SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Marindahl, Yankton County
VER-Lake-276-000
2018

Lake Information

Name: Marindahl

County: Yankton

Legal Description: T95N-R54W-Sec. 7, 17, 18, 20

Surface Area: 147 Acres

Maximum Depth: 30 Feet

Mean Depth: 13 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	May 14, 2018	3 net-nights
frame net (std 3/4 in)	May 14, 2018	5 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

White Sucker

Yellow Perch

Common Carp

Channel Catfish

Walleye

Terminology

Catch per unit effort (**CPUE**) refers to the relative abundance of a species. It is defined as the number of fish captured per unit of effort (i.e., number of fish captured per net-night or number of fish captured per hour electrofishing). In this report CPUE is typically given for only stock-length fish (see length categories table for stock lengths).

A statewide effort to help make netting efforts comparable to all waters sampled across the state, occurred in 2017, with a switch to American Fisheries Society gill nets. Past gill netting efforts were completed with different style/types of nets and are not comparable side by side.

- **AFS std gill net** – 80 ft experimental gill net containing eight panels (10 ft each) of varying monofilament meshes of 0.75, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25 and 2.50 inches.
- **std experimental gill net for non-Missouri River waters** - 150 ft experimental gill net containing six panels (25 ft each) of varying monofilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.
- s**td experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

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

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

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

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

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (W) compared to a length-specific standard weight (Ws) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

$$Wr = \left(\frac{W}{Ws}\right) \text{x } 100$$

Confidence intervals (**CI**) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (**S**), quality (**Q**), preferred (**P**), memorable (**M**) and trophy (**T**). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

	Stock		Quality		Preferred		Memorable		Trophy	
Species Name	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
Walleye	10	25	15	38	20	51	25	63	30	76
White Bass	6	15	9	23	12	30	15	38	18	46
White Crappie	5	13	8	20	10	25	12	30	15	38
Yellow Bullhead	4	10	7	18	9	23	11	28	14	36
Yellow Perch	5	13	8	20	10	25	12	30	15	38

Catch Summary of Stock Length Fish

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

*** Methods/Species that ignore stock length**

			Abundance		Stock Density Indices				Condition	
Gear	Species	Sample Size (n)	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	2	0.7	0.6	0		0		89	7
	Black Crappie	2	0.7	1.3	100		100		97	4
	Channel Catfish	14	0.7	1.3	50		0		95	23
	Common Carp	9	2.0	1.9	0		0			
	Walleye	1	0.0	0.0	0		0			
	White Sucker	1	0.3	0.6	100		0			
	Yellow Perch	9	3.0	5.7	0		0		88	4
frame net (std 3/4 in)	Black Bullhead	80	16.0	6.6	5		0			
	Black Crappie	356	71.2	32.6	100		94	2	98	1
	Bluegill	2	0.2	0.3	0		0			
	Channel Catfish	3	0.4	0.6	0		0		84	
	Common Carp	9	1.4	2.1	0		0			
	Largemouth Bass	1	0.2	0.3	100		100		99	
	White Sucker	19	3.8	4.5	100		68	17	58	
	Yellow Perch	5	1.0	0.7	40		0		97	28

10-Year Catch Per Unit Effort by Gear and Species

Catch per unit effort (CPUE) and average (Avg) of species across 10 years using different gear types.

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std frame net	Black Bullhead									41.8		41.8
	Black Crappie									68.0		68.0
	Common Carp									0.0		0.0
	White Sucker									5.6		5.6
	Yellow Perch									0.2		0.2
AFS std gill net	Black Bullhead									12.0	0.7	6.4
	Black Crappie									2.8	0.7	1.8
	Bluegill									0.2		0.2
	Channel Catfish									3.8	0.7	2.3
	Common Carp									1.2	2.0	1.6
	Gizzard Shad									3.3		3.3
	Smallmouth Bass									0.3		0.3
	Walleye										0.0	0.0
	White Sucker									5.0	0.3	2.7
	Yellow Perch									4.2	3.0	3.6
boat shocker (night)	Largemouth Bass	5.5				6.0	8.1	7.5	6.0			6.6
	Smallmouth Bass							0.5				0.5
frame net (std 3/4 in)	Black Bullhead	0.3		3.9		11.0	52.1	185.2	51.3		16.0	45.7
	Black Crappie	70.0		46.1		3.6	5.6	19.0	49.4		71.2	37.8
	Bluegill	28.3		81.9		6.3	4.7	21.9	17.9		0.2	23.0
	Channel Catfish	0.5		1.8		1.4	0.5	1.3	0.6		0.4	0.9
	Common Carp	0.1		0.9		0.0	1.4	0.1	0.6		1.4	0.6
	Green Sunfish	0.3		3.5		0.5	0.3	1.2	1.2			1.2
	Largemouth Bass			0.0				0.0			0.2	0.1
	Sunfish Hybrid					0.0						0.0
	White Sucker	25.4		43.7		4.8	5.5	19.8	12.6		3.8	16.5
	Yellow Perch	0.1		0.3							1.0	0.5

10-Year Size Structure and Condition Statistics by Gear and Species

Species proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) collected by different gear types across 10 years.

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std frame net	Black Bullhead	PSD									13	
		PSD-P									1	
	Black Crappie	PSD									94	
		PSD-P									4	
		Wr									94	
	Common Carp	PSD									0	
		PSD-P									0	
	White Sucker	PSD									96	
		PSD-P									64	
	Yellow Perch	PSD									100	
		PSD-P									100	
		Wr									75	
AFS std gill net	Black Bullhead	PSD									18	0
		PSD-P									1	0
		Wr										89
	Black Crappie	PSD									94	100
		PSD-P									0	100
		Wr									96	97
	Bluegill	PSD									0	
		PSD-P									0	
		Wr									85	
	Channel Catfish	PSD									91	50
		PSD-P									9	0
		Wr									103	95
	Common Carp	PSD									0	0
		PSD-P									0	0
	Walleye	PSD										0
		PSD-P										0
	White Sucker	PSD									90	100
		PSD-P									63	0
	Yellow Perch	PSD									96	0
		PSD-P									80	0

			Year									
Gear	Species	Index	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AFS std gill net	Yellow Perch	Wr									82	88
boat shocker (night)	Largemouth Bass	PSD	91				100	100	13	58		
		PSD-P	27				85	100	13	17		
		Wr	109				96	105	98	95		
frame net (std 3/4 in)	Black Bullhead	PSD	0		5		80	2	1	1		5
		PSD-P	0		0		0	1	0	0		0
		Wr	74		84		85					
	Black Crappie	PSD	33		93		47	98	2	9		100
		PSD-P	0		0		3	0	1	7		94
		Wr	95		98		105	104	115	99		98
	Bluegill	PSD	73		38		49	32	49	61		0
		PSD-P	0		0		0	2	1	1		0
		Wr	92		94		105	109	93	95		
	Channel Catfish	PSD	20		17		57	20	31	50		0
		PSD-P	0		0		0	0	8	0		0
		Wr	79		84		96	82	78	117		84
	Common Carp	PSD	0		11		0	0	0	0		0
		PSD-P	0		11		0	0	0	0		0
		Wr	97		99							
	Largemouth Bass	PSD			0				0			100
		PSD-P			0				0			100
		Wr										99
	White Sucker	PSD	99		100		100	100	100	100		100
		PSD-P	82		54		98	98	99	100		68
		Wr	81		74		86					58
	Yellow Perch	PSD	100		33							40
		PSD-P	0		0							0
		Wr	89		67							97

Length at Capture

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

Species: Black Crappie

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	356		215 (4)	258 (43)	272 (221)	269 (74)		303 (15)			
2017	340		174 (16)	213 (60)	226 (249)	256 (4)		302 (8)	294 (4)		
2015	191	147 (188)	216 (1)	241 (1)	250 (1)						
2014	56		176 (1)	227 (54)	216 (1)						
2013	36		198 (30)	204 (5)	261 (1)						
2011	461	167 (23)		215 (438)							
2009	700	156 (349)	194 (76)	204 (166)	212 (108)						

Species: Bluegill

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	217	118 (107)	162 (52)	171 (50)	181 (9)						
2014	47	136 (29)	152 (5)	168 (8)	189 (3)	198 (2)					
2013	63	110 (31)	163 (13)	167 (18)	182 (1)						
2011	819	129 (510)	165 (39)	171 (208)	184 (62)						
2009	283	142 (110)	162 (158)	175 (4)	183 (10)						

