SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Campbell, Brookings County
MBS-Lake-234-000
2019

Lake Information

Name:	Campbell	**Maximum Depth:**	8 Feet
County:	Brookings	**Mean Depth:**	3 Feet
Legal Description:	T109n-R50W-Sec.28, 29, 32, 33; T108N-R50W-Sec. 5	**OHWM Elevation:**	1,576
Surface Area:	798 Acres	**Outlet Elevation:**	1,575

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 26, 2019	6 net-nights

Common Fish Species Present

Walleye

Yellow Perch

White Sucker

Channel Catfish

Black Bullhead

Saugeye

Shorthead Redhorse

Common Carp

White Bass

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	8	1.2	1.1	71		14			
	Black Bullhead	19	3.2	1.7	89		5			
	Black Crappie	2	0.3	0.5	100		0		116	18
	Channel Catfish	24	4.0	2.6	92		8		105	2
	Common Carp	9	1.5	1.0	89		56			
	Northern Pike	6	1.0	0.7	83		0		85	3
	Saugeye	16	2.3	1.0	50	22	0		90	3
	Shorthead Redhorse	10	1.7	0.9	100		80			
	Walleye	1	0.2	0.2	100		100		91	
	White Bass	7	1.2	0.6	57		57		95	2
	White Sucker	81	13.5	5.4	100		99			
	Yellow Perch	19	3.2	1.3	79		26		113	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	Bigmouth Buffalo								1.5	1.3	1.2	1.33
	Black Bullhead								10.8	17.8	3.2	10.60
	Black Crappie								0.0	0.2	0.3	0.17
	Channel Catfish								2.3	6.0	4.0	4.10
	Common Carp								4.3	1.2	1.5	2.33
	Northern Pike								0.8	0.3	1.0	0.70
	Saugeye								1.3	3.7	2.3	2.43
	Shorthead Redhorse								0.2	0.2	1.7	0.70
	Walleye								10.8	3.0	0.2	4.67
	White Bass								1.5	1.7	1.2	1.47
	White Sucker								9.5	8.2	13.5	10.40
	Yellow Perch								3.3	1.5	3.2	2.67
frame net (std 3/4 in)	Bigmouth Buffalo	34.9	11.4		1.2							15.83
	Black Bullhead	158.3	322.9		32.3							171.17
	Black Crappie	0.4	0.1		0.0							0.17
	Channel Catfish	2.5	8.6		6.1							5.73
	Common Carp	6.1	1.7		8.2							5.33
	Green Sunfish	0.0	0.0		0.0							0.00
	Northern Pike	1.5	2.9		0.2							1.53
	Orangespotted Sunfish	0.0	0.0		0.0							0.00
	Shorthead Redhorse	0.0	0.1		0.1							0.07
	Walleye	0.3	0.3		0.0							0.20
	White Bass	0.0	0.5		0.0							0.17
	White Sucker	6.9	3.0		0.8							3.57
	Yellow Bullhead	0.3	2.3		0.0							0.87
	Yellow Perch	4.0	0.6		0.0							1.53
std exp gill net	Bigmouth Buffalo	0.7	0.0		0.0	0.7	2.0	0.0				0.57
	Black Bullhead	41.0	26.0		21.3	27.7	39.7	61.0				36.12
	Channel Catfish	3.3	4.3		7.3	3.7	3.0	5.3				4.48
	Common Carp	0.0	0.3		1.3	0.0	4.0	1.3				1.15
	Common Shiner	0.0	0.0		0.0	0.0	0.0	0.0				0.00
	Emerald Shiner	0.0	0.0		0.0	0.0	0.0	0.0				0.00
	Northern Pike	1.7	8.0		1.0	8.7	2.7	1.3				3.90
	Orangespotted Sunfish	0.0	0.0		0.0	0.0	0.0	0.0				0.00

		CPUE										
Gear	Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
std exp gill net	Shorthead Redhorse	0.0	0.0		1.0	0.0	0.0	0.3				0.22
	Walleye	1.3	0.7		0.3	3.0	0.3	22.7				4.72
	White Bass	0.0	1.0		0.0	0.0	2.7	2.0				0.95
	White Sucker	41.3	5.7		2.3	3.3	7.7	9.3				11.60
	Yellow Bullhead	0.0	0.3		0.0	0.0	0.0	0.0				0.05
	Yellow Perch	146.7	5.3		0.0	2.3	26.3	6.0				31.10

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	38	71
		PSD-P								0	13	14
	Black Bullhead	PSD								29	95	89
		PSD-P								3	3	5
	Channel Catfish	PSD								50	100	92
		PSD-P								14	17	8
		Wr								98	93	105
	Common Carp	PSD								85	100	89
		PSD-P								58	57	56
	Saugeye	PSD								0	9	50
		PSD-P								0	0	0
		Wr								88	88	90
	Shorthead Redhorse	PSD								100	100	100
		PSD-P								100	100	80
	Walleye	PSD								20	33	100
		PSD-P								0	0	100
		Wr								82	83	91
	White Bass	PSD								100	90	57
		PSD-P								100	80	57
		Wr								92	89	95
	White Sucker	PSD								100	100	100
		PSD-P								98	100	99
	Yellow Perch	PSD								95	78	79
		PSD-P								80	44	26
		Wr								91	100	113
frame net (std 3/4 in)	Bigmouth Buffalo	PSD	93	97		100						
		PSD-P	11	18		50						
		Wr	88	92		84						
	Black Bullhead	PSD	22	10		89						
		PSD-P	1	0		0						
		Wr	100	90		83						
	Channel Catfish	PSD	36	20		92						
		PSD-P	4	2		3						

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
frame net (std 3/4 in)	Channel Catfish	Wr	100	95		86						
	Common Carp	PSD	100	65		99						
		PSD-P	80	53		52						
		Wr	96	92		92						
	Shorthead Redhorse	PSD		100		100						
		PSD-P		100		0						
		Wr		103		112						
	Walleye	PSD	100	100								
		PSD-P	33	0								
		Wr	106	97								
	White Bass	PSD		0								
		PSD-P		0								
		Wr		84								
	White Sucker	PSD	97	97		100						
		PSD-P	46	80		100						
		Wr	95	96		86						
	Yellow Perch	PSD	48	50								
		PSD-P	38	0								
		Wr	95	85								
std exp gill net	Bigmouth Buffalo	PSD	100				0	0				
		PSD-P	0				0	0				
		Wr	89									
	Black Bullhead	PSD	15	9		72	45	45	60			
		PSD-P	2	0		0	0	2	3			
		Wr	100	100		87						
	Channel Catfish	PSD	0	38		100	100	100	19			
		PSD-P	0	0		0	27	11	6			
		Wr	101	106		94	107	109	99			
	Common Carp	PSD		0		100	0	8	100			
		PSD-P		0		50	0	8	25			
		Wr		108		91						
	Shorthead Redhorse	PSD				67			100			
		PSD-P				67			100			
		Wr				93						
	Walleye	PSD	100	50		0	100	0	0			
		PSD-P	0	0		0	11	0	0			
		Wr	105	97		100	105	113	90			

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
std exp gill net	White Bass	PSD		0				13	100			
		PSD-P		0				13	100			
		Wr		111				100	102			
	White Sucker	PSD	80	100		100	70	22	96			
		PSD-P	31	65		100	70	9	46			
		Wr	101	94		100						
	Yellow Perch	PSD	25	31			0	100	100			
		PSD-P	17	6			0	43	83			
		Wr	98	97			112	103	91			

Length at Capture

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

Species: Saugeye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	16	224 (3)	353 (10)	433 (3)							
2018	22	263 (4)	336 (18)								

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	1				550 (1)						
2018	18	282 (5)	327 (6)	405 (7)							
2017	66	270 (28)	376 (37)					505 (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+
2019	19	143 (4)	218 (9)	256 (6)							
2018	9	166 (2)	235 (2)	243 (1)	273 (1)	295 (3)					

Fish Condition

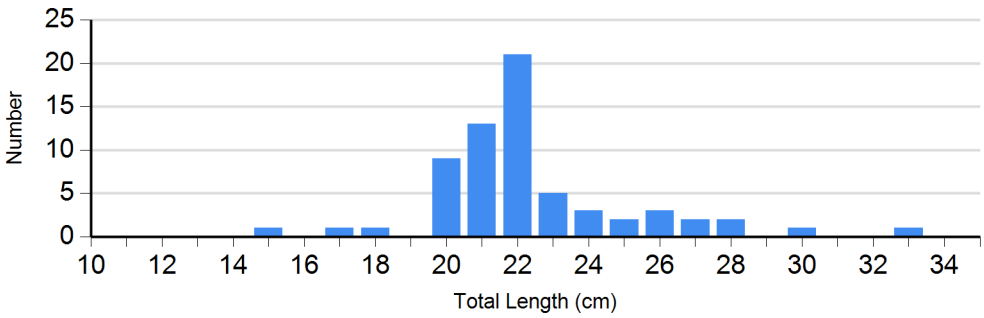
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Channel Catfish Gill Net	2015	0		8	109 (3.2)	1	106	0	
	2016	13	96 (2.6)	2	104 (4.0)	1	128	0	
	2017	7	98 (2.3)	5	95 (3.2)	1	108	1	109
	2018	0		30	91 (1.9)	4	100 (4.2)	2	111 (10.7)
	2019	2	99 (9.9)	20	105 (1.5)	2	113 (2.5)	0	
Saugeye Gill Net	2017	8	88 (1.9)	0		0		0	
	2018	20	88 (1.2)	2	90 (2.0)	0		0	
	2019	7	91 (2.3)	7	89 (4.6)	0		0	
Walleye Gill Net	2015	1	113	0		0		0	
	2016	68	90 (0.7)	0		0		0	
	2017	52	82 (0.8)	13	84 (1.6)	0		0	
	2018	12	85 (1.6)	6	81 (1.3)	0		0	
	2019	0		0		1	91	0	
White Bass Gill Net	2015	7	100 (3.4)	0		0		1	103
	2016	0		0		6	102 (2.7)	0	
	2017	0		0		9	92 (2.2)	0	
	2018	1	95	1	85	6	90 (2.1)	2	85 (0.0)
	2019	3	95 (3.1)	0		2	97 (0.8)	2	95 (0.1)
Yellow Perch Gill Net	2015	0		45	103 (1.1)	34	103 (1.0)	0	
	2016	0		3	87 (3.7)	12	91 (2.5)	3	92 (3.9)
	2017	1	81	3	104 (2.5)	9	90 (2.2)	7	88 (4.8)
	2018	2	105 (4.7)	3	101 (4.0)	2	103 (0.9)	2	91 (8.1)
	2019	4	127 (4.2)	10	113 (2.5)	5	103 (2.4)	0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



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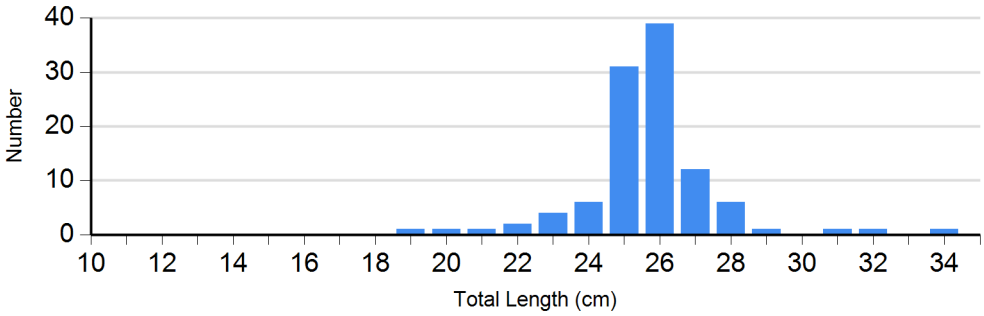

