



**AquaTechnex**

*"Advancing the Science  
of Lake Management"*



**Big Lake Aquatic  
Plant Management  
Program**

**Report on Activities  
for  
2003**

## **Introduction**

Big Lake is a 520 acre water body located in Skagit County Washington. This lake is relatively shallow and has been impacted by the introduction of two invasive aquatic weed species. In the mid 1990's the citizens living around the lake organized a committee to investigate control options. This committee teamed with Skagit County Department of Public Works and took the first step of developing an Integrated Aquatic Vegetation Management Plan (IAVMP). This plan identified two invasive weeds as causing the bulk of the problems in Big Lake.

The citizens voted to form a Lake Management District with the help of the County. This entity received funding from the Washington Department of Ecology and collected dedicated tax revenues from the residents to implement the IAVMP. The first step in this process was to hire a service firm to manage the aquatic vegetation in the lake. Our company was selected to perform this work. A Sonar SRP treatment protocol was developed and applied to the lake in 1998 to target the invasive species. This treatment was highly successful. The Eurasian Milfoil was eradicated from the lake and the Brazilian Elodea was severely impacted. Brazilian Elodea has not yet been successfully eradicated using this or other technologies in Washington State, but control was very good during 1998 and into the following years.

Since 1998, our team has met with the citizen steering committee each year. For a number of years after the 1998 treatment, Brazilian Elodea remained under control. Mapping efforts confirmed this. No additional aquatic plant management activities were necessary in 1999 and 2002. Treatments again took place in 2002 using contact herbicides to target Brazilian Elodea present in the lake system. The citizens of the Lake Management District also voted to continue the LMD for the next ten years. This vote authorized the continued management of problem aquatic vegetation. A contract was provided to Aquatechnex, LLC to manage this aquatic vegetation during the 2003-2004 timeframe. This report summarizes the work performed during 2003 on Big Lake.

## **2003 Activities**

The first step that was undertaken during the 2003 season was to obtain permit coverage to conduct aquatic plant management operations on Big Lake. The Department of Ecology issued a general National Pollution Discharge Elimination System (NPDES) permit to the Washington Department of Agriculture for the management of noxious aquatic weeds in Washington waters. This permit was required after the US Ninth Circuit Court of Appeals Decision in the *Headwaters vs. Talent Irrigation District* case in 2001. This permit allows the discharge of aquatic herbicides into Waters of the United States within Washington.

Aquatechnex applied for and obtained coverage under this general NPDES permit using Ecology's on line application system. This web site (<http://www.ecy.wa.gov/programs/wq/pesticides/index.html>) is used to file the required

“Notice of Intent” to obtain coverage under this permit. Key information is entered into this on line system such as the number of acres estimated to be treated, the herbicides selected and target noxious weed. Once this is performed, coverage is granted under this NPDES permit and the applicator follows the direction and guidance published as part of this permit document.

Aquatechnex biologists surveyed the littoral area of the lake prior to treatment on May 24<sup>th</sup>. The purpose of this survey was to define the treatment areas and get a estimate of pre treatment conditions. Approximately 100 points were sampled on the lake from a boat equipped with a DGPS receiver and data logger. The rake sampling point survey method was used in this effort along with visual inspection of these plant communities. The points were collected around the lake with approximately 3 points on a transect from the shoreline to the outer edge of the littoral area. Transects were spaced along the shoreline to provide complete coverage of the lake.

At each point, the GPS receiver was used to log the location of the sample. A double sided rake on a 50 foot rope was tossed into the lake, allowed to sink to the lake bottom and retrieved. If aquatic plants are present, the rake will collect them and transport them to the boat. The species of plants present were recorded for the point. *Egeria densa* (common name Brazilian Elodea) was collected at the majority of the points sampled. This weed was well distributed throughout the littoral area of the lake. Our team also noted the presence of a few scattered *Myriophyllum spicatum* (common name Eurasian Milfoil) plants in the southwest bay of the lake approximately 150 feet off the west shoreline. The location of these plants were noted as well.

Aquatechnex biologists attended a public meeting to present the scope of work for the summer and to answer questions regarding the treatment to interested property owners. This meeting was also attended by Envirovision Staff as part of the public process on the development of a updated Integrated Aquatic Vegetation Management Plan (IAVMP) for the lake. After the meeting, we viewed a few of the citizens properties to view specific concerns they had.

The herbicide selected for use during the 2003 treatment was Sonar Precision Release aquatic herbicide. This product is manufactured by SePRO Corporation. Sonar impacts aquatic plants by preventing the production of a key pigment that plant uses to protect chlorophyll from photo-degradation by sunlight. Plants utilize chlorophyll to manufacture the energy or “food” necessary to survive. The carotene pigments produced by plants act as a filter or sunscreen for the chlorophyll, without this pigment the sun will break down this compound and the plant can’t produce food. Over time the plant will use up reserves and eventually perish.

The mode of action of Sonar is such that the target plants need to be exposed to this herbicide at rates of between 8 and 12 parts per billion for six to eight weeks to achieve optimum control. Plants like Eurasian Milfoil that are very sensitive to Sonar have been eradicated from a number of lakes in Washington State using this type of treatment protocol. Brazilian Elodea is a bit more resistant to this as the plant has a couple of

unique reproductive and survival mechanism. Sonar takes from 60 to 90 days to control plants in the treatment area. The plants will start to bleach out at the growing tips and eventually turn brown and black as they start to die off.

