



Midewin National Tallgrass Prairie

A Shared Vision
For Restoration

Acknowledgments

The National Forest Foundation wishes to recognize the commitment of those who supported the creation of this shared vision for prairie restoration.

For leadership and support in developing the prairie vision document, **thank you to:**

**Sirius Fund
Peter Foreman**

Alliance Pipeline
Gaylord and Dorothy
Donnelley Foundation

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Midewin National Tallgrass Prairie: A Shared Vision for Restoration

Introduction

After two centuries of sustained agricultural, industrial and residential development, only fragments of the original tallgrass prairie remain in Illinois. Less than one percent of the Prairie State is, in fact, native prairie. Nowhere can the modern traveler enjoy the sweeping vistas that greeted early settlers to northern Illinois—vast grasslands dotted with bison, drained by meandering prairie creeks, and home to an impossible diversity of plants and animals.

With so little left, it comes as no surprise that so many people have lost connection with this archetypal Midwestern landscape. In the public mind, tallgrass prairie has become an abstraction, an artifact evoking the distant past.

Yet we allow the living prairie to fade from memory at our peril. The ecologists tell us of prairie's high biodiversity value. Farmers and ranchers appreciate its economic value generated from deep soil and tall grasses. And do not overlook its influence on our common culture and values. Consign the prairie to history and we lose part of ourselves, part of what made—and still makes—the American Midwest and Illinois (the Prairie State) so special.

To reconnect the people of this state with this rich natural heritage, nothing could be more important than restoring the prairie at a scale that does justice to the magnificent tallgrass ecosystem. Less than an hour from Chicago, on 30 square miles set aside from the old U.S. Army Arsenal in Joliet, the opportunity now exists to do precisely that.

What is a tallgrass prairie?

Native to central North America, tallgrass prairie once covered a large portion of the American Midwest, just east of the Great Plains, and portions of the Canadian Prairies. As its name suggests, tallgrass prairie's most dominant features are the tall grasses—like indiangrass, big bluestem, little bluestem and switchgrass—that average 5 to 6 feet in height but can stretch as high as 8 or 9 feet. Beyond the waves of grass, however, tallgrass prairie incorporates a complex ecosystem, including forbs, flowers, some trees, and diverse bird, mammal and insect life.

What the eye first sees only reveals half of the prairie. The other half resides underground. Roots reach several feet down to tap deep moisture in times of drought. These extensive root systems also store energy from which to produce new growth, helping the plants survive weather extremes, mowing, grazing and fire.

Historically, fire played a critical role in maintaining the prairie. Periodic fires—both natural and human-caused—eliminated tree seedlings and invasive plant species without fire tolerance. These fires also cleared dead plant debris from the ground, allowing rain and sun to penetrate the soil, stimulating plant growth and increasing seed yields.

With the accumulation of loess (sediment dominated by silt) and organic matter, tallgrass prairies developed deep, rich topsoils. This fertile land became an important resource as settlers moved across America—resulting in more than 99 percent of our original tallgrass prairie being converted into farmland.

Administered by the U.S. Forest Service and known as the Midewin National Tallgrass Prairie, this tract is the largest island in the archipelago of protected areas that collectively comprise the Chicago Wilderness. Although seriously degraded in many places, it represents by far the best chance in the region to reassemble the full array of species and natural processes typical of the tallgrass prairies, including the reintroduction of bison.

Nothing remotely on this scale or complexity has ever been attempted before. Turning back the clock from a landscape dominated by rusting munitions factories and abandoned ammunition bunkers into a 20,283-acre pristine prairie will strain our collective intellect, willpower, and pocketbook.

Yet these challenges are also what fire the imagination and make the long-term vision for Midewin so compelling. The great conservationist Aldo Leopold wrote, “What a thousand acres of Silphium looked like when they tickled the bellies of the buffalo is a question never again to be answered, and perhaps not even asked.” At Midewin, we can both ask and answer that question, in the most unlikely of settings—a decommissioned ammunitions plant.

