Horseshoe Lake Survey Summary

Horseshoe Lake, located 9.0 miles south and 4.5 miles west of Webster, is managed as a smallmouth bass, walleye and yellow perch fishery; other fish species (e.g., northern pike) are present and contribute to the fishery.

- **Smallmouth bass.** More smallmouth bass were sampled in 2019 (38.0/hour) than 2018 (19.0/hour). In 2019, sampled fish ranged in length from 13.0 to 19.3 inches, most (97%) were $\geq$14.0 inches and 74% were 17.0 inches or longer. Though smallmouth bass are not abundant, those present tend to be larger and of interest to a segment of anglers.

- **Walleye.** A 28-inch minimum length limit and one fish daily limit is in effect for walleyes at Horseshoe Lake. The objective of the regulation is to provide a unique fishery with high catch rates for large fish. In 2019, the relative abundance of walleyes in the gill net catch was low to moderate (4.1/gill net). Sampled walleyes ranged in length from 6.3 to 27.6 inches of the fish that were at least 10.0 inches more than half (51%) were 20.0 inches or longer. Individuals from eight year classes contributed to the catch, those from the 2017 (age-2) cohort were the most abundant accounting for 40% of walleyes in the sample. Growth appears to be variable with mean length at capture values from 13.9 to 18.0 inches for age-3 walleyes sampled since 2011.

- **Yellow perch**. Yellow perch were not abundant (4.7/gill net) in 2019. Those sampled ranged in length from 5.1 to 10.2 inches, nearly 70% were from the 2018 (age-1) cohort, which had a mean length at capture of 5.8 inches.

For more detailed results see the computer generated South Dakota Statewide Fisheries Survey for Horseshoe (Day; below).

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Horseshoe, Day County
UBS-Lake-303-001
2019

Lake Information

Name:	Horseshoe	**Maximum Depth:**	24 Feet
County:	Day	**Mean Depth:**	15 Feet
Surface Area:	614 Acres		

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jul 09, 2019	4 net-nights
AFS std gill net	Jul 10, 2019	4 net-nights
AFS std gill net	Jul 11, 2019	4 net-nights
boat shocker (day)	May 29, 2019	3600 seconds

<u>Common Fish Species Present</u>

Yellow Perch

Walleye

Smallmouth Bass

Northern Pike

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	Northern Pike	1	0.1	0.1	100		100		73	
	Smallmouth Bass	36	3.0	0.9	89		86	9	125	2
	Walleye	60	4.1	1.2	51	11	51	11	87	1
	Yellow Perch	56	4.7	1.7	29	9	4		111	2
boat shocker (day)	Smallmouth Bass	38	38.0	31.9	100		97		124	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.
* Includes night sampling conducted prior to 2018

| Gear | Species | CPUE | | | | | | | | | | |
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
AFS std gill net	Northern Pike								0.1		0.1	0.1
	Smallmouth Bass								3.6		3.0	3.3
	Walleye								3.9		4.1	4.0
	Yellow Perch								19.2		4.7	12.0
boat shocker (day)*	Smallmouth Bass		23.9		49.9		11.0			19.0	38.0	28.4
frame net (std 3/4 in)	Black Bullhead		0.0			0.1	0.0					0.0
	Black Crappie		0.0			0.0	0.0					0.0
	Bluegill		1.4			17.9	3.6					7.6
	Green Sunfish		0.0			0.4	0.0					0.1
	Northern Pike		0.6			1.6	0.4					0.9
	Smallmouth Bass		0.8			2.5	1.8					1.7
	Walleye		0.8			1.4	0.3					0.8
	Yellow Perch		0.4			5.2	0.2					1.9
std exp gill net	Bluegill		0.0			0.0	0.3					0.1
	Northern Pike		0.7			1.3	1.2					1.1
	Smallmouth Bass		0.0			0.3	0.0					0.1
	Walleye		2.8			3.5	4.0					3.4
	Yellow Perch		6.1			8.2	29.7					14.7

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.
* Includes night sampling conducted prior to 2018

Gear	Species	Index						Year				
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AFS std gill net	Walleye	PSD								98		51
		PSD-P								72		51
		Wr								92		87
	Yellow Perch	PSD								6		29
		PSD-P								0		4
		Wr								112		111
boat shocker (day)	Smallmouth Bass	PSD		71		98		91			100	100
		PSD-P		67		90		91			95	97
		Wr		118		134		120			122	124
std exp gill net	Walleye	PSD		16			52	63				
		PSD-P		6			24	21				
		Wr		93			89	99				
	Yellow Perch	PSD		69			45	33				
		PSD-P		43			22	3				
		Wr		110			104	110				

