Mina Lake Survey Summary

Mina Lake, located approximately 11.0 miles west of Aberdeen on the north side of Highway 12, is managed as a black crappie, bluegill, and walleye (includes saugeye) fishery; however, other fish species (e.g., channel catfish, northern pike, freshwater drum, etc.) are present and contribute to the fishery.

In 2018, experimental gill nets and fall night electrofishing (used to monitor age-0 walleye relative abundance) were the only gears deployed at Mina Lake. Frame nets are included in fish sampling efforts on a rotational basis (next survey scheduled for 2019). Thus, the following summary will focus on those fish populations commonly evaluated with gill nets (e.g., walleye, yellow perch).

- **Channel catfish.** Although not abundant, the opportunity exists for anglers to catch channel catfish from Mina Lake. In 2018, gill nets sampled 17 individuals that ranged in length from 16.5 to 29.1 inches.

- **Walleye.** The number of walleyes (includes saugeye) ≥10.0 inches was higher in 2018 than 2016 and 2017. However at only 2.5/gill net, relative abundance was considered low. Those sampled ranged in length from 8.7 to 15.0 inches; 46 of the 48 individuals collected were from year classes produced in 2016 and 2017, which coincided with recent saugeye stockings.

- **Yellow Perch**. Yellow perch were the most abundant fish species in the 2018 gill net catch (15.4/gill net). Sampled yellow perch ranged in length from 5.1 to 11.0 inches; most (64%) were ≥8.0 inches and 14% exceeded 10.0 inches. Six consecutive year classes (2012 – 2017) were represented. Individuals belonging to cohorts produced from 2015 – 2017 were the most abundant accounting for nearly 90% of fish sampled. Growth is considered moderate. In 2018, the mean length of age-3 fish was 9.3 inches.
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For more detailed results see the computer generated South Dakota Statewide Fisheries Survey for Mina Lake (below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Mina, Edmunds County
SNK-Lake-23-800
2018

Lake Information

Name: Mina

County: Edmunds

Surface Area: 741 Acres

Maximum Depth: 27 Feet

Mean Depth: 9 Feet

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 01, 2018	4 net-nights
AFS std gill net	Aug 02, 2018	8 net-nights
fall night EF-WAE	Oct 16, 2018	3600 seconds

Common Fish Species Present

Channel Catfish

Bluegill

Black Crappie

Walleye

Yellow Perch

Black Bullhead

Freshwater Drum

White Sucker

Northern Pike

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)
Bigmouth Buffalo	11	28	18	46	24	61	30	76	37	94
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
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Common Carp	11	28	16	41	21	53	26	66	33	84
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Gizzard Shad	7	18	11	28						
Green Sunfish	3	8	6	15	8	20	10	25	12	30
Lake Herring	5	13	8	20	11	28	14	35	17	43
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
Rock Bass	4	10	7	18	9	23	11	28	13	33
Rudd	6	15	10	25	12	30	15	38	19	48
Saugeye	9	23	14	35	18	46	22	56	27	69
Shorthead Redhorse	6	15	10	25	13	33	16	41	20	51
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
White Sucker	6	15	10	25	13	33	16	41	20	51
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	CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	6.8	2.2	100		83	6	97	1
	Bluegill	0.1	0.1	100		0		121	
	Channel Catfish	1.4	0.9	100		53	20	108	3
	Freshwater Drum	5.1	1.0	100		33	9	91	1
	Northern Pike	0.4	0.2	100		20		80	4
	Walleye	2.5	0.6	7		0		90	1
	White Sucker	0.6	0.3	100		100		101	4
	Yellow Perch	15.4	2.5	64	5	14	4	105	1
fall night EF-WAE*	Walleye	78.0	33.5					87	1

