

# Conservation Planning Tools for Public Land Management

*Ronda Burnett*  
*November 06, 2019*



Presented by the  
**Missouri Department of Conservation**





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## OUR MAGAZINES

### Conservationist Magazine

Our monthly publication about conservation in Missouri—free to all residents.



### Xplor Magazine for kids

Xplor helps kids find adventure in their own backyard. Free to residents of Missouri.



## COMMUNITY CONSERVATION

### BENEFITS OF NATURE

Restoration of nature in cities is as much about people as it is about nature. Studies show social, environmental benefits.

#### Social Benefits

- Improves mood, concentration and self-discipline
- Reduces tension and violence
- Fosters social connections

#### Health Benefits

- Cools, reducing heat stress and heat-related illnesses
- Filters air pollutants, reducing cold and asthma
- Promotes exercise and reduces obesity

#### Environmental Benefits

- Improves air quality (and improves health)
- Manages stormwater
- Supports wildlife

#### Economic Benefits

- Leads to new training and employment opportunities
- Attracts investment and invigorates local economies
- Raises property values

## IN THIS SECTION

### Community Conservation Funding Opportunities

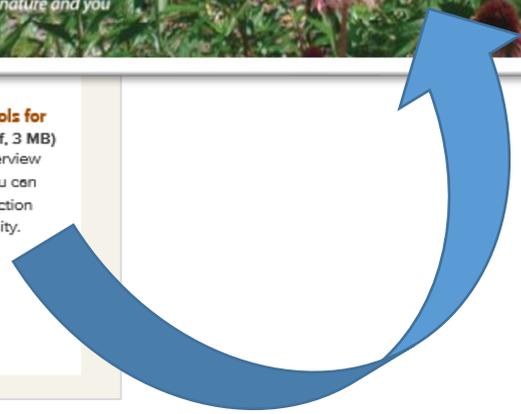
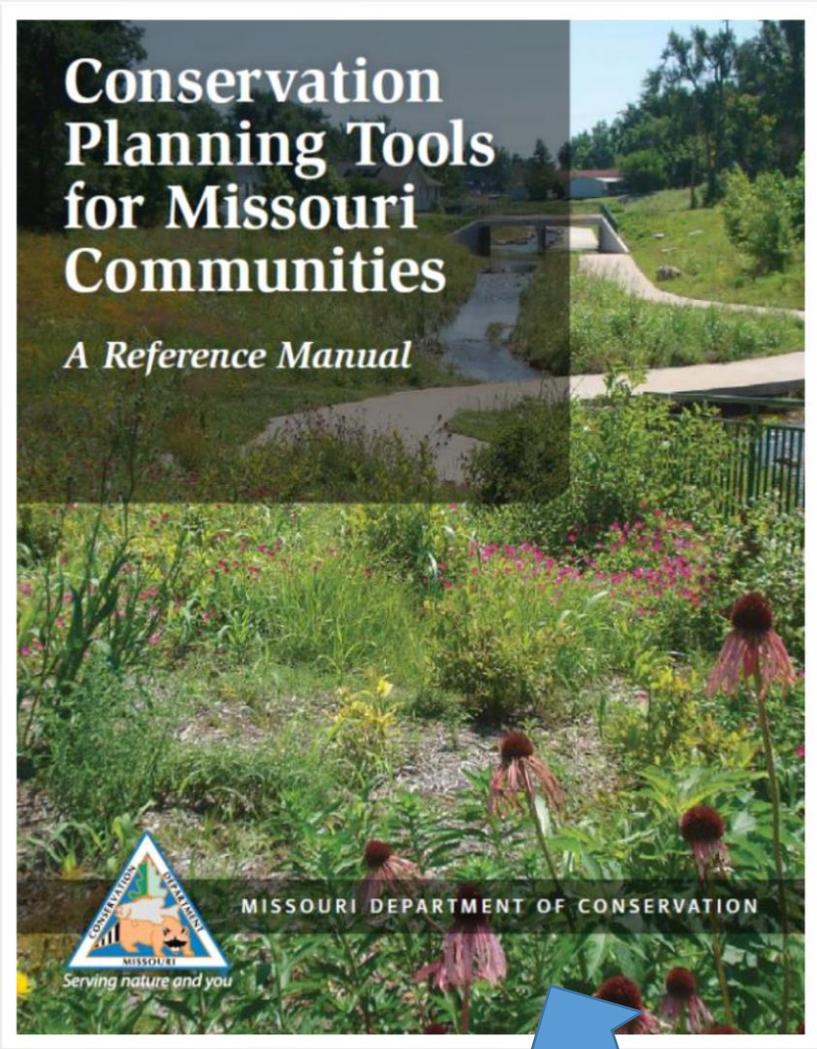
The Department of Conservation offers communities and partners a number of grant and cost-share options to assist with everything from green development, to wildlife habitat to enhancing outdoor recreation opportunities.

### Tree City USA

Every community can benefit from caring for their publicly owned trees and achieving Tree City USA certification. Find out how to participate.

### Conservation Planning Tools for Missouri Communities (pdf, 3 MB)

Download this 108-page overview of the planning tools that you can use to transform your jurisdiction into a conservation community.





What is a Conservation  
Community?



Public investments in infrastructure favor green over gray infrastructure where applicable. When integrated within the built environment and maintained for functionality, the natural systems and/or resources that comprise green infrastructure use ecosystem services to accomplish tasks that are traditionally associated with gray infrastructure, e.g., rainwater management, wastewater treatment, air quality protection, etc.

**a) Green infrastructure** consists of strategically planned and managed networks of natural lands and engineered systems, working landscapes and other open spaces that conserve ecosystem values and functions and provide associated benefits to human populations.

**b) Gray infrastructure** (aka built or constructed infrastructure) consists of man-made systems that support communities, including roads and other transportation systems, stormwater management systems, and utilities.



**Ecosystem services** are the benefits of nature to people, households, communities, and economies. There are:

- a) *Provisioning services*** such as food, fiber, fresh water;
- b) *Regulating services*** such as flood control, disease control, and climate regulation (carbon sequestration);
- c) *Supporting services*** such as soil formation and retention, crop pollination, and the nutrient cycling that maintains the conditions for life on Earth; and
- d) *Cultural services***, which are the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience including, e.g., knowledge systems, and social relations.





# *My Dearest Ulmus,*

“As I was leaving St. Mary’s College today I was struck, not by a branch, but by your radiant beauty. You must get these messages all the time. You’re such an attractive tree.”

Urban Forestry &  
Civic Engagement

A group of four people are gathered outdoors near a stream, examining a sample in a white container. The man on the right is wearing a yellow t-shirt with a logo that says "MISSOURI STREAM TEAM". The man on the left is wearing a green polo shirt. The woman in the center is wearing a blue denim jacket. The man in the background is wearing a green shirt and dark overalls. They are all looking intently at the sample, which appears to be a sediment sample from the stream bed. The background shows trees and a stream.

## Citizen Science Opportunities

- Missouri Forestkeepers Network
- Missouri Master Naturalists
- Missouri Stream Teams
- Nature in the City is a program in Fort Collins, CO where the public helps track wildlife



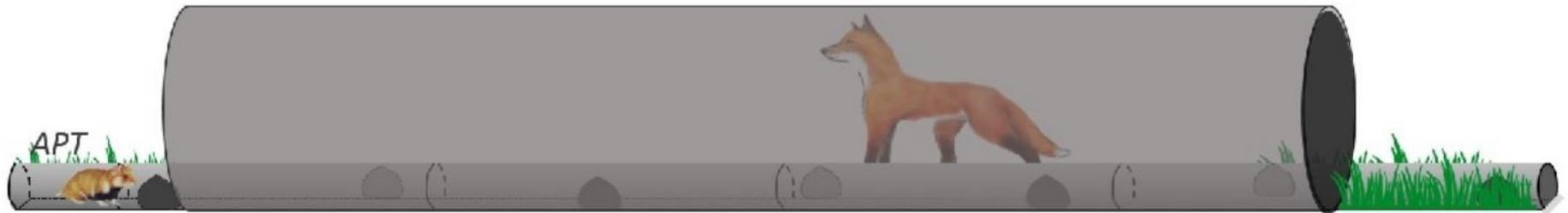
“Please relocate the deer crossing to a less busy stretch of road where it will be safer for them to cross. Thank you.”



[https://herberttiemens.wordpress.com/2015/12/30/exploring-the-cycle-highway-of-eindhoven/20151225\\_142559-2/](https://herberttiemens.wordpress.com/2015/12/30/exploring-the-cycle-highway-of-eindhoven/20151225_142559-2/)



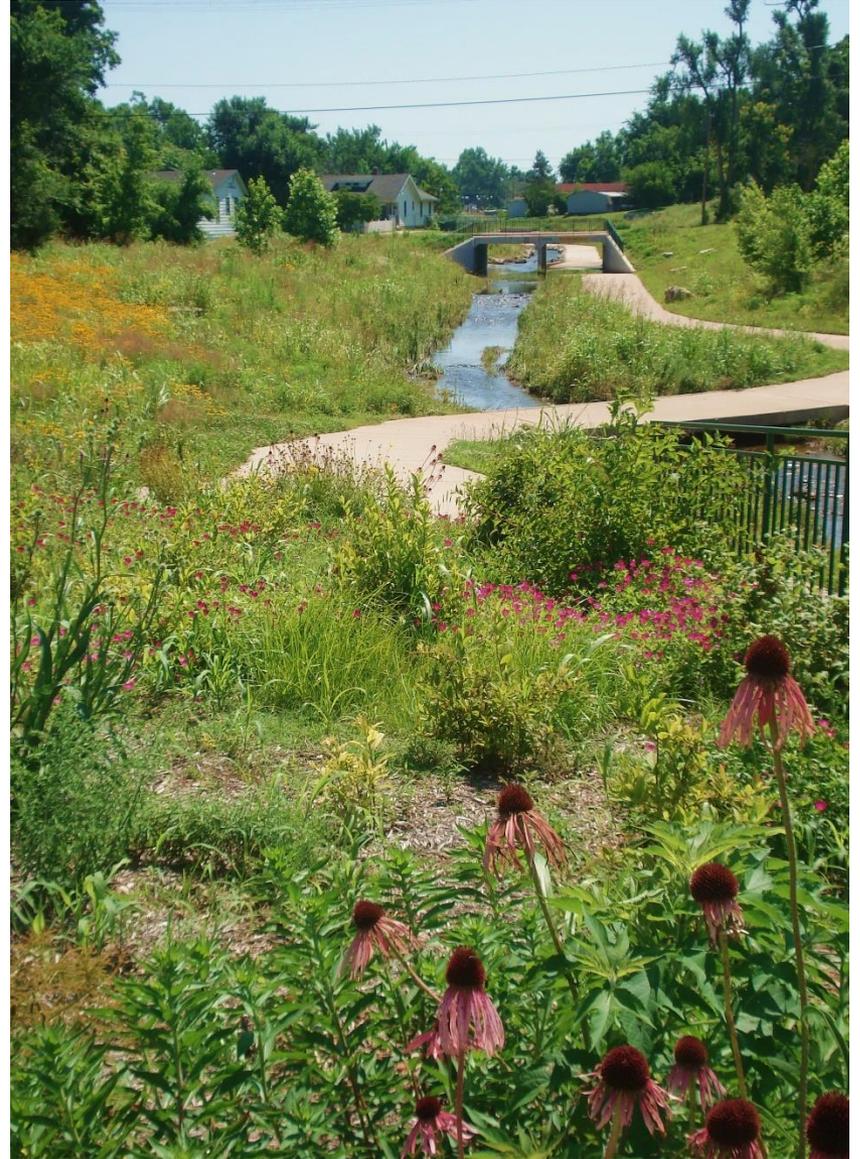
<https://www.theguardian.com/cities/gallery/2015/jul/16/urban-wildlife-crossings-highways-bridges-in-pictures>



<https://www.sciencedirect.com/science/article/pii/S0925857416304633>

**An anti-predation device to facilitate and secure the crossing of small mammals in motorway wildlife passages**







**Native Plant Garden**

These native plants provide food sources for beneficial insects and support songbirds and other cherished wildlife.

