

# Pelican Lake

## Site Description

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### Location

Water designation number (WDN)	05-0003-00
Legal description	T116N-R53W-Sec. 1,2,3,8,9,10,11,12,15,16,17
County (ies)	Codington
Location from nearest town	southwestern city limits of Watertown

### Survey Dates and Sampling Information

Survey dates	June 30-July 2, 2009 (FN, GN)
Frame net sets (n)	18
Gill net sets (n)	6

### Morphometry (Figure 1)

Watershed area (acres)	15,686
Surface area (acres)	2,796
Maximum depth (ft)	8
Mean depth (ft)	5

### Ownership and Public Access

Pelican Lake is a meandered lake managed by the SDGFP. Three public access sites exist on Pelican Lake, two are maintained by SDGFP (Northwest Lakeside Use Area and Pelican Lake Recreation Area), and the other is maintained by city of Watertown (East-Side Access; Figure 1). Pelican Lake shoreline has mixed ownership including the State of South Dakota, Codington County, the city of Watertown, and private parties.

### Watershed and Land Use

The Pelican Lake watershed is comprised of a mix of cropland (70%), pasture/grassland (17%), housing (7%), and 6% other (wetlands, treebelts, and roads).

### Water Level Observations

The Water Management Board established Ordinary High Water Mark is 1710.2 fmsl (feet above mean sea level), and the established outlet elevation of Pelican Lake is 1709.7 fmsl. On May 11, 2009, Pelican Lake was slightly above the Ordinary High Water Mark at an elevation of 1710.5 fmsl. By October 7, 2009 the elevation the elevation had declined to 1710.1 fmsl.

### Aquatic Nuisance Species Monitoring

#### Plant Survey

Scattered beds of sago pondweed and coontail were present along much of the shoreline of Pelican Lake. No aquatic nuisance plant species were encountered.

#### Macro-Invertebrate/Mussel Survey

No aquatic nuisance macro-invertebrate or mussel species were sampled in 2009.

#### Fish Community Survey

Common carp was the only aquatic nuisance fish species captured during the 2009 survey.

### Fish Management Information

Primary species	walleye, yellow perch
Other species	bigmouth buffalo, black bullhead, common carp, northern pike, tadpole madtom, white sucker, yellow bullhead
Lake-Specific regulations	NE Panfish Management Area: 10 daily; 50 possession
Management classification	warm-water semi-permanent
Fish consumption advisories	none

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South Dakota Department of Game Fish and Parks