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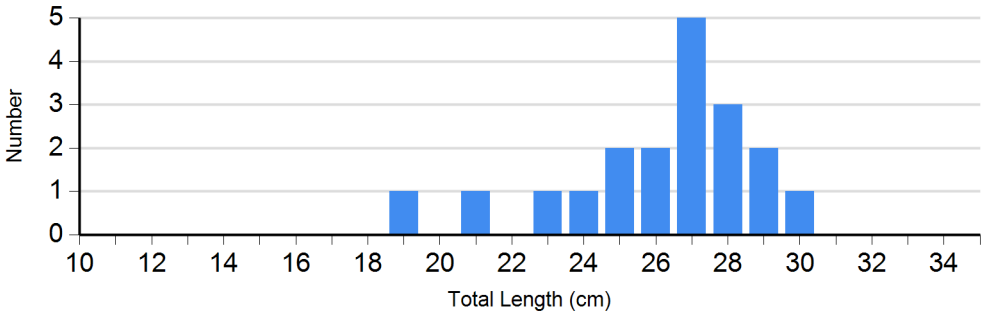

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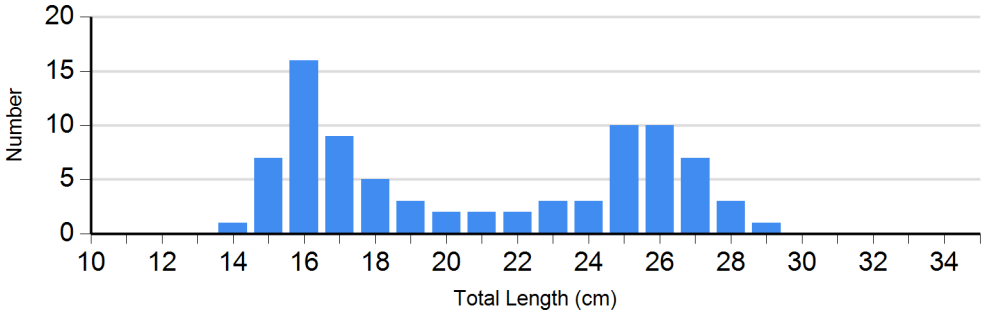
Species: Black Bullhead
Gear: std exp gill net



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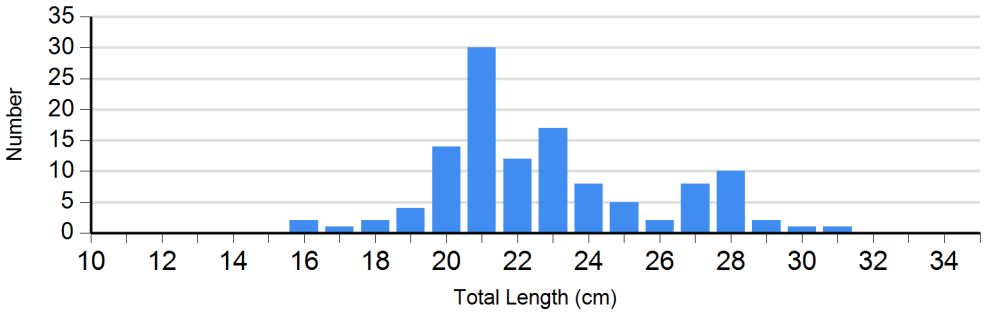

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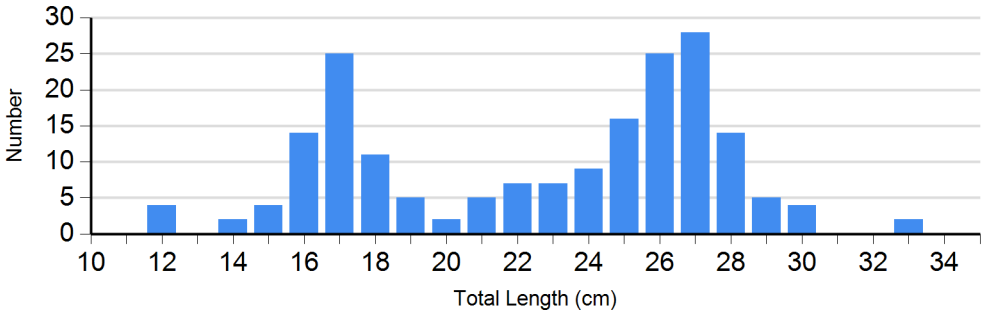

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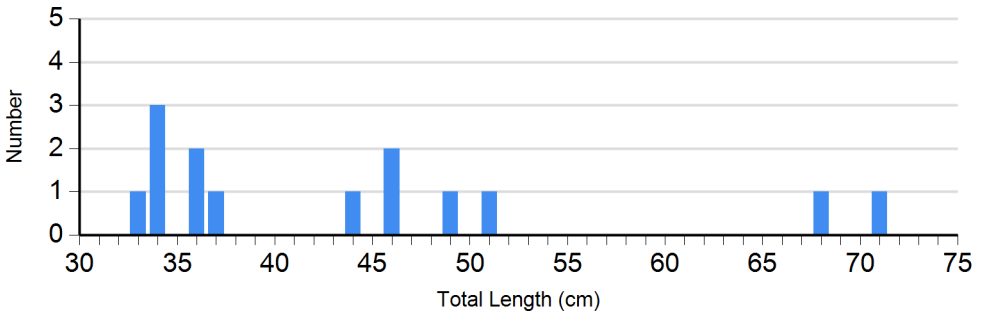
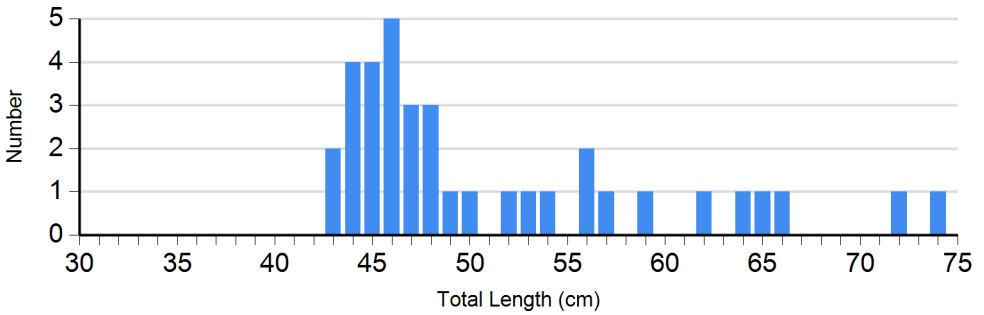
Species: Channel Catfish
Gear: AFS std gill net



2017



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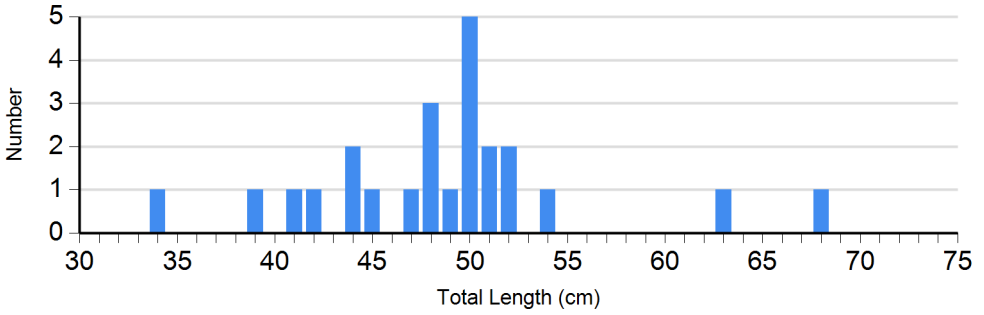
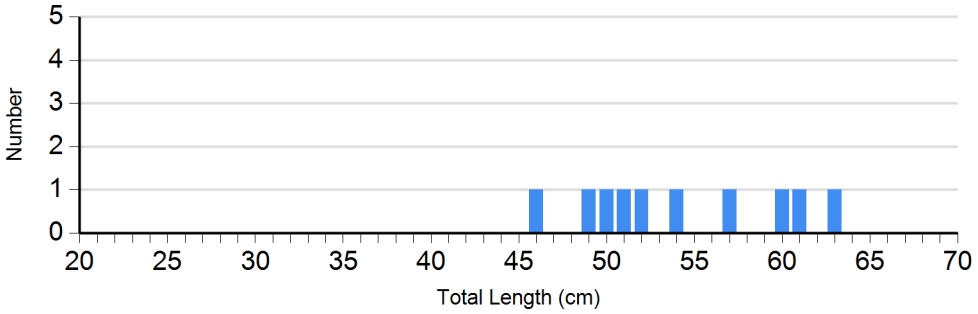
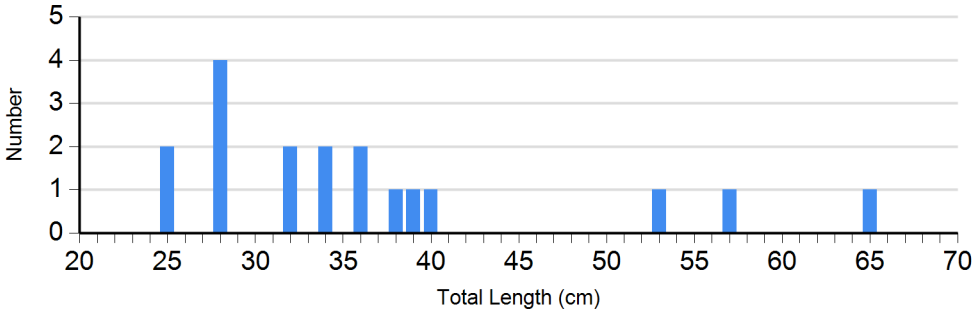


