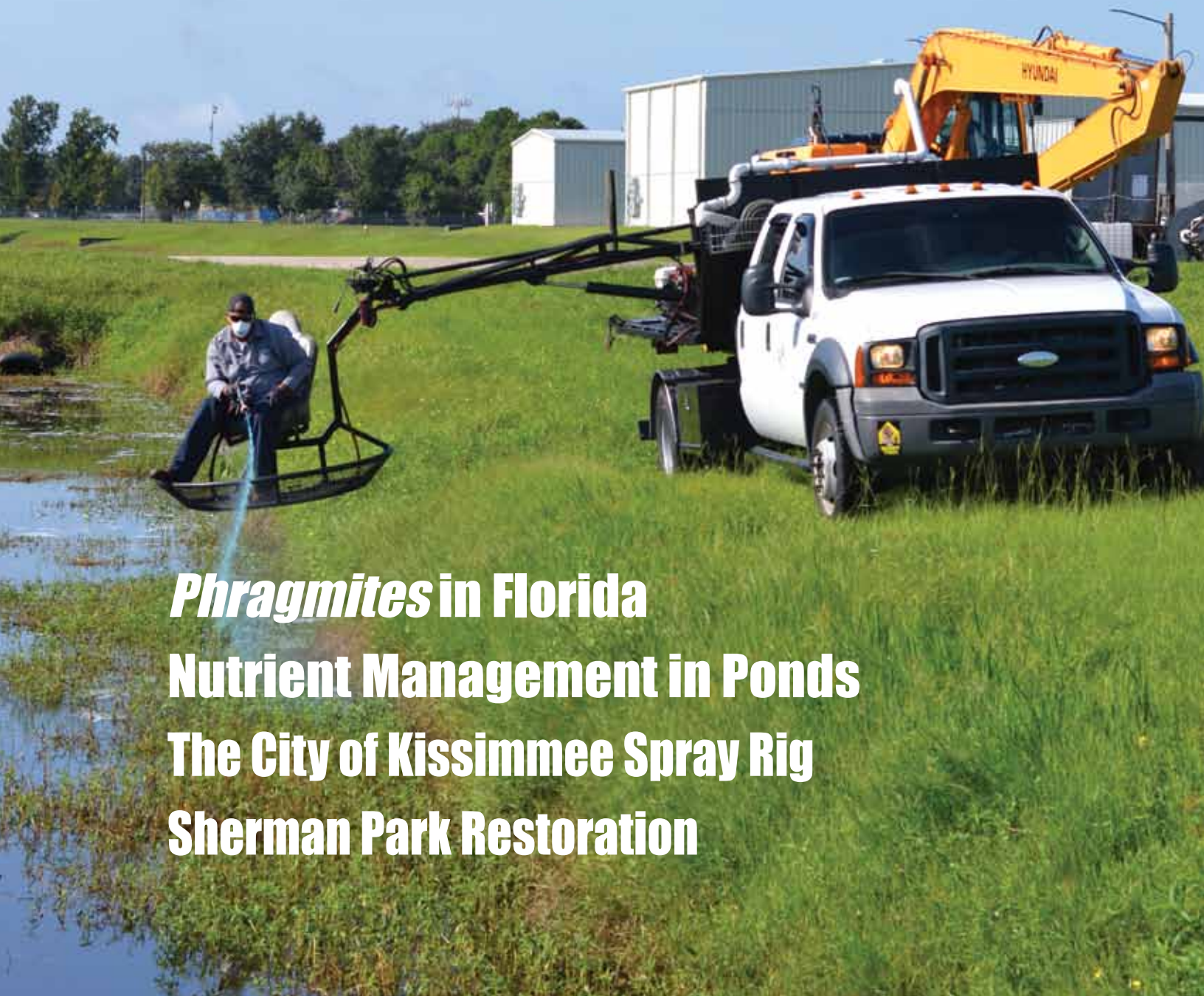
Aquatics

FALL 2011

A Publication of the Florida Aquatic Plant Management Society



Phragmites in Florida

Nutrient Management in Ponds

The City of Kissimmee Spray Rig

Sherman Park Restoration

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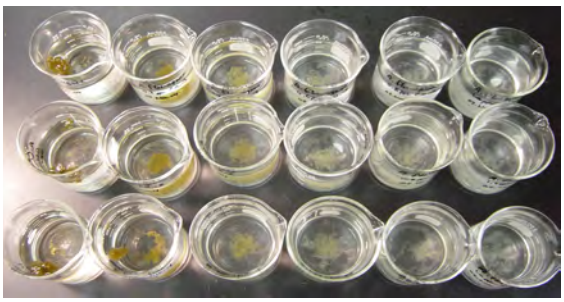

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Aquatics

FALL 2011 Volume 33, Number 2

Photo by Tina M. Bond, Kissimmee, FL. The City of Kissimee's custom built spray rig in action. This is Luis Garcia and Vincent Hickey demonstrating how the spray rig works.

