Invasives Plants: A Lifetime Commitment

How to approach the game and maybe win!

Burnsie
Burns Environmental

Defining Invasive

- Invasive Plant:
  - introduced
  - spreads rapidly
  - displaces native flora
  - persists in natural landscapes
  - impacts natural biodiversity
  - viable seed?

Dame's Rocket

Hesperis matronalis

Hesperis matronalis is frequently found in riparian or wetland habitats, as well as rich open woods. It is also found along roads and in gardens, where it is still planted.

Black Locust

Robinia pseudoacacia

Movement of Invasive Plants

- Garden Introductions
- Accidental Transport
- Habitat Disturbance, Roads, Trails
- Birds, Wildlife, Livestock
- Movement by Water
- Other Vectors: Machinery, Humans
- Absence of Natural Predators and Pathogens


What about animals?


Dianne Saunders


Tamarac Swamp Road --one of main entrances to Tyler Mill Preserve
Spring, 2009
Dianne Saunders

COMMON INVASIVES

Norway maple
(*Acer platanoides*)

Japanese barberry
(*Berberis thunbergii*)

Burning bush
(Euonymus alatus)

Glossy buckthorn
(Frangula alnus)

Morrow's honeysuckle
(*Lonicera morrowii*)

Multiflora rose
(*Rosa multiflora)*

COMMON INVASIVES

Oriental bittersweet
(*Celastrus orbiculatus)*

Garlic mustard
(*Alliaria petiolata*)

Japanese knotweed
(*Reynoutria japonica*)

Common reed
(*Phragmites australis*)

Reed Canary Grass
(*Phalaris arundinacea*)

Purple loosestrife
(*Lythrum salicaria*)

Japanese Barberry

Berberis thunbergii

Berberis thunbergii can be found in a variety of habitats throughout New England. It occurs in open fields, thickets, woodlands, forests, and wetlands. The shrub has the ability to form dense, continuous stands.

Common Barberry

Berberis vulgaris

Berberis vulgaris is found sporadically in New England, usually in open-canopied forests and sometimes along roads. It is also very successful in calcareous soils.

Autumn Olive

Elaeagnus umbellata

Elaeagnus umbellata is found in pastures, fields, sparse woodlands and planted as ornamentals along roads. It is often found in poor soils because it has nitrogen-fixing nodules that allow it to tolerate these conditions.

Burning Bush

Euonymus alatus

Euonymus alatus occurs in habitats from full sun to full shade. It can tolerate a variety of soil types and pH levels, preferring well-drained soils.

Winged euonymus seedlings

Glossy buckthorn

Frangula alnus

Frangula alnus tolerates moist soils, and can be found in swamps, fens and the edges of bogs. It also can be present in upland habitats such as woodland edges, fencerows and old fields.

Morrow's Honeysuckle

Lonicera morrowii

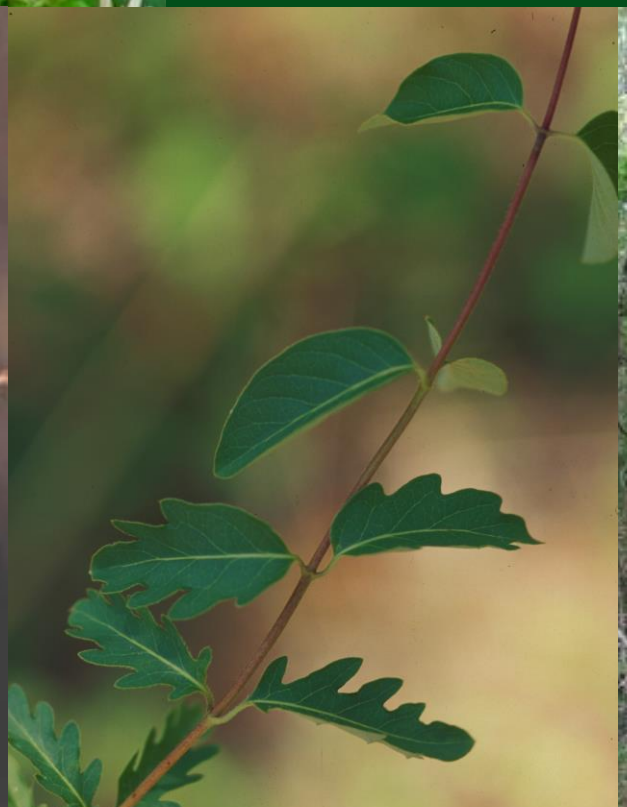
Amur honeysuckle

Lonicera maackii

Amur honeysuckle is one of several invasive shrub honeysuckles. Distinctive features include the very short flower stalks (shorter than the leaf stalks) and the long, taper-pointed leaves. The fruits are deep red, and the flowers are white, fading to yellow. Like other invasive shrub honeysuckles, Amur honeysuckle can grow to about 15 feet in height. The stems are hollow, gray, and have shreddy bark.

Japanese honeysuckle

Lonicera japonica



Comparison: Amur honeysuckle and other shrub honeysuckles

Amur honeysuckle

- Leaves: tapered
- Flower/fruit stalks: shorter than leaf stalks

Other Shrub Honeysuckles

- Leaves: blunt
- Flower/fruit stalks: longer than leaf stalks

Amur honeysuckle

American fly-honeysuckle (*Lonicera canadensis*)


Morrow's honeysuckle (*Lonicera morrowii*)

Wild Honeysuckle and Japanese Honeysuckle Vine Comparison

Wild honeysuckle

Japanese honeysuckle

The native limber, or wild honeysuckle *(Lonicera dioica*) vine has yellow-orange flowers that produce red fruit. All the leaves are entire, and the terminal leaves are fused to form a cup-like structure beneath the inflorescence. Undersides of the leaves are white.

