

Littorally Speaking



The Wonders of the Littoral Zone

And how citizen scientists are enhancing our understanding of these vital near-shore areas

by Roberta Hill

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Imagine... the last ice age in North America is giving way to warmer times, and the geological processes associated with the retreat of Maine's ice sheets are yet hard at work--carving, scraping, impounding, and otherwise molding the depth contours and meandering shorelines of the 6000 or so lakes and ponds that we know and love in Maine today. Fast forward over the next 12,000 years or so, as the seasons turn again and again, bringing the meltwater and rainwater that flows over the land, eroding the scarred earth, carrying mineral particles, organic debris, and dissolved nutrients into the receiving lake basins. These processes in turn fuel the natural cycles of growth and decay, set in motion the successional colonization of a dazzling array of flora and fauna, ranging from the single celled planktonic organisms to the mighty moose, and animate the intricate ecological web of life that connects them all. Through this natural process of eutrophication, Maine's rocky, barren, crystal-clear lakes slowly but steadily become more enriched, more productive, more biologically active and diverse, especially the sun-filled near-shore areas, the 'fertile fringe,' (or littoral zone) where vascular aquatic plants (macrophytes) reside.

Since the days of Thoreau, naturalists and scientists have been drawn to the sun-filled nearshore portions of Maine's lakes, to study plant taxonomy, species diversity, the role aquatic plants play in lake ecosystems, and more. These earlier scientific pioneers and their contemporary counterparts have provided us with a fairly thorough account of the macrophyte species native to Maine, a sense of their general relative abundance, and an understanding of the inherently dynamic nature of aquatic plant communities. But the littoral zones of most lakes in Maine have never been thoroughly surveyed in this way, and there are still many questions left unanswered, for example: How do species diversity and community composition differ from lake to lake, and from location to location within a single waterbody? . . . What are the physical, biological, chemical, and cultural factors at play? . . . Are all aquatic plants currently listed as 'rare' really rare? . . . Are Maine's macrophyte communities changing in response to climate change? If so, which species will likely do better, and which will do worse? How will these changes affect other members of the lake community?

And, of course, the perennial (indefinitely ongoing) question: *Have any invasive plants become established here?*

The VLMP Invasive Plant Patrol (IPP) program started with this last question. Through this program we have worked to help build the statewide early detection system needed to answer this question on a lake by lake, year by year basis. Since our first workshop in 2001, we have now trained over 4,200 people through the program. Engagement at every level of this early detection system is encouraged, from those who are keeping a casual eye out for anything suspicious while they are out recreating on the water, to those who are conducting high-quality professional-caliber invasive species screening surveys on an annual basis, or leading lake-wide IPP teams, or coordinating IPP efforts at the regional level.

One of the outcomes of engaging in the careful, methodical search for possible aquatic invaders in a State where less than 1% of our lakes are known to be infested, is that one becomes naturally curious about the plants that one does encounter. For some, this curiosity grows

into a great passion; in others, the desire to learn grows into something more resembling obsession! Thus, the VLMP have somewhat accidentally set off a whole new wave of serious interest in aquatic botany here in Maine. I actually think it quite safe to say that there has never been a time in the history of our State when there have been so many amateur botanists exploring Maine's lakes, ponds, streams and rivers.



IPP Plant Paddles are 3-hour guided explorations that takes place on shore and on the water. Participants learn about the threat of aquatic invaders how they can get involved in the early detection effort.



IPP 101 is a comprehensive 6-hour classroom experience that prepares attendees for conducting or leading invasive aquatic plant screening surveys, and satisfies the quality assurance requirement for IPP certification.

With the help and input of this growing cadre of citizen aquatic botanists we are continually finding new ways to keep this unique interest, energy, and momentum alive. In addition to our Invasive Plant Patrol workshop offerings (*IPP Plant Paddle*, *IPP 101*, and *IPP Field Methods*) the VLMP has for several years offered an *Advanced Plant ID* course that essentially picks up where IPP 101 leaves off, delving into the ecology and the distinctive physical characteristics of the native plants that inhabit Maine's lakes and ponds. Attendees hone their identification skills with live specimens, and have the option of participating in an Aquatic Plant ID Proficiency Certification exam.

