



Invasive Plant Management and Climate Change

Tom Keenan & Bob Schwartz
Watershed Foresters, Maryland
Forest Service

06/18/2025

What is an invasive species?

- Executive Order 13112 defines an invasive species as a species that:
 - Is non-native or alien to the ecosystem under consideration
 - Whose introduction causes or is likely to cause:
 - Economic harm
 - Environmental harm
 - Harm to human health

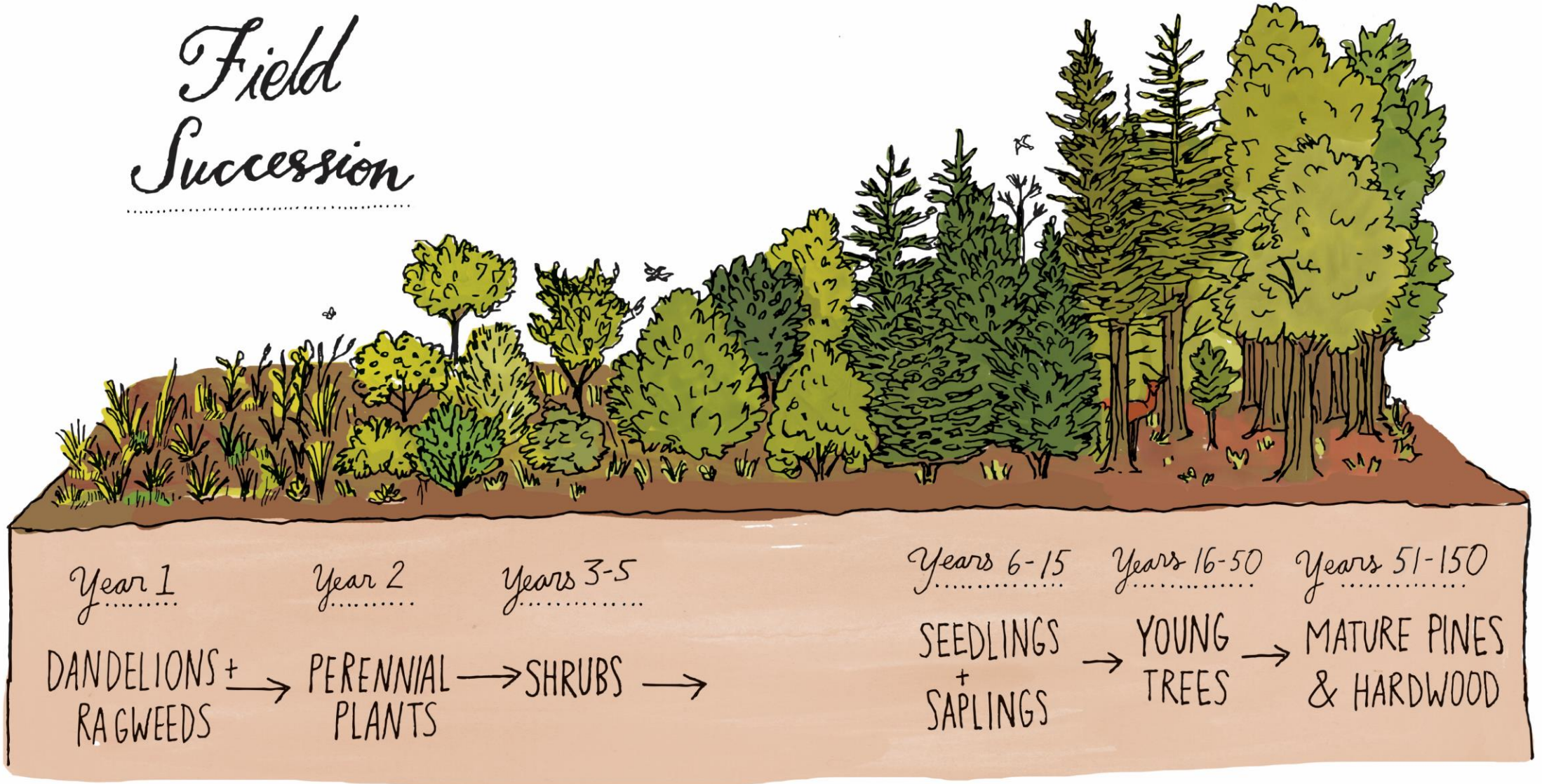


Why so successful?

