Identification and Management of Invasive Vine Species

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Roundleaf bittersweet (Celastrus orbiculatus)

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Invasive Vine Growth

Trailing/creeping

English ivy (Hedera helix)

2

Invasive Vine Growth

Unattached climbing

Roundleaf bittersweet (Celastrus orbiculatus)

3

Invasive Vine Growth

Attached climbing

Wintercreeper (Euonymus fortunei)

4

Attached climbing

English ivy (Hedera helix)

Unattached climbing

Chinese wisteria (Wisteria sinensis)

5

Invasive Vines

Japanese hops (Humulus japonicus)

Herbaceous

- Japanese hops
- Chinese yam
- Crown vetch
- Mile-a-minute
- Swallow-wort
- Sweet autumn clematis

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Invasive Vines

Chinese wisteria (Wisteria sinensis)

Woody

- Japanese honeysuckle
- Chinese wisteria
- Kudzu
- Roundleaf bittersweet
- Wintercreeper
- English ivy

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Invasive Vines

Japanese climbing fern (Lygodium japonicum)

Fern

- Japanese climbing fern
- Old world climbing fern

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Impacts
Girdling/Deforming

9

Impacts
Overtopping

Chocolate vine (Akebia quinata)

Kudzu (Pueraria montana)

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Impacts
Shading

Japanese hops (Humulus japonicus)

Chinese yam (Dioscorea polystachya)

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Impacts
Altered Fire Conditions

Japanese climbing fern (Lygodium japonicum)

Roundleaf bittersweet (Celastrus orbiculatus)

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Impacts
Reduced access

Chinese wisteria (Wisteria chinensis)

Chinese yam (Dioscorea polystachya)

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Roundleaf bittersweet (Celastrus orbiculatus)
Edge Habitat

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Disturbance

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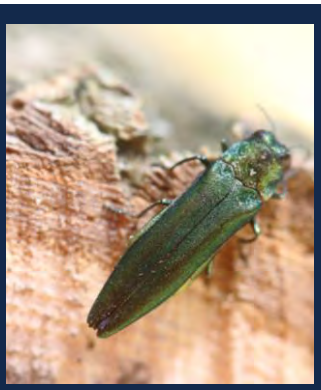

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Unique Challenges Managing Vines

- **Height of foliage**
- Potentially growing over desirable vegetation
- Many have multiple rooting points

Roundleaf bittersweet (Celastrus orbiculatus)

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Unique Challenges Managing Vines

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Chinese yam (Dioscorea polystachya)

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Unique Challenges Managing Vines

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Wintercreeper (Euonymus fortunei)

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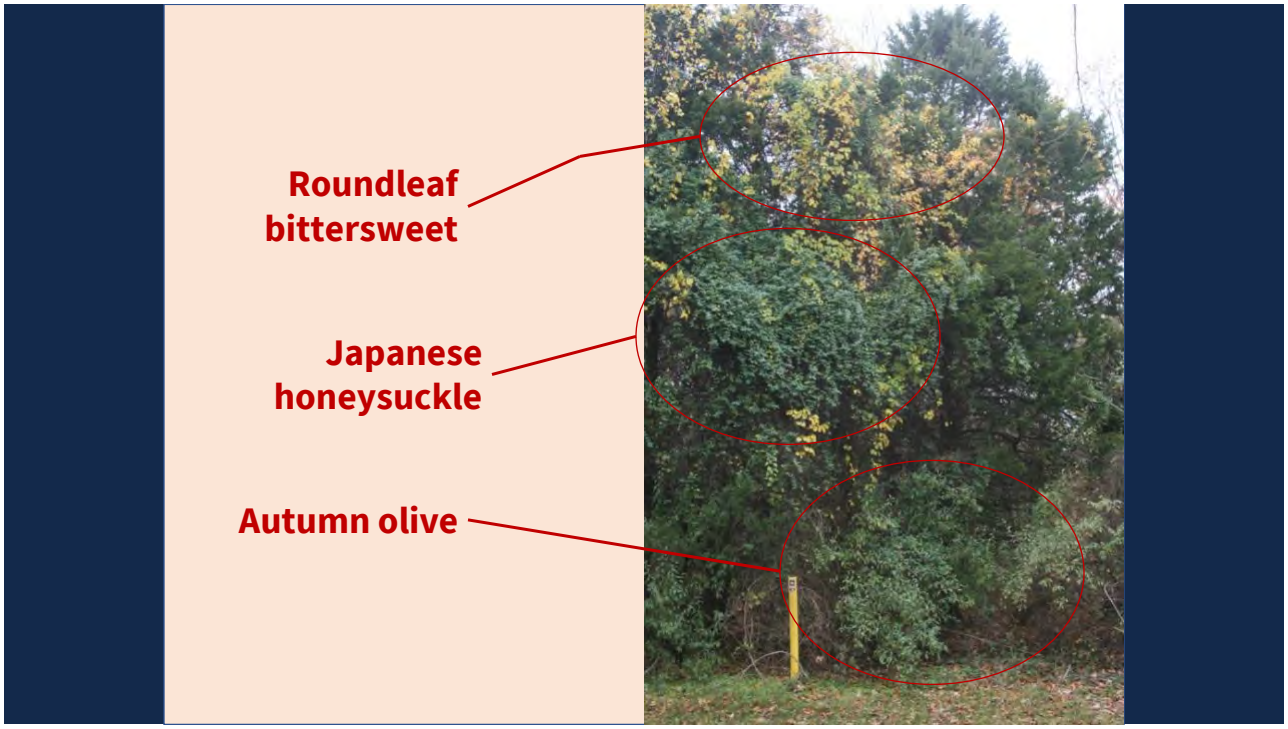

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Invasive Vines

- Roundleaf Bittersweet – *Celastrus orbiculatus*
- Wintercreeper – *Euonymus fortunei*
- Kudzu - *Pueraria montana*
- Chinese Yam – *Dioscorea polystachya*
- Japanese Honeysuckle – *Lonicera japonica*

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Roundleaf Bittersweet
Celastrus orbiculatus

