

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Swan, Turner County

VER-Lake-113-000

2021

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 24, 2021	4 net-nights
frame net (std 3/4 in)	May 24, 2021	5 net-nights

Common Fish Species Present

Walleye

Black Bullhead

Channel Catfish

Bigmouth Buffalo

White Sucker

Common Carp

Bluegill

River Carpsucker

Gizzard Shad

Yellow Perch

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.
- **std 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.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

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.

$$PSD = \left(\frac{\text{number of fish} \geq \text{quality length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

$$PSD - P = \left(\frac{\text{number of fish} \geq \text{preferred length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

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.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

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).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(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**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition	
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr
AFS std gill net	Bigmouth Buffalo	56	14.0	3.5	2		2		
	Black Bullhead	37	9.3	5.4	76	11	0		
	Channel Catfish	65	16.3	1.6	66	9	0	93	3
	Common Carp	1	0.3	0.4	100		100		
	Gizzard Shad	1	0.3	0.4	0				
	River Carpsucker	1	0.3	0.4	100		100		
	Shortnose Gar	1	0.0	0.0					
	Walleye	7	1.8	0.4	43		43	88	5
	White Sucker	9	2.3	1.8	100		100		
frame net (std 3/4 in)	Bigmouth Buffalo	30	6.0	4.7	0		0		
	Black Bullhead	738	147.6	100.0	100		0		
	Bluegill	2	0.4	0.6	50		50	131	10
	Channel Catfish	35	7.0	3.4	91		3	94	5
	Common Carp	2	0.4	0.4	100		0		
	River Carpsucker	1	0.2	0.3	100		100		
	Shortnose Gar	14	0.0	0.0					
	Sunfish Hybrid	3	0.0	0.0					
	Walleye	7	1.4	1.1	86		86	90	6
	White Sucker	27	5.4	3.1	100		96		
	Yellow Perch	1	0.2	0.3	0		0	58	

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.

* Methods/Species that ignore stock length

Gear	Species	CPUE										Avg	
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		
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		14.0		4.75
	Black Bullhead						2.0	0.5	0.5		9.3		3.08
	Channel Catfish						3.3	6.5	6.8		16.3		8.23
	Common Carp						7.7	2.5	0.2		0.3		2.68
	Gizzard Shad						0.0	0.0	0.0		0.3		0.08
	Quillback						0.0	0.0	0.0		0.0		0.00
	River Carpsucker						0.0	0.0	0.3		0.3		0.15
	Shortnose Gar						0.0	0.0	0.0		0.0		0.00
	Walleye						6.0	7.0	3.2		1.8		4.50
	White Crappie						0.0	0.3	0.8		0.0		0.28
White Sucker						0.0	0.2	0.3		2.3		0.70	
frame net (std 3/4 in)	Bigmouth Buffalo		0.4	0.2	0.4	0.4		0.0	1.8		6.0		1.31
	Black Bullhead		37.8	40.4	31.8	60.6		23.0	17.4		147.6		51.23
	Black Crappie		0.0	0.0	0.0	0.2		0.0	0.0		0.0		0.03
	Bluegill		0.0	0.4	0.4	0.0		0.0	0.4		0.4		0.23
	Channel Catfish		1.2	0.4	0.0	5.2		1.4	17.0		7.0		4.60
	Common Carp		0.4	2.4	0.2	3.4		0.2	4.0		0.4		1.57
	Green Sunfish		0.2	0.4	22.8	0.4		0.4	0.0		0.0		3.46
	Northern Pike		0.2	0.0	0.0	0.0		0.0	0.0		0.0		0.03
	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	

		CPUE											
Gear	Species	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg	
frame net (std 3/4 in)	River Carpsucker		0.0	0.0	0.0	0.0		0.2	2.0		0.2	0.34	
	Shorthead Redhorse		0.0	0.0	0.0	0.0		0.0	0.2		0.0	0.03	
	Shortnose Gar		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.00	
	Sunfish Hybrid		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.00	
	Walleye		3.2	2.4	1.8	2.4		2.2	1.6		1.4	2.14	
	White Crappie		0.0	5.0	5.0	46.2		25.2	12.4		0.0	13.40	
	White Sucker		4.4	10.6	10.2	2.8		3.0	1.2		5.4	5.37	
	Yellow Perch		0.0	0.0	0.0	0.0		0.0	0.0		0.2	0.03	
std exp gill net	Bigmouth Buffalo		3.7	2.7	1.7	2.7						2.70	
	Black Bullhead		8.0	13.7	21.7	5.3						12.18	
	Channel Catfish		0.0	0.7	3.0	2.0						1.43	
	Common Carp		2.3	0.3	1.7	3.0						1.83	
	River Carpsucker		0.3	0.0	0.0	0.0						0.08	
	Shortnose Gar		0.0	0.0	0.0	0.0						0.00	
	Sunfish Hybrid		0.0	0.0	0.0	0.0						0.00	
	Walleye		2.3	20.3	34.7	20.7							19.50
	White Crappie		0.0	0.0	0.7	1.3							0.50
	White Sucker		2.3	2.3	0.7	0.0							1.33
	Yellow Perch		0.0	0.0	4.0	0.3							1.08

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.

Gear	Species	Index	Year											
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		
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					
	White Sucker	Wr							71					
		PSD							100					
			PSD-P						33					
	AFS std gill net	Bigmouth Buffalo	PSD							60	88	78		
PSD-P									0	0	11			2
Black Bullhead		PSD							42	67	33			76
		PSD-P							0	0	0			0
Channel Catfish		PSD							80	59	22			66
		PSD-P							0	3	0			0
		Wr							87	87	88			93
Common Carp		PSD							87	93	100			100
		PSD-P							17	33	100			100
Gizzard Shad		PSD												0
River Carpsucker		PSD										100		100
		PSD-P										100		100
Walleye		PSD							97	98	95			43
		PSD-P							31	55	47			43
		Wr							78	80	86			88
White Sucker		PSD									100	100		100
		PSD-P									100	50		100
frame net (std 3/4 in)		Bigmouth Buffalo	PSD		0	0	100	100					89	
	PSD-P			0	0	0	0					22		0

Gear	Species	Index	Year									
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
std exp gill net	River Carpsucker	PSD-P		100								
		Wr		119								
	Walleye	PSD		29	18	93	87					
		PSD-P		14	2	2	5					
		Wr		92	87	93	88					
	White Sucker	PSD		100	100	100						
		PSD-P		100	100	100						
		Wr		101								
	Yellow Perch	PSD				67	100					
		PSD-P				0	0					
		Wr				103	96					

Fish Condition

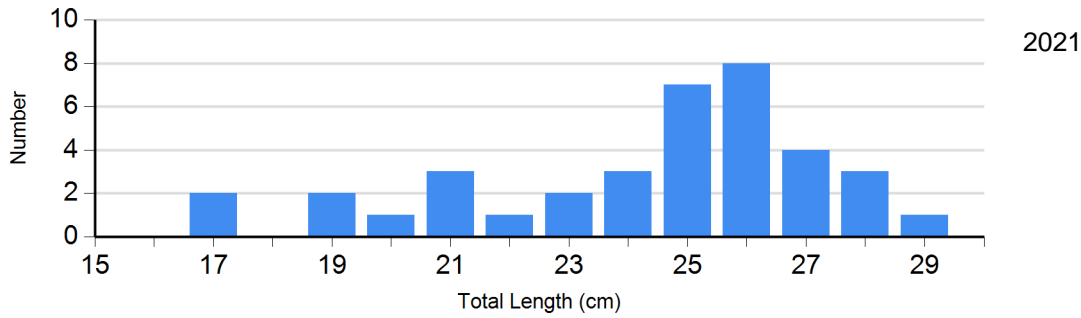
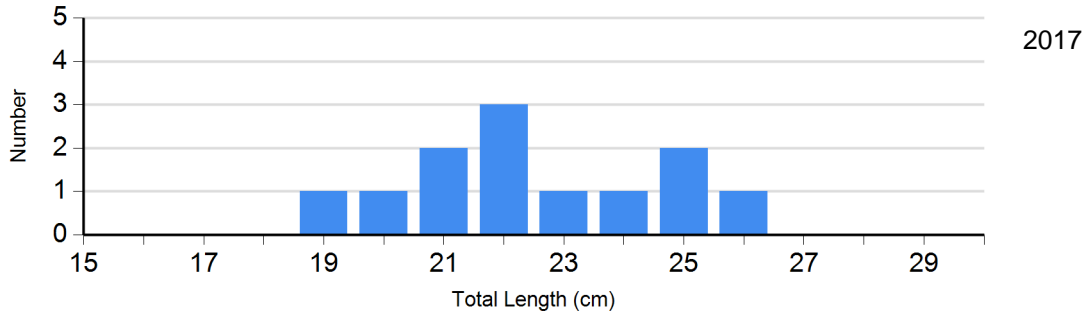
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Bluegill Frame Net	2019	0		1	116	1	112	0	
	2021	1	139	0		1	123	0	
Channel Catfish Gill Net	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	
	2021	22	96 (1.7)	43	91 (2.8)	0		0	
Walleye Gill Net	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	
	2021	4	90 (6.3)	0		3	86 (6.0)	0	

