

Invasive Plants and Their Impacts on Wildlife

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Credit: Madison Audubon



Credit: Creative Commons

Credit: Mary-Vann Johnson

Outline



- What is an invasive species?
- Why should we care?
- How do they impact wildlife?
- Where and why are they present (biology & ecology)?
- What are the top offenders in western NC?
- What can landowners do beyond doom & gloom?
- What resources are available?

What is an invasive species?

A plant that is both non-native and able to establish on many sites, grow quickly, and spread to the point of disrupting plant communities or ecosystems.*

*USDA Natural Resources Conservation Service

Just because a plant is non-native doesn't mean it is invasive. Some native plants can be invasive, too!

Why Are Invasive Plants Successful?

- Often produce large quantities of seed at a young age
- Have long flowering and fruiting periods
- Seeds often distributed by birds, wind, or humans
- Many thrive on disturbed soil
- Some have aggressive and wide-spreading root systems
- Dense root systems often smother roots of surrounding vegetation
- Some produce chemicals in their leaves or root systems which inhibit the growth of other plants

Randall & Marinelli (1996) *Invasive Plants (Weeds of the Global Garden)*
USDA Forest Service - <https://www.fs.fed.us/wildflowers/invasives/index.shtml>

- Transported to new region without their natural predators from place of origin
- Often first to leaf out in the spring and last to drop leaves in fall
- Easily establish in disturbed environments (openings, soil disturbance) created naturally or by humans – wind storms, fire, timber harvesting, road construction, mowing, etc.



From where and how did they get here?

- Intentional

- Medicinal qualities
 - Culinary delights
 - Horticulture – Tree-of-heaven, English ivy, Burning bush
 - Forage
 - Erosion control
 - Wildlife food
- } Garlic mustard, Wineberry
- } Kudzu
- Autumn olive

- Accidental

- Packing, cargo – Japanese stiltgrass
- Seed mixes

- Most non-natives have been introduced from Asia (China, Japan, Korea) and Europe

NOTE: North American native plants and trees can be invasive in Europe, Asia, etc.

Why care about non-native invasive plants?

- Invasive species cost the U.S. economy more than **\$120 billion** annually
- **~4,000 species of exotic plants** (Kartesz and Morse 1997) have established free-living populations in the US
- **>1,000 exotic plant species pose a threat** to native flora and fauna
 - Reduce biological diversity, change food webs, and displace wildlife
 - Put at least 42% of the federally endangered and threatened species in the US at risk

International Union for Conservation of Nature (IUCN)



ISSUES BRIEF

Invasive alien species and climate change

- **Invasive alien species (IAS) are animals, plants or other organisms that are introduced into places outside their natural range, negatively impacting native biodiversity, ecosystem services or human well-being.**
- **IAS are one of the biggest causes of biodiversity loss and species extinctions, and are also a global threat to food security and livelihoods.**
- **IAS are compounded by climate change. Climate change facilitates the spread and establishment of many alien species and creates new opportunities for them to become invasive.**
- **IAS can reduce the resilience of natural habitats, agricultural systems and urban areas to climate change. Conversely, climate change reduces the resilience of habitats to biological invasions.**
- It is essential that IAS be incorporated into climate change policies. This includes **biosecurity measures to prevent the introduction of IAS** to new regions as a result of climate change, and **rapid response measures to monitor and eradicate alien species** that may become invasive due to climate change.

Why are non-native invasives bad for wildlife?

- Nutritional quality of berries may be less than those of native plants
- When invasives displace native plants, they change insect numbers and/or distribution
- Plant branching patterns can increase bird nest predation
- Invasive shrub dominated forests reduces butterfly habitat
- Leaf and stem detritus in streams affects food base for fish
- Insect-eating animals that control pest insects can be impacted



Invasive Plants – The Bad & Ugly

Species and infestations are site and time specific

- Site - interior mature forest (evergreen vs deciduous), abandoned homestead, former pasture or farmland, young forest, stream banks, wetland, right-of-ways, edge habitats (roads, trails)
- Past land use – a recent activity or decades ago
- Soil moisture – dry (ridgetop), moist (cove), or wet
- Invasives can establish quickly after a disturbance

NC Invasive Plants

Species fact sheets and tools by region

Click on a region to learn more about the invasive plants found in that region



MOUNTAINS



PIEDMONT



COASTAL

List of invasive plant species in alphabetical order by common

<http://nc-ipc.weebly.com/nc-invasive-plants.html>

Trees

- ★ *Ailanthus altissima* (Tree-of-Heaven)
- Albizia julibrissin* (Mimosa)
- ★ *Paulownia tomentosa* (Princess Tree)
- ★ *Pyrus calleryana* (Bradford Pear)
- Triadica sebifera* (Chinese Tallow Tree)

SHRUBS

- Berberis (Mahonia) bealei* (Leatherleaf Mahonia)
- Berberis thunbergii* (Japanese Barberry)
- Buddleja davidii* (Butterfly Bush)
- Elaeagnus angustifolia* (Russian Olive)
- Elaeagnus pungens* (Thorny Olive)
- ★ *Elaeagnus umbellata* (Autumn Olive)
- ★ *Euonymus alata* (Burning Bush)
- ★ *Ligustrum sinense* (Chinese Privet)
- Lonicera fragrantissima* (Fragrant Honeysuckle)
- Lonicera maackii* (Bush Honeysuckle)
- Poncirus trifoliata* (Trifoliolate Orange)
- ★ *Rosa multiflora* (Multiflora Rose)
- Spiraea japonica* var. *fortunei* (Japanese Spiraea)
- Tamarix ramosissima* (Salt Cedar)

