

Aquatics

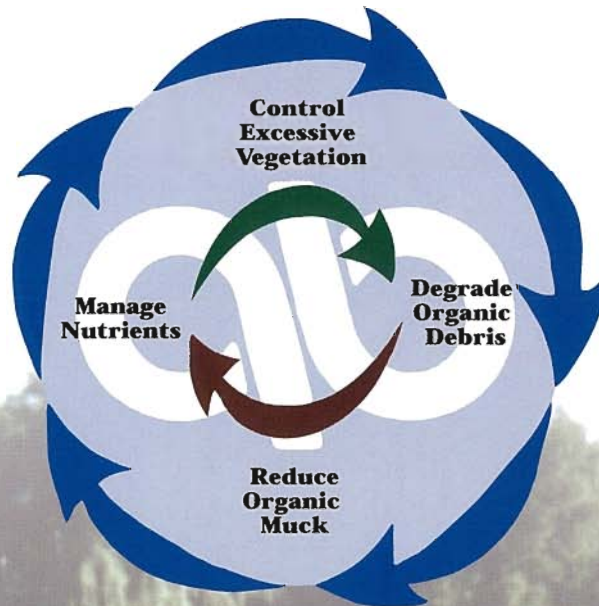
Winter 2006



PRSRRT STD
U.S. Postage
Paid
Tallahassee, FL
Permit No. 407

Manage The Pond Cycle

Change The Way Your Pond Cycles Nutrients



Quality Products For Water Quality

CUTRINE-PLUS
LIQUID
ALGAEICIDE / HERBICIDE

AQUASHADE
ALGALIC PLANT GROWTH CONTROL

AQUA-PREP
ENZYME SOLUTION

NUTRI-SORB
MICROBIAL BLEND

MixAirTech
AERATION

The Applied Biochemists Five Step Approach

1. Treat existing aquatic growth problems caused by excessive nutrients.
2. Prevent re-growth and enhance aesthetics.
3. Initiate the break-down of organic debris.
4. Augment existing pond bacteria with superior strains to reduce muck.
5. Aeration drives the cycle to improve pond conditions.

ab applied biochemists

1-800-558-5106

www.appliedbiochemists.com

Available From Quality Distributors and Dealers

Aquatics

Winter 2006 / Vol. 28, No. 4



Fox Lake (Brevard County) muck scraping project conducted during FY 2003/2004.
Photograph by Bruce Jaggars.

Contents

Regrowth of Egyptian paspalidium *Paspalidium geminatum* after harvesting
Craig T. Mallison¹, Bill Pouder¹, Boyd Z. Thompson² and Rue S. Hestand, III² 4

Efforts to Establish Egyptian Paspalidium *Paspalidium geminatum* Following Lake Enhancement on Lake Tohopekaliga, Florida
Bill Pouder¹, Craig Mallison¹, Rue Hestand, III², and Boyd Thompson² 8

Response to Editorial: "Restoring Sport Fishing at Lake Apopka"
St. Johns River Water Management District, Dept. of Water Resources 16

Florida Aquatic Plant Management Society		
2007 Board of Directors Officers		
President Vicki Pontius Highlands County 4344 George Blvd Sebring, FL 33875-6899 863-402-6812 863-402-6899 fax vpontius@bcc.co.highlands.fl.us	President-Elect Chance Dubose USACE 602 N Palm Ave Palatka, FL 32177 386-328-2737 386-328-1298 fax Chance.W.Dubose@saj02.usace.army.m	Past President Bill Moore Consultant 11512 Lake Katherine Cir Clermont, FL 34711 352-242-2360 williamhmo@aol.com
Secretary Stephanie Walters Prosource One PO Box 200 Plymouth, FL 32768-0200 407-466-8360 407-884-0111 fax swalters@prosourceone.com	Treasurer Jennifer Myers Applied Aquatic Management, Inc P.O. Box 1469 Eagle Lake, FL 33839-1469 863-533-8882 863-534-3322 fax jmyers43@tampabay.rr.com	Editor Jeffrey Holland Reedy Creek Improvement Dist PO Box 10170 Lake Buena Vista, FL 32830-0170 407-824-7301 Fax 407-824-7309 jholland@rcid.dst.fl.us
Third Year Dr William (Bill) Haller University of Florida 7922 NW 71st Street Gainesville, FL 32653 352-392-9615 352-392-3462 fax wth@ifas.ufl.edu	Johnnie Drew St. Johns River Water Mgmt District P.O. Box 1429 Palatka, FL 32178-1429 386-329-4269 386-329-4310 fax jdrew@sjrwm.com	Michael Netherland US Army Engineer Research & Development 7922 NW 71st Street Gainesville, FL 32653 352-392-0335 352-392-3462 fax mdnether@ifas.ufl.edu
Second Year Bruce Jaggars Florida Fish & Wildlife Conservation Commission 601 West Woodward Ave. Eustis, FL 32726 352-742-6438 352-742-6461 fax bruce.jaggars@fwc.state.fl.us	Jennifer Bustos-Fitz Allstate Resource Management 6900 SW 21st Court, Bldg. #9 Davie, FL 33317 954-382-9766 954-382-9770 fax waterweed@aol.com	Robbie Lovstrand FL DEP, Invasive Plant Management 6355 South Florida Avenue Floral City, FL 34436 352-726-8622 352-726-4911 fax Robert.Lovstrand@dep.state.fl.us
First Year Lowell Trent 4919 Sycamore Street Apopka, FL 32712 407.889.0276 ltrent@mpinet.net	John A. Evertsen City of Orlando, Streets and Stormwater 1030 South Woods Avenue Orlando, FL 32805 407-246-2234 ext. 36 407-246-4050 fax john.evertsen@cityoforlando.net	Tim Harris USACE 602 N Palm Ave Palatka, FL 32177 386-328-2737 386-328-1298 fax tim.t.harris@usace.army.m
Auditing Committee: Keshav Setaram SFWMD (407)824-7274 ksetaram@sfwmd.gov	Awards Mitch Morgan City of Gainesville 405 NW 39th Ave Gainesville, FL 32609 352-316-6540 352-334-3110 Fax morganmm@ci.gainesville.fl.us	By-Laws Stephanie McCarty Walt Disney World Co. Environmental Affairs Div. P.O. Box 10000 Lake Buena Vista, FL 32830 407-824-7274 stephanie.mccarty@disney.com
Governmental Affairs Bill Haller University of Florida 7922 NW 71st Street Gainesville, FL 32653 352-392-9615 352-392-3462 fax wth@ifas.ufl.edu	Editorial Jeff Holland RCID Environmental Services 2191 South Service Lane Lake Buena Vista, FL 32830 407-824-7324 407-824-7309 fax jholland@rcid.dst.fl.us	Historical Robbie Lovstrand FL DEP 6355 South Florida Ave Floral City, FL 34436 352-726-8622 Robert.Lovstrand@dep.state.fl.us
Local Arrangements Bill Torres DEP, Invasive Plant Mgmt 3900 Commonwealth Blvd MS 705 Tallahassee, FL 32399 850-245-2809 850-245-2834 fax william.torres@dep.state.fl.us	Mailing List Jackie Smith DEP-Invasive Plant Management 9737 Gumbo Limbo Lane Jensen Beach, FL 34957 561-722-2479 Jackie.c.smith@dep.state.fl.us	Membership and Publicity Chance Dubose USACE 602 N Palm Ave Palatka, FL 32177 386-328-2737 386-328-1298 fax Chance.W.Dubose@saj02.usace.army.mil
Merchandise Jennifer Bustos-Fitz Allstate Resource Management 6900 SW 21st Court, #9 Davie, FL 33317 954-382-9766 954-382-9770 fax waterweed@aol.com	Nominating Bill Moore Consultant 11512 Lake Katherine Cir Clermont, FL 34711 352-242-2360 williamhmo@aol.com	Program Tim Harris & Chance Dubose USACE 602 N Palm Ave Palatka, FL 32177 386-328-2737 386-328-1298 fax Chance.W.Dubose@saj02.usace.army.mil
Resource Demonstration Paul Mason UAP 2250 Oak Shadow Ct Oviedo, FL 32766 Cell: 407-718-9154 Fax : 321-226-0213 paul.mason@uap.com	Scholarship Don Doggett Lee County Hyacinth Control Dist P.O. Box 60005 Ft Myers, FL 33906 239-694-2174 Doggett@lchcd.org	Vendor Dan Bergeson SePro Corporation Post Office Box 625 Safety Harbor, FL 34695 813-267-5650 danb@sepro.com
Web Site David Farr Volusia County Mosquito Control 801 South Street New Smyrna Beach, FL 32168 386-424-2920 386-424-2924 fax dfarr@co.volusia.fl.us	FAPMS Website: www.fapms.org	

The Florida Aquatic Plant Management Society, Inc. has not tested any of the products advertised or referred to in this publication, nor has it verified any of the statements made in any of the advertisements or articles. The Society does not warrant, expressly or implied, the fitness of any product advertised or the suitability of any advice or statements contained herein.
© 2006 FAPMS, Inc. All rights reserved. Reproduction in whole or in part without permission is prohibited.
AQUATICS (ISSN 1054-1799): Published quarterly as the official publication of the Florida Aquatic Plant Management Society Registration No. 1,579,647. This publication is intended to keep all interested parties informed on matters as they relate to aquatic plant management particularly in Florida. To become a member of FAPMS and receive the Society newsletter and Aquatics magazine, send \$35.00 plus your mailing address to the Treasurer.
EDITORIAL: Address all correspondence regarding editorial matter to Jeff Holland, *Aquatics Magazine*.