- aka Oriental bittersweet
- Non-tendril, non-aerial root climbing woody deciduous vine
  - Wraps tightly to climb
- Can climb high into trees
  - Girdling, shading, and increasing the chance of storm throw
- Clonal grower capable of forming dense, interconnected patches
- Hybridizes with native bittersweet

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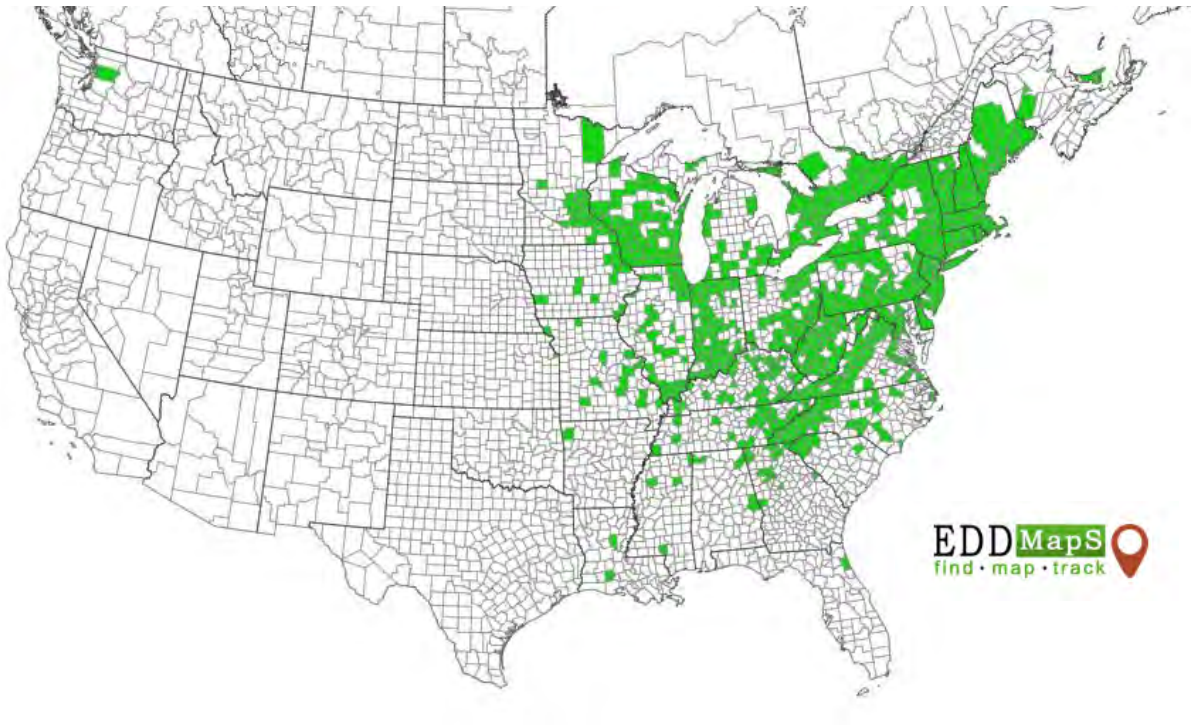

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Roundleaf Bittersweet Identification

- Alternate, deciduous leaves are nearly round in shape
  - Slightly serrated
  - May or may not have an acute tip
  - Turn yellow-green color in fall
- Does not have an extended leaf phenology

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Roundleaf Bittersweet Identification

- Bark is light-gray to silver in color
  - Diamond-shaped lenticels on smaller vines
  - Becoming rough-textured with age
- Vines can get large (over 4” in diameter)
  - Vines often twist together when climbing
  - Lacks tendrils or aerial roots

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Roundleaf Bittersweet Identification

- Dioecious plant (separate male and female plants)
- Small, yellow-green flowers borne in leaf axils
- Fruit yellowish orange, split to reveal bright red seed
  - On female plants
  - In leaf axils
  - Often abundant on plant

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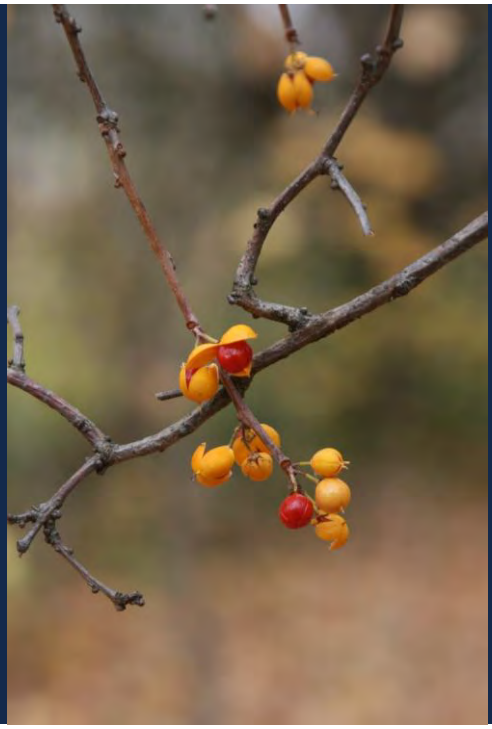

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Roundleaf Bittersweet Look-a-Likes

Very similar in appearance to American bittersweet (C. scandens)

Roundleaf

- Round leaves
- Fruit/flowers axillary
- Many fruit per plant
- Smaller fruits with yellow-orange covering

American

- Oval leaves
- Fruit/flowers terminal only
- Much fewer fruit per plant
- Larger fruits with dark orange-red covering

