

# LOVELL LAKE

## 2015 SAMPLING HIGHLIGHTS

### Station – 2 South

Sanbornville, NH



Blue = Oligotrophic

Yellow = Mesotrophic

Red = Eutrophic

Gray = No Data

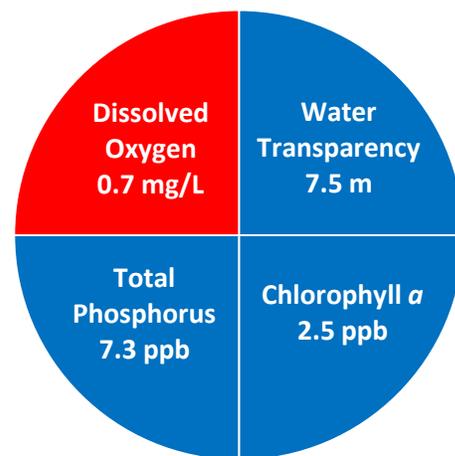


Figure 1. Lovell Lake Water Quality (2015)

Table 1. 2015 Lovell Lake Seasonal Averages and NH DES Trophic Level Classification Criteria

Parameter	Oligotrophic	Mesotrophic	Eutrophic	Lovell Lake Average (range)	Lovell Lake Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	7.5 meters (5.2 – 10.8)	Oligotrophic
Chlorophyll <i>a</i> (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	2.5 ppb (1.5 – 3.6)	Oligotrophic
Total Phosphorus (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	7.3 ppb (5.4 – 10.7)	Oligotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	0.7 mg/L (0.1 – 3.0)	Eutrophic

\* Dissolved oxygen concentrations were measured between 8.0 and 11.0 meters, in the layer of rapidly decreasing temperatures, on September 8, 2015.

Table 2. 2015 Lovell Lake Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Lovell Lake Average (range)	Lovell Lake Classification
	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored		
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	8.7 color units (6.1 – 12.6)	Uncolored
Alkalinity (mg/L)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	14.2 mg/L (10.3 – 15.3)	Low vulnerability
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			7.4 standard units (6.9 – 7.6)	Optimal range for fish growth and reproduction
Specific Conductivity (uS/cm)	< 50 uS/cm Characteristic of minimally impacted NH lakes		50-100 uS/cm Lakes with some human influence	> 100 uS/cm Characteristic of lakes experiencing human disturbances		120.5 uS/cm (115.7 – 125.7)	Characteristic of lakes experiencing human disturbances

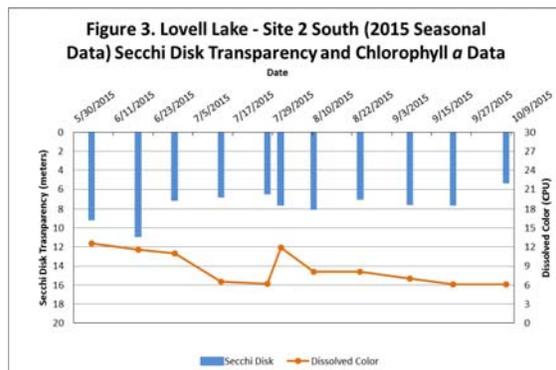
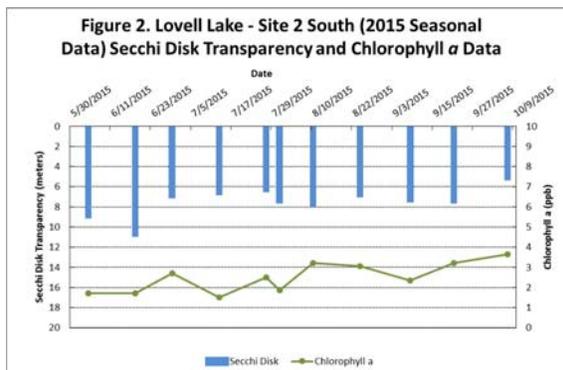


Figure 2 and 3. Seasonal Secchi disk transparency, chlorophyll *a* changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

## LONG-TERM TRENDS

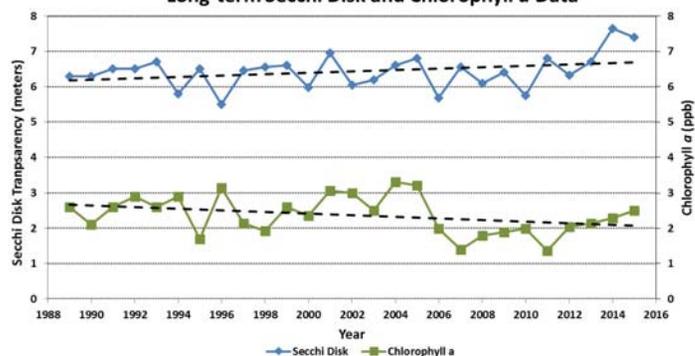
**WATER CLARITY:** The Lovell Lake water clarity measurements, measured as Secchi Disk transparency, display a trend of increasing water clarity over the past twenty-seven years.

