

On **18 August 2009**, Gloria Eby (Seminole County [SC] Senior Biologist), Dean G Barber (SC Consultant), surveyed the aquatic plants in Spring Lake. Eelgrass (*Vallisneria americana*) continues to be the lake's dominant aquatic plant, observed to a depth of 8.3 feet. With the eelgrass flowering season over and higher water level, this plant is not impeding navigation to the extent that it was in previous months. Additionally, none of the dock accesses noted along the eastern shore were blocked. Hydrilla (*Hydrilla verticillata*) was observed only in the area adjacent to the Spring Lake Farms community park. Because of impending thunderstorms, hydrilla was not checked in the shallows around the lake and on the deep side of the eelgrass. We are optimistic that the stocking rate of triploid grass carp, with the native submersed aquatic vegetation (SAV) will continue to keep the hydrilla from expanding. So far this has been true as no hydrilla herbicide treatments have been required. The only other SAV observed was sago pondweed (*Potamogeton pectinatus*). Although these SAV: water hyssop (*Bacopa monnieri*), muskgrass (*Chara spp.*), baby tears (*Micranthemum glomeratum*), southern naiad (*Najas guadalupensis*), storewort (*Nitella spp.*), were not observed in this hasty survey, they were noted on the previous surveys and we have no reason to believe they are not there.

All the previously planted sites have well established emergent plant populations. At several locations, the new plantings were helping to keep the torpedo grass (*Panicum repens*) from re-establishing. Several waterfronts that have not been vegetated, the shoreline have extensive torpedo grass stands. Consideration should be given to expand the SC treatment of torpedo grass to lakewide.

The Secchi (water quality) was 3.5 feet, down from the previous reading of 4.8 feet. The historic Secchi readings, from 1973 to present, including 178 samples, has been 1-36 ft. All this information and much more is available on the Seminole County Water Atlas at: <http://www.seminole.wateratlas.usf.edu>

On **17 July 2009**, Gloria Eby (Seminole County Senior Biologist), Marianne Pluchino (SC Senior Scientist), and Thomas Calhoun (SC Assistant Scientist) surveyed the aquatic plants in Spring Lake.

Eelgrass was noted to a depth of 8 ft with the access corridors (for boats) open due to the previous treatments. Additionally, sago pondweed and hydrilla were observed to a depth of 8ft, mixed with the eelgrass. Hydrilla was found in isolated locations at a depth of 10ft existing as a monoculture (one single plant). In absence of any competition (eelgrass) hydrilla is establishing within this region. Beyond a depth of 11ft, no submersed aquatic vegetation was observed in the samples.

Hydrilla was observed just off Spring Valley Farms dock mixed with eelgrass at a depth of 8ft. Two grass carp fish were observed in one of the previously removed cattail locations in which hydrilla began to establish. The hydrilla in this area was reduced by the triploid grass carp. Additionally, more carp were observed near the Lister's property.

The Secchi (water clarity) was 4.1 feet in a water depth of 14.3ft.

On 24 June 2009, Gloria Eby (Seminole County Senior Biologist), Marianne Pluchino (SC Senior Scientist), Dean G Barber (SC Consultant), Thomas Calhoun (SC Assistant Scientist) and Joe Faella (Dredging & Marine Consultants Biologist) surveyed the aquatic plants in Spring Lake while doing a Lake Vegetation Index (LVI). A LVI is used to assess a waterbody's health by documenting the aquatic and wetland plants in 4 of 12 randomly chosen lake sectors. During this assessment two boats were used with 2 sectors surveyed by each vessel. All 4 sectors are represented in this report. Sixty plants were observed in these four sectors, 50 native plants and 10 exotic plant species. The major exotic of concern was hydrilla (*Hydrilla verticillata*) which was observed mostly in shallow water (1-3 ft), but also seen on the deep side (7.5 ft) of the native submersed aquatic vegetation (SAV) mostly eelgrass (*Vallisneria americana*), the dominant plant observed in all of the sectors and storewort (*Nitella spp.*). Hydrilla tubers were observed on some of the hydrilla plants. Hydrilla still represents less than 1% area of vegetation. Other exotic plants included: alligator weed (*Alternanthera philoxeroides*), wild taro or elephant ear (*Colocasia esculenta*), exotic canna (*Canna spp.*), torpedo grass (*Panicum repens*), and creeping oxeye (*Wedelia trilobata*). Alligator weed is controlled by the alligator weed flea beetle. With the exotic canna, they are not species of concern. However, the others will continue to expand and if unchecked will cover more of the shoreline and reduce native plant diversity. Exotic trees included: camphor tree (*Cinnamomum camphora*), Brazilian pepper (*Schinus terebinthifolius*), and Chinese tallow (*Sapium sebiferum*). It is recommended that these trees be removed as they will and have expanded in the last several years. There were 7 native submersed aquatic vegetation (SAV) including: water hyssop (*Bacopa monnieri*), muskgrass (*Chara spp.*), baby tears (*Micranthemum glomeratum*), southern naiad (*Najas guadalupensis*), sago pondweed (*Potamogeton pectinatus*), storewort (*Nitella spp.*), eelgrass, and one exotic, hydrilla. Eelgrass, like hydrilla, was also observed to a depth of 7.5 ft. These native SAV and the triploid grass carp are playing the key role in preventing hydrilla from expanding. Hopefully with the late summer rains and getting into the fall period the eelgrass will recede from the water's surface, reducing its effect on navigation.

