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About Aquaphyte

This 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.

EDITORS:
Victor Ramey
Karen Brown

AQUAPHYTE is sent to managers, researchers, and agencies in 71 countries. Comments, announcements, news items and other information relevant to aquatic 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.

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Are Aquatic Herbicide Permitting Changes on the Horizon?

[Editor's note: During the summer of 2001, few, if any, herbicide applications to manage aquatic plants, took place in Washington state. As a result of that state's interpretation of a federal circuit court ruling, aquatic plant management operations using aquatic herbicides, as well as mosquito and burrowing shrimp control activities, now require a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits were originally created by the U.S. Clean Water Act. Though the circuit court ruling may be interpreted and implemented in different ways by the nine states of the circuit, nonetheless, aquatic pesticides, even when registered and labeled under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), now are considered in one circuit district to be a form of pollution requiring additional permitting under the Clean Water Act. The ruling also effectively federalizes what used to be a state permitting power in the 9th Circuit.

As of now, no entity in the nine states has appealed the Talent decision to the U.S. Supreme Court. The ruling suggests implications for all herbicide-based management operations on public waters and lands of the U.S. Here, Ms. Hamel presents a brief review of the decision and her department's implementation of its findings. ***VR*]**

The Impact of the Talent Irrigation District Court Decision on Aquatic Pesticide Regulation in Washington State

by **Kathy S. Hamel,** Washington State Department of Ecology, P.O. Box 47600, Olympia, WA 98504-7600, E-mail: kham461@ecy.wa.gov

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Background

Many irrigation districts in the western United States for many years have routinely applied acrolein (Magnacide H) to their ditches and canals to control the growth of submersed aquatic vegetation. Removing vegetation is essential to maintain water delivery to crops and to prevent flood damage to the canals. Acrolein is highly toxic to fish, wildlife, and humans and must be carefully applied. The districts use acrolein, instead of the less toxic aquatic herbicides used for aquatic plant control in lakes and rivers, because acrolein treated water can be used for crop irrigation much sooner than other aquatic herbicides.

In May 1996, the Talent Irrigation District in southwestern Oregon applied acrolein to the Talent Canal. The next day dead fish were discovered in Bear Creek around and downstream from a leaking canal waste gate. Over 92,000 juvenile steelhead were killed. Release of treated waters into a fish-bearing stream clearly violated the Magnacide H label and the District was heavily fined by Oregon agencies for the fish kill. Environmental groups (Headwaters, Inc. et al.) also sued Talent for violating the Clean Water Act (CWA) by treating its canals without a National Pollutant Discharge Elimination System (NPDES) permit.

After a lower federal district court concluded that it was not necessary to obtain an NPDES permit for treatment with acrolein, Headwaters, Inc. et al. appealed the case to the 9th Circuit Court of Appeals. The 9th Circuit Court has jurisdiction over Alaska, Washington, Oregon, Idaho, Montana, Nevada, Arizona, California, Hawaii, and Guam. These nine states and Guam are bound by any decisions made by the 9th Circuit Court. On March 12, 2001, this court reversed the lower court's ruling and found that "the registration and labeling of Magnacide H under the Federal Insecticide, Fungicide, Rodenticide Act (FIFRA) does not preclude the need for a permit under the CWA." The Talent decision was not appealed to the Supreme Court. [See http://www.owrc.org/litigation/tidopinion.htm]

Washington's Response to the Talent Irrigation District Decision

The state of Washington's Assistant Attorney General to the Department of Ecology (Ecology) interpreted the Talent court decision to mean that the application of any aquatic pesticide to Washington waterbodies requires coverage under an NPDES permit. This interpretation was partially in response to the threat of lawsuits from environmental groups if an NPDES permit program was not put in place. Pesticides are applied to waters of the state for the control of mosquitoes, burrowing shrimp, some fish species, noxious submersed weeds (Eurasian watermilfoil, hydrilla), noxious emergent weeds (purple loosestrife, spartina), nuisance native aquatic plants, and algae.

Washington, Oregon, California, Montana, Nevada, and Hawaii have been delegated authority from the Environmental Protection Agency (EPA) to develop and administer NPDES permit programs. Idaho, Alaska, and Arizona obtain their NPDES permit coverage from EPA. Ecology administers Washington's NPDES programs for industrial waste discharges, sewage treatment, municipal and industrial stormwater, and dairy waste. However, aquatic pesticide application does not fit neatly into state and federal laws that regulate point source pollutant discharge to water. To date EPA has provided little guidance or direction to the affected states on how to interpret the court decision or how to develop an aquatic pesticide NPDES permitting program.

