

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Flat Creek Dam, Perkins County
GRA-Lake-767-000
2017

Lake Information

Name: Flat Creek Dam
County: Perkins
Surface Area: 164 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std frame net	June 12, 2017	5 net-nights
AFS std frame net	June 13, 2017	5 net-nights
AFS std gill net	June 12, 2017	2 net-nights
AFS std gill net	June 13, 2017	2 net-nights

Common Fish Species Present

Yellow Perch

Channel Catfish

Bluegill

Black Crappie

Walleye

Northern Pike

Common Carp

Black Bullhead

White Crappie

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).

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

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.

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

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

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.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

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).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(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

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Blue Catfish	12	30	20	51	30	76	35	89	45	114
Bluegill	3	8	6	15	8	20	10	25	12	30
Bluegill X Gr. Sunfish Hybrid	3	8	6	15	8	20	10	25	12	30
Brown Bullhead	5	13	8	20	11	28	14	36	17	43
Burbot	8	20	15	38	21	53	26	67	32	82
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Common Carp	11	28	16	41	21	53	26	66	33	84
Flathead Catfish	14	35	20	51	28	71	34	86	40	102
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
Longnose Gar	16	41	27	69	36	91	45	114	55	140
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Paddlefish	16	41	26	66	33	84	41	104	51	130
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Redear Sunfish	4	10	7	18	9	23	11	28	13	33
River Carpsucker	7	18	11	28	14	36	18	46	22	56
Rock Bass	4	10	7	18	9	23	11	28	13	33
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
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
Smallmouth Buffalo	11	28	18	46	24	61	30	76	37	94
Spotted Bass	7	18	11	28	14	35	17	43	20	51
Striped Bass	12	30	20	51	30	76	35	89	45	114
Striped Bass Hybrid (wiper)	8	20	12	30	15	38	20	51	25	63
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 Perch	5	13	8	20	10	25	12	30	15	38
White Sucker	6	15	10	25	13	33	16	41	20	51
Yellow Bass	4	10	7	18	9	23	11	28	13	33
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).

Gear	Species	Abundance		Stock Density Indices			Condition		
		CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std frame net	Black Bullhead	8.0	2.8	0		0		76	1
	Black Crappie	0.2	0.2	50		50		107	9
	Common Carp	1.3	1.2	38		8		84	3
	Northern Pike	0.1	0.1	100		0		77	
	Smallmouth Bass	0.0	0.0	0		0			
	Walleye	1.0	0.5	60		30		76	1
	White Crappie	0.9	0.8	100		0		97	3
	White Sucker	0.2	0.2	50		0		75	1
	Yellow Perch	0.1	0.1	100		0		88	
AFS std gill net	Black Bullhead	18.8	8.0	0		0		78	1
	Channel Catfish	0.3	0.4	100		0		89	
	Common Carp	23.0	5.4	12	5	1		85	1
	Northern Pike	1.3	0.4	100		60		81	7
	Walleye	1.8	1.2	100		71		86	4
	Yellow Perch	0.3	0.4	0		0		111	

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.

Gear	Species	CPUE										Avg
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
AFS std frame net	Black Bullhead										8.0	8.0
	Black Crappie										0.2	0.2
	Common Carp										1.3	1.3
	Northern Pike										0.1	0.1
	Smallmouth Bass										0.0	0.0
	Walleye										1.0	1.0
	White Crappie										0.9	0.9
	White Sucker										0.2	0.2
	Yellow Perch										0.1	0.1
AFS std gill net	Black Bullhead										18.8	18.8
	Channel Catfish										0.3	0.3
	Common Carp										23.0	23.0
	Northern Pike										1.3	1.3
	Walleye										1.8	1.8
	Yellow Perch										0.3	0.3
frame net (1/2 inch)	Black Bullhead			0.0								0.0
	Common Carp			0.3								0.3
	Walleye			2.3								2.3
	Yellow Perch			4.3								4.3
frame net (std 3/4 in)	Black Bullhead					19.5	99.0	63.8	80.1			65.6
	Black Crappie							0.1	0.5			0.3
	Channel Catfish					0.3						0.3
	Common Carp					0.0	6.5	2.9	4.9			3.6
	Green Sunfish							0.1				0.1
	Northern Pike					1.0	0.8	2.6	0.5			1.2
	Walleye					2.8	1.0	0.8	1.0			1.4
	White Crappie								0.4			0.4
	White Sucker							0.3	0.1			0.2
	Yellow Perch					1.8	1.3	1.3	0.1			1.1
std exp gill net	Black Bullhead			1.0					79.0	23.5		34.5
	Common Carp			1.0					17.0	7.5		8.5
	Northern Pike			10.0					2.5	2.0		4.8
	Walleye			3.0					1.0	0.5		1.5

Gear	Species	CPUE										Avg
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
std exp gill net	White Sucker							1.0	1.0			1.0
	Yellow Perch			9.0								9.0
std exp gill net (150 ft)	Black Bullhead					4.0	32.0					18.0
	Common Carp					0.0	1.0					0.5
	Northern Pike					4.0	2.0					3.0
	Walleye					5.0	1.0					3.0
	Yellow Perch					2.0						2.0

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.

