

Lake Campbell and Lake Erie 2015 Aquatic Plant Control Program

Prepared for:

Lake Erie & Campbell LMD #3
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Project Overview

This will be Northwest Aquatic Ecosystems sixth consecutive year providing services to the Lake Erie and Campbell waterways. Components of the prior year reports have been incorporated into the 2015 report. Some of the past historical data is necessary in providing the reviewer adequate project baseline references. Our 2015 contract encompassed many of the same objectives and components as the earlier agreements. Management objectives have always focused on noxious weed activities as such species have been managed to reduce their appearance lake-wide. Native plants have recently begun to pose similar recreational hazards as the noxious macrophytes. Although not prevalent yet within Lake Campbell, native species have expanded throughout Lake Erie and have required management in order to provide a safe recreational environment to abutting property owners and the local community. Lake Campbell during 2015 has seen a notable increase in native plants a component of the lakes ecosystems that has been problematic since fluridone was applied lake wide to control milfoil. As both lakes continue to reestablish native plant growth, management objectives will be required to consider the benefit of such species while also recognizing the potential danger unchecked growth may pose to lake users. Prior to the onset of 2015, Lake Erie retained small problematic patches of milfoil that have historically been identified to reside within specific lake areas. Lake Campbell however during 2014 & 2015 has shown a marked increase in milfoil occurrences in both the eastern and western shoreline areas. Some of this milfoil increase is likely attributed to two shoreline parcels that contain milfoil infested ponds that have direct access to the main lake.

Survey Protocol

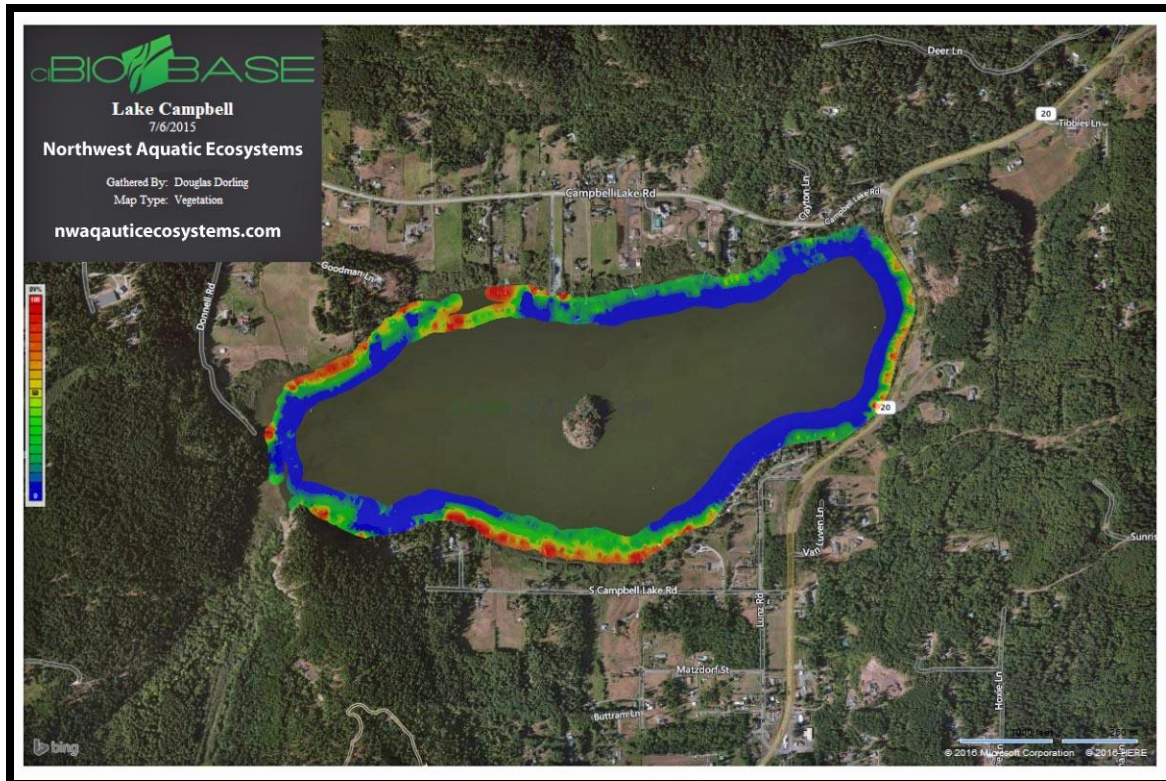
Survey techniques for 2015 were similar to those utilized during 2014. Macrophyte data was collected utilizing specific transducers and bottom scanning equipment. Once collected the SD card was uploaded via cloud based technology and the processing of the data was finalized. During the survey when milfoil plants were identified their locations were noted along the transect line and their GPS coordinates were recorded. Each milfoil data point was identified by a red dot. The resulting processed map produced is a color coded map of the lake bottom identifying weed growth areas, plant densities and milfoil locations. Not only is a well defined map produced but a sonar log of the survey is saved allowing a complete review and evaluation of the survey to occur in house. The sonar log affords you the ability to view all plant growth along the boats survey track. This new protocol avoids the possibility of missing plants between bottom surveying data points.