For native plant resources, see The Native Plant Society and [www.grownative.org](http://www.grownative.org)

**MONARCH WAYSTATION**



This site provides milkweeds, nectar sources, and shelter needed to sustain monarch butterflies as they migrate through North America. Certified and registered by Monarch Watch as an official Monarch Waystation.

**CREATE, CONSERVE, & PROTECT MONARCH HABITATS**

[WWW.MONARCHWATCH.ORG](http://WWW.MONARCHWATCH.ORG)



# Native Landscape

## Professional Certification Program



A native plant education and marketing program of



# Grow Native! Native Plant & Landscape Professional Proficiency Testing Program

## SECTIONS OF THE TEST:

- 1) Native plant identification, botanical terminology, growing conditions, and plant communities
- 2) Native plants and ecology (“plants with a purpose”)
- 3) Native plant design and aesthetics
- 4) Native plant installation, establishment, and maintenance

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## Native Landscape

*Professional Certification Program*



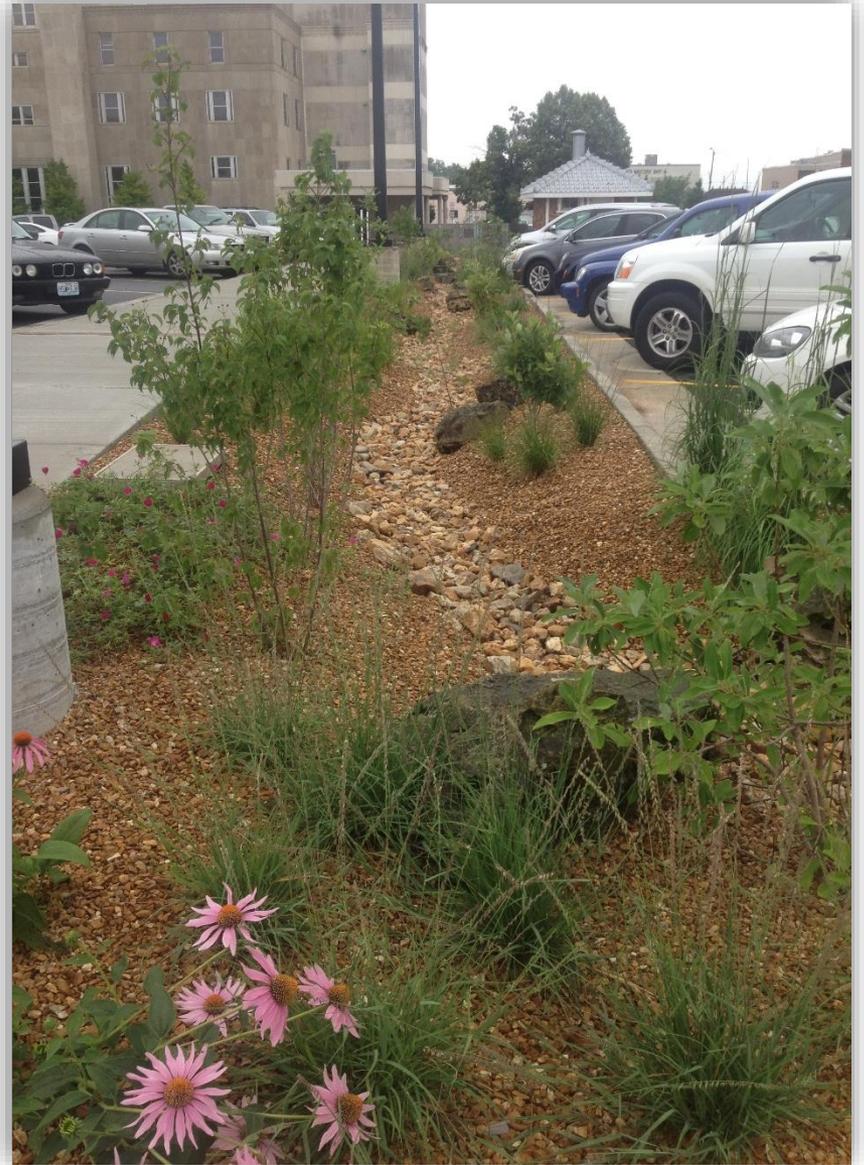
A native plant education  
and marketing program of



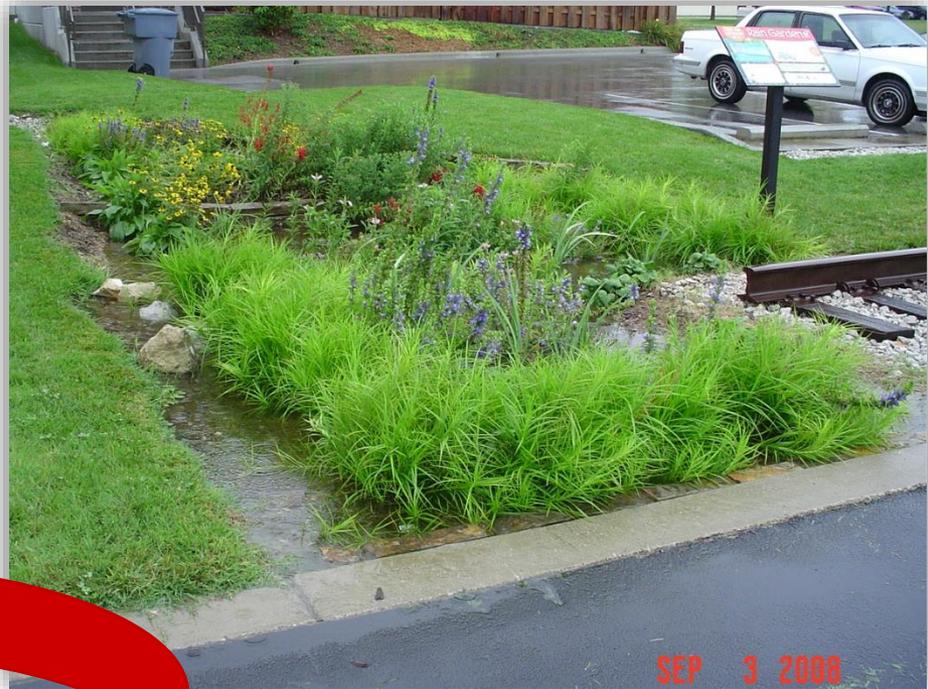
# Springfield, Missouri



**Before**



**After**







JUN 27 2007



WHERE  
DO I  
START





# Municipal Proclamations



# AUSTIN CHILDREN'S **OUTDOOR BILL of RIGHTS**

In which every child has the right to:

**Climb** a tree

**Catch** a fish

**Picnic** in a park

**Hike** a trail

**Ride** a bike

**Splash** in a creek or river

**Discover** plants and wildlife

**Play** in the sand and mud

**Gaze** at the night sky

**Chase** a firefly

**Plant** a seed and watch it grow

**Harvest** and eat a fruit or vegetable



Understanding that research shows children who learn and play in nature are healthier, happier and perform better in school, we enthusiastically support this Children's Outdoor Bill of Rights.

Learn more at [www.austintexas.gov/ccn](http://www.austintexas.gov/ccn)



Children in Nature  
Collaborative of Austin



# Know your code

Code reviews can uncover unintentional barriers to conservation practices such as a requirement for curbs around parking lot medians or a prohibition on tall plants in landscaping.



# Planning Process

*Planners advocate for the public interest and therefore shall have a special concern for the long-term consequences of present actions.*

- American Planning Association

- **Ecological Sites**
- Geography
- Geology
- Natural communities
- Vegetation
- Wildlife

Natural Resource  
Inventory



- With public and community leaders, develop a vision and goals for conservation.  
Consider:
- Ecosystem value & management (economics)
- Land ethic (environment)
- Social equity (3 E's)

Community  
Vision and Goals



- Who
- When
- How much
- **Planning tools**
- Monitor

Implementation  
Plan



# Missouri's Ecological Sites



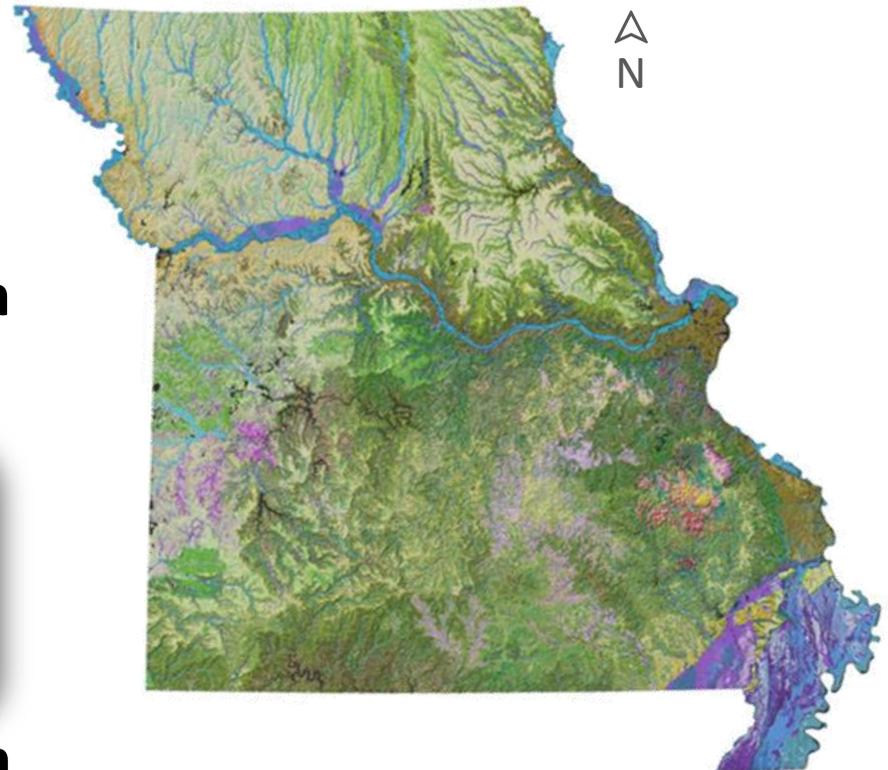
**Soils**



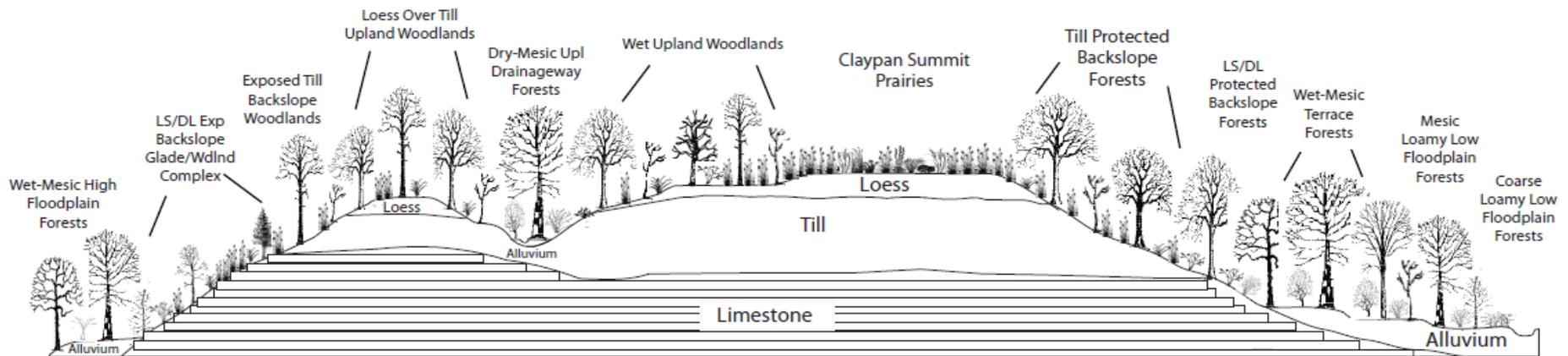
**Vegetation**



**Landform**



- 1) **LANDSCAPE POSITIONS** are identified within a given landscape.
- 2) **PARENT MATERIALS** are then used to further subdivide landforms.
- 3) **SOIL PROPERTIES** are then used to further subdivide landform/parent material groups



