Greetings Lake Howell Residents!

Please find the bioassessment report for your lake below. Key highlights of this update include:

- Hydrilla (sprigs and tubers)
- Native Submersed Aquatic Vegetation
- Emergent vegetation
- Recommendations for you and your lake

On **October 28nd, 2015**, Lake Management Program staff, Gloria Eby and Joey Cordell, surveyed the aquatic plants in **Lake Howell** and conducted a Lake Vegetation Index (LVI) bioassessment.

The LVI was created by the Florida Department of Environmental Protection as a rapid screening tool (bioassessment) for ecological condition; it determines how closely a lake's flora (aquatic plants) resembles that of an undisturbed lake. Results of the LVI will be provided soon.

Four young sprigs of hydrilla were found spread throughout the lake, at a maximum depth of 4.5 ft. Two of these sprigs were propagated from tubers. Tubers are small potato-like structures that form at the roots of hydrilla and break off to reproduce. Hydrilla tubers may lay dormant for as long as 4 years before sprouting new growth.

Photo: Hydrilla tuber.

Four native species of submersed aquatic vegetation (SAV) were observed during inspection: coontail, red ludwigia, roadgrass, and eelgrass. Eelgrass was the dominant SAV.

Photo: Eelgrass (native).

Native emergent vegetation observed during the survey included: water hyssop, bur-marigold, canna, buttonbush, swamp lily, flat sedge, pennywort, hempvine, American lotus, maidencane, peltandra, smartweed, pickerelweed, cupscale grass, duck potato, Carolina willow, bulrush, cordgrass, fire flag, cattail, and creeping aster. The native vegetation in Lake Howell was very diverse.

Invasive emergent species observed included: alligator weed, para grass, wild taro, umbrella grass, water hyacinth, primrose willow, Eurasian water-milfoil, torpedo grass, salvinia, Chinese tallow, Brazilian pepper tree, and creeping oxeye. Invasives were present in low abundance. 4 patches of water hyacinth were observed.

Photo: Water hyacinth (invasive).

Photo: East cove.

The Secchi measurement (water clarity) was 3.5 feet in a total depth of 6.2 feet. The lake elevation was 51.40 feet above sea level at the time of inspection. The grass carp barrier was inspected and found to be clear of debris and in good condition. No grass carp were observed during the inspection.

12/9/2016

On **December 9th 2015**, Lake Management Program staff, Gloria Eby, Thomas Calhoun and Joey Cordell, as well as FWC Regional Biologist, Kristen Campbell, and City of Casselberry Natural Resources Officer, Marisa Williams, surveyed the aquatic plants in **Lake Howell**.

Hydrilla sprigs and tubers were found along the north shore of the lake, at a maximum depth of 7 ft. Tubers are small potato-like structures that form at the roots of hydrilla and break off to reproduce. Hydrilla tubers may lay dormant for as long as 4 years before sprouting new growth. Hydrilla will continued to be monitored to see if any "spot treatment" herbicide applications will be necessary.

Photo: Hydrilla tuber.

Four native species of submersed aquatic vegetation (SAV) were observed during inspection. These species included: coontail to a depth of 2 feet, lemon bacopa to 2 feet, and eelgrass to 2 feet. Eelgrass was the dominant SAV.

Photo: Native SAV eelgrass and coontail.

Native emergent vegetation observed during the survey included: water hyssop, bur-marigold, canna, buttonbush, swamp lily, flat sedge, pennywort, hempvine, American lotus, maidencane, peltandra, smartweed, pickerelweed, cupscale grass, duck potato, Carolina willow, bulrush, cordgrass, fire flag, cattail, and creeping aster. The native vegetation in Lake Howell was very diverse.

Invasive emergent species observed during the survey included: parrot feather, alligator weed, para grass, wild taro, water hyacinth, primrose willow, torpedo grass, salvinia, Chinese tallow, Brazilian pepper tree, and creeping oxeye. Invasive species were present in low abundance. There was a noticeable decrease in torpedo grass and water hyacinth since the previous survey.

Photo: Parrot feather (invasive).

The Secchi measurement (water clarity) was 3.3 feet in a total depth of 8.4 feet. The lake elevation was 51.25 feet above sea level at the time of inspection. No grass carp were observed during the inspection.

4/7/2016

On **April 7th, 2016**, Lake Management Program staff, Gloria Eby and Joey Cordell, surveyed the aquatic plants in **Lake Howell**.

A few sprigs of hydrilla were found around the lake, to a maximum depth of 7 feet. There was a noted increase in the amount of tubers present compared to the previous inspection. Tubers are small potato-like structures that form at the roots of hydrilla and break off to reproduce. Hydrilla tubers may lay dormant for as long as 4 years before sprouting new growth.

Photo: Hydrilla sprig.

Native SAV was found to have expanded in many areas of the lake. Species included: coontail to a depth of 7 feet, stonewort to a depth of 1 foot, southern naiad to a depth of 6 feet and eelgrass to a depth of 5 feet. Eelgrass was still the dominant SAV. Native SAV plays an import role in the lake ecosystem by: competing with hydrilla for space, providing habitat for wildlife, and reducing nutrients within the water column.