Data is collected by a survey vehicle transecting the lake along the littoral zone. Boat tracks are designed to be approximately 100 feet apart. To ensure the efficacy of the survey, a bottom sampling rake was thrown from the boat at various locations lake-wide. The rake was then drawn across the lake bottom, brought to the surface and into the boat. Plants attached to the rake were identified and confirmed as being the same species as

noted through the structure scan or visually through the water column. The system automatically calculates, maps and stores the position of every data point.

Lake Campbell Pre Treatment Survey Results

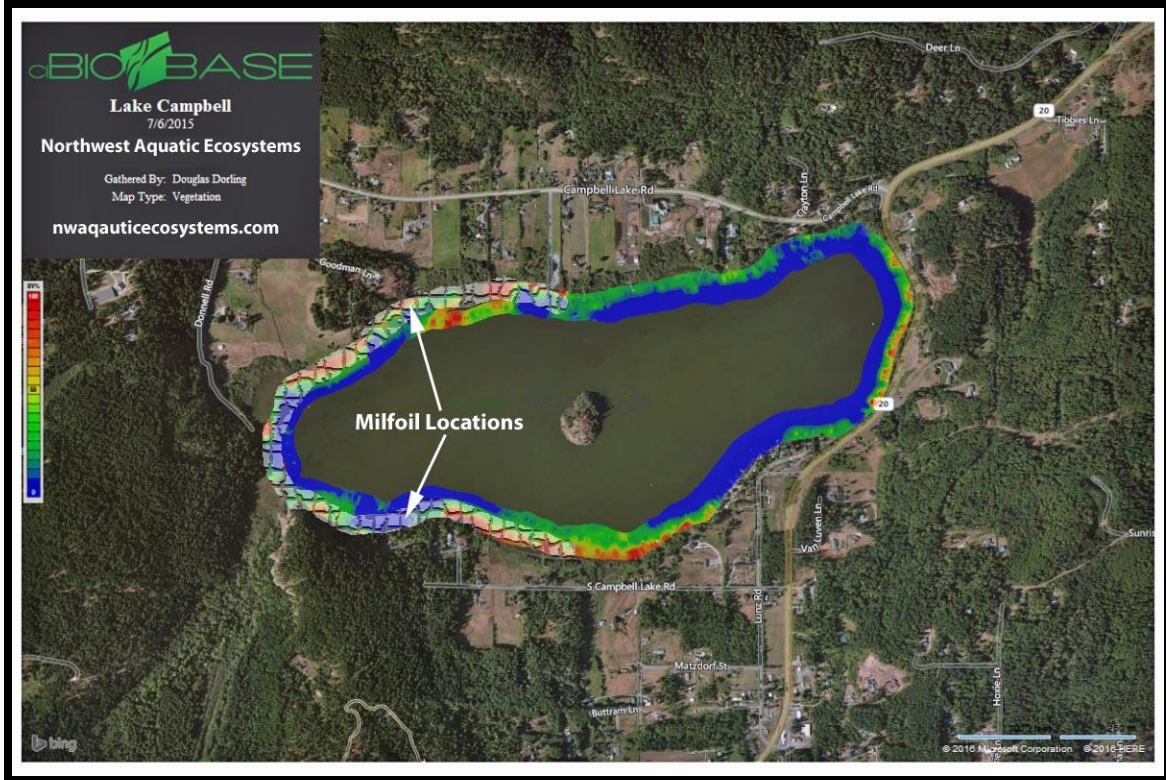
Lake Campbell was surveyed on July 6, 2015. At the time of the survey Lake Campbell was experiencing an algae bloom. There was no shoreline scum noted at the time of the survey. Results of the spring survey were similar to those noted during the fall 2014 survey. Milfoil growth was documented within much of the spadderdock perimeter along the western, northwest and southwest shorelines. The lake area infested with native spadderdock is a difficult one to survey because of the dense spadderdock growth. Milfoil plants and/or fragments can remain undetected beneath the pads and then surface later in the season as the pads begin to die back. Native plant growth was elevated over past surveys and suggests that this current plant community has started to recover from the initial fluridone treatment applied approximately ten years past.