- 4) **Potential natural communities** are then tied to each land unit, resulting in **ECOLOGICAL SITES**

# ESD reports on the FOTG

## Ecological Site Description

### Shallow Igneous Knob Glade

Major Land Resource Area 116C  
St. Francois Knobs and Basins



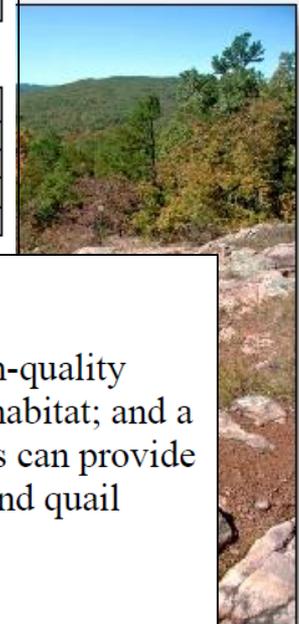
#### Reference State Plant Community

##### Canopy Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
BLACKJACK OAK	<i>Quercus marilandica</i>	0-5	15
POST OAK	<i>Quercus stellata</i>	0-5	20
EASTERN REDCEDAR	<i>Juniperus virginiana</i>	0-5	10

##### Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
WINGED ELM	<i>Ulmus alata</i>	0-10	5
WINGED SUMAC	<i>Rhus copallinum</i>	0-10	5
FARCKLEBERRY	<i>Vaccinium arboreum</i>	0-10	3
AROMATIC SUMAC	<i>Rhus aromatica</i>	0-5	3



#### Site Interpretations

##### Wildlife\*

- Wildlife habitat: oaks provide hard mast; numerous native legumes provide high-quality wildlife food; native warm-season grasses provide extensive cover and nesting habitat; and a diversity of forbs provides a diversity and abundance of insects. Post-burn areas can provide temporary bare-ground – herbaceous cover habitat important for turkey poults and quail chicks.
- Game species that utilize this ecological site include:

##### Grasses and sedges

Common Name	Botanical Name	Cover % (low-high)
CHRUCH MOUSE THREE AWN	<i>Aristida dichotoma</i>	5-10
PORCUPINEGRASS	<i>Hesperostipa spartea</i>	5-10
BROOMSEDE	<i>Andropogon virginicus</i>	5-10
WESTERN PANIC GRASS	<i>Dichanthelium acuminatum</i>	5-10
POVERTY OAT GRASS	<i>Danthonia spicata</i>	5-10
LITTLE BLUESTEM	<i>Schizachyrium scoparium</i>	5-10
BUSH'S SEDGE	<i>Carex bushii</i>	5-10
INDIANGRASS	<i>Sorghastrum nutans</i>	5-10

#	Ecological
1	Igneous Up
2	Shallow Ig
3	Dry Igneou Backslope
4	Igneous Up Woodlands & Forests
5	Fragipan Igneous Basin Woodlands

# NRCS Web Soil Survey

Area of Interest (AOI)

Soil Map

Soil Data Explorer

Download Soils Data

Shopping Cart (Free)

View Soils by Use: All Uses

Intro to Soils

Suitabilities and Limitations for Use

Soil Properties and Qualities

Ecological Site Assessment

Soil Reports

Search

Ecological Sites

Open All Close All

All Ecological Sites

View All Ecological Sites Info

View Options

Dominant Ecological Site Map

Ecological Sites by Map Unit Component Table

Basic Data

Ecological Site Type Forestland

View All Ecological Sites Info

- F115BY001MO — Deep Loess Upland Woodland
- F115BY003MO — Deep Loess Protected Backslope Forest
- F115BY031MO — Loamy Floodplain Forest
- F115BY043MO — Deep Loess Exposed Backslope Woodland
- F116AY011MO — Chert Upland Woodland
- F116AY042MO — Sandy/Gravelly Floodplain Forest
- F131AY002MO — Natric Terrace Flatwoods
- F131AY003MO — Wet Loess Terrace Forest
- F131AY010MO — Loamy Floodplain Forest
- F131AY012MO — Wet Backswamp Forest
- F131AY013MO — Swamp
- F131AY015MO — Sand Terrace Woodland
- F131AY017MO — Sand Dune Swale Forest
- F134XY014MO — Wet Footslope Forest

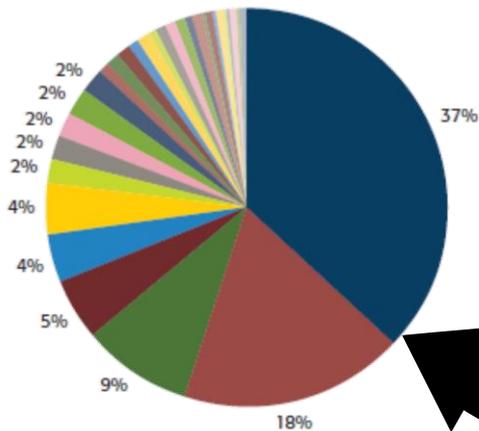
Map — Dominant Ecological Site — Forestland

Legend Scale (not to scale)

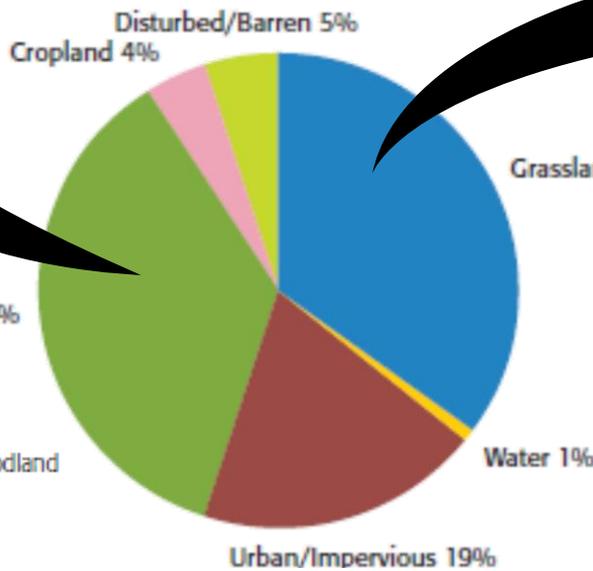


# Land Cover Mapping

## Columbia, Missouri



Tree canopy 36%



- Till Upland Woodland
- Loamy Floodplain Forest
- Loamy Upland Woodland
- Calcareous Limestone Exposed Backslope Woodland
- Loess High Terrace Forest

- Loess Upland Prairie
- Claypan Summit Prairie
- Till Upland Savanna
- Limestone/Dolomite Exposed Cliff
- Limestone/Dolomite Protected Cliff
- Wet Floodplain Prairie
- Wet Terrace Prairie

# The Planning Tools: Comprehensive Plans

**Comprehensive plans** are the foundational policy document for local governments. They establish a framework to guide decisions over the next 10 to 20 years.

Sustainability standards for comprehensive plans can be found in Report 578 from the Planning Advisory Service published by the American Planning Association.





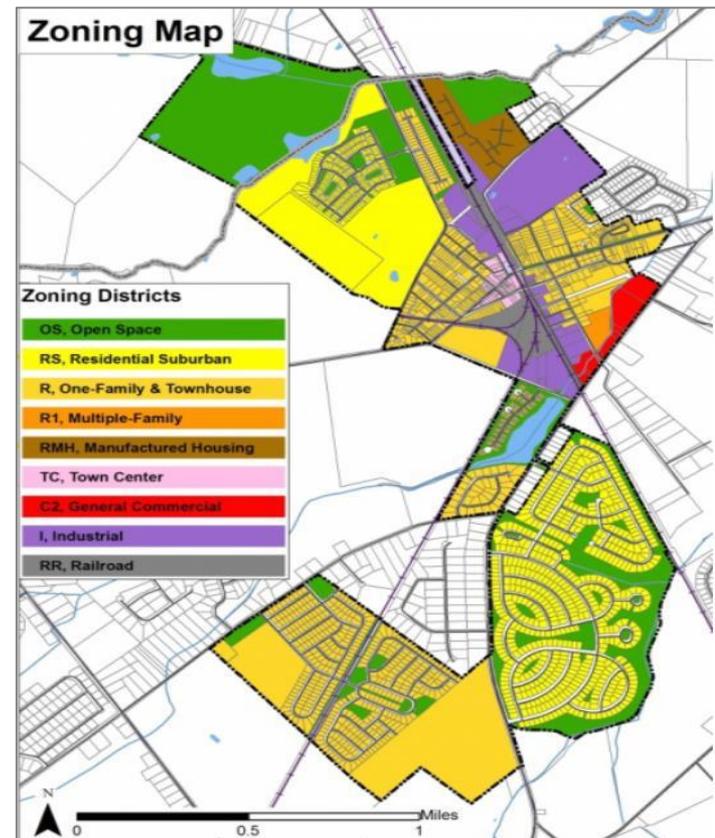
# The Zoning Code

The **zoning code** is the duly approved, enacted, and amended ordinance that controls and regulates land use in the city.

**Zoning** is the act of dividing a community into various districts and specifying the permitted and prohibited uses for each district. It is the exercise of a community's police powers in which utilization and development of privately owned land is regulated to promote the health, safety, morals or general welfare of the community. Designating land for different uses can protect natural resources, public health, and the economy.

# Base Zoning Districts

**Base zoning districts** use standard zoning classifications for purposes of development regulation specificity. When combined with an **overlay zone**, the base zone is also known as the **underlying zone**. Base zones shall apply unless expressly superseded by overlay zoning provisions.

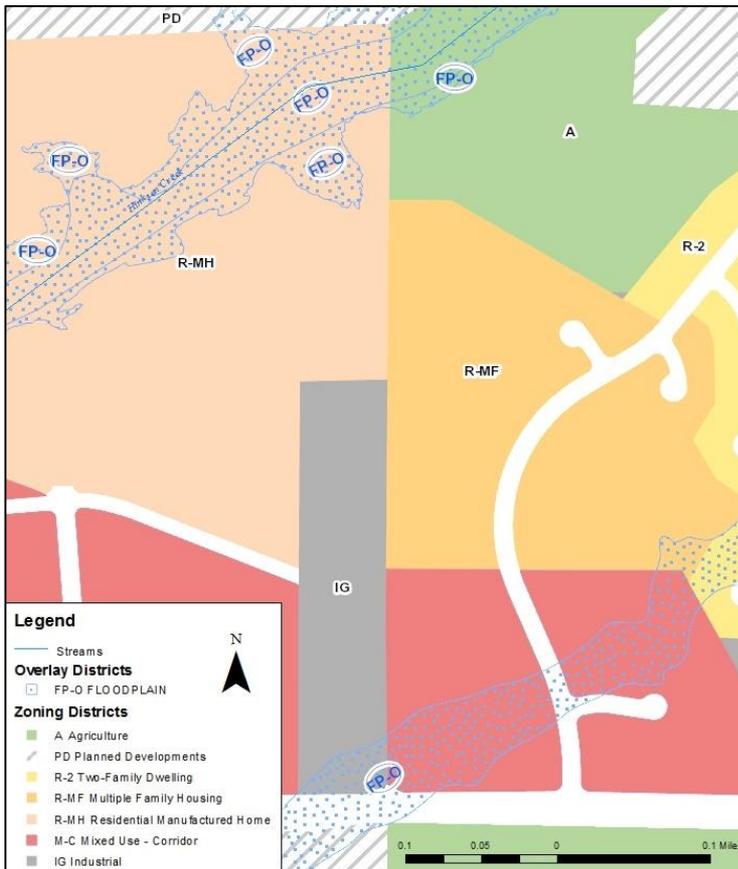




# Base Zoning Districts

- **Forestry zoning** protects a critical mass of commercial timberland and separates forestry operations from conflicting non-forestry land uses.
- **Floodplain zoning** implements public health and safety objectives by preventing development in areas where flooding could damage life and property.

