

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,
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Over The Top!

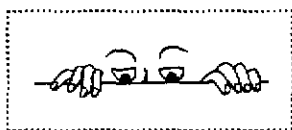
<http://plants.ifas.ufl.edu>

During the summer of 2002, the APIRS web site attained a cyber milestone: we now receive more than 1 million hits per month. ("Hits" are defined as pages viewed.) We know this because our brand new Sun/Unix dual processor server tells us so. It also tells us that most people access our web site on Tuesdays between 11 AM and 2 PM. (Nonetheless, about 120,000 hits/month occur between midnight and 4 AM: pings from our users on the other side of the planet no doubt.) The most popular pages on our 7,000-page web site include our plant photopages (twice as many hits as any others); our line drawings pages; our Sea Grant sponsored pages; aquatic birds pages; and our online glossary.

The online APIRS database receives around 2,100 hits per month, which is quite high considering the rigmarole users must go through to use it. By January 2003, the database should be accessible through a new web-style interface that will make it easier to use.

Note:

See the new feature, APIRS Picks, on page 15.



Hydrilla in Guatemala

Dr. William Haller, University of Florida, Center for Aquatic and Invasive Plants, recently visited Guatemala as a USAID (United States Agency for International Development) consultant to evaluate the current status and potential problems of *Hydrilla verticillata* in that country. Following are excerpts from his final report.

The native home of hydrilla is not known with certainty. Cook reports that he believes hydrilla is native to the Indian subcontinent which is particularly rich in Hydrocharitaceae species, but is not strongly opposed to the theory that hydrilla may be native to east Africa. Hydrilla also was reported in Europe early in the 1900s, and most recently in Poland and Lithuania, but only isolated and small populations currently exist. Though classified as a single taxonomic species worldwide, recent enzymatic and DNA analyses suggest the existence of several "types" of hydrilla including monoecious and dioecious plants (Madeira et al. 1997). Hydrilla produces excessive growth, causing problems in the western hemisphere, Asia and Australia, but it is not a problem in Europe and Africa.

Dr. Margaret Dix, University del Valle, indicated that she had collected hydrilla outside the Polochic watershed in Guatemala in approximately 1990. Fishermen noted that hydrilla was first observed in Lake Izabal in approximately 2000. This date seems correct based upon the current characteristics of the distribution in Lake Izabal. Hydrilla now occurs in many locations, with some areas of growth approaching 400-500 acres in size, and other areas of less than 1 acre, suggesting that hydrilla is in an early colonization mode. Likely, hydrilla was present in the watershed, in a pond or isolated area, in 1998 when flood water from Hurricane Mitch moved it into the lake.

In Florida, the "type" of hydrilla is the dioecious female plant which only produces female flowers twice a year near the fall and spring equinox. Hydrilla in Lake Izabal was flowering during early September 2002 and no rhizomes suggestive of tuber production were located. Consequently I believe that the hydrilla in Lake Izabal is the same type as that in Florida, Texas, Mexico and Panama. This could be confirmed by planting hydrilla in shallow pans in October to determine if tuber production occurs during October through April, indicative of dioecious female plants in the southern USA where hydrilla produces tubers during short day conditions (<12-13 hours of day length).

Hydrilla in Lake Izabal

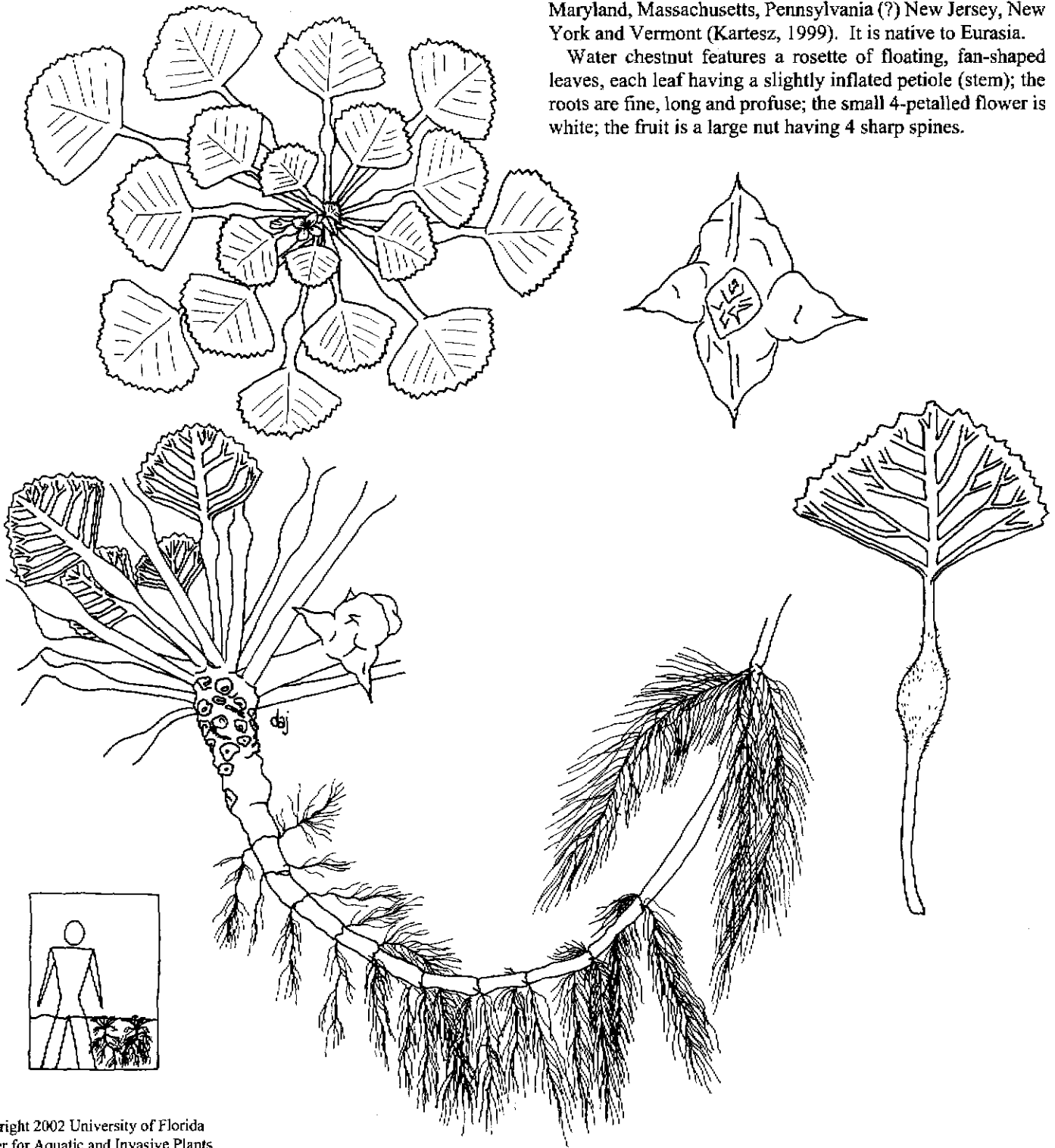
Recent surveys conducted by Alejandro Arrivillaga for the Scientific Commission and CONAP (Consejo Nacional de Areas Protegidas) show over 2,000 ha (5,000 acres) currently growing in the 170,000 acre lake. The lake is sustained by several rivers, primarily the Polochic entering Lake Izabal from the west. The lake outlet to the east is a heavily populated area, the Rio Dulce, which after approximately 3-4 miles widens into the Golfete. The Golfete is a large (approximately 15,000 acre) shallow, tidally influenced area which contains a manatee preserve and is largely surrounded by public lands. Further east, the Golfete narrows

