

## Lake Stevens 2023 Aquatic Plant Survey



Prepared for  
City of Lake Stevens

**AquaTechnex,  
LLC**

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## 2023 Aquatic Plant Survey of Lake Stevens

### Introduction

Lake Stevens has a history of invasive aquatic plants. In the late 2000's, the lake was heavily impacted by Eurasian Milfoil. Approximately 250 acres of the littoral zone were completely choked by this noxious weed. The City of Lake Stevens took the proactive step to begin addressing this problem. The City issued an RFP for the development and implementation of a treatment program. The lake was treated by our firm in the summer of 2011 targeting all 250 acres with a systemic herbicide Renovate OTF. This provided excellent results. In the years since annual surveys have located and targeted remaining Eurasian Milfoil plants and the population has been significantly reduced.

During the ensuing years, aquatic plant life native to the region has begun to fill the niche that Eurasian Milfoil dominated. Largeleaf Pondweed species are now the dominate species in the lake. While these plants provide good habitat for fish and wildlife, they have begun to impact some of the beneficial uses of the lake. The treatment program has shifted toward targeting this growth in some areas of the lake.

A second invasive aquatic plant was noted in the lake a few years ago. Curly Leaf Pondweed was observed for the first time in very low densities at a couple locations in the lake.

An ongoing program of survey and necessary treatment continues this year. This report will summarize the conditions found during this mission.

### Survey methods

Aquatechnex biologists mobilized three mapping teams to Lake Stevens on Thursday June 8<sup>th</sup> to perform the 2023 pre treatment survey. An additional trip to the lake was performed the week of June 1<sup>st</sup>, during that trip drone photography was collected to help inform the mapping team as to the location and extent of aquatic plant growth in the lake.

The mapping teams were equipped with two systems to map plants. The BioBase hydroacoustic mapping system was installed on each of the three survey boats. This system records sonar data along planned transects across the littoral areas of the lake. The sonar logs are processed using algorithms to map the location and shape of aquatic plant beds. The system will also map aquatic plant biovolume which is a measure of the height of plant growth within each plant bed.

The team also used Trimble TDC 600 datalogging DGPS receivers with a data dictionary set up to log the location of the species noted in the survey. This data was collected by observation along the transects covering the littoral areas of the lake. The data was then processed and exported to ArcGIS shapefiles and used to create maps of the aquatic plant communities present.

### Findings

The lake littoral zone has extensive areas where the native Potamogeton Big Leaf Pondweed has established. There are other Potamogeton species and Elodea mixed in as an understory to this plant. Eurasian Milfoil is largely absent from the lake at this point, a few small patches were discovered and mapped for treatment. Curly Leaf Pondweed is an emerging problem and will be discussed below.

The BioBase report can be viewed at the link presented here.

