

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,
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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 18th 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

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.

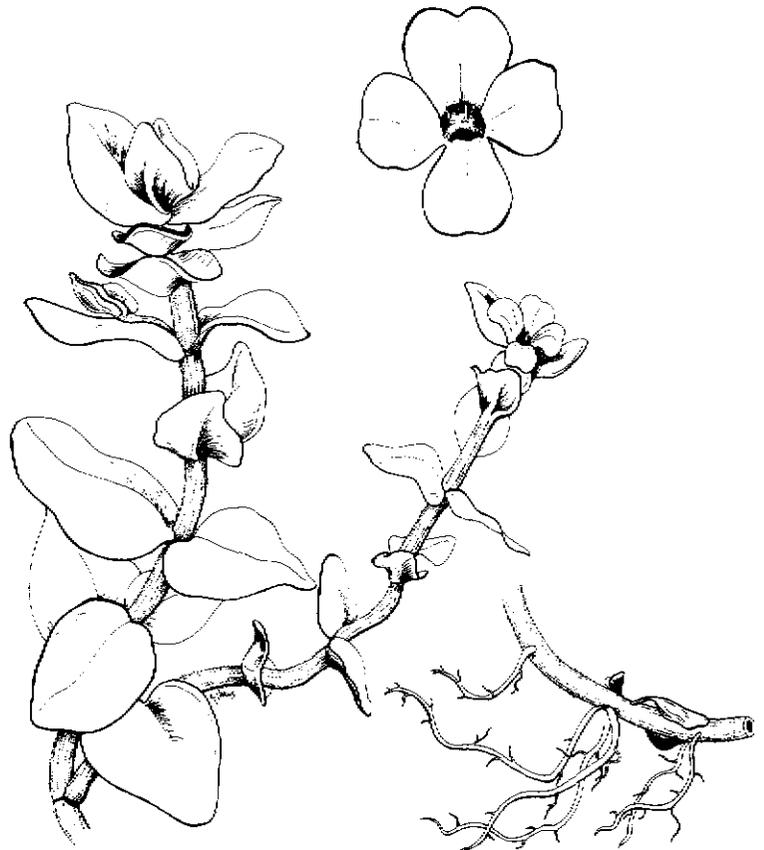
Let me share one such gem with you - **Flowers of Marsh and Stream** by Iolo A. Williams (Penguin Books, Ltd., Harmondsworth, Middlesex, England, 1946). Williams saw that

... 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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University of Florida, Gainesville

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)

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)

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)

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 WWW: 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 "herbicidal gel" for controlling vines; the Species Ecology section includes papers on some of the US's least favorite invaders.

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.

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.

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.

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)

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 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.

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.

*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*¹ (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*² (1967), the work is cited only nine times and in *Limnological Botany*³ (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.

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

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

³Hutchinson, 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>

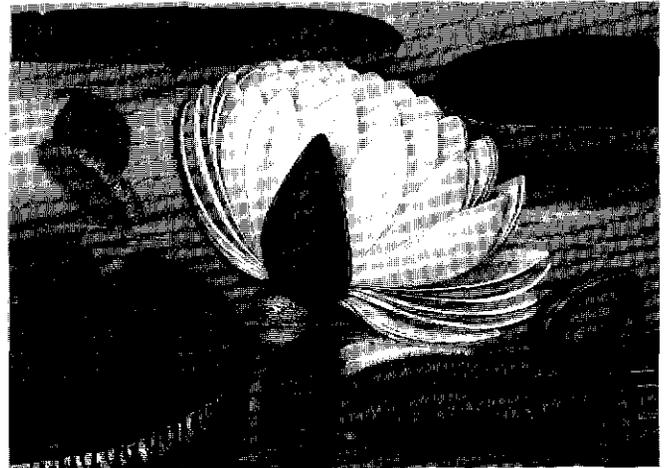
“RACHEL MCMASTERS MILLER HUNT’S collecting interests brought together aspects of art, history, science and literature as they related to plants and gardens. Her private book collection was well known, and her scholarship led her also to collect related artworks, portraits and manuscripts significant 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.”⁽¹⁾

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.

⁽¹⁾ 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 71st 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-qr.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