Regrowth of Egyptian paspalidium *Paspalidium geminatum* after harvesting

Craig T. Mallison¹,
Bill Pouders¹, Boyd Z.
Thompson² and Rue S.
Hestand, III²
Florida Fish and Wildlife
Conservation Commission

¹3900 Drane Field Rd., Lakeland, FL 33811
²601 W. Woodward Ave., Eustis, FL 32726

Introduction

Over the past four decades, the Florida Fish and Wildlife Conservation Commission (FWC) has conducted projects to restore or improve degraded aquatic habitats (e.g., Holcomb and Wegener 1971, Moyer et al. 1995, Hulon et al. 1998, Mallison and Hujik 1999). One component of habitat enhancement included revegetation to reestablish native aquatic plants. Whole plants

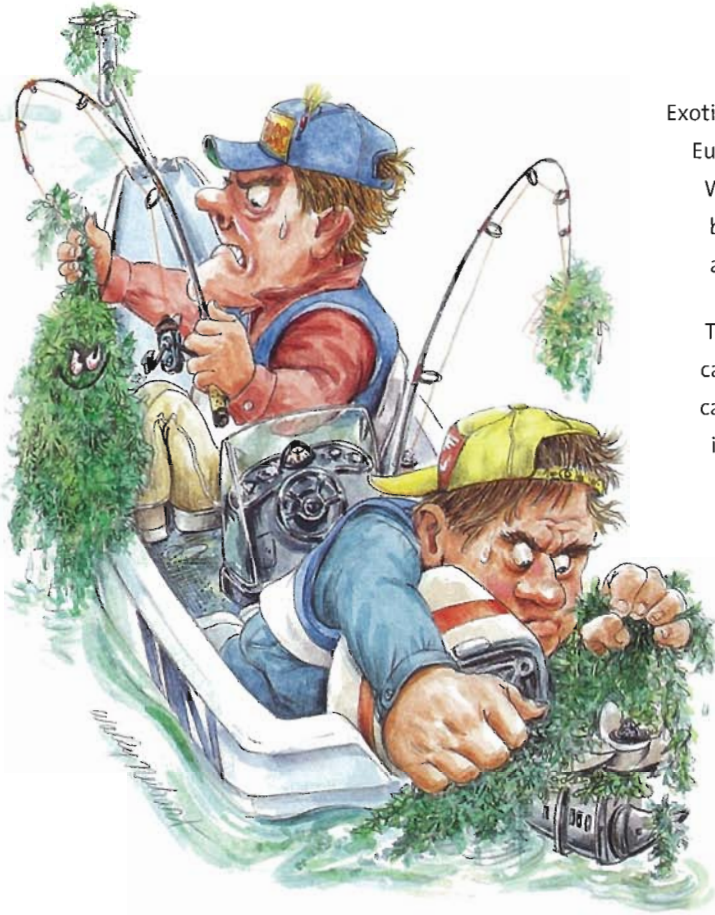
were obtained from wild collection sites or nurseries and planted into the desired locations. Sustained populations of desirable emergent plants [Egyptian paspalidium (*Paspalidium geminatum*), maidencane (*Panicum hemitomon*),

- A) pre-harvest
- B) post-harvest
- C) three weeks post-harvest
- D) six months post-harvest



Figure 1. Sampling sites of Egyptian paspalidium on Lake Kissimmee, Florida, on A) 5/18/04, before harvesting, B) 5/18/04, following harvesting, C) 6/10/04, and D) 11/17/04.

Too Many Weeds Spoil the Fishing



Exotic invasive aquatic plants such as Hydrilla, Eurasian Watermilfoil, Curlyleaf Pondweed, Water Chestnut and Water Hyacinth can be detrimental to a healthy fishery in lakes across the country.

These invasive plants when left unmanaged can alter the ecosystem of lakes and reservoirs, causing a decline in the fishery, as well as interfering with other valued uses of waterbodies.

The Authoritative Leader in Aquatic Habitat Management

Successful aquatic habitat management is all about achieving a balance in the aquatic ecosystem. Cerexagri offers assistance and a full line of aquatic products for properly managing exotic and invasive plants and algae to achieve and maintain a healthy aquatic environment for native aquatic plants.

Aquathol® K and Aquathol® Super K Aquatic Herbicide
For selective control of Hydrilla, Curlyleaf Pondweed, Coontail and other Invasive and Nuisance aquatic plants.

Aqua-Kleen® Aquatic Herbicide
One of the most tested and proven herbicides known today for control of Eurasian Watermilfoil, Water Chestnut and other Invasive aquatic weeds.

Hydrothol® 191 Aquatic Herbicide & Algicide
A broad-spectrum herbicide and algicide. Hydrothol® 191 provides a companion product or an alternative to copper algicides when controlling difficult algae species.



To obtain a copy of our video,
Aquatic Plant and Habitat Management,
call 1-800-438-6071



cerexagri

www.cerexagri.com

and bulrush (*Schoenoplectus* spp. = *Scirpus* spp.)) have been established in several locations, including Lake Thonotosassa and Lake Henry (Denson and Langford 1982) and Emerald Marsh (Marburger et al 1998).

In fiscal year 2005-06, the FWC secured permits from the Florida Department of Environmental Protection's (DEP) Cooperative Plant Control Program to plant more than one million aquatic plants (including up to 603,750 maidencane and Egyptian paspalidium) in 27 lakes for various revegetation projects statewide. Due to logistical constraints and higher costs associated with nursery-reared propagules, donor plants for most FWC projects were obtained from nearby lakes with well-established populations suitable for serving as wild collection sites. Typically, permit conditions specify that no more than 5-10% of any stand may be collected in order to prevent damage to source populations. To obtain enough plants required for supplying large-scale revegetation projects, collections must be spread over a large area and adequate populations of source plants must be located. Suitable collection sites contain robust, moderately-dense stands of desired plants that are free of exotic vegetation in a water depth appropriate to the collection method. Sites with these criteria and within close proximity to planting sites may be difficult to secure.

Planting grass cuttings (growing tips or tops) is an effective method for establishing grasses in pastures (Adjei and Mislavy 2001). In aquatic habitats, this method showed potential in test plots to establish Egyptian paspalidium in Lake Jackson (Osceola County; Jim Sweatman, FWC, personal communication) and maidencane in Newnans Lake. On Lake Istokpoga, Egyptian paspalidium and maidencane growing tips were collected and replanted within the lake. Concurrently, whole plants (rhizome and stem) were collected

Table 1. Mean stem density (number of stems per m²) of Egyptian paspalidium in harvest sites - Lake Kissimmee, Florida, May-November 2004.

Date	Number of weeks post harvest	Mean stem density ¹	Standard error
Plot 1			
May 18	(pre-harvest)	16.0	3.1
June 10	3	18.0	4.0
June 30	6	13.0	2.3
August 5	11	13.3	1.3
November 17	26	17.8	3.7
Plot 2			
May 18	(pre-harvest)	23.5	4.2
June 10	3	18.0	3.8
June 30	6	18.0	3.2
August 5	11	17.8	2.7
November 17	26	15.5	1.0

¹ Each value is the mean of four replicates.

and replanted in adjacent locations. Regrowth of cut stems was observed within one month in the harvest area. Survival and growth of planted stems was comparable to that of transplanted whole plants. However, no scientific evaluations were made on any of these projects to determine the effects of cutting on source plants or to compare survival rates for planted cuttings and whole plants.

During 2004, the FWC conducted a habitat enhancement project on Lake Tohopekaliga (Osceola County). This involved an extreme drawdown (artificial lowering of water levels) of this 7,615 ha lake to expose the lake bottom in the littoral zone. Dense vegetation and associated organic material was then removed from greater than 1,500 ha of littoral zone with heavy machinery. Approximately four million Egyptian paspalidium cuttings were planted on 79 ha of cleared lake bottom via disking and rolling to reestablish desirable aquatic plants.

Source plants for the revegetation effort were mechanically harvested (cut 30-70 cm below the water surface) with a Kelpin 800 harvester (Haller 1996) from nearby Lake Kissimmee during May 2004.

A subsequent project was conducted to evaluate recovery of harvested sites on Lake Kissimmee. The objective of this study was to document the response of source plants to cutting via mechanical harvester.