The Nature Conservancy ranks Illinois' prairies as “globally imperiled” because most have been eliminated through conversion to other land uses. Midewin is a particularly critical piece of the state's remnant prairie because of its size, its biodiversity and the concentrated efforts at restoration. This combination of ecology and opportunity makes the restoration of Midewin a top conservation priority, as well as a national *Treasured Landscapes* campaign site for the National Forest Foundation (NFF).

Over the summer of 2011, the NFF facilitated a process that engaged dozens of local stakeholders in helping craft a 10-year vision for restoring the Midewin National Tallgrass Prairie. This document summarizes the consensus that emerged from that process, drawing on a detailed report that articulates the conservation vision, context and challenges, restoration costs, and project sequencing.

For Midewin, a return to tallgrass prairie would bring full circle a pattern of land use that traces the arc of Illinois history.





Conservation Vision

Partnership serves as the bedrock for the conservation vision at Midewin. A model of agency-community collaboration, Midewin enjoys unusually broad regional support. It was created through a grassroots campaign of partners and has garnered bipartisan support ever since. Many of the original partners remain engaged in restoration activities and educational efforts today. These stakeholders will be absolutely essential to achieving the vision going forward.

A common sense of purpose and direction—a conservation vision—unifies these partners and provides direction to

the restoration effort as a whole.

Consensus around a vision of success at Midewin allows agencies and organizations alike to align their activities around a shared agenda, shared priorities, and a shared agreement of success.

So what does success look like?

How will we know if we have succeeded? We will know because in 10 years the landscape will look very different.

The heavy human footprint at Midewin will be transformed through the systematic removal of most of the structures, including hundreds of ammunition bunkers, decaying buildings, roads, and railroads.

A healed prairie will explode with life as 600 species of native prairie grasses and plants take root in soil reclaimed from row-crop agriculture and industrial development. At least 75 percent of the 20,283 acres at Midewin will be returned to tallgrass prairie, using native seed produced on site and collected by local volunteers.

As the centerpiece of a region-wide network of open spaces, Midewin will once again play host to a herd of bison and support flourishing populations of grassland birds and other native fauna.

The nonnative species of plants that have invaded many portions of the property

will be controlled or eliminated.

Midewin's creeks will run lazy and clear down to the Des Plaines and Kankakee rivers. Natural processes that shaped the prairie ecosystem of old—particularly bison grazing and fire—will be employed to successfully maintain the prairie.

Midewin will be a globally recognized example of prairie restoration on a landscape scale, supporting an active research agenda that influences other grassland restoration efforts in the United States and around the world.



As the centerpiece of a region-wide network of open spaces, Midewin will once again play host to a herd of bison.

And perhaps most important, people will be thoroughly integrated into the Midewin landscape.

Strong partnerships and new educational and outreach programs will reveal the wonders of the tallgrass prairie to new audiences. A network of multi-use trails will open up Midewin to visitation in a way that has never been possible, with other transit links improving access to Midewin from Chicago and beyond. An enhanced visitor experience, including the chance to view bison in their native habitat, will make Midewin a major regional attraction for recreation, interpretation, and education.



From Vision to Action

Imagining the future state at Midewin is one thing; actually orchestrating the wide range of activities involved to bring back the prairie is another. A primary goal of the conservation vision is to provide a roadmap for ramping up the process in a coordinated manner, so that the efforts of the Forest Service, the National Forest Foundation, state and local agencies, and other non-governmental organizations are aligned and mutually reinforcing.

The vision assumes that a condensed, 10-year time frame for the restoration effort will save money over the life of the project. Midewin should be able to achieve significant economies of scale by addressing the various challenges (especially around infrastructure removal) in a holistic manner, instead of piecemeal and subject to the vagaries of the federal budgetary process. A key principle has been to do as much as possible, as fast as possible.