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**

**** AFS std frame nets used in 2017**

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std gill net	Black Bullhead								16.8	9.3	6.8	11.0
	Bluegill								0.3	0.6	0.1	0.3
	Channel Catfish								3.3	2.2	1.4	2.3
	Common Carp								0.5	0.3	0.0	0.3
	Freshwater Drum								6.9	2.6	5.1	4.9
	Largemouth Bass								0.1	0.0	0.0	0.0
	Northern Pike								0.3	1.0	0.4	0.6
	Walleye								1.6	0.4	2.5	1.5
	White Sucker								0.7	1.2	0.6	0.8
	Yellow Perch								16.7	7.1	15.4	13.1
fall night EF-WAE*	Walleye	54.9	14.4	32.0		0.0	7.0	69.0	77.6	133.5	74.0	51.4
frame net (std 3/4 in)**	Black Bullhead	0.9	8.9	8.1	85.5	35.2	31.1	41.8		15.3		28.4
	Black Crappie	3.2	1.1	16.7	31.3	0.2	0.1	0.1		0.3		6.6
	Bluegill	0.6	1.8	3.9	5.6	6.7	16.5	5.7		14.1		6.9
	Channel Catfish	3.6	4.2	5.7	1.2	0.6	1.4	0.7		1.2		2.3
	Common Carp	2.1	1.0	1.1	0.5	0.2	0.6	0.6		0.2		0.8
	Freshwater Drum	2.1	1.1	1.0	0.0	0.4	0.3	0.9		0.1		0.7
	Northern Pike	2.2	2.4	1.1	2.0	0.9	0.8	0.4		0.6		1.3
	Orangespotted Sunfish*	0.0	0.5	0.0	0.0	0.0	0.2	0.0		0.0		0.1
	Walleye	0.3	0.3	0.5	0.7	0.1	0.3	0.1		0.2		0.3
	White Sucker	0.3	0.3	0.1	0.1	0.5	0.3	0.3		0.4		0.3
	Yellow Perch	1.9	1.0	1.4	2.1	1.2	9.6	1.6		1.1		2.5
std exp gill net	Black Bullhead	12.2	10.7	7.5	44.7	17.0	24.5	23.5				20.0
	Black Crappie	0.0	0.5	1.5	1.0	0.0	0.0	0.0				0.4
	Bluegill	0.0	0.0	0.0	0.0	0.7	0.2	0.0				0.1
	Channel Catfish	1.8	0.8	1.7	1.0	3.2	1.0	2.7				1.7
	Common Carp	1.2	0.2	0.2	1.2	0.2	0.5	1.2				0.7
	Freshwater Drum	12.8	6.0	7.2	3.3	7.3	5.5	2.3				6.3
	Largemouth Bass	0.0	0.0	0.0	0.2	0.0	0.0	0.0				0.0
	Northern Pike	1.5	3.3	0.3	1.3	0.7	0.5	2.3				1.4
	Orangespotted Sunfish*	0.5	0.0	0.0	0.0	0.0	0.0	0.0				0.1
	Walleye	0.2	0.7	1.8	1.2	3.5	0.7	1.7				1.4
	White Sucker	0.0	0.0	0.2	0.2	0.0	0.2	0.2				0.1
	Yellow Perch	4.3	6.0	8.3	14.8	8.7	27.2	32.5				14.5

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 gill net	Channel Catfish	PSD								77	54	100
		PSD-P								56	15	53
		Wr								110	109	108
	Walleye	PSD								74	100	7
		PSD-P								16	0	0
		Wr								97	82	90
	Yellow Perch	PSD								86	91	64
		PSD-P								36	22	14
		Wr								102	104	105
std exp gill net	Channel Catfish	PSD	9	60	90	100	100	100	100			
		PSD-P	0	0	0	0	16	67	56			
		Wr	101	105	100	116	102	119	93			
	Walleye	PSD	100	0	0	29	62	100	60			
		PSD-P	0	0	0	0	5	25	20			
		Wr	115	82	86	84	91	104	96			
	Yellow Perch	PSD	38	44	40	81	81	43	92			
		PSD-P	0	11	14	10	12	20	15			
		Wr	95	99	101	106	106	104	99			

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+
2018	48	248 (31)	324 (15)	390 (2)							
2017	6	201 (1)		418 (2)	436 (2)				492 (1)		
2016	19	267 (2)	393 (11)				551 (1)	533 (3)			404 (2)
2015	10	290 (4)	386 (2)		470 (2)		562 (1)	599 (1)			
2014	4				431 (1)	472 (3)					
2013	21		317 (5)	389 (4)	411 (11)		513 (1)				
2012	7			357 (7)							
2011	11		303 (11)								
2010	43	224 (43)									
2009	1				489 (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+
2018	185	160 (59)	219 (45)	236 (61)	268 (9)	256 (8)	225 (4)				
2017	85	162 (7)	213 (33)	242 (12)	249 (30)	287 (3)					
2016	200	159 (24)	223 (23)	244 (152)	282 (1)						
2015	195	159 (2)	221 (154)	249 (19)	270 (19)	302 (1)					
2014	163	164 (91)	225 (19)	248 (37)	258 (5)	267 (12)					
2013	52	159 (5)	213 (30)	220 (7)	247 (10)						
2012	89	152 (8)	203 (17)	227 (55)	264 (2)	244 (7)					
2009	26		196 (24)	233 (1)		233 (1)					