The March court decision did not allow Washington enough time to develop an aquatic pesticide NPDES program for the 2001-treatment season. Although Ecology's existing aquatic pesticide permitting program was not an NPDES program, Ecology continued to issue orders (permits) under this program for 2001. Applicants were informed that these permits were not NPDES

permits and that they could be subject to third party lawsuits as a result of the Talent court decision. Willapa Bay oyster growers (who treat oyster beds for burrowing shrimp) were threatened with a third party lawsuit because they didn't have NPDES permit coverage. They subsequently chose not to treat in 2001, permanently losing some oyster beds by this action. All state-funded and most locally funded herbicide applications to control noxious aquatic weeds did not take place. Many irrigation districts asked for coverage under Ecology's existing program, something they had not done before.

For most NPDES permits, people are trying to dispose of unwanted wastes into a waterbody. In the case of aquatic pesticides, people are deliberately introducing a toxic compound into a waterbody to improve beneficial uses. Ecology is currently developing seven general NPDES permits for aquatic pesticide application to Washington waters in 2002 and beyond. Permit holders will include: irrigation districts; mosquito districts; Departments of Fish and Wildlife; Agriculture; and Transportation; oyster growers; and aquatic herbicide applicators. Advisory committees have been formed to provide oversight to each general permit and informational meetings have been held. Each advisory committee is expected to meet twice to provide input into the draft permit before it is made available for public review. Because of public and internal review processes, Ecology doesn't anticipate having final permits in place until late spring or early summer of 2002.

While most aquatic pesticide applicators are accustomed to being regulated by Ecology, there will be some changes under the new program. Because of state law, fees will be charged to cover the administration of the NPDES permits. Although the amounts are as yet unknown, in some cases, permit fees could be substantial. Some type of limited monitoring of the receiving waters, most likely for pesticide concentrations, will also be required. Requirements already in place under the superceded permit program, such as public notification and Endangered Species Act protections, will be incorporated into the NPDES permits where appropriate. The NPDES permits will be at least as, or more, protective of the aquatic environment than the superseded aquatic pesticide permitting program.

There has been great interest in Washington's aquatic pesticide NPDES program from affected parties and environmental groups. Washington interpreted the Talent decision to mean that all aquatic pesticide applications must be regulated under an NPDES program. Other western states may have made different interpretations, although California has developed a general NPDES permit for aquatic pesticide use. Several environmental groups indicated to Ecology that had Washington continued to allow aquatic pesticide applications under the existing program we would have been challenged in court with the Talent Irrigation District decision forming the basis for that legal challenge. Moving forward with the development of an NPDES program for aquatic pesticides is a necessary action for Washington.

Editor's note: The industry response to the Ninth Circuit Court's Ruling has included the formation and funding of the Aquatic Pesticide Coalition (APC) by a group of agricultural

producers, irrigation district managers, aquatic pesticide manufacturers, mosquito control interests and companies in the lake management industry. The APC hopes to help develop a solution to the problem. They have hired attorneys experienced with the Clean Water Act and have presented a Position and Background paper to the EPA. An industry newsletter, *AquaTechnex e-news*, makes the following observations: "Western irrigated agriculture depends on approximately 16,000 miles of irrigation canals and 37,000 miles of laterals. In 1997, irrigated Western cropland produced $22 billion in sales (as compared to national crop sales in 1997 of approximately $100 billion). . . .This ruling has paralyzed necessary aquatic plant management operations in the western United States. . . . . U.S. EPA has had long-standing policy and guidance in place that specifies under what circumstances an NPDES permit is needed to discharge pesticides into the waters of the U. S. from an industrial facility. NPDES permits have not been required for the application of aquatic pesticides to water in accordance with product labels under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Further, EPA has never instituted an enforcement action against any such person for failing to have an NPDES permit under these circumstances. . . . The imposition of NPDES permits on the use of aquatic herbicides . . . could have the perverse effect of impairing water quality through the negative consequences of aquatic invasive plant infestations." To contact the Aquatic Pesticide Coalition, write to 1156 15th Street NW, Suite 400, Washington, DC 20005. ***KB***

Federal Regulations Reviewed:

The **Clean Water Act (CWA)**, as originated in the Federal Water Pollution Control Act Amendments of 1972, generally prohibits the discharge of pollutants into "navigable waters" or "waters of the United States." The CWA's objective "is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." It requires a **National Pollutant Discharge Elimination System (NPDES)** permit before any pollutant can be discharged into navigable waters from a point source. Point sources are defined as discrete conveyances such as discharge pipes or man-made ditches. Permits typically are obtained for discharges of industrial wastewater, sewage treatment plant effluent, etc.

