

Lake Campbell and Lake Erie 2012 Aquatic Plant Control Program

Prepared By
Northwest Aquatic Eco-Systems
855 Trosper Road SW #108-313
Tumwater, WA 98512
360-357-3285
Pondweeds@comcast.net
www.nwaquaticecosystems.com

Project Overview

This will be Northwest Aquatic Ecosystems third consecutive year providing services to the Lake Erie and Campbell waterways. The 2012 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 begun to pose similar recreational hazards as the noxious macrophytes. Although not prevalent yet on Lake Campbell, native species have expanded throughout Lake Erie and will require management in order to provide a safe recreational environment to those abutting property owners and the local community population. 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. This report reviews all activities undertaken at both lake systems during the year 2012. Prior to the onset of 2012, both lakes retained small problematic patches of milfoil that have historically been identified to reside within specific lake areas.

Survey Protocol

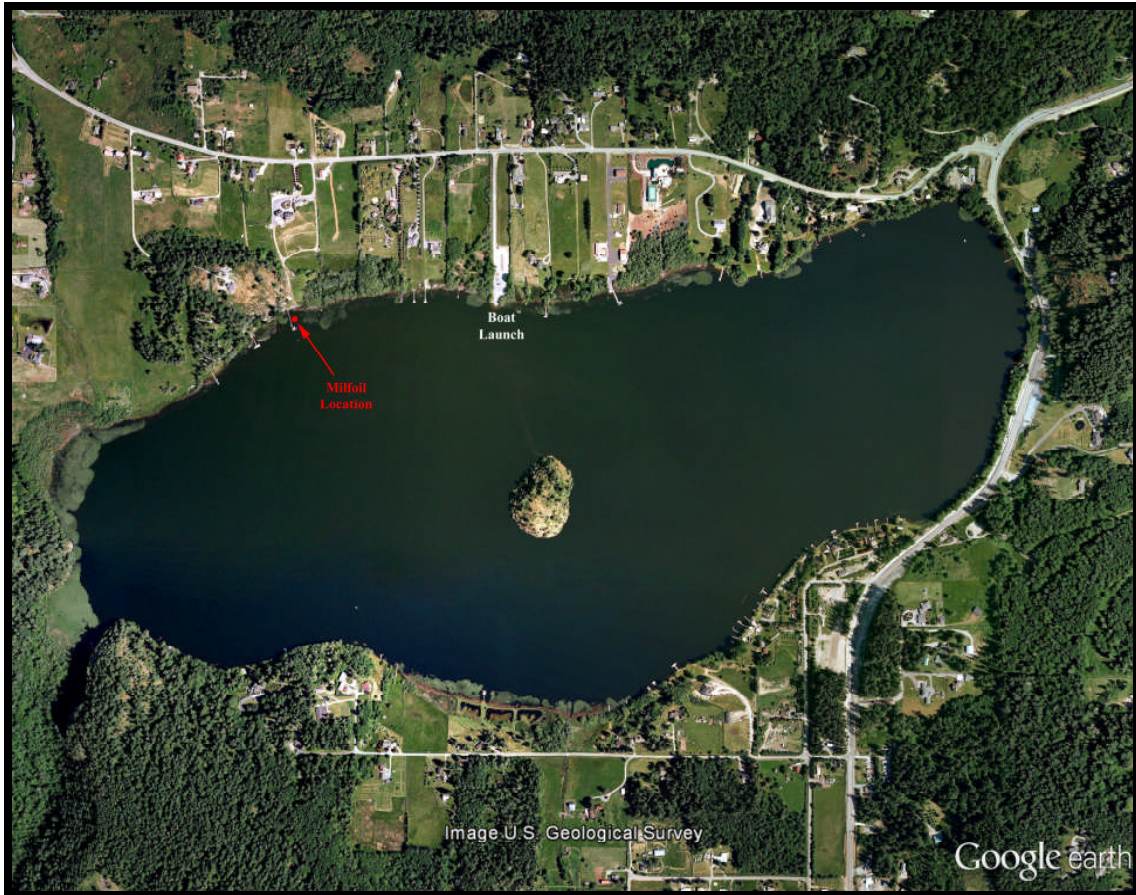
Survey techniques were typical of those utilized during 2011 and are identified throughout the industry as standard protocol. Surveys did not occur until mid-July at which time water clarity ranged from good to poor. Lake Campbell was experiencing an algae bloom while waters throughout Lake Erie were relatively clear. Water clarity and weather conditions at Lake Erie resulted in the survey team having the ability to observe the lake bottom and identify plant coverage without the need of divers or extensive manual bottom sampling. Lake Campbell required a mixture of shoreline observations and manual bottom sampling in waters typically at or near the dock edges and into the