Fish Condition

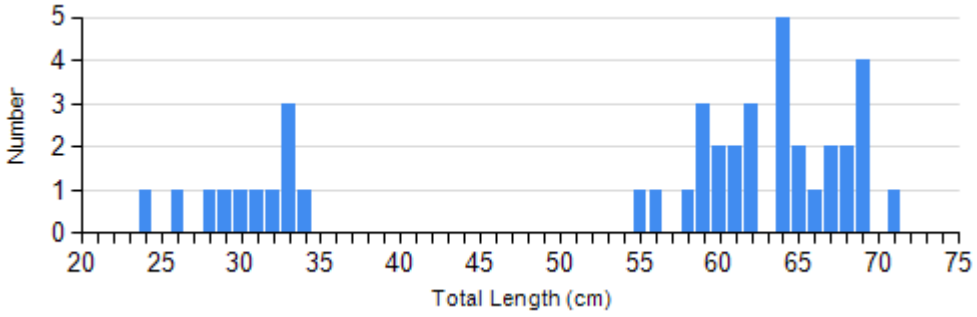
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Channel Catfish Gill Net	2014	0		2	122 (4.0)	4	118 (9.7)	0	
	2015	0		7	97 (4.8)	8	88 (5.4)	1	104
	2016	9	108 (3.2)	8	119 (4.9)	21	107 (2.9)	1	98
	2017	12	105 (3.8)	10	119 (3.4)	4	96 (8.7)	0	
	2018	0		8	104 (2.2)	7	110 (5.7)	2	116 (3.5)
Walleye Gill Net	2014	0		3	107 (2.8)	1	96	0	
	2015	4	97 (3.0)	4	94 (3.0)	2	99 (5.9)	0	
	2016	5	96 (2.3)	11	100 (2.7)	3	89 (3.7)	0	
	2017	0		5	82 (3.0)	0		0	
	2018	28	90 (0.9)	2	89 (1.5)	0		0	
Yellow Perch Gill Net	2014	93	106 (0.9)	38	103 (1.1)	32	99 (1.0)	0	
	2015	16	104 (1.8)	149	99 (0.6)	28	96 (1.2)	2	93 (5.7)
	2016	28	109 (2.0)	101	104 (1.1)	71	97 (1.1)	0	
	2017	8	106 (1.6)	58	107 (0.9)	19	95 (1.0)	0	
	2018	66	111 (0.9)	93	103 (0.6)	26	97 (1.3)	0	

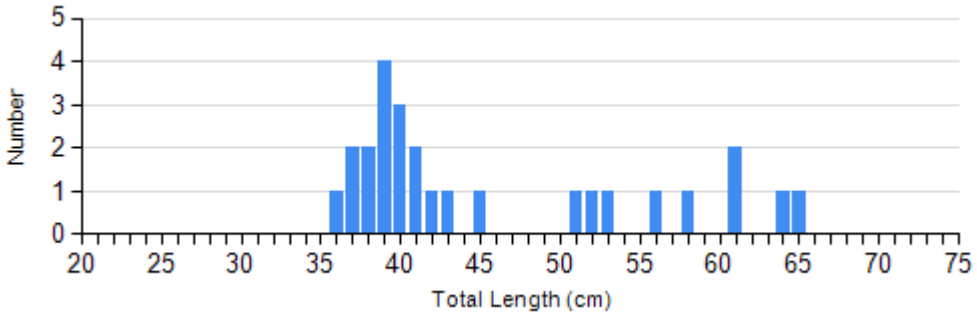
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Channel Catfish
Gear: AFS std gill net



2016



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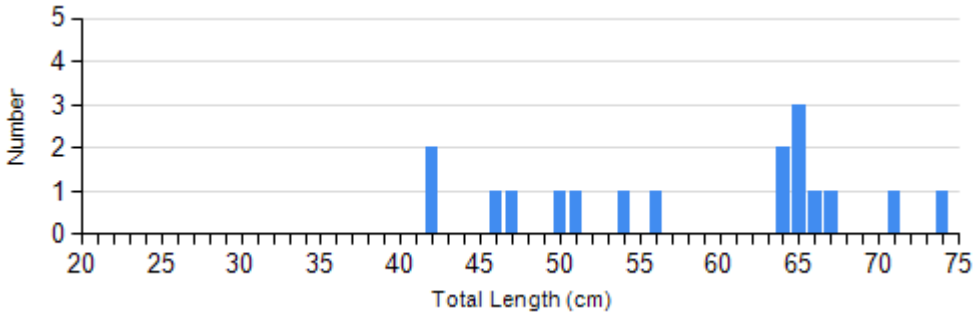
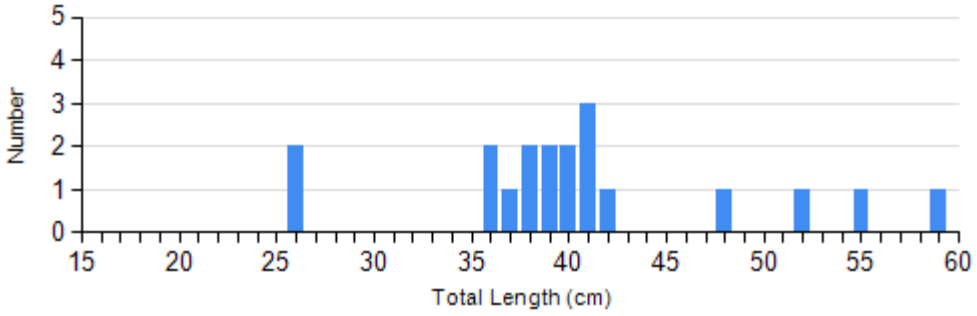