Gear	Species	Index	Year											
			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		
AFS std frame net	Black Crappie	PSD											50	
		PSD-P											50	
		Wr											107	
	Northern Pike	PSD											100	
		PSD-P											0	
		Wr											77	
	Walleye	PSD											60	
		PSD-P											30	
		Wr											76	
Yellow Perch	PSD											100		
	PSD-P											0		
	Wr											88		
AFS std gill net	Northern Pike	PSD											100	
		PSD-P											60	
		Wr											81	
	Walleye	PSD											100	
		PSD-P											71	
		Wr											86	
	Yellow Perch	PSD											0	
		PSD-P											0	
		Wr											111	
frame net (1/2 inch)	Walleye	PSD			0									
		PSD-P			0									
		Wr			87									
	Yellow Perch	PSD			12									
		PSD-P			6									
		Wr			92									
frame net (std 3/4 in)	Black Crappie	PSD								100	100			
		PSD-P								0	0			
		Wr								91	98			
	Northern Pike	PSD							100	100	100	100		

Gear	Species	Index	Year									
			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
frame net (std 3/4 in)	Northern Pike	PSD-P						50	67	81	50	
		Wr					91	97	88	84		
	Walleye	PSD					27	100	50	63		
		PSD-P					0	50	50	25		
		Wr					75	91	83	87		
	Yellow Perch	PSD					0	0	10	0		
		PSD-P					0	0	0	0		
		Wr					88	82	76	95		
	std exp gill net	Northern Pike	PSD			0					100	75
PSD-P					0					80	75	
Wr					103					96	88	
Walleye		PSD			0					100	0	
		PSD-P			0					50	0	
		Wr			85					93	80	
Yellow Perch		PSD			0							
		PSD-P			0							
std exp gill net (150 ft)		Northern Pike	PSD					100	100			
	PSD-P						75	100				
	Wr						102	95				
	Walleye	PSD					40	100				
		PSD-P					20	0				
		Wr					85	86				
	Yellow Perch	PSD					0					
		PSD-P					0					
		Wr					81					

Back-Calculated Lengths

Mean species back-calculated total length (mm) at age, standard error (SE), and sample size (N).

Species: Black Crappie

Year Class	Age	Mean back-calculated length (SE) at age										
		N	1	2	3	4	5	6	7	8	9	10
2012	5	1	96	191	206	225	252					
Weighted Mean		1	96	191	206	225	252					
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2012	5	1										
Weighted Mean		1										

Species: Walleye

Year Class	Age	Mean back-calculated length (SE) at age										
		N	1	2	3	4	5	6	7	8	9	10
2016	1	13	132 (2.1)									
2014	3	2	241 (20.3)	350 (6.4)	408 (2.4)							
2014	3	7	196 (13.8)	299 (11.9)	352 (14.2)							
2013	4	1	271	376	465	560						
2013	4	1	314	390	442	571						
2011	6	1	224	380	450	511	545	576				
2011	6	1	254	386	469	541	570	586				
2010	7	1	206	289	362	408	480	542	584			
2010	7	1	225	347	450	514	554	569	589			
2009	8	2	257 (23)	329 (.1)	401 (5.5)	457 (8.6)	503 (0)	548 (13.1)	574 (5.1)	603 (6.1)		
Weighted Mean		30	186	331	395	502	526	562	580	603		
Year Class	Age	N	11	12	13	14	15	16	17	18	19	20
2016	1	13										

2014	3	2
2014	3	7
2013	4	1
2013	4	1
2011	6	1
2011	6	1
2010	7	1
2010	7	1
2009	8	2
Weighted Mean		30

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+
2017	1					258 (1)					

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2017	7			423 (2)	585 (1)		585 (1)	605 (1)	613 (2)		

