Lake Campbell and Lake Erie
2013 Aquatic Plant Control Program

Prepared By
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Project Overview

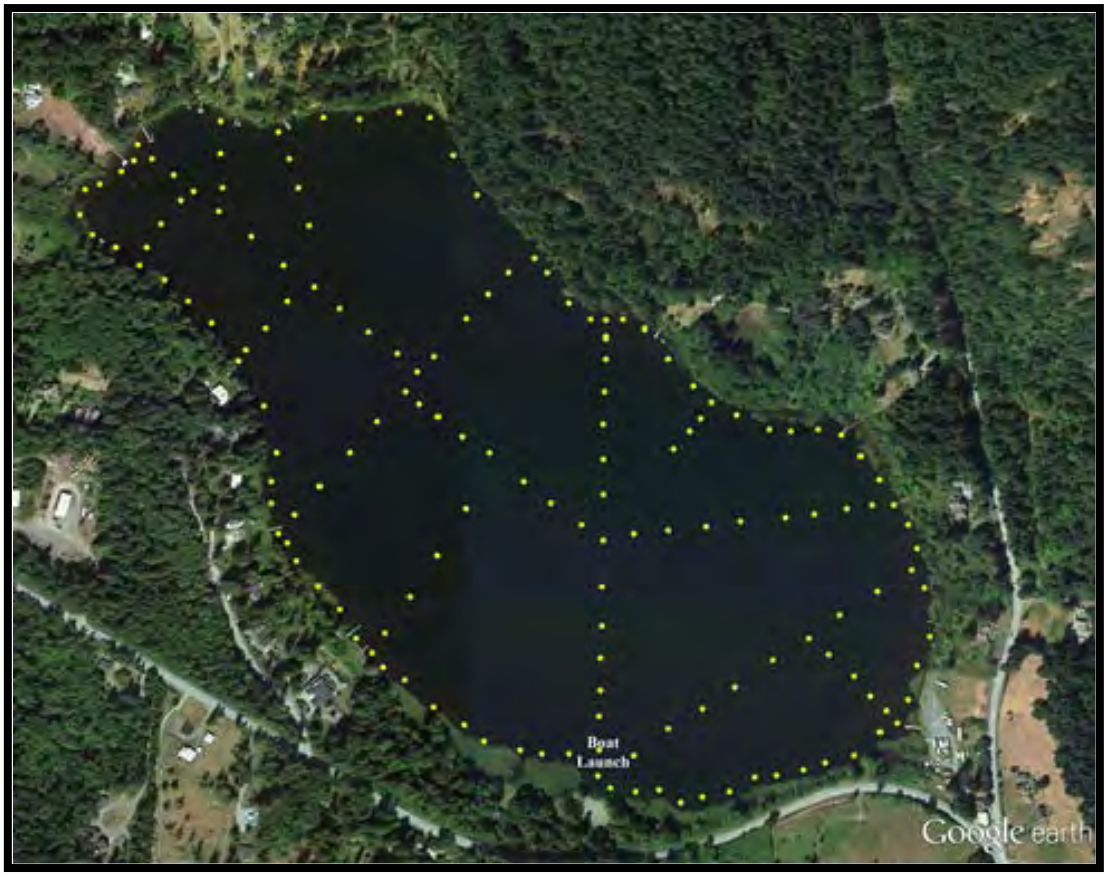
This will be Northwest Aquatic Ecosystems fourth consecutive year providing services to the Lake Erie and Campbell waterways. Some of the components of the 2012 report have again been incorporated into the 2013 report been. This approach has been taken so that a report reviewer will have an adequate historical timeline to reference. The 2013 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 within 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. 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 2013 season. Prior to the onset of 2013, both lakes retained small problematic patches of milfoil that have historically been identified to reside within specific lake areas.