open main lake body. Typically, sampling consisted of manually retrieving weed samples from numerous locations lake-wide. Although effective, this process can only identify plants within the immediate area sampled. Visual observation is a far superior method for plant inventory since it allows for inspection of the entire lake bottom wherever the survey boat operates. This avoids the possibility of missing plants between bottom surveying data points. Data was gathered while transversing both lakes in a gas powered boat. 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 visually through the water column. If the lake bottom was void of plants, no data was stored. The survey boat spent most of the day within 600 feet of the shoreline.

When non native species were identified, data was collected and stored on a Trimble Geo XT GPS system. Nuphar (spatterdock) and Nymphaea (fragrant water lily) infestation data had been collected during earlier surveys and were not incorporated into this year's survey protocol. Nuphar and Nymphaea growth rates are relatively slow and there were no expectations that the species had increased in range since the 2010 survey. The survey boat started collecting data circling the immediate shore. Once the initial shoreline pass was completed the boat moved outward approximately 50 to 100 feet for each successive pass. The survey was completed once the boat obtained a 600 foot distance from the shoreline.

Lake Campbell Pre Treatment Survey Results

Lake Campbell was visited on July 11 & 12. At the time of the survey, water clarity was poor with visibility to only about four feet. Water color was brownish green in color with no surface scums observed. The survey was delayed due to communication problems between the contractor and Skagit County. Limited native macrophytes were noted and only one milfoil plant was noted west of the boat launch. No milfoil fragments were noted on the water's surface or adjacent to the shorelines during the survey. These results were not unexpected due to the relatively low occurrence of milfoil plants noted during 2011.



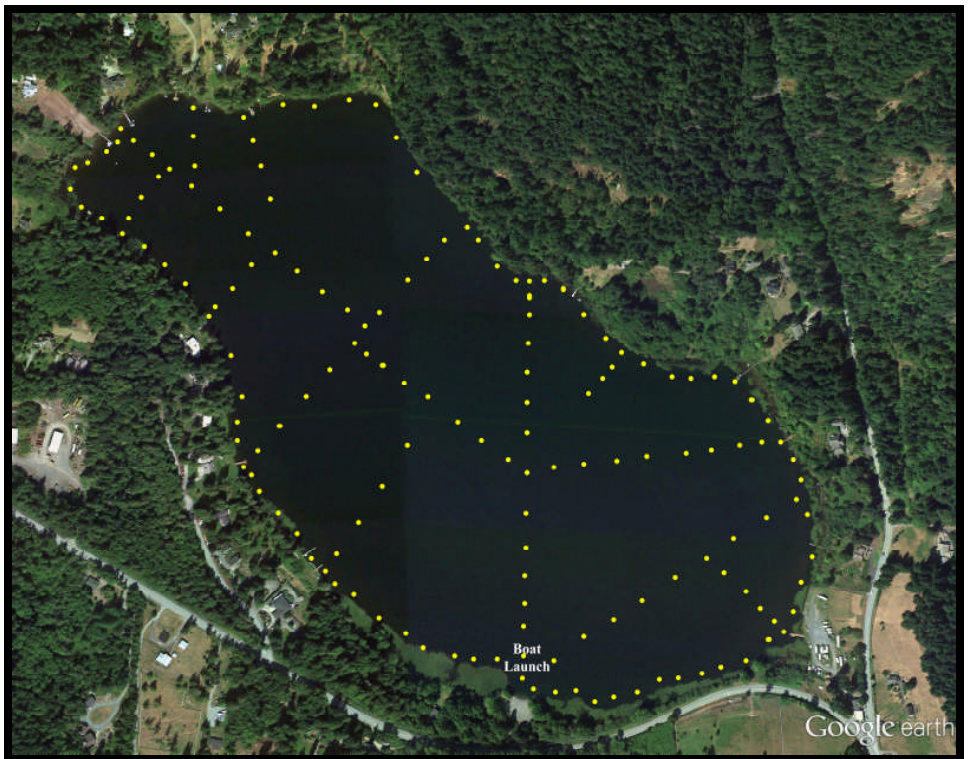
Lake Campbell Milfoil Locations July 2012

