Celebrating and Enhancing Biodiversity in the Champaign-Urbana-Savoy-University of Illinois Metropolitan Area

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“All living creatures change the world around them simply by going about the daily business of staying alive. To change the physical world is thus inevitable and appropriate … Our challenge – our oldest task – [is] to use nature but not to abuse it.”

~Eric T. Freyfogle, Professor Emeritus, University of Illinois School of Law “Our Oldest Task”

“The care of the Earth is our most ancient and most worthy, and after all our most pleasing responsibility. To cherish what remains of it and to foster its renewal is our only hope.”

~Wendel Berry

“Native ecosystems in Illinois play important roles in reducing the adverse effects of climate change and provide many other benefits to people. Given the widespread conversion of these ecosystems to other land uses in Illinois, the first priority must be to reduce current rates of ecosystem destruction and degradation in the state.”

~An Assessment of the Impacts of Climate Change in Illinois, 2021

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# Background

According to Merriam-Webster Dictionary, Biodiversity is “biological diversity in an environment as indicated by the number of different species of plants and animals.” Conscious management of urban environments, with an eye toward improving biodiversity, can play an important role in restoring native species’ habitat, mitigating climate change, and improving human health and community resilience.

In urban areas, improved biodiversity can improve walkability, quality of life, and may improve community cohesion. Increased biomass means an increase in sequestered carbon and can reduce heat island effects and nighttime temperatures. As climate change is predicted to increase the frequency and severity of precipitation events, the built environment can benefit from green infrastructure projects, such as increased vegetation to help reduce harmful impacts of floods. Overall, improved biodiversity helps create resilient communities.

This report is primarily written for local government entities and university researchers and students. Local agriculture and recommendations for private land are included in this report to move beyond what can be done in the public sector and help to expand the range of impact.

This white paper aims to, first, provide strategies to increase native species and adapt to our changing climate. The aspirational goal is to spark robust collaborations that will establish the Champaign, Urbana, Savoy, and University of Illinois campus metro area as an innovative leader at the intersection of community-university partnerships and environmental sustainability. This white paper seeks to provide a roadmap for biodiversity best management practices from around the world, foster a living-learning lab for applied research to enhance local biodiversity and secure the metro region as a leader in biodiversity innovation.

**Champaign-Urbana-Savoy-University of Illinois Metropolitan Region**

This white paper has been developed for the Champaign-Urbana-Savoy-University of Illinois metropolitan region, henceforth referred to as the Region. The area is home to the University of Illinois, and the communities of Champaign, population 89,144, Urbana, population 38,681, and Savoy, population 8,823. The region is rich in agricultural production and sits at the intersection of two interstates, making transportation efficient and accessible.

According to Kenneth Robertson of the Illinois Natural History Survey, prior to development, Champaign county was 93.7% prairie and 6.3% forest. Prairies in Illinois have been reduced to 0.01% of the original expanse.

**What is a Biodiversity Plan?**

A Biodiversity Plan is an aspirational guide to maximizing the uses of open spaces on public and private lands and minimizing the impacts of development. It can be considered a recovery plan for lost diversity, a celebration of biodiversity and the assets that the region has achieved, and a reference for ways to guide future development and redevelopment. A multi-municipality plan such as this one is an opportunity to unite the region around a similar set of goals.

This plan includes a celebration of achievements, suggested future opportunities, achievable goals, and strategies to help achieve these goals.

This plan does not promote diversity for diversity’s sake. Rather, it will focus on increasing the overall plant and tree species diversity to the point that the landscape is functional for the most insect and animal species over the Region. The goal will vary throughout landscape and must consider cost, maintenance, and co-benefits.

**Why should we have a plan?**

There are many reasons why the Region should invest in biodiversity goals. Conserving biological diversity is not only important for plant and animal species, but offers social benefits like recreation, cultural activities, and even mental health improvements. Creating recommendations and small changes to practices already started in cities can significantly increase biodiversity in cost effective and sustainable ways. By doing this, cities can help provide valuable stopover habitat for migratory species and increase the overall habitat for non-migratory species of animals and plants.

**Methods**

Through key informant interviews and snowball sampling, 44 individuals from the community provided insight that shaped the overall goals and strategies presented here. These people were surveyed individually and in small groups to better understand the regions biodiverse assets and needs to create informed decisions on strategies and goals. Notes were collected from each meeting and transformed into the achievements, opportunities, goals, and strategies sections below.

# Habitats

There are three main habitat types historically found in the Region: big grove, prairie, and wetlands. Looking at, expanding, and publicizing the three major habitats historically found in central Illinois, could be beneficial for ecotourism, biodiversity, and general livability.

## Big Grove and Woodland Habitat

Forest habitat can be the most difficult habitat type to improve in the short term. Trees can take 200 years to fully mature. Other aspects of woodland habitat can be improved in a shorter time frame, like increasing woodland wildflower patches, planting the most suitable species of trees, dedicating land for future woodland groves, and continuing support for street tree programs.

Urban street trees offer support for many species of birds and insects. In the region, there are more urban street trees with a larger percentage cover than are found in Busey Woods. Street trees (when planted densely enough) function as a forest without the understory habitat. This is undesirable for understory species but is very valuable for birds who have been observed to use urban street trees for food and shelter, regardless of the developed urban understory. Dr. Michael Ward, local ornithologist, stated that the urban tree canopy directly impacts the abundance of warblers, owls, and other species of birds observed in the area. Trees offer support for wildlife, not only through pollination of their flowers, but also their capacity to provide food for species of birds and mammals. Hardwood trees are host to 100s of species of moths and other insects that birds and bats utilize as a food source. Trees also provide an array of fruits that different birds and mammals can eat depending on the species of tree and season.

Because urban tree canopy alone offers support for a variety of species, it is a beneficial tool to increasing diversity in areas that require open understory for gathering space and recreation. It is also important to consider understory vegetation and ground cover where open space is not required. Under many urban trees lies turf grass, mulch, and pavement. Mulched beds around tree trunks can be planted with spring ephemeral wildflowers that offer the first bright burst of color for people and pollinators. These plants usually completely retreat into the ground until next spring and the space would revert to a typical mulch bed. Understory shrubs, like witch-hazel, offer wonderful fall colors, support for native wildlife, and can be grown in shady conditions under larger trees. There are gardens in the region that emphasize understory vegetation with large portions of their yard encompassing understory vegetation.

The Illini Experimental Forest in Urbana is a chance to preserve the natural diversity of Illinois forests by accounting for every species of oak and hickory represented in the state within a dedicated space. This space functions as a living learning space and allows students to learn about different types of native species. If feasible, having more land set aside for tree grove plantings, food forests, and constructed woodlands will help ensure future generations have access to learn about natural diversity while also improving the woodland habitat in the area.

**Resources**

[TreeKeeper 8 System for University of Illinois (treekeepersoftware.com)](https://illinoisedu.treekeepersoftware.com/index.cfm?deviceWidth=800)

## Prairie Habitat

Prairie habitat has increasing support in the region with initiatives like pollinator gardens and monarch waystations growing in popularity. Larger scale reconstructed prairies in the Region include Meadowbrook Park and Porter Park. Moving away from turf towards other species of warm season grasses and perennial herbaceous forbs will expand prairie habitat. This can be accomplished on a large scale or with multiple smaller residential pollinator friendly gardens. Promoting these native prairie plants through educational materials, native plant sales, and demonstration gardens can motivate property owners to engage in the practice and will help with accessibility of native prairie plants.

Prairie habitat is relatively easy to establish and can be installed in one season with noticeable ecological benefits, like pollinator support, observed the same year they are planted. Making sure different species of pollinators are accounted for with their unique food relationships is important to account for a broader diversity of pollinators. It is commonly known that monarchs have a unique relationship with milkweeds, but it is less known that a certain species of weevil relies on wild indigo, or that swallowtail butterflies rely on plants in the carrot family like golden alexanders. A diverse pallet of prairie plants can be considered in larger plantings to account for these unique and less known interactions.

## Wetland habitat

Wetland habitat is the least abundant of the three habitats in the Region. It is also the quickest and easiest habitat to improve. Flooded fields, monitored for invasives, can provide wetland habitat for a variety of migratory birds.

Wetlands can be installed on a small scale but provide a great benefit at a larger scale. For example, migratory bird species require a larger space than urban rain gardens as stop over habitat. When possible, larger wetlands should be considered outside of the urban core to allow birds to recognize the habitat.

Wetlands require a source of water, either naturally or artificially. Stormwater from subdivisions and streets can be directed towards a larger wetland to help mitigate flooding in the cities and create a source of water for the habitat. Many neighborhoods are built in wetland type of habitats and require detention ponds to mitigate basement and street flooding. This extra water can be directed to a larger wetland. Multiple neighborhoods could direct their extra water towards a single wetland through green or grey infrastructure. Another option is directing tile drainage water towards wetlands like the wetland at Meadowbrook Park. The wetlands improve water quality, removing nutrients and other by products form urban environments from water before it enters the larger watersheds and can help reduce larger, nation wide problems like gulf hypoxia. The land just west of Champaign floods often and could provide stormwater detention from neighborhoods and improve biodiversity.

Flooded agriculture fields, or “fluddles” as some people call them, are valuable spaces for migratory birds. These are usually locations on agriculture fields that regularly flood. They are not very productive for crops and can also attract bird species. Fluddles could potentially be transformed into constructed wetlands. Making permanent wetlands out of fluddles will provide breeding habitat for migratory birds.

