

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Hwy 81 West, Kingsbury County
MBS-Lake-233-800
2020

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 11, 2020	6 net-nights
AFS std gill net	Aug 12, 2020	4 net-nights
frame net (std 3/4 in)	Aug 11, 2020	5 net-nights
frame net (std 3/4 in)	Aug 12, 2020	5 net-nights

Common Fish Species Present

Yellow Perch

Muskellunge

Walleye

White Bass

Common Carp

Smallmouth Bass

Yellow Bullhead

Northern Pike

Bluegill

Black Bullhead

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	CI-80
AFS std gill net	Black Bullhead	2	0.2	0.2	100		50			
	Common Carp	9	0.9	0.4	56		11			
	Northern Pike	4	0.4	0.4	0		0		84	5
	Smallmouth Bass	9	0.8	0.8	13		0		92	3
	Walleye	33	3.0	0.9	23	12	20	12	80	1
	White Bass	35	2.8	1.5	100		68	14	88	2
	Yellow Perch	49	4.9	2.2	78	9	24	9	103	1
frame net (std 3/4 in)	Black Bullhead	4	0.4	0.3	75		0			
	Black Crappie	2	0.2	0.2	50		0		134	22
	Bluegill	5	0.5	0.7	80		0		192	43
	Common Carp	59	5.9	2.6	88	7	58	9		
	Northern Pike	10	1.0	0.4	40		20		87	3
	Smallmouth Bass	46	4.6	1.6	78	9	52	11	94	2
	Walleye	48	4.7	1.6	40	11	34	10	82	2
	White Bass	137	13.7	4.3	100		91	4	85	1
	Yellow Bullhead	11	1.1	0.7	100		100			
	Yellow Perch	28	2.8	2.0	100		39	14	111	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.

* Methods/Species that ignore stock length

Gear	Species	CPUE										Avg
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
AFS std gill net	Black Bullhead							6.9	2.5	0.0	0.2	2.40
	Common Carp							0.3	0.2	2.6	0.9	1.00
	Northern Pike							0.0	0.0	0.1	0.4	0.13
	Smallmouth Bass							0.9	1.2	1.8	0.8	1.18
	Walleye							6.0	4.9	2.3	3.0	4.05
	White Bass							3.7	2.4	1.2	2.8	2.53
	Yellow Bullhead							0.0	0.4	0.0	0.0	0.10
	Yellow Perch							14.4	17.7	2.1	4.9	9.78
frame net (std 3/4 in)	Black Bullhead	173.6			39.8	100.4	10.9		9.7	0.3	0.4	47.87
	Black Crappie	0.1			0.0	0.0	0.0		0.0	0.0	0.2	0.04
	Bluegill	4.1			0.0	0.0	0.0		0.2	3.2	0.5	1.14
	Common Carp	1.2			3.5	0.4	0.2		6.1	2.0	5.9	2.76
	Green Sunfish	3.0			0.0	0.2	0.0		0.0	0.0	0.0	0.46
	Largemouth Bass	0.2			0.0	0.1	0.0		0.1	0.0	0.0	0.06
	Northern Pike	0.1			0.1	0.0	0.5		0.1	0.0	1.0	0.26
	Orangespotted Sunfish	0.0			0.0	0.0	0.0		0.0	0.0	0.0	0.00
	Smallmouth Bass	0.9			1.0	0.4	1.0		2.2	0.7	4.6	1.54
	Sunfish Hybrid	0.0			0.0	0.0	0.0		0.0	0.0	0.0	0.00
	Walleye	1.7			0.6	0.7	1.6		2.2	0.7	4.7	1.74
	White Bass	2.6			0.1	0.1	5.8		2.1	0.3	13.7	3.53
	White Sucker	0.0			0.0	0.0	0.0		0.0	0.0	0.0	0.00
	Yellow Bullhead	20.1			6.7	16.7	2.3		8.1	0.1	1.1	7.87
Yellow Perch	10.1			2.8	0.6	0.1		2.5	0.1	2.8	2.71	
std exp gill net	Black Bullhead	198.7			89.6	68.0	16.5					93.20
	Common Carp	0.0			0.4	0.3	0.3					0.25
	Largemouth Bass	0.0			0.0	0.0	0.0					0.00
	Muskellunge	0.3			0.0	0.0	0.0					0.08
	Northern Pike	0.3			0.4	0.7	0.3					0.43
	Smallmouth Bass	0.0			2.0	2.7	1.8					1.63
	Walleye	13.7			5.2	30.3	7.3					14.13
	White Bass	6.0			0.6	10.3	9.0					6.48
	Yellow Bullhead	1.0			0.0	0.7	0.3					0.50
Yellow Perch	94.7			15.8	50.3	75.8					59.15	

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											
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
AFS std gill net	Black Bullhead	PSD								98	92		100	
		PSD-P								97	56		50	
	Common Carp	PSD								67	50	38	56	
		PSD-P								67	50	23	11	
	Northern Pike	PSD										100	0	
		PSD-P										0	0	
		Wr										92	84	
	Smallmouth Bass	PSD									38	50	22	13
		PSD-P									38	25	22	0
		Wr									109	106	101	92
	Walleye	PSD									74	84	78	23
		PSD-P									48	61	61	20
		Wr									91	86	82	80
	White Bass	PSD									100	100	100	100
		PSD-P									100	100	100	68
		Wr									97	93	89	88
	Yellow Bullhead	PSD										100		
		PSD-P										100		
	Yellow Perch	PSD									61	7	10	78
		PSD-P									19	2	0	24
Wr										101	96	102	103	
frame net (std 3/4 in)	Black Bullhead	PSD		80		9	98	96			81	100	75	
		PSD-P		6		0	44	73			34	100	0	
		Wr		87										
	Bluegill	PSD		88								0	3	80
		PSD-P		0								0	0	0
		Wr		120								109	123	192
	Common Carp	PSD		75		40	100	100			61	35	88	
		PSD-P		0		0	50	100			49	10	58	
		Wr		108										
	Northern Pike	PSD		100		100		100			100	0	40	
		PSD-P		0		0		80			100	0	20	
		Wr		72		81		98			80		87	

Gear	Species	Index	Year									
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
frame net (std 3/4 in)	Smallmouth Bass	PSD		100		90	100	70		77	86	78
		PSD-P		33		70	100	50		68	57	52
		Wr		97		109	106	87		104	95	94
	Walleye	PSD		71		67	100	81		86	100	40
		PSD-P		29		17	71	75		68	43	34
		Wr		85		92	89	75		83	89	82
	White Bass	PSD		100		100	100	100		100	100	100
		PSD-P		96		100	0	86		95	100	91
		Wr		84		100	97	79		93	95	85
	Yellow Bullhead	PSD		100		91	100	100		100	100	100
		PSD-P		98		90	58	100		98	100	100
		Wr		101								
	Yellow Perch	PSD		7		11	83	0		8	0	100
		PSD-P		4		7	0	0		8	0	39
		Wr		78		105	96	83		95	106	111
std exp gill net	Black Bullhead	PSD		48		89	84	100				
		PSD-P		1		1	28	88				
		Wr		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				
		PSD-P		0		100	50	100				
		Wr		63		87	93	81				
	Smallmouth Bass	PSD				0	63	57				
		PSD-P				0	25	57				
		Wr				110	109	114				
	Walleye	PSD		85		77	44	76				
		PSD-P		10		31	29	31				
		Wr		87		90	92	88				
	White Bass	PSD		100		100	97	100				
		PSD-P		94		67	81	72				
		Wr		91		91	100	94				
	Yellow Bullhead	PSD		100			100	100				
		PSD-P		67			100	100				

Gear	Species	Index	Year									
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
std exp gill net	Yellow Bullhead	Wr		97								
	Yellow Perch	PSD		57		42	90	13				
		PSD-P		7		24	14	10				
		Wr		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+
2020	33	227 (3)	293 (23)		508 (2)						636 (5)
2019	35	216 (15)	338 (2)	417 (1)	445 (2)		516 (3)			589 (1)	634 (11)
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)		

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

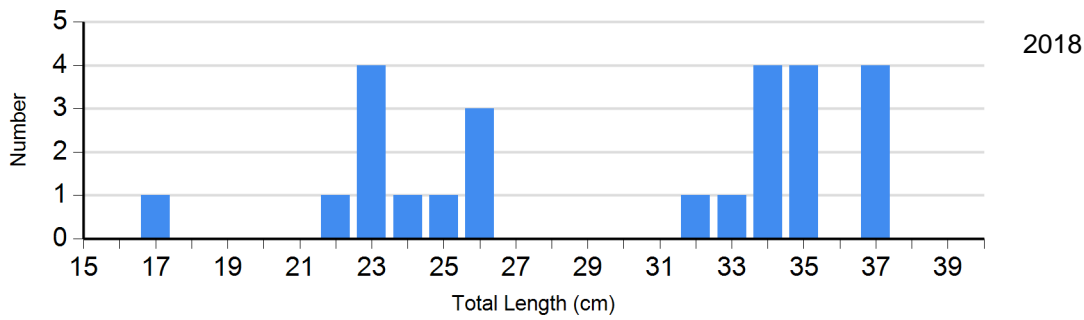
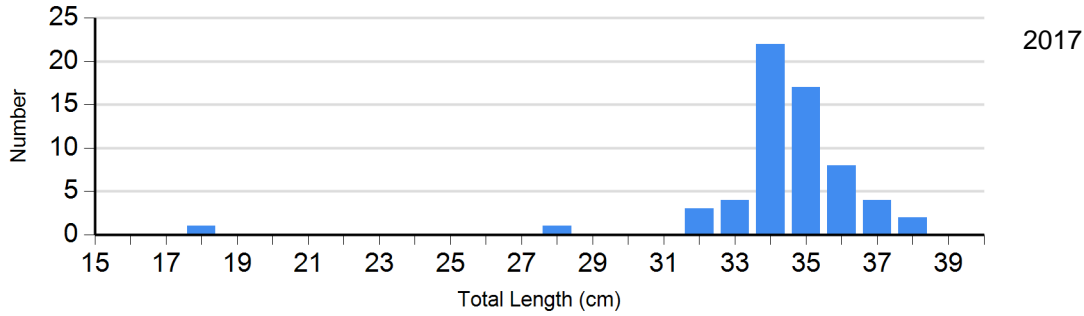
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