Species: Largemouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2013	20	130 (1)			363 (1)	388 (3)	393 (4)	454 (9)	485 (1)	545 (1)	
2009	13	164 (3)	280 (1)	330 (2)	315 (1)	353 (4)	433 (1)	429 (1)			

Fish Condition

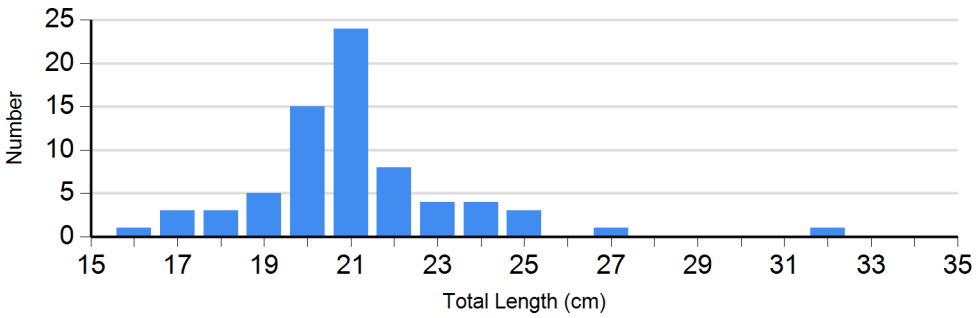
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2018	2	89 (5.1)	0		0		0	
Black Crappie Frame Net	2014	1	58	55	105 (0.9)	0		0	
	2015	187	117 (2.3)	2	89 (1.7)	1	84	0	
	2016	449	101 (0.8)	10	83	35	81 (1.0)	0	
	2017	19	98 (1.3)	306	94 (0.5)	11	93 (1.5)	4	93
	2018	0		23		318	98 (0.5)	15	99 (0.8)
Bluegill Frame Net	2014	32	110 (2.8)	14	106 (2.1)	1	91	0	
	2015	112	98 (2.0)	105	87 (0.9)	2	81	0	
	2016	69	99 (0.9)	108	92 (0.8)	2		0	
Channel Catfish Gill Net	2017	2	83 (2.3)	19	104 (2.1)	2	119 (13.4)	0	
	2018	1	78	1	113	0		0	
Largemouth Bass Electro Fishing	2014	0		0		13	104 (1.9)	2	114 (11.0)
	2015	13	102	0		0		2	96 (0.3)
	2016	5	83 (3.8)	5	99 (4.4)	0		2	113 (0.2)
Walleye Gill Net	2018	0		0		0		0	
Yellow Perch Gill Net	2017	1	89	4	89 (4.0)	16	83 (1.5)	4	74 (2.6)
	2018	9	88 (2.8)	0		0		0	

Length Frequency Distribution

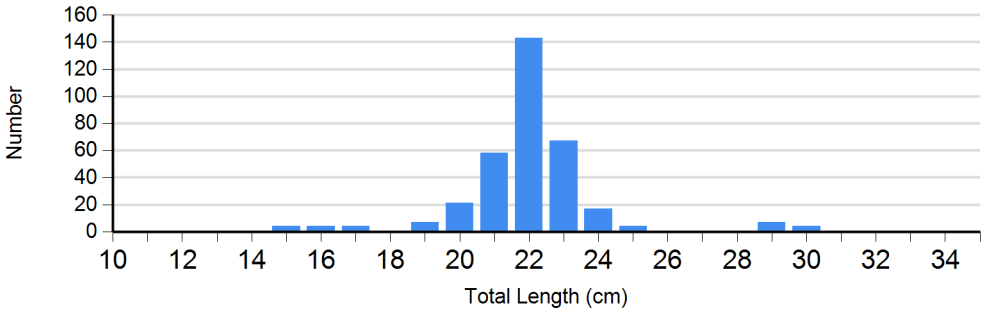
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



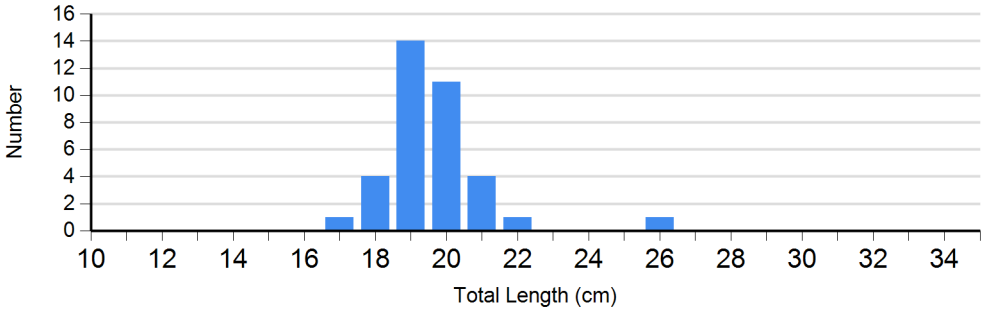
2017

Species: Black Crappie
Gear: AFS std frame net

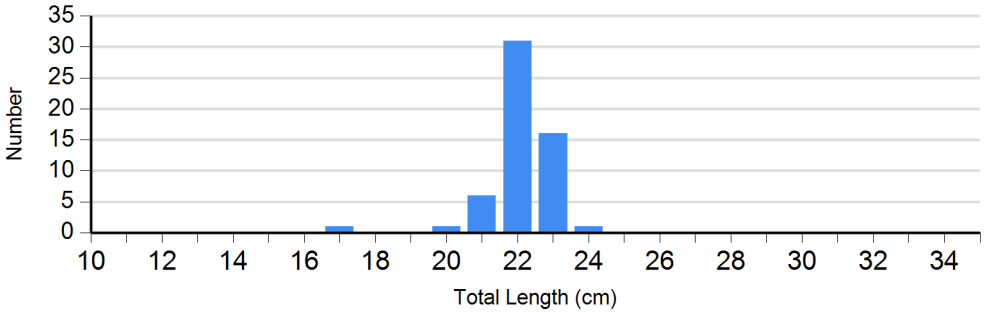


2017

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



2013



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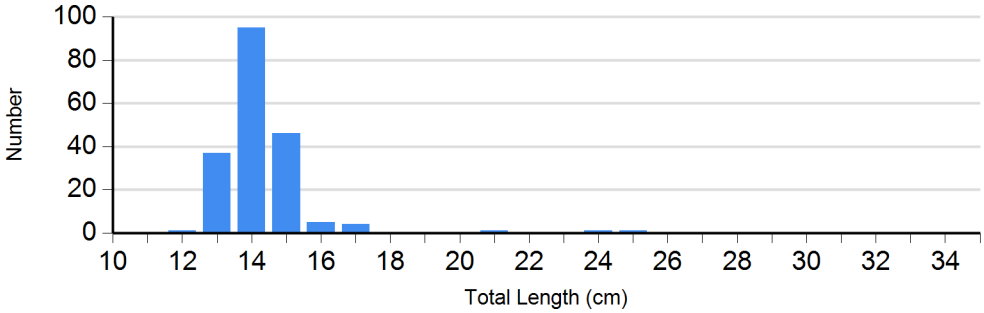

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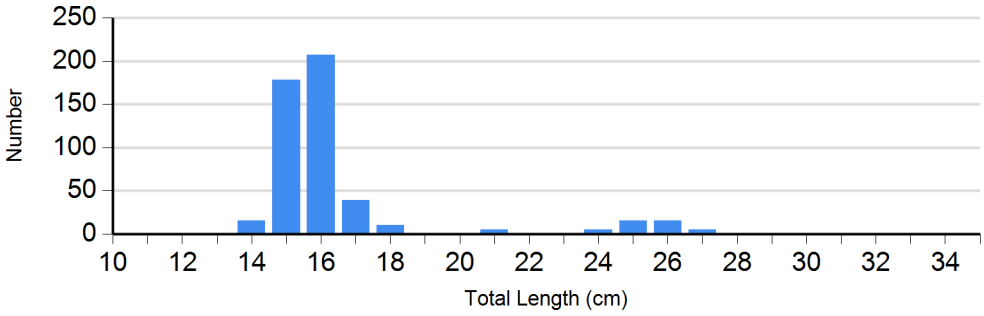

