



Bio- Diversity, Vegetation Management & Exotics / Invasives

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Bio-Diversity

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

Bio-Diversity

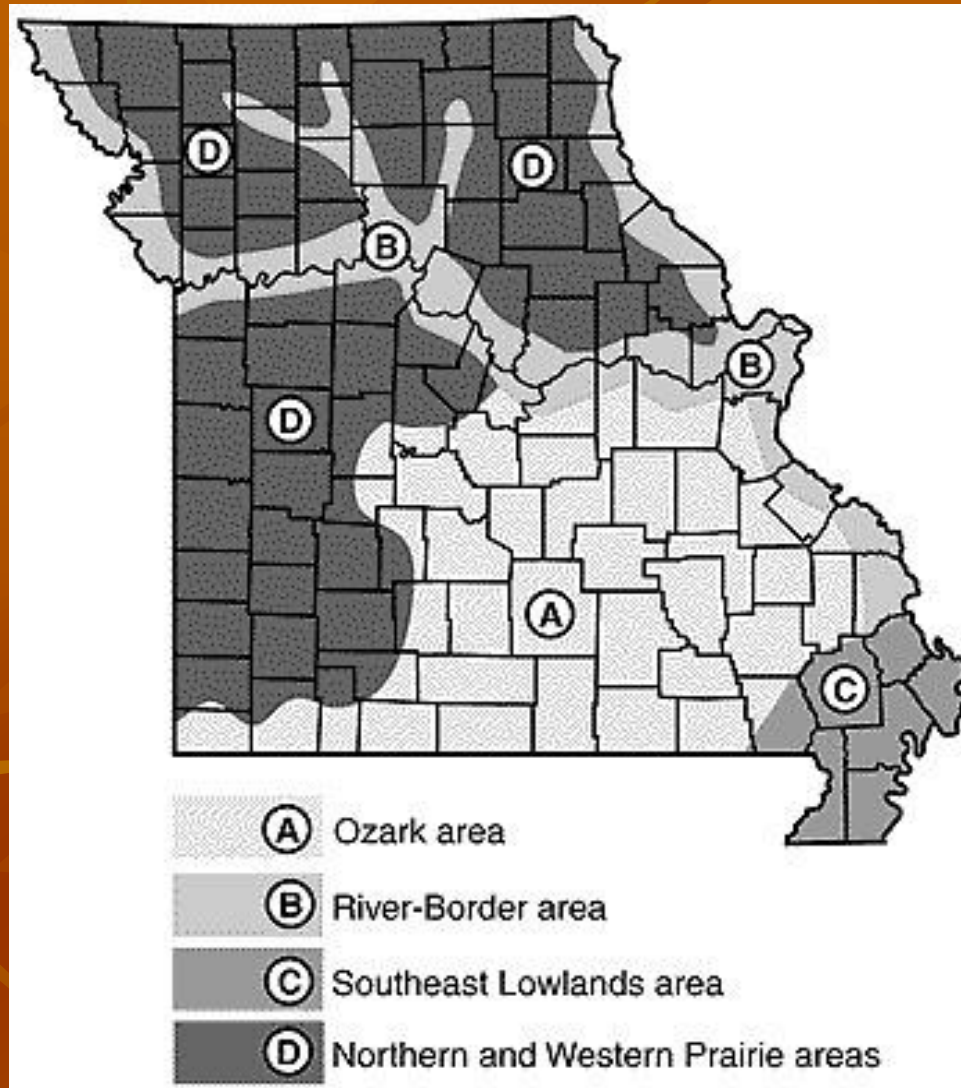
Traditional urban and suburban landscapes (even parks), tend to eliminate natural biodiversity.



Bio-Diversity

- When 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

Eco-Regions of Missouri



Missouri Ecosystems

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

What type of ecosystem does your yard look like?



Starting Out

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

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



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 Callery pear hybrids and *S. lespedeza*
- Re-establishment of bottomland forest





Exotics and Invasives

Invasive Plants

- Defining the nomenclature
 - Various terms: weeds, exotic plants, alien species, and non-native.
- Weeds are undesirable plants in a specific location.
- 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.