Fish Condition

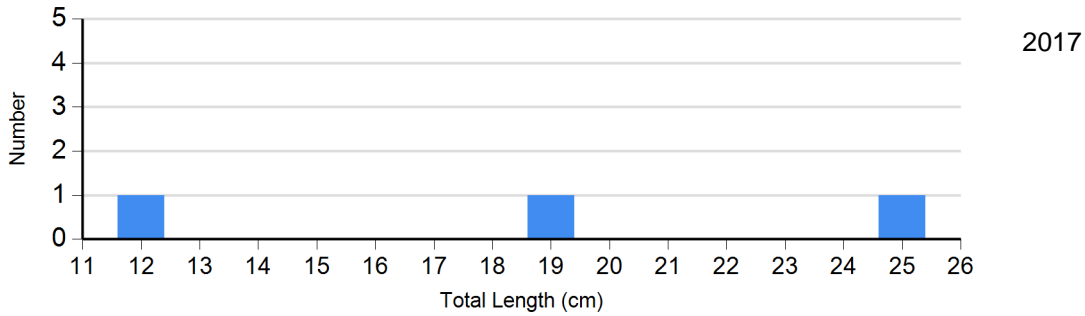
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2014	0		2	91 (0.0)	0		0	
	2015	0		8	98 (0.7)	0		0	
	2017	1	114	0		1	100	0	
Northern Pike Gill Net	2013	0		0		4	95 (1.3)	0	
	2014	0		2	85 (0.0)	8	98 (2.0)	0	
	2015	2	89 (0.0)	0		4	87 (3.1)	2	
	2017	0		2	82 (9.6)	3	80 (8.5)	0	
Walleye Gill Net	2013	0		2	86 (0.0)	0		0	
	2014	0		2	102 (0.0)	2	84 (0.0)	0	
	2015	2	80 (0.0)	0		0		0	
	2017	0		2	78 (1.9)	5	90 (3.0)	0	
Yellow Perch Gill Net	2017	1	111	0		0		0	

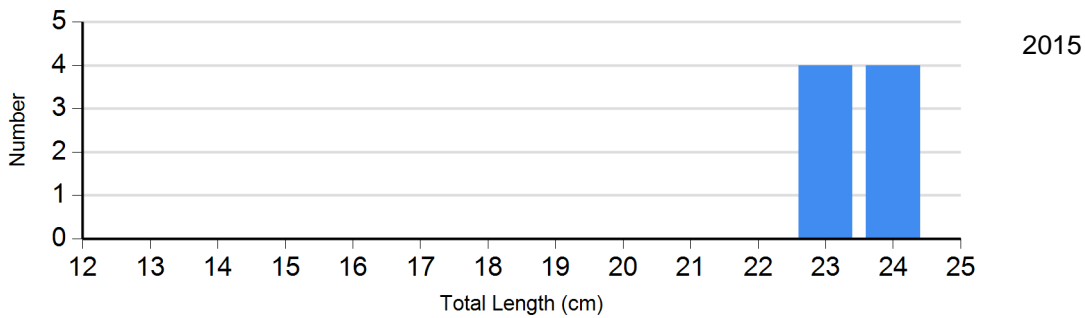
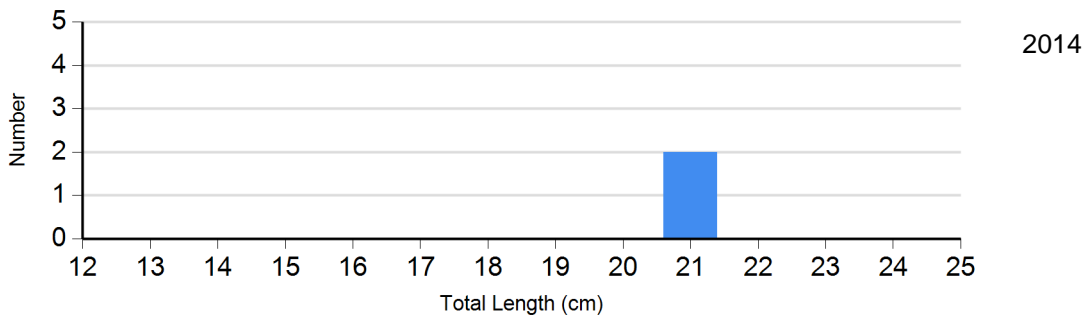
Length Frequency Distribution

Length frequency histogram of species sampled by year.

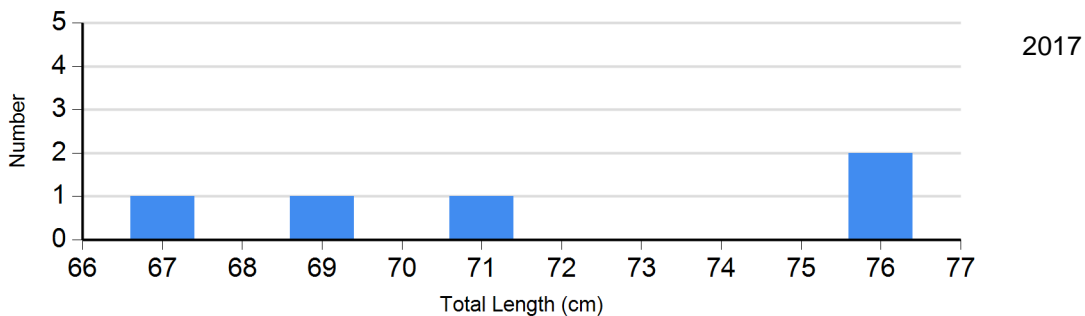
Species: Black Crappie
Gear: AFS std frame net