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+
2019	60	179 (10)	276 (24)	353 (1)		551 (4)		553 (1)	563 (4)	590 (8)	621 (8)
2017	53	206 (6)	355 (1)	456 (8)		523 (3)	536 (9)	570 (13)	617 (7)	712 (1)	683 (5)
2015	35	185 (11)	276 (3)	375 (7)		483 (11)	568 (3)				
2014	23		274 (6)	366 (7)	397 (5)	567 (3)					611 (2)
2011	82	189 (32)	346 (45)	438 (2)		556 (1)					673 (2)

Species: Yellow Perch

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	56	147 (38)	223 (16)	260 (2)							
2017	230	147 (206)	201 (24)								
2015	178		190 (172)	264 (2)	285 (3)	307 (1)					
2014	74	128 (48)	166 (5)	231 (12)	260 (11)						
2011	125	132 (50)	224 (24)		286 (51)						

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)
Smallmouth Bass Electro Fishing	2015	1	104	0		4	128 (4.8)	6	118 (2.7)
	2018	0		1	101	8	126 (6.8)	10	121 (5.0)
	2019	0		1	122	9	130 (3.0)	28	122 (2.1)
Walleye Gill Net	2015	9	95 (2.6)	10	99 (1.5)	5	106 (4.4)	0	
	2017	1	94	12	96 (2.2)	25	94 (1.3)	9	83 (2.8)
	2019	24	90 (1.4)	0		21	86 (1.5)	4	77 (3.5)
Yellow Perch Gill Net	2015	119	110 (0.6)	53	111 (1.0)	4	105 (4.6)	2	115 (6.6)
	2017	217	113 (0.6)	13	109 (2.2)	0		0	
	2019	40	111 (1.7)	14	111 (1.7)	2	112 (1.2)	0	

Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Smallmouth Bass
Gear: boat shocker (day)
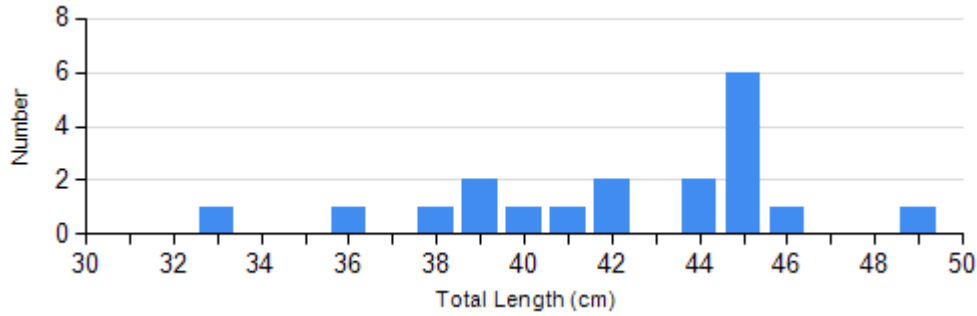
2018
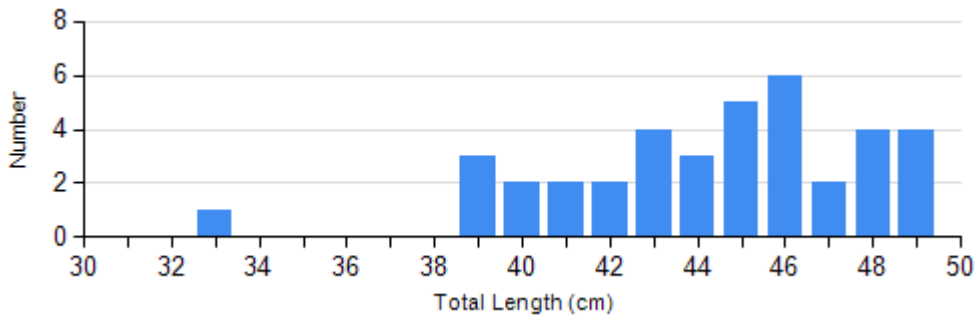