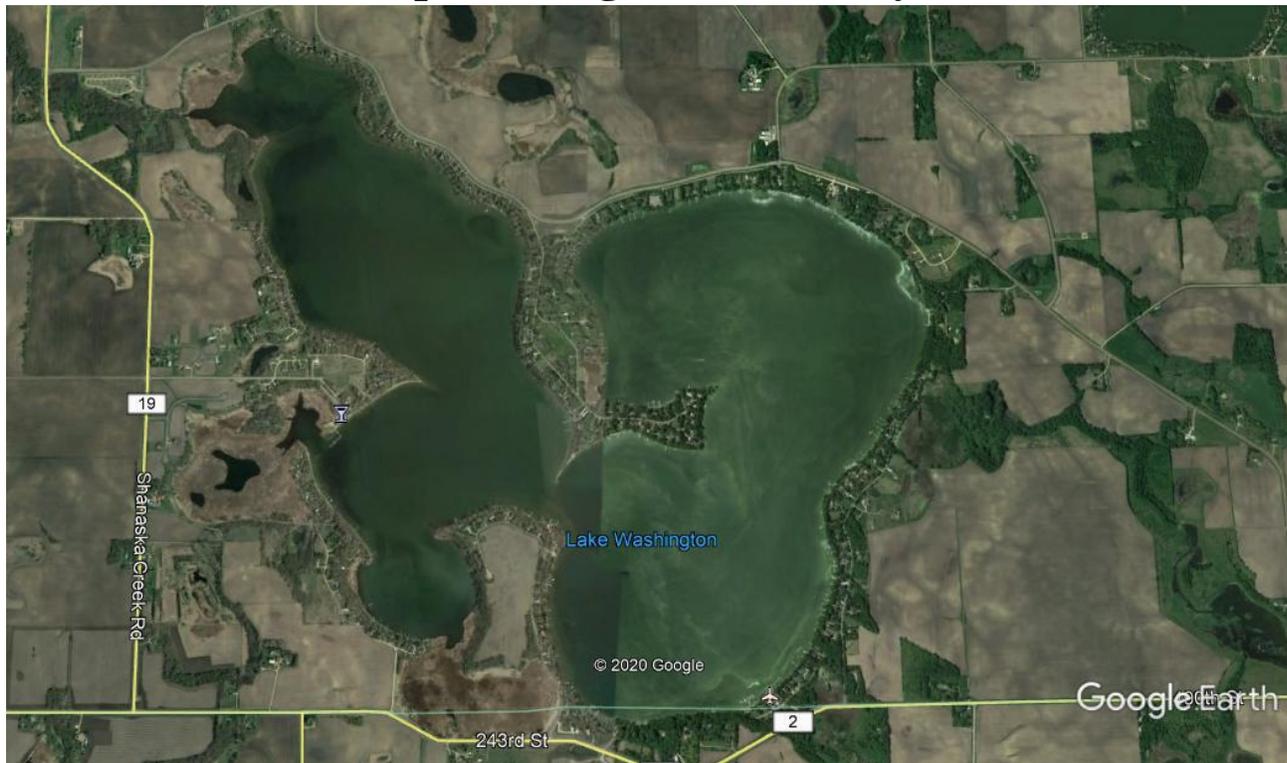


2020 Point Intercept/Navico Bio Base Survey
Lake Washington, LeSueur County, Minnesota

Aquatic Vegetation Survey



Submitted by:



Submitted to:

Lake Washington Improvement Association

July 20, 2020

Summary

An aquatic vegetation survey of Lake Washington (DOW 02008400), located near Kasota, MN in LeSueur County, was conducted on July 8th and 9th. The Navico Bio Base System was used at the same time to also electronically determine vegetation densities and is available for the Lake Washington Improvement Association to use as a base line survey. A total of nine native and one non-native plant species were identified. Plants were found to a depth of twelve feet, but most were restricted to depths at eight feet and shallower.

Native plant species found included: Muskgrass (*Chara sp.*), Coontail (*Ceratophyllum demersum*), Flat Stem Pondweed (*Potamogeton zosteriformis*), Clasp Leaf Pondweed (*Potamogeton perfoliatus*), Elodea (*Elodea canadensis*) Large Leaf Pondweed (*Potamogeton amplifolius*), Water Celery (Eelgrass) (*Vallisneria americana*), Water Star Grass (*Heteranthera dubia*) and White Waterlily (*Nymphaea odorata*).

Non-native plant species found included: Curly Leaf Pondweed (*Potamogeton crispus*). Curly Leaf Pondweed was found at 10 points throughout the lake. Curly Leaf Pondweed was found at an average depth of five feet and at a max depth of seven feet, intermingled amongst native species.

Other Notes

The surveyors noted very high surface water temps ranging from 85 degrees to above 90 degrees in shallow water and bays. Overall surveyors saw planktonic algae grow throughout the lake causing water clarity to be very low with only 1 or 2 feet of clarity. Other algae was found also in the bays and close to shore. This algae was filamentous algae but also some that could have been Cyanobacteria. Without scientific testing it would be impossible to get a true determination but had all the signs of Cyanobacteria (smell, color, etc.). This should be monitored so that it does not cause problems in the future on the lake. Pictures at the end of the report show the problem algae.

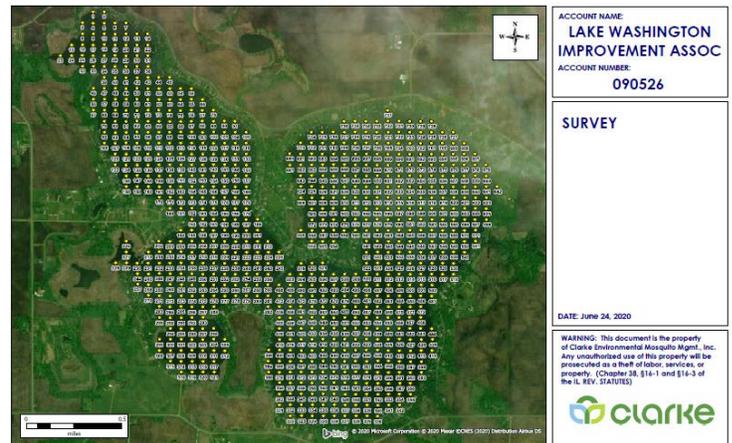
Methods:

A Point-Intercept survey of Lake Washington was conducted following the methods described by Madsen (1999). A Geographic Information System (GIS) was used to generate sample points across the lake surface in a 200 foot by 200 foot grid. Survey waypoints were created and downloaded into a Global Positioning System (GPS) enabled depth finder and was used to navigate the boat to each sample point.