- Invasive species are not necessarily inherently more competitive than native species BUT:
- Some common traits:
 - Fast reproduction and high seed viability
 - Early reproduction age
 - Plasticity and habitat generality
- Invasive species have several potential advantages
 - Enemy release hypothesis
 - Novel weapons hypothesis

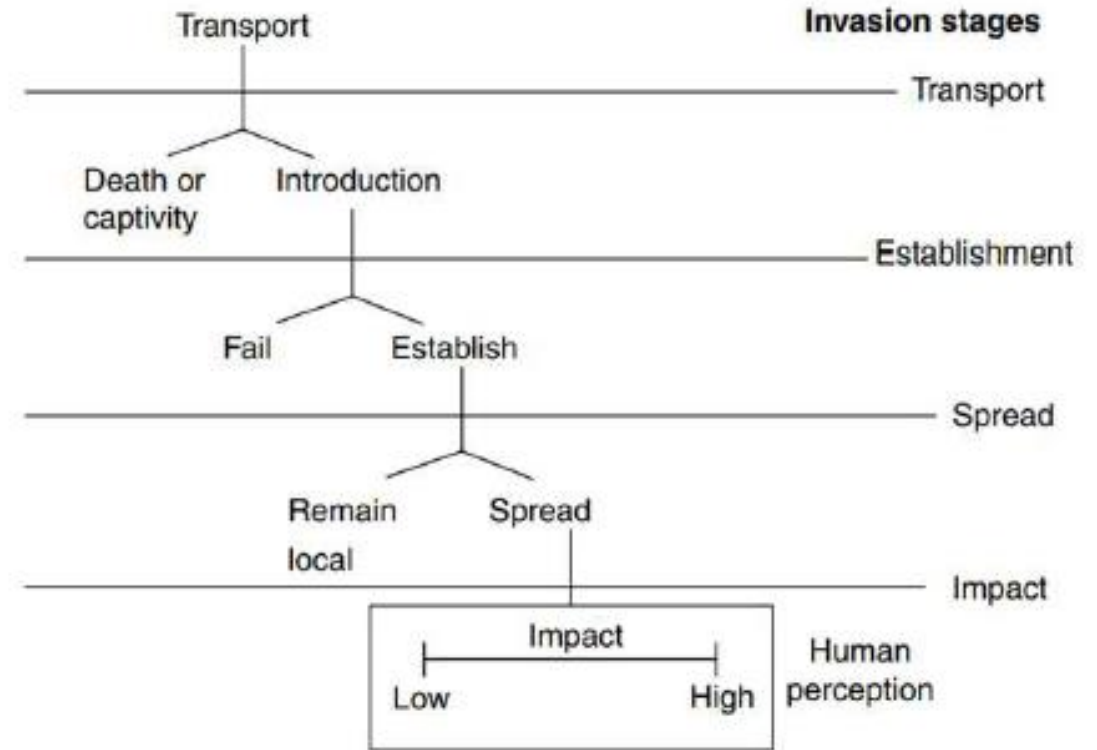


Field Succession

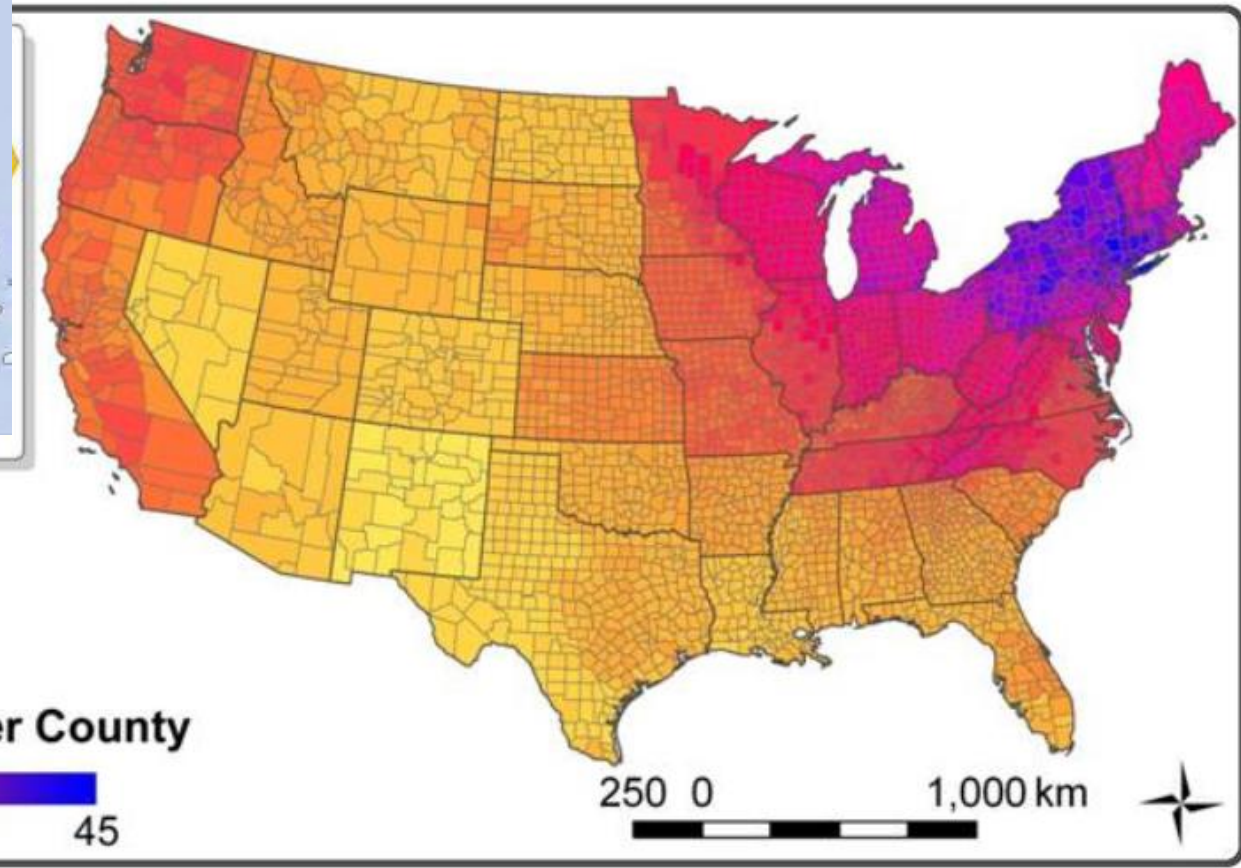
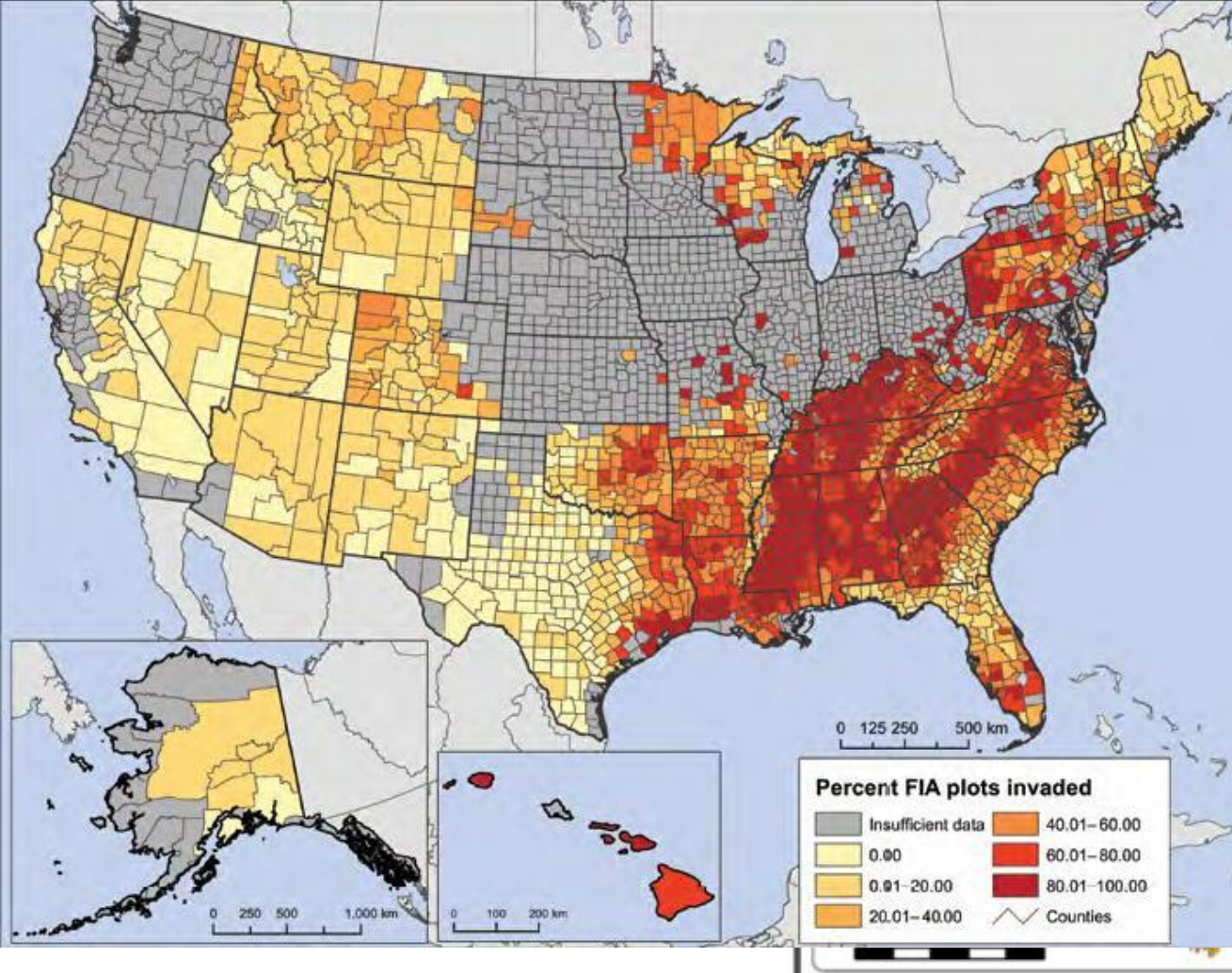