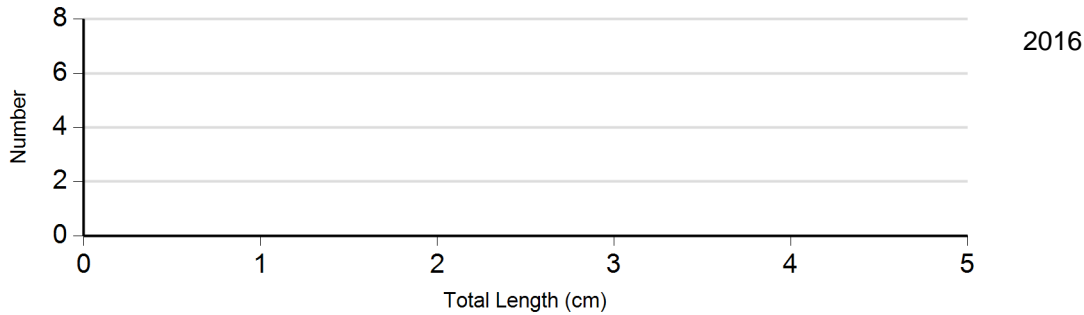
Length Frequency Distribution

Length frequency histogram of species sampled by year.

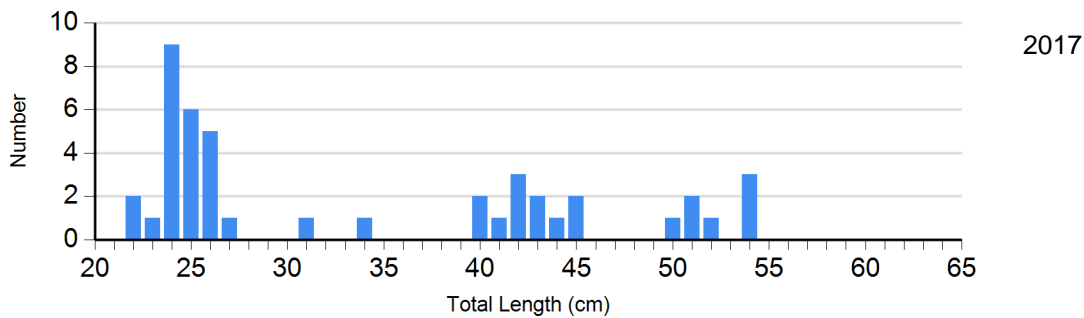
Species: Black Bullhead
Gear: AFS std gill net

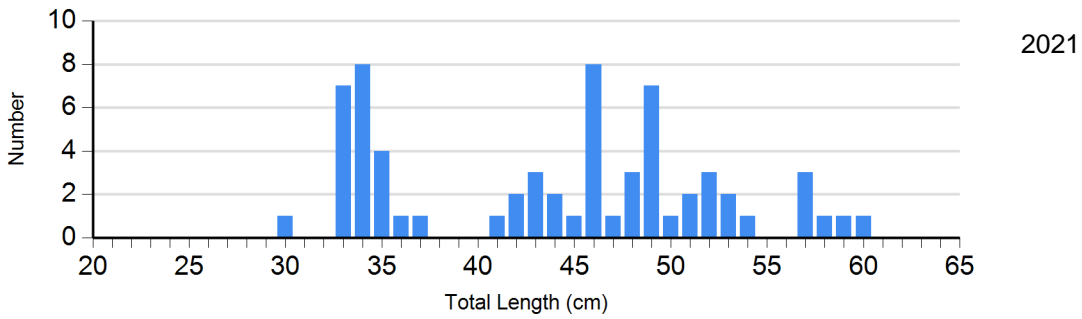
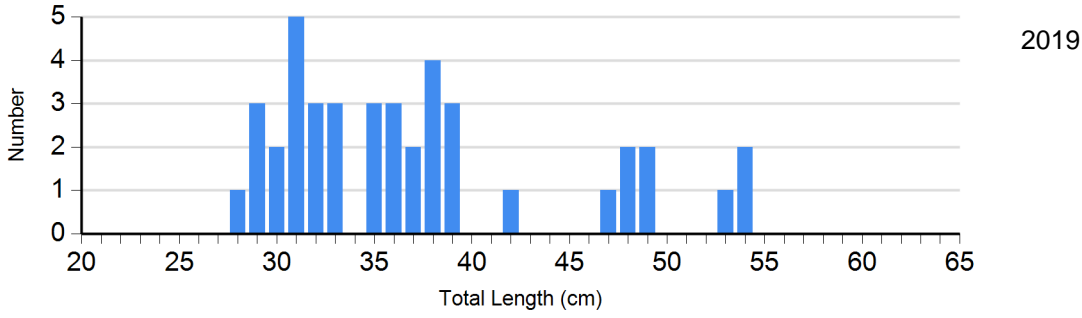
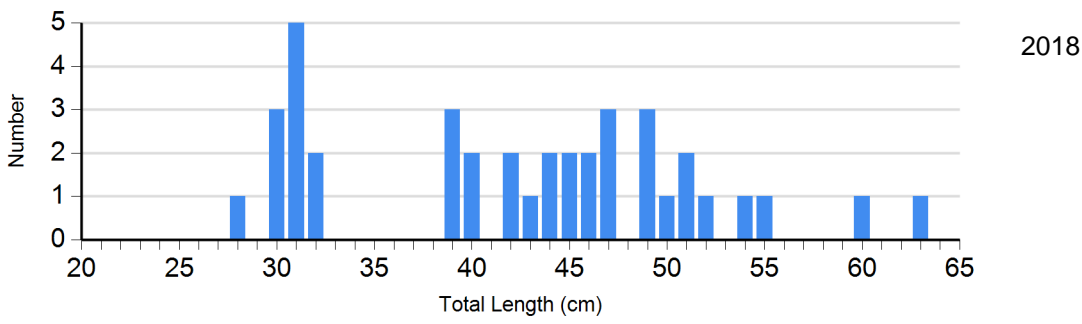