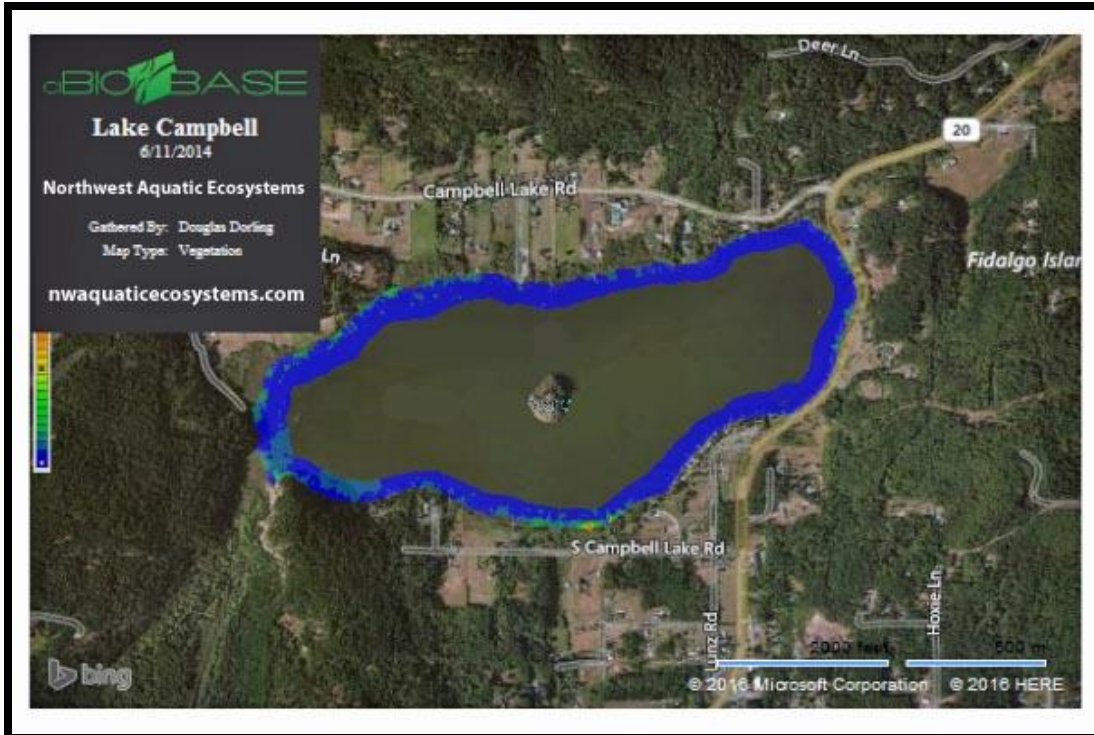
Spring 2015

Red areas indicate 100 % coverage

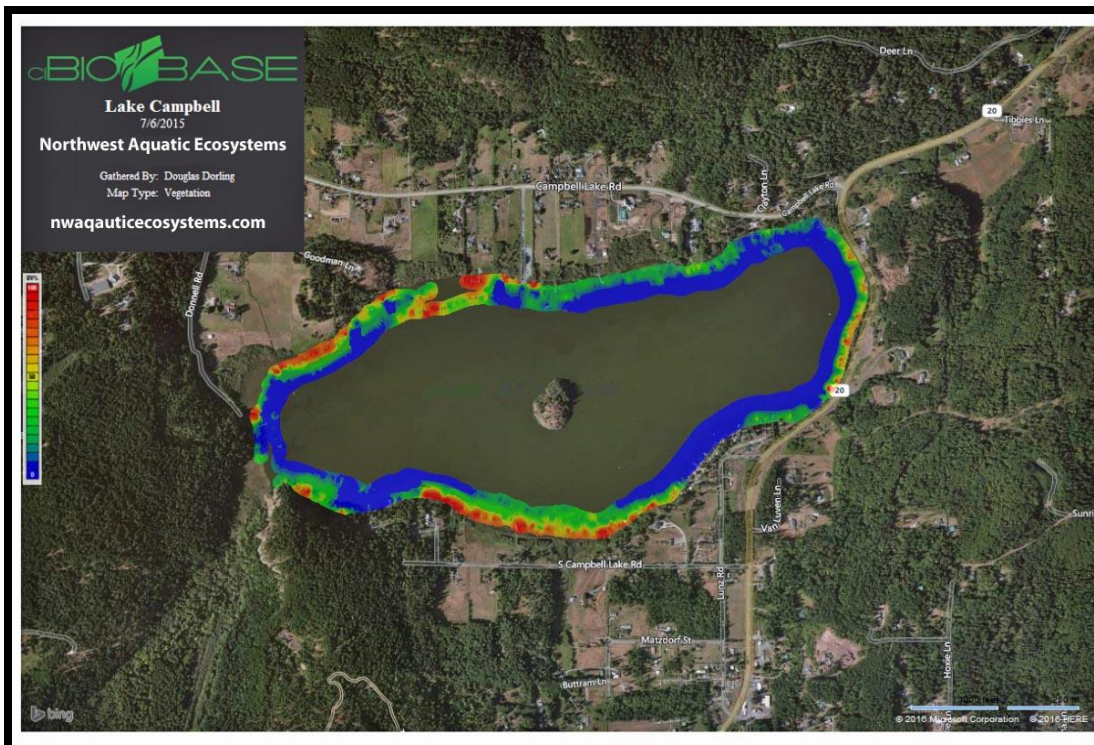
Blue areas indicate 0 % coverage



Lake Campbell Milfoil Locations October 2015

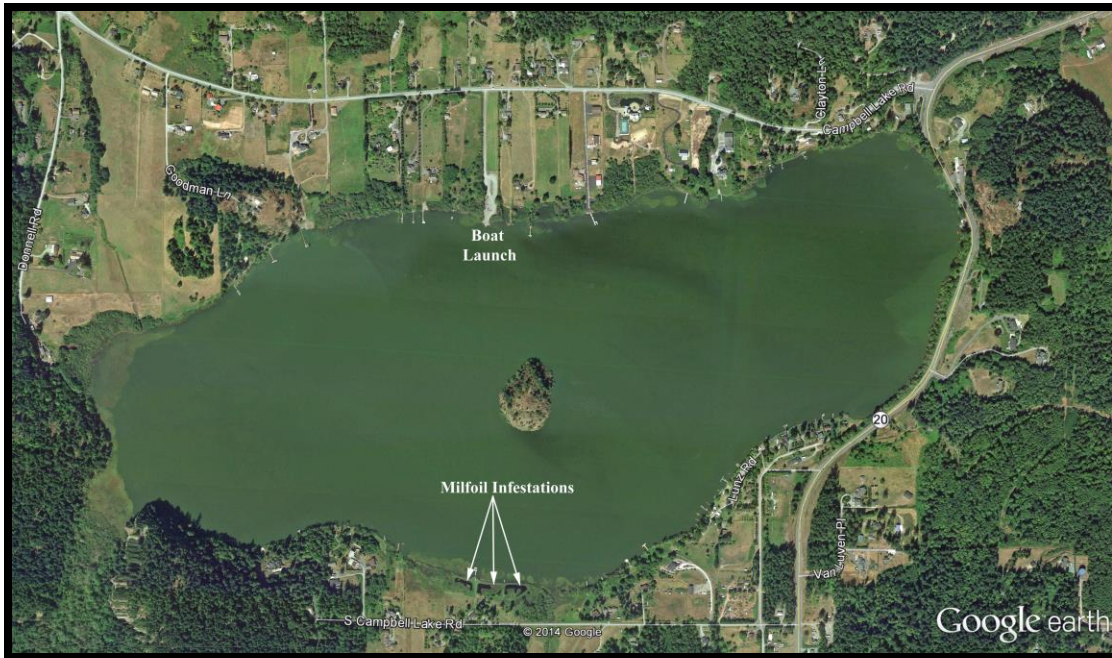


Lake Campbell Spring 2014



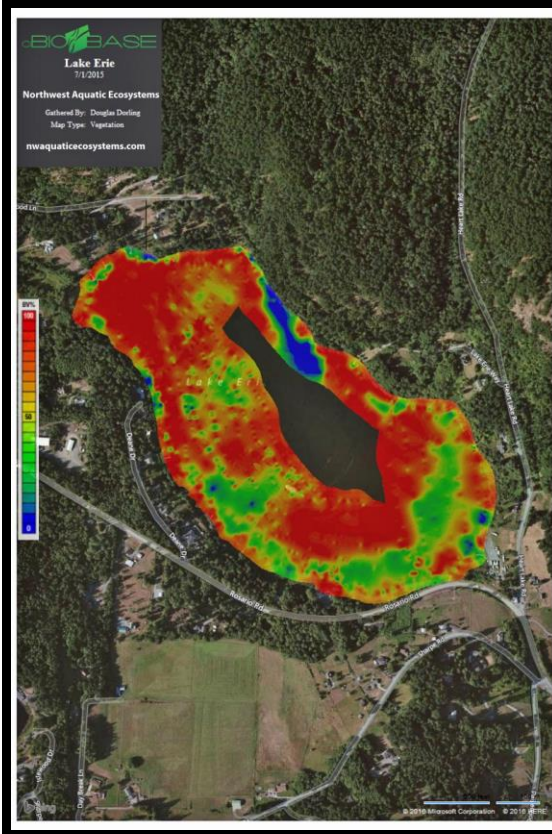
Lake Campbell Spring 2015

During the main lake survey the three small ponds located along the mid northern shoreline that were identified infested with milfoil during 2014 again were inspected for growth. All three ponds contained milfoil and the lake water level was elevated enough to provide direct flow of milfoil fragments into the main lake. The narrow causeway separating these waterbodies from the main lake was also undermined and contained a pipe permitting movement of plant fragments into and out of the ponds, even when the lake level was normal. Waterfowl and other animals were also potential avenues for movement of plant fragments out into the main lake basin..