Vegetation samples were consistently taken from the same side of the boat using a 2 sided aquatic vegetation sampling rake. The areas sampled were approximately 3

foot square in size. Depth measurements were taken at each site to determine the lake's littoral zone which was found to be at a max depth of just over 12 feet. At each site, all taxa of plants sampled was determined and recorded on a scale of 1 to 3 where 1 being the plant is present and 3 being the plant is extremely high density.

Clarke also utilized the Navico Bio Base mapping system which shows the biovolume and spatial distribution of vegetation. The Bio Base system allows the ability to document changes in weed densities from season to season and one year to the next (historical comparison). The Clarke supplied survey can be loaded into the Bio Base system when they receive it and can be used as a base line.



Vegetation results for Lake Washington:

Washington Lake was found to have ten species of aquatic plant present at the time of the survey of which nine were submerged and one was a floating-leaf. The charts below illustrates the relative abundance of each species, **N** = 708 or the number of sites sampled. The number of sites a plant species was found present, divided by **N** equals the total percentage of sample sites a particular species was found.

Native Submerged

Common Name	Scientific Name	Sites Present	%
Coontail	<i>Ceratophyllum demersum</i>	147	21%
Elodea	<i>Elodea canadensis</i>	131	19%
Muskgrass	<i>Chara sp.</i>	31	4%
Water Star Grass	<i>Heteranthera dubia</i>	8	1%
Clasping Leaf Pondweed	<i>Potamogeton perfoliatus</i>	6	< 1%
Water Celery	<i>Vallisneria americana</i>	3	< 1%
Large Leaf Pondweed	<i>Potamogeton amplifolius</i>	2	< 1%
Flat Stem Pondweed	<i>Potamogeton zosteriformis</i>	1	< 1%

Floating-Leaf

Common Name	Scientific Name	Sites Present	%
White Waterlily	<i>Nymphaea odorata</i>	19	3%

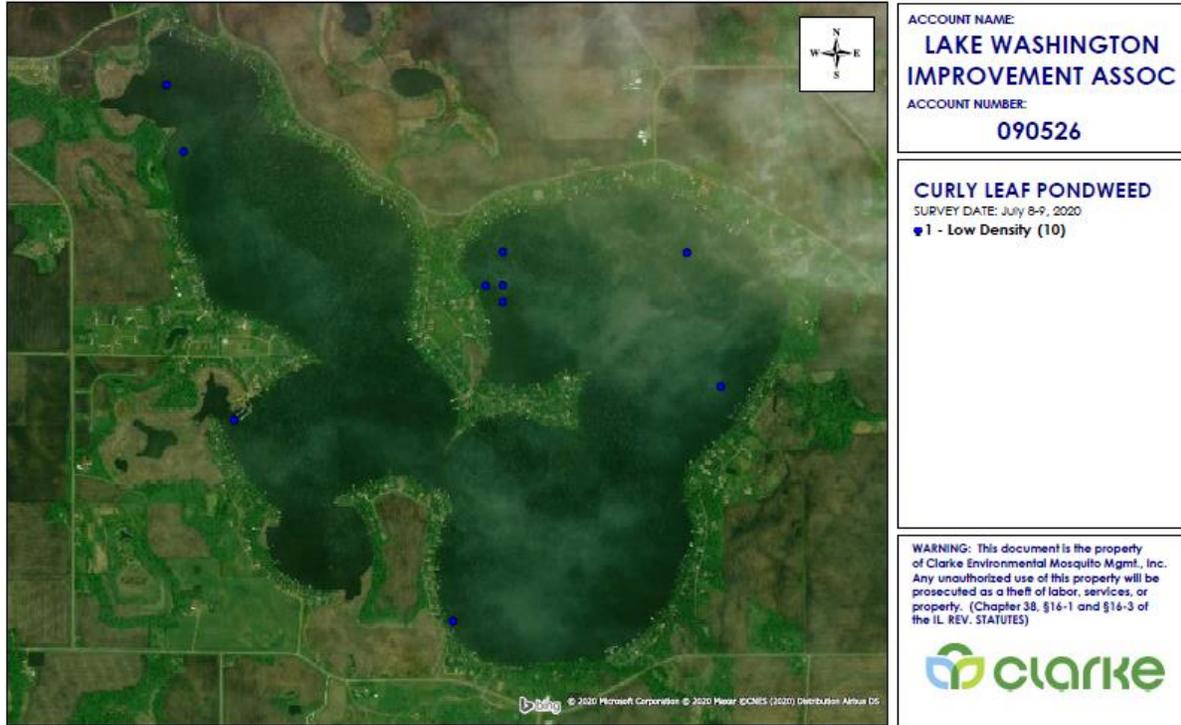
Non-Native Submerged

Common Name	Scientific Name	Sites Present	%
Curly Leaf Pondweed	<i>Myriophyllum spicatum</i>	10	1%

