



# Plants Out of Place

the newsletter of the

INVASIVE PLANTS ASSOCIATION OF WISCONSIN

Issue 3—October 2002

## Native and Invasive Strains of Common Reed Grass (*Phragmites australis*), How Can You Tell Them Apart?

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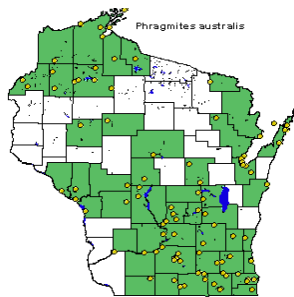
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*Phragmites australis* (common reed grass) is a cosmopolitan species. The North American distribution and abundance of *Phragmites* has increased dramatically over the past 150 years. Recent research by Kristin Saltonstall [K. Saltonstall, 2002. Cryptic invasion by a non-native genotype of the common reed, *Phragmites australis*, into North America. *Proc. Natl. Acad. Sci. USA*, Vol. 99, Issue 4, 2445-2449. (Available on the web at [www.pnas.org/cgi/doi/10.1073/pnas.032477999](http://www.pnas.org/cgi/doi/10.1073/pnas.032477999))] tested the hypothesis that non-native strains of *Phragmites* are responsible for the observed spread. Chloroplast DNA was sequenced for samples collected worldwide, throughout the range of *Phragmites*, to determine genetic differences between North American populations and populations from other continents. The results indicated that an introduction to North America has occurred, and that the introduced type has displaced native types as well as expanded to regions previously not known to have *Phragmites*. The dramatic increase in abundance of *Phragmites* in North America is indeed due to the spread of non-native strains, and these invasive strains may be threatening the native *Phragmites*, but how are we to know whether a population is native or introduced? Most of us don't have a DNA sequencer in our garage!

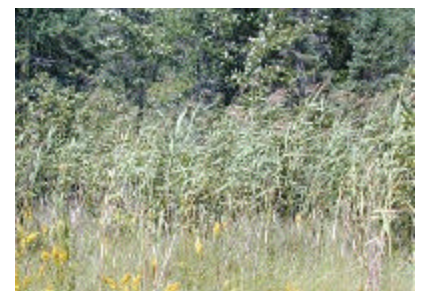


### *Phragmites* in Wisconsin

Source: Wisconsin State Herbarium website determine the origin of strains based on morphological characters of specimens that are sent to them. The program's website:

[www.invasiveplants.net](http://www.invasiveplants.net) has guidelines and instructions for collection and submission of *Phragmites* specimens, and for reporting of sampling locations. Their website also contains an excellent summary of the morphological characters used to distinguish native and invasive strains including photographs of many of the distinguishing features. The table and description of morphological characters presented below are excerpted from the Cornell Biological Control

The Biological Control of Non-indigenous Plant Species Program, directed by Dr. Bernd Blossey at Cornell University, has solved this identification problem for us. They have taken specimens positively identified using DNA sequencing and searched for morphological characters that distinguish between native and invasive strains. They have found 16 morphological characters that, used in combination, provide a way to positively distinguish between native and invasive strains without getting that DNA sequencer out of your garage. The Biological Control Program at Cornell also offers a free diagnostic service through which they will



*Phragmites australis*  
Source: Wisconsin State Herbarium website

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Program’s website with permission from Dr. Bernd Blossey.