The vision also assumes that any regulatory obstacles can be overcome. In part, this expectation reflects the strong consensus among stakeholders about the vision for Midewin and what needs to happen. But to the extent that the regulatory requirements can be addressed collectively, through a combination of outreach and engagement strategies at both the federal and state levels, the more quickly the restoration can proceed.

Finally, the vision assumes that both the philanthropic community and the public at large will find Midewin a compelling story worthy of support through donations, volunteerism, and advocacy. In an era of severely constrained government budgets, the only way to mobilize resources for Midewin at the necessary scale will be capturing the public imagination with the project's vision and promise. The vision accordingly focuses more on estimating costs than identifying sources of revenue.

Over the summer of 2011, the NFF facilitated a process that engaged dozens of local stakeholders in helping craft a 10-year vision for restoring the Midewin National Tallgrass Prairie.





Overarching Strategy: Reconnect, Remove, Restore

In addition to painting a vision of success for Midewin, the conservation vision also articulates a holistic strategy for the 10-year life of the project, organized around three major initiatives:

1. Reconnecting people with the prairie.
2. Removing infrastructure.
3. Restoring the land, water, species and systems.

These initiatives should not be viewed as linear. Some 2,000 acres of the prairie have already been restored, for example, and the plan does not envisage this work stopping while the other issues are addressed. But on many other parts of the property a lot of infrastructure needs to be removed first before restoration can begin. Even efforts to engage the public more aggressively in Midewin—which the restoration vision identifies as the top near-term priority—will stretch across the full lifecycle of the project.

Better, then, to think of these three initiatives as closely intertwined, feeding off of each other and contributing to an integrated approach to the immensely complex task of returning Midewin to its pre-settlement splendor.

Midewin's creeks will run lazy and clear
down to the Des Plaines River.



Midewin National Tallgrass Prairie Facts

- Following decommissioning of the Joliet Arsenal, Midewin was established in 1996.
- During WWII, more than 10,000 workers at the Joliet Arsenal produced a record 1 billion pounds of TNT.
- The first national tallgrass prairie in the United States, Midewin is managed as a unit of the U.S. Forest Service.
- The prairie restoration needs span 20,283 acres, including 22 miles of streams.

Infrastructure scheduled for removal includes:

- 373 ammunition bunkers.
- 429 buildings and other structures.
- 78 miles of paved roads and 105 miles of railbed.

Ecological values include:

- 570 vascular plant species.
- 172 bird species.
- 1000+ insect species.
- 53 fish species.
- 27 mammal species.
- 15 reptile species.

10 Reconnecting

People hold the key to Midewin's rebirth as a tallgrass prairie. Quite simply, it will be impossible to generate resources on the scale necessary to fulfill the vision for the project without the active support of the public—as volunteers, land stewards, donors, visitors, and advocates for the prairie in the political process.

But at present, most citizens of United States find themselves disconnected from our prairie past. For them, the tallgrass ecosystem exists in textbooks and in the imagination—or not at all. And why should the public know?

The restoration vision is predicated on the notion that people will save what they know. As a result, a major thrust of the vision is to invest as soon as possible in an array of programs and infrastructure improvements that will help reconnect people with the prairie by improving access.

These initiatives fall into three primary categories:

Bison reintroduction Nothing will draw visitors from Chicago and elsewhere to Midewin like the chance to see a herd of bison grazing in their native habitat. Beginning with an experimental project covering about 1,000 acres and 75 bison, the restoration vision forecasts eventually expanding bison operations to encompass more than 6,000 acres and 1,000 animals. Viewing platforms and a 12-mile tram loop will enable visitors to experience the bison up close but in safety. Other than these amenities for visitors, the most significant expense associated with reintroducing bison will be the construction of 5-12 miles of heavy-duty fencing. Ideally, it will be possible to use the bison herd as a management tool to improve habitat for grassland birds and other species.