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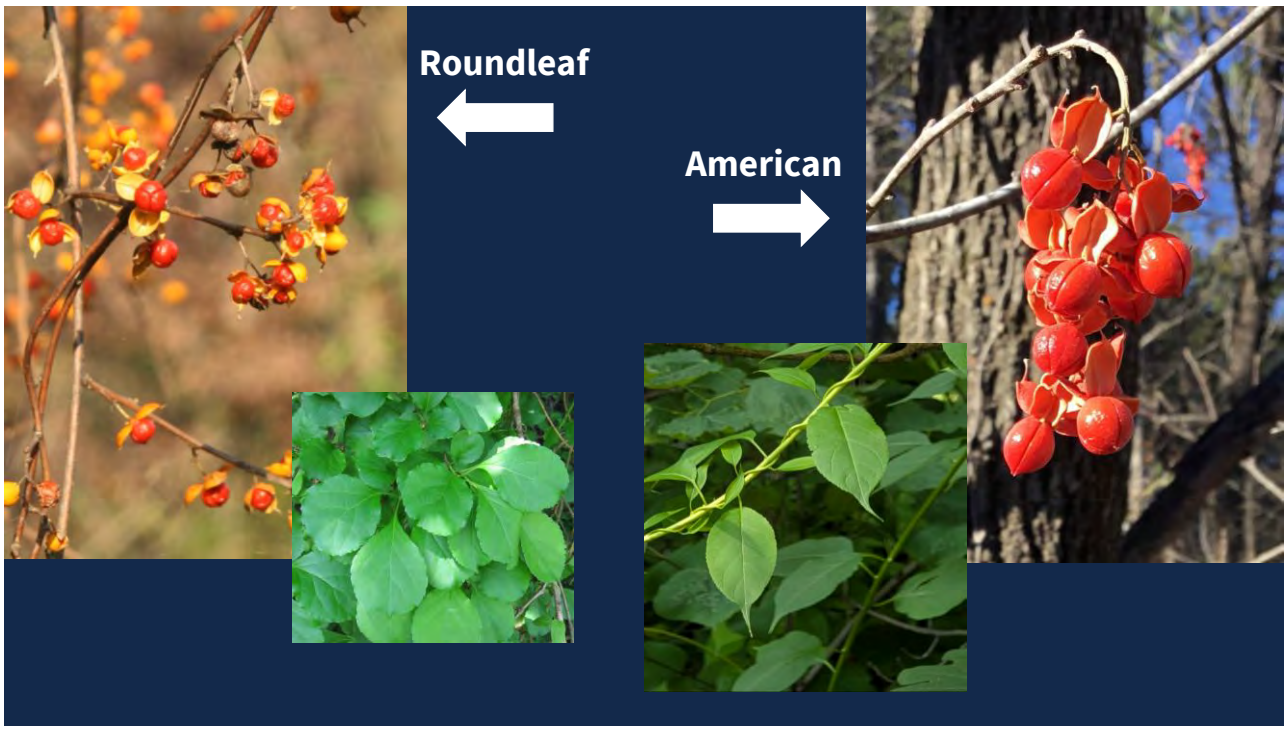

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Roundleaf Bittersweet Management

Mechanical/Cultural Techniques

- Hand-pulling may be possible on smaller individuals
  - Vines often have multiple rooting points, making pulling difficult
  - Smaller vines may be suckers from larger root system
- Prescribed fire tends to top-kill vines and stimulate aggressive suckering
  - Not generally recommended without herbicidal control first

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Roundleaf Bittersweet Management

Foliar Applications

- Applicable technique for low-growing vines or suckers
- Apply 2% v/v glyphosate in water or 1% to 3% v/v triclopyr in water to healthy foliage

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Roundleaf Bittersweet Management

Cut Stump Applications

- Cut stump applications generally not recommended.
  - Cutting will stimulate root suckering, increasing stem density.
  - Herbicide may not translocate to the end of the root system.

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Roundleaf Bittersweet Management

Basal Bark Applications

- Apply 20% to 30% v/v solution of triclopyr ester in basal oil
  - Small addition of Aminopyralid (2%) can increase efficacy

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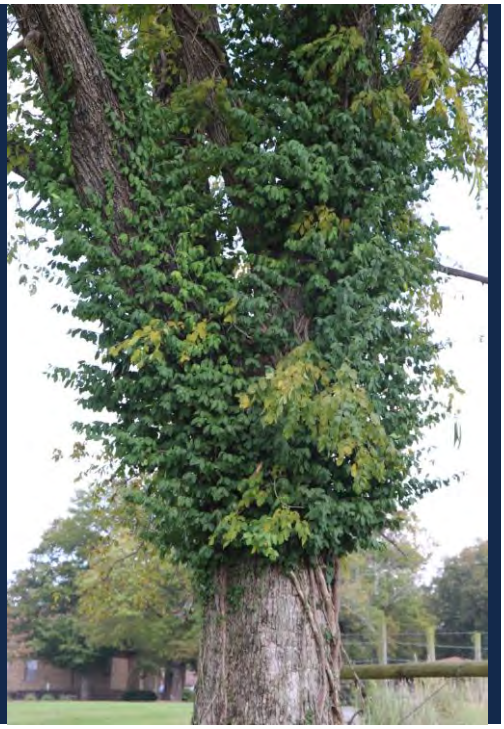
Wintercreeper
Euonymus fortunei

- aka - Fortune's spindle
- Creeping and climbing evergreen vine
- Can form extensive, thick mats of ground-covering vegetation
  - Many-branching vines with abundant rooting sites
- Clings to trees, cliffs, and other vertical structure via rootlets