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Water chestnut, *Trapa natans*
<http://plants.ifas.ufl.edu/tranat.html>

This invasive non-native is present in Delaware, Virginia, Maryland, Massachusetts, Pennsylvania (?) New Jersey, New York and Vermont (Kartesz, 1999). It is native to Eurasia.

Water chestnut features a rosette of floating, fan-shaped leaves, each leaf having a slightly inflated petiole (stem); the roots are fine, long and profuse; the small 4-petaled flower is white; the fruit is a large nut having 4 sharp spines.



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European frog-bit, *Hydrocharis morsus-ranae*
<http://plants.ifas.ufl.edu/hydmor.html>

This invasive non-native is present in shallow, slow-moving waters of New York, Quebec and Ontario (Kartesz, 1999). It was introduced from Europe.

European frog-bit leaves may be floating or emersed. The heart-shaped leaves are on long stems. The single 3-petaled flower is white. This plant looks similar to the native American frog-bit, *Limnobium spongia*.



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Tempest Invades a Teapot

Following are excerpts from the *Bulletin of the Ecological Society of America* which form a dialog regarding use of the term *invader* in the field of ecology. The ESA Bulletin publishes "letters, longer commentaries, and philosophical and methodological items related to the science of ecology." The Ecological Society of America also publishes the journals *Ecology*, *Ecological Monographs*, and *Ecological Applications*. For more information, go to <http://www.esa.org/>

From "Eight Ways to be a Colonizer; Two Ways to be an Invader: A Proposed Nomenclature Scheme for Invasion Ecology" by M.A. Davis and K. Thompson, ESA Bulletin 81(3), July 2000, "We believe that inconsistent and imprecise use of invasion terminology is one factor that is contributing to the ongoing difficulties of the field. . . . Depending on the author, a species in the invasion literature might be referred to as *alien*, *exotic*, *invasive*, *nonindigenous*, *imported*, *weedy*, *introduced*, *non-native*, *immigrant*, *colonizer*, *native*, *naturalized*, *endemic*, or *indigenous* [references omitted-Ed.]. In many cases, these terms are not defined, or if they are defined, they are not always defined consistently. Until a commonly accepted vocabulary is adopted by invasion ecologists, we think the field will continue to have difficulty developing reliable generalizations, partly due to misunderstandings and misinterpretations among investigators. . . . Clearly, an invader is not just any newcomer, but one that has a large impact on the new environment. This impact could involve community, ecosystem, and/or economic effects."

January 2001: From "Two Ways to Be an Invader, But One is More Suitable for Ecology" by C.C. Daehler, ESA Bulletin 82(1), "Some invading species have greater ecological impacts than others, but defining *invaders* as those species with the largest impacts is an exercise in subjectivity that will be unlikely to contribute to clarity. For ecology, defining *invader* based on population growth and spread in a new region is preferable. It captures a general ecological process that can be confirmed with simple measurements, leading to greater agreement among ecologists, and greater progress in understanding invasions as ecological phenomena."

July 2001: From "Invasion Terminology: Should Ecologists Define Their Terms Differently Than Others? No, Not if We Want to be of Any Help!" by M.A. Davis and K. Thompson, ESA Bulletin 82(3), "We believe that there are compelling practical and conceptual reasons for impact to be a part of the defining criteria for an invading species. The primary practical reason is that, outside of the discipline of ecology, "invasive species" are usually explicitly defined on the basis of their impact. . . . it would be counterproductive to the field and to society if ecologists were to define the terms "invader" and "invasive" differently than the rest of society, and not include "impact" as part of their definitions."

April 2002: From "Biological Invasions: Politics and the Discontinuity of Ecological Terminology" by M. Rejmanek, D.M. Richardson, et al, ESA Bulletin 83(2), "According to these authors [Davis and Thompson], invasion always implies some kind of impact, and all "invasive" taxa are harmful. There are several

problems with their proposal. . . . there is much confusion, especially in the recent literature, particularly because many newcomers to the burgeoning field of invasion ecology ignore existing terminology and instead rely on the highly emotional negative connotations of the word "invasion" in relation to war and other aggressive human activities. This is especially true for the popular literature on invasions. Unfortunately, such sloppy terminology has permeated what should be authoritative documents on this topic. . . ."

July 2002: From "Newcomers" Invade the Field of Invasion Ecology: Question the Field's Future" by M.A. Davis and K. Thompson, ESA Bulletin 83(3), "We developed our proposed nomenclature on the explicit recognition that some new species "have a negligible effect on the new environment, whereas some have a very large impact (Davis and Thompson 2000)." We proposed that usage of the word "invasion" be confined to those circumstances in which the newcomers have a large impact on the community, ecosystem, or economy. . . . To most readers, this argument over the usage of a couple of words must seem like a tempest in a teapot. However, there may be more at stake here than just vocabulary. . . . Invasion ecology clearly has been a hot area of research in recent years, spawning invasion journals, invasion symposia, special grant initiatives, and countless books and articles on the topic. Yet, despite all this activity, very little progress in understanding the ecology of these new introductions has been gained, beyond that which could already be acquired using existing ecological models and knowledge. We fear that, despite original good intentions, the emergence of invasion ecology as a distinct subdiscipline has hindered more than helped our efforts to understand the ecology of these new introductions (Davis et al 2001). Paradoxically, ecology may contribute more constructively to society's efforts to deal with the ecological, economic, and health problems caused by some of these new species if the field proceeds without the language and paradigms promoted in invasion ecology."

