

# West Stink Lake

## Site Description

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### Location

Water designation number (WDN)	48-0039-00
Legal description	T125N-R55W-Sec. 3,4,9,10
County (ies)	Marshall
Location from nearest town	3.0 miles north of Eden, SD

### Survey Dates and Sampling Information

Survey dates	May 28, 2014 (GN)
Gill net sets (n)	3

### Morphometry

Watershed area (acres)	29,465
Surface area (acres)	580
Maximum depth (ft)	≈16
Mean depth (ft)	unknown

### Ownership and Public Access

West Stink Lake is a meandered lake owned by the State of South Dakota and the fishery is managed by SDGFP. No public boat ramp exists on West Stink Lake and public access is limited to flooded road rights-of-way. Lands adjacent to West Stink Lake are primarily owned by private individuals.

### Watershed and Land Use

West Stink Lake is located within the 29,465 acre Cattail-Kettle Lakes sub-watershed (HUC-12). Land use within the watershed is primarily agricultural including a mix of grassland (i.e., hay land, rangeland, and CRP), cropland, and scattered shelterbelts.

### Water Level Observations

Water levels on West Stink Lake are not monitored by SDDENR.

### Fish Management Information

Primary species	walleye, yellow perch
Other species	black bullhead, white sucker
Lake-Specific regulations	none
Management classification	none
Fish consumption advisories	none

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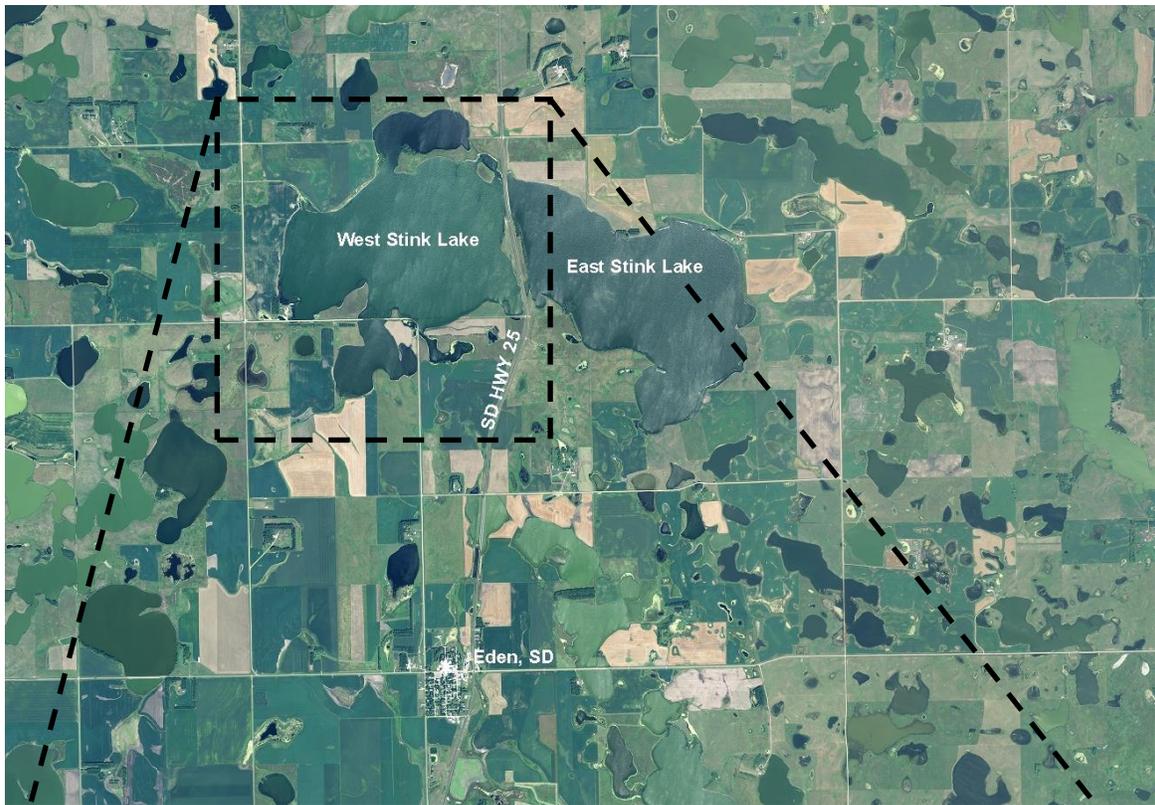


Figure 1. Map depicting geographic location of East and West Stink Lakes from Eden, South Dakota (top). Also noted are standardized net locations for West Stink Lake (bottom). Note: In 2014, only gill nets 01-03 were fished. WSTGN= gill net

## 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.

## Results and Discussion

In 2004, West Stink Lake was utilized as a natural walleye rearing pond by SDGFP. Natural walleye rearing ponds are stocked with walleye fry in the spring. The walleye grow during the summer months and a portion are harvested as large fingerlings in the fall. If winterkill does not occur, often a substantial year class remains and can provide angling opportunities as is the case in West Stink Lake. Provided water levels remain sufficient to support a sport fishery, West Stink Lake will be managed as a walleye and yellow perch fishery.