**Table 1. Observed differences between native and introduced *Phragmites* clones**

<b>Trait</b>	<b>Native</b>	<b>Introduced</b>
<b>Leaf sheaths</b>	<b>Fall off</b> in the fall or are very easily removed if they stay on the stem.	Leaf sheaths <b>stay on</b> the plant; occasionally basal sheaths fall off the stem. Leaf sheaths are difficult to remove (use a twisting motion).
<b>Stem color at base (spring/summer)</b> Remove leaf sheath	<b>Red to Chestnut</b>	<b>Tan</b> Very occasionally do lower internodes show a brownish coloration in the winter.
<b>Stem color at base (winter)</b> Remove leaf sheath	<b>Light chestnut to light brown/gray</b>	<b>Tan</b>
<b>Stem texture</b> Note: Run finger across and up and down the stem after removing the leaf sheath.	<b>Smooth and shiny</b> (Looks polished. Often with dark spots [fungal attack] clustered at nodes in winter.)	<b>Rough and dull</b> (Stems are ribbed. Ridges visible with naked eye. Very occasionally do basal internodes appear smooth.)
<b>Stem flexibility</b>	<b>Flexible</b>	<b>Rigid</b>
<b>Stem toughness</b>	<b>Low</b>	<b>High</b>
<b>Stem density</b>	<b>Low</b>	<b>High</b>
<b>Time of Flowering</b>	<b>Early (July-August)</b>	<b>Intermediate (August-September)</b>
<b>Inflorescence</b>	<b>Sparse</b>	<b>Dense</b>
<b>Senescence</b>	<b>Early</b>	<b>Late</b>
<b>Leaf color</b>	<b>Yellow-green</b>	<b>Dark green/gray</b>
<b>Rhizome density</b>	<b>Low</b>	<b>High</b>
<b>Rhizome color</b>	<b>Yellowish</b>	<b>White to light yellow.</b> Rhizomes will darken after excavation.
<b>Rhizome diameter</b>	<b>Usually under 15mm</b> Almost perfectly round. Occasionally slightly compressed.	<b>Few nodes under 15mm</b> , most >15mm Mostly compressed (oval)
<b>Clonal expansion rate</b>	<b>Slow</b>	<b>Rapid</b>
<b>Habitat requirements</b>	<b>Potentially restricted?</b> All examined native populations grow on moist soils. Sites can be under tidal influence but are never continuously inundated.	<b>Wide range of conditions</b> Introduced genotypes can grow on fairly dry sites and on sites where rhizomes are continuously inundated.

In general, native populations appear to have a lower stem density, and produce a reddish-purple color on their stems and ligules in spring and summer that is not present in non-native populations. When checking for these differences, note that the side of the stems exposed to the sun will show the brightest coloration. The reddish color fades somewhat into a chestnut brown in the fall; in the winter the red stems turn light to chestnut brown and somewhat gray. Stems of native genotypes are smooth and shiny as if polished, particularly in the winter, while stems of introduced genotypes are dull, rough and ribbed (ridges visible with the naked eye once the leaf sheath has been removed). These differences are easy to recognize by running your fingers up and down the stems. Please note that a leaf sheath wraps around the stem almost entirely. It is important to remove the leaf sheath when checking for stem morphology or texture.

For all native genotypes, leaf sheaths either fall off by themselves or are very easily removed when handling *Phragmites*. In the introduced genotypes, leaf sheaths may fall off at the base of the stem (which is also occasionally reddish or brownish), but on upper nodes sheaths are very difficult to remove (hold a stem close to an internode and use a twisting motion to check). In instances

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where native and introduced clones grow in close proximity to each other, differences in stem density and stem toughness become obvious on windy days. Introduced genotypes remain sturdy and erect and move little, while native genotypes easily bend and swing in the wind. Stems of introduced genotypes are often almost perfectly straight, while stems of native genotypes often grow crooked.

In the fall and winter, differences in the density of inflorescences are also obvious; introduced genotypes appear to have much denser and larger inflorescences. Observations in New York and Virginia also suggest that native genotypes senesce earlier than introduced genotypes (this is a common phenomenon in introduced species which often show extended growing periods). In addition, an unidentified stem fungus attacks native genotypes producing dark spots often clustered around internodes, while introduced genotypes remain fungus free. There appears to be a reduction over the winter in the abundance of this stem spot fungus and not all western populations appear to be attacked.

Excavations of rhizomes at several sites have also produced consistent differences between native and introduced strains. Native strains have round rhizomes that are yellow and have diameters of less than 15mm. Rhizomes of introduced genotypes, particularly when freshly excavated and rinsed, are white (they darken over time) and compressed (flattened). Although there are some rhizomes with diameters <15mm, most rhizome diameters of introduced genotypes are larger than 15mm (measure in the center of an internode and use the largest diameter).

## You Can Help in the Native/Invasive *Phragmites* War!

Kelly Kearns, Plant Conservation Program Manager with the Wisconsin DNR is collecting information on native Wisconsin *Phragmites* populations so that the DNR can start a nursery that produces native genotypes. Wisconsin and the Midwest currently have a number of wastewater treatment facilities that use *Phragmites* to dewater sludge. The designers of these wastewater systems currently use *Phragmites* rootstocks that are most likely non-native genotypes. The Wisconsin DNR has agreed that if native *Phragmites* genotypes can be made readily available, future planting on wastewater facilities should be the native types. Several native genotypes are needed, since the most robust native genotypes may have to be selected to be as effective as the invasives for sludge dewatering.