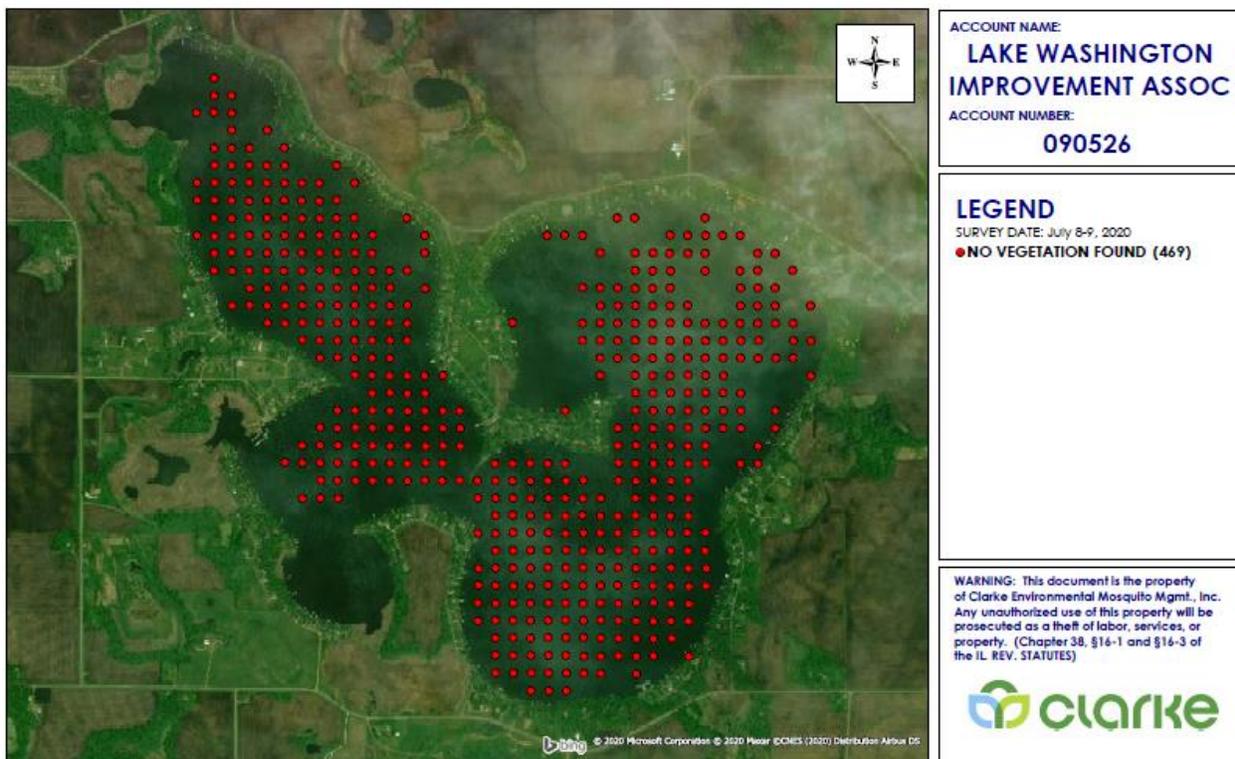
Native Emergent

Cattail (*Typha spp.*) was observed around the lake, but none fell exactly in the survey point.

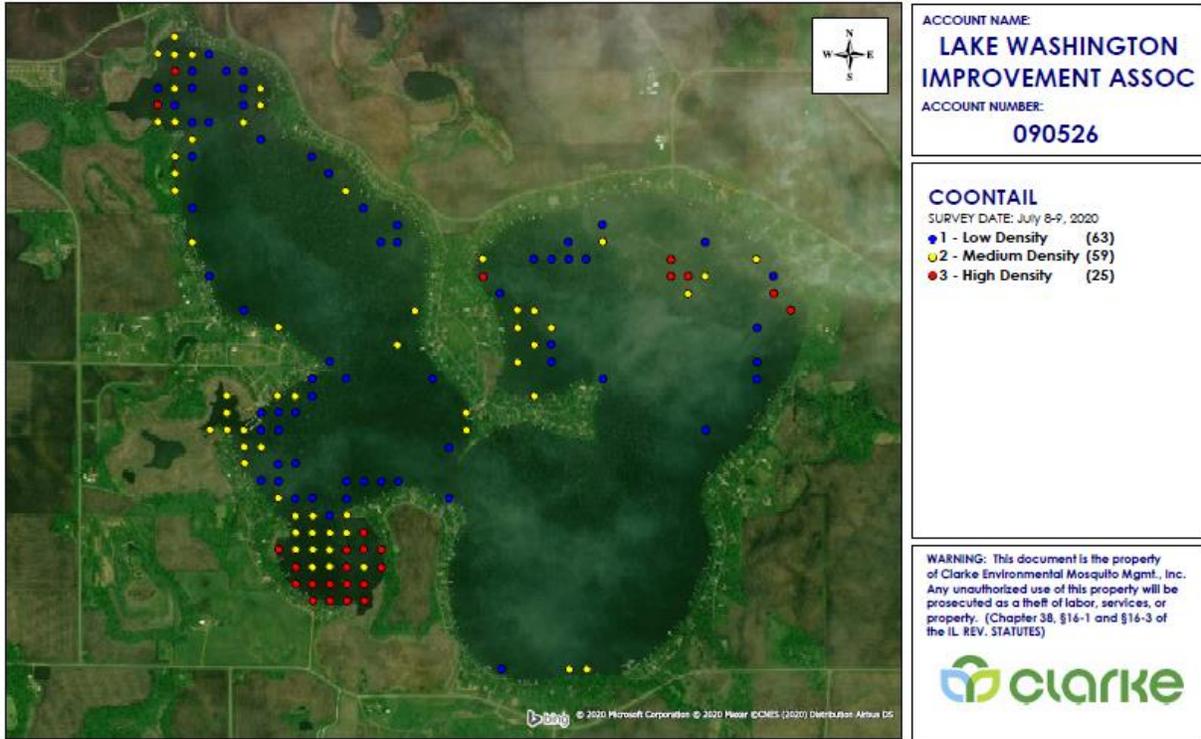
Lake Washington Curly Leaf Pondweed Locations and Densities