Survey Protocol

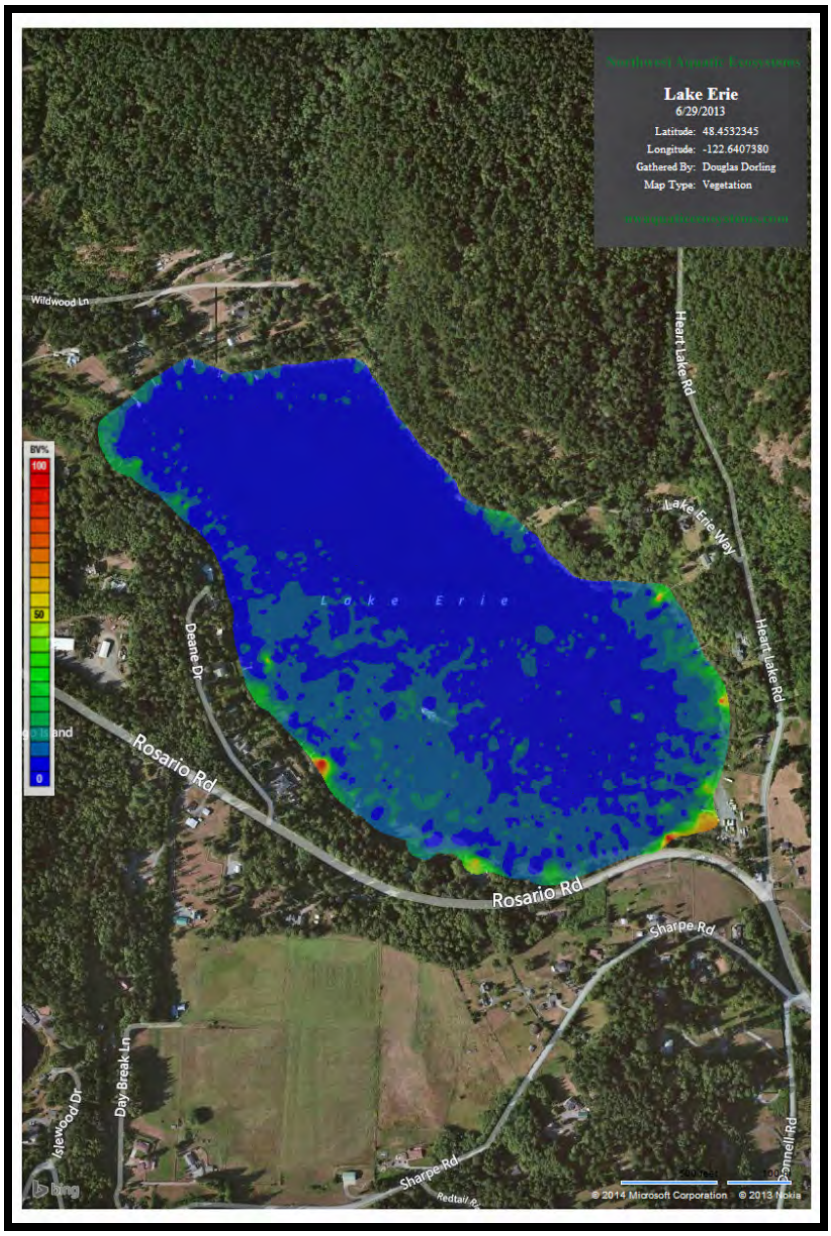
Survey techniques for 2013 differed slightly from past efforts in that new technology was incorporated into survey protocol. During 2013 sonar data was collected utilizing specific transducers and bottom scanning equipment. Once collected the SD card was uploaded via. cloud based technology and the processing of the data was finalized. The resulting product is a color coded map of the lake bottom identifying weed growth areas and plant densities. 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 allows you the ability to view all plant growth along the boats survey track. Past Lake Campbell and Erie surveys consisted of manually retrieving weed samples from numerous locations lake-wide while observing growth through the water column. Although effective, individual bottom sampling can only identify plants within the immediate area sampled. This new protocol avoids the possibility of missing plants between bottom surveying data points. This updated protocol encompasses a surface vehicle transecting the lake along the littoral zone.. Boat tracks are designed to be approximately 50 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 and stores the position of every transect data point enabling the mapping of thousands of data points on a daily basis.

When individual milfoil plants were identified from the surface way points were added to the transect line.



