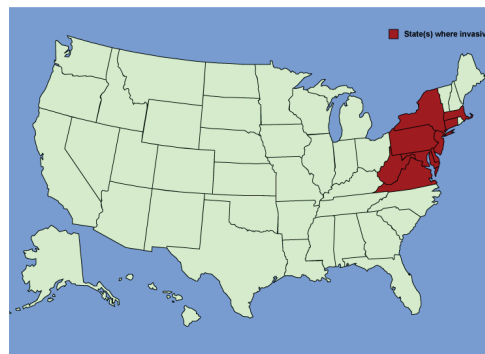


New Invasives

One of the most efficient ways to control invasive species is with the “Early Detection – Rapid Response” system. By recognizing potential invaders and taking action early on, we can prevent further ecosystem damage and avoid expensive, time consuming, and overwhelming removal efforts. Some invasive plants to be on the lookout for include:

Mile-a-minute vine

Mile-a-minute vine (*Polygonum perfoliatum*) has spread to Connecticut, Delaware, Massachusetts, Maryland, New Jersey, New York, Pennsylvania, Virginia, West Virginia since its initial introduction to Pennsylvania in the late 1930s. Mile-a-minute grows rapidly, covering and smothering native vegetation, impacting their ability to photosynthesize.



States infested with mile-a-minute



Mile-a-minute smothers native plants

Leslie J. Mehrhoff, U of Ct, Bugwood.org

Watermilfoils

Eurasian watermilfoil (*Myriophyllum spicatum*), variable watermilfoil (*M. heterophyllum*), and parrot feather watermilfoil (*M. aquaticum*) can all form dense, floating mats on water bodies, blocking sunlight from native aquatic vegetation and impeding water traffic.



States infested with watermilfoil



Watermilfoils can kill a waterbody

Alison Fox, U. of Florida, Bugwood.org

Japanese Stiltgrass

Japanese stiltgrass (*Microstegium vimineum*) has spread to 15 eastern states since its accidental introduction in Tennessee in 1919. This grass spreads to extensive patches, displacing and shading out native plants and changing the soil chemistry. White-tailed deer avoid Japanese stiltgrass, making their impact on native species greater.



States infested with Japanese stiltgrass



Common invader of forests and floodplains

David Moorhead, University of Georgia

For More Information

The Rhode Island Wild Plant Society
RIWPS, P.O. Box 114
Peace Dale, R.I. 02883
(401)783-5895 www.riwps.org

The Rhode Island Natural History Survey
RINHS, Room 101 Coastal Institute
Kingston
1 Greenhouse Road, URI
Kingston, R.I. 02881
(401)874-5800 www.rinhs.org

The Rhode Island Agricultural Experiment Station
RIAES, Woodward Hall, URI
9 East Alumni Avenue
Kingston, R.I. 02881
(401) 874-5493 www.riaes.org

New England Wildflower Society
180 Hemenway Road
Framingham, M.A. 01701-2699
(508) 877-7630 www.newenglandWILD.org

References

Tallamy D.W. 2007. Bringing Nature Home: How Native Plants Sustain Wildlife in Our Gardens. Portland, London: Timber Press.

Plant Conservation Alliances Alien Plant Working Group. 2009. Least Wanted: Alien Plant Invaders of Natural Areas. <http://www.nps.gov/plants/alien/fact.htm>

For a list of local nurseries selling native plants, visit the Rhode Island Wild Plant Society at <http://www.riwps.org/nativeplantnurseries.htm>

For additional information or questions contact:

U.S. Fish and Wildlife Service
The Rhode Island National Wildlife Refuge Complex
P.O. Box 307
Charlestown, RI 02813
401/364-9124
401/364-0170 fax

Federal Relay Service
for the deaf and hard-of-hearing
1 800/877-8339

U.S. Fish & Wildlife Service
1 800/344 WILD
<http://www.fws.gov/invasives>

October 2009



U.S. Fish & Wildlife Service

Invasive Species

Partnering with Landowners to Control the Spread of Invasive Plants on the Rhode Island National Wildlife Refuge Complex

What are Invasive Species?

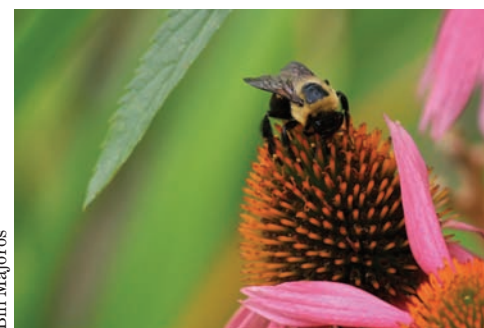
Invasive species are plants, animals, or other organisms that have come into the world. Unlike most introduced species, invasive species grow aggressively and lack the pests and diseases that control their numbers in their native home. They spread and take over natural areas in their adopted home.

Impacts of Invasives

Invasive species can cause local extinctions of plants and animals, lowering biological diversity and weakening the rich tapestry of life upon which we all depend.