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	2018	2	109 (5.1)	0		0		0	
	2019	31	123 (6.8)	1	125	0		0	
	2020	1	324	4	159 (3.4)	0		0	
Northern Pike Gill Net	2016	0		0		1	81	0	
	2019	0		1	92	0		0	
	2020	4	84 (4.2)	0		0		0	
Walleye Gill Net	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)
	2019	5	84 (2.5)	4	86 (3.4)	8	83 (2.3)	6	76 (3.1)
	2020	23	79 (1.1)	1	87	2	82 (3.2)	4	80 (3.1)
White Bass Gill Net	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)
	2018	0		0		5	90 (2.0)	19	94 (1.4)
	2019	0		0		1	94	11	89 (1.5)
	2020	0		9	95 (1.8)	3	91 (1.8)	16	83 (0.8)
Yellow Perch Gill Net	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)	9	98 (0.2)	4	86	0	
	2019	19	104 (1.3)	2	88 (0.7)	0		0	
	2020	11	100 (3.6)	26	104 (1.1)	12	104 (2.0)	0	

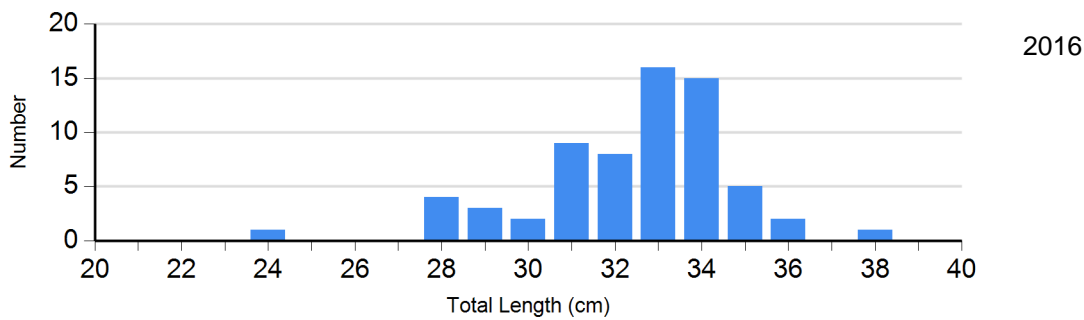
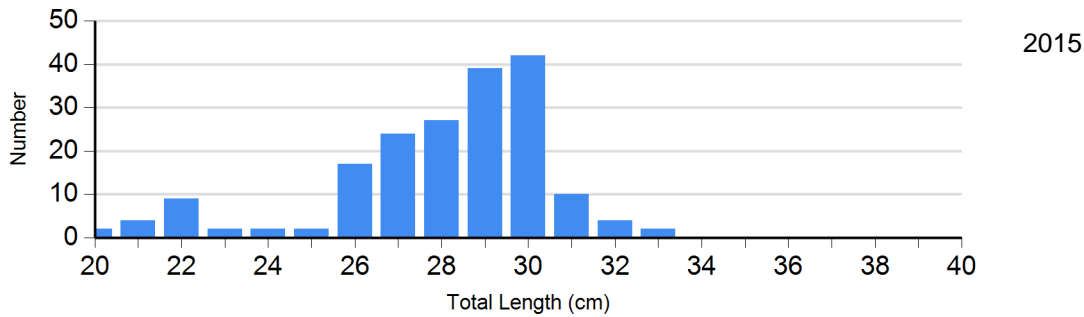
Length Frequency Distribution

Length frequency histogram of species sampled by year.

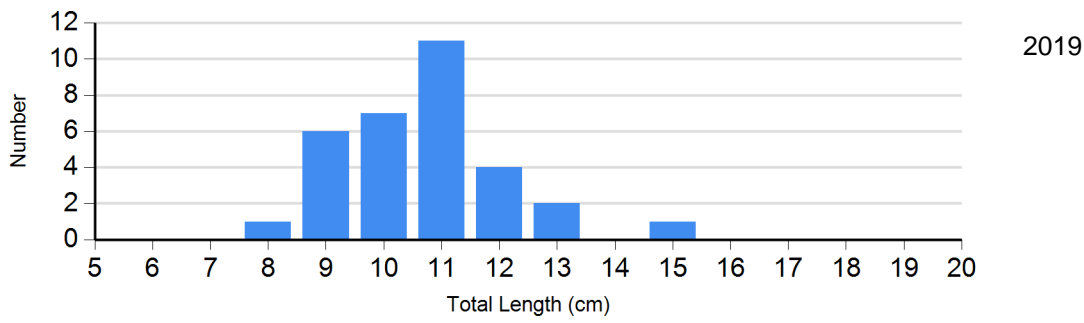
Species: Black Bullhead
Gear: AFS std gill net



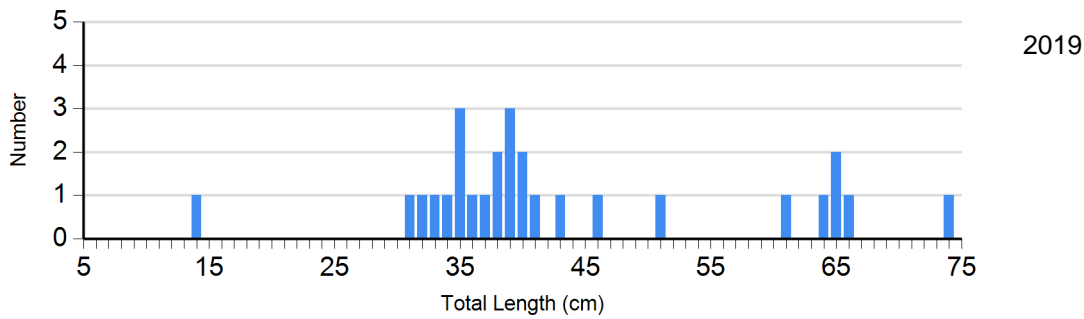
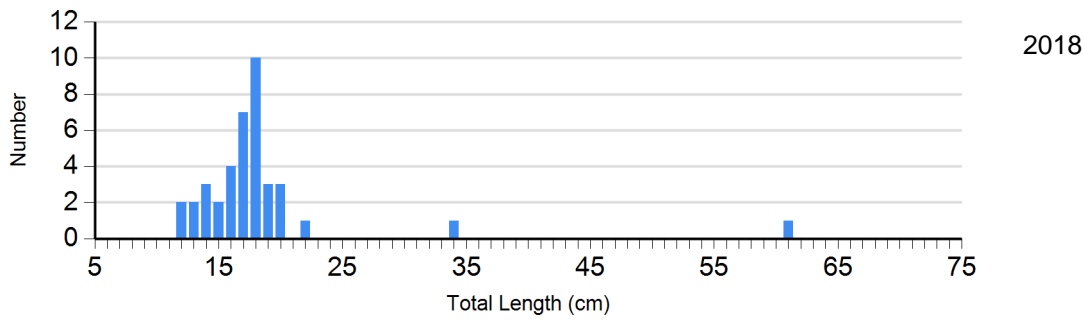
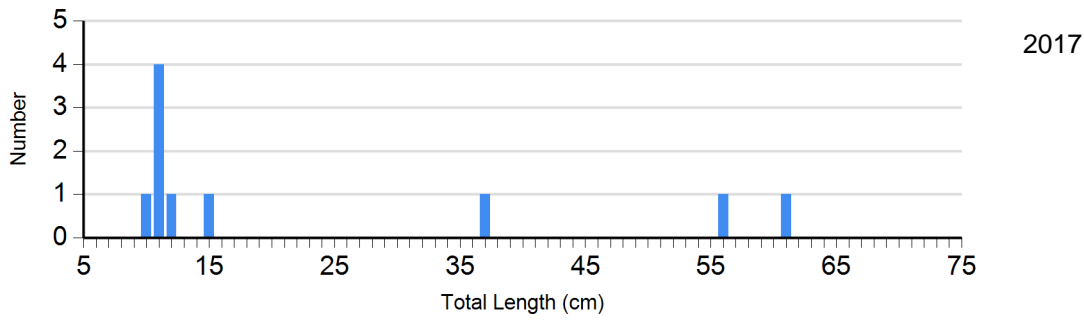
Species: Black Bullhead
Gear: std exp gill net



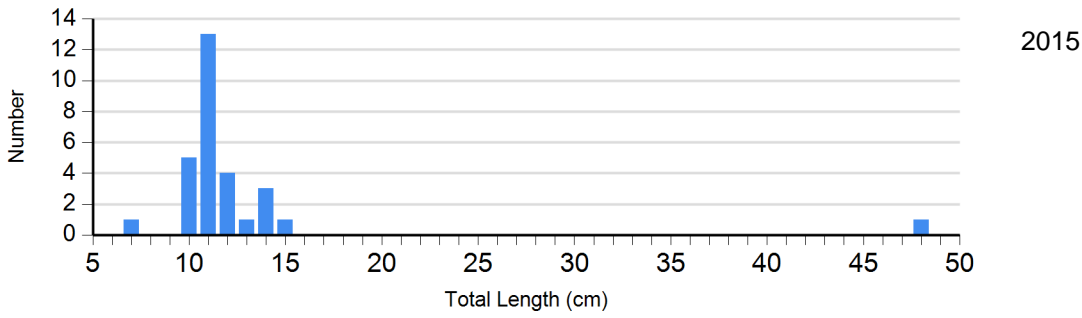
Species: Bluegill
 Gear: frame net (std 3/4 in)



