This brochure was produced by the Bennington County Conservation District (BCCD). All illustrations are courtesy of Anne Hunter.

Much of the information was drawn from Element Stewardship Abstracts (ESAs) prepared for The Nature Conservancy. More information on these and other species can be had by reference to those ESAs, which can be found on-line at tncweeds.ucdavis.edu/esadoc.html.

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Guests Who Won't Go Home

Managing invasive non-native plant species in home landscapes, fields and forests in Bennington County, Vermont

Changed Landscapes

Sugar maples in our forests, gray-stemmed dogwoods in our hedgerows, shining willow along our rivers and streams – they're just a few signatures of southern New England's native biodiversity, a living record of thousands of years of plant life adapting to our own distinctive topography, soils, climate and location on the Earth. These and other naturally occurring plants, animals, and micro-organisms have produced a biological community here like no other, a place unique on the planet.

But in some landscapes in Bennington County, native plant communities have been invaded by Asian honeysuckles, common buckthorn, Japanese knotweed, Norway maple, garlic mustard and others. These non-indigenous plant species have taken over our wild and cultivated places, rending a biological web many millennia old. Some researchers believe that, next to the loss of habitats (to development, farming, forestry, and other human activities), invasive non-indigenous species pose the greatest threat to native biodiversity worldwide.

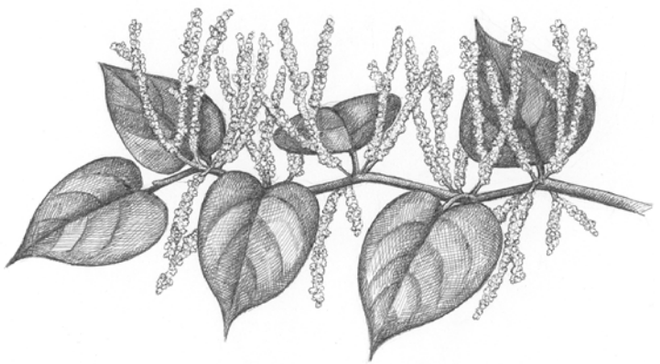
What Makes a Plant Invasive

Relatively few of the thousands of plants introduced to North America – accidentally or for horticultural or agricultural reasons – are problem species, and no particular suite of features distinguishes pest plants from those that are less aggressive. But though there is no recipe for invasiveness, some biological themes occur again and again.

Often, invasive non-native (or "exotic") plants are plants of disturbed habitats both here and at home. Garlic mustard (*Alliaria petiolata*) is an edge species in its native Europe, where it's found in hedgerows and waste areas. In New England, the plant is most common along streams and rivers, in disturbed moist woodlots, and along roadways.

Invasive exotics often reproduce unusually successfully, for reasons that might include early maturation, self-fertility and high seed set, remarkable vegetative vitality, an ability to inhibit the growth of other species nearby (a phenomenon known as "allelopathy"), and others. In North America, Japanese knotweed or Japanese bamboo (*Polygonum cuspidatum*) reproduces vegetatively by means of rhizomes (some up to sixty feet in length) or pieces of rhizomes so vigorous their shoots can penetrate asphalt.

Once established, invasive exotics usually outcompete their neighbors – often through allelopathy or by shading out other plants. Tatarian and Morrow's honeysuckles (*Lonicera tatarica and L.*



Japanese knotweed (*Polygonum cuspidatum*) This and all illustrations by Anne Hunter.

morrowii) leaf out at least two weeks earlier than native woody plants in New England woods, and retain their leaves until November, constantly photosynthesizing.

Invasives usually colonize new locations more efficiently than other species, often with the help of birds (which consume and spread seeds), floodwaters, or other dispersal mechanisms. Common buckthorn (*Rhamnus cathartica*) produces abundant crops of berry-like fruits each year, most of which are consumed and spread by birds.

And invasive exotics have few significant pests or diseases in their new locations, although they may be prey to a number of pests at home. Garlic mustard, which has nearly 70 known predators in its native Europe, has none in North America.

