# Eurasian Watermilfoil in Forest Lake

January 17th, 2012

# Eurasian Watermilfoil (EWM)

- Exotic milfoil
- Can grow nearly 10 feet in length
- Can forms dense mats at the waters surface
- Grows in muck, sand, or rock substrates
- Aggressive growth that quickly outcompetes native species
- Identifying features:
  - Pattern of 4 leaves whorled around a hollow stem.
  - Feathery in appearance, each leaf consists of 10-21 pairs of closely packed leaflets.
  - Out of the water the leaves become limp, compressing against the stem.
  - Recent hybridization with native milfoil species is common.

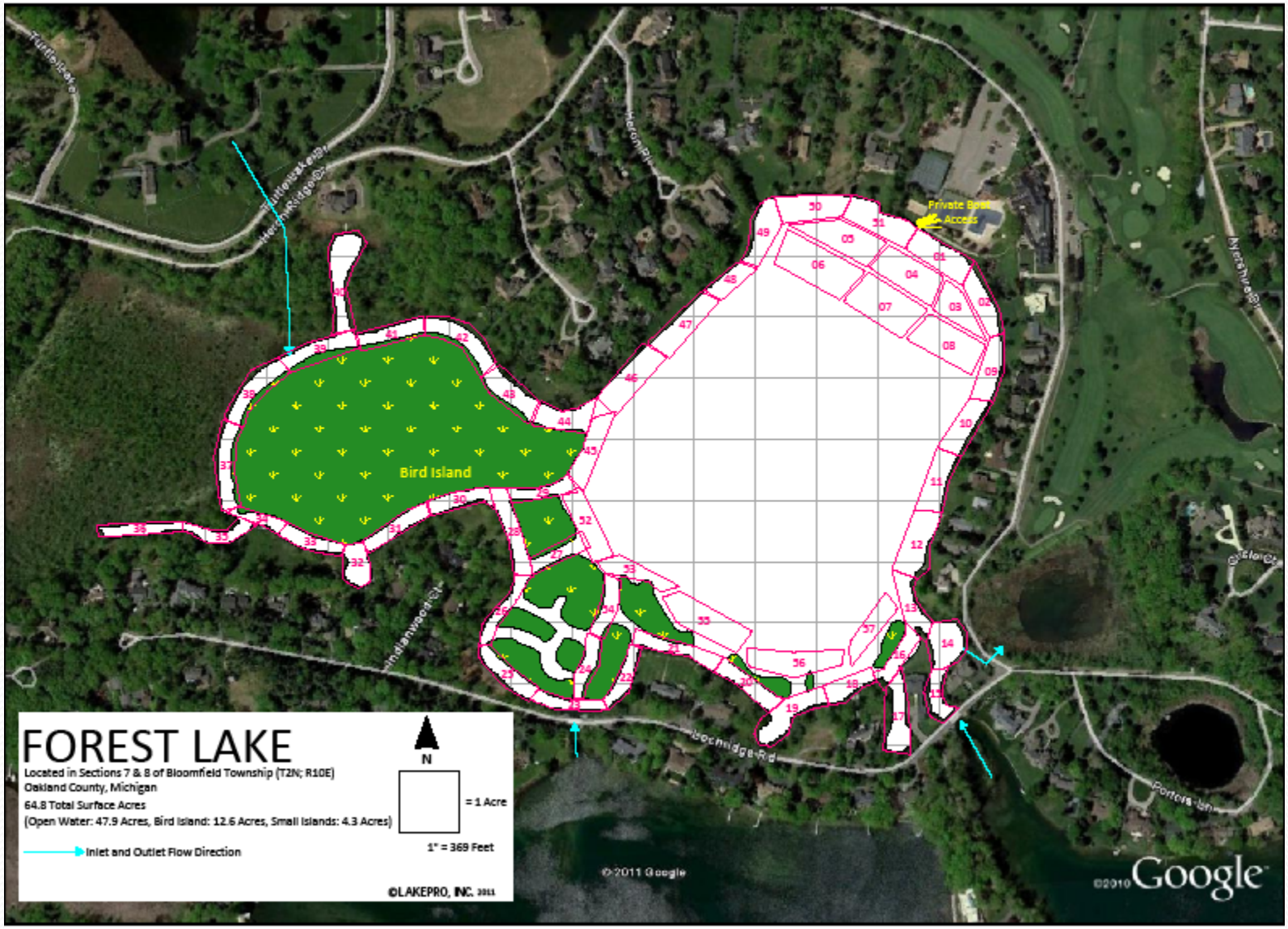
# What's so bad about EWM?

