

# A Q U A P H Y T E

A NEWSLETTER ABOUT AQUATIC, WETLAND AND INVASIVE PLANTS

## Center for Aquatic and Invasive Plants

with support from

The Florida Department of Environmental Protection,  
Bureau of Invasive Plant Management  
The U.S. Army Corps of Engineers,  
Waterways Experiment Station,  
Aquatic Plant Control Research Program  
The St. Johns River Water Management District



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## ANNOUNCING

<http://plants.ifas.ufl.edu/guide>

## The first COMPLETE web site about aquatic plant management in Florida

We are in the 18<sup>th</sup> month of a 24-month production of *Aquatic Plant Management in Florida Waters, A Web Site For The Interested Public*. Much of it is online already, awaiting your attention. ("We" are the University of Florida IFAS Center for Aquatic and Invasive Plants and the Florida DEP Bureau of Invasive Plant Management.)

Florida is home to 8,000 lakes, 1,700 rivers, thousands of miles of canals, 400 springs, a half-dozen aquifers, millions of acres of marshes and swamps, and 14 million people. Each lake, each river and each acre of marsh is unique, often home to native plants and animals, often threatened by non-native invasive plants, and often surrounded by happy homeowners, many of whom have their own ideas about what their waterbody should be like. Talk about aquatic plant management problems!

<http://plants.ifas.ufl.edu/guide> is here to help explain Florida's watery ecosystems, the need for their management, and the methods used for their management. The goal of the web site is:

- ◆ to help citizens, long-time and recently-arrived, understand plants and their management in Florida waters
- ◆ to help field workers, office supervisors, management agencies, elected boards and government officials, eco-advocacy groups, legislators and others understand plants and their management in Florida waters.

Come visit this 500+ page, 3,000 photograph web site, click on the major topics, or scroll down to the large index of keywords.

## APIRS Users

Does anyone actually use APIRS? You bet!

Following are some usage statistics for the APIRS web site:

**Time frame:** 30 days, November 2003

**Average hits:** at 4AM, 620 hits/hour;  
at 3PM, 3,368 hits/hour (56 hits/min)

**User sessions/month:** 78,234 (an average of 2,607 user sessions/day.)

Users view 137,112 jpeg images/ month and 194,472 html pages/month.

Among the most frequently accessed parts of the web site:

**Plant photos/drawings,** 137,112 jpeg image downloads/month;

**Database,** 5,892 searches/month.

In addition to basic support from the University of Florida, Institute of Food and Agricultural Sciences, the APIRS office of the Center for Aquatic and Invasive Plants is especially appreciative of the generous support of the Aquatic Plant Control Research Program of the Army Corps of Engineers.

In addition, significant support is received from the Florida Department of Environmental Protection, Bureau of Invasive Plant Management. The DEP Bureau was the original sponsor of the database, and also currently supports web site development, public education and manager education projects.

Other necessary and much appreciated support has come from the St. Johns River Water Management District, the U.S. Army Corps of Engineers - Jacksonville District, and Cerexagri.

## U.S. Invasive Species Advisory Committee (ISAC) - A Brief Overview

by Randall K. Stocker, Director of the UF-IFAS Center for Aquatic and Invasive Plants and Chair of ISAC

In February 1999, the Clinton Administration responded to pressure from scientists, resource managers, environmentalists, and many others by issuing **Executive Order 13112, Invasive Species**. Among other provisions, the Executive Order required the Secretary of Interior to establish an advisory committee "to provide information and advice for consideration by the [Invasive Species] Council." The Invasive Species Advisory Committee (ISAC), as it came to be called, was to be composed of individuals "representing stakeholders," with a broad definition of who would be considered stakeholders in the invasive species issue, including non-federal government agencies, the scientific community, non-governmental organizations, trade groups, commercial interests, and private landowners. This group would be asked to "...recommend plans and actions at [local to ecosystem-based] levels to achieve the goals and objectives of the Management Plan," also called for by the Executive Order. These recommendations would be addressed to the "Invasive Species Council" (now the "National Invasive Species Council" or NISC), composed of the Secretaries of State, Treasury, Defense, Interior, Agriculture, Commerce, Transportation, and the Administrator of the Environmental Protection Agency. NISC is co-chaired by the Secretaries of Interior, Agriculture and Commerce. There is currently a small staff, lead by Executive Director of the Council Lori Williams.

The goals of the NISC/ISAC process included efforts to prevent the introduction of invasive species; detect and respond rapidly to control invasive species; monitor invasive species populations; restore native species and habitats; and promote public education.

The first ISAC meeting was held in January 2000 in Washington, DC, and ISAC members were appointed for two-year terms. Since then, ISAC has met three times per year, with the most recent meeting held 29-30 October 2003. I was appointed to the first ISAC group, and re-appointed in April 2002 for a second term, serving as ISAC chair. With the approaching conclusion of my

second term (my last meeting will be March 2004), this is an appropriate time to review some of the expectations for ISAC and the subsequent performance of the partners in this process.

At the first meeting, the Advisory Committee was asked to help executive branch agencies target resources and address invasive species issues in a coordinated fashion to identify threats and eradicate invasives where possible. We were asked to outline policy options, and to strive for practical, budget-based recommendations from the best available science on resource management. Members were informed that their deliberations would have far reaching consequences, even international importance.

**Results thus far:** The Executive Order and the General Accounting Office have asked federal agencies to identify current federal expenditures on invasive species, an important starting point for tracking total federal budget allocations. ISAC assisted in the development of this country's first National Invasive Species Management Plan. There has been a general increase in awareness of the invasive species issue by federal agency, Congressional, and state agency staff. Public awareness has increased as the media reports on new problems. Academic programs reflect this increase in awareness as more campuses develop curricula on invasive species and new centers/institutes are created. There are still many areas where progress has been limited or non-existent: deadlines in the National Management Plan were too optimistic and most have been missed; changes in administration and staffing have delayed progress; and the fundamental role that the Advisory Committee could play with members of the National Invasive Species Council has not clearly been defined. Still, significant progress has been made that deserves recognition, and the scientific community, and especially professional societies such as the **Weed Science Society of America** and the **Aquatic Plant Management Society**, were key factors in that progress.

For more information, go to: [www.invasivespecies.gov](http://www.invasivespecies.gov)

## U.S. Agency 'AIMS' at Internet Sales of Banned Plants

*"The U.S., jolted into action by the mushrooming magnitude of invasive plants and the damage they have wrought-- and continue to cause-- has launched a new, internet-based effort to choke off domestic retail sales of banned plants as one phase of a strategy to limit further introduction and spread of invasive plant species."*

Scientists at the Center for Integrated Pest Management (CIPM) at North Carolina State University, together with the U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA/APHIS), have developed a "web-crawler," software that searches the internet for web sites selling plants officially defined as noxious weeds or invasive species\*. The system, **Agricultural Internet Monitoring System (AIMS)**, will be used primarily to locate, then notify, offending vendors, according to R.E. Stinner, lead researcher on the AIMS program.

Vendors identified by AIMS as offering banned species online

will be notified and directed to stop selling the plants. AIMS will then keep track of retailers who continue to sell illegal plants; refusal to comply with notification can lead to prosecution and the possibility of substantial fines.

Depending on performance and results from the AIMS program, federal officials will consider developing a cooperative effort with equivalent organizations in other countries. Authorities in Australia, New Zealand, and South Africa have expressed an interest in some form of joint effort.

\***The USDA/APHIS Regulated Pest List** can be accessed at: <http://www.aphis.usda.gov/ppq/regpestlist/> or in PDF format at: <http://www.invasivespecies.org/RegulatedPestList.pdf>  
Pests other than weeds are listed (viruses, insects, bacteria, etc.)

**For more information**, contact Ron Stinner@ncsu.edu, CIPM, North Carolina State University, 919-515-1648.

**To report internet sites** offering prohibited plants for sale, contact Sherrrena.A.Harrison@aphis.usda.gov

# LOOKING BENEATH THE SURFACE

by Mary Langeland, University of Florida, Center for Aquatic and Invasive Plants, APIRS

As the one who assigns keywords and categories to the thousands of articles, books, and miscellaneous printed materials for the Aquatic and Invasive Plant Information Retrieval System (APIRS), I thoroughly enjoy the occasional "odddity" that crosses my desk. After reviewing and cataloguing hundreds of "regular articles" published in refereed journals or reports by government agencies or books written by earnest authors on the value of biodiversity or environmental implications of plant invasions, imagine my delight when an out-of-the-ordinary piece of literature appears in the stacks of papers and books cluttering my office. It causes me to take stock and, so to speak, "look beneath the surface."

The human face of science usually characterizes these serendipities. The sheer delight and joy that the researcher experiences rarely shines through in the scientific literature - it is *de rigueur* to be detached and unbiased. But, as humans, we are not just workers; rather, we respond to our work and our environment.