2019

Species: Channel Catfish
Gear: std exp gill net

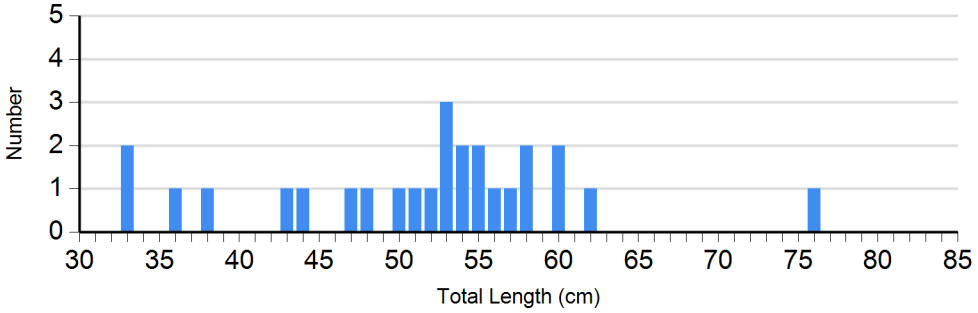


2014



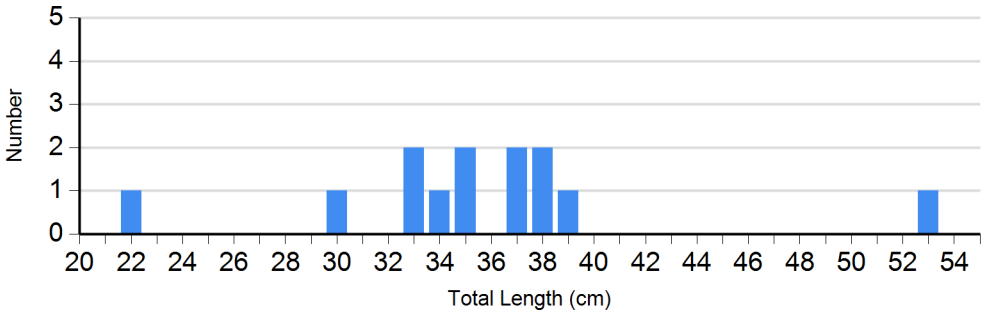
2016

Species: Common Carp
Gear: AFS std gill net



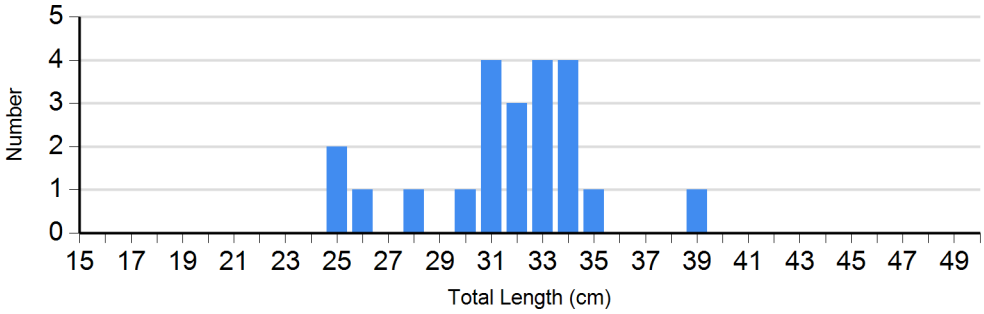
2017

Species: Common Carp
Gear: std exp gill net



2015

Species: Saugeye
Gear: AFS std gill net



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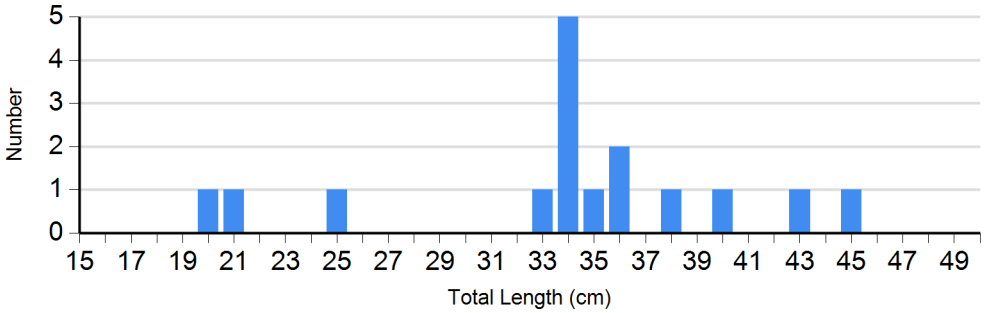
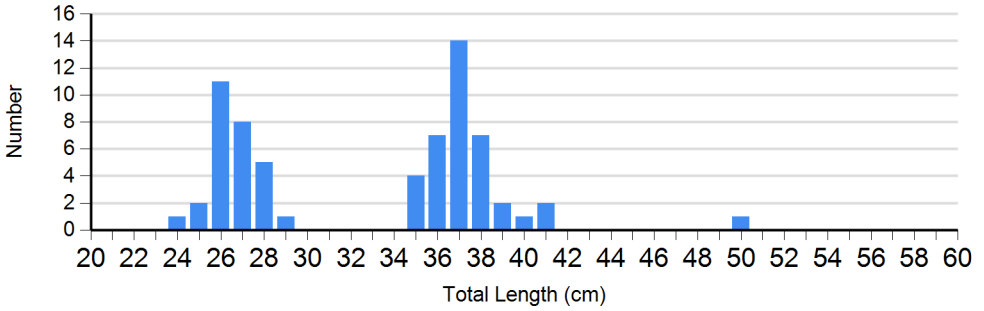
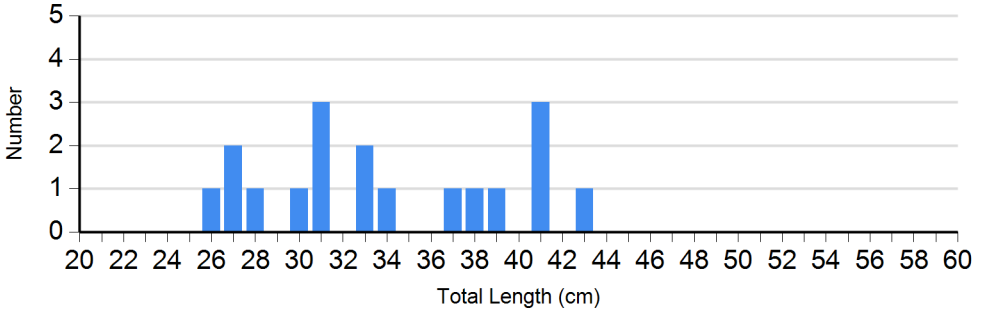


2019

Species: Walleye
Gear: AFS std gill net

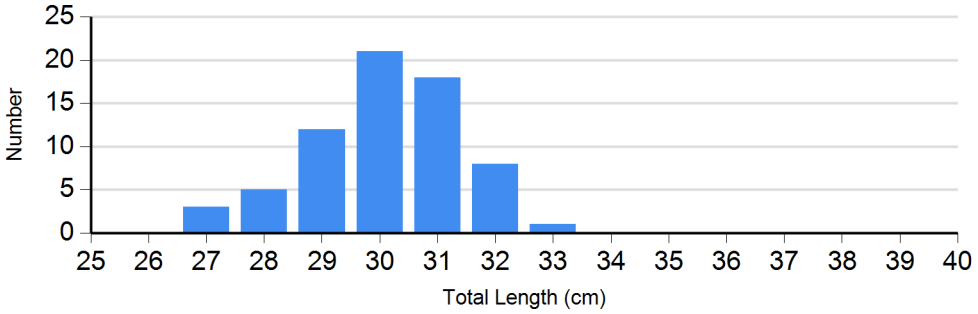


2017



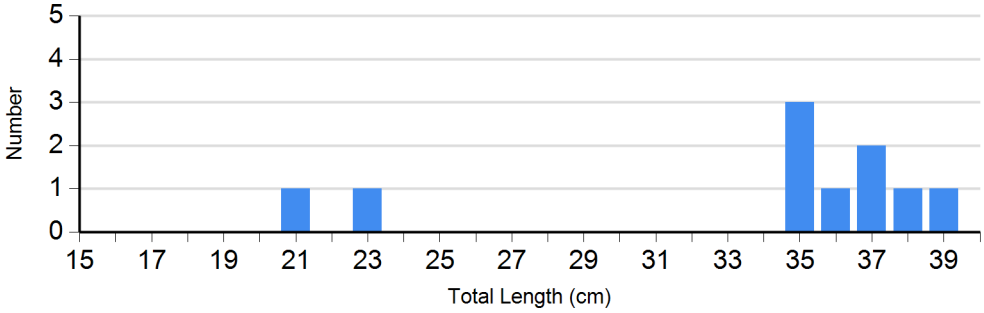
2018

Species: Walleye
Gear: std exp gill net



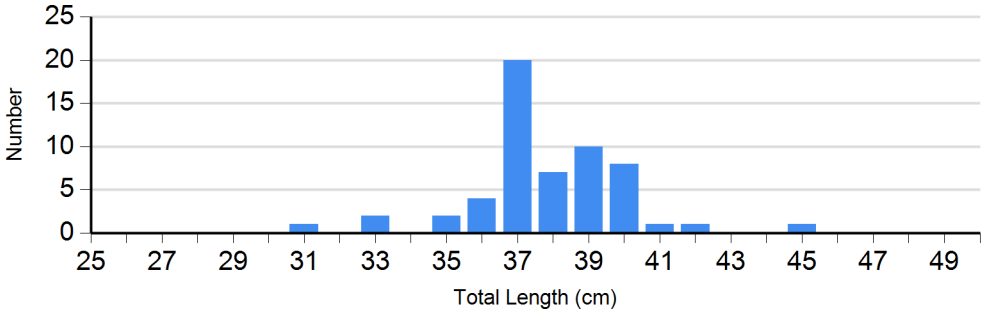
2016

Species: White Bass
Gear: AFS std gill net

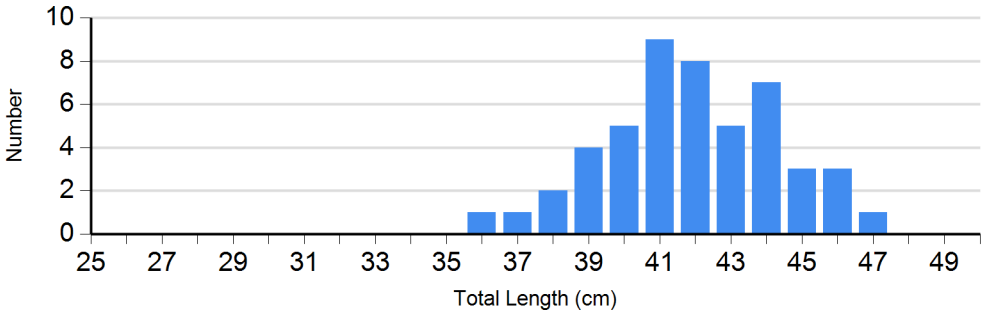


2018

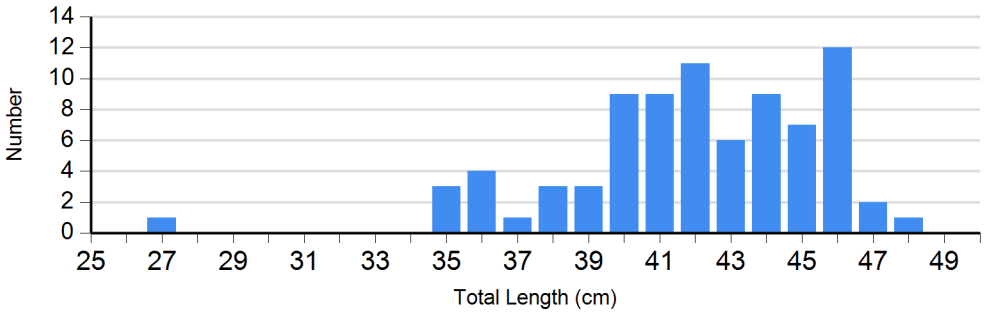
Species: White Sucker
Gear: AFS std gill net