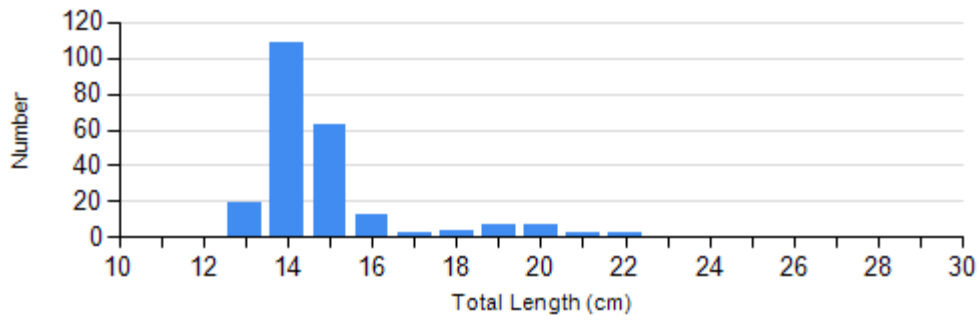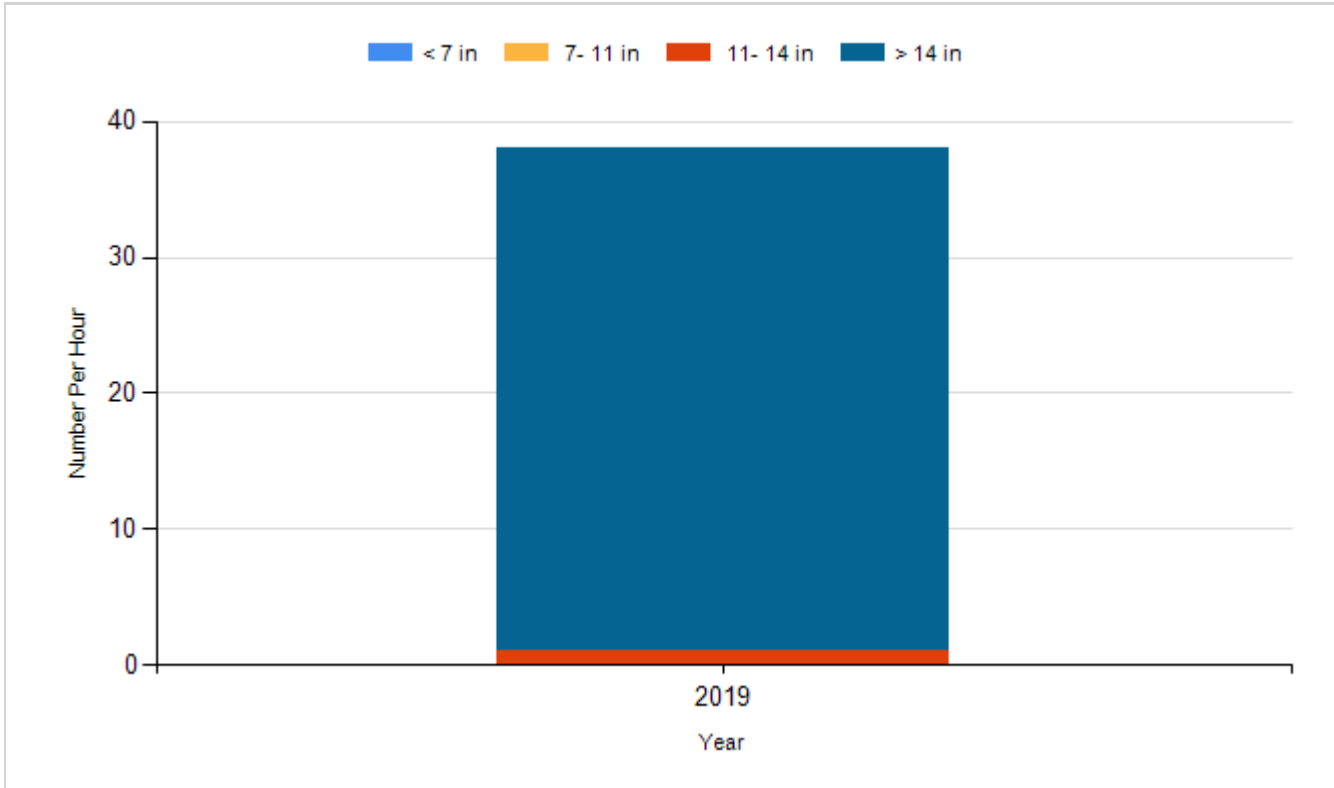

2019

Species: Walleye
Gear: AFS std gill net
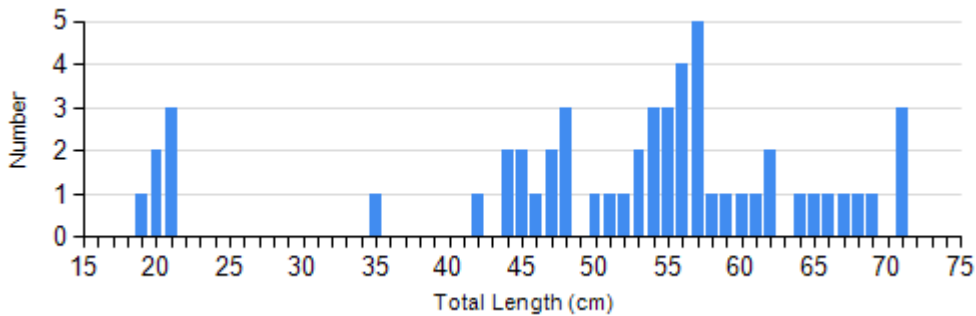
2017
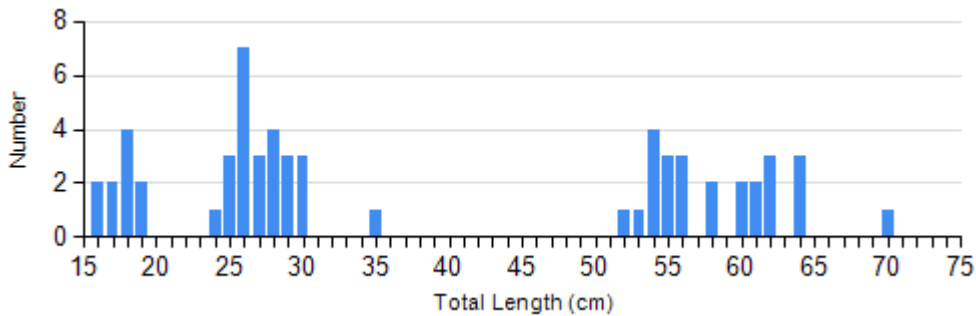
2019