Old Technology

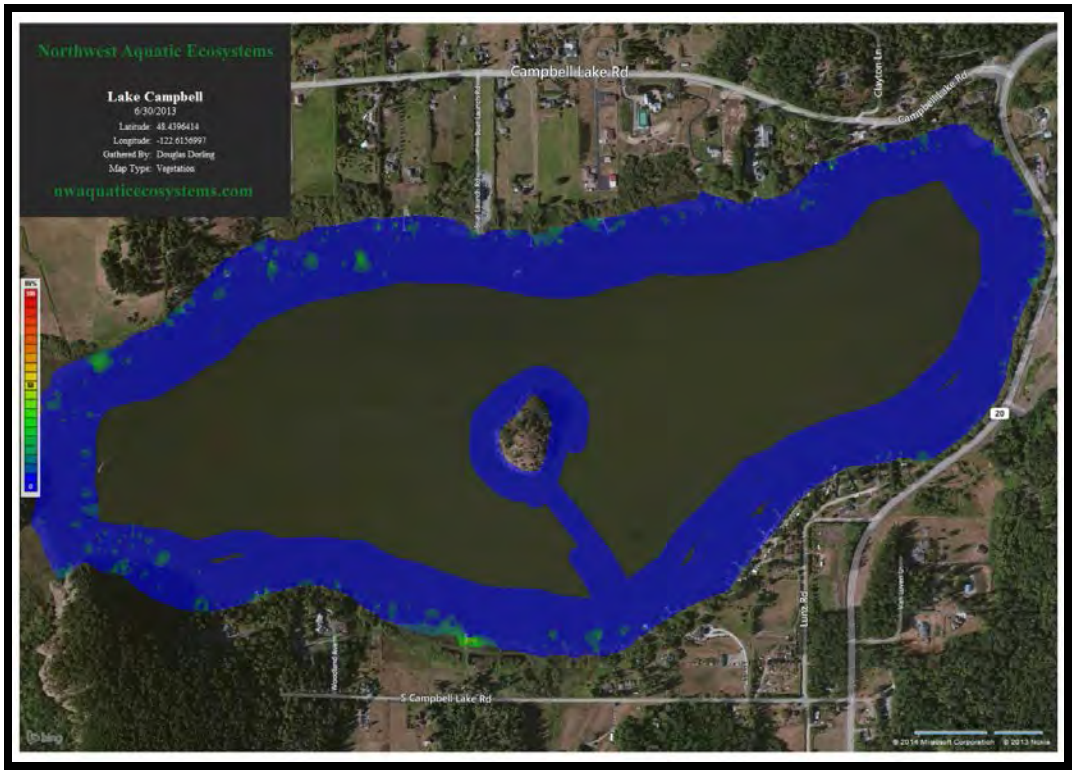


New technology

Lake Campbell Pre Treatment Survey Results

Lake Campbell was visited on June 30, 2013. At the time of the survey, water clarity was below average. Water color was brownish green in color with no surface scums observed. Similar to 2012 limited native macrophytes were noted and only a few single stemmed milfoil plants were noted southwest of the boat launch and at two locations along the south western shoreline. No milfoil fragments were noted on the water's surface or adjacent to the shorelines during the survey.

Lake Campbell Milfoil Locations June 2013

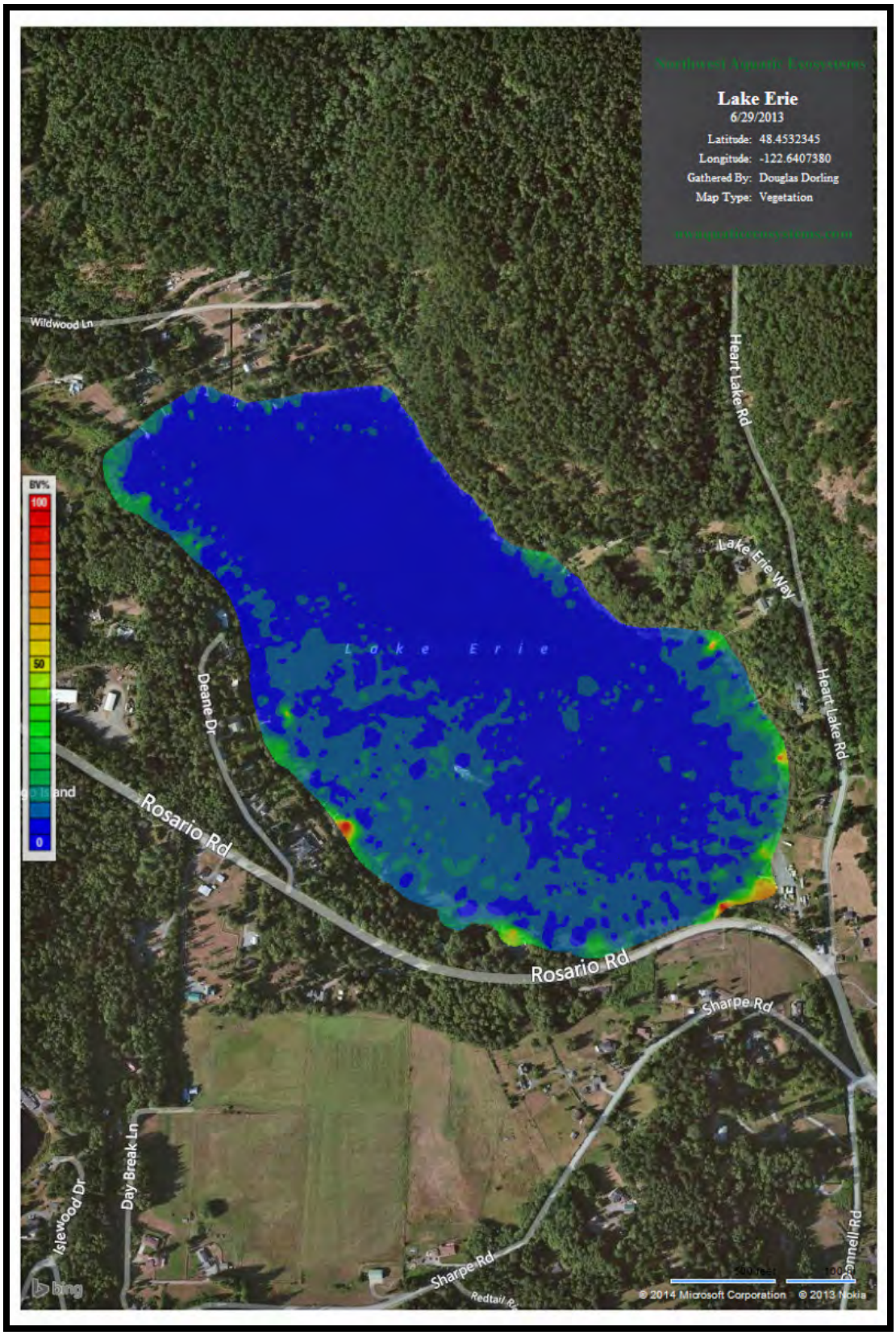


Lake Campbell weed densities and location. Blue areas indicate no weed growth.

