

Aquatechnex, LLC

www.aquatechnex.com

Big Lake Aquatic Plant Management Year End Report

*Skagit County and the Big Lake Management
District*

Big Lake Aquatic Plant Management Program

Year End Report

Introduction

In 1996, the community around Big Lake in Skagit County recognized that invasive aquatic weed species were having a detrimental effect on their use of the lake and on water quality. *Egeria densa* or Brazilian Elodea is an invasive aquatic weed and has expanded in the lake to form dense mats in approximately 177 acres dominating the entire littoral zone of the lake. This thick growth was a direct threat to swimmers. It caused problems with navigation and this species is known to degrade a number of water quality parameters critical to fish, especially cold water species such as salmon.

The community rallied together and formed a committee that developed an Integrated Aquatic Vegetation Management Plan (IAVMP). This document was used to secure funding from the Washington Department of Ecology to begin targeting this growth. It also was the catalyst for the formation of the current Lake Management District (LMD). The primary tool used by the community to target this growth was Sonar Aquatic Herbicide. As the budget would not support a whole lake Sonar treatment, a treatment using Sonar Slow Release Pellets was used in 1998 to substantially reduce the Brazilian Elodea present in the system. A second Sonar treatment was performed in the early 2000's after the Department of Ecology did not have a treatment permit available for a couple of years because of a lawsuit that forced them to develop an NPDES permit to allow this work. Brazilian Elodea recovered in that period of no treatment options.

Since that time, the community has been using a combination of survey efforts and treatments with a contact herbicide to manage this and other problem species in the lake. Reward has over this time frame continued to reduce the Brazilian Elodea populations in the lake. Other plant species have begun to impact the community however.

Aquatechnex has been providing management services for the community throughout the life of the LMD's on this project. During 2008, the focus of our work was to perform a survey and target remaining Brazilian Elodea and other problem aquatic plant growth. This report will summarize our findings for 2008 and make recommendations for the work to be performed in 2009.

2008 Management Efforts

At the start of the treatment season the County determined that a contract revision was required to meet their legal department's needs. While that process took the bulk of the summer to complete, we did receive permission from the County to proceed with a June aquatic plant survey and a treatment based on our findings from that survey.

Aquatechnex biologists performed aquatic plant mapping efforts on Big Lake on July 5th and 6th of 2008. This summer has been slow in coming in many parts of the state and surveys performed early in June proved to be too early in many cases. This lake was scheduled on that basis and on the basis that there is a fish treatment window for Big

Lake. Contact herbicides are not allowed by DOE permit to be applied in this system prior to July 15th. This lake as scheduled on that basis.

We mobilized a mapping vessel to the lake equipped with a Trimble ProXT GPS system and data logger. This system links to ArcGIS mapping software on a Panasonic Toughbook computer system. We used this technology to record our findings on the water with submeter accuracy.

We used a combination of point intercept sampling to document species present at these locations and a littoral visual and diver survey where we mapped the plants and beds observed from the boat between sampling stations. This information was brought back to our Bellingham office for processing. A brief discussion of the conditions in the lake is presented here.

Noxious Water Lily Growth

One of the primary problems facing many residents on the lake is the expansion of the noxious aquatic water lily *Nymphaea odorata* or White/Fragrant Water Lily. This plant has expanded to the point of impacting many of the dock areas along the eastern shoreline and to a lesser extent on the western shoreline. The locations are shown on the attached map. This species of water lily is listed on the Washington State Noxious Weed List. There are also a few homes that are impacted by *Brasenia schreberi* or Water Shield. While this plant is not wide spread, those locations where it is present are extremely dense and pose a weed problem to those few residents.

Submerged Aquatic Plant Growth

While *Egeria densa* or Brazilian Elodea remains present in the lake, the densities have dropped considerably from years of management efforts targeted toward this species. There are dense beds of mixed aquatic plant growth throughout the littoral area of the lake. There are two primary dominant species, *Ruppia maritima* or Widgeon Grass and *Potamogeton nodosus* or Long Leaf Pondweed. Other species mixed into these beds are *Potamogeton illinoensis* or Illinois Pondweed and *Potamogeton prealongus* or White Stemmed Pondweed. These areas are mapped based on the dominant species present in the bed.