**CHLOROPHYLL:** The Lovell Lake chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, display a trend of decreasing concentrations over the past twenty-seven years.

**TOTAL PHOSPHORUS:** Phosphorus is the nutrient most responsible for microscopic plant growth. The Lovell Lake total phosphorus concentrations display a trend of increasing concentrations over the twenty-seven year span.

**COLOR:** The Lovell Lake color data, the result of naturally occurring “tea” colored substances from the breakdown of soils and plant materials, have decreased over the past twenty-seven years.

**Figure 4. Lovell Lake - Site 2 South (1989-2015)  
Long-term Secchi Disk and Chlorophyll *a* Data**

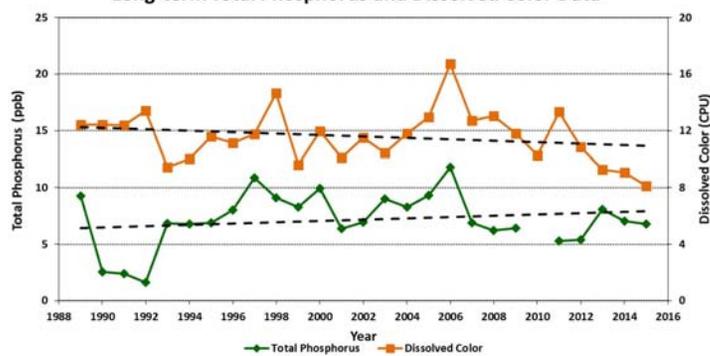


**Table 3. Salmon Falls Headwaters Seasonal Average Water Quality Inter-comparison (2015)**

Lake	Average Secchi Disk Transparency (meters)	Average Chlorophyll <i>a</i> (ppb)	Average Total Phosphorus (ppb)	Average Dissolved Oxygen (ppm)
Great East Lake	11.1	2.6	3.6	6.7
Wilson Lake	7.5	2.1	6.5	0.6
Lovell Lake	7.5	2.5	7.3	0.7
Horn Pond	7.6	2.1	7.2	1.7
Lake Ivanhoe	5.1	3.3	5.6	-----

- Water quality data are reported for a deep reference sampling location in each water body
- Dissolved oxygen measurements were taken late season (early-mid September) and from the bottom water layer (hypolimnion).
- ----- Indicates the site is too shallow to form a bottom water layer (hypolimnion).

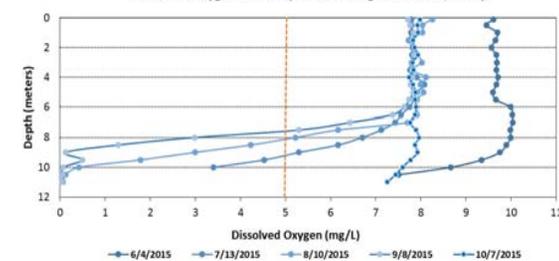
**Figure 5. Lovell Lake - Site 2 South (1989-2015)  
Long-term Total Phosphorus and Dissolved Color Data**



Figures 4 and 5. Changes in the Lovell Lake water clarity (Secchi Disk depth), chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 1989 and 2015. **These data illustrate the relationship among plant growth, dissolved color and water clarity. Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.** Trendlines are displayed when sufficient data are available.

Figure 6. Monthly Lovell Lake dissolved oxygen profiles collected between June 4 and October 7, 2015. The vertical red line indicates the oxygen concentration commonly considered the threshold for successful growth and reproduction of cold water fish such as trout and salmon. *Notice the low oxygen concentrations near the lake bottom between July 13 and September 8.*

