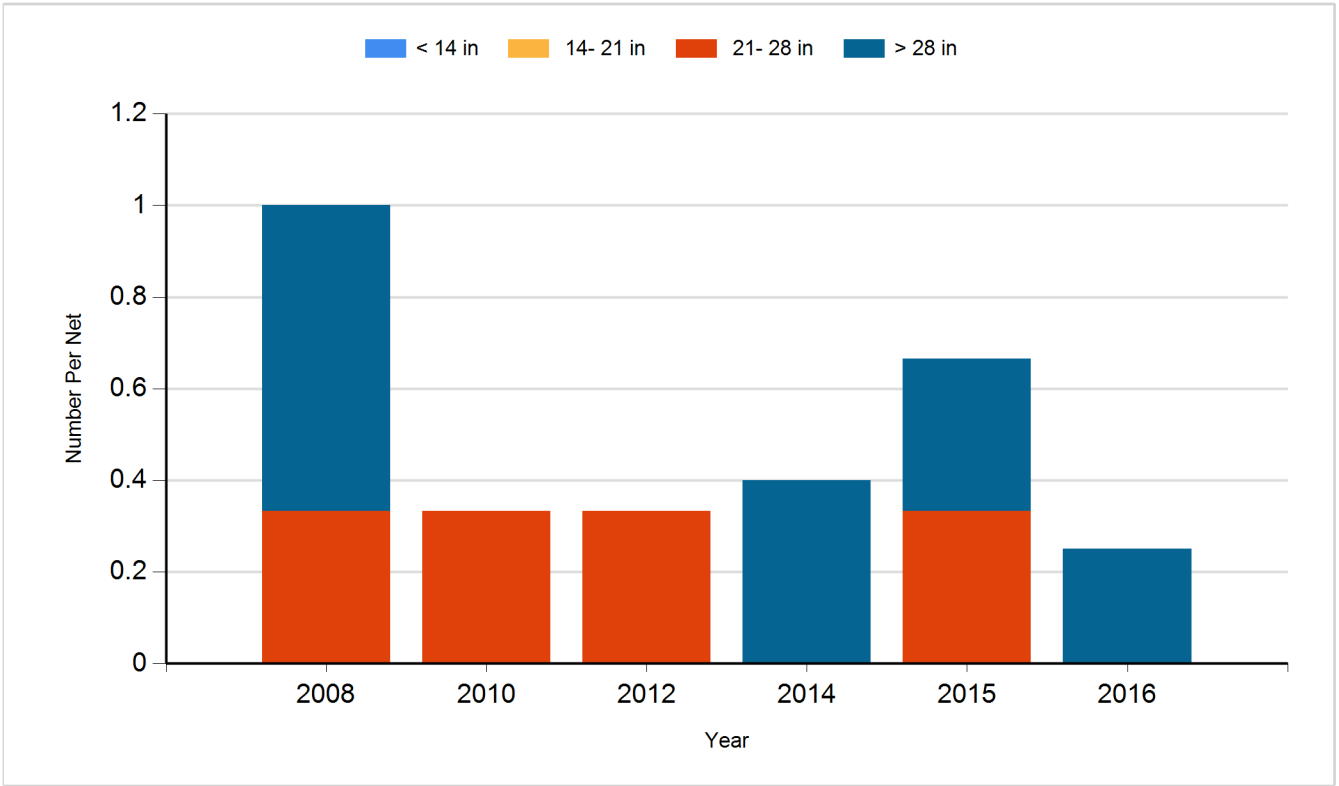
Species: Common Carp
Gear: AFS std gill net



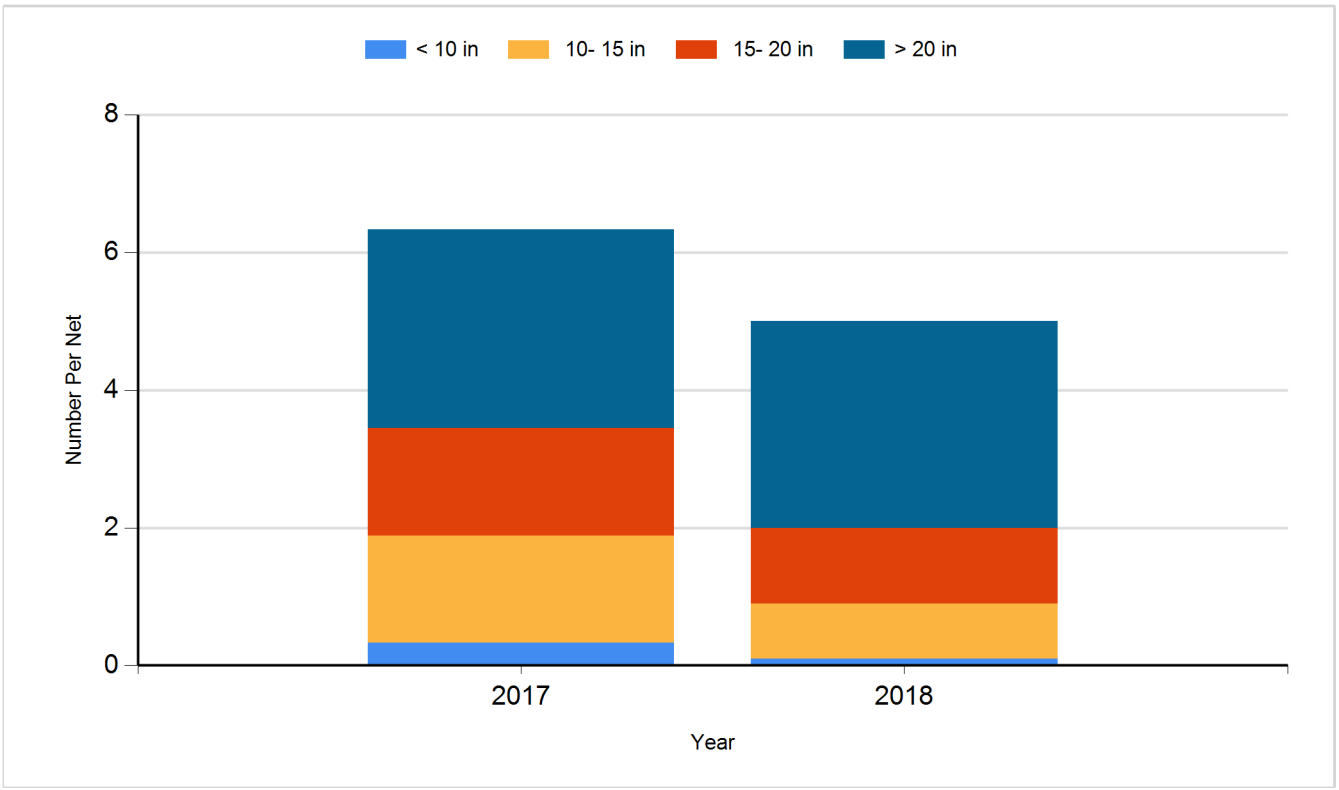
Species: Common Carp