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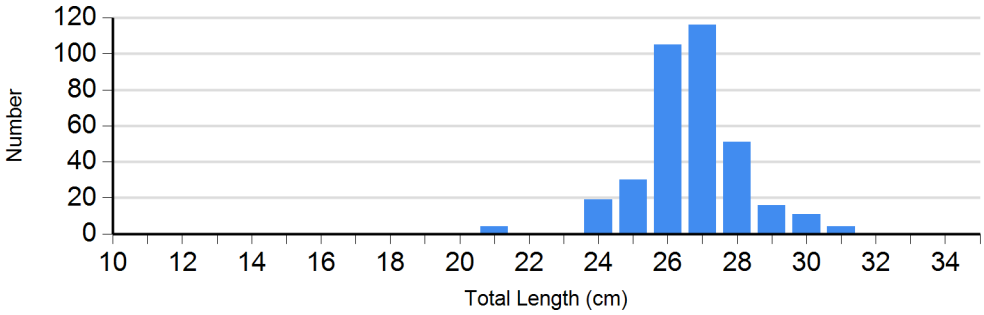
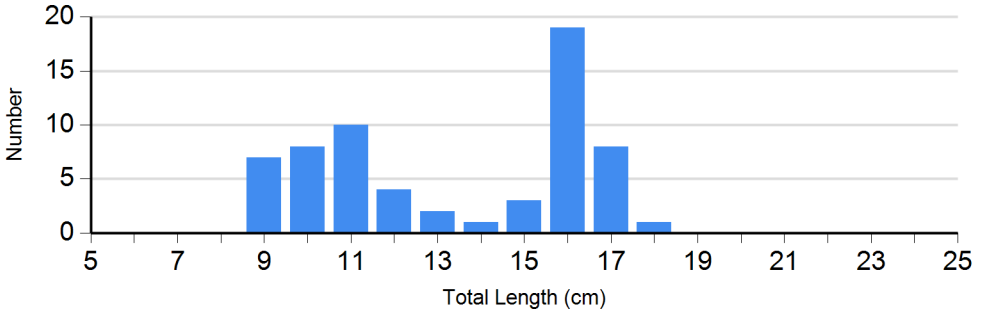
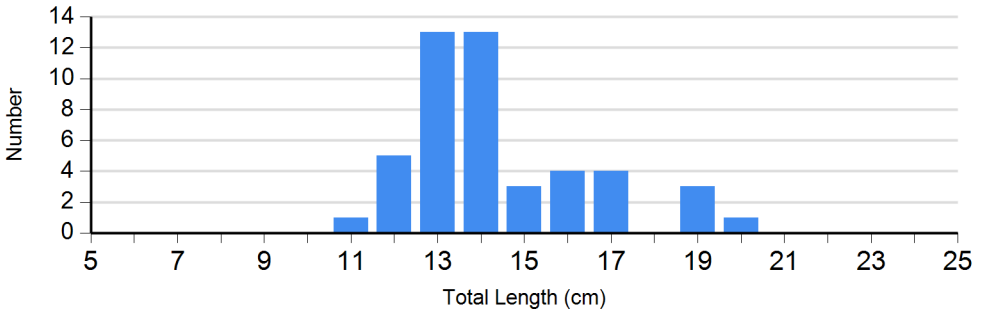


2018

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



2013



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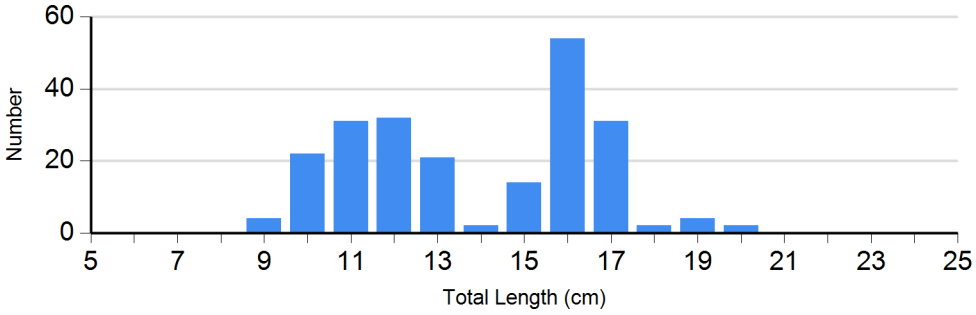

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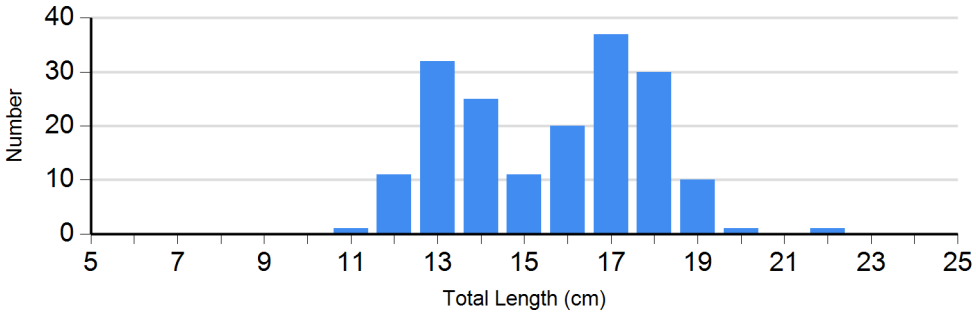
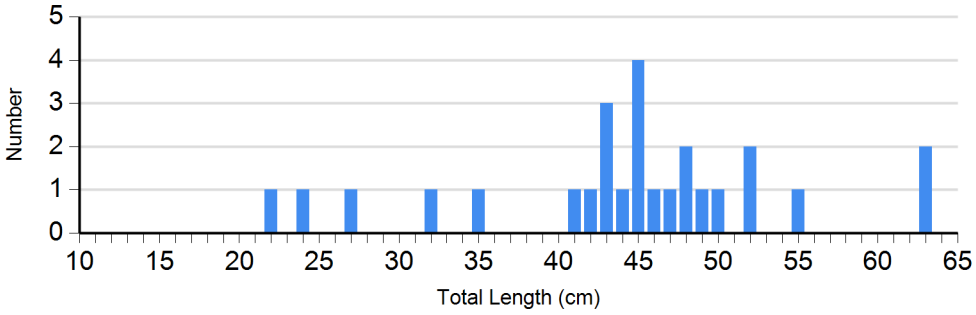
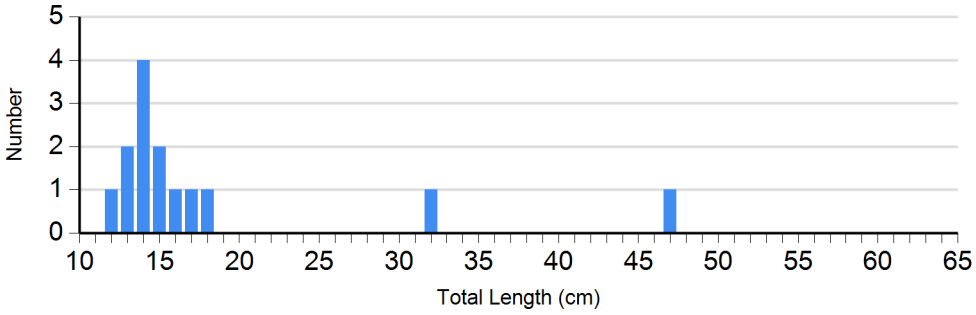


2016

Species: Channel Catfish
Gear: AFS std gill net

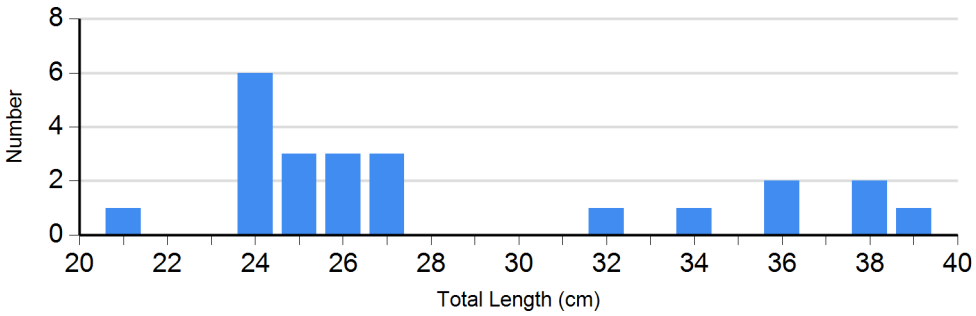


2017



2018

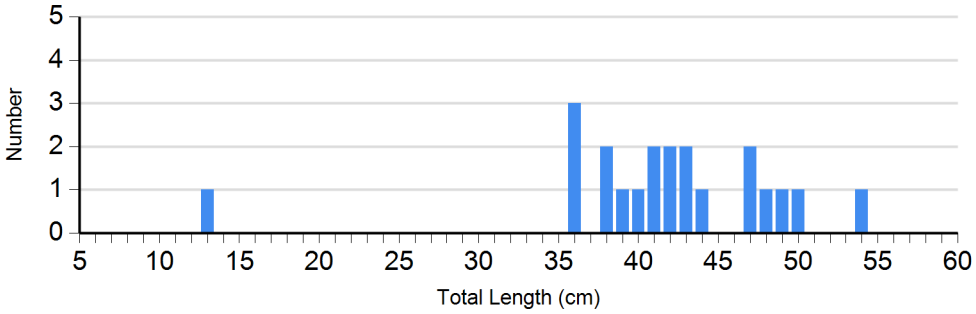
Species: Common Carp
Gear: AFS std gill net