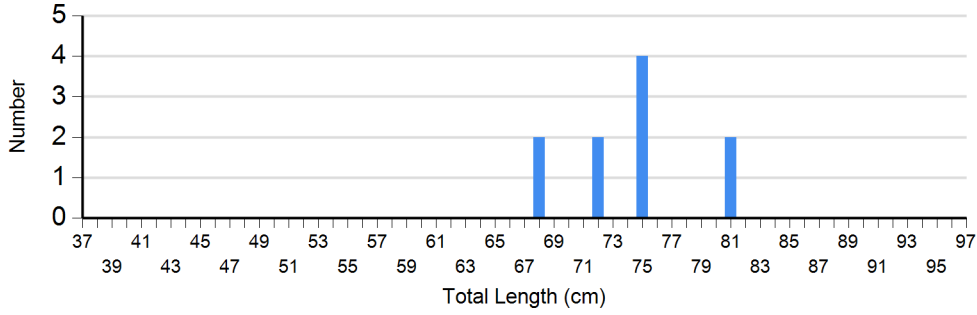
Species: Black Crappie
Gear: frame net (std 3/4 in)



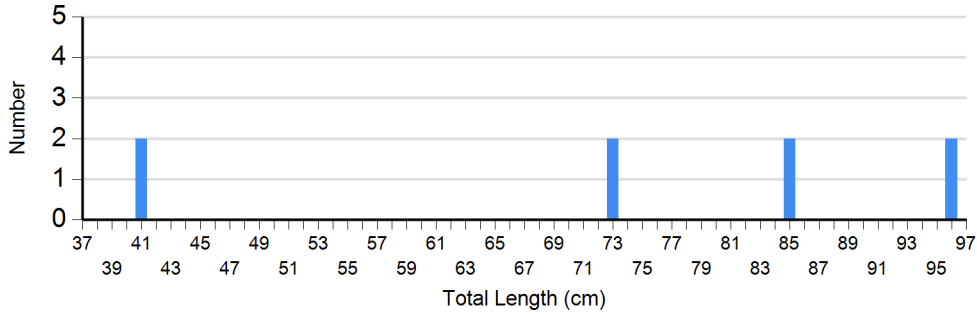
Species: Northern Pike
Gear: AFS std gill net



Species: Northern Pike
Gear: std exp gill net

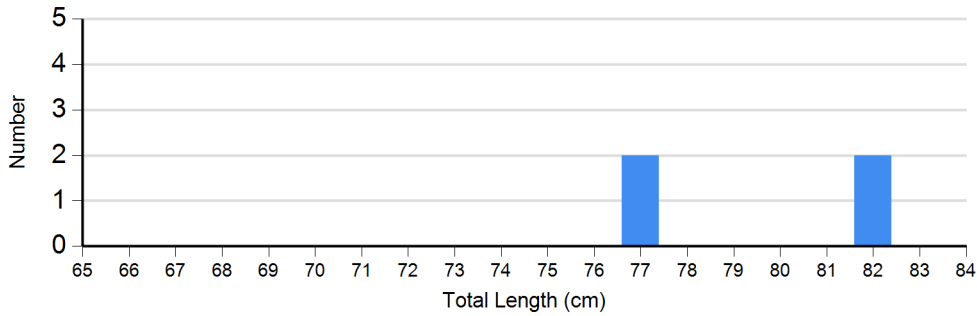


2014



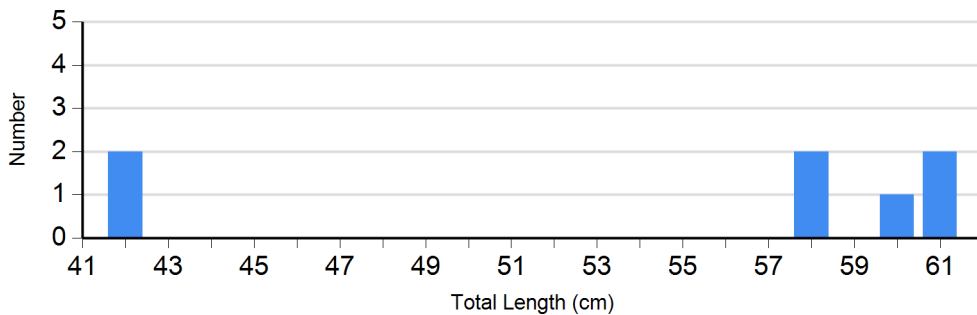
2015

Species: Northern Pike
Gear: std exp gill net (150 ft)