Education and interpretation

Midewin's size and proximity to the four largest metropolitan areas in Illinois make it a perfect location for large-scale education and interpretation programs. Building on the solid foundation of partnerships with programs for school-age children and young adults, the restoration vision anticipates a quantum increase in the availability and quality of programming. On the interpretation side, meanwhile, the vision anticipates at least three major sites (including one to commemorate the history of the Joliet Arsenal) and more than a dozen minor sites, with appropriate signage to demonstrate prairie ecology or progress on restoration.



Recreation To enhance recreational opportunities at Midewin, the vision calls for constructing a network of 43 miles of new trails for pedestrians, cyclists, and equestrians (along with two new trailheads); erecting or rehabilitating seven pedestrian and bicycle bridges; continuing access for hunters; and designating areas for parking, picnicking, and other activities consistent with the vision. In addition, the restoration vision anticipates a variety of regional transportation improvements that will make it easier to get to Midewin, including the possibility of trails connecting Midewin with nearby local communities and with other statewide trail networks.

Central to the overall success of these efforts to reconnect the public and the prairie will be upgrading the overall visitor experience through the construction of two “prairie learning centers.” The vision calls for the learning centers to echo the prairie landscape in design and rely solely on renewable energy, while serving as a hub for a projected 500,000-600,000 annual visitors. The learning centers will be focused on providing education for visitors about prairies and grasslands, points of access for prairie exploration, and a place for volunteers to gather for project workdays.

A network of multi-use trails will open up Midewin to visitation in a way that has never been possible, with other transit links improving access to Midewin from Chicago and beyond.





More than 400 buildings and structures
totaling 1.7 million square feet
still stand at Midewin.

Removing

Perhaps the biggest—and certainly the most apparent—challenge in restoring the tallgrass prairie at Midewin revolves around removing the hundreds of buildings, ammunition bunkers, and roads remaining from the days when it was the Joliet Arsenal. A vast complex of factories, buildings, roads, railroads and associated facilities, the arsenal was once considered the most modern munitions plant in the world. But 70 years later, the elements and lack of use have left a desolate wasteland of abandoned buildings and roads to nowhere.

The good news is that the vast majority of this infrastructure can be dismantled in the near term should adequate funding be received. An important task for dismantling the remaining physical infrastructure of the arsenal will be complying with federal and state regulations. For Midewin, the most important of these are the National Environmental Policy Act (NEPA), National Historic Preservation Act, Endangered Species Act, and Clean Water Act, administered by the U.S. Army Corps of Engineers, for stream and wetland restoration.

The varied nature of these regulations means that some compliance issues can be bundled and carried out on a large scale, while others must be addressed on a smaller, project-by-project basis. Any of them have the potential to derail the accelerated timetable for the restoration effort and also could exponentially increase the cost. As a consequence, throughout the conservation vision are woven proposed approaches to regulatory compliance, with the explicit recognition of resources required.

The other major tasks associated with infrastructure removal are much more straightforward, if more expensive. Three primary types of infrastructure require demolition: buildings and structures; concrete bunkers used for ammunition storage; and the maze of roads and railways connecting factory buildings.



Buildings and Structures More than 400 buildings and structures totaling 1.7 million square feet still stand at Midewin, ranging from several large factories to many administrative facilities. Fortunately, most are constructed from a few common materials, which simplifies the approach to demolition. Unfortunately, most have roofs made from transite, which contains asbestos that requires special handling and disposal. Some of the materials can be sold for scrap, recycled, or reused but much will have to be landfilled. The vision document estimates that the costs of removing these structures at a rate of \$12 per square foot, compounded by costs to dispose of hazardous materials safely, will total more than \$25 million.



In its heyday, the Joliet Arsenal boasted 118 miles of paved roads and 110 miles of railway.



Ammunition bunkers To store the munitions produced by the arsenal, the Army constructed 390 earth-and-concrete bunkers, averaging around 2,000 square feet each. The Forest Service has successfully demolished two dozen of these bunkers, a laborious process that entails removing soil from the roof; removing the steel doors (which contain asbestos and need special handling); and using jackhammers or wrecking balls to knock down the concrete walls and foundations. The soil from the roof can be reused on site, but the other materials must be recycled or landfilled. These requirements drive the price of eliminating a single bunker to \$50,000 on average, or a total of \$18,650,000 for the entire site.

