



Training the Public to Identify Aquatic Invasive Plants

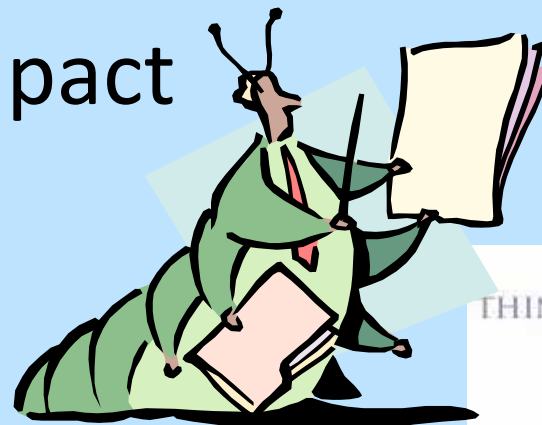
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Program Coordinator
URI Watershed Watch





Presentation Overview

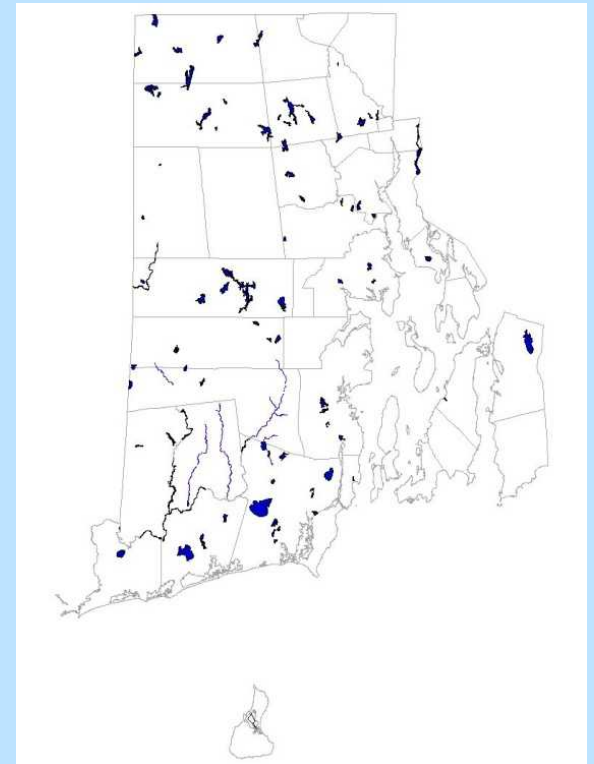
- Brief introduction to URIWW
- Aquatic plant training course evolution
- Course materials
- Public education impact





URI Watershed Watch (URIWW)

- 💧 Begun in 1988 with 14 lakes
- 💧 Now monitors +250 sites on +120 waterbodies with ~350 volunteers
- 💧 Provides ~90% of RI's lake multi-year baseline data
- 💧 Comprehensive program adaptable to local needs





Routine Monitoring Parameters



Field

- Secchi Depth
- Water Temperature
- Dissolved Oxygen
- Chl. - a Processing



Laboratory

- pH
- Alkalinity
- Total & Dissolved Phosphorus
- Total, nitrate and ammonium nitrogen
- Chlorophyll - a
- Chlorides
- Bacteria

State Certified Laboratory!



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Aquatic Plant Training

- 1993 Plant sessions (class & field) in Advanced Training course
- 1994 Plant Identification and Mapping Project
 - Native and non-native plants
 - 9 sessions (classroom, lab and field)
 - Emphasis on mapping and ID
 - Comparison with 1988/89 surveys

Great research project – but too much as a volunteer monitoring effort

Spring 1993
ADVANCED WATER QUALITY TRAINING
All classes will be Tuesday evenings from 7 - 9:15 PM
All field sessions will start at 9:00 am and end at noon.

SESSION 1 Introduction to Watersheds and Quality Assurance
Review of watershed components
QA/QC demonstration

FIELD 1 Assessing Hydrology - measuring stream flow hydrology including cross section, discharge volume, and flow rates.

SESSION 2 Nitrogen and Phosphorus in Natural Waters
Nutrient cycles and their importance in natural waters
How to monitor for and quality assure nutrient samples.

SESSION 3 Introduction to Aquatic Plants
Macrophytes and algae in fresh and salt waters.