Photos: GoBotany

Oriental Bittersweet

Celastrus orbiculatus


Celastrus
Talus, Palmer, MA
August 14, 2008
T.J. Rawinski


Celastrus orbiculata
Pleasant Valley, W.S.
Lenox, MA
July 5, 2006
T. J. Rawinski

This one is really special, and becoming very rare.

American Bittersweet

Celastrus scandens

Becoming genetically overwhelmed by Asiatic Bittersweet.

Hybrid Bittersweet

(note yellow anthers)

Garlic Mustard

Alliaria petiolata

Alliaria petiolata prefers moist, shaded areas, but can grow well at roadsides, wood edges, trails and forest openings. Because of its shade tolerance it is one of few invasives that can be present and dominate a forest understory.

Japanese Knotweed

Reynoutria japonica

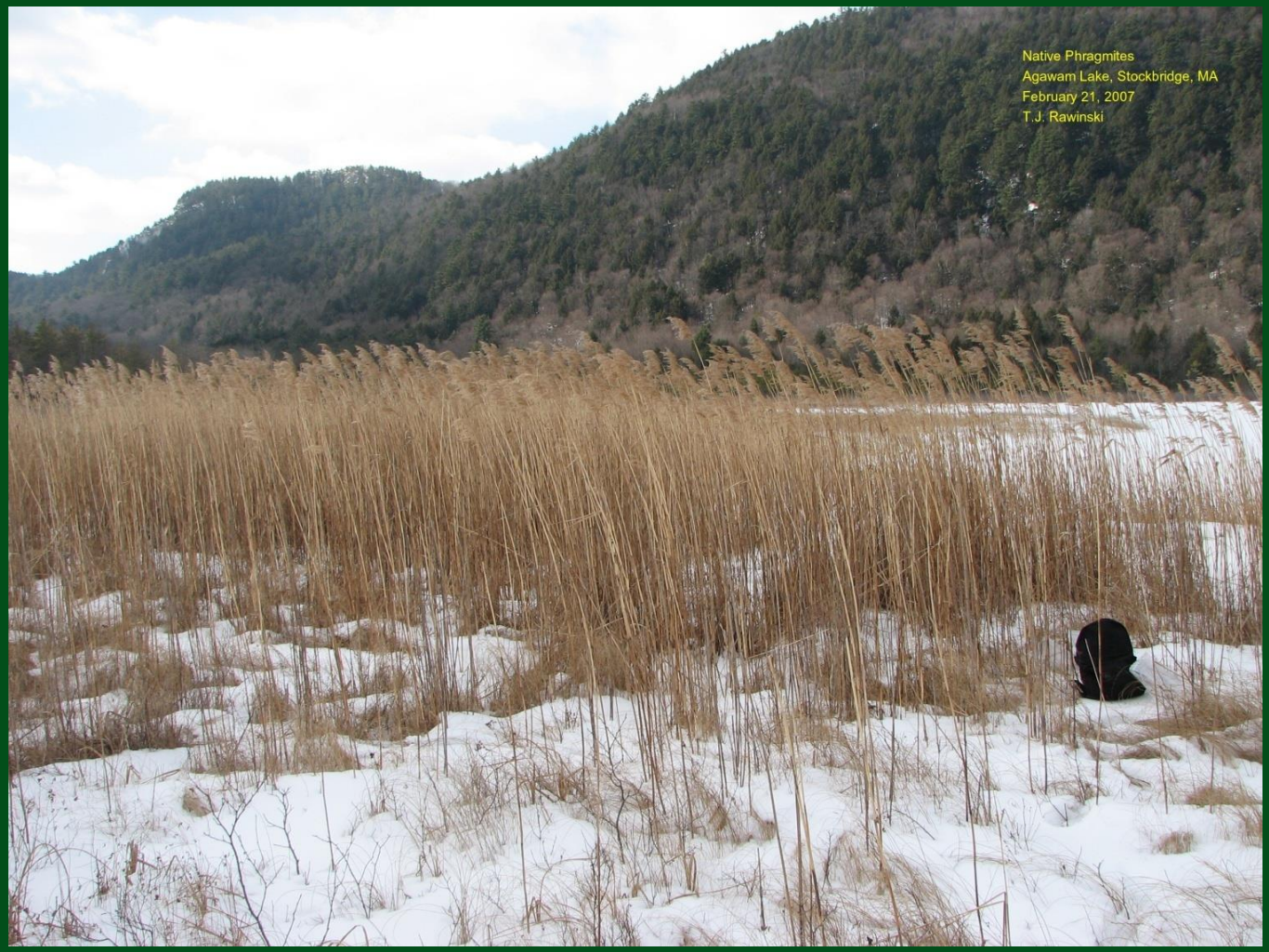
Roadsides
Riversides
Wetlands
Yards

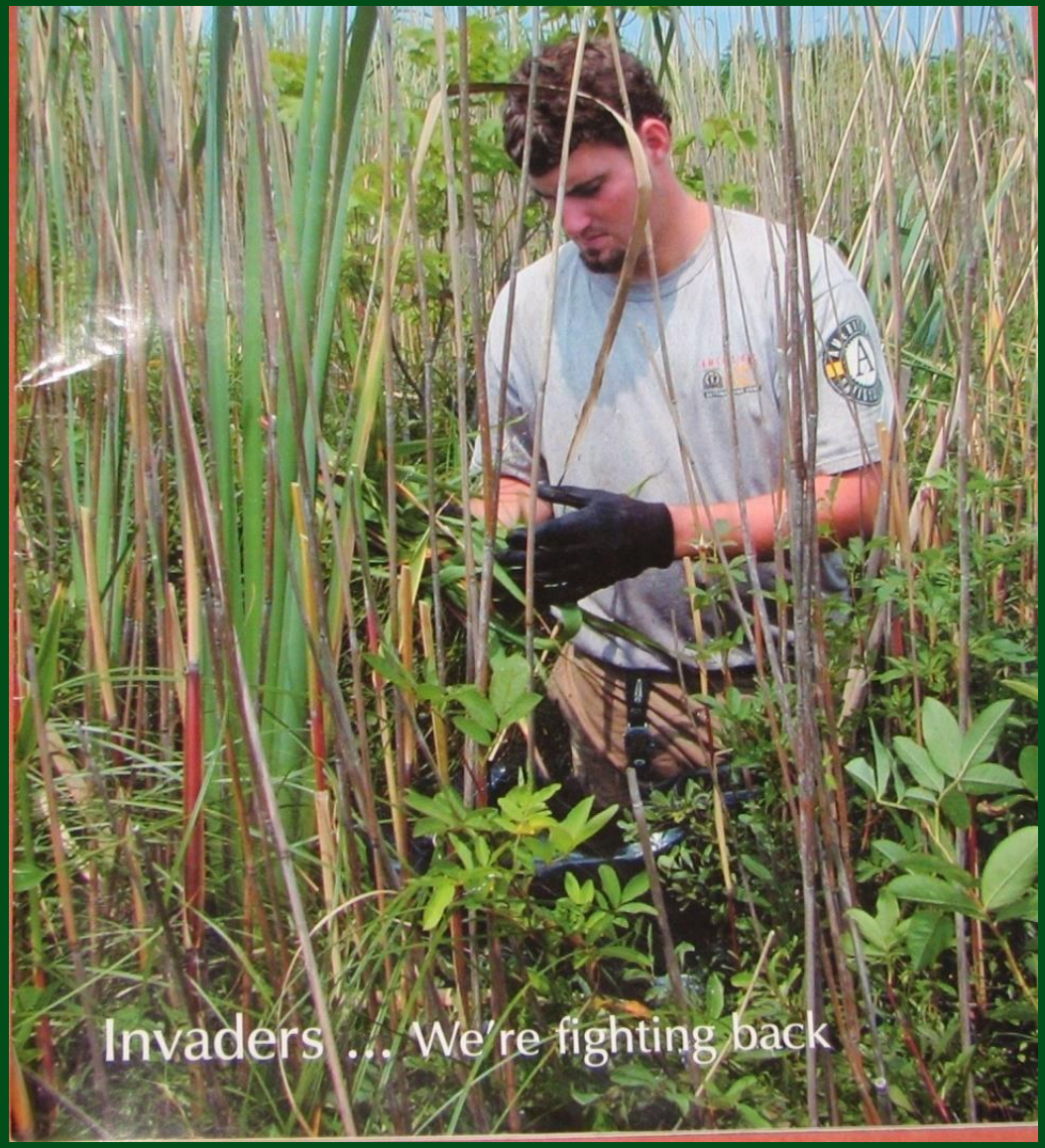
Common Reed

Phragmites australis

Phragmites australis is most often found in wet or marshy areas. This plant grows best in fresh water, but can be found in brackish, acid or alkaline wetlands. It is also found at the interface between wetlands and uplands.

A Good One
(*Phragmites americanus*)




