

Mirror 2009-2010

On **29 October 2009**, SC Lake Management Program staff, Dean G Barber and Thomas Calhoun surveyed the aquatic plants in Mirror Lake. As in the previous month, hydrilla was observed to a depth of 6 feet, healthy and maintaining to this depth. This month it was the dominant aquatic plant in the lake with more hydrilla on the surface than previously noted. However, the native SAV, although no plant is a close second to hydrilla, all of these species are competing with hydrilla for space. They consisted of: lemon bacopa, chara, road grass, southern naiad, stonewort, bladderwort and eelgrass. Monthly monitoring of these plant populations will determine whether additional stocking of triploid grass carp is necessary in the near future.

Both the 23 and 24 October 2009 lake wide planting sites looked good, with plants successfully establishing and very few uprooted (pop ups). SC contractor had sprayed successfully most of the torpedo grass sites, but there were a few sites that had been missed or sites that included native emergent plants that the torpedo grass could be sprayed around the natives. Also the two permitted access corridors between the northern and southern portion of the lake need to be widened. Most of the alligator weed in the southern portion of the lake was either without leaves or been cut by the grass carp, therefore was difficult to treat.

On **19 November 2009**, SC Lake Management Program staff, Dean G Barber and Thomas Calhoun surveyed the aquatic plants in Mirror Lake. As in the previous two months, hydrilla was observed to a depth of 6 feet. Last month it was the dominant aquatic plant in the lake with more hydrilla on the surface than previously noted. However, this month it was dominant in the southern area of the lake, but in the northern portion, as it was competing with the native SAV, chara, nitella and bladderwort. These plants were more prevalent in the shallow water with chara extended to a depth of 7 feet, deeper than the hydrilla. Other native SAV observed were lemon bacopa, road grass, southern naiad and eelgrass. Eelgrass was to a depth of 6 ft. As we get into the winter months and anticipated drought period, the hydrilla will reduce and the resident population of triploid grass carp fish should continue to impact this most invasive aquatic plant. By spring, we anticipate native plants to expand, becoming dominant in the area from the shore to 6-8 ft. Monthly surveys will continue to monitor these plant populations to determine if this is occurring or whether additional stocking of triploid grass carp will be required. Both native lilies, spatterdock and fragrant water lily, were observed to a depth of 9-10 ft. respectfully, however, the spatterdock had extensive native beetle damage.

The 23 and 24 October 2009 lake wide planting sites continue to look good, with re-vegetated plants expanding at all sites. On 12 November 2009, Gloria Eby and Dean G Barber met with SC contractor to review the aquatic herbicide program. Subsequently, SC contractor sprayed much more invasive vegetation just prior to this survey, such that, the results were not yet apparent. This timely application was done when the plants are storing energy for the winter, thereby; the target plants take up more herbicide for a more effective kill. Access corridors along the south lobe were treated as the lilies were impeding wind/recreation access.

The staff gauge (lake elevation) reading was 59.03 ft., down from the 11/29/2009 reading of 59.36 ft. Secchi reading (water clarity) was 8.5 ft in a depth of 9 ft., a continued improvement

from last month reading of 7.1 ft. Several grass carp were observed, one was over 3 ½ ft. long, most likely about 50lbs.

On 7 December 2009, SC Lake Management Program staff, Dean G Barber and Thomas Calhoun surveyed the aquatic plants in Mirror Lake. As in the previous month, hydrilla was observed to a depth of 6 feet, healthy and maintaining to this depth. This month it was the dominant aquatic plant in the lake. However, the native SAV is continuing to compete with hydrilla for space. They consisted of: lemon bacopa, chara, road grass, southern naiad, stonewort, bladderwort and eelgrass and were found to a depth up to 5 feet. Monthly monitoring of these plant populations will determine whether additional stocking of triploid grass carp is necessary in the near future.

Both the 23 and 24 October 2009 lake wide planting sites looked good, with plants successfully establishing and very few uprooted (pop ups). SC contractor had sprayed successfully most of the torpedo grass sites. Also the access corridors on the south end of the lake have been opened due to treating. Many of the lily pads have been effected by a leaf eating beetle or aphid. This has been observed recently in many of the lakes around Seminole County.