Invasive species origins

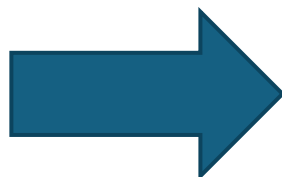
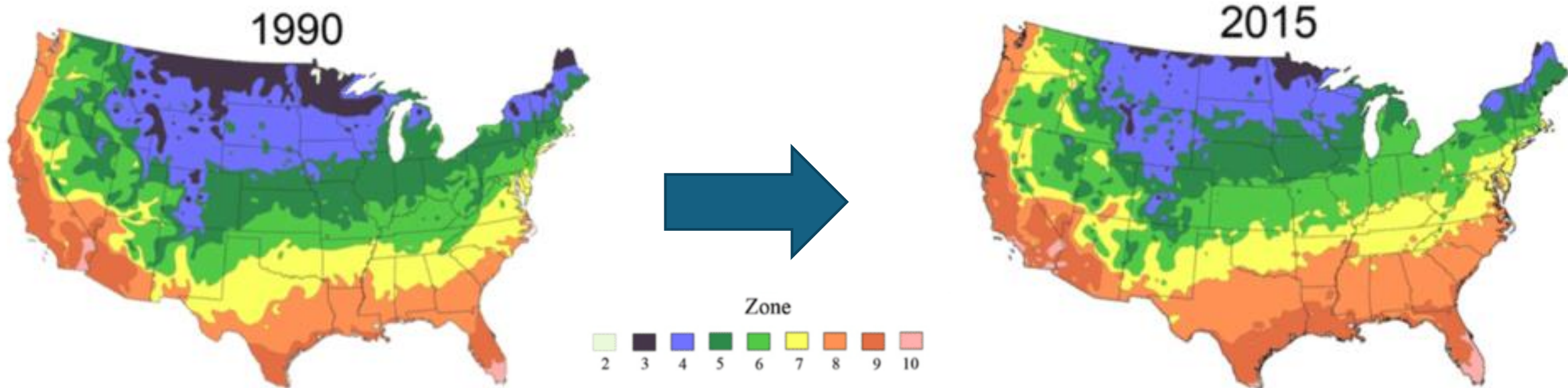
- Human transport is a main driver
 - Gardening and plant collecting in 1800s is to thank for all our invasives
- Invasion stages and lag time
 - Tens Rule
 - 10% of non-native species become naturalized
 - 10% of naturalized species become invasive



Where are they now?