2017

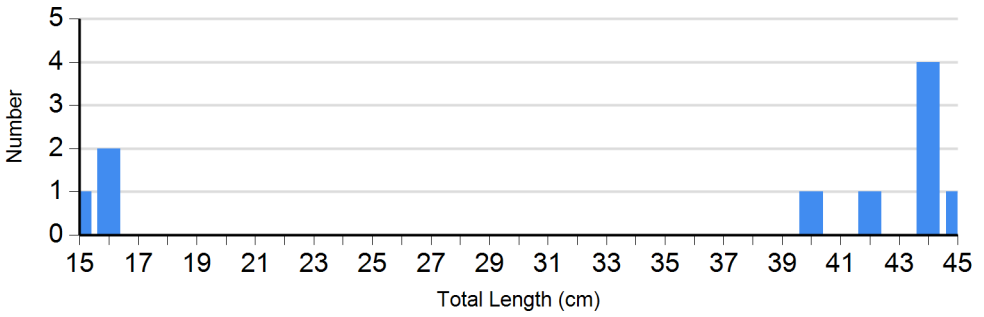


2018

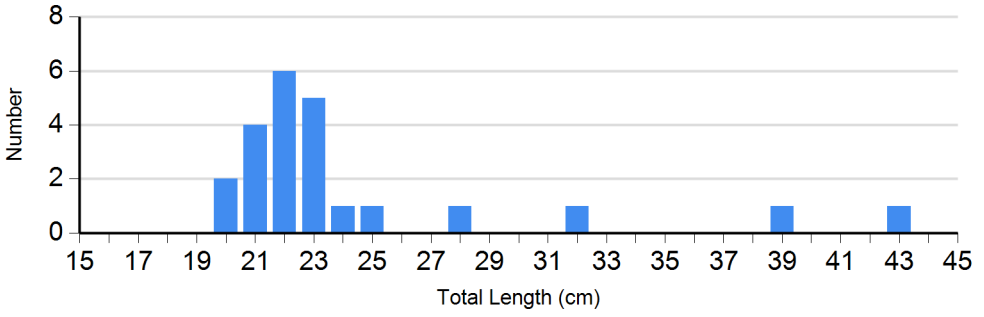


2019

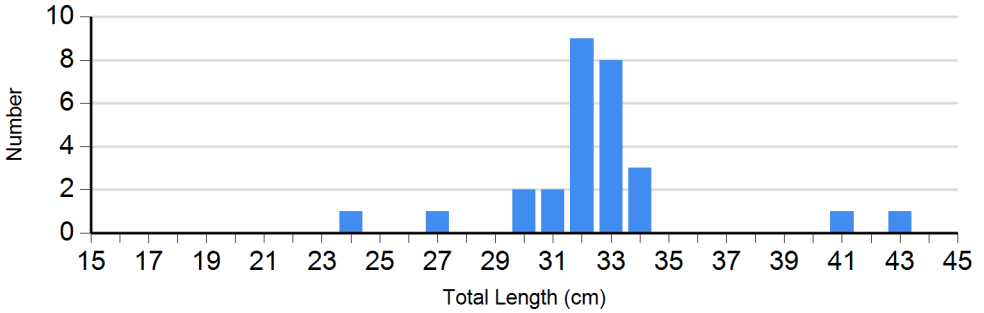
Species: White Sucker
Gear: std exp gill net



2014

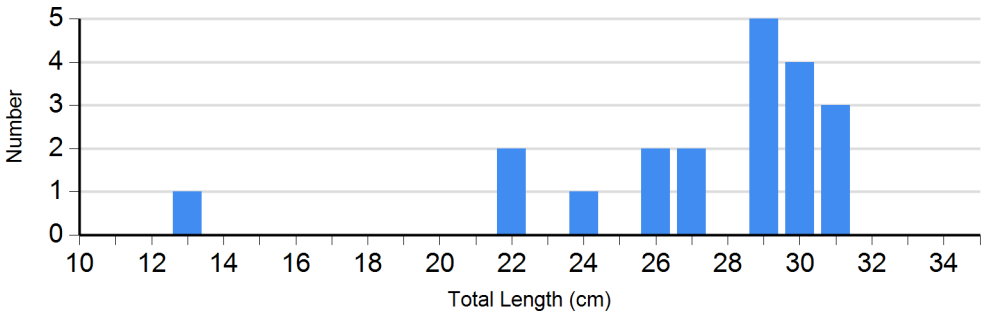


2015

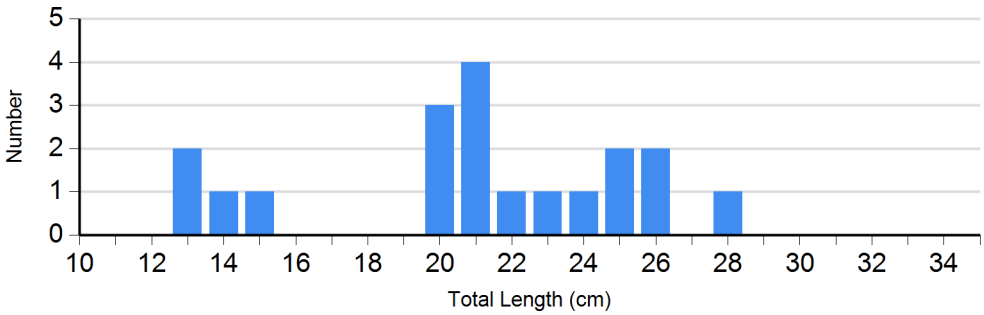


2016

Species: Yellow Perch
Gear: AFS std gill net

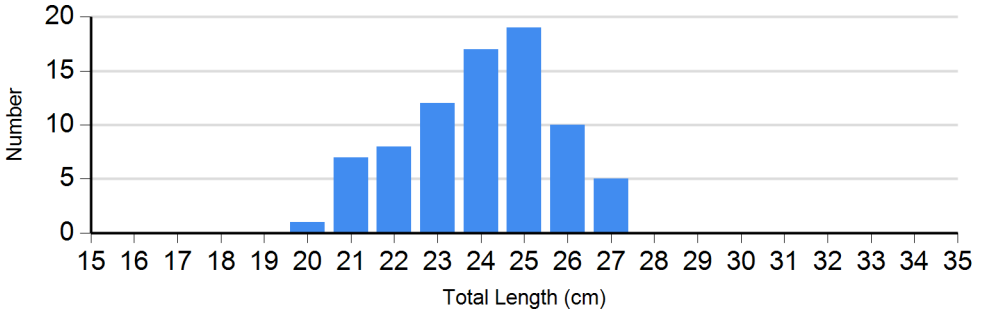


2017

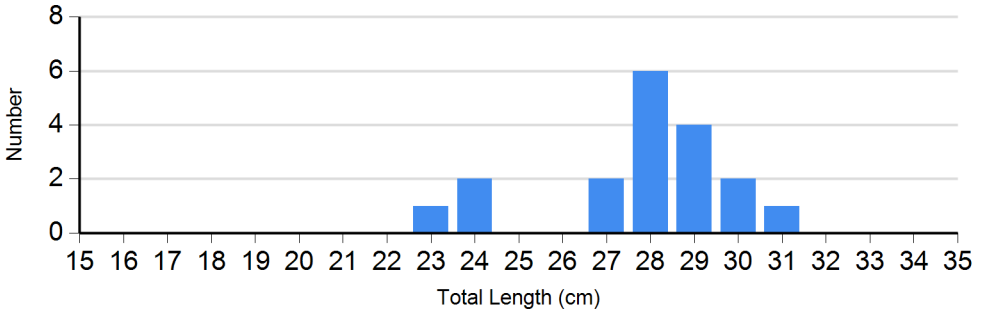


2019

Species: Yellow Perch
Gear: std exp gill net



2015

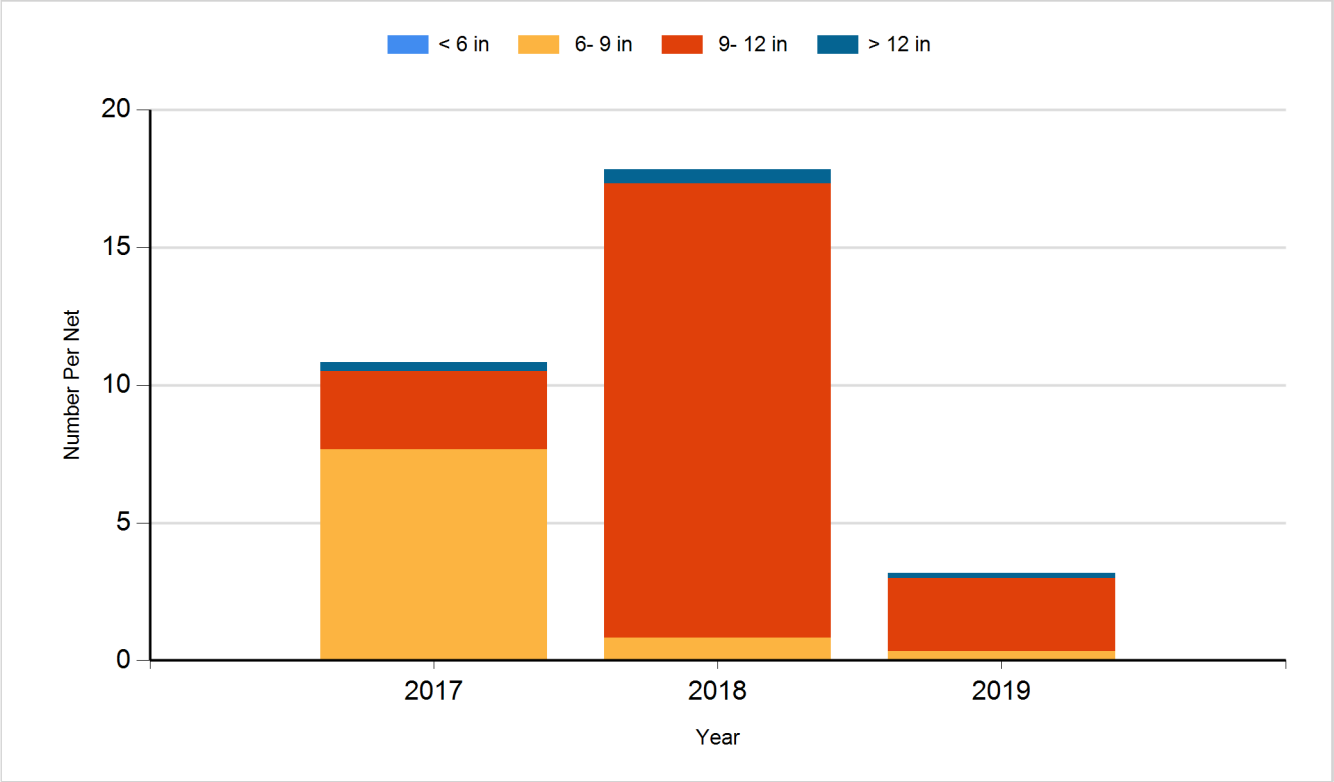


2016

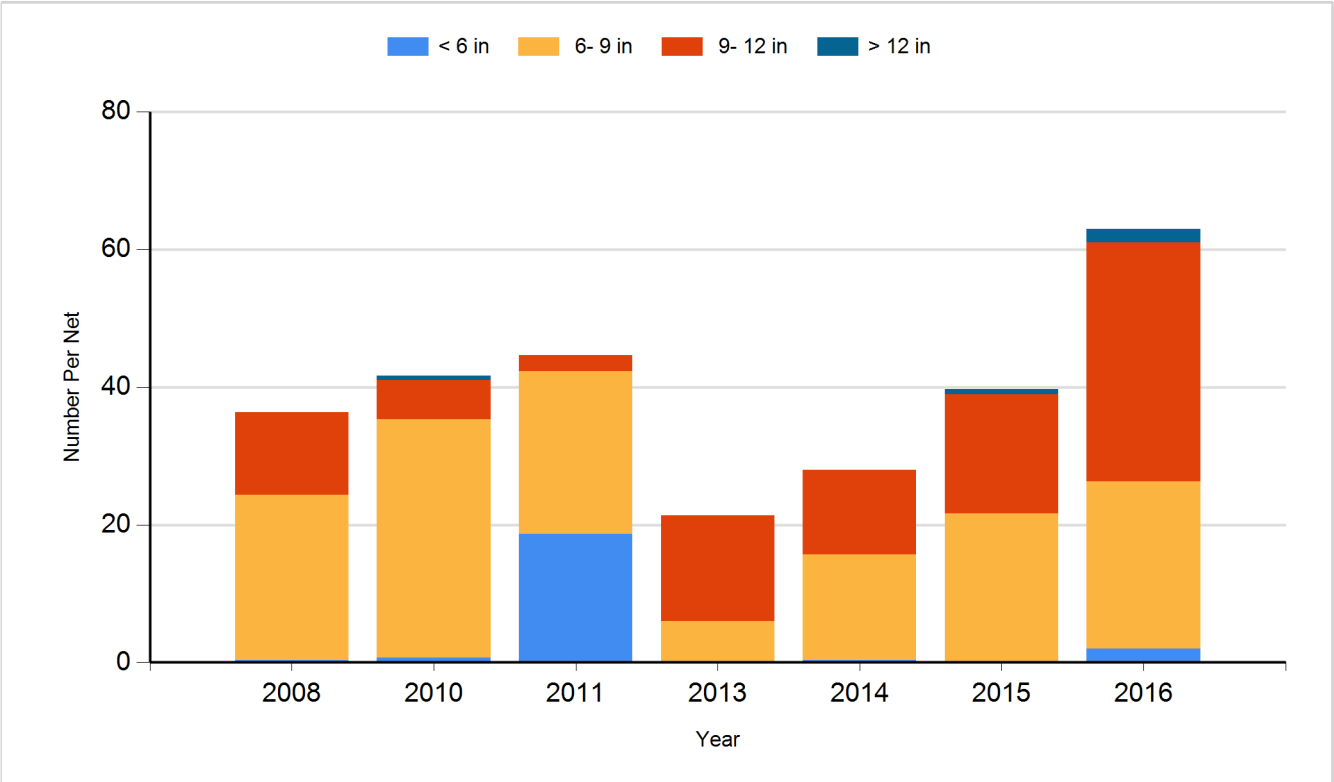
Historic Fish Sizes and Relative Abundance

