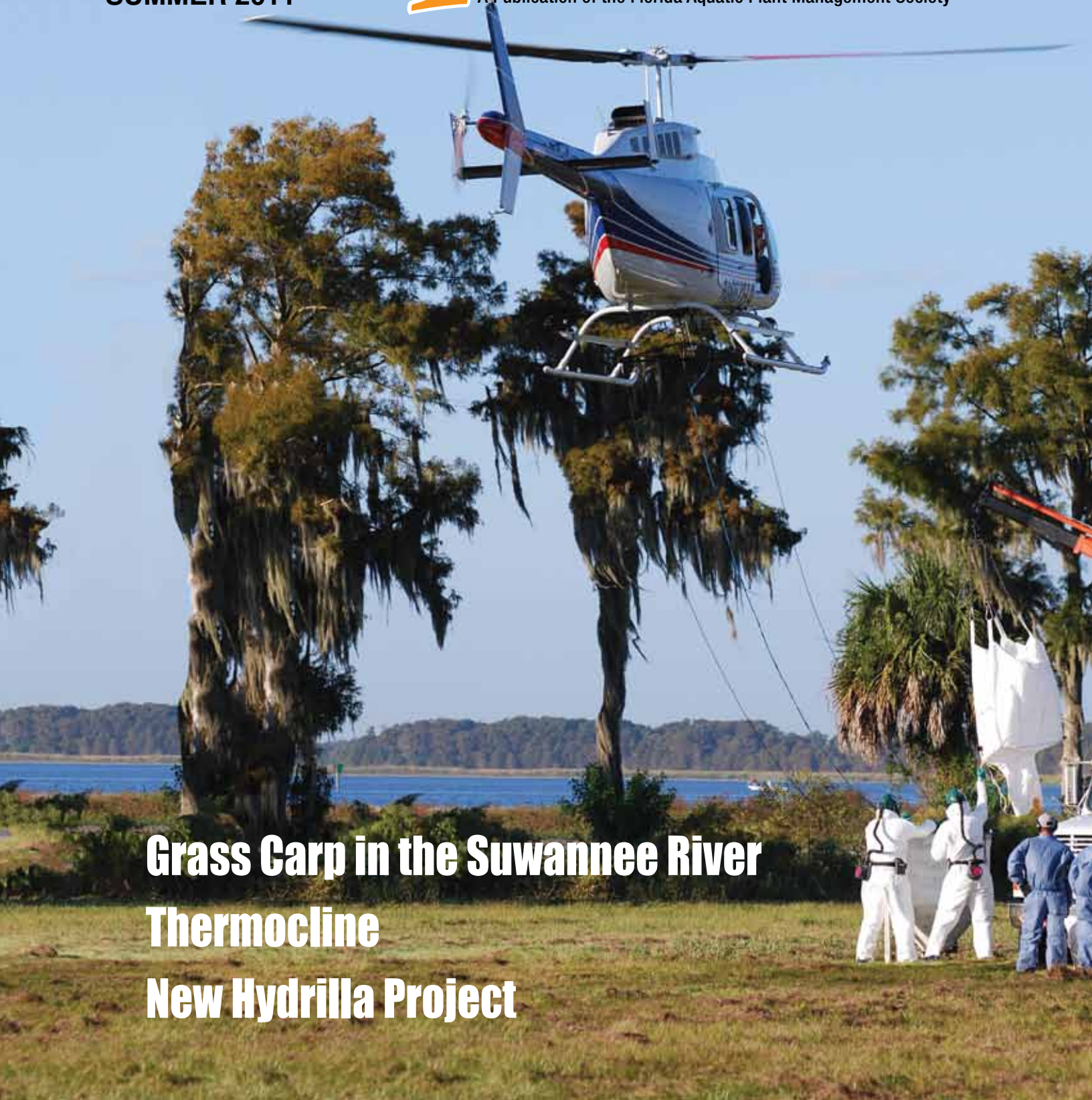


# Aquatics

SUMMER 2011

A Publication of the Florida Aquatic Plant Management Society



**Grass Carp in the Suwannee River**  
**Thermocline**  
**New Hydrilla Project**



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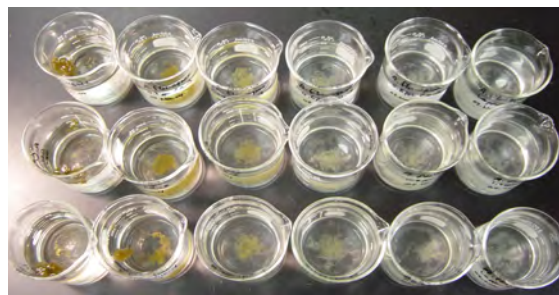
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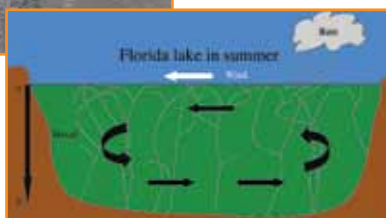
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Cover Photograph: by James Hines.  
Preparing for a hydrilla treatment on Lake Tohopekaliga at Liberty Point.



Netting a large grass carp, see page 5



Circulation pattern of a typical Florida lake infested with hydrilla, see page 12

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# Invasive plant student videos now online!

Osceola County  
**INVASIVE PLANT**  
Student Video Challenge

By Stacia Hetrick, Osceola County Extension

The Osceola County Extension Office and the University of Florida/IFAS Center for Aquatic and Invasive Plants (CAIP) are pleased to announce the debut of the **Invasive Plant Student Video Challenge** project. Over 250 students were challenged to create short videos on topics relating to hydrilla, hygrophylla and other invasive aquatic plants infesting area lakes and ponds.

After learning about the impacts invasive aquatic plants have on freshwater habitats, students were challenged to write, act and film short stories as part of their science studies. The student videos are being used to help spread awareness about invasive aquatic plants that threaten Florida's waters and cause economic hardship. Story plots range from invasive plant invasions on airplanes to adventures of local anglers. There's even one story with a citizen unwittingly emptying invasive plants from an aquarium into a nearby lake.

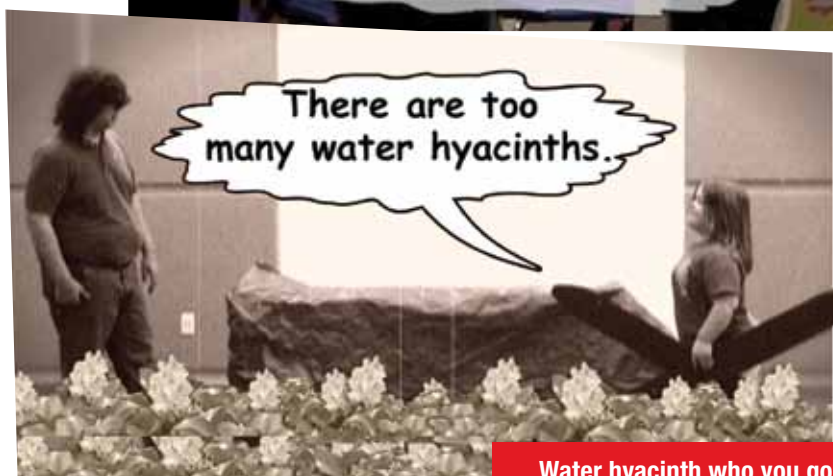
Videos can be viewed at <http://plants.ifas.ufl.edu/osceola/challenge> or the UF/IFAS Invasive Plant YouTube channel, <http://www.youtube.com/user/UFInvasivePlantsEDU>. The event is also posted on Facebook™ (search for UF Center for Aquatic and Invasive Plants – Education Initiative).