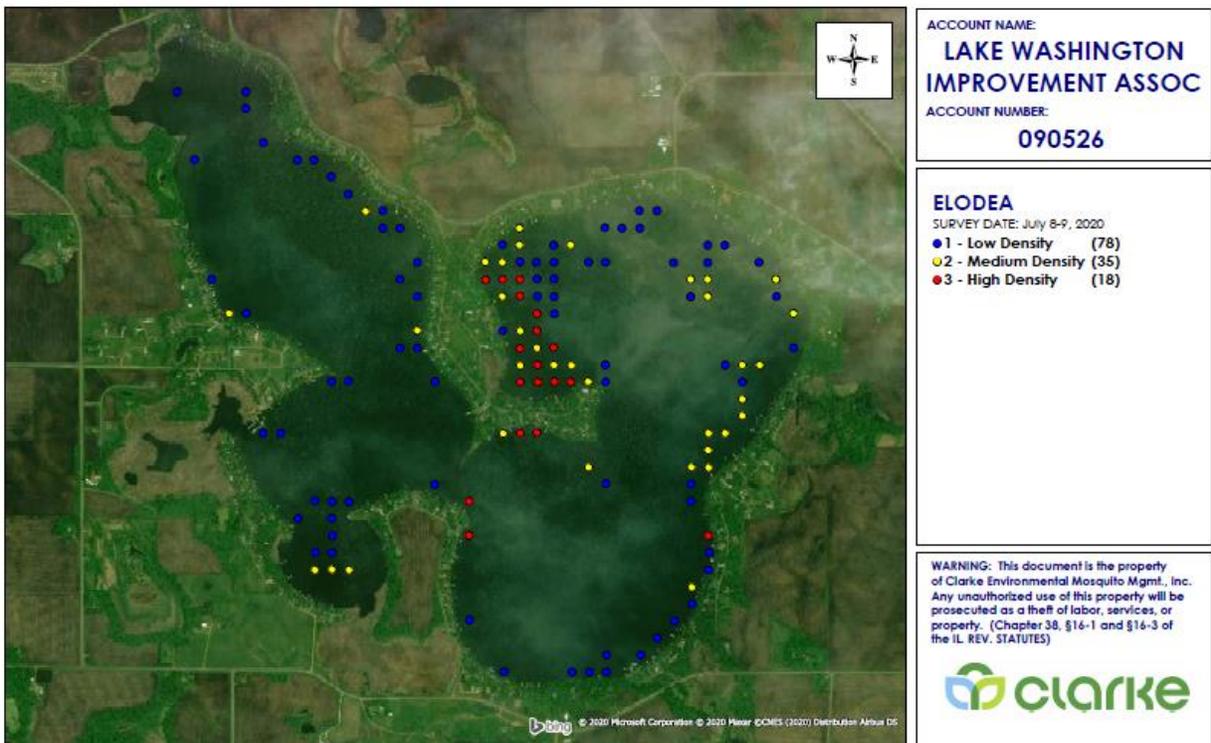
Lake Washington No Vegetation Locations



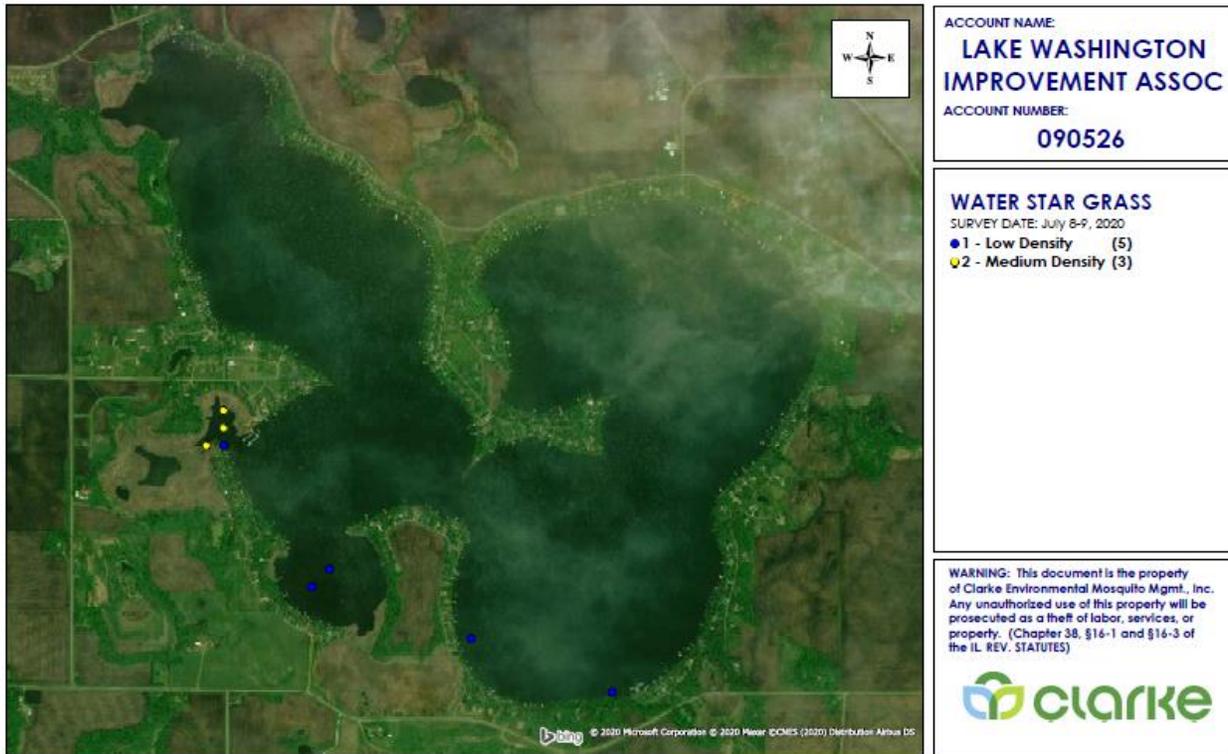
Lake Washington Coontail Locations and Densities



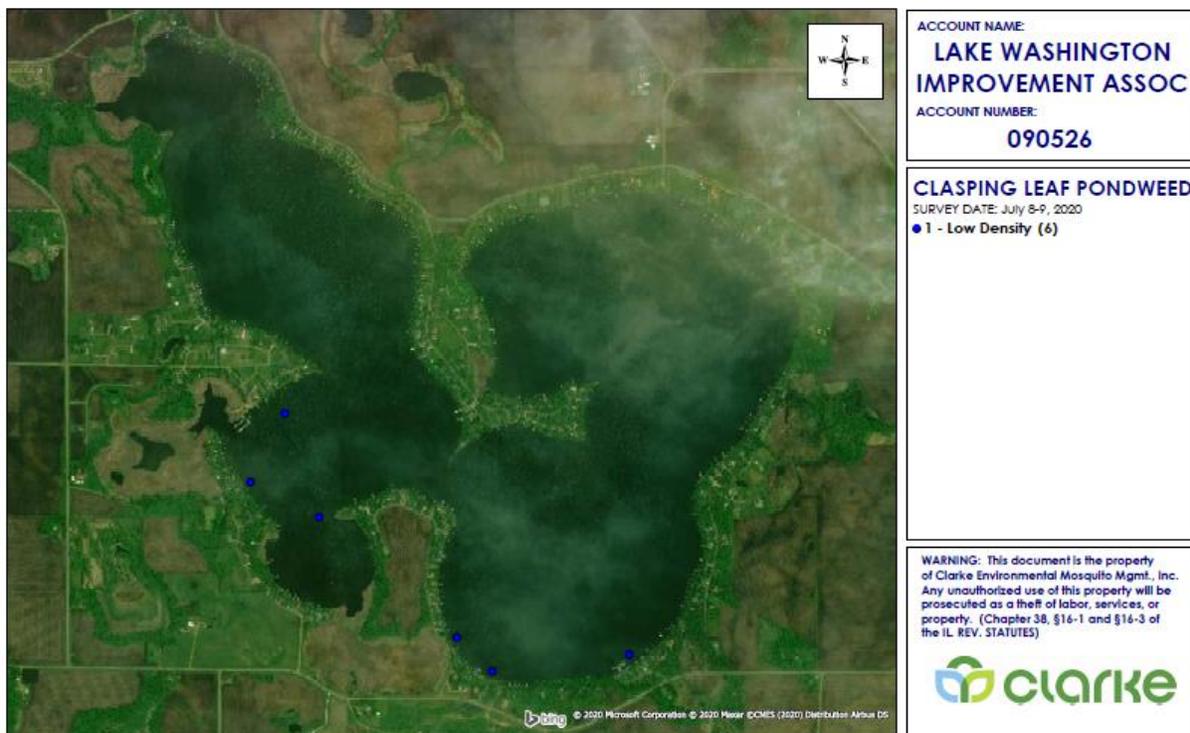
Lake Washington Elodea Locations and Densities



