The Complexity and Perplexity of Invasive Plants

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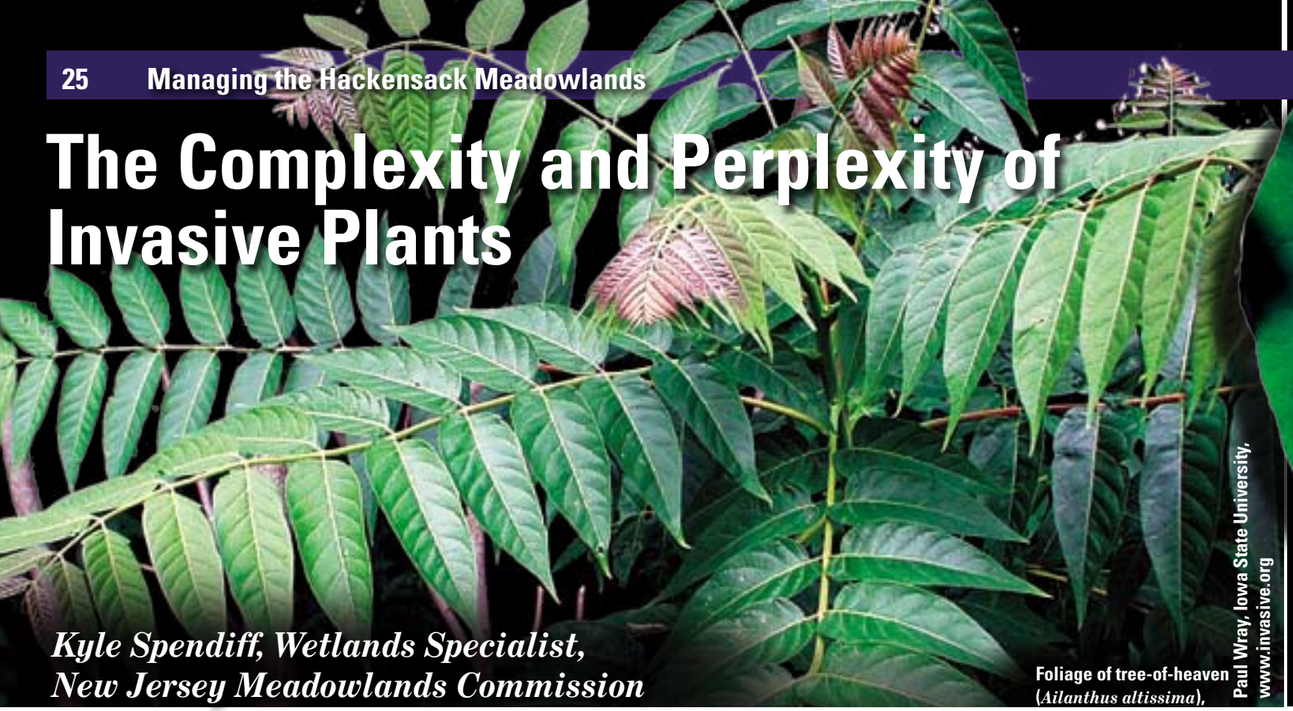
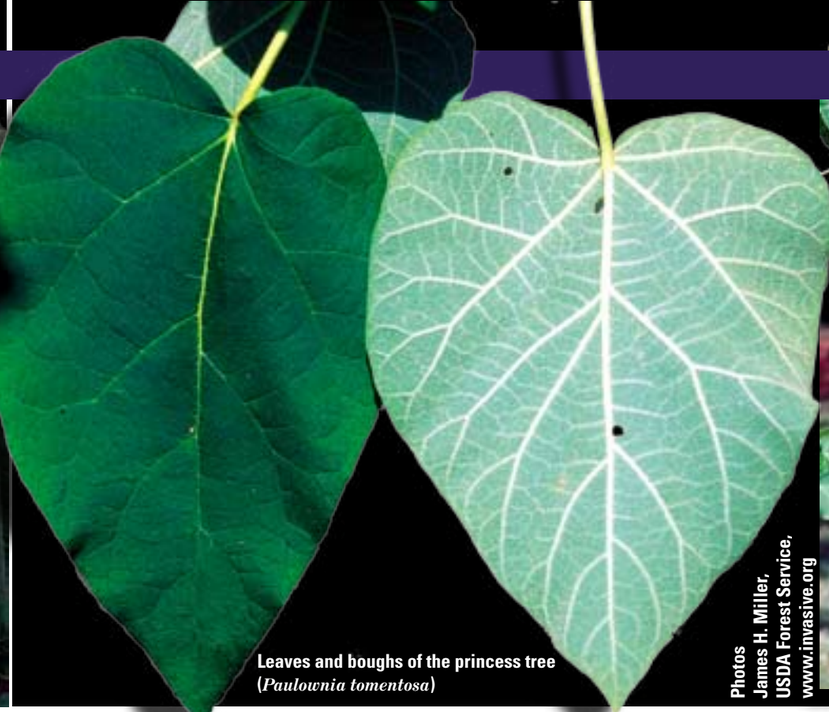


Foliage of tree-of-heaven (*Ailanthus altissima*), Paul Wray, Iowa State University, www.invasive.org



Leaves and boughs of the princess tree (*Paulownia tomentosa*)

Photos James H. Miller, USDA Forest Service, www.invasive.org

For a wetlands/wildlife manager in the Hackensack Meadowlands, the difficulties of managing exotic species can be perplexing. In a system where the vast majority of the landscape is dominated by one exotic plant or another, where re-invasion is a constant threat, and existing conditions favor highly adaptable and aggressive plant species, what can or should be done to manage the vegetative communities in the Meadowlands? Driving down Valley Brook Road on the way to the New Jersey Meadowlands Commission, one instantly notices high marsh and transition zones dominated by monotypic stands of common reed (*Phragmites australis*). In the uplands, tree-of-heaven (*Ailanthus altissima*), princess tree (*Paulownia tomentosa*), red mulberry (*Morus rubra*), mugwort (*Artemisia vulgaris*), and purple loosestrife (*Lythrum salicaria*), all exotic species, compete for any space left vacant by the common reed. What beneficial qualities might these exotic invasives possess?

