



# Aquatics

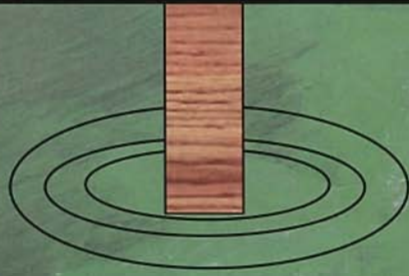
Summer 2008

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



# DON'T LET ALGAE RUIN YOUR DAY

**Algae are Aquatic  
Plants Too . . .  
We Demand  
Equal Treatment!**

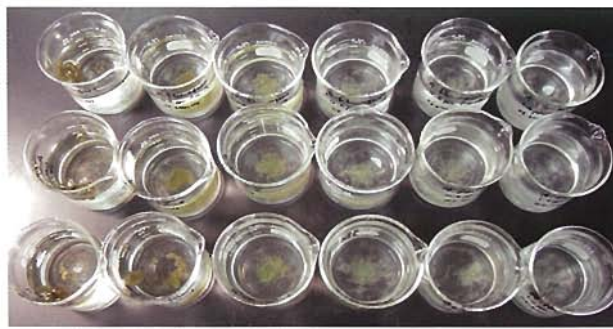


**“We’re being watched and monitored as if we were terrorists.”**

**“In some places they even test us on a regular basis.”**

**“We have the news media talking about us.”**

**One of our biggest fears is the Applied Biochemists “Algal Challenge Test”™**



**Choose Your Best Defense**

**1-800-558-5106**  
[www.appliedbiochemists.com](http://www.appliedbiochemists.com)



Businesses must adopt new marketing strategies in order to be successful in today's fast paced, buy-now society, and product recognition is a key factor in that success. Although FAPMS is volunteer-based organization, it too must consider fresh tactics for attracting new members and retaining the interest of existing members. In an effort to spruce up the society's logo your Board Members voted to hold a logo drawing contest. Drawings must be original artwork created by active FAPMS society members. Details of the contest are available in the *Aquavine* section and on the FAPMS website. The winning logo will be voted on by the general membership at the 32<sup>nd</sup> Annual FAPMS 2008 Training Conference and awarded a cash prize. Did we peak your interest?

Editor



Another day at the office for a weed scientist - checking plots in the Florida Everglades.

Photo by: Vernon Vandiver, Jr.

# Aquatics

Summer 2008 / Vol. 30, No. 2



## Contents

**Feathered mosquito fern (*Azolla pinnata* R. Br.) comes to Florida.** ..... 4  
 By Mike Bodle

**The Conservation Balancing Act: Part I. In the Home** ..... 10  
 By Virginia Peart

**Summer Heat and Aquatic Environments** ..... 14  
 By Patrick Simmsgeiger

**TIIMS Web Portal Supports "Snapshot Day" in the Lake Tahoe Basin** ..... 15  
 By Jamie Anderson

### Florida Aquatic Plant Management Society

**2008 - 2007 Board of Directors Officers**

**President**  
 Chance Dubose  
 USACE  
 602 N Palm Ave  
 Palatka, FL 32177  
 386-328-2737  
 386-328-1298 fax  
 Chance.W.Dubose@saj02.usace.army.m

**President-Elect**  
 Michael Netherland  
 US Army Engineer Research & Development  
 7922 NW 71st Street  
 Gainesville, FL 32653  
 352-392-0335  
 352-392-3462 fax  
 mcinether@ifas.ufl.edu

**Past 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

**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**  
 Jeff Holland  
 Reedy Creek Improvement District  
 PO Box 10170  
 Lake Buena Vista, FL 32830-0170  
 407-824-7301  
 Fax 407-824-7309  
 jholland@rcid.dst.fl.us

**Third year**  
 Bruce Jaggars  
 Florida Fish & Wildlife Conservation Commission  
 601 West Woodward Avenue  
 Eustis, FL 32726  
 352-742-6438  
 352-742-6461 fax  
 bruce.jaggars@myfwc.com

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

**Second 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.mil

**First Year**

Stephanie McCarty  
 Walt Disney World Company  
 Environmental Affairs Division  
 P.O. Box 10000  
 Lake Buena Vista, FL 32830  
 407-824-7274  
 stephanie.mccarty@disney.com

Dan Bergeson  
 SePro Corporation  
 Post Office Box 625  
 Safety Harbor, FL 34695  
 813-267-5650  
 danb@sepro.com

Jerrey Renney  
 Applied Aquatic Management  
 P.O. Box 1469  
 Eagle Lake, FL 33839-1469  
 863-533-8882  
 863-534-3322 fax

**Committee Chairs**

**Auditing Committee:**  
 Keshav Setaram  
 SFWMD  
 (407)824-7274  
 ksetaram@sfwmd.gov

**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

**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

**Merchandise**  
 Allstate Resource Management  
 6900 SW 21st Court, Bldg. #9  
 Davie, FL 33317  
 954-382-9766  
 954-382-9770 fax  
 waterweed@aol.com

**Resource Demonstration**  
 Paul Mason  
 UAP  
 2250 Oak Shadow Ct  
 Oviedo, FL 32766  
 Cell: 407-718-9154  
 Fax: 321-226-0213  
 paul.mason@uap.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

**Awards**  
 Mitch Morgan  
 City of Gainesville  
 405 NW 39th Ave  
 Gainesville, FL 32609  
 352-316-6540  
 352-334-3110 Fax  
 morganmn@ci.gainesville.fl.us

**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

**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

**Nominating**  
 Bill Moore  
 Consultant  
 11512 Lake Katherine Cir  
 Clermont, FL 34711  
 352-242-2360  
 williamhmo@aol.com  
 Chance.W.Dubose@saj02.usace.army.mil

**Scholarship**  
 Don Doggett  
 Lee County Hyacinth Control Dist  
 P.O. Box 60005  
 Ft Myers, FL 33906  
 239-694-2174  
 Doggett@lchcd.org

**By-Laws**  
 Stephanie McCarty  
 Walt Disney World Co.  
 Environmental Affairs Division  
 P.O. Box 10000  
 Lake Buena Vista, FL 32830  
 407-824-7274  
 stephanie.mccarty@disney.com

**Historical**  
 Robbie Lovstrand  
 FL DEP  
 6355 South Florida Ave  
 Floral City, FL 34436  
 352-726-8622  
 Robert.Lovstrand@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

**Program**  
 Tim Harris & Chance Dubose  
 USACE  
 602 N Palm Ave  
 Palatka, FL 32177  
 386-328-2737  
 386-328-1298 fax

**Vendor**  
 Dan Bergeson  
 SePro Corporation  
 Post Office Box 625  
 Safety Harbor, FL 34695  
 813-267-5650  
 danb@sepro.com

