Twin Lake Survey Summary

Twin Lake, located 6.0 miles south and 0.5 miles west of Redfield, is managed as a black crappie and walleye fishery; however, a variety of other fish species (e.g., northern pike, yellow perch) are present and contribute to the fishery.

- **Black crappie**. Black crappies were abundant in the 2019 frame net catch; however, most 86%) were ≤4.0 inches. These abundant small crappies were born this spring and are not reported in the Length at Capture table at age 0. Relative abundance of black crappies ≥5.0 inches was low (4.9/frame net), nearly all (98%) were 10.0 inches or longer. Of those older than age 0, year classes produced in 2011 (age-8) and 2015 (age-4) were the most abundant accounting for 70 of 89 fish sampled. Growth is good with a mean length at capture of 12.0 inches at age 4.

- **Walleye.** Walleyes were the most abundant species in the 2019 gill net catch. At 10.5/ gill net, relative abundance was high. Sampled walleyes ranged in length from 6.7 to 23.6 inches, of those that were at least 10.0 inches, 20% were ≥15.0 inches and 3% were 20.0 inches or longer. Individuals from six cohorts (2010, 2012, 2014, 2016, 2018, and 2019), most of which (except 2019) coincided with fry stockings, contributed to the catch. The 2018 (age-1) cohort was the most abundant and accounted for 80% of walleyes in the sample. Growth appears to be moderate to fast with mean length at capture values ≥15.0 inches at age 3. In 2019, the mean length at capture of age-3 fish was 16.6 inches.

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

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Twin, Spink County
TUR-Lake-589-000
2019

Lake Information

Name: Twin

County: Spink

Surface Area: 1,327 Acres

OHWM Elevation: 1,299

Outlet Elevation: 1,300

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Aug 20, 2019	6 net-nights
AFS std gill net	Aug 21, 2019	6 net-nights
frame net (std 3/4 in)	Aug 20, 2019	9 net-nights
frame net (std 3/4 in)	Aug 21, 2019	9 net-nights

Common Fish Species Present

Walleye

Northern Pike

Black Crappie

Common Carp

Green Sunfish

Yellow Perch

Freshwater Drum

White Sucker

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 Crappie	7	0.5	0.2	100		100		106	4
	Common Carp	84	1.8	0.6	100		77	15	89	2
	Freshwater Drum	21	0.3	0.3	100		100		109	3
	Green Sunfish	1	0.1	0.1	0		0		114	
	Walleye	136	10.5	1.6	20	5	3		96	1
	Yellow Perch	5	0.4	0.4	80		60		102	5
frame net (std 3/4 in)	Black Crappie	628	4.9	3.1	98		98		108	1
	Common Carp	42	1.8	0.6	100		97		86	1
	Freshwater Drum	137	0.0	0.0	0		0			
	Green Sunfish	17	0.9	0.3	12		0		114	3
	Northern Pike	1	0.0	0.0	0		0			
	Walleye	59	3.1	1.1	21	8	9	6	95	1
	White Sucker	3	0.2	0.2	100		100		93	3

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**

		CPUE										
Gear	Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
AFS std gill net	Black Crappie										0.5	0.5
	Common Carp										1.8	1.8
	Freshwater Drum										0.3	0.3
	Green Sunfish										0.1	0.1
	Walleye										10.5	10.5
	Yellow Perch										0.4	0.4
frame net (std 3/4 in)	Black Bullhead		53.4				0.1				0.0	17.8
	Black Crappie		1.1				29.1				4.9	11.7
	Bluegill		0.2				0.2				0.0	0.1
	Common Carp		9.4				0.7				1.8	4.0
	Freshwater Drum		0.0				0.0				0.0	0.0
	Green Sunfish		0.0				0.0				0.9	0.3
	Northern Pike		0.2				0.1				0.0	0.1
	Orangespotted Sunfish*		0.0				0.2				0.0	0.1
	Walleye		6.3				4.5				3.1	4.6
	White Sucker		0.0				0.0				0.2	0.1
	Yellow Perch		0.0				0.2				0.0	0.1
std exp gill net	Black Bullhead		19.0				0.2					9.6
	Black Crappie		1.0				1.7					1.4
	Common Carp		17.5				2.0					9.8
	Freshwater Drum		0.0				0.2					0.1
	Northern Pike		0.3				0.3					0.3
	Walleye		33.0				45.2					39.1
	Yellow Perch		0.0				2.8					1.4

