SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Swan, Turner County
VER-Lake-113-000
2019

Lake Information

Name:	Swan	**Maximum Depth:**	6 Feet
County:	Turner	**Mean Depth:**	3 Feet
Legal Description:	T97N-R53W-Sec 15-16	**OHWM Elevation:**	1,253
Surface Area:	183 Acres	**Outlet Elevation:**	1,252

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 29, 2019	6 net-nights
frame net (std 3/4 in)	May 29, 2019	5 net-nights

Common Fish Species Present

Walleye

Black Bullhead

Channel Catfish

White Crappie

Common Carp

River Carpsucker

Bigmouth Buffalo

White Sucker

Bluegill

Shorthead Redhorse

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	9	1.5	0.6	78		11			
	Black Bullhead	3	0.5	0.5	33		0			
	Channel Catfish	41	6.8	2.1	22	10	0		88	2
	Common Carp	1	0.2	0.2	100		100			
	Quillback	1	0.0	0.0						
	River Carpsucker	2	0.3	0.3	100		100			
	Walleye	19	3.2	1.0	95		47	18	86	2
	White Crappie	5	0.8	0.6	40		40		110	10
	White Sucker	2	0.3	0.3	100		50			
frame net (std 3/4 in)	Bigmouth Buffalo	9	1.8	1.0	89		22			
	Black Bullhead	88	17.4	9.9	44	8	0			
	Bluegill	2	0.4	0.4	100		50		114	3
	Channel Catfish	92	17.0	10.5	16	6	0		86	1
	Common Carp	20	4.0	1.9	80		10			
	Quillback	1	0.0	0.0						
	River Carpsucker	10	2.0	1.6	100		100			
	Shorthead Redhorse	1	0.2	0.3	100		0			
	Walleye	8	1.6	1.4	100		88		92	4
	White Crappie	62	12.4	4.8	87	7	85	7	105	2
	White Sucker	6	1.2	1.8	100		100			

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 frame net	Bigmouth Buffalo								0.4			0.40
	Black Bullhead								1.0			1.00
	Common Carp								0.2			0.20
	Green Sunfish								0.6			0.60
	Orangespotted Sunfish								0.0			0.00
	River Carpsucker								0.6			0.60
	Shortnose Gar								0.0			0.00
	Sunfish Hybrid								0.0			0.00
	Walleye								0.6			0.60
	White Crappie								49.4			49.40
	White Sucker								0.6			0.60
AFS std gill net	Bigmouth Buffalo								0.8	2.7	1.5	1.67
	Black Bullhead								2.0	0.5	0.5	1.00
	Channel Catfish								3.3	6.5	6.8	5.53
	Common Carp								7.7	2.5	0.2	3.47
	Quillback								0.0	0.0	0.0	0.00
	River Carpsucker								0.0	0.0	0.3	0.10
	Walleye								6.0	7.0	3.2	5.40
	White Crappie								0.0	0.3	0.8	0.37
	White Sucker								0.0	0.2	0.3	0.17
frame net (std 3/4 in)	Bigmouth Buffalo		0.0		0.4	0.2	0.4	0.4		0.0	1.8	0.46
	Black Bullhead		162.0		37.8	40.4	31.8	60.6		23.0	17.4	53.29
	Black Crappie		0.0		0.0	0.0	0.0	0.2		0.0	0.0	0.03
	Bluegill		0.8		0.0	0.4	0.4	0.0		0.0	0.4	0.29
	Channel Catfish		0.6		1.2	0.4	0.0	5.2		1.4	17.0	3.69
	Common Carp		0.4		0.4	2.4	0.2	3.4		0.2	4.0	1.57
	Green Sunfish		13.0		0.2	0.4	22.8	0.4		0.4	0.0	5.31
	Northern Pike		0.4		0.2	0.0	0.0	0.0		0.0	0.0	0.09
	O. Spotted X Gr. Sunfish Hybrid		0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.00
	Orangespotted Sunfish		0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.00
	Quillback		0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.00
	River Carpsucker		0.0		0.0	0.0	0.0	0.0		0.2	2.0	0.31
	Shorthead Redhorse		0.0		0.0	0.0	0.0	0.0		0.0	0.2	0.03
	Shortnose Gar		0.0		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
frame net (std 3/4 in)	Sunfish Hybrid		0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.00
	Walleye		2.8		3.2	2.4	1.8	2.4		2.2	1.6	2.34
	White Crappie		5.8		0.0	5.0	5.0	46.2		25.2	12.4	14.23
	White Sucker		18.8		4.4	10.6	10.2	2.8		3.0	1.2	7.29
	Yellow Perch		2.0		0.0	0.0	0.0	0.0		0.0	0.0	0.29
std exp gill net	Bigmouth Buffalo		0.0		3.7	2.7	1.7	2.7				2.16
	Black Bullhead		21.3		8.0	13.7	21.7	5.3				14.00
	Channel Catfish		0.0		0.0	0.7	3.0	2.0				1.14
	Common Carp		1.0		2.3	0.3	1.7	3.0				1.66
	River Carpsucker		0.0		0.3	0.0	0.0	0.0				0.06
	Shortnose Gar		0.0		0.0	0.0	0.0	0.0				0.00
	Sunfish Hybrid		0.0		0.0	0.0	0.0	0.0				0.00
	Walleye		10.0		2.3	20.3	34.7	20.7				17.60
	White Crappie		0.7		0.0	0.0	0.7	1.3				0.54
	White Sucker		11.3		2.3	2.3	0.7	0.0				3.32
	Yellow Perch		3.3		0.0	0.0	4.0	0.3				1.52

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 frame net	Bigmouth Buffalo	PSD								100		
		PSD-P								0		
	Black Bullhead	PSD								60		
		PSD-P								0		
	Common Carp	PSD								0		
		PSD-P								0		
	River Carpsucker	PSD								100		
		PSD-P								100		
	Walleye	PSD								100		
		PSD-P								33		
		Wr								71		
	White Crappie	PSD								98		
		PSD-P								63		
		Wr								91		
	White Sucker	PSD								100		
		PSD-P								33		
AFS std gill net	Bigmouth Buffalo	PSD								60	88	78
		PSD-P								0	0	11
	Black Bullhead	PSD								42	67	33
		PSD-P								0	0	0
	Channel Catfish	PSD								80	59	22
		PSD-P								0	3	0
		Wr								87	87	88
	Common Carp	PSD								87	93	100
		PSD-P								17	33	100
	River Carpsucker	PSD										100
		PSD-P										100
	Walleye	PSD								97	98	95
		PSD-P								31	55	47
		Wr								78	80	86
	White Crappie	PSD									50	40
		PSD-P									50	40
		Wr									95	110

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AFS std gill net	White Sucker	PSD									100	100
		PSD-P									100	50
frame net (std 3/4 in)	Bigmouth Buffalo	PSD				0	0	100	100			89
		PSD-P				0	0	0	0			22
		Wr				92						
	Black Bullhead	PSD		1		5	5	62	73		76	44
		PSD-P		0		0	0	0	0		0	0
		Wr		90		82						
	Bluegill	PSD		75			50	50				100
		PSD-P		0			0	0				50
		Wr		122			111	133				114
	Channel Catfish	PSD		100		33	50		35		43	16
		PSD-P		33		17	0		0		0	0
		Wr		95		92	101		93		86	86
	Common Carp	PSD		50		100	75	100	94		100	80
		PSD-P		0		0	0	0	35		0	10
		Wr		89		87						
	River Carpsucker	PSD									100	100
		PSD-P									100	100
	Shorthead Redhorse	PSD										100
		PSD-P										0
	Walleye	PSD		21		88	83	100	100		91	100
		PSD-P		7		31	50	11	50		73	88
		Wr		86		87	88	94	85		77	92
	White Crappie	PSD		34			28	84	15		100	87
		PSD-P		0			28	68	15		100	85
		Wr		92			108	109	106		90	105
	White Sucker	PSD		98		100	100	100	100		100	100
		PSD-P		45		100	100	100	100		87	100
		Wr		92		95						
std exp gill net	Bigmouth Buffalo	PSD				0	25	40	38			
		PSD-P				0	0	0	25			
		Wr				98						
	Black Bullhead	PSD		0		0	2	46	31			
		PSD-P		0		0	0	0	0			
		Wr		94		95						

			Year									
Gear	Species	Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
std exp gill net	Channel Catfish	PSD		0			100	11	83			
		PSD-P		0			0	0	0			
		Wr					78	102	93			
	Common Carp	PSD		33		29	100	60	78			
		PSD-P		0		0	0	0	11			
		Wr		94		89						
	River Carpsucker	PSD				100						
		PSD-P				100						
		Wr				119						
	Walleye	PSD		7		29	18	93	87			
		PSD-P		0		14	2	2	5			
		Wr		93		92	87	93	88			
	White Crappie	PSD		0				50	25			
		PSD-P		0				50	0			
		Wr		96				110	106			
	White Sucker	PSD		91		100	100	100				
		PSD-P		21		100	100	100				
		Wr		96		101						

