Pickerel Survey Summary

Pickerel Lake, located 6.0 miles northeast of Grenville, is managed as a multiple species fishery including panfish (i.e., black crappie, bluegill, and yellow perch), smallmouth bass and walleye; other fish species (e.g., northern pike, white bass, etc.) also contribute to the fishery.

Frame netting, which is typically used to sample black crappie and bluegill populations in northeast South Dakota, was not conducted in 2018. Frame nets are included in fish sampling efforts on a rotational basis at Pickerel Lake (next survey scheduled for 2019). Thus, the following summary is limited to those fish species assessed using gill nets (i.e., northern pike, walleye, and yellow perch) and daytime electrofishing (i.e., smallmouth bass).

- **Northern pike.** Northern pike numbers were similar to those observed in 2017. At 1.5/gill net, relative abundance was considered moderate. Sampled northern pike ranged in length from 18.1 to 30.7 inches.

- **Smallmouth bass.** Few smallmouth bass were caught during daytime electrofishing (6.0/hour); low catch rates are believed to be related to high water clarity observed in the spring of 2018 and are likely not reflective of the at-large smallmouth bass population. Sampled smallmouth bass ranged in length from 10.0 to 14.3 inches; three year classes (2012, 2013, and 2015) were represented.

- **Walleye.** At 4.3/gill net, relative abundance was considered low to moderate in 2018. Gill net captured walleyes ranged in length from 7.1 to 27.6 inches; most (≈70%) exceeded 15.0 inches. Ten year classes (2006, 2007, and 2010 – 2017) were present; those from the 2013 (age 3) and 2015 (age 5) cohorts, which coincided with small fingerling stockings, were the most abundant accounting for 60% of sampled walleyes. Mean length at capture of age 3 and age 5 walleyes was 14.4 and 18.1 inches.

- **Yellow perch**. Yellow perch numbers were substantially higher in 2018 than 2017. The 2018 mean gill net CPUE of 21.8 suggested moderate to high relative abundance. Sampled yellow perch ranged in length from 4.7 to 12.6 inches; 48% were >8.0 inches and 11% exceeded 10.0 inches. Eight consecutive year classes (2009 – 2016) were represented; those from the 2015 and 2016 cohorts were the most abundant and accounted for nearly 87% of fish in the sample. Growth tends to be slow to moderate as mean length at capture values for age-3 yellow perch have ranged from 6.8 to 8.8 inches since 2009. In 2018, the mean length of age-3 fish was 8.5 inches.

For more detailed results see the computer generated South Dakota Statewide Fisheries Survey for Pickerel Lake (below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Pickerel, Day County
UBS-Lake-358-000
2018

Lake Information

Name:	Pickerel	**Maximum Depth:**	41 Feet
County:	Day	**Mean Depth:**	16 Feet
		OHWM Elevation:	1,846
Surface Area:	989 Acres	**Outlet Elevation:**	1,845

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 19, 2018	4 net-nights
AFS std gill net	Jun 20, 2018	4 net-nights
AFS std gill net	Jun 21, 2018	4 net-nights
fall night EF-WAE	Sep 18, 2018	3600 seconds
spring night EF-SMB	May 14, 2018	3600 seconds

Common Fish Species Present

Bluegill

Black Crappie

Northern Pike

Walleye

Smallmouth Bass

Yellow Perch

White Sucker

White Bass

Rock Bass

Common Carp

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 Crappie	0.9	0.5	91		91		93	5
	Bluegill	1.3	0.6	81		0		122	2
	Common Carp	0.4	0.2	100		60		102	9
	Northern Pike	1.5	0.6	83		11		86	2
	Rock Bass	0.5	0.5	50		17		105	4
	Smallmouth Bass	2.0	0.7	71	15	46	16	96	2
	Walleye	4.3	0.9	71	9	10	7	85	1
	White Bass	1.5	0.7	100		89		89	2
	White Sucker	1.8	0.6	100		95		108	2
	Yellow Perch	21.8	4.7	48	4	11	3	100	1
fall night EF-WAE*	Walleye	76.0	20.2					91	1
spring night EF-SMB	Smallmouth Bass	6.0	3.2	83		33		89	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**

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

		CPUE										
Gear	Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
AFS std gill net	Black Bullhead								0.1	1.3	0.0	0.5
	Black Crappie								0.2	0.2	0.9	0.4
	Bluegill								0.2	0.1	1.3	0.5
	Common Carp								0.1	0.2	0.4	0.2
	Northern Pike								0.5	1.3	1.5	1.1
	Rock Bass								0.0	0.1	0.5	0.2
	Smallmouth Bass								2.1	1.4	2.0	1.8
	Walleye								2.3	2.5	4.3	3.0
	White Bass								2.9	1.9	1.5	2.1
	White Sucker								1.1	1.7	1.8	1.5
	Yellow Perch								8.9	5.0	21.8	11.9
fall night EF-WAE*	Walleye	8.4				139.0	10.0	44.4	0.0	28.0	76.0	43.7
boat shocker (night, DC)	Smallmouth Bass	77.4		51.0		286.0		164.0				144.6
frame net (std 3/4 in)**	Black Bullhead	14.9	4.6	2.8	4.1	6.2	10.1	10.9		1.3		6.9
	Black Crappie	11.6	4.0	3.8	2.5	9.3	1.0	0.9		0.1		4.2
	Bluegill	9.7	3.5	2.6	5.4	12.8	0.6	0.4		11.6		5.8
	Common Carp	0.0	0.0	0.0	0.1	0.0	0.0	0.1		0.0		0.0
	Northern Pike	0.4	0.3	0.0	0.6	0.1	0.2	0.5		0.2		0.3
	Rock Bass	3.7	4.3	1.2	2.6	3.4	6.0	8.5		1.2		3.9
	Smallmouth Bass	1.9	1.9	1.6	5.1	3.2	2.3	2.3		0.9		2.4
	Walleye	0.6	0.8	0.1	1.8	0.4	0.6	0.3		0.2		0.6
	White Bass	0.1	0.0	3.4	1.9	0.1	0.1	0.2		0.2		0.8
	White Sucker	0.0	0.3	0.0	0.1	0.0	0.2	0.2		0.1		0.1
	Yellow Perch	0.1	0.2	0.5	1.4	0.2	0.2	0.1		0.3		0.4
spring EF-SMB	Smallmouth Bass										6.0	6.0
std exp gill net	Black Bullhead	0.5	0.2	0.7	1.0	1.0	0.2	3.2				1.0
	Black Crappie	3.8	8.3	2.2	4.5	2.0	7.2	2.5				4.4
	Bluegill	0.0	0.2	0.0	0.5	1.3	0.0	0.0				0.3
	Common Carp	0.3	0.0	0.0	0.0	0.2	0.2	0.3				0.1
	Northern Pike	3.3	2.7	3.8	3.3	4.7	3.0	3.3				3.4
	Rock Bass	0.2	0.0	0.7	0.2	0.0	0.0	0.0				0.2
	Smallmouth Bass	1.3	0.3	0.5	0.8	1.0	2.2	1.7				1.1
	Spottail Shiner*	0.5	0.7	0.5	0.2	0.3	0.0	0.0				0.3
	Walleye	4.8	9.2	13.5	8.0	17.3	12.3	18.5				11.9
	White Bass	1.2	0.5	0.0	3.2	1.8	3.0	4.0				2.0
	White Sucker	1.2	1.7	2.0	1.5	1.7	1.5	1.7				1.6
	Yellow Perch	7.5	21.0	35.8	27.5	56.0	23.2	27.8				28.4

