

Bio- Diversity, Vegetation Management & Exotics / Invasives

**David Dittmer
City of Columbia
Parks and Recreation**

Bio-Diversity

- The variety of organisms found within a specific geographical area

Bio-Diversity

- The variety of organisms found within a specific geographical area
- Plants
- Animals
- Insects
- Micro-organisms

Bio-Diversity

- The variety of organisms found within a specific geographical area
- Plants
- Animals
- Insects
- Micro-organsims
- The more variety a ecosystem has, the more stable it is.

Bio-Diversity

Traditional urban and suburban landscapes (even parks), tend to eliminate natural biodiversity.



Bio-Diversity

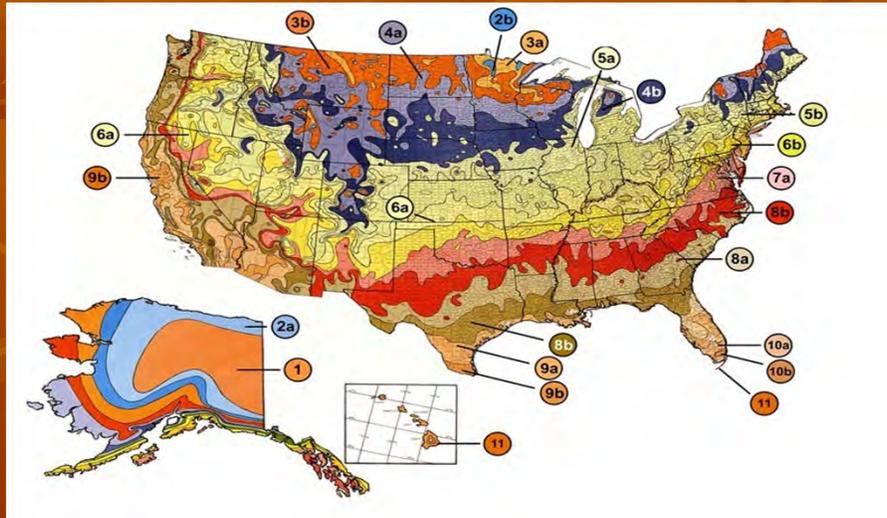
- When the natural diversity is eliminated or damaged, invasive and exotic species can, and probably will, replace it.

Bio-Diversity

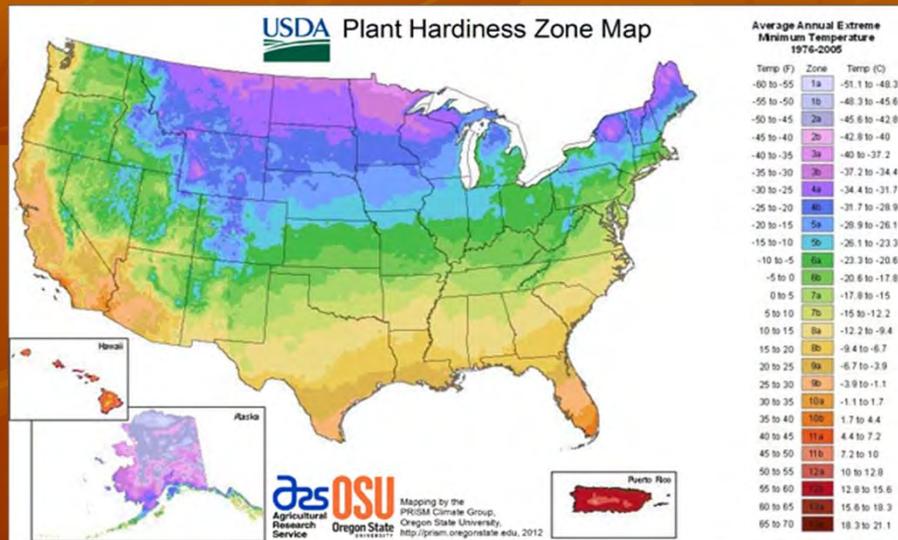
- When natural diversity is eliminated, invasive and exotic species will replace them
- The best way to control invasives is to keep them out from the very beginning



2011 USDA Plant Hardiness Zone Map



New USDA Zone map



Missouri Soil & Climate



Missouri Ecosystems

- Forest
- Savannah
- Prairie
- Wetlands
- Glades
- Caves
- Rivers and Streams

What do you have in your yard (park)?



Starting Out

- Selecting the right plants for the right place
 - Soils
 - Water
 - Light
 - Slope
 - Aspect
 - Topography and elevations

Here's where the TreeKeepers come in!



Grindstone Nature Area

- Conversion of old cropland to native prairie/savannah
- Management of Bush Honeysuckle, Sirecia lespedeza and Callery pear hybrids
- Re-establishment of a bottomland ecosystem



Scott Blvd. Project



Scott Blvd. Planting

- Manage exotics (Johnson Grass)
- Restore bottomland forest ecosystem
- Stabilize the Hinkson Creek floodplain





Garth Nature Area

- Establish a wetland system
- Replace fescue (non-native) with native grasses and forbes
- Planting of site-appropriate trees





Forum Nature Area

- Old Agricultural Fields
- Acquired by the city and turned into wetlands and a prairie restoration project.