Methods

Two fixed sites (3 m x 3 m) were selected within the area to be harvested and marked with PVC pipe. GPS (Garmin 76) coordinates were recorded and digital photos taken to document the overview. Sites were sampled prior to harvest and at 3, 6, 11, and 26 weeks following harvest. Egyptian paspalidium stems with at least one green leaf were counted within a randomly-tossed PVC grid (m² area at the water surface). Estimated mean stem density was based on the average of four stem counts

per site, and was calculated for each site during each sampling event (i.e., the area sampled per event was 1 m², or 11% of each 3 m x 3 m site). Data for successive sampling were compared to the initial (pre-harvest) mean stem density for each site, using a two-sample t test and significance level $\alpha = 0.05$ (Devore 1987).

Results and Discussion

Substantial regrowth of Egyptian paspalidium had occurred by three weeks after harvest. Harvested areas were difficult to distinguish from non-harvested areas (Figure 1). There was no significant difference (both $P > 0.1$) between initial (pre-harvest) stem density and post-harvest stem density at either site (Table 1). No significant changes in stem density were observed for the remainder of the study. Regrowth of Egyptian paspalidium in all other harvested areas appeared comparable to that of the study sites. No effects of three hurricanes or high water levels (Figure 1-D), which occurred at three to six months following

harvest, were evident on source plants.

Results indicated that harvesting Egyptian paspalidium cuttings as donor plants for revegetation projects had minimal impact to source populations. Revegetation with cuttings may be preferable to that using whole plants because regrowth of source plants can be expected very soon after cutting, ensuring that donor sites remain intact. In addition, whole plant collections would require more time for adjacent plants to expand and replenish source populations. Survival of planted cuttings, compared to that of transplanted whole plants, needs to be evaluated.

Literature cited

Adjei, M. B. and P. Mislevy. 2001. Five basic steps to successful perennial pasture grass establishment from vegetative cuttings on South Florida flatwoods. Agronomy Department, Florida Cooperative Extension Service, IFAS, University of Florida, Gainesville. SS AGR 24.

Denson, K. and F. Langford. 1982. Expansion of transplanted giant bulrush in central Florida lakes. Proc. Annu. Conf. South-

east. Assoc. Fish and Wildl. Agencies 36: 287-293.

Devore, J. L. 1987. Probability and statistics for engineering and the sciences. Brooks/Cole Publishing Co., Monterey, California. 672 p.

Haller, W. T. 1996. Evaluation of the Kelpin 800 aquatic weed harvester. *Aquatics* 18(3): 10-15.

Holcomb, D. and W. Wegener. 1971. Hydrophytic changes related to lake fluctuation as measured by point transects. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 25: 570-583.

Hulon, M., A. Furukawa, J. Buntz, J. Sweatman, and C. Michael. 1998. Lake Jackson Wildlife Islands. *Aquatics* 20(4): 4-9.

Mallison, C. T. and B. Hujik. 1999. Tussock removal using a trackhoe on a floating barge. *Aquatics* 21(3): 14-18.

Marburger, J. E., E. A. Gisondi, W. F. Godwin and D. R. Douglas. 1998. Establishment of Native Aquatic Vegetation from Planting in a Flooded Muck Farm in the Emerald Marsh Conservation Area. Technical Memorandum No. 28. St Johns River Water Management District, Palatka, Florida.

Moyer, E. J., M. W. Hulon, J. J. Sweatman, R. S. Butler, and V. P. Williams. 1995. Fishery responses to habitat restoration in Lake Tohopekaliga, Florida. *North American Journal of Fisheries Management* 15: 591-595.

**Herbicides / Adjuvants / Service
FOR
Aquatics, Roadside, & Utility Rights of Way**

U A P

UNITED AGRI PRODUCTS

<p>Paul Mason, Aquatic / VM Specialist PH 407-718-9154 paul.mason@uap.com</p> <p>Joe Collins, Government Acct. Coordinator PH 352-222-0655 joseph.collins@uap.com</p>	<p>Terry Whitecar, Utility Specialist PH 386-473-3882 terrence.whitecar@uap.com</p> <p>Dan McMillan, Aquatic / VM Specialist PH 706-318-3238 daniel.mcmillan@uap.com</p>
---	--

Office 863-425-6139, Fax 321-226-0213

Efforts to Establish Egyptian Paspalidium *Paspalidium geminatum* Following Lake Enhancement on Lake Tohopekaliga, Florida

Bill Pouder¹, Craig Mallison¹, Rue Hestand, III², and Boyd Thompson²
 Florida Fish and Wildlife Conservation Commission

Introduction

Lake Tohopekaliga (Lake Toho) is a 7,615 ha eutrophic lake located within the Kissimmee Chain of Lakes (KCOL) in Osceola County, Florida. Years of regulated (i.e., stabilized) water levels on Lake Toho have led to dense monocultures of aquatic vegetation [cattail (*Typha* spp.) and pickerelweed (*Pontederia cordata*)] and the accumulation of organic sediments in the littoral zone (Moyer et al. 1995). These areas were characterized by having limited angler accessibility and low dissolved oxygen levels that provide poor or unusable habitat for sportfish. In response to this habitat degradation, the Florida Fish and Wildlife Conservation Commission (FWC) implemented drawdowns (artificial lowering of water levels) on Lake Toho in 1971, 1979, and 1987 to promote drying and decomposition of accumulated sediments (Wegner and Williams 1975, Williams et al. 1992, Moyer et al. 1995).

A pilot project was conducted during the 1987 drawdown to evaluate the removal of 136 ha of vegetation and organic sediments with heavy equipment (bulldozers, front-end loaders, and dump trucks) from the littoral zone (Moyer et

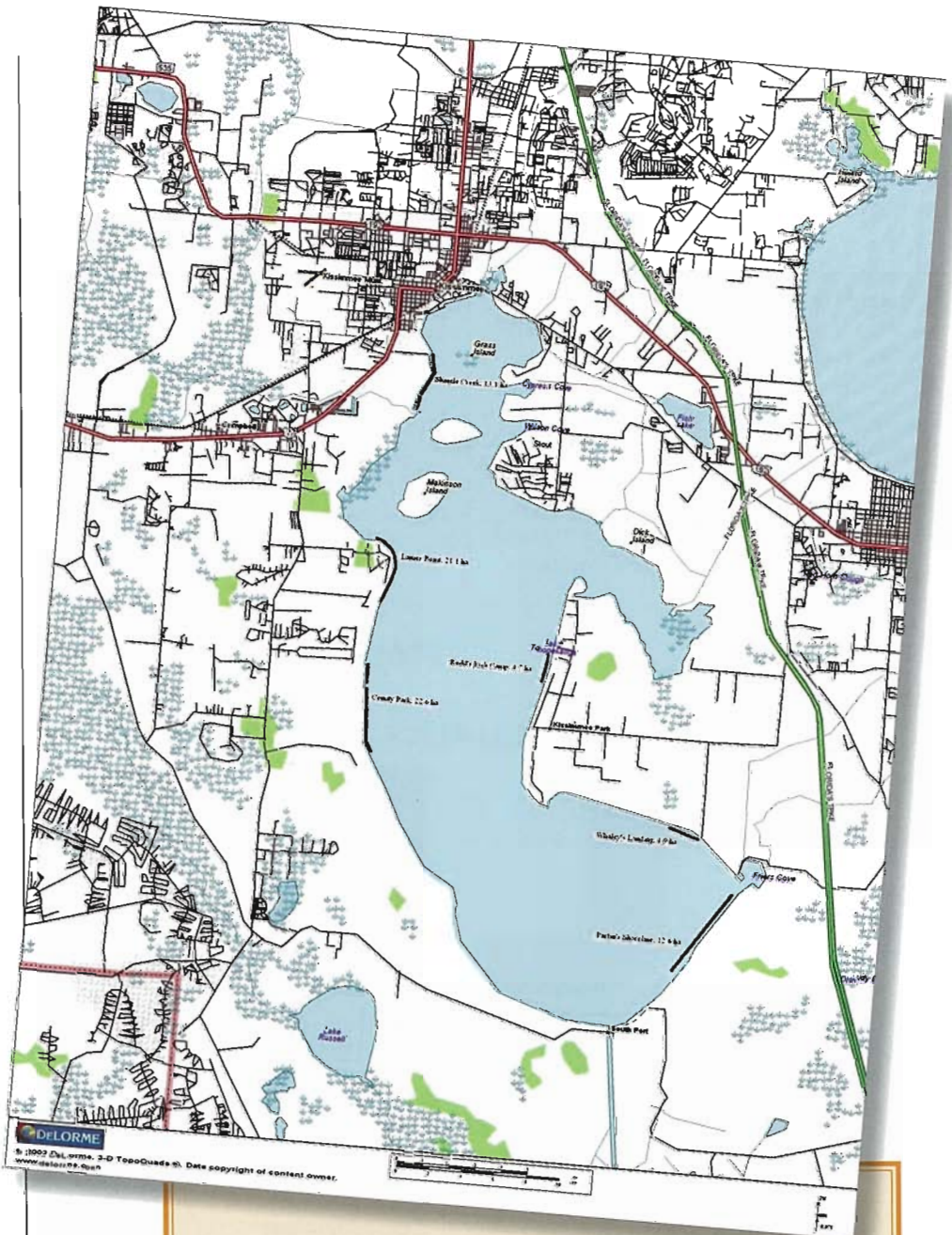


Figure 1. Map of six revegetation sites on Lake Tohopekaliga, May 2004. A total of 79 ha were planted with Egyptian paspalidium. (DeLorme 2002).