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	Northern Pike	PSD								67	67	83
		PSD-P								33	0	11
		Wr								78	89	86
	Walleye	PSD								57	60	71
		PSD-P								7	3	10
		Wr								83	88	85
	Yellow Perch	PSD								98	60	48
		PSD-P								52	33	11
		Wr								109	101	100
boat shocker (night, DC)	Smallmouth Bass	PSD	44		27		30		59			
		PSD-P	25		4		6		10			
		Wr	89		98		89		91			
spring EF-SMB	Smallmouth Bass	PSD										83
		PSD-P										33
		Wr										89
std exp gill net	Northern Pike	PSD	60	69	61	50	54	56	40			
		PSD-P	25	13	4	5	7	17	5			
		Wr	81	84	86	82	78	80	80			
	Walleye	PSD	17	4	36	25	16	16	52			
		PSD-P	7	0	4	0	1	1	1			
		Wr	87	82	90	83	83	86	87			
	Yellow Perch	PSD	56	40	23	41	63	86	79			
		PSD-P	0	0	5	4	7	12	40			
		Wr	106	104	114	107	107	108	110			

Length at Capture

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

Species: Smallmouth Bass

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	6			254 (1)		341 (4)	355 (1)				
2015	110		193 (7)	255 (38)	304 (13)	330 (35)	341 (6)	365 (1)	391 (6)	415 (2)	467 (2)
2013	207		197 (8)	260 (129)	300 (44)	336 (12)	351 (5)	368 (4)	407 (5)		443 (1)
2011	51		188 (5)	248 (30)	282 (5)	328 (9)	354 (2)				
2009	79		186 (5)	230 (30)	289 (18)	333 (11)	397 (2)	411 (9)		412 (4)	

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	52	180 (1)	311 (3)	367 (16)	443 (1)	460 (15)	474 (2)	457 (5)	463 (7)		677 (2)
2017	30		325 (10)	376 (3)	420 (9)		478 (3)	450 (4)	414 (1)		
2016	32	197 (4)	296 (1)	356 (10)	372 (1)	420 (9)	422 (6)				645 (1)
2015	114	186 (3)	298 (28)	373 (25)	388 (37)	410 (19)		604 (1)	427 (1)		
2014	75	184 (1)	307 (5)	351 (41)	367 (23)	463 (1)	416 (1)	406 (1)	443 (1)		556 (1)
2013	106	186 (1)	276 (19)	345 (68)	383 (6)	412 (4)	422 (3)	442 (4)			676 (1)
2012	53	207 (7)	277 (26)	312 (4)	376 (4)	405 (4)	417 (7)		483 (1)		508 (1)
2011	86	178 (5)	277 (3)	333 (25)	377 (10)	385 (37)	366 (2)	385 (1)			546 (3)
2010	59		258 (17)	312 (14)	322 (26)		433 (1)	398 (1)			
2009	30		258 (3)	316 (18)	357 (2)	385 (3)	563 (1)	486 (2)		486 (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	263		153 (122)	216 (108)	249 (10)	266 (8)	280 (2)	273 (10)	310 (3)	274 (1)	
2017	60		171 (25)	223 (11)	257 (12)	266 (2)	266 (4)	286 (3)	290 (3)		
2016	107		164 (1)	209 (10)	237 (18)	247 (26)	258 (26)	272 (24)	294 (1)		
2015	168	100 (1)	157 (16)	196 (24)	238 (50)	255 (46)	260 (23)	249 (4)			
2014	139		146 (6)	202 (27)	229 (67)	240 (38)	234 (3)				
2013	340	99 (1)	137 (27)	192 (127)	222 (150)	247 (31)		264 (4)	276 (2)		
2012	186	102 (22)	150 (44)	195 (79)	224 (25)	241 (3)	237 (8)	249 (2)	268 (3)		
2011	254	95 (30)	146 (130)	192 (65)	224 (7)	239 (11)	248 (7)	255 (3)	252 (1)		
2010	149	96 (22)	148 (68)	193 (11)	221 (24)	223 (20)	230 (4)				
2009	45		150 (2)	172 (9)	196 (15)	221 (18)	224 (1)				

Fish Condition

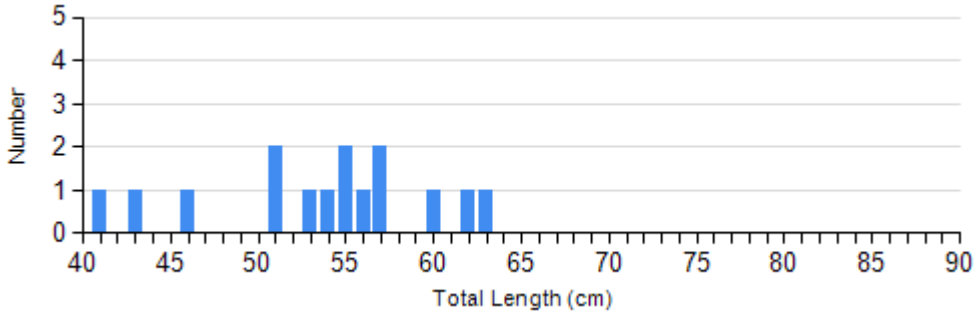
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Northern Pike Gill Net	2014	8	77 (2.2)	7	81 (1.2)	1	80	2	85 (6.8)
	2015	12	78 (2.5)	7	81 (4.5)	1	92	0	
	2016	2	79 (0.5)	2	77 (7.7)	1	80	1	79
	2017	5	93 (7.4)	10	87 (1.8)	0		0	
	2018	3	88 (3.6)	13	85 (1.9)	2	91 (0.5)	0	
Smallmouth Bass Electro Fishing	2015	44	93 (0.8)	53	90 (0.6)	9	90 (1.3)	4	90 (3.4)
	2018	1	91	3	89 (1.1)	2	88 (4.5)	0	
Walleye Gill Net	2014	62	86 (0.6)	11	85 (1.4)	1	78	0	
	2015	53	90 (0.6)	57	84 (0.6)	1	87	0	
	2016	12	85 (1.5)	14	81 (1.5)	1	79	1	88
	2017	12	88 (1.0)	17	87 (1.3)	1	93	0	
	2018	15	84 (1.5)	31	86 (1.1)	3	84 (2.5)	2	87 (2.8)
Yellow Perch Gill Net	2014	19	106 (2.5)	103	110 (0.7)	17	105 (1.6)	0	
	2015	35	107 (1.3)	66	111 (0.9)	66	110 (1.1)	0	
	2016	2	117 (10.4)	49	109 (1.1)	56	109 (0.8)	0	
	2017	24	101 (1.3)	16	102 (2.7)	20	102 (2.0)	0	
	2018	136	100 (0.6)	97	100 (0.7)	26	98 (1.0)	3	94 (3.1)

