

DIRTY DOZEN INVASIVES

CHATTANOOGA NATIVE PLANTS AND WILDFLOWER
GROUP - MASTER GARDENERS OF HAMILTON COUNTY

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WHY SHOULD WE BE CONCERNED?

- Many native plants, including those that only grow in Tennessee, are threatened or endangered by exotics
 - Exotics outcompete with natives for food, sunlight, territory
 - Exotics often don't support local wildlife (food and shelter)
 - Can create "monocultures" and therefore reduce biodiversity
- High cost to control or fight invasives
- Controls like pesticides put extra burden on beneficial plants and animals and may have unintended consequences
- Exotic plant takeovers destroy aesthetics

ECOLOGICAL EFFECTS

- Change in animal-dispersed seeds of native plants
- Alter stream biodiversity
- Increase susceptibility to fire and storm disturbances
- Alter distribution and connectivity of habitats
- Change nutrient cycling and soil chemistry
- Exclude native perennials and tree seedlings

INVASIVE EXOTIC PEST PLANT DEFINITION

SOURCE: TENNESSEE EXOTIC PLANT PEST COUNCIL (TNEPPC)

1. Plant is established outside of cultivation and is non-native to some portion of North America
2. Species has potential for rapid growth, high seed or propagule production (i.e., spreading by rhizomes and other non-seed ways) and dispersal
3. Species occurs in Tennessee
4. Species is known to out-compete other species in native plant communities within Tennessee

SEVERE THREAT DEFINITION

- Species meets criteria 1-2 and is listed as a noxious weed in Tennessee or by the federal government (USDA), OR
- Species meets criteria 1-4 and occurs in at least 30 counties (30% of the state) and presents substantial management problems

SIGNIFICANT THREAT

- Species meets criteria 1-4 and either
 - Occurs within at least 30 counties and management does not present substantial management difficulties
 - Occurs in 10 to 29 counties and does present substantial management difficulties

LESSER THREAT

- Species meets criteria 1-4 AND the species occurs in 10-29 counties and does not present substantial management difficulties

ALERT

- Species meets criteria 1-2 and shows invasiveness in similar habitats to those in Tennessee OR
- Species meets criteria 1-4, occurs in fewer than 10 counties, and is considered a severe threat in adjacent states or poses substantial management difficulties.

EXAMPLES OF SEVERE THREATS

- Princess Tree (*Paulownia tomentosa*)
- Kudzu (*Pueraria montana*)
- Multiflora rose (*Rosa multiflora*)
- Tropical soda apple (*Solanum viarum*)
- Shrubby bushclover (*Lespedeza bicolor*)
- St. John's-wort (*Hypericum perforatum*)
- Asian bittersweet (*Celastrus orbiculatum*)

EXAMPLES OF SIGNIFICANT THREATS

- Japanese barberry (*Berberis thunbergii*)
- Paper mulberry (*Broussonetia papyrifera*)
- Osage Orange (*Maclura pomifera*)
- Peppermint (*Mentha x piperita*)
- Zebra grass (*Miscanthus sinensis*)
- Yellow iris (*Iris pseudocorus*)
- Watercress (*Nasturtium officinale*)
- White poplar (*Populus alba*)

LESSER THREAT

- Japanese wisteria (*Wisteria floridunda*)
- Rose of Sharon (*Hibiscus syriacus*)
- Grape hyacinth (*Muscari neglectum*)
- Poison hemlock (*Conium maculatum*)
- Bachelor's button (*Centaurea cyanus*)
- Balloonvine (*Cariospermum haliacacabum*)
- Star of Bethlehem (*Ornithogalum umbellatum*)

ALERT

- Butterfly bush (*Buddleja davidii*)
- Goldenrain tree (*Koelreuteria paniculata*)
- Oregon grape (*Mahonia bealei*)
- Chinese wisteria (*Wisteria sinensis*)
- Nandina (*Nandina domestica*)
- Bradford pear (*Pyrus calleryana*)
- Ox-eye daisy (*Leucanthemum vulgare*)
- Japanese holly (*Ilex crenata*)

WHY DO WE USE INVASIVE EXOTIC PLANTS?