Invasive Plants

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

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
- Glyphosate (Round-Up): Foliar (leaves) treatment
 - can be used in concentrated form for cut stumps 25%-50%

Control Methods

Chemical Herbicides

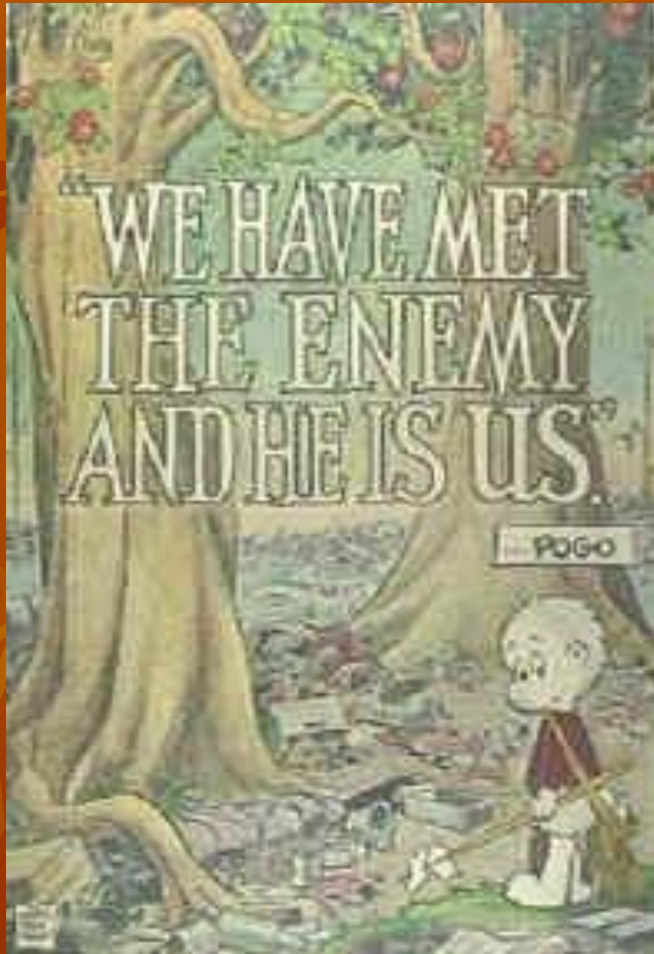
- Use your Personal Protective Equipment!
 - Gloves, long pants and shirt, eye protection
 - **THE LABEL IS THE LAW!**

Control Methods

Mechanical

- Mower / string trimmers
- A means to an end
- Most likely will not kill the plants
- Can help stress the plants
- Mow or cut during the flowering stage

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

- Out competes all other under story species
- Creates a monoculture and eliminates the biodiversity



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



BH Control

- Pull by hand when young or dig with hand tools.
- Cut down and chemically treat the stumps (Tordon or concentrated glyphosate).
- Foliar chemical application on small plants (Round-up).



Japanese Honeysuckle

- Introduced from Japan in the early 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 new growth

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
- Thick, waxy leaf that is evergreen or semi-evergreen

Winter Creeper

Euonymus fortunei



Winter Creeper



Winter Creeper

- Control Methods

- Cardboard layers covered by mulch
- Dig it up
- Round-Up is not very effective
- Tordon (2-4D)
 1. Apply to cut stems

Autumn Olive

Elaeagnus sp.

- Russian Olive out west
- 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, glossy green on top, silver on the underneath
- Thorns / spines



Autumn Olive

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



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 perennial 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.



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.



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.