Invaders ... We're fighting back

Reed Canary Grass

Phalaris arundinacea

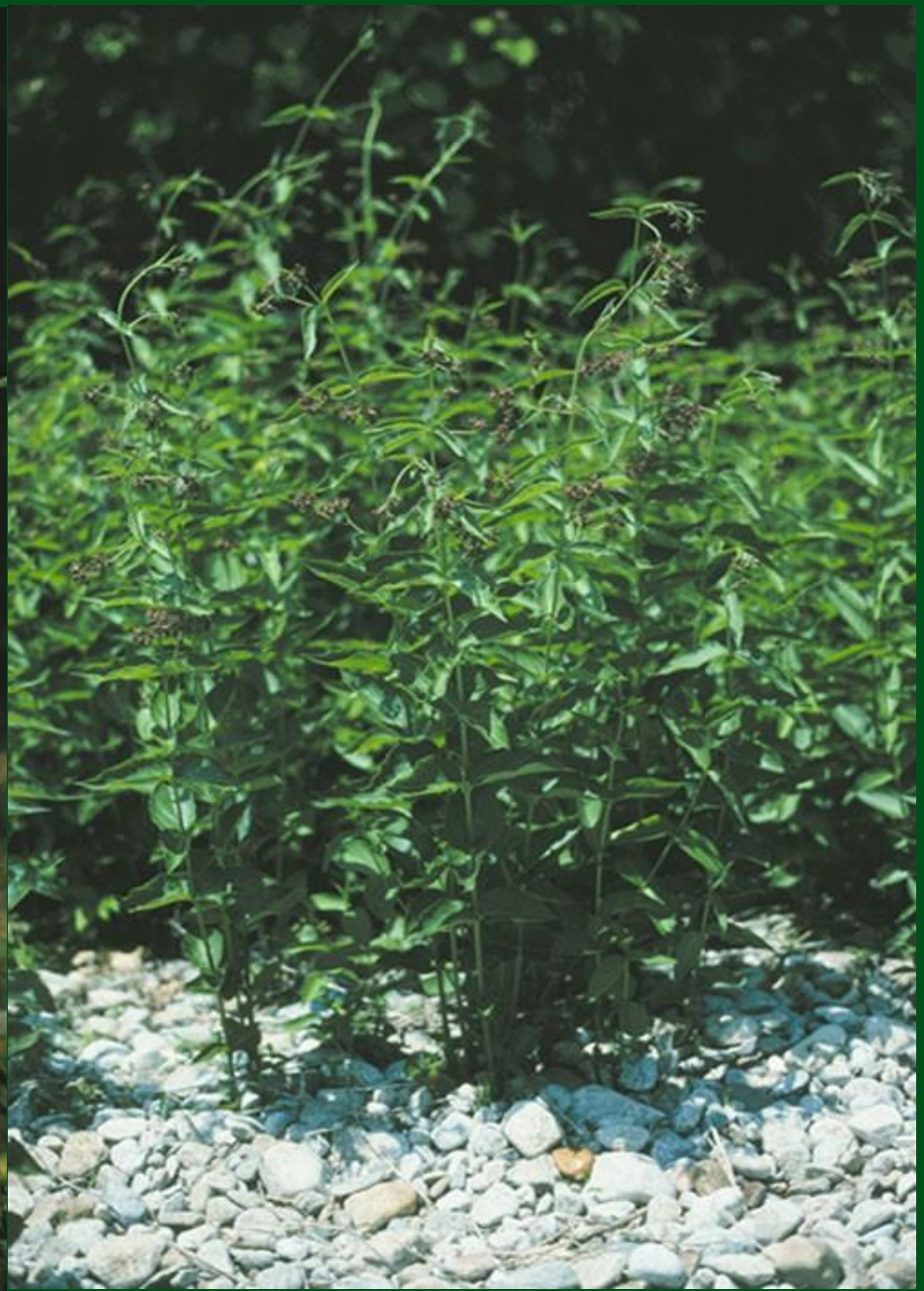
Phalaris arundinacea grows best on streambanks, lakesides, marshes, ditches and moist ground. The grass is native in New England.

Black Swallow-wort

Cynanchum louisae

Woodlands
Fields
Roadsides
Floodplains
Urban areas
Utility rights-of-way.
RR Tracks

Spreads by “milkweed” fruits and vegetatively



Giant Hogweed

Heracleum mantegazzianum

Giant hogweed is a biennial or sometimes perennial member of the parsley family that can grow 15-20 feet in height. The stem is hollow and blotched with purple. The inflorescence (umbel) can reach two feet in diameter, and the segmented, sharply divided leaves can reach five feet in width. Giant hogweed is phytotoxic—exposure to the sap can cause serious skin burns and blisters. The plant grows in disturbed sites and shaded stream corridors. It prefers moist soils and partial shade.

Hogweed

The primary hogweed inflorescence has 50-150 rays. Cow-parsnip, a native look-a-like, has 15-40 rays in its primary inflorescence.




Hogweed Look-a-Likes

Purple-stem angelica
(*Angelica atropurpurea*)

Giant hogweed

Cow-parsnip
(*Heracleum maximum)*

Wild parsnip
(*Pastinaca sativa)*

Poison hemlock
(*Conium maculatum*)

Photos: top and lower left: GoBotany;
lower right: John Bush

Wild chervil

Anthriscus sylvestris

Wild chervil is a member of the parsley family that grows one to four feet in height. It has fern-like leaves that clasp the stem, with few (if any) hairs. The stems are furrowed, smooth above and hairy below. Wild chervil grows in meadows, roadsides, and disturbed areas. Unlike some parsley family species, the leaves are not aromatic. Wild chervil resembles several other non-native members of the parsley family.

Photos: IPANE

Wild Chervil and Look-a-Likes

Hemlock-parsley
(Conioselinum chinense)

Poison hemlock
(*Conium maculatum*)

Wild chervil

Queen Anne's-lace
(*Daucus carota*)

Caraway (*Carum carvi*)

Wild chervil
(beaked fruit)