Displacement and Habitat Degradation

Many invasive species crowd out native plants by taking over their habitat, reducing light availability, and stealing water and nutrients. Oriental bittersweet, common reed, multiflora rose, Japanese barberry, purple loosestrife, Japanese knotweed, non-native honeysuckles, and privets are examples of some locally persistent “habitat hogs.” Other invasive species, such as autumn olive, change soil chemistry by adding nitrogen to the soil, making it ripe for other invasives, such as garlic mustard and buckthorns, to move in and crowd out native species that prefer infertile soils.



Bill Majors

Bees distracted by invasive plants spend less time pollinating natives.



Cedar Waxwing on native red chokeberry

Competition for Pollinators

Purple loosestrife, buckthorns, and non-native bush honeysuckle are non-native plants that attract pollinators so successfully that they distract birds and bees from pollinating native plants. This causes the native plants to develop less fruit and therefore unable to spread their seeds widely.

Disrupted Breeding and Nesting

Common reed has replaced native vegetation used by marsh wren and rails. At Trustum Pond National Wildlife Refuge (NWR) dense stands once obscured island and pond shore habitats, making them unsuitable for foraging shorebirds and wading birds as well as crowding out native rare plants.

Reduced Population and Extinction

When a monarch butterfly lays its eggs on black swallowwort rather than on native milkweed, the larvae feed on the swallowwort then die. Garlic mustard can also fool native butterflies, leading to reduced populations.

Food Scarcity and Reduced Nutrition

Japanese knotweed, Japanese barberry, and garlic mustard form dense stands, reducing the quantity of prey and make it harder for woodland amphibians to find food. Although some invasive plants produce edible berries during migration season, there is currently research underway to determine the relative quality of those fruits when compared to native species. In addition, the invasive plants do not support the native insects that songbirds depend on to feed their young during the breeding season.

Economic and Societal Impacts

Loss of biological diversity can change ecological processes affecting such vital activities as food production and maintenance of water quality. Lowered biological diversity also decreases our ability to “mine” species for new food crops, medicines, and industrial materials. Invasive species are also expensive. In the U.S. alone, they cost an estimated \$137 billion a year in losses to agriculture, industry, forestry, commercial fishing, recreation, and water supplies.

USFWS

Even over time, few wildlife species are able to adapt to using invasive plants. After more than 300 years after its introduction to North America, *Phragmites*, an exotic wetland plant supports only five herbivore species as opposed to 170 species of herbivores in its native land.

Current Refuge Projects

Early Detection – Rapid Response

One of the primary goals on Rhode Island refuges is to stop new invaders from spreading and becoming established. To accomplish this, we train volunteer weed warriors and organizes days of focused hand pulling and cutting to eradicate these populations. Although it often requires several years of pulling to remove all of the plants and exhaust the seed bank, this approach has prevented the spread of species such as garlic mustard, black swallowwort, Japanese knotweed, Japanese barberry, and winged euonymus.



Staff and volunteers after hand pulling at Sachuest Point NWR

In addition, we have worked with adjacent landowners to eradicate new invaders that have appeared on our border. Refuge staff worked closely with the town of Middletown to eradicate Asiatic sand sedge from beaches on both town and refuge property at Sachuest Point NWR. Occuring in two locations in Rhode Island, we've observed that this species quickly spreads and displaces all native beach grasses, forbs and shrubs. It forms a dense monoculture that provides inferior habitat for nesting birds and other wildlife.



Monarch butterfly

a multi-year effort to deplete the seed bank, but has significantly reduced the population. Numerous refuge volunteers as well as volunteers from the Rhode Island Natural History Survey, the New England Wildflower Society, Invasive Plant Atlas of New England, and the Rhode Island Wild Plant Society have contributed to this effort.

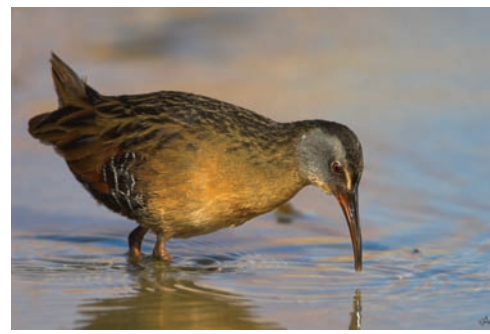
Managing the Heavily Invaded Sites

For larger infestations we have used mechanical equipment to cut back the invasive monocultures and treat the areas with low doses of selective herbicide. This method is often required in areas that have a long history of disturbance, having been cleared of all vegetation at some point in the past. Once the invasives have been cut and treated during two to three consecutive years, refuge staff follow up with spot treatments until the native species are more abundant than the invasives, and the fields can begin reverting to native shrub habitats. Eventually, as these restored areas become dense with native species, they are able to out compete invasive plants.