¹3900 Drane Field Rd., Lakeland, FL 33811
²601 W. Woodward Ave., Eustis, FL 32726

TASTE AND ODOR COMPLAINTS AGAIN?

Control your **blue-green algae** problem
at the source with **PAK™ 27**

- For drinking water reservoirs, lakes, and ponds
- Algaecide–selective for blue-green algae
- Reduce costs, improve efficiency of in-plant treatment
- Nonpersistent, nontoxic to the ecosystem
- Peroxide chemistry is completely biodegradable and environmentally ideal

For efficiency and the environment,
THE CHOICE IS CLEAR
PAK™ 27



For sales or technical inquiries contact
Jef Morgan at Peroxygen Solutions:

phone 336.707.1829
fax 336.854.4042
email jef@peroxygensolutions.com
www.peroxygensolutions.com

al. 1995). Initial evaluations documented improvements in substrate, aquatic macrophyte communities, and standing crops of fish in scraped areas within two years of the drawdown. However, plant communities dominated by dense monoculture stands of cattail and pickerelweed returned to pre-drawdown levels by the third year. By 2002, the majority of the lake's shallow littoral zone was covered in dense rooted emergent vegetation and floating plant communities with associated organic material (tussock). In November 2003, FWC implemented an extreme drawdown that incorporated the removal of organic sediment and plant biomass with heavy equipment from 1,538 ha of the littoral zone. The project was completed by June 2004, at which time enhanced areas of the lake contained predominantly bare (non-vegetated) sand substrate.

Vegetation and associated organic sediment removal in the littoral zone of a lake can be an effective tool in enhancing littoral habitat for sport-fish populations (Moyer et al. 1995). However, this process is non-selective in the removal and subsequent reestablishment of native aquatic vegetation. Native plants provide valuable fish and wildlife habitat (Dibble et al. 1996) and through direct competition may suppress some exotic and nuisance invasive species (Smart et al. 1998). To promote the establishment of Egyptian paspalidium (*Paspalidium geminatum*), a native emergent grass, a large-scale revegetation project was implemented on Lake Toho within portions of the scraped shoreline.

Previous revegetation projects conducted by FWC entailed manually transplanting plants from within-lake or from a donor lake. In most cases, regrowth and survival with this technique is considered good; however, it is time consuming and costly, depending on the scale of the project. Personal observation indicates it takes five workers approximately eight man-hours per worker to harvest and replant

10,000 stems of a plant species at an estimated cost of \$2,500. Alternatively, during a 1997 drawdown of Lake Jackson (Osceola County), an area was planted with Egyptian paspalidium using vegetative cuttings (propagules) that were disked into the soil (Jim Sweatman, FWC, Personnel Communication). Each cutting had multiple growth points (nodes) along the stem. The procedure included cutting stems of Egyptian paspalidium above the soil-water interface, collecting the stems, spreading the cut stems within the revegetation site and disking them into the soil. This procedure appeared to have been successful as subsequent observations indicated that Egyptian paspalidium was growing in the revegetation zone. However, no scientific studies were conducted to evaluate the procedure. A similar technique is used by upland farmers in Florida to establish perennial pasture grasses for livestock (Adjei and Mislavy 1998). These authors use the technique described above, followed by rolling the disked area in two directions to prevent drying. Disking would allow for a larger area to be planted in a shorter period of time, relative to standard hand-planting procedures.

The objectives of this study were to 1) establish desirable, native vegetation in areas that had undergone vegetation and associated organic sediment removal, and 2) evaluate and document the efficacy of the disk/roll planting method.

Methods

In May 2004, six revegetation locations (Partin's Shoreline, 12.6 ha; Lanier Point, 21.1 ha; Shingle Creek, 13.1 ha; County Park, 22.6 ha; Whaley's Landing, 4.9 ha; and Redd's Fish Camp, 4.7 ha; Figure 1) totaling 79.0 ha were established. Egyptian paspalidium was selected for revegetation due to 1) its habitat value, 2) its reproductive ability to root and form tillers from the stems nodes, and 3) prior success planting this species by disking (although

not scientifically documented). This species occurs naturally in the lake, and donor plants for revegetation were available at nearby Lake Kissimmee (Osceola County).

Egyptian paspalidium was mechanically harvested in the north cove of Lake Kissimmee during May 12-25, 2004. All grasses were harvested with an aquatic harvester (Kelpin 800, 21.3 m harvester) with a 3.0 m specially designed cutting head 10 cm wide and capable of cutting to a depth ≤ 90 cm below the water surface. During harvesting, stems were collected on a conveyer belt (20.4 m²) on the front of the harvester and personnel searched the cuttings to identify and remove all unwanted plant species. Each full conveyer load held approximately 6,500 stems and thirteen loads (total 84,500 stems) were collected per harvesting event. Cut stems were off-loaded into a dump truck, washed down with lake water to keep stems hydrated, and transported to Lake Toho revegetation sites. One full harvester load (84,500 stems) was equal to one dump truck load. In the bed of the dump truck, stems were divided into quadrants with approximately 21,125 stems per quadrant. Transit from harvest site to revegetation sites ranged from 32 to 80 km, and total time from harvesting to disking did not exceed 18 hours.

Revegetation sites were divided into 0.4 ha blocks, as measured with a Garmin 76 GPS unit and/or Bushnell 1000 rangefinder, and marked with PVC poles. At the revegetation sites, the dump truck drove a straight path from one end of the 0.4 ha plot to the opposite end and continued this pattern until the whole plot was covered. Three people scattered the cut stems non-uniformly within the plot until approximately 21,125 stems were dispersed per 0.4 ha plot. One dump truck load covered four 0.4 ha plots. Once plants were dispersed, a Massey Ferguson Model 243 tractor pulling a Model A & B 1.8 m, 3 point hitch with disk gang consisting of 16, 45.7-cm scallop blades was run through the planting plot at a depth of 7 to

15 cm. The disking process cut the stems, loosened the sediment and covered stems with soil. Following the disking, a 0.5 m x 1.8 m wide drum, water-filled roller (45.5 kg) was used to roll ridges flat and prevent drying of newly disked stems.

Survival of planted Egyptian paspalidium was evaluated during August 2004 (three months after planting). A random-stratified sampling design was used to establish sampling locations. Control sites (scrape only; 79.0 ha) were selected adjacent to revegetation (scraped, planted, disked, and rolled; 79.0 ha) sites. Each of the six revegetation and six control sites was divided equally into three zones; lower (closest to the waters edge), middle (middle of the planting zone) and upper (closest to the natural shoreline). Each of these zones was divided into 25 m² microgrids (25 m length parallel to shore, 1 m width), and each microgrid was assigned a number. Numbers were randomly selected prior to field sampling and coordinates were determined using Topoquads version 2.0 (DeLorme Inc. 2002). The number of microgrids selected at each revegetation site was proportional to the total area planted. A total of three replicates were collected in each zone per site except for County Park and Lanier Points, where six replicates per site were collected. Plant densities were collected following procedures described in U.S. Department of Interior (1996), as follows: A 25 m line transect was established in each selected microgrid. A person walked with a meter stick directly centered on the line (0.5 m of the meter stick laid on each side of the line). All Egyptian paspalidium plants growing within the 25 m² transect were counted (one plant was counted as one, regardless of the number of stems growing from that plant). Total number of plants was enumerated for each transect to calculate the mean number of plants per 25 m². For comparison, these numbers were extrapolated to



Figure 2. Photograph of Egyptian paspalidium plant removed from soil approximately 30 days after planting on Lake Tohopekaliga, June 2004. Initial planted stem notated with white oval.

estimate the total number of plants per sample site and per zone (lower, middle, and upper).