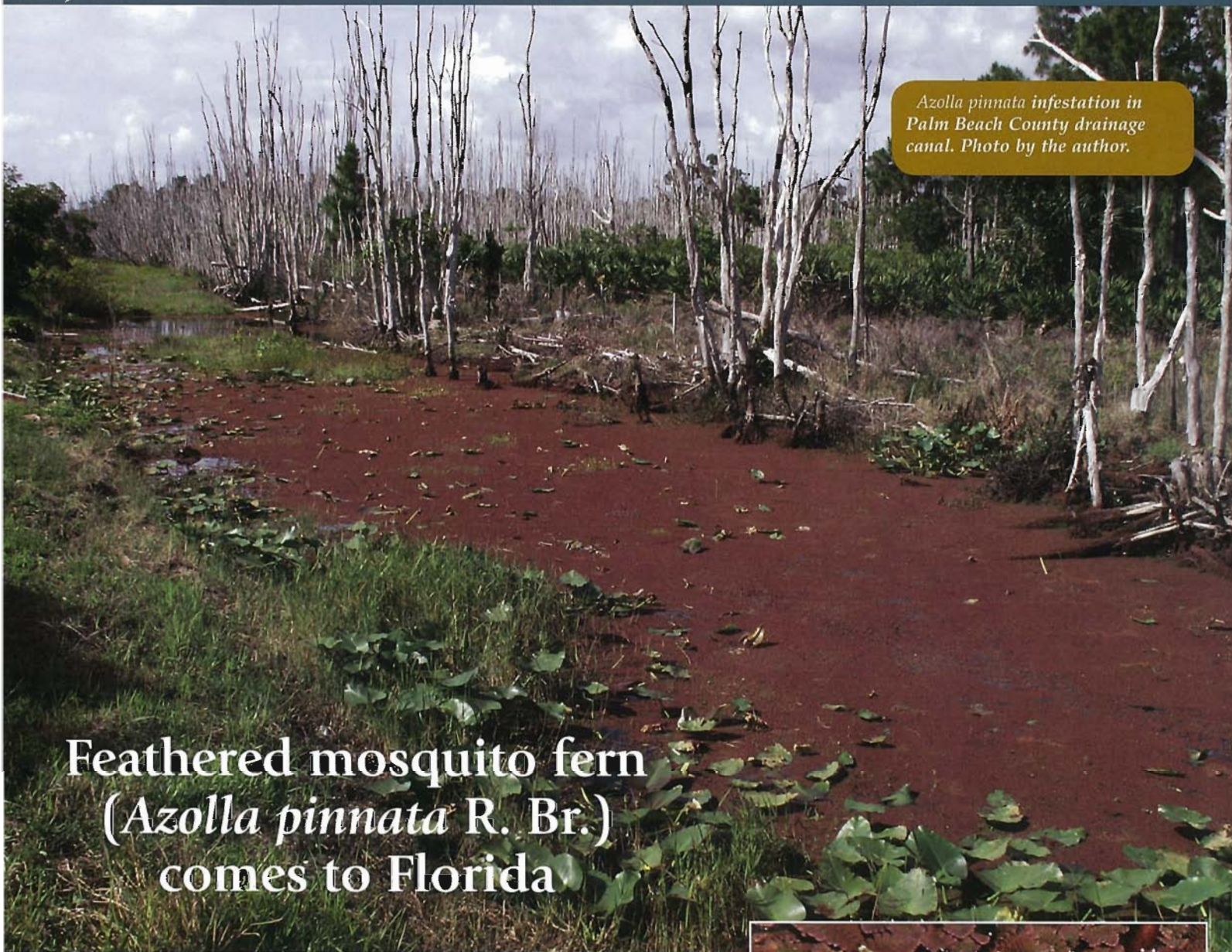
FAPMS Website: [www.fapms.org](http://www.fapms.org)

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.

2007 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*. ADVERTISING INFORMATION CONTACT: Outdoor Tech, Inc., 6791 Proctor Rd., Tallahassee, FL 32308, 850-668-2353





*Azolla pinnata* infestation in Palm Beach County drainage canal. Photo by the author.

# Feathered mosquito fern (*Azolla pinnata* R. Br.) comes to Florida

**By Mike Bodle**  
Senior scientist  
South Florida Water  
Management District  
West Palm Beach

*Azolla pinnata* – feathered water fern R. Br.  
In May 2007, a Palm Beach County homeowner called Jackie Smith, Florida DEP, asking how to control a problematic reddish, floating growth overtaking their pond. Expecting to find native *Azolla caroliniana*, Ms. Smith was surprised to find the pond surface covered with a different plant, *Azolla pinnata*, or feathered mosquito fern. In April 2000, she had found this plant at a nursery located in Martin

County, FL. The plant was confiscated by U.S. Department of Agriculture personnel the following month (J. Smith, pers. comm., 25 April 2008). Until this appearance in the outdoors, *A. pinnata* had been reported only one prior time in North America. It was found in North Carolina in 1999 and continues to be reported as present there (North Carolina State University weed alert, 1999).

### Description and noxious weed status

*Azolla pinnata*, R. Br., feathered mosquito fern, is an exotic aquatic fern that has a vast



Floating *Azolla pinnata* plants. Photo by the author.



# Too Many Weeds Spoil the Fishing



Exotic invasive aquatic plants such as Hydrilla, Eurasian Water Milfoil, 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. United Phosphorus, Inc. 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.

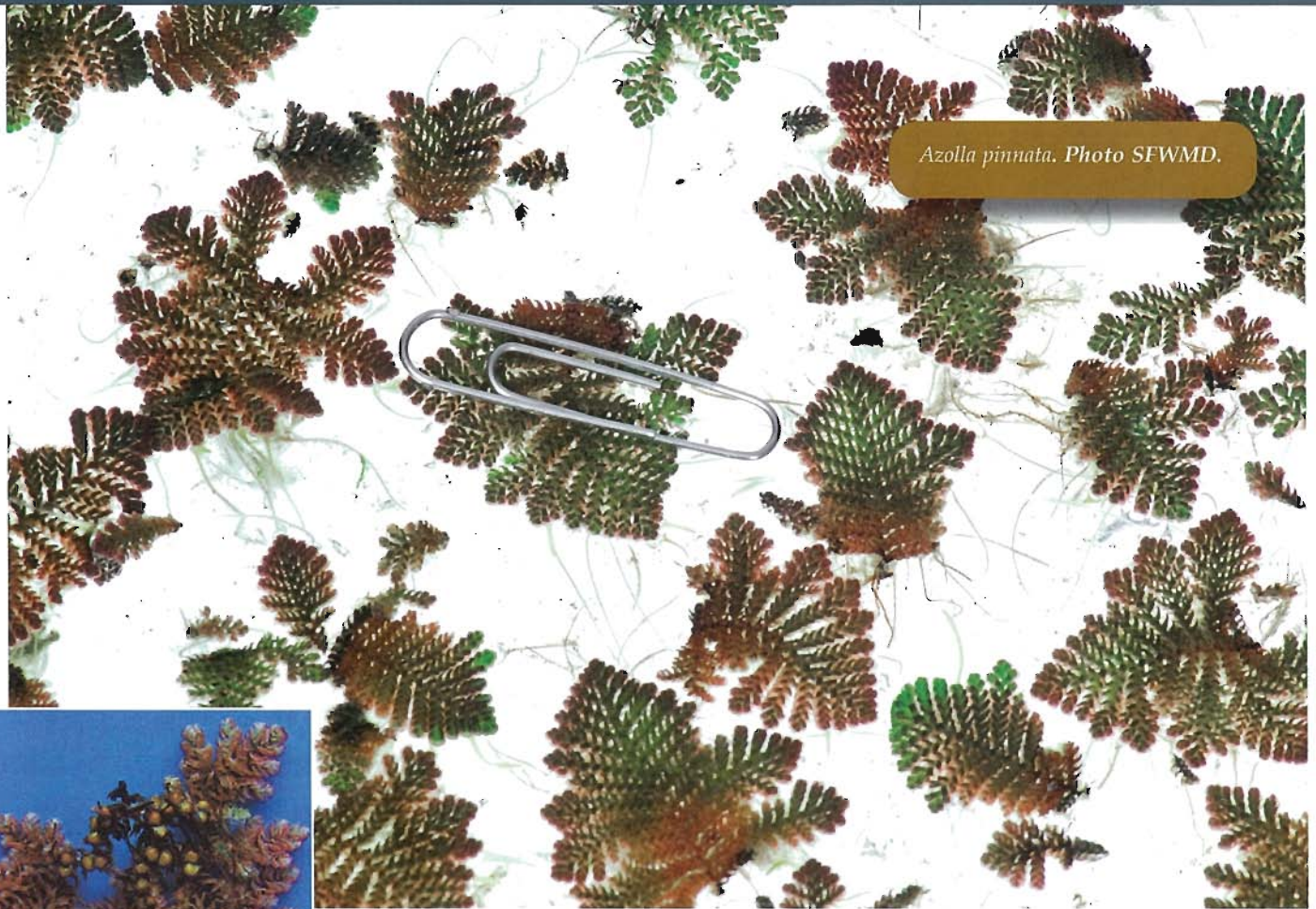
**Hydrothol® 191 Aquatic Herbicide & Algicide**  
A broad-spectrum herbicide and algicide. Hydrothol® 191 provides a companion product or an alternative to copper algicides when controlling difficult algae species.



United Phosphorus, Inc.  
[www.upi-usa.com](http://www.upi-usa.com)

TO OBTAIN A COPY OF OUR VIDEO, *AQUATIC PLANT AND HABITAT MANAGEMENT*, CALL 1-800-438-6071





*Azolla pinnata*. Photo SFWMD.