- What makes them invasive makes them easy to grow
 - Stabilize tough places like slopes
 - Relatively disease-free
 - Fewer insect and animal pests
 - Easy/cheap to propagate
- May be showier than native plants
- Some extension services still recommend
- Are available in nurseries and garden centers

DIRTY DOZEN

- Tree of Heaven
- Mimosa
- Autumn Olive
- Privet
- Bush Honeysuckle
- Japanese Spirea
- English Ivy
- Japanese Honeysuckle
- Winter Creeper
- Japanese Knotweed
- Purple Loosestrife
- Congongrass

Tree-of-Heaven

TREES



TREE OF HEAVEN

- Grows quickly on disturbed hillsides, crowding out all other growth by forming a dense canopy that does not allow sunlight to filter down
- Resembles the sumacs and hickories, but is easily distinguished by the glandular, notched base on each leaflet (buttons) and large leaf scars on the twigs
- Extremely tolerant of poor soil conditions and can even grow in cement cracks
- Not shade tolerant, but thrive in disturbed forests or edges
- Native to Asia, was first introduced into North America in 1748 by a Pennsylvania gardener. It was widely planted in cities because of its ability to grow in poor conditions.

Silktree, Mimosa

TREES



T. Bodner



MIMOSA

- Small tree 10 to 50' in height, often having multiple trunks with delicate looking fernlike compound leaves
- Flowers in early summer with showy, feathery, fragrant, pink flowers that develop in groups at the ends of the branches. Fruit are flat, 6" seed pods that develop in the late summer
- Quickly invades any type of disturbed habitat.
- Commonly found in old fields, stream banks, and roadsides.
- Once established, difficult to remove due to the long lived seeds and its ability to re-sprout vigorously
- Asia and was first introduced into the U.S. in 1745 and was used widely used as an ornamental.

Autumn Olive

SHRUBS



AUTUMN OLIVE

- Deciduous shrub from 3-20' easily recognized by the silvery, dotted underside of the leaves
- Leaves are alternate and 1" wide. The small, yellowish flowers are abundant and occur in clusters near the stems become red, juicy, and edible fruit in late summer and fall
- Invades old fields, woodland edges, and other disturbed areas forming a dense shrub layer which displaces native species and closes open areas
- Native to China and Japan and was introduced into US in 1830. Widely planted for wildlife habitat, mine reclamation, and shelterbelts.

Chinese/European Privet



Chinese privet shown in all images

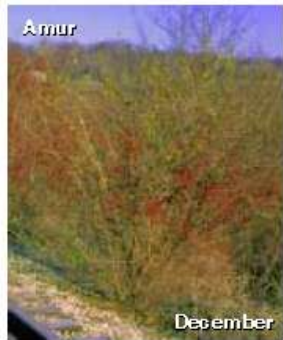


PRIVETS

- Group of shrubs native to Asia, Europe and North Africa
- All privets are thick, evergreen shrubs that grow up to 20' with trunks usually multiple stemmed with many long, leafy branches, making dense thickets.
- Leaves are opposite, oval, up to 2 " long, are leathery and contain high levels of phenolic compounds that make them resistant to insects, herbivores and pesticide control
- Flowers in spring to summer with abundant, white flowers clusters at the end of branches. Fruits are small dark purple to black berries that persist into winter
- Thickets shade and out-compete many native species, and once established is very difficult to remove
- Introduced into the United States in the early 1800s.

Bush Honeysuckles

SHRUBS



BUSH HONEYSUCKLES

- Exotic honeysuckles which include Morrow's, January Jasmine, Bell's Bush and Tartarian
- Can rapidly invade and overtake a site, forming a dense shrub layer that crowds and shades out native plant species
- Alter habitats by decreasing light availability, by depleting soil moisture and nutrients, and possibly by releasing toxic chemicals that prevent other plant species from growing in the vicinity
- May compete with native bush honeysuckles for pollinators, resulting in reduced seed set for native species
- Fruits do not offer migrating birds the high-fat, nutrient-rich food sources needed for long flights that are supplied by native plant species.

