ISSN 1072-8244

Environmental Research and Education
Science for Conservation

News from Hudsonia

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Volume 14, Number 2 Late Summer 1999

Loosestrife: *Purple Peril or Purple Prose?*

by Erik Kiviat *

When and where does loosestrife threaten biodiversity? We have a lot to learn.

Purple loosestrife (*Lythrum salicaria*) has attracted my attention ever since I began recording natural history observations more than 30 years ago. I started watching loosestrife at the edges of the recreational pond where I grew up in Dutchess County, New York, continued at Tivoli North Bay on the freshwater tidal Hudson River, and have looked for this striking marsh and meadow plant wherever I have gone since.

Purple loosestrife arrived on this continent from Europe approximately 200 years ago, and has since spread throughout much of the U.S. The Hudson Valley was one of four areas in the northeastern U.S. where loosestrife spread early, and it is now one of our most abundant wetland plants. Many ecologists consider it an "invasive" that aggressively overtakes native plant communities.

Invasive plants are a hot topic in theoretical ecology as well as environmental management. Probably as much has been written about purple loosestrife as any invasive plant in North America.

Management of invasive plants is expensive and can have significant ecological side effects. Therefore we should seek to understand the ecology of invasives before killing them, and select the sites and techniques for managing invasives carefully, to achieve the best economic and ecological outcomes.

For a project underwritten by the Wildlife Conservation Society, I am compiling my reviews and studies of purple loosestrife in a report and a paper which will include information from the literature and unpublished data. The publications emerging from this project will be announced in later issues of this newsletter.

A close look at a purple loosestrife flower spike may reveal several organisms using the plant for different purposes. In this drawing, a vine, swamp dodder, parasitizes the stem. A silver-spotted skipper sips nectar from the flower. A water-lily leaf beetle feeds on the leaf. © Kathleen A. Schmidt

* *Science Director, Hudsonia*

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Loosestrife's "Image"

Commonly held ideas about loosestrife include: 1. It aggressively forms "pure" stands; 2. It always increases once established at a site; 3. It overgrows and displaces occurrences of rare plants; 4. It is a problem in and of itself (and, as a corollary, if loosestrife is removed, wetland "health" will return). 5. It is used little or not at all by wildlife.

On close examination, however, there are few scientific data to support these assertions, and contradictory evidence abounds. Let's examine the five ideas listed above, in the light of published information as well as my own unpublished observations.

Pure stands: Purple loosestrife may form dense stands of robust individuals that exclude most other vascular plants. Loosestrife also may form mixed stands with cattail, tussock sedge, or other wetland or upland plants, and these mixed stands may persist for many years, perhaps indefinitely.

Inevitable increase: Certainly loosestrife may increase and consolidate to dominate a site. Loosestrife may also remain stable or even decline. I have observed several loosestrife stands, in both tidal and nontidal wetlands, that have declined markedly over two decades.

Rare plants. It seems logical that a large, densely-growing plant could displace smaller plants, some of them rare species. But this has actually been documented seldom if at all. Perhaps many of the places invaded by dense purple loosestrife stands had no rare plants, or any rare plants were long gone due to agriculture or other problems that preceded the loosestrife. The hard data remain to be collected.

Problem *per se*: Loosestrife often invades or becomes dominant in wetlands damaged by drainage, siltation, salt runoff from roads, partial filling, or other ecological abuses. In most of these cases, we know little about what was there before the loosestrife, and what would be there if the loosestrife were removed. Loosestrife may be more often a symptom than a problem in and of itself.

Wildlife: This depends, of course, on the definition of "wildlife." Nonetheless, well over 200 species of insects and 40 species of birds, plus mammals, amphibians, and spiders have been found using purple loosestrife plants or stands in North America, and the real totals are almost certainly much higher --because hardly anyone has looked!

Which Species Use Loosestrife?

I'm neither defending nor attacking loosestrife, simply trying to tell the whole story -- which I believe ecologists are obliged to do.

So, is purple loosestrife a problem at all? Yes. Notwithstanding the inadequate documentation, loosestrife can be a threat to biodiversity. Even though loosestrife stands can support many species of other plants and animals, they often do not support the species that require the cattail marshes, sedge meadows, or other special habitats displaced by the loosestrife.