Forum Nature Area

- Old Agricultural Fields
- Acquired by the city and turned into wetlands and a prairie restoration project.
- Land is perfectly suited for wetlands, but definitely not for prairie.
- As a result, it became a blank canvas for invasives.

Forum Nature Area

- Removal of pears and *S. lespedeza*
- Re-establishment of bottomland forest





Exotics and Invasives



Exotics

- Defining the nomenclature

Exotics

- Defining the nomenclature
 - Various terms: weeds, invasive plants, alien species, and non-native.

Weed vs. Exotic

- Weeds are undesirable plants in a specific location.

Weed vs. Exotic

- Exotic plants have been removed from their own native environments and transported to a foreign region.

Non-Native

- Non Native doesn't always mean "invasive"
- The vast majority of landscape plants which are introduced to our country are completely benign.



Exotic Plants



Exotic Plants

-non-native and invasive

Exotics

- Exotics out compete native plants.

Exotics

- Exotics out compete native plants.
- Create monotypic stands that reduce biotic diversity.

Exotics

- Exotics out compete native plants.
- Create monotypic stands that reduce biotic diversity.
- Degrades wildlife habitat.

Exotics

- Exotics out compete native plants.
- Create monotypic stands that reduce biotic diversity.
- Degrades wildlife habitat.
- Exotic plants can even aid in the success of exotic pests.

Control Methods

Control Methods

Manual Removal

- Hand Pulling, Digging, ect
- Cheap
- Eco- friendly
- Labor intensive

Control Methods

Chemical

- RTU (ready to use) chemicals
- Tordon: Cut stump treatments
- Round-Up: Foliar (leaves) treatment
 - can be used in concentrated form for cut stumps

Control Methods

Chemical

- Use your P.P.E!
 - Personal Protective Equipment
 - Gloves, long pants and shirt, eye protection
 - **THE LABEL IS THE LAW!**



Control Methods

Mechanical

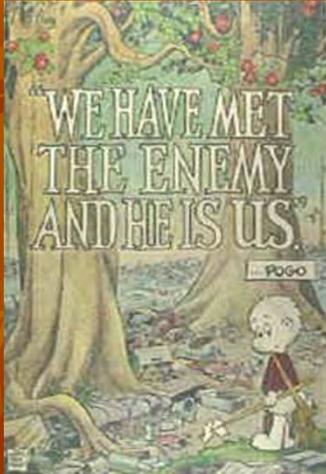
- Mower / string trimmers

Control Methods

Mechanical

- Mower / string trimmers
- A means to an end
- Most likely will not kill the plants
- Can help stress the plants

Identifying Invasive species



- Ultimately, we are responsible for bringing most of these plants here.
- We need to be conscientious about what else we bring in
-ex. Biomass fuels:
miscanthus vs. switchgrass

Bush Honeysuckle



- Brought into the United States from Asia as a ornamental shrub in the late 1800's .

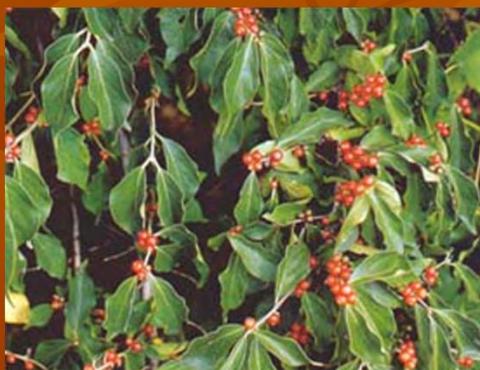
Bush Honeysuckle

- Brought into the United States from Asia as a ornamental shrub in the 1800's .
- Out competes all other under story species



Bush Honeysuckle

- Grows to a height of about 6-25 feet
- Has opposite leaves that are oval in shape
- Produces red berries by the thousands.



BH Control

- First shrub to bud out, and last to lose its leaves



BH Control

- First shrub to bud out, and last to lose its leaves
- Cut down and chemically treat the stumps (Tordon).



BH Control

- First shrub to bud out, and last to lose its leaves
- Cut down and chemically treat the stumps (Tordon).
- Foliar chemical application (Round-up).
- Easy to pull out when young



Japanese Honeysuckle

- Introduced from Japan in the 1900's
- Creeping vine used as a horticultural ground cover



Japanese Honeysuckle

- Has white to yellow tubular flowers from May-June



Japanese Honeysuckle

- Leaves are ovate and 1-3 inches long.



Control

- Herbicide application (Glyphosate)
- Cutting mowing and burning may control the spread, but will increase density of stems and regrowth

Winter Creeper *Euonymus fortunei*

- Introduced from Asia as an ornamental groundcover
- Can climb up to 70ft on trees
- Also spreads as a densely matted groundcover
- Weight of vines will literally tear down trees

Winter Creeper *Euonymus fortunei*



Winter Creeper



Winter Creeper

- Control Methods
 - Burning
 - Dig it up
 - Glyphosate (concentrated)
 - Tordon
 1. Foliar or on cut stems
 2. Foliar treatments will be persistent!