Species: Yellow Perch
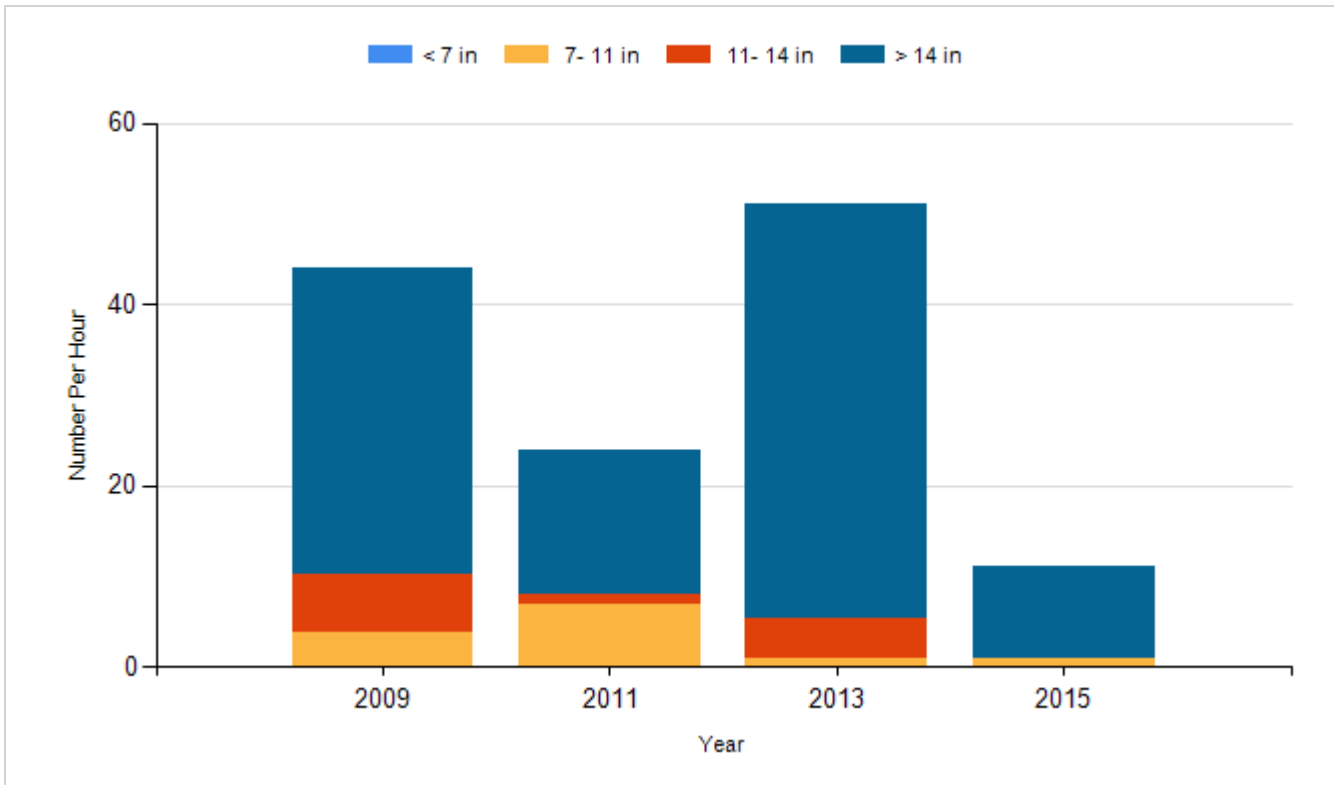Gear: AFS std gill net