My analysis of the available information on animal use of loosestrife indicates that most (but not all) users of loosestrife are common, ecological-generalist mammals, birds, herps, and insects, and the same may be true for vines and mosses associated with loosestrife. These generalists include red-winged blackbird and American goldfinch that nest in loosestrife; spring peeper choruses in loosestrife marshes; cecropia and polyphemus moths that eat loosestrife leaves; and many butterflies that sip nectar at loosestrife flowers.

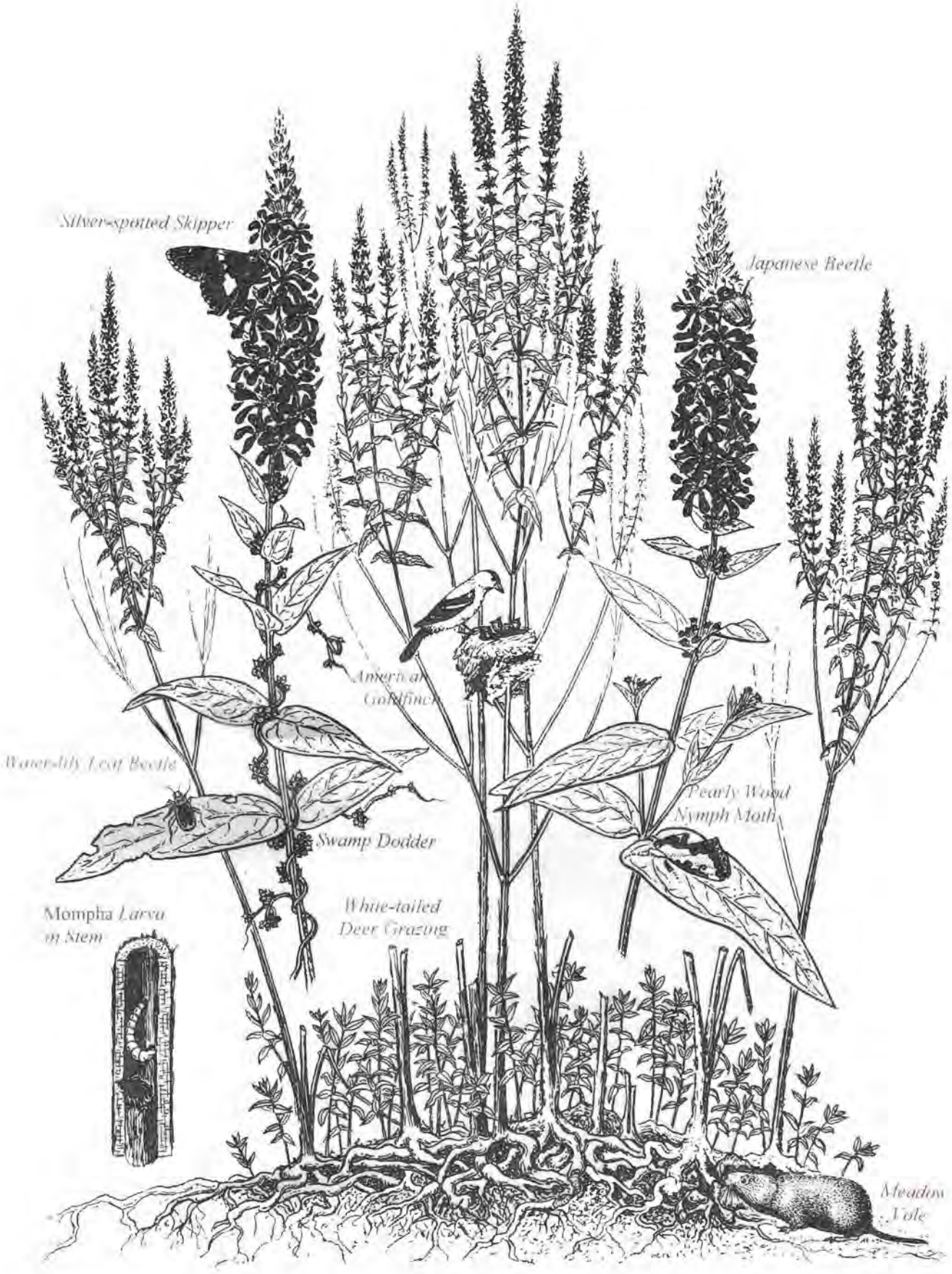
Fewer animals that are habitat or dietary specialists use purple loosestrife. There are exceptional specialists that use loosestrife plants or loosestrife stands, however, and these may turn out to be some of the most interesting cases: marsh wren, Blanding's turtle, pearly wood nymph moth, *Mompha* (a moth), buttonbush dodder (a parasitic vine), *Helodium paludosum* (a moss), *Septoria lythrina* (a fungus), and others.