Photo: Coontail (native).

Native emergent vegetation observed during the survey included: bur-marigold, canna, buttonbush, swamp lily, flat sedge, pennywort, hempvine, american lotus, maidencane, peltandra, smartweed, pickerelweed, cupscale grass, duck potato, carolina willow, bulrush, cordgrass, fire flag, cattail, and creeping aster.

Photo: Native stand of pickerelweed.

Invasive emergent species observed during the survey included: alligator weed, para grass, wild taro, umbrella grass, water hyacinth, primrose willow, torpedo grass, salvinia, Chinese tallow, Brazilian pepper tree, paragrass and creeping oxeye. These species will be targeted by the MSBU funded herbicide contractor. Water hyacinth was impacted by recent treatment in several areas of the lake.

Photo: Treated vegetation at Howell Arms condos.

The Secchi measurement (water clarity) was 3.4 feet in a total depth of 10.1 feet. The lake elevation was 51.35 feet above sea level at the time of inspection. The grass carp barrier was inspected and found to be clear of debris and in good condition. No grass carp were observed during the inspection.

5/18/2016

On **May 18th, 2016**, Lake Management Program staff, Thomas Calhoun and Joey Cordell, surveyed the aquatic plants in **Lake Howell**.

There was a small increase in the amount of hydrilla sprigs compared to the previous survey. These sprigs were found in areas along the North shore, particularly the Sausalito Shores boat ramp and Lago Vista areas. Hydrilla tubers were found in the Northwest cove.

Photo: Hydrilla mixed in with eelgrass.

Three native species of submersed aquatic vegetation (SAV) were observed during inspection. These species included: coontail to a depth of 1 foot, southern naiad to a depth of 4 feet, and eelgrass to a depth of 4 feet. Eelgrass was the dominant SAV.

Photo: Eelgrass.

Native emergent vegetation observed during the survey included: golden canna, buttonbush, flatsedge, pennywort, softrush, spatterdock, pickerelweed, duck potato, carolina willow, bulrush, cordgrass, fire flag, and cattail.

Photo: Duck potato, fire flag, and pickerelweed.

Invasive emergent species observed during the survey included: alligator weed, paragrass, wild taro, primrose willow, torpedograss, Chinese tallow, Brazilian pepper tree, creeping oxeye, and papyrus.

On May 14th, Seminole County's SERV program held an event to plant native shoreline vegetation. With the help of 67 volunteers, 5,320 plants were planted at 8 sites around the lake. Those species planted included: duck potato, pickerelweed, softrush, and fire flag. Having a healthy community of shoreline vegetation filters run-off pollutants, protects against erosion, and provides habitat for the wildlife.

Photo: SERV planting site.

The Secchi measurement (water clarity) was 2.2 feet in a total depth of 9.5 feet. The lake elevation was 51.11 feet above sea level at the time of inspection. Four grass carp were observed during the inspection.

6/14/2016

On **June 14th, 2016**, Lake Management Program staff, Joey Cordell and Beth Beals, surveyed the aquatic plants in **Lake Howell**.

Hydrilla was again found in areas along the North shore, particularly the Sausalito Shores boat ramp and Lago Vista areas. Hydrilla tubers were found in the Southeast cove. The hydrilla had not expanded since the previous inspection, though we expect faster growth to occur with higher water temperatures.

Photo: Hydrilla with new growth.

Eelgrass was the only native submersed aquatic vegetation (SAV) observed during the inspection. The maximum depth for the eelgrass was 5.5 feet.