2017

2019
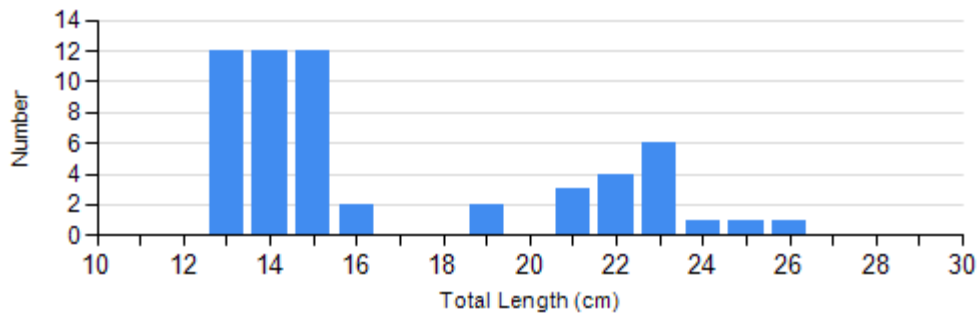
Historic Fish Sizes and Relative Abundance

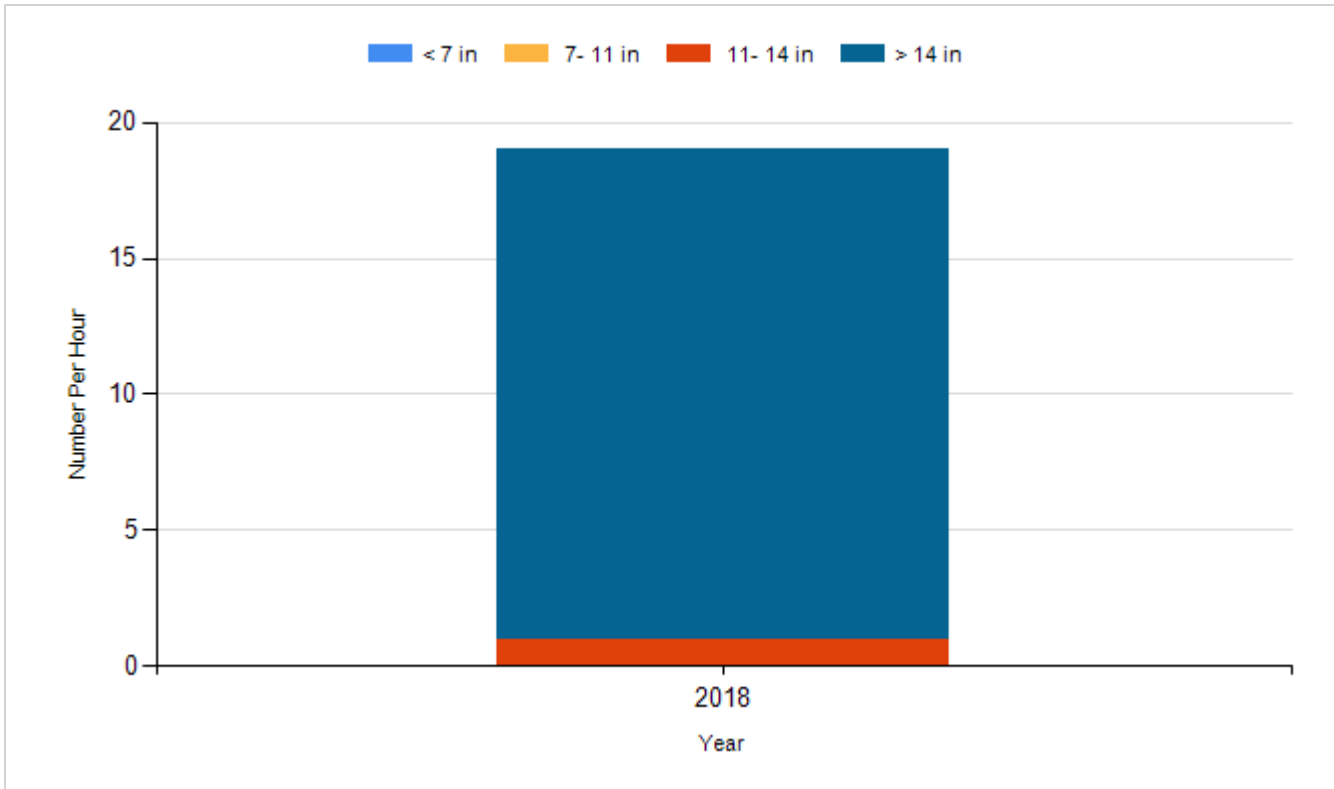Size distribution per net by color for species sampled by year.
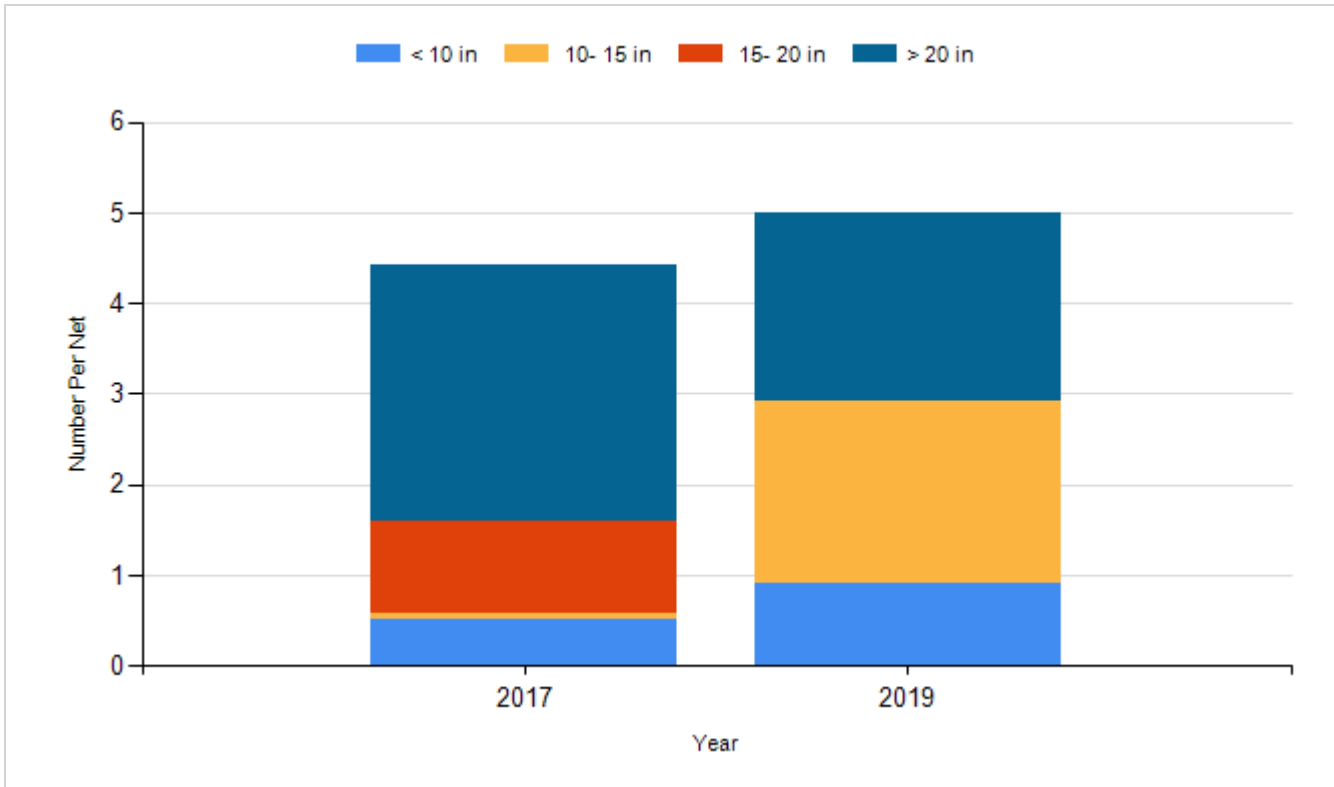
Species: Smallmouth Bass
Gear: boat shocker (day)

