

Report for 2004ME33B: NATIVE AND INVASIVE AQUATIC PLANT VIRTUAL HERBARIUM

- Other Publications:
 - Buckley, Dan, Jeffrey S. Kahl, Scott Williams. 2005. Maine Center for Invasive Aquatic Plants Virtual Herbarium. Website, Volunteer Lakes Monitoring Program, University of Maine Farmington, www.mciap.org/herbarium

Report Follows

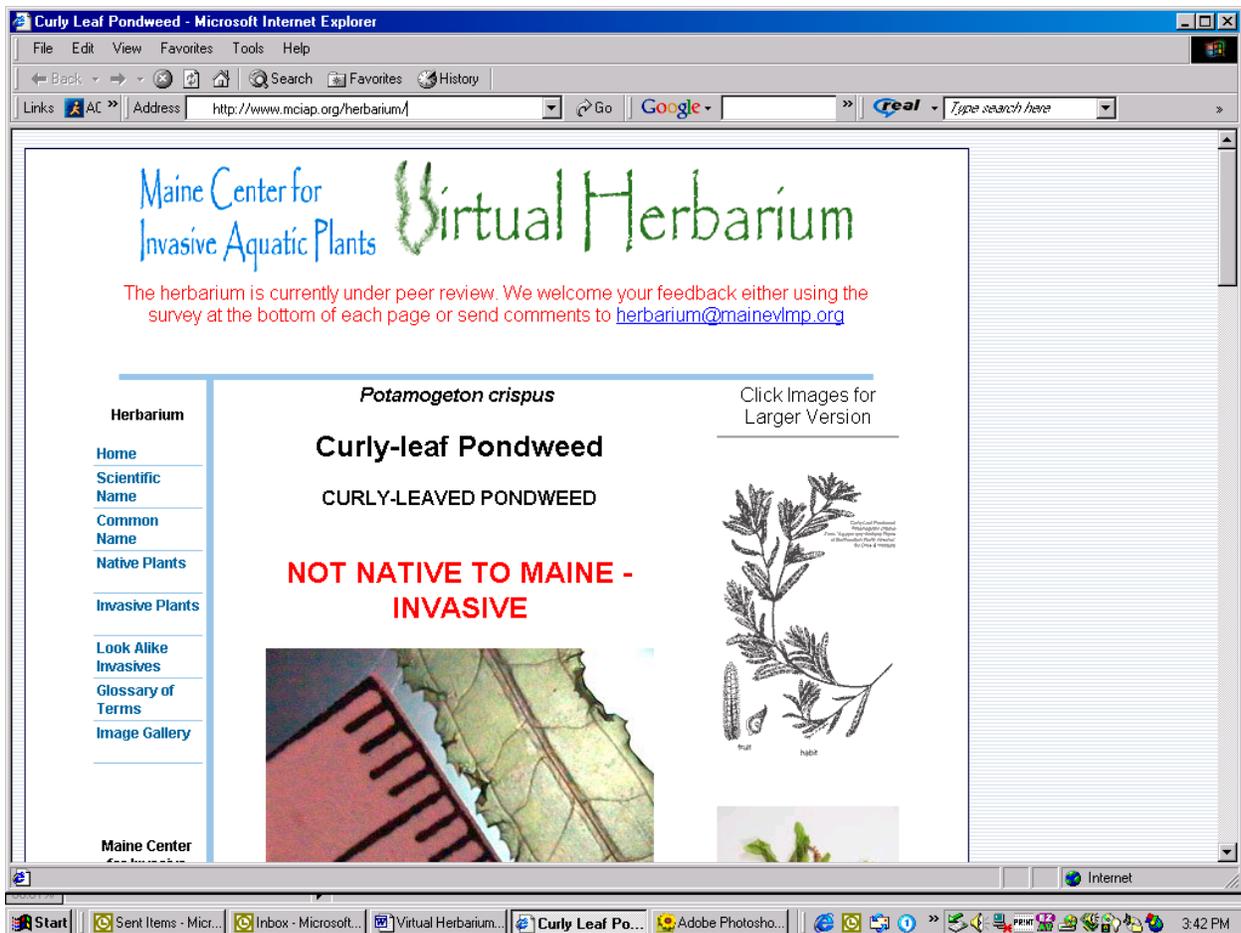
Maine Water Resources Research Grants Program Final Report

for

Maine Volunteer Lake Monitoring Program's

**MAINE CENTER FOR INVASIVE AQUATIC PLANTS
VIRTUAL HERBARIUM**

Published on line at: www.mciap.org/herbarium



Project Timeframe: April 1, 2004 to April 1, 2005

Agency Funding Requested: \$4,000

Matching Funds Provided: \$15,000

PI Names and Affiliations:

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Congressional District: Second

Problem and Research Objectives: The introduction of non-indigenous invasive plant and animal species to the United States has been escalating with widespread destructive consequences. Until now Maine has been spared the worst introductions, but we would be remiss to assume that this situation will continue indefinitely. Significant habitat disruption, loss of native plant and animal communities, loss of property values, reduced fishing and water recreation opportunities and large public/private expenditures have accompanied invasive plant introductions in all of the lower 48 states except Maine.

Though Maine is a relative latecomer to the national invasive aquatics scene, as awareness of this new threat to Maine waters has emerged across the state, Mainers have taken swift and decisive action. In 2000, the State of Maine passed legislation that outlaws the sale, propagation, or introduction to Maine waters eleven invasive aquatic plants. (Currently, four of these plants are known to be established in Maine waters: variable leaf water-milfoil (and a hybrid form of this plant), Eurasian water-milfoil, curly-leaf pondweed and hydrilla. In 2001 further legislation was enacted, instituting more sweeping authorities, programs and planning requirements relating to invasive plants and other nuisance species. The law put in place some key components for an effective invasive aquatic species program for inland waters including: a boat sticker program to raise funds and public awareness for prevention, detection, and control of

invasive species; an inspection and education program; and an emergency authority to regulate surface use in plant infested waters. The law also established an *Interagency Task Force on Invasive Aquatic Plants and Nuisance Species* comprised of state agency personnel and private citizens representing a wide array of stakeholders. One of the first tasks of the Task Force was the development of the *State of Maine Action Plan for Managing Invasive Aquatic Species*, a document created to provide guidance for the State's management of invasive aquatic species for the subsequent four-year period.

One of the five main objectives of Maine's *Action Plan* includes the development of a practical and effective statewide "early detection" system. And one of the key action steps listed for meeting this objective is the continuance of the VLMP's Invasive Plant Patrol training. "The Volunteer Lake Monitoring Program will continue to train volunteers [and agency personnel] to identify freshwater plants and conduct invasive aquatic plant screening surveys on lakes and ponds." ¹

One of the major players in bringing this issue to the public's attention, the VLMP has continued to provide leadership through the recent establishment of the Maine Center for Invasive Aquatic Plants (MCIAP). Through the Center, the VLMP has developed a comprehensive hands-on workshop series and field guide to aid Plant Patrollers with identification of the eleven target invasive aquatic plants and conducting screening surveys. With support from the MDEP and the boat sticker program, the VLMP/MCIAP has trained more than 1250 volunteers to date, and has implemented what has come to be considered one of New England's most comprehensive and successful citizen-based plant patrol programs. Public feedback on both the training program and the guide has been excellent. *However many patrollers, especially those who are new to plant identification, have expressed the need for additional visual and descriptive resources, to provide further aid in identifying and understanding the target invaders and also in identifying the native plants most frequently encountered during the screening survey process.* Our vision for the development of the on-line "Virtual Herbarium" has taken form in direct response to the specific needs and suggestions of Maine's citizen volunteers, agency collaborators, teachers, students and others.

The Herbarium will consist of photos, line drawings, and scanned images for eleven target invasive species, as defined under Maine law, as well as for native plants that are often mistaken for invaders and others that will likely be encountered during the survey process. The photos will include plants in situ, close-up shots, and micrographs of structures that are key to definitive identification. Factual information will be provided for each of the featured plants, including: species description, similar species, origin and range, habitat and yearly growth cycle, value in aquatic communities (native species) and case studies of infestations and management strategies (invasive species). The site will also include links to survey maps and data collected by State agencies and

volunteers. A dichotomous key will be provided to allow users to rule-out target species. The web site will link to PEARL, the on-line database for Maine lakes, providing additional value-added information for the data and educational activities of PEARL (<http://pearl.maine.edu>). PEARL is a collaborative of the Umaine Mitchell Center, VLMP and Maine DEP.