2018

Species: Walleye
Gear: AFS std gill net



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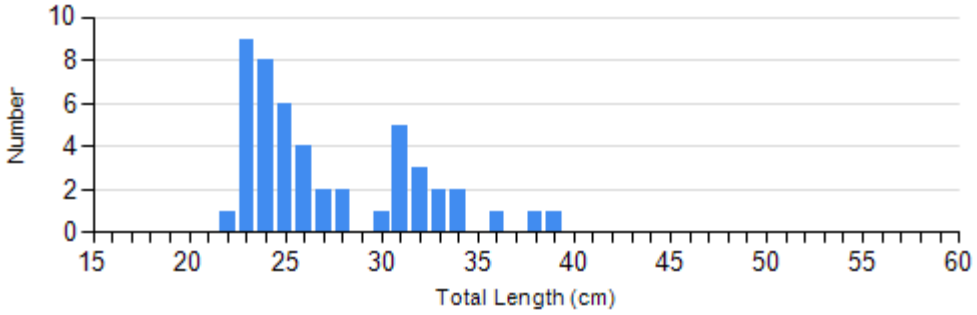
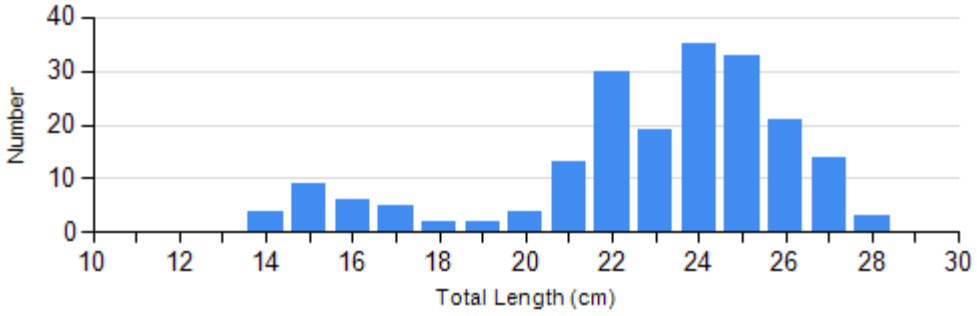


2018

Species: Yellow Perch
Gear: AFS std gill net



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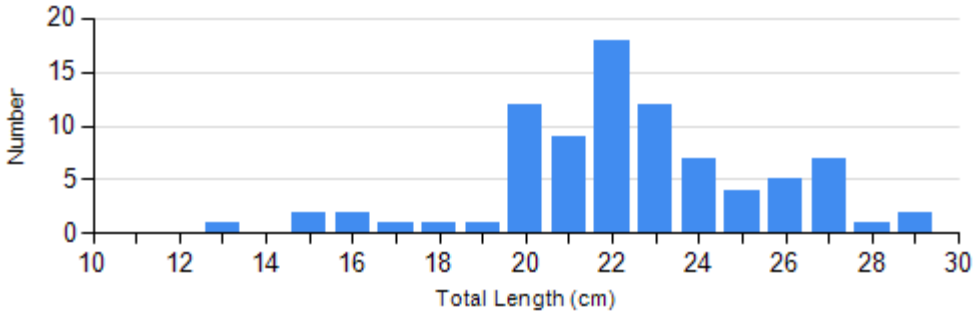

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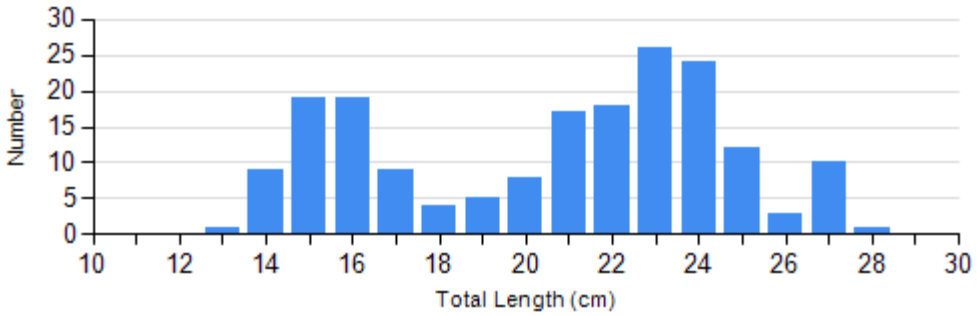
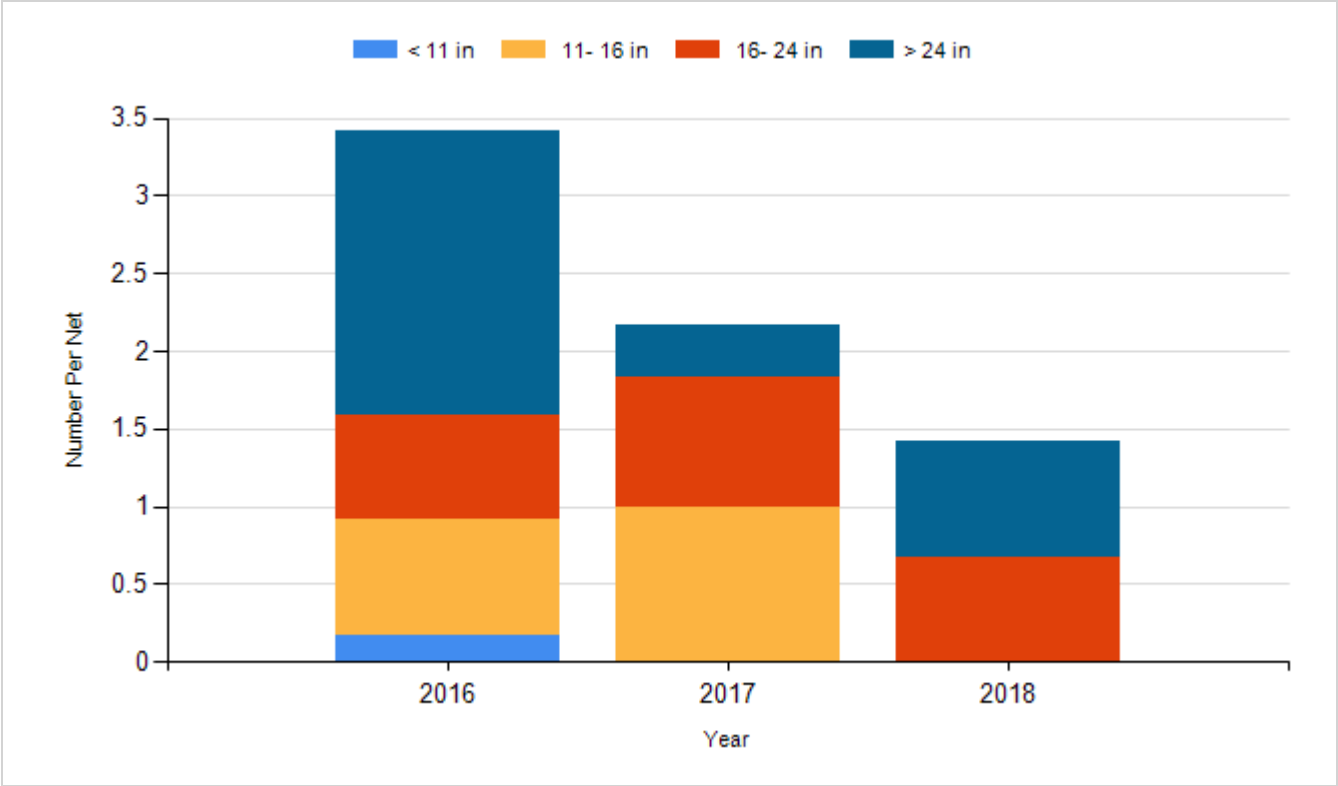