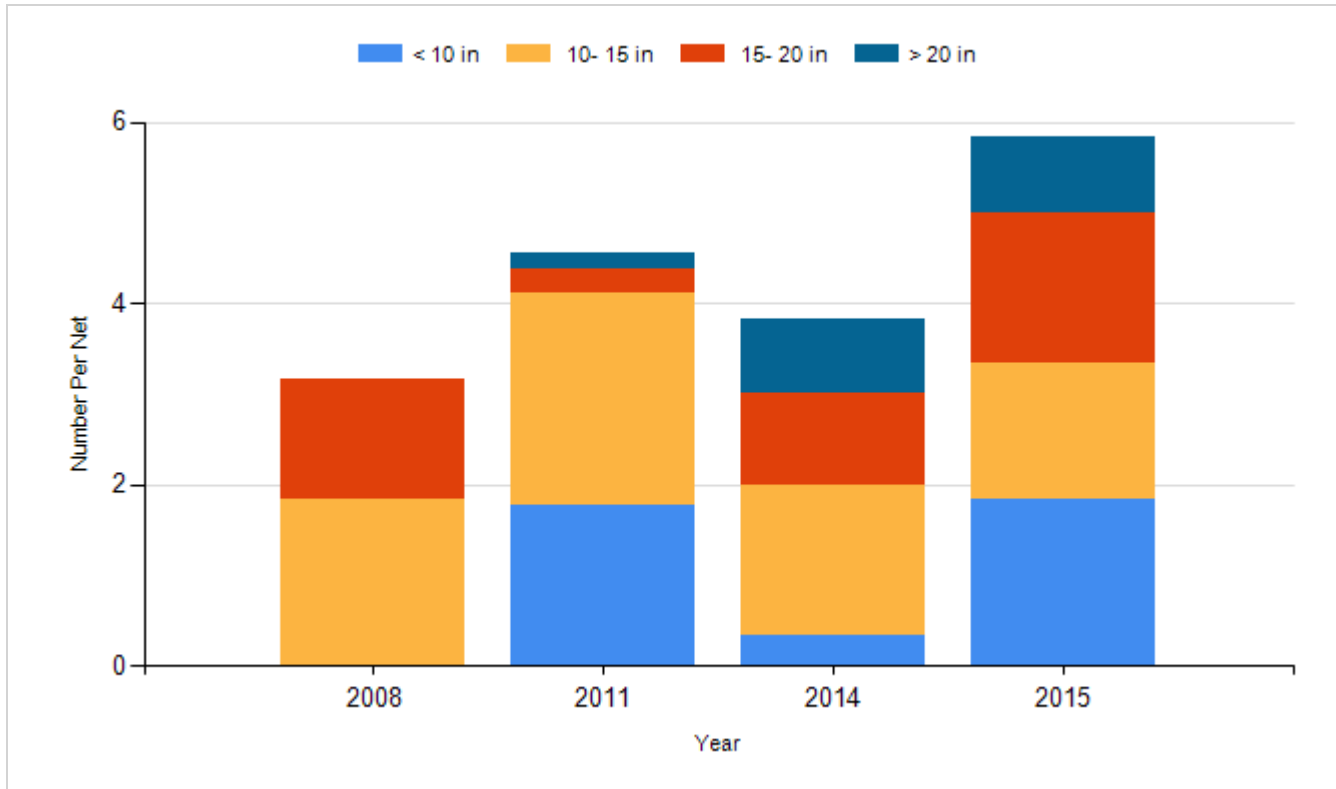Species: Smallmouth Bass
Gear: boat shocker (night, DC)