### *Primary Species*

Walleye: The mean gill net CPUE of stock-length walleye during 2014 was 57.3 (Table 1) and above the minimum objective ( $\geq 10$  stock-length walleye/net night; Table 3). The 2014 gill net CPUE represented a substantial increase from the 20.8 observed in 2011 (Table 2) and indicated high relative abundance.

Walleye captured in the 2014 gill net catch ranged in TL from 19 to 61 cm (7.5 to 24 in), had a PSD of 87, and a PSD-P of 11 (Table 1; Table 3; Figure 2). The 2014 PSD and PSD-P values were above management objectives of 30-60 and 5-10 (Table 3).

Otoliths were collected from a sub-sample of gill net captured walleye. Seven walleye year-classes (2005 and 2008-2013) were present (Table 4). The 2011 year class comprised approximately 72% of the walleye in the 2014 gill net catch (Table 4). The 2009, 2011, and 2013 year classes coincided with fry stockings; while the 2005, 2008, 2010 and 2012 year classes were naturally produced (Table 4; Table 6). The contribution of stocked or naturally-produced walleye to year classes produced during stocked years is unknown, as stocked walleye were unmarked making it difficult to differentiate stocked from naturally-produced walleye.

In 2014, weighted mean TL at capture values for age-2 and age-3 walleye were 313 and 395 mm (12.3 and 15.6 in; Table 5). Mean  $W_r$  values for walleye captured in the 2014 gill net catch ranged from 82 to 103 for all 10-mm length groups sampled. The mean  $W_r$  of stock-length walleye was 91 (Table 1) and no length-related trends in condition were apparent.

Yellow Perch: In 2014, 41 yellow perch ranging in TL from 9 to 34 cm ( 3.5 to 13.4 in) were sampled; most were < stock-length (i.e., 13 cm; 5 in; Figure 3). The mean gill net CPUE of stock-length yellow perch was 3.0 (Table 1) and below the minimum objective ( $\geq 30$  stock-length perch/net night; Table 3). The 2014 gill net CPUE represented a decrease from the 2011 CPUE of 16.3 (Table 2) and suggested low relative abundance.

Otoliths were collected from a sub-sample of gill net captured yellow perch; four year classes (2008, 2010, 2012 and 2013) were present (Table 7). The 2013 year class was the most represented and comprised 80% of yellow perch in the gill net catch (Table 7). Mean  $W_r$  values ranged from 85-105 for all 10-mm length groups represented.

### *Other Species*

Other: White sucker and black bullhead were the only other fish species captured during the 2014 survey (Table 1).

## **Management Recommendations**

- 1) Conduct fish community surveys utilizing gill nets on an every third year basis (next survey scheduled in summer 2017) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.
- 2) Collect otoliths from walleye and yellow perch to assess age structure and growth rates of each population.
- 3) Stock walleye ( $\approx 500$  fry/ acre) on a biennial basis (odd years) to establish additional year classes.
- 4) Establish a public boat ramp and parking on West Stink Lake.

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 experimental gill nets from West Stink Lake, 2014. Confidence intervals include 80 percent ( $\pm$  CI-80) or 90 percent ( $\pm$  CI-90). BLB= black bullhead; WAE= walleye; WHS= white sucker; YEP= yellow perch

Species	Abundance		Stock Density Indices				Condition	
	CPUE	CI-80	PSD	CI-90	PSD-P	CI-90	Wr	CI-90
<i>Gill Nets</i>								
BLB	0.7	0.6	50	50	50	50	94	38
WAE	57.3	16.3	87	5	11	4	91	<1
WHS	0.7	0.6	100	0	100	0	114	93
YEP	3.0	1.1	67	31	67	31	96	4

Table 2. Historic mean catch rate (CPUE; catch/net night) of stock-length fish for various fish species captured in experimental gill nets from West Stink Lake, 2008-2014. BLB= black blackhead; WAE= walleye; WHS= white sucker; YEP= yellow perch