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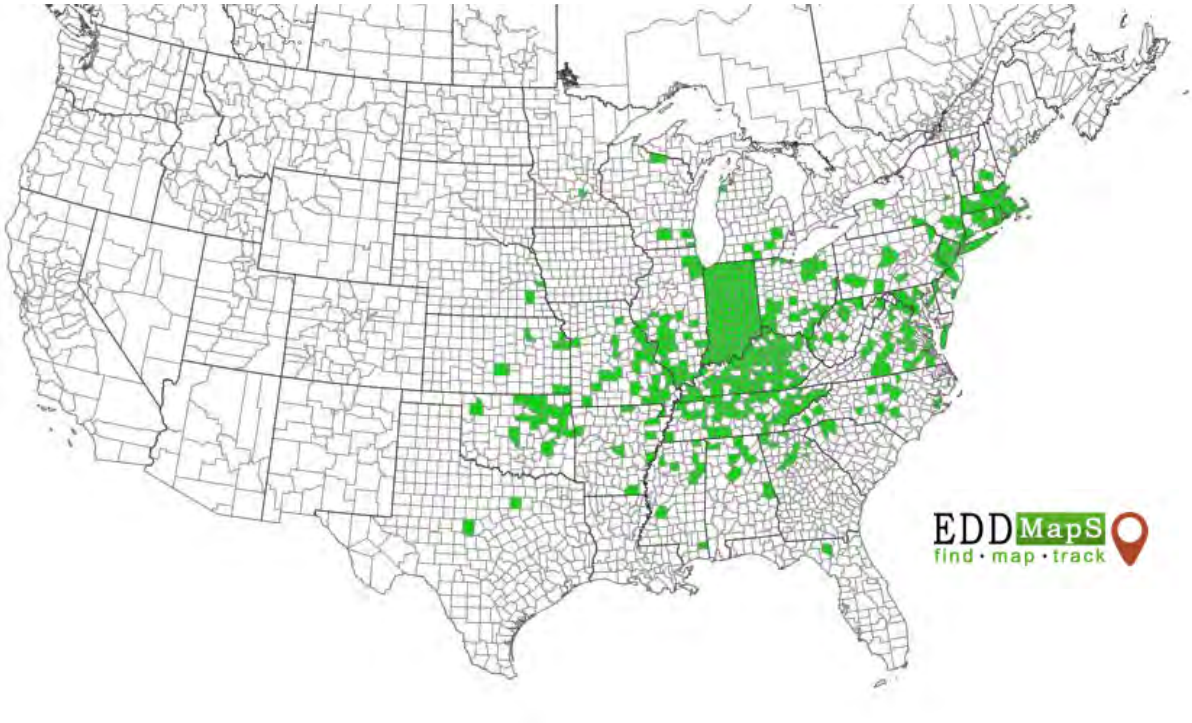

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Wintercreeper Identification

- Opposite leaves (evergreen)
  - Thick, dark-green, leathery, serrated
  - Can sometimes have purple hue to underside
- Two leaf forms
  - Shade leaves – thicker, often smaller, narrow, more prominent venation and serration
  - Sun leaves – Thinner, often larger, oval shaped, less prominent venation and serration

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Two leaf forms
(sun vs shade)

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Wintercreeper Identification

- Smaller vines green in color
- Larger vines covered in dense hair-like rootlets
  - Clings tight when climbing
- Aerial lateral branches short and abundant
  - Gives the plant a thick, bushy appearance

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Wintercreeper Identification

- Flowers small, yellow-green in color
  - Only climbing plants tend to flower
- Fruit capsule that splits to reveal seeds
  - White, ripening to pink

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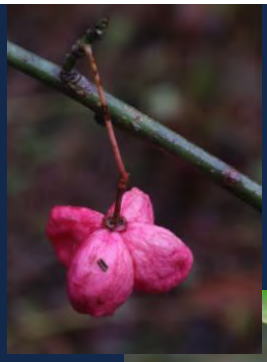
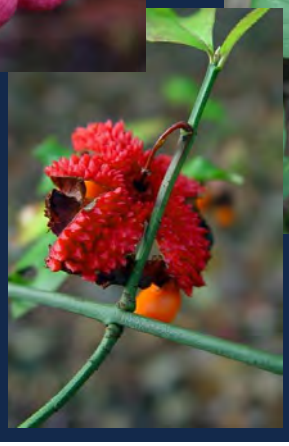
Wintercreeper Look-a-Likes

- Several native Euonymus vine and shrub species
- Typically leaves are less thick, some are deciduous, fruit different colors and/or not rounded
- Do not climb high into trees





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Wintercreeper Management

Mechanical/Cultural Techniques

- Hand pulling is effective for small infestations
  - Care should be taken to get the entire plant as stems can run a long distance under leaves and duff
  - Regrowth likely, so repeat treatment
- Prescribed fire can reduce infestation density but unlikely to eliminate infestation

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Wintercreeper Management

Foliar Applications

- Best suited for creeping infestations
  - Severe vines climbing in trees and treat with cut-stump application at same time
- Thick, waxy leaves impede herbicide uptake via foliar applications
  - Add penetrant to herbicide
    - Methylated seed oil or crop oil
  - Use ester-formulation of triclopyr
- Repeat treatments necessary for heavy infestations due to vine layering

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Wintercreeper Management

Cut Stump Applications

- Sever climbing stems close to the ground and remove at least a 2” section of vine to prevent reconnecting and allow access for herbicide application
- Apply glyphosate at a 25% to 50% v/v rate in water or triclopyr amine in water or ester in oil at a 20% to 25% v/v rate within 10 minutes of cutting.

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Kudzu
Pueraria montana

- Large, woody, deciduous vine
- Grows very tall, potentially overtopping and covering entire trees
- Shade intolerant

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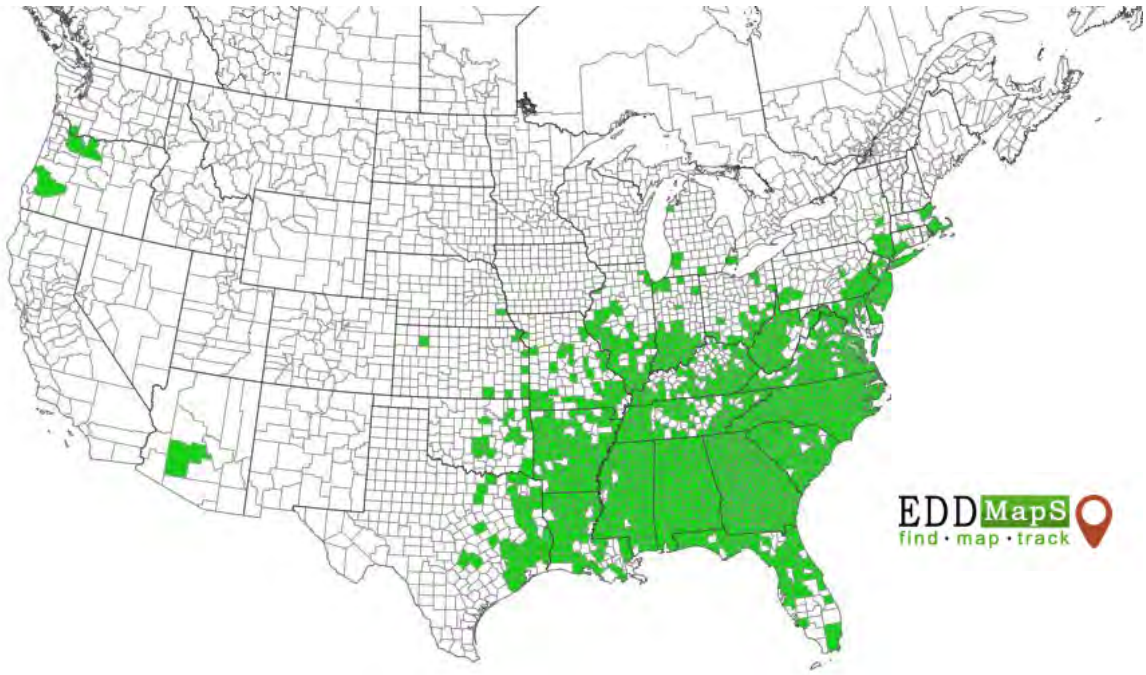

