



# News from Hudsonia

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## 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.

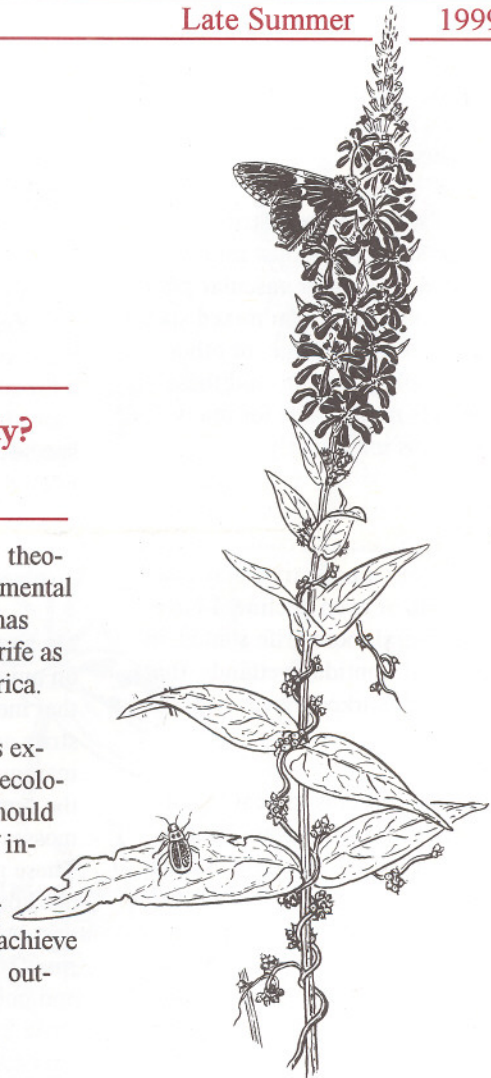
Purple loosestrife arrived on this continent from Europe approximately 200 years ago, and has since spread throughout much of the U.S. The Hudson Valley was one of four areas in the northeastern U.S. where loosestrife spread early, and it is now one of our most abundant wetland plants. Many ecologists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

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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and studies of purple loosestrife in a report and a paper which will include information from the literature and unpublished data.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*

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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),

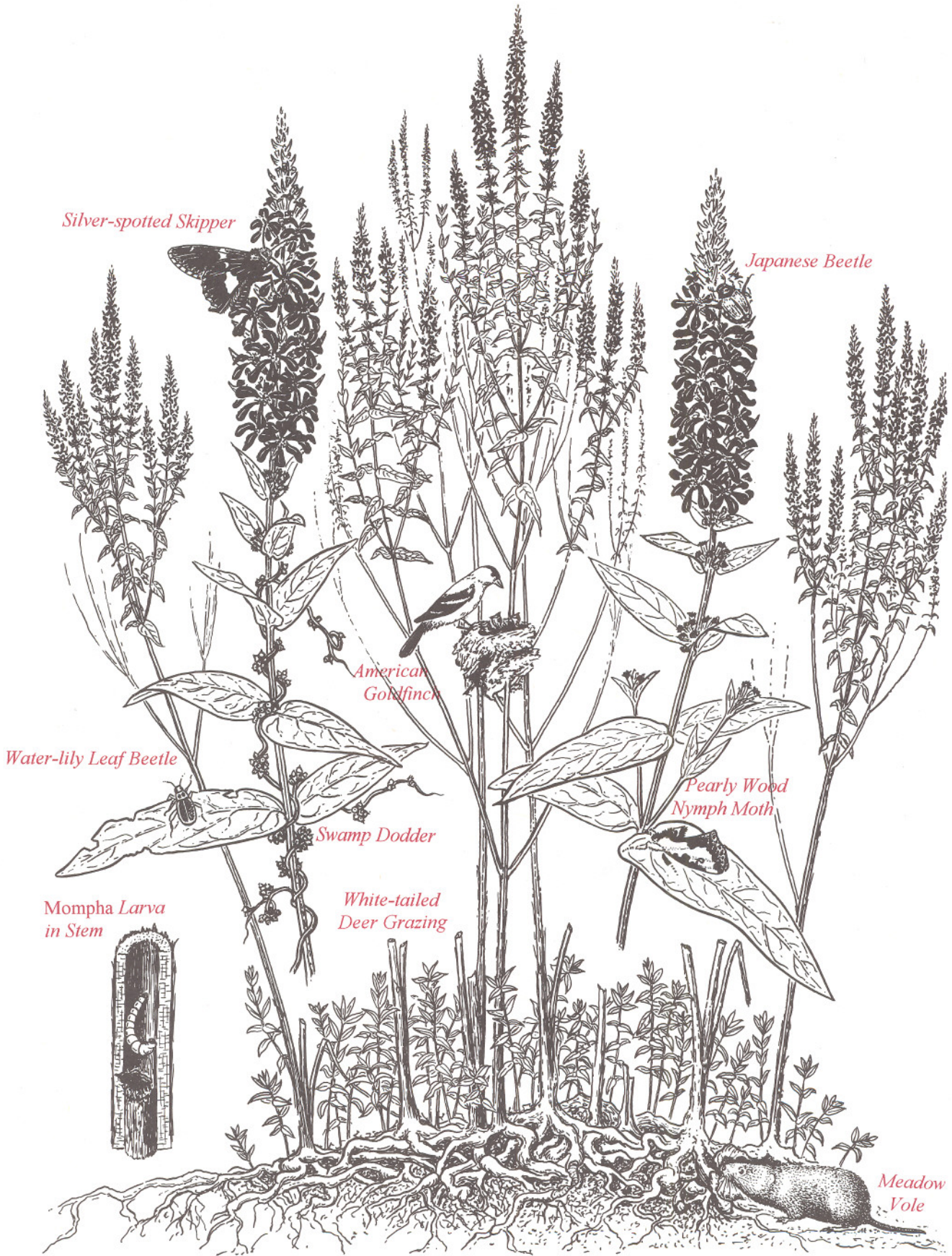
*Helodium paludosum* (a moss), *Septoria lythrina* (a fungus), and others.

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. © Kathleen A. Schmidt