FIELD 2 Field Identification of Aquatic Plants
CHOOSE ONE: Belleville Pond (fresh water)
Mingoa Pond and Succolash Marsh (saltwater).

SESSION 4 HOUR ONE Lake Restoration and Management Techniques
HOUR TWO Turning Monitoring into Action - how to move from "watching to "doing" a waterbody.

FIELD 3 Performing a Quality Assurance Field Visit: Session will review protocols for summer QA visits with volunteers.

SESSION 5 HOUR ONE - Monitoring for Bacteria - Bacterial contamination of waters and how to monitor for Bacteria
HOUR TWO - Introduction to Estuarine Shellfish

SESSION 6 HOUR ONE - Introduction to Macroinvertebrates - How to sample macroinvertebrates, why they are indicators of water quality.
HOUR TWO - Zebra Mussels - What are they? Are they coming to RI? How do we identify them?

FIELD 4 Macroinvertebrates - Field Sampling techniques and field ID. Conduct a small water quality study and assess results.

URI WATERSHED WATCH
1994 Advanced Training for Water Quality Volunteers:
Aquatic Plants

Session 1 July 12, Tuesday: Introduction to common aquatic plants
Classroom session:
I. Training program introduction
II. Basic introduction to aquatic plants
III. Introduction to identification keys
Laboratory session:
• practice identification of plants

Session 2 July 14, Thursday: Macrophyte identification
Field session:
I. Basic aquatic plant ecology
II. Identify plants found at the site, especially those common to RI waters
III. Students collect and identify plants with assistance

Session 3 July 19, Tuesday: Survey method
Field session:
I. Plant survey protocol
II. Conduct survey of local lake in small groups

Session 4 July 21, Thursday: Survey techniques (II)
Field session:
I. Review survey protocol
II. Continue practicing (conducting) survey
III. Field training wrap up

Session 5 July 25, Monday: Evening of algae
Classroom:
I. Basic introduction to algae
II. How to identify some common algae
Laboratory:
I. Viewing algae under scopes
II. Keying out of some common algae

Session 6 July 28, Thursday: nuisance aquatics
Classroom (1): nuisance aquatics
• identify which species are nuisances
• why are they nuisances
• best way to control (i.e. prevent spread)
Classroom (2): aquatic plant control techniques
• chemical methods (what, rules, costs etc.)
• mechanical (what, rules, costs etc.)
• pros/cons of methods



Learning from those...

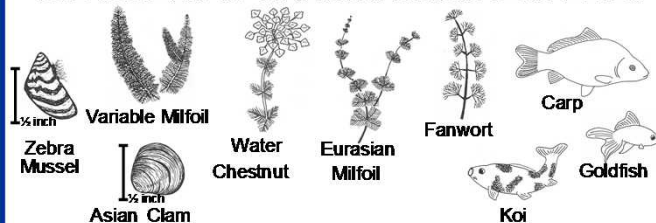
- 2007 teamed with RI Natural History Survey (RINHS)
 - Focused on invasive species only (AIS)
 - No mapping requirement
- 2008 classroom only (building awareness)
- 2009 - present: Classroom and field components



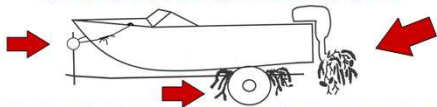
Why reactivate plant monitoring?



THE SPREAD OF AQUATIC INVASIVE SPECIES



BOATERS: INSPECT VESSEL CAREFULLY BEFORE & AFTER USE!



• Remove ALL weeds and plant fragments from watercraft & trailer before & after use

• Drain boat & motor far from water; allow to dry before next use

• Clean off all waders, boots and gear after use in any waterbody

• Do not release bait or aquarium fish, shellfish or plants



For more information contact:
RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



SAVE THE LAKES

AN ALLIANCE OF INDIVIDUALS AND ASSOCIATIONS DEDICATED TO IMPROVING, PROTECTING AND PRESERVING THE FRESH WATER BODIES OF RHODE ISLAND FOR FUTURE GENERATIONS



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10 Tips for Improved Lakeshore Stewardship from US EPA

Save The Lakes was founded as the only statewide organization dedicated to the preservation and protection of Rhode Island's lakes, ponds and fresh water resources. We provide a forum for education, discussion and action on lake-related issues; we advocate for better fresh water management policies at the local, state and federal levels.