Roads and railways In its heyday, the Joliet Arsenal boasted 118 miles of paved roads and 110 miles of railway, usually elevated on railbeds constructed from stone ballast. The Forest Service has since removed 23 miles of roads and 5 miles of railway, as well as most of the railroad ties and all of the rails; 16 miles of road will be retained for administrative purposes. The rest of this transportation infrastructure needs to be demolished. Ideally, much of the material from the old roads and ballast from the railbeds can be reused as the base for trails and to fill ditches, sunken rail beds, and so forth. Average costs for demolishing roads are estimated at \$35,000 per mile, and \$43,000 per mile for the railbeds. This translates into about \$7.3 million for the entire site.

In addition to these major infrastructure removal projects, achieving the restoration goals for Midewin will also necessitate demolishing a host of smaller items—including bridge trestles, utility poles, and 150 non-functioning fire hydrants. Collectively, the vision document estimates the cost of the activities at about \$2.5 million.



It will be impossible to generate resources on the scale necessary to fulfill the vision for the project without the active support of the public—as volunteers, land stewards, donors, visitors, and advocates for the prairie in the political process.



Restoring

Since taking over stewardship of the property in 1996, the Forest Service has worked with hundreds of volunteers and dozens of private and nonprofit partners to restore more than 2,000 acres of prairie at Midewin. The challenge now is to take these efforts to the next level and return most of the remaining 18,000 acres to prairie as quickly and efficiently as possible.

First, extensive site preparation will be required after the structures are removed. Over the years, farmers and then the Army installed a vast network of underground clay and plastic pipes—known as “field tiles”—to drain wetland areas and manage water flows. Locating and disabling or eliminating these tiles will be essential to restoring the natural aquatic regime at Midewin. Usually found at a depth of 3-4 feet, drain tiles cannot be removed without using heavy machinery.

Equally disruptive to Midewin’s native habitat has been the introduction of nonnative species, which now dominate the landscape. In areas that once were open prairie, visitors now find overgrown trees and shrubs, the legacy of the property’s past. Meanwhile, a handful of highly competitive European grasses and legumes, imported to provide fodder for cattle, have crowded out hundreds of species of native prairie plants. The elimination of the historic natural processes that helped shape the prairie of old—especially bison grazing and fire—has greatly exacerbated the nonnative species challenge at Midewin.

Midewin needs to expand its capacity in a variety of areas, particularly production of seed. In keeping with the ecological vision for the project, Midewin only purchases seeds with genotypes evolved to specific local conditions and operates its own seedbeds and nurseries for rare plant species. With these high standards, there is a very real concern that the pace of restoration could outstrip the supply of seed. Doubling the capacity of seed production would meet this need and potentially provide an ongoing source of revenue in the out years of the project.

The conservation vision focuses on restoring two major habitat types at Midewin: the tallgrass prairie itself and the riparian areas that flow through it.



Prairie restoration Drawing on the experience of restoring the first 2,000 acres at Midewin, the challenge for Midewin's managers and partners will be ramping up the pace of restoration activities. Additional staff, equipment, and resources will be needed to remove drain tiles, combat nonnative species, and increase seed production, to say nothing of replanting 18,000 acres of prairie, some of which must be performed by hand. The conservation vision estimates the cost of restoration at roughly \$4,500 per acre, with an additional \$1,000 per acre required to increase native seed production to sufficient levels. The total estimated cost for the entire restoration effort comes to more than \$98 million—the single greatest expense over the lifetime of the project.



A healed prairie will explode with life.