Gene Nieminen / USFWS, NJFO

Tassels of common reed (*Phragmites australis*) beside the New Jersey Meadowlands Commission with Snake Hill on the horizon

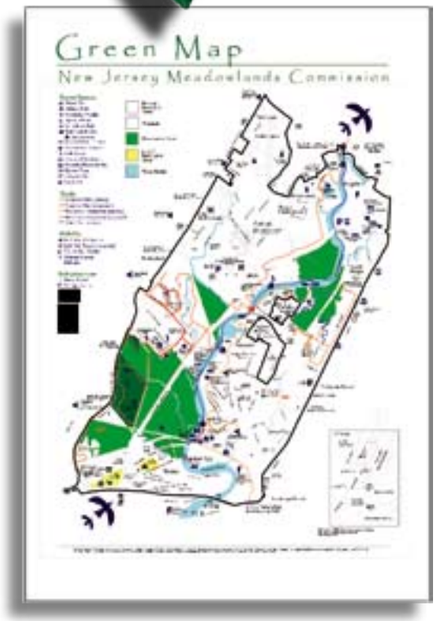
Tree-of-heaven and the princess tree, for instance, are fast-growing species tolerant of the poor growing conditions characteristic of the Meadowlands. These trees provide much-needed vertical strata and suitable canopies for many arboreal passerines. Both host a bounty of nutritional insects and provide foraging habitats for birds raising broods. Cavity-nesting birds such as flickers (*Colaptes auratus*), other woodpeckers (*Melanerpes* spp. and *Picoides* spp.) and tree swallows (*Tachycineta bicolor*) all benefit from these short-lived and easily excavated trees. Eastern cottonwood (*Populus deltoides*) is the only native tree species that grows under similar site conditions and offers the aforementioned habitat values. Should management plans encourage homogenous stands of native cottonwoods?

Chuck Bargeron, The University of Georgia, www.invasive.org

A tree-of-heaven takes advantage of a disturbed area

Last year, I observed a muskrat (*Ondatra zibethicus*) pushing a large mass of green vegetation in front of it as it swam. I watched the rodent make several trips to its bank den before I inspected it. Several entrances were stuffed to the brim with freshly cut mugwort. Some of the mugwort had been stripped and eaten. I found that other muskrats had done the same. Could this highly invasive and regenerative plant be an integral part of the Meadowlands food chain?

Another highly invasive plant that is overrunning parts of the Meadowlands is purple loosestrife. The plant with its beautiful purple flower spikes adds further hue and contrast to the landscape. A multitude of pollinators are attracted to it, such as honeybees (*Apis mellifera*– another exotic), flies, and butterflies. To halt its invasion, many thousands of *Galerucella* beetles have been released in dense stands of loosestrife. Eating only loosestrife and an occasional multiflora rose (*Rosa multiflora*), another exotic with problematic tendencies, the beetles form the classic predator/prey relationship with the loosestrife. When there is a bountiful food source, *i.e.*, dense, healthy stands, the beetles reproduce rapidly and feed voraciously until the food supply is diminished. Subsequently, the *Galerucella* population crashes, allowing some loosestrife to produce seed and begin the cycle over again. Using biology to control loosestrife allows "nature" to do the work, transforming the plant from a monoculture into part of a diverse wetland community.



It is impossible to deal with exotic invasives in the Meadowlands without addressing that predominant intruder, the common reed. Although, *Phragmites* is known to have been in the area for perhaps thousands of years, Haplotype M, the only variety found in the Meadowlands, is a recent immigrant. This variety is highly aggressive, tolerates a wide range of growing conditions, and forms extremely dense stands that are virtually inaccessible to wildlife. Yet even Haplotype M can be beneficial. Its massive rhizome structures retain and bind heavy metals and other contaminants. The dense stands provide bank stabilizers and sediment traps. Waterfowl seek refuge from the energy-sapping winter winds behind stands of common reed, while some passerines nest on stand edges. But there is a flip side. The same qualities of bank stabilization and sediment retention can cause accretion of the marsh surface at notable rates. The reed improves its growing conditions by elevating the marsh plain, in turn reducing the functionality of the wetland. Since *Phragmites* doesn't need to "have its feet wet," "mother plants" can grow in upland areas and pump oxygen and essential nutrients through rhizomes to clones that persist in tidally influenced zones, allowing the reed to compete with native wetland species. Because of the plant's resistance to decomposition, dead canes form massive wrack loads, which cover potential shoreline habitat and scour native plants trying to establish footholds, thus preventing successful colonization. Studies have shown that wildlife uses only the outermost boundaries of a stand, rendering countless acres of wetland unproductive.

So how can we ensure the success of native plant communities in the Meadowlands? For better or worse, exotic species are here to stay. While in some cases it is possible to eliminate exotic invasives, control and management is by far a more realistic goal. For instance, it would be impossible to eradicate *Phragmites* in the Meadowlands; however, controlling common reed so as to maximize its benefits and minimize its detriments is a sensible and "do-able" alternative. Exotic invasives can co-exist with native plant communities as good neighbors if they are kept in check and appropriate management schemes are implemented.