Lake Erie

Lake Erie was surveyed on July 11, 2012. There were no observed milfoil fragments floating on the lake's surface or along the shoreline. Only four sampling events identified the presence of milfoil. These were all located southeast of the boat launch within the shoreline property boundaries of the recreational camper facility parcel. Similar to 2011, much of the lake bottom was experiencing native plant growth consisting of Najas, pondweeds, bladderwort and coontail. Najas was the dominant species throughout the system, najas had begun to surface along the shoreline areas of the lake. Najas was already restricting lake access from numerous shoreline areas.



Lake Erie Milfoil Locations Spring 2012



Lake Erie Native Weed Species Locations

Proposed Treatments

Lake Campbell

At the time of the July survey, the single milfoil plant was hand dug and removed from the system. No further action was anticipated until the late summer spraying of the shoreline emergent noxious species yellow iris and purple loosestrife. During this event residential properties experiencing spatterdock encroachment were also considered for possible treatment. No native plant control is scheduled to occur during 2012.

Lake Erie

The limited appearance of milfoil and the lake wide demand for native plant control will shift the 2012 treatment program to one that targets the native weed problem. Limited control of native plants proved very successful during 2011 and an expansion of the program appears to be in order. Areas targeted during 2012 will include only those lake areas that are used for residential or commercial purposes. Treatments will extend outward to the mid portion of the lake until the maximum acreage available for treatment under the permit is achieved. We estimate that acreage to be approximately 50 acres. Since one of the targeted sites also contains the few noted milfoil plants, these plants will also receive treatment.

Spraying of the spatterdock adjacent to the public boat launch will also occur. This is a yearly spraying encompassing no more than a five to ten foot swath along the outside of the edge of the infestation. This procedure will slow down the plants encroachment into the main lake-body.

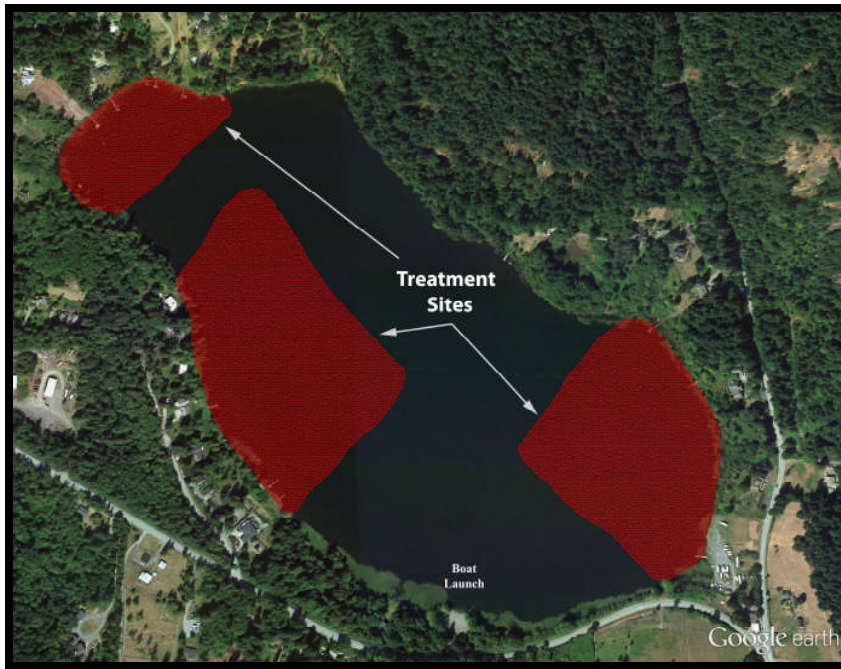
Macrophyte control will be accomplished with the use of a contact herbicide, Reward (active ingredient diquat). Application will be made at rates between 1-2 gallons per surface acre depending on the waters depth. Application protocol will utilize weighted injection hoses mounted on the bow of an Airgator Airboat. Lake water will be drawn into the boat with the herbicide being added through an injection manifold. Lake water will then be discharged through the weighted hoses extended just above the plant canopy. Once mixed, the Spatterdock control will be accomplished by tank mixing the appropriate spray mixture on board and then dispersing the mixture through a hand held spray gun.