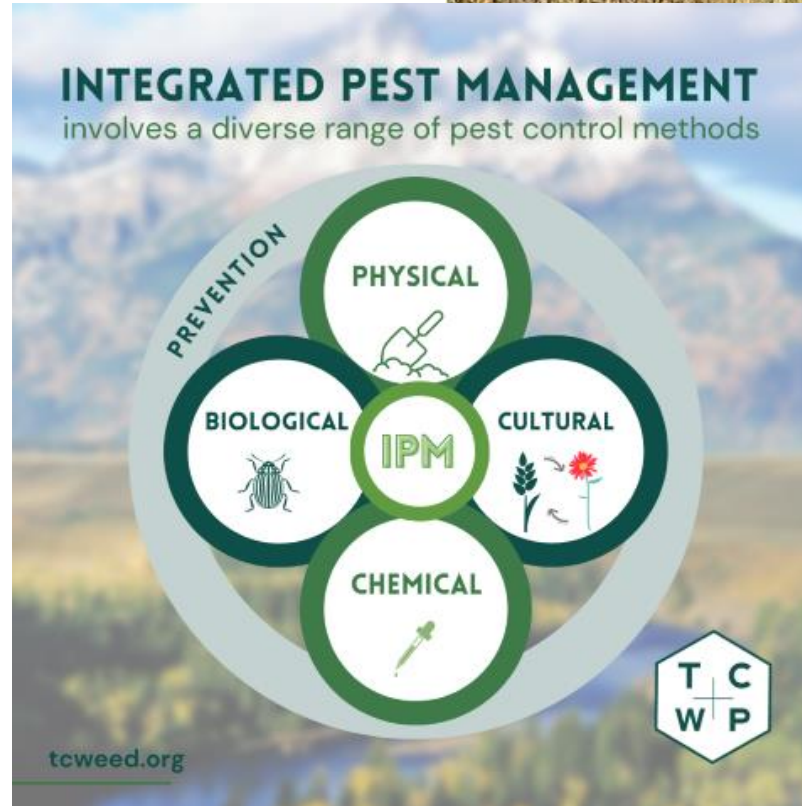


USDA Zone Map



Managing your invasives

- Integrated pest management
 - Prevention
 - Treatment
 - Mechanical
 - Chemical
 - Biological
 - Cultural
 - Monitoring



Prevention

- “An ounce of prevention is worth a pound of cure.”
 - Cost of eradication (if possible) is 10x+ higher than cost of prevention
- Commonly planted upcoming invasive species:
 - Orange daylily
 - Lily of the Valley
 - Liriope
 - Fountain Grass/Miscanthus
 - Butterfly bush
 - Nandina
 - Burning bush
 - Periwinkle



Prevention – Banned Species

- MD Invasive Plant List
 - Tier 1 – Banned from sale
 - Incised fumewort
 - Wintercreeper
 - Lesser celandine
 - Shining geranium
 - Yellow flag iris
 - Amur honeysuckle



- Tier 2 – Can be sold but must be labelled
 - Japanese angelica tree
 - Japanese barberry
 - Scotch broom
 - Burning bush
 - Privet
 - Nandina
 - Golden bamboo
 - Yellow groove bamboo
 - Callery pear
 - Beebee tree
 - Japanese wisteria
 - Chinese wisteria
 - Hybrid wisteria

Mechanical



Chemical

- Aka herbicide
- “The label is the law”
- Choose the method that allows for most effective/least amount of herbicide used
- Work with plant biology
- Highly recommend marker dye
- Main treatment methods:
 - Foliar spray
 - Cut stump
 - Basal bark
 - Hack and squirt



Biological

- Reducing invasive species through the use of natural enemies
- Can go VERY wrong
- Mile-a-minute weevil