Fish Condition

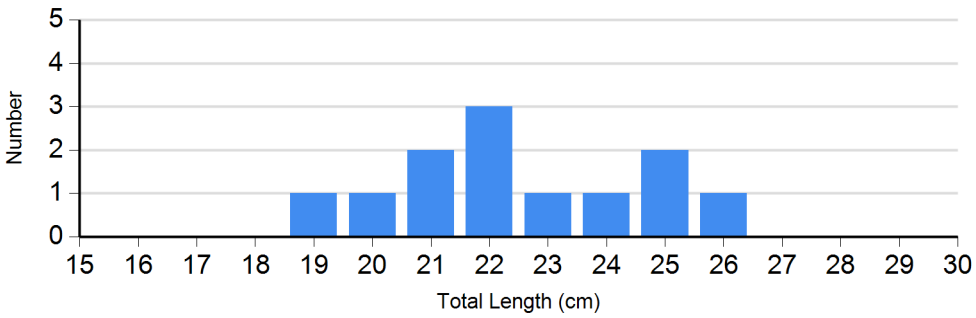
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	2015	1	154	1	113	0		0	
	2019	0		1	116	1	112	0	
Channel Catfish Gill Net	2015	8	105 (2.7)	1	79	0		0	
	2016	1	98	5	93 (3.6)	0		0	
	2017	4	86 (3.3)	16	88 (3.5)	0		0	
	2018	16	86 (1.9)	22	88 (2.3)	1	77	0	
	2019	32	86 (1.3)	9	95 (4.5)	0		0	
Walleye Gill Net	2015	7	97 (3.5)	95	93 (0.5)	2	87 (5.0)	0	
	2016	8	96 (4.1)	51	87 (0.8)	3	80 (13.6)	0	
	2017	1	75	24	78 (1.8)	9	76 (1.5)	2	81 (1.2)
	2018	1	87	18	82 (1.1)	22	77 (0.7)	1	81
	2019	1	87	9	89 (1.8)	9	83 (1.8)	0	
White Crappie Frame Net	2015	4	120 (3.0)	4	117 (8.2)	14	108 (4.5)	3	90 (4.7)
	2016	196	107 (0.9)	0		28	104 (1.5)	7	91 (8.6)
	2017	6	96	85	91 (1.3)	145	90 (0.6)	11	91 (2.3)
	2018	0		0		109	90 (0.6)	17	89 (1.1)
	2019	8	117 (4.7)	1		28	105 (2.1)	25	103 (1.4)

Length Frequency Distribution

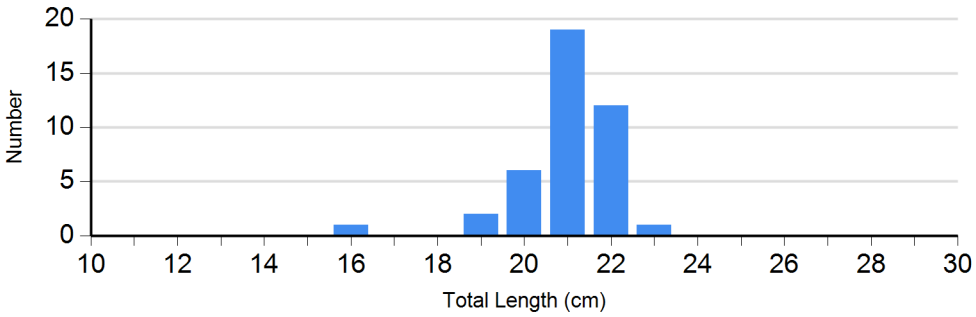
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net

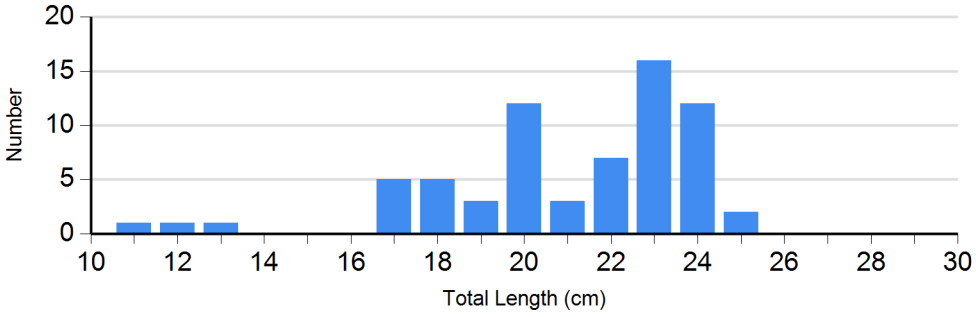


2017

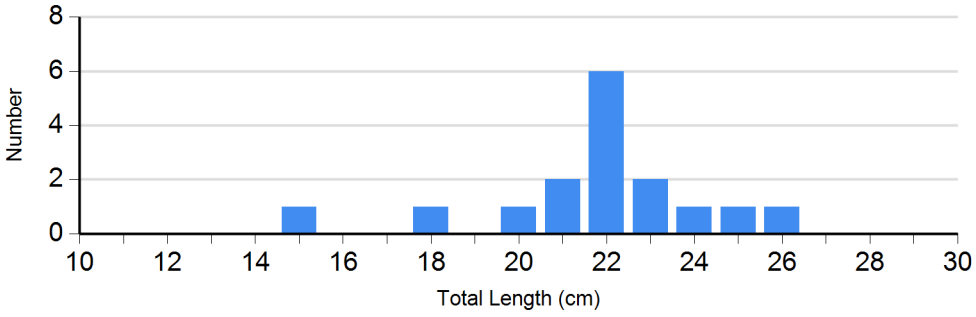
Species: Black Bullhead
Gear: std exp gill net



2014

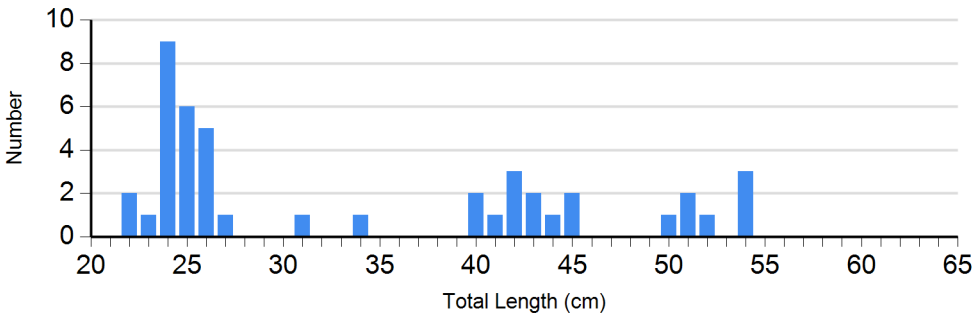


2015



2016

Species: Channel Catfish
Gear: AFS std gill net



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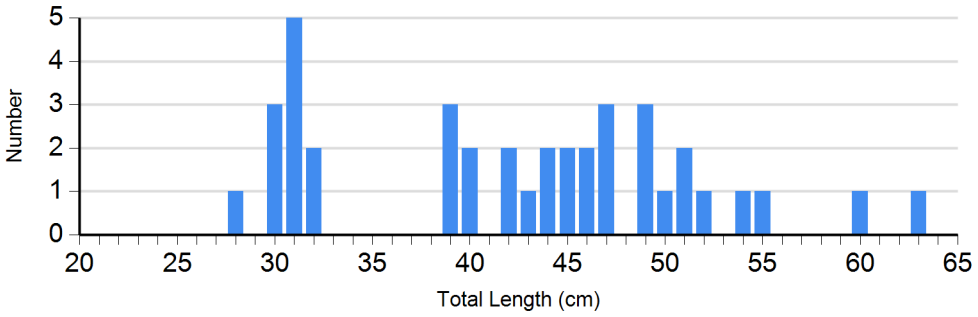
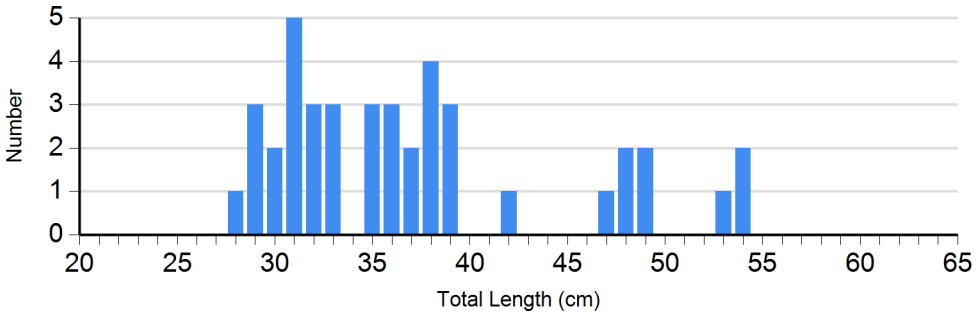
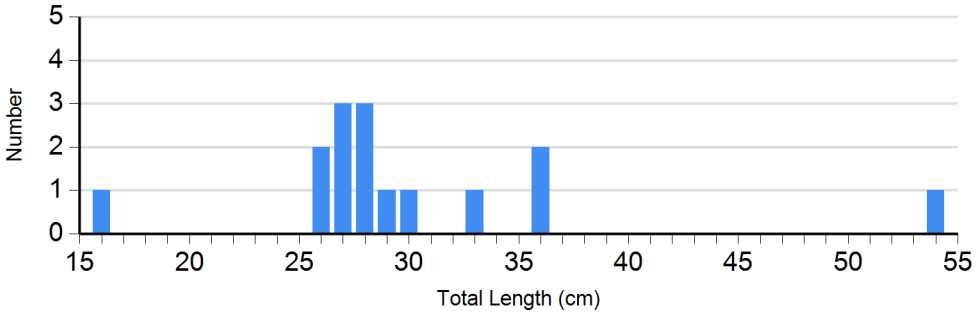