Sherman Park restoration, see page 10

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To become a member of FAPMS and receive Aquatics magazine, please visit the website at: www.fapms.org

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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The City of Kissimmee Spray Rig

By Chuck Barboza

You may not know this, but the City of Kissimmee Public Works & Engineering Department operates an extremely successful Weld Shop which provides welding and hydraulic repair and parts fabrication on vehicles and equipment for all City Departments and other municipalities. Over the past 25 years the Weld Shop has designed and fabricated several pieces of specialized equipment to help improve operations, increase worker safety and save money. One ingenious system designed and fabricated was a custom boom unit for a spray truck in the City's Stormwater Division. This division maintains man-made structures designed to collect, convey, hold, divert, or discharge storm water. Structures include sewers, canals, ditches, culverts, detention structures, and retention structures. The Stormwater Division is the only department in Osceola County with this one-of-a-kind chemical spray truck, which is simply called the "Spray Rig." It was designed and created by Weld Shop Supervisor, Craig Harless.

The Stormwater Division needed a rig that would allow technicians to ride out over embankments to 1) provide more precise herbicide applications to target plants along ditch banks, 2) to help decrease erosion and 3) to improve the safety of workers walking

Luis Garcia on the spray rig (above)
Kissimmee Spray Rig (right)
Photos by Karen Brown

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along numerous miles of ditchbanks to perform applications. Craig and the Weld Shop crew drew up plans and fabricated the rig between their normal workload. From start to finish, it took roughly 3 months to complete and cost between $8,000 and $10,000. Since the City already had a vehicle in use for this type of application, the only materials needed were for the spray rig and boom attachment.

What makes the spray rig different than any other is its 12 foot hydraulic boom attachment. The addition of this boom permits the chemical technician to ride out over the embankment allowing pinpoint dispersion of the herbicide. Prior to having this rig, the City used a truck outfitted with hose reels with varying length of hose to treat ditches. "It is not easy lugging around 300 feet of hose, walking along uneven terrain in the Florida heat treating ditch banks," said boom operator Luis Garcia. The hydraulic boom attachment allows the herbicide applicator to perform the daily job in a more efficient and safe manner, and aids in keeping the spray swath on the target.

Operation of the spray rig is a two-person job, requiring the driver of the truck and the boom operator to work in tandem. While the driver keeps the vehicle steady as it moves along the edge of the embankment, the boom operator moves the boom into position using control levers. All chemical application, movement of the boom, direction of the spray and operation of the on and off switch to the pump is controlled by the boom operator. The boom operator directs the driver to slow down, stop, or move forward as needed to manage the herbicide application. Constant visual contact between the boom operator and the driver is paramount for overall safety. Using this system, a team can complete a job in 15 to 20 minutes that used to take 1 ½ hours.

The concept of this unique truck came about in part due to the physical demand of walking on the steep slopes of ditches. Another reason was to reduce the amount of time it takes to spray both sides of 17 miles of ditch bank and nearly 70 stormwater retention ponds. The spray rig has been in use since 2006 and projects are now being completed more efficiently and safely—90% of the physical demand placed on the applicator has been removed. The maintenance costs for the rig are minimal as long as the rig is kept clean and lubricated.

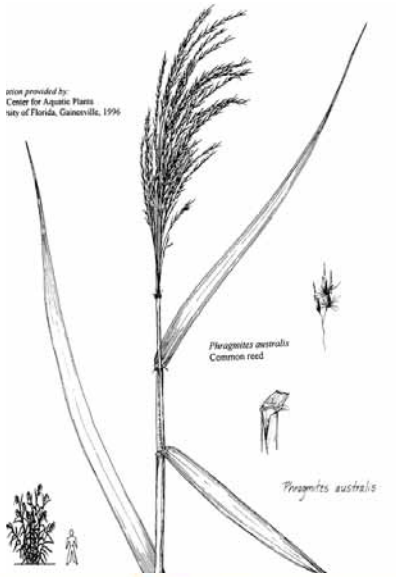
Thanks to the vision, talent and creativity by two divisions working towards a common goal of improving operational efficiency and worker safety, the City of Kissimmee Public Works Stormwater Division and Weld Shop can proudly boast that they have one of the finest chemical spray rigs available.