Save The Lakes (STL) is managed entirely by volunteers and is a 501(c)3 qualified non-profit organization. We are supported almost exclusively through membership dues and donations, which are fully tax deductible. Members are encouraged to join one of STL's committees to become actively engaged in critical issues and interesting challenges, while gaining valuable information on lake and watershed issues (and even have some fun!)

Save The Lakes members receive information on current and critical lake issues through email communications, access to environmental agency personnel at forums and workshops, and opportunities to network with other members at events. If you are a permanent or part-time lake area residents, recreational lake user, lake area or lake dependent business, we encourage you to join STL and support our efforts for YOUR lake's sake!



Rhode Island lakes and ponds - beautiful in every season!

LATEST NEWS

Saturday, March 31st, Save the Lakes launches its Voluntary Inspection Program (VIP), a boater education and inspection program to help prevent the spread of aquatic invasives species with new volunteer training ([read more](#))

Saturday, March 31st (and April 5th) URI Watershed Watch classroom training for new water quality monitoring volunteers! New



New Approach

- Aquatic plant ecology (RINHHS)
- Aquatic invasives in RI (RIDEM)
- Overview of Lake Management Strategies (Lake management company)
- Provide monitoring opportunities
 - Plant ID resource
 - Equipment (view buckets)





Course Binder Contents

- I. Volunteer Monitoring: Invasive Aquatic Plant Survey Manual Tier I
- II. How to Use the *Key to Non-native and Invasive Plants in Rhode*
- III. *Key to Non-native and Invasive Plants in Rhode*
- IV. Glossary of Plant Terms (line drawings)
- V. Look Alike Plants with Feathery Leaves (photos)
- VI. Hydrilla Look Alike Plants
- VII. Non-Native Invasive Freshwater Aquatic Plants Found in Rhode Island and Neighboring States (Color pictorial guide on waterproof paper)
- VII. Rhode Island Department of Environmental Management Aquatic Invasive Species Factsheet Series
- VIII. Guide to Keying Out Aquatic Invasive Species in Rhode Island (RIDEM)





Volunteer Monitoring:

University of Rhode Island Watershed Watch (URIWW) Invasive Aquatic Plant Survey Manual

Available at
www.uri.edu/ce/wq/ww/PlantProtocol.pdf

- Upo
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- Incl
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Key to Non-Native Plants RI

Key to Non-native and invasive aquatic plants in Rhode Island (Adapted from C. Barre Hellquist, Massachusetts College of Liberal Arts)

1. Leaves arising from base of plant in flowering plants
 2. Flowers white; leaves arrow-shaped or lance-like, lacking a marginal vein..... (arrowhead). The genus *Sagittaria* contains various species that are found statewide may be a source of problems.

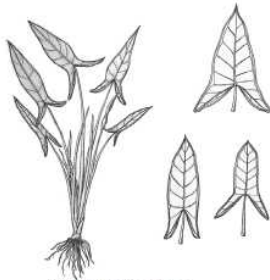


Sagittaria latifolia
(Native)



Sagittaria graminea
(Native)

2. Flowers green (spathe & spadix); leaves arrow-shaped with a distinct marginal vein (arrow arum). Arrow arum is not considered weedy, but is included due to its similar and pickerel weed.



Peltandra virginica (Native)

3. Plant upright with showy blue or purplish flowers..... (pickerel weed). Common throughout Rhode Island, may become



Pontederia cordata (Native)

3. Plant submersed and/or floating, flowers white, yellow or green
4. Main portion of leaves are floating
 - a) Triangular leaves arranged in a rosette with white flower barbed nuts..... This is an extremely troublesome plant in various water annual plant, it MAY be more manageable than its production.

Trapa natans (Non-Native)



How to use *The Key to Non-native and Invasive Plants in Rhode Island*

The plant identification key that we are using was excerpted and adapted from *Key to Non-native and Invasive Aquatic plants in Massachusetts* (Hellquist, 1990). It is a dichotomous key, meaning that two choices (couplets) are presented for each numbered statement and you must decide which of the choices applies to the particular plant in question. Plant names are listed in the Latin form, indicating 'Genus' and 'species' epithet, as well as common name.