Personal communication from M.A. Davis, Nov. 2002: My feeling now is that if for some reason we continue to feel compelled to use the word 'invader', it would make more pragmatic sense if we used the word in the way that the public and policy members have been using it, i.e., defined in terms of impact. However, personally, I've come to the conclusion that both scientific research and conservation efforts would be facilitated if we dropped the native/exotic/invader paradigm and language completely and referred to species as 'long-term residents' or 'recently introduced species' or 'problem species' (which can include either long-term residents or recently introduced species).

KB

Continued from Page 1

once again and passes through the "Gorges" area for approximately 4-6 miles, emptying into the Gulf of Honduras at the City of Livingston.

My visit coincided with the end of the wet season and water flows in the Rio Dulce were high with whirlpools and strong currents very noticeable wherever the river was narrow. During and for a period after the wet season, the system from the shallow Golfete through the Upper Rio Dulce is essentially fresh water, with salinities sufficiently low for hydrilla growth. (Additional data are needed on the salinity levels in the Golfete during the dry season (Nov-May)). Hydrilla was present to the water surface in the upper Rio Dulce and western Golfete during September 2002, near the end of the wet season. It is possible that salinity will control this growth during the dry season, but it appears hydrilla will become a problem in the Golfete for 2-3 months at the end of the wet season and persist until killed by saltwater intrusion in the dry season. The water depth of the Golfete appears to be suitable for hydrilla growth; the limiting factor in this area will be the effects of salinity as hydrilla cannot tolerate extended periods in excess of 6 parts per thousand or 20% of the salt concentration of seawater. The Rio Dulce east of the Golfete is too deep and too saline (I believe) for hydrilla to cause problems, though it may grow into creek deltas of inflowing fresh water in the lower Rio Dulce and interfere with local boat traffic. Research on the salinity and water depths of the Rio Dulce and Golfete will permit more accurate prediction of the future extent of hydrilla growth downstream of the Central Golfete.

Extent of Problem

At the current level of infestation, primarily in beds in Lake Izabal, hydrilla is causing relatively minor problems to fishing and transportation. Hydrilla is currently growing to water depths of approximately 15 feet. If hydrilla continues to expand to cover the 15-18 foot contour of the lake bed, it is estimated that it will cover 10-15% of the lake surface (20-30,000 acres of the 170,000 acre lake). While this level of infestation may appear small, it will cause access and navigation problems for villagers and create problems for fisherman.

The major concern I envision is if hydrilla were to establish in the upper Rio Dulce, near the river bridge, where marinas, transportation, and tourism would be severely impacted. Many people in this area rely upon river transport for commerce, and tourism and recreation is a significant industry. Though water flow in this area is high during the wet season, flows are negligible during the dry season which will permit hydrilla to become established in these shallow waters. In fact, hydrilla beds have already been found in the upper Rio Dulce and western Golfete. The Golfete provides access to the transportation and commerce center of the upper Rio Dulce and is likely to be severely impacted as well. It is in these areas, the western Golfete and the upper Rio Dulce that I fear hydrilla will cause severe economic hardship.

Hydrilla is currently too widespread to be eradicated from this system and Guatemala needs to be prepared for expansion of hydrilla into areas which will be economically affected. While we

can hope hydrilla does not spread further, historically it has and likely will continue expansion.

The Scientific Committee and concerned Guatemalan officials and agencies have already initiated much needed research, monitoring, and evaluation of management options. The following information is critically needed to be able to accurately predict the ultimate effects of hydrilla: vegetation surveys; a new bathymetric map (Hurricane Mitch in 1998 may have changed the depth contours of the lake); fisheries surveys; salinity monitoring; insect surveys; herbicide acute toxicity studies; and baseline limnological studies. While the current hydrilla infestation is causing problems in the lake, it has not invaded what I consider high priority economic sites, and it is critical to be prepared for this event. This a very large and dynamic system in which it is impossible to predict with certainty the ultimate infestation.

Arundo donax

Giant reed

E-grass?

See note on page 9.



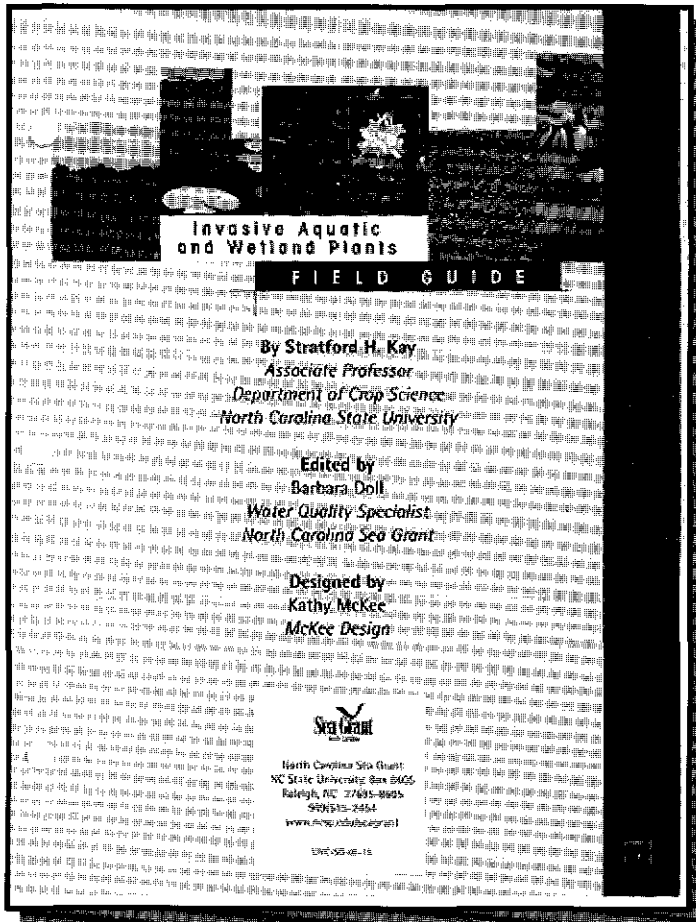
Invasive Aquatic and Wetland Plants Field Guide

by S.H. Kay; edited by B. Doll

This field guide was produced to help extension agents, regulatory and environmental agency field personnel, and plant nursery and water garden industry personnel to recognize the most invasive noxious aquatic and wetland weeds being sold and distributed in the United States. Twenty-one species are treated using color photographs and line drawings. Their origin, growth habit, ecological threat, ID characteristics, reproduction method and similarity to other plants is presented.