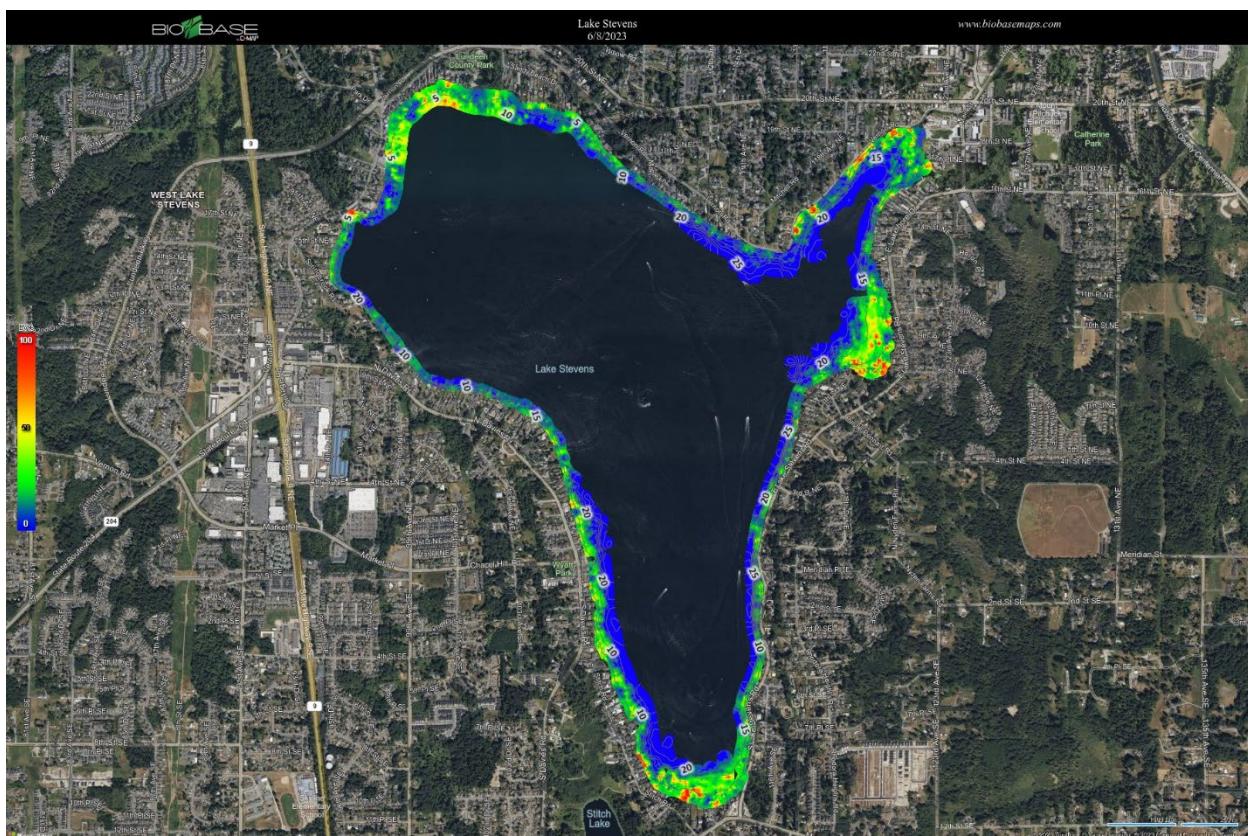
<https://noxreportprod.s3.amazonaws.com/f44c0d91-980b-49dd-a63a-691b2c1222d7/Report.html>