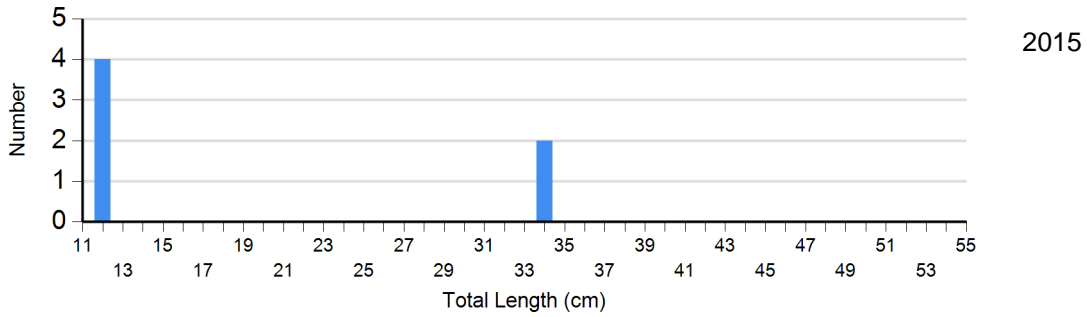
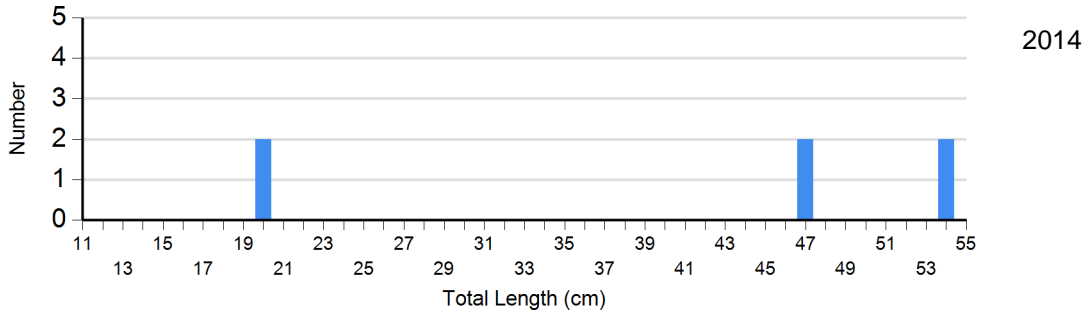
2013

Species: Walleye
Gear: AFS std gill net

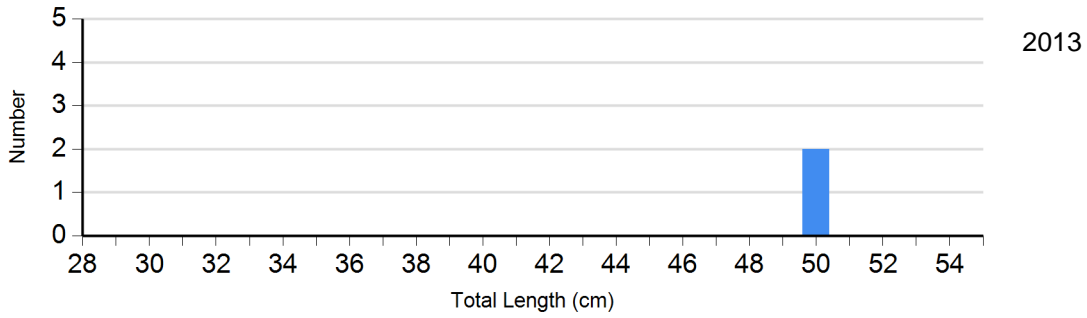


2017

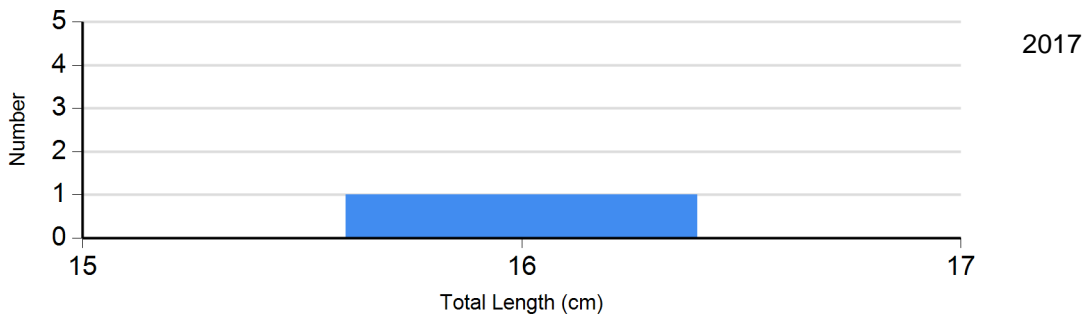
Species: Walleye
Gear: std exp gill net



Species: Walleye
Gear: std exp gill net (150 ft)



