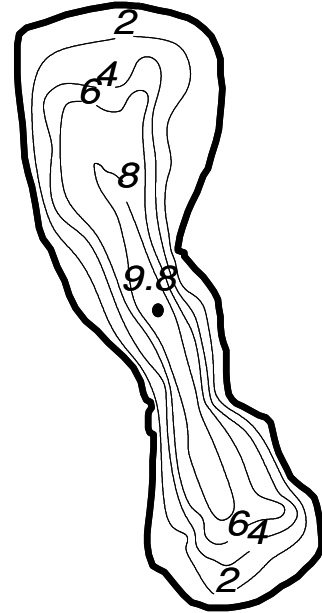


Bone Lake

2009 Lake Grade: C+

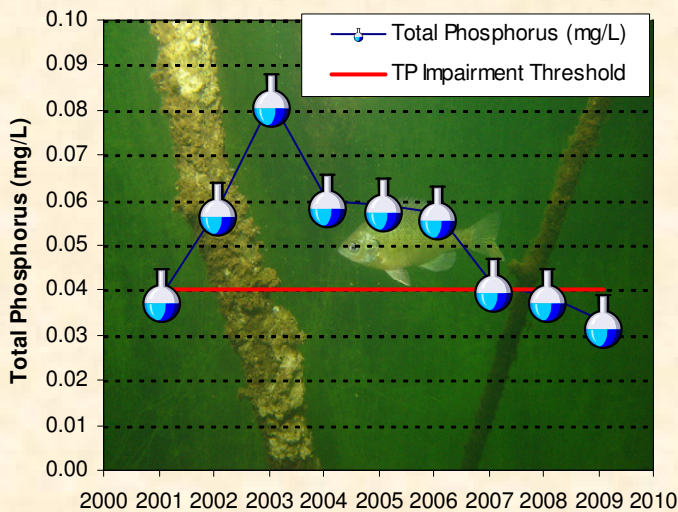
- DNR ID #: 820054
 - Municipality: City of Scandia
 - Location: Section 5 T32N-R20W
 - Lake Size: 210 Acres
 - Maximum Depth: 32 ft
 - Ordinary High Water Mark: 909.1 ft
 - 58% Littoral
- Note: Littoral area is the portion of the lake <15 ft and dominated by aquatic vegetation.



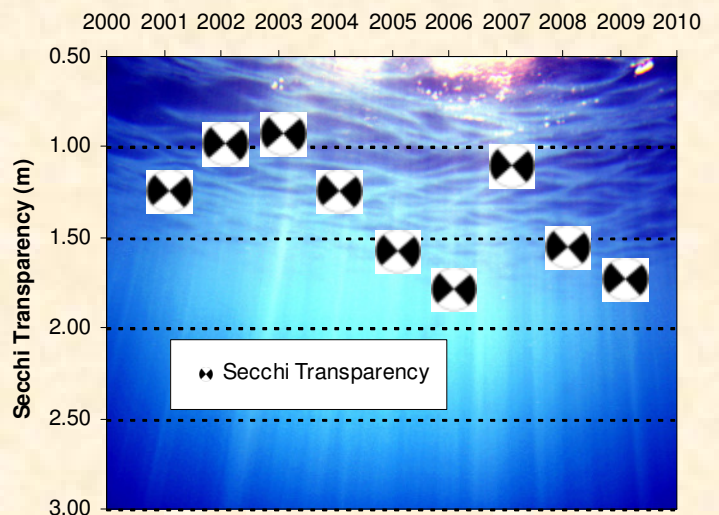
Summary Points

- Bone Lake was considered a eutrophic lake in 2009, based on the Carlson Trophic State Index (similar to 2006-2008).
- Bone Lake's summer phosphorus mean was lower than that experienced in 2003-2008.
- **Bone Lake is listed on the MPCA's Impaired Waters List for excessive nutrients.**
- **Eurasian Milfoil and Curly leaf pondweed (invasive aquatic plants) are extensive in this lake.**
- The major land use is rural/agricultural.
- The lake does stratify throughout the summer months.

Average Summer Surface Total Phosphorus



Average Summer Secchi Transparency



| Date | Total Phosphorus (mg/L) | Chlorophyll-a (ug/L) | Total Kjeldahl Nitrogen (mg/L) | Secchi Disk Depth (m) |
|----------------------------|-------------------------|----------------------|--------------------------------|-----------------------|
| 5/11/09 | 0.097 | 6.3 | 1.4 | 2.4 |
| 5/18/09 | 0.044 | 14 | 1.3 | 2 |
| 5/28/09 | 0.031 | 27 | 1.2 | 1.7 |
| 6/9/09 | 0.04 | 10 | 1.5 | 1.8 |
| 6/15/09 | 0.033 | 7.7 | 1.2 | 2 |
| 6/20/09 | 0.036 | 5.4 | 1.2 | 2.1 |
| 7/1/09 | 0.031 | 8.2 | 1.3 | 3.5 |
| 7/19/09 | 0.031 | 14 | 0.96 | 1.2 |
| 8/2/09 | 0.036 | 17 | 0.98 | 1.2 |
| 9/6/09 | 0.036 | 73 | 1.4 | 1.1 |
| 9/15/09 | 0.03 | 11 | 1.3 | 1.3 |
| 9/26/09 | 0.028 | 6.4 | 0.96 | 1.4 |
| 2009 Summer Average | 0.033 | 16.967 | 1.200 | 1.733 |

Water Quality threshold is 0.04 mg/L TP or higher*

Shallow Lake water quality threshold is 0.06 mg/L or higher*

| 2009 Elevation (ft) | High | High Date | Low | Low Date | Average |
|---------------------|------|-----------|-----|----------|---------|
| | NA | NA | NA | NA | NA |

*MPCA description of Impaired Lake's Listing criteria: "At a minimum, a decision that a given lake is impaired for the 303(d) list due to excessive nutrients will be supported by data for both causal and response factors. Data requirements for 303(d) listing consist of 12 or more TP measurements collected from June through September over the most recent 10-year period. Ideally this should represent 12 separate visits to the lake over the course of two summers; however it might also reflect four monthly samples over the course of three years (a typical sampling regimen for many lake monitoring programs). In addition to exceeding the TP guideline thresholds, lakes to be considered for 303(d) listing should have at least 12 Secchi measurements and 12 chlorophyll-a measurements. This amount of data will allow for at least one season (preferably more) of paired TP, chlorophyll-a, and Secchi disk data and provide a basis for evaluating their interrelationships and hence the trophic status of the lake."

Lake Water Quality Summary

| | Trophic Status | | | | | Lake Grades | | | | | |
|-------------------------|----------------|------|------|------|------|-------------|------|------|------|------|------|
| | 2009 | 2009 | 2008 | 2007 | 2006 | 2005 | 2004 | 2003 | 2002 | 2001 | 2000 |
| Total Phosphorus (mg/l) | Eutrophic | C | C | C | C | C | C | D | C | C | C |
| Chlorophyll-a (ug/l) | Eutrophic | B | B | B | B | C+ | C | C | C | C | C |
| Secchi depth (ft) | Eutrophic | C | C | C | C | C | C | C | C | B | C |
| Overall | Eutrophic | C+ | C+ | C+ | C+ | C | C | C- | C | C+ | C |