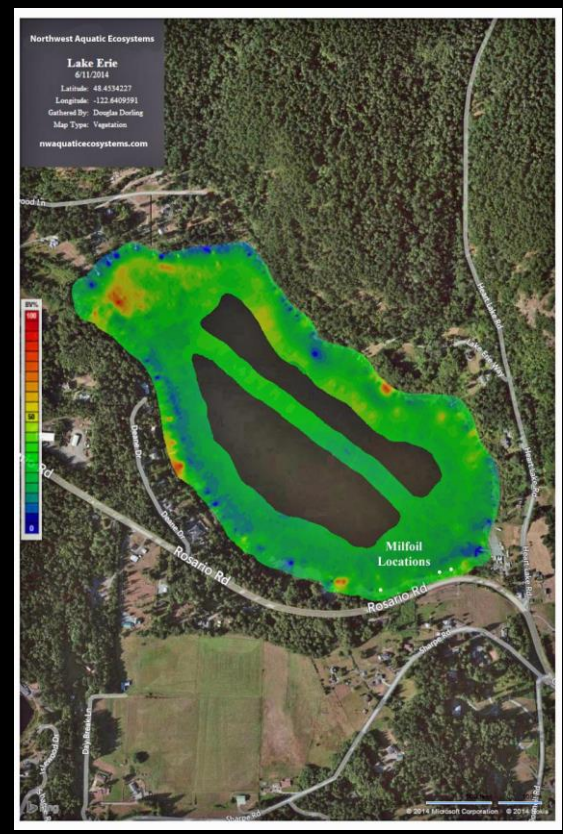


Lake Erie Pre Treatment Survey Results

Lake Erie was surveyed on July 1, 2015, water clarity was good. Once again sporadic single milfoil plants were noted along the southeastern shoreline. Native weed growth density had increased considerably lake wide in comparison to 2014 densities. Growth had reached the water's surface and was impacting the immediate shoreline residential homes. These survey results were not surprising since at the close of 2014 regrowth from the earlier summer weed treatment was evident. Najas over the past few years has become the dominant species throughout the lake. Although numerous thin leaved pondweeds were present these species comprised only a small percentage of the lakes total biomass associated with macrophyte growth.



Spring 2015 Survey



Spring 2014 Survey



Milfoil Locations Spring 2015

Lake Campbell Treatment

Lake Campbell was treated on July 28, 2015. Prior to treatment the area was posted. The public boat launch was posted with two large signs and the residential shorelines received smaller signs. Postings noted the materials used and water use restrictions. A private staging area just north of the public boat launch was employed during treatment. Two materials were applied during the application phase of the project. Sections of the shoreline required either the use of diquat, 2,4-D or a diquat/2,4-D mixture. Shoreline emergent plants, lily pads, purple loosestrife, yellow iris and Nuphar were also treated on July 28 with glyphosate. A majority of the treatment was directed toward purple loosestrife and yellow flag iris control. A tank mixture of 1% glyphosate was sprayed directly onto the targeted sites. Upon location of an infestation the treatment boat anchored along the shoreline and either walked the shoreline or moved from one shoreline location to another.