The size of these wetlands is not as important as size of forest because the species are less sensitive to edge effect or contrasting environments along edges of habitat. Larger wetlands will have a larger buffer for changing conditions and capacities to accommodate various ecological processes. Half a mile by half a mile fluddles have successfully attracted various birds and would be a suitable size. Waterfowl and shore birds particularly will be attracted to these sites.

## Patch & Corridor Framework

Another way to think about expanding habitats is through the patch and corridor framework. It is important to look at Region as a whole when creating a biodiverse, urban ecosystem, rather than focusing on smaller parcels of recreation/park/habitat space. Cities have the potential to link the fragmented pieces together, ultimately creating one large patch of habitat. Creating new spaces of habitat is important but linking these pieces together to create a larger system of suitable habitat is equally as important because it increases the amount of space wildlife has to move around.

Each municipality has a park patch that is over 40 acres. There are a few parks in the region that are over 60 acres. These larger parks act as larger sources for and anchor to the ecosystem. Between these larger parks are smaller supporting patches including home landscapes, pocket parks, and pollinator patches. These smaller patches are vital for connecting the region because they offer support for flora and fauna in a steppingstone fashion. Species can disperse to these smaller patches from the large ones so long as they are within a reasonable, species-specific distance.

Creating two woodland habitat patches and two prairie habitat patches per city block would be a good goal. These plots can be relatively small. 100-200 square feet is suitable for many species. Each patch should include a temporal scale of blooms, with different species of plants in bloom from early spring to late fall. Woodland and prairie patches should focus on plants typically found in those habitats. High human traffic patches should have some aesthetic characteristics for public acceptance and be maintained to fit city ordinances.

Corridors are planted passages that connect patches together to create a mosaic framework. Corridors can be planted green streets, bike trails, or old railroad paths. By connecting large and small patches together with corridors, most species will be able to traverse the entire region without running into barriers of urban fragmentation. Increasing the number of planted bike/hiking trails and green streets in the region will expand the corridor network, ultimately linking more patches together, and unifying the urban ecosystem. An integrated biking/hiking/walking/jogging trail network will also expand the recreational opportunities available for residents.

**Resources**

[Frontiers | Ecological networks and corridors development in urban areas: An example of Tabriz, Iran (frontiersin.org)](https://www.frontiersin.org/articles/10.3389/fenvs.2022.969266/full)

[A GIS-based Green Infrastructure Planning for Sustainable Urban Land Use and Spatial Development (sciencedirectassets.com)](https://pdf.sciencedirectassets.com/270397/1-s2.0-S1878029612X00021/1-s2.0-S187802961200309X/main.pdf?X-Amz-Security-Token=&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20230422T111803Z&X-Amz-SignedHeaders=host&X-Amz-Expires=300&X-Amz-Credential=ASIAQ3PHCVTYQS3OFB7J/20230422/us-east-1/s3/aws4_request&X-Amz-Signature=a1ccfb14ae644dd49a304c363e739b056f91183692e30cd841345a2855b5e5c7&hash=b7b0dc4fe4e0fbbbdd6d593798e46bd5e0e15bd5fed8804cbb838f98b4e1f430&host=68042c943591013ac2b2430a89b270f6af2c76d8dfd086a07176afe7c76c2c61&pii=S187802961200309X&tid=spdf-ed1bd748-090a-4826-a82c-ac0a46dd7bd4&sid=7b09b80096c3a3471459ec3984af8791af5egxrq)

[Frontiers | Urban wildlife corridors: Building bridges for wildlife and people (frontiersin.org)](https://www.frontiersin.org/articles/10.3389/frsc.2022.954089/full)

# Community Assets

The Region is already rich with examples of biodiversity success stories. Below are some of the community assets identified during key informant interviews that deserve to be celebrated.

## Urbana

* Urbana maintains its Tree City USA designation. Urbana was the first Illinois community to receive the Tree City USA designation in 1976, the program's inaugural year, for work completed in 1975.
* Urbana has a 2.7 acre prairie restoration site on Florida Avenue and Orchard Street restored by the University of Illinois.
* The Sola Gratia farm in east Urbana is an example of urban agriculture that employs organic production methods with 50 different vegetables, herbs, and fruits with 125 different varieties.
* Many private landowners also have biodiverse yards and the tree diversity, both in the right of ways and in their yards.

The City of Urbana has many programs that support biodiversity, including incorporation of native and nativar (a cultivar derived from native parents and bred for a particular trait, typically resulting in a loss of genetic diversity) species into public landscaping, seed collection and exchange at the Urbana Free Library. Urbana also participates in the Midwest Grows Green program to reduce or eliminate synthetic fertilizers and pesticides. Ordinance and zoning requirements also support biodiversity.

* Newly permitted parking lots have a required number of shade trees (one shade tree per nine parking spots for lots with more than twenty spaces).
  + Zoning requires open space in residential, business, and conservation districts.
  + In Planned Unit Developments, residents can apply for waivers to certain codes if they incorporate beneficial practices, such as stormwater management best management practices.
  + Stormwater Utility Fees support green infrastructure installations. Residents can also apply for waivers to stormwater utility fees by installing green infrastructure practices such as rain barrels and rain gardens.
  + Landscape ordinances carve out exceptions for residents to grow plants taller than what would otherwise be allowed.
  + Guidance on low mow is also included in ordinance.

Members of the public may participate in the Urbana Tree Commission, which is an Urbana Commission charged with providing advice and consultation to the City Arborist on policies concerning selection, planting maintenance and removal of trees, plants and shrubs, the establishment of educational and informational programs concerning vegetation, development of policies and procedures regarding the duties of the Arborist.

Urbana has constructed model bioswales, including one on Race Street, and has plans to naturalize streams systems, including rock dams and rock veins to reduce velocity and improve aquatic habitat. And the city participates in community activities such as Boneyard Creek Community days and other outdoor events on Boneyard Creek.

### Urbana Park District

The Urbana Park District has reduced mowing and is committed to building up pollinator habitat, including native seed collections, including training maintenance crews on native plant identification. The Urbana Park District has a [Climate Action, Resilience, Education, and Sustainability](https://www.urbanaparks.org/assets/1/6/UPD_CARES_Plan_Final.pdf) (CARES) Plan.

Wetlands, bioswales, and habitat preservation projects have been built or preserved at

* + Weaver Park (prairiereconstruction, wetlands, and some of the original Big Grove woodlands)
  + Perkins Road Wetland
  + Meadowbrook Park (including 80 acres of recreated tall grass prairie)
  + Anita Purves Nature Center
  + Busey Woods
  + Crystal Lake Park

## Champaign

* In Champaign, local businesses are embracing biodiverse landscaping and inspiring others to use more native plants in landscaping projects. Some examples include:
  + The Carle complex on Staley Road and Curtis Road includes special overlay zoning requirements to allow native vegetation and natural water management practices.
  + Guido’s Bar and Grill in downtown Champaign asked the city’s horticulturist for a native planting in the right of way and inspired others to ask for native plantings.
* Local schools are including biodiverse features in their landscaping.
  + At Bottenfield elementary school the Parent and Teacher Association installed a biodiverse planting in front of the school and a green infrastructure feature with native plants in the back. The PTA supports fundraisers for ongoing maintenance and parents and teachers maintain the garden.
  + The Champaign Unit 4 School District Administration Building has a rain garden in the right-of-way.
* The Boneyard Creek is a 3.3-mile-long waterway that drains much of the cities of Champaign and Urbana, Illinois, United States. It is a tributary of the Saline Branch of the Salt Fork Vermilion River. Community members participate in an annual event to clean up Boneyard Creek. The creek is also used for educational activities. Boneyard Creek activities include:
  + Taking fish and mussels out of creek temporarily for education
  + Removing litter around in and around the creek
  + Providing opportunities for dialogue around urban conservation
* The City of Champaign has constructed several stormwater-management retrofit projects to better handle stormwater runoff from increasing rain events. Projects have incorporated native plantings, increased recreational space, and reduced the cost of maintenance. The city strives to maintain the properties as community amenities and provides signage at some sites to promote understanding. When possible, the City seeks to move to pollinator friendly plantings, transition right of ways from junipers to natives, and reduce fertilizer use. City retrofits and studies include:
* Healy Basin was the first retrofit. It has proved hard to maintain and has erosion problems.
* 2nd Street Basin has 5 types of turtles, bass, shiners, chubs, and serves as a stopover for many types of waterfowl and other birds (herons, kingfishers). Park amenities are offered to the community at this site.
* Glen Park serves as stormwater detention and includes native plants and wetland plugs.
* Preservation Pond has two detention basins and rain gardens.
* Scott Park has diverse plants and bird activity.
* There is a dry basin on Mattis.
* Two smaller rain gardens have been installed on Miller St. and Garfield St. The city has also supported the installation of some smaller residential rain gardens.
* New watershed improvements are being constructed for drainage purposes and will include native plantings instead of grass.
* Champaign is undertaking a RES Bioassessment as part of the MS4 Monitoring. The bioassessment will evaluate the stream ecology with a focus on the Boneyard Creek, Copper Slough, and Phinney Branch.
* Dutch Elm Disease and the Ash borer have paved the way to increase tree diversity. The city now maintains a 30/20/10 ratio of family/genus/species for trees.