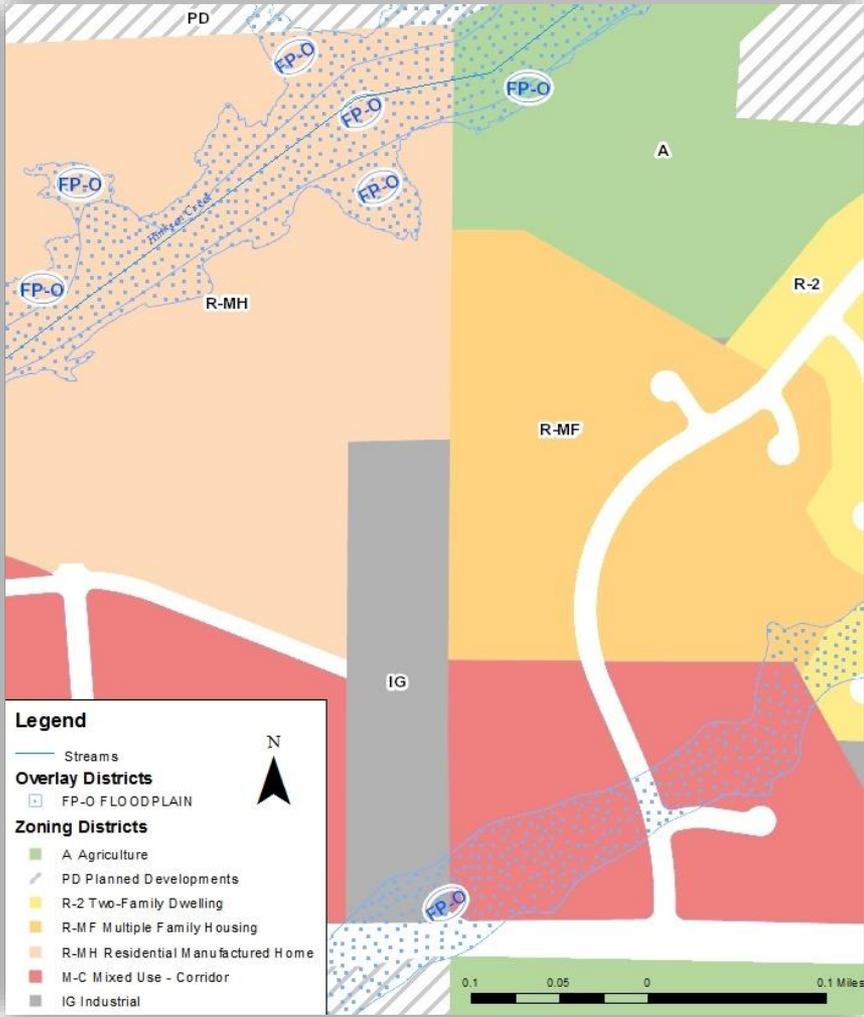
# Overlay Zoning Districts



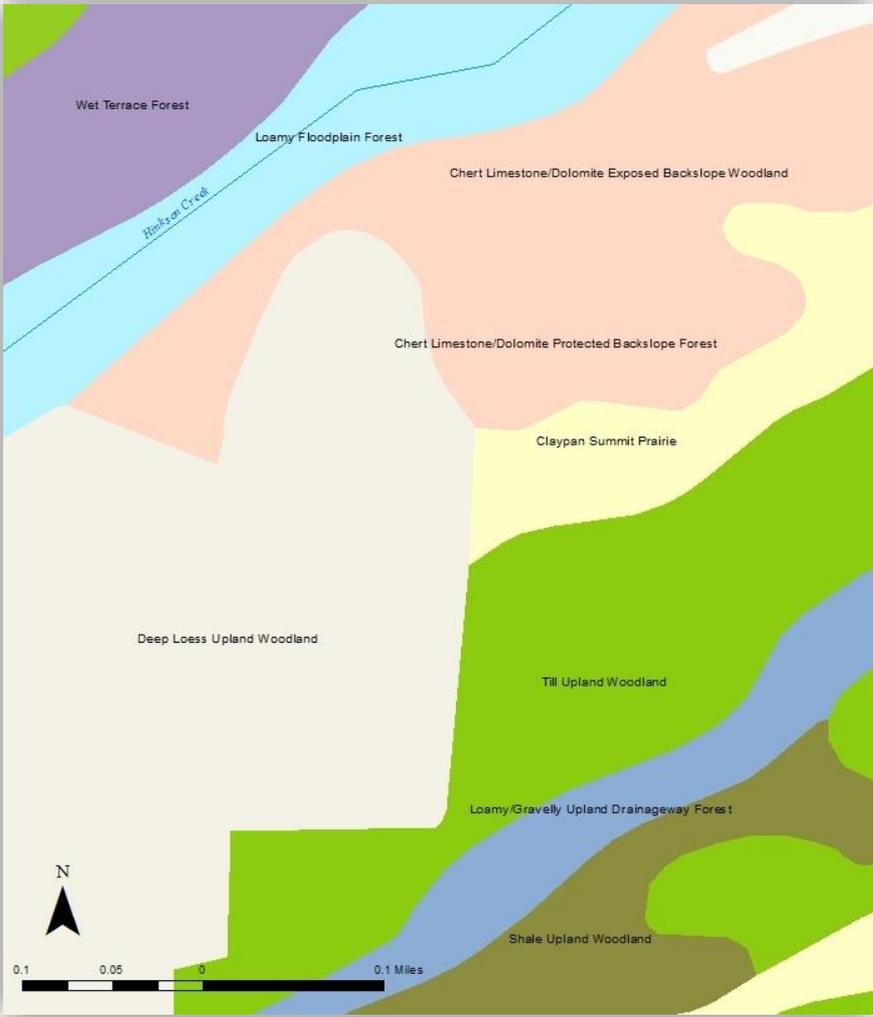
City of Columbia, Missouri

**Overlay zoning districts** address special land use circumstances or environmental safeguards and are superimposed over underlying zoning district(s). Permitted uses in the underlying zoning district shall continue subject to compliance with the regulations of the overlay district.

# Columbia, Missouri



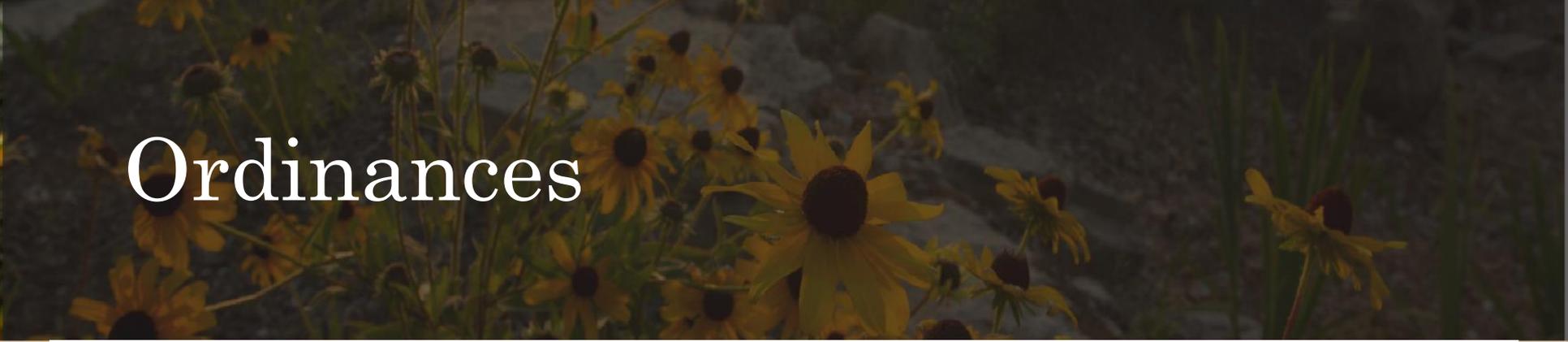
Zoning Map



Ecological Site Map

# Overlay Zoning Districts

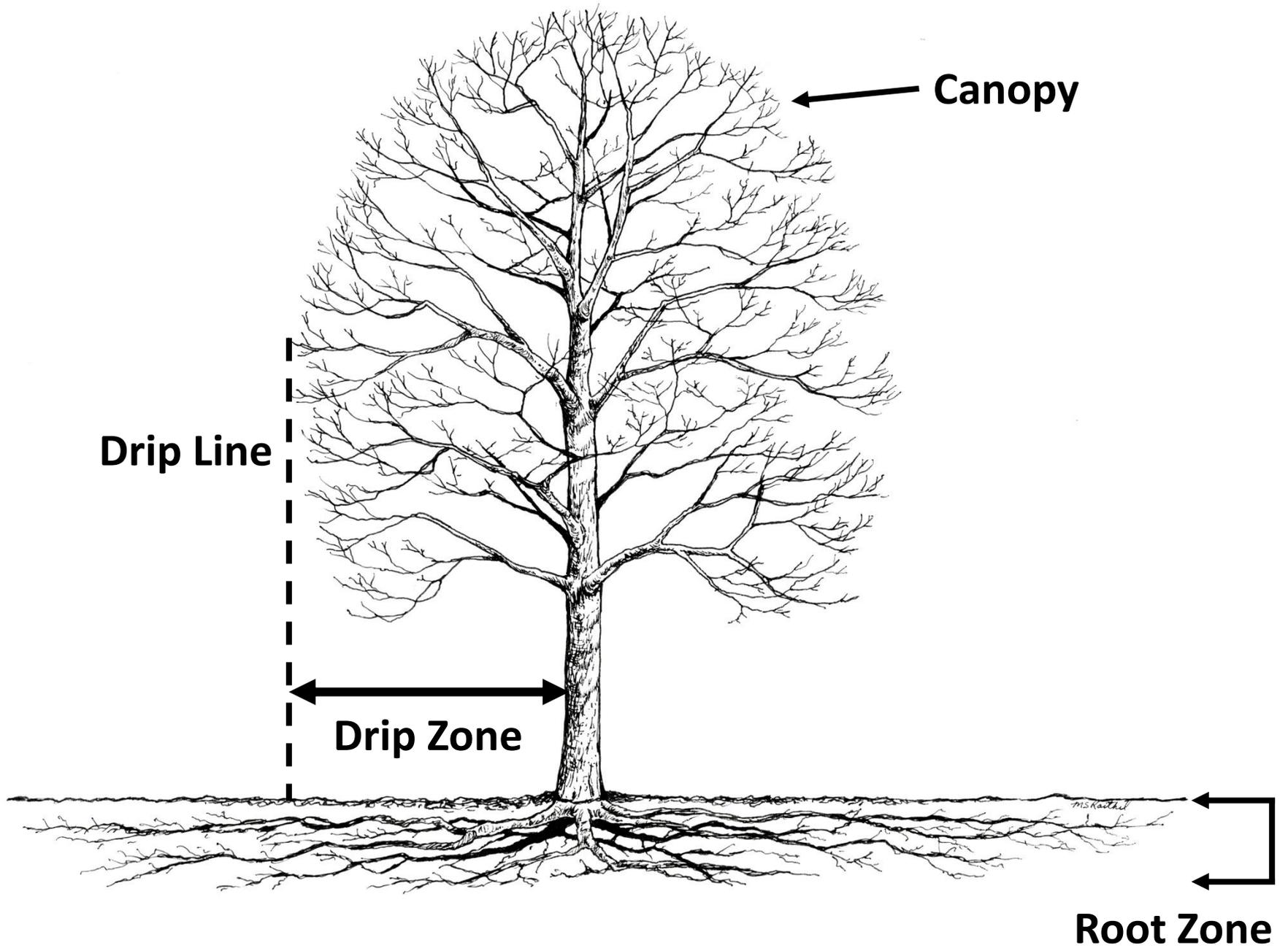
- **Green infrastructure overlay zoning** is explicitly concerned with establishing or enhancing a green infrastructure network, rather than protecting discrete natural features.
- **Lake watershed overlay zoning** protects the quality of water in a lake from nonpoint and point-source pollution by regulating land uses within the lake's watershed, while allowing flexibility of land use consistent with maintaining such quality.
- **Wildlife habitat overlay zoning** is a tool that can be used to reduce habitat fragmentation resulting from development and subdivision of land. It provides additional guidance for open space approaches to subdivision layout.