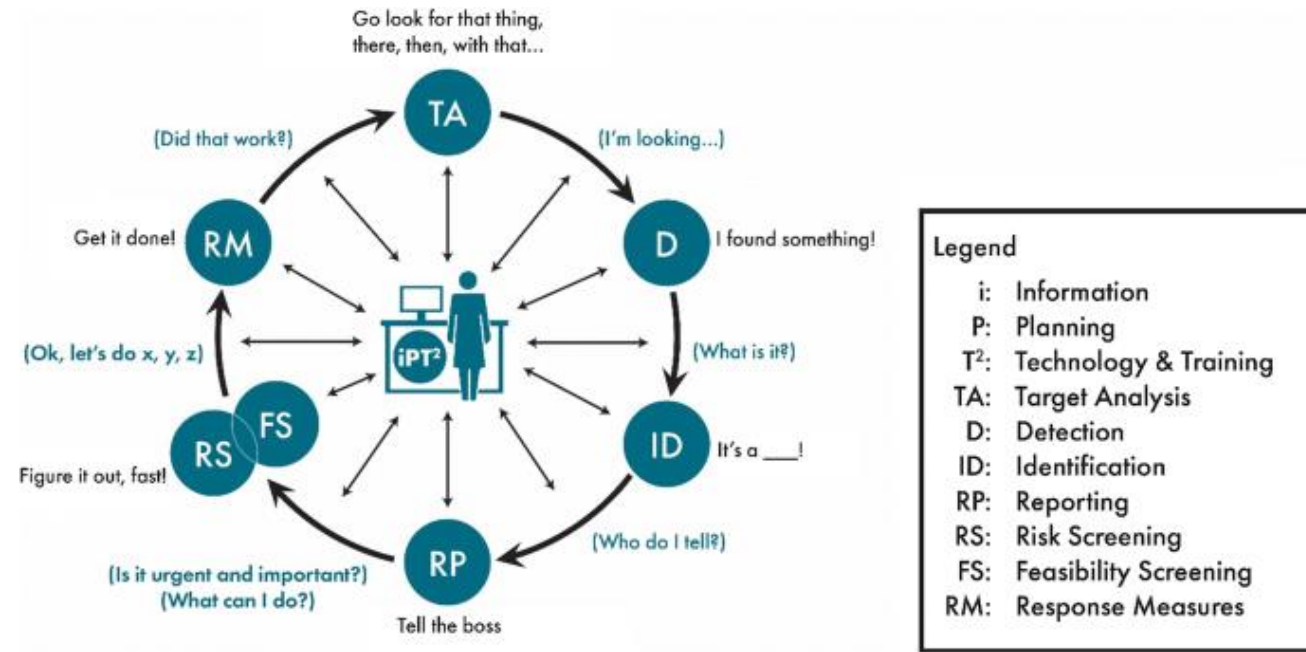
Cultural

- Manipulating the growing environment to favor native species or disfavor weed species
- Almost always used in conjunction with another method on invaded sites
- Providing competition through revegetation is a key practice

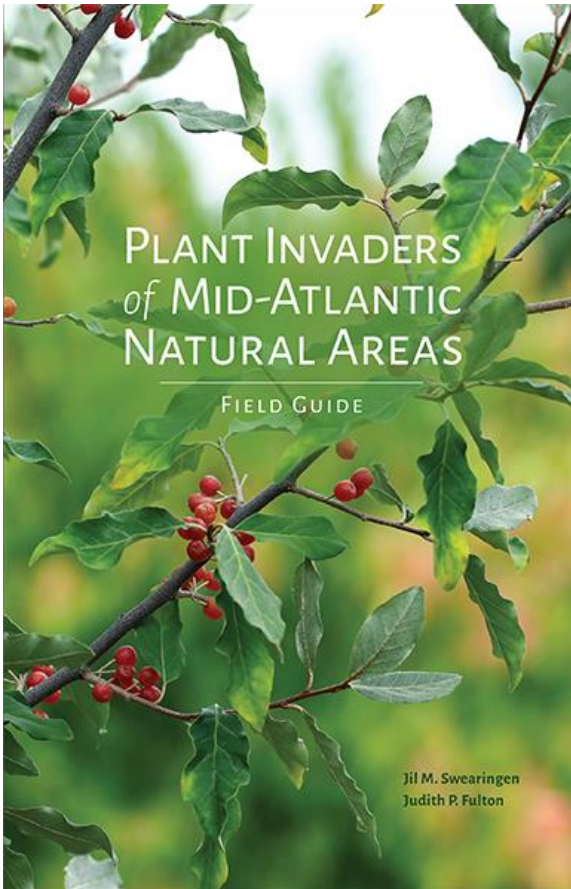


Monitoring

- Early detection on your property makes control easier, and cheaper
- Monitoring previously treated areas helps eliminate wasted effort
- Systematic survey of all areas of your property (not just in used areas)
 - Document occurrences, treatments, extent, etc
- Correct ID of invasives is key