# Pelican Lake

Codington County

1992

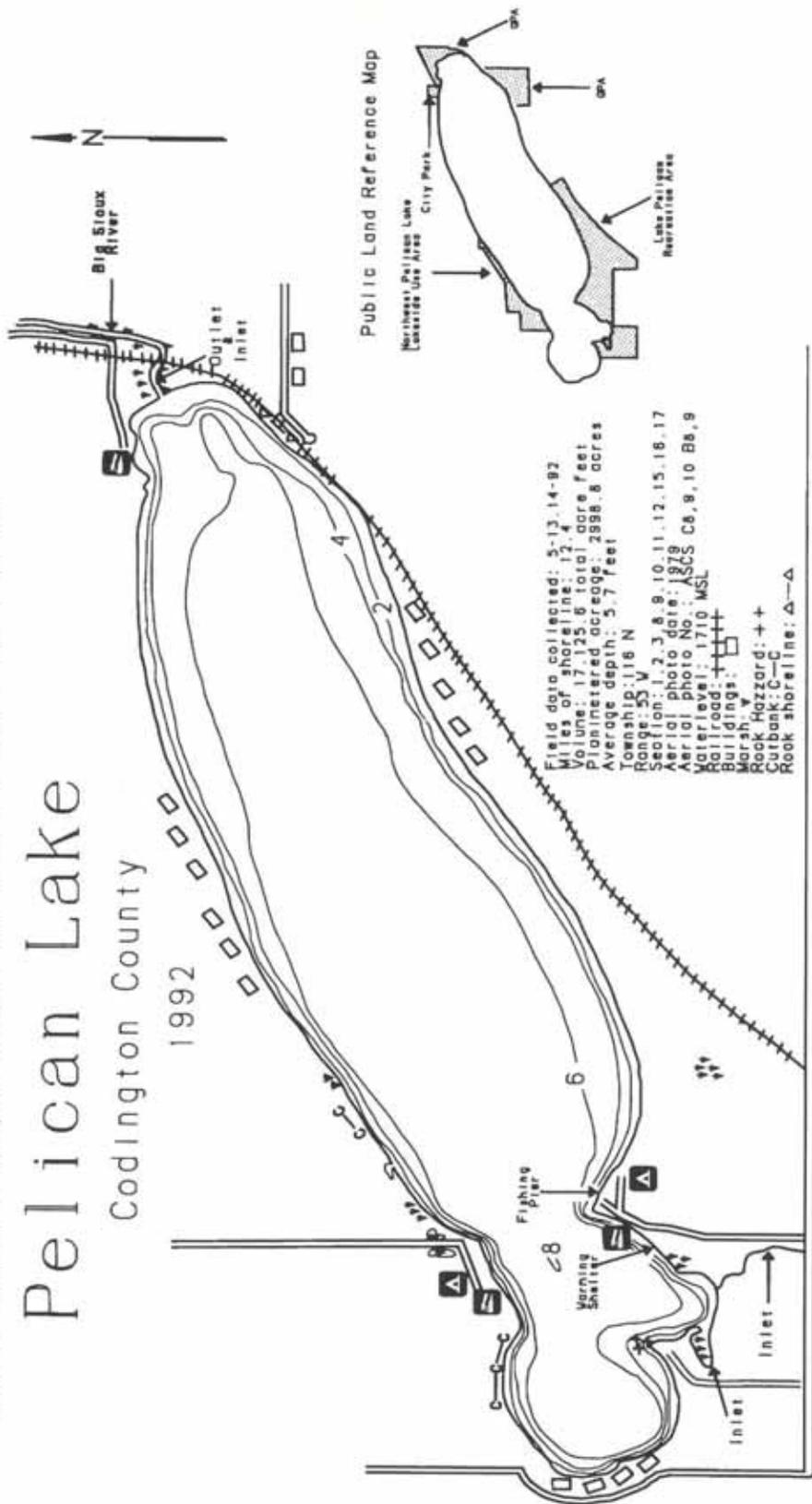


Figure 1. Contour Map of Pelican Lake, Codington County, South Dakota.