Species: Black Bullhead
Gear: std exp gill net

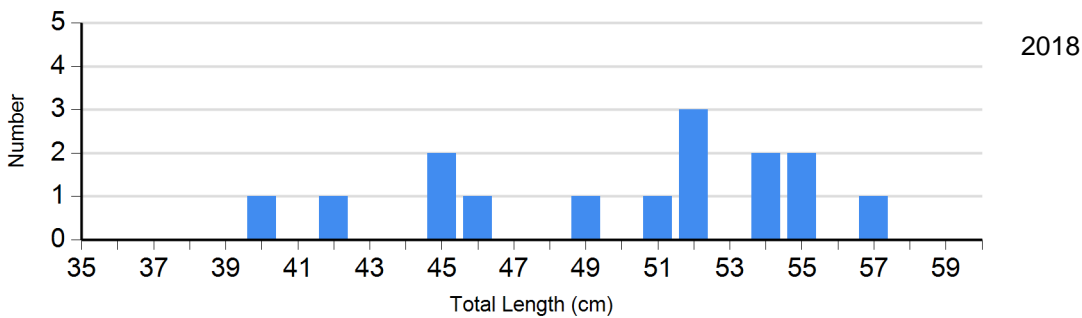
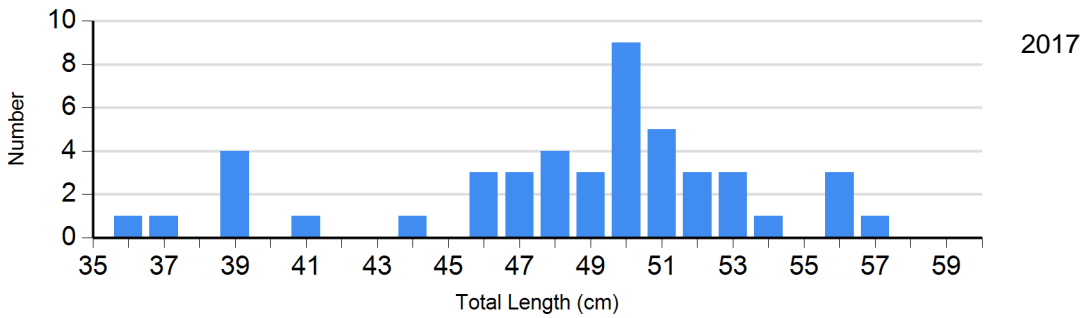


Species: Channel Catfish
Gear: AFS std gill net

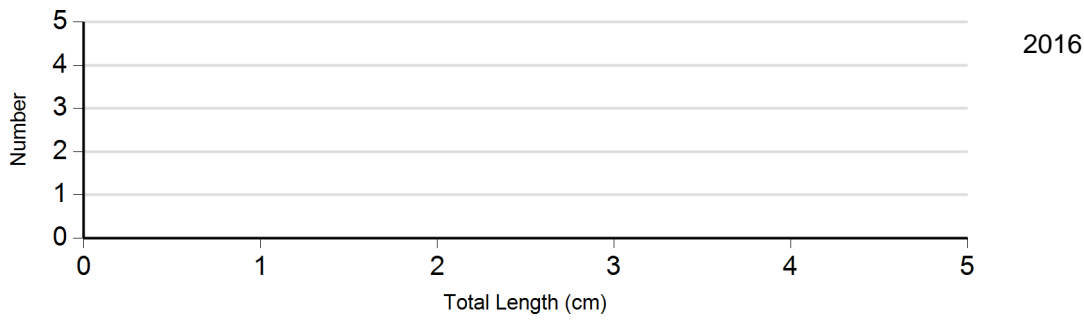




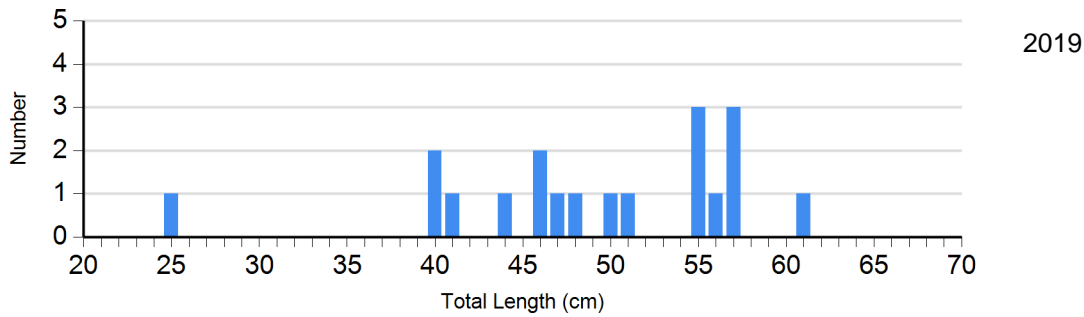
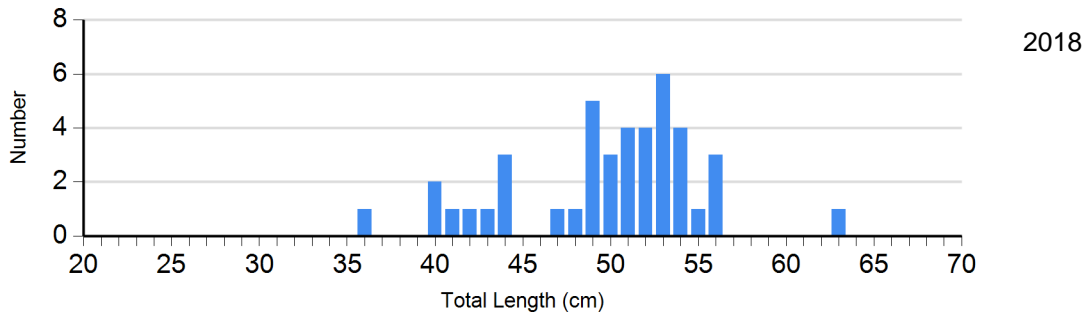
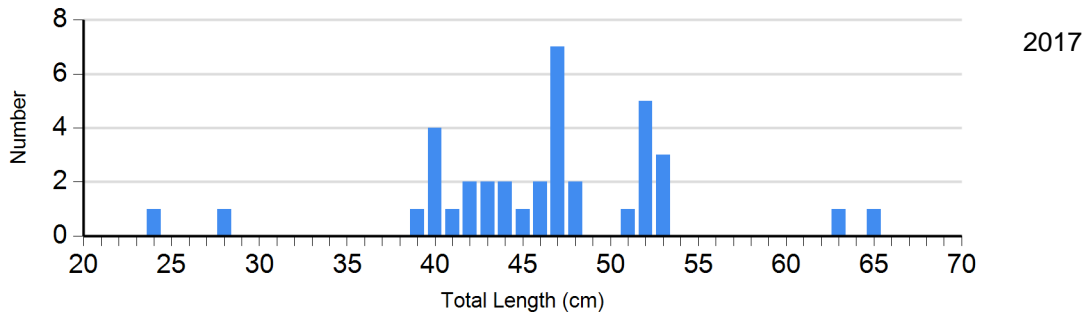
Species: Common Carp
 Gear: AFS std gill net



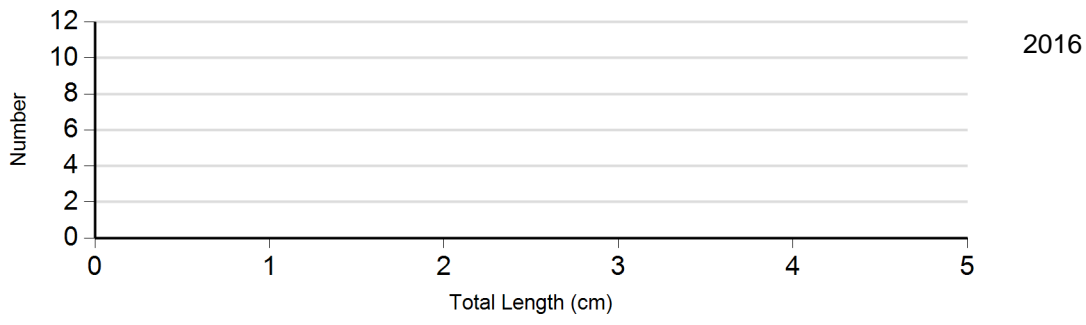
Species: Common Carp
Gear: std exp gill net