### Champaign Park District

The Champaign Park District provides green trails and space with most natural areas planted with prairie ecosystems. The park district has 3-4 full time arborists who take care of the current tree population and plant about 200 trees per year to align with the Tree City USA designation. The District is considering the impacts of climate change in new tree plantings. The past 5 years have seen increased growth. The first large scale natural park was started 8 years ago. Park sites include:

* + Human Kinetics Park which includes a dry detention pond and low mow management.
  + Robert C. Porter Park has a pond with native plants up to the water. This park was created in partnership with the USCD.
  + Heritage Park was originally invaded with invasive species. It is now under control and has been transitioned to high quality grasses and forbs. Master naturalist classes use the park as a teaching tool.
  + Commissioner Park covers 20 acres, 15 in low-mow. This is part of the Districts Greenway Master Plan.
  + Smaller park pockets are also being incorporated.
  + The Champaign Park district has carried over the Urbana Park District standards.

## Village of Savoy

* The Village of Savoy has a [Parks Master Plan](https://www.savoy.illinois.gov/vertical/sites/%257BD0463038-CAC4-4485-B59A-9F55DCAB155B%257D/uploads/%257BD268E931-74DF-4820-827D-A0999E37B453%257D.PDF) that includes pollinator gardens and will evaluate Savoy’s assets and needs, including a chance for the public to provide opinions.
* The Village also has an approved tree species list and is committed to replacing every tree that has to be removed. The Village also has a cost share program for tree planting in the right-of-way.
* Miniparks have been transitioned to pollinator habitat. Along the railroad there are prairie patch remnants that are no mow or low mow zones. They have been designed and maintained in keeping with [Dave Monk’s](http://prairiemonk.org/projects.html) vision for restoring railroad rights-of-way.
* The Village code includes green infrastructure guidelines and the [Savoy Comprehensive Plan](https://www.savoy.illinois.gov/vertical/sites/%257BD0463038-CAC4-4485-B59A-9F55DCAB155B%257D/uploads/Savoy-Comprehensive-Plan_web_20191220.pdf) requires new development to include some open space.
* A new bike path on 1st street to savoy will include managed vegetation along path.

## University of Illinois

* The University of Illinois, with Bee Campus USA designation, practices integrated pest management and reduces synthetic fertilizer and insecticide. Campus landscaping practices use leaves for compost. An approved plant list with the goal of reintroducing perennials in plantings and agriculture is in place to support more natives and plants that suit the environment. The design aesthetic being deployed by campus landscaping is leaning towards higher diversity plantings that are more pollinator and wildlife friendly. These practices require different maintenance and landscaping staff training considerations.
* The University has a strong commitment to tree diversity with 189 different tree species, 75 genera, and 38 families. When trees are replaced, they are replaced with native species. A comprehensive campus tree survey identified trees and locations and campus is examining tree canopy cover.
* All native oak species are planted on campus at the University of Illinois. Ten of the fourteen native hickories are represented at the teaching arboretum across from Meadowbrook Park on Race Street in Urbana. Trelease Woods has 1 acre of flatland wooded area with perched water table. This site is adapting with pollinator, pheasant, or quail habitat and promotes shrubs and pollinators with Pheasants Forever.
* The Arboretum on Lincoln between Florida and Windsor is transitioning to a largely perennial landscape composed of mostly natives. The Arboretum is working with Pheasants Forever to create a savanna-style prairie strip along Lincoln Avenue. On the south Arboretum, efforts to remove honey suckle are underway and native trees and shrubs are selected to support bird species. Understory vegetation is being established.
* Many pollinator pockets have been established on campus. These pockets and plantings of prairie plants can be found at the following locations:
  + National Soybean Research Center
  + Orchard Downs
  + Allen Hall
  + The Red Oak Rain Garden
  + GIES College of Business
  + Dorner Drive Retention Pond (in transition to low mow)
  + Solar farm 2.0 (54 acres of pollinator friendly plants with 19 acres low mow)
  + Six pack dorms
* The South Farms houses the Sustainable Student Farm which is managed by students and contains a number of native plant species and beehives within a 50-foot radius of the native plants. The students also grow annual vegetables and are experimenting with agroforestry.

**Interested in bee-keeping?**

Champaign County allows beekeeping in all Zoning Districts because it’s considered agriculture. There are no ordinances regulating beekeeping in Champaign County at this time.

Illinois 4-H can provide education and resources about beekeeping.

https://4h.extension.illinois.edu/ways-participate/projects/beekeeping

* ISEE has funded a larger experimental woody perennial polyculture forest designed to provide tree nuts such as chestnuts and hazelnuts.
* Stretches of the Boneyard Creek on campus have been transformed into a living drainage system.

## Urbana-Champaign Sanitary District (UCSD)

* The Urbana-Champaign Sanitary District (UCSD) has supported biodiversity on and around both of their wastewater treatment plants.
  + At the northeast plant in Urbana, the UCSD has partnered with the Urbana Park District to create a 35-acre wetland and prairie restoration site converted from a “solid biowaste disposal site”. The site is called the Perkins Road Restoration Project. The low areas have been reverted to wetlands and the high areas to prairie. The project was funded with grants and the UCSD has committed $50,000 per year to maintenance. The site will be open to the public soon as a demonstration of what can be achieved on disturbed land.
  + At the southeast plant in Champaign, the UCSD has partnered with the Champaign Park District to develop Robert C. Porter Park to provide a buffer between the wastewater treatment plant and residential neighborhoods. Half of the park parcel is an active park, with a picnic gazebo and playground equipment and half is prairie restoration.
  + The UCSD has also made stream improvements including lowering creek bottoms and exposing previously buried sewers. The stream bottoms have been armored with rocks, making a pool and riffle system, giving air and complexity to creeks, and creating microhabitats for fish and microbes.

## Champaign County Forest Preserve District

The Champaign County Forest Preserve District headquarters is located around 10 miles northwest of Champaign stewarding seven forest preserves covering over 4,000 acres in Champaign County.

* iNaturalist projects have been established to categorize plants in all preserves. This citizen science driven project helps survey plants either planted or introduced and helps guide management at sites.
* Genetic, species, and habitat diversity is a primary goal. All new projects are established to maximize genetic diversity including planting with seeds found on other sites and native plant nurseries to increase genetic diversity.
* The CCFPD is collaborating with U.S. Fish & Wildlife Service for grants, and on USDA Farm Service Agency Conservation Reserve Program projects (in exchange for a yearly rental payment, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality (<https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index>).
* Heron View Forest Preserve is a new CCFPD site (2021) made up of 103-acres of mixed floodplain and oak-hickory forest.

# Opportunities and Gaps

While biodiversity exists in the region among the areas highlighted in the previous section, key informants identified several opportunities that local government and institutions can begin to work on. Funding and staff time, of course, are barriers to changing current practices. However, the following opportunities could be provide significant benefit to the overall biodiversity of the region. Three key opportunities are provided below.

Engaging diverse stakeholders on multiple levels will be important for improving biodiversity. Efforts to bring the Region together through groups like ISEE’s Resilience Committee are excellent first steps. Engaging developers, business owners, and citizens are needed to continue progress.

We also find that research and outreach collaborations with the University of Illinois can be beneficial for identifying and conducting applied research, providing opportunities for learning with real-world examples, and a source of potential internships for students. These opportunities are highlighted in green text at the conclusion of each section.

## Promote Biodiversity and Quality Habitat for Species on Public Land

Public lands include lands owned and maintained by public entities such as cities, schools, and park districts. Much of this space is made up of turf grass. This opportunity explores ideas for introducing native plantings to these public spaces and includes some considerations for addressing barriers and challenges.

* Many city and park district plantings are currently planted with annual or non-native species. Transition to perennial native cultivars, where and when possible. City owned vacant lots and right-of-way land can also be transitioned from turf grass to native species.
* In areas where native plantings may not be sustainable to maintain, no-mow strips may be a lower-maintenance alternative that provides habitat for a greater number of species than turfgrass.
* While turf grass is important for recreational activities, land that is less desirable for recreation can be transitioned to native plantings. This may include land along roadways, in right of ways or medians, or land that is prone to flooding.
* Many birds and insects need continuous habitat to thrive. The current species in the region reflect the available habitat. Improvements will provide support for a broader range of species. Vegetative corridors can also provide desirable hiking and biking opportunities for residents.
  + Native vegetation corridors can be designed so that beneficial fauna can safely move through the region. Corridors might include continuous tree cover, increased diversity of tree species, and actively leaving snags in place when safe. (Snags are the name for dead trees that are left upright to decompose naturally. Dead trees provide vital habitat for more than 1,000 species of wildlife nationwide, according to the National Wildlife Foundation.)
  + In streams and waterways that have not been naturalized, consider leaving dead logs, adding rocks to encourage riffling, and creating pool systems.
* Schools have large amounts of turf grass, some of which is not suitable for children to play on and might be useful for pollinator or community food gardens. Converting school property to native habitat can be challenging because students and teachers are not on site over the summer months when much of the maintenance is needed. Consider engaging volunteer groups or training parents, teachers, and students to support and maintain native habitat on school property when school is both in and out of session.
* Where and when possible, restore sizable prairie, wetland, or big grove forest habitat. This can also serve for recreational and tourism interest as these habitats attract migrating birds. This is an opportunity for parks districts but could also be a best practice and opportunity to create vegetative landscapes around freeway interchanges.
  + Some areas where drainage is a concern can be turned into “fluddles” or areas where water temporarily pools after big storms. These spaces also provide habitat for species. Where possible maintain these areas and make them recreational amenities as well as stormwater and biodiversity amenities.
* Include long-term maintenance plans in all designs to avoid failed plots. Consider providing training to grounds crews to ensure maintenance is consistent and appropriate. To maintain healthy levels of pollinator insects, consider banning all synthetic products on publicly maintained property.