Chuck Barboza is the Supervisor of Ditch & Pond Maintenance with the City of Kissimmee and can be reached at 407-847-2821 or CBARBOZA@kissimmee.org

Editor's note: *Thanks to Mr. Barboza, Mr. Garcia, Mr. Harless and Mr. Hickey for their time and providing me with this great article for the FAPMS readership!*

Luis in action. Photo by Tina Bond

Phragmites in Florida



By W. A. Overholt, R. Diaz, M. Hanson and D. Williams

Phragmites is a tall, perennial, wetland grass, occurring in both fresh and brackish waters. In North America, *Phragmites* can be divided into three genetic lineages: native North America types, a Gulf Coast type, and a Eurasian type. The native types are found in the northeast, midwest and western USA, but not in the southeast. The Gulf Coast lineage occurs widely from the eastern Atlantic coast of Florida, along the Gulf Coast from Florida to Texas and south into Mexico (Saltonstall 2002). The Eurasian lineage was introduced into Philadelphia with ships ballast in the 1800s (Burk 1877), and has become increasingly abundant and widespread in North America. It is now the dominant type along the Atlantic coast from Georgia northwards, and has moved into the Midwest, the Mississippi River Delta, and western states (Saltonstall 2002).

Native and Eurasian *Phragmites* are currently considered to be the same species, *Phragmites australis*, while the Gulf Coast type may be a different species, *Phragmites karka*, which is also known to occur in Australia and Polynesia (Ward 2010).

A survey of *Phragmites* conducted in 2009-2010 in coastal areas from South Carolina to Louisiana did not find Eurasian plants in Florida (Figure 1). However, populations of Eurasian *Phragmites* were identified in Georgia, South Carolina, Mississippi and Louisiana. The closest the Eurasian type was found to Florida was 42 miles north of the Florida border along Interstate 95 in Georgia. Along the Gulf Coast, a Eurasian population was found 60 miles west of Florida on Petit Bois Island, Mississippi (Williams et al. 2011). Due to the proximity of the Eurasian type to Florida, it would seem likely that it will eventually invade the state.

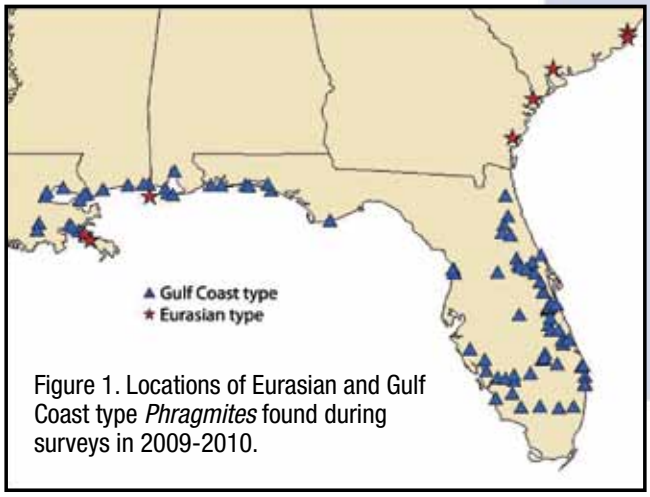


Figure 1. Locations of Eurasian and Gulf Coast type *Phragmites* found during surveys in 2009-2010.

Character	Gulf Coast	Exotic
Stem texture	Smooth, shiny 	Ribbed, slightly dull 
Panicle form	Open, often drooping 	Compact, tightly erect 
Stem color	Red where exposed to sun, green behind leaf sheath 	Green where exposed to sun 

Characters to distinguish Gulf Coast and Eurasian ***Phragmites australis.***

Reproduction of *Phragmites australis*

There are reports of prolific seed production in some populations of *Phragmites*, but in the Gulf Coast, little or no seed production has been observed (Hauber et al. 1991, Ward 2010, Williams et al. 2011). The lack of seed may be due to self-incompatibility, as most plants at a given location could belong to a single clone. *Phragmites* does spread through the growth of rhizomes, and it is thought that the majority of spread within a population is due to clonal growth. Broken pieces of rhizomes may be responsible for dispersal of *Phragmites* along water courses.