Biological control (using a living organism to control a pest species) is another option in controlling large or widespread infestations of certain invasive plants. Currently, we control purple loosestrife at Sachest NWR and numerous off-refuge sites by introducing two species of leaf-eating beetles. Beetles released in late summer over-winter in leaf litter and breed the following spring, producing larvae that feed almost exclusively on the leaves of purple loosestrife. The damage done by these larvae prevents the plant from flowering, seeding, and spreading. Because these beetles have such a low preference for plants other than purple loosestrife, the risk of damage to native species is extremely low, especially in comparison to the risk imposed by the purple loosestrife itself.

Education and Outreach

The refuge biologist is also involved in an invasive certification program for local landscape professionals that is coordinated by the University of Rhode Island College of Environment and Life Sciences outreach office and the Coastal Resources Management Council. In addition, the biologist has recently been working closely with an Eagle Scout who is assisting with restoring an invaded area along the refuge boundary at Trustom Pond NWR and developing an interpretive sign to share information about invasive species with adjacent



Stephen Ting

Virginia Rail benefit from *Phragmites* control at Trustom Pond NWR

landowners. This effort is an important first step in explaining how seemingly innocent yard clippings can cause invasions of pristine habitats.

In order to successfully eradicate harmful invasive species, the National Wildlife Refuge System must coordinate with agencies and individuals outside of refuge boundaries. One program that the refuge system works closely with is the U.S. Fish and Wildlife Service's Southern New England-New York Bight Coastal Program (SNEP). The SNEP staff are dedicated to working with landowners to restore and preserve coastal ecosystems. SNEP focuses on high priority species and habitats and is currently working directly with the refuge on purple loosestrife control and mapping of invasive species on land adjacent to refuge property.

What You Can Do

- Be informed. Know which plants are invasive in your area and educate others in your community;
- Plant only native plants on your property;
- Seek advice on how to remove and/or control existing invasive species on your property and make sure to dispose of them properly, so as not to spread the problem to other sites;
- Encourage your local nurseries to stop selling invasive plants and instead offer a wide variety of native species;
- Prevent the establishment of invasive species by never releasing non-native species into the wild (i.e. plants, live bait, aquarium fish and plants, snakes, etc.);
- Prevent the spread of aquatic invasives by thoroughly cleaning your boat and motor after leaving a water body. If you hike through an area with invasives, be cautious of spreading seeds or other plant parts via boots, clothing, and tires; and
- Volunteer to assist conservation groups in their efforts to monitor and control invasive plants.

Common Ornamental Invasives and Native Alternatives

Although these plants are known invasives to New England and are harmful to our native ecosystems, most are still widely available through nurseries, catalogs, and the internet. However, these common ornamental invasives can be replaced with native alternatives.

Invasive: Oriental bittersweet (*Celastrus orbiculatus*)

Native Alternative: Virginia creeper (*Parthenocissus quinquefolia*), American bittersweet (*Celastrus scandens*)



Oriental bittersweet taking over native habitat

Invasive: Japanese barberry (*Berberis thunbergii*)

Native Alternative: Virginia sweetspire (*Itea virginica*), highbush blueberry (*Vaccinium corymbosum*), bayberry (*Myrica pennsylvanica*), winterberry (*Ilex verticillata*), red chokeberry (*Aronia arbutifolia*)



Virginia creeper is an excellent alternative

Invasive: Burning bush (*Euonymys alatus*)

Native Alternative: sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), bayberry (*Myrica pennsylvanica*), red chokeberry (*Aronia arbutifolia*)



Beautiful colors but highly invasive burning bush

Invasive: Norway maple (*Acer plantanoides*)

Native Alternative: red maple (*Acer rubrum*), sugar maple (*Acer saccharum*)



Equally beautiful and native chokeberry

Invasive: Japanese honeysuckle (*Lonicera japonica*)

Native Alternative: limber honeysuckle (*Lonicera dioica*), trumpet honeysuckle (*Lonicera sempervirens*)



Norway maple looks much like native maples

Invasive: Morrow honeysuckle (*Lonicera morrowii*), bella honeysuckle (*Lonicera x Bella*)

Native Alternative: serviceberry (*Amelanchier sp.*)



Red maple is a fall favorite and an excellent alternative

Invasive: Purple loosestrife (*Lythrum salicaria*)

Native Alternative: Joe-pye weed (*Eupatorium dubium*), swamp milkweed (*Asclepias incarnata*)



Don't be fooled by the pretty flowers of Japanese honeysuckle

Invasive: Multiflora rose (*Rosa multiflora*)

Native Alternative: climbing prairie rose (*Rosa setigera*), Carolina rose (*Rosa carolina*), Virginia rose (*Rosa virginiana*)



Trumpet honeysuckle is a North America native alternative

Invasive: Autumn olive (*Elaeagnus umbellata*)

Native Alternative: bayberry (*Myrica pennsylvanica*), winterberry (*Ilex verticillata*), red chokeberry (*Aronia arbutifolia*)

John Randall, TNC

USFWS

James Miller, USFWS, bugwood.org

The Dow Gardens Archive

USFWS

The Dow Gardens Archive

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John D. Eyrct, Mississippi State University