The guide was prepared by North Carolina Sea Grant and was funded by the U.S. Sea Grant's Aquatic Nuisance Species Research and Outreach Initiative.

The Guide is available to certain individuals by contacting North Carolina Sea Grant at North Carolina State University, 919-515-2454; WWW: <http://www.ncsu.edu/seagrants>



BIOLOGY OF INLAND WATERS

Editorial Board: The Russian Academy of Sciences

Editor-in-Chief: D.S. Pavlov, Professor, Academician of Russian Academy of Sciences, Institute of Ecology & Evolution, Moscow, 117071, Russia.

The Journal was founded in 2000 by the Russian Academy of Sciences and is published quarterly. The Journal is publishing problematic, review and original papers dealing with various aspects of the biology of aquatic ecosystems, in particular flora and fauna of water bodies, biology, morphology, systematics of aquatic organisms, ecology, ecological physiology and biochemistry of aquatic animals, behaviour of aquatic organisms, their populations and communities, aquatic toxicology, biological cycles, structure and function of aquatic ecosystems, anthropogenic impact on aquatic organisms and aquatic ecosystems, protection of aquatic ecosystems and organisms, and methods of hydrobiological and ichthyological studies.

The Journal is a successor and continues traditions of the publication of the same name of the Institute for Biology of Inland Waters RAS and of the "Russian Journal of Aquatic Ecology." In the nearest future an English version of the Journal "Biology of Inland Waters" is to be published. It will contribute to better information exchange between Russian and foreign scientists. The English version of the Journal "Biology of Inland Waters" will offer foreign investigators an opportunity to obtain regular information about the scientific results of Russian colleagues. The English version of the Journal will be published by the "International Academic Publishing House Nauka/Interperiodicals." Tentative annual subscription rate (4 issues) -US\$ 300-400.

Orders and inquiries regarding subscription should be addressed to Nina A. Ziminova, Executive Secretary, Institute for Biology of Inland Waters RAS, Borok, Yaroslavl, 152742, Russia; phone/fax (08547) 2-40-42, e-mail: isdat@ibiw.yaroslavl.ru
WWW: <http://www.ibiw.yaroslavl.ru/eng/jour.htm>

Odds 'n' Ends

Teaching Points available. Created especially for science teachers, eco-trainers and others responsible for answering questions and presenting basic information about invasive plants and native plants, the *Teaching Points* is a four-page list of questions and answers that may be adapted for use in a 50-minute classroom-style presentation. So that this useful document might be used over and over, year after year, it is printed on plastic paper. The *Teaching Points* are even more meaningful when used in conjunction with the plant photo-murals (described next). Available free-of-charge from APIRS, varamey@nersp.nerdc.ufl.edu

Murals Aplenty. During the past 12 months, nearly 2,500 K-12 science teachers around the U.S. have requested and obtained free copies of the two giveaway photo-murals produced by the University of Florida and the Florida Department of Environmental Protection. The laminated photo-murals, *Invasive Non-Native Plants* and *Native Freshwater Plants*, feature many "classroom size" photos. Used with the accompanying *Teaching Points*, science teachers may tailor their own science lessons about invasive plants for students of any grade. Besides being free to K-12 teachers, they also are for sale to anyone else. <http://plants.ifas.ufl.edu>

The St. Louis Declaration. "To curb the use and distribution of invasive plant species," these are rules to live by for nurserymen, plant sellers, botanic gardens, landscape architects and the gardening public, as promulgated and agreed upon by nurserymen, plant sellers, botanic gardens, landscape architects and members of the gardening public. Read your own Code of Conduct at <http://www.mobot.org/iss>

Oklahoma Aquatic Weeds Poster. A new poster, *Don't Free Lily! - An Aid For the Responsible Handling of Aquatic Plants*, depicts and describes Oklahoma's 23 Prohibited Aquatic Plant Species. It also shows recommended native species which should be used instead. It was produced by the Oklahoma Department of Wildlife Conservation, Langston University, and the University of Oklahoma. To obtain a free copy of the poster, contact Gene Gilliland, Oklahoma Fishery Research Laboratory, 500 E. Constellation, Norman, OK 73072; ggillokla@aol.com

Acting Locally. The Wolf River Conservancy is one of the original eco-advocacy groups of its kind. Established in 1985, the goal of its 1,500 members is "to establish a protected public greenway along the 90-mile Wolf River from its headwaters near Holly Springs, Mississippi, to its mouth at the Mississippi River in Memphis, Tennessee." Over the years, WRC has purchased and otherwise helped protect 8,000 acres of the river's "unmatched natural beauty and large pockets of undisturbed forest." Visit: <http://www.wolfriver.org>

Florida Keys GreenSweep. For the past three years, The Nature Conservancy has run a "volunteer-based habitat restoration initiative" in the Keys. Named GreenSweep, the volunteer workers clear invasive plants from four National Wildlife Refuges, 11 state parks, 5 CARL properties and countless municipal conservation lands. Alison Higgins, Land Stewardship Coordinator, The Nature Conservancy, POB 420237, Summerland Key, FL 33042. 305-745-8402.