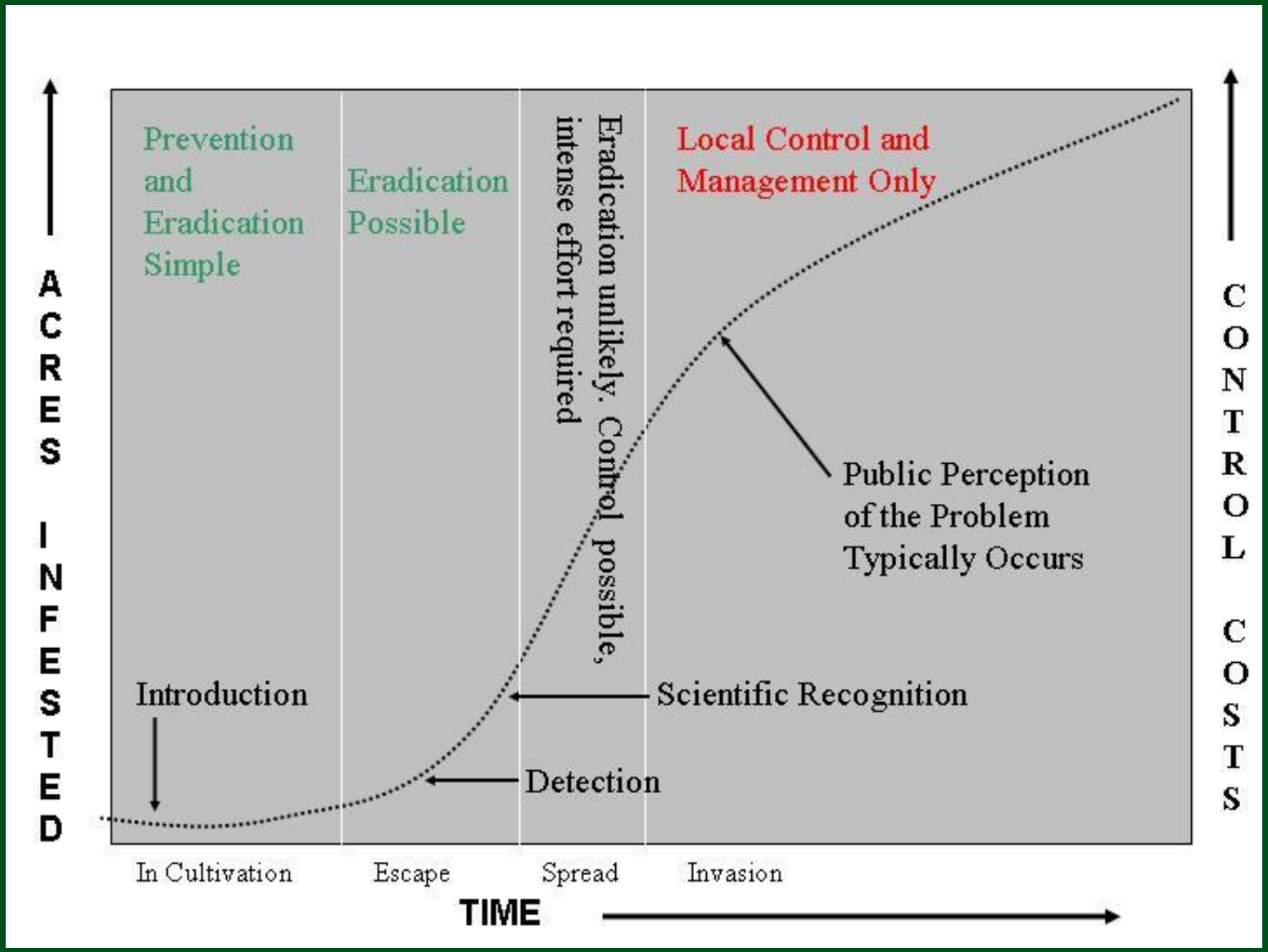
Early Detection Invasives:

- limited presence
- based on its spread in adjacent areas will quickly become invasive
- still possible to control successfully

Early Detection Species

- Why focus on early detection?
- Will spread rapidly and have serious impacts on natural habitats
- Possible to control or even eliminate the species from the region with a rapid, coordinated management response
- Prevent further dispersion of the species

INVASION, DETECTION, AND RESPONSE



Tom Rawinski

Japanese Stiltgrass

Microstegium vimineum


Japanese Stiltgrass

Japanese Stiltgrass

Microstegium vimineum

Japanese stiltgrass is an annual grass with weak, prop-like roots. It generally grows from one to three feet in height. The leaves are lime-green and feature a silvery stripe that runs down the middle of the upper side. When it is full grown in late summer, it typically arches over. Japanese stiltgrass flowers in mid to late August, and the seeds ripen in September. It infests fields, thickets, woodlands, swamps, and floodplains, thriving in both open and shaded conditions.