Methodology: The following is the work plan for the project. Asterisks (*) indicate tasks that involved a high degree of student involvement.

1. A project team was activated, comprised of VLMP/MCIAP staff, principal investigators, agency partners and student investigator. The team met several times and communicated regularly throughout the project period.*
2. The scope of the initial version of the herbarium was defined by the project team.
3. Resources needed for the project were assembled, and inventoried. *
4. A list of needs (images, permissions, narrative material, etc.) was developed. *
5. A layout and functional prototypes of herbarium pages were developed
6. "Needed" items were collected, created, and/or obtained.. *
7. Individual plant pages and glossary were constructed and hyperlinks were developed and integrated into a "draft version" of the Virtual Herbarium website
8. The draft website was sent out to project team and others for peer and user review and comment
9. The website was revised in accordance with peer feedback.
10. The website was formally launched at the 2005 Maine Water Conference
11. The website was publicized through various media: e-mail list serves, newsletters, television news and radio spots, and articles in regional and national journals.
12. The website continues to invite public feedback. A user-friendly on-line feedback loop provides timely response to recommendations.
13. The Virtual Herbarium website will continue to develop. "Phase two" of the project is now in the planning stage, and will be implemented in stages from 2005 – 2006.

Principal Findings and Significance

The primary and most beneficial expected outcome of this project is the *early detection* of new invasive aquatic plant infestations. Certainly preventing infestations through education, public awareness campaigns and courtesy boat inspection programs is the best and foremost defense against the spread of invasive organisms. But lessons learned from other states also make it clear that no defense can be 100% effective, a fact that is even more certain in a state with close to 6000 lakes and ponds and thousands of miles of stream and river habitat. In time, invaders will most certainly slip through the cracks. Our second line of defense: an active, effective and widespread early detection system is ultimately just as critical to the future of Maine's lakes as prevention efforts.

With the vast amount of potential invasive aquatic plant habitat in the State, and with the limited amount of funds available to screen all waterbodies for the presence of these invaders, volunteers will play an essential role in the statewide early detection program. One excellent example of an effective volunteer-based monitoring effort is very near at hand! Volunteer lake water quality monitors, trained and organized by the VLMP for over thirty years, have provided enormous benefits to the State in the form of high-quality lake data. The contribution made by qualified volunteers to the better understanding and protection of Maine's water resources is beyond measure.

Building upon the water quality monitor model and adapting it to meet the needs of our current challenge, the VLMP's Invasive Plant Patrol Program has already begun to produce promising results. In the four years of the Invasive Patrol Program, over 1250 volunteers and agency personnel have been trained. The number of Maine waterbodies screened for invasive aquatic plants has grown steadily during that four year period from one waterbody screened in 2001, to 51 in 2002, to 146 in 2003, to 249 in 2004. Trained volunteers have conducted a majority of the surveys done in Maine to date.

Creating a web-based, Maine-specific, aquatic plant information resource will go a long way in helping to ensure the future viability of this promising effort. The cost benefits of this project will greatly exceed the total budget if only a single Maine waterbody is protected through the encouragement and support of citizen-based efforts.

The feedback we have received from Plant Patrollers and the general public points to a second, extremely valuable result of this project. Through training and educational outreach, Maine citizens are not only becoming more aware of the threat of invasive plant species, they are gaining a greater appreciation for, and interest in, Maine's native plant communities. The Virtual Herbarium features many common native Maine plants, which will help to enhance and support this growing interest. (In the second phase of this project, more native plants will be added).

The project also provided an outstanding collaborative opportunity, through which many stakeholders came together to produce a high-quality product, one well positioned to attract additional support to ensure the ongoing maintenance and improvement of the website. The response of the public to this new resource has been overwhelmingly positive. An e-mail sent out to roughly 1000 volunteers, agency partners and interested members of the public, announcing the formal launching of the Virtual Herbarium (and providing a quick link to the website) produced the largest, most positive response ever received by the VLMP in its 35 year history.