Most of these specialists seem to have "switched" to purple loosestrife from related plants such as swamp loosestrife (*Decodon*), other *Lythrum* species, members of the evening primrose family (Onagraceae), or shrubs of habitat and growth form similar to purple loosestrife. Too little is known to say whether loosestrife benefits or harms these organisms.

Management Approaches

Cornell University, in collaboration with federal and state agencies, has developed a biological control strategy for purple loosestrife using four species of loosestrife-feeding beetles introduced from Europe after laboratory testing of their dietary behavior. It is predicted that these beetles will cause the North American loosestrife population to collapse to a low level, but many years may elapse before the outcome is known. Other management of loosestrife may be needed until biocontrol is fully functional, or if biocontrol does not live up to the predictions.

Before implementing any controls, however, ecologists and managers must assess loosestrife stands to determine if and where management is needed, and which techniques make ecological and financial sense. Where loosestrife is only a symptom of other underlying factors, such as nutrient pollution or hydrological alteration, then those factors must be addressed first. A scientifically sound and detailed knowledge of the relationships of purple loosestrife with other organisms is needed for intelligent decision making. New ideas about the ecology of purple loosestrife also have implications for the management of other invasive plants in North America.



Many species of animals and plants find purple loosestrife a source of food or other support. Loosestrife plants often grow to 2 m (about 6.5 ft) and taller, and a spike of flowers can be over 50 cm (19 in) in length. The vole, Mompha *larva, and other cutouts have been magnified relative to the loosestrife plant, for better visibility.*

Hudsonia Research Highlights, 1998-1999

Hudson River State-Owned Lands

To provide a sound basis for management plans for certain undeveloped state properties along the Hudson River in Columbia and Greene counties, the New York State Department of Environmental Conservation (NYSDEC) asked Hudsonia to conduct natural resource and human use studies on six parcels totaling over 600 acres, and to make recommendations for management and conservation.

This large project, just completed this summer, included surveys for rare plants, breeding and migratory birds, reptiles and amphibians, recreational uses, and historical and archaeological features. To understand patterns of human use, we interviewed boaters, swimmers, ATV users, fishers, hunters, trappers, and local residents. Using a computer Geographic Information System (GIS), we mapped plant communities, and the locations of rare species and sensitive habitats, trails, campsites, and other features of conservation and cultural interest.

Not only did we survey many high-quality estuarine and terrestrial habitats in these study areas, but we also conducted the first-ever ecological surveys of new land created by the deposition of Hudson River dredge spoils over the last 70 years.

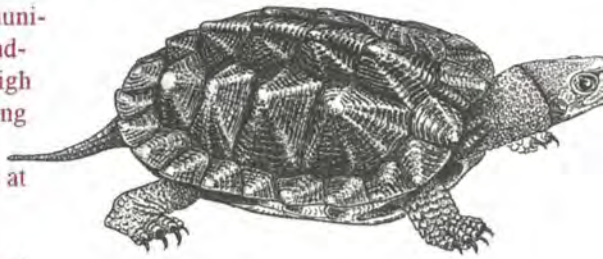
Despite a common perception that dredge spoil lands are biological wastelands, we found diverse bird communities in dredge spoil forests and meadows, a bank swallow colony on a high dredge spoil bluff, abundant breeding amphibians in dredge spoil vernal pools, and 11 species of rare plants at over 30 locations.

We were also interested to discover 1) the scarcity of breeding amphibians in tidal habitats, 2) the abundance of breeding amphibians in supratidal habitats, and 3) numerous bird species that are rare in the state or region or uncommon along the Hudson River, including least bittern, Virginia rail, fish crow, American woodcock, wild turkey, osprey, Cooper's hawk, and bald eagle.

These lands offer abundant opportunities both for public uses and for conservation of important biological resources.