2018

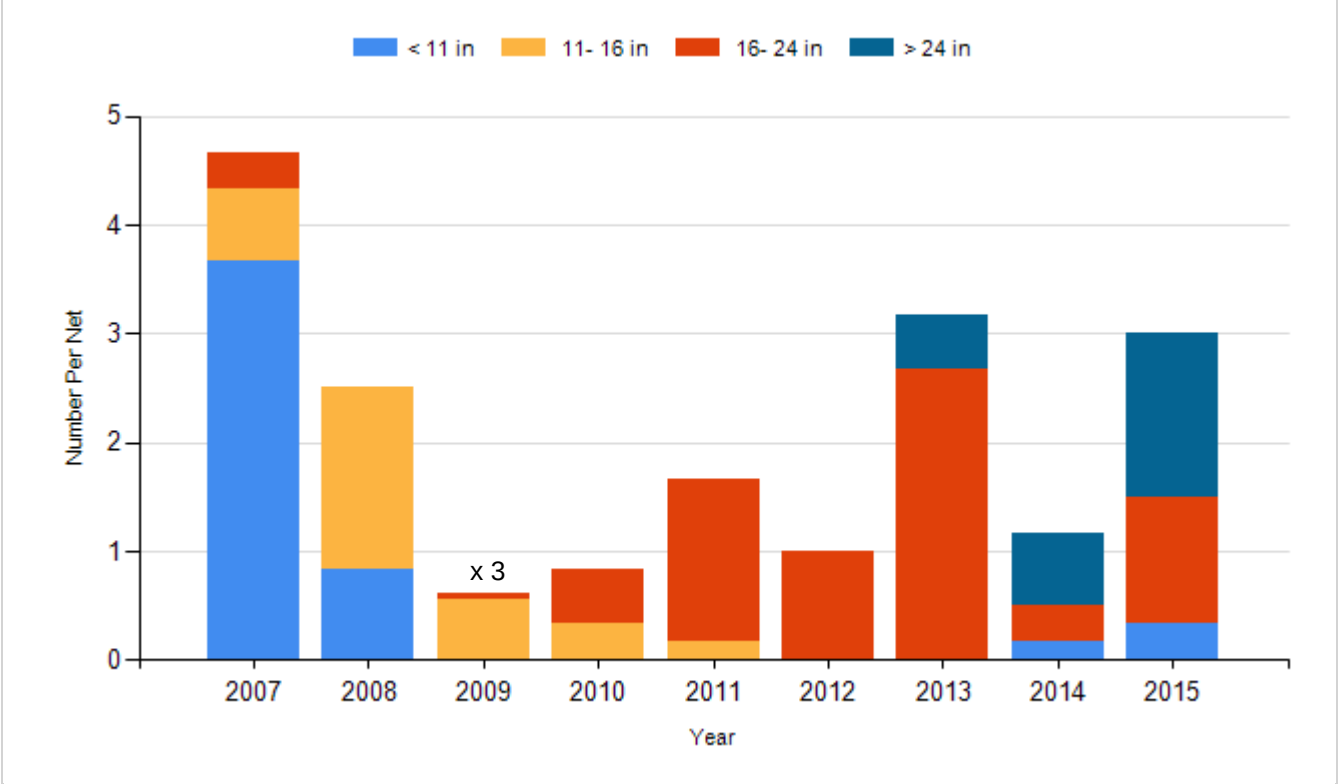
Historic Fish Sizes and Relative Abundance