Detail, underside of *Azolla pinnata* showing fertile sporocarps, plant roots removed (photo courtesy Ecoport: [www.ecoport.org/](http://www.ecoport.org/)).

native range extending from Australia across southeastern Asia to Japan and beyond to Madagascar and Africa (Sweet, 1971). The plant is commonly transplanted in rice paddies in Asia. Its symbiotic bacteria (*Anabaena azollae*) capture atmospheric nitrogen, giving farmers the benefit of added nitrogen in aquatic agricultural systems (Moore, 1969).

Each plant is triangular-shaped and typically about a centimeter in overall dimensions. Each frond consists of 200-300 tiny overlapping scale-like leaflets or segments and has thin hanging roots. The fronds are green when young and become reddish to dark brown at maturity.

Further, as a fern, this plant produces spores, which are, in *Azolla* species, contained in separate male and female sporocarps on the plant's underside. The release of spores leads to sexual reproduction. Vegetative reproduction is rapid, resulting in dense surface mats.

*Azolla*, the mosquito fern genus, contains seven species in temperate and tropical regions of the world. *Azolla caroliniana* is the only member of the genus native to North America. *A. pinnata* has several subspecies and varieties and their differentiation is reportedly difficult as characteristics of the reproductive structures must be examined and these structures are variable and often absent. The *A. pinnata* found in Florida has not been identified beyond the species level.

This mosquito fern is listed as a Federal Noxious Weed by the U.S.D.A. Such listing usually indicates that a plant has been known to be a serious agricultural pest elsewhere in the world. Interstate

transport and sale of federal noxious weeds is prohibited. It is listed and recognized as a serious weed in many nations. For instance, it has overwhelmed and replaced the native *A. rubra* in much of northern New Zealand (PIER, 2007). *A. pinnata* is also included on the noxious weeds lists of seven states, however, it is not included on the Florida prohibited plants list.

### Rapid response and, hopefully, containment

The Palm Beach county homeowner repeatedly manually cleared the pond surface only to see the pond surface disappear again under the reddish floating mat. The rapid regrowth and dense covering of the pond alarmed the homeowner who also recalled that a family member had caught fish in the neighboring canal and put them into the pond, likely transferring the mosquito fern at the same time. Upon inspection, the adjacent canal system was





Quality Vegetation Management  
Making The World a Better Place.

Clean Up  
The Weeds  
Without  
Upsetting  
The Locals.

**Habitat**  
herbicide

WITH HABITAT® HERBICIDE, YOU CAN  
RESTORE AQUATIC AREAS WITHOUT  
HARMING WILDLIFE.

As part of a responsible **Quality Vegetation Management™** program, **Habitat** provides long-term control, eliminating the need for repeat applications. And **Habitat** uses less active ingredient and breaks down quickly, so it's gentle on the environment. Be tough on weeds, not wildlife. Use **Habitat**.

1-800-545-9525 | [www.vmanswers.com](http://www.vmanswers.com)

 **BASF**

The Chemical Company

Always read and follow label directions.  
Habitat is a registered trademark and Quality Vegetation Management is a trademark of BASF. ©2007 BASF Corporation. All rights reserved.

Professional Vegetation Management





found to have an extensive population of *Azolla pinnata*. At that time, DEP immediately authorized South Florida Water Management District to begin treatments of the canal system. Repeated treatments using diquat dibromide have been made by a SFWMD contractor, Aquatic Vegetation Control, Inc. This work has brought the plant under maintenance control in the infested canal system. But it is unlikely to be eradicated due to the plant's floating growth habit, small size, fragmentation and the likelihood that spores of the waterfern have been dispersed in the region. Inspections and treatments will continue as needed, with possible application of systemic herbicides such as penoxsulam. The homeowner's pond where the initial infestation was discovered was stocked with triploid grass carp to control the problem at that site.

### Biological control?

Further, it is hoped that native *Azolla caroliniana*-feeding insects will feed upon *A. pinnata*. These insects are the waterfern flea beetle, *Pseudolampsis guttata* and the North American waterfern weevil *Stenopelmus rufinasus* Gyllenhal. Robert Pemberton, USDA - Agricultural Research Service, is evaluating whether the insects are already feeding upon the feathered mosquito fern in Palm Beach County.



*Azolla caroliniana* Photo by the author.



The prospects for suppression of *A. pinnata* by native *Azolla* insects are promising. These insects have been evaluated thoroughly during biological control studies of European *A. filiculoides* which had become a serious weed in South Africa. The North American waterfern weevil was introduced to South Africa to control *Azolla filiculoides* which resulted in good control. However, during quarantine tests South African researchers found that the North American waterfern flea beetle was very damaging to all *Azolla* species tested, including *A. pinnata*. Therefore, the flea beetle was not released in South Africa. However, these tests establish a firm basis to expect that *Azolla pinnata* may be controlled, to some degree, by these Florida natives (T. Center, pers. comm., 29 April 2008, Found. for Water Research report). These insects survive temperate North American weather conditions and, interestingly, also survive cold weather in South Africa. This further supports the hope that if *Azolla pinnata* is introduced in other parts of North America, insects may provide at least some control of the plant there as well.

Croft, J. R. 1986. The Aquatic Pteridophytes of New Guinea (online resource).

Foundation for Water Research Report KV 158/05. Biological Control of Red Water Fern in South Africa, Report, 2005. <http://www.fwr.org/wrcsa/kv15805.htm> (online resource).

International Union for Conservation of Nature (IUCN), Invasive Species Specialist Group, Global Invasive Species Database, *Azolla pinnata*: <http://www.issg.org/database/species/ecology.asp?fr=1&si=204> (online resource).

Moore, A.W. 1969. *Azolla*: biology and agronomic significance. Bot. Rev. 34: 17 - 34.

North Carolina State University Crop Science Department aquatic weed fact sheet: <http://www.weedscience.ncsu.edu/aquaticweeds/facts/apfs009-00.pdf> (online resource).

Pacific Islands Ecosystems at Risk (PIER), Species list, *Azolla pinnata*: [http://www.hear.org/pier/species/azolla\\_pinnata.htm](http://www.hear.org/pier/species/azolla_pinnata.htm) (online resource).

Sweet, A. & Hills, L.V. 1971. A study of *Azolla pinnata* R. Brown. Amer. Fern J. 71: 1 - 13, pl. 1 - 4.





*Azolla pinnata, Azolla caroliniana*  
in hand. Photo S. Navie.

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

**UAP**

**UNITED AGRI PRODUCTS**

**Paul Mason, Aquatic / VM Specialist**  
PH 407-718-9154  
paul.mason@uap.com

**Joe Collins, Government Acct. Coordinator**  
PH 352-222-0655  
joseph.collins@uap.com

**Terry Whitecar, Utility Specialist**  
PH 386-473-3882  
terrence.whitecar@uap.com

**Dan McMillan, Aquatic / VM Specialist**  
PH 706-318-3238  
daniel.mcmillan@uap.com

Office 877-482-7411, Fax 321-226-0213



# The Conservation Balancing Act: Part I. In the Home<sup>1</sup>

By Virginia Peart<sup>2</sup>  
Department of Family, Youth  
and Community Sciences,  
Cooperative Extension  
Service, Institute of Food and  
Agricultural Sciences, University  
of Florida, Gainesville, FL

## The Situation

Conservation is everybody's business. The big questions are: When? How much? What do I have to give up? The answer may be to get into **The Conservation Balancing Act**. Learn what waste is and you may be able to conserve more water and the energy required to heat water than you think without sacrificing the benefits.

We couldn't live long in a world without a supply of pure, safe water. How many times a day does each of us turn on a tap for a drink, to wash our hands, to prepare food, to wash clothes or dishes, to bathe, to water plants? The list goes on and on. Don't tell us "the well is dry." We have to have water.

We don't want to live without energy either: gas and electricity. We want to be able to cool and heat our homes. Heating water for bathing, cleaning, laundering clothes is important to the way we want to live. And we can't do without electric light and all the work done by our appliances.