- Swimming, boating, and fishing are hindered by EWM's thick canopy.
- The thick canopy becomes unsightly when it breaches the surface, reducing "visual" water quality.
- Reduced water circulation and reduced sunlight penetration degrade "chemical" water quality.
- EWM outcompetes native plants, reducing the biodiversity of the ecosystem, degrading "biological" water quality.

# EWM in Forest Lake

As part of LakePro's consulting services to Forest Lake, we survey the lake for all aquatic vegetation to document the types of plants and their distribution throughout the lake.

This information is useful to determine the current health of the aquatic ecosystem and to determine if conditions are improving or degrading.


FOREST LAKE
Located in Sections 7 & 8 of Bloomfield Township (T2N; R10E)
Oakland County, Michigan
64.8 Total Surface Acres
(Open Water: 47.9 Acres, Bird Island: 12.6 Acres, Small Islands: 4.3 Acres)
Inlet and Outlet Flow Direction
N
= 1 Acre
1" = 369 Feet
©LAKEPRO, INC. 2011
Bird Island
Private Boat Access
Beechridge Rd
Porters Ln
©2011 Google
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Lake Name:_____ County:_____ Surveyor Name:_____ Survey Date:_____

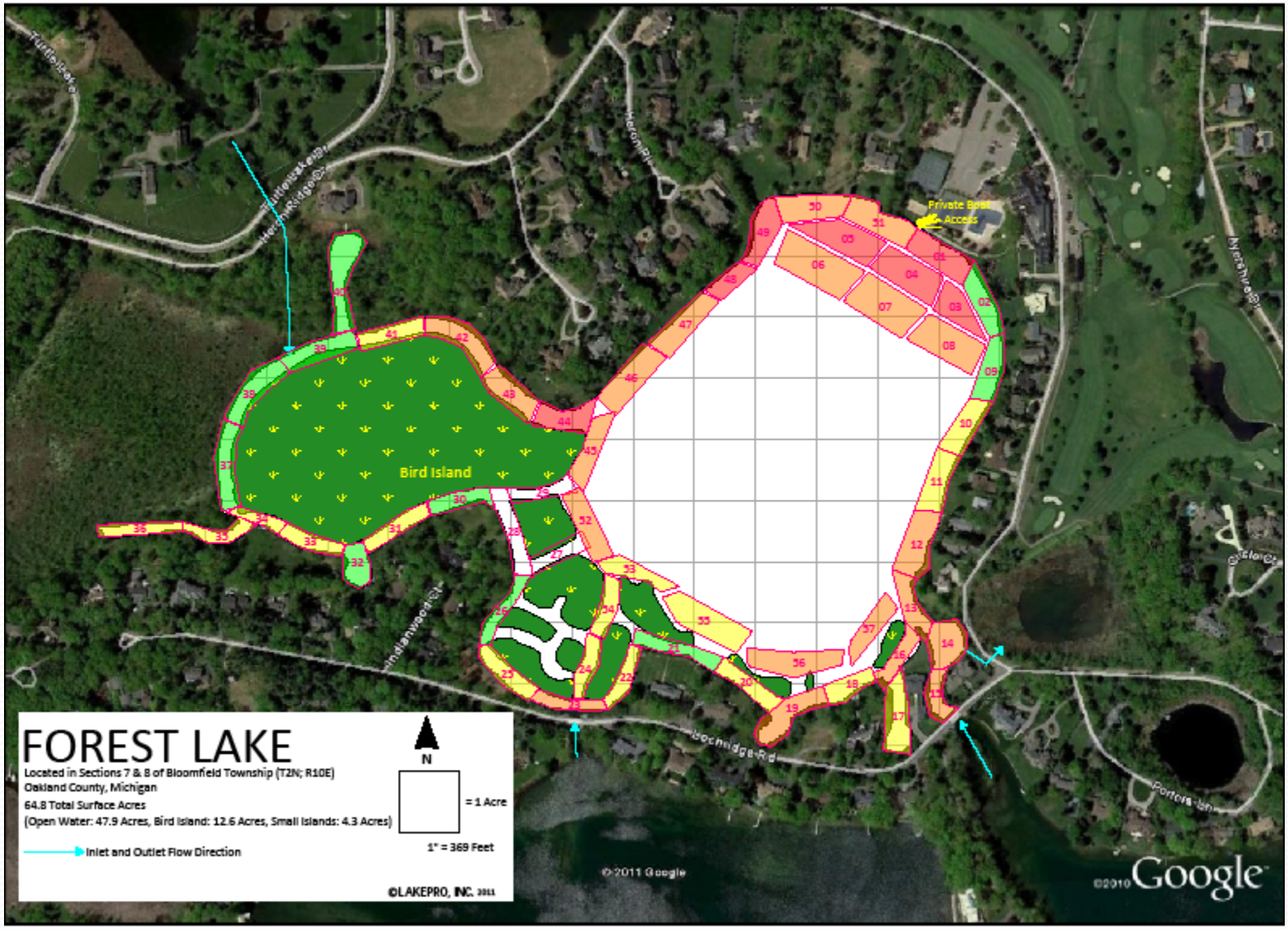
## Standard Aquatic Vegetation Assessment Site Species Density Sheet