**Figure 6. Lovell Lake - Station 2 South  
Dissolved Oxygen Profiles (June 4 through October 7, 2015)**



## Recommendations

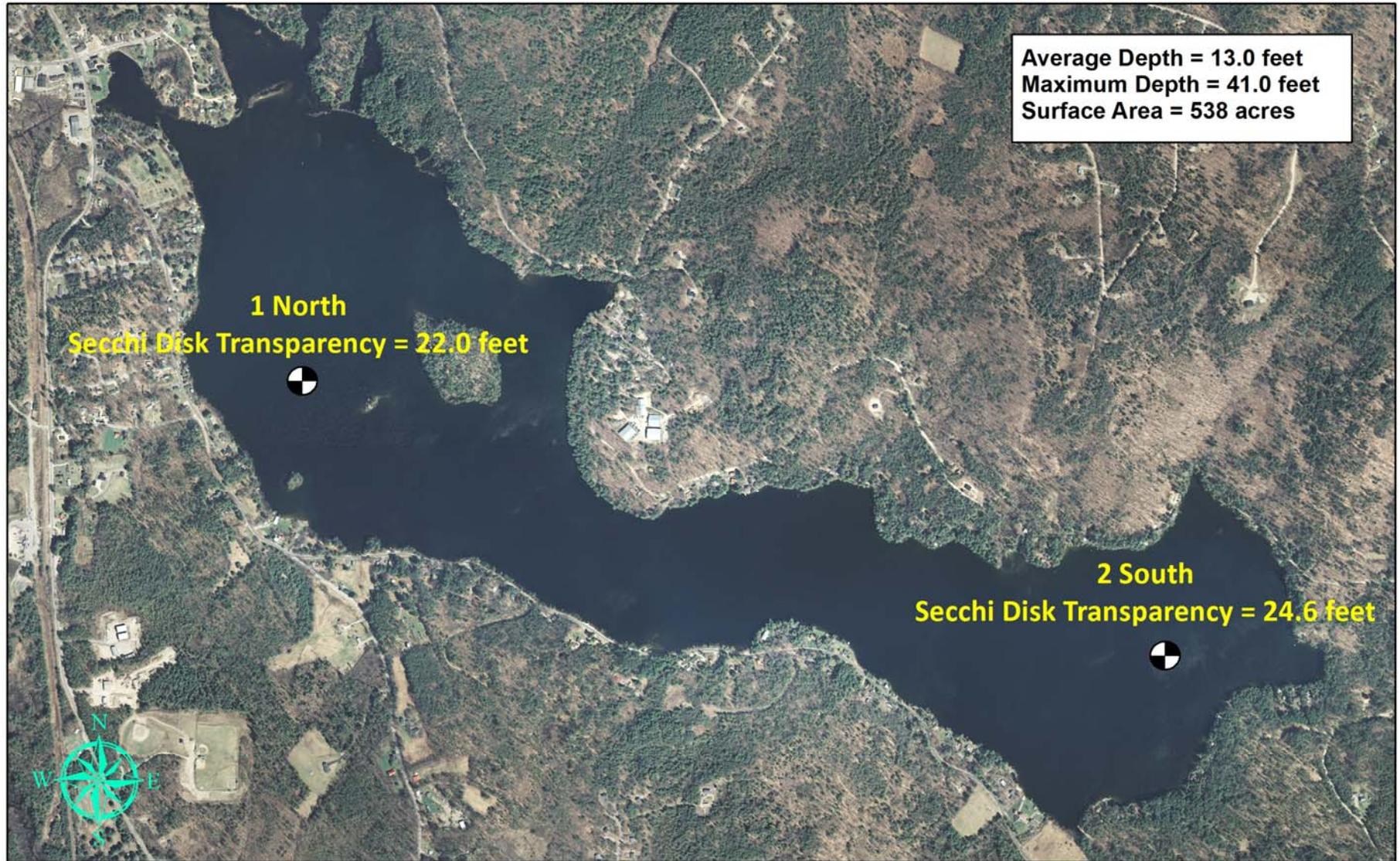
Implement Best Management Practices within the Lovell Lake watershed to minimize the adverse impacts of polluted runoff and erosion into the lake. Refer to “Landscaping at the Water’s Edge: An Ecological Approach” and “New Hampshire Homeowner’s Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home” for more information on how to reduce nutrient loading caused by overland run-off. The Acton Wakefield Watershed Alliance also offers technical assistance to help design and implement erosion control projects that protect and improve the water quality.

- [http://extension.unh.edu/resources/files/Resource004159\\_Rep5940.pdf](http://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf)
- <http://soaknh.org/wp-content/uploads/2016/04/NH-Homeowner-Guide-2016.pdf>
- <http://awwatersheds.org/healthy-lakes/conservation-practices-for-homeowners/>

# Figure 7. Lovell Lake

Sanbornville, NH

2015 Deep water sampling site locations that display the seasonal average water clarity



Aerial Orthophoto Source: NH GRANIT  
Site locations GPSed by the UNH Center for Freshwater Biology



University of New Hampshire  
Cooperative Extension