Coordination of the project and editing support was provided by faculty and staff from the Osceola County Extension Office and the CAIP. This video challenge is an outreach component of Osceola County's Demonstration Project on Hydrilla and Hygrophylla in the Upper Kissimmee Chain of Lakes. Thanks to a \$2.881 million grant from the U.S. Environmental Protection Agency, Osceola County is conducting a Demonstration Project which seeks to find new solutions for managing hydrilla and hygrophylla. For more information, please contact the Osceola County Extension Office at (321) 697-3000.

Hydrilla Rescue Squad



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# Grass Carp in the Suwannee River, Florida

By Bruce V. Jagers, Allen Martin and Joe Hinkle

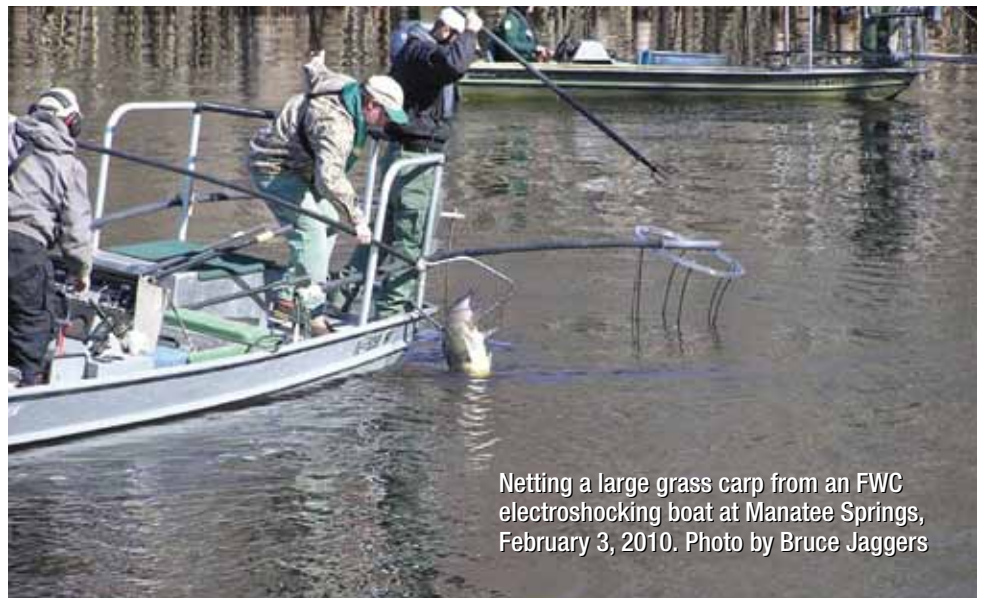
On February 3, 2010 the Florida Fish and Wildlife Conservation Commission (FWC) collected twenty-seven grass carp (*Ctenopharyngodon idella*) from the Suwannee River at the mouth of Manatee Springs and within Manatee Springs Run. Twenty-one live grass carp were transported to a private fish hatchery in Hampton FL and ploidy (the number of chromosomes in the nucleus of a cell) was determined for each fish using a Coulter Counter Model ZF. A Coulter counter is a fast and reliable method of determining ploidy from blood samples (Wattendorf, 1986). Information collected from these 21 grass carp is summarized (Table 1). Length was measured to the nearest ¼ inch and weight to the nearest 0.1 pound. Triploid grass carp (3N, three sets of chromosomes) are functionally sterile due to an uneven number of chromosome sets; whereas diploids (2N, two sets of chromosomes) are potentially fertile and therefore capable of reproducing in suitable habitats.

## Aquatic Plant Management and the Introduction of Grass Carp

Aquatic plants are a natural part of Florida lakes, rivers and springs, providing food, habitat for reproduction, and shelter for numerous

species of fish, amphibians, reptiles and birds. In general, biologists recommend that 30-50 percent of a lake or pond have rooted aquatic vegetation to maintain a healthy ecosystem. However, non-native plants can sometimes take over a waterbody, reducing the amount of open water to levels that preclude recreation and other vital functions of the ecosystem.

Herbicides are costly and can have undesirable side effects. Grass carp, one of the few fish species which eat plants, can provide a low-cost, long-term, herbicide-free means of dealing with aquatic plant problems (Osborne, 1982, Shireman, et al. 1985). Grass carp were imported from Asia in the 1970s for use as a biological control agent to control excessive growth of aquatic vegetation. However, too many grass carp have the potential to eat all aquatic plants in a system and disrupt natural functions. To prevent grass carp from spawning and becoming another environmental problem, only grass carp certified as triploid may be stocked in Florida waters. A permit from the FWC (Rule 68A-23.088, FAC Regulations Governing Grass Carp) is required to stock triploid grass carp in Florida. The "triploid" certification signifies that the grass carp have been genetically altered at hatcheries to prevent them from producing viable offspring (Cassani and Caton, 1986). A U.S. Fish and Wildlife Service (USFWS) inspec-



Netting a large grass carp from an FWC electroshocking boat at Manatee Springs, February 3, 2010. Photo by Bruce Jagers



tion program helps certify the ploidy of grass carp based on a procedure developed by Florida fisheries biologists in the 1980s (Wattendorf, 1986). This inspection is required before the fish can be transported across state lines and released.

## How did grass carp get into other water bodies?

The February 3, 2010 finding of grass carp from the Suwannee River, near the mouth of Manatee Springs and within Manatee Springs Run is only the second substantial documentation of diploid grass carp collected from open Florida waters; the first being from the St. Johns River in the early to mid 1990s. Five of the twenty-one grass carp sampled from Manatee Springs were documented as diploid (24% of this sampled population were diploid, Table 1). Discovery of diploid grass carp in the Suwannee River was not totally unexpected. Some anecdotal information exists suggesting that a flooding event on

the Withlacoochee River, a tributary to the Suwannee River, facilitated the escape of diploids from a private Georgia hatchery in the 1980s. At least one other private Georgia hatchery sells grass carp within the Alapaha floodplain, also a tributary of the Suwannee River flowing south from Georgia.

FWC has never issued a permit to stock triploid grass carp in a Florida river system. However, there have been several documented illegal releases of grass carp in Florida, some of which were diploid. In the early to mid 1990s, several grass carp collected from the St. Johns River at George Kirkpatrick Dam (Rodman Reservoir) were documented as diploid from blood samples examined under a microscope (Rue Hestand, personal communication 2010). Blood samples are not as reliable as the Coulter Counter technology for determining ploidy. Schools of grass carp have also been observed in the Caloosahatchee River (John Cassani, personal communication 2010), the Kissimmee River

(Wes Porak, personal communication 2010) and Spruce Creek (Volusia Port Authority, personal communication 1999). There is some concern regarding the potential impacts of these grass carp on vegetation in estuaries and other backwater areas associated with these rivers. Department of Environmental Protection (DEP) park personnel at Blue Springs State Park (St. Johns River in Volusia County) have recently observed grass carp in increasing numbers and currently possess an FWC permit to remove them from the spring run.

