

Erie and Campbell Lakes Management District 2024 Annual Report on Aquatic Plant Management



Prepared for
Skagit County Noxious
Weed Board and LMD

Introduction

Erie and Campbell Lakes are in Skagit County and connected via a stream. Erie Lake is upstream from Campbell Lake and is approximately 110 surface acres. Campbell Lake is a 384 surface acres waterbody and drains to the Puget Sound.

Aquatechnex biologists began working on Campbell Lake in 1982 when the Entranco Engineering Project to treat Campbell Lake with Aluminum Sulfate was performed. Part of that project was to purchase aquatic weed harvesting equipment because the previous few years Entranco alum treatment projects had resulted in much improved water clarity and significant expansion of aquatic weed problems. Our company delivered aquatic plant harvesting equipment to the County after winning the bid to produce harvesters. We provided training on operations and maintenance as well.

During the 2000's, both lakes were heavily infested with Eurasian Milfoil and the communities voted to form a lake management district or LMD. Aquatechnex biologists helped develop an Integrated Aquatic Vegetation Management Plan for both waterbodies. Initial work was funded by the Washington Department of Ecology and systemic herbicide treatments were used to selectively target the milfoil in both lakes.

At the time the community also had an interest in using biological control strategies to provide longer term control of problem aquatic weeds. Triploid grass carp were selected as a control strategy primarily because of budget constraints from the small number of property owners on these lakes. Many lakes in Washington state that have LMD's established have over 1,000 properties in the taxing district, these lakes have under 100 between them. Our team engineered and installed a fish screen at the outlet of Campbell Lake and performed the initial stocking. The community took over stocking operations after that.

In 2024, our team submitted a proposal to perform aquatic weed control activities and Skagit County and the LMD steering committee selected us to move forward.

Pre Treatment Survey and Treatment Report

A survey of both lakes was completed in the week of June 25th to review conditions and suggest treatment options within the budget of the organization.

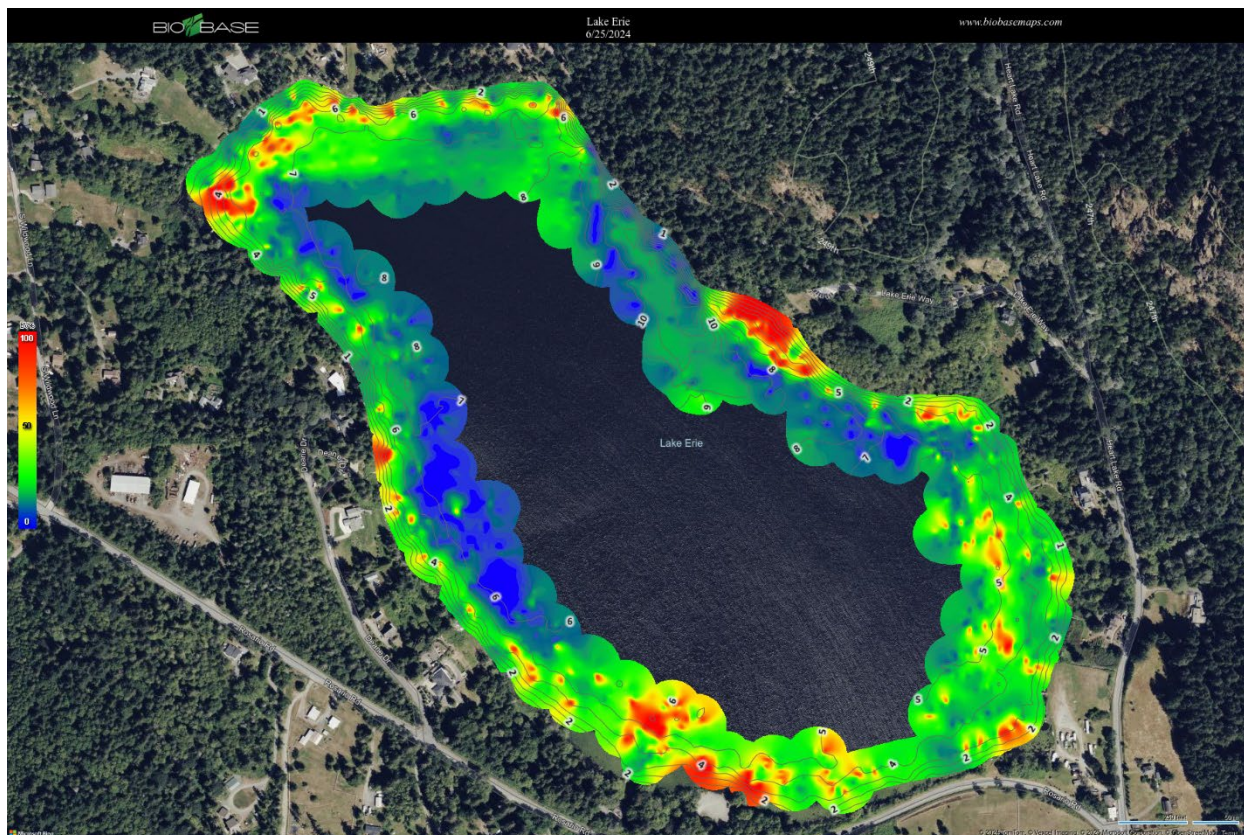
The team utilized a 17-foot LUND mapping vessel equipped with BioBase Hydro-acoustic submerged vegetation mapping systems and a Trimble TCI600 Data Logging DGPS receiver running Trimble TerraFlex mapping software. Forms were built in TerraFlex for collecting positions and attributes for species of floating leaf, submerged species, and emergent shoreline noxious weeds.