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Kudzu Identification

- Large, trifoliate leaves
  - Alternate arrangement
- Hairy leaves and stems
- Fragrant flowers in clusters
  - Purple and pea-like and very fragrant
- Fruit short, hairy bean pod

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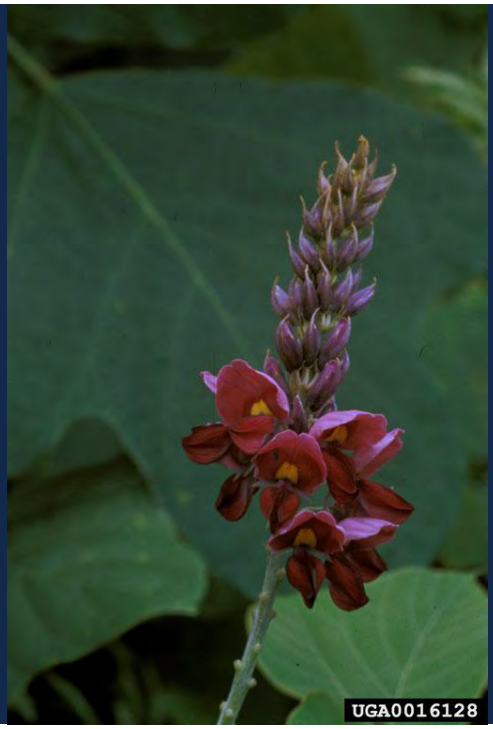
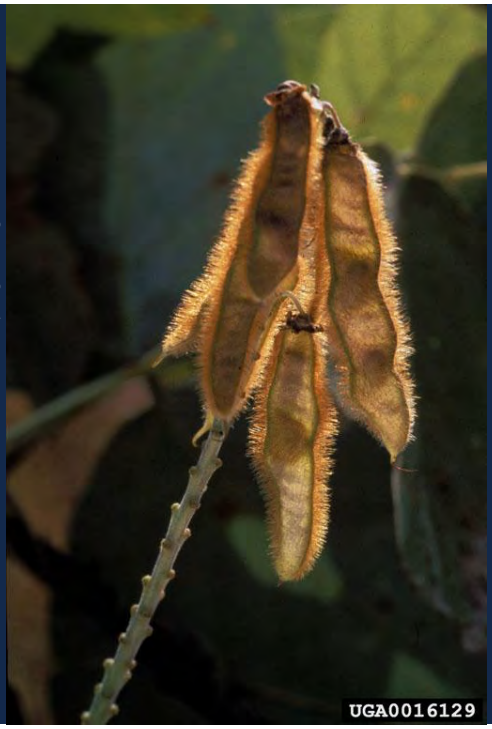


James H. Miller & Ted Bodner, Southern Weed Science Society, Bugwood.org



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Kudzu Management

Mechanical/Cultural Techniques

Mechanical means are less successful with larger, well-established infestations.

- Very heavy grazing pressure can reduce population size and potentially eliminate smaller infestations
- Repeated mowing or cutting throughout the summer may also be effective on smaller infestations
- Prescribed fire can be used to clear thatch and old vines. May assist in reducing infestation size

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Kudzu Management

Foliar Applications

Dealing with height and extent of infestation

- High pressure equipment-mounted sprayer, only reaches so far
- Pre-treat with prescribed fire or cutting vines out of trees to lower infestation height
- Drone applications

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Kudzu Management

Foliar Applications

- Triclopyr or glyphosate (4% v/v solution)
  - Not as effective, but no soil residual. Will reduce infestation size but not eliminate
- Aminocyclopyrachlor (Method 240sl) @ 2-4 oz ae/ac
  - Effective but runs risk of impact trees mixed in with kudzu, soil residual
- Picloram + 2,4-D amine @ 1lb ae/ac + 4lb ae/ac
  - Soil residual

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Kudzu Management

Foliar Applications

- Aminopyralid 7 oz ae/ac
  - Gives you some selectivity to protect desirable trees
- Clopyralid 1.3 pints ae/ac
  - Gives you the best selectivity but is less effective at controlling kudzu than many other treatments

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Kudzu Management

Cut Stump or Basal Bark Applications

- Triclopyr ester @ 20% in basal oil
- Picloram, Imazapyr, glyphosate can all be used as stem injections or cut stump

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Chinese Yam
Dioscorea polystachya

- Herbaceous, twining vine
- Generally reproduces through asexual bulbils
- Rarely produces viable seed
- Can form dense stands in forest understory, streamsides, and roadsides