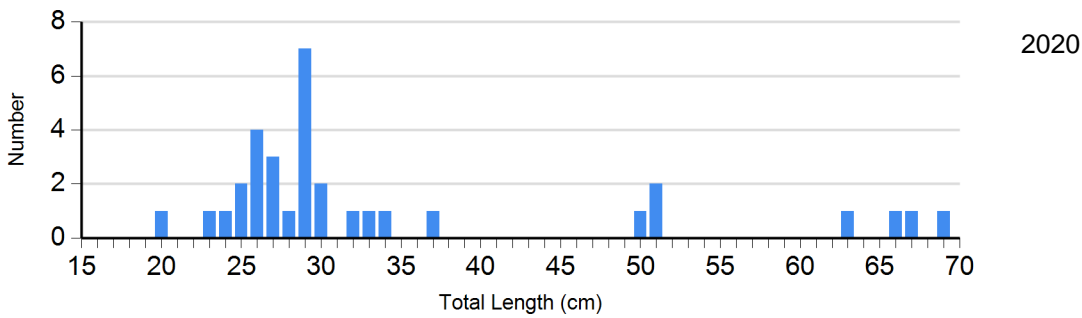
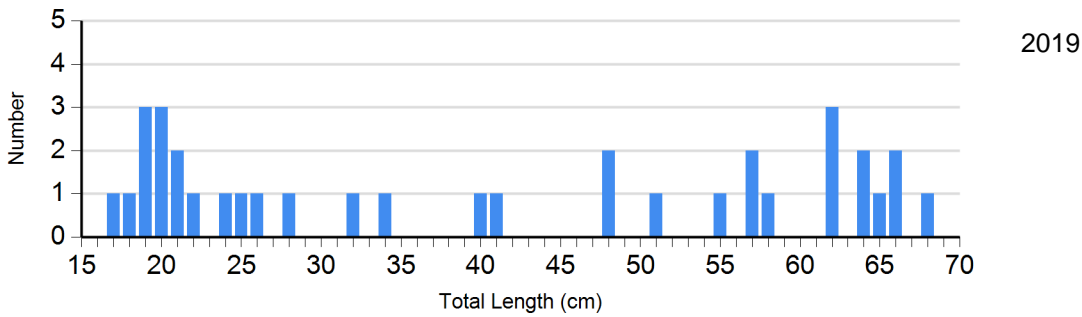
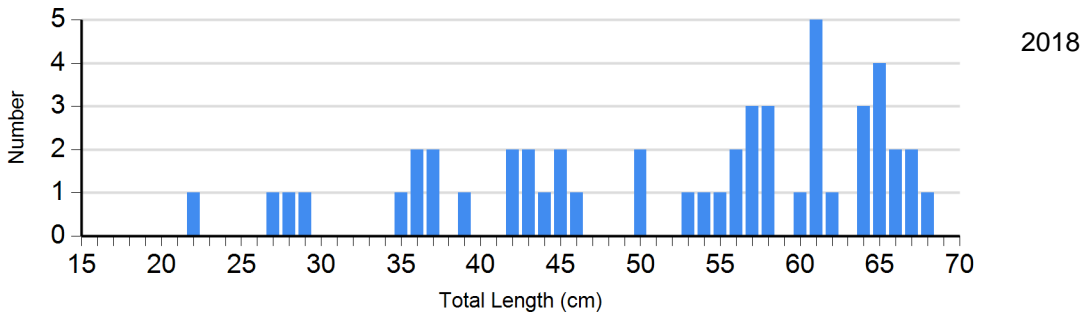
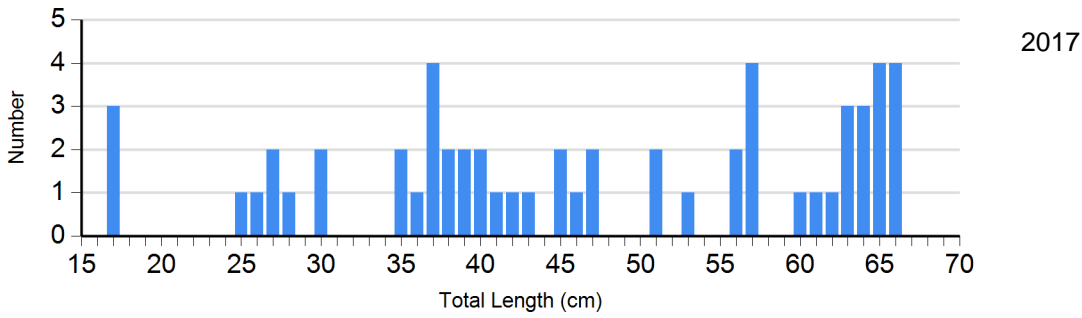
Species: Common Carp
 Gear: AFS std gill net



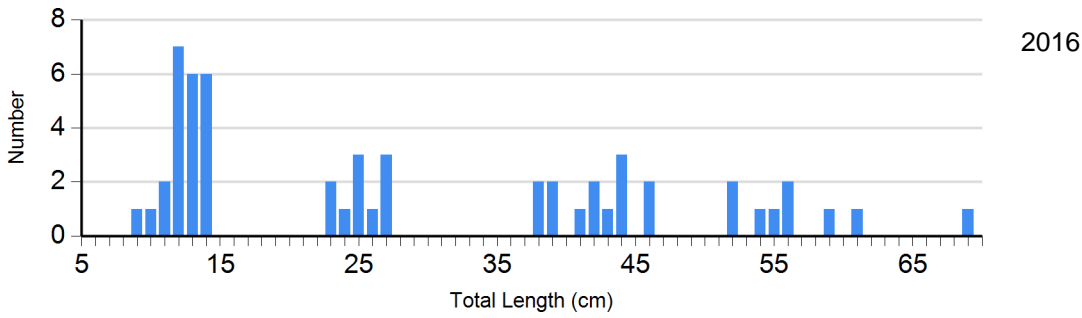
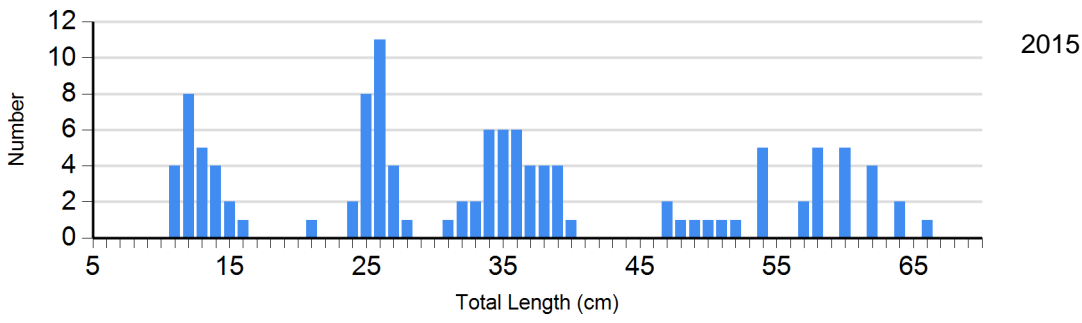
Species: Common Carp
Gear: std exp gill net



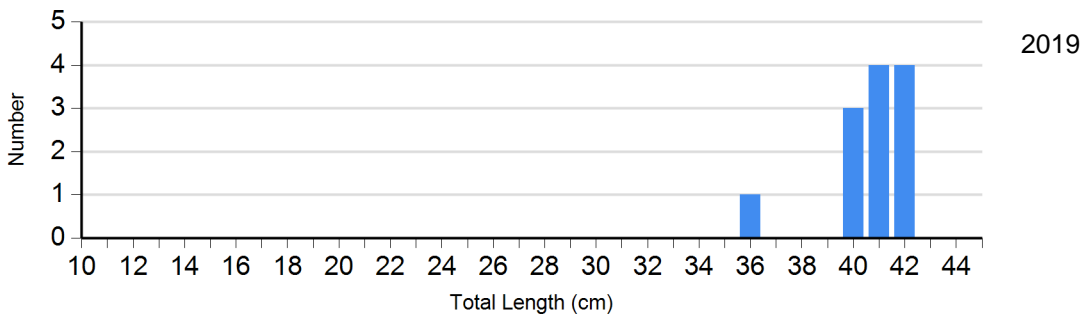
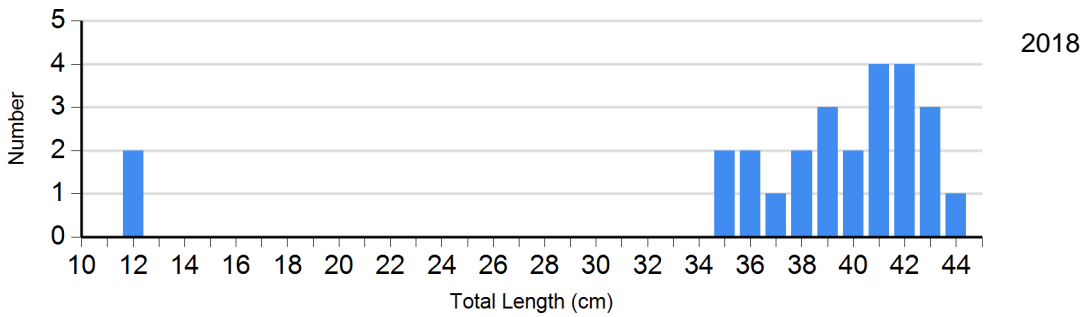
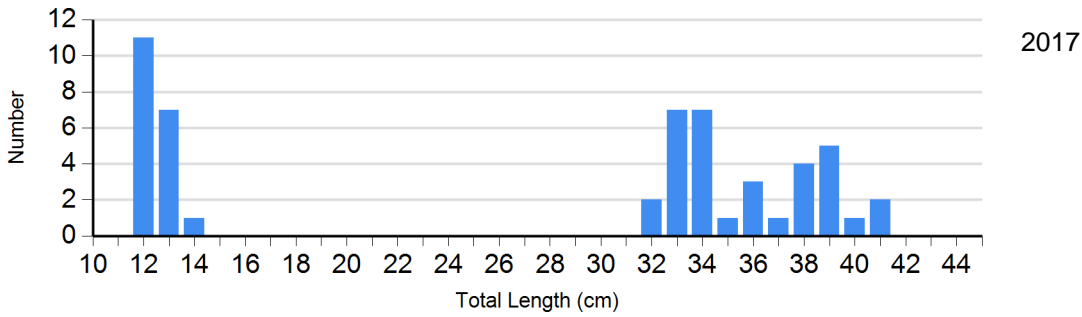
Species: Walleye
Gear: AFS std gill net