Lake Erie

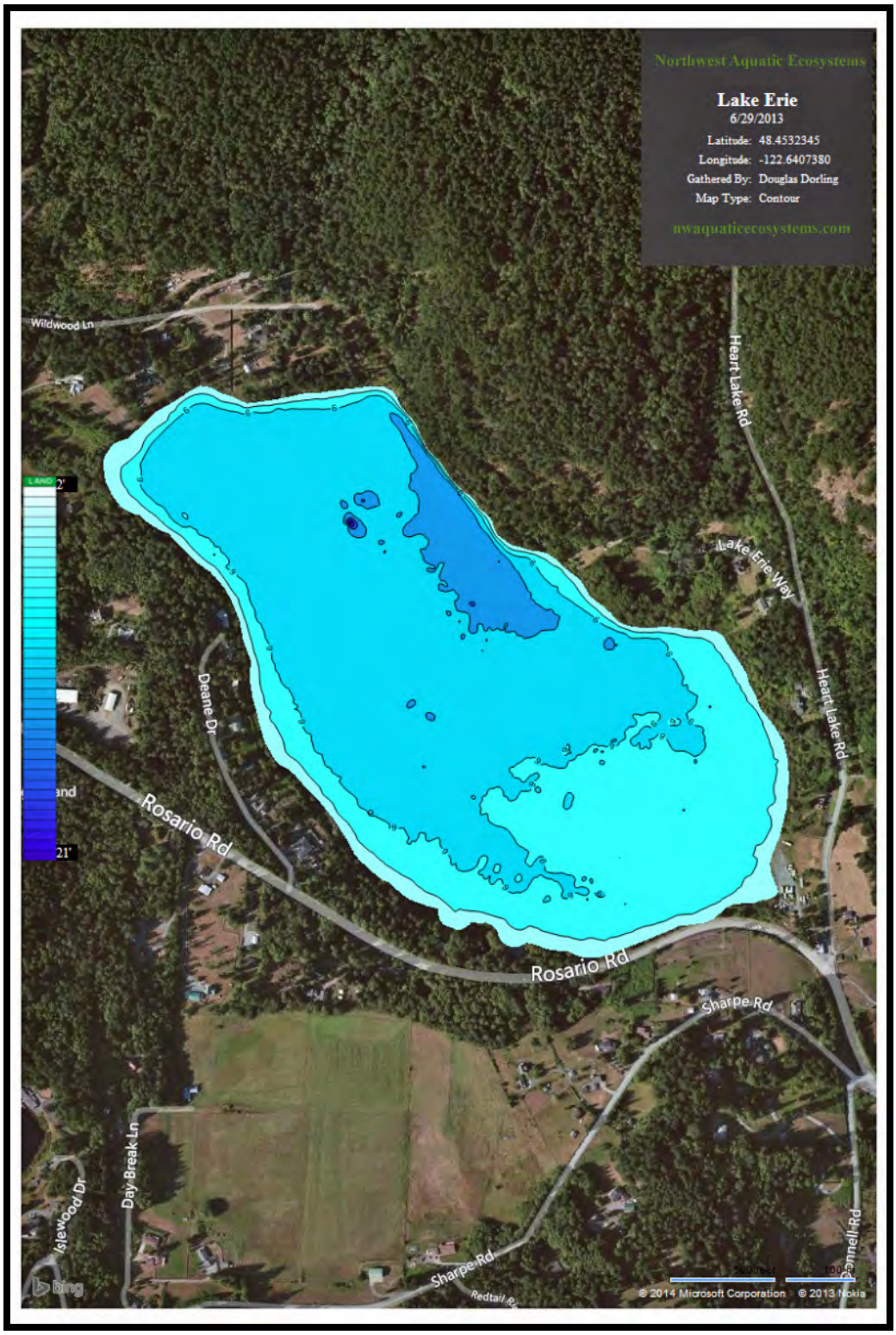
Lake Erie was surveyed on June 30, 2013. There were no observed milfoil fragments floating on the lake's surface or along the shoreline. Only five single milfoil plants were identified. These plants appeared in all the same areas as noted during 2012, along the southeast shoreline closed portion of the lake. Native weed growth had been reduced considerably from that observed during 2012 plants however were still impacting the immediate shoreline residential homes. Najas was the dominant species throughout the system. None of the native species had begun to surface along the surface of the lake.