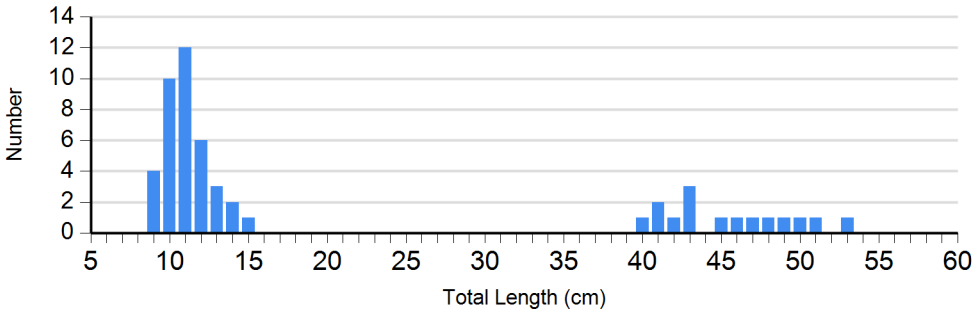
2017

Species: Largemouth Bass
Gear: boat shocker (night)

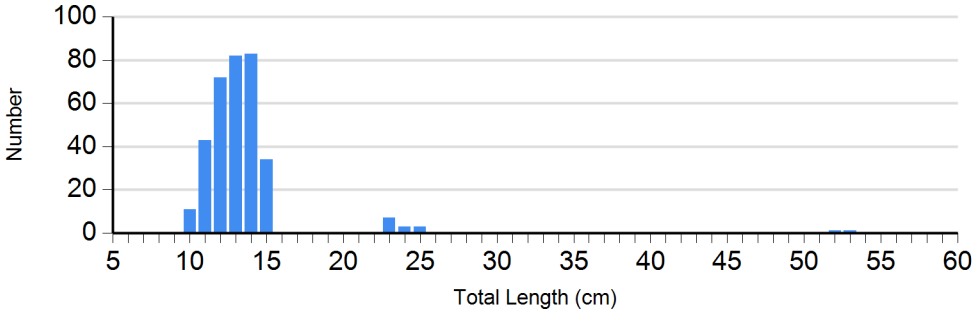
2013



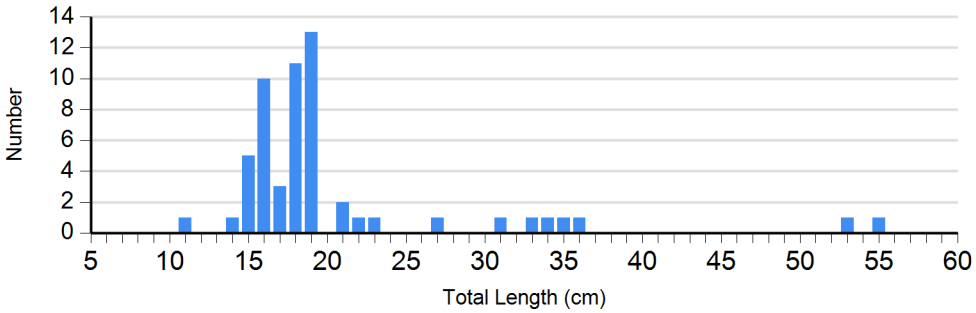
2014



2015

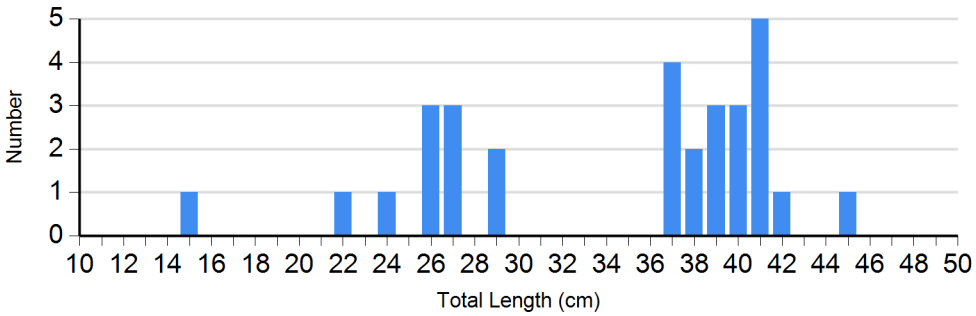


2016

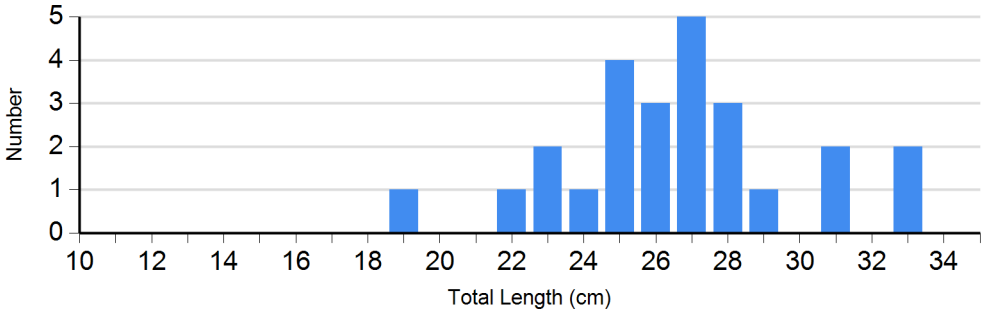


Species: White Sucker
Gear: AFS std gill net