2018



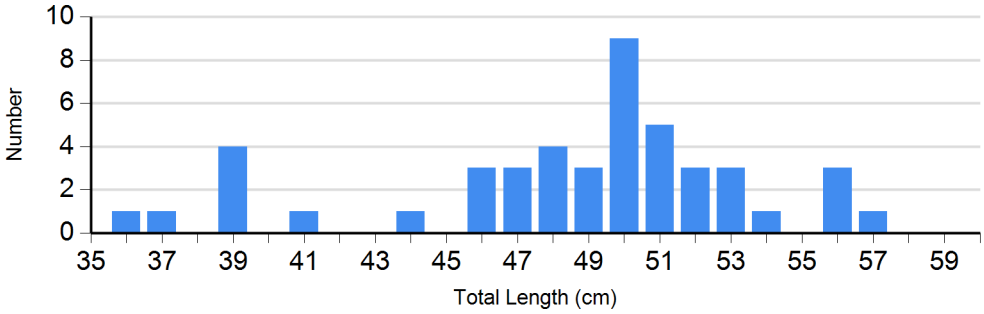
2019

Species: Channel Catfish
Gear: std exp gill net

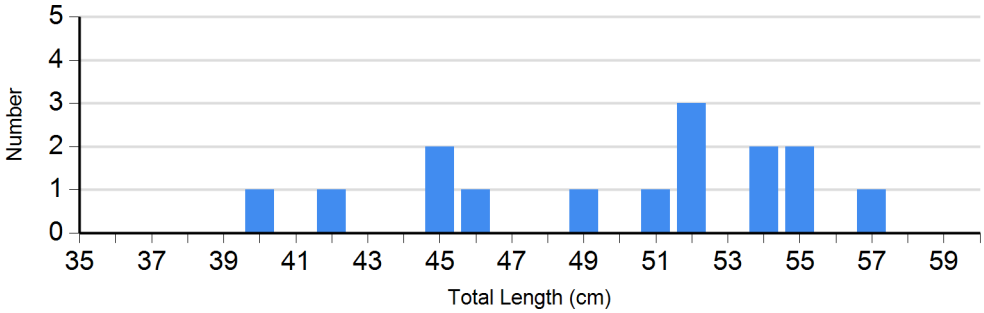


2015

Species: Common Carp
Gear: AFS std gill net

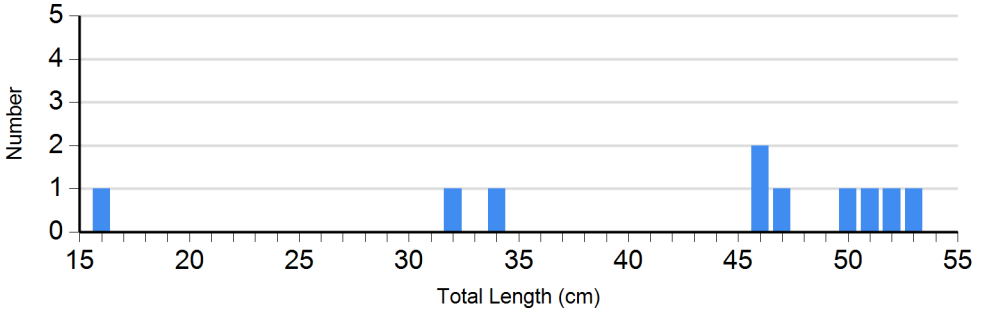


2017



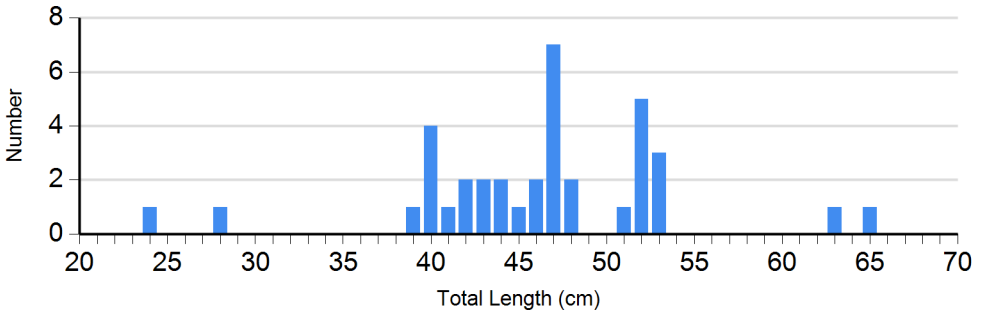
2018

Species: Common Carp
Gear: std exp gill net

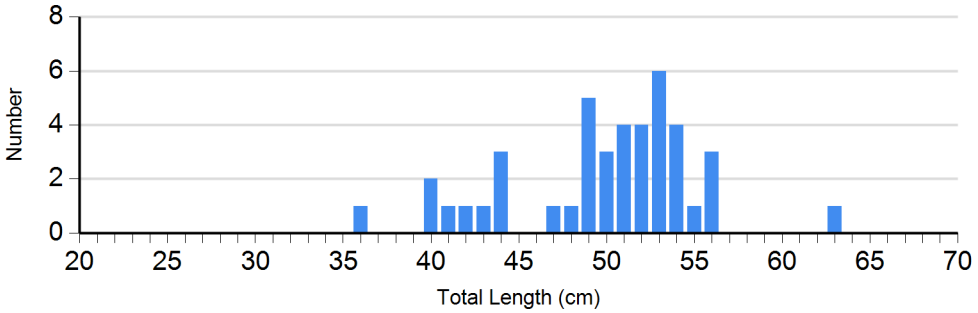


2016

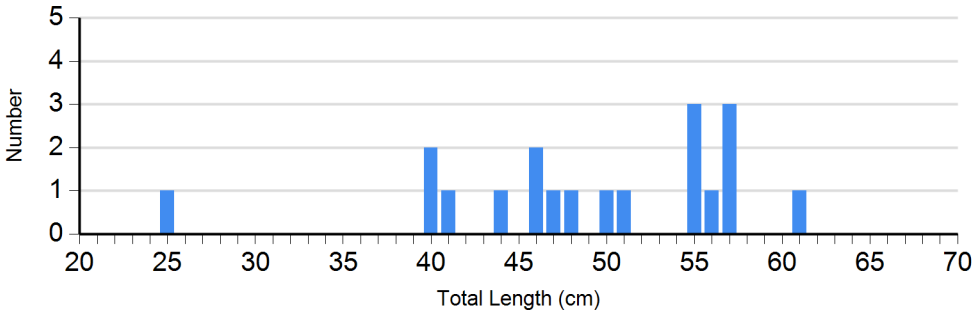
Species: Walleye
Gear: AFS std gill net



2017

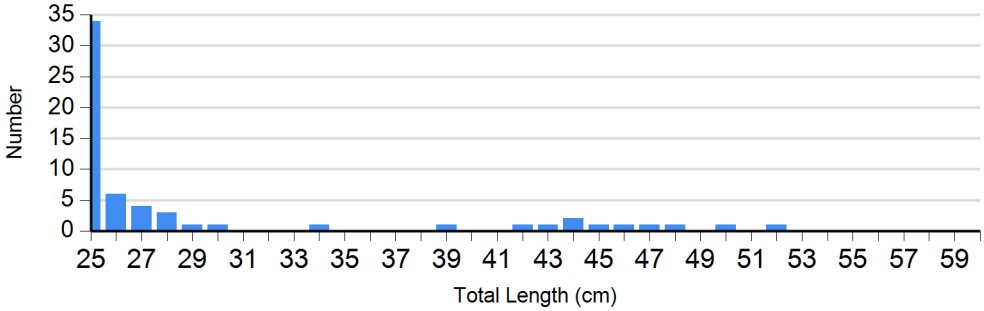


2018

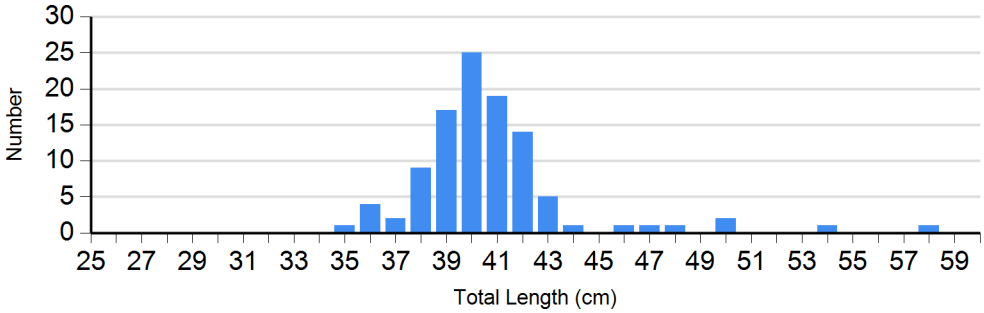


2019