The staff gauge (lake elevation) reading was 59.34 feet down from the previous month of 59.36 feet. Secchi reading (water clarity) was 9.7 feet in a depth of 12.6 feet, a significant increase from last month reading of 7.1 feet. The historic secchi readings range from 1 foot to 8 feet.

On 28 January 2010, SC Lake Management Program staff, Gloria Eby, Dean G Barber and Thomas Calhoun surveyed the aquatic plants in Mirror Lake. As in the previous month, hydrilla was observed to a depth of 6 feet, healthy and maintaining to this depth. This month it was the dominant aquatic plant in the lake and is continuing to expand within the shallow regions of the lake especially in the southern portion. However, the native SAV is continuing to compete with hydrilla for space. They consisted of: lemon bacopa (*Bacopa caroliniana*), musk grass (*Chara* spp.), road grass (*Eleocharis* spp.), southern naiad (*Najas guadalupensis*), bladderwort (*Utricularia inflata*) and eelgrass (*Vallisneria americana*) and were found to a depth up to 4.5 feet.

Both the 23 and 24 October 2009 lake wide planting sites are continuing to look good, with some winter die back due to the recent cold weather but these are expected to recover and continue to expand with warmer temperatures. SC contractor has sprayed successfully most of the torpedo grass sites. Also the access corridors on the south end of the lake have been opened due to treating. Many of the lily pads have been effected by a leaf eating beetle or aphid. This has been observed recently in many of the lakes around Seminole County.

The staff gauge (lake elevation) reading was 59.41 feet up from the previous month of 59.34 feet. Secchi reading (water clarity) was 12.0 feet in a depth of 12.9 feet, an increase from last month reading of 9 feet. The historic secchi readings range from 1 foot to 8 feet.

On 4 February 2010, SC Lake Management Program staff, Gloria Eby, Dean G Barber, Thomas Calhoun and Dharmen Setaram (Aquathol herbicide representative) surveyed the aquatic plants in **Mirror Lake**. Hydrilla continues to be the dominant aquatic plant in the lake, extending to a

depth of 6 feet. It is most abundant in the southern shallow portion of the lake where most of the lake bottom is less than 5 feet. In the rest of the waterbody, hydrilla is restricted to the inshore area as the water reaches 6 feet in depth relatively close to shore. Also in the middle and northern portion of the lake there are more abundance of native submersed aquatic vegetation (SAV) like: lemon bacopa, musk grass, road grass, southern naiad, bladderwort and eelgrass to compete with hydrilla. With our concerns of the percent of hydrilla in the lake during the winter months and its potential for expansion in the spring, Dharmen joined us to discuss a possible hydrilla treatment plan with associated cost. The intention is to treat the southern portion of the lake to reduce the hydrilla population to a level that the triploid grass carp can control the remaining hydrilla with the help of the native SAV. The MSBU does have contingency funds built in for this specific task.

The staff gauge (lake elevation) reading was 59.46 feet up from the 28 January 2010 reading of 59.41 feet and the previous month of 59.34 feet.

On **16 March 2010**, Seminole County Lake Management Program staff, Gloria Eby, and Dean G Barber (Consultant), surveyed the aquatic plants in **Mirror Lake**. Hydrilla continues to be the dominant aquatic plant in the lake, observed to a depth of 8 feet. In the southern area of the lake, where the hydrilla has been the most abundant, much of it was covered with algae, possibly from the recent rainfall events bringing increased nutrients into the lake. Hydrilla is more restricted in the rest of the waterbody present adjacent to the shore to a depth of 6-8 feet. In this area native submersed aquatic vegetation (SAV): lemon bacopa, musk grass, road grass, southern naiad, bladderwort and eelgrass are impacting the expansion of hydrilla. The percent of torpedo grass within the lake has been reduced by the monthly herbicide treatment, expansion of vegetated native emergent aquatic plants and the winter impact. The native plants, primarily pickerelweed, canna and duck potato, are healthy and expanding. The secchi (water clarity) was 10.7 feet in a depth of 14.5 feet compared to 12.0 feet in January 2010. Five grass carp were observed, several very large (20 lbs +).