The **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)** is a comprehensive federal statute which regulates pesticide use, sales, registration and labeling, and grants enforcement authority to the **Environmental Protection Agency (EPA)**. FIFRA's objective is to protect human health and the environment from harm from pesticides.

FIFRA establishes a national uniform labeling system to regulate pesticide use, but does not establish a system for granting permits for individual herbicide applications. The CWA establishes national effluent standards to regulate the discharge of all pollutants into

the waters of the United States, but also establishes a permit program that allows, under certain circumstances, individual discharges. FIFRA's labels are the same nationwide, and so the statute does not and cannot consider local environmental conditions. By contrast, the NPDES program under the CWA does just that.

From the U.S. Court of Appeals, Ninth Circuit, Opinions

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Rare and Unusual Aquatic Sedge is Invasive in Florida

by **Colette Jacono,** US Geological Survey; E-mail: colette_jacono@usgs.gov

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Heavy growth of *Scleria lacustris* covers several hectares in water 40 cm deep. Many additional colonies are scattered in the distance.

What could be unusual about another invasive plant in Florida? Our most southern and species-rich state has surely received an overly generous share of "out-of-place" plants. In fact, *Scleria lacustris* C. Wright, more simply called Wright's Nut-rush, is strikingly unusual in many respects.

As a sedge (family Cyperaceae) it is atypical in existing as an annual species, truly aquatic in nature. The juvenile plants are well adapted to water influx during the summer growing season, developing thick, spongy stems and rooting at the nodes when submersed. The fibrous, floating roots help support the upright growth of plants until maturity and later the lodging that ensues across standing water in late season.

Scleria lacustris is extraordinary for its large size and robust stature. Where late season water levels reach 30 cm, single stemmed plants can grow to over two meters long while the stems expand to a hefty thickness of 2.5 cm. Plants develop multiple culms and a smaller stature; yet mature equally well where water has withdrawn in autumn.

Scleria lacustris is exceptional not only for its singular beauty but for its beastly touch. Silica impregnated prickles along the stem and leaves impart a deep slicing wound when handled. And finally, Scleria lacustris is rarely found in its native range, which extends across the tropics of Africa and America.

What may not be unusual about *Scleria lacustris* is the time lag, in this case twelve years, that has elapsed between early collections and the first troubling populations in Florida. Researchers acquainted with the task of reviewing herbarium specimens to analyze invasion processes typically find similar initial lag patterns in distribution.

Emergent with maidencane (*Panicum hemitomon*) and *Eleocharis* spp. in 30 cm of water, *Scleria lacustris* exceeds a height of 1.5 m.

In conservation marshes of central Florida, *Scleria lacustris* has demonstrated the ability to disperse rapidly and to develop into dense colonies. Open marshes subjected to hydroperiod fluctuations appear especially vulnerable. It is suspected that ducks and airboats may disperse the shining white nutlets. Nutlets may also float through drainage systems, leaving vast open water marshes, including the Everglades, at risk.

Recognize *Scleria lacustris* by its wide (~2 cm) pleated leaves, thick, three-angled stem streaked in red, and upright branching inflorescences full of large (to 4 x 2.5 mm), whitish shining nutlets.

Full results of findings are in press: Jacono, C.C. 2001. *Scleria lacustris* (Cyperaceae), an aquatic and wetland sedge introduced to Florida. Sida, Contributions to Botany 19(4). If you know of this plant, either in or out of its native place, please contact:
Colette Jacono, U.S. Geological Survey, 7920 NW 71st St., Gainesville, Fl 32653; (352) 378-8181 X 315; colette_jacono@usgs.gov

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Go to the new USGS website about *Scleria lacustris* which includes detailed ID information, a distribution map and a downloadable flyer: http://www.fcsc.usgs.gov/Nonindigenous_Species/

Scleria_lacustris/scleria_lacustris.html

See more *Scleria lacustris* pictures here.

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Preliminary Note on the Floating Islands of Zacaton Sinkhole, Mexico

by **Chet Van Duzer,** 12177 Winton Way, Los Altos Hills, California 94024; E-mail: ChetV@aol.com

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On El Rancho Azufrosa near the small town of Aldama (22º 55'N, 98º 04'W) in the state of Tamaulipas in northeastern Mexico, there is a remarkable group of five cenotes or sinkholes, vertical caves filled with fresh water. The water in the sinkholes is highly mineralized, smelling strongly of sulfur, and is also quite warm, with average temperatures ranging from 28.3ºC to 33.8ºC. One of these cenotes, called Zacaton, is the world's deepest known water-filled pit, more than 305 meters deep, and is the site of the world's deepest scuba dive, which was made by Jim Bowden, leader of El Proyecto de Buceo Espeleologico Mexico y America Central, a group of divers which has been exploring the sinkholes since 1989.