No ageing or food habits were investigated on the grass carp sample collected from the Suwannee River and Manatee Springs. However, the range of fish sizes suggests that at least several year-classes were represented. Most of the fish appeared to be in moderately good to good condition based on length and weight. Of the diploid fish, two of the males appeared to be in good condition and the female in excellent condition based on length,

**Table 1.** Lengths, weights and ploidy of grass carp captured from the Suwannee River and Manatee Springs, Florida on February 3, 2010.

Grass Carp#	Total Length (inches)	Weight (pounds)	Ploidy	Comments
1	41.75	27.3	3N	
2	39	24.5	3N	
3	39.50	28.5	3N	
4	38.50	20.8	3N	
5	38.50	29.1	3N	
6	37	22.4	3N	
7	43	31.9	3N	
8	42.50	42.0	3N	
9	45.75	44.1	2N	Male; good condition (body fat)
10	45	41.1	3N	
11	48	60.8	2N	Female; abundant immature eggs; excellent condition (body fat)
12	36	16.1	3N	Thin & in poor condition (body fat)
13	36.25	24.5	3N	
14	41	27.3	3N	
15	43.50	41.0	3N	
16	34	20.5	3N	
17	43.50	36.5	3N	
18	40.50	30.5	3N	
19	40.75	41.7	2N?	Male; Ploidy questionable; deformed tail; short length; good condition (body fat)
20	38.50	27.4	2N	Male
21	42.50	29.1	2N	Male; very thin fish
<b>Totals</b>	<b>40.70 avg.</b>	<b>667.1; 31.8 avg.</b>	<b>5 – 2N</b>	

weight and body fat. Good conditioning in grass carp is important for high fecundity and successful spawning as the fish normally do not feed much or at all prior to spawning (Shireman and Smith, 1983).

### **Are grass carp reproducing in Florida waters?**

Although natural reproduction by grass carp has never been documented in Florida, the presence of diploid grass carp in the Suwannee River raises questions. The Suwannee River is one of the few water bodies in Florida with the right conditions for grass carp reproduction, which requires a long stretch of sufficiently flowing water to allowtime for fertilized eggs to remain buoyant and develop (Shireman and Smith, 1983; Verigin et al., 1978). Grass carp reproductive requirements closely parallel the successful spawning requirements for striped bass. To date FWC personnel have not reported collecting juvenile grass carp from the Suwannee River or its tributaries. However, neckton (free-swimming aquatic organisms) sampling and the positive identification of grass carp larvae and/or eggs would confirm grass carp reproduction in the Suwannee River.



The largest and smallest (by weight) of the grass carp collected at Manatee Springs on February 3, 2010. Large fish is a diploid female (60.8 pounds). Photo by Bruce Jagers

Distribution of grass carp in the Suwannee River appears to be concentrated at Manatee Springs. Observations by Bruce Jagers (FWC) in February 2009 estimated over 100 grass carp in the Suwannee at the mouth of Manatee Springs. Joe Hinkle (FWC) also

estimated more than 100 grass carp in the same location in October 2009. Reports of grass carp from other areas of the Suwannee River and its tributaries are mostly of sporadic individuals or small groups. However, John Layer (FWC contractor) reported schools



Although natural reproduction by grass carp has never been documented in Florida, the presence of diploid grass carp in the Suwannee River raises questions about this possibility.





Diploid female ovary containing multiple thousands of immature eggs.  
Photo by Ed Hayes FWC

of grass carp in other feeder creeks in the lower Suwannee, as well as attracting grass carp to a fish feeding station at his residence on the Santa Fe River (Joe Hinkle, personnel communication 2010). It is not clear why grass carp congregate in large numbers in Manatee Springs but Shireman and Smith (1983) reported that grass carp overwinter in deep holes in the lower reaches of rivers without feeding.

There has been growing concern regarding Asian carp reproduction in the United States, particularly in the Mississippi River System (Conover et al. 2007). Grass carp reproduction has most recently been confirmed in the Trinity River, Texas, a much smaller system than the Mississippi River (Elder and Murphy 1997). A risk analysis was recently completed relative to the use of triploid grass carp in Florida (Zajicek et al. 2009).

The preliminary results reported here would seem to indicate that a feral grass carp population may persist in the Suwannee River due to illegal introductions, escape from permitted stocking sites and/or hatcheries, and possibly natural reproduction. This has some implications for habitat management; particularly FWC's springs working groups, the Manatee Management Section and Division of Freshwater Fisheries Management. Previous research has shown that grass carp have food preferences and prefer such species as hydrilla (*Hydrilla verticillata*) and southern naiad (*Najas guadalupensis*) over species such as vallisneria (*Vallisneria americana*), lyngbya (*Lyngbya* spp.) and hygrophila (*Hygrophila polysperma*). However, even a low number of grass carp can hinder re-establishment of a non-preferred species such as vallisneria once it disappears (e.g. from manatee grazing or natural population cycling). Manatee Springs

had abundant vallisneria and/or hydrilla recently (1990s and early 2000s) but is now dominated by macrophytic algae, including *Vaucheria* spp. (Smith and Mezich, 2004) and lyngbya. Grazing by grass carp may be a contributing (Smith and Mezich, 2004) or even a dominant factor in this long-term change in vegetation at Manatee Springs. Re-establishment of beneficial aquatic vegetation in Suwannee River springs, particularly Manatee Springs, would likely require at least initial protection from herbivores (manatees, grass carp, turtles). Long term exclusion of herbivores from selected areas may be required in order to maintain a local "seed stock" of desirable aquatic vegetation. In addition, selection of non-preferred aquatic plant species may yield better results than selecting species preferred by grass carp. Smart et al. (1996) as well as Smart and Dick (1999) provide excellent recommendations for establishing aquatic plants and protecting them from herbivores.

## Recommendations for Further Research:

The results presented here suggest the need to further investigate aspects of grass carp food habits, ages, behavior and reproductive activity in Florida rivers. This knowledge would facilitate informed decisions by our habitat management groups and add to the body of knowledge about grass carp. Following are recommendations for further research:

- 1) The status of grass carp in Florida, in particular diploid grass carp. Status would include population densities, distribution, ploidy, and reproductive status.
- 2) Seasonal food habits and reproductive status of grass carp in the Suwannee River and other Florida rivers. Little is known about

food habits and behavior of grass carp and the long-term impacts on habitat, interspecific competition, etc., should grass carp fry and juveniles be present in a system.

- 3) Suwannee River grass carp ages and population structure. Is the Suwannee population from just a few releases or escapes or are escapements occurring on a continual basis?

