

Progressive's study includes base mapping and an assessment of water quality, aquatic vegetation, the fishery, and the watershed. Here is the status of each of those study elements.

### **Base Mapping**

Completed:

- Detailed hydro-acoustic (i.e., a SONAR) survey to determine bottom depth and plant bio-volume.
- Create an aquatic plant survey map.

In progress:

- Determine the number of homes currently bordering the lake and evaluate the extent of natural versus disturbed shoreline around the lake.

To be completed this fall:

- Create an updated bathymetric (i.e., depth contour map) of Gravel Lake.
- Calculate the physical characteristics of the lake.
- Create maps of the Gravel Lake watershed overlain on USGS topographic base maps, recent orthodigital aerial photography, and USDA hydrologic soil groups.

### **Assess Water Quality**

Completed:

- Collect water quality samples during spring and late summer at 10-foot intervals over the two deep basins of the lake and the channel to measure temperature, total phosphorus, dissolved oxygen, pH, and total alkalinity. Measure surface water chlorophyll-*a* levels and water transparency during each of the aforementioned sampling periods.
- Collect sediment samples during late summer from the two deep basins of the lake and the channel to evaluate sediment composition (sand, silt, clay, marl) and organic content.
- Collect water quality samples during spring and late summer from the inlet and the outlet of the lake to measure total phosphorus, total solids, and total suspended solids.

To be completed this fall:

- Determine lake trophic state; thermal and chemical stratification; oxygen depletion; and phosphorus levels relative to aquatic plant growth.

### **Assess Aquatic Vegetation**

Completed:

- Conduct a detailed aquatic plant survey using the point-intercept method.
- If present, collect up to six non-native milfoil (*Myriophyllum*) plants.

In progress:

- Conduct genetic (DNA) testing to determine if hybrid milfoil is present in Gravel Lake.

To be completed this fall:

- Import aquatic plant bio-volume data from the hydro-acoustic survey into the GIS. Create a geo-rectified map showing densities of plant beds in Gravel Lake.
- Map locations of invasive species such as Eurasian milfoil (*Myriophyllum spicatum*). Tabulate plant species observed in the lake and their relative abundance.
- Evaluate the Association's current aquatic plant control program. Compile treatment records filed with DEQ and assess type, amount, frequency, and timing of herbicide applications.

### **Assess Fishery**

I believe Dr. Jude provided you with an update on his fishery assessment.

### **Assess Watershed**

In progress:

- Evaluate land use and drainage patterns in the watershed and impacts on lake water quality with emphasis on the near-shore land areas.
- Identify point and non-point sources of pollution and make recommendations to reduce pollutant loads to Gravel Lake.