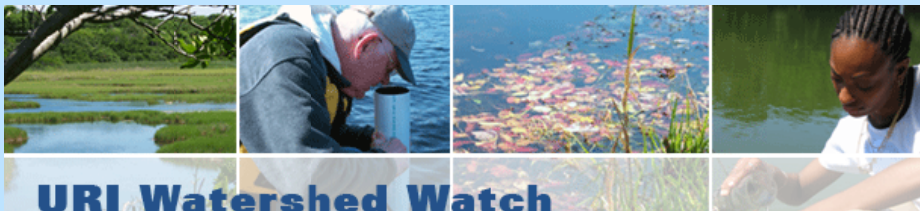
The best way to become familiar with the key is to read it over before you try to use it. There are two choices for each numeral – two 1's, two 2's, etc. The key begins with statement 1. *Leaves arising from base of plant in flowering plants*. If that is true of the plant you're trying to identify, move to the indented (sub-) statement #2. If it is not, turn to statement 1 on Page 2, and start working from there. At each statement if the plant does not have features matching the description of the first choice look to see if it matches the description of second choice matching that number (i.e. 3. *Plant upright with showy blue flowers* or 3. *Plant submersed and/or floating*...). Continue to select those descriptions that best fit the plant until either a selection is made where the illustration looks the same as the plant you are trying to identify, or you run out of questions. If your plant does not exactly match the species illustrated it may be another species found within the same Genus.

If a wrong decision was made at one of the couplets the difference between the plant in question and the descriptions will likely widen with each successive couplet. If this occurs, return to a point in the key where the plant features match the description and proceed again, examining the plant more critically at each couplet. If a particular term is unclear, turn to the glossary provided in the course binder before continuing. A magnifying glass or hand lens may be helpful in examining characteristics at certain points.

An important consideration is that many plants may be without flowers or fruit much of the year. Unfortunately, positive identification of some species requires those parts. To reduce ambiguities in the key, two to three distinguishing features are included in each couplet if possible. That way, if one feature is unclear, or if flowers or fruit are absent from a plant that you want to identify, it is still possible to work through the key.

While it may be tempting to just look through the pictorial guide to simply compare the plant with the illustrations, using the key will enable you to readily identify a plant most of the time. The key will also allow you to narrow the range of possibilities and minimize the number of illustrations with which the plant must be compared. The improved efficiency in identifying a specimen will be well worth the effort expended in learning how to use the key.

If your plant does not match either of the guides, you likely have a native species or possibly an unexpected non-native species. Unknown plants can be brought to URIWW, the RINHS, RIDEM or WPWA for identification on the schedule plant verification days or with advance notice. You might also consult on-line plant identification keys.



Floating Leaved Species

Native look-alikes

Spatterdock

Nuphar species

White water-lily

Nymphaea odorata

Water-lily Family (*Nymphaeaceae*)



Spatterdock



White water-lily

*For both species, the floating leaves are cleft, with stems joining the leaf-blade at the tip of the cleft. Leaves measure 10-30cm long.

*For Spatterdock, the flower is yellow and raised above the surface of the water by 10-20cm. Once fertilized flowers fall into the water.

*For White water-lily, the flowers are white with numerous petals, and float on the surface of the water. Following fertilization the flower is pulled beneath the surface of the water.



Aquatic Plant Tag

Aquatic Plant Tag
URI Watershed Watch Program and Rhode Island Natural History Survey

Please complete this form and submit with your plant specimen. Use a separate form for each different plant collected. Include all leaf types present on the plant, and representative flower or seed structures. Gently rinse all debris from the plant and root structures, and place it in a sealed plastic bag, with enough tap water to keep it moist. Keep the plant refrigerated until you can bring it to the URI Watershed Watch lab, 002 Coastal Institute on URI's Kingston campus. Remember that plants are perishable!

