Aquatics

SUMMER 2012

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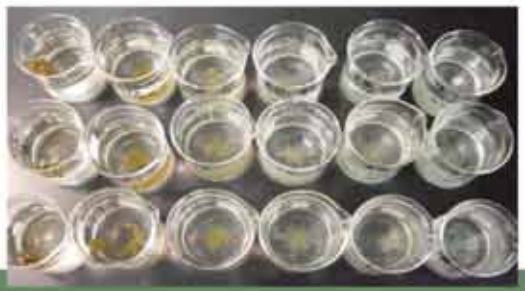

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Narrow leaf pickerelweed, see article page 12.

Cover photo by Ken Langeland. St Lucie West Services District uses a variety of integrated management techniques to manage vegetation in surface water retention ponds, including custom designed and fabricated harvesting equipment.

Contents

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The mission of FAPMS is "To Preserve Florida's Aquatic Heritage." FAPMS was formed in 1976 and provides a forum for those interested in aquatic plant management to meet, discuss and exchange ideas and information.

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Feral Hogs and Their Impacts on Aquatic Ecosystems

By K. T. Gioeli and J. Huffman

Florida's population of feral hogs may now exceed 500,000 animals. They occur in every county in Florida. Some of the highest hog population densities in Florida can be found north and west of Lake Okeechobee in areas with large forested tracts, dense understory vegetation, and limited public access.[1]

It is believed that hogs were first brought to Florida in 1539 when Hernando de Soto brought swine to provision a settlement established at Charlotte Harbor in Lee County. However, it is possible that hogs had been brought to the same site in 1521 by Ponce de Leon. Over the next four centuries, explorers and settlers brought pigs with them as they travelled throughout Florida. Many of these animals escaped from captivity and established feral populations.

Hog wallowing is of particular concern for aquatics managers. Feral hogs will wallow along the shoreline to help them cool off in Florida's warm environment. They also wallow to rid themselves of pests such as fleas, ticks and other parasites. If you are managing ponds, lakes, canals and other bodies of freshwater in Florida, chances are you have seen the damage they can cause. Literally overnight, feral swine can destroy the shoreline vegetation and littoral plantings you've cared for over the years.

Photo courtesy of University of Florida/IFAS Communications.

What can be done?

Adaptive management is the key because no one method of feral hog management is 100% effective. You will need to devise a site-specific plan for managing feral hogs.

Mississippi State University published a report in 2011 indicating that hunting (including hunting with dogs) as the sole management technique is rarely effective for significant reduction of large populations of feral hogs. Instead, they stated that rigorous corral trapping is the most effective method of catching large groups of feral hogs. Prebaiting the corral trap over a period of several days will help lure hogs into the trap. Hogs will eventually wise-up to this strategy so relocating the corral may be necessary.

If corral trapping is not feasible on your site, then adaptive management comes into play. Basically, you will need to do whatever it takes to get the job done while *complying with the law and local site restrictions*. For example, leg snares and other strategies may be illegal without special permits. Also, the use of firearms and dogs may be prohibited on the site you are managing. Some sites may require a hunting license if you use firearms or archery. However, feral hogs are often considered nuisance wildlife which does not require a license. Check with your local and state authorities.

The Florida Department of Agriculture and Consumer Services requires feral hog trappers to have a Feral Swine Dealer's ID Card when (1) moving hogs to slaughter; (2) moving hogs to a game reserve; and (3) moving hogs to an approved feral swine holding facility. The ID card is not required if the feral hog is slaughtered on site.

The UF/IFAS St Lucie County Cooperative Extension Office conducted a survey of public and private natural areas managers as well as feral hog trappers to determine what practices are being undertaken for feral hog management. Eighty-seven land managers and 32 trappers and hunters responded to the survey.

Of land managers, 82% were managing properties larger than 200 acres. The majority of respondents were managing public lands. 100% indicated that rooting was the major hog damage, followed by wallowing (70%). In addition, 47% of respondents indicated that the practices they currently used were only marginally effective while 25% of them indicated total failure.

There is an obvious need for increased education to help land managers adopt an adaptive management strategy to improve feral hog control.

For additional information and references, please contact Ken Gioeli, UF/IFAS Natural Resource Extension Agent for St. Lucie County, at ktgioeli@ufl.edu

1. William Giuliano. "Wild Hogs in Florida: Ecology and Management." University of Florida-IFAS EDIS Publication WEC 277. 2010.

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The Distribution of Licensed Restricted Use Pesticide Applicators in Florida

By Vernon V. Vandiver, Jr. and Karen P. Brown

In the aquatic weed and plant industry, the subject of Restricted Use Pesticide Applicator Licenses is discussed frequently. Many organizations require their applicators to have such a license as one of the conditions of employment. By holding a Restricted Use Pesticide Applicator License one has had to demonstrate a certain level of competence in their selected Category or Categories; the individual must pass certain certification exams to be eligible to purchase a license. In Florida, the Pesticide Applicator License program is administered by the Florida Department of Agriculture and Consumer Services.

There are three types of Restricted Use Pesticide Applicator Licenses: Private, Commercial, and Public. Most of us within the Florida Aquatic Plant Management Society (FAPMS) are generally seeking either a Commercial or Public License. Many of

Table 1. Distribution by County of Florida Pesticide Applicators Licensed in the Aquatic Pest Control Category.

County	Number of Applicators per County	County	Number of Applicators per County	County	Number of Applicators per County
Broward	238	Putnam	35	Jackson	4
Palm Beach	199	Hendry	30	Taylor	4
Polk	142	Martin	29	Washington	4
Lee	111	Highlands	27	Gadsden	3
Hillsborough	104	Citrus	26	Gulf	3
Orange	100	Columbia	22	Jefferson	3
Pinellas	92	Saint Johns	20	Liberty	3
Brevard	88	Clay	19	Suwannee	3
Duval	65	DeSoto	13	Union	3
Miami-Dade	64	Leon	13	Bradford	2
Saint Lucie	57	Glades	11	Gilchrist	2
Seminole	56	Marion	11	Monroe	2
Sarasota	55	Hardee	10	Wakulla	2
Volusia	54	Hernando	9	Calhoun	1
Okeechobee	53	Flagler	8	Dixie	1
Manatee	48	Nassau	8	Holmes	1
Pasco	47	Santa Rosa	8	Baker	0
Collier	42	Escambia	7	Franklin	0
Lake	41	Levy	7	Hamilton	0
Indian River	40	Okaloosa	7	Lafayette	0
Osceola	37	Bay	6	Madison	0
Alachua	36	Sumter	5		
Charlotte	35	Walton	5		

Table 2. Distribution by County of Florida Pesticide Applicators Licensed in the Right-of-Way Pest Control Category.

County	Number of Applicators per County	County	Number of Applicators per County	County	Number of Applicators per County	County	Number of Applicators per County
Palm Beach	117	Manatee	30	Hardee	14	Jackson	4
Pinellas	106	Osceola	30	Flagler	13	Liberty	4
Polk	102	Lake	28	Martin	13	Madison	4
Lee	95	Columbia	27	Walton	13	Taylor	4
Miami-Dade	95	Putnam	24	Sumter	12	Union	4
Broward	87	Santa Rosa	22	Suwannee	12	Gilchrist	3
Brevard	79	Citrus	21	Escambia	10	Jefferson	3
Hillsborough	65	Hendry	21	Levy	10	Lafayette	3
Duval	61	Marion	20	Okeechobee	9	Baker	2
Volusia	55	Saint Johns	18	Bay	8	Dixie	2
Pasco	54	Saint Lucie	18	Monroe	8	Wakulla	2
Orange	51	Highlands	17	Hernando	7	Calhoun	1
Sarasota	47	DeSoto	16	Bradford	6	Gadsden	1
Alachua	36	Nassau	16	Washington	6	Gulf	1
Charlotte	35	Indian River	15	Leon	5	Franklin	0
Clay	34	Okaloosa	15	Glades	4	Hamilton	0
Seminole	31	Collier	14	Holmes	4		

the presentations at the FAPMS Annual Training Conference and at the annual University of Florida — Institute of Food and Agricultural Sciences (UF/IFAS) Aquatic Weed Control Short Course are structured either to prepare applicators for their Restricted Use Pesticide Applicator License certification exams, or to provide Continuing Education Units (CEUs) that enable an applicator to renew the license.