The Secchi (water quality) was 4.8 feet. The historic Secchi readings, from 1973 to present, including 178 samples, has been 1-36 ft. All this information and much more is available on the Seminole County Water Atlas at: <http://www.seminole.wateratlas.usf.edu>

On April 21, 2009, Gloria Eby, Dean G Barber and lake resident Bobbi Vogel surveyed the aquatic plants in Spring Lake with special attention to the eelgrass (*Vallisneria americana*) blocking both boat accesses, and in and around the ski course. Some accesses were open but most had some portion or all of the access blocked. In the ski course, the northern four buoys had the most eelgrass on the surface in and adjacent to the course. Several times during the inspection we were forced to stop and clear the eelgrass from the engine prop and algae from its water intakes. In addition to the eelgrass and algae on the surface, fragments of the eelgrass flowers are floating throughout the lake, especially near the shore.

Hydrilla was observed more frequently within the large eelgrass stands than during previous surveys, mostly along the western shore. These hydrilla populations were few plants in number, hopefully between the eelgrass and triploid grass carp, they will keep the hydrilla from spreading. The water clarity, Secchi was 7.8 feet, we were able to observe several areas that

were without any submersed aquatic, vegetation even though the depth of water could support aquatic plants.

No triploid grass carp were observed.

On March 11, 2009, Gloria Eby (Seminole County[SC] Lake Manager), Dean G Barber (SC Consultant) and Thomas Calhoun (SC Assistant Biologist) surveyed the aquatic plants in Spring Lake and reviewed the treatment of the eelgrass (*Vallisneria americana*) blocked boating accesses. Forty percent of the treated eelgrass accesses were open. Because of the limited results on the eelgrass, on March 17, 2009, we invited Dharmen Setaram, (representative of United Phosphorus, Inc. [manufacturer of Hydrothol 191, used to treat eelgrass]) and Keith Mangus (applicator for Applied Aquatics, SC aquatic contractor). They agreed that larger Hydrothol 191 plots and higher rates are required.

The invasive aquatic plant, hydrilla (*Hydrilla verticillata*), as noted in previous surveys, was observed both in shallow water adjacent to the shoreline and in deep water to a depth of 10 feet. However, it was not observed as frequently as previously noted, although it was mixed in with the eelgrass which was present to 11 feet. Eelgrass continues to be the most abundant aquatic plant, on the surface in over ¼ of the lake. Other native submersed aquatic vegetation (SAV) noted included: chara (*Chara spp.*), southern naiad (*najas quadalupensis*), and nitella (*Nitella spp.*). However these SAV species have decreased significantly as the eelgrass has expanded.

There is still no aquatic plant re-growth of significance within the cattail removal sites. The decaying cattail bases are still present, apparently inhibiting any other aquatic plants from establishing naturally. During the next planning some species will be tested. It is important to establish some native aquatic plants to keep the invasive exotic torpedo grass (*Panicum repens*) from establishing.

No triploid grass carp were observed. Secchi (water quality) was 8.6 feet, over two times greater than the historic average.

On January 28th, 2009, Spring lake was surveyed by Thomas Calhoun (Seminole County [SC] staff assistant) and myself. Hydrilla was observed in more locations than previous month's survey from shallow water to the deep side of eelgrass. Eelgrass was observed to a depth of 8 feet with pocketed areas in competition with hydrilla throughout the lake (see hydrilla within eelgrass photo). In some areas, where eelgrass was treated for boating access, a significant increase in hydrilla re-growth was noted (see hydrilla re-growth photo). Hydrilla was also observed in the cove adjacent to the Spring Valley Boat Ramp (see hydrilla photo). This area is currently under a monthly contract for hydrilla, cattails and torpedo grass including the HOA parcel. Other native SAV, other than eelgrass included: chara (*Chara spp.*), southern naiad (*najas quadalupensis*), and nitella (*Nitella spp.*), all still in isolated small populations throughout the lake. A minor pond weed (see pondweed photo) was also found in one location. This

beneficial native plant is shown in the photo attached and is mixed within the eelgrass.