Species: Walleye
Gear: AFS std gill net



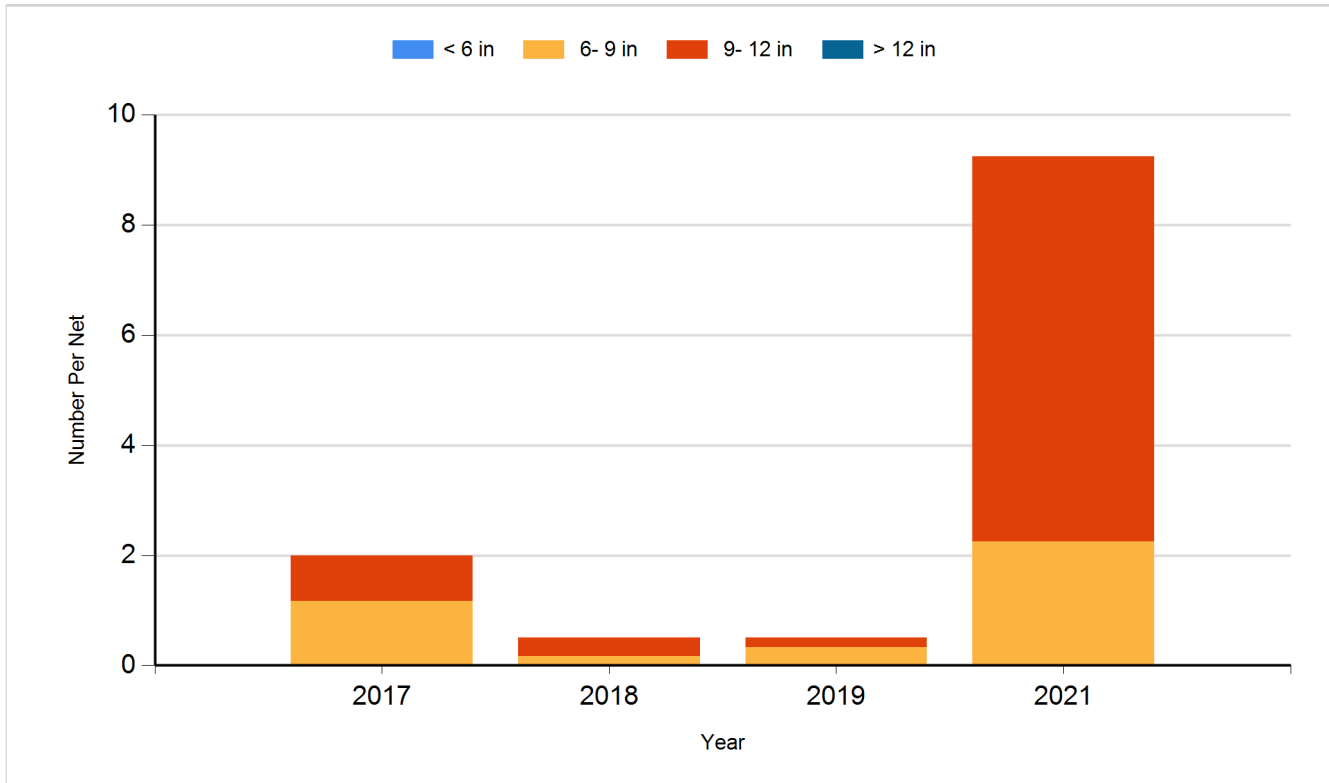
Species: Walleye
Gear: std exp gill net



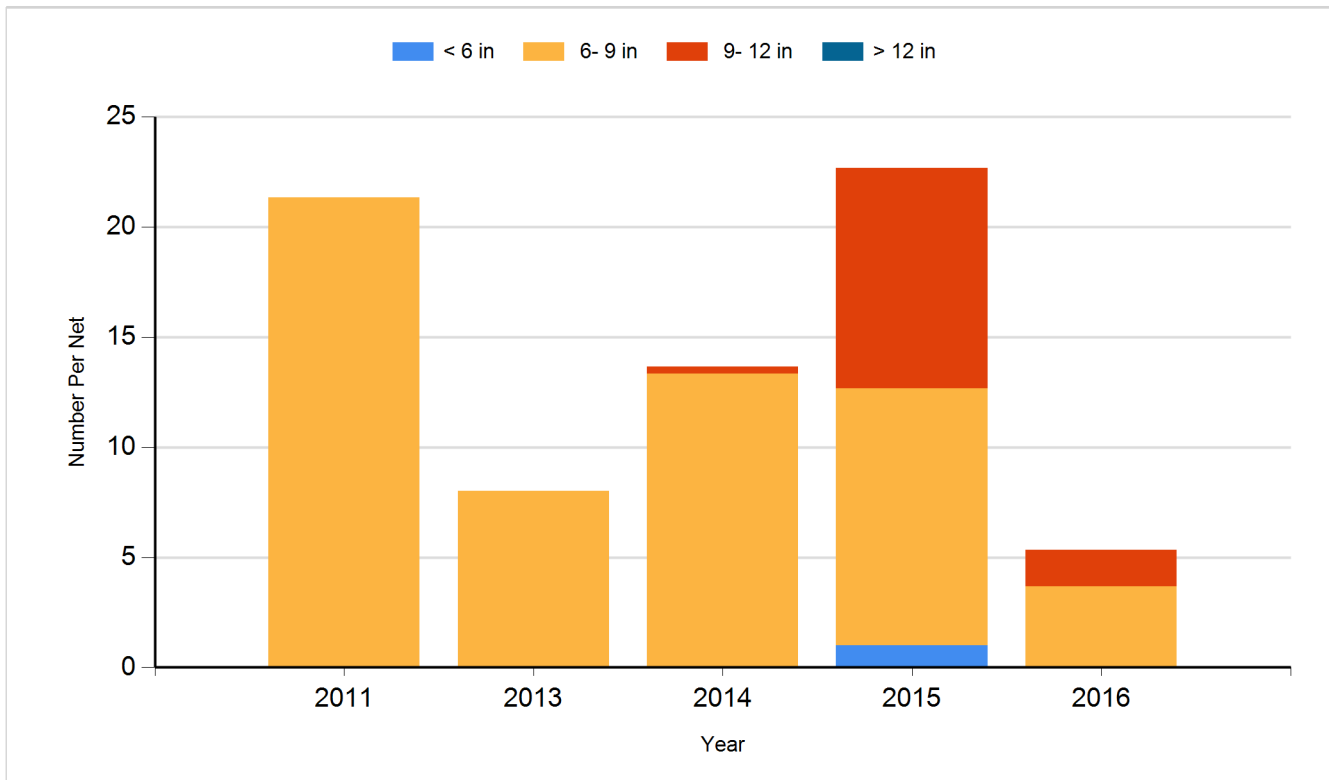
Historic Fish Sizes and Relative Abundance

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

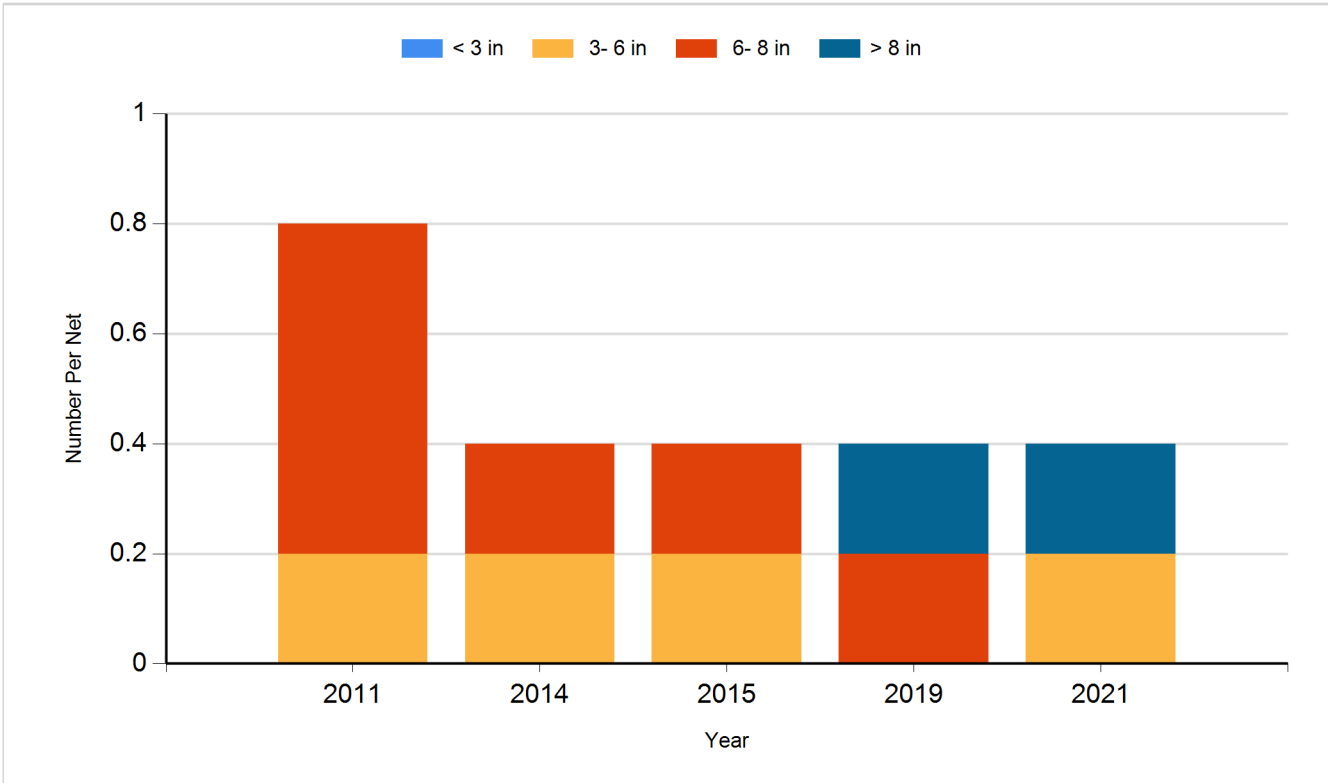
Species: Black Bullhead
Gear: AFS std gill net