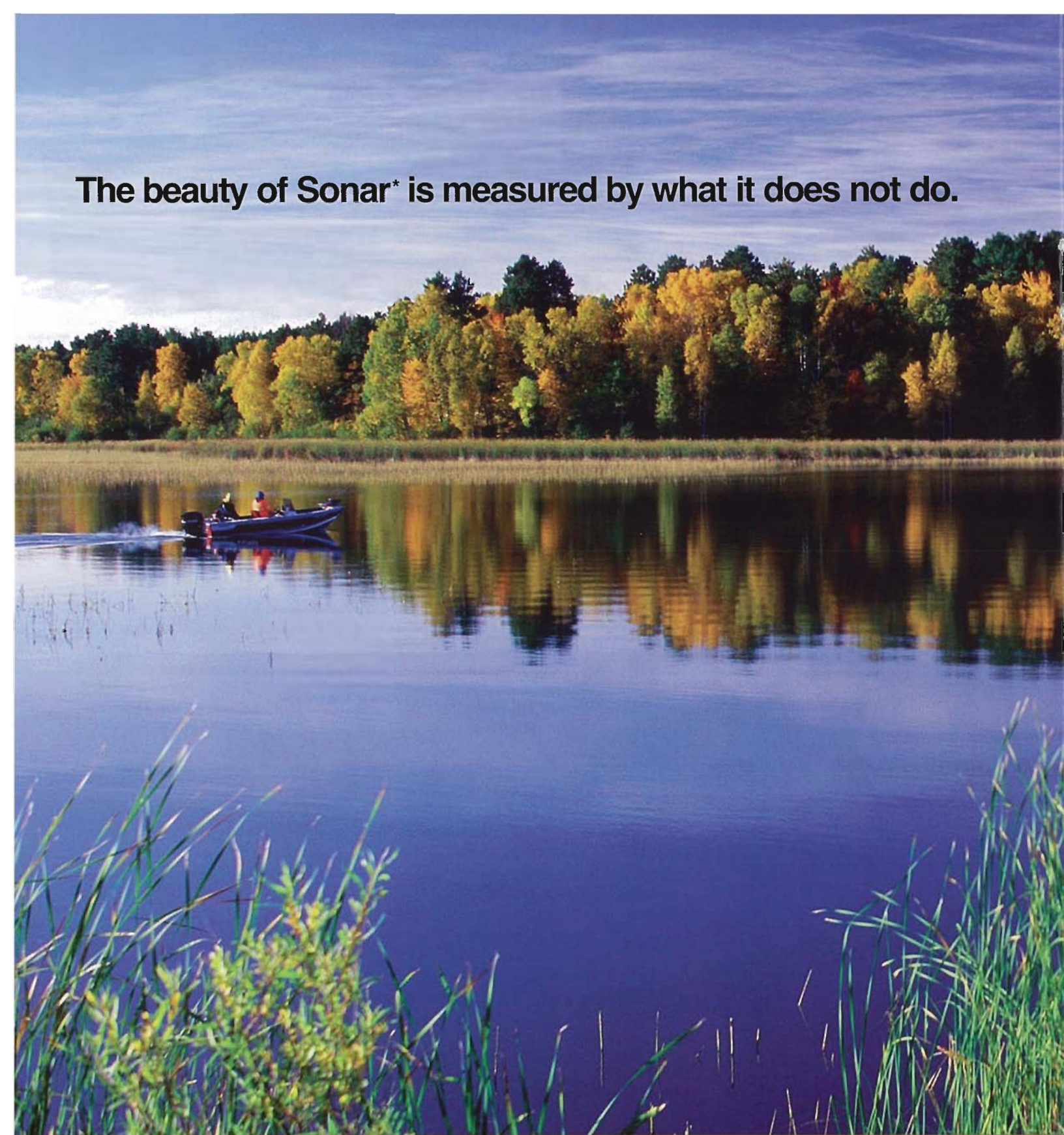
Results And Discussion

An estimated 4,100,000 Egyptian paspalidium stems were harvested from Lake Kissimmee and transported to Lake Toho, where they were disked and rolled into six revegetation sites for a total of 79.0 ha of planted area (Table 1). Total cost of the project was \$74,800 which was \$946.84 per hectare. All disking activities were completed in 13 workdays with an average of 6.2 ha of revegetation per workday.

Initial observations indicated poor survival of exposed cut stems due to desiccation with no signs of growth. Exposed stems that were not covered with soil were completely dehydrated and appeared to have a poor chance of survival. For a total of 28 calendar days during and following the project, precipitation was variable across the sites but all received very little

rain, which likely limited initial survival. However, one month after project completion, stems that were buried within the sediments began sprouting new shoots. To confirm these as planted stems, several plants were removed from the soil to verify that the new growth originated from planted stems (Figure 2). Poor initial survival was apparently due to limited rainfall during the project and future projects of this type should coincide with the rainy season (beginning in June in this region), and/or have an irrigation plan to keep stems hydrated until plants germinate and become established.

Estimates made three months after planting indicated a total 465,598 Egyptian paspalidium plants within revegetation sites and 871,040 plants within control sites (Table 1). Relatively high natural recruitment was evident, which makes it difficult to discern what was planted and what grew back naturally. One noticeable difference was that both terrestrial

A scenic view of a lake with a boat and autumn foliage. The sky is blue with light clouds. The background is a dense forest of trees with vibrant autumn colors in shades of yellow, orange, and red. The middle ground shows a calm lake reflecting the sky and trees. A small motorboat with two people is moving across the water from left to right, leaving a white wake. The foreground is filled with tall green reeds and grasses, some with small yellow flowers, framing the bottom and sides of the lake.

The beauty of Sonar* is measured by what it does not do.

A beautiful lake can turn ugly once invasive aquatic weeds like hydrilla or Eurasian watermilfoil take over. But before you introduce non-selective grass carp or launch a mechanical harvesting program, consider what Sonar Aquatic Herbicide does not do.

Sonar does not eliminate desirable vegetation. SePRO has the technology to manage application rates and monitor the treatment progress to ensure that invasive species are removed with minimal effect on native plants and the lake's ecosystem. After treatment, desirable native species are allowed to thrive and often become more abundant, creating a more diverse habitat.



Sonar does not harm fish or waterfowl nor carry any restrictions for using treated water for swimming, fishing, boating or drinking—when used according to label directions—which is unique among aquatic herbicides.

The one thing Sonar does do is restore a lake to its more natural, pristine condition. Sonar has been used by wildlife groups to successfully restore numerous aquatic habitats. In addition, a lake treated with Sonar often requires fewer re-applications than lakes treated with other aquatic herbicides. That's because results can last for more than just one season.

For more information about Sonar Aquatic Herbicide and the entire line of SePRO aquatic products, visit our web site at www.sepro.com or call 1-800-419-7779.

Sonar*
Restores Aquatic Habitats

SePRO Corporation Carmel, IN 46032

and aquatic vegetation (all species) in the revegetation sites was reduced in comparison to control sites. It appeared that the disking and roll-

ing technique may have reduced or delayed natural recruitment of Egyptian paspalidium and other plant species. Poor initial survival of planted

Egyptian paspalidium stems coupled with reduced growth of naturally recruited plants may explain the observed difference in stem densi-

Table 1. Estimated number of Egyptian paspalidium stems planted, mean number of Egyptian paspalidium plants counted per 25 m² transect, and extrapolated total number of plants, for six revegetation and six control sites on Lake Tohopekaliga, August 2004. Sites were divided into three zones, lower (closest to waters edge), middle (middle of planting site), and upper (closest to the natural shoreline) for evaluation. SE = Standard error.

Site/Zone	Number Planted	Mean (SE) number of plants per 25 m ² transect		Extrapolated total number of plants	
		Revegetation	Control	Revegetation	Control
County Park					
Lower	397,854	11.5 (3.3)	61.3 (30.9)	34,638	184,635
Middle	397,854	5.8 (2.5)	1.0 (0.6)	17,470	3,012
Upper	397,854	4.5 (1.3)	0.3 (0.3)	13,554	904
Total	1,193,562			65,662	188,551
Lanier Point					
Lower	341,448	24.5 (8.8)	47.7 (5.4)	68,894	134,132
Middle	341,448	9.3 (1.7)	6 (1.7)	26,152	16,872
Upper	341,448	1.5 (0.4)	6 (4.5)	4,218	16,872
Total	1,024,344			99,264	167,876
Partin's Shoreline					
Lower	221,813	50.7 (37.5)	108.7 (107.2)	85,176	182,616
Middle	221,813	20 (17.1)	54.7 (54.7)	33,600	91,896
Upper	221,813	23.7 (20.2)	17 (3.6)	39,816	28,560
Total	665,439			158,592	303,072
Shingle Creek					
Lower	230,615	35.7 (21.4)	42.3 (27.5)	62,404	73,940
Middle	230,615	4.3 (2.6)	12.7 (8.8)	7,516	22,200
Upper	230,615	1.0 (0.6)	8.3 (2.0)	1,748	14,508
Total	691,845			71,668	110,648
Redd's Fish Camp					
Lower	82,740	69.7 (43.9)	117.0 (32.6)	43,772	73,476
Middle	82,740	7.0 (1.2)	14.3 (8.7)	4,396	8,980
Upper	82,740	5.0 (1.2)	0.3 (0.3)	3,140	181
Total	248,220			51,308	82,637
Whaley's Landing					
Lower	86,260	15.3 (10.7)	24.0 (6.9)	9,976	15,648
Middle	86,260	5.7 (1.9)	8.7 (3.7)	3,716	2,412
Upper	86,260	8.3 (4.1)	0.7 (0.3)	5,412	196
Total	258,780			19,104	18,256
Grand Total	4,082,190			465,598	871,040

ties between revegetation and control sites. Regrowth of Egyptian paspalidium was greatest along Partin's shoreline with an estimated 158,592 plants in revegetation sites and nearly double that in control sites. This site was the first to be planted and one of the first to be scraped, which may have resulted in a longer growing period for plants to become established. In both revegetation and control sites at all locations, Egyptian paspalidium plants were greatest in number in the lower zone (closest to the waters edge). Higher soil moisture due to capillary movement of water from the lake may have provided enough water for survival of planted stems as well as for natural recruitment to occur.

