Appendix D. History of Hydrilla Removal Efforts at Wakulla Springs

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Soon after its discovery, attempts were made to remove hydrilla from the spring and river. Removal by hand was the first method used. The extent of the hydrilla infestation became apparent when it invaded the swimming area and complaints were made about an abrasive plant that was entangling some swimmers. Hydrilla was now a major problem at Wakulla Springs State Park. In February 1998, a full-time OPS position was created and an individual was hired to help in the control and removal of hydrilla. Swimmers and volunteers were first used in the swimming area to help hand-pull the hydrilla and load it onto dump trucks. Shortly after this, divers were used to pull it out of the deeper areas of the spring and swimming area. Tarps were put down to shade out the hydrilla in parts of the spring basin and the area directly behind the floating dock. Shading with tarps can kill hydrilla. However, the tarps must be down for over 80 days or the hydrilla can resprout from the roots and tubers. In April 1998, the approved aquatic herbicide Aquathal was applied to a portion of the swimming area. The hydrilla was observed to turn brown but did not die from this herbicide application. None of these efforts was successful in controlling the spread of hydrilla. At the end of 1998, despite an estimated 260,000 kg removed, involving 4,265 man-hours at an estimated cost of $33,500, hydrilla continued its invasion of the spring and river.

Late in 1998, Prism Ecological Services, Inc. was contracted to remove hydrilla from certain parts of the river by the use of a mechanical plant harvester. In 10 days of cutting during March 1999, totaling 282 man-hours, a total of 100,000 kg of hydrilla was removed from the river. Prism returned 4 times in 1999 and removed 280,000 additional kg of hydrilla. Until October 1999, Prism was cutting hydrilla and harvesting the clippings that were being hauled to a dump site in the park. This method was improved upon; in October 1999, Prism developed a way to mechanically pull hydrilla from the river while leaving some of the native Tapegrass (*Vallisneria americana*). In five days, 64,000 kg of hydrilla were pulled from the river.

Between December 1999 and January 2000, 19 volunteers completed 40 dives and park personnel completed 28 dives. This totaled 24 volunteer man-hours and 21 man-hours for park personnel. Done in coordination with the Prism mechanical harvesting, this massive dive effort greatly increased the efficiency of the hydrilla removal effort. In 11 days a total of 120,000 kg of hydrilla was removed. Some of the hydrilla was being removed off site, but most was still being hauled to the on-site dump. In May 2000, a second loading area was developed at the Warehouse/Railroad area downriver. This new loading site allowed hydrilla removal from farther downriver with a shorter travel time. A third loading site was built between the swim area and the Warehouse/Railroad area.

In May 1999, an attempt at biological control was made in conjunction with Dr. O'Brien from Florida A&M University. Specimens of the fly *Hydrellia pakistane* were collected from central Florida. Approximately 20,000 flies were introduced to a small section of the river near the boat drydock area. In November 1999, several specimens were collected in the area in which they were released. A small population appears to have been established. No other control methods were used in this area designated for biological control. There has never been any evidence of the flies having any negative impacts to the hydrilla and we are not sure if they are present today.

Hydrilla removal by mechanical harvesting and diving (in the swim area and spring) continued until April 2002. This method of treatment was somewhat successful for short-term control of the hydrilla in the swim area, the spring, and the boat tour route. A total of over 2,000,000 kg of hydrilla was removed at a cost of over $400,000. But the infestation was getting worse in areas that were not being used and downriver past the tour route. In 2002 it was determined that alternative treatments were needed. A herbicide application of Aquathol K was done on April 16, 2002, for 52 hours at a rate of 4.25 parts per million (ppm) (a total of 1,750 gallons). The results were remarkable. Since then herbicide treatments at lesser rates (1.5–2.15 ppm) were completed in November 2002, November 2003, May 2004, and April 2005. The treatments cost about $80,000 each.

Since the herbicide treatments of hydrilla, the vegetation of the river has changed. There has been a decrease in most plants, most notably hydrilla, musk-grass and *Sagittara kurziana*. There have also been some increases and spread of Illinois pondweed, Southern naiad (*Najas guadalupensis*), and *Vallisneria americana.* The system acts like a yo-yo; after the herbicide treatment there is much less vegetation and algae covers most everything in the water. As the system recovers, the natives (pondweed, naiad, *Sagittaria,* and *Vallisneria*) grow back faster than the hydrilla, but over time the hydrilla grows back and overtakes the natives. This yo-yo effect takes 6 to 8 months to occur. But there has been improvement. We do now have large areas with good native growth and little hydrilla, but we also have large areas where hydrilla continues to dominate.

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Report of the Peer Review Committee
on the Workshop
Solving Water Pollution Problems
in the Wakulla Springshed of North Florida
May 12–13, 2005
Tallahassee, Florida

December 2005

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