Japanese Spirea



JAPANESE SPIREA

- Perennial, deciduous shrub that grows to 4 to 6' in height and about the same in width and can be found in many forms and varieties at nurseries
- Leaves are generally egg-shaped, 1" to 3" long, have toothed margins and alternate along the stem. Clusters of attractive, rosy-pink flowers are borne at the tips of branches. Seeds, measuring about 1/10 inch in length, are contained in small lustrous capsules
- Can rapidly take over disturbed areas, creep into meadows, forest openings, and other sites.
- Seeds last for many years in the soil, making its control and the restoration of native vegetation especially difficult.

Winter Creeper

VINES



K. Langdon



WINTERCREEPER

- Evergreen, woody vine or small shrub, growing in mats along the forest floor to 3' high or a vine climbing trees to heights of 40-70'
- Opposite leaves are dark green, oval, slightly toothed, glossy, thick, less than 1" long and often with silvery-white veins
- Young stems are green, becoming light gray and corky with age. Flowers are inconspicuous, yellow-green, five petaled and develop in mid-summer
- Usually only flower when climbing and almost never when trailing along the ground. Fruit are pinkish-red capsules that open to show orange seeds
- Aggressively invades open forests, forest margins, and openings creating a dense ground cover that can displace native understory species and restrict tree seedling establishment
- Native to Asia first introduced in the US in 1907 as an ornamental ground cover plant

English Ivy

VINES



ENGLISH IVY

- Evergreen vine that can grow to 100' in length (or height); leaves are dark-green and waxy with palmate veins. Leaf shape is variable, but commonly occurs as a 3-5 lobed leaf with a heart-shaped base
- Flowering triggered by sunlight, such as when the vines climb into taller vegetation
- Can invade woodlands, fields and other upland areas and is spread by runners . Seeds can also be spread by birds
- Can grow both along the ground, where it can displace native understory species, and in the tree canopy, often covering branches and slowly killing trees. Ivy vines can also strangle or girdle trees, stressing the tree and making it vulnerable to boring insects and disease.
- Native to Europe and was introduced into North America by early settlers for ornamental purposes. It continues to be widely planted as an ornamental and is stocked by many gardening centers.

Japanese Honeyuckle

VINES



JAPANESE HONEYSUCKLE

- Evergreen to semi-evergreen vine that can be found either trailing or climbing to over 80' in length. Leaves are opposite, sessile, oval and 1 to 2.5 inches long
- Flowers from April to July - showy, fragrant, tubular, whitish-pink to yellow flowers develop in the axils of the leaves
- Fruits develop in the fall and are small, shiny black berries
- Invades a variety of habitats including forest floors, canopies, roadsides, wetlands, and disturbed areas.
- Can girdle small saplings by twining around them, and it can form dense mats in the canopies of trees, shading everything below
- Native of eastern Asia, it was first introduced in 1806 in Long Island, NY. Has been planted widely throughout the United States as an ornamental, for erosion control, and for wildlife habitat.

Japanese Knotweed



JAPANESE KNOTWEED

- Upright, shrub-like herbaceous perennial that can grow to over 10'
- Base of the stem above each joint is surrounded by a membranous sheath, stems are smooth, stout and swollen at joints where the leaf meets the stem
- Leaf size may vary, they are normally about 6" by 3" to 4", broadly oval to somewhat triangular and pointed at the tip. Small greenish-white flowers occur in attractive, branched sprays in summer and are followed soon after by small winged fruits. Seeds are triangular, shiny, and very small, about 1/10"
- Can tolerate a variety of adverse conditions including full shade, high temperatures, high salinity, and drought. It is found near water sources, such as along streams and rivers, in low-lying areas, waste places, utility rights-of-way, and around old homesites
- Can quickly become an invasive pest in natural areas after escaping from cultivated gardens.

Purple Loosestrife



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The Natives - MGHC

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PURPLE LOOSESTRIFE

- Perennial from Europe grow 3 – 4' tall, forming colonies 4' wide with numerous erect stems growing from a single woody root mass.
- Stems are reddish-purple or red to purple and square in cross-section. The flowers are reddish purple that are clustered tightly on a spike.
- Many states have declared it a noxious weed and banned its sale because it can take over sensitive wetlands.
- Large monotypic stands threaten native plants and wildlife by eliminating their food sources and can even impede irrigation systems
- Originally hitchhiked in ship ballasts and was also brought as a medicinal herb.