Species	CPUE		
	2008	2011	2014
<i>Gill Nets</i>			
BLB	0.0	0.0	0.7
WAE	5.8	20.8	57.3
WHS	0.0	0.8	0.7
YEP	0.0	16.3	3.0

Table 3. Mean catch rate (CPUE; catch/net night) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) for selected species captured in experimental gill nets from West Stink Lake, 2008-2014. WAE = walleye; YEP = yellow perch

Species	2008	2011	2014	Objective
<i>Gill nets</i>				
WAE				
CPUE	6	21	57	$\geq 10$
PSD	9	27	87	30-60
PSD-P	0	3	11	5-10
Wr	88	97	91	---
YEP				
CPUE	0	16	3	$\geq 30$
PSD	---	69	67	30-60
PSD-P	---	33	67	5-10
Wr	---	100	96	---

Table 4. Year class distribution based on the expanded age/length summary for walleye sampled in gill nets and associated stocking history (# stocked x 1,000) from West Stink Lake, 2008-2014.

Survey Year	Year Class										
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
2014		1	2	124	18	17	9			1	
2011	---	---	---		49	84	32				9
2008	---	---	---	---	---	---					23
# stocked											
fry		300		300		150					2,500
sm. fingerling											
lg. fingerling											

Table 5. Weighted mean length at capture (mm) for walleye captured in experimental gill nets (expanded sample size) from West Stink Lake, 2008-2014. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends.

Year	Age								
	1	2	3	4	5	6	7	8	9
2014	191 (1)	313 (2)	395 (124)	462 (18)	512 (17)	536 (9)	---	---	530 (1)
2011	197 (49)	348 (84)	400 (32)	---	---	---	506 (9)	---	---
2008	---	---	---	352 (23)	---	---	---	---	---

Table 6. Stocking history including size and number for fishes stocked into West Stink Lake, 2004-2014. WAE= walleye

Year	Species	Size	Number
2004	WAE	fry	2,500,000
2009	WAE	fry	150,000
2011	WAE	fry	300,000
2013	WAE	fry	300,000

Table 7. Year class distribution based on the expanded age/length summary for yellow perch sampled in gill nets from West Stink Lake, 2011-2014.

Survey Year	Year Class						
	2014	2013	2012	2011	2010	2009	2008
2014		32	2		4		2
2011	---	---	---		875	40	32

Table 8. Weighted mean total length (mm) at capture by gender for yellow perch captured in experimental gill nets (expanded sample size) from West Stink Lake, 2011-2014.

Year	Age					
	1	2	3	4	5	6
2014						
Male	103 (8)	---	---	---	---	---
Female	102 (24)	170 (2)	---	291 (4)	---	347 (2)
Combined	103 (32)	170 (2)	---	291 (4)	---	347 (2)
2011						
Male	103 (147)	203 (12)	253 (2)	---	---	---
Female	104 (708)	218 (28)	280 (30)	---	---	---
Combined	104 (875)	213 (40)	279 (32)	---	---	---