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

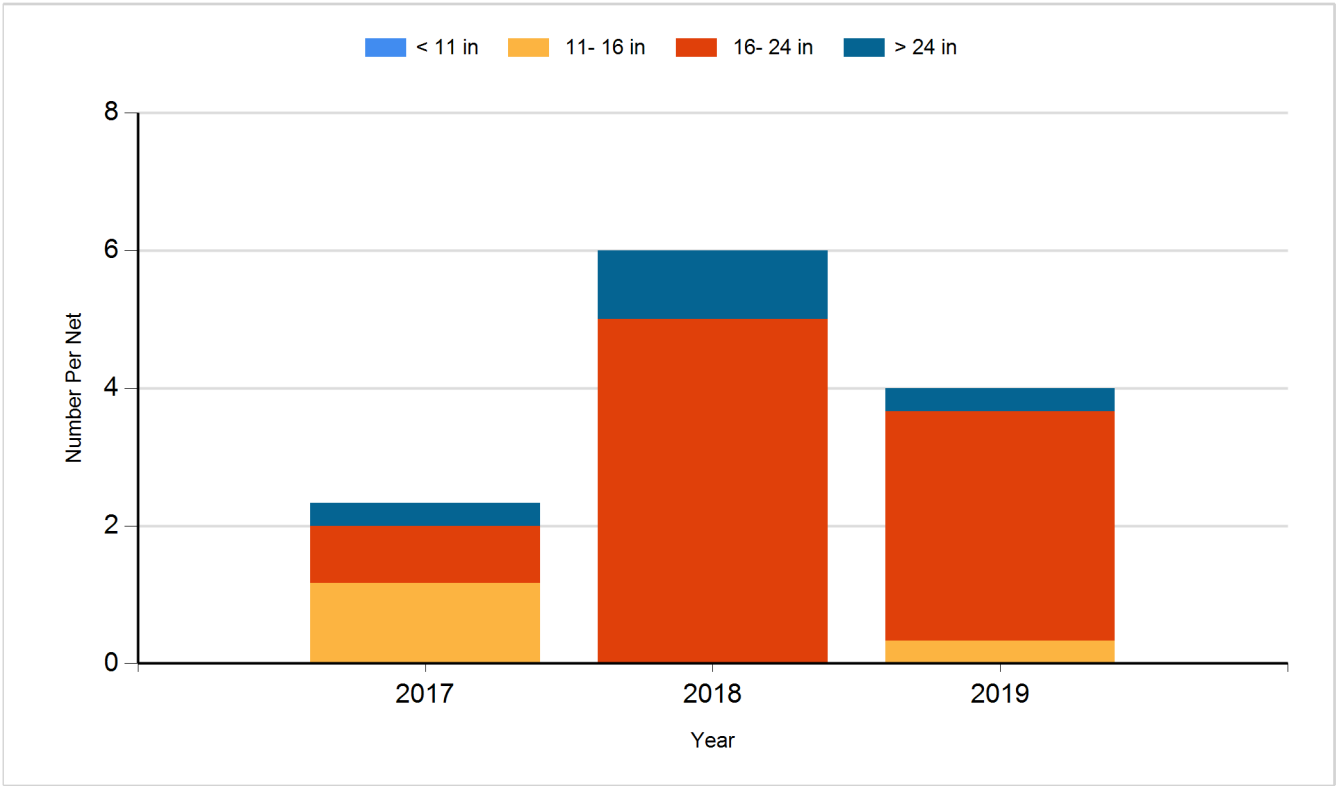
Species: Black Bullhead
Gear: AFS std gill net



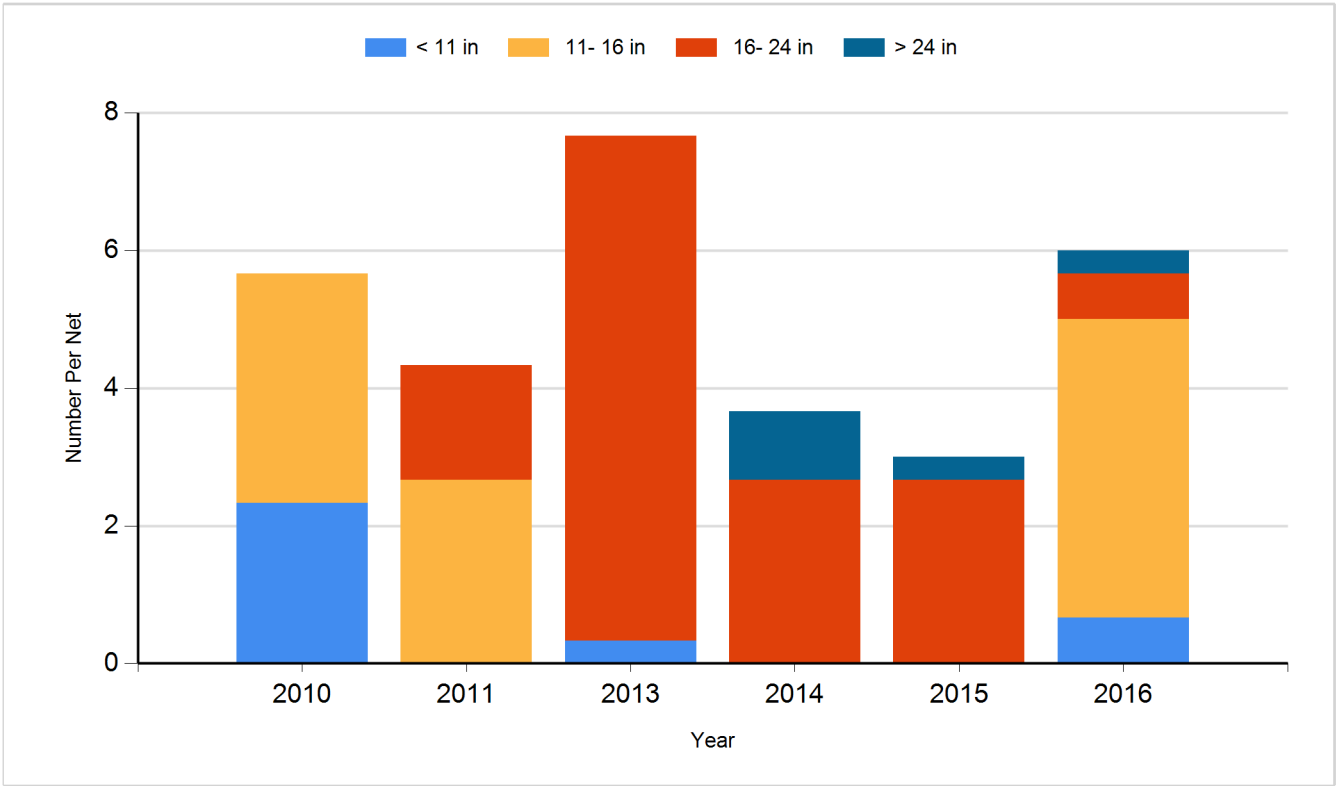
Species: Black Bullhead
Gear: std exp gill net



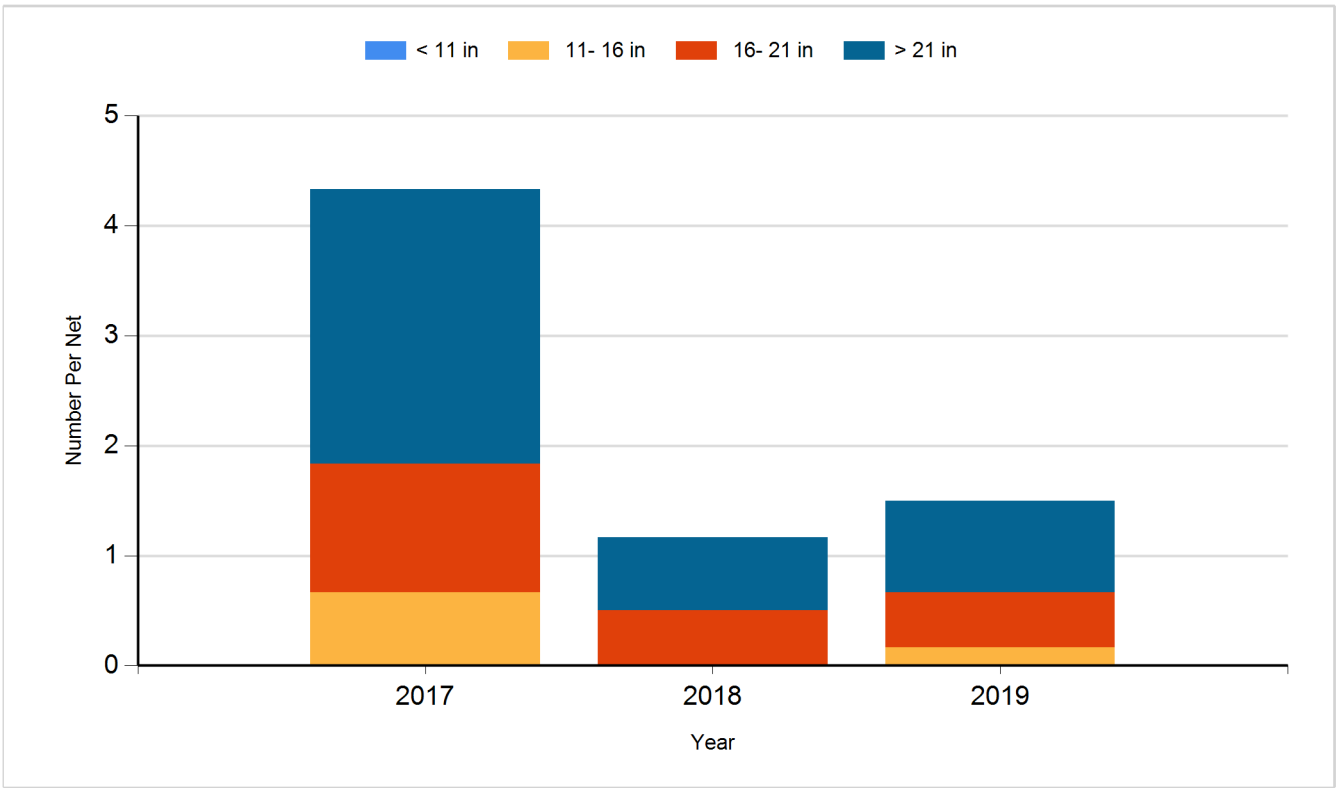
Species: Channel Catfish
Gear: AFS std gill net



