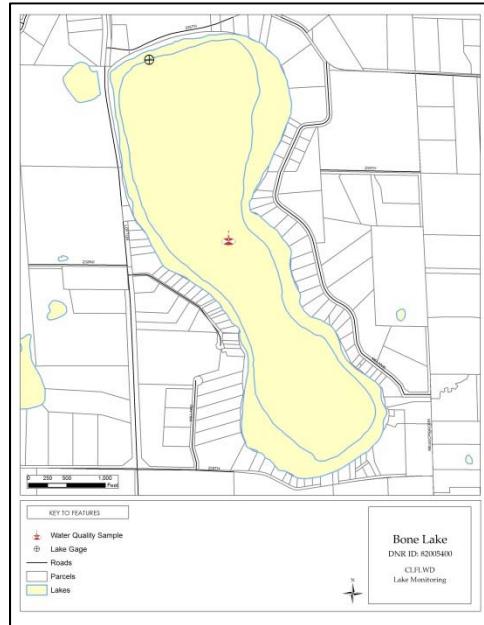


## Bone Lake

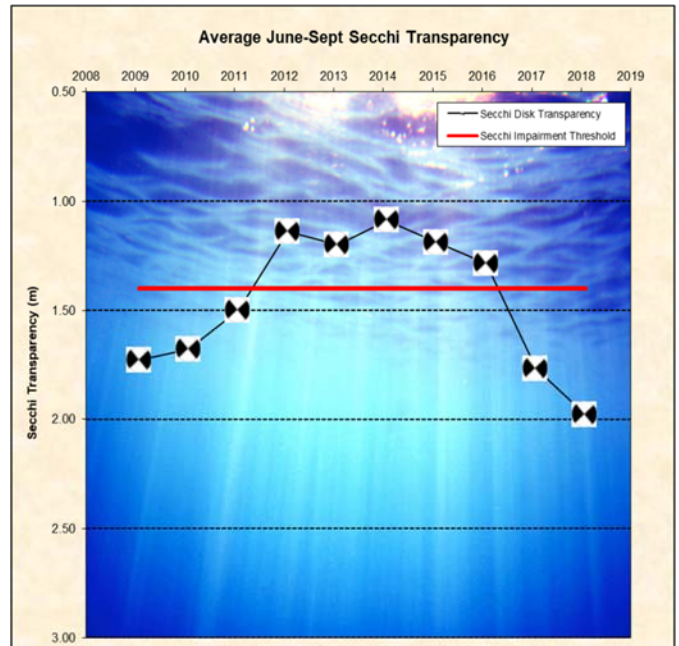
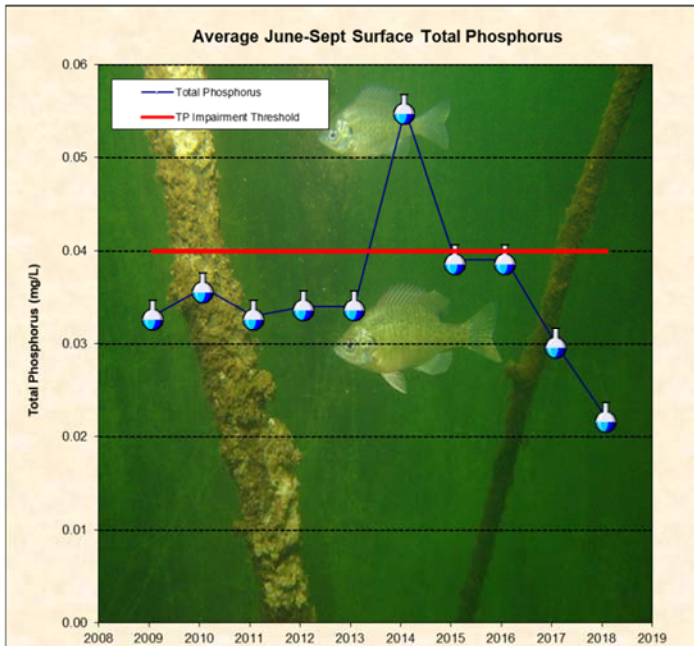
### 2018 Lake Grade: B-

- DNR ID #: 82005400
  - Municipality: City of Scandia
  - Location: Section 5 T32N-R20W
  - Lake Size: 221.45 acres
  - Maximum Depth (2018): 30.5 ft.
  - Ordinary High Water Mark: 909.1 ft.
  - 56% Littoral
- Note: Littoral area is the portion of the lake <15 ft. and dominated by aquatic vegetation.