The team first circumnavigated the lake littoral area collecting Hydro-Acoustic submerged aquatic vegetation data. This system utilizes sonar signals to map the lake bottom and the height of aquatic plant growth in the water column and produces a HEAT map showing the location of aquatic plant beds. It also generates statistics on aquatic plant biovolume. The littoral area was set at the 15-foot depth contour.

The survey for Erie Lake covered 67.8 acres or 56.4 percent of the surface area of the lake. The survey area contained dense aquatic vegetation and 86.6 percent coverage by biovolume. The

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report for Erie Lake can be viewed at this link: [Vegetation Analysis Report \(2024 July 31 - 07:05 \(UTC\)\)](#) and the map image showing coverage is presented here.

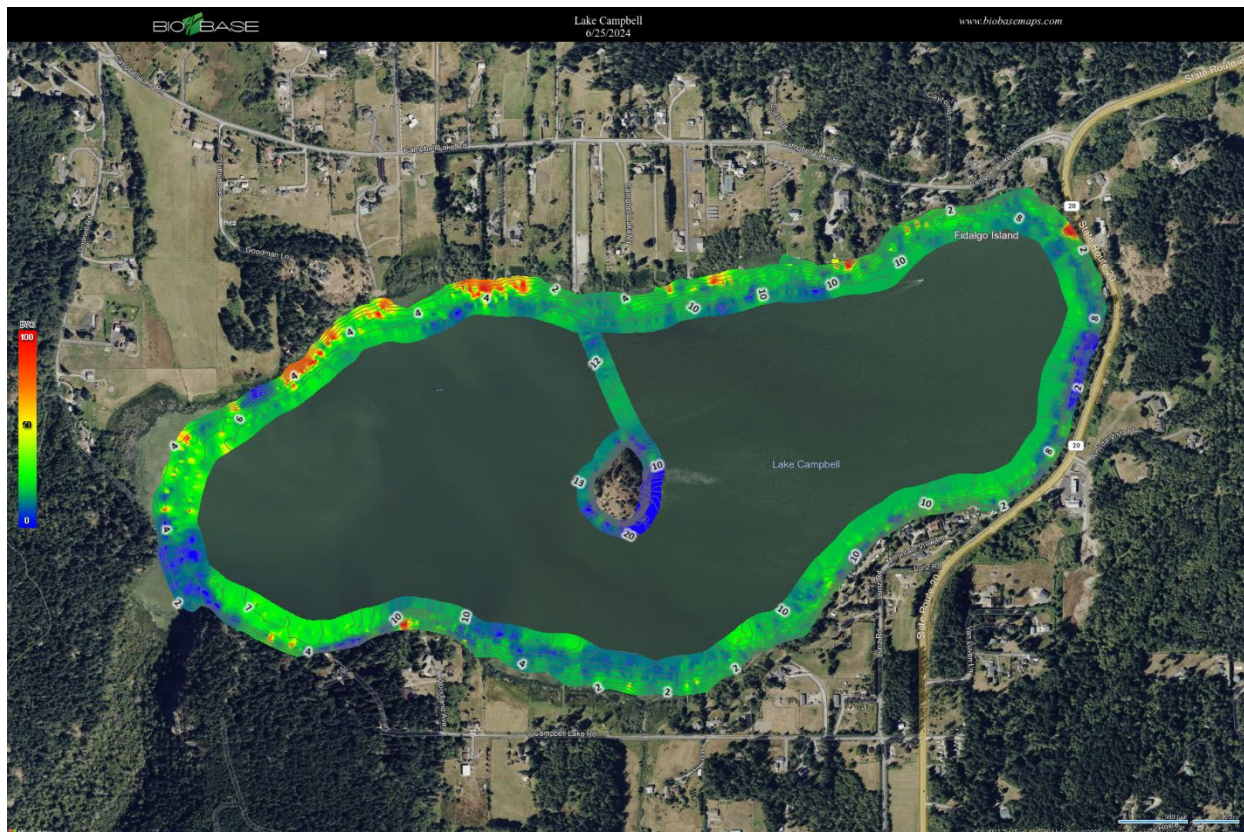


Localized Eurasian Milfoil beds in Erie Lake targeted for control

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The hydro-acoustic survey for Campbell Lake can be found at this link: [Vegetation Analysis Report \(2024 June 26 - 00:16 \(UTC\)\)](#) and the imagery of the aquatic plant coverage is shown below.

The survey for Campbell Lake targeted 120 acres of the littoral area of the lake or 30.0% of the waterbody. Within that zone aquatic plant biovolume coverage was 90.9 percent.



After collection of the hydro-acoustic data, our biologists surveyed those areas in both lakes identified with vegetation present and mapped the species found using the Trimble DGPS data logger in both lakes. This information was used to create treatment polygons that were submitted to Skagit County Noxious Weed Board for approval.



Curly Leaf Pondweed Colonies in Campbell Lake North Shore

Lake Erie

Lake Erie has localized patches of two invasive aquatic species, Eurasian Milfoil and Curly Leaf Pondweed. There were also large areas of the lake that had dense growth of native potamogetons and Naiad that were interfering with beneficial uses of the lake. After discussion with the noxious weed board the determination was made to target the invasive plants and provide relief to shoreline properties by clearing aquatic vegetation to the open water areas of the lake.

The treatment map that was developed can be viewed at this link: <https://arcg.is/1K9GrP1>

The areas in red were treated with ProcallaCOR, a systemic selective herbicide for Eurasian Milfoil. This herbicide is one of the selective tools we have for this plant. It should provide long term control of the plants in those target zones. Areas mapped in yellow were targeted for Curly Leaf Pondweed using Aquathol K aquatic herbicide. This product is very effective on this species and should have cleared that area. The areas in Green were infested with dense levels of native aquatic species, we build these polygons to provide access to open water zones for the property owners on the lake after consultation with the Weed Board. The permit does not allow targeting of all native plant growth in the lake so we balanced targeting access zones to open water.