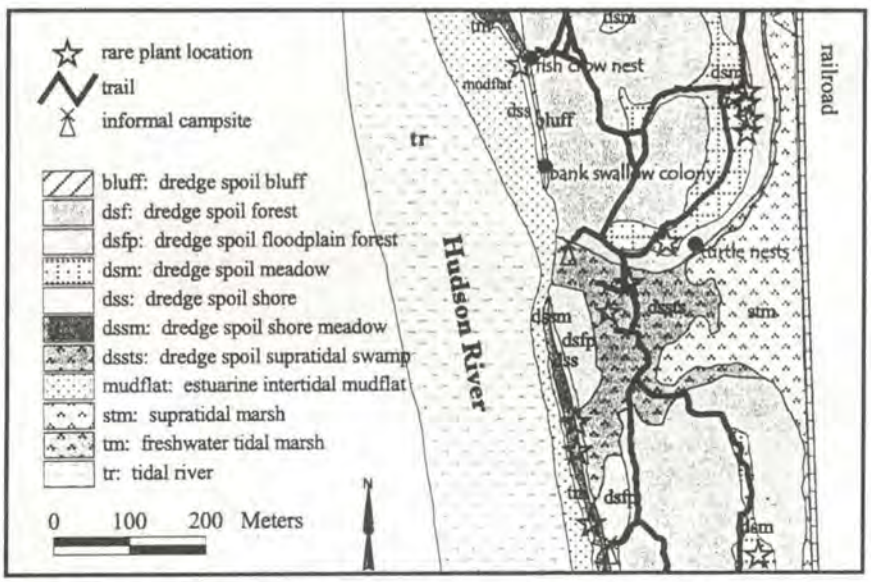
Our management recommendations included measures to protect the most ecologically sensitive areas, and to direct recreational activities toward the areas most capable of accommodating such uses without environmental harm.

Biodiversity Manual



Hudsonia's long-awaited *Biodiversity Assessment Manual for the Hudson River Corridor* will be completed this fall and published in March 2000, with funding from many individuals plus the Geoffrey Hughes Foundation, Norcross Wildlife Foundation, Sweet Water Trust, Hudson River Foundation, and the New York State Department of Environmental Conservation, in collaboration with the Cornell University Cooperative Fish and Wildlife Research Unit.

The *Manual* will assist conservationists, planners, regulators, land managers, educators, citizen activists, agency and organization staff, naturalists, and others in assessing special habitats and rare species on sites proposed for development or preservation. It can also be used for proactive surveys of whole towns, watersheds, or regions. By helping to integrate biodiversity with traditional concerns of open space protection (scenery, agriculture, historic resources, water), it will strengthen communities' ability to conserve the landscape while yielding an additional benefit: saving irreplaceable species and habitats. This richly illustrated looseleaf guide also offers assistance in finding and using information from government agencies, published literature, local naturalists, and other sources, and in analyzing



Our GIS maps showed the proximity of special habitats to potentially harmful human uses. In this map segment, ATV trails (the heavy black line) encroach on several locations of rare plants, on a turtle nesting site, and on the nesting sites of uncommon bird species. Map by Gretchen Stevens & Sarah Love.

maps of topography, geology, and soils for habitat prediction.

The *Biodiversity Assessment Manual* contains detailed profiles of habitats and species of importance to the Hudson Valley. Each of 40 habitat profiles includes information on distribution and extent of the habitat in the Hudson River corridor, habitat characteristics including physical and biological indicators, rare species associated with the habitat, particular sensitivities of the habitat, suggestions for conservation and management, and references to ecological literature. Each of 55 species profiles includes a physical description of the species, conservation status, global and regional distribution, seasonal and temporal distribution (for animals) or phenology (for plants), habitats in the Hudson River corridor, and references.

The *Manual* will be available in March 2000. Two hundred copies of the first printing will be distributed free-of-charge to planning boards, conservation advisory councils and land trusts. To order a copy or find out more, contact us.

Blanding's Turtle Monitoring

Since 1996, we have been monitoring the Blanding's turtle population at a site where we designed new habitat for the turtles in southern Dutchess County. With 1998-99 funding from the U.S. Environmental Protection Agency, we have expanded the monitoring to include the Blanding's turtle population in an adjacent state park.

We are collaborating with the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP), and will use the information gained from this year's monitoring to assist OPRHP in developing a management plan for the turtles and their habitats in the park.

Using radiotelemetry, we track the turtles to ascertain which upland areas they use for nesting, which wetlands they use for foraging, rehydration, drought refuge, and overwintering, and which overland corridors they use to reach these habitats.

We also track the female turtles during nesting season, and cover each completed nest with a wire-mesh guard to prevent disturbance from predators. This year, six radiomonitored turtles nested in the habitat restoration area, and four nested in an agricultural field just outside the park boundary. Those four nests, which would have been poisoned by pesticides or destroyed by farm equipment at harvest time, were moved to the restoration site along with another nest found in a nearby hazardous location.