2017



Species: Yellow Perch
Gear: AFS std gill net

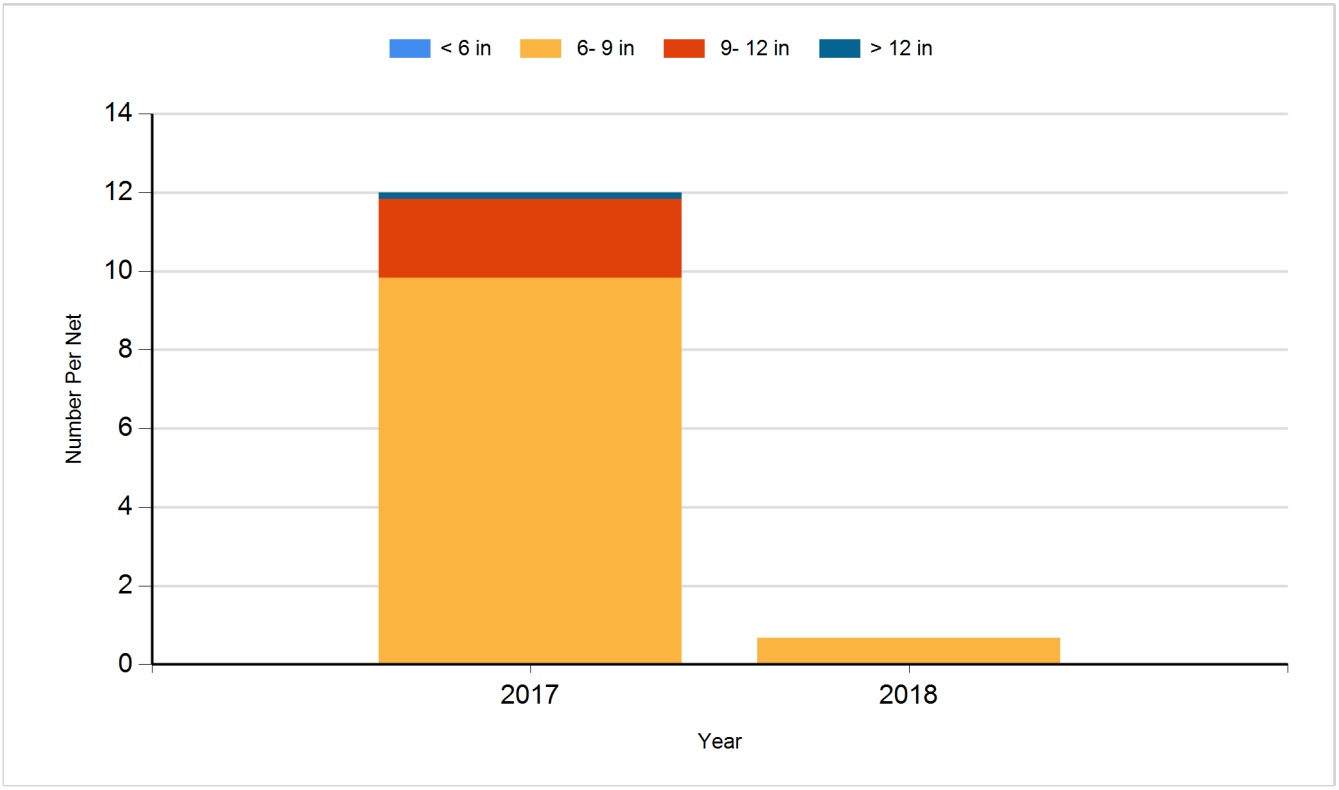


2017

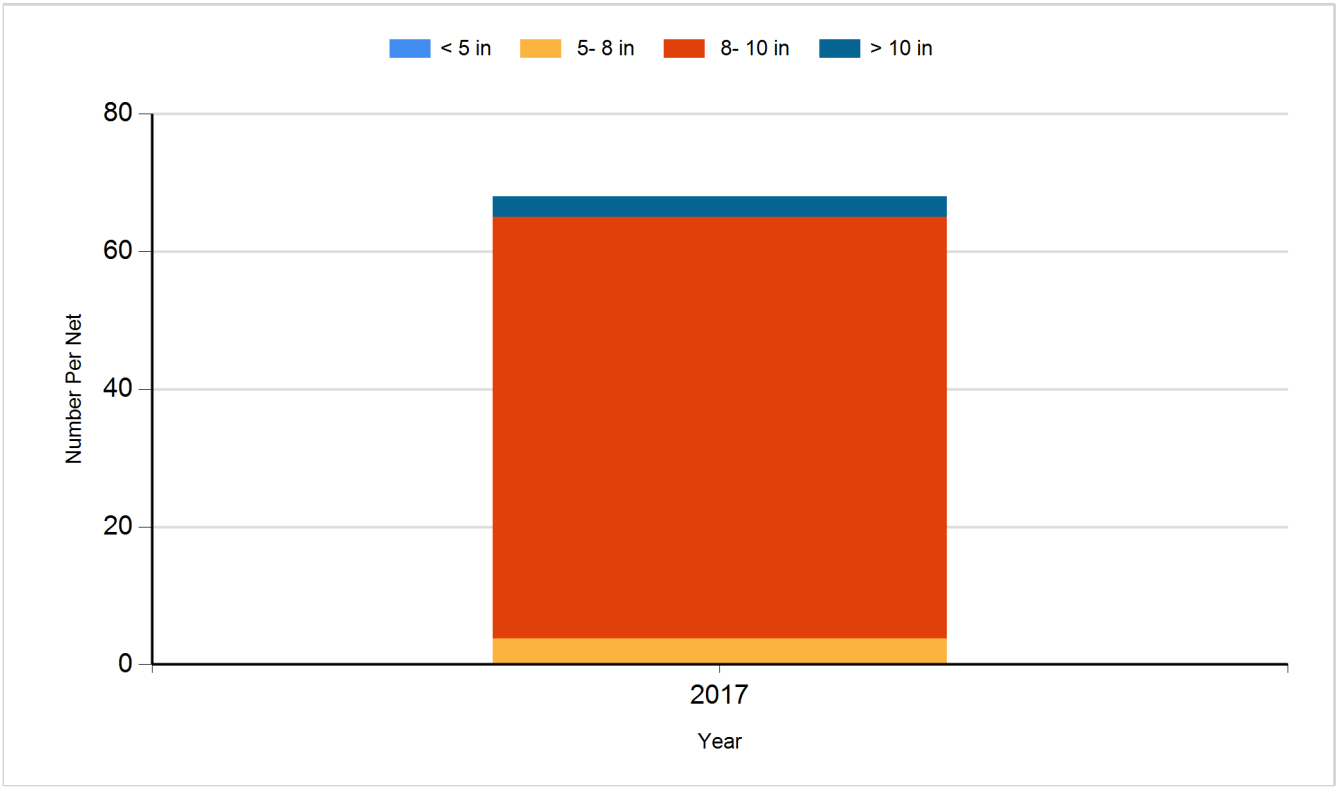
Historic Fish Sizes and Relative Abundance

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

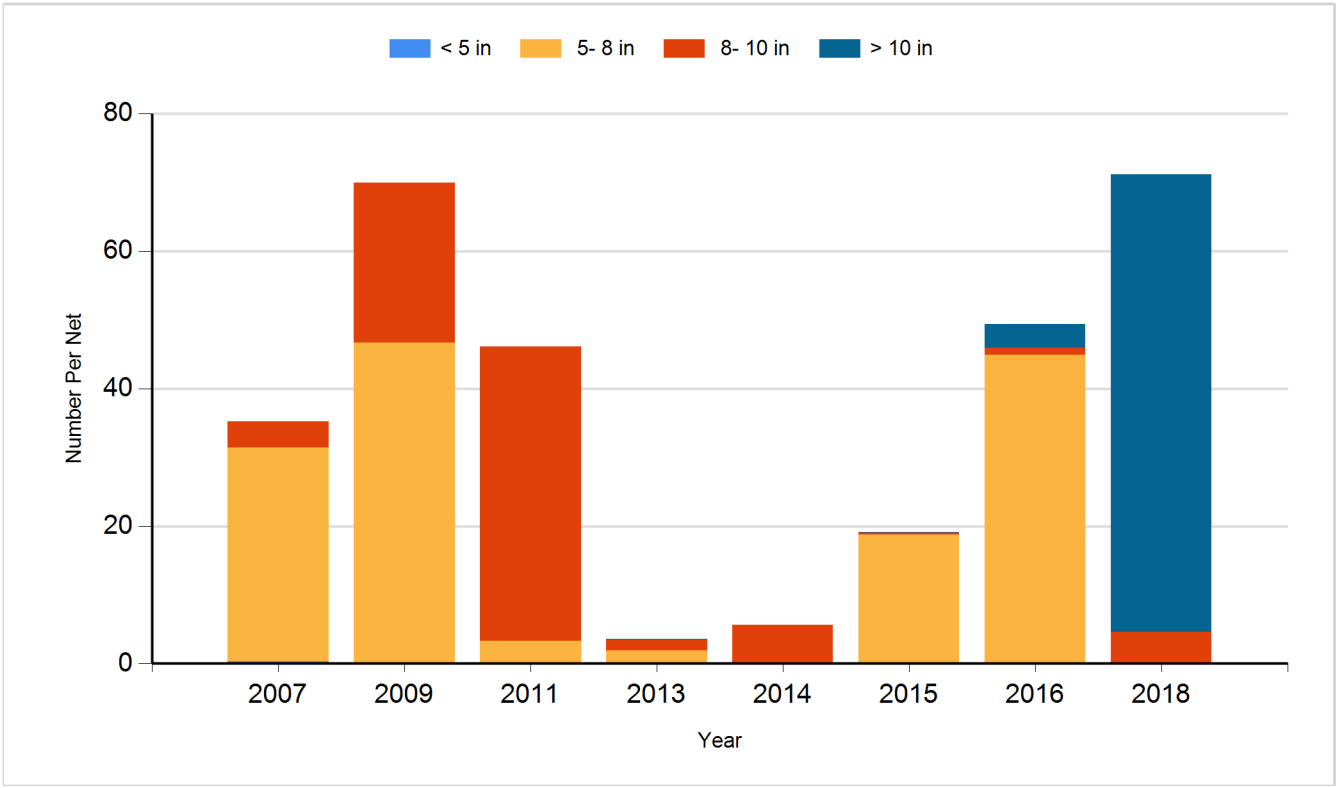
Species: Black Bullhead
Gear: AFS std gill net