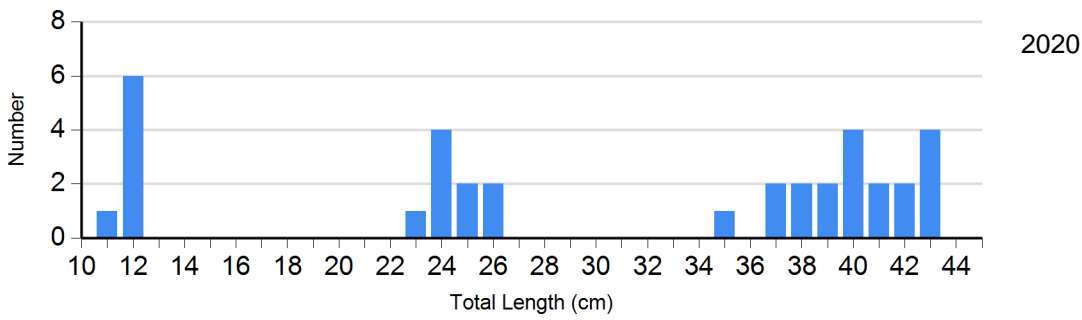


Species: Walleye
 Gear: std exp gill net

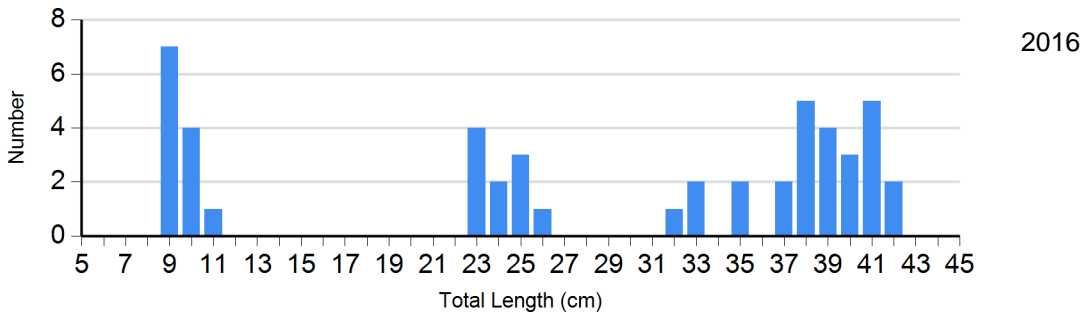
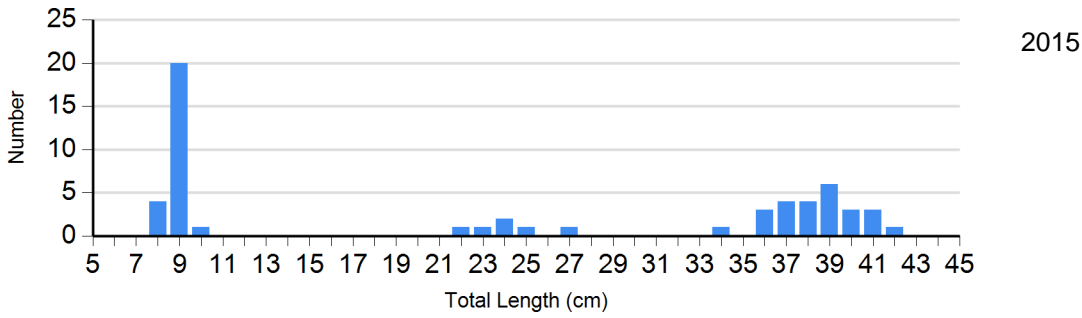


Species: White Bass
 Gear: AFS std gill net

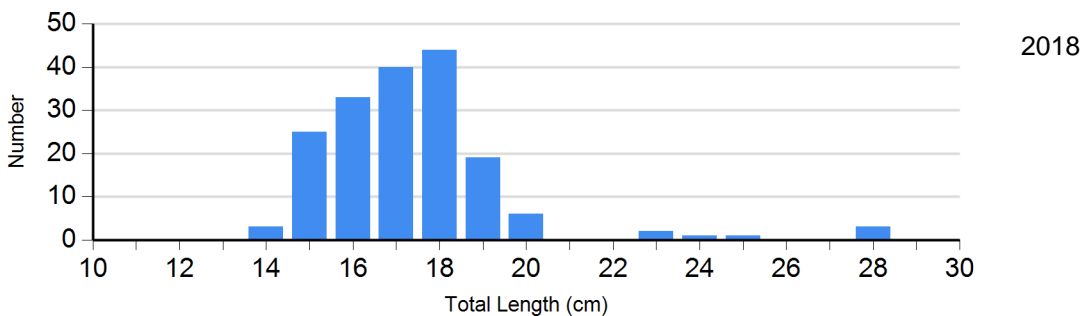
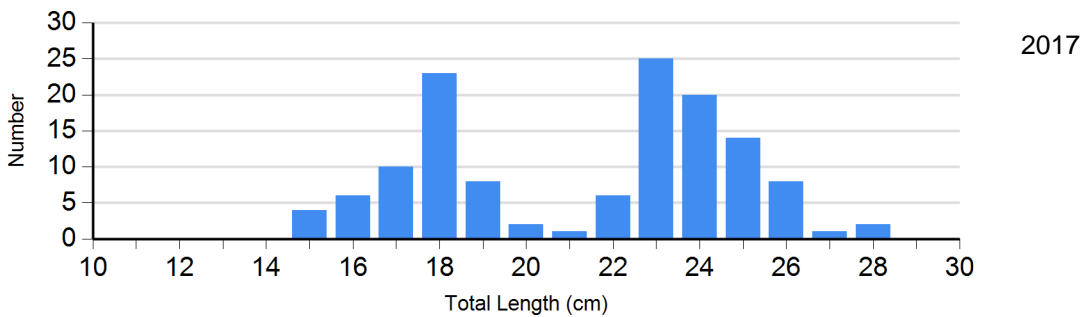


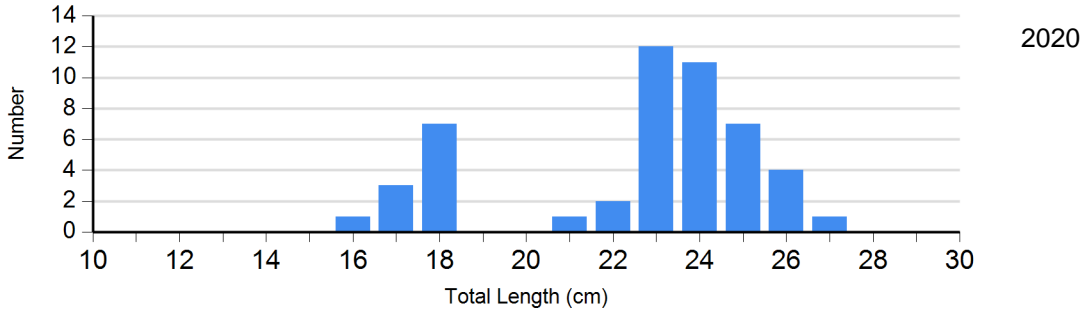
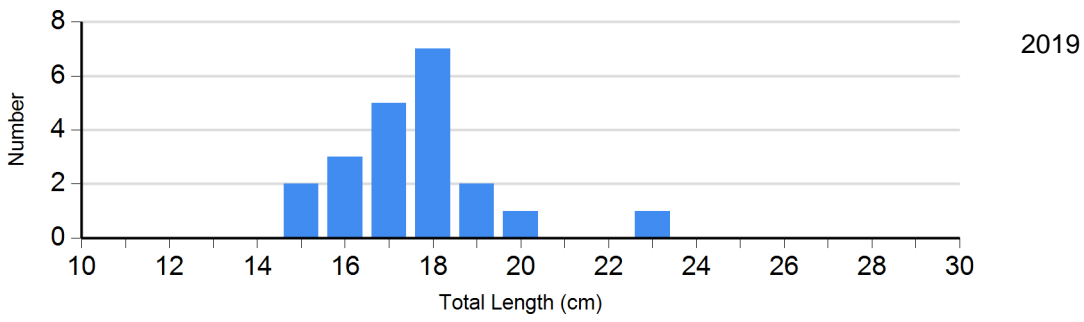


Species: White Bass
Gear: std exp gill net

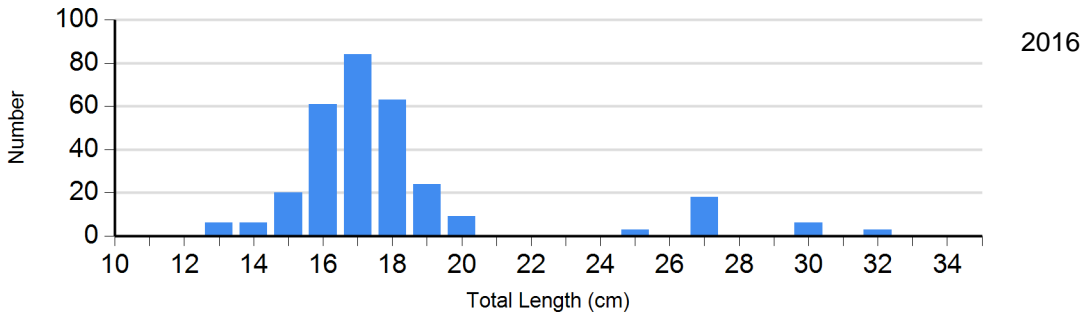
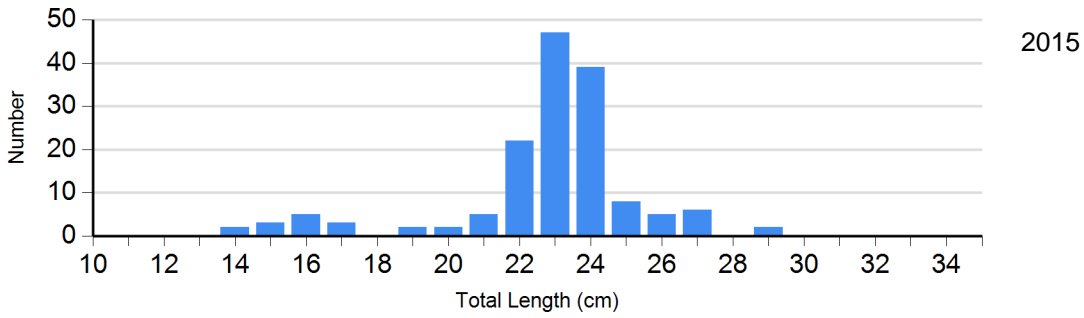