In summary, our results indicated that natural recruitment was at least as effectual in establishing Egyptian paspalidium as the disk/roll technique used in this study. Prior to this project, Egyptian paspalidium was already one of the dominant plant species in Lake Toho. Therefore, we recommend not using this tech-

nique (at least without modification) when the species is already present. However, germination of planted stems was documented and this technique holds promise. We recommend that future projects using the disk/roll technique be conducted on lakes with little or no Egyptian paspalidium so that a more comprehensive evaluation of survival can be reported. Our results also indicated that adequate soil moisture is crucial to the establishment of this species. Therefore, we recommend that planting be concentrated as close to the lake's edge as possible and during the rainy season.

Literature Cited

Adjei, M.B. and P Mislevy. 1998. Five basic steps to successful perennial pasture grass establishment from vegetative cuttings on South Florida flatwoods. University of Florida, IFAS Extension. SS AGR24.

DeLorme. 2002. 3-D TopoQuads, version 2.0. DeLorme, Yarmouth, Maine.

Dibble, E.D., K.J. Killgore, and S.L. Harrel. 1996. Assessment of fish-plant interactions. In L.E. Miranda and D.R. DeVries (eds.) Multidimensional Approaches

to Reservoir Fisheries Management. American Fisheries Society Symposium 16: 347-356.

Moyer, E.J., M.W. Hulon, J.J. Sweatman, R.S. Butler, and V.P. Williams. 1995. Fishery responses to habitat restoration in Lake Tohopekaliga, Florida. North American Journal of Fisheries Management 15: 591-595.

Smart, R.M., G.O. Dick, and R.D. Doyle. 1998. Techniques for establishing native aquatic plants. Journal of Aquatic Plant Management 36: 44-49.

U.S. Department of Interior, Bureau of Land Management. 1996. Sampling Vegetation Attributes, TR 1734-4. BLM National Business Center, Denver, Colorado. 176 pp.

Wegener, W. and V. Williams. 1975. Fish population responses to improved lake habitat utilizing an extreme drawdown. Proceedings of the Annual Conference Southeastern Association of Game and Fish Commissions 28: 144-161.

Williams, V., E. Moyer, and D. Moxley. 1992. Lake restoration for aquatic habitat and fisheries improvement in Florida. Pages 49-63 in C.E. Watkins, H. McGinnis, and K.J. Hatcher, editors. Proceedings of the Southeastern Lake Management Conference. North American Lake Management Society, Alachua, Florida.



Being the BIGGEST is not what is important to us,

It's being the "BEST" at what we do.

Customer service is ProSource One's goal,
Your business is appreciated.

Stephanie Walters..... Central Florida Government/AVM accounts manager
407-466-8360

Jorge Menocal..... South Florida AVM accounts manager
Sales Manager Aquatics, Vegetation Management, & Forestry
305-797-6308

Response to Editorial: "Restoring Sport Fishing at Lake Apopka"

St. Johns River Water Management District, Dept. of Water Resources

This comment was submitted in response to the editorial "Restoring Sport Fishing at Lake Apopka" published in the spring, 2006 issue of Aquatics magazine (Aquatics 28(1). 2006). Editor.

In a recent editorial, Murphy, Hoyer, and Canfield (2006) proposed a four-point program that in their view would restore a largemouth bass (*Micropterus salmoides*) fishery to Lake Apopka within a few years. Their proposal was based on their conclusion that the current restoration program for Lake Apopka by the St. Johns River Water Management District (District) is not working to restore aquatic plants and therefore habitat for game fish. Although we share the goal of Murphy et al. (2006) to improve recreational fishing in Lake Apopka, we disagree with some of their analyses and conclusions. Further, we disagree with their recommendations to allow hydrilla (*Hydrilla verticillata*) to colonize the lake and to begin now to utilize the former farm lands for temporary water storage to enhance lake level fluctuation. We present evidence that restoration of both water quality and habitat has been occurring for more than a decade in Lake Apopka and that the plan proposed by Murphy et al. (2006) is ill advised.

First, Murphy et al. (2006) acknowledged improvements in water quality in Lake Apopka due to the restoration program but did not recognize that the District's nutrient load reduction program is a work in progress. Reductions in nutrient levels, increases in transparency, and volunteer colonization by eelgrass (*Vallisneria spiralis*) in Lake Apopka first were noted in 1995 (Battoe et al. 1999).

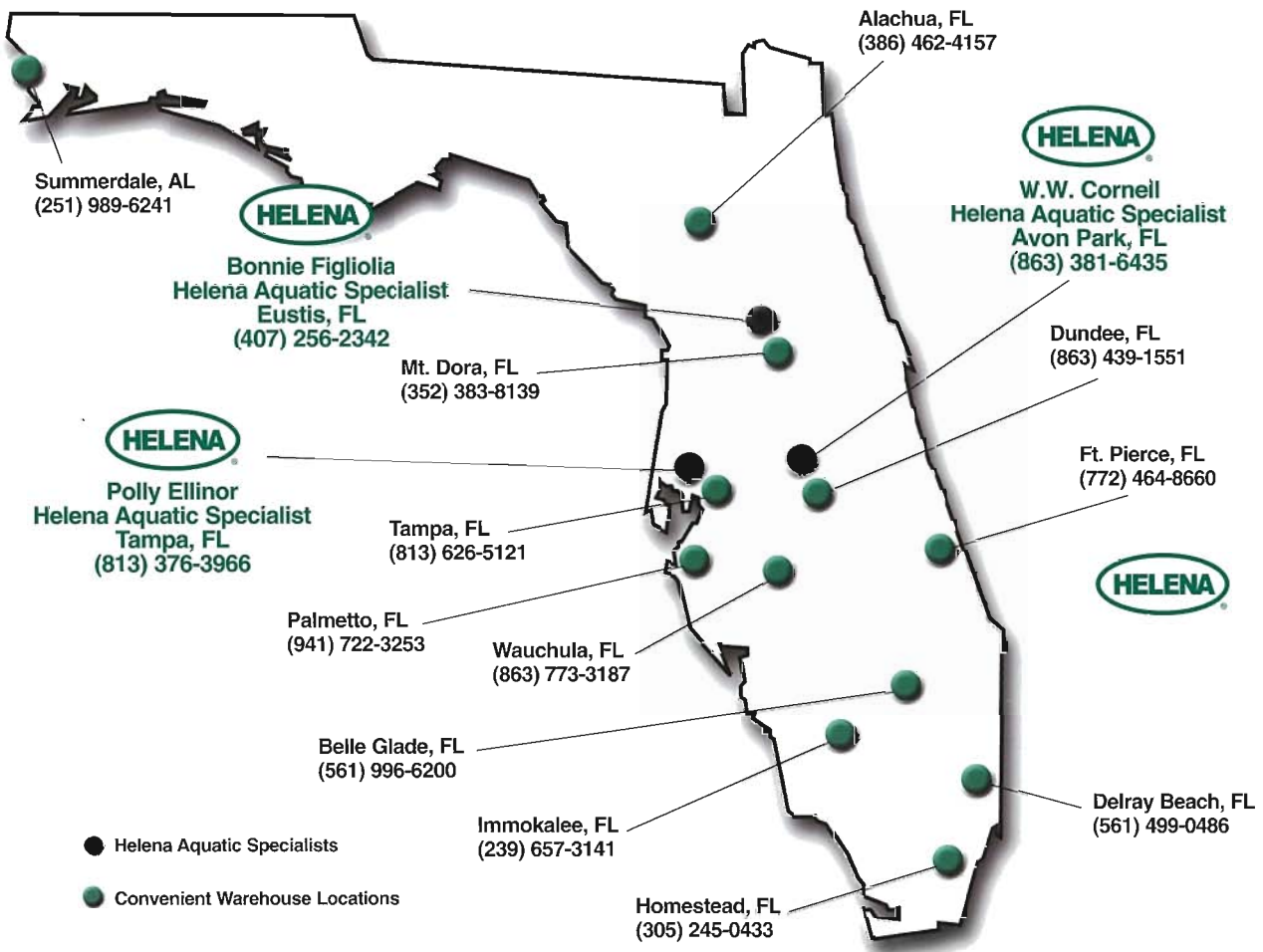
These improvements have continued (Coveney et al. 2005), but about 50% of the former farm area still cannot be flooded because of risk for bioaccumulation of pesticide residues from the farm soils. To keep the fields dry, drainage water still is discharged to Lake Apopka although with partial treatment to remove phosphorus. The District will slowly expand the wetland areas, and reduce nutrient loading further, in coming years. In response to the District's restoration program, improvements to Lake Apopka have been much stronger and have occurred much sooner than many in the scientific community predicted (Coveney et al. 2005). Average values in recent years (January 2003 to July 2006) for important water quality indicators (phosphorus, chlorophyll, Secchi depth) represent a 52% to 67% improvement compared to conditions prior to 1995.