Here's news. It takes water to get energy to our homes. Steam-driven turbines powered by coal, gas or nuclear fission drive electrical generators. Water is used to remove excess heat that is a by-product of electricity generation. About 1 percent of a home electricity bill covers the cost of water used in the production of the energy we use. One percent is a small percentage, but it is a lot of water.

More news: It takes energy to provide the water we use. It is true. About 4 percent of our home water bill pays for energy to pump the

water, treat and deliver it. About 17 percent of our waste water bill pays for energy to treat wastewater and reclaim it. Additionally, chemicals used to treat water and wastewater are energy intensive.

We hear about water shortages and water contamination. No wonder! Consider these impacts on water use in Florida:

The population of Florida grew from half a million in 1900 to 13 million in 1990. Imagine a 2600 percent population growth in 90 years! Additionally, Florida has more than 29 million visitors annually and many snowbirds who reside here every year for just part of the year. More people means more water and energy are needed.

Though water use figures for the early part of the century are not available, the Water Resources Atlas of Florida, published in 1984 by Florida State University, indicates that water for all residential uses (including lawn watering) was about 50 gallons/person/day in 1950 (350 gallons/person/week). This residential use of water grew to almost 100 gallons/person/day person by 1980 (700 gallons/person/week). In Florida, we doubled the per person water use in the 30 years from 1950 to 1980. Since the turn of the century, when water was used sparingly, the growth of water use has been even greater.

We estimate that home water use has grown from as little as 100 gallons/person/week early in the century when there were 500,000 people living in Florida to over 700 gallons a week in 1990 with over 13 million Florida residents. For all Florida households home water use can be estimated to have grown from 50 million gallons per year in 1900 to 9.1 billion gallons per year in 1990. Statewide, home water use is 18,200 times as great as it was 90 years ago.



Energy also plays an important role in the lives of Floridians. How many times a day do you turn on a light, start a motor, draw hot water and activate the water heater, relax, work and play in a comfortable, temperature-controlled environment? Does your electric meter get much rest? And natural gas quietly does its job heating water and air in homes.

The use of energy is so basic to the way we live, we accept as normal the necessity of electric and gas bills — griping only from time to time when these bills are higher than we would like. We know we can save money by using less energy in our homes, but our efforts are spotty. Often we question the effectiveness of those energy conservation techniques we know. But we can change.

Bear this important fact in mind: Florida can never be energy independent since there are no coal, oil, natural gas or nuclear reserves in Florida.



The state will always be dependent on out-of-state sources for electricity production.

**Cleanliness**

Cleanliness is the primary function of water in Florida homes. Cleanliness is priceless and at the same time cleanliness is costly. Costs associated with clean water, energy and the resources required for cleanliness can eat into our pocket books. One of the largest uses of energy in a home is for heating water. More important, water, energy and other resources are limited; their uncontrolled use can cost our environment.

**Water and Energy Facts**

Water, energy, environment, cleanliness — all are important to us. Can we conserve without sacrificing the cleanliness, the comfort we want in our homes? The answer is YES. And, the most important place to start is cutting the use of water and other resources where they are wasted — where they are “used” without serving any real purpose.

**Attack Waste**

Water and energy are too precious to waste. They are too costly in dollars and resources. Water in most Florida homes comes from municipal plants where every drop is carefully tested and treated to make it safe for drinking. That means we water our plants, water our lawns and wash our cars with drinking water! Energy is used to draw the water from wells, treat it and deliver it to our homes.

While a house is being planned and built water and energy conservation can be built-in. If our home is not as efficient as it could be, there are some things we can change, some we cannot. But there are habits we can change; practices we can adopt to avoid waste.



**Consider Leaks**

Note that a “little” leak of one drop a second wastes seven gallons of water per day — over 2,500 gallons a year. In the example shown, water costs only \$2.56. Not enough to worry about? Look again. Wastewater treatment costs \$4.85. The total goes up to \$7.41. Not convinced? What about a steady stream — like one that happens in a leaking toilet? Twenty gallons a day means 7,300 gallons a year: a total of over \$21.17. Want to do something about the leak yet?

If it’s hot water, there’s a BIG difference. Heating the water for that little drip adds \$3.75 if you have a gas water heater and a whopping \$28.38 with an electric water heater. The total leak “bill” (water, wastewater, gas or electricity) goes up to \$11.16 (with a gas heater) or \$35.79 with an electric water heater. The total stream “bill?” That’s \$31.89 (gas water heating) and \$102.25 (electric water heating). It’s your choice.

**Running Water**

Also consider the times you turn on a faucet and leave it running while you do something else. Maybe you only do this for half a minute two or three times a day. Maybe everyone in the family does the same thing. In Table 1 you can see what happens to your water bill for just 5 minutes (or three minutes) a day. By working with your family to change their water use habits, you may be able to cut your bills for water and wastewater alone by \$15.88 to \$26.47 a year. For hot water your savings might be as high as \$39.87 with a gas heater or \$127.82 with an electric water heater.

**Your Conservation Balancing Act**

**Plan Carefully When Building a House**

When building a new home, see to it that the water heater is located

near the places where warm or hot water is needed (bathrooms, laundry and kitchen sink) to save both water and the energy to heat it.

**Your water heater**

Buy your water heater wisely. Water heaters store water so heated water is ready for use when you want it. Buy the gallon-size that meets your family’s peak hourly needs. (The gallon-size corresponds to the first-hour rating; takes into account how quickly cold water can be heated in that size tank. A 70-gallon first-hour rating calls for a 65-gallon electric water heater or a 40-gallon gas water heater.) Also get water heater efficiency by checking the energy efficiency label right on the appliance.

Lower your water heater thermostat from 140° to 120°F. This saves energy and protects young children and the elderly from scalds. It also takes longer to heat your water. And, if you have a dishwasher you may find your dishes don’t get clean at 120°. Then set the water heater up to 130° or 140° again.

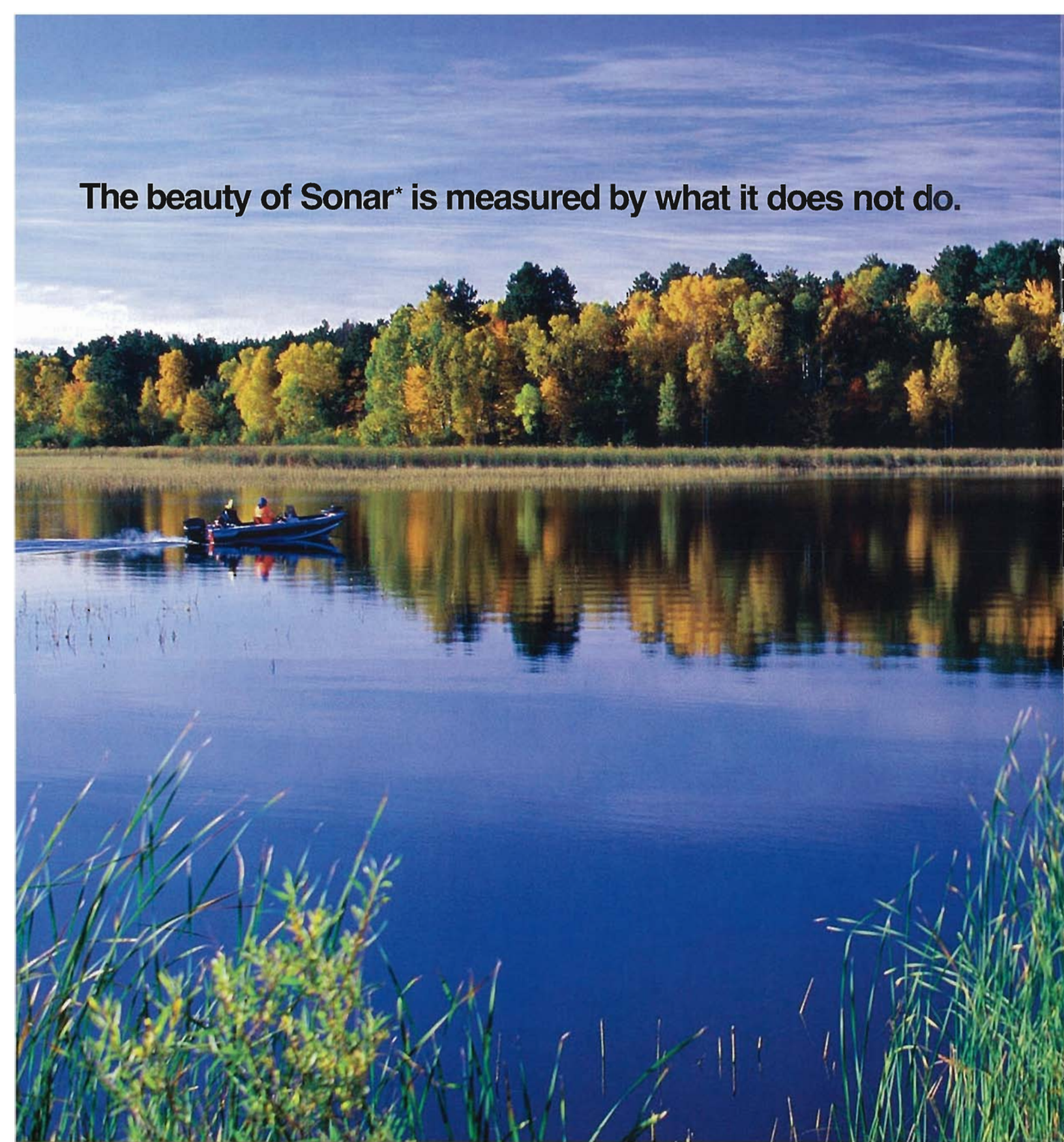
Protect your water heater. Locate the valve on the bottom of the heater and drain a few gallons from the water heater twice yearly. The water you drain contains mineral deposits and sediment that collect in the tank and reduces the amount of heat transferred from the heating element to the water. Draining reduces energy waste and increases the life of both the element and the water heater.