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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AFS std gill net	Walleye	PSD										20
		PSD-P										3
		Wr										96
frame net (std 3/4 in)	Black Crappie	PSD		0				97				98
		PSD-P		0				92				98
		Wr		120				114				108
std exp gill net	Walleye	PSD		1				28				
		PSD-P		0				0				
		Wr		98				94				

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+
2019	89	187 (2)		279 (6)	304 (32)	304 (6)	325 (5)		330 (38)		
2015	1054	89 (531)	204 (21)	244 (32)	291 (221)	301 (251)					

Species: Walleye

		Mean Length (expanded sample number) at capture by age									
Year	N	1	2	3	4	5	6	7	8	9	10+
2019	127	292 (102)		422 (17)		490 (4)		517 (3)		601 (1)	
2015	273	292 (121)		380 (147)		465 (5)					
2011	161	268 (160)				453 (1)					

Fish Condition

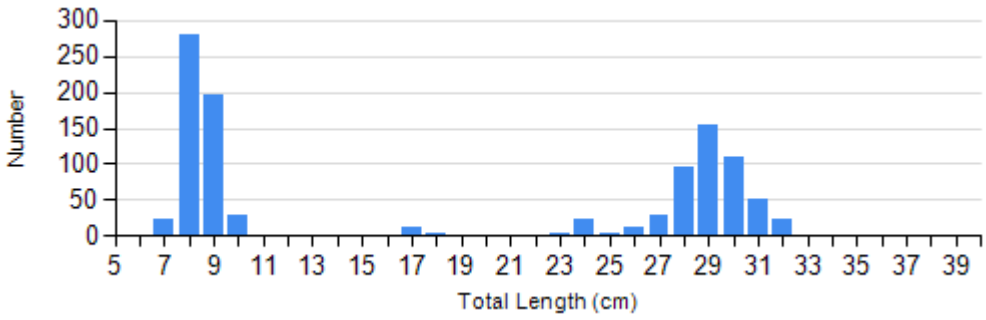
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		Length Groups							
		S-Q		Q-P		P-M		M	
Species	Year	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2015	15	116 (2.3)	28	118 (0.9)	296	115 (0.6)	184	110 (0.8)
	2019	2	125	0		8	104 (1.8)	79	107 (0.8)
Walleye Gill Net	2015	194	94 (0.9)	77	93 (0.6)	0		0	
	2019	101	97 (0.5)	21	95 (1.5)	4	91 (3.5)	0	

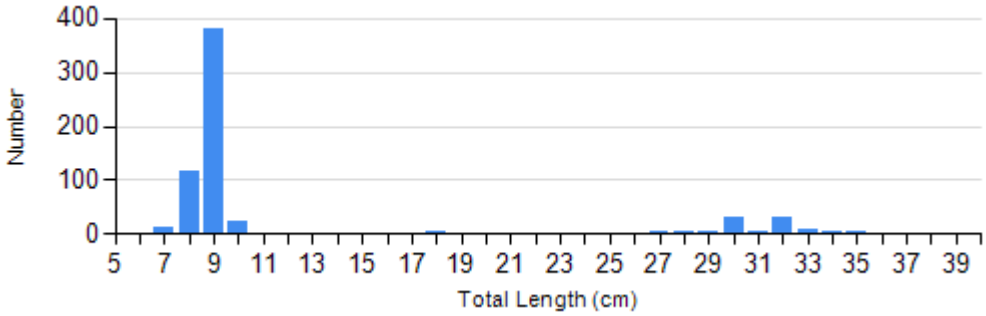
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