**University of Illinois Collaborations**

* University faculty and students can identify and share information with cities about the amount and type of habitat and cover to optimally support a variety of species.
* Understanding and sharing the status of regional biodiversity is necessary to make improvements. A further in-depth analysis of the species richness and composition would be valuable in assessing the regions biodiversity. Baseline data is required to understand what is currently existing here and what can be improved. This includes the types of species present and the abundance of species. Attention needs to be given towards threatened and endangered species when gathering data for the region. Understanding the impacts of recreated habitat for plants and wildlife is also important to guide future decisions on habitat expansion and urban landscape designs. This will help reveal the bigger picture of the region and make educated decisions for the future survival of native species.
* Cost-benefit and life cycle cost analysis is needed to help cities evaluate options and make optimal choices to increase habitat. This area presents an opportunity for applied research.

## Support Biodiversity on New and Retrofit Development

The quality and quantity of habitat could be improved in the city with changes in ordinances and guidance for developers.

* In new developments, where topsoil is removed and sold, soil health is greatly impacted. Where and when possible, encourage developers to prioritize soil health in new developments.
* Detention basins required for new construction can be problematic for a variety of reasons, not the least of which is that private ownership can lead to mismanagement and lost biodiversity and water quality opportunities. Consider alternatives to privately own detention ponds, such as regional, publicly managed systems. At a minimum consider adapting requirements for new construction that provide more robust habitat.
* Provide incentives and education for developers to encourage adoption of best management practices, including increased biodiversity and stormwater retention in parking.
* Consider rethinking parking lot design and ordinances to provide more attractive and diverse spaces. Further, urban planning at the city level should review parking lot requirements. Most cities provide parking minimums; but new thinking in sustainable development suggests that jurisdictions should set parking maximums to encourage public transportation, walking, and biking to transform communities. Reducing impervious surfaces for parking has benefits for stormwater systems as well as potential to reduce heat island effects. Reduced traffic congestion has positive effects on local air pollution. Linkages between reduced parking; utilization of green infrastructure; and biodiversity can be explored.
* .
* Always include maintenance guidance and support to ensure success.
* Cemeteries and golf courses typically have large expanses of turf grass and few native plant species. Consider providing incentives for owners or property managers that encourage revisioning of these facilities.

**University of Illinois Collaborations**

University of Illinois can be instrumental in providing applied and accessible research and best management practices. Those efforts must be designed in collaboration with the cities or other stakeholders to ensure the recommendations provided are useful and implementable.

* Consider setting up a Region-wide Biodiversity Taskforce to monitor and promote progress.
* Collect and analyze existing new and retrofit development ordinances and codes and share best practices and models with the communities.
* Consider biodiversity and equity models to demonstrate best practices for cities that ensure all residents have reasonable access to native plantings and biodiverse landscapes.
* Provide models, best practices, ordinances and incentives, and cost-benefit analysis for these types of retrofits.

## Provide Resource for Homeowners and Private Businesses

While much can be done on public land, homeowners and private business are an important part of improving biodiversity and connecting habitats. While the cities and university have little direct control over how private homeowners and businesses maintain their landscapes, following are some suggestions for activities that are under municipal or university purview.

* Programs to support native and pollinator friendly landscaping are increasingly popular. However negative perceptions about native plants still persist. Expand reach and support for these programs and education about benefits through partnerships with Extension, Parkland, Park District and other community education and outreach avenues.
* Continue and expand residential rain garden and other stormwater management programs that support diverse species. Demonstration gardens and readily available rain garden plans are recommended to help adoption.
* Provide outreach and training on natural lawncare to companies in the Region. Consider supporting local businesses that embrace natural lawn care management. Continue and increase education and outreach to homeowners about lawn maintenance.

**University of Illinois Collaborations**

* Share research and available tools and techniques to promote behavior change and techniques to improve acceptance and adoption by residents.

# Short, Medium, and Long-term Actions

The following are action items that can support efforts to address the opportunities and gaps addressed above. A next step in this effort will include conversations among the cities and the university to identify specific and time-bound goals and approaches based on the recommendations in this report.

## Short term actions

* Create a diverse, multi-stakeholder Biodiversity Taskforce
* Compile existing surveys and maps of biodiversity to identify places of abundant diversity, those lacking diversity, and data gaps.

## Medium term actions

* Expand science-based, accessible public outreach and education.
* Identify target areas for improved diversity.
* Install more demonstration gardens and biodiverse patches and corridors. Demonstration sites can include:
  + both private and public land
  + vacant lots
  + parks
  + commercial property
  + rights-of-way, and
  + stormwater retrofits.
* Explore funding for patches and larger habitats like wetlands.
* Map ideal locations for patches and corridors to support migrating species.

## Long term actions

* Change public perception about native plants (attitudes and beliefs).
* Update ordinances.
* Expand natural areas and create migration corridors.
* Create large scale habitats such as large scale wetlands; create connectivity between wetlands and other patches with wildlife corridors and recreational opportunities such as bike paths lined with native plants.
* Create a mosaic of prairie, wetland, and forest habitats.
* Conduct ongoing survey and research to understand progress.

# Strategies

The following strategies assist in enhancing biodiversity throughout the Region by using and building on the existing regional assets and strengths. This section is organized into themes that include regional collaboration; data collection and research; community programs and demonstration sites; biodiversity at home; partnerships with local nurseries/horticultural centers & landscape designers; and some ideas and best practices for land retrofits among different use cases.

## Collaborate Regionally

### Create a Biodiversity Working Group

The Region is already working together to share resources related to biodiversity. Create a formal biodiversity working group to share information, seed campus research to address biodiversity challenges, and coordinate management strategies to maximize habitat. Document successes, failures, and lessons learned.

Potential partners: representatives from all municipalities in the Region, Illinois Department of Transportation, Illinois Department of Natural Resources, Illinois Extension, University of Illinois researchers, private agriculture landowners, Urbana Champaign Sanitary District, Champaign County Forest Preserve District, City Park District, Red Oak Rain Garden, Soil and Water Conservation District, city boards, school districts, residents, stormwater engineers, developers or home owners association, landscape architects, landscaping organizations, local nurseries, property managers, golf courses managers, and others.

## Collect Data, Conduct Research, Track Results

### Biodiversity Land Survey

Determining the **functional diversity** of the area will be especially important for future projects. Understanding the functional role of plants and insects within the ecosystem can help determine a sufficient goal for plant diversity within the landscape to effectively account for ecological interactions, without over projecting an abundance of species that fulfill the same ecological role in the environment.

Conduct a comprehensive regional biodiversity survey to understand community assets, understand where habitat could provide maximum benefit, and create a baseline to measure long term success. Incorporate and synthesize information from existing surveys completed by campus, municipalities, and community organizations. Engage students in this effort to benefit both the Region and the student’s educational goals.

Sources of existing baseline data include:

* The Illinois Natural Areas Inventory

List of quality natural areas in the state of Illinois

[Crystal Reports - (illinois.gov)](https://www2.illinois.gov/sites/naturalheritage/Documents/INAICountyList.pdf)

* The Illinois Natural History Survey collections search

List of plant and animal specimen collections

* [INHS collections data Collections Search (illinois.edu)](https://biocoll.inhs.illinois.edu/portal/collections/index.php)
* iNaturalist

Online public database with georeferenced species observations

[A Community for Naturalists · iNaturalist](https://www.inaturalist.org/)

* eBird

Birding database for avian observations

[eBird - Discover a new world of birding...](https://ebird.org/home)

### Map Habitat Patches

A map including larger natural areas, pollinator pockets, green infrastructure, parks, and home landscapes across the region are helpful to determine suitable habitat corridor locations that could bridge the patches together. Accomplish this type of analysis with GIS mapping tools, drive-by surveys, and manual data entry of specific places.

### Engage Citizens to Collect Data

Engage citizens to participate in a bioblitz style survey to help provide comprehensive baseline data. A bioblitz survey is a community focused survey designed to gather as much information about species composition as possible within a specific area and time frame. iNaturalist offers a framework for this style of survey. Within iNaturalist, the boundaries of the location can be set and anyone participating in the bioblitz can add entries on their phone. The app also has a robust identification platform that allows novice participants to be involved in the efforts. Bioblitz surveys have been successful twice previously at Busey Woods and the South Arboretum Woods.

**Pros:** Community-based surveys are cost effective ways to understand the biological composition of a region while also involving and educating the community about biodiversity. The data from the survey can be downloaded and further analyzed. A survey of this magnitude would be sufficient at two- or three-year intervals to keep momentum and avoid exhaustion.

**Cons:** It is difficult to record every species present. Certain species must be observed from a distance or under a magnifying glass and require professionals.

Bioblitz guides can be found at [Bioblitz Guide · iNaturalist](https://www.inaturalist.org/pages/bioblitz+guide) and [BioBlitz (nationalgeographic.org)](https://education.nationalgeographic.org/resource/bioblitz/)

## Community Programs: Education and Demonstration

Public outreach and education are important tools to engage and inform the region about the importance of biodiversity and what individual residents can do to support biodiversity efforts.