Why be concerned about possible invasion of exotic Phragmites into Florida?

The Eurasian type of *Phragmites* has proven to be a highly aggressive invader, particularly in the northeastern and mid-Atlantic states, where it has largely displaced native *Phragmites* (Myerson et al. 2009). A study conducted in the Mississippi River Delta in Louisiana demonstrated that the exotic type can outcompete the Gulf Coast type (Howard et al. 2008). Thus, the exotic *Phragmites* may have the potential to displace Gulf Coast *Phragmites* and other wetland plants if it invades Florida.

How can Gulf Coast and Eurasian Phragmites be distinguished?

Eurasian and Gulf Coast *Phragmites* are morphologically distinct, and can be separated by three characters indicated in the table below. Fine longitudinal ribbing on the stems of Eurasian *Phragmites* may be the best character to separate the two types. The ribbing can be detected visually, but also by slowly rotating the stem under a fingernail.

References are available upon request from the author

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The Importance of Nutrient Management in Ponds

Photo by Tina Bond

Photo by Maria Angel

By Cullen Danner

Lake and pond management is rife with challenges concerning submersed weed and algae control. Weed and algae control are often the most substantial part of managing a pond, especially when it comes to diagnosing and eliminating them in the best interest of the pond owner. Most times pond owners just want the weeds and algae gone – "out of sight, out of mind!" But will simply using copper sulfate be the end of the treatment process for algal blooms? In order to achieve long terms results the source of the problem must be controlled. If the nutrients that fuel algae growth can be minimized, will future blooms in frequency decrease? Another saying comes to mind, "an ounce of prevention is worth a pound of cure."

What are Nutrients?

Nutrients are ever present in lakes and pond systems and are the food source for plants and algae. Carbon, nitrogen, phos-

phorus, and silicon are some of the major nutrients that limit the presence and/or potential of algal cell formation. The more nutrients present in the pond, the more algae one can expect to see. There are also a handful of important micronutrients, like manganese and zinc that play a role. However the macronutrient phosphorus most clearly supports algal productivity. Since phosphorus is most often the limiting nutrient, meaning that algal growth is consuming all of the available phosphorus, it is the nutrient over which pond managers can gain significant control. Once the source of the phosphorus is detected, great improvements can be made through various methods of preventive management.

Where Do Nutrients Come From?

Nutrients naturally occur in ponds from the day they are filled with water. Depending on the geology of the area, soils will contribute a certain portion of the internal nutrients to the water, especially if they are rich in phosphorus. Fish and waterfowl waste, decomposing vegetation, and decaying aquatic organisms are other examples of internal contributors of phosphorus. As aquatic weeds and algae slowly decompose, they release the phosphorus back into the water. External sources of phosphorus include leaf litter, grass clippings, fertilizer runoff, and even well water and rain. Yard waste and other organic debris that make their way into the lake will also release nutrients as they break down.

Whether they come from within or without, nutrients such as phosphorus are food for aquatic plants and algae. Submersed, emergent, and floating weeds alike all thrive on phosphorus. Ponds with heavy populations of submersed weeds generally contain less algae because the macrophytes are utilizing most of the available phosphorus. However, some ponds are dominated by algae growth and will have thick, floating mats of hair-like filamentous algae or the pea-green soup appearance from planktonic algae. Many ponds contain both varieties and both decrease water clarity, leading to complaints from pond owners.

Even Phosphorus is Beneficial in Moderation

It is important to remember that nutrients are an essential piece of the complex web of life that resides in and around every lake and pond. Kept in check and without excessive outside influences, most Florida ponds maintain a phosphorus level that supports a beneficial algal population and a healthy fishery. Algae aren't all bad. In fact, they are the number one producer of dissolved oxygen in most ponds. However, when nutrients increase dramatically, water clarity can decrease just as dramatically. Heavy nutrient loads are, by definition, the reason ponds begin the eutrophication process. Eutrophic lakes are rich in organic nutrients and often undergo large algal blooms.

Regardless of how an algae bloom occurs, pond owners want them gone. Application of a herbicide for submersed plant control or an algaecide (e.g. a copper-containing compound) and applicator know-how will certainly do the trick, but what do herbicides and algaecides do to nutrients in the pond? The short answer is nothing. All things organic will decompose once they die. As the plants and algae begin to decay, they slowly release phosphorus from their cells back into the water as soluble phosphorus, ready to be recycled in the next algae bloom. This decay process plays a significant role in internal nutrient recycling and speaks to the pond management imperative to address not just the symptoms of a nutrient issue, but the source of the nutrients. Although algaecides provide reliable temporary solutions, they are merely a bandage on a more acute, but less obvious, ecological issue.