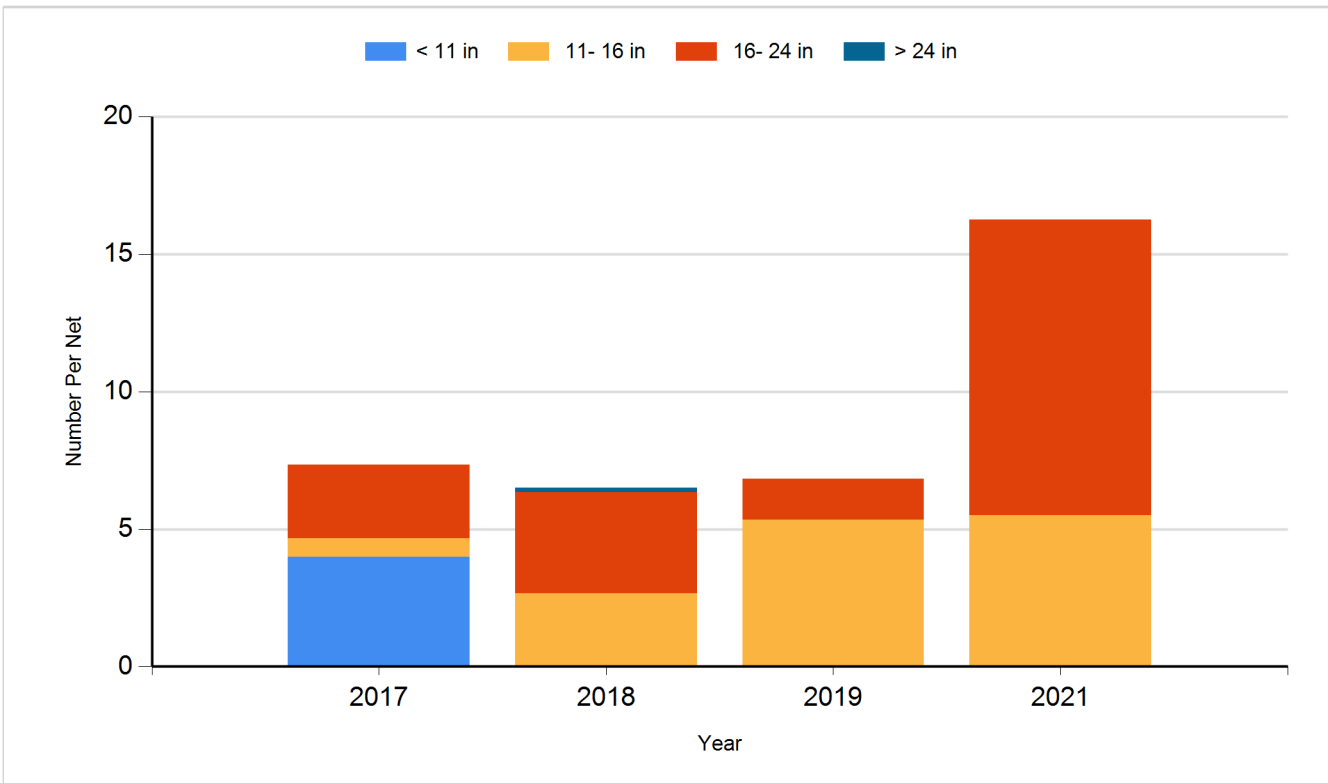
Species: Black Bullhead
Gear: std exp gill net



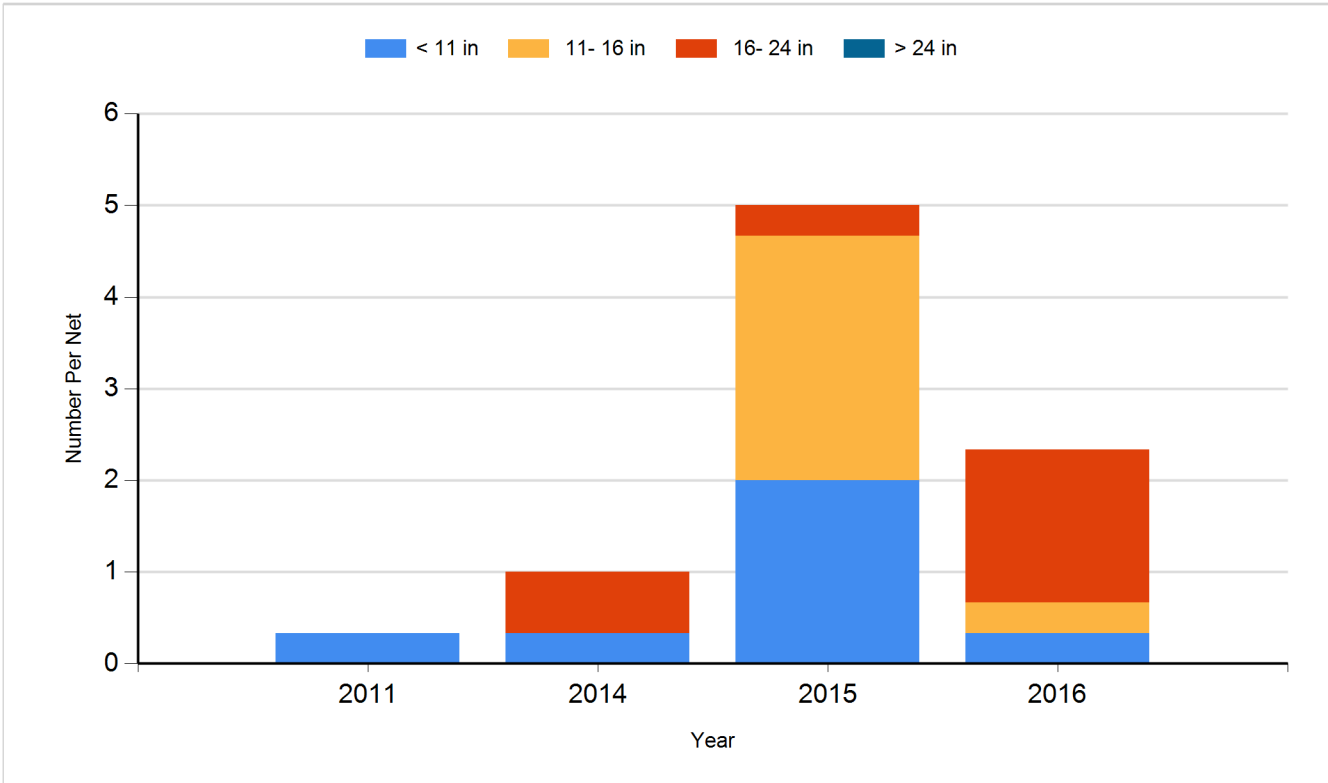
Species: Bluegill
Gear: frame net (std 3/4 in)