When entities such as the FAPMS, the UF/IFAS, herbicide basic manufacturers, and herbicide distributors are selecting sites to offer training programs, one factor considered is where the target audience is concentrated. For this reason, I was interested in where the Aquatic Pest Control, Right-of-Way Pest Control, and Natural Areas Weed Management Category License holders were located.

The Pesticide Certification Section, Florida Department of Agriculture and Consumer Services kindly provided data on the location of Florida Restricted Use Pesticide Applicator License holders in the three Categories of interest. One of

Table 3. Distribution by County of Florida Pesticide Applicators Licensed in the Natural Areas Weed Management Category.

County	Number of Applicators per County	County	Number of Applicators per County	County	Number of Applicators per County	County	Number of Applicators per County
Palm Beach	105	Okeechobee	19	Escambia	2	Gadsden	0
Lee	82	Lake	18	Jackson	2	Gulf	0
Polk	72	Martin	18	Leon	2	Holmes	0
Broward	64	Pasco	15	Liberty	2	Jefferson	0
Miami-Dade	48	Duval	13	Marion	2	Lafayette	0
Brevard	47	Indian River	13	Nassau	2	Walton	0
Collier	35	Osceola	13	Okaloosa	2	Washington	0
Hillsborough	31	Saint Johns	11	Sumter	2		
Alachua	25	Seminole	11	Taylor	2		
Pinellas	24	Clay	10	Wakulla	2		
Sarasota	23	Highlands	9	Dixie	1		
Saint Lucie	22	Levy	9	Gilchrist	1		
Manatee	21	Putnam	9	Hamilton	1		
Bradford	20	DeSoto	6	Madison	1		
Columbia	20	Hernando	5	Suwannee	1		
Hendry	20	Santa Rosa	5	Union	1		
Monroe	20	Citrus	4	Baker	0		
Orange	20	Flagler	3	Bay	0		
Volusia	20	Glades	3	Calhoun	0		
Charlotte	19	Hardee	3	Franklin	0		

Table 4. Top ten counties by number of licensed applicators. Highlighted counties are distinct. All other counties occur in all three categories.

AQUATIC PEST CONTROL	
Broward	238
Palm Beach	199
Polk	142
Lee	111
Hillsborough	104
Orange	100
Pinellas	92
Brevard	88
Duval	65
Miami-Dade	64
RIGHT-OF-WAY	
Palm Beach	117
Pinellas	106
Polk	102
Lee	95
Miami-Dade	95
Broward	87
Brevard	79
Hillsborough	65
Duval	61
Volusia	55
NATURAL AREAS	
Palm Beach	105
Lee	82
Polk	72
Broward	64
Miami-Dade	48
Brevard	47
Collier	35
Hillsborough	31
Alachua	25
Pinellas	24

the *Aquatics* Editorial Committee members suggested we might provide this information to the *Aquatics* readership. This information is summarized below. (The data cutoff date is 27 September 2011.)

Table 1 depicts the distribution by county of Florida pesticide applicators licensed in the Aquatic Pest Control Category. Some applicators licensed in this category were located in other states: Alabama–5; Arkansas–1; California–3; Georgia–5; Idaho–1; Illinois–1; Indiana–1; Louisiana–3; Michigan–1; Mississippi–2; North Carolina–2; South Carolina–1; Tennessee–1.

Table 2 depicts the distribution by county of Florida pesticide applicators licensed in the Right-of-Way Pest Control Category. Some applicators licensed in this category were located in other states: Alabama–20; Arkansas–33; California–4; Georgia–15; Iowa–1; Idaho–1; Louisiana–7; Maryland–1; Mississippi–33; North Carolina–5; New York–1; Ohio–8; Pennsylvania–2; South Carolina–10; Tennessee–11; Virginia–1; Washington–1.

Table 3 depicts the distribution by county of Florida pesticide applicators licensed in the Natural Areas Weed Management Category. Some applicators licensed in this category were located in other states: Alabama–2; Arkansas–1; Georgia–5; Mississippi–2; South Carolina–1.

Table 4 depicts the ten counties in each category (Aquatic, Right-of-Way, and Natural Areas) with the most licensed applicators. With the exception of the highlighted counties (Orange, Volusia, Collier and Alachua), the ten counties are the same in each category. Overall, the most RUP licensed applicators occur in Palm Beach County (421), Broward County (389), Polk County (316) and Lee County (288).

Vernon V. Vandiver, Jr., Vandiver Consultants Corporation, 9715 NW 63rd Lane, Gainesville FL 32653-6808.

This data was provided by Derrick Pereira, Pesticide Certification Section, Florida Department of Agriculture and Consumer Services, Tallahassee, FL; (850) 617-7877.

Pond Aeration:

Selecting the Right Aerator

By Cullen Danner

Why Aeration

There are many ways pond owners can beautify their waterfronts. Adding an aeration device is one way. All types of aeration have one thing in common—moving water. Though the mechanisms behind how the water is moved are unique (lifted, propelled, pushed, or pulled) the common goal is always the same—to improve the water in the ponds we love. Some aerators will benefit the ecology of the pond, while others are added purely for curb appeal, so it's important to be clear on what you expect to achieve when choosing an aeration system.

First, we must understand that although the three primary types of aeration are all considered "aerators"—bottom-based destratification, surface agitation, and floating fountains—they are, in fact, quite distinct in their applications. More often than not, one pond owner's idea of "aeration" doesn't match up with his neighbor's.

"WHEN DECIDING TO IMPLEMENT A POND MANAGEMENT PROGRAM THAT INCLUDES AERATION, IT IS IMPORTANT TO CLEARLY DEFINE THE GOALS FOR AERATION."

When deciding to implement a pond management program that includes aeration, it is important to clearly define the goals for aeration. Reduce nutrients? Support more fish?