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## Literature Cited:

- Cassani, J.R. and W.E. Caton. 1986. Efficient production of triploid grass carp (*Ctenopharyngodon idella*) utilizing hydrostatic pressure. *Aquaculture* 55(1): 43-50.
- Conover, G., R. Simmonds and M. Whalen, editors. 2007. Management and control plan for big-head, black, grass and silver carps in the United States. Asian Carp Working Group, Aquatic Nuisance Species Task Force, Washington, D.C. 223 pp.
- Osborne, J.A. 1982. \$ Herbicide vs. grass carp \$. *Aquatics* 4(2): 13-14.
- Elder, H.S. and B.R. Murphy. 1997. Grass carp (*Ctenopharyngodon idella*) in the Trinity River, Texas. *J. Freshwater Ecology* 12(2): 281-289.
- Shireman, J.V. and C.R. Smith. 1983. Synopsis of biological data on the grass carp (*Ctenopharyngodon idella*) (Cuvier and Valenciennes, 1844). FAO Fisheries Synopsis No. 135, Rome. 86 pp.
- Shireman, J.V., D.E. Colle and D.E. Canfield. 1985. Efficiency and cost of aquatic weed control in small ponds. *Aquatics* 7(2): 14-16.
- Smart, R.M., R.O. Doyle, J.D. Madsen and G.O. Dick. 1996. Establishing native submersed aquatic plant communities for fish habitat. American Fisheries Society Symposium 16: 347-356.
- Smart, R.M. and G.O. Dick. 1999. Propagation and establishment of aquatic plants: a handbook for ecosystem restoration projects. U.S. Army Corps of Engineers Technical Report A-99-4.
- Smith, K. and R. Mezich. 2004. Managing natural aquatic plant communities in Manatee Springs: the effects of manatee grazing, nutrient pollution and flooding. *Aquatics* 26(2): 12-20.
- Verigin, B.V., A.P. Makeyeva and M.I. Zaki Mokhamed. 1978. Natural spawning of the silver carp (*Hypophthalmichthys molitrix*), the bighead carp (*Aristichthys nobilis*) and the grass carp (*Ctenopharyngodon idella*) in the Syr-Darya River. *J. of Ichthyology* 18(1): 80-92.
- Wattendorf, R. J. 1986. Rapid identification of triploid grass carp with a Coulter Counter and Channelyzer. *Progressive Fish-Culturist* 48(2): 125-132.
- Zajicek, P.W., T. Weier, S. Hardin, J.R. Cassani and V. Mudrak. 2009. A triploid grass carp risk analysis specific to Florida. *J. of Aquatic Plant Management* 47(1): 15-20.



# New Hydrilla Project: RAMP Up!

**By James Cuda and Jennifer Gillett-Kaufman**

We're not talking about boat ramps here. The University of Florida / Institute of Food and Agricultural Sciences (UF/IFAS) Entomology and Nematology Department is pleased to announce grant funding for a new project, The Hydrilla Integrated Pest Management Risk Avoidance and Mitigation Project, or Hydrilla IPM RAMP\*, designed to tackle one of the most troublesome invasive plants in the U.S..

*Hydrilla verticillata* (a.k.a. hydrilla) is an invasive freshwater plant all too common in Florida. Scientists believe hydrilla was brought to Florida in the late 1950s as an aquarium plant. By the 1970s it was established throughout the state. If left

unmanaged, hydrilla is capable of creating damaging infestations which can displace native plants, clog flood control structures, and impede navigation and recreational usage of waterways. After many years of successful management with herbicides, hydrilla developed a resistance to fluridone, a systemic herbicide used to manage the invasive plant for the past 20 years. According to the UF/IFAS Center for Aquatic and Invasive Plants, millions of dollars are spent each year on herbicides and mechanical harvesters in an effort to keep hydrilla under "maintenance control" in Florida.

Thanks to a new 4-year, \$500k grant from the USDA National Institute of Food and Agriculture (NIFA), UF/IFAS research and extension faculty; Florida Agricultural and Mechanical University faculty and U.S.

Army Corps of Engineer researchers are tackling the hydrilla problem with renewed vigor. The grant will enable the team to study the impacts of the integrated use of a new herbicide, a naturalized hydrilla mining midge and a native fungal pathogen as part of an overall hydrilla IPM plan.

\*USDA NIFA RAMP Grant 2010-02825 "Sustainable Approach for Integrated Management of Herbicide Resistant Hydrilla in the U.S."

For additional information about the Hydrilla IPM RAMP Project, please contact: James P. Cuda, [jcuda@ufl.edu](mailto:jcuda@ufl.edu); or Jennifer L. Gillett-Kaufman, [gillett@ufl.edu](mailto:gillett@ufl.edu) both with the UF/IFAS Entomology & Nematology Department



Hydrilla tip mining midge, *Cricotopus lebetis*.  
Photo by Dan Denson

Dr. Bill Overholt on Lake Toho surveying hydrilla. Photo by Stacia Hetrick

# FAPMS Scholarship and Research Foundation Celebrates

25  
Years

**By Don Doggett**

The Florida Aquatic Plant Management Society Scholarship and Research Foundation, Inc. celebrated its Silver Anniversary in 2010. Since its inception in 1986, the foundation has been comprised entirely of FAPMS past presidents who have donated countless hours to the advancement of the Foundation and FAPMS. In addition to celebrating the foundation's 25<sup>th</sup> Anniversary in 2010, members reached another milestone when the endowment reached \$100,000! To date, the foundation has awarded 16 William L. Maier Jr. Memorial Scholarships and 62 Paul C. Myers Applicator Dependent Scholarships. A total of \$76,450 has been awarded to worthy individuals over the past twenty five years. This is an amazing accomplishment for the foundation as well as for the aquatic plant management industry.

## **Contributions to the APMS Graduate Student Stipend**

Since 2002, the Foundation has contributed \$1,000 annually to the Aquatic Plant Management Society (APMS) Graduate Student Stipend. The APMS awards graduate student stipends to a research institution using contributions from the APMS, regional chapters, the Aquatic Ecosystems Restoration Foundation (AERF), and individual sponsors. The recipient is chosen by a panel of APMS and regional chapter representatives to conduct research on nationally significant aquatic plant management issues.

## **Paul C. Myers Applicator Dependent Scholarship**

Paul C. Myers was a charter member of FAPMS, the society's seventh president, and editor of *Aquatics* magazine (1981-1982). In 2004, the FAPMS Foundation honored Paul posthumously by designating

his name to the Applicator Dependent Scholarship. Paul's legacy lives on through his many contributions to the society and the industry.

The Paul C. Myers Applicator Dependent Scholarship recipient must have a parent or guardian who has been a FAPMS member in good standing for three consecutive years. The recipient is chosen based on need and the expected family contribution amount indicated in the results of a Student Aid Report. The Student Aid Report is a document provided to students who submit a Free Application for Federal Student Aid (FAFSA) form (available online at <https://fafsa.ed.gov>). All applicants are required to submit a Student Aid Report in order to be considered for FAPMS scholarships. An essay is also required.

## **William L. Maier Jr. Memorial Scholarship**

William L. Maier Jr. was a charter member of FAPMS, President in 1982 and on the Board of Directors from 1978-1980. He conceived and developed *Aquatics* magazine, the official publication of the Florida Aquatic Plant Management Society, and was its first editor (1979-1980). The William L. Maier Jr. Memorial Scholarship award is based on each applicant's potential contribution to the science of aquatic plant management as demonstrated by past academic performance, field of study, and his or her philosophy of aquatic plant management as expressed in a required essay. This scholarship is typically awarded to a junior, senior, post-bachelor or graduate student who is enrolled in an accredited university or college in Florida, and majoring in a field of study directly related to the management of freshwater or aquatic vegetation for the ecological benefit of aquatic or freshwater environments. This scholarship is not awarded every year.