Recommendations to the County and Treatment Performed

Based on these conditions, the budget and the contract we have for this project we recommended treating these areas with Reward herbicide at the point where the permits fish treatment window opened for Big Lake on or about the 15th of July. Aquatechnex staff delivered the required 10-21 day public notification to all residents on the lake. We also posted this information on a BLOG website developed for this project. We also suggested treatment of the Water Shield and White Water Lily growth where it was impacting homeowners and the water use at their property.

The Reward treatment was approved and moved forward. To comply with the permit for this project the team first posted all affected shoreline areas with signage indicating the treatment was being performed at that time. Reward is a liquid herbicide and is mixed in a tank and applied through a system of injection drop hoses. This application was made on July 18th and targeted those areas mapped for submerged treatment.

The team at the end of the day cleared the public access area and processed all herbicide containers and packaging for recycling.

Additional Thoughts for 2008

The issue of having a signed contract for this project and discussion with the County regarding that led to limited work on this project after this major application. We did visit the site a few times through the summer to inspect treatment areas with County staff and steering committee members. Control of Brazilian Elodea continues to be good. Some of the areas treated with Reward that were dominated by Pondweeds and Widgeon Grass did not obtain 100 percent control based on these observations.

We also received a number of telephone calls requesting information on water lily treatments. This application was not cleared to proceed this year. It is something that should be addressed in the future.

Thoughts for 2009

With the contract signed and in place as of September, the tasks for 2009 are well laid out.

The first task for the coming year will be to again perform a mapping survey of the lake to determine conditions present and focus control efforts. This work will be scheduled with the County in June after consideration of the weather and plant growth patterns that emerge this coming spring and summer.

There has been a shift in problem species present in this lake over time. The Sonar and Reward treatments designed to target the Brazilian Elodea have done an excellent job of reducing the populations of that species below problem levels in the lake. The problem species now present in the lake however are increasingly Long Leaf Pondweed, Widgeon Grass and White Water Lily. If that condition persists in 2009, consideration of the permit requirements for treating native aquatic plants and the selection of herbicides use may alter the treatment program.

The permit allows for control of up to 30 percent of the acres in the littoral area of a lake that is larger than 500 acres when targeting submerged weeds not on the state noxious weed list. The littoral area of Big Lake varies with water clarity. Light penetration to the lake bottom defines where aquatic plants can survive as they need light for photosynthesis. In lakes with poor water clarity, light penetration is limited and the littoral area is smaller as only the shallow waters can support growth. Big Lake traditionally has about 190 acres that could be considered the littoral area of the lake. As such, up to 57 acres of the lake can be targeted for control of submerged vegetation of plants not on the state noxious weed list. Additional areas that remain infested with Brazilian Elodea can also still be targeted. The mapping work done next summer should focus on these communities and develop a map that documents the size of the littoral area for the year, calculates the number of acres that can be treated based on that information and maps both of these communities.

This information should be presented to the Steering Committee representing the lake community well before the July 15th fish window opening allowing treatment. If the areas impacted by native plants exceeds the amount allowed by permit, these areas will have to be prioritized for control.

A second consideration should be focused on the choice of herbicides. Reward is generally a good broad spectrum contact herbicide. It does lack activity against Widgeon Grass, a plant that is starting to expand in the lake. A secondary problem is that the artificial fish timing window forces the use of this tool a bit outside it's

optimum performance window. All contact herbicides are optimized to perform during the earlier growing stages of the plants they target. This fish treatment window is designed to protect salmon. These herbicides however have been proven to have no impact on salmon smolt and could be used earlier without any impact on the environment, but that permit conditions limits their use in Big Lake. It may be that Aquathol K or Aquathol Granular should be considered for use in the areas that are dominated by Long Leaf Pondweed and Widgeon Grass. This herbicide costs a bit more to deploy, but has better activity against those species. The treatment maps generated in 2009 will have both options for treatment and associated costs outlined so the County and the Steering Committee can focus the budgeted funds to most effectively target these weeds.

As was noted this year, there are many areas of the lake locally where the lily growth is a severe weed problem for those residents. The White Water Lily is on the state noxious weed list and can be targeted with Glyphosate herbicide. This material is sprayed onto the lily pads and trans-located to kill the root systems as well as the vegetative growth. Using the public notice and the BLOG (www.biglakelmd.wordpress.com) we will have a method for people to contact us and get listed as requesting control of those species with the approval of the steering committee.