While the depths of Zacaton are of speleological interest, its surface is of botanical interest for the lush floating islands that move across it. The cenote's surface is circular, about 100 m in diameter, and is surrounded by 21 m high rocky cliffs. On the water are fifteen floating islands, ranging in diameter from 3 to 10 m, and 1 to 1.5 m thick. Beneath the water, the edges of the islands are essentially vertical, a result of the islands' collisions with each other and with the vertical rock "shores." The islands are moved only by the wind; there are no currents in Zacaton.

The flora of the floating islands is dominated by a grass known as "zacate," and in fact it was the

distinctive islands of zacate that gave the cenote its name "Zacaton. "This grass has not yet been collected and identified. The names "zacate" and "zacaton" are applied to several different species, including *Muhlenbergia robusta, Festuca amplissima*, and *Sporobolus wrightii*, as well as other species in these genera. A *Sporobolus* grass seems the most likely candidate, as *Muhlenbergia* spp. and *Festuca* spp. are typically found in dry environments, while *Sporobolus* spp. are known to grow in desert marshes, playa lakes, and floodplains. A small number of shrubs and cacti also grow on the islands, and the islands are inhabited by turtles and snakes. I have heard a report of floating islands of zacate grass which are called "zacatones" in Laguna Verde near Coapilla (93º9'59"W, 17º7'59"N), Chiapas, Mexico. These islands might prove interesting to compare with those of Zacaton, but information about the islands in Laguna Verde has not been forthcoming.

Perhaps the most interesting question raised by the floating islands of Zacaton is how they formed. There are no shelves near the water's surface on which a colony of grass might grow, become dislodged, and float, and indeed there are no stands of this species= of grass in the immediate vicinity of the sinkhole. Further, there are no shallow underwater shelves upon which humus might have accumulated, become buoyant due to decompositional gasses, and then been colonized by the grass. Marcus Gary, a hydrologist with the U.S. Geological Survey who is studying the Rancho Azufrosa sinkholes, has suggested to me that the islands may have formed on buoyant "skins" of travertine, a precipitate of calcium carbonate. There are other sinkholes in the area that are now filled with travertine deposits. It seems that the chemistry of Zacaton's waters has changed so that travertine is no longer forming, and may in fact be dissolving, but the islands remain. Over time, dust would have accumulated on these travertine rafts, and the grass seeds might have been carried to Zacaton by birds -- this area is well known among birdwatchers, and many different species of birds live in and around the cenotes.

Other floating islands have formed on travertine rafts. A lake now called Lago della Regina, and formerly known as Lacus Albuleus, La Solfatra, or Lago delle Isole Natanti, near Tivoli, Italy, once had vegetated floating islands formed on floating masses of travertine. These were famously described by Athanasius Kircher and Francesco Lana in the 17th century, and in more detail by Sir Humphry Davy in the 19th century, not long before they ceased to exist, probably because water was diverted from the lake to supply thermal baths. Lana describes these floating islands as follows: "I myself saw several of these islands in a small lake of sulfurous water not far from the Tiber; they were mostly circular or oval, and rose four or six inches above the water. Their surface is flat and grassy, and at the edges of some of them a few larger plants grow, which act as sails, so that even the slightest breeze pushes the islands from one part of the lake to another. The largest of them are a few yards in diameter, yet nonetheless can sustain several men standing upon them."

Hopefully an opportunity for a thorough investigation of the floating islands of Zacaton, including a survey of their flora and fauna, will present itself soon.

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Brand, Charles J., and Merrill, Jason L.,"Zacaton as a Paper-making Material," *United States Department of Agriculture Bulletin*No. 309 (November 4, 1915) (28 pp.).

Brown, David E., "Chihuahuan Desertscrub," p. 169-79 in David E. Brown, ed., *Biotic Communities of the American Southwest -- United States and Mexico* (Tucson, 1982) (p. 175 on the occurrence of *Sporobolus wrightii* and *Sporobolus airoides* in wetland communities).

Davy, Humphry, Sir, *Consolations in Travel, or, The Last Days of a Philosopher* (London, 1830) (p. 122-9 gives an account of the floating islands in La Solfatara or Lago della Regina).