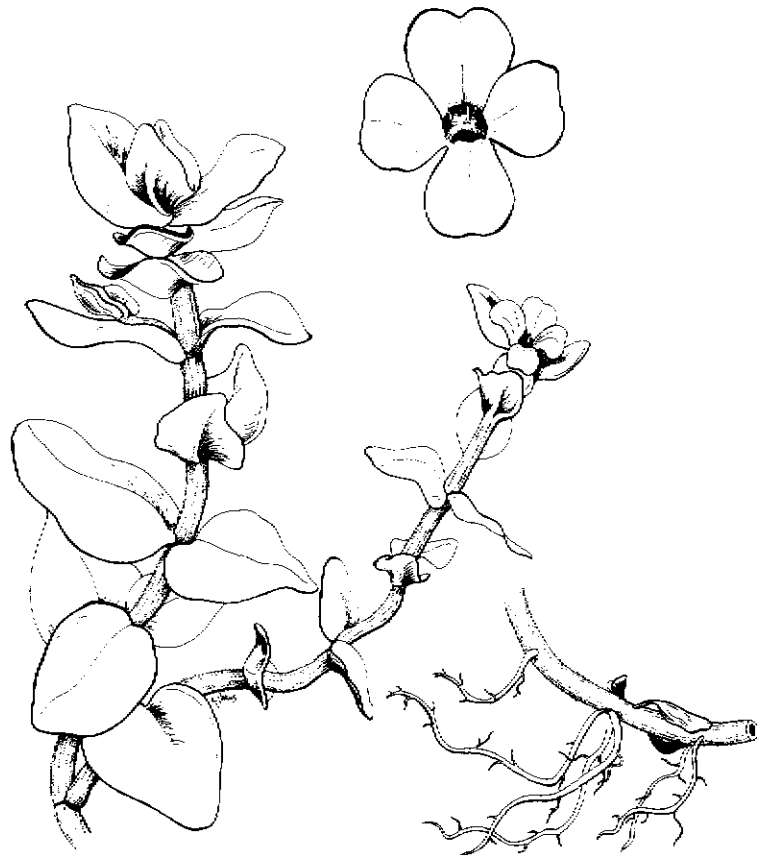
Let me share one such gem with you - **Flowers of Marsh and Stream** by Iolo A. Williams (Penguin Books, Ltd., Harmondsworth, Middlesex, England, 1946). Williams saw that

... the winter ponds and streams have their beauty of vegetation, too - not on the banks or near the shores, where the coots and water hens tread sodden alleyways among the dead and broken stems and leaves of *Typha* and *Sparganium*, but in the clear depths where the tufts of water starwort wave rhythmically to and fro as the current glides past. On a winter's day they can, seen through the glistening pellucid stream as one peers down to its sandy bottom, seem the greenest thing in the whole landscape. (p. 5)

This kind of writing attracts attention because of its insight into *why* the scientist or researcher does what they do. Perhaps you have stood on the banks of a clear stream and seen the incomparable beauty of the natural world, your heart was touched and a desire to protect, preserve and understand this priceless treasure was born and you were lead to seek a career in the environmental sciences. In that moment your spirit sought to understand the mystery behind the creation, behind "the greenest thing in the whole landscape."

*Editor's Note:* Mary Langeland has performed one of our most important functions at APIRS for the last fifteen years: the cataloging of literally thousands of citations in the APIRS database. Mary truly looks beneath the surface to understand the mystery behind the creation. She is an invaluable asset both to us and to all users of the APIRS database. *Thank you Mary!*

*Bacopa caroliniana*  
Blue-hyssop



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## Books/Reports

### INVASIVE PLANT SPECIES OF THE WORLD - A reference guide to environmental weeds, by E. Weber. 2003. 548 pp.

(Published by CABI Publishing, Oxford, England. ISBN 0851996957. Order from Oxford University Press, 2001 Evans Road, Cary, NC 27513. WWW: <http://www.oup.com/us>)

Want to know where an invasive plant is from, and where it is already invasive? This comprehensive primary reference book focuses on more than 400 non-agricultural plant species, and includes global distributions for the plants, where they are native and where they are already invasive.

For each species, the author includes their growth form, synonymy, commercial use, global distribution, types of habitats invaded, ecology, and best control methods, as well as primary references.

### UNDERSTANDING WETLANDS - Fen, bog and marsh, by S.M. Haslam. 2003. 296 pp.

(Published by Taylor and Francis, 11 New Fetter Lane, London EC4P 4EE, Great Britain. ISBN 0-415-25794-8. \$85.00 plus S/H, hardbound. WWW: <http://www.tandf.co.uk>)

This "holistic" book, written by a lively scientist of distinction, concentrates on wetland habitat, vegetation, animals and humans, and the interactions between them. It is intended as a primer suitable for college students, conservationists and agency workers. In it, terminology is discussed (wetland is an American term which has jumped to Europe; according to the author, wetland names from Dr. Johnson's dictionary (1755) include bog, fen, marsh, meadow, mire, moor, moorland, morass, quagmire, slough, swamp); the World Charter for Nature is reviewed (the U.N.'s official view on nature: who knew?); wetland functions are presented; soil chemistry is related to plants present; and plant behaviour and human use of *Phragmites* is discussed. Finally, a fresh and understandable view of vegetation dynamics, including plant invasions, is presented as The Silent Battlefield.

### INVASIVE AQUATIC PLANTS - A guide to the identification of the most important and potentially dangerous invasive aquatic and wetland plants in South Africa, by L. Henderson and C.J. Cilliers. 2002. 88 pp.

(Published by Plant Protection Research Institute, Handbook No. 16, Pretoria, South Africa. ISBN 1-86849-254-0. Order from ARC-PPRI Publications, Private Bag X 134, Pretoria, 0001, South Africa. \$11.72 plus S/H. Email: [nipbhc@plant1.agric.za](mailto:nipbhc@plant1.agric.za))

This colorful handbook is by Lesley Henderson, who has studied invasive plants of South Africa for the past 23 years, and Carina Cilliers, a biocontrol expert for lantana, water hyacinth, salvinia, water lettuce and parrot's feather.

Twenty-one aquatic weeds are described and illustrated with numerous color photos and plant line drawings. Biocontrol efforts for many of the plants also are pictured and described. (Twenty color pictures of plants and biocontrol results are included in the water hyacinth section.) South African distribution maps for each species also are featured.

Eighteen of these 21 South African aquatic weeds also are non-native aquatic weeds of the U.S.; three of their aquatic weeds are native plants of Florida (*Nymphaea mexicana*, *Cabomba caroliniana* and *Pontederia cordata*).

### TURNING THE TIDE - Saving the Chesapeake Bay, by T. Horton. 2003. 386 pp.

(Published by Island Press, 1718 Connecticut Avenue NW, Suite 300, Washington, DC 20009-1148. ISBN 1-55963-549-5. \$18.95 plus S/H.)

This new edition of the original 1991 book, sponsored by the Chesapeake Bay Foundation, "addresses new developments of the past decade and examines the factors that will have the most significant effects on the health of the bay in the coming years." It includes new case studies, updated maps, charts and graphs.

"How can we ensure that the next decade does not end like the last, with numerous battles won but little progress made?"

### LIVING RESOURCES AND HABITATS OF THE LOWER CONNECTICUT RIVER, edited by G.D. Dreyer and M. Caplis. 2001. 79 pp.

(Published by the Connecticut College Arboretum, Campus Box 5201, 270 Mohegan Ave., New London, Connecticut 06320-4196. Bulletin Number 37. Email: [arbo@conncoll.edu](mailto:arbo@conncoll.edu))

The Connecticut River is the longest and largest river system in New England, originating in the mountains of northern New Hampshire, flowing southward more than 400 miles to discharge into Long Island Sound. Once referred to as "the best landscaped sewer in the nation, . . . it has come full circle to be a very high quality, fully functioning ecological system."

The focus of this booklet is on the southern reaches of the river. Find out here why it is so special, and why the Ramsar Convention rates the lower Connecticut a "Wetland of International Importance."

### MANAGING LAKES AND RESERVOIRS, by NALMS and Terrene Institute. 2001. 382 pp.

(Published by North American Lake Management Society and the Terrene Institute. Order from NALMS, POB 5443, Madison, WI 53705. Email: [nalms@nalms.org](mailto:nalms@nalms.org))

This is the third edition of a manual produced to provide guidance to citizens. In 9 chapters, this informative and easy-to-read book reviews ecological concepts, management planning, water quality, problem identification, watershed management, lake and reservoir management, and lake protection.

### PLANT INVASIONS - Ecological threats and management solutions, edited by L. Child, J.H. Brock, G. Brundu, K. Prach, P. Pysek, P.M. Wade and M. Williamson. 2003. 457 pp.