Consider installing a water-heater timer that “tells” the water to heat only during the times of the day when hot water is needed.

New water heaters are more efficient and better insulated than those made 10 or more years ago. If your water heater is an older model, you can buy and install an insulation kit. Follow directions carefully.

If you’re planning a trip and won’t need water for three days or more, turn your water heater off. If your heater is gas turn your controls to pilot. (If you have an electronic starter on your gas water heater, it can reignite the water heater when you turn it back on.)



A scenic view of a lake with a boat and autumn foliage. The image shows a calm body of water reflecting the sky and the surrounding trees. In the foreground, there are tall green reeds. In the middle ground, a small motorboat with two people is moving across the water, leaving a small wake. The background is a dense forest of trees with vibrant autumn foliage in shades of yellow, orange, and red. The sky is a clear, pale blue with some light clouds.

**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](http://www.sepro.com) or call 1-800-419-7779.

**Sonar**<sup>\*</sup>  
Restores Aquatic Habitats



**Avoid Water Waste — Especially Hot Water Waste**

A most important approach to true conservation is to BE AWARE. Train your family to be aware of leaks, of waste. Teach children to turn off water faucets tightly after each use.

Install low-volume flow-control devices and faucets in the bath and kitchen. Aerator faucets splash less and use less water per minute.

**Stop All Leaks and Drips, Once Water Is Heated, Don't Waste It**

Collect rain water from a downspout or condensate from an air conditioner for watering house plants. This water is better for plants than well water which contains minerals that can build up in flower pots and inhibit the growth of plants.

Although not addressed specifically in this publication, we encourage you to take your new water ways with you everywhere. Spread the word: Encourage others to conserve water outside, as well as inside, the home.

Remember: When you save water, you are saving the energy to produce that water. When you save energy, you are saving the water required to produce that energy.

**THINK EFFICIENCY** — Say YES to the benefits of water and energy, but say NO to waste. You will save money, too

1. This document is FCS 3232, one of a series of the Department of Family, Youth and Community Sciences, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: January 2001. First published: September 1994. Reviewed: January 2001. Please visit the EDIS Web site at <http://edis.ifas.ufl.edu>
2. Virginia Peart, former associate professor, Housing, reviewed by Nayda I. Torres, professor, Family and Consumer Economics, Department of Family, Youth and Community Sciences, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611

# Summer Heat and Aquatic Environments

By Patrick Simmsgeiger<sup>1</sup>

**Heat and it's Effects**

Summer heat can spell destruction for water systems in smaller private properties and larger scale Home Owner's Associations (HOA's). Everything that has gone into the water feature during the winter months; leaves, rain water, runoff from neighboring yards, such as fertilizers, soap from washing cars, and debris, will affect the water once the heat of summertime hits. The water's surface may look good during the cooler months, but underneath that surface all the ingredients are gathering to make for a "big show" when the heat of summer arrives.

**What Will Happen**

During the cooler months, decomposition (of all the debris and runoff) is slow. When summer arrives, the heat kicks decomposition into high gear and starts lowering the oxygen level and changing the chemical balance of the water. This warm environment is perfect for growing all sorts of algae, bugs and nuisance weeds, to grow and multiply at an alarming rate. Subsequently your beautiful water feature may end up with a rapid growth of all types of aquatic weeds and algae. Accompanying this may be green water, disgusting odor and midge flies (pesky little things everyone thinks are mosquitoes.)

**Action to Take**

In the best case scenario you'll want to take a pro-active stance during the cooler months.

Ensure your water features have properly operating and maintained aeration, circulation, and filtration systems all year round. Everyone will be happier with the way the water feature looks when the sun begins to beat down on it.

During the cooler months it's also a good idea to treat the water with products made specifically for aquatic environments to reduce the food source for summer algae. When the trees drop their leaves and wind blows them and other matter into the water, decomposition occurs and becomes food for summer algae. Reducing the food source, reduces the overgrowth of algae and helps keep your water feature clear.

By making sure your waterscape vendor is getting a handle on things prior to the heat of summer you will prevent a myriad of problems. Neglecting a water feature during cooler seasons can result in serious and/or unsightly problems in the summer.

You can count on your waterscape professional to take a very aggressive approach. The aquatic professional will have the tools and knowledge at hand to treat the rapid growth of algae, aquatic weeds and pesky midge flies. The end result being an aquatic environment that is aesthetically pleasing to all.

**Bottom Line**

Care for the water feature year round and it will provide you with years and years of and beauty enjoyment.

<sup>1</sup> Patrick Simmsgeiger is the President of Diversified Waterscapes, 27324 Camino Capistrano, Suite 213, Laguna Niguel, California 92677, (949)582-5414, E-Mail Regarding Articles: [Debbie@dwiwater.com](mailto:Debbie@dwiwater.com)



# TIIMS Web Portal Supports "Snapshot Day" in the Lake Tahoe Basin

**By Jamie Anderson**  
 Colorado Regional Manager,  
 Data Transfer Solutions, LLC.

## Introduction

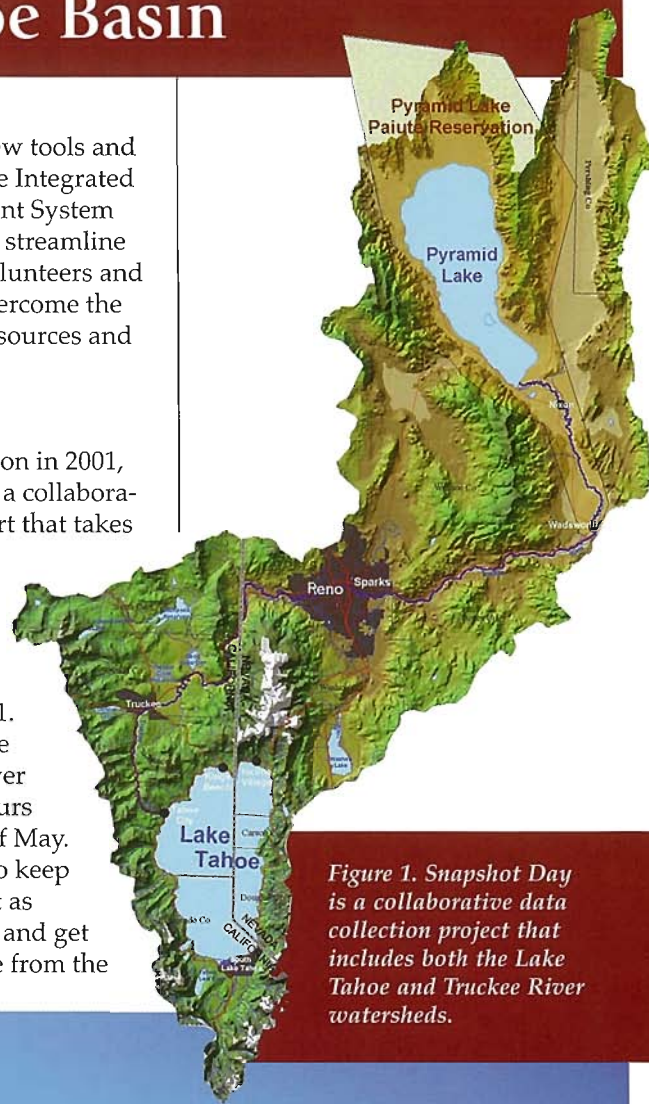
On the morning of May 10th, 2008, approximately 250 volunteers from the Lake Tahoe-Truckee River Watershed anxiously awaited their stream assignments as part of the 8th annual Citizens Monitoring "Snapshot Day". Snapshot Day is a nationally recognized, grass-roots effort to get citizens involved in environmental stewardship at a local level. In particular, Snapshot is intended to stimulate citizen interest and build awareness of water quality issues, aquatic resources, and pollution prevention.