You should also note a new page on this project blog for to "Log a Case". This makes available a method for those on the lake to easily communicate with us. Filling out and submitting this easy to use form creates a case in our client relationship management software and gets it processed. As we are often in the field during the day and schedules vary greatly depended on the weather, we often don't receive telephone messages until late in the day or later in the week. When we return them, people often aren't home or at the number they left. This system generates an email to us in the field as soon as it's filed. Many of these questions can then be answered by email from the field. Where a more detailed communication is required, we keep moving until the issue is resolved then close the case. The software we use for this also keeps a record of these and is useful in documenting questions and resolution of these issues.

Please give this report some thought. We are available to meet with the Steering Committee to review this report. Any questions about this report should be directed to Terry McNabb or Adam Kleven at 360-527-1271. Thank you for your consideration and the opportunity to serve you in 2008.

Big Lake Aquatic Plant Communities June 2008

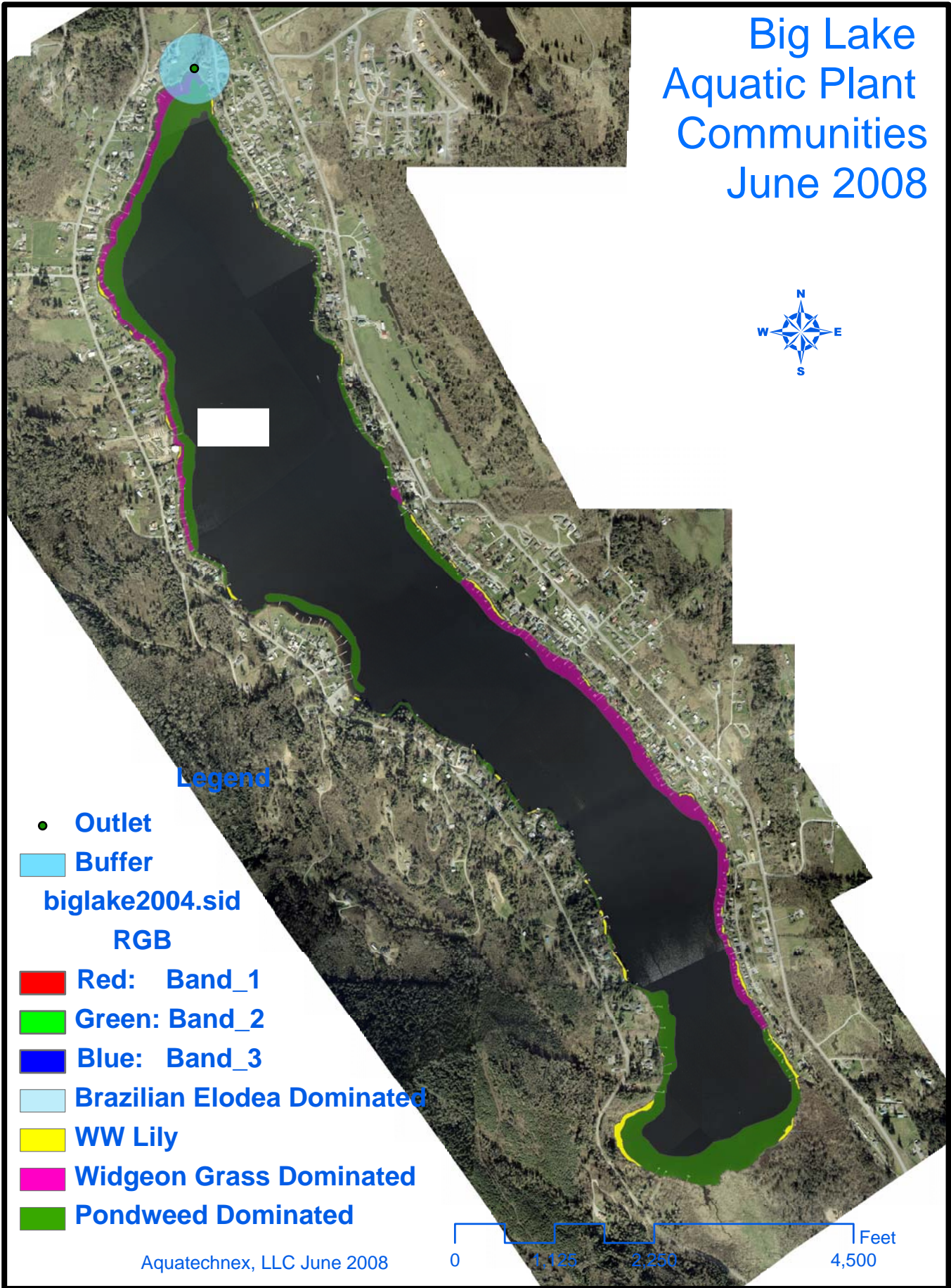


Legend

- Outlet
- Buffer
- biglake2004.sid
RGB
- Red: Band_1
- Green: Band_2
- Blue: Band_3
- Brazilian Elodea Dominated
- WW Lily
- Widgeon Grass Dominated
- Pondweed Dominated