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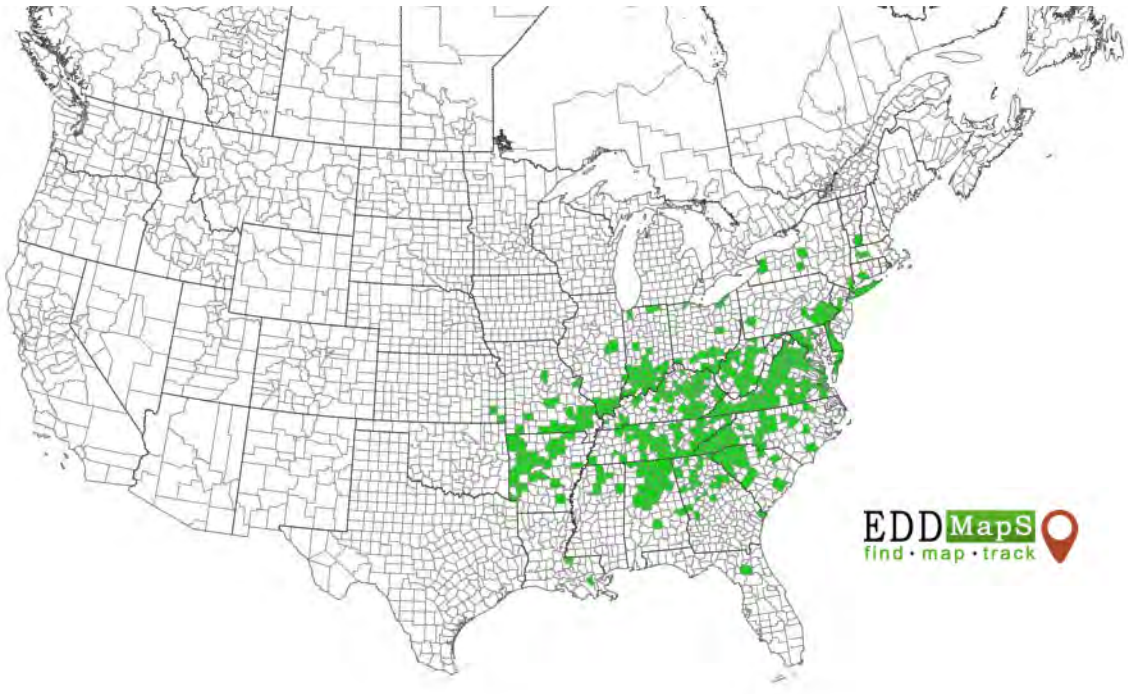

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Chinese Yam Identification

- Heart or Violin shaped leaves
  - Prominent veination
  - Often a reddish-purple spot where petiole meets leaf
- Alternate arrangement at first, but usually becoming opposite towards end of vine

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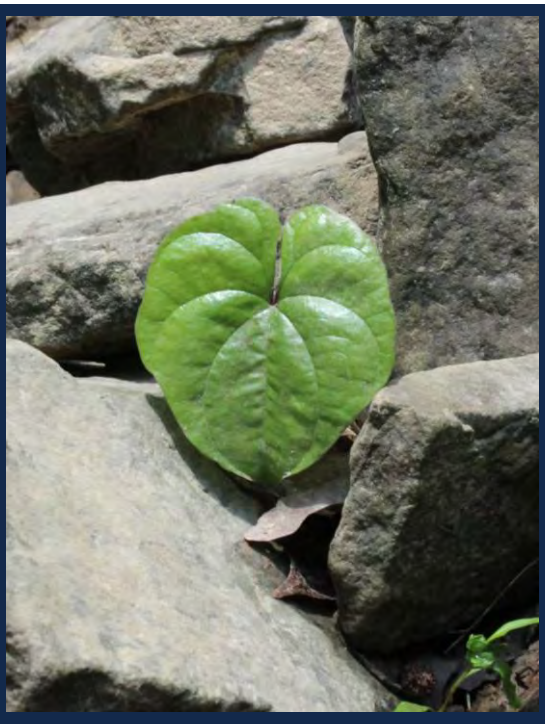

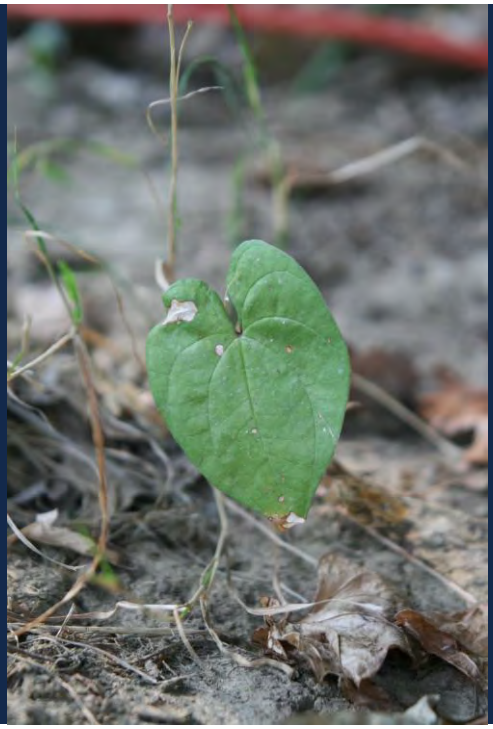

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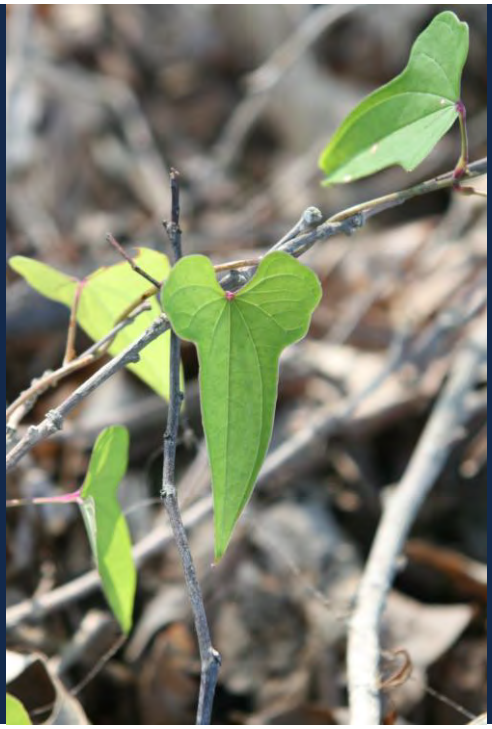