If you know of, or locate, a native *Phragmites* population, please contact Kelly Kearns with the following information:

- 1) Exact location of the population (Township, Range, and Quarter-quarter Section, or directions from accessible roads).
- 2) The landowner's name and contact information.
- 3) Approximate size of the population (a rough estimate of acreage and plant density).

Contact: Kelly Kearns, Plant Conservation Program Manager, Endangered Resources Program  
Wisconsin DNR, P.O. Box 7921, Madison, WI 53707-7921  
Phone: (608) 267-5066; Fax: (608) 266-2925; email: [kelly.kearns@dnr.state.wi.us](mailto:kelly.kearns@dnr.state.wi.us)

## Top-killing Canada Thistle with Vinegar?

Excerpted from a news report on the USDA, Agricultural Research Service website  
(go to: [www.nps.ars.usda.gov/](http://www.nps.ars.usda.gov/) and search for **vinegar**)

Some home gardeners already use vinegar as an herbicide, and some garden stores sell vinegar pesticides. But no one has tested it scientifically until now. Agricultural Research Service scientists offer the first scientific evidence that vinegar may be a potent weedkiller that is inexpensive and environmentally safe — perfect for organic farmers.

ARS researchers Jay Radhakrishnan, John R. Teasdale and Ben Coffman tested vinegar on five major weeds — common lamb's-quarters, giant foxtail, velvetleaf, smooth pigweed and Canada thistle — in greenhouse and field studies. Canada thistle, one of the most tenacious weeds in the world, proved the most susceptible of the five weeds tested; a 5-percent concentration of Vinegar (acetic acid) had a 100-percent kill rate of the perennial's above-ground growth. (Household vinegar is about a 5-percent concentration.) There was some regrowth from the roots of Canada thistle plants of all age groups. (However, regrowth from Canada thistle roots also occurs after a single top killing with most, if not all, conventional herbicides, according to information in The Nature Conservancy's invasive plant "Management Library" found at: [tncweeds.ucdavis.edu/](http://tncweeds.ucdavis.edu/))

## Regional Focus

### Door County Soil and Water Conservation Department Receives a Wisconsin Coastal Management Program Grant to Develop an Invasive Species Strategic Plan!

The Soil and Water Conservation Department of Door County received a 2002 – 2003 grant from the Wisconsin Coastal Management Program to develop a countywide invasive species work plan for both public and private sector partners. The grant funds the work of several partner organizations to provide input to the plan through a series of meetings among agencies, partners and other stakeholders. The completed work plan will include: 1) a review of invasive species issues and resource needs in Door County, 2) an analysis of agency resources and capacities, 3) establishment of specific goals for invasive species control, 4) an implementation schedule, 5) strategies for success, 6) methods of measuring success and updating the plan, and 7) identification of long-term funding to support invasive species control. The Door County invasive species work plan will serve to better coordinate the countywide invasive species control efforts of several diverse organizations committed to control of invasive species.

Development of a Door County invasive species work plan will compliment invasive species control projects that are presently ongoing including: the City of Sturgeon Bay Eurasian water milfoil control project, the development of individual state park management and control plans, and the development of a control plan for purple loosestrife by the Little Sturgeon Bay Property Owners Association. The Door County invasive species work plan could serve as a template that other counties or regions could use to more effectively coordinate their local invasive species control projects.

***The project will host a large, one-day, informational gathering and education session to kick off the plan. The meeting will be in Sturgeon Bay, 5 November 2002. Anyone and Everyone is invited to attend.***

***If you are interested in attending, contact the Workshop Coordinator:***

***Julie Tochor, (414) 225-5108, [Julie\\_tochor@earthtech.com](mailto:Julie_tochor@earthtech.com)***

For more information about the project, contact:  
Jaime Corbisier, Door County Soil and Water Conservation Department  
P O Box 670, 421 Nebraska Street, Sturgeon Bay, WI 54235  
Phone: (920) 746-2214; Fax: (920) 746-2369; [jcorbisi@co.door.wi.us](mailto:jcorbisi@co.door.wi.us)

### Get Involved in Regional and County Groups!

The following groups are actively working at invasive species control around Wisconsin. They can use your help! Contacts are listed.