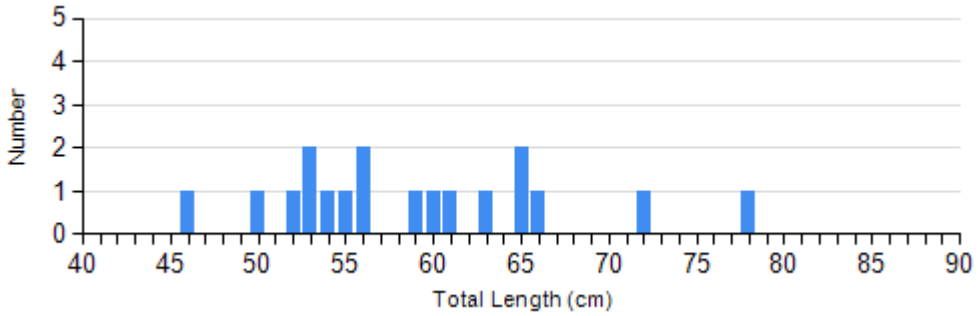
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Northern Pike
Gear: AFS std gill net

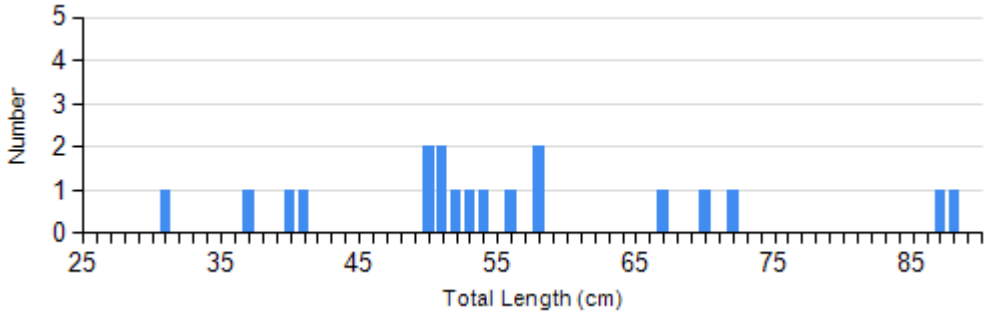


2017



2018

Species: Northern Pike
Gear: std exp gill net



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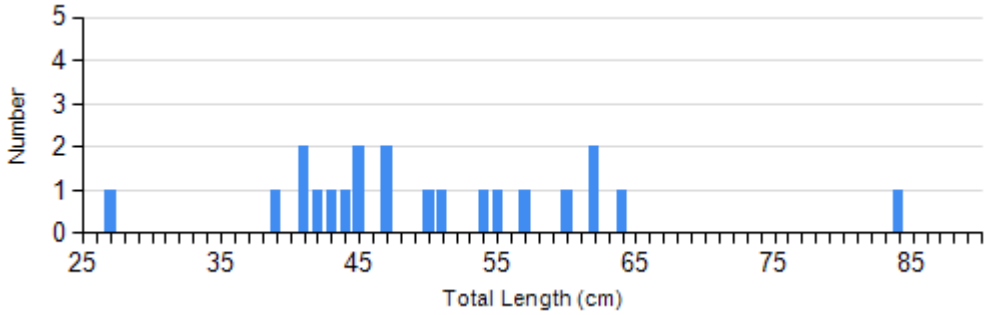
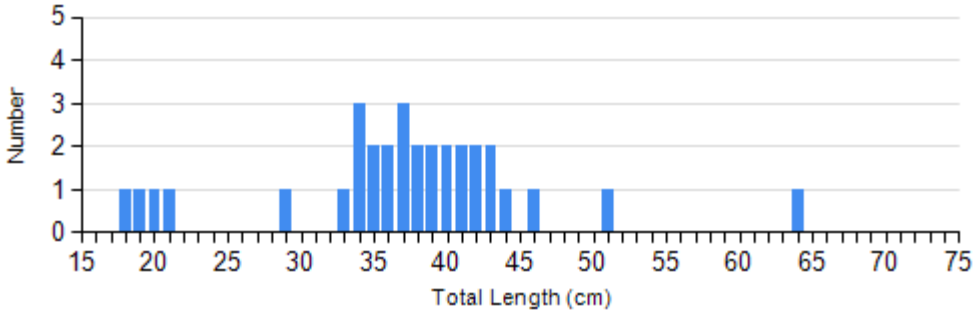