Botanical Dermatology Database. This interesting and easy-to-use online database presents text and citations regarding toxicity of plants. Click on "BoDD Search Engine"; type in the word "melaleuca", retrieve a large file about the Myrtaceae, scroll down past *Eucalyptus* and *Eugenia*, and find toxicity references for six species of melaleuca. Visit: <http://bodd.cf.ac.uk/index.html>

K-12 Teachers A California Priority. When it comes to invasive species, many organizations forget to enlist the support of professional science teachers, even though it is well known that what teachers teach their students, the students teach their parents. The California Department of Food and Agriculture recognizes this simple yet effective cycle, and the Department specifically targets school teachers and classrooms in the effort to teach the public about invasive species and what to do about them. Visit http://www.cdffa.ca.gov/phpps/ipc/weedededucation/k-12_education/k-12_ed_hp.htm

Know Your Watershed. The stream down the street, the rain on that hillside: where does the water go? Are you sure? Call up this Purdue University web site; learn about watersheds; scroll down; type in your city, county or zip code, and see an EPA map of the watershed that you live in. <http://www.ctic.purdue.edu/KYW/KYW.html>

Izaak Walton League Rocks! One of the oldest conservation orgs in the U.S. (it was founded in 1922), the Izaak Walton League seeks to conserve, maintain, protect and restore the soil, air, woods, water and wildlife of the United States. Among other activities, it has strong initiatives in *Save Our Streams* and in the *American Wetlands Campaign*. For information, visit: <http://www.iwla.org>

New England Invasives. This web site maintains the *Invasive Plant Atlas of New England*, a place to report and retrieve sightings, and to download distribution maps. The Atlas is in its early stages, but much technical effort has been put into its preparation. With continued user participation, this *Atlas* promises to be a first-rate resource in the fight against invaders: <http://invasives.eeb.uconn.edu/ipane>

250 ft. long native plant mural. The City of Titusville (FL) has taken yet another approach to public education by painting a plant mural on a 250 ft. retaining wall alongside a city street. The mural illustrates the plant communities of Florida's various ecosystems; each plant is labeled with its common name. The wall is used as a teaching aid for various conservation outreach programs, including encouraging the use of native plants and Florida-friendly landscaping techniques to reduce water use. It is located at 2836 Garden Street, Titusville, Florida. For more information, contact Maureen Phillips at maureen.phillips@titusville.com

Books/Reports

A GLOBAL COMPENDIUM OF WEEDS, by R. P. Randall. 2002. 905 pp.

(Order from R.G. and F.J. Richardson Publishers, PO Box 42 Meredith, Victoria 3333, Australia. Hardbound, \$110.00 plus \$40 S/H. ISBN 0-9587439-8-3. WWW: <http://www.weedinfo.com.au>)

This book is a compilation of 300 published lists of documented plant weediness from throughout the world. More than 18,000 plants are listed. Its purpose is "to give a weed risk assessor a condensed report of the status of a species with further avenues for finding more information." In this book, for example, you will find that *Annona glabra*, the highly desirable pond apple of the Florida Everglades, is a weed in other parts of the world. To find out where pond apple is a weed, the reader must acquire and read the publications cited as numbers 3, 76, 86, 87, 88, 98, 107, 155, 191, 230 and 268.

FRESHWATER WETLANDS AND THEIR SUSTAINABLE FUTURE - A case study of Třeboň Basin Biosphere Reserve, Czech Republic, edited by J. Květ, J. Jeník and L. Soukupová. 2002. 495 pp.

(Published by UNESCO. Order from Parthenon Publishing Group, One Blue Hill Plaza, POB 1564, Pearl River, New York 10965.)

For about 700 years, the people of the Třeboň area have created fish ponds, dams and canals, grew and cut down trees, dug up peat, and otherwise eliminated large areas of natural wetlands. Then in the 1970s, the Třeboň Basin Biosphere Reserve came into being: literally a patchwork of 33 individual "nature reserve/monuments," most of which are wetlands.

This is an apparently exhaustive review of the literature about the Biosphere Reserve, including 40 papers about topics including hydrobiology, plants, birds, fish, eutrophication, primary production, evapotranspiration, and future prospects for the area.

WEEDS WON'T WAIT! The Strategic Plan for Managing Florida's Invasive Exotic Plants, by R.F. Doren. Four parts: I. An Assessment, 271 pp.; II. The Strategy, 90 pp.; III. Assessment Executive Summary, 16 pp.; IV. Strategic Plan Executive Summary, 17 pp. No Date.

(Published by South Florida Ecosystem Restoration Task Force, Florida International University. ISBN 0-9718804-0-9. Available as a CD or PDF file: <http://www.sfrestore.org>)

This is a report on the most invasive plants in Florida, "their status, distribution, management and regulation." It uses plain language in a question/answer format to summarize the responsibilities of the many key players in Florida's fight against invasive plants, and also presents a variety of control programs and results.

APPLIED AQUATIC ECOSYSTEM CONCEPTS, by G.L. Mackie. 2001. 744 pp.

(Order from Kendall/Hunt Publishing Co., Customer Service, 4050 Westmark Drive, Dubuque, IA 52004-1840. Phone: 800-228-0810.)

According to the author, this text book is meant to show how to "apply" water concepts such as lake morphometry, nutrient cycles, dissolved gases, biological assessment, water quality, biodiversity. . . The large-format, many-paged, almost-encyclopedic work is an unusual construction which combines full-blown erudition ("apparently some epipelagic algae are capable of supplementing photosynthetic growth by heterotrophic utilization of organic materials"), with detailed descriptions of novel field applications ("the paper weight method is great for determining areas of any shape"), with perhaps hundreds of "how to-s": "by the end of this chapter you will know the effects of acidification on zooplankton" or ". . . how to use 18 macroinvertebrates metrics to assess water quality of rivers." It represents an enormous effort, presenting a huge variety of information. It contains no photographs, but does have a number of drawings and quite a few graphs.

AQUARIUM PLANTS, by C. Kasselmann. 2003. 528 pp.

(Order from Krieger Publishing Co., POB 9542, Melbourne, FL 32902-9542. Hardbound, \$84.50. ISBN 1-57524-091-2. Phone: 800-724-0025. WWW: <http://www.krieger-publishing.com>)

This is the long-awaited English translation of the German book. It is a nicely-made book which describes temperature, water, fertilizer and light needs of more than 300 aquarium plants. Ecological factors, flower biology and morphology, and reproduction methods are discussed. The book contains 525 color photographs.

MAUVAISES HERBES DES CULTURES, by J. Mamarot. 2002. 560 pp. In French.

(Published by ACTA, BP 90006, 59718 Lille Cedex 9, France. 53 Euros plus S/H. WWW: <http://www.acta.asso.fr>)

This is a very well designed and produced field identification manual for 207 of the most important crop weeds in France. Two full pages are devoted to each plant, and include excellent, large, color photos of the plants as seedlings and as adults. Full descriptions are enhanced by 600 very clear line drawings.

Traditional dichotomous keys may be used to key-out adult plants in the usual way. And easy-to-use graphical keys enable users to key-out seedlings according to cotyledon. The manual is completed by a glossary and scientific/common name index.

VASCULAR FLORA OF ILLINOIS, by R.H. Mohlenbrock. 2002. 490 pp.