(Published by Backhuys Publishers, POB 321, 2300 AH Leiden, The Netherlands. ISBN 90-5782-135-4. Euro 108.00 plus S/H. Email: [backhuys@backhuys.com](mailto:backhuys@backhuys.com) WWW: [www.backhuys.com](http://www.backhuys.com))

This contains 30 papers presented at the 6th EMAPi (Ecology and Management of Alien Plant Invasions) conference at Loughborough University, UK (September,

2001). "This volume explores ecological threats posed by alien plants through relevant case studies of species biology and ecology, mechanisms of invasion (including rates of spread), ecological impacts, the relationship between invasive species and their congeners, and offers management solutions through a variety of control and management techniques." Presentations include case studies and alien flora lists of Britain, Italy, Germany, the Czech Republic, Hungary, Poland, Wales, South Africa, New Zealand, Argentina, Australia... The Control section discusses a new "herbicide gel" for controlling vines; the Species Ecology section includes papers on some of the US's least favorite invaders.

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**PLAYAS OF THE GREAT PLAINS, by L.M. Smith. 2003. 257 pp.**

(Published by the University of Texas Press, POB 7819, Austin, TX 78713-7819. ISBN 0-292-70177-2. \$24.95 (paperback) plus S/H. To order, phone 800-252-3206.)

The shallow wetlands found in semi-arid to arid environments are called "playas." In the western great plains of North America, playas provide habitat to plants and animals, including migratory birds. They also serve as recharge areas. Needless to say, playas are threatened.

This book presents what is known about great plains prairie playas, their origin, development, flora, fauna, structure, function, diversity and human use since prehistoric times. The author also presents a blueprint for playa conservation.

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**ECOLOGIA E MANEJO DE MACROFITAS AQUATICAS, by S.M. Thomaz and L.M. Bini. 2003. 341 pp. (In Portuguese)**

(Published by Universidade Estadual de Maringá, NPL-IA, Biblioteca Setorial, Avenida Colombo, 5790 - CEP-87020-900, Bloco G-90, Maringá - PR, Brasil. Email: biblioteca@nupelia.uem.br)

The ecology and management of aquatic plants of Brasil is the main topic of this book, a collection of 16 papers by the country's leading plant scientists. Topics include primary production, limiting fac-

tors, habitat predictability, decomposition, phytosociology, biological control, dynamics, bioindicators, zooplankton and invertebrates.

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**TROPICAL FLOWERING PLANTS - A Guide to Identification and Cultivation, by K.A. Llamas. 2003. 424 pp.**

(Published by Timber Press, 122 SW Second AVE, Suite 450, Portland, OR 97204-3527. ISBN 0-88192-585-3. \$69.95 plus S/H. Email: mail@timberpress.com WWW: <http://www.timberpress.com>)

For scientists and gardeners alike, this large-format book is organized by botanical family, but includes no keys. It includes introductory writeups about families and genera, and short descriptions and more than 1,500 excellent (though smallish) color photos of 1,400 species of tropical and subtropical flowering trees, shrubs, vines and herbaceous plants of the world.

Included are appendices on invasive and potentially invasive species; threatened and endangered species; plants for coastal landscaping; and xerophytic (adapted to dry conditions) plants.

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**AQUATIC AND RIPARIAN WEEDS OF THE WEST, by J.M. DiTomaso and E.A. Healy. 2003. 442 pp.**

(Published by the University of California, Publication #3421. ISBN 1-879906-59-7. \$40.00 plus S/H. Order through the California Weed Science Society: [http://www.cwss.org/aquatic\\_book.htm](http://www.cwss.org/aquatic_book.htm))

This excellent book is the "first comprehensive identification manual for aquatic and riparian weeds west of the Rocky Mountains." Full descriptions and pictures of seeds, seedlings and mature plants, root structure, flowers and fruits of 89 species are included, and another 96 plants are pictured and compared as similar species. Other information includes synonyms, habitat, distribution, propagation and phenology, and similar species. Field and closeup pictures are plentiful, large, sharp and very well printed. Handy "identification tables" and keys are included.

A real bargain at \$40.

**WETLANDS - NUTRIENTS, METALS AND MASS CYCLING, edited by J. Vymazal. 2003. 376 pp.**

(Published by Backhuys Publishers, POB 321, 2300 AH Leiden, The Netherlands. ISBN 90-5782-140-0. Euro 106.00 plus S/H. Email: [backhuys@backhuys.com](mailto:backhuys@backhuys.com) WWW: <http://www.backhuys.com>)

This book consists of 21 papers from the workshop, "Nutrient Cycling and Retention in Natural and Constructed Wetlands IV" held at Trebon, Czech Republic in September, 2001. It is for scientists who are working on functioning constructed wetlands for wastewater treatment. The authors estimate there are 1,000 wastewater treatment wetlands systems in North America and a similar number in Europe. The subjects of these papers include nutrient removal by *Pistia stratiotes*; efficacy of wetlands for phosphorus removal in the Everglades; comparisons of various artificial wetlands; sludge drying reed beds; emission rates of gases; acid rain effects and other relevant topics.

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**GLOBAL SEAGRASS RESEARCH METHODS, edited by F.T. Short and R.G. Coles. 2001. 482 pp.**

(Published by Elsevier Science, POB 211, 1000 AE Amsterdam, The Netherlands; or Elsevier, Customer Service Dept., 11830 Westline Industrial Drive, St. Louis, MO 63146. ISBN 0444508910. \$174.50 plus S/H. WWW: <http://www.elsevier.com>)

Seagrasses provide food for sea turtles, nearly 100 fish species, waterfowl, manatees and other animals. Their physical structures support breeding and nurseries for crustaceans, fish and molluscs, in addition to stabilizing sediments and filtering nutrients and contaminants.

This book for seagrass scientists and managers presents "globally applicable techniques for seagrass research," from basic plant collection to statistical approaches and plant-animal interactions.

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*Authors/Editors/Publishers:  
Please send any books that may be of interest to our readers for review in AQUAPHYTE.*

## New Translation of Classic Book

*The Biology of Aquatic Plants*, translated from Heinrich Schenck's German *Biologie der Wassergewächse*, 1886, by Donald H. Les, Professor of Ecology and Evolutionary Biology at the University of Connecticut.

"... one of the most important general contributions ever made to the study of water plants..."

- Agnes Arber (1920) on Schenck's *Die Biologie der Wassergewächse*

### Introduction

The German scientific literature of the 19th century comprises an extensive collection of original, meticulous, and accurate botanical information. As an American graduate student in the 1980's, I was warned lightheartedly, "Never get too excited about your findings because a German botanist had probably made the same discovery a hundred years ago." Several semesters of graduate school German gave me access to this literature and revealed the impressive amount of botanical data that remained virtually inaccessible to most English speaking scientists. Unfortunately, this problem is exacerbated by the preeminence of the English language in the contemporary scientific literature, which in English speaking countries has perhaps reduced the need for fluency in the classical languages.

*Die Biologie der Wassergewächse* is an essential reference for students in the field of aquatic plant biology because it presents an insightful review of major research conducted during the 19th century, a period of intensive botanical investigation. Today, with a shift in emphasis to molecular and other laboratory based scientific research, basic studies of aquatic plant natural history have waned and this area is still best represented in the older literature. *Die Biologie der Wassergewächse* contains invaluable knowledge on this topic.

Unfortunately, Schenck's work has become increasingly forsaken in subsequent English language books written on aquatic plants. In *Water plants*<sup>1</sup> (1920), the first comprehensive monograph of aquatic plants to be published in English, *Die Biologie der Wassergewächse* is cited more than 25 times. However, in *The Biology of Aquatic Vascular Plants*<sup>2</sup> (1967), the work is cited only nine times and in *Limnological Botany*<sup>3</sup> (1975), it is not even mentioned.

The reduced citations are not simply due to obsolescence of subject matter, because much of the content remains accurate to this day. Moreover, Schenck's book provides an important historical perspective on the state of knowledge that existed in this branch of science during the 19th century. This book appeared in the aftermath of Darwin's *Origin of species* and presents some of the first characterizations of aquatic plant adaptations with evolutionary overtones.

<sup>1</sup>Arber, A. 1920. *Water plants: a study of aquatic angiosperms*. Cambridge: University Press.

<sup>2</sup>Sculthorpe, C. D. 1967. *The biology of aquatic vascular plants*. London: Edward Arnold (Publishers) Ltd.

<sup>3</sup>Hutchinson, G. E. 1975. *A treatise on limnology*. Volume 3: *Limnological botany*. New York: John Wiley & Sons.

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ISBN 3-906166-11-2, issued in hardcover with six pages of new introduction and eight pages of new appendix. \$57. Euro (US\$72.)

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Heinrich Schenck,

photog. 1889.