Vines

- Akebia quinata* (Chocolate Vine)
- Ampelopsis brevipedunculata* (Porcelain Berry)
- Cayratia japonica* (Bushkiller)
- ★ *Celastrus orbiculatus* (Oriental Bittersweet)
- Clematis terniflora* (Sweet Autumn Virgin's Bower)
- Dioscorea bulbifera* (Air Potato)
- Euonymus fortunei* var. *radicans* (Winter Creeper)
- ★ *Hedera helix* (English Ivy)
- ★ *Lonicera japonica* (Japanese Honeysuckle)
- Persicaria perfoliata* (Mile-A-Minute Vine)
- Pueraria montana* (Kudzu)
- Tribulus terrestris* (Puncturevine)
- Wisteria floribunda* (Japanese Wisteria)
- Wisteria sinensis* (Chinese Wisteria)

Aquatic plants

- Hydrilla verticillata* (Hydrilla)
- Nymphoides cristata* (Crested Floating Heart)

NC INVASIVE PLANT COUNCIL

HERBACEOUS PLANTS

Alliaria petiolata (Garlic Mustard)

Arthraxon hispidus (Small Carpetgrass)

Arundo donax (Giant Reed)

Cyperus entrerianus (Deep-rooted Sedge)

Ficaria verna (Fig Buttercup)

Glechoma hederacea (Ground Ivy)

Heracleum mantegazzianum (Giant Hogweed)

Imperata cylindrica (Cogongrass)

Iris pseudacorus (Yellowflag Iris)

Lespedeza bicolor (Bicolor/Shrub Lespedeza)

Lespedeza cuneata (Chinese Lespedeza)

Lygodium microphyllum (Old World Climbing Fern)

Lythrum salicaria (Purple Loosestrife)

★ *Microstegium vimineum* (Japanese Stilt Grass)

★ *Miscanthus sinensis* (Chinese Silvergrass)

Oplismenus hirtellus ssp. *undulatifolius* (Wavyleaf Basketgrass)

Perilla frutescens (Beefsteak Plant)

Phalaris arundinacea (Reed Canarygrass)

Phyllostachys aurea (Golden Bamboo)

★ *Reynoutria japonica* (Japanese Knotweed)

Solanum viarum (Tropical Soda Apple)

Sorghum halepense (Johnson Grass)

Stellaria media (Common Chickweed)

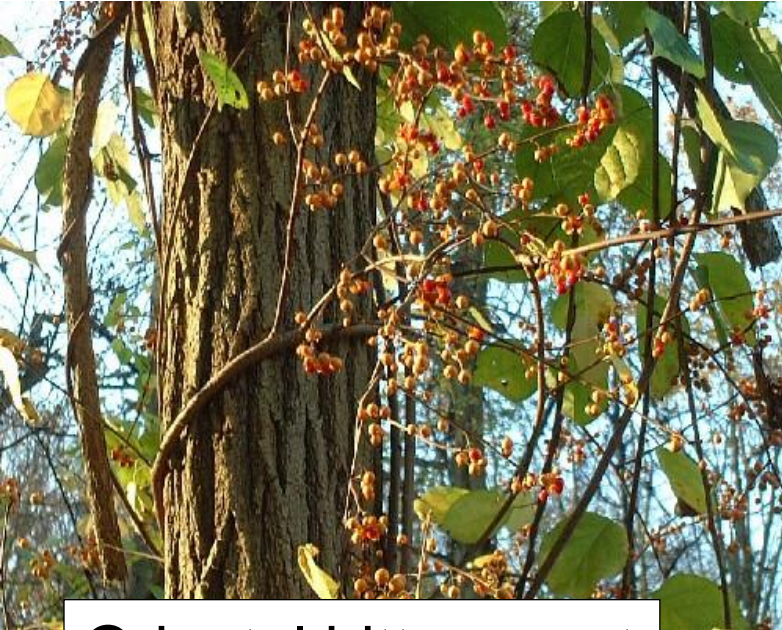
Tribulus terrestris (Puncturevine)



Problematic invasive trees, shrubs, vines
and herbaceous plants in western NC

A few top offenders, and those to watch

Our Top Offenders in Western NC



Oriental bittersweet



Ailanthus, Tree-of-heaven



Kudzu



Multiflora rose

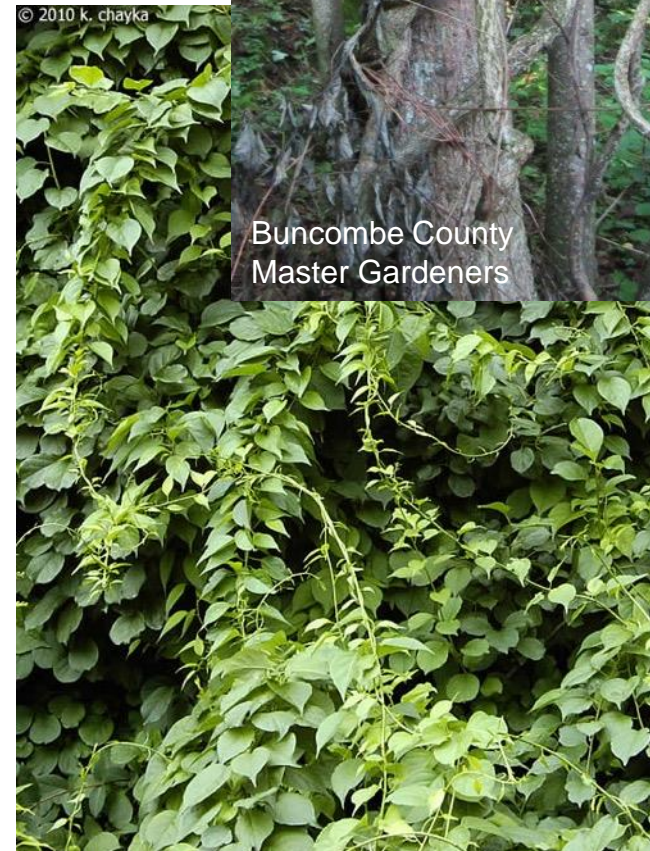
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Oriental bittersweet, *Celastrus orbiculatus*