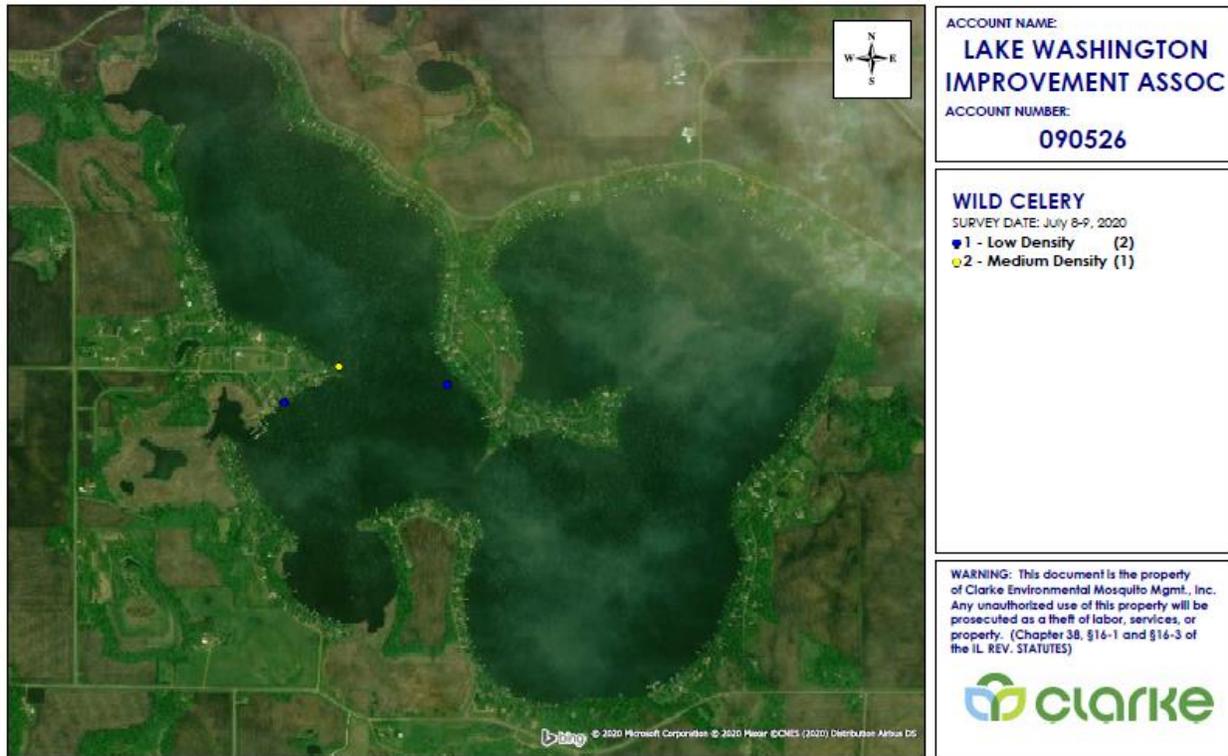
Lake Washington Water Star Grass Locations and Densities



Lake Washington Clasp Leaf Pondweed Locations and Densities



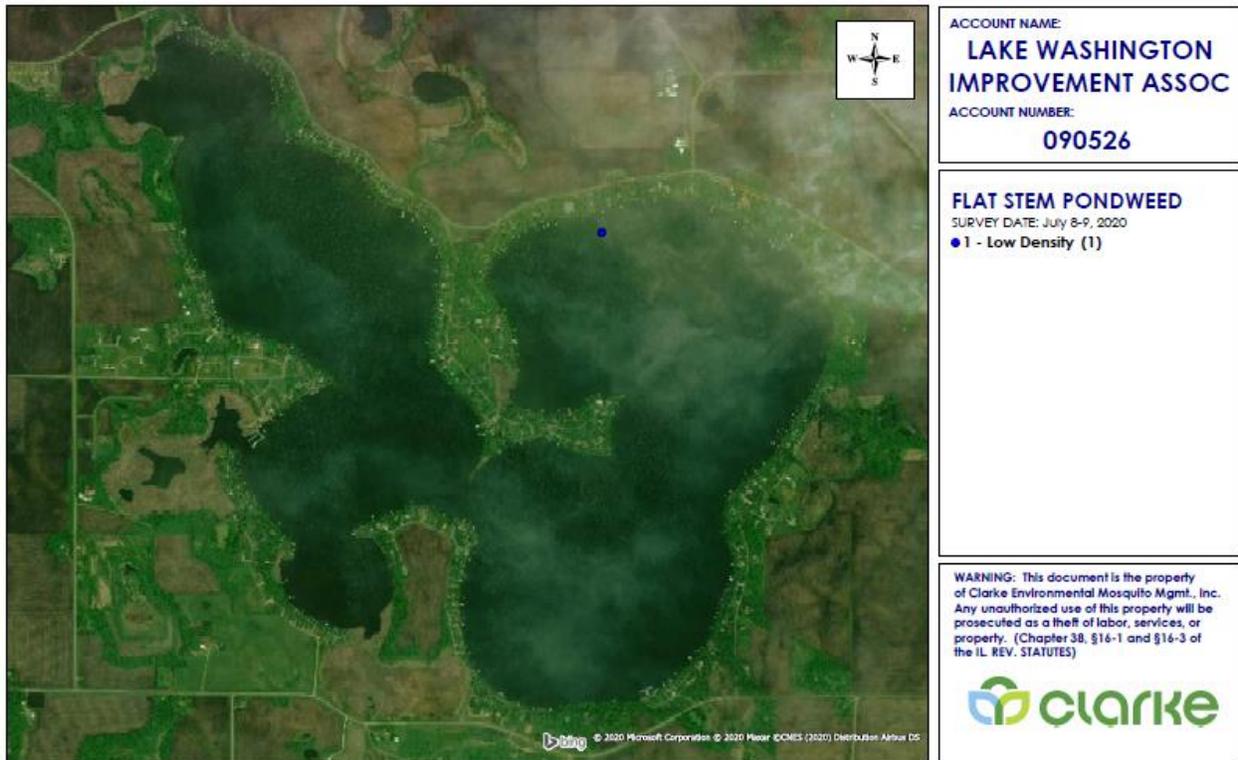
Lake Washington Water Celery Locations and Densities