Stream restoration Four major streams measuring more than 22 miles cut across the property, draining down to the Des Plaines and Kankakee rivers. All have been heavily impacted by human development, with the banks stabilized and natural meanders replaced with straight, deep channels. Equally intrusive action will be required to return them to their original condition. Unlike prairie restoration, however, the per-mile cost of stream restoration varies widely according to local circumstances, making it difficult to forecast costs with any confidence. According to one upper-end estimate, it might require as much as \$33 million to bring back the streams to pre-settlement condition, but it could be considerably less. As a key next step, therefore, the vision document calls for a detailed assessment of Midewin's streams and riparian areas so that these figures can be refined.



Four major streams cross Midewin, draining to the Des Plaines and Kankakee rivers.



What better gift to the future?

Cost Projections

The restoration vision document estimates the total cost for this project at roughly \$174 million, exclusive of expenses associated with on-the-ground stream and wetlands restoration and ongoing operations and maintenance. At current appropriation levels, the Midewin National Tallgrass Prairie is on track to invest about \$45 million in the project over the 10-year period outlined by the vision. With expanding partnerships and enhanced interest, private dollars will be leveraged and additional federal funds are anticipated. That leaves a need of \$100 million from private sources to complete the implementation of this important project.

Project Timeline and Sequence

To keep costs down and ensure continuity of planning and action, the full restoration vision document includes a detailed timetable and sequence for key tasks. In general, in the near term—the next five years—the vision recommends pursuing a major infrastructure removal effort, while simultaneously tackling regulatory compliance requirements, necessary planning initiatives (such as an updated Visitor Engagement Vision), and ramping up prairie restoration capacity.

In addition, in this first phase the restoration vision emphasizes the need to assess the condition of streams and riparian areas, with the goal of developing a comprehensive cost estimate for restoration. And the document urges that the Midewin partners take immediate action on short-term opportunities to dramatically improve visitor experiences. This includes introducing an experimental bison herd, constructing a prairie learning center, and advancing the trail network.

Over the intermediate term (5-10 years), meanwhile, the conservation vision aspires to complete prairie restoration in areas where visitors can benefit most and expand restoration into new areas. During this period, it will also be important to expand recreation and interpretation options on multiple fronts and begin stream restoration. The final phases of the project will almost certainly extend beyond the conservation vision's 10-year horizon.