*The Foundation's primary mission is to support the members of FAPMS, as well as to stimulate greater academic interest in the aquatic plant management career field.*

## **Criteria and Selection of Scholarship Recipients**

Scholarship applications are reviewed and ranked by a selection committee comprised of a chairperson, three Scholarship Foundation members, and three FAPMS members appointed by the current FAPMS President. Both the Myers and Maier Scholarship applications are evaluated based on a short essay and the quality and thoroughness of the application. Interest in the scholarships has grown as more applicator's dependents/students learn of this opportunity.

## **Income Generation for the Foundation**

Typically, 70%-80% of the foundation's annual income is dispersed in the form of scholarships. The goal is to strike a balance between awarding annual scholarships to deserving students and creating a self-sustaining endowment fund. The endowment fund has steadily grown over the years. Other than annual corporate filings with the



State of Florida, there are no administrative expenditures incurred by the foundation.

In an effort to increase constituent support, the FAPMS Board of Directors voted to contribute \$5 per member each year from annual membership dues to the Scholarship and Research Foundation.

The Foundation also sponsors a Silent Auction, an annual raffle, and the very popular Rubber Duck Race at the FAPMS annual meeting. Items for the Silent Auction are graciously donated by foundation members and vendors. Raffle ticket sales for door prizes and a grand prize at the annual meeting continue to be the mainstay of the foundation's fundraising by adding \$3,000 to \$4,000 per year to the endowment. The sponsorship list for door prize donations and other fundraisers has also grown significantly—from four to sixteen sponsors over the past six years. Since 2008, the annual Rubber Duck Race has been a popular event that adds nearly \$3,000 to the Foundation's endowment.

The society and the foundation depend heavily on sponsors and we sincerely appreciate their generosity and continued support. The most important participation in fundraising events, however, is by FAPMS members through annual dues, sponsorships, attendance at the annual meeting, purchasing raffle tickets and other FAPMS items, and buying ducks for the rubber duck races, all of which helps to support and fund the Scholarship and Research Foundation.

### Looking to the Future

The foundation's primary mission is to continue to support the members of FAPMS as well as promote academic interest in the field of aquatic plant management. The foundation's annual fundraising goal is always to exceed the previous year's goal, but we need your continued support to do so. When starting a planned giving program or when deciding to make a donation, please consider the foundation. Remember, the foundation is a non-profit, tax-exempt, charitable organization. Please support the local organization that locally supports you!

We thank all of the Scholarship and Research Foundation members, FAPMS Board of Directors, Officers, Members and sponsors for supporting the foundation and FAPMS. It would not be possible without you!

For more information about the foundation please visit our website at [www.fapms.org](http://www.fapms.org), and click on "Scholarship".

## Florida Aquatic Plant Management Society Scholarship & Research Foundation, Inc.

### 2010 Paul C. Myers Applicator Dependent Scholarship Recipients

Sarah Burn, University of Central Florida, Junior

Tiffany Duke, Florida Atlantic University, Senior

Alexis Pontius, South Florida Community College, Freshman

Cody Wolfe, University of Florida, Junior

*Don Doggett, Board Member and Past President, FAPMS; President, FAPMS Scholarship and Research Foundation, Inc.; [Doggett@LCHCD.ORG](mailto:Doggett@LCHCD.ORG)*



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# Thermocline

## North versus South: Friend or Foe?



**By Christopher Mudge, William Haller and Lyn Gettys**

The temperature characteristics of lakes comprise a chapter in most limnology textbooks and are important variables to be considered by aquatic plant managers. Why is the water so much cooler when one goes swimming and dives down into water 8 to 12 feet deep? How do critters that live in the sediments of northern lakes survive freezing temperatures? What does this have to do with applying aquatic herbicides to control submersed weeds?

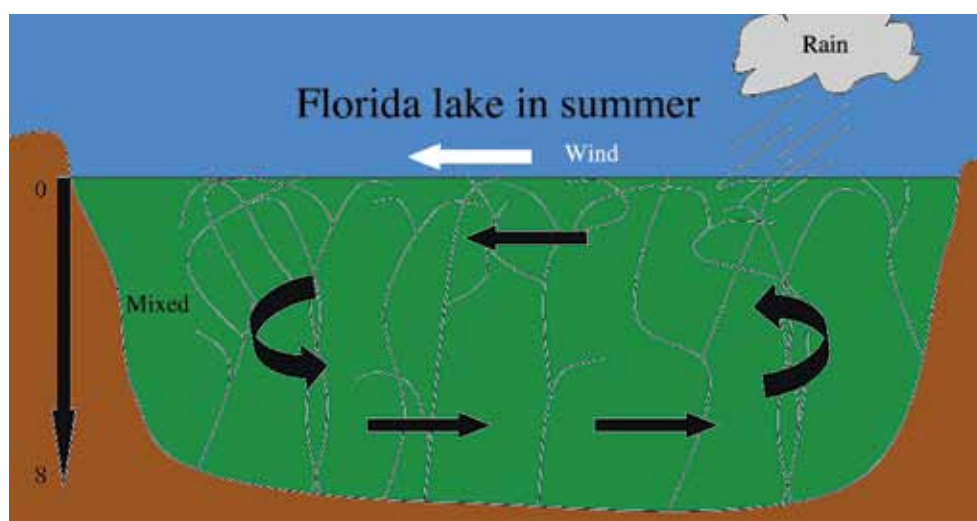
### Northern or temperate lakes

A good understanding of the seasonal temperature relationships from the top to the bottom of northern lakes will help explain the temperature relationships of more complex, shallow and heavily vegetated lakes in Florida. The most important thing to know about water movement and circulation in lakes is that water is most dense or “heaviest” at a temperature of 4 °C (39 °F). As water warms to higher temperatures, it becomes less dense, so if the water is undisturbed, this warmer, “lighter” water will rise to (or remain on) the surface of the lake. Water that cools to temperatures below 4 °C (39 °F) is also lighter and will rise to (or remain on) the surface of the lake because it is less dense.

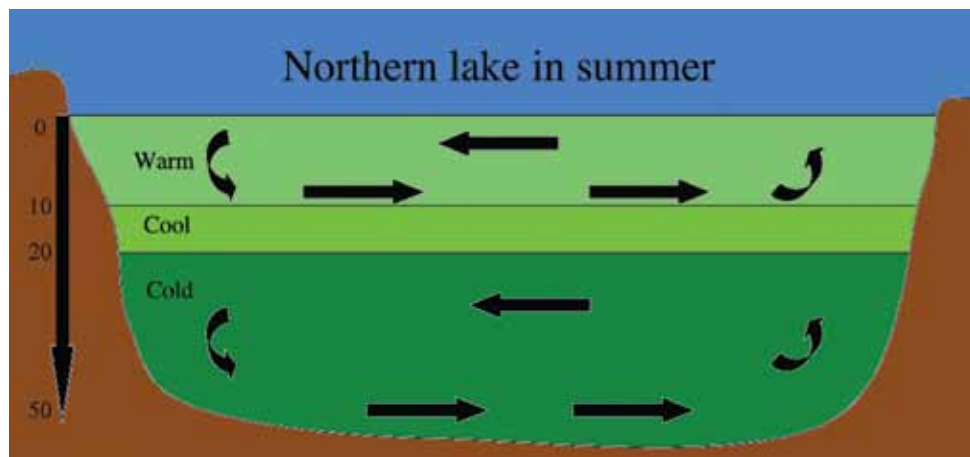
Consider the seasonal changes in water temperature in a 50 acre lake in Wisconsin. The lake has a maximum depth of 60 feet and an average depth of 20 feet. When an early, windy, fall cold front moves in, the air temperature falls below freezing for several hours and the surface water of the lake cools quickly due to cold winds and wave action. As these surface waters cool, they become more dense and descend from the surface to mix with the warmer waters below. At the same time, warmer waters

below the surface rise to the top because they are less dense than the surface water chilled by cold winds. As air temperatures continue to decrease over time, the water in the lake

will become “isothermal”—temperatures will become consistent from the surface to the depths of the lake. This isothermal condition is also referred to as the fall turnover, or fall