Callery Pear

Removal methods

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



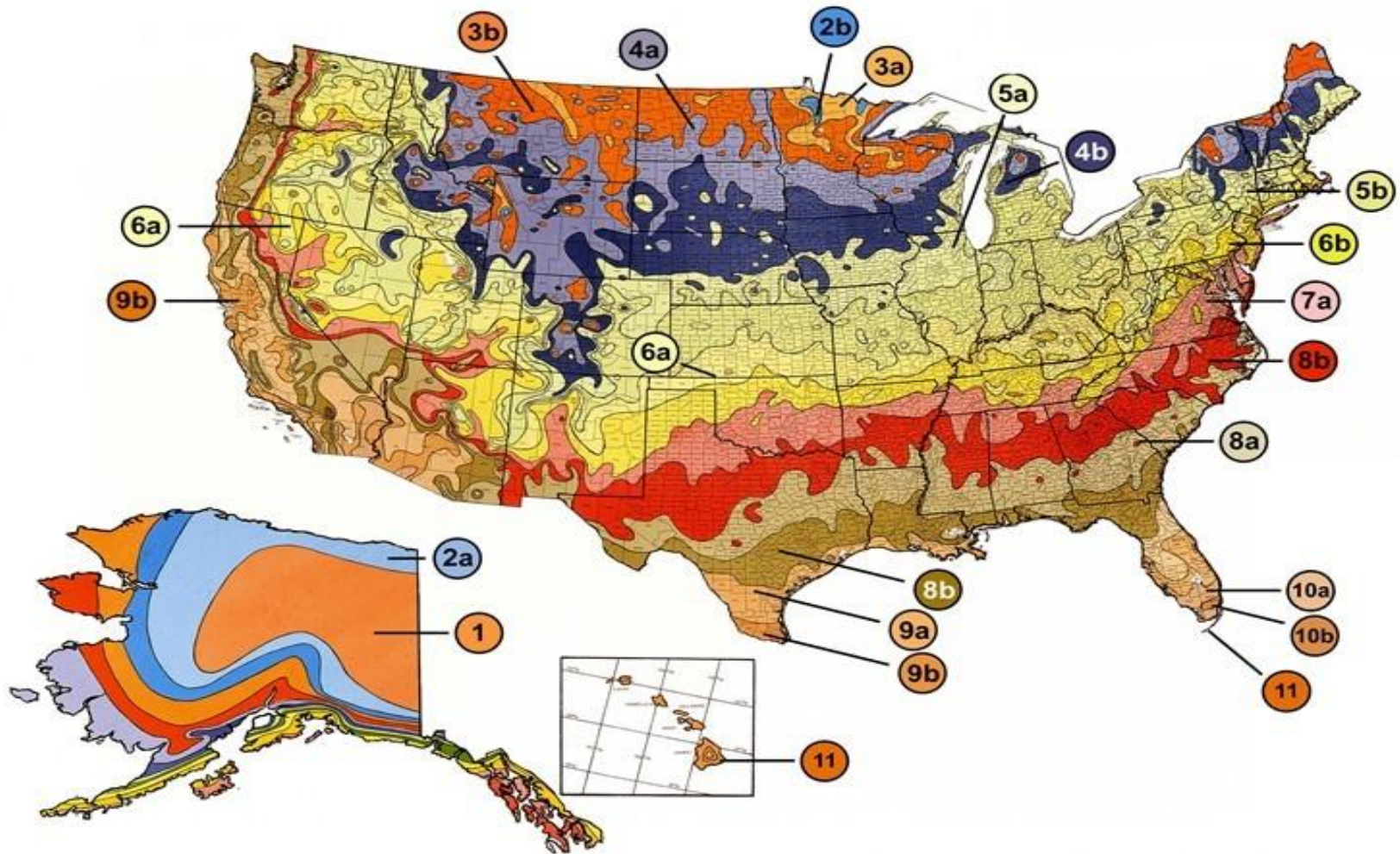
Replanting with Natives



Replanting with Natives

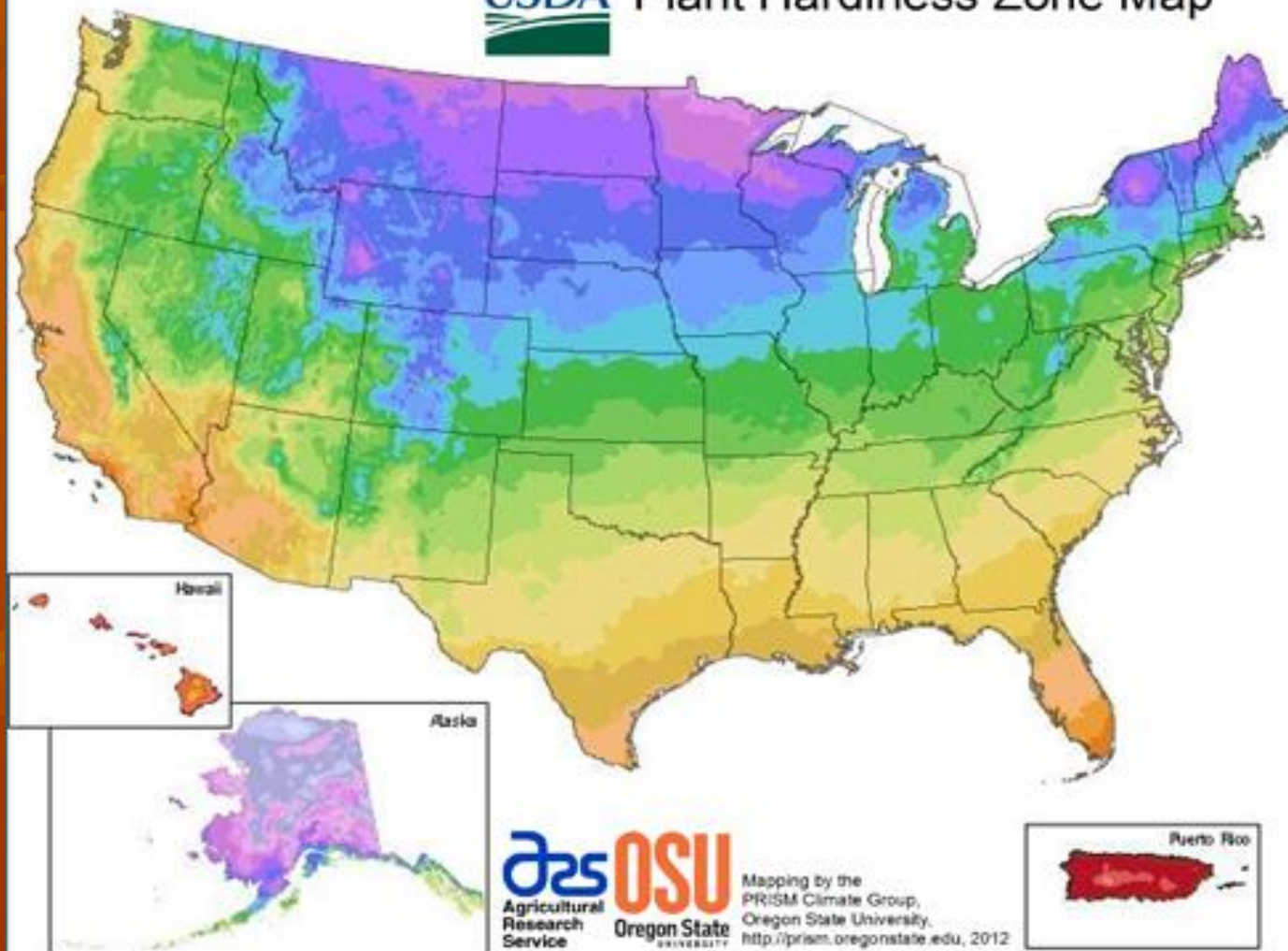
- How do you define “Native”?
 - State boundaries?
 - Geographical regions?
 - Eco-regions?

2011 USDA Plant Hardiness Zone Map



New USDA Zone map

USDA Plant Hardiness Zone Map



Average Annual Extreme Minimum Temperature 1976-2005

Temp (F)	Zone	Temp (C)
-60 to -55	1a	-51.1 to -48.3
-55 to -50	1b	-48.3 to -45.6
-50 to -45	2a	-45.6 to -42.8
-45 to -40	2b	-42.8 to -40
-40 to -35	3a	-40 to -37.2
-35 to -30	3b	-37.2 to -34.4
-30 to -25	4a	-34.4 to -31.7
-25 to -20	4b	-31.7 to -28.9
-20 to -15	5a	-28.9 to -26.1
-15 to -10	5b	-26.1 to -23.3
-10 to -5	6a	-23.3 to -20.6
-5 to 0	6b	-20.6 to -17.8
0 to 5	7a	-17.8 to -15
5 to 10	7b	-15 to -12.2
10 to 15	8a	-12.2 to -9.4
15 to 20	8b	-9.4 to -6.7
20 to 25	9a	-6.7 to -3.9
25 to 30	9b	-3.9 to -1.1
30 to 35	10a	-1.1 to 1.7
35 to 40	10b	1.7 to 4.4
40 to 45	11a	4.4 to 7.2
45 to 50	11b	7.2 to 10
50 to 55	12a	10 to 12.8
55 to 60	12b	12.8 to 15.6
60 to 65	13a	15.6 to 18.3
65 to 70	13b	18.3 to 21.1

OSU
Agricultural
Research
Service
Oregon State
University

Mapping by the
PRISM Climate Group,
Oregon State University.
<http://prism.oregonstate.edu>, 2012

Flowering Dogwood

Cornus florida

- 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



Downy Serviceberry

Amelanchier arborea



Downy Serviceberry

- White flower,
Delicious 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
- Very aesthetic bark and trunk characteristics



American Hornbeam



Red Horsechestnut

Aesculus x carnea



Ohio Buckeye

Aesculus glabra



Ohio Buckeye

- Full sun to partial shade
- Well drained soils



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 origin of your plants!

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/>
- [http://www.missouribotanicalgarden.org/
plantfinder](http://www.missouribotanicalgarden.org/plantfinder)