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CENTRAL TALLGRASS PRAIRIE ECOREGIONAL ASSESSMENT: UPDATE ON BIODIVERSITY

JULY 2008

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Authors:
Adrian J. Brown
Mary Harkness
Paula Gagnon

Central Tallgrass Prairie Ecoregional Assessment Team:
Jason Skold
Shannon Horn
John Shuey
Rob Manes
Brian Schreurs
Deanna Zercher
Susanne Hickey
Rebecca Esselman
Dave DeGeus
Greg Wingfield

The Mission of The Nature Conservancy is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

Photo credit. Cover: Big Bluestem (Andropogon gerardii), Dunn Ranch, Missouri © TNC; Mississippi River, Illinois © Robert J, Hurt

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EXECUTIVE SUMMARY

The Central Tallgrass Prairie (CTP) ecoregion encompasses 110,468 square miles in North America, extending from eastern Nebraska and northeastern Kansas east to northwestern Indiana. This ecoregion constitutes the heart of the tallgrass prairie ecosystem that once blanketed the eastern plains of North America; the diverse prairie and its associated savanna, wetland and other habitats formerly supported notable species such as bison, elk, gray wolf, cougar, black bear, and whooping crane. The Mississippi, Missouri and Illinois Rivers form the central network of the ecoregion's freshwater ecosystem diversity, which ranges from small headwater prairie streams to large floodplain rivers; these streams and rivers were historically bordered by mosaics of wet prairies, oxbow lakes, marshes, and riparian forests and now are primarily surrounded by agricultural landscapes.

This update on the biodiversity of the CTP ecoregion was built on an earlier effort to identify the area and spatial arrangement of lands and waters needed to preserve the plants, animals, and natural communities that represent the diversity of life in the ecoregion. Previous lists of globally significant species, natural communities and ecological systems assumed to collectively represent the full array of biodiversity in the ecoregion were reviewed and revised. Known viable occurrences of these conservation targets form the cornerstone around which the updated ecoregional conservation portfolio was configured.

The ecoregional portfolio identified as a result of this assessment consists of 24 freshwater conservation area networks and 156 terrestrial conservation areas. The freshwater portfolio encompasses 8,800 stream kilometers, or approximately 27% of the aggregate stream kilometers within the CTP. Terrestrially, the aggregate of the identified conservation areas occupies 4.4 million acres, or less than 7% of the total area of the ecoregion.

Since the first iteration assessment was completed, the Conservancy and its partners embraced some of the recommendations outlined in the first iteration assessment and made significant contributions to slowing the loss of more of the ecoregion's natural heritage. For example, the Conservancy is leading the restoration or reconstruction of some of the most degraded natural communities in conservation areas such as Kankakee Sands, Illinois River Floodplain, and the Grand River Grasslands. However, they also face significant challenges in achieving conservation goals within the agricultural landscape that now defines the ecoregion. Each landscape has its own unique set of biophysical, agricultural, and socioeconomic characteristics, which collectively present both opportunities and challenges for biodiversity conservation. The particular social, cultural, and economic contexts of different agricultural landscapes adds layers of complexity, which can either facilitate or constrain the implementation of conservation initiatives.

Achieving the biodiversity aims outlined in this assessment requires innovative systems of sustainable agricultural and natural resource management that simultaneously provide viable local livelihoods, conservation of biodiversity and ecosystem services, and sustainable agricultural production at a landscape level. Institutions and policies supporting such sustainable management practices must be developed and implemented

or further enhanced. Collectively, these landscape management practices will improve the distribution and quality of available habitat and natural resources, decrease mortality among native plant and animal species, alter patterns of landscape connectivity and heterogeneity, restore the remaining terrestrial and freshwater habitats, improve ecosystem processes, and change patterns of fire, predation, pest outbreaks and other natural disturbances.

Communication and collaboration between people lie at the heart of mission success in the ecoregion. New connections between issues and relevant areas of knowledge, skills, and power, as well as between people and organizations having those capacities, are required. It is crucial to enable partnerships that can replicate, adapt and scale up successful programs, like those in the Kankakee Sands Macrosite and Loess Hills North conservation areas, into new settings across the ecoregion. Developing continuous dialogue between different stakeholders that inspires collaborative action based on the common vision presented here is critical. People and process will significantly impact future outcomes: how we communicate, make decisions, and work together can enable or obstruct success.

A. INTRODUCTION

Background

An ecoregion can be broadly defined as an area where a commonality of natural process regimes and physical and biotic factors create an area of biological cohesiveness. Ecoregions provide a useful terrestrial geographic unit for understanding, organizing and addressing many conservation issues that transcend socio-political boundaries. Better suited to delineating terrestrial classifications, ecoregional boundaries pose challenges to incorporating freshwater system assessments defined by river basins.

The Nature Conservancy began developing ecoregion-based conservation assessments in the mid-1990's to provide a broad-spectrum analysis of the condition of species, communities and ecosystems within an ecoregion; determine conservation needs and gaps; and define priority areas to ensure conservation of the ecoregion's full array of biodiversity. An ecoregional assessment answers questions of what is important from a perspective of global biodiversity conservation, and what is the most efficient configuration of the landscape that must be the subject of conservation attention to ensure conservation of this biodiversity (TNC 2003). The primary output of an ecoregional assessment is the "identification of a portfolio of lands and waters for conserving the elements of biodiversity within an ecoregion" (Groves 2003). Based on a systematic analysis of existing data and expert information, an ecoregional assessment indicates where to most effectively expend scarce conservation resources in support of The Nature Conservancy's mission.

The Central Tallgrass Prairie (CTP) ecoregion spans parts of three major river basins, the Missouri, Mississippi, and Ohio encompassing 71 million acres of Midwestern North America. Much of the region is extremely fertile due to its deep soils, abundant water sources and temperate climate. The CTP contains parts of seven states: Indiana, Illinois, Iowa, Missouri, Kansas, Nebraska and South Dakota (Figure 1). It is home to over 14 million people. The ecoregion contains a wide range of freshwater and terrestrial ecosystems, including large and small riverine communities, wetlands, multiple species guilds, riparian forests, barrens, woodlands and savannas, and a rich array of matrix-forming prairie systems. All provide priceless ecological services to human inhabitants. Roughly two-thirds of the ecoregion has been completely converted from native ecosystems to high-intensity agricultural production or urban and suburban development, and less than 1.8% of the ecoregion is managed for conservation.

The Nature Conservancy launched its original CTP ecoregional assessment in January 1996 and completed it in January 2000; this was one of the organization's first ecoregional plans. This first iteration assessment identified 167 freshwater and terrestrial conservation areas that addressed 98 terrestrial natural communities, 18 vertebrate species, 26 invertebrate species and 27 plant species (TNC 2000). The portfolio of conservation areas range in size from 3 acres to 1 million acres; 9% of the 3.8 million acres represented were explicitly considered restoration areas.

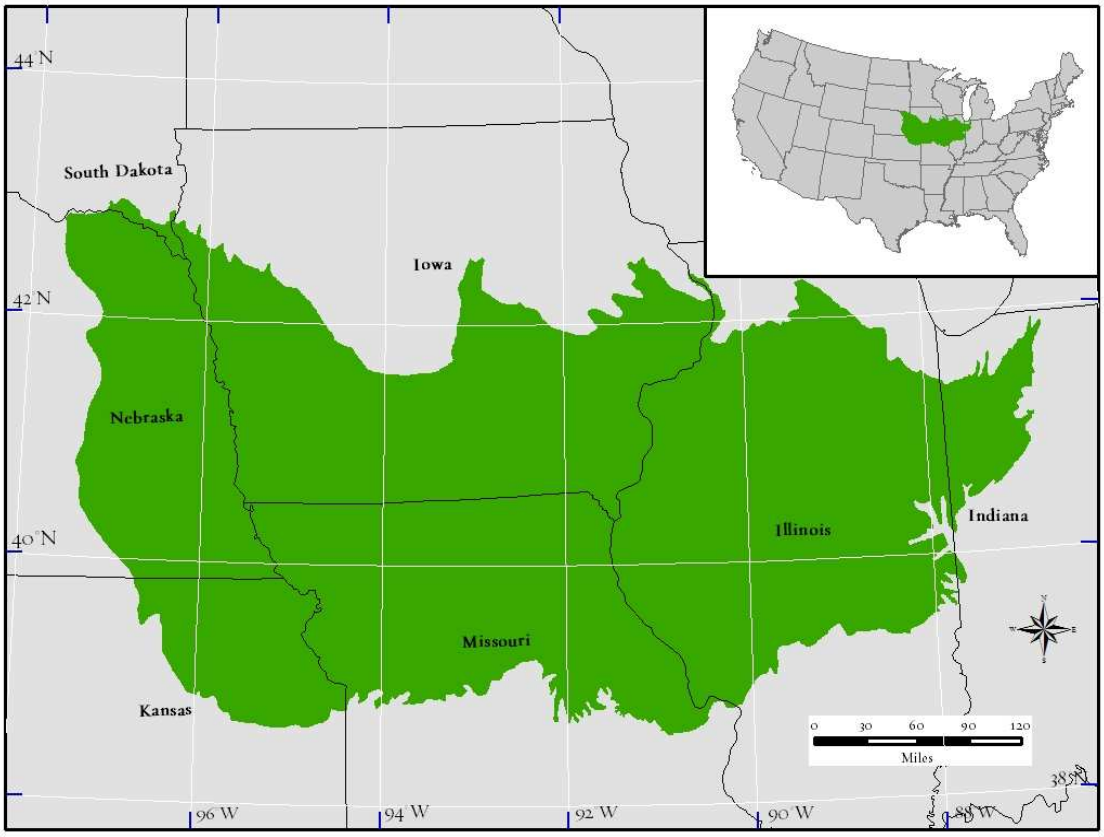

Figure 1: Central Tallgrass Prairie ecoregion

Purpose of the Update

The 2000 CTP ecoregional assessment was intended to guide conservation actions, investments and partnerships for five to ten years. The 2008 assessment presented here provides an updated portfolio of conservation areas – one that reflects the most current biological diversity data and knowledge, land use patterns, and geographic information management aimed to facilitate future measurement of conservation success.

Specific goals of the second iteration CTP assessment include the following:

- Incorporate current data and expert knowledge on target species and ecosystem locations, distribution, viability and threats to their viability.
- Conduct a freshwater assessment for the lower Missouri River subbasin that complements completed freshwater assessments for the upper Mississippi River (Weitzell et al. 2003), middle Missouri River (Gagnon et al. 2004) and lower Ohio (North Central Tillplain Ecoregional Planning Team 2003) subbasins. Merge relevant portions of the three existing assessments (upper Mississippi, middle Missouri, and lower Ohio) with freshwater priorities identified for the lower Missouri River subbasin in this assessment into a comprehensive portfolio of freshwater priorities for the CTP ecoregion.
- Explicitly incorporate geographic stratification into the ecoregion-wide goals for terrestrial conservation targets to ensure their proportional representation in all ecoregional sections where they are found.
- Address declining and vulnerable grassland birds.

B. OVERVIEW OF ECOREGION

Location

The CTP ecoregion encompasses 110,468 square miles (286,112 km^2) in North America extending from eastern Nebraska and northeastern Kansas east to northwestern Indiana. (Figure 2). It forms the eastern lobe of the Prairie Parkland Province and sections of two ecoregions (Central Dissected Till Plains and Central Till Plains) delineated by Bailey (1995). The ecoregion falls between the 43º N and 38.5º N standard parallels of latitude.

Table 1: Central Tallgrass Prairie state statistics

State Name	CTP Acreage in State (acres)	Percent of CTP in State	Percent of State
South Dakota	239,134	0.3	0.5
Iowa	17,955,987	25.4	49.9
Nebraska	10,144,601	14.3	20.3
Indiana	2,225,815	3.1	9.5
Illinois	20,808,475	29.4	57.6
Kansas	4,597,442	6.5	8.7
Missouri	14,724,708	20.8	33.0
Total	70,696,162		

Physiography and Climate

The ecoregion is characterized by flat to gently rolling topography with steep bluffs bordering three major river valleys: the Mississippi, Missouri and Illinois. Landforms are somewhat uniform and often occur in repeating patterns. Soils have a predominantly dark-colored surface horizon and are base rich (mollisols), or have udic moisture regimes where rainfall is well distributed (alfisols), with occasional deposits of undeveloped sands (entisols) in the western big river valleys and in the far eastern portion of the ecoregion. Wide temperature fluctuations and persistent winds characterize the climate, with annual precipitation ranging from 17 inches in the west to 40 inches in the east.

During the Pleistocene Epoch, glaciers advanced and retreated at least four times across all or portions of this ecoregion, resulting in large areas of glacial drift and loess and creating the characteristic rolling topography. The area of most recent glaciation is the Grand Prairie region of central Illinois and northwestern Indiana. From east to west the ecoregion rises toward the continental divide of the Rocky Mountains. Elevation averages 1161 feet across the ecoregion with a high of 1925 feet in northeast Nebraska and a low of 400 feet near St Louis, Missouri (Figure 2).

Land Use

The region has a history of significant human influence. Native Americans occupied the region for 10,000 years prior to Euro-American settlement. In the 200 years since Euro-American settlement few places in the world have undergone the degree of human-caused

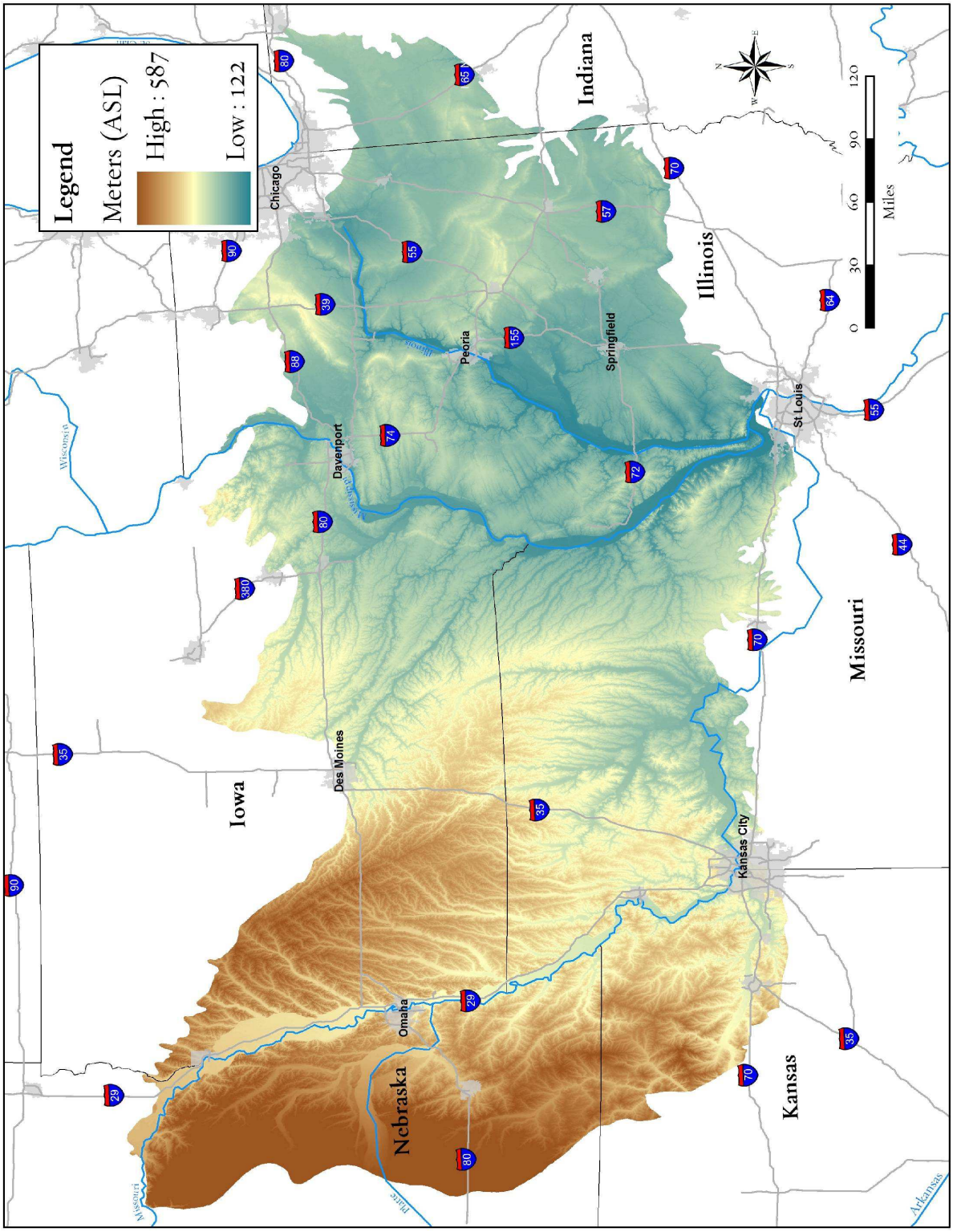

Figure 2: Elevation model of the CTP ecoregion

land use change documented in the prairie regions of the central United States. Human infrastructure and activities threaten the viability of most natural communities and freshwater stream networks. More than 56% of the ecoregion is dedicated to crop production. There are 1,591,337 million acres dedicated to transportation, housing and industry in the ecoregion, which is greater than the total number of acres secured for conservation. Ninety-seven percent of the ecoregion is in private ownership.

Major population centers are located on the margins of the CTP, primarily Chicago, St Louis, and Kansas City, with several large state capitals and regional cities serving as the focus of human population within the ecoregion. The 1995 population for the CTP was 12,457,189 and by 2004 the population had risen 18% to 14,701,587. As we move into the 21st century, the U.S. population will continue to rise and place more demands on the terrestrial and aquatic resources in the CTP.

Vegetation

The CTP ecoregion was named for the extensive tallgrass prairie mosaic that dominated the landscape prior to Euro-American settlement, and the prairie influence suffused virtually every facet of the landscape. Embedded within this matrix were a complex array of extensive woodland systems and a plethora of smaller community types.

Prairies occurred on varied substrates in a variety of contexts, creating a diverse matrix of grassland community types. Tallgrass prairies ranged from wet prairie in deep organic soils that were constantly at or near saturation, to xeric upland prairies on thin soils in excessively drained sandy and rocky sites. Prairie occurred on both acidic leached substrates and on base-rich substrates derived from carbonate bedrock or calcareous glacial till. Prairies in the western part of the ecoregion, such as the northern portion of the Flint Hills, are on relatively thin soils over Paleozoic sedimentary rocks. Over millennia, many of the wetter prairies formed vast accumulations of carbon-rich organic soils, creating some of the most productive agricultural sites in the temperate world. The very productivity of these soils proved the undoing of the prairie landscape, as the intensive agriculture that characterizes the region today became established in the last 180 years.

Predominant grasses in these prairies include big bluestem (*Andropogen gerardii*), little bluestem (*Schizachyrium scoparium*), prairie dropseed (*Sporobolus heterolepis*) indian grass (*Sorghastrum nutans),* switch grass (*Panicum virgatum*), side oats grama (*Bouteloua curtipendula*), and various sedges (*Carex* spp., *Scirpus* spp.) and cool-season grasses (*Kohleria macrantha*, *Panicum* spp., *Stipa spartea*). Besides their lush fertility and productivity, these prairies are also characterized by a well-developed and diverse forb component. Forbs compose nearly a thousand taxa of angiosperms, and in many cases total forb importance approaches total grass importance in Midwestern prairie vegetation.

Associated with the prairies were extensive timbered systems, ranging from open savannas to closed canopy woodlands, and some limited, localized areas of true forest. Most of the extensive woodland systems were associated with major riverine systems in topographically dissected areas. Woodlands occurred on soils ranging from acidic to alkaline, in a variety of habitat contexts. Woodlands typically occurred in areas where the pervasive, frequent, dormant season fires that characterized the Midwestern landscape were excluded, infrequent, or attenuated by infertile conditions or moisture.

Prior to Euro-American settlement, terrestrial portions of the Central Tallgrass landscape were essentially totally vegetated. The taxa composing this vegetation were overwhelmingly perennial, and characterized by deep, well-developed root systems. Especially in the northern and eastern portions of the ecoregion, a diversity of small- and large-patch wetland types, ranging from marshes, fens, and wet prairies to riparian prairie systems and sloughs, augmented regional biodiversity patterns and contributed to the rich faunal diversity of the region.

The primary ecological processes driving the natural systems of the tallgrass prairie were climate, grazing and fire, each operating at multiple scales, frequencies and intensities (Weaver and Albertson 1956, Vogl 1974, Singh et al. 1983, Axelrod 1985, Risser 1985, Anderson 1990). Grazing and fire interacting with climate, landform, and soils produced variable regional vegetation patterns. The landscape experienced frequent surface fire, primarily anthropogenic in origin, with the fire return interval ranging from 1 to 7 years, depending on topography, community type and moisture regime. Large portions of a landscape were kept open and repeatedly ignited by Native Americans to stimulate new growth to attract wildlife, clear vegetation and facilitate travel, as a tool of warfare or hunting, and to reduce the likelihood of wildfire. Bison, elk and white-tailed deer were the principal large grazers in the ecoregion. They moved to locations with preferred forage in response to patterns of precipitation, drought and fire (Risser 1985). Their transitory grazing patterns allowed the vegetation to recover from intermittent, and sometimes intensive, grazing events.

Today, native vegetative communities cover less than 1% of the ecoregion, and most are degraded and highly threatened. Many of the species that depend on these native vegetation communities and that are migratory or have large area needs, such as some grassland bird species, are threatened due to fragmentation and reduction in large expanses of native habitat. The large prairie remnants in the ecoregion are concentrated in just a few places such as the Loess Hills of Iowa and the Flint Hills of Kansas. The remaining small prairie remnants tend to be widely scattered. The disproportionate loss of prairie community types has resulted in once common species becoming rare. Fire suppression has contributed to the invasion of woody and exotic species into many of the remaining prairie, savanna, and woodland remnants and is a predominant threat to many remaining terrestrial ecological systems in the ecoregion.

Big Rivers

The Mississippi, Missouri and Illinois Rivers form the central network of the CTP's freshwater ecosystem diversity, which ranges from small headwater prairie streams to large floodplain river systems bordered by a mosaic of coarse hydric grasslands, oxbow lakes, wet prairies, marshes and forested lands. This diverse array of aquatic systems makes a significant contribution to the region's biological diversity.

The Missouri River system in the CTP includes the lower portions of several major tributary basins: the Platte (Nebraska), Kansas (Kansas) and Grand (Missouri) Rivers. Major tributaries of the Mississippi River within the CTP include the Rock (Illinois), Iowa, Cedar, Des Moines (Iowa), and Illinois (Illinois) Rivers.

Historically, typical headwater streams in the CTP emerged from a network of prairie wetlands into perennially flowing, prairie and shrub-bordered stream and river systems. Faunal assemblages of these streams were generally adapted to severe fluctuations in conditions, with intermittent drying, flooding, freezing, upland burning and high temperatures not uncommon. Algae within the stream were the foundation of the food chain; however, detritus from prairie grasses provided an additional, significant energy source. These headwater prairie streams gradually gave way to well-shaded, meandering, small river bodies characterized by savanna and forested riparian areas, coarse substrate bottoms, clear waters, and riparian detritus-derived energy sources. The sinuosity of these small rivers created an array of depth and current velocities and resulted in diverse instream habitats for supporting faunal assemblages adapted to the unique mix of conditions found there.

As the small river systems fed into large floodplain rivers, the channel widened, canopy cover was reduced, and suspended sediments in the water column increased. Periodic flooding, primarily associated with snowmelt, was an essential part of the ecology of the floodplain river system; the annual flushing of the river valley provided organic matter and nutrients, biological cues for a range of fauna, and channel scouring and deposition that maintained a diversity of in- and off-channel habitats. The extensive and intricate floodplain systems of the great rivers in the CTP, including the Missouri, Mississippi and Illinois, were composed of a mosaic of backwater habitat including floodplain lakes and wetlands, as well as an extensive and dynamic web of main and side channel connections that supported diverse riverine plant and animal communities.

Today, many of the freshwater systems of the CTP are barely reminiscent of their historic condition. Many headwater marsh/stream complexes have been drained and channelized; midsize streams have been straightened; and large rivers have been dammed, leveed, channelized or converted to reservoir systems. Formerly clear-flowing prairie streams have been clogged with nutrient-rich soils and sediments eroded from intensively cultivated lands. Mean particle size of substrates across all sizes of streams and rivers has become smaller, with fine sediments dominating the substrate loads conveyed by the whole system. In-channel habitats are now homogenized, riparian, in-stream and floodplain vegetation reduced, and geomorphic complexity largely eliminated. Innumerable barriers, in the form of dams, levees, check dams and bank stabilization features impede movement of fauna, propagules and genes. Water quality is compromised by wastes from urban and agricultural sources. The natural flows of the region's rivers and streams has been significantly impacted by levees, lock and dam systems, floodplain drainage systems, water supply infrastructure, flood protection, and stream channelization.

These alterations seriously impact the region's aquatic diversity. The net effect of these stressors on the freshwater systems of the CTP is a decline in the abundance and diversity of native species that once thrived in these basins. Taxa once characteristic of small prairie streams and large prairie river systems, such as the Topeka shiner (*Notropis topeka*) and pallid sturgeon (*Scaphirynchus albus*), are now federally listed. Multiple introduced exotic and invasive species, such as grass, silver and bighead carp, are common and widespread in the region's major rivers. Although no aquatic species historically present in these systems has yet become extinct, many have declined precipitously and are increasingly vulnerable to extirpation within subbasins and watersheds.

C. APPROACH

The approach and methods used in this assessment were adapted from the ecoregional planning guidelines articulated in the Conservancy's "Designing a Geography of Hope: A Practitioner's Handbook to Ecoregional Conservation Planning" (Groves et al. 2000). The iterative and integrated nature of the approach is shown in Figure 3. This section briefly outlines the approach used by the team and highlights key methods. Additional details on methods are provided in later sections of this report.

Currently there are few examples of second-generation ecoregional assessments in the Conservancy that might have informed this process. In the early planning stages of this assessment, the team decided to conduct a full planning process, developing an updated portfolio that would be compared and reconciled with the previous portfolio. This approach was viewed to be preferable to that of an ad-hoc revision to the previous iteration portfolio, for several reasons:

- Linkages between the raw data and processed assessment data in the original assessment were intentionally removed due to data licensing requirements, making it difficult to directly compare raw data from the original assessment to updated raw data obtained for this assessment.
- This assessment was intended to fill substantial gaps in the first assessment by systematically addressing freshwater systems, addressing terrestrial ecological systems, addressing declining and vulnerable grassland birds, and incorporating geographically stratified conservation goals and new viability criteria.
- Biological data and assessment methods have both been updated and improved since the original assessment was completed.

Three freshwater assessments addressing over half of the CTP ecoregion have been completed since the 2000 CTP assessment was published:

1) the upper Mississippi River subbasin assessment (Weitzell et al 2003);
2) the middle Missouri River subbasin assessment that was part of the Northern Tallgrass Prairie ecoregion's freshwater assessment (Gagnon et al 2004); and
3) the freshwater assessment conducted for the North Central Tillplain ecoregion (North Central Tillplain Ecoregional Planning Team 2003).

These plans generally employed systematic and currently accepted freshwater assessment methods and they address three of the four major subbasins (Figure 3) that overlap with the CTP ecoregion: the upper Mississippi, middle Missouri, and lower Ohio. The fourth subbasin – the lower Missouri – had not been addressed in any previous assessments. Therefore, the freshwater component of this planning effort was focused primarily on completing a freshwater assessment for the lower Missouri subbasin and integrating the existing freshwater portfolios for the other three subbasins to develop a comprehensive freshwater portfolio for the CTP ecoregion.

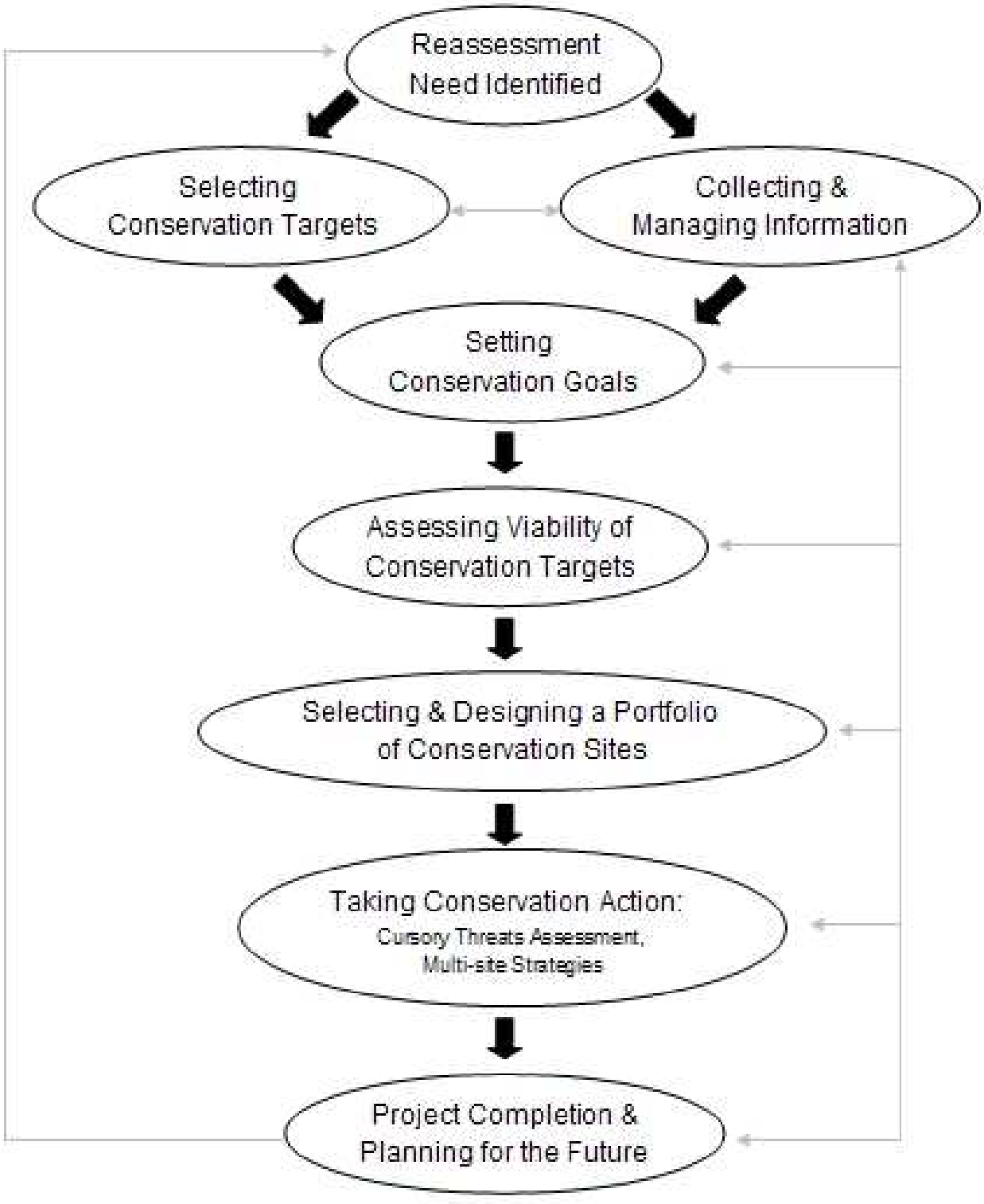

Figure 3: Iterative and integrated reassessment approach used in this assessment.

The assessment approach is iterative and is built around six key components (Figure 3):

1. **Selecting Conservation Targets** - Given that thousands of species occur in an ecoregion, an initial challenge in an ecoregional assessment is to identify a subset of species and natural systems or communities that can adequately represent the biodiversity of the entire area. The Conservancy refers to this subset as "conservation targets." These targets are surrogates for biodiversity, and serve as the primary basis for identifying and selecting areas that collectively constitute an ecoregional portfolio. We employed the "coarse-filter/fine-filter" approach to selecting both freshwater and terrestrial conservation targets. This approach is based on the assumption that protection of representative examples of all types of ecological systems in an ecoregion - the coarse filter - will protect the majority of species that exist within these systems. Some species with restricted distributions or unique characteristics may not be represented through this strategy – they will "fall through" the coarse filter. Therefore, a fine filter is also needed as a complement to the ecological systems selection. Fine filter targets generally include species that are rare, endemic and/or in severe decline.

   Locations where conservation targets are found are referred to as target occurrences. Target occurrences may include locations of individuals or populations (in the case of species), or river segments or land patches (in the case of freshwater and terrestrial communities).

2. **Setting Conservation Goals** - Conservation goals are working hypotheses describing the number and spatial distribution of populations or "occurrences" of targets that will ensure each target's long-term survival. Conservation of multiple examples of each target distributed across its geographic range is assumed to capture ecological and genetic variability and maximize the target's resilience.

   Terrestrial ecoregional goals were based on the generic, range-wide, distribution-based goals used in the first assessment. In the 2008 assessment, these goals were modified for terrestrial natural communities by adding a geographic stratification and increasing the number of occurrences assumed to ensure long-term viability for select community types.

   Because the freshwater assessment incorporated previous upper Mississippi, middle Missouri, and lower Ohio assessment work (Weitzell et al. 2003; Gagnon et al. 2004; North Central Tillplain Ecoregional Planning Team 2003), freshwater target conservation goals were established independently for each of the three freshwater assessment units that substantially overlap with the CTP: the upper Mississippi subbasin, and the middle and lower Missouri subbasins. Despite this geographic stratification of goals, every effort was made to apply a consistent rationale to target goal setting, and efforts were made to align conservation goals for targets that crossed basin boundaries. In general, freshwater conservation goals for aquatic ecosystems and species include a specific number of occurrences (usually determined through expert guidance), and an unique spatial distribution for those occurrences (usually a list of the subbasin units or watersheds in which the occurrences should reside).

3. **Assessing Viability and Ecological Integrity of Individual Target Occurrences** - Ultimately, individual conservation areas within the ecoregional portfolio must be of

sufficient viability - in terms of size, condition and landscape context - to sustain targets over a specific time horizon, which for planning purposes we set at 100 years. Evaluating the viability of individual populations of species targets and the ecological integrity of occurrences of systems or community targets is a challenge. However, in order to select the best sites for inclusion in the portfolio, individual target occurrences must be evaluated.

The team attempted to derive specific viability information for all target occurrences using NatureServe data and extensive interviews with dozens of taxonomic experts and ecologists across the ecoregion (see Acknowledgements section). Despite these efforts, the understanding of viability conditions for numerous target occurrences was still incomplete. Other indicators were used to complement the qualitative work done by experts and gain a more complete picture of viability of target occurrences to assist in portfolio assembly.

A coarse threat assessment was also completed to identify and compile threats that transcend state boundaries by isolating those that have a high frequency of impact on multiple areas of biological significance across the ecoregion. The compilation of threats in this assessment is invaluable to further understand the nature and causes of biological diversity declines in the CTP.

4. **Designing a Portfolio of Conservation Areas** - Determining the suite of sites to include in the ecoregional portfolio is the primary aim of ecoregional assessments. Choosing areas that are rich in targets and have high ecological integrity and viability is challenging. Both rule-based, manual site selection models and expert knowledge of the ecoregion are important in the portfolio assembly process; expert input is essential in determining a final portfolio that makes sense to those knowledgeable on the distribution of targets, threats, land use patterns and practices.

   Determining the best suite of conservation areas for the CTP portfolio involved two phases. As a starting point, the team used a set of simple decision rules to capture highest-viability conservation target occurrences and assemble an efficient configuration of conservation areas that best met conservation goals for all targets. This map of conservation areas was compared to the 2000 iteration assessment to identify differences, resolve them if necessary, and develop a draft portfolio. The second phase involved expert review of and revisions to the draft portfolio solution to select a final ecoregional portfolio.

5. **Taking Conservation Action** - The revised portfolio and information base created through this assessment will enable TNC and partners to 1) refine conservation priorities, 2) establish new long-term goals and strategies, and 3) evaluate emerging opportunities based on a more complete ecological context.

   Multiple public and private partners along with the Conservancy are already taking action in many of the conservation areas included in this ecoregional portfolio. This step in our approach is to integrate the new ecoregional portfolio into established on-the-ground efforts to further delineate common threats, and refine multi-site strategies into a set of discrete and measurable conservation actions.

6. **Collecting and Managing Information** – Gathering, compiling, analyzing and managing information underpins all steps of this ecoregional assessment process. Numerous data sets in various formats from a range of sources were obtained, generated or analyzed to conduct this ecoregional assessment.

   Both state chapter staff and central US regional science staff managed these data. Data were largely managed using MS Access 2000 and ERSI Geographic Information System (GIS) software products ArcGIS 9.1 and ArcInfo. The Conservation Planning Tool (CPT) v1.5, a standardized relational database developed by the Conservancy and used in conjunction with raster and vector GIS data layers, serves as the primary venue for storage of tabular and geospatial information.

D. CONSERVATION TARGETS

Biological diversity occurs at multiple scales and can be organized into broad categories: biomes, ecological systems, communities, taxa, populations and organisms. Since it is impractical to explicitly plan for all of the elements of biodiversity in an ecoregion, it is critical to identify a representative subset of the biological diversity native to the ecoregion to serve as the focus of planning efforts. These representative sets of biodiversity elements, the conservation targets, are the foundation around which a portfolio of conservation areas is built.

As discussed previously, the Conservancy employs a coarse-filter/fine-filter approach to define a subset of conservation targets that best represents all biodiversity of the region. Ideally, the list of conservation targets includes three basic levels of biological organization (species, communities, and ecological systems) and four spatial scales (local, intermediate, coarse and regional). The assumption is that by focusing planning on this list of conservation targets, there will be a high likelihood of conserving the vast majority of species and system-scale diversity in a region. In practice, ecological systems and natural communities serve as the "coarse filter" and represent the broader levels of biological organization. In addressing them, it is assumed that most of the relatively common species that inhabit these communities or systems will be captured in the conservation portfolio without focusing on each of them individually. Therefore, systems and communities serve as surrogates for ensuring the representation of numerous individual species. Some species, due to rarity, endemism, mobility and geographic range, or other characteristics, may not be adequately addressed even if all ecological systems and communities are considered. These species serve as part of the "fine filter."

To represent the various levels of biological diversity and their spatial scales, and to employ a coarse-filter/fine-filter approach, conservation targets for this second iteration include all aquatic ecological systems (AESs), all terrestrial ecological systems, all native plant communities, and a subset of freshwater and terrestrial species that warrant individual attention for various reasons or represent taxa group with unique life history needs or traits. The target list from the first iteration assessment was used to help build the target list for the second iteration. Table 2 illustrates, by category, the number of targets in the 2000 and 2008 assessments.

Table 2: Comparison of conservation targets in successive CTP ecoregional plans.

Conservation Target Category	**2000 Iteration**	**2008 Iteration**
Aquatic Ecological Systems	0	55
Aquatic Species	28	43
Terrestrial Ecological Systems	0	24
Terrestrial Plant Communities	96	135
Terrestrial Species	42	59
Karst Communities	2	0
Karst Species	1	0

The primary difference between first and second iteration conservation targets is the addition of freshwater and terrestrial ecological system targets. (Although terrestrial

ecological systems were developed and incorporated as targets in the 2008 iteration, major technological hurdles, spatial data gaps and loss of staff prevented them from being fully evaluated and included in the portfolio development process for this assessment.) Additionally, freshwater species and systems received minimal attention in the first iteration and are more comprehensively addressed in this iteration. Although the first iteration did include two karst communities and one karst species as targets, karst systems and their associated species were not comprehensively or adequately addressed in this iteration. A comprehensive effort is needed to address the karst-associated biota gap in this ecoregion in the future.

The following account of how conservation targets for the ecoregion were derived and enumerated is divided into separate sections for species, natural communities, and ecological systems.

Species Targets

Freshwater and terrestrial species targets were selected largely to serve as fine filter targets. Species that are globally rare, endemic to the ecoregion, disjunct in the ecoregion, declining, vulnerable, focal, or wide-ranging, were chosen as fine filter targets. Species were also chosen as either primary or secondary targets. Primary targets were assigned numeric and distributional conservation goals, and the ecoregional portfolio was explicitly designed to meet those goals. Conservation goals were not set for secondary species targets; they are represented only incidentally in the final portfolio of conservation areas. Where they are present in the portfolio, conservation action plans should include them as targets.

Species and subspecies meeting one or more of the following criteria were included as primary targets: 1) globally rare (NatureServe conservation status rank of G1-G3); 2) endemic to the CTP ecoregion; and 3) disjunct. Numeric and distributional conservation goals were set for primary species, and the ecoregional portfolio was designed to meet those goals.

Globally rare species

Most species and subspecies targets in this assessment were included on the basis of rarity across their entire range. These taxa have a global conservation status rank – or "G-rank" – of G1-G3 or T1-T3. G-ranks are assigned by NatureServe and take into account number of occurrences, quality and condition of occurrences, population size, and conservation status across its entire range, and are expressed on a scale from G1 (critically imperiled) to G5 (secure)[1]. For all species, range ranks were defaulted to the lower priority G-rank; for example, a species ranked G3G4 was assumed to be G4 in developing the target list.

There are two distinct patterns of global rarity: 1) habitat or process-limited taxa that were always rare in the post-glacial environment and 2) formerly more abundant species that have declined as a direct consequence of anthropogenic perturbations associated with post Euro-American settlement environment (TNC 2003). It is in the second category of rarity where many of the identified species targets in this

[1] See http://www.natureserve.org/explorer/ranking.htm for a brief overview of G-ranks.

assessment fall, particularly terrestrial species. At the beginning of the assessment, the team reviewed the target list from the first iteration assessment (TNC 2000) and current element occurrence (EO) data to identify a draft list of G1-G3 species. Biologists from state heritage programs reviewed lists of G1-G3 species and added missing ones to finalize an initial list. As information was corrected or updated during the planning process (e.g., a G3 target was discovered to be G4), adjustments were made and documented; most such adjustments were made near the end of the assessment. Fifty-four of the 102 freshwater and terrestrial species targets in the CTP are classified as globally rare taxa.

Endemic species

By definition, the range of a species endemic to an ecoregion is restricted solely to that ecoregion; the species is found nowhere else in the world. Because such species are so limited in their distribution, they are more vulnerable to stochastic events and potentially more vulnerable to negative impacts from anthropogenic activities. Therefore, it is necessary to take extra precaution to ensure their long-term survival in the ecoregion where they are found. The relative uniformity of the ecoregion's climate and geology and its connectivity to surrounding ecoregions has created little pressure or opportunity for the evolution of endemic flora and fauna; consequently few terrestrial species are classified as endemic in the Central Tallgrass Prairie.

Disjunct species

Disjunct species typically occur as distinct populations in the ecoregion isolated from other populations in adjacent ecoregions. Most taxa in the CTP have a wide geographic distribution, with many species' ranges centered in the CTP. Few CTP populations represent outliers disjunct from the main range of the species, although several aquatic species were identified as disjunct. Analogous to the reasons for the low degree of endemism in the CTP, disjunct species represent only 5 of the 102 total species targets in the CTP. However, from a genetic and conservation perspective, disjunct status remains an important selection criterion for species conservation targets.

Declining and vulnerable grassland bird species

Given the importance of this ecoregion to grassland birds and the historic and ongoing losses of grassland habitat, particular consideration was given to vulnerable and declining grassland birds as a group. Grassland bird species that were identified by Partners in Flight for "immediate action" in the Prairie Avifaunal Biome were considered for target status (Rich et al. 2004). As the Prairie Avifaunal Biome is larger than the CTP ecoregion, avian experts helped narrow this list of grassland bird species to those that breed within the CTP region and these species became primary conservation targets. Also, those grassland bird species identified as "management" species by Partners in Flight (Rich et. al, 2004) are included as secondary targets if they are known to occur in identified conservation areas.

Aquatic species assemblages

In addition to including individual freshwater species as primary conservation targets on the basis of rarity, endemism, or disjunction, several quintessential and declining freshwater faunal assemblages were also included as primary conservation targets. Target assemblages are composed of characteristic native fauna typically co-occurring

in high-quality streams, rivers and/or lakes and therefore sharing common ecological processes and threats. Because of the current condition of aquatic habitats and watersheds in the region, these assemblages are commonly declining or vulnerable. For example, freshwater mussels were selected and grouped into target assemblages.

Species meeting two or more of the following criteria were also included as primary targets: 1) declining; 2) vulnerable; 3) focal; and 4) wide-ranging.

Declining species
Species that are exhibiting significant, long-term declines in habitat and/or numbers were considered. Many terrestrial CTP species fall within this category. Most of these declines are the direct result of post Euro- American settlement changes in land use and land cover, as well as other anthropogenic activities, but few declining species meet a second criterion that would elevate them to primary conservation targets.

Vulnerable species
Vulnerable species that weren't included on the basis of global rarity are usually relatively abundant across their range and have some aspect of their life history makes them especially vulnerable. For example, the eastern massasauga *(Sistrurus catenatus catenatus)* is vulnerable due to human persecution and habitat destruction (wet prairie) and is a species in decline. Many aquatic species targets are considered both declining and vulnerable, particularly invertebrates.

Focal species
Focal species have spatial, compositional and functional requirements that encompass those of multiple other species in the region and may help address the functionality of ecological systems. They may include taxa whose impact on a community or ecological system is disproportionately large for their abundance. They contribute to ecosystem function in a unique and significant manner through their activities. Their removal initiates changes in ecosystem structure and often a loss of diversity. Few species met this criterion due to post Euro-American settlement habitat modifications and human persecution, and the few remaining species that did were aquatic species.

Wide-ranging species
These species typically require large blocks of habitat that are relatively unaltered by anthropogenic influences to maintain viable populations. In the CTP, these species include top-level predators, anadromous fish, birds, bats and some insects. Several of the most area sensitive species are extirpated from the ecoregion and are not included as conservation targets here.

Although efforts to consider all four of these criteria for all taxa were by no means exhaustive, the mechanism did prove useful as a method for species inclusion as conservation targets. Given the known declines in grassland bird species and their habitat, the team focused its consideration of declining taxa on that group. Future iterations will require a more thorough assessment of all taxa that would likely meet these criterions, particularly the combination of vulnerable and declining. As stated earlier, many formerly abundant species within the CTP have declined as a direct consequence of human modifications of habitat; however, their global populations have not reached a level where their global rarity has elevated them to a G3 or higher rank but they are particularly

rare within the CTP ecoregion. Therefore these species do not meet the criteria outlined here for primary conservation target inclusion but they are species of concern in the CTP that warrant continued vigilance.

Appendix 1 lists primary terrestrial species conservation targets, their global rarity, distribution and justification for inclusion as target in the 2008 CTP ecoregional plan. A total of 59 terrestrial species for the CTP ecoregion were selected as targets, including 26 vascular plants, 15 invertebrates, 1 amphibian, 4 reptiles, 10 birds, and 2 mammals. In this iteration 14 bird species were selected as secondary targets and are listed in Appendix 2. The final list of aquatic species and taxa assemblage targets, their global rarity, distribution and justification for inclusion as targets for the lower Missouri River basin is provided in Appendix 3. A total of 43 aquatic species were selected as conservation targets, including 30 fish, 11 mussels, 1 snail, and 1 aquatic insect.

Terrestrial Ecological System Targets

Groves et al. (2000) describes ecological systems as dynamic spatial assemblages of ecological communities that 1) occur together on the landscape; 2) are tied by similar ecological processes, underlying environmental features or environmental gradients; and 3) form a robust, cohesive and distinguishable unit on the ground.

Typically, ecological systems serve as important coarse-filter targets in ecoregional planning. Given the spatial data gaps relating to ecological systems of the CTP and the technical hurdles to filling those gaps, they were not used as coarse-filter targets in this assessment. At the time this assessment was undertaken, no comprehensive list of ecological systems occurring in the CTP existed. In 2006, NatureServe and its partners developed a comprehensive classification of ecological systems in the CTP, built on the foundation of the National Vegetation Classification (Grossman et al. 1998). A total of 19 ecological systems were identified as having a significant portion of their range within the CTP ecoregion. Five additional ecological systems were also identified as occurring in the CTP. Each of the five was at the extreme periphery of their range and had a single allied vegetation association in the region.

The extent of habitat loss, isolation and degradation across the ecoregion makes identification of distinguishable ecological system units difficult, and any efforts to do so will rely heavily on interpreting abiotic characteristics and remnants that, in most cases, are the only indication of the ecological system type that was formerly present. An initial delineation and mapping of distinguishable ecological system units across the CTP ecoregion was completed by NatureServe and Nature Conservancy staff during the drafting of this report. Following the completion of this CTP assessment effort, an important next step will be to review the ecological systems map for accuracy and then evaluate ecological system target representation and redundancy across the range of environmental gradients of the CTP, within the portfolio of conservation areas.

Ecological systems are used in this assessment to group, describe and assign viability ranks to their member natural communities; each natural community type was assigned to one or more of the 24 terrestrial ecological systems identified as occurring in the ecoregion. A complete description of the 24 ecological systems is included in Appendix 4.

For this assessment a vegetation association as described in the National Vegetation Classification is synonymous with a natural community.

Terrestrial Natural Community Targets

In the first iteration of the CTP ecoregional assessment, natural communities found in the ecoregion served as coarse-filter terrestrial targets. The natural communities were assembled into ecological groups that were defined by habitat, ecological processes, vegetation, biogeography, and abiotic factors (Faber-Langendoen 2001). In this assessment, the natural communities continue to serve as the coarse-filter targets but were assessed for viability using the newly developed viability ranking developed by NatureServe for the ecological systems.

The natural community list from the 2000 iteration was reviewed for completeness, including checks for any natural communities that had been lumped, split or dropped as part of any updates to the National Vegetation Classification system. Ecologists and biologists from state heritage programs, Conservancy chapters and other institutions then cross-walked and attributed these natural communities, plus any new natural community delineations found in the CTP, to the list of 24 ecological systems developed by NatureServe and described above. As a result of this process, 134 natural community targets were identified and are listed in Appendix 5**.**

These 134 natural community conservation targets are the foundation for terrestrial conservation planning in the CTP ecoregion. The geographic distribution of each natural community, as well as its pattern of occurrence (matrix, large patch, small patch, linear), within the ecoregion was assigned to assist in conservation goal determination.

The pattern of occurrence of each of the 134 natural communities was taken one step further. For each of the natural community conservation targets, its pre-Euro-American settlement presence and pattern of occurrence (matrix, large patch, small patch, linear) within terrestrial stratification units was determined, resulting in a baseline of community occurrence and pattern across the ecoregion (Appendix 6). This matrix of occurrence can be used to ensure that the full spectrum of natural community variability within the ecoregion is captured as well as improve our understanding of what natural communities need to be restored and where.

Aquatic Ecological System Targets

To date, no comprehensive *biotic* classification of freshwater communities or freshwater ecological systems of the CTP ecoregion exists. In the absence of such a biologically based classification, we are unable to identify and designate biotic freshwater ecological systems targets for the CTP. However, abiotic aquatic habitat types or freshwater ecological systems are considered suitable surrogates for freshwater community targets, and using abiotic targets may allow more effective capture of a full range of biodiversity (Noss 2004; Kirpatrick and Brown 1994).

Accordingly, abiotic Aquatic Ecological System (AES) types were designated as target surrogates for freshwater systems. The AES types that serve as coarse-filter aquatic targets for the CTP conservation plan were identified following methods for aquatic systems classification developed by The Nature Conservancy (Higgins et al. 2005). Each

AES type describes a different ecological setting (as defined by drainage area, surface geology type, network position, slope, and flow permanence) found in the CTP ecoregion. Because each AES type has a characteristic combination of physical attributes that differ from that of other AES types, it is thought to represent a distinct combination of habitat attributes, geophysical processes, disturbance regimes, species composition and potential natural state. The classification process is detailed in Appendix 7.

A total of 55 AES types were identified within the four lower Missouri River basin Ecological Drainage Units (EDU). EDUs are defined further in the following section. These 55 AES types include 12 headwater (size 1) AES types, 12 creek (size 2) AES types, 6 small river (size 3) AES types, 6 medium river (size 4) AES types, and 18 large river/floodplain (size 5) AES types. Natural lake system types did not occur in the CTP, except for oxbow lakes and other channel remnants associated with floodplain river systems. Because these lake systems are intimately tied to the riverine systems that created them, they were considered nested targets within the large river/floodplain system types (size 5) and were not distinguished as unique aquatic system types. The AES target types found within the lower Missouri River basin EDUs are listed and described in Appendix 7.

For complete lists of systems and species conservation targets for middle Missouri EDUs and upper Mississippi River EDUs in the CTP ecoregion and beyond, see Gagnon et al. (2004) and Weitzell et al. (2003), respectively.

Target Occurrences

To identify a suite of conservation areas representing the most viable examples of conservation targets in the ecoregion, it is necessary to know specific locations of species, communities, and ecological systems throughout the ecoregion.

Species and Terrestrial Community Occurrences

The primary source of information on the locations of freshwater and terrestrial species and plant community targets was the network of natural heritage programs in this ecoregion:

- Illinois Natural Heritage Database
- Indiana Natural Heritage Data Center
- Iowa Natural Areas Inventory
- Kansas Natural Heritage Inventory
- Missouri Natural Heritage Program
- Nebraska Natural Heritage Program

Like other state and provincial natural heritage programs throughout North America, these six programs collect and maintain detailed records on the location and condition of native plants, animals, natural communities and other biotic features throughout their state. Most records come from field inventory by staff or contract biologists; observations are also compiled from professionals in other agencies or institutions, museum collections, and knowledgeable members of the public. These records are called “element occurrences” or “EOs” (as well as “element occurrence records.”); native species and natural communities are “elements” of biodiversity, and the specific locations where these elements have been observed and documented are “occurrences.” The collection and storage of element

occurrence records is standardized across heritage programs. (For more background on heritage programs and their biological data, visit www.natureserve.org/aboutUs/network.jsp.) A set of element occurrence data was obtained from each of the above heritage programs for use in this assessment and was last refreshed between fall 2004 and early spring 2005. Updates were added by assessment team members in 2006 and 2007.

Element occurrence data are the most taxonomically and geographically comprehensive data from a single source on the locations and condition of native species and plant communities. However, they have some limitations. Resources do not permit most heritage programs to regularly and thoroughly re-survey across taxa and geographies; it is common for many records from a program to have been last observed in the field ten or more years ago. Regardless of how long ago it was last observed, it is always possible that the occurrence has been destroyed or highly degraded in the years since it was last observed. To address this issue, the assessment team used the subset of occurrence records that had been observed since 1995 and solicited updated viability rankings from knowledgeable sources.

In addition, many records are obtained through surveys focused on particular taxa, habitats, and localities – e.g. freshwater mussel surveys for a state's streams, or grassland bird breeding surveys for a handful of counties of interest; such specialized surveys are often undertaken only because of the availability of grants or other special funds or because of particular interest by agencies, policy-makers or others in a particular taxon. By design, the narrow geographic and/or taxonomic focus of such surveys results in data gaps for other geographies and/or taxa. This data gap was partially addressed by compiling additional locations of species and communities based on the knowledge of professional biologists within the Conservancy, heritage programs, and other agencies and institutions.

A third limitation in the use of these data for ecoregional assessment purposes lies in the translation from a field observation to an element occurrence. Conservation goals are described in terms of the number of "occurrences" that must be conserved in order for an element to have adequate resilience to persist in the long-term; goals have the inherent assumption that occurrences represent distinct subpopulations for species, or an ecologically cohesive extent of a freshwater or plant community (even if it has minor spatial disjunctions). However, users of these data will find situations where several records for a single species are clustered in a small area or along discontinuous sections of a small river segment; the observations are documented as individual records, even though they are likely a single, interacting population and should only be counted as one occurrence for the purpose of evaluating conservation goals. Conservancy staff worked with heritage biologists to aggregate some of these highly clustered individual observations into "true" occurrences; however, this review and aggregation was not comprehensive.

Aquatic Ecological System Occurrences

While heritage programs serve as a primary data source for species and plant communities, they often do not track aquatic ecological systems; many programs lack a comprehensive classification of freshwater systems and most lack funding and capacity to develop a freshwater classification and track freshwater system occurrences in the field. To address freshwater target occurrences, the CTP team used the classification of Aquatic Ecological Systems; every stream or river segment classified as a particular AES type

(Appendix 7) was treated as an occurrence of that AES target, regardless of the condition or quality of the system occurrence. The AES classification resulted in a comprehensive set of AES occurrences for the entire ecoregion; unlike other target groups in this assessment, there are no gaps in the location data for aquatic ecological systems.

E. CONSERVATION GOALS

Conserving multiple viable examples of each conservation target, stratified across the ecoregion, is necessary to ensure maximum probability of each target's long-term survival. Conservation goals enumerate the quantity and distribution of examples that are hypothesized to be necessary for a target's persistence. However, there is little empirical research that demonstrates minimum population sizes, area requirements and geographic distributions necessary for species' persistence. Similarly, there is no scientific consensus on minimum area or distributional requirements for conserving natural communities or ecological systems across their ranges. Therefore, conservation goals for individual targets represent, at best, working hypotheses of the number and spatial distribution of examples necessary to ensure long-term survival.

Numeric Goals

Because the information necessary to develop empirically based conservation goals for the vast majority of CTP targets does not exist, the CTP team consulted experts to revise general numeric goals that were developed in the first iteration assessment and were based on targets' geographic distribution relative to the ecoregion. Targets endemic to the ecoregion can only be conserved in this ecoregion and consequently had the highest numeric goals. Similarly, targets with limited distribution that included this ecoregion were assigned relatively high numeric goals. Widespread targets occurring in many ecoregions were assigned intermediate numeric goals. Targets that are peripheral to this ecoregion are best protected in ecoregions in the heart of their range, but should also be conserved at the edge of their range; consequently, they were assigned low numeric goals. These conservation goals are considered preliminary objectives that must be tested and refined through time by monitoring the status and trends of individual species and ecological communities.

Goals are closely tied to the viability assessment process because an occurrence of a particular target on the landscape must meet minimum viability standards to be "counted" toward the goal; those that do not meet these standards do not contribute to goal attainment, even if the occurrence is within a portfolio site. For this ecoregional assessment, only viable occurrences of targets – those with either a Very Good (A) or Good (B) overall viability rank - count toward conservation goals. Lesser-ranked occurrences [Fair (C) overall viability rank] may be included in the portfolio, but these target occurrences do not count toward the target's goal.

Distribution Goals and Stratification Units

In order to develop geographic distribution goals that represent conservation targets across their full range of genetic and environmental variation, it is necessary to identify a set of geographic units within the CTP ecoregion that are defined by appropriate environmental variables. Therefore, the CTP ecoregion was subdivided into six terrestrial units and four freshwater units encompassing the lower Missouri River subbasin.

Terrestrial Stratification Units

Biogeographic patterns vary within the Central Tallgrass Prairie ecoregion, and the ecoregion can be stratified into finer ecological units according to these patterns. Keys et

al. (1995) developed a hierarchical classification of ecological map units for the eastern United States. The planning team chose this spatial stratification system as a foundation for building terrestrial stratification units in this ecoregion for a few reasons:

- Keys et al. (1995) is a hierarchical classification of ecological map units based on the abiotic factors that shape patterns of environmental variation.
- The Conservancy's ecoregion boundaries were developed using Bailey et al.'s (1994) and Keys et al.'s (1995) ecological map units; by design, Keys et al.'s sections and subsections are spatially nested within and therefore easily aggregated to Conservancy ecoregions.

The Central Tallgrass Prairie ecoregion is composed of two of Keys et al.'s (1995) ecological section units; their Central Dissected Till Plains section is further subdivided into 18 ecological subsections, while their Central Till Plains section is subdivided into eight ecological subsections. Two section-scale stratification units were considered insufficient to adequately capture fine-scale biogeographic patterns, but 26 subsection-scale units were too numerous. Therefore, the planning team aggregated the 26 subsection-scale units into six intermediate biophysical units based on patterns of precipitation, temperature, evaporation, geology and soils (Figure 4). The aggregation rationale and resulting biophysical units are described in Appendix 7.

Freshwater Stratification Units

The freshwater assessment employed EDUs as stratification units for freshwater conservation goals. EDUs are the second-tier classification units in a nested hierarchy of freshwater units that includes Aquatic Subregions, Ecological Drainage Units, Aquatic Ecological Systems and Macrohabitats. EDUs are aggregations of 8-digit United States Geological Survey Hydrological Unit Codes within Aquatic Subregions that share similar physiographic and biogeographic properties. They serve as appropriate freshwater stratification units because they map large-scale patterns of variation in environmental conditions thought to shape freshwater communities and species' composition, distribution and genetic variability. Maps and additional descriptions of the freshwater classification are provided in Appendix 8.

As noted previously, the CTP freshwater assessment focused primarily on the lower Missouri River subbasin because assessments were already completed for the three other subbasins that overlap with the CTP ecoregion. The upper Mississippi, middle Missouri (Northern Tallgrass Prairie) and lower Ohio (North Central Tillplain) assessments all used EDUs as stratification units as well (see Weitzell et al 2003, Gagnon et al 2004, and North Central Tillplain Ecoregional Planning Team 2003). Figure 5 illustrates the location of the EDUs within the lower Missouri subbasin and the location of the three other subbasins, the upper Mississippi, middle Missouri, and lower Ohio, that overlap with the CTP ecoregion.

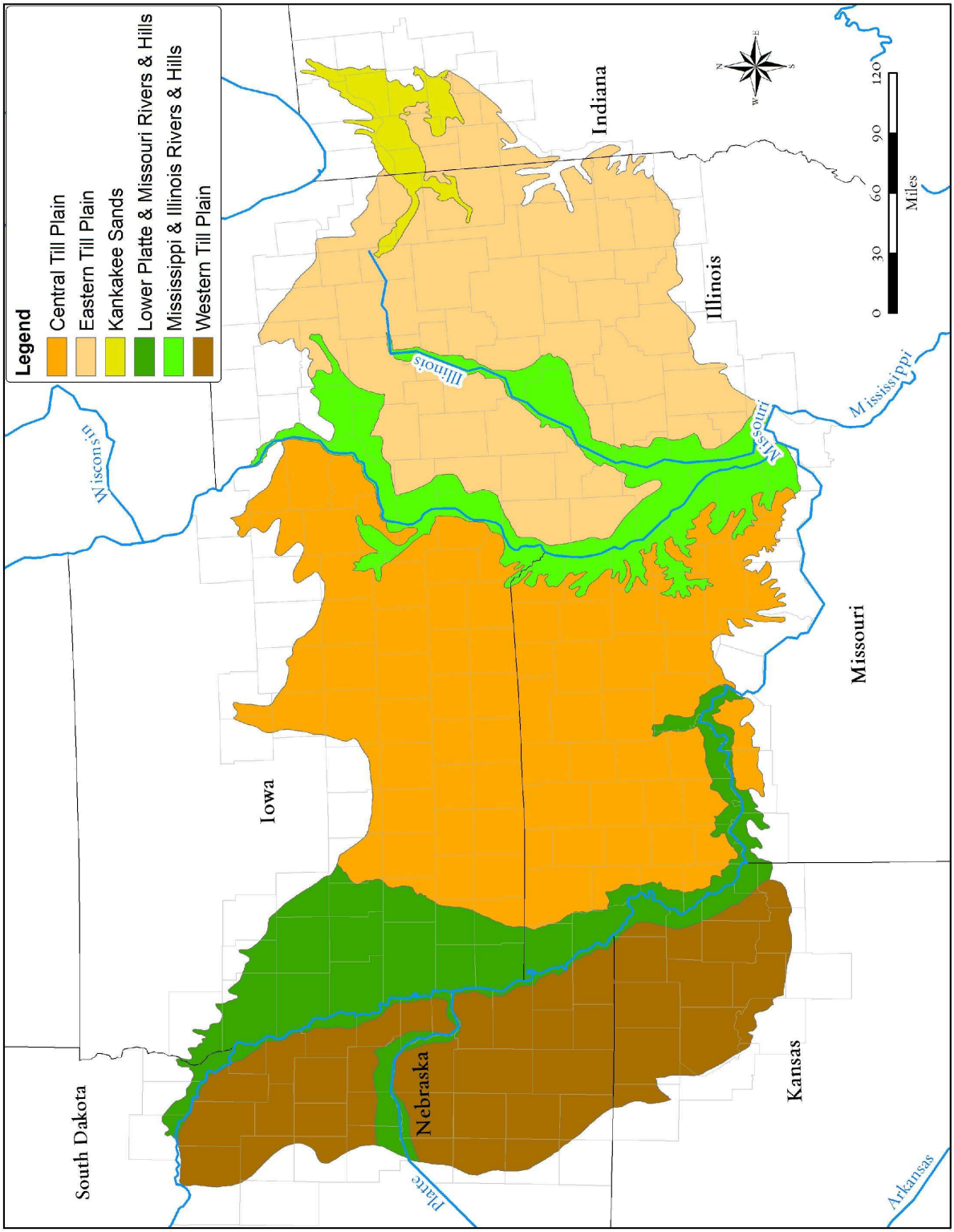

Figure 4: Terrestrial stratification units

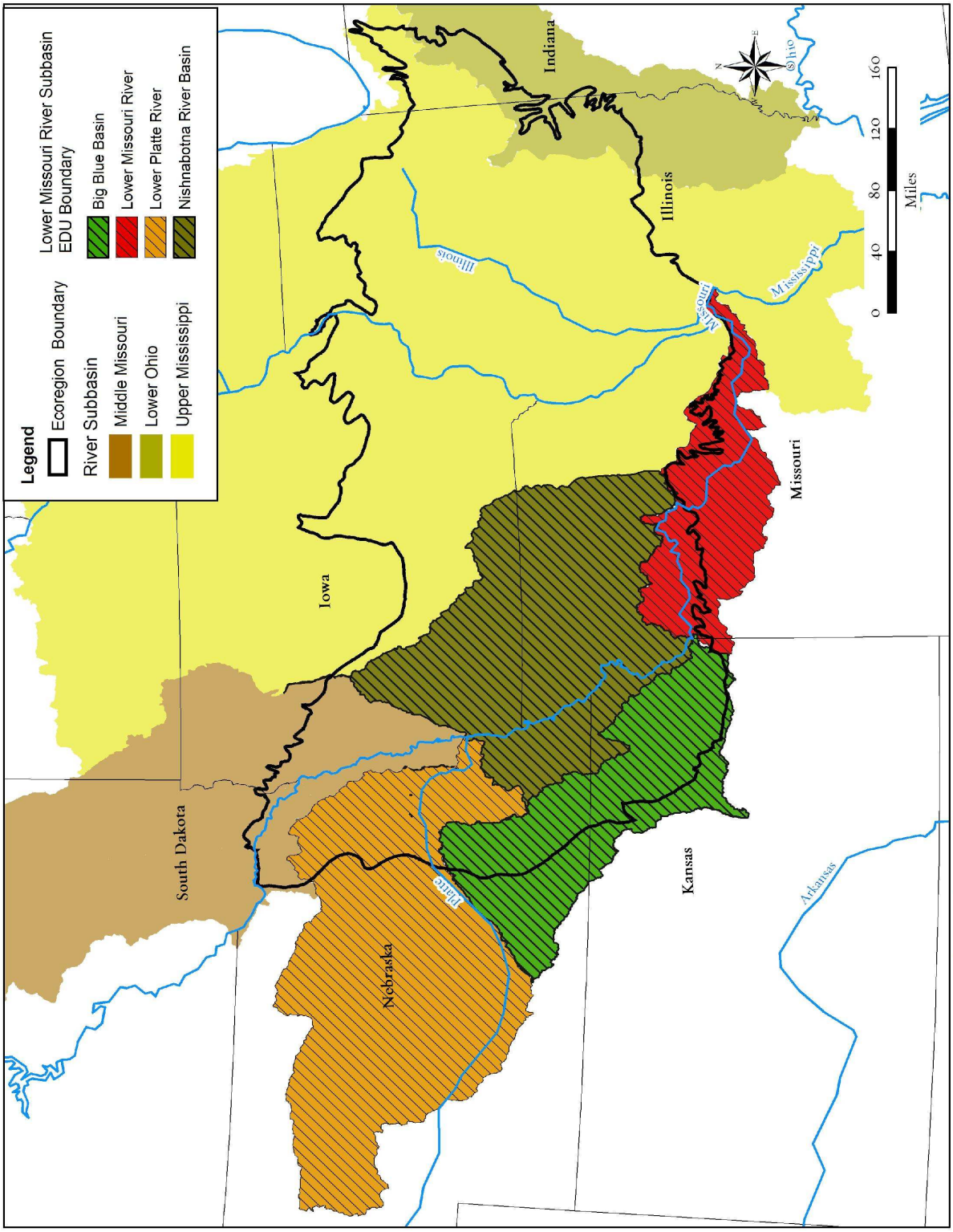

Figure 5: Ecological Drainage Units (EDUs) of the lower Missouri River and other subbasins of the CTP ecoregion.

Conservation Goals

The conservation goals outlined below guide the development of a CTP conservation portfolio that includes lands and waters critical to supporting and maintaining all the biological diversity existing in the ecoregion.

Terrestrial Species

Ecoregion-wide conservation goals for species targets from the first CTP ecoregional assessment were used in this assessment as well. Those goals were established based on the species' geographic distribution (i.e., endemic, limited, widespread, peripheral) relative to the CTP ecoregion (Table 3). The numeric goal is the total number of viable target occurrences that the portfolio should include across the ecoregion. In all cases, occurrences should be distributed across the environmental gradients that each target historically occupied within the ecoregion. At a minimum, occurrences selected to meet goals must be distributed so that at least one occurrence in every stratification unit of the target's current geographic range is included in the portfolio. If the conservation target is a G1/G2 taxon, species conservation goals enumerated below are replaced by the goal of capturing all remaining viable populations of that target within the ecoregion.

Table 3: Conservation goals for terrestrial species targets

Distribution Type*	Numeric Goal (ecoregion-wide)	Stratification Goal
Endemic	10	At least 1 viable example in every stratification unit where it occurs.
Limited/Disjunct	7	
Widespread	4	
Peripheral	2	

Terrestrial Natural Communities

Community target goals were established based on each community's geographic distribution (i.e., endemic, limited, widespread, peripheral) relative to the CTP ecoregion (Table 4). Unlike the first iteration CTP assessment, the spatial pattern of the natural community target was used to further modify conservation goals for each community type in the second iteration (Table 5).

The geographic distribution relative to the ecoregion and within each biophysical stratification unit was determined for each community target. In addition, the spatial pattern in which it typically occurs on the landscape was also determined, at both the ecoregion level and for each stratification unit within its range. Distribution relative to the ecoregion and spatial pattern dictated the overall numeric conservation goal. Distribution within each stratification unit broadly determined each community's distribution goal: a minimum of one community occurrence is required in each stratification unit in the community's range. The sum of the occurrences in each stratification unit should meet the overall numeric goal.

Table 4: Conservation goals for terrestrial natural community targets*

Distribution Type	**Pattern of Distribution Numeric Goal (ecoregion-wide)**		**Stratification Goal**
	Small Patch or Linear	Large Patch or Matrix	
Endemic	15	10	At least 1 viable example in every stratification unit where it occurs.
Limited/Disjunct	11	7	
Widespread	6	4	
Peripheral/Disjunct	3	2	

**Note: If the target is globally ranked with G1/G2 conservation status, the goals listed in these tables will be superseded by the goal of capturing all viable occurrences of the target.*

Table 5: Spatial pattern (patch size) descriptions

Matrix (Mx)	Communities/systems are characteristic of the ecoregion and form extensive and often contiguous cover. Matrix communities generally occur on the most extensive landforms and typically have wide ecological tolerances. The Central Mesic Tallgrass Prairie ecological system is an example of a matrix-forming system. Under natural conditions, these types of communities dominated the landscape in mosaics of patches ranging from 5,000 to 250,000 acres.
Large Patch (LP)	Communities/systems form large areas of interrupted cover and typically have narrower ranges of ecological tolerances than matrix types. Disturbance events, underlying geology and drainage patterns tend to define occurrences of large patch communities. Under natural disturbance dynamics (e.g. fire, flooding), the size and spatial distribution of the patches may shift somewhat within large landscapes over time spans of several hundred years. The natural communities of Central Bur Oak Openings and Mesic Sand Tallgrass Prairie are examples. Under natural conditions, large patch communities form(ed) patches of 125 – 5,000 acres.
Small Patch (SP)	Communities/systems form small, discrete areas of vegetation cover typically limited in distribution by localized environmental features. The natural communities of Central Tallgrass Fen and Bur Oak Bottomland Woodland are examples. Under natural conditions, these communities generally form(ed) patches less than 125 acres in size.
Linear (Li)	Communities/systems occur as linear strips and are often ecotonal between terrestrial and aquatic ecosystems. The natural communities of Central Dry-Mesic Limestone-Dolomite Prairie and Midwestern Cottonwood-Black Willow Forest are examples. They naturally occur in linear patterns ranging from 0.5 – 100 kilometers in length.

In this assessment, conservation goals attempt to reflect the current and historic geographic distribution of each terrestrial community, as well as the community's overall spatial pattern. However, the goals do not address variations in spatial pattern that some communities exhibit from one stratification unit to the next, nor do they specify an actual number of occurrences of a community that should be represented in each stratification unit. (They only specify a *minimum* number for each stratification unit.) In a future update to this assessment, conservation goals should be revised to address those issues.

To illustrate these proposed future improvements, consider a hypothetical community with limited distribution and a small patch spatial pattern. Four of the six stratification units are included in its current and historic geographic range in this ecoregion, and it occurs (or occurred) as a small patch in all four stratification units. The current overall goal for this hypothetical community is 11 occurrences for the entire ecoregion, and a minimum of one occurrence should be represented in each of the four stratification units within its range. Suppose the bulk of the hypothetical community's range (which may or may not be where the bulk of its currently documented occurrences are located) is in two stratification units: the Central Till Plain and Eastern Till Plain. A third stratification unit, Mississippi and Illinois Rivers and Hills, contains a significant portion of this type's range as well, but that unit is much smaller in area than the other two units. The fourth unit, Kankakee Sands, contains only a sliver of this community's range. Even if eight occurrences were selected from in the Kankakee Sands unit and only one occurrence was selected from each of the other three stratification units, this community's goal would technically be met under the current requirements. However, that geographic distribution is not reflective of the community's actual distribution within the stratification units; far too much emphasis is placed on the Kankakee Sands unit, which contains only a sliver of this hypothetical community's range.

Given the community's geographic distribution in those four units and their relative size, an ecologically appropriate distribution of the 11 occurrences across stratification units might look like this:

Stratification Unit	**Number of Occurrences**
Central Till Plain	4
Eastern Till Plain	4
Mississippi and Illinois Rivers and Hills	2
Kankakee Sands	1
Total Numeric Ecoregional Goal:	**11**

Consider a second hypothetical community with a spatial pattern that varies from one stratification unit to another. This hypothetical community's geographic range includes all of the CTP stratification units, and it is endemic to the CTP. It is a large-patch community in the four eastern stratification units, and small-patch in the two westernmost stratification units. A simplistic application of current overall numeric goals would require this community to have a total of ten occurrences, with a minimum of one occurrence in each of the six stratification units. Technically, its goal would be met if five of the ten occurrences are represented in the tiny Kankakee Sands unit and one additional occurrence is represented in each of the remaining five stratification units. However, this is not a balanced representation of the ecological and genetic variability of that community,

and it does not account for the community's small patch character in the two westernmost stratification units. An improved goal would explicitly account for the small-patch character by increasing the "subgoals" for each of those two units. Considering the overall goal of 15 occurrences for a small-patch, endemic community, and that this hypothetical community is small patch in the two western stratification units, geographically balanced subgoals might be three occurrences for each of the two western units. Considering the overall goal of 10 occurrences for a large-patch, endemic community for the remaining four stratification units, an ecologically appropriate set of subgoals that accounts for the relative size of the stratification units might look like this:

Stratification Unit	**Number of Occurrences**
Western Till Plain	3
Lower Platte and Missouri Rivers and Hills	3
Central Till Plain	2
Eastern Till Plain	2
Mississippi and Illinois Rivers and Hills	1
Kankakee Sands	1
Total Numeric Ecoregional Goal:	**12**

The resulting overall numeric goal of 12 is slightly higher than what it would be for a universally large-patch, endemic community, but lower than what it would be for a universally small-patch, endemic community.

Freshwater Species
Conservation goals for aquatic species of the lower Missouri River EDUs were based on the spatial requirements (i.e., local – regional scale) of the life histories of target aquatic taxa and their distribution relative to the lower Missouri River basin (Table 6). Conservation goals for aquatic species in the middle Missouri, upper Mississippi and lower Ohio subbasins may be referenced in Gagnon et al (2004), Weitzell et al (2003), and North Central Tillplain Ecoregional Planning Team (2003), respectively.

Aquatic Ecological Systems
The minimum conservation goal for coarse-filter aquatic targets (Aquatic Ecological Systems; AES types) included at least one occurrence of each medium and large river AES type in the final CTP ecoregion portfolio network, and at least three occurrences of small rivers, headwaters and creek AES types (Table 7). Note that these conservation goals establish minimum levels; it would be optimal to include additional occurrences of each AES type if viable occurrences were available. Conservation goals for aquatic ecological systems in the middle Missouri, upper Mississippi and lower Ohio subbasins may be referenced in Gagnon et al (2004), Weitzell et al (2003), and North Central Tillplain Ecoregional Planning Team (2003), respectively.

The classification of Aquatic Ecological Systems is based in part on Ecological Drainage Units, as well as several abiotic factors (stream gradient, bedrock geology, stream size, etc.) By definition, Aquatic Ecological Systems are unique to the geographic area in which they are classified. Therefore, it isn't meaningful to try to ensure the representation of each AES type across multiple freshwater stratification units (EDUs); each type is usually

only found in one EDU. As a result, AES types differ from one EDU to the next, so a numeric AES goal inherently incorporates a distribution element.

Table 6: Conservation goals for species/assemblages of the lower Missouri River EDUs (If a taxon could be described by more than one of the distribution patterns listed in the table, the conservation goal for that taxon was assigned the greater of the goals.)

Distribution relative to CTP ecoregion	**Number of occurrences required** (with at least one occurrence in each EDU of historic distribution)				
	Local spatial scale (10-100m)	**Inter-mediate spatial scale** (100-1000m)	**Coarse spatial scale** (1 – 25km)	**Very coarse spatial scale** (25-100km)	**Regional spatial scale** (>100km)
Endemic – >90% of occurrences found in CTP	25	18			
Modal/Limited - >75% of occurrences found in CTP	20	13	25		
Disjunct – occurrences are geographically isolated from other populations	13	5	20		
Peripheral – occurrences on the edge of the taxon's range	8	5			
Widespread – occurrences extend widely beyond the CTP	15	15	12	12	14

*Note: *Spatial scale refers to the linear distance that a population consisting of approximately 200 individuals would be expected to occupy and utilize under average environmental conditions.*

Table 7: Conservation goals for coarse filter AES types in the lower Missouri River mainstem

Aquatic Ecological System (AES) Size Category	**Conservation Goal**	**Minimum length for viable system occurrence**
Medium (Size 4) and Large River/Floodplain Systems (Size 5)	1 occurrence of each AES type	40 km
Small River Systems (Size 3)	3 occurrences of each AES type, with a minimum of 6 in each size category	15 km
Headwater (Size 1) and Creek (Size 2) Systems	3 occurrences of each AES type, with a minimum of 10 in each size category	5 km

Although these conservation goals are somewhat conservative, they provide a benchmark to strive toward when designing the ecoregional portfolio. As a benchmark, they influence the number and distribution of areas of biodiversity significance and stipulate the minimum geography needed to ensure effective conservation. This continuing vision for conservation success provides the basis for measuring progress in conserving and restoring biodiversity in the CTP ecoregion.

F. VIABILITY AND ECOLOGICAL INTEGRITY ASSESSMENT

To successfully and efficiently achieve the vision of conserving biodiversity representative of the CTP ecoregion, it is critical to identify the examples of that biodiversity which are most likely to persist in the long-term. Biodiversity having a high probability of persisting over time is considered to be viable or to have good ecological integrity. A viable species population has the capacity to maintain itself and its evolutionary potential, while a viable ecological system has the capacity to support and maintain the full range of species diversity and ecological processes that historically characterized the system.

It is standard TNC practice to base an evaluation of target occurrence viability on the intrinsic characteristics of size and condition, and the extrinsic characteristic of landscape context (Stein and Davis 2000). These characteristics are shaped by natural patterns and processes and the impacts of past and current human activities.

- *Size* is the abundance/density of a population, or the area of a population or ecological system.
- *Condition* is the quality of biotic and abiotic factors, structures and processes within a population or ecological system occurrence, such as age structure, species composition, ecological processes and physical/chemical factors.
- *Landscape context* is the quality of structures, processes and biotic/abiotic factors of the landscape surrounding a population or ecological system, including degrees of connectivity to or isolation from adjacent habitats, populations and ecological systems.

In the CTP, the viability of target occurrences was evaluated using two methods: 1) expert judgment of occurrence viability (using the metrics of size, condition and landscape context), and 2) a GIS-derived ecological integrity index.

Expert-based Viability Assessment

To evaluate the viability of individual occurrences of terrestrial and freshwater conservation targets, experts used a set of standard narrative criteria to assign target occurrences a rank of very good, good, fair or poor based on the size, condition and landscape context of each occurrence. The assessment team adapted existing viability criteria from work completed in the Great Lakes ecoregion. The adapted qualitative criteria were reviewed by experts in the fields of freshwater and terrestrial biota to ensure that the examples given were a close approximation of the reality on the ground. The criteria used to evaluate terrestrial and freshwater species viability are included in Appendices 9 and 10, respectively; those used for freshwater ecological systems are detailed in Appendix 11.

Detailed viability ranking metrics were developed by NatureServe for each of the 19 terrestrial ecological systems found in the Central Tallgrass Prairie; these metrics were applied by experts to assess the viability of plant community occurrences across the CTP. An example of the metrics used to evaluate those natural communities constituting the Central Tallgrass Prairie ecological system is included in Appendix 12; a complete listing of the viability criteria for each of the 19 ecological systems may be requested from NatureServe. The viability ranks assigned by experts to conservation target occurrences

are integral to the identification of areas of biological significance and are a cornerstone of the conservation portfolio assembly process.

Ecological Integrity Index

An expert-based viability assessment is difficult to obtain for all target occurrences due to constraints of time, capacity and data availability; of approximately 2,800 terrestrial occurrence records in this ecoregion, only 30% received an updated viability ranking. To complement the qualitative, expert-based viability assessment and to further inform the size and landscape context components of the viability assessment, the team developed a geographically comprehensive, GIS-based index of ecological integrity.

The ecological integrity index is an aggregation of indicators of degradation, fragmentation, and connectivity of natural and semi-natural habitats. It was based on four indicators of human activity and influence that are generally considered to impact the ecological intactness of a landscape:

- distance from roads
- amount of non-natural edge
- developed land cover
- agricultural land cover

A spatial layer of uniform, 640-acre hexagonal assessment units was generated for the entire CTP ecoregion. The hexagon size of 640 acres was selected because it was sufficiently fine-scale for the purpose of this assessment, yet wouldn't overwhelm the computing capability. (Smaller-sized hexagons would be more numerous and therefore likely to exceed the limits of the computer's processing power.) A numeric score was calculated for each of the hexagon assessment units for each of the four indicators of human influence. The resulting scores were multiplied by weighting factors and then summed to get an overall ecological integrity score. The resulting index provides a qualitative rank of the ecological integrity of each planning unit in the CTP (Figure 6). This index was used in conjunction with the viability ranks associated with individual occurrences to assemble the ecoregional portfolio; the use of this index is described in more detail in Appendix 13.

In conjunction with the expert-based viability rankings, the ecological integrity index informed the identification of the best examples of conservation targets to include in the ecoregional portfolio. In addition to driving the configuration of the ecoregional portfolio, the results of the viability and ecological integrity assessment will serve as a baseline measure of biodiversity status in the ecoregion. In the context of conservation measures, biodiversity status is one of the three factors that constitute the estimation of effective conservation (Higgins et al. 2007). Estimates of effective conservation are the measure against which the Conservancy can evaluate the effectiveness of its conservation activities and strategies.

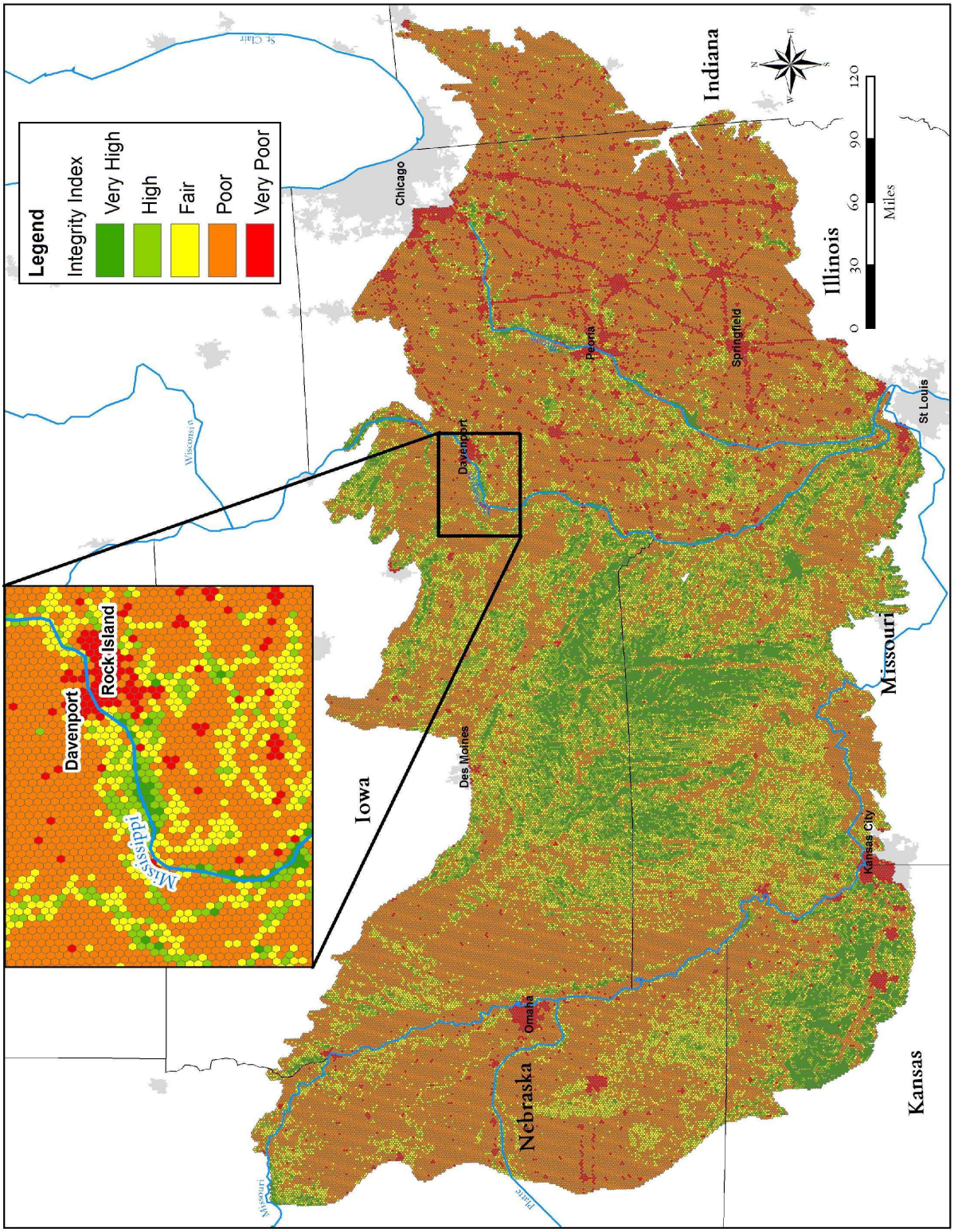

Figure 6: Index of ecological integrity

G. PORTFOLIO ASSEMBLY AND RESULTS

The CTP portfolio represents a network of lands and waters that – if adequately conserved - has the highest probability of ensuring the continued persistence of the full range of the ecoregion's biodiversity.

Assembly Process

The portfolio assembly process was organized around the following principles:
Representation: Capture viable examples of all conservation targets across their range of environmental gradients, or across major gradients inherent to the ecoregion, within the ecoregional portfolio.
Redundancy: Capture multiple viable examples of each target within the ecoregional portfolio to ensure persistence by avoiding extinction or endangerment caused by both naturally occurring stochastic events (floods, fire, and disease) and human-induced threats.
Efficiency/Functionality: Give priority to areas that 1) support multiple targets, in order to meet conservation goals in the least amount of area; 2) have relatively intact ecosystem function; and 3) are already being managed for biodiversity conservation.
Integration: Give priority to areas that contain targets across multiple realms (terrestrial and freshwater), or contain targets that occur at multiple spatial scales.

The terrestrial and freshwater portfolios were developed in parallel, guided by the same principles and selection criteria. The conservation goals, target occurrence records and their associated viability ranks were the main sets of information used to assemble a representative, redundant, efficient, functional and integrated portfolio. Assembling the portfolio entailed a series of meetings among the core team, other Conservancy staff and experts to complete the sequences of procedures described in Appendix 13 and periodically review the results. When goals and viability were not sufficient to determine whether an area should be included, the following additional factors further informed the team's decisions:

- Projected future housing density
- GAP management status
- Ecological integrity index rank
- Presence of Central Plains Center for BioAssessment (CPCB) stream reference site (freshwater only)

Integration of Existing Freshwater Assessments

As described previously, multiple freshwater aquatic assessments were combined to build a comprehensive portfolio of freshwater priorities for the CTP. In preparation for incorporation into the CTP plan, results from the three earlier freshwater assessments – the upper Mississippi River (Weitzell et al. 2003), middle Missouri River (Gagnon et al. 2004), and lower Ohio (North Central Tillplain Ecoregional Plan, 2003) – were circulated for review among regional freshwater experts. Through this review, minor adjustments and corrections to the freshwater portfolios were made. These revised portfolios were then merged with the portfolio for the lower Missouri River basin to create a comprehensive conservation portfolio of freshwater priorities within the CTP ecoregion.

Portfolio Overview

The Central Tallgrass Prairie ecoregional portfolio consists of 24 freshwater conservation area networks and 156 terrestrial conservation areas. The freshwater portfolio encompasses 8,800 river and stream kilometers, or approximately 27% of the aggregate within the CTP. Terrestrially, the aggregate of the identified conservation areas occupies 4.39 million acres, or less than 7% of the total area of the ecoregion.

The freshwater conservation areas shown in Figure 7 include both confirmed and possible streams and rivers. Figure 7 depicts the mainstem and major tributaries of the freshwater portfolio as well as the associated networks of smaller size class streams and headwaters. Appendix 14 contains individual maps and profiles for each of the confirmed and possible freshwater sites in the portfolio. Terrestrial conservation areas (Figure 8) are composed of the hexagonal assessment units that encompass or overlap the target occurrences that were selected to meet conservation goals.

Freshwater conservation area networks typically consist of connected stream or river systems within a single drainage. Most networks capture a full range of aquatic ecological system types, from small headwater streams to large floodplain river systems. Although these networks contain many highly degraded reaches, they serve to connect many of the best remaining locations of freshwater biodiversity across the CTP.

Terrestrial conservation areas range in size from small, isolated units containing rare natural community targets to relatively intact landscapes over 500,000 acres in size where the landscape is predominantly natural vegetation. The majority of the portfolio is poorly connected, reflecting 200 years of extensive Euro-American agricultural use. Most of the terrestrial conservation areas identified in the portfolio are centered around existing protected areas. Predominantly public lands, these protected areas serve as vital cores in the maintenance of terrestrial biological diversity across the ecoregion.

A brief profile of each conservation area in the portfolio is given in Appendix 14. Each profile contains a short description and list of the documented conservation targets found at the site. A list of threats impacting the long term viability of targets and the strategic actions believed necessary to abate the listed threats are also presented.

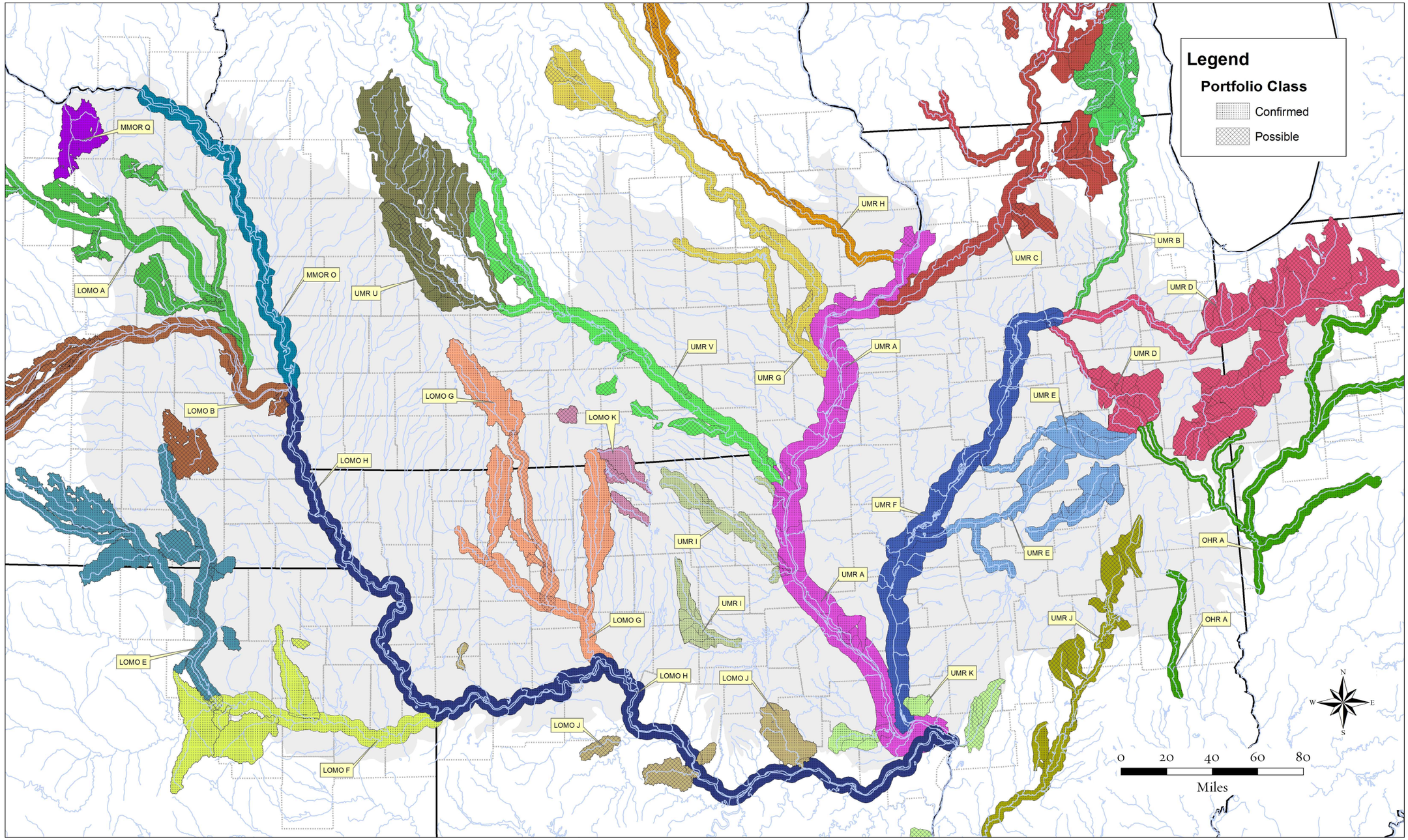

Figure 7: Central Tallgrass Prairie freshwater ecoregional portfolio

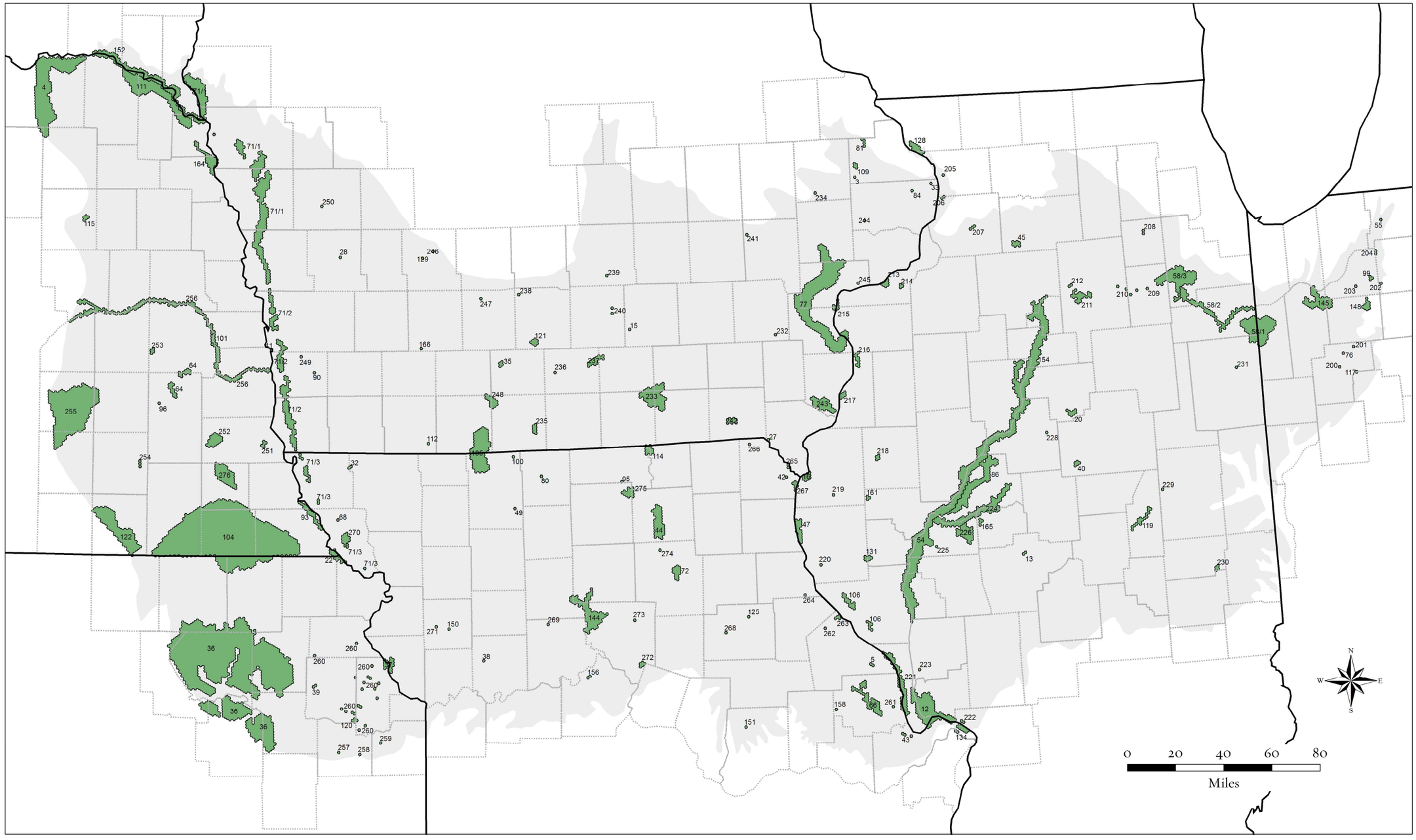

Figure 8: Central Tallgrass Prairie terrestrial ecoregional portfolio

Figures 7 and 8: Key to Conservation Areas

ID	Freshwater Conservation Area Name	STATE
LOMO A	Elkhorn Basin	NE
LOMO B	Lower Platte River Basin	NE
LOMO E	Little & Lower Big Blue River Basin	NE/KS
LOMO F	Lower Kansas River	KS
LOMO G	Grand River Basin	MO/IA
LOMO H	Lower Missouri River Mainstem (Omaha to St Louis)	NE/IA/KS/MO
LOMO J	Small Missouri Ozark Tributaries	MO
LOMO K	Upper Chariton River Tributaries	IA/MO
MMOR O	Missouri River Mainstem (Galvins Point to Platte River)	IA/NE
MMOR Q	Bazile & Little Bazile Creek	NE
OHR A	Wabash River Basin	IL/IN
UMR A	UMR Lower Impounded Reach	IL/MO/IA
UMR B	Fox River	IL
UMR C	Rock River	IL
UMR D	Upper Illinois River Tributaries	IL/IN
UMR E	Middle Illinois River Tributaries	IL
UMR F	Illinois River Mainstem - Lower Reach	IL
UMR G	Cedar River Basin	IA
UMR H	Wapsipinicon River	IA
UMR I	Fabius & Upper Salt Rivers	MO
UMR J	Kaskaskia River	IL
UMR K	Small Mississippi Ozark Tributaries	MO/IL
UMR U	Raccoon River Basin	IA
UMR V	Des Moines River Mainstem - Lower Reach	IA

ID		Terrestrial Conservation Area Name	Functional Type	STATE
3		Baldwin Marsh	SITE	IA
4		Bazile Creek Uplands	LAND	NE
5		Ben Watts Knob	SITE	MO
12		Marquette/Alton Bluff and Bottom Complex	LAND	IL/MO
13		Carpenter Park	SITE	IL
15		Cedar Bluffs	SITE	IA
16		Cedar Glen	SITE	IL
20		Chinquapin Bluffs	SITE	IL
22		Rulo Bluffs	LAND	NE/KS
27		Des Moines River Ravines Nature Area	SITE	IA
28		Dinesen Prairie	SITE	IA
32		Tarkio Prairie	SITE	MO
33		Elk River	SITE	IA
35		Flaherty Prairie/Little Prairie Complex	SITE	IA
36		Flint Hills Tallgrass Prairie	LAND	KS
37		Fort Leavenworth	SITE	KS/MO
38		Foxglove Prairie	SITE/W	MO
39		French Creek Prairie	SITE	KS
40		Funks Grove	SITE	IL
41		Gifford Point	SITE	NE
42		Goose Pond	SITE	MO
43		Grassy Lake/Maple Lake	SITE	MO
44		Green Hills	LAND	MO
45		Green River Sand Prairies	SITE	IL
47		Hannibal Bottoms	LAND	IL
49		Helton Prairie	SITE	MO
54		Illinois River Floodplain Complex	LAND	IL
55		Kankakee Fen	SITE	IN
	Greater Kankakee River Ecosystem			
58	1	Kankakee Sands Macrosite	LAND/REST	IL/IN
	2	Kankakee River Floodplain Macrosite	LAND/REST	IL
	3	Prairie Parklands Macrosite	LAND/REST	IL
64		Lancaster Saline Wetlands	SITE	NE
66		Lincoln Hills	LAND	MO
68		Little Tarkio Prairie	SITE	MO
	Loess Hills Ecosystem			
71	1	Loess Hills North	LAND	IA
	2	Loess Hills Central	LAND/REST	IA
	3	Loess Hills South	SITE	IA/MO
72		Long Branch State Park	LAND/REST	MO

ID	Terrestrial Conservation Area Name	Functional Type	STATE
76	Lowe Prairie	SITE/REST	IN
77	Lower Cedar River	LAND/REST	IA
80	Lowry Marsh	SITE	MO
81	Lytle Creek	SITE	IA
84	Manikowski Prairie	SITE	IA
86	Mason County Sands	LAND	IL
90	Mills County No. 3	SITE	IA
93	Indian Cave Bluffs	LAND	NE
95	Morris Prairie	SITE	MO
96	Nine-Mile Prairie	SITE/W	NE
99	Ober Sand Savanna	SITE	IN
100	Old Catholic Church Cemetery Prairie	SITE/W	MO
101	Otoe Creek Prairie	SITE	NE
104	Pawnee Prairies	LAND/REST	NE/KS
105	Grand River Grasslands	LAND/REST	MO/IA
106	Pike County Bluffs	LAND	IL
109	Pine Creek	SITE	IA
111	Ponca Bluffs	LAND	NE
112	Powell Prairie	SITE	IA
114	Rebel's Cove	LAND	MO
115	Madison County Meadows	SITE	NE
117	River View Hill Prairie	SITE	IN
119	Robert Allerton Park	SITE	IL
120	Rockefeller Prairie	SITE	KS
121	Rolling Thunder	SITE	IA
122	Rose Creek Prairies	LAND	NE
125	Salt River Narrows	SITE	MO
128	Lost Mound - Hanover Bluff	SITE	IL
129	Sheeder Prairie	SITE	IA
131	Siloam Springs	SITE	IL
134	Spadderdock Bottoms	SITE	MO
144	Swan Lake	LAND/REST	MO
145	Tefft Savanna Macrosite	LAND/REST	IN
148	Tippecanoe State Park	SITE	IN
150	Trice-Dedman Woods	SITE	MO
151	Tucker Prairie	SITE	MO
152	Unchannelized Missouri River Corridor	LAND	NE/SD
154	Upper Illinois River Bottoms and Bluffs	LAND	IL
156	Van Meter Marsh	SITE	MO
158	Peace Wildlife Sanctuary	SITE	MO
161	Weinberg-King Natural Area	SITE	IL
164	Thurston-Dakota Bluffs	LAND	NE
165	Witter's Bobtown Hill Prairie	SITE	IL
166	Woodside Prairie	SITE	IA
200	Spinn Prairie Nature Preserve	SITE	IN
201	Camp Buffalo Site	SITE	IN
202	Houghton Lake Preserve	SITE/REST	IN
203	Round Lake Wetland Nature Preserve	SITE	IN
204	Koontz Lake Nature Preserve	SITE	IN
205	Ayers Sand Prairie	SITE	IL
206	Thompson-Fulton Sand Prairie	SITE	IL
207	Lyndon - Agnew Prairie	SITE	IL
208	Yorkville Wetlands	SITE	IL
209	Route 47 Prairie	SITE	IL
210	Marseilles-Seneca Hill Prairies	SITE	IL
211	Starved Rock Complex	SITE	IL
212	Mitchell's Grove Nature Preserve	SITE	IL
213	Milan Bottoms	SITE	IL
214	Indian Bluff	SITE	IL
215	Big Sand Mound - Blanchard Island	SITE	IA
216	Big River State Park	SITE	IL
217	New Crystal Lake Club	SITE	IL
218	Argyle Lake Barrens	SITE	IL
219	Geissler Savanna	SITE	IL
220	Marblehead Cliff	SITE	IL
221	Golden Eagle Ferry Floodplain and Bluff Complex	LAND	IL/MO
222	Olin Nature Preserve	SITE	IL
223	Dayton Hollow Hill Prairie	SITE	IL

ID	Terrestrial Conservation Area Name	Functional Type	STATE
224	Sangamon River Floodplain	LAND	IL
225	Shick Shack Sand Pond	SITE	IL
226	Jim Edgar Site M Complex	LAND/REST	IL
228	Log Cabin Prairie	SITE	IL
229	Sangamon River Phlox	SITE	IL
230	Walnut Point State Park	SITE	IL
231	Watseka Sand Pond	SITE	IL
232	Fern Cliff	SITE	IA
233	Soap Creek / Stephens State Forest Unionville Unit	LAND	IA
234	Muskrat Slough	SITE	IA
235	Timberhill Savanna	LAND	IA
236	Stephens State Forest White Breast Unit	SITE	IA
237	Stephens State Forest Chariton Unit	SITE	IA
238	Great Western Trail - Cummings Site	SITE	IA
239	Kish-Ke-Kosh Prairie	SITE/W	IA
240	Red Rock	SITE	IA
241	Williams Prairie	SITE/W	IA
242	Keosauqua	SITE	IA
243	Iowa Army Ammunition Plant	SITE	IA
244	Syslo Sand Prairie	SITE/W	IA
245	Wildcat Den	SITE	IA
246	Bundt Prairie	SITE/W	IA
247	Goeldner Woods	SITE	IA
248	Sand Creek	SITE	IA
249	Mills County Prairie	SITE/W	IA
250	Crawford County Prairie	SITE/W	IA
251	Otoe County East Prairies	SITE/REST	NE
252	Otoe County West Prairies	LAND/REST	NE
253	Madigan Prairie	SITE/RSET	NE
254	Saline County East Prairies	SITE/REST	NE
255	Rainwater Basin	LAND/REST	NE
256	Lower Platte River Corridor	LAND	NE
257	Melanthium Prairie	SITE/W	KS
258	Vinland Prairie	SITE/W	KS
259	Kill Creek	SITE	KS
260	Central Mesic Prairies	SITE/W	KS
261	Sandstone Glade	SITE/W	MO
262	Ranacker Cave	SITE	MO
263	DuPont Bluffs	SITE	MO
264	White Bear Cave	SITE	MO
265	Frost Island	SITE	MO
266	Sterling Bottom	SITE	MO
267	Two Rivers	SITE/REST	MO
268	Rocky Hollow	SITE	MO
269	Bunch Hollow	SITE	MO
270	Squaw Creek	SITE	MO
271	Plattsburg Prairie	SITE/W	MO
272	Salisbury Bottoms	SITE	MO
273	Nehai Tonkayea Prairie	SITE/REST	MO
274	Hidden Hollow	SITE/W	MO
275	Union Ridge	LAND	MO
276	Johnson County North Prairies	LAND/REST	NE

Functional Type Designation

As the portfolio was assembled, a "functional type" was assigned to each terrestrial conservation area based on the spatial scale of target occurrences, the viability of target occurrences, and the relative intactness / relative need for restoration. Conservancy staff and partners reviewed and revised these designations in the ecoregional assessment workshops. There are five possible designations: LAND, SITE, SITE/W, LAND/REST, and SITE/REST. The functional type designations provide a broad indication of the type and scale of on-the-ground conservation action that will be necessary to maintain or enhance the ecological integrity of the conservation areas.

"LAND" was assigned to conservation areas selected for target occurrences occupying large areas (numerous hexagons) or for targets of intermediate spatial scale; these are landscape-scale conservation areas.

"SITE" was assigned to conservation areas selected for fine-scale targets or occurrences occupying a relatively small area (one or two hexagons). The spatial pattern (matrix, large patch, small patch, linear) of natural communities present in the conservation area also influenced whether it was designated LAND or SITE. For example, a conservation area supporting a small-patch community target was assigned SITE because small-patch communities typically occur in patches no larger than the area of a single hexagonal assessment unit (640 acres).

The "REST" postfix was added to LAND and SITE conservation areas based on the integrity of the conservation target occurrences and their associated need for restoration. A relatively isolated target occurrence requiring restoration to improve connectivity was assigned a REST postfix. Target occurrences that are highly threatened because vital environmental processes are absent or key biological condition attributes need to be enhanced were also assigned this postfix.

The "W" postfix was added to SITE-designated conservation areas that contain moderately viable conservation target occurrences with medium to low landscape ecological integrity. As noted in the detailed portfolio assembly procedures (Appendix 13), hexagon assessment units were ranked "possible" under these conditions. The W postfix was also assigned to those conservation areas having a G1/G2 ranked community or species occurrence with moderate to low viability. This particular postfix was applied in Iowa, Kansas, Missouri and Nebraska because conservation target occurrences regularly exist with moderate viability and medium to low landscape ecological integrity in these states.

Conservation Goal Attainment

Assessing the attainment of conservation goals for all species targets and terrestrial community targets is problematic because not all species and terrestrial natural communities are tracked and data are not geographically comprehensive for those that are tracked. Since AES (Aquatic Ecological Systems) are based on abiotic attributes, they do not have a biological component that is trackable, although this provides a relatively rapid filter of capture or non-capture for goal assessment. As a result, a comprehensive determination of conservation goal status for all ecoregional targets continues to be elusive.

Goal attainment can be evaluated by assessing the number and distribution of occurrences selected for inclusion in the portfolio. This information allows conservation practitioners to identify the conservation targets that have no occurrence data and pin-point those targets having occurrence data on but lacking updated viability information. Future iterations must use this information to address these data gaps and further refine the conservation portfolio.

Conservation goals were met for 15 of the 96 primary species targets (Figure 9a). No goals were met for freshwater species (Figure 9b). Appendices 15 and 16 summarize how well the portfolio represents terrestrial and freshwater species. The results shown in Appendices 15 and 16 illustrate the significant gaps in progress toward goal attainment. For both freshwater and terrestrial species, our limited knowledge of the location and condition of species occurrences substantially contributes to this gap. A first step in addressing this gap would be to rank the viability of the occurrences that remain unranked or that were not revisited during the viability assessment; this would markedly improve goal attainment.

Conservation goals for terrestrial communities were met for approximately 20% of communities (Figure 9a). The numeric and distribution goals for the 130 communities are enumerated in Appendix 17. Gaps in community representation are overwhelmingly centered around prairie types and hydrologically driven communities.

Attainment of overall numeric conservation goals for freshwater targets was low: none of the freshwater species attained their numeric goals and only 9% of aquatic ecological systems attained theirs (Figure 9b) (Appendix 18). Distribution goals for species were slightly better; 19% of the species had adequate distribution of their occurrences across the freshwater stratification units (EDUs). As described in the section on conservation goals for Aquatic Ecological Systems, AES types differ from one EDU to the next, so a numeric AES goal inherently incorporates a distribution element.

The degree and extent of ecological degradation in the ecoregion is one of the primary reasons for unmet conservation goals. When there weren't enough viable occurrences to meet numeric or distribution goals, low-viability occurrences were added as "possible" portfolio sites; if resources permit, conservation action may rehabilitate and restore the viability of these conservation target occurrences. However, these low-viability occurrences do not count toward conservation goal attainment (and are lower priorities for conservation action than high viability occurrences).

The ecoregional portfolio identified in this assessment represents the currently known distribution and diversity of native species, natural communities and ecological systems, both freshwater and terrestrial, within the CTP. Adequate representation of the distribution and diversity of freshwater and terrestrial targets remains elusive. In many cases, full representation may never be realized because of the anthropogenic alterations to the ecoregion and prohibitive social and financial costs of ecological restoration.