Gary, Marcus, "Speleogenesis of Zacaton and Cenotes of Rancho La Azufrosa," Poster Presentation, American Academy of Underwater Sciences 20th Annual Symposium, "Diving for Science in the 21st Century," 11 to 15 October 2000, Sirata Beach Resort, St. Petersburg Beach, Florida.

Kircher, Athanasius, *Latium; id est, Nova & parallela Latii tum veteris tum novi descriptio* (Amsterdam, 1671) (Book 4, Part 3, chapter 4 on the floating islands in the Lago della Regina).

Kristovich, Ann, "Zacaton. A History," Nitrox Diver Magazine 94.4 (Nov. 1994 - Jan. 1995) (on scuba diving in Zacaton; online at http://www.iantd .com/articles/94-4kristovich. html")

Lana Terzi, Francesco, *Magisterium naturae, et artis* (Brescia, 1684-92) (Vol. 3, Book 25, chapter 1, number 54 on the floating islands in the Lago della Regina).

Mr. Van Duzer is currently compiling a global bibliography on floating islands. Here follow some additional citations from this bibliography relating to the floating islands near Tivoli:

Bacci, Andrea,*Discorso delle acque Albule, bagni di Cesare Augusto a' Tivoli, delle acque acetose presso a Roma, & delle acque d'Anticoli*(Rome, 1564) (32 p.; esp. p. 3-4 on the qualities of the water and on the floating islands in Lago della Regina).

Cappello, Agostino, *De' bagni minerali presso Tivoli* (Rome: *Tipofrafia delle belle arti,* 1839) (29 p., offprint from Giornale Arcadico, vol. 80; p. 15-7 on the floating islands).

Kircher, Athanasius, *Latium; id est, Nova & parallela Latii tum veteris tum novi*

descriptio (Amsterdam, 1671) (describes the floating islands near Tivoli in Book 4, part 3. chapt. 4.; the islands were known as *le sedici barchette*, "the sixteen little boats," and are mistakenly depicted as boats on the map of the lake and surrounding regions in Book 3, part 2, chapt. 1).

Gigli, Girolamo, *Il Gorgoleo ovvero il governatore dell'isole natanti* (Sienna, 1753) (a comedy; in Act 1, Scene 2, p. 14-5 the characters discuss the floating islands of Acque Albule near Tivoli, mentioning some of the names of the individual islands, and that local shepherds ride on the islands).

Viale, Benedetto, and Latini, Vincenzo, *Sulle Acque Albule presso Tivoli: Analisi chimica* (Rome: Tipografia di Gaetano Menicanti, 1857) (76 p.; p. 12-4, 49, 69, and 74 on the floating islands).

Zezi, Pietro, "The Travertine and the Acque Albule in the= Neighbourhood of Tivoli," p. 83-8 in Henry James Johnston-Lavis, ed., *The South Italian Volcanoes, Being the Account of an Excursion to Them Made by English and Other Geologists in 1889 Under the Auspices of the Geologists' Association of London* (Naples, 1891) (p. 85-6 on the Lago della Regina, with brief reference to its floating islands).

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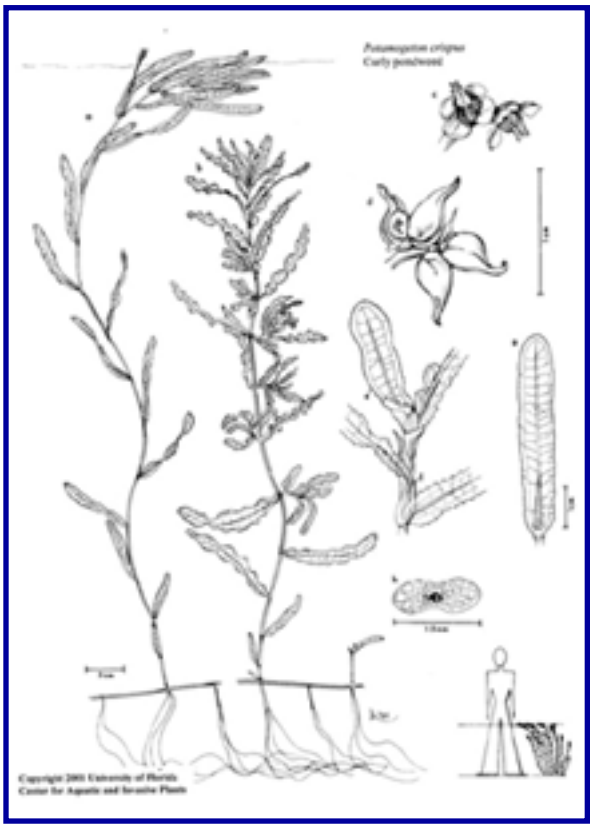
New Line Drawing!