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

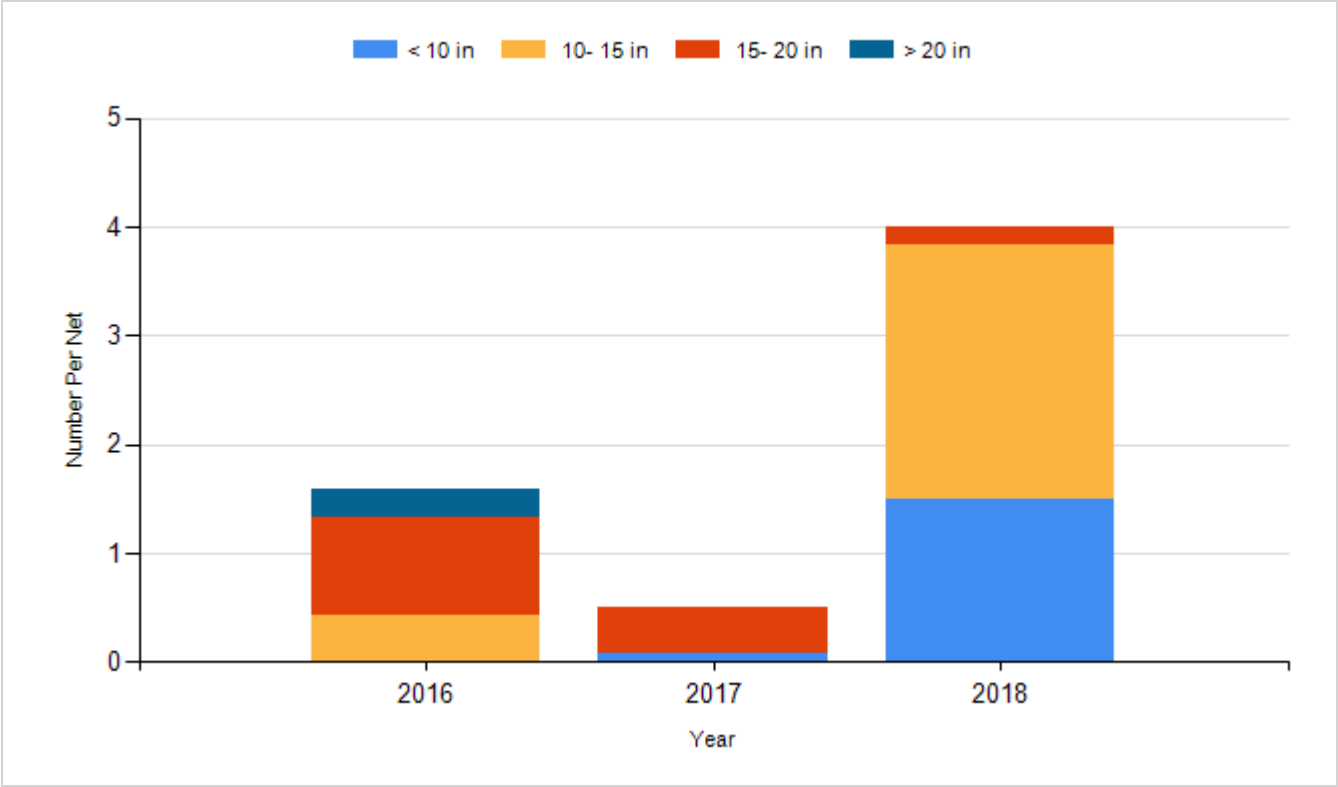
Species: Channel Catfish
Gear: AFS std gill net