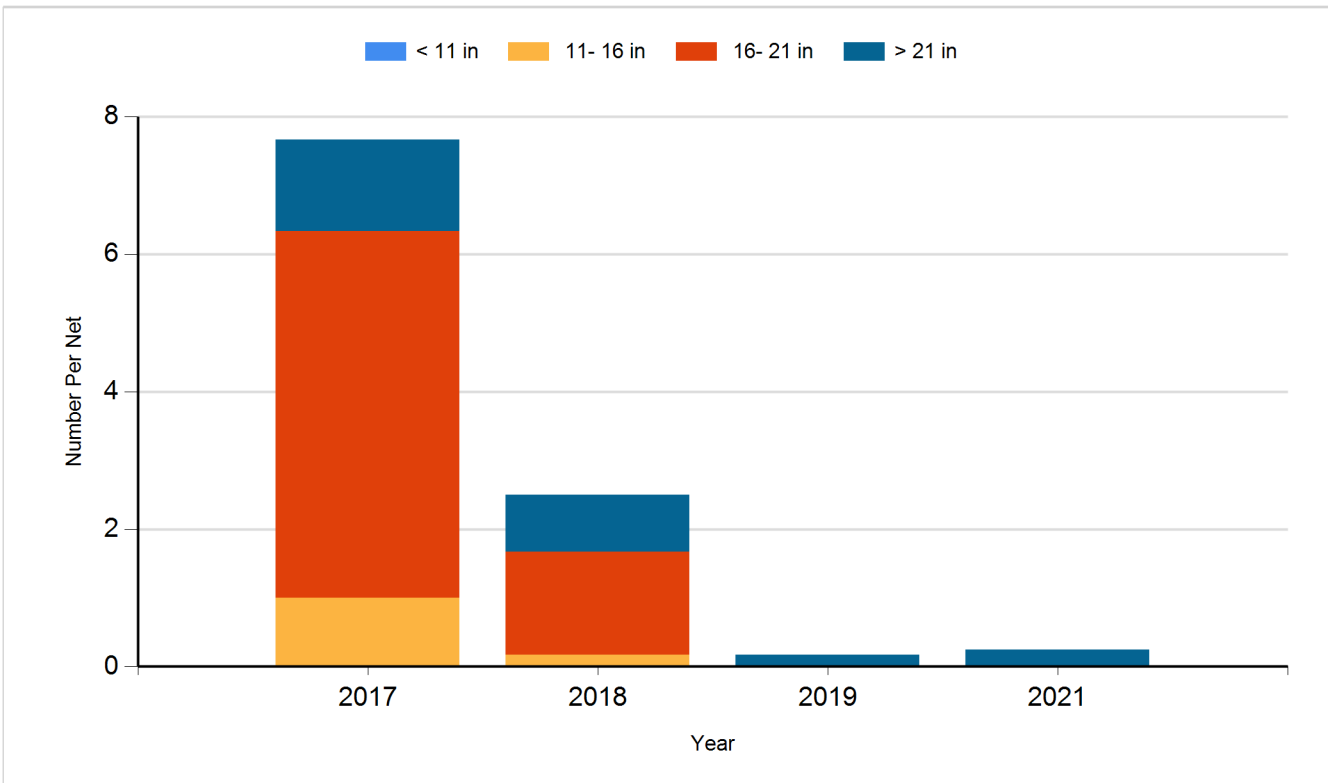
Species: Channel Catfish
Gear: AFS std gill net



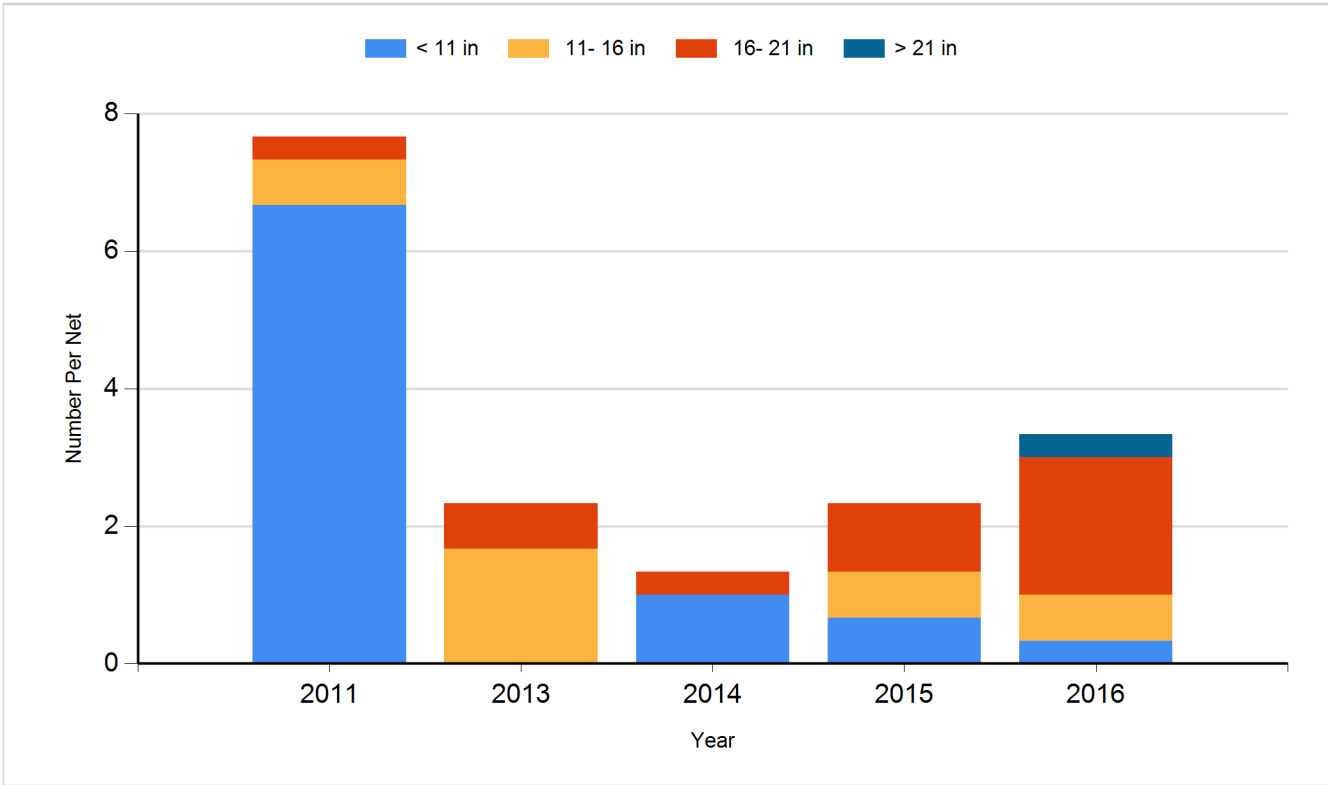
Species: Channel Catfish
Gear: std exp gill net