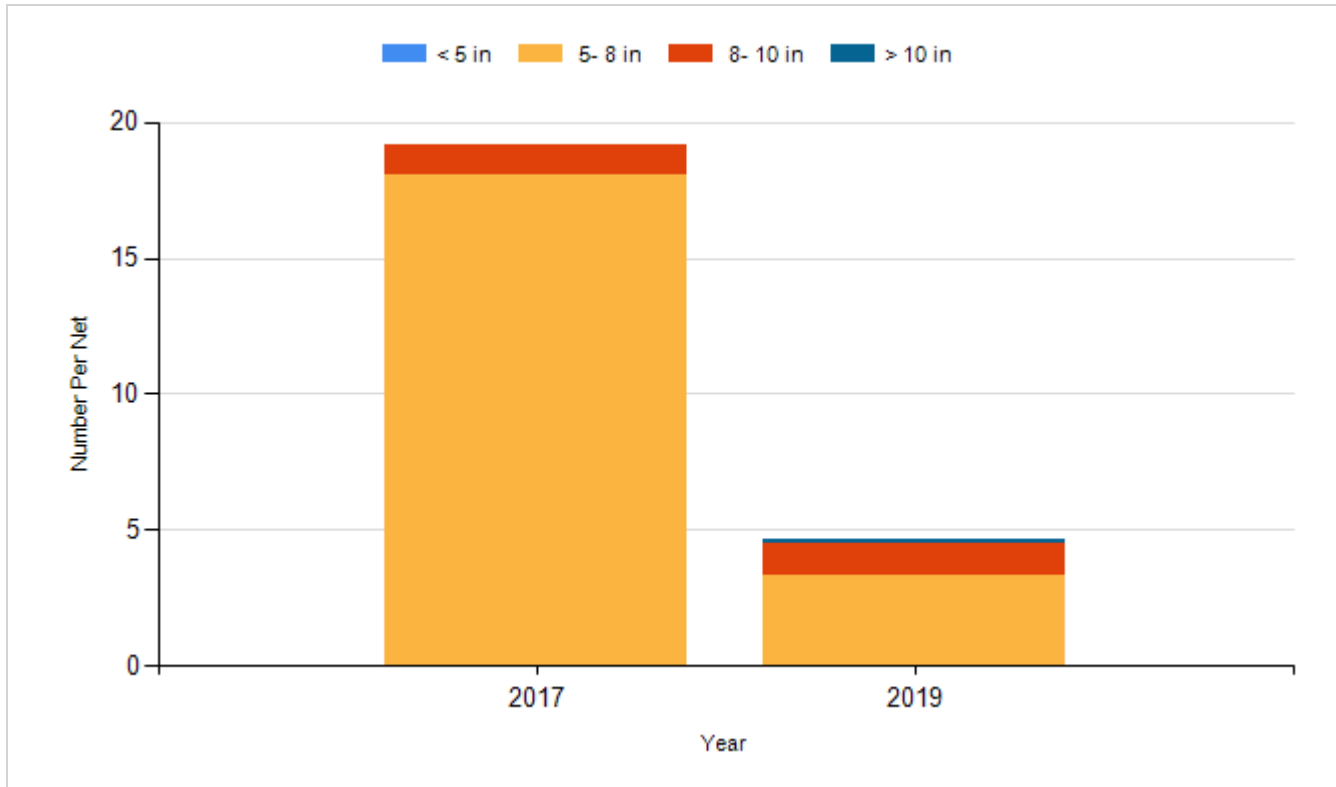Species: Smallmouth Bass
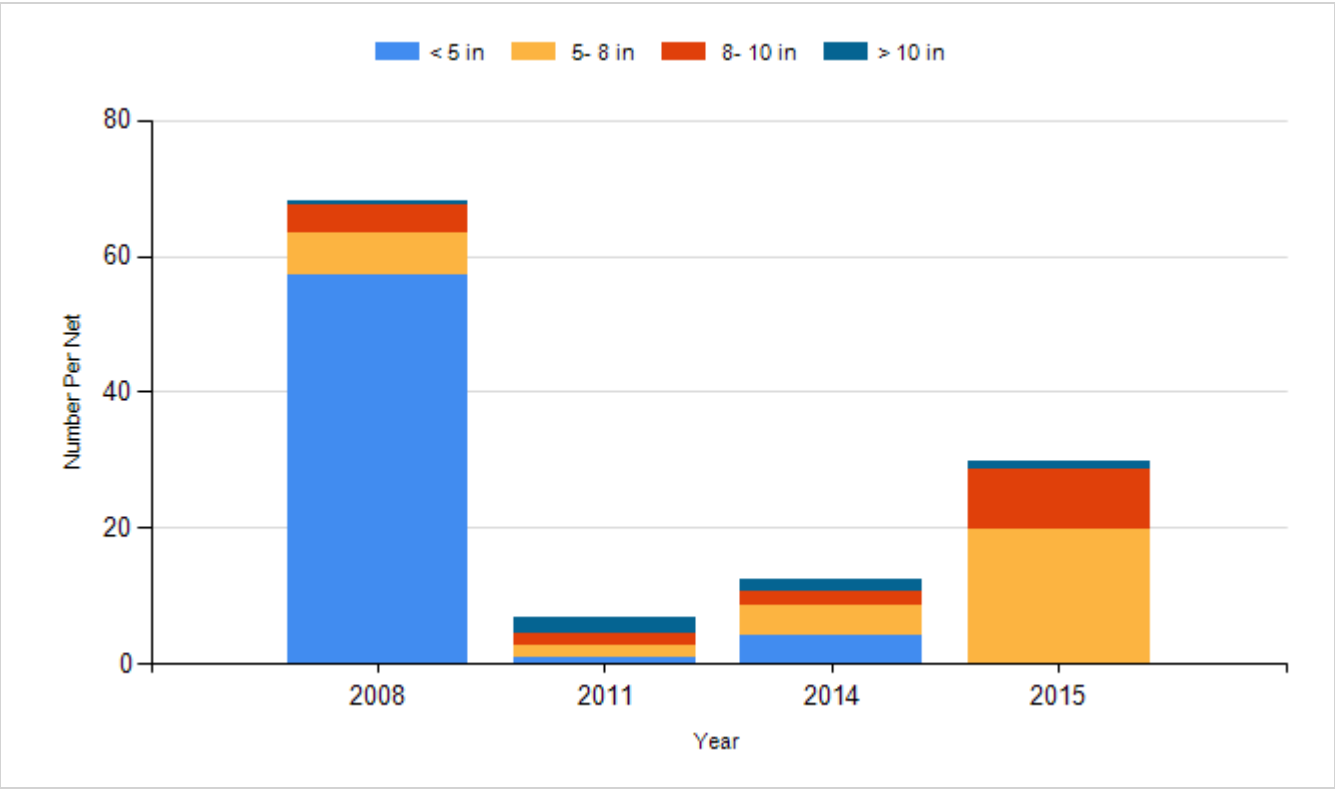Gear: spring night EF-SMB

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
2008	Walleye	Small Fingerling	55,480
2010	Walleye	Fry	600,000
2012	Walleye	Small Fingerling	60,510
2014	Walleye	Fry	300,000
2016	Walleye	Fry	300,000
2018	Walleye	Fry	300,000