| | | Vegetation Assessment Site | | |

Forest Lake Oakland County 5/23/2011

Standard Aquatic Vegetation Summary Sheet SURVEY BY: Peter Filpanick

| | | Total number of AVAI's for each Density Category | | | | Calculations | | | | Sum of Previous Four Columns | Total Number of AVAI's | Quotient of Column 9 divided by Column 10 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | Category A x 1 | Category B x10 | Category C x 40 | Category D x 80 | | | | | |
| Code No | Plant Name | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Code No | Plant Name |
| 1 | Eurasian milfoil | 10 | 17 | 20 | 7 | 10 | 170 | 800 | 560 | 1540 | 57 | 27.0 | 1 | Eurasian milfoil |
| 2 | Curly leaf pondweed | 20 | 13 | 20 | 4 | 20 | 130 | 800 | 320 | 1270 | 57 | 22.3 | 2 | Curly leaf pondweed |
| 3 | Chara | 26 | 7 | 9 | 0 | 26 | 70 | 360 | 0 | 456 | 57 | 8.0 | 3 | Chara |
| 4 | Thinleaf pondweed | 8 | 5 | 0 | 0 | 8 | 50 | 0 | 0 | 58 | 57 | 1.0 | 4 | Thinleaf pondweed |
| 5 | Flatstem pondweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 5 | Flatstem pondweed |
| 6 | Robbins pondweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 6 | Robbins pondweed |
| 7 | Variable pondweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 7 | Variable pondweed |
| 8 | Whitestem pondweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 8 | Whitestem pondweed |
| 9 | Richardsons pondweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 9 | Richardsons pondweed |
| 10 | Illinois pondweed | 2 | 3 | | | 2 | 30 | 0 | 0 | 32 | 57 | 0.6 | 10 | Illinois pondweed |
| 11 | Large leaf pondweed | 1 | 1 | | | 1 | 10 | 0 | 0 | 11 | 57 | 0.2 | 11 | Large leaf pondweed |
| 12 | American pondweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 12 | American pondweed |
| 13 | Floating leaf pondweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 13 | Floating leaf pondweed |
| 14 | Water stargrass | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 14 | Water stargrass |
| 15 | Wild Celery | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 15 | Wild Celery |
| 16 | Sagittaria | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 16 | Sagittaria |
| 17 | Northern milfoil | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 17 | Northern milfoil |
| 18 | M. verticillatum | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 18 | M. verticillatum |
| 19 | M. heterophyllum | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 19 | M. heterophyllum |