As previously reported, no cattail re-growth was observed on the sites that had been treated and harvested.

It was difficult to determine herbicide treatment impact from frost damage for this inspection. Much of the fire flag (*Thalia* spp.) and pickerelweed (*Pontederia* spp.) was impacted from the frost but should recover.

Secchi reading (water clarity) was 7.9 ft, an increase of 1.3 feet from the previous month.

On **December 23, 2008**, Dean G Barber (SC Consultant) and myself, surveyed Spring Lake and reviewed the November 19th treatment of the eelgrass (*Vallisneria americana*) that has blocked boating accesses by SC's contractor, Applied Aquatics. Only forty percent of the treated accesses were open through eelgrass.

Hydrilla (*Hydrilla verticillata*), as noted in the previous month's survey, was observed both in shallow water adjacent to the shoreline and on the deep side of the native submersed aquatic vegetation (SAV), primarily eelgrass. The hydrilla on the deep side of the eelgrass was much healthier and denser than observed in November, coming up 3-4 feet from the bottom in 9 feet of water. This concern has prompted a request for a quote of 90 triploid grass carp (1 fish/lake acreage, to impact this hydrilla expansion. Other native SAV, other than eelgrass included: chara (*Chara* spp.), southern naiad (*Najas quadalupensis*), and nitella (*Nitella* spp.), all still in isolated small populations throughout the lake.

As previously reported, no cattail re-growth was observed on the sites that had been treated and harvested. As Spring approaches these sites will need to be re-vegetated. However, sparse desirable aquatic plants are naturally establishing in these locations and will be monitored. Native aquatic plants will play an important role in helping to keep the invasive exotic torpedo grass (*Panicum repens*) from establishing.

No triploid grass carp were observed. Water clarity, secchi, was 6.6 ft, which is almost double previous reading of 3.6 feet.

On **November 19, 2008**, Dean G Barber (SC Consultant) and myself surveyed Spring Lake and GPS'ed the blocked boating accesses for SC's contractor, Applied Aquatics, to treat the eelgrass (*Vallisneria americana*) with an aquatic herbicide.

The invasive aquatic plant, hydrilla (*Hydrilla verticillata*), was observed both in shallow water adjacent to the shoreline and on the deep side of the native submersed aquatic vegetation (SAV), primarily eelgrass. Even though hydrilla was observed at these two sites, the plant was sparse and having a difficult time competing with the native SAV. Eelgrass has established to the surface from six feet, but extends to 8 feet below the surface. It has out competed other native SAV, like chara (*Chara* spp.) and nitella (*Nitella* spp.) both which are still present in shallow and deep water, usually in isolated populations. These macro-algae remain healthy, but their acreage has been reduced from previous surveys.

No cattail re-growth was observed on the sites that had been treated and harvested. Only sparse dead cattail roots were observed in the shallow water less than three feet. Anticipate that the treatment success will restrict any cattail re-growth from the shore only.

No triploid grass carp were observed.

Applied Aquatic's applicator, was taken to all the previous 12 documented boating access sites in which eelgrass is inhibiting boating access to open water. Twelve sites were observed with access problems. These varied from ~ 20-100 feet from the dock to open water. Contractor treated the 12 sites, to provide a 20 foot wide boating access to open water. Treatment results will be monitored.

September 9, 2008 survey of Spring Lake.

Hydrilla was sparsely present, mostly in waters less than 2 feet, on the west side of the lake. In the NW area adjacent to the park, this invasive aquatic plant was present in deeper water, 3-4 feet, but still sparse. No hydrilla was observed on the lake's east side. Eelgrass is present to 5 1/2 feet in depth. Southern naiad and chara continue to be dominant submersed plants followed closely by eelgrass. No grass carp were observed.

Cattail removal sites were almost complete. Previous treatment of the cattails with the aquatic herbicide Rodeo which has translocated to any remaining root material, will make it difficult for the cattail to re-establish, except by seed in the shallow water. There was no observed offsite turbidity violation associated to this mechanical removal. A turbidity screen was onsite. The screen was not in use, as the blustery wind was blowing from deep water to shallow water, keeping any turbidity change onsite.

The Rodeo treated torpedo grass, that was also mechanically removed on several sites, is more difficult to eradicate than the cattails, therefore, will require additional treatments and management on WAV/resident workday, October 11, 2008.

Overall, both the cattail and torpedo grass removal sites look promising, especially with follow up clearing of mostly inshore torpedo grass and subsequent re-vegetation with native plants.

Eighteen resident boat accesses were GPS for possible treatment of eelgrass in individual waterfront owners boat access. Of these, 11 had boats at the resident's waterfront and 7 were sites that resident could desire access, although, no boat was present at the time of the survey.