# Ordinances

**Ordinances** are laws or regulations set forth and adopted by a governmental authority, usually a city or county.

- **Tree preservation and protection ordinances** are used for the preservation, planting, maintenance, and removal of trees within a city.
- **Weed ordinances** are a specific type of plant ordinance that regulates nuisances such as unkempt landscapes and invasive, nonnative plant species.





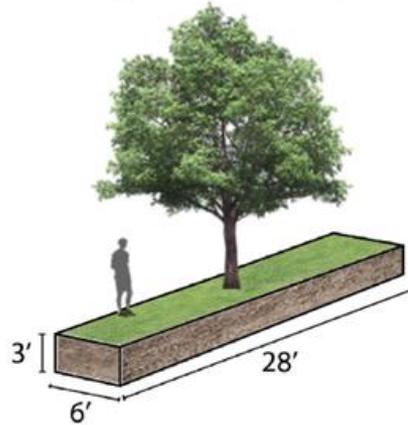
# Soil Volume

Estimate Crown Spread=  
10 feet diameter



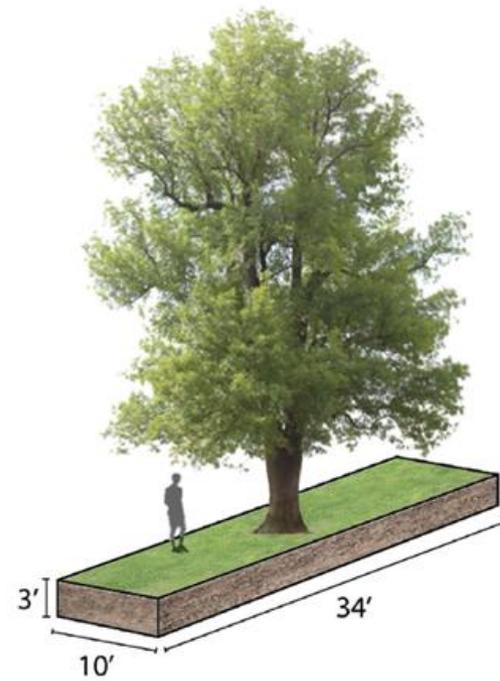
**Soil Volume = 120 cubic feet**

Estimate Crown Spread=  
21 feet diameter



**Soil Volume = 500 cubic feet**

Estimate Crown Spread=  
30 feet diameter



**Soil Volume = 1000 cubic feet**

# BRADFORD PEAR

*Pyrus calleryana*

INVASIVE



FLOWER



FORM



FALL

**HOW TO IDENTIFY** : Showy white foul-smelling flowers blooming in early spring. Oval, glossy, dark green alternate leaves with pointed tip turning purplish-red in fall.

**HOW TO REMOVE** : Cut tree down to stump and apply appropriate herbicide.

**NEGATIVE IMPACTS** : Competes for natural resources, invades urban and forested areas, shading out other native species and inhibiting forest regeneration. Seeds widely dispersed by birds.

## CHARACTERISTICS

**DECIDUOUS**

**SIZE** : 30' - 50'

**HARDINESS** : Zone 5 - 9

**GROWTH RATE** : Rapid



# YELLOW - WOOD

*Cladrastis kentukea*

NATIVE  
ALTERNATIVE



FLOWER



FORM



FALL

**LANDSCAPE VALUE** : Showy fragrant flowers in spring with beautiful fall color.

**OTHER NON-INVASIVE ALTERNATIVES** : Flowering Dogwood (*Cornus florida*), Fringe Tree (*Chionanthus virginicus*), Two-Winged Silverbell (*Halesia diptera*), Eastern Swampprivet (*Forestiera acuminata*), American Snowbell (*Styrax americana*), Serviceberry (*Amelanchier arborea*), Cockspur Hawthorn (*Crataegus crus-galli*), Sweet Crabapple (*Malus coronaria*), Prairie Crabapple (*Malus ioensis*)

## CHARACTERISTICS

**DECIDUOUS**

**SIZE** : 30' - 50'

**HARDINESS** : Zone 4 - 8

**GROWTH RATE** : Medium



## AN ORDINANCE

amending Chapter 11 of the City Code relating to landscape management; and fixing the time when this ordinance shall become effective.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. Chapter 11 of the Code of Ordinances of the City of Columbia, Missouri, is hereby amended as follows:

Material to be deleted in ~~strikeout~~, material to be added underlined.

### DIVISION 4. LANDSCAPE MANAGEMENT-WEEDS

Sec. 11-251. Definitions-Weeds defined.

As used in this division, the following terms mean ~~term "weeds" means~~:

*Exotic plant.* A vegetation species not native to the continent on which it is now found.

*Invasive plant.* A vegetation species that grows aggressively in the State of Missouri and is designated as invasive by the Missouri Department of Conservation.

*Landscape.* An alteration of surrounding landforms using ornamental and/or native vegetation including, but not limited to, trees, shrubs, wildflowers and grasses.

*Managed landscape.* A planned and designed yard or landscape that controls, directs, and maintains the growth of vegetation including, but not limited to, ornamental flower gardens and native landscapes.

*Native landscape.* A managed landscape that is designed to mimic the natural habitat types of Missouri as defined by the Missouri Department of Conservation, by exclusively using native plants including, but not limited to, trees, shrubs, wildflowers and grasses which are indigenous to the geographic area of the garden. Additionally, a managed native landscape is an area where non-native invasive and/or exotic plants are controlled.

Native plant. A vegetation species that is indigenous to a particular region, ecosystem, or habitat in geologic time as listed by the Missouri Department of Conservation including, but not limited to, certain wildflowers, shrubs, grasses and trees that are indigenous to the geographic area.

Noxious weed. A vegetation species that is listed as a Missouri State Noxious Weed by the United States Department of Agriculture.

Nuisance plant. A vegetation species known to cause death or severe allergic reactions among certain individuals including, but not limited to, poison hemlock (*Conium maculatum*), poison ivy (*Toxicodendron radicans*) and ragweeds (*Ambrosia* spp.).

Ornamental plants. Native or non-native vegetation planted for aesthetic reasons.

Turf grass. A type of ground cover comprised mainly of grasses including, but not limited to, bluegrass, fescue and ryegrass blends. Turf grass must be maintained at a height of no more than twelve (12) inches and managed by mowing to maintain a uniform height.

Turf weed. Broadleaf weeds and other annual and perennial grasses that invade or disrupt the uniformity of turf grass lawns.

Vermin harborage. A combination of dense vegetation, human infrastructure and refuse in an area that causes or could cause an overpopulation of rats or mice.

(1) ~~All vegetation, other than commonly known and recognized trees, decorative shrubs and ornamental grasses, which has attained a height of twelve (12) inches or more and which meets any one (1) of the following tests:~~

a. ~~Vegetation which may exhale unpleasant or noxious odors.~~

Sec. 11-252. Public nuisance—Weeds declared a nuisance.

Any growth of weeds on any lot or ground is hereby declared to be a nuisance.

(a) The following shall be declared to be public nuisances related to landscape management on a property:

- (1) Causing, permitting, maintaining or allowing turf grass or turf weeds to attain a height of more than twelve (12) inches.
- (2) Failing to prevent or mitigate against vermin harborage.
- (3) Failing to remove nuisance plants or noxious weeds.
- (4) Failing to remove vegetation that causes a safety hazard by obstructing the line of sight of a motor vehicle driver, bicyclist or pedestrian at a street intersection.
- (5) Failing to remove vegetation which could interfere with the passage of a motor vehicle, bicycle or pedestrian on any public right-of-way.

(b) Exceptions:

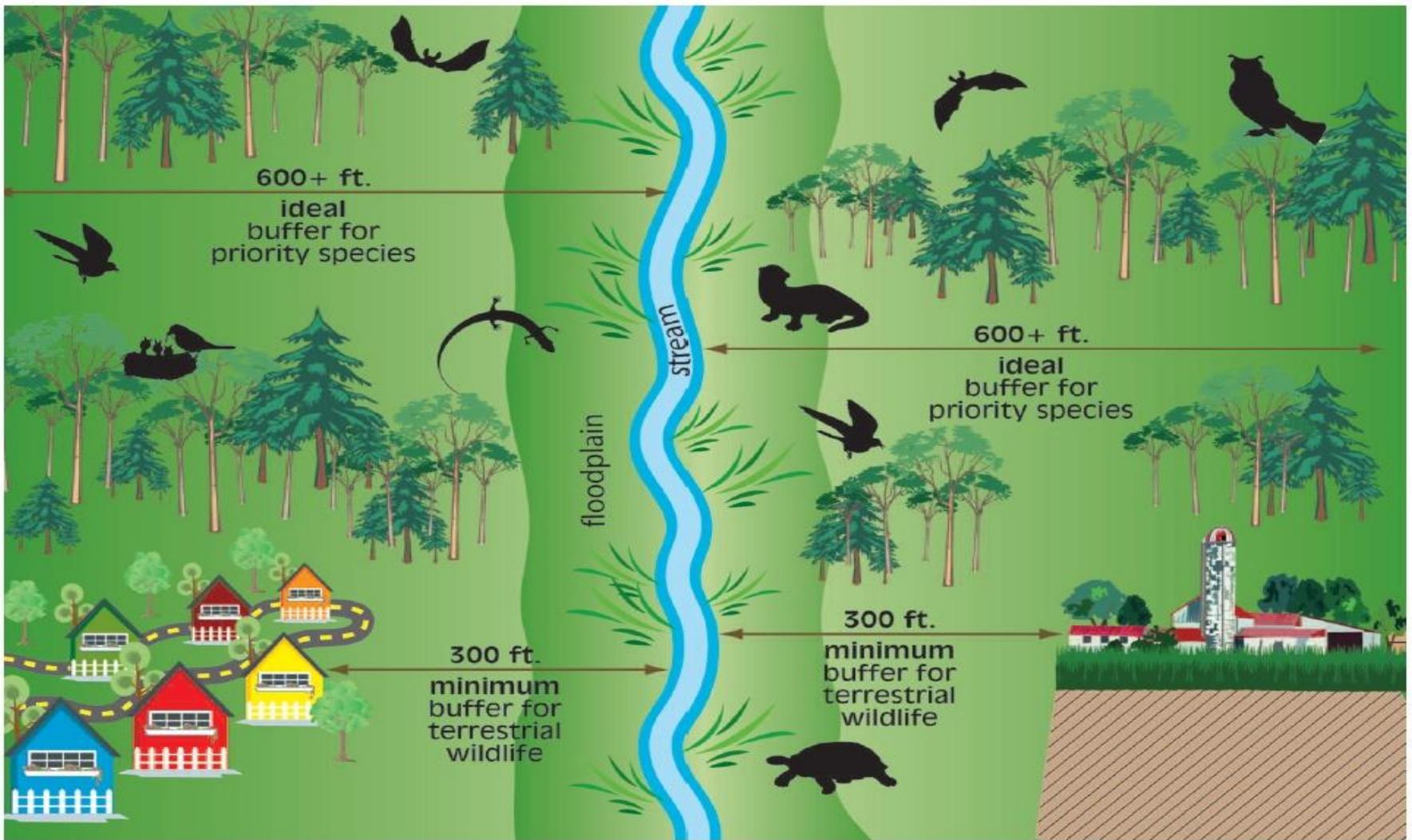
- (1) Managed landscapes of native and/or ornamental plants and vegetable gardens exceeding twelve (12) inches in height and which have gone to seed or developed to maturity are permitted provided they are maintained free of nuisance plants, noxious weeds, turf weeds or turf grasses, and does not exceed property boundaries into neighboring properties.
- (2) Cultivated agricultural crops exceeding twelve (12) inches in height and which have gone to seed are permitted provided there is a fifteen (15) foot buffer maintained free of turf weeds, nuisance plants, invasive plants or noxious weeds on the perimeter of the property wherever the property adjoins property used for residential or commercial purposes.
- (3) Managed landscapes of native and/or ornamental plants that comprise ninety percent (90%) or more of the total landscape area is permitted provided that it is devoid of non-native invasive plants, nuisance plants, and noxious weeds, and it contains a three (3) foot buffer area of vegetation that does not exceed a height of twelve (12) inches or a hardscape border including, but not limited to, a fence or wall that borders the perimeter of the landscape area where residential or commercial property boundaries meet.