- Woody perennial vine; shade tolerant
- Showy fruits – bird & human dispersed
- Grows on forest floor, up into the tree canopy, strangles shrubs & trees
- Wide site range – forest edges & openings, roadsides
- From Asia in 1736; Class C Noxious Weed - NC



Buncombe County
Master Gardeners



Ailanthus ~~Tree of Heaven~~ Stink Tree

- Heavy seed producer – 300,000 seeds/tree/year
- Seeds persist throughout winter
- Seeds remain viable in soil for 5+ years
- From China via Europe in 1874





Kate St. John



Ailanthus is a prolific shoot & root sprouter

Allelopathic – produces chemicals that inhibit other plant species

Ailanthus ID Hints

- **ODOR** – strong, rancid peanut butter
- Leaf smooth margin with rounded tooth at base & glands on greenish underside



© Jeremy Stovall



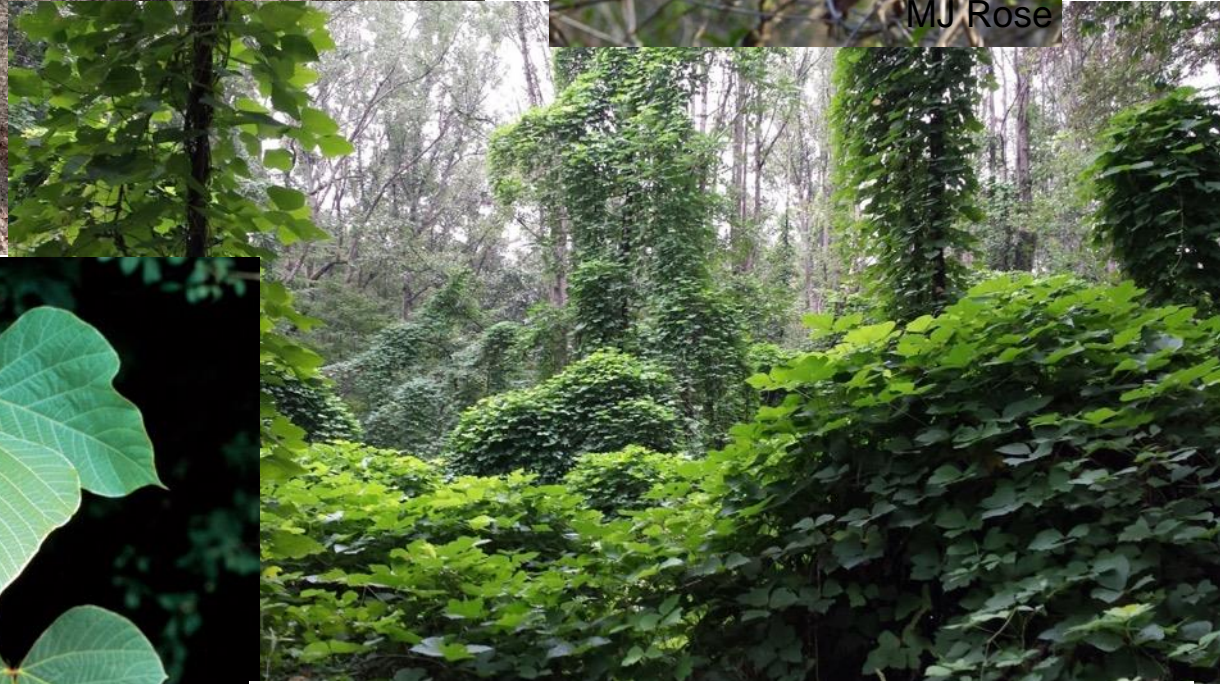
Sumac is a native look-a-like

Multiflora rose, *Rosa multiflora*

- Clump forming, arching climbing shrub with prickles, often climbing up trees
- Glossy red rose fleshy hip fruit when ripe
- Invades right-of-ways, new forests and forest edges
- Prolific sprouting and rooting stems
- Animal-dispersed seeds
- Planted as ornamentals, living fences, wildlife habitat
- Introduced from Asia



Kudzu, *Pueraria montana*



Fragrant purple flowers



- Woody vine with large tuberous roots
- Occurs in a wide range of habitats
- Colonizes by vines rooting at nodes
- Wind, animal, and water seed dispersal
- From Japan & China in early 1900's

The Top Offender in Madison County

Miscanthus sinensis
Chinese silvergrass,
maiden grass,
cemetery grass



Chinese Silvergrass, *Miscanthus sinensis*



- Tall, densely bunched, perennial grass, 5-10 ft
- Forms extensive infestations from established older ornamental plantings to roadsides, forest margins, right-of-ways and adjoining disturbed sites
- Highly flammable fire hazard
- Wind-dispersed seeds from September to January
- From Eastern Asia, still widely sold



MISCANTHUS

Madison County's "Wildfire Grass"

DID YOU KNOW?

The Mars Hill, Grapevine, Petersburg, and Paint Fork areas of Madison County have extensive infestations of *Miscanthus sinensis*. It is quickly spreading into the Hot Springs, Laurel, Spring Creek, Big Pine, Marshall, and Walnut areas of the county.

In 2020, 80% of Madison County's wildfires occurred in the Mars Hill Fire District where the *Miscanthus* infestation is the worst.



What is *Miscanthus* (aka pampas grass)?

Miscanthus is commonly referred to as pampas grass or Mars Hill grass in Madison County. It is also known as maiden grass, eulalia and Chinese silvergrass.

Miscanthus is:

- Tall, perennial, densely bunched grass that can grow 5 to 10 feet in height.
- Elongated, upright to arching leaves 3 feet long and 1 inch wide with whitish upper midrib; leaves have sharp tips and rough margins.
- Blades are green to variegated (light green horizontal stripes).
- Showy, fan-shaped, silvery to pink, terminal inflorescence that emerges in late August to early September and matures in early fall.