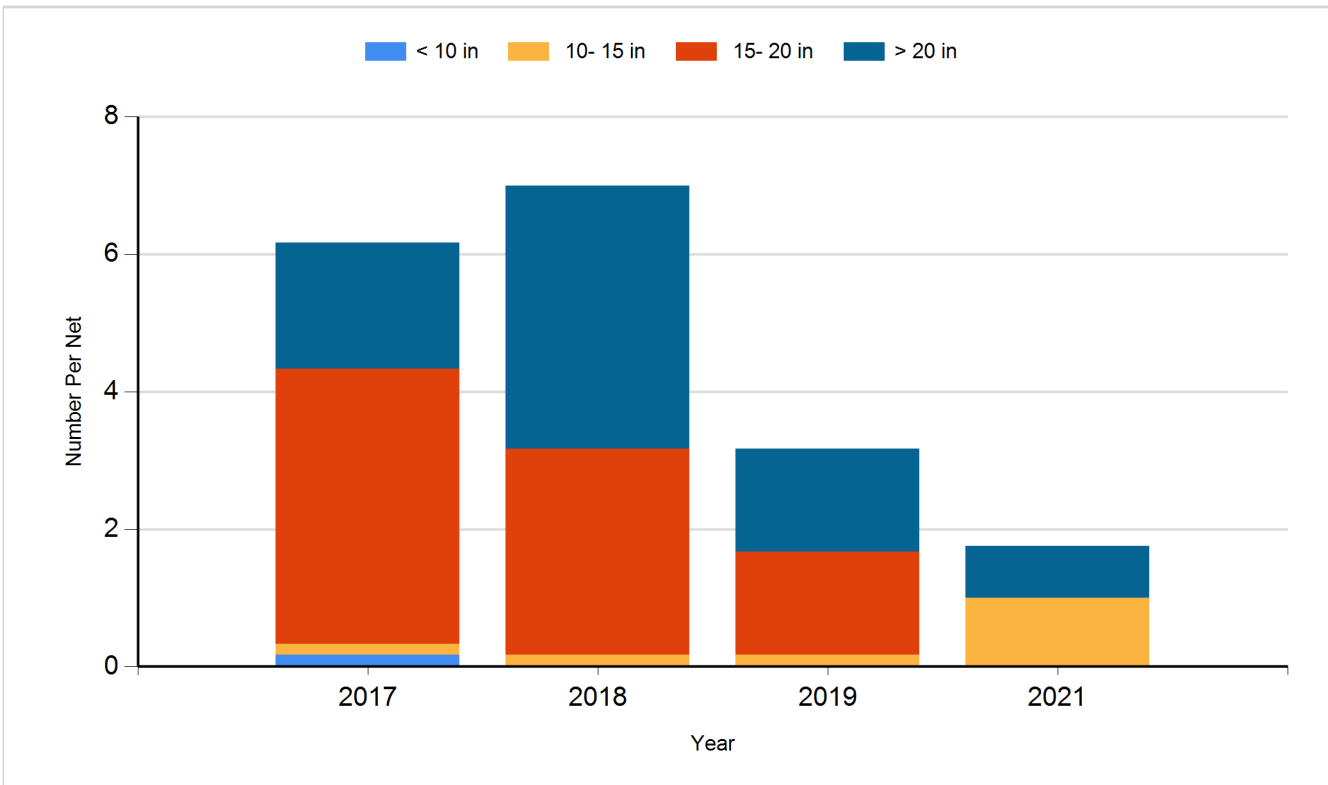
Species: Common Carp
Gear: AFS std gill net



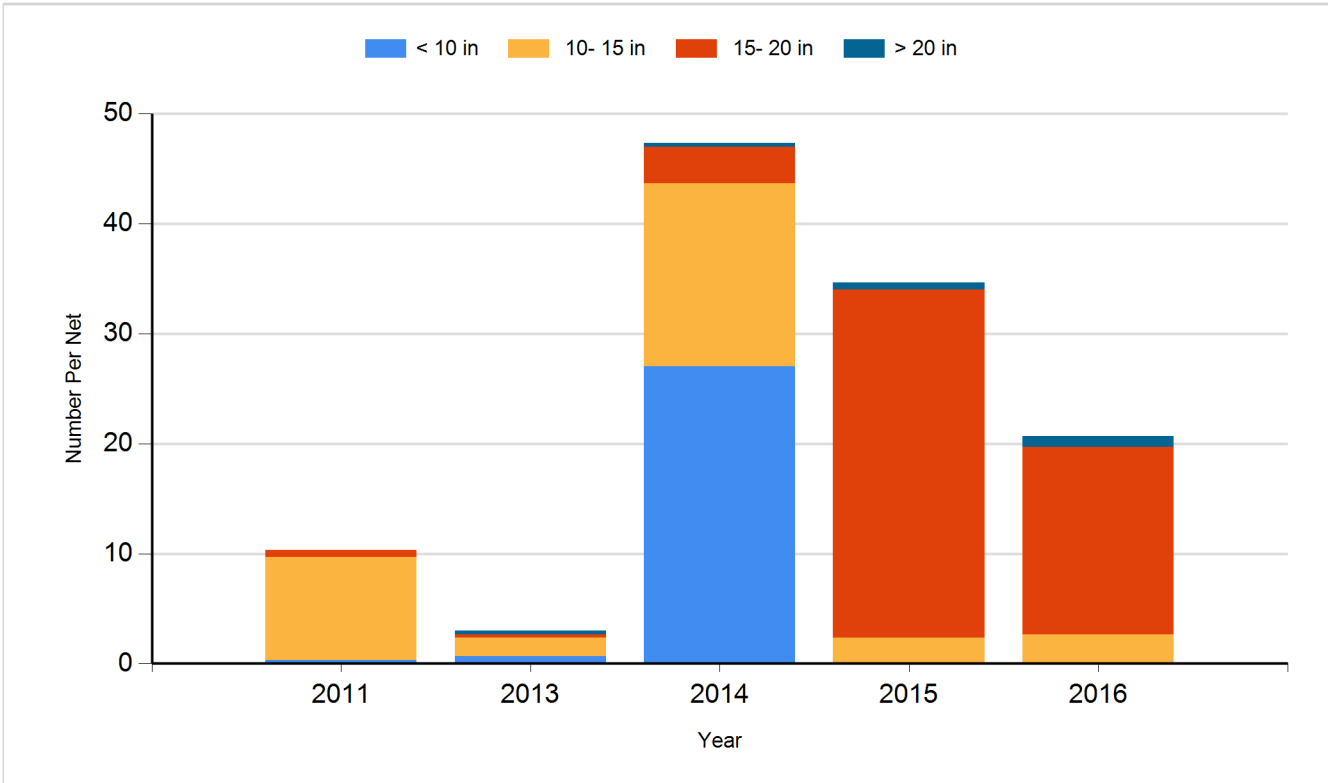
Species: Common Carp
Gear: std exp gill net