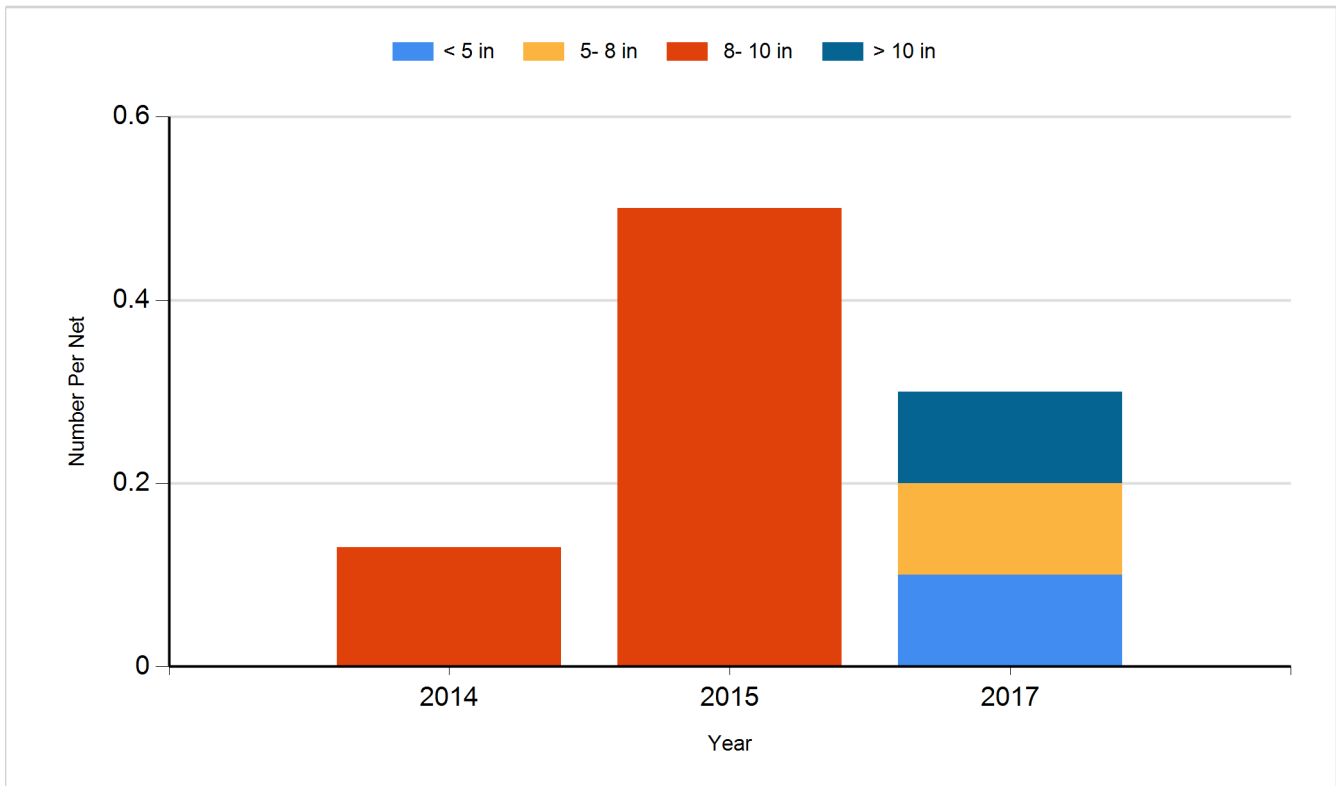
Species: Yellow Perch
Gear: AFS std gill net