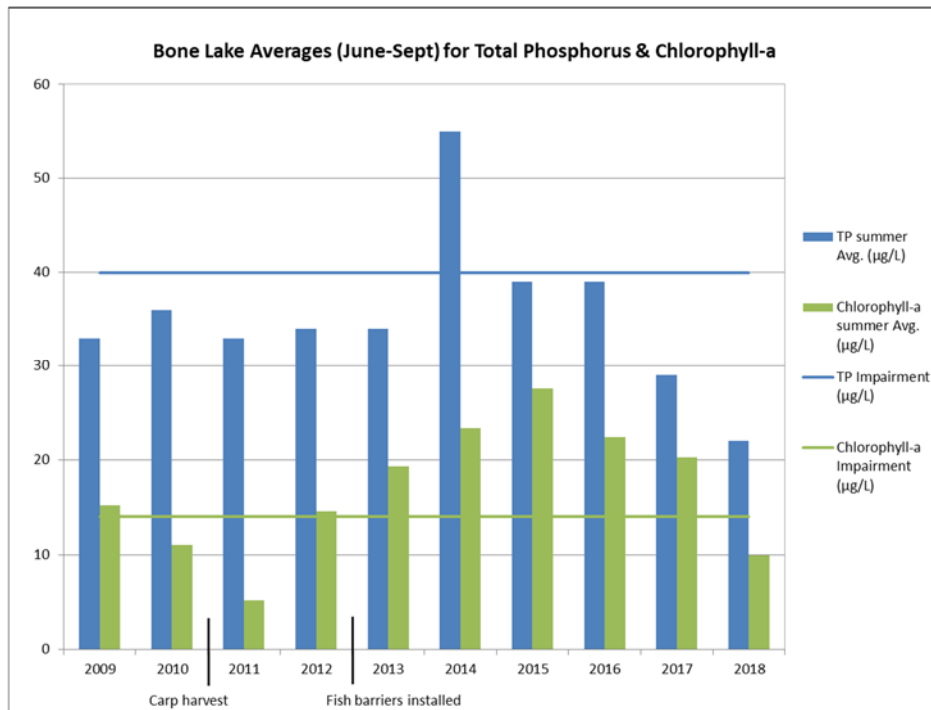


### Summary Points

- Based on the chlorophyll-*a* results Bone Lake was considered eutrophic in 2018, according to the Carlson Trophic State Index.
- Using the 2-tailed Kendall Tau correlation test ( $p < 0.05$ ) there is a statistically significant **improving** trend for the average total phosphorus and chlorophyll-*a* and no trend for average Secchi transparency.
- The major land use is rural/agricultural.
- The lake stratified in 2018 with the thermocline varying between 4 and 6 meters.
- Bone Lake is listed as impaired for nutrients on the Minnesota Pollution Control Agency's Impaired Waters List.
- Eurasian watermilfoil and Curly-leaf pondweed (invasive aquatic plants) are present in this lake.
- Carp removal was performed in the winter of 2010.
- Low velocity fish barriers were installed at Bone Lake north inlet and Bone Lake outlet in the fall of 2012.



