Executive Summary of 2016 Monitoring Results

The accompanying charts summarize the data from last year's Cooperative Lakes Monitoring Program (CLMP). The results show that little change has occurred in the lake's trophic status (productivity, or degree of nutrient enrichment), whether measured by water clarity (Secchi disk), algal abundance (chlorophyll-a), or nutrient availability (total phosphorus). Water quality remains high, and biological productivity is sufficient to support diverse plant and animal communities.

Oxygen is depleted at depths below about 20 ft during the warmer months. This results when warming of surface waters divides the lake into zones of different densities: a warm, less dense upper layer underlain by a cold layer of higher density. The density difference inhibits vertical mixing and isolates deeper waters from contact with the atmosphere. Oxygen depletion occurs as dead plant cells and other detritus sink to the bottom and undergo bacterial decomposition. The nutrients that are released by this process remain in the depths until Fall cooling breaks down the layering and allows the lake to 'turn over'.

As in recent years, there is no evidence of a need to change management practices, as long as nutrient inputs from external sources remain near current levels.

Duck Lake benefits enormously from its largely undeveloped northern shore, as well as from the absence of high-density development elsewhere. Other positive factors include low-density development upstream in the watershed and little agriculture; a wide, wooded buffer strip along Duck Creek below Simonelli Road; and the wetland through which the creek flows between Orshal and Nestrom Roads. All these factors act to limit nutrient inputs from Duck Creek.

Furthermore, studies of sediment transport conducted by Muskegon Community College students in Summer 2016[1] showed that the upper watershed---roughly the part east of Simonelli Road---is not a significant source of eroded sediment. The evidence suggests that current land management practices are keeping erosion within desirable limits. This finding is also important because phosphorus, the nutrient that contributes most to over-enrichment of lakes, is mainly transported in association with sediment particles. Less sediment therefore equals less phosphorus.

We are pleased to report once again that intensive observations of Duck Lake's aquatic plant community failed to detect any new invasive species. While Eurasian milfoil occurs at most sites, it is nowhere present at nuisance levels. DCWA also looks for invasive mud snails and for the nuisance alga commonly known as 'rock snot', both of which are present in the Pere Marquette River. So far, they are absent from Duck Lake.

The DCWA's monitoring efforts will continue in 2017, provided we can maintain the necessary level of volunteer participation. You can be a part of this effort, even if you can only spare a few hours. Please consider volunteering (email@dc-wa.com).

1 DCWA thanks the Community Foundation for Muskegon County for a grant in support of this work.