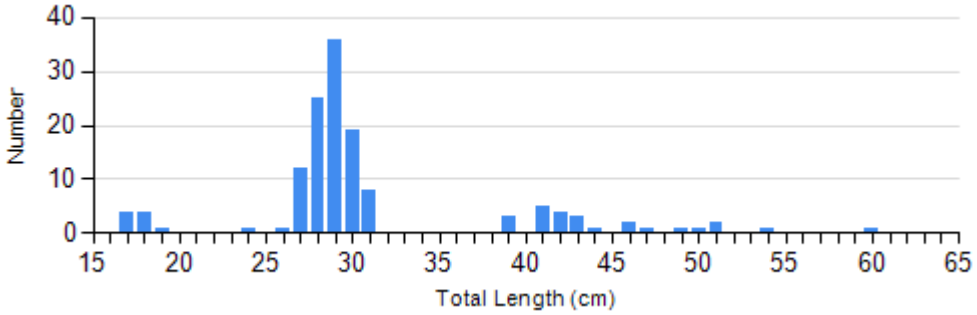


2015



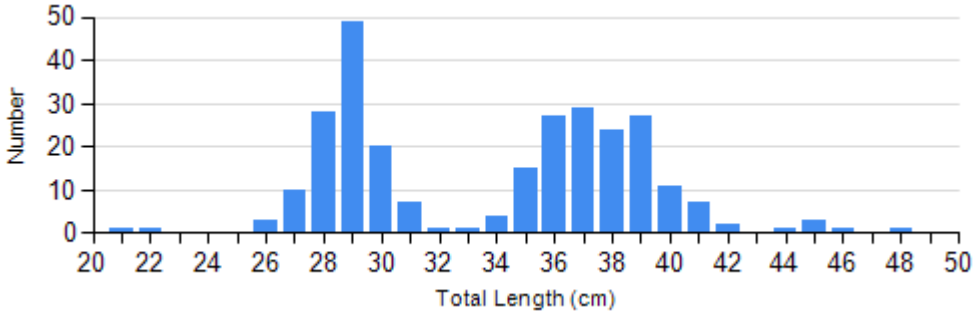
2019

Species: Walleye
Gear: AFS std gill net



2019

Species: Walleye