Aquatechnex, LLC June 2008

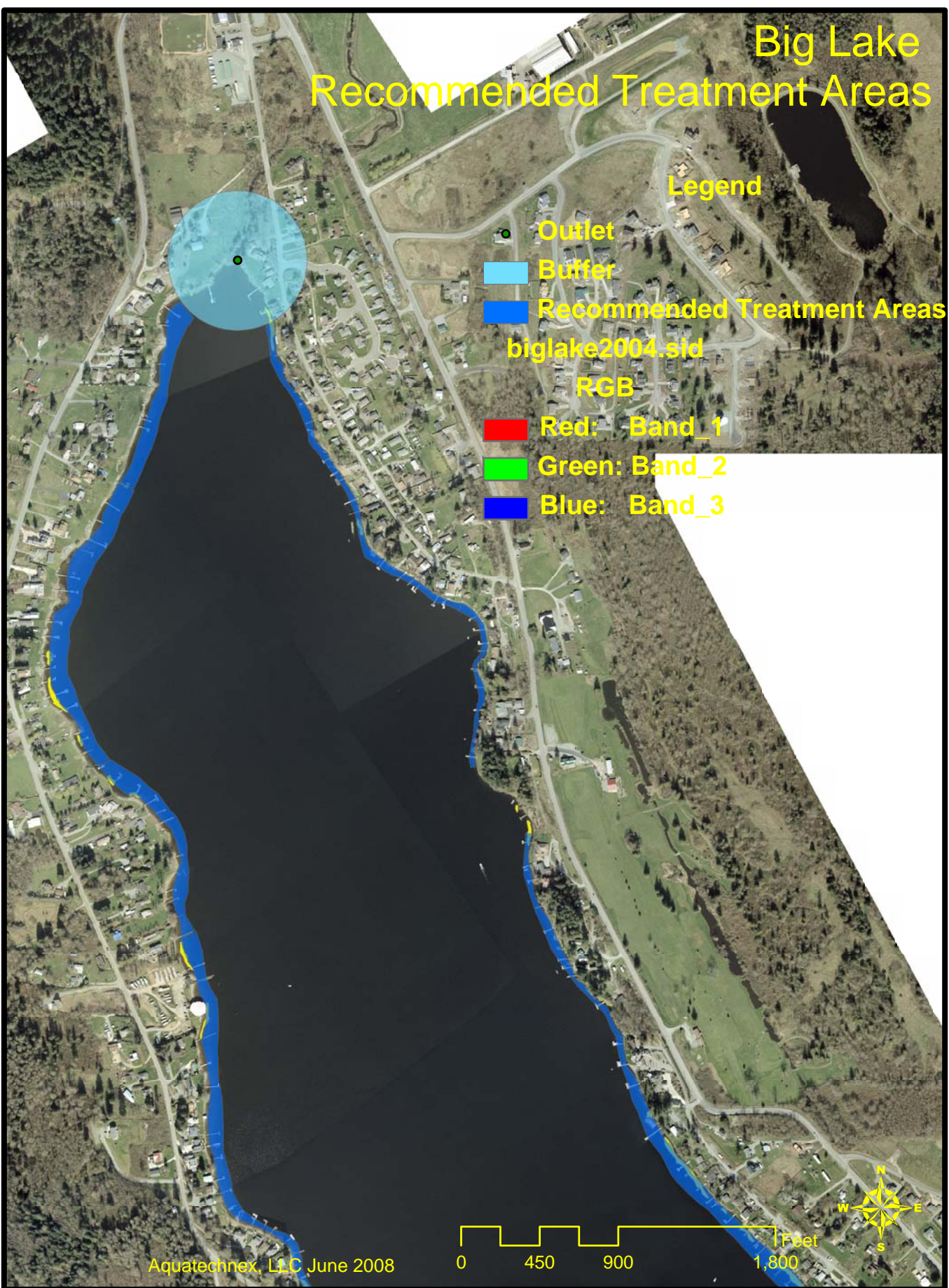
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