Cogongrass

GRASSES



T. Bodner



T. Bodner



COGONGRASS

- Bright green perennial grass that grows 2-6' tall in dense stands
- Leaves are flat and have saw-like edges lined with sharp microscopic silica crystals; roots sharp pointed white barbwire-life rhizomes that branch rapidly and readily, going through roots of adjacent plants.
- Flowers appear in late winter through May, and are formed on showy feathery spikes. White/silvery seeds are fluffy like dandelions and are dispersed widely in the wind.
- Invades natural and disturbed areas, displaces natural grasses, decreases tree seedling growth and alters fire regimes and intensity. Usually appears on poor, acidic soils
- One variety, called "Red Baron" is claimed to be less aggressive, but there is no proof
- Tennessee has declared it a noxious weed.

ALTERNATIVE NATIVE PLANTS

Small flowering trees:

- Red Bud, Black Locust, Honey Locust, Flowering Dogwood

Flowering Shrubs (with berries and seeds):

- Red or Black Chokeberry, Southern Bush Honeysuckle, American Beautyberry, Flame Azalea, Ninebark, Possumhaw Viburnum

Hedges and Screening

- Inkberry, Southern Waxmyrtle, Winterberry, Devilwood

Flowering Vines

- Native clematis (Virgin's Bower), Native Coral or Trumpet Honeysuckle, Dutchman's Pipe, Passionflower

ALTERNATIVE NATIVE PLANTS

Erosion control in shady areas:

- Allegheny Spurge, native ferns, Wild Ginger, Partridgeberry, Winterberry

Large Flowering Perennials/small shrubs that grow in part shade/shade:

- Summersweet (Clethra), Goatsbeard, Virginia Sweetspire

Perennials with flowering spikes that grow in sun/part shade (replacing Loosestrife)

- Obedient Plant, Blazing Star, Scullcap

ALTERNATIVE NATIVE PLANTS

Ornamental Grasses

Instead of Zebra Grass, Japanese Bloodgrass and other exotics, use

- River Oats
- Little and Big Blue Stem
- Purple Love Grass
- Red Switch Grass
- Side Oats Grama

All these native plants support wildlife by providing food and shelter

HOW TO CONTROL INVASIVE PLANTS

- Know your pest – type (annual, perennial, biennial), reproduction, when it flowers, root system, control, et al
- Learn about conditions that contribute to presence, persistence and spread
- Practice prevention
- Look at all the control methods available – don't jump to chemical control first
- Be persistent!

CONTROL

- Prevention is the best strategy – don't plant it!
- Mechanical removing – hoeing, cutting, pulling, burning, tilling, digging
- Chemical – organic or commercial preparations
 - Always read the labeled directions first!
 - Get a copy of the Material Safety Data Sheets (MSDS)
 - Wear protective equipment
- Planting/restoring after control – choose native plants (or non-invasive exotics to taste if necessary)

SUPPORTING NATIVE PLANTS

- While it is difficult to find native plants at local nurseries, customer pressure for natives will help remedy this situation (“market forces”)
- Native plant sales in the area: Reflection Riding spring and fall plant sale
- Chattanooga Market and Main Street Market local native plant nurseries can deliver “special orders”
- Several native plant nurseries are within 100 miles of Chattanooga. For a listing, go to www.tnps.org/Links.html
- Join the Tennessee Native Plant Society

RESOURCES

- Tennessee Exotic Pest Plant Council www.tneppc.org
- Southeast Exotic Pest Plant Council www.se-eppc.org
- Tennessee Native Plant Society www.tnps.org
- Tennessee Department of Environment & Conservation www.state.tn.us/environment/#
- TVA Native Plant Selector www.tva.com/river/landandshore/stabilization/plantsearch.htm
- Controlling Invasive Plants, NC Botanical Garden <http://ncbg.unc.edu/uploads/files/ControllingBooklet.pdf>
- Gardening with the Native Plants of Tennessee: The Spirit of Place," Margie Hunter

CREDITS

- Photographic montages of Tree of Heaven, Mimosa, Autumn Olive, Privet, Bush Honeysuckle, Japanese Honeysuckle, Wintercreeper, English Ivy, and Cogongrass from “Nonnative Invasive Plants of Southern Forests” by James H. Miller, USDA Forest Service Research Station General Technical Report SRS-XX