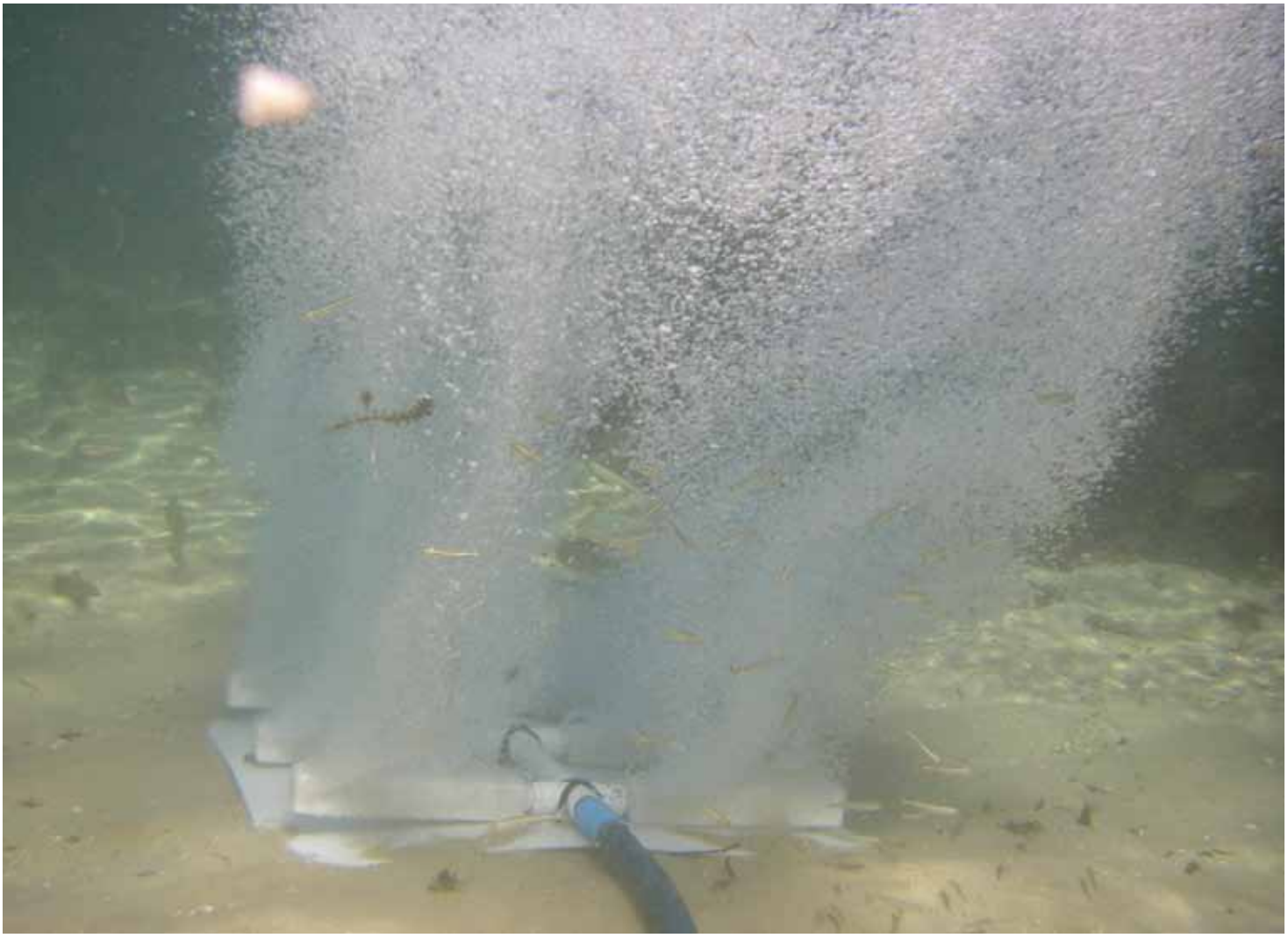

Figure 1. Bottom-based destratification using a bubble diffuser.

Increase property value? Emergency oxygenation? Fewer algae blooms? The list is long when considering the varied benefits that aeration can offer. While some advantages overlap, not all aerators are created equally.

Choose the right aerator for your pond based on your conditions and goals.

Surface Aeration

Surface aerators work by churning large volumes of water into the air via motorized paddlewheels or propellers (see Figure 2). As the water is thrown into atmospheric air, it readily takes in oxygen and creates a highly oxygenated area in the pond.

Surface aerators can be used when:

- The pond is less than six feet deep.
- The volume of water is small compared to a high fish stocking density, such as in a commercial fish-farming pond.
- Fish are gasping for air at the surface and dissolved oxygen must quickly be raised.

Figure 2. Surface aeration.

- Portability is important—propeller-style aerators are easily relocated and operated using a gas powered generator.

These are not an effective option when:

- Destratification and nutrient reduction are desired.
- Aesthetics are important.

Bottom-Based Destratification

In a stratified pond the cooler, denser water on the bottom does not mix with warmer, oxygenated waters above, resulting in a thermocline. A short time after stratification occurs, the cooler water below the thermocline becomes devoid of oxygen, or anoxic. This loss of oxygen starts a series of events beginning with the buildup of carbon dioxide that renders the water more acidic. Anoxia also changes decomposers from aerobic to anaerobic. The resulting byproducts are black muck and hydrogen sulfide, which is toxic to fish and smells like rotten eggs. Anaerobic conditions on the bottom also cause the release of phosphorus from the sediments, feeding more algae blooms.

Stratified ponds are also subject to natural turnover, or a rapid mixing of thermal layers. Drastic temperature changes, heavy rains, and even strong winds can too quickly mix a pond's bottom water with its upper waters, depleting oxygen levels enough to cause fish kills.

Destratification systems (see Figure 1) produce unconfined bubble plumes that create synergistic lift to raise bottom water to the surface and release hydrogen sulfide and other toxic gases. At the surface, the water takes in atmospheric oxygen and is slowly mixed throughout the entire pond while also, and most importantly, oxygenating the sediment-water interface. This constant circulation prevents thermal stratification layers from forming, thereby preventing fish kills due to natural and seasonal turnover. The effectiveness of a bottom-based system can be determined by measuring dissolved oxygen levels at the very bottom of the pond. If at least 5 parts per million (ppm) are present, the system is properly sized and sufficiently circulating the entire pond.

Destratification systems can be used when:

- The pond is greater than six feet deep.
- Fish kills due to natural pond turnover must be prevented.
- Nutrient binding is desired to reduce excessive phosphorus concentrations—this is achieved by oxygenating the sediment-water interface.

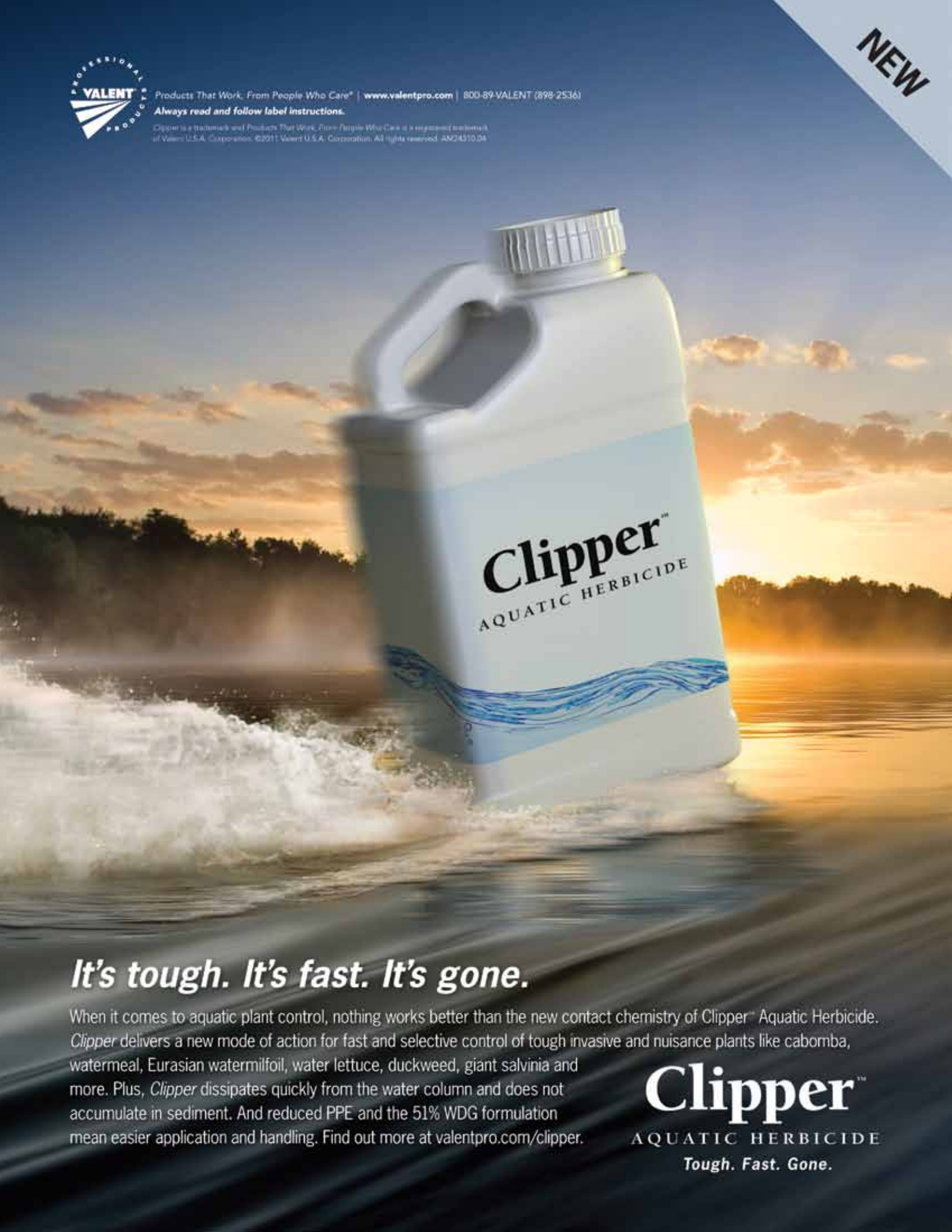
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Figure 3. Three-tier fountain aeration.