Fort Lauderdale, FL



<https://media.mnn.com/assets/images/2015/08/ft-lauderdale-sea-turtle-sign.jpg> 838x0\_q80.jpg

**Outdoor lighting ordinances** are a regulatory tool for communities to control light pollution including glare, light trespass, and skyglow. Communities adopt this type of ordinance because they recognize the night sky as a natural resource or because they want to protect the habitat of nocturnal wildlife.



GRAPHIC BY KIMBERLY KC SCHOTT, RED GATE DESIGN

**Stream set back or buffer ordinances** create a “buffer zone” between a stream and adjoining land uses, by specifying where construction of buildings and other infrastructure is or is not permitted. The distance of the set back is based on a community’s goals such as protection of water quality or riparian habitat.

# Design & Development Regulations

**Codes** are mandatory and come in two basic formats: prescriptive and performance. A prescriptive path is a definitive approach to code compliance where construction materials and equipment must meet certain levels of stringency. Performance-based codes are designed to achieve particular results, rather than meeting prescribed requirements for individual components.

**Standards** establish the criteria against which a design can be judged. They can be used to direct or guide the external features of a development, as well as the relationships within the development site and between the development and adjacent uses.

# Building Codes



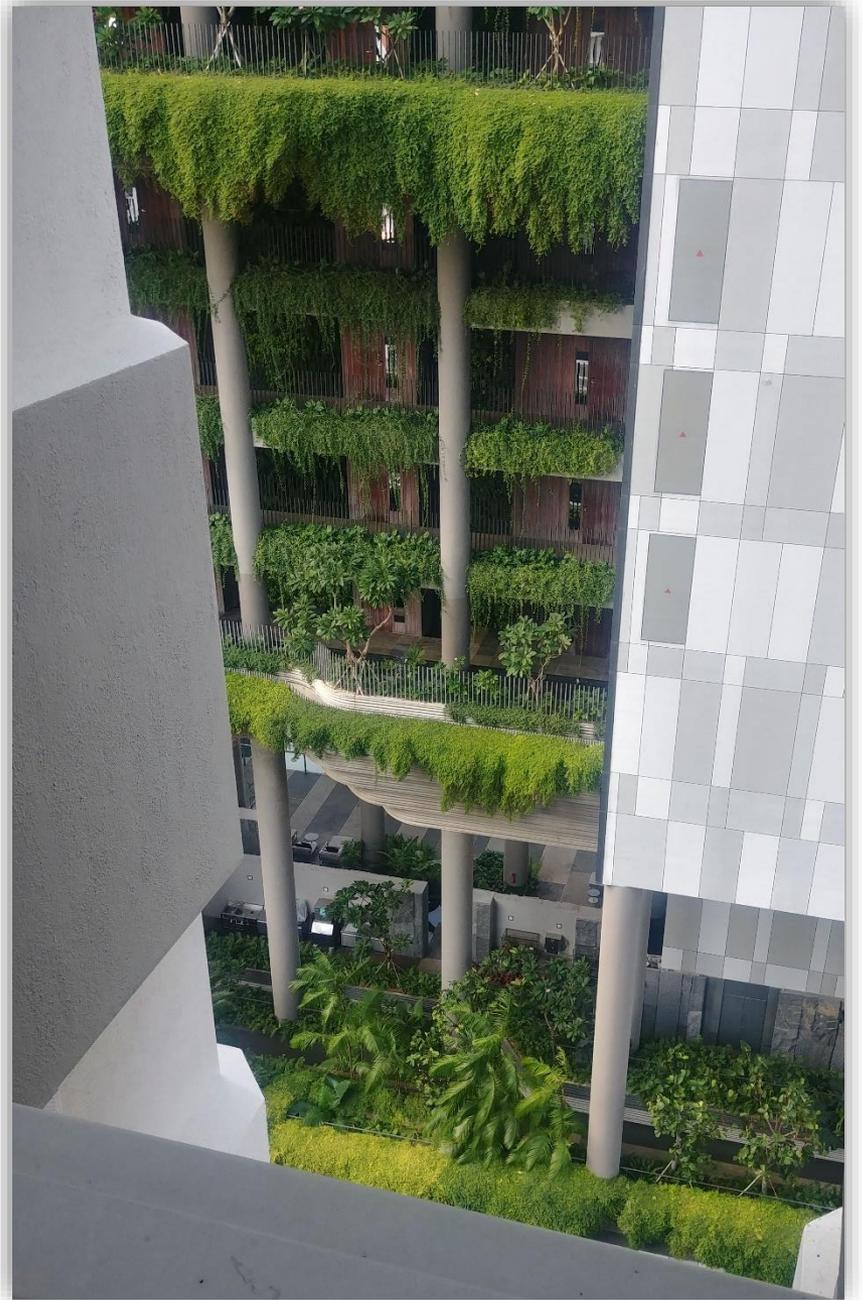
Photo: New York Audubon's "Bird-Safe Guidelines"



Photo: Lights Out SF

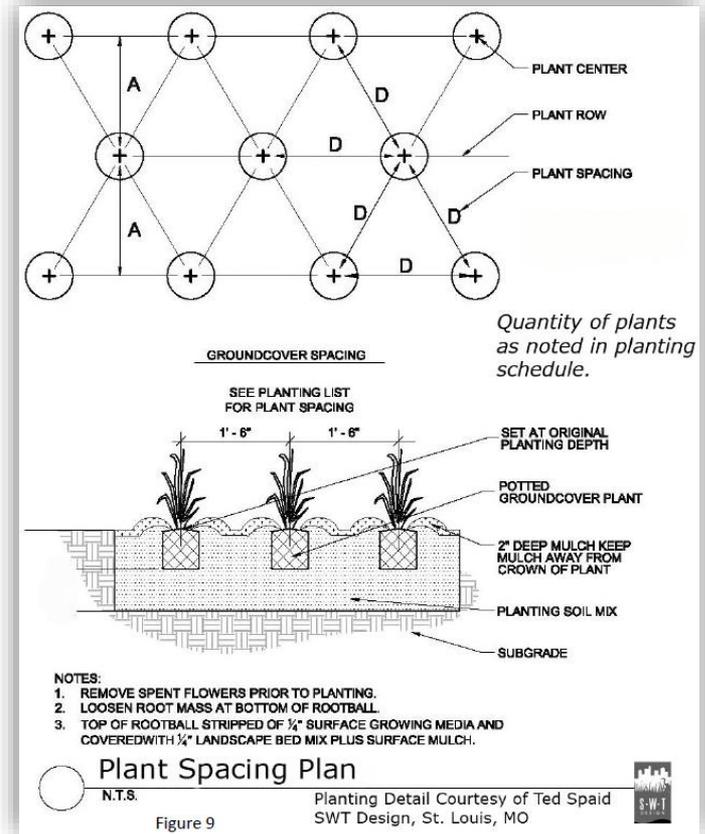
**Bird-safe building codes** aim to reduce bird deaths from collisions with windows by addressing items that enable birds to better see buildings such as exterior construction materials and lighting practices.





# Design Standards

- **Landscape design guidelines** communicate desirable plant selection and design qualities for planting of trees, shrubs, and other vegetation.
- **Site design standards** control the design and layout of new streets, lots, and parking areas and establish minimum setbacks or build-to lines for new structures. Through these standards, localities have considerable influence over the amount of impervious cover added by new development.



"Landscape Guide for Stormwater Best Management Practice Design – St. Louis, Missouri"

# Design Standards



Edminster Hinshaw Russ, Davidson Landscape Architecture, Legend Homes

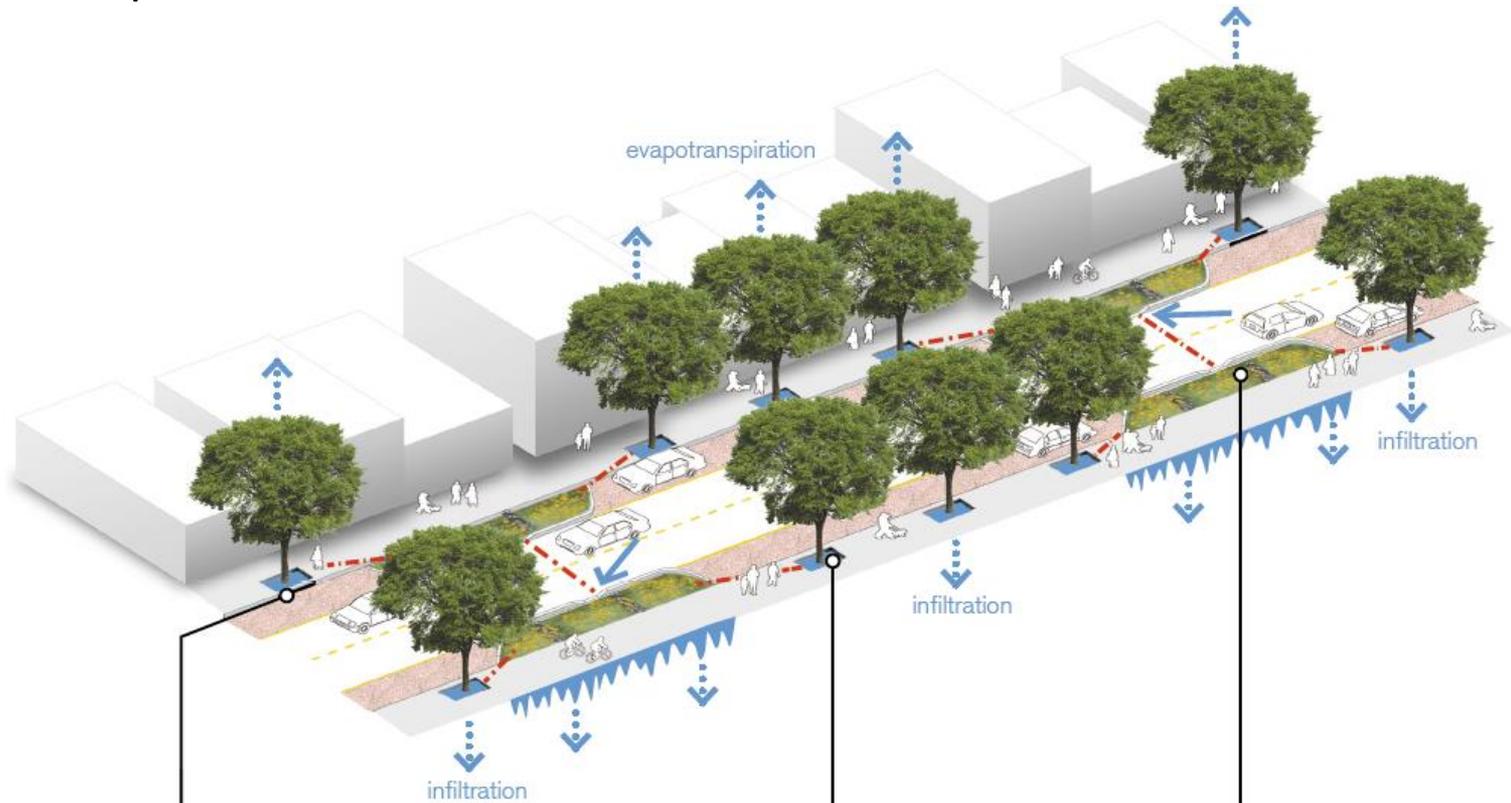
**Green infrastructure design standards** provide guidance to developers or public agencies regarding how to integrate natural resources into infrastructure.