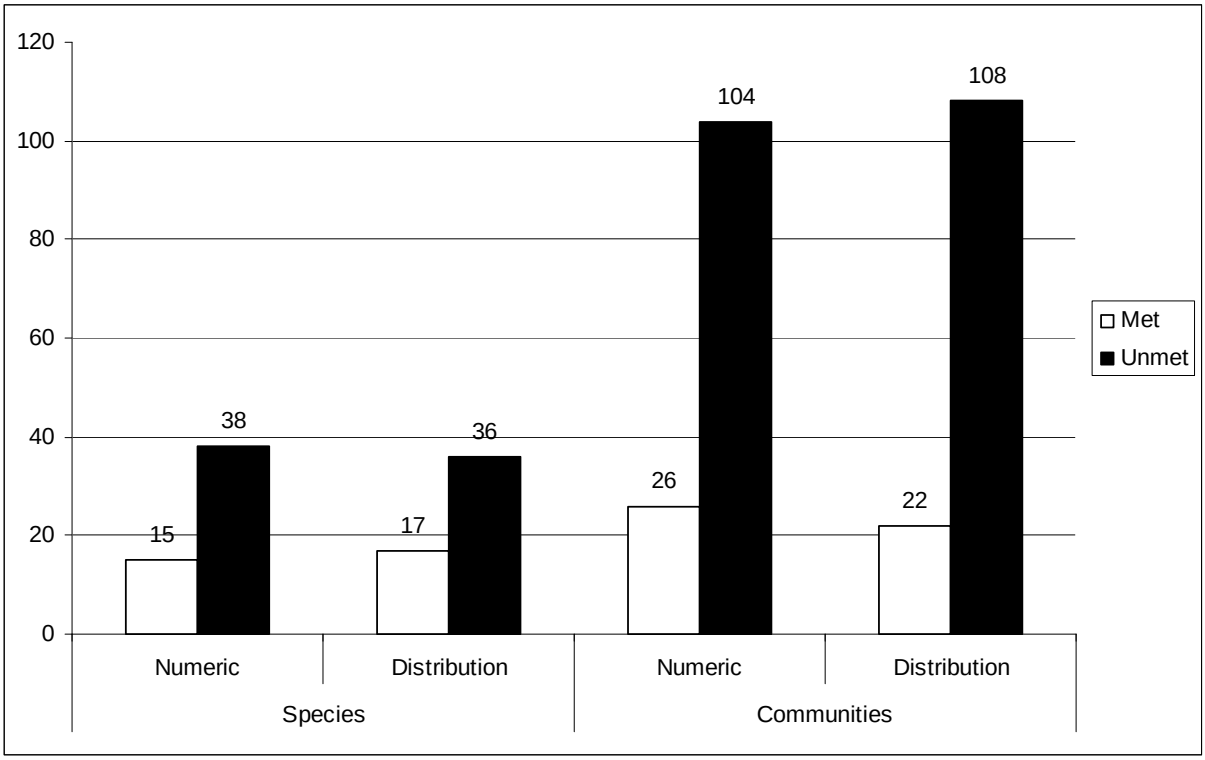

Figure 9(a). Terrestrial goal attainment

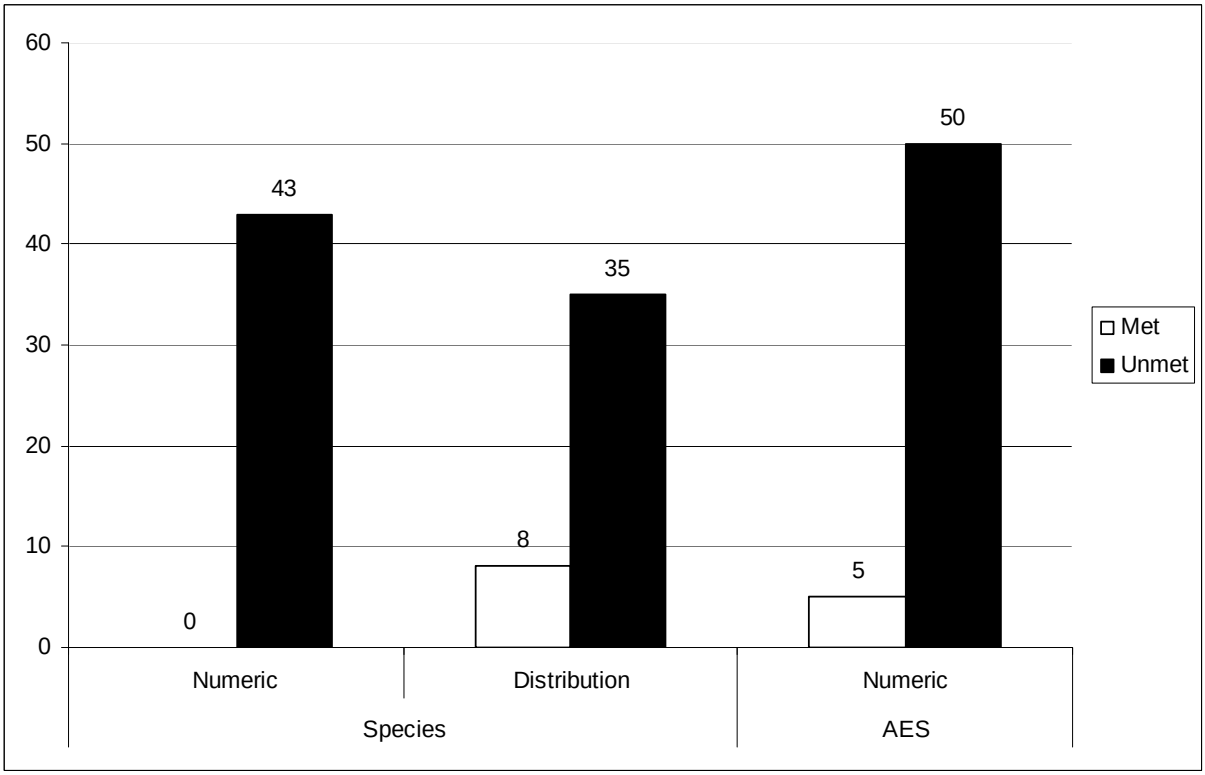

Figure 9(b). Freshwater goal attainment for lower Missouri River EDUs

H. CONSERVATION CONTEXT

Given the highly modified state of the Central Tallgrass Prairie ecoregion, it is difficult to identify, with any certainty, priorities among the conservation areas identified in the portfolio. Although 27% of the aggregate freshwater stream miles are identified, many of the selected stream segments serve as connectors between other aquatic ecological systems; in freshwater networks, all have a role in the representation of freshwater biodiversity and are critical in maintaining the ecological connectivity of the identified networks. The identified terrestrial conservation areas represent less than 7% of the land area of the ecoregion. The relictual state of the ecoregion's terrestrial ecosystems makes all the conservation areas a priority in the maintenance of terrestrial biological biodiversity. Given the wholesale loss of habitat and ecological connectivity in the ecoregion, the portfolio areas can be thought of as a starting point for the rehabilitation of the biological attributes necessary to sustain target species and prevent extinction.

To provide context for taking conservation action in an ecoregion where all conservation areas are important, the team evaluated the ecoregional portfolio's threat status, potential strategies and secured area areas status. A synoptic threat assessment for targets at conservation areas was conducted to identify threats recurring across the ecoregion. Strategies that are currently being implemented or are likely to be implemented in the ecoregional portfolio were characterized in order to identify the subset of strategies that transcend state boundaries and offer an opportunity to impact multiple conservation areas. The current land area considered to be secured for conservation across the ecoregion was documented.

Threat Assessment

The threat assessment was conducted for several reasons: 1) to provide a preliminary summary of threats at individual conservation areas, for use as a starting point for project-scale conservation planning and action; 2) to identify threats that are common to many places and to identify the associated potential opportunities for collaboration to address those common, multi-site threats; 3) to improve our understanding of the general, current causes of on-going biodiversity declines throughout the ecoregion; and 4) to provide a simple baseline against which progress toward threat mitigation and abatement can be measured.

Threats were identified and evaluated for the portfolio of conservation areas throughout the Central Tallgrass Prairie ecoregion. Conservancy staff evaluated as many areas as time and resources permitted, focusing first on areas where TNC is working or is likely to begin work in the next ten years. Eighty-three percent (or 131) of 158 terrestrial conservation areas were evaluated; 79% (or 19) of 26 freshwater conservation areas were evaluated. Although threats were identified and summarized for each portfolio conservation area as a whole, they were identified with the conservation area's target species, communities and ecological systems in mind.

The assessment team qualitatively evaluated threats to targets at conservation areas based on their knowledge of the areas. Using the detailed (Level 2) threat categories in a standard taxonomy of threats (Appendix 19), Conservancy staff in each state identified the

three (or so) most critical threats to the targets in each conservation area and qualitatively ranked the severity, scope and irreversibility of each threat. The rankings of severity, scope and irreversibility[2] are intended to determine the impact of a specific threat on the targets in a given conservation area. As time permitted, staff consulted with knowledgeable colleagues both within and outside of the Conservancy to refine the list of threats and their ranks. The threat information was compiled and stored in a standard, Excel-based template – the "CAP workbook" – that is commonly used for project-level planning within the Conservancy.[3]

The use of a standard threats taxonomy and the CAP workbook template provided several benefits. The common taxonomy ensures that a threat is described using the same terms and definitions at all locations where it occurs, allowing the easy identification of threats that are common to many places. Use of the standard taxonomy will also facilitate a relatively straightforward comparison and evaluation of progress toward mitigating threats when threats are re-assessed at some future point in time. The CAP workbook ensures a standard calculation of overall threat ranks – both for each threat as a whole, and each conservation area as a whole. A standard algorithm is applied to the qualitative ranks for a threat's severity, scope and irreversibility to assign an overall rank for each threat. Similarly, a standard algorithm is applied to the overall ranks for all threats identified at a conservation area to assign an overall threat rank to the entire conservation area.

The qualitative and subjective nature of the threats information compiled, and the varying degrees of geographical, ecological and taxonomic knowledge among the experts compiling these threats, necessitates careful use and interpretation of the results. For any given conservation area, the list of threats may be incomplete and the qualitative ranks subject to interpretation; these lists should be treated as a starting point for project-scale conservation planning and action. Similarly, the overall threat rank to an individual conservation area may be subject to interpretation. However, given that most conservation areas were evaluated, the compiled information provides a reasonable, initial approximation of the frequency of threats across the ecoregion within the portfolio of conservation areas.

Based on the threat information compiled, invasive species and altered fire regimes are by far the most common threats, identified at 79% and 68%, respectively, of the 151 conservation areas that received threats evaluations. Dams and water management, non-timber crops, housing and urban areas, and problematic native species are the four next most frequent threats, impacting from 39% to 32% of the conservation areas evaluated. Livestock impacted nearly one-fourth of conservation areas evaluated, while the remaining threats impacted from 1% to 13% of these areas. Table 8 lists the detailed threats in the order of their frequency at both terrestrial and freshwater portfolio sites; this summary does not take into account the overall threat ranks for individual threats or individual portfolio sites. If threat frequency were evaluated separately for the terrestrial portfolio and the freshwater portfolio, the order of threat frequency would likely be a little different for the freshwater portfolio. For example, invasives would likely still be the most common threat

[2] For a complete discussion of threat scope, severity and irreversibility, see Higgins et al. 2007

[3] Version 5a of the Excel-based CAP workbook was used; current versions of the CAP Excel Tool workbook may be obtained from the Conservation by Design Gateway at http://conserveonline.org/workspaces/cbdgateway/cap/resources/index_html. The Conservation by Design Gateway is part of ConserveOnline (www.conserveonline.org/).

for the freshwater portfolio, but altered fire regimes would probably not appear at all; dams and water management would likely be the second most common threat.

Table 8: Frequency of threats within the portfolio areas that were evaluated

Relative Rank of Detailed Threat	Detailed Threat*	Number of Conservation Areas Having This Threat	Percentage of Conservation Areas Having This Threat	General Threat Category**
1	Invasive Non-Native/Alien Species	119	79%	Invasive & Other Problematic Species & Genes
2	Fire & Fire Suppression	102	68%	Natural System Modifications
3	Dams & Water Management/Use	59	39%	Natural System Modifications
4	Annual & Perennial Non-Timber Crops	58	38%	Agriculture & Aquaculture
5	Housing & Urban Areas	54	36%	Residential & Commercial Development
6	Problematic Native Species	49	32%	Invasive & Other Problematic Species & Genes
7	Livestock Farming & Ranching	35	23%	Agriculture & Aquaculture
8	Agricultural & Forestry Effluents	19	13%	Pollution
9	Renewable Energy	18	12%	Energy Production & Mining
10	Recreational Activities	15	10%	Human Intrusions & Disturbance
11	Logging & Wood Harvesting	11	7%	Biological Resource Use
12	Commercial & Industrial Areas	10	7%	Residential & Commercial Development
13	Mining & Quarrying	10	7%	Energy Production & Mining
14	Other Ecosystem Modifications	8	5%	Natural System Modifications
15	Roads & Railroads	7	5%	Transportation & Service Corridors
16	Storms & Flooding	6	4%	Geological Events
17	Droughts	6	4%	Geological Events
18	Shipping Lanes	4	3%	Transportation & Service Corridors
19	Air-Borne Pollutants	4	3%	Pollution
20	Temperature Extremes	4	3%	Geological Events
21	Gathering Terrestrial Plants	3	2%	Biological Resource Use
22	Utility & Service Lines	2	1%	Transportation & Service Corridors
23	Hunting & Collecting Terrestrial Animals	2	1%	Biological Resource Use
24	Industrial & Military Effluents	2	1%	Pollution
25	Tourism & Recreation Areas	1	1%	Residential & Commercial Development
26	War, Civil Unrest & Military Exercises	1	1%	Human Intrusions & Disturbance
27	Excess Energy	1	1%	Pollution

*The detailed threats are the Level 2 threats in the standard threats taxonomy.

**The general threat categories are the Level 1 threats in the standard threats taxonomy.

The detailed threats identified at each conservation area were aggregated by their associated general threat categories in the standard threats taxonomy, and the relative importance of each of the major threats was calculated. The importance of each general threat type relative to the other threats identified at portfolio sites in the ecoregion is summarized in Figure 10. Not surprisingly, natural system modifications and invasive and other problem species stand out as important threats: of the total number of "occurrences" of threats at conservation areas, 30% fall in the general threat category of natural system modifications and another 30% are invasive and other problem species. Agriculture and development account for another 12% each. The remainder of major threat categories represent from 1.7% to 5% of the total threat "occurrences" identified. The general threat category of climate change and severe weather was not included because it is assumed that this threat affects all conservation areas in the CTP.

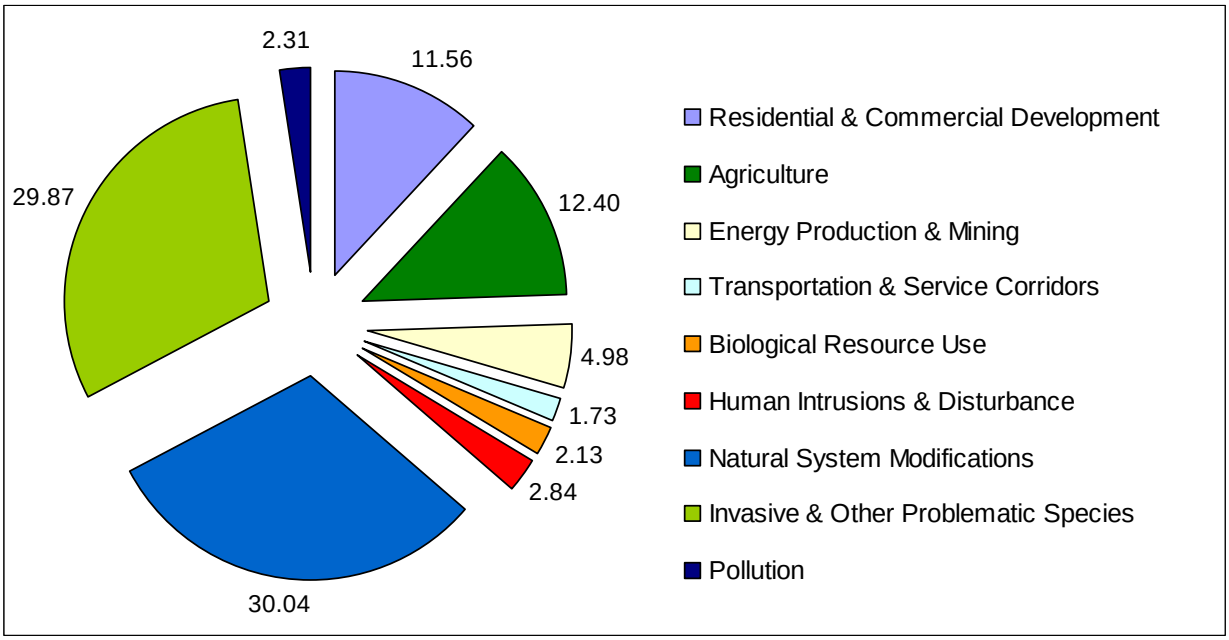

Figure 10. Relative importance of major threat types identified in the ecoregional portfolio

Secured Areas Assessment

The secured areas assessment focused on the following specific objectives: 1) update the secured areas data set for the ecoregion; 2) link existed secured areas to the updated terrestrial portfolio; and 3) record the number of acres secured by the managing land agency for each conservation area.

All recent spatial updates to both public and private secured areas were compiled from Conservancy information managers in each state. This revised secured areas boundary information was merged with the Protected Areas Database (PAD) version 4. See Section J Data Management and Data Products for more detail on data sources. For those secured areas not included in the PAD, each area was tagged within a comparable GAP stewardship status category[4].

[4] The Gap Analysis Program (GAP) is a federally initiated, state-based cooperative effort to identify gaps in biodiversity conservation in each of the 50 states. See Crist 2007 for GAP stewardship status categories.

At a little over 70 million acres, the Central Tallgrass Prairie is a very large ecoregion with few acres devoted to securing biodiversity from future land conversion. Approximately 97% of the ecoregion is privately owned and is mostly divided among countless small holdings. Private lands managed under some kind of private land preservation agreement or easement are considered secured and were added to the secured areas data set in this assessment. Over 152,000 acres are currently managed under private land preservation agreements in the ecoregion. To successfully conserve the biodiversity of the CTP in the coming years, this total acreage must be significantly increased.

The remaining 3% of the CTP land surface is owned and managed by either government agencies or Native American tribes. Approximately 1.7% or 1.2 million acres of the ecoregion is under a conservation-oriented management mandate (GAP stewardship classes 1, 2 or 3), where protection from future land conversion is assured. Of the total secured acres in the CTP, approximately 600,000 acres are located within the boundaries of an identified terrestrial conservation area. This represents 13.6% of the total acres of the terrestrial ecoregional portfolio.

State agencies continue to make the largest contribution to biodiversity conservation via land protection in the ecoregion. Approximately 43% of the acres within the terrestrial conservation portfolio are managed by state agencies, underscoring the importance of working with state agencies partners to ensure the long-term protection of the lands and waters of the ecoregion. Within the portfolio of conservation areas, The Nature Conservancy currently manages nearly 31,000 acres in the ecoregion with over 2,000 acres secured under a private land preservation agreement.

Strategic Action Characterization

Conservation work has been ongoing at multiple areas of biological significance in the CTP ecoregion for many years. In conjunction with the threat assessment, the team identified the conservation actions that are ongoing and those that will likely be undertaken to abate threats or enhance biodiversity viability at conservation areas in the next ten years. This assessment was conducted in order to 1) provide a preliminary summary of strategies at individual conservation areas, for use as a starting point for project-scale conservation planning and action; 2) identify strategies that are common to many places and identify the potential opportunities for collaboratively implementing common strategies; and 3) to provide a simple baseline against which to compare future strategic activities. Eighty-three percent of terrestrial conservation areas were evaluated and 79% of freshwater areas were evaluated.

In consultation with colleagues and partners, core team members evaluated as many areas as time and resources permitted. The Conservancy is active at a small subset of the areas identified in the portfolio; therefore, staff focused first on areas where TNC is working or is likely to begin work in the next ten years and engaged with partners to evaluate areas where TNC is not actively working. Using a standard list of strategic actions[5], both on-going strategic activities and strategies likely to be implemented in the

[5] Through an organization-wide effort to determine how the Conservancy would best meet its ten-year (2015) goal, a series of twenty-four strategies were compiled and refined from strategies identified by each of TNC's conservation regions.

near future were identified for conservation areas and compiled using the CAP workbook template. The use of a standard list of strategies and compilation within the CAP workbook permits the easy identification of strategies common to multiple areas and potential for collaboration across those areas.

As with the threats assessment, the compilation of strategies should be used carefully. The list of strategic actions for each conservation area may be incomplete and may be particularly subject to change over time; these lists should only serve as a starting point to inform on-going or proposed project-scale conservation action. The compiled information does provide a reasonable approximation of strategies commonly employed within the portfolio of conservation areas.

Given that altered fire regimes and invasive species were the most frequent threats, it is not surprising that the most commonly identified strategies were restoring and maintaining natural fire regimes, and building capacity to prevent, detect, and control invasive species. Land acquisition was almost as frequently identified as the top two strategies. The fourth, fifth and sixth most frequent strategies may address any number of threats, depending on how they are implemented. Although restoring and maintaining hydrologic regimes was only the seventh most frequently identified strategy, it was identified for approximately 73% of all freshwater conservation areas evaluated. Figure 11 illustrates the frequency of each strategy, whether on-going or likely to be undertaken in the next ten years, at conservation areas.

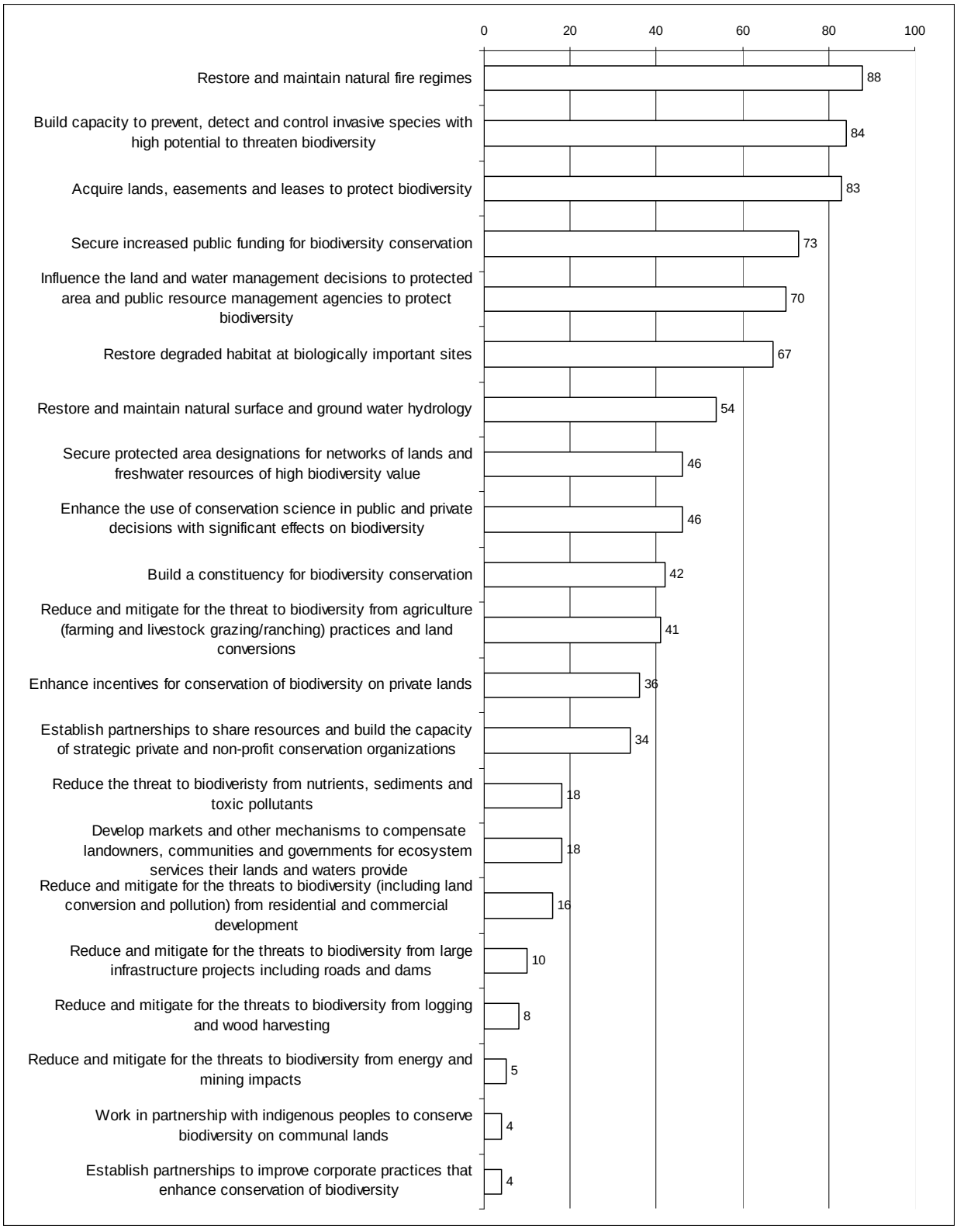

Figure 11. Frequency of specific strategies at ecoregional portfolio sites

I. INTERPRETING AND USING THE ECOREGIONAL PORTFOLIO

The CTP ecoregional portfolio is the suite of conservation areas needed to fully represent the biodiversity of the Central Tallgrass Prairie ecoregion; it represents conservation priorities at the ecoregional scale, rather than local scales. It is intended to guide the Conservancy's and – we hope – our partners' conservation priorities and strategies at coarse scales such as ecoregions, states, or multi-state regions. Although the following discussion is particularly geared toward Nature Conservancy chapters operating within this ecoregion, the general concepts are relevant to any agency or organization sharing similar biodiversity conservation priorities.

Challenges of Conserving the Portfolio

In the highly fragmented Central Tallgrass Prairie ecoregion, there are substantial challenges to conserving biodiversity. As noted previously, a majority of the land is used to produce a significant proportion of several agricultural commodities critical to human livelihoods, and with increasing global demand for both food and energy, this will continue to be the case. Remaining natural or semi-natural habitats are typically in need of significant, on-going restoration and management, and the wholesale restoration necessary to achieve even small increases in the amount of native habitat is a costly and complex endeavor. The pattern of private land ownership and isolation of remaining natural habitats creates further challenges to the conservation of those habitats, simply by virtue of the sheer numbers of remnant habitats and of stakeholders that need to be engaged. Finally, climate change may have an inordinately large impact in the ecoregion; even if change doesn't happen as quickly as may be expected, the degree of habitat conversion and fragmentation will greatly limit the opportunity for rapid dispersal and re-establishment of many native species.

Using the Ecoregional Assessment

With those challenges in mind, this assessment provides broad guidance for continued biodiversity conservation efforts in the Central Tallgrass Prairie ecoregion. Several major products have resulted from this assessment: the portfolio itself, the associated characterizations of threats, strategies, and secured areas within the portfolio of conservation areas, the preliminary mapping of terrestrial ecological systems, and the classification and mapping of aquatic ecological systems. While the portfolio and associated products represent an endpoint for this ecoregional assessment effort, they are a starting point to inform next steps.

Because the portfolio represents the best current estimation of the areas needed to sustain biodiversity in the long-term in the Central Tallgrass Prairie, a primary use of the portfolio is to broadly guide The Nature Conservancy's future investments in place-based projects. An appropriate next step for Conservancy chapters would be to conduct a simple comparison of the updated portfolio with established, Conservancy-led, place-based projects in their state. If a chapter intends to increase the number of place-based conservation projects where it will work, the chapter should be guided by the places identified in the updated ecoregional portfolio. It will be up to the chapter to determine which new portfolio area(s) to begin working in; the information on threats and current protected status may be used to help make those determinations.

Programs may also use the conservation area-specific threat and strategy summaries as a starting point for the development of site-specific conservation action plans. However, as noted previously, there may be numerous data gaps relating to the presence and viability of occurrences and the threats impacting those occurrences; a site-specific planning effort can often fill those information gaps. For those and other reasons, these ecoregion-based conservation area summaries are not a substitute for detailed, project-level conservation action plans.

The threats and strategies characterizations may be used to broadly inform the strategic plans and non-placed-based conservation work of both Conservancy chapters and other entities with a biodiversity conservation focus. In the normal course of refining strategic or programmatic plans, chapters may want to ensure that they include an adequate degree of focus on partnerships and policies that will address the most commonly identified threats at scales beyond that of individual conservation areas. In many if not most cases, state-wide, regional or national efforts to address common threats may already be underway; for example, the Midwest Invasive Plants Network is a well-established, multi-agency network supported in part by TNC to address invasive plant species by promoting prevention, early identification and eradication, and outreach and education among land managers. However, using agriculture-based threats as an example, programs might revisit over-arching factors such as farm policy, the continued development, testing and application of best management practices, or the economics of crop production to determine whether the threat is being adequately addressed within the Conservancy's scope of conservation actions.

The identification of the most common threats and strategies also suggests thematic areas where additional in-depth assessment might be warranted, and the results used to further inform the work of the Conservancy and its partners. Again using agriculture-based threats as an example, partnerships and policies could be further refined and focused if answers to questions such as these were better understood and quantified:

- What is the expected quantitative impact of current energy and agriculture policies on the amount of lands enrolled in the Conservation Reserve Program, Wetland Reserve Program, etc? Where are these impacts likely to occur?
- More specifically, where are Conservation Reserve Program lands most likely to go back to crop production for biofuels? How much is likely to go back?
- Is there any potential for additional conversion from natural or semi-natural land cover to row crop agriculture? If so, where and how much?
- What is the relationship between existing secured areas and existing natural or semi-natural habitat remnants? Are remnants largely secured?

Although a formal, ecoregion-wide prioritization of conservation areas within the portfolio was not attempted, Conservancy chapters may want to use the biodiversity targets and threats information to prioritize additional place-based conservation work within their state, or to prioritize work on strategies or policies impacting multiple conservation areas.

In addition to guiding future conservation work, the portfolio of conservation areas and the associated threats, strategies and secured areas characterizations will serve as a baseline

against which conservation progress may be measured, as the Conservancy's methods for measuring effective conservation evolves.

For a list of specific data products that resulted from this assessment effort and that may assist in implementing the conservation of this ecoregional portfolio, see section J. Data Management and Data Products. (Note that element occurrence data sets obtained from heritage programs are governed by license agreements and are not available as a product of this assessment; interested parties would need to request occurrence data directly from the relevant program.)

Limitations, Caveats and Inappropriate Uses

As Conservancy programs or partner organizations use the products of this assessment, some limitations, caveats and inappropriate uses must be kept in mind.

Although based on the best information available, limitations of occurrence-related data sets (as outlined in the section on Target Occurrences) mean that the locations, viability and ecological integrity of many occurrences is poorly known. Some taxa and terrestrial and freshwater communities are very poorly inventoried or understood. Therefore, conservation areas currently having few occurrence records, occurrences with no viability ranks, or low-viability occurrences may eventually be discovered to have sufficiently high numbers and viability of occurrences to warrant adjustments to the ecoregional portfolio. Human activities may also alter the ecological integrity of occurrences in a relatively short time frame, either for better or worse. For example, residential development or biofuels production may eliminate current occurrences in the next few years, while restoration may improve low-viability occurrences to high-viability occurrences. The threats and strategies information has similar limitations, as outlined previously; it is qualitative and almost certainly incomplete. Users of this assessment must assume that the information on which it is based is not complete and will change on an unknown time frame to an unknown degree. Therefore, two actions are critical:

1. Prior to investing in conservation action at a new area, site visits will be necessary to confirm or update the presence and ecological integrity of the species and ecosystem occurrences thought to be in the area.
2. As noted in most Conservancy ecoregional assessments, the ecoregional portfolio must be periodically reviewed and updated to reflect such changes. The timing and nature of the updates will be dependent on how much has changed since the last assessment, and whether updated information can be incorporated on an on-going basis.

Partly as a consequence of the coarse ecoregional scale of this assessment, the boundaries of most conservation areas are highly generalized. Individual conservation areas within the portfolio broadly encompass the geographic extent needed to maintain their associated conservation targets and the ecological processes required to sustain the targets over the long-term. Because the boundaries are coarse, they frequently encompass areas lacking biological significance, such as agricultural or developed land. The approximate nature of the conservation area boundaries makes it inappropriate to use those boundaries to make site-scale or project-scale decisions (e.g., where to locate prescribed burns, which parcel might be considered for acquisition, etc.) without any additional supporting information. It is beyond the scope of ecoregion-scale assessments

to determine the precise geographic extent or the detailed conservation strategies appropriate for each conservation area. Project- or site-specific planning is required to define more explicit, ecologically appropriate boundaries and to identify the specific actions that will best conserve the biota of each conservation area.

J. DATA MANAGEMENT AND DATA PRODUCTS

Good information is the mainstay of good planning. The collection, analysis and management of information was integral to each component of the overall assessment approach. The interconnectedness of data and information used in this assessment is illustrated in Figure 3.

Ecoregional data management was handled by The Nature Conservancy's Central Region Office and individual Conservancy State Field Offices. Data were largely managed using Microsoft Access 2000 and ERSI Geographic Information System (GIS) software products such as ArcGIS 9.2 and ArcInfo. The Conservation Planning Tool (CPT) v1.5, a standardized MS Access relational database developed by the Conservancy and used in conjunction with raster and vector GIS formats, served as the primary storage infrastructure for tabular and geospatial information relating to conservation targets, conservation goals, threats, and other assessment data in this iteration.

Numerous data sets in various formats from a range of sources were obtained, compiled, generated or analyzed to conduct this re-assessment in the Central Tallgrass Prairie ecoregion. Table 9 lists the data sets that were obtained from external sources and were integral to the analyses and evaluations that form the foundation of this assessment.

Key spatial and tabular data sets that were compiled or generated for this assessment include the following and together constitute the major data products from this re-assessment:

- Aquatic ecological system classification and associated shapefile for the lower Missouri River basin
- Aquatic ecological system classifications and shapefiles for the other subbasins (they can be referenced in their associated assessments)
- An ecological integrity index tagged to the hexagon assessment unit shapefile (the hexagons served as the building blocks for terrestrial conservation areas in the portfolio
- Conservation areas shapefiles – the ecoregional "portfolio"
    - aggregations of hexagons for terrestrial conservation areas
    - stream reaches and AES type boundaries for freshwater conservation areas
- Modified element occurrence records; primary modifications including grouping of related occurrences, updated viability information, and whether they contribute to meeting conservation goals
- Terrestrial ecological systems shapefile
- Lists of freshwater and terrestrial conservation targets
- Lists of conservation goals for the freshwater and terrestrial targets
- Lists of threats and strategies identified for the conservation areas
- An updated secured areas shapefile that includes private land preservation agreements

Metadata have been or will be developed for these data products.

The tracking of geographic information used in ecoregional assessments is critical to supporting, guiding, and taking actions. As we move into the future, the lasting

conservation of biodiversity across the CTP ecoregion will depend on accurate, current and accessible geographic information about the location, distribution and integrity of conservation targets; the type, source and scope of threats to them; and the conservation management status of those lands and waters harboring target occurrences. This ecoregional update ensures that the biological diversity information associated with the CTP assessment is transparent, scalable and efficient so that it can be readily used in the measurement of effective conservation, as well as in future planning and biodiversity protection.

Table 9: Major data sets used in the CTP ecoregional assessment

Data Title	Authors	GIS Format	Contact Agency	Year Published	Used For
State heritage element occurrence records	Heritage programs in Illinois, Indiana, Iowa, Kansas, Missouri and Nebraska	Vector	• Illinois Division of Natural Heritage • Indiana Natural Heritage Data Center • Iowa Natural Areas Inventory • Kansas Natural Heritage Inventory • Missouri Natural Heritage Program • Nebraska Natural Heritage Program	• Mar 2006 • Oct 2004 • June 2005 • Mar 2005 • Feb 2005 • April 2005	Identification of terrestrial and freshwater portfolio
2001 National Land Cover Data (NLCD) www.mrlc.gov	Multi-Resolution Land Characteristics Consortium	Raster	U.S. DOI, USGS	2007	Ecological integrity index
State road layers	• MO-DOT • KS-DOT • IL-DOT • IN-DOT • NDNR • IDNR	Vector	• Missouri Department of Transportation: Design Division • Kansas Department of Transportation: Bureau of Transportation Planning • Illinois Department of Transportation Technology Transfer Center • Indiana Department of Transportation • Nebraska Department of Natural Resources • Iowa Department of Natural Resource, Geologic Survey	• 2005 • 2006 • 1993 • 2003 • 2005 • 2002	Ecological integrity index

Data Title	Authors	GIS Format	Contact Agency	Year Published	Used For
Landscape patterns of exurban growth in USA from 1980 to 2020 www.nrel.colostate.edu	Theobald, D.M.	Raster	Colorado State University	2005	Projected Future Housing Threat
National Elevation Dataset (30 meter digital elevation models) http://ned.usgs.gov/	USGS	Raster	U.S. DOI, USGS	Varies	Developing and classifying Aquatic Ecological Systems for freshwater portfolio
Aquatic Subregions (from A Hierarchical Framework of Aquatic Ecological Units in North America, General Technical Report NC-176.) http://ncrs.fs.fed.us/gla/elc/aqsubreg.htm	Maxwell, J.R., C.J. Edwards, M.E. Jensen, S.J. Paustian, H. Parrott, and D.M. Hill	Vector	USFS	1995	Developing and classifying Aquatic Ecological Systems for freshwater portfolio
Hydrologic Unit Maps (USGS Water Supply Paper 2294) http://water.usgs.gov/GIS/huc.html	Seaber, P.R., Kapinos, F.P., and Knapp, G.L.	Vector	USGS	1987	Developing and classifying Aquatic Ecological Systems for freshwater portfolio
National Hydrologic Dataset http://nhd.usgs.gov/	USGS	Vector	USGS	1999	Developing and classifying Aquatic Ecological Systems for freshwater portfolio

Data Title	Authors	GIS Format	Contact Agency	Year Published	Used For
Shuttle Radar Topography Mission Elevation Dataset http://www2.jpl.nasa.gov/srtm/	NASA	Raster	NASA	2002	Developing and classifying Aquatic Ecological Systems for freshwater portfolio
Quaternary Geology of North America (Geologic Map of North America) http://esp.cr.usgs.gov/info/gmna/	Geological Society of America (Reed, J.C., Jr., Wheeler, J.O., and Tucholke, B.E.)	Raster	USGS	2005	Developing and classifying Aquatic Ecological Systems for freshwater portfolio
Secured Areas Data Sets Some data sets were received from personnel responsible for managing the secured areas data set for the state. Other data sets were taken from official spatial data websites: - Missouri Department of Conservation Ownership - Missouri Department of Natural Resources Ownership http://msdisweb.missouri.edu - Wildlife Management Areas - Native American Lands - Conservation and Recreation Lands http://www.igsb.uiowa.edu/nrgislibx/ - Refuge Ownership Boundaries http://www.fws.gov/data/statdata/index.html - CBI/WWF Protected Areas Database, Fourth Edition	• Fiona Solkowski • Sudhir Ponnappan • Ralph Jones • Josh Thompson • Nick Walters • Adrian J. Brown • Thomas D'Avello • Elizabeth Cook • Jason Skold • Kimberly Penner • Keith Short • John Kroct • Greg Wingfield • Charlie Floor • MDC • MODNR – GSD • IDNR – WMD • IDNR – GD	Vector	• TNC (IN) • Nebraska Game & Parks Commission • TNC (NE) • TNC (IL) • TNC (IA) • TNC (MO) • Natural Resources Conservation Service (IL) • Natural Resources Conservation Service (MO) • TNC (NE) • US Army Corp of Engineers (Kansas City District) • US Army Corp of Engineers (St Louis District)	• 2006 • 2006 • 2006 • 2006 • 2006 • 2007 • 2005 • 2005 • 2006 • 2006 • 2006 • 2006 • 2006 • 2004 • 2002 • 2000 • 2005 • 2003	Secured areas assessment

Data Title	Authors	GIS Format	Contact Agency	Year Published	Used For
http://www.consbio.org/cbi/projects/PAD/index.htm	• IDNR – IGS • USFWS • CBI		• US Army Corp of Engineers (Omaha District) • TNC (KS) • Illinois Department of Natural Resources • University of Missouri – Columbia • Iowa Geological Survey • USFWS – Division of Information Technology • Conservation Biology Institute	• 2006 • 2006 • 2006	

K. FUTURE NEEDS AND LESSONS LEARNED

This assessment should be regarded as a dynamic document that is regularly updated. As our knowledge of the biota within the ecoregion improves and the field of applied conservation biology develops, continuous effort must be made to refine and update the conservation portfolio produced in this assessment iteration.

Key data gaps to be filled and methods and approaches to be improved or considered in future iterations of this assessment are summarized below.

Aquatic Assessments

- Freshwater assessments should be conducted at a basin-wide scale and subsequently overlain with terrestrial ecoregional assessments, in a manner similar to the approach used in the upper Mississippi River basin (Weitzell et al. 2003). The standard approach to conducting freshwater assessments (i.e., bounding the assessment largely along terrestrial ecoregional lines) results in disjunctive targets, goals and assessment approaches within basins and does not provide for a comprehensive, systematic basin-wide classification and analysis. Within TNC, freshwater basin planning needs to be viewed and approached as a stand-alone process, separate from, but equal to terrestrial ecoregional planning.

Targets

- Continue to advance and refine information for CTP biota, particularly karst taxa, macro-invertebrates, and terrestrial ecological systems developed in this iteration. This includes mapping locations or occurrences of these taxa and systems.

Occurrences

- Through inventory, increase the number of documented occurrences of G3, G4, and G5 community targets. For example, shortfalls in terrestrial goal attainment could be improved through targeted inventory of the 36 communities that currently have this designation and do not have any occurrence records documented to date within the CTP.
- Determine the historical distribution of terrestrial species relative to individual stratification units.
- Use the viability rating metrics generated in this assessment to rank the viability of terrestrial community occurrences, particularly those in isolated habitat remnants.

Portfolio

- Use the decision tree portfolio assembly process employed in this iteration (and summarized in Appendix 13) to incorporate new occurrence data and geospatial information as it is developed (e.g. climate change, threats), and as a platform for possible future automation of the portfolio assembly process.
- Develop a geospatial analysis to identify viable candidate restoration sites for reintroduction of extant natural communities across the ecoregion.
- Although the integration of climate change information was considered in this assessment, the scale of the analysis conducted in various climate models did not lend itself well to integration at the ecoregional and portfolio site scales.

Data Management

- Transition all ecoregional data to a spatial geodatabase platform for use in the Conservancy's data nodes and associated enterprise-level geodatabases.

In the completion of this assessment iteration several lessons were re/learned and are regarded by the team to be paramount to the prompt and efficient completion of future iterations.

Scope of Work

- Decide on and formally document the deliverables, project objectives, and a description of project success early in the assessment. This is a critical product in the project initiation stage. For this assessment, deliverables, roles, funding, scheduling, and services to be provided as a project were never really defined.
- Calibrate the scope of the ecoregional revision to the level of institutional support for the revision. The level of commitment to the completion of this assessment was highly variable and reflected different state perspectives making consensus and timely progress difficult.
- Formalize contingency plans to offset the loss of staff during the project cycle. The combination of staff loss, inadequate documentation, and inadequate communication among planning team members in various phases of the process resulted in inefficiencies and duplication of effort. For example, poor documentation of conservation targets, their rationale for inclusion or exclusion, and their geographic distribution within the ecoregion resulted in substantial time wasted in revisiting those lists to confirm that critical information.

Capacity

- Dedicated staff, whose primary responsibility is the completion of the assessment, is a priority.
- Ensure that the data manager is an active member of the assessment team throughout the entire process so that target lists, occurrence records, and all of the other data sets are clearly and well documented as the assessment progresses.

Linkages Between Successive Iterations

- Ensure that the lessons learned from previous assessments are well understood by the core team. Although other ecoregional teams have previously faced similar challenges or mistakes and shared their lessons learned, our experience here shows that these mistakes are sometimes repeated and are extremely costly in terms of time and effort spent; future assessment teams should make every effort to avoid repeating them.
- Actively managing information between iterations is critical. For example, carefully and adequately documenting data and regularly incorporating new data to fill information gaps will save substantial time and headaches.
- Understanding the strengths and limitations of the data on hand is crucial, particularly for inexperienced teams.
- Develop formal guidance for updating ecoregional information; such a process needs to be drafted and adopted at an organizational level to ensure long-term organizational success.

Institutional Guidance and Standards

- Develop standards or guidelines for the ecoregional revision process at a regional or continental scale. Both the methods and the content required for an assessment revision need to be clarified.
- Identify a core ecoregional planning team at the regional level to improve assimilation of global strategies and streamline ecoregional status measures. A core team should have experienced ecoregional assessment staff. Establishment of a regional leadership of this kind prior to undertaking this assessment would have sped up the assessment process significantly.
- Store and manage ecoregional data products in a standard format and in an internally accessible location so conservation staff can readily update ecoregional data informed by project-level planning and conservation. For example, updating information on targets, threats, and conservation areas can be integrated into an accessible and standardized data set.

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Ed	Anderson	Illinois Department of Natural Resources
Mike	Arduser	Missouri Department of Conservation
Debbie	Baker	Central Plains Center for Bioassessment
Barry	Baker	The Nature Conservancy, Climate Change Initiative
Ken	Bazata	Nebraska Department of Environmental Quality
Todd	Bittner	Illinois Department of Natural Resources
Kim	Bogenschutz	Iowa Department of Natural Resources
Jeff	Briggler	Missouri Department of Conservation
Angie	Bruce	Iowa Department of Natural Resources
Dorothy	Bulter	Missouri Department of Conservation
William	Busby	Kansas Biological Survey
Jim	Christiansen	Drake University
Matt	Combes	Missouri Department of Conservation
Pat	Comer	NatureServe
George	Cunningham	Eco-Centrics; University of Nebraska-Omaha
Diane	Debinski	Iowa State University
Jim	Drake	NatureServe
Pauline	Drobney	United States Fish and Wildlife Service
Bill	Elliott	Missouri Department of Conservation
Dan	Erickson	United States Army Corps of Engineers
Charlie	Floor	Illinois Department of Natural Resources
Andrew	Forbes	Missouri Department of Conservation
Mike	Fritz	Nebraska Game and Parks Commission
Keith	Gido	Kansas State University
William	Glass	Forest Service Midewin National Tallgrass Prairie
Greg	Gremaud	Missouri Department of Conservation
Francis	Harty	The Nature Conservancy Illinois
Kristen	Hase	Kansas Department of Wildlife and Parks
Steve	Haslouer	Kansas Department of Health & Environment
Cloyce	Hedge	Indiana Natural Heritage Program
Renae	Held	Tern and Plover Partnership
Chris	Helzer	The Nature Conservancy Nebraska
Cathy	Henry	United States Fish and Wildlife Service
Jim	Herkert	The Nature Conservancy Illinois
Daryl	Howell	Iowa Department of Natural Resources
Don	Huggins	Central Plains Center for Bioassessment
Tyler	Janke	The Nature Conservancy Nebraska
Ralph	Jones	The Nature Conservancy Nebraska

Joel	Jorgensen	Nebraska Game and Parks Commission
Joe	Kath	Illinois Department of Natural Resources
Tim	Kelley	Illinois Department of Natural Resources
Tara	Kieninger	Illinois Department of Natural Resources
Dan	Kirk	Illinois Department of Natural Resources
Layne	Knight	Kansas State University
Jeff	Kopaska	Iowa Department of Natural Resources
Paul	Labus	The Nature Conservancy Indiana
Vern	LaGesse	LaGesse and Associates, Inc.
Becky	Latka	United States Army Corps of Engineers
Mike	Leahy	Missouri Department of Conservation
Warren	Lockwood	The Nature Conservancy, Conservation Strategies Division
Mark	Loeschke	Iowa Department of Natural Resources
Chris	Mammoliti	The Watershed Institute
Susanne	Masi	Chicago Botanic Garden
Louise	Mauldin	United States Fish and Wildlife Service
Maureen	McHale	
David	Mehlman	The Nature Conservancy Illinois
Shannon	Menard	NatureServe
Angella	Moorehouse	Illinois Nature Preserves Commission
Thomas	Nagel	Missouri Department of Conservation
Tim	Nigh	Missouri Department of Conservation
James	Novak	University of South Dakota
Doug	Novinger	Missouri Department of Conservation
Randy	Nyboer	Illinois Natural History Survey
Ron	Oesch	
Chip	O'Leary	The Nature Conservancy Indiana
Ron	Panzer	Northeastern Illinois University
Greg	Pavelka	United States Army Corps of Engineers
John	Pearson	Iowa Department of Natural Resources
Kim	Penner	United States Army Corps of Engineers
Chris	Phillips	Illinois Natural History Survey
Mark	Phipps	Illinois Department of Natural Resources
Sudhir K.	Ponnappan	Nebraska Game and Parks Commission
Cory	Reade	Nebraska Game and Parks Commission
Kim	Roman	Illinois Nature Preserves Commission
Tom	Rosburg	Drake University
Dan	Salzar	The Nature Conservancy, Conservation Strategies Division
Steven	Schainost	Nebraska Game and Parks Commission
Rick	Schneider	Nebraska Game and Parks Commission
Dave	Schumacher	Nebraska Department of Environmental Quality
Yale	Sedman	Western Illinois University (retired)
Jerry	Selby	Ecological and GIS Services
Vince	Shay	The Nature Conservancy, Upper Mississippi River Program
Keith	Short	United States Army Corps of Engineers
Dane	Shuman	United States Fish and Wildlife Service
Bryan	Simmons	Kansas Department of Wildlife and Parks
Michelle	Simone	Illinois Department of Natural Resources
Rachel	Simpson	Nebraska Game and Parks Commission

Jan	Slaats	The Nature Conservancy Central US Region
Eric	Smith	Illinois Department of Natural Resources
Marian	Smith	Southern Illinois University – Edwardsville
John	Sowl	National Park Service
Leslee	Spraggins	The Nature Conservancy Illinois
Gerry	Steinauer	Nebraska Game and Parks Commission
Todd	Strole	The Nature Conservancy, Upper Mississippi River Program
Vernon	Tabor	United States Fish and Wildlife Service
Steve	Taylor	Illinois Natural History Survey
Josh	Thompson	The Nature Conservancy Illinois
Carmen	Thomson	National Park Service
Eric	Ulaszek	Forest Service Midewin National Tallgrass Prairie
Tim	Vogt	Missouri Department of Natural Resources
Jeff	Walk	The Nature Conservancy Illinois
Nick	Walters	The Nature Conservancy Iowa
Scott	Wessel	Nebraska Game and Parks Commission
Jim	Wiker	Independent Lepidopterist
John	Wilker	Illinois Department of Natural Resources
Chris	Zganjar	The Nature Conservancy, Climate Change Initiative

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CENTRAL TALLGRASS PRAIRIE ECOREGIONAL ASSESSMENT: UPDATE ON BIODIVERSITY

APPENDICES

Appendix 1. Primary Terrestrial Conservation Targets: Species

Key to column headings

Common Name	The common name of the species target
Scientific Name	The scientific name of the species target (see www.natureserve.org/explorer/class.htm for information on taxonomic systems used by NatureServe)
GELCODE	NatureServe's unique identifying code for the species (also known as the "Global Element Code")
Global Rank	The global conservation status ranking assigned to this species by NatureServe; values range from G1 (critically imperiled) to G5 (demonstrably widespread, abundant, and secure). Range G-ranks, such as G4G5, indicate uncertainty about the precise rank but confidence that the rank is within the range of those two values. A "Q" suffix indicates uncertainty about the species taxonomy. See www.natureserve.org/explorer/ranking.htm for more information on global ranks.
Distribution	The geographic distribution of this target relative to the Central Tallgrass Prairie ecoregion; endemic = 90% or more of the target's range is in the ecoregion of interest; limited = a substantial majority of the target's range is in the ecoregion of interest, but its range also extends into one or a few other ecoregions; widespread = the target is distributed broadly in several to many ecoregions, with relatively even distribution across many or most of those ecoregions, including the ecoregion of interest; peripheral = less than approximately 10% of this target's range is in the ecoregion of interest
Selection Justification	The rationale(s) for including this species as a conservation target; the vast majority of terrestrial species conservation targets were chosen on the basis of rarity. Exceptions are the declining and vulnerable eastern massasauga, the disjunct Illinois mud turtle, and declining and vulnerable grassland birds identified for this region by Partners in Flight.

Common Name	*Scientific Name*	*GELCODE*	*Global Rank*	*Distribution*	*Selection Justification*
Mammal					
Gray Myotis	Myotis grisescens	AMACC01040	G3	Peripheral	Rarity
Indiana Myotis	Myotis sodalis	AMACC01100	G2	Widespread	Rarity
Bird					
Piping Plover	Charadrius melodus	ABNNB03070	G3	Peripheral	Rarity
Interior Least Tern	Sternula antillarum athalassos	ABNNM08102	G4T2Q	Peripheral	Rarity
Greater Prairie-chicken	Tympanuchus cupido	ABNLC13010	G4	Widespread	Partners in Flight score
Bell's Vireo	Vireo bellii	ABPBW01110	G5	Widespread	Partners in Flight score
Golden-winged Warbler	Vermivora chrysoptera	ABPBX01030	G4	Peripheral	Partners in Flight score
Baird's Sparrow	Ammodramus bairdii	ABPBXA0010	G4	Peripheral	Partners in Flight score
Henslow's Sparrow	Ammodramus henslowii	ABPBXA0030	G4	Widespread	Partners in Flight score
Reptile					
Yellow Mud Turtle	Kinosternon flavescens	ARAAE01020	G5	Disjunct	Disjunct
Kirtland's Snake	Clonophis kirtlandii	ARADB06010	G2	Limited	Rarity
Copperbelly Water Snake	Nerodia erythrogaster neglecta	ARADB22023	G5T3	Limited	Rarity
Eastern Massasauga	Sistrurus catenatus catenatus	ARADE03011	G3G4T3T4Q	Limited	Vulnerable Declining

Common Name	Scientific Name	GELCODE	Global Rank	Distribution	Selection Justification
Amphibian					
Illinois Chorus Frog	Pseudacris streckeri illinoensis	AAABC05061	G5T3	Limited	Rarity
Mollusk					
Bluff Vertigo	Vertigo meramecensis	IMGAS20190	G2G3	Limited?	Rarity
Hubricht's Vertigo	Vertigo hubrichti	IMGAS20380	G3	Peripheral	Rarity
Pleistocene Disc	Discus macclintocki	IMGAS54060	G1	Peripheral	Rarity
Insect					
Salt Creek Tiger Beetle	Cicindela nevadica lincolniana	IICOL02173	G5T1	Endemic	Rarity
American Burying Beetle	Nicrophorus americanus	IICOL42010	G2G3	Widespread	Rarity
Red-Tailed Leafhopper	Aflexia rubranura	IIHOM08010	G2	Widespread	Rarity
Persius Dusky Wing	Erynnis persius persius	IILEP37171	G5T1T3	Peripheral	Rarity
Powesheik Skipperling	Oarisma powesheik	IILEP57010	G2G3	Peripheral	Rarity
Dakota Skipper	Hesperia dacotae	IILEP65140	G2	Peripheral	Rarity
Bucholz Black Dash	Euphyes conspicua bucholzi	IILEP77061	G4T1	Endemic	Rarity
Frosted Elfin	Callophrys irus	IILEPE2220	G3	Peripheral	Rarity
Regal Fritillary	Speyeria idalia	IILEPJ6040	G3	Widespread	Rarity
Rattlesnake-master Borer Moth	Papaipema eryngii	IILEYC0310	G1G2	Limited	Rarity
Blazing Star Stem Borer	Papaipema beeriana	IILEYC0450	G2G3	Limited	Rarity
Prairie Mole Cricket	Gryllotalpa major	IIORT17010	G3	Peripheral	Rarity
Vascular Plant					
Mead's Milkweed	Asclepias meadii	PDASC02150	G2	Limited	Rarity
Decurrent False Aster	Boltonia decurrens	PDAST1E040	G2	Endemic	Rarity
Hill's Thistle	Cirsium hillii	PDAST2E1C0	G3	Widespread	Rarity
Lakeside Daisy	Tetraneuris herbacea	PDASTDY060	G3	Limited	Rarity
Forked Aster	Eurybia furcata	PDASTEB0H0	G3	Widespread	Rarity
American Barberry	Berberis canadensis	PDBER02010	G3	Peripheral	Rarity
Royal Catchfly	Silene regia	PDCAR0U1G0	G3	Widespread	Rarity
Creeping St. John's-wort	Hypericum adpressum	PDCLU03010	G3	Peripheral	Rarity
Tennessee Milk-vetch	Astragalus tennesseensis	PDFAB0F8S0	G3	Peripheral	Rarity
Leafy Prairie-clover	Dalea foliosa	PDFAB1A0K0	G2G3	Peripheral	Rarity
Prairie Bushclover	Lespedeza leptostachya	PDFAB27090	G3	Peripheral	Rarity
Running Buffalo Clover	Trifolium stoloniferum	PDFAB40250	G3	Peripheral?	Rarity
Bush's Poppy-mallow	Callirhoe bushii	PDMAL0A020	G3	Peripheral	Rarity
Clustered Poppy-mallow	Callirhoe triangulata	PDMAL0A080	G3	Widespread	Rarity
Kankakee Globemallow	Iliamna remota	PDMAL0K060	G1Q	Endemic?	Rarity
Sangamon Phlox	Phlox pilosa ssp. sangamonensis	PDPLM0D1J9	G5T1	Endemic	Rarity

Common Name	*Scientific Name*	*GELCODE*	*Global Rank*	*Distribution*	*Selection Justification*
Northern Wild Monkshood	Aconitum noveboracense	PDRAN01070	G3	Peripheral	Rarity
Iowa Golden-saxifrage	Chrysosplenium iowense	PDSAX07030	G3?	Peripheral	Rarity
Earleaf False Foxglove	Agalinis auriculata	PDSCR01130	G3	Widespread	Rarity
Kitten Tails	Besseya bullii	PDSCR09030	G3	Peripheral	Rarity
Rose Turtlehead	Chelone obliqua var. speciosa	PDSCR0F043	G4T3	Widespread	Rarity
North American Dwarf Burhead	Echinodorus parvulus	PMALI02050	G3Q	Peripheral	Rarity
Mohlenbrock's Umbrella-sedge	Cyperus grayoides	PMCYP061G0	G3	Widespread	Rarity
Hall's Bulrush	Schoenoplectus hallii	PMCYP0Q0R0	G3	Limited	Rarity
Eastern Prairie White-fringed Orchid	Platanthera leucophaea	PMORC1Y0F0	G3	Widespread	Rarity
Western Prairie White-fringed Orchid	Platanthera praeclara	PMORC1Y0S0	G3	Widespread	Rarity
Bog Bluegrass	Poa paludigena	PMPOA4Z1W0	G3	Peripheral	Rarity

Appendix 2. Secondary Terrestrial Conservation Targets: Species

Declining and vulnerable grassland birds identified as Management Concern species for this region by Partners in Flight are included as secondary targets. Conservation goals are not set for these species; at portfolio sites where these species are present, they should receive conservation attention.

Key to column headings

Common Name	The common name of the species target
Scientific Name	The scientific name of the species target (see www.natureserve.org/explorer/class.htm for information on taxonomic systems used by NatureServe)
GELCODE	NatureServe's unique identifying code for the species (also known as the "Global Element Code")
Global Rank	The global conservation status ranking assigned to this species by NatureServe; values range from G1 (critically imperiled) to G5 (demonstrably widespread, abundant, and secure). Range G-ranks, such as G4G5, indicate uncertainty about the precise rank but confidence that the rank is within the range of those two values. A "Q" suffix indicates uncertainty about the species taxonomy. See www.natureserve.org/explorer/ranking.htm for more information on global ranks.

Common Name	*Scientific Name*	*GELCODE*	*Global Rank*
Bird			
Swainson's Hawk	Buteo swainsoni	ABNKC19070	G5
Short-eared Owl	Asio flammeus	ABNSB13040	G5
Red-headed Woodpecker	Melanerpes erythrocephalus	ABNYF04040	G5
Willow Flycatcher	Empidonax traillii	ABPAE33040	G5
Sprague's Pipit	Anthus spragueii	ABPBM02060	G4
Blue-winged Warbler	Vermivora pinus	ABPBX01020	G5
Painted Bunting	Passerina ciris	ABPBX64060	G5
Dickcissel	Spiza americana	ABPBX65010	G5
Lark Bunting	Calamospiza melanocorys	ABPBX98010	G5
Grasshopper Sparrow	Ammodramus savannarum	ABPBXA0020	G5
Harris's Sparrow	Zonotrichia querula	ABPBXA4050	G5
Chestnut-collared Longspur	Calcarius ornatus	ABPBXA6040	G5
Rusty Blackbird	Euphagus carolinus	ABPBXB5010	G4

Appendix 3. Primary Freshwater Conservation Targets: Species

Key to column headings

Common Name	The common name of the species target
Scientific Name	The scientific name of the species target (see http://www.natureserve.org/explorer/class.htm for information on taxonomic systems used by NatureServe)
GELCODE	The unique identifier (or "Global Element Code" of the species), used by NatureServe and Heritage Programs
Global Rank	The global conservation status ranking assigned to this species by NatureServe; values range from G1 (critically imperiled) to G5 (demonstrably widespread, abundant, and secure). Range G-ranks, such as G4G5, indicate uncertainty about the precise rank but confidence that the rank is within the range of those two values
Group	Target assemblages composed of characteristic native fauna typically co-occurring in high-quality streams, rivers and/or lakes that share common ecological processes and threats
Selection Justification	The rationale(s) for including this species as a conservation target

Common Name	*Scientific Name*	*GELCODE*	*Global Rank*	*Group*	*Selection Justification*
Fish	Ichthyomyzon castaneus	AFBAA01020	G4		Rare, wide-ranging, declining
Chestnut lamprey					
Lake sturgeon	Acipenser fulvescens	AFCAA01020	G3G4		G3
Pallid sturgeon	Scaphirhynchus albus	AFCAA02010	G1		G1G2
Shovelnose sturgeon	Scaphirhynchus platorynchus	AFCAA02020	G4		Declining; Vulnerable
Paddlefish	Polyodon spathula	AFCAB01010	G4		Declining; Vulnerable
American eel	Anguilla rostrata	AFCEA01010	G5		Declining; Wide Ranging
Skipjack herring	Alosa chrysochloris	AFCFA01030	G5		Vulnerable; declining
Grass pickerel	Esox americanus vermiculatus	AFCHD01012	G5		Disjunct; Vulnerable
Western silvery minnow	Hybognathus argyritis	AFCJB16010	G4	Minnows	Declining; Vulnerable; Focal
Plains minnow	Hybognathus placitus	AFCJB16050	G4	Minnows	Declining; Vulnerable; Focal
River shiner	Notropis blennius	AFCJB28190	G5		Vulnerable, declining
Blacknose shiner	Notropis heterolepis	AFCJB28530	G4		Disjunct; Vulnerable
Topeka shiner	Notropis topeka	AFCJB28960	G3		G3
Northern redbelly dace	Phoxinus eos	AFCJB31020	G5	Sandhill Fish Assemblage	Key species in a declining and Vulnerable Native Assemblage Type
Southern redbelly dace	Phoxinus erythrogaster	AFCJB31030	G5		Disjunct, vulnerable

Common Name	Scientific Name	GELCODE	Global Rank	Group	Selection Justification
Finescale dace	Phoxinus neogaeus	AFCJB31040	G5	Sandhill Fish Assemblage	Key species in a declining and Vulnerable Native Assemblage Type
Western blacknose dace	Rhinichthys obtusus (formerly atratulus)	AFCJB37010	G5		Disjunct, vulnerable
Sturgeon chub	Macrhybopsis gelida	AFCJB53020	G3	Tributary Chubs; Missouri Mainstem Chubs	Declining; Vulnerable
Sicklefin chub	Macrhybopsis meeki	AFCJB53030	G3	Missouri Mainstem Chubs	Key species in a declining and Vulnerable Native Assemblage Type
Silver chub	Macrhybopsis storeriana	AFCJB53040	G5	Tributary Chubs; Missouri Mainstem Chubs	Key species in a declining and Vulnerable Native Assemblage Type
Shoal chub	Macrhybopsis hyostoma	AFCJB53080	G5	Tributary Chubs; Missouri Mainstem Chubs	Key species in a declining and Vulnerable Native Assemblage Type
Pearl dace	Margariscus margarita	AFCJB54010	G5	Sandhill Fish Assemblage	Key species in a declining and Vulnerable Native Assemblage Type
Flathead chub	Platygobio gracilis	AFCJB57010	G5	Tributary Chubs; Missouri Mainstem Chubs	Key species in a declining and Vulnerable Native Assemblage Type
Highfin carpsucker	Carpiodes velifer	AFCJC01030	G4G5		Declining; Vulnerable
Blue sucker	Cycleptus elongatus	AFCJC04010	G3G4		Declining; Vulnerable
Trout perch	Percopsis omiscomaycus	AFCLC01010	G5		Peripheral; imperiled in southern portion of range, NE
Plains topminnow	Fundulus sciadicus	AFCNB04170	G4		Declining; Wide-Ranging
Plains killifish	Fundulus kansae (formerly zebrinus)	AFCNB04210	G5		Declining
Western sand darter	Ammocrypta clara	AFCQC01040	G3		G3; rare; vulnerable
Blackside darter	Percina maculata	AFCQC04140	G5		Disjunct, vulnerable
Insect Platte River caddisfly	Ironoquia plattensis	IITRI88040	G1G2		Endemic; vulnerable
Mussel Threeridge	Amblema plicata	IMBIV03020	G5	Native Unionid Assemblage	Vulnerable; declining
Flat floater	Anodonta suborbiculata	IMBIV04130	G5	Native Unionid Assemblage	Vulnerable; disjunct

Common Name	*Scientific Name*	*GELCODE*	*Global Rank*	*Group*	*Selection Justification*
Yellow sandshell	Lampsilis anodontoides (teres)	IMBIV21240	G5	Native Unionid Assemblage	Vulnerable; declining
Slough sandshell	Lampsilis teres teres	IMBIV21241	G5T1Q	Native Unionid Assemblage	Vulnerable; declining
Plain pocketbook	Lampsilis cardium	IMBIV21250	G5	Native Unionid Assemblage	Vulnerable; declining
Black sandshell	Ligumia recta	IMBIV26020	G5	Native Unionid Assemblage	Vulnerable; declining
Pondmussel	Ligumia subrostrata	IMBIV26030	G4G5	Native Unionid Assemblage	Vulnerable; declining
Wartyback	Quadrula nodulata	IMBIV39090	G4	Native Unionid Assemblage	Vulnerable; declining
Pimpleback	Quadrula pustulosa	IMBIV39110	G5	Native Unionid Assemblage	Vulnerable; declining
Pistolgrip	Tritogonia verrucosa	IMBIV44010	G4	Native Unionid Assemblage	Vulnerable; declining
Pondhorn	Uniomerous Tetralasmus	IMBIV46050	G4	Native Unionid Assemblage	Vulnerable; declining
Marsh pondsnail	Stagnicola (formerly Lymnaea) elodes	IMGASL5070	G5	Native Unionid Assemblage	Vulnerable; declining

Appendix 4. Core Ecological Systems of the CTP Ecoregion

INTERNATIONAL ECOLOGICAL CLASSIFICATION STANDARD:

TERRESTRIAL ECOLOGICAL CLASSIFICATIONS

Ecological Systems of the Central Tallgrass Prairie (TNC Ecoregion 36)

by

NatureServe

1101 Wilson Blvd., 15th floor
Arlington, VA 22209

1101 West River Parkway, Suite 200
Minneapolis, MN 55415

This subset of the International Ecological Classification Standard covers ecological systems attributed to the Central Tallgrass Prairie (TNC Ecoregion 36). This classification has been developed in consultation with many individuals and agencies and incorporates information from a variety of publications and other classifications. Comments and suggestions regarding the contents of this subset should be directed to Mary J. Russo, Central Ecology Data Manager, Durham, NC <mary_russo@natureserve.org> and Jim Drake, Regional Vegetation Ecologist, Minneapolis, MN <jim_drake@natureserve.org>.

Citations:

The following citation should be used in any published materials which reference ecological system and/or International Vegetation Classification (IVC hierarchy) and association data:

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. U.S.A. Data current as of 25 July 2007.

NatureServe
1101 Wilson Blvd, 15th floor
Arlington, VA 22209

These data are extracted from:

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. U.S.A. Data current as of 25 July 2007.

This document may be generally cited as follows:

NatureServe[1]. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. Ecological Systems of the Central Tallgrass Prairie (TNC Ecoregion 36). NatureServe Central Databases. Arlington, VA. Data current as of 25 July 2007.

[1] NatureServe is an international organization including NatureServe regional offices, a NatureServe central office, U.S. State Natural Heritage Programs, and Conservation Data Centres (CDC) in Canada and Latin America and the Caribbean. Ecologists from the following organizations have contributed the development of the ecological systems classification:

United States
Central NatureServe Office, Arlington, VA; Eastern Regional Office, Boston, MA; Midwestern Regional Office, Minneapolis, MN; Southeastern Regional Office, Durham, NC; Western Regional Office, Boulder, CO; Alabama Natural Heritage Program, Montgomery AL; Alaska Natural Heritage Program, Anchorage, AK; Arizona Heritage Data Management Center, Phoenix AZ; Arkansas Natural Heritage Commission Little Rock, AR; Blue Ridge Parkway, Asheville, NC; California Natural Heritage Program, Sacramento, CA; Colorado Natural Heritage Program, Fort Collins, CO; Connecticut Natural Diversity Database, Hartford, CT; Delaware Natural Heritage Program, Smyrna, DE; District of Columbia Natural Heritage Program/National Capital Region Conservation Data Center, Washington DC; Florida Natural Areas Inventory, Tallahassee, FL; Georgia Natural Heritage Program, Social Circle, GA; Great Smoky Mountains National Park, Gatlinburg, TN; Gulf Islands National Seashore, Gulf Breeze, FL; Hawaii Natural Heritage Program, Honolulu, Hawaii; Idaho Conservation Data Center, Boise, ID; Illinois Natural Heritage Division/Illinois Natural Heritage Database Program, Springfield, IL; Indiana Natural Heritage Data Center, Indianapolis, IN; Iowa Natural Areas Inventory, Des Moines, IA; Kansas Natural Heritage Inventory, Lawrence, KS; Kentucky Natural Heritage Program, Frankfort, KY; Louisiana Natural Heritage Program, Baton Rouge, LA; Maine Natural Areas Program, Augusta, ME; Mammoth Cave National Park, Mammoth Cave, KY; Maryland Wildlife & Heritage Division, Annapolis, MD; Massachusetts Natural Heritage & Endangered Species Program, Westborough, MA; Michigan Natural Features Inventory, Lansing, MI; Minnesota Natural Heritage & Nongame Research and Minnesota County Biological Survey, St. Paul, MN; Mississippi Natural Heritage Program, Jackson, MI; Missouri Natural Heritage Database, Jefferson City, MO; Montana Natural Heritage Program, Helena, MT; National Forest in North Carolina, Asheville, NC; National Forests in Florida, Tallahassee, FL; National Park Service, Southeastern Regional Office, Atlanta, GA; Navajo Natural Heritage Program, Window Rock, AZ; Nebraska Natural Heritage Program, Lincoln, NE; Nevada Natural Heritage Program, Carson City, NV; New Hampshire Natural Heritage Inventory, Concord, NH; New Jersey Natural Heritage Program, Trenton, NJ; New Mexico Natural Heritage Program, Albuquerque , NM; New York Natural Heritage Program, Latham, NY; North Carolina Natural Heritage Program, Raleigh, NC; North Dakota Natural Heritage Inventory, Bismarck, ND; Ohio Natural Heritage Database, Columbus, OH; Oklahoma Natural Heritage Inventory, Norman, OK; Oregon Natural Heritage Program, Portland, OR; Pennsylvania Natural Diversity Inventory, PA; Rhode Island Natural Heritage Program, Providence, RI; South Carolina Heritage Trust, Columbia, SC; South Dakota Natural Heritage Data Base, Pierre, SD; Tennessee Division of Natural Heritage, Nashville, TN; Tennessee Valley Authority Heritage Program, Norris, TN; Texas Conservation Data Center, San Antonio, TX; Utah Natural Heritage Program, Salt Lake City, UT; Vermont Nongame & Natural Heritage Program, Waterbury, VT; Virginia Division of Natural Heritage, Richmond, VA; Washington Natural Heritage Program, Olympia, WA; West Virginia Natural Heritage Program, Elkins, WV; Wisconsin Natural Heritage Program, Madison, WI; Wyoming Natural Diversity Database, Laramie, WY

Canada
Alberta Natural Heritage Information Centre, Edmonton, AB, Canada; Atlantic Canada Conservation Data Centre, Sackville, New Brunswick, Canada; British Columbia Conservation Data Centre, Victoria, BC, Canada; Manitoba Conservation Data Centre. Winnipeg, MB, Canada; Ontario Natural Heritage Information Centre, Peterborough, ON, Canada; Quebec Conservation Data Centre, Quebec, QC, Canada; Saskatchewan Conservation Data Centre, Regina, SK, Canada; Yukon Conservation Data Centre, Yukon, Canada

Latin American and Caribbean
Centro de Datos para la Conservacion de Bolivia, La Paz , Bolivia; Centro de Datos para la Conservacion de Colombia, Cali,Valle, Columbia; Centro de Datos para la Conservacion de Ecuador, Quito, Ecuador; Centro de Datos para la Conservacion de Guatemala, Ciudad de Guatemala , Guatemala; Centro de Datos para la Conservacion de Panama, Querry Heights , Panama; Centro de Datos para la Conservacion de Paraguay, San Lorenzo , Paraguay; Centro de Datos para la Conservacion de Peru, Lima, Peru; Centro de Datos para la Conservacion de Sonora, Hermosillo, Sonora , Mexico; Netherlands Antilles Natural Heritage Program, Curacao , Netherlands Antilles; Puerto Rico-Departmento De Recursos Naturales Y Ambientales, Puerto Rico; Virgin Islands Conservation Data Center, St. Thomas, Virgin Islands.

NatureServe also has partnered with many International and United States Federal and State organizations, which have also contributed significantly to the development of the International Classification. Partners include the following The Nature Conservancy; Provincial Forest Ecosystem Classification Groups in Canada; Canadian Forest Service; Parks Canada; United States Forest Service; National GAP Analysis Program; United States National Park Service; United States Fish and Wildlife Service; United States Geological Survey; United States Department of Defense; Ecological Society of America; Environmental Protection Agency; Natural Resource Conservation Services; United States Department of Energy; and the Tennessee Valley Authority. Many individual state organizations and people from academic institutions have also contributed to the development of this classification.

TABLE OF CONTENTS

Forest and Woodland

CES202.692 CENTRAL INTERIOR HIGHLANDS DRY ACIDIC GLADE AND BARRENS

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Forest and Woodland
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
National Mapping Codes: EVT 2363; ESLF 4305; ESP 1363
Concept Summary: This system is primarily found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions with small occurrences in northern Missouri. It occurs on flatrock outcrops and along moderate to steep slopes or valley walls of rivers along most aspects. Parent material includes chert, igneous, and/or sandstone bedrock with well- to excessively well-drained, shallow soils interspersed with rock and boulders. These soils are typically dry during the summer and autumn, becoming saturated during the spring and winter. Grasses such as *Schizachyrium scoparium* and *Sorghastrum nutans* dominate this system with stunted oak species (*Quercus stellata, Quercus marilandica*) and shrub species such as *Vaccinium* spp. occurring on variable depth soils. *Juniperus virginiana* can be present and often increases in the absence of fire. In Kentucky, this system includes both sandstone glades found in the Shawnee Hills (EPA Ecoregions 71a, 72h of Woods et al. (2002)), as well as shale glades found in the Knobs region (EPA Ecoregions 70d, 71c of Woods et al. (2002)), both in the Kentucky Interior Low Plateau. It also includes dry *Quercus stellata*-dominated barrens on Cretaceous-aged gravel substrates on the northern fringes of the Upper East Gulf Coastal Plain Ecoregion in southern Illinois and western Kentucky. This system is influenced by drought and infrequent to occasional fires. Prescribed fires help manage this system by maintaining an open glade structure.
Comments: Indiana and Illinois have this system in preference to Cumberland Sandstone Glade and Barrens (CES202.337). Both are found in Kentucky but in different parts of the state. The occurrence of this system in TNC Ecoregion 43 is apparently confined to southern Illinois and/or Kentucky but does not include any portions of states to the south. Not all examples are acidic. Sometimes a layer of limestone or neutral shale occurs in these and thus are not acidic.

DISTRIBUTION

Range: This system is found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions, with rare and limited occurrences in the Upper East Gulf Coastal Plain of Kentucky and Illinois.
Divisions: 202:C, 203:C
TNC Ecoregions: 36:C, 38:C, 39:C, 43:C, 44:C
Subnations: AR, IL, IN, KY, MO, OK, TN?
Map Zones: 43:P, 44:C, 47:C, 48:C, 49:C, 53:C
USFS Ecomap Regions:

CONCEPT

Associations:
- *(Quercus stellata, Ulmus alata) / Schizachyrium scoparium - Symphyotrichum patens* var. *patentissimum* Wooded Herbaceous Vegetation (CEGL007824, G2?)
- *Asplenium montanum - Heuchera parviflora* var. *parviflora - Silene rotundifolia* Sparse Vegetation (CEGL004392, G3G4)
- *Pinus virginiana - Pinus (rigida, echinata) - (Quercus prinus) / Vaccinium pallidum* Forest (CEGL007119, G4?)
- *Quercus marilandica - Juniperus virginiana* var. *virginiana / Schizachyrium scoparium - Hypericum gentianoides* Wooded Herbaceous Vegetation (CEGL004062, G3?)
- *Quercus marilandica / Vaccinium arboreum / Danthonia spicata* Scrub Woodland (CEGL002425, G3G4)
- *Quercus prinus / Cornus florida - Amelanchier arborea / Pityopsis graminifolia* var. *latifolia* Woodland (CEGL003706, G2?)
- *Quercus prinus / Danthonia spicata - Silene caroliniana* Woodland (CEGL004439, G2?)
- *Quercus stellata - (Pinus echinata) / Vaccinium arboreum / Andropogon gerardii - Symphyotrichum patens* var. *patentissimum* Wooded Herbaceous Vegetation (CEGL007814, G2?)
- *Quercus stellata - Quercus marilandica - Quercus velutina - Carya texana / Schizachyrium scoparium* Woodland (CEGL002149, G2G3)
- *Quercus stellata - Quercus marilandica / Schizachyrium scoparium - Silphium terebinthinaceum* Wooded Herbaceous Vegetation (CEGL005134, G1)
- *Schizachyrium scoparium - Aristida dichotoma - Croton willdenowii* / Lichens Wooded Herbaceous Vegetation (CEGL002242, G3)
- *Schizachyrium scoparium - Sedum nuttallianum - Selaginella rupestris - Portulaca pilosa* / Lichens Wooded Herbaceous Vegetation (CEGL002244, G1G2)
- *Schizachyrium scoparium - Sorghastrum nutans - Andropogon ternarius - Coreopsis grandiflora* Sandstone - Shale Herbaceous Vegetation (CEGL002212, G3)
- *Schizachyrium scoparium - Sorghastrum nutans - Coreopsis lanceolata - Croton willdenowii* Wooded Herbaceous Vegetation (CEGL002243, G4?)

- *Schizachyrium scoparium - Sorghastrum nutans - Danthonia spicata - Silene regia* Chert Herbaceous Vegetation (CEGL002211, G3)

Alliances:
- *(Juniperus virginiana) / Schizachyrium scoparium - (Bouteloua curtipendula)* Wooded Herbaceous Alliance (A.1919)
- *(Quercus stellata, Quercus marilandica) / Schizachyrium scoparium* Wooded Herbaceous Alliance (A.1920)
- *Asplenium montanum* Sparsely Vegetated Alliance (A.1831)
- *Pinus virginiana* Forest Alliance (A.131)
- *Quercus prinus - Quercus coccinea* Woodland Alliance (A.622)
- *Quercus stellata - Quercus marilandica* Woodland Alliance (A.625)
- *Schizachyrium scoparium - Sorghastrum nutans* Herbaceous Alliance (A.1198)

Environment: This system occurs on flat outcrops of sandstone rock and along moderate to steep slopes or valley walls of rivers along most aspects. Parent material includes chert, shale, igneous and/or sandstone bedrock with well- to excessively well-drained, shallow soils interspersed with rock and boulders. These soils are typically dry during the summer and autumn, becoming saturated during the spring and winter.

Vegetation: Grasses such as *Schizachyrium scoparium* and *Sorghastrum nutans* dominate this system with stunted oak species (*Quercus stellata, Quercus marilandica*) and shrub species such as *Vaccinium* spp. occurring on variable depth soils. In the Shawnee Hills (EPA Ecoregions 71a, 72h of Woods et al. (2002)) of the Kentucky Interior Low Plateau, *Quercus marilandica, Quercus stellata,* and *Juniperus virginiana* are the dominant trees. Scattered shrubs, such as *Vaccinium arboreum* and *Chionanthus virginicus*, occur on the margins in patches of deeper soil. *Quercus prinus* may be present in the eastern part of the range. Some other plants that may be associated with these glades include *Andropogon ternarius, Danthonia spicata, Symphyotrichum patens var. patentissimum, Silene rotundifolia, Pityopsis graminifolia var. latifolia, Coreopsis grandiflora, Silene regia, Coreopsis lanceolata, Croton willdenowii, Sedum nuttallianum, Selaginella rupestris,* and *Portulaca pilosa*.

Dynamics: This system is influenced by drought and infrequent to occasional fires. Prescribed fires help manage this system by maintaining an open glade structure.

SOURCES

References: Comer et al. 2003, Evans 1991, Heikens and Robertson 1995, Nelson 1985, Woods et al. 2002

Version: 30 May 2007 **Stakeholders:** Midwest, Southeast

Concept Author: S. Menard and T. Nigh **LeadResp:** Midwest

CES202.693 NORTH-CENTRAL INTERIOR BEECH-MAPLE FOREST

Primary Division: Central Interior and Appalachian (202)

Land Cover Class: Forest and Woodland

Spatial Scale & Pattern: Large patch

Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland

National Mapping Codes: EVT 2313; ESLF 4119; ESP 1313

Concept Summary: This system is found primarily along the southern Great Lakes ranging from central Indiana to southern Ontario. It is typically found on flat to rolling uplands to steep slopes with rich loam soils over glacial till. This system is characterized by a dense tree canopy that forms a thick layer of humus and leaf litter leading to a dense and rich herbaceous layer. *Acer saccharum* and *Fagus grandifolia* comprise up to 80% of the canopy. Other associates can include *Quercus rubra, Tilia americana, Carpinus caroliniana,* and *Ostrya virginiana*. The relative dominance of sugar maple compared to other tree species varies across the range of this system based on regional climate and microclimate. The herbaceous layer is very diverse and typically includes spring ephemerals. Some common species include *Arisaema triphyllum, Galium aparine, Osmorhiza claytonii, Polygonatum biflorum,* and *Trillium grandiflorum*. The primary natural dynamic influencing this system includes wind-driven gap dynamics. Conversion to agriculture has significantly decreased the range of this system, and very few large stands remain intact.

Comments: North-Central Interior Wet Flatwoods (CES202.700) may co-occur in close proximity to this system on clay-plain landscapes. This is on richer sites than the corresponding Appalachian (Hemlock) - Northern Hardwoods Forest (CES202.593).

DISTRIBUTION

Range: This system is located in the southern Great Lakes from central Indiana north into southern Ontario, and east to northwestern Pennsylvania and western New York.

Divisions: 202:C

TNC Ecoregions: 36:C, 45:C, 47:P, 48:C

Subnations: IN, MI, NY, OH, ON, PA

Map Zones: 47:C, 49:C, 51:C, 52:C, 62:P, 63:P, 64:C

USFS Ecomap Regions: 222H:CC, 222J:CC, 222K:CC, 222L:CC, 222M:CC, 222U:CC, 251D:CC

CONCEPT

Associations:
- *Acer saccharum - Fagus grandifolia - Betula* spp. / *Maianthemum canadense* Forest (CEGL005004, G4G5)
- *Fagus grandifolia - Acer saccharum* Glaciated Midwest Forest (CEGL005013, G2G3)

Alliances:
- *Acer saccharum - Betula alleghaniensis - (Fagus grandifolia)* Forest Alliance (A.216)
- *Fagus grandifolia - Acer saccharum - (Liriodendron tulipifera)* Forest Alliance (A.227)

SOURCES

References: Barbour and Billings 1988, Comer and Albert 1997, Comer et al. 1995a, Comer et al. 1998, Comer et al. 2003
Version: 20 Jul 2007 **Stakeholders:** Canada, East, Midwest
Concept Author: S. Menard **LeadResp:** Midwest

CES202.047 NORTH-CENTRAL INTERIOR DRY OAK FOREST AND WOODLAND

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Forest and Woodland
Spatial Scale & Pattern: Large patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
Diagnostic Classifiers: Forest and Woodland (Treed); Outwash plain; Sand Soil Texture; Intermediate Disturbance Interval; F-Patch/Medium Intensity
National Mapping Codes: EVT 2311; ESLF 4117; ESP 1311
Concept Summary: This system is found throughout the glaciated regions of the Midwest, typically in gently rolling to flat landscapes. It can occur on uplands within the prairie matrix or within the context of dry-mesic oak-hickory forests and oak savannas. These are common on rolling glacial moraines and outwash plains. Soils are typically well-drained to excessively drained Mollisols or Alfisols that range from sand to sandy loam in texture. Historically, this type was quite extensive in Michigan, Indiana, Illinois, Missouri, Iowa, Wisconsin, and Minnesota. It is distinguished from other forested systems within the region by a dry edaphic condition that is transitional between dry prairies, oak barrens, or savannas and dry-mesic oak-hickory forests and woodlands. Forest cover can range from dense to moderately open canopy. Fire-resistant oak species, in particular *Quercus velutina, Quercus macrocarpa, Quercus coccinea*, and *Quercus ellipsoidalis*, dominate the overstory. *Carya glabra*, *Prunus serotina*, and *Sassafras albidum* are also common in portions of the range of this system. Depending on range of distribution and overstory canopy density, the understory may include species such as *Gaylussacia baccata* (in MI, WI, and MN), *Vaccinium angustifolium*, and *Rhus aromatica*, and/or a mixture of woodland and grassland species, including *Schizachyrium scoparium, Deschampsia flexuosa*, and *Carex pensylvanica*. Extreme drought, along with periodic ground and crown fire events, constitute the main natural processes for this type and likely maintained a more open canopy structure that supported oak regeneration. In fact, many current examples of this type have resulted from long-term fire suppression and conversion of oak barrens to these forests and woodlands. Fire suppression may also account for examples of this system with the more dry-mesic understory. It likely has allowed for other associates such as *Quercus rubra* and *Fraxinus americana* to become more prevalent. Extensive conversion for agriculture in the surrounding landscape with more productive soils has fragmented and isolated examples of this system. It is found primarily within the "corn belt" of the United States, and remaining large areas of this system are likely under considerable pressure due to conversion to pastureland and urban development.

DISTRIBUTION

Range: Found throughout the glaciated regions of the Midwest.
Divisions: 202:C, 205:P
TNC Ecoregions: 35:P, 36:C, 37:?, 44:?, 45:C, 46:C, 47:?, 48:C
Subnations: IL, IN, MI, MN, ND, OH, WI
Map Zones: 38:P, 39:P, 40:P, 41:C, 42:C, 43:C, 47:P, 49:C, 50:C, 51:C, 52:C
USFS Ecomap Regions: 222H:CC, 222J:CC, 222U:CC, 223A:PP, 251B:CC, 251E:CC, 251G:CC, 251H:CC, 255A:CC, 331F:CC, 331M:CC, 332B:PP

CONCEPT

Associations:
- *Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium* Woodland (CEGL002150, G2G3)
- *Quercus ellipsoidalis - (Quercus macrocarpa)* Forest (CEGL002077, G4?)
- *Quercus velutina - (Quercus ellipsoidalis) - Quercus alba / Deschampsia flexuosa* Woodland (CEGL005029, GNR)
- *Quercus velutina - Quercus alba - Carya (glabra, ovata)* Forest (CEGL002076, G4?)
- *Quercus velutina - Quercus alba / Vaccinium (angustifolium, pallidum) / Carex pensylvanica* Forest (CEGL005030, G4?)
- *Quercus velutina / Carex pensylvanica* Forest (CEGL002078, G4?)

Alliances:
- *Quercus alba - (Quercus velutina)* Woodland Alliance (A.612)
- *Quercus alba - Quercus stellata - Quercus velutina - (Quercus falcata)* Woodland Alliance (A.613)
- *Quercus ellipsoidalis* Forest Alliance (A.255)
- *Quercus velutina - Quercus alba - (Quercus coccinea)* Forest Alliance (A.1911)

Environment: This system can occur on uplands within the prairie matrix or within the context of dry-mesic oak-hickory forests and oak savannas. These are common on rolling glacial moraines and outwash plains. Soils are typically well-drained to excessively

drained Mollisols or Alfisols that range from sand to sandy loam in texture. Historically, this type was quite extensive in Michigan, Indiana, Illinois, Missouri, Iowa, Wisconsin, and Minnesota. It is distinguished from other forested systems within the region by a dry edaphic condition that is transitional between dry prairies, oak barrens, or savannas and dry-mesic oak-hickory forests and woodlands.
Vegetation: Forest cover can range from a dense to moderately open canopy. Fire-resistant oak species, in particular *Quercus velutina, Quercus macrocarpa, Quercus coccinea,* and *Quercus ellipsoidalis,* dominate the overstory. *Carya glabra, Prunus serotina,* and *Sassafras albidum* are also common in portions of the range of this system. Depending on range of distribution and overstory canopy density, the understory may include species such as *Gaylussacia baccata* (in MI, WI, and MN), *Vaccinium angustifolium,* and *Rhus aromatica,* and/or a mixture of woodland and grassland species, including *Schizachyrium scoparium, Deschampsia flexuosa,* and *Carex pensylvanica*.
Dynamics: Extreme drought, along with periodic ground and crown fire events, constitute the main natural processes for this type and likely maintained a more open canopy structure that supported oak regeneration. In fact, many current examples of this type have resulted from long-term fire suppression and conversion of oak barrens to these forests and woodlands. Fire suppression may also account for examples of this system with the more dry-mesic understory. It likely has allowed for other associates such as *Quercus rubra* and *Fraxinus americana* to become more prevalent. Extensive conversion for agriculture in the surrounding landscape with more productive soils has fragmented and isolated examples of this system. It is found primarily within the "corn belt" of the United States, and remaining large areas of this system are likely under considerable pressure due to conversion to pastureland and urban development.

SOURCES

References: Abrams 1992, Archambault et al. 1989, Archambault et al. 1990, Comer and Albert 1997, Comer et al. 1995a, Comer et al. 1999, Comer et al. 2003, MNNHP 1993
Version: 18 Jul 2006 **Stakeholders:** Midwest
Concept Author: P. Comer, K. Kindscher, S. Menard, D. Faber-Langendoen **LeadResp:** Midwest

CES202.046 NORTH-CENTRAL INTERIOR DRY-MESIC OAK FOREST AND WOODLAND

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Forest and Woodland
Spatial Scale & Pattern: Large patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
Diagnostic Classifiers: Forest and Woodland (Treed); Udic; F-Patch/Low Intensity; Quercus - Carya
National Mapping Codes: EVT 2310; ESLF 4116; ESP 1310
Concept Summary: This system is found throughout the glaciated regions of the Midwest, typically in gently rolling landscapes. It can occur on uplands within the prairie matrix and near floodplains, or on rolling glacial moraines and among kettle-kame topography. Soils are typically well-drained Mollisols or Alfisols that range from loamy to sandy loam in texture. Historically, this type was quite extensive in Michigan, Indiana, Illinois, Missouri, Iowa, Wisconsin, and Minnesota. Well over 700,000 hectares likely occurred in southern Michigan alone (ca. 1800). It is distinguished from other forested systems within the region by a dry-mesic edaphic condition that is transitional between dry oak forests and woodlands and mesic hardwood forests, such as maple-basswood forests. Forest cover can range from a dense to moderately open canopy and there is commonly a dense shrub layer. Fire-resistant oak species, in particular *Quercus macrocarpa, Quercus rubra,* and/or *Quercus alba*, dominate the overstory. *Carya* spp., including *Carya ovata, Carya cordiformis,* and *Carya alba (= Carya tomentosa),* are diagnostic in portions of the range of this system. Depending on site location and overstory canopy density, the understory may include species such as *Corylus americana, Amelanchier* spp., *Maianthemum stellatum, Caulophyllum thalictroides, Laportea canadensis, Trillium grandiflorum, Aralia nudicaulis,* and *Urtica dioica*. Occasionally, prairie grasses such as *Andropogon gerardii* and *Panicum virgatum* may be present. Fire constitutes the main natural process for this type and likely maintained a more open canopy structure to support oak regeneration. Historic fire frequency was likely highest in the prairie-forest border areas. Fire suppression may account for the more closed oak forest examples of this system with the more mesic understory. It likely has allowed for other associates, such as *Acer saccharum, Celtis occidentalis, Liriodendron tulipifera, Ostrya virginiana,* and *Juglans nigra,* to become more prevalent, especially in upland areas along floodplains. Periodic drought, intensified by local conditions, such as slope, southern exposure, or sandy soil, also inhibit growth of mesophytic trees. Extensive conversion for agriculture has fragmented this system. Continued fire suppression has also resulted in succession to mesic hardwoods, such that in many locations, no oak species are regenerating. Remaining large areas of this system are likely under considerable pressure due to conversion to agriculture, pastureland, and urban development.

DISTRIBUTION

Range: Found throughout the glaciated regions of the Midwest.
Divisions: 202:C, 205:C
TNC Ecoregions: 35:C, 36:C, 44:?, 45:C, 46:C, 47:?, 48:C
Subnations: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
Map Zones: 38:C, 39:C, 40:C, 41:?, 42:C, 43:C, 44:P, 47:P, 49:C, 50:C, 51:C, 52:C
USFS Ecomap Regions: 222H:CC, 222J:CC, 222K:CC, 222L:CC, 222M:CC, 222U:CC, 251B:CC

CONCEPT

Associations:
- *Acer saccharum - Quercus muehlenbergii* Forest (CEGL005010, GNR)
- *Quercus alba - (Carya ovata) / Carex pensylvanica* Glaciated Woodland (CEGL002134, G1Q)
- *Quercus alba - (Quercus velutina) - Carya ovata / Ostrya virginiana* Forest (CEGL002011, G3)
- *Quercus alba - Quercus macrocarpa - Quercus rubra / Corylus americana* Woodland (CEGL002142, G3G4)
- *Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin* Forest (CEGL002058, G3?)
- *Quercus alba - Quercus rubra - Carya ovata* Glaciated Forest (CEGL002068, G4?)
- *Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis* Forest (CEGL002070, G4G5)
- *Quercus alba / Cornus florida* Unglaciated Forest (CEGL002066, G4?)
- *Quercus bicolor - (Quercus macrocarpa, Quercus stellata)* Woodland (CEGL005181, G1)
- *Quercus macrocarpa / (Amelanchier alnifolia, Cornus drummondii) / Aralia nudicaulis* Forest (CEGL002072, G4)
- *Quercus macrocarpa / Andropogon gerardii - Panicum virgatum* Woodland (CEGL002052, G1G2)
- *Quercus macrocarpa / Corylus americana - Amelanchier alnifolia* Woodland (CEGL000556, G3)
- *Quercus rubra - Quercus alba - (Quercus velutina, Acer rubrum) / Viburnum acerifolium* Forest (CEGL002462, GNR)
- *Tilia americana - (Quercus macrocarpa) / Ostrya virginiana* Forest (CEGL002012, G3)

Alliances:
- *Acer saccharum - Tilia americana - (Quercus rubra)* Forest Alliance (A.220)
- *Quercus alba - (Quercus rubra, Carya* spp.) Forest Alliance (A.239)
- *Quercus alba - (Quercus velutina)* Woodland Alliance (A.612)
- *Quercus macrocarpa - Quercus (alba, ellipsoidalis, velutina)* Woodland Alliance (A.619)
- *Quercus macrocarpa* Forest Alliance (A.245)
- *Quercus macrocarpa* Woodland Alliance (A.620)
- *Quercus muehlenbergii - (Acer saccharum)* Forest Alliance (A.1912)
- *Quercus rubra - (Acer saccharum)* Forest Alliance (A.251)

Environment: This system can occur on uplands within the prairie matrix and near floodplains, or on rolling glacial moraines and among kettle-kame topography. Soils are typically well-drained Mollisols or Alfisols that range from loamy to sandy loam in texture. Historically, this type was quite extensive in Michigan, Indiana, Illinois, Missouri, Iowa, Wisconsin, and Minnesota. Well over 700,000 hectares likely occurred in southern Michigan alone (ca. 1800). It is distinguished from other forested systems within the region by a dry-mesic edaphic condition that is transitional between dry oak forests and woodlands and mesic hardwood forests, such as maple-basswood forests.

Vegetation: Forest cover can range from a dense to moderately open canopy and there is commonly a dense shrub layer. Fire-resistant oak species, in particular *Quercus macrocarpa, Quercus rubra*, and/or *Quercus alba*, dominate the overstory. *Carya* spp., including *Carya ovata, Carya cordiformis*, and *Carya alba (= Carya tomentosa)*, are diagnostic in portions of the range of this system. Depending on site location and overstory canopy density, the understory may include species such as *Corylus americana, Amelanchier* spp., *Maianthemum stellatum, Caulophyllum thalictroides, Laportea canadensis, Trillium grandiflorum, Aralia nudicaulis*, and *Urtica dioica*. Occasionally, prairie grasses such as *Andropogon gerardii* and *Panicum virgatum* may be present. Fire suppression likely has allowed for other associates, such as *Acer saccharum, Celtis occidentalis, Liriodendron tulipifera, Ostrya virginiana*, and *Juglans nigra*, to become more prevalent, especially in upland areas along floodplains.

Dynamics: Fire constitutes the main natural process for this type and likely maintained a more open canopy structure to support oak regeneration. Historic fire frequency was likely highest in the prairie-forest border areas. Fire suppression may account for the more closed oak forest examples of this system with the more mesic understory. It likely has allowed for other associates, such as *Acer saccharum, Celtis occidentalis, Liriodendron tulipifera, Ostrya virginiana*, and *Juglans nigra*, to become more prevalent, especially in upland areas along floodplains. Periodic drought, intensified by local conditions like slope, southern exposure, or sandy soil, also inhibit growth of mesophytic trees. Extensive conversion for agriculture has fragmented these systems. Continued fire suppression has also resulted in succession to mesic hardwoods, such that in many locations, no oak species are regenerating. Remaining large areas of this system are likely under considerable pressure due to conversion to agriculture, pastureland, and urban development.

SOURCES

References: Abrams 1992, Archambault et al. 1989, Archambault et al. 1990, Comer and Albert 1997, Comer et al. 1995a, Comer et al. 2003, MNNHP 1993

Version: 18 Jul 2006 **Stakeholders:** Midwest, Southeast

Concept Author: P. Comer, K. Kindscher, S. Menard, D. Faber-Langendoen **LeadResp:** Midwest

CES202.696 NORTH-CENTRAL INTERIOR MAPLE-BASSWOOD FOREST

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Forest and Woodland
Spatial Scale & Pattern: Large patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
National Mapping Codes: EVT 2314; ESLF 4120; ESP 1314

Concept Summary: This system is primarily found in the prairie forest border region of Minnesota, Wisconsin, and Iowa, but it can range north into northern Minnesota and Wisconsin and south to southern Illinois, central Missouri, and eastern Kansas. This forest system is distinguished by underlying mesic soils and the predominance of mesic deciduous species forming a moderately dense to dense canopy. Examples of this system occur on valley slopes and bottoms often with northern or eastern aspects. Soils are moderately well-drained, fertile, and medium to deep loams that have developed from glacial till or loess parent material. *Acer saccharum* typifies this system, with *Tilia americana, Quercus rubra*, and *Ostrya virginiana* as common associates. The dense canopy allows for a rich mixture of shrub and herbaceous species in the understory. Examples of common herbaceous species include *Anemone quinquefolia, Adiantum pedatum, Arisaema triphyllum*, and *Sanicula* spp. Dynamic processes such as wind and fire can impact this system over long return cycles; however, the most immediate threats to remaining examples of this system are grazing and conversion to agriculture.

DISTRIBUTION

Range: This system ranges from Minnesota and Wisconsin south to eastern Kansas and Nebraska and southeast to Illinois, Missouri, and possibly western Indiana.
Divisions: 202:C, 205:C
TNC Ecoregions: 36:C, 37:?, 38:?, 45:C, 46:C, 47:C, 48:C
Subnations: IA, IL, IN, KS, MI, MN, MO, NE, WI
Map Zones: 39:C, 40:C, 41:C, 42:C, 43:C, 44:P, 49:C, 50:C, 51:C, 52:C
USFS Ecomap Regions: 212Q:CC, 212Z:CP, 222K:CC, 222L:CC, 222M:CC, 222R:CC, 251B:CC, 251G:CC, 251H:CC

CONCEPT

Associations:
- *Acer saccharum - Acer nigrum - Tilia americana - Quercus rubra / Ostrya virginiana* Forest (CEGL002061, G3G4)
- *Acer saccharum - Tilia americana / Ostrya virginiana - Carpinus caroliniana* Forest (CEGL002062, G3G4)
- *Fraxinus pennsylvanica - Ulmus americana - (Juglans nigra, Celtis occidentalis)* Forest (CEGL005239, GNA)
- *Quercus rubra - (Acer saccharum, Quercus alba)* Forest (CEGL005017, GNRQ)
- *Quercus rubra - Acer saccharum* Forest (CEGL002461, G4G5)

Alliances:
- *Acer saccharum - Tilia americana - (Quercus rubra)* Forest Alliance (A.220)
- *Fraxinus pennsylvanica - (Ulmus americana)* Forest Alliance (A.259)
- *Quercus rubra - (Acer saccharum)* Forest Alliance (A.251)

Environment: This system is found primarily on mesic soils that are moderately well-drained and fertile. These are mostly moderate to deep loams that have developed from glacial till or loess. This system occurs primarily on valley slopes and bottoms often with northern or eastern aspects.
Vegetation: Mesic deciduous trees form a moderately dense to dense canopy in examples of this system. *Acer saccharum* is the most common tree species forming the majority of the canopy and sapling layers. Common associates include *Tilia americana, Quercus rubra*, and *Ostrya virginiana*. The understory contains a rich mixture of shrub and herbaceous species such as *Anemone quinquefolia, Adiantum pedatum, Arisaema triphyllum*, and *Sanicula* spp.
Dynamics: Wind and fire can impact this system over long return intervals. Small gap development and replacement due to tree death is more frequent than more catastrophic fire or wind. The greatest impacts on this system are due to conversion to agriculture, logging and grazing.

SOURCES

References: Barbour and Billings 1988, Comer et al. 2003
Version: 07 Mar 2003 **Stakeholders:** Midwest, Southeast
Concept Author: S. Menard and K. Kindscher **LeadResp:** Midwest

Steppe/Savanna

CES202.691 CENTRAL INTERIOR HIGHLANDS CALCAREOUS GLADE AND BARRENS

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Steppe/Savanna
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
Diagnostic Classifiers: Woody-Herbaceous; Rock Outcrops/Barrens/Glades; Alkaline Soil
National Mapping Codes: EVT 2401; ESLF 5417; ESP 1401
Concept Summary: This system is found primarily in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions with scattered occurrences in northern Missouri. It occurs along moderate to steep slopes and steep valleys on primarily southerly to westerly facing slopes. Limestone and/or dolomite bedrock typify this system with shallow, moderately to well-drained

soils interspersed with rocks. These soils often dry out during the summer and autumn, and then become saturated during the winter and spring. *Schizachyrium scoparium* dominates this system and is commonly associated with *Andropogon gerardii, Bouteloua curtipendula*, and calcium-loving plant species. Stunted woodlands primarily dominated by *Quercus muehlenbergii* interspersed with *Juniperus virginiana* occur on variable-depth-to-bedrock soils. Fire is the primary natural dynamic, and prescribed fires help manage this system by restricting woody growth and maintaining the more open glade structure.

Comments: In Alabama, this system is found in the Moulton Valley region, which is technically part of TNC Ecoregion 50, but ambiguously placed there. This region is included in the Interior Plateau (71) of EPA (2004). Also included here, somewhat uncomfortably, is an unusual series of flatrock glades on Silurian dolomite in Bullitt County, Kentucky (71d of Woods et al. (2002)).

DISTRIBUTION

Range: This system is found primarily in the Interior Highlands of the Ozark, Ouachita, and the Interior Low Plateau regions ranging east to southern Ohio and including the Knobs region and Cliff section of Kentucky, the Cumberland Plateau escarpment of Tennessee, and the Moulton Valley of northern Alabama.

Divisions: 202:C, 203:C

TNC Ecoregions: 36:C, 38:C, 39:C, 43:C, 44:C, 50:C

Subnations: AL, AR, IL, IN, KY, MO, OH, OK, TN

Map Zones: 43:P, 44:C, 47:C, 48:C, 49:C, 53:C

USFS Ecomap Regions:

CONCEPT

Associations:

- *(Quercus stellata, Ulmus alata) / Schizachyrium scoparium - Symphyotrichum patens* var. *patentissimum* Wooded Herbaceous Vegetation (CEGL007824, G2?)
- *Acer saccharum - Quercus muehlenbergii / Cercis canadensis* Forest (CEGL006017, G4?)
- *Eleocharis compressa - Nothoscordum bivalve* Herbaceous Vegetation (CEGL004669, GNR)
- *Fraxinus quadrangulata - Juniperus virginiana* var. *virginiana / Schizachyrium scoparium - Lithospermum canescens* Woodland (CEGL007994, G2)
- *Juniperus ashei / Cotinus obovatus / Carex eburnea - Rudbeckia missouriensis* Woodland (CEGL007833, G2?)
- *Juniperus ashei* Dry Chalk Outcrop Woodland (CEGL007967, G1)
- *Juniperus ashei* Ozark Clifftop Woodland (CEGL004672, G2?)
- *Juniperus virginiana / Schizachyrium scoparium - (Andropogon gerardii, Sorghastrum nutans) - Silphium (trifoliatum, terebinthinaceum)* Wooded Herbaceous Vegetation (CEGL004738, G2)
- *Juniperus virginiana / Schizachyrium scoparium - Silphium terebinthinaceum* var. *luciae-brauniae - Carex juniperorum - Castilleja coccinea* Wooded Herbaceous Vegetation (CEGL004464, G1Q)
- *Juniperus virginiana* Alkaline Bluff Woodland (CEGL002426, G3)
- *Juniperus virginiana* var. *virginiana - Fraxinus quadrangulata / Symphyotrichum oblongifolium - Panicum flexile - Sedum pulchellum* Woodland (CEGL004271, G2)
- Limestone - Dolostone Midwest Dry Cliff Sparse Vegetation (CEGL002291, G4G5)
- Limestone - Dolostone Midwest Moist Cliff Sparse Vegetation (CEGL002292, G4G5)
- Limestone - Dolostone Talus Sparse Vegetation (CEGL002308, G4G5)
- *Quercus marilandica - (Juniperus virginiana) / Schizachyrium scoparium - Danthonia spicata* Wooded Herbaceous Vegetation (CEGL002428, G2)
- *Quercus muehlenbergii - Fraxinus (quadrangulata, americana) / Schizachyrium scoparium* Woodland (CEGL002143, G3G4)
- *Quercus muehlenbergii - Juniperus virginiana / Schizachyrium scoparium - Manfreda virginica* Wooded Herbaceous Vegetation (CEGL005131, G2G3)
- *Quercus muehlenbergii - Quercus shumardii* Forest (CEGL004602, G2G4)
- *Quercus muehlenbergii / Schizachyrium scoparium - Bouteloua curtipendula* Wooded Herbaceous Vegetation (CEGL005284, G2G3)
- *Quercus stellata - Quercus alba - (Quercus falcata) / Schizachyrium scoparium* Woodland (CEGL004217, G1)
- *Quercus stellata - Quercus marilandica / Schizachyrium scoparium* Wooded Herbaceous Vegetation (CEGL002391, G2G3)
- *Rhus aromatica - Celtis tenuifolia / Carex eburnea* Shrubland (CEGL004393, G3)
- *Schizachyrium scoparium - Bouteloua curtipendula - Rudbeckia missouriensis - Mentzelia oligosperma* Wooded Herbaceous Vegetation (CEGL002251, G2)
- *Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula - Rudbeckia missouriensis - Hedyotis nigricans* Wooded Herbaceous Vegetation (CEGL002398, G3G4)
- *Schizachyrium scoparium - Sorghastrum nutans - Tradescantia bracteata* Alkaline Bedrock Herbaceous Vegetation (CEGL005280, G1G2)
- *Schizachyrium scoparium - Sporobolus compositus* var. *compositus - Rudbeckia fulgida* var. *fulgida* Wooded Herbaceous Vegetation (CEGL004078, G2)
- *Sedum pulchellum - Talinum calcaricum - Leavenworthia* spp. / *Nostoc commune* Herbaceous Vegetation (CEGL004346, G3)
- *Sedum pulchellum - Talinum calycinum - Oenothera linifolia* Shale Herbaceous Vegetation (CEGL004347, G2G3)

- *Sporobolus (neglectus, vaginiflorus) - Leavenworthia exigua* var. *laciniata - Viola egglestonii* Herbaceous Vegetation (CEGL007772, G1Q)
- *Sporobolus vaginiflorus* var. *ozarkanus* Ozark Herbaceous Vegetation (CEGL008563, G3?)

Alliances:

- *(Juniperus virginiana) / Schizachyrium scoparium - (Bouteloua curtipendula)* Wooded Herbaceous Alliance (A.1919)
- *(Quercus stellata, Quercus marilandica) / Schizachyrium scoparium* Wooded Herbaceous Alliance (A.1920)
- *Eleocharis compressa - Nothoscordum bivalve* Saturated Herbaceous Alliance (A.1458)
- *Fraxinus quadrangulata - (Juniperus virginiana)* Woodland Alliance (A.1913)
- *Juniperus ashei* Woodland Alliance (A.501)
- *Juniperus virginiana - Rhus aromatica* Shrubland Alliance (A.1049)
- *Juniperus virginiana* Woodland Alliance (A.545)
- *Quercus muehlenbergii - (Acer saccharum)* Forest Alliance (A.1912)
- *Quercus muehlenbergii* Woodland Alliance (A.621)
- *Quercus stellata - Quercus marilandica* Woodland Alliance (A.625)
- *Schizachyrium scoparium - Sorghastrum nutans* Herbaceous Alliance (A.1198)
- *Sedum pulchellum* Saturated Herbaceous Alliance (A.1820)
- *Sporobolus (neglectus, vaginiflorus)* Herbaceous Alliance (A.1815)
- Lowland Talus Sparsely Vegetated Alliance (A.1847)
- Open Cliff Sparsely Vegetated Alliance (A.1836)

High-ranked species: Arabis georgiana (G1), Astragalus tennesseensis (G3), Canis rufus (G1Q), Clematis addisonii (G2), Delphinium alabamicum (G2), Leavenworthia alabamica var. alabamica (G2T2Q), Leavenworthia crassa (G1), Leavenworthia exigua var. laciniata (G4T1T2), Lesquerella densipila (G3), Onosmodium decipiens (G2), Silphium glutinosum (G2), Talinum calcaricum (G3), Thaspium pinnatifidum (G2G3), Virginia valeriae pulchra (G5T3T4)

Environment: This system is found primarily along moderate to steep slopes and steep valleys on primarily southerly to westerly facing slopes. Limestone and/or dolomite bedrock typify this system with shallow, moderately to well-drained soils interspersed with rocks. Soils are affected by the bedrock chemistry and tend to have high levels of calcium and potassium and a relatively high pH. Due to seasonal rainfall patterns and the extremely thin soils, these soils dry out during the summer and autumn and become saturated during the winter and spring. In northern Alabama (Moulton Valley), the stratum on which the system is found is a type of "marl." Seeps may occur where impervious rock strata meet relatively permeable limestone.

Vegetation: *Schizachyrium scoparium* dominates this system and is commonly associated with *Andropogon gerardii, Bouteloua curtipendula,* and calcium-loving plant species. Stunted woodlands primarily dominated by *Quercus muehlenbergii* interspersed with *Juniperus virginiana* occur on variable-depth-to-bedrock soils. The trees typically occur as islands in a wider herbaceous or rocky area. The islands are found in microenvironments where the soil depth and available water are sufficient to support trees (e.g., depressions in the bedrock). Other woody plants associated with this system (within their ranges) include *Quercus shumardii, Cercis canadensis, Ulmus alata, Fraxinus quadrangulata, Juniperus ashei, Acer saccharum,* and *Frangula caroliniana*. Other herbaceous taxa include *Silphium trifoliatum, Silphium terebinthinaceum, Liatris* spp., *Symphyotrichum oblongifolium, Castilleja coccinea, Hedyotis nigricans, Talinum* spp., *Sedum* spp., and *Panicum flexile*. Small-scale stands of annual *Sporobolus* spp. may be prominent in some examples. In some examples, small-scale seepage areas may contain *Eleocharis compressa, Nothoscordum bivalve, Isoetes butleri,* and *Hypoxis hirsuta*.

Dynamics: Fire is the primary natural dynamic, and prescribed fires help manage this system by restricting woody growth and maintaining the more open glade structure.

SOURCES

References: Comer et al. 2003, DeSelm and Murdock 1993, Delcourt and Delcourt 1997, EPA 2004, Erickson et al. 1942, Evans 1991, Nelson 1985, USFWS 1974, Webb et al. 1997, Woods et al. 2002

Version: 18 Jul 2006 **Stakeholders:** Midwest, Southeast

Concept Author: S. Menard, T. Nigh, M. Pyne **LeadResp:** Midwest

CES202.698 NORTH-CENTRAL INTERIOR OAK SAVANNA

Primary Division: Central Interior and Appalachian (202)

Land Cover Class: Steppe/Savanna

Spatial Scale & Pattern: Matrix

Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland

National Mapping Codes: EVT 2394; ESLF 5410; ESP 1394

Concept Summary: This system is found primarily in the northern glaciated regions of the Midwest with the largest concentration in the prairie-forest border ecoregion. It is typically found on rolling outwash plains, hills and ridges. Soils are typically moderately well- to well-drained deep loams. This system is typified by scattered trees over a continual tallgrass prairie. *Quercus macrocarpa* is the most common tree species and can range from 10-60% cover. The understory is dominated by tallgrass prairie species such as *Andropogon gerardii* and *Schizachyrium scoparium* associated with several forb species. Historically, frequent fires maintained this savanna system within its range and would have restricted tree canopies to 10-30%. Fire suppression in the region has allowed trees to

establish more dense canopies. Periodic, strong wind disturbances and browsing also impact this system. Much of this system has also been converted to agriculture, and thus its range has decreased considerably.

