

## The Effects of Changing Water Levels on *Myriophyllum heterophyllum*

By Debbie Broderick (debbie@mixmox.com)

Water levels on Lake Arrowhead in York County, Maine went through a series of changes between October 2022 and May 2023. Some of the lowering events were due to scheduled dam repairs, others to repair failures, and still others to unprecedented storm damage. The planned drawdown to 4 feet below normal for repairs in October 2022 lasted for 4 weeks, but a week later, when the water level was almost back to normal, it was discovered that the repairs were ineffective. Another drawdown of 3 feet was necessary, taking 2 weeks. On Dec 2nd, the dam began refilling again. A December 23, 2022 storm damaged half the flashboards, and the water level fell 3.5 feet. It remained that way for 2 months over the winter. The repairs made towards the end of February failed yet again in an April 29, 2023 flood event. It took 3 weeks to repair, during which time many aquatic plants were left high and dry in the growing season (Lake Arrowhead is a shallow lake with an average depth of 6 feet).

Between June 7 and June 24, 2023, I noticed a lot of variability in growth forms along the stems of *Myriophyllum heterophyllum* (Variable Watermilfoil). It appears that the changing water levels between October and May led to a mixed growth response, causing the plant to fluctuate between terrestrial, flowering and submersed morphs all in one plant.

I present here a series of photographs of some of the variability presumably in response to changing water levels.



Figure 1: June 7, 2023 specimen with submersed, feather divided leaves at growing tip of plant, with confusing array of possible flower bracts and terrestrial morph



Figure 1: The leaves on this specimen were very reminiscent of the submersed leaves of *Proserpinaca palustris* (Common Mermaid Weed)





Figure 2: June 22,2023 A combination of what appears to be the terrestrial morph, feather-divided submersed leaves on the side branches, and flowering bracts (top)





Figure 4: June 22, 2023 A flowering bract on the growing tip of the plant, with some unusual leaf forms towards the lower half, and a typical feather divided leaf on the side branch

While it may be possible that there is hybrid *Myriophyllum* involvement (*M. verticillatum* is known in Lake Arrowhead), the unprecedented water level changes appear to address the varied growth forms noticed here.