This volunteer-based program is designed to take a "snapshot" in time of water quality and stream conditions in approximately 63 tributaries that feed into Lake Tahoe, the 11th deepest lake in the world also known for its water clarity and

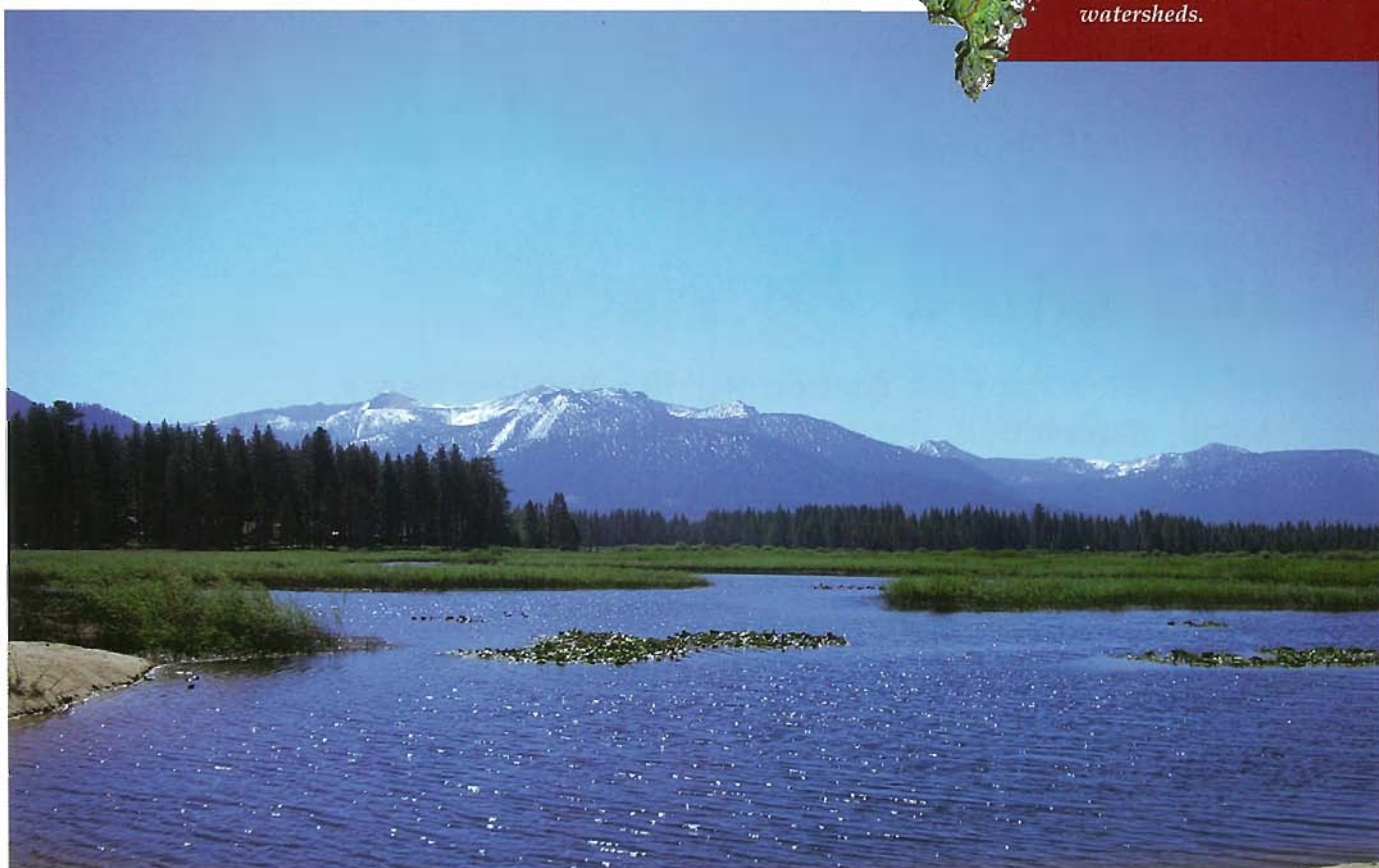
mountainous views. New tools and technology on the Tahoe Integrated Information Management System (TIIMS) web portal will streamline the process and help volunteers and supporting agencies overcome the challenges of limited resources and staff time.

## Snapshot Day

Since its local inception in 2001, Snapshot Day has been a collaborative data collection effort that takes place in the North and South Lake Tahoe, and Middle and Lower Truckee River watersheds (including Lake Pyramid), Figure 1. Coordinators try to time this event with peak river flow which usually occurs in the first two weeks of May. The purpose of this is to keep the timing as consistent as possible between years and get a representative sample from the



*Figure 1. Snapshot Day is a collaborative data collection project that includes both the Lake Tahoe and Truckee River watersheds.*







# 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**<sup>™</sup> 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](http://www.phoenixenvcare.com)

1-888-240-8856





waters moving in the basin. Snapshot requires donations from various organizations whether in the form of lab equipment, agency staff time, or laboratory analysis of the samples collected in the field.

Each year volunteers conduct visual stream assessments, take photos, measure field water quality data (pH, conductivity, temperature, dissolved oxygen, etc.), and collect a water sample for laboratory nutrient analysis. However, only about half of the samples collected by volunteers each year are tested for further laboratory analysis (nutrients, fecal coliform, and other bacteria) based on limited resources.

### Why is Snapshot Day Significant?

Lake Tahoe is a federally - protected lake with millions of dollars spent each year to preserve its clarity through monitoring efforts, research, environmental restoration, and best management practice

(BMP) enforcement. And although a number of highly - qualified agencies and university - sponsored monitoring activities take place in the basin on a day-to-day basis, there is still insufficient information to adequately assess the complex aquatic resources in the Tahoe watershed. All data collected by Snapshot Day supplements existing agency monitoring efforts and is provided to the regulatory and resource management agencies responsible for protecting water quality. With Snapshot Day in place this program fills in some of the data gaps that exist.

Furthermore, Snapshot data is critical in determining "hot spots" or locations where water parameters are high (such as turbidity, nutrients, or fecal coliform bacteria). Snapshot Day identifies areas, if any, where water quality may be unfavorable, including sources of pollution and detection of illegal activities (e.g. chemical spills, filling of wetlands,

illicit discharges, or destruction of stream environment zones). This provides agencies an opportunity to conduct additional monitoring activities and may be used for restoration project identification or other environmental improvement initiatives.

In 2001, volunteers in South Lake Tahoe discovered high fecal coliform coming from one of the marinas. As soon as this "hot spot" was reported to the California Lahontan Regional Water Quality Control Board (Lahontan RWQCB), they sent agency employees to re - sample the area, thinking the first sample collected by volunteers could have been erroneous or the result of faulty sampling. When the Lahontan RWQCB approached the site they happened to catch ferry workers improperly leaking raw sewage because of flawed "pump out" procedures. The ferry owners were charged and assessed a fine for violating regulations and contaminating water resources.