DISTRIBUTION

Range: This system is found throughout the northern glaciated regions of the Midwest. Its main concentration, where it was likely the matrix type, is within the Prairie Forest Border of Minnesota, Wisconsin, Iowa, and Illinois. Conversion to agriculture and fire suppression have significantly impacted the range of this system.
Divisions: 201:?, 202:C, 205:C
TNC Ecoregions: 35:C, 36:C, 45:P, 46:C, 47:P
Subnations: IA, IL, IN, MI?, MN, MO, WI
Map Zones: 39:P, 40:C, 41:C, 42:C, 43:P, 44:P, 49:C, 50:C, 51:P, 52:C
USFS Ecomap Regions: 212K:CP, 212Q:CP, 222K:CC, 222L:CC, 222M:CC, 222N:CC, 251A:CC, 251B:CC

CONCEPT

Associations:
- *Quercus alba - Quercus macrocarpa - Quercus rubra / Corylus americana* Woodland (CEGL002142, G3G4)
- *Quercus alba - Quercus macrocarpa / Andropogon gerardii* Wooded Herbaceous Vegetation (CEGL005121, G1)
- *Quercus macrocarpa - (Quercus alba, Quercus stellata) / Andropogon gerardii* Wooded Herbaceous Vegetation (CEGL002159, G1)
- *Quercus macrocarpa - (Quercus alba, Quercus velutina) / Andropogon gerardii* Wooded Herbaceous Vegetation (CEGL002020, G1)
- *Quercus macrocarpa - Quercus palustris - Quercus bicolor / Calamagrostis canadensis* Wooded Herbaceous Vegetation (CEGL005120, G1)
- *Quercus macrocarpa* Northern Tallgrass Wooded Herbaceous Vegetation (CEGL002158, G1G2)

Alliances:
- *Quercus macrocarpa - (Quercus alba)* Wooded Herbaceous Alliance (A.1491)
- *Quercus macrocarpa - Quercus (alba, ellipsoidalis, velutina)* Woodland Alliance (A.619)

Environment: This system is typically found on rolling outwash plains, hills and ridges. Soils are typically moderately well- to well-drained deep loams. This system is typified by scattered trees over a continual tallgrass prairie.
Vegetation: *Quercus macrocarpa* is the most common tree species and can range from 10-60% cover. The understory is dominated by tallgrass prairie species such as *Andropogon gerardii, Calamagrostis canadensis,* and *Schizachyrium scoparium* associated with several forb species.
Dynamics: Historically, frequent fires maintained this savanna system within its range and would have restricted tree canopies to 10-30%. Fire suppression in the region has allowed trees to establish more dense canopies. Periodic, strong wind disturbances and browsing also impact this system. Much of this system has also been converted to agriculture, and thus its range has decreased considerably.

SOURCES

References: Albert 1995b, Comer et al. 1995a, Comer et al. 1998, Comer et al. 2003, MNNHP 1993
Version: 18 Jul 2006 **Stakeholders:** Midwest, Southeast
Concept Author: S. Menard **LeadResp:** Midwest

CES202.727 NORTH-CENTRAL OAK BARRENS

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Steppe/Savanna
Spatial Scale & Pattern: Large patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
Diagnostic Classifiers: Woody-Herbaceous
National Mapping Codes: EVT 2395; ESLF 5411; ESP 1395
Concept Summary: This community occurs on well-drained, coarse-textured sandy soils derived from glacial outwash, end moraine formations, or lakeplain dune systems in the north-central U.S. into Ontario, Canada. Soils range from almost pure sand, to loamy sand, to sandy loam. The soils have low fertility, organic matter, and moisture-retention capacity. Factors which affect seasonal soil moisture are strongly related to variation in this type. This oak barrens system is a scrubby, open-treed system dominated by graminoids and shrubs. Canopy structure varies from a dominant herbaceous ground layer with sparse, scattered "savanna" canopy (5-30%), through oak-dominated scrub, to a more closed woodland canopy (30-80%). The canopy layer is dominated by *Quercus velutina*, with some *Quercus ellipsoidalis, Quercus macrocarpa*, and *Quercus alba* (the latter more common eastward and in woodland conditions). Occasional *Pinus banksiana* can occur in the northern parts of the range. Species found in the herb layer include *Ambrosia psilostachya, Amphicarpaea bracteata, Artemisia ludoviciana, Andropogon gerardii, Calamovilfa longifolia, Carex pensylvanica, Carex* spp., *Comandra umbellata, Sorghastrum nutans, Hesperostipa spartea (= Stipa spartea),* and *Schizachyrium scoparium*. Fire was an important factor in maintaining this community. Oak wilt and droughts also reduce tree cover.

Comments: Black oak woodland variants may occur in this system, but because *Quercus velutina* and *Quercus ellipsoidalis* can sprout after stems have been killed by fires, stands generally have a somewhat scrubby structure that can vary from 10-60% cover over time. Some stands may occur on fairly mesic sands. In New England and (most of) New York, similar settings are occupied by pitch pine - oak barrens (North-Central Appalachian Pine Barrens (CES202.590)) which are characterized by *Quercus ilicifolia*, not *Quercus ellipsoidalis*.

DISTRIBUTION

Range: This system is found in the north-central U.S. from North Dakota to western New York and into Ontario, Canada.
Divisions: 202:C
TNC Ecoregions: 35:C, 36:C, 45:C, 46:C, 47:C, 48:C
Subnations: IL, IN, MI, MN, ND, NY, OH, ON, WI
Map Zones: 39:C, 40:C, 41:C, 42:C, 43:C, 49:C, 50:C, 51:C, 52:C, 63:C
USFS Ecomap Regions: 222K:CC, 222L:CC, 222M:CP, 222R:CC

CONCEPT

Associations:
- *Quercus macrocarpa - (Quercus ellipsoidalis) / Schizachyrium scoparium - Koeleria macrantha* Wooded Herbaceous Vegetation (CEGL002160, G2)
- *Quercus velutina - (Quercus alba) - Quercus ellipsoidalis / Schizachyrium scoparium - Lupinus perennis* Wooded Herbaceous Vegetation (CEGL002492, G3)
- *Quercus velutina - (Quercus ellipsoidalis) - Quercus alba / Deschampsia flexuosa* Woodland (CEGL005029, GNR)

Alliances:
- *Quercus alba - (Quercus velutina)* Woodland Alliance (A.612)
- *Quercus velutina - (Quercus ellipsoidalis)* Wooded Herbaceous Alliance (A.1492)

Environment: This system occurs on well-drained, coarse-textured sandy soils derived from glacial outwash, end moraine formations, or lakeplain dune systems. Soils range from almost pure sand, to loamy sand, to sandy loam. The soils have low fertility, organic matter, and moisture-retention capacity. Factors which affect seasonal soil moisture are strongly related to variation in this type.
Vegetation: This oak barrens system is a scrubby, open-treed system dominated by graminoids and shrubs. Canopy structure varies from a dominant herbaceous ground layer with sparse, scattered "savanna" canopy (5-30%), through oak-dominated scrub, to a more closed woodland canopy (30-80%). The canopy layer is dominated by *Quercus velutina*, with some *Quercus ellipsoidalis, Quercus macrocarpa*, and *Quercus alba* (the latter more common eastward and in woodland conditions). Occasional *Pinus banksiana* can occur in the northern parts of the range. Species found in the herb layer include *Ambrosia psilostachya, Amphicarpaea bracteata, Artemisia ludoviciana, Andropogon gerardii, Calamovilfa longifolia, Carex pensylvanica, Carex* spp., *Comandra umbellata, Sorghastrum nutans, Hesperostipa spartea (= Stipa spartea)*, and *Schizachyrium scoparium*.
Dynamics: Fire was an important factor in maintaining this community. Oak wilt and droughts also reduce tree cover.

SOURCES

References: Chapman et al. 1994, Comer and Albert 1997, Comer et al. 1995a, Comer et al. 1998, Comer et al. 2003
Version: 11 Apr 2007 **Stakeholders:** Canada, East, Midwest
Concept Author: D. Faber-Langendoen **LeadResp:** Midwest

Herbaceous

CES303.659 CENTRAL MIXEDGRASS PRAIRIE

Primary Division: Western Great Plains (303)
Land Cover Class: Herbaceous
Spatial Scale & Pattern: Matrix
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
National Mapping Codes: EVT 2132; ESLF 7104; ESP 1132
Concept Summary: This mixedgrass prairie system ranges from South Dakota into the Rolling Plains and the Edwards Plateau of Texas. It is bordered by the shortgrass prairie on its western edge and the tallgrass prairie to the east. The loessal regions in west-central Kansas and central Nebraska, the Red Hills region of south-central Kansas and northern Oklahoma are all located within this system. Because of its proximity to other ecoregions, this system contains elements from both shortgrass and tallgrass prairies, which combine to form the mixedgrass prairie ecological system throughout its range. The distribution, species richness and productivity of plant species within the mixedgrass ecological system is controlled primarily by environmental conditions, in particular soil moisture and topography. Grazing and fire are important dynamic processes in this system. The relative dominance of the various grass and forb species within different associations in the system also can strongly depend on the degree of natural or human disturbance. This system can contain grass species such as *Bouteloua curtipendula, Schizachyrium scoparium, Andropogon gerardii, Hesperostipa*

comata, Sporobolus heterolepis, and *Bouteloua gracilis*, although the majority of the associations within the region are dominated by *Pascopyrum smithii* or *Schizachyrium scoparium*. Numerous forb and sedge species (*Carex* spp.) can also occur within the mixedgrass system in the Western Great Plains. Although forbs do not always significantly contribute to the canopy, they can be very important. Some dominant forb species include *Ambrosia psilostachya, Echinacea angustifolia*, and *Lygodesmia juncea*. Oak species such as *Quercus macrocarpa* can occur also in areas protected from fire due to topographic position. This can cause an almost oak savanna situation in certain areas, although fire suppression may allow for a more closed canopy and expansion of bur oak beyond those sheltered areas. In those situations, further information will be needed to determine if those larger areas with a more closed canopy of bur oak should be considered part of Western Great Plains Dry Bur Oak Forest and Woodland (CES303.667). Likewise, within the mixedgrass system, small seeps may occur, especially during the wettest years. Although these are not considered a separate system, the suppression of fire within the region has enabled the invasion of both exotics and some shrub species such as *Juniperus virginiana* and also allowed for the establishment of *Pinus ponderosa* in some northern areas.

Comments: This system is found primarily in the Central Mixed-grass Prairie (TNC Ecoregion 33); it becomes more restricted to mesic lowlands sites to the west and southwest in the shortgrass prairie region of Texas (S. Menard pers. comm. 2005). This is probably a reference to the Llano Estacado region rather than the Southern Shortgrass Prairie (TNC Ecoregion 28) (J. Teague pers. obs 2005). The Central Mixed-grass Prairie (TNC Ecoregion 33) should be extended south to include the Rolling Plains of Texas; being separated from the Southern Shortgrass Prairie (TNC Ecoregion 28) by the Caprock Escarpment (L. Elliott pers. comm. 2005).

DISTRIBUTION

Range: This system is found throughout the central and southern areas of the western Great Plains ranging from southern South Dakota into the Rolling Plains and Edwards Plateau of Texas.

Divisions: 205:C, 303:C

TNC Ecoregions: 27:P, 28:P, 29:C, 32:C, 33:C, 36:C, 37:P

Subnations: CO, KS, ND, NE, OK, SD, TX

Map Zones: 27:P, 30:C, 31:C, 32:C, 33:C, 34:C, 35:C, 38:C, 39:P, 43:P

USFS Ecomap Regions: 223A:??, 251A:CP, 251B:CC, 251E:CP, 251F:CC, 251G:CC, 251H:CC, 255A:??, 315F:CC, 331B:CC, 331C:CC, 331E:CC, 331F:CC, 331H:CC, 331I:CC, 331M:CP, 332B:CC, 332C:CC, 332D:CC, 332E:CC, 332F:CC

CONCEPT

Associations:

- *Artemisia tridentata* ssp. *wyomingensis* / Mixed Grasses Shrub Herbaceous Vegetation (CEGL001534, G5)
- Blacktailed Prairie Dog Town Grassland Complex (CECX005703, G4)
- *Bothriochloa ischaemum* var. *songarica* Herbaceous Vegetation (CEGL004915, GNA)
- *Buchloe dactyloides* Modified Herbaceous Vegetation (CEGL004948, GNA)
- *Cornus drummondii - (Rhus glabra, Prunus* spp.) Shrubland (CEGL005219, GNA)
- *Cynodon dactylon* Herbaceous Vegetation (CEGL004701, GNA)
- *Hesperostipa comata - Bouteloua gracilis - Carex filifolia* Herbaceous Vegetation (CEGL002037, G5)
- *Hesperostipa comata - Carex filifolia* Herbaceous Vegetation (CEGL001700, G4)
- *Hesperostipa comata - Carex inops* ssp. *heliophila* Herbaceous Vegetation (CEGL001701, G4)
- *Hesperostipa curtiseta - Elymus lanceolatus* Herbaceous Vegetation (CEGL002253, GNR)
- *Hilaria belangeri - Bouteloua curtipendula* Herbaceous Vegetation (CEGL002238, G3?)
- *Juniperus virginiana* var. *virginiana / Schizachyrium scoparium - Bouteloua curtipendula* Great Plains Herbaceous Vegetation (CEGL004066, G2)
- *Juniperus virginiana* var. *virginiana / Schizachyrium scoparium* Forest (CEGL003628, GNA)
- *Krascheninnikovia lanata / Bouteloua gracilis* Dwarf-shrub Herbaceous Vegetation (CEGL001321, G4)
- *Panicum obtusum - Buchloe dactyloides* Herbaceous Vegetation (CEGL001573, GNRQ)
- *Pascopyrum smithii - Bouteloua gracilis* Herbaceous Vegetation (CEGL001578, G5)
- *Pascopyrum smithii - Hesperostipa comata* Central Mixedgrass Herbaceous Vegetation (CEGL002034, G4)
- *Pascopyrum smithii* Herbaceous Vegetation (CEGL001577, G3G5Q)
- *Pleuraphis mutica - Buchloe dactyloides* Herbaceous Vegetation (CEGL002272, G4?)
- *Poa palustris* Herbaceous Vegetation (CEGL001659, GNA)
- *Poa pratensis - (Pascopyrum smithii)* Semi-natural Herbaceous Vegetation (CEGL005265, GNA)
- *Quercus macrocarpa* / Mixedgrass Loam Wooded Herbaceous Vegetation (CEGL002163, G1Q)
- *Quercus macrocarpa* / Mixedgrass Sand Wooded Herbaceous Vegetation (CEGL002162, G1)
- *Quercus macrocarpa* / Mixedgrass Shale Wooded Herbaceous Vegetation (CEGL002164, G1Q)
- *Rhus lanceolata - Baccharis neglecta* Ruderal Shrubland (CEGL004212, GNA)
- *Sarcobatus vermiculatus / Sporobolus airoides* Shrubland (CEGL001368, G3?)
- *Schizachyrium scoparium - (Sorghastrum nutans) - Sporobolus compositus var. compositus - Liatris mucronata* Herbaceous Vegetation (CEGL004211, GNR)
- *Schizachyrium scoparium - Bouteloua (curtipendula, gracilis) - Carex filifolia* Herbaceous Vegetation (CEGL001681, G3G4)
- *Schizachyrium scoparium - Bouteloua curtipendula - Bouteloua gracilis* Central Plains Herbaceous Vegetation (CEGL002246, G2G4)

- *Schizachyrium scoparium - Bouteloua curtipendula - Nassella leucotricha* Herbaceous Vegetation (CEGL004070, GNR)
- *Schizachyrium scoparium - Bouteloua curtipendula* Chalkflat Herbaceous Vegetation (CEGL002247, G2)
- *Schizachyrium scoparium - Bouteloua curtipendula* Loess Mixedgrass Herbaceous Vegetation (CEGL002036, G3?)
- *Schizachyrium scoparium - Bouteloua curtipendula* Red Hills Herbaceous Vegetation (CEGL002248, G2Q)
- *Schizachyrium scoparium - Bouteloua curtipendula* Western Great Plains Herbaceous Vegetation (CEGL001594, G3)
- *Schizachyrium scoparium - Lesquerella gordonii - Castilleja purpurea* var. *citrina* Herbaceous Vegetation (CEGL002252, G2?)
- *Yucca glauca / Calamovilfa longifolia* Shrub Herbaceous Vegetation (CEGL002675, G4)

Alliances:

- *Artemisia tridentata* ssp. *wyomingensis* Shrub Herbaceous Alliance (A.1527)
- *Bothriochloa ischaemum* Herbaceous Alliance (A.1210)
- *Buchloe dactyloides* Herbaceous Alliance (A.1276)
- *Cornus drummondii* Shrubland Alliance (A.3558)
- *Cynodon dactylon* Herbaceous Alliance (A.1279)
- *Hesperostipa comata - Bouteloua gracilis* Herbaceous Alliance (A.1234)
- *Hesperostipa curtiseta - Elymus lanceolatus* Herbaceous Alliance (A.3523)
- *Hilaria belangeri - Bouteloua curtipendula* Herbaceous Alliance (A.1214)
- *Juniperus virginiana* Semi-natural Forest Alliance (A.137)
- *Krascheninnikovia lanata* Dwarf-shrub Herbaceous Alliance (A.1565)
- *Panicum obtusum* Herbaceous Alliance (A.1238)
- *Pascopyrum smithii* Herbaceous Alliance (A.1232)
- *Pleuraphis mutica* Herbaceous Alliance (A.1249)
- *Poa palustris* Semi-natural Seasonally Flooded Herbaceous Alliance (A.1409)
- *Poa pratensis* Semi-natural Herbaceous Alliance (A.3562)
- *Quercus macrocarpa* Wooded Medium-Tall Herbaceous Alliance (A.1505)
- *Rhus lanceolata - Baccharis neglecta* Successional Shrubland Alliance (A.2024)
- *Sarcobatus vermiculatus* Intermittently Flooded Shrubland Alliance (A.1046)
- *Schizachyrium scoparium - Bouteloua curtipendula* Herbaceous Alliance (A.1225)
- *Schizachyrium scoparium - Sorghastrum nutans* Herbaceous Alliance (A.1198)
- *Yucca glauca* Shrub Herbaceous Alliance (A.1540)

Environment: Differences in topography and soil characteristics also occur across the range of this system. It is often characterized by rolling to extremely hilly landscapes with soils developed from loess, shale, limestone or sandstone parent material. Mollisol soils are most prevalent and range from silt loams and silty clay loams with sandy loams possible on the western edge of the range. The Red Hills region of Kansas and Oklahoma, which contains examples of this system, contains somewhat unique soil characteristics and has developed from a diversity of sources including red shale, red clay, sandy shale, siltstone, or sandstone. These soils have developed a characteristic reddish color from the primary material. These soils can consist of silt, loam, or clay and can have textures ranging from a fine sandy loam to a more clayey surface.

Vegetation: This system contains elements from both Western Great Plains Shortgrass Prairie (CES303.672) and Western Great Plains Tallgrass Prairie (CES303.673). This system typically contains grass species such as *Bouteloua curtipendula, Schizachyrium scoparium, Andropogon gerardii, Hesperostipa comata, Sporobolus heterolepis,* and *Bouteloua gracilis,* although the majority of the associations within the region are dominated by *Pascopyrum smithii* or *Schizachyrium scoparium.* Isolated patches of *Quercus macrocarpa* also can occur.

Dynamics: Fire and grazing are the primary processes occurring within the system. The diversity in this mixedgrass system likely reflects both the short- and long-term responses of the vegetation to these often concurrent disturbance regimes. Fire suppression and overgrazing can lead to the invasion of this system by woody species such as *Juniperus virginiana* and *Pinus ponderosa*. Likewise, fire suppression may lead to a more closed canopy of bur oak.

SOURCES

References: Barbour and Billings 1988, Comer et al. 2003, Ricketts et al. 1999, Shiflet 1994, Weaver and Albertson 1956, Weaver and Bruner 1948

Version: 27 Sep 2005 **Stakeholders:** Midwest, Southeast, West

Concept Author: S. Menard and K. Kindscher **LeadResp:** Midwest

CES205.683 CENTRAL TALLGRASS PRAIRIE

Primary Division: Eastern Great Plains (205)

Land Cover Class: Herbaceous

Spatial Scale & Pattern: Matrix

Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland

National Mapping Codes: EVT 2421; ESLF 7134; ESP 1421

Concept Summary: This system is found primarily in the Central Tallgrass Prairie ecoregion ranging from eastern Kansas and Nebraska to northwestern Indiana. This system differs from other prairie systems to the north and south by being the most mesic with

primarily deep, rich Mollisol soils. These soils are usually greater than 1 meter deep. This system is dominated by tallgrass species such as *Andropogon gerardii*, *Sorghastrum nutans*, and *Panicum virgatum*. These species typically grow to 1-2 m tall in the rich soils found in this system. Other mid- and shortgrass species, such as *Bouteloua curtipendula*, *Hesperostipa spartea*, and *Schizachyrium scoparium*, are usually present and can be common or locally dominant on patches of this system, particularly slopes or other areas with drier habitats. Several forb species are also associated with this system making it one of the most diverse grassland systems. As many as 300 herbaceous plant species could occur in this system across its range. The environment and habitat of this system do not prevent invasion by shrubs and trees. High-quality examples of this system have trees and shrubs widely scattered or clustered in areas that are wetter and/or more sheltered from fire than the surrounding grassland. Fire, drought, and grazing are the primary natural dynamics influencing this system and help prevent woody species from invading. However, conversion to agriculture has been the prime disturbance since post-European settlement. The rich soils and long growing season make this an ideal location for farming row crops, and as a result very few examples of this system remain.

DISTRIBUTION

Range: This system is found primarily in the Central Tallgrass Prairie (TNC Ecoregion 36) ranging from eastern Kansas and Nebraska to north-central Missouri and northwestern Indiana.
Divisions: 205:C
TNC Ecoregions: 36:C, 45:C, 46:C
Subnations: IA, IL, IN, KS, MO, NE, WI
Map Zones: 31:?, 38:C, 39:?, 42:C, 43:C, 44:P, 49:C, 50:C, 51:C, 52:C
USFS Ecomap Regions: 222K:CC, 223A:CC, 251B:CC, 251C:CC, 251F:CC, 251G:CC, 251H:CC, 255A:CC, 332C:CC, 332D:CC, 332E:CC, 332F:CC

CONCEPT

Associations:
- *Andropogon gerardii - Panicum virgatum - Helianthus grosseserratus* Herbaceous Vegetation (CEGL002024, G2G3)
- *Andropogon gerardii - Panicum virgatum - Schizachyrium scoparium - (Tradescantia tharpii)* Herbaceous Vegetation (CEGL005231, G3?)
- *Andropogon gerardii - Sorghastrum nutans - (Sporobolus heterolepis) - Liatris* spp. *- Ratibida pinnata* Herbaceous Vegetation (CEGL002203, G1G2)
- *Andropogon gerardii - Sorghastrum nutans - Hesperostipa spartea* Loess Hills Herbaceous Vegetation (CEGL002025, G2)
- *Cornus drummondii - (Rhus glabra, Prunus* spp.) Shrubland (CEGL005219, GNA)
- *Juniperus virginiana* var. *virginiana / Schizachyrium scoparium* Forest (CEGL003628, GNA)
- *Schizachyrium scoparium - Bouteloua curtipendula - Agrostis hyemalis - Eleocharis* spp. Hardpan Herbaceous Vegetation (CEGL002249, G2?)
- *Schizachyrium scoparium - Bouteloua curtipendula - Bouteloua hirsuta - (Yucca glauca)* Herbaceous Vegetation (CEGL002035, G2)
- *Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula* Herbaceous Vegetation (CEGL002214, G2G3)
- *Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula* Hill Herbaceous Vegetation (CEGL005183, G2)
- *Schizachyrium scoparium - Sorghastrum nutans - Clinopodium arkansanum* Alkaline Herbaceous Vegetation (CEGL005179, G2)

Alliances:
- *Andropogon gerardii - (Calamagrostis canadensis, Panicum virgatum)* Herbaceous Alliance (A.1191)
- *Andropogon gerardii - (Sorghastrum nutans)* Herbaceous Alliance (A.1192)
- *Cornus drummondii* Shrubland Alliance (A.3558)
- *Juniperus virginiana* Semi-natural Forest Alliance (A.137)
- *Schizachyrium scoparium - Bouteloua curtipendula* Herbaceous Alliance (A.1225)
- *Schizachyrium scoparium - Sorghastrum nutans* Herbaceous Alliance (A.1198)

Environment: This system differs from other prairie systems to the north and south by being the most mesic with primarily deep, rich Mollisol soils. These soils are usually greater than 1 meter deep.
Vegetation: This system is dominated by tallgrass species such as *Andropogon gerardii*, *Sorghastrum nutans*, and *Panicum virgatum*. These species typically grow to 1-2 m tall in the rich soils found in this system. Other mid- and shortgrass species, such as *Bouteloua curtipendula*, *Hesperostipa spartea*, and *Schizachyrium scoparium*, are usually present and can be common or locally dominant on patches of this system, particularly slopes or other areas with drier habitats. Several forb species are also associated with this system making it one of the most diverse grassland systems. As many as 300 herbaceous plant species could occur in this system across its range. The environment and habitat of this system do not prevent invasion by shrubs and trees. High-quality examples of this system have trees and shrubs widely scattered or clustered in areas that are wetter and/or more sheltered from fire than the surrounding grassland.
Dynamics: Fire, drought, and grazing are the primary natural dynamics influencing this system and help prevent woody species from invading. However, conversion to agriculture has been the prime disturbance since post-European settlement. The rich soils and long growing season make this an ideal location for farming row crops, and as a result very few examples of this system remain. Fire suppression can lead to increased cover of woody species.

SOURCES

References: Barbour and Billings 1988, Comer et al. 2003, Ricketts et al. 1999
Version: 11 Apr 2007 **Stakeholders:** Midwest, Southeast
Concept Author: S. Menard **LeadResp:** Midwest

CES202.695 NORTH-CENTRAL INTERIOR SAND AND GRAVEL TALLGRASS PRAIRIE

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Herbaceous
Spatial Scale & Pattern: Large patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
National Mapping Codes: EVT 2412; ESLF 7125; ESP 1412
Concept Summary: This system is found in the northern Midwest, particularly in Minnesota, Wisconsin, Michigan, and possibly ranging into Ontario. It is often found on glacial features such as kames, eskers, moraines, lakeplains (though excluding the Great Lakes lakeplain) and sandplains, and along eolian dunes. In contrast to the deeper, richer soils supporting other tallgrass systems in the region, the underlying soils in this system tend to be more shallow, sandy, rocky, and/or gravelly outwash soils. Organic content is significantly lower. Grassland species such as *Schizachyrium scoparium, Andropogon gerardii*, and *Bouteloua* spp., varying in cover from sparse to moderately dense, dominate this system. *Hesperostipa spartea* and *Sporobolus heterolepis* are also common components of this system. Woody species more tolerant of droughty conditions may be found in some examples. The most common trees are *Pinus banksiana, Quercus ellipsoidalis, Quercus macrocarpa*, and *Populus tremuloides*. Fire and drought are the major dynamics influencing this system. If fire and periodic drought are not present, woody species begin to invade this system, especially in the eastern parts of its distribution. Wind can also play a role, especially on examples found on sandplains and/or eolian dunes.

DISTRIBUTION

Range: This system is found in the northern Midwest possibly ranging into Ontario.
Divisions: 202:C, 205:P
TNC Ecoregions: 35:C, 36:P, 45:C, 46:C, 47:C, 48:C
Subnations: IA, IL, IN, MI, MN, MO, ND, ON, SD, WI
Map Zones: 39:C, 40:C, 41:P, 42:C, 43:P, 49:P, 50:C, 51:C, 52:C
USFS Ecomap Regions: 212K:CP, 212M:CP, 212N:CP, 222K:CC, 222L:CC, 222M:CC, 222N:CC, 222R:CP, 251A:CC, 251B:CC

CONCEPT

Associations:
- *Andropogon gerardii - Calamagrostis canadensis* Sand Herbaceous Vegetation (CEGL005177, G2G3)
- *Andropogon gerardii - Sorghastrum nutans - Schizachyrium scoparium - Aletris farinosa* Herbaceous Vegetation (CEGL005096, G2)
- *Schizachyrium scoparium - Bouteloua curtipendula* Gravel Herbaceous Vegetation (CEGL002215, G3)
- *Schizachyrium scoparium - Bouteloua* spp. *- Hesperostipa spartea* Gravel Herbaceous Vegetation (CEGL002499, G2G3)
- *Schizachyrium scoparium - Danthonia spicata - Carex pensylvanica - (Viola pedata)* Herbaceous Vegetation (CEGL002318, G2G3)
- *Schizachyrium scoparium - Hesperostipa spartea - Bouteloua (curtipendula, gracilis)* Sand Herbaceous Vegetation (CEGL005204, G2G3)
- *Schizachyrium scoparium - Sorghastrum nutans - Andropogon gerardii - Lespedeza capitata* Sand Herbaceous Vegetation (CEGL002210, G3)

Alliances:
- *Andropogon gerardii - (Calamagrostis canadensis, Panicum virgatum)* Herbaceous Alliance (A.1191)
- *Andropogon gerardii - (Sorghastrum nutans)* Herbaceous Alliance (A.1192)
- *Schizachyrium scoparium - (Sporobolus cryptandrus)* Herbaceous Alliance (A.1224)
- *Schizachyrium scoparium - Bouteloua curtipendula* Herbaceous Alliance (A.1225)
- *Schizachyrium scoparium - Sorghastrum nutans* Herbaceous Alliance (A.1198)

Environment: This system is often found on glacial features such as kames, eskers, moraines, lakeplains (though excluding the Great Lakes lakeplain) and sandplains, and along eolian dunes. In contrast to the deeper, richer soils supporting other tallgrass systems in the region, the underlying soils in this system tend to be more shallow, sandy, rocky, and/or gravelly outwash soils. Organic content is significantly lower.
Vegetation: Grassland species such as *Schizachyrium scoparium, Andropogon gerardii*, and *Bouteloua* spp., varying in cover from sparse to moderately dense, dominate this system. *Hesperostipa spartea* and *Sporobolus heterolepis* are also common components of this system. Woody species more tolerant of droughty conditions may be found in some examples. The most common trees are *Pinus banksiana, Quercus ellipsoidalis, Quercus macrocarpa*, and *Populus tremuloides*.
Dynamics: Fire and drought are the major dynamics influencing this system. If fire and periodic drought are not present, woody species begin to invade this system, especially in the eastern parts of its distribution. Wind can also play a role, especially on examples found on sandplains and/or eolian dunes.

SOURCES

References: Comer et al. 2003, MNNHP 1993, Thompson 1940
Version: 18 Jul 2006 **Stakeholders:** Canada, Midwest
Concept Author: S. Menard **LeadResp:** Midwest

CES205.685 SOUTHEASTERN GREAT PLAINS TALLGRASS PRAIRIE

Primary Division: Eastern Great Plains (205)
Land Cover Class: Herbaceous
Spatial Scale & Pattern: Large patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
Diagnostic Classifiers: Herbaceous; Graminoid
National Mapping Codes: EVT 2423; ESLF 7136; ESP 1423
Concept Summary: This system is found primarily within the Flint Hills of Kansas and the Osage Plains of Oklahoma; however, it can range into the Ozarks of Missouri and the Arbuckle Mountains of Oklahoma. In Texas, this is the primary natural system of the "Grand Prairie" or "Fort Worth Prairie" (EPA 29d) of Texas. It is distinguished from Central Tallgrass Prairie (CES205.683) by having more species with southwestern geographic affinities and the presence of a thin soil layer over limestone beds ranging to more acidic substrates, although some areas of deeper soils are found within the region, especially on lower slopes, draws, and terraces. Because of the presence of the rocky substrate close to the surface and the rolling topography, this area is relatively unsuitable for agriculture. The Flint Hills contain one of the largest remaining, relatively intact pieces of tallgrass prairie. The vegetation in this system is typified by tallgrass species such as *Andropogon gerardii, Panicum virgatum, Schizachyrium scoparium*, and *Sorghastrum nutans* forming a dense cover. A moderate to high density of forb species such as *Oligoneuron rigidum (= Solidago rigida), Liatris punctata, Symphyotrichum ericoides, Lespedeza capitata*, and *Viola pedatifida* also occur. Areas of deeper soil, especially lower slopes along draws, slopes and terraces, can include *Baptisia alba var. macrophylla, Liatris pycnostachya*, and *Vernonia missurica*. Shrub and tree species are relatively infrequent and, if present, constitute less than 10% cover in the area. Fire and grazing constitute the major dynamic processes for this region. Although many of the native common plant species still occur, grazing does impact this region. Poor grazing practices can lead to soil erosion and invasion by cool-season grasses such as *Bromus inermis.*
Comments: This includes the Flint Hills, in addition to prairies in Oklahoma and Missouri south of the glacial line (including Ozarks of Missouri). There may need to be further review concerning the prairies in Missouri and Oklahoma.

DISTRIBUTION

Range: This system is found primarily within the Flint Hills and Osage Plains, but small patches can be found in the Ozarks of Missouri and the Arbuckle Mountains of Oklahoma. In Texas, this should be the primary natural system of the "Grand Prairie" or "Fort Worth Prairie" (EPA 29d) of Texas. In Missouri, attributed to EPA 40c, 40d, 47d, 47f, 72f, and possibly 39k.
Divisions: 205:C
TNC Ecoregions: 32:C, 36:C, 37:C, 38:P
Subnations: KS, MO, OK, TX
Map Zones: 32:P, 38:P, 43:C, 44:C
USFS Ecomap Regions: 223A:PP, 251E:CC, 251F:CC, 251G:CC, 251H:CC, 255A:CC, 332E:CC

CONCEPT

Associations:
- *Andropogon gerardii - Panicum virgatum - Helianthus grosseserratus* Herbaceous Vegetation (CEGL002024, G2G3)
- *Andropogon gerardii - Schizachyrium scoparium* Northern Plains Herbaceous Vegetation (CEGL002205, G3G5)
- *Andropogon gerardii - Sorghastrum nutans - Schizachyrium scoparium* Flint Hills Herbaceous Vegetation (CEGL002201, G4?)
- *Andropogon gerardii - Sorghastrum nutans* Unglaciated Herbaceous Vegetation (CEGL002204, G3)
- *Bouteloua curtipendula - Bouteloua (eriopoda, gracilis)* Herbaceous Vegetation (CEGL002250, G4)
- *Juniperus ashei / Bouteloua (curtipendula, hirsuta)* Woodland (CEGL002125, G2G3)
- *Muhlenbergia reverchonii - Croton monanthogynus* Herbaceous Vegetation (CEGL004785, G2G3)
- *Schizachyrium scoparium - Aristida dichotoma - Croton willdenowii* / Lichens Wooded Herbaceous Vegetation (CEGL002242, G3)
- *Schizachyrium scoparium - Bouteloua curtipendula - Rudbeckia missouriensis - Mentzelia oligosperma* Wooded Herbaceous Vegetation (CEGL002251, G2)
- *Schizachyrium scoparium - Sorghastrum nutans - Andropogon ternarius - Coreopsis grandiflora* Sandstone - Shale Herbaceous Vegetation (CEGL002212, G3)
- *Schizachyrium scoparium - Sorghastrum nutans - Danthonia spicata - Silene regia* Chert Herbaceous Vegetation (CEGL002211, G3)
- *Schizachyrium scoparium - Sorghastrum nutans - Tradescantia bracteata* Alkaline Bedrock Herbaceous Vegetation (CEGL005280, G1G2)

Alliances:
- *(Juniperus virginiana) / Schizachyrium scoparium - (Bouteloua curtipendula)* Wooded Herbaceous Alliance (A.1919)
- *(Quercus stellata, Quercus marilandica) / Schizachyrium scoparium* Wooded Herbaceous Alliance (A.1920)

- *Andropogon gerardii - (Calamagrostis canadensis, Panicum virgatum)* Herbaceous Alliance (A.1191)
- *Andropogon gerardii - (Sorghastrum nutans)* Herbaceous Alliance (A.1192)
- *Bouteloua curtipendula* Herbaceous Alliance (A.1244)
- *Juniperus ashei* Woodland Alliance (A.501)
- *Muhlenbergia reverchonii* Herbaceous Alliance (A.1218)
- *Schizachyrium scoparium - Sorghastrum nutans* Herbaceous Alliance (A.1198)

Environment: This system is typified by the thin soil layer over limestone beds or acidic substrates such as chert or granite, although areas of deeper soils are possible along lower slopes, draws, and terraces. The topography is rolling and mostly unsuitable for agriculture.

Vegetation: Tallgrass species such as *Andropogon gerardii, Panicum virgatum, Schizachyrium scoparium,* and *Sorghastrum nutans* predominate this system and often form a dense cover. Forb species such as *Oligoneuron rigidum (= Solidago rigida), Liatris punctata, Symphyotrichum ericoides, Lespedeza capitata,* and *Viola pedatifida* can also occur. In those areas of deeper soils, *Baptisia alba var. macrophylla, Liatris pycnostachya,* and *Vernonia missurica* can also occur. Tree and shrub species are relatively infrequent and constitute less than 10% cover. Some other plant species which can occur include *Andropogon ternarius, Aristida dichotoma, Bouteloua curtipendula, Bouteloua eriopoda, Bouteloua gracilis, Bouteloua hirsuta, Calamagrostis canadensis, Coreopsis grandiflora, Danthonia spicata, Helianthus grosseserratus, Mentzelia oligosperma, Rudbeckia missouriensis, Silene regia, Croton willdenowii,* and *Tradescantia bracteata*.

Dynamics: Fire and grazing are the prevalent dynamic processes in examples of this system. Overgrazing can lead to soil erosion and invasion of cool-season grasses. Fire suppression can lead to increased cover of woody species.

SOURCES

References: Barbour and Billings 1988, Comer et al. 2003, Lauver et al. 1999, Ricketts et al. 1999

Version: 31 May 2007 **Stakeholders:** Midwest, Southeast

Concept Author: S. Menard and K. Kindscher, mod. M. Pyne and T. Foti **LeadResp:** Midwest

CES303.670 WESTERN GREAT PLAINS SAND PRAIRIE

Primary Division: Western Great Plains (303)

Land Cover Class: Herbaceous

Spatial Scale & Pattern: Large patch

Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland

National Mapping Codes: EVT 2148; ESLF 7121; ESP 1148

Concept Summary: The sand prairies constitute a very unique system within the western Great Plains. These sand prairies are often considered part of the tallgrass or mixedgrass regions in the western Great Plains but can contain elements from Western Great Plains Shortgrass Prairie (CES303.672), Central Mixedgrass Prairie (CES303.659), and Northwestern Great Plains Mixedgrass Prairie (CES303674). The largest expanse of sand prairies (approximately 5 million ha) can be found in the Sandhills of north-central Nebraska and southwestern South Dakota. These areas are relatively intact. The primary use of this system has been grazing (not cultivation), and areas such as the Nebraska Sandhills can experience less degeneration than other prairie systems. Although greater than 90% of the Sandhills region is privately owned, the known fragility of the soils and the cautions used by ranchers to avoid poor grazing practices have allowed for fewer significant changes in the vegetation of the Sandhills compared to other grassland systems. The unifying and controlling feature for this system is that coarse-textured soils predominate and the dominant grasses are well-adapted to this condition. Soils in the sand prairies can be relatively undeveloped and are highly permeable. Soil texture and drainage along with a species' rooting morphology, photosynthetic physiology, and mechanisms to avoid transpiration loss are highly important in determining the composition of the sand prairies. In the northwestern portion of its range, stand size corresponds to the area of exposed caprock sandstone, and small patches predominate, but large patches are also found embedded in the encompassing Northwestern Great Plains Mixedgrass Prairie (CES303674). Another important feature is their susceptibility to wind erosion. Blowouts and sand draws are some of the unique wind-driven disturbances in the sand prairies, particularly the Nebraska Sandhills. In most of eastern Montana, substrates supporting this system have weathered in place from sandstone caprock; thus the solum is relatively thin, and the wind-sculpted features present further east, particularly in Nebraska, do not develop. Graminoid species dominate the sand prairies, although relative dominance can change due to impacts of wind disturbance. *Andropogon hallii* and *Calamovilfa longifolia* are the most common species, but other grass and forb species such as *Hesperostipa comata, Carex inops ssp. heliophila,* and *Panicum virgatum* may be present. Apparently only *Calamovilfa longifolia* functions as a dominant throughout the range of the system. In the western extent, *Hesperostipa comata* becomes more dominant, and *Andropogon hallii* is less abundant but still present. Communities of *Artemisia cana ssp. cana* are included here in central and eastern Montana. Patches of *Quercus havardii* can also occur within this system in the southern Great Plains. Fire and grazing constitute the other major dynamic processes that can influence this system.

Comments: This system was edited to expand the concept to include sandy portions of the mixedgrass prairie of the Montana plains. Although in terms of potentially dominant graminoids there is virtually a complete overlap between the eastern and western extremities of the system, there is a distinct shift from west to east from midgrass species dominance, most notably *Hesperostipa comata,* to tallgrass species dominance, including prominently *Andropogon gerardii* and *Andropogon hallii*. Prevailing patch size also shifts from smaller to larger moving west to east. Current thinking is to include this variation within this system, but with more

information and input from other Great Plains ecologists in the U.S. and Canada, this concept is subject to change, including the possibility of creating a new system.

DISTRIBUTION

Range: This system is found throughout the Western Great Plains Division. The largest and most intact example of this system is found within the Sandhills region of Nebraska and South Dakota. However, it is also common (though occurring in predominantly small patches) farther west into central and eastern Montana. Its western extent in Wyoming is still to be determined, but it does occur in mapzone 29 on weathered-in-place sandy soils, where *Calamovilfa longifolia* is found, along with *Artemisia cana*.
Divisions: 303:C
TNC Ecoregions: 26:C, 27:C, 28:C, 33:C, 34:C, 36:P
Subnations: CO, KS, MT, ND, NE, NM?, OK, SD, TX?, WY
Map Zones: 20:C, 27:P, 29:C, 30:C, 31:C, 33:C, 34:C, 38:C, 39:C, 40:C
USFS Ecomap Regions: 251F:CC, 251H:CC, 255A:PP, 315A:CC, 315B:CC, 315F:CC, 321A:??, 331B:CC, 331C:CC, 331D:CC, 331E:CC, 331F:CC, 331G:CC, 331H:CC, 331K:CC, 331L:CC, 331M:CP, 331N:C?, 332C:CC, 332D:CC, 332E:CC, 332F:CC

CONCEPT

Associations:
- *Andropogon gerardii - Panicum virgatum* Sandhills Herbaceous Vegetation (CEGL002023, G3?)
- *Andropogon hallii - Calamovilfa gigantea* Herbaceous Vegetation (CEGL004016, G2G3)
- *Andropogon hallii - Calamovilfa longifolia* Herbaceous Vegetation (CEGL001467, G4G5)
- *Andropogon hallii - Carex inops* ssp. *heliophila* Herbaceous Vegetation (CEGL001466, G3)
- *Artemisia cana* ssp. *cana / Calamovilfa longifolia* Shrub Herbaceous Vegetation (CEGL001555, G3Q)
- *Artemisia cana* ssp. *cana / Hesperostipa comata* Shrub Herbaceous Vegetation (CEGL001553, G3)
- *Betula occidentalis - Juniperus horizontalis / Calamovilfa longifolia* Shrubland (CEGL002184, GNR)
- *Calamovilfa longifolia - Carex inops* ssp. *heliophila* Herbaceous Vegetation (CEGL001471, G3)
- *Calamovilfa longifolia - Hesperostipa comata* Herbaceous Vegetation (CEGL001473, G3)
- *Carex interior - Eleocharis elliptica - Thelypteris palustris* Herbaceous Vegetation (CEGL002390, G1G2)
- *Hesperostipa comata - Bouteloua gracilis - Carex filifolia* Herbaceous Vegetation (CEGL002037, G5)
- *Hesperostipa comata - Carex filifolia* Herbaceous Vegetation (CEGL001700, G4)
- *Pseudoroegneria spicata - Achnatherum hymenoides* Herbaceous Vegetation (CEGL001674, G3G4)
- *Pseudoroegneria spicata - Hesperostipa comata* Herbaceous Vegetation (CEGL001679, G4)
- *Quercus havardii / Sporobolus cryptandrus - Schizachyrium scoparium* Shrubland (CEGL002171, G3)
- *Rhus trilobata / Calamovilfa longifolia* Shrub Herbaceous Vegetation (CEGL001457, G3Q)
- *Rhus trilobata / Pseudoroegneria spicata* Shrub Herbaceous Vegetation (CEGL001120, G4)
- *Schizachyrium scoparium - Aristida basiramea - Sporobolus cryptandrus - Eragrostis trichodes* Herbaceous Vegetation (CEGL005221, GNR)
- *Yucca glauca / Calamovilfa longifolia* Shrub Herbaceous Vegetation (CEGL002675, G4)

Alliances:
- *Andropogon gerardii - (Calamagrostis canadensis, Panicum virgatum)* Herbaceous Alliance (A.1191)
- *Andropogon hallii* Herbaceous Alliance (A.1193)
- *Artemisia cana* ssp. *cana* Shrub Herbaceous Alliance (A.2554)
- *Betula occidentalis* Shrubland Alliance (A.914)
- *Calamovilfa longifolia* Herbaceous Alliance (A.1201)
- *Carex pellita - (Carex nebrascensis) - Schoenoplectus* spp. Saturated Herbaceous Alliance (A.1466)
- *Hesperostipa comata - Bouteloua gracilis* Herbaceous Alliance (A.1234)
- *Pseudoroegneria spicata* Herbaceous Alliance (A.1265)
- *Quercus havardii* Shrubland Alliance (A.780)
- *Rhus trilobata* Shrub Herbaceous Alliance (A.1537)
- *Schizachyrium scoparium - (Sporobolus cryptandrus)* Herbaceous Alliance (A.1224)
- *Yucca glauca* Shrub Herbaceous Alliance (A.1540)

Environment: The distribution, species richness and productivity of plant species within the sand prairie ecological system are controlled primarily by environmental conditions, in particular the temporal and spatial distribution of soil moisture and topography. Soils in the sand prairies can be relatively undeveloped and are highly permeable. Soil texture and drainage along with a species' rooting morphology, photosynthetic physiology, and mechanisms to avoid transpiration loss are highly important in determining the composition and distribution of communities/associations within the sand prairies. Another important aspect of soils in the sand prairies is their susceptibility to wind erosion. Blowouts and sand draws are some of the unique wind-driven disturbances in the sand prairies, particularly the Nebraska Sandhills, which can profoundly impact vegetation composition and succession within this system. This tallgrass system is found primarily on sandy and sandy loam soils that can be relatively undeveloped and highly permeable as compared to Western Great Plains Tallgrass Prairie (CES303.673), which occurs on deeper loams. This system is usually found in areas with a rolling topography and can occur on ridges, midslopes and/or lowland areas within a region. It often occurs on moving sand dunes, especially within the Sandhills region of Nebraska and South Dakota. In Montana, occurrences are intimately associated

with Northwestern Great Plains Mixedgrass Prairie (CES303.674), usually occupying higher positions in local landscapes due to the fact that sandy members of some formations (that are predominantly marine shales) constitute the highest (and most weathering-resistant) points in the landscape.
Vegetation: This system is distinguished by the dominance of graminoids such as *Andropogon hallii* and *Calamovilfa longifolia*. Other graminoids such as *Hesperostipa comata, Carex inops ssp. heliophila,* and *Panicum virgatum* may be present. Characteristic forbs differ by region, but species of *Psoralidium* and *Pediomelum* are a common feature. *Penstemon haydenii* is endemic to the sand prairie system and of special conservation concern because of its probable decline due to grazing and fire suppression. Very diffuse patches of *Rhus trilobata* are found on shallow sandy soils, often associated with breaklands; other shrubs occasionally occurring include *Artemisia cana ssp. cana, Betula occidentalis, Juniperus horizontalis,* and *Yucca glauca*. Many of the warm-season graminoids extend at least to the Rocky Mountain Front as dominant components on appropriate sites or as a response to disturbance. All the characteristic species mentioned for Nebraska and South Dakota are also found in Montana stands (and possibly Wyoming and perhaps the rest of the states cited). Some of the communities cited as part of the concept in Nebraska and South Dakota are only marginally present in Montana, but others are found throughout Montana's Great Plains region. In the southern range of this system, patches of *Quercus havardii* can also occur.
Dynamics: The distribution, species richness and productivity of plant species within the sand prairie ecological system are controlled primarily by environmental conditions, in particular the temporal and spatial distribution of soil moisture and topography. Another important aspect of this system is its susceptibility to wind erosion. Blowouts and sand draws are some of the unique wind-driven disturbances in the sand prairies, particularly the Nebraska Sandhills, which can profoundly impact vegetation composition and succession within this system. Fire and grazing constitute the other major disturbances that can influence this system. Overgrazing, fire and trampling that leads to the removal of vegetation within those areas susceptible to blowouts can either instigate a blowout or perpetuate one already occurring. Overgrazing can also lead to significant erosion.

SOURCES

References: Barbour and Billings 1988, Comer et al. 2003, Shiflet 1994, Tolstead 1942
Version: 27 Apr 2006 **Stakeholders:** Midwest, Southeast, West
Concept Author: S. Menard and K. Kindscher **LeadResp:** Midwest

Woody Wetland

CES202.018 CENTRAL INTERIOR HIGHLANDS AND APPALACHIAN SINKHOLE AND DEPRESSION POND

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Woody Wetland
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland
Diagnostic Classifiers: Lowland [Lowland]; Depressional [Pond, Sinkhole]; Muck; Mineral: W/ A-Horizon >10 cm
National Mapping Codes: EVT ; ESLF 9160; ESP
Concept Summary: This system of ponds and wetlands is found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions, and ranges north from the southern and central Appalachians to the northern Piedmont regions. Stands occur in basins of sinkholes or other isolated depressions on uplands. Soils are very poorly drained, and surface water may be present for extended periods of time, rarely becoming dry. Water depth may vary greatly on a seasonal basis and may be a meter deep or more in the winter. Some examples become dry in the summer. Soils may be deep (100 cm or more), consisting of peat or muck, with parent material of peat, muck or alluvium. Ponds vary from open water to herb-, shrub-, or tree-dominated. Tree-dominated examples typically contain *Quercus* species, *Platanus occidentalis, Fraxinus pennsylvanica, Acer saccharinum,* or *Nyssa* species, or a combination of these. In addition, *Liquidambar styraciflua* may be present in southern examples. *Cephalanthus occidentalis* is a typical shrub component. The herbaceous layer is widely variable depending on geography.
Comments: Many of these ponds have their geologic origin as a more-or-less complete karst collapse feature. Some of them may display this geologic origin in a more explicit manner, with definite walls and exposed limestone or dolomite at the surface ("sinkholes"). Others are more subtle, and exist as more gentle depressions, with no exposed surface geology ("depression ponds"). This includes the "sagponds" of northwestern Georgia and adjacent Alabama. Rare examples in the Ridge and Valley of Georgia (Coosa Valley) are included here. These occur on limestones or dolomites of the Chickamauga Group. Matt Elliott (pers. comm.): "I would put Ridge and Valley sagponds in with Interior Highlands ponds rather than Piedmont, as they are essentially karst features. R&V sagponds are generally pretty rare but are common in parts of Bartow County, Georgia, and a few other places. The shallower ones are dominated by willow oak, the deeper ones *Nyssa biflora*. On the Cumberland Plateau, the ones I have seen usually have sweetgum and *Nyssa sylvatica*, but I think willow oak and possibly *Nyssa biflora* might occur in some of the deeper ones. A lot of the plateau ponds seem more like swales than deep ponds, but they still may be related to underlying karst features. The Ridge and Valley sagponds may be somewhat different from those on the plateau - often deeper and with even more Coastal Plain elements.″ It also includes sinkhole ponds of northern New Jersey (K. Strakosch-Walz pers. comm.) and ponds of the Ridge and Valley in

Pennsylvania. These are very similar to Shenandoah sinkhole ponds of Virginia and are in Maryland as well (L. Sneddon pers. comm.).

DISTRIBUTION

Range: This system is found from the Ozark and Ouachita mountains east to the southern and central Appalachians and the northern Piedmont regions (?), including the unglaciated Interior Low Plateau and Ridge and Valley. It ranges from Missouri, West Virginia, Pennsylvania, and Delaware south to Arkansas, Alabama and Georgia.
Divisions: 202:C
TNC Ecoregions: 36:P, 38:C, 39:C, 44:C, 50:C, 59:C, 61:C
Subnations: AL, AR, DE, GA, IL, IN, KY, MD, MO, NC, NJ, OH, PA, TN, VA, WV
Map Zones: 44:C, 47:C, 48:C, 49:C, 53:C, 57:C, 61:C, 62:P, 64:P
USFS Ecomap Regions:

CONCEPT

Associations:
- *Brasenia schreberi* Herbaceous Vegetation (CEGL004527, G4?)
- *Carex aquatilis - Dulichium arundinaceum* Herbaceous Vegetation (CEGL008542, G1?)
- *Carex barrattii* Herbaceous Vegetation (CEGL007857, G1)
- *Carex comosa - Carex decomposita - Dulichium arundinaceum - Lycopus rubellus* Herbaceous Vegetation (CEGL002413, G3G4)
- *Cephalanthus occidentalis - (Salix nigra, Quercus lyrata)* Karst Depression Shrubland (CEGL008439, G1Q)
- *Cephalanthus occidentalis / Dulichium arundinaceum* Shrubland (CEGL007854, G1)
- *Cephalanthus occidentalis / Hibiscus moscheutos* ssp. *moscheutos* Depression Pond Shrubland (CEGL004742, G3?)
- *Cephalanthus occidentalis / Torreyochloa pallida* Shrubland (CEGL007855, G1?)
- *Ceratophyllum demersum - Stuckenia pectinata* Herbaceous Vegetation (CEGL004528, G4G5)
- *Dasiphora fruticosa* ssp. *floribunda / Rhynchospora capillacea - Scleria verticillata* Shrub Herbaceous Vegetation (CEGL006356, G1)
- *Fraxinus pennsylvanica - Acer saccharinum - Quercus bicolor / Boehmeria cylindrica* Forest (CEGL006634, GNR)
- *Leersia oryzoides - Boehmeria cylindrica - Ranunculus flabellaris* Herbaceous Vegetation (CEGL006903, GNR)
- *Liquidambar styraciflua - Acer rubrum / Carex* spp. *- Sphagnum* spp. Forest (CEGL007388, G2G3Q)
- *Ludwigia peploides* Herbaceous Vegetation (CEGL007835, G4G5)
- *Nelumbo lutea* Herbaceous Vegetation (CEGL004323, G4?)
- *Nuphar lutea* ssp. *advena - Nymphaea odorata* Herbaceous Vegetation (CEGL002386, G4G5)
- *Nyssa aquatica / Cephalanthus occidentalis* Pond Forest (CEGL004712, G1?)
- *Nyssa biflora / Cephalanthus occidentalis - Lyonia lucida* Sagpond Forest (CEGL004116, G1G2)
- *Orontium aquaticum - Schoenoplectus subterminalis - Eriocaulon aquaticum* Herbaceous Vegetation (CEGL007859, G1)
- *Panicum hemitomon - Dulichium arundinaceum* Herbaceous Vegetation (CEGL004126, G1)
- *Phalaris arundinacea* Eastern Herbaceous Vegetation (CEGL006044, GNA)
- *Platanus occidentalis - Fraxinus pennsylvanica - Ulmus americana / Cornus sericea* Forest (CEGL006901, G2G3)
- *Pontederia cordata - Sagittaria graminea - Sagittaria latifolia* Semipermanently Flooded Herbaceous Vegetation (CEGL004986, G1G2Q)
- *Quercus alba - Nyssa sylvatica* Sandstone Ridgetop Depression Forest (CEGL008440, G2Q)
- *Quercus alba - Nyssa sylvatica* Seasonally Flooded Forest [Provisional] (CEGL008473, GNR)
- *Quercus bicolor - Fraxinus pennsylvanica / Carex* spp. Forest (CEGL004422, G1G2)
- *Quercus lyrata - Quercus (palustris, phellos) - Liquidambar styraciflua - (Populus heterophylla)* Forest (CEGL004421, G2G3)
- *Quercus lyrata / Betula nigra / Pleopeltis polypodioides* ssp. *michauxiana* Forest (CEGL004975, G1)
- *Quercus lyrata* Pond Forest (CEGL004642, G1G3)
- *Quercus palustris - (Quercus bicolor) / Carex crinita / Sphagnum* spp. Forest (CEGL002406, G3?)
- *Quercus palustris - Quercus bicolor - (Liquidambar styraciflua)* Mixed Hardwood Forest (CEGL002432, G3G4)
- *Quercus palustris / Panicum rigidulum* var. *rigidulum - Panicum verrucosum - Eleocharis acicularis* Herbaceous Vegetation (CEGL007858, G1)
- *Quercus palustris* Pond Forest (CEGL007809, G2)
- *Quercus phellos - Liquidambar styraciflua / Chasmanthium laxum* Cumberland / Southern Ridge and Valley Forest (CEGL008441, G3)
- *Quercus phellos* Seasonally Flooded Ozark Pond Forest [Provisional] (CEGL007402, GNR)
- *Saccharum baldwinii - Calamagrostis coarctata - Panicum rigidulum - Rhynchospora capitellata* Herbaceous Vegetation (CEGL004750, G2G3)
- *Scirpus cyperinus - Dulichium arundinaceum / Sphagnum* spp. Herbaceous Vegetation (CEGL004134, G1Q)
- *Scirpus cyperinus - Panicum rigidulum - Rhynchospora corniculata - (Dulichium arundinaceum)* Herbaceous Vegetation (CEGL004719, G2G3)
- *Sparganium americanum - (Sparganium erectum* ssp. *stoloniferum) - Epilobium leptophyllum* Herbaceous Vegetation (CEGL004510, G2G3)

- *Typha latifolia* Southern Herbaceous Vegetation (CEGL004150, G5)
- *Vaccinium oxycoccos - (Vaccinium macrocarpon) / Rhynchospora alba - Drosera rotundifolia / Sphagnum* spp. Dwarf-shrubland (CEGL007856, G2)

Alliances:

- *Acer rubrum - Fraxinus pennsylvanica* Seasonally Flooded Forest Alliance (A.316)
- *Brasenia schreberi* Permanently Flooded Herbaceous Alliance (A.1742)
- *Carex (flava, hystericina, interior, sterilis)* Saturated Shrub Herbaceous Alliance (A.1561)
- *Carex barrattii* Seasonally Flooded Herbaceous Alliance (A.1930)
- *Carex comosa - (Carex decomposita)* Semipermanently Flooded Herbaceous Alliance (A.1439)
- *Cephalanthus occidentalis* Seasonally Flooded Shrubland Alliance (A.988)
- *Cephalanthus occidentalis* Semipermanently Flooded Shrubland Alliance (A.1011)
- *Dulichium arundinaceum* Seasonally Flooded Herbaceous Alliance (A.1398)
- *Fraxinus pennsylvanica - Ulmus americana - Celtis (occidentalis, laevigata)* Temporarily Flooded Forest Alliance (A.286)
- *Leersia oryzoides - Glyceria striata* Seasonally Flooded Herbaceous Alliance (A.1399)
- *Liquidambar styraciflua - (Acer rubrum)* Seasonally Flooded Forest Alliance (A.321)
- *Ludwigia peploides* Semipermanently Flooded Herbaceous Alliance (A.1928)
- *Nelumbo lutea* Permanently Flooded Temperate Herbaceous Alliance (A.1671)
- *Nymphaea odorata - Nuphar* spp. Permanently Flooded Temperate Herbaceous Alliance (A.1984)
- *Nyssa (aquatica, biflora, ogeche)* Pond Seasonally Flooded Forest Alliance (A.324)
- *Orontium aquaticum - (Schoenoplectus subterminalis)* Permanently Flooded Herbaceous Alliance (A.1931)
- *Panicum hemitomon* Seasonally Flooded Temperate Herbaceous Alliance (A.1379)
- *Phalaris arundinacea* Seasonally Flooded Herbaceous Alliance (A.1381)
- *Pontederia cordata - Peltandra virginica* Semipermanently Flooded Herbaceous Alliance (A.1669)
- *Potamogeton* spp. - *Ceratophyllum* spp. - *Elodea* spp. Permanently Flooded Herbaceous Alliance (A.1754)
- *Quercus alba - (Nyssa sylvatica)* Seasonally Flooded Forest Alliance (A.1996)
- *Quercus lyrata - (Carya aquatica)* Seasonally Flooded Forest Alliance (A.328)
- *Quercus palustris - (Quercus bicolor)* Seasonally Flooded Forest Alliance (A.329)
- *Quercus phellos* Seasonally Flooded Forest Alliance (A.330)
- *Rhynchospora* spp. - *Panicum (rigidulum, verrucosum)* - *Rhexia virginica* Seasonally Flooded Herbaceous Alliance (A.1384)
- *Scirpus cyperinus* Seasonally Flooded Herbaceous Alliance (A.1386)
- *Sparganium americanum* Seasonally Flooded Herbaceous Alliance (A.1388)
- *Typha (angustifolia, latifolia) - (Schoenoplectus* spp.) Semipermanently Flooded Herbaceous Alliance (A.1436)
- *Vaccinium macrocarpon* Saturated Dwarf-shrubland Alliance (A.1094)

High-ranked species: Aureolaria patula (G3), Boltonia montana (G1G2), Canis rufus (G1Q), Carex decomposita (G3), Fimbristylis perpusilla (G2), Glyptemys muhlenbergii (G3), Helenium virginicum (G3), Isoetes virginica (G1), Muhlenbergia torreyana (G3), Myotis austroriparius (G3G4), Platanthera leucophaea (G3), Potamogeton hillii (G3), Potamogeton tennesseensis (G2), Schoenoplectus hallii (G3), Scirpus ancistrochaetus (G3)

Environment: Examples of this system occur in basins of sinkholes or other isolated depressions on uplands. Soils are very poorly drained, and surface water may be present for extended periods of time, rarely becoming dry. Water depth may vary greatly on a seasonal basis, and may be a meter deep or more in the winter. Some examples become dry in the summer. Soils may be deep (100 cm or more), consisting of peat or muck, with parent material of peat, muck or alluvium.

Vegetation: Ponds vary from open water to herb-, shrub-, or tree-dominated types. Tree-dominated examples typically contain *Quercus* species, *Platanus occidentalis, Fraxinus pennsylvanica, Acer saccharinum,* or *Nyssa* species, or a combination of these. In addition, *Liquidambar styraciflua* may be present in southern examples. *Cephalanthus occidentalis* is a typical shrub component. The herbaceous layer is widely variable depending on geography.

Dynamics: Water depth may vary greatly on a seasonal basis, and may be a meter deep or more in the winter. Some examples become dry in the summer.

SOURCES

References: Comer et al. 2003, Elliott pers. comm., Evans 1991, Wharton 1978

Version: 26 Jan 2006 **Stakeholders:** East, Midwest, Southeast

Concept Author: M. Pyne, S. Menard, D. Faber-Langendoen **LeadResp:** Midwest

CES202.702 NORTH-CENTRAL INTERIOR SHRUB-GRAMINOID ALKALINE FEN

Primary Division: Central Interior and Appalachian (202)

Land Cover Class: Woody Wetland

Spatial Scale & Pattern: Small patch

Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland

National Mapping Codes: EVT ; ESLF 9184; ESP

Concept Summary: This fen system is found in the glaciated portions of the Midwest and southern Canada. Examples of this system can be located on level to sloping seepage areas, in pitted outwash or in kettle lakes associated with kettle-kame-moraine topography. Groundwater flows through marls and shallow peat soils, and groundwater is typically minerotrophic and slightly alkaline. Examples of this system contain a core fen area of graminoids surrounded by shrubs with a fairly continuous sphagnum moss layer. Herbaceous and shrub cover is variable with little to no tree cover. Characteristic species include prairie grasses such as *Andropogon gerardii* and *Spartina pectinata* with prairie forbs and sedges (*Carex* spp.). Common shrub species include *Dasiphora fruticosa ssp. floribunda*, *Cornus* spp., and *Salix* spp. Alterations in wetland hydrology and agricultural development can threaten examples of this system.

DISTRIBUTION

Range: This system is found in the northern Midwest and southern Canada.
Divisions: 201:C, 202:C
TNC Ecoregions: 35:C, 36:C, 45:C, 46:C, 47:C, 48:C, 49:P
Subnations: IA, IL, IN, MI, MN, ND, OH, ON, PA, SD, WI
Map Zones: 39:C, 40:C, 41:C, 42:C, 43:C, 49:C, 50:C, 51:C, 52:C, 62:P
USFS Ecomap Regions: 222J:CC, 222M:CC, 222U:CP, 251B:CC

CONCEPT

Associations:
- *Carex lasiocarpa - Carex oligosperma / Sphagnum* spp. Herbaceous Vegetation (CEGL002265, G3G4)
- *Cladium mariscoides - (Carex lasiocarpa, Hypericum kalmianum, Oligoneuron riddellii, Eleocharis elliptica)* Herbaceous Vegetation (CEGL005104, G2?)
- *Cornus amomum - Salix* spp. - *Toxicodendron vernix - Rhamnus lanceolata* Fen Shrubland (CEGL005087, G2G3)
- *Cornus racemosa / Carex (sterilis, aquatilis, lacustris)* Shrub Herbaceous Vegetation (CEGL006123, G2G3)
- *Cornus* spp. - *Salix* spp. - *Vaccinium corymbosum - Rhamnus alnifolia - Toxicodendron vernix* Shrubland (CEGL005083, G4?)
- *Dasiphora fruticosa* ssp. *floribunda / Carex interior - Carex flava - Sarracenia purpurea* Shrub Herbaceous Vegetation (CEGL005140, G3)
- *Dasiphora fruticosa* ssp. *floribunda / Carex sterilis - Andropogon gerardii - Arnoglossum plantagineum* Shrub Herbaceous Vegetation (CEGL005139, G3G4)
- *Symplocarpus foetidus* Herbaceous Vegetation (CEGL002385, G4?)
- *Vaccinium corymbosum - Gaylussacia baccata - Photinia melanocarpa / Calla palustris* Shrubland (CEGL005085, G2G3)

Alliances:
- *Carex (flava, hystericina, interior, sterilis)* Saturated Shrub Herbaceous Alliance (A.1561)
- *Carex oligosperma - Carex lasiocarpa* Saturated Herbaceous Alliance (A.1467)
- *Cladium mariscoides* Seasonally Flooded Herbaceous Alliance (A.1368)
- *Cornus sericea - Photinia melanocarpa - Toxicodendron vernix* Saturated Shrubland Alliance (A.1016)
- *Dasiphora fruticosa* ssp. *floribunda / Carex (flava, interior, lasiocarpa, sterilis)* Saturated Shrub Herbaceous Alliance (A.1562)
- *Symplocarpus foetidus - Caltha palustris* Saturated Herbaceous Alliance (A.1694)
- *Vaccinium corymbosum* Saturated Shrubland Alliance (A.1018)

High-ranked species: Calephelis muticum (G3), Clonophis kirtlandii (G2), Hypericum adpressum (G3), Oecanthus laricis (G1G2), Poa paludigena (G3), Valeriana edulis var. ciliata (G5T3)
Environment: Examples of this system can be located on level to sloping seepage areas, in pitted outwash or in kettle lakes associated with kettle-kame-moraine topography. Groundwater flows through marls and shallow peat soils, and groundwater is typically minerotrophic and slightly alkaline.
Vegetation: Examples of this system contain a core fen area of graminoids surrounded by shrubs with a fairly continuous sphagnum moss layer. Herbaceous and shrub cover is variable with little to no tree cover. Characteristic species include prairie grasses such as *Andropogon gerardii* and *Spartina pectinata* with prairie forbs and sedges (*Carex* spp.). Common shrub species include *Dasiphora fruticosa ssp. floribunda*, *Cornus* spp., and *Salix* spp.
Dynamics: Alterations in wetland hydrology and agricultural development can threaten examples of this system.

SOURCES

References: Comer et al. 2003, MNNHP 1993
Version: 18 Jul 2006
Concept Author: S. Menard
Stakeholders: Canada, Midwest
LeadResp: Midwest

CES202.700 NORTH-CENTRAL INTERIOR WET FLATWOODS

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Woody Wetland
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland
National Mapping Codes: EVT 2518; ESLF 9186; ESP 1518

Concept Summary: This small-patch system is found throughout the northern glaciated Midwest ranging east into Lower New England. It usually occurs on poorly drained uplands or in depressions associated with glacial features such as tillplains, lakeplains or outwash plains. Soils often have an impermeable or nearly impermeable clay layer that can create a shallow, perched water table. Saturation can vary, with ponding common during wetter seasons, and drought possible during the summer and autumn months. These fluctuating moisture levels can lead to complexes of forest upland and wetland species occurring within this system. *Quercus palustris* typically dominates and is often associated with *Quercus bicolor* and *Acer rubrum*. *Liquidambar styraciflua* and *Nyssa sylvatica* are also common associates. Understory herbaceous and shrub species present in examples of this system can vary. Stands with more dense tree cover have less shrub and herbaceous cover, while those with moderate tree canopy cover tend to have a dense understory. Some common species include *Carex* spp., *Osmunda cinnamomea, Cephalanthus occidentalis, Alnus* spp., and *Ilex* spp. Flooding, drought and fire can influence this system.

Comments: These are mostly north of the glacial line, but one association is in the Interior Low Plateau and that placement may need to be reviewed. Some examples in Michigan, Indiana, Ohio, and southern Ontario are dominated by *Fagus grandifolia* associated with oak (*Quercus* spp.) and maple species (*Acer* spp.).

DISTRIBUTION

Range: This system is found in the northern Midwest, southern Ontario, and southern portions of the northeastern U.S.
Divisions: 201:P, 202:C
TNC Ecoregions: 36:C, 44:C, 45:C, 47:?, 48:C, 49:P, 59:P, 60:P, 61:C
Subnations: CT, IA, IL, IN, MA, MI, MO, NY, OH, ON, PA
Map Zones: 41:?, 42:C, 43:C, 44:P, 47:C, 49:?, 50:?, 51:C, 52:C, 53:P, 61:C, 62:P, 63:C, 64:C, 65:C
USFS Ecomap Regions:

CONCEPT

Associations:
- *Cephalanthus occidentalis / Carex* spp. Northern Shrubland (CEGL002190, G4)
- *Fagus grandifolia - Acer saccharum - Quercus bicolor - Acer rubrum* Flatwoods Forest (CEGL005173, G2G3)
- *Fagus grandifolia - Quercus alba - (Quercus michauxii) - Acer rubrum* Flatwoods Forest (CEGL005015, G3)
- *Quercus falcata* Flatwoods Forest (CEGL004412, G2?)
- *Quercus palustris - (Quercus bicolor) - Acer rubrum / Vaccinium corymbosum / Osmunda cinnamomea* Forest (CEGL006240, GNR)
- *Quercus palustris - (Quercus stellata) - Quercus pagoda / Isoetes* spp. Forest (CEGL002101, G2G3)
- *Quercus palustris - Quercus bicolor - (Liquidambar styraciflua)* Mixed Hardwood Forest (CEGL002432, G3G4)
- *Quercus palustris - Quercus bicolor - Acer rubrum* Flatwoods Forest (CEGL005037, G2G3)
- *Quercus palustris - Quercus bicolor - Nyssa sylvatica - Acer rubrum* Sand Flatwoods Forest (CEGL002100, G2?)

Alliances:
- *Cephalanthus occidentalis* Semipermanently Flooded Shrubland Alliance (A.1011)
- *Fagus grandifolia - Quercus* spp. - *Acer* spp. Forest Alliance (A.230)
- *Quercus falcata* Forest Alliance (A.243)
- *Quercus palustris - (Quercus bicolor)* Seasonally Flooded Forest Alliance (A.329)

High-ranked species: Euphyes dukesi (G3)
Environment: This system usually occurs on poorly drained uplands or in depressions associated with glacial features such as tillplains, lakeplains or outwash plains. Soils often have an impermeable or nearly impermeable clay layer that can create a shallow, perched water table. Saturation can vary, with ponding common during wetter seasons, and drought possible during the summer and autumn months. These fluctuating moisture levels can lead to complexes of forest upland and wetland species occurring within this system.
Vegetation: *Quercus palustris* typically dominates and is often associated with *Quercus bicolor* and *Acer rubrum*. *Liquidambar styraciflua* and *Nyssa sylvatica* are also common associates. Some examples in Michigan, Indiana, Ohio, and southern Ontario are dominated by *Fagus grandifolia* associated with oak (*Quercus* spp.) and maple species (*Acer* spp.). Understory herbaceous and shrub species present in examples of this system can vary. Stands with more dense tree cover have less shrub and herbaceous cover, while those with moderate tree canopy cover tend to have a dense understory. Some common species include *Carex* spp., *Osmunda cinnamomea, Cephalanthus occidentalis, Alnus* spp., and *Ilex* spp.
Dynamics: Flooding, drought and fire can influence this system.

SOURCES

References: Braun 1950, Comer et al. 2003
Version: 11 Apr 2007 **Stakeholders:** Canada, East, Midwest, Southeast
Concept Author: S. Menard **LeadResp:** Midwest

CES202.701 NORTH-CENTRAL INTERIOR WET MEADOW-SHRUB SWAMP

Primary Division: Central Interior and Appalachian (202)

Land Cover Class: Woody Wetland
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland
Diagnostic Classifiers: Depressional [Lakeshore]; Broad-Leaved Shrub; Graminoid
National Mapping Codes: EVT ; ESLF 9185; ESP
Concept Summary: This system is found throughout the northern Midwest ranging into southern Canada. It is typically found on glacial potholes, river valleys, ponds, channels in glacial outwash, and on lakeplains. This system contains a deep to shallow area of freshwater marsh dominated by emergent species surrounded by a zone of wet meadow. The emergent marsh zone within this system contains hydric soils flooded by water ranging from several centimeters to over 1 meter for most of the growing season. Emergent marsh species such as *Typha* spp. and *Schoenoplectus* spp. dominate the core of this system. Wet meadows can surround the emergent marsh core along wet mineral soils or shallow peat with the water table typically just below the surface for most of the growing season. The vegetation in this zone of the system is dominated by sedges (*Carex* spp.) and grasses such as *Calamagrostis canadensis*. This system also can contain a zone of wet prairie species such as *Spartina pectinata*. Shrub swamps can also be associated with the wet meadows within this system. Typical shrub species include *Cornus* spp., *Salix* spp., and/or *Cephalanthus occidentalis*. Trees are generally absent and, if present, are scattered. Fire originating in adjacent uplands, as well as hydrology, can influence this system. In the absence of fire, drought and/or ditching can increase the proportion of shrubs compared to the wet meadow or prairie species.
Comments: If examples of these associations are found within a medium to large floodplain, they should be considered part of North-Central Interior Floodplain (CES202.694). The freshwater marsh component was removed from this system to create a new system, North-Central Interior Freshwater Marsh (CES202.899).

DISTRIBUTION

Range: This system is found in the northern Midwest and southern Canada.
Divisions: 201:C, 202:C
TNC Ecoregions: 35:C, 36:C, 45:C, 46:C, 47:C, 48:C, 49:?
Subnations: IA, IL, IN, MI, MN, MO, ND, OH, ON, SD, WI
Map Zones: 39:C, 40:C, 41:C, 42:C, 43:C, 44:P, 49:C, 50:C, 51:C, 52:C, 62:P
USFS Ecomap Regions:

CONCEPT

Associations:
- *Calamagrostis canadensis - Phalaris arundinacea* Herbaceous Vegetation (CEGL005174, G4G5)
- *Carex (rostrata, utriculata) - Carex lacustris - (Carex vesicaria)* Herbaceous Vegetation (CEGL002257, G4G5)
- *Carex aquatilis - Carex* spp. Herbaceous Vegetation (CEGL002262, G4?)
- *Carex atherodes* Herbaceous Vegetation (CEGL002220, G3G5)
- *Carex crinita - Osmunda* spp. / *Physocarpus opulifolius* Seep Herbaceous Vegetation (CEGL002392, G2)
- *Carex lacustris* Herbaceous Vegetation (CEGL002256, G4G5)
- *Carex stricta - Carex* spp. Herbaceous Vegetation (CEGL002258, G4?)
- *Cephalanthus occidentalis / Carex* spp. Northern Shrubland (CEGL002190, G4)
- *Cornus sericea - Salix (bebbiana, discolor, petiolaris) / Calamagrostis stricta* Shrubland (CEGL002187, G3G4)
- *Cornus sericea - Salix* spp. - (*Rosa palustris*) Shrubland (CEGL002186, G5)
- *Spartina pectinata - Calamagrostis stricta - Carex* spp. Herbaceous Vegetation (CEGL002027, G3?)
- *Spartina pectinata - Carex* spp. - *Calamagrostis canadensis - Lythrum alatum - (Oxypolis rigidior)* Herbaceous Vegetation (CEGL002224, G3?)
- *Spartina pectinata - Carex* spp. - *Calamagrostis canadensis* Sand Herbaceous Vegetation (CEGL005178, G3?)
- *Spiraea tomentosa - Salix humilis / Andropogon gerardii - Panicum virgatum* Shrubland (CEGL005069, G1Q)

Alliances:
- *Calamagrostis canadensis* Seasonally Flooded Herbaceous Alliance (A.1400)
- *Carex (rostrata, utriculata)* Seasonally Flooded Herbaceous Alliance (A.1403)
- *Carex aquatilis* Seasonally Flooded Herbaceous Alliance (A.1404)
- *Carex atherodes* Seasonally Flooded Herbaceous Alliance (A.1396)
- *Carex crinita - Osmunda* spp. / *Sphagnum* spp. Saturated Herbaceous Alliance (A.1451)
- *Carex lacustris* Seasonally Flooded Herbaceous Alliance (A.1367)
- *Carex stricta* Seasonally Flooded Herbaceous Alliance (A.1397)
- *Cephalanthus occidentalis* Semipermanently Flooded Shrubland Alliance (A.1011)
- *Cornus sericea - Salix* spp. Seasonally Flooded Shrubland Alliance (A.989)
- *Corylus americana - (Spiraea tomentosa, Malus ioensis)* Shrubland Alliance (A.897)
- *Spartina pectinata* Temporarily Flooded Herbaceous Alliance (A.1347)

High-ranked species: Calephelis muticum (G3), Clonophis kirtlandii (G2), Eleocharis wolfii (G3G4), Platanthera leucophaea (G3), Schoenoplectus hallii (G3), Scirpus ancistrochaetus (G3), Valeriana edulis var. ciliata (G5T3)
Environment: This system is typically found on glacial potholes, river valleys, ponds, channels in glacial outwash, and on lakeplains. It contains a deep to shallow area of freshwater marsh dominated by emergent species surrounded by a zone of wet meadow. The

emergent marsh zone within this system contains hydric soils flooded by water ranging from several centimeters to over 1 meter for most of the growing season.

Vegetation: Emergent marsh species such as *Typha* spp. and *Schoenoplectus* spp. dominate the core of this system. Wet meadows can surround the emergent marsh core along wet mineral soils or shallow peat with the water table typically just below the surface for most of the growing season. The vegetation in this zone of the system is dominated by sedges (*Carex* spp.) and grasses such as *Calamagrostis canadensis*. This system also can contain a zone of wet prairie species such as *Spartina pectinata*. Shrub swamps can also be associated with the wet meadows within this system. Typical shrub species include *Cornus* spp., *Salix* spp., and/or *Cephalanthus occidentalis*. Trees are generally absent and, if present, are scattered.

Dynamics: Fire originating in adjacent uplands, as well as hydrology, can influence this system. In the absence of fire, drought and/or ditching can increase the proportion of shrubs compared to the wet meadow or prairie species.

SOURCES

References: Comer and Albert 1997, Comer et al. 2003

Version: 18 Jul 2006 **Stakeholders:** Canada, Midwest, Southeast

Concept Author: S. Menard **LeadResp:** Midwest

CES202.605 NORTH-CENTRAL INTERIOR AND APPALACHIAN RICH SWAMP

Primary Division: Central Interior and Appalachian (202)

Land Cover Class: Woody Wetland

Spatial Scale & Pattern: Small patch

Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland

Diagnostic Classifiers: Temperate; Depressional; Broad-Leaved Deciduous Tree; Mesotrophic Water; Saturated Soil

National Mapping Codes: EVT ; ESLF 9306; ESP

Concept Summary: These forested wetlands are scattered throughout the north-central Midwest (south of the Laurentian region),the north-central Appalachians and southern New England at low to mid elevations. They are found in basins where higher pH and/or nutrient levels are associated with a rich flora. Species include *Acer rubrum, Fraxinus nigra*, as well as calciphilic herbs. Conifers include *Larix laricina*, but typically not *Thuja occidentalis*, which is characteristic of more northern wetland systems. There may be shrubby or herbaceous openings within the primarily wooded cover. The substrate is primarily mineral soil, but there may be some peat development.

Comments: This system occurs south of the Laurentian-Acadian region, and these circumneutral or enriched swamps are often rather distinctive and discrete elements of the landscape. They are related to Laurentian-Acadian Alkaline Conifer-Hardwood Swamp (CES201.575) but have more temperate elements and generally lack *Thuja occidentalis*. More alkaline shrub/herb fens are treated as part of North-Central Interior Shrub-Graminoid Alkaline Fen (CES202.702).

DISTRIBUTION

Range: This system is found from central New England to the southern Great Lakes and south-central Minnesota south to northern Illinois, Indiana, Ohio, Pennsylvania, and perhaps West Virginia. It is not known to extend south into the Southern Blue Ridge.

Divisions: 202:C

TNC Ecoregions: 36:C, 45:C, 46:C, 48:C, 49:P, 59:C, 60:?, 61:C

Subnations: CT, DE?, IL, IN, MA, MD, MI, MN, NJ, NY, OH, ON, PA, RI, VT, WI, WV?

Map Zones: 41:C, 49:C, 50:C, 51:C, 52:C, 53:C, 61:C, 62:C, 63:C, 64:C, 65:C

USFS Ecomap Regions: 222H:CC, 222J:CC, 222K:CC, 222L:CC, 222M:CC, 222U:CC

CONCEPT

Associations:

- *Acer (rubrum, saccharinum) - Fraxinus* spp. - *Ulmus americana* Forest (CEGL005038, G4?)
- *Fraxinus nigra - Acer rubrum - (Larix laricina) / Rhamnus alnifolia* Forest (CEGL006009, GNR)
- *Fraxinus nigra - Acer rubrum / Rhamnus alnifolia / Carex leptalea* Saturated Forest (CEGL007441, GNR)
- *Larix laricina - Acer rubrum / (Rhamnus alnifolia, Vaccinium corymbosum)* Forest (CEGL005232, G2G3)

Alliances:

- *Acer rubrum - Fraxinus pennsylvanica* Seasonally Flooded Forest Alliance (A.316)
- *Fraxinus nigra - Acer rubrum* Saturated Forest Alliance (A.347)
- *Larix laricina* Saturated Forest Alliance (A.349)

High-ranked species: Euphyes dukesi (G3), Poa paludigena (G3)

SOURCES

References: Comer et al. 2003, Fleming et al. 2005

Version: 01 Feb 2007 **Stakeholders:** Canada, East, Midwest, Southeast

Concept Author: S.C. Gawler **LeadResp:** East

Herbaceous Wetland

CES205.687 EASTERN GREAT PLAINS WET MEADOW, PRAIRIE, AND MARSH

Primary Division: Eastern Great Plains (205)
Land Cover Class: Herbaceous Wetland
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland
National Mapping Codes: EVT 2488; ESLF 9213; ESP 1488
Concept Summary: This system is found along creeks and streams from Nebraska and Iowa to Illinois, and from Minnesota to Texas. It is also found in depressions and along lake borders, especially in the northern extension of its range into Minnesota. It is often adjacent to a floodplain system but is devoid of trees and riparian vegetation. It is also distinguished from upland prairie systems by having more hydrology, especially associated with silty, dense clay soils that are often hydric, classified as Vertic Haplaquolls. The landform is usually floodplain or poorly drained, relatively level land. The vegetation is dominated by *Spartina pectinata, Tripsacum dactyloides*, numerous large sedges, such as *Carex frankii* and *Carex hyalinolepis*, and in wetter areas, *Eleocharis* spp. Other emergent marsh species such as *Typha* spp. can be associated with this system. Forbs can include *Helianthus grosseserratus, Vernonia fasciculata*, and *Physostegia virginiana*. Some parts of this system may be saline and have species such as *Distichlis spicata* and *Schoenoplectus maritimus*. Fire has been the primary influence in keeping these wet areas free of trees. Other dynamic processes include grazing and flooding (often in late spring). Many areas have been converted to agricultural, but this usually requires some sort of drainage.

DISTRIBUTION

Range: This system is found throughout the northeastern Great Plains ranging from eastern Kansas to western Illinois and north into Minnesota.
Divisions: 205:C
TNC Ecoregions: 35:C, 36:C, 45:P, 46:P
Subnations: IA, IL, KS, MN, MO, ND, NE, OK, SD, TX?
Map Zones: 31:P, 38:C, 39:C, 40:C, 41:P, 42:C, 43:C, 49:C, 50:C, 51:P, 52:P
USFS Ecomap Regions: 251A:CC, 251B:CC, 251E:CC, 251F:CC, 251G:CC, 251H:CC, 255A:PP, 332B:CP, 332C:CC, 332D:CC, 332E:CC, 332F:C?

CONCEPT

Associations:
- *Calamagrostis canadensis - Phalaris arundinacea* Herbaceous Vegetation (CEGL005174, G4G5)
- *Calamagrostis stricta - Carex sartwellii - Carex praegracilis - Plantago eriopoda* Saline Herbaceous Vegetation (CEGL002255, G2G3)
- *Carex (rostrata, utriculata) - Carex lacustris - (Carex vesicaria)* Herbaceous Vegetation (CEGL002257, G4G5)
- *Carex aquatilis - Carex* spp. Herbaceous Vegetation (CEGL002262, G4?)
- *Carex atherodes* Herbaceous Vegetation (CEGL002220, G3G5)
- *Carex lacustris* Herbaceous Vegetation (CEGL002256, G4G5)
- *Carex pellita - Calamagrostis stricta* Herbaceous Vegetation (CEGL002254, G3G5)
- *Carex stricta - Carex* spp. Herbaceous Vegetation (CEGL002258, G4?)
- *Ceratophyllum demersum - Stuckenia pectinata* Herbaceous Vegetation (CEGL004528, G4G5)
- *Cornus sericea - Salix (bebbiana, discolor, petiolaris) / Calamagrostis stricta* Shrubland (CEGL002187, G3G4)
- *Cornus sericea - Salix* spp. - (*Rosa palustris*) Shrubland (CEGL002186, G5)
- *Distichlis spicata - Schoenoplectus maritimus - Salicornia rubra* Herbaceous Vegetation (CEGL002043, G1G2)
- *Impatiens pallida - Cystopteris bulbifera - Adoxa moschatellina - (Chrysosplenium iowense, Aconitum noveboracense)* Herbaceous Vegetation (CEGL002387, G2)
- *Nuphar lutea* ssp. *advena - Nymphaea odorata* Herbaceous Vegetation (CEGL002386, G4G5)
- *Polygonum amphibium - (Polygonum hydropiperoides)* Seasonally Flooded Herbaceous Vegetation (CEGL004699, G4G5)
- *Polygonum* spp. - Mixed Forbs Herbaceous Vegetation (CEGL002430, G4G5)
- *Potamogeton nodosus* Herbaceous Vegetation (CEGL004529, GNR)
- *Potamogeton* spp. - *Ceratophyllum* spp. Midwest Herbaceous Vegetation (CEGL002282, G5)
- *Sagittaria latifolia - Leersia oryzoides* Herbaceous Vegetation (CEGL005240, GNR)
- *Sagittaria latifolia - Sagittaria longiloba* Herbaceous Vegetation (CEGL004525, GNR)
- *Schoenoplectus acutus - (Schoenoplectus fluviatilis)* Freshwater Herbaceous Vegetation (CEGL002225, G4G5)
- *Schoenoplectus fluviatilis - Schoenoplectus* spp. Herbaceous Vegetation (CEGL002221, G3G4)
- *Schoenoplectus maritimus - Atriplex patula - Eleocharis parvula* Herbaceous Vegetation (CEGL005111, G1)
- *Schoenoplectus tabernaemontani - Typha* spp. - (*Sparganium* spp., *Juncus* spp.) Herbaceous Vegetation (CEGL002026, G4G5)
- *Spartina pectinata - Calamagrostis stricta - Carex* spp. Herbaceous Vegetation (CEGL002027, G3?)

- *Spartina pectinata - Carex* spp. - *Calamagrostis canadensis - Lythrum alatum - (Oxypolis rigidior)* Herbaceous Vegetation (CEGL002224, G3?)
- *Spartina pectinata - Carex* spp. - *Calamagrostis canadensis* Sand Herbaceous Vegetation (CEGL005178, G3?)
- *Spartina pectinata - Eleocharis* spp. - *Carex* spp. Herbaceous Vegetation (CEGL002223, G2G4)
- *Spiraea tomentosa - Salix humilis / Andropogon gerardii - Panicum virgatum* Shrubland (CEGL005069, G1Q)
- *Typha (angustifolia, domingensis, latifolia) - Schoenoplectus americanus* Herbaceous Vegetation (CEGL002032, G3G4)
- *Typha latifolia - Thalia dealbata* Herbaceous Vegetation (CEGL004526, GNR)
- *Typha* spp. - *Schoenoplectus acutus* - Mixed Herbs Midwest Herbaceous Vegetation (CEGL002229, G4?)
- *Typha* spp. Midwest Herbaceous Vegetation (CEGL002233, G5)

Alliances:

- *Calamagrostis canadensis* Seasonally Flooded Herbaceous Alliance (A.1400)
- *Carex (rostrata, utriculata)* Seasonally Flooded Herbaceous Alliance (A.1403)
- *Carex aquatilis* Seasonally Flooded Herbaceous Alliance (A.1404)
- *Carex atherodes* Seasonally Flooded Herbaceous Alliance (A.1396)
- *Carex lacustris* Seasonally Flooded Herbaceous Alliance (A.1367)
- *Carex pellita* Seasonally Flooded Herbaceous Alliance (A.1414)
- *Carex stricta* Seasonally Flooded Herbaceous Alliance (A.1397)
- *Carex* spp. - *Plantago eriopoda* Temporarily Flooded Herbaceous Alliance (A.1350)
- *Cornus sericea - Salix* spp. Seasonally Flooded Shrubland Alliance (A.989)
- *Corylus americana - (Spiraea tomentosa, Malus ioensis)* Shrubland Alliance (A.897)
- *Distichlis spicata - (Hordeum jubatum)* Temporarily Flooded Herbaceous Alliance (A.1341)
- *Impatiens pallida - Cystopteris bulbifera - Adoxa moschatellina* Herbaceous Alliance (A.1598)
- *Nymphaea odorata - Nuphar* spp. Permanently Flooded Temperate Herbaceous Alliance (A.1984)
- *Polygonum* spp. (section *Persicaria*) Seasonally Flooded Herbaceous Alliance (A.1881)
- *Potamogeton* spp. - *Ceratophyllum* spp. - *Elodea* spp. Permanently Flooded Herbaceous Alliance (A.1754)
- *Sagittaria latifolia* Semipermanently Flooded Herbaceous Alliance (A.1675)
- *Schoenoplectus acutus - (Schoenoplectus tabernaemontani)* Semipermanently Flooded Herbaceous Alliance (A.1443)
- *Schoenoplectus fluviatilis* Seasonally Flooded Herbaceous Alliance (A.1387)
- *Schoenoplectus maritimus* Semipermanently Flooded Herbaceous Alliance (A.1444)
- *Spartina pectinata* Temporarily Flooded Herbaceous Alliance (A.1347)
- *Typha (angustifolia, latifolia) - (Schoenoplectus* spp.) Semipermanently Flooded Herbaceous Alliance (A.1436)
- *Typha* spp. - (*Schoenoplectus* spp., *Juncus* spp.) Seasonally Flooded Herbaceous Alliance (A.1394)

High-ranked species: Calephelis muticum (G3), Eleocharis wolfii (G3G4), Platanthera leucophaea (G3), Schoenoplectus hallii (G3)

Environment: This system is found primarily on silty and/or dense clay, hydric soils, usually classified as Vertic Haplaquolls. It is often found within poorly drained, relatively level areas.

Vegetation: *Spartina pectinata, Tripsacum dactyloides*, and numerous large sedges, such as *Carex frankii* and *Carex hyalinolepis*, dominate this system. In wetter areas, *Eleocharis* spp. and *Typha* spp. may be significant. Forbs such as *Helianthus grosseserratus, Vernonia fasciculata*, and *Physostegia virginiana* also may be common. Shrub species can be present, especially in the northern range of this system; however, they are usually insignificant compared to the prairie and meadow species.

Dynamics: Fire is the major dynamic process that helps maintain the herbaceous nature of this system and prevents trees from establishing. Grazing and periodic flooding can also influence this system.

SOURCES

References: Comer et al. 2003, Lauver et al. 1999, Steinauer and Rolfsmeier 2000

Version: 18 Jul 2006 **Stakeholders:** Canada, Midwest, Southeast

Concept Author: S. Menard and K. Kindscher **LeadResp:** Midwest

CES202.899 NORTH-CENTRAL INTERIOR FRESHWATER MARSH

Primary Division: Central Interior and Appalachian (202)

Land Cover Class: Herbaceous Wetland

Spatial Scale & Pattern: Small patch

Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland

Diagnostic Classifiers: Depressional [Lakeshore]; Graminoid; Shallow (<15 cm) Water; >180-day hydroperiod

National Mapping Codes: EVT ; ESLF 9294; ESP

Concept Summary: This system is found throughout the northern Midwest ranging into southern Canada. It is typically found on glacial potholes, along small streams, ponds, channels in glacial outwash and on lakeplains. This system contains a deep to shallow area of freshwater marsh dominated by emergent and submergent species. Stands may be open ponds with floating or rooted aquatics, or deep marsh with bulrush or cattails, and range from fairly small to several acres. It contains hydric soils flooded by water ranging from several centimeters to over 1 meter for most of the growing season. Emergent marsh species such as *Typha* spp. and

Schoenoplectus spp. dominate this system with an occasional scattering of tall *Carex* spp. and forbs that can vary from dense to open cover. Trees are generally absent and, if present, are scattered. Submergent wetlands include a variety of macrophytes.
Comments: Some of the specific communities will also be found in the floodplain system and should not be considered a separate system in that case [see North-Central Interior Floodplain (CES202.694)]. Many of these marshes also may have a border of shrubby wet-meadow species similar to North-Central Interior Wet Meadow-Shrub Swamp (CES202.701), but only those areas with a relatively narrow border (<5-10 m) should included with this system.

DISTRIBUTION

Range: This system is found in the northern Midwest and southern Canada.
Divisions: 201:C, 202:C
TNC Ecoregions: 35:C, 36:C, 45:C, 46:C, 47:C, 48:C, 49:?
Subnations: IA, IL, IN, MI, MN, MO, ND, OH, ON?, SD, WI
Map Zones: 39:C, 40:C, 41:P, 42:C, 43:C, 44:P, 49:C, 50:C, 51:C, 52:C, 62:P
USFS Ecomap Regions:

CONCEPT

Associations:
- *Nelumbo lutea* Herbaceous Vegetation (CEGL004323, G4?)
- *Nuphar lutea* ssp. *advena* - *Nymphaea odorata* Herbaceous Vegetation (CEGL002386, G4G5)
- *Phragmites australis* Eastern North America Temperate Semi-natural Herbaceous Vegetation (CEGL004141, GNA)
- *Polygonum* spp. - Mixed Forbs Herbaceous Vegetation (CEGL002430, G4G5)
- *Potamogeton* spp. - *Ceratophyllum* spp. Midwest Herbaceous Vegetation (CEGL002282, G5)
- *Schoenoplectus acutus* - *(Schoenoplectus fluviatilis)* Freshwater Herbaceous Vegetation (CEGL002225, G4G5)
- *Schoenoplectus fluviatilis* - *Schoenoplectus* spp. Herbaceous Vegetation (CEGL002221, G3G4)
- *Typha* spp. - *Schoenoplectus acutus* - Mixed Herbs Midwest Herbaceous Vegetation (CEGL002229, G4?)
- *Typha* spp. - *Schoenoplectus* spp. - Mixed Herbs Great Plains Herbaceous Vegetation (CEGL002228, G4G5)
- *Typha* spp. Midwest Herbaceous Vegetation (CEGL002233, G5)
- *Zizania (aquatica, palustris)* Herbaceous Vegetation (CEGL002382, G3G4)

Alliances:
- *Nelumbo lutea* Permanently Flooded Temperate Herbaceous Alliance (A.1671)
- *Nymphaea odorata* - *Nuphar* spp. Permanently Flooded Temperate Herbaceous Alliance (A.1984)
- *Phragmites australis* Semipermanently Flooded Herbaceous Alliance (A.1431)
- *Polygonum* spp. (section *Persicaria*) Seasonally Flooded Herbaceous Alliance (A.1881)
- *Potamogeton* spp. - *Ceratophyllum* spp. - *Elodea* spp. Permanently Flooded Herbaceous Alliance (A.1754)
- *Schoenoplectus acutus* - *(Schoenoplectus tabernaemontani)* Semipermanently Flooded Herbaceous Alliance (A.1443)
- *Schoenoplectus fluviatilis* Seasonally Flooded Herbaceous Alliance (A.1387)
- *Typha (angustifolia, latifolia)* - *(Schoenoplectus* spp.) Semipermanently Flooded Herbaceous Alliance (A.1436)
- *Zizania (aquatica, palustris)* Semipermanently Flooded Herbaceous Alliance (A.1441)

Environment: This system is typically found on glacial potholes, along small streams, ponds, channels in glacial outwash, and on lakeplains. This system contains a deep to shallow area of freshwater marsh dominated by emergent and submergent species. It contains hydric soils flooded by water ranging from several centimeters to over 1 meter for most of the growing season.
Vegetation: This system contains a deep to shallow area of freshwater marsh dominated by emergent and submergent species. Stands may be open ponds with floating or rooted aquatics, or deep marsh with bulrush or cattails, and range from fairly small to several acres. Emergent marsh species such as *Typha* spp. and *Schoenoplectus* spp. dominate this system with an occasional scattering of tall *Carex* spp. and forbs that can vary from dense to open cover. Trees are generally absent and, if present, are scattered. Submergent wetlands include a variety of macrophytes.

SOURCES

References: Comer and Albert 1997, Midwestern Ecology Working Group n.d.
Version: 18 Jul 2006 **Stakeholders:** Canada, Midwest, Southeast
Concept Author: S. Menard **LeadResp:** Midwest

CES203.518 NORTHERN ATLANTIC COASTAL PLAIN PONDSHORE

Primary Division: Gulf and Atlantic Coastal Plain (203)
Land Cover Class: Herbaceous Wetland
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland
National Mapping Codes: EVT ; ESLF 9283; ESP
Concept Summary: This system includes vegetation of groundwater-flooded depressions characterized by a flora generally restricted to the Coastal Plain from the southern portion of the Delmarva peninsula to Cape Cod, Massachusetts. Ponds may contain permanent water, such as the deep glacial kettleholes of Cape Cod and Long Island, New York, or may be shallow basins where groundwater

drops below the surface late in the growing season. This system occurs on sandy deposits such as outwash plains of the glaciated region (Long Island and Cape Cod), on the deep sands of the New Jersey Pine Barrens, or on finer sediments of the Coastal Plain of Cape May, New Jersey, the Delmarva peninsula, and the Chesapeake Bay region. The vegetation of steeper-sided basins (generally those containing permanent water) are characterized by strong zonation, with a border of tall shrubs, such as *Vaccinium corymbosum*, and several essentially concentric bands or zones dominated by different associations, depending on geography. Characteristic species in Massachusetts and Long Island include *Rhexia virginica, Cyperus dentatus, Gratiola aurea, Panicum verrucosum, Euthamia caroliniana (= Euthamia tenuifolia), Carex striata, Juncus pelocarpus, Rhynchospora capillacea, Rhynchospora macrostachya, Xyris difformis, Fimbristylis autumnalis, Scleria reticularis, Sabatia kennedyana, Drosera filiformis, Juncus militaris*, and many others.

Ponds of the New Jersey Pine Barrens share many of these species, with others including *Juncus repens, Muhlenbergia torreyi, Rhynchospora oligantha, Rhynchospora cephalantha, Rhynchospora chalarocephala*, and many others. In shallow basins, such strong zonation is generally lacking but still remains evident in some cases. On Cape Cod, Long Island, and New Jersey, this system most often occurs within the pitch pine barrens.

From Cape May and south, the system occurs within an upland matrix of mixed hardwood forests and generally supports a seasonally flooded swamp forest characterized by *Liquidambar styraciflua, Acer rubrum*, wetland oaks such as *Quercus phellos*, and in Virginia and scattered locations on the Inner Coastal Plain of Maryland *Nyssa biflora*. The vegetation is characterized by many of the species from New England, New York and New Jersey and also includes *Juncus repens, Boltonia asteroides, Fimbristylis perpusilla, Coelorachis rugosa, Dichanthelium spretum, Saccharum giganteum, Eleocharis quadrangulata*, and others. *Cephalanthus occidentalis* often occurs as scattered individuals or as a shrub swamp with less diversity and cover of Coastal Plain flora.
Comments: In some cases, these are locally known as "Delmarva bays."

DISTRIBUTION

Range: This system ranges from the southern portion of the Delmarva peninsula to Cape Cod, Massachusetts, and also in limited, highly disjunct occurrences on sand lakeplain near southern Lake Michigan and in southeastern Vermont.
Divisions: 202:C, 203:C
TNC Ecoregions: 48:C, 58:C, 61:C, 62:C
Subnations: DE, MA, MD, MI, NJ, NY, VA, VT, WI
Map Zones: 49:?, 51:C, 60:C, 63:P, 64:P, 65:C
USFS Ecomap Regions: 212T:CC, 222J:CC, 222R:CC

CONCEPT

Associations:
- *Calamagrostis canadensis - Dichanthelium meridionale* - (Mixed Shrub) Herbaceous Vegetation (CEGL006243, GNR)
- *Carex striata* var. *brevis* Herbaceous Vegetation (CEGL004120, G3G4)
- *Cephalanthus occidentalis / Polygonum hydropiperoides - Panicum verrucosum* Shrubland (CEGL006242, G3?)
- *Cladium mariscoides - Coelorachis rugosa* Herbaceous Vegetation (CEGL006332, G1)
- *Cladium mariscoides - Eleocharis equisetoides* Herbaceous Vegetation (CEGL006016, GNR)
- *Decodon verticillatus / Triadenum virginicum* Shrubland (CEGL006087, GNR)
- *Decodon verticillatus* Semipermanently Flooded Shrubland (CEGL005089, GNR)
- *Dulichium arundinaceum - Juncus canadensis - Juncus pelocarpus* Herbaceous Vegetation (CEGL006415, GNR)
- *Eleocharis (obtusa, flavescens) - Eriocaulon aquaticum* Herbaceous Vegetation (CEGL006261, G3G5)
- *Eleocharis flavescens - Xyris difformis* Herbaceous Vegetation (CEGL006400, GNR)
- *Eragrostis hypnoides - Ludwigia sphaerocarpa - Polygonum hydropiperoides* Herbaceous Vegetation (CEGL006608, GNR)
- *Eriocaulon aquaticum - Lobelia dortmanna* Herbaceous Vegetation (CEGL006346, GNR)
- *Fraxinus pennsylvanica - Juglans nigra - Ulmus americana / Cornus amomum / Onoclea sensibilis* Forest (CEGL006918, GNR)
- *Juncus militaris - Eriocaulon aquaticum* Herbaceous Vegetation (CEGL006345, GNR)
- *Juncus repens - Boltonia asteroides* Herbaceous Vegetation (CEGL006610, GNR)
- *Leersia hexandra - (Panicum verrucosum, Scleria reticularis)* Herbaceous Vegetation [Provisional] (CEGL004047, G2G3)
- *Liquidambar styraciflua - Acer rubrum - Nyssa biflora / Carex joorii* Forest (CEGL006223, G1G2)
- *Liquidambar styraciflua - Acer rubrum - Quercus phellos / Leucothoe racemosa* Forest (CEGL006110, G4G5)
- *Lysimachia terrestris - Dulichium arundinaceum - Rhexia virginica* Herbaceous Vegetation (CEGL006035, G2G3)
- *Nymphaea odorata - Eleocharis robbinsii* Herbaceous Vegetation (CEGL006086, G2)
- *Panicum hemitomon - Panicum verrucosum* Herbaceous Vegetation (CEGL006338, GNR)
- *Panicum virgatum* Seasonally Flooded Herbaceous Vegetation (CEGL004128, GNR)
- *Populus heterophylla - Acer rubrum - Quercus palustris - Liquidambar styraciflua* Forest (CEGL006469, GNR)
- *Rhexia virginica - Crotalaria sagittalis* Herbaceous Vegetation (CEGL006300, G2)
- *Rhexia virginica - Panicum verrucosum* Herbaceous Vegetation (CEGL006264, G2G3)
- *Rhynchospora capitellata - Cyperus dentatus - Rhexia virginica - Xyris difformis* Herbaceous Vegetation (CEGL006210, G2)
- *Rhynchospora capitellata - Rhexia virginica - Rhynchospora scirpoides - Schoenoplectus hallii* Herbaceous Vegetation (CEGL005108, G2?)

- *Saccharum giganteum - (Dichanthelium spretum, Panicum verrucosum)* Herbaceous Vegetation (CEGL006609, G1G2)
- *Spartina pectinata* North Atlantic Coast Herbaceous Vegetation (CEGL006095, GNR)
- *Taxodium distichum - Nyssa biflora* Chesapeake Bay Forest (CEGL006214, GNR)
- *Taxodium distichum - Taxodium ascendens / Panicum hemitomon - Sclerolepis uniflora* Woodland (CEGL004465, G1)
- *Taxodium distichum - Taxodium ascendens / Panicum hemitomon* Woodland (CEGL004466, G3?)
- *Vaccinium corymbosum - Rhododendron viscosum - Clethra alnifolia* Shrubland (CEGL006371, G4)

Alliances:

- *Acer (rubrum, saccharinum) - Ulmus americana* Temporarily Flooded Forest Alliance (A.299)
- *Acer rubrum - Fraxinus pennsylvanica* Seasonally Flooded Forest Alliance (A.316)
- *Calamagrostis canadensis* Seasonally Flooded Herbaceous Alliance (A.1400)
- *Carex striata* Seasonally Flooded Herbaceous Alliance (A.1426)
- *Cephalanthus occidentalis* Seasonally Flooded Shrubland Alliance (A.988)
- *Cladium mariscoides* Saturated Herbaceous Alliance (A.1447)
- *Cladium mariscoides* Seasonally Flooded Herbaceous Alliance (A.1368)
- *Decodon verticillatus* Seasonally Flooded Shrubland Alliance (A.990)
- *Decodon verticillatus* Semipermanently Flooded Shrubland Alliance (A.1013)
- *Dulichium arundinaceum* Seasonally Flooded Herbaceous Alliance (A.1398)
- *Eleocharis* spp. - *Eriocaulon aquaticum* Semipermanently Flooded Herbaceous Alliance (A.1429)
- *Eragrostis hypnoides - Lipocarpha micrantha - Micranthemum umbrosum* Seasonally Flooded Herbaceous Alliance (A.1816)
- *Juncus militaris* Semipermanently Flooded Herbaceous Alliance (A.1430)
- *Juncus repens - Eleocharis microcarpa* Seasonally Flooded Herbaceous Alliance (A.1376)
- *Liquidambar styraciflua - (Acer rubrum)* Seasonally Flooded Forest Alliance (A.321)
- *Nymphaea odorata - Nuphar* spp. Permanently Flooded Temperate Herbaceous Alliance (A.1984)
- *Panicum hemitomon* Seasonally Flooded Temperate Herbaceous Alliance (A.1379)
- *Panicum virgatum* Seasonally Flooded Herbaceous Alliance (A.1362)
- *Rhynchospora* spp. - *Panicum (rigidulum, verrucosum) - Rhexia virginica* Seasonally Flooded Herbaceous Alliance (A.1384)
- *Spartina pectinata* Temporarily Flooded Herbaceous Alliance (A.1347)
- *Taxodium distichum - (Taxodium ascendens)* Seasonally Flooded Lakeshore Woodland Alliance (A.652)
- *Taxodium distichum - Nyssa (aquatica, biflora, ogeche)* Seasonally Flooded Forest Alliance (A.337)
- *Vaccinium formosum - Vaccinium fuscatum - Vaccinium corymbosum* Seasonally Flooded Shrubland Alliance (A.992)

High-ranked species: Clonophis kirtlandii (G2), Coreopsis rosea (G3), Dichanthelium hirstii (G1), Eulimnadia agassizii (G1G2), Eupatorium leucolepis var. novae-angliae (G5T1), Eupatorium resinosum (G3), Euthamia galetorum (G3), Fimbristylis perpusilla (G2), Helenium virginicum (G3), Hypericum adpressum (G3), Lobelia boykinii (G2G3), Lycopodiella margueritiae (G2), Lycopodiella subappressa (G2), Oxypolis canbyi (G2), Papaipema sulphurata (G2), Rhexia aristosa (G3), Sabatia kennedyana (G3), Sagittaria teres (G3), Schoenoplectus etuberculatus (G3G4), Scirpus ancistrochaetus (G3)

SOURCES

References: Comer et al. 2003, Eastern Ecology Working Group n.d.
Version: 02 Feb 2007 **Stakeholders:** East, Midwest, Southeast
Concept Author: SC. Gawler, R. Evans, L. Sneddon, M. Pyne **LeadResp:** East

Mixed Upland and Wetland

CES202.694 NORTH-CENTRAL INTERIOR FLOODPLAIN

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Mixed Upland and Wetland
Spatial Scale & Pattern: Linear
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland; Wetland
National Mapping Codes: EVT ; ESLF 9338; ESP
Concept Summary: This system is found along rivers across the glaciated Midwest. It occurs from river's edge across the floodplain or to where it meets a wet meadow system. It can have a variety of soil types found within the floodplain from very well-drained sandy substrates to very dense clays. It is this variety of substrates and flooding that creates the mix of vegetation that includes *Acer saccharinum, Populus deltoides*, willows, especially *Salix nigra* in the wettest areas, and *Fraxinus pennsylvanica, Ulmus americana*, and *Quercus macrocarpa* in more well-drained areas. Within this system are oxbows that may support *Nelumbo lutea* and *Typha latifolia*. Understory species are mixed, but include shrubs, such as *Cornus drummondii* and *Asimina triloba* (in Kansas), sedges and grasses, which sometimes help form savanna vegetation. Flooding is the primary dynamic process, but drought, grazing, and fire have all had historical influence on this system. Federal reservoirs have had a serious and negative effect on this system, along with agriculture that has converted much of this system to drained agricultural land.

Comments: The distribution limit northward is considered to be the Laurentian region boundary. This system is distinguished from floodplain systems northeastward, Laurentian-Acadian Floodplain Forest (CES201.587), and eastward, Central Appalachian River Floodplain (CES202.608). *Celtis* and *Populus deltoides* are absent (or essentially so) from the Laurentian-Acadian type.