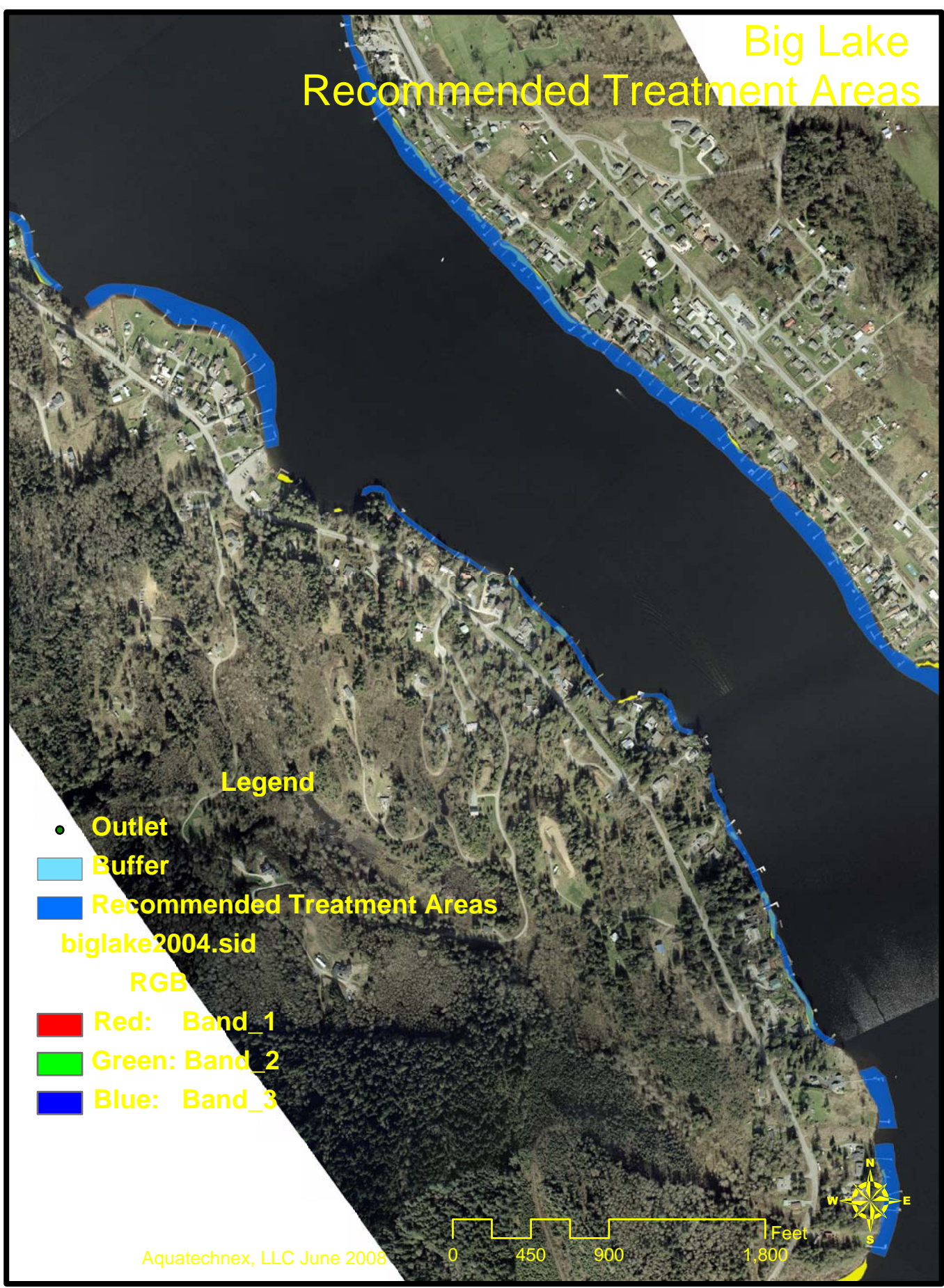
Big Lake Recommended Treatment Areas