Photo: Chris Evans, University of Illinois, Bugwood.org

Burgin "Bo" Dossett

Madison County Ranger
North Carolina Forest Service
5210 Us 25-70 Marshall, NC
28753
Office: 828-649-3821
Cell: 828-782-1045

Other Problem Species



Chinese privet

BA2307078



Japanese honeysuckle



Princess tree



Bradford Callery pear



Bradford Callery Pear



- Deciduous tree, grows up to 60 ft tall
- Early spring flowers with unpleasant odor
- Produces abundant small pears consumed by birds and other animals
- Cultivars are self-sterile but can cross-pollinate with other pears
- Rapidly growing, forming thickets and dense stands by root sprouts
- Tolerates partial shade and grows in dry to wet soils
- Native to China, Korea & Taiwan; Bradford cultivar introduced in 1908

Bounty Offered on Bradford Pear Trees

March 10, 2022 | [Laura Oleniacz](#)



Bradford pear tree in bloom. Credit: Kelly Oten.



NC Bradford Pear Bounty

THE PROGRAM

BRADFORD PEAR

FAQS

EVENTS

DONATE

April 23, 2022 in Greensboro

Thank you for the positive response! All trees available for our inaugural event in Greensboro have been claimed. Stay tuned for fall 2022 and spring 2023 events in other locations.

<https://www.treebountync.com>

Princesstree, *Paulownia tomentosa*



Juvenile leaves 1-3 ft long

- Fast-growing tree, showy fragrant flowers, prolific sprouter when cut
- Root sprouts grow ~15 ft in a single season
- Common around old homes, roadsides, forest edges, & riparian areas
- Quickly establish after harvesting, fire and other disturbances
- Introduced in 1800's from Asia – ornamental & timber



Prominent pecan-shaped seed capsules persist throughout winter

Produces >20 million seeds/tree/year which can travel over >2 miles



Chinese Privet, *Ligustrum sinense*



- Aggressive evergreen shrub forms dense thickets
- Common in forests, roadsides, right-of-ways, fence rows, & fields
- Birds and animals *will* eat fruits
- Escaped ornamental (1800's)



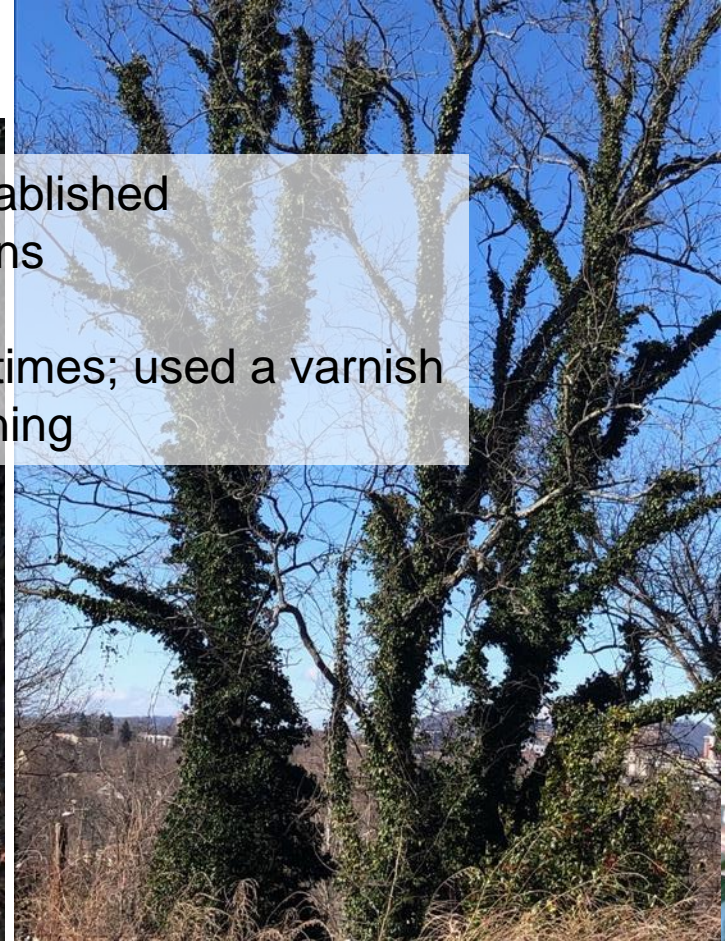
Japanese honeysuckle, *Lonicera japonicum*

- Semi-evergreen woody vine, high climbing in upper canopy and ground cover
- Produces dense infestations along forest edges, right-of-ways and dense forests
- Shade tolerant
- Animal-dispersed black glossy fruits
- Persists by large woody rootstocks and spreads by rooting at vine nodes
- Introduced from Japan and England in early 1800s as ornamental; some value for erosion control and deer browse