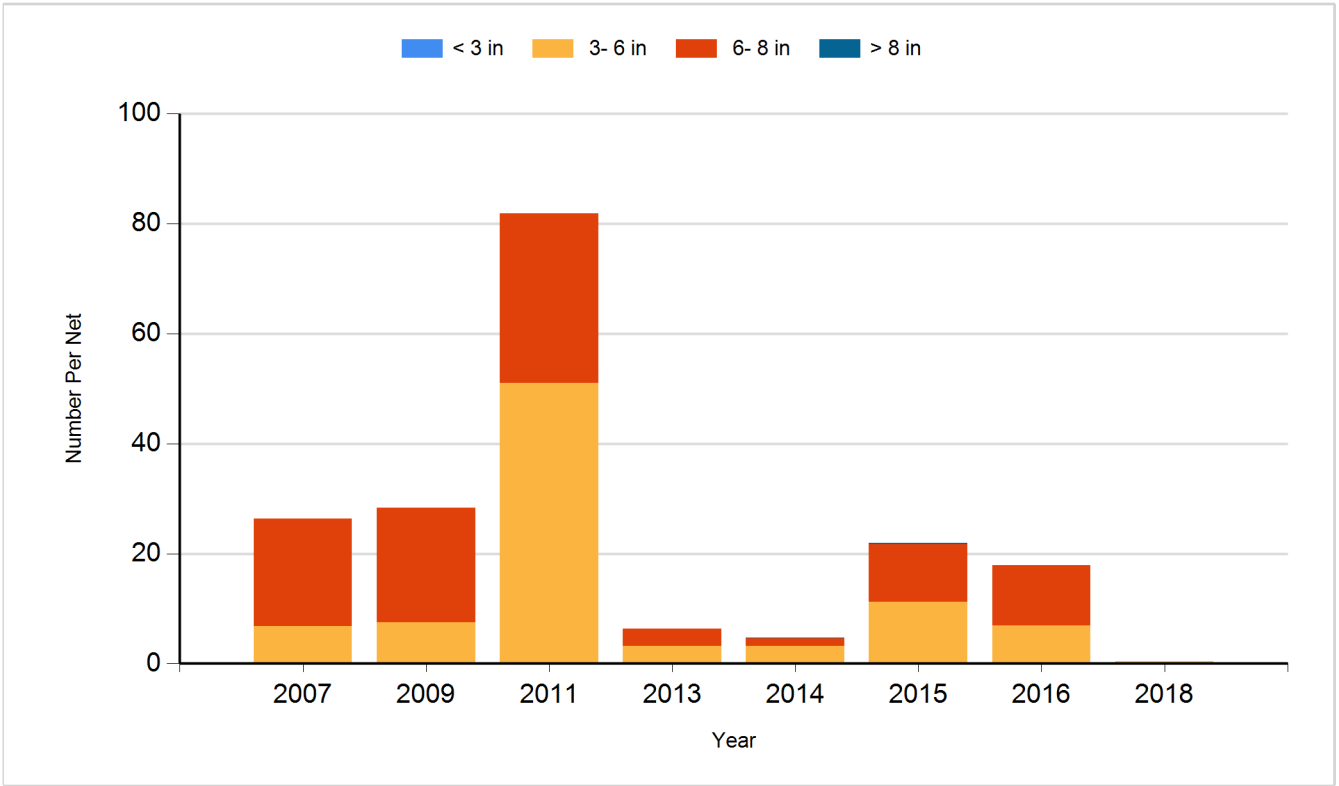
Species: Black Crappie
Gear: AFS std frame net



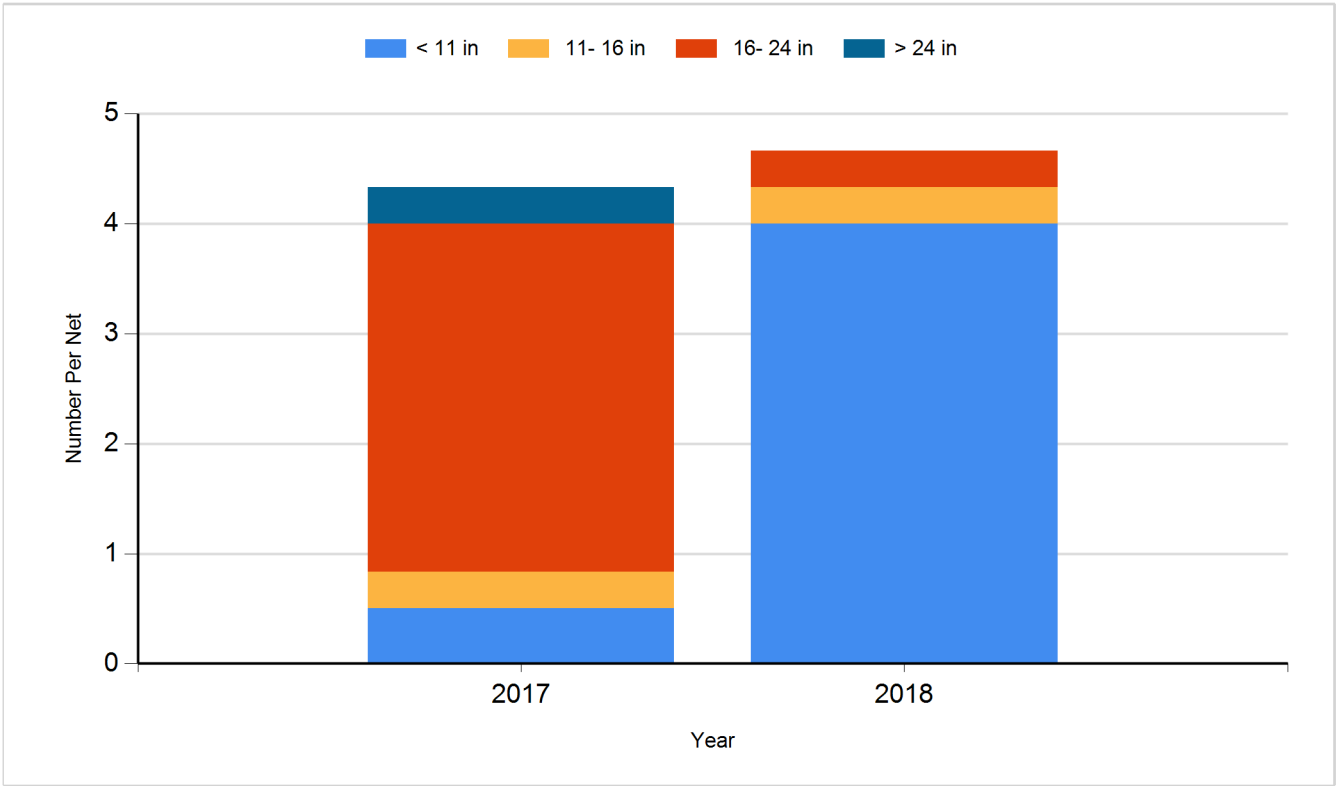
Species: Black Crappie
Gear: frame net (std 3/4 in)