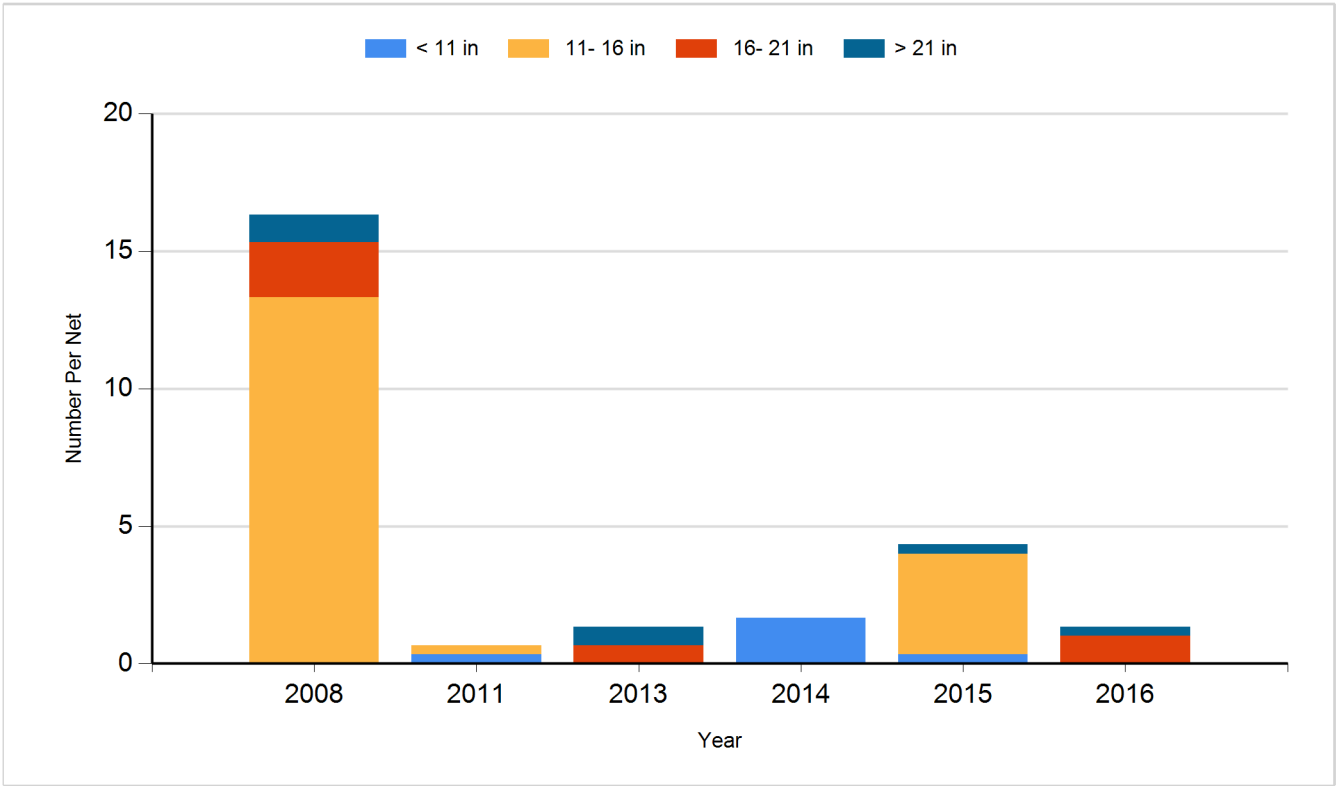
Species: Channel Catfish
Gear: std exp gill net



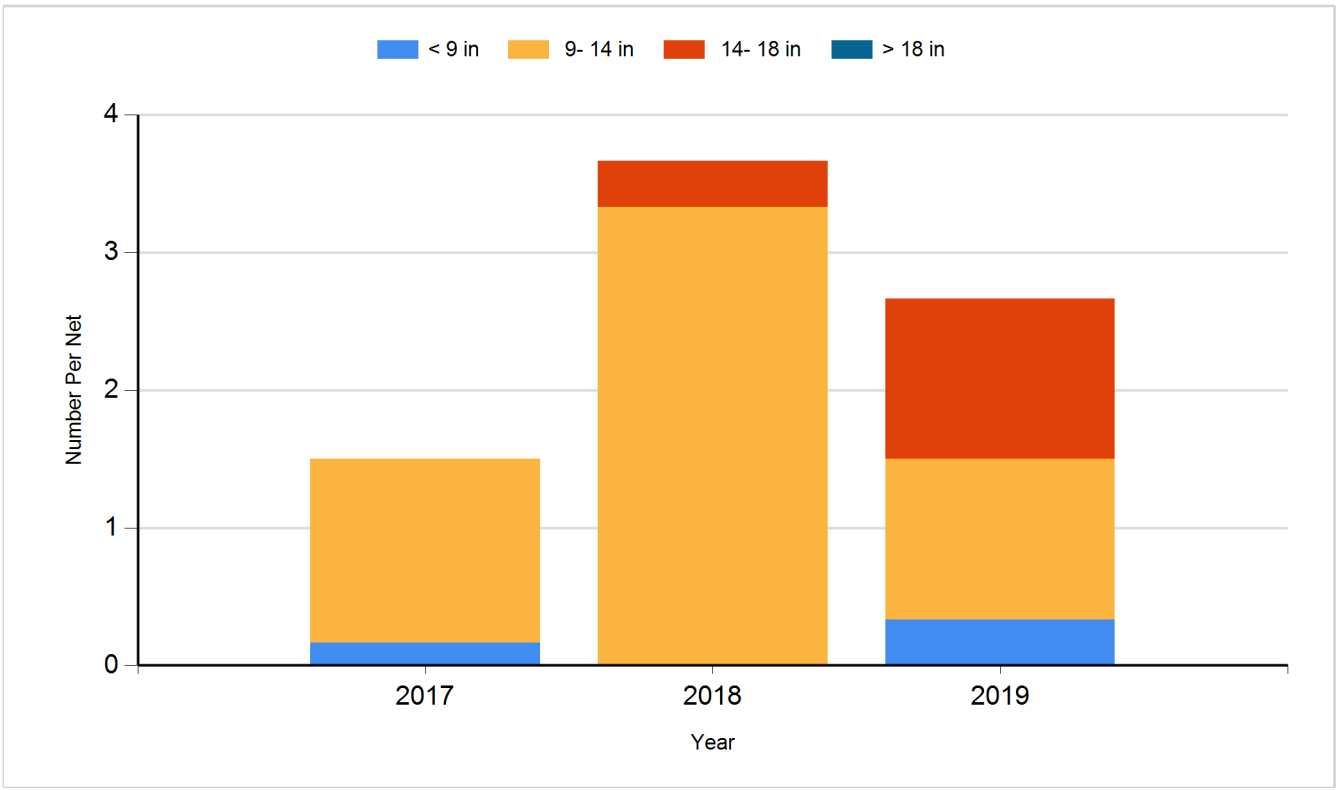
Species: Common Carp
Gear: AFS std gill net



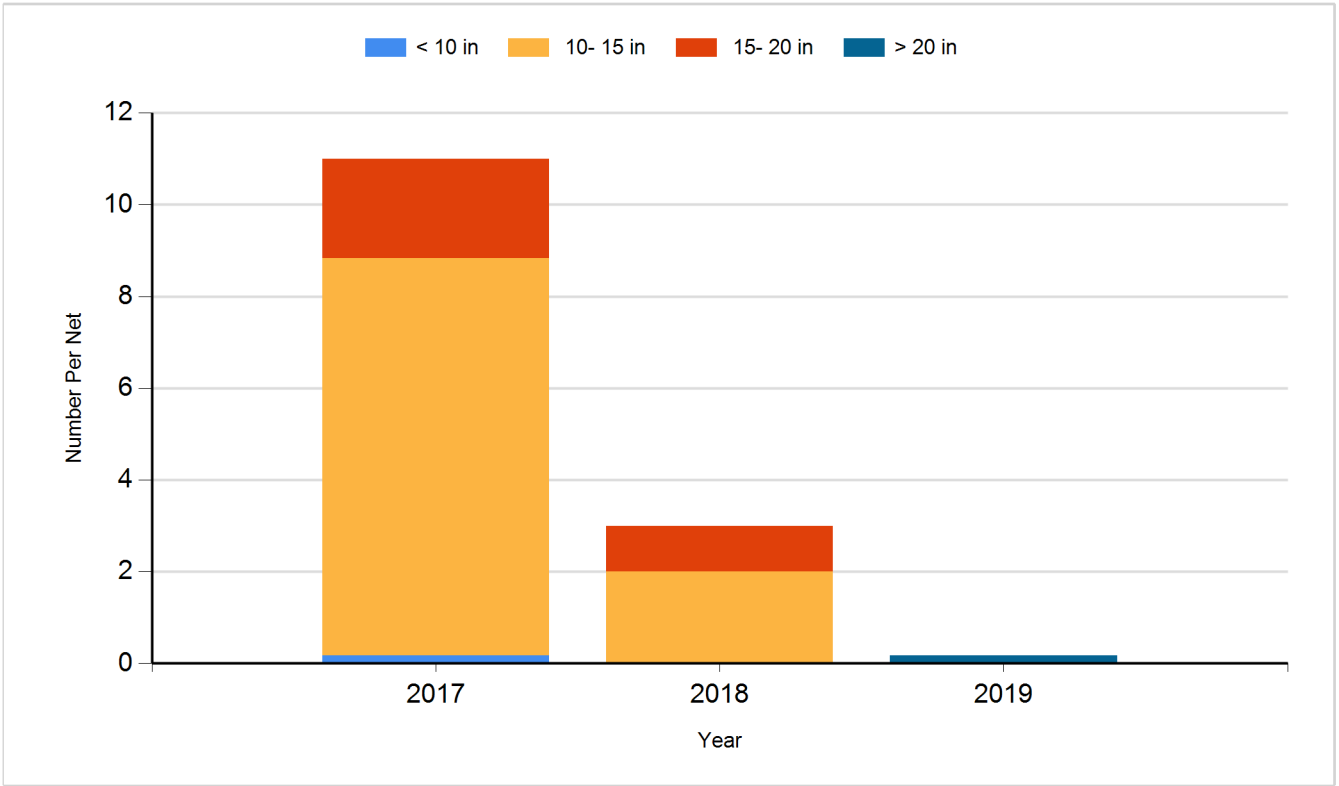
Species: Common Carp
Gear: std exp gill net