Species: Yellow Perch
Gear: AFS std gill net





Species: Yellow Perch
 Gear: std exp gill net

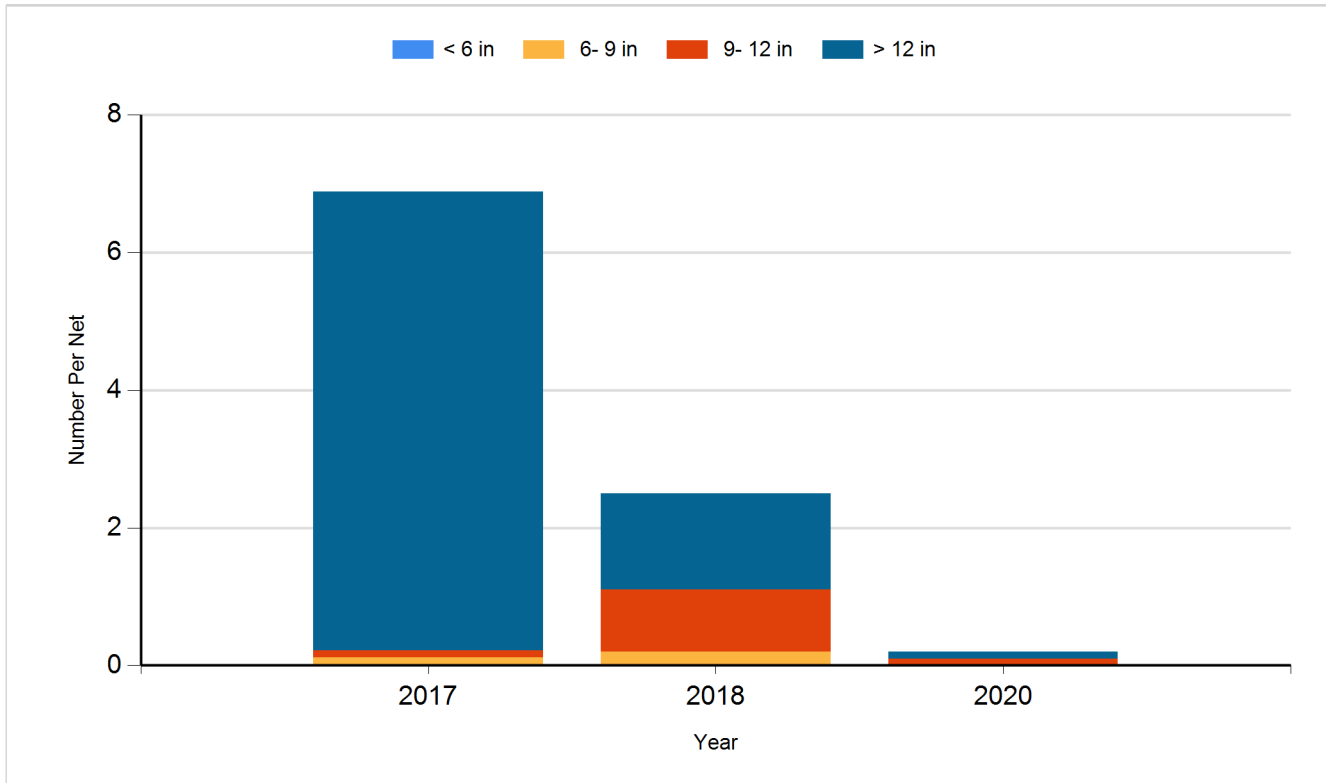


Historic Fish Sizes and Relative Abundance

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

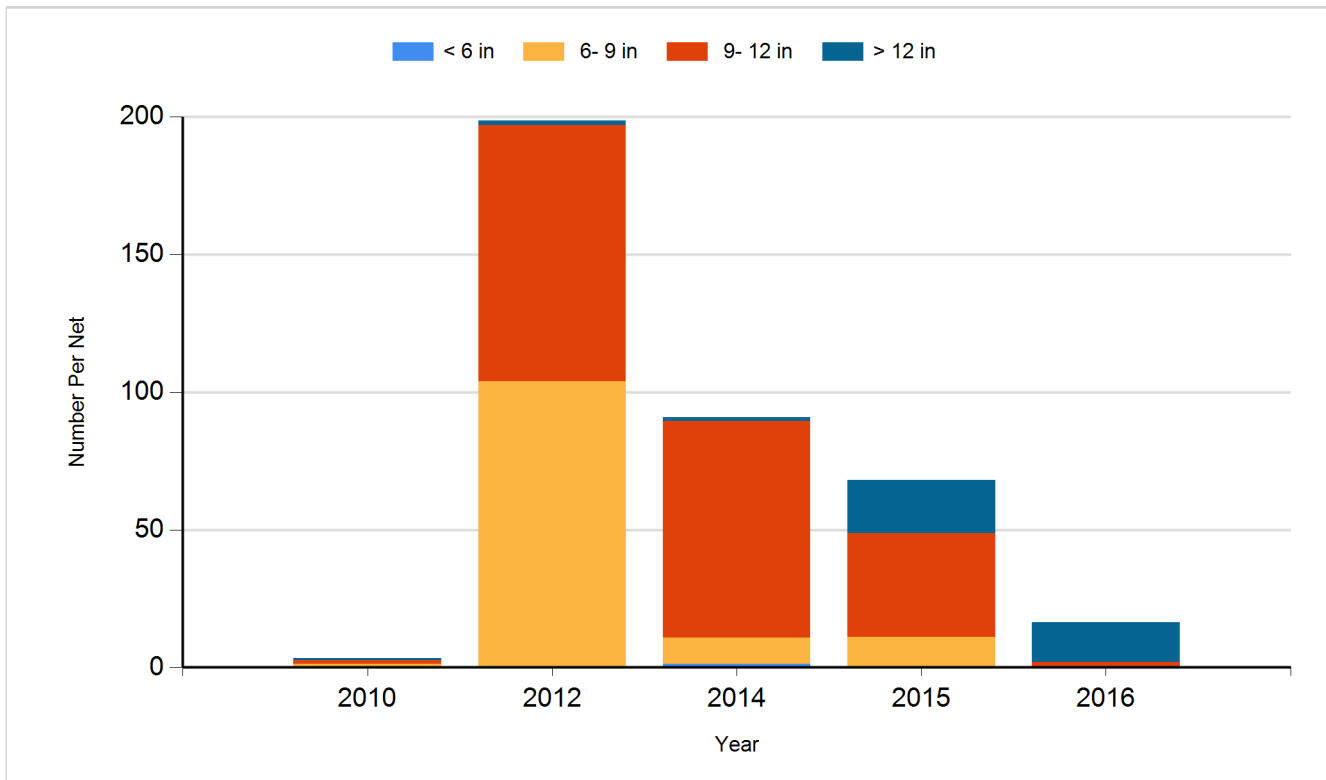
Species: Black Bullhead

Gear: AFS std gill net

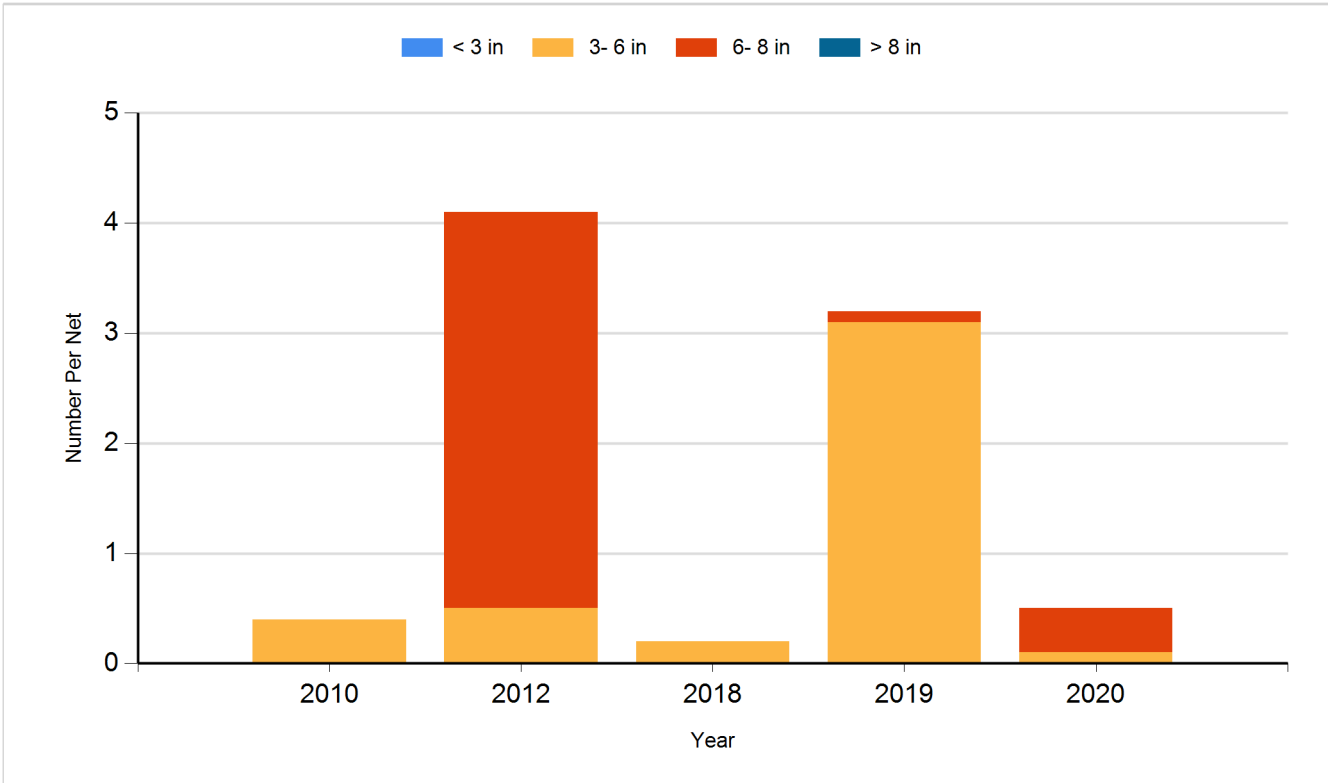