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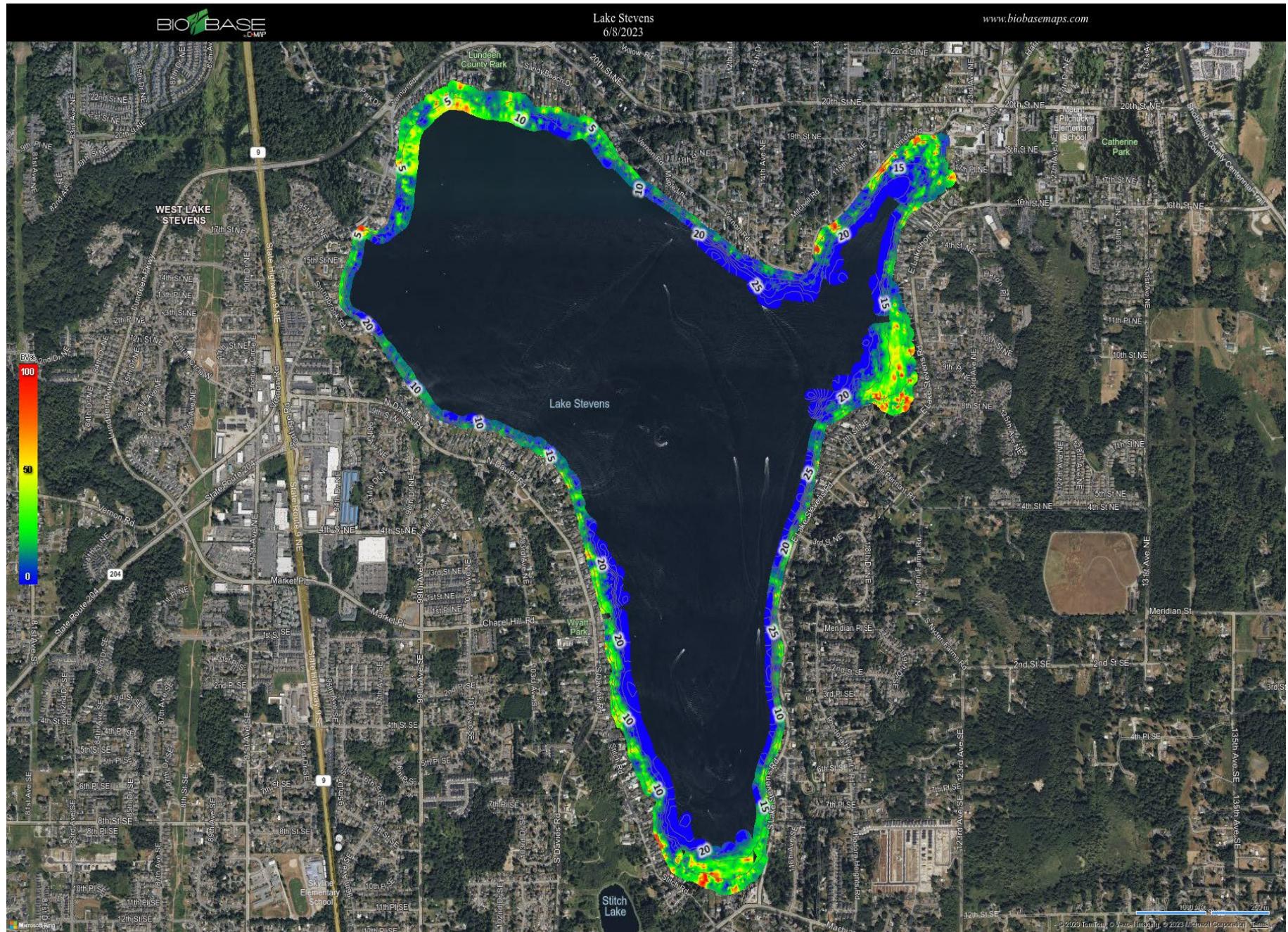
The survey covered 247.66 acre of the lake which is the littoral zone. This is approximately 24.3% of the surface area of Lake Stevens. The remaining acres are in deep water, areas that will not support aquatic plant growth.

Within the survey area, 53% of the zone supported aquatic plant growth. There are many areas of the littoral zone that are vegetation free. Much of the north shoreline of the lake does not support aquatic plant growth at this point. This is probably due to lake substrates.

Biovolume data is presented and can also be viewed as a “HEAT” map. The HEAT map attached has a color ramp that shows the percent of the water column filled with vegetation where aquatic plants are present. The bottom of the HEAT ramp is blue and indicates no vegetation present. The top of the HEAT ramp is red and that indicated that aquatic vegetation fills the entire water column at those locations. These plant communities can be viewed on the map attached and the statistics are present in the report link.



The GIS map attached next shows the distribution of aquatic plant species noted around the lake. This map shows that the dominate species was Largeleaf Pondweed and that plant is well dispersed throughout much of the littoral areas. A map of the plant communities by species is presented on the next page.





## Legend

World Boundaries and Places

- Yellow circle: Curly Leaf Pondweed
- Blue circle: Nuisance Pondweed
- Green circle: Water Shield
- Yellow circle: Curly Leaf Pondweed
- Blue circle: Elodea\_Point
- Red circle: Eurasian Milfoil
- Blue circle: Largeleaf Pondweed
- Green circle: Other Pondweed
- Green circle: White Water Lily

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Lake Stevens June 2023 Aquatic Weed Survey

## 2023 Aquatic Plant Survey of Lake Stevens

The noxious aquatic weed Eurasian Milfoil was observed at a few locations on the western shoreline of the lake. These patches are within the dock lines and a proposed treatment zone would be 3.34 acres. ProcellaCOR herbicide should be applied to this location soon. Procellacor herbicide is selective for Eurasian Milfoil and will not place any restriction on water use for potable supply, swimming or fishing. There would be a 24 hour irrigation restriction on drawing water from the treatment area.