This non-native, invasive, submersed plant, **curly pondweed (*Potamogeton crispus*),** was introduced from Europe more than 100 years ago and is now widespread in the U.S. It occurs in all sstates (except Maine and South Carolina) and in southern Canada. In more northerly climes where it is particularly weedy, curly pondweed actively grows under ice and snow; is often the first plant to emerge in the spring; forms dense floating mats; flowers in June; and dies and "drops out" long before the end of summer. This difficult-to-control aquatic weed is relatively easy to identify -- it is the **only** pondweed with toothed leaves.



***Potamogeton crispus* is an invasive non-native plant to be controlled.**

This line drawings was just completed by Laura Line, Center for Aquatic and Invasive Plants, University of Florida. With proper attribution and in not-for-sale items only, please feel free to use these line drawings for manuals,

brochures, reports, proposals, web sites...

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NEW!
Two PHOTO-MURALS
INVASIVE NON-NATIVE PLANTS

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Center for Aquatic and Invasive Plants, University of Florida
Bureau of Invasive Plant Management, Florida Department of Environmental Protection
and
Cerexagri

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Here are two large photo-murals of **75 invasive non-native plants** in the U.S. Of the plants depicted, 100% are found in Florida, 50% are also found elsewhere in the Southeast U.S.; 50% are also found in Hawaii; 15% are also found in the West; 15% are also found in the East; and 17% are also found in most of the rest of the U.S.

All plants are depicted in large, strikingly attractive color photographs. Here is the list of plants.

At the request of teachers and enviro-trainers, these photo-murals were produced to be attention-grabbing teaching tools for science classes and management agency training, and for

homeowners' forums, ecology clubs, environmental advocacy groups and others concerned about the onslaught of non-native plants in the United States. **It was produced by** the University of Florida and the Florida Department of Environmental Protection, with printing support from Cerexagri. Additional printing support came from Sea Grant, the national Aquatic Plant Management Society, the Florida Aquatic Plant Management Society, and from the U.S. Army Corps of Engineers Jacksonville Office.

The photo-murals are available:

-- **free-to-teachers:**

fully laminated copies of the murals are free to teachers (U.S., K-12) and public agency trainers (U.S.) who request them in writing, on letterhead, to the non-virtual **APIRS**address below. **- there is a limited number of free copies available -**

Please do not telephone or e-mail us about the free photo-mural s offer; we are happy to accept letters on letterhead from teachers (U.S., K-12) and *public* agency trainers (U.S.) who want their free copies. Send your request letters to: **APIRS** Photo-Mural, Center for Aquatic and Invasive Plants, 7922 NW 71 ST, Gainesville, FL 32653.

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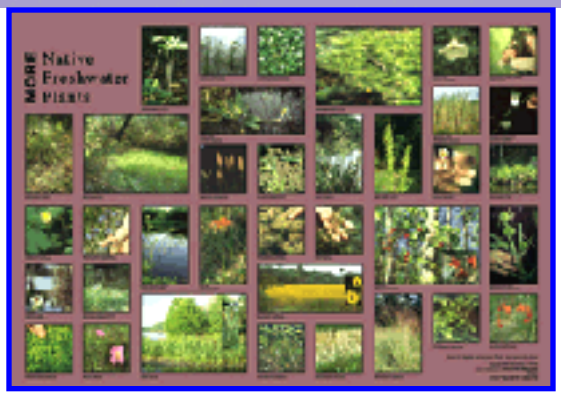
These photo-murals were produced at the request of teachers and enviro-trainers to be attention-grabbing teaching tools for science classes and management agency training, and for homeowners' forums, ecology clubs, environmental advocacy groups and others interested in marshes, swamps and other wetlands of the United States. The murals were produced by the University of Florida and the Florida Department of Environmental Protection, with printing support from Cerexagri. Additional printing support came from Sea Grant, the national Aquatic Plant Management Society, the Florida Aquatic Plant Management Society, and from the U.S. Army Corps of Engineers Jacksonville Office.

NATIVE AQUATIC PLANTS



Lest we forget, with so much current emphasis on invasive non-natives, **most plants in the U.S. are native**; beneficial to animals, humans, and the environment; and often beautiful. So, here are two photo-murals of 76 native freshwater plants of the U.S.. Of the plants depicted, 100% are in Florida; 97% are also found in the rest of the Southeast U.S.; 50% are found in the Eastern U.S.; 22% are found in the West; and 22% are found throughout most of the U.S.