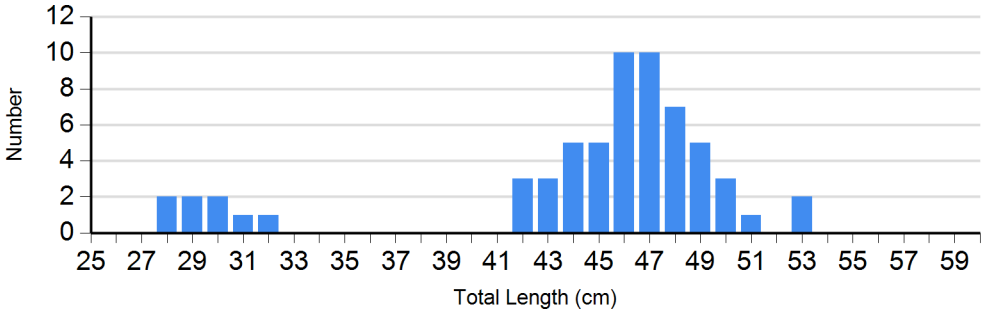
Species: Walleye
Gear: std exp gill net



2014

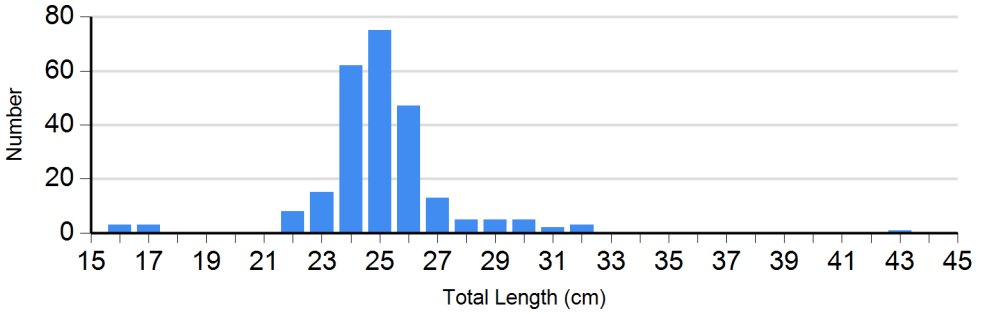


2015



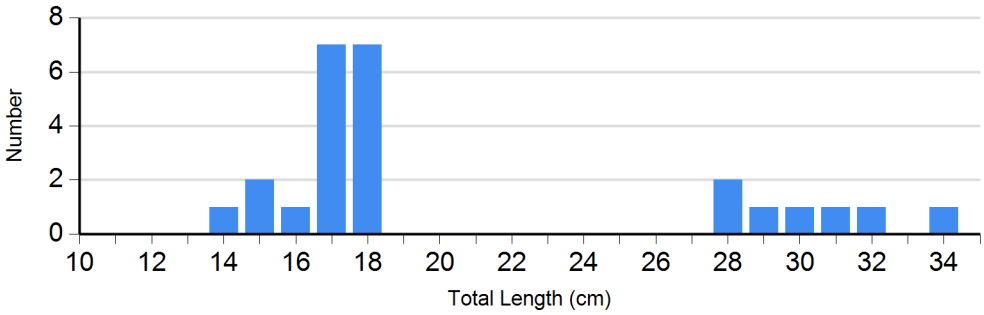
2016

Species: White Crappie
Gear: AFS std frame net

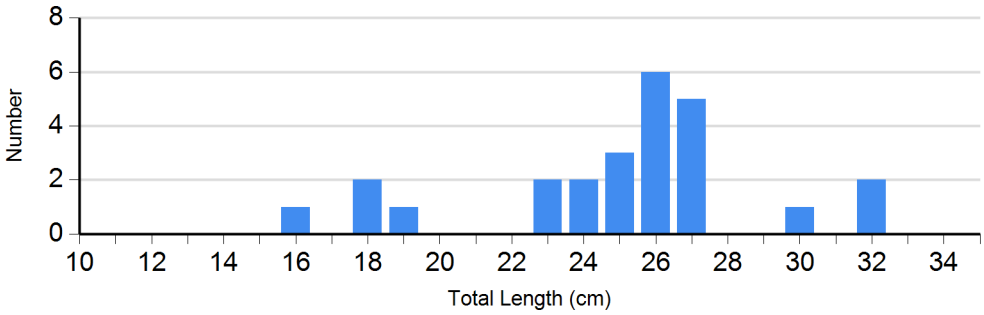


2017

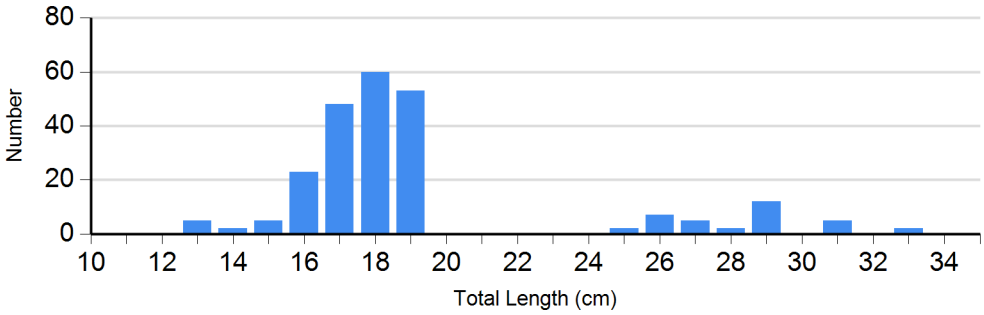
Species: White Crappie
Gear: frame net (std 3/4 in)



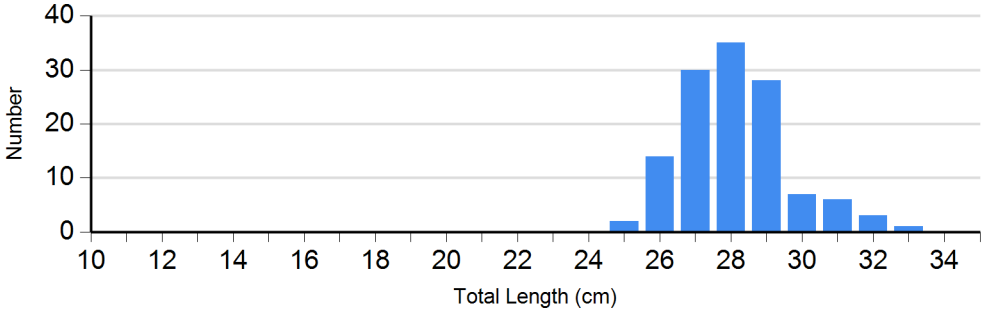
2014



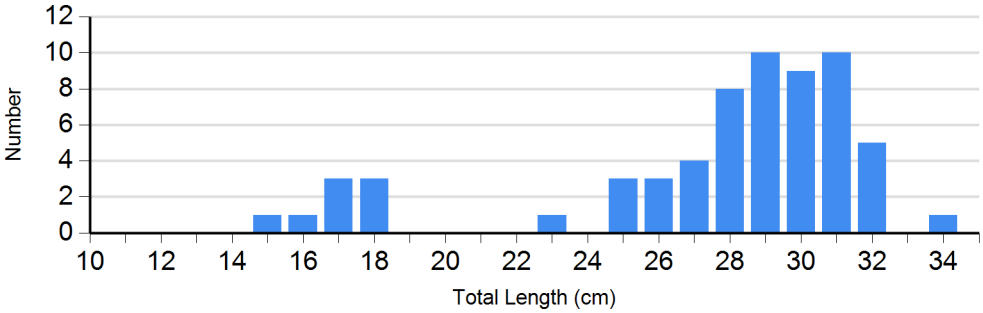
2015



2016



2018

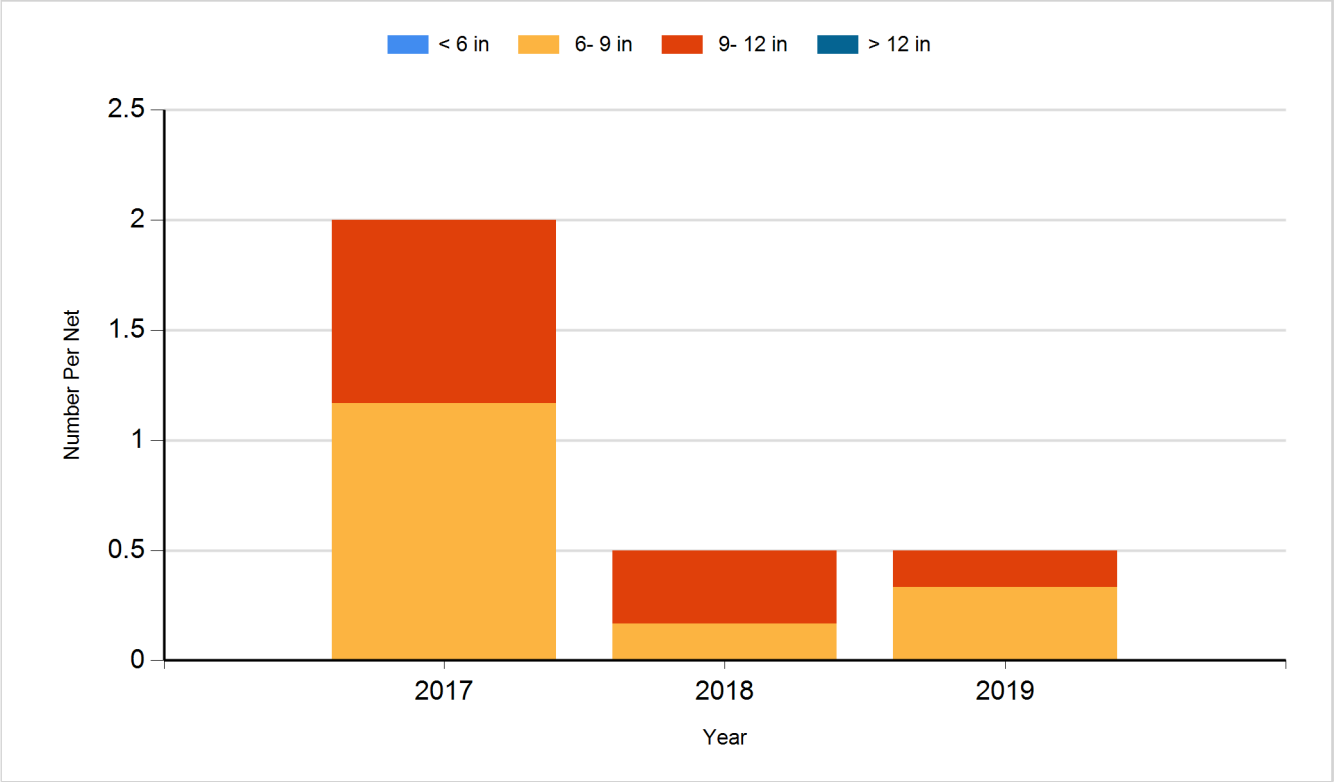

12
10
8
6
4
2
0
Number
10
12
14
16
18
20
22
24
26
28
30
32
34
Total Length (cm)