## Hunt Institute for Botanical Documentation

A Research Division of Carnegie Mellon University,  
Pittsburgh, Pennsylvania, <http://huntbot.andrew.cmu.edu>

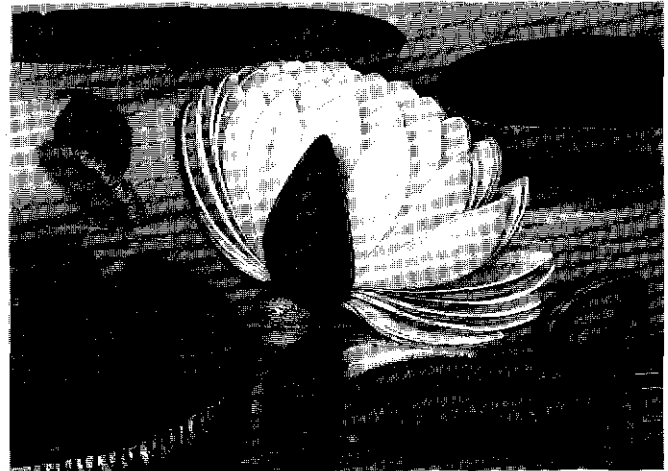
“RACHEL MCMASTERS MILLER HUNT’S collecting interests brought together aspects of art, history, science and literature as they related to plants and gardens. Her private book collection was well known, and her scholarship led her also to collect related artworks, portraits and manuscripts significant in the history of botany. Her collecting efforts, as well as those of the early Hunt Botanical Library staff, focused on publications and manuscripts from 1730 to 1840, a period of intense intellectual ferment and productivity in botanical history.”<sup>(1)</sup>

The Hunt Institute for Botanical Documentation specializes in the history of botany. Founded in 1961, the Institute is an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. It serves the international scientific community through research and documentation. The Institute maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other forms of information service. It serves the reference needs of biologists, historians, librarians, bibliographers and the interested public.

The Institute’s collections are curated by four departments: archives, art, bibliography, and the library. The current collections include approximately 28,000 books and botanical publications that date from the 1400s; 24,000 portraits and 30,000 watercolors, drawings and prints; manuscripts, with 2,000 items such as letters, journals and diaries, field notes, documents, drafts of published and unpublished books and articles, annotated maps, passports, and other personal papers of botanists.

Databases at the Hunt Institute include one of the world’s largest and most broadly representative collections of botanical art and illustration; the library, which is searchable via the Carnegie Mellon University Libraries’ online catalogues at <http://cameo.library.cmu.edu>; the Categorical Glossary for the Flora of North America Project; the Register of Original Botanical Art; the Portrait Collection; and databases pertaining to Linnaean dissertations. The Institute is in the process of formatting existing databases for the Web.

<sup>(1)</sup> Hunt Institute for Botanical Documentation web site at <http://huntbot.andrew.cmu.edu>



From John Fisk Allen’s *Victoria regia*, 1854. Courtesy of Hunt Institute.

## AGORA - Online access to research for low-income countries

AGORA, or Access to Global Online Research in Agriculture, is an initiative launched in October 2003 to provide free or low-cost online access to major scientific journals in agriculture and related biological, environmental and social sciences to public institutions in developing countries. Access to over 400 journals from leading academic publishers will be provided via AGORA. Led by the Food and Agriculture Organization (FAO) of the United Nations, the goal of AGORA is to increase the quality and effectiveness of agricultural research, education and training in low-income countries, with the long range goal of improving food security.

Founding publishers of AGORA are Blackwell, CABI, Elsevier, Kluwer Academic, Lippincott, Williams & Wilkins, Nature Publishing Group, Oxford University Press, Springer-Verlag, and John Wiley & Sons. Of the 400 plus journals being offered, the following are included: *American Journal of Botany*, *Annals of Botany*, *Annual Review of Plant Biology*, *Aquaculture*, *Aquatic Botany*, *Aquatic Ecology*, *Biological Control*, *Biological Invasions*, *Botanical Journal of the Linnean Society*, *Conservation Biology*, *Ecological Modelling*, *Environmental and Experimental Botany*,

*Freshwater Biology*, *Hydrobiologia*, *International Review of Hydrobiology*, *Journal of Ecology*, *Journal of Experimental Botany*, *Nature*, *New Phytologist*, *Oecologia*, *Plant Pathology*, *Remote Sensing of Environment*, *Science of the Total Environment*, *Weed Research*, and *Wetlands Ecology and Management*.

Access to AGORA will be password controlled and relevant institutions will be required to register with FAO. Approximately 70 eligible countries have been listed, primarily those with an annual GNI per capita per year of US\$1000 or less. The Publishing Partners reserve the right to amend the list. Within these countries, AGORA will benefit not-for-profit national academic, research or government institutions in agriculture and related biological, environmental and social sciences. This will include universities and colleges; research institutes; agricultural extension centers, government offices and libraries. A simple online form is all that is required to register for AGORA and only one form per institution is required.

To learn more about AGORA, go to:  
<http://www.aginternetwork.org/en/about.php>

## Look at the Web Sites, Complete the Crossword, Win a Prize!

The first 10 people (any state, any country) who return the correctly-completed crossword puzzle will win TWO sets of the four laminated plant-photomurals (<http://plants.ifas.ufl.edu/mural.html>) and an aquatic plant ID deck. This puzzle can be solved by referring to two web sites:

our original web site: <http://plants.ifas.ufl.edu> and our brand new one: <http://plants.ifas.ufl.edu/guide>

Read the clue, refer to the URL cited, find the answer, and fill it in. Photocopy your completed crossword puzzle at 100% and send it via snailmail to: CROSSWORD, Center for Aquatic and Invasive Plants, 7922 NW 71<sup>st</sup> Street, Gainesville, FL 32653 - USA.

### Across

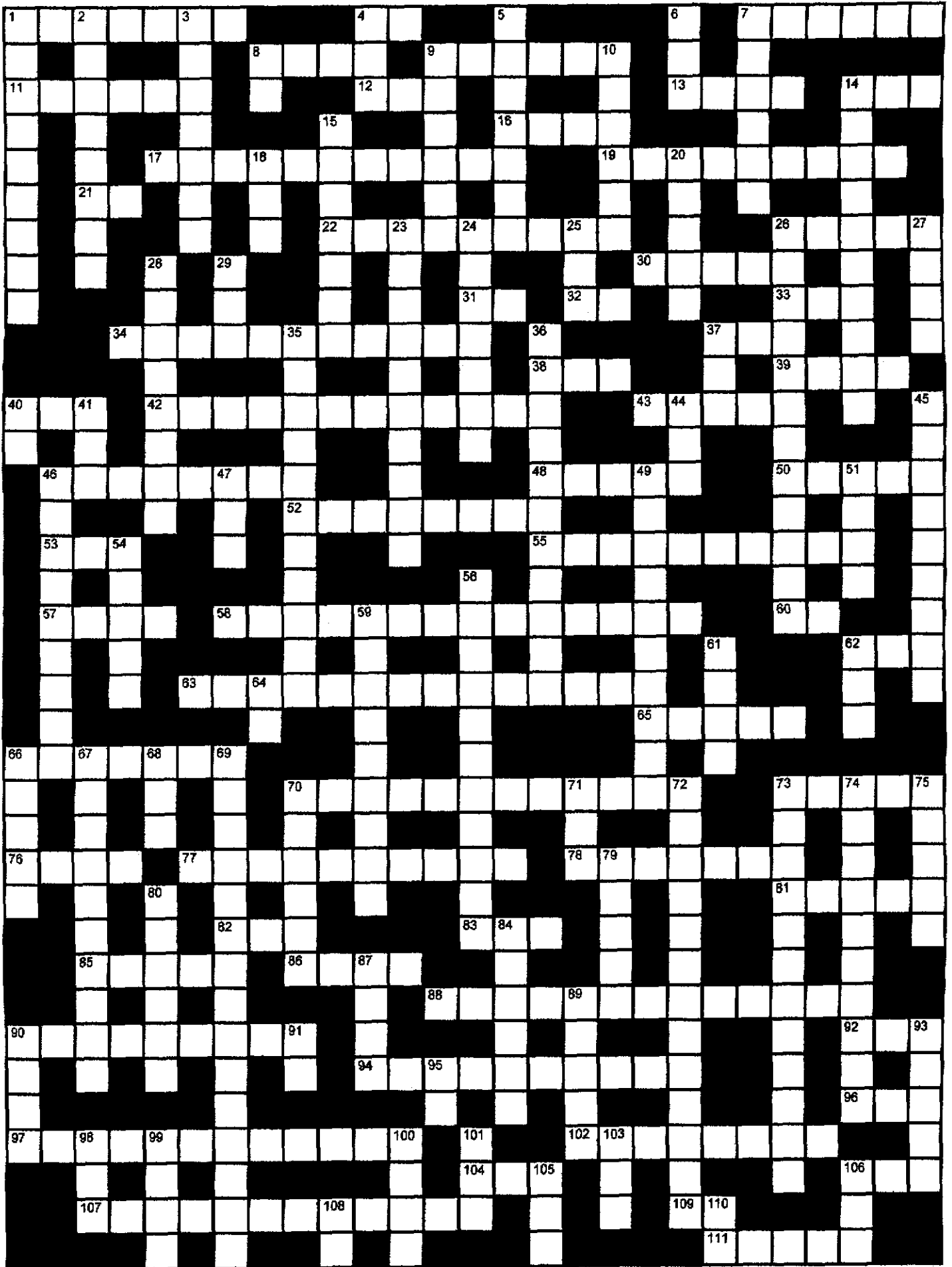
1. The Sunshine state
4. Weight, abb.
7. Used aquatic herbicide containers must be triple \_\_\_\_\_
8. Harvested plants left in a \_\_\_\_\_
11. Plants produce it for fish too
12. 2,000 lbs
13. Not hard water, but \_\_\_\_\_
14. A quagmire (...edu/gloss-b.html)
16. A kind of map
17. Famous Strand of orchids (...edu/gallery2.html)
19. *Vallisneria americana* (...edu/allplants.html)
21. A measure of weight
22. \_\_\_\_\_ flushing rate (...edu/guide/hyflrt.html)
26. Keeping the plant in its place
30. Bi-manual-powered craft
31. A DEP Regional Biologist (abb.)
32. Thousandth of a liter
33. \_\_\_\_\_-grass (...edu/cjapic.html)
34. \_\_\_\_\_ *americana* (...edu/vaampic.html)
37. At the end of a nozzle
38. Describes what's legal and what's not
39. Singular of number 26 Across
40. Lots of applicators in one place
42. Genus of beakrushes (...edu/rhynch.html)
43. Famous bacteria (...edu/guide/bacteria.html)
46. First author listed, From the Database, AQUAPHYTE, summer 2003 (...edu/auaph.html)
48. Tiny droplets going where you don't want them
50. One of these: ...edu/wthhydtub1.jpg
52. Leaves may be alternate, whorled, or \_\_\_\_\_
53. Not bottom, but \_\_\_\_\_
55. "Use rototiller-like blades to churn..." (...edu/guide/mechcons.html)
57. \_\_\_\_\_ of speed, \_\_\_\_\_ of application, \_\_\_\_\_ of flow
58. The most enriched state (...edu/guide/trophstate.html)
60. The \_\_\_\_\_ Johns River flows north in Florida.
62. The center of the hurricane
63. A National Wildlife Refuge (...edu/chassa.html)
65. Southern \_\_\_\_\_ (...edu/nagupic.html)
66. The sixth picture of "Some Florida Springs" (...edu/guide/springs.html)
70. *Panicum repens* (...edu/panrep.html)
73. The least enriched is \_\_\_\_\_ trophic (...edu/guide/trophstate.html)
76. Multiples of 2,000 lbs
77. Principles of knowledge and conduct (...edu/guide/whymanag.html)
78. A vine's little helper (...edu/gloss-tu.html)
81. Extension worker (<http://ifas.ufl.edu/extension/ces.html>)
82. A pair
83. A member of a pod
85. *Hygrophila polysperma*'s nickname
86. A plant where we don't want it