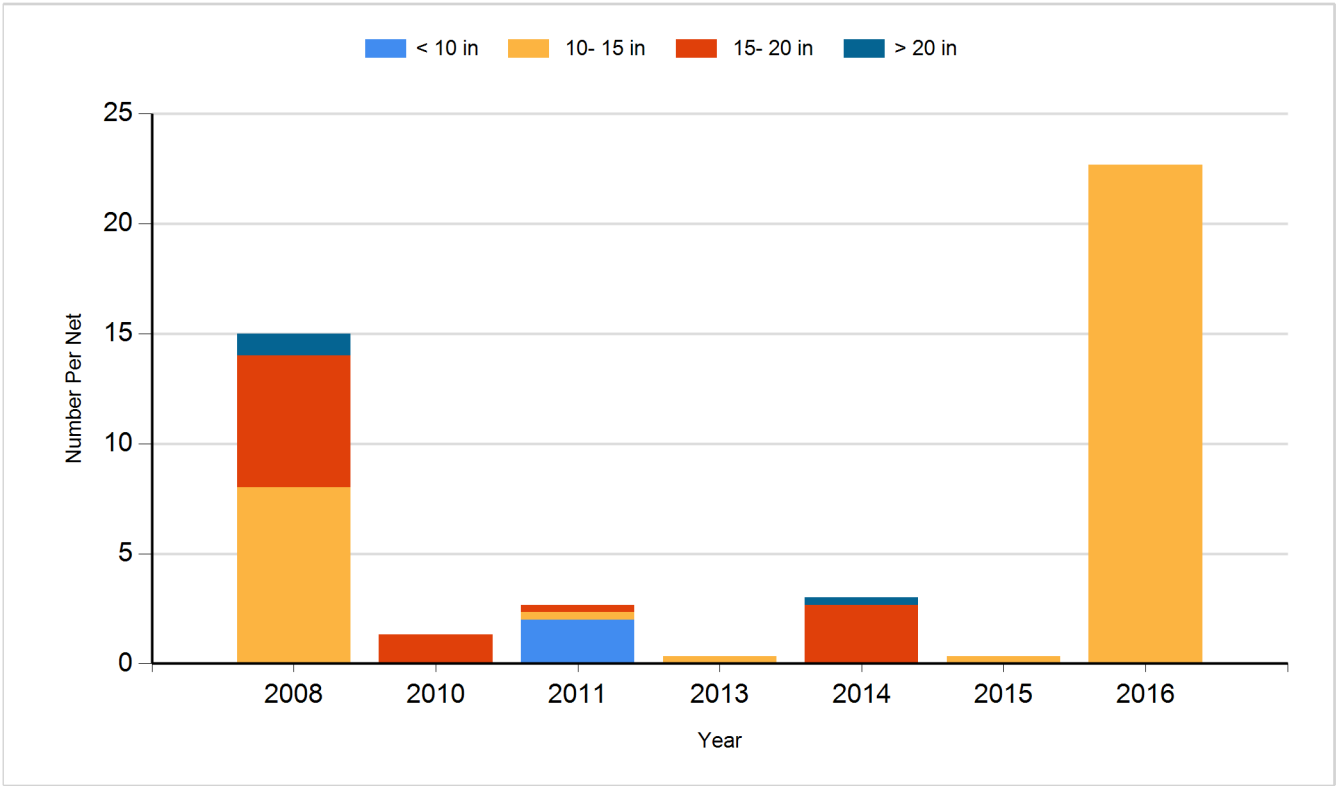
Species: Saugeye
Gear: AFS std gill net



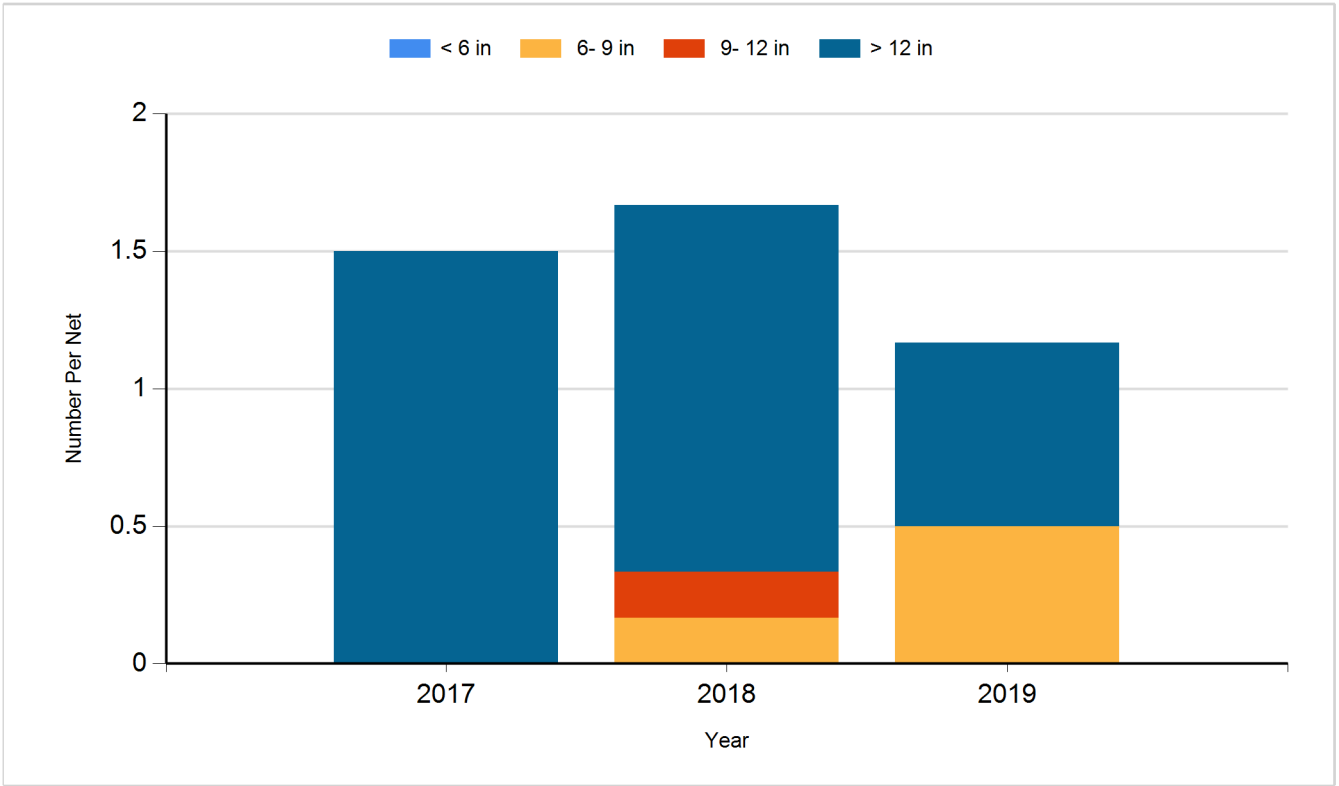
Species: Walleye
Gear: AFS std gill net



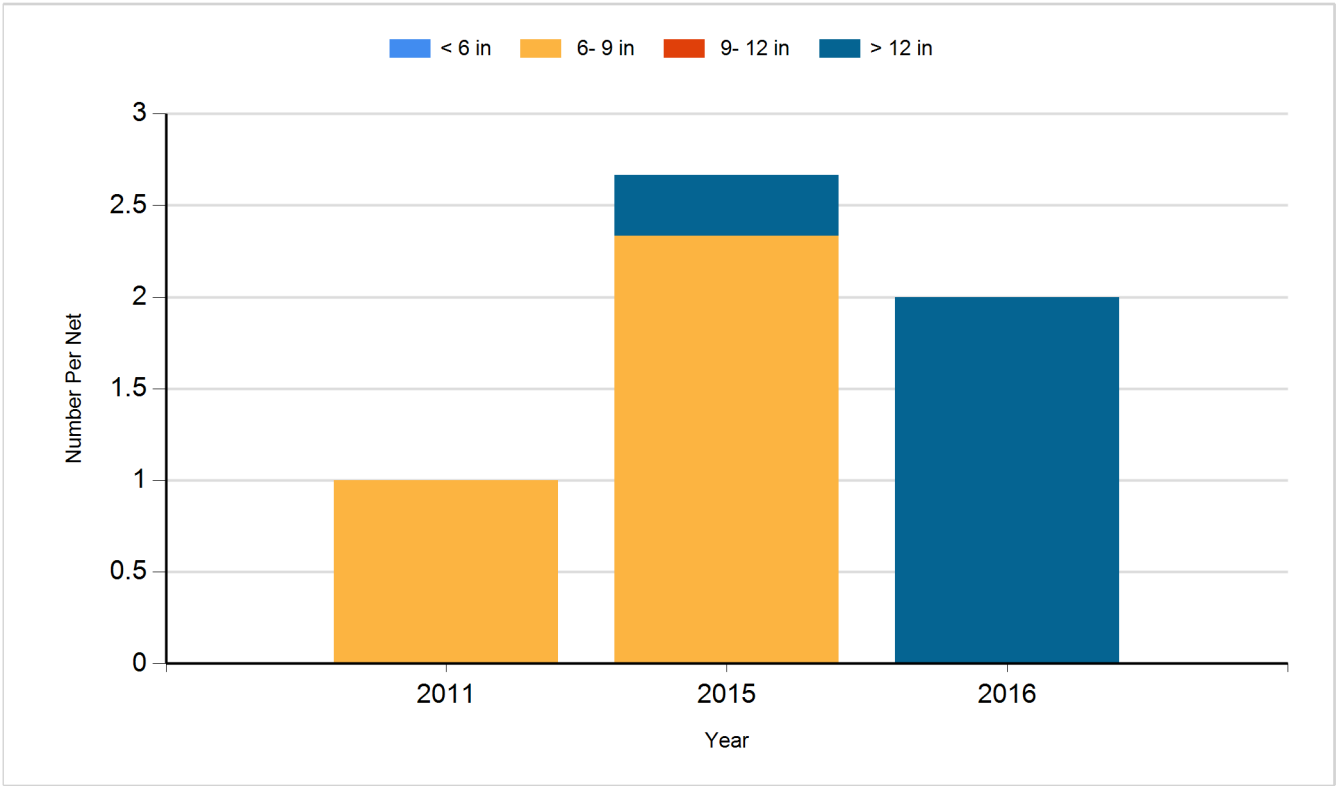
Species: Walleye
Gear: std exp gill net



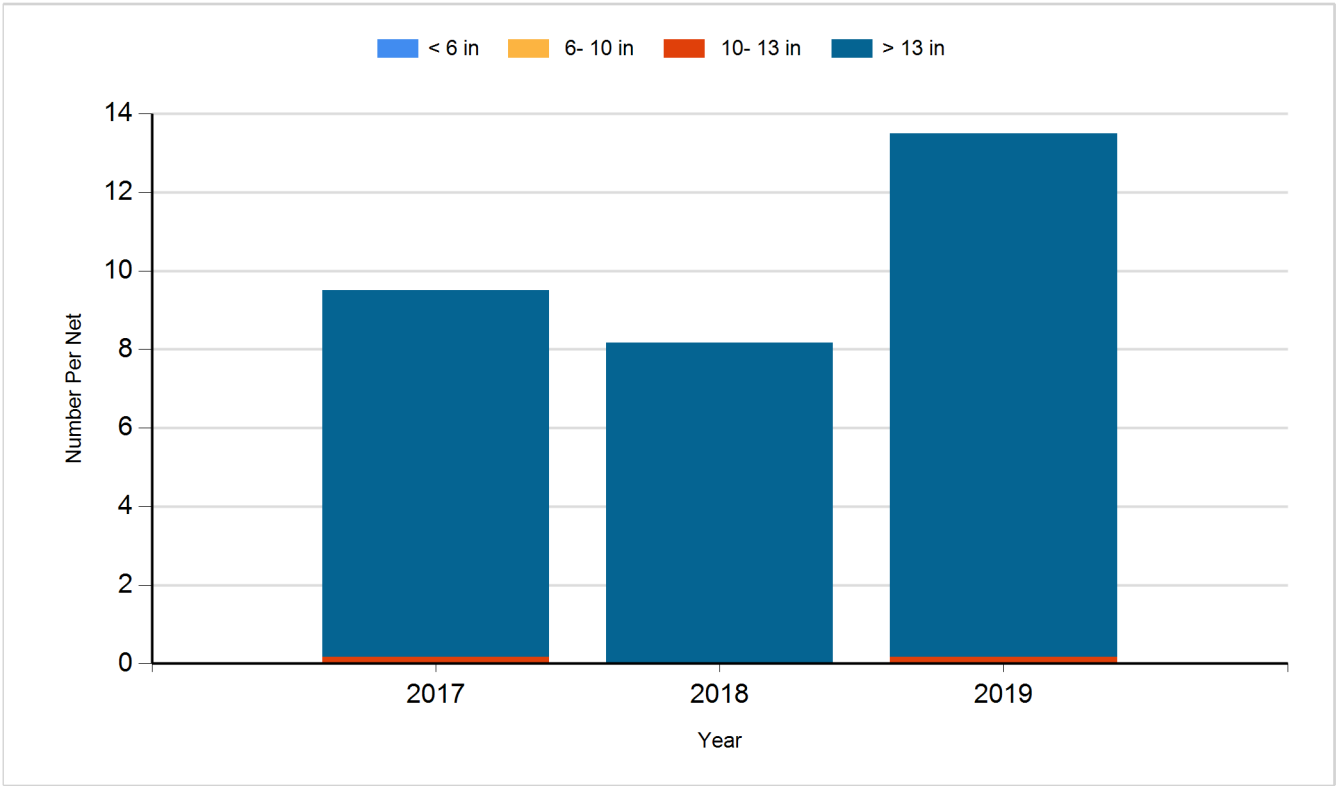
Species: White Bass
Gear: AFS std gill net