DISTRIBUTION

Range: This system is found along medium and large river floodplains throughout the glaciated Midwest ranging from eastern Kansas and western Missouri to western Ohio and north along the Red River basin in Minnesota.
Divisions: 202:C, 205:C
TNC Ecoregions: 35:C, 36:C, 45:C, 46:C, 47:?, 48:?
Subnations: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
Map Zones: 38:C, 39:C, 40:C, 42:C, 43:C, 44:P, 49:C, 50:C, 51:C, 52:C
USFS Ecomap Regions: 222H:CC, 222I:CC, 222J:CC, 222K:CC, 222L:CC, 222M:CC, 223A:CC, 251B:CC, 251E:CC, 251F:CC, 251G:CC, 251H:CC, 255A:CC, 332B:CC, 332C:CC, 332D:CC, 332E:CC

CONCEPT

Associations:
- *Acer saccharinum - Celtis laevigata - Carya illinoinensis* Forest (CEGL002431, G3G4)
- *Acer saccharinum - Ulmus americana* Forest (CEGL002586, G4?)
- *Acer saccharum - Carya cordiformis / Asimina triloba* Floodplain Forest (CEGL005035, G2)
- *Betula nigra - Platanus occidentalis* Forest (CEGL002086, G5)
- *Brasenia schreberi* Herbaceous Vegetation (CEGL004527, G4?)
- *Calamagrostis canadensis - Juncus* spp. - *Carex* spp. Sandhills Herbaceous Vegetation (CEGL002028, G3G4)
- *Calamagrostis stricta - Carex sartwellii - Carex praegracilis - Plantago eriopoda* Saline Herbaceous Vegetation (CEGL002255, G2G3)
- *Carex (rostrata, utriculata) - Carex lacustris - (Carex vesicaria)* Herbaceous Vegetation (CEGL002257, G4G5)
- *Carex pellita - Carex* spp. - *Schoenoplectus tabernaemontani* Fen Herbaceous Vegetation (CEGL002041, G1)
- *Carex* spp. - *(Carex pellita, Carex vulpinoidea)* Herbaceous Vegetation (CEGL005272, GNR)
- *Carya illinoinensis - Celtis laevigata* Forest (CEGL002087, G4?)
- *Cephalanthus occidentalis / Carex* spp. - *Lemna* spp. Southern Shrubland (CEGL002191, G4)
- *Cephalanthus occidentalis / Carex* spp. Northern Shrubland (CEGL002190, G4)
- *Fagus grandifolia - Quercus* spp. - *Acer rubrum - Juglans nigra* Forest (CEGL005014, G2G3)
- *Fraxinus pennsylvanica - (Ulmus americana) / Symphoricarpos occidentalis* Forest (CEGL002088, G4?)
- *Fraxinus pennsylvanica - Celtis occidentalis - Tilia americana - (Quercus macrocarpa)* Forest (CEGL002081, G4?)
- *Fraxinus pennsylvanica - Celtis* spp. - *Quercus* spp. - *Platanus occidentalis* Bottomland Forest (CEGL002410, G3G4)
- *Fraxinus pennsylvanica - Ulmus americana - (Acer negundo, Tilia americana)* Northern Forest (CEGL002089, G3G4)
- *Fraxinus pennsylvanica - Ulmus* spp. - *Celtis occidentalis* Forest (CEGL002014, G3G5)
- *Nelumbo lutea* Herbaceous Vegetation (CEGL004323, G4?)
- *Nuphar lutea* ssp. *advena - Nymphaea odorata* Herbaceous Vegetation (CEGL002386, G4G5)
- *Phalaris arundinacea* Eastern Herbaceous Vegetation (CEGL006044, GNA)
- *Pinus strobus - (Pinus resinosa) - Quercus rubra* Forest (CEGL002480, G4)
- *Populus deltoides - (Salix nigra) / Spartina pectinata - Carex* spp. Woodland (CEGL002017, G1)
- *Populus deltoides - Fraxinus pennsylvanica* Forest (CEGL000658, G2G3)
- *Populus deltoides - Platanus occidentalis* Forest (CEGL002095, G1G2)
- *Populus deltoides - Salix nigra* Forest (CEGL002018, G3G4)
- *Potamogeton* spp. - *Ceratophyllum* spp. Midwest Herbaceous Vegetation (CEGL002282, G5)
- *Quercus alba - Quercus rubra - Carya ovata* Glaciated Forest (CEGL002068, G4?)
- *Quercus macrocarpa - Quercus bicolor - (Celtis occidentalis)* Woodland (CEGL002140, G1)
- *Quercus macrocarpa - Quercus bicolor - Carya laciniosa / Leersia* spp. - *Cinna* spp. Forest (CEGL002098, G2G3)
- *Quercus macrocarpa - Quercus shumardii - Carya cordiformis / Chasmanthium latifolium* Forest (CEGL004544, G3?)
- *Quercus macrocarpa / Andropogon gerardii - Hesperostipa spartea* Woodland (CEGL002053, G2G3)
- River Mud Flats Sparse Vegetation (CEGL002314, GNR)
- Riverine Sand Flats - Bars Sparse Vegetation (CEGL002049, G4G5)
- *Sagittaria latifolia - Leersia oryzoides* Herbaceous Vegetation (CEGL005240, GNR)
- *Salix interior* Temporarily Flooded Shrubland (CEGL008562, G4G5)
- *Salix nigra* Forest (CEGL002103, G4)
- *Salix* spp. / *Andropogon gerardii - Sorghastrum nutans* Gravel Wash Herbaceous Vegetation (CEGL005175, G2Q)
- *Sarcobatus vermiculatus / Distichlis spicata - (Puccinellia nuttalliana)* Shrub Herbaceous Vegetation (CEGL002146, GNR)
- *Schoenoplectus fluviatilis - Schoenoplectus* spp. Herbaceous Vegetation (CEGL002221, G3G4)
- *Schoenoplectus tabernaemontani - Typha* spp. - (*Sparganium* spp., *Juncus* spp.) Herbaceous Vegetation (CEGL002026, G4G5)
- *Symphoricarpos occidentalis* Shrubland (CEGL001131, G4G5)
- *Typha latifolia - Equisetum hyemale - Carex (hystericina, pellita)* Seep Herbaceous Vegetation (CEGL002033, G3)

- *Typha* spp. Midwest Herbaceous Vegetation (CEGL002233, G5)

Alliances:

- *Acer saccharinum* Temporarily Flooded Forest Alliance (A.279)
- *Acer saccharum - Carya cordiformis* Temporarily Flooded Forest Alliance (A.302)
- *Andropogon gerardii - (Sorghastrum nutans)* Temporarily Flooded Herbaceous Alliance (A.1337)
- *Betula nigra - (Platanus occidentalis)* Temporarily Flooded Forest Alliance (A.280)
- *Brasenia schreberi* Permanently Flooded Herbaceous Alliance (A.1742)
- *Carex (rostrata, utriculata)* Seasonally Flooded Herbaceous Alliance (A.1403)
- *Carex pellita - (Carex nebrascensis) - Schoenoplectus* spp. Saturated Herbaceous Alliance (A.1466)
- *Carex pellita* Seasonally Flooded Herbaceous Alliance (A.1414)
- *Carex* spp. - *Plantago eriopoda* Temporarily Flooded Herbaceous Alliance (A.1350)
- *Carex* spp. - *Typha* spp. Saturated Herbaceous Alliance (A.1465)
- *Carya illinoinensis - (Celtis laevigata)* Temporarily Flooded Forest Alliance (A.282)
- *Cephalanthus occidentalis* Semipermanently Flooded Shrubland Alliance (A.1011)
- *Fagus grandifolia* Temporarily Flooded Forest Alliance (A.284)
- *Fraxinus pennsylvanica - (Ulmus americana)* Temporarily Flooded Forest Alliance (A.308)
- *Fraxinus pennsylvanica - Ulmus americana - Celtis (occidentalis, laevigata)* Temporarily Flooded Forest Alliance (A.286)
- *Nelumbo lutea* Permanently Flooded Temperate Herbaceous Alliance (A.1671)
- *Nymphaea odorata - Nuphar* spp. Permanently Flooded Temperate Herbaceous Alliance (A.1984)
- *Phalaris arundinacea* Seasonally Flooded Herbaceous Alliance (A.1381)
- *Pinus strobus - Quercus (alba, rubra, velutina)* Forest Alliance (A.401)
- *Platanus occidentalis - (Fraxinus pennsylvanica, Celtis laevigata, Acer saccharinum)* Temporarily Flooded Forest Alliance (A.288)
- *Populus deltoides* Temporarily Flooded Forest Alliance (A.290)
- *Populus deltoides* Temporarily Flooded Woodland Alliance (A.636)
- *Potamogeton* spp. - *Ceratophyllum* spp. - *Elodea* spp. Permanently Flooded Herbaceous Alliance (A.1754)
- *Quercus alba - (Quercus rubra, Carya* spp.) Forest Alliance (A.239)
- *Quercus macrocarpa - Quercus (alba, ellipsoidalis, velutina)* Woodland Alliance (A.619)
- *Quercus macrocarpa - Quercus bicolor - (Carya laciniosa)* Temporarily Flooded Forest Alliance (A.293)
- *Quercus macrocarpa* Woodland Alliance (A.620)
- *Sagittaria latifolia* Semipermanently Flooded Herbaceous Alliance (A.1675)
- *Salix (exigua, interior)* Temporarily Flooded Shrubland Alliance (A.947)
- *Salix nigra* Temporarily Flooded Forest Alliance (A.297)
- *Sarcobatus vermiculatus* Shrub Herbaceous Alliance (A.1535)
- *Schoenoplectus fluviatilis* Seasonally Flooded Herbaceous Alliance (A.1387)
- *Spartina pectinata* Temporarily Flooded Herbaceous Alliance (A.1347)
- *Symphoricarpos occidentalis* Temporarily Flooded Shrubland Alliance (A.961)
- *Typha (angustifolia, latifolia) - (Schoenoplectus* spp.) Semipermanently Flooded Herbaceous Alliance (A.1436)
- *Typha* spp. - (*Schoenoplectus* spp., *Juncus* spp.) Seasonally Flooded Herbaceous Alliance (A.1394)
- Non-tidal Mudflat Seasonally/Temporarily Flooded Sparsely Vegetated Alliance (A.1878)
- Sand Flats Temporarily Flooded Sparsely Vegetated Alliance (A.1864)

Environment: This ecological system occurs in floodplains of medium to large rivers. It primarily is found on alluvial soils ranging from sandy to very dense clays.

Vegetation: The variety of soil properties associated with this system can create a mixture of vegetation. *Acer saccharinum* occurs on the wetter soils of floodplains in the eastern portion of this system, with *Populus deltoides* and willows, especially *Salix nigra*, occurring more in the western range of this system. *Fraxinus pennsylvanica, Ulmus americana*, and *Quercus macrocarpa* occur in more well-drained areas. Understory species can vary across the range of this system but can include shrubs such as *Cornus drummondii* and *Asimina triloba*, and sedge and grass species. Oxbows within this system may have species such as *Nelumbo lutea* and *Typha latifolia*.

Dynamics: This system is primarily controlled by moderate to frequent flooding. Grazing can also impact this system and can lead to decreased cover of many graminoid species in some areas.

SOURCES

References: Comer et al. 2003

Version: 18 Jul 2006 **Stakeholders:** Canada, Midwest, Southeast

Concept Author: S. Menard and K. Kindscher **LeadResp:** Midwest

Barren

CES202.689 CENTRAL INTERIOR ACIDIC CLIFF AND TALUS

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Barren
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Unvegetated (<10% vasc.); Upland
National Mapping Codes: EVT ; ESLF 3149; ESP
Concept Summary: This system is found primarily in the Interior Highlands, including the Ozarks, Ouachita, and Interior Low Plateau ecoregions, extending marginally north and west along the Missouri and Mississippi rivers. Sandstone outcrops and talus ranging from moist to dry typify this system. It is typically sparsely vegetated; however, on moister sites with more soil development, several fern species and sedges (*Carex* spp.) can establish. Wind and water erosion are the major dynamic processes influencing this system.
Comments: In Kentucky, this system covers the sandstone cliffs of the Shawnee Hills (Interior Low Plateau). In Illinois, one exemplary example is the "Garden of the Gods" in the Shawnee National Forest.

DISTRIBUTION

Range: This system is found primarily in the Interior Highlands, including the Ozark, Ouachita, and Interior Low Plateau ecoregions. It extends marginally into the Central Tallgrass Prairie Ecoregion along the Missouri and Mississippi rivers.
Divisions: 202:C
TNC Ecoregions: 36:C, 38:C, 39:C, 44:C
Subnations: AR, IA?, IL, IN, KY, MO, TN
Map Zones: 43:P, 44:C, 47:C, 48:C, 49:C, 53:C
USFS Ecomap Regions:

CONCEPT

Associations:
- *(Carex interior, Carex lurida) - Carex leptalea - Parnassia grandifolia - Rhynchospora capillacea* Herbaceous Vegetation (CEGL002404, G2G3)
- *(Hydrangea arborescens, Ribes cynosbati) / Deschampsia flexuosa - Dryopteris marginalis - Dennstaedtia punctilobula* Shrubland (CEGL007820, G2?)
- Chert Ozark Dry Cliff Sparse Vegetation (CEGL002285, G3?)
- Chert Ozark Moist Cliff Sparse Vegetation (CEGL002288, G2G3)
- Igneous Ozark Dry Cliff Sparse Vegetation (CEGL002286, G4)
- Igneous Ozark Moist Cliff Sparse Vegetation (CEGL002289, G4Q)
- Igneous Ozark Talus Sparse Vegetation (CEGL005203, G4)
- *Osmunda cinnamomea - Rhynchospora capitellata - Heuchera parviflora* var. *puberula - Xyris jupicai* Herbaceous Vegetation (CEGL007837, G1Q)
- Sandstone Dry Cliff Sparse Vegetation (CEGL002045, G4G5)
- Sandstone Interior Highlands Talus Sparse Vegetation (CEGL002309, G4G5)
- Sandstone Midwest Moist Cliff Sparse Vegetation (CEGL002287, G4G5)

Alliances:
- *(Hydrangea* spp., *Philadelphus* spp.) / *Heuchera* spp. Shrubland Alliance (A.1905)
- *Carex crinita - Osmunda* spp. / *Sphagnum* spp. Saturated Herbaceous Alliance (A.1451)
- *Carex lurida - Carex leptalea - (Carex atlantica, Carex interior, Parnassia grandifolia)* Saturated Herbaceous Alliance (A.1452)
- Lowland Talus Sparsely Vegetated Alliance (A.1847)
- Open Cliff Sparsely Vegetated Alliance (A.1836)

Environment: Sandstone outcrops and talus ranging from moist to dry typify this system.
Vegetation: This system is typically sparsely vegetated; however, on moister sites with more soil development, several fern species and sedges (*Carex* spp.) can establish. Some taxa that could be present include *Ribes cynosbati, Deschampsia flexuosa, Dryopteris marginalis*, and *Dennstaedtia punctilobula*, as well as *Carex interior, Carex lurida, Carex leptalea, Parnassia grandifolia, Rhynchospora capillacea, Osmunda cinnamomea, Rhynchospora capitellata, Heuchera parviflora var. puberula*, and *Xyris jupicai* on wetter sites.
Dynamics: Wind and water erosion are the major dynamic processes influencing this system.

SOURCES

References: Comer et al. 2003, Evans 1991
Version: 17 Apr 2006
Concept Author: S. Menard, T. Foti, R. Evans
Stakeholders: East, Midwest, Southeast
LeadResp: Midwest

CES202.690 CENTRAL INTERIOR CALCAREOUS CLIFF AND TALUS

Primary Division: Central Interior and Appalachian (202)
Land Cover Class: Barren
Spatial Scale & Pattern: Small patch
Required Classifiers: Natural/Semi-natural; Unvegetated (<10% vasc.); Upland
National Mapping Codes: EVT ; ESLF 3148; ESP
Concept Summary: This system is found primarily in non-Appalachian portions of the Central Interior Division. It ranges from the Ouachitas east to the Cumberlands and north into the Western Allegheny Plateau and Lake states. Limestone and dolomite outcrops and talus distinguish this system. Examples range from moist to dry and from sparsely to moderately well-vegetated. Woodland species such as *Thuja occidentalis* can establish along the ridgetops. Understory species can range from grassland species, such as *Andropogon gerardii* on drier slopes, to more mesic species in areas with higher moisture and more soil development. Wind and water erosion along with fire are the primary natural dynamics influencing this system. Some associations included here are rocky openings in forest stands, sometimes with moisture present from groundwater seepage. Also included are wet and dry cliffs. The flora of these wetter examples may include (across the broad range of the system) *Aconitum noveboracense, Adiantum capillus-veneris, Adoxa moschatellina, Aquilegia canadensis, Asplenium rhizophyllum, Boehmeria cylindrica, Chrysosplenium iowense, Cystopteris bulbifera, Cystopteris bulbifera, Dichanthelium depauperatum, Heuchera americana, Heuchera americana var. hirsuticaulis, Heuchera villosa var. arkansana, Hydrangea arborescens, Impatiens pallida, Lobelia siphilitica, Toxicodendron radicans,* and *Woodsia obtusa*.
Comments: Similar examples in the driftless region of Minnesota, Wisconsin, Iowa and Illinois should be considered part of Paleozoic Plateau Bluff and Talus (CES202.704).

DISTRIBUTION

Range: This system is found primarily in non-Appalachian portions of the Central Interior Division.
Divisions: 201:?, 202:C, 205:P
TNC Ecoregions: 36:C, 38:C, 39:C, 44:C, 45:C, 46:C, 47:?, 48:C, 49:C
Subnations: AR, IA, IL, IN, KY?, MI, MN, MO, NY, OH, OK, PA, TN, WI
Map Zones: 41:?, 42:P, 43:P, 44:C, 47:C, 48:C, 49:P, 50:C, 51:C, 52:C, 53:C, 61:C, 62:C, 63:C, 64:C
USFS Ecomap Regions: 222M:CC

CONCEPT

Associations:
- *(Hydrangea arborescens, Toxicodendron radicans) / Heuchera americana - (Dichanthelium depauperatum, Woodsia obtusa)* Shrubland (CEGL004395, G3?)
- *Acer saccharum - Tilia americana - Fraxinus americana / Ostrya virginiana / Geranium robertianum* Woodland (CEGL005058, G3G5)
- *Adiantum capillus-veneris - Boehmeria cylindrica - Lobelia siphilitica* Herbaceous Vegetation (CEGL004728, G2G3)
- *Andropogon gerardii - Chasmanthium latifolium - Amsonia tabernaemontana* var. *salicifolia* Herbaceous Vegetation (CEGL004739, G2G3)
- *Cystopteris bulbifera - Asplenium rhizophyllum* Ozark Sparse Vegetation [Provisional] (CEGL008486, GNR)
- *Hydrangea arborescens / Heuchera (americana* var. *hirsuticaulis, villosa* var. *arkansana) - Aquilegia canadensis* Shrubland (CEGL007819, G3?)
- *Hydrangea arborescens / Impatiens (capensis, pallida) - Heuchera villosa* Shrubland (CEGL004708, G3)
- *Impatiens pallida - Cystopteris bulbifera - Adoxa moschatellina - (Chrysosplenium iowense, Aconitum noveboracense)* Herbaceous Vegetation (CEGL002387, G2)
- Limestone - Dolostone Midwest Dry Cliff Sparse Vegetation (CEGL002291, G4G5)
- Limestone - Dolostone Midwest Moist Cliff Sparse Vegetation (CEGL002292, G4G5)
- Limestone - Dolostone Talus Sparse Vegetation (CEGL002308, G4G5)
- *Rhus aromatica - Celtis tenuifolia / Carex eburnea* Shrubland (CEGL004393, G3)
- *Schizachyrium scoparium - Bouteloua curtipendula* Bedrock Bluff Herbaceous Vegetation (CEGL002245, G3G4)
- *Schizachyrium scoparium - Sporobolus compositus* var. *compositus - Rudbeckia fulgida* var. *fulgida* Wooded Herbaceous Vegetation (CEGL004078, G2)
- Small Eroding Bluffs Midwestern Sparse Vegetation (CEGL002315, GNR)
- *Thuja occidentalis / Carex eburnea - Pellaea atropurpurea* Woodland (CEGL002596, G2G3)
- *Thuja occidentalis* Cliff Woodland (CEGL002451, G3)

Alliances:
- *(Hydrangea* spp., *Philadelphus* spp.) / *Heuchera* spp. Shrubland Alliance (A.1905)
- *(Juniperus virginiana) / Schizachyrium scoparium - (Bouteloua curtipendula)* Wooded Herbaceous Alliance (A.1919)
- *Adiantum capillus-veneris* Saturated Herbaceous Alliance (A.1683)
- *Andropogon gerardii - (Sorghastrum nutans)* Temporarily Flooded Herbaceous Alliance (A.1337)
- *Cystopteris bulbifera - Asplenium rhizophyllum* Sparsely Vegetated Alliance (A.1834)
- *Impatiens pallida - Cystopteris bulbifera - Adoxa moschatellina* Herbaceous Alliance (A.1598)

- *Juniperus virginiana - Rhus aromatica* Shrubland Alliance (A.1049)
- *Schizachyrium scoparium - Bouteloua curtipendula* Herbaceous Alliance (A.1225)
- *Thuja occidentalis* Woodland Alliance (A.544)
- *Tilia americana - Fraxinus americana - (Acer saccharum)* Woodland Alliance (A.628)
- Lowland Talus Sparsely Vegetated Alliance (A.1847)
- Open Cliff Sparsely Vegetated Alliance (A.1836)
- Small Eroding Bluffs Sparsely Vegetated Alliance (A.1872)

Environment: Limestone and dolomite outcrops and talus distinguish this system. Examples range from moist to dry and from sparsely to moderately well-vegetated. Some examples are rocky openings in forest stands, sometimes with moisture present from groundwater seepage. Also included are wet and dry cliffs.

Vegetation: Examples range from moist to dry and from sparsely to moderately well-vegetated. Woodland species such as *Thuja occidentalis* can establish along the ridgetops. Understory species can range from grassland species, such as *Andropogon gerardii* on drier slopes, to more mesic species in areas with higher moisture and more soil development. The flora of some moister examples (e.g., rocky openings in forest stands, with moisture present from groundwater seepage as well as wet cliffs) includes (across the broad range of the system) *Aconitum noveboracense, Adiantum capillus-veneris, Adoxa moschatellina, Aquilegia canadensis, Asplenium rhizophyllum, Boehmeria cylindrica, Chrysosplenium iowense, Cystopteris bulbifera, Cystopteris bulbifera, Dichanthelium depauperatum, Heuchera americana, Heuchera americana var. hirsuticaulis, Heuchera villosa var. arkansana, Hydrangea arborescens, Impatiens pallida, Lobelia siphilitica, Toxicodendron radicans*, and *Woodsia obtusa*.

Dynamics: Wind and water erosion along with fire are the primary natural dynamics influencing this system.

SOURCES

References: Comer et al. 2003, Evans 1991

Version: 01 Feb 2007 **Stakeholders:** East, Midwest, Southeast

Concept Author: S. Menard **LeadResp:** Midwest

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Appendix 5. Terrestrial Conservation Targets: Plant Communities

The plant community targets are listed in order of GELCODE. As noted in the report, all plant communities, regardless of rarity, served as coarse-filter targets for this assessment.

Key to column headings

Common Name The common name of the plant community target

GELCODE The unique identifier (or "Global Element Code"), used by NatureServe and Heritage Programs, of the plant community

Global Rank The global conservation status ranking assigned to this species by NatureServe; values range from G1 (critically imperiled) to G5 (demonstrably widespread, abundant, and secure). Range G-ranks, such as G4G5, indicate uncertainty about the precise rank but confidence that the rank is within the range of those two values. A "Q" suffix indicates uncertainty about the classification of the community type. See www.natureserve.org/explorer/ranking.htm for more information on global ranks.

Distribution The geographic distribution of this target relative to the Central Tallgrass Prairie ecoregion; endemic = 90% or more of the target's range is in the ecoregion of interest; limited = a substantial majority of the target's range is in the ecoregion of interest, but its range also extends into one or a few other ecoregions; widespread = the target is distributed broadly in several to many ecoregions, with relatively even distribution across many or most of those ecoregions, including the ecoregion of interest; peripheral = less than approximately 10% of this target's range is in the ecoregion of interest

Spatial Pattern The spatial pattern formed by this community on the landscape.
Matrix (MX) communities are dominant in the landscape and form extensive and contiguous cover. They naturally occur(red) in patches ranging from 2,000 to 100,000's hectares.
Large patch (LP) communities form discrete patches on the landscape; under natural conditions, typical examples would range in size from approximately 50 – 2,000 hectares.
Small patch (SP) communities/systems form small, discrete areas of vegetation cover. Under natural conditions, these occurrences would generally be up to 50 hectares.
Linear (LI) communities/systems occur as linear strips and are often ecotonal between terrestrial and aquatic ecosystems. They typically naturally range from approximately .5 – 100 kilometers in length.

Common Name	*GELCODE*	*Global Rank*	*Distribution*	*Spatial Pattern*
Bur Oak / Hazelnut Woodland	CEGL000556	G3	Peripheral	SP
Cottonwood - Green Ash Floodplain Forest	CEGL000658	G2G3	Peripheral	LP
Western Wheatgrass Mixedgrass Prairie	CEGL001577	G3G5Q	Peripheral	SP
White Oak - Hickory Forest	CEGL002011	G3	Limited	LP
Basswood - Bur Oak Forest	CEGL002012	G3	Limited	LP
Central Green Ash - Elm - Hackberry Forest	CEGL002014	G3G5	Widespread	LI
Midwestern Cottonwood - Black Willow Forest	CEGL002018	G3G4	Widespread	LI
Sandhills Wet-Mesic Prairie	CEGL002023	G3?	Peripheral	LP
Central Wet-mesic Tallgrass Prairie	CEGL002024	G2G3	Limited	LP
Central Tallgrass Big Bluestem Loess Prairie	CEGL002025	G2	Endemic	MX
Bulrush - Cattail - Bur-reed Shallow Marsh	CEGL002026	G4G5	Widespread	LP
Northern Cordgrass Wet Prairie	CEGL002027	G3?	Peripheral	LP
Sandhills Wet Prairie	CEGL002028	G3G4	Peripheral	SP

Common Name	*GELCODE*	*Global Rank*	*Distribution*	*Spatial Pattern*
Central Tallgrass Saline Meadow	CEGL002031	G2G3	Endemic	LP
Southern Great Plains Cattail - Bulrush Marsh	CEGL002032	G3G4	Widespread	SP
Great Plains Neutral Seep	CEGL002033	G3	Widespread	SP
Loess Hills Little Bluestem Dry Prairie	CEGL002035	G2	Endemic	LP
Little Bluestem Loess Mixedgrass Prairie	CEGL002036	G3?	Limited	LP
Needle-and-Thread - Blue Grama Mixedgrass Prairie	CEGL002037	G5	Peripheral	LP
Central Tallgrass Fen	CEGL002041	G1	Limited	SP
Eastern Great Plains Saline Marsh	CEGL002043	G1G2	Widespread	SP
Midwest Dry Sandstone Cliff	CEGL002045	G4G5	Widespread	LI
Riverine Sand Flat	CEGL002049	G4G5	Widespread	LI
Western Tallgrass Bur Oak Mesic Woodland	CEGL002052	G1G2	Limited	SP
Western Tallgrass Bur Oak Woodland	CEGL002053	G2G3	Limited	LP
White Oak - Red Oak - Sugar Maple Mesic Forest	CEGL002058	G3?	Peripheral	LP
Central Maple - Basswood Forest	CEGL002061	G3G4	Limited	LP
North-Central Maple - Basswood Forest	CEGL002062	G3G4	Peripheral	LP
Aspen / American Hazel Forest	CEGL002063	G5	Peripheral	SP
White Oak / Dogwood Dry-mesic Forest	CEGL002066	GNR	Peripheral	LP
White Oak - Red Oak Dry-Mesic Acid Forest	CEGL002067	G3	Peripheral	SP
Midwestern White Oak - Red Oak Forest	CEGL002068	G4?	Widespread	MX
White Oak - Mixed Oak Dry-Mesic Alkaline Forest	CEGL002070	G4G5	Peripheral	LP
Northern Bur Oak Mesic Forest	CEGL002072	G4	Peripheral	SP
Black Oak - White Oak - Hickory Forest	CEGL002076	G4?	Peripheral	LP
Black Oak Forest	CEGL002078	G4?	Peripheral	LP
River Birch - Sycamore Small River Floodplain Forest	CEGL002086	G5	Widespread	LP
Pecan - Sugarberry Forest	CEGL002087	G4?	Peripheral	LI
Cottonwood - Sycamore Forest	CEGL002095	G1G2	Peripheral	SP
Bur Oak - Swamp White Oak Mixed Bottomland Forest	CEGL002098	G2G3	Widespread	LI
Pin Oak - Swamp White Oak Sand Flatwoods	CEGL002100	G2?	Limited	LP
Black Willow Riparian Forest	CEGL002103	G4	Widespread	LI
Black Ash - Mixed Hardwood Swamp	CEGL002105	G4	Peripheral	SP
Chinquapin Oak - Red Cedar Dry Alkaline Forest	CEGL002108	G3G4	Peripheral	LP
Central Midwest White Oak - Mixed Oak Woodland	CEGL002134	G1Q	Endemic	LP
Bur Oak Bottomland Woodland	CEGL002140	G1	Limited	SP
North-central Dry-Mesic Oak Woodland	CEGL002142	G3G4	Limited	LP
Chinquapin Oak - Ash / Little Bluestem Woodland	CEGL002143	G3G4	Peripheral	LP
Chinquapin Oak - Bur Oak Ravine Woodland	CEGL002145	G2	Limited	LP
Post Oak - Blackjack Oak Cross Timbers Woodland	CEGL002147	G4	Peripheral	SP
White Oak - Post Oak / Bluestem Ozark Woodland	CEGL002150	G2G3	Peripheral	SP
Northern Bur Oak Opening	CEGL002158	G1G2	Peripheral	LP
Central Bur Oak Opening	CEGL002159	G1	Endemic	LP

Common Name	GELCODE	Global Rank	Distribution	Spatial Pattern
Dogwood - Willow Swamp	CEGL002186	G5	Peripheral	LP
Northern Buttonbush Swamp	CEGL002190	G4	Widespread	LP
Flint Hills Tallgrass Prairie	CEGL002201	G4?	Peripheral	MX
Northern Mesic Tallgrass Prairie	CEGL002202	G2G3	Peripheral	LP
Central Mesic Tallgrass Prairie	CEGL002203	G1G2	Limited	MX
Unglaciated Mesic Tallgrass Prairie	CEGL002204	G3	Peripheral	MX
Midwest Dry-Mesic Sand Prairie	CEGL002210	G3	Widespread	LP
Midwest Dry-Mesic Prairie	CEGL002214	G2G3	Widespread	MX
Midwest Dry Gravel Prairie	CEGL002215	G3	Limited	LP
River Bulrush Marsh	CEGL002221	G3G4	Widespread	LP
Southern Great Plains Cordgrass Wet Prairie	CEGL002223	G2G4	Peripheral	LP
Central Cordgrass Wet Prairie	CEGL002224	G3?	Limited	LP
Midwest Mixed Emergent Deep Marsh	CEGL002229	G4?	Widespread	LP
Midwest Cattail Deep Marsh	CEGL002233	G5	Widespread	LP
Ozark Sandstone Glade	CEGL002242	G3	Peripheral	LP
Little Bluestem Bedrock Bluff Prairie	CEGL002245	G3G4	Peripheral	SP
Little Bluestem Hardpan Prairie	CEGL002249	G2?	Peripheral	LP
Ozark Limestone Glade	CEGL002251	G2	Peripheral	LP
Tussock Sedge Wet Meadow	CEGL002258	G4?	Peripheral	LP
Northern Sedge Poor Fen	CEGL002265	G3G4	Peripheral	LP
Midwest Pondweed Submerged Aquatic Wetland	CEGL002282	G5	Widespread	SP
Ozark Dry Chert Cliff	CEGL002285	G3?	Peripheral	SP
Midwest Moist Sandstone Cliff	CEGL002287	G4G5	Widespread	LI
Ozark Moist Chert Cliff	CEGL002288	G2G3	Peripheral	LI
Ozark Moist Igneous Cliff	CEGL002289	G4Q	Peripheral	LI
Midwest Dry Limestone - Dolostone Cliff	CEGL002291	G4G5	Widespread	LI
Midwest Moist Limestone - Dolostone Cliff	CEGL002292	G4G5	Widespread	LI
Midwest Limestone - Dolostone Talus	CEGL002308	G4G5	Widespread	SP
River Mud Flats	CEGL002314	GNR	Widespread	LI
Midwestern Small Eroding Bluffs	CEGL002315	GNR	Widespread	LI
Midwest Dry Sand Prairie	CEGL002318	G2G3	Widespread	LP
Skunk-cabbage Seepage Meadow	CEGL002385	G4?	Widespread	SP
Water-lily Aquatic Wetland	CEGL002386	G4G5	Widespread	SP
Algific Talus Slope	CEGL002387	G2	Peripheral	SP
Post Oak Central Dry Barrens	CEGL002391	G2G3	Peripheral	LP
Midwest Sand Seep	CEGL002392	G2	Peripheral	SP
North-central Dry Limestone - Dolomite Prairie	CEGL002403	G2	Peripheral	LP
Ash - Oak - Sycamore Mesic Bottomland Forest	CEGL002410	G3G4	Limited	LP
Sinkhole Pond Marsh	CEGL002413	G3G4	Peripheral	SP
Central Shale Glade	CEGL002428	G2	Peripheral	SP

Common Name	*GELCODE*	*Global Rank*	*Distribution*	*Spatial Pattern*
Midwest Ephemeral Pond	CEGL002430	G4G5	Widespread	SP
Silver Maple - Sugarberry - Pecan Floodplain Forest	CEGL002431	G3G4	Peripheral	LP
Pin Oak Mixed Hardwood Forest	CEGL002432	G3G4	Peripheral	LP
Black Oak / Lupine Barrens	CEGL002492	G3	Limited	LP
Silver Maple - Elm Forest	CEGL002586	G4?	Widespread	LI
American Lotus Aquatic Wetland	CEGL004323	G4?	Widespread	SP
Beech - Maple Glaciated Forest	CEGL005013	G3G4	Peripheral	LP
Beech - Mixed Hardwood Floodplain Forest	CEGL005014	G2G3	Peripheral	LP
Red Oak - Sugar Maple - Elm Forest	CEGL005017	GNRQ	Peripheral	LP
Black Oak - White Oak / Blueberry Forest	CEGL005030	G4?	Peripheral	LP
Box-elder Floodplain Forest	CEGL005033	G4G5	Widespread	LP
Maple - Hickory Mesic Floodplain Forest	CEGL005035	G2	Peripheral	LP
Northern (Great Lakes) Flatwoods	CEGL005037	G2G3	Limited	SP
Maple - Ash - Elm Swamp Forest	CEGL005038	G4?	Peripheral	LP
Rich Northern Hardwood Woodland	CEGL005058	G3G5	Peripheral	SP
Hardhack Wet-Mesic Sand Shrub Meadow	CEGL005069	G1Q	Endemic	SP
Dogwood - Willow - Poison Sumac Shrub Fen	CEGL005087	G2G3	Peripheral	SP
Leatherleaf Kettle Bog	CEGL005092	G3G4	Peripheral	SP
Mesic Sand Tallgrass Prairie	CEGL005096	G2	Widespread	LP
Twig-rush Wet Prairie	CEGL005104	G2?	Peripheral	SP
Inland Coastal Plain Marsh	CEGL005108	G2?	Peripheral	SP
Inland Saline Marsh	CEGL005111	G1	Limited	SP
Central Limestone Glade	CEGL005131	G2G3	Widespread	SP
Cinquefoil - Sedge Prairie Fen	CEGL005139	G3G4	Widespread	SP
Central Wet-Mesic Sand Tallgrass Prairie	CEGL005177	G2G3	Limited	LP
Central Cordgrass Wet Sand Prairie	CEGL005178	G3?	Limited	LP
North-central Dry-Mesic Limestone - Dolomite Prairie	CEGL005179	G2	Peripheral	SP
Swamp White Oak Woodland	CEGL005181	G1	Endemic	LP
Midwest Glacial Drift - Loess Hill Prairie	CEGL005183	G2	Endemic	SP
Northern Sandstone Talus	CEGL005202	G4G5	Peripheral	
Dakota Sandstone Tallgrass Prairie	CEGL005231	G3?	Peripheral	MX
Arrowhead - Rice Cutgrass Marsh	CEGL005240	GNR	Widespread	SP
Central Midwest Sedge Meadow	CEGL005272	GNR	Limited	LI
Central Dry-Mesic Limestone - Dolomite Prairie	CEGL005280	G1G2	Limited	SP
Central Tallgrass Post Oak Woodland	CEGL005281	G1G3	Limited	SP
Chinquapin Oak Limestone - Dolomite Savanna	CEGL005284	G2G3	Limited	LP
Sandbar Willow Shrubland	CEGL008562	G4G5	Widespread	SP

Appendix 6. Natural Community Pattern by Biophysical Unit.

This appendix provides a comprehensive list of likely Euro-American presettlement natural community occurrence pattern by terrestrial stratification unit in the CTP ecoregion. Pattern of occurrence definitions are defined below and include:

Matrix – communities formed the characteristic vegetation type of the ecoregion and dominated a landscape generally 2,000 to 100,000 hectares in size. Occur on the most extensive landforms and typically have wide ecological tolerances. Typically, the aggregate of all matrix communities historically covered as much as 75-80% of the natural vegetation of the ecoregion. Matrix community types are often influenced by large-scale processes (e.g. climate, fire) and are important habitat for wide-ranging or large area-dependent fauna, such as large herbivores or birds like bison and/or prairie chickens. These communities shape the dynamics of the landscape where they occur, influencing the biological and physical relationships of the embedded smaller community types.

Large Patch – communities typically formed blocks of 50 to 2,000 hectares within the above matrix. These communities are associated with environmental conditions that are more specific than those of matrix communities, and that are less common or less extensive in the landscape. Historically, the aggregation of all large patch communities in the ecoregion covered as much as 20% of the natural vegetation. These types are usually embedded within matrix communities.

Small Patch/Linear – communities tend to be less than 50 hectares in size. They occur in very specific ecological settings, such as on specialized landform types or in unusual microhabitats; and historically covered only as much as 5% of the natural vegetation of the ecoregion. Small patch community types are characterized by localized, small-scale ecological processes that can be quite different from the large-scale processes operating in the overall landscape. The specialized conditions of small patch communities, however, are often dependent on the maintenance of ecological processes in the surrounding matrix and large patch communities. In the CTP, small patch communities contain a disproportionately large percentage of the total flora, and also support a specific and restricted set of associated fauna dependent on specialized conditions.

Natural Community Conservation Target			Stratification Unit					
			1	2	3	4	5	6
Element Code	Common Name	Description	Western Till Plain	Lower Platte / MO River	Central Till Plain	MS/IL River	Eastern Till Plain	Knk Sands
CEGL002404	Ozark Fen	*(Carex interior, Carex lurida) - Carex leptalea - Parnassia grandifolia - Rhynchospora capillacea* Herbaceous Vegetation						
CEGL005038	Maple-Ash-Elm Swamp Forest	*Acer (rubrum, saccharinum) - Fraxinus* spp. *- Ulmus americana* Forest		LP	LP	LP		LP
CEGL005033	Box-elder Floodplain Forest	*Acer negundo* Forest		LP	LP	LP		
CEGL002431	Silver Maple - Sugarberry - Pecan Floodplain Forest	*Acer saccharinum - Celtis laevigata - Carya illinoinensis* Forest		LP	LP	LP	SP	SP
CEGL002586	Silver Maple - Elm - (Cottonwood) Forest	*Acer saccharinum - Ulmus americana - (Populus deltoides)* Forest		LI	LI	LI	LI	LI
CEGL002061	Central Maple - Basswood Forest	*Acer saccharum - Acer nigrum - Tilia americana - Quercus rubra / Ostrya virginiana* Forest		SP	SP	SP	SP	
CEGL005035	Maple - Hickory Mesic Floodplain Forest	*Acer saccharum - Carya cordiformis / Asimina triloba* Floodplain Forest		LP	LP	LP	LP	
CEGL005058	Rich Northern Hardwood Woodland	*Acer saccharum - Tilia americana - Fraxinus americana / Ostrya virginiana / Geranium robertianum* Woodland				SP		
CEGL002062	North-Central Maple - Basswood Forest	*Acer saccharum - Tilia americana / Ostrya virginiana - Carpinus caroliniana* Forest			SP	LP	LP	
CEGL005177	Central Wet-Mesic Sand Tallgrass Prairie	*Andropogon gerardii - Calamagrostis canadensis* Sand Herbaceous Vegetation				LP	LP	LP
CEGL002202	Northern Mesic Tallgrass Prairie	*Andropogon gerardii - Hesperostipa spartea - Sporobolus heterolepis* Herbaceous Vegetation						
CEGL002024	Central Wet-mesic Tallgrass Prairie	*Andropogon gerardii - Panicum virgatum - Helianthus grosseserratus* Herbaceous Vegetation	SP	LP	LP	LP	LP	LP
CEGL005231	Dakota Sandstone Tallgrass Prairie	*Andropogon gerardii - Panicum virgatum - Schizachyrium scoparium - (Tradescantia tharpii)* Herbaceous Vegetation	MX					
CEGL002023	Sandhills Wet-Mesic Prairie	*Andropogon gerardii - Panicum virgatum* Sandhills Herbaceous Vegetation	LP					
CEGL002203	Central Mesic Tallgrass Prairie	*Andropogon gerardii - Sorghastrum nutans - (Sporobolus heterolepis) - Liatris* spp. *- Ratibida pinnata* Herbaceous Vegetation	LP	LP	MX	LP	MX	LP
CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	*Andropogon gerardii - Sorghastrum nutans - Hesperostipa spartea* Loess Hills Herbaceous Vegetation	MX	LP				
CEGL005096	Mesic Sand Tallgrass Prairie	*Andropogon gerardii - Sorghastrum nutans - Schizachyrium scoparium - Aletris farinosa* Herbaceous Vegetation				LP	LP	MX
CEGL002201	Flint Hills Tallgrass Prairie	*Andropogon gerardii - Sorghastrum nutans - Schizachyrium scoparium* Flint Hills Herbaceous Vegetation	MX					
CEGL002204	Unglaciated Mesic Tallgrass Prairie	*Andropogon gerardii - Sorghastrum nutans* Unglaciated Herbaceous Vegetation	LP					
CEGL002086	River Birch - Sycamore Small River Floodplain Forest	*Betula nigra - Platanus occidentalis* Forest	SP	SP	LP	LP		
CEGL002028	Sandhills Wet Prairie	*Calamagrostis canadensis - Juncus* spp. *- Carex* spp. Sandhills Herbaceous Vegetation	SP					
CEGL002413	Sinkhole Pond Marsh	*Carex comosa - Carex decomposita - Dulichium arundinaceum - Lycopus rubellus Herbaceous Vegetation*			SP	SP		
CEGL002392	Midwest Sand Seep	*Carex crinita - Osmunda spp. / Physocarpus opulifolius* Seep Herbaceous Vegetation				SP		
CEGL002265	Northern Sedge Poor Fen	*Carex lasiocarpa - Carex oligosperma / Sphagnum* spp. Herbaceous Vegetation				SP		
CEGL002041	Central Tallgrass Fen	*Carex pellita - Carex* spp. *- Schoenoplectus tabernaemontani* Fen Herbaceous Vegetation		SP	SP	SP	SP	
CEGL005272	Central Midwest Sedge Meadow	*Carex* spp. *- (Carex pellita, Carex vulpinoidea)* Herbaceous Vegetation	SP	SP	SP	SP		
CEGL002258	Tussock Sedge Wet Meadow	*Carex stricta - Carex* spp. Herbaceous Vegetation		SP	SP	SP	LP	LP
CEGL002087	Pecan - Sugarberry Forest	*Carya illinoinensis - Celtis laevigata* Forest		LI	LI	LI	LI	
CEGL002190	Northern Buttonbush Swamp	*Cephalanthus occidentalis / Carex* spp. Northern Shrubland				LP	LP	
CEGL005092	Leatherleaf Kettle Bog	*Chamaedaphne calyculata / Carex oligosperma - Eriophorum virginicum* Dwarf-shrubland						SP
CEGL002288	Ozark Moist Chert Cliff	Chert Ozark Moist Cliff Sparse Vegetation				LI		
CEGL005104	Twig-rush Wet Prairie	*Cladium mariscoides - (Carex lasiocarpa, Hypericum kalmianum, Oligoneuron riddellii, Eleocharis elliptica)* Herbaceous Vegetation						SP
CEGL005087	Dogwood - Willow - Poison Sumac Shrub Fen	*Cornus amomum - Salix spp. - Toxicodendron vernix - Rhamnus lanceolata* Fen Shrubland						
CEGL002186	Dogwood - Willow Swamp	*Cornus sericea - Salix* spp. *- (Rosa palustris*) Shrubland			SP	LP		
CEGL005139	Cinquefoil - Sedge Prairie Fen	*Dasiphora fruticosa* ssp. *floribunda / Carex sterilis - Andropogon gerardii - Arnoglossum plantagineum* Shrub Herbaceous Vegetation				SP	SP	SP
CEGL002031	Central Tallgrass Saline Meadow	*Distichlis spicata - Hordeum jubatum - (Poa arida, Iva annua)* Herbaceous Vegetation	SP		SP			

Natural Community Conservation Target			Stratification Unit					
			1	2	3	4	5	6
Element Code	Common Name	Description	Western Till Plain	Lower Platte / MO River	Central Till Plain	MS/IL River	Eastern Till Plain	Knk Sands
CEGL002043	Eastern Great Plains Saline Marsh	*Distichlis spicata - Schoenoplectus maritimus - Salicornia rubra* Herbaceous Vegetation	SP	SP				
CEGL005013	Beech-Maple Glaciated Forest	*Fagus grandifolia - Acer saccharum* Glaciated Midwest Forest					LP	LP
CEGL005014	Beech - Mixed Hardwood Floodplain Forest	*Fagus grandifolia - Quercus spp. - Acer rubrum - Juglans nigra Forest*						SP
CEGL002105	Black Ash-Mixed Hardwood Swamp	*Fraxinus nigra* - Mixed Hardwoods - Conifers / *Cornus sericea / Carex* spp. Forest					SP	
CEGL002410	Ash - Oak - Sycamore Mesic Bottomland Forest	*Fraxinus pennsylvanica - Celtis spp. - Quercus spp. - Platanus occidentalis* Bottomland Forest		LP	LP	LP		
CEGL002014	Central Green Ash - Elm - Hackberry Forest	*Fraxinus pennsylvanica - Ulmus* spp. - *Celtis occidentalis* Forest	LI	LI	LI	LI		LI
CEGL002037	Needle-and-Thread - Blue Grama Mixedgrass Prairie	*Hesperostipa comata - Bouteloua gracilis - Carex filifolia* Herbaceous Vegetation	SP					
CEGL002289	Ozark Moist Igneous Cliff	Igneous Ozark Moist Cliff Sparse Vegetation			LI			
CEGL005203	Ozark Igneous Talus	Igneous Ozark Talus Sparse Vegetation						
CEGL002387	Algific Talus Slope	*Impatiens pallida - Cystopteris bulbifera - (Chrysosplenium iowense, Aconitum noveboracense)* Herbaceous Vegetation				SP		
CEGL002291	Midwest Dry Limestone - Dolostone Cliff	Limestone - Dolostone Midwest Dry Cliff Sparse Vegetation			LI	LI		
CEGL002292	Midwest Moist Limestone - Dolostone Cliff	Limestone - Dolostone Midwest Moist Cliff Sparse Vegetation			LI	LI	LI	
CEGL002308	Midwest Limestone - Dolostone Talus	Limestone - Dolostone Talus Sparse Vegetation			LI	LI		
CEGL004323	American Lotus Aquatic Wetland	*Nelumbo lutea Herbaceous Vegetation*						
CEGL002386	Water-lily Aquatic Wetland	*Nuphar lutea* ssp. *advena - Nymphaea odorata* Herbaceous Vegetation		SP	SP	SP	SP	SP
CEGL002285	Ozark Dry Chert Cliff	Ozark Dry Cliff Sparse Vegetation						
CEGL001577	Western Wheatgrass Mixedgrass Prairie	*Pascopyrum smithii* Herbaceous Vegetation	LP	SP				
CEGL002430	Midwest Ephemeral Pond	*Polygonum* spp. - Mixed Forbs Herbaceous Vegetation		SP	SP	SP	SP	
CEGL000658	Cottonwood - Green Ash Floodplain Forest	*Populus deltoides - Fraxinus pennsylvanica* Forest	SP	LP	SP	SP		
CEGL002095	Cottonwood - Sycamore Forest	*Populus deltoides - Platanus occidentalis* Forest	SP	SP	SP	SP	SP	SP
CEGL002018	Midwestern Cottonwood - Black Willow Forest	*Populus deltoides - Salix nigra* Forest		LI	LI	LI	LI	
CEGL002063	Aspen / American Hazel Forest	*Populus tremuloides / Corylus americana Forest*					SP	
CEGL002282	Midwest Pondweed Submerged Aquatic Wetland	*Potamogeton* spp. - *Ceratophyllum* spp. Midwest Herbaceous Vegetation	SP	SP	SP	SP		SP
CEGL002134	Central Midwest White Oak - Mixed Oak Woodland	*Quercus alba - (Carya ovata) / Carex pensylvanica* Glaciated Woodland	SP	LP	LP	LP	LP	
CEGL002011	White Oak - Hickory Forest	*Quercus alba - (Quercus velutina) - Carya ovata / Ostrya virginiana* Forest	SP	SP	LP	LP		
CEGL002142	North-central Dry-Mesic Oak Woodland	*Quercus alba - Quercus macrocarpa - Quercus rubra / Corylus americana* Woodland	LP	LP	LP	LP		
CEGL002067	White Oak - Red Oak Dry-Mesic Acid Forest	*Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida* Acid Forest			SP			
CEGL002068	Midwestern White Oak - Red Oak Forest	*Quercus alba - Quercus rubra - Carya ovata* Glaciated Forest			MX	MX	MX	
CEGL002070	White Oak-Mixed Oak/Redbud Dry-mesic Alkaline Forest	*Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis* Forest		SP	SP	LP	SP	
CEGL002150	White Oak - Post Oak / Bluestem Ozark Woodland	*Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland*		SP	LP	LP		
CEGL002066	White Oak/Dogwood Dry-mesic Forest	*Quercus alba / Cornus florida* Unglaciated Forest		LP	LP			
CEGL005181	Swamp White Oak Woodland	*Quercus bicolor - (Quercus macrocarpa, Quercus stellata)* Woodland			SP	LP	LP	
CEGL002159	Central Bur Oak Openings	*Quercus macrocarpa - (Quercus alba, Quercus stellata) / Andropogon gerardii* Wooded Herbaceous		LP	LP	LP	LP	
CEGL002140	Bur Oak Bottomland Woodland	*Quercus macrocarpa - Quercus bicolor - (Celtis occidentalis)* Woodland			SP	LP	LP	
CEGL002098	Bur Oak - Swamp White Oak Mixed Bottomland Forest	*Quercus macrocarpa - Quercus bicolor - Carya laciniosa / Leersia* spp. - *Cinna* spp. Forest		LI	LI	LI	LI	LI
CEGL002072	Northern Bur Oak Mesic Forest	*Quercus macrocarpa / (Amelanchier alnifolia, Cornus drummondii) / Aralia nudicaulis Forest*	SP	SP				
CEGL002053	Western Tallgrass Bur Oak Woodland	*Quercus macrocarpa / Andropogon gerardii - Hesperostipa spartea* Woodland	SP	LP	LP			
CEGL002052	Western Tallgrass Bur Oak Mesic Woodland	*Quercus macrocarpa / Andropogon gerardii - Panicum virgatum* Woodland		LP	LP			

Natural Community Conservation Target			Stratification Unit					
			1	2	3	4	5	6
Element Code	Common Name	Description	Western Till Plain	Lower Platte / MO River	Central Till Plain	MS/IL River	Eastern Till Plain	Knk Sands
CEGL000556	Bur Oak / Hazelnut Woodland	*Quercus macrocarpa / Corylus americana - Amelanchier alnifolia* Woodland		SP	SP	LP	LP	LP
CEGL002158	Northern Bur Oak Opening	*Quercus macrocarpa Northern Tallgrass* Wooded Herbaceous Vegetation			LP	SP		
CEGL002428	Central Shale Glade	*Quercus marilandica - (Juniperus virginiana) / Schizachyrium scoparium - Danthonia spicata* Wooded Herbaceous Vegetation			SP	SP	SP	
CEGL002143	Chinquapin Oak - Ash / Little Bluestem Woodland	*Quercus muehlenbergii - Fraxinus (quadrangulata, americana) / Schizachyrium scoparium Woodland*		SP	SP			
CEGL002108	Chinquapin Oak - Red Cedar Dry Alkaline Forest	*Quercus muehlenbergii - Juniperus virginiana - Acer saccharum / Frangula caroliniana* Forest			SP	SP		
CEGL005131	Central Limestone Glade	*Quercus muehlenbergii - Juniperus virginiana / Schizachyrium scoparium - Manfreda virginica* Wooded Herbaceous Vegetation	SP	SP	SP	SP	SP	
CEGL002145	Chinquapin Oak - Bur Oak Ravine Woodland	*Quercus muehlenbergii - Quercus macrocarpa / Andropogon gerardii Ravine Woodland*		SP	SP	SP		
CEGL005284	Chinquapin Oak Limestone - Dolomite Savanna	*Quercus muehlenbergii / Schizachyrium scoparium - Bouteloua curtipendula* Wooded Herbaceous Vegetation	LP	SP				
CEGL002432	Pin Oak Mixed Hardwood Forest	*Quercus palustris - Quercus bicolor - (Liquidambar styraciflua)* Mixed Hardwood Forest		LP	LP	LP		
CEGL005037	Northern (Great Lakes) Flatwoods	*Quercus palustris - Quercus bicolor - Acer rubrum* Flatwoods Forest						SP
CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	*Quercus palustris - Quercus bicolor - Nyssa sylvatica - Acer rubrum* Sand Flatwoods Forest						SP
CEGL005017	Red Oak - Sugar Maple - Elm Forest	*Quercus rubra - (Acer saccharum, Quercus alba)* Forest				LP	LP	LP
CEGL002391	Post Oak Central Dry Barrens	*Quercus stellata - Quercus marilandica / Schizachyrium scoparium* Wooded Herbaceous Vegetation		LP	LP	LP		
CEGL002147	Post Oak - Blackjack Oak Cross Timbers Woodland	*Quercus stellata - Quercus marilandica / Schizachyrium scoparium Woodland*	SP					
CEGL005281	Central Tallgrass Post Oak Woodland	*Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland*		SP	LP	SP		
CEGL002492	Black Oak / Lupine Barrens	*Quercus velutina - (Quercus alba) - Quercus ellipsoidalis / Schizachyrium scoparium - Lupinus perennis* Wooded Herbaceous Vegetation		LP	LP	LP	LP	LP
CEGL002076	Black Oak - White Oak - Hickory Forest	*Quercus velutina - Quercus alba - Carya (glabra, ovata)* Forest		LP	LP	LP	LP	
CEGL005030	Black Oak - White Oak / Blueberry Forest	*Quercus velutina - Quercus alba / Vaccinium (angustifolium, pallidum) / Carex pensylvanica* Forest		SP	SP	LP		
CEGL002078	Black Oak Forest	*Quercus velutina / Carex pensylvanica* Forest		SP	SP	LP	SP	
CEGL005108	Inland Coastal Plain Marsh	Rhynchospora capitellata - Rhexia virginica - Rhynchospora scirpoides - Schoenoplectus hallii Herbaceous Vegetation						SP
CEGL002314	River Mud Flats	River Mud Flats Sparse Vegetation		LI	LI	LI	LI	LI
CEGL002049	Riverine Sand Flats - Bars Sparse Vegetation	Riverine Sand Flats - Bars Sparse Vegetation		LI	LI	LI	LI	LI
CEGL005240	Arrowhead - Rice Cutgrass Marsh	*Sagittaria latifolia - Leersia oryzoides* Herbaceous Vegetation		SP	SP	SP		
CEGL008562	Sandbar Willow Shrubland	Salix interior Temporarily Flooded Shrubland	SP	SP	SP	SP		
CEGL002103	Black Willow Riparian Forest	Salix nigra Forest		SP	SP		SP	
CEGL002045	Midwest Sandstone Dry Cliff	Sandstone Dry Cliff Sparse Vegetation			LI	LI	LI	
CEGL002287	Midwest Moist Sandstone Cliff	Sandstone Midwest Moist Cliff Sparse Vegetation			LI	LI		
CEGL005202	Northern Sandstone Talus	Sandstone Talus Northern Sparse Vegetation						
CEGL002242	Ozark Sandstone Glade	*Schizachyrium scoparium - Aristida dichotoma - Croton willdenowii* / Lichens Wooded Herbaceous Vegetation				SP		
CEGL002249	Little Bluestem Hardpan Prairie	*Schizachyrium scoparium - Bouteloua curtipendula - Agrostis hyemalis - Eleocharis* spp. Hardpan Herbaceous Vegetation			LP			
CEGL002035	Loess Hills Little Bluestem Dry Prairie	*Schizachyrium scoparium - Bouteloua curtipendula - Bouteloua hirsuta - (Yucca glauca)* Herbaceous Vegetation		MX	LP	SP	SP	
CEGL002403	North-central Dry Limestone - Dolomite Prairie	*Schizachyrium scoparium - Bouteloua curtipendula - Muhlenbergia cuspidata - Symphyotrichum sericeum* Alkaline Herbaceous Vegetation	LP			SP		
CEGL002251	Ozark Limestone Glade	*Schizachyrium scoparium - Bouteloua curtipendula - Rudbeckia missouriensis - Mentzelia oligosperma* Wooded Herbaceous Vegetation			LP	LP		
CEGL002245	Little Bluestem Bedrock Bluff Prairie	*Schizachyrium scoparium - Bouteloua curtipendula* Bedrock Bluff Herbaceous Vegetation			SP			
CEGL002215	Midwest Dry Gravel Prairie	*Schizachyrium scoparium - Bouteloua curtipendula* Gravel Herbaceous Vegetation	SP	LP	LP	LP	SP	
CEGL002036	Little Bluestem Loess Mixedgrass Prairie	*Schizachyrium scoparium - Bouteloua curtipendula* Loess Mixedgrass Herbaceous Vegetation	SP	SP				
CEGL002318	Midwest Dry Sand Prairie	*Schizachyrium scoparium - Danthonia spicata - Carex pensylvanica - (Viola pedata)* Herbaceous Vegetation	LP	LP	SP	LP	SP	LP
CEGL002210	Midwest Dry-Mesic Sand Prairie	*Schizachyrium scoparium - Sorghastrum nutans - Andropogon gerardii - Lespedeza capitata* Sand Herbaceous Vegetation	SP	SP		SP	LP	LP

Natural Community Conservation Target			Stratification Unit					
			1	2	3	4	5	6
Element Code	Common Name	Description	Western Till Plain	Lower Platte / MO River	Central Till Plain	MS/IL River	Eastern Till Plain	Knk Sands
CEGL002398	Ozark Dolomite Glade	*Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula - Rudbeckia missouriensis* Wooded Herbaceous Vegetation						
CEGL002214	Midwest Dry-Mesic Prairie	*Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula* Herbaceous Vegetation	SP	MX	MX	LP	LP	
CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	*Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula* Hill Herbaceous Vegetation				SP	SP	
CEGL005179	North-central Dry-Mesic Limestone - Dolomite Prairie	*Schizachyrium scoparium - Sorghastrum nutans - Clinopodium arkansanum* Alkaline Herbaceous Vegetation					SP	
CEGL005280	Central Dry-Mesic Limestone - Dolomite Prairie	*Schizachyrium scoparium - Sorghastrum nutans - Tradescantia bracteata* Alkaline Bedrock Herbaceous Vegetation				SP		
CEGL002221	River Bulrush Marsh	*Schoenoplectus fluviatilis - Schoenoplectus* spp. Herbaceous Vegetation		SP	SP	LP	LP	
CEGL005111	Inland Saline Marsh	*Schoenoplectus maritimus - Atriplex patula - Eleocharis parvula* Herbaceous Vegetation					SP	
CEGL002026	Bulrush - Cattail - Burreed Shallow Marsh	*Schoenoplectus tabernaemontani - Typha* spp. - (*Sparganium* spp., *Juncus* spp.) Herbaceous Vegetation	SP			LP	LP	LP
CEGL002315	Small Eroding Bluffs Midwestern Sparse Vegetation	Small Eroding Bluffs Midwestern Sparse Vegetation			LI	LI	LI	
CEGL002027	Northern Cordgrass Wet Prairie	*Spartina pectinata - Calamagrostis stricta - Carex* spp. Herbaceous Vegetation	SP	LP				
CEGL002224	Central Cordgrass Wet Prairie	*Spartina pectinata - Carex* spp. - *Calamagrostis canadensis - Lythrum alatum - (Oxypolis rigidior)* Herbaceous Vegetation	LP	SP	SP	SP	LP	LP
CEGL005178	Central Cordgrass Wet Sand Prairie	*Spartina pectinata - Carex* spp. - *Calamagrostis canadensis* Sand Herbaceous Vegetation				SP	LP	LP
CEGL002223	Southern Great Plains Cordgrass Wet Prairie	*Spartina pectinata - Eleocharis spp. - Carex spp.* Herbaceous Vegetation	LP					
CEGL005069	Hardhack Wet-Mesic Sand Shrub Meadow	*Spiraea tomentosa - Salix humilis / Andropogon gerardii - Panicum virgatum* Shrubland						SP
CEGL002385	Skunk Cabbage Seepage Meadow	*Symplocarpus foetidus* Herbaceous Vegetation				SP	SP	
CEGL002596	Appalachian Cliff White-cedar Woodland	*Thuja occidentalis / Carex eburnea - Pellaea atropurpurea* Woodland						
CEGL002012	Basswood - Bur Oak Forest	*Tilia americana - (Quercus macrocarpa) / Ostrya virginiana* Forest	SP	SP				
CEGL002032	Southern Great Plains Cattail - Bulrush Marsh	*Typha (angustifolia, domingensis, latifolia) - Schoenoplectus americanus* Herbaceous Vegetation		LP				
CEGL002033	Great Plains Neutral Seep	*Typha latifolia - Equisetum hyemale - Carex (hystericina, pellita)* Seep Herbaceous Vegetation	SP	SP	SP	SP		
CEGL002229	Midwest Mixed Emergent Deep Marsh	*Typha* spp. - *Schoenoplectus acutus* - Mixed Herbs Midwest Herbaceous Vegetation	LP	LP	LP	LP		LP
CEGL002233	Midwest Cattail Deep Marsh	*Typha* spp. Midwest Herbaceous Vegetation	SP	SP	LP	LP	LP	LP
CEGL002058	White Oak-Red Oak-Sugar Maple Mesic Forest	*White Oak-Red Oak-Sugar Maple Mesic Forest*		LP	LP	LP		

Appendix 7. Biophysical Stratifying Unit Classification of the CTP Ecoregion

There are significant uncertainties and data gaps in our understanding of the biota and the composition and dynamics of natural communities and ecological systems in the Central Tallgrass Prairie ecoregion. The area exhibits a known, although poorly quantified, variation within natural community types and biogeographic distribution patterns across the ecoregion. Therefore, some type of stratification is necessary to ensure that the full range of organismal and ecological diversity is adequately represented in the conservation portfolio. This appendix outlines some of the factors influencing the derivation of terrestrial stratification units within the ecoregion along with interpretative maps of key environmental variations.

As a unit of geography, an ecoregion is a relatively large unit of land and water delineated by abiotic and biotic factors that regulate the structure and function of the natural communities within it (Maybury 1999). East to west and north to south, the biogeographic environment of the Central Tallgrass Prairie ecoregion is an ever changing landscape moderated by the interplay between physical, biological and climatic variables. Examination of specific variables like precipitation, evaporation, temperature, soil, geology and potential natural vegetation are among the factors that allow the grouping of similar biophysical landscapes.

Precipitation

Precipitation is one of the pivotal climatic factors influencing vegetation distribution. Longitudinally, from west to east there is a distinct gradient from a summer high rainfall to a more evenly distributed yearly rainfall pattern (Transeau 1935, Horn and Bryson 1960, Livingston and Shreve 1921). There is also an expression of faithfulness in the rainfall west to east; the further east one travels the more certainty in rain falling and less the likelihood and severity of drought (Shelford 1963, Transeau 1935, Bailey 1995) (Figure 1).

Both the Missouri and Mississippi Rivers correlate with tension zones in precipitation. The Missouri River in the west shows a coincidence with the 33 inch annual precipitation isohyet and for every 15 miles west of the river there is a 1” decrease in rainfall (Weaver and Bruner 1959). To the east, the Mississippi River acts as a tension zone where seasonal variation in precipitation becomes less distinct. The further east from the river, the greater the precipitation and the greater the uniformity in seasonal precipitation from year to year (Horn and Bryson 1960, Carpenter 1935 Livingston and Shreve 1921). Latitudinally, the discrepancies in rainfall are less discernable; however, there is a general decrease in precipitation south to north (Figure 1).

Temperature

Temperature differences are fairly uniform across the ecoregion and a few consistencies are worthy of mention to highlight this: (Andrews 1974a, Ellis and Mellor 1995, Livingston and Shreve 1921, Visher 1946) (Figure 1)

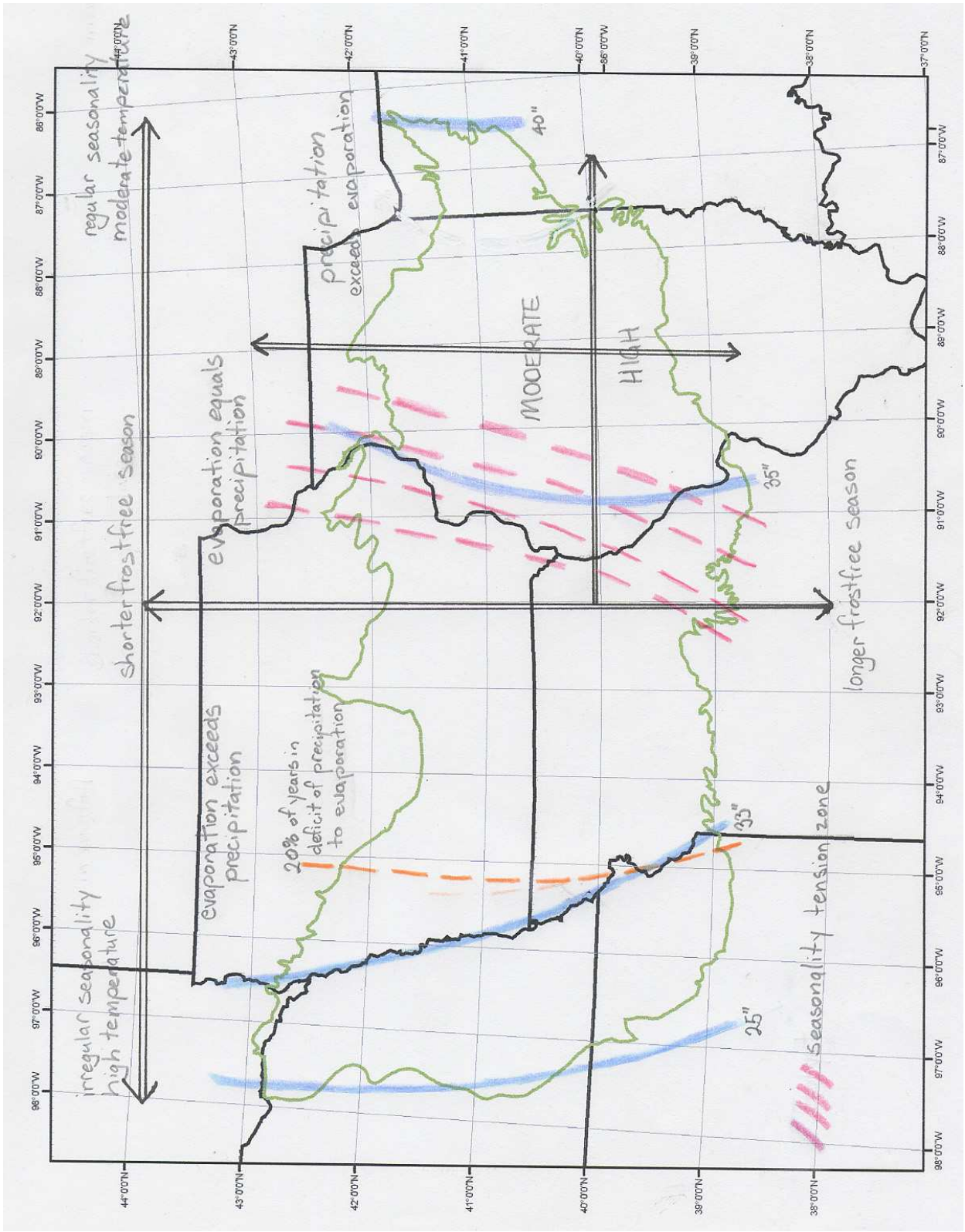

Figure 1: Temperature, precipitation and evaporation trend lines, isohyets and tension zones in the Central Tallgrass Prairie ecoregion.

1) Most of the ecoregion falls within the 90-120 days of daily mean temperature of 68℉ or above except for the most eastern geography extending into Indiana with 60-90 days of 68℉ or above. These lower daily means in the east could be explained by the geography's proximity to the Great Lakes and their ability to cool the region in hot weather.
2) The entire ecoregion falls within the 60-100 days of daily means of 32℉ or below.
3) Extremes in seasonal variation in temperature are more prevalent in the west. These greater temperatures could be related to greater distances from large cooling water bodies, continental air flows, and or an increasing proximity to the rain shadow influences of the Rocky Mountains.

Temperature variation across the ecoregion is predictable and generally coincides with the north to south increase in annual frostfree season duration which in turn influences vegetation composition and productivity (Livingston and Shreve 1921, Ellis and Mellor 1995). This predictable march of temperature decrease northward across the ecoregion is greatly influenced by the day length or the arc of the sun (season). Seasonality in temperature is evident through the general trends in the east – west direction of the isotherms (Livingston and Shreve 1921, Visher 1946). Another illustration of this temperature march is the average frostfree season or growth season of 160 to 180 days north to south, respectively, across the ecoregion (Bailey 1995, Livingston and Shreve 1921, Bailey 1995) (Figure 1).

Across the ecoregion there appears to be frequent reciprocal relations between isoclimatic factors of precipitation and temperature. As one approaches lower values the other approaches a higher value. The trends in temperature control to that of moisture control are easily distinguished; however, the most influential remains unclear. Evidence points to a relationship between the two, possibly the moisture ratio. The moisture ratio is an expression of the relationship between water availability for plants and the amount of water lost as a result of climatic conditions, such as temperature, precipitation or evaporation (Livingston and Shreve 1921). Evaporation appears to be the most significant climatic variable acting on the moisture ratio in the ecoregion and is used here to further delineate geographies across the Central Tallgrass Prairie ecoregion.

Evaporation

Evaporation is the process by which water or other liquids change from liquid to a gas vapor, derived from such sources as leaf surfaces (interception), water bodies (lakes, streams, wetlands, oceans) and small puddled depressions in the landscape. When considering soil moisture, it is important to remember that evaporation can also return infiltrated water to the atmosphere from upper soil layers before it reaches groundwater or surface water.

The ecoregion can be broken into three zones of evaporation:

1) Evaporation exceeds precipitation,
2) Evaporation equals precipitation, and
3) Precipitation exceeds evaporation.

Although not congruent with precipitation or temperature isoclimatic lines, these evaporation zones appear to have a west to east orientation and are exacerbated seasonally east to west (Figure 1). In the zones where precipitation equal or exceeds evaporation, decreasing temperatures northward across the zones results in correspondingly lower potentials of evaporation south to north. With this in mind, the eastern half of the ecoregion can be divided into two zones of moderate and high potentials of evaporation and precipitation (Visher 1946, Livingston and Shreve 1921, Cowles 1928) (Figure 1).

There is some agreement on the relationships between the climatic variables of temperature, precipitation and evaporation, which are illustrated here as crucial parameters in the biogeography of the Central Tallgrass Prairie (Andrews 1974a, Bailey 1995, Carpenter 1935, Visher 1915, 1916 and 1946, Ellis and Mellor 1995, Transeau 1935, Livingston and Shreve 1921, Shelford 1963, McNab and Avers 1994, Cowles 1928, Horn and Bryson 1960, Roy 2001, Nigh and Schroeder 2002, Weaver and Bruner 1954, Shantz 1954). It is clear that when taken together these climatic variables can be used to locate tension zones or boundaries to show range fluctuations or responses by biota to changes in ambient climatic conditions.

Geology

The glacial history is markedly different east to west across the ecoregion with distinct boundaries associated with each glacial event of the Pleistocene. There are three factors of geology that are of interest to this stratification (Unklesbay and Vineyard 1992, Andrews 1974b, Keller 1992) (Figure 2):

1) Age: The three most recent glacial events, the Wisconsinan, Illinoisan and Kansan are all expressed in the ecoregion and serve here to subdivide the ecoregion into distinct age classes northward and eastward across the ecoregion.
2) Surficial Character: Glacial material and material depth help to separate these age classes into intervals of prevailing glacial and interglacial environment processes.
3) Glacial Features: The eastern third of the ecoregion is a legacy of active glaciation during the Wisconsinan. The ice sheet ebb and flow combined with the inexorable forces of running water and aeolian processes, acted through time to erode and shape the landscape to form moraines, ablations and proglacial lakes.

Soils

Broad relationships exist across the ecoregion related to soil type, soil moisture and biota. Three broad soil types are found in the ecoregion: entisols, alfisols and mollisols (Soil Survey Staff 2003) (Figure 2). Important general attributes of these three soil types include the following:

1) Entisols: low water-holding capacity; low nutrients; high sand content; poorly developed; shallow; colluvial parent material or floodplain locations
2) Alfisols: high water-holding capacity; low organic matter content, high nutrients; high clay content; developed; prone to water-logging; leaching of bases leads to increased acidity; brown earths
3) Mollisols: high nutrients; high organic matter content; well-developed; deep; dark; prone to wind erosion, extensive bioturbation; neutral to alkaline

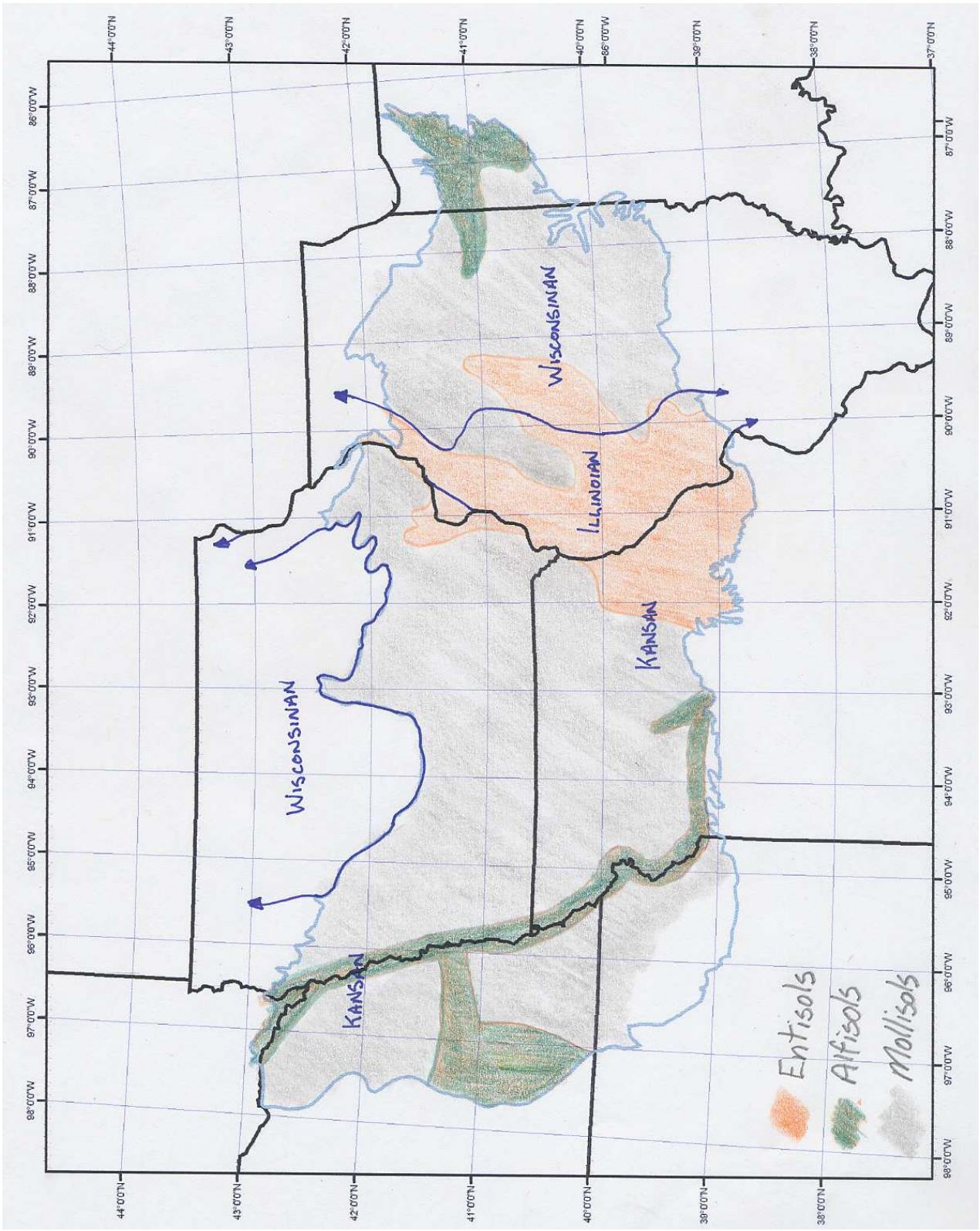

Figure 2: Pleistocene period glacial events and broad soil types in the Central Tallgrass Prairie ecoregion.

The soil moisture regime of the three soil types vary considerably and this important soil taxonomic trait helps to further understand the conditions that exist within the geographies of the ecoregion. Soil moisture increases respectively from aridic to xeric to ustic to udic to aquic (Soil Survey Staff 2003)

1) Entisols: aquic to ustic which implies there is a tendency for these soil types to be highly influenced by the climatic conditions, such as flood or drought
2) Alfisols: udic to aquic which implies a ready supply of soil moisture to meet plant requirements, but there is a tendency of the soil to become saturated
3) Mollisols: ustic to udic which implies a stable soil moisture regime for plant requirements during conditions of suitable plant growth, but there are times when water availability may be limited

Based on these five specific variables, coincidental boundaries of variation among the factors help to group similar biophysical landscapes into six units. Each is described in Table 1.

Table 1: Terrestrial Stratification Unit Descriptions

Biophysical Unit Name	**Description**
Western Till Plain	Unit dominated by distinctly variable seasonal rainfall; prolonged drought is common; high temperatures; drying winds; evaporation regularly exceeds precipitation by 20% or more; landform grades east to west from rolling hills to steep bluffs to irregular and smooth plains; elevation ranges from 600 to 1800 feet; Kansan-aged substratum with glacial till of greatest depths in the ecoregion; dominated by udic to ustic soil moisture regimes east to west; soils are hapludalfs in east and haplustolls/argiustolls in west; mixture of tall grasses grading into a mosaic of tall and short grasses with smaller and more dispersed mosaic of oak savannas westward across the unit.
Central Till Plain	Unit dominated by a decreasing to regular rainfall west to east that is less seasonally affected than the western till plain; drought does occur; evaporation exceeds precipitation but potential decreases eastward; a north to south increase in precipitation and evaporation leads to alterations in potential natural vegetation – more tree growth; landform grades from low hills out into irregular and smooth plains west to east; elevation ranges from 640 to 1040 feet; Kansan-aged substratum with glacial till of moderate depths; udic soil moisture regimes dominate; uniformity of soils with argiudolls in west, albaqualfs in southeast, and argiudolls in the northeast - there is a significant increase in clay content in the southeast; tallgrass prairie dominant in west grading to prairie-woodland mosaic to east.
Eastern Till Plain	Unit dominated by regularity in temperature and precipitation; precipitation regularly exceeds evaporation that is moderate to high? north to south (see Figure 1); landform consisting mostly of level to rolling plains with ravines and a few bluffs; elevation ranges 450 to 870 feet averaging 600 feet; substratum varies in age east to west, Wisconsinan to Illinoisan respectively, glacial fluxes of the Wisconsinan have markedly influenced existing landforms and soils; soil moisture regime udic to aquic throughout; soils are argiudolls in the

Table 1: Terrestrial Stratification Unit Descriptions	
Biophysical Unit Name	**Description**
	east and hapludalfs in the west, soils vary in texture from a loamy-sand in the east to a higher content of silt, alluvium and clay particles in the west; tallgrass-dominated potential vegetation changing to a more timbered mosaic nearer the Mississippi and Illinois Rivers and eastern border.
Kankakee Sands	Unit is dominated by expressions of past glacial events; temperature is moderated by proximity to the Great Lakes; high rainfall; landform consists of smooth plains of 400 to 600 feet in south and west, and a northward complex of low dunes that reach a maximum of 890 feet on the Valparaiso moraine; Kankakee River dissects unit; aquic and ustic soil moisture regimes throughout and is related to landform, soil profile experiences rapid infiltration on the ridges and is saturated for extended periods in the depressions; soil types are predominately udipsamments with a veneer of argiaquolls and haplaquolls; undulating landform and historic proglacial lake beds profoundly impact the potential natural vegetation with marsh and wet prairie on plains and in depressions and mixed oak mosaic on the ridges.
Lower Platte and Missouri Rivers and Hills	Unit marks a zone of rapid precipitation decline; temperature and evaporation potential increase markedly with a greater likelihood of drought; landform consists of a flat alluvial plain of low grade bordered by hills; elevation drop from the Platte down to the Missouri River where it exits the ecoregion is considerable - 570 feet in the south to 1500 feet in the west; stratum and substratum is an expression of the glacial outwash (silty-sandy alluvium) deposited during the Pleistocene and present-day eroded upstream materials; soil types are mostly udifluvents with a veneer of haplustolls; soil moisture regimes ustic in the west to udic in the east; the river hills in the west were mixed hardwood woodland communities with open oak woodlands and few prairie savannas occupying the slopes and ridges.
Mississippi and Illinois Rivers and Hills	Unit marks a seasonal tension zone where east to west rainfall decreases, evaporation potential increases and temperatures are influenced by the river itself and adjacent landform which in turn regulates local rainfall patterns; land form is diverse, local elevation range is 660 feet, a low of 340 feet in flat alluvial plain to a high of 1000 feet in the river hills; west to east landform grades from low hills and karst features down into the river plain with its terraces and up into deeply dissected steep ridges, narrow valleys and bluffs; stratum and substratum are an expression of glacial deposition with Illinoisan glacial till overlaid by glacial outwash from the Wisconsinan; soil types are hapludalfs in the hills and hapludolls confined to the floodplain; soil moisture regimes correspond to landform with aquic conditions at low elevations and near in the river and udic conditions at higher elevations; vegetation was a complex mosaic of narrow ridgetop prairies and savannas graded into oak woodlands on the upper slopes, through well-developed oak and mixed hardwood forest on the slopes and bottoms; floodplains and terraces are well developed with alluvium soils that were historically dominated by a mosaic of bottomland marshes and prairie communities and productive mixed bottomland hardwood forests with marshes and wet prairies interspersed throughout.

Appendix 8. Stream Classification for the Lower Missouri River Basin

Aquatic Classification Framework – General Model

One of the goals of the ecoregional planning process is to develop a strategy to protect ecosystems and habitats on a systematic basis. This strategy depends on a consistent classification of aquatic ecological systems which identifies, distinguishes and maps the varied freshwater ecological systems and settings within an ecoregion. In the CTP ecoregion, aquatic systems classifications have previously been conducted for the upper Mississippi River basin (Weitzell et al. 2003), the Ohio River basin (North Central Tillplain Ecoregional Planning Team 2003), and watersheds of the middle Missouri River (Gagnon et al. 2004 using TNC's standard model for aquatic classification (Higgins et al. 2005). For this iteration of the CTP plan, the objective was to apply TNC's aquatic classification framework to rivers and streams of the lower Missouri River basin, the only portion of the CTP where aquatic systems had not been previously classified. By identifying all of the river/stream ecological system types that occur in the ecoregion through a standardized classification process, we could include them as coarse-filter targets and appropriately address their conservation needs in the CTP plan.

The Nature Conservancy's river/stream classification approach is to successively divide the surficial hydrologic landscape into Aquatic Subregions, Ecological Drainage Units (EDUs), Aquatic Ecological Systems (AESs; also called systems) and Macrohabitats (Figure 1). Once the boundaries of these areas have been drawn, the macrohabitats and AESs are grouped into macrohabitat and AES "types" based on similarities in the physical habitat parameters that make up the individual AESs and macrohabitats. These habitat parameters include physical features of aquatic systems that are known to influence the composition and abundance of biota in a particular region. Details about the classification units and specific methods and parameters employed in the classification of rivers and streams of the lower Missouri River basin are provided below.

Aquatic Subregions

In TNC's aquatic classification hierarchy (Figure 1), the first order classification unit, at the largest geographic scale is the Aquatic Subregions. These are large drainage regions that generally correspond to the Aquatic Zoogeography of North America, as defined by the United States Forest Service (Maxwell et al. 1995) and the Aquatic Subregions of North America as defined by the World Wildlife Fund (Abell et al. 2000). Boundaries of these units are based on fish zoogeography, physiography, climate and drainage pattern history. The CTP crosses 5 subregions: the middle Missouri, upper and middle Mississippi, Old Ohio and Central Prairie (Figure 2).

Ecological Drainage Units

The second-order classification units in the standard hierarchy are Ecological Drainage Units (EDUs). EDUs are aggregates of 8-digit United States Geoglogical Survey Hydrological Units that share finer-scale physiographic and zoogeographic properties. We defined 4 EDUs for the lower Missouri River basin (Figure 3, Table 1) using physiographic and zoogeographic data provided in Bailey (1995) and Hocott and Wiley (1986).

Aquatic Ecological Systems (AESs)

Aquatic Ecological Systems are the surface hydrologic units (e.g., lake basins, stream basins or large river segments) nested within EDUs. AES boundaries are mapped using protocols and GIS tools developed by the Nature Conservancy's Freshwater Initiative (Higgins et al. 2005; TNC-FWI 2000). Using the National Hydrologic Dataset (NHD) (USGS 1999), and Shuttle Radar Topographic Mission (SRTM) (NASA 2002), we drew boundaries were drawn around the drainage areas for five size classes of streams and rivers: headwaters (size 1), creeks (size 2), and small (size 3), medium (size 4), and large river/floodplain systems (size 5). The minimum and maximum drainage areas for AESs assigned to each of these size classes are listed in Table 2. For our conservation planning purposes, polygons of the entire drainage areas for size 1 through 3 systems serve as our conservation planning units (Figures 4 – 6). For size 4 and 5 systems, the conservation planning units encompass the river reach and the adjacent zone within 5 km of either side of the river reach (Figure 7 & 8).

Once the AES boundaries were established, the systems were grouped into AES types according to similarities in persistent, natural macrohabitat attributes that could be mapped at a fairly coarse resolution. Attributes included surface geology, drainage network position, slope, proximity to lakes, and climatic region. Each attribute consisted of several classes that distinguished potentially biologically meaningful thresholds in the environmental gradients of each attribute. The appropriate class of each attribute was assigned to the macrohabitats within each system by overlaying digital environmental spatial data on the NHD in a geographic information system (Table 2). After all macrohabitats were attributed, the extent of each attribute class in the macrohabitats of each system was calculated. Hierarchical agglomerative cluster analysis in PCOrd (McCune 1995) was used to group systems based on the relative proportions of macrohabitat attributes found in each system.

Because this assessment procedure is designed to identify groups (i.e., "types") of AESs with similar patterns of physical properties, each system type is thought to represent a unique ecological setting, with a distinctive combination of macrohabitat attributes and corresponding geophysical processes, disturbance regimes, biological species composition, and potential natural state (Table 2). A total of 55 AES types were identified within the lower Missouri River basin EDUs. This number included 12 headwater (size 1) AES types, 12 creek (size 2AES types), 6 small river (size 3) AEs types, 6 medium river (size 4) AES types, and 18 large river/floodplain (size 5) AES types.

Macrohabitats

Macrohabitats are river segments and stream reaches as mapped in the NHD. The boundaries of a reach or a segment are usually marked by the confluence of two or more stream/river segments. Each macrohabitat is defined by a combination of macrohabitat attributes (Table 2), as assigned through the methods described in the previous section. Groups of macrohabitats that share a similar series of attribute conditions are considered a macrohabitat type.

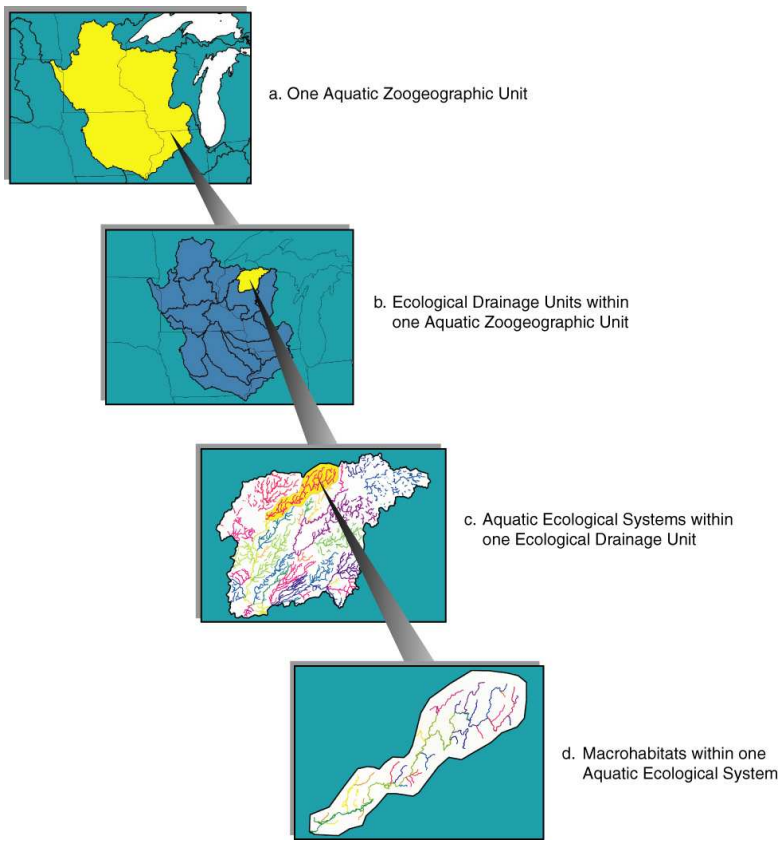

Figure 1. The Nature Conservancy's Aquatic Classification hierarchy.

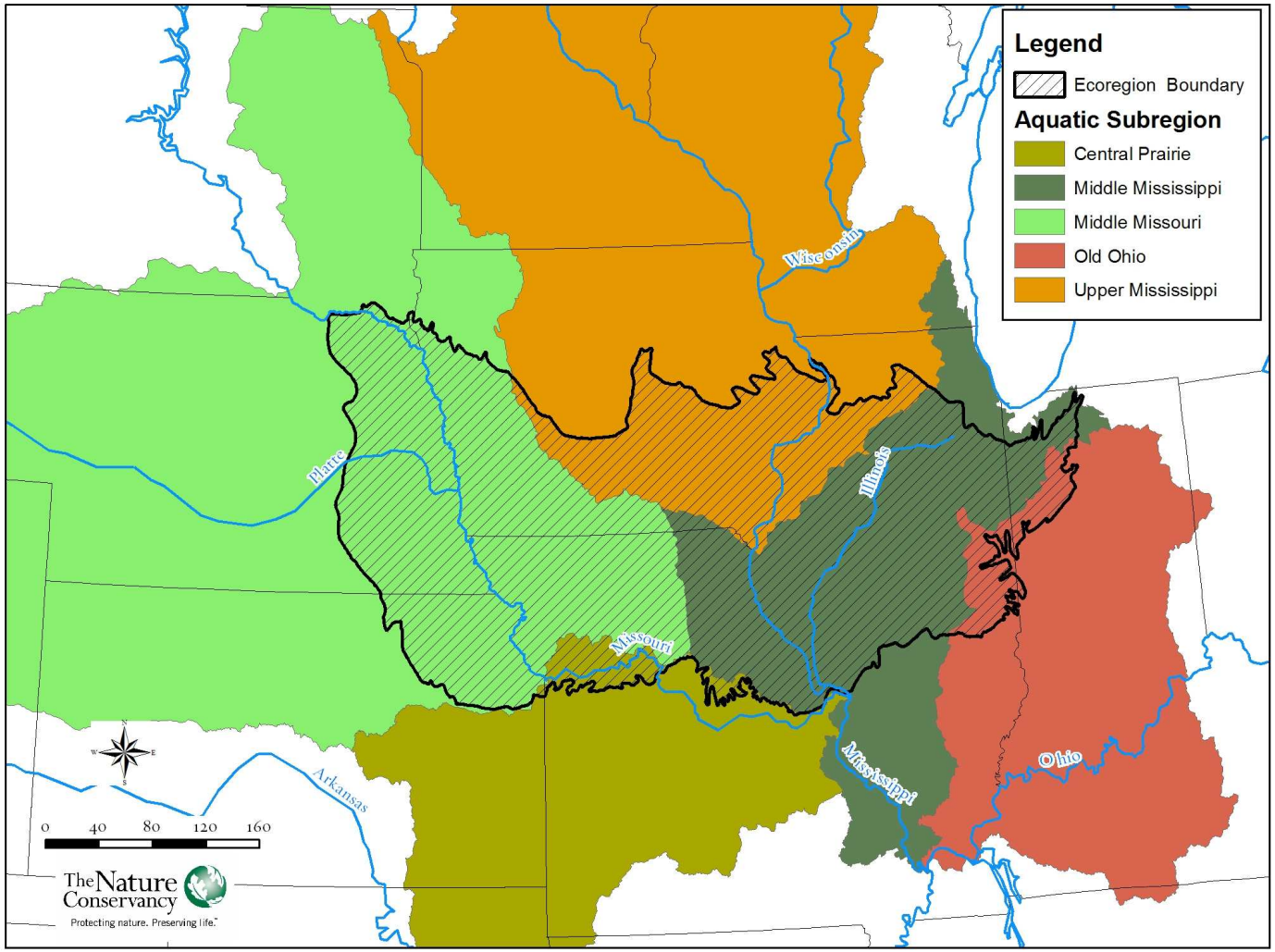

Figure 2 Aquatic zoogeographic subregions of the CTP Ecoregion.

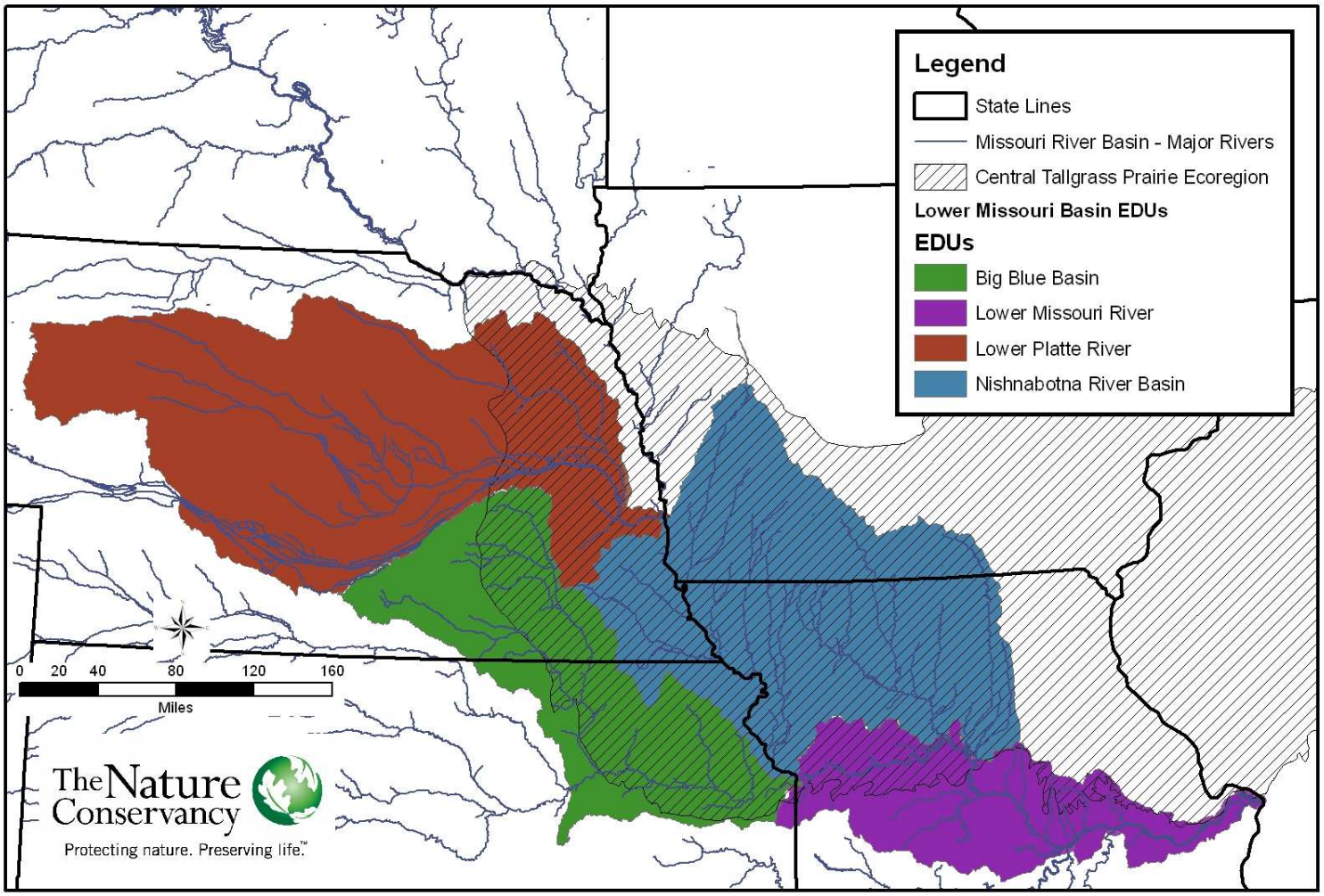

Figure 3. Ecological Drainage Units (EDUs) of the lower Missouri River basin.

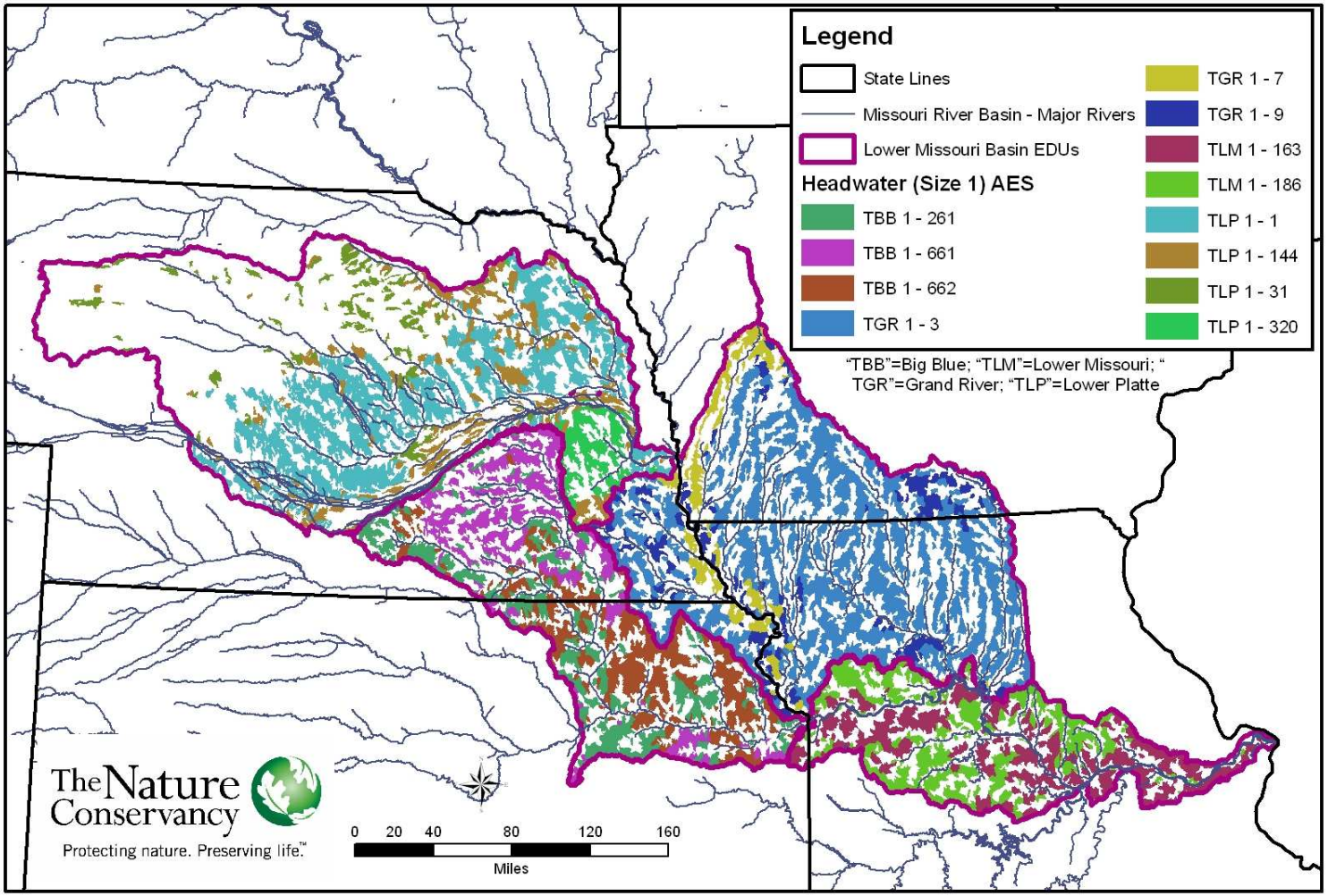

Figure 4. Locations of headwater (size 1) AES Types in the EDUs of the lower Missouri River basin. Each AES type code (e.g., "TGR 3 – 76") starts with a 3-letter abbreviation for the EDU code (e.g., "TBB"=Big Blue; "TLM"=Lower Missouri; "TGR"=Grand River; "TLP"=Lower Platte) followed by a number indicating the system size class (sizes 1 through 5) followed by a unique number identifier for the AES type.

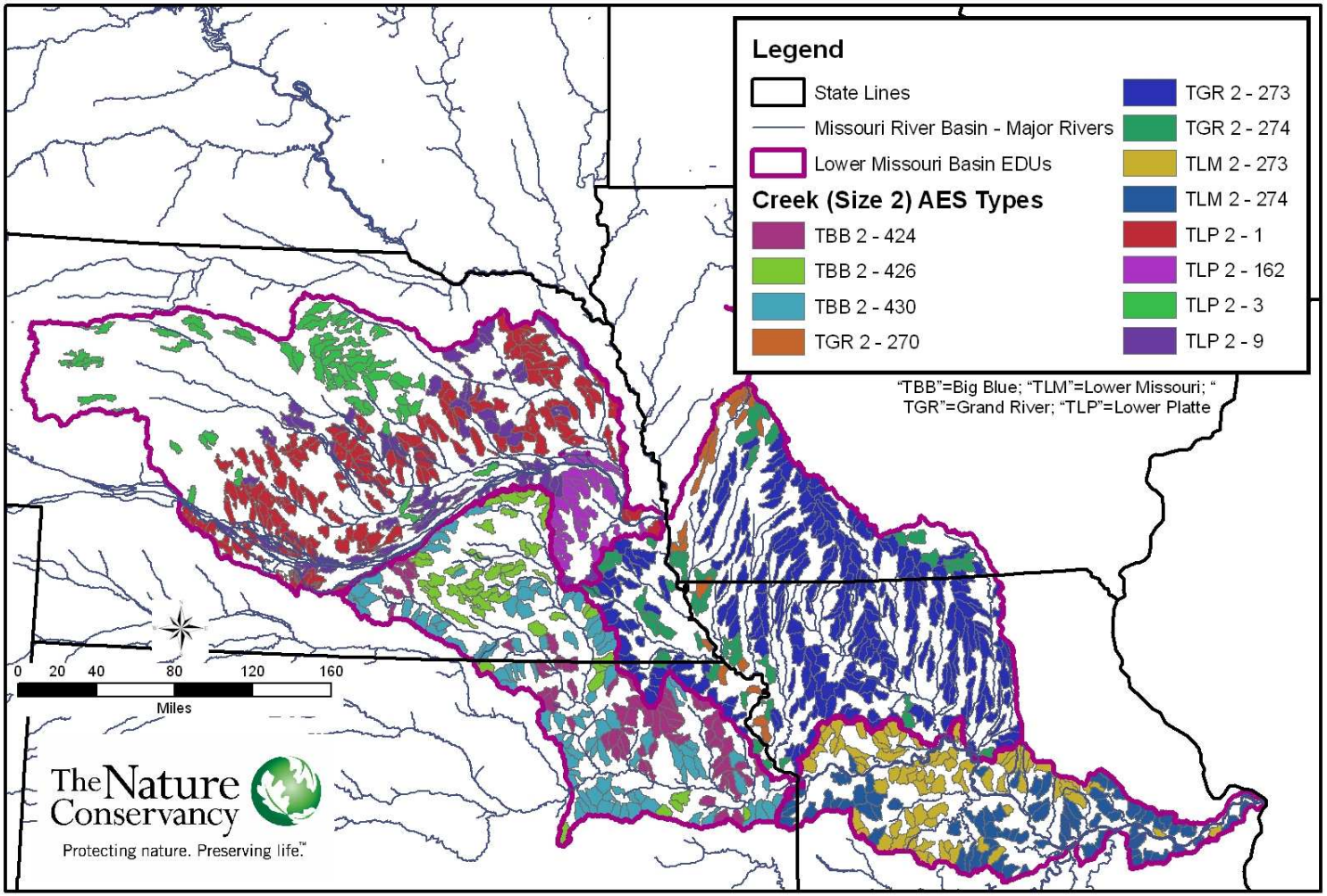

Figure 5. Locations of Creek (size 2) AES Types in the EDUs of the lower Missouri River basin.

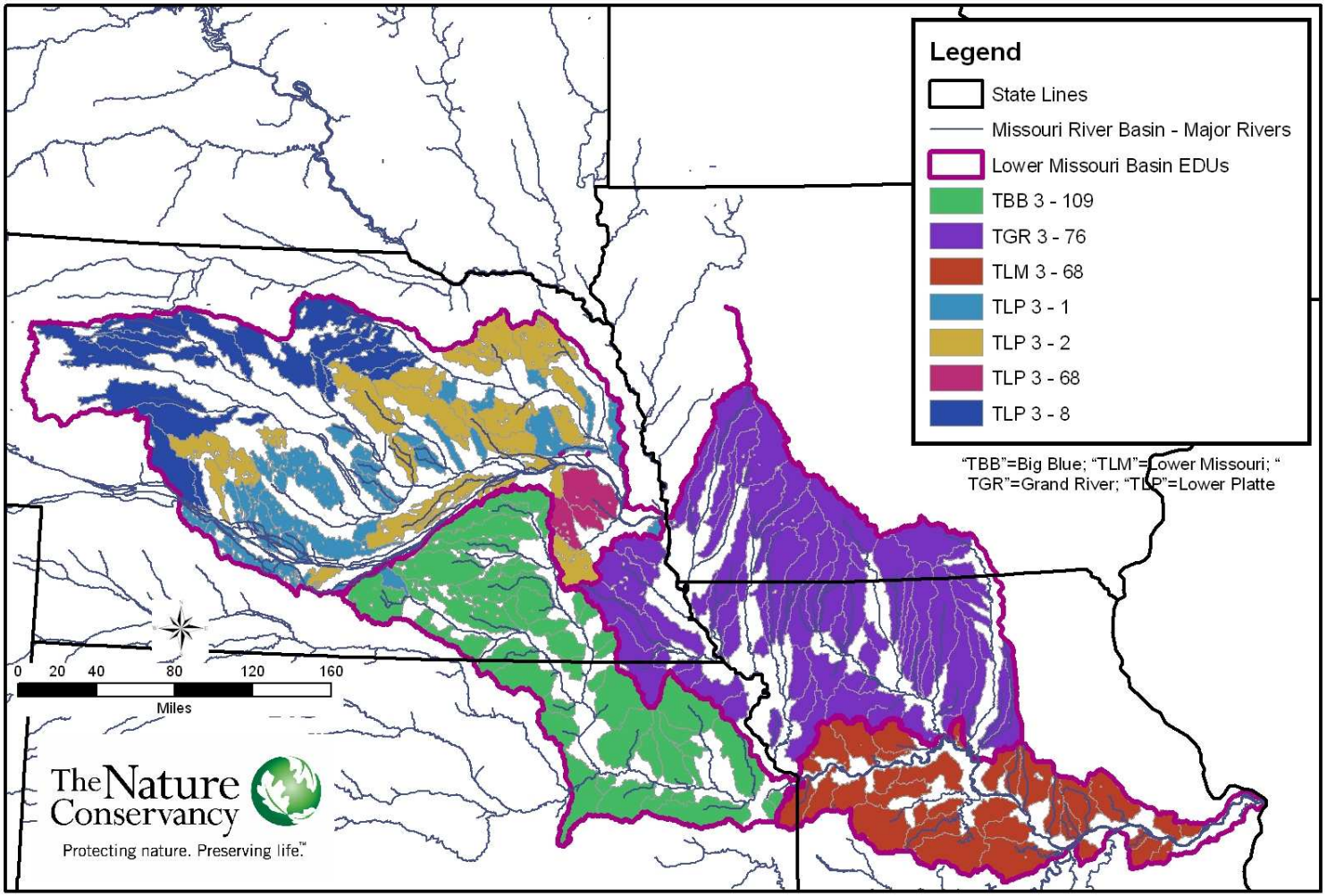

Figure 6. Locations of Small River (size 3) AES types in the EDUs of the lower Missouri River basin.

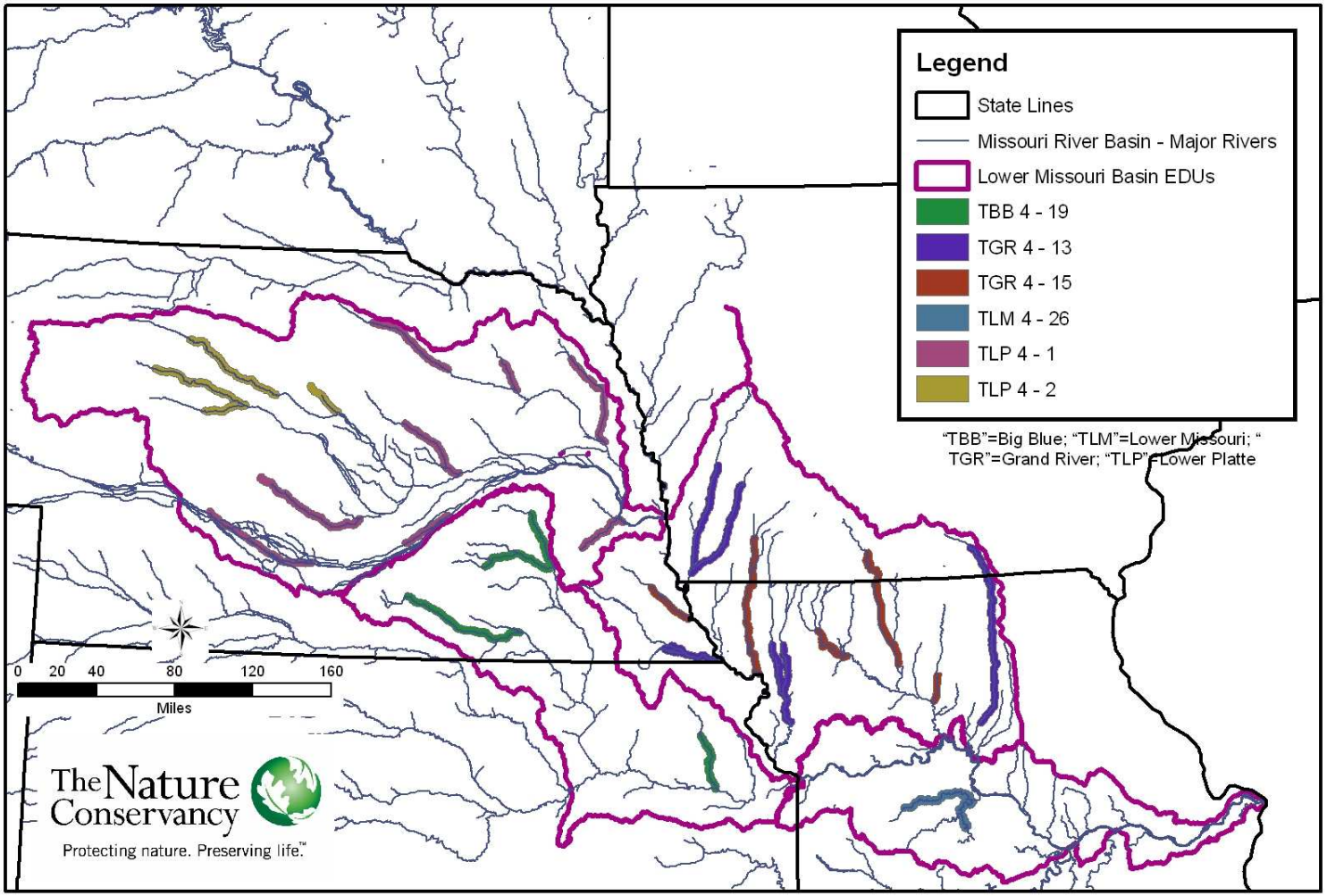

Figure 7. Locations of Medium River (size 4) AES types in the EDUs of the lower Missouri River basin.

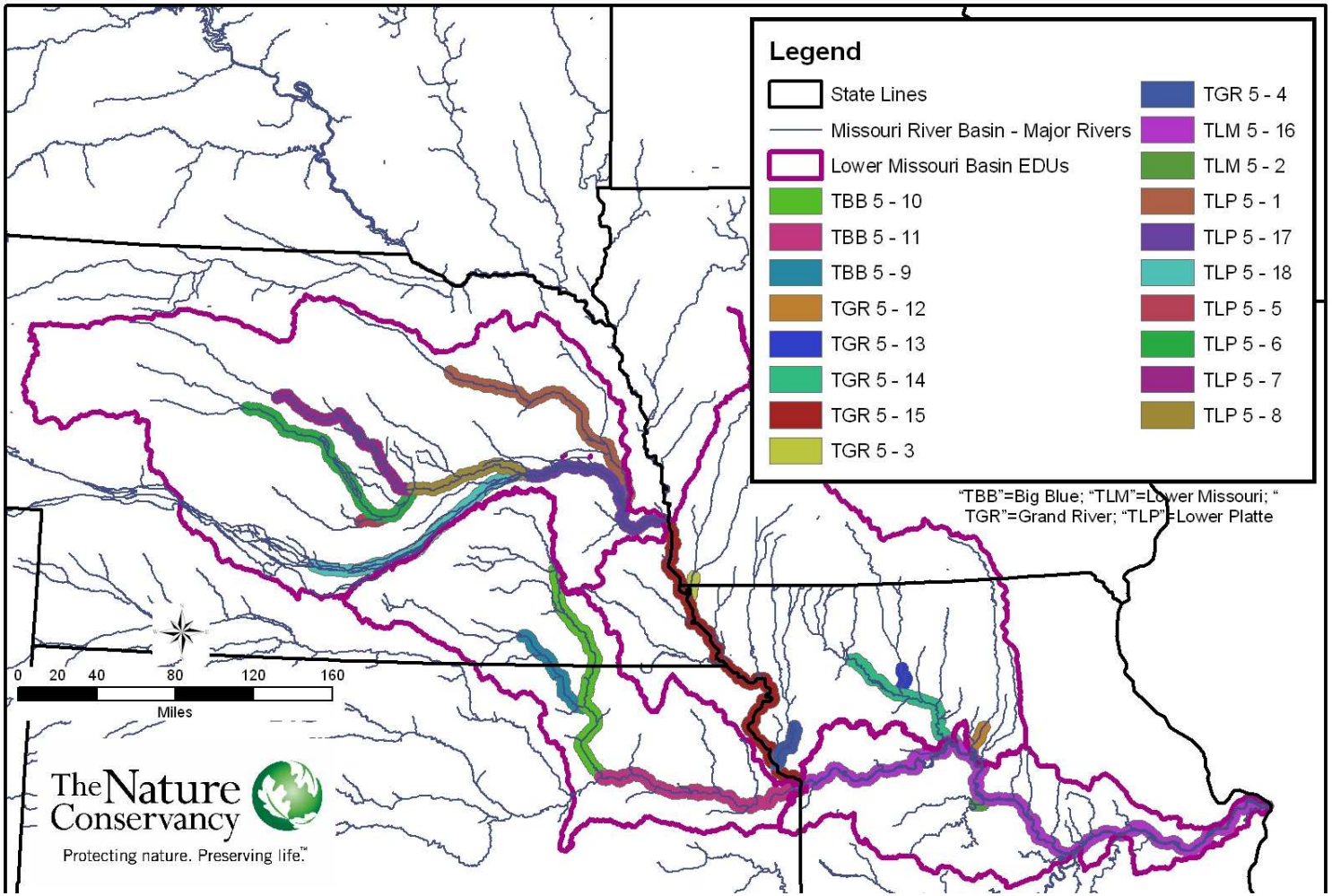

Figure 8. Locations of Large River/Floodplain (Size 5) AES types in the EDUs of the lower Missouri River basin.

Table 1. Ecological Drainage Units (EDUs) of the lower Missouri River basin.