Species: Black Bullhead

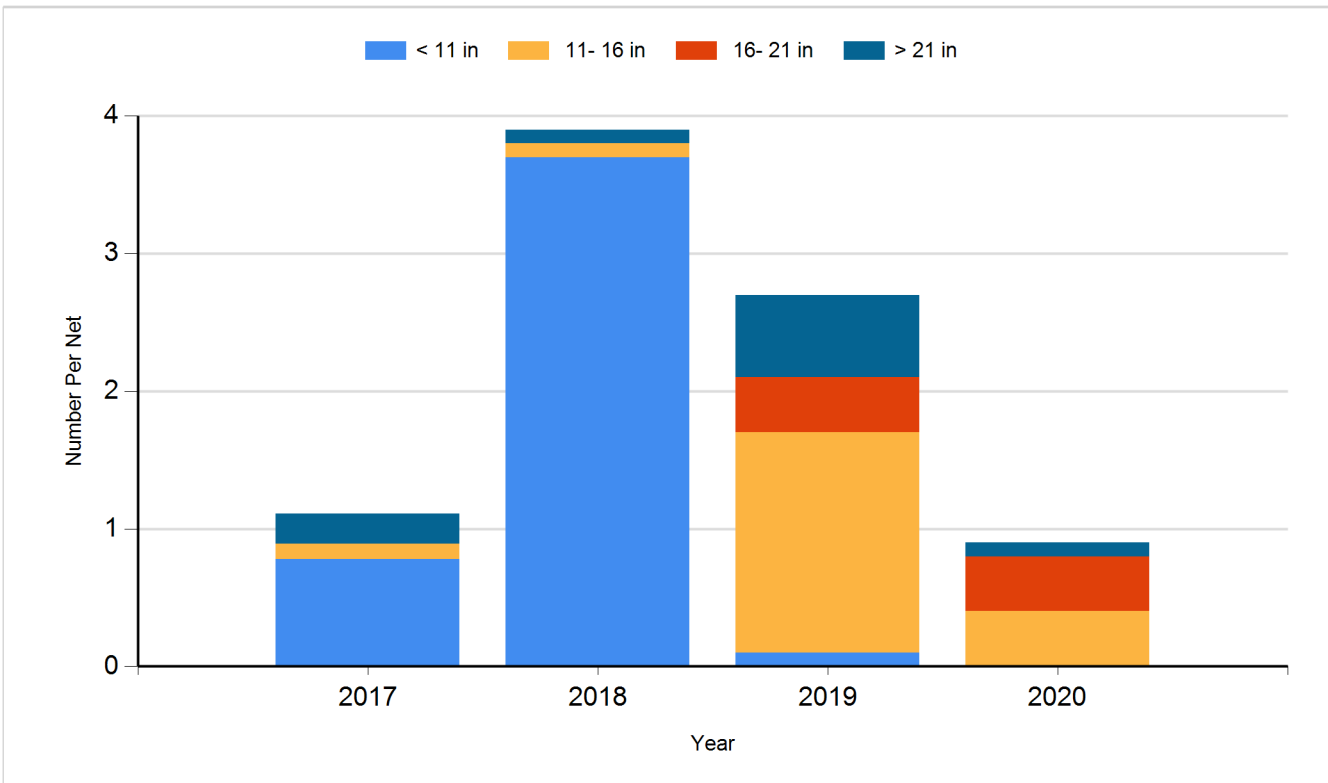
Gear: std exp gill net



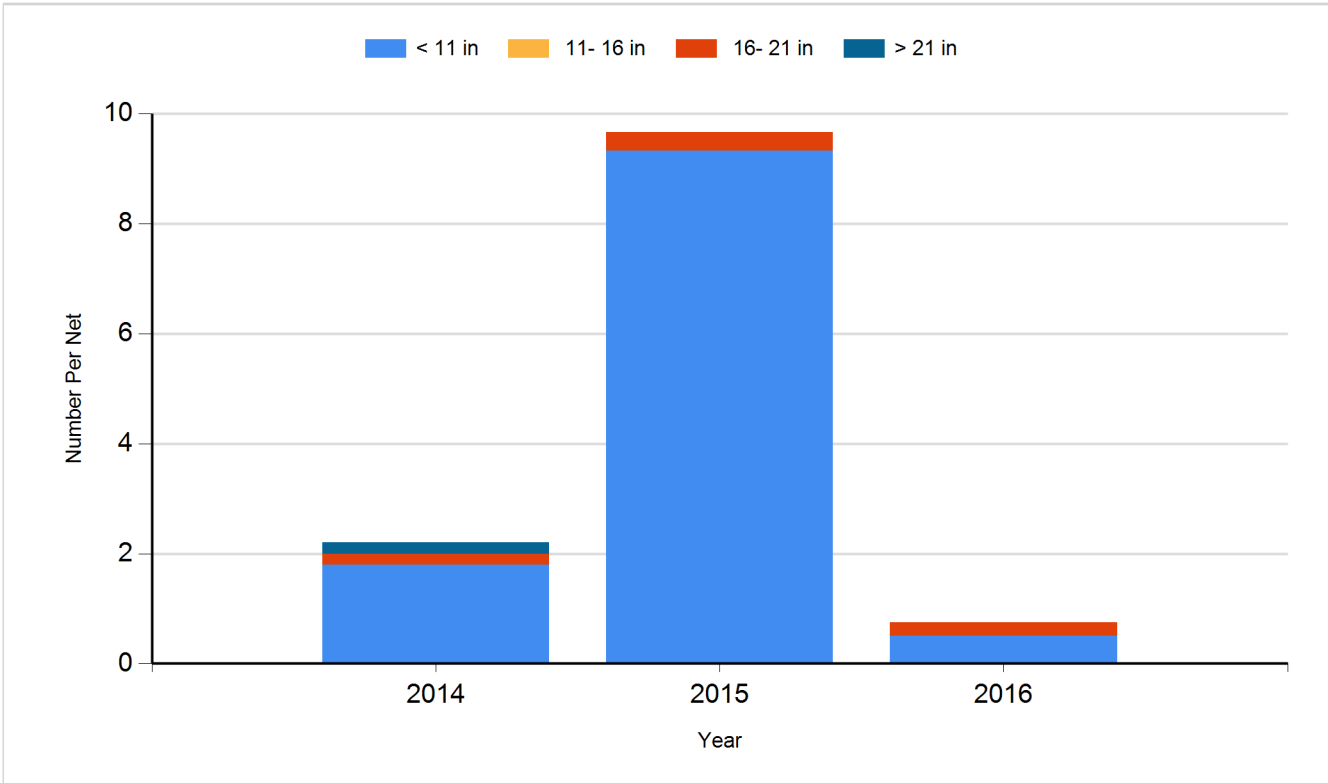
Species: Bluegill
Gear: frame net (std 3/4 in)



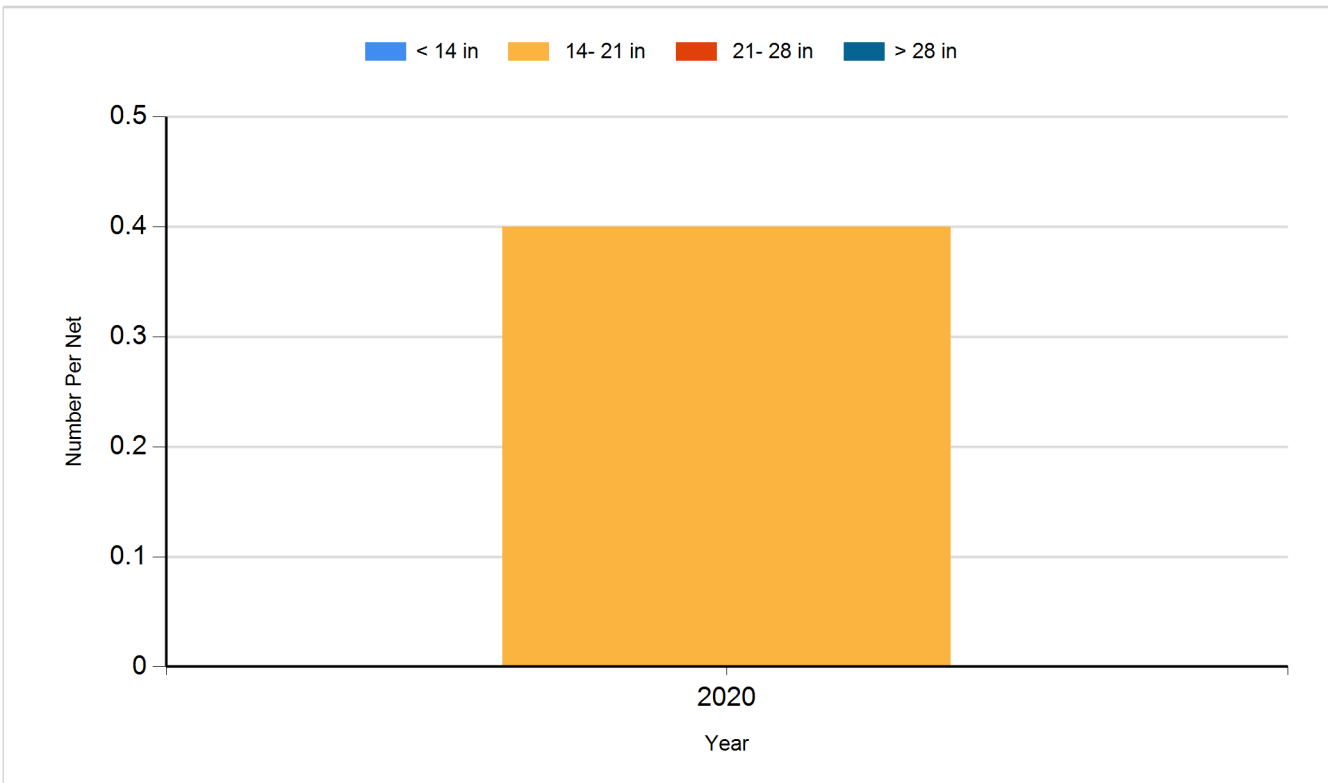
Species: Common Carp
Gear: AFS std gill net



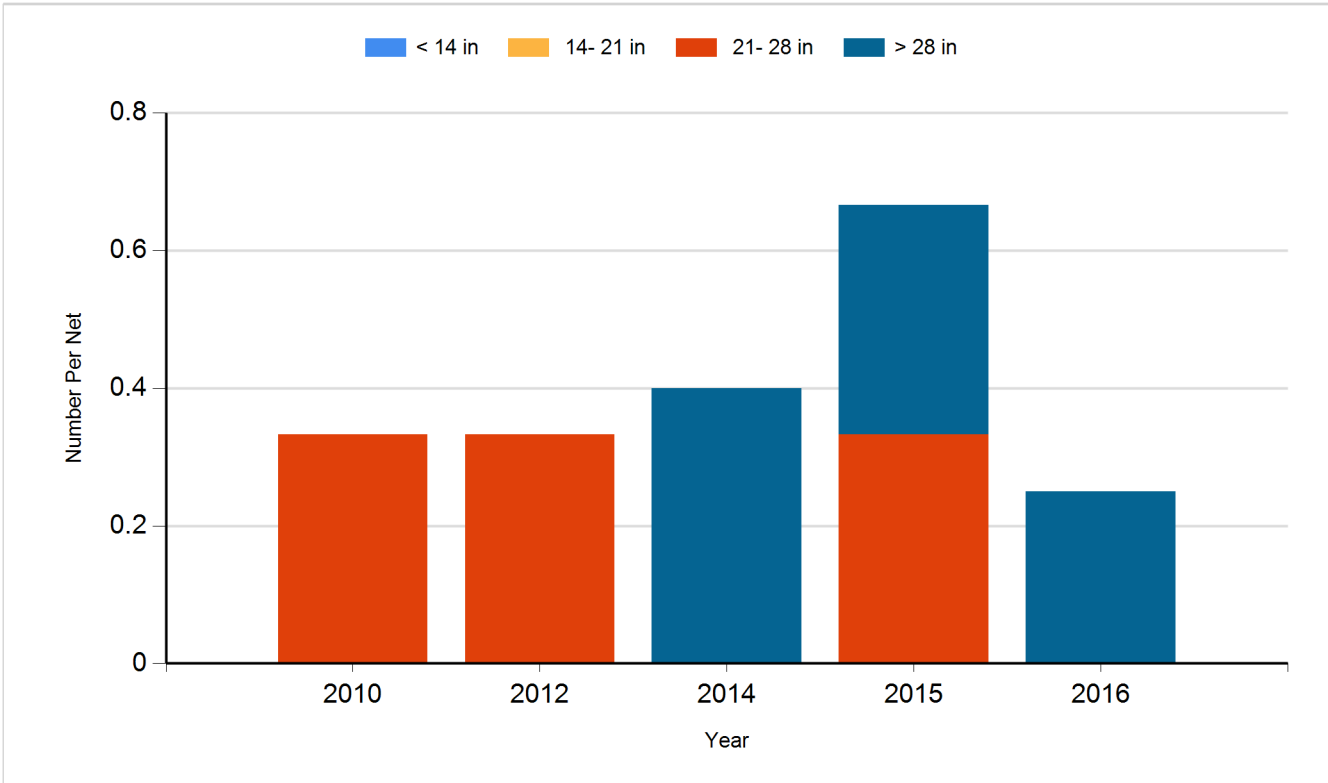
Species: Common Carp
Gear: std exp gill net