Autumn Olive

- *Elaeagnus* sp.
- Russian Olive out west



Autumn Olive

- Native to China, Japan, and Korea
- Introduced in the USA in the 1830's
- Used for wind breaks and erosion control.



Autumn Olive

- Grows to 20 feet
- Leaves are alternate on the stem, oval in shape, 1-3 inches in length, and lack teeth
- Thorns / spines



Autumn Olive

- Flowers are small and light yellow.
- Blooms appear in April/May
- Fruit is pink/red



Elizabeth J. Czaranata

Autumn Olive Control

- Spray cut stumps with herbicide
- Pull young saplings
- Mowing, burning, or cutting of plants will cause it to sprout vigorously!



Sericea lespedeza

- A native of Asia and introduced into USA in 1896
- Brought to Missouri in the 1930's
- Used for erosion control, livestock feed, and wildlife habitat



Sericea lespedeza

- Grows 3-6 feet
- Has many erect branches
- Leaflets are long with a wide midsection and narrowing at the base.



Elizabeth J. Czarapata

Sericea lespedeza

- The flowers are creamy-yellow
- The upper petal has two purplish-rose colored streaks.
- Typically flowering in April through June



Sericea lespedeza Control

- It is not classified as a noxious weed in MO.
- Mowing in the flowering stage for 2-3 years will slow its vigor.
- Burning it will break the dormancy of seeds in the soil
- Cycle of mowing, spraying, and reseeding can take several years.



Johnson Grass

- Introduced from the Mediterranean
- The Missouri Bootheel has over 300,000 acres infested with JG



Johnson Grass

- Leaves are 6-20 inches long
- Leaves have a white or light green mid-vein
- Seed head is pyramidal and a reddish purple color
- Grows to 8 feet



Johnson Grass

- JG is a aggressive perennial grass that spreads by seed and rhizomes.
- Mowing will minimize seed and rhizome production.



Johnson Grass Control

- Very hard to control once it is established
- Chemical Herbicides
- Hand pulling the grass/dig up roots is labor intensive but can work for small infestations.



Callery Pear

- Newly recognized as an invasive
- Originally thought to be sterile and unable to self-pollinate or cross pollinate



Callery Pear

- Photo: Scott Blvd and Smith Rd.



Grindstone Nature Area



Callery Pear Removal methods

- Basal bark spray



Callery Pear Control methods

- Basal bark spray
- Hack and spray



Callery Pear Removal methods

- Basal bark spray
- Hack and Spray
- Cut and treat stumps (Tordon)



Replanting with Natives



Replanting with Natives

- How do you define “Native”?
 - State boundaries?
 - Geographical regions?
 - Eco-regions?

Flowering Dogwood

Cornus florida



Flowering Dogwood

- Partial shade to full shade
- 20 – 30 ft. tall
- Bright red fruit eaten by birds

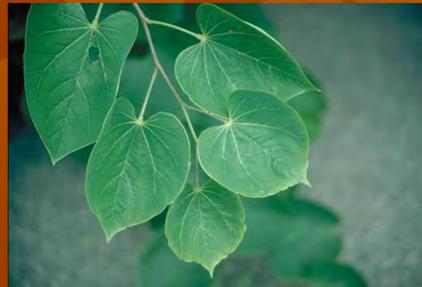


Redbud *Cercis canadensis*



Eastern Redbud

- Fast growing
- 20 – 30 ft.
- Moist soil





Blackhaw Viburnum *Viburnum prunifolium*



Blackhaw Viburnum

- Partial shade to full sun
- Well drained soil
- Fruit is palatable by humans and critters
- Can be found in both tree and shrub form



Sweet Spire
Itea virginica



Downy Serviceberry
Amelanchier arborea



Downy Serviceberry

- White flower, purple fruit
- Great fall color
- Moist soil
- Will sucker and spread



American Hophornbeam *Ostrya virginiana*

- Ironwood
- Prefers dry sites



American Hornbeam *Carpinus carolinia*

- Ironwood
- Musclewood
- Blue Beech
- Moist soils
- Transplants best in springtime



American Hornbeam



Red Horsechestnut
Aesculus x carnea



Ohio Buckeye
Aesculus glabra



Ohio Buckeye

- Full sun to partial shade
- Well drained soils



Other Options

- Mid Size
 - White Fringetree 25-30ft.
 - Shantung Maple 20-25ft.
 - Pawpaw 20-30ft. (needs good soil & shade)
 - Sumac: many varieties
 - Chokecherry up to 25 ft.

Other options

- Large Trees
 - Oaks and Hickories
 - Kentucky Coffeetree
 - Sassafras
 - Bald Cypress, Tulip Poplar, Blackgum

Acquiring (low cost) Plants

- MO Forest ReLeaf
- Missouri Dept. of Conservation
- Forest Keeling trees, grasses, perennials
- Missouri Wildflower Nursery
- Take a hike
- Take a chance
- Beware of the provenance of seed sources

References

- <http://hort.ifas.ufl.edu/woody/index.shtml>
- Dirr, Michael. 1990 Manual of Woody Landscape Plants. Stipes Pub. Co.
- <http://www.mdc.mo.gov/>