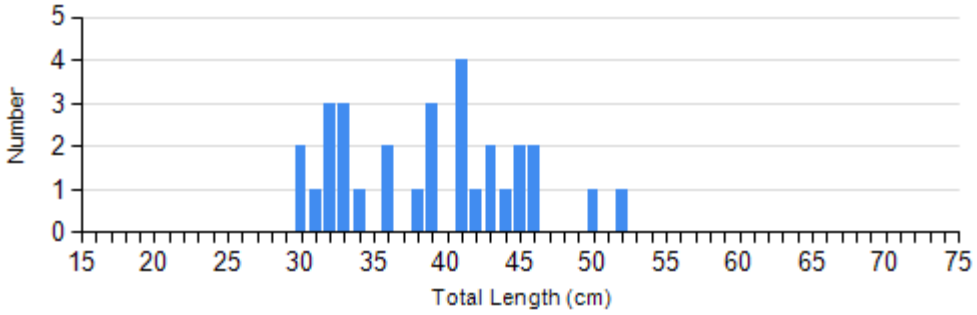
2015

Species: Walleye
Gear: AFS std gill net

2016



2017



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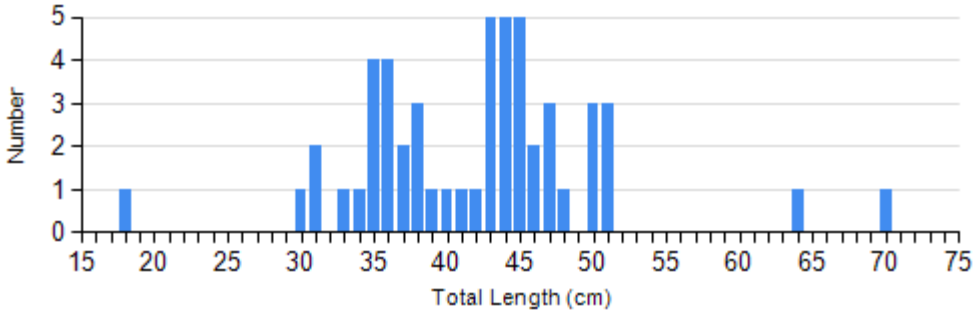
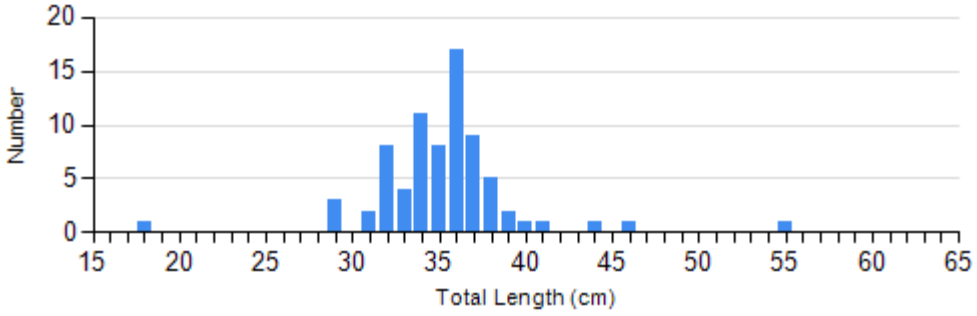
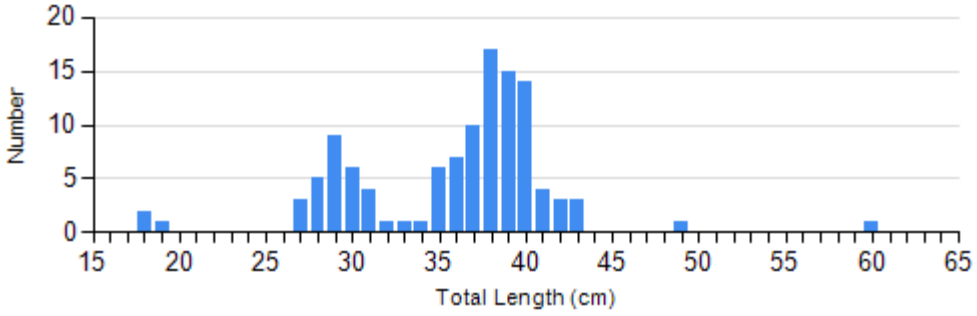