EDU	EPA Terrestrial Ecoregions (Level III)	Topography/Geomorphology (Bailey, McNab and Avers 1994)	Geology (Bailey, McNab and Avers 1994)	Climate (Bailey, McNab and Avers 1994)	Zoogeography (Hocutt and Wiley 1986; and Maxwell 1998)	Native Vegetation Types
Lower Platte River	Nebraska Sandhills; Central Great Plains; Western Corn Belt Plains	In west, rolling to steep, irregular sand dunes with narrow, elongated, gently rolling sloping valleys between dunes. In south, gently sloping loess-mantled narrow ridgetops and moderately steep valley sides. In east, level to rolling till plains.	In west and south, shales and sandstones covered by dune sands and loess. In east, till, drift and lacustrine sand and clay covered with loess in patches.	Average annual precipitation ranges from 17 to 30 inches from west to east.	Missouri Subregion	Tallgrass prairie covered most upland and lowland areas. Deciduous forests found along major river bluffs and in riparian areas along stream and river banks.
Nishnabotna River Basin	Western Corn Belt Plains; Central Irregular Plains	Near the Missouri River, gently rolling smooth and irregular plains mantled by loess. Stream valleys narrow, not deeply incised. Relief ranges from tens to hundreds of feet. In eastern part of EDU, moderately dissected, glaciated, flat to rolling plains that slope gently toward the Missouri River valley	Near the Missouri River, Quaternary loess as much as 25 ft thick mantles most uplands. Till underlying the loess, covering bedrock up to 300 ft. Missouri River valley floodplain has up to 150 ft of alluvium overlying bedrock. In eastern upland part of EDU, surficial geology is characterized by glacial till, lacustrine and fluvial deposits with local windblown dune sand and loess.	Average annual precipitation ranges from 30-40 inches.	Missouri Subregion	Bluestem prairie covered most of the uplands, with bur oak and white oak savannas interspersed and in transitional areas. Upland woodland (white oak-shagbarck hickory occurred on more dissected land, grading into bottomland forests, woodlands, and wet bottomland prairies along rivers. Northern floodplain forest/woodland or oak-hickory forest/woodland occurred along major drainages,

EDU	EPA Terrestrial Ecoregions (Level III)	Topography/Geomorphology (Bailey, McNab and Avers 1994)	Geology (Bailey, McNab and Avers 1994)	Climate (Bailey, McNab and Avers 1994)	Zoogeography (Hocutt and Wiley 1986; and Maxwell 1998)	Native Vegetation Types
Big Blue Basin	Central Great Plains; Western Corn Belt Plains; Flint Hills; Central Irregular Plains	I n eastern part of EDU, Quaternary loess mantles most uplands. Till underlying the loess, covering bedrock up to 300 ft. Along the western margins of the EDU, loess-mantled narrow ridgetops are separated by steep slopes bordering drainage ways. In the southwest part of the EDU, sedimentary rock forms gentle sloping hills with relief of 300 to 500 ft.	In west and south, Cretaceous marine shales or Pennsylvanian carbonates and shales often covered by Quaternary windblown dune sands and loess. In north and east, Quaternary glacial till, lacustrine and fluvial deposits dominate	Average annual precipitation ranges from 20-35 inches.	Missouri Subregion	Bluestem prairie with northern floodplain forest or woodlands along major drainages.
Lower Missouri River	Interior River Valleys and Hills; Western Corn Belt Plains; Central Irregular Plains	In the southwest part of the EDU, sub parallel, southwestern to northeastern trending, maturely dissected, low escarpments separating level to gently rolling plains	Quaternary loess and residuum blanket this area. Bedrock is composed almost entirely of Pennsylvanian shale, coal, limestone, and sandstone; sandstones and cherty limestones support the cuestas	Mean annual precipitation ranges from 35 to 41 in	Central Prairie Subregion	Upland prairie graded into wet bottomland prairie, with sloughs, marshes, and mixed bottomland forest.

Table 2. Macrohabitat attributes for EDUs of the lower Missouri River basin.

Attribute	Attribute Classes for Lower Missouri Basin EDUs	Data Source(s)
Watershed Size	1- 10-50 km^2: headwater 2- 50-150 km^2: creek 3- 150-1500 km^2: small river 4- 1500-5000 km^2: med river 5- >5000 km^2: large river	NHD/SRTM* analysis using TNC Tools for Freshwater Classification (TNC-FWI 2000)
Flow Perm-anence	1- intermittent (Ln2at2 = 610) 2 – perennial (Ln2at2 ≠ 610)	"fcode" field in NHD
Network Position	1- Dlink # 1-50 2- Dlink # 51-700 3- Dlink # > 700	Link/order number calculations from NHD/SRTM* using TNC Tools
Gradient	1 - low (<0.0005) 2 - mod (0.0005-0.0010) 3 - high (>0.0010)	NHD/SRTM* analysis with TNC tools
Surface Geology or Soils	1 – loamy sand; formed in loess 2 – sandy loam mixed with coarse-textured materials; formed in alluvium 3 – loam; formed in alluvium 4 – clay loam with coarse materials; formed in residuum and till 5 – coarse materials mixed with clay loam; formed in coarse tills and residuum 6 – silt loam; formed in loess 7 – silt loam; formed in till, loess and weathered glacial materials 8 – silty clay loam; formed in till, loes and weaterhed glacial materials 9 – clay with coarse materials; cherty clay residuum 10 - bedrock	State surficial geology maps; USGS quaternary geology map

* NHD is the National Hydrologic Dataset (USGS 1999); SRTM is the Shuttle Radar Topography Mission Elevation Dataset (NASA 2002).

Appendix 9: Viability Guidelines for Terrestrial Species Targets

Rank	**Size** Consider the population abundance and density and the spatial extent of appropriate habitat for life history needs	**Condition** Consider the composition, structure (age classes), success and regularity of reproduction, presence/absence of competitors/predators and exotics, and the degree of local anthropogenic impacts	**Landscape Context** Consider the intactness of large-scale natural ecological processes and environmental regimes (flow, sediments, flood, drought, etc.) and the levels of fragmentation and species access between and among suitable habitats for metapopulation processes
Very Good (A)	Population or occurrence size is sufficient to maintain or support natural genetic diversity and reproductive capacity over the next 100 years. Population appears sufficient to recover from major disturbances that would cause high mortality.	Viable (self sustaining). Population/occurrence is self-sustaining and would persist long-term (100 yrs) if protected from threats.	Part of an intact, functional natural ecosystem or embedded in a natural matrix. Highly connected to other unimpaired habitats - population/occurrence has access to all habitats and resources needed to complete their life cycle. Disturbance processes necessary to promote species are active/present. Population is not isolated from other reproducing populations by anthropogenic factors and can move/migrate to suitable habitat in response to environmental change.
Good (B)	Population or occurrence size is small but considered sufficient to maintain or support reproductive capacity over the next 100 years. Population would likely survive low to moderate levels of disturbance.	Viable (but some impairment present). Population/ occurrence is currently self-sustaining, but conservation intervention is needed to maintain long-term (100 yrs) viability. Reproduction is occurring but not optimally. Anthropogenic impacts present but may be controlled with intervention.	Part of a functioning (but not necessarily natural) ecosystem. Moderately connected to other functioning habitats - population/occurrence has access to most habitats and resources needed to complete their life cycle. Disturbance processes necessary to promote and maintain species are present and only minimally impaired. Population/occurrence is not isolated from other reproducing populations by anthropogenic factors.
Fair (C)	Population or occurrence size is small and considered insufficient to maintain or support reproductive capacity over the next 100 years. Population would not likely survive low to moderate levels of disturbance.	Marginal / Restorable (could recover if threats are removed or minimized). Reproduction and ecological interactions are impaired. Anthropogenic impacts pose a serious threat to the condition of the species.	Part of a partially-functional ecosystem. Population/occurrence has limited access to habitats and resources needed to complete life cycle. Disturbance processes necessary to maintain the species are impaired, but could be restored with conservation intervention. Population is isolated (to some degree) from other reproducing populations by anthropogenic factors.
Poor (D)	Population or occurrence size is very small and considered insufficient to survive over the next 50 years. Population may not be sufficient to sustain itself in the face of disturbances.	Non-restorable. Non-viable (would not recover if threats are removed, unless augmented with reintroductions)	Part of a non-natural, poorly functioning ecosystem. Species do not have access to habitats and resources needed to complete their life cycle. Disturbance processes necessary to maintain the species are absent. Isolation prevents access to other reproducing populations.
Unknown (E)	No knowledge of population size or habitat conditions.	No knowledge of population interactions and anthropogenic threats	

Appendix 10: Viability Guidelines for Freshwater Species and Assemblage Targets

Rank	**Size** Consider the population abundance and density and the spatial extent of appropriate habitat for life history needs	**Condition** Consider the composition, structure (age classes), success and regularity of reproduction, presence/absence of competitors/predators and exotics, and the degree of local anthropogenic impacts	**Landscape Context** Consider the intactness of large-scale natural ecological processes and environmental regimes (flow, sediments, flood, drought, etc.) and the levels of fragmentation and species access between and among suitable habitats for metapopulation processes
Very Good **(A)** ***Functioning within an ecologically desirable range of variation, and requires little human intervention*.**	Population or occurrence size is sufficient to maintain or support natural genetic diversity and reproductive capacity over the next 100 years. Population appears sufficient to recover fro m major disturbances that would cause high mortality.	Viable (self-sustaining). Population or occurrence is self-sustaining and would persist if protection from threats were provided.	Part of an intact natural ecosystem or embedded in a natural matrix. Highly connected to other unimpaired lotic habitats, natural flow and sediment transport regimes intact; >20% natural vegetation in watershed (prairie, wetland, ungrazed grassland - not necessarily original); non-point source impairment not present. Populations are not isolated from other reproducing populations by anthropogenic factors.
Good **(B)** ***Functioning within its range of acceptable variation; it may require some human intervention***	Population or occurrence size is small but considered sufficient to maintain or support natural genetic diversity and reproductive capacity over the next 100 years. Population would likely survive low to moderate levels of disturbance.	Viable (self-sustaining but some impairment present). Population or occurrence is self-sustaining, but conservation intervention is needed to maintain.	Part of a highly functioning (but not necessarily natural) ecosystem. Moderately connected, hydrologic regime mostly intact (e.g., regulated releases mimic natural flow regime, i.e., allow peak flows and/or prevent unnaturally low flows); <20% natural vegetation in the watershed, but very low levels of urban development; non-point source pollution present, but very low. Populations are not isolated from other reproducing populations by anthropogenic factors.
Fair **(C)** ***Lies outside of its range of acceptable variation and requires human intervention. If unchecked, target will be vulnerable to serious degradation.***	Population or occurrence size is small and considered insufficient to maintain or support natural genetic diversity and reproductive capacity over the next 100 years. Population would not likely survive low to moderate levels of disturbance.	Restorable. Marginal (could recover if threats are removed).	Part of a functioning ecosystem (not very natural). Moderately fragmented, hydrologic regime restorable but currently altered by retention of peak flow and/or consumption of water causing periodic too low flows; <20% natural vegetation in watershed with moderate amounts of urban development; point source impairment present, moderate levels. Populations are isolated from other reproducing populations by anthropogenic factors.
Poor **(D)** ***Remaining in this condition for an extended period will make restoration or preventing extirpation practically impossible.***	Population or occurrence size is very small and considered insufficient to survive over the next 50 years. Population may not be sufficient to sustain itself in the face of disturbances.	Non-restorable. Non-viable (would not recover if threats are removed, unless augmented with reintroductions)	Part of a non-natural, poorly functioning ecosystem. Highly fragmented, hydrologic regime altered; <20% natural vegetation in watershed with high amounts of urban development; water quality not meeting designated uses under the Clean Water Act (on 303(d) list). Populations are isolated from other reproducing populations by anthropogenic factors.
Unknown **(U?E)**	No knowledge of population size.	No knowledge of population interactions and anthropogenic threats	

Appendix 11: Viability Guidelines for Freshwater System Targets

Rank	**Size** Consider the spatial extent (linear and lateral) of appropriate habitat for life history needs of most species and refugia during disturbance events. Assess the home range needs of key species (top predator, characteristic species), and the minimum dynamic area in terms of likely extent of largest natural disturbance (e.g., the area needed to ensure survival and recolonization after a 500 year flood event)	**Condition** Consider the viability of individual populations, the ecological interactions among species (e.g., competition, predation), the presence and viability of rare, indicator, keystone, exotic and wide-ranging species, the presence of biological legacies (e.g., coarse woody debris) and the level of local anthropogenic impacts	**Landscape Context** Consider the intactness of large-scale natural ecological processes and environmental regimes (flow, sediments, flood, drought, etc.) and the levels of fragmentation and species access between and among suitable habitats for metapolulation processes
Very Good (A) ***Functioning at an ecologically desirable status, and requires little human intervention*.**	Occurrence size is sufficient to maintain or support natural genetic diversity and reproductive capacity over the next 100 years. Habitats suitable for reproduction, rearing and feeding of all species (including wide-ranging taxa). Upstream/downstream and floodplain habitats sufficient for species to find refugia from major disturbances and recolonize	Occurrence is self-sustaining and would persist if protection from threats were provided. Most or all of species targets are viable (very good or good), none are non-viable (poor); ecological interactions appear to mimic historic conditions; anthropogenic impacts absent	Part of an intact natural ecosystem or embedded in a natural matrix. Highly connected to other unimpaired lotic habitats, natural flow and sediment transport regimes intact; >20% natural vegetation in watershed (prairie, wetland, ungrazed grassland - not necessarily original); non-point source impairment not present. Populations are not isolated from other reproducing populations by anthropogenic factors.
Good (B) ***Functioning within its range of acceptable variation; it may require some human intervention***	Occurrence size is small but considered sufficient to maintain or support natural genetic diversity and reproductive capacity over the next 100 years. Habitats suitable for life history needs of most species. Refugia available for most species.	Occurrence is self-sustaining, but conservation intervention is needed to maintain. Most of the species targets are viable (very good or good); none are non-viable (poor); ecological interactions among species are functional but may be impaired	Part of a highly functioning (but not necessarily natural) ecosystem. Moderately connected, hydrologic regime mostly intact (e.g., regulated releases mimic natural flow regime, i.e., allow peak flows and/or prevent unnaturally low flows; <20% natural vegetation in the watershed, but very low levels of urban development; non-point source pollution present, but very low. Populations are not isolated from other reproducing populations by anthropogenic factors.
Fair (C) ***Lies outside of its range of acceptable variation & requires human intervention. If unchecked, target will be vulnerable to serious degradation.***	Occurrence size is small and considered insufficient to maintain or support natural genetic diversity and reproductive capacity over the next 100 years. Some habitats for life history needs of some species not available. Access to refugia limited for most species.	Restorable. Less than half of the species targets are viable; ecological interactions impaired	Part of a functioning ecosystem (not very natural). Moderately fragmented, hydrologic regime restorable but currently altered by retention of peak flow and/or consumption of water causes periodic too low flows; <20% natural vegetation in watershed with moderate amounts of urban development; point source impairment present, moderate levels. Populations are isolated from other reproducing populations by anthropogenic factors.
Poor (D) ***Allowing to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.***	Occurrence size is very small and considered insufficient to survive over the next 50 years. Habitats highly impaired or absent. Vulnerable to natural disturbance because refugia are lacking.	Non-restorable. Few of the species targets are viable; ecological interactions non-functional	Part of a non-natural, poorly functioning ecosystem. Highly fragmented, hydrologic regime altered; <20% natural vegetation in watershed with high amounts of urban development; water quality not meeting designated uses under the Clean Water Act (on 303(d) list). Populations are isolated from other reproducing populations by anthropogenic factors.
Un-known (E)	No knowledge of habitat conditions, life history needs or refugia.	No knowledge of ecological interactions, anthropogenic threats and general condition	

Appendix 12: Viability Guidelines for an Example for Terrestrial System

Central Tallgrass Prairie System

Ecological Integrity Assessment Criteria

Prepared by:

Ecology Department
NatureServe

Date prepared: 11 May, 2006

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Central Tallgrass Prairie

A. Ecological Integrity Metrics

A.1. List of Ecological Integrity Metrics

A synopsis of the ecological metrics and ratings is presented in Tables 1 and 2. The three tiers refer to levels of intensity of sampling required to document a metric. Tier 1 metrics are able to be assessed using remote sensing imagery, such as satellite or aerial photos. Tier 2 typically require some kind of ground sampling, but may require only qualitative or semi-quantitative data. Tier 3 metrics typically require a more intensive plot sampling or other intensive sampling approach. A given metric could be assessed at multiple tiers, though some metrics cannot be measured at Tier 1 (i.e., they require some kind of ground visit). The focus for this System is primarily on metrics using both Tier 1 and Tier 2 metrics.

For each metric, a rating is developed, scored as A – (Excellent) to D – (Poor). The background, methods, and rationale for each metric are provided in section B. Each metric is rated, and then various metrics are rolled together into one of four categories: Landscape Context, Biotic Condition, Abiotic Condition, and Size.

A.1.1. Calculating Overall Ecological Integrity Score

Scores in each of the four categories are then combined into an overall ranking for the System. However, a simple average of the four metric category scores is rarely adequate. Often, some metric categories are of more importance than others in determining the overall ecological integrity of a site and these are given more weight when determining the final ecological integrity score. Use the table below to determine the sequence of importance when combining the four metric categories.

Sequence	Metric Category
1	Size
2	Abiotic Condition
2	Biotic Condition
2	Landscape Condition

Sequence Justification: Size is most important in widespread, matrix forming Systems like this. Abiotic and Biotic Condition are slightly less important because they can vary in natural occurrences. Landscape Condition is slightly less important because a large occurrence of this System should have a large interior/perimeter ratio so the surrounding landscape will have slightly less effect on the overall occurrence.

Table 1. Overall Set of Metrics for the Central Tallgrass Prairie System with Definition and Metric Ratings. Tier: 1 = Remote Sensing, 2 = Rapid or Extensive, 3 =Intensive.

Category	**Essential Ecological Attribute**	**Indicator & Metric**	**Tier**	**Definition**	*Metric Rating Criteria*			
					Excellent	**Good**	**Fair**	**Poor**
LANDSCAPE CONDITION	Landscape Composition	Adjacent Land Use	1	This metric addresses the intensity of human dominated land use near the prairie.	>90% of surrounding landscape is wildland.	60-90% of surrounding landscape is agricultural and/or wildland.	20-<60% of surrounding landscape is agricultural and/or wildland.	<20% of surrounding landscape is agricultural and/or wildland.
BIOTIC CONDITION	Community Structure	Woody Canopy Cover	1, 2, 3	Percent cover of woody plants	<10%	10-20%	>20-35%	>35%
	Community Composition	Percent Cover of Exotic Plant Species	2, 3	Percent cover of the plant species that are exotic, relative to total cover (sum by species)	<1% cover of exotic plant species	1-15% cover of exotic plant species	>15-50% cover of exotic plant species	>50% cover of exotic plant species
		Herbaceous Composition	2, 3	Relative percent cover of native forbs in the herbacecous layer	Relative cover of native forbs is >40-50%	Relative cover of native forbs is >30-40 % or 50-60%	Relative cover of native forbs is 20-30% or 60-70%	Relative cover of native forbs is <20% or >70%.
ABIOTIC CONDITION	Disturbance Regime	Anthropogenic Disturbances	2	Addresses the intensity of human caused disturbances within the prairie.	Little to none	Light	Moderate	Heavy
		Fire Regime	2	Fire frequency	2-4 years	5-8 years	9-13 years	>13 years
SIZE	Absolute Size	Absolute Size	1,2	The current size of the prairie	>1300 acres	640-1300 acres	100-<640 acres	<100 acres

A.2 Scorecard Protocols

A point-based approach is used to roll up the metrics into Category scores. Points are assigned for each rating level (A, B, C, D) within a measure. The default set of points are A = 5.0, B = 4.0, C = 3.0, D = 1.0. Sometimes, within a category, one measure is judged to be more important than the other(s). For such cases, each metric will be weighted according to its perceived importance. Points for the various measures are then added up and divided by the total number of metrics. The resulting score is used to assign an A-D rating for the category.

It is not always possible to develop a four grade rating system for each metric, because we lack sufficient detail on how the metric changes or what the thresholds might be. In some cases, the ratings may combine A and B. The point scoring approach is A/B = 5, C=3, D = 1.

A.2.1. Landscape Context Rating Protocol

Rate the Landscape Context metrics according to their associated protocols (see Table 1 and details in Section B). Use the scoring table below (Table 2) to determine an overall Landscape Context Rating.

Table 2. Landscape Context Metrics and Ratings for this System. Scores for the ratings are shown in each cell.

Measure	**Tier**	**A**	**B**	**C**	**D**	**Weight**	**Score** (weight x rating)
Adjacent Land Use	1	5	4	3	1	1.0	
Landscape Context Rating A=4.5 - 5.0 B=3.5 - 4.4 C=2.5 - 3.4 D=1.0 – 2.4							**Total = sum of N scores**

A.2.2. Biotic Condition Rating Protocol

Rate the Biotic Condition metrics according to their associated protocols (see Table 1 and details in Section B). Use the scoring table below (Table 3) to roll up the metrics into an overall Biotic Condition rating.

Table 3. Biotic Condition Rating Calculation.

Measure	**Definition**	**Tier**	**A**	**B**	**C**	**D**	**Weight**	**Score** (weight x rating)
Woody Canopy Cover	Percent cover of woody plants.	1, 2, 3	5	4	3	1	0.33	
Percent Cover of Exotic Plant Species	Percent of the plant species which are exotic to the region	2, 3	5	4	3	1	0.33	
Herbaceous Composition	Relative percent cover of native forbs in the herbaceous layer.	2, 3	5	4	3	1	0.33	
Biotic Condition Rating	A = 4.5 - 5.0 B = 3.5 – 4.4 C = 2.5 – 3.4 D = 1.0 – 2.4							**Total = sum of N scores**

A.2.3 Abiotic Condition Rating Protocol

Rate the Abiotic Condition metrics according to their associated protocols (see Table 1 and details in Section B). Use the scoring table below (Table 4) to roll up the metrics into an overall Abiotic Condition rating.

Table 4. Abiotic Condition Rating Calculation.

Measure	**Definition**	**Tier**	**A**	**B**	**C**	**D**	**Weight**	**Score** (weight x rating)
Negative Anthropogenic Disturbances	Addresses the intensity of human caused disturbances within the prairie.	2	5	4	3	1	0.60	
Fire Regime	Frequency of fires	2	5	5	0	0	0.40	
Abiotic Condition Rating	A = 4.5 - 5.0 B = 3.5 – 4.4 C = 2.5 – 3.4 D = 1.0 – 2.4							**Total = sum of N scores**

A.2.4 Size Rating Protocol

Rate the measure according to the metrics protocols (see Table 1 and details in Section B). Use the scoring table below (Table 5) to calculate an overall Size rating.

Table 5. Size Rating Calculation.

Measure	Definition	Tier	A	B	C	D	Weight	Score (weight x rating)
Absolute Size	The current size of the prairie	1	5	4	3	1	1.0	
Size Rating	A = 4.5 - 5.0 B = 3.5 – 4.4 C = 2.5 – 3.4 D = 1.0 – 2.4							**Total = sum of N scores**

B. Documentation For Metrics

B.1 Landscape Condition Metric

Adjacent Land Use

Definition: This metric addresses the intensity of human dominated land use near the prairie. Landscape level processes are important in maintaining the characteristics of prairies.

Measurement Protocol: This metric is measured by documenting surrounding land use(s) within the surrounding 10,000 acres of the prairie. This can be completed in the field then verified in the office using aerial photographs or GIS. However with access to current aerial photography and/or GIS data a good calculation of Adjacent Land Use can be made in the office.

Metric Rating			
Excellent	**Good**	**Fair**	**Poor**
>90% of surrounding landscape is wildland.	60-90% of surrounding landscape is agricultural and/or wildland.	20-<60% of surrounding landscape is agricultural or wildland.	<20% of surrounding landscape is agricultural or wildland.

B.2. Biotic Condition Metrics

Percent Cover of Exotic Plant Species

Definition: Percent of the plant cover contributed by exotic species.

Measurement Protocol: Although quantitative measurements are preferred, depending on time and financial constraints, this metric can be measured with qualitative or quantitative data. The two methods are described as follows: (1) Site Survey (semi-quantitative):

walk the occurrence of the prairie system and make a qualitative ocular estimate of the total cover of each species: (2) Quantitative Plot Data: The plot method described by Peet et al. (1998) is recommended for collecting quantitative data for this metric but other methods are acceptable, too.

The metric is calculated by dividing the total cover of exotic species by the total cover of all species and multiplying by 100.

Metric Rating			
Excellent	**Good**	**Fair**	**Poor**
<1% cover of exotic plant species	1-15% cover of exotic plant species	>15-50% cover of exotic plant species	>50% cover of exotic plant species

Scaling Rationale: The criterion is based on best scientific judgment.

Woody Canopy Cover

Definition: Percent cover of woody plants (trees and shrubs).

Measurement Protocol: Although quantitative measurements are preferred, depending on time and financial constraints, this metric can be measured with qualitative or quantitative data. The three methods are described as follows: (1) Site Survey (semi-quantitative): walk the occurrence of the prairie system and make a qualitative ocular estimate of the total cover of trees. (2) Quantitative Plot Data: The plot method described by Peet et al. (1998) is recommended for collecting quantitative data for this metric but other methods are acceptable, too. (3) Remotely Sensed Data: aerial photographs or other remotely sensed data can be used to estimate percent tree canopy.

Metric Rating			
Excellent	**Good**	**Fair**	**Poor**
Percent cover of woody plants is <10%	Percent cover of trees is >10-20%	Percent cover of woody plants is >20-35%	Percent cover of woody plants is >35%

Scaling Rationale: The criterion is based on best scientific judgment.

Herbaceous Composition

Definition: Relative percent cover in the herbaceous layer of forbs native to the region. Forb composition can vary greatly depending on where the prairie occurs.

Measurement Protocol: Although quantitative measurements are preferred, depending on time and financial constraints, this metric can be measured with qualitative or quantitative data. The two methods are described as follows: (1) Site Survey (semi-quantitative): walk the occurrence of the prairie system and make a qualitative ocular estimate of the relative cover of native forbs compared to other species in the herbaceous layer. (2)

Quantitative Plot Data: The plot method described by Peet et al. (1998) is recommended for collecting quantitative data for this metric but other methods are acceptable, too.

Metric Rating			
Excellent	**Good**	**Fair**	**Poor**
Relative cover of native forbs is 40-50%	Relative cover of native forbs is 30-40%, or >50-60%.	Relative cover of native forbs is 20-30% or 60-70%.	Relative cover of native forbs is <20% or >70%

B.3 Abiotic Condition Metrics

Negative Anthropogenic Disturbances

Definition: This metric addresses the intensity of negative human caused disturbances within the prairie.

Measurement Protocol: This metric is measured by documenting land use(s) within the prairie. This should be completed in the field. Below are examples of common factors to consider when estimating the level of anthropogenic disturbance.

Little to none – Little to no grazing impact (grazing may be present but is not heavy enough to result in overgrazing), no timber harvesting, no mowing; little to no impact from roads (most of site >200 m from roads);
Light – Light grazing impact, no timber harvest, sporadic (less than once per year) mowing, little impact from roads (most of site >100 m from roads);
Moderate – Moderate grazing impacts, some timber harvesting, annual mowing, moderate impact from roads (most of site >15 m from roads);
Heavy – Heavy grazing impacts, abundant timber harvesting; mowing more than once per year, heavy impact from roads (most of site <15 m from roads)

Metric Rating			
Excellent	**Good**	**Fair**	**Poor**
Little to no anthropogenic disturbance	Light anthropogenic disturbance	Moderate anthropogenic disturbance	Heavy anthropogenic disturbance

Scaling Rationale: The ranks were assigned according to best scientific judgment regarding each land use's potential impact and evaluations of the effects of roads and other management practices on prairie function (McPhearson 1997).

Fire Regime

Definition: The frequency of fires in the prairie.

Measurement Protocol: This metric is calculated by determining the average fire frequency the prairie has been subject to during the past 20 years. After 20-40 years without fire

most prairies will become closed forests unable to be returned to prairie conditions without extensive effort (Bragg and Hulbert 1976, McPhearson 1997).

Metric Rating			
Excellent	**Good**	**Fair**	**Poor**
Average fire return interval is 2-4 years	Average fire return interval is 5-8 years	Average fire return interval is 9-13 years.	Average fire return interval is >13 years

Scaling Rationale: The criteria are based on Bragg and Hulbert (1976), Peterson and Reich (2001), and best scientific judgment. The fire frequencies necessary to maintain A or B ranked prairies will limit the establishment of tree seedlings and shrubs.

B.4 Size

Absolute Size

Definition: Absolute size is the current size of prairie.

Measurement Protocol: Absolute size can be measured easily in GIS using aerial photographs, orthophoto quads, etc. Absolute size can also be estimated in the field using 7.5 minute topographic quads or a global positioning system. Size is then calculated in acres.

Metric Rating			
Excellent	**Good**	**Fair**	**Poor**
>1300 acres	640-1300 acres	100-640 acres	<100 acres

Scaling Rationale: Scaling criteria are based on best scientific judgment. These sizes are smaller than similarly ranked historic examples of this system but they are scaled to allow differentiation among the few examples remaining.

Appendix 13: Portfolio Assembly Methods

This appendix contains two major elements. The first part describes the rule-based terrestrial portfolio assembly process and the second part describes the rule-based freshwater portfolio assembly process.

Terrestrial Portfolio Assembly Process

To facilitate a standardized, repeatable, transparent portfolio assembly process, the ecoregion was divided into 640-acre hexagons which served as individual assessment units for the portfolio assembly process. Each hexagon was tagged with information regarding biodiversity significance, ecological integrity, conservation management status, and 2000 CTP portfolio site locations. The team evaluated the hexagon assessment units to identify the most efficient set of hexagons required to meet conservation goals. The locations of viable target occurrences were the primary factor for adding hexagons to the portfolio. Ancillary data, such as ecological integrity and conservation management status, provided additional guidance in refining the portfolio. The draft portfolio was compared with the portfolio that resulted from the original ecoregional assessment. Experts reviewed draft terrestrial portfolios at multiple points in this process, both in the context of expert workshops and independently. After step 7 was completed, a final review was conducted. The final terrestrial portfolio consists of those hexagons that most efficiently met the conservation goals of all terrestrial targets.

Terrestrial Step 1: Generate an ecoregion-wide layer of uniformly-sized, fine-scale assessment units.

We divided the CTP ecoregion into 640-acre hexagons which served as individual assessment units for the portfolio assembly process.

a) Using the ArcView extension 'Repeating Shapes'[1] [1], an array of uniform, repeating hexagonal polygons was generated for the entire CTP ecoregion.

Terrestrial Step 2: Assign target occurrence viability and ecological integrity information to the hexagon assessment units.

a) Using GIS overlays and intersections, each terrestrial target occurrence along with its associated overall viability score was assigned to the hexagon in which it was located.

b) Ecological integrity scores were previously calculated for each hexagon in the ecological integrity assessment (described in section F in the main report).

Terrestrial Step 3: Identify terrestrial Areas of Biodiversity Significance (ABS).

The subset of hexagons containing viable target occurrences were identified as Areas of Biodiversity Significance (ABS). Target occurrences and their associated viability rankings were used to assign ABS designations as described in Table 1.

a) Hexagons were assigned to ABS designations according to the criteria detailed in Table 1.

[1] Jenness, J. 2005. Repeating shapes (repeat_shapes.avx) extension for ArcView 3.x. Jenness Enterprises. Available at: http://www.jennessent.com/arcview/repeat_shapes.htm.

Table 1. Designations and descriptions for terrestrial Areas of Biodiversity Significance

ABS Designation	Description
AA	Hexagons containing target natural community occurrences with very good (A) or good (B) viability
BB	Hexagons containing target natural community occurrences with fair (C) viability ***and*** target species occurrences with very good (A) or good (B) viability
CC	Hexagons containing target species occurrences with very good (A) or good (B) viability
DD	Hexagons containing target natural community occurrences with fair (C) viability
EE	Hexagons containing target species occurrences with fair (C) viability
X	All other hexagons

Note: ABS Designation reflects a priority deference to natural community ranks such that if a A or B-ranked community occurrence and A, B or C-ranked species co-occurred in the same hexagon, the hexagon was given a AA designation. For a C-ranked community occurrence and C-ranked species co-occurred in the same hexagon, the hexagon was given a DD designation. See Figure 1 for decision rules.

Terrestrial Step 4: Develop the first draft of the terrestrial portfolio using top-ranked Areas of Biodiversity Significance.

a) All AA, BB and CC-designated hexagons were selected as a preliminary portfolio against which conservation goals were initially evaluated.

b) Using the decision rules depicted in Figure 1, each target was evaluated individually to determine its conservation goal attainment in the preliminary portfolio layer. The optimal suite of hexagons containing viable occurrences required to advance or meet each target's goal were assigned "confirmed" status. The "confirmed" hexagons constitute the first draft terrestrial portfolio. In this evaluation, some AA, BB or CC-designated hexagons were assigned "omitted" status if the hexagons were determined to be unnecessary for goal attainment for all targets present in the hexagons.

Terrestrial Step 5: Amend the first draft terrestrial portfolio to include lower-ranked Areas of Biodiversity Significance that contain targets with unmet conservation goals and that meet minimum thresholds for ecological integrity and conservation management.

*In this step, the draft terrestrial portfolio was amended to add DD and EE-designated hexagons if they contained targets with unmet conservation goals **and** met minimum thresholds for ecological integrity and conservation management status. This resulted in a refined set of "confirmed" and "possible" hexagons that included lower viability target occurrences. These added hexagons are critical for conservation goal attainment, but the occurrences they contain require restoration or rehabilitation to improve their viability before they can contribute to goal attainment.*

a) Using the decision rules depicted in Figure 2, each DD-designated hexagon was assigned as "omitted", "possible" or "confirmed".

b) Using the decision rules depicted in Figure 3, each EE-designated hexagon was assigned as "possible" or "omitted".

Terrestrial Step 6: Compare the draft terrestrial portfolio with the portfolio developed in the first CTP ecoregional assessment that was published in 2000 ("CTP 2000"). Review differences and adjust as appropriate.

a) The first iteration conservation portfolio (published in 2000) was overlaid on the current draft terrestrial portfolio as a process check. Conservation areas from the first iteration assessment

that did not overlap with “confirmed” or “possible” hexagons in the current draft portfolio were flagged for review by Conservancy field offices. Each program individually evaluated these hexagons to determine the original justification for inclusion in the 2000 portfolio and whether viable occurrences had been overlooked in this assessment or targets were better conserved in the occurrences contained within the current draft portfolio. Corrections, additions and adjustments were made as necessary.

Terrestrial Step 7: Aggregate the confirmed hexagons into conservation areas, guided by conservation area boundaries from the original terrestrial portfolio and by the spatial extent of target occurrences needed to meet conservation goals. Assign conservation area names and functional type.

In this step, we used CTP 2000 conservation portfolio boundaries to aggregate the hexagons into preliminary conservation areas for the CTP 2008 portfolio. These preliminary boundaries were then modified as appropriate to encompass target occurrences necessary to meet conservation goals of the associated targets.

a) Overlay the locations of the current draft terrestrial portfolio and the CTP 2000 conservation portfolio boundaries and identify one-to-one matches. Use the CTP 2000 boundaries to assign boundaries to the provisional 2008 CTP Terrestrial Portfolio using the same unique ID and name.

b) Identify those conservation areas in the provisional 2008 portfolios that were not part of the CTP 2000 portfolio and assign preliminary boundaries to the new conservation areas using a unique ID and name.

c) Determine the “functional type” of each conservation area based on the spatial scale of target occurrences, the viability of target occurrences, and the relative intactness / relative need for restoration. As the hexagons were aggregated into a conservation portfolio, a “functional type” was assigned to each terrestrial conservation area. The functional type designations provide a broad indication of the type and scale of on-the-ground conservation action that will be necessary to maintain or enhance the ecological integrity of the conservation areas. There are five possible designations: LAND, SITE, SITE/W, LAND/REST, and SITE/REST.

d) Revise the preliminary portfolio conservation area boundaries drawn in steps 7a, 7b and 7c as necessary using the ecological integrity index, grassland and forest blocks, and conservation management status to inform boundary revisions.

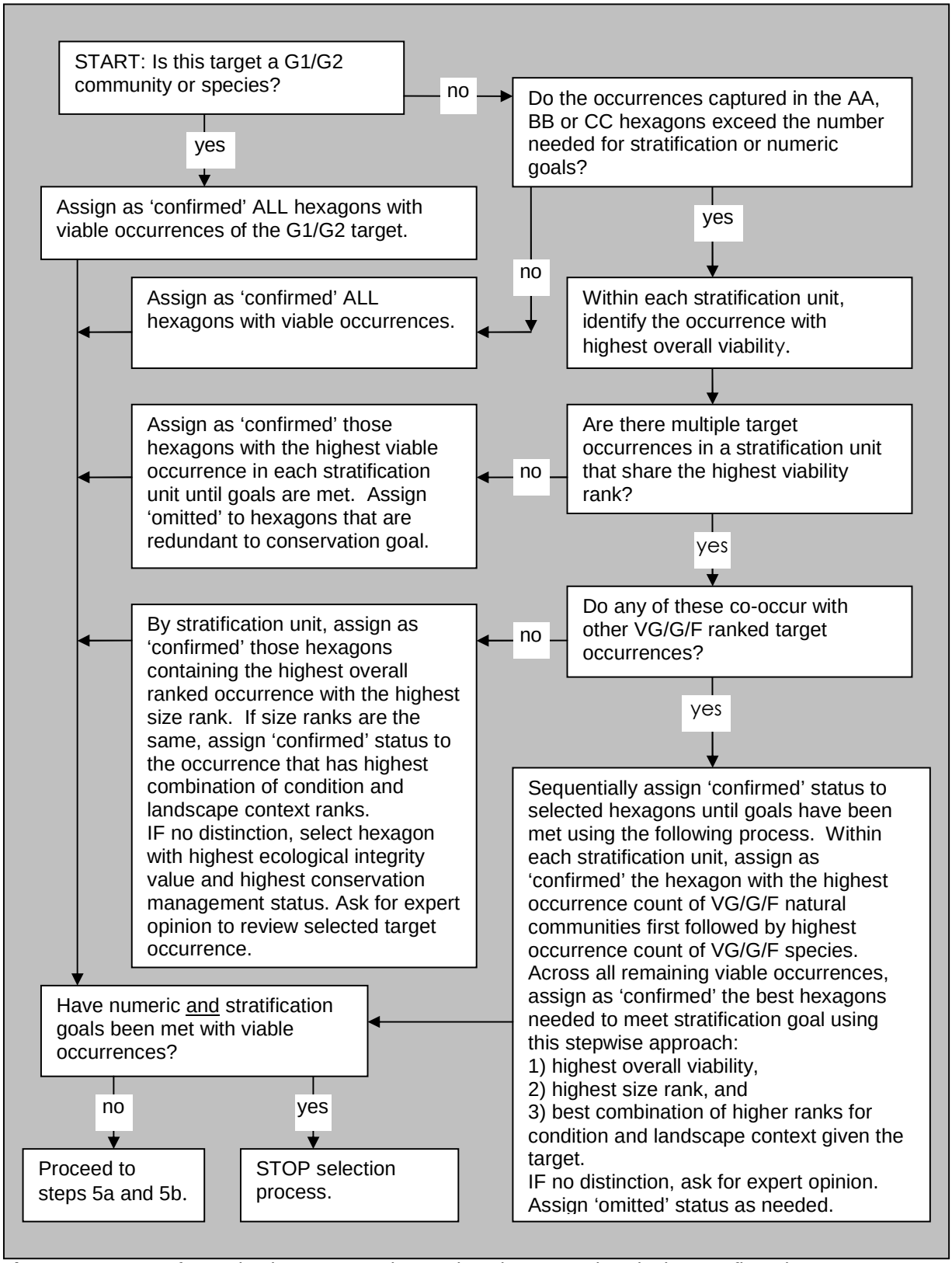


Figure 1: Process for evaluating conservation goal attainment and assigning 'confirmed' status to hexagons as described in step 4.

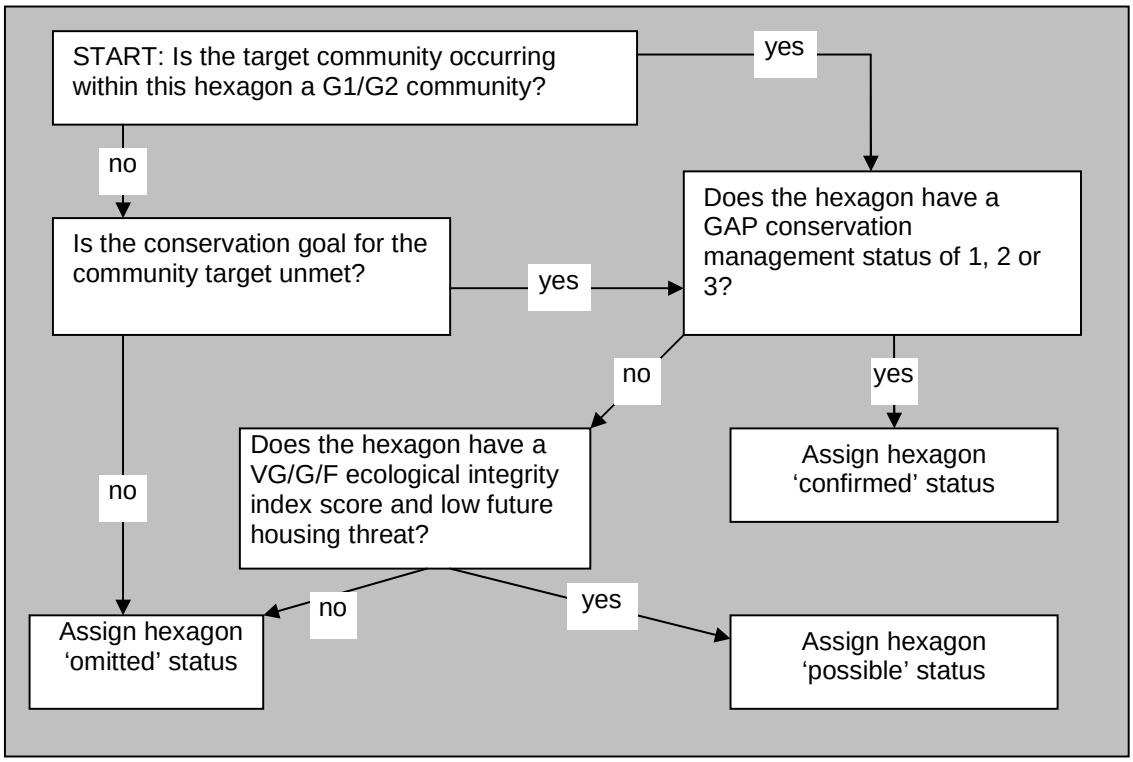


Figure 2: Process for evaluating DD-designated hexagons for inclusion in the draft terrestrial portfolio as described in step 5.

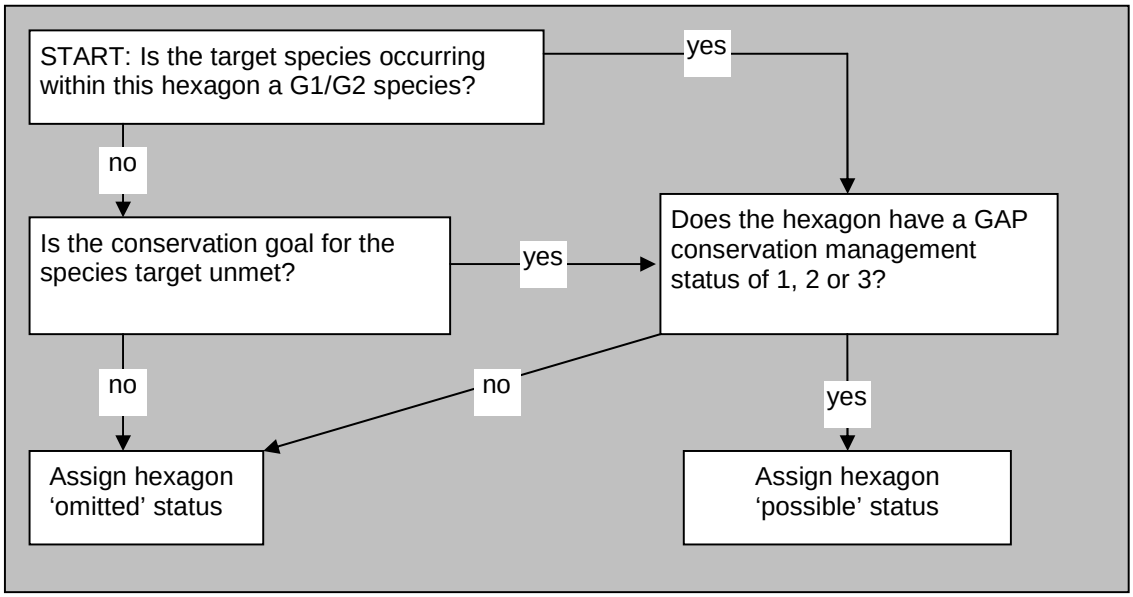


Figure 3: Process for evaluating EE-designated hexagons for inclusion in the draft terrestrial portfolio as described in step 5.

Freshwater Portfolio Assembly Process

River basins and stream watersheds of the lower Missouri River basin in the CTP were delineated and classified into Aquatic Ecological Systems (AES) types within five watershed size classes. Similar to the hexagon assessment units for the terrestrial portfolio, AES polygons served as the base unit of evaluation for the freshwater portfolio assembly process. Every AES polygon was evaluated and included or omitted from the portfolio using the steps outlined below. Ancillary data, such as ecological integrity and conservation management status, provided additional guidance in refining the portfolio. Experts reviewed draft freshwater portfolios at multiple points in this process, both in the context of expert workshops and independently. After the last step was completed, a final review was conducted. The final freshwater portfolio consists of those AES polygons that most efficiently met the conservation goals of all freshwater targets.

Aquatic assessments for the portions of the CTP ecoregion within the upper Mississippi River basin, the middle Missouri basin, and the Wabash basin were not included in the process outlined below because previous ecoregional planning exercises (Weitzell et al. 2003, North Central Tillplain Ecoregional Planning Team 2003, and Gagnon et al. 2004) have already identified aquatic Areas of Biodiversity Significance for these basins. The freshwater portfolio assembly process described below only pertains to the lower Missouri River basin portion of the CTP ecoregion.

Freshwater Step 1: Create Aquatic Ecological Systems (AES) layer.

a) River basins and stream watersheds of the lower Missouri River basin in the CTP were delineated and classified into Aquatic Ecological System (AES) polygons within five watershed size classes (headwaters, streams, small rivers, medium rivers, great rivers). Similar to the terrestrial hexagon assessment units, the AES polygons are the building blocks of the freshwater portfolio. Details on the classification and delineation of AES polygons are presented in Appendix 7.

Freshwater Step 2: Assign current target occurrence viability and CTP 2000 sites to AES polygons.

a) Using GIS overlays and intersections, each freshwater target occurrence and its associated overall viability score was assigned to the AES polygon in which it was located.

b) The first iteration ecoregional portfolio (The Nature Conservancy 2000) was overlaid on the AES polygons to determine if any freshwater sites from the original portfolio were missing target occurrence records. Data gaps were addressed as necessary to ensure a complete accounting of Year 2000 CTP portfolio target occurrences.

Freshwater Step 3: Identify aquatic Areas of Biodiversity Significance (ABS).

The subset of AES polygons containing viable target occurrences were identified as Areas of Biodiversity Significance (ABS). Target occurrences and their associated viability rankings were used to assign ABS designations as described in Table 2.

a) Each AES polygon was assigned an ABS designation based on the presence and viability of targets within the AES. Criteria for ABS designations are provided in Table 2.

Table 2. Designations and descriptions for freshwater Areas of Biodiversity Significance

ABS Designation	Description
AA	AESs with very good (A) or good (B) system viability
BB	AESs with fair (C) system viability *and* species occurrences with very good (A) or good (B) viability
CC	AESs containing target species occurrences with very good (A) or good (B)

	viability
DD	AESs with fair (C) system viability
EE	AESs containing target species occurrences with fair (C) viability ***or*** AESs containing target G1or G2 species occurrences with unknown viability
X	All other AESs

Freshwater Step 4: Develop the first draft of the lower Missouri Basin freshwater portfolio using top-ranked Areas of Biodiversity Significance.

a) All AA, BB and CC-designated AES polygons were selected as a preliminary portfolio against which conservation goals were initially evaluated.

b) Each target was evaluated individually to determine its conservation goal attainment in the preliminary portfolio layer. AES polygons were assigned 'confirmed' status if they contained occurrences required to meet conservation goals for any target. Those that were not needed for conservation goals were omitted from the portfolio.

Freshwater Step 5: Refine the portfolio by adding lower-ranked Areas of Biodiversity Significance within the lower Missouri River basin, ABS locations outside of the lower Missouri Basin, and Year 2000 CTP portfolio freshwater sites.

a) Using the decision rules depicted in Figure 4, all DD and EE-designated AES polygons in the lower Missouri River basin were evaluated and assigned "confirmed", "possible" or "omitted" status.

b) Goal attainment for each freshwater target was re-evaluated using "confirmed" AES polygons only (i.e., those with viable occurrences of targets). Additionally, the number of target occurrences contained within both "confirmed" and "possible" AES polygons were summed by target. (Occurrences in DD and EE AES polygons do not count toward meeting conservation goals, but it was helpful to know how much additional DD and EE AES polygons contributed to goal attainment across the portfolio.)

c) ABS polygons for areas outside of the lower Missouri River basin in the CTP (including parts of the upper Mississippi River basin, the middle Missouri basin and the Wabash basin) were reviewed by experts to determine if revisions were necessary based on information obtained since these polygons were originally identified. Very few changes in limited locations were necessary. These ABS polygons were appended to the lower Missouri Basin draft portfolio to represent all freshwater systems within the CTP.

d) Year 2000 freshwater portfolio sites were overlaid on the current draft freshwater portfolio to identify and flag river and stream portfolio sites in the 2000 plan that were not designated as 'confirmed' in the current draft portfolio. Omissions were evaluated individually (through consultations with local experts) to determine their justification for inclusion in the original 2000 portfolio and ascertain whether they met criteria for inclusion in the current portfolio. Corrections were made to the current draft portfolio as necessary.

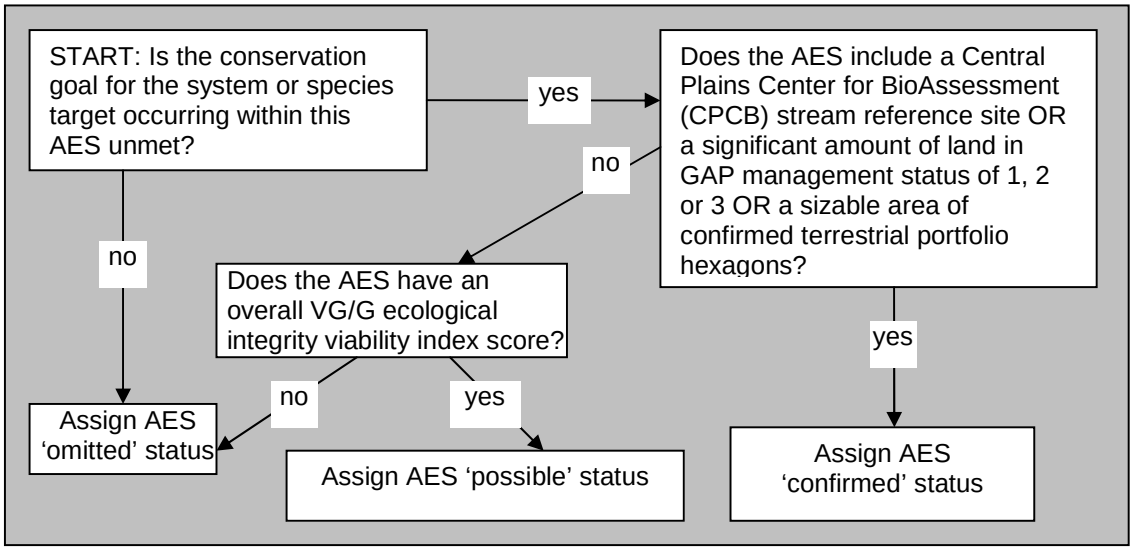


Figure 4: Process for evaluating DD and EE-designated freshwater AES polygons for inclusion in the draft freshwater portfolio as described in step 5a. (NOTE: In step 5c, for the upper Mississippi portion of the CTP ecoregion, we used these decision rules to evaluate ALL "possible" areas.)

Freshwater Step 6: Further refine the draft freshwater portfolio by comparing the lower-ranked AES polygons with the draft terrestrial portfolio hexagons. AES polygons that encompass terrestrial conservation areas are added to the draft freshwater portfolio.

In this step, the draft terrestrial portfolio hexagons were overlaid on the lower-ranked freshwater AES polygons to identify additional "possible" AES polygons to include in the draft freshwater portfolio.

a) The draft terrestrial portfolio was overlaid on the draft freshwater portfolio. DD and EE-designated AES polygons that were not yet included in the draft freshwater portfolio, but contained draft terrestrial conservation areas, were identified.

b) Based on their degree of overlap with draft terrestrial conservation areas, the AES polygons identified in step 6a were added to the draft freshwater portfolio with "possible" status. The added "possible" AES polygons were modified, if necessary, to fully encompass the associated terrestrial conservation areas.

Appendix 14. Conservation Area Profiles

Table of Contents

OVERVIEW OF PROFILES

This appendix contains summary information for each of the conservation areas selected for the Central Tallgrass Prairie ecoregional portfolio. Profiles for terrestrial areas are in the first part of this appendix, followed by freshwater profiles. Terrestrial conservation area profiles are grouped by state and then ordered by their site number. The freshwater profiles are ordered by subbasin (lower Missouri, middle Missouri, lower Ohio, and upper Mississippi) and then by their site code (e.g., LOMO J).

The first line of each terrestrial profile contains the conservation area number, the conservation area type (LAND, SITE, SITE/W, etc.), the conservation area name, and the state abbreviation; it is followed by a basic description of the area.

Occurrences of conservation targets documented at the site are listed next; they are ordered by target type (community, species), taxa (animals, plants; mammals, birds, insects, etc.), and HO Code. The column headings for the occurrence lists include the following:

- Portfolio Status: The portfolio status specifies whether the occurrence was included in the ecoregional portfolio in order to help meet the goal for the target species or community. All occurrences present within a conservation area are listed; an occurrence may be **confirmed** for the portfolio because it is both viable and contributes to the attainment of the target's conservation goal; **possible** to be included if the occurrence is later determined to be viable and is needed to help attain the goal for that target, **omitted** because it is not viable or is not needed to help attain the goal; or **unknown** if viability information was insufficient.
- HO (EO) Code: Heritage Occurrence Code, or Element Occurrence Code; the unique identifier for the occurrence, used by the state heritage program
- GELCODE: Global Element Code; the unique identifier of the species or community, used by NatureServe and the network of natural heritage programs
- NatureServe Common Name: For communities, the common name used in NatureServe's *International Ecological Classification Standard: Terrestrial Ecological Classifications* is listed; for species, the common name used by NatureServe is listed.
- Viability: The viability rank assigned during this assessment process is listed last; these are **not** the element occurrence (EO) ranks that were provided with the heritage target occurrence data.

The threats table in each profile lists the major threats that were identified for targets at the conservation area, as well as the rankings associated with each of the individual threats. A composite threat ranking is listed at the bottom of the table. The process for identifying and ranking these threats is described in Section H of the report.

The final component of each terrestrial profile is a list of recommended strategic actions for conserving the area. The process for identifying these strategies is described in Section H of the report.

Profiles for freshwater conservation areas are very similar to the terrestrial profiles. The first line of each profile contains the conservation area code and name, followed by a basic description of the area.

Occurrences of conservation targets documented at the site are listed next; they are grouped into two lists, one for ecological systems and one for species. Both lists are ordered by Portfolio Status. The lists of aquatic ecological system (AES) occurrences have the following column headings:

- Portfolio Status: The occurrence is either **confirmed** in the portfolio because it is viable and helps meet conservation goals, or it is **possible** to add it to the portfolio to help meet conservation goals, if it is later determined to be viable.
- AES Type: The unique identifier or code for the aquatic ecological system type
- AES ID: The unique identifier for the individual occurrence of the aquatic ecological system
- AES Name: The name of the occurrence of this aquatic ecological system
- Viability: The viability rank determined for the occurrence

The lists of species occurrences have similar headings which are described above: Portfolio Status, GELCODE, Scientific Name, Common Name, and Viability.

The threats and strategic action lists have the same content and format as those lists in the terrestrial profiles.

TERRESTRIAL PORTFOLIO

KANSAS

36 LAND Flint Hills Tallgrass Prairie KS

Description

This landscape is located at the northern edge of the largest remaining area of native tallgrass prairie in North America. The topography comprises level to gently rolling uplands situated on Permian limestones and shales. Numerous headwater streams, which

ultimately give rise to or join the rivers of eastern Kansas, have their source in this region. Extensive upland areas are used for cattle grazing during spring and summer, while most floodplains along larger streams and rivers have been converted to cropland, especially for corn, soybeans, and milo. A number of rare fishes occur in the region, including the hornyhead chub, Topeka shiner, southern redbelly dace, blue sucker, brindled madtom, and blackside darter. Historically, the rare western prairie white-fringed orchid occurred in the region.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002201*015*KS	CEGL002201	Flint Hills Tallgrass Prairie	B
Confirmed	CEGL002201*037*KS	CEGL002201	Flint Hills Tallgrass Prairie	B
Bird				
Confirmed	ABNLC13010*N01*KS	ABNLC13010	Tympanuchus cupido / Greater Prairie-chicken	B
Confirmed	ABPBW01110*N01*KS	ABPBW01110	Vireo bellii / Bell's Vireo	B
Confirmed	ABPBXA0030*007*KS	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	B
Unknown	ABPBXA0030*048*KS	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Insect				
Confirmed	IILEPJ6040*N01*KS	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Vascular Plant				
Omitted	PMORC1Y0S0*008*KS	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	D
Unknown	PMORC1Y0S0*019*KS	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	U

Threats

Threat	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Very High	High	High	High
Fire & Fire Suppression	Medium	High	Medium	Low	Low
Invasive Non-Native/Alien Species	Medium	High	Medium	Low	Low
Livestock Farming & Ranching	Medium	Very High	Medium	Low	Low
Renewable Energy	High	Medium	Medium	High	Medium
Housing & Urban Areas	Medium	High	Medium	Very High	High

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams
- Reduce and mitigate for the threats to biodiversity from energy and mining impacts

39 SITE French Creek Prairie KS

Description

French Creek Prairie contains several very small (less than 50 acres) tracts of native tallgrass prairie. The plant community representation is generally diverse and of high quality. Their small size and the extensive fragmentation of the surrounding land mean that these plant communities will require intensive restoration to remain viable in the long term. A small, mesic to wet-mesic, upland, tallgrass prairie remnant is situated on an east-facing slope above French Creek. This site is hayed annually, and it supports sizeable populations of the federally protected plant, Mead's milkweed.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002203*017*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Vascular Plant				
Confirmed	PDASC02150*093*KS	PDASC02150	Asclepias meadii / Mead's Milkweed	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Very High	High	High	High
Fire & Fire Suppression	Medium	High	Medium	Low	Low
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

120 SITE Rockefeller Prairie KS

Description

Rockefeller Prairie is a small, mesic, upland, tallgrass prairie remnant on a level ridge north of the Kansas River floodplain. This site supports two populations of three rare plants: Mead's milkweed, western prairie white-fringed orchid, and earleaf foxglove. Although the site is small and isolated from other remnant prairies, it is managed by the University of Kansas as a nature preserve and is used for nondestructive, long-term ecological research by scientists from KU and other universities.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002203*038*KS	CEGL002203	Central Mesic Tallgrass Prairie	A
Possible	CEGL002203*103*KS	CEGL002203	Central Mesic Tallgrass Prairie	B
Bird				
Unknown	ABPBXA0030*030*KS	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Vascular Plant				
Confirmed	PDASC02150*034*KS	PDASC02150	Asclepias meadii / Mead's Milkweed	B
Omitted	PDASC02150*105*KS	PDASC02150	Asclepias meadii / Mead's Milkweed	D
Confirmed	PDSCR01130*014*KS	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	C
Confirmed	PMORC1Y0S0*009*KS	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Very High	High	High	High
Fire & Fire Suppression	Medium	High	Medium	Low	Low
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

257 SITE/W Melanthium Prairie KS

Description

Melanthium Prairie is comprised of very small (less than 50 acres) tracts of native tallgrass prairie. The plant community is generally diverse and of high quality. Their small size and the extensive fragmentation of the surrounding land mean that these plant communities will require intensive restoration to remain viable in the long term.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002223*011*KS	CEGL002223	Southern Great Plains Cordgrass Wet Prairie	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	Very High	Very High
Fire & Fire Suppression	Medium	High	Medium	Low	Low
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to improve corporate practices that enhance conservation of biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

258 SITE/W Vineland Prairie KS

Description

Vineland Prairie is comprised of very small (less than 50 acres) tracts of native tallgrass prairie. The plant community is generally diverse and of high quality. Their small size and the extensive fragmentation of the surrounding land mean that these plant communities will require intensive restoration to remain viable in the long term.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002203*003*KS	CEGL002203	Central Mesic Tallgrass Prairie	AB

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	High	High
Fire & Fire Suppression	Medium	High	Medium	Low	Low
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide

- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

259 SITE Kill Creek KS

Description

This conservation area is comprised of very small (less than 50 acres) native tallgrass prairie tracts. The plant community is generally diverse and of high quality. Their small size and the extensive fragmentation of the surrounding land mean that these plant communities will require intensive restoration to remain viable in the long term.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002204*298*KS	CEGL002204	Unglaciated Mesic Tallgrass Prairie	B
Vascular Plant				
Confirmed	PDASC02150*099*KS	PDASC02150	Asclepias meadii / Mead's Milkweed	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	High	High
Fire & Fire Suppression	Medium	High	Medium	Low	Low
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

260 SITE/W Central Mesic Prairies KS

Description

This conservation area is comprised of several very small (less than 50 acres) tracts of native tallgrass prairie. The plant community is generally diverse and of high quality. Their small size and the extensive fragmentation of the surrounding land mean that these plant communities will require intensive restoration to remain viable in the long term.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002203*012*KS	CEGL002203	Central Mesic Tallgrass Prairie	C

Possible	CEGL002203*014*IA	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*016*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Unknown	CEGL002203*023*KS	CEGL002203	Central Mesic Tallgrass Prairie	AB
Possible	CEGL002203*026*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*027*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*046*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*051*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*092*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*093*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*095*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*096*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*097*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Confirmed	CEGL002203*104*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Unknown	CEGL002203*106*KS	CEGL002203	Central Mesic Tallgrass Prairie	D
Possible	CEGL002203*107*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*110*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*129*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*130*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*134*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*136*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*137*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Possible	CEGL002203*138*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Confirmed	CEGL002203*140*KS	CEGL002203	Central Mesic Tallgrass Prairie	C
Bird				
Unknown	ABPBXA0030*056*KS	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Vascular Plant				
Possible	PDASC02150*103*KS	PDASC02150	Asclepias meadii / Mead's Milkweed	C
Possible	PDASC02150*118*KS	PDASC02150	Asclepias meadii / Mead's Milkweed	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Very High	High	High	High	High
Fire & Fire Suppression	Medium	High	Medium	Low	Low
Housing & Urban Areas	High	Medium	Medium	High	Medium
Invasive Non-Native/Alien Species	Medium	Medium	Medium	High	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

KANSAS/MISSOURI

37 SITE Fort Leavenworth KS

Description

The Fort Leavenworth Military Reservation is home to an active military base. It is situated on rolling hills and bluffs above the Missouri River floodplain and on a small portion of the river floodplain. Oak-hickory forest and maple-basswood forest dominate the uplands and steep northeast-facing slopes above the river. The level to gently undulating river floodplain supports one of the largest remnants of old-growth floodplain forest along the

lower Missouri River. The site's natural communities support nearly 20 species of state-rare plants and animals. In addition, the installation has tremendous cultural and historical significance.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002011*005*KS	CEGL002011	White Oak - Hickory Forest	C
Confirmed	CEGL002061*001*KS	CEGL002061	Central Maple - Basswood Forest	C
Confirmed	CEGL002087*001*KS	CEGL002087	Forest Pecan - Sugarberry Forest	B
Confirmed	CEGL002095*005*KS	CEGL002095	Forest Cottonwood - Sycamore Forest	B
Unknown	CTEZZ18110*026*MO	CEGL002430	Midwest Ephemeral Pond	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Medium	Medium	Very High	High
Fire & Fire Suppression	Medium	Medium	Medium	Low	Low
Housing & Urban Areas	Medium	Low	Low	Very High	Medium
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium
War, Civil Unrest & Military Exercises	Medium	High	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build a constituency for biodiversity conservation
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to improve corporate practices that enhance conservation of biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams

ILLINOIS

13 SITE Carpenter Park IL

Description

The area is composed of upland and floodplain components that are predominantly forested. Both are relatively flat, with some gently to steeply sloping areas connecting the two. The floodplain area contains some old meander scars from the Sangamon River. The upland forest is dominated by oaks, sugar maple, sassafras and shagbark hickory. The floodplain is composed of silver maple, elms, Kentucky coffee tree and bur oak. The area

was owned by the city of Springfield for many years as a park and was eventually dedicated as a nature preserve. Consequently, it has not been logged or disturbed by grazing for over 75 years.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFBB00000*107*IL	CEGL002068	Midwestern White Oak – Red Oak Forest	B
Confirmed	CPFAB00000*004*IL	CEGL002586	Silver Maple - Elm Forest	B
Omitted	CTFBC00000*077*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

16 SITE Cedar Glen IL

Description

Sharply dissected river bluffs of this area divide the level bottomland along the river from the higher, gently rolling uplands. The rugged terrain of the bluffs is mostly wooded, but very little forest remains intact on the bottomland or level upland. Most of the surrounding land is now cultivated. Fortunately, the Cedar Glen area escaped development and is still forested. The natural features include mature second-growth forest stands, meandering streams, high cliffs and unique geologic features. The forests are dominated by oaks, hickories, sugar maple and basswood. This area also contains a large winter bald eagle roost.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTSAD00000*004*IL	CEGL002142	North-central Dry-Mesic Oak Woodland	U
Confirmed	CTPG00000C*004*IL	CEGL002292	Midwest Moist Limestone -Dolostone Cliff	A

Omitted	CTPCA0000A*001*IL	CEGL002318	Midwest Dry Sand Prairie	C
Confirmed	CTSBC00000*014*IL	CEGL002391	Post Oak Central Dry Barrens	B
Confirmed	CPWQ00000B*001*IL	CEGL002392	Midwest Sand Seep	C
Unknown	CTSCB00000*001*IL	CEGL002492	Black Oak / Lupine Barrens	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

20 SITE Chinquapin Bluffs IL

Description

This site on the banks of the Mackinaw River is situated in a landscape of generally rolling topography and dissected bluffs. Ridge tops are 15-20 meters above the bottoms of local ravines. Forested areas with scattered trees are typical, with grade C woods having been grazed and harvested in the past. Broad spreading old-growth chinquapin oak trees characteristic of open settings have perpetuated through the years. In some cases, the extremely steep south-facing bluffs can rise as much as 50 meters. It is on top of these south-facing bluffs where the glacial drift hill prairies formed. The hill prairie component includes little bluestem, big bluestem, leadplant, and a few Hill's thistles. The dominant oak communities of these south-facing slopes and bluffs are comprised primarily of gnarled, twisted chinquapin oaks with occasional bur oaks and white oaks.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPG00000B*025*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C
Vascular Plant				
Omitted	PDAST2E1C0*040*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	D

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	High	Very High	High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

40 SITE Funks Grove IL

Description

This large remnant prairie grove contains areas of old-growth sugar maple and basswood forests. The prairie grove contains an active commercial sugar maple syrup enterprise. Efforts to restore prairie and woodland components are on-going, and there is an excellent nature center and active local stewardship group. There are some small wetland seeps that contain skunk cabbage and marsh marigold. In addition, restoration of presettlement prairie and savanna communities are underway.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CPFBA00000*011*IL	CEGL002062	North-Central Maple – Basswood Forest	B
Omitted	CTFBC00000*051*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	B
Reptile				
Unknown	ARADB06010*028*IL	ARADB06010	Clonophis kirtlandii / Kirtland's Snake	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Roads & Railroads	Very High	Very High	Very High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

45 SITE Green River Sand Prairies IL

Description

The Green River Sand Prairies Conservation Area has generally sandy soils with characteristic rolling dunes and swales. In the absence of fire, trees have invaded the area, but historically it was very open with a mix of prairies, ponds, and marshes. There is substantial variation in the prairie types as they range from wet-mesic to dry sand prairies. The Illinois Department of Natural Resources has been involved in brush and tree removal, burning, and exotic species control.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPCB00000*024*IL	CEGL002210	Midwest Dry-Mesic Sand Prairie	B
Omitted	CPWL000000*038*IL	CEGL002258	Tussock Sedge Wet Meadow	B
Omitted	CTPCA0000B*013*IL	CEGL002318	Midwest Dry Sand Prairie	C
Confirmed	CTPCC00000*017*IL	CEGL005096	Mesic Sand Tallgrass Prairie	B
Bird				
Unknown	ABPBXA0030*047*IL	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Insect				
Unknown	IILEPJ6040*020*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Confirmed	IILEYC0450*N20*IL	IILEYC0450	Papaipema beeriana / Blazing Star Stem Borer	B
Vascular Plant				
Omitted	PDAST2E1C0*039*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	High	High	High	Medium	High
Other Ecosystem Modifications	High	High	High	Medium	High
Dams & Water Management/Use	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

47 LAND Hannibal Bottoms IL

Description

This large area along the Mississippi River floodplain encompasses a diverse array of habitats including the river bluff area along the Wyaconda region, and the very flat, expansive floodplain along the Long Island stretch of the Mississippi River. The area has high-quality floodplain forests including silver maple, cottonwood, elm and ash in the lower lands at Long Island along the sloughs, and bur oak and hickory forests on the higher ground. Important bluff/cliff habitat occurs in patches along the river.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTCDL16111*004*MO	CEGL002291	Midwest Dry Limestone -Dolostone Cliff	BC
Confirmed	CPFAB00000*014*IL	CEGL002586	Forest Silver Maple - Elm Forest	B
Unknown	CPFBC00000*029*IL	CEGL002586	Forest Silver Maple - Elm Forest	U
Mammal				
Unknown	AMACC01100*022*IL	AMACC01100	Myotis sodalis / Indiana Bat	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology

54 LAND Illinois River Floodplain Complex IL

Description

This portfolio site contains the portfolio site from the 2000 iteration of the Central Tallgrass Prairie ecoregional assessment, Manito Prairie. The La Grange Reach is the most ecologically diverse segment of the Illinois River. In addition to the federally threatened decurrent false aster, populations of ancient fishes such as the paddlefish and sturgeon are found here, along with a diversity of floodplain and wetland communities. Although two navigation dams prevent low water levels in the summer along this stretch of the river, these dams do not influence the magnitude or duration of annual spring floods. Because much of the historic floodplain is still open to the river along this stretch, fish are able to access backwater areas during floods. The many natural areas in this reach of the river provide important habitat for migratory birds, including waterfowl and shorebirds.

Manito Prairie is situated in primarily flat uplands with a sloping west-facing bluff having much gravel exposure. The bluff line and slopes are lightly wooded, and the site contains the only occurrence of the Tennessee milk vetch in Illinois, as well as the dry gravel prairie community. Brush clearing and prescribed burning are carried out by the Illinois Department of Natural Resources. The prairie is located in a predominantly agricultural landscape.

The Conservancy is restoring two sites along the Illinois River within this portfolio site: Emiquon (~ 7,000 acres) and the Merwin Preserve at Spunky Bottoms (1,200 acres). Emiquon, located near Havana, Illinois, is one of the largest floodplain restoration projects in the country outside the Florida Everglades. It is the premiere demonstration site for The Nature Conservancy's work on the Illinois River and within the Upper Mississippi River system and may ultimately help guide large floodplain river restoration efforts around the world.

The Spunky Bottoms floodplain/backwater restoration is located just west of the Meredosia National Wildlife Refuge. Restoration efforts include reconnection with the Illinois River to enhance habitat for various organisms, including ancient fish such as the paddlefish and sturgeon, and the federally threatened decurrent false aster. Additionally, The Nature Conservancy is working with partner agencies on land protection efforts and prioritizing acquisitions for the Conservation Reserve Enhancement Program.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPG00000A*006*IL	CEGL002215	Gravel Midwest Dry Gravel Prairie	C
Unknown	CTPG00000C*005*IL	CEGL002292	Midwest Moist Limestone - Dolostone Cliff	U
Unknown	CTPG00000C*006*IL	CEGL002292	Midwest Moist Limestone - Dolostone Cliff	U
Unknown	CTPG00000C*007*IL	CEGL002292	Midwest Moist Limestone - Dolostone Cliff	U
Unknown	CPWN000000*002*IL	CEGL002385	Skunk-cabbage Seepage Meadow	U
Confirmed	CPWN000000*010*IL	CEGL002385	Skunk-cabbage Seepage Meadow	B
Confirmed	CTFDB00000*001*IL	CEGL005030	Black Oak - White Oak / Blueberry Forest	C
Omitted	CTPC000000*011*IL	CEGL005131	Central Limestone Glade	C
Confirmed	CTPC000000*P53*IL	CEGL005131	Central Limestone Glade	B
Unknown	CTPF00000A*042*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Amphibian				
Confirmed	AAABC05061*P29*IL	AAABC05061	Pseudacris streckeri illinoensis / Illinois Chorus Frog	B
Confirmed	AAABC05061*P30*IL	AAABC05061	Pseudacris streckeri illinoensis / Illinois Chorus Frog	B
Bird				
Unknown	ABPBXA0030*068*IL	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Insect				
Unknown	IILEPJ6040*007*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Omitted	IILEPJ6040*P34*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	C
Vascular Plant				
Unknown	PDAST1E040*023*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	U
Confirmed	PDAST1E040*P09*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	B
Confirmed	PDAST1E040*P10*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	B
Possible	PDAST1E040*P11*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	C
Confirmed	PDASTDY060*001*IL	PDASTDY060	Tetraneuris herbacea / Lakeside Daisy	C
Confirmed	PDFAB0F8S0*001*IL	PDFAB0F8S0	Astragalus tennesseensis / Tennessee Milk-vetch	C
Unknown	PDSCR09030*010*IL	PDSCR09030	Besseya bullii / Kitten Tails	C
Unknown	PDSCR09030*012*IL	PDSCR09030	Besseya bullii / Kitten Tails	U
Omitted	PMCYP061G0*007*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	C
Unknown	PMCYP0Q0R0*004*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*006*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*011*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*012*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*013*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*014*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*015*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Medium	High	Medium	Very High	High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Recreational Activities	High	High	High	Medium	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams

86 LAND Mason County Sands IL

Description

This area is a large inland sand deposit vegetated by sand prairies and sand savannas. Some open expanses of wet sand prairies have low swales that include temporary ponds during times of high ground water. It also contains a population of regal fritillaries.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTFDA00000*003*IL	CEGL002078	Black Oak Forest	U
Confirmed	CTPCB00000*001*IL	CEGL002210	Midwest Dry-Mesic Sand Prairie	C
Unknown	CTPCA0000B*001*IL	CEGL002318	Midwest Dry Sand Prairie	U
Unknown	CTPCA0000B*003*IL	CEGL002318	Midwest Dry Sand Prairie	U
Omitted	CTPCA0000B*007*IL	CEGL002318	Midwest Dry Sand Prairie	C
Unknown	CTPCA0000B*012*IL	CEGL002318	Midwest Dry Sand Prairie	U
Unknown	CTSCA00000*001*IL	CEGL002492	Black Oak / Lupine Barrens	U
Unknown	CTSCA00000*005*IL	CEGL002492	Black Oak / Lupine Barrens	U
Confirmed	CTPCE00000*001*IL	CEGL005178	Central Cordgrass Wet Sand Prairie	B
Amphibian				
Confirmed	AAABC05061*P29*IL	AAABC05061	Pseudacris streckeri illinoensis / Illinois Chorus Frog	B
Insect				
Omitted	IILEPJ6040*004*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Confirmed	IILEPJ6040*P33*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	A
Vascular Plant				
Confirmed	PDAST1E040*P10*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	B
Confirmed	PDMAL0A080*N22*IL	PDMAL0A080	Callirhoe triangulata / Clustered Poppy-mallow	B
Unknown	PDSCR01130*001*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U
Unknown	PMCYP061G0*002*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	U
Confirmed	PMCYP061G0*003*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	B
Unknown	PMCYP061G0*008*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	U
Unknown	PMCYP061G0*009*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	U
Confirmed	PMCYP061G0*010*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	B
Unknown	PMCYP061G0*011*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	U
Confirmed	PMCYP061G0*012*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	B
Unknown	PMCYP061G0*014*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	U
Unknown	PMCYP061G0*015*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	U
Unknown	PMCYP0Q0R0*001*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*002*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*009*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*018*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U

Unknown	PMCYP0Q0R0*020*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Unknown	PMCYP0Q0R0*021*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U
Omitted	PMCYP0Q0R0*N13*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	D
Confirmed	PMCYP0Q0R0*N14*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	B
Confirmed	PMCYP0Q0R0*N15*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Hunting & Collecting Terrestrial Animals	High	High	High	High	High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Gathering Terrestrial Plants	High	High	High	Medium	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

106 LAND Pike County Bluffs IL

Description

This conservation area is situated on a set of very steep, forested bluffs with associated small hill prairies ranging from 2 to 20 acres in size. The bluffs are highly dissected with considerable variation in local relief. The forest has a closed canopy. Most of the area remains privately owned, although some prescribed burning, brush removal and other stewardship activities have been conducted in conjunction with the Illinois Department of Natural Resources.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPF00000A*015*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Confirmed	CTPF00000A*P40*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	B
Confirmed	CTPF00000A*P42*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C
Confirmed	CTPF00000A*P43*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C

Insect				
Unknown	IILEPJ6040*009*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Vascular Plant				
Unknown	PDAST2E1C0*043*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Recreational Activities	Medium	Low	Low	Medium	Low
Mining & Quarrying	Medium	Low	Low	Very High	Medium

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

119 SITE Robert Allerton Park IL

Description

This site is a largely forested area situated along both sides of the Sangamon River. The bottomland forest is composed of silver maple, shellbark hickory, sycamore and ash. The upland forest is predominantly white and red oak, shagbark hickory and sugar maple. It contains populations of eastern massasauga and Kirtland's snake. Parts of this area are included on the list of National Natural Landmarks Program.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFBB00000*094*IL	CEGL002068	Midwestern White Oak – Red Oak Forest	B
Omitted	CPFAB00000*003*IL	CEGL002586	Silver Maple - Elm Forest	B
Confirmed	CPFAB00000*032*IL	CEGL002586	Silver Maple - Elm Forest	B
Confirmed	CPFBC00000*033*IL	CEGL002586	Silver Maple - Elm Forest	B
Omitted	CTFBC00000*068*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	B
Bird				
Unknown	ABPBXA0030*072*IL	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Reptile				
Confirmed	ARADB06010*027*IL	ARADB06010	Clonophis kirtlandii / Kirtland's Snake	B
Unknown	ARADE03011*005*IL	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

128 SITE Lost Mound - Hanover Bluff IL

Description

Lost Mound – Hanover Bluff is 9,000 acres of rolling sand prairie, sand savanna, and Mississippi River floodplain. This area was used as an ammunition depot during World War II and is now a closed military site. It is an important area for grassland and savanna birds, such as the red-headed woodpecker and grasshopper sparrow, and some rare sand prairie plants such as kitten tails and clustered poppy-mallow. It connects to the Hanover Bluff Nature Preserve, providing a rare uninterrupted stretch from the Mississippi floodplain forest to sand hill prairies.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPCB00000*N49*IL	CEGL002210	Midwest Dry-Mesic Sand Prairie	B
Confirmed	CTPCA0000B*N48*IL	CEGL002318	Midwest Dry Sand Prairie	B
Confirmed	CEGL002403*N204*IL	CEGL002403	North-central Dry Limestone - Dolomite Prairie	B
Confirmed	CTSCA00000*N52*IL	CEGL002492	Black Oak / Lupine Barrens	C
Vascular Plant				
Confirmed	PDMAL0A080*N06*IL	PDMAL0A080	Callirhoe triangulata / Clustered Poppy-mallow	A
Omitted	PDSCR09030*026*IL	PDSCR09030	Besseya bullii / Kitten Tails	C
Confirmed	PDSCR09030*032*IL	PDSCR09030	Besseya bullii / Kitten Tails	B

Confirmed	PDSCR09030*N03*IL	PDSCR09030	Besseya bullii / Kitten Tails	A
Omitted	PMCYP061G0*001*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Commercial & Industrial Areas	Very High	Very High	Very High	Very High	Very High
Renewable Energy	Medium	Medium	Medium	Medium	Medium
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	High	Very High	High	Medium	High
Problematic Native Species	High	High	High	Medium	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams

131 SITE Siloam Springs IL

Description

The site is located on a rolling landscape dissected deeply in areas by streams with associated woodlands; it also contains some associated prairie remnants. The woodland has a closed canopy dominated by oaks, with some hickory, maple, and ash present as well. The woodland is surrounded by agricultural land and forest. Historically, there were eight to ten springs in this area, around which a resort and bath house were built in the early part of this century; those buildings have since been removed.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTSAD00000*002*IL	CEGL002142	North-central Dry-Mesic Oak Woodland	C
Omitted	CTPG00000C*N39*IL	CEGL002292	Midwest Moist Limestone - Dolostone Cliff	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

154 LAND Upper Illinois River Bottoms & Bluffs IL

Description

This portion of the Illinois River corridor contains a series of lakes that comprise the widest stretches of the Illinois River. They are bordered by predominantly forested river bluffs with hill prairies surrounded by upland forests comprised of red oak, sugar maple, and elm. The wide river valley contains a number of protected areas that are home to skunk cabbage seeps and populations of decurrent false aster.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Omitted	CTFBB00000*042*IL	CEGL002068	Midwestern White Oak – Red Oak Forest	C
Unknown	CTFBB00000*055*IL	CEGL002068	Midwestern White Oak – Red Oak Forest	U
Confirmed	CPWN000000*008*IL	CEGL002385	Skunk-cabbage Seepage Meadow	B
Unknown	CPWN000000*009*IL	CEGL002385	Skunk-cabbage Seepage Meadow	
Confirmed	CPWN000000*011*IL	CEGL002385	Skunk-cabbage Seepage Meadow	B
Confirmed	CPWN000000*029*IL	CEGL002385	Skunk-cabbage Seepage Meadow	B
Omitted	CPWA000000*008*IL	CEGL002386	Water-lily Aquatic Wetland	C
Unknown	CTFBC00000*025*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	U
Unknown	CTFBC00000*026*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	U
Omitted	CTFBC00000*028*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	B
Omitted	CTFBC00000*037*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	B
Confirmed	CTFBC00000*P50*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	B
Unknown	CPWJB00000*003*IL	CEGL005139	Cinquefoil - Sedge Prairie Fen	U
Unknown	CTSAA00000*001*IL	CEGL005181	Swamp White Oak Woodland	U
Confirmed	CTPG00000B*010*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C
Unknown	CTPG00000B*016*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Unknown	CTPG00000B*020*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Unknown	CTPG00000B*030*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Unknown	CTPG00000B*036*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Confirmed	CTPG00000B*P47*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C
Vascular Plant				
Confirmed	PDAST1E040*P09*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	B
Confirmed	PDAST1E040*P10*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	B
Omitted	PDAST2E1C0*029*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	B

Unknown	PDAST2E1C0*041*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	U
Unknown	PDAST2E1C0*052*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Recreational Activities	High	High	High	Medium	High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams

161 SITE Weinberg-King Natural Area IL

Description

The topography of this area is rolling, forested terrain with highly dissected areas cut by numerous tributaries. The cliffs and eroding bluffs are surrounded by forests on all sides, contained completely within the natural area.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPE000000*007*IL	CEGL002045	Midwest Dry Sandstone Cliff	U
Confirmed	CTPJ000000*004*IL	CEGL002315	Midwestern Small Eroding Bluffs	A

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation

165 SITE Witter's Bobtown Hill Prairie IL

Description

This site contains a small loess hill prairie situated on a forested bluff line along a small tributary to the Sangamon River. The bottomlands and upper flat lands are farmed as row-crop agriculture. This prairie is dominated by little bluestem and sideoats grama, with pale purple coneflower, leadplant, purple prairie clover, and scurf pea. It is buffered by one-half to one mile of forested land that includes poorer-quality hill prairies.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPF00000A*043*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Vascular Plant				
Confirmed	PDAST2E1C0*N05*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation

- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

205 SITE Ayers Sand Prairie IL

Description

Ayers Sand Prairie is a 109-acre nature preserve with an additional 6 acres of buffer that was dedicated in 1974 and is located in Carroll County. It is a relatively large preserve containing dry sand prairie, sand dune and blowout communities typical of the Mississippi River Section of the Illinois and Mississippi River Sand Areas Natural Division. A plant inventory revealed 39 species of grasses and sedges, 16 species of woody plants and 96 forbs. The dominant herbaceous species are little bluestem, prairie Junegrass and hairy grama. Carolina anemone, sandcress, puccoon and sand primrose are typical sand prairie species. Black oak and cottonwood occur in the blowouts along with scattered clones of aromatic sumac. Resident mammals include deer, skunk, rabbit, mole, shrew and western harvest mice. Summer resident birds include upland sandpiper, loggerhead shrike, western meadowlark, grasshopper sparrow and dickcissel. A number of reptiles characteristic of sand prairies are found at Ayers Sand Prairie. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPCA0000B*005*IL	CEGL002318	Midwest Dry Sand Prairie	B
Vascular Plant				
Omitted	PDMAL0A080*N07*IL	PDMAL0A080	Callirhoe triangulata / Clustered Poppy-mallow	B
Omitted	PMCYP061G0*006*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Recreational Activities	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

206 SITE Thompson-Fulton Sand Prairie IL

Description

This 212-acre nature preserve dedicated in 1970 is located in Whiteside County. It contains 212 acres of sand prairie that is recovering from past grazing. Little bluestem, three-awn grass, plains prickly pear cactus and prairie Junegrass are some of the common plants in the preserve. The big-flowered penstemon also occurs on this site. The preserve is also habitat for several unusual reptile species. The western hognose snake, six-lined racerunner and bullsnake are known to occur here. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPCB00000*021*IL	CEGL002210	Midwest Dry-Mesic Sand Prairie	B
Vascular Plant				
Confirmed	PDMAL0A080*N08*IL	PDMAL0A080	Callirhoe triangulata / Clustered Poppy-mallow	A
Confirmed	PMCYP061G0*004*IL	PMCYP061G0	Cyperus grayoides / Mohlenbrock's Umbrella-sedge	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	High	High	Very High	Very High
Fire & Fire Suppression	Very High	High	High	Medium	High
Invasive Non-Native/Alien Species	High	High	High	Medium	High
Problematic Native Species	Medium	High	Medium	Medium	Medium
Recreational Activities	Medium	Medium	Medium	Medium	Medium
Gathering Terrestrial Plants	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

207 SITE Lyndon - Agnew Prairie IL

Description

This 36-acre nature preserve is northeast of Lyndon in Whiteside County. It consists of wet mesic prairie and dry mesic prairie of the Mississippi River Section of the Upper Mississippi River and Illinois River Bottomlands Natural Division. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPAD00000*026*IL	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Confirmed	CTPAC00000*054*IL	CEGL002203	Central Mesic Tallgrass Prairie	C
Unknown	CTPAB00000*028*IL	CEGL002214	Midwest Dry-Mesic Prairie	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	Very High	High	Medium	High
Invasive Non-Native/Alien Species	High	High	High	Medium	High
Recreational Activities	Medium	High	Medium	Medium	Medium
Problematic Native Species	Medium	High	Medium	Medium	Medium
Roads & Railroads	Medium	Very High	Medium	Very High	High

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

208 SITE Yorkville Wetlands IL

Description

This site is located near Yorkville in Kendall County; its wetlands are characteristic of the seeps and fens that occurred along the Fox River in presettlement times. These wetlands are Illinois Natural Area Inventory sites named Yorkville Seep and Yorkville Forested Seep and Fen.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CPWN000000*016*IL	CEGL002385	Skunk-cabbage Seepage Meadow	B
Confirmed	CPWN000000*031*IL	CEGL002385	Skunk-cabbage Seepage Meadow	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	High	Very High	High	Medium	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

209 SITE Route 47 Prairie IL

Description

This site is a privately owned Natural Heritage Landmark containing a mesic prairie and a population of eastern prairie white-fringed orchid.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Vascular Plant				
Confirmed	PMORC1Y0F0*012*IL	PMORC1Y0F0	Platanthera leucophaea / Eastern Prairie White-fringed Orchid	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Gathering Terrestrial Plants	Medium	Very High	Medium	Very High	High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity

- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

210 SITE Marseilles-Seneca Hill Prairies IL

Description

This complex of hill prairies represents the best example of these communities along the Illinois River at its upper reaches.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	CTPG00000A*033*IL	CEGL002215	Midwest Dry Gravel Prairie	C
Confirmed	CTPG00000B*P46*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Renewable Energy	Medium	Medium	Medium	Very High	High
Recreational Activities	High	High	High	Medium	High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

211 SITE Starved Rock Complex IL

Description

Blackball Mines, a portfolio site identified in the 2000 iteration of the Central Tallgrass Prairie ecoregional assessment, is incorporated into the Starved Rock Complex portfolio site in this assessment. High, sheer sandstone bluffs with deep ravines and canyons along the Illinois River characterize this important site. The bluffs are heavily forested, with dry forests on the ridges, and wetter communities in the ravine bottoms. There is some work to control exotics at the site. The area is heavily developed for tourism, with an extensive trail network and associated camp grounds. The area overlooks a lock and dam on the Illinois River. A saline marsh occurs at the easternmost end of the area. This area contains seeps along the Illinois River, as well as high-quality, dry-mesic upland forests that are dedicated Illinois Nature Preserves.

The Blackball Mines are located in rolling topography that is partially forested and has associated glades in the vicinity. Pecumsaugan Creek is a narrow canyon with dolomite cliffs, dolomitic prairie, dry-mesic savanna, and upland and bottomland forest communities along the Illinois River. This area is best known for a series of abandoned limestone mines and its colonies of bats. Blackball Mines is one of the largest known bat hibernaculas in Illinois. Five species of bats are found in the mines, including the federally endangered Indiana bat, little brown bat, big brown bat, and eastern pipistrelle. It is an old limestone mine with several entrances that are fairly easy to access, resulting in vandalism problems in the past. Gates made for some of the cave entrances were vandalized several years ago. A relict population of timber rattlesnakes is found on the site. The savanna community has scattered white and black oaks with Pennsylvania sedge, poverty oats and little bluestem in the understory. The cool, shaded canyon provides habitat for northern relict species such as white pine and white cedar. This area is dedicated as a state nature preserve and is owned and managed by the Illinois Department of Natural Resources. [This description is taken in part from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPE000000*065*IL	CEGL002045	Midwest Dry Sandstone Cliff	A
Confirmed	CTPE000000*066*IL	CEGL002045	Midwest Dry Sandstone Cliff	A
Omitted	CTFBB00000*021*IL	CEGL002068	Midwestern White Oak – Red Oak Forest	C
Confirmed	CTFBB00000*097*IL	CEGL002068	Midwestern White Oak – Red Oak Forest	B
Confirmed	CTFCA00000*022*IL	CEGL002076	Black Oak - White Oak – Hickory Forest	B
Confirmed	CTPG00000C*N38*IL	CEGL002292	Midwest Moist Limestone - Dolostone Cliff	C
Confirmed	CTFBC00000*071*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	B
Confirmed	CPWE000000*001*IL	CEGL005111	Inland Saline Marsh	B
Confirmed	CPWE000000*002*IL	CEGL005111	Inland Saline Marsh	C
Bird				
Unknown	ABPBXA0030*027*IL	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Unknown	ABPBXA0030*045*IL	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Unknown	ABPBXA0030*076*IL	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Mammal				
Confirmed	AMACC01100*010*IL	AMACC01100	Myotis sodalis / Indiana Bat	B
Vascular Plant				
Confirmed	PDASTEB0H0*N01*IL	PDASTEB0H0	Eurybia furcata / Forked Aster	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Tourism & Recreation Areas	High	High	High	Very High	Very High
Mining & Quarrying	High	High	High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

212 SITE Mitchell's Grove Nature Preserve IL

Description

This site is a 180-acre nature preserve dedicated in 1998 and located in LaSalle County near the confluence of Tomahawk Creek and the Little Vermilion River. It consists of dry-mesic upland forest, mesic upland forest, mesic floodplain forest, sandstone cliff, seeps, springs and streams. Three state-threatened species occur in the preserve. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Insect				
Unknown	IILEPJ6040*021*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Vascular Plant				
Confirmed	PDASTEB0H0*N02*IL	PDASTEB0H0	Eurybia furcata / Forked Aster	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

213 SITE Milan Bottoms IL

Description

Milan Bottoms is part of a large floodplain complex owned partly by the US Fish and Wildlife Service and is located near Milan in Rock Island County.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002098*N203*IL	CEGL002098	Mixed Bottomland Forest	A

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Commercial & Industrial Areas	Very High	Very High	Very High	Very High	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Dams & Water Management/Use	High	High	High	High	High
Logging & Wood Harvesting	High	High	High	Medium	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity

- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology

214 SITE Indian Bluff IL

Description

Indian Bluff is a hill prairie comprised of little bluestem, Indian grass, and sideoats grama in Rock Island County.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPF00000A*016*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

216 SITE Big River State Park IL

Description

This state forest located in western Illinois' Henderson County is a remnant of a vast prairie-woodland ecotone that once covered much of Illinois. It is home to two endangered species: penstemon, also known as beardtongue, and Patterson's bindweed. Some of the common plants found in the prairie are big and little bluestem, Indian grass, prairie Junegrass, grama grass, flower-of-an-hour, cottonweed, prairie coneflower, pale prairie coneflower, prairie bush clover, purple prairie clover and blazing star. Other plants present include western sunflower, kitten tails, leadplant, prickly pear cactus, flowering spurge, aromatic sumac, false dragonhead, Sullivan's milkweed, horsemint, goat's-rue and hoary

puccoon. [This description is modified from the Illinois Department of Natural Resources' on-line description for this forest.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Omitted	CTPCB00000*012*IL	CEGL002210	Midwest Dry-Mesic Sand Prairie	C
Unknown	CTPCA0000B*002*IL	CEGL002318	Midwest Dry Sand Prairie	U
Confirmed	CTSCA00000*012*IL	CEGL002492	Black Oak / Lupine Barrens	B
Vascular Plant				
Unknown	PDSCR09030*001*IL	PDSCR09030	Besseya bullii / Kitten Tails	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	High	Very High	High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

217 SITE New Crystal Lake Club IL

Description

This area contains floodplain forests dominated by pin oak and swamp white oak and open wetland ponds with water lilies and other aquatic plants.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPAE00000*002*IL	CEGL002224	Central Cordgrass Wet Prairie	U
Confirmed	CPWA000000*009*IL	CEGL002386	Water-lily Aquatic Wetland	B
Confirmed	CEGL002432*N205*IL	CEGL002432	Pin Oak Mixed Hardwood Forest	B
Omitted	CPFAB00000*021*IL	CEGL002586	Silver Maple - Elm Forest	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	High	Very High	High	Medium	High

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology

218 SITE Argyle Lake Barrens IL

Description

This 17-acre nature preserve is located within Lake Argyle State Park north of Colchester in McDonough County. It contains oak barrens, a plant community characterized by gnarled, stunted, open-grown trees, scattered shrubs and an herbaceous understory composed of prairie plants and occurring on thin soil over bedrock. Scattered, open-grown white and black oaks as well as shagbark hickory are present in the woody overstory of the Argyle Hollow Barrens. Two shrubs – hazelnut and aromatic sumac – and several prairie plants – little bluestem, leadplant, white prairie clover, showy goldenrod and poverty grass – are the dominant plants of the herbaceous understory. Outcrops of sandstone are present throughout the barrens. Barrens were once very common in Illinois, but they are now very rare. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTSAD00000*001*IL	CEGL002142	North-central Dry-Mesic Oak Woodland	C
Unknown	CPWN000000*003*IL	CEGL002385	Skunk-cabbage Seepage Meadow	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

219 SITE Geissler Savanna IL

Description

Geissler Savanna consists of 37 acres in Hancock County, located in west-central Illinois. This site contains approximately 9 acres of high-quality mesic and dry-mesic savanna representative of the Galesburg Section of the Western Forest-Prairie Natural Division. It was recognized by the Illinois Natural Areas Inventory as a Category I site or high-quality natural community in 1990. Geissler Savanna is the second largest intact savanna of this type in Illinois. Four state-endangered and -threatened plant species are found at this location, including savanna blazing star, Mead's milkweed, eastern prairie white-fringed orchid, and Virginia bunchflower. Savanna blazing star naturally occurs at this site; the other three species had been extirpated from this area and have recently been restored through reintroduction programs. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTSAA00000*005*IL	CEGL005181	Swamp White Oak Woodland	C
Vascular Plant				
Unknown	PDASC02150*008*IL	PDASC02150	Asclepias meadii / Mead's Milkweed	U
Unknown	PMORC1Y0F0*036*IL	PMORC1Y0F0	Platanthera leucophaea / Eastern Prairie White-fringed Orchid	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

220 SITE Marblehead Cliff IL

Description

This cliff is located near the town of Marblehead in Adams County, Illinois.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPG00000C*002*IL	CEGL002292	Midwest Moist Limestone - Dolostone Cliff	A

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Mining & Quarrying	Medium	Very High	Medium	Very High	High

Overall Threat Rank: MEDIUM

Strategic Actions

- Acquire lands, easements and leases to protect biodiversity

222 SITE Olin Nature Preserve IL

Description

This 213-acre nature preserve is located in Alton in Madison County and has an additional 80 acres of buffer. It is situated on steep limestone bluffs overlooking the Mississippi River, and sinkholes, ravines, bedrock outcrops, small streams, a waterfall, upland forest and loess hill prairie characterize this area. Dry upland forest occurs on the ridges and bluff tops and grades from dry to mesic on the slopes and along the streams. The forest is mostly young to mature second growth with the largest trees found on the lower slopes and bottoms of the ravines. Old second-growth trees are scattered on some of the ravines. The forest has a high diversity of tree species with the dry and dry-mesic woods dominated by post oak, black oak, white oak and chinquapin oak. Mesic woods contain white oak, red oak, chinquapin oak, sugar maple, hickory, ash and hackberry. The sheltered ravine forests provide potential winter roost sites for bald eagles. A small, diverse hill prairie occurs on a southwest-facing loess bluff. Little bluestem and sideoats grama are the most common prairie grasses with purple coneflower, bluets and purple prairie clover among the most common forbs. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPF00000A*048*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

223 SITE Dayton Hollow Hill Prairie IL

Description

This hill prairie is in Greene County near the Illinois River. The hill prairie is a good example of this type of community in the lower reaches of the Illinois River.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPF00000A*037*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C
Vascular Plant				
Unknown	PDAST2E1C0*003*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	High	Very High	High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

224 LAND Sangamon River Floodplain IL

Description

The Sangamon River Floodplain conservation area is located in Cass, Mason, and Morgan Counties. Revis Hill Prairie is part of this portfolio site and was a portfolio site in the 2000 ecoregional assessment. Revis Hill Prairie is an area of rolling topography with loess hills along the northern side of Salt Creek. It contains a series of small, open prairies on narrow ridge tops buffered by some forested land in a largely agricultural setting. The southwest-facing hill prairies suffer from encroachment of woody plants from the surrounding forested land. Brush clearing and prescribed burning have been carried out over the last several years at the site. Some vegetation and butterfly monitoring has been carried out in conjunction with Illinois Department of Natural Resources.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CTFDA00000*002*IL	CEGL002078	Black Oak Forest	C
Confirmed	CTFDA00000*004*IL	CEGL002078	Black Oak Forest	C
Confirmed	CTPF00000A*023*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	B
Unknown	CTPF00000A*040*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Unknown	CTPF00000A*049*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Amphibian				
Confirmed	AAABC05061*P29*IL	AAABC05061	Pseudacris streckeri illinoensis / Illinois Chorus Frog	B
Insect				
Unknown	IILEPJ6040*017*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Vascular Plant				
Unknown	PDAST1E040*032*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	U
Confirmed	PDAST1E040*N12*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	B
Confirmed	PDAST2E1C0*001*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	B
Unknown	PMCYP0Q0R0*016*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

225 SITE Shick Shack Sand Pond IL

Description

This 46-acre nature preserve with 11 acres of buffer is located in Cass County. The Illinois River Sand Area, like other sand areas in Illinois, was once characterized by numerous marshes and sand ponds. Most of these areas have been greatly altered, but this one is relatively undisturbed. Pond and shrub swamp are the primary plant communities. The shrub swamp contains buttonbush and willows which exist in a dense 10-20 foot zone around the periphery of the pond. Duckweed, a floating aquatic plant, and numerous submerged aquatic plants characterize the pond community. Due to the presence of the pond, this site supports an interesting assemblage of amphibian species, including mudpuppies, tiger salamanders and Illinois chorus frogs. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CPWG000000*004*IL	CEGL002190	Northern Buttonbush Swamp	B
Confirmed	CPLA000000*010*IL	CEGL002386	Water-lily Aquatic Wetland	B
Insect				
Omitted	IILEPJ6040*P34*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	C
Vascular Plant				
Unknown	PDCLU03010*001*IL	PDCLU03010	Hypericum adpressum / Creeping St. John's-wort	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity

- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology

226 LAND/RES Jim Edgar Site M Complex IL

Description

The Jim Edgar Site M Complex includes the Cox Creek Hill Prairie Complex portfolio site from the 2000 iteration of the CTP ecoregional assessment. This portfolio site encompasses the 26-square mile (16,640-acre), state-owned Jim Edgar Panther Creek State Fish & Wildlife Area (JEPC). A mosaic of mature forest land, agricultural land and grassland, the JEPC is dissected by Panther and Cox Creeks and their tributaries. The common hardwood species of the forest include American elm, black walnut, black cherry and several types of oaks, including white, black and bur. Since the state began to manage the area in 1993, 1,200 acres of native grass, 820 acres of cool-season grass, 180 acres of habitat strips, and 105 acres of trees have been planted in land that was once agriculture fields or pasture. An additional 670 acres have been idled and allowed to move towards forest through natural succession. Because agriculture on a lease basis is an integral management component for conservation and fiscal purposes, about 4,200 acres of JEPC is leased as cropland to farmers using conservation-oriented agricultural practices.

In addition to 6,000 acres of timberland and 4,200 acres of prime farmland, this site contains an outstanding example of the original loess hill prairies of central Illinois at Cox Creek Hill Prairie Natural Area. This natural area is a 175-acre site with remnants of scattered hill prairies composed of loess (windblown silt), which occur within forest openings on steep terrain where soils are droughty and well drained. Among the plant species found on loess hill prairies are little bluestem, sideoats grama, fringed puccoon, wild petunia and prairie dock. Several rare Illinois plant species also grow here: the state-endangered small white lady's-slipper orchid, and the state-threatened savanna blazing star, pale false foxglove, large-seeded mercury and Hill's thistle. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPF00000A*061*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Confirmed	CTPF00000A*P41*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C
Mammal				
Unknown	AMACC01100*028*IL	AMACC01100	Myotis sodalis / Indiana Bat	U
Unknown	AMACC01100*029*IL	AMACC01100	Myotis sodalis / Indiana Bat	U
Vascular Plant				
Omitted	PDAST2E1C0*006*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	C
Confirmed	PDAST2E1C0*019*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	B
Omitted	PDAST2E1C0*038*IL	PDAST2E1C0	Cirsium hillii / Hill's Thistle	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

228 SITE Log Cabin Prairie IL

Description

This hill prairie containing little bluestem, sideoats grama, and Indian grass is located in Tazewell County.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPF00000A*009*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	High	High	High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity

- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

229 SITE Sangamon River Phlox IL

Description

This site is in Champaign County along a road right-of-way.

Target Occurrences

Portfolio Status Vascular Plant	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	PDPLM0D1J9*002*IL	PDPLM0D1J9	Phlox pilosa ssp. sangamonensis / Sangamon Phlox	C
Unknown	PDPLM0D1J9*003*IL	PDPLM0D1J9	Phlox pilosa ssp. sangamonensis / Sangamon Phlox	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Roads & Railroads	Very High	Very High	Very High	Very High	Very High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Other Ecosystem Modifications	Medium	Low	Low	Low	Low

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

230 SITE Walnut Point State Park IL

Description

This site is located in Oakland in Douglas County and retains many of its original natural features and attributes. Ash, oak, hickory, maple, walnut, locust and sassafras dominate the park's extensive wooded acres. In addition, the park is home to a prairie restoration plot and a 65-acre nature preserve, Upper Embarrass Woods. The forest community within Upper Embarrass Woods Nature Preserve is a dry-mesic forest representative of

the Grand Prairie Section of the Grand Prairie Division[1]. The primary plant community of this site is a white oak, black oak and red oak forest located on bluffs near the Embarrass River. This old-growth forest contains several large oaks in excess of 40 inches in diameter. The spring woodland wildflower population includes trilliums, spring beauty, Dutchman's breeches, bloodroot, toothwort, maidenhair fern, sensitive fern and grape fern. Pileated woodpeckers, scarlet tanagers, and several other bird species inhabit this area. [This description is modified from the Illinois Department of Natural Resources' on-line description for this park.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFBB00000*011*IL	CEGL002068	Midwestern White Oak – Red Oak Forest	B
Reptile				
Unknown	ARADB06010*018*IL	ARADB06010	Clonophis kirtlandii / Kirtland's Snake	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

231 SITE Watseka Sand Pond IL

Description

Watseka Sand Pond is an 11-acre nature preserve called Bonnie's Prairie located in Iroquois County. This site contains the only sand pond protected as a nature preserve in east-central Illinois. The site encompasses a high-quality sand pond and wet sand prairie characteristic of the Kankakee Sand Area Section of the Grand Prairie Natural Division. The area is underlain by wind-blown sand deposits. The sand pond is a still body of typically shallow water brimming with a wide array of wetland plants, including cordgrass, fowl manna grass, small-flowered water plantain, pickerel weed, burreed, and yellow pond

[1] See http://dnr.state.il.us/LANDS/education/biodiversity/index.htm for descriptions and a map of Schwegman's natural divisions for Illinois.

lily. Two very uncommon, native species of bee that gather pollen exclusively from pickerel weed occur here. A variety of waterfowl frequent the pond. Wet sand prairie lies on an adjacent flat, low area and is strongly dominated by bluejoint grass with occasion water smartweed and blue flag. On the other side of the pond, a low hill supports dry-mesic sand prairie typified by plants such as little bluestem, panic grass, hairy puccoon, goat's rue, and sand milkweed. [This description is modified from the Illinois Nature Preserves Commission's on-line description for this preserve.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CPLA000000*003*IL	CEGL002386	Water-lily Aquatic Wetland	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Fire & Fire Suppression	High	Very High	High	Medium	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology

58/2 LAND/RES Kankakee River Floodplain Macrosite IL

Description

Kankakee River Floodplain Macrosite now encompasses the Aroma Park Forest Preserve, Kankakee River Floodplain Complex, and Momence Wetlands portfolio sites from the 2000 iteration of the Central Tallgrass Prairie ecoregional assessment. This corridor along the Kankakee River contains floodplain forests, sand savannas, dolomite prairies, and mussel beds. There are some disjunct plant populations including the swamp cottonwood, pumpkin ash, and storax, and it is the only place that Kankakee mallow grows naturally. The forest includes pin oak, swamp white oak, silver maple, green ash, and elm. This portion of the Kankakee River hasn't been channelized and meanders widely. Many of the wetlands occupy former meanders and oxbows of the Kankakee River. [This description is taken in part and modified from the Illinois Nature Preserves Commission's on-line description for some of these areas.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002098*N209*IL	CEGL002098	Bur Oak-Swamp White Oak Mixed Bottomland Forest	B
Confirmed	CTPG00000C*N37*IL	CEGL002292	Midwest Moist Limestone -Dolostone Cliff	C
Confirmed	CTPHA00000*002*IL	CEGL002292	Midwest Moist Limestone -Dolostone Cliff	A
Confirmed	CPWN000000*024*IL	CEGL002385	Vegetation Skunk-cabbage Seepage Meadow	B
Omitted	CPLA000000*002*IL	CEGL002386	Water-lily Aquatic Wetland	C
Confirmed	CPWA000000*019*IL	CEGL002386	Water-lily Aquatic Wetland	B
Unknown	CPFAB00000*013*IL	CEGL002586	Forest Silver Maple - Elm Forest	U
Confirmed	CPFBC00000*026*IL	CEGL002586	Silver Maple - Elm Forest	B
Unknown	CPFBC00000*027*IL	CEGL002586	Silver Maple - Elm Forest	U
Confirmed	CTFBC00000*012*IL	CEGL005017	Red Oak - Sugar Maple – Elm Forest	C
Confirmed	CEGL005179*N206*IL	CEGL005179	North-central Dry-Mesic Limestone-Dolomite Prairie	B
Vascular Plant				
Confirmed	PDMAL0A080*N23*IL	PDMAL0A080	Callirhoe triangulata / Clustered Poppy-mallow	B
Confirmed	PDMAL0K060*001*IL	PDMAL0K060	Iliamna remota / Kankakee Globemallow	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Commercial & Industrial Areas	Very High	Very High	Very High	Very High	Very High
Mining & Quarrying	Very High	Medium	Medium	Very High	High
Recreational Activities	Very High	High	High	Medium	High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

58/3 LAND/RES Prairie Parklands Macrosite IL

Description

Over 40,000 acres are in conservation ownership in the Prairie Parklands Macrosite; it onsists of multiple protected areas that link terrestrial and aquatic natural resources of importance. It is located between the Des Plaines and Kankakee Rivers just east of their confluence. The area has thin soils overlying dolomite bedrock, a result of meltwaters from glacial Lake Chicago carrying away the glacial material laid down at earlier times. Where the soils are typically less than 24 inches in depth, high-quality dolomite prairie is common. The most extensive dolomite prairies in the Des Plaines River valley are located within the Des Plaines Composite Site and range from wet to dry. Where the soils are deeper, some high-quality remnants of mesic tallgrass prairie are found. The rattlesnake master borer moth is found in mesic prairie areas, while the red-veined prairie leafhopper is found in dolomite prairie areas with prairie dropseed. The eastern prairie white-fringed orchid is also found within the area. This site is one of Illinois' most sizable blocks of habitat for grassland birds, including the Bell's vireo, Henslow's sparrow, and grasshopper sparrow. The area is connected to and partially buffered by other protected lands in public and corporate ownership.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPAD00000*015*IL	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CTPAD00000*018*IL	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CTPAD00000*020*IL	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CTPAD00000*025*IL	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CTPAC00000*026*IL	CEGL002203	Central Mesic Tallgrass Prairie	U
Confirmed	CTPAC00000*042*IL	CEGL002203	Central Mesic Tallgrass Prairie	C
Confirmed	CTPAC00000*051*IL	CEGL002203	Central Mesic Tallgrass Prairie	C
Unknown	CTPAB00000*008*IL	CEGL002214	Midwest Dry-Mesic Prairie	U
Confirmed	CTPAE00000*012*IL	CEGL002224	Central Cordgrass Wet Prairie	B
Confirmed	CTPAE00000*014*IL	CEGL002224	Central Cordgrass Wet Prairie	B
Confirmed	CPWL000000*021*IL	CEGL002258	Tussock Sedge Wet Meadow	B
Omitted	CPWL000000*022*IL	CEGL002258	Tussock Sedge Wet Meadow	B
Confirmed	CPLA000000*001*IL	CEGL002386	Water-lily Aquatic Wetland	B
Confirmed	CPWA000000*025*IL	CEGL002386	Water-lily Aquatic Wetland	B
Confirmed	CTSCB00000*010*IL	CEGL002492	Black Oak / Lupine Barrens	B
Confirmed	CTPH00000B*004*IL	CEGL005069	Hardhack Wet-Mesic Sand Shrub Meadow	C
Confirmed	CTPH00000B*005*IL	CEGL005069	Hardhack Wet-Mesic Sand Shrub Meadow	C
Confirmed	CTPCC00000*012*IL	CEGL005096	Mesic Sand Tallgrass Prairie	B
Confirmed	CTPCC00000*013*IL	CEGL005096	Mesic Sand Tallgrass Prairie	B
Confirmed	CTPCD00000*006*IL	CEGL005177	Central Wet-Mesic Sand Tallgrass Prairie	B
Confirmed	CEGL005179*N207*IL	CEGL005179	North-central Dry-Mesic Limestone - Dolomite Prairie	A
Unknown	CTPEB00000*001*IL	CEGL005179	North-central Dry-Mesic Limestone - Dolomite Prairie	U
Bird				
Confirmed	ABPBW01110*N16*IL	ABPBW01110	Vireo bellii / Bell’s Vireo	B
Unknown	ABPBXA0030*007*IL	BPBXA0030	Ammodramus henslowii / Henslow’s Sparrow	U
Confirmed	ABPBXA0030*P31*IL	ABPBXA0030	Ammodramus henslowii / Henslow’s Sparrow	A
Insect				
Confirmed	IIHOM08010*002*IL	IIHOM08010	Aflexia rubranura / Red-Tailed Leafhopper	A
Unknown	IIHOM08010*004*IL	IIHOM08010	Aflexia rubranura / Red-Tailed Leafhopper	U
Confirmed	IIHOM08010*005*IL	IIHOM08010	Aflexia rubranura / Red-Tailed Leafhopper	B
Unknown	IIHOM08010*007*IL	IIHOM08010	Aflexia rubranura / Red-Tailed Leafhopper	U
Unknown	IILEPJ6040*003*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Confirmed	IILEYC0310*001*IL	IILEYC0310	Papaipema eryngii / Rattlesnake-master Stem Borer	A
Confirmed	IILEYC0310*002*IL	IILEYC0310	Papaipema eryngii / Rattlesnake-master Stem Borer	A
Unknown	IILEYC0310*003*IL	IILEYC0310	Papaipema eryngii / Rattlesnake-master Stem Borer	U
Unknown	ILEYC0310*005*IL	IILEYC0310	Papaipema eryngii / Rattlesnake-master Stem Borer	U
Confirmed	IILEYC0450*N17*IL	IILEYC0450	Papaipema beeriana / Blazing Star Stem Borer	A
Confirmed	IILEYC0450*N18*IL	IILEYC0450	Papaipema beeriana / Blazing Star Stem Borer	A
Vascular Plant				
Omitted	PDAST2E1C0*023*IL	PDAST2E1C0	Cirsium hillii / Hill’s Thistle	C
Confirmed	PDAST2E1C0*034*IL	PDAST2E1C0	Cirsium hillii / Hill’s Thistle	A
Unknown	PDCLU03010*003*IL	PDCLU03010	Hypericum adpressum / Creeping St. John’s-wort	U
Confirmed	PDFAB1A0K0*007*IL	PDFAB1A0K0	Dalea foliosa / Leafy Prairie-clover	B

Unknown	PDSCR01130*020*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U
Unknown	PDSCR01130*033*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U
Unknown	PDSCR01130*034*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U
Unknown	PDSCR01130*035*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U
Unknown	PDSCR01130*037*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U
Confirmed	PDSCR01130*N24*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	B
Omitted	PDSCR01130*N25*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	B
Omitted	PDSCR01130*N26*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	C
Confirmed	PDSCR01130*N27*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	B
Confirmed	PDSCR01130*N28*IL	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	B
Confirmed	PMORC1Y0F0*020*IL	PMORC1Y0F0	Platanthera leucophaea / Eastern Prairie White-fringed Orchid	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	High	High	High	Medium	High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Other Ecosystem Modifications	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Commercial & Industrial Areas	Very High	Very High	Very High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

ILLINOIS/INDIANA

58/1 LAND/RES Kankakee Sands Macrosite IL/IN

Description

The Kankakee Sands Macrosite is a complex assemblage of natural ecosystem remnants embedded in an agricultural landscape. Straddling the state line in Indiana and Illinois, the key conservation target is a landscape-scale occurrence of sand ecosystems across a

hydrological gradient. Herbaceous habitats range from open marsh to mesic and xeric sand prairie. Treed habitats include pin oak flatwoods and oak barrens. Approximately 60% of the site is composed of native vegetation, but extensive restoration is required to restore landscape connectivity to the macrosite.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002100*P101*IL/IN	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	B
Confirmed	CEGL002210*P102*IL/IN	CEGL002210	Midwest Dry-Mesic Sand Prairie	B
Confirmed	CEGL002258*P103*IL/IN	CEGL002258	Tussock Sedge Wet Meadow	B
Omitted	CWETMEASED*017*IN	CEGL002258	Tussock Sedge Wet Meadow	B
Confirmed	CPRASANDRY*009*IN	CEGL002318	Midwest Dry Sand Prairie	B
Unknown	CPWA000000*022*IL	CEGL002386	Water-lily Aquatic Wetland	U
Confirmed	CEGL002492*P51*IL/IN	CEGL002492	Black Oak / Lupine Barrens	B
Confirmed	CTPH00000B*003*IL	CEGL005069	Shrubland Hardhack Wet-Mesic Sand Shrub Meadow	B
Confirmed	CPRASANMES*005*IN	CEGL005096	Mesic Sand Tallgrass Prairie	B
Confirmed	CPRASANWME*021*IN	CEGL005177	Central Wet-Mesic Sand Tallgrass Prairie	B
Confirmed	CPRASANWET*011*IN	CEGL005178	Central Cordgrass Wet Sand Prairie	B
Confirmed	CTSAA00000*N56*IL	CEGL005181	Swamp White Oak Woodland	A
Bird				
Unknown	ABPBX01030*003*IN	ABPBX01030	Vermivora chrysoptera / Golden-winged Warbler	U
Confirmed	ABPBXA0030*P32*IL/IN	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	B
Insect				
Omitted	IILEPJ6040*002*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Confirmed	IILEPJ6040*005*IN	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Unknown	IILEPJ6040*023*IL	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Confirmed	IILEYC0450*006*IN	IILEYC0450	Papaipema beeriana / Blazing Star Stem Borer	B
Confirmed	IILEYC0450*N19*IL	IILEYC0450	Papaipema beeriana / Blazing Star Stem Borer	A
Vascular Plant				
Unknown	PDCLU03010*002*IL	PDCLU03010	Hypericum adpressum / Creeping St. John's-wort	U
Confirmed	PDCLU03010*004*IL	PDCLU03010	Hypericum adpressum / Creeping St. John's-wort	B
Omitted	PDCLU03010*005*IL	PDCLU03010	Hypericum adpressum / Creeping St. John's-wort	C
Omitted	PDCLU03010*006*IL	PDCLU03010	Hypericum adpressum / Creeping St. John's-wort	C
Omitted	PDCLU03010*007*IL	PDCLU03010	Hypericum adpressum / Creeping St. John's-wort	D
Omitted	PDCLU03010*008*IL	PDCLU03010	Hypericum adpressum / Creeping St. John's-wort	B
Confirmed	PMALI02050*001*IN	PMALI02050	Echinodorus parvulus / North American Dwarf Burhead	C
Unknown	PMCYP0Q0R0*010*IL	PMCYP0Q0R0	Schoenoplectus hallii / Hall's Bulrush	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	High	High	High	High
Fire & Fire Suppression	High	High	High	Medium	High
Annual & Perennial Non-Timber Crops	Very High	High	High	Medium	High
Invasive Non-Native/Alien Species	High	High	High	Medium	High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Commercial & Industrial Areas	Very High	Very High	Very High	Very High	Very High
Roads & Railroads	Very High	High	High	Very High	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation

- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams

ILLINOIS/MISSOURI

12 LAND Marquette/Alton Bluffs and Bottoms Complex IL/MO

Description

The Marquette/Alton Bluffs and Bottoms encompass the confluence of the Illinois and Mississippi Rivers and associated high bluffs of mostly dolomite and limestone cliffs. The area is generally forested with dry oak-hickory forests on the ridge tops, more mesic forest communities of red oak and sugar maple in the ravines, and wetter forest communities of silver maple, green ash, elms and hackberry on the floodplain. There is great variation in topography with the high bluffs dropping down to large areas of river floodplain. The bluffs support associated loess hill prairies and glades, rare plants with a western affinity such as the Carolina delphinium and the narrow-leaved milkweed, and other species such as stick leaf, little bluestem, pale purple coneflower, and the plains prickly pear cactus. Large backwater lakes occur here with American lotus. The caves have significant bat populations, including the Indiana bat. This area also supports populations of important herptofaunal species, including the timber rattlesnake and various skinks.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPG00000C*N35*IL	CEGL002292	Midwest Moist Limestone - Dolostone Cliff	C
Unknown	CTFZB11750*017*MO	CEGL002586	Silver Maple - Elm Forest	C
Confirmed	CTPC000000*017*IL	CEGL005131	Central Limestone Glade	B
Confirmed	CTPC000000*018*IL	CEGL005131	Central Limestone Glade	B
Confirmed	CTPC000000*019*IL	CEGL005131	Central Limestone Glade	C
Confirmed	CTPF00000A*047*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C
Confirmed	CTPF00000A*P45*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C
Mammal				
Confirmed	AMACC01100*043*IL	AMACC01100	Myotis sodalis / Indiana Bat	B
Vascular Plant				
Possible	PDAST1E040*P11*IL	PDAST1E040	Boltonia decurrens / Decurrent False Aster	C
Unknown	PDSCR0F043*006*MO	PDSCR0F043	Chelone obliqua var. speciosa / Rose Turtlehead	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Mining & Quarrying	Very High	Medium	Medium	Very High	High
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Problematic Native Species	Very High	High	High	Medium	High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

221 LAND Golden Eagle Ferry Floodplain and Bluff Complex IL/MO

Description

The Golden Eagle Ferry Floodplain is generally forested with dry oak-hickory forests on the ridgetops, more mesic forest communities of red oak and sugar maple in the ravines, and wetter forest communities of silver maple, green ash, elms and hackberry on the floodplain. There is great variation in topography with the high bluffs dropping down to large areas of river floodplain. The bluffs support associated loess hill prairies and glades, rare plants with a western affinity such as the Carolina delphinium and the narrow-leaved milkweed, and other species such as stick leaf, little bluestem, pale purple coneflower, and the plains prickly pear cactus. Large backwater lakes occur here with American lotus. The caves have significant bat populations, including the Indiana bat. This area also supports populations of important herptofaunal species, including the timber rattlesnake and various skinks.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Unknown	CPFAB00000*019*IL	CEGL002586	Silver Maple - Elm Forest	U
Confirmed	CPFBC00000*031*IL	CEGL002588	Silver Maple - Elm Forest	B
Unknown	CTFZB11750*012*MO	CEGL002586	Silver Maple - Elm Forest	BC
Omitted	CTFZB11750*016*MO	CEGL002586	Silver Maple - Elm Forest	C
Unknown	CTPF00000A*054*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	U
Confirmed	CTPF00000A*P44*IL	CEGL005183	Midwest Glacial Drift - Loess Hill Prairie	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Mining & Quarrying	Very High	Medium	Medium	Very High	High
Fire & Fire Suppression	Very High	Very High	Very High	Low	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Problematic Native Species	Very High	Very High	Very High	Medium	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

INDIANA

55 SITE Kankakee Fen IN

Description

Kankakee Fen is a small remnant of a once-extensive fen complex. It supports a diverse array of fen species including several plants that are regionally rare.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CWETFENFEN*025*IN	CEGL005139	Cinquefoil - Sedge Prairie Fen	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Low	High	Low	Medium	Low
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes

76 SITE/RES Lowe Prairie IN

Description

Lowe Prairie is the largest black-soil prairie remnant remaining in Indiana. The site has been grazed, but never cropped, and is currently leased by The Nature Conservancy on an annual basis to control activity on the remnant. Over the last decade, shrubby encroachment at the site has been eliminated, and the remnant is a mosaic of wet/mesic prairie with scattered fescue encroachment.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CPRAPRAMES*017*IN	CEGL002203	Central Mesic Tallgrass Prairie	C
Bird				
Omitted	ABPBXA0030*030*IN	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	D
Vascular Plant				
Confirmed	PMORC1Y0F0*021*IN	PMORC1Y0F0	Platanthera leucophaea / Eastern Prairie White-fringed Orchid	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	Medium	High
Invasive Non-Native/Alien Species	High	High	High	Medium	High
Fire & Fire Suppression	Medium	Medium	Medium	Low	Low

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance incentives for conservation of biodiversity on private lands
- Acquire lands, easements and leases to protect biodiversity
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

99 SITE Ober Sand Savanna IN

Description

Ober Sand Savanna is a small but very high-quality black oak barrens mosaic that includes open upland barrens, mesic sand prairie and wet pin oak forest / woodland. Expansion of the site would improve viability of area-sensitive species.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CSAVSANDRY*011*IN	CEGL002492	Black Oak / Lupine Barrens	B
Insect				
Confirmed	IILEP37171*N102*IN	IILEP37171	Erynnis persius persius / Persius Dusky Wing	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Low	Medium	Low	Low	Low
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Low	Low

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance incentives for conservation of biodiversity on private lands
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

117 SITE River View Hill Prairie IN

Description

River View Hill Prairie is a small bluff prairie overlooking the Tippecanoe River. The site supports a small but diverse assemblage of prairie species.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CPRAPRADME*014*IN	CEGL002214	Midwest Dry-Mesic Prairie	C
Vascular Plant				
Omitted	PDAST2E1C0*001*IN	PDAST2E1C0	Cirsium hillii / Hill's Thistle	D

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Medium	Medium	Medium	Medium	Medium
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation

145 LAND/RES Tefft Savanna Macrosite IN

Description

The macrosite includes portions of two Indiana Department of Natural Resources properties, Jasper Pulaski State Fish and Wildlife Area and Tefft Savanna Nature Preserve. In addition, The Nature Conservancy of Indiana owns and manages Prairie

Border Nature Preserve and Prairie Border South. Several other registry areas are included in the site as well.