(Published by Southern Illinois University Press, POB 3697, Carbondale, IL 62902-3697. ISBN 0-8093-2421-0 \$50.00 plus S/H. WWW: <http://www.siu.edu/~siupress>)

More than 3,100 species are keyed-out in this, the third edition of this book. It includes nearly 300 more species than did the 1986 edition. For each plant, the flowering time, general habitat and Illinois distribution are noted. There are no pictures or drawings. A glossary and indexes are included.

PLANTAS ACUÁTICAS DE LAS LAGUNAS Y HUMEDALES DE CASTILLA-LA MANCHA, by S. Cirujano, L. Medina and M. Chirino. 2002. 340 pp. In Spanish.

(Published by Real Jardín Botánico, CSIC, Madrid. Order from Distribuidora Literaria, Camino Boca Alta naves 8 y 9, Polígono El Malvar, 28500 Arganda del Rey, Spain. Phone: +34 91 42030 17, ext. 208. \$33.84 plus S/H)

The Castilla-La Mancha is a region in the center of Spain. This exceptional large format book is about the aquatic plants and the different types of lakes and wetlands there. More than 140 aquatic plants are described by nice color photos and many full-page line drawings, along with distribution maps of Castilla-La Mancha. Lakes and wetlands are pictured with very good large color scenics and are described by their physico-chemical data, botanical history and problems related to their conservation. The book makes extensive use of cross-section drawings of plant zonation in the various lakes and wetlands.

THE FRESHWATER ALGAL FLORA OF THE BRITISH ISLES - An Identification Guide to Freshwater and Terrestrial Algae, edited by D.M. John, B.A. Whitton and A.J. Brook; Includes a Photo-CD by P.V. York, D.M. John and L.R. Johnson. 2002. 702 pp.

(Published by Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211. ISBN 0-521-77051-3. \$125.00 plus S/H. WWW: <http://www.cambridge.org>)

This is "the first modern account and identification guide to more than 1700 out of a total of over 2200 species of freshwater algae (excluding diatoms) in the British Isles, the majority of which also have a worldwide distribution." The book includes non-technical descriptions and hundreds of line-drawings of identifying features. The accompanying CD-ROM photo catalog features more than 500 color photos of the algae and their habitats. The CD is nicely organized and operates through your Internet browsers; the pictures are rather small.

THE EAST AFRICAN GREAT LAKES: LIMNOLOGY, PALAEO-LIMNOLOGY AND BIODIVERSITY, edited by E.O. Odada and D.O. Olago. 2002. 586 pp.

(Published by Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061. ISBN 1-4020-0772-8 \$138.00 plus S/H.)

This represents the Proceedings of the Second International Symposium on the East African Lakes held in January 2000. The lakes include Lakes Malawi, Albert, Edward, Victoria, Naivasha and Tanganyika, and the volcanic crater lakes of Ethiopia. Papers discuss the geologic history of the lakes, climate dynamics including rain and temperature tables, hydrology, fisheries, paleoenvironment and human impacts. Holocene vegetation changes in Lake Victoria also are discussed.

RURAL AQUACULTURE, edited by P. Edwards, D.C. Little and H. Demaine. 2002. 358 pp.

(Published by CAB International. Order from Oxford University Press, 2001 Evans Road, Cary, NC 27513. 800-451-7556. WWW: <http://www.cabi-publishing.org>)

This book "represents a real advance in understanding of the nature and scope of aquaculture and development in Asia, particularly as it affects poorer families and communities." The chapters are based on papers presented at the Fifth Asian Fisheries Forum in November 1998, and cover rice-fields, rice-fish culture, rice-prawn-fish culture, and fish seed production, as well as discussions of social aspects and development models.

THE ILLUSTRATED FLORA OF ILLINOIS GRASSES - *Bromus* to *Paspalum*, by R.H. Mohlenbrock. 2nd ed. 2002. 416 pp.

(Published by Southern Illinois University Press, POB 3697, Carbondale, IL 62902-3697. ISBN 0-8093-2359-1 \$60.00 plus S/H. WWW: <http://www.siu.edu/~siupress>)

As in other "second editions" from this series, the original keys are left in their first edition pages, along with the original plant descriptions and distribution maps; rather than integrate new information into the first edition and its keys, new partial keys for 22 new discoveries, along with nomenclatural changes and distribution additions, are tacked on at the end of the book. This book is not easy to use. For each new species, a full-page illustration is provided.

Is *Arundo donax* "e-grass" ?

The front page of the *Wall Street Journal* recently featured an article entitled, *Arundo Has Two Lives: A Pest in California, a Boon to Florida* (Wed., October 16, 2002). The article, about *Arundo donax*, giant reed, states that "Environmentalists here [in Florida] see the plant as a godsend, offering a fast-growing replacement for coal and wood products without gouging the earth or chopping down forests." The article goes on to explain that a company, Biomass Industries, "with the blessings of the Northern Florida Sierra Club," has secured a contract with Jacksonville city utilities to deliver electricity derived from the burning (gasification) of tons of giant reed. The giant reed is to be grown on an 8,000 acre *Arundo* farm on "leased land near the Everglades." Reportedly, a gasification plant will be built on the farm and the electricity it produces will be transmitted from there to Jacksonville. According to the *Journal*, the eight thousand acres of *Arundo* are to be planted in Spring, 2003.

In California, there exists a "multimillion-dollar federal and state

effort" to rid the state of *Arundo*, which is listed in the A-1, *Most Invasive Wildland Pest Plants - Widespread* list of the California Exotic Pest Plant Council. "State officials, along with local Sierra Club chapters and other environmental groups, blame the reed for fueling wildfires, causing floods and killing fish. *Arundo* ranks near the top of the state's list of botanical pests." In Florida, it is not listed as an invasive plant, although it may be found locally around the state.

For its purposes, the *Arundo donax*-growing company's Web site and literature refers to the plant as "e-grass:" <http://www.egrass.com>

Team *Arundo* del Norte (California), a forum of local, state, and federal organizations dedicated to the control of *Arundo donax* (giant reed): <http://www.teamarundo.org/>

The Nature Conservancy Wildland Invasive Species Team on *Arundo donax*: <http://tncweeds.ucdavis.edu/esadocs/arundona.html>

Editor's note: The North Florida Sierra Club has stated that they were misrepresented in the *Wall Street Journal* article and that they "do not support the introduction of *Arundo donax* or any other species without a review . . . to understand the implications of introduction."

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 2002.