How to Get a Handle on Nutrients

It is apparent that nutrients are creating management issues that can be simple to control, but how are the nutrients controlled? Three primary methods exist.

Physical removal is the most permanent method of nutrient reduction. However, it may be the least feasible due to labor demands, costs and nonselective plant and animal removal. Aquatic weed harvesters can make short order of over-grown submersed weed populations but their use is limited in small ponds. Floating mats of filamentous algae can be raked to shore. Dredging is another effective, albeit drastic and very expensive, approach to removing internal nutrients. By removing layers of muck, years of decayed plant and animal matter can be mitigated.

Animal biomass does contain nutrients. However, the efficiency of such a method in removing nutrients would be similar to harvesting aquatic plants to remove nutrients in that cost and time are extremely prohibitive. Draining the pond would be beneficial in reducing nutrient availability not so much from the aspect of removing nutrients in fish but in oxidizing bottom sediments, firming up substrate and rejuvenating aquatic plant habitat.

The third method of nutrient reduction is nutrient binding. Binding nutrients involves targeting phosphorus specifically with a binding agent known as aluminum sulfate, or alum. Alum is a chemical compound normally used in water treatment facilities in the purification of drinking water. It is also used to clear up turbidity in ponds. Alum can affect the food web and decrease pH of water if applied incorrectly, but alum is regularly used in lakes and ponds for nutrient reduction and water clarification.

Alum

Alum has a strong chemical affinity for phosphorus and naturally binds with its soluble form, orthophosphate. The bond between alum and orthophosphate lasts indefinitely. Algal cells can no longer use nutrients when they are bound to alum and no longer have a ready fuel source. As the newly-formed compound settles to the bottom, it gradually creates a thin blanket of alum-bound nutrients that prevents internal nutrient recycling from the sediment at the bottom of the pond. Alum treatments are referred to as sediment deactivation since the bottom of the pond is slowly—or no longer—returning phosphorus into the water. Additionally, because of their positive electrical charge alum molecules stick, or flocculate, to negatively-charged colloidal particles floating in the water, thereby decreasing turbidity and increasing water clarity. Applying alum to a lake or pond is generally a safe way to make soluble phosphorus unavailable for algae growth.

Nutrient Reduction

Nutrients are an essential part of aquatic ecosystems in supporting plant, algae, and other aquatic life. Phosphorus is beneficial in terms of biological diversity, dissolved oxygen production, and general pond productivity. However, when there are too many nutrients, they can create a variety of pond management problems. If curtailed, perpetual algae issues can be reduced and algae can remain "out of sight, out of mind!"

References available from the author.

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Sherman Park – The Restoration of a Chicago Treasure

By Keith Gray

Sherman Park – A History

Renowned architect Daniel Burnham understood the human need to connect with nature. His work on many of the Chicago Park District parks, specifically Sherman Park, allowed visitors to get away from the hustle and bustle of city life without having to leave the city.

John B. Sherman Park is a 60-acre jewel on Chicago's South Side. It was built in 1905 by the Olmsted Brothers who transformed the low, wet site into a lagoon surrounding an island of athletic fields and walking trails with beautiful stone bridges that provide access to the island.

Former Chicago Mayors Richard J. and Richard M. Daley were big supporters of fishing, a popular pastime at the park. They knew fishing would draw for urban families from surrounding neighborhoods. This park and its water features have been an important resource to the residents of Chicago over the years.

The Decline of the Lagoon

In recent years, the entire water surface of the lagoon became covered with floating plants, mainly watermeal (*Wolffia*) and duckweed, giving the lake the appearance of a very flat putting green. Management of these and other weeds became a priority and management options were sought to return the lagoon to its former state so that the local residents could enjoy it once again.

Management Options

Chemical, mechanical, and cultural controls were used to manage duckweed and watermeal in the lagoons. Aquatic herbicides became a costly and often ineffective approach. The concentration of herbicide needed to effectively control these hardy weeds was high and made the growth and survival of beneficial plants difficult.

Mechanical control in the form of harvesting was possible, but this method proved to be exceedingly difficult and labor intensive. The typical size of a floating duckweed plant is roughly the size of the tip of a pencil and watermeal is roughly the size of a pin head. Staff described harvesting these weeds like "picking up spilled water with a plastic bag."