Date/Time	Total Phosphorus (mg/L)	Uncorrected Trichromatic Chlorophyll-a (µg/L)	Pheophytin-Corrected Chlorophyll-a (µg/L)	Total Kjeldahl Nitrogen (mg/L)	Secchi Disk Depth (m)	Surface Temperature (Celsius)	Surface Dissolved Oxygen (mg/L)
5/15/2018 10:44	0.034	14.0	13.0	1.10	1.98	17.3	11.18
5/29/2018 11:04	0.049	9.4	8.6	1.10	2.44	24.8	9.59
6/14/2018 10:25	0.022	8.8	9.4	0.94	1.98	22.5	9.15
6/26/2018 10:43	0.021	6.9	5.9	0.82	2.13	24.4	7.62
7/10/2018 10:40	0.024	4.5	1.0	0.83	1.98	26.4	7.20
7/24/2018 8:31	0.026	14.0	12.0	1.00	2.29	25.2	7.78
8/7/2018 11:04	0.022	20.0	20.0	1.10	1.37	24.2	9.78
8/21/2018 10:10	0.020	11.0	9.7	0.91	1.52	24.7	7.66
9/6/2018 12:04	0.019	7.8	6.5	0.95	2.74	22.4	5.78
9/18/2018 13:25	0.020	17.0	16.0	0.85	1.83	22.3	7.49
10/4/2018 10:45	0.027	21.0	20.0	1.40	1.37	13.6	7.32
10/23/2018 13:38	0.033	28.0	27.0	1.30	1.98	8.1	11.48
<b>2018 Average</b>	0.026	13.5	12.4	1.03	1.97	21.3	8.50
<b>2018 Summer Average</b>	0.022	11.3	10.1	0.93	1.98	24.0	7.81
Volunteer Data							
5/20/2018 13:00	0.026	15.0	14.0	0.83	2.00	20.0	NA
6/14/2018 14:00	0.029	11.0	11.0	0.94	1.70	23.5	NA
6/24/2018 18:00	0.027	9.2	8.4	0.58	1.60	26.5	NA
7/10/2018 16:00	0.017	3.7	3.1	0.63	2.20	28.0	NA
8/12/2018 18:30	0.021	7.9	7.5	0.79	1.40	27.5	NA
9/6/2018 15:30	0.011	9.6	8.9	0.87	2.20	23.0	NA
10/3/2018 11:00	0.028	19.0	19.0	1.30	1.90	14.5	NA
<b>2018 Average</b>	0.023	10.8	10.3	0.85	1.86	23.3	NA
<b>2018 Summer Average</b>	0.021	8.3	7.8	0.76	1.82	25.7	NA
Water quality thresholds are 0.04 mg/L TP, 14 µg/L CL-a, 1.4 m Secchi depth*							
Shallow lake water quality thresholds are 0.06 mg/L TP, 20 µg/L CL-a, 1.0 m Secchi depth*							
	High	High Date	Low	Low Date	Average		
<b>2018 Elevation (ft)</b>	909.33	7/24/2018	908.78	5/29/2018	909.04		
*Data requirements and determinations of use assessment according to the MPCA's Guidance Manual for Assessing the Quality of Minnesota Surface Waters. *Samples must be collected over a minimum of 2 years and data used for assessments must be collected from June to September. Typically, a minimum of 8 individual data points for TP, corrected chlorophyll-a (chl-a corrected for pheophytin), and Secchi are required. Data used for phosphorus and chlorophyll-a calculations are limited to those collected from the upper most 3 meters of the water column (surface). If more than one sample is collected in a lake per day, these values are averaged to yield a daily average value. Following this step, all June to September data for the 10-year assessment window are averaged to determine summer-mean values for TP, corrected chl-a, and Secchi depth. These values are then compared to the standards and the assessment is made."							



Lake Water Quality Summary										
	Lake Grades (May-Sept)									
	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Total Phosphorus (mg/L)	B	B	C	C	C	C	C	C	C	C
Chlorophyll-a (µg/L)	B	C	C	B	C	C	B	A	B	B
Secchi depth (ft)	C	C	C	D	D	C	D	C	C	C
<b>Overall</b>	<b>B-</b>	<b>C+</b>	<b>C</b>	<b>C</b>	<b>C-</b>	<b>C</b>	<b>C</b>	<b>C+</b>	<b>C+</b>	<b>C+</b>

## Bone Lake Water Surface Elevation Statistics

Outlet Elevation (culvert): 907.3 ft.

Ordinary High Water Level (OHW) Elevation: 909.1 ft.

100 Year Flood Elevation (CLFLWD): 910.6 ft.

Highest Recorded Elevation: 910.97 ft. (07/07/1975)

Lowest Recorded Elevation: 906.7 ft. (11/07/1966)

Datum: NGVD 29 (ft.)

Additional elevation data can be found at <https://www.clflwd.org/waterbody-bone-lake.php>.