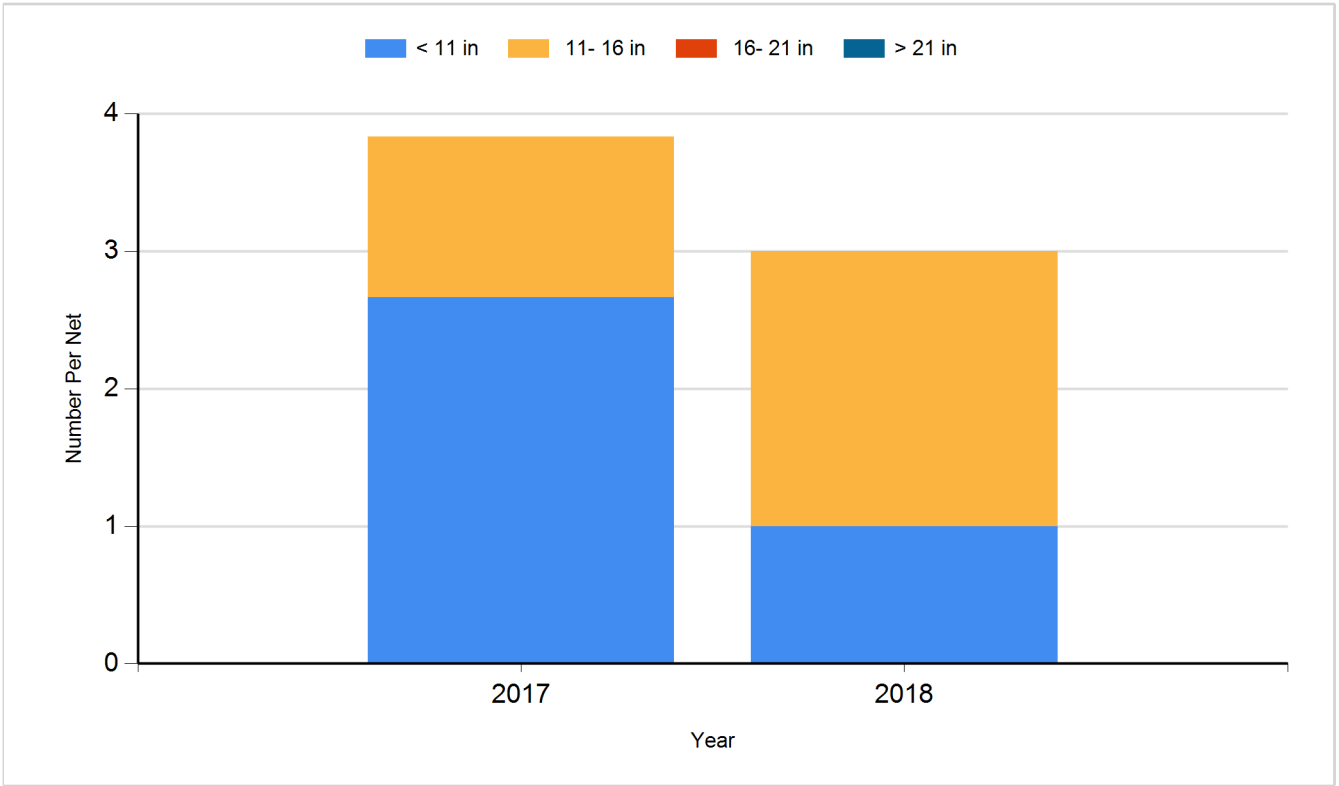
Species: Bluegill
Gear: frame net (std 3/4 in)



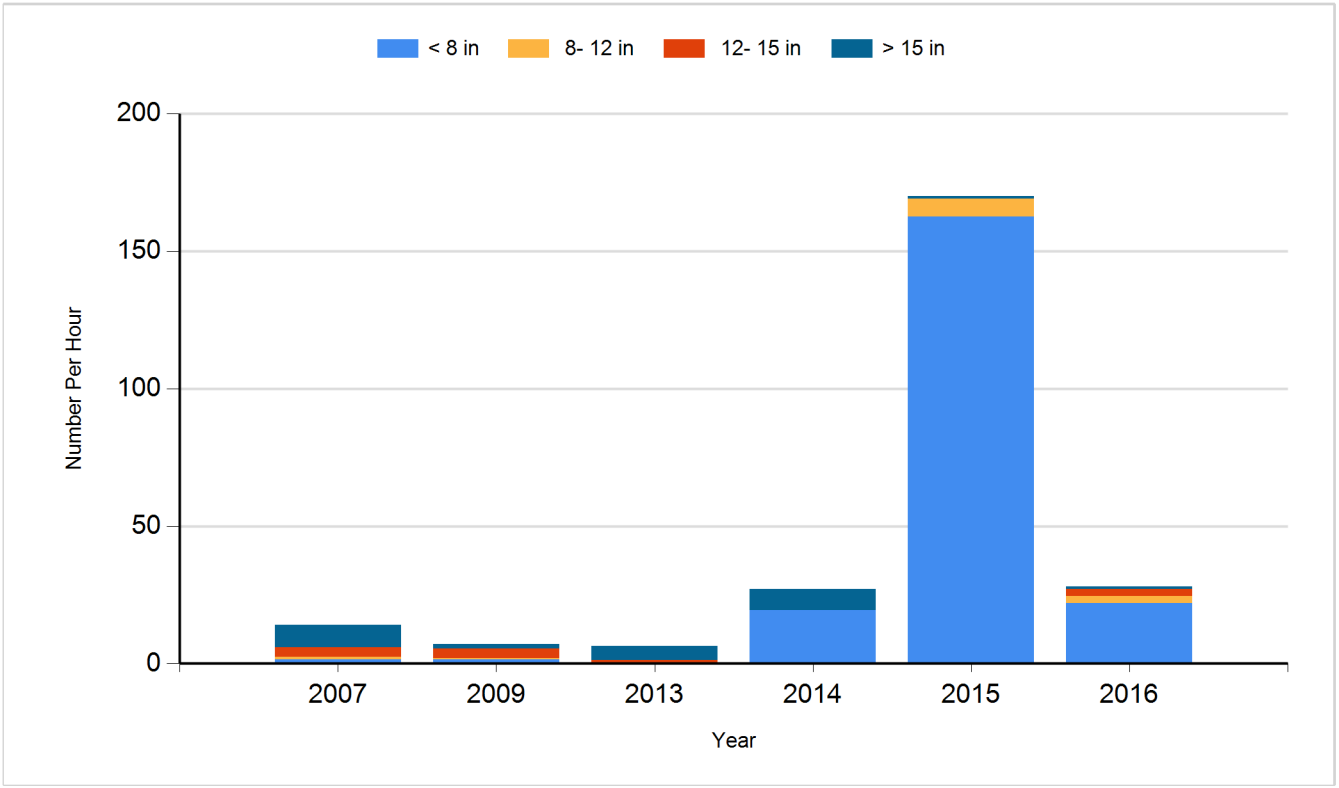
Species: Channel Catfish
Gear: AFS std gill net



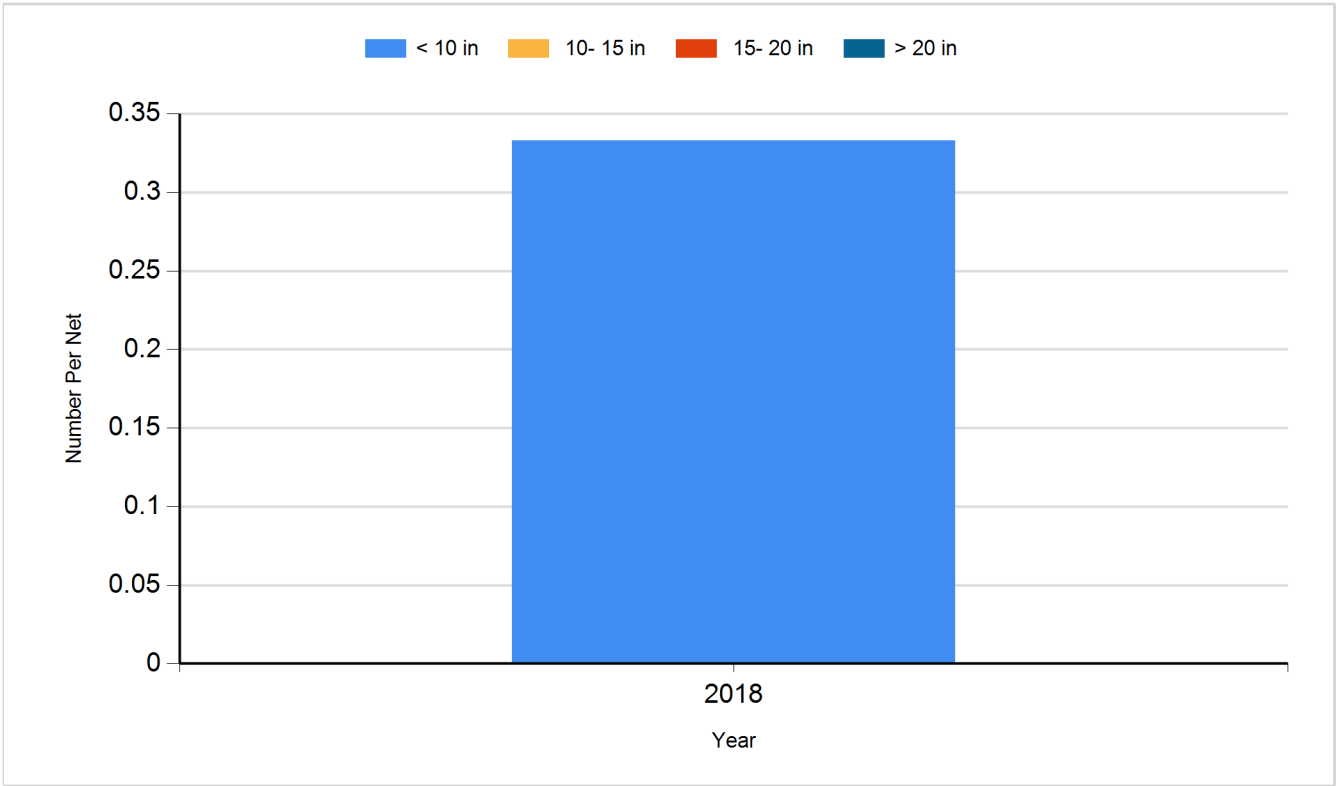
Species: Common Carp
Gear: AFS std gill net