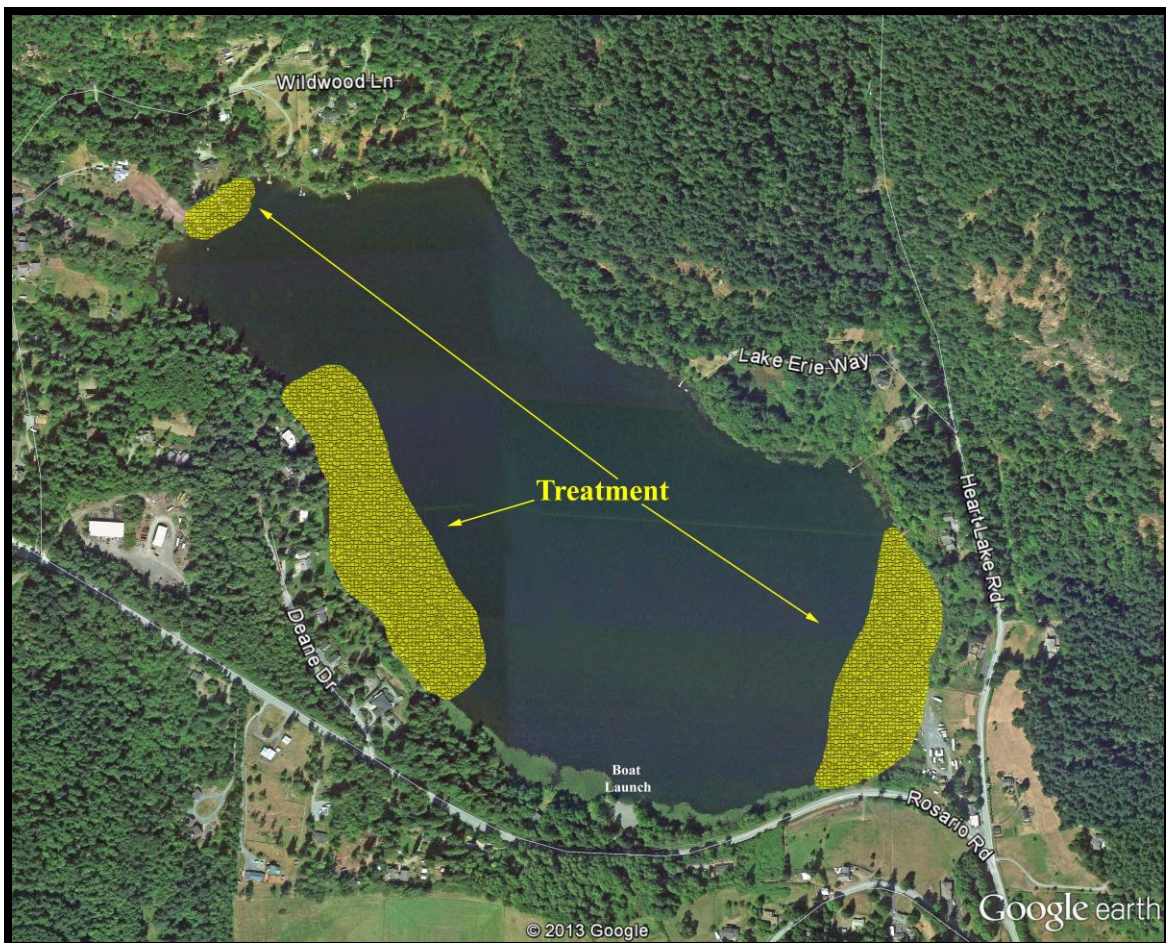
July 28, 2015 Macrophyte Control

Lake Erie Treatment July 1, 2015

Lake Erie shoreline was posted prior to the spraying event on July 1. Shoreline postings were placed on the immediate docks or near shore trees. Two large two foot by three foot signs were also positioned along the access road leading to the launch site and one sign

was placed adjacent to the boat launch. These larger signs identified where the materials were applied and what materials were used.

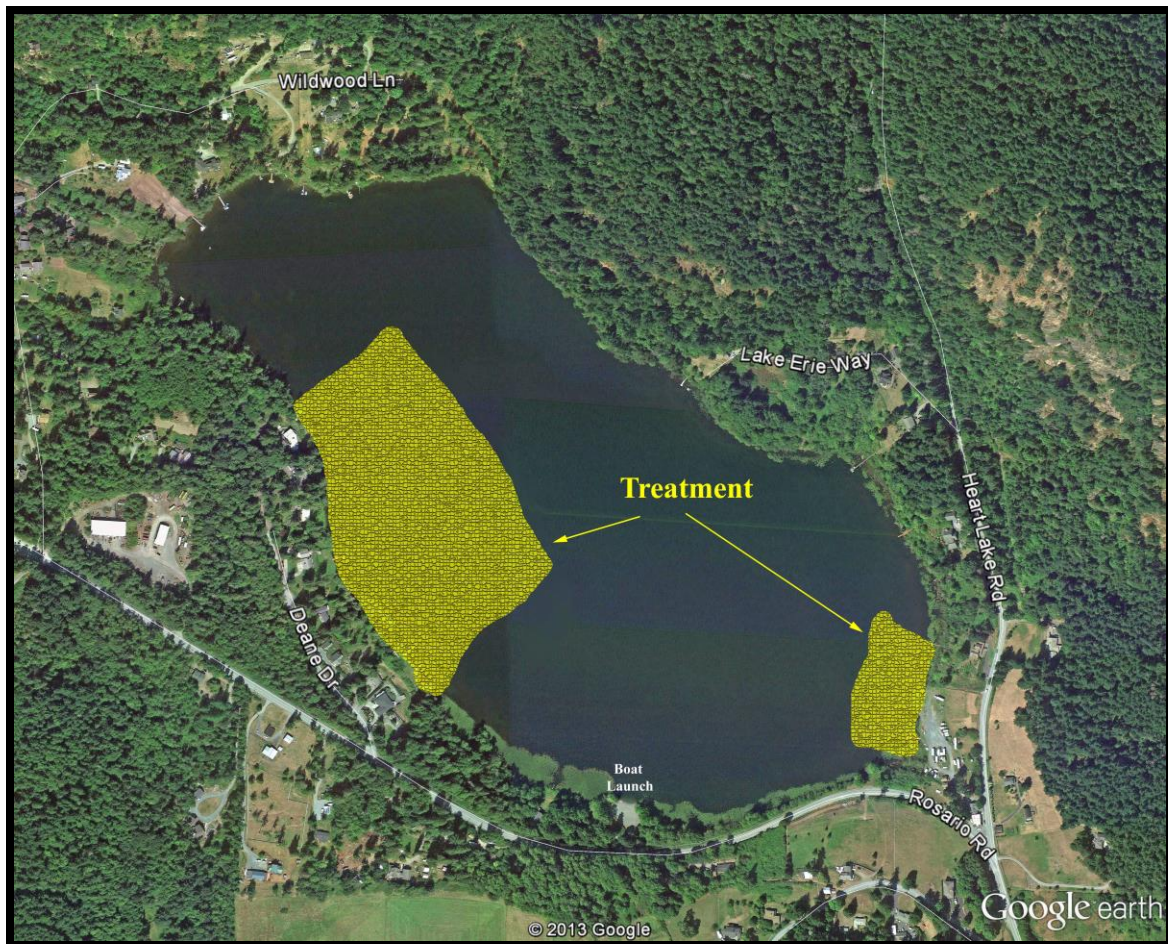
Treatment acreage was reduced from 25 acres in 2014 to 20 acres with the contact herbicide Tribune (diquat). No shoreline emergent or floating plants were targeted. Staging area was located at the public boat launch. Materials were stored in a locked pickup truck and transferred from the truck to the application boat as needed. Once material transfer occurred and the boats tanks were full, the licensed applicator preceded to the targeted treatment sites and dispersed the material. Materials were injected directly over the targeted weed beds via a boom system designed to disperse the mixture vertically throughout the macrophyte column. The treatment boat was equipped with a GPS system that ensured the application vehicle remained within the boundaries of the treatment zone.