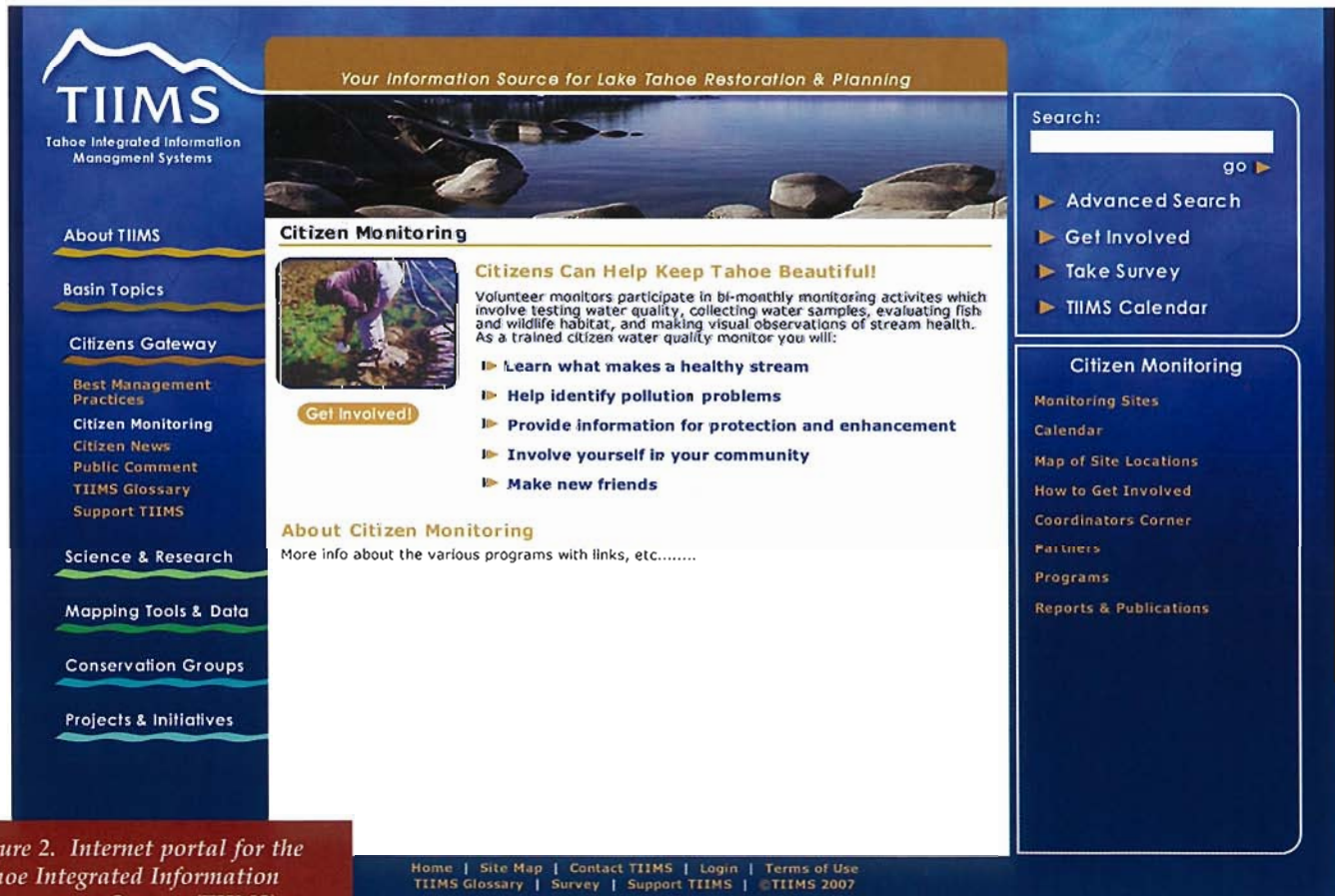


Figure 2. Internet portal for the Tahoe Integrated Information Management System (TIIMS).



As mentioned earlier, Snapshot Day also promotes environmental education and stewardship with participating citizens in an attempt to reach environmental goals and support project initiatives that protect the watershed from further degradation. Heather Segale, a former coordinator, leader of the Snapshot Day program, and staff member for the University of Reno-Nevada's Lake Tahoe Environmental Education Coalition, experienced this firsthand when she received a phone call from one citizen in particular:

"I had a group of people come to Snapshot Day one year that had been living in the Tahoe basin for 20 years or more. The volunteers were there for training purposes and to learn about stream monitoring. About a year later, the same people called to tell me they noticed that a neighbor had been overwatering their lawn and was concerned about nutrient runoff and soil erosion ending up in the streams. These people were used to seeing their neighbor water the lawn all the time....it was amazing to see people's perception change, and the direct impact of what environmental awareness can have on the community with a few hours spent learning the intricacies of our ecosystem."

**Other Snapshot Day Objectives:**

- Provide water quality data that may be used in long term trend analyses
- Provide data for evaluating the effectiveness of restoration activities (BMPs) and various other pollution control strategies
- Provide water quality data that may be compared to the Tahoe Regional Planning Agency's (TRPA) environmental thresholds and/or water quality standards set by the States of California and Nevada
- Assess the status and trend of valued biologic and ecologic resources within the watershed

**The Value of Technology**

Snapshot Day is not only limited by the equipment and laboratory time, but also the time coordinators

or "team leaders" spend organizing, training volunteers, and collecting data. Each year several hundred volunteers are sent into the field in small groups with paper - based forms to collect a variety of data, photos, and samples. Paper forms are collected from volunteers and then entered manually by one of the team leaders into an Excel spreadsheet - a timely process for a hundred or more monitoring sites! Another challenge of this data entry process is interpreting hand - writing and field notes, making the transfer of data difficult and potentially less accurate.


The Tahoe Integrated Information Management System (TIIMS), an information web portal serving the public and agencies in the Tahoe basin, is turning this paper-based method into an electronic one (Figure 2). A new version of the site is currently under construction but is expected to 'go live' in July 2008. New features of this site

include password protected areas for scientists and researchers, on-line enrollment opportunities for basin volunteers, unique mapping applications using Virtual Earth, and much more...


In particular, the TIIMS website includes a "Citizens Gateway" section where users will be able to access volunteer, program-specific information. Here, Snapshot Day volunteers will be able to login to the system, select their monitoring site location from a list or map, and upload field data and photographs through an online web form. Eventually the system will allow users to generate graphs 'on-the-fly' by querying all Snapshot Day data by date, analyte, and monitoring site location.

TIIMS will eliminate duplicate data entry, reduce the time required by volunteer coordinators, and streamlines the process for better results. A system like this also gives volunteers ownership of

## Surface Water Management Equipment




**Aquatic Plant Harvesters**



**Amphibious Excavators**

The wonderful world of water management.  
You can do it... we can help.



**AQUARIUS SYSTEMS**  
A Division of D&D Products

Phone 262-392-2162 | Toll free 800-328-6555 | [www.aquarius-systems.com](http://www.aquarius-systems.com)



the process and something to look forward to each year when they are able to visually compare and contrast data in graph form. Whether looking at numbers on a graph or by visual monitoring through photo assessment over time, it will all be at the fingertips of the TIIMS user and is "Snapshot Day's" way of giving back to the dedicated volunteers.

### The Future of Snapshot Day

Lead volunteers of Snapshot Day want to expand the geographic region to include additional monitoring site locations throughout the

watershed and also increase the number of samples tested for nutrient analysis. Perhaps the new TIIMS website coming in July 2008, with its new citizen monitoring features will spark additional interest and project funding from others in the basin (Figure 3). But one thing is certain; the time required for entering data will be reduced dramatically.

Folks in the Tahoe basin have a particular need to expand monitoring efforts related to the Quagga mussel. The Quagga is an invasive species that was first observed in Lake Erie in 1989. Since then it has crossed the Continental Divide

affecting various lakes along the way, including the 2007 mussel discovery in Lake Powell only about 600 miles from Lake Tahoe. Today, Lake Tahoe remains free of the Quagga mussel. With increased citizen awareness and additional monitoring efforts like Snapshot Day, Lake Tahoe certainly stands a better chance against this invasive species.