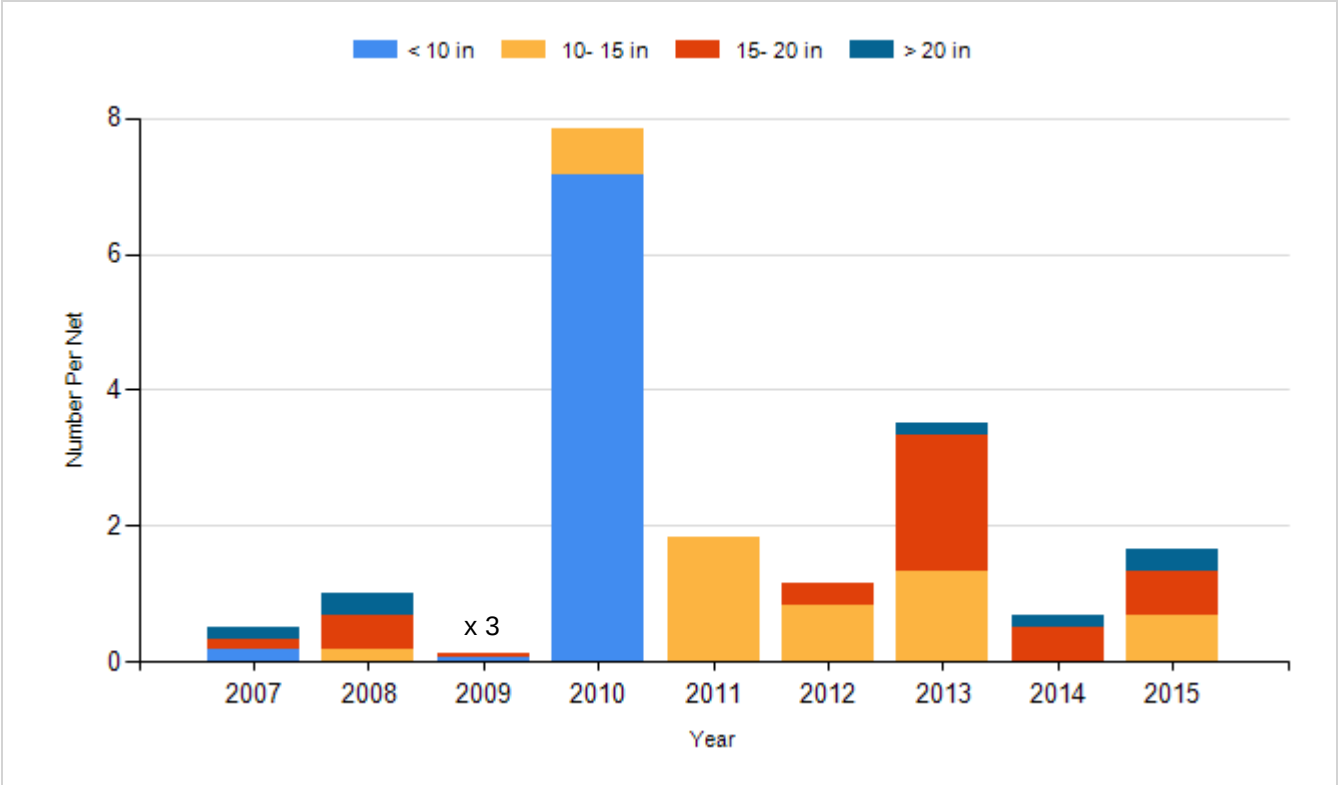
Species: Channel Catfish
Gear: std exp gill net