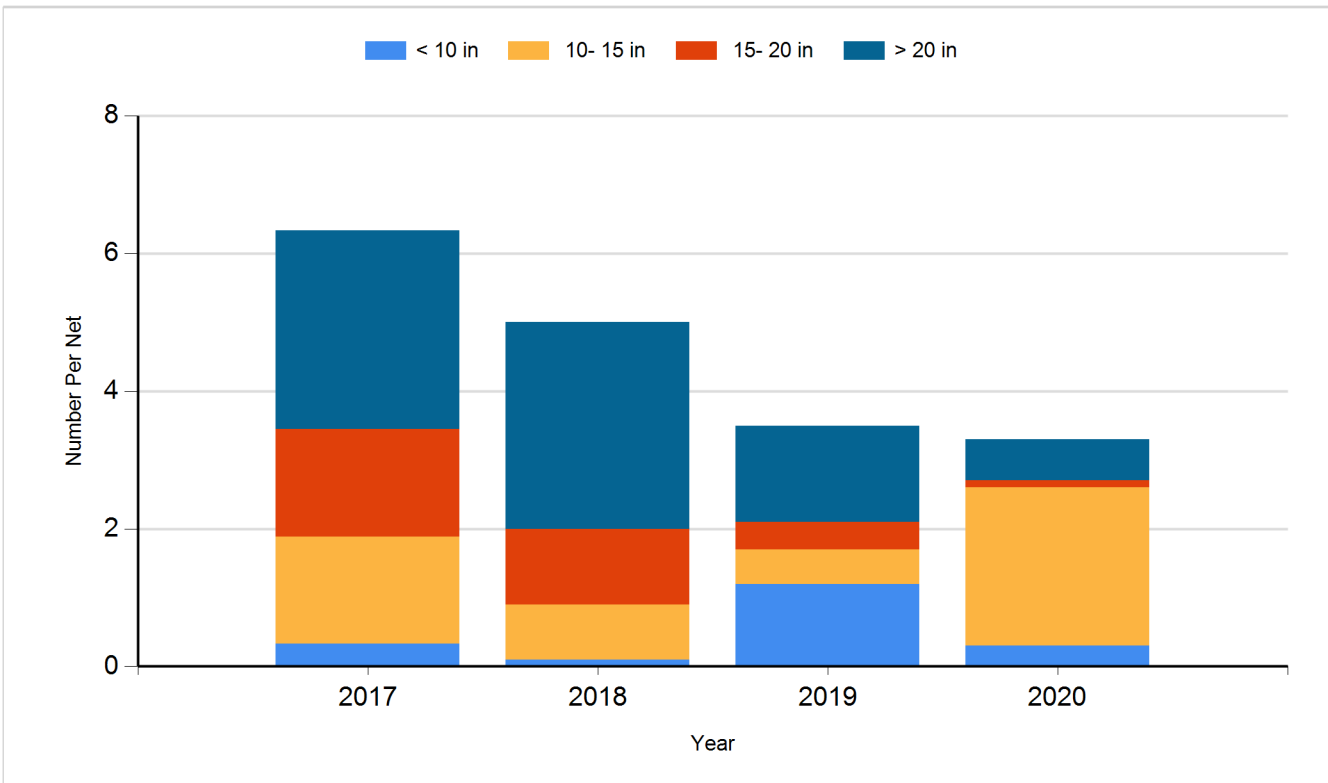
Species: Northern Pike
Gear: AFS std gill net



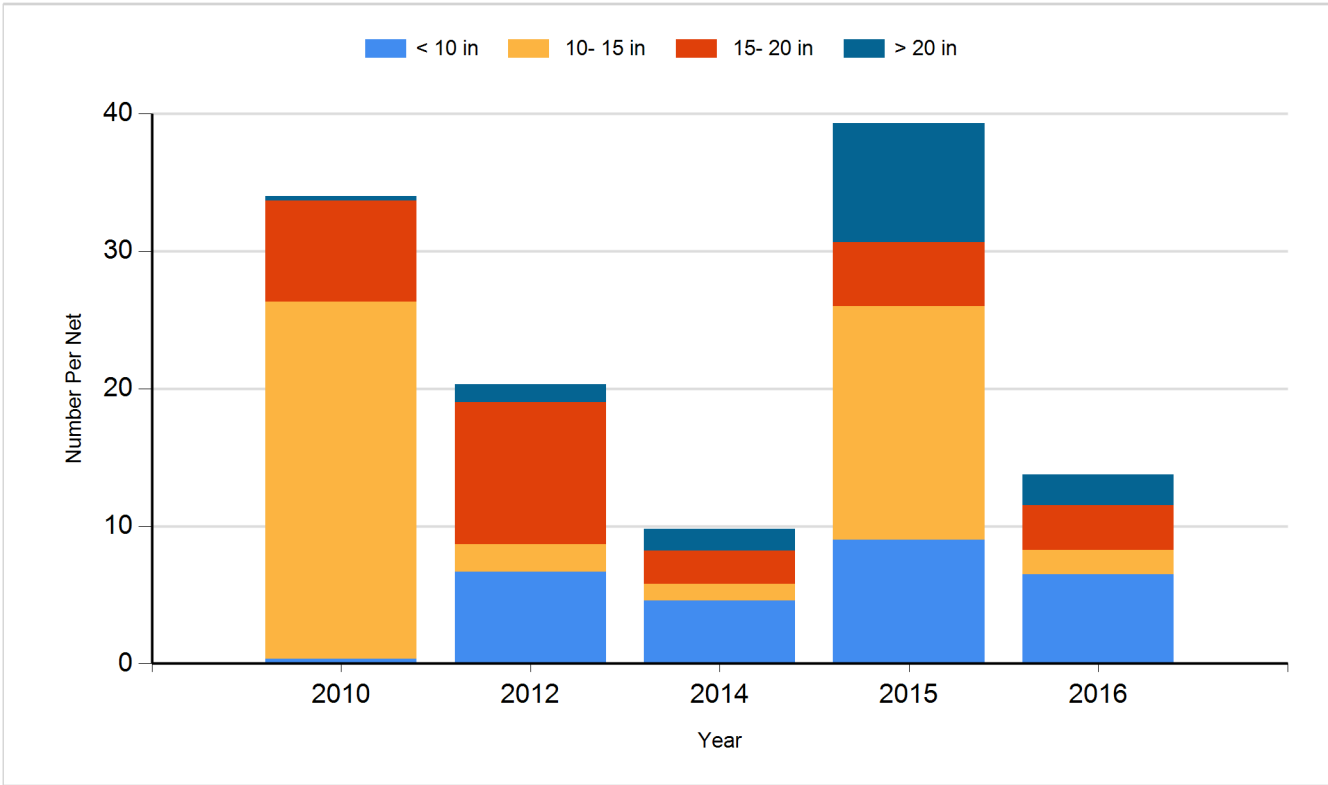
Species: Northern Pike
Gear: std exp gill net