July Macrophyte Control

Lake Erie July 23, 2012

Lake Erie shoreline was posted prior to the spraying event on July 23. A small gas powered boat was used to accomplish the task. Shoreline postings were placed on the immediate docks or near shore trees. Two large two foot by three foot signs were placed along the access road leading to the 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

Fifty acres of the lake were treated with the contact herbicide Reward (diquat). Staging area was located at the public boat launch. Material was stored in a locked cargo truck and transferred from the truck to the application boat as needed. Once material transfer occurred and the boat tanks were full, the boat operator and licensed applicator proceeded to the targeted treatment sites and dispersed the material.



Native and Non-Native Species Application Sites



Nuphar (Spadderdock) Application Sites

Lake Erie & Campbell Inspection/Treatment August 20, 2012

Lake Erie and Campbell were inspected on August 20, 2012. The intent of the inspections was to evaluate any past treatments and perform additional applications if necessary. Lake Campbell was also scheduled to receive treatment of purple loosestrife and yellow iris infestations.

Lake Erie – The inspection revealed the apparent beginnings of a blue green algae bloom die-off. Northwest was unable to determine if the result of the die-off would result in algae free water or trigger an additional long term bloom. Targeted native species had responded well to the earlier herbicide application. It was unclear if the plant die-off triggered the bloom or if this particular bloom was similar to other historical yearly blooms. A few new milfoil plants were noted within the same lake area that has historically supported such growth. These single milfoil plants in conjunction with some shoreline Nuphar growth were treated.



Lake Campbell - Lake Campbell was experiencing an algae bloom similar to those underwent in years past. Purple loosestrife, yellow iris and spadderdock infestations were sprayed during this visit. Most of the emergent control was conducted along the northwestern shoreline previously sprayed during 2011. Contact was made with the single resident within this area that was not treated last year. Conversation resulted in approval to proceed with the spraying at this location. Two attached milfoil plants were observed in the area. Initially an attempt was made to dig the plants up. Proper equipment was not available to complete the task so the area was treated.