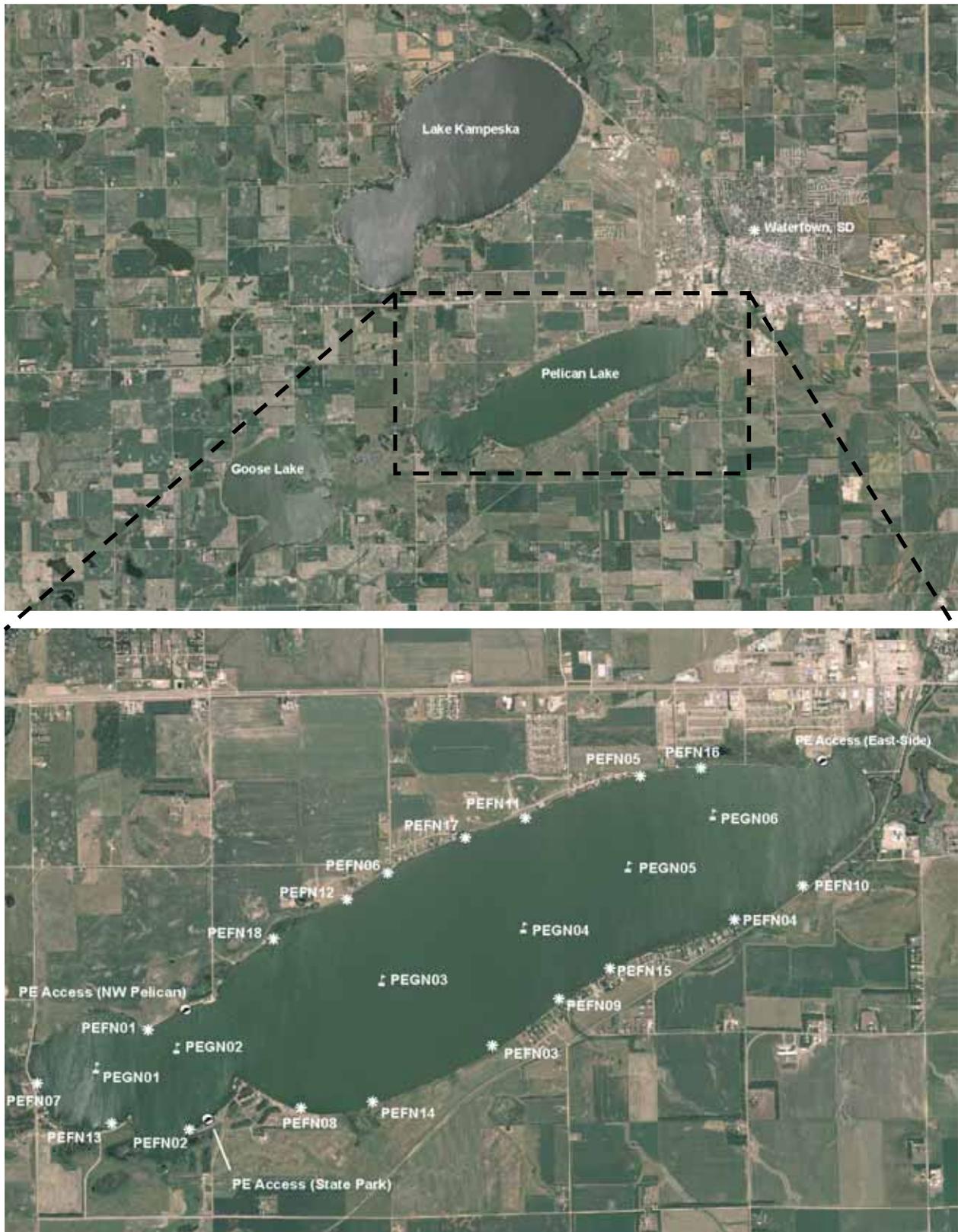


Figure 2. Map depicting location of Pelican Lake from Watertown , SD (top). Also noted are public access points and standardized net locations for Pelican Lake PEFN= frame nets; PEGN= gill nets

## Management Objectives

- 1) Maintain a mean gill net CPUE of stock-length walleye  $\geq 10$ , a PSD of 30-60, and a PSD-P of 5-10.
- 2) Maintain a mean gill net CPUE of stock-length yellow perch  $\geq 30$ , a PSD of 30-60, and a PSD-P of 5-10.
- 3) Maintain a mean frame net CPUE of stock-length bullhead  $\leq 100$ .

## Results and Discussion

Pelican Lake is a natural lake located on the southwest edge of Watertown, Codington County, South Dakota. Pelican Lake is a relatively-shallow lake with a maximum depth of 8 ft and mean depth of 5 ft. A diversion channel, with weir structure, connects Pelican Lake to the Big Sioux River and serves as both the inlet and outlet. The close proximity of Pelican Lake to the city of Watertown makes the lake a popular recreational destination. Public access to Pelican Lake is available on the northwest, east, and south (State Park) shores of the lake (Figure 1). Pelican Lake is primarily managed as a walleye and yellow perch fishery. However, as many as 18 species of fish have been collected from Pelican Lake.

Due to its shallow nature and eutrophication, Pelican Lake has a history of relatively-frequent winterkill and summerkill events the latest of which occurred during the winter of 2007-08 when Pelican Lake suffered a substantial winterkill. The 2007-08 winterkill severely limited walleye and yellow perch populations. Gill nets set just after ice-out during 2008 captured low numbers of adult northern pike and sub-stock ( $< 13$  cm) yellow perch. Since the 2007-08 winterkill Pelican Lake has been restocked with walleye and yellow perch (Table 2); however, the effects of the 2007-08 winterkill are still obvious as the 2009 fish community survey revealed a fish community primarily dominated by rough fish (i.e, black bullhead, bigmouth buffalo, and common carp; Table 1).