Species: Walleye
Gear: std exp gill net

2014

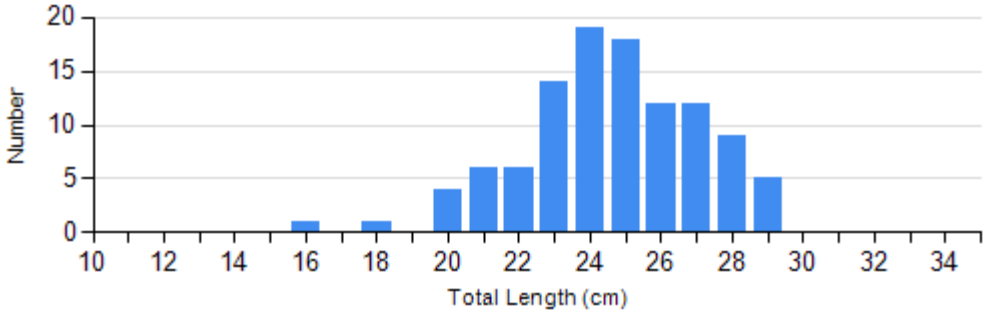


2015

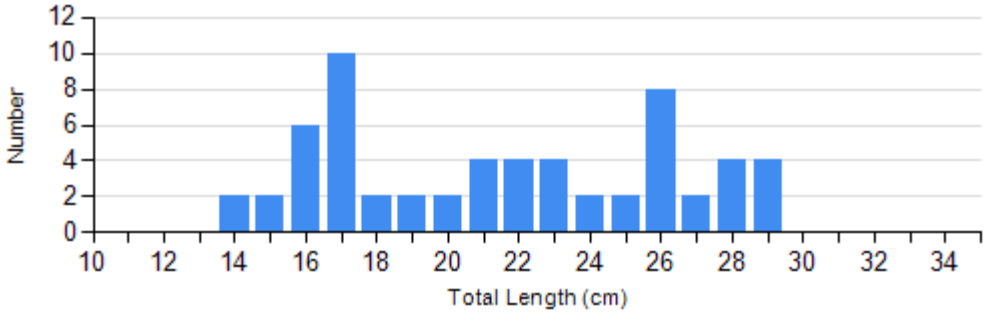


Species: Yellow Perch
Gear: AFS std gill net

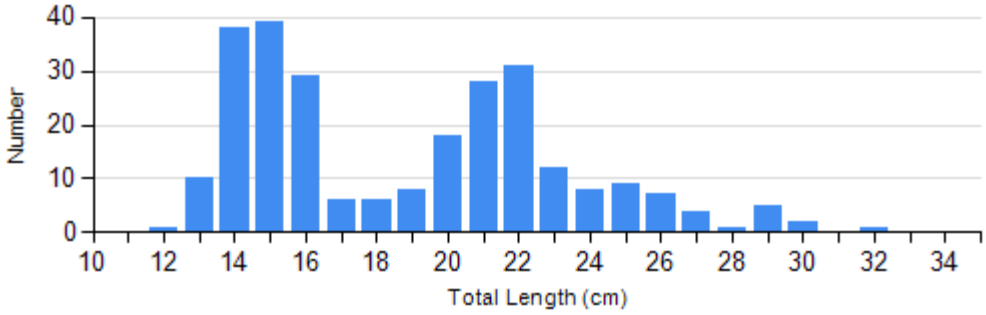
2016



2017

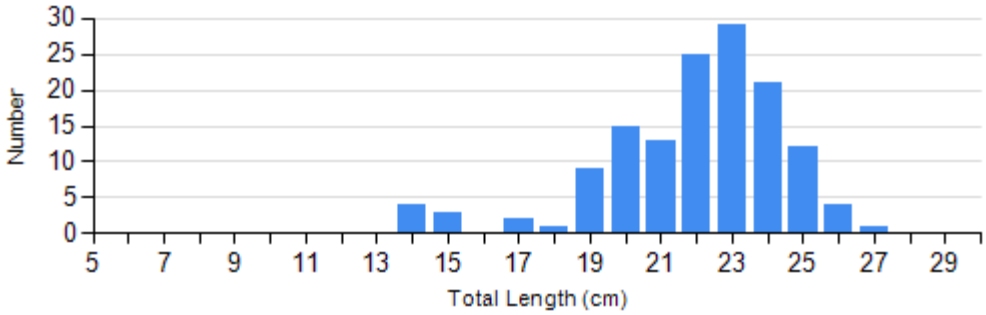


2018

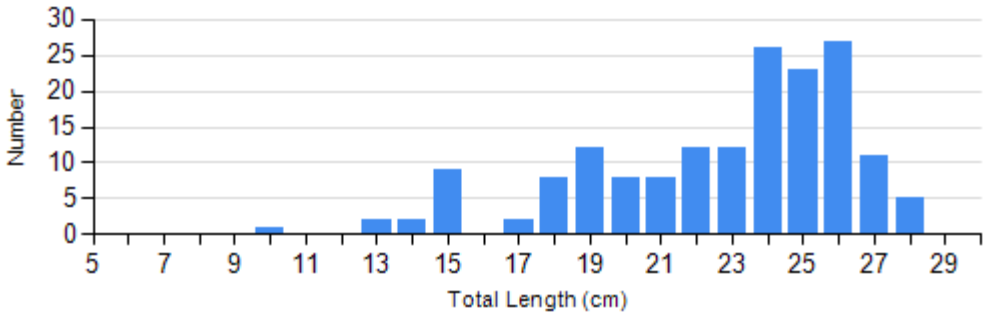


Species: Yellow Perch
Gear: std exp gill net

2014



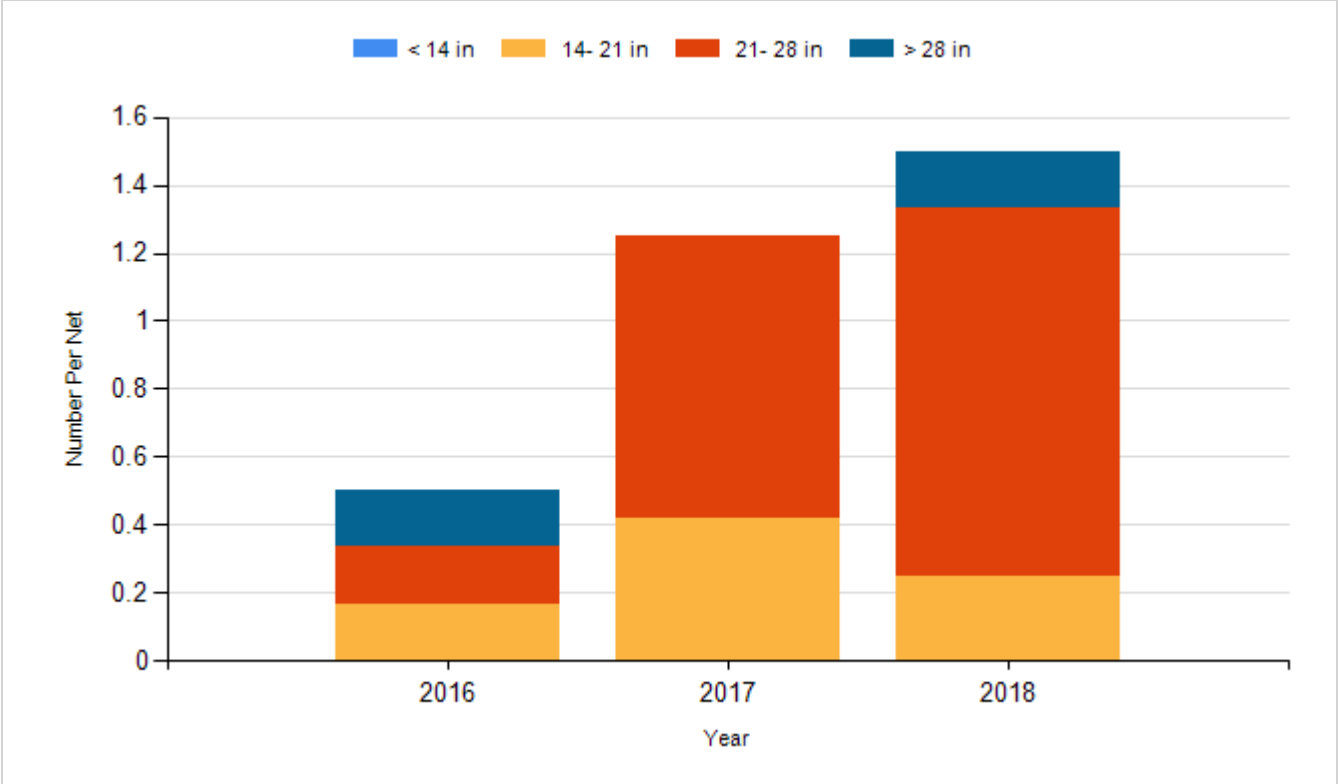
2015



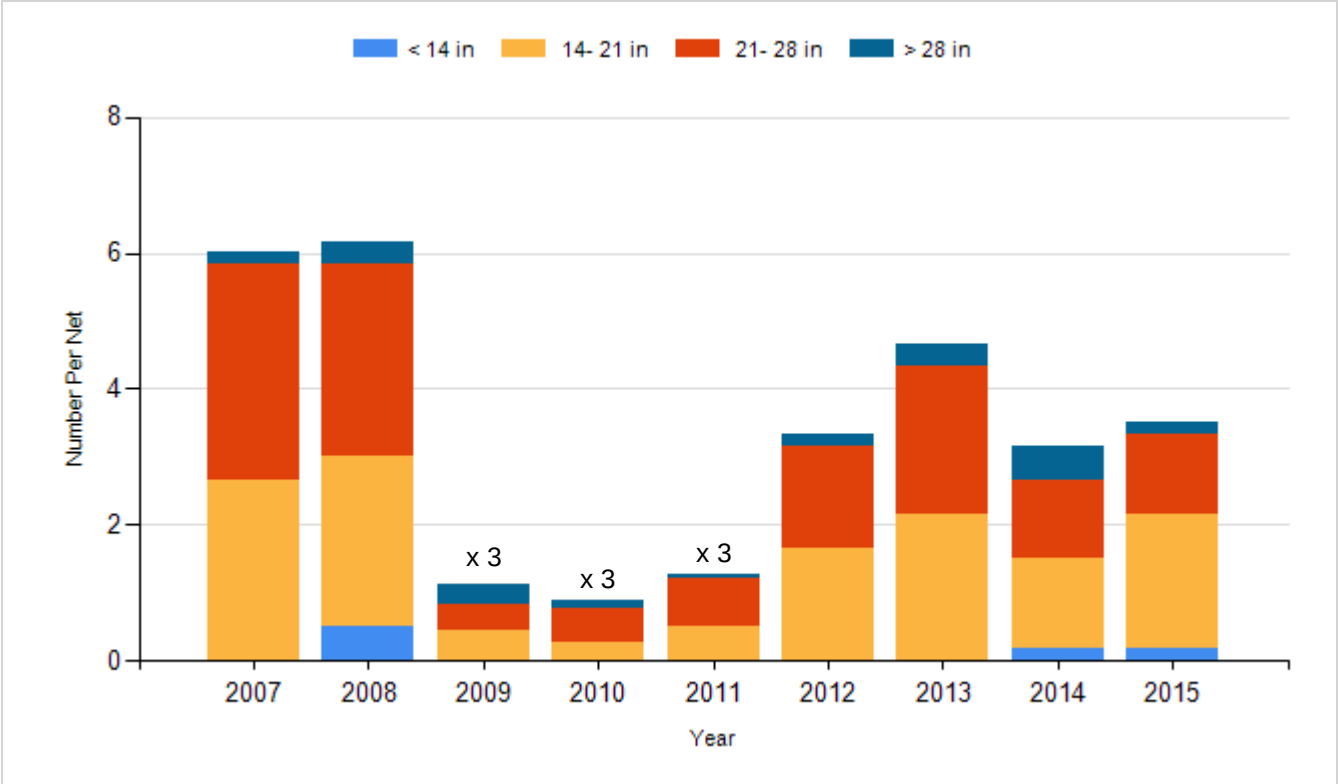
Historic Fish Sizes and Relative Abundance