Gear: std exp gill net



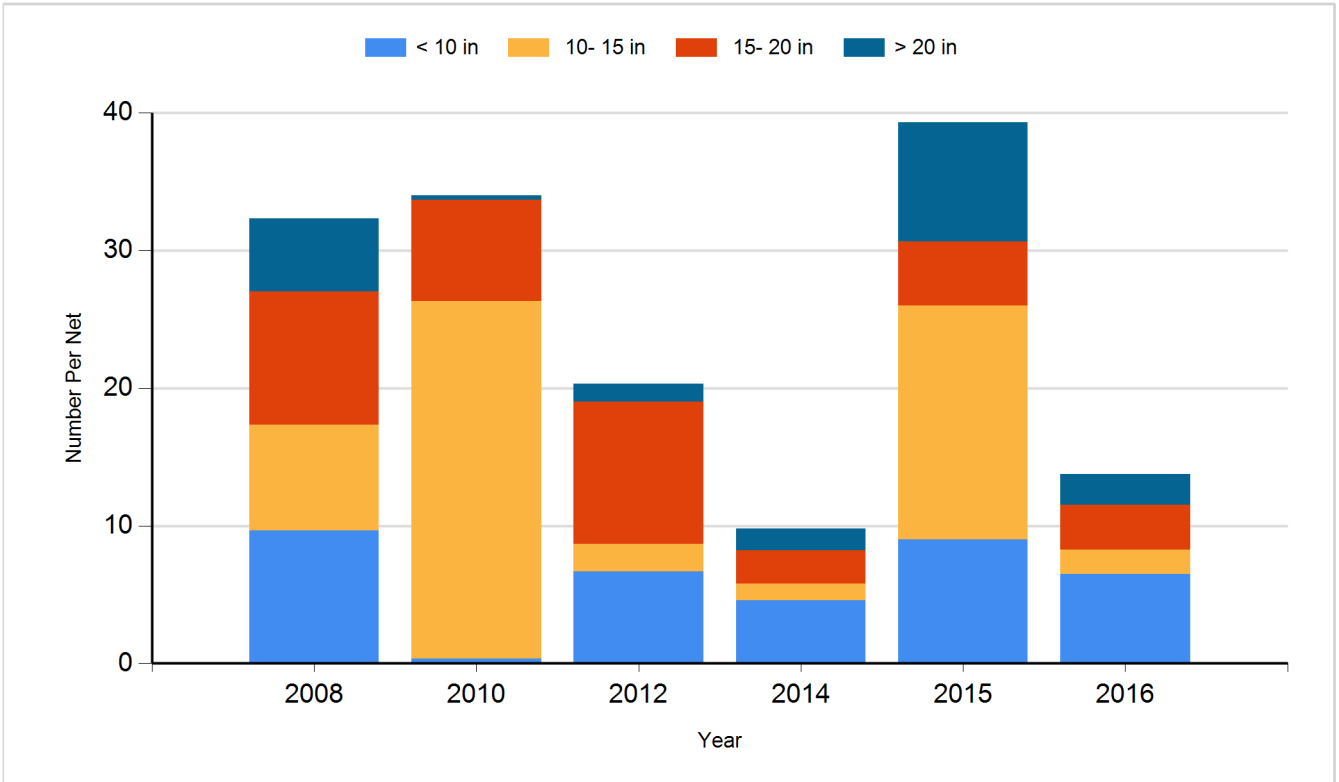
Species: Northern Pike
Gear: std exp gill net



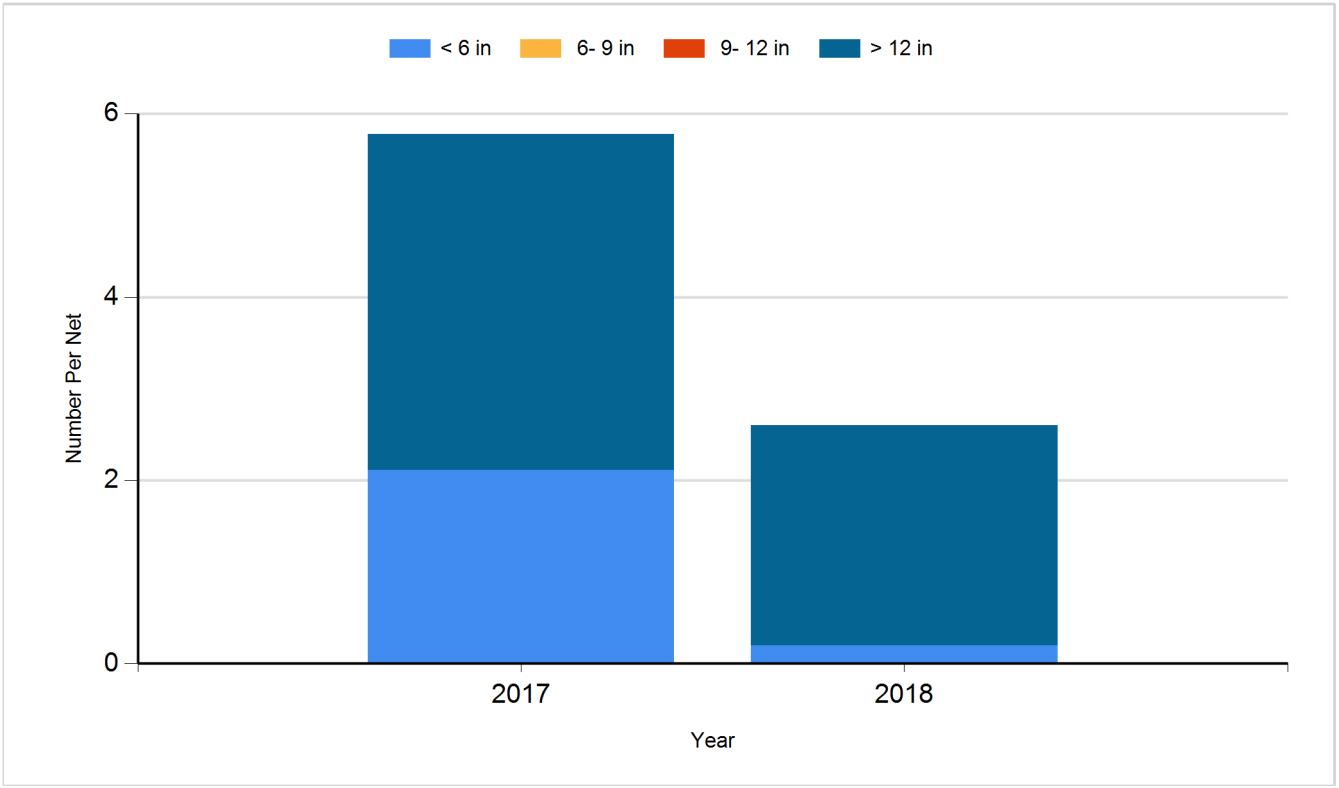