**Figure 1** Circulation pattern of a typical Florida lake infested with hydrilla on a cloudy, windy summer afternoon with a thunderstorm, or following a cold front in winter. Water at the surface of the lake quickly cools and sinks toward the bottom of the lake. Approximate lake depth is listed in feet.



**Figure 2** Circulation pattern of a typical northern U.S. lake in the summer. The upper layer of surface water is the epilimnion and the lower deeper water is the hypolimnion. The transition zone between the epilimnion and the hypolimnion is the metalimnion or thermocline. Approximate lake depth is listed in feet.



mixing, of water in northern lakes and is similar to the phenomenon that occurs in shallow Florida lakes that are cooled by a summer thunderstorm (Figure 1).

The arrival of winter in northern regions causes the isothermal water in northern lakes to remain at around 4 °C (39° F) from top to bottom. As surface waters cool to temperatures below 4 °C, they become less dense and remain on the surface of the lake, where they will form an ice layer on calm, cold nights. The surface layer of ice stays frozen at 0 °C (32 °F) throughout the winter and floats because it is less dense (at 0 °C) than the water below it (at 4 °C). Waters on the bottom of the lake remain at 4 °C during the winter due to heat-generating bacterial and fungal decomposition of organic matter in the sediments. The waters in this lake no longer mix together and are stratified, or separated into layers, based on temperature throughout the winter.

The arrival of spring brings higher air temperatures that warm the surface of the lake. The ice layer melts and surface water is warmed to 4 °C. The water at the bottom of the lake remains at 4 °C, so the lake is once again isothermal with a consistent temperature throughout. Cool nights and sunny days cause a gradual increase in surface

water temperatures during a period referred to as spring turnover, but the lake remains isothermal. Spring turnover may last days, weeks or more than a month, depending on air temperature and local conditions.

As the summer sun increasingly warms waters on the surface of the lake, the temperature differential between the warm surface waters and the cool lower waters increases, which leads to a “strongly stratified” condition or a greater resistance to mixing between these layers. This stratification by water temperature—and the accompanying differences in water density—is maintained throughout the summer until the cooler temperatures of fall arrive and fall turnover occurs, starting the cycle anew.

The area of transition from surface water (the epilimnion layer) to the deeper water (the hypolimnion layer) is referred to as the thermocline. The depth at which the thermocline occurs varies greatly by latitude, lake depth, water clarity and climate. The thermocline may occur at depths as great as 200 to 260 feet in clear, deep lakes (such as Crater Lake in Oregon), but is typically found between 8 and 12 feet below the surface in most northern lakes.

Water does not mix vertically (between upper and lower layers) across the thermo-

cline, so how does the thermocline affect aquatic weed control? Is it a friend or a foe? If the growth of a submersed weed is above the thermocline, a surface application using a short trailing hose may be very effective. It may even be possible to apply slow-acting, long-contact products like penoxsulam or fluridone to the epilimnion without having to treat the water in the hypolimnion, provided the treatment is applied after the thermocline becomes established in early summer. In these cases, the thermocline is your friend and the stratification of the lake can be used to your advantage by allowing treatment of only the upper part of the water column. However, if a submersed weed grows in the epilimnion **and** in the hypolimnion—that is, on both sides of the thermocline—surface application of herbicides such as those described above will only control growth of the weed above the thermocline (in the epilimnion). In this case, the thermocline is your foe because stratification of the lake prevents surface applications from reaching weeds growing in the hypolimnion. Effective treatment of weeds growing below the thermocline would likely require long-hose injection or properly applied granular herbicides both above and below the thermocline for adequate control. Northern applicators typically apply herbicides in spring or early summer when a lake is isothermal and the thermocline has not become well-established because they understand how the thermocline can affect herbicide effectiveness by preventing mixing between upper and lower waters.

## Florida lakes

Lakes and ponds (but not reservoirs) in the southeastern U.S. are typically very shallow, do not freeze and have greater areas inhabited by submersed vegetation. However, water in southeastern lakes commonly becomes stratified by temperature (and density); as with their northern counterparts, this phenomenon is driven by weather conditions.

Let's examine the seasonal changes in water temperature in a 50-acre lake in Florida. The lake has a maximum depth of 16 feet and an average depth of 8 feet. When a fall or winter cold front moves in, the air temperature falls and the surface water of the lake cools. As these surface waters cool, they become more dense, descend from the surface and are mixed through wind action with warmer waters below the surface. As a result, the water in the lake becomes isothermal and temperatures will become consistent from the surface to the bottom of the lake (Figure



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1). Unseasonably warm temperatures for a week during winter may warm surface waters and create a weak stratification effect, but regular cold fronts soon return the lake to an isothermal state, with free mixing of upper and lower waters and a consistent temperature throughout the lake. “Weak” stratification is easily and regularly broken by cold fronts and results in “polymictic” lakes, where vertical mixing between the epilimnion and the hypolimnion occurs many times throughout the year. Polymictic lakes are very different from the “dimictic” lakes characteristic of northern latitudes, where mixing between the epilimnion and the hypolimnion occur only twice per year—during fall and spring turnovers.

The arrival of spring and summer brings strong temperature stratification to many Florida lakes, especially those that are heavily vegetated and have topped-out hydrilla growing along the water surface (Figure 3).

For example, hot, calm days can result in temperatures as high as 40 °C (104 °F) in the upper few inches of a hydrilla mat, while water one foot below the mat is only 20 to 25 °C (68 to 77 °F). This occurs because sunlight is intercepted and blocked by the surface-matted hydrilla. As a result, water below the matted hydrilla does not receive solar warming and remains much cooler than water on the surface of the lake.

In this example, a few summer days with hot, calm conditions can result in stratification, but a severe, windy afternoon thunderstorm can—and usually does—cause vertical mixing, which again results in isothermal conditions. The wind creates water movement, wave action and evaporative cooling, and the rain cools the surface of the water as well. Air temperatures drop overnight and by

morning, isothermal conditions are restored.