Lake Campbell

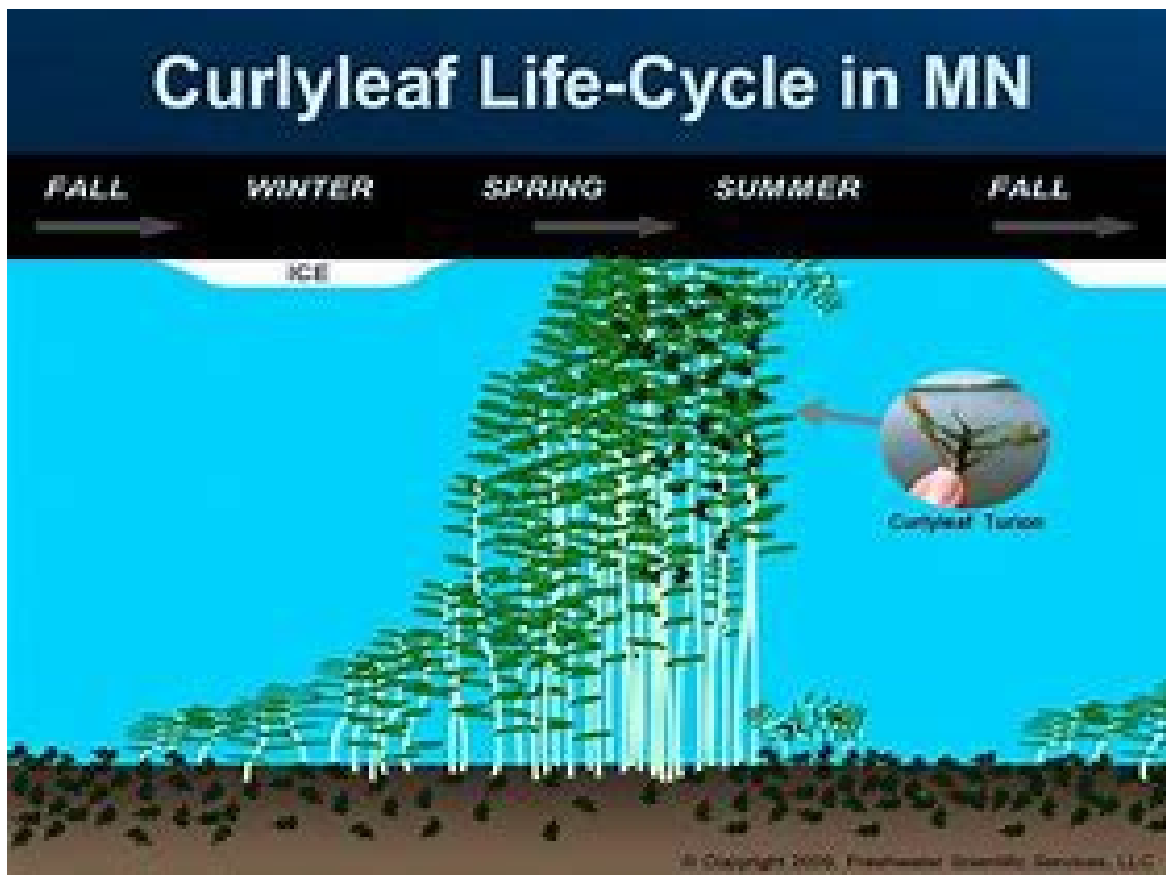
The primary problem we were asked to address on Lake Campbell were the localized patches of Curly Leaf Pondweed and Eurasian Milfoil along the north shoreline. The community input focused us on these treatment zones.

The treatment map for Campbell Lake can be found at this link: <https://arcg.is/T9Wyl>

The yellow areas on the map were targeted with Aquathol K herbicide to control the Curly Leaf Pondweed present in those locations. One additional area shown in red was treated with ProcellaCOR herbicide to target Eurasian Milfoil. As noted above ProcellaCOR is a selective systemic herbicide that effectively controls Eurasian Milfoil.

Recommendations for 2025

Curly Leaf Pondweed has a unique growth habit. The plant grows very rapidly in the spring when day lengths increase, outcompeting native plants for space. The plant through the course of the summer developed turions at the margins of the leaves, these will fall to the lakebed in late summer and sprout. The newly sprouted turions will grow about 6 inches and overwinter starting the cycle again in the spring. As such one plant turns into 10 that turns into 100 and so on. These should be targeted where observed in the lake.



There is only one herbicide that is systemic that is effective on Curly Leaf Pondweed and that is Galleon SC. Galleon can be used to treat larger patches of this plant where present, it has a bit

longer contact exposure time requirement and can't really be used to spot treat. This past year review of rfps submitted and contracting took us into the early summer before work could begin. By this point Curly Leaf Pondweed has generally formed turions. As such we targeted it with Aquathol K to knock down and kill that growth. Galleon can be used earlier in the season as it is not subject to the fish timing window in the Washington Department of Ecology permit that doesn't allow the use of Aquathol or Diquat until July.

Eurasian Milfoil found in both lakes was localized at the time of survey and treatment, but the patches present were well established. In addition, I attended a Friends of Campbell Lake meeting last month and one of the comments was that Eurasian Milfoil expanded beyond those areas visible in the June survey in the early fall. As Eurasian Milfoil spreads primarily by fragments, it is probable that next year there will be additional area that need focus.

In addition, Lake Campbell has experienced significant cyanobacteria (bluegreen algae) blooms in recent years. The community is gearing up to mitigate phosphorus and help reduce the carrying capacity of the lake to produce these blooms and that should lead to improved water clarity. At present, these algae blooms are limiting light penetration in the lake and thus limiting aquatic plant growth to the shallows. This coming year the lake may experience expansion of the littoral areas if phosphorus treatments go forward.

It would be beneficial to extent the management contract for these lakes so that survey work and treatments can happen earlier in the spring.

Lake Campbell has been plagued by cyanobacteria in recent years. The community there is attempting to develop treatment protocols that meet with recommendations of the recent Phosphorus Management Plan developed under a grant from the Washington Department of Ecology. Our team is working with them as requested to help determine costs and how to implement such a treatment. The County has submitted a grant application to the Washington Department of Ecology.