Lake Erie Milfoil Locations Spring 2013

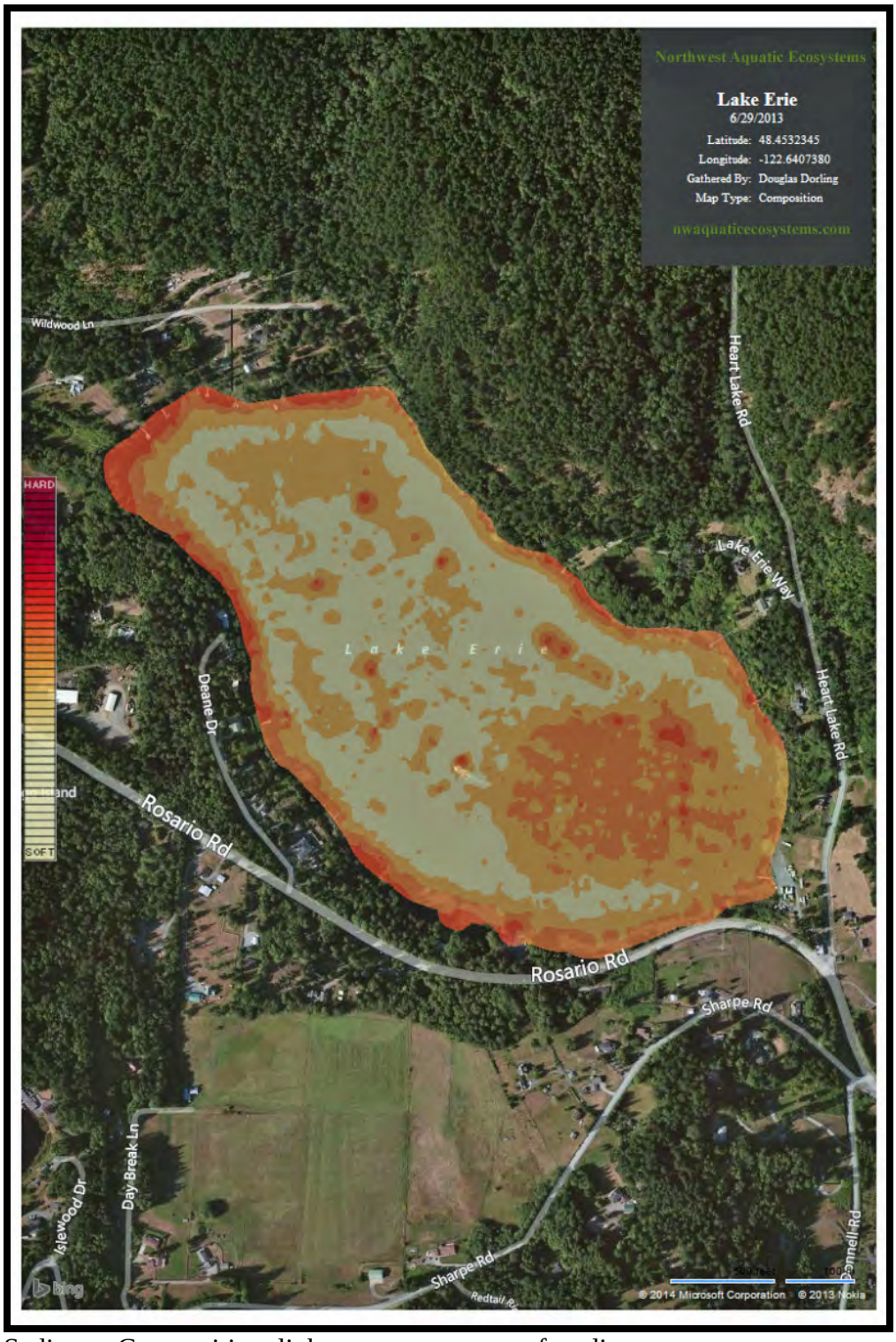


Lake Erie Native Weed Species Locations

The new survey format also produces a bottom contour of the lake and a sediment composition profile.



Bathymetric mapping, three foot contour lines.



Sediment Composition, light areas represent soft sediments.

Proposed Treatments

Lake Campbell

At the time of the June survey, poor water clarity may have restricted our efforts to locate all of the milfoil that had been present during the survey. A decision was made that either the milfoil plants would be manual removed from the system or chemically treated depending on densities and locations. Treatment if required would consist of a granular application of 2,4-D. Emergent noxious species, yellow iris and purple loosestrife would be targeted with a 1.5% tank mixture of glyphosate. Spadderdock populations restricting dock use would be considered for control. No native plant control was scheduled to occur during 2013.

Lake Erie

The limited appearance of milfoil and the problematic occurrences of native weed species lake wide warranted control efforts to ensure safe recreational opportunities lake wide. Limited control of native plants proved very successful during 2011. The success of the 2011 program expanded control to a greater portion of the lake during 2012. These areas were again treated during 2013. NWAE estimated that approximately 50 acres will require treatment. Since one of the targeted sites also contains the few noted milfoil plants, milfoil within this portion of the lake will also receive treatment.

Spraying of the spadderdock 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 limited approach will slow down the plants encroachment into the main lake-body.