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Chinese Yam Identification

- Flowers are small and inconspicuous
- Rarely fruits, but fruit are multi-winged
- Primary means of reproduction are small, potato-like bulbils produced on vines

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Chinese Yam Look-a-Likes

- Two other invasive yam species in far south
- Several native yam species
  - Generally do not form dense stands
  - Lack bulbils and red-purple spot at base of leaves
  - Leaves are generally thinner, not waxy

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Chinese Yam Management

Mechanical/Cultural Techniques

- Small plants can be hand dug, but it is labor intensive to remove tuber
- Mowing/cutting can prevent/reduce bulbil production for one year if timed right but generally will not eradicate infestation

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Chinese Yam Management

Foliar Applications

- Triclopyr or glyphosate (2% v/v solution)
  - Not as effective, but no soil residual. Will reduce infestation size but not eliminate
  - Time applications before bulbil production (mid-summer) to reduce propagule spread

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Japanese Honeysuckle
Lonicera japonica

- Woody, twining vine
- Semi-evergreen/tardily deciduous
- Nearly ubiquitous throughout the Southeast and Lower Midwest
- Can creep along the ground or climb into trees

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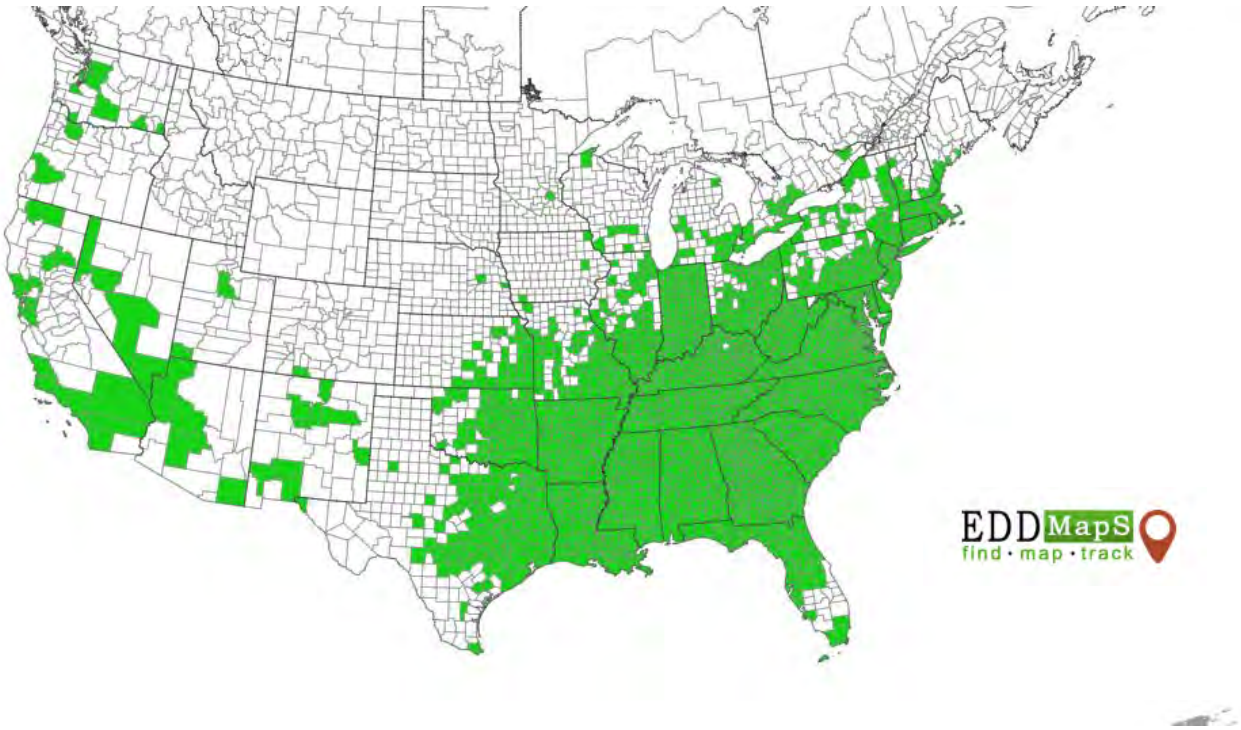

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Japanese Honeysuckle Identification

- Dark green, thick leaves
  - Usually smooth margins, but can be lobed
  - Opposite arrangement
- Tardily deciduous

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Japanese Honeysuckle Identification

- White, turning yellow, large, tubular flowers
  - Very fragrant
  - Very long blooming window
- Fruit are small, black berries

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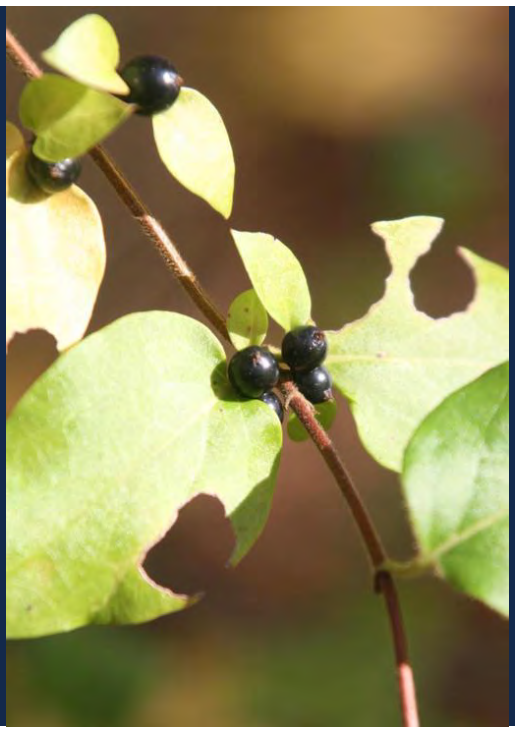
Japanese Honeysuckle Identification

- Young vines wiry, hairy
- Older vines with light tan, papery bark
- Twines tightly to climbing



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Japanese Honeysuckle Management

Conditional Control

- Japanese honeysuckle often persists at low levels
  - Control may not always be warranted
- Focus on situations where honeysuckle is impactful or where disturbance is expected