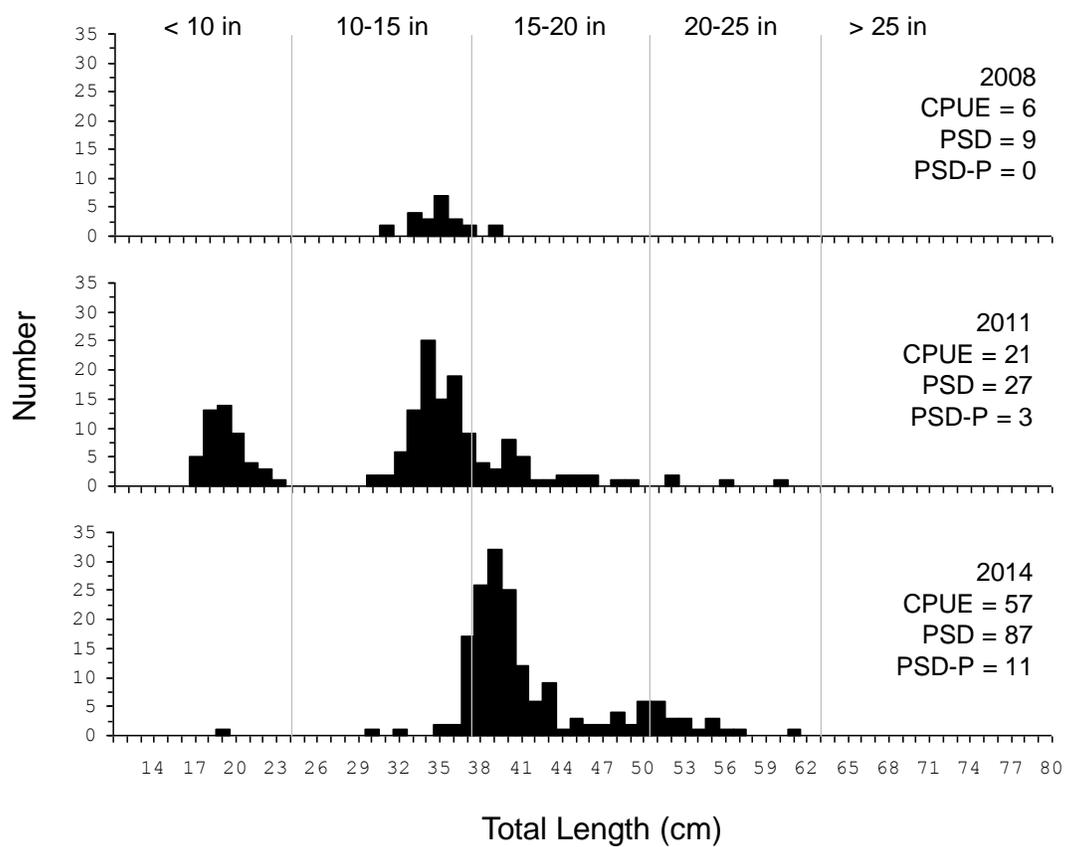


Figure 2. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for walleye captured using experimental gill nets in West Stink Lake, 2008-2014.

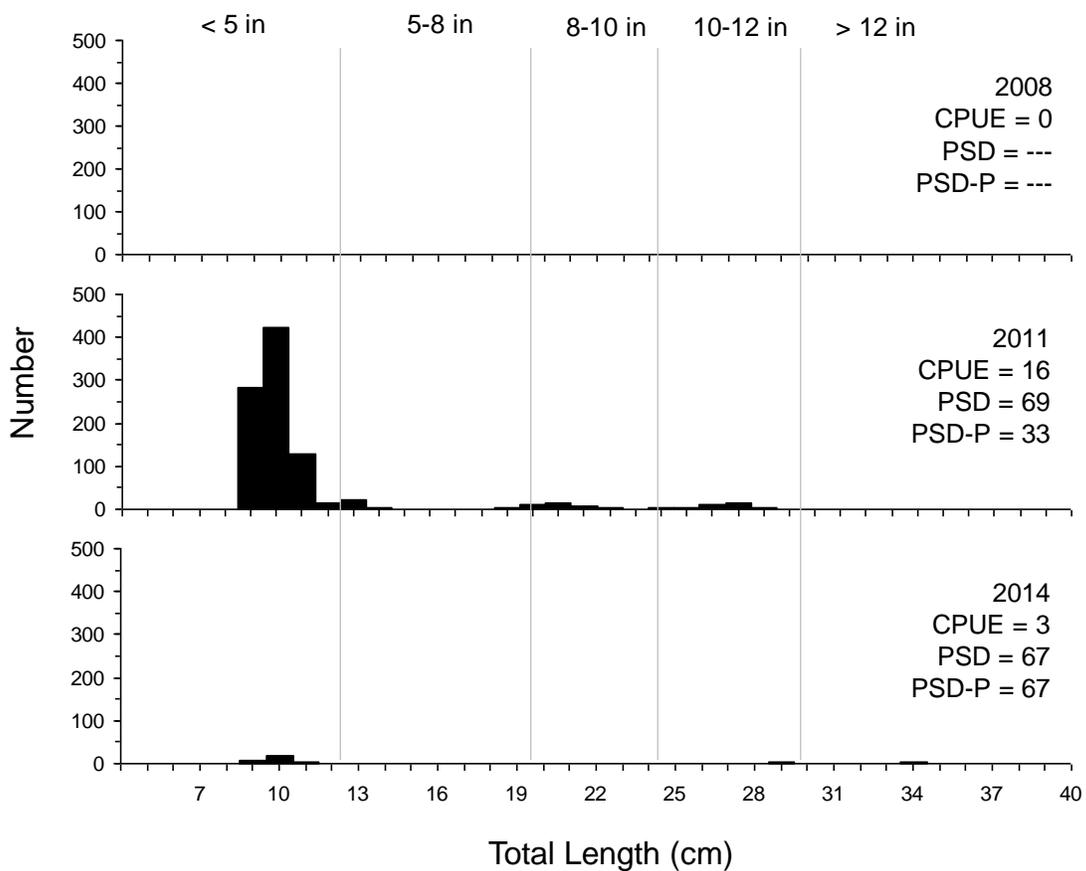


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