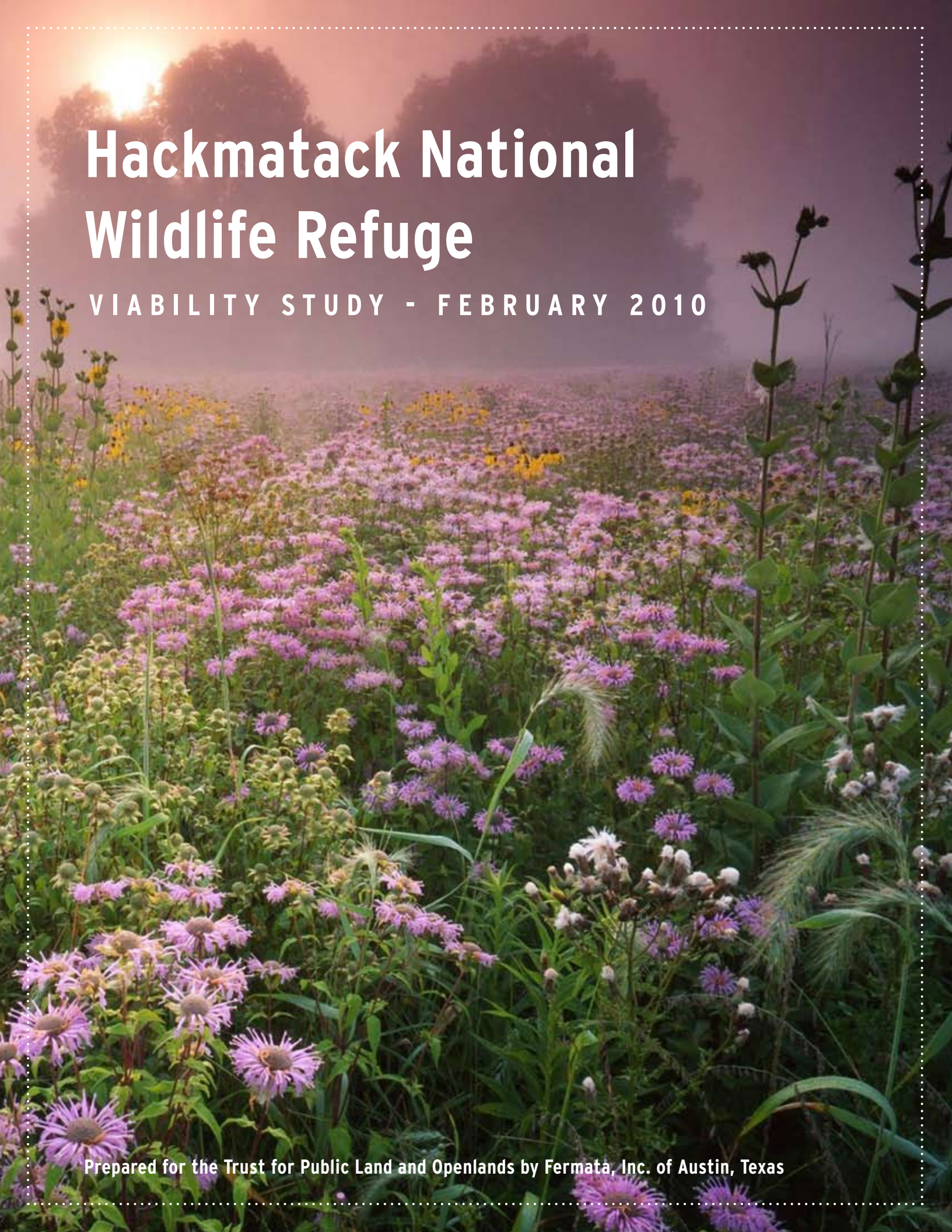

Hackmatack National Wildlife Refuge

VIABILITY STUDY - FEBRUARY 2010

Prepared for the Trust for Public Land and Openlands by Fermata, Inc. of Austin, Texas

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Restored landscapes provide wildlife habitat and enhance opportunities for viewing wildlife. Photo by Ray Mathis.

This study was funded by:

Burnham Plan Centennial Committee

Gaylord & Dorothy Donnelley Foundation

Oberweiler Foundation.

Cover photo by Ray Mathis.

Introduction

The Opportunity

High horns, low horns, silence, and finally a pandemonium of trumpets, rattles, croaks, and cries that almost shakes the bog with its nearness, but without yet disclosing whence it comes. At last a glint of sun reveals the approach of a great echelon of birds. On motionless wing they emerge from the lifting mists, sweep a final arc of sky, and settle in clangorous descending spirals to their feeding grounds. A new day has begun on the crane marsh.

--Aldo Leopold, from the essay "Wisconsin," A Sand County Almanac, 1949

In the early 1800s, the region we now know as northern Illinois and southern Wisconsin was a sweeping wilderness sculpted by glaciers and teeming with wildlife. Rich, poorly drained soils underlay a tapestry of marshes, fens, kettle ponds and lakes, prairie, forests, and savanna—varied habitats that supported phenomenally diverse and abundant plants and animals. This verdant landscape drew settlers, whose hard work transformed these natural habitats into farm fields and town sites, a transformation that accelerated as the region grew more populated.

Today, only small pockets of those once-widespread wildlands remain. But straddling the Wisconsin/Illinois state line lies an area where a vital network of these wild habitats still exists—a region of outstanding natural biodiversity, where whooping cranes, silvery blue butterflies, Blanding's turtles, and countless other species, both common and rare, can be found. A region at the doorstep of Chicago and Milwaukee, where visitors can still experience wildness, solitude, and intimate encounters with the natural world. With Richmond, Illinois, as its rough geographic center, this bi-state area includes such natural gems as Glacial Park, Geneva Lake, Nippersink Creek, and Chain O'Lakes, interspersed with some 88 publicly and privately owned parks, preserves, and conservation areas.