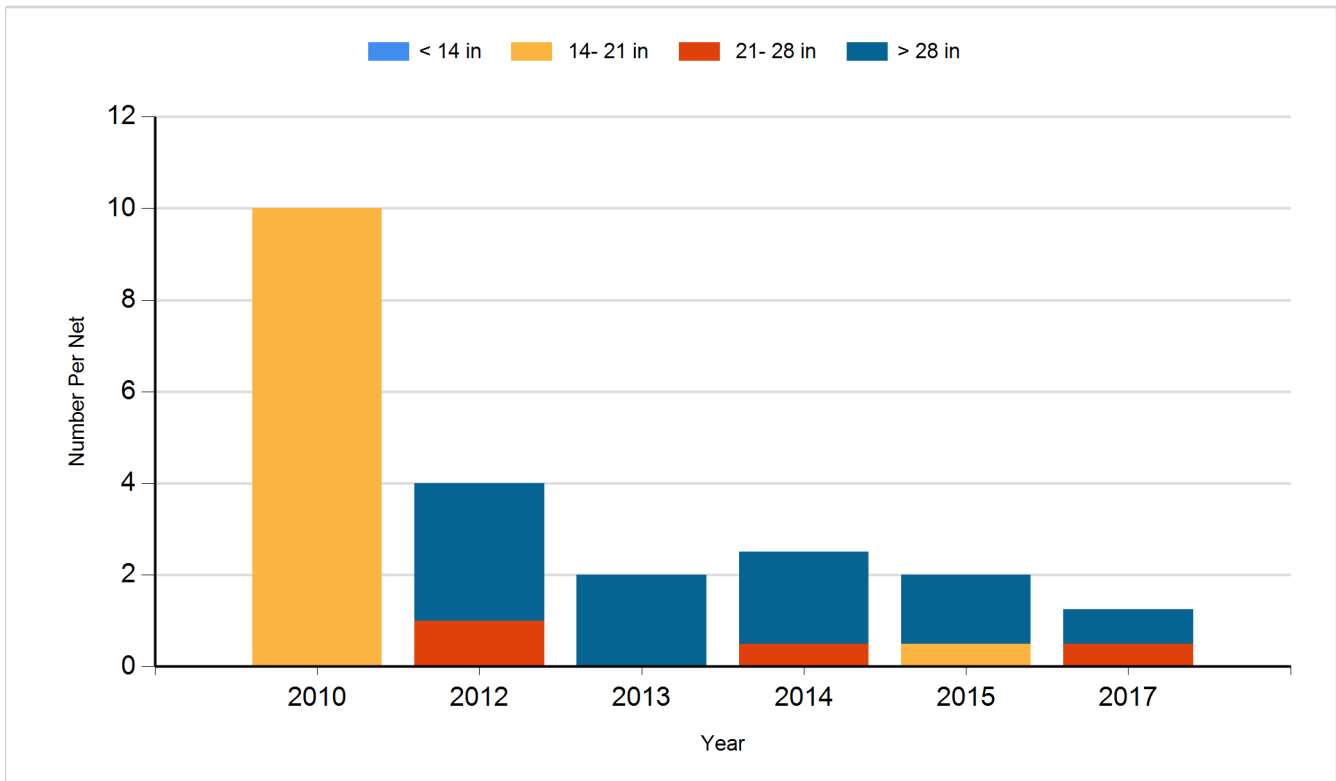
Historic Fish Sizes and Relative Abundance