| 20 | Coontail | 6 | 7 | 2 | | 6 | 70 | 80 | 0 | 156 | 57 | 2.7 | 20 | Coontail |
| 21 | Elodea | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 21 | Elodea |
| 22 | Utricularia spp. | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 22 | Utricularia spp. |
| 23 | Bladderwort-mini | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 23 | Bladderwort-mini |
| 24 | Buttercup | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 24 | Buttercup |
| 25 | Najas spp. | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 25 | Najas spp. |
| 26 | Brittle naiad | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 26 | Brittle naiad |
| 27 | Sago pondweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 27 | Sago pondweed |
| 28 | | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 28 | |
| 29 | | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 29 | |
| 30 | Nymphaea | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 30 | Nymphaea |
| 31 | Nuphar | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 31 | Nuphar |
| 32 | Brasenia | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 32 | Brasenia |
| 33 | Lemna minor | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 33 | Lemna minor |
| 34 | Spirodella | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 34 | Spirodella |
| 35 | Watermeal | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 35 | Watermeal |
| 36 | Arrowhead | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 36 | Arrowhead |
| 37 | Pickerelweed | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 37 | Pickerelweed |
| 38 | Arrow Arum | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 38 | Arrow Arum |
| 39 | Cattails | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 39 | Cattails |
| 40 | Bulrushes | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 40 | Bulrushes |
| 41 | Iris | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 41 | Iris |
| 42 | Swamp Loosestrife | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 42 | Swamp Loosestrife |
| 43 | Purple Loosestrife | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 43 | Purple Loosestrife |
| 44 | | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 44 | |
| 45 | | | | | | 0 | 0 | 0 | 0 | 0 | 57 | 0.0 | 45 | |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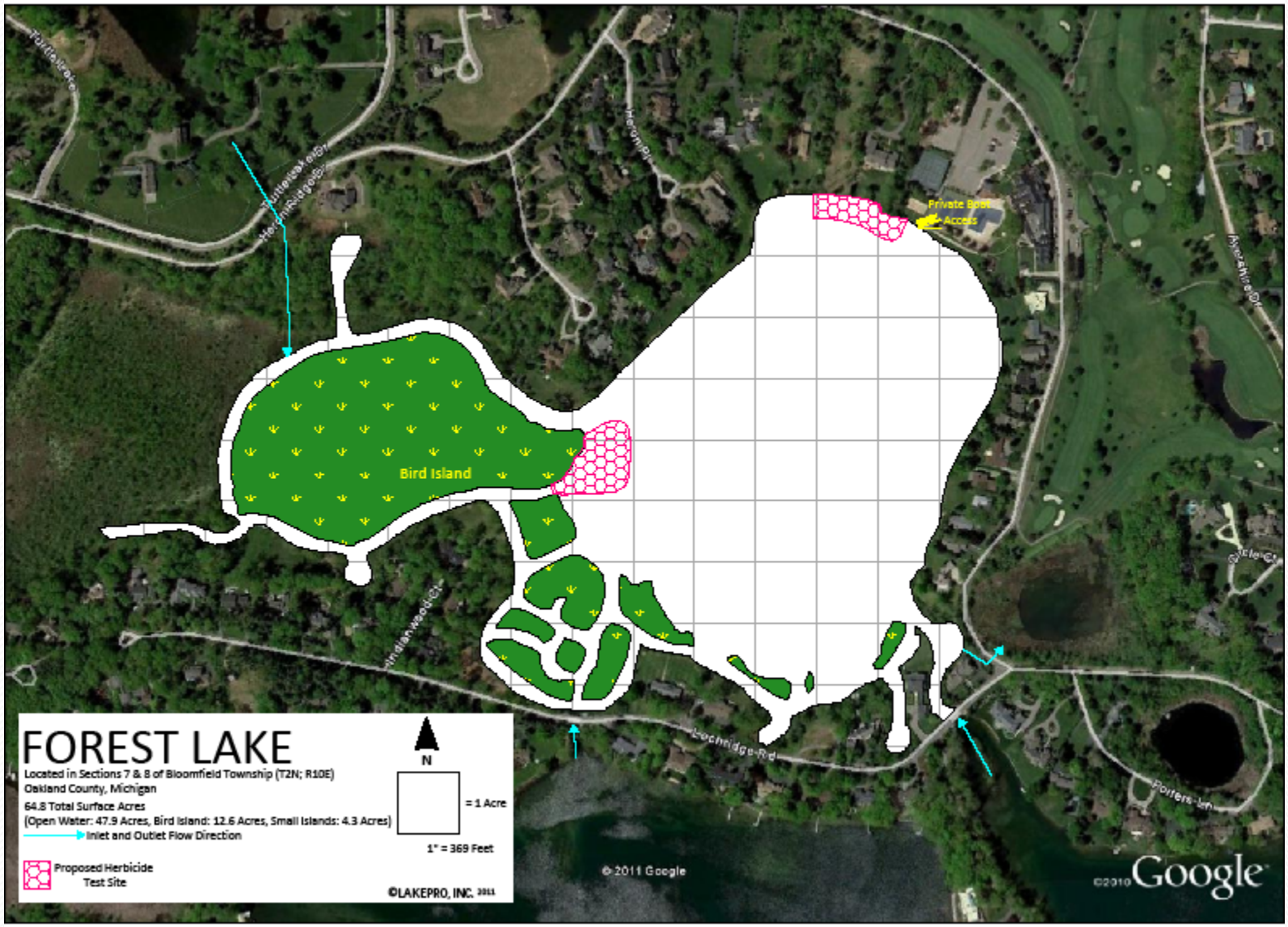
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# EWM Options for Control