Native and Non-Native Species Application Sites 2015

Lake Erie Treatment August 20, 2015

At the close of the 2014 season native plant growth had re-infested sections of Lake Erie. A decision was made by the board that if such conditions surfaced once again during 2015 than a secondary treatment would be performed. Such conditions surfaced and a secondary treatment consisting of approximately 17 acers was executed. The majority of this treatment targeted the mid-eastern residential shoreline lake area.



Lake Erie & Campbell Surveys October 10, 2015

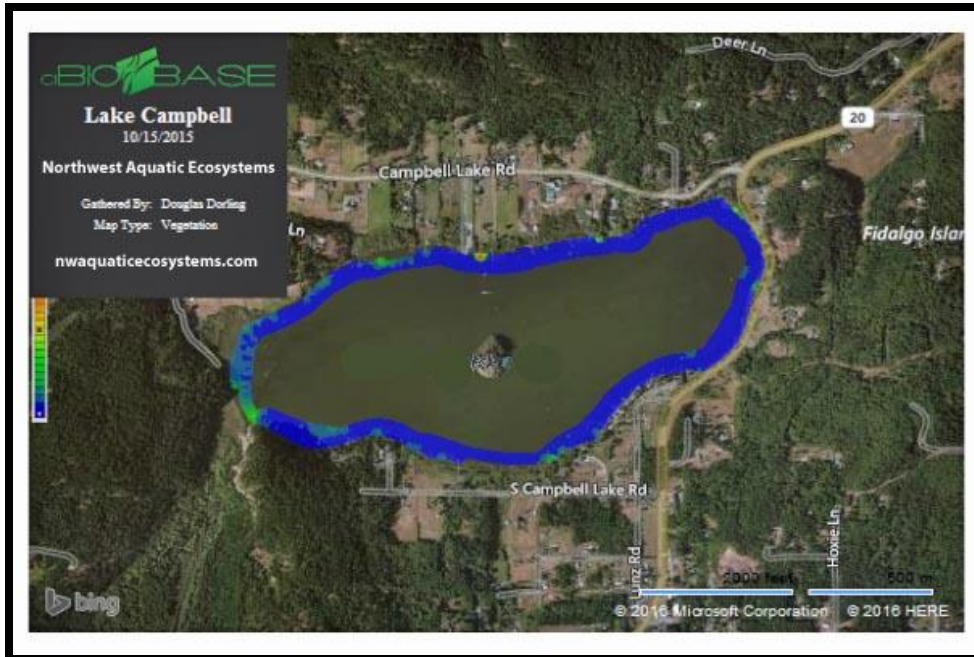
Lake Erie and Campbell were both surveyed on October 15, 2015. No milfoil plants were identified during the Lake Erie survey and the late season submersed weed treatment succeeded in suppressing weed growth considerably. The Lake Campbell survey resulted in two unexpected occurrences both of which were discouraging.

1. Northwest Aquatic Ecosystems received a phone call from a property owner located just east of the public boat launch that their small private pond with direct access to the lake was infested with milfoil. The problem became apparent after the property owner had cleared brush from along the ponds shoreline and entrance

to the main lake. The pond was not visible from the lake until after the brush had been removed.