On **16 April 2010**, Seminole County Lake Management Program staff, Gloria Eby, Dean G Barber (Consultant) and Thomas Calhoun (SC Assistant Scientist) surveyed the aquatic plants in **Mirror Lake**. Hydrilla continues to be the dominant aquatic plant in the lake, observed to a depth of 9 feet. In the southern area of the lake, where the hydrilla has been the most abundant, much of it was covered with algae, possibly from the recent rainfall events bringing increased nutrients into the lake. Hydrilla is more restricted in the rest of the waterbody present adjacent to the shore to a depth of 6-8 feet. In this area native submersed aquatic vegetation (SAV): lemon bacopa, musk grass, road grass, southern naiad, bladderwort and eelgrass are impacting the expansion of hydrilla. The percent of torpedo grass within the lake has been reduced by the monthly herbicide treatment, expansion of vegetated native emergent aquatic plants and the winter impact. The native plants, primarily pickerelweed, canna and duck potato, are healthy and expanding. The secchi (water clarity) was 12.5 feet in a depth of 17.2 feet compared to 10.7 feet in March 2010.

On **27 May 2010**, Seminole County Lake Management Program staff, Thomas Calhoun and Dean G Barber, surveyed the aquatic plants in **Mirror Lake**. Hydrilla continues to show impact from the recent Aquathol treatment, especially the western plot, adjacent to the NW residential

area. The percent of hydrilla in the lake has been significantly reduced from the herbicide treatment. Native SAV, like musk grass, southern naiad and bladderwort (*Utricularia foliosa* and *U. inflata*) are expanding in the treated plots, taking space previously held by hydrilla. *U. foliosa* was observed to a depth of 8 feet. Other native SAV observed included: lemon bacopa, coontail, road grass, stonewort and eelgrass. The exclusion trap, used to monitor introduction of lemon bacopa and its impact from triploid grass carp fish was removed from the lake. The secchi (water clarity) was 9.2 feet in a depth of 9.2 feet, increase from the 11 May reading of 6.1 feet.

On **24 June 2010**, Gloria Eby (Seminole County [SC] Senior Environmental Scientist), Marianne Pluchino (SC Senior Environmental Scientist), Dean G Barber (SC Consultant), Thomas Calhoun (Assistant Scientist), surveyed the aquatic plants and conducted a Lake Vegetation Index (LVI) of Mirror Lake. 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.

Observed during this survey was expansion of the macro-algae musk grass (photo attached) and eelgrass, both of these plant species are beneficial natives that aid in the uptake of nutrients within the lake. The secchi (water clarity) was 8.2 ft in a depth of 9.2 ft.

On **22 July 2010**, Seminole County Lake Management Program (SCLMP) personnel Thomas Calhoun and Dean G Barber surveyed the aquatic plants in **Mirror Lake**. Submersed aquatic vegetation (SAV) observed included: lemon bacopa to a depth of 4 feet, musk grass to 6 feet, road grass to 5 feet, the invasive exotic hydrilla to 7 feet, southern naiad in shallow water, stonewort (big nitella) to 3 feet, small nitella 1-2 feet, bladderwort (*Utricularia foliosa*) to 9 feet, and *Utricularia inflata* to 4 feet and eelgrass to 4 feet. *Hydrilla* was only seen in short individual stressed strands, no populations or clusters of plants were observed. The recent selective hydrilla treatment and additional triploid grass carp fish have reduced hydrilla throughout the lake, especially in the southern portion.

Musk grass was thickly covering the bottom of the southern eastern access channel. Musk grass and *U. foliosa* were the co-dominant SAV throughout the lake. Small stonewort and musk grass covered most the bottom in the NE cove. Torpedo grass was prevalent emergent in both the southern lobe and NE cove. The emergent road grass in the southern lobe that used to be so prevalent is gone. Now the dominant emergent plant in this area is torpedo grass and maidencane grass. The secchi (water clarity) was 8.6 feet in a depth of 10 feet, compared to 8.2 ft the previous month. Water elevation was 59.29 feet above sea level.