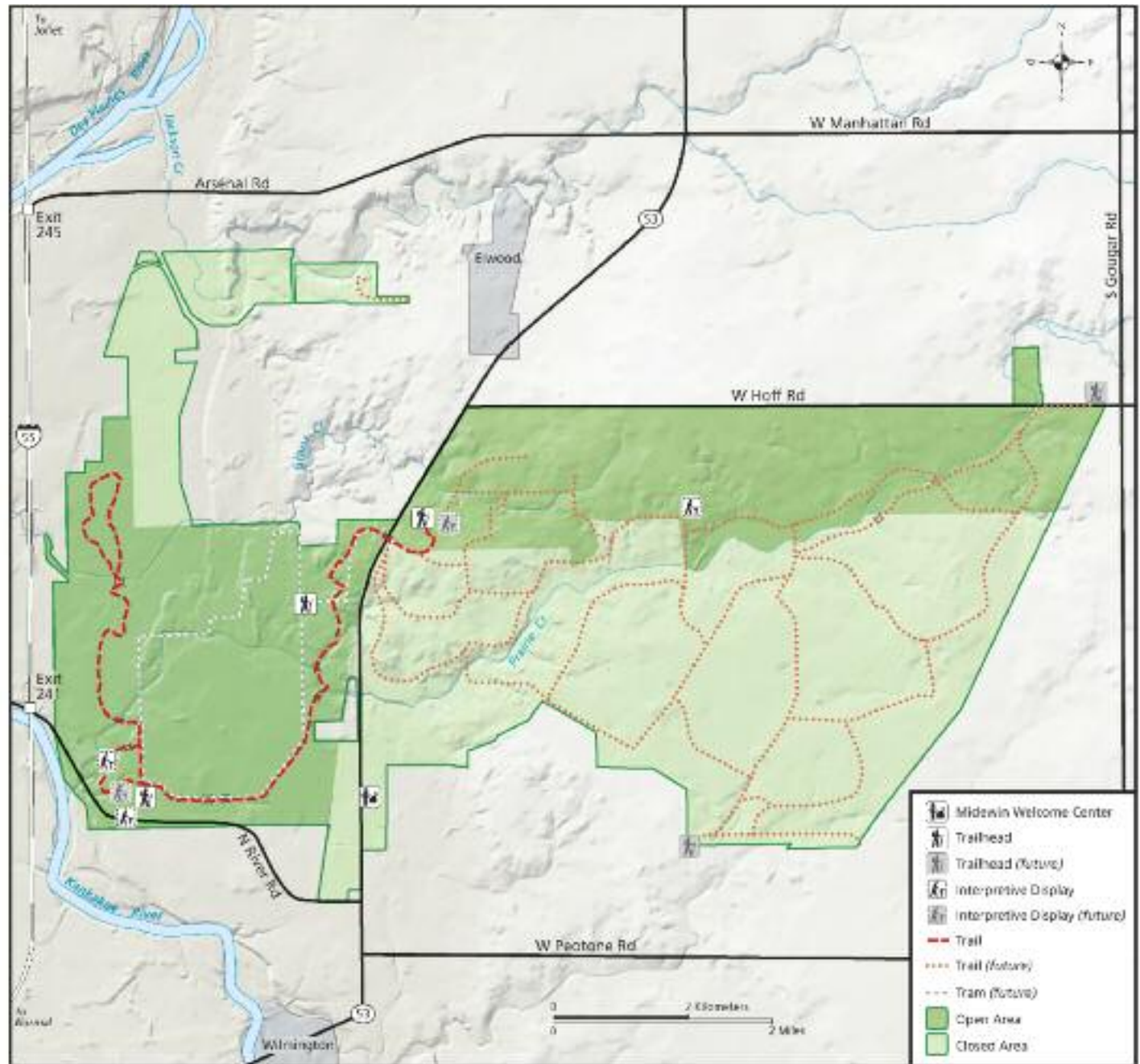
...the conservation vision aspires to
complete prairie restoration in areas where
visitors can benefit most...

Closing Thoughts

For Midewin, a return to tallgrass prairie would bring full circle a pattern of land use that traces the arc of Illinois history. From virgin prairie the land went to agriculture (some of the most productive soil on Earth) and then into intensive industrial development as the nation prepared for world war and global leadership. For 50 years the place hummed as a literal arsenal of democracy. With the end of the Cold War, Midewin underwent another transformation, its shuttered factories and vacant roads a symbol of a new post-industrial age. Now, with our help, the door is open for native prairie to return.

It is entirely right and proper for us to complete that cycle. This generation of Illinoisans has the opportunity—the obligation—to bring back the tallgrass prairie to its former splendor. Everyone will benefit: plants and animals, neighboring communities, people of all ages seeking out a place for recreation, education, or reflection.

And perhaps most all, future generations of Americans will reap the dividends of what we restore today. They can revel in the landscape that Eliza Steele witnessed in 1841, “a world of grass and flowers [that] stretched around me, rising and falling in gentle undulations, as if an enchanter had struck the ocean swell and it was at rest forever.” What better gift to the future?



Administered by the U.S. Forest Service and known as the Midewin National Tallgrass Prairie, this tract is the largest island in the archipelago of protected areas that collectively comprise the Chicago Wilderness.

Midewin Restoration Plan Participants



CHICAGO BOTANICAL GARDEN

Field
Midwestern
Herbarium
University of Illinois



The Wetlands
INITIATIVE



et valor



Chicago
Wilderness



“a world of grass and flowers that stretched around me,
rising and falling in gentle undulations, as if an enchanter
had struck the ocean swell and it was at rest forever.”

—Eliza Steele, 1841



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