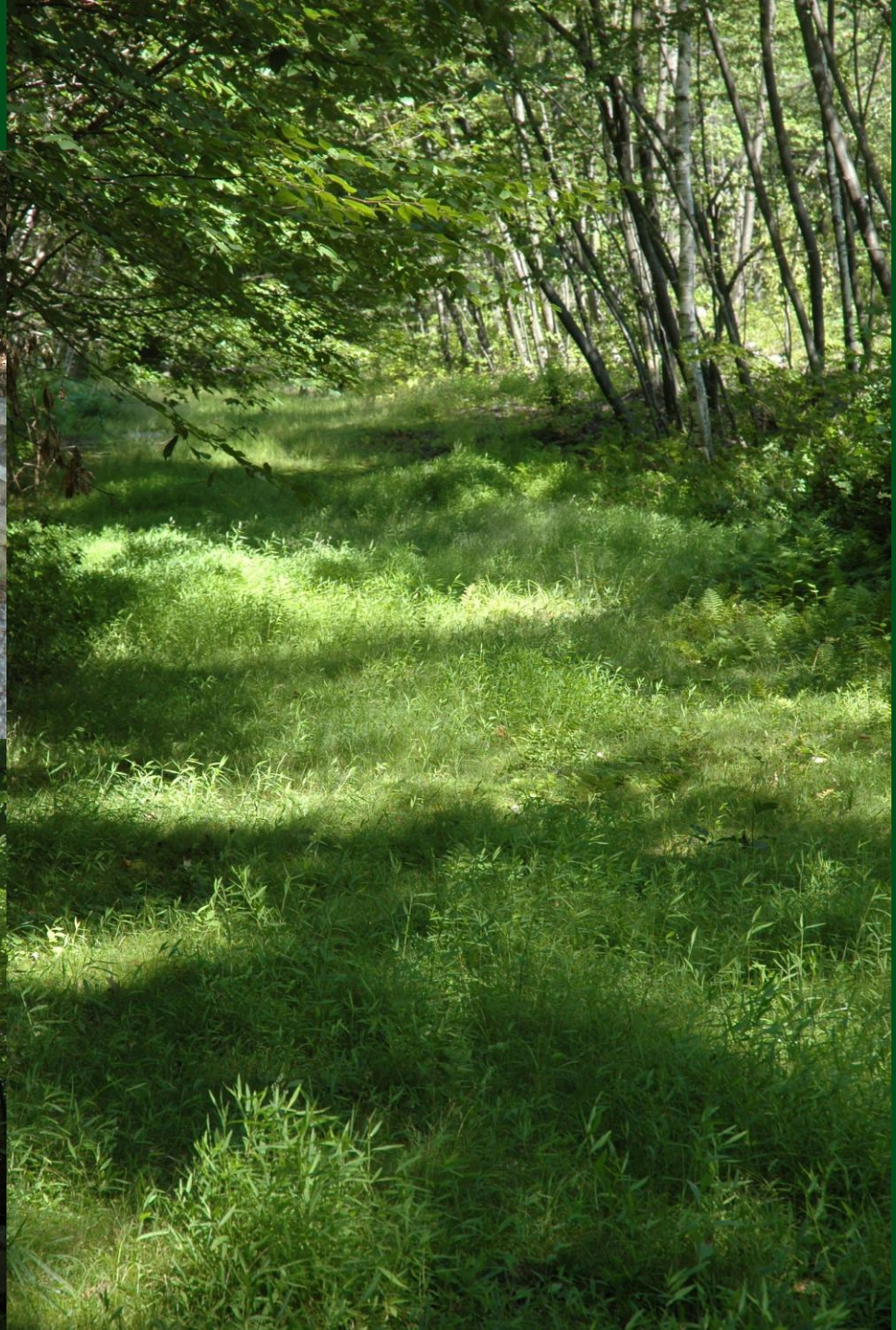
Japanese Stiltgrass Look-a-Likes

Whitegrass leaves are longer 3-8”, and lack the silver stripe. Underground, it has a hard, scaly rhizome. It blooms earlier, and has a more sparse inflorescence. The two species grow in same habitats, often alongside eachother.

Whitegrass (*Leersia virginica*)

Japanese stiltgrass

Vectors of dispersal



Vectors

Tires
Lawn mowers
Snow plows
Rain
Animals' Feet
Wind

What we do about it!

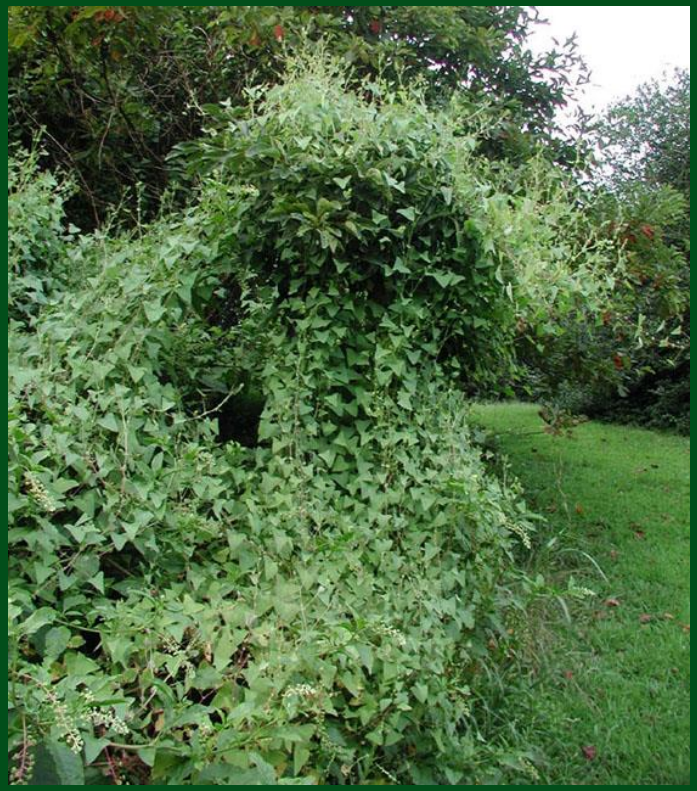
Mile-a-Minute Vine

Polygonum perfoliatum

Polygonum perfoliatum is usually found in open disturbed areas and abandoned agricultural fields. At a Connecticut site it is spreading into early successional forest, climbing the trunks of trees up to 4 m (13 ft.) high.