The macrosite hosts an array of terrestrial communities distributed across a fairly intact hydrologic gradient. Xeric barrens and oak woodlands dominate dune ridges, while small marshes and pin oak flatwoods occur in poorly drained sites. Mesic sand prairie occurs in a few small patches at the site, but has largely been converted to agriculture. Because of past management, much of the site is in very good ecological condition, but sites that are less intensively managed are more fire-suppressed.

The site is a critical stopover site during the autumn migration of sandhill cranes. The vast majority of migrating sandhill cranes east of the Mississippi River congregate in a small portion of Jasper Pulaski for approximately a month or so each fall. During the day, these birds forage in agricultural lands adjacent to the macrosite, but return in the evening to communally rest in shallow wetlands.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CWETMARMAR*045*IN	CEGL002229	Midwest Mixed Emergent Deep Marsh	A
Confirmed	CEGL002258*N100*IN	CEGL002258	Tussock Sedge Wet Meadow	A
Confirmed	CEGL002318*P108*IN	CEGL002318	Midwest Dry Sand Prairie	C
Confirmed	CEGL002492*P109*IN	CEGL002492	Black Oak / Lupine Barrens	B
Confirmed	CEGL005108*N101*IN	CEGL005108	Inland Coastal Plain Marsh	A
Confirmed	CEGL005108*P112*IN	CEGL005108	Inland Coastal Plain Marsh	B
Confirmed	CPRASANWET*012*IN	CEGL005178	Central Cordgrass Wet Sand Prairie	B
Bird				
Confirmed	ABPBX01030*004*IN	ABPBX01030	Vermivora chrysoptera / Golden-winged Warbler	C
Insect				
Confirmed	IILEPE2220*001*IN	IILEPE2220	Callophrys irus / Frosted Elfin	C
Confirmed	IILEYC0450*003*IN	IILEYC0450	Papaipema beeriana / Blazing Star Stem Borer	B
Reptile				
Omitted	ARADE03011*004*IN	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	D
Vascular Plant				
Confirmed	PDCLU03010*P111*IN	PDCLU03010	Hypericum adpressum / Creeping St. John's-wort	A

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Medium	Medium	Medium	Medium	Medium
Invasive Non-Native/Alien Species	Medium	Low	Low	High	Low
Annual & Perennial Non-Timber Crops	Medium	Low	Low	Medium	Low
Housing & Urban Areas	Medium	Medium	Medium	Very High	High

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation

- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

148 SITE Tippecanoe State Park IN

Description

Tippecanoe State Park is an upland and forested wetland complex that borders the Tippecanoe River, which is an aquatic portfolio site. The terrestrial portion of the park includes two dedicated nature preserves, Sandhill Nature Preserve and Tippecanoe River Nature Preserve. Sandhill Nature Preserve is primarily a xeric oak barrens complex on glacial outwash sand with scattered small depressions supporting wet sand forests. Tippecanoe River Nature Preserve is an extensive bottomland / floodplain forest system adjacent to the Tippecanoe River that supports a diverse array of wildlife associated with the river.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CFORFLOWME*031*IN	CEGL002014	Central Green Ash - Elm - Hackberry Forest	B
Confirmed	CFORFLASAN*004*IN	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	C
Omitted	CPRASANDRY*011*IN	CEGL002318	Midwest Dry Sand Prairie	C
Confirmed	CSAVSANDME*023*IN	CEGL002492	Black Oak / Lupine Barrens	C
Confirmed	CFORFLOMES*011*IN	CEGL005014	Beech - Mixed Hardwood Floodplain Forest	B
Bird				
Omitted	ABPBX91050*024*IN	ABPBX91050	Aimophila aestivalis / Bachman's Sparrow	D
Reptile				
Confirmed	ARADE03011*003*IN	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	B
Omitted	ARADE03011*065*IN	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Medium	Low	Low	Medium	Low
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity

200 SITE Spinn Prairie Nature Preserve IN

Description

Spinn Prairie Nature Preserve is a small grassland savanna remnant on organic-rich sand soil. Habitats range from herbaceous wetland to mesic prairie to open mesic savanna on slight rises. It adjoins a railroad prairie to the west, which extends north and south for several miles from the site. The preserve has been intensively managed and is in good ecological condition.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Omitted	CPRASANMES*002*IN	CEGL005096	Mesic Sand Tallgrass Prairie	B
Confirmed	CPRASANWME*025*IN	CEGL005177	Central Wet-Mesic Sand Tallgrass Prairie	B
Confirmed	CPRASANWET*014*IN	CEGL005178	Central Cordgrass Wet Sand Prairie	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	High	Medium	Medium	Medium
Fire & Fire Suppression	High	Low	Low	Low	Low
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes

201 SITE Camp Buffalo Site IN

Description

Camp Buffalo is a small camp providing a range of recreational opportunities and containing high-quality natural areas.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Vascular Plant				
Confirmed	PDASTEB0H0*015*IN	PDASTEB0H0	Eurybia furcata / Forked Aster	B
Omitted	PDBER02010*001*IN	PDBER02010	Berberis canadensis / American Barberry	D
Omitted	PDSCR09030*003*IN	PDSCR09030	Besseya bullii / Kitten Tails	D

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Acquire lands, easements and leases to protect biodiversity

202 SITE/RES Houghton Lake Preserve IN

Description

Houghton Lake is a small glacial lake surrounded by submergent, emergent and fen wetlands. It supports a rich assemblage of wildlife. The site is almost fully conserved, but extensive restoration of agricultural wetlands will be phased in starting in 2009 to increase wetland habitats and restore groundwater flow to the lake and adjacent wetlands.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CWETBEAMRL*009*IN	CEGL005104	Twig-rush Wet Prairie	B
Reptile				
Confirmed	ARADE03011*N108*IN	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Agricultural & Forestry Effluents	Medium	High	Medium	Medium	Medium
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Low	Low
Dams & Water Management/Use	Medium	High	Medium	Medium	Medium
Fire & Fire Suppression	High	Medium	Medium	Medium	Medium
Invasive Non-Native/Alien Species	High	High	High	High	High

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

203 SITE Round Lake Wetland Nature Preserve IN

Description

This site is home to a small, shallow glacial lake surrounded by submergent, emergent and fen wetlands. It supports a rich assemblage of wildlife. The wetlands at the site are almost fully conserved, but adjacent uplands are primarily in agricultural production.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CWETMARMAR*023*IN	CEGL002233	Midwest Cattail Deep Marsh	B
Confirmed	CLAKLAKLAK*006*IN	CEGL002282	Midwest Pondweed Submerged Aquatic Wetland	B
Unknown	CFORUPLMES*076*IN	CEGL005013	Beech - Maple Glaciated Forest	D
Unknown	CFORUPLDME*062*IN	CEGL005017	Red Oak - Sugar Maple – Elm Forest	D
Confirmed	CWETFENFEN*064*IN	CEGL005139	Cinquefoil - Sedge Prairie Fen	B
Insect				
Confirmed	IILEYC0450*004*IN	IILEYC0450	Papaipema beeriana / Blazing Star Stem Borer	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Agricultural & Forestry Effluents	Medium	High	Medium	Medium	Medium
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance incentives for conservation of biodiversity on private lands
- Acquire lands, easements and leases to protect biodiversity

204 SITE Koontz Lake Nature Preserve IN

Description

Koontz Lake Nature Preserve supports a vegetational gradient ranging from emergent wetlands to xeric oak barrens. Key conservation targets at the site are swamp forests, including bog-like patches that support numerous northern species, and emergent marshes. Much of the site is managed by the Indiana Division of Nature Preserves as a dedicated nature preserve.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	CWETMARMAR*029*IN	CEGL002229	Midwest Mixed Emergent Deep Marsh	B
Omitted	CSAVSANDME*019*IN	CEGL002492	Black Oak / Lupine Barrens	C
Confirmed	CWETSWAFOR*016*IN	CEGL005038	Maple - Ash - Elm Swamp Forest	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Low	High	Low	Medium	Low
Agricultural & Forestry Effluents	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore degraded habitat at biologically important sites

IOWA

3 SITE Baldwin Marsh IA

Description

Baldwin Marsh is one of the rare examples of upland marsh remaining in the area, and some remnant prairie is also present. There is a very large population of eastern prairie white-fringed orchid. In 1998, 1,560 plants were observed in flower/bud. Sixty-seven acres are under conservation ownership and managed by the Jackson County Conservation Board.

Target Occurrences

Portfolio Status Vascular Plant	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	PMORC1Y0F0*054*IA	PMORC1Y0F0	Platanthera leucophaea / Eastern Prairie White-fringed Orchid	B

Threats

To be determined

Strategic Actions

To be determined

15 SITE Cedar Bluffs IA

Description

Cedar Bluffs features a remarkably scenic terrain which includes 100-foot sandstone bluffs rising above the Des Moines River, steep-walled box canyons cut into the bluffs, small waterfalls, plunge pools, vertical rock cliffs, large-block rock talus and modern alluvial cutbanks. The flora and fauna of the rich deciduous woodlands and sandstone cliffs combine with unique geological, historical and archaeological features to produce a complex blend of natural and cultural features. The site has been selected in this assessment for the high-quality example of the Midwest Moist Sandstone Cliff community. Cedar Bluffs State Preserve is immediately upstream of the confluence of Cedar Creek with the Des Moines River, within the Southern Iowa Drift Plain landform region. Over 150 plant species have been documented here. The upland woods consist of oak forest with an abundance of creeping fragile fern. The cool, moist, north-facing cliffs and slopes are crowned with a maple-basswood forest with a dense understory of ironwood. Narrow lowlands are characterized by bottomland hardwoods, including silver maple, cottonwood, and hackberry. The impressive array of spring flora includes hepatica, bloodroot, Virginia bluebells and many other species. Shallow, acidic soils in the northeastern portion of the preserve have thin coverings of moss. Many ferns are present including rattlesnake fern. In addition to vascular plants, twenty-three species of mushrooms have been found, including morels and puffballs. The habitat created by the close proximity of Cedar Creek, nearby sandstone bluffs, and mature forest supports several species of bats. During the winter, bald eagles often roost in protected valleys along the bluffs.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002287*N01*IA	CEGL002287	Midwest Moist Sandstone Cliff	A

Threats

To be determined

Strategic Actions

To be determined

27 SITE Des Moines River Ravines NA IA

Description

This area was selected for the portfolio for the White Oak-Mixed Oak Dry Mesic Alkaline Forest community.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFML11220*001*MO	CEGL002070	White Oak - Mixed Oak Dry-Mesic Alkaline Forest	BC

Threats

To be determined

Strategic Actions

To be determined

28 SITE Dinesen Prairie IA

Description

Dinesen Prairie contains a small but diverse example of the tallgrass prairie in western Iowa and is designated as a State Preserve. Plant communities range from wet prairie dominated by slough grass and sedges, to mesic prairie dominated by big and little bluestem. The community type documented is Northern Mesic Tallgrass Prairie. The gently rolling native prairie, with its loess-topped ridges, is typical of the western portion of the Southern Iowa Drift Plain. An east-west ridge gradually drains eastward towards the wide valley of the Nishnabotna River. Porcupine grass and prairie horsetail are seen here, along with prairie Junegrass, sideoats grama, Indian grass, and Canada wild rye. Forbs are abundant and showy during the growing season, with at least 114 species of plants. In the spring, beautiful swells of prairie phlox, indigo bush, hoary puccoon, blue-eyed grass, lousewort, and bird's-foot violet bloom across the prairie, followed by the summer flowers of Canada anemone, rattlesnake master, prairie turnip, prairie coreopsis, leadplant, New Jersey tea, compass plant, and gayfeather. Autumn's flora includes several asters, blazing star, Maximillian sunflower, and stiff goldenrod. The prairie is excellent habitat for bobolink, dickcissel, meadowlarks, vesper sparrow, and upland sandpiper. Western prairie white-fringed orchid is documented on the site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002202*001*IA	CEGL002202	Northern Mesic Tallgrass Prairie	C
Unknown	CEGL002203*001*IA	CEGL002203	Central Mesic Tallgrass Prairie	U
Vascular Plant				
Confirmed	PMORC1Y0S0*061*IA	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	B

Threats

To be determined

Strategic Actions

To be determined

33 SITE Elk River IA

Description

This conservation area features wooded ravines and steep slopes along the lower end of the Elk River. There are historic records of ice caves and the site contains populations of the Pleistocene disc (a terrestrial snail). The Clinton County Conservation Board owns a former Girl Scout camp along the upper portion of this stretch of the river.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002308*342*IA	CEGL002308	Midwest Limestone – Dolostone Talus	U
Unknown	CEGL002308*343*IA	CEGL002308	Midwest Limestone – Dolostone Talus	U
Mollusk				
Unknown	IMGAS54060*035*IA	IMGAS54060	Discus macclintocki / Pleistocene Disc	B

Threats

To be determined

Strategic Actions

To be determined

35 SITE Flaherty Prairie/Little Prairie Complex IA

Description

The site features scenic rolling topography dissected by a stream and its small tributaries with mesic to dry-mesic prairie (Central Mesic Tallgrass Prairie). There is a good mixture of prairie grasses, but the overall diversity is low. It contains the most southerly population of prairie bush clover. Populations of Mead's milkweed have also been documented at the site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002203*028*IA	CEGL002203	Central Mesic Tallgrass Prairie	U
Omitted	CEGL002214*056*IA	CEGL002214	Midwest Dry-Mesic Prairie	D
Vascular Plant				
Confirmed	PDASC02150*005*IA	PDASC02150	Asclepias meadii / Mead's Milkweed	C
Confirmed	PDFAB27090*019*IA	PDFAB27090	Lespedeza leptostachya / Prairie Bushclover	B
Confirmed	PDFAB27090*040*IA	PDFAB27090	Lespedeza leptostachya / Prairie Bushclover	B
Confirmed	PDFAB27090*049*IA	PDFAB27090	Lespedeza leptostachya / Prairie Bushclover	B

Threats

To be determined

Strategic Actions

To be determined

77 LAND/RES Lower Cedar River IA

Description

The Lower Cedar River valley hosts two rare plant communities: swamp white oak woodlands and rich peat fens. Perched along the Cedar River, this remarkable wetland complex contains a wondrous array of natural diversity - oxbows, sand prairie, peat bogs, floodplain forest and oak savanna. Sandy soils provide habitat for more than 300 plant species and 19 types of reptiles and amphibians, including rare massasaugas and ornate box turtles. The area has been designated an important reptile and amphibian conservation area by the Iowa Department of Natural Resources. The Nature Conservancy owns 767 acres (as of 2007) and an additional 20,000 acres have been protected by private landowners and other partners. The Nature Conservancy is working with partners to focus on natural areas management, sharing research and developing science-based conservation plans.

The swamp white oak woodland community is poorly studied; therefore, The Nature Conservancy recently completed an examination of the pre-settlement vegetative characteristics to aid in restoration. TNC will continue with this research, to better understand how the interaction between flood and fire maintained the open canopy characteristic of this floodplain community. Botanical and herpetofaunal surveys have been completed.

The Nature Conservancy's long-term goals include working with partners to conserve and restore 5,000 acres of swamp white oak and floodplain savannas through controlled fire and other science-based techniques. TNC is working with partners to create a viable aquatic passage to the Mississippi River, providing critical habitat for large freshwater fish that spawn in its tributaries.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002014*005*IA	CEGL002014	Central Green Ash - Elm - Hackberry Forest	U
Confirmed	CEGL002026*N202*IL	CEGL002026	Bulrush - Cattail - Bur-reed Shallow Marsh	B
Confirmed	CEGL002041*N201*IA	CEGL002041	Central Tallgrass Fen	B
Unknown	CEGL002203*021*IA	CEGL002203	Central Mesic Tallgrass Prairie	U
Unknown	CEGL002229*003*IA	CEGL002229	Midwest Mixed Emergent Deep Marsh	A
Unknown	CEGL002229*004*IA	CEGL002229	Midwest Mixed Emergent Deep Marsh	B
Unknown	CEGL002265*003*IA	CEGL002265	Northern Sedge Poor Fen	A
Omitted	CEGL002318*025*IA	CEGL002318	Midwest Dry Sand Prairie	C
Confirmed	CEGL002318*028*IA	CEGL002318	Midwest Dry Sand Prairie	B
Omitted	CEGL002318*029*IA	CEGL002318	Midwest Dry Sand Prairie	C
Unknown	CEGL002318*031*IA	CEGL002318	Midwest Dry Sand Prairie	D
Omitted	CPWA000000*010*IL	CEGL002386	Water-lily Aquatic Wetland	C
Confirmed	CEGL005181*N200*IA	CEGL005181	Swamp White Oak Woodland	B
Confirmed	CPSM0000SO*003*IA	CEGL005272	Central Midwest Sedge Meadow	B
Confirmed	CPSM0000SO*004*IA	CEGL005272	Central Midwest Sedge Meadow	C
Mammal				
Unknown	AMACC01100*015*IA	AMACC01100	Myotis sodalis / Indiana Bat	U
Reptile				
Unknown	ARADB22023*002*IA	ARADB22023	Nerodia erythrogaster neglecta / Copperbelly Water Snake	U
Confirmed	ARADB22023*003*IA	ARADB22023	Nerodia erythrogaster neglecta / Copperbelly Water Snake	B
Confirmed	ARADE03011*N104*IA	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	C
Confirmed	ARADE03011*N105*IA	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	C
Vascular Plant				
Omitted	PDASTEB0H0*001*IA	PDASTEB0H0	Eurybia furcata / Forked Aster	C
Unknown	PDASTEB0H0*005*IA	PDASTEB0H0	Eurybia furcata / Forked Aster	U
Unknown	PDSCR09030*005*IA	PDSCR09030	Besseya bullii / Kitten Tails	U
Omitted	PDSCR09030*009*IA	PDSCR09030	Besseya bullii / Kitten Tails	B
Confirmed	PDSCR09030*024*IA	PDSCR09030	Besseya bullii / Kitten Tails	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Low	Medium	Low	Medium	Low
Fire & Fire Suppression	Medium	High	Medium	High	Medium
Invasive Non-Native/Alien Species	Medium	Medium	Medium	High	Medium
Annual & Perennial Non-Timber Crops	Medium	High	Medium	High	Medium
Dams & Water Management/Use	Medium	Low	Low	Medium	Low
Housing & Urban Areas	Medium	Low	Low	Medium	Low
Hunting & Collecting Terrestrial Animals	Low	Low	Low	High	Low
Mining & Quarrying	Low	Low	Low	High	Low
Roads & Railroads	Low	Low	Low	High	Low
Logging & Wood Harvesting	Medium	Low	Low	High	Low

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Acquire lands, easements and leases to protect biodiversity

- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Restoration and linkage of natural areas
- Restore and maintain natural grazing regimes

81 SITE Lytle Creek IA

Description

This site is part of a complex of 15 algific talus slopes that straddle the boundary between the Central Tallgrass Prairie and the Prairie Forest Border ecoregions along Lytle Creek. The portion that falls within the CTP ecoregion features steep, forested slopes. The site contains seven algific talus slopes, as well as ravines, agricultural uplands and valley floors. It contains populations of the Pleistocene disc (a terrestrial snail), northern wild monkshood and Iowa golden-saxifrage.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002387*P114*IA	CEGL002387	Algific Talus Slope	B
Mollusk				
Unknown	IMGAS20190*030*IA	IMGAS20190	Vertigo meramecensis / Bluff Vertigo	U
Unknown	IMGAS20380*031*IA	IMGAS20380	Vertigo hubrichti / Hubricht's Vertigo	U
Confirmed	IMGAS54060*034*IA	IMGAS54060	Discus macclintocki / Pleistocene Disc	A
Vascular Plant				
Omitted	PDRAN01070*037*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	C
Omitted	PDRAN01070*038*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	C
Omitted	PDRAN01070*039*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	D
Omitted	PDRAN01070*040*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	B
Confirmed	PDRAN01070*041*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	A
Omitted	PDRAN01070*042*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	B
Omitted	PDRAN01070*043*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	B
Confirmed	PDSAX07030*050*IA	PDSAX07030	Chrysosplenium iowense / Iowa Golden-saxifrage	B

Threats

To be determined

Strategic Actions

To be determined

84 SITE Manikowski Prairie IA

Description

Manikowski Prairie includes a diverse dry-mesic to mesic prairie associated with limestone outcrops on gently rolling topography, located in the easternmost portion of the Southern Iowa Drift Plain. This area was included in this assessment for its Little Bluestem Bedrock Bluff Prairie community. Low outcrops of Silurian dolomite form bluffs along the eastern edge of an ancestral valley of the Mississippi River known as the "Goose Lake Channel," which was carved into the bedrock thousands of years ago when the river carried huge volumes of glacial meltwater. Part of the site has been designated as a State Preserve and is owned by the Clinton County Conservation Board. The prairie is dominated by little bluestem and sideoats grama with over forty species of plants. Early in the spring, shooting stars prevail among the rock outcrops, along with rockcress, indigo bush, bastard toadflax, and alumroot. Cliff-brake ferns grow on exposed ledges, while leadplant, false gromwell, columbine, mountain mint, pale purple coneflower and rock sandwort grow on deeper soils in the prairie. The abundance of bird’s-foot violets supports a good population

of regal fritillaries. The Ottoe skipper has also been documented on the site. A number of other butterflies inhabit the preserve, including wild indigo duskywing, columbine duskywing, and zabulon skipper.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002245*002*IA	CEGL002245	Little Bluestem Bedrock Bluff Prairie	U

Threats

To be determined

Strategic Actions

To be determined

90 SITE Mills County No.3 IA

Description

This 97-acre conservation area is located along the Nishnabotna River. The prairie (known as Wearin Prairie) is fairly level, wet-mesic prairie on silty clay-loam soils. Western prairie white-fringed orchids are documented on this site. The prairie is in private ownership and is managed to maintain the prairie community. The surrounding landscape is primarily row crop agriculture.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CPSM0000SO*001*IA	CEGL005272	Central Midwest Sedge Meadow	B
Vascular Plant				
Omitted	PMORC1Y0S0*057*IA	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	High	High	High	Medium	High
Fire & Fire Suppression	High	High	High	Medium	High

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Work with local agencies and organizations to ensure long-term conservation

109 SITE Pine Creek IA

Description

This site contains two algific talus slopes with populations of northern wild monkshood and the Pleistocene disc (a terrestrial snail), within the context of steep forested slopes and ravines. Pine Valley Nature Area is within this site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002387*P113*IA	CEGL002387	Algific Talus Slope	B
Mollusk				
Unknown	IMGAS20190*029*IA	IMGAS20190	Vertigo meramecensis / Bluff Vertigo	U
Confirmed	IMGAS54060*025*IA	IMGAS54060	Discus macclintocki / Pleistocene Disc	B
Vascular Plant				
Omitted	PDRAN01070*086*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	C
Confirmed	PDRAN01070*087*IA	PDRAN01070	Aconitum noveboracense / Northern Wild Monkshood	B

Threats
To be determined

Strategic Actions
To be determined

112 SITE Powell Prairie IA
Description
A 10-acre prairie remnant, Powell Prairie is located in the rolling topography of the Southern Iowa Drift Plain. Western prairie white-fringed orchids have been documented on the site as well as Mead's milkweed.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Vascular Plant				
Confirmed	PDASC02150*008*IA	PDASC02150	Asclepias meadii / Mead's Milkweed	C
Omitted	PMORC1Y0S0*058*IA	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	B

Threats
To be determined

Strategic Actions
To be determined

121 SITE Rolling Thunder IA
Description
Rolling Thunder Conservation Area is located in the Southern Iowa Drift Plain landform region. The rolling prairie is dissected by several wooded ravines. The prairie plant community displays a progressive change of flowering species during the year. In spring, hoary puccoon, golden alexanders, prairie phlox, bird's-foot violet, violet wood sorrel, blue-eyed grass, indigo bush, yellow stargrass, wild indigo, and false gromwell are found. By June, prairie cinquefoil, leadplant, prairie coreopsis, pale purple coneflower, pale spiked lobelia, spiderwort, purple prairie clover, rattlesnake master, butterfly weed, prairie rose and wild petunia bloom. Thimbleweed, compass plant, prairie blazing star, ironweed and wild bergamot begin flowering in July. In the fall, heath aster, New England aster, fall aster Jerusalem artichoke, showy goldenrod, Canada goldenrod, and downy gentian are scattered around the hills. A small population of prairie bush clover has been documented. Song sparrow, bobolink, grasshopper sparrow, western meadowlark, vesper sparrow, and yellow warbler are frequent birds, along with an occasional upland sandpiper and northern harrier. Butterflies include the dusted skipper, regal fritillary, coral hairstreak, great spangled fritillary, common wood nymph, wild indigo duskywing and black dash.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002203*055*IA	CEGL002203	Central Mesic Tallgrass Prairie	U
Confirmed	CEGL002203*P112*IA	CEGL002203	Central Mesic Tallgrass Prairie	B
Insect				
Unknown	IILEPJ6040*016*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Confirmed	IILEPJ6040*023*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Omitted	IILEPJ6040*024*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Vascular Plant				
Omitted	PDFAB27090*042*IA	PDFAB27090	Lespedeza leptostachya / Prairie Bushclover	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	Very High	High	Medium	High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Restore and maintain natural fire regimes
- Restoration and linkage of natural areas
- Restore and maintain natural grazing regimes

129 SITE Sheeder Prairie IA

Description

The 25-acre Sheeder Prairie is located in the rolling topography of the Southern Iowa Drift Plain. Ridges and slopes are dominated by mesic prairie with woody vegetation in the draws. The site contains a population of western prairie white-fringed orchid.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002203*008*IA	CEGL002203	Central Mesic Tallgrass Prairie	B
Vascular Plant				
Confirmed	PMORC1Y0S0*051*IA	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	Very High	High	Medium	High
Invasive Non-Native/Alien Species	High	High	High	Medium	High
Dams & Water Management/Use	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Restore and maintain natural fire regimes

166 SITE Woodside Prairie IA

Description

Woodside Prairie is a small, 7-acre, remnant containing highly diverse mesic to dry-mesic prairie situated in the rolling topography of the Southern Iowa Drift Plain. The exposure is primarily west-facing, with dry-mesic to mesic prairie ridges and slopes and a wet-mesic draw. It hosts populations of western prairie white-fringed orchid and Mead's milkweed. Regal fritillaries are also noted on the site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002203*005*IA	CEGL002203	Central Mesic Tallgrass Prairie	C
Vascular Plant				
Confirmed	PDASC02150*003*IA	PDASC02150	Asclepias meadii / Mead's Milkweed	C
Confirmed	PMORC1Y0S0*037*IA	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	B

Threats

To be determined

Strategic Actions

To be determined

215 SITE Big Sand Mound - Blanchard Island IA

Description

The site supports a diverse system of sand dunes, dry sand prairies, woodlands and shallow ponds. Plants and animals of the site are more like those found in the southwestern United States, and the vegetation is well adapted to the dry, infertile sandy soil. More than 600 different plants have been identified on the site, and due to available habitat, a wide variety of unusual animals flourish. Key species found here include the prickly pear cactus (Iowa state-endangered), the western hognose snake (Iowa state-endangered), the Illinois mud turtle (Iowa state-endangered) and the Blanding's turtle (Iowa state-threatened). The preserve is jointly owned by MidAmerican Energy and Monsanto and is managed by an ecological advisory committee consisting of local scientists and land management partners. The efforts of the committee focus on resource management, research, education and providing controlled access to the public. Educational tours are available to students and other groups upon request.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002098*N208*IL	CEGL002098	Bur Oak - Swamp White Oak Mixed Bottomland Forest	A
Confirmed	CEGL002318*030*IA	CEGL002318	Midwest Dry Sand Prairie	B
Reptile				
Confirmed	ARAAE01022*N01*IA	ARAAE01022	Kinosternon flavescens / Yellow Mud Turtle	B
Unknown	ARADB22023*001*IA	ARADB22023	Nerodia erythrogaster neglecta / Copperbelly Water Snake	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Medium	Medium	Medium	Low	Low
Fire & Fire Suppression	High	High	High	Low	Medium
Invasive Non-Native/Alien Species	High	Medium	Medium	Low	Low
Problematic Native Species	High	High	High	Medium	High

Overall Threat Rank: MEDIUM

Strategic Actions

- Establish partnerships to improve corporate practices that enhance conservation of biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Work with local agencies and organizations to ensure long-term conservation

232 SITE Fern Cliff IA

Description

Fern Cliff is a 57-acre site along the east fork of Crooked Creek and is managed by the Washington County Conservation Board. A summer maternity population of Indiana bats has been documented in this riparian forest.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Mammal				
Confirmed	AMACC01100*020*IA	AMACC01100	Myotis sodalis / Indiana Bat	B

Threats

To be determined

Strategic Actions

To be determined

233 LAND Soap Creek / Stephens State Forest Unionville Unit IA

Description

The 2,245-acre Unionville Unit is comprised of nine separate tracts in northeast Appanoose County and northwest Davis County. There are no developed recreation facilities such as picnic areas, campgrounds and trails. The geology of most of Stephens Forest was influenced by the Nebraskan and Kansan glaciers which left deposits of glacial till over the area, covering the sedimentary deposits which had been formed under a vast inland sea. Loess is found on the ridge tops overlaying glacial till. On the sides of hills, erosion has exposed glacial deposited materials. The relatively narrow valleys are covered by alluvial material carried from the hills by water. In some instances, erosion has proceeded far enough in the valley to expose glacial till or underlying sedimentary material. The terrain is characterized by narrow, flat ridges separated by deeply cut drainages. The area streams are intermittent or seep-fed, slow-running and dry up completely at times.

Many dew ponds, small water holes for fire protection and wildlife, were built by the Civilian Conservation Corps

The flora of the area consists of the tallgrass prairie association and the oak-hickory and bottomland hardwood forests and their transition zones. On the better upland sites, white oak, red oak and hickory are common. The oak-hickory timber (Central Midwest Dry-Mesic Oak Woodland type), usually found on the less fertile upland sites, consists mostly of black oak, bur oak, shingle oak and hickory. The bottomland forest includes red and white elm, cottonwood, hackberry, green ash, silver maple and black walnut. Many areas have been planted to coniferous trees and some broad-leaved trees which are not native to the area. These include a variety of pines as well as Douglas fir, spruce, black locust, Osage orange and tulip poplar. [Parts of this description are taken and modified from the Iowa Department of Natural Resources' on-line description of this area.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002142*N01*IA	CEGL002142	North-central Dry-Mesic Oak Woodland	C
Mammal				
Confirmed	AMACC01100*016*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*017*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*018*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*019*IA	AMACC01100	Myotis sodalis / Indiana Bat	B

Threats
To be determined

Strategic Actions
To be determined

234 SITE Muskrat Slough IA
Description
The Muskrat Slough conservation area contains a population of eastern prairie white-fringed orchids.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Vascular Plant				
Confirmed	PMORC1Y0F0*005*IA	PMORC1Y0F0	Platanthera leucophaea / Eastern Prairie White-fringed Orchid	B

Threats
To be determined

Strategic Actions
To be determined

235 LAND Timberhill Savanna IA
Description
The Timberhill Savanna contains nearly 200 acres of high-quality woodland, mostly classified as Central Midwest White Oak - Mixed Oak Woodland (CEGL002134). This site is the core of an opportunity to conserve a woodland landscape within the rolling

topography of the Southern Iowa Drift Plain. The site contains populations of earleaf false foxglove, round-stemmed false foxglove, and Wolf's bluegrass.

Timberhill Savanna is located within the Southern Iowa Oak Savanna area, which spans several counties in south-central Iowa. Well over 95% of the landscape is privately owned. Grazing is the main use of the land in this area with conventional row-crop agriculture on the less steep hilltops and river bottoms.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community Confirmed	CEGL002134*N01*IA	CEGL002134	Central Midwest White Oak - Mixed Oak Woodland	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Low	Medium	Low	Medium	Low
Fire & Fire Suppression	High	Medium	Medium	Low	Low

Overall Threat Rank: LOW

Strategic Actions

- Build a constituency for biodiversity conservation
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Restore and maintain natural fire regimes
- Restore and maintain natural grazing regimes
- Work with local agencies and organizations to ensure long-term conservation

236 SITE Stephens State Forest White Breast Unit IA

Description

The 3,207-acre Whitebreast Unit is located two miles south and two miles west of the town of Lucas. It has two small lakes, two campgrounds and one equestrian campground. The geology of most of Stephens Forest was influenced by the Nebraskan and Kansan glaciers which left deposits of glacial till over the area, covering the sedimentary deposits which had been formed under a vast inland sea. Loess is found on the ridge tops overlaying glacial till. On the sides of hills, erosion has exposed glacial deposited materials. The relatively narrow valleys are covered by alluvial material carried from the hills by water. In some instances, erosion has proceeded far enough in the valley to expose glacial till or underlying sedimentary material. The terrain is characterized by narrow, flat ridges separated by deeply cut drainages. The area streams are intermittent or seep-fed, slow-running and dry up completely at times. Many dew ponds, small water holes for fire protection and wildlife, were built by the Civilian Conservation Corps.

The flora of the region consists of the tallgrass prairie association and the oak-hickory and bottomland hardwood forests and their transition zones. On the better upland sites, white oak, red oak and hickory are common. The oak-hickory timber (Central Midwest Dry-Mesic Oak Woodland type), usually found on the less fertile upland sites, consists mostly of black oak, bur oak, shingle oak and hickory. The bottomland forest includes red and white elm, cottonwood, hackberry, green ash, silver maple and black walnut. Many areas have been planted to coniferous trees and some broad-leaved trees which are not native to the area.

These include a variety of pines as well as Douglas fir, spruce, black locust, Osage orange and tulip poplar. [Parts of this description are taken and modified from the Iowa Department of Natural Resources' on-line description of this area.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTSADRLOSO*005*IA	CEGL002203	Central Mesic Tallgrass Prairie	C
Confirmed	CPSM0000SO*005*IA	CEGL005272	Central Midwest Sedge Meadow	C

Threats
To be determined

Strategic Actions
To be determined

237 SITE Stephens State Forest Chariton Unit IA
Description
The 1,513-acre Chariton Unit is six miles east of the town of Williamson. An all-weather road runs along its east side. The geology of most of Stephens Forest was influenced by the Nebraskan and Kansan glaciers which left deposits of glacial till over the area, covering the sedimentary deposits which had been formed under a vast inland sea. Loess is found on the ridge tops overlaying glacial till. On the sides of hills, erosion has exposed glacial deposited materials. The relatively narrow valleys are covered by alluvial material carried from the hills by water. In some instances, erosion has proceeded far enough in the valley to expose glacial till or underlying sedimentary material. The terrain is characterized by narrow, flat ridges separated by deeply cut drainages. The area streams are intermittent or seep-fed, slow-running and dry up completely at times. Many dew ponds, small water holes for fire protection and wildlife, were built by the Civilian Conservation Corps.

The flora of the region consists of the tallgrass prairie association and the oak-hickory and bottomland hardwood forests and their transition zones. On the better upland sites, white oak, red oak and hickory are common. The oak-hickory timber (Central Midwest Dry-Mesic Oak Woodland type), usually found on the less fertile upland sites, consists mostly of black oak, bur oak, shingle oak and hickory. The bottomland forest includes red and white elm, cottonwood, hackberry, green ash, silver maple and black walnut. Many areas have been planted to coniferous trees and some broad-leaved trees which are not native to the area. These include a variety of pines as well as Douglas fir, spruce, black locust, Osage orange and tulip poplar. [Parts of this description are taken and modified from the Iowa Department of Natural Resources' on-line description of this area.]

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002142*N02*IA	CEGL002142	North-central Dry-Mesic Oak Woodland	C
Mammal				
Confirmed	AMACC01100*004*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*008*IA	AMACC01100	Myotis sodalis / Indiana Bat	B

Threats
To be determined

Strategic Actions
To be determined

238 SITE Great Western Trail - Cummings Site IA
Description
This site, located in Warren County, supports remnant prairie along an abandoned railroad right-of-way. Mead's milkweed is documented on the site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Omitted	CEGL002203*020*IA	CEGL002203	Central Mesic Tallgrass Prairie	C
Vascular Plant				
Confirmed	PDASC02150*004*IA	PDASC02150	Asclepias meadii / Mead’s Milkweed	C

Threats
To be determined

Strategic Actions
To be determined

239 SITE/W Kish-Ke-Kosh Prairie IA
Description
The Kish-Ke-Kosh conservation area contains a 16-acre native tallgrass prairie designated as a State Preserve. The prairie is classified as a Midwest Dry Sand Prairie.

Upland prairie encompasses a major portion of the State Preserve, blending into moist drainageways and wet swales. Prairie vegetation is recovering from grazing. In spring, the prairie hosts hoary and hairy puccoons. Blooming peaks in June and July as indigo bush and prairie larkspur begin to fade and leadplant, prairie coreopsis and pale purple coneflower start to appear. Prairie rose, purple prairie clover, sand primrose, and partridge pea emerge among purple rough blazing stars. By the end of September, prairie sunflower, sky blue and silky asters, sweet everlasting and Missouri goldenrod provide yellow, blue, and gold blooms. Birds include red-tailed hawks, eastern meadowlarks, dickcissels, and horned larks. Occasionally upland sandpipers or shrikes are seen here. Ten species of butterflies are confirmed, including black swallowtail, orange sulphur, pearl crescent and wood satyr.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002318*032*IA	CEGL002318	Midwest Dry Sand Prairie	C
Insect				
Omitted	IILEPJ6040*020*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	B

Threats
To be determined

Strategic Actions
To be determined

240 SITE Red Rock IA

Description

This site includes Harvey Woods, a disturbed oak-hickory woodland, consisting primarily of bur oak and shagbark hickory. There are numerous potential Indiana bat maternity sites. The conservation area includes parts of Red Rock Reservoir and a number of public lands.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Mammal				
Confirmed	AMACC01100*007*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*010*IA	AMACC01100	Myotis sodalis / Indiana Bat	B

Threats

To be determined

Strategic Actions

To be determined

241 SITE/W Williams Prairie IA

Description

Located along the edge of the Iowan Surface landform region[2], Williams Prairie State Preserve is situated within the broad valley of the Iowa River. Most of the preserve consists of shallow lowland that remains wet through the spring and into midsummer. A wet prairie, dominated by dense stands of sedges and bluejoint grass, is located here. Some dry knolls are located in the eastern and southern portions of the site, dominated by big bluestem and Kentucky bluegrass. Over 300 species of vascular plants have been reported in the preserve, including twelve species of sedges and about forty species of grasses. Eight bryophytes (mosses and liverworts) are also found here. In the spring, hoary puccoon, prairie phlox, yellow stargrass, spring cress, golden alexanders, shooting star, marsh marigold and swamp buttercup can be seen in bloom, followed by swamp milkweed, butterfly weed, Michigan lily, marsh vetchling, wild indigo, indigo bush, leadplant, blue flag iris, marsh bellflower and prairie blazing star in the summer. Rare plants found here include Virginia bunch-flower and northern adder's tongue fern. Fall brings the flowering of swamp lousewort, sneezeweed, panicled aster, nodding bur marigold, New England aster, flat-topped aster, Canada goldenrod, grassleaf goldenrod and bottle gentian. Nesting birds include sedge wren, bobolink, grasshopper sparrow, eastern meadowlark, yellow-throated warbler, and song sparrow. Ornate box turtles are common in the area. The linkage to the Hawkeye Wildlife Area is important.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CPSM0000NW*031*IA	CEGL002258	Tussock Sedge Wet Meadow	B
Vascular Plant				
Omitted	PMORC1Y0F0*017*IA	PMORC1Y0F0	Platanthera leucophaea / Eastern Prairie White-fringed Orchid	D

[2] See www.igsb.uiowa.edu/Browse/landform.htm for a map and descriptions of the landform regions of Iowa.

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Dams & Water Management/Use	High	High	High	Very High	Very High
Invasive Non-Native/Alien Species	High	High	High	Medium	High
Problematic Native Species	Medium	Medium	Medium	Low	Low

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Restoration and linkage of natural areas
- Work with local agencies and organizations to ensure long-term conservation

242 SITE Keosauqua IA

Description

This conservation area contains both the 1,653-acre Lacey-Keosauqua State Park and the 3,000-acre Indian Creek Wildlife area. Lacey-Keosauqua State Park contains bluffs and valleys bordering the great horseshoe bend of the Des Moines River in southeast Iowa. The oak-hickory forest provides habitat for the Indiana bat. Indian Creek Wildlife Area includes open grassland habitat managed for upland wildlife species and contains populations of Henslow's sparrows.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002142*N03*IA	CEGL002142	North-central Dry-Mesic Oak Woodland	C
Bird				
Unknown	ABPBXA0030*011*IA	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Omitted	ABPBXA0030*018*IA	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	B
Mammal				
Confirmed	AMACC01100*001*IA	AMACC01100	Myotis sodalis / Indiana Bat	B

Threats

To be determined

Strategic Actions

To be determined

243 SITE Iowa Army Ammunition Plant IA

Description

This conservation area was selected for the population of Indiana bats. The 19,000-acre Army Ammunition Plant was constructed in 1941 to load, assemble and pack various ammunition and fusing systems. The installation is still active today. The site contains several thousand acres of timber including old-age stands of oak and hickory. In 2003,

mist-netting surveys captured seven bats which were radio tracked. A large maternity roost was found in a nearby barn.

Target Occurrences

Mammal

Confirmed	AMACC01100*028*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*029*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*030*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*031*IA	AMACC01100	Myotis sodalis / Indiana Bat	B
Confirmed	AMACC01100*032*IA	AMACC01100	Myotis sodalis / Indiana Bat	B

Threats

To be determined

Strategic Actions

To be determined

244 SITE/W Syslo Sand Prairie IA

Description

Two small (4 to 5-acre) sand prairie remnants are located at this site in Clinton County. The remnants are located on Chelsea loamy find sand with 9 - 18% slopes. Clustered poppy-mallow populations have been noted on the site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Vascular Plant				
Confirmed	PDMAL0A080*003*IA	PDMAL0A080	Callirhoe triangulata / Clustered Poppy-mallow	C

Threats

To be determined

Strategic Actions

To be determined

245 SITE Wildcat Den IA

Description

This conservation site contains the 417-acre Wildcat Den State Park along the Pine Creek drainage. The site is marked by imposing sandstone exposures. The park was dedicated in 1935 to preserve the diverse plant communities, archaeological and historical resources and its scenic geology. A population of forked asters is documented at the site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Vascular Plant				
Confirmed	PDASTEB0H0*006*IA	PDASTEB0H0	Eurybia furcata / Forked Aster	B

Threats

To be determined

Strategic Actions

To be determined

246 SITE/W Bundt Prairie IA

Description

Bundt Prairie is a small, 3-acre remnant prairie located at the site of a former one-room school house in the Southern Iowa Drift Plain, which is composed of rolling terrain with a thin cap of loess. The prairie community is classified as Central Mesic Tallgrass Prairie. The remnant is managed by the Guthrie County Conservation Board.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002203*002*IA	CEGL002203	Central Mesic Tallgrass Prairie	B

Threats

To be determined

Strategic Actions

To be determined

247 SITE Goeldner Woods IA

Description

Goeldner Woods is located approximately five miles southeast of Earlham, Iowa in the northwest corner of Madison County. This 44-acre county park is primarily upland hardwood forest, with some bottomland timber on the north end of the park adjacent to the North Branch of North River. Summer roosts for Indiana bats are documented here.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Mammal				
Confirmed	AMACC01100*002*IA	AMACC01100	Myotis sodalis / Indiana Bat	B

Threats

To be determined

Strategic Actions

To be determined

248 SITE Sand Creek IA

Description

The conservation area contains mesic tallgrass prairie as well as deep marsh habitat. Summer roosts for Indiana bats are documented here.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTSADRLOSO*014*IA	CEGL002203	Central Mesic Tallgrass Prairie	C
Unknown	CTSADRLOSO*026*IA	CEGL002203	Central Mesic Tallgrass Prairie	U
Unknown	CEGL002233*153*IA	CEGL002233	Midwest Cattail Deep Marsh	C
Mammal				
Confirmed	AMACC01100*011*IA	AMACC01100	Myotis sodalis / Indiana Bat	B

Threats

To be determined

Strategic Actions
To be determined

249 SITE/W Mills County Prairie IA
Description
Mills County Prairie was selected for the mesic tallgrass prairie remnant (Burgoin Prairie). The prairie is bordered by a gravel road and ditch on west, cropland on the south and an intermittent stream on the east. There is little invasion by weeds, except for smooth brome on the edges. Western prairie white-fringed orchids have been documented on the site. The site is privately owned and is leased for haying. The remnant is located on an east-facing upland site with silt-loam soils. It is located in the Southern Iowa Drift Plain.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002203*033*IA	CEGL002203	Central Mesic Tallgrass Prairie	C
Vascular Plant				
Omitted	PMORC1Y0S0*056*IA	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	High	High	Medium	High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	Medium	High	Medium	High	Medium

Overall Threat Rank: HIGH

Strategic Actions
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Work with local agencies and organizations to ensure long-term conservation

250 SITE/W Crawford County Prairie IA
Description
The conservation site is selected for a mesic central tallgrass prairie remnant (Welch Prairie) located on a northeast-facing slope. Soils are Monona silt loam, 14-20% (Moe; IVe; fine-silty Typic Hapludoll). A few western prairie white-fringed orchids have been documented from the site. The remnant is bordered on the south and west by roads and on the northeast by trees and cropland. The site has been mowed annually.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002203*041*IA	CEGL002203	Central Mesic Tallgrass Prairie	C
Vascular Plant				
Omitted	PMORC1Y0S0*054*IA	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	D

Threats
To be determined

Strategic Actions
To be determined

IOWA/MISSOURI

71 Loess Hills IA/MO

Description

The Loess Hills conservation areas are located within a 650,000-acre region of deep loess soils in western Iowa and northwestern Missouri. The steep and rugged topography of the area contains some of the best-known examples of Loess Hills tallgrass prairie and Loess Hills little bluestem prairie. The extensive loess deposits (up to 200 feet deep), the rugged terrain, and the southwestern-facing slopes create habitat for many Great Plains species at the eastern edge of their range. The far northern portion, for example, provides refugia for the prairie rattlesnake (*Crotalis viridis*), while the southern portion harbors populations of Great Plains skink (*Eumeces obsoletus*). The intact prairies also hold populations of Ottoe skipper and the regal fritillary. Approximately 22,000 acres of remnant prairie have been identified within the Loess Hills landform. Over 50% of the landform is in grasscover, in a combination of prairie and cool-season pastures. Eastern Great Plains Bur Oak Woodland is also present in the landform. The predominant land use has historically been a mix of grazing and row crop agriculture, although today urban development and recreational use are also prevalent, particularly near the Sioux City and Council Bluffs metropolitan areas.

1 LAND Loess Hills North IA

Description

The Loess Hills North conservation area includes the following Special Landscape Areas as identified by the National Park Service in 2002: Plymouth North, Plymouth South, Luton, Grant Center, Turin, Little Sioux and Mondamin.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002025*003*IA	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	A
Confirmed	CEGL002025*005*IA	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	B
Confirmed	CEGL002025*N01*IA	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	B
Confirmed	CEGL002035*004*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Unknown	CEGL002035*016*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	A
Confirmed	CEGL002035*020*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Confirmed	CEGL002035*021*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	CD
Confirmed	CEGL002035*037*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	A
Confirmed	CEGL002035*N01*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Confirmed	CEGL002035*P01*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	A
Confirmed	CEGL002035*P02*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Confirmed	CEGL002035*P03*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Confirmed	CEGL002035*P04*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Confirmed	CEGL002049*N01*NE	CEGL002049	Riverine Sand Flat	C
Unknown	CEGL002072*002*IA	CEGL002072	Northern Bur Oak Mesic Forest	U
Unknown	CEGL002072*003*IA	CEGL002072	Northern Bur Oak Mesic Forest	U
Unknown	CEGL002072*005*IA	CEGL002072	Northern Bur Oak Mesic Forest	U
Bird				
Confirmed	ABNNB03070*P01*NE/IA	ABNNB03070	Charadrius melodus / Piping Plover	B
Confirmed	ABNNM08102*P01*NE/IA	ABNNM08102	Sternula antillarum athalassos / Interior Least Tern	B
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Insect				
Confirmed	IILEP37171*001*IA	IILEP37171	Erynnis persius persius / Persius Dusky Wing	B
Unknown	IILEPJ6040*026*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Unknown	IILEPJ6040*027*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Omitted	IILEPJ6040*028*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Unknown	IILEPJ6040*029*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Unknown	IILEPJ6040*030*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Unknown	IILEPJ6040*031*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Unknown	IILEPJ6040*032*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Unknown	IILEPJ6040*033*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	U
Confirmed	IILEPJ6040*034*IA	IILEPJ6040	Speyeria idalia / Regal Fritillary	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Mining & Quarrying	High	Low	Low	Very High	Medium
Invasive Non-Native/Alien Species	Very High	High	High	High	High
Housing & Urban Areas	High	Very High	High	Very High	Very High
Livestock Farming & Ranching	Medium	High	Medium	Low	Low

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Acquire lands, easements and leases to protect biodiversity
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Restore and maintain natural grazing regimes

2 LAND/RES Loess Hills Central IA

Description

The Loess Hills Central conservation area includes the following Special Landscape Areas as identified by the National Park Service in 2002: Loveland, Council Bluffs North, Folsom Point, Bur Oak Ridge and Waubonsie.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002035*015*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Possible	CEGL002035*P05*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Possible	CEGL002035*P06*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Bird				
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Very High	Very High	Very High	Medium	Very High
Housing & Urban Areas	Very High	High	High	Very High	Very High
Mining & Quarrying	Very High	High	High	Very High	Very High
Invasive Non-Native/Alien Species	High	Medium	Medium	Medium	Medium
Livestock Farming & Ranching	Medium	Medium	Medium	Low	Low

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Acquire lands, easements and leases to protect biodiversity
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Restore and maintain natural grazing regimes

IOWA/MISSOURI

3 SITE Loess Hills South MO

Description

The Loess Hills South conservation area is a collection of the most southern expressions of the Loess Hills complex.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002025*N02*IA	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Confirmed	CEGL002035*N02*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Confirmed	CEGL002035*P07*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Confirmed	CTPDT14110*001*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Confirmed	CTPDT14110*002*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Possible	CTPDT14110*008*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Possible	CTPDT14110*009*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Confirmed	CTPDT14110*011*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Confirmed	CTPDT14110*012*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Unknown	CTPDT14110*013*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Unknown	CTPDT14110*015*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Possible	CTPDT14110*016*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Confirmed	CTPDT14110*017*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Unknown	CTPDT14110*019*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	BC
Confirmed	CTPDT14110*020*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Confirmed	CTPDT14110*021*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Possible	CTPDT14110*025*MO	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Confirmed	CTFMT11120*010*MO	CEGL002058	White Oak - Red Oak – Sugar Maple Mesic Forest	BC
Bird				
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Problematic Native Species	Medium	High	Medium	Medium	Medium
Fire & Fire Suppression	High	High	High	Medium	High
Livestock Farming & Ranching	High	Medium	Medium	High	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

105 LAND/RES Grand River Grasslands IA/MO

Description

The area encompasses 70,000 acres in southwestern Iowa and northwestern Missouri. Dunn Ranch, a key protected area in this landscape, contains the last known large (>900 acres) unplowed tallgrass prairie remnant on deep fertile loams in the ecoregion. The area contains multiple hydric to dry-mesic prairie types. A potentially viable population of greater prairie chickens is found here along with a suite of other grassland birds.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002214*047*IA	CEGL002214	Midwest Dry-Mesic Prairie	C
Confirmed	CTPRT14120*012*MO	CEGL002214	Midwest Dry-Mesic Prairie	A
Confirmed	CTPRT14120*023*MO	CEGL002214	Midwest Dry-Mesic Prairie	A
Bird				
Omitted	ABPBXA0030*010*IA	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	B
Omitted	ABPBXA0030*016*IA	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	B
Confirmed	ABPBXA0030*017*IA	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	A
Unknown	ABPBXA0030*028*MO	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Unknown	ABPBXA0030*049*MO	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Unknown	ABPBXA0030*064*MO	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Unknown	ABPBXA0030*081*MO	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Insect				
Omitted	IILEPJ6040*047*MO	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Mammal				
Possible	AMACC01100*087*MO	AMACC01100	Myotis sodalis / Indiana Bat	C
Vascular Plant				
Confirmed	PDSCR01130*040*MO	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	High	Low	Low	Very High	Medium
Livestock Farming & Ranching	High	High	High	Medium	High
Logging & Wood Harvesting	Low	Low	Low	Medium	Low
Invasive Non-Native/Alien Species	Medium	Low	Low	Medium	Low
Annual & Perennial Non-Timber Crops	Medium	High	Medium	Medium	Medium
Fire & Fire Suppression	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity from logging and wood harvesting

- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

MISSOURI

5 SITE Ben Watts Knob MO

Description

This high-quality knob has a mosaic of relatively undisturbed dry, mesic and dry-mesic limestone dolomite forest on relatively steep north and south slopes and in an east-running draw between two main arms of the knob. Dry forest is found on noses facing south into the draw. The plant community consists of old second-growth (80-120 years old) forest of black oak, white oak, white ash and black hickory. The site is in private ownership.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFML11220*004*MO	CEGL002070	White Oak - Mixed Oak Dry-Mesic Alkaline Forest	BC
Omitted	CTFRL11210*003*MO	CEGL002070	White Oak - Mixed Oak Dry-Mesic Alkaline Forest	BC
Confirmed	CTWDL12210*003*MO	CEGL002108	Chinquapin Oak - Red Cedar Dry Alkaline Forest	BC

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Logging & Wood Harvesting	High	Medium	Medium	High	Medium
Livestock Farming & Ranching	Low	Low	Low	Very High	Medium
Fire & Fire Suppression	High	Very High	High	Medium	High

Overall Threat Rank: MEDIUM

Strategic Actions

- Enhance incentives for conservation of biodiversity on private lands
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from logging and wood harvesting

32 SITE Tarkio Prairie MO

Description

This site lies at the upper headwaters of Tarkio Creek and Long Branch Creek flows through the area, bisecting the prairie. The diverse prairie flora is on loess and glacial till soils. There is an interesting small shrub component of dwarf chinquapin oak, hazelnut and prairie willow. The Missouri Department of Conservation is restoring some degraded portions of the site to prairie.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPMT14130*028*MO	CEGL002203	Central Mesic Tallgrass Prairie	B
Confirmed	CTPRT14120*020*MO	CEGL002214	Midwest Dry-Mesic Prairie	B
Insect				
Omitted	IILEPJ6040*069*MO	IILEPJ6040	Speyeria idalia / Regal Fritillary	C
Vascular Plant				
Omitted	PMORC1Y0S0*001*MO	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	High	Medium	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity

38 SITE/W Foxglove Prairie MO

Description

Foxglove Prairie contains a example of a former matrix community that contains a good population of earleaf false foxglove. The site is threatened by urban expansion.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPRT14120*005*MO	CEGL002214	Midwest Dry-Mesic Prairie	C
Bird				
Confirmed	ABPBW01110*001*MO	ABPBW01110	Vireo bellii / Bell's Vireo	B
Vascular Plant				
Confirmed	PDSCR01130*018*MO	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	High	High	High	Very High	Very High
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

42 SITE Goose Pond MO

Description

This remnant spring-fed freshwater marsh is in the western floodplain of the Mississippi River, in a former river channel of the Des Moines River. The amount of open water varies with precipitation and several springs issue from the east side. The adjacent western section is man-made. The original channel system is now dissected by several highways, and most of it has been ditched, drained and farmed. The area is bound by wet grassland and pasture and is surrounded by cropland. Goose Pond is home to the Blanding's turtle, central mudminnow and the Illinois mud turtle. The site is in private ownership.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTEZZ18340*004*MO	CEGL002041	Central Tallgrass Fen	C
Confirmed	CTEZZ18110*005*MO	CEGL002430	Midwest Ephemeral Pond	C
Reptile				
Confirmed	ARAAE01022*001*MO	ARAAE01022	Kinosternon flavescens / Yellow Mud Turtle	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	Very High	High	Medium	High
Annual & Perennial Non-Timber Crops	High	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build a constituency for biodiversity conservation
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural surface water and groundwater hydrology

43 SITE Grassy Lake/Maple Lake MO

Description

This shallow freshwater marsh/wet prairie/shrub swamp community occurs in the Mississippi River floodplain. The shallow marsh is dominated by large continuous stands of yellow pond lily and the wet prairie is dominated by prairie cordgrass and bur marigold. This is one of the largest remaining natural marshland lakes in Missouri. It has never been plowed and although it has drainage ditches, the natural quality remains high. It is managed by a duck hunting club.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Omitted	CTPWB14820*014*MO	CEGL002027	Northern Cordgrass Wet Prairie	C
Possible	CTPWB14820*015*MO	CEGL002027	Northern Cordgrass Wet Prairie	C
Possible	CTEZZ18120*002*MO	CEGL002190	Northern Buttonbush Swamp	C
Possible	CTEZZ18120*009*MO	CEGL002190	Northern Buttonbush Swamp	C
Confirmed	CTEZZ18110*008*MO	CEGL002430	Midwest Ephemeral Pond	BC

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	High	High	Medium	High
Recreational Activities	Medium	High	Medium	Low	Low
Commercial & Industrial Areas	Very High	High	High	High	High

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Restore and maintain natural surface water and groundwater hydrology

44 LAND Green Hills MO

Description

This rugged, mainly forested landscape is interspersed with prairie and woodlands. Old fields and man-made ponds are scattered throughout the area. The landscape had small prairie remnants with prairie chicken populations in the past. The mesic and dry-mesic woodlands have degraded into restorable old-growth woodlands and secondary-growth forests. The canopy is 90 to 120 years old and the herbaceous ground layer diversity is high. The restoration potential of the prairie/savanna remnants is high. The north end of

Big Creek Conservation Area is managed for demonstration grazing in cooperation with Northeast Missouri State University. The area is mostly in private ownership, yet the Missouri Department of Natural Resources and Department of Conservation own sites in the landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTFRT11110*031*MO	CEGL002068	Midwestern White Oak - Red Oak Forest	B
Confirmed	CTWRT12120*008*MO	CEGL002134	Central Midwest White Oak -Mixed Oak Woodland	B
Insect				
Unknown	IILEPJ6040*088*MO	ILEPJ6040	Speyeria idalia / Regal Fritillary	U
Vascular Plant				
Unknown	PDSCR01130*006*MO	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U
Omitted	PDSCR0F043*020*MO	PDSCR0F043	Chelone obliqua var. speciosa / Rose Turtlehead	D

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Logging & Wood Harvesting	Medium	High	Medium	Medium	Medium
Livestock Farming & Ranching	High	Low	Low	Very High	Medium
Housing & Urban Areas	Medium	Medium	Medium	Very High	High

Overall Threat Rank: MEDIUM

Strategic Actions

- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

49 SITE Helton Prairie MO

Description

This high-quality upland prairie is situated on gently rolling topography over a deep layer of loess and glacial till. The prairie is mainly mesic with some wet-mesic prairie along the small drainages. The prairie has excellent plant diversity with rare plants such as Mead's milkweed and the western prairie white-fringed orchid. Along the drainages there is some woody invasion and evidence of past grazing and local erosion. It is bordered by young forest land to the south and crop fields to the east. The former croplands adjacent to the prairie are being restored, using fire as one management tool.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPMT14130*015*MO	CEGL002203	Central Mesic Tallgrass Prairie	AB
Insect				
Omitted	IILEPJ6040*051*MO	IILEPJ6040	Speyeria idalia / Regal Fritillary	C
Vascular Plant				
Confirmed	PDASC02150*061*MO	PDASC02150	Asclepias meadii / Mead's Milkweed	C
Omitted	PMORC1Y0S0*007*MO	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Medium	Medium
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Low	Low
Fire & Fire Suppression	High	Very High	High	Low	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

66 LAND Lincoln Hills MO

Description

Although glaciated, Lincoln Hills has Ozark-like characteristics. It has karst geologic features and associated natural communities such as limestone glades due to the geologic uplifting of the region. This area supports over 30 species on the state's list of species of conservation concern, and species at the northern periphery of their range. Significant natural communities include savannas, woodlands, forests, glades, prairies, pond marsh, limestone talus and cliffs. The area also has many features of karst topography such as losing streams, springs, sinkholes, sinkhole ponds, and caves. The landscape is highly fragmented; the only sizable remnant of natural habitat is the 6,400-acre Cuivre River State Park. The park encompasses a substantial portion of the dissected watershed of Big Sugar Creek and is primarily covered by good-quality, dry-mesic woodland. Both the Missouri Department of Natural Resources and the Missouri Department of Conservation own sites in the landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTFMS11420*007*MO	CEGL002058	White Oak-Red Oak-Sugar Maple Mesic Forest	B
Confirmed	CTWRT12120*004*MO	CEGL002134	Central Midwest White Oak-Mixed Oak Woodland	B
Unknown	CTCMS16122*030*MO	CEGL002287	Midwest Moist Sandstone Cliff	B
Confirmed	CTEZZ18210*012*MO	CEGL002413	Sinkhole Pond Marsh	B
Confirmed	CTGZM15100*005*MO	CEGL005131	Central Limestone Glade	B
Unknown	CTGZM15100*058*MO	CEGL005131	Central Limestone Glade	B
Unknown	CTGZM15100*059*MO	CEGL005131	Central Limestone Glade	B
Vascular Plant				
Unknown	PDSCR01130*004*MO	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U
Omitted	PDSCR01130*020*MO	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	C
Unknown	PDSCR01130*021*MO	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	High	High	Very High	Very High
Recreational Activities	Medium	Medium	Medium	Low	Low
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium
Fire & Fire Suppression	High	Medium	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

68 SITE Little Tarkio Prairie MO

Description

This small upland prairie on a west-facing slope has a small wooded draw on the south side of the site. It is the last intact dry-mesic prairie in the county and is surrounded by agriculture. There is some brome invasion along upper slopes due to the presence of a dirt road. The site has been managed for hay using progressive farming techniques and is periodically burned. The Missouri Department of Conservation has recently acquired the prairie.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPRT14120*008*MO	CEGL002214	Midwest Dry-Mesic Prairie	BC
Insect				
Omitted	IILEPJ6040*049*MO	IILEPJ6040	Speyeria idalia / Regal Fritillary	C
Vascular Plant				
Omitted	PMORC1Y0S0*004*MO	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Low	High	Low	Medium	Low

Overall Threat Rank: LOW

Strategic Actions

- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

72 LAND/RES Long Branch State Park MO

Description

Long Branch State Park is home to a small white oak-dominated savanna and prairie remnant found within larger tracts of degraded forest. It is actively managed by the Missouri Department of Natural Resources to restore representative northern Missouri habitats. It provides habitat for the Henslow's sparrow and a state-listed sedge. The

Missouri Department of Conservation and US Army Corps of Engineers also own areas within the site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTFEB11730*024*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	B
Confirmed	CTSRT13110*004*MO	CEGL002159	Central Bur Oak Opening	B
Unknown	CTPRT14120*033*MO	CEGL002214	Midwest Dry-Mesic Prairie	BC
Bird				
Unknown	ABPBXA0030*090*MO	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Mammal				
Confirmed	AMACC01100*091*MO	AMACC01100	Myotis sodalis / Indiana Bat	C
Vascular Plant				
Confirmed	PDSCR0F043*023*MO	PDSCR0F043	Chelone obliqua var. speciosa / Rose Turtlehead	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Livestock Farming & Ranching	High	Low	Low	Medium	Low
Housing & Urban Areas	High	Medium	Medium	High	Medium
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

80 SITE Lowry Marsh MO

Description

This wetland complex of freshwater marsh and wet-mesic prairie is located in the historic channel of the Weldon Fork of the Grand River. The wet-mesic prairie/marsh mosaic is in the center and to the south of the marsh. A low-quality, wet-mesic savanna dominated by swamp white oak is found to the north. The site also includes a forest and cool-season pasture. The site supports six rare or endangered species including several sedges, marsh skullcap, star duckweed, tufted loosestrife, and the rare northern leopard frog. The area is heavily used by waterfowl and it provides habitat for several other uncommon bird species including upland sandpipers, sedge wrens, bobolinks and sora rails. The site is owned by the Missouri Department of Conservation.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPEB14810*010*MO	CEGL002024	Central Wet-mesic Tallgrass Prairie	B
Unknown	CTWEB12830*002*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	C
Confirmed	CTEZZ18110*009*MO	CEGL002430	Midwest Ephemeral Pond	AB

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Medium	Low	Low	Medium	Low
Fire & Fire Suppression	Medium	High	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

95 SITE Morris Prairie MO

Description

Morris Prairie is a dry-mesic prairie with moderate to high species diversity in a rolling upland landscape. Some eroded slopes and woody draws are found on the site. Unique plants include dwarf chinquapin oak, tall agrimony and pale and earleaf false foxglove. Timothy and deadly nightshade were established in 1989 from hay bales. The landowners have a management agreement with the Missouri Department of Conservation.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPRT14120*022*MO	CEGL002214	Midwest Dry-Mesic Prairie	B
Vascular Plant				
Omitted	PDSCR01130*014*MO	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	Medium	High
Fire & Fire Suppression	Medium	Medium	Medium	Low	Low

Overall Threat Rank: MEDIUM

Strategic Actions

- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes

100 SITE/W Old Catholic Church Cemetery Prairie MO

Description

This cemetery prairie contains a small, annually hayed, dry-mesic prairie at the top of an east-facing slope (3-9%) that grades down into a mesic prairie on the lower slope and in the swale. The soil is Adair loam formed on glacial till. The 0.3-acre cemetery is kept closely mowed throughout the year. Some disturbance is associated with the old St. Mary's Church site which was active until 1932 and burned in the late 1930's. There is some red clover invasion along the south edge. The site is owned by the Catholic Diocese of Kansas City.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTPRT14120*009*MO	CEGL002214	Midwest Dry-Mesic Prairie	B
Vascular Plant				
Omitted	PDASC02150*060*MO	PDASC02150	Asclepias meadii / Mead's Milkweed	D

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	Very High	High	Low	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Restore and maintain natural fire regimes

114 LAND Rebel's Cove MO

Description

A suite of terrestrial communities are documented in the landscape. Predominately forested, the rugged landscape has a history of mixed landuses until it was recently acquired in part through the Pittman-Robertson Wildlife Restoration Act administered by the U.S. Fish and Wildlife Service. Nearly five miles of the unchannelized Chariton River runs through the area. The meandering river channel has created several oxbow lakes and natural marshes among the forested river bottoms. Most of the uplands have cleared for crop or cattle pasture, restoration is on-going in uplands under conservation ownership. The steep slopes that form sides of the river valley remain forested. A small seepage fen that grades into a marsh is located on private ownership in the northeast of the conservation area. The fen is dominated by cattails with local woody thickets of pussy willow and dogwood. Lake-bank sedge, willow herb and gooseberry are found in the fen. More inventory of biota on this site will likely yield other communities of importance.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFWB11740*011*MO	CEGL002018	Midwestern Cottonwood – Black Willow Forest	B
Confirmed	CTEZZ18340*005*MO	CEGL002041	Central Tallgrass Fen	C
Confirmed	CTFEB11730*006*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	B
Confirmed	CTEZZ18120*006*MO	CEGL002190	Northern Buttonbush Swamp	B
Vascular Plant				
Omitted	PDSCR01130*029*MO	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Medium	Medium	Medium	High	Medium
Dams & Water Management/Use	High	Very High	High	High	High

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural surface water and groundwater hydrology

125 SITE Salt River Narrows MO

Description

This site is a semi-open glade with southwestern exposure. The unique topography gives rise to diverse communities such as limestone glade, shale glade-savanna, dry-mesic

limestone forest, and dry limestone forest that are contained within a small area. As a result, there is a high diversity of plant species. The massive shale outcrop is overlain by limestone and eroded away by the Salt River. The dip between the shale and limestone layers supports dry-mesic forest between the two glade types. The short bluffs at the tip harbor dry limestone forest, and the scattered mature oaks give the site a savanna-like appearance. There is erosion from a road cut at the base of the slope and woody invasion at the south end of the site. It has been grazed and logged in the past. The site is in both private and US Army Corps of Engineers ownership.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Omitted	CTFRL11210*006*MO	CEGL002070	White Oak - Mixed Oak Dry-Mesic Alkaline Forest	BC
Confirmed	CTWDL12210*007*MO	CEGL002108	Chinquapin Oak - Red Cedar Dry Alkaline Forest	BC

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	High	High	Medium	High
Invasive Non-Native/Alien Species	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural fire regimes

134 SITE Spadderdock Bottoms MO

Description

The Spadderdock Bottoms conservation area is adjacent to the Mississippi River and is part of the Melvin Price Dam mitigation project. The bottomlands consist of wet-mesic forests and the area contains prime waterfowl habitat. An east-west levee and roads are found throughout the site. Decurrent false aster populations are established in a low area of former soybean fields and along a thinly wooded roadside ditch on the west side of a state highway. The population was augmented by salvaged plants. The site is owned by the US Army Corps of Engineers and managed by the Missouri Department of Conservation.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTTZA17100*001*MO	CEGL002049	Riverine Sand Flat	C
Vascular Plant				
Confirmed	PDAST1E040*003*MO	PDAST1E040	Boltonia decurrens / Decurrent False Aster	C
Confirmed	PDAST1E040*004*MO	PDAST1E040	Boltonia decurrens / Decurrent False Aster	C
Confirmed	PDAST1E040*005*MO	PDAST1E040	Boltonia decurrens / Decurrent False Aster	C
Confirmed	PDAST1E040*008*MO	PDAST1E040	Boltonia decurrens / Decurrent False Aster	C
Confirmed	PDAST1E040*009*MO	PDAST1E040	Boltonia decurrens / Decurrent False Aster	C
Confirmed	PDAST1E040*011*MO	PDAST1E040	Boltonia decurrens / Decurrent False Aster	C
Confirmed	PDAST1E040*012*MO	PDAST1E040	Boltonia decurrens / Decurrent False Aster	B
Omitted	PDAST1E040*013*MO	PDAST1E040	Boltonia decurrens / Decurrent False Aster	D

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	High	High	High	High
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Low	Low

Overall Threat Rank: MEDIUM

Strategic Actions

- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

144 LAND/RES Swan Lake MO

Description

This large Missouri River floodplain restoration landscape includes the Grand River and Locust Creek. The landscape is an active meandering river system with numerous major wetland communities, including bottomland forest, wet savanna, freshwater marsh, shrub swamp, oxbows, sloughs and a natural lake. Frequent flood events result in heavy deposition of silt from channelized upstream reaches of Locust Creek. The bottomland forest consists of shellbark hickory, cottonwood and bur, pin and swamp white oaks. The wet prairie, with wet savanna borders and a mosaic of open water marshes, shrub swamp, and slough, are underlain by alluvial silt loam soils. The cordgrass prairie and marsh are surrounded by wet bottomland forest along Locust Creek. Characteristic plants include cordgrass, cow parsnip, blue flag, arrowhead and smartweed. This area provides habitat for one of only three viable populations of the eastern massasauga in the state. Several Missouri-listed species, including the flat floater, marsh wren and trout perch, are found here. This area has six significant bodies of water (Che-Ru Lake, Bittern Marsh, Jo Shelby Lake, Silver Lake, Swan Lake, and South Pool), and there are high concentrations of waterfowl found in the landscape. This landscape has large areas in state and federal ownership (Missouri Department of Conservation, Missouri Department of Natural Resources, and US Fish and Wildlife Service).

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFWB11740*006*MO	CEGL002018	Midwestern Cottonwood – Black Willow Forest	B
Confirmed	CTPWB14820*001*MO	CEGL002027	Northern Cordgrass Wet Prairie	B
Confirmed	CTFEB11730*002*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	B
Unknown	CTFEB11730*007*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	BC
Unknown	CTFEB11730*011*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	B
Confirmed	CTFEB11730*016*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	B
Confirmed	CTFZB11750*010*MO	CEGL002586	Silver Maple - Elm Forest	B
Confirmed	CAPSO21100*001*MO	CES202.694	North-Central Interior Floodplain	B
Bird				
Unknown	ABNNM08102*038*MO	ABNNM08102	Sternula antillarum athalassos / Interior Least Tern	U
Mammal				
Unknown	AMACC01100*055*MO	AMACC01100	Myotis sodalis / Indiana Bat	U
Reptile				
Confirmed	ARADE03011*004*MO	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	B
Unknown	ARADE03011*005*MO	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	U
Unknown	ARADE03011*006*MO	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	U
Confirmed	ARADE03011*018*MO	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	High	High
Dams & Water Management/Use	High	High	High	Medium	High
Fire & Fire Suppression	Medium	High	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants

150 SITE Trice-Dedman Woods MO

Description

Trice-Dedman Woods supports mesic and dry-mesic old-growth woodlands, dominated by white oaks in the 160 to 180-year age class. The site's topography is gently rolling, with a small, intermittent creek running through The Nature Conservancy preserve. Surrounding lands are row crop fields or pasture. There is a small abandoned limestone quarry west of the site. Soils are deep, moderately well-drained upland soils developed in loess and glacial till. This site is owned by The Nature Conservancy and managed by TNC and the Missouri Department of Natural Resources.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTWRT12120*007*MO	CEGL002134	Central Midwest White Oak - Mixed Oak Woodland	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	Medium	High
Housing & Urban Areas	High	High	High	High	High
Invasive Non-Native/Alien Species	High	High	High	Medium	High
Fire & Fire Suppression	Medium	Very High	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

151 SITE Tucker Prairie MO

Description

Tucker Prairie is a flat, upland tallgrass prairie surrounded on three sides by cropland. Interstate 70 runs along the north boundary. The soil is derived from loess overlaying glacial till at the southern edge of continental glaciation. The site lies at the southern edge of the ecoregion. Cedar, elm and hawthorn trees have invaded the prairie along some of the small drainage thickets. The prairie is dominated by prairie grasses such as big bluestem, little bluestem and Indian grass, with switchgrass and slough grass occurring in the wetter areas. Tucker Prairie is owned by the University of Missouri; there is an active biological research and field station on the site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTPZH14700*001*MO	CEGL002249	Little Bluestem Hardpan Prairie	B
Bird				
Unknown	ABPBXA0030*006*MO	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	High	High	Medium	High
Invasive Non-Native/Alien Species	High	Very High	High	Low	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Restore and maintain natural fire regimes

156 SITE Van Meter Marsh MO

Description

Van Meter Marsh is a wetland complex approximately 200 acres in size, consisting of freshwater marsh, shrub swamp, wet bottomland forest and several small calcareous seeps in the floodplain of the Missouri River. The marsh is bordered by mesic forest and dry-mesic forest. It supports several species listed in Missouri, including a pond snail, star duckweed, and tufted loosestrife. Ecological management consisting of hydrologic manipulation and prescribed burning has improved the integrity of the communities. The area is owned and managed by the Missouri Department of Natural Resources.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFMT11120*023*MO	CEGL002058	White Oak - Red Oak – Sugar Maple Mesic Forest	BC
Confirmed	CTFRT11110*004*MO	CEGL002068	Midwestern White Oak – Red Oak Forest	BC
Confirmed	CTEZZ18110*029*MO	CEGL002430	Midwest Ephemeral Pond	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	High	High	High	High
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants

158 SITE Peace Wildlife Sanctuary MO

Description

The limestone bluff and talus community along Bear Creek is dominated by arrow-wood, blue beech and wild hydrangea. Few contiguous forest tracts of this size exist in the surrounding fragmented region. The community is surrounded by a diverse landscape with large areas of native woodland vegetation and has extensive frontage along the Cuivre River. The site also encompasses the headwaters of a large permanent stream, Bear Creek. The floodplains associated with the Cuivre River and Bear Creek are moderately degraded. Upland woodlands dominate much of the area and have the typical species assemblage of well-drained soils, including white oak, black oak, slippery elm and black cherry. Some small limestone glades occur on south- and west-facing side slopes; these are largely overgrown and in need of management. The mesic lower slopes and cove hollows are more floristically diverse. Some of the old fields have grown into brush and a portion of the site is leased by The Nature Conservancy to a local farmer.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	CTCZL16210*002*MO	CEGL002308	Midwest Limestone – Dolostone Talus	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Medium	High	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Restore and maintain natural fire regimes

261 SITE/W Sandstone Glade MO

Description

The sandstone glades and cliffs at the site are highly threatened by the urban expansion of the greater St Louis metropolitan area and remain unprotected.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	CTGZS15400*001*MO	CEGL002242	Ozark Sandstone Glade	BC
Confirmed	CTCMS16122*005*MO	CEGL002287	Midwest Moist Sandstone Cliff	BC

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Medium	High	Medium	Medium	Medium
Recreational Activities	High	High	High	Medium	High
Housing & Urban Areas	High	Medium	Medium	High	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build a constituency for biodiversity conservation
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

262 SITE/W Ranacker Cave MO

Description

This cave has a medium-sized population of Indiana bats. It is a hibernaculum and a summer male roost site. Little is known about this privately owned site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Mammal				
Possible	AMACC01100*068*MO	AMACC01100	Myotis sodalis / Indiana Bat	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Recreational Activities	Medium	Medium	Medium	High	Medium

Overall Threat Rank: LOW

Strategic Actions

- Build a constituency for biodiversity conservation
- Acquire lands, easements and leases to protect biodiversity

263 SITE DuPont Bluffs MO

Description

DuPont Bluffs occurs in some of the most rugged hills along the Mississippi River with good examples of calcareous cliff and talus communities and dry-mesic oak forest and woodlands. The area is part of a larger floodplain and bluff complex of protected areas. More inventory of biota on this site will likely yield other communities of importance.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTFMT11120*013*MO	CEGL002058	White Oak - Red Oak – Sugar Maple Mesic Forest	A
Confirmed	CTFMT11120*026*MO	CEGL002058	White Oak - Red Oak – Sugar Maple Mesic Forest	BC
Confirmed	CTFRC11310*006*MO	CEGL002066	White Oak / Dogwood Dry-mesic Forest	BC
Omitted	CTFRT11110*012*MO	CEGL002068	Midwestern White Oak – Red Oak Forest	BC
Confirmed	CTGZM15100*065*MO	CEGL005131	Central Limestone Glade	BC

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Medium	High	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Restore and maintain natural fire regimes

264 SITE/W White Bear Cave MO

Description

White Bear Cave is an old rock quarry mine that has a small population of Indiana bats. It is a hibernaculum and a summer male roost site. Little is known about this privately owned site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Mammal				
Possible	AMACC01100*060*MO	AMACC01100	Myotis sodalis / Indiana Bat	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Low	Medium	Low	Medium	Low
Recreational Activities	Medium	Medium	Medium	High	Medium

Overall Threat Rank: LOW

Strategic Actions

- Build a constituency for biodiversity conservation
- Acquire lands, easements and leases to protect biodiversity

265 SITE Frost Island MO

Description

Frost Island is located at the point where the Des Moines River joins the Mississippi River alluvial floodplain. The yellow mud turtle and Blanding's turtle are residents of the area. The area remains unleveed, allowing dynamic fluvial processes to regenerate riparian sand flats and other floodplain communities.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Reptile				
Confirmed	ARAAE01022*005*MO	ARAAE01022	Kinosternon flavescens / Yellow Mud Turtle	C
Confirmed	ARAAE01022*006*MO	ARAAE01022	Kinosternon flavescens / Yellow Mud Turtle	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	High	High	Medium	High
Annual & Perennial Non-Timber Crops	Medium	High	Medium	High	Medium

Overall Threat Rank:

Strategic Actions

- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

266 SITE Sterling Bottom MO

Description

An example of the formerly widespread Bur Oak – Swamp White Oak Mixed Bottomland Forest is found at Sterling Bottom along the Fox River. Few examples of this bottomland

forest now remain. Sterling Bottom is part of a larger 2,000-acre bottomland forest block and is in a landscape that retains high ecological integrity. More inventory of biota on this site will likely yield other communities of importance.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CTFEB11730*028*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	C
Vascular Plant				
Confirmed	PDSCR0F043*021*MO	PDSCR0F043	Chelone obliqua var. speciosa / Rose Turtlehead	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Medium	Medium	High	Medium
Logging & Wood Harvesting	Medium	Medium	Medium	Very High	High
Livestock Farming & Ranching	Medium	Very High	Medium	Low	Low

Overall Threat Rank: MEDIUM

Strategic Actions

- Acquire lands, easements and leases to protect biodiversity
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity from logging and wood harvesting

267 SITE/RES Two Rivers MO

Description

This conservation area encompasses a large area of bottomland in the Mississippi River alluvial floodplain. It includes the confluence of the Honey Creek with the Fox River; the lower mainstem of Fox River remains unchannelized. The area sustains breeding populations of two declining and vulnerable turtle species, the yellow mud turtle and Blanding's turtle. The area also contains wet prairie and marsh as well as interior floodplain forest.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Reptile				
Confirmed	ARAAE01022*002*MO	ARAAE01022	Kinosternon flavescens / Yellow Mud Turtle	C

Threats

Threat	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	Medium	High
Dams & Water Management/Use	High	High	High	Medium	High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology

- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

268 SITE Rocky Hollow MO

Description

Rocky Hollow is a small-scale site containing high-quality examples of small-patch communities, including sandstone dry cliff and dry-mesic acid forest.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	CTCDS16121*011*MO	CEGL002045	Midwest Dry Sandstone Cliff	BC
Confirmed	CTWDS12410*009*MO	CEGL002067	White Oak - Red Oak Dry-Mesic Acid Forest	BC

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Restore and maintain natural fire regimes

269 SITE Bunch Hollow MO

Description

Bunch Hollow is located within a larger landscape of good connectivity and little threat from development. The site contains example of communities that formerly dominated the central till plain, namely dry-mesic prairie and white oak-mixed oak woodland.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	CTWRT12120*009*MO	CEGL002134	Central Midwest White Oak - Mixed Oak Woodland	B
Unknown	CTPRT14120*029*MO	CEGL002214	Midwest Dry-Mesic Prairie	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	High	High	Medium	High
Invasive Non-Native/Alien Species	High	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural fire regimes

270 SITE Squaw Creek MO

Description

Squaw Creek National Wildlife Refuge is located in northwestern Missouri within the historic Missouri River floodplain. The 7,350-acre refuge was established in 1935 as a resting, feeding, and breeding ground for migratory birds and other wildlife. Wetland-

dependent reptiles and communities such as wet prairies and ephemeral ponds are common.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CTPWB14820*002*MO	CEGL002027	Northern Cordgrass Wet Prairie	C
Confirmed	CTEZZ18110*033*MO	CEGL002430	Midwest Ephemeral Pond	C
Reptile				
Confirmed	ARADE03011*014*MO	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	A

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	High	High	Medium	High
Fire & Fire Suppression	Medium	High	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes

271 SITE/W Plattsburg Prairie MO

Description

Plattsburg Prairie is a small-scale site containing an example of the matrix-forming mesic prairie once common to the region. The site remains unprotected. It is located in an area with good ecological integrity. Grassland birds and obligate prairie insects are regularly seen.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CTPMT14130*008*MO	CEGL002203	Central Mesic Tallgrass Prairie	C
Bird				
Unknown	ABPBXA0030*082*MO	ABPBXA0030	Ammodramus henslowii / Henslow's Sparrow	U
Insect				
Unknown	IILEPJ6040*085*MO	IILEPJ6040	Speyeria idalia / Regal Fritillary	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	Medium	High	Medium	Medium	Medium
Invasive Non-Native/Alien Species	High	Medium	Medium	Medium	Medium
Housing & Urban Areas	High	Very High	High	Very High	Very High

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

272 SITE Salisbury Bottoms MO

Description

This unprotected conservation area supports quality bottomland forest and wetland communities. The altered hydrology of the East and Middle Forks of the Chariton River threaten the integrity of this suite of bottomland natural communities.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFEB11730*042*MO	CEGL002100	Pin Oak - Swamp White Oak Sand Flatwoods	B
Confirmed	CTEZZ18120*001*MO	CEGL002190	Northern Buttonbush Swamp	B
Unknown	CTEZZ18110*007*MO	CEGL002430	Midwest Ephemeral Pond	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	High	High
Dams & Water Management/Use	Medium	High	Medium	High	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build a constituency for biodiversity conservation
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

273 SITE/RES Nehai Tonkayea Prairie MO

Description

Nehai Tonkayea Prairie is a small-scale site containing good examples of white oak-mixed oak woodland and dry-mesic prairie. The site is unprotected. Opportunities exist to the east to expand the site. Lack of fire and invasive weeds threatens the integrity of the prairie.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTSRT13110*003*MO	CEGL002134	Central Midwest White Oak - Mixed Oak Woodland	B
Confirmed	CTPRT14120*003*MO	CEGL002214	Midwest Dry-Mesic Prairie	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	High	High	Medium	High
Invasive Non-Native/Alien Species	High	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Restore and maintain natural fire regimes

274 SITE/W Hidden Hollow MO

Description

The area is located in the transition zone between the Chariton River alluvial plain and the associated wooded hills. It contains examples of mesic forest that formerly studded the side slopes of the Chariton River valley. The area is located near multiple large blocks of timber.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFMB11720*002*MO	CEGL005035	Maple - Hickory Mesic Floodplain Forest	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Livestock Farming & Ranching	High	High	High	Medium	High
Fire & Fire Suppression	High	High	High	Medium	High
Logging & Wood Harvesting	Medium	Low	Low	Very High	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Enhance incentives for conservation of biodiversity on private lands
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from logging and wood harvesting

275 LAND Union Ridge MO

Description

Centered around the Union Ridge Conservation Area (owned and managed by the Missouri Department of Conservation), this area provides an opportunity to restore a mosaic of large-patch communites. Both dry-mesic and mesic forest communities are found here, as well as numerous examples of upland and bottomland prairie communities. Pastures dominate the surrounding landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CTFMT11120*004*MO	CEGL002058	White Oak - Red Oak – Sugar Maple Mesic Forest	B
Confirmed	CTFRT11110*005*MO	CEGL002068	Midwestern White Oak – Red Oak Forest	B
Confirmed	CTWDT12110*001*MO	CEGL002150	White Oak - Post Oak / Bluestem Ozark Woodland	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: LOW

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural fire regimes

NEBRASKA

4 LAND Bazile Creek Uplands NE

Description

This site borders the bluffs and breaks of Bazile Creek and the Missouri River and portions of the floodplains. This stretch of the Missouri River is now part of Lewis and Clark Lake. The bluffs are steep and most were historically covered in prairie, with woodlands present on steep north- and east-facing slopes and in the floodplains. Cropland and former crop fields are fairly common. Much of the remaining native prairie has been invaded by red cedar and exotic cool-season grasses. Woodlands have become more extensive in recent years because of the spread of red cedar. Most of the natural woodlands are bur oak-dominated, second-growth stands which are now infested with red cedar. The floodplain along Bazile Creek is dominated by cottonwoods. The Nature Conservancy is partnering in limited efforts to conserve this landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002012*014*NE	CEGL002012	Basswood - Bur Oak Forest	U
Confirmed	CEGL002025*277*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Confirmed	CEGL002025*278*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Confirmed	CEGL002025*279*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002053*009*NE	CEGL002053	Western Tallgrass Bur Oak Woodland	C
Confirmed	CES303.659*N115*NE	CES303.659	Central Mixed-grass Prairie	B
Bird				
Confirmed	ABNLC13010*N110*NE	ABNLC13010	Tympanuchus cupido / Greater Prairie-chicken	B
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Medium	Low	Low	Very High	Medium
Annual & Perennial Non-Timber Crops	High	Medium	Medium	High	Medium
Livestock Farming & Ranching	High	High	High	Medium	High
Renewable Energy	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	Medium	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	High	Very High
Air-Borne Pollutants	Low	High	Low	High	Low
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Work in partnership with indigenous peoples to conserve biodiversity on communal lands

41 SITE Gifford Point NE

Description

Gifford Point occupies a bend in the channelized Missouri River just south of Omaha. The majority of Gifford Point is floodplain forest dominated by cottonwoods and young green ash. Most of this is fairly young forest which has developed since the channelization of the river. The site also contains about 400 acres of cropland. The site is used as an educational farm by the city of Omaha and is bordered by blufflands owned by Fontenelle Nature Association.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002018*001*NE	CEGL002018	Midwestern Cottonwood – Black Willow Forest	C
Bird				
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Very High	Very High	Very High	High	Very High
Fire & Fire Suppression	High	High	High	High	High
Problematic Native Species	Medium	Medium	Medium	High	Medium
Invasive Non-Native/Alien Species	High	High	High	High	High
Housing & Urban Areas	Medium	Low	Low	Very High	Medium
Recreational Activities	Medium	Medium	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes

64 SITE Lancaster Saline Wetlands NE

Description

This landscape includes the saline wetlands that occur in the floodplains of Salt Creek, Little Salt Creek and Rock Creek and surrounding uplands. The wetlands' salinity is derived from deeply buried salts brought to the soil surface through artesian groundwater flow. The marsh vegetation is dominated by salt-tolerant species such as saltgrass, seablite, and saltwort. The majority of the uplands surrounding the marshes are in cropland, though there are a few tallgrass prairie remnants. Commercial and residential development is common in the landscape. The Nature Conservancy owns land and is active in multiple conservation efforts in this landscape

This landscape is significant because it contains the only remaining example of this type of saline wetland in the state of Nebraska. Over 90% of the original saline wetlands within this landscape have been lost or highly degraded. The most viable remaining marshes occur in two core areas in the upper reaches of the Little Salt Creek valley near Raymond and the Rock Creek valley near Ceresco. The Little Salt Creek wetlands contain the world's only known populations of the Salt Creek tiger beetle. This species is state-endangered and proposed for federal listing. Several protected areas are located within this landscape, including Arbor Lake WMA, Little Salt Creek WMA, Jack Sinn WMA, the City of Lincoln's Shoemaker Marsh, Anderson Tract, and King Tract, the Lower Platte South NRD's Lincoln Saline Wetland Nature Center and Warner Wetland, and The Nature Conservancy's Little Salt Fork Marsh.

The Saline Wetlands Conservation Partnership has developed the "Implementation Plan for the Conservation of Nebraska's Eastern Wetlands." The plan's goal is "no net loss of saline wetlands and their associated functions with a long-term gain in sustaining wetland functions through the restoration of hydrology, prescribed wetland management, and watershed protection." The plan has identified three categories of saline wetlands with Category 1 wetlands being the highest quality.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002043*006*NE	CEGL002043	Eastern Great Plains Saline Marsh	C
Unknown	CEGL002043*007*NE	CEGL002043	Eastern Great Plains Saline Marsh	U
Confirmed	CEGL002043*009*NE	CEGL002043	Eastern Great Plains Saline Marsh	C
Confirmed	CEGL002043*010*NE	CEGL002043	Eastern Great Plains Saline Marsh	B
Confirmed	CEGL002043*011*NE	CEGL002043	Eastern Great Plains Saline Marsh	C
Unknown	CEGL002043*012*NE	CEGL002043	Eastern Great Plains Saline Marsh	U
Unknown	CEGL002043*014*NE	CEGL002043	Eastern Great Plains Saline Marsh	U
Confirmed	CEGL002043*015*NE	CEGL002043	Eastern Great Plains Saline Marsh	B
Confirmed	CEGL002043*016*NE	CEGL002043	Eastern Great Plains Saline Marsh	C
Confirmed	CEGL002043*017*NE	CEGL002043	Eastern Great Plains Saline Marsh	C
Confirmed	CEGL002043*020*NE	CEGL002043	Eastern Great Plains Saline Marsh	C
Insect				
Unknown	IICOL02173*002*NE	IICOL02173	Cicindela nevadica lincolniana / Salt Creek Tiger Beetle	U
Unknown	IICOL02173*003*NE	IICOL02173	Cicindela nevadica lincolniana / Salt Creek Tiger Beetle	U
Confirmed	IICOL02173*004*NE	IICOL02173	Cicindela nevadica lincolniana / Salt Creek Tiger Beetle	C
Omitted	IICOL02173*005*NE	IICOL02173	Cicindela nevadica lincolniana / Salt Creek Tiger Beetle	D
Confirmed	IICOL02173*006*NE	IICOL02173	Cicindela nevadica lincolniana / Salt Creek Tiger Beetle	C
Unknown	IICOL02173*007*NE	IICOL02173	Cicindela nevadica lincolniana / Salt Creek Tiger Beetle	U
Unknown	IICOL02173*008*NE	IICOL02173	Cicindela nevadica lincolniana / Salt Creek Tiger Beetle	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Very High	High	High	Very High	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	High	High	High	High	High
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	High	Medium
Fire & Fire Suppression	Medium	Medium	Medium	Medium	Medium
Commercial & Industrial Areas	Very High	High	High	Very High	Very High
Livestock Farming & Ranching	High	High	High	Medium	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to improve corporate practices that enhance conservation of biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

93 LAND Indian Cave Bluffs NE

Description

This landscape includes the steep bluffs of the Missouri River in Nemaha and Richardson Counties. Due to its location in southeastern Nebraska, the majority of the bluffs support an eastern deciduous forest of oaks, hickories and basswood, as well as other eastern plant and animal species. Tallgrass prairie remnants are still found on some bluff tops and south- and west-facing slopes. These have been greatly reduced in size and degraded over the years by shrub and tree encroachment resulting from the lack of fire. Indian Cave State Park is the only protected area in the landscape. The Nature Conservancy is working with partners in a limited capacity in this landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL000658*004*NE	CEGL000658	Cottonwood - Green Ash Floodplain Forest	U
Unknown	CEGL000658*012*NE	CEGL000658	Cottonwood - Green Ash Floodplain Forest	U
Confirmed	CEGL002011*017*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*018*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*021*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*022*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*023*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*026*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*027*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*028*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*029*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*042*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*043*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*044*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*045*NE	CEGL002011	White Oak - Hickory Forest	B
Unknown	CEGL002025*101*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*154*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL005272*003*NE	CEGL005272	Central Midwest Sedge Meadow	U

Bird

Confirmed	ABPBW01110*N01*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Logging & Wood Harvesting	High	Medium	Medium	High	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from logging and wood harvesting

96 SITE/W Nine-Mile Prairie NE

Description

This tallgrass prairie occurs on rolling loess hills just west of Lincoln, Nebraska. It contains many woody ravines and is bordered by cropland, grazed pasture, and an old munitions plant. The site is owned by the University of Nebraska Foundation and is protected as a conservation and research site. The site is managed primarily for research purposes and its biological diversity has suffered because of lack of active management. The Nature Conservancy is working with partners on limited conservation efforts at this site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002025*018*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Vascular Plant				
Confirmed	PMORC1Y0S0*001*NE	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Fire & Fire Suppression	High	High	High	Medium	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	High	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Commercial & Industrial Areas	Very High	Very High	Very High	Very High	Very High
Problematic Native Species	Very High	Very High	Very High	High	Very High
Air-Borne Pollutants	Low	High	Low	High	Low

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

101 SITE Otoe Creek Prairie NE

Description

This site is located in the floodplain of the Platte River. The site is a 120-acre wet-mesic prairie located near other grazed native meadows on adjacent sites.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL000658*014*NE	CEGL000658	Cottonwood - Green Ash Floodplain Forest	U
Unknown	CEGL002014*007*NE	CEGL002014	Central Green Ash - Elm - Hackberry Forest	U
Unknown	CEGL002018*003*NE	CEGL002018	Midwestern Cottonwood – Black Willow Forest	U
Confirmed	CEGL002024*N117*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	B
Confirmed	CEGL002049*007*NE	CEGL002049	Riverine Sand Flat	B
Bird				
Possible	ABNNB03070*P02*NE	ABNNB03070	Charadrius melodus / Piping Plover	C
Possible	ABNNM08102*P02*NE	ABNNM08102	Sternula antillarum athalassos / Interior Least Tern	C
Confirmed	ABPBW01110*N06*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Insect				
Omitted	IILEPJ6040*N112*NE	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Reptile				
Omitted	ARADE03011*N105*NE	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	High	Low	Low	Very High	Medium
Annual & Perennial Non-Timber Crops	High	Medium	Medium	Medium	Medium
Livestock Farming & Ranching	High	High	High	Medium	High
Renewable Energy	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	Medium	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	High	Very High
Air-Borne Pollutants	Low	High	Low	High	Low
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Enhance incentives for conservation of biodiversity on private lands
- Secure increased public funding for biodiversity conservation

111 LAND Ponca Bluffs NE

Description

This landscape includes the steep bluffs along the unchannelized Missouri River in Dakota, Dixon, and Cedar Counties. This reach of the Missouri River has been designated as a National Recreational River. The majority of the bluffs support eastern deciduous forest dominated by bur oak, basswood and ironwood. Remnants of tallgrass prairie and loess bluff prairie are scattered on the bluffs. Cropland is scattered throughout the landscape on the more rolling hills. Ponca State Park is the largest protected area in the landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002025*005*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*304*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002035*006*NE	CEGL002035	Loess Hills Little Bluestem Dry Prairie	U
Unknown	CEGL002035*007*NE	CEGL002035	Loess Hills Little Bluestem Dry Prairie	U
Unknown	CEGL002035*008*NE	CEGL002035	Loess Hills Little Bluestem Dry Prairie	U
Confirmed	CEGL002049*N01*NE	CEGL002049	Riverine Sand Flat	C
Unknown	CEGL002072*004*NE	CEGL002072	Northern Bur Oak Mesic Forest	U
Unknown	CEGL002072*016*NE	CEGL002072	Northern Bur Oak Mesic Forest	U
Bird				
Confirmed	ABNNB03070*P01*NE/	ABNNB03070	Charadrius melodus / Piping Plover	B
Confirmed	ABNNM08102*P01*NE/	ABNNM08102	Sternula antillarum athalassos / Interior Least Tern	B
Confirmed	ABPBW01110*N02*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Logging & Wood Harvesting	High	Medium	Medium	High	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Medium	Medium	Medium	High	Medium

Overall Threat Rank: VERY HIGH

Strategic Actions

- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from logging and wood harvesting

115 SITE Madison County Meadows NE

Description

The Madison County Meadows site is a small landscape of rolling meadow in northeastern Nebraska that are a combination of wet swales and drier ridges. Prairie cordgrass, bluejoint and sedge are typically the dominant species in the meadows. All meadows of known biological significance are privately owned; haying, grazing, and herbicide application are normal practices.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002023*015*NE	CEGL002023	Sandhills Wet-Mesic Prairie	U
Confirmed	CEGL002027*N116*NE	CEGL002027	Northern Cordgrass Wet Prairie	B
Unknown	CEGL002028*035*NE	CEGL002028	Sandhills Wet Prairie	U
Unknown	CEGL001699*113*NE	CEGL002037	Needle-and-Thread – Blue Grama Mixedgrass Prairie	U
Unknown	CEGL001699*114*NE	CEGL002037	Needle-and-Thread – Blue Grama Mixedgrass Prairie	U
Unknown	CEGL001699*117*NE	CEGL002037	Needle-and-Thread – Blue Grama Mixedgrass Prairie	U
Vascular Plant				
Unknown	PMORC1Y0S0*074*NE	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	C
Unknown	PMORC1Y0S0*075*NE	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	C
Unknown	PMORC1Y0S0*076*NE	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	Medium	Low	Low	Very High	Medium
Annual & Perennial Non-Timber Crops	High	Medium	Medium	High	Medium
Livestock Farming & Ranching	High	High	High	Medium	High
Renewable Energy	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	Medium	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	High	Very High
Air-Borne Pollutants	Low	High	Low	High	Low
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Enhance incentives for conservation of biodiversity on private lands
- Secure increased public funding for biodiversity conservation

122 LAND Rose Creek Prairies NE

Description

This landscape includes the bluffs and breaks along the Little Blue River and Rose Creek in Jefferson and Thayer Counties. The soils in some parts of the area are shallow and derived from sandstone, which has limited agricultural development in many areas. Large blocks of native tallgrass prairie still remain. These prairies are often interspersed with cropland. Most of the prairies have been overgrazed and invaded by eastern red cedar and invasive deciduous trees. Bur oak woodlands occur in many of the drainage bottoms. Prairie fens occur occasionally in canyon bottoms and on side slopes.

The landscape contains some of the last remaining populations of massasaugas and timber rattlesnakes in the state. Even though many of the prairies are degraded, the large size of the prairie remnants makes this area unique and provides an opportunity for landscape-scale tallgrass prairie conservation. The largest protected areas in the landscape include Rock Glen WMA, Rose Creek WMA, and Rock Creek Station State Historical Park.

The Nature Conservancy is partnering in various activities in this landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002033*009*NE	CEGL002033	Great Plains Neutral Seep	U
Confirmed	CEGL002052*002*NE	CEGL002052	Western Tallgrass Bur Oak Mesic Woodland	C
Confirmed	CEGL002053*001*NE	CEGL002053	Western Tallgrass Bur Oak Woodland	C
Bird				
Confirmed	ABNLC13010*N108*NE	ABNLC13010	Tympanuchus cupido / Greater Prairie-chicken	B
Confirmed	ABPBW01110*N03*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Reptile				
Omitted	ARADE03011*N106*NE	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Medium	Medium	High	Medium
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Low	Low	Very High	Medium
Invasive Non-Native/Alien Species	Very High	Very High	Very High	High	Very High
Livestock Farming & Ranching	High	High	High	Medium	High
Renewable Energy	Medium	Medium	Medium	Very High	High
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

164 LAND Thurston-Dakota Bluffs NE

Description

This landscape includes the steep bluffs and floodplain of the Missouri River in Thurston and Burt Counties in north-central Nebraska. The majority of the bluffs support eastern deciduous forest of bur oak, basswood and ironwood. The Missouri River floodplain contains some of the last remnants of cottonwood-dominated floodplain forest and wet meadows, although the meadows are somewhat degraded. The majority of the landscape lies within the Omaha and Winnebago Indian reservations. It is the largest intact deciduous forest in the state. There are primitive roads through the forest on the reservations and many scattered houses. Much of the forest on the reservations is divided into small ownership tracts with multiple owners, creating challenges for identifying and coordinating conservation activities.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Confirmed	CEGL000658*011*NE	CEGL000658	Cottonwood - Green Ash Floodplain Forest	B
Confirmed	CEGL002011*015*NE	CEGL002011	White Oak - Hickory Forest	B
Unknown	CEGL002011*016*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002014*013*NE	CEGL002014	Central Green Ash - Elm -Hackberry Forest	U

Unknown	CEGL002018*007*NE	CEGL002018	Midwestern Cottonwood – Black Willow Forest	U
Unknown	CEGL002025*133*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002061*001*NE	CEGL002061	Central Maple - Basswood Forest	U
Unknown	CEGL002229*013*NE	CEGL002229	Midwest Mixed Emergent Deep Marsh	U
Unknown	CEGL002229*014*NE	CEGL002229	Midwest Mixed Emergent Deep Marsh	U
Unknown	CEGL005272*001*NE	CEGL005272	Central Midwest Sedge Meadow	U
Bird				
Confirmed	ABPBW01110*N05*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Enhance incentives for conservation of biodiversity on private lands
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threats to biodiversity from logging and wood harvesting

251 SITE/REST Otoe County East Prairie NE

Description

Three good-quality, privately owned prairies are located within a mile of each other in this site. Each contains good plant diversity and at least one also contains a population of western prairie white-fringed orchid. The surrounding landscape is largely cropland and includes some degraded, but unplowed, prairie as well.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002025*070*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*071*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*073*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Species				
Unknown	PMORC1Y0S0*036*NE	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	U
Unknown	PMORC1Y0S0*037*NE	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

252 SITE/REST Otoe County West Prairies NE

Description

Otoe County West Prairies have three high-quality prairie remnants between 10 and 15 acres in size. All three have good plant diversity, and one, Dieken Prairie, is protected by the local Wachiska Audubon Society. There are more than 6 square miles of relatively contiguous grassland, most of it unplowed but degraded, spread across the portfolio site.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002025*064*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*063*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*062*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Vascular Plant				
Omitted	PMORC1Y0S0*031*NE	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

253 SITE/REST Madigan Prairies NE

Description

Madigan Prairie is a 20-acre hay meadow owned by the University of Nebraska that is currently used solely for annual haying. Although small, it is one of the highest-quality prairies in eastern Nebraska and includes both upland and lowland prairie communities with excellent forb diversity. There are a number of unplowed but degraded prairies in the surrounding landscape, as well as woodlands and a small stream.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Possible	CEGL002025*099*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Unknown	CEGL002053*004*NE	CEGL002053	Western Tallgrass Bur Oak Woodland	U
Unknown	CEGL002072*019*NE	CEGL002072	Northern Bur Oak Mesic Forest	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

254 SITE/REST Saline County East Prairies NE

Description

The Saline County East Prairies are anchored by one high-quality, privately owned prairie approximately 20 acres in size. It is a sloping prairie dominated by a diverse mix of upland tallgrass prairie plants with prairie cordgrass and sedges in the lower portions. The landscape around it is a mixture of cropfield, degraded but unplowed prairie, and a few wooded areas.