2019

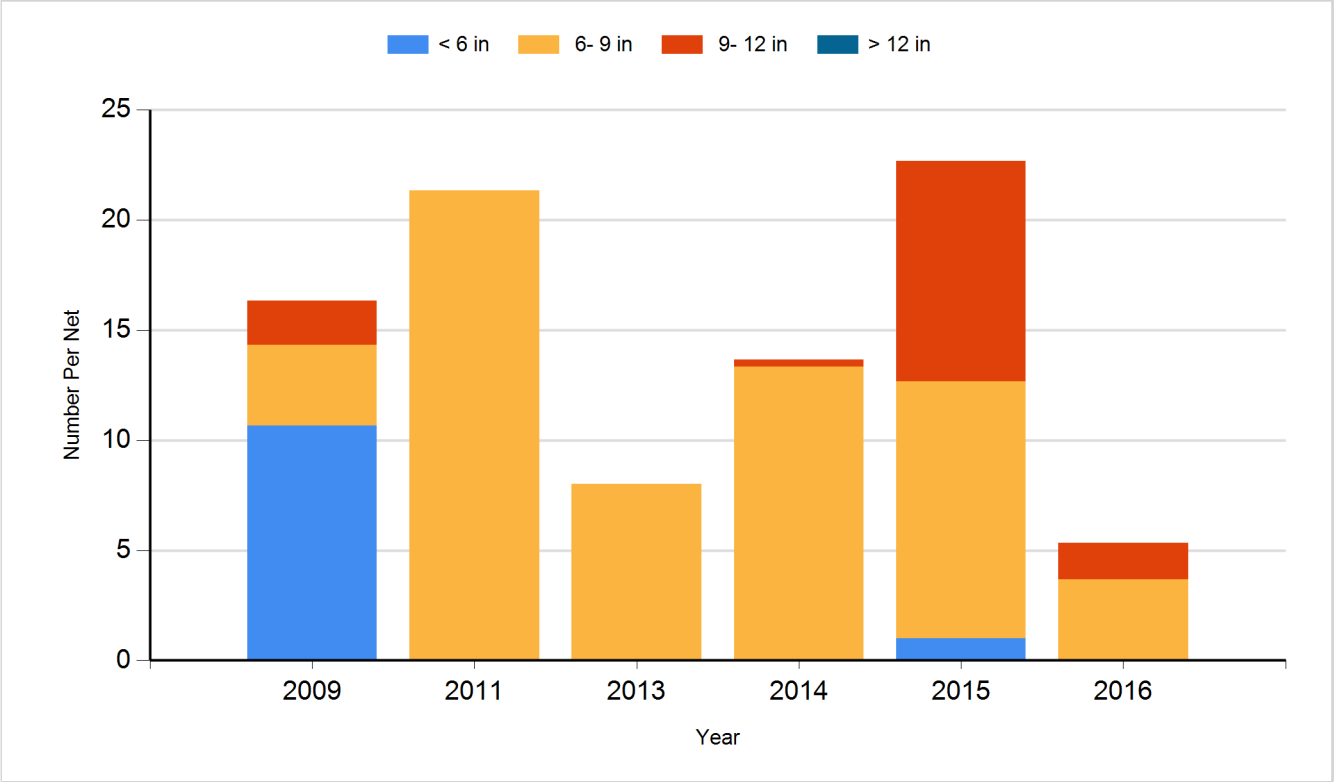
Historic Fish Sizes and Relative Abundance

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

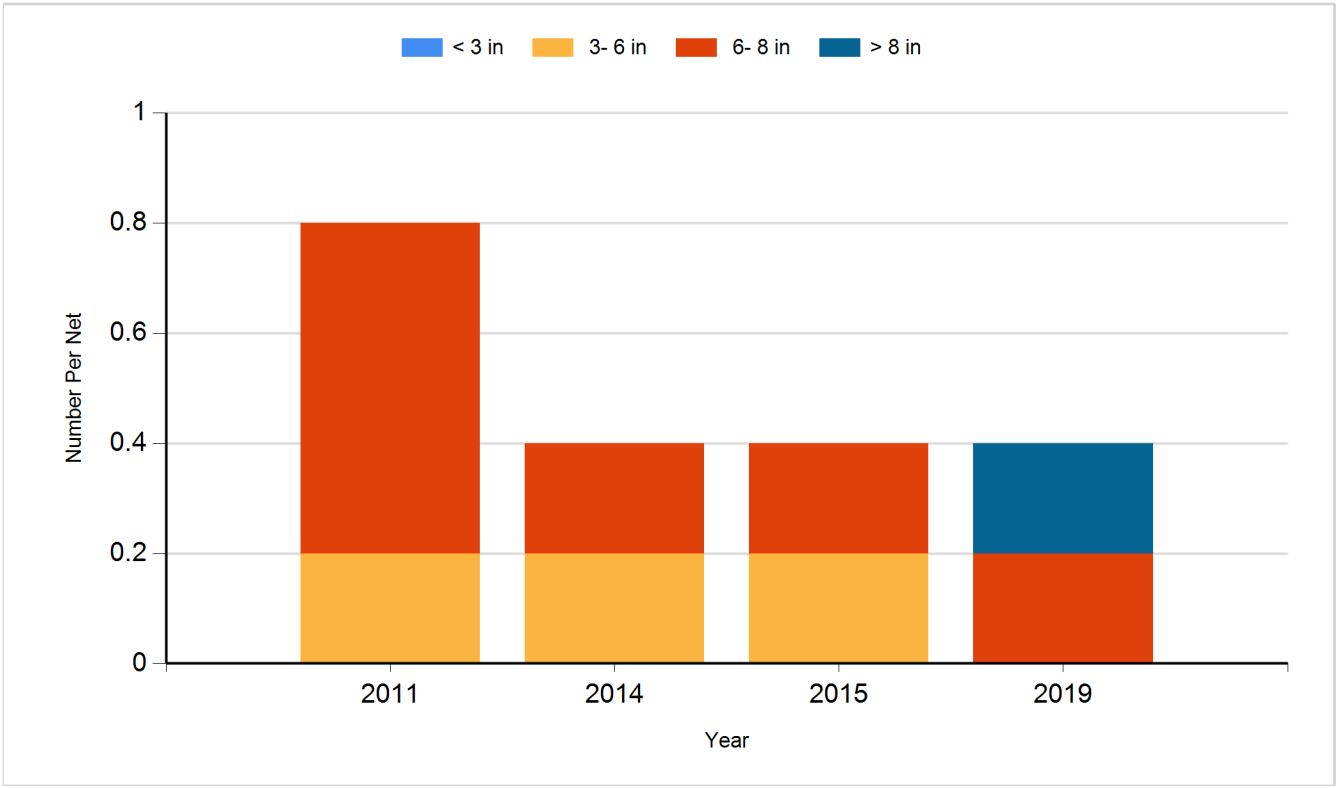
Species: Black Bullhead
Gear: AFS std gill net



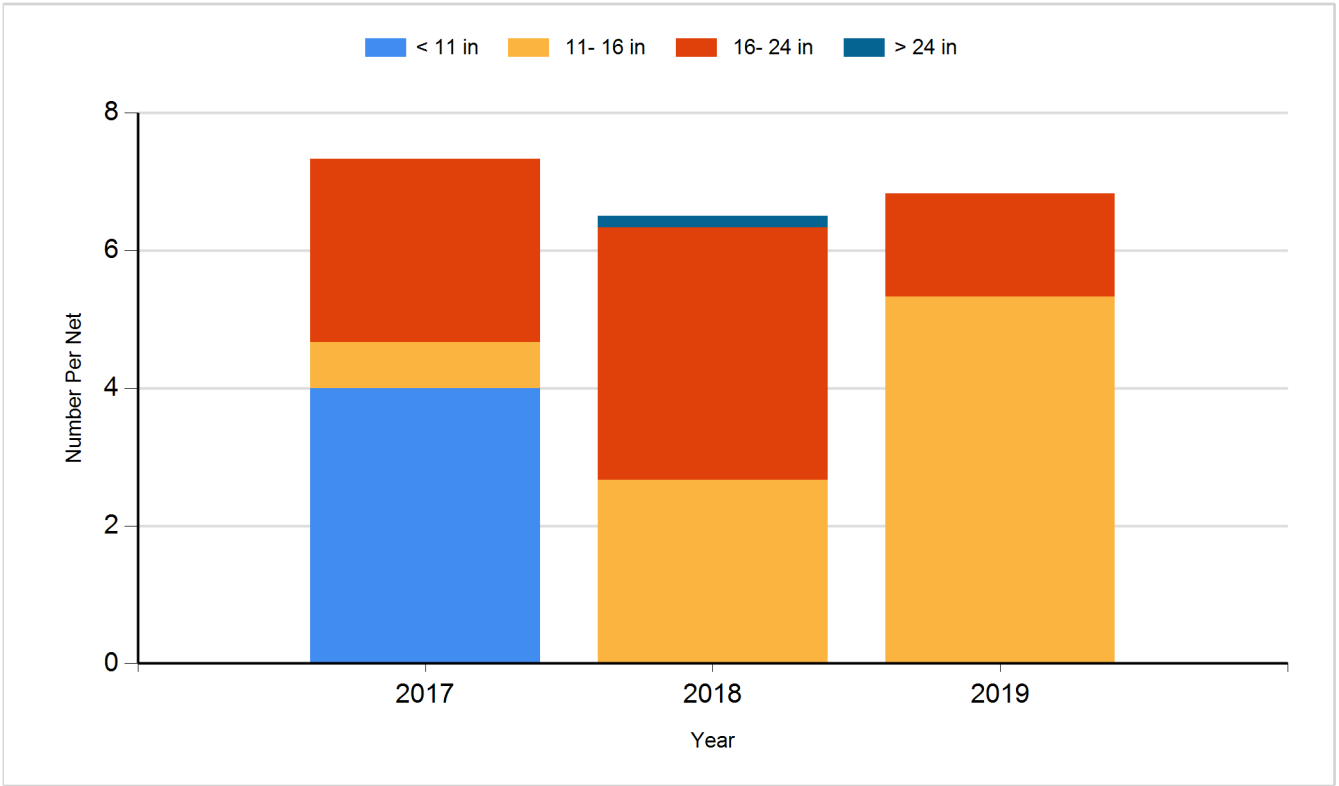
Species: Black Bullhead
Gear: std exp gill net