These are not an effective option when:

- Emergency aeration is required—destratification systems cannot raise the oxygen level of such a large volume quickly enough to avoid an *imminent* fishkill. It can actually aggravate the problem by circulating poor quality water in an already dire situation.

Fountains

Fountains use submersible or onshore water pumps to push large volumes of water through discharge nozzles to create attractive patterns (see Figure 3).

Fountains can be used when:

- The aim is to add visual appeal to an existing pond and/or increase property value.
- Some circulation is desired. Onshore fountains will circulate more of a pond's water volume than a traditional floating fountain (with submersible float-mounted pump) because they are pulling water from the bottom and discharging it through a pattern nozzle. They also offer more convenient maintenance with no electricity in the water.

These are not an effective option when:

- Oxygenation is needed to improve the overall health of the pond.

Note: Although not specifically designed to do so, onshore fountains are capable of circulating enough water to achieve destratification.

Standard Aeration Efficiency

Another important aspect to consider when comparing one aerator with another is the standard aeration efficiency (SAE).

The SAE can be calculated by measuring the aerator's oxygen transfer and the amount of energy used per horsepower, per hour, under standard conditions. For example, an SAE of 2.1 means that 2.1 pounds of oxygen per horsepower, per hour, are transferred to the water under standard conditions. The higher the SAE, the higher the oxygen transfer, and the higher the efficiency.

Keep in mind that SAE numbers are a fair comparison *only* when comparing aeration equipment of the same exact type. You cannot use the SAE as your only tool in the selection of an aeration system. Before looking at the SAE numbers, choose the right type aerator for the job.

Don't Cut Corners

Aeration is always good to consider, but make sure your goals are in line with the capabilities of the aerator. Prioritizing those goals is also part of that process. Once you decide on the aerator that's right for you, ensure that it is the proper size for your specific application. Never undersize aeration as this could be more detrimental to the pond than not adding any aeration at all. Surface aerators or fountains that are too small and don't support the fish load will only send you back to the drawing board. Undersized bottom-based aeration can simply stir up poor quality water and send nutrients and toxic gases throughout the water column, further degrading water quality. To quote a late, great modern author, "Anything worth doing, is worth doing right!" and that includes aerating your pond.

Cullen Danner is a Lakes Technician with Aquatic Eco-Systems, Inc. He can be reached at (407) 472-0520 ext. 155 or cullend@aquaticeco.com. Photos courtesy of Aquatic Eco-systems, Inc.

Aerator Type	SAE (lb. O_2/HP/hr)
Surface Agitation	4.1
Bottom-Based Destratification	2.7
Floating Fountain	no SAE

Pontederia cordata: Pickerelweed Perfect for the Job!

By Juan Rodriguez & Dave Nunlist

Background: My friends call me Pickerelweed. I call the Southeast United States home but can be found as far north as Virginia. I'm a perennial with creeping rhizomes that form extensive colonies in the right conditions. My rich green waxy leaves grow in two forms: narrow leaf (lanceolate) or a broad leaf (ovate). I'm most noted for my flower spike. I have two color forms: blue/purple and the very rarely seen white. Both forms have a dash of yellow inside the individual flowers.

Habitat: I love my feet wet; in fact, very wet at times. Most often you'll observe me living it up in 1 to 2 feet of water and hugging the water's edge; the more mucky and organic, the better. To spot me, drive to your nearest marsh, stream, ditch, lake, pond or constructed retention pond. As long as it's fresh water, it's possible I'm there.

Restoration Involvement: In recent years I've become a favorite of homeowners and state and county officials in habitat and lakefront restorations. In fact, I've become a base plant and am thought of first for use. I'm tame when compared to some plants and only grow to about 3 feet in height. I adapt to most any conditions and grow pretty fast. When spring arrives here in Florida around March and April, I put on a colorful show of flower spikes. In a large colony it's breathtaking. My attraction doesn't stop there because I also attract butterflies (swallowtails adore me) and various native bees find my nectar irresistible.

Why Hire Me? Simply put, why not? I'll work hard for you by multiplying but stay tame and not grow out of control. I'm low growing so lakefront homeowners can see over me to the water while they watch pollinating insects and butterflies flitter and buzz around me. While my flowers are beautiful, I'm not all show. My roots take up nutrients which helps to enhance water quality. All in all if you need a native aquatic plant for beauty or restoration, please try me. I'm perfect for the job!

Editor's note: To learn more about pickerelweed, see Characteristics of Pickerelweed by Dr. Lyn Gettys, et al, Aquatics, Vol. 24(4) Winter 2002; http://www.fapms.org/aquatics/issues/2002winter.pdf and Pickerelweed by Frank Melton and David Sutton, Aquatics Vol. 13(2), June 1991; http://www.fapms.org/aquatics/issues/1991summer.pdf

Juan Rodriguez and Dave Nunlist work for Biosphere Consulting and can be reached at 407-656-8277. Photos by Juan Rodriguez.

Narrow leaf pickerelweed - purple flower.

Narrow leaf pickerelweed - white flower.

APPLICATOR ACCOLADES

Meet C. Elroy Timmer

Many of you know or have at least heard of Elroy Timmer. Elroy's adventure into aquatic weed control began in 1959 when the U.S. Department of Agriculture (USDA) hired him as a technician to evaluate herbicide plots throughout the southeastern U.S. For 14 years he did a lot of driving and worked hundreds of hours, all day, every day, from sun-up till sundown, evaluating these plots for the USDA. Elroy helped to determine efficacy for products we are all familiar with and use today such as endothall, diquat, and glyphosate.

After completing his time with the USDA, Elroy decided it was time to start a business. He was founder and vice president of AmerAquatic for 21 years, and was responsible for research and all operations of the weed control business that employed 55 to 60 workers. The business stretched across Florida in Ft. Lauderdale, Ft. Myers, Sarasota, Daytona, and even north into South Carolina around Myrtle Beach. Eventually he sold the company to Aquagenix and worked for them for about a year.