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

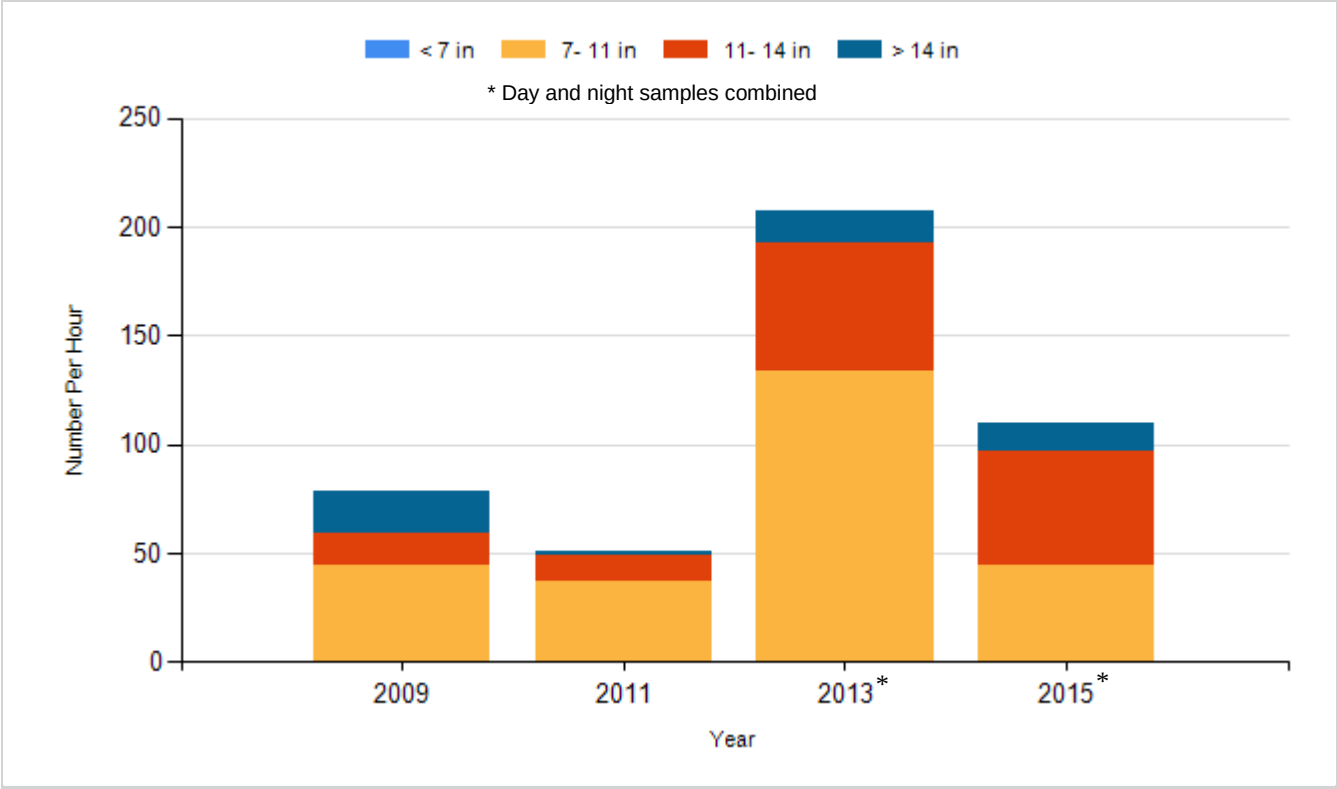
Species: Northern Pike
Gear: AFS std gill net



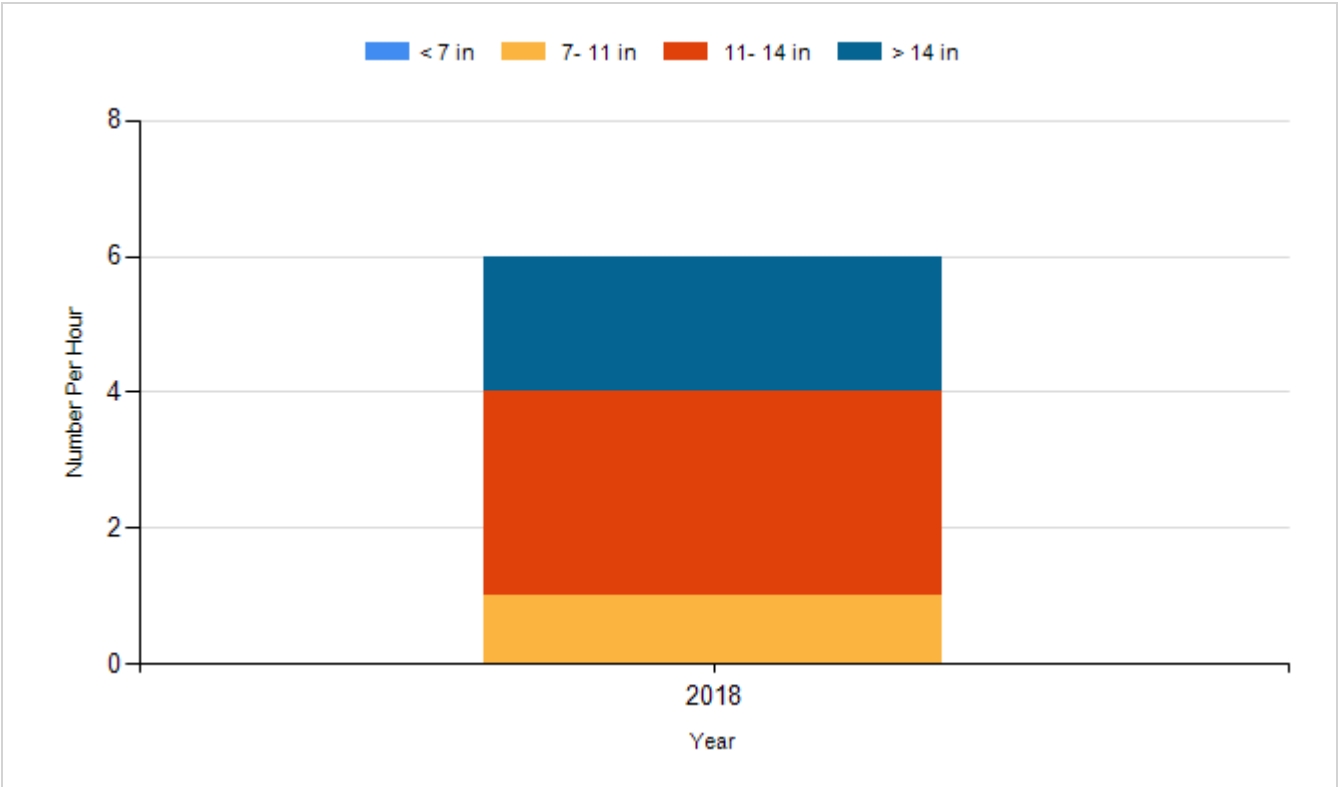
Species: Northern Pike
Gear: std exp gill net