*Local Climate Change Effects*

Climate change is predicted to impact heat and drought periods, increase frequency and intensity of severe weather events, and alter the historic range of plant, animal, and insect species. These changing conditions will modify the current species composition present in the region. Planning for projected temperatures and precipitation regimes can determine suitable species to plant that will be resilient to the changing conditions. Trees, with their long lifespan, should be selected at the north end of their range to adapt to changing conditions over the next 50 years.

### Existing Community Programs

Utilize existing local resources to provide community-based education and training about biodiversity. Local resource groups can also help provide guidance and information about maintaining ecosystems that are new and unfamiliar.

Engage Illinois Extension Master Gardener and Master Naturalist volunteers to potentially help design, install, and maintain biodiverse landscapes. More information about the Master Gardner and Master Naturalist programs is available in the links below.

[Champaign County Master Gardeners | Illinois Extension | UIUC](https://extension.illinois.edu/cfiv/champaign-county-master-gardeners)

[East Central Illinois Master Naturalist | Illinois Extension | UIUC](https://extension.illinois.edu/cfiv/east-central-illinois-master-naturalist)

#### Increase Visibility

Signs are important to communicate practices that may be unconventional or not fully accepted yet. Native plantings and demonstration gardens should have signs that indicate what is going on in this area and why it is helping with a website or QR code for where further information can be found.

Established sign programs in the region:

* Pollinator Pockets
  + [Pollinator Pockets | Illinois Extension | UIUC](https://extension.illinois.edu/cfiv/pollinator-pockets)
* Leave the Leaves
  + [Leave the Leaves! | Xerces Society](https://xerces.org/blog/leave-the-leaves)
* The Monarch Waystation
  + [Monarch Watch Monarch Waystation Program](https://www.monarchwatch.org/waystations/)
* Bee Campus USA
  + [Bee Campus USA Commitments - Bee City USA](https://beecityusa.org/bee-campus-usa-commitments/)

### Demonstration gardens

Demonstration gardens are gardens that demonstrate the successful benefits of native diversity and their potential to be aesthetically pleasing. They are a tool to showcase native species plantings as a suitable alternative to annual and nonnative species. Large and small demonstration gardens that are well marked are beneficial to help gain public support.

A close-up of flowers and plants

Description automatically generatedThe Red Oak Rain Garden is an excellent example of a demonstration garden that is highly maintained for aesthetic appeal and functionality. This rain garden showcases that native plants are suitable for landscaping, looks great, provides ecosystem services to the community including flood mitigation and pollinator support, and is also widely used as an educational site to teach about green infrastructure.

Image source: Red Oak Rain Garden Report April 2021. The Red Oak Rain Garden Website <https://redoakraingarden.org> (https://redoakraingarden.files.wordpress.com/2021/05/rorg-report-april-2021.pdf)

### Ecotourism

Ecotourism

*Ecotourism is defined as “responsible travel to natural areas that conserves the environment, sustains the wellbeing of local people and involves interpretation and education” (International Ecotourism Society, 2015).*

*From:* [Encyclopedia of the World's Biomes, 2020](https://www.sciencedirect.com/science/article/pii/B9780124095489119177)

[Ecotourism - an overview | ScienceDirect Topics](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/ecotourism)

Nature enthusiasts will travel across the state and country to visit high quality habitats and to observe unique species. The Region has multiple high-quality habitats, with remnant patches of bottomland forests and reconstructed quality habitats of prairie. The University of Illinois has the Tree Campus USA designation and has multiple legacy trees that would interest arborists and tree enthusiasts from around the state. Using these natural amenities as a basis for tourism can expand the knowledge of biodiversity and help promote biodiversity moving forward. Nature walks and tree tours are effective ways to engage with the public about biodiversity without being time consuming or expensive. Virtual story maps can be created to take the place of in person tours where people could explore the areas on their own.

* Champaign is a Tree City that has over 150 different species of trees ([Champaign Tree City](https://urldefense.com/v3/__https:/champaignil.gov/departments/arbor-day-in-champaign/__%3B!!DZ3fjg!7Rqx0kmOYSws_Zh4uS_pANRTEz53A-7y_c3mB5GcNjRFCP3BMvRv6pcrUV83g2WSCFrSAVvERjgZfpAoPZJ4lrO8hA$)).
* Urbana is a Tree City with over 262 different species ([Urbana’s Tree City USA Designation | City of Urbana (urbanaillinois.us)](https://urldefense.com/v3/__https:/www.urbanaillinois.us/visitors/tree-city-usa__%3B!!DZ3fjg!7Rqx0kmOYSws_Zh4uS_pANRTEz53A-7y_c3mB5GcNjRFCP3BMvRv6pcrUV83g2WSCFrSAVvERjgZfpAoPZLCcYJuOQ$).
* Carle Park Tree Walk
  + [Updated\_Hickman\_Tree\_Walk\_Brochure.pdf (urbanaparks.org)](https://www.urbanaparks.org/assets/1/6/Updated_Hickman_Tree_Walk_Brochure.pdf)
* University of Illinois Quad Tree Walk
  + [Tree Brochure Outside 4.21.19 (illinois.edu)](https://sustainability.illinois.edu/wp-content/uploads/2019/04/Tree-Brochure-Flyer-4.21.19.pdf)
* Hessel Park Tree Walk
  + [Hessel-Tree-Walk-brochure-16-singles.pdf (champaignparks.com)](https://champaignparks.com/wp-content/uploads/2016/12/Hessel-Tree-Walk-brochure-16-singles.pdf)
* University of Illinois Urbana-Champaign maintains a Tree Campus USA designation through the Arbor Day Foundation. [Tree Campus Higher Education (Ongoing) | iCAP Portal | University of Illinois](https://icap.sustainability.illinois.edu/project/tree-campus-higher-education)

## Increase Biodiversity in Residential Areas

### Neighborhood landscaping:

Most established neighborhoods already have a diverse collection of plants many of which are not native to the Region. Many non-native plants are desirable for certain qualities like aesthetics and fauna attractions, especially in landscaping or gardening projects, and can support local pollinator populations. High quality non-native species can be integrated into native plantings where they provide an important aesthetic or ecosystem function.

Movement away from traditional residential landscaping can lower maintenance costs, reduce chemical use, and increase biodiversity. Education and demonstration gardens will help encourage this migration. Free public resources are available to help homeowners design attractive gardens that incorporate native plantings. Illinois Extension has published materials to help homeowners [design a native garden](https://extension.illinois.edu/news-releases/planning-designing-native-garden). The [Red Oak Rain Garden website](https://redoakraingarden.org/resources/) has also published several [design guides](https://redoakraingarden.org/resources/) for home garden spaces that make the use of native Illinois plants.

[A group of yellow flowers

Description automatically generated](https://iiseagrant.org/publications/illinois-native-plants-for-the-home-landscape/)[A green house with a garden

Description automatically generated](https://iiseagrant.org/publications/woodland-border-garden/)

Interested Homeowner’s Associations can expand approved species and planting requirements to encourage more residents to participate in native landscaping. HOAs can encourage or provide information about existing incentives for homeowners. For example, the [City of Urbana Stormwater Utility Fee Incentive Program](https://www.urbanaillinois.us/sites/default/files/attachments/final-credit-and-incentive-manual-forms-rev-1.pdf) provides an incentive to owners for rain gardens, bioswales, vegetated swales, and green roofs.

*Landscaping Maintenance*

Maintaining native and biodiverse landscaping is different than maintaining traditional landscaping. Maintenance plans, including trained staff and volunteers, is vital for success. There isn’t a one-size-fits-all path to proper maintenance, but all new and retrofit projects should be designed with maintenance in mind.

### Multi-family Opportunities

Cities can encourage and provide incentives to landlords and apartment leasing companies to include biodiverse landscaping and garden spaces for residents would expand biodiversity corridors, particularly in high rental areas near campus. Cities can also provide lists of acceptable plantings for new developments. If an apartment complex already has annual flower beds, planting perennial natives will reduce costs of replanting each year and labor to do so.

A second opportunity is for students to lobby their apartment leasing agencies to allow gardens on the property. Agreements or lease terms can be worked on to allow gardens at apartments if tenants maintain them. These rentals could have raised garden beds or pollinator patches as part of the incentive to rent with the company.

## Partner with Local Nurseries/Horticultural Centers, Landscape Designers

Making natives readily available is an important step. Free seed programs, like the seed exchange at the Urbana Free Library, encourage residents to learn about home gardening and diversify plantings. Plant sales like the [Grant Prairie Friend](https://www.grandprairiefriends.org/) sale are also important.

Nurseries often stock relatively few natives, with some exceptions. Country Arbors Nursery in Urbana has a section of the nursery dedicated to native plants. Educate nursery owners or create partnerships with them to encourage more availability. Couple this with education, planting guides, or guidance to homeowners at the point-of-sale to help home gardeners understand the benefits of and how to care for native species.

### Native Plant Kit

Kits that include native plants, a garden plan, installation instructions, and a maintenance guide make native plantings easy for home gardeners. Kits could be sold at local plant sales, city events, or in partnership with local nurseries.

Maintaining native and biodiverse landscaping is different than maintaining traditional landscaping. Maintenance plans, including trained staff and volunteers, is vital for success. There isn’t a one-size-fits-all path to proper maintenance, but all new and retrofit projects should be designed with maintenance in mind.