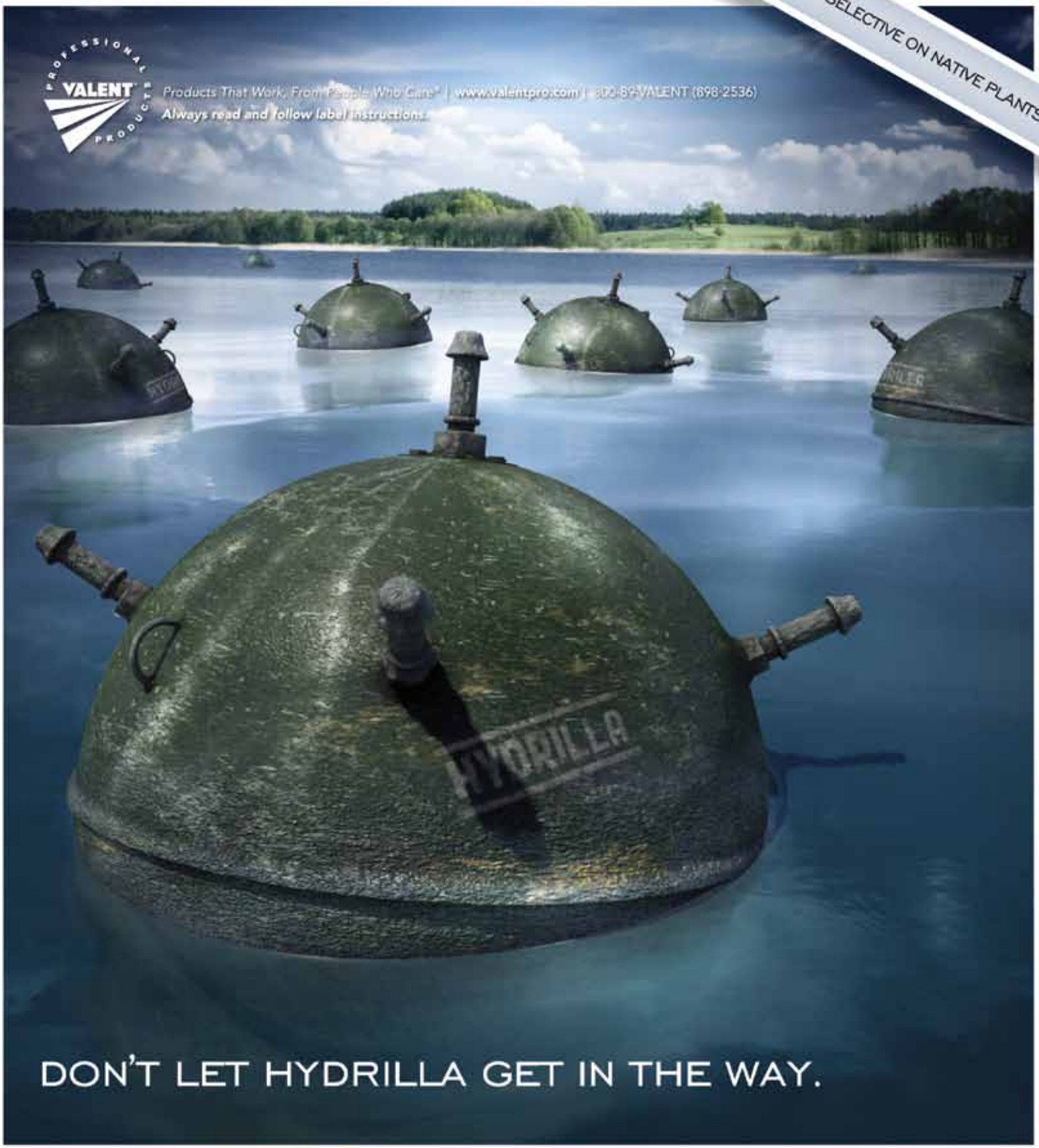
Elroy worked briefly for UAP/Timberland as a sales representative, then moved on to work at Aquatic Vegetation Control (AVC) with Jim Burney in Riviera Beach, Florida. He has worked as a biologist for AVC for about 9 years and enjoys conducting research and working with high school students such as Casey Reardon on projects that relate to weed management (see the Winter 2011 issue of *Aquatics* for Casey's project).

When asked how the industry has changed since 1959, Elroy mentioned that there are more people and lots of new faces. He also said it has gotten much more competitive with many more applicators now than in the past. Overall his favorite aspects of the industry are the challenges of managing aquatic plants. Elroy said, "The most challenging thing is figuring out how to kill the plant you don't want and not hurt the one you want to keep."

"The aquatics industry has been a great place to work. This industry has some of the best people around. We share research and are willing to talk about things that are developed to benefit the industry. People are friends. Even the companies that compete against each other are friends. Our ability to have such great relationships and friendships and share information is what makes this one of the greatest industries there is." *–Tina Bond, Editor*

To recommend someone for *Applicator Accolades,* contact Tina Bond (AquaticsEditor@gmail.com)

Elroy conducting herbicide test treatments. Photo by Vernon Vandiver.



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Nature's Role in Water Quality

Algae forest

By Patrick Simmsgeiger

When bottled water companies want us to think their product is pure they show images of spring-fed lakes high in the mountains. These lakes are assumed to be free of organic contaminants, bacteria, and chemical toxins. Therefore, our impression of pure water includes white snow melting on a rocky peak far from the perils of contamination. However, water is a chemical molecule that includes only hydrogen and oxygen. You won't find pure water anywhere on earth except in a laboratory.

Mountain lakes have weeds and contaminants just like those in cities. They experience the same life cycle as their cousins down below. Once a flood, earthquake, or volcano forms a lake, nature begins a long process to eliminate it. All lakes will eventually become land again, unless we do something to prevent it.

Water is a solvent that dilutes minerals and chemicals and carries suspended solids. When we judge a lake's cleanliness, we are really comparing different chemicals, minerals, and suspended matter in the water. Some can be harmful, whereas others can be helpful. To make accurate judgments, we really need to know more about each.

Filters, while removing suspended contaminants, can't make water pure. They have no impact on dissolved materials in the water. Water conditioners, which aren't practical for lakes, utilize a chemical reaction to replace some dissolved minerals in water with others. This exchange makes the water seem "softer." It also increases the content of other minerals, including sodium in the softer water.

Bottom line — no simple way exists to say with certainty that one lake is cleaner than another. Instead, we use subjective opinions based on appearance, odor and taste. We can take water from a lake to a laboratory and find out exactly what's in it. But few people would actually do that.

Solutions Exist

We don't need a laboratory test to detect obvious problems such as weeds, odors, and murkiness in lakes. There are treatments for each problem and a combination of these is most beneficial in the long term.

These problems are not entirely preventable. Weather conditions can tip the scales in favor of algae in shallow lakes. It's difficult to prevent runoff from surrounding landscapes from reaching lakes. It's impossible to keep birds and fish and their excrement out of lakes. Consequently, even the best property manager can run into lake problems under certain circumstances.

Dredging, filtration, circulation, and treatment can all work together to provide the greatest protection against outbreaks of weeds. However, not all of them are practical for lake owners. Doing nothing, on the other hand, is a prescription for serious lake quality problems at some point. You can try to beat the odds or you can carry out a lake maintenance program that is practical and affordable for you. Prevention is preferable to curing an established problem. Once aquatic weeds gain a foothold, they are harder to control for a number of reasons.

One way to look at a lake is by its nutrient content. Algae competes with other plants and bacteria for nutrients in the water. These nutrients come from waste from birds and fish, dead plants, and fertilizers applied to surrounding landscapes that drain into the lake. While controlling runoff and animal waste is nearly impossible, we can reduce the amount of dead plant material by various control methods. We can also increase competition by adding manageable plants and beneficial bacteria.

Chemical methods of weed control are more practical than mechanical methods. Dredging, weed removal, filtration and circulation involve equipment and power. Chemical treatments can be handled by a professional in a relatively short amount of time on a regular basis. Algae control products used properly are not harmful to beneficial bacteria, wildlife or fish.

Chemicals used in aquatic weed control have to be approved by the U.S. Environmental Protection Agency and your state environmental agency. Most must be applied by a certified pesticide applicator who has been trained in weed identification, proper use of pesticides, and ability to determine the appropriate dose for the particular lake.