- Winter Drawdown
- Suction Harvesting
- Biological Control (Weevils)
- Mechanical Harvesting
- Herbicides
  - Contact Herbicides
  - Systemic Herbicides

# Control Using a Systemic Herbicide

- Based on cost, selectivity, and effectiveness, we recommend using the systemic herbicide Navigate (2,4-d) for trial use on Forest Lake.
- Renovate OTF (Triclopyr) is more expensive and restrictions are longer than Navigate.
- Sonar AS (Fluridone) is a lake-wide treatment that carries more restrictions and is more expensive than Navigate.

# Navigate (2,4-d)

- Granular herbicide that is spread over the surface of the water and falls through water column. The granules settle onto the plants or onto the bottom.
- Granules dissolve, releasing the active ingredient.
- The active ingredient is absorbed by the plant through the leaves and is transported throughout the entire plant (leaves, stems, roots).

# Environmental Fate of Navigate

- Once put into the water, Navigate (ester) hydrolyzes into an acid in no more than 3 days, depending upon the water temperature.
- If the acid is absorbed by the plant, enzymes within the plant bind to the acid, inactivating it for further use.
- 2,4-d Acid that remains in the water is broken down by microbial degradation and photolysis.

# Environmental Fate of Navigate

- Degradation depends upon the amount of sunlight and water temperature.
- The EPA's published rates for degradation are:
  - Microbial Degradation in Aerobic Aquatic Environments: $T_{1/2}$ = 15 Days
  - Photolysis in Aquatic Environments: $DT_{50}$ = 12.98 Days
- 2,4-d is broken down into "compounds of nontoxological significance" and ultimately into carbon.

# Benefits of Using Navigate

- Controlling the EWM early in the season will allow the harvesters to cut without proliferating the EWM.
- Selectivity for EWM allows us to target EWM without affecting native plants.
- The systemic herbicide will provide complete control of the treated plants.  Any regrowth will come from the seed bed in the next growing season.
- We can test the water for 2,4-d residues, to determine the exact time when it is safe to use the water after the herbicide treatment.