

Maryland Department of Natural Resources

Tidewater Ecosystem Assessment

Deep Creek Lake Submerged Aquatic Vegetation Survey Year 4

Report of Survey Activity and Results

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EXECUTIVE SUMMARY

Submerged aquatic vegetation can be found in a variety of aquatic habitats and forms the foundation of healthy lake ecosystems. Similar to their terrestrial counterparts, SAV are underwater grasses which provide a myriad of important ecological functions. Through the process of photosynthesis, SAV produce oxygen which is vital to the survival of all lake organisms. It provides food, habitat and nursery grounds for many species of fish and invertebrates, absorbs nutrients which decreases the likelihood of algal blooms, improves water clarity by reducing turbidity, diminishes shoreline erosion by reducing the effects of waves and currents, and is a major food source for waterfowl. Healthy native aquatic plant communities also help prevent the establishment of invasive plants like *Myriophyllum spicatum* (Eurasian watermilfoil) and *Hydrilla verticillata* (Water thyme).

Maryland Department of Natural Resources (DNR) Resource Assessment Service (RAS) biologists conducted a fourth season of Submerged Aquatic Vegetation (SAV) monitoring in Deep Creek Lake (DCL), Garrett County, MD, during summer 2013 as part of the lake's expanding water quality and aquatic habitat monitoring program. The project's goal was to define the distribution and relative abundance of SAV species present by surveying transects in six representative areas throughout the lake using globally accepted methodology. In June 2012, the transect survey was expanded to include a comprehensive shoreline survey of *Myriophyllum spp.* This shoreline survey was repeated in June 2013. Following the discovery of *Hydrilla verticillata* in Deep Creek Cove in September 2013, an additional shoreline survey was completed. Monitoring objectives were to define the distribution and relative abundance of all SAV species present in the lake and to record their change over time via the study of representative transects, and to determine the location and extent of *Myriophyllum spp.* and *Hydrilla verticillata* via the shoreline surveys. Survey results are as follows:

- **The majority of observed species, as well as the physical characteristics of each survey site, showed no significant change in density or distribution from 2010 to 2013.**
- There is a diverse population of SAV growing throughout the lake with densities ranging from sparse to 100% cover where present.
- Ten genera of vascular plants (nineteen species) and two genera of macroalgae were observed on the transects and during the shoreline surveys.
- *Sagittaria cristata*, (Crested arrowhead), *Vallisneria americana*, (Wild celery), *Elodea canadensis*, (Canadian waterweed), *Ceratophyllum demersum*, (Coontail), and *Myriophyllum spp.*, (Watermilfoil) were dominant vascular species observed throughout the lake. Macroalgae was also dominant in some areas.
- Species zonation is apparent at every site with *Sagittaria cristata* dominating the shallows; *Potamogeton spp.*, *Vallisneria americana*, and *Ceratophyllum demersum* dominating the mid depths; and *Elodea canadensis*, *Myriophyllum spp.*, and Macroalgae most commonly observed at greater depths.

- The distribution and abundance of these species differ primarily by site, with significant annual changes occurring rarely.
- *Potamogeton amplifolius* and *P. robinssii* were observed during the surveys. Both of these species are rare and thought to be extirpated from Maryland waters.
- Based on the six study areas under this assessment, there is no evidence that *Myriophyllum* density increased significantly from 2010 to 2013, but frequency of occurrence is trending upwards.
- Though not identified to the species level during the transect surveys, *Myriophyllum spicatum*, or Eurasian Watermilfoil, is present in DCL. This plant is considered an Aquatic Invasive Species. Invasive species are non-native plants or animals that adversely affect the habitats they invade economically and/or ecologically. They disrupt by dominating a region and oftentimes displacing native populations. Over the past 300 years, approximately 50,000 non-native species have become established in the United States; 200 introduced species have viable, wild populations in the Chesapeake Bay watershed.
- DNR biologists conducted a second *Myriophyllum* survey in 2013. Results of the survey indicate that there was both less *Myriophyllum* in June 2013 than in July 2012, and that it was more difficult to locate. These results are likely due to lower than normal spring temperatures, increased turbidity, and abnormally high water levels. *Myriophyllum* was present at 69 locations throughout the Lake at the time of the 2013 survey, and occupied less than 2% (~29 acres) of available benthic habitat.
- During the September transect survey, the invasive aquatic plant *Hydrilla verticillata* was discovered in Deep Creek Cove. In response, an additional comprehensive shoreline survey was completed on October 21, 2013. The results of the survey indicate that *Hydrilla* is growing in 14 locations at varying densities in the Lake, but those 14 sites are contained within the southwest leg. A panel of experts from around the country has been assembled to advise MD DNR of control options in the implementation of a Deep Creek Lake specific *Hydrilla* Management Plan.
- The high density and diversity of SAV in DCL is promoting water clarity throughout the lake and providing habitat for a healthy population of fish and invertebrates.

Like most any ecosystem, Deep Creek Lake has a fluctuating environment. Because of its role as a hydroelectric utility, the water level in the lake fluctuates often, which affects the distribution of SAV growing in the lake. There are also periods of heavy precipitation, drought conditions, and record high and low temperatures. Because of its fluctuating environment, it is necessary to maintain a long-term SAV monitoring program in DCL in order to track changes over time.