## Retrofit Existing Spaces

### Stormwater Retrofits

The Region has retrofitted stormwater infrastructure into multi-use, biodiverse amenities. For example, Boneyard Creek was highly channelized to move water away from the cities as fast as possible. Successful renovations along the stream reverted the Boneyard Creek back to naturalized conditions. For example, both the 2nd street basin and Scott Park now function as recreational outdoor space, while managing excessive stormwater naturally, restoring natural processes, and increasing biodiversity.

[Boneyard Creek Restoration: Scott Park and the Second Street Detention Basin | Landscape Performance Series](https://www.landscapeperformance.org/case-study-briefs/boneyard-creek-restoration)

### Vacant Lot Retrofits

Improve biodiversity on city-owned vacant lots. These spaces can become temporary, or permanent, greenified using low-cost techniques like seeding the area and reducing mowing. Using warm-season grasses and native perennials, while avoiding any permanent plants like trees, will help improve biodiversity until future development occurs at the site. Urban agriculture may also be an attractive use for these spaces.

Palmisano Park in Chicago is a great example of a vacant lot transformed into a community greenspace. Chicago acquired the land in 2009 for development into a park space in the Bridgeport neighborhood. Previously the land was used as a quarry (1800s-1900s) and later a dumping ground for construction waste.

[Palmisano (Henry) Park | Chicago Park District](https://www.chicagoparkdistrict.com/parks-facilities/palmisano-henry-park)

### Golf Courses

There are five large golf courses within the Region. Golf courses can function as urban oases for wildlife. These spaces usually have large trees with a good diversity of woody plants. Golf courses can transition non-playing surfaces to more natural landscapes using native grasses and perennials. Working with the golf associations is essential to help promote native landscaping, and may be advantageous for creating wildlife corridors.

[The Value Of Native Areas (usga.org)](https://www.usga.org/content/usga/home-page/course-care/forethegolfer/2019/the-value-of-native-areas.html)

### Cemeteries

Cemeteries can also function as open green space for wildlife in urban environments. Plant sections of cemeteries with prairie seed and following low-mow practices may be attractive and lower maintenance costs. High quality remnant prairies exist at cemeteries just north of the region.

Eco-burial grounds are also increasing in popularity and could be considered in the Region. The practice of planting a tree instead of a headstone is growing in popularity.

[Welcome - Better Place Forests](https://betterplaceforests.com/welcome-eco-friendly-memorials/?utm_source=g&utm_medium=ppc&utm_campaign=5RockRiver_6Core_7SEM_8NonBrand_Exact_New&utm_adgroup=ROR_Green_Burial_Exact&utm_content=646280483498&utm_campaignid=19617253394&utm_adgroupid=145386267973&utm_device=&utm_term=natural+cemetery&utm_matchtype=e&field__source1=paid&gad=1&gclid=Cj0KCQjwi46iBhDyARIsAE3nVrZPeojuJ2DxUqpfw4PO9LZlcTlJ0bpAyufkIyddU_eaDkNUwcz8qTgaAslLEALw_wcB)

[Prospect Cemetery Prairie Nature Preserve (grandprairiefriends.org)](https://www.grandprairiefriends.org/Preserves/Prospect-Cemetery-Prairie-Nature-Preserve)

### Right-of-Ways

Right-of-ways, or the space in between sidewalks and roads, are typically owned by the city and planted with grass and trees. Right-of-ways, road medians, interstate ramps, and buffer zones are excellent places to help improve diversity with native plantings and low-mow practices. Interstate ramps and major road corridors can beautify city entrances. The plants along roads can also help directly manage stormwater from adjacent impervious surfaces.

[Rights-of-Way as Habitat Working Group | Energy Resources Center | University of Illinois Chicago (uic.edu)](https://erc.uic.edu/bioenergy/row/)

### Parking Lots

Native planting in parking lots can help beautify retail space and mitigate impervious surface in addition to increasing biodiversity.

[When 5% of the United States is Covered By Parking Lots, How Do We Redesign our Cities? | ArchDaily](https://www.archdaily.com/976069/when-5-percent-of-the-united-states-is-covered-by-parking-lots-how-do-we-redesign-our-cities)

[Depave Chicago](https://www.depavechicago.org/#page-section-625cd30640d7da43e11d304e)

[Green-Sustainable-Parking-Guide-2\_10\_2016-Web (montcopa.org)](https://www.montcopa.org/DocumentCenter/View/9735/Green-Sustainable-Parking-Guide-2_10_2016-Web?bidId=)

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### Low Mows

Low mows can be a positive practice or a negative, but it is important to mention them either way. Low mows are essentially areas of lawn that are left to grow with infrequent or no mowing through the growing season. These can be valuable for insects, plants, and wildlife. Native seeds will usually find their way into low mows and provide increased diversity for the area. Low mows also require less maintenance than typical landscapes with reduced need to mow and fertilize. Unfortunately, non-native, and invasive species find their way into low mows. Low mows may have fewer aesthetic qualities and could be considered a nuisance depending on who is asked. Nonetheless, with the right removal of invasives and acceptance of the looks, low mows can be an extremely cost and labor effective way to improve biodiversity.

There are specific species that are good for low-mow areas. Extension offices in cooler climates have posted lists of alternative plant species that work in low-mow areas. These can include cover-crops, fine fescue grasses, ornamental and native grasses.

[Low maintenance lawns in the Midwest - MSU Extension](https://www.canr.msu.edu/news/low_maintenance_lawns_in_the_midwest)

[Lawn Alternatives (psu.edu)](https://extension.psu.edu/lawn-alternatives)

[Planting and maintaining a fine fescue lawn | UMN Extension](https://extension.umn.edu/lawns-and-landscapes/planting-and-maintaining-fine-fescue-lawn)

[Lawn Alternatives | University of Maryland Extension (umd.edu)](https://extension.umd.edu/resource/lawn-alternatives)

[Low Mow Zones (Ongoing) | iCAP Portal | University of Illinois](https://icap.sustainability.illinois.edu/project/low-mow-zones)

[Selecting a turfgrass species for your lawn | Illinois Extension | UIUC](https://extension.illinois.edu/blogs/good-growing/2022-03-25-selecting-turfgrass-species-your-lawn)

# Local Policies, Zoning Codes & Ordinances

Current codes do not specifically require biodiversity to be incorporated into landscapes. Biodiversity can be incorporated into local ordinances through local code updates. Consider uniform codes across the Region to support improved biodiversity across municipal boundaries. Codes that state native landscaping is allowed with certain restrictions will deter nuisance complaints and promote public acceptance of native plants. Dedicate a specific zoning category towards conservation (as opposed to grouping it with recreation and education) to help highlight land in reserve for conservation. By separating conservation from recreation and education-purpose lands, cities can allocate resources towards and dedicate land for conservation specifically. Update stormwater ordinances to have a minimum diversity of plant species in green stormwater infrastructure depending on the size of the management practice.

## Model Ordinances

Model ordinances can help account for certain codes that are lacking from the current ordinances. Including height requirements, setback distances from sidewalks or roads, and a list of restricted species in the code will allow community members to see what is allowed in terms of native landscaping. Model ordinances should allow taller plantings and more native plants around the region. In addition to required shade trees, including a percentage of public space to be dedicated towards native landscaping could considerably improve the biodiversity of the region and improve understory ecology. Converting around 5% of publicly owned turf grass to natives by a certain date is a reasonable goal mentioned during the survey process. Including specific plant species within the model ordinance (or further resources about the topic) can help educate and inform people about what plants to use and where to use them. This would help people pick what plants to use and why they should be used. The code would not account for every native plant that people can use, but by having a select list of tried-and-true species, people can understand the idea of native plants. The plant list should be comprehensive enough to provide habitat for different pollinators and wildlife even if people decide to adhere to the list outlined. Plants included on this list should be easily obtainable from local sources or reasonably purchased from online vendors.

## Incentives

Help encourage people to create and maintain native plantings, encourage local nurseries to carry more native species, and encourage people to shop locally through municipal incentives. Incentivizing native plants and biodiversity in the code would encourage more people to participate in native gardening. Incentives for green infrastructure are already established in some of the cities in the Region. Taking this program farther to implicitly require diversity of planted green infrastructure practices would help improve biodiversity. Revise incentive programs to provide higher incentives to those who include biodiversity within their green infrastructure facilities. Other incentives to help biodiversity can be included in the city code that do not require green infrastructure. Green infrastructure can be expensive to install (even with the incentives) and may deter people from participating in the program. Native plantings offer some overlapping benefits for the city as green infrastructure does, like increased stormwater infiltration. Cost share incentives for native plant purchases could be an incentive to encourage biodiversity. Enrolled participants could receive a rebate in the mail by submitting their receipt from a local nursery for native plants or seeds. These programs require public awareness to encourage the community to enroll.