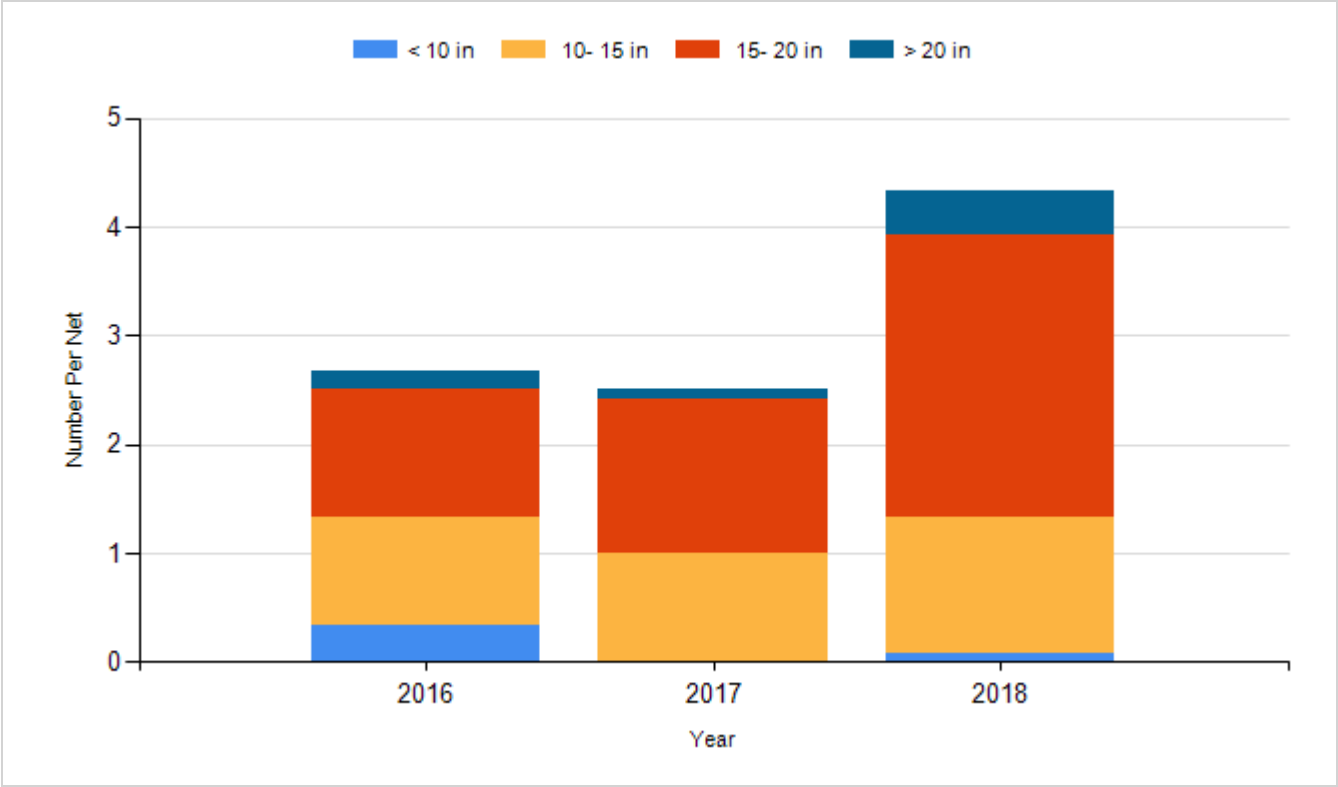
Species: Smallmouth Bass
Gear: boat shocker (night, DC)



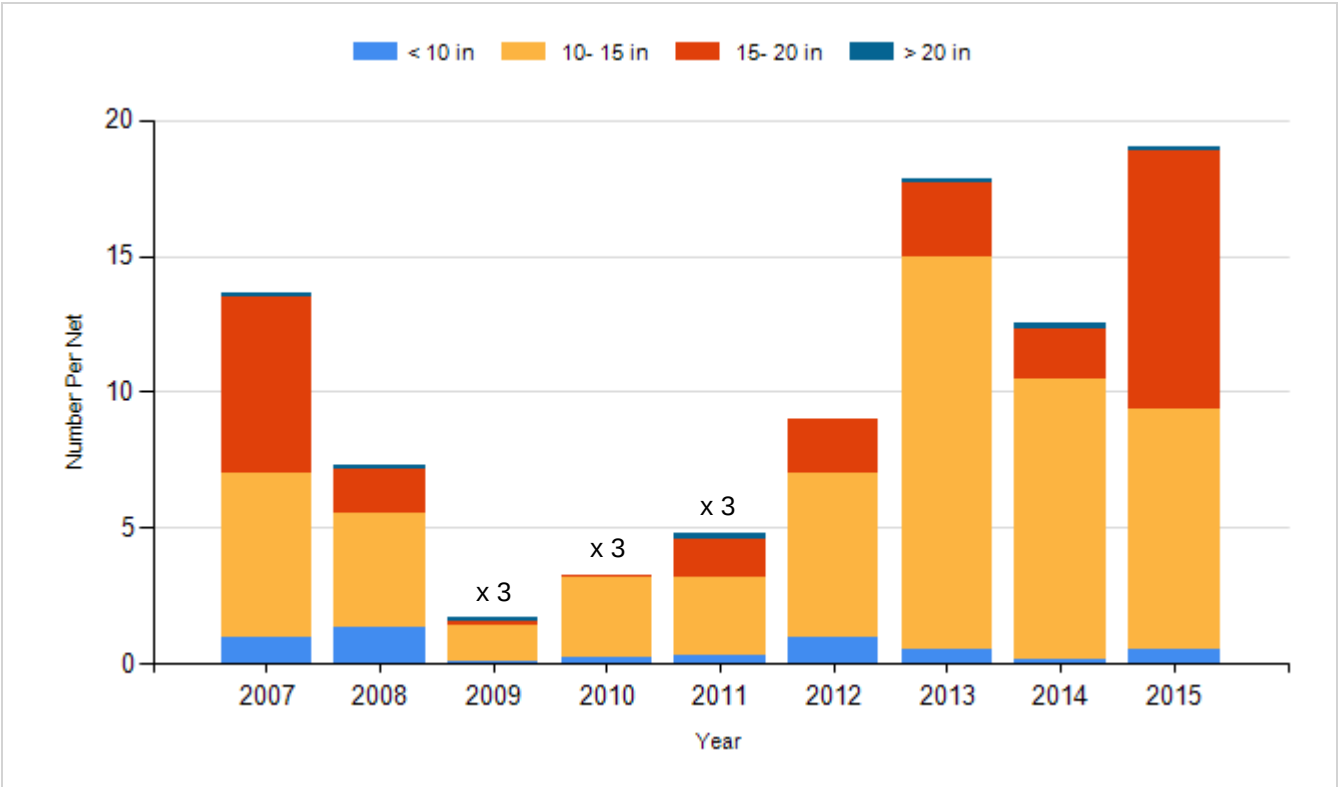
Species: Smallmouth Bass
Gear: spring night EF-SMB