Click here for the list of plants featured on the two "native" murals.

NON-NATIVE INVASIVE PLANTS, AQUATIC AND TERRESTRIAL

Here are two large photo-murals of 75 invasive non-native plants in the U.S. Of the plants depicted, 100% are found in Florida, 50% are also found elsewhere in the Southeast U.S.; 50% are also found in Hawaii; 15% are also found in the West; 15% are also found in the East; and 17% are also found in most of the rest of the U.S. As in the other photo-murals of this series, all plants are depicted in large, strikingly attractive color photographs.

Click here for the list of plants featured on the two "invasive" murals.

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AQUAPHYTE ONLINE
Winter 2001

New Regional Scientific Journal - *SOUTHEASTERN NATURALIST*

Southeastern Naturalist announces a new interdisciplinary regional scientific journal with its first call for papers and subscribers. The quarterly journal is intended to serve as a standard scientific reference resource for the southeastern United States. Manuscripts are solicited in the general categories of original research articles; research summaries and general interest articles; and field observations and notes. Manuscripts may focus on terrestrial, freshwater, and marine organisms, and their habitats. Subject areas include but are not limited to field ecology, biology, behavior, biogeography, wildlife and fisheries management, taxonomy, evolution, anatomy, physiology, geology, and related fields. Manuscripts on genetics, molecular biology, archaeology, and anthropology, etc., are welcome if they provide natural history insights that are of strategic interest to field scientists. Manuscripts may be submitted by anyone who has a serious interest in natural history, including university and college faculty members and their students, researchers, field biologists, professional and amateur naturalists, and writers.

The *Southeastern Naturalist* has no page charges, but does encourage contributions towards printing costs, especially when allowed by grants, contracts, or reprint budgets of the authors. The Humboldt Field Research Institute is a nonprofit corporation of the State of Maine.

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AQUAPHYTE ONLINE
WINTER 2001

Traditional medicinal knowledge about a noxious weed, jal kumbhi (*Eichhornia crassipes*), in Chhattisgarh (India)

by **by P. Oudhia,** Department of Agronomy, Indira Gandhi Agricultural University, Raipur 492001, India, E-mail: pankaj.oudhia@usa.net

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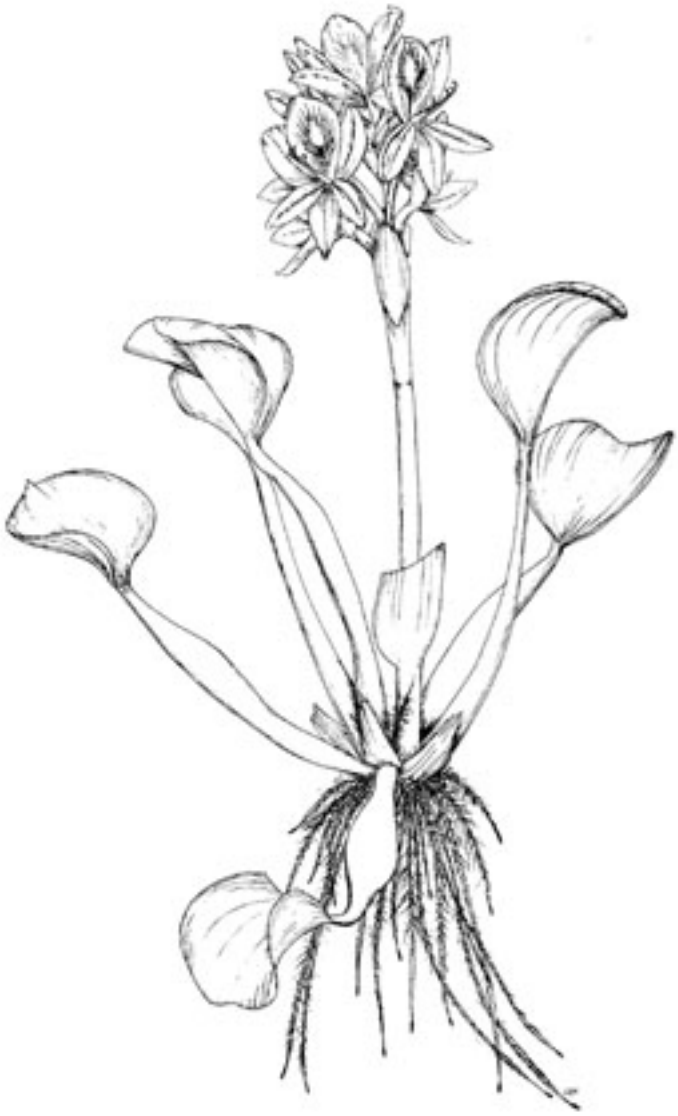
Water hyacinth (*Eichhornia crassipes*) is the most predominant, persistent and troublesome aquatic weed in India. It was first introduced as an ornamental plant in India in 1896 from Brazil (Rao, 1988). In Chhattisgarh, water hyacinth grows as a pond weed and also as a rice weed in lowland fields. In ancient Indian literature, it is clearly mentioned that every plant on this earth is useful for human beings, animals and also for other plants (Oudhia, 1999a). Many medicinal, industrial and allelopathic uses of common weeds have been reported (Oudhia, 1999b; 1999c). The natives of Chhattisgarh use many common weeds to treat their health problems (Oudhia, 1999c; 1999d).