In the 1997-98 nesting seasons, 156 turtles have hatched from the monitored nests in the restoration area; all hatchlings were released into nearby pre-existing or constructed wetlands.

To share the lessons learned about Blanding's turtles, habitat restoration techniques, conditions for success, benefits and costs, we are offering a series of workshops on Blanding's turtle ecology, conservation, and habitat restoration. These sessions will benefit members of state, local and regional planning, regulatory, and conservation agencies, park managers, conservation biologists, field research ecologists, and wetland specialists.

--Gretchen Stevens
Botanist

The wood turtle (opposite page), slimy salamander (above), and smooth green snake (right) are among the many species significant to the Hudson Valley described in the Biodiversity Assessment Manual *.*
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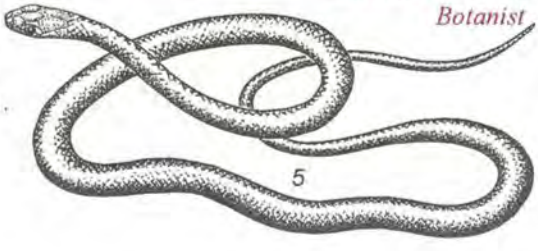

Message from Hudsonia's Board Chair

Like other living things, organizations have life cycles. Hudsonia is maturing and thriving. Our scientists have achieved acclaim and seniority in their fields. We note with satisfaction that the Bard College Field Station is bursting with resources.

Until recently, though, we have operated the way small organizations often do, with researchers playing multiple roles as project managers, fundraisers, and communicators. This lean and frugal mode has been a source of strength. But we are clearly outgrowing it. It is no longer efficient or professionally desirable for our staff to play such multiple roles.

After considerable reflection, we have arrived at a new structure for Hudsonia's next phase. Erik Kiviat, a co-founder of Hudsonia who has served as Executive Director since 1988, will assume the position of Science Director. This will enable him to concentrate his exceptional talents and energy on the scientific work that has built Hudsonia from the start, and free him from the manifold distractions of organizational administration.

To join him in running the institute and expanding its programs, we are pleased to welcome Melissa Everett as our new Executive Director. Building on a successful career as a writer and communications consultant working with nonprofits and socially responsible businesses, Melissa brings abundant experience and commitment to the leadership of Hudsonia.

We trust you will share our enthusiasm for working with this new team. We promise you plenty of opportunities to do just that.

--Larry Weintraub

Meet Melissa Everett, Hudsonia's New Executive Director

Three years ago, when I moved to the Hudson Valley from Boston, it was the first time I had consciously chosen a dwelling place for its own sake, rather than being driven by economics or expediency. On the wall in my new home office, I hung a fragment by the poet Wendell Berry: "to be whole in the world, at peace and in place." Living here, I have even lost some of my characteristic travel fever. This is home.

B.H.V. – Before Hudson Valley – my connection to environmental issues was mainly through an interest in human attitudes and practices, and how to influence them. In spite of the human species' excesses, I must confess that I love people and nourish hope that we can become effective stewards of the environment. Through an eclectic career as a freelance communicator, I had been focused on the factors that motivate citizens, consumers, and working people to make socially responsible choices, whether the issue at hand was energy policy or national security or protecting urban gardens.

In spite of the human species' excesses, I must confess that I love people and nourish hope that we can become effective stewards of the environment.

When I settled in here and began getting involved with citizen groups, I noticed something pleasant. Hudson Valley environmentalists knew a lot about nature! Hikes with new friends were not only fun but educational. Bookstores offered abundant natural history. In public meetings, even when tempers flared, enough of the players on all sides knew how to go back to the scientific foundations and seek some common ground. To be sure, we had knowledgeable people in Boston; but there wasn't the same critical mass.

Obviously, credit for this state of affairs is widely shared. But one of the most influential players has clearly been Hudsonia. It's a delight to join this organization, and an honor to be entrusted with raising the profile and impact of work that is already so significant.

As we move forward, many of the things you appreciate about Hudsonia will be unchanged. You can expect the same low-key, meticulous mode of operation. You can expect the same prolific flow of research reports. You can expect the people who pick up the phone to be thoughtful and responsive to your questions, whether you want to know what to do with the invasive plants in your nature preserve or the turtle in your bathtub.