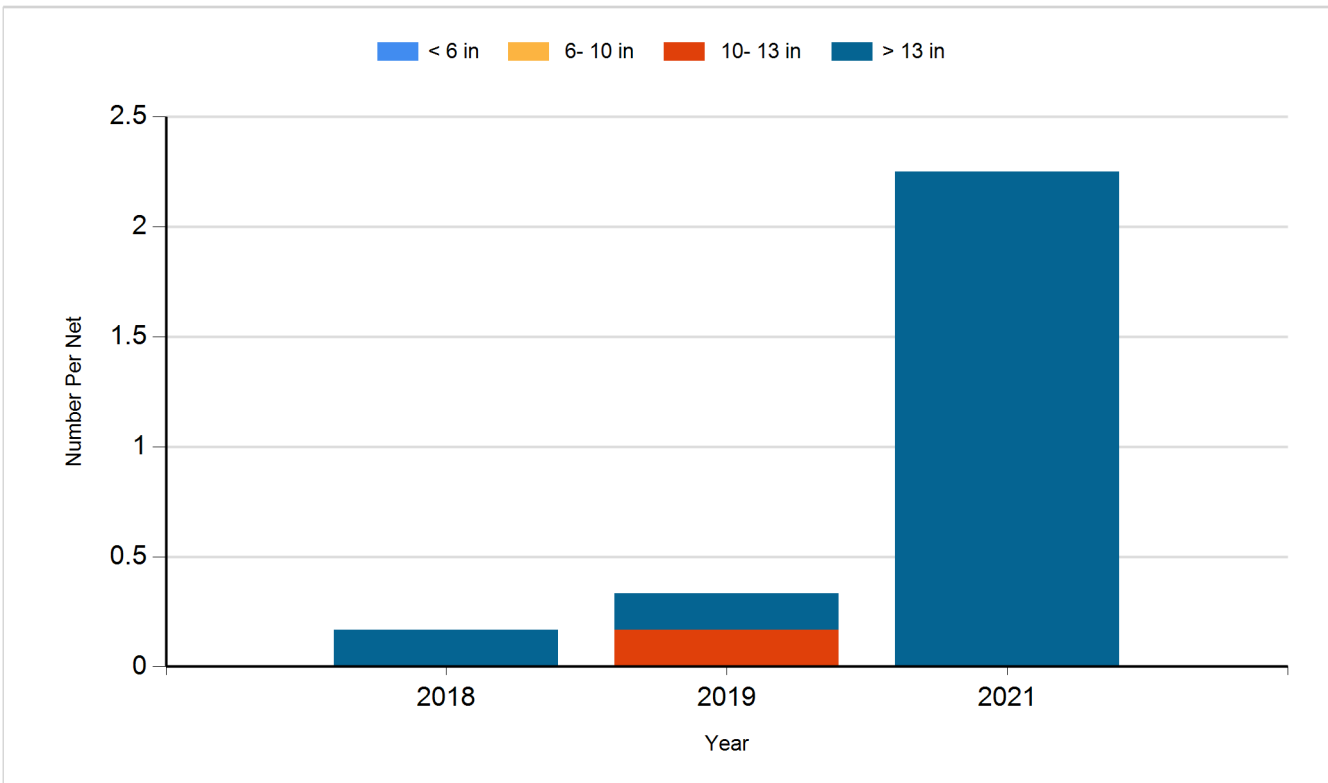
Species: Walleye
Gear: AFS std gill net



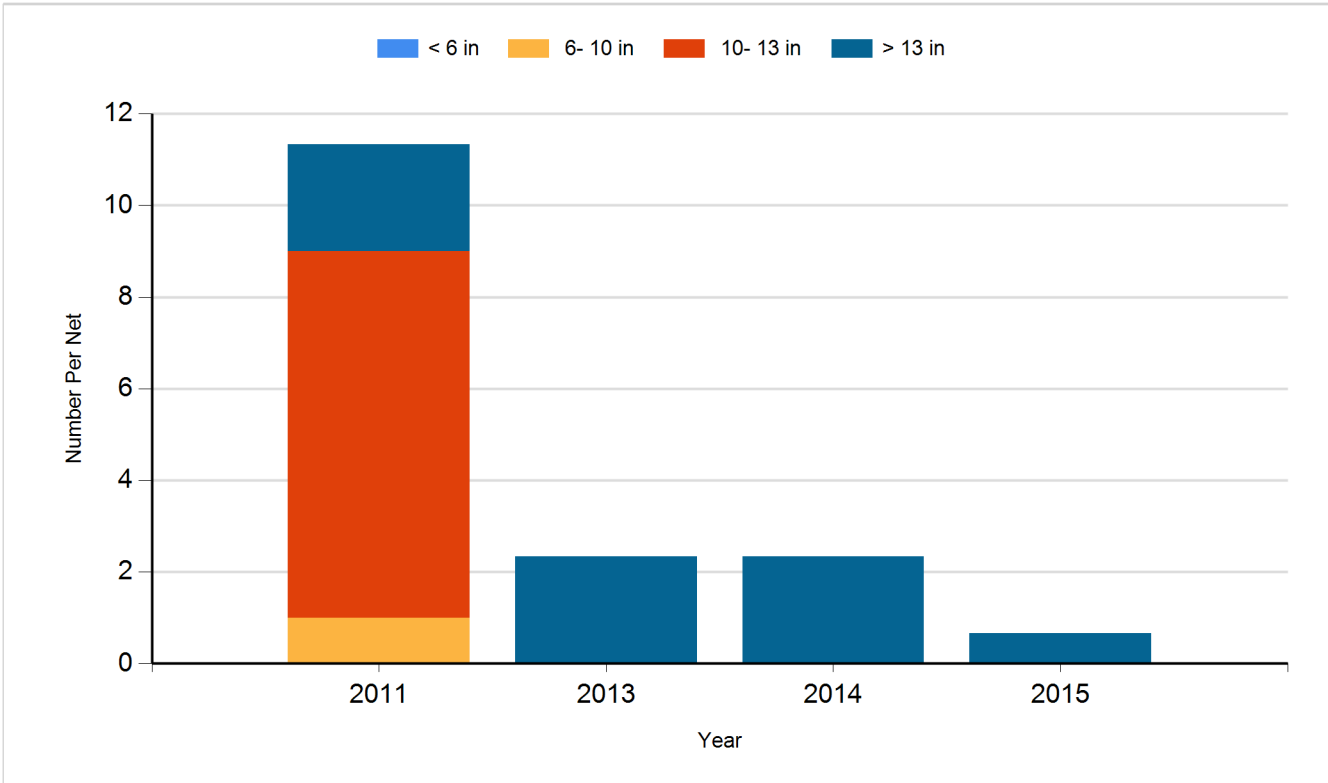
Species: Walleye
Gear: std exp gill net



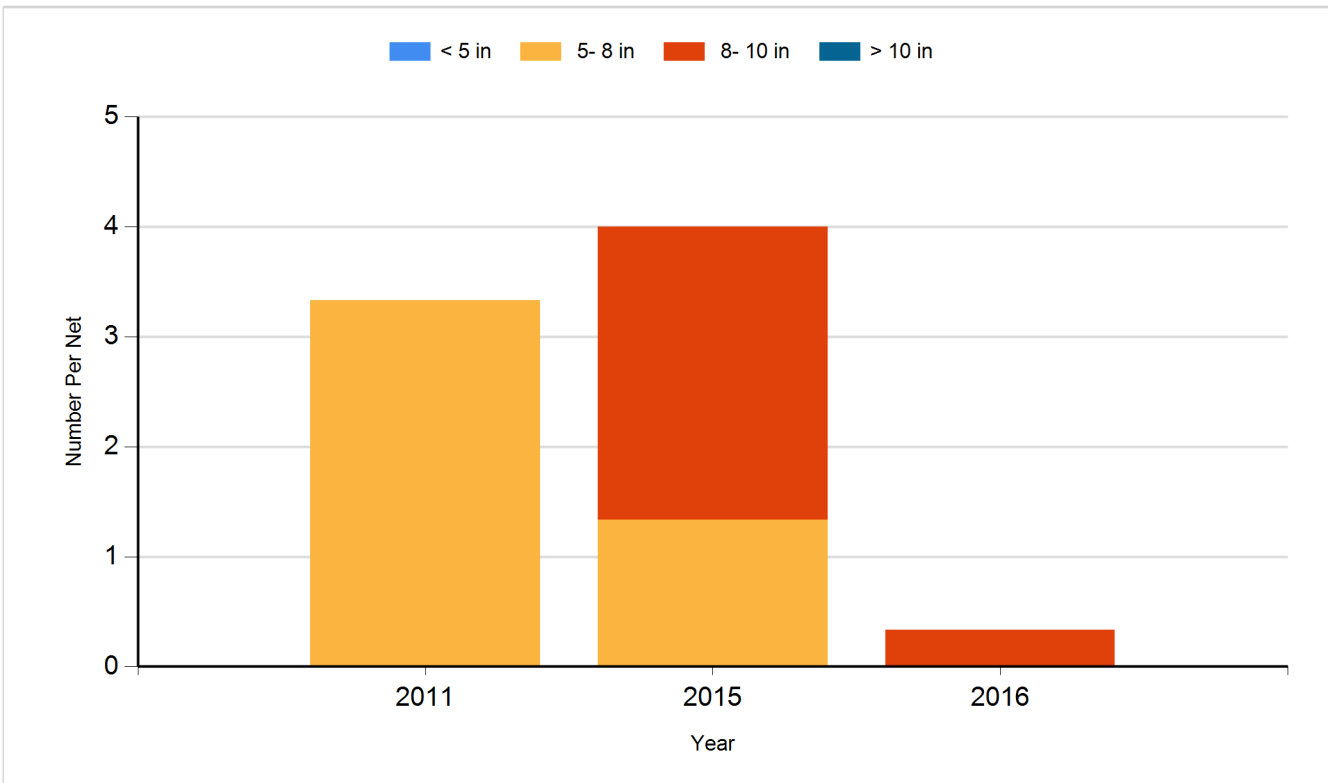
Species: White Sucker
Gear: AFS std gill net



Species: White Sucker
Gear: std exp 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	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
2021	Walleye	Fingerling	15,200