Primary Problems

Lake health and appearance are most severely impacted by foam, murkiness

(suspended solids) and algae. Foam can be caused by detergent residue entering the lake. Detergents are minerals that clean by latching onto particles of dirt. The combined detergent/dirt particles move with the water until they find a collecting point—your lake. The visible foam is detergent particles that have mixed with air and water to form bubbles. These bubbles have significant surface tension and remain intact. The way to eliminate them is to lower the surface tension of the bubbles so they will break down.

Murkiness is caused by a large amount of solids suspended in the lake water. Why these particles remain suspended, rather than fall to the bottom, is the result of an electrical attraction between water molecules and the tiny particles. By eliminating the charge with a chemical, the particle will no longer be held in suspension by the water and will fall to the bottom quickly. Circulation and filtration also can lower the amount of suspended solids in water.

Algae are selectively sensitive to mild concentrations of copper in water. The effectiveness of algaecides depends upon the ability of the copper to reach and stay in the vicinity of the algae. Chelated copper algaecides are notably more effective.

Once the copper has killed the algae, there has to be adequate oxygen in the water to permit rapid decomposition of the algae. Bacteria carry out decomposition. When oxygen is lacking in the water, the bacteria's ability to break the algae down is restricted. Anaerobic bacteria can continue to break the algae down, but in the process they release an unpleasant-smelling sulfur gas.

"ONCE THE BALANCE BETWEEN NUTRIENTS AND DECOMPOSITION IS DISRUPTED, CHEMICALS ARE A USEFUL WAY TO RESTORE BALANCE SO YOU CAN MAKE YOUR LAKE AS PURE AS IT CAN BE."

Aeration and circulation can improve the oxygen content of the lake water. Beneficial bacteria are commercially available to provide reinforcements for your lake's bacteria. However, they also require oxygen to do their job.

Finally, algae need light to carry out photosynthesis, which enables them to grow and reproduce. Dyes can be mixed with the lake water to shade out sunlight and rob the algae of their ability to perform photosynthesis. These dyes are blue and are chemically inert and safe to wildlife.

Dead algae, once broken down by bacteria, become nutrients for other algae if protection does not continue. Once you experience an algae problem, follow-up treatment is necessary until the nutrient load caused by the dead algae is brought down to normal. Cool, well-oxygenated water is necessary to prevent algae blooms from raising the nutrient load in your lake. Steps to reduce nutrients from runoff and animal waste will also contribute to a healthier lake.

Once the balance between nutrients and decomposition is disrupted, chemicals are a useful way to restore balance so you can make your lake as pure as it can be.

Patrick Simmsgeiger is President of Diversified Waterscapes and a Certified Lake Manager. Patrick can be reached at patrick@dwiwater.com

Aquatic Plant Managers of the Year - Where have they gone?

BY Jerry Renney, FAPMS President

Did anyone else realize that something was missing during the 2011 Annual Meeting of the Florida Aquatic Plant Management Society (FAPMS)?

I know a few people did because they asked me after the banquet, "What happened to the Aquatic Plant Manager of the Year" award? It was only then that I realized that the award was not presented this past year.

"Aquatic Plant Manager of the Year" is still often referred to as the "Applicator of the Year" because that has always been the underlying focus of the Society, the herbicide applicator. Historians of the Society tell us that FAPMS was formed specifically for the applicator. Where other groups concentrate on the science behind the process, the FAPMS has always been most proud of its members in the field.

The term "Aquatic Plant Manager of the Year" still fits today because many past nominees and winners have spent a considerable amount of time performing field tasks other than applying herbicides. Harvesting, hand pulling, fish barrier construction and repair, fish stocking, mixing, loading and everything else under the sun right on down to ditch digging have been some of the tasks of these aquatic plant managers..

The state of Florida has not succumbed to flooding or other natural disasters due to a lack of aquatic plant management. So where are the aquatic plant managers who are performing these duties?

We did not have a 2011 Aquatic Plant Manager of the Year because there were no nominations. Not one.

Prestige, pride and near perfection. These are some of the words that come to mind when I think of some of the past winners of this award.

The first FAPMS annual meeting that I attended was in 1994. I presented an Applicator Paper and won the Applicator Paper of the Year Award. I was proud and very excited partly, I'll admit, because this was the first year a monetary award was offered. My brief glory as winning paper was quickly overshadowed by the next award presented. "Aquatic Plant Manager of the Year" was awarded to Lonnie Taylor of the Southwest Florida Water Management District (SWFWMD) and the crowd went wild. Now that was a big deal! I was not long out of school and still knew how to write a book report and to a degree knew how to present it and, to be honest, that is about all I had done. Mr. Taylor earned the respect of every single person in the room. He built a life in the aquatics industry, carved out his own niche with weathered hands, and I thought that was really admirable.

FAPMS 2006 Applicators of the Year, Highlands County. Photo by Don Doggett.

Lonnie was not the first, nor was he the first from SWFWMD, to win the award. Louis German and Phillip Jones became the very first team to win Aquatic Plant Manager of the Year and both worked for the SWFWMD in 1980.

In 1988, the SWFWMD gave us another winner in Grady Vance. I had the opportunity to work for Grady a few times and although he may not remember me, I remember him as really fitting the bill for this award. Grady was an applicator's applicator. Grady retired a short time ago and may hold the record as the longest serving applicator at SWFWMD—42 years.

Other entities have provided us with multiple award winners in this category as well. In 1989 and 1992, two South Florida Water Management District employees (SFWMD) won the award: Frank "Donnie" Chandler (1989, now retired) and Willie Cope (1992).

The U.S. Army Corps of Engineers has always proven to be a cornerstone of our industry and that is evident by their multiple award recipients. Johnny Mason won in 1982 and again in 1999 along with David Register. John Mason is now retired with over 30 years of service. Calvin W. Long, who is still with the Corps after more than 27 years, was awarded the honor in 2007.

It is difficult to think of the Highlands County program without talking about

CONTINUED NEXT PAGE.

Carl Smith. Carl won in 1998 and again with the entire crew consisting of Chris Mayhew, Wesley Williams and Danny Copeland in 2006. Carl is also now retired but if those Lake Istokpoga water hyacinths get out of line he would most likely return to show us how controlling hyacinths is done.

The Lee County Hyacinth Control District championed Fred Schudel (1991) and Peter Verhulst (1993). The St. Johns River Water Management District nominated the winning team in 2004: Shawn Moore and Richard Krantz. Charles "Chuck" Stevens won in 1986 and again in 2000 while working with St. Johns County. The group from my home county of Polk consisting of Bryan Finder, Craig Johnson, Donny Mills, Jason Woodard, Kevin Smith, Lee Singleton and Phillip Stephens epitomized teamwork as 2010 winners. Citrus County fondly remembers its 1990 award recipient Terry "Turkeyfoot" Warson. Mark Edwards with Citrus County recalls that winning the award was one of Terry's proudest moments.

John Pierce and George Robinson won in 1983 while working for Orange County, and again in 1995 with their own company, Central Florida Aquatic Consultants.

In 1981, the second time it was offered, the award went to James E. Ducotoe and the unforgettable James "Jimbeau" Wilmoth, or "Wildman Wilmoth", who were nominated by Dr. Ken Langeland. Now pushing well past 30 years since winning the award, Jimbeau is still at it. I spoke to him at 6:00 pm a few days ago and he had to shut off the boat to talk and was anxious to get back to killing weeds. He did mention that his son, who is working his way through college, wants to follow in dad's footsteps. Be on the lookout for another "Wild Wilmoth" to come.

The 1996 winner, Scott Glasscock, is still very active, employed by Disney, and ironically is currently serving as the Society's Awards Committee Chair and a Board member.

There are other recipients but I would be remiss if I did not take the opportunity to mention two of my co-workers at Applied Aquatic Management. Wade Pharis (1987) and Keith Mangus (2008) were each recipients and are still my friends after many long years. To keep their heads from swelling beyond this story I will not list their many accolades nor let them know how I truly feel about them or how deserving they were of this award.