We also provide a number of opportunities for volunteers to expand their IPP horizons geographically while getting valuable in-lake experience. The goal of the *IPP Jump-Start* is to promote and support citizen-based early detection efforts in areas of the state where such activities are currently lacking. We work to accomplish this through: 1) organizing a survey team—comprised primarily of seasoned volunteer Invasive Plant Patrollers, supported by VLMP staff—to conduct a comprehensive invasive aquatic plant screening survey; and 2) helping to “jump-start” a locally sustainable citizen-based monitoring program in the region through outreach, training, and direct interaction with the host community. Our first major project took place on Moosehead Lake and is featured in the short documentary, *The Hunt for Aquatic Invaders*. We are currently partnering with **Acadia National Park** and **Somes-Meynell Wildlife Sanctuary** on a similar project on the waters of Mount Desert Island.

IPP Rapid Responders work in partnership with Maine DEP and VLMP staff to survey areas that need immediate attention. This citizen-powered rapid response team has been officially deployed six times now, in most cases in response to a newly-identified infestation. As with the Jump-Start surveys, the entire littoral zone of the target waterbody is gone over with a fine-tooth comb. Given the inherent thoroughness of these surveys, Jump-Start and Rapid Response actions provide excellent opportunities to gather detailed

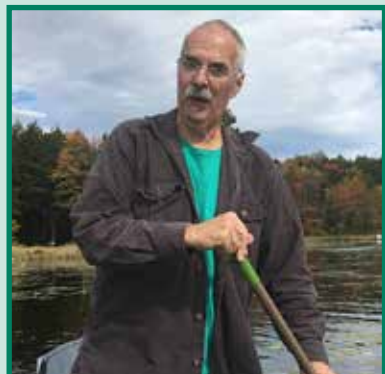
information on the native aquatic plants that are observed. Specimens are collected during the course of the survey and are later examined in ‘extreme-botanizing’ sessions; the best specimens are pressed, dried, and mounted for the VLMP herbarium.

At the beginning of 2016, a small group of dedicated volunteers, with extensive collective experience in aquatic plant identification, plant systematics, specimen collection and preservation, decided to adopt the *VLMP Herbarium Project* and apply their zeal for lakes and lake plants to the task of bringing it to full fruition.

Thanks to all of you who participate in this important work, native plant data has now been collected on close to 300 Maine waterbodies! Each year the data set becomes more robust, more revealing, and more scientifically useful. And because it is now readily available on the VLMP Lakes of Maine website, it is increasingly being used by researchers, students, lake associations, lake managers, and many others. Toddy Pond Association and East Pond Association, for example, have now both used their native plant inventory data to create customized field guides for their lakes. (Please see the Fall 2016 *Water Column* on our website for more on the Toddy Pond project.)

We may not yet be able to answer all of the pressing questions now emerging from the littoral zones of Maine, but thanks to VLMP Invasive Plant Patrollers, we are starting to gather the kind of data needed to do so. 🌿

Volunteers Helping to Answer Important Questions About Maine Lakes



When the call for help went out, IPP Rapid Response Team members Nick Cody, Bob French, Sibyl French, Marsha Letourneau, Dennis Roberge (*pictured*), Bunny Wescott and Ross Wescott dropped what they were doing to help determine the extent of the variable water-milfoil infestation in Long Lake, Bridgton.



The VLMP Jump-Start Team continue the hunt for aquatic invaders on the waters of Acadia. The 2017 team was powered by the following IPP volunteers: Unn Bourcher, Sue Carrington, Bob French, Sibyl French, Janene Gorham, Ellie Hopkins, Sandy Larned, Tom Larned, Marsha Letourneau, Toni Pied, Sherry Pettyjohn, Dennis Roberge, Lea Stabinski, Steve Underwood, Keith Williams, Ellie White and Willis White.



Our Acadia Jump-Start partners and hosts: Jesse Wheeler (Acadia National Park) and Billy Helprin (Somes-Meynell Wildlife Sanctuary). Jesse and Billy are working with the VLMP to build a volunteer IPP team on Mount Desert Island. For more information, contact Billy Helprin at somesmeynell@gmail.com.