The database contains more than 58,000 citations. To receive free bibliographies on specific plants and/or subjects, contact APIRS using the information on the back page or use the database online at <http://plants.ifas.ufl.edu/>

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

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Macrophyte development and habitat characteristics in Sweden's large lakes.

AMBIO 30(8):503-513. 2001.

Austin, D.

Sundews: discovering Florida's ethnobotany.

PALMETTO 21(3):12-13. 2002.

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The *Spartina* invasion of San Francisco Bay.

AQUATIC NUISANCE SPECIES DIGEST 4(4):37-39. 2002.

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Physiological diversity of rhizoplane diazotrophs of the saltmeadow cordgrass, *Spartina patens*: implications for host specific ecotypes.

MICROBIAL ECOL. 42(3):466-473. 2001.

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SCIENTIFIC WORLD J. 2:740-750. 2002.

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Palaeolimnological responses of nine North Africa lakes in the Cassarina Project to recent environmental changes and human impact detected by plant macrofossil, pollen, and faunal analyses.

AQUATIC ECOLOGY 35:405-430. 2001.

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A transient transformation system for duckweed (*Wolffia columbiana*) using agrobacterium-mediated gene transfer.

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Competition for pollination: effects of pollen of an invasive plant on seed set of a native congener.

OECOLOGIA 129(1):43-49. 2001.

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The influence of disparate levels of submerged aquatic vegetation on largemouth bass population characteristics in a Georgia reservoir.

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The life history of *Carex cespitosa*.

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HYDROBIOLOGIA 462:233-240. 2001.

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MEETINGS

43RD ANNUAL MEETING OF THE WEED SCIENCE SOCIETY OF AMERICA (WSSA).

February 10-13, 2003. Adams Mark Hotel, Jacksonville, FL.

February 13-14, 2003. Weeds in Natural Areas Workshop.

The scientific program will feature timely symposia, a discussion session, and poster and oral paper presentations on the latest weed science research. CCA credits will be available in certain sessions. The workshop may be attended separately or in conjunction with the general meeting.

Contact: E-mail: wssameeting@allenpress.com or WWW: www.wssa.net/

DETECTING & ASSESSING INVASIVE EXOTIC PLANTS: APPROACHES FOR THE FLORIDA LANDSCAPE.

February 12-14, 2003. Florida International University, Koven's Conference Center, Miami, FL.

A conference and workshop sponsored by the Noxious Exotic Weed Task Team (NEWTT), Florida International University, the South Florida Water Management District, and the US Army Corps of Engineers. "Integrating and "harmonizing" agency activities, and developing compatible and interoperable methods for managing invasive exotic plants for Florida and the multibillion dollar South Florida Ecosystem Restoration Initiative."

Contact: R. Monchek, E-mail: rmonchek@sfrestore.org, WWW: <http://www.sfrestore.org/issueteams/exotic/iepda/IEPDAindex.htm>

NIWAW IV, THE NATIONAL INVASIVE WEEDS AWARENESS WEEK.

February 24 – 28, 2003. Washington, DC.

The week will include meetings, hosted receptions, and opportunities to talk with key agency managers from federal agencies about their national plans and priorities for helping in the war on weeds.

Contact: North American Weed Management Association (NAWMA), WWW: <http://www.nawma.org/index.html>

67TH ANNUAL MEETING OF THE FLORIDA ACADEMY OF SCIENCES.

March 21-22, 2003. University of Central Florida, Orlando.

There will be a special session on *Science and the Lake: Baseline Environmental Studies of Lake Okeechobee and its Watershed*.

Contact: WWW: www.floridaacademyofsciences.org

IZAAK WALTON LEAGUE'S AMERICAN WETLANDS CONFERENCE.

May 1-4, 2003. Thunderbird Hotel, Minneapolis, MN.

Information and training on a broad array of wetland issues, with a special focus on conservation of vulnerable ephemeral and isolated waters. Other topics will include public outreach, monitoring, legislative advocacy, land use planning, mitigation and wetland restoration.

Contact: WWW: www.iwla.org/sos.awm

23RD ANNUAL CONFERENCE OF THE FLORIDA NATIVE PLANT SOCIETY.

May 8-11, 2003. Fort Myers, FL.

The conference theme is *Symbiosis: The Power of Partnerships*.

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

SOUTHEAST EXOTIC PEST PLANT COUNCIL 2003 ANNUAL SYMPOSIUM.

May 15-17, 2003. Lexington, KY.

Contact: mwilliams@mail.state.ky.us

THE AQUATIC WEED CONTROL SHORT COURSE.

May 19-23, 2003. UF/IFAS Fort Lauderdale Research and Education Center.

The short course will include plant ID, equipment demonstrations, sprayer calibration, CORE and sectional training in Aquatic, Right of Way and Natural Areas. There will be presentations on current aquatic plant management, vegetation management safety, West Nile virus, evolution of Florida lakes, and nuisance algae.

Contact: WWW: <http://conference.ifas.ufl.edu/>

18TH ANNUAL SYMPOSIUM, FLORIDA EXOTIC PEST PLANT COUNCIL.

June 5-6, 2003. Renaissance Vinoy Resort, St. Petersburg, FL.

Contact: WWW: www.fleppc.org

LAKESHORES 2003 - ECOLOGY, QUALITY ASSESSMENT, SUSTAINABLE DEVELOPMENT.

19-21 June 2003. Lake Constance, Germany.

We invite a broad range of experts, managers and users to join the conference, feeling at home in fields like limnology, aquatic and wetland ecology, hydrology and water resource management, nature conservancy, landscape ecology, regional planning, touristic management etc., and coming from universities, state and private research institutions, agencies, NGO's and user groups in Europe and from overseas.

Contact: Conference Bureau LAKESHORES 2003, PD Dr. Wolfgang Ostendorp, Limnologisches Institut, Universität Konstanz D-78457 Konstanz, Germany, E-mail: seeufer2003@uni-konstanz.de -or- lakeshores2003@uni-konstanz.de

Meetings - Continued

3RD IOBC GLOBAL WORKING GROUP MEETING ON BIOLOGICAL AND INTEGRATED CONTROL OF WATER HYACINTH. August 2003. Uganda.

Presented by the Working Group on Water Hyacinth of the International Organisation for Biological Control of Noxious Animals and Plants (IOBC).

