Peno Lake Survey Summary

Peno Lake is a 40-acre impoundment located in Hyde County, South Dakota approximately 12 miles south, 3 miles east and 1 mile south of Highmore. The artificial impoundment was created in 1934 by the Works Progress Administration (WPA) with the construction of an earthen dam on an unnamed tributary of Elm Creek. The lake is surrounded by private property. Please respect the property and keep gates they way they were when approaching the lake.

Fishing access is great for shore fishing. There is no boat ramp but a hard gravel area on the north east side of the lake allows for small boats to be launched. Ice fishing opportunities are good depending on snow and mud. The trail into the lake is a dirt two-track trail and is rough and may be impassible depending on snow and wet conditions. The dam grade is in good conditions, due to reconstruction in the spring of 1999.

Peno Lake's fishery was sampled using frame nets and boat electrofishing during 2019. Black Bullhead, Black Crappie and Northern Pike were sampled during the survey.

- **Black Bullhead:** Black Bullhead were the most abundant species collected during sampling at 295 fish/net. The abundance is the highest seen in recent surveys. Majority of the fish were small and not of size attractive to anglers. There were a few larger bullheads to be found.
- **Black Crappie:** Abundance of Black Crappie has increased to 4.9 fish/net. A good proportion of the fish were larger than 10 inches and averaged 11 to 12 inches in length. Growth rates of Black Crappie is comparable to the statewide average with several ages found including a few smaller, younger fish. This indicates natural reproduction of Black Crappie is occurring for Peno Lake and is a self-sustaining population.
- **Northern Pike:** Abundance of Northern Pike is good for a small lake as Peno at 1.7 fish/net. Size of Northern Pike ranged from 12 to 35 inch and averaged 24 inches. At time of survey the Northern Pike were in healthy condition averaging 83 in relative weight.
- **Other Species:** Fall boat electrofishing survey was conducted to index the Largemouth Bass population. No Bass were seen or collected indicating a very low or nonexistent population. A few white suckers were seen during electrofishing as well within the population. During 2019, no Bluegill and Walleye were collected during survey as in previous years of sampling.

For more detailed results see the computer-generated South Dakota Statewide Fisheries Survey for Peno Lake below. Please contact South Dakota Game, Fish and Parks Ft. Pierre office – (605) 223-7700 for additional information.

Prepared 02-19-2020 by KDP

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Peno, Hyde County
CRW-Lake-48-000
2019

Lake Information

Name: Peno

County: Hyde

Legal Description: T110-R71-S9

Surface Area: 45 Acres

Maximum Depth: 15 Feet

Mean Depth: 7 Feet

Surveys and Investigations

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

Gear	Date	Effort
boat shocker (day)	Oct 01, 2019	3000 seconds
frame net (std 3/4 in)	Jun 04, 2019	5 net-nights
frame net (std 3/4 in)	Jun 05, 2019	5 net-nights

Common Fish Species Present

Largemouth Bass

Bluegill

Black Crappie

Black Bullhead

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)
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
frame net (std 3/4 in)	Black Bullhead	2992	295.7	110.0	34	1	0		86	1
	Black Crappie	49	4.9	1.8	78	9	71	10	109	7
	Northern Pike	21	1.7	0.8	71		41	20	83	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.

		CPUE										
Gear	Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg
frame net (std 3/4 in)	Black Bullhead			4.3			9.9				295.7	103.30
	Black Crappie			0.2			3.3				4.9	2.80
	Bluegill			0.0			0.0				0.0	0.00
	Largemouth Bass			0.0			0.0				0.0	0.00
	Northern Pike			2.2			0.9				1.7	1.60
	Walleye			0.0			0.0				0.0	0.00
	White Sucker			0.1			0.0				0.0	0.03

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
frame net (std 3/4 in)	Black Bullhead	PSD			12			2				34
		PSD-P			5			1				0
		Wr			82			76				86
	Black Crappie	PSD			100			85				78
		PSD-P			0			58				71
		Wr			111			108				109
	Northern Pike	PSD			77			100				71
		PSD-P			9			22				41
		Wr			77			87				83
	White Sucker	PSD			100							
		PSD-P			100							
		Wr			92							

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	N	Mean back-calculated length (SE) at age									
			1	2	3	4	5	6	7	8	9	10
2017	2	8	69 (1.4)	179 (2.6)								
2016	3	2	78 (3.6)	146 (5)	188 (1.7)							
2014	5	7	89 (3.4)	164 (9.1)	225 (11.5)	247 (13.3)	265 (12.6)					
2013	6	30	87 (2.4)	158 (5.2)	214 (6.1)	239 (5.1)	263 (3.9)	280 (3.1)				
2012	7	1	95	186	246	272	297	315	321			
Weighted Mean		48	84	162	215	241	264	281	321			

Length at Capture

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

Species: Black Crappie

Year	N	Mean Length (expanded sample number) at capture by age									
		1	2	3	4	5	6	7	8	9	10+
2019	49		184 (8)	192 (2)		268 (8)	280 (30)	322 (1)			
2015	61	120 (32)	210 (9)	251 (10)	276 (1)	288 (9)					

Fish Condition

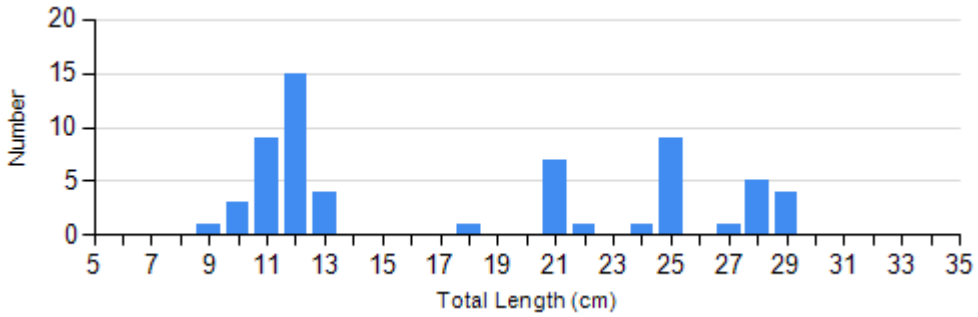
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

		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	5	116 (1.4)	9	109 (1.1)	19	106 (1.1)	0	
	2019	11	135 (24.1)	3	104 (2.8)	32	102 (1.7)	3	99 (1.8)

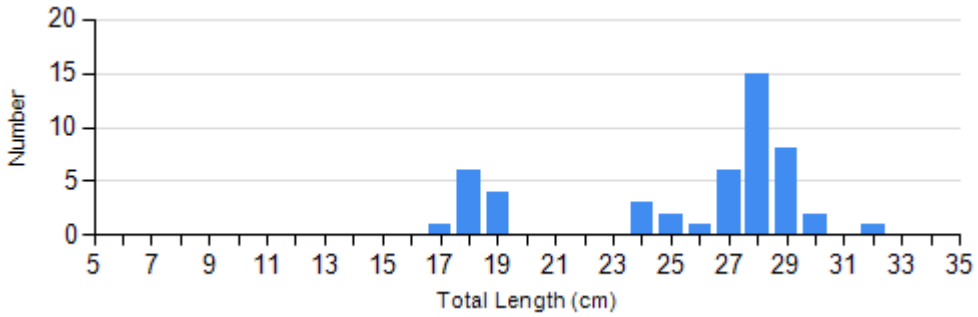
Length Frequency Distribution

Length frequency histogram of species sampled by year.

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



2015



2019

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)