At the same time, you can expect some new approaches from Hudsonia in the months to come. We will be creating more opportunities for interaction with our scientific work – including seasonal open houses, forums, a website, and a Volunteer Observer Network of amateur and professional biologists to enhance our data-collection capabilities. We will be seeking more opportunities to do both basic and applied research in partnership with other nongovernmental organizations and public agencies. As I take on more of the administrative role, Hudsonia's scientific staff will be freed up to speak at more conferences and public meetings, and get more publications out. Education and training, always a part of Hudsonia's work, will become more systematic and targeted.

I recently spent three weeks in Lund, Sweden, at an environmental institute funded by the Parliament. Picture it: a well-appointed, four-story building, with huge classrooms, a library equal in size to those in many small towns, and offices for several dozen visiting scholars. Now picture the fruits of the Institute's environmental management initiative: energy-saving office equipment, dorm fridges and washers; printers that automatically give you two-sided pages; low-flow plumbing devices; rooftop gardens. All this is in a city so friendly to pedestrians and bicycles that the parking lot across from the train station contains about 600 bikes, and there are rarely more than a dozen cars visible anywhere. In case I needed them, here were my reminders. Humans can prosper in greater harmony with the environment. Schol arly research, properly financed and supported, can be a practical catalyst in bringing about the changes we need.

I came back inspired and determined to help Hudsonia strengthen its partnerships and impact, and build a new level of visibility. Our tastes are a good bit less opulent than those of my friends in Lund, but our mission is every bit as important. I look forward to working with Hudsonia's community.

Melissa Everett

Mark Your Calendar

Open House. October 15, 1999, Friday, 4:00 to 6:00 p.m. Please join us at the Bard College Field Station, overlooking Tivoli Bay, for an afternoon open house. A walk along the bay with Hudsonia biologists (weather permitting), research updates, and light refreshments. R.S.V.P. (914) 758-7053.

Performance and Celebration, May 20, 2000, Saturday evening. Celebrate Hudsonia's achievements in science for conservation, and meet many of our project partners. Watch for details in future issues.

The **1998 Hudsonia Prize** is awarded this year to Bard students Dareth McKenna, Kathy Scullion, and Amy Toth. The prize is given each year to a student or students with professional promise in the environmental sciences.

Volunteer Observer Network

Hudsonia receives so many interesting reports from our newsletter readers that we decided to create a volunteer observer network. You will read more about the network and the observers in the next *News*. Meanwhile, we are processing records of mudpuppies and porpoises in the Hudson River, birds in phragmites stands, butterflies visiting purple loosestrife flowers, and snapping turtle hatchlings.

Hudsonia Staff in Print:

The August 1999 issue of *Discover* magazine features Erik Kiviat's research on the ecology of invasive plant species.

Melissa Everett's new book, *Making a Difference: The Expanded Guide to Creating Careers with a Conscience* (New Society Publishers), will be available in bookstores September 24.

Staff Update

Laura Heady joins Hudsonia as Research Assistant in September. With a recent M.S. in ecology from Idaho State University, she has worked in wetlands, prairie, mountain, and desert ecosystems. Most recently a turtle biologist for the Nature Conservancy specializing in the monitoring of Blanding's turtles, Laura brings broad experience and enthusiasm to the position.

Victoria Balcomb, Hudsonia's Administrative Coordinator, leaves to pursue other opportunities after a year and a half with Hudsonia. We appreciate Victoria's professionalism and attention to detail, and especially her sophisticated eye in designing *News from Hudsonia.*

Hudsonia is grateful for the services of Kristen Cafasso, Dwane Decker, and Bard students Adina Estreicher, Emily Legutko, and Amanda Thimmayya as office assistants; Bard graduate student Stacey Thew and AmeriCorps member Krista Munger as the turtle team; and Melissa Everett, Elizabeth Hamilton, and Sarah Love on special projects.

Master's Program in Environmental Studies:

For information about the Bard College Graduate School of Environmental Studies, phone (914) 758-7073.

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We welcome suggestions for articles, and offers of underwriting for future issues.

Dear Friends,

Individual gifts to Hudsonia have risen this year, and we are extremely grateful. As you are well aware, Hudsonia's research is too important to rely entirely on the uncertainties of grant funding. Our research informs the protection of the environment and quality of human life. Please continue to help us generously.

Larry Weintraub
Chair, Board of Directors

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