88. Alligator weed, \_\_\_\_\_ *philoxeroides* (...edu/alphpic.html)
90. The third category of threats listed on this page, ...edu/guide/humimpac.html
92. Humic acids can make the water \_\_\_\_\_-colored (...edu/guide/humacd.html)
94. Star-rush is a \_\_\_\_\_ species (...edu/dichpic.html)
96. The BPM is part of the \_\_\_\_\_
97. This Florida river has rapids! (...edu/hillsbor.html)
102. This page is about herbicide testing and \_\_\_\_\_; ...edu/guide/sup7herb.html
104. \_\_\_\_\_ root really does have \_\_\_\_\_ roots! (...edu/idthis.html)
106. To put into service
107. Amount of production over a given period of time (...edu/glosin9.html)
109. Sodium, on the periodic chart
111. The oldest \_\_\_\_\_ in the Western Hemisphere is at Ortona, Florida (...edu/guide/canals.html)

### Down

1. "Floating plants" is the plant type category at ...edu/\_\_\_\_\_ .html
2. \_\_\_\_\_ *filiformis* drawing at ...edu/oxyfl12.jpg
3. Leaves with large saw-like teeth (...edu/gloss-de.html)
4. Not dry
5. We're on a tectonic platform called the "Florida \_\_\_\_\_" (...edu/guide/geology.html)
6. 4.410 kg equals two \_\_\_\_\_ (...edu/o-conver.html)
7. St. Marks is a \_\_\_\_\_ (...edu/marks.html)
8. Point of View abb.
9. The anther to this question
10. Not from around here
14. 9th choice under "B", ...edu/photocom.html
15. Another common name for wild taro (...edu/coespic.html)
18. \_\_\_\_\_ boat, a necessity for APM in Florida (...edu/guide/geology.html)
20. Part of the corolla (...edu/gloss-p.html)
23. Lake Okeechobee is a \_\_\_\_\_ lake (...edu/guide/lakes.html)
24. Aeration is provided by an \_\_\_\_\_ (...edu/guide/physcons.html)
25. ...edu/guide/ipmanage.html is about \_\_\_\_\_
26. ...edu/guide/sup5herb.html is about use \_\_\_\_\_
27. Not a freshwater marsh, but a \_\_\_\_\_ marsh
28. Smooth, without hairs (...edu/gloss-fg.html)
29. Obligate abb. (A plant that requires water)
35. American cupscale grass, \_\_\_\_\_ *striata* (...edu/graplants.html)
36. Submersed *Utricularia* eats animals (...edu/photocom.html)
37. \_\_\_\_\_logy, \_\_\_\_\_diversity, \_\_\_\_\_tic, \_\_\_\_\_chemistry
40. Eighth most abundant natural element (...edu/guide/magnes.html)
41. Insect's nickname (...edu/guide/biocons.html)
44. What a harvester does (...edu/guide/mechcons.html)
45. Where aquatic plants are grown for sale
46. Not opposite or whorled leaves, but \_\_\_\_\_
47. Not even, but \_\_\_\_\_
49. Florida's native rare pondweed, *Potamogeton* \_\_\_\_\_ (...edu/photos.html)
51. In the job, the one above
54. Same as 20 down
56. ...edu/guide/invplant.html#invsteward - what this is about
59. *Eleocharis baldwinii* common name (...edu/photos.html)
61. Replenishes our lakes and rivers
62. To flow away
64. Arsenic in the periodic chart
66. Bunches of small feathers or hairs
67. The 14th picture on ...edu/subplants.html
68. What world does it come from: ...edu/lygod.html
69. Fall panic grass, *Panicum* \_\_\_\_\_ (...edu/allplants.html)
70. *Sapium sebiferum* is Chinese \_\_\_\_\_ (...edu/photos.html)
71. Large Florida snake likes river swamps (...edu/guide/snakes.html)
72. Dead plants fall to the bottom in the process of \_\_\_\_\_
73. Shaped like a lance point reversed (...edu/gloss-no.html)
74. When several management methods are used at once, they are (or ought to be) \_\_\_\_\_ (...edu/guide/ipmanage.html)
75. Egg-shaped (...edu/gloss-no.html)
79. "There's no hydrilla because the grass carp have \_\_\_\_\_ it."
80. Hydrilla tuber weevil, \_\_\_\_\_ *affinis* (...edu/guide/biocons.html)
84. Having a smooth leaf margin (...edu/gloss-de.html)
87. *Sisyrinchium* is blue-\_\_\_\_\_ (...edu/sisang.html)
89. Member of a clone (...edu/gloss-gr.html)
90. Soft, spongy center of the stem (...edu/gloss-p.html)
91. Scientific abb. for nickel
93. Tropical soda \_\_\_\_\_ (...edu/allplants.html)
95. Scientific abb. for copper
98. A petal might have one \_\_\_\_\_ (...edu/gloss-km.html#123)
99. Where the equipment is repaired
100. Might be found at the ligule
101. Not wet
103. Invert ingredient
105. 24 hours
106. A web address
108. Not out
110. You wish you had on an airboat





## FROM THE DATABASE

Here is a sampling of the research articles, books and reports which have been entered into the aquatic, wetland and invasive plant database since Summer 2003.

The database contains more than 61,000 citations. To use the free APIRS database online, go to <http://plants.ifas.ufl.edu/> and click on APIRS Online Database.