English Ivy, *Hedera helix*

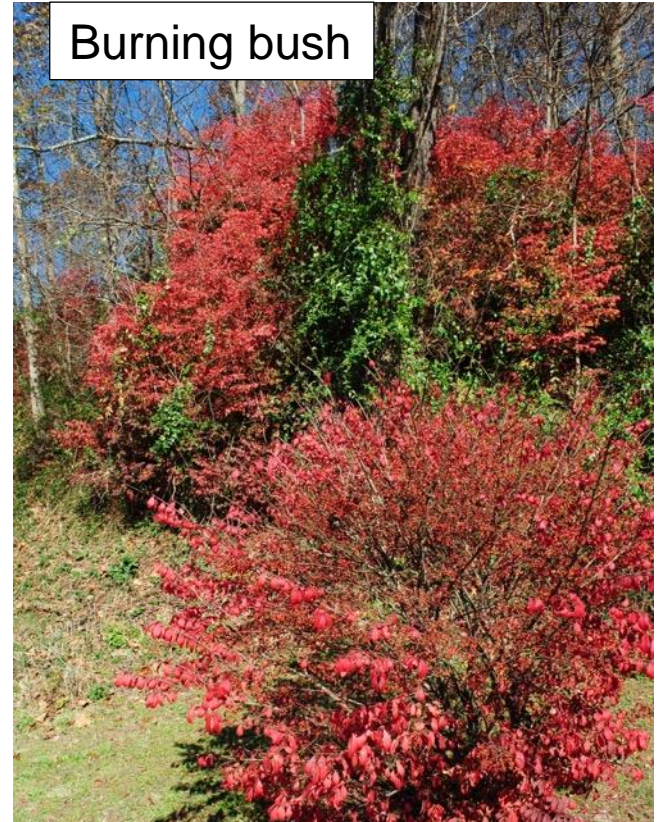
- Grows vigorously once established
- Adaptable to most conditions
- Fruits spread by birds
- Introduced during colonial times; used a varnish resin, dye, and leather tanning



Invasive Plants to Watch



Autumn olive



Burning bush



Japanese knotweed



Japanese stiltgrass

Japanese knotweed, *Polygonum cuspidatum*



- Tall perennial herbaceous shrub
- Many dangling winged fruits
- Prefers wet soils along streams, roadsides, ditches
- Spreads along streams by stem and root fragments & seeds
- Serious threat since it dense infestations exclude all other plants and animals
- Ornamental from China, Japan & Taiwan in late 1800's
- Traditional Chinese medicine



Why are non-native invasives bad for wildlife?

Japanese Knotweed

- Leaf and stem detritus can **affect the food base for trout and other stream fish** (Sweeny 1993)
- **Reduces nitrogen input** into streams, reduces abundance of understory herbs, shrubs, and juvenile trees (Urgenson and Reichard 2007)
- **Reduces foraging success of green frogs** (*Rana clamitans*) in invaded sites, alters vegetative composition and structure (Maerz, Blossey, and Nuzzo 2005).
- **Alters leaf-litter dwelling invertebrate community**, greatly decreasing snail densities, species richness, and diversity, and decreasing abundance of Isopods, while increasing abundance of detritivores and predatory
- **Invaded soils had lower pH and potassium depletion** (Kappes, Lay and Topp 2007).

Japanese stiltgrass, *Microstegium vimineum*



- Annual, sprawling grass grows 0.5-3 ft tall
- Very shade tolerant
- Prolific >1000 seeds remain viable for >3 years



- Common on forest edges, roadsides, trails, damp fields, etc.
- Ground cover with little wildlife food value
- Asian native introduced accidentally in 1900's as packing material for dishes



Burning Bush, *Euonymus alatus*



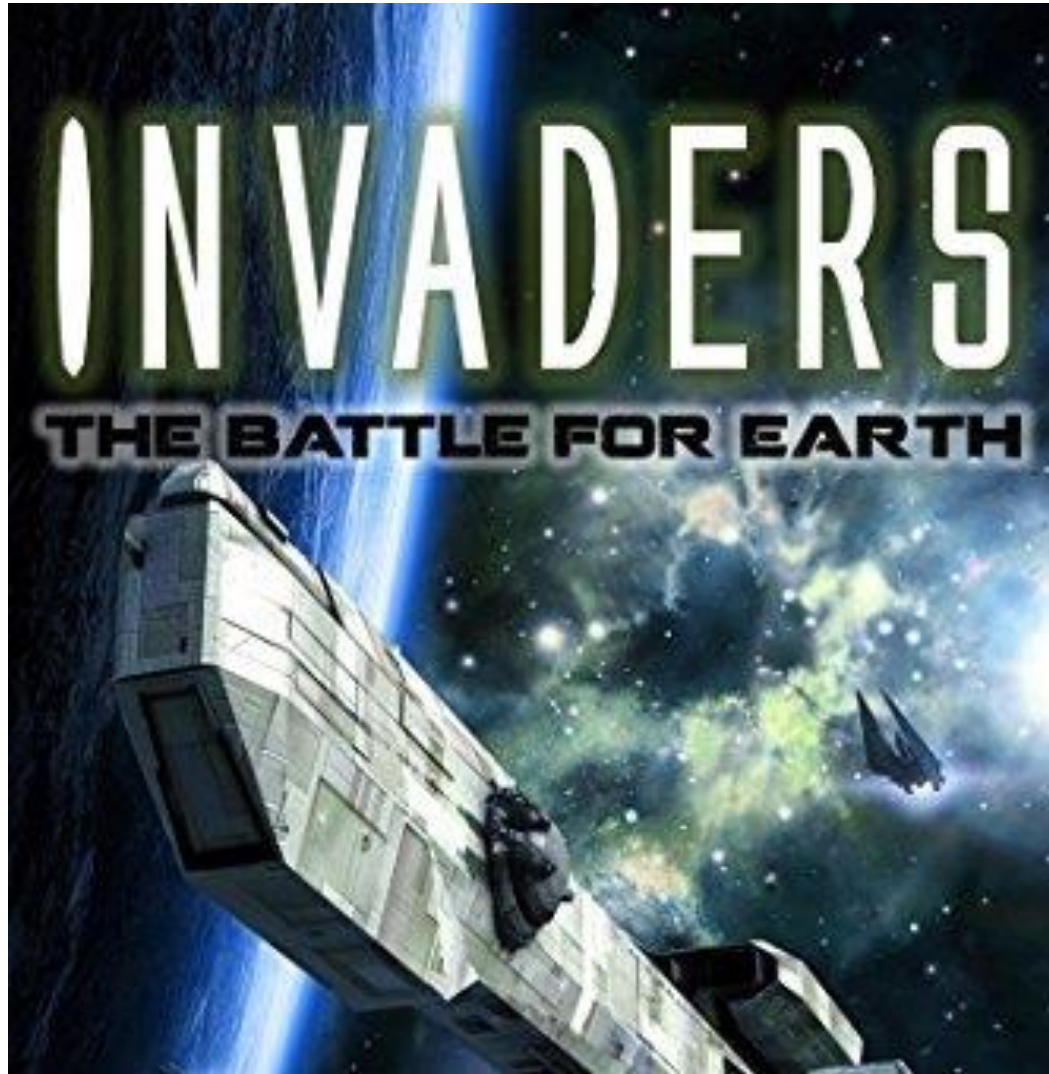
- Deciduous wing-stemmed bushy shrub
- Dangling pair of reddish capsule fruits
- Shade tolerant
- Invades forest understories, pastures, and disturbed areas
- Colonizes by root suckers and animal-dispersed seeds
- Popular ornamental introduced from Northeast Asia in 1860s