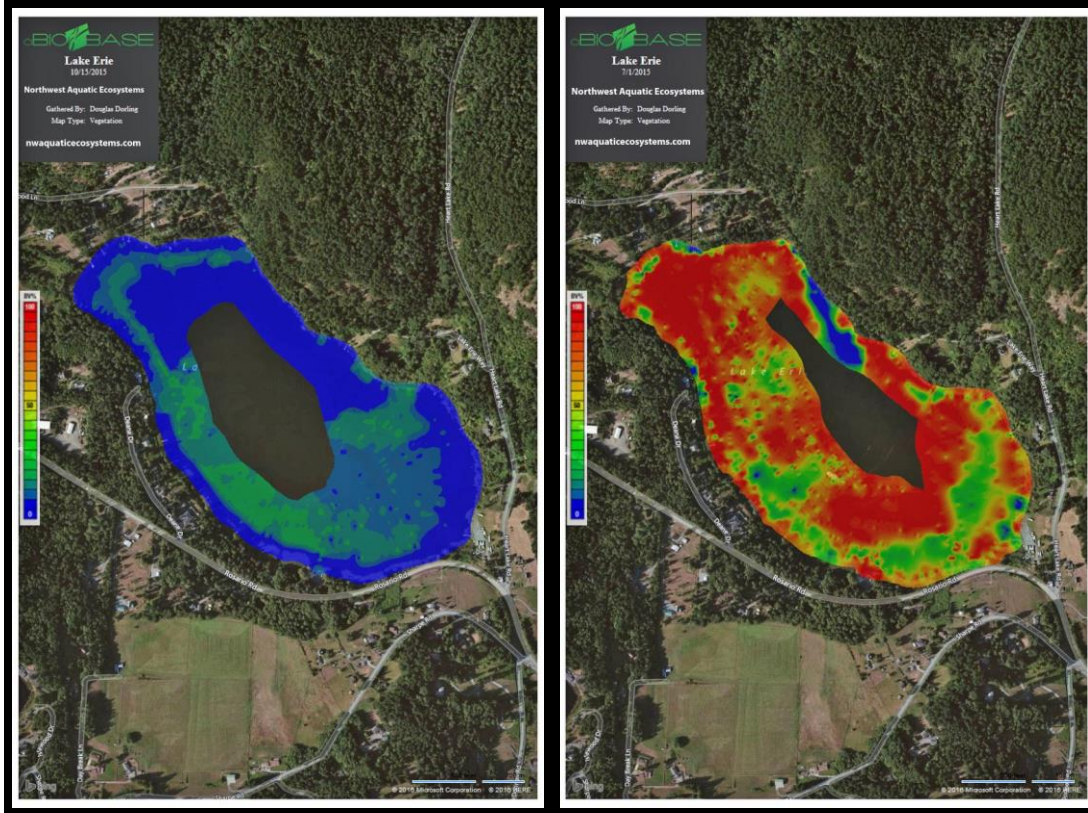
2. The extreme eastern shoreline of the main lake was experiencing a moderate late season milfoil growth that was not present during the spring survey. This was a disappointing finding since the infestation was at the opposite end of the lake from the milfoil treatment performed earlier in the year.

As a result of the findings it was decided to exceed the allocated budgeted funding for 2015 and treat both sites.



Fall Survey 2015





Fall Survey Lake Erie 2015

Spring Survey Lake Erie 2015

Lake Campbell Milfoil Treatment October 21, 2015

A late season milfoil treatment was conducted in response to the fall survey. The private residence located along the eastern shoreline was treated with Triclopyr (Renovate) while the main lake application consisted of a diquat application. The goal of the main basin treatment was to control the milfoil in a cost effective fashion in an effort to eliminate the production of plant fragments lake wide and possible expansion of the infestation. Approximately 17 acres of the main lake were treated. The lake treatment site and public boat launch were posted similar to other shoreline postings required prior to treatment.

Recommendations For 2014

Milfoil growth within Lake Campbell increased during 2015 with late season growth noted similar to 2014. As a result of the increased growth native weed control activities were reduced within Lake Erie in order to address the elevated noxious growth occurring at Lake Campbell. Native weed species are still problematic at Lake Erie while native species are beginning to increase their range on Lake Campbell. Lake Erie native weed growth will probably follow cycles where one year growth may require two treatments and others only one. It is safe to assume that Lake Erie will require some degree of native weed control on a year to year basis. The areas treated for problem milfoil growth at Lake Campbell during 2015 will likely require additional applications in the upcoming years. The unexpected milfoil infestations that have direct access to the main lake have now been identified and treated. This should reduce the possibility of future infestations from non lake sources.

Northwest Aquatic Eco-Systems recommendations for the 2016 season are as follows:

1. Control of approximately 30 acres of single stemmed milfoil plants within lake Campbell as noted on the survey maps. This infestation has increased in range along the perimeter of the shoreline. Current infestation needs to be addressed again during 2016 in order to halt further expansion lake wide.
2. Extend the Lake Campbell surveys to include the two individual private shoreline residential parcels.
3. Targeted control of spatterdock at both lake sites to manage the encroachment of this species into the main basin and along residential shorelines. Control of the noxious species fragrant waterlily, purple loosestrife and yellow iris should continue lake wide as the budget permits.
4. Treatment of problematic Lake Erie native weed species when such species are hindering lake use. These treatments are typically cyclical in nature when only one treatment may be required one year and others two. The need for either one or two treatments will probably be weather dependent.
5. Lake Campbell management continues to focus solely on milfoil growth while Lake Erie requires the ability to manage both noxious and troublesome species in an effort at keeping the best interest of the property owners and the lake systems health in perspective. Milfoil treatments should be designed to control the targeted species while resulting in the least negative effect to the Nuphar.
6. Continued use of the new survey technology. This technology and mapping has proven to provide a broad based evaluation of the macrophyte communities. Yearly surveys are now capable of providing simple color coded maps reflecting yearly changes in plant densities.
7. Expansion of the budget for 2016 may be necessary to account for the increased milfoil problems associated with Lake Campbell and potential secondary treatments on Lake Erie.
8. The shallow nature of Lake Erie and the growth characteristics of najas tends to favor surface weeds late in the season. These plant features encourage a secondary treatment.