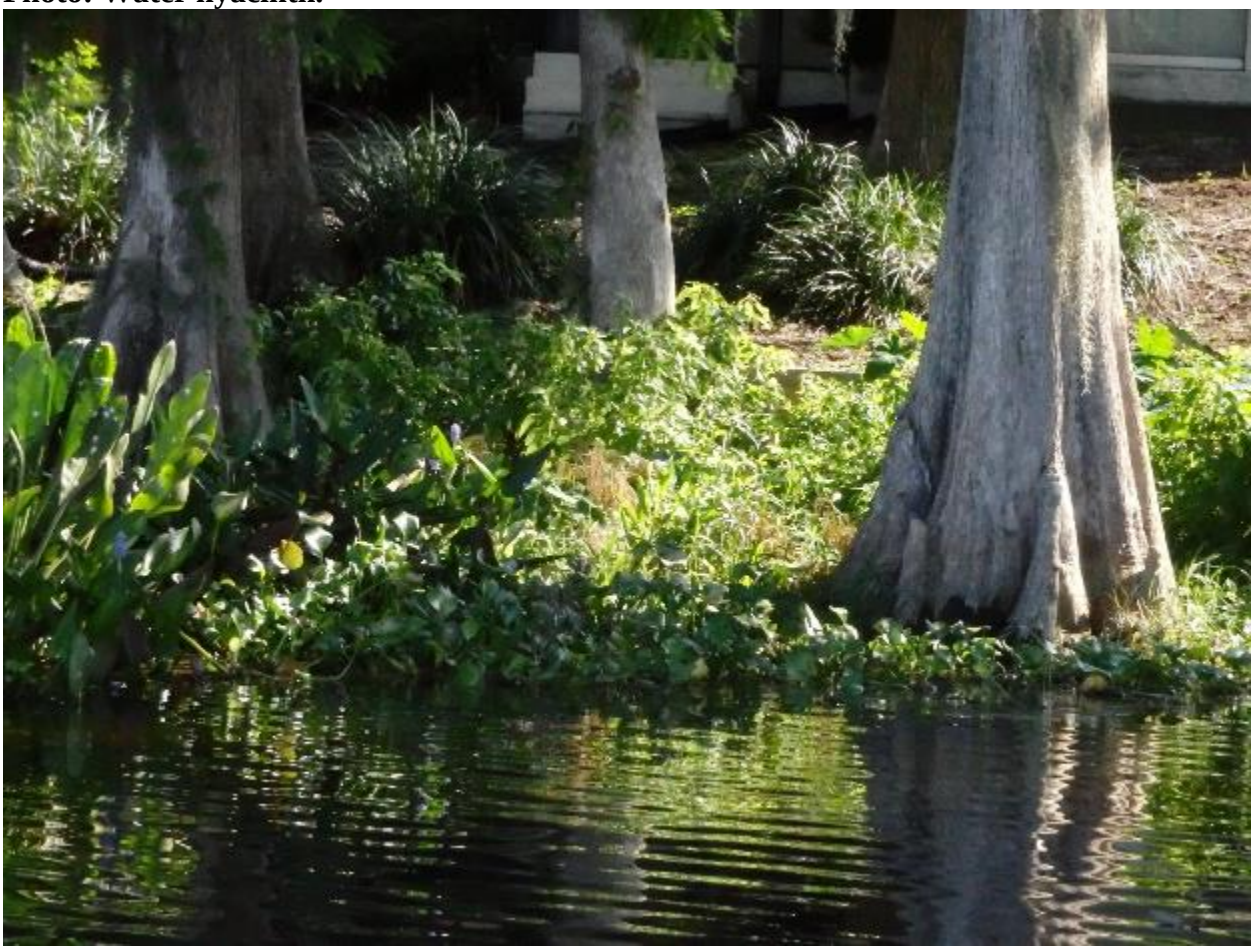
Photo: Eelgrass and freshwater mussels.

Native emergent vegetation observed during the survey included: golden canna, buttonbush, water hemlock, swamp lily, flatsedge, pennywort, softrush, hempvine, spatterdock, maidencane, smartweed, pickerelweed, duck potato, Carolina willow, cordgrass, fire flag, and cattail. The native vegetation had expanded since the previous survey.

Photo: Golden canna.

Invasive emergent species observed during the survey included: alligator weed, paragrass, wild taro, umbrella grass, barnyard grass, water hyacinth, primrose willow, parrot feather, torpedograss, creeping oxeye and papyrus.

Photo: Water hyacinth.



Most of the planting sites from the May 14th restoration event were in healthy condition, but a few sites had a lower than desired survival rate. Those species planted included: duck potato, pickerelweed, softrush, and fire flag. Having a healthy community of shoreline vegetation filters run-off pollutants, protects against erosion, and provides habitat for the wildlife.

Photo: Restoration site at Marbeya Club Condo Association.

The Secchi measurement (water clarity) was 3.5 feet in a total depth of 10.5 feet. The lake elevation was 52.22 feet above sea level at the time of inspection. Four grass carp were observed during the inspection.

Lake Recommendations:

1. Treat invasive species such as torpedo grass, water hyacinth, and water lettuce. In order to do this, a request must first be made to Seminole County to establish a Municipal Service Benefit Unit (MSBU) for aquatic weed control services. For additional information contact Tom Gilbert at (407) 665-7164, tgilbert@seminolecountyfl.gov, or go to http://www.seminolecountyfl.gov/fs/msbu/.

2. Control of aquatic and wetland plants will also require a Florida Fish and Wildlife Conservation Commission (FWC) aquatic plant control permit. Contact Kristine Campbell at (321) 246-0682 or Kristine.Campbell@myfwc.com for assistance in obtaining the permit and further recommendations.

3. Increase educational outreach programs, i.e. Shoreline Restoration Workshops, Florida Yards and Neighborhoods (FYN), Lake Management Video mail-outs. Reduce personal

pollution by: decreasing fertilizer usage, using only phosphorous free fertilizers, keeping a functional shoreline with beneficial native aquatic plants, keeping grass clippings out of your lake and the storm drains that lead to the lake. All of these activities aid in protecting your lake! Contact Seminole County Lake Management Program (407) 665-2439 for more information regarding the free educational programs available.

4. Help spread the word! Obtain email addresses from neighbors not currently on the distribution list. Valuable information is contained within these assessments