Mile-a-minute vine

Persicaria perfoliata



Mile-a-minute is an annual herbaceous vine covered with small barbs. Its leaves are broadly triangular and long-petioled. The flowers and fruit are subtended by circular, leaf-like bracts that are pierced by the stem. The berry-like fruits are deep blue when ripe. Mile-a-minute climbs and scrambles over fields, thickets, and woodland edges, occurring in dry, moist, and wet soils. It spreads very rapidly and forms massive infestations. Former scientific name: *Polygonum perfoliatum*.

Photos: IPANE

Mile-a-Minute Look-a-Likes

Arrow-leaf tearthumb
(Persicaria sagittata)

Climbing false buckwheat
(*Fallopia scandens*)

Halbred-leaf tearthumb
(*Persicaria arifolia*)

Hedge bindweed
(Calystegia sepium)

Mile-a-Minute

Learning from our mistakes

Kudzu of the North?

Remember kudzu?

Hardy Kiwi

Hardy Kiwi

Actinidia arguta

Watch for this species. Don't plant it?

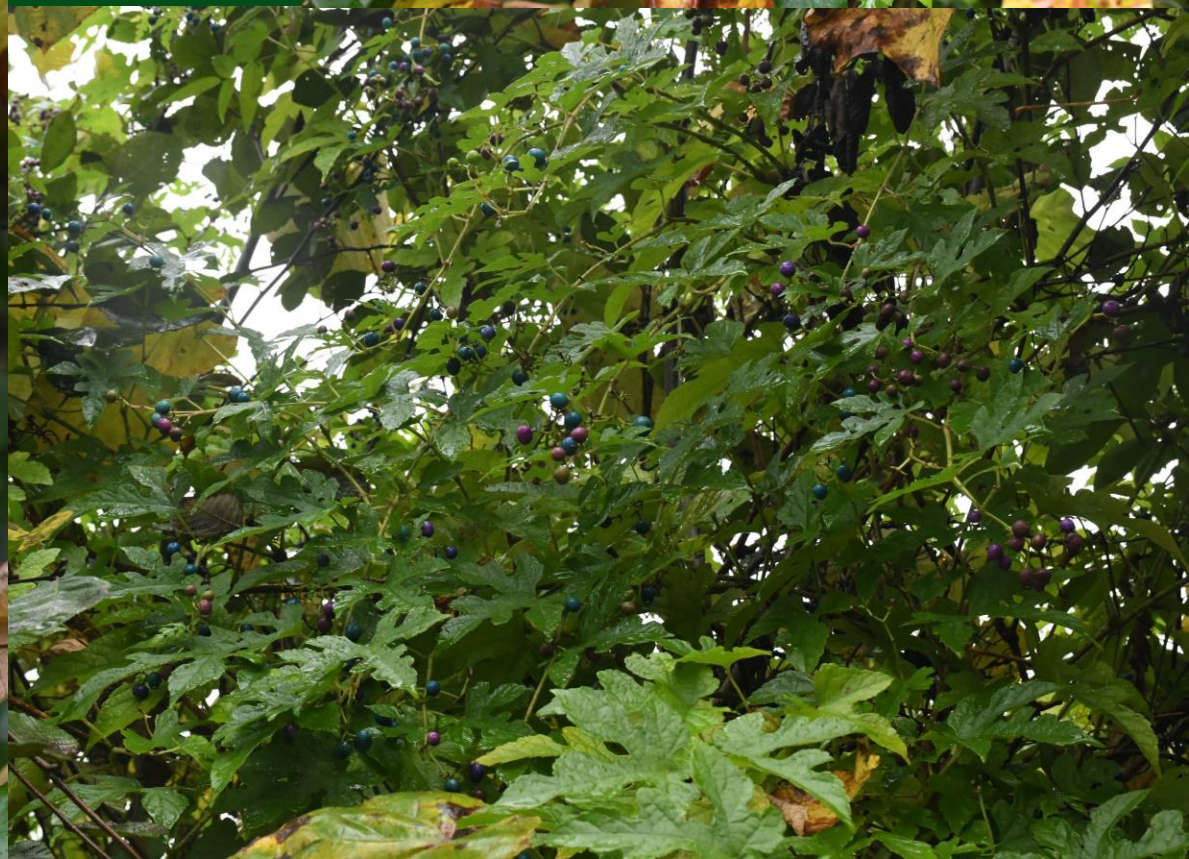
Porcelainberry

Ampelopsis brevipedunculata

Ampelopsis brevipedunculata prefers moist soils and partial sun. It grows well along stream banks and thickets. It can also be found along highway shoulders, railroad beds, shorelines, in fields, hedges or at the edges of forests.

Porcelainberry

Ampelopsis brevipedunculata



Tree-of-Heaven

Ailanthus altissima

Ailanthus altissima can be found in a variety of habitats, such as disturbed urban areas, alleys, sidewalks, streets, fields, fencerows, woodland edges, forest gaps, and agricultural fields.

Tree-of-Heaven Look-a-Likes

Smooth sumac (*Rhus glabra*)

Staghorn sumac (*Rhus hirta*)

Butternut (*Juglans cinerea*) is a tree with ridged bark and leaves with 11-17 serrated leafets. The fruit is a hard, oblong, nut.

Sumacs are shrubs with 10-30 serrated leaflets and pyramidal clusters of red fruits.

Photos: GoBotany

Narrow-leaf bittercress

Cardamine impatiens

Narrow-leaf bittercress is a spring-blooming member of the mustard family with a rosette of basal leaves and sharply divided stem leaves that grows to 2+ feet in height. A key identification feature is the leaf base that clasps the stem. Narrow-leaf bittercress occurs in moist woods, stream corridors, and roadsides.