# Development Strategies

**Development Strategies** establish an approach, pattern, layout, or location for development that achieves site-specific or community goals. Some strategies are intended to maximize creative design flexibility while others focus on natural resource conservation, human health considerations, or existing infrastructure.

- Infill development strategies locate new development on vacant or under-used parcels within existing urban areas that are already largely developed instead of on greenfields that contribute to urban sprawl.

**Low-impact development strategies** mimic natural processes that result in the infiltration, evapotranspiration, or use of stormwater to protect water quality and associated aquatic habitat.



### Slow

Cut curbs to allow for stormwater flow into curb extensions or other LID facilities. *Flow Control Devices* pp. 148-149

### Spread

Construct tree box filters along the right-of-way to filter and attenuate stormwater runoff during **one to two-year storm events**. Connect in a series or to rain gardens using perforated pipe to handle larger events. *Tree Box Filter* pp. 176-177

### Soak

Use curb extensions to retrofit existing parking lanes with rain gardens. This reduces impervious surface area, and encourages infiltration during **10 to 25-year storm events**. *Rain Garden* pp. 178-179

# Growth Management Strategies

**Growth Management Strategies** consist of techniques employed by a community that allow it to grow purposefully and avoid the pitfalls of urban sprawl. A community's growth management strategy enables it to determine its amount, type, and rate of growth, and channel it into designated areas.

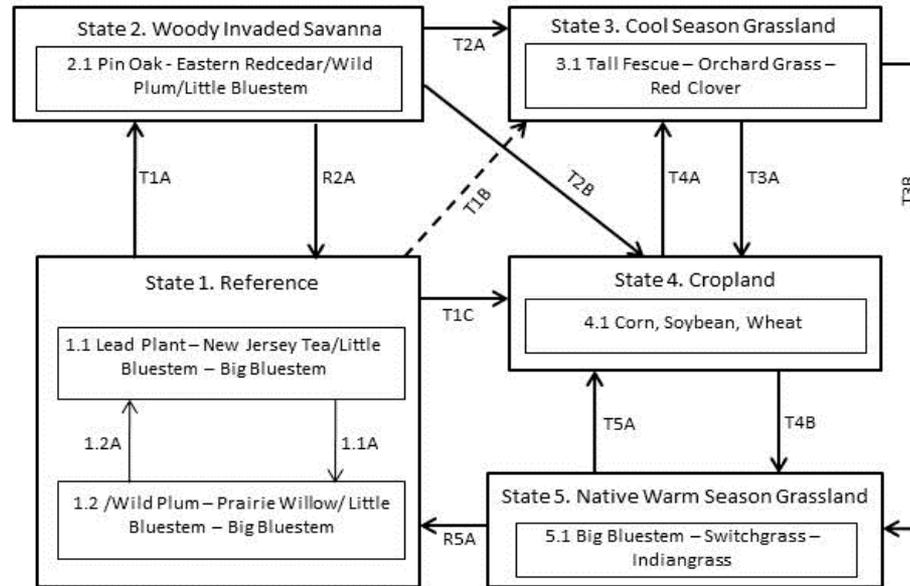
- Smart Decline is a type of growth management strategy that focuses on improving the lives of existing residents rather than exhaust city resources through hopeless efforts to increase population.

A photograph of a field of yellow flowers, possibly Black-eyed Susans, with dark brown centers. The flowers are in various stages of bloom and are set against a blurred background of more flowers and greenery. The lighting is soft, suggesting a natural outdoor setting.

# Management Plans

**Management Plans** establish a strategy and/or a work plan for achieving resource goals within a defined geography. They provide inventory and assessment information for the resource under management, they identify action items needed to implement the plan, and they estimate the cost of those actions. Functional plans establish goals and make recommendations regarding best management practices and proposed policy changes. Management plans are written to provide guidance on how to protect natural resources or mitigate nuisances such as invasive species

# Ecological Site Data: State Transition Diagrams and Public Land Management



Code	Event/Activity/Process
T1A	Fire suppression > 20 years; woody invasion
T1B	Tillage; vegetative seeding; grassland management
T1C, T3A, T5A	Tillage; conservation cropping system
T2A	Woody removal; tillage; vegetative seeding; grassland management
T2B	Woody removal; tillage; conservation cropping system
T4A	Vegetative seeding ; grassland management
T3B, T4B	Vegetative seeding; prescribed fire; grassland management
1.1A	Fire-free interval 10+ years
1.2A	Fire interval 1-3 years
R2A	Woody removal; prescribed fire 1-3 years
R5A	Vegetative seeding; prescribed fire 1-3 years

Loess Upland Prairie, R109XY002MO

# Management Plans

- **Integrated Water Resource Management Plans** are an emerging type of plan in which all aspects of how a community uses water, and how those uses relate to each other, are considered in a comprehensive manner. This one plan takes the place of individual water plans such as: stormwater, wastewater, potable supply, and water quality.
- **Invasive Species Management Plans** contain an inventory and assessment of undesirable plants found within a selected geography along with recommendations for how to control or eradicate them.
- **Watershed Management Plans** provide assessment and management information for land that is contained within a river basin.

# Management Plans

Under the Disaster Mitigation Act of 2000, local governments must adopt a **hazard mitigation plan** in order to access federal disaster mitigation funds. It contains, goals and recommendations related to reducing risk from identified natural hazards.

Thu, 12/14/2017 - 5:15pm

## Savannah receives grant to convert FEMA lots into tree nurseries

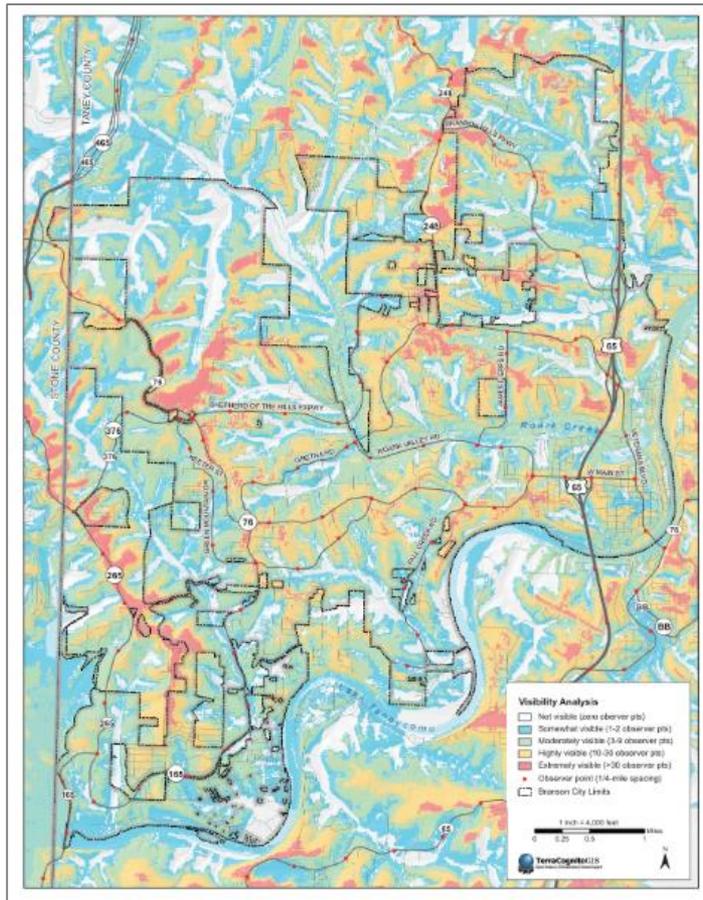
ERIC CURL

[eric.curl@savannahnow.com](mailto:eric.curl@savannahnow.com)



Savannah's sustainability director, Nick Deffley, discusses a new grant program to convert FEMA lots into tree nurseries to alleviate flooding and provide job training opportunities for unemployed residents. (Eric Curl/Savannah Morning News)

# Management Plans



A **viewshed management plan** limits development of areas within view from a defined observation point and is beneficial in communities that wish to protect aspects of their cultural heritage such as rural scenery or protect scenic views that are vital to an established ecotourism industry.

Branson's Community Plan 2030 contains a visual assessment survey of hillsides as seen from the major tourism routes through town. Regulations and development standards were established for areas identified as sensitive lands.

# Brownfield Remediation

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KS Bankers Awards

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### Phytoremediation Database

Through a cooperative effort with the NRCS Plant Materials Center, faculty in the Kansas State University Department of Agronomy developed a phytoremediation database. The database contains more than 120 contaminants and 1,130 plant species. There are more than 1,000 publications on the use of vegetation for phytoremediation and more than 25 case studies describing full-scale phytoremediation in practice.

The database was developed to facilitate the identification of plants that have potential for successful phytoremediation for specific contaminants. The database allows searching by contaminant or plant species, includes references to published research studies, and classifies the phytoremediation success based on eight phytoremediation mechanisms. More information about the database and about advantages and disadvantages of phytoremediation can be found in the KSU Extension publication "[Phytoremediation: Protecting the Environment with Plants.](#)"

The phytoremediation database is written in Microsoft Access 2002 format and is available for download at the link below.

Database Downloads [Version 1.0 August 2012](#)

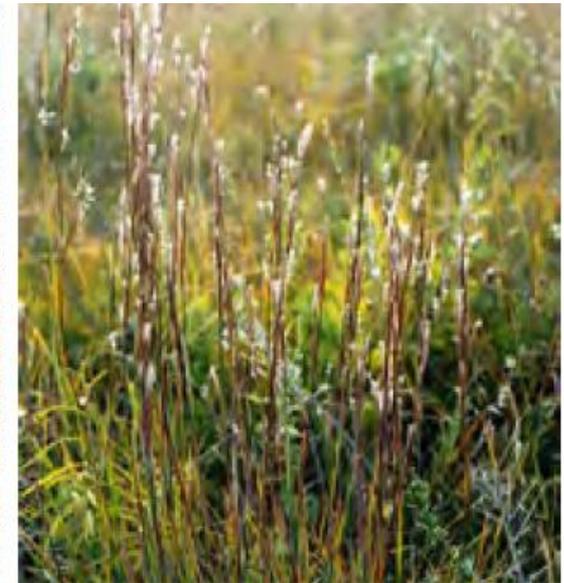
### Credits

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# Property Rights

**Property Rights** are privileges, often imagined as a “bundle of sticks,” that are associated with land ownership and balanced with state and local governments’ obligation to protect health, safety, and general welfare of citizens. Property rights include right to occupy and use property for an economically productive purpose, to exclude others, to convey title or ownership interests, and to convey by will the property to others.

# Conservation Easements

Voluntary legal agreements between a landowner and a land trust or government agency that permanently limit the use of land in order to protect its conservation values.