**Central** – Mike Engel  
[Mike\\_Engel@fws.gov](mailto:Mike_Engel@fws.gov)  
(608) 221-1206 ext 21

**Western** – Rolf Utegaard  
[bigute-hort@prodigy.net](mailto:bigute-hort@prodigy.net)  
(715) 834-0065

**Northwoods Weed Initiative** —  
Quita Sheehan  
[msheehan01@fs.fed.us](mailto:msheehan01@fs.fed.us)  
(715) 479-2827

**Northeastern** — Gene Tiser  
[tiserg@dnr.state.wi.us](mailto:tiserg@dnr.state.wi.us)  
(920) 492-5836

**Southern** – Coordinator needed  
**Southeast** – Coordinator needed

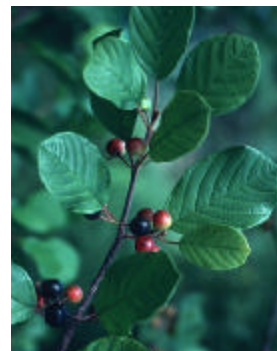
**Milwaukee County Weed Out** —  
Ken Solis  
[ksolis@drjump.com](mailto:ksolis@drjump.com)  
(414) 423-1709

**Southwest** – Coordinator needed  
**Door County** — Jamie Corbisier  
[jcorbisi@co.door.wi.us](mailto:jcorbisi@co.door.wi.us)  
(920) 746-2214

**Greater Sauk County** - Jim Welsh  
[jwelsh@tnc.org](mailto:jwelsh@tnc.org)  
(608) 251-8140

**Monroe County** — Kim Mello  
[kim.mello@emh2.mccoy.army.mil](mailto:kim.mello@emh2.mccoy.army.mil)  
(608) 388-5766

**Brown County** — Paul Hartman  
[paul.hartman@ces.uwex.edu](mailto:paul.hartman@ces.uwex.edu)  
(920) 391-4610



Glossy buckthorn (*Rhamnus frangula*)  
Source: Wisconsin State Herbarium Website

## The Bradley Method for Control of Invasive Plants

**Thomas D. Brock**, Professor Emeritus, University of Wisconsin-Madison  
1227 Dartmouth Rd., Madison, WI 53705 email: [tdbrock@facstaff.wisc.edu](mailto:tdbrock@facstaff.wisc.edu)

An interesting approach to control of invasive plants in natural habitats is the Bradley Method, first developed in Australia by the late Joan Bradley and her sister Eileen. Outside of Australia it has apparently only been used in California, but it should be applicable to most parts of the world.

The Bradley method is first of all a strategy for, or even a “philosophy” of, long-term control of invasive plants.

There are three basic principles of the Bradley Method:

**1) Always begin control work in undisturbed natural areas, and then work out toward areas more heavily infested with invasives.**

According to the Bradleys, if native plants are given a chance they will recover the ground that has been taken from them by invasive plants. The principal here is to start in areas where the native plants are thriving and gradually clear into the more heavily invaded areas. Non-natives do not invade readily into areas where the native plants are already well established.

If one clears invasives in the worst areas first, this may not only be ineffective, it may be harmful. Removing non-natives in such areas exposes bare ground, tipping the balance in favor of the weeds. On the other hand, weeding a little at a time within and adjacent to good stands of native plants, then moving outward toward the most invaded areas, gives the natives a chance to move in and thrive.

**2) While removing invasive plants, try to keep from disturbing the environment any more than necessary.**

Large numbers of invasive plant seeds rain down on natural areas. If the ground is opened, these seeds can thrive. Undisturbed native soil, with its natural mulch, is resistant to invasion by non-native plants.

**3) Do not over-clear.**

Leave the natural area as undisturbed as possible. If a large team of workers is available, people should spread out and weed small amounts in many places, rather than having the entire crew work in one place. The total area cleared of invasives will be as large, but regeneration by native plants will be greater.

The Bradley method emphasizes that removing invasive plants from a natural area involves two different kinds of time, *working time* and *waiting time*. Patience is not only a virtue; it is essential.