Curly Leaf Pondweed is an emerging problem and has expanded in a few areas of the lake. This plant has a unique growth habit that allows it to expand geometrically from year to year. The plant grows turions like the one shown in the image here in mid summer.



This hard reproductive structure will form at the tips of the stems and a number of these can be present on one plant. These fall to the lake sediments in mid to late summer and sprout as new plants in the fall. The new plants overwinter and grow rapidly in the spring when day lengths increase often outcompeting native vegetation. One plant produces several turions which sprout into new plants that produce numbers of turions. One of the keys to control is to target the plant before turion production.

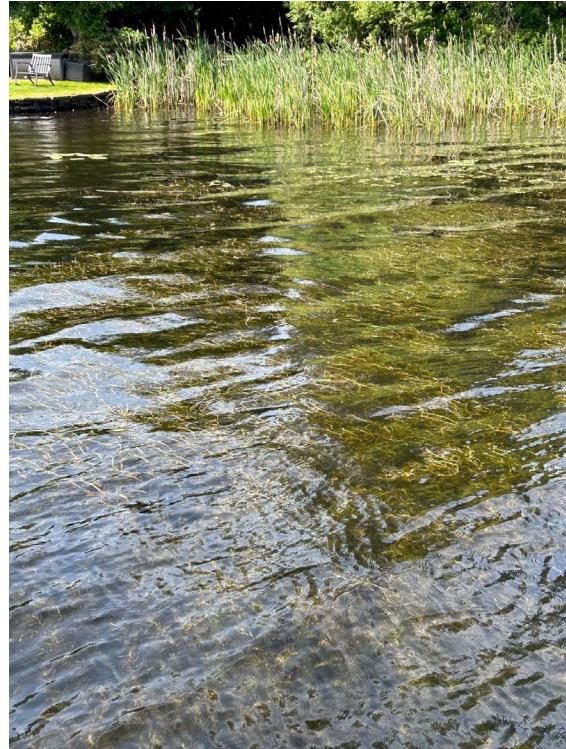
The areas of the lake where this plant dominate should be treated soon with Galleon herbicide. This herbicide is effective against this noxious weed. The herbicide stops turion production within 24 hours of exposure and controls the plants over a few weeks' time frame. This treatment would halt production of next years crop and control the plants present in the treatment zones. Galleon can be used without placing any water use restrictions for potable supply, swimming and fishing. There is a short irrigation restriction.

There are 23.5 acres that should be treated with Galleon to target Curly Leaf Pondweed in the near future. The largest area where this plant occurs in in the south bay of the lake. A proposed treatment map is attached.



Proposed Early Treatment Zones Procellacor and Galleon

## 2023 Aquatic Plant Survey of Lake Stevens



*Curly Leaf Pondweed from Lake Stevens, these images were collected in the south bay proposed treatment zone.*

There are also areas where the Largeleaf Pondweed is present at nuisance conditions. The herbicides used to treat this plant are subject to a fish timing window in the WA DOE permit and can not be treated until after July 15<sup>th</sup>. We would suggest meeting with the City staff to develop a treatment map soon to implement that part of the program.

## 2023 Aquatic Plant Survey of Lake Stevens



The permit requires a 10 day public notice be delivered to the lake residents adjacent to a treatment area and for a quarter mile in each direction from the treatment zone. We will organize and get this notice mailed this week. We will include both treatments in the notice.

We will also update the project website and treatment maps for the initial treatment for noxious weeds that should happen shortly and the second treatment targeting nuisance growth that will happen after July 15<sup>th</sup>. This web site will have a map of the upcoming treatment that people can view to determine how it might impact them.