Aside from the few I did not mention by name, there were other vacancies in the records as I researched the winners. I could not find winners for 1984, 2001, 2002, 2005 or 2009. If any readers are aware of these honorable recipients, please contact the Society. The FAPMS web site has a growing list of award winners and we would like to complete the history if it is available. It may be that, like 2011, there were no nominees. I hope that is not the case. I also hope that in the process of remembering some of these past winners we can look forward to awarding the Aquatic Plant Manager of the Year 2012.

If you would like to nominate someone for the Aquatic Plant Manager of the Year Award, please contact Scott Glasscock at scott.glasscock@disney.com or 407-824-1528.

Aquatic Invasive Species: Spreading Prevention Activities

Glacier National Park.

By Thomas J. McNabb

During an early summer trip in 2011 from Coeur d'Alene, Idaho to northern Wisconsin with my colleague, Thomas Moorhouse, it became apparent that the issues and concerns associated with the spread of aquatic invasive species (AIS) in freshwater lake systems varies from state to state. What Tom and I call our "annual pilgrimage" takes us through many states including Idaho, Minnesota, Wisconsin and Michigan. This time we investigated how these states handle the detection and prevention of aquatic invasive species. For the past three years we have been able to move freely with our research vessel and trailer through western and southern states around Wisconsin without any interference from state agencies.

The story changes in Wisconsin, where the state Department of Natural Resources, working in conjunction with various lake associations, lake districts, and concerned citizens, have elevated their AIS prevention efforts through educational and outreach activities. The Wisconsin DNR even has vessel decontamination procedures in place to slow the spread of fish-borne diseases. Every lake or boat ramp we approached had signage regarding the spread of AIS, ranging from quagga and zebra mussels to Eurasian watermilfoil (EWM) and rusty crayfish.

Our first stop in Wisconsin was the Phelps Lake District to perform some aquatic herbicide applications for the control of EWM in Long Lake. Efforts were already underway to rid the lake of EWM. The lake was well-posted with signage related to AIS. During the summer months the District has a group present at the boat launch to inspect boats and educate the

boating public about the issues associated with AIS.

According to local fisherman in Lake Metonga, the rusty crayfish are a big problem and are presumed to have eaten all the native aquatic vegetation. Zebra mussels have also been a problem in this lake, so the lake association and cooperators established a station at the public boat launch to educate boaters and the public. In their effort to help stop the spread of AIS from Metonga to other waterbodies, the station also helps ensure that boats leaving Lake Metonga are clean.

On the Eagle River Chain, also in Wisconsin, we encountered a dam with a boat lift that allows boaters to move upstream. This boat lift moves approximately 1,100 boats up and down the system each year, and has great potential to transport AIS throughout the chain as well. As we pulled up to the boat lift, we were pleasantly surprised to see AIS signage and information. The first person to greet us at this semi-remote location was Jacob Anderson, an intern working for the Three Lakes Association. Jacob's job was to inspect boats for AIS, in an effort to prevent them from moving upstream.

In Glacier National Park in Montana, we were denied entry until we could obtain a "vessel inspection clearance letter" from the National Park Service (NPS). We gladly headed to the inspection station—we were interested to see how the station was staffed, to hear what questions they would ask, and to see if they could find AIS on our vessel. The process was thorough and the staff kept apologizing for the delay, which we appreciated. We spoke with them regarding the NPS rule requiring inspection letters prior to entry into any national park, and expressed our dissatisfaction that boats are allowed to leave Lake Mead infested with zebra mussels. We suggested that park staff make efforts to have this policy changed system-wide.

Reaching the Idaho border on June 15th, we stopped to take a picture of the "Welcome to Idaho" sign. There was still snow on the hills and the temperature was 52°. As we came over the pass, a flashing sign above the highway announced "Boat Inspection Ahead." Again, we were delighted at the opportunity to pull into a boat inspection station. We were even more pleased to see that we were unable to enter the State of Idaho without having our boat inspected. This was a first after crossing back and forth through six northern states (Idaho, Montana, North Dakota, Minnesota, Michigan, and Wisconsin) during our two-week trek.

Based on our experiences in the various states we visited, the Wisconsin efforts are having a positive impact on preventing the spread of AIS. The National Park Service would not allow us into Glacier National Park without an inspection.

Glacier National Park boat inspection checkpoint.

The State of Idaho had the most stringent rule by requiring a boat inspection before being granted entry into the state. For this reason, I would rank Idaho at the top of the list for AIS prevention efforts.

I would like to take this opportunity to congratulate the State of Idaho and the Idaho legislators who enacted the AIS bills and provided funding mechanisms for the boat inspection stations. I must also commend the Idaho Department of Agriculture and its staff who oversee the inspection stations for their efforts in protecting state waters from AIS.

The research vessel we used for the trip was decontaminated and quarantined at the Clean Lakes Inc. facility in a clean, drained and dry condition. There it remained for the minimum 30-day holding period to ensure no potential AIS hitchhikers would have the opportunity to enter Idaho waters.

Thomas McNabb is the President of Clean Lakes, Inc. and can be reached at 208-665-1475 or www.cleanlake.com for additional information. Photos by the author.

Aquavine

New Novel by Stephanie McCarty

"Everglades," a novel by our own Stephanie "Petie" McCarty (FAPMS by-laws committee chair), was released by Desert Breeze Publishing and is available (online only) from Amazon.com and Barnes and Noble. Meet fiery photographer Kayli Heddon as she explores the Everglades in all its beauty with half-Seminole airboat driver extraordinaire, Skye Landers. Danger, trouble, and love ensues. Next time you see Stephanie, make sure to congratulate her and check out the book, too!

FAPMS 36th Annual Training Conference

October 8 – 11, 2012 –
St. Augustine, Florida

CALL FOR EXHIBITORS

FAPMS is now accepting exhibitor applications for the 36th Annual FAPMS Conference being held October 8 – 11 in St. Augustine. There are a number of sponsorship levels (Grand, Diamond, Platinum, Gold and Silver) to choose from.

The meeting will provide an excellent forum for you to exhibit your goods and services, and to interact with key individuals and organizations involved in aquatic plant management in Florida. A Vendor Registration Form and additional conference information can be found on the FAPMS website: www.fapms.org.

Vendor support has always been critical to the success of this meeting and 2012 will be no exception. Your generous contributions will be most appreciated!

The final date to sign up for any sponsorship level (excluding Silver) is September 10. Please direct questions to FAPMS Vendor Committee Chair, Melissa Barron at 407-257-8043 or melissa.barron@syngenta.com

Sponsor presentation abstracts are also due by August 7. If you are not planning to

submit a talk/abstract, please submit your registration by September 10 in order to be included in the program.

CALL FOR PAPERS

Have you ever considered writing about your experiences as an aquatic plant manager, but aren't quite ready to write an entire book about it? Here's your opportunity! We are looking for papers on herbicide application and mechanical techniques (aquatic and right-of-way), mixtures, innovative control measures, re-vegetation projects, new invasive plant introductions, research projects, safety issues, etc. You don't have to be a professional speaker to present a paper! Remember, FAPMS was formed for the applicator and the annual training conference is a chance to share what you have learned with other members.

The society awards a plaque to each plant manager who presents a paper. There's also a cash award for the 1st, 2nd and 3rd place winners AND your paper will be featured in *Aquatics* magazine. That's great incentive! The rest is up to you.