Gear: std exp gill net

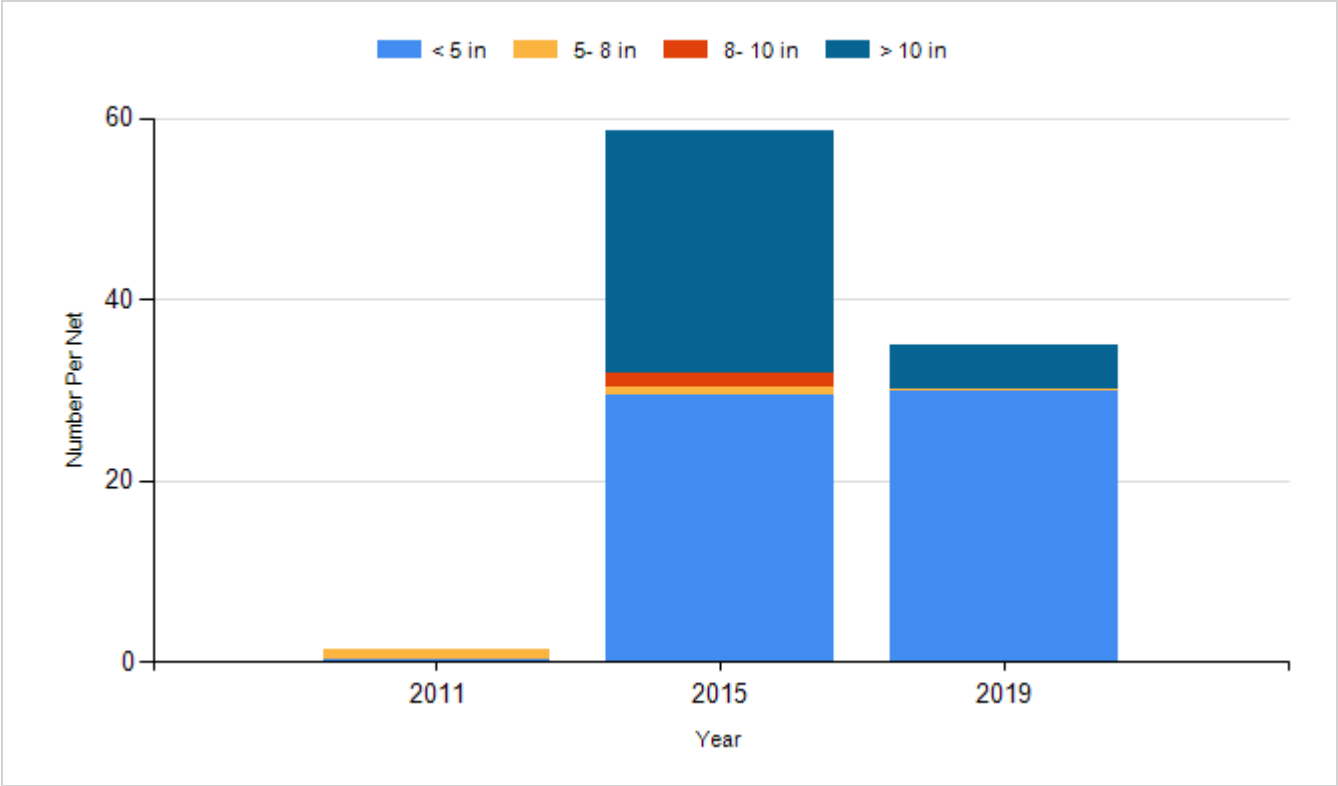


2015

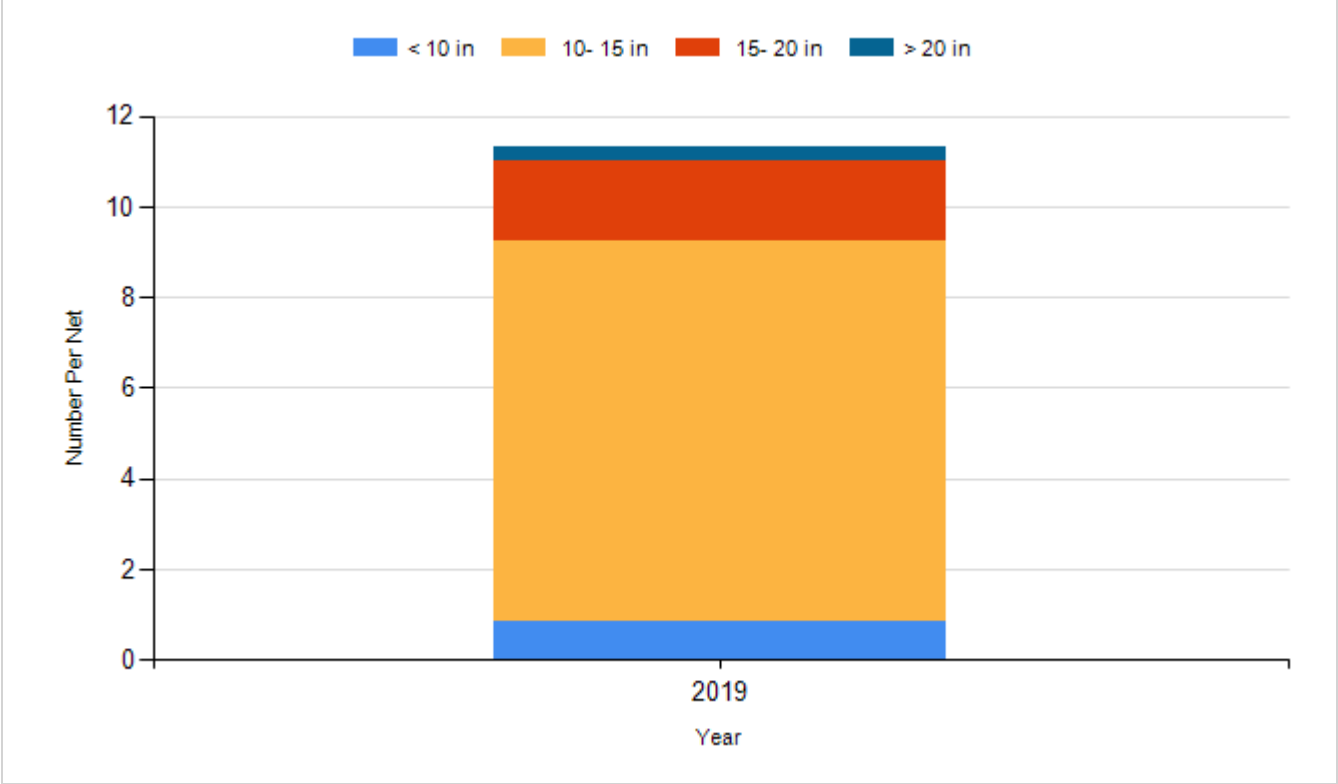
Historic Fish Sizes and Relative Abundance