Sonar Precision Release (PR) is a granular material that is applied to the lake using spreaders or air blower application systems. The pellets are designed to release the herbicide over a period of four to six weeks. This allows the applicator to maintain exposure over an extended period of time. Sequential treatments are often used to maintain these levels as well.

Three applications of Sonar PR were made to Big Lake in the early to mid summer of 2003. The applications targeted Brazilian Elodea in 177 acres of the lake. The treatment dates were:

Tuesday, May 27th  
Tuesday, June 17th  
Tuesday, July 1<sup>st</sup>

Prior to each application, the public notification procedures required by the NPDES permit were performed at the lake. Ten days prior to the first treatment, a handbill was delivered to each dwelling around the lake outlining the treatment to be performed, the approximate timing of the treatment and the restrictions the label places on the use of water from the treatment area. One each treatment day, additional public notification was performed. Large informational signage was posted at public access sites and boat ramps around the lake. Smaller signage was posted on each property around the lake to inform residents that the treatments had been performed and to remind them of the irrigation precaution from the product label.

During each treatment, 25 parts per billion of Sonar PR were applied to the 177 acre treatment area. The application was performed from two boats equipped with granular distribution systems. The pellets were evenly applied over these acres. On application, the granular pellets fall through the water into the plant beds and begin the controlled release of the herbicide to the plants. The herbicide release starts to peak about two weeks after application when using this herbicide and tapers off about four weeks after application. The three treatments extended this exposure, the release curves for the individual applications overlapped so herbicide was delivered over an extended period of time.

Water samples were collected prior to treatment and five days after each of the three treatments. These samples were processed to review the Sonar residues present. Five stations were selected to collect samples and marked with GPS points.

The aquatic plant communities in the lake were inspected through the summer and once in the fall of 2003 to review the progress of the treatment. The plant injury was reviewed and noted.

## Discussion and Recommendations

The results of the 2003 treatment were as expected. Sonar is a very slow acting herbicide that disrupts the plants ability to produce the carotene pigments necessary to protect the chlorophyll in the leaves from sunlight. Sunlight will photo-degrade chlorophyll in the absence of this pigment and the plant will eventually be impacted by it's inability to produce food. It normally takes from 60 to 90 days to see results. Plant injury was noted two to three weeks after the first treatment as the Sonar started to release from the pellets.

Eurasian Milfoil is very sensitive to Sonar. At the end of the season, this plant was not observed at all in the areas on the southeast portion of the lake where it was observed in the spring.

Brazilian Elodea is a bit more tolerant of Sonar as the plant has a considerable amount of plant tissue present and does not fall apart as effectively as Eurasian Milfoil. Overall, the Sonar treatment was very effective in removing this plant from the water column and eliminating it as a weed problem in the lake. There were no areas where weed mats were present on the lake surface as they were prior to treatment and control was in excess of 90 percent. The results were comparable to the 1998 treatment using this same material. The plants will continue to decay over the fall and winter months. There were some areas of the lake where the shoreline drops off rapidly and the littoral area is very narrow where control was not complete. The Brazilian Elodea plants in these areas were injured and crashed to the lake bottom. When the shoreline plant beds are very narrow, there can be some loss of herbicide as it dilute out of the treatment area and that can have an impact on control. These areas will be reviewed and targeted as discussed below.

### 2004

In order to provide treatment of the noxious aquatic weeds present in Big Lake, the applicator must obtain coverage under the NPDES permit for noxious aquatic weed control. This permit is a five year permit that was issued by the Department of Ecology to the Department of Agriculture. Permit coverage is obtained by the applicator each year prior to treatment and the applicator must follow the conditions present in that document. One of the conditions of this permit is that an Integrated Aquatic Vegetation Management Plan (IAVMP) be developed and adopted prior to the third year of treatment on a specific lake. As treatments were performed in 2002 and 2003, this requirement must be met prior to the 2004 treatment season.

The Lake Management District did develop and adopt a IAVMP in the late 1990's. This plan was accepted by Ecology and used to obtain funding in prior years. This document could be used to meet the permit obligation in this regard. The County has hired a consultant to update this plan. Since the original plan was developed, a number of changes have occurred with regard to aquatic plant management in Washington State. There are new herbicides available to applicators for example. Reward is the herbicide that is planned for use in the 2004 treatment season. This herbicide was not available under permits until last year. The original IAVMP does not discuss this product as it was

not available at that time. The objective of the plan update is to take these consideration into account and bring the plan current.

It is strongly recommended that this plan be completed prior to March of 2004 so that it can go through the process of approval prior to the treatment season. It is also recommended that Aquatechnex staff review the draft well prior to that to insure that it meets our needs with regard to obtaining permit coverage and so we can offer comments if necessary in a time frame necessary to insure treatment in 2004.

In May of 2004, our biologists will examine the aquatic plant community in the lake and make a determination of the need for control. It is assumed that Reward will be used in some areas of the lake to supplement the Sonar treatment and impact emerging Brazilian Elodea. A map will be developed indicating treatment recommendations and presented to the County staff after that survey. Our team will then implement treatment as necessary.

There is an emerging problem with the noxious aquatic weed Fragrant Water Lily in some portions of the developed shoreline around the lake. Some residents have expressed a concern about this plant. There is a task in our contract to provide control of this plant as necessary. It is recommended that the 2004 public herbicide notification that we deliver to the individual dwellings around the lake include information on this noxious weed and request that lake residents contact us if they want to control this weed on their individual properties.

If there are any questions on this report, please contact Terry McNabb at 360-239-5173