Contact: Dr. James Ogwang, PO Box 7084, Kampala, Uganda; E-mail: jamesogwang@hotmail.com or Dr. Martin Hill, University of Rhodes, Zoology/Entomology, PO Box 94, Grahamstown 6140, South Africa; E-mail: m.p.hill@ru.ac.za

INVASIVE PLANTS IN NATURAL AND MANAGED SYSTEMS: LINKING SCIENCE AND MANAGEMENT. November 3-7, 2003. Wyndham Bonaventure Resort, Ft. Lauderdale, FL.

A joint conference and workshop, co-hosted by the Ecological Society of America and the Weed Science Society of America in conjunction with the 7th International Conference on Ecology and Management of Alien Plant Invasions.

Contact: <http://www.esa.org/ipinams-emap7/>

EWRS-Aquatic Weeds 2002 meeting held in France

The European Weed Research Society's 11th International Symposium on Aquatic Weeds took place in Moliets et Maâ in the Landes region of France from 2-6 September 2002. The symposium was organized by Cemagref (<http://www.cemagref.fr/>), in partnership with INRA (<http://www.inra.fr/>) and ENSA of Rennes (<http://agro.roazhon.inra.fr/>), a national scientific group working on macrophytes of continental waters of France, and the Conseil Général des Landes. Previous symposia have taken place in different European countries since 1964.

Approximately 150 participants from 27 countries presented more than 100 papers at the five-day meeting. Topics ranged from biology (16 papers), environmental relationships (36 papers), bioindication (14 papers), management (17 papers), control (20 papers), and invasions (8 papers). Presentations were given in French or English, with simultaneous

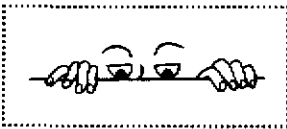
translation available via wireless headphones. *Hydrobiologia* will be publishing a special issue for papers presented at the symposium.

Two field trips during the meeting showcased the Basque country, the rivers of the Pyrenées Piedmont, and the lakes and wetlands of the Aquitaine coast.

The sumptuous gala dinner was preceded by a jai-alai demonstration (a traditional Basque sport), and concluded with an anonymous late paper presented by Dr. Max Wade (UK) titled "Observations of the invasion by alien aquatic weed scientists on the ecology of Moliets et Maâ, France." This fascinating paper was one of the highlights of the evening.

The 12th International EWRS Symposium on Aquatic Weeds is expected to be held in Poland.

KB



APIRS Picks:

The most likely invaders of natural areas include aquatic or semi-aquatic plants, grasses, nitrogen-fixers, climbing plants, and clonal trees, according to an analysis of almost 2,800 agricultural weeds and natural area invaders world-wide. The analysis also found that only 25% of natural area invaders were also serious agricultural weeds.

Daehler, C.C. 1998. *The Taxonomic Distribution of Invasive Angiosperm Plants: Ecological Insights and Comparison to Agricultural Weeds*. Biol. Cons. 84:167-180.

A "greenhouse insect," *Orthezia insignis*, is a serious, non-native pest now infesting Florida landscape plants, including cultivated lantanas (*Lantana* sp.). This study compares susceptibility to this invasive insect by Florida's two native lantana species and 38 cultivars of two non-native lantana species. It was found that our native *Lantana depressa*

and *Lantana involucrata* are much more susceptible to this insect threat than are any of the 38 exotic nursery cultivars.

Boschat, T.K. and Weissling, T.J. 2001. *Susceptibility of Lantana Cultivars to Orthezia insignis*. HortTechnology 11(3):460-462.

An endangered butterfly in the U.S. is becoming more endangered because its host plant, a wetland sedge, *Carex stricta*, is being paved over and drained by new highway and dredging projects. In 1997 only eleven populations were known; we wonder how many there are now.

Shuey, J.A. 1997. *Conservation Status and Natural History of Mitchell's Satyr, Neonympha mitchellii mitchellii French (Insecta: Lepidoptera: Nymphalidae)*. Natural Areas Journal 17(2):153-163.

Read about "lag phase": "The promotion of new plants in the nursery trade creates an increasing incentive to only briefly evaluate and then immediately introduce new plants...It may be possible to effectively evaluate some herbaceous species in a given region within a few years, but woody plants may require twenty, thirty, or more years to effectively evaluate them."

McWilliams, E.L. and Arnold, M.A. 1998.

Horticultural History Repeating Itself: Dispersal and the Invasion Lag Phase of Exotic Plants on the TAMU Campus. In: Proc. 10th Conf., Metropolitan Tree Improvement Alliance, St. Louis, MO, Sept 30-Oct 1, 1998.

Is this "the foundation for building a general theory of seed plant invasiveness"? The author reviews Darwin's explanation for invasion success, presents certain characteristics that may be required for invasiveness (seed size and periodicity, vertebrate availability, latitudinal range and genome size), and propounds a theory of plant invasiveness.

Rejmanek, M. 1996. *A Theory of Seed Plant Invasiveness: The First Sketch*. Biol. Cons. 78:171-181.

Watermilfoil Hybrids. DNA studies of invasive watermilfoil species reveal distinct sequences acquired from both nonindigenous and native North American species; that is, they are hybrids of native and non-native plants.

Moody, M.L. and Les, D.H. 2002. *Evidence of Hybridity in Invasive Watermilfoil (Myriophyllum) Populations*, Proc. National Academy of Sciences 99(23):14867-14871, November 12, 2002.

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AQUAPHYTE

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**EDITORS: Victor Ramey
Karen Brown**

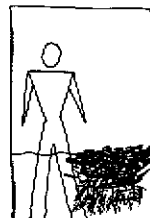
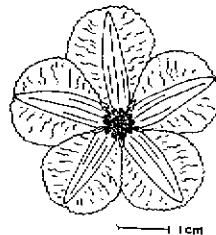
AQUAPHYTE is sent to managers, researchers and agencies in 71 countries around the world. Comments, announcements, news items and other information relevant to aquatic and invasive plant research are solicited.

Inclusion in *AQUAPHYTE* does not constitute endorsement, nor does exclusion represent criticism, of any item, organization, individual, or institution by the University of Florida.



Yellow floating-heart, *Nymphoides peltata* <http://plants.ifas.ufl.edu/nympel.html>

A floating-leaved plant with large yellow flowers, and adventitious roots along an underwater stem.



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Introduced as an ornamental from eastern Asia, this invasive non-native is present in the states found along a diagonal line from Texas to New Hampshire, and into Quebec, also present in Arizona, California and Washington (Kartesz, 1999).