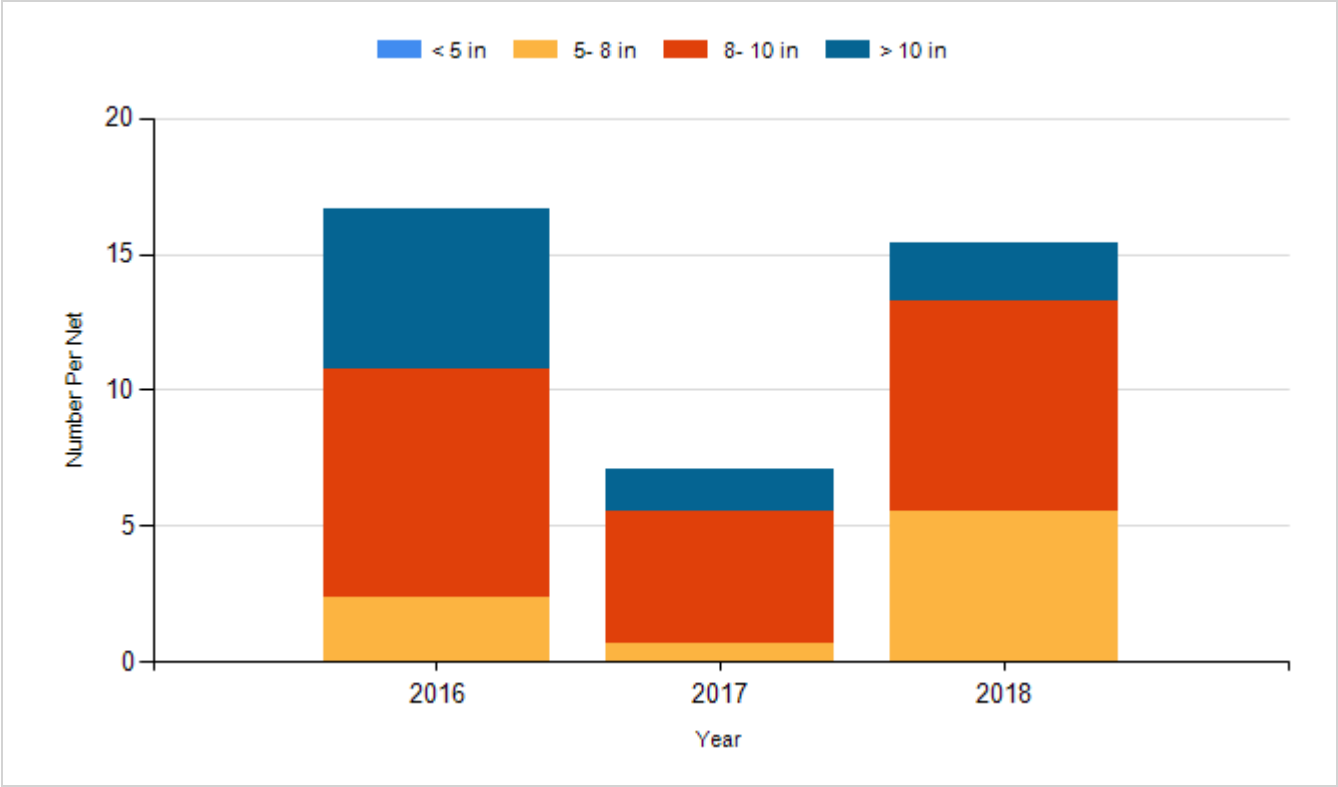
Species: Walleye
Gear: AFS std gill net



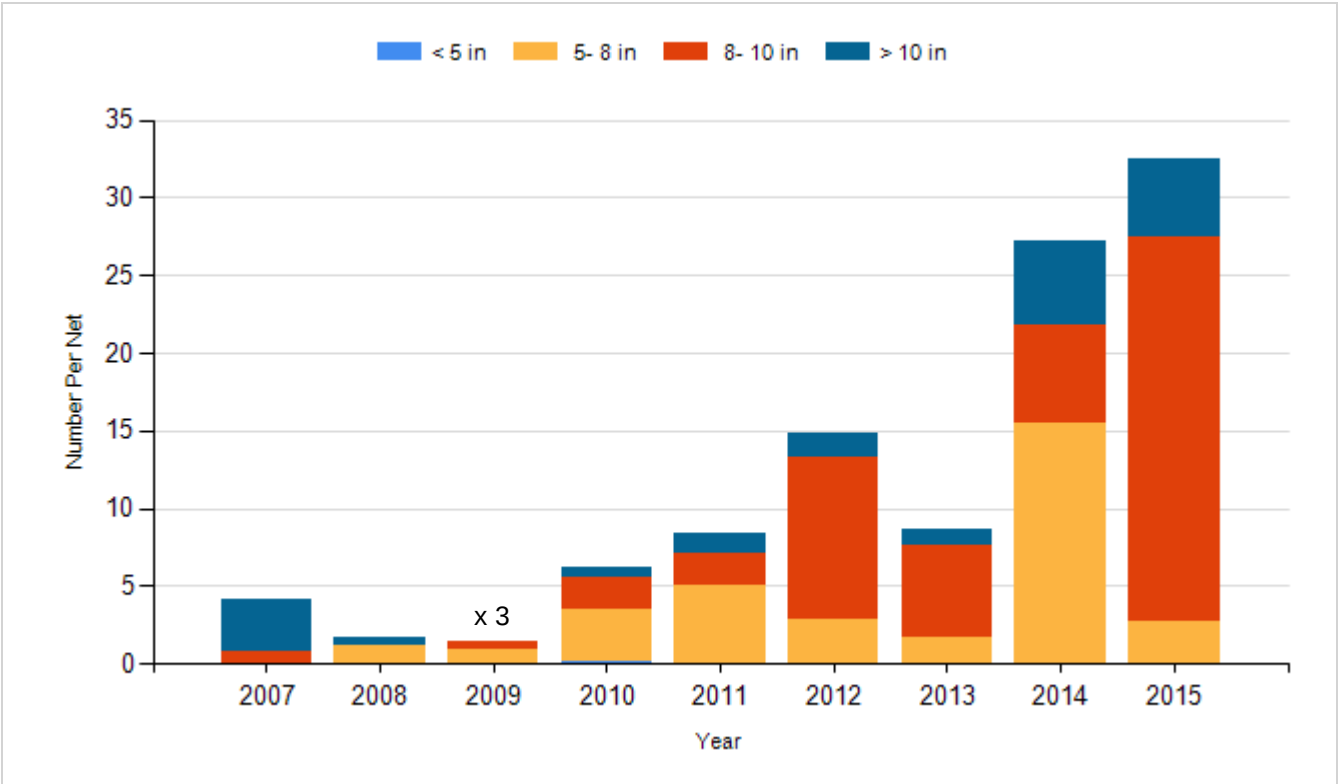
Species: Walleye
Gear: std exp gill net



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	Walleye	Small Fingerling	80,115
2010	Walleye	Small Fingerling	80,300
2011	Walleye	Small Fingerling	79,980
2012	Channel Catfish	Fingerling	17,075
	Walleye	Small Fingerling	80,850
	Walleye	Large Fingerling	7,485
2013	Walleye	Small Fingerling	48,900
2014	Walleye	Small Fingerling	79,906
2015	Walleye	Small Fingerling	80,060
2016	Saugeye	Small Fingerling	115,890
2017	Saugeye	Small Fingerling	65,420
2018	Saugeye	Small Fingerling	60,180