Species: Walleye
Gear: AFS std gill net



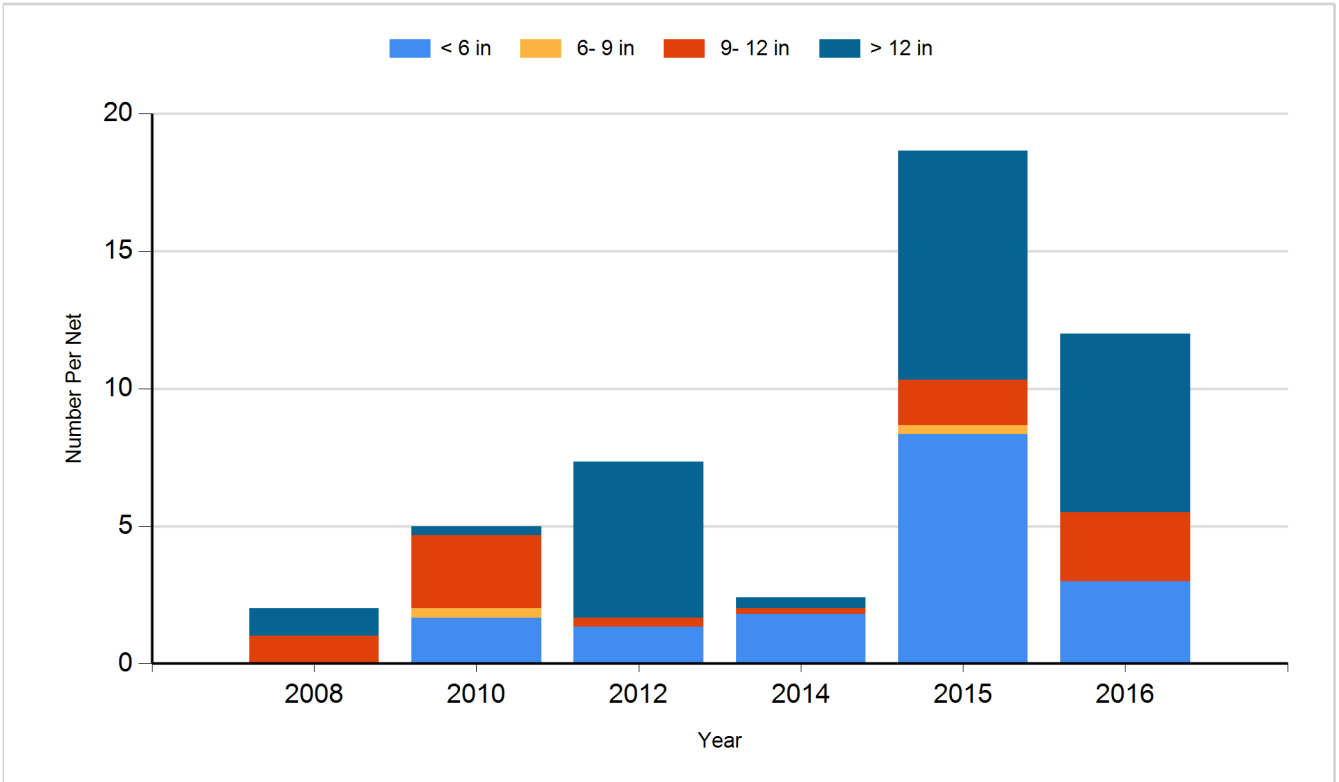
Species: Walleye
Gear: std exp gill net