To obtain articles, contact your nearest state or university library, or a

**Armstrong, N., Planas, D., Prepas, E.**  
Potential for estimating macrophyte surface area from biomass.  
AQUAT. BOT. 75(2):173-179 2003

**Arora, A., Singh, P. K.**  
Comparisons of biomass productivity and nitrogen fixing potential of *Azolla* spp.  
BIOMASS AND BIOENERGY 24(3):175-178 2003

**Azim, M.E., Wahab, M.A.**  
Development of a duckweed-fed carp polyculture system in Bangladesh.  
AQUACULTURE 218(1-4):425-438 2003

**Balestri, E., Cinelli, F.**  
Sexual reproductive success in *Posidonia oceanica*.  
AQUAT. BOT. 75(1):21-32 2003

**Baret, S., Nicolini, E., Le Bourgeois, T., Strasberg, D.**  
Developmental patterns of the invasive bramble (*Rubus alceifolius* Poiret, Rosaceae) in Reunion Island: an architectural and morphometric analysis.  
ANN. BOT. 91(1):39-48 2003

**Bell, C.E.**  
Invasive plants of horticultural origin.  
HORTSCIENCE 38:14-16 2003

**Bennett, A.C.**  
Alligator weed (*Alternanthera philoxeroides*) control in Florida sugarcane.  
IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P. 7 (ABSTRACT) 2003

**Bouffin, C., Jobin, B., Belanger, L.**  
Importance of riparian habitats to flora conservation in farming landscapes of southern Quebec, Canada.  
AGRIC., ECOSYSTEMS, AND ENVIRON. 94(1):73-87 2003

**Brewin, L. E., Mehra, A., Lynch, P.T., Farago, M.E.**  
Mechanisms of copper tolerance by *Armeria maritima* in Dolfrwynog Bog, North Wales - initial studies.  
ENVIRON. GEOCHEM. AND HEALTH 25(1):147-156 2003

**Brown, R. L., Peet, R. K.**  
Diversity and invasibility of southern Appalachian plant communities.  
ECOLOGY 84(1):32-39 2003

**Burundukova, O.L., Zburavlev, Y.N., Solopov, N.V., P'yankov, V.I.**  
A method for calculating the volume and surface area in rice mesophyll cells.  
RUSSIAN J. PLANT PHYSIOL. 50(1):133-139 2003

**Campbell, D., Rochefort, L., Lavoie, C.**  
Determining the immigration potential of plants colonizing disturbed environments: the case of milled peatlands in Quebec.  
J. APPL. ECOL. 40(1):78-91 2003

**Campbell, M.H., Nicol, H.I.**  
Germination, emergence, growth, ecotypes and control of *Carex appressa* R. br. (Tussock sedge).  
AUSTR. J. EXPER. AGRIC. 42(1):27-36 2002

**Center, T.D., Hill, M.P.**  
Field efficacy and predicted host range of the pickerelweed borer, *Bellura densa*, a potential biological control agent of water hyacinth.  
BIOCONTROL 47(2):231-243 2002

**Chandramohan, S., Charudattan, R., Devalerio, J.T., Hanlon, C.**  
Use of a multiple-pathogen bioherbicide system for integrated management of torpedograss.  
IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL. 43, ED. R.J. KREMER, JACKSONVILLE, FL, P.58 (ABSTRACT) 2003

**Chandrasena, N., Pinto, L., Sim, R.**  
Reclaiming Botany Wetlands, Sydney through integrated management of *Ludwigia peruviana* and other weeds.  
IN: PAPERS AND PROC., 13TH AUSTRALIAN WEEDS CONF., EDS. H. SPAFFORD JACOB, J. DODD, ET AL, SEPT. 8-13, PERTH, WESTERN AUSTRALIA, PLANT PROT. SOC. WESTERN AUSTRALIA, PP. 134-137 2002

**Chornesky, E.A., Randall, J.M.**  
The threat of invasive alien species to biological diversity: setting a future course.  
ANN. MISSOURI BOT. GARD. 90(1):67-76 2003

**Colmer, T.D.**  
Long-distance transport of gases in plants: a perspective on internal aeration and radial loss from roots.  
PLANT, CELL AND ENVIRON. 26:17-36 2003

**Coops, H., Van Nes, E.H., Van Den Berg, M.S., Butijn, G.D.**  
Promoting low-canopy macrophytes to compromise conservation and recreational navigation in a shallow lake.  
AQUAT. ECOL. 36:483-492 2002

**Cuda, J.P., Dunford, J.C., Macdonald, G.E., Langeland, K.A., et al**  
Torpedograss, *Panicum repens* L. (Poaceae): prognosis for classical biological control in the southeastern United States.  
IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.29 (ABSTRACT) 2003

**Cui, L.-H., Luo, S.-M., Zhu, X.-Z., Liu, Y.-H.**  
Treatment and utilization of septic tank effluent using vertical-flow constructed wetlands and vegetable hydroponics.  
J. ENVIRON. SCI. 15(1):75-82 2003

**Davies, J., Honegger, J.I., Tencalla, F.G., Meregalli, G., et al**  
Herbicide risk assessment for non-target aquatic plants: sulfosulfuron - a case study.  
PEST MANAG SCI 59(2):231-237 2003

**De Groote, H., Ajuonu, O., Attignon, S., Djessou, R., et al**  
Economic impact of biological control of water hyacinth in southern Benin.  
ECOL. ECONOMICS 45:105-117 2003

**Demierre, A., Perfetta, J.**

Macrophyte harvesting management in Lake Geneva (Switzerland).

IN: PROC. 11TH EWRS (EURO. WEED RES. SOC.) INTL. SYMP. AQUATIC WEEDS, SEPT. 2-6, EDS. A. DUTARTRE & M.-H. MONTEL, MOLIETS ET MAA, FRANCE, PP. 345-347 (IN FRENCH, ENGLISH SUMMARY) 2002

**De Troch, M., Fiers, F., Vincx, M.**

Niche segregation and habitat specialisation of harpacticoid copepods in a tropical seagrass bed.

MAR. BIOL. 142(2):345-355 2003

**Earl, H.J., Ferrell, J.A., Vencill, W.K.**

Physiological response of yellow nutsedge to systemic and contact herbicides.

IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.77 (ABSTRACT) 2003

**Eckert, C.G., Lui, K., Bronson, K., Corradini, P., et al**

Population genetic consequences of extreme variation in sexual and clonal reproduction in an aquatic plant.

MOL. ECOL. 12(2):331-344 2003

**Estime, L., O'Shea, M., Borst, M., Gerrity, J., et al**

Effect of phosphorus concentration on the growth of cattail callus cells.

J. PLANT NUTRITION 26(3):691-707 2003

**Filizadeh, Y., Murphy, K.J.**

Response of sago pondweed to combinations of low doses of diquat, cutting, and shade.

J. AQUATIC PLANT MANAGE. 40:72-76 2002

**Fosman, N.E., Sutton, D.L.**

Surface micromorphology of torpedograss (*Panicum repens*), and three native, emerged aquatic plants in relation to application of glyphosate.

IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.14 (ABSTRACT) 2003

**Fowler, L., Caton, B.P., Fowler, G., Fieselmann, D.A., et al**

Creation of a prioritization model to identify weeds of global significance.

IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P. 15 (ABSTRACT) 2003

**Gaskin, J.F.**

Molecular systematics and the control of invasive plants: a case study of *Tamarix* (Tamaricaceae).

ANN. MISSOURI BOT. GARD. 90(1):109-118 2003

**Gichuki, J., Dahdouh Guebas, F., Mugo, J., Rabuor, C.O., et al**

Species inventory and the local uses of the plants and fishes of the Lower Sondu Miriu wetland of Lake Victoria, Kenya.

HYDROBIOLOGIA 458:99-106 2001

**Gopal, B., Zutshi, D.P., Van Duzer, C.**

Floating islands in India: control or conserve?

INTERNAT'L. J. ECOL. ENVIRON. SCI. 29:157-169 2003

**Hammerli, A., Reusch, T.B.H.**

Inbreeding depression influences genet size distribution in a marine angiosperm.

MOLECULAR ECOL. 12(3):619-629 2003

**Hauxwell, J., Cebrian, J., Valiela, I.**

Eelgrass *Zostera marina* loss in temperate estuaries: relationship to land-derived nitrogen loads and effect of light limitation imposed by algae.

MAR. ECOL. PROG. SER. 247:59-73 2003

**Hellsten, S., Ahonen, H., Dieme, C., Diouf, S., et al**

Efficiency of a weed cutting boat for controlling *Typha australis* in the River Senegal: re-growth potential in relation to timing and cutting depth.

IN: PROC. 11TH EWRS (EURO. WEED RES. SOC.) INTL. SYMP. AQUATIC WEEDS, SEPT. 2-6, EDS. A. DUTARTRE & M.-H. MONTEL, MOLIETS ET MAA, FRANCE, PP. 367-370 2002

**Hill, M.P., Oberholzer, I.G.**

Laboratory host range testing of the flea beetle, *Pseudolampsis guttata* (Leconte) (Coleoptera: Chrysomelidae), a potential natural enemy for red water fern, *Azolla filiculoides* Lamarck (Pteridophyta: Azollaceae) in South Africa.

COLEOPTERISTS BULL. 56(1):79-83 2002

**Holt, J.S., Tayyar, R., Khudamrongsawat, J.**

Genetic diversity of giant reed in the Santa Ana River, California.

IN: WSSA ABSTRACTS, MEETING OF THE

WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.62 (ABSTRACT) 2003

**Huong, T.T.L., Vermaat, J.E., Terrados, J., Tien, N.V., et al**

Seasonality and depth zonation of intertidal *Halophila ovalis* and *Zostera japonica* in Ha Long Bay (Northern Vietnam).