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

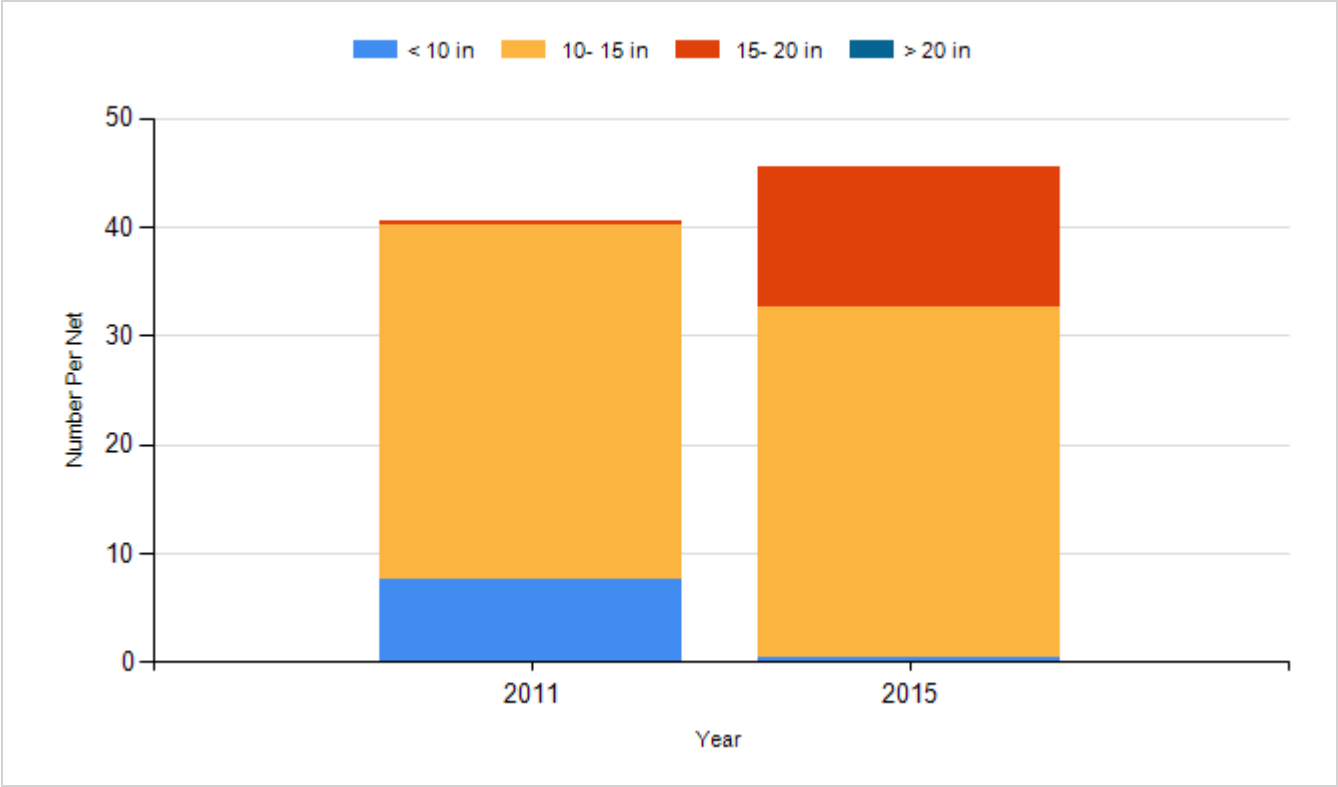
Species: Black Crappie
Gear: frame net (std 3/4 in)



Species: Walleye
Gear: AFS std gill net



Species: Walleye
Gear: std exp gill net



Fish Stocking

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

Year	Species	Size	Number
2008	Walleye	Fry	1,200,000
2010	Walleye	Fry	1,250,000
2012	Walleye	Fry	604,448
2014	Walleye	Fry	620,000
2015	Yellow Perch	Adult	4,950
2016	Walleye	Fry	620,000
2018	Walleye	Fry	620,000