### *Primary Species*

Walleye: During the 2009 fish community survey, no walleye were captured in the gill net catch and only a single walleye measuring 444 mm in total length was captured in the frame net catch. Walleye fry stocked in 2008 likely were too small to capture in gill nets in 2009. Walleye fry will be stocked for 3 consecutive years to re-establish the walleye population in Pelican Lake.

Yellow Perch: Similar to walleye, few yellow perch were captured during the 2009 fish community survey. Three yellow perch ranging in total length from 14 to 22 cm (5.5 to 8.7 in) were captured in the 2009 gill net catch resulting in a mean gill net CPUE of 0.5 (Table 1). Adult pre-spawn yellow perch were stocked following the 2007-08 winterkill; however, it appears that they failed to produce a year class in 2008.

### *Other Species*

Black Bullhead: Black bullheads were the most abundant species in the 2009 frame net catch (Table 1). The mean frame net CPUE for all sizes of black bullhead was 25.8 and the mean frame net CPUE of stock-length black bullhead was 7.9 (Table 1). Based on the 2009 frame net catch, relative abundance of black bullhead appears to be moderate.

Black bullheads captured in the 2009 frame net catch ranged in total length from 9 to 29 cm (3.5 to 11.4 in), had a PSD of 2, and a PSD-P of 0 (Table 1, Figure 3). No growth information was collected in 2009. Mean  $W_r$  values of black bullheads captured in the 2009 frame net catch ranged from 88 to 110 for length categories sampled, with the mean  $W_r$  of stock-length black bullheads being 95 (Table 1).

Northern Pike: Adult northern pike were present in Pelican Lake immediately following the 2007-08 winterkill and continue to maintain what appears to be a low density population. However, northern pike typically are not sampled effectively using standard mid-summer lake survey methods; therefore reported values may not accurately represent the at-large population. Neumann and Willis (1995) reported the most reliable time to sample northern pike with gill nets was late spring following the spawn.

In 2009, 5 stock-length northern pike ranging in total length from 49 to 60 cm (19.3 to 23.6 in) were captured in the 2009 gill net catch resulting in a CPUE of 0.8 (Table 1; Figure 4). Few inferences can be made concerning northern pike size structure and condition due to low sample size.

Other: Bigmouth buffalo, common carp, tadpole madtom, white sucker, and a single yellow bullhead were captured during 2009. Adult bigmouth buffalo were captured in relatively-high numbers with the 2009 mean frame net CPUE being 12.1 (Table 1). Common carp and white sucker were the two most abundant species in the 2009 gill net catch; however, all common carp were less than stock length and therefore are not reported in Table 1. The 2009 mean gill net CPUE for all sizes of common carp was 6.8; while the mean gill net CPUE of stock-length white sucker was 4.3 (Table 1).

## **Management Recommendations**

- 1) Conduct fish community assessment surveys on a biennial basis; however, given the recent winterkill the next survey will be scheduled for 2012 to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.
- 2) Stock walleye annually for 3 consecutive years (2008-2010) following winterkill, then resume biennial stockings ( $\approx 1,000$  fry/acre) to add additional year-classes to the population.
- 3) Collect otoliths from walleye and yellow perch to assess age structure and growth rates of each population.
- 4) Encourage commercial harvest of black bullhead to limit abundance if the abundance exceeds the management objective. At the time of this survey, the abundance of black bullhead in Pelican Lake did not necessitate the need for commercial harvest.
- 5) Monitor water levels and winterkill events. In cases of substantial winterkill re-stock with walleye and yellow perch to establish a fish community.