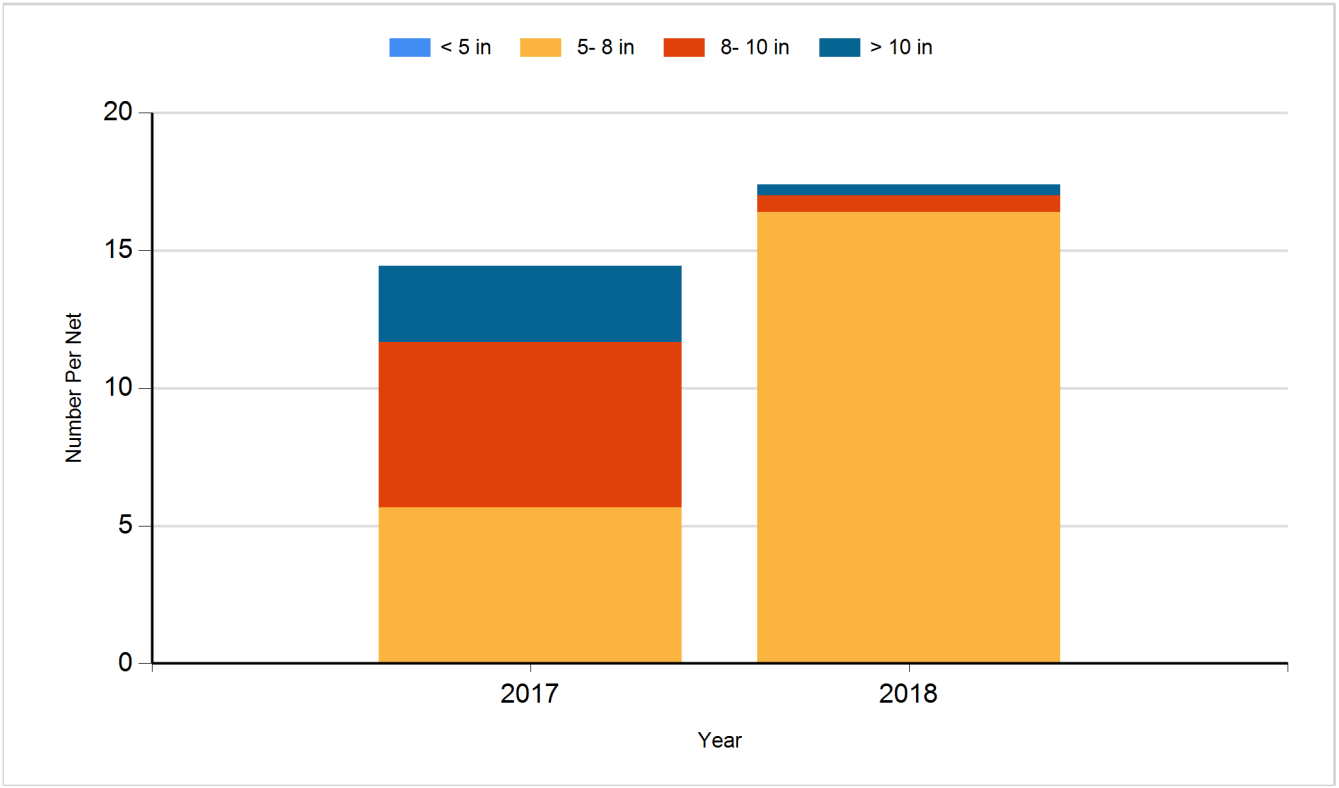
Species: White Bass
Gear: AFS std gill net



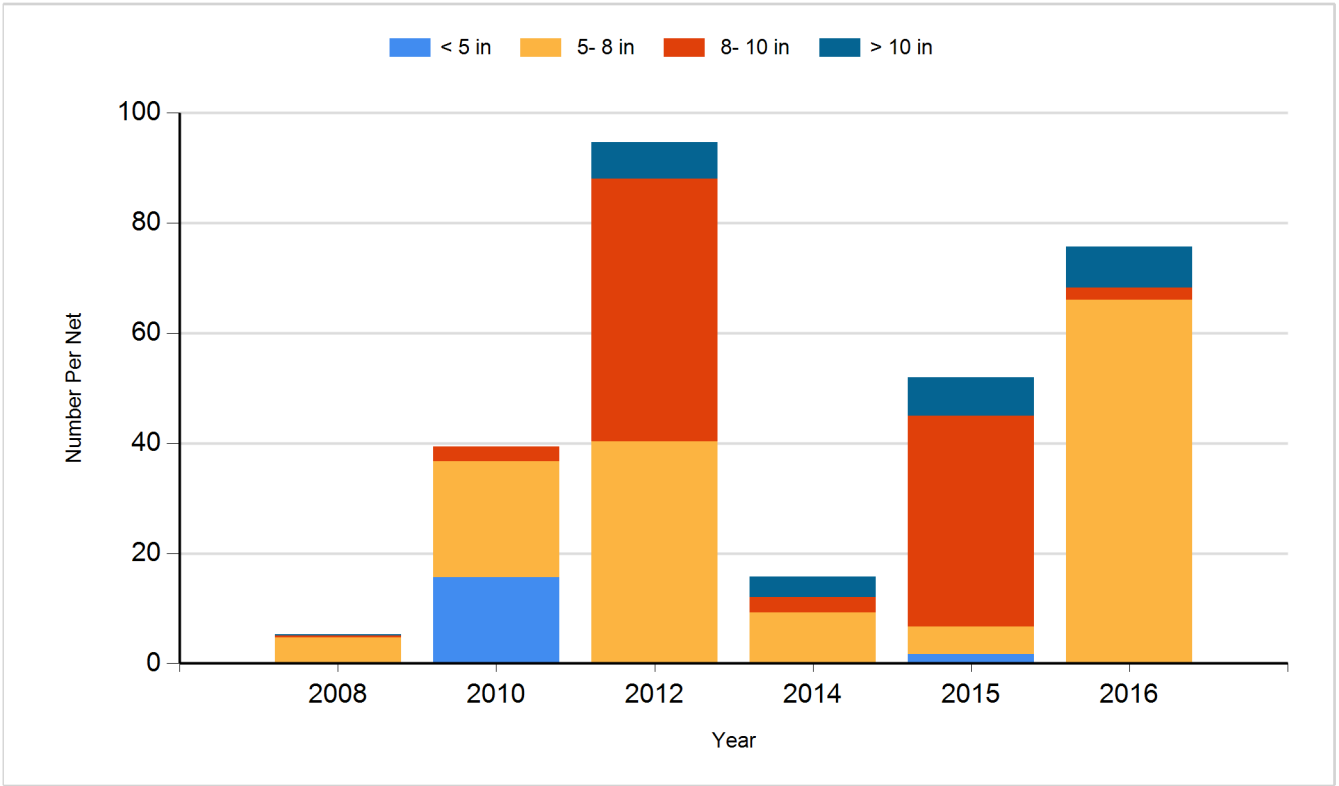
Species: White Bass
Gear: std exp gill net



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
2010	Muskellunge	Large Fingerling	790
2012	Muskellunge	Large Fingerling	1,150
2014	Muskellunge	Large Fingerling	1,063
2015	Walleye	Small Fingerling	108,300
2016	Muskellunge	Large Fingerling	1,387
2017	Walleye	Fingerling	113,760