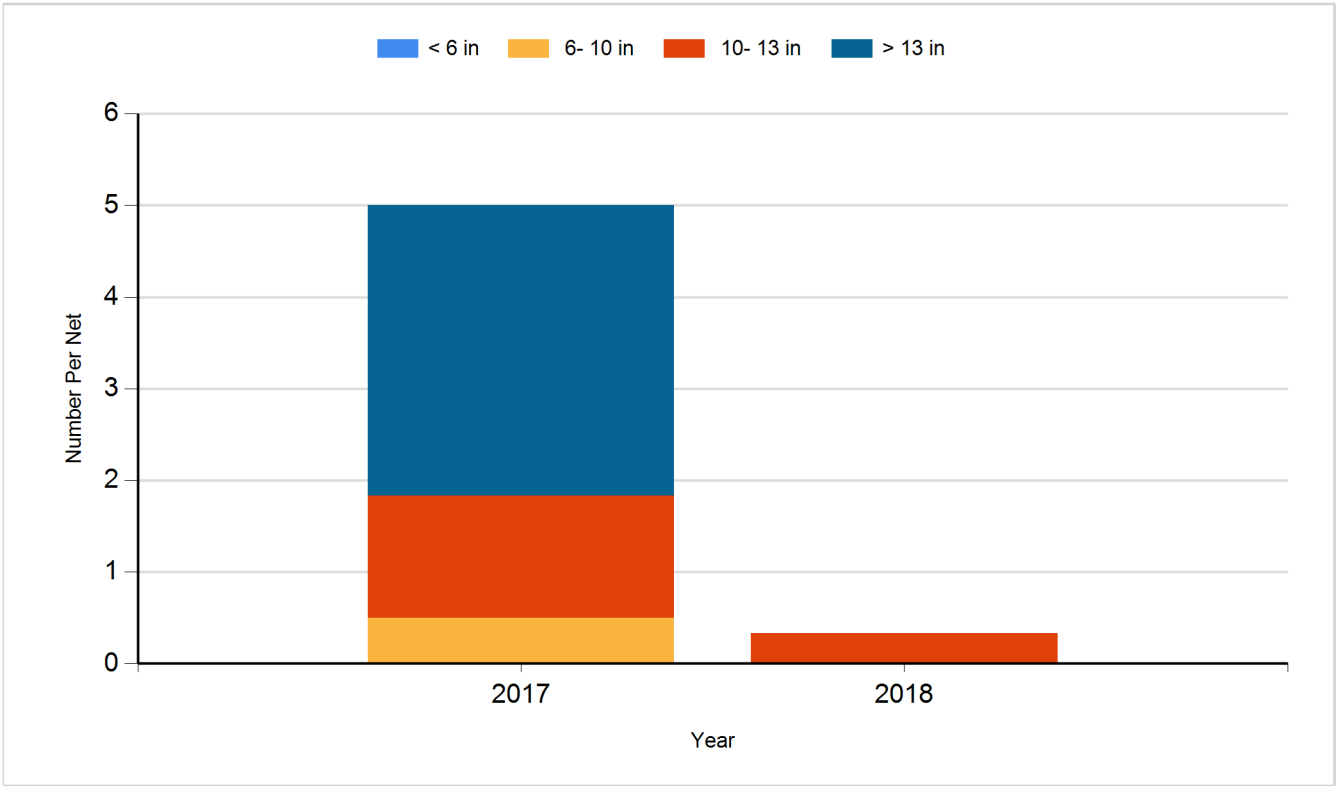
Species: Largemouth Bass
Gear: boat shocker (night)



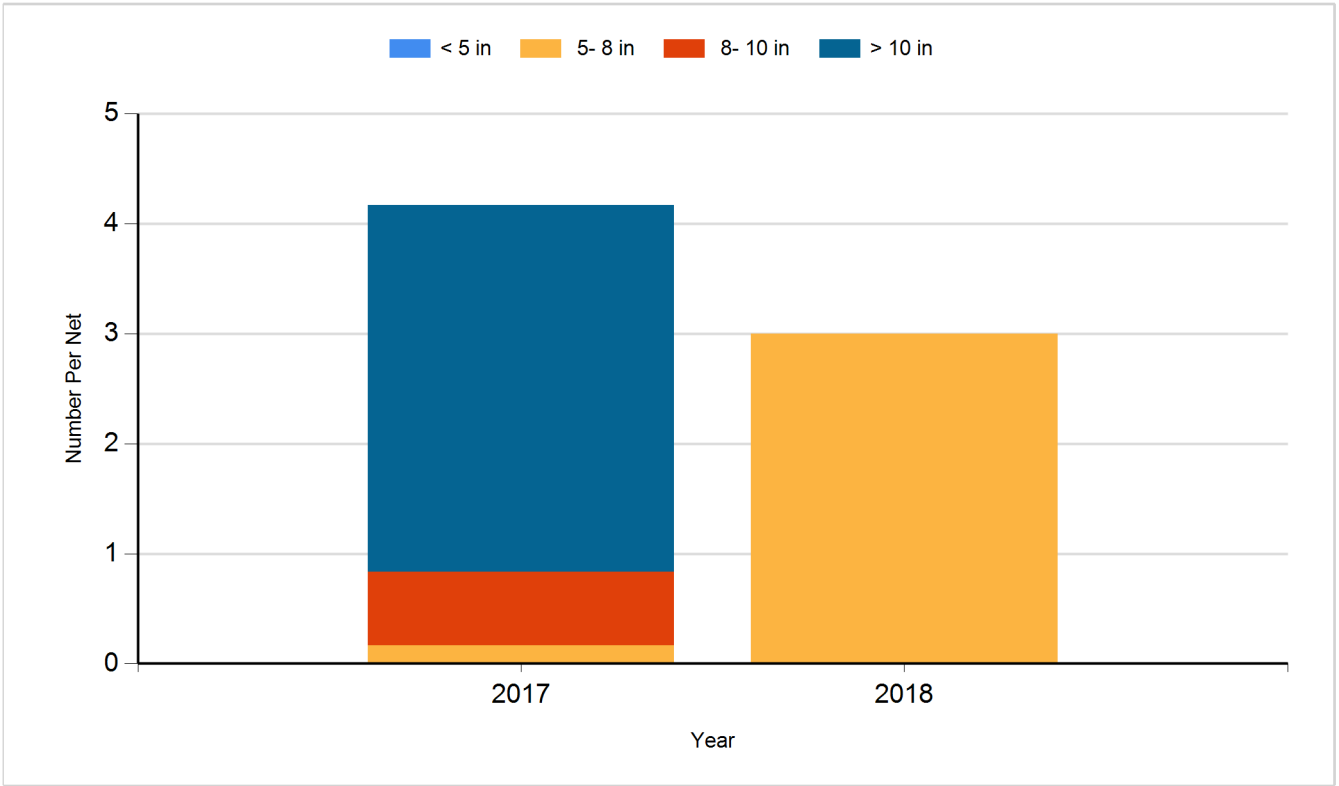
Species: Walleye
Gear: AFS std gill net



Species: White Sucker
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net



Fish Stocking

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

Year	Species	Size	Number
2009	Largemouth Bass	Juvenile	2,025
2011	Largemouth Bass	Fingerling	2,880
2013	Largemouth Bass	Large Fingerling	3,104
2013	Rainbow Trout	Fingerling	3,424
2014	Bluegill	Adult	144
2014	Channel Catfish	Adult	3
2015	Gizzard Shad	Adult	74
2015	Largemouth Bass	Juvenile	1,590
2016	Gizzard Shad	Adult	360
2017	Walleye	Fingerling	1,200
2017	Walleye	Juvenile	225
2017	Yellow Perch	Adult	7,437
2018	Gizzard Shad	Adult	