Resources



Background

Japanese stiltgrass (*Microstegium vimineum*) is a widespread invader of woodlands. It was first reported in 1919, introduced as packing material for imported porcelain from China. Initially documented in Tennessee, it is now found across most

roots emerge. Each stem is supported by small, stiltlike prop roots, giving the species its name. The stems remain over winter, forming a dense, matted layer, or thatch, over the soil.

Look-Alikes



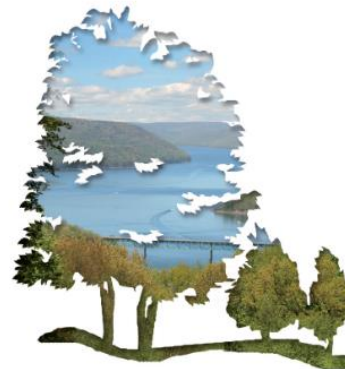
PSU Competing and Invasive Plants: <https://extension.psu.edu/forests-and-wildlife/forest-management/invasive-and-competing-plants>

Where can I go for more information?

- Northern Institute for Applied Climate Science (NIACS)
- Northeast/Southeast Climate Adaptation Science Center
- State Climate Change Vulnerability Assessments
- Climate Change Tree Atlas (also for birds!)
 - <https://www.fs.usda.gov/nrs/atlas/>
- Climate Analogues:
 - <https://fitzlab.shinyapps.io/cityapp/>
- US National Climate Assessment
 - <https://nca2014.globalchange.gov/report>
- Gardening with Climate Smart Native Plants:
<https://necasc.umass.edu/sites/default/files/2021-06/climate-smart-gardening.pdf>
- Center for Humans and Nature:
<https://humansandnature.org/>

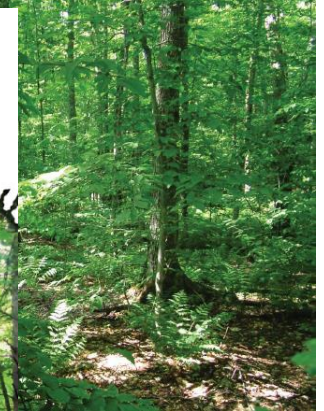
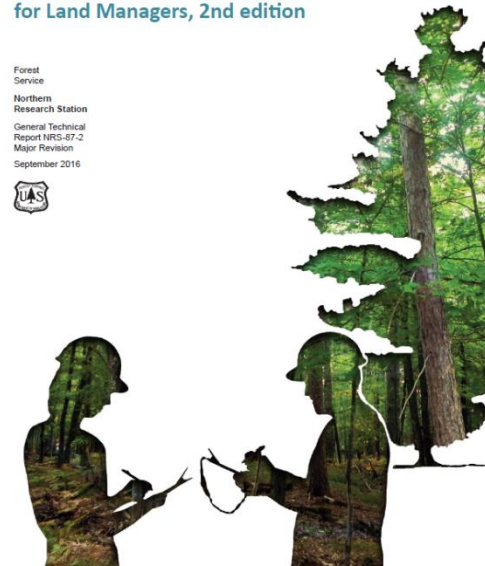


Mid-Atlantic Forest Ecosystem
Vulnerability Assessment and Synthesis:
A Report from the Mid-Atlantic Climate Change
Response Framework Project



Forest Adaptation Resources:
Climate Change Tools and Approaches
for Land Managers, 2nd edition

Forest Service
Northern Research Station
General Technical Report NRS-67-2
Major Revision
September 2016



Kudzu (*Pueraria* spp.)

- Several different species
- Introduced at 1876
Philadelphia Centennial
Exposition
- Widely planted by farmers and
CCC
- Recognized by USDA as a pest
in 1953



Kudzu Control

- Level of infestation will determine control method
- Combination of mechanical/chemical
- Long term battle