In order to list the existing medicinal uses of this noxious weed, a survey was conducted during the year 2000. The survey was conducted in six selected districts of Chhattisgarh state. From each selected district, two blocks were selected and from each block, a random sample of four villages was taken to make a sample of 100 respondents. Information regarding existing uses was collected through personal

interviews.

The survey revealed that many natives are using the water hyacinth as a medicinal plant. It is mainly used as a remedy to treat the goitre disease. Two basic formulations were identified as the most frequently used:

1) Fresh water hyacinth, table salt and Pippali (*Piper longum*), a common herb, are mixed in equal quantity. 12 grams of this mixture are prescribed for a patient daily until relief is gained.

2) Dried water hyacinth is burnt and taken with fresh cow urine.

In Chhattisgarh, water hyacinth also is used as a styptic. Natives apply fresh juice of the weed in fresh wounds. It is believed to stop the spread of infection. For rice farmers, it is one of the best first aid remedies for minor injuries. In septic wounds, it is applied with vinegar.

The above mentioned uses of water hyacinth have not been reported in available literature. This survey suggests there is a strong need to identify the potential medicinal uses of this obnoxious weed so that it can be used for the welfare of human beings.

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Meetings

May 15-18, 2008; Palmetto, Florida - www.fnps.org
28th Annual Florida Native Plant Society Conference
Uplands to Estuaries: Celebrating Florida's Native Plant Heritage

May 20-22, 2008; Imperial Palace Casinos, Biloxi, Mississippi - http://www.se-eppc.org
10th Annual Southeast EPPC Conference

June 23-27, 2008; International Weed Science Society, Vancouver, Canada - http://iws.ucdavis.edu/5intlweedcong.htm
International Weed Science Society

Aquatic Weed Management

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June 23-26, 2008; University of Florida, Gainesville, Florida - http://www.conference.ifas.ufl.edu/soils/wetland082/site.htm
Biogeochemistry of Wetlands: Science and Applications Short Course

August 25-26th, 2008; LSU Energy, Coast, and Environmental Building, Baton Rouge, Louisiana - http://www.sce.lsu.edu/conference
Sustainable Management of Deltaic Ecosystems: Integration of Theory and Practice

September 7-12, 2008; Daniel Boone National Forest, Olympia Springs, Kentucky - http://tfce.uky.edu/wri_2008.htm
2008 Eastern Regional Wetland Restoration Institute

September 23-25, 2008; Austin Carey Memorial Forest Education Building, Gainesville, Fl. - http://soils.ifas.ufl.edu
Hydric Soils Short Course - Specialized Training for Wetland Specialists
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October 21-23 , 2008; Austin Carey Memorial Forest Education Building, Gainesville, Fl. - http://soils.ifas.ufl.edu
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November 12-14, 2008; Stellenbosch, South Africa http://academic.sun.ac.za/cib/events/Elton_CIB_symposium.htm
Fifty Years of Invasion Ecology - the Legacy of Charles Elton
Centre of Excellence for Invasion Biology, Stellenbosch University

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June 23-26, 2009; Guadalajara, Jalisco, Mexico http://www.paleolim.org/index.php/symposia/
11th International Paleolimnology Symposium

August 23-27, 2009; Stellenbosch, South Africa www.emapi2009.co.za or rich@sun.ac.za
The 10th International Conference on the Ecology and Management of Alien Plant Invasions (EMAPI)
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AQUAPHYTE ONLINE
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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 2001. The database has more than 55,000 citations. To receive free bibliographies on specific plants and/or subjects, contact **APIRS** at 352-392-1799 or use the database online at http://plants.ifas.ufl.edu/database.html

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

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