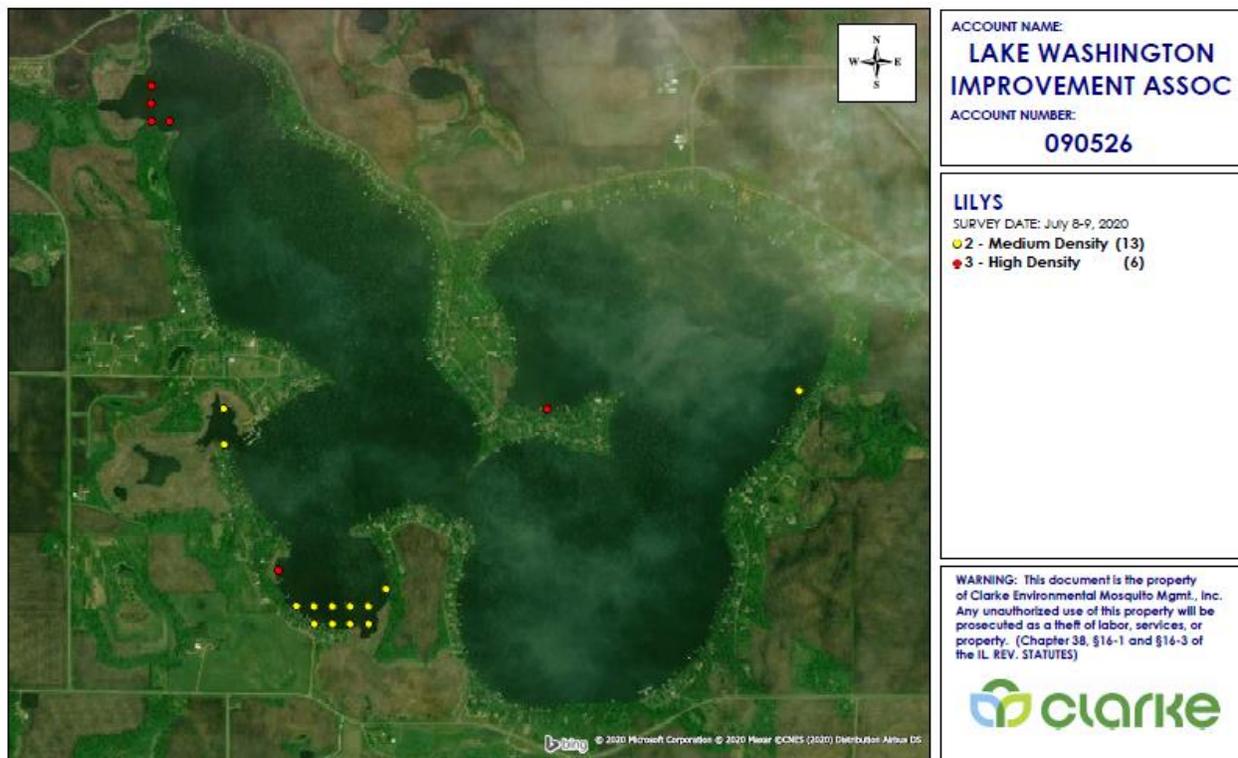
Lake Washington Large Leaf Pondweed Locations and Densities



Lake Washington Flat Stem Pondweed Locations and Densities



Lake Washington White Water Lily Locations and Densities



Curly Leaf Pondweed

Scientific Name: *Potamogeton crispus*

Common Name: Curly Leaf Pondweed

Family: *Potamogetonaceae*

Most Similar to: Claspingleaf Pondweed

Identification: Stem partially flattened, originating from a slender rhizome. Leaves very wavy, crispy when mature, with serrated edges, a prominent midvein, 3-5 veins, no petiole, and blunt tipped. No floating leaves are produced. Stipules 3-8 mm, partially attached to the leaf, and disintegrating early. A curved flower spike is held above the water. Fruits are 5-5.5 mm, with 3 ridges and a conical beak. Tolerates cold water and disperses mainly by turions produced from the leaf axils.

Habitat: Highly variable; lakes and streams; shallow to deep



Native Species

Coontail

Scientific Name: *Ceratophyllum demersum*

Common Name: Coontail, hornwort

Family: *Ceratophyllaceae*

Most similar to: Spiny hornwort

Identification: Plant often heavily branched, to 2mm tall, light green to brown. Leaves whorled, branching once or twice, with small teeth to the margins. Tip of plant is often bushy. Flowers, if present, are small and located in the leaf axils in early summer. Fruits are rarely produced, but are round with three narrow projections, about 2 cm long including the projections, and originate in the leaf axils. May be a dominant species in warm, nutrient-rich water. Stores energy as oils and may cause natural “oil slicks” when it decays.

Habitat: Lakes and streams; shallow to deep



Elodea

Scientific Name: *Elodea canadensis*

Common Name: Common waterweed, Canada waterweed

Family: *Hydrocharitaceae*

Most similar to: Slender waterweed

Identification: Leaves flat, pointed, in whorls of 3, or rarely 4. Leaf width is 1.75-4 mm wide and 2-5 times as long. Bushy near the top of the branch. Tiny, female flowers are white, produced on long, thread-like stalks that reach to the surface. Seeds 5-6.5 mm with a 5-6 mm beak. Winter buds may be present as small, bushy branches from late fall to spring.

Habitat: Soft substrate; tolerant of polluted and eutrophic waters; lakes and streams.



Water Star Grass

Scientific Name: *Heteranthera dubia*

Common Name: Water Star Grass

Family: *Pontederiaceae*

Most similar to: Flat-Stem Pondweed

Identification: Slightly flattened stems originate from rhizomes. Long, linear leaves (0-15 cm long), have no leaf stalk and no obvious mid vein. Yellow flowers with 6 tepals (similar to petals) are produced if the plant is stranded on shore or in shallow water and are held slightly above the water surface. Flowers are 1-2 cm in diameter.

Habitat: Soft sediment; shallow to deep; lakes and streams.



Clasping Leaf Pondweed

Scientific Name: *Potamogeton richardsonii*

Common Name: Clasping Leaf Pondweed, Richardson's Pondweed

Family: *Potamogetonaceae*

Most similar to: Curly Leaf Pondweed

Identification: Alternate leaves with prominent midvein. 13-33 veins, usually with 3-5 stronger veins, wavy edges, and coming to a sharp point. Leaves clasp (partially wrap around) the stem. No floating leaves produced. Stipules are 1-2 cm long and free from the leaf, which disintegrate into fibers by midsummer. Fruits are 2.2-4.2 mm.

Habitat: Lakes and streams; shallow to deep.