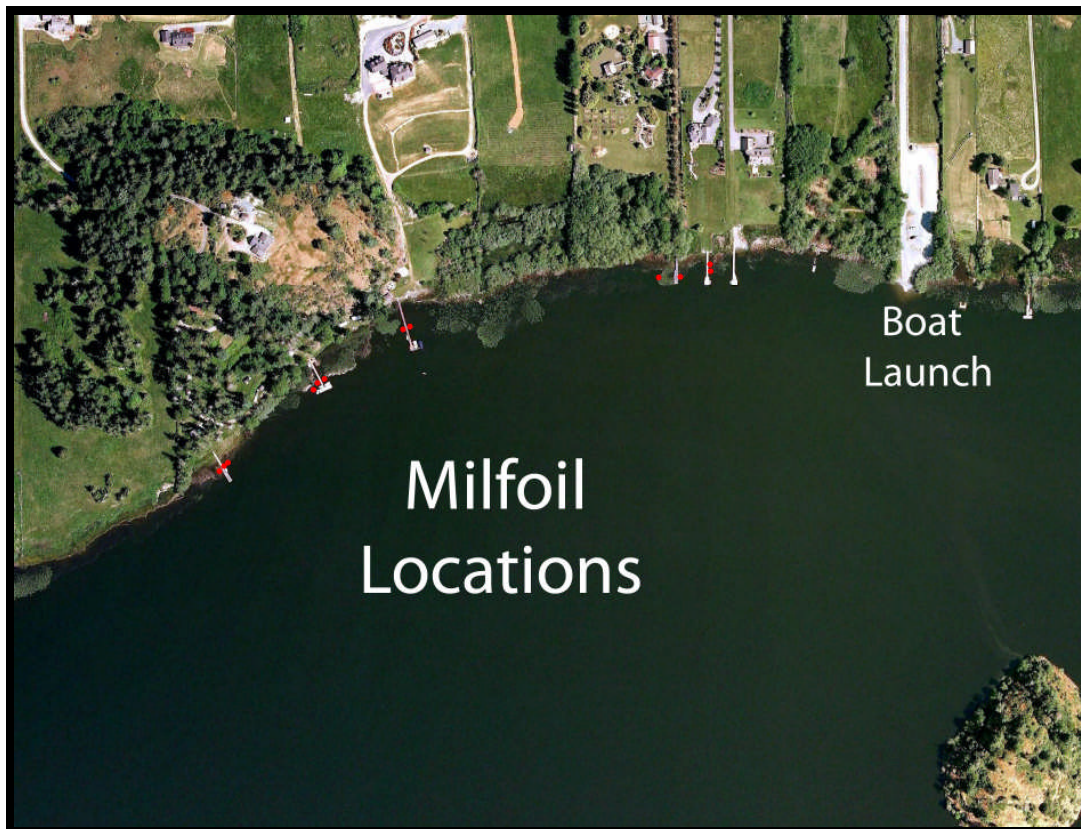
Emergent Plant Control



Milfoil Treatment

Lake Campbell Macrophyte Survey October 18, 2012

Spadderdock, yellow iris and purple loosestrife, targeted during our August 20 treatments, had responded well. Loosestrife plants were brown and brittle, yellow iris plants were in various stages of decomposition and those targeted spadderdock sites had a few floating plants present but the majority of the areas exhibited only plant stems with no leaves. The survey did reveal a late season growth of twelve single milfoil plants that had surfaced within the area previously treated. All plants were in shallow waters less than five feet in depth.



Milfoil Locations

There was relatively little change in the native plant populations as noted in the July survey. Much of the lake bottom was void of macrophytes. One would expect that due to the relatively shallow nature of the lake native plant growth would proliferate throughout the basin. Poor water clarity associated with suspended sediments and algae related problems has created a shallow photic zone prohibiting ample light penetration down to the lakes bottom sediments. Without a desirable light source seeds will not germinate or grow.

Recommendation For 2012

Milfoil plants continue to appear in very low single plant densities throughout both Lake Erie and Campbell. Plant locations are similar to those that have historically been treated with various materials on almost a yearly basis. Some years no milfoil is noted while others a few plants appear. 2012 proved to be an unusual year on Lake Campbell with the majority of milfoil appearing extremely late in the season. Native plants continue to plague Lake Erie while such species are virtually non-existent on Campbell

Northwest Aquatic Eco-Systems recommendations for the 2013 season are as follows:

1. Continued use of open communication between consultant, Skagit County and lakefront property owners in an effort to respond to changes in the lake environment quickly and provide the needed services effectively and in a timely fashion.
2. Early spring survey of both water bodies with special attention being given to those lake areas where milfoil appeared during 2012.
3. If water levels are shallow enough during the spring or early summer of 2013 where scuba gear would not be required to manually remove the few plants identified at the close of 2012 within Lake Campbell, such an attempt should be made. Only twelve plants were recorded along approximately 2,000 feet of shoreline supporting seven residential docks. If manual removal fails then a treatment again with a 2,4-D based product would be in order.
4. Continued control of the noxious species yellow iris and, purple loosestrife at both lake sites.
5. 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 should continue lake wide.
6. Treatment of Lake Erie native weed species that hinders lake use should be evaluated on a year to year basis. If treatment is warranted then such actions need to be implemented. Currently nearly 100 % of the lake is impacted by native plant growth.
7. The treatment of Lake Erie native weeds will probably occur within those lake areas that also supported the few remaining single milfoil plants. Native weed control will also seasonally control any milfoil plants residing within the treatment site. If the fall survey reveals the presence of milfoil regrowth, then a 2,4-D application should be applied to the site specific infestations.
8. 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.