So how do these lake phenomena affect aquatic herbicide applicators in Florida? First, few (if any) applicators surface-spray herbicides for control of submersed weeds; most inject herbicides using trailing hoses where water mixing is facilitated by the wake of the boat. Also, most submersed herbicide treatments are applied in early spring or summer before hydrilla reaches the surface, so

## Terminology

**Limnology:** the study of freshwater lakes, rivers and ponds

**4 °C (39 °F):** the temperature at which fresh water is most dense (heaviest) at 1 g / cubic cm; a unique physical characteristic of water

**Freezing point:** the temperature at which water becomes solid (turns to ice); 0 °C (32 °F)

**Isothermal:** consistent temperature within a substance; in this context, water temperature in a lake is the same or very close to the same throughout the water column from the surface to the bottom

**Epilimnion:** surface waters of a lake stratified by temperature

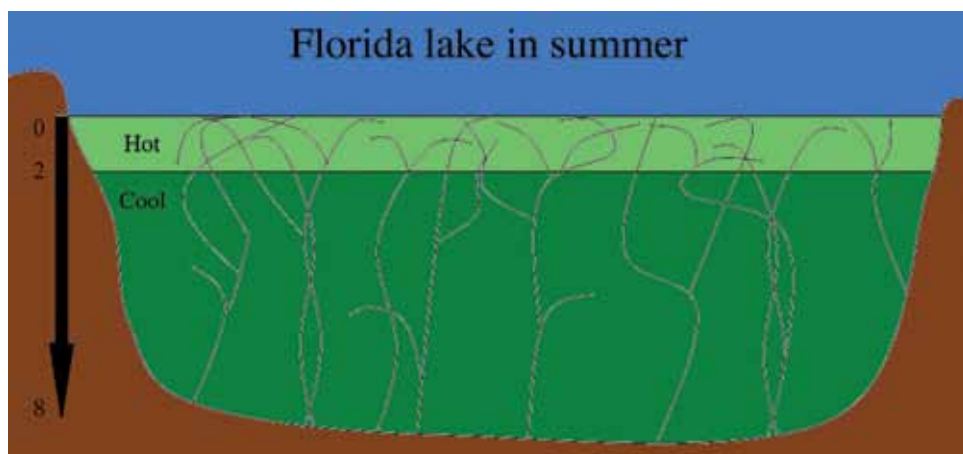
**Metalimnion:** the transition zone in a stratified lake where water temperature changes between the epilimnion and the hypolimnion; typical location of the thermocline

**Hypolimnion:** lower, deeper waters of a lake stratified by temperature

**Thermocline:** area in a lake where water temperature changes by 1°C or more over a depth of 1 m; more rapid temperature change reduces the likelihood of vertical mixing of upper and lower waters

**Dimictic:** lakes in which water mixes vertically twice per year (in fall and spring); typical of northern or temperate lakes

**Polymictic:** lakes in which water mixes vertically many times throughout the year; typical in shallow, subtropical lakes



**Figure 3** Circulation pattern of a typical Florida lake infested with hydrilla on a calm summer afternoon. Intense sunlight greatly warms the surface water and a temporary stratification is established. Approximate lake depth is listed in feet.

water in the lake is isothermal or only weakly stratified. The thermocline is less critical for Florida applicators than it is for their northern counterparts, but you should still be familiar with the effect that the thermocline can have on herbicide applications.

For example, many years ago we performed a helicopter application to surface-matted hydrilla in late June. Application was delayed until around 11:00 a.m. due to heavy fog; then the hot, calm, sunny day was perfect for spraying herbicide without the risk of drift. Around 200 acres were treated with a contact herbicide between 11:00 a.m. and 2:00 p.m. No rain occurred for the next 2 to 3 days and night temperatures were very hot. Only the top 6 to 12 inches of the hydrilla was killed by the treatment; do you wonder why?

*Christopher R. Mudge, US Army Engineer Research and Development Center, Christopher.R.Mudge@usace.army.mil; William T. Haller, University of Florida IFAS Center for Aquatic and Invasive Plants, whaller@ufl.edu; and Lyn A. Gettys, University of Florida IFAS Center for Aquatic and Invasive Plants, lgettys@ufl.edu*

*Cited literature is available upon request from the author.*





# APMS Chapter Updates

## Editor's Note

In an effort to promote APMS Chapters and the value, success and knowledge that each chapter brings to the society, *Aquatics* magazine will now be publishing APMS Chapter Updates! We rarely get the opportunity to hear what is happening across the nation with aquatic weed control. This is a great opportunity for all APMS Chapters to showcase important matters to the readership of *Aquatics*. Thank you to all the APMS Chapter Presidents for your cooperation in submitting updates!

Remember to contact me at [Tina.Bond@rrsi.com](mailto:Tina.Bond@rrsi.com) for any questions or help with submitting articles for the magazine. Send me your ideas for future issues. This magazine is for you and we welcome your contributions.

Tina Bond

## Mid-South



The Mid-South APMS Chapter is working hard to expand our membership. Our goal this year is to add new members, not only from sister chapters but from related working groups including fisheries, resource management and extension. All groups of aquatic studies are tied together with a common cause which is why it is important to get support from every group that has an interest in aquatic plant management.

We look forward to seeing current members and some new folks at our annual meeting in early October. Please come and share our common interest in providing great aquatic resources to our communities. Keep an eye on our website for meeting dates and location.

*Submitted by Harry Knight, MSAPMS President, [Harryknight@appliedbiochemists.com](mailto:Harryknight@appliedbiochemists.com)*

## Midwest



The 31<sup>st</sup> Annual MAPMS Conference held in Grand Rapids, Michigan this past March was a great success! As we all know, a successful conference does not happen without hard work from our Board of Directors, our Past President Jim Kannenberg, and our committee chairs and members. THANK YOU and job well done!

The Grand Rapids event was a financial success thanks in large part to our conference exhibitors and sponsors. The Society is financially sound allowing the Board the flexibility to plan future first-class MAPMS conference venues.

During the 2011 conference three student papers were selected for prize earnings. These students are: 1st place, Ms. Hannah Tavalire, Grand Valley State University; 2nd place, Mr. Matthew Zuelig, Grand Valley State University; 3rd place, Ms. D. Jo Heuschele, University of Minnesota.

Additionally, during the 2011 conference, the Society awarded a total of \$2,750 to fund two research grants. These grants are awarded

to: Ms. Elizabeth Ann LaRue, Grand Valley State University, under the direction of Dr. Ryan Thum; and Mr. Leif Willey, University of Florida, under the direction of Dr. Mike Netherland.

The Annual Banquet was again the highlight of the conference offering an opportunity to relax, unwind and reacquaint with old friends and colleagues. The highlight of the event was the presentation of Honorary Member status to Mr. Bob Johnson. There wasn't a dry eye in the room when President Jim Kannenberg eloquently presented this award to Bob. Bob is one of the "founding fathers" of our society and, in fact, is the society's first serving president. Bob is a true gentleman and has represented this society admirably for many years. Bob is well deserving of this prestigious award. Congratulations Bob!

Membership numbers are an important measure of the health of any organization. I am pleased to report that current active membership in MAPMS is at an all time high! Since 2010 we have added at least 30 new active members!

I would like to express my gratitude for the honor of being selected Midwest Chapter President for 2011/2012. I can attest that the Midwest Board of Directors is committed to the continued financial soundness and growth of our society and to the planning and execution

of a successful 2012 conference event. It's on to Milwaukee in 2012!

Have a safe and successful 2011 season!