Sherman Park before (above) and after (below) restoration. Photos by Keith Gray

The water in the lagoon was also prohibiting effective aquatic plant management strategies due to high levels of phosphorus. The water in the lagoon is maintained using water from the City's water distribution system, which is high in phosphorus. Phosphorus is a key nutrient that fuels growth of the very plants that we are trying to control. Controlling the nutrient level by obtaining water from an alternate source proved cost prohibitive as well.

Water Movement at the End of the Tunnel

One option that looked promising was to create water movement within the lagoon. At the time nearly 100% of the 7,000 feet of shoreline was bordered by cattails (*Typha* spp.) and other tall trees and shrubs that blocked wind from reaching the water.

As part of a three-tiered approach to gain water movement in the lagoons, physical characteristics were evaluated to determine the size and number of underwater pumps needed to create a current fast enough to discourage the growth of the floating plants.

When the lagoon's evaluation was complete, thirteen – 230 volt Sub-Triton Mixer Industrial Aerators were installed at the bottom of the lagoon. Each pump circulated millions of gallons of water to create the steady flow needed.

This was only the beginning.

The Second Phase of Restoration

Dense cattails covered over a mile of shoreline and shielded the water surface from the benefits of wind action. Cattails are very prolific and spread by rhizomes and seed. They are not affected by herbicide until the leaves reach approximately 36" in length, which usually occurs around the beginning of July in Chicago. Aquatic herbicides were used to treat the thick stands of cattail around the lagoon. Amphibious vehicles were used to gain access to overgrown areas. A high pressure application was used to coat the cattails with aquatic glyphosate containing a surfactant to help the product stick to and penetrate the plant cuticle. A second application was needed to treat late-growing leaves missed in the first application. In the southwest corner of the lagoon, a large stand of overgrown plants prevented water and wind movement of the water. The vegetation was cleared in 2009 and seeded with native plants in 2010.

To reduce the organic matter along the shoreline and make way for native plants in the spring, a controlled burn was executed. There were many concerns due to the number of residents close to the lagoon. Another concern was the massive amount of material that needed to be burned. Heavy brush was removed and composted. One goal was to be able to conduct routine burns once the initial mass had been reduced. Volunteer cattails had to be managed and broadcast herbicide applications were no longer a viable method since they would damage the recently installed native plants. Cattail sprouts were hand treated two seasons after the initial installation—to insure that the slower growing native plants had sunlight and a chance to survive. Thousands of low growing native plants that were installed (various sedge, iris, reed, rush, lily, and arrowhead) survived and thrived along the shoreline.

After the Pumps Were Installed

Since Sherman Park is a highly visible and highly used park, we were not able to wait to see if the pumps, cattail removal and native plantings were sufficient to rid the lagoon of the duckweed and watermeal. To remove the phosphorus load in the lagoon quickly, a nutrient deactivation slurry was used.

Aluminum sulfate, or alum, slurry was applied twice a year. Aluminum sulfate is not harmful to plant or animal life and the molecular structure causes it to bind with the phosphorus in the water, making it unavailable for plant uptake and causing it to sink to the lake bottom. The lagoon water was analyzed before and after the applications to measure the amount of phosphorus and to make sure the pump was delivering the proper dose. An application of aluminum sulfate consisted of approximately 3,200 pounds of dry material per application.

The Good News – Results

After two full seasons the Sherman Park Lagoon has open water and native plants. Aquatic herbicides are used only in specified areas to control small outbreaks of invasive plants. Hand pulling, mowing, and burning are all management options that are used as needed to encourage the growth of native plants. Habitat for the fishery has improved with the addition of emergent aquatic plants around the entire shoreline. Anglers are enjoying the vast improvement of the lagoon's condition, the fish and the surrounding areas.

The amount of herbicide used has been reduced by 75%. Even though the cost savings in chemicals and labor are matched by the cost of this restoration project, the value of the aesthetic improvements and increased usability of this historic natural resource in a densely-populated area of Chicago are priceless.