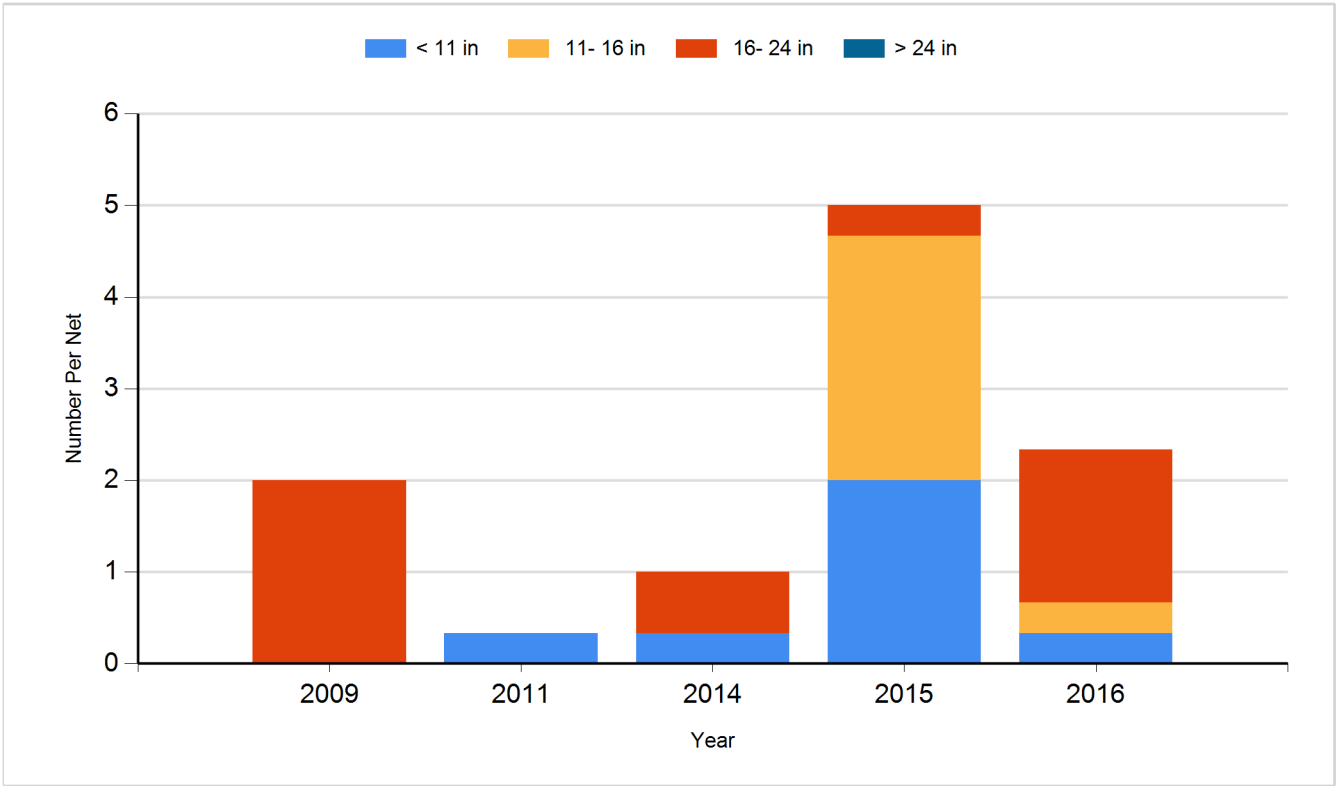
Species: Bluegill
Gear: frame net (std 3/4 in)



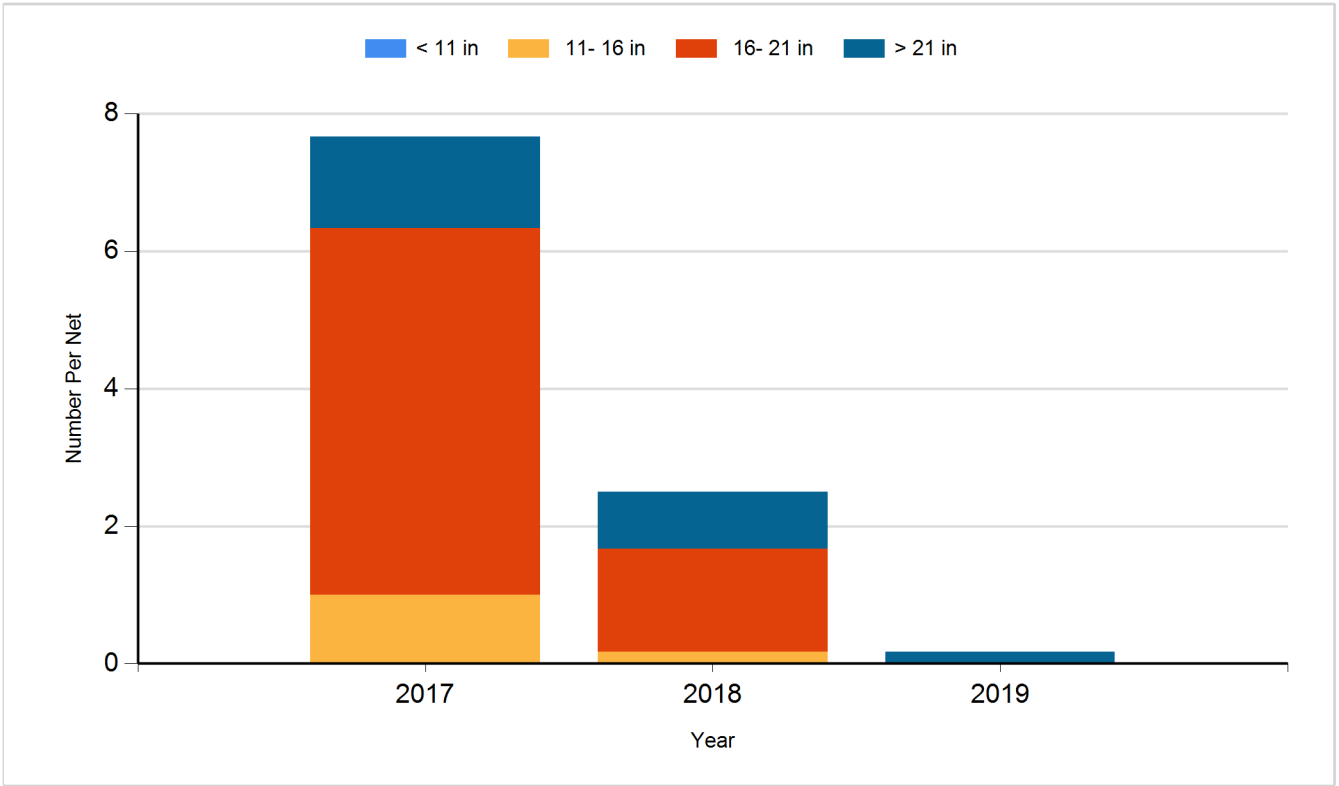
Species: Channel Catfish
Gear: AFS std gill net



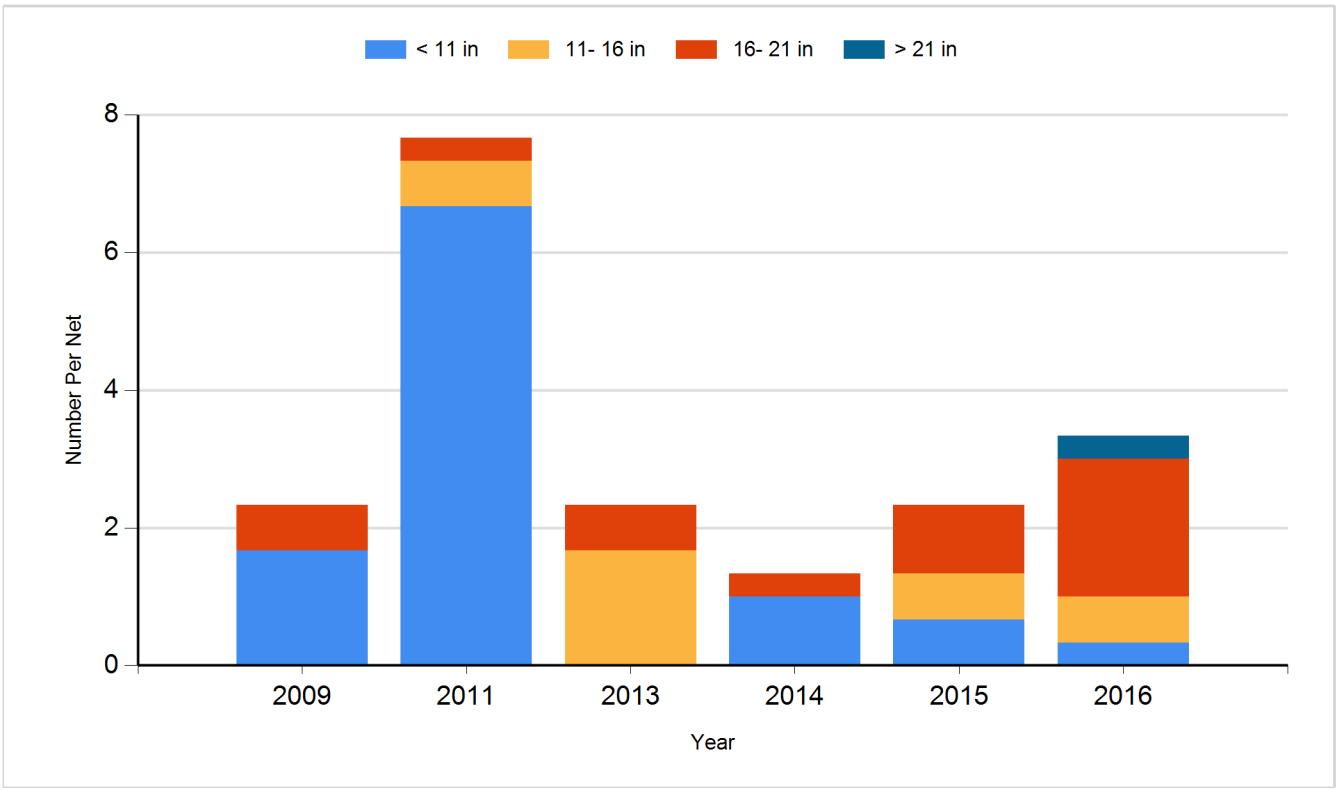
Species: Channel Catfish
Gear: std exp gill net