AQUATIC BOT. 75(2):147-157 2003

**Jackson, M.B., Ram, P.C.**

Physiological and molecular basis of susceptibility and tolerance of rice plants to complete submergence.

ANN. BOT. 91:227-241 2003

**Jager-Zurn, I.**

The occurrence of apical septum in the ovary of *Rhynholacis*, *Apinagia*, *Marrathrum* and *Mourera* (Podostemoideae - Podostemaceae): taxonomic implications.

BOT. JAHRB. SYST. 124(3):303-324 2003

**James, W.F., Barko, J.W., Eakin, H.L.**

Water quality impacts of mechanical shredding of aquatic macrophytes.

J. AQUAT. PLANT MANAGE. 40:36-42 2002

**Jose, S., Cox, J., Miller, D.L., Shilling, D.G., et al**

Alien plant invasions: the story of cogon-grass in southeastern forests.

J. FORESTRY 100(1):41-44 2002

**Kahara, S.N., Vermaat, J.E.**

The effect of alkalinity on photosynthesis-light curves and inorganic carbon extraction capacity of freshwater macrophytes.

AQUATIC BOT. 75(3):217-227 2003

**Kato-Noguchi, H., Kugimiya, T.**

Preferential induction of alcohol dehydrogenase in coleoptiles of rice seedlings germinated in submergence condition.

BIOLOGIA PLANTARUM 46(1):153-155 2003

**Kellogg, C.H., Bridgham, S.D., Leicht, S.A.**

Effects of water level, shade and time on germination and growth of freshwater marsh plants along a simulated successional gradient.

J. ECOL. 91:274-282 2003

**Kellogg, L.E., Bridgham, S.D.**

Phosphorus retention and movement across an ombrotrophic-minerotrophic peatland gradient.

BIOGEOCHEMISTRY 63:299-315 2003

**Keppner, E.J., Keppner, L.A.**

Biology and conservation status of smoothbark St. John's-wort.

BAY COUNTY AUDUBON SOCIETY, FLORIDA, 29 PP. 2001

**Koschnick, T.J., Haller, W.T.**

Effects of endothall in irrigation water on selected turf and ornamental species.

IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.72 (ABSTRACT) 2003

**Lalke-Porczyk, E., Donderski, W.**

Distribution of epiphytic bacteria on the surface of selected species of helophytes and nymphoides from the littoral zone of the southern part of Jeziorak Lake in Poland.

POLISH J. ENVIRON. STUDIES 12(1):83-93 2003

**Lass, L.W., Prather, T.S.**

Improving the detection of Brazilian pepper with geo-spatial enhancement of hyperspectral remote sensing imagery.

IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.13 (ABSTRACT) 2003

**Leslie, A.J., Spotila, J.R.**

Alien plant threatens Nile crocodile (*Crocodylus niloticus*) breeding in Lake St. Lucia, South Africa.

BIOL. CONSERV. 98(3):347-355 2001

**Limpens, J., Berendse, F., Klees, H.**

N deposition affects N availability in interstitial water, growth of sphagnum and invasion of vascular plants in bog vegetation.

NEW PHYTOL. 157(2):339-347 2003

**Mack, R.N.**

The United States naturalized flora: largely the product of deliberate introductions.

ANN. MISSOURI BOT. GARD. 89:176-189 2002

**Marion, L., Paillisson, J.-M.**

A mass balance assessment of the contribution of floating-leaved macrophytes in

nutrient stocks in an eutrophic macrophyte-dominated lake.

AQUATIC BOT. 75(3):249-260 2003

**McKinney, M.L.**

Influence of settlement time, human population, park shape and age, visitation and roads on the number of alien plant species in protected areas in the USA.

DIVERSITY AND DISTRIB. 8(6):311-318 2002

**Michel, A., Dayan, F.E., Netherland, M.D., Scheffler, B.E.**

Resistance to PDS-inhibitors in an invasive aquatic weed species.

IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.89-90 (ABSTRACT) 2003

**Mille-Lindblom, C., Tranvik, L.J.**

Antagonism between bacteria and fungi on decomposing aquatic plant litter.

MICROB. ECOL. 45(2):173-182 2003

**Mueller, T., Robinson, D.K., Main, C.L., Beeler, J.E., et al**

Chinese yam (*Dioscorea oppositifolia* L.) in the Great Smoky Mountains National Park.

IN: ABSTRACTS, 4TH ANNU. SYMP., SOUTH-EAST EXOTIC PEST PLANT COUNCIL, APR. 3-5, NASHVILLE, TN, PP. 17-18 (ABSTRACT) 2002

**Nobbs, M.**

Effects of vegetation differ among three species of fiddler crabs (*Uca* spp.)

J. EXP. MAR. BIOL. ECOL. 284(1-2):41-50 2003

**Norton, D.A., De Lange, P.J.**

Fire and vegetation in a temperate peat bog: implications for the management of threatened species.

CONSERV. BIOL. 17(1):138-148 2003

**Orth, R.J., Fishman, J.R., Harwell, M.C., Marion, S.R.**

Seed-density effects on germination and initial seedling establishment in eelgrass *Zostera marina* in the Chesapeake Bay region.

MAR. ECOL. PROG. SER. 250:71-79 2003

**Pahl, J.W., Mendelssohn, I.A., Henry, C.B., Hess, T.J.**

Recovery trajectories after *in situ* burning of an oiled wetland in coastal Louisiana, USA.

ENVIRON. MANAGE. 31(2):236-251 2003

**Paling, E.I., Van Keulen, M., Wheeler, K.D., Phillips, J., et al**

Influence of spacing on mechanically transplanted seagrass survival in a high wave energy regime.

RESTORATION ECOL. 11(1):56-61 2003

**Peralta, G., Bouma, T.J., Van Soelen, J., Perez-Ilorens, J.L., et al**

On the use of sediment fertilization for seagrass restoration: a mesocosm study on *Zostera marina* L.

AQUATIC BOT. 75:95-110 2003

**Pinheiro, P., Ferreira, T., Franco, A., Moreira, I.**

Radio-tracking movements of grass carp in irrigation channels.

IN: PROC. 11TH EWRS (EURO. WEED RES. SOC.) INTL. SYMP. AQUATIC WEEDS, SEPT. 2-6, EDS. A. DUTARTRE & M.-H. MONTEL, MOLIETS ET MAA, FRANCE, PP. 385-388 2002

**Pitelli, R.A., Reis, R.A., Pitelli, R.L.C.M.**  
*Brachiaria decumbens*, a major exotic invasive plant in Brazil.

IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.23 (ABSTRACT) 2003

**Pot, R.**

Invasion and management of floating pennywort (*Hydrocotyle ranunculoides* L.f.) and some other alien species in The Netherlands.

IN: PROC. 11TH EWRS (EURO. WEED RES. SOC.) INTL. SYMP. AQUATIC WEEDS, SEPT. 2-6, EDS. A. DUTARTRE & M.-H. MONTEL, MOLIETS ET MAA, FRANCE, PP. 435-438 2002

**Pro, J., Ortiz, J.A., Boleas, S., Fernandez, C., et al**

Effect of assessment of antimicrobial pharmaceuticals on the aquatic plant *Lemna minor*.

BULL. ENVIRON. CONTAM. TOXICOL. 70(2):290-295 2003

**Puri, A., MacDonald, G.E., Haller, W.T.**  
Investigations into fluridone tolerance in selected hydrilla [*Hydrilla verticillata* (L.f.) Royle] populations.

IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.89 (ABSTRACT) 2003

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## MEETINGS

### **WEED SCIENCE 2004 - WEED SCIENCE SOCIETY OF AMERICA (WSSA) ANNUAL MEETING.** **February 9-12, 2004. Westin Crown Center, Kansas City, MO.**

Includes an Invasive Plant Species Workshop, February 12-13, 2004.

Contact: <http://www.wssa.net>

### **13th ANNUAL SOUTHEASTERN LAKE MANAGEMENT CONFERENCE** **presented by The North American Lake Management Society (NALMS).**

**March 7-9, 2004. Wild Dunes Resort, Isle of Palms, SC.**

Hosted by the Lake and Watershed Association of South Carolina, the theme for this meeting is "Working Together - Sharing Resources." Conference, technical workshops and field trips to local projects.

Contact: Suzanne Thomas-Cole, LWASC, POBox 0176, FairPlay, SC 29643, Phone: 864-287-3297; FAX: 864-287-9641;

E-mail: [suzycote@msn.com](mailto:suzycote@msn.com)

### **65th ANNUAL MEETING OF THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS (ASB).** **April 14-17, 2004. Memphis, TN.**

Contact: WWW: <http://www.people.memphis.edu/~biology/asb/>

### **17th ANNUAL NATIONAL CONFERENCE ON ENHANCING THE STATES' LAKE MANAGEMENT PROGRAMS MONITORING LAKES AND RESERVOIRS.**

**April 20 - 23, 2004. Congress Plaza Hotel, Chicago, IL.**

Cosponsored by the Chicago Botanic Garden, U.S. Environmental Protection Agency, and North American Lake Management Society.