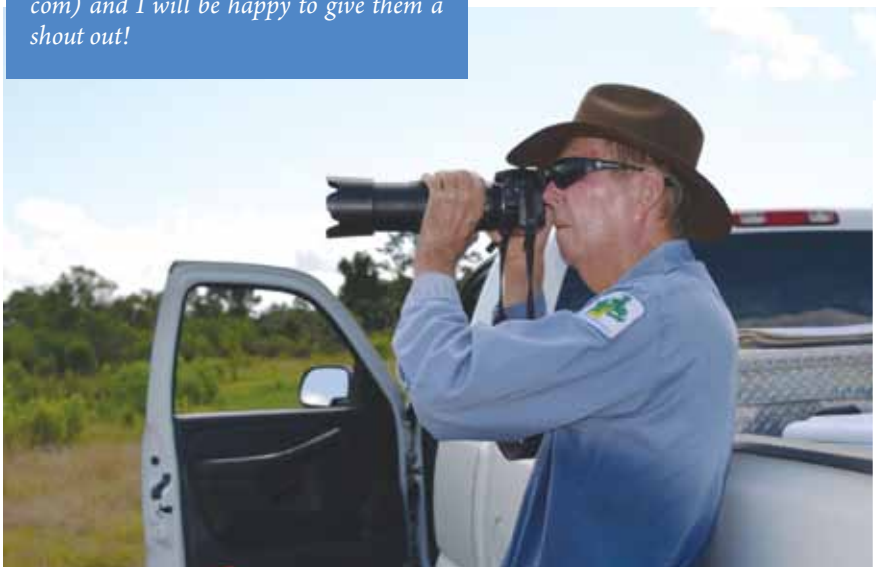
Keith Gray is the Owner and President of Integrated Lakes Management, Inc. Keith can be reached at 847.244.6662 or kgray@lakesmanagement.com

Applicator Accolades

Welcome to the first installment of ***Applicator Accolades*** *which I hope to feature regularly in Aquatics magazine. Applicators have one of the toughest jobs in Florida and you guys and gals deserve credit for all you do! If you know someone who you think should be showcased in the next* ***Applicator Accolades****, please send me their information (tina.bond@rrsi.com) and I will be happy to give them a shout out!*

Meet Jimmy Hines!

The very first applicator interviewed for **Applicator Accolades** is Jimmy Hines with the South Florida Water Management District (SFWMD). Jimmy is a native Floridian born in Arcadia and has worked for the SFWMD for 24 years. He is currently an Aquatic Plant Technician based out of the Clewiston Field Station. 90% of Jimmy's time is spent working closely with Stephen Smith with the SFWMD and Helicopter Applicators to make sure treatments are going out as scheduled and without any problems. He hauls herbicide for helicopter applications conducted throughout the SFWMD jurisdictional boundaries from Homestead up to Lake Tohopekaliga. Jimmy also works closely with a variety of land managers and field stations to schedule aquatic plant management activities. The other 10% of his job consists of Weedar (the SFWMD's exotic plant control database), 454s (FWC reports), Inspection Reports and calculating the herbicides for various jobs!



Jimmy in action. Photo by Tina Bond

Jimmy Hines Photo by Tina Bond

A favorite part of Jimmy's job is getting to meet people while doing his work. He really enjoys talking and once you get to know Jimmy, you know that he's a great man, easy to talk to and excellent at his job. One of the more challenging parts of his job is getting the work scheduled in a timely fashion. Jimmy has to work with many stakeholders on scheduling applications, and it can be complicated trying to coordinate with all of those people at times. That fact that he enjoys meeting and talking to people makes him a perfect fit for this job.

When Jimmy is not at work he loves photography (the Summer 2011 issue of Aquatics featured one of Jimmy's shots on the cover) and airboats!! If you're ever in Clewiston, stop by the Field Station to say "Hello" – that is, if he isn't out in the field performing the job he loves!

Aquavine

Townsend Chemical Merges with Red River Specialties

Specialty Professional Products, Inc. (SPP), parent company of ADAPCO, Inc. and Red River Specialties, Inc., announced on July 15 it has acquired Townsend Chemical LLC, an herbicide distributor that provides vegetation management products and services for end-user customers, applicators and government agencies. Townsend Chemical will merge with and assume the Red River Specialties name, with the goal to grow the combined company's industrial vegetative management (IVM) business segment to form an industry-leading distribution business.

For more information, visit Red River Specialties at www.RRSI.com or call 800-256-3344.

New Clipper™ Herbicide Gets EPA Registration

Valent Professional Products announced that Clipper™ Aquatic Herbicide has received federal registration through the Environmental Protection Agency (EPA) and state approval from the Florida Department of Agriculture and Consumer Services for use in Florida. Clipper™ (flumioxazin) selectively controls a number of invasive and nuisance aquatic plants including hydrilla, Eurasian watermilfoil, duckweed and watermeal. With a new chemistry and a new mode-of-action for the aquatics market, Clipper™ will play an important role in herbicide resistance management programs.