Controlling Invasives

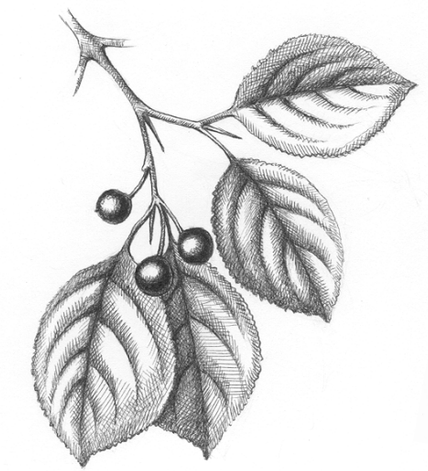
Because most New England invasive exotics are disturbance-adapted, the best way to prevent invasion is to minimize disturbance, especially near existing populations of pest species. (Maintaining a wide buffer of undisturbed woods around a logging operation, for example, can reduce honeysuckle invasion of interior forests. Maintaining a forested buffer along a stream will help keep the bank intact and protected from invasion by Japanese knotweed.) Other measures include avoiding using construction fill or topsoil which might contain seed or rhizomes of invasives, and, of course, never purchasing species known to be threats.

Control methods for terrestrial plants include pulling out individuals, cutting and re-cutting until food resources have been exhausted, burning, and using herbicides. (Permits may be required for the use of some herbicides. Contact the VT Agency of Natural Resources at 802 241-3770 or the VT Department of Agriculture at 802 828-2431). Restored sites may need monitoring for several years.

TAKE CONTROL! of these common invasive exotic species

Species	Control methods
Garlic mustard	Cut or pull plants before seeds set each spring. Continue for 4-5 years until seed bank is exhausted.
Shrub honeysuckles	Pull by hand or with heavy equipment. Cut plant to ground in early spring or late summer to early autumn annually until root reserves are exhausted. Natural lands managers have had success with a 20-25% solution of the herbicide glyphosate* applied to cut stumps from late summer through the dormant season. Monitor the infested area and remove seedlings as necessary.
Purple loosestrife	For small infestations, pull by hand before seeds set, removing as much of the rootstock as possible and avoiding unnecessary disturbance of the soil.
Common reed	Cut stems below the first leaf in late July or early August annually until rhizome reserves are exhausted and re-sprouting no longer occurs. Remove and burn or compost cut stems.
Japanese knotweed	Cut at least 3 times during the growing season each year until rhizome reserves are exhausted. Some managers have combined cutting with a foliar application of glyphosate late in the growing season for quicker control.
Buckthorns	Pull by hand or with heavy equipment. Girdle the stem during the winter months. Natural lands managers have had success with a 20-25% solution of the herbicide glyphosate applied to cut stumps from late summer through the dormant season.

Garlic mustard



Common buckthorn

An introduced honeysuckle

Vermont's Worst Invasives

According to Vermont's Natural Heritage Program, these pests are already significantly altering native plant communities.

Goutweed (*Aegopodium podagraria*)
Garlic mustard (*Alliaria petiolata*)
Flowering rush (*Butomus umbellatus*)
Yellow flag iris (*Iris pseudacorus*)
Morrow honeysuckle (*Lonicera morrowii*)
Tatarian honeysuckle (*L. tatarica*)
Purple loosestrife (*Lythrum salicaria*)
Eurasian watermilfoil (*Myriophyllum spicatum*)
Common reed (*Phragmites australis*)
Japanese knotweed (*Polygonum cuspidatum*)
Common buckthorn (*Rhamnus cathartica*)
Glossy buckthorn (*R. frangula*)
Water chestnut (*Trapa natans*)

*** The herbicide glyphosate** is used by natural lands managers where infestations can't be controlled by mechanical means or by prescribed burning. Though it will kill non-target species too, the active ingredient is non-toxic to most animals and biodegrades in days into non-toxic natural components. Surfactants added to some formulations can be human respiratory irritants and may harm fish and amphibians. The formulation "Biactive" lacks these compounds.