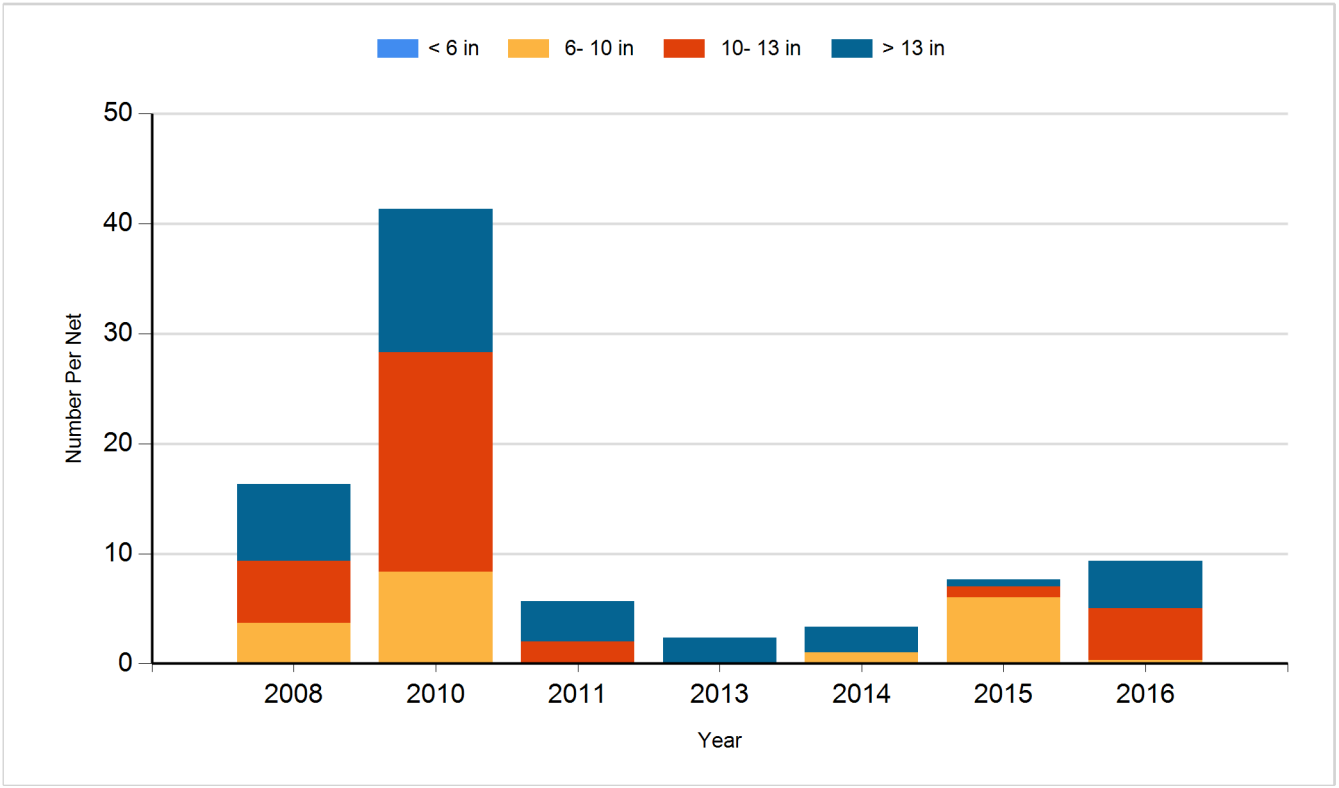
Species: White Bass
Gear: std exp gill net



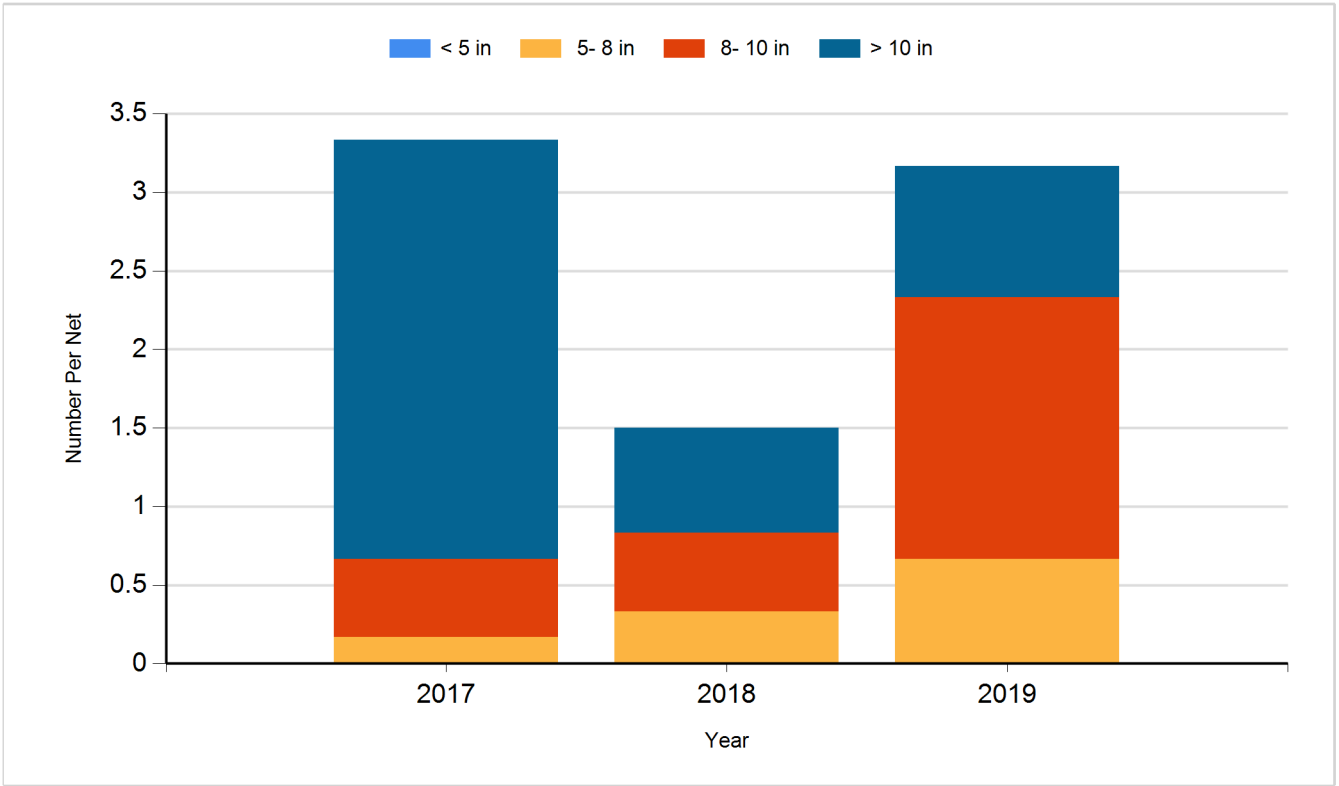
Species: White Sucker
Gear: AFS std gill net



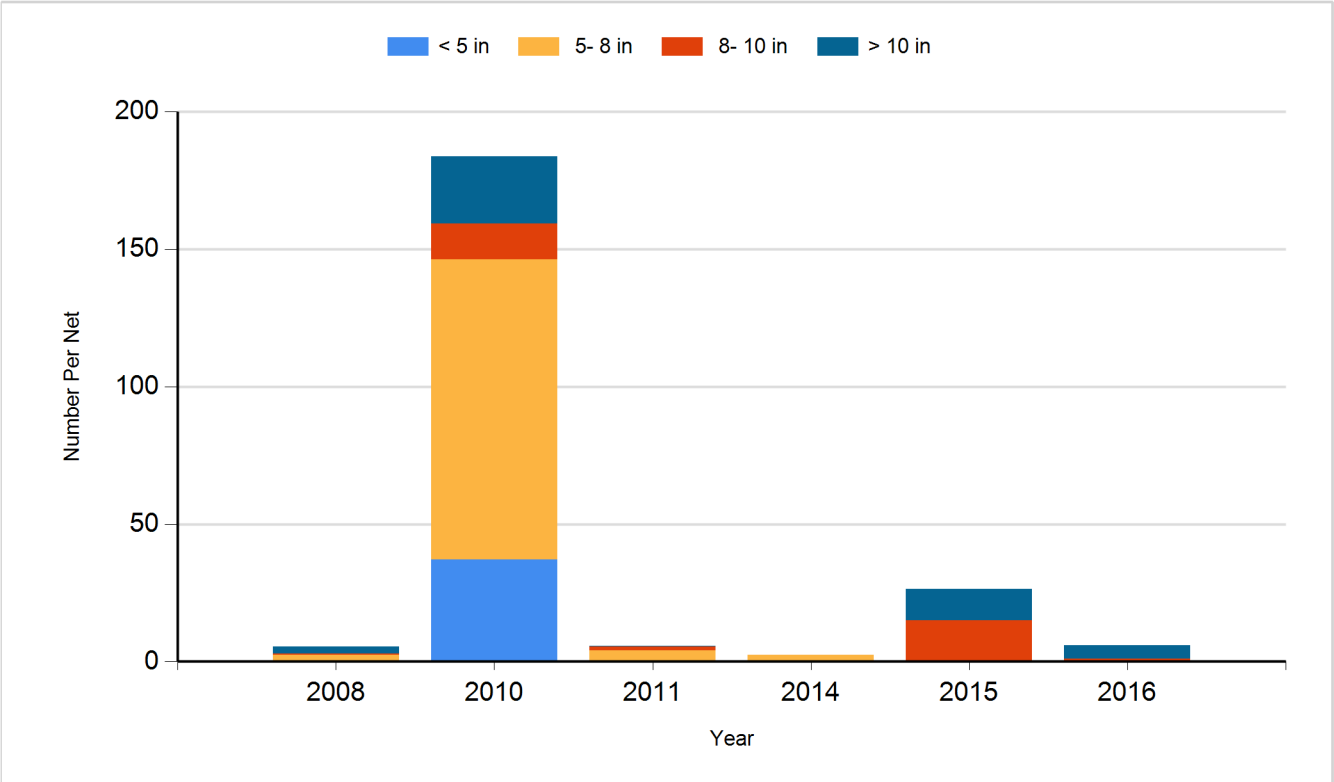
Species: White Sucker
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



Species: Yellow Perch
Gear: std exp gill net



Fish Stocking

Number of fish stocked by year, species, and size.

Year	Species	Size	Number
2009	Yellow Perch	Fry	4,584,000
2010	Walleye	Small Fingerling	91,320
2014	Walleye	Fry	553,320
2015	Walleye	Fry	450,000
2016	Saugeye	Small Fingerling	46,310
2017	Saugeye	Small Fingerling	62,500
2017	Yellow Perch	Small Fingerling	510,590
2018	Saugeye	Small Fingerling	64,390
2018	Yellow Perch	Small Fingerling	455,780
2019	Saugeye	Small Fingerling	64,580
2019	Yellow Perch	Small Fingerling	487,470