For more information about Clipper™ and to find out if it is registered in your state, please visit www.valentpro.com/clipper.

Everyone's Going Electronic!

The **Florida Aquatic Plant Management Society** and **Aquatic Ecosystem Restoration Foundation** are now on Facebook!! For the most up-to-date information or just to see what's going on in the aquatics industry, check out these new Facebook pages.

You can find these pages by using the search feature at the top of the Facebook page. Just type in the page name and you will see the results listed. Click on the page, then 'Like' the page and you will begin receiving all the great content posted to these two pages.

If you don't have a Facebook account, go to www.facebook.com to sign up!

John Madsen with Mississippi State University has also established a page for the **Aquatic Plant Management Society** on LinkedIn! LinkedIn is a business-oriented networking site that allows you to connect with colleagues, business prospects or people within your industry. You can post discussions and information and even search job postings on this site.

Go to www.linkedin.com/myGroups to get a LinkedIn account!

Another Gator championship!

Congratulations to three UF students attending the 51st Aquatic Plant Management Society (APMS) annual meeting July 24-27 in Baltimore, MD. Brett Bultemeier won the oral student paper competition with his presentation "Release Dynamics of Granular Herbicides in an Aquatic Environment." Brett is quickly wrapping up his doctoral degree under the direction of Dr. W.T. Haller, and is scheduled for completion in the next semester or two. Two UF students placed first and second in the student poster competition. Sarah Berger, an M.S. student completing

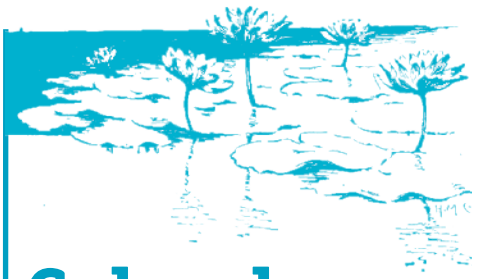
her research with Drs. Greg MacDonald and Mike Netherland, placed first with her poster titled "Suspected Endothall Tolerant Hydrilla in Florida." Leif Willey, midway through his M.S. program with Dr. Netherland, placed second with his poster titled "Comparative Response of Five Members of the Hydrocharitaceae Family to Varying Concentrations and Exposures of Aquathol K and Hydrothol 191." Congratulations to all for a job very well done. To read the abstracts for these presentations, visit the APMS website. Submitted by Dr. William T. Haller, Director, UF-IFAS Center for Aquatic Plants.

United Phosphorus Inc. (UPI) acquires Phoenix Environmental Care LLC (PEC).

PEC has developed and offers a comprehensive Turf/Ornamental and Aquatics portfolio to the industry since 2005. UPI has been involved in the aquatic herbicide and algaecide business for more than 40 years. This acquisition demonstrates UPI's commitment to provide quality services and a comprehensive line of products to the aquatic plant management industry. For more information about UPI's complete line of aquatic herbicides go to http://www.upi-usa.com/aquatics or call 800-438-6071.

The APMS Congratulates:

Carole A. Lembi for receiving Honorary Membership to APMS; Kurt D. Getsinger for receiving the Outstanding Research/Technical Contributor Award; Michael D. Netherland who received the T. Wayne Miller Distinguished Service Award; the Outstanding Graduate Student Award went to Joseph D. Vassios; and the best Non-Student poster went to LeeAnn Glomski! For having the best exhibit at the Annual APMS Meeting, Aquatic Eco-Systems, Inc. received the Exhibitor's Award.



Calendar

2011 Meetings

October 3-5
Southeast Herbicide Applicator Conference
Panama City Beach, Florida
http://conference.ifas.ufl.edu/sehac/index.html

October 4-6
MidSouth APMS
30th Annual Conference
Lake Guntersville State Park, AL
www.msapms.org/conferences/2011/

October 10-13
Florida APMS
35th Annual Training Conference
St. Augustine, FL
www.fapms.org/

October 24-26
Texas APMS
Annual Meeting
Bandera, TX
www.tapms.org/

October 26-28
North American Lakes Management Society
31st International Symposium
Spokane, WA
www.nalms.org/nalmsnew/

October 27
South Florida APMS
General Meeting
www.sfapms.org

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 Phosporus, 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.

To obtain a copy of our video, *Aquatic Plant and Habitat Management*, call 1-866-287-9190

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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.

UPI

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