Autumn Olive, *Elaeagnus umbellata*

- Bushy, leafy shrub creating dense stands
- Leaf underside is silvery
- Fragrant white flowers in spring
- Edible juicy berries in fall
- Bird-dispersed
- Prefers drier sites, found in open forests & canopy gaps
- Nonlegume nitrogen fixer
- Planted for wildlife & surface mine reclamation
- 1830 introduction from China & Japan



Resources – Local and Beyond

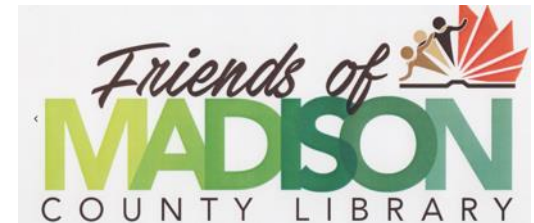


MARSHALL NATIVE GARDENS INITIATIVE

The Friends of Madison County Library has undertaken a long term project to create environmentally sensitive and sustainable gardens and landscapes on the grounds of the Madison County Public Libraries for the general public's education, use, and enjoyment. The vision for this project would be accomplished by fostering land and water stewardship through environmentally friendly garden designs and maintenance and associated educational programs on the library grounds. The website for the Marshall Native Gardens Initiative will tell you more! <https://sites.google.com/site/madisoncountygardens/>



Native Plant Initiative



North Carolina Resources:

- **North Carolina Tree Farm Program.** The state program of the American Tree Farm System supports North Carolina's private woodland owners in the sustainable management of their woodlands. The North Carolina Tree Farm program offers field days and seminars for woodland owners on topics that include managing invasive species. <https://www.treefarmssystem.org/North-Carolina>