Water Celery

Scientific Name: *Vallisneria americana*

Common name: Water Celery

Family: *Hydrocharitaceae*

Most similar to: Ribbon-leaf pondweed

Identification: Water celery grows in a basal rosette form, with long, thin leaves up to 2 m long and 1 cm wide, that often stream along the surface. The edge of the leaf may be wavy. Leaves have a wide strip of hollow cells down the middle. Female flowers are produced on a long, spiral stalk, and can often be seen in large numbers in mid-summer. Fruits are long, resembling a bead pod.

Habitat: Sandy sediment; lakes and streams.



Large Leaf Pondweed

Scientific Name: *Potamogeton amplifolius*

Common Name: Large-leaf pondweed, cabbage, musky-weed

Family: *Potamogetonaceae*

Most similar to: Illinois pondweed

Identification: Alternate, sickle-shaped submerged leaves are 4-7 cm wide and 8-20 cm long, have more than 19 veins, and are folded upward on both sides. Floating leaves are 2-22.5 cm long, with a petiole longer than the leaf blade, 27-49 veins, supporting a large spike inflorescence that is held above water. Stipules are large and white, up to 12 cm long, with 2 ridges on the top. Fruit egg-shaped, 4-5.5 cm, with 2 indistinct ridges.

Habitat: Soft substrate; shallow to deep lakes.



Flat Stem Pondweed

Scientific Name: *Potamogeton zosteriformis*

Common Name: Flat-stem pondweed

Family: *Potamogetonaceae*

Most similar to: Water stargrass

Identification: Stem obviously flattened. Leaves up to 20 cm long, pointed, with a prominent midvein. 3-5 prominent veins with many finer veins, up to 35 total. Stipules 1-2 cm, free from the leaf, somewhat firm. Stiff, fan-shaped winter buds often formed, consisting of many leaves packed together. A slender flower stalk produces 7-11 whorls of flowers. Fruits egg-shaped, smooth, 4-4.5 mm long with a sharp, narrow keel.

Habitat: Soft sediment; lakes and streams



White Water Lily

Scientific Name: *Nymphaea odorata*

Common Name: White Water Lily

Family: *Nymphaeaceae*

Most similar to: American lotus

Identification: Large, round leaves with a narrow notch from the edge of the leaf to nearly the center, floating, up to 30 cm in diameter, with 6-27 veins radiating away from the petiole. Delicate submerged leaves may be seen near the base of the plant. Flowers white with a yellow center, floating, 6-19 cm across, with 17-43 petals, and 35-120 stamens. Seeds 1.5-2.5 mm. Spreads by spongy rhizomes up to about 5 cm in diameter.

Habitat: Soft, mucky sediment; shallow water to 2.5 m deep.

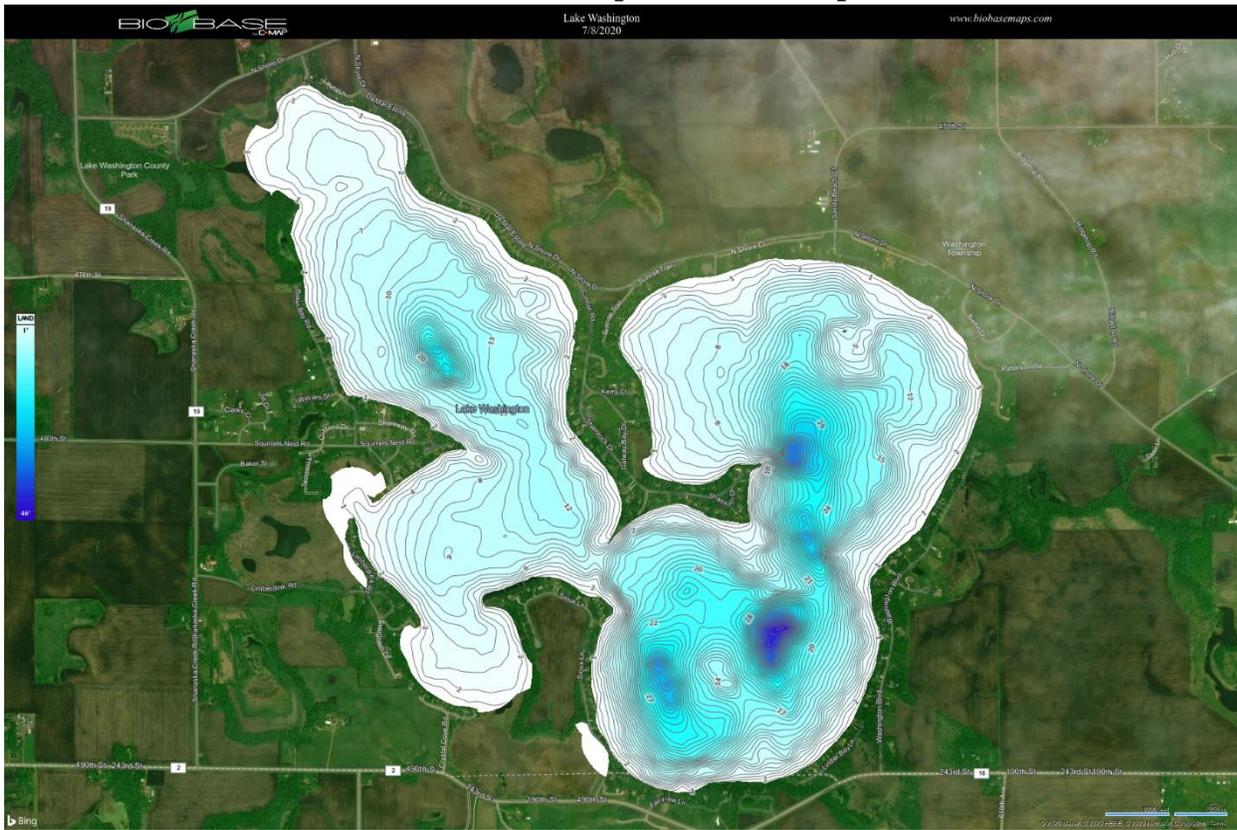


Sources:

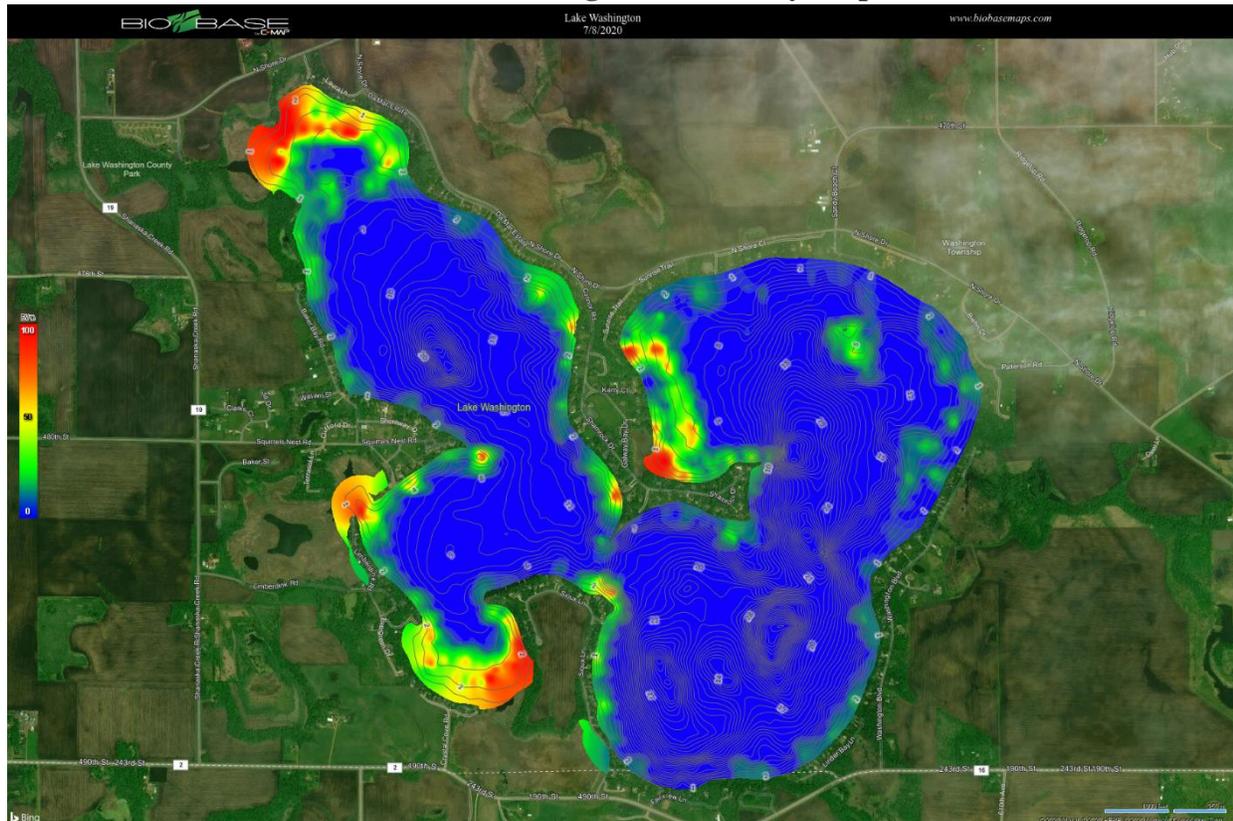
Aquatic plants of the Upper Midwest: a photographic field guide to our underwater forests
Skawinski - Paul M. Skawinski - 2018

<https://www.dnr.state.mn.us/nr/plants/aquatic/index.html>

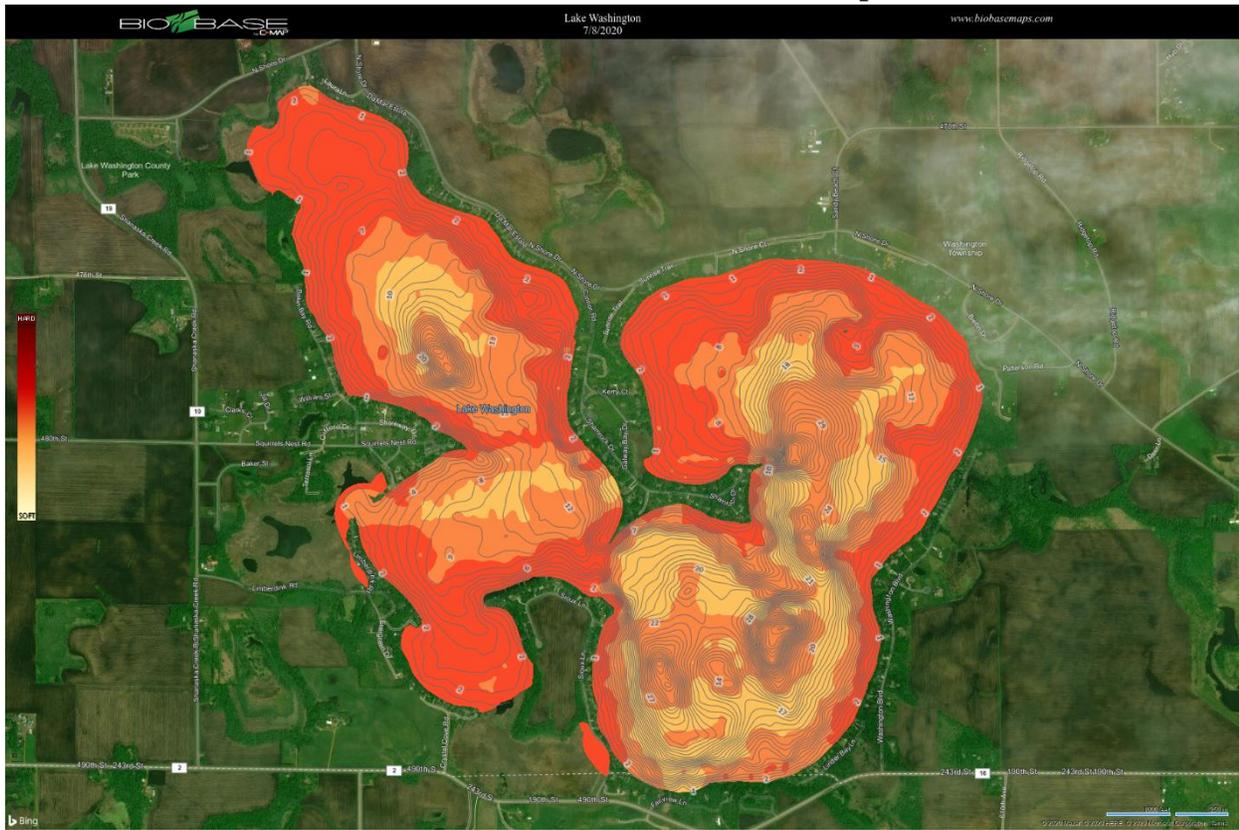
Bio Base Depth Contour Map



Bio Base Vegetation Density Map



Bio Base Bottom Hardness Map



Survey Pictures

Heavy Elodea Growth Found



Curly Leaf Pondweed Found



Filamentous Algae



Filamentous Algae



Problem Algae



Problem Algae