Plant Collector Information
Your Name _____
Address _____ Phone Number _____
_____ Alt. phone _____
_____ Email _____

Water Body Information
Name of Water body _____ Town _____
Date of Collection: _____
Water Depth: _____ Approx. distance from shore: _____
General description of plant location(s) _____

Overall plant abundance (how much of the water body it covers): (circle one)
Single patch Sparsely throughout Multiple patches Densely throughout

Substrate where found (circle one) Muck/Mud Sand Gravel Rock

Water Clarity (circle one) Clear Slightly turbid Very turbid

Additional Comments:

Plant Identification:
Genus and species: _____
Common name: _____
Identified by: _____
Date: _____

Invasive Plant Data

- ID plant
- Record location
- Waterbody information
- Shared with RINHS and RIDEM



Piloting RI Boater Education/Inspection Program

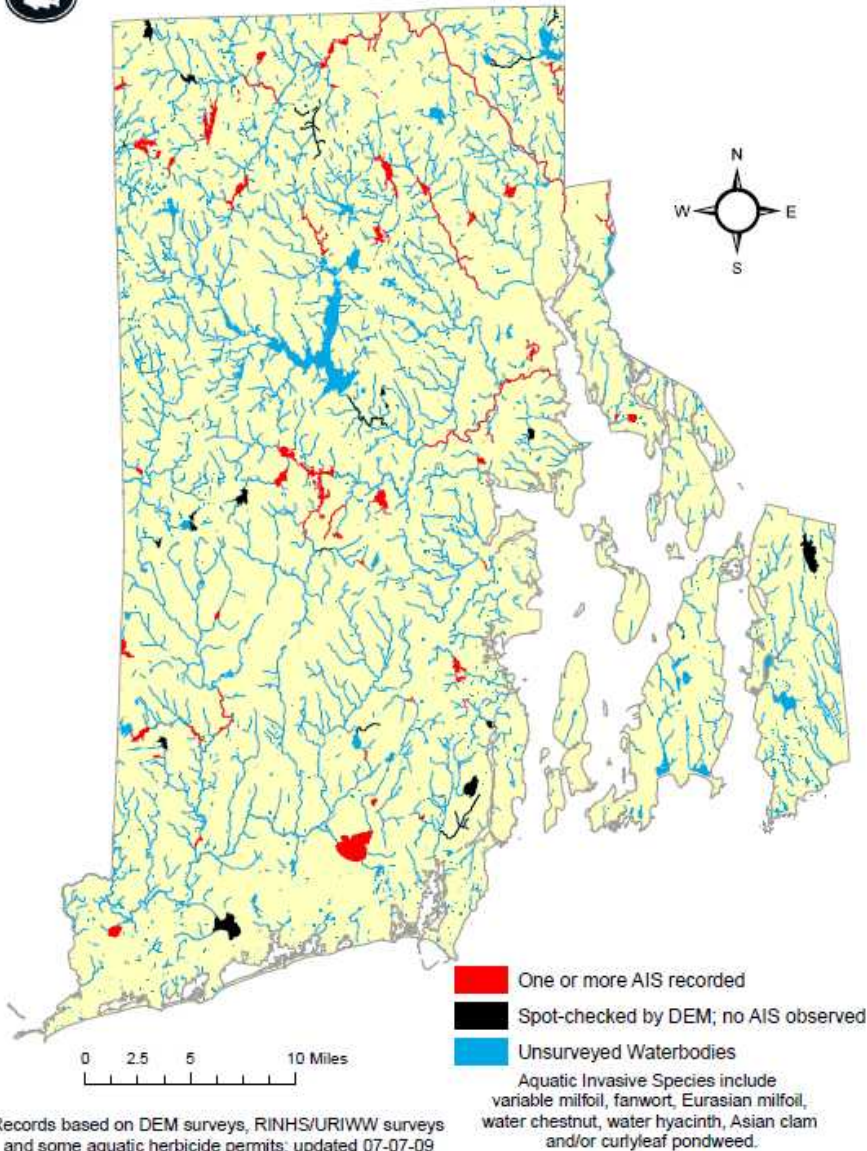


- Worked with RI DEM to develop inspection protocol & materials to be distributed
- Focused on boat ramps with intensive boating activity
- Well received
- Launching full program in 2012

www.stlri.org



Aquatic Invasive Species (AIS) Recorded* in Rhode Island



RIDEM

- Actively monitoring AIS
- Working with Save The Lakes to educate residents & boaters, and to inspect boats
- Engaging with local lakes groups



Outcomes

- Public and agency awareness of AIS
- Public understanding that not ALL plants are bad
- Active participation to educate
- Focus on prevention