Target Occurrences

Portfolio Status Natural Community	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Possible	CEGL002025*066*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

255 LAND/RES Rainwater Basin NE

Description

The Rainwater Basin landscape occupies parts of 17 counties in south-central Nebraska. The topography is flat to gently rolling loess plain. The surface water drainage is poorly developed and many watersheds drain into low-lying wetlands. Soil survey maps from the early 1900s indicate that approximately 4,000 larger wetlands totaling nearly 100,000 acres were found in the area prior to Euro-American settlement. By the beginning of the twentieth century, most upland areas had been converted to cropland. A 1983 survey indicated that only 10 percent of the original wetlands had not been drained or filled. Nearly all remaining Rainwater Basin wetlands have been farmed at some time in the last century.

The Rainwater Basin wetlands have been identified by the North American Waterfowl Management Plan as a waterfowl habitat area of major concern in North America. The Basins are a focal point of a spring migration corridor used annually by millions of ducks, geese, and shorebirds. In addition, the wetlands provide important migratory stopover

habitat for whooping cranes, bald eagles, and other bird species. It is estimated that nearly the entire North American population of buff-breasted sandpipers stage in the eastern Rainwater Basins during their spring migration. These wetlands are also important breeding sites for amphibians.

The Nature Conservancy is active in multiple conservation efforts in this landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Confirmed	CEGL002026*017*NE	CEGL002026	Bulrush - Cattail - Bur-reed Shallow Marsh	B
Confirmed	CEGL002026*018*NE	CEGL002026	Bulrush - Cattail - Bur-reed Shallow Marsh	U
Confirmed	CEGL002026*020*NE	CEGL002026	Bulrush - Cattail - Bur-reed Shallow Marsh	B
Confirmed	CEGL002026*031*NE	CEGL002026	Bulrush - Cattail - Bur-reed Shallow Marsh	B
Confirmed	CEGL002026*036*NE	CEGL002026	Bulrush - Cattail - Bur-reed Shallow Marsh	U
Confirmed	CEGL002026*037*NE	CEGL002026	Bulrush - Cattail - Bur-reed Shallow Marsh	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	Very High	Very High	Very High	High	Very High
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Medium	Medium
Invasive Non-Native/Alien Species	High	High	High	High	High
Fire & Fire Suppression	High	High	High	Medium	High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Problematic Native Species	High	High	High	High	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Restore and maintain natural fire regimes
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

256 LAND Lower Platte River Corridor NE

Description

This landscape includes the Platte River channel and its floodplain from the river's confluence with the Loup River in Platte County eastward to its mouth in Sarpy County.

The lower Platte River is a mid-size, shallow, braided river. Sandbars and wooded islands are common within the channel. Much of the stream bank is wooded with the dominant species being cottonwood and eastern red cedar. Sand pits are common along the river and in many areas the riverbank is lined with cabins. Most of the river floodplain is now cropland, though there are scattered wet meadows and marshes.

The lower Platte River receives water from the Loup and Elkhorn Rivers and has a more stable flow than the central Platte River. The lower Platte River is unique in that its sandbars support numerous colonies of the federally and state-listed piping plover and interior least tern. The construction of dikes and levees has constricted the natural channel and eliminated or isolated most of the floodplain sloughs, backwaters and wetlands. The narrowing of the channel has resulted in higher flow stages after heavy rain events that wash away tern and plover nests. The lower Platte also supports many rare large river fish including the lake sturgeon, blue sucker, sturgeon chub, and pallid sturgeon. Protected areas along this reach of the Platte River include Two Rivers SRA, Louisville SRA, Platte River State Park, and Mahoney State Park.

In 2007, The Nature Conservancy began a Platte River Program located in Cozad, Nebraska after a long history of concentrating on conservation issues on the Platte River in central Nebraska. TNC's activity on the Lower Platte should increase as the program progresses.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL000658*007*NE	CEGL000658	Cottonwood - Green Ash Floodplain Forest	U
Unknown	CEGL000658*013*NE	CEGL000658	Cottonwood - Green Ash Floodplain Forest	U
Unknown	CEGL002011*024*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002011*031*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002011*032*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002012*008*NE	CEGL002012	Basswood - Bur Oak Forest	U
Unknown	CEGL002024*003*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*037*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*038*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*039*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*040*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*041*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*044*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*048*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*049*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*051*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002024*065*NE	CEGL002024	Central Wet-mesic Tallgrass Prairie	U
Unknown	CEGL002025*150*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*151*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*152*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*188*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*189*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*256*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*261*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002027*029*NE	CEGL002027	Northern Cordgrass Wet Prairie	U
Unknown	CEGL002027*030*NE	CEGL002027	Northern Cordgrass Wet Prairie	U
Unknown	CEGL002027*036*NE	CEGL002027	Northern Cordgrass Wet Prairie	U
Unknown	CEGL002035*001*NE	CEGL002035	Loess Hills Little Bluestem Dry Prairie	U
Confirmed	CEGL002049*N02*NE	CEGL002049	Riverine Sand Flat	B
Unknown	CEGL002072*020*NE	CEGL002072	Northern Bur Oak Mesic Forest	U
Bird				
Possible	ABNNB03070*P02*NE	ABNNB03070	Charadrius melodus / Piping Plover	C
Possible	ABNNM08102*P02*NE	ABNNM08102	Sternula antillarum athalassos / Interior Least Tern	C
Confirmed	ABPBW01110*N06*NE	BPBW01110	Vireo bellii / Bell's Vireo	C
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Insect				
Omitted	IILEPJ6040*N112*NE	IILEPJ6040	Speyeria idalia / Regal Fritillary	B

Reptile				
Omitted	ARADE03011*N105*NE	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	C
Vascular Plant				
Unknown	PMORC1Y0S0*011*NE	PMORC1Y0S0	Platanthera praeclara / Western Prairie White-fringed Orchid	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: HIGH

Strategic Actions

- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development
- Reduce and mitigate for the threats to biodiversity from energy and mining impacts

276 SITE/REST Johnson County North Prairies NE

Description

There are at least twelve confirmed prairies within this portfolio site, five of which are at least B-ranked or better in quality. While cropland dominates the remainder of the 60-square-mile site, there is also considerable acreage of unplowed but degraded native grassland, much of it in large blocks.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Possible	CEGL002025*098*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*046*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*002*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*116*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*121*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*122*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*123*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*119*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*120*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*117*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C
Possible	CEGL002025*118*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

NEBRASKA/KANSAS

22 LAND Rulo Bluffs NE/KS

Description

This landscape includes the steep bluffs of the Missouri River in the far southeast corner of Nebraska. Due to its location in extreme southeastern Nebraska, the majority of the bluffs support an eastern deciduous forest of oaks, hickories and basswood, as well as other eastern plant and animal species. Tallgrass prairie remnants still remain on some bluff tops and south- and west-facing slopes. These have been reduced in size and degraded over the years by shrub and tree encroachment resulting from the lack of fire. Scattered cropland and pastureland occur in the landscape. Some areas of woodland have been farmed or logged in the past. The Nature Conservancy's Rulo Bluffs Preserve is the only permanently protected area in the landscape. The landscape falls partly within the reservation boundary of the Iowa Tribe and they are actively managing tribally owned lands in the landscape for various purposes including wildlife and agriculture.

As mentioned above, The Nature Conservancy owns land and is working with partners and private landowners on management activities focused on biodiversity conservation.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002011*001*KS	CEGL002011	White Oak - Hickory Forest	AB
Confirmed	CEGL002011*001*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*010*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*020*NE	CEGL002011	White Oak - Hickory Forest	B
Confirmed	CEGL002011*034*NE	CEGL002011	White Oak - Hickory Forest	B
Unknown	CEGL002025*091*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Confirmed	CEGL002035*003*NE	CEGL002035	Loess Hills Little Bluestem Dry Prairie	C
Bird				
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Vascular Plant				
Unknown	PDSCR01130*006*KS	PDSCR01130	Agalinis auriculata / Earleaf False Foxglove	U

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	Very High	High
Fire & Fire Suppression	High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	Medium	Medium
Renewable Energy	Medium	Low	Low	Very High	Medium
Problematic Native Species	Very High	Very High	Very High	High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity from logging and wood harvesting
- Work in partnership with indigenous peoples to conserve biodiversity on communal lands

104 LAND/RES Pawnee Prairies NE/KS

Description

This landscape includes the rolling hills of western Richardson, Pawnee, southern Johnson, and southern Gage Counties. The landcover is primarily cropland, but there are also many tallgrass prairie remnants dominated by big bluestem and Indian grass and reseeded native and exotic grasslands. The native prairies are of two types: hay meadows

and grazed pastures. The hay meadows are generally in better ecological condition. The Big Nemaha River drains the eastern portion of the region while the Big Blue River drains the western portion of the region. Eastern deciduous woodlands are found along the bluffs and floodplains of these streams and their tributaries. The larger streams in the area have highly incised stream channels, although several smaller streams, including Wildcat, Turkey, Rock, and Yankee Creeks, are still in good ecological condition.

The abundance of native and restored grasslands in the regions supports a stable population of greater prairie chickens and other grassland birds. Burchard Lake WMA and Pawnee Prairie WMA are the largest protected areas in the landscape. These areas are strongholds for the largest remaining massasauga populations in Nebraska. The Barneston Bluff area in Gage County on the Big Blue River contains rocky woodlands, which support populations of timber rattlesnakes and copperheads.

The Nature Conservancy is partnering in various activities in this landscape.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL002011*002*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002011*003*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002011*004*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002011*007*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002011*013*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002011*014*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002011*019*NE	CEGL002011	White Oak - Hickory Forest	U
Unknown	CEGL002012*009*NE	CEGL002012	Basswood - Bur Oak Forest	U
Unknown	CEGL002041*011*NE	CEGL002041	Central Tallgrass Fen	U
Possible	CEGL002053*005*NE	CEGL002053	Western Tallgrass Bur Oak Woodland	C
Unknown	CEGL002072*001*NE	CEGL002072	Northern Bur Oak Mesic Forest	U
Unknown	CEGL002072*006*NE	CEGL002072	Northern Bur Oak Mesic Forest	U
Unknown	CEGL002072*011*NE	CEGL002072	Northern Bur Oak Mesic Forest	U
Unknown	CEGL002224*001*NE	CEGL002224	Central Cordgrass Wet Prairie	U
Bird				
Confirmed	ABNLC13010*N109*NE	ABNLC13010	Tympanuchus cupido / Greater Prairie-chicken	B
Omitted	ABPBW01110*N04*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Insect				
Confirmed	IILEPJ6040*N113*NE	IILEPJ6040	Speyeria idalia / Regal Fritillary	B
Reptile				
Confirmed	ARADE03011*N107*NE	ARADE03011	Sistrurus catenatus catenatus / Eastern Massasauga	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Agricultural & Forestry Effluents	High	High	High	High	High
Dams & Water Management/Use	Very High	Very High	Very High	High	Very High
Housing & Urban Areas	High	Medium	Medium	Very High	High
Other Ecosystem Modifications	High	Very High	High	High	High
Invasive Non-Native/Alien Species	High	High	High	High	High
Utility & Service Lines	Medium	Low	Low	Very High	Medium

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation

- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural fire regimes
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

NEBRASKA/SOUTH DAKOTA

152 LAND Unchannelized Missouri River Corridor NE/SD

Description

The unchannelized Missouri occupies the stretch of the river below Gavins Point Dam to Sioux City. Much of the river's floodplain is in cropland in this reach. Floodplain woodlands dominated by cottonwoods are common. The river channel itself is wide and meandering with wooded islands and sandbars. Marshes are distributed along the channel. Recreational development (cabins) is common along this stretch of the river.

Target Occurrences

Portfolio Status	HO (EO) Code	GELCODE	NatureServe Common Name	Viability Rank
Natural Community				
Unknown	CEGL000658*005*NE	CEGL000658	Cottonwood - Green Ash Floodplain Forest	U
Unknown	CEGL002025*092*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Unknown	CEGL002025*100*NE	CEGL002025	Central Tallgrass Big Bluestem Loess Prairie	U
Confirmed	CEGL002035*P02*IA	CEGL002035	Loess Hills Little Bluestem Dry Prairie	B
Unknown	CEGL002049*004*NE	CEGL002049	Riverine Sand Flat	U
Confirmed	CEGL002049*N01*NE	CEGL002049	Riverine Sand Flat	C
Confirmed	CEGL002072*009*NE	CEGL002072	Northern Bur Oak Mesic Forest	B
Unknown	CEGL002072*022*NE	CEGL002072	Northern Bur Oak Mesic Forest	U
Unknown	CEGL002229*015*NE	CEGL002229	Midwest Mixed Emergent Deep Marsh	U
Bird				
Confirmed	ABNNB03070*P01*NE/	ABNNB03070	Charadrius melodus / Piping Plover	B
Confirmed	ABNNM08102*P01*NE/	ABNNM08102	Sternula antillarum athalassos / Interior Least Tern	B
Confirmed	ABPBW01110*N02*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C
Confirmed	ABPBW01110*N07*NE	ABPBW01110	Vireo bellii / Bell's Vireo	C

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Agricultural & Forestry Effluents	High	High	High	High	High
Dams & Water Management/Use	Very High	Very High	Very High	High	Very High
Housing & Urban Areas	High	Medium	Medium	Very High	High
Other Ecosystem Modifications	High	Very High	High	High	High
Invasive Non-Native/Alien Species	High	High	High	High	High
Utility & Service Lines	Medium	Low	Low	Very High	Medium

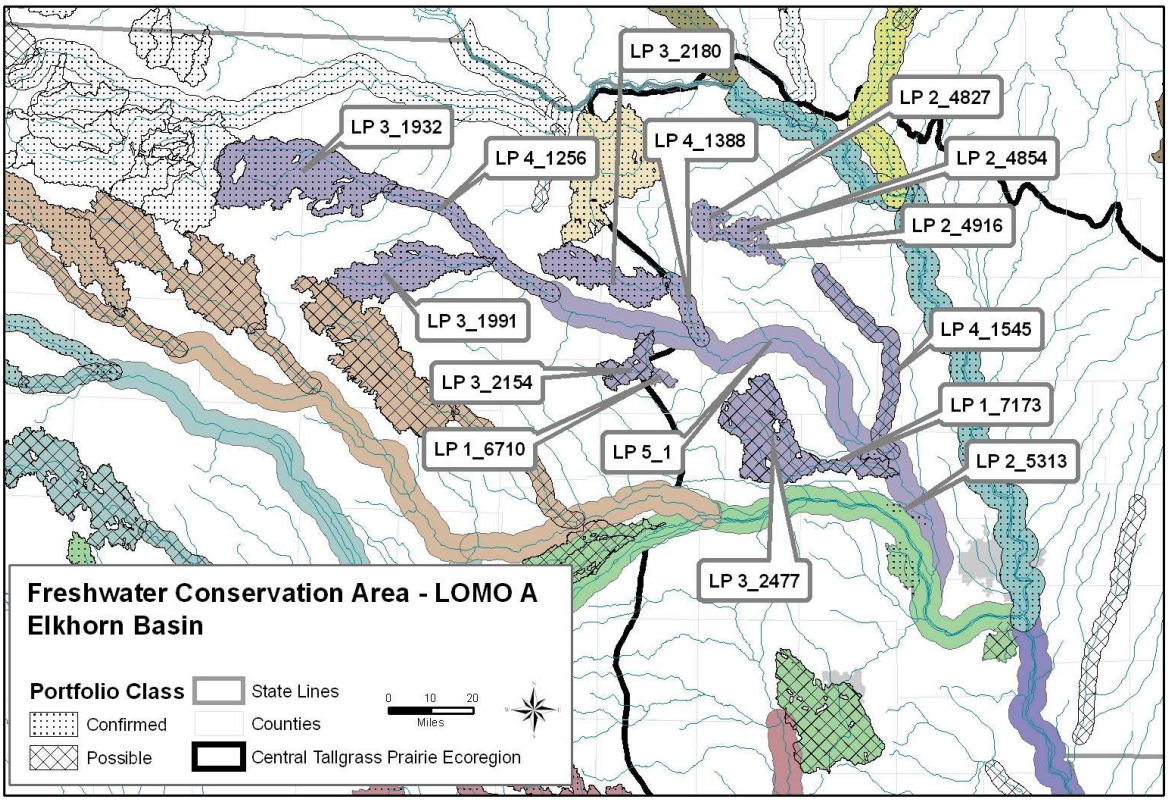
Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development
- Work in partnership with indigenous peoples to conserve biodiversity on communal lands

FRESHWATER PORTFOLIO

LOMO A Elkhorn Basin



Description

The Elkhorn River is located in northeast and north-central Nebraska and flows southeasterly through semiarid to subhumid plains to its confluence with the Platte River near Gretna, Nebraska. Principal land uses in this drainage area of 6,900 square miles are corn and soybean cropland (56 percent) and pasture and rangeland (33 percent). This conservation area straddles the Central Mixed-grass Prairie (CMGP) ecoregion and the CTP, with most of the confirmed parts of the conservation area located in the upper basin, which falls in the CMGP. The stream and river systems regarded as confirmed parts of this portfolio area include the mainstem Elkhorn River; the North and South Fork Elkhorn Rivers and Willow Creek (in the basin headwaters; CMGP); and the lower Elkhorn mainstem and Baker, Dog, and Middle Logan Creeks (in Wayne and Cedar Counties in the central and lower parts of the basin; CTP). In addition, Battle Creek, West Fork Maple Creek and the lower mainstem of Logan Creek (in Burt and Thurston Counties) are considered possible additions to this conservation area; all fall within the CTP. Much of the basin is under severe strain from groundwater withdrawals for center pivot irritation, stream and wetland channelization and ditching, riparian degradation and clearing, and wastes from confined animal operations. EPA studies of the basin during the mid-1990s demonstrated that the Elkhorn River basin contributed the majority of herbicides transported from the Platte River basin (Frenzel and others, 1998). Despite these challenges, numerous reaches support rare fish populations and a diverse invertebrate fauna. The lower Elkhorn River is a reference site for large eastern Nebraska river systems.

The Nature Conservancy is not currently active in freshwater conservation in the Elkhorn River basin.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	TLP 3 - 2	LP 3_2180	Willow Creek	B
Confirmed	TLP 1 - 1	LP 1_7173	Elkhorn River	B
Confirmed	TLP 2 - 1	LP 2_4827	Middle Logan Creek	B
Confirmed	TLP 2 - 1	LP 2_4854	Baker Creek	B
Confirmed	TLP 2 - 1	LP 2_4916	Dog Creek	B
Confirmed	TLP 2 - 162	LP 2_5313	Fremont Storm Drainage Canal	B
Confirmed	TLP 5 - 1	LP 5_1	Elkhorn River	B
Confirmed	TLP 4 - 1	LP 4_1388	North Fork Elkhorn River - lower section	B
Confirmed	TLP 4 - 1	LP 4_1256	Elkhorn River	B
Confirmed	TLP 3 - 8	LP 3_1991	South Fork Elkhorn River	B
Possible	TLP 3 - 1	LP 3_2154	Battle Creek	E
Possible	TLP 3 - 1	LP 3_2477	West Fork Maple Creek	B
Possible	TLP 4 - 1	LP 4_1545	Logan Creek - lower section	B
Possible	TLP 1 - 1	LP 1_6710	Taylor Creek	C

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	C
Confirmed	AFCJB54010	Phoxinus neogaeus	Finescale Dace	C
Confirmed	AFCJB54010	Phoxinus neogaeus	Finescale Dace	B
Confirmed	AFCJB54010	Phoxinus eos	Northern Redbelly Dace	C
Confirmed	AFCJB54010	Phoxinus eos	Northern Redbelly Dace	B
Confirmed	AFCJB54010	Margariscus margarita	Pearl Dace	C
Confirmed	AFCJC04010	Cycleptus elongatus	Blue Sucker	C
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	B
Confirmed	AFCJB57010	Platygobio gracilis	Flathead Chub	C
Confirmed	AFCJB57010	Platygobio gracilis	Flathead Chub	B
Confirmed	AFCJB57010	Macrhybopsis storeriana	Silver Chub	C
Confirmed	AFCJB57010	Macrhybopsis storeriana	Silver Chub	B
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	E
Confirmed	AFCJB54010	Margariscus margarita	Pearl Dace	B
Confirmed	AFCAA02010	Scaphirhynchus albus	Pallid Sturgeon	
Confirmed	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	C
Confirmed	AFCNB04170	Fundulus sciadicus	Plains Topminnow	B
Confirmed	AFCNB04170	Fundulus sciadicus	Plains Topminnow	C
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	B
Confirmed	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	B
Confirmed	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	C
Confirmed	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	B
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	B
Possible	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	B
Possible	AFCJB16050	Hybognathus placitus	Plains Minnow	B
Possible	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	B
Possible	AFCJB28960	Notropis topeka	Topeka Shiner	C
Possible	AFCJB28960	Notropis topeka	Topeka Shiner	

Threats

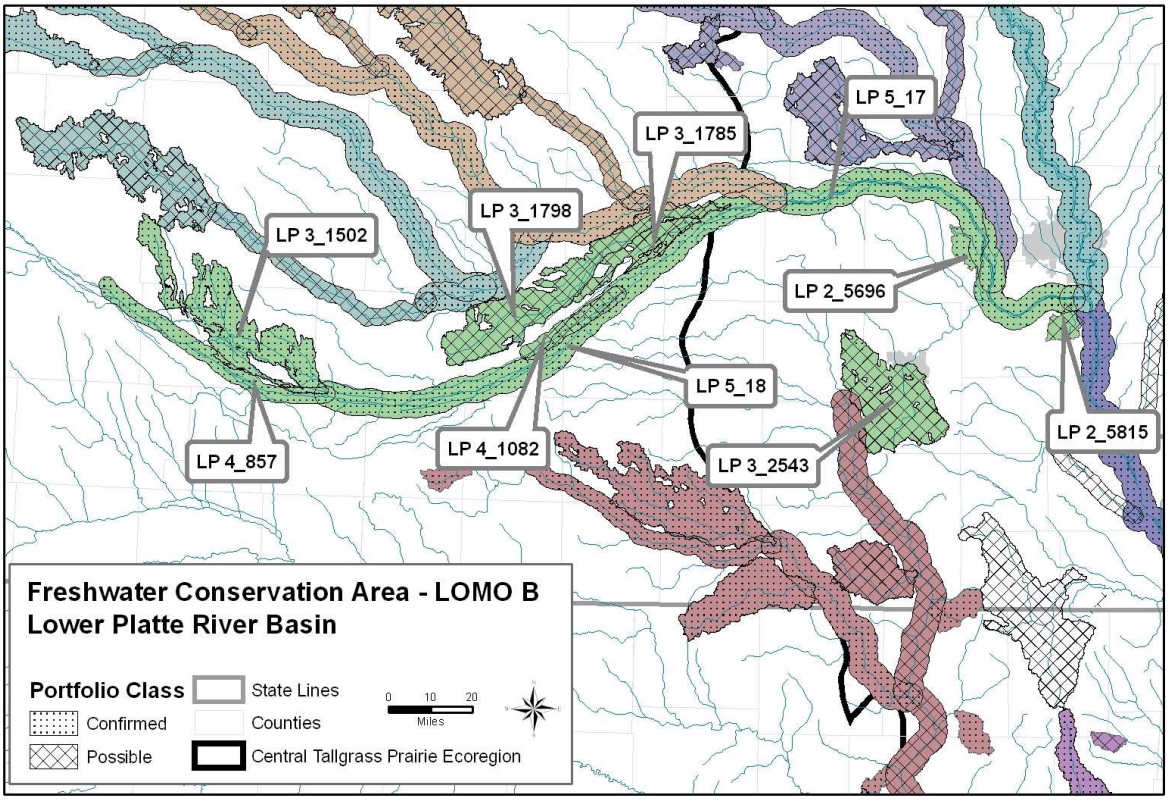
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	High	High
Other Ecosystem Modifications	High	High	High	High	High
Livestock Farming & Ranching	High	Medium	Medium	High	Medium
Dams & Water Management/Use	Very High	High	High	High	High
Housing & Urban Areas	Medium	Medium	Medium	Very High	High

Overall Threat Rank: HIGH

Strategic Actions

- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threats to biodiversity from energy and mining impacts

LOMO B Lower Platte River Basin



Description

This landscape includes the Platte River channel and its floodplain from the river's confluence with the Loup River in Platte County eastward to its mouth in Sarpy County. The lower Platte River is a mid-size, shallow, braided river. Sandbars and wooded islands are common within the channel. Much of the stream bank is wooded, with cottonwood and eastern red cedar dominant in the wooded areas. Sand pits are common along the river and in many areas the riverbank is lined with cabins. Most of the river floodplain is now cropland, although there are scattered wet meadows and marshes.

The lower Platte River receives water from the Loup and Elkhorn Rivers and has a more stable flow than the central Platte River. The lower Platte River is unique in that its sandbars support numerous colonies of the federally and state listed piping plover and interior least terns. The construction of dikes and levees has constricted the natural channel and eliminated or isolated most of the floodplain sloughs, backwaters and wetlands. The narrowing of the channel has resulted in higher flow stages after heavy rain events that wash away tern and plover nests. The lower Platte also supports many rare

large river fish including the lake sturgeon, blue sucker, sturgeon chub, and pallid sturgeon. Protected areas along this reach of the Platte River include Two Rivers SRA, Louisville SRA, Platte River State Park, and Mahoney State Park.

In 2007, The Nature Conservancy began a Platte River Program located in Cozad, NE after a long history of concentrating on conservation issues on the Platte River in central Nebraska. TNC's activity on the Lower Platte should increase as the program progresses.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	TLP 2 - 1	LP 2_2887	Spring Creek	B
Confirmed	TLP 5 - 18	LP 5_18	Platte River - middle section to Loup River	C
Confirmed	TLP 5 - 18	LP 5_18	Platte River - middle section to Loup River	B
Confirmed	TLP 5 - 17	LP 5_17	Platte River - from Loup River to the mouth	C
Confirmed	TLP 5 - 17	LP 5_17	Platte River - from Loup River to the mouth	B
Confirmed	TLP 4 - 1	LP 4_857	Platte River	B
Confirmed	TLP 3 - 1	LP 3_1502	Elm Creek	B
Confirmed	TLP 2 - 162	LP 2_5696	Upper Clear Creek	B
Possible	TLP 3 - 2	LP 3_2543	Salt Creek	B
Possible	TLP 3 - 2	LP 3_1785	Silver Creek	B
Possible	TLP 2 - 1	LP 2_5815	Four Mile Creek	C
Possible	TLP 1 - 144	LP 1_4910	Bader Park	C
Possible	TLP 4 - 1	LP 4_1082	Bader Park	C

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJC04010	Cycleptus elongatus	Blue Sucker	A
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	B
Confirmed	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	A
Confirmed	AFCJB57010	Platygobio gracilis	Flathead Chub	A
Confirmed	IITRI88040	Ironoquia plattensis	Platte River Caddisfly	C
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	B
Confirmed	IITRI88040	Ironoquia plattensis	Platte River Caddisfly	
Confirmed	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	A
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	A
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	B
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Confirmed	AFCAA02010	Scaphirhynchus albus	Pallid Sturgeon	
Confirmed	AFCAA02010	Scaphirhynchus albus	Pallid Sturgeon	C
Confirmed	AFCAA02020	Scaphirhynchus platorynchus	Shovelnose Sturgeon	A
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	B
Confirmed	AFCNB04210	Fundulus kansae	Northern Plains Killifish	B
Confirmed	AFCJB57010	Macrhybopsis storeriana	Silver Chub	A
Confirmed	AFCNB04170	Fundulus sciadicus	Plains Topminnow	B
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	
Confirmed	AFCJB28190	Notropis blennius	River Shiner	A
Possible	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	C
Possible	IITRI88040	Ironoquia plattensis	Platte River Caddisfly	C
Possible	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	B
Possible	AFCJB16050	Hybognathus placitus	Plains Minnow	B
Possible	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	B
Possible	AFCNB04210	Fundulus kansae	Northern Plains Killifish	B

Threats

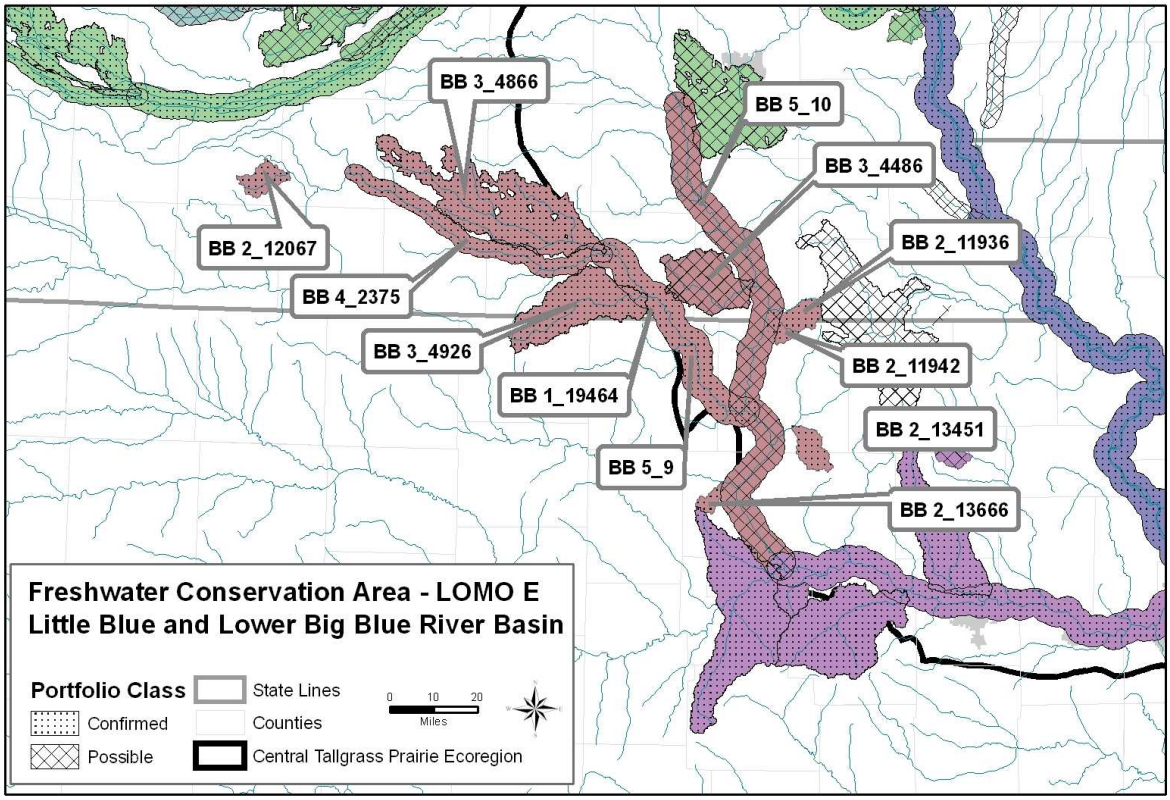
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	High	Medium	High	Medium
Dams & Water Management/Use	High	High	High	High	High
Agricultural & Forestry Effluents	Medium	Medium	Medium	High	Medium
Livestock Farming & Ranching	Medium	Low	Low	High	Low
Other Ecosystem Modifications	High	High	High	High	High
Housing & Urban Areas	High	Medium	Medium	Very High	High

Overall Threat Rank: HIGH

Strategic Actions

- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threats to biodiversity from energy and mining impacts

LOMO E Little and Lower Big Blue River Basin



Description

The Lower Big Blue and Little Blue River basins cover approximately 9,690 square miles in southeast Nebraska and northeast Kansas. The Blue River is the largest tributary of the Kansas River, nearly doubling the flow of the Kansas River at Manhattan. The watershed of both the Little Blue and Lower Blue Rivers is heavily dominated by agricultural use,

though the Kansas portion of the Lower Blue has a significant grassland component in the watershed (~44%). The Lower Big Blue is significantly impacted by Tuttle Creek Lake, a 16-mile-long reservoir (at normal conservation level). Like the Lower Kansas, fecal coliform bacteria, dissolved oxygen, eutrophication, pesticides and siltation are prevalent water quality impairments for both streams. Both point source (municipal wastewater treatment facilities and confined animal feeding operations) and non-point source (e.g., agricultural runoff) pollutants are threats to water quality.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	TBB 2 - 426	BB 2_11942	North Elm Creek	C
Confirmed	TBB 2 - 430	BB 2_12067	Sand Creek	B
Confirmed	TBB 1- 662	BB 1_19464	Coon Creek	B
Confirmed	TBB 3 - 109	BB 3_4866	Big Sandy Creek	B
Confirmed	TBB 3 - 109	BB 3_4926	Rose Creek	B
Confirmed	TBB 4 - 19	BB 4_2375	Little Blue River	C
Confirmed	TBB 5 - 9	BB 5_9	Little Blue River	E
Confirmed	TBB 2 - 430	BB 2_13666	Walnut Creek	C
Possible	TBB 5 - 10	BB 5_10	Big Blue River	B

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJB31030	Phoxinus erythrogaster	Southern Redbelly Dace	B
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	C
Confirmed	AFCJB57010	Platygobio gracilis	Flathead Chub	B
Confirmed	AFCJB57010	Macrhybopsis storeriana	Silver Chub	B
Confirmed	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	B
Confirmed	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	B
Confirmed	AFCNB04210	Fundulus kansae	Northern Plains Killifish	
Confirmed	AFCJB31030	Phoxinus erythrogaster	Southern Redbelly Dace	
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	
Confirmed	AFCNB04210	Fundulus kansae	Northern Plains Killifish	B
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	C
Possible	AFCJB31030	Phoxinus erythrogaster	Southern Redbelly Dace	
Possible	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	B
Possible	AFCJB28960	Notropis topeka	Topeka Shiner	
Possible	AFCJB57010	Platygobio gracilis	Flathead Chub	B
Possible	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	C
Possible	AFCJB57010	Macrhybopsis storeriana	Silver Chub	B
Possible	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	B

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Very High	High	Very High	Very High
Livestock Farming & Ranching	High	Medium	Medium	Medium	Medium
Dams & Water Management/Use	High	Medium	Medium	High	Medium
Agricultural & Forestry Effluents	High	High	High	Medium	High

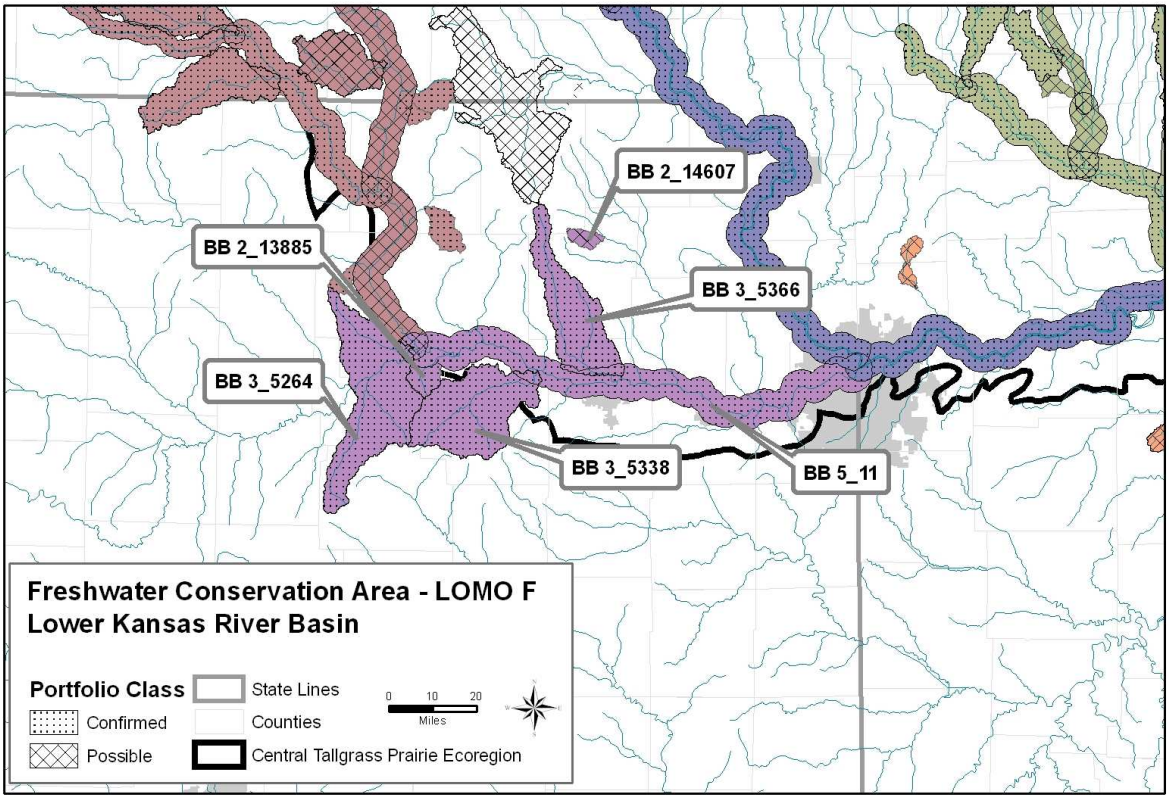
Overall Threat Rank: HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity

- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

LOMO F Lower Kansas River



Description

The Lower Kansas River is a relatively shallow river with unstable sand substrates and high suspended sediment loads. Hydrology was historically dynamic and largely controlled by highly variable precipitation events. However, the Lower Kaw's hydrology is now largely regulated by four major federal reservoirs: Milford, Tuttle Creek, Perry and Clinton. Most of the bottomland and about 50 percent of the uplands are cultivated. This reach of the Kansas River is rapidly urbanizing, particularly within a 50-mile radius of Kansas City. Fecal coliform bacteria, dissolved oxygen, eutrophication (nutrient loading), pesticides and siltation are prevalent water quality impairments. Mining of sand resulting in accelerated stream bank erosion and destabilization of substrate is also a concern. This large river forms the approximate southern limit of Pleistocene glaciation in Kansas. A major tributary of the Missouri River, the Kansas River has been impacted heavily by a variety of human activities, including agriculture, sand dredging, dam construction, and urbanization.

Nevertheless, it still supports several rare species, including pallid sturgeon, sturgeon chub, sicklefin chub, least tern, piping plover, and bald eagle.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	TBB 2 – 430	BB 2_13840	Wildcat Creek	B
Confirmed	TBB 2 - 430	BB 2_13885	Deep Creek	C
Confirmed	TBB 3 - 109	BB 3_5338	Mill Creek	B
Confirmed	TBB 3 - 109	BB 3_5338	Mill Creek	C

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	
Confirmed	AFCJB31030	Phoxinus erythrogaster	Southern Redbelly Dace	B
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	B
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	C
Confirmed	AFCQC04140	Percina maculata	Blackside Darter	C
Confirmed	AFCQC04140	Percina maculata	Blackside Darter	E
Confirmed	AFCJB31030	Phoxinus erythrogaster	Southern Redbelly Dace	
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	
Confirmed	AFCJB28190	Notropis blennius	River Shiner	
Confirmed	AFCJC04010	Cycleptus elongatus	Blue Sucker	
Confirmed	IMBIV46050	Uniomerous tetralasmus	Pondhorn	

Threats

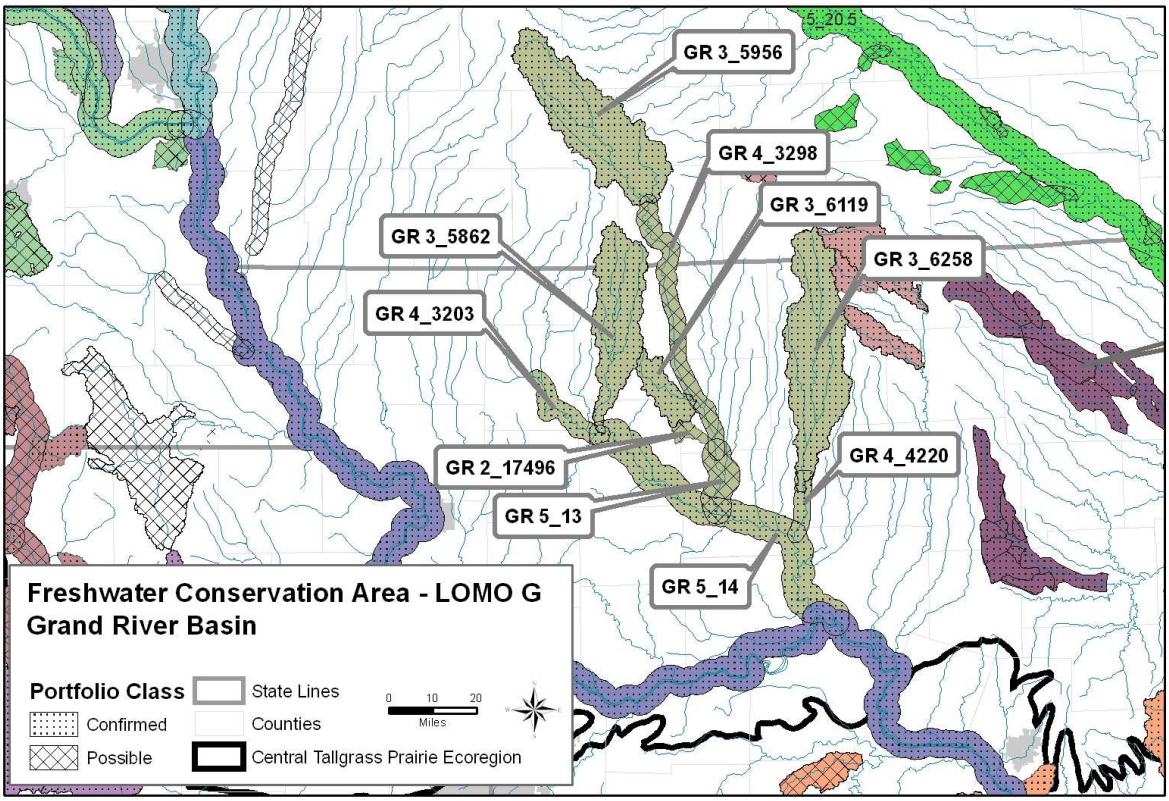
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	Medium	High
Dams & Water Management/Use	High	Medium	Medium	High	Medium
Livestock Farming & Ranching	Medium	High	Medium	Medium	Medium
Industrial & Military Effluents	High	Medium	Medium	Medium	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

LOMO G Grand River Basin



Description

The Grand River Basin is a freshwater network consisting of medium and small rivers as well as their associated headwater streams. A suite of native fishes including suckers, minnows, shiners, floaters and chubs occur within the basin. Altered hydrology and sediment inputs are significant threats. The basin remains sparsely populated and good opportunities exist to enhance hydrological function and processes at large scales.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	TGR 3 - 76	GR 3_5956	Thompson River	C
Possible	TGR 4 - 15	GR 4_3298	Thompson River	C
Confirmed		GR 3_3862	Big Creek	
Confirmed		GR 4_3203	Grand River	
Possible	TGR 2 - 783	GR 2_17496		
Possible		GR 5_13	Thompson River	
Confirmed		GR 5_14	Grand River	
Confirmed		GR 4_4220	Locust Creek	
Confirmed	TGR 3 - 496	GR 3_6258	Locust Creek	
Confirmed	TGR 3 -582	GR 3_6119	Sugar Creek	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	C
Confirmed	AFCLC01010	Percopsis omiscomaycus	Trout Perch	
Confirmed	IMBIV04130	Anodonta suborbiculata	Flat Floater	
Confirmed	AFCJC04010	Cycleptus elongatus	Blue Sucker	
Confirmed	AFCJB57010	Platygobio gracilis	Flathead Chub	
Confirmed	AFCJB57010	Macrhybopsis storeriana	Silver Chub	
Confirmed	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	C
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	

Confirmed	AFCAA02010	Scaphirhynchus albus	Pallid Sturgeon	
Confirmed	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	
Possible	AFCJB16050	Hybognathus placitus	Plains Minnow	
Possible	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	
Possible	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	C
Possible	AFCJB57010	Platygobio gracilis	Flathead Chub	
Possible	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	
Possible	AFCJB57010	Macrhybopsis storeriana	Silver Chub	
Possible	AFCLC01010	Percopsis omiscomaycus	Trout Perch	
Possible	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	C
Possible	AFCJB16050	Hybognathus placitus	Plains Minnow	C
Possible	AFCJB28960	Notropis topeka	Topeka Shiner	
Possible	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	

Threats

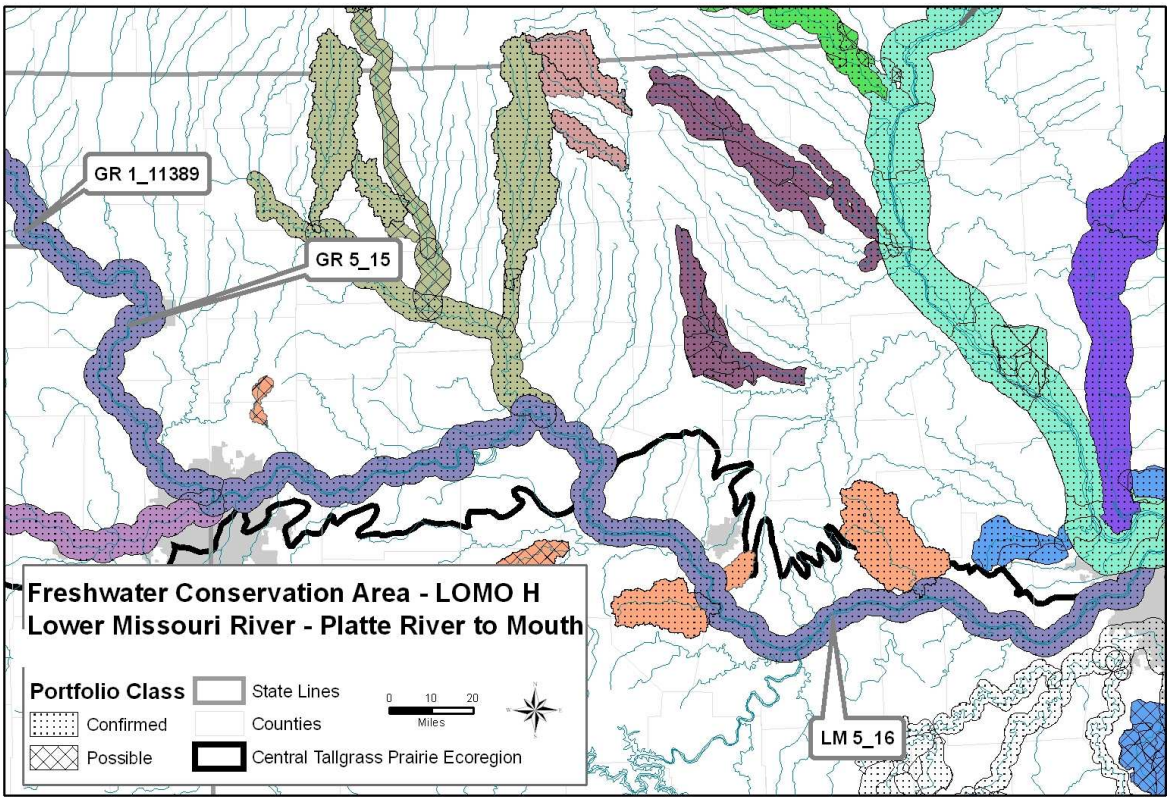
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Medium	High	Medium	High	Medium
Dams & Water Management/Use	High	Very High	High	High	High
Invasive Non-Native/Alien Species	Medium	High	Medium	High	Medium
Livestock Farming & Ranching	High	High	High	High	High

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development

LOMO H Lower Missouri River Mainstem (Omaha to St Louis)



Description

The lower Missouri River mainstem extends from Omaha, Nebraska to the confluence with the Mississippi River near St. Louis, Missouri. The area includes the mainstem and its associated floodplain and bluffland systems. Historically, the Missouri was a shallow, wide, sediment-choked, braided system, seasonally swelling out onto the floodplain to re-work the valley floor, carve new habitats, and flush rich organic matter and sediments into the river. As a result, Missouri River fauna and flora, including the federally listed pallid sturgeon, were uniquely adapted to dark, turbid waters. During the mid-twentieth century, the Missouri was engineered into a narrow, deep navigation channel. In rapid succession, floodplain lands were leveed and cleared for agriculture, effectively disconnecting the river and its floodplain. As a result of large-scale modifications, the Missouri River today has lost integral pieces of its historic hydrological and biological function, including floodplain-river connection and the seasonal flood pulses. Despite these alterations, no native fishes have been lost in the mainstem, and the river retains much of the native fauna needed to recover a functional system. Numerous federal and state efforts are underway to restore and rehabilitate the Missouri River, including an Army Corps of Engineers program to recover over 150,000 acres of floodplain lands.

The Missouri River Program of The Nature Conservancy, in partnership with numerous state and federal agencies, is actively engaged in conservation planning and action on the lower mainstem.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	TLM 5 - 16	LM 5_16	Missouri River - from Kansas River to mouth	C

Confirmed	TLM 5 - 16	LM 5_16	Missouri River - from Kansas River to mouth	E
Confirmed	TGR 1 - 7	GR 1_11389	Cottier Creek	B
Confirmed	TGR 5 - 15	GR 5_15	Missouri River - from Platte River to Kansas River	C

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJB57010	Platygobio gracilis	Flathead Chub	
Confirmed	AFCJB57010	Platygobio gracilis	Flathead Chub	B
Confirmed	AFCJB57010	Platygobio gracilis	Flathead Chub	C
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	B
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	C
Confirmed	AFCJC01030	Carpiodes velifer	Highfin Carpsucker	C
Confirmed	AFCJC04010	Cycleptus elongatus	Blue Sucker	
Confirmed	AFCJC04010	Cycleptus elongatus	Blue Sucker	C
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	
Confirmed	AFCJB57010	Macrhybopsis storeriana	Silver Chub	C
Confirmed	AFCJC01030	Carpiodes velifer	Highfin Carpsucker	
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	B
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	C
Confirmed	AFCAA02010	Scaphirhynchus albus	Pallid Sturgeon	
Confirmed	AFCAA02010	Scaphirhynchus albus	Pallid Sturgeon	C
Confirmed	AFCAA02010	Scaphirhynchus albus	Pallid Sturgeon	D
Confirmed	AFCAA02020	Scaphirhynchus platorynchus	Shovelnose Sturgeon	B
Confirmed	AFCAA02020	Scaphirhynchus platorynchus	Shovelnose Sturgeon	C
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	C
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	C
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	
Confirmed	AFCJB57010	Macrhybopsis storeriana	Silver Chub	B
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	C
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	B
Confirmed	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	
Confirmed	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	B
Confirmed	AFCJB57010	Macrhybopsis gelida	Sturgeon Chub	C
Confirmed	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	
Confirmed	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	B
Confirmed	AFCJB57010	Macrhybopsis hyostoma	Shoal Chub	C
Confirmed	AFCJB57010	Macrhybopsis storeriana	Silver Chub	
Confirmed	AFCJB28190	Notropis blennius	River Shiner	

Threats

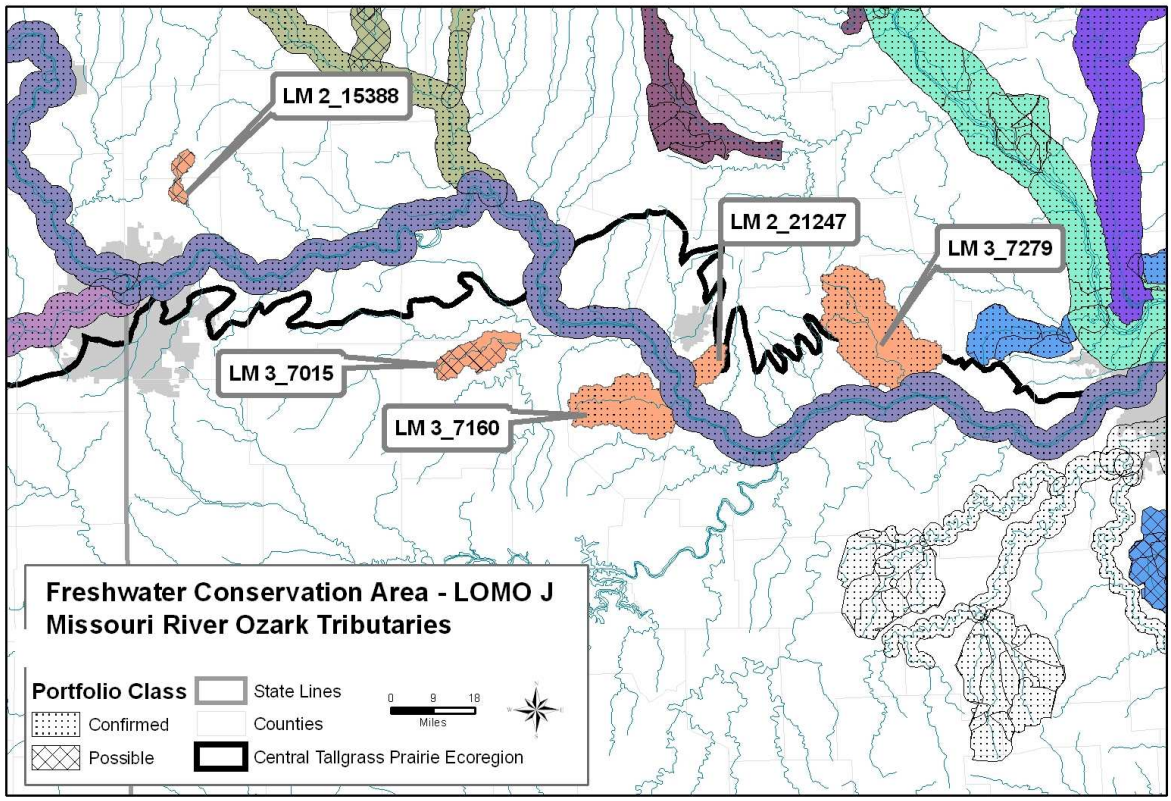
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	High	High	Very High	Very High
Invasive Non-Native/Alien Species	Medium	Very High	Medium	High	Medium
Shipping Lanes	High	High	High	High	High

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams

LOMO J Small Missouri River Ozark Tributaries



Description

The tributaries in this freshwater conservation area include Clear Creek, Salt Creek, Loutre River, and Moniteau Creek. The network consists of a suite of headwater streams and creeks that flow directly into the mainstem of the Missouri River. Each hosts various species of fish and mussels. The elimination of riparian vegetation and rapid runoff from row crop agriculture threaten these headwater stream systems.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	TLM 3 - 68	LM 3_7279	Loutre River	
Confirmed	TGR 2 - 1091	GR 2_21247		
Confirmed	TGR 3 - 689	GR 3_7160	Moniteau Creek	
Possible	TGR 3 - 680	GR 3_7015	Heath Creek	
Possible	TGR 2 - 915	GR 2_15388	Clear Creek	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJB28530	Notropis heterolepis	Blacknose Shiner	
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	
Possible	AFCJB28960	Notropis topeka	Topeka Shiner	
Possible	AFCNB04210	Fundulus kansae	Northern Plains Killifish	

Threats

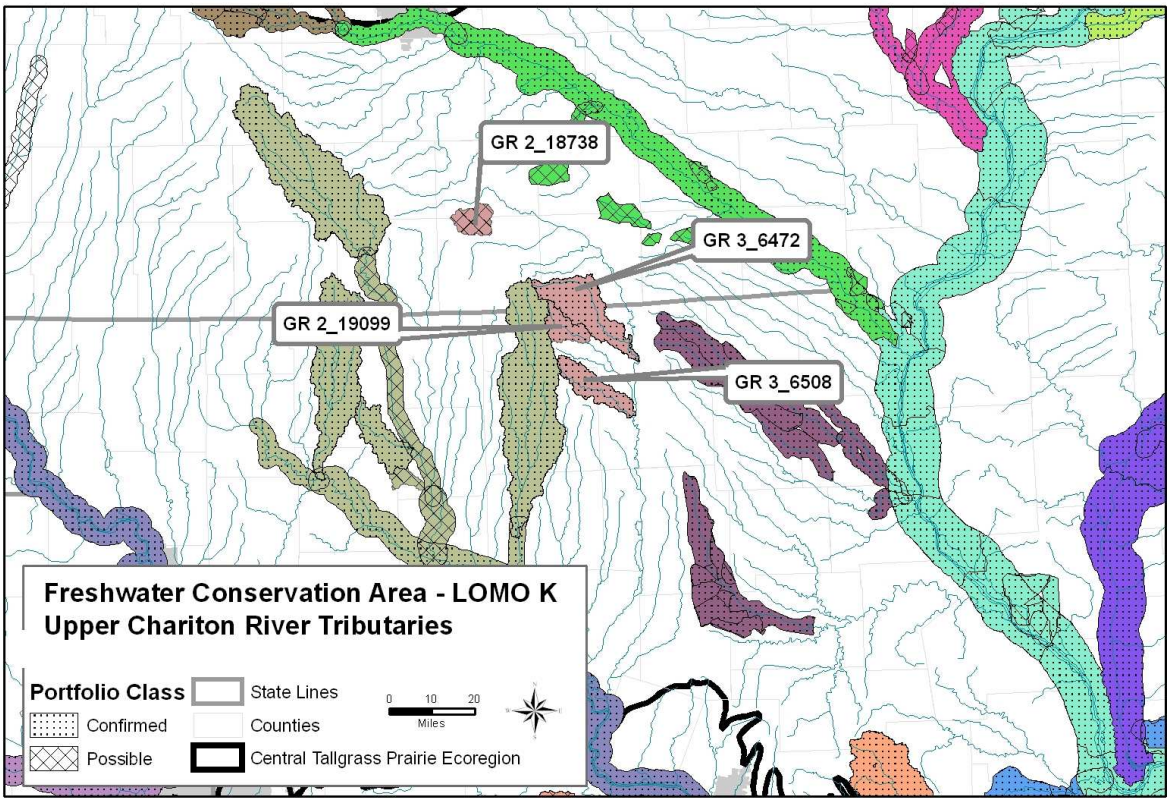
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Dams & Water Management/Use	High	High	High	Medium	High
Annual & Perennial Non-Timber Crops	High	High	High	Medium	High

Overall Threat Rank: HIGH

Strategic Actions

- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

LOMO K Upper Chariton River Tributaries



Description

This freshwater network includes multiple representative headwater streams in the upper Chariton River including Spring Creek, Shoal Creek, and Wolf Creek. Each is considered to contain native fish, crayfish and mussel species. Further inventory of these representative streams is needed to confirm predicted distributions of species targets.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Possible	TGR 2 - 274	GR 2_18738	Wolf Creek	C
Confirmed	TGR 3 - 493	GR 3_6472	Shoal Creek	
Confirmed	TGR 3 - 562	GR 3_6508	Spring Creek	
Possible	TGR 2 - 261	GR 2_19099	North Blackbird Creek	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJB16050	Hybognathus placitus	Plains Minnow	
Confirmed	AFCJB16050	Hybognathus argyritis	Western Silvery Minnow	
Confirmed	AFCLC01010	Percopsis omiscomaycus	Trout Perch	
Possible	IMBIV46050	Uniomerous tetralasmus	Pondhorn	D

Threats

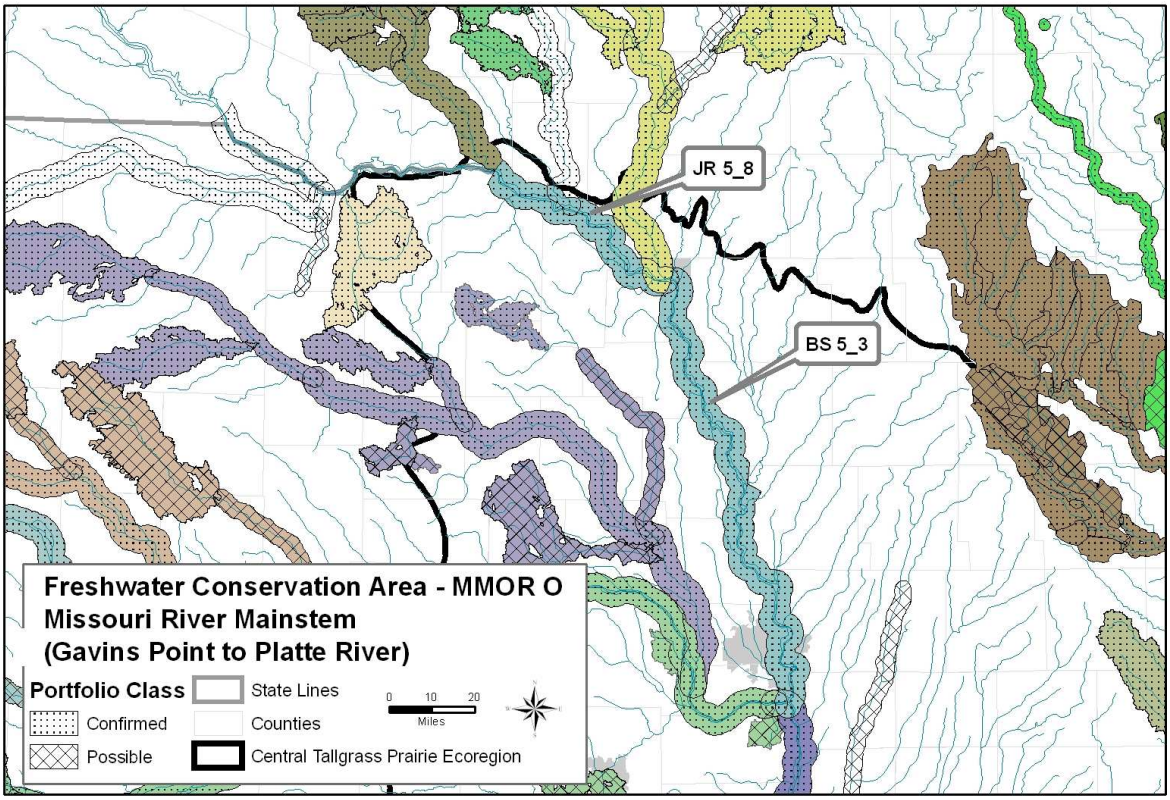
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	High	High
Dams & Water Management/Use	High	High	High	Very High	Very High
Livestock Farming & Ranching	Medium	Medium	Medium	High	Medium
Invasive Non-Native/Alien Species	Medium	High	Medium	Medium	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

MMOR O Missouri River Mainstem (Gavins Point to Platte River)



Description

This portfolio area includes the Missouri River mainstem and associated valley/bluff system from Gavins Point Dam (near Yankton, South Dakota), to the confluence with the Platte River south of Omaha, Nebraska. This stretch includes one of only a handful of semi-natural reaches on the Missouri, the 50-mile-long Missouri National Recreation River. The portfolio area also includes the segment of the river downstream from the Recreation

River reach, starting in Sioux City, Iowa, where the Missouri is mostly channelized and confined. Nine species and assemblage targets are found in this segment of river: the federally endangered pallid sturgeon, river otter, paddlefish, blue sucker, sturgeon chub, sicklefin chub, the Large River Turtle Assemblage and the Mainstem Lower Missouri River Native Fish Assemblages (Shallow and Deep Water). The conservation value of this river includes its role in providing large river habitat for numerous native species, as well as movement corridors between and among tributary streams.

The Nature Conservancy's Missouri River Program is actively engaged in conservation planning and action on the Missouri River mainstem.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	BS 5 - 3	BS 5_3	Missouri River - from Sioux City Iowa to the Platte River	
Confirmed	JR 5 - 8	JR 5_8	Missouri River (1) Gavins Point Dam to confluence with the Big Sioux River in Sioux City, IA	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCJB53030	Macrhybopsis meeki	Sicklefin Chub	
Confirmed	AMAJF10010	Lontra canadensis	River Otter	
Confirmed		Lower Missouri River Native Fish	Mainstem Lower Missouri River	
Confirmed		Lower Missouri River Native Fish	Mainstem Lower Missouri River	
Confirmed		Large River Turtle Assemblage	Large River Turtle Assemblage	
Confirmed	AFCJC04010	Cycleptus elongates	Blue Sucker	
Confirmed	AFCAA02010	Scaphirhynchus albus	Pallid Sturgeon	
Confirmed	AFCJB53020	Macrhybopsis gelida	Sturgeon Chub	
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Agricultural & Forestry Effluents	High	High	High	High	High
Dams & Water Management/Use	Very High	High	High	High	High
Excess Energy	Medium	Medium	Medium	High	Medium
Housing & Urban Areas	High	Medium	Medium	Very High	High
Mining & Quarrying	Medium	Medium	Medium	High	Medium
Other Ecosystem Modifications	High	Very High	High	High	High
Invasive Non-Native/Alien Species	High	High	High	High	High
Utility & Service Lines	Medium	Low	Low	Very High	Medium

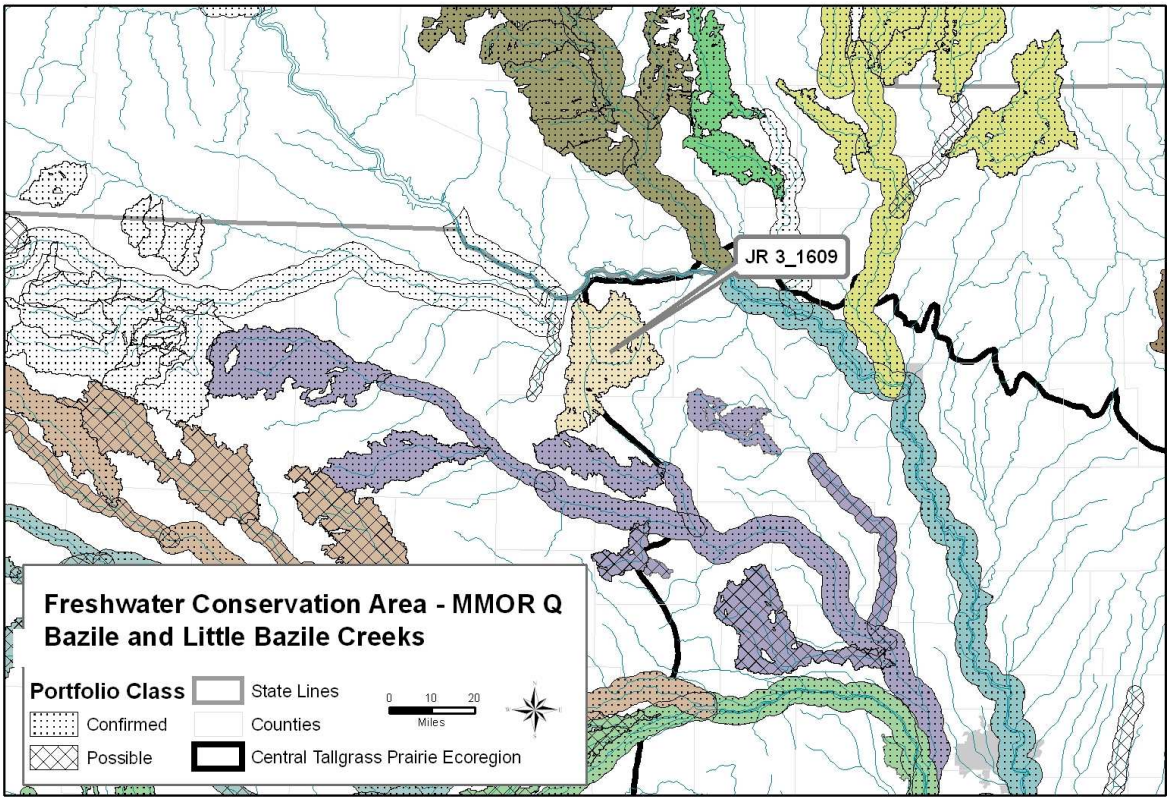
Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity

- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams
- Reduce and mitigate for the threats to biodiversity (including land conversion and pollution) from residential and commercial development
- Reduce and mitigate for the threats to biodiversity from energy and mining impacts
- Work in partnership with indigenous peoples to conserve biodiversity on communal lands

MMOR Q Bazile and Little Bazile Creeks



Description

This portfolio area includes the entire Bazile Creek drainage, a small stream basin that drains in a northeasterly direction through northeastern Nebraska before emptying directly into the Missouri River at Lewis and Clarke Lake. This basin is unique in that the stream flows through a landscape consisting of partially untilled, native grassland. The Santee Sioux Indian Reservation straddles the lower half of the portfolio area. Stream substrates consist of coarser material than most streams in the area due to the presence of limestone and glacial geological features. Targets include Topeka shiner, blackside darter, and the Perennial Flow/Groundwater Contact Native Fish Assemblage as well as the Lower Missouri River Native Fish Assemblage (Shallow Water). This system is also notable as a zone of sympatry for several non-target species, including blacknose dace, longnose dace,

Iowa darter and johnny darter. This system has been impacted in the recent past by direct water withdrawal from the stream for irrigation.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	JR 3 - 2	JR 3_1609	Bazile Creek	

Threats

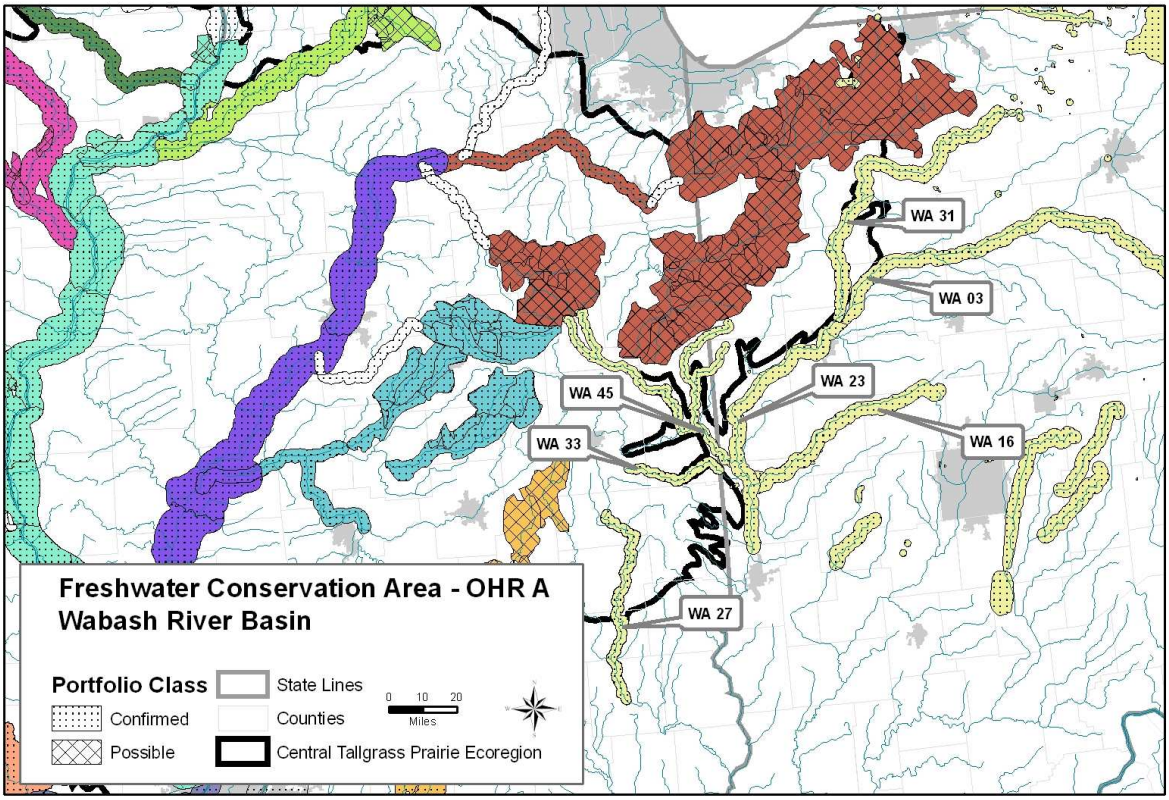
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Agricultural & Forestry Effluents	Medium	Medium	Medium	High	Medium
Annual & Perennial Non-Timber Crops	Medium	Medium	Medium	High	Medium
Invasive Non-Native/Alien Species	Medium	High	Medium	High	Medium
Dams & Water Management/Use	Medium	High	Medium	High	Medium

Overall Threat Rank: MEDIUM

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural surface water and groundwater hydrology
- Work in partnership with indigenous peoples to conserve biodiversity on communal lands

OHR A Wabash River Basin



Description

The Wabash ecosystem contains rich assemblages of mussels and fish representative of the midwestern US before most rivers were dammed. The Wabash mainstem is the longest free-running river east of the Mississippi and continues to support species that were once widespread in the upper Mississippi drainage, but which are now absent from impounded systems. This freshwater conservation area network includes several tributaries and headwater basins within the Wabash basin. The Upper Embarras River flows through a basin of varied topography ranging from relatively rough and hilly terrain to a very flat entrance into the Wabash River. The central portion of the river has a wide variety of habitats including gravel and sand bars, silt-bottomed pools, fast-running riffles and sandy raceways that contribute to unusually rich species diversity. The North Fork Vermillion River cuts ravines and valleys of up to 100 feet in depth through a level, glacial plain. Bottomland forests, occasional hill prairies and forested ravines are characteristic. The substrate is gravel and sand with some silt deposits, good for mussel populations. The Little Vermillion River, at the headwaters of the basin, is regarded as the finest mussel stream in Illinois. Twenty-four mussel species can be found alive in the drainage, including five state-listed species and one federally listed species – the clubshell. The Tippecanoe River is a very high-quality aquatic system flowing through deep glacial deposits. It is thought to support a nearly intact and healthy presettlement community of fish and mussels.

The Wabash system was selected in the first iteration of the CTP plan as a portfolio site. It has been included as a confirmed portfolio site in the current assessment for its regional ecological significance and viability of native fauna, although a systematic classification and assessment of the aquatic ecological systems of the Wabash has not been completed. (This freshwater conservation area is located in the only basin in the CTP ecoregion – the Ohio – that falls outside of the Missouri and upper Mississippi River basins and was not classified and assessed with precisely the same methods used in those basins.)

Target Occurrences

Systems

- Tippecanoe
- Upper Embarras
- Sugar
- Upper Wabash
- Vermillion
- Little Vermillion

Species

- Clubshell
- Fanshell
- Northern Riffleshell
- Ohio Pigtoe
- Purple Lilliput
- Pyramid Pigtoe
- Rabbitsfoot
- Rayed Bean
- Sheepnose
- Snuffbox

Threats

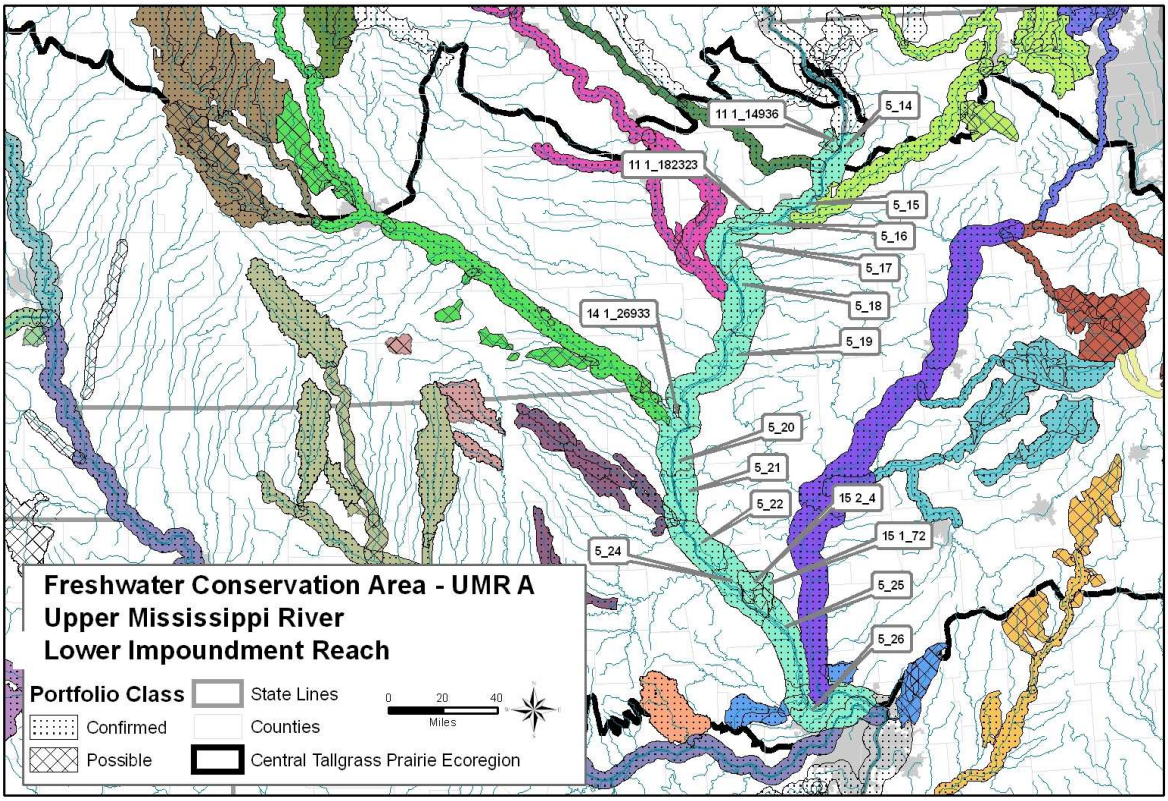
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Agricultural & Forestry Effluents	Medium	Medium	Medium	High	Medium
Commercial & Industrial Areas	Medium	Medium	Medium	High	Medium
Housing & Urban Areas	Medium	High	Medium	High	Medium
Industrial & Military Effluents	Medium	Medium	Medium	Medium	Medium
Invasive Non-Native/Alien Species	High	High	High	High	High
Dams & Water Management/Use	Medium	Low	Low	Very High	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams

UMR A Upper Mississippi River Lower Impoundment Reach



Description

This section of the Mississippi River from Dubuque, Iowa to St. Louis, Missouri represents all of what a modern floodplain river is: an efficient and relatively inexpensive transportation system, a source of drinking water, recreational areas, and industrial developments along its banks to use its waters or access its barges. The river has been physically altered primarily by the US Army Corps of Engineers to accommodate commercial barge traffic by the installation of a series of locks and dams, and other river training structures. The water quality and chemistry have been altered by urban and industrial pollution and by agricultural runoff in the form of fertilizers and pesticides, while the water flow has been altered by the rapid runoff associated with urban and suburban communities and an efficiently drained agricultural landscape. As a whole, 66% of the upper Mississippi River basin is agricultural land, the dominant feature on the landscape. The floodplain within the lower impounded reach is also dominated by agriculture and 53% of the floodplain is isolated from the river by levees; consequently, the natural services once provided by the floodplain such as floodwater storage, removal and storage of nutrients and sediments, and the seasonal provision of wetlands for wildlife have largely been lost. The floodplain areas that have remained connected to the river, while still providing some measure of ecosystem benefit, have been severely degraded by a host of stressors including pollution, extreme sedimentation, severely altered hydrology, and invasive species. Plant diversity in these areas is usually reduced and habitat quality is compromised. In spite of these changes, the river remains an ecological treasure in many ways, including its still-impressive diversity of freshwater fish and mussels. The entire mainstem river and the floodplain are a priority for biodiversity conservation.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	GR5 5_17	Pool 17		
Confirmed	GR5 5_16	Pool 16		
Confirmed	GR5 5_15	Pool 15		
Confirmed	GR5 5_14	Pool 14		
Confirmed	15_2D 10	15 2_4	MISSISSIPPI R	
Confirmed	15_1D 4	15 1_72	SIXMILE Creek	
Confirmed	15_1D 4	15 1_48	Dutch Creek	
Confirmed	15_1D 1	15 1_61		
Confirmed	11_1B 2	11 1_18323	PINE Creek	
Confirmed	GR7 5_20	Pool 20		
Confirmed	GR6 5_19	Pool 19		
Confirmed	15_1D 1	15 1_55	MISSISSIPPI R	
Confirmed	GR7 5_21	Pool 21		
Confirmed	GR6 5_18	Pool 18		
Confirmed	GR7 5_22	Pool 22		
Confirmed	GR8 5_24	Pool 24		
Confirmed	GR8 5_25	Pool 25		
Confirmed	GR8 5_26	Pool 26		
Possible	11_1B 24	11 1_14936	MILL Creek	
Possible	14_1B 3	14 1_26933	SUGAR Creek	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV39080	Quadrula metanerva	Monkeyface	
Confirmed	IMBIV21100	Lampsilis higginsii	Higgins Eye	
Confirmed	IMBIV21240	Lampsilis teres	Yellow Sandshell	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	IMBIV26030	Ligumia subrostrata	Pondmussel	
Confirmed	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Confirmed	IMBIV34030	Plethobasus cyphus	Sheepnose	
Confirmed	IMBIV37030	Potamilus capax	Fat Pocketbook	
Confirmed	IMBIV39090	Quadrula nodulata	Wartyback	
Confirmed	IMBIV17060	Fusconaia ebena	Ebonyshell	
Confirmed	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Confirmed	AFCJB16010	Hybognathus argyritus	Western Silvery Minnow	
Confirmed	IMGASF0030	Viviparus subpurpureus	Olive Mysterysnail	
Confirmed	AFCQC04090	Percina evides	Gilt Darter	
Confirmed	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	
Confirmed	AFCQC01040	Ammocrypta clara	Western Sand Darter	
Confirmed	AFCFA01030	Alosa chrysochloris	Skipjack Herring	
Confirmed	AFCEA01010	Anguilla rostrata	American Eel	
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Confirmed	AFCJC10040	Moxostoma carinatum	River Redhorse	
Confirmed	AFCQC02120	Etheostoma chlorosoma	Bluntnose Darter	
Confirmed	ICMAL25020	Bactrurus brachycaudus	an amphipod	
Confirmed	ICMAL01370	Caecidotea packardi	an isopod	
Confirmed	IMBIV14080	Elliptio crassidens	Elephantear	
Confirmed	IMBIV04130	Anodonta suborbiculata	Flat Floater	
Confirmed	IMBIV06010	Arcidens confragosus	Rock Pocketbook	
Confirmed	IMBIV08010	Cumberlandia monodonta	Spectaclecase	
Confirmed	IMBIV13010	Ellipsaria lineolata	Butterfly	
Confirmed	AFCJC04010	Cycleptus elongatus	Blue Sucker	

Threats

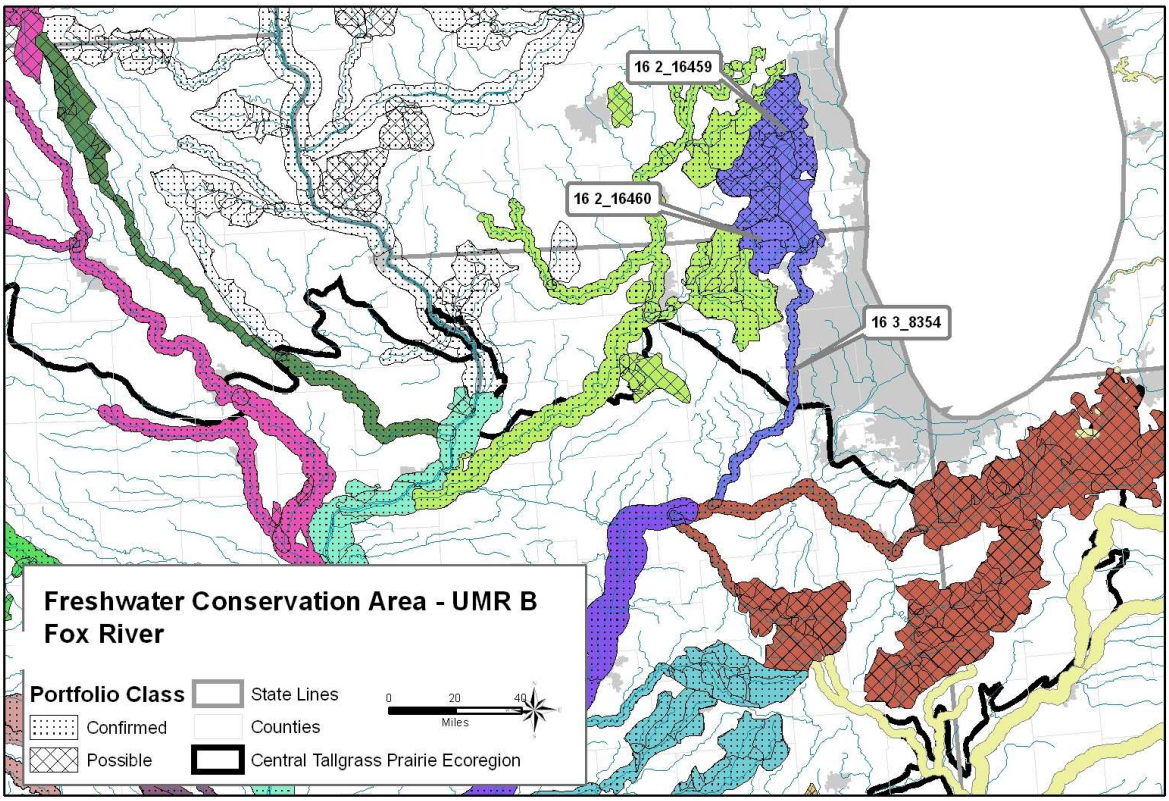
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Very High	High	Medium	High
Shipping Lanes	Medium	Very High	Medium	High	Medium
Dams & Water Management/Use	High	Very High	High	High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Agricultural & Forestry Effluents	High	High	High	Low	Medium
Droughts	Medium	Very High	Medium	Very High	High
Temperature Extremes	Medium	Very High	Medium	Very High	High
Storms & Flooding	Medium	Very High	Medium	Very High	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

UMR B Fox River



Description

The Fox River system of southeastern Wisconsin and northeastern Illinois is one of the largest tributaries of the Illinois River. Located near suburban Chicago, it is heavily impacted by urban sprawl in its middle reaches, but still retains numerous high-quality terrestrial and aquatic areas, including Nippersink Creek, Cherry Lake wetlands, Mukwonago River, and the lower Fox River. The systems are characterized as low-density perennial streams in variable geology, including mostly fine ground and end moraines with areas of outwash, alluvium, sand, lake sands and clay, peat and muck. Fourteen targets are found in the priority area: eight mussels, one turtle, and five fishes, including the large-bodied suckers, river redhorse and greater redhorse. Approximately 21% of the watershed retains natural vegetative cover, including prairies, oak savannas, wetlands, hardwood swamps, sedge meadows, shrub-carr and emergent marshes. Four terrestrial conservation areas, identified in the first-iteration Central Tallgrass Prairie and Prairie-Forest Border ecoregional plans (The Nature Conservancy 2000 and The Nature Conservancy 2001), are within this freshwater priority area.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	16_1D 221	16 1_30961	Mukwonago River	
Confirmed	16_1D 221	16 1_30999	SUGAR Creek	
Confirmed	16_3D 15	16 3_8345	FOX R	
Confirmed	16_2D 11	16 2_16460	NIPPERSINK Creek	
Confirmed	16_1D 221	16 1_31124	North Branch Nippersink Creek	
Confirmed	16_1D 221	16 1_30955	FOX R	
Confirmed	16_1D 1	16 1_31123	NIPPERSINK Creek	
Confirmed	16_1D 1	16 1_30956	Mill Brook	
Confirmed	16_1D 221	16 1_30998	WHITE R	
Confirmed	16_1D 32	16 1_30990	MUSKEGO Creek	

Possible	16_2D 30	16 2_16459	FOX R

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV02040	Alasmidonta marginata	Elktoe	
Confirmed	IMBIV47060	Villosa iris	Rainbow	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	MBIV14100	Elliptio dilatata	Spike	
Confirmed	IMBIV02110	Alasmidonta viridis	Slippershell Mussel	
Confirmed	AFCJC10170	Moxostoma valenciennesi	Greater Redhorse	
Confirmed	AFCJC10040	Moxostoma carinatum	River Redhorse	
Confirmed	AFCJC05020	Ericymba sucetta	Lake Chubsucker	
Confirmed	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Confirmed	AFCJB28080	Notropis anogenus	Pugnose Shiner	
Confirmed	AFCFA01030	Alosa chrysochloris	Skipjack Herring	
Confirmed	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	
Confirmed	ARAAD04010	Emydoidea blandingii	Blanding's Turtle	
Possible	IMBIV02110	Alasmidonta viridis	Slippershell Mussel	
Possible	AFCFA01030	Alosa chrysochloris	Skipjack Herring	
Possible	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Possible	IMBIV47060	Villosa iris	Rainbow	
Possible	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	
Possible	IMBIV26020	Ligumia recta	Black Sandshell	
Possible	IMBIV14100	Elliptio dilatata	Spike	
Possible	ARAAD04010	Emydoidea blandingii	Blanding's Turtle	
Possible	AFCJC10170	Moxostoma valenciennesi	Greater Redhorse	
Possible	AFCJC10040	Moxostoma carinatum	River Redhorse	
Possible	AFCJC05020	Ericymba sucetta	Lake Chubsucker	
Possible	AFCJB28080	Notropis anogenus	Pugnose Shiner	
Possible	IMBIV02040	Alasmidonta marginata	Elktoe	
Possible	IMBIV21250	Lampsilis cardium	Plain Pocketbook	

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Housing & Urban Areas	High	High	High	High	High
Annual & Perennial Non-Timber Crops	High	High	High	Very High	Very High
Roads & Railroads	High	High	High	Very High	Very High
Dams & Water Management/Use	High	High	High	High	High
Invasive Non-Native/Alien Species	High	High	High	Very High	Very High
Droughts	High	Very High	High	Very High	Very High
Temperature Extremes	High	Very High	High	Very High	Very High
Storms & Flooding	High	Very High	High	Very High	Very High

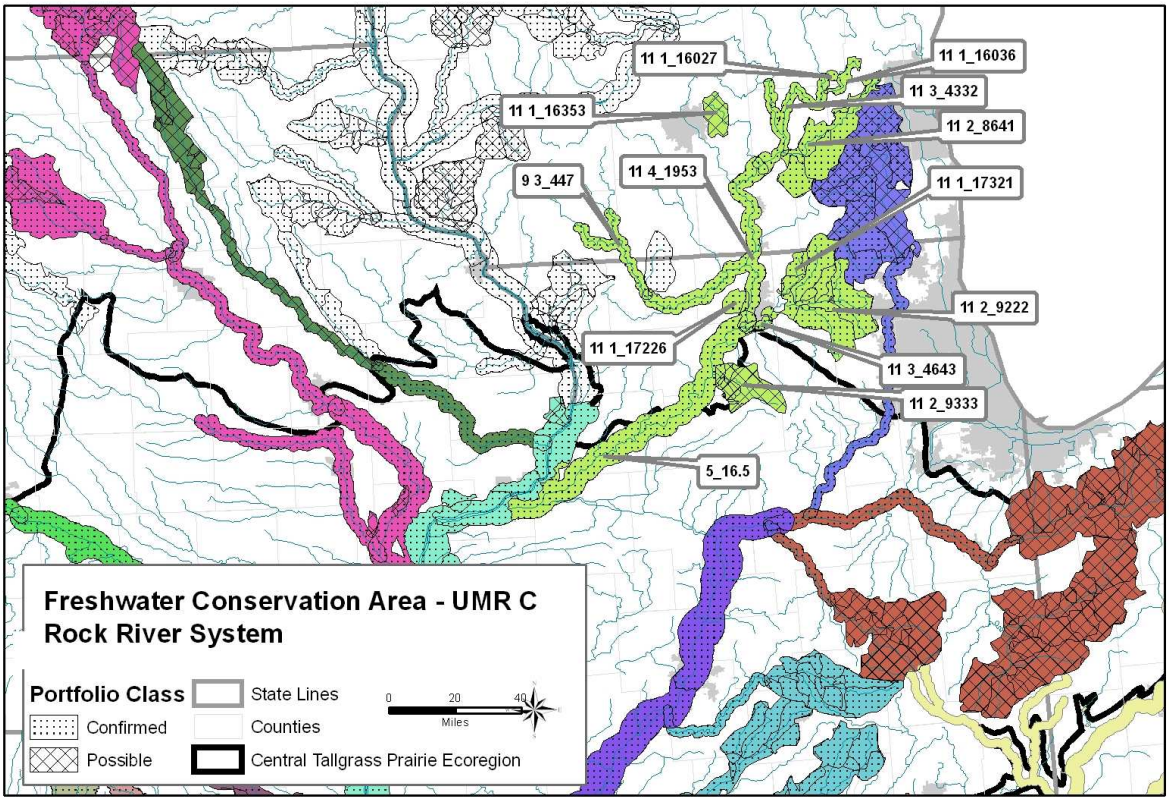
Overall Threat Rank: VERY HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites

- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

UMR C Rock River



Description

The upper Rock River system of extreme north-central Illinois includes several high-quality tributary streams (Kishwaukee, Piscasaw) and numerous state- and privately protected natural areas (The Nature Conservancy's Nachusa Grasslands and Lowden-Miller State Forest). The area is mostly agricultural, with only 11% of the selected priority zone in natural cover. However, several conservation targets are found in this priority area: eight mussels, four fishes, one insect, and one turtle. Headwaters and creek systems range from low to high gradient and are underlain by a mixture of ground and end moraines, outwash, lake sands, loess and calcareous bedrock. The mainstem of the Rock is a low-gradient system underlain by alluvium. The Rock River system was included in the Prairie-Forest Border ecoregional plan (The Nature Conservancy 2001) as a selected conservation area.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	11_2B 6	11 2_9222	KISHWAUKEE R	
Confirmed	11_1C 3	11 1_17285	Mud Creek	
Confirmed	GR5.1	5_16.5	Lower Rock	
Confirmed	9_3B 10	9 3_4447	PECATONICA R	
Confirmed	11_W1953	11 4_1953	ROCK R/LOWER WAPSIPINICON R	
Confirmed	11_3B 13	11 3_4332	ROCK R	
Confirmed	11_2B 48	11 2_8641	BARK R	
Confirmed	11_1C 3	11 1_17321	BEAVER Creek	
Confirmed	11_1C 3	11 1_17226	KENT Creek, N FK	
Confirmed	11_1C 3	11 1_16327	WHITEWATER Creek	

Confirmed	11_1C 3	11 1_16325	SCUPPERNONG R
Confirmed	11_3B 16	11 3_4643	KISHWAUKEE R
Confirmed	11_1C 3	11 1_16036	ASHIPPUN R
Confirmed	11_1C 3	11 1_16027	Dawson Creek
Confirmed	11_1C 291	11 1_16324	BARK R
Confirmed	11_1C 2	11 1_17301	PISCASAW R
Confirmed	11_1C 2	11 1_17289	COON Creek
Confirmed	11_1C 3	11 1_17282	Rush Creek
Confirmed	11_1C 2	11 1_17271	KISHWAUKEE R
Possible	11_1C 322	11 1_16353	KOSHKONONG Creek
Possible	11_2B 1	11 2_9333	KYTE R
Possible	11_1C 3	11 1_17562	
Possible	11_1C 3	11 1_17554	KYTE R
Possible	11_1C 21	11 1_17553	KYTE R

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV39080	Quadrula metanerva	Monkeyface	
Confirmed	IMBIV14100	Elliptio dilatata	Spike	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Confirmed	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	
Confirmed	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Confirmed	IMBIV02110	Alasmidonta viridis	Slippershell Mussel	
Confirmed	IMBIV39090	Quadrula nodulata	Wartyback	
Confirmed	AFCJB28080	Notropis anogenus	Pugnose Shiner	
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Confirmed	AFCEA01010	Anguilla rostrata	American Eel	
Confirmed	IMBIV02040	Alasmidonta marginata	Elktoe	
Confirmed	IMBIV47060	Villosa iris	Rainbow	
Confirmed	AFCJC04010	Cycleptus elongates	Blue Sucker	
Confirmed	AFCJC05020	Ericymba sucetta	Lake Chubsucker	
Confirmed	AFCJC10040	Moxostoma carinatum	River Redhorse	
Confirmed	AFCJC10170	Moxostoma valenciennesi	Greater Redhorse	
Confirmed	ARAAD04010	Emydoidea blandingii	Blanding's Turtle	
Confirmed	IIODO80050	Stylurus notatus	Elusive Clubtail	
Confirmed	AFCFA01030	Alosa chrysochloris	Skipjack Herring	
Possible	IMBIV26020	Ligumia recta	Black Sandshell	
Possible	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Possible	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Possible	IMBIV39090	Quadrula nodulata	Wartyback	
Possible	IMBIV39080	Quadrula metanerva	Monkeyface	
Possible	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Possible	IIODO80050	Stylurus notatus	Elusive Clubtail	
Possible	ARAAD04010	Emydoidea blandingii	Blanding's Turtle	
Possible	AFCJC04010	Cycleptus elongatus	Blue Sucker	
Possible	AFCFA01030	Alosa chrysochloris	Skipjack Herring	
Possible	AFCEA01010	Anguilla rostrata	American Eel	
Possible	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Possible	IMBIV02040	Alasmidonta marginata	Elktoe	
Possible	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	

Threats

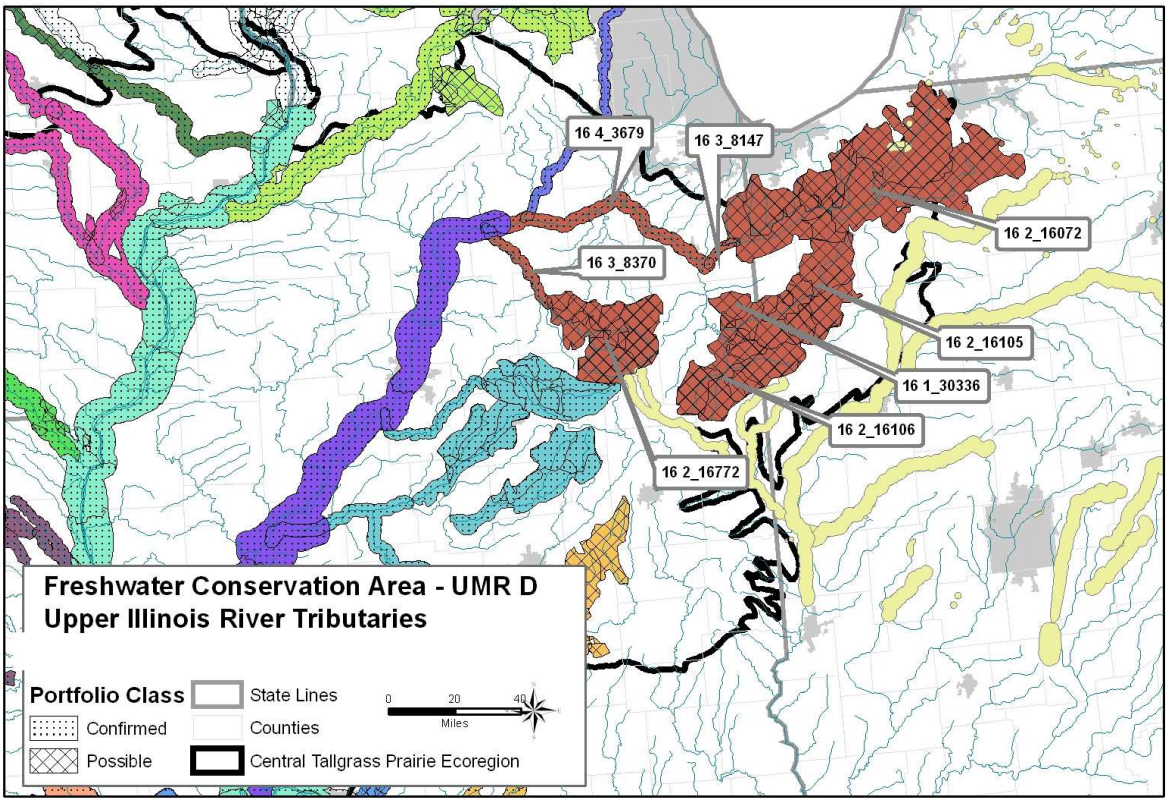
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Very High	High	Medium	High
Livestock Farming & Ranching	Medium	High	Medium	Medium	Medium
Dams & Water Management/Use	High	High	High	High	High
Agricultural & Forestry Effluents	High	High	High	Low	Medium
Droughts	High	Very High	High	Very High	Very High
Temperature Extremes	High	Very High	High	Very High	Very High
Storms & Flooding	High	Very High	High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Secure increased public funding for biodiversity conservation
- Reduce the threat to biodiversity from climate change, and enhance the ability of biodiversity to adapt to the threat
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

UMR D Upper Illinois River Tributaries



Description

Seven terrestrial conservation areas identified in the first-iteration Central Tallgrass Prairie ecoregional plan (The Nature Conservancy 2000) intersect this priority area. The Kankakee River priority area includes a portion of the mainstem Kankakee in western Indiana, and the river corridor in Will, Kankakee and Grundy Counties in northeastern Illinois. In this area, the river is small to medium-sized, low gradient, and flowing over mostly outwash and alluvium. The headwaters of this river are highly altered by channelization, but the mainstem is of relatively high quality in Illinois. It has long undammed stretches that retain meanders and oxbow lakes characteristic of very low-gradient rivers. The river offers rich habitat for macroinvertebrates and retains two rare mussels, the ellipse and the sheepnose. The ironcolor shiner, lake chubsucker, river redhorse, and eight mussel species comprise the targets found in this priority area. Historically, the river supported 20 species of mussels, including the endangered Higgins' eye mussel. Uplands are 24% natural vegetative cover, including dry savanna, oak barrens, sand prairie and wetlands.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	16_3D 17	16 3_8370	VERMILION R	
Confirmed	16_W3679	16 4_3679	ILLINOIS R	
Confirmed	16_3D 15	16 3_8147	KANAKEE R	
Possible	6_1D 219	16 1_30121	SINGLETON DITCH	
Possible	16_1D 219	16 1_29961	YELLOW R	
Possible	16_1D 219	16 1_31457	VERMILION R, N FK	
Possible	16_1D 221	16 1_29980	CROOKED Creek	
Possible	16_1D 221	16 1_30268	Coon Creek	
Possible	16_1D 221	16 1_30336	PIKE Creek	
Possible	16_1D 32	16 1_30172	OLIVER DITCH	
Possible	16_1D 32	16 1_30173	CARPENTER Creek	
Possible	16_1D 32	16 1_30234	SUGAR Creek	
Possible	16_1D 32	16 1_30235	MUD Creek	
Possible	16_1D 32	16 1_30236	FOUNTAIN Creek	
Possible	16_1D 32	16 1_31488	INDIAN Creek	
Possible	16_2D 30	16 2_16072	KANAKEE R	
Possible	16_2D 32	16 2_16105	IROQUOIS R	
Possible	16_2D 32	16 2_16106	SUGAR Creek	
Possible	16_1D 219	16 1_29959	KANAKEE R	
Possible	16_1D 1	16 1_30187	Hickory Branch	
Possible	16_2D 32	16 2_16772	VERMILION R	
Possible	16_1D 1	16 1_30182	Mosquito Creek	
Possible	16_1D 1	16 1_29982	Wolf Creek	
Possible	16_1D 1	16 1_29986	Cobb Creek	
Possible	16_1D 1	16 1_29984		
Possible	16_1D 1	16 1_30175	IROQUOIS R	
Possible	16_1D 1	16 1_31506	Wolf Creek	
Possible	16_1D 1	16 1_30191	IROQUOIS R	
Possible	16_1D 1	16 1_30195		
Possible	16_1D 1	16 1_30223		
Possible	16_1D 1	16 1_30229	IROQUOIS R	
Possible	16_1D 1	16 1_31476		
Possible	16_1D 1	16 1_29988		
Possible	16_1D 1	16 1_30231	IROQUOIS R	
Possible	16_1D 1	16 1_31482	FELKY SLOUGH	
Possible	16_1D 1	16 1_31474	FIVEMILE Creek	
Possible	16_1D 1	16 1_31462	VERMILION R, N FK	
Possible	16_1D 1	16 1_30272		
Possible	16_1D 1	16 1_30246		
Possible	16_1D 1	16 1_30240	Gay Creek	
Possible	16_1D 1	16 1_31496	Smith Branch	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV43030	Toxolasma lividus	Purple Lilliput	
Confirmed	IMBIV14100	Elliptio dilatata	Spike	
Confirmed	IMBIV21240	Lampsilis teres	Yellow Sandshell	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Confirmed	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Confirmed	IMBIV46050	Uniomerus tetralasmus	Pondhorn	
Confirmed	IMBIV34030	Plethobasus cyphus	Sheepnose	
Confirmed	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	
Confirmed	IMBIV39090	Quadrula nodulata	Wartyback	
Confirmed	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Confirmed	IMBIV13010	Ellipsaria lineolata	Butterfly	
Confirmed	AFCJC10170	Moxostoma valenciennesi	Greater Redhorse	
Confirmed	IMBIV39080	Quadrula metanerva	Monkeyface	
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	
Confirmed	ARAAD04010	Emydoidea blandingii	Blanding's Turtle	
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Confirmed	IMBIV09010	Cyclonaias tuberculata	Purple Wartyback	
Confirmed	AFCEA01010	Anguilla rostrata	American Eel	
Confirmed	AFCFA01030	Alosa chrysochloris	Skipjack Herring	
Confirmed	AFCJB28310	Notropis chalybaeus	Ironcolor Shiner	
Confirmed	AFCJC05020	Ericymba sucetta	Lake Chubsucker	
Confirmed	AFCQC01040	Ammocrypta clara	Western Sand Darter	
Confirmed	ARAAE01020	Kinosternon flavescens spooneri	"Illinois" Yellow Mud Turtle	
Confirmed	ICMAL25020	Bactrurus brachycaudus	an amphipod	

Confirmed	IMBIV02040	Alasmidonta marginata	Elktoe
Confirmed	IMBIV04130	Anodonta suborbiculata	Flat Floater
Confirmed	IMBIV06010	Arcidens confragosus	Rock Pocketbook
Confirmed	AFCJC10040	Moxostoma carinatum	River Redhorse
Confirmed	AAABC05061	Pseudacris streckeri illinoiensis	Illinois Chorus Frog

Threats

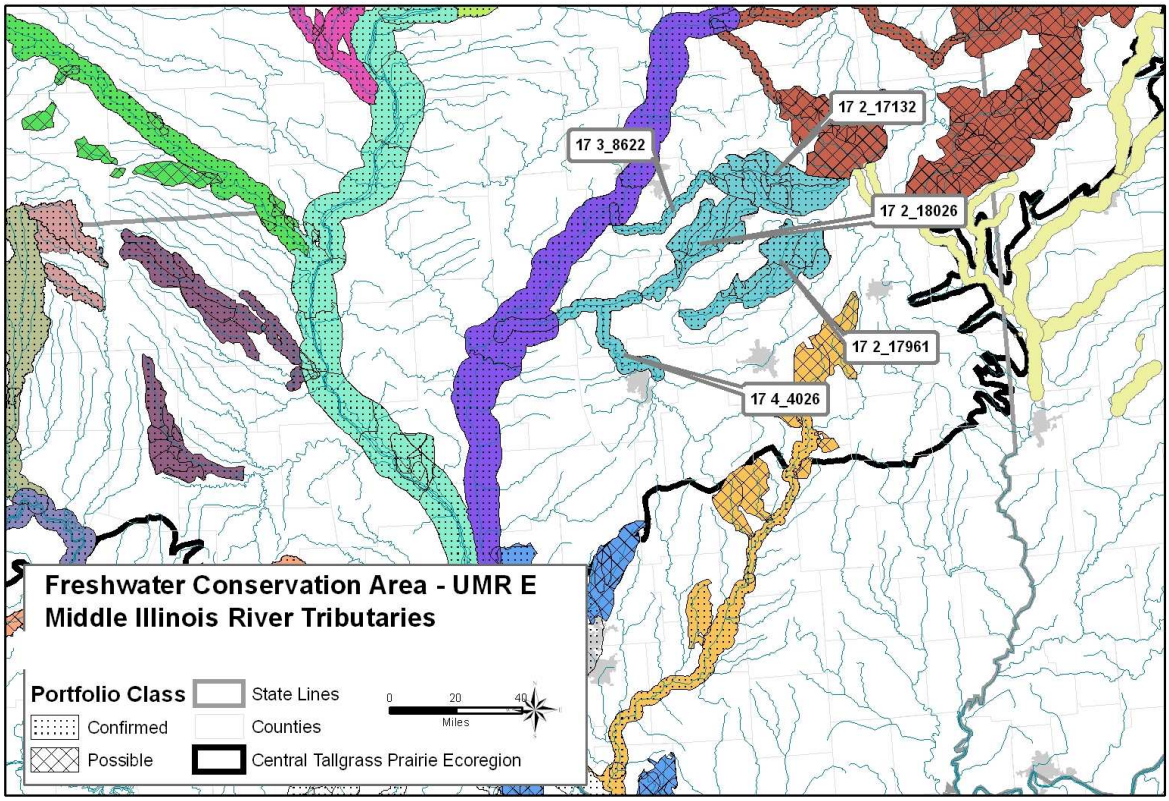
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Commercial & Industrial Areas	Very High	Very High	Very High	Very High	Very High
Housing & Urban Areas	Very High	Very High	Very High	Very High	Very High
Dams & Water Management/Use	Very High	Very High	Very High	Very High	Very High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	High	Very High
Renewable Energy	High	Medium	Medium	High	Medium
Other Ecosystem Modifications	Medium	Low	Low	Medium	Low
Annual & Perennial Non-Timber Crops	Medium	Very High	Medium	High	Medium
Roads & Railroads	Very High	High	High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Acquire lands, easements and leases to protect biodiversity
- Secure protected area designations for networks of lands and freshwater resources of high biodiversity value
- Secure increased public funding for biodiversity conservation
- Restore and maintain natural surface water and groundwater hydrology
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions
- Reduce and mitigate for the threats to biodiversity from large infrastructure projects including roads and dams

UMR E Middle Illinois River Tributaries



Description

Like so much of the Midwest, the landscape within the watersheds of these creeks and rivers has been almost completely altered by agriculture. This area boasts some of the most fertile farm land in the country. Prior to Euro-American settlement, the area was largely tallgrass prairie, but the advent of the moldboard plow changed that. So too did field drainage tile. Prior to these two modern alterations, glaciations had left a relatively level landscape of deep, fertile soils that was often poorly drained. Many counties of this area are 80 - 90% agriculture. Prior to these land use changes, the prairie landscape provided clean, stable flows within these streams. Although the aquatic diversity within these streams remains impressive, it is stressed by pollution, sediments and altered hydrology. The Mackinaw River is among the oldest Nature Conservancy freshwater projects within the upper Mississippi River basin and continues to be an area of research on best management practices for watershed management.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	17_1D 17	17 1_32040	MACKINAW R	
Confirmed	17_3D	17 17 3_8622	MACKINAW R	
Confirmed	17_1D	17 17 1_33252	SALT Creek	
Confirmed	17_1D	17 17 1_32041	Henline Creek	
Confirmed	17_1D	17 17 1_32078	Money Creek	
Confirmed	17_1D	17 17 1_32094	Sixmile Creek	
Confirmed	17_1D	17 17 1_33283	West Fork Salt Creek	
Confirmed	17_1D	17 17 1_33613	Kings Mill Creek	
Confirmed	17_2D 32	17 2_17132	MACKINAW R	
Confirmed	17_2D 32	17 2_18026	SUGAR Creek	
Confirmed	17_W4026	17 4_4026	SANGAMON R	
Confirmed	17_1D 17	17 1_33253	Trenkle Slough	
Confirmed	17_2D 32	17 2_17961	SALT Creek	

Confirmed	17_1D 1	17 1_32066	Buck Creek
Confirmed	17_1D 17	17 1_33564	SUGAR Creek
Confirmed	17_1D 17	17 1_33565	Timber Creek
Confirmed	17_1D 1	17 1_32050	Patton Creek
Confirmed	17_1D 1	17 1_32052	Little Creekooked Creek
Confirmed	17_1D 1	17 1_33635	
Confirmed	17_1D 1	17 1_32064	
Confirmed	17_1D 1	17 1_32085	Wolf Creek
Confirmed	17_1D 17	17 1_33612	SUGAR Creek, W FK
Confirmed	17_1D 1	17 1_32107	Denman Creek
Confirmed	17_1D 1	17 1_33263	
Confirmed	17_1D 1	17 1_33327	Tenmile Creek
Confirmed	17_1D 1	17 1_33333	
Confirmed	17_1D 1	17 1_33335	
Confirmed	17_1D 1	17 1_33615	
Confirmed	17_1D 1	17 1_32062	Turkey Creek

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV39090	Quadrula nodulata	Wartyback	
Confirmed	ARAAD04010	Emydoidea blandingii	Blanding's Turtle	
Confirmed	AFCQC01040	Ammocrypta clara	Western Sand Darter	
Confirmed	AFCJC10170	Moxostoma valenciennesi	Greater Redhorse	
Confirmed	AFCJC10040	Moxostoma carinatum	River Redhorse	
Confirmed	AFCFA01030	Alosa chrysochloris	Skipjack Herring	
Confirmed	AFCEA01010	Anguilla rostrata	American Eel	
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	
Confirmed	AAABC05061	Pseudacris streckeri illinoiensis	Illinois Chorus Frog	
Confirmed	ARAAE01020	Kinosternon flavescens spooneri	"Illinois" Yellow Mud Turtle	
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Confirmed	IMBIV46050	Uniomerus tetralasmus	Pondhorn	
Confirmed	ICMAL25020	Bactrurus brachycaudus	an amphipod	
Confirmed	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Confirmed	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Confirmed	IMBIV39080	Quadrula metanerva	Monkeyface	
Confirmed	IMBIV34030	Plethobasus cyphus	Sheepnose	
Confirmed	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV02110	Alasmidonta viridis	Slippershell Mussel	
Confirmed	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	
Confirmed	IMBIV21240	Lampsilis teres	Yellow Sandshell	
Confirmed	IMBIV02040	Alasmidonta marginata	Elktoe	
Confirmed	IMBIV04130	Anodonta suborbiculata	Flat Floater	
Confirmed	IMBIV06010	Arcidens confragosus	Rock Pocketbook	
Confirmed	IMBIV09010	Cyclonaias tuberculata	Purple Wartyback	
Confirmed	IMBIV13010	Ellipsaria lineolata	Butterfly	
Confirmed	IMBIV14100	Elliptio dilatata	Spike	

Threats

Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Very High	Very High	Very High	High	Very High
Agricultural & Forestry Effluents	High	High	High	Low	Medium
Dams & Water Management/Use	High	High	High	High	High
Invasive Non-Native/Alien Species	Medium	Very High	Medium	Medium	Medium
Droughts	Medium	Very High	Medium	Very High	High
Storms & Flooding	High	Very High	High	Very High	Very High

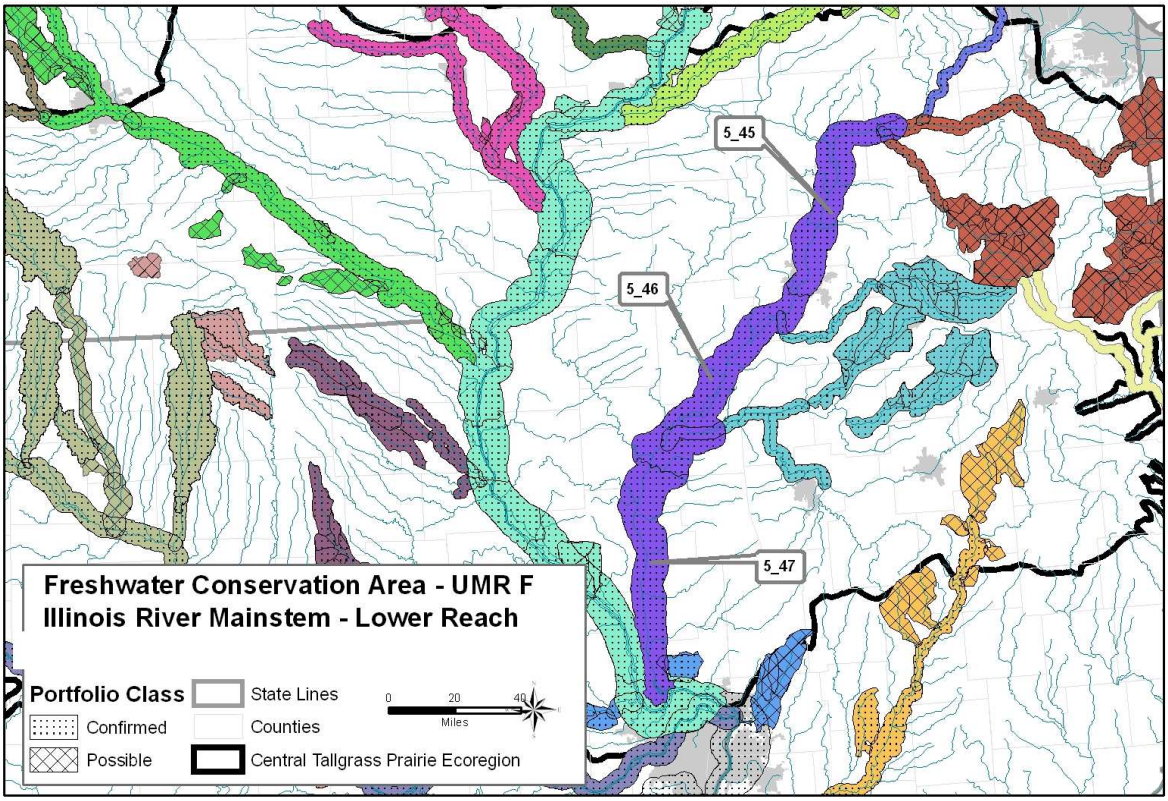
Overall Threat Rank: VERY HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands

- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

UMR F Illinois River Mainstem – Lower Reach



Description

The lower Illinois River mainstem has an incredible history from the Native Americans who used this river and its floodplain forests and wetlands for centuries as documented in the Dixon Mounds State Museum, to the heyday of market waterfowl hunting and fishing in the backwater lakes, through the rise and fall of the freshwater mussel industry. The economy of communities along the river has been dominated by the abundance of the natural biological resources of its waters and floodplain. Modern row crop agriculture dominates the landscape today and approximately 50% of its 400,000-acre floodplain is separated from the river by flood protection levees. The river itself has been extensively modified for commercial navigation, most notably by the construction of two locks and dams that maintain water depths required by fully loaded barges. Another threat to the natural communities along the river is the highly altered hydrology of the modern river. Due to the

loss of wetlands throughout the basin, the rapid runoff from urban and suburban communities and the efficiently drained farmland, the once-predictable water levels of the Illinois River have become erratic and unpredictable. All species, plants and animals that are adapted to the natural flood pulse of the river are negatively affected by this altered hydrology. Although there are some significant areas under protection and management, such as the 10,000-acre Sanganois Conservation Area, much of the conservation work of the area is restoration or recreation of natural landscapes and the natural processes that drive them. Good examples of this are Spunky Bottoms (2,000 acres) and Emiquon (7,000 acres) where The Nature Conservancy and its partners are working to restore former agricultural land to functional floodplain wetlands.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	GR11	5_45	Peoria Pool	
Confirmed	GR11	5_46	LaGrange Pool	
Confirmed	GR11	5_47	Alton Pool	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV14100	Elliptio dilatata	Spike	
Confirmed	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Confirmed	IMBIV34030	Plethobasus cyphus	Sheepnose	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Confirmed	IMBIV21240	Lampsilis teres	Yellow Sandshell	
Confirmed	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	
Confirmed	IMBIV39080	Quadrula metanerva	Monkeyface	
Confirmed	IMBIV39090	Quadrula nodulata	Wartyback	
Confirmed	IMBIV46050	Uniomerus tetralasmus	Pondhorn	
Confirmed	IMBIV13010	Ellipsaria lineolata	Butterfly	
Confirmed	AFCQC01040	Ammocrypta clara	Western Sand Darter	
Confirmed	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Confirmed	AFCJC10170	Moxostoma valenciennesi	Greater Redhorse	
Confirmed	AAABC05061	Pseudacris streckeri illinoiensis	Illinois Chorus Frog	
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	
Confirmed	AFCEA01010	Anguilla rostrata	American Eel	
Confirmed	ARAAE01020	Kinosternon flavescens spooneri	"Illinois" Yellow Mud Turtle	
Confirmed	AFCJC10040	Moxostoma carinatum	River Redhorse	
Confirmed	IMBIV09010	Cyclonaias tuberculata	Purple Wartyback	
Confirmed	ARAAD04010	Emydoidea blandingii	Blanding's Turtle	
Confirmed	ICMAL25020	Bactrurus brachycaudus	an amphipod	
Confirmed	IMBIV02040	Alasmidonta marginata	Elktoe	
Confirmed	IMBIV04130	Anodonta suborbiculata	Flat Floater	
Confirmed	IMBIV06010	Arcidens confragosus	Rock Pocketbook	
Confirmed	AFCFA01030	Alosa chrysochloris	Skipjack Herring	

Threats

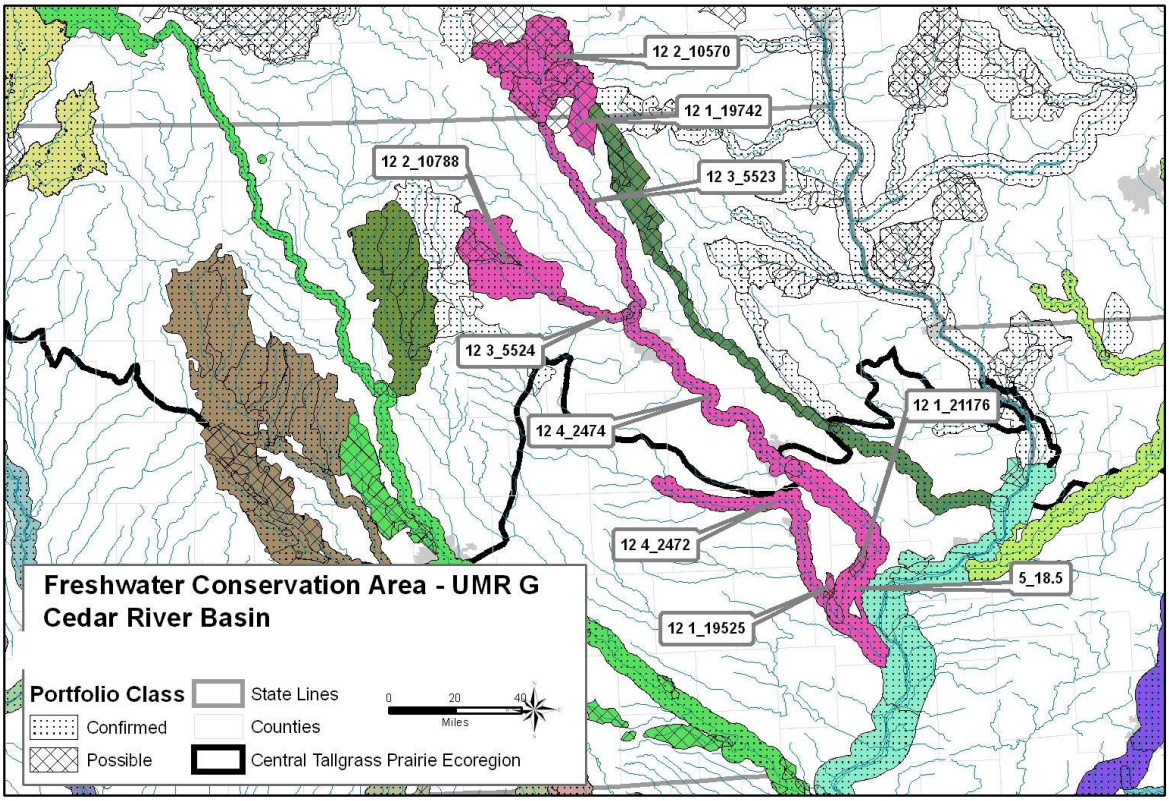
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	Very High	High	Medium	High
Shipping Lanes	Medium	Very High	Medium	High	Medium
Dams & Water Management/Use	High	Very High	High	High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	Very High	Very High
Agricultural & Forestry Effluents	High	High	High	Low	Medium
Droughts	Medium	Very High	Medium	Very High	High
Temperature Extremes	Medium	Very High	Medium	Very High	High
Storms & Flooding	Medium	Very High	Medium	Very High	High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Enhance the use of conservation science in public and private decisions with significant effects on biodiversity
- Establish partnerships to share resources and build the capacity of strategic private and non-profit conservation organizations
- Influence the land and water management decisions to protected area and public resource management agencies to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Restore degraded habitat at biologically important sites
- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

UMR G Cedar River Basin



Description

This priority area is composed of the mainstem of the Cedar River and the lower portion of the West Fork of the Cedar River in northeastern Iowa. These are both medium-sized, low- to moderate-gradient rivers with intermittent headwaters. They flow through coarse ground moraine, coarse outwash, dune sand and alluvium. The mainstem is noteworthy for its lack of dams, excellent biocriteria score, good fish assemblages, and intact riparian corridors. It supports populations of ancient fishes and includes five target mussel species: elktoe, spike, plain pocketbook, monkeyface, and ellipse. Upland areas of both system types are largely agricultural, with only 2 to 3% of natural vegetation intact. The Prairie-Forest Border ecoregional plan (The Nature Conservancy 2001) also included these systems as conservation priorities. The Lower Cedar River priority area includes the portion in Muscatine County, Iowa, to the confluence with the Iowa River. It is a big, low-gradient river system underlain by alluvium and colluvium with a relatively intact riparian corridor. There are no dams on the Cedar River, making it viable habitat for ancient fishes and a variety of other non-game fish. Target mussel species include yellow sandshell, plain pocketbook, black sandshell, threehorn wartyback, wartyback, and pistolgrip. This area was originally identified in both the first-iteration Central Tallgrass Prairie ecoregional plan (The Nature Conservancy 2000) and the upper Mississippi River assessment (Weitzell et al 2003).