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Japanese Honeysuckle Management

Mechanical/Cultural Techniques

- Small/young plants can be hand-pulled
  - Larger vines might be removeable with a pulling aid (weed wrench)
- Repeated mowings can reduce population
- Prescribed fire can greatly reduce population size and can be effective as a long-term management strategy in many situations

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Japanese Honeysuckle Management

Foliar Applications

- Semi-evergreen nature allows for greater selectivity during late fall/winter foliar applications
- Triclopyr or glyphosate (2% v/v solution)

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Japanese Honeysuckle Management

Cut Stump or Basal Bark Applications

- Glyphosate or triclopyr amine or choline - 20%-25% v/v with water
- Triclopyr ester @ 20% in basal oil for basal bark

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Invasive Vine Management Summary

Understanding your options:

- **What is feasible**
- **What is practical**
- **What do you have capacity for**

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Invasive Vine Management Summary

Capacity
- **Time/Resources available**
  - Staff/volunteers/contractors
  - Funding available
  - Training level
  - Equipment available

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Invasive Vine Management Summary

Control feasibility
- **Site accessibility/permissions**
- **Other management ongoing**
- **Follow-up commitment**

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Invasive Vine Management Summary

Priorities

- **Established or incipient infestation**
  - Actively spreading or maintaining
- **Resources at risk**
  - Rare native species, intact natural area or significant investment

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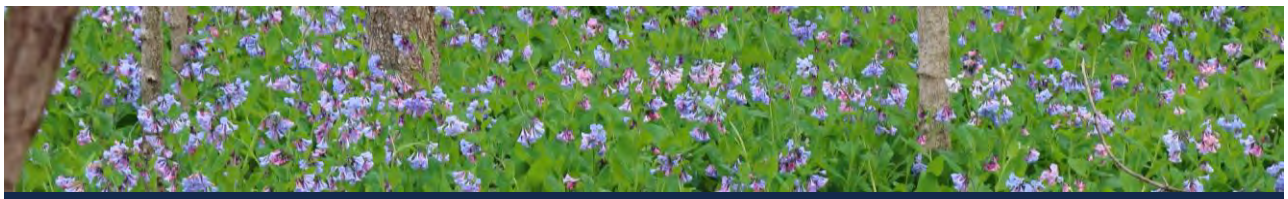
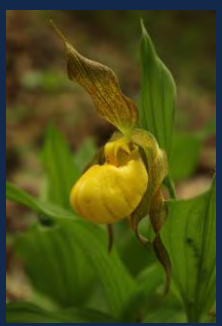
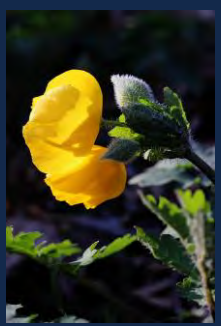


“We control invasive species because they are harming the native plants and animals we care so much about protecting.”

- The Nature Conservancy Global Invasive Species Initiative website





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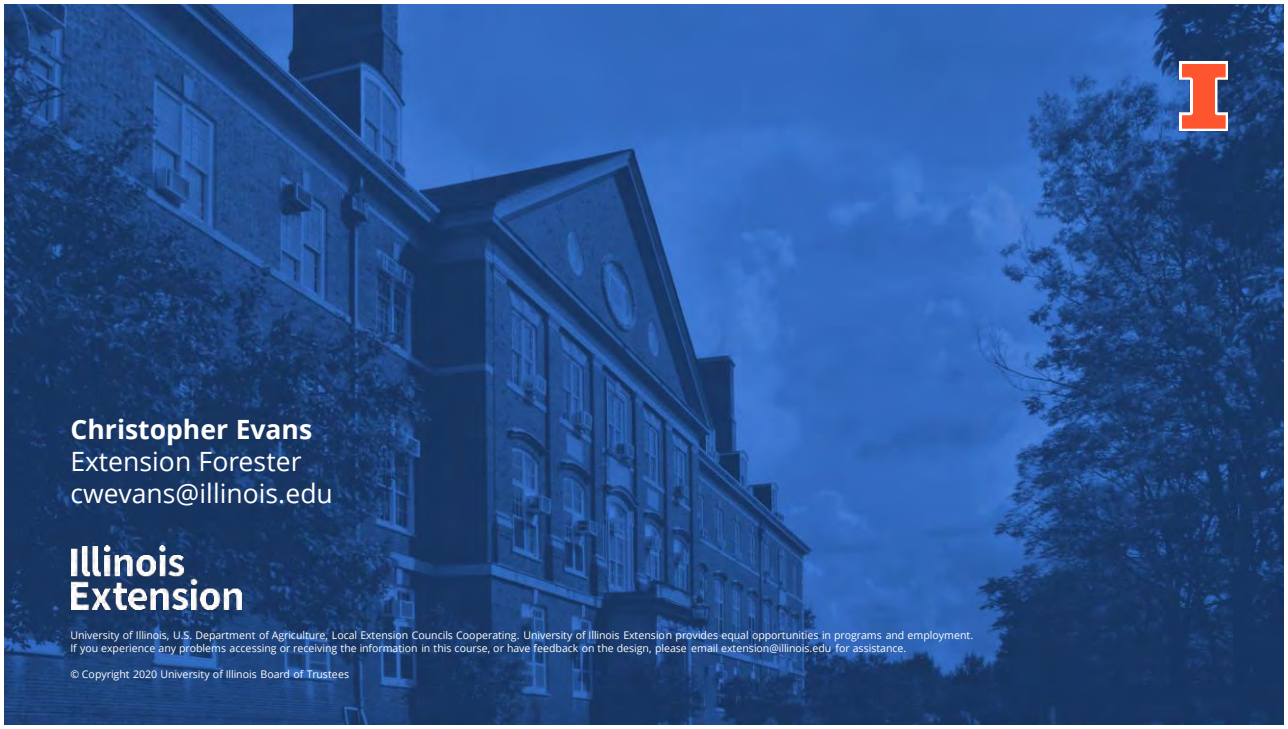
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