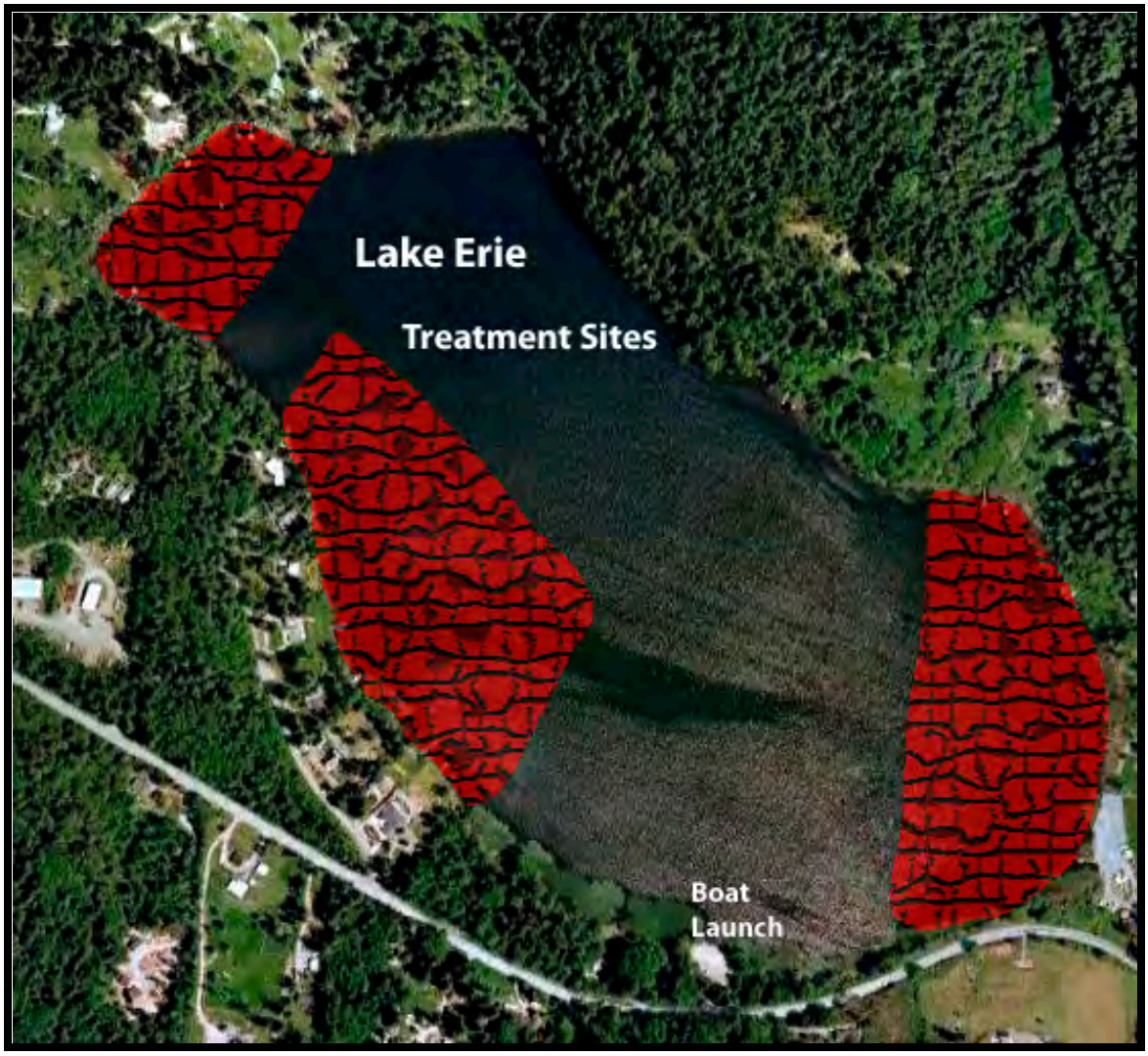
Macrophyte control will be accomplished with the use of a contact herbicide, Reward (active ingredient diquat). Application will be made at rates between 1-2 gallons per surface acre depending on the waters depth. Application protocol will utilize weighted injection hoses mounted on the bow of an Airgator 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. Spadderdock control will be accomplished by tank mixing a 1.5% solution of glyphosate on board in two 25 gallon tanks and then dispersing the mixture through a hand held spray gun directly onto the surface of the targeted plants.

July Macrophyte Control

Lake Erie July 23, 2013

Lake Erie shoreline was posted prior to the spraying event on July 23. The treatment boat was used to accomplish the shoreline posting 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 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.

Forty-five acres of the lake were treated with the contact herbicide Reward (diquat). Six acres were treated for milfoil control and only .25 acres received spadderdock control. The majority of the spadderdock control took place along the boat launch shoreline and one residential property just north of the launch. 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 preceded to the targeted treatment sites and dispersed the material.