For more information please visit [www.tiims.org](http://www.tiims.org) or contact Data Transfer Solutions (TIIMS web developer) at [www.edats.com](http://www.edats.com). Written by Jamie Anderson (email [janderson@edats.com](mailto:janderson@edats.com)).

**TIIMS**  
Tahoe Integrated Information Management Systems

Your Information Source for Lake Tahoe Restoration & Planning

**Citizen Monitoring**  
**How to Get Involved**

Use the form below to register as a volunteer for a Citizen Monitoring or Citizen Restoration Program. Getting involved is easy and your contact information is kept confidential. To learn more about specific programs TIIMS can involve you in, see the [Programs](#) section.

All fields are required on this form.

Name:

Email:

Address:

City:

State/Province:

Zip Code:

Phone:

Type of Monitoring:

Regional Preference:

Location Preference:

9bK7 Re-type text here:

Submit

**Contact Links**  
Use these links to email your area of interest:

- North Lake Tahoe
- South Lake Tahoe
- Truckee
- Reno
- Incline Village Clean Water Team
- Truckee River Aquatic Monitoring
- Tahoe Forest Stewardship Day

1 2 3 4 5 6

Home | Site Map | Contact TIIMS | Login | Terms of Use  
TIIMS Glossary | Survey | Support TIIMS | ©TIIMS 2007

Search:  go

- Advanced Search
- Get Involved
- Take Survey
- TIIMS Calendar

**Citizen Monitoring**

- Overview
- Monitoring Sites
- Calendar
- Map of Site Locations
- How to Get Involved
- Coordinators Corner
- Partners
- Programs
- Reports & Publications

Figure 3. Example of TIIMS's volunteer application form for citizen-based monitoring.



# Photographs Taken from Members in the Field:



*Bladderwort (Utricularia inflata) on Orange Lake, Alachua County, FL 2004. Photo by Bruce Jagers, FFWCC.*



*Operational photograph taken by Don Dogget, Lee County Hyacinth Control District, FL.*



*Professional Lake Management applying Renovate OTF on Wixom Lake, MI. Photo by Tyler Koschnick, SePRO.*



*Rocket launch September 2007 over St. Johns River. Photo by Kelli Gladding, FDEP.*



**Alachua, FL**  
386-462-4157  
**Belle Glade, FL**  
561-996-6200  
**Dade City, FL**  
352-567-5622  
**Delray Beach, FL**  
561-499-0486

**Dundee, FL**  
863-439-1551  
**Ft. Pierce, FL**  
772-464-8660  
**Homestead, FL**  
305-248-3012  
**Immokalee, FL**  
239-657-3141

**Mt. Dora, FL**  
352-383-8139  
**Palmetto, FL**  
941-722-3253  
**Plant City, FL**  
813-759-1111  
**Wauchula, FL**  
863-773-3187

**Bonnie Figliolia**  
407-256-2342

**James Boggs**  
863-557-0076

**Polly Ellinor**  
813-376-3966

People...Products...Knowledge... is a registered trademark of Helena Holding Company. Always read and follow label directions. ©2007 Helena Holding Company.

**HELENA** People...Products...Knowledge... [www.helenachemical.com](http://www.helenachemical.com)

Helena Chemical Company • 2405 N. 71st St. • Tampa, FL 33619 • 813-626-5121



## Calendar

June 13-14, 2008

New England Chapter NALMS  
Lake Morey Resort, Fairlee, VT  
[www.vtwaterquality.org/lakes.htm](http://www.vtwaterquality.org/lakes.htm)

June 23-27, 2008

The 5th International Weed Science Congress  
Westin Bayshore Hotel in Vancouver, Canada  
<http://iws.ucdavis.edu/5intlweedcong.htm>

July 13-16, 2008

Aquatic Plant Management Society, Inc. 48th  
Annual Meeting  
The Mills House Hotel, Charleston, South Carolina  
[www.apms.org/2008/2008.htm](http://www.apms.org/2008/2008.htm)

October 13-16, 2008

FAPMS 32<sup>nd</sup> Annual Training Conference  
Hilton Resort Daytona Beach, FL  
[www.fapms.org/meeting.html](http://www.fapms.org/meeting.html)

October 14-17, 2008

Natural Areas Conference 2008  
Hosted by National Association of Exotic Pest  
Plant Councils, Nashville, TN  
[www.naturalarea.org/](http://www.naturalarea.org/)

December 3-5, 2008


Florida Stormwater Association Winter Confer-  
ence  
Hyatt Regency, Tampa  
[www.florida-stormwater.org](http://www.florida-stormwater.org)

December 8-10, 2008


Northeast Mosquito Control Association 54<sup>th</sup>  
Annual Meeting  
Marriott Providence Downtown Hotel, Provi-  
dence, Rhode Island.  
[www.mosquito.org](http://www.mosquito.org)

*always thinking ahead.*


**From crystal clear ponds to mirror-like lakes,  
we have aquatic solutions that deliver.**



**ADMIRAL**  
Control weeds and algae



**BLACK ONYX**  
Colorant creates a natural,  
mirror-like appearance



**LAKEPAK WSP**  
Concentrated microbial

**ADMIRAL™...  
BLACK ONYX™...  
LAKEPAK® WSP®... The right  
solutions for your aquatic features.**

From controlling algae growth to adding a beautiful, natural color to lakes and ponds, Becker Underwood has the right aquatic solution. Our comprehensive line of innovative aquatic products improve the appearance and value of your ponds and lakes. Whether your business is agricultural watershed management, golf and ornamental ponds, lake and pond management or commercial fish farms, we have the solution that will deliver outstanding results for you.

Learn more about our full line of aquatic products—see your supplier or visit:  
[www.beckerunderwood.com](http://www.beckerunderwood.com)

**BECKER  
UNDERWOOD®**

Becker Underwood 801 Dayton Avenue, Ames, Iowa 50010 USA 515-232-5907 • 800-232-5907 • fax 515-232-5961





## AQUAVINE



### FAPMS Logo Contest Now Accepting Entries

Do you have an idea for a new FAPMS logo? If so, consider submitting it to the editor (jholland@rcid.dst.fl.us) starting June 1, 2008. The winner will be selected by majority vote from the FAPMS general membership at the annual training conference. Visit the society's website (www.fapms.org) for more information and contest rules. Deadline is October 8, 2008.

### Non-native Aquarium Plant Releases

Literature Review from John Randall (jarandall@ucdavis.edu):

Cohen, J., Mirotnick, N., and Leung, B. 2007. **Thousands introduced annually: the aquarium pathway for non-indigenous plants to the St. Lawrence Seaway.** *Front. Ecol. Environ.* 5(10):528-532.

The authors calculated numbers of non-native aquarium plants released to the St Lawrence Seaway watershed annually in the Montreal, Canada. They found

that over 78,000 aquarium plants from 138 species were sold in Montreal each year and calculated that over 3,000 of these were released to the St Lawrence Seaway based on surveys of aquarium stores and customers. Two of the most commonly released species are recognized invaders: *Egeria densa* and *Cambomba caroliniana* with estimated releases of 145 and 116 individual plants respectively. The study used a step-by-step process to ascertain the numbers of invasive organisms released in a given area over a given time (=propagule pressure) which could be used to ascertain propagule pressures for other types of organisms and other pathways elsewhere around the world. This information could be extremely useful in developing strategies to close the most important invasion pathways.

### Three Contributors to FAPMS Will Be Missed:

Jess Van Dyke retired January 31, 2008. He served 35 years with the State of Florida, first with the Fish and Wildlife Conservation Commission, and then with the Department of Environmental Protection. Jessie worked tirelessly preserving Florida's aquatic ecosystems. His commitment and dedication along with his wit and joyful outlook on life made a lasting impression on those that have worked with him.

Harold Brown died September 12, 2007 at his residence in Sebastian, Florida. Harold was the second President of FAPMS, and a Charter Member. He was 75.

Clarke Hudson died December 2, 2007 at Florida Hospital, Deland, Florida. Clarke was the ninth President of FAPMS, and a Charter Member. He was 64.

### 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.



Important: Always read and follow label instructions before buying or using this product.  
©2006 Syngenta. Syngenta Professional Products, Greensboro, NC 27419. Reward® and the Syngenta logo  
are trademarks of a Syngenta Group Company.