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Aquatechnex, LLC June 2008

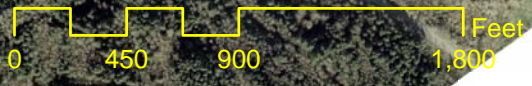
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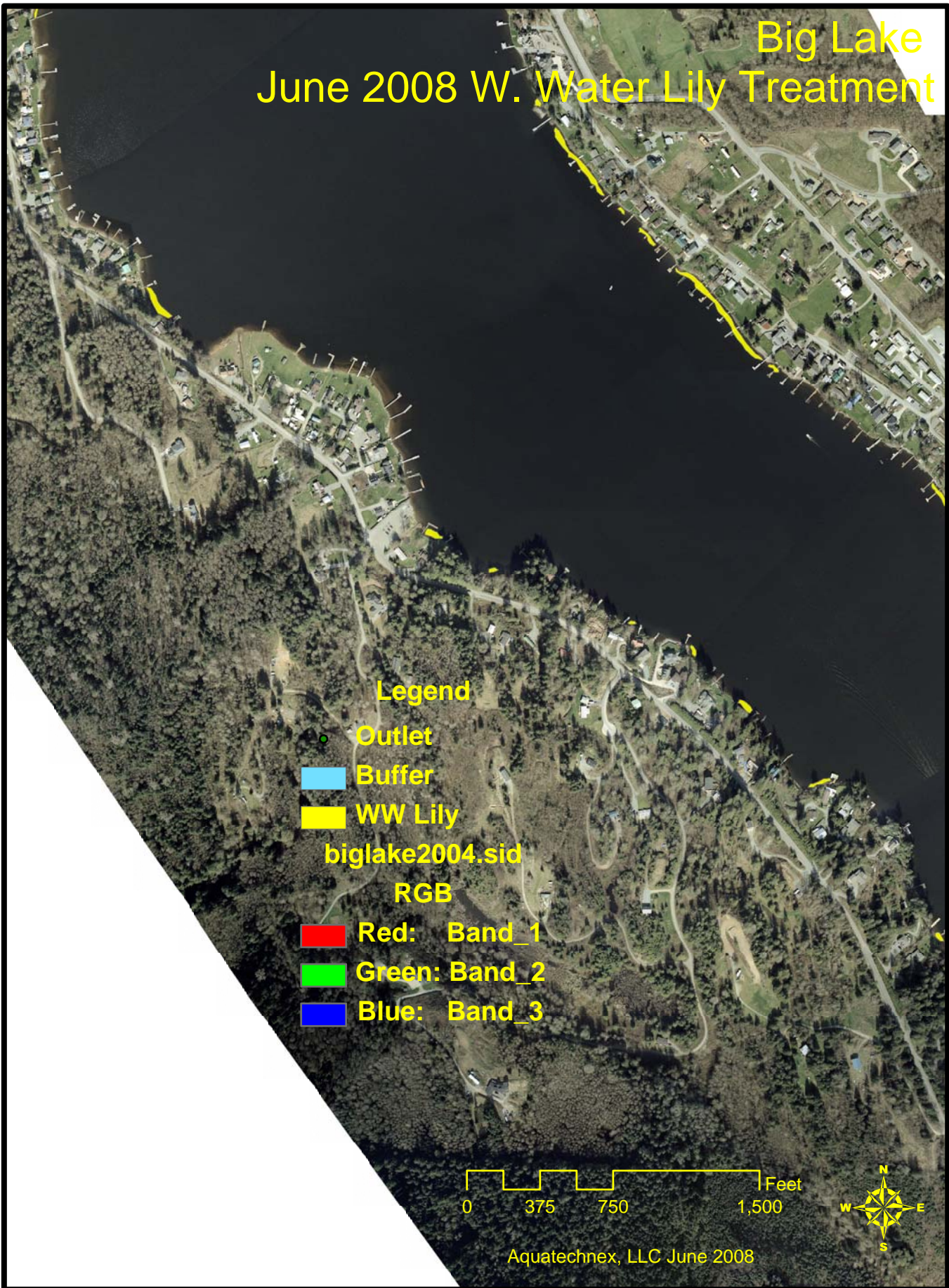
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Big Lake June 2008 W. Water Lily Treatment



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