### *The Bradley plan of approach*

**1)** Start with areas where native plants are dominant. Invasive plants may be scattered throughout, singly or in small groups. The risk of over-clearing here is nil, so this is the place to start. After clearing all the invasives, return once or twice a year and remove any that were missed, or which have colonized by seed.

**2)** After the least disturbed areas are cleared of non-natives, move into areas more heavily invaded, where there is some native undergrowth. Choose an area of substantial native plant growth, where native plants are pushing up against a mixture of invasive plants and natives. Remove non-natives in a strip about 10 feet across, then stop and give the natives time to move into the weeded areas. As the natives take hold, extend the strip along the boundary.



Common Buckthorn invasion in a woodland  
Photo: David Boyer

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3) Maintain the advantage already gained. It is important to resist the temptation to clear more deeply into the heavily invaded areas before regenerating natives have become established. Invasive plant seeds will continue to germinate in newly cleared areas, so they should be removed as soon as possible. This is more important than starting to clear new areas.

4) Be very cautious when moving into the worst areas. However ugly an area of solid invasive plants may look, do not start clearing it until the native vegetation has been brought right up to its border.

Although Joan and Eileen Bradley were trained as chemists, their method makes very little use of herbicides. "We regenerate [native vegetation] by using methods that give us the most effective kill of weeds and the most bountiful growth of natives; that is, by skilful manual weeding. This can be laborious, and we are often asked, especially when we are having to spend a long time extracting a big weed, 'Why don't you poison it?' We prefer not to use poisons if we can avoid it, and we certainly condemn their indiscriminate use."

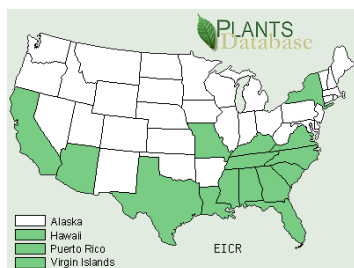
Their reasoning is that herbicides are not truly selective, may have detrimental effects on the environment, and do not always work. However, they do admit that for some invasive plants, or for some areas, herbicides may be necessary. However, their hand weeding technique is perfectly safe, highly effective, and reliable. It does require one trait that we do not always have or want to use: staying power.

Details of the Bradley method, including many practical suggestions for weeding, have been published: **Bradley, Joan**. 1997. *Bringing back the bush: The Bradley method of bush regeneration*. Lansdowne Publishing Pty. Ltd. 18 Argyle Street, The Rocks, New South Wales, Australia. I obtained my copy of this book from Books of Nature, P.O. Box 345, Lindfield NSW 2070, Australia. <http://www.booksofnature.com>

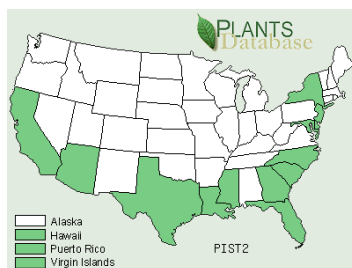
## Water Hyacinth and Water Lettuce ... In Wisconsin???

Yes, it's true! This summer both water hyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*) were found in Wisconsin. Both of these aquatic plants are invasive in the southern United States. Jim Hansen, DNR, found water hyacinth growing in the Fifield wastewater treatment lagoon. Gene Tiser, DNR, found water lettuce growing along a creek in Green Bay. Both are thought to be recent escapes. Can either of these southern invasive plants survive and reproduce in Wisconsin?

**Constant vigilance for new invaders seems to be in order!**



Water Hyacinth



Water Lettuce

## Work of the IPAW Science Committee

Since its first scheduled meeting in Madison last year, the IPAW Science Committee has been actively working on the development of a list of *Invasive* and *Potentially Invasive* plants for Wisconsin. The concept used by the committee was to generate a credible list by using a survey completed by a large number of experienced naturalists and land managers (described in PooP, Issue 2). The committee designed a survey, containing a list of all those plants that might possibly be considered invasive or potentially invasive in Wisconsin. That survey was distributed last spring to approximately 300 people. A copy of the survey can be viewed on, and downloaded from, the IPAW website. Completion of additional surveys is welcome. To date, 60 surveys have been returned, and the data from these responses has been compiled. The committee discussed approaches to analysis of survey results at their last meeting (3 September 2002) at UW-Stevens Point. Within the next two months analysis of the survey results will be completed, and the list of Invasive Plants will be finalized for presentation to the board.

