

Prepared for: Normanoch Association  
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 August 1, 2006

## Culver Lake – Status 2007 (a mid-summer report)

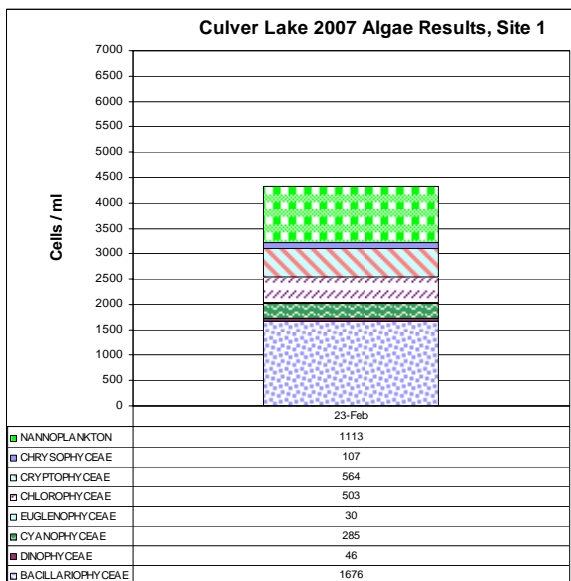
### Winter 2006-07

Weather patterns during the winter can influence lake conditions the following growing season. In some cases that influence sets the stage for Cyanobacteria blooms (bluegreen algae) by exhausting available nitrogen and silica early in the growing season (giving N-fixing algae a competitive advantage). In other cases the influence can be positive, by “super-cooling” the entire water column, retarding respiration and reducing populations of invasive fish species like land-locked alewife. (see client advisory- winter at [www.ecosystemconsulting.com](http://www.ecosystemconsulting.com) for further discussion of climatic influences).

Culver Lake was visited in February 2007 in order to anticipate and forecast summer conditions and to be prepared to manage water quality if adverse influence was forecast.



Fortunately, results of that reconnaissance suggested that no serious adverse effects of the unusually warm winter were expected. Indeed, the water body was expected to be colder during winter 2006-07 than normal ice-cover winters because open water persisted through February (continued heat loss). That can reduce alewife population size, zooplanktivory, and enhance diatom dominance during winter and spring.



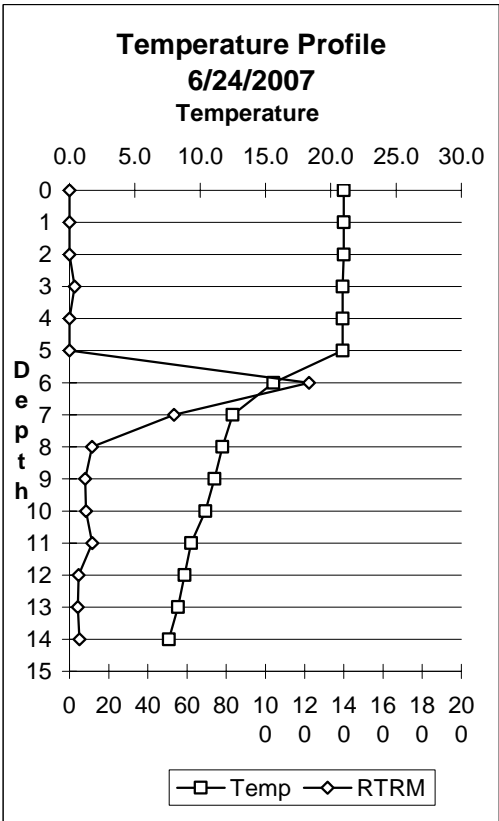
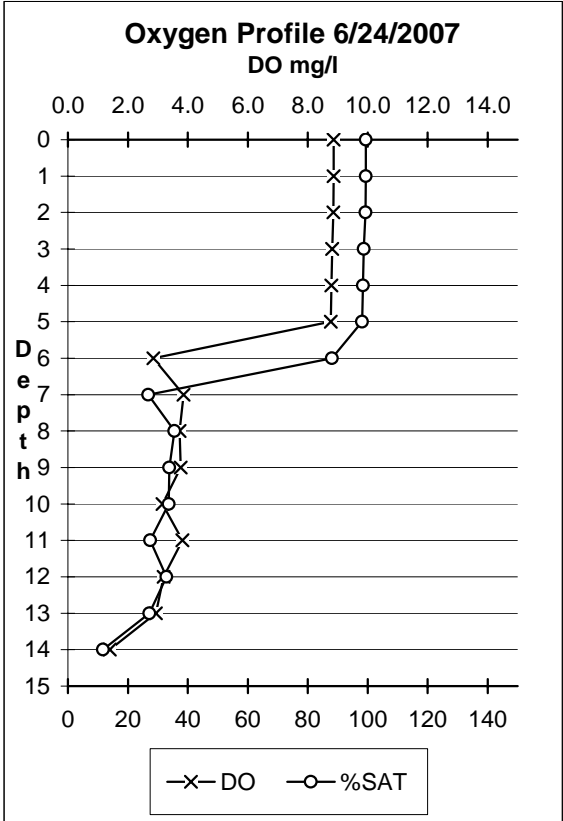
The phytoplankton community was dominated by diatoms in February, with green algae and chrysophytes also relatively abundant. Year-round Cyanobacteria dominance was not observed. Total phosphorus content was modest; nitrate and silica continued to support green algae and diatoms.

### Culver Chemistry

26-Feb-07

	Total Phosphorus	Nitrate	Silica
Surface	22	23	0.035

Early summer conditions have been relatively good at Culver Lake. The entire water column has remained aerobic through the end of June, with a strong thermocline at 6m and a second weaker thermocline developing below the aerated mid-depth layer (11m).



Depth (m)	17-May
1	14
3	18
5	16
7	13
9	11
12	16
14	33

Total P May 17, 2007 Total phosphorus has remained relatively low, especially in the depth range of the layer aeration system.

Secchi disk water transparency (clarity) was approximately 6ft at the end of May 2007, and increased to between 8-9 ft through June. Depth of 1% light penetration (compensation depth where oxygen production by photosynthesis balances respiration demand) is approximately 16 ft (4.8m).

**Forecast:**

We do not anticipate an intense algae bloom event, but transparency is likely to remain at about 8-9 ft through July, and 6 feet as the lake begins to mix downward through August and September. Once surface waters cool to about 18 degrees Centigrade the aerated mid-depth layer will mix into the surface.

The temperature/oxygen profiles over the next several weeks will indicate whether the “Controlled Mixing Diffuser” component should be activated (or whether the current settings should be maintained). Total P concentration in the aerated layer is slightly lower than the epilimnion, and the layer temperature is cooler. If transparency decreases (below about 6 ft) and/or if cool water habitat at the interface of the epilimnion and metalimnion declines (i.e. no observation with temperature below 24 degrees and oxygen above 4ppm) the diffuser manifold can be activated for several weeks. That will sustain habitable conditions for cool water fish and will retard development of bloom conditions.

Continued monitoring by the Normanoch Association will help determine whether operational changes are warranted.

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