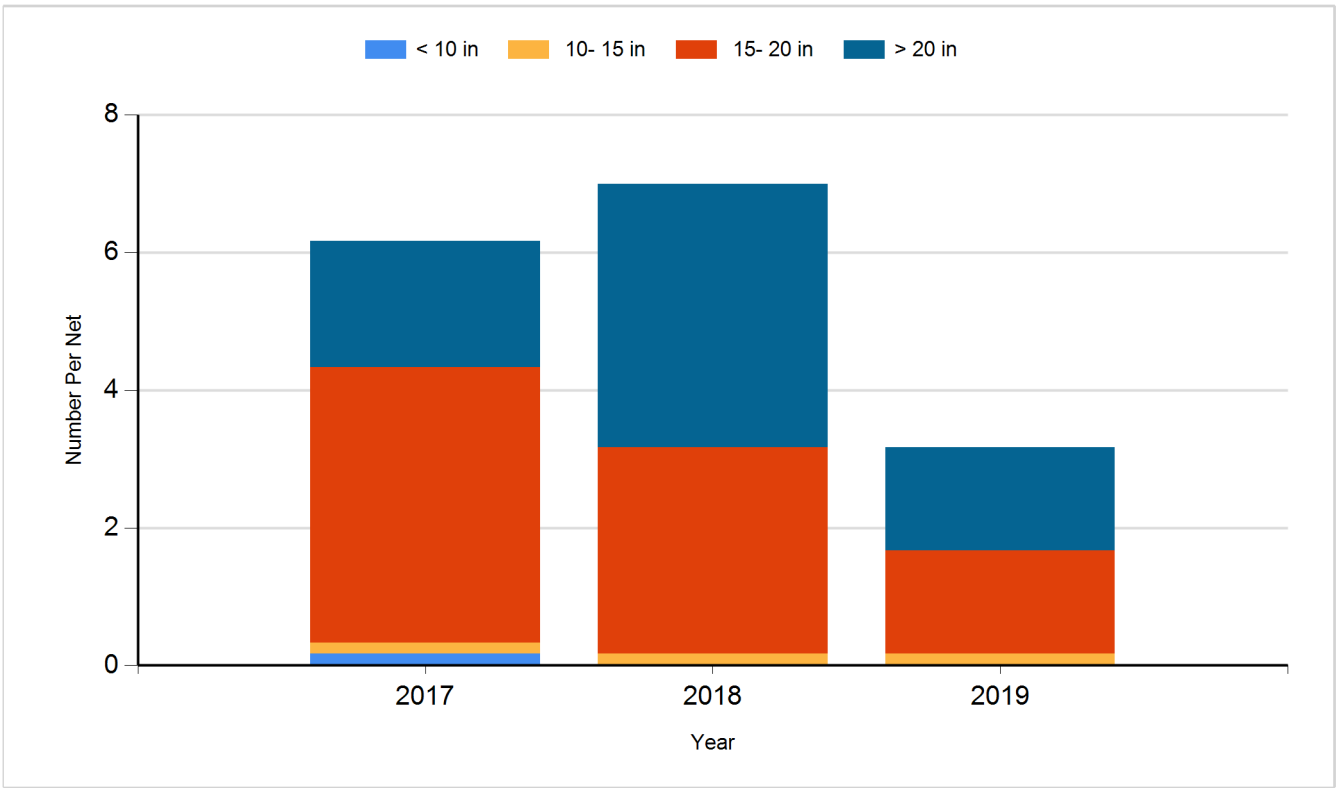
Species: Common Carp
Gear: AFS std gill net



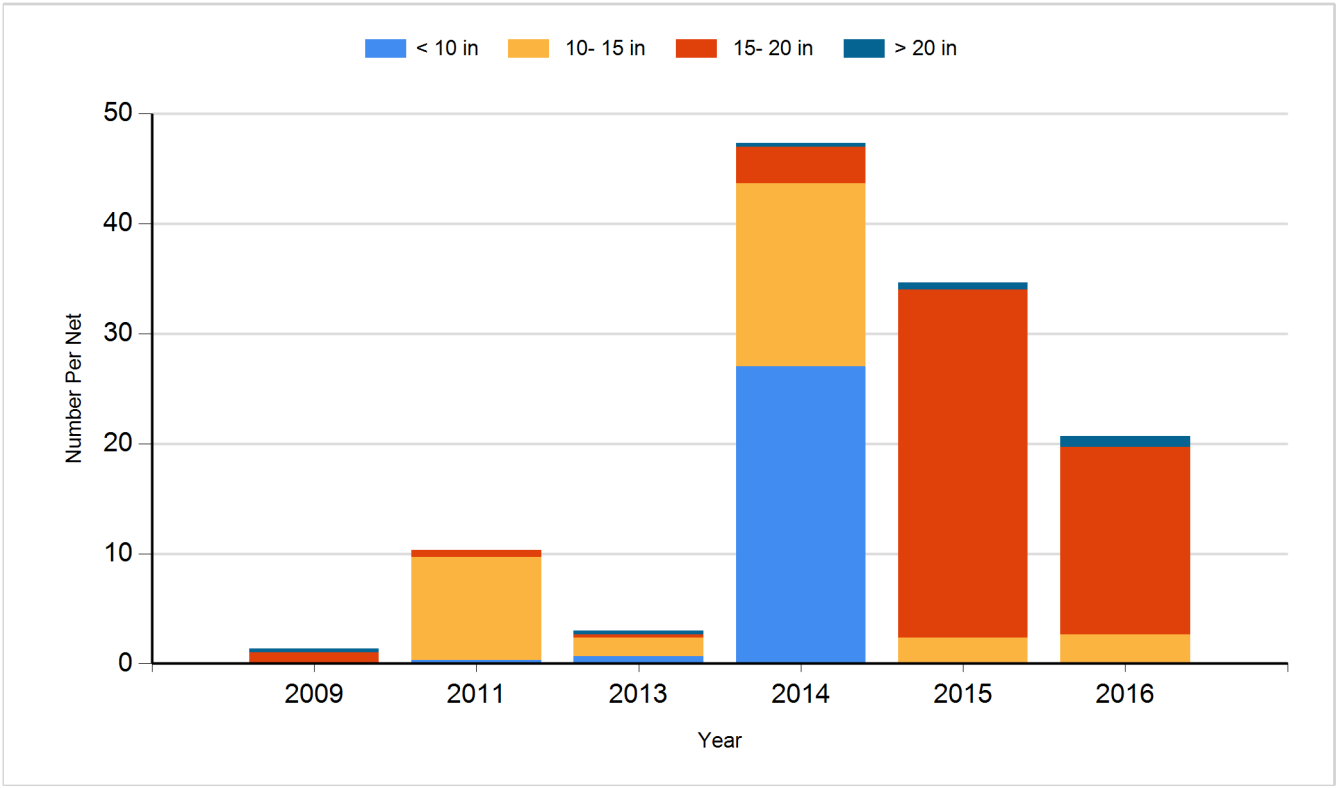
Species: Common Carp
Gear: std exp gill net