If you have not yet participated in the survey, it is not too late. IPAW is inviting anyone with knowledge of invasive plants to participate. A copy of the survey and instructions can be obtained from the IPAW website at: [www.ipaw.org](http://www.ipaw.org).



Water Hyacinth  
at the Fifield  
Wastewater  
Lagoon

Photo: James  
Hansen

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## *Notes ... Announcements ... Meetings ...*

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**Buckthorn Bust Neighborhood Guide** - The Minneapolis Park and Recreation Board and Saint Paul Parks and Recreation received funding from the USDA Forest Service to implement buckthorn removal programs on public and private land in each city. One of their products is a Guidebook, which is a tool kit to help neighborhoods organize buckthorn removal projects. In addition to developing the Guidebook, Saint Paul and Minneapolis also developed a mini-grant program and funded neighborhood organizations that wanted to take on the challenge of mobilizing homeowners to remove buckthorn.

To see the guidebook that the program developed go to: [www.ci.stpaul.mn.us/](http://www.ci.stpaul.mn.us/) search on "buckthorn" and click on the: "**Buckthorn Bust Neighborhood Guide**".

If you have questions about the program, contact: Rebecca Stenberg, Saint Paul Parks and Recreation  
(651) 266-6416; email: [rebecca.stenberg@ci.stpaul.mn.us](mailto:rebecca.stenberg@ci.stpaul.mn.us)

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**IPAW Call for Photos** - IPAW is still seeking the donation of photographs of invasive plants, their effects on native plant communities, invasive species control, and other related topics. If you are willing to share your best photographs of an invasive plant problem, please send them to Jim Reinartz, PooP Editor (full contact information on the first page).

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**Garlic Mustard Biocontrol Insects Available Soon!** - It's true! Garlic mustard biocontrol insects will be available soon, - possibly as soon as the spring of 2004! The insects will first be distributed to sites that establish long-term monitoring plots and collect data on the vegetation in the plots and the effects of the insects. Each state in the range of garlic mustard is being encouraged to set up several plots. Ideally these monitoring plots should be set up this fall so that plot data can be collected for a full year prior to release of the insects. Each monitoring site needs 10 - 20, ¼ m<sup>2</sup> quadrats. Data collection occurs in the fall and in the late spring/early summer, prior to garlic mustard seed drop, and should only take a few hours each time. Data will be collected on garlic mustard and other plants found in each plot.

The Wisconsin DNR is looking for sites to establish monitoring plots. Because the study is focused on the impacts of the biocontrol insects alone, it is important that there be no traditional control methods used in the vicinity of the plots for the duration of the study. If you have a site that is infested with garlic mustard, and you know that you will not be conducting control on the site in the near future, your site may be eligible to participate in this study. Each selected site will require a person committed to establishing the plots and collecting data twice each year. This can be a property manager, private landowner, or volunteer. Monitoring plots should receive the insects in the spring of 2004, at the earliest, or by the spring of 2005, at the latest. It will be a few more years before biocontrol insects are generally available to others.

If you think you might have a good site for a monitoring plot,  
contact: Kelly Kearns, Plant Conservation Program Manager, Endangered Resources Program  
Wisconsin DNR, P.O. Box 7921, Madison, WI 53707-7921  
Phone: (608) 267-5066; Fax: (608) 266-2925; email: [kelly.kearns@dnr.state.wi.us](mailto:kelly.kearns@dnr.state.wi.us)

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## **Join IPAW Today!**

**Invasive Plants Association of Wisconsin**  
P.O. Box 5274  
Madison, WI 53705-0274

Membership Categories: \$20.00 individual; \$100.00 organization/agency

**For information on joining and a membership form, email:**  
**[IPAWmbrship@aol.com](mailto:IPAWmbrship@aol.com)**



***Plants out of Place***

is a periodic newsletter distributed to the members of **IPAW**.

Send comments, suggestions, and articles that you think may be of interest to IPAW to the newsletter **Editor**:

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*Visit the IPAW website:*

**[www.ipaw.org](http://www.ipaw.org)**



Water Hyacinth at the Fifield Wastewater Lagoon

Photo: James Hansen



Invasive Plants Association of Wisconsin  
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