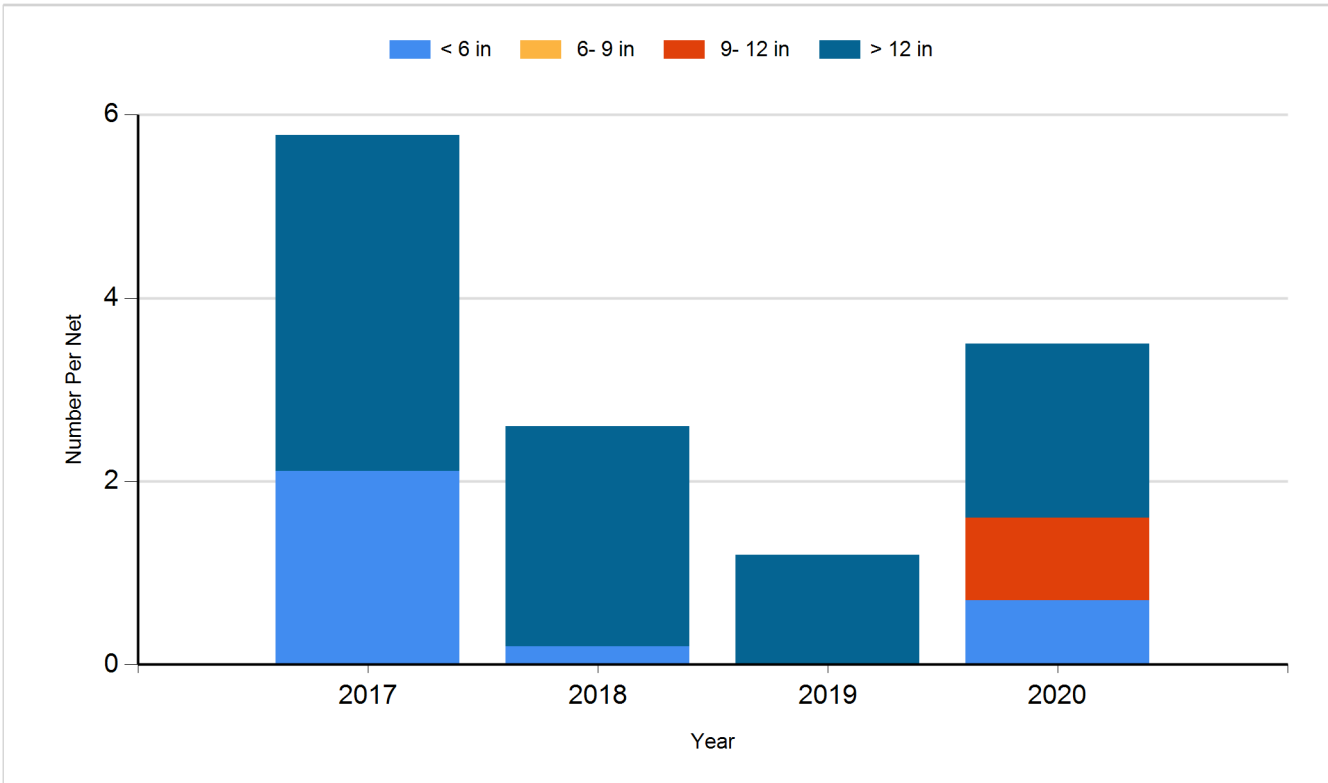
Species: Walleye
Gear: AFS std gill net



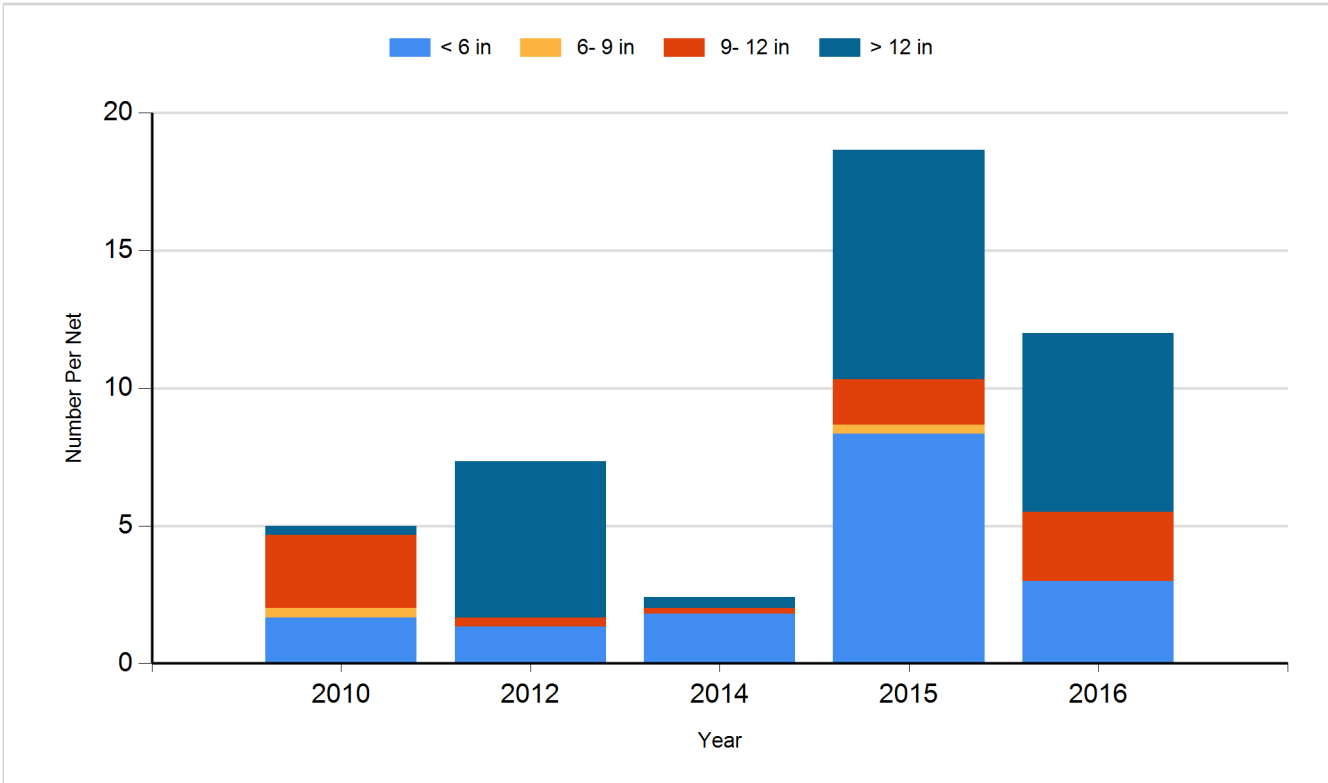
Species: Walleye
Gear: std exp gill net



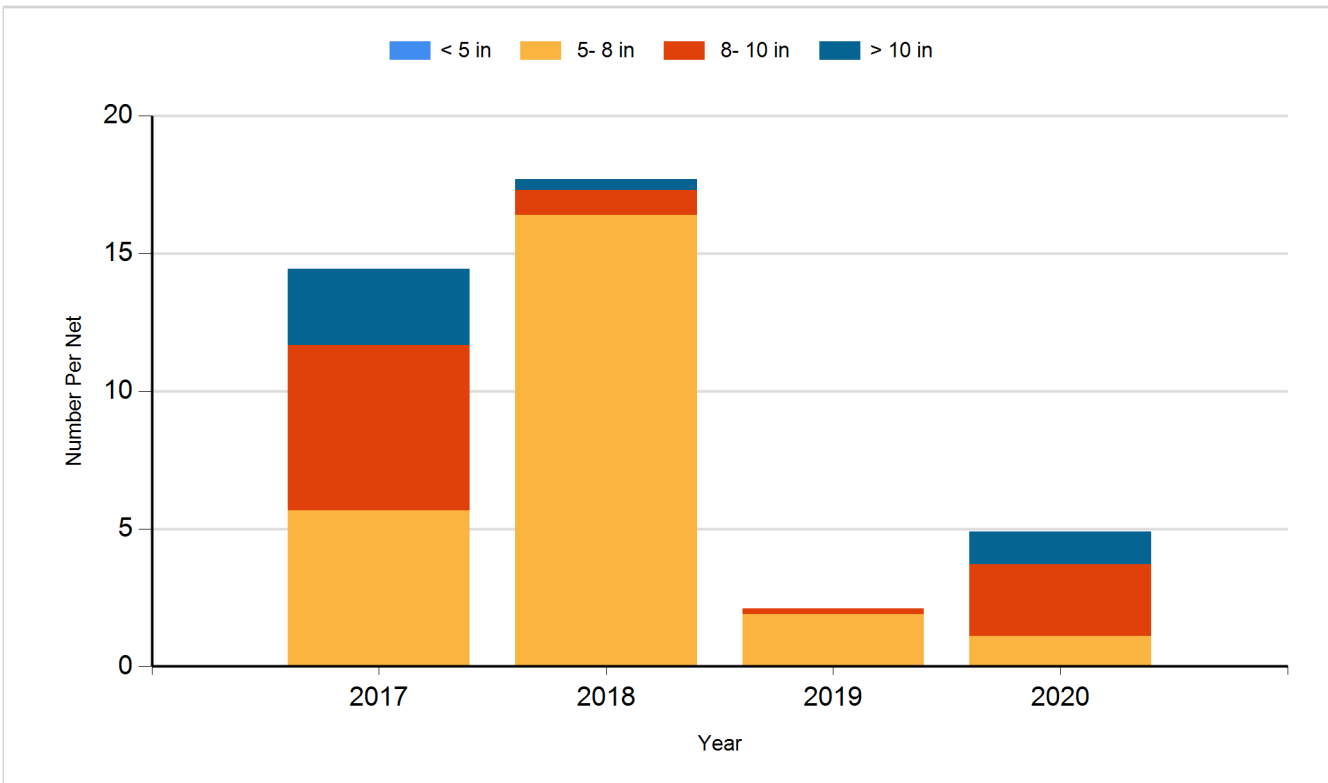
Species: White Bass
Gear: AFS std gill net



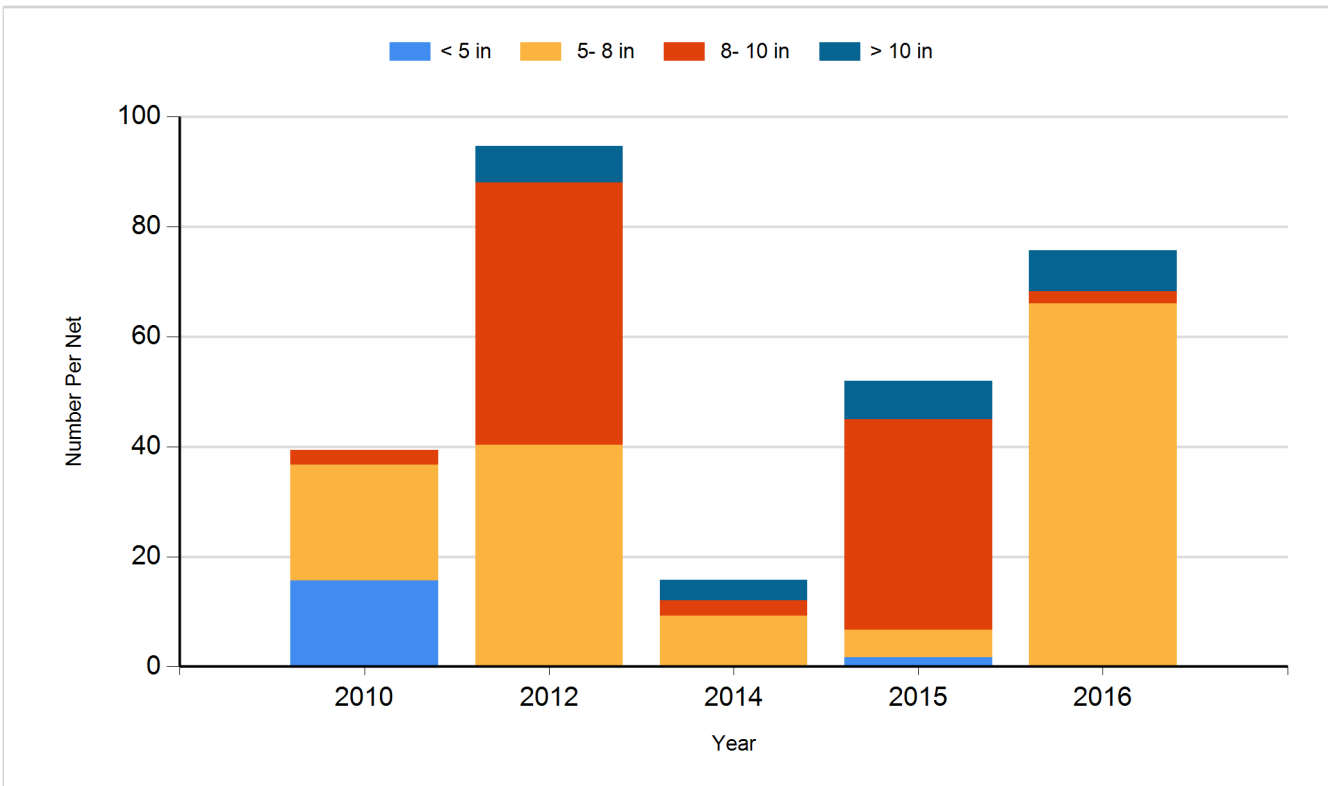
Species: White Bass
Gear: std exp gill net



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
2019	Walleye	Small Fingerling	108,900
2020	Muskellunge		25