Table 1. Mean catch rate (CPUE; catch/net night) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P), and mean relative weight (Wr) of stock-length fish for various fish species captured in frame nets and experimental gill nets from Pelican Lake, 2009. Confidence intervals include 80 percent ( $\pm$  CI-80) or 90 percent ( $\pm$  CI-90). BIB= bigmouth buffalo; BLB= black bullhead; COC= common carp; NOP= northern pike; SPS= spottail shiner; WAE= walleye; WHS= white sucker; YEB= yellow bullhead; YEP= yellow perch

Species	Abundance		Stock Density Indices				Condition	
	CPUE	CI-80	PSD	CI-90	PSD-P	CI-90	Wr	CI-90
<i>Frame Nets</i>								
BIB	12.1	3.1	100	0	71	5	80	1
BLB	7.9	1.6	2	2	0	---	92	3
COC	0.1	0.0	100	---	100	---	88	---
NOP	1.3	0.4	61	18	0	---	96	1
WAE	0.1	0.0	100	---	0	---	91	---
WHS	1.4	0.8	100	0	96	4	104	1
YEB	0.1	0	0	---	0	---	103	---
YEP	0.1	0.1	0	---	0	---	89	---
<i>Gill Nets</i>								
BIB	0.3	0.3	100	0	50	50	95	---
BLB	0.3	0.3	50	50	0	---	110	---
NOP	0.8	0.6	60	40	0	---	100	5
SPS	0.2	0.2	---	---	---	---	---	---
WHS	4.3	2.1	35	16	35	16	109	2
YEP	0.5	0.3	67	33	0	---	104	3

Table 2. Stocking history including size and number for fishes stocked into Pelican Lake, 2008-2009. WAE= walleye; Yep= yellow perch

Year	Species	Size	Number
2008	WAE	fry	2,800,000
	YEP	pre-spawn adults	8,880
2009	WAE	fry	2,800,000

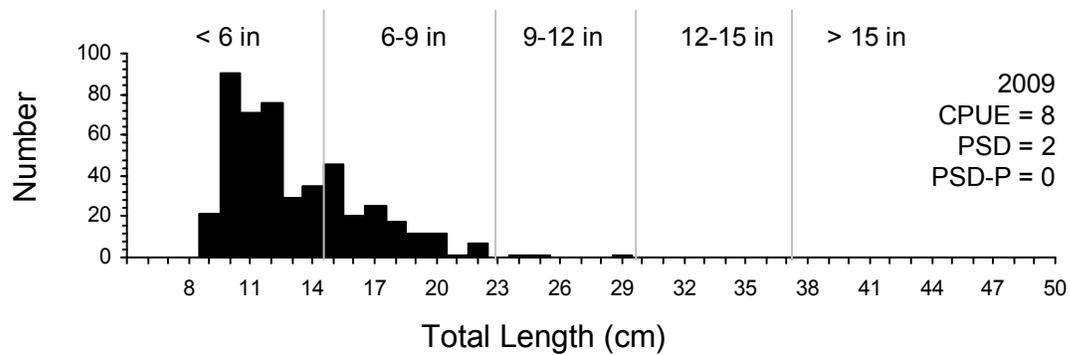


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P) for black bullhead captured using frame nets in Pelican Lake, 2009.

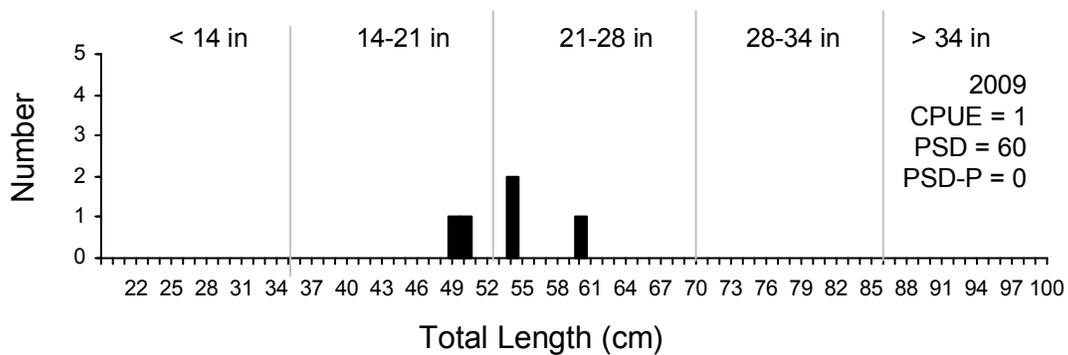


Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P) for northern pike captured using gill nets in Pelican Lake, 2009.