Second, we believe that the statement by Murphy et al. (2006) that eelgrass was planted in Lake Apopka in 1998 and 1999 was incorrect. The District unsuccessfully attempted to plant eelgrass at two sites in the early 1990s. We know of no successful planting of eelgrass and believe that all the eelgrass beds that developed in Lake Apopka starting in 1995 came from volunteer growth.

Third, the conclusion by Murphy et al. (2006) that the current restoration program for Lake Apopka has not improved growth conditions for native aquatic plants and will not accomplish this goal in the foreseeable future is based on an incomplete analysis. They noted that the District found approximately 11,000 m² of eelgrass in the lake in 1997 (cited by Murphy et al. as 1999). Murphy et al. compared that area with their own data (900 m²) from 2004 and concluded that eelgrass had drastically declined due to poor sediment conditions. However, their

analysis did not consider the severe drought that occurred between those two observations. In summer 2001 and again in 2002, Lake Apopka reached record low levels. Lake volume was reduced almost 75% from the long-term average, and the eelgrass beds located by District staff in 1997 were eliminated by exposure, desiccation, and replacement by terrestrial plants. Thus the observations by Murphy et al. in 2004 reflected recovery of the eelgrass population from the drought rather than reduction of the population by poor sediment conditions. In 2005 District staff mapped 9,915 m² eelgrass, an area more than 10-fold greater than the area reported by Murphy et al. in 2004. A still ongoing mapping in 2006 already has located over 62,000 m² eelgrass and more than 10,000 m² musk-grass (*Chara* sp.). Although several-fold increases in area covered by submerged aquatic vegetation from one year to the next will not necessarily be the norm, these data show that eelgrass has increased greatly since the drought, contrary to the conclusion of Murphy et al. (2006).

Murphy et al. (2006) described a scenario for Lake Apopka where water quality improvements have reached the limit of the District's program and where planted eelgrass largely disappeared because of extensive soft sediments. The scenario that better fits the evidence is that partial nutrient load reductions have been accomplished and that water quality improvements have continued despite record drought and hurricane activity. Colonizing eelgrass beds lost to drought several years ago now are rebounding. Nutrient levels are declining, algal levels are declining, water transparency is increasing, and native aquatic plants are increasing. The District has found a small percentage of eelgrass beds growing



Aquatic Weed Control Products From Helena Chemical Company

Agent for the Sonar Product Line in Florida:

NEW!

Sonar* A.S. • Sonar SRP • Sonar PR • **Sonar "Q" Quick Release* Pellets**

Complete Line of Herbicides including:

Nautique* • Aqua-Kleen® • Aquathol® K • Aquathol® SuperK • Hydrothol® 191
 Reward® • Rodeo® • Weedar® • **Renovate®** **NEW!**

Florida Distributor for SePRO Products:

Sonar* A.S. (pints & quarts) • Captain* Algaecide • AquaPro® • Revive*

Complete Line of Adjuvants including:

Kinetic® HV • Optima® • Quest® • Induce® • Dyne-Amic®

HELENA *People...Products...Knowledge™*

Helena Chemical Company • P.O. Box 1758 • Dade City, FL 33526-1758

© 2002 Helena Chemical Company. Aqua-Kleen and Weedar are registered trademarks of Rhone-Poulenc Ag Co. Aquathol and Hydrothol are registered trademarks of ELF Atochem. Reward is a registered trademark of Syngenta Professional Products. Rodeo is a registered trademark of the Monsanto Company. AquaPro and Renovate are registered trademarks of Dow AgroSciences. *Captain, Nautique, Revive, Sonar, Precision Release and Sonar Quick Release are trademarks of SePRO Corporation.

in soft sediments; therefore, soft sediments do not preclude eelgrass colonization. The conclusion by Murphy et al. (2006) that the current restoration program for Lake Apopka will not provide improved habitat for largemouth bass any time soon is premature.

At the policy level, we disagree with the proposal by Murphy et al. (2006) to allow the non-native, invasive hydrilla to proliferate in Lake Apopka to provide habitat for largemouth bass. This recommendation directly opposes the current work of the District to locate and eradicate even small patches of hydrilla to prevent infestation and promote native species. We see a great risk that control of hydrilla would be prohibitively expensive or impossible to achieve once the plant is allowed to grow freely. Hydrilla could eliminate native submersed plants and require repeated and costly treatments with herbicides to control a lake-wide infestation.


Although they mentioned growing hydrilla behind artificial reefs, Murphy et al. did not describe how hydrilla would be limited to the desirable 10 – 15% coverage nor did they estimate the cost of control. The cost of a single whole-lake treatment with fluridone in Lake Apopka (155,000 acre-feet, 10 ppb fluridone) would be about \$1 million (Hoyer et al. 2005). Furthermore, hydrilla is becoming increasingly resistant to fluridone, so control might be impossible even if funding were available. Murphy et al. (2006) proposed that Lake Apopka be the “test lake to determine if the FWCC can manage hydrilla to the benefit of recreational fishing.” A 31,000-acre lake, in which federal, state, and local governments have invested well over 100 million dollars, is not a good candidate for such testing. There are many hydrilla-infested lakes in Florida that better could serve this “test” purpose.

Lastly, Murphy et al. (2006) rec-

ommended that water level in Lake Apopka now should be fluctuated by temporarily flooding the restored wetlands (former farms). Their recommendation did not consider the complexities of this process. Large areas of the former farms currently cannot be flooded because of risks with exposure of wildlife to pesticide residues. The District expects to flood these areas eventually, but only through a careful, deliberate, and gradual process that will include risk assessment, monitoring, and possibly remediation. Even if all the former wetlands at Lake Apopka currently were restored and available for flooding, the proposal by Murphy et al. raises other problems. First, the water levels, flooding durations, and return intervals of flooding these wetlands must be carefully regulated. Otherwise, damaged vegetation and degraded wetland quality would result. Second, return-pumping of large volumes of water to Lake Apopka would exceed the allowable phosphorus loading unless costly chemical treatment were provided. Water pumped from this area during the period of farming was the primary source of nutrients that damaged the lake in the first place. Third, fish growing in some areas of the former farms would accumulate sufficient pesticides to be unsuitable for human consumption. This situation will persist until pesticides are reduced by remediation or by natural degradation. Fish from these wetland areas should not be allowed to enter the lake. Finally, lake water levels towards the end of the recent drought (2001 – 2002), reached lower elevations naturally than levels achievable by flooding the north shore.

The District is implementing a comprehensive lake and watershed restoration program for Lake Apopka with goals that extend well beyond improved water quality. Important components of this program include reduction in external nutrient loading from the watershed, removal of nutrients and suspended solids from lake water in a treatment wetland, and large-scale harvest of gizzard

Introducing GreenCleanPRO®:

- Non-hazardous to fish and aquatic life
- Completely biodegradable
- Releases oxygen into the water column
- EPA Registered
- Organic Approved by 
- Available in easy-to-use 50 lb. bags

888.273.3088
biosafesystems.com

GreenClean[®] PRO
Granular Algaecide

**A new formulation
with double the active ingredient
reduces application costs.**



GreenCleanPRO's non-copper chemistry eliminates algae on contact –
Try it and see the results for yourself!

Manufactured by BioSafe Systems LLC



shad (*Dorosoma cepedianum*) to remove nutrients and reduce nutrient recycling. Lack of habitat for fish and wildlife and poor recreational value have been priority issues in this program from the beginning, and important progress has been made in correcting the underlying causes of poor gamefish production in Lake Apopka. Measures of water quality have improved ~60 % compared to baseline, and native aquatic plants are increasing. These improvements have occurred with only partial implementation of the restoration program.

There is no evidence that further reduction in P loading will fail to provide further improvements in water quality. The rate of vegetation expansion should increase with improved water clarity. Moreover, because population growth of plants capable of vegetative expansion is proportional to the standing stock, vegetation expansion should accelerate until the limits of suitable habitat are approached. With more than 300 eelgrass colonies present in 2006, we believe that Lake Apopka is in the early stages of this population expansion.

Evidence of the efficacy of the District's restoration approach can be found in another lake in the Harris Chain, Lake Griffin, where external nutrient loading has been reduced and gizzard shad also have been harvested. There, improvements in lake water quality, combined with aggressive, multi-agency control of hydrilla, have resulted in expansion of native plants. Improved habitat should lead to larger gamefish production. According to local media reports, sportfishing has improved in Harris Chain lakes in recent years (e.g. "Harris Chain has earned status among anglers", *The Daily Commercial*, February 26, 2006). In Lake Griffin the catch per unit effort in May experimental gill nets for four gamefish species combined increased from the first two years (2002/03) to the last two years (2005/06) of monitoring, although the increase was not statistically significant. Further monitoring will determine whether gamefish populations are responding to habitat improvements in Lake Griffin.