The Challenge

Less than two hours by car from both the growing urban centers of Chicago and Milwaukee, this region faces steady development pressure. The State Wildlife Action Plans for both Wisconsin and Illinois cite fragmentation as a leading threat to the integrity of this region's habitats. While this area has a strong conservation heritage and an excellent base of conserved lands, these conserved habitats are at risk of becoming islands in a rising sea of development. As

these wildlands become increasingly fragmented and degraded, the wildlife and plants that depend on this habitat mosaic continue to decline, as do the opportunities for experiencing these wild places.

The Vision

Hackmatack National Wildlife Refuge

Imagine connecting the disparate dots of conserved land within this region into a cohesive picture of landscape-level conservation. Imagine restoring grassland, wetland, and forest habitats, and conserving habitat corridors between protected parcels so that the region functions ecologically as an interconnected whole. Imagine raising the conservation status of this vital region to national significance. That's what community members and conservation organizations in Wisconsin and Illinois propose to do.

Imagine raising the conservation status of this vital region to national significance.

For years, conservation organizations across the greater Chicago metropolitan area have worked to identify key lands for conservation, open space, and greenways. At the heart of their work lies a vision of sustainable communities that value and nurture healthy ecosystems, recreational opportunities close to home, and vibrant economies. In portions of McHenry and Lake counties, Illinois, and Walworth, Racine, and Kenosha counties, Wisconsin, a coalition of residents saw a unique and fleeting opportunity to take a big step toward that vision.

Their vision: to create a new national wildlife refuge that forms the nucleus of a cohesive regional conservation identity. A core conserved area owned and managed by the U.S. Fish and Wildlife Service as a national wildlife refuge would anchor this conservation initiative. Its far-reaching ecological and social impact would come from extensive partnerships with the many public and private landowners committed to furthering conservation in the region. This new refuge and regional identity would, in turn, become an economic driver for local towns, as visitors travel to the region to recreate and experience restored native landscapes.

Refuge planners have given this potential national wildlife refuge and surrounding network of conserved land the name *Hackmatack*, a Native American word for the region's now rare tamarack.

The Purpose of this Report

This report addresses a central question: Does the idea of creating Hackmatack National Wildlife Refuge make sense—ecologically, economically, and socially? In other words, is it feasible? To answer this question, analysis for this feasibility report focused on a study area defined by a 30-minute driving radius from the village of Richmond, Illinois (Figure 1). This report also references the larger area

Figure 1: Geographic center of Hackmatack study area

Boundary of study area, 30-minute drive from center

within a 2-hour drive of Richmond, referred to in this report as "the region" (Figure 2). The Hackmatack study area is not a hard-and-fast delineation of the conserved areas that might eventually be connected with the Hackmatack National Wildlife Refuge initiative, but it does encompass most of the key conservation areas that Hackmatack planners have identified. The study area includes lands within McHenry and Lake counties in Illinois and within Walworth, Racine, and Kenosha counties in Wisconsin.

In the pages that follow, this report will identify and assess the biological, recreational, economic, and social implications of establishing Hackmatack National Wildlife Refuge.

What is a National Wildlife Refuge?

The National Wildlife Refuge (NWR) System protects nationally and internationally significant wildlands to conserve a diversity of native fish, wildlife, plants, and their habitats. The U.S. Fish and Wildlife Service (USFWS) owns and manages national wildlife refuges. Scattered throughout the country, these refuges maintain a network of habitats for migratory wildlife and conserve landscapes that are unique, rare, declining, or underrepresented in existing conservation efforts. What sets NWRs apart from many other state and federal conservation management systems is their explicit overarching policy that "Wildlife Comes First."

In any given NWR, refuge managers strive to provide recreation opportunities like hunting, fishing, wildlife observation, trails, and photography, as long as they do not negatively impact the refuge's wildlife. Moreover, refuge managers promote environmental education to build public awareness and appreciation of the refuge's diverse and interconnected wildlife, plants and habitats.

While most NWRs have been designated in remote, rural areas (not surprisingly, the state with the largest number of NWRs is North Dakota), the Hackmatack study area lies within the Chicago Metropolitan Statistical Area (MSA). Recognizing that the remoteness of most NWRs hindered their educational goals, the USFWS developed an Urban Refuge Policy, *"to acquire lands and waters in or adjacent to metropolitan statistical areas to protect fish and wildlife resources and habitats that will provide the public wildlife-oriented recreation, education, and interpretation opportunities …the primary purpose for establishment of new urban refuges will be to foster environmental awareness and outreach programs, and to develop an informed and involved citizenry that will support fish and wildlife conservation."*

In the case of the proposed Hackmatack National Wildlife Refuge, proponents envision both acquiring land that will serve as the refuge proper and partnering with local public and

The northern leopard frog is common among the ponds and marshes of the study area. Photo by Ted Lee Eubanks.

private landowners to conserve and restore habitat corridors between and among NWR lands and surrounding conservation areas.

The USFWS has a variety of tools that enable a network of lands to follow a consistent set of conservation objectives while maintaining different ownerships. These approaches are entirely voluntary on the part of the landowner. Existing public lands can maintain their own identity and be shown on regional maps as separate entities. If needed, USFWS can develop cooperative agreements with landowners who do not have the resources to manage their land.

NWR designation has no effect on the rights, privileges, and responsibilities of adjacent private landowners.