Native and Non-Native Species Application Sites

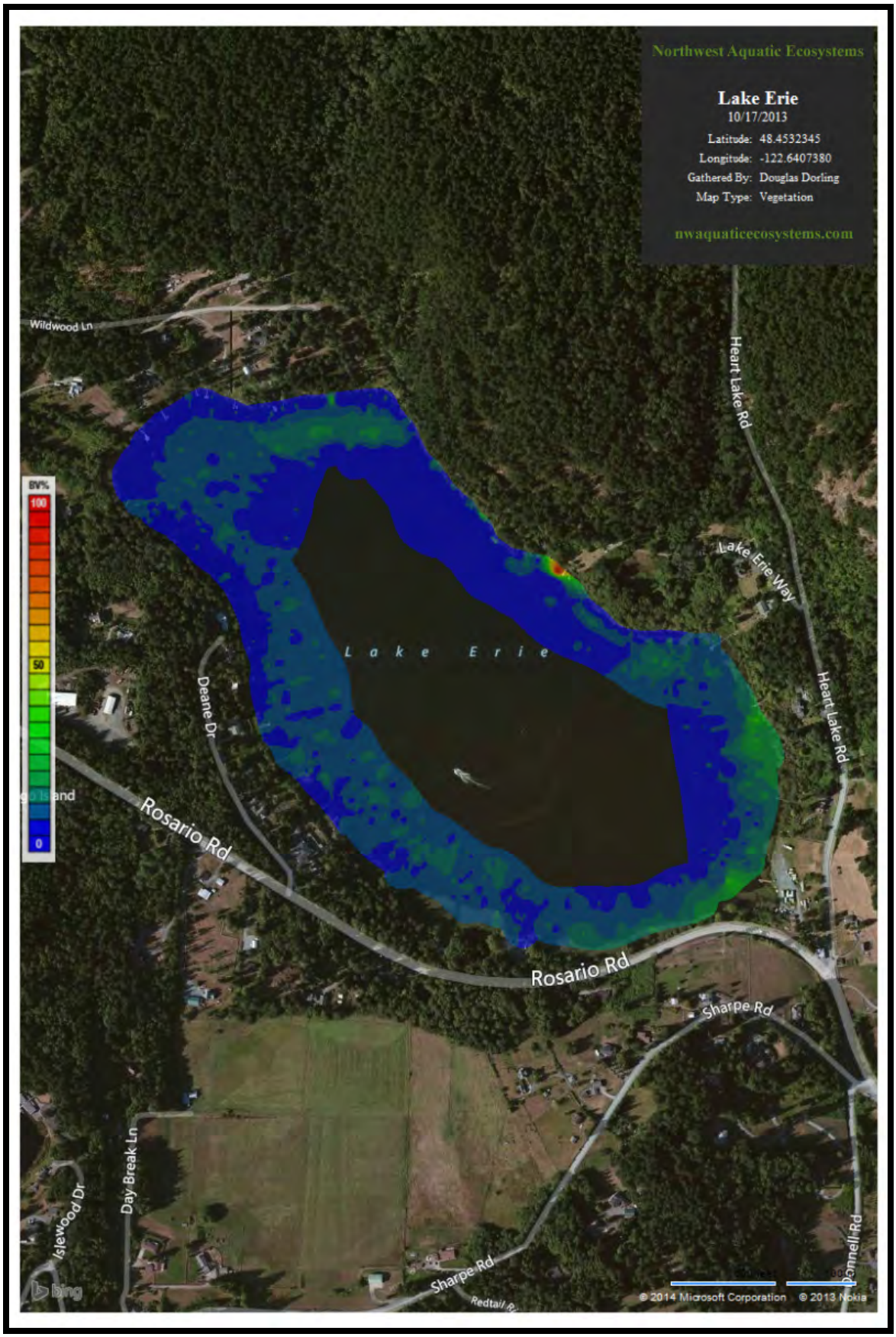
Nuphar (Spadderdock) Application Sites

Lake Campbell July 23, 2013

A brief inspection of the prior milfoil locations noted an increase in the number of plants throughout those lake areas previously identified with milfoil. The decision was made to treat the area with a granular formulation of 2,4-D. Twelve acres were treated with the granular material Navigate. A granular spreader attached to the bow of an Airgator airboat dispersed the material as the treatment vehicle transversed the application zone. Once this phase of the application was completed the application boat was then reconfigured for the spraying of the spadderdock, iris and loosestrife.

October Survey

Lake Erie and Campbell were both surveyed on October 17, 2013. The Lake Erie survey was hampered by an algae bloom that had persisted throughout most of the summer. The intensity of bloom at the time of the survey was in decline. Our Lake Erie survey did reveal the absence of milfoil plants and that the targeted native plant species (najas) had been controlled. Most of the areas once infested with Najas were now supporting the native bottom dwelling filamentous algae species nitella and chara. These are typically low growing species that occasionally create problems. The shallow nature of Lake Erie in the past has produced problems associated with chara.


