

LLPOA - LOON LAKE WATER QUALITY MONITORING PROGRAM

2016 ANNUAL REPORT

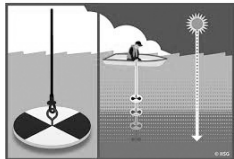
By Jim Davies

Three times per year (May – July - September), for the last 10 years, a group of volunteers from the Loon Lake Property Owners' Association has been testing the quality of Loon Lake water. The purpose is to have credible data to draw from, and to measure improvements and worsening conditions that affect safety for swimmers and lasting habitat for healthy fish life in Loon Lake. We use this data to educate those who live on the lake about how to preserve the quality of the lake for this and future generations. See the list at the end of this article of ways you can help.

2016 is the 10th year of the program. Rather than report on all data collected over the years, we have selected three categories that directly relate to the condition of the lake water: 1) water clarity, 2) dissolved oxygen, and 3) phosphorus (nutrient).

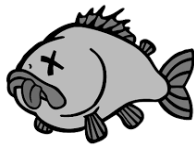
Water Clarity – Diminished water clarity is due to the presence of algae. Live algae is present where sunlight can penetrate through water. Algae are single cell plants that use sunlight for energy and are dependent on warm water, water soluble carbon dioxide, and nutrient. They contribute dissolved oxygen (DO₂) to the water while alive - but are very short lived. When algae are plentiful, water clarity is poor.

Secchi Disk



Three individuals conduct three water clarity tests each year using a Secchi Disk (a 7 inch white plastic disk), which is slowly lowered into the water until it disappears. Three separate depth readings done by three different individuals are then averaged to come up with one depth reading for each foray.

Dissolved Oxygen - DO₂ - Dissolved oxygen (DO₂) is critical to aquatic life. It comes from surface waters that absorb oxygen from the air, and live algae respiration. It is negatively impacted by temperature and the amount of dead algae either sinking to the bottom or already there. Dead algae is consumed by living bacteria that consume DO₂. This means that where there is a lot of dead algae, there is an associated low level of DO₂. When the DO₂ level is less than 4 milligrams per liter of water



- **fish cannot survive**. When almost all DO₂ is gone, a condition called “anoxia” exists. When this condition occurs at the lake bottom, Phosphorus is released, and, at fall turnover, distributed back to the entire water column, promoting more algae growth.

Phosphorus (P) - “P” is a nutrient upon which all plant life is dependent. There are other nutrients that are necessary to aquatic plants, but “P” is the most important. Phosphorus gets into the lake from surface run-off from the watershed; underground water, some of which is contaminated by septic-drain fields; ash from fire pits and beach burning; and lawn fertilizer. “P” levels at Loon Lake in 2012 were reported by WSU to be **18 times that of a healthy lake**. Less “P” means less algae, which means less dead algae, which means less bacteria, which means more DO₂, which enhances and enlarges fish habitat, and inhibits anoxia, which prevents “P” from being released back to the water column.

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STAT CHART

DATA	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Water Clarity (in meters)	6.08	6.80	6.85	6.89	5.25	7.51	7.43	6.85	5.56	6.09
	Average = 6.37					Average = 6.69 (+5% improvement)				
Phosphorus (P) mg/L	0.022	0.017	0.023	0.030	0.015	0.017	0.017	0.016	0.013	0.016
	Average = .0214					Average = .0158 (+26% improvement)				
Habitable Zone (meters from water surface)	16.0	14.6	13.7	15.0	18.7	15.0	14.7	13.7	17.0	16.3
	Average = 15.6					Average = 15.3 (-2% decline)				

As shown in the STAT CHART, we see an improvement in two categories (Water Clarity – up 5%, and Phosphorus – down 26%) and a small decline in one category (Habitable Zone – declined by 2%). We can hope that the two improving trends are due to better stewardship of the lake by lake-front and watershed landowners, as well as others using the lake - and not due to the vagaries of weather or other factors. The 2% loss of fish habitat remains troublesome in light of the other trends.

We have yet to see if this unusually cold, wet, snowy winter has any effect on the data. There may have been some dilution of the lake, as heavy rains and quick thawing produced fast run-off into the lake, with less time for water to be cleansed by the wetlands. As evidenced by basement flooding, there was obviously a significant rise in the water table. This leads to a greater contribution of groundwater to the lake.

Two potentially good outcomes exist: 1) Loon Lake should be able to maintain higher water levels throughout the summer, and 2) Since the arrival of Sewer District #4, which eliminated most on-site sewer systems, groundwater feeding the lake should contain much less harmful nutrients.

Here are seven ways you can help:

1. Only have fire pits that protect land soil from ash.
2. Don't burn wood or debris directly on your beach or ground soil.
3. Don't dump fire wood or ash into the lake.
4. Don't wash your boat or anything else in the lake. Detergents are loaded with phosphorus.
5. Don't dump tree/bush clippings into the lake.
6. Use phosphorus-free fertilizer.
7. Minimize impervious services (asphalt or cement). Use permeable surfaces (such as gravel) for roads and driveways.