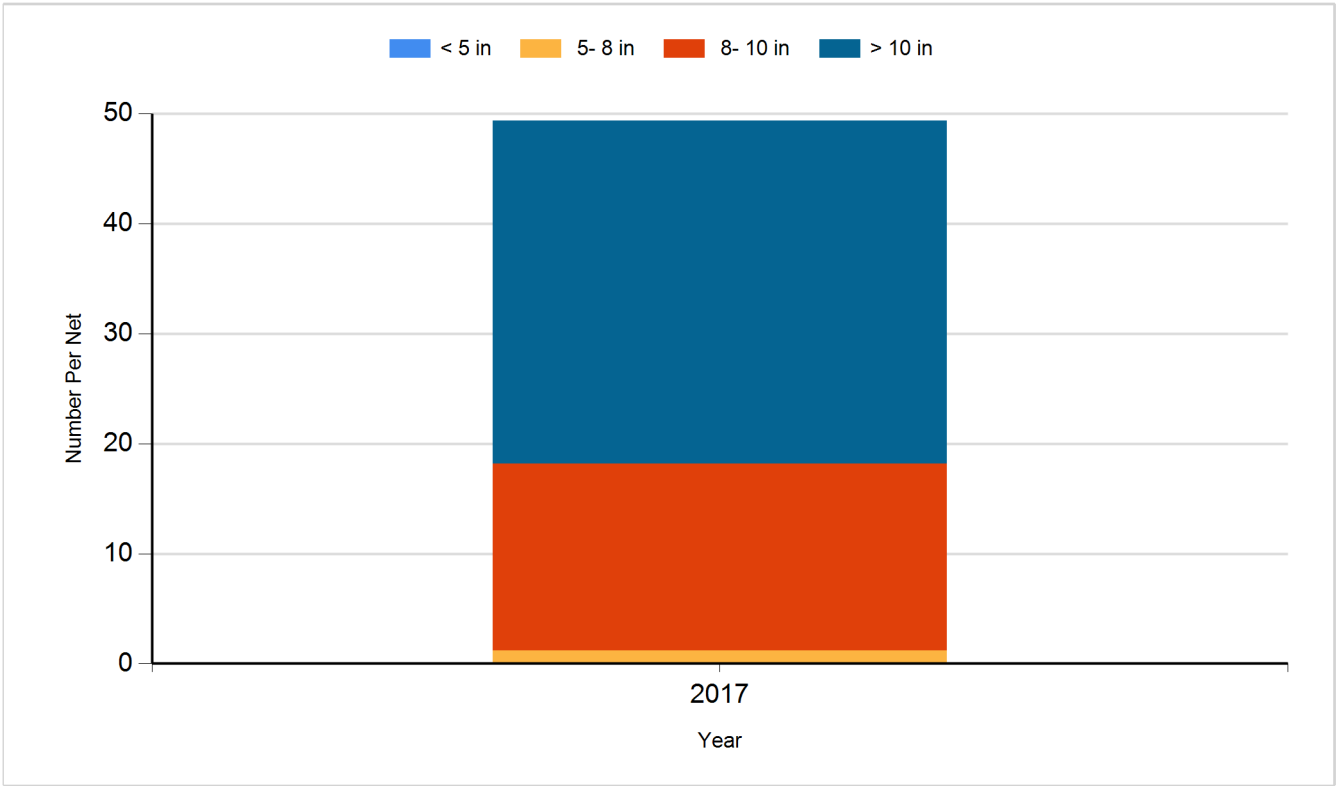
Species: Walleye
Gear: AFS std gill net



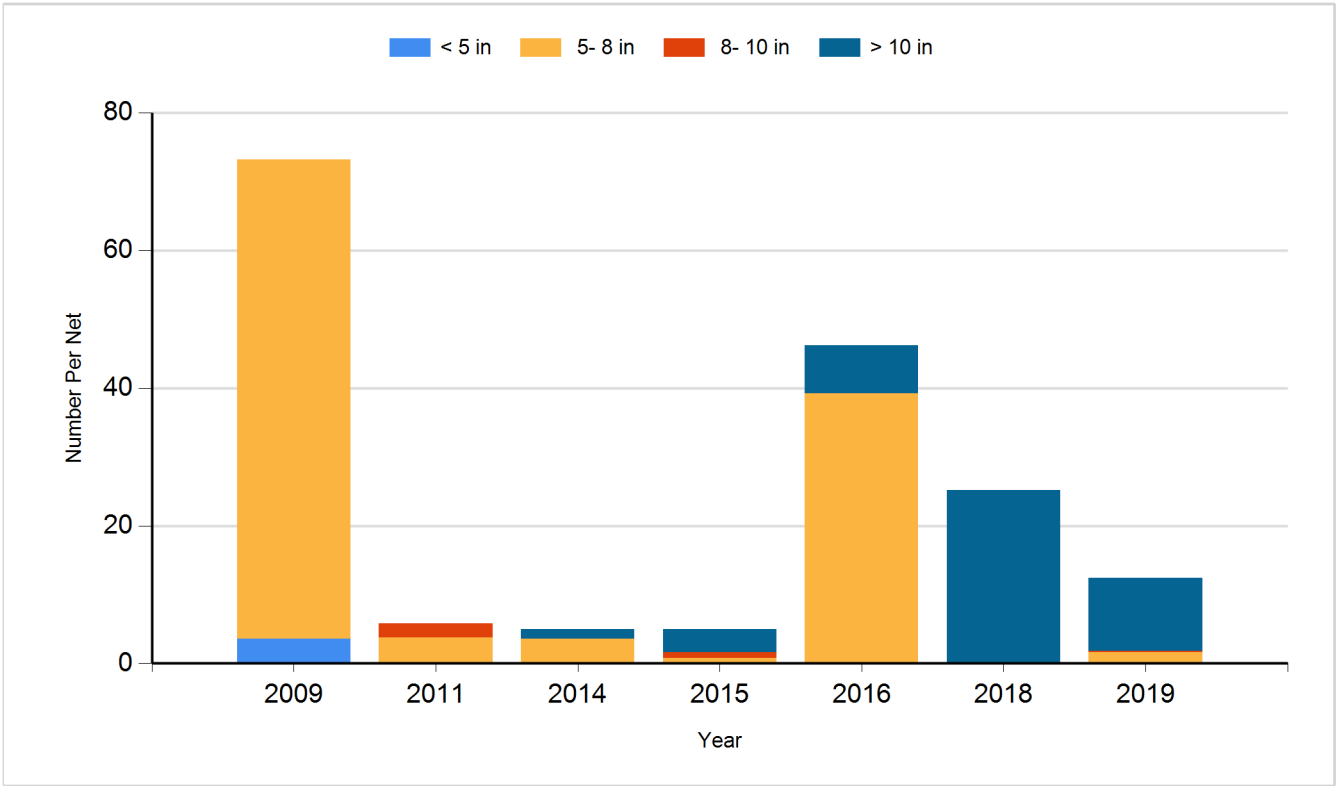
Species: Walleye
Gear: std exp gill net



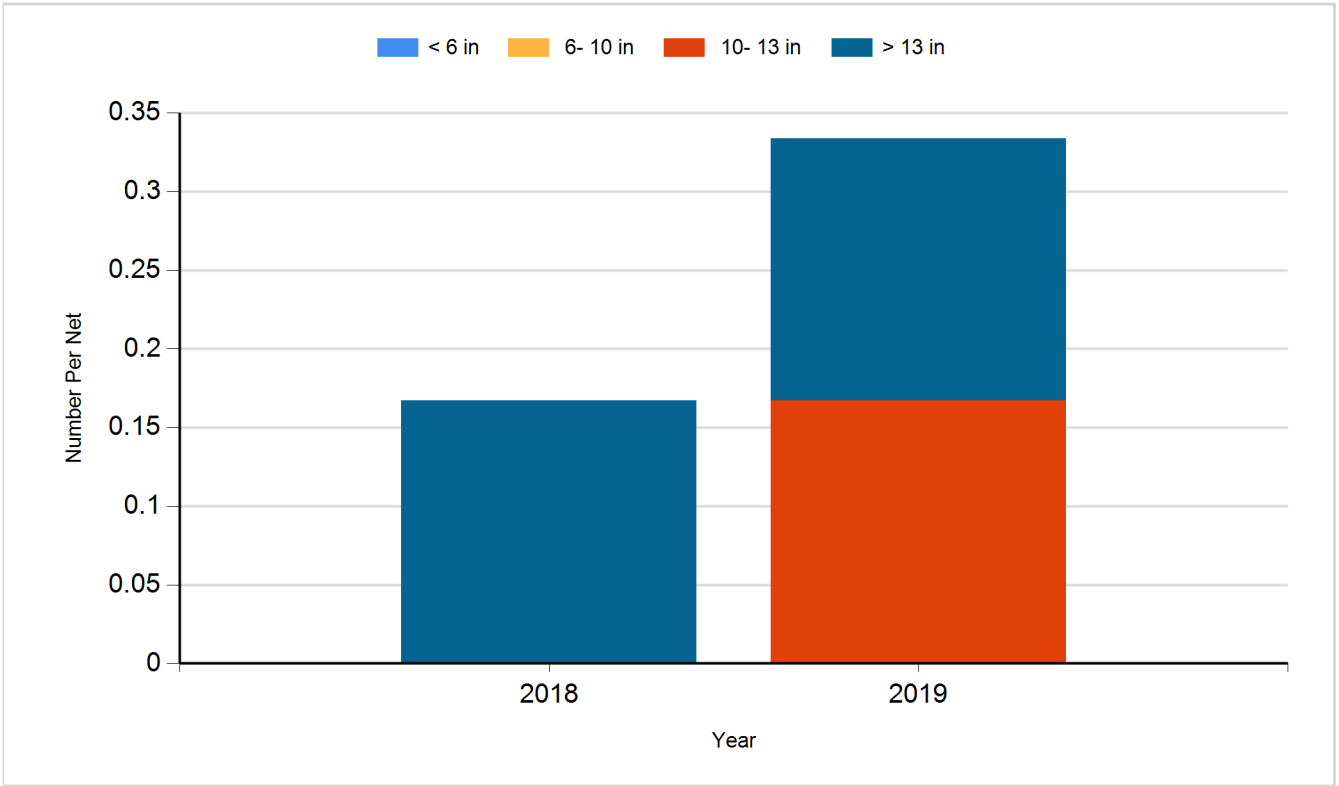
Species: White Crappie
Gear: AFS std frame net



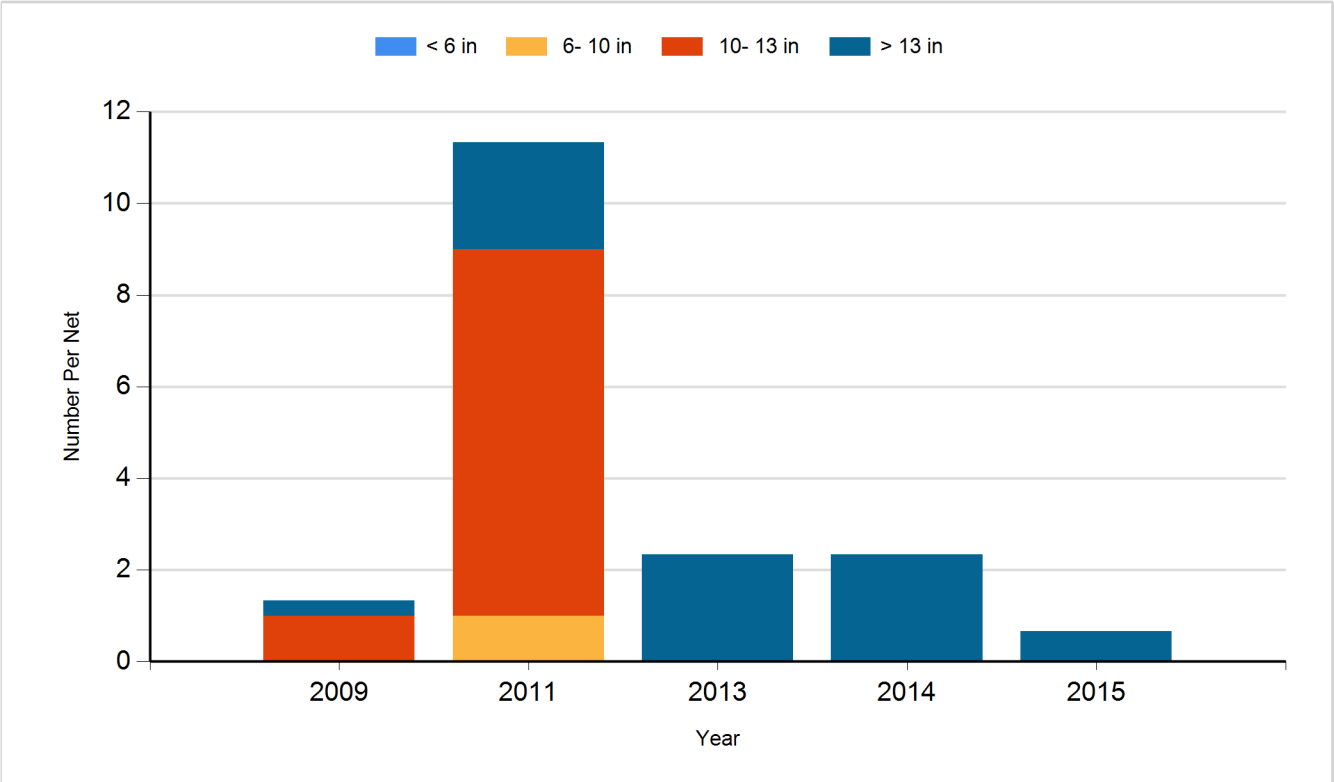
Species: White Crappie
Gear: frame net (std 3/4 in)



Species: White Sucker
Gear: AFS std gill net



Species: White Sucker
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2009	Walleye	Large Fingerling	1,080
2010	Walleye	Small Fingerling	18,200
2011	Walleye	Large Fingerling	438
2011	Yellow Perch	Adult	2,260
2012	Walleye	Fingerling	36,750
2013	Walleye	Small Fingerling	20,000
2014	Walleye	Fry	232,000
2019	Walleye	Small Fingerling	15,030