*Submitted by Dick L. Pinagel, MAPMS President, dick@aquaweed.com*

## South Carolina



The South Carolina APMS Chapter is looking forward to the annual meeting on August 16-18, 2011, in Clemson, SC. This year's meeting is being held at the Madren Conference Center and Martin Inn on the campus of Clemson University. Current SCAPMS Vice President, Dr. Rob Richardson, is assembling an interesting and educational program. Please contact Dr. Richardson if you are interested in presenting at the meeting. We anticipate updates on the NPDES "situation" and talks on new invasive species (to SCAPMS) such as crested floating heart. Activities such as golf and a tour of upstate reservoirs that are sponsored by Duke Energy are in the works. Plan to join us and enjoy some southern hospitality.  
*Submitted by John Rodgers, SCAPMS President, jrodger@clemson.edu*

## Northeast



The Northeast APMS Chapter held its annual meeting at the historic Wentworth by the Sea Hotel in New Castle, New

Hampshire in January 2011. Our first meeting in New Hampshire since the society's inception in 1999 attracted 135 members for yet another informative and stimulating program. After the summer 2011 field season, the NEAPMS Board of Directors will plan in earnest for the society's return to New Castle January 17-19, 2012.

In the meantime, the NEAPMS Board is keeping members informed of pressing issues that can't wait until January such as the latest on NPDES permitting. The society is actively seeking sound proposals for student scholarships and/or stipends related to work in the field of aquatic plant management. If you are a student in the northeast looking for funding for your graduate or undergraduate project, please visit the NEAPMS website for more information: [www.neapms.net](http://www.neapms.net).

*Submitted by John McPhedran, NEAPMS President, john.mcphedran@maine.gov*

## Western



The 30<sup>th</sup> annual WAPMS conference was held in Westminster, Colorado March 28 – 30, 2011. Members of the Board of Directors made significant contributions to make the meeting a success. Specifically, Tom Moorhouse (then President) worked very hard behind the scenes to secure the venue and navigate the logistics. Tom Moorhouse and Andrea Austel (Treasurer) coordinated with our sponsors and exhibitors to whom we are grateful for their continued support of WAPMS. Tom also coordinated the continuing education credits... for most all the western states. Whew! All board members kindly assisted in pulling together the agenda and chairing the sessions. In addition to Robert Levitt, we thank John Goidosik for assisting Andrea in running the registration table. New to the agenda this year, Cody Gray rallied our sponsors and exhibitors for

a "vendor moment" where approximately 5 minutes was provided to speak about their products and services. Though we were shooting from the hip this year, we received sufficient positive feedback to continue providing the vendor moment in 2012.

Other items for the 30<sup>th</sup> annual meeting included an insightful keynote presentation from Dr. Tom Remington, Director of the Colorado Division of Wildlife, followed by Ms. Elizabeth Brown, Colorado's Invasive Species Coordinator. Being something of a landmark meeting, Dr. Lars Anderson (a founding member) walked us through the Society's history from its formative meeting in San Diego in 1981 to the present (many thanks to Lars for his past and continued contributions!). Other presentations included NPDES updates, regional issues such as tamarisk in the southwest, controlling invasive plants in flowing waters, current research and innovative methods for aquatic weed control, and emerging weed problems such as South American Spongeplant.

Again this year, Scott Nissen coordinated the Barbra H. Mullin Scholarship. The Society was very pleased to provide \$2,000 to Mr. Joe Vassios of Colorado State University (advisor: Scott Nissen). Many may know Joe from the national APMS meetings where he has been recognized for his M.S. and Ph.D. research. The WAPMS is very proud of Joe and wish him the best as he wraps up his dissertation research this fall!

Board update: Robert Levitt (Past President), Lars Anderson (Director), and Tom McNabb (Director) have fulfilled their duties on the board and we extend our gratitude for their substantial contributions. At the 2011 business meeting, Mark Sytsma (Vice-President), Pat Akers (current newsletter editor, Director) and Mike Stephenson (Director) were nominated to the board. Welcome new board members!

The 32<sup>nd</sup> annual meeting will be held April 2-4, 2012 at the downtown Westin in San Diego, California. As Vice-President, Mark Sytsma will be the Program Chair. Look for a call for papers from him this fall.

*Submitted by Toni Pennington, WAPMS President, toni.pennington@tetrattech.com*





# Aquavine

## New Aquatics Listserv Available!

A new listserv is available to provide news to Florida aquatic plant managers, researchers, and agency personnel. Hosted by the University of Florida-IFAS Center for Aquatic and Invasive Plants, the list will provide announcements of interest to the Florida aquatic plant management community. Examples include meeting announcements, CEU opportunities, new aquatic weeds in Florida, legislative changes directly affecting the community, etc. If you would like to subscribe (it's free), have a question or would like to post something to the list, please send an e-mail to CAIP-FL-AQUATICS-request@LISTS.IFAS.UFL.EDU.

## CALL FOR PAPERS - FAPMS 2011 MEETING

The 35<sup>th</sup> annual FAPMS training conference will be at the World Golf Village, St. Augustine, FL. You don't have to be a professional speaker in order to present a paper! We are looking for papers on herbicide application and mechanical techniques (aquatic and right-of-way), mixtures, innovative control measures, re-vegetation projects, new plant introductions, research projects, etc. Remember, FAPMS was formed for the applicator and the annual training conference is a chance to share what you have learned with other members.

Each year the society awards all field applicators that present a paper with a plaque.

This year the field applicators presenting the top three papers will receive a plaque and cash awards. First place will receive a \$300 cash award, second place will receive a \$200 cash award, and third place will receive a \$100 cash award. That's great incentive to submit a paper!

## NOTE: DEADLINE FOR SUBMISSION July 31, 2011

### Please submit your paper to:

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Lake Wales, FL 33859  
Fax to (863) 696-2922  
email: [texasaquaticmh@aol.com](mailto:texasaquaticmh@aol.com)

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## Calendar

### 2011 Meetings

#### July 24-27

**Aquatic Plant Management Society**  
51<sup>st</sup> Annual Meeting  
Baltimore, MD  
[www.apms.org/](http://www.apms.org/)

#### July 28

**South Florida APMS**  
General Meeting  
[www.sfapms.org](http://www.sfapms.org)

#### August 17-19

**South Carolina APMS**  
Clemson, SC  
[www.scapms.org/](http://www.scapms.org/)

#### October 3-5

**Southeast Herbicide Applicator Conference**  
Panama City Beach, Florida  
[conference.ifas.ufl.edu/sehac/index.html](http://conference.ifas.ufl.edu/sehac/index.html)

#### October 10-13

**Florida APMS**  
35<sup>th</sup> Annual Training Conference  
St. Augustine, FL  
[www.fapms.org/](http://www.fapms.org/)

#### October 24-26

**Texas APMS**  
Annual Meeting  
Bandera, TX  
[www.tapms.org/](http://www.tapms.org/)

#### October 26-28

**North American Lakes Management Society**  
31<sup>st</sup> International Symposium  
Spokane, WA  
[www.nalms.org/nalmsnew/](http://www.nalms.org/nalmsnew/)

#### October 27

**South Florida APMS**  
General Meeting  
[www.sfapms.org](http://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 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.

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**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.



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