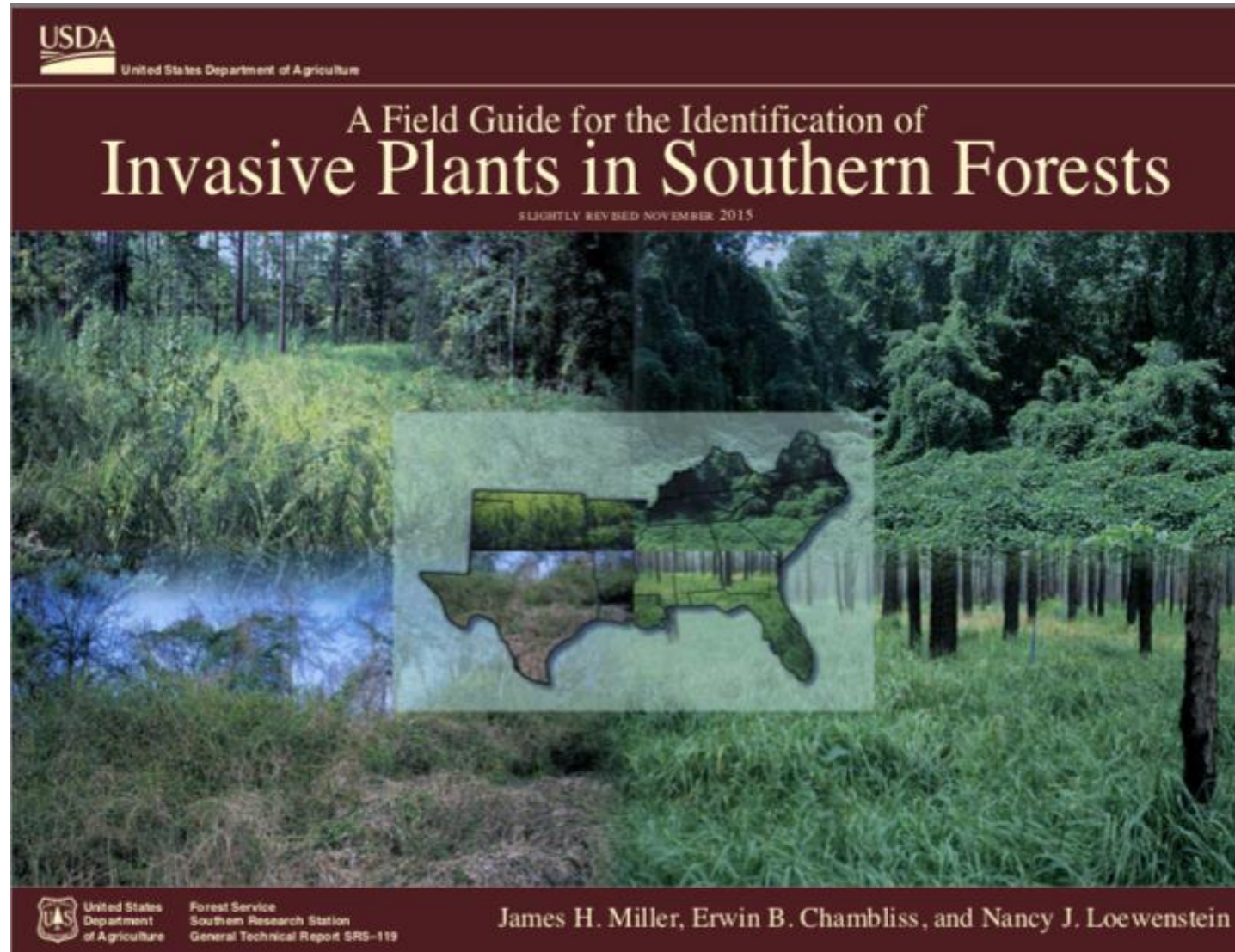


- **North Carolina Forest Service.** The state forestry agency can help you identify a county forester to help you with invasive plants, insects or diseases affecting your woods: http://ncforestservice.gov/contacts/contacts_main.htm. The N.C. Forest Service website also offers forest health maps that show the most up-to-date locations of invasive tree-killing pests in the state: http://www.ncforestservice.gov/forest_health/fh_maps.htm



- **North Carolina Cooperative Extension Service.** Offices in all N.C. counties are staffed by professionals who can provide advice on managing invasive plants and insect pests: <http://www.ces.ncsu.edu/local-county-center>

Free Online Invasive Plant Publications



https://www.srs.fs.fed.us/pubs/gtr/gtr_srs119.pdf



A Management Guide for Invasive Plants in Southern Forests

SLIGHTLY REVISED NOVEMBER 2015

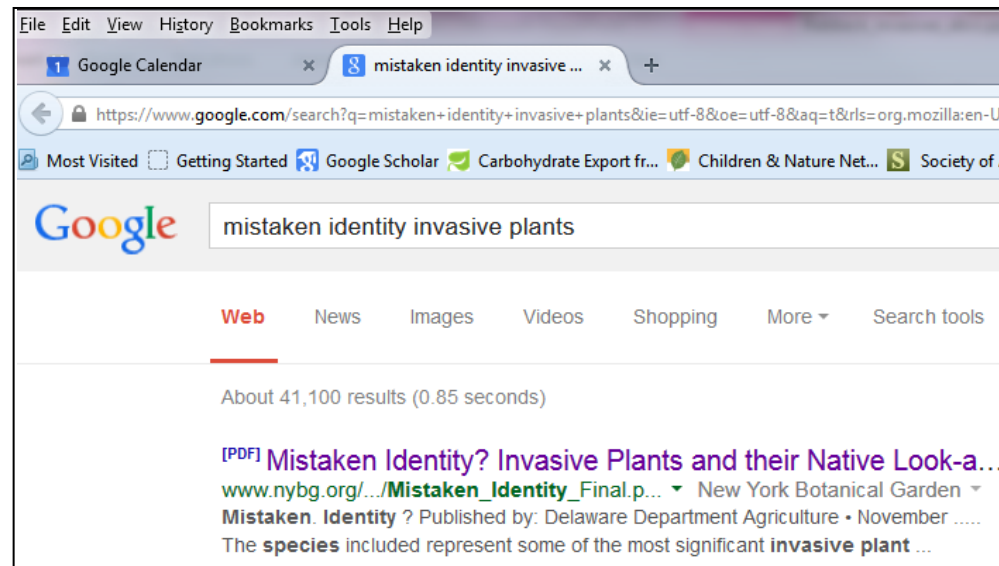
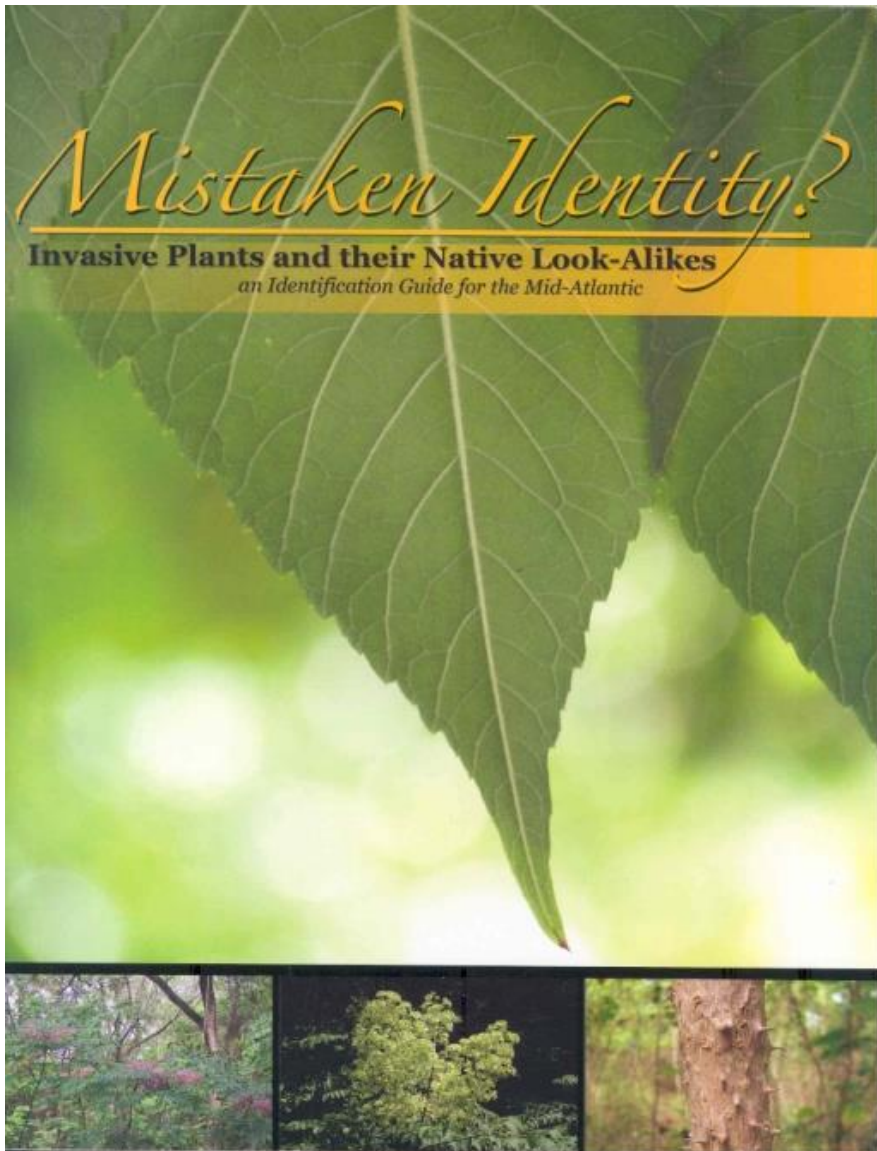
James H. Miller, Steven T. Manning, and Stephen F. Enloe