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

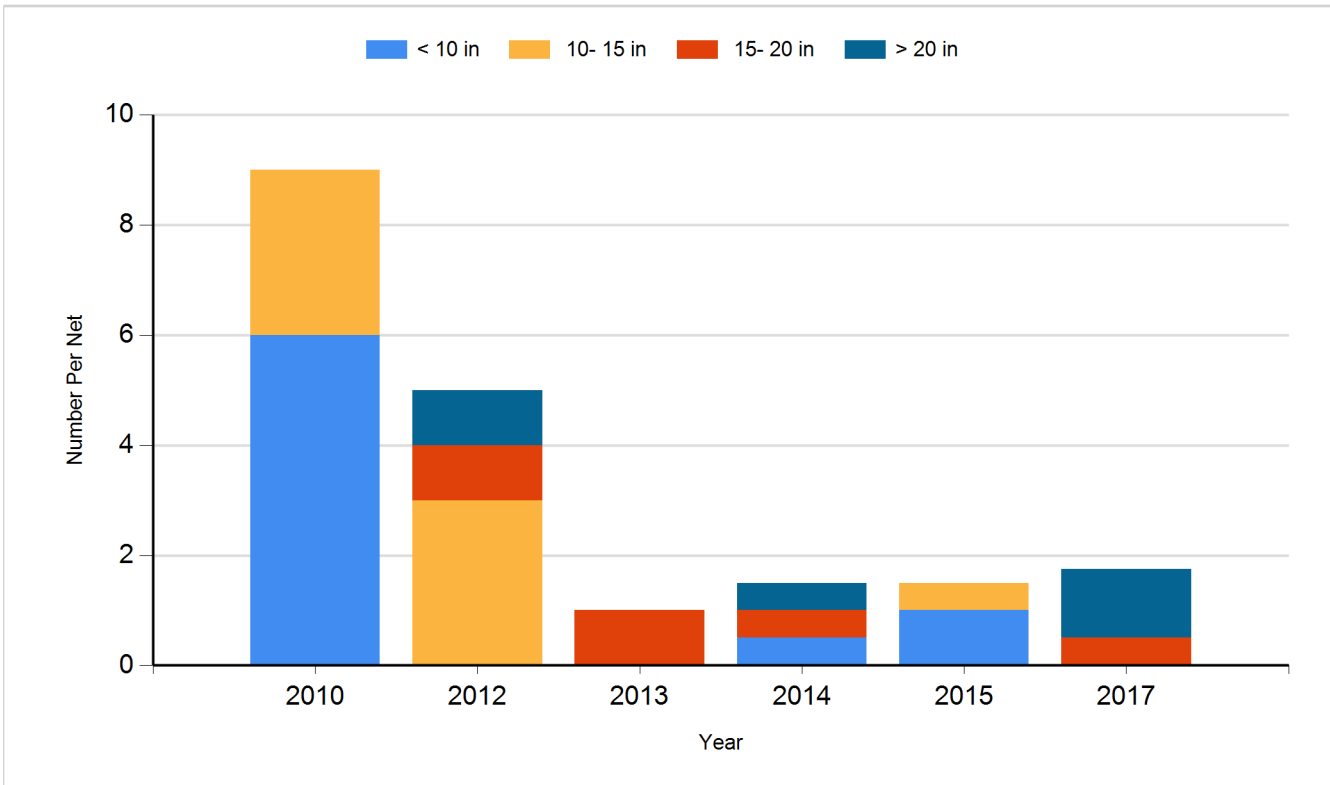
Species: Black Crappie
Gear: Frame Net



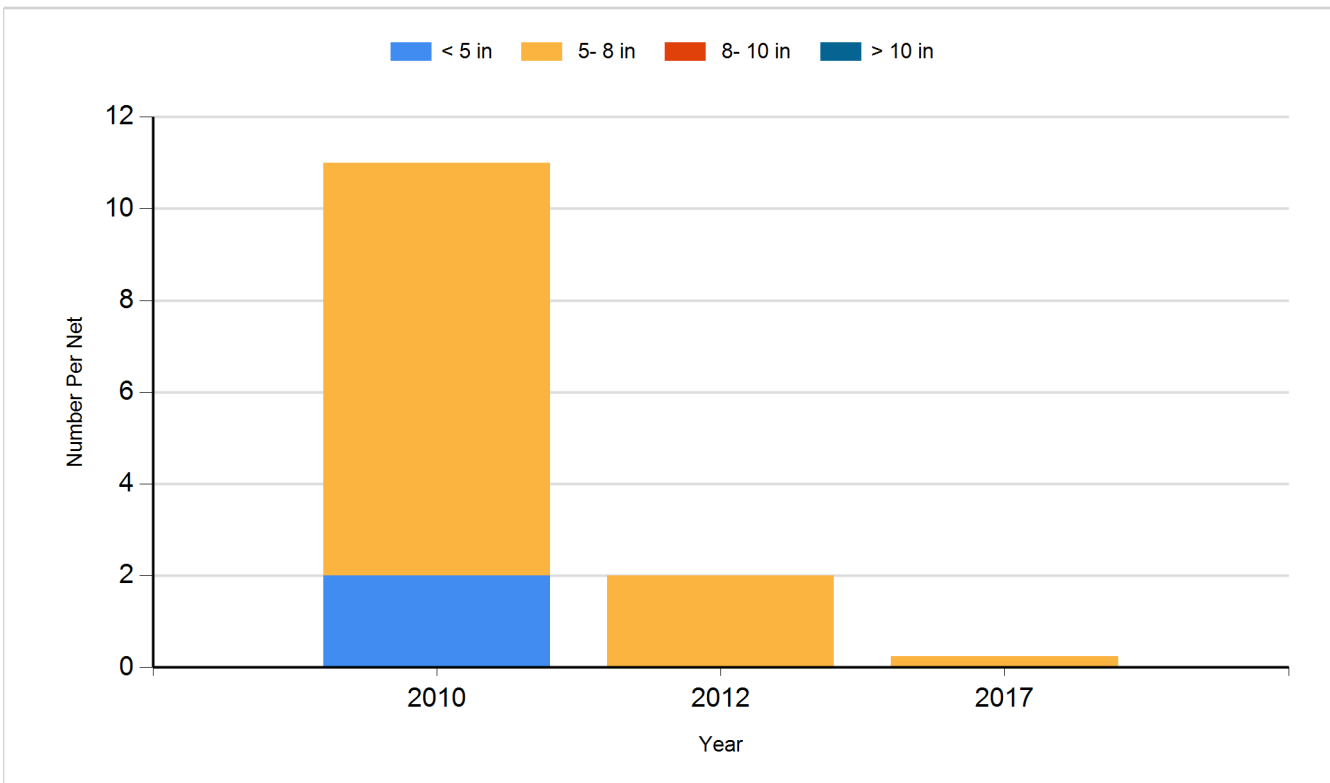
Species: Northern Pike
Gear: Gill Net



Species: Walleye
Gear: Gill Net



Species: Yellow Perch
Gear: Gill Net



Fish Stocking

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

Year	Species	Size	Number
2009	Largemouth Bass	Fingerling	1,000
2009	Walleye	Fingerling	46,625
2010	Largemouth Bass	Fingerling	1,000
2010	Northern Pike	Fry	191,200
2010	Walleye	Fingerling	20,000
2010	Yellow Perch	Adult	680
2011	Largemouth Bass	Fingerling	7,800
2011	Northern Pike	Fry	30,000
2011	Walleye	Small Fingerling	13,930
2012	Largemouth Bass	Fingerling	14,460
2013	Walleye	Large Fingerling	4,000
2014	Largemouth Bass	Adult	100
2014	Walleye	Small Fingerling	19,800
2016	Walleye	Fingerling	25,500
2017	Walleye	Small Fingerling	29,700