Contact: Bob Kirschner, Chicago Botanic Garden, E-mail: [bkirschn@chicagobotanic.org](mailto:bkirschn@chicagobotanic.org) WWW: <http://www.nalms.org>

### **19TH ANNUAL FLEPPC AND 6TH ANNUAL SE-EPPC JOINT SYMPOSIUM.**

**April 28-30, 2004. Clarion Conference Center, Pensacola Beach, Florida.**

"West of Eden" - Where research, policy and practice meet just steps away from the warm waters of the Gulf of Mexico.

Contact: WWW: <http://www.fleppc.org> or <http://www.se-eppc.org>

### **2004 AQUATIC WEED SHORT COURSE.**

**May 4-7, 2004. Fort Lauderdale, Florida.**

Aquatic, Upland and Invasive Weed Control; Aquatic Plant Identification. A new concurrent session will focus on first time attendees with a morning of equipment calibration training and an afternoon of Aquatic and Natural Area weed control training.

Contact: Tyler J. Koschnick, Center for Aquatic and Invasive Plants, IFAS, University of Florida phone: (352) 392-5126 / FAX: (352) 392-3462 E-mail: [tjkoschnick@ifas.ufl.edu](mailto:tjkoschnick@ifas.ufl.edu) WWW: <http://conference.ifas.ufl.edu/aw/>

### **NUTRIENT MANAGEMENT IN AGRICULTURAL WATERSHEDS - A WETLANDS SOLUTION.**

**May 24-26, 2004. Teagasc Research Centre, County Wexford, Ireland.**

Co-hosted by the UF/IFAS Soil and Water Science Department and the Teagasc Research Centre in County Wexford, Ireland. Designed to bring together leading international scientists, managers, regulators and engineers to critically summarize and evaluate state-of-the-art research on wetlands for water quality improvement, with special emphasis on agricultural catchments. Space limited to 150 attendees.

Contact: Sharon Borneman, 352/392-5930 E-mail: [spborneman@ifas.ufl.edu](mailto:spborneman@ifas.ufl.edu) WWW: <http://conference.ifas.ufl.edu/nutrient/>

### **SECOND LATIN-AMERICAN SHORT COURSE ON BIOLOGICAL CONTROL OF WEEDS.**

**June 7-10, 2004. Barcelo Hotel, Montelimar, Nicaragua.**

Organized by the University of Florida in cooperation with the Universidad Nacional Agraria of Nicaragua. Short course will provide participants with a basic understanding of the principles and concepts of biological control of weeds using insects and pathogens. Participants will receive training in the procedures involved in the implementation of a weed biocontrol program. Group discussions will focus on the prospects for and limitations of biological weed control in the Latin-American region. Conference will be in Spanish.

Contact: Dr. Julio Medal, Course Coordinator, E-mail: [medal@ifas.ufl.edu](mailto:medal@ifas.ufl.edu) WWW: <http://biocontrol.ifas.ufl.edu/materials/nicaragua.htm>

**15<sup>th</sup> ANNUAL MEETING, FLORIDA LAKE MANAGEMENT SOCIETY (FLMS).****June 7-10, 2004, Saddlebrook Resort, Tampa, FL.**

"A Tale of Many Waters: Florida's Limnic Resources" is the theme for this year's conference. The meeting site is a 480 acre natural Florida wetland and uplands site, with "walking villages" around the 82,000 square foot meeting facility. The conference will include a full day of workshops on June 7<sup>th</sup>.

Contact: Dr. Jim Griffin, Conference Chairman, E-mail: [jim.griffin@swfwmd.state.fl.us](mailto:jim.griffin@swfwmd.state.fl.us) or 800-423-1476 x4286

**44th ANNUAL MEETING, AQUATIC PLANT MANAGEMENT SOCIETY (APMS).****July 11-14, 2004, Hyatt Regency, Tampa, FL.**

Contact: WWW: <http://www.apms.org/>

**13th INTERNATIONAL CONFERENCE ON AQUATIC INVASIVE SPECIES.****September 19-23, 2004, Ennis, County Clare, Ireland.**

Contact: Elizabeth Muckle-Jeffs, E-mail: [profedge@renc.igs.net](mailto:profedge@renc.igs.net) WWW: <http://www.aquatic-invasive-species-conference.org/>

**8th CONFERENCE OF THE INTERNATIONAL SOCIETY FOR PLANT ANAEROBIOSIS (ISPA).****September 20-24, 2004, Perth, Western Australia.**

The ISPA is composed of scientists interested in the mechanisms of acclimation and adaptation of plants to poorly aerated environments. Plants studied include those inhabiting marine, aquatic, salt marsh, and wetland environments; and terrestrial ecosystems subjected to seasonal episodes of waterlogging or submergence (including crop species and agricultural systems).

Contact: Tim Colmer, University of Western Australia, School of Plant Biology, 35 Stirling Highway, Crawley 6009 WA, Australia, E-mail: [tdcolmer@cyllene.uwa.edu.au](mailto:tdcolmer@cyllene.uwa.edu.au) WWW: <http://www.ibba.cnr.it/ispa/>

**31<sup>st</sup> NATURAL AREAS ASSOCIATION.****October 13-16, 2004, Holiday Inn Mart Plaza, Chicago, IL.**

*Emerging issues: Possibilities & Perils* is the theme of the 2004 meeting. Symposia and plenary sessions will focus on emerging problems and creative strategies to preserve biological resources for the future.

Contact: WWW: <http://www.naturalarea.org/>

**24th INTERNATIONAL SYMPOSIUM - NALMS 2004 (NORTH AMERICAN LAKE MANAGEMENT SOCIETY)****November 3-5, 2004, Victoria, British Columbia, Canada.**

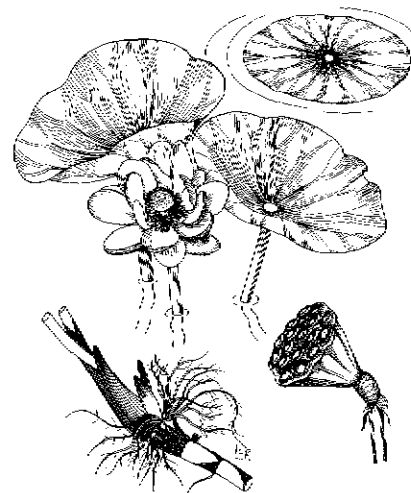
Contact: NALMS, PO Box 5443, Madison, WI 53705-0443, (608)233-2836; Fax: (608)233-3186. E-mail: [nalms@nalms.org](mailto:nalms@nalms.org) WWW: <http://www.nalms.org/>

**Sanshui's Lotus World**

**Sanshui's Lotus World** is the largest lotus ecological park in the world, which has exclusively integrated buildings, sculpture and lotus culture. The facility was founded by the Xinan town government of Sanshui under the guidance of professors Wang Qichao and Zhang Xingyan of the China Lotus Research Center. At present, there are over 300 varieties of lotus planted within, including "Space lotus" cultivated from air space and "Ancient lotus" cultivated from Liaoning province. Visitors can enjoy the park by bus or on foot, or canoe among the lotuses and pick flowers or roots. One can enjoy a lotus dinner of fresh lotus leaves, seeds and roots and take in the daily song and dance drama, "Lotus Fairy," which tells of an old but beautiful lotus fairy and a lotus root boy who loved each other and jointly fought against devils and sirens for their future happiness together. Lotus World has farmhouse-like villas as well as elegant and tranquil auditoriums to accommodate up to 400 people.

For more information, go to:

[http://www.foshan.gov.cn/english/02\\_travelling/01\\_lyjd/02\\_lyjd\\_15\\_slw.htm](http://www.foshan.gov.cn/english/02_travelling/01_lyjd/02_lyjd_15_slw.htm)



*Nelumbo lutea*  
American lotus

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## AQUAPHYTE

**AQUAPHYTE** is the newsletter of the Center for Aquatic and Invasive Plants and the Aquatic, Wetland and Invasive Plant Information Retrieval System (**APIRS**) of the University of Florida Institute of Food and Agricultural Sciences (IFAS). Support for the information system is provided by the Florida Department of Environmental Protection, the U.S. Army Corps of Engineers Waterways Experiment Station Aquatic Plant Control Research Program (APCRP), the St. Johns River Water Management District and UF/IFAS.

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Karen Brown

**AQUAPHYTE** is sent to managers, researchers and agencies in 71 countries around the world. Comments, announcements, news items and other information relevant to aquatic and invasive plant research are solicited.

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Regular features of each issue include **Books/Reports; Meetings; and From the Database**, which provides a sampling of new additions to the Aquatic, Wetland and Invasive Plant Information Retrieval System (**APIRS**) database. We also keep readers informed of other important developments in the world-wide field of aquatic and wetland plants, and invasive upland plants in Florida.

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Florida law (FSS 283.55) requires that we purge our mailing list every other year.  
We will be deleting individuals who do not respond by June 1, 2004.