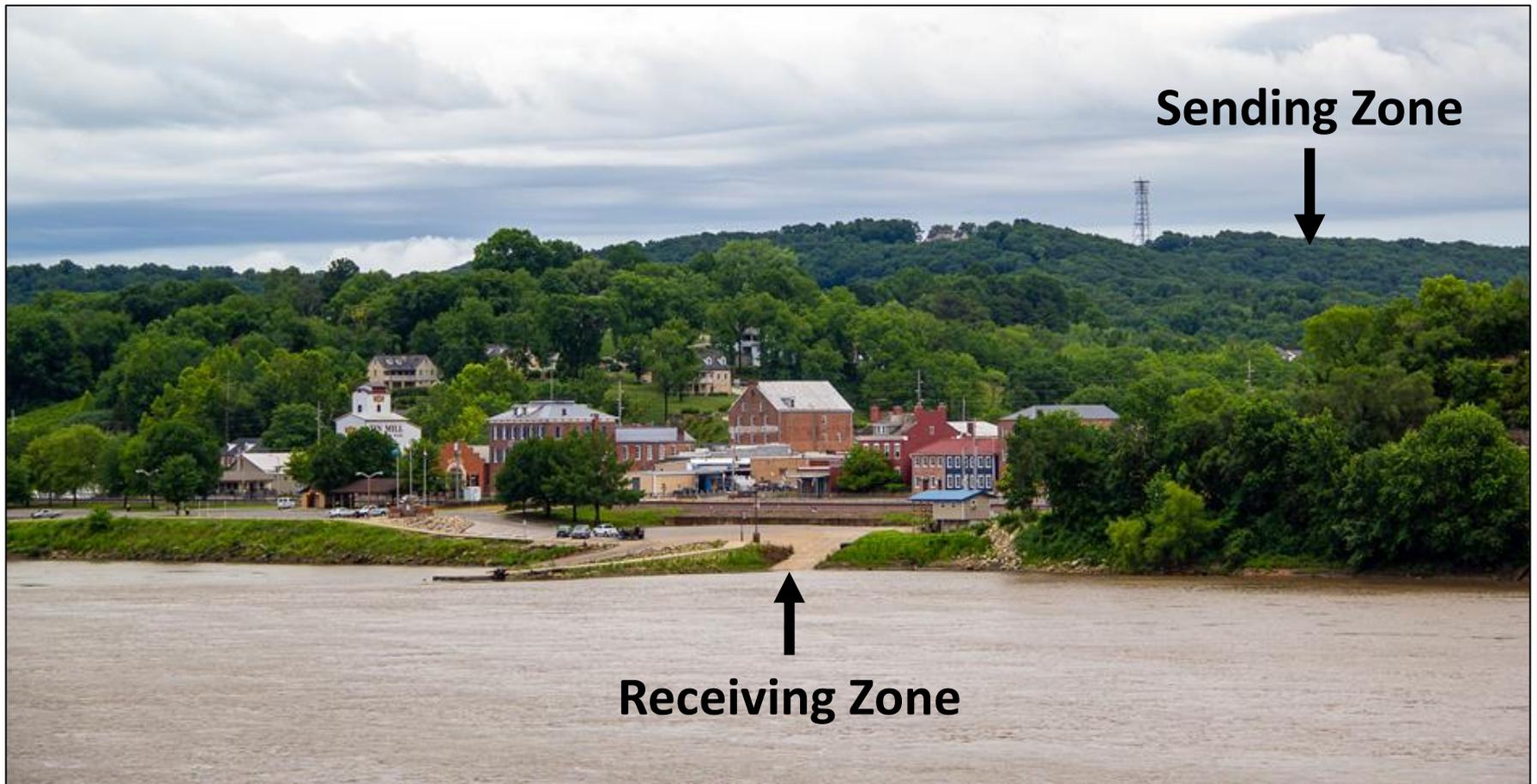


**OZARK**   
**LAND TRUST**  
Conservation Close to Home

[www.OzarkLandTrust.org](http://www.OzarkLandTrust.org)

# Transfer of Development Rights

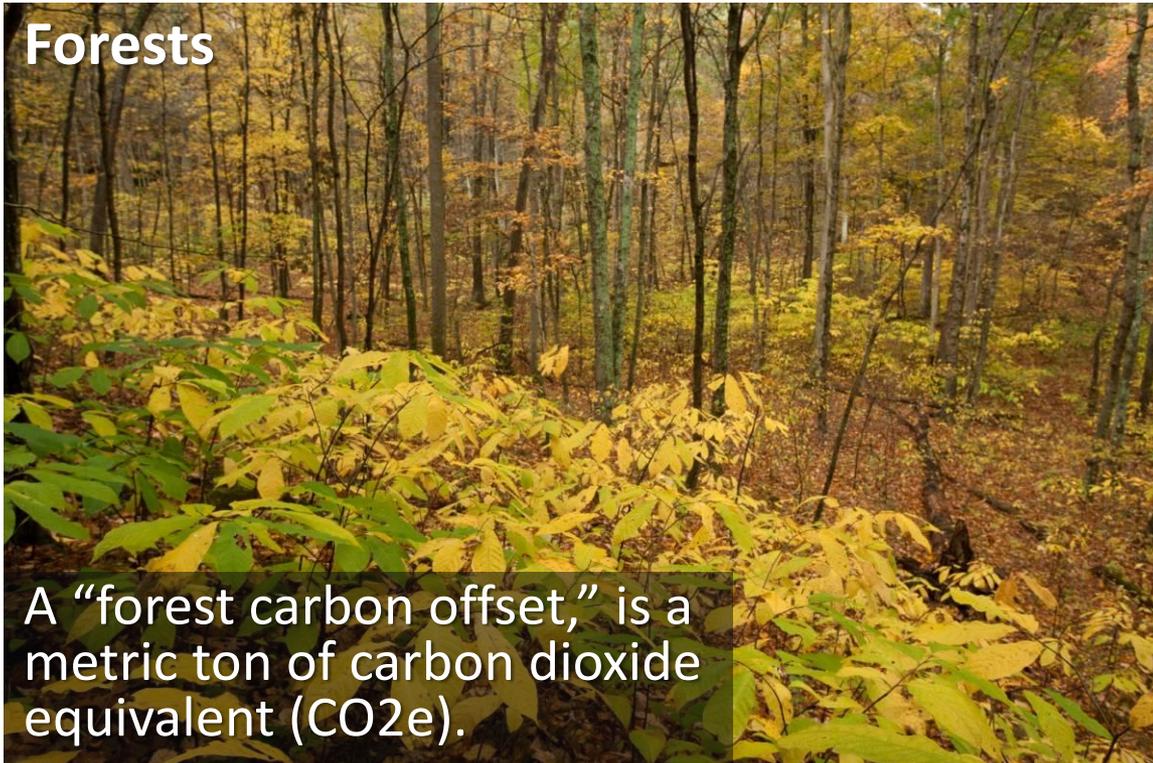
Programs that exist where sending zones and receiving zones have been established. Developers may purchase density bonuses from landowners whose property will remain undeveloped for habitat or as working landscape.



# Trading Programs: Carbon Credits

Greenhouse gas emitters may purchase carbon credits to compensate for emissions occurring elsewhere.

## Forests



A “forest carbon offset,” is a metric ton of carbon dioxide equivalent (CO<sub>2</sub>e).

## Prairies



# Mitigation Banks

Preserve and/or restore large natural systems or areas for the purpose of mitigating in advance the adverse effects of development that occurs elsewhere.



**CHARITON HILLS  
CONSERVATION BANK**

**1<sup>ST</sup>**

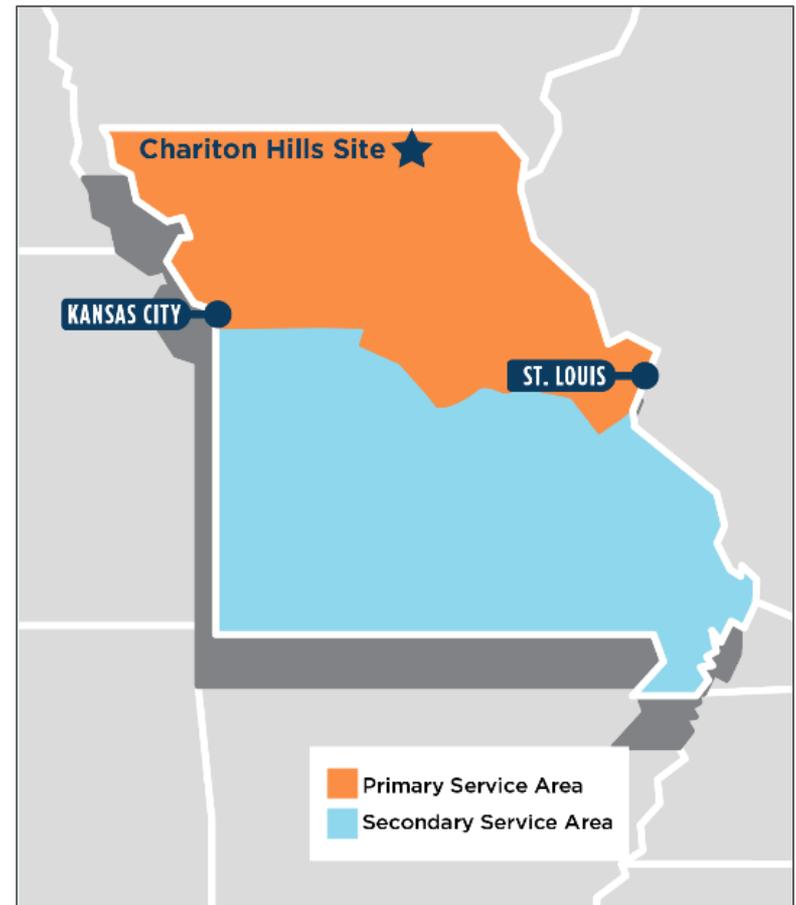
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**CONSERVATION**

BANK FOR INDIANA BATS AND NORTHERN LONG-EARED BATS

**1,300+**

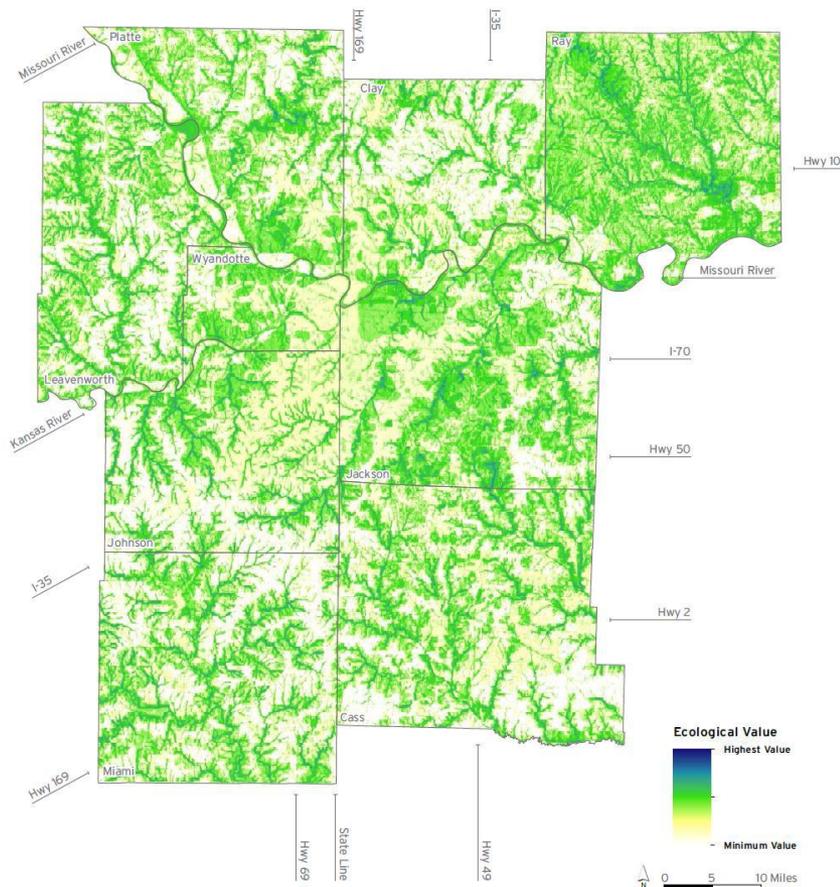
ACRES IN  
CONSERVATION BANK



# Green Certification Programs



# Landscape-scale planning: Connected Open Space



## Regional Planning

- Mid-America Regional Council – Kansas City
  - Green Infrastructure Framework
  - MetroGreen Landscape Corridors
- NW Arkansas Regional Planning Commission
  - Northwest Arkansas Regional Open Space Plan

# Wildlife Corridors



# Utility Corridors



# Transportation Corridors



<https://iowadot.gov/lrtf/living-roadway-trust-fund/what-we-do>

Iowa Living Roadway Trust Fund



[www.dirtandgravelroads.org](http://www.dirtandgravelroads.org)



*Thank You*

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