Photos: IPANE

Narrow-leaf Bittercress and Look-a-Likes

Cuckoo-flower
(*Cardamine pratensis*)

Small-flowered bittercress
(*Cardamine parviflora)*

Pennsylvania bittercress
(*Cardamine pensylvanica*)

Hairy bittercress
(*Cardamine hirsuta*)

Narrow-leaf bittercress

Photos: GoBotany

Brown Knapweed

Centaurea jacea

Brown knapweed has pink, thistle like flowers with spreading rays, and fringed brown bracts under the inflorescence. The leaf is coarsely toothed or entire (it is not divided or segmented). Brown knapweed blooms in mid to late summer, grows to three feet in height, and infests old fields and thickets. It occurs in similar habitats to black knapweed, but in New England has a more northern distribution.

GoBotany

Spotted knapweed

Centaurea biebersteinii

Centaurea biebersteinii is most commonly found in disturbed sites, roadsides and open areas. It is common in sandy areas along rivers, rock outcrops and barrens.

Brown knapweed look-a-likes

Spotted knapweed (*Centaurea stoebe*) is a very invasive species that looks like brown knapweed. Key differences includes the black-tipped bracts under the inflorescence, and its divided leaves.

Canada thistle (*Cirsium arevense*), also invasive, has spiny leaves. The bracts beneath the inflorescence are pink or purple-tipped and not fringed.

All photos: GoBotany

Wall lettuce

Mycelis muralis

Photo: forestryimages.org

GoBotany

Image: Roger Latour

GoBotany

GoBotany

Wall lettuce has a branching inflorescence of small yellow, 5-petalled flowers, and sharply divided basal and stem leaves. The terminal segment on the leaf is larger than the lateral segments. Wall lettuce blooms in late spring and early summer, growing 2-4 feet in height. It invades rich deciduous and mixed deciduous-conifer forests, shaded stream corridors, and wetland edges.

GoBotany

Wild lettuce

Photo: CalPhotos

GoBotany

GoBotany

Panicled Hawkweed

GoBotany

GoBotany

There are a number of native and non-native members of the aster family with small,yellow, dandelion-like flowers that resemble wall lettuce. The hawkweeds, sow-thistles, and wild yellow lettuces are a few of the species that could be mistaken for it. Key identification features: 1) 5-petalled flowers, and 2) the sharply segmented leaf with the large terminal segment. Wild yellow lettuce (*Lactuca canadensis*) and panicled hawkweed (*Hieracium paniculatum*), two native species with similar features, are pictured above.

Goutweed

Aegopodium podagraria

Aegopodium podagraria does well in partial sun to full shade, with a preference for well-drained, evenly moist soils. It is tolerant of poor soils and can grow in a wide range of soil pH values.

Approaches to Invasive Management

- Manual
- Mechanical
- Chemical
- Biological
- Livestock
- Fire

Mechanical Treatments

There are many different types of mechanical treatments.

This suite of options is often the first looked at when evaluating a project.

Mechanical methods are heavy on labor and site disturbance, but require less permitting and do not introduce chemicals into the environment

The Great Pitfall

Mechanical control usually causes soil disturbance.

Invasives thrive on disturbance. Controlling them may exacerbate the problem.

There is no solution for this problem, and it should be factored into the planning of any project.

Could take 7 years for success.

Mechanical Control Summary

- Can be very cost effective
- Requires little permitting and is very resource efficient
- Labor intensive
- Time intensive
- Has distinct disadvantages
- Introduces no chemicals into the environment
- Not feasible for large scale infestations in most cases
- Volunteers can help and maintain

Biological Treatments

Other treatments are being studied for

- Multiflora rose
- Cypress and leafy spurge
- Eurasian water milfoil
- Phragmites
- Spotted knapweed
- Swallowworts
- Mile-a-minute
- Garlic mustard
- Water chestnut
- Japanese knotweed
- Hydrilla

Resources

- Go Botany – https://Gobotany.NativePlantTrusts.org
  - All plants in New England – native or not.

- Inv. Plant Atlas of New England https://www.invasiveplantatlas.org/
- MA Invasive Plant Advisory Group https://massnrc.org/MIPAG/
- Bugwood – good photos - https://www.bugwood.org/
- Report Early Detection Species - https://www.eddmaps.org/
- Organic Gardening Websites
- Umass Ctr. For Ag, Food, and Env https://ag.umass.edu/umass-extension-your-community
- MA Master Gardener Ass. https://www.massmastergardeners.org/gardening-resources
- USDA Nat. Inv. Species Info Ctr. https://www.invasivespeciesinfo.gov/

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Himalayan jewelweed

Impatiens glandulifera

Photos: IPANE

Himalayan Jewelweed

Impatiens glandulifera

Impatiens glandulifera is found in sites with high soil moisture. It is partially shade tolerant and can grow in lowland, moist forests. It occurs in riparian habitats and in roadside ditches.

Kudzu

Pueraria lobata var. *montana*

Pueraria montana var. *lobata* occurs in forest edges, roadsides and disturbed areas. This plant does not thrive without ample sun. It grows best in areas with mild winters and summer temperatures greater than 80 degrees Fahrenheit.

Japanese Hops

Humulus japonicus