## Street Scape Plan

A new street scape plan has the potential to solidify biodiversity agendas across different municipalities. Green streets and trail systems extend beyond municipality boundaries and working on these require participation from multiple cities to collaborate on a plan that would work best for everyone. Developing a street scape plan will require mapping of current road connections and conditions. The plan should encourage space for biodiversity for new development or street retrofits. Streets that are 18 feet wide could account for all stormwater generated from the streets with the use of green infrastructure like bioswales and silva cell tree trenches. This width would accommodate separated bike paths and sidewalks from vehicle traffic and would create safer roads for travel. Requiring silva cells in new streets and retrofits will improve the health of street trees and minimize compaction of soil around tree roots. New or retrofitted streets should require a percentage of the public land adjacent to streets to be natives with an adjusted diversity of species. The city arborists adhere to a ratio of family/genus/ratio of public street trees currently. Establishing a lower ratio for the region in this plan can help all cities to diversify street trees. Rethinking the street scape invites new aesthetic possibilities into the cities, creates corridors of habitat, improves walkability, increases stormwater capture capacity, and can unify the region with a connected walking and biking trail system.

Silva cells: [download (nc.gov)](https://www.deq.nc.gov/energy-mineral-and-land-resources/stormwater/bmp-manual/d-2-silva-cell-suspended-pavement-bioretention/download#:~:text=A%2520Silva%2520Cell%2520Suspended%2520Pavement,temporarily%2520hold%2520and%2520filter%2520stormwater.)

## Registration for Native Patches

Create a form and portal for residents to register pollinator patches and native plantings to help keep track of practices in the region, avoid nuisance claims, and reduce the use of banned or restricted plants. Outlined plans with species, size, and location would be submitted for the city to review. Plants species that grow too high and plantings that violate setback distances can be declined. Updating the nuisance complaint form to include registered properties when filling out a claim will reduce the number of unsatisfied claims. Residents can display a sign outside their native garden to educate others about the practice and grow community interest. Registration would allow regulations for certain constraints without requiring someone to manually enforce each garden. Registering for these patches would allow residents to utilize plants that would not be allowed under other codes. For example, a taller compass plant that exceeds a height of 2 feet could be planted, if the resident is beyond a setback distance and registers the garden. The registration form could be a model for other cities and towns in Illinois and could be shared with other cities in the region.

## New Development

Develop a prescriptive path and points-based adoption system for new development and construction to incentivize native plants and biodiversity. New development is required to account for shade trees in parking lots, include natural (or artificial) screening, and manage stormwater depending on the size of project and zoning type. Point systems can incentivize diversity by prioritizing multiple species over one. Reductions in turf gras coverage can also be incentivized or included in the prescriptive path. New developments can be required to follow the prescriptive path or achieve a certain number of points to meet minimum requirements. Points are achieved from different construction strategies utilized. Using multiple native species would score a higher value than using one type of common or non-native species. Developers would be incentivized to use multiple native species to satisfy the point requirement. Placing a cap on certain species that new development can help improve biodiversity depending on the size of the project. Caps and point value would have to be determined by city arborists and horticulturists depending on current status of species diversity in the region.

Encourage and support [Bird Friendly Building Design](https://urldefense.com/v3/__https:/abcbirds.org/wp-content/uploads/2019/04/Bird-Friendly-Building-Design_Updated-April-2019.pdf__%3B!!DZ3fjg!7Rqx0kmOYSws_Zh4uS_pANRTEz53A-7y_c3mB5GcNjRFCP3BMvRv6pcrUV83g2WSCFrSAVvERjgZfpAoPZLjJ-hC9w$) practices for new construction

[Bird-Friendly Building Resources for Architects & Planners | ABC (abcbirds.org)](https://urldefense.com/v3/__https:/abcbirds.org/glass-collisions/architecture-planning/__%3B!!DZ3fjg!7Rqx0kmOYSws_Zh4uS_pANRTEz53A-7y_c3mB5GcNjRFCP3BMvRv6pcrUV83g2WSCFrSAVvERjgZfpAoPZLgZ_0gmg$)

## Streambank Restoration Ordinance

Create a streambank restoration ordinance to improve aquatic ecosystems in the region and help manage stormwater. Expanding the width of streams and creeks depending on how wide it is currently will help revert streams to historical conditions and manage local stormwater. Natural edges accommodate multiple species of plants and animals. Expanding the width would only be applicable to places that allow for it without current infrastructure or private ownership. New development should require a larger setback from water bodies and areas that flood frequently. Setbacks from water bodies and flooded land would allow the region to expand on creek reversion projects and wetland restoration projects where development is restricted. The setbacks would also reduce future flooding issues.

## Landscape Enforcement

There is currently no city staff dedicated to enforcing plants remain in the ground, are maintained, or satisfy code requirements. Hiring an enforcement officer or landscape horticulturist for the cities to oversee plantings will help ensure biodiversity is maintained and that plantings satisfy city requirements.

[Slide 1 (depaul.edu)](https://las.depaul.edu/centers-and-institutes/chaddick-institute-for-metropolitan-development/programs/mdrn/Documents/Glenview_Design_Guidelines--Parking_Lots.pdf)

[Champaign County Regional Environmental Framework (illinois.gov)](https://www.savoy.illinois.gov/vertical/sites/%257BD0463038-CAC4-4485-B59A-9F55DCAB155B%257D/uploads/Champaign_County_Regional_Environmental_Framework_2020.pdf)

# Next Steps

This white paper gathered the perspectives from around 40 community members with different perspectives and areas of expertise across the Region. Opportunities, actions, and strategies were identified from these conversations for this report. Increasing the biodiversity of the region can be accomplished by utilizing the strategies provided to support three key opportunities: promote quality habitat on public land; provide education and guidance through ordinance and policy changes for new and retrofit development; and provide resources, both information and incentives for homeowners and private businesses. Coordination among stakeholders with leadership from the municipalities and university through the formation of a biodiversity working group can accelerate progress and maximize ecosystem services and functional diversity in the local environment. We encourage members of the iCAP Resilience Team to serve as early coordinators to help create and facilitate future biodiversity working group activities. Early goal setting can include:

1. Establish the Champaign-Urbana-Savoy metro region as a leader in biodiversity innovation and development.
2. Develop practices of coordination and collaboration between stakeholder institutions to incorporate biodiversity best management practices.
3. Support applied research to enhance local biodiversity.
4. Increase native plantings and restore habitats to support a diversity of wildlife on public and private property.

# Appendix 1 – Admired Places

Key informants were asked which they admired for their biodiversity. Following are their responses.

### State of Illinois

* [Charleston, IL food forest](https://www.cultivatedwithcare.org/welcome)
* Chicago
  + [Millennium Park](https://www.tclf.org/landscapes/millennium-park) is a notable mention
  + [Morton Arboretum](https://mortonarb.org/explore/activities/explore-grounds/schulenberg-prairie/); good prairie restoration
  + The [Lurie Garden](https://www.luriegarden.org/)
* [Grayslake Prairie Crossing](https://prairiecrossing.com/), a conservation communtiy
* [Kickapoo Rail Trail](https://www.onekrt.org/)
* [Lake County Buffer Strips](https://www.lakecountyil.gov/2390/Buffer-Strips)
* Mahomet Lake of the woods
  + [Lake of the Woods | Champaign County Forest Preserve | Mahomet (ccfpd.org)](https://www.ccfpd.org/lake-of-the-woods-mahomet-illinois)
* Normal
  + The roundabout in downtown Normal
    - [About - Uptown Normal](https://uptownnormal.com/about/)
    - [Uptown Normal Circle and Streetscape | Landscape performance Series](https://www.landscapeperformance.org/case-study-briefs/uptown-normal-circle-and-streetscape)
    - Green space that captures and collects stormwater and turns it into a fountain and helps water trees in the downtown area.
  + Colene Hoose Elementary School
    - Riparian restoration
    - Conservation buffer
    - Best practices
    - [$5 Million 'World Class' Playground Coming to Colene Hoose Elementary | WGLT](https://www.wglt.org/local-news/2021-05-12/world-class-playground-coming-to-colene-hoose-elementary); [Colene Hoose Natural Playground Project Brief V3 (brightspotcdn.com)](https://npr.brightspotcdn.com/de/49/fd1bca4949529c7e9e013e8cd493/hoosenaturalplaygroundprojectbrief.pdf)
  + Food forest: Perennial polyculture
* Paxton
  + Two remnant prairies: Prospect cemetery prairie and Don Gardner’s prairie
* Southern IL
  + Good diversity of bat populations