Article submitted by: Coveney, M. F., E. F. Lowe, E. R. Marzolf, R. Conrow, and L.

E. Battoe. Please send correspondence to: Michael F. Coveney
St. Johns River Water Management District
Department of Water Resources
P.O. Box 1429, Palatka FL 32178-1429
mcoveney@sjrwmd.com

References

- Battoe L.E., Coveney M.F., Lowe E.F. & Stites D.L. (1999) The role of phosphorus reduction and export in the restoration of Lake Apopka, Florida. In: *Phosphorus Biogeochemistry of Subtropical Ecosystems* (Eds K.R. Reddy, G.A. O'Connor & C.L. Schelske, pp. 511-526. Lewis Publishers, Boca Raton.
- Coveney, M. F., E. F. Lowe, L. E. Battoe, E. R. Marzolf, and R. Conrow. 2005. Response of a eutrophic, shallow subtropical lake to reduced nutrient loading. *Freshwater Biology* 50:1718-1730 (plus Erratum. *Freshwater Biology* 50:2167).
- Hoyer M. V., M. D. Netherland, M. S. Allen, and D. E. Canfield, Jr. 2005. Hydrilla management in Florida: A summary and discussion of issues identified by professionals with future management recommendations. Florida Lakewatch. Department of Fisheries and Aquatic Sciences, University of Florida/ Institute of Food and Agricultural Sciences. 68 p.
- Murphy, S., M. Hoyer, and D. Canfield, Jr. 2006. Editorial, Restoring sport fishing at Lake Apopka. *Aquatics* 28(1):3 & 17-20.

Above And Below The Surface...

ADMIRAL TAKES COMMAND!

Becker Underwood's Admiral™ Liquid and WSP® formulas control the growth of algae and aquatic vegetation in lakes, ponds and other bodies of water while adding a beautiful, natural-looking blue.

As an important part of a lake management program, Admiral delivers all of the algae control you demand, and Admiral has been registered by the EPA. Create more beautiful waterways two different ways with the commanding presence of Admiral Liquid only from Becker Underwood.

www.beckerunderwood.com

801 Dayton Avenue . Ames, Iowa 50010 . 800-232-5907 . Fax 515-232-5961

Admiral is a trademark of Becker Underwood, Inc., and is registered with the Environmental Protection Agency, No. 87064-2. Read and follow label directions.





Current[™] for Weeds

Chelated Copper with EDA Controls Hydrilla, Brazilian Elodea, Naiads, Coontail, Watermilfoil, Water Hyacinth and Water Lettuce and other submersed and floating plants.

Current provides fast uptake by target plants, results are evident in 3-7 days. The superior formulating agent in Current complexes Copper ions keeping them available longer in hard or turbid water. Rely on Current for slow moving and quiescent bodies of water including lakes, potable water reservoirs, ponds, and fish hatcheries.



The right balance for maximum rewards

No delay in water use after applications.
Apply alone or together.

Symmetry[™] for Algae

Chelated Copper with TEA Controls filamentous, planktonic and branched algae.

Symmetry requires less copper per acre than soluble copper products and provides maximum copper availability for algae control. Symmetry stays suspended longer in hard and turbid waters to turn over a top performance on free-floating and branched algae.

www.phoenixenvcare.com

1-888-240-8856





AQUAVINE

2006 Aquatic Plant Manager/Team of the Year: Highlands County Invasive Plant Team

Highlands County Invasive Plant Team members: Carl Smith, Chris Mayhew, Wesley Williams, and Danny Copeland received the 2006 Aquatic Plant Manager/Team of the Year Award at the 30th Annual FAPMS Conference in St. Petersburg, Florida. The award highlighted their combined experience of 57 years in herbicide controls, biological controls, mechanical controls, public relations, weed identification, ingenuity, research, work quality, environmental awareness, contributions to the aquatic field, and FAPMS activity contributions.

Searching for the name of an aquatic plant or how to control it?

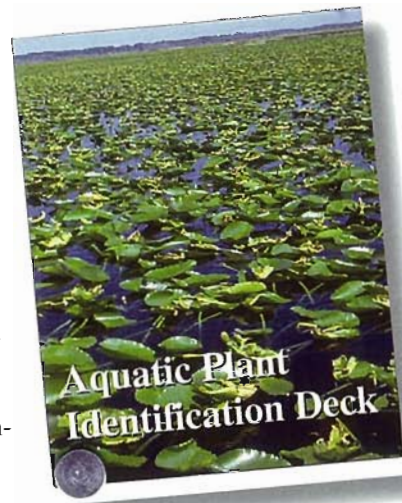
Send an email to mail@fapms.org and your question will be routed to a panel of experts who will help answer your question. Visit the "Information Center" on the society's web page www.fapms.org to see links to plant ID charts and other useful aquatic plant information.



www.fapms.org

Aquatic Plant Identification Decks are Back In Stock.

The Aquatic Plant ID Deck, formerly out-of-print, is now back in stock. Decks can be purchased at the UF/IFAS Extension Bookstore at 1-800-226-1764 or on the web at www.ifasbooks.ufl.edu. The cost per deck is \$15.00 plus S/H and the item number is SM 050. Information on other educational items we have available can be found at <http://plants.ifas.ufl.edu>.



Scholarships Awarded

The FAPMS Scholarship and Research Foundation, Inc. has named seven recipients of the Paul C. Myers Applicator Dependent Scholarship. The following students each received \$750.00 for the upcoming school year:

- 1) **Daniel Deese**, son of Buddy Deese, is a sophomore attending the University of Miami.
- 2) **Heather Hertel**, daughter of Eric Hertel, is a junior attending Indian River Community College.
- 3) **Katie Hertel**, daughter of Eric Hertel, is a sophomore attending Indian River Community College.
- 4) **Greg Magee**, son of Norma Cassinari, is a junior attending Indian River Community College.
- 5) **Jenna Pontius**, daughter of Vicki Pontius, is a freshman attending South Florida Community College.
- 6) **Brianna Schooley**, daughter of Nick Schooley, is a freshman at the University of Central Florida.
- 7) **Rena Tchekmeian**, daughter of David Blackburn, is a junior at Florida Gulf Coast University.

Congratulations to these individuals and their parents. This is the greatest number of scholarships awarded by the Foundation in a given year. Thanks for the continued support of our membership that allows us to be so generous.

Calendar

January 15 - 17, 2007
8th Annual Northwest Aquatic Plant Management Society Meeting
 Mount Snow Resort.
 West Dover, VT.
www.neapms.net/

January 29 - February 2, 2007
FL Mosquito Control Association 2007 Dodd Plenary Short Courses
 Ocala, FL
www.floridamosquito.org/

February 20 - 22, 2007
Annual Meeting of the Florida Chapter of American Fisheries Society.
 4-H Camp Ocala. Ocala FL.
www.sdafs.org/flafs/

March 3 - 5, 2007
27th Annual Midwest APMS Annual Conference,
 Wyndham Milwaukee Center Hotel. Milwaukee, WI.
www.mapms.org

March 25 - 27, 2007
Western APMS Annual Meeting, Coeur d' Alene Resort
 Coeur d' Alene, ID
www.wapms.org

April 1 - 5, 2007
73rd Annual American Mosquito Control Association Conference, Peabody Orlando, Orlando, FL.
www.mosquito.org

April 30-May 3, 2007
Florida Exotic Pest Plant Council Annual Symposium
 Cocoa Beach Holiday Inn.
 Cocoa Beach, FL.
www.fleppc.org



Florida Aquatic Plant Management Society

Membership Application

Date _____

Name _____

Representing _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____

E-Mail _____

If this is a renewal application, please indicate the year(s) dues are payable for: _____

Membership includes four issues of *Aquatics* and the Newsletter.

Membership Categories and Dues

Active	\$ 35	Associate (Non-Florida	
Student	\$ 5	Resident)	\$ 35

Mail check, payable to FAPMS, to: **FAPMS Treasurer**
P.O. Box 560700
Orlando, FL 32168-1327

IT PAYS TO ADVERTISE!

- *Aquatics* is circulated to approximately 2000 environmental managers, landscape managers, governmental resource managers, and commercial applicators.
- *Aquatics* is a resource for the people who buy and use aquatic products and services.
- Compared to other magazines, advertising in *Aquatics* is a profitable investment.
- Your advertisement not only provides the reader pertinent information, but your support helps maintain the quality of this publication.

Please call Outdoor Tech at 850-668-2353, and ask Debra for more information. Thank you for your interest.

syngenta

24 hr. support • 1-866-SYNGENTA
syngentaprofessionalproducts.com

Lose the weeds. Make everyone happy.

Quickly restore lakes and ponds while keeping the animal life that lives there. With Reward® Landscape and Aquatic Herbicide you can control a broad spectrum of submersed, marginal, and floating aquatic weeds and see results within hours of application. Reward: the no-wait, no-worry management tool for aquatic systems.