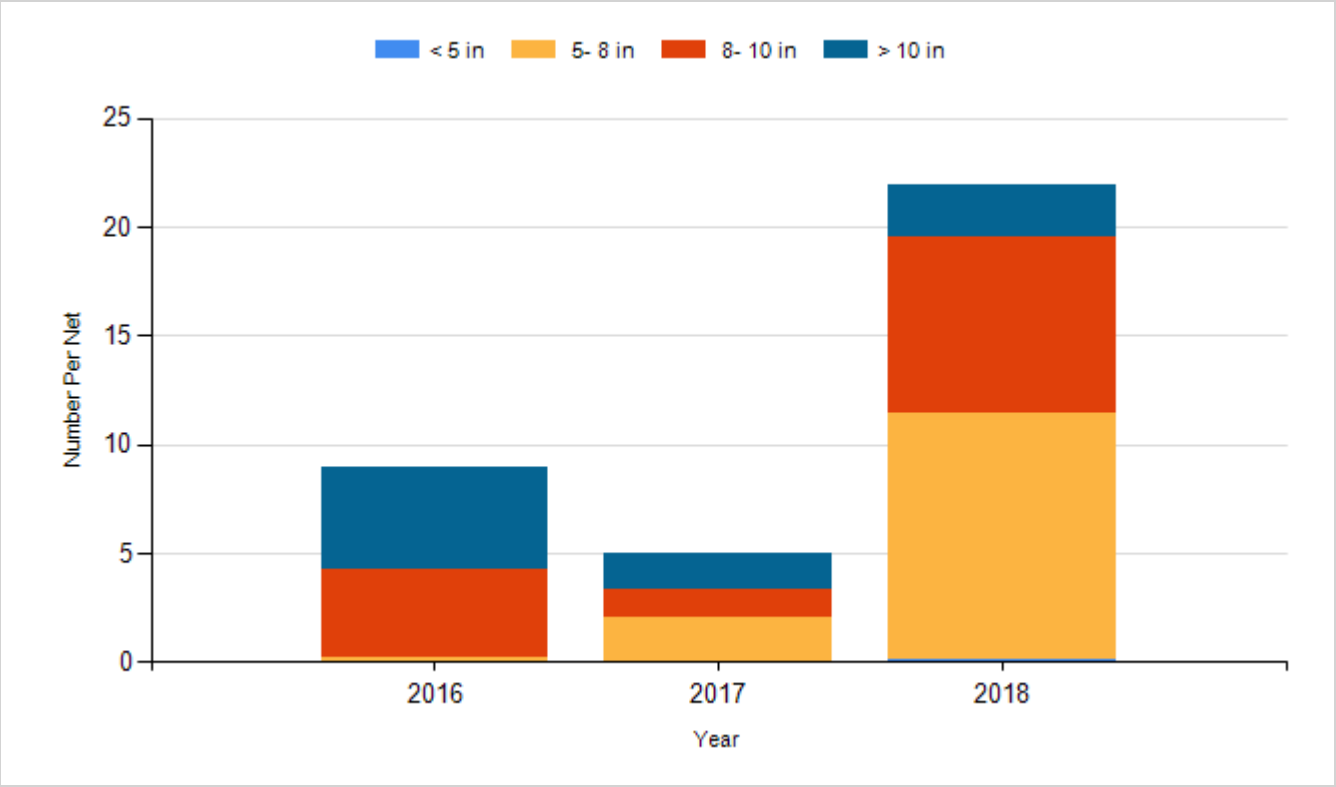
Species: Walleye
Gear: AFS std gill net



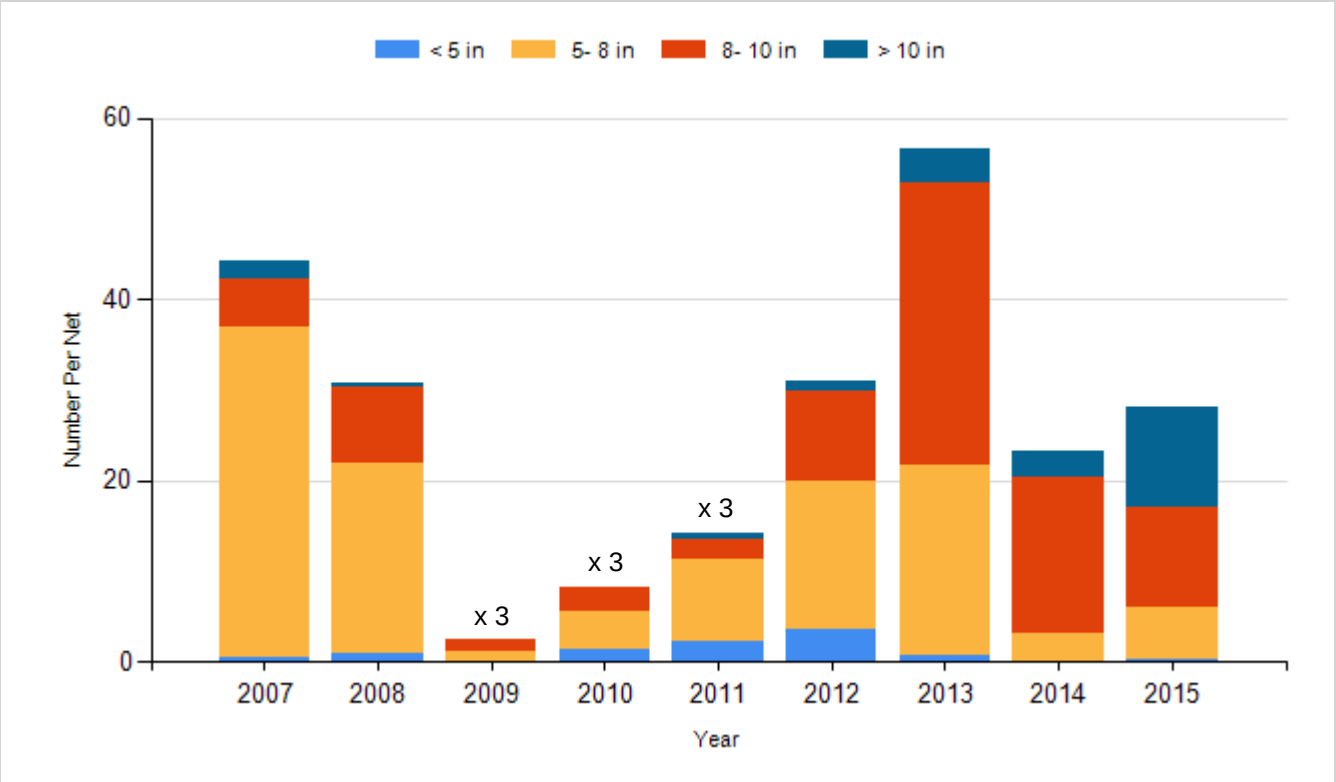
Species: Walleye
Gear: std exp gill net



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
2007	Walleye	Large Fingerling	765
2008	Walleye	Large Fingerling	15,135
2010	Walleye	Large Fingerling	17,442
2011	Walleye	Large Fingerling	18,585
2013	Walleye	Small Fingerling	93,410
2015	Walleye	Small Fingerling	91,850
2017	Walleye	Small Fingerling	71,130
2018	Walleye	Fry	470,000