### National

* Ann Arbor, Michigan
  + Park district
  + Habitat Creation
  + Retrofitting downtown w/ stormwater outdoor dining
  + Foreword thinking when developing
  + Green belt program
  + Zone and acquire land outside of city to prevent urban sprawl
  + Huron river
* Austin Texas
  + Wastewater runs through series of ponds. Could not happen here because of winter
* Bloomington Indiana
  + Volunteers offered training on a Saturday to help manage streams (<-?)
  + Miller Showers Park, Indiana
* Cleveland
  + Stream Policies
  + Bio habitats
* Detroit & Chicago
  + Urban Ag programs
  + Reduced density areas turned into community agriculture spots
  + Vacant lot management
  + [Detroit Biodiversity Network](https://urldefense.com/v3/__https:/www.detroitbiodiversitynetwork.com/__%3B!!DZ3fjg!7Rqx0kmOYSws_Zh4uS_pANRTEz53A-7y_c3mB5GcNjRFCP3BMvRv6pcrUV83g2WSCFrSAVvERjgZfpAoPZJcl0IPTw$), [SEAS Sustainability Clinic](https://urldefense.com/v3/__https:/seas.umich.edu/clinic__%3B!!DZ3fjg!7Rqx0kmOYSws_Zh4uS_pANRTEz53A-7y_c3mB5GcNjRFCP3BMvRv6pcrUV83g2WSCFrSAVvERjgZfpAoPZLOeoLCgQ$), [Huron-Clinton Metroparks](https://urldefense.com/v3/__https:/www.metroparks.com/__%3B!!DZ3fjg!7Rqx0kmOYSws_Zh4uS_pANRTEz53A-7y_c3mB5GcNjRFCP3BMvRv6pcrUV83g2WSCFrSAVvERjgZfpAoPZIT1YHi8Q$)
* Detroit and Baltimore
  + Many vacant lots that have been transformed to be “green”
* Grand Rapids, MI
  + Retrofitted grey infrastructure with GI and street trees
  + Replaced pipes and installed GI
* Iowa
  + Has integrative roadside management
  + Planting roadsides with perennials
  + Reducing mowing
* Kentucky
  + Nursery working on productive native cultivars
* Las Vegas Nature preserve
  + Grey water used to recharge aquifer under nature preserve
* Madison, Wisconsin
  + Davis campus. Planning with infrastructure around campus with diversity and recreation
* Missouri botanical garden
* San Francisco
  + Uses wetlands and phytoremediation to process human waste
  + Places that don’t have access to sanitary districts
* Milwaukee
  + [Milwaukee's Climate and Equity Plan](https://urldefense.com/v3/__https:/city.milwaukee.gov/ImageLibrary/Groups/cityGreenTeam/ClimateandEquityPlan2022extended.pdf__%3B!!DZ3fjg!7Rqx0kmOYSws_Zh4uS_pANRTEz53A-7y_c3mB5GcNjRFCP3BMvRv6pcrUV83g2WSCFrSAVvERjgZfpAoPZIhUWtfbQ$) could lead to biodiversity benefits
* Minneapolis and St. Paul, Minnesota was noted for their
  + Arboretum
  + Designated spaces for species
  + Aesthetics
  + Water bodies
  + Natural parks
    - Goats eat grass to maintain land
  + Composting programs
  + Volunteer programs
  + Hiking trails
    - Helps foster interest in the outdoors
  + Top three bike cities in country
  + Dedicated bike trails have habitat for wildlife
  + Incentive to build rain gardens
* Philadelphia and DC in incorporating nature based solutions into planning process.
  + Rain gardens
  + Rain barrels
  + Compost
* Virginia has a student farm that works with the community
  + Started farmers market on campus grounds
  + Made investments on ways to scale up

### Global

* Mulan, Italy
  + Balconies have vegetation
  + Walls covered with plants
* Vienna Austria Low-income housing
  + Community housing
  + Vegetable gardens
  + Water is recycled and provides water for irrigation and people
* Costa Rica
  + Ethic and pride in diversity
  + Industry initiatives: Growing eucalyptus and trying to fix the problem of that species
  + Set aside large areas for habitat
  + Targeted restoration
  + Dealing with clear cuts
* Paris
  + Has micro parks and other places for people to go to interact with nature
* Germany
  + Laws about protecting wildlife
  + Disappointed that so much diversity is lost already
    - Inspired movement for diversity

# Appendix 2 – Potential Funding Sources

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| * [$7.6 Million in Grants to Support Imperiled Species | U.S. Fish & Wildlife Service (fws.gov)](https://www.fws.gov/press-release/2022-06/76-million-grants-support-imperiled-species) |
| * [5 Species Supported By The State Wildlife Grant Program | U.S. Fish & Wildlife Service (fws.gov)](https://www.fws.gov/story/2022-05/5-species-supported-state-wildlife-grant-program) |
| * [Clean Water State Revolving Fund (CWSRF) | US EPA](https://www.epa.gov/cwsrf) |
| * [Conservation Reserve Enhancement Program - Conservation Reserve Enhancement Program (illinois.gov)](https://www2.illinois.gov/dnr/conservation/CREP/Pages/default.aspx) |
| * [Conservation Reserve Program (usda.gov)](https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index) |
| * [Environmental Quality Incentives Program | Natural Resources Conservation Service (usda.gov)](https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives) |
| * [Environmental Quality Incentives Program | NRCS (usda.gov)](https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/) |
| * [Farmable Wetlands Program (usda.gov)](https://www.fsa.usda.gov/programs-and-services/conservation-programs/farmable-wetlands/index) |
| * [Five Star and Urban Waters Restoration Grant Program 2022 Request for Proposals | NFWF](https://www.nfwf.org/programs/five-star-and-urban-waters-restoration-grant-program/five-star-and-urban-waters-restoration-grant-program-2022-request-proposals) |
| * [Funding Opportunities and EPA Programs Related to the Food System | US EPA](https://www.epa.gov/sustainable-management-food/funding-opportunities-and-epa-programs-related-food-system) |
| * [Grant Opportunities - Grants (illinois.gov)](https://www2.illinois.gov/dnr/grants/Pages/default.aspx) |
| * [Grants - Illinois Native Plant Society (illinoisplants.org)](https://illinoisplants.org/grants/) |
| * [Grants | Pollinator.org](https://www.pollinator.org/grants) |
| * [Green Infrastructure Grant Opportunities - Water Grant Programs (illinois.gov)](https://www2.illinois.gov/epa/topics/grants-loans/water-financial-assistance/Pages/gigo.aspx) |
| * [Habitat Funding - Grants (illinois.gov)](https://www2.illinois.gov/dnr/grants/Pages/Habitat-Funding-Opportunity.aspx#:~:text=The%2520Illinois%2520Habitat%2520Fund%2520portion%2520involved%2520in%2520the,to%2520the%2520Department%2520to%2520help%2520fund%2520their%2520projects.) |
| * [Hazard Mitigation Grant Program (HMGP) | FEMA.gov](https://www.fema.gov/grants/mitigation/hazard-mitigation) |
| * <https://pheasantsforever.org/calloftheuplands> |
| * [Illinois Acres for Wildlife - Wildlife](https://www2.illinois.gov/dnr/conservation/wildlife/Pages/AcresWildlife.aspx) |
| * [Illinois Natural Areas Stewardship Grant Program - Grants](https://www2.illinois.gov/dnr/grants/Pages/StewardshipGrants.aspx#:~:text=The%2520Illinois%2520Natural%2520Areas%2520Stewardship%2520Grant%2520Program%2520provides,and%2520Increase%2520stewardship%2520capacity%2520within%2520Conservation%2520Land%2520Trusts.) |
| * [Illinois Wildlife Action Plan](https://www2.illinois.gov/dnr/conservation/IWAP/Pages/Wetlands-SWG-Projects.aspx) |
| * [Monarch Butterfly and Pollinators Conservation Fund | NFWF](https://www.nfwf.org/programs/monarch-butterfly-and-pollinators-conservation-fund) |
| * [North American Wetlands Conservation Act | U.S. Fish & Wildlife Service (fws.gov)](https://www.fws.gov/law/north-american-wetlands-conservation-act) |
| * [PF\_FactSheet\_2022.aspx (pheasantsforever.org)](https://pheasantsforever.org/getmedia/d7650bed-5381-42da-8acd-402a9677aae3/PF_FactSheet_2022.aspx) |
| * [Pollinator Meadows Program – Illinois Clean Energy Community Foundation](https://www.illinoiscleanenergy.org/natural-areas-program/pollinator-meadows-program/) |
| * [Recover Replant Restore – Trees Forever](https://treesforever.org/Recover-Replant-Restore/) |
| * [Section 319 - Nonpoint Sources (illinois.gov)](https://www2.illinois.gov/epa/topics/water-quality/watershed-management/nonpoint-sources/Pages/section-319.aspx) |
| * [Special Wildlife Funds Grant Program - Grants (illinois.gov)](https://www2.illinois.gov/dnr/grants/Pages/Special-Wildlife-Funds-Grant-Program.aspx#:~:text=The%2520Office%2520of%2520Resource%2520Conservation%25E2%2580%2599s%2520Division%2520of%2520Wildlife,Furbearer%2520Fund%2520and%2520the%2520Migratory%2520Waterfowl%2520Stamp%2520Fund.) |
| * [Sustainable Agriculture (illinois.gov)](https://www2.illinois.gov/sites/agr/Resources/Conservation/Pages/default.aspx#:~:text=The%2520stream%2520bank%2520stabilization%2520and%2520restoration%2520program%2520is,assistance%2520to%2520landowners%2520with%2520severely%2520eroding%2520stream%2520banks.) |
| * [The Bee Grant – The Bee Cause](https://www.thebeecause.org/the-bee-grant/) |
| * [Two University of Illinois Extension Master Gardener Pollinator Projects Receive Grants: University of Illinois Extension](https://extension.illinois.edu/spotlight/two-university-illinois-extension-master-gardener-pollinator-projects-receive-grants#:~:text=The%2520Illinois%2520Clean%2520Energy%2520Foundation%2520awarded%2520the%2520Mercer,at%2520the%2520Mercer%2520County%2520Fairgrounds%2520in%2520Aledo%252C%2520IL.) |
| * [Urban and Community Forestry (illinois.gov)](https://www2.illinois.gov/dnr/conservation/Forestry/UrbanForestry/Pages/IDNRUrbanandCommunityForestryGrants.aspx) |
| * [Urban Bird Treaty Grant | U.S. Fish & Wildlife Service (fws.gov)](https://www.fws.gov/service/urban-bird-treaty-grant) |
| * [Wetland Reserve Enhancement Partnership (WREP) | NRCS (usda.gov)](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/easements/acep/?cid=nrcseprd1459249) |

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