United States Department of Agriculture • Forest Service • Southern Research Station
General Technical Report SRS-131

https://www.srs.fs.fed.us/pubs/gtr/gtr_srs131.pdf

Invasive Plants & Native Look-Alikes



http://www.nybg.org/files/scientists/rnaczy/Mistaken_Identity_Final.pdf

University of Georgia Center for Invasive Species & Ecosystem Health – www.bugwood.org



Welcome
Chuck Bargeron, University of Georgia
[Logout](#)

Report Sightings

Distribution Maps

Species Information

Tools & Training

My EDDMapS

About

Invasive Species Mapping Made Easy!



EDDMapS, started in 2005 with Southeastern U.S. focus, is now providing a picture of the distribution of invasive species across the U.S.

- ✓ Fast and easy to use - no knowledge of GIS required
- ✓ Web-based mapping of invasive species distribution to help fill gaps and identify "leading edge" ranges
- ✓ Facilitates Early Detection and Rapid Response implementation with online data entry forms, e-mail alerts and network of expert verifiers
- ✓ One Database for both local and national data
- ✓ Data can be searched, queried and downloaded in a variety of formats
- ✓ Cooperates with and aggregates data from other invasive species mapping projects
- ✓ Custom/hosted applications can be quickly and inexpensively developed

Who's Using It?

- ✓ Southeast Exotic Pest Plant Council
- ✓ Alaska Exotic Plant Information Clearinghouse
- ✓ Missouri River Watershed Coalition
- ✓ Biological Control Agents of Weeds
- ✓ Florida Exotic Pest Plant Council
- ✓ Everglades Cooperative Invasive Species Management Area
- ✓ Florida Invasive Species Partnership
- ✓ Invaders of Texas
- ✓ Mid-Atlantic Invasive Plant Council

Statistics

1,558,544 County Reports
754,057 Point Reports
2,065 Species / 3,344 Users

Map It!



Zap It!



Map it Again!



Educational Resources

- ✓ EDDMapS: Invasive Plant Mapping Handbook
- ✓ EDRR Training Workshop Handouts
- ✓ EDDMapS Florida Training Video
- ✓ EDDMapS Florida Animals Training Video
- ✓ EDDMapS Missouri River Watershed Coalition Training Video

Recent Reports

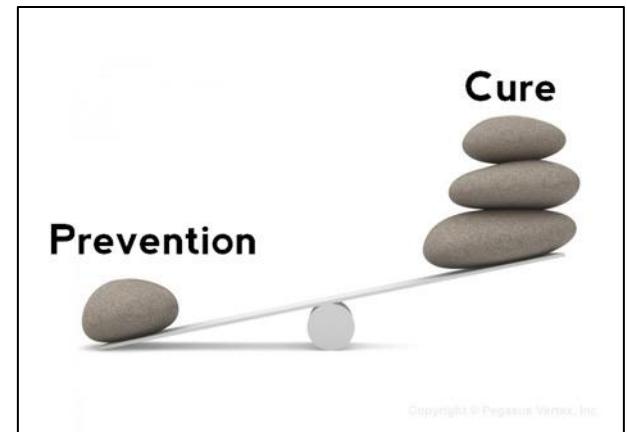
- ✓ [crested floating heart](#) by Kelly Duffie in Jefferson

Proactive Management

- Actively monitor for invasives on your property
- Talk to your neighbors – what's nearby
- Build your “invasive plant” awareness
- Sanitation - clean equipment to minimize spread
- Eliminate before it starts reproducing
- Focus on seed-bearing trees (to minimize dispersal)
- Eliminate populations in advance of a planned disturbance
- Focus on treating least infested areas first

What can a landowner do?

- Be vigilant - early detection and rapid response!
- Proactive management – an ounce of prevention is worth a pound of cure!
- Be patient, persistent, and creative!
- Remain positive!





Be vigilant! Monitor your property for invasives regularly. Look for early “bud breakers” in spring, and “leaf holders” in the fall.

Use guides & phone apps to learn; take pictures; map locations; reach out to local resource people

EARLY DETECTION RAPID RESPONSE

It's easier and less expensive to control a few individuals than an acre

Best to remove invasives before they reproduce

Employing a different kind of weed killer against an invasive species

By Sean P. Ray Herald Staff Writer Aug 31, 2019 1



A herd of goats comb the Erie National Wildlife Refuge for multiflora roses, an invasive species that have wreaked havoc on the forest's ecosystem. The goats are a newly introduced program this year meant to get rid of the roses without herbicides.

Contributed photo/ U.S. Fish and Wildlife Service

<https://www.titusvilleherald.com>

WHAT YOU CAN DO TO HELP?

- **Spread the word** about invasive species
- **Volunteer** to help control invasives
- **Plant native**, non-invasive plants
- **Be on the lookout** for new populations
- Be careful **not to transport** invasive species
- **Discourage the use** of invasive plants



Questions?

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