Target OccurrencesSystems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	12_3C 6	12 3_5523	CEDAR R	
Confirmed	GR6.1	5_18.5	Lower Iowa-Cedar	
Confirmed	12_W2472	12 4_2472	IOWA R	
Confirmed	12_2C 8	12 2_10570	CEDAR R	
Confirmed	12_2C 10	12 2_10788	CEDAR R, W FK	

Confirmed	12_W2474	12 4_2474	CEDAR R, W FK
Confirmed	12_3C 5	12 3_5524	CEDAR R, W FK
Possible	12_1B 62	12 1_19567	CEDAR R
Possible	12_1B 62	12 1_21176	Pike Run
Possible	12_1B 62	12 1_19742	LITTLE CEDAR R
Possible	12_1B 62	12 1_19611	WOODBURY Creek
Possible	12_1B 62	12 1_19931	BAILEY Creek
Possible	12_1B 62	12 1_19584	ROSE Creek
Possible	12_1B 62	12 1_19549	ROBERTS Creek
Possible	12_1B 149	12 1_19577	TURTLE Creek
Possible	12_1B 149	12 1_19575	DOBBIN Creek
Possible	12_1B 62	12 1_19548	CEDAR R
Possible	12_1B 62	12 1_19525	RICHEY Creek
Possible	12_1B 62	12 1_19593	CEDAR R

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV02040	Alasmidonta marginata	Elktoe	
Confirmed	IMBIV39080	Quadrula metanerva	Monkeyface	
Confirmed	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Confirmed	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Confirmed	IMBIV39090	Quadrula nodulata	Wartyback	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV14100	Elliptio dilatata	Spike	
Confirmed	IMBIV21240	Lampsilis teres	Yellow Sandshell	
Confirmed	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Possible	IMBIV39090	Quadrula nodulata	Wartyback	
Possible	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Possible	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Possible	IMBIV26020	Ligumia recta	Black Sandshell	
Possible	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Possible	IMBIV21240	Lampsilis teres	Yellow Sandshell	

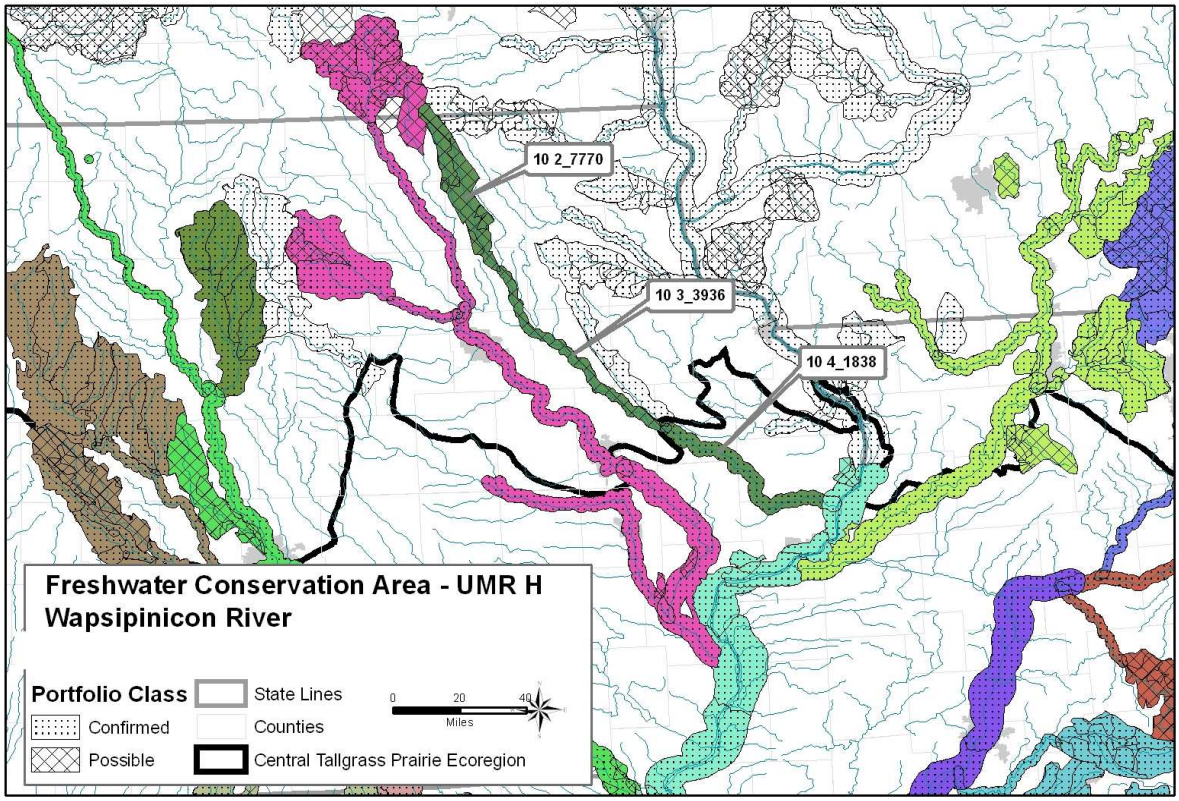
Threats

To be determined

Strategic Actions

To be determined

UMR H Wapsipinicon River



Description

A long, narrow catchment in northeastern Iowa, the Wapsipinicon River drains directly into the Mississippi River just north of the Quad Cities. A large tributary of the Wapsipinicon, Buffalo Creek, is also included in the priority area. This basin is remarkable for its high mussel diversity, and rich fish (30+ species) and insect fauna. Six mussel species targets are known from this system: elktoe, spike, plain pocketbook, black sandshell, wartyback, and ellipse. The riparian zone of Buffalo Creek is also relatively intact, and water quality is generally high. This system is a creek to small river system, coursing through fine ground moraine in its upper reaches and headwaters, and alluvium or coarse colluvium in its lower reaches. The Wapsipinicon drainage includes small headwater and creek systems in fine ground moraines, and a small through large, low-gradient river system consecutively underlain by fine ground moraine, colluvium, sand and alluvium. The drainage has relatively little natural cover remaining; systems range from 1 to 8% natural vegetation, including prairies, riparian and upland forests, and fens. The Wapsipinicon River was also identified as a conservation priority in the Prairie-Forest Border ecoregional plan (The Nature Conservancy 2001).

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	10_W1838	10 4_1838	WAPSIPINICON R	
Possible	10_1B 3	10 1_15009		
Possible	10_1B 3	10 1_14949	WAPSIPINICON R	
Possible	10_1B 3	10 1_15023	LITTLE WAPSIPINICON R	
Possible	10_1B 3	10 1_15039	Etter Creek	
Possible	10_1B 73	10 1_14946	WAPSIPINICON R	
Possible	10_2C 9	10 2_7770	WAPSIPINICON R	
Possible	10_3C 4	10 3_3936	WAPSIPINICON R	
Possible	10_1B 3	10 1_14947	WAPSIPINICON R	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV14100	Elliptio dilatata	Spike	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	IMBIV39090	Quadrula nodulata	Wartyback	
Confirmed	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Confirmed	IMBIV02040	Alasmidonta marginata	Elktoe	
Possible	IMBIV26020	Ligumia recta	Black Sandshell	
Possible	IMBIV39090	Quadrula nodulata	Wartyback	
Possible	IMBIV14100	Elliptio dilatata	Spike	
Possible	IMBIV02040	Alasmidonta marginata	Elktoe	
Possible	IMBIVA4010	Venustaconcha ellipsiformis	Ellipse	
Possible	IMBIV21250	Lampsilis cardium	Plain Pocketbook	

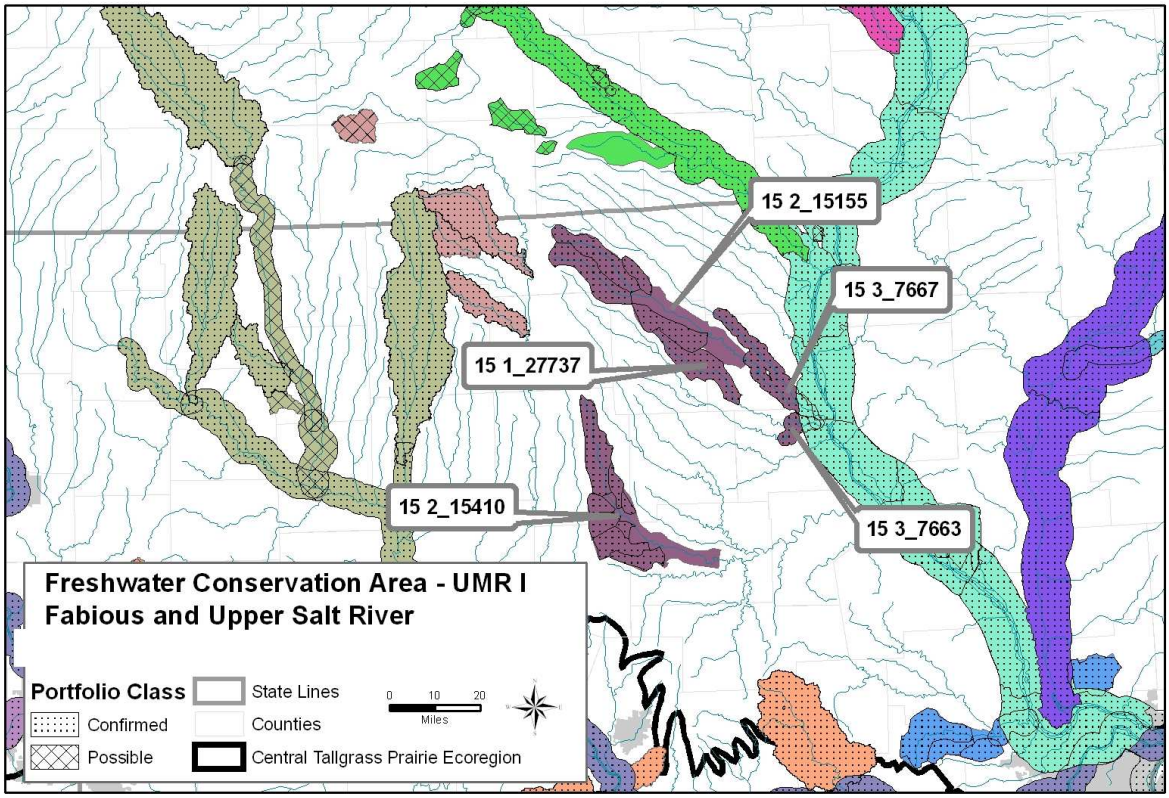
Threats

To be determined

Strategic Actions

To be determined

UMR I Fabius and Upper Salt River



Description

The Fabius River system of extreme northeastern Missouri drains into the Mississippi River near Quincy, Illinois. The mainstem of the Fabius River is a perennial, small, low-gradient river, with low- to high-gradient, largely intermittent tributaries in fine ground moraines, the main channel in alluvium, with isolated areas of fine, calcareous bedrock residuum. Tributaries of the Fabius River are good examples of Ozark border streams with high habitat and fish species diversity. Most notably, Troublesome Creek contains relict populations of bluntnose and slough darters in its middle portion. Five mussel targets and four fish targets are found in the priority area, which is marked by 31% natural cover. The

first-iteration Central Tallgrass Prairie ecoregional plan (The Nature Conservancy 2000) also selected the middle Fabius River corridor as a conservation priority for the region.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	15_1D 32	15 1_28733	MUD Creek	
Confirmed	15_1D 32	15 1_28699	Hoover Creek	
Confirmed	15_3D 5	15 3_7667	N FABIUS R	
Confirmed	15_3D 5	15 3_7663 S	FABIUS R	
Confirmed	15_2D 4	15 2_15410	SALT R, MIDDLE FK	
Confirmed	15_1D 32	15 1_28679	SALT R, MIDDLE FK	
Confirmed	15_1D 32	15 1_28751	FLAT Creek	
Confirmed	15_1D 1	15 1_28032	TOBIN Creek	
Confirmed	15_1D 32	15 1_28112	BRIDGE Creek	
Confirmed	15_1D 32	15 1_28020	M FABIUS R, S FK	
Confirmed	15_1D 32	15 1_28019	M FABIUS R, N FK	
Confirmed	15_1D 32	15 1_27737	TROUBLESOME Creek	
Confirmed	15_1D 1	15 1_28715	Rich Land Creek	
Confirmed	15_1D 1	15 1_28705		
Confirmed	15_1D 1	15 1_28697	Winn Branch	
Confirmed	15_1D 1	15 1_28693	Narrows Creek	
Confirmed	15_2D 4	15 2_15155	M FABIUS R	
Confirmed		15 3_7604	FOX R	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Confirmed	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV21240	Lampsilis teres	Yellow Sandshell	
Confirmed	IMBIV04130	Anodonta suborbiculata	Flat Floater	
Confirmed	AFCQC01040	Ammocrypta clara	Western Sand Darter	
Confirmed	AFCQB11120	Lepomis miniatus	Redspotted Sunfish	
Confirmed	AFCJC10040	Moxostoma carinatum	River Redhorse	
Confirmed	AFCEA01010	Anguilla rostrata	American Eel	

Threats

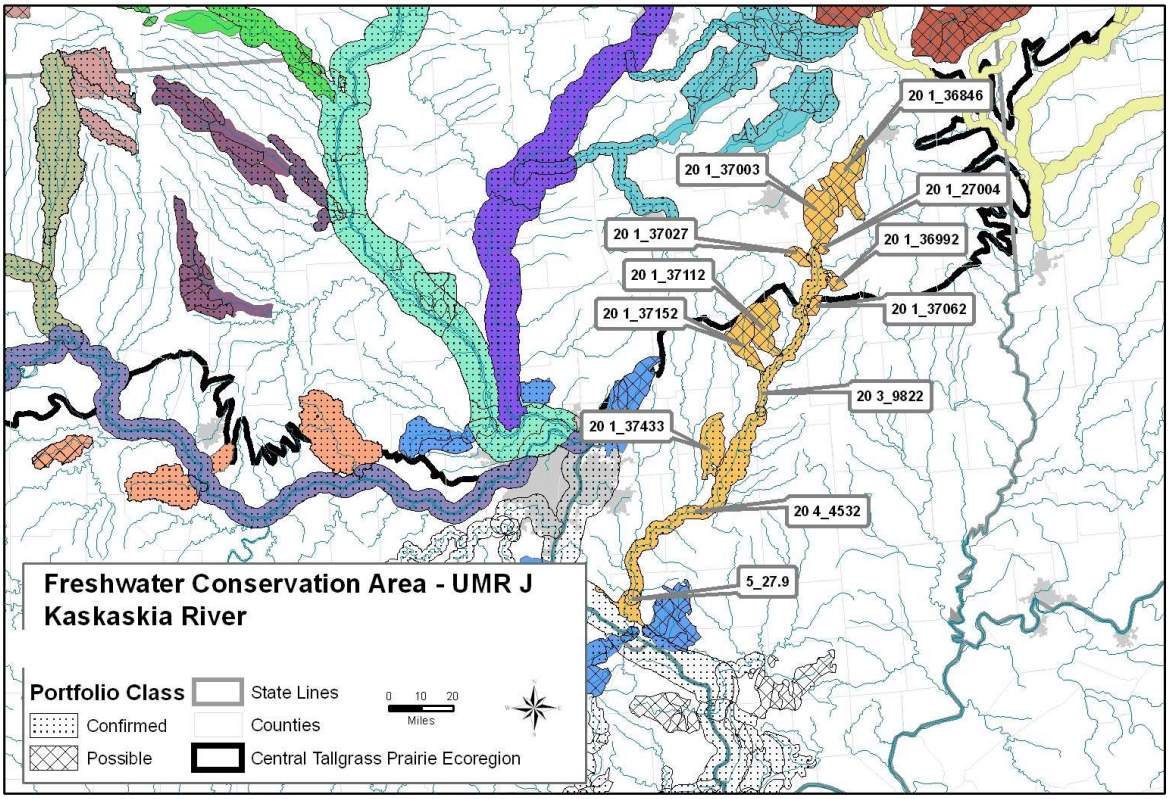
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	High	High	High	High	High
Livestock Farming & Ranching	Medium	High	Medium	Medium	Medium
Dams & Water Management/Use	Very High	High	High	High	High
Invasive Non-Native/Alien Species	Medium	Medium	Medium	High	Medium

Overall Threat Rank: HIGH

Strategic Actions

- Build capacity to prevent, detect and control invasive species with high potential to threaten biodiversity
- Restore and maintain natural surface water and groundwater hydrology
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

UMR J Kaskaskia River



Description

The Kaskaskia River basin covers 5,700 square miles, entirely contained within the state of Illinois. Located in central and southwestern Illinois, the land use within the basin is largely row crop agriculture today. The river now boasts two of the three largest man-made lakes in Illinois, Lake Shelbyville and Carlyle Lake, due to flood control projects by the US Army Corps of Engineers. The Corps has also channelized the lower 36 miles of the river and built a lock and dam at the confluence with the Mississippi River to accommodate commercial barge traffic. In spite of these alterations, 136,000 acres or 13% of the basin, remain as bottomland hardwood forest, including the largest contiguous forest in Illinois of 7,000 acres. The basin has 59 state-threatened or -endangered species, 60 Illinois Natural Area Inventory sites and 10 Illinois Nature Preserves. In addition to the large blocks of forest, perhaps the most notable natural community is the high-quality flatwoods occurring in the central and southern portions of the basin. The primary threats to the natural resources of the area are exotic species, fire suppression, erosion, excessive drainage and fragmentation.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	20_1E 185	20 1_37433	BEAVER Creek	
Confirmed	20_3D 17	20 3_9822	KASKASKIA R	
Confirmed	20_W4532	20 4_4532	KASKASKIA R	
Confirmed	GR9.2	5_27.9	Lower Kaskaskia	
Possible	20_1E 2	20 1_37062	Jordan Creek	
Possible	20_1E 185	20 1_37003		
Possible	20_1E 185	20 1_37112	BECKS Creek	
Possible	20_1E 185	20 1_37152	RAMSEY Creek	
Possible	20_1E 2	20 1_36986		
Possible	20_1E 2	20 1_36992	Sand Creek	

Possible	20_1E 2	20 1_37027	
Possible	20_1E 185	20 1_36846	KASKASKIA R, LAKE FK
Possible	20_1E 2	20 1_37004	

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	AFCQC02120	Etheostoma chlorosoma	Bluntnose Darter	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV26030	Ligumia subrostrata	Pondmussel	
Confirmed	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Confirmed	AFCQC01040	Ammocrypta clara	Western Sand Darter	
Possible	AFCQC01040	Ammocrypta clara	Western Sand Darter	
Possible	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Possible	IMBIV44010	Tritogonia verrucosa	Pistolgrip	

Threats

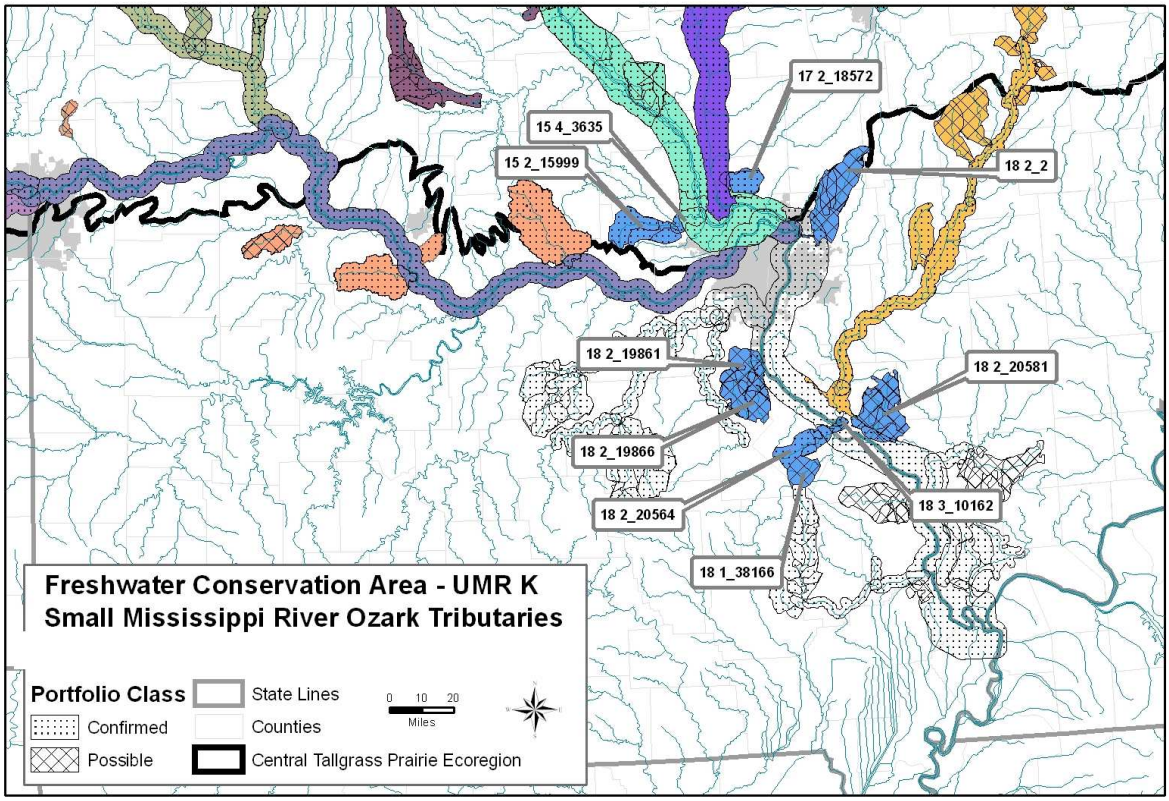
Threats	Severity of Threat	Scope of Threat	Threat Magnitude	Irreversibility	Threat Rank
Annual & Perennial Non-Timber Crops	Very High	Very High	Very High	Medium	Very High
Agricultural & Forestry Effluents	High	High	High	Low	Medium
Shipping Lanes	Very High	Medium	Medium	Very High	High
Invasive Non-Native/Alien Species	Very High	Very High	Very High	High	Very High
Droughts	High	Very High	High	High	High
Storms & Flooding	High	Very High	High	Very High	Very High

Overall Threat Rank: VERY HIGH

Strategic Actions

- Build a constituency for biodiversity conservation
- Enhance incentives for conservation of biodiversity on private lands
- Develop markets and other mechanisms to compensate landowners, communities and governments for ecosystem services their lands and waters provide
- Acquire lands, easements and leases to protect biodiversity
- Secure increased public funding for biodiversity conservation
- Reduce the threat to biodiversity from climate change, and enhance the ability of biodiversity to adapt to the threat
- Reduce the threat to biodiversity from nutrients, sediments and toxic pollutants
- Reduce and mitigate for the threat to biodiversity from agriculture (farming and livestock grazing/ranching) practices and land conversions

UMR K Small Mississippi River Ozark Tributaries



Description

A full description was not available for this freshwater conservation area. This conservation area is composed of several small tributaries to the Mississippi River, located in counties adjoining the greater St. Louis metropolitan area as well as counties slightly downstream of St. Louis. The tributary systems include Otter Creek in Jersey County (Missouri); Paddock, Cherry and Cahokia Creeks in Madison County (Illinois); Cuivre River in Lincoln County and Big Creek in St. Charles County; Plattin and Joachim Creeks in Jefferson County (Missouri); River aux Vases and Saline Creek in Sainte Genevieve County; and Mary's River in Randolph County (Illinois). The tributaries all drain directly into the Mississippi River, except for Otter Creek and nearby tributaries, which drain into the Illinois River just upstream of its confluence with the Mississippi. Otter Creek is part of the Biologically Significant Illinois Streams System called the Lower Illinois River Tributaries and American Bottoms.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	18_1E 4	18 1_38142	Mill Creek	
Confirmed	18_2D79	18 2_20564	R AUX VASES	
Confirmed	18_1E 4	18 1_38154		
Confirmed	17_2D 32	17 2_18572	OTTER Creek	
Confirmed	15_W3635	15 4_3635	CUIVRE R	
Confirmed	15_2D 4	15 2_15999	Big Creek	
Confirmed	15_1D 32	15 1_29814	Big Creek	
Confirmed	15_1D 32	15 1_29813	Big Creek	
Confirmed	15_1D 32	15 1_29810	McCoy Creek	
Confirmed	17_1D 17	17 1_34608	OTTER Creek	
Confirmed	18_1E 43	18 1_38141	R AUX VASES	
Possible	18_3D 3	18 3_10162	R AUX VASES	
Possible	18_1E 4	18 1_36720		

Possible	18_1E 43	18 1_36638	JOACHIM Creek
Possible	18_1E 43	18 1_36706	PLATIN Creek
Possible	18_1E 43	18 1_38166	SALINE Creek
Possible	18_2D 4	18 2_2	CAHOKIA CANAL
Possible	18_2D 4	18 2_20581	MARYS R
Possible	18_2D 79	18 2_19866	PLATIN Creek
Possible	18_1E 4	18 1_36718	PLATIN Creek
Possible	18_1E 4	18 1_36639	Cotter Creek
Possible	18_2D 79	18 2_19861	JOACHIM Creek
Possible	18_1E 296	18 1_38255	LITTLE MARYS R
Possible	18_1E 296	18 1_11	PADDOCK Creek
Possible	18_1E 4	18 1_36671	Buck Creek
Possible	18_1E 4	18 1_36707	Flucom Creek
Possible	18_1E 296	18 1_3	CAHOKIA Creek
Possible	18_1E 296	18 1_38243	COX Creek
Possible	18_1E 296	18 1_38258	Mill Creek
Possible	18_1E 296	18 1_7	Sherry Creek
Possible	18_1E 4	18 1_36646	Haverstick Creek
Possible	18_1E 4	18 1_36675	Little Creek
Possible	18_1E 296	18 1_38242	MARYS R

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV14080	Elliptio crassidens	Elephantear	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	IMGASF0030	Viviparus subpurpureus	Olive Mysterysnail	
Confirmed	IMBIV44010	Tritogonia verrucosa	Pistolgrip	
Confirmed	IMBIV39090	Quadrula nodulata	Wartyback	
Confirmed	IMBIV39080	Quadrula metanerva	Monkeyface	
Confirmed	IMBIV37030	Potamilus capax	Fat Pocketbook	
Confirmed	IMBIV35070	Pleurobema sintoxia	Round Pigtoe	
Confirmed	IMBIV34030	Plethobasus cyphus	Sheepnose	
Confirmed	IMBIV08010	Cumberlandia monodonta	Spectaclecase	
Confirmed	IMBIV26030	Ligumia subrostrata	Pondmussel	
Confirmed	AFCAA01020	Acipenser fulvescens	Lake Sturgeon	
Confirmed	IMBIV21250	Lampsilis cardium	Plain Pocketbook	
Confirmed	IMBIV21240	Lampsilis teres	Yellow Sandshell	
Confirmed	IMBIV21100	Lampsilis higginsii	Higgins Eye	
Confirmed	IMBIV17060	Fusconaia ebena	Ebonyshell	
Confirmed	AFCFA01030	Alosa chrysochloris	Skipjack Herring	
Confirmed	IMBIV30010	Obliquaria reflexa	Threehorn Wartyback	
Confirmed	AFCEA01010	Anguilla rostrata	American Eel	
Confirmed	IMBIV13010	Ellipsaria lineolata	Butterfly	
Confirmed	AFCJB16010	Hybognathus argyritus	Western Silvery Minnow	
Confirmed	AFCJC04010	Cycleptus elongates	Blue Sucker	
Confirmed	AFCJC10040	Moxostoma carinatum	River Redhorse	
Confirmed	AFCQC02120	Etheostoma chlorosoma	Bluntnose Darter	
Confirmed	AFCQC04090	Percina evides	Gilt Darter	
Confirmed	ICMAL01370	Caecidotea packardi	an isopod	
Confirmed	ICMAL25020	Bactrurus brachycaudus	an amphipod	
Confirmed	IMBIV04130	Anodonta suborbiculata	Flat Floater	
Confirmed	IMBIV06010	Arcidens confragosus	Rock Pocketbook	
Confirmed	AFCQC01040	Ammocrypta clara	Western Sand Darter	
Confirmed	AFCAB01010	Polyodon spathula	Paddlefish	

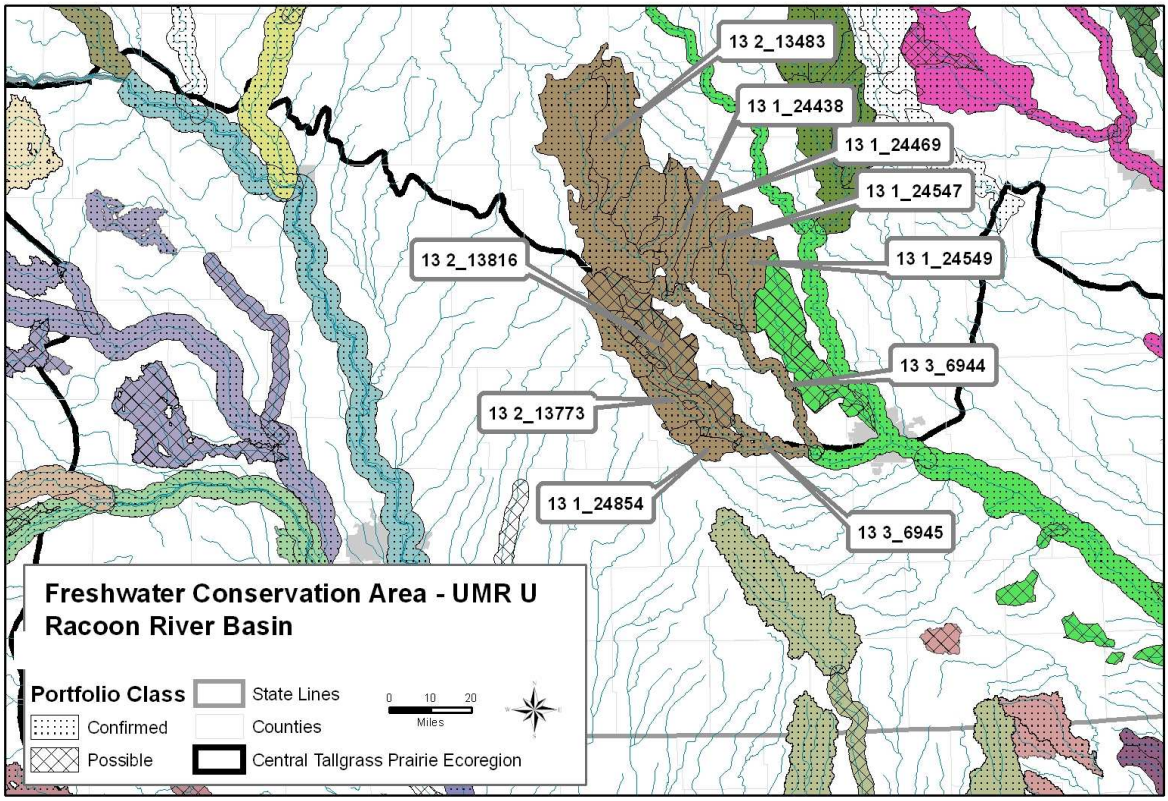
Threats

To be determined

Strategic Actions

To be determined

UMR U Raccoon River Basin



Description

The Raccoon River basin portfolio area includes the headwaters and mainstems of the North, Middle and South Branches of the Raccoon River. During the Northern Tallgrass Prairie ecoregional planning process, this system was added to the network of freshwater areas of biodiversity significance (ABS) in the upper Mississippi River basin (described in Weitzell et al. 2003) because of expert opinion and new survey data. This system is a tributary of the Des Moines River system in west-central Iowa. Most of the streams and tributaries of the Raccoon basin are low- to moderate-gradient channels underlain by thick deposits of fine ground and end moraines. The mainstem of the river flows through coarse outwash and alluvium. Over 90% of upland areas in this basin are cultivated. Despite unfavorable upland conditions, this basin is notable for the presence of fair-quality, off-channel habitats and a semi-natural flood regime. Four target species persist in the basin: Topeka shiner, plain pocketbook, monkeyface, and wartyback. Experts particularly noted the conservation value of East and West Buttrick Creek and Hardin Creek. These three subbasins of the Raccoon provide some of the most stable populations of and critical habitat for the federally endangered Topeka shiner. In addition, they serve as habitat for diverse mussel assemblages, although recent surveys were not able to document evidence of mussel recruitment. Finally, they also support a fairly good diversity of other fish species.

Target Occurrences

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	13_3C 15	13 3_6944	N RACCOON R	
Confirmed	13_1B 3	13 1_24742	S RACCOON R	
Confirmed	13_1B 3	13 1_24796		
Confirmed	13_1B 3	13 1_24404	Buck Run	

Confirmed	13_1B 3	13 1_24926	M RACCOON R
Confirmed	13_1B 3	13 1_24934	M RACCOON R
Confirmed	13_2C 36	13 2_13483	N RACCOON R
Confirmed	13_3C 1	13 3_6945	S RACCOON R
Confirmed	13_1B 149	13 1_24469	Cedar Creek
Confirmed	13_1B 3	13 1_24401	Marrowbone Creek
Confirmed	13_2C 6	13 2_13773	Brushy Creek
Confirmed	13_1B 149	13 1_24284	N RACCOON R
Confirmed	13_1B 24	13 1_24854	
Confirmed	13_1B 24	13 1_24752	Brushy Creek
Confirmed	13_1B 24	13 1_24732	MASON Creek
Confirmed	13_1B 24	13 1_24727	S RACCOON R
Confirmed	13_1B 149	13 1_24547	HARDIN Creek
Confirmed	13_1B 149	13 1_24438	PURGATORY Creek
Confirmed	13_1B 149	13 1_24360	LAKE Creek
Confirmed	13_1B 149	13 1_24343	CAMP Creek
Confirmed	13_1B 149	13 1_24289	CEDAR Creek
Confirmed	13_1B 149	13 1_24549	West Buttrick Creek
Confirmed	13_1B 3	13 1_24352	PRAIRIE Creek
Possible	13_2C 3	13 2_13816	M RACCOON R
Possible	13_1B 3	13 1_24915	Willey Branch
Possible	13_1B 3	13 1_24913	Spring Branch
Possible	13_1B 3	13 1_24897	
Possible	13_1B 24	13 1_24896	M RACCOON R
Possible	13_1B 149	13 1_24903	STORM Creek
Possible	13_1B 149	13 1_24960	WILLOW Creek

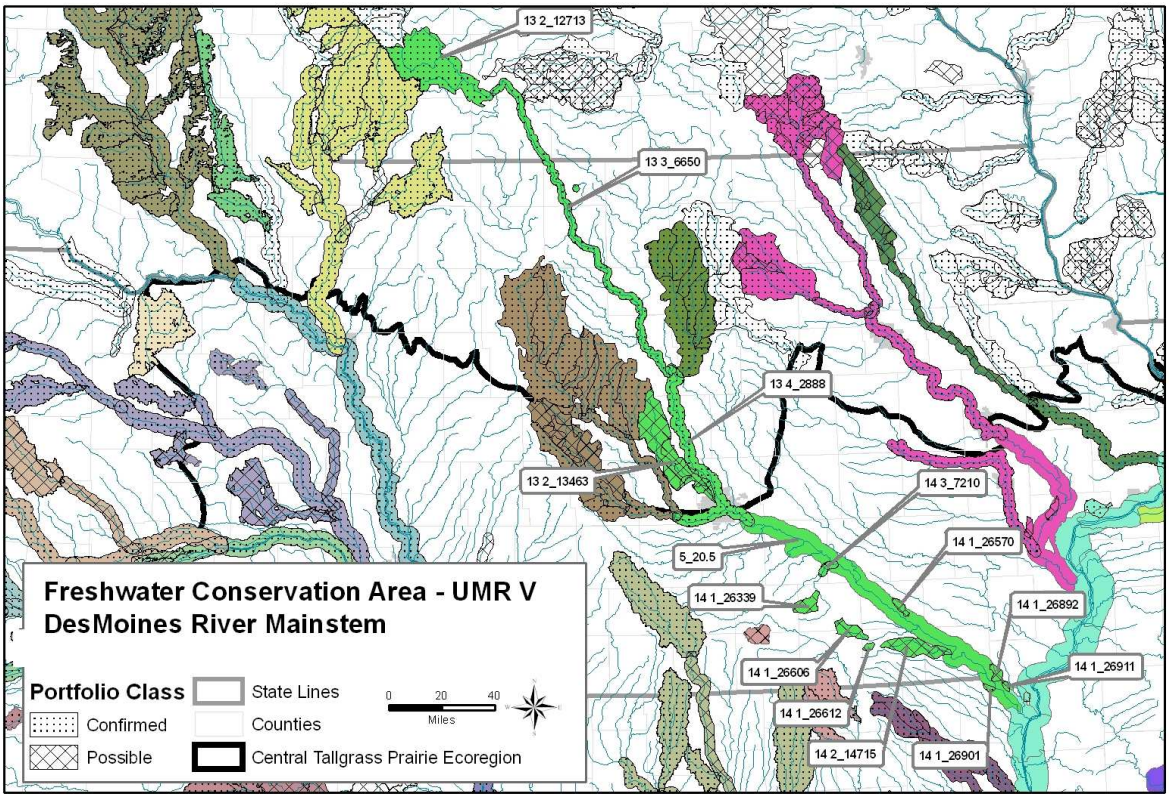
Threats

To be determined

Strategic Actions

To be determined

UMR V Des Moines River Mainstem - Lower Reach



Description

The Des Moines River portfolio area includes the mainstem of the Des Moines River and several headwater drainages. During the Northern Tallgrass Prairie ecoregional planning process, this system was added to the network of areas of biodiversity significance (ABS) in the upper Mississippi River basin (described in Weitzell et al. 2003) because of expert opinion and new survey data. The upper mainstem of the river flows southeasterly through a narrow basin located in north-central Iowa and southwestern Minnesota. The basin consists primarily of fine ground and end moraines with some areas of outwash. More than 90% of upland areas are covered in row crop agriculture. Experts noted the presence of high-quality calcareous fens and isolated examples of high-quality upland cover (mesic/gravel prairie systems) in this basin. In addition, experts felt that the riparian corridor of the Des Moines River was relatively good quality. Six mussel species targets occur in the basin, but have only been noted in the northernmost reaches of the river: elktoe, spike, plain pocketbook, black sandshell, and round pigtoe.

Weitzell et al (2003) note the following for the lower mainstem of the Des Moines River: Flowing in a southeasterly direction through central and southern Iowa, the Des Moines River enters the Mississippi River at Keokuk, in extreme southeastern Iowa. The river primarily courses through fine ground and end moraines in its upper reaches, and alluvium and outwash in its lower reaches. Although water quality in this region is greatly impacted by nutrients from agriculture, especially nitrogen, at least five target species have been found in this portion of the basin: Topeka shiner, ebonyshell, black sandshell, wartyback, and pondhorn. The first iteration Central Tallgrass Prairie ecoregional plan (The Nature Conservancy 2000) also identified five conservation areas within this priority area. All are affiliated with the river system: bluff habitats, cove ravines, creeks and the mainstem of the Des Moines. Systems draining into the lower Des Moines support 14-59% natural cover, which is relatively high for this part of the state.

Targets

Systems

Portfolio Status	AES Type	AES ID	AES Name	Viability
Confirmed	13_1B 149	13 1_23075	DES MOINES R	
Confirmed	13_1B 149	13 1_23076	BEAVER Creek	
Confirmed	14_1B 3	14 1_26901	Cedar Creek	
Confirmed	GR7.1	5_20.5	Lower Des Moines	
Confirmed	13_2C 36	13 2_12713	DES MOINES R	
Confirmed	13_W2888	13 4_2888	DES MOINES R	
Confirmed	13_3C 15	13 3_6650	DES MOINES R	
Possible	14_1B 149	14 1_26339	Whites Creek	
Possible	14_3C 6	14 3_7210	CEDAR Creek	
Possible	14_2C 10	14 2_14715	CHEQUEST Creek	
Possible	14_1B 3	14 1_26911	Monks Creek	
Possible	14_1B 3	14 1_26892	Lick Creek	
Possible	14_1B 3	14 1_26612	Pee Dee Creek	
Possible	14_1B 3	14 1_26578		
Possible	14_1B 149	14 1_26606	SOAP Creek	
Possible	13_2C 3	13 2_13463	BEAVER Creek	
Possible	13_1B 3	13 1_24233	Little Beaver Creek	
Possible	13_1B 3	13 1_24197	Royer Creek	
Possible	13_1B 149	13 1_24178	Little Beaver Creek	
Possible	13_1B 149	13 1_24177	BEAVER Creek	
Possible	14_1B 3	14 1_26570		

Species

Portfolio Status	GELCODE	Scientific Name	Common Name	Viability
Confirmed	IMBIV17060	Fusconaia ebena	Ebonyshell	
Confirmed	IMBIV46050	Uniomerus tetralasmus	Pondhorn	
Confirmed	IMBIV26020	Ligumia recta	Black Sandshell	
Confirmed	AFCJB28960	Notropis topeka	Topeka Shiner	

Confirmed	IMBIV39090	Quadrula nodulata	Wartyback
Possible	AFCJB28960	Notropis topeka	Topeka Shiner
Possible	IMBIV17060	Fusconaia ebena	Ebonyshell
Possible	IMBIV26020	Ligumia recta	Black Sandshell
Possible	IMBIV39090	Quadrula nodulata	Wartyback
Possible	IMBIV46050	Uniomerus tetralasmus	Pondhorn

Threats

To be determined

Strategic Actions

To be determined

Appendix 15. Terrestrial Species Targets: Goal Status Summary

This appendix summarizes how well the Central Tallgrass Prairie ecoregional portfolio has captured occurrences and contributed toward ecoregional conservation goals for each species target. Species are grouped by broad taxa (e.g., mammal, bird) and then sorted by GELCODE. Each species' summary is headed by its common name, GELCODE, global rank, and distribution relative to this ecoregion.

There are three major components to the goal status summaries for species. The first section shows the number of occurrences of the species that have been documented in the ecoregion, summarized by stratification unit. The number of occurrences present in each stratification unit is subtotaled according to viability ranks ("VG+G" = total number of Very Good and Good occurrences, "F" = total number of Fair occurrences, and "Oth" = total number of occurrences of all other ranks). If there are no numbers, no occurrences of this species have been documented in this ecoregion to date.

The second section shows the number of occurrences that have been captured within the ecoregional portfolio within each stratification unit. Only those occurrences having a viability rank of Very Good, Good or Fair and are within the portfolio are counted; occurrences that lie within the portfolio, but have a viability rank of Poor or Unknown, are not counted. If this section is blank, no occurrences were captured in the portfolio.

Ecoregion-wide totals are listed at the bottom of each summary. The total number of occurrences throughout the entire ecoregional portfolio that were counted toward conservation goals is listed. Because an occurrence may straddle two stratification units, the total number of occurrences captured may be slightly smaller than the sum of the occurrences captured in each of the stratification units. The ecoregion-wide conservation goal is the total number of occurrences that should be conserved across the entire ecoregion in order for the target as a whole to persist in the long-term in good ecological health.

Mammal

Gray Myotis — *Myotis grisescens* — AMACC01040 G3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth
											1	4						

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Indiana Myotis — *Myotis sodalis* — AMACC01100 G2 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth
							19	17	11	2	2	14	1		13			4
# of EOs Captured in Portfolio by SU:	0			0			19			3			1			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **20** — Ecoregion-wide Conservation Goal: **4**

Bird

Greater Prairie-chicken — *Tympanuchus cupido* — ABNLC13010 G4 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth	VG+G	F	Oth
	4					2	1		54			1						
# of EOs Captured in Portfolio by SU:	4			0			1			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **5** — Ecoregion-wide Conservation Goal: **4**

Piping Plover — *Charadrius melodus* — ABNNB03070 G3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			16	1	1	7			2									
# of EOs Captured in Portfolio by SU:	0			2			0			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Interior Least Tern — *Sternula antillarum athalassos* — ABNNM08102 G4T2Q — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	1		8	1	1	2												
# of EOs Captured in Portfolio by SU:	1			2			0			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Bell's Vireo — *Vireo bellii* — ABPBW01110 G5 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	1	5	2		5	1	1		3				1					
# of EOs Captured in Portfolio by SU:	6			5			1			0			1			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **9** — Ecoregion-wide Conservation Goal: **4**

Golden-winged Warbler — *Vermivora chrysoptera* — ABPBX01030 G4 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																	1	1
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Baird's Sparrow — *Ammodramus bairdii* — ABPBXA0010 G4 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Henslow's Sparrow — *Ammodramus henslowii* — ABPBXA0030 — G4 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	1	1	6			1	6	2	37			4	1		19	1		3
# of EOs Captured in Portfolio by SU:	1			0			4			0			1			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **4** — Ecoregion-wide Conservation Goal: **4**

Reptile

Yellow Mud Turtle — *Kinosternon flavescens* — ARAAE01020 — G5 — **Disjunct**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									1			24			1			

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **5** — Ecoregion-wide Conservation Goal: **7**

Kirtland's Snake — *Clonophis kirtlandii* — ARADB06010 — G2 — **Limited**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
													1	1	14			
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **7**

Copperbelly Water Snake — *Nerodia erythrogaster neglecta* — ARADB22023 — G5T3 — **Limited**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1		5						
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Eastern Massasauga — *Sistrurus catenatus catenatus* — ARADE03011 — G3G4T3T4Q — **Limited**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	2	1		2	1	9	1		1		2	3			4	2	1	4
# of EOs Captured in Portfolio by SU:	3			3			1			2			0			2		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **8** — Ecoregion-wide Conservation Goal: **7**

Amphibian

Illinois Chorus Frog — *Pseudacris streckeri illinoensis* — **AAABC05061** — **G5T3** — **Limited**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										2								
# of EOs Captured in Portfolio by SU:	0			0			0			2			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 2** **Ecoregion-wide Conservation Goal: 7**

Mollusk

Bluff Vertigo — *Vertigo meramecensis* — **IMGAS20190** — **G2G3** — **Limited?**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									6									

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 7**

Hubricht's Vertigo — *Vertigo hubrichti* — **IMGAS20380** — **G3** — **Peripheral**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									1									

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal:**

Pleistocene Disc — *Discus macclintocki* — **IMGAS54060** — **G1** — **Peripheral**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							3											
# of EOs Captured in Portfolio by SU:	0			0			3			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 2** **Ecoregion-wide Conservation Goal:**

Insect

Salt Creek Tiger Beetle — *Cicindela nevadica lincolniana* — **IICOL02173** — **G5T1** — **Endemic**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
		2	6															
# of EOs Captured in Portfolio by SU:	2			0			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 2** **Ecoregion-wide Conservation Goal: 10**

American Burying Beetle — *Nicrophorus americanus* — IICOL42010 — G2G3 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			1			1												1

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **4**

Red-Tailed Leafhopper — *Aflexia rubranura* — IIHOM08010 — G2 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
													2		1			1
# of EOs Captured in Portfolio by SU:	0			0			0			0			2			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **4**

Persius Dusky Wing — *Erynnis persius persius* — IILEP37171 — G5T1T3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
				1					1								1	
# of EOs Captured in Portfolio by SU:	0			1			0			0			0			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **2**

Powesheik Skipperling — *Oarisma powesheik* — IILEP57010 — G2G3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
						1			1									

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Dakota Skipper — *Hesperia dacotae* — IILEP65140 — G2 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
						1			1									

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Bucholz Black Dash | *Euphyes conspicua bucholzi* | IILEP77061 | G4T1 | **Endemic**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			1															

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: | Ecoregion-wide Conservation Goal: **10**

Frosted Elfin | *Callophrys irus* | IILEPE2220 | G3 | **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																	1	
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** | Ecoregion-wide Conservation Goal: **2**

Regal Fritillary | *Speyeria idalia* | IILEPJ6040 | G3 | **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	3			3	1	12	5	3	22	2	1	3	1	2	7	1		1
# of EOs Captured in Portfolio by SU:	3			4			6			3			2			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **6** | Ecoregion-wide Conservation Goal: **4**

Rattlesnake-master Stem Borer | *Papaipema eryngii* | IILEYC0310 | G1G2 | **Limited**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
													2					2
# of EOs Captured in Portfolio by SU:	0			0			0			0			2			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** | Ecoregion-wide Conservation Goal: **7**

Blazing Star Stem Borer | *Papaipema beeriana* | IILEYC0450 | G2G3 | **Limited**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1			3	2		2	1	
# of EOs Captured in Portfolio by SU:	0			0			0			1			3			3		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **7** | Ecoregion-wide Conservation Goal: **7**

Prairie Mole Cricket — *Gryllotalpa major* — IIORT17010 — G3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			1															
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **2**

Vascular Plant

Mead's Milkweed — *Asclepias meadii* — PDASC02150 — G2 — **Limited**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	1	5	25		1	1		6	5						3			
# of EOs Captured in Portfolio by SU:	5			0			5			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **8** — Ecoregion-wide Conservation Goal: **7**

Decurrent False Aster — *Boltonia decurrens* — PDAST1E040 — G2 — **Endemic**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										4	7	6						
# of EOs Captured in Portfolio by SU:	0			0			0			11			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **10** — Ecoregion-wide Conservation Goal: **10**

Hill's Thistle — *Cirsium hillii* — PDAST2E1C0 — G3 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
								1		3	2	14	5	2	14			1
# of EOs Captured in Portfolio by SU:	0			0			0			3			6			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **4** — Ecoregion-wide Conservation Goal: **4**

Lakeside Daisy — *Tetraneuris herbacea* — PDASTDY060 — G3 — **Limited**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
											1							
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **7**

Forked Aster — *Eurybia furcata* — PDASTEB0H0 G3 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							1		1		1	1	1	2		1		
# of EOs Captured in Portfolio by SU:	0			0			1			1			2			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **4** — Ecoregion-wide Conservation Goal: **4**

American Barberry — *Berberis canadensis* — PDBER02010 G3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
														1				1

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Royal Catchfly — *Silene regia* — PDCAR0U1G0 G3 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
															3			

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **4**

Creeping St. John's-wort — *Hypericum adpressum* — PDCLU03010 G3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
														1	1	4	1	3
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			4		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **2**

Tennessee Milk-vetch — *Astragalus tennesseensis* — PDFAB0F8S0 G3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
											1							
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Leafy Prairie-clover — *Dalea foliosa* — **PDFAB1A0K0 G2G3** — **Peripheral**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
													1					
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Prairie Bushclover — *Lespedeza leptostachya* — **PDFAB27090 G3** — **Peripheral**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							4	1	3									
# of EOs Captured in Portfolio by SU:	0			0			4			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 3** **Ecoregion-wide Conservation Goal: 2**

Running Buffalo Clover — *Trifolium stoloniferum* — **PDFAB40250 G3** — **Peripheral?**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 2**

Bush's Poppy-mallow — *Callirhoe bushii* — **PDMAL0A020 G3** — **Peripheral**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
						2												

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal:**

Clustered Poppy-mallow — *Callirhoe triangulata* — **PDMAL0A080 G3** — **Widespread**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
								1		4	1	1	1					
# of EOs Captured in Portfolio by SU:	0			0			1			4			1			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 5** **Ecoregion-wide Conservation Goal: 4**

Kankakee Globemallow — *Iliamna remota* — **PDMAL0K060 G1Q** — **Endemic?**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
													1					
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **10**

Sangamon Phlox — *Phlox pilosa ssp. sangamonensis* — **PDPLM0D1J9 G5T1** — **Endemic**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
														1	10			
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **10**

Northern Wild Monkshood — *Aconitum noveboracense* — **PDRAN01070 G3** — **Peripheral**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							5	5	4									
# of EOs Captured in Portfolio by SU:	0			0			8			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **2**

Iowa Golden-saxifrage — *Chrysosplenium iowense* — **PDSAX07030 G3?** — **Peripheral**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							1											
# of EOs Captured in Portfolio by SU:	0			0			1			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Earleaf False Foxglove — *Agalinis auriculata* — **PDSCR01130 G3** — **Widespread**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
		1	1			2	4	11	9	1	1	6	4	1	13			1
# of EOs Captured in Portfolio by SU:	1			0			4			1			5			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **6** — Ecoregion-wide Conservation Goal: **4**

Kitten Tails — *Besseya bullii* — PDSCR09030 G3 — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							1			3	3	10						1
# of EOs Captured in Portfolio by SU:	0			0			1			5			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **3** — Ecoregion-wide Conservation Goal: **2**

Rose Turtlehead — *Chelone obliqua var. speciosa* — PDSCR0F043 G4T3 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
								4	3	1	1	9						
# of EOs Captured in Portfolio by SU:	0			0			2			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **4**

North American Dwarf Burhead — *Echinodorus parvulus* — PMALI02050 G3Q — **Peripheral**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																	1	
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Mohlenbrock's Umbrella-sedge — *Cyperus grayoides* — PMCYP061G0 G3 — **Widespread**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										5	2	7		1				
# of EOs Captured in Portfolio by SU:	0			0			0			7			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **4** — Ecoregion-wide Conservation Goal: **4**

Hall's Bulrush — *Schoenoplectus hallii* — PMCYP0Q0R0 G3 — **Limited**

# of EOs in Ecoregion by SU and Viability Rank:	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1	1	20			1			1
# of EOs Captured in Portfolio by SU:	0			0			0			2			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **7**

Eastern Prairie White-fringed Orchid — *Platanthera leucophaea* — **PMORC1Y0F0 G3** — **Widespread**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
						1	2	1	2			1	3		4		1	2
# of EOs Captured in Portfolio by SU:	0			0			2			0			2			1		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 5** **Ecoregion-wide Conservation Goal: 4**

Western Prairie White-fringed Orchid — *Platanthera praeclara* — **PMORC1Y0S0 G3** — **Widespread**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	3	4	16	1	6	11	3	2	5									
# of EOs Captured in Portfolio by SU:	6			4			5			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 5** **Ecoregion-wide Conservation Goal: 4**

Bog Bluegrass — *Poa paludigena* — **PMPOA4Z1W0 G3** — **Peripheral**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																		1

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 2**

Appendix 16: Freshwater Species Targets: Goal Status Summary

This appendix provides a species-by-species account of the number and locations of freshwater target species occurrences captured in the freshwater portfolio for the lower Missouri River basin. [Freshwater goal capture for other parts of the CTP may be found in assessment reports for the Upper Mississippi River basin (Weitzel et al. 2003) and the Middle Missouri Basin (Gagnon et al. 2004)].

This table first lists target fish taxa (sorted by taxonomic age) and then target invertebrates. The first two columns of the table list the target species name, common name, assemblage type (for those species included in assemblage targets), distribution type (see table x for distribution type descriptions) and the Global Element Code.

The remaining columns list the numbers of element occurrences captured by portfolio class: confirmed (definitely included), possible (further analysis required for determination) and not in portfolio (omitted for lack of viable targets; or not needed for goal capture). Element occurrences were grouped by viability status (VG/G = very good or good; F/P = fair or poor; NR = not rated) and Ecological Drainage Unit (Big Blue, Grand River, Lower Missouri, Lower Platte). Each species' numeric conservation goal specifies the number of viable (VG/G) occurrences the CTP team aimed to include in the confirmed portfolio. The distribution goal specifies the Ecological Drainage units across which the target species should occur. For a conservation goal to be met, both the numeric and distribution goals needed to be met.

Target Species	Global Element Code	AES Portfolio Class	Element Occurrences Captured												Occurrences Captured	VG/G Occurrences Captured
			Big Blue (BB) EDU			Grand River (GR) EDU			Lower Missouri (LM) EDU			Lower Platte (LP) EDU				
			VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR		
Ichthyomyzon castaneus	AFBAA01020															
Chestnut lamprey															0	0
Global Rank: G4																
Distribution Type: Widespread/Regional		Conservation Goal: 14							Distribution Goal: LM							
Acipenser fulvescens	AFCAA01020															
Lake sturgeon		Confirmed					1	7		3	8			2	21	0
		Possible														
Global Rank: G3G4		Not in Portfolio						1							1	
Distribution Type: Widespread/Regional		Conservation Goal: 14							Distribution Goal: LM, LP							
Scaphirhynchus albus	AFCAA02010															
Pallid sturgeon		Confirmed					1	12		3	6		2	5	29	0
		Possible														
Global Rank: G1		Not in Portfolio														
Distribution Type: Widespread/Regional		Conservation Goal: 14							Distribution Goal: BB, LM, GR, LP							
Scaphirhynchus platorynchu	AFCAA02020															
Shovelnose sturgeon		Confirmed				1	1		1	2		2			7	4
		Possible														
Global Rank: G4		Not in Portfolio														
Distribution Type: Widespread/Regional		Conservation Goal: 14							Distribution Goal: BB, LM, GR, LP							

Target Species	Global Element Code	AES Portfolio Class	Element Occurrences Captured												Occurrences Captured	VG/G Occurrences Captured
			Big Blue (BB) EDU			Grand River (GR) EDU			Lower Missouri (LM) EDU			Lower Platte (LP) EDU				
			VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR		
Polyodon spathula	AFCAB01010															
Paddlefish		Confirmed					1			3	3	2			9	2
		Possible														
Global Rank: G4		Not in Portfolio														
Distribution Type: Widespread/Regional		Conservation Goal: 14							Distribution Goal: BB, LM, GR, LP							
Anguilla rostrata	AFCEA01010															
American eel															0	0
Global Rank: G5																
Distribution Type: Widespread/Regional		Conservation Goal: 14							Distribution Goal: BB, LM, GR, LP							
Alosa chrysochloris	AFCFA01030															
Skipjack herring															0	0
Global Rank: G5																
Distribution Type: Widespread/Very Coarse		Conservation Goal: 12							Distribution Goal: LM, GR							
Esox americanus vermiculat	AFCHD01012															
Grass pickerel															0	0
Global Rank: G5																
Distribution Type: Widespread/Intermediate		Conservation Goal: 15							Distribution Goal: GR, LP							
Hybognathus argyritis	AFCJB16010															
Western silvery minnow		Confirmed						2			2	10		2	18	10
Minnows		Possible										4			2	
Global Rank: G4		Not in Portfolio														
Distribution Type: Widespread/Coarse		Conservation Goal: 12							Distribution Goal: BB, LM, GR, LP							
Hybognathus placitus	AFCJB16050															
Plains minnow		Confirmed			6	2	4	34		4	22	28		4	104	30
Minnows		Possible				2	4	4				2			12	
Global Rank: G4		Not in Portfolio					2	4			6				12	
Distribution Type: Widespread/Coarse		Conservation Goal: 12							Distribution Goal: BB, LM, GR, LP							
Notropis blennius	AFCJB28190															
River shiner		Confirmed			1			1				2			4	2
		Possible														
Global Rank: G5		Not in Portfolio						1							1	
Distribution Type: Widespread/Coarse		Conservation Goal: 12							Distribution Goal: BB, GR, LP							
Notropis heterolepis	AFCJB28530															
Blacknose shiner		Confirmed									2	1			3	1
		Possible														
Global Rank: G4		Not in Portfolio									7				7	
Distribution Type: Disjunct/Coarse		Conservation Goal: 20							Distribution Goal: BB, LM, LP							
Notropis topeka	AFCJB28960															
Topeka shiner		Confirmed	3	3	37			9			15			1	68	3
		Possible			4			1			1		1	1	8	
Global Rank: G3		Not in Portfolio			3										3	
Distribution Type: Modal-Limited/Coarse		Conservation Goal: 25							Distribution Goal: BB, LM, GR, LP							

Target Species	Global Element Code	AES Portfolio Class	Element Occurrences Captured												Occurrences Captured	VG/G Occurrences Captured
			Big Blue (BB) EDU			Grand River (GR) EDU			Lower Missouri (LM) EDU			Lower Platte (LP) EDU				
			VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR		
Phoxinus eos	AFCJB31020															
Northern redbelly dace		Confirmed										3		3	6	3
Sandhill Fish Assemblage		Possible														
Global Rank: G5		Not in Portfolio														
Distribution Type: Peripheral/Intermediate		Conservation Goal: 5							Distribution Goal: LP							
Phoxinus erythrogaster	AFCJB31030															
Southern redbelly dace		Confirmed	4		14										18	4
		Possible			5										5	
Global Rank: G5		Not in Portfolio			8										8	
Distribution Type: Disjunct/Coarse		Conservation Goal: 20							Distribution Goal: BB							
Phoxinus neogaeus	AFCJB31040															
Finescale dace		Confirmed										3			3	3
Sandhill Fish Assemblage		Possible														
Global Rank: G5		Not in Portfolio														
Distribution Type: Peripheral/Intermediate		Conservation Goal: 5							Distribution Goal: LP							
Rhinichthys obtusus (former	AFCJB37010															
Western blacknose dace		Confirmed														0
		Possible					2								2	
Global Rank: G5		Not in Portfolio														
Distribution Type: Disjunct/Coarse		Conservation Goal: 10							Distribution Goal: GR							
Macrhybopsis gelida	AFCJB53020															
Sturgeon chub		Confirmed				4	4	8		4	68	8			96	12
Tributary Chubs; Missouri Mainstem Chubs		Possible														
Global Rank: G3		Not in Portfolio									8				8	
Distribution Type: Widespread/Very Coarse		Conservation Goal: 12							Distribution Goal: BB, LM, GR, LP							
Macrhybopsis meeki	AFCJB53030															
Sicklefin chub		Confirmed					1	1		1	24				27	0
Missouri Mainstem Chubs		Possible														
Global Rank: G3		Not in Portfolio									3				3	
Distribution Type: Widespread/Very Coarse		Conservation Goal: 12							Distribution Goal: LM, GR, LP							
Macrhybopsis storeriana	AFCJB53040															
Silver chub		Confirmed				1	1	36		1	28	2	5		74	3
Tributary Chubs; Missouri Mainstem Chubs		Possible				1	1	16					1		19	
Global Rank: G5		Not in Portfolio						12			8				20	
Distribution Type: Widespread/Very Coarse		Conservation Goal: 12							Distribution Goal: BB, LM, GR, LP							
Macrhybopsis hyostoma	AFCJB53080															
Shoal chub		Confirmed				1	1			1		10			13	11
Tributary Chubs; Missouri Mainstem Chubs		Possible										3			3	
Global Rank: G5		Not in Portfolio														
Distribution Type: Widespread/Very Coarse		Conservation Goal: 12							Distribution Goal: BB, LM, GR, LP							
Margariscus margarita	AFCJB54010															
Pearl dace		Confirmed										9		6	15	9
Sandhill Fish Assemblage		Possible														
Global Rank: G5		Not in Portfolio														
Distribution Type: Widespread/Intermediate		Conservation Goal: 15							Distribution Goal: LP							

Target Species	Global Element Code	AES Portfolio Class	Element Occurrences Captured												Occurrences Captured	VG/G Occurrences Captured
			Big Blue (BB) EDU			Grand River (GR) EDU			Lower Missouri (LM) EDU			Lower Platte (LP) EDU				
			VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR		
Platygobio gracilis	AFCJB57010															
Flathead chub		Confirmed				1					8	11			20	12
Tributary Chubs; Missouri Mainstem Chubs		Possible				1									1	
Global Rank: G5		Not in Portfolio				1	1	56			8				64	
Distribution Type: Widespread/Very Coarse		Conservation Goal: 12							Distribution Goal: BB, LM, GR, LP							
Carpiodes velifer	AFCJC01030															
Highfin carpsucker		Confirmed					1			1	2				4	0
		Possible														
Global Rank: G4G5		Not in Portfolio			1						2				3	
Distribution Type: Widespread/Very Coarse		Conservation Goal: 8							Distribution Goal: LM							
Cycleptus elongatus	AFCJC04010															
Blue sucker		Confirmed			1		1	5		2	5	2	1		17	2
		Possible						1							1	
Global Rank: G3G4		Not in Portfolio														
Distribution Type: Widespread/Very Coarse		Conservation Goal: 18							Distribution Goal: BB, LM, GR, LP							
Percopsis omiscomaycus	AFCLC01010															
Trout perch		Confirmed						18							18	0
		Possible						2							2	
Global Rank: G5		Not in Portfolio						2							2	
Distribution Type: Peripheral/Intermediate		Conservation Goal: 5							Distribution Goal: LM, GR							
Fundulus sciadicus	AFCNB04170															
Plains topminnow		Confirmed										14	1	9	24	14
		Possible														
Global Rank: G4		Not in Portfolio												1	1	
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: LP							
Fundulus kansae (formerly z	AFCNB04210															
Plains killifish		Confirmed	6		2							8			16	14
		Possible									7	1			8	
Global Rank: G5		Not in Portfolio									5				5	
Distribution Type: Widespread/Intermediate		Conservation Goal: 15							Distribution Goal: BB, LP							
Ammocrypta clara	AFCQC04140															
Western sand darter		Confirmed		1	1										2	0
		Possible														
Global Rank: G3		Not in Portfolio						1							1	
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: LM							
Percina maculata	AFCQC04140															
Blackside darter															0	0
Global Rank: G5																
Distribution Type: Disjunct/Intermediate		Conservation Goal: 5							Distribution Goal: BB							
Ironoquia plattensis	IITRI88040															
Platte River caddisfly		Confirmed											2	6	8	0
		Possible											2		2	
Global Rank: G1G2		Not in Portfolio												3	3	
Distribution Type: Endemic/Intermediate		Conservation Goal: 18							Distribution Goal: LP							

Target Species	Global Element Code	AES Portfolio Class	Element Occurrences Captured												Occurrences Captured	VG/G Occurrences Captured
			Big Blue (BB) EDU			Grand River (GR) EDU			Lower Missouri (LM) EDU			Lower Platte (LP) EDU				
			VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR		
Amblema plicata	IMBIV03020															
Threeridge															0	0
Native Unionid Assemblage																
Global Rank: G5																
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: BB, LM, GR							
Anodonta suborbiculata	IMBIV04130															
Flat floater		Confirmed						1							1	0
Native Unionid Assemblage		Possible														
Global Rank: G5		Not in Portfolio						2							2	
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: LM, LP							
Lampsilis anodontoides (ter	IMBIV21240															
Yellow sandshell		Confirmed														0
Native Unionid Assemblage		Possible														
Global Rank: G5		Not in Portfolio			5										5	
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: BB, LM, LP							
Lampsilis teres teres	IMBIV21241															
Slough sandshell															0	0
Native Unionid Assemblage																
Global Rank: G5T1Q																
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: LM, LP							
Lampsilis cardium	IMBIV21250															
Plain pocketbook															0	0
Native Unionid Assemblage																
Global Rank: G5																
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: BB, LM, LP							
Ligumia recta	IMBIV26020															
Black sandshell		Confirmed			1						1				2	0
Native Unionid Assemblage		Possible														
Global Rank: G5		Not in Portfolio			2										2	
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: BB							
Ligumia subrostrata	IMBIV26030															
Pondmussel		Confirmed														0
Native Unionid Assemblage		Possible														
Global Rank: G4G5		Not in Portfolio			2										2	
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: BB, LM, LP							
Quadrula nodulata	IMBIV39090															
Wartyback															0	0
Native Unionid Assemblage																
Global Rank: G4																
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: LM							
Quadrula pustulosa	IMBIV39110															
Pimpleback															0	0
Native Unionid Assemblage																
Global Rank: G5																
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: BB, LM							

Target Species	Global Element Code	AES Portfolio Class	Element Occurrences Captured												Occurrences Captured	VG/G Occurrences Captured
			Big Blue (BB) EDU			Grand River (GR) EDU			Lower Missouri (LM) EDU			Lower Platte (LP) EDU				
			VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR	VG/G	F/P	NR		
Tritogonia verrucosa	IMBIV44010															
Pistolgrip		Confirmed														0
Native Unionid Assemblage		Possible														
Global Rank: G4		Not in Portfolio									2				2	
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: BB, LM							
Uniomerous Tetralasmus	IMBIV46050															
Pondhorn		Confirmed			2										2	0
Native Unionid Assemblage		Possible					1								1	
Global Rank: G4		Not in Portfolio														
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: LM, GR							
Stagnicola (formerly Lymnae	IMGASL5070															
Marsh pondsnail		Confirmed														0
Native Unionid Assemblage		Possible														
Global Rank: G5		Not in Portfolio									1				1	
Distribution Type: Widespread/Local		Conservation Goal: 15							Distribution Goal: LM							

Appendix 17. Terrestrial Community Targets: Goal Status Summary

This appendix summarizes how well the Central Tallgrass Prairie ecoregional portfolio has captured occurrences and contributed toward ecoregional conservation goals for each plant community target. Community targets are sorted by GELCODE. Each community's summary is headed by its common name, GELCODE, global rank, distribution relative to this ecoregion, and spatial pattern that is typical of this type in this ecoregion.

There are four major components to the goal status summaries for communities. The first component shows the historic or expected distribution of the community in each stratification unit (SU) and lists the spatial pattern (MX, LP, SP or LI) typical of that community in that stratification unit. If the community is not found in a particular stratification unit, no spatial pattern is listed. A handful of community targets are not listed in any of the six stratification units; their presence in the ecoregion has not been fully resolved through various expert reviews, so they are retained as targets for this iteration.

The second section shows the number of occurrences of the community that have been documented in the ecoregion, summarized by stratification unit. The number of occurrences present in each stratification unit is subtotaled according to viability ranks ("VG+G" = total number of Very Good and Good occurrences, "F" = total number of Fair occurrences, and "Oth" = total number of occurrences of all other ranks). If there are no numbers, no occurrences of this community have been documented in this ecoregion to date.

The third section shows the number of occurrences that have been captured within the ecoregional portfolio within each stratification unit. Only those occurrences having a viability rank of Very Good, Good or Fair and are within the portfolio are counted; occurrences that lie within the portfolio, but have a viability rank of Poor or Unknown, are not counted. If this section is blank, no viable occurrences were captured in the portfolio.

Ecoregion-wide totals are listed at the bottom of each summary. The total number of occurrences throughout the entire ecoregional portfolio that were counted toward conservation goals is listed. Because an occurrence may straddle two stratification units, the total number of occurrences captured may be slightly smaller than the sum of the occurrences captured in each of the stratification units. The ecoregion-wide conservation goal is the total number of occurrences that should be conserved across the entire ecoregion in order for the target as a whole to persist in the long-term in good ecological health.

Bur Oak / Hazelnut Woodland **CEGL000556** **G3** **Peripheral** **SP**

	Western Till Plain			*Platte-MO Rivers Hills*			*Central Till Plain*			*Miss-IL Rivers Hills*			*Eastern Till Plain*			*Kankakee Sands*		
Historic Distribution and Landscape Pattern:				SP			SP			LP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Cottonwood - Green Ash Floodplain Forest — CEGL000658 — G2G3 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			LP			SP			SP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
				1	1	7												
# of EOs Captured in Portfolio by SU:	0			1			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Western Wheatgrass Mixedgrass Prairie — CEGL001577 — G3G5Q — Peripheral — SP

	Western Till Plain			Platte-MO Rivers_Hills			Central Till Plain			Miss-IL Rivers_Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP			SP														
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

White Oak - Hickory Forest — CEGL002011 — G3 — Limited — LP

	Western Till Plain			Platte-MO Rivers_Hills			Central Till Plain			Miss-IL Rivers_Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP			LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
	1		17	4	1	17			5									
# of EOs Captured in Portfolio by SU:	1			5			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 5** **Ecoregion-wide Conservation Goal: 7**

Basswood - Bur Oak Forest — CEGL002012 — G3 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP														
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
	3		2	3		2												
# of EOs Captured in Portfolio by SU:	3			3			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 4** **Ecoregion-wide Conservation Goal: 7**

Central Green Ash - Elm - Hackberry Forest — CEGL002014 — G3G5 — Widespread — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LI			LI			LI			LI						LI		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	1		5			3			3			1				1		
# of EOs Captured in Portfolio by SU:	1			0			0			0			0			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **6**

Midwestern Cottonwood - Black Willow Forest — CEGL002018 — G3G4 — Widespread — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LI			LI			LI			LI					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
				1	1	6	1	1										
# of EOs Captured in Portfolio by SU:	0			2			1			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **3** — Ecoregion-wide Conservation Goal: **6**

Sandhills Wet-Mesic Prairie — CEGL002023 — G3? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP																	
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			1															

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Central Wet-mesic Tallgrass Prairie — CEGL002024 — G2G3 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			LP			LP			LP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	1	2	18	1		32	1				1	2			4			3
# of EOs Captured in Portfolio by SU:	1			0			1			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **7**

Central Tallgrass Big Bluestem Loess Prairie — CEGL002025 — G2 — Endemic — MX

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	MX			LP														
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	4	8	152	3	2	25												
# of EOs Captured in Portfolio by SU:	10			4			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 13** **Ecoregion-wide Conservation Goal: 10**

Bulrush - Cattail - Bur-reed Shallow Marsh — CEGL002026 — G4G5 — Widespread — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP									LP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	4		2							1								
# of EOs Captured in Portfolio by SU:	4			0			0			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 7** **Ecoregion-wide Conservation Goal: 4**

Northern Cordgrass Wet Prairie — CEGL002027 — G3? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			LP														
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	1		7		1	9	1		3		2							
# of EOs Captured in Portfolio by SU:	1			1			1			2			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 2** **Ecoregion-wide Conservation Goal: 2**

Sandhills Wet Prairie — CEGL002028 — G3G4 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP																	
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			2															

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Central Tallgrass Saline Meadow — CEGL002031 — G2G3 — Endemic — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:		SP						SP										
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 10**

Southern Great Plains Cattail - Bulrush Marsh — CEGL002032 — G3G4 — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:					LP													
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 6**

Great Plains Neutral Seep — CEGL002033 — G3 — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:		SP			SP			SP			SP							
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
			4									2						

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Loess Hills Little Bluestem Dry Prairie — CEGL002035 — G2 — Endemic — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:					MX			LP			SP			SP				
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
			4	14	14	13												
# of EOs Captured in Portfolio by SU:		0			26			0			0			0			0	

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 19** **Ecoregion-wide Conservation Goal: 7**

Little Bluestem Loess Mixedgrass Prairie — CEGL002036 — G3? — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP														
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **7**

Needle-and-Thread - Blue Grama Mixedgrass Prairie — CEGL002037 — G5 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP																	
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			47			3												

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Central Tallgrass Fen — CEGL002041 — G1 — Limited — SP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			SP			SP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
		1	7			5		2	2	1	1							
# of EOs Captured in Portfolio by SU:	1			0			1			2			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **4** — Ecoregion-wide Conservation Goal: **11**

Eastern Great Plains Saline Marsh — CEGL002043 — G1G2 — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP														
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	2	7	9						2			1						
# of EOs Captured in Portfolio by SU:	8			0			0			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **8** — Ecoregion-wide Conservation Goal: **6**

Midwest Dry Sandstone Cliff — CEGL002045 — G4G5 — Widespread — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LI			LI			LI					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							1						2		1			
# of EOs Captured in Portfolio by SU:	0			0			1			0			2			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **3** — Ecoregion-wide Conservation Goal: **6**

Riverine Sand Flat — CEGL002049 — G4G5 — Widespread — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LI			LI			LI			LI			LI		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			1	2	1	1						1						
# of EOs Captured in Portfolio by SU:	0			3			0			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **4** — Ecoregion-wide Conservation Goal: **6**

Western Tallgrass Bur Oak Mesic Woodland — CEGL002052 — G1G2 — Limited — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP											
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
		1				1												
# of EOs Captured in Portfolio by SU:	1			0			0			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **11**

Western Tallgrass Bur Oak Woodland — CEGL002053 — G2G3 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			LP			LP											
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	1	3	4			1												
# of EOs Captured in Portfolio by SU:	4			0			0			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **7**

White Oak - Red Oak - Sugar Maple Mesic Forest — CEGL002058 — G3? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
				2		2	1		5	1		2						
# of EOs Captured in Portfolio by SU:	0			2			1			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 4** **Ecoregion-wide Conservation Goal: 2**

Central Maple - Basswood Forest — CEGL002061 — G3G4 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			SP			SP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			1		1				1									
# of EOs Captured in Portfolio by SU:	0			1			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 7**

North-Central Maple - Basswood Forest — CEGL002062 — G3G4 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							SP			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									2				1					
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Aspen / American Hazel Forest — CEGL002063 — G5 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:													SP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									1									

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

White Oak / Dogwood Dry-mesic Forest — CEGL002066 — GNR — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:					LP			LP										
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										2								
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 1	Ecoregion-wide Conservation Goal: 2

White Oak - Red Oak Dry-Mesic Acid Forest — CEGL002067 — G3 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							SP											
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							1											
# of EOs Captured in Portfolio by SU:	0			0			1			0			0			0		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 1	Ecoregion-wide Conservation Goal: 2

Midwestern White Oak - Red Oak Forest — CEGL002068 — G4? — Widespread — MX

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							MX			MX			MX					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
				1		1	1		12	2	4	6	4	5	12			
# of EOs Captured in Portfolio by SU:	0			1			1			2			5			0		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 6	Ecoregion-wide Conservation Goal: 4

White Oak - Mixed Oak Dry-Mesic Alkaline Forest — CEGL002070 — G4G5 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:					SP			SP			LP			SP				
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									2	4		4						
# of EOs Captured in Portfolio by SU:	0			0			0			4			0			0		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 2	Ecoregion-wide Conservation Goal: 2

Northern Bur Oak Mesic Forest — CEGL002072 — G4 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP														
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
	1		16			5												
# of EOs Captured in Portfolio by SU:	1			0			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 3**

Black Oak - White Oak - Hickory Forest — CEGL002076 — G4? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
													1					
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Black Oak Forest — CEGL002078 — G4? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			LP			SP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
											2	1						
# of EOs Captured in Portfolio by SU:	0			0			0			2			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

River Birch - Sycamore Small River Floodplain Forest — CEGL002086 — G5 — Widespread — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP			LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 4**

Pecan - Sugarberry Forest — CEGL002087 — G4? — Peripheral — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LI			LI			LI			LI					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
				1														
# of EOs Captured in Portfolio by SU:	0			1			0			0			0			0		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 1	Ecoregion-wide Conservation Goal: 3

Cottonwood - Sycamore Forest — CEGL002095 — G1G2 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP			SP			SP			SP			SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			2	1														
# of EOs Captured in Portfolio by SU:	0			1			0			0			0			0		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 1	Ecoregion-wide Conservation Goal: 3

Bur Oak - Swamp White Oak Mixed Bottomland Forest — CEGL002098 — G2G3 — Widespread — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LI			LI			LI			LI			LI		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										2						1		
# of EOs Captured in Portfolio by SU:	0			0			0			2			0			1		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 3	Ecoregion-wide Conservation Goal: 6

Pin Oak - Swamp White Oak Sand Flatwoods — CEGL002100 — G2? — Limited — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:																SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
				1		1	3		8		1	1				1	1	2
# of EOs Captured in Portfolio by SU:	0			1			3			0			0			2		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 6	Ecoregion-wide Conservation Goal: 7

Black Willow Riparian Forest — CEGL002103 — G4 — Widespread — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP						SP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 6**

Black Ash - Mixed Hardwood Swamp — CEGL002105 — G4 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:													SP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Chinquapin Oak - Red Cedar Dry Alkaline Forest — CEGL002108 — G3G4 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							SP			SP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
									1	2		1						
# of EOs Captured in Portfolio by SU:	0			0			0			2			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 2** **Ecoregion-wide Conservation Goal: 2**

Central Midwest White Oak - Mixed Oak Woodland — CEGL002134 — G1Q — Endemic — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			LP			LP			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
							5		6	1								
# of EOs Captured in Portfolio by SU:	0			0			5			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 6** **Ecoregion-wide Conservation Goal: 10**

Bur Oak Bottomland Woodland — CEGL002140 — G1 — Limited — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							SP			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 11**

North-central Dry-Mesic Oak Woodland — CEGL002142 — G3G4 — Limited — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP			LP			LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
								3				1		2				
# of EOs Captured in Portfolio by SU:	0			0			3			0			2			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 5** **Ecoregion-wide Conservation Goal: 7**

Chinquapin Oak - Ash / Little Bluestem Woodland — CEGL002143 — G3G4 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP											
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 2**

Chinquapin Oak - Bur Oak Ravine Woodland — CEGL002145 — G2 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			SP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 7**

Post Oak - Blackjack Oak Cross Timbers Woodland | **CEGL002147** | **G4** | **Peripheral** | **SP**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP																	
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
			1															

Ecoregion-wide Totals:	**Total # of EOs Captured in Portfolio Across Ecoregion:**	**Ecoregion-wide Conservation Goal:** **3**

White Oak - Post Oak / Bluestem Ozark Woodland | **CEGL002150** | **G2G3** | **Peripheral** | **SP**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
							1		1									
# of EOs Captured in Portfolio by SU:	0			0			1			0			0			0		

Ecoregion-wide Totals:	**Total # of EOs Captured in Portfolio Across Ecoregion:** **1**	**Ecoregion-wide Conservation Goal:** **3**

Northern Bur Oak Opening | **CEGL002158** | **G1G2** | **Peripheral** | **LP**

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LP			SP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals:	**Total # of EOs Captured in Portfolio Across Ecoregion:**	**Ecoregion-wide Conservation Goal:** **2**

Central Bur Oak Opening | **CEGL002159** | **G1** | **Endemic** | **LP**

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
							1											
# of EOs Captured in Portfolio by SU:	0			0			1			0			0			0		

Ecoregion-wide Totals:	**Total # of EOs Captured in Portfolio Across Ecoregion:** **1**	**Ecoregion-wide Conservation Goal:** **11**

Dogwood - Willow Swamp — CEGL002186 — G5 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							SP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 2**

Northern Buttonbush Swamp — CEGL002190 — G4 — Widespread — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
							2	1			3	2	1		2			
# of EOs Captured in Portfolio by SU:	0			0			2			2			1			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 3** **Ecoregion-wide Conservation Goal: 4**

Flint Hills Tallgrass Prairie — CEGL002201 — G4? — Peripheral — MX

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	MX																	
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
	1																	
# of EOs Captured in Portfolio by SU:	1			0			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Northern Mesic Tallgrass Prairie — CEGL002202 — G2G3 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
					1				2									
# of EOs Captured in Portfolio by SU:	0			1			0			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Central Mesic Tallgrass Prairie — CEGL002203 — G1G2 — Limited — MX

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP			LP			MX			LP			MX			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
	2	36	32		14	7	5	7	63		1	4		5	21		2	11
# of EOs Captured in Portfolio by SU:	16			10			9			1			1			2		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **13** — Ecoregion-wide Conservation Goal: **7**

Unglaciated Mesic Tallgrass Prairie — CEGL002204 — G3 — Peripheral — MX

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	MX																	
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
		6	71			1												

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Midwest Dry-Mesic Sand Prairie — CEGL002210 — G3 — Widespread — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP						SP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										3	2	4	1		2	1		7
# of EOs Captured in Portfolio by SU:	0			0			0			4			1			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **4** — Ecoregion-wide Conservation Goal: **4**

Midwest Dry-Mesic Prairie — CEGL002214 — G2G3 — Widespread — MX

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			MX			MX			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
				1		1	4	4	26			3		1	17			
# of EOs Captured in Portfolio by SU:	0			1			6			0			1			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **8** — Ecoregion-wide Conservation Goal: **4**

Midwest Dry Gravel Prairie — CEGL002215 — G3 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			LP			LP			LP			SP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
											1			2	2			
# of EOs Captured in Portfolio by SU:	0			0			0			1			1			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **7**

River Bulrush Marsh — CEGL002221 — G3G4 — Widespread — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **4**

Southern Great Plains Cordgrass Wet Prairie — CEGL002223 — G2G4 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP																	
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
		1	4															
# of EOs Captured in Portfolio by SU:	1			0			0			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Central Cordgrass Wet Prairie — CEGL002224 — G3? — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP			SP			SP			SP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			2									2	1			1		3
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **7**

Midwest Mixed Emergent Deep Marsh — CEGL002229 — G4? — Widespread — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP			LP			LP			LP						LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			5			3			2			1			1	2		
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			2		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **4**

Midwest Cattail Deep Marsh — CEGL002233 — G5 — Widespread — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP			LP			LP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									1							1		
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **4**

Ozark Sandstone Glade — CEGL002242 — G3 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1								
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Little Bluestem Bedrock Bluff Prairie — CEGL002245 — G3G4 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							SP											
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									2									

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **3**

Little Bluestem Hardpan Prairie — CEGL002249 — G2? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LP											
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							1											
# of EOs Captured in Portfolio by SU:	0			0			1			0			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Ozark Limestone Glade — CEGL002251 — G2 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Tussock Sedge Wet Meadow — CEGL002258 — G4? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			SP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							1						3		2	4		3
# of EOs Captured in Portfolio by SU:	0			0			1			0			2			4		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **4** — Ecoregion-wide Conservation Goal: **2**

Northern Sedge Poor Fen — CEGL002265 — G3G4 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
												2						

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **3**

Midwest Pondweed Submerged Aquatic Wetland							CEGL002282						G5			Widespread			SP
	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands			
Historic Distribution and Landscape Pattern:	SP			SP			SP			SP						SP			
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	
																1			
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			1			

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 1	Ecoregion-wide Conservation Goal: 6

Ozark Dry Chert Cliff							CEGL002285						G3?			Peripheral			SP
	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands			
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion:	Ecoregion-wide Conservation Goal: 3

Midwest Moist Sandstone Cliff							CEGL002287						G4G5			Widespread			LI
	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands			
Historic Distribution and Landscape Pattern:							LI			LI									
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	
							1		1	1		1							
# of EOs Captured in Portfolio by SU:	0			0			1			1			0			0			

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 2	Ecoregion-wide Conservation Goal: 6

Ozark Moist Chert Cliff							CEGL002288						G2G3			Peripheral			LI
	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands			
Historic Distribution and Landscape Pattern:										LI									
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion:	Ecoregion-wide Conservation Goal: 3

Ozark Moist Igneous Cliff — CEGL002289 — G4Q — Peripheral — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LI											
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Midwest Dry Limestone - Dolostone Cliff — CEGL002291 — G4G5 — Widespread — LI

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LI			LI								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
										1		1						
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 6**

Midwest Moist Limestone - Dolostone Cliff — CEGL002292 — G4G5 — Widespread — LI

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LI			LI			LI					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
									2	2	1	4	1	4				
# of EOs Captured in Portfolio by SU:	0			0			0			3			4			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 6** **Ecoregion-wide Conservation Goal: 6**

Midwest Limestone - Dolostone Talus — CEGL002308 — G4G5 — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LI			LI								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
									9	1								
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 6**

River Mud Flats | **CEGL002314** | **GNR** | **Widespread** | **LI**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LI			LI			LI			LI			LI		
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 6**

Midwestern Small Eroding Bluffs | **CEGL002315** | **GNR** | **Widespread** | **LI**

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							LI			LI			LI					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
													1					
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 6**

Midwest Dry Sand Prairie | **CEGL002318** | **G2G3** | **Widespread** | **LP**

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP			LP			SP			LP			SP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
								5	1	5	5	8				1	2	2
# of EOs Captured in Portfolio by SU:	0			0			2			8			0			3		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 7** **Ecoregion-wide Conservation Goal: 4**

Skunk-cabbage Seepage Meadow | **CEGL002385** | **G4?** | **Widespread** | **SP**

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP			SP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
										4		2	3		5			
# of EOs Captured in Portfolio by SU:	0			0			0			4			3			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 7** **Ecoregion-wide Conservation Goal: 6**

Water-lily Aquatic Wetland — CEGL002386 — G4G5 — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			SP			SP			SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1	2	2	7	1	2	2		1
# of EOs Captured in Portfolio by SU:	0			0			0			3			4			2		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 6** **Ecoregion-wide Conservation Goal: 6**

Algific Talus Slope — CEGL002387 — G2 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							2											
# of EOs Captured in Portfolio by SU:	0			0			2			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 2** **Ecoregion-wide Conservation Goal: 3**

Post Oak Central Dry Barrens — CEGL002391 — G2G3 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1								
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Midwest Sand Seep — CEGL002392 — G2 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
											1				1			
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 3**

North-central Dry Limestone - Dolomite Prairie — CEGL002403 — G2 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:		LP									SP							
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									1	1								
# of EOs Captured in Portfolio by SU:		0			0			0			1			0			0	

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **3**

Ash - Oak - Sycamore Mesic Bottomland Forest — CEGL002410 — G3G4 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:					LP			LP			LP							
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **7**

Sinkhole Pond Marsh — CEGL002413 — G3G4 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:								SP			SP							
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1		1						
# of EOs Captured in Portfolio by SU:		0			0			0			1			0			0	

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **3**

Central Shale Glade — CEGL002428 — G2 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:								SP			SP			SP				
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **3**

Midwest Ephemeral Pond — CEGL002430 — G4G5 — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			SP			SP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
				1	4	6	1	1	7	1	2	3						
# of EOs Captured in Portfolio by SU:	0			2			1			2			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 5** **Ecoregion-wide Conservation Goal: 6**

Silver Maple - Sugarberry - Pecan Floodplain Forest — CEGL002431 — G3G4 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP			SP			SP		
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Pin Oak Mixed Hardwood Forest — CEGL002432 — G3G4 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
										1								
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Black Oak / Lupine Barrens — CEGL002492 — G3 — Limited — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
										1	1	5				4	4	10
# of EOs Captured in Portfolio by SU:	0			0			0			2			0			6		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 7** **Ecoregion-wide Conservation Goal: 7**

Silver Maple - Elm Forest — CEGL002586 — G4? — Widespread — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LI			LI			LI			LI			LI		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
							1		1	2	3	5	4		3	1		2
# of EOs Captured in Portfolio by SU:	0			0			1			4			4			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **7** — Ecoregion-wide Conservation Goal: **6**

American Lotus Aquatic Wetland — CEGL004323 — G4? — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **6**

Beech - Maple Glaciated Forest — CEGL005013 — G3G4 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:													LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
															1			1

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **2**

Beech - Mixed Hardwood Floodplain Forest — CEGL005014 — G2G3 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:																SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																1		
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Red Oak - Sugar Maple - Elm Forest — CEGL005017 — GNRQ — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										LP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
										3	1	3	4	2	8		1	1
# of EOs Captured in Portfolio by SU:	0			0			0			3			4			1		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 3** **Ecoregion-wide Conservation Goal: 2**

Black Oak - White Oak / Blueberry Forest — CEGL005030 — G4? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
											1							
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Box-elder Floodplain Forest — CEGL005033 — G4G5 — Widespread — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 4**

Maple - Hickory Mesic Floodplain Forest — CEGL005035 — G2 — Peripheral — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
								1							1			
# of EOs Captured in Portfolio by SU:	0			0			1			0			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 2**

Northern (Great Lakes) Flatwoods — CEGL005037 — G2G3 — Limited — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:																SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **11**

Maple - Ash - Elm Swamp Forest — CEGL005038 — G4? — Peripheral — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				LP			LP			LP						LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																1		
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			1		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **1** — Ecoregion-wide Conservation Goal: **2**

Rich Northern Hardwood Woodland — CEGL005058 — G3G5 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: — Ecoregion-wide Conservation Goal: **3**

Hardhack Wet-Mesic Sand Shrub Meadow — CEGL005069 — G1Q — Endemic — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:																SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																1	2	
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			3		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **3** — Ecoregion-wide Conservation Goal: **15**

Dogwood - Willow - Poison Sumac Shrub Fen — CEGL005087 — G2G3 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Leatherleaf Kettle Bog — CEGL005092 — G3G4 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:																SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																		1

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Mesic Sand Tallgrass Prairie — CEGL005096 — G2 — Widespread — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										LP			LP			MX		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
												1	1		2	4		5
# of EOs Captured in Portfolio by SU:	0			0			0			0			1			4		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 4** **Ecoregion-wide Conservation Goal: 4**

Twig-rush Wet Prairie — CEGL005104 — G2? — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:																SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																1		
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			1		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 1** **Ecoregion-wide Conservation Goal: 3**

Inland Coastal Plain Marsh — CEGL005108 — G2? — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:																SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
																2		
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			2		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **3**

Inland Saline Marsh — CEGL005111 — G1 — Limited — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:													SP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
													1	1				
# of EOs Captured in Portfolio by SU:	0			0			0			0			2			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **11**

Central Limestone Glade — CEGL005131 — G2G3 — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP			SP			SP			SP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
									1	6	2	10						
# of EOs Captured in Portfolio by SU:	0			0			0			7			0			0		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **6** — Ecoregion-wide Conservation Goal: **6**

Cinquefoil - Sedge Prairie Fen — CEGL005139 — G3G4 — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP			SP			SP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
												1			2	2		2
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			2		

Ecoregion-wide Totals: Total # of EOs Captured in Portfolio Across Ecoregion: **2** — Ecoregion-wide Conservation Goal: **6**

Central Wet-Mesic Sand Tallgrass Prairie — CEGL005177 — G2G3 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										LP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
												1			1	3		7
# of EOs Captured in Portfolio by SU:	0			0			0			0			0			3		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 3	Ecoregion-wide Conservation Goal: 7

Central Cordgrass Wet Sand Prairie — CEGL005178 — G3? — Limited — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP			LP			LP		
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1					1	3		3
# of EOs Captured in Portfolio by SU:	0			0			0			1			0			3		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 4	Ecoregion-wide Conservation Goal: 7

North-central Dry-Mesic Limestone - Dolomite Prairie — CEGL005179 — G2 — Peripheral — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:													SP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
													2		1			
# of EOs Captured in Portfolio by SU:	0			0			0			0			2			0		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 2	Ecoregion-wide Conservation Goal: 3

Swamp White Oak Woodland — CEGL005181 — G1 — Endemic — LP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:							SP			LP			LP					
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
										1	1	3		3	1	1		
# of EOs Captured in Portfolio by SU:	0			0			0			1			1			1		

Ecoregion-wide Totals:	Total # of EOs Captured in Portfolio Across Ecoregion: 3	Ecoregion-wide Conservation Goal: 10

Midwest Glacial Drift - Loess Hill Prairie — CEGL005183 — G2 — Endemic — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP			SP					
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
										4	8	18		4	12			
# of EOs Captured in Portfolio by SU:	0			0			0			12			4			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 16** **Ecoregion-wide Conservation Goal: 15**

Northern Sandstone Talus — CEGL005202 — G4G5 — Peripheral

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 3**

Dakota Sandstone Tallgrass Prairie — CEGL005231 — G3? — Peripheral — MX

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	MX																	
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*
			1															

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 2**

Arrowhead - Rice Cutgrass Marsh — CEGL005240 — GNR — Widespread — SP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			SP			SP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 6**

Central Midwest Sedge Meadow — CEGL005272 — GNR — Limited — LI

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	SP			SP			SP			SP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth
			1	1		2		2	1	1								
# of EOs Captured in Portfolio by SU:	0			1			2			1			0			0		

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion: 4** **Ecoregion-wide Conservation Goal: 11**

Central Dry-Mesic Limestone - Dolomite Prairie — CEGL005280 — G1G2 — Limited — SP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:										SP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 11**

Central Tallgrass Post Oak Woodland — CEGL005281 — G1G3 — Limited — SP

	Western Till Plain			Platte-MO Rivers _Hills			Central Till Plain			Miss-IL Rivers _Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:				SP			LP			SP								
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 15**

Chinquapin Oak Limestone - Dolomite Savanna — CEGL005284 — G2G3 — Limited — LP

	Western Till Plain			Platte-MO Rivers Hills			Central Till Plain			Miss-IL Rivers Hills			Eastern Till Plain			Kankakee Sands		
Historic Distribution and Landscape Pattern:	LP			SP														
# of EOs in Ecoregion by SU and Viability Rank:	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth	VG +G	F	Oth

Ecoregion-wide Totals: **Total # of EOs Captured in Portfolio Across Ecoregion:** **Ecoregion-wide Conservation Goal: 7**

Sandbar Willow Shrubland																				
				CEGL008562			G4G5			Widespread			SP						
	Western Till Plain			*Platte-MO Rivers Hills*			*Central Till Plain*			*Miss-IL Rivers Hills*			*Eastern Till Plain*			*Kankakee Sands*		
Historic Distribution and Landscape Pattern:	SP			SP			SP			SP								
# of EOs in Ecoregion by SU and Viability Rank:	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*	*VG +G*	*F*	*Oth*

Ecoregion-wide Totals:	**Total # of EOs Captured in Portfolio Across Ecoregion:**	**Ecoregion-wide Conservation Goal:**	**6**

Appendix 18: Freshwater Ecological System Targets: Goal Status Summary

This table provides an account of the lower Missouri River basin Aquatic Ecological System (AES) types captured in the CTP portfolio.

The column titled “Total number of AES types in LMOR” lists the number of unique places (“occurrences”) in the LMOR where specific aquatic ecological systems of the specified type may be found.

The following two columns list the number of occurrences contained within the confirmed (Class 1) and possible (Class 2) freshwater portfolio. “Total number of ABS category AA" lists the number of occurrences in the previous column that were ranked by experts as having very good or good viability.

The “Conservation Goal” column specifies the minimum number of VG/G occurrences the team sought to include in the confirmed freshwater portfolio.

AES Type Code	Total number of AES types in LMOR	AES type occurrences selected as confirmed	AES type occurrences selected as possible	Total number of ABS category "AA"	Conservation Goal
TBB 1 - 261	293	75			3
TBB 1 - 661	260	41	5		3
TBB 1 - 662	332	25	10	1	3
TBB 2 - 424	58	2	2		3
TBB 2 - 426	43	9			3
TBB 2 - 430	90	22	1	3	3
TBB 3 - 109	46	5	1	4	3
TBB 4 - 19	4	1			3
TBB 5 - 10	1		1		1
TBB 5 - 11	1	1			1
TBB 5 - 9	1	1			1
TGR 1 - 3	997	63	63		3
TGR 1 - 7	140	1		1	3
TGR 1 - 9	175	7	6		3
TGR 2 - 270	18				3
TGR 2 - 273	240	22	17	1	3
TGR 2 - 274	41	1	1		3
TGR 3 - 76	71	5	1	2	3
TGR 4 - 13	5		1		3
TGR 4 - 15	4	1	2		3
TGR 5 - 12	1				1
TGR 5 - 13	1		1		1
TGR 5 - 14	1	1			1
TGR 5 - 15	1	1			1
TGR 5 - 3	1				1
TGR 5 - 4	1				1
TLM 1 - 1630	321	32	3		3
TLM 1 - 186	293	13	3		3
TLM 2 - 273	74	1	2		3
TLM 2 - 274	73	12			3
TLM 3 - 68	33	2	1		3
TLM 4 - 26	2				3
TLM 5 - 16	1	1			1

AES Type Code	Total number of AES types in LMOR	AES type occurrences selected as confirmed	AES type occurrences selected as possible	Total number of ABS category "AA"	Conservation Goal
TLM 5 - 2	1				1
TLP 1 - 1	607	39	35	1	3
TLP 1 - 144	238	13	33		3
TLP 1 - 31	120	27	22		3
TLP 1 - 3209	98	4	9	1	3
TLP 2 - 1	133	11	7	4	3
TLP 2 - 162	28	2	3	2	3
TLP 2 - 3	56	16	16	1	3
TLP 2 - 9	55	2	5		3
TLP 3 - 1	28	1	2	1	3
TLP 3 - 2	22	1	5	1	3
TLP 3 - 68	3			1	3
TLP 3 - 8	19	5	1	4	3
TLP 4 - 1	8	3	4	3	3
TLP 4 - 2	4	1	3	1	3
TLP 5 - 1	1	1		1	1
TLP 5 - 17	1	1		1	1
TLP 5 - 18	1	1		1	1
TLP 5 - 5	1	1		1	1
TLP 5 - 6	1	1		1	1
TLP 5 - 7	1	1		1	1
TLP 5 - 8	1	1		1	1

Appendix 19: Threat Taxonomy Used in the Threat Assessment

This taxonomy was taken directly from The Nature Conservancy's Excel-based CAP Workbook, version 5a, dating from November 18, 2007. The Conservancy uses a common threats taxonomy developed by the IUCN and a coalition of conservation organizations, the Conservation Measures Partnership.

Threat - Level 1	Threat - Level 2	Definition - Level 1	Definition - Level 2
Residential & Commercial Development	Housing & Urban Areas	Threats from human settlements or other non-agricultural land uses with a substantial footprint	Human cities, towns, and settlements including non-housing development typically integrated with housing
	Commercial & Industrial Areas		Factories and other commercial centers
	Tourism & Recreation Areas		Tourism and recreation sites with a substantial footprint
Agriculture & Aquaculture	Annual & Perennial Non-Timber Crops	Threats from farming and ranching as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture	Crops planted for food, fodder, fiber, fuel, or other uses
	Wood & Pulp Plantations		Stands of trees planted for timber or fiber outside of natural forests, often with non-native species
	Livestock Farming & Ranching		Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching)
	Marine & Freshwater Aquaculture		Aquatic animals raised in one location on farmed or non-local resources; also hatchery fish allowed to roam in the wild
Energy Production & Mining	Oil & Gas Drilling	Threats from production of non-biological resources	Exploring for, developing, and producing petroleum and other liquid hydrocarbons
	Mining & Quarrying		Exploring for, developing, and producing minerals and rocks
	Renewable Energy		Exploring, developing, and producing renewable energy
Transportation & Service Corridors	Roads & Railroads	Threats from long narrow transport corridors and the vehicles that use them including associated wildlife mortality	Surface transport on roadways and dedicated tracks
	Utility & Service Lines		Transport of energy & resources
	Shipping Lanes		Transport on and in freshwater and ocean waterways
	Flight Paths		Air and space transport
Biological Resource Use	Hunting & Collecting Terrestrial Animals	Threats from consumptive use of "wild" biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species	Killing or trapping terrestrial wild animals or animal products for commercial, recreation, subsistence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
	Gathering Terrestrial Plants		Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsistence, research or cultural purposes, or for control reasons
	Logging & Wood Harvesting		Harvesting trees and other woody vegetation for timber, fiber, or fuel
	Fishing & Harvesting Aquatic Resources		Harvesting aquatic wild animals or plants for commercial, recreation, subsistence, research, or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
Human Intrusions & Disturbance	Recreational Activities	Threats from human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources	People spending time in nature or traveling in vehicles outside of established transport corridors, usually for recreational reasons
	War, Civil Unrest & Military Exercises		Actions by formal or paramilitary forces without a permanent footprint
	Work & Other Activities		People spending time in or traveling in natural environments for reasons other than recreation or military activities
Natural System Modifications	Fire & Fire Suppression	Threats from actions that convert or degrade habitat in service of “managing” natural or semi-natural systems, often to improve human welfare	Suppression or increase in fire frequency and/or intensity outside of its natural range of variation
	Dams & Water Management/Use		Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities
	Other Ecosystem Modifications		Other actions that convert or degrade habitat in service of “managing” natural systems to improve human welfare

Threat - Level 1	Threat - Level 2	Definition - Level 1	Definition - Level 2
Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species	Threats from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread and/or increase in abundance	Harmful plants, animals, pathogens and other microbes not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities
	Problematic Native Species		Harmful plants, animals, or pathogens and other microbes that are originally found within the ecosystem(s) in question, but have become “out-of-balance” or “released” directly or indirectly due to human activities
	Introduced Genetic Material		Human altered or transported organisms or genes
Pollution	Household Sewage & Urban Waste Water	Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources	Water-borne sewage and non-point runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments
	Industrial & Military Effluents		Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments
	Agricultural & Forestry Effluents		Water-borne pollutants from agricultural, silivicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on the site where they are applied
	Garbage & Solid Waste		Rubbish and other solid materials including those that entangle wildlife
	Air-Borne Pollutants		Atmospheric pollutants from point and nonpoint sources
	Excess Energy		Inputs of heat, sound, or light that disturb wildlife or ecosystems
Geological Events	Volcanoes	Threats from catastrophic geological events	Volcanic events
	Earthquakes/Tsunamis		Earthquakes and associated events
	Avalanches/Landslides		Avalanches or landslides
Climate Change & Severe Weather	Habitat Shifting & Alteration	Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events that are outside of the natural range of variation, or potentially can wipe out a vulnerable species or habitat	Major changes in habitat composition and location
	Droughts		Periods in which rainfall falls below the normal range of variation
	Temperature Extremes		Periods in which temperatures exceed or go below the normal range of variation
	Storms & Flooding		Extreme precipitation and/or wind events