DEADLINE FOR SUBMISSION
July 31, 2012

Please submit your abstract to FAPMS Program Chair, Mike Hulon at:

P.O. Box 4034
Lake Wales, Fl 33859
Fax: (863) 696-2922
E-mail: texasaquaticmh@aol.com

CALL FOR PHOTOS

The annual VIC RAMEY PHOTO CONTEST will also be held at the Annual Training Conference in St Augustine. The contest was created to inspire photographs to promote education, discussion and competition towards the Society's objective of aquatic plant management. There are two categories: Aquatic Scene (any natural aquatic scene); and Aquatic Operations (operation equipment, application method, or field applicator).

Requirements for entry:

- Photos must be taken by a FAPMS member during the contest year.
- Photos must be submitted as a 5" x 7" or 8" x 10" print, with or without mat or frame.
- Back of photo must contain photographer's name, contact number, photo category, location and description or title.
- Prizes are first, second, and third place ribbons for each category.
- Photos are judged on category relevance (40%), creativity or artistic impression (40%), composition and arrangement (10%), and focus and sharpness (10%). Judges are selected from attending conference members. Photo entries may be submitted at the registration desk.

Note: Winning photos may be used in *Aquatics* magazine at the editor's discretion if they are available as a .jpg file in sufficient resolution (1MB or higher). They may also be posted on the FAPMS website if a .jpg file is submitted. *Good luck, photographers!*

MOVERS AND SHAKERS

The University of Florida IFAS Aquatic Plant Research Lab at the Fort Lauderdale Research and Education Center welcomes **Dr. Warner Orozco Obando** to south Florida. Dr. Orozco has joined Dr. Lyn Gettys' program as a post-doctoral associate after completing his PhD at Auburn University in May 2012. He has extensive experience evaluating lotus (*Nelumbo* spp.) as an ornamental plant, food source and a potential phytoremediation agent to remove contaminants such as nutrients and heavy metals from sediments. Please join me in welcoming Dr. Orozco to the wonderful world of aquatic weeds!

Mr. Dean Jones is now a Senior Biologist for the University of Florida Center for Aquatic and Invasive Plants housed at the Lake Alfred Research and Education Center. Dean was the Senior Biologist for the University of Florida/IFAS Osceola County Extension from 2009 through 2012. Mr. Jones (kdjones@ufl.edu) did a great deal of research on hydrilla for the Hydrilla and Hygrophila Demonstration Project. Much of the research initiated in the project will continue for the next several years.

EAST LAKE TOHOPEKALIGA UPDATE

The Florida Fish and Wildlife Conservation Commission (FWC) conducted selective management of dense aquatic vegetation in the open water areas of East Lake Toho. Topped-out vegetation was managed on April 4 and 5 via airboat using Aquathol KTM herbicide.

An additional aerial application was postponed. Surveys by helicopter of the area to be treated showed that most of the plants were no longer topped-out and inhibiting navigation. FWC staff will continue to monitor this area and are prepared to reschedule the management if vegetation reaches the surface once again.

The treatments are being undertaken to enable navigation access and flood protection.

If you have questions about this treatment, please contact Ed Harris with the Invasive Plant Management Section, FWC at 407-858-6170.

CORRECTION NOTE

In the article "Biological control prospects for hygrophila" in *Aquatics* Vol 34 No 1, page 14, the caption 'Noctuid moth' should read '*Parapoynx bilinealis*'

Calendar of Events 2012

July 22-25
Aquatic Plant Management Society
52nd Annual Meeting
Salt Lake City, UT
www.apms.org/

July 26
South Florida APMS
General Meeting - Davie, FL
www.sfapms.org

September 17-19
MidSouth APMS
31st Annual Conference
Mobile, AL
www.msapms.org/

October 8-11
Florida APMS
36th Annual Conference
St. Augustine, FL
www.fapms.org/index.html

October 17-19
South Carolina APMS
34th Annual Meeting
Myrtle Beach, SC
www.scapms.org/

October 22-24
Texas APMS
Annual Meeting
Bandera, TX
www.tapms.org/

October 25
South Florida APMS
General Meeting
www.sfapms.org

November 7-9
North American Lakes Management Society
32nd International Symposium
Madison, WI
www.nalms.org/nalmsnew/

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.

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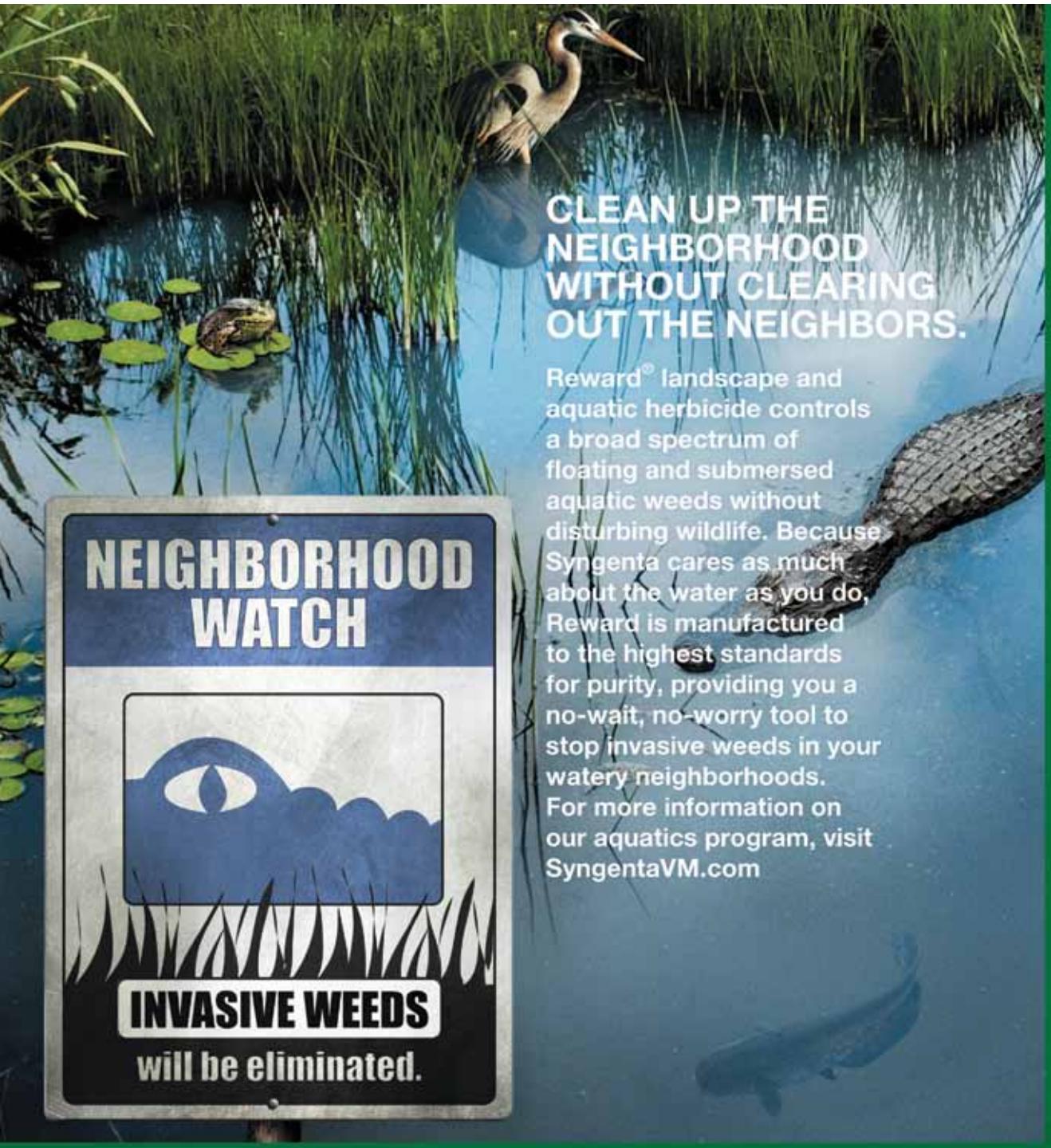

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