Northwest Aquatic Ecosystems
Lake Erie
10/17/2013
Latitude: 48.4532345
Longitude: -122.6407380
Gathered By: Douglas Dorling
Map Type: Vegetation
nwaquaticecosystems.com
BV%
100
50
0
Wildwood Ln
Heart Lake Rd
Lake Erie Way
Lake Erie
Deane Dr
Rosario Rd
Rosario Rd
Sharpe Rd
Sharpe Rd
Day Break Ln
Islewood Dr
Heart Lake Rd
bing
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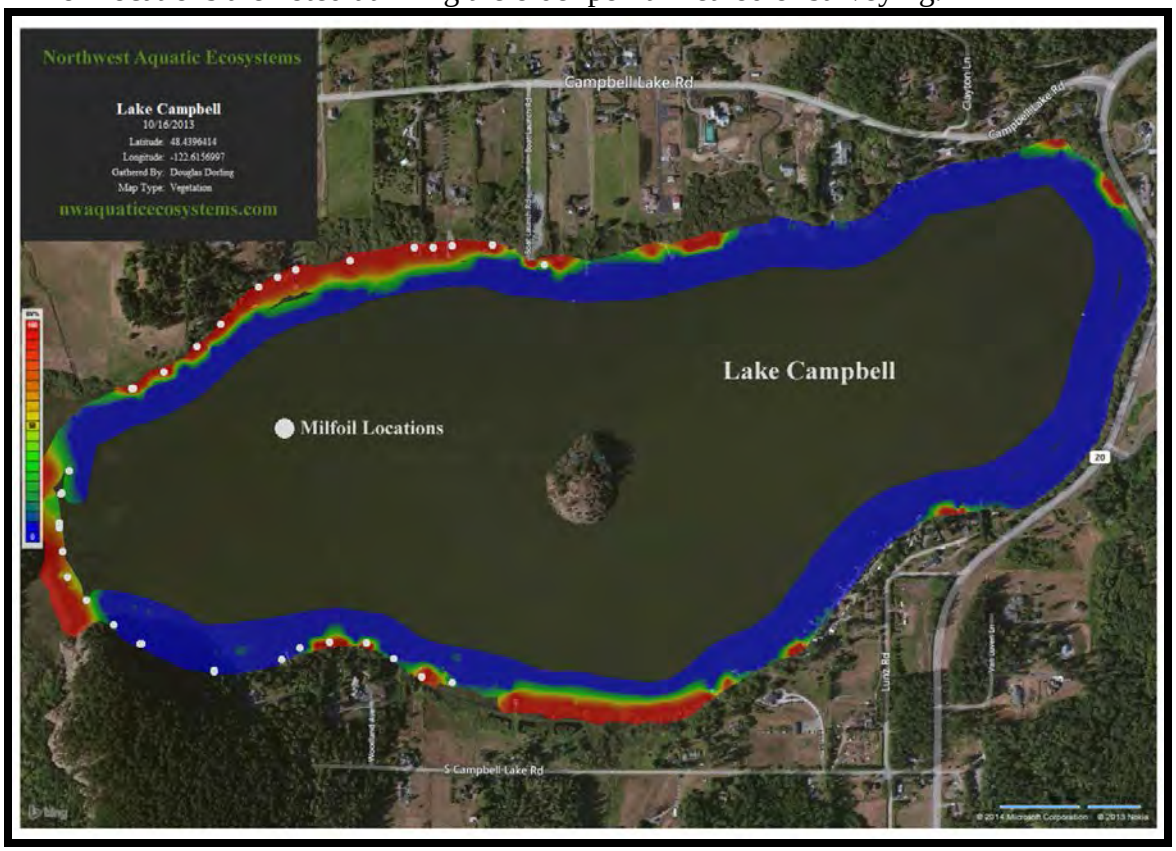
Our Lake Campbell survey was also hindered by a persistent algae bloom. This bloom was greater in intensity then the Lake Erie bloom. Windrowing of algae was very apparent with thick green scums observed lake wide. Most all of the areas noted on the fall mscrophyte map are related to filamentous algae growth that was occurring. These growth areas are identified as deep red and green areas on the map. Much of the milfoil identified was on the surface and easy to locate. Surprisingly the milfoil again appeared to have a late season growth spurt that surprised our staff during the survey. Poor water clarity throughout the summer likely delayed germination of the identified plants until late in the season. The present milfoil infestation had increased in range to include much of the spadderdock perimeter along the eastern shoreline and adjacent to the south west shoreline. The area infested with 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. This may also have been the reason for the increased late seasonal growth.

Milfoil locations are noted utilizing the older point method of surveying.



Recommendation For 2014

Milfoil growth within Lake Campbell has increased as prior surveys would suggest. Both native and noxious species throughout Lake Erie have stabilized. A few problematic milfoil plants may be detected during 2014 in conjunction with sporadic light native plant growth. Some years no milfoil is noted while others a few plants appear within Lake Erie. Once again similar to 2012 within Lake Campbell the majority of milfoil appeared extremely late in the season.

Northwest Aquatic Eco-Systems recommendations for the 2014 season are as follows:

1. Control of approximately 30 acres of single stemmed milfoil plants within lake Campbell as noted on the survey map. This infestation has increased in range along the perimeter of the shoreline. Current infestation needs to be addressed during 2014 in order to halt further expansion lake wide.
2. Early spring survey of both water bodies with special attention being given to those lake areas where milfoil appeared during the close of 2013.
3. Extensive late season survey through the spadderdock growth areas located in the eastern closed portion of the Lake Campbell in an attempt to locate single milfoil plants.
4. Continued control of the noxious species yellow iris and, purple loosestrife at both lake sites.
5. Targeted control of spadderdock 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 problematic Lake Erie native weed species when such species are hindering lake use. These treatments are typically cyclical in nature necessary one year and not the next. NWAE anticipates limited native weed control required this year at Lake Erie. If the fall survey reveals the presence of milfoil plants regrowth, then a 2,4-D application should be applied to the site specific infestations.
7. 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.
8. There are no salmonid or endangered species noted within either Lake Campbell or Erie. Historically treatments have occurred after July 15. There are no salmonid species noted by WDFW within Lake Campbell or Erie. No timing restrictions associated with salmonid species will allow lake treatments to occur earlier in the season if water levels support such action.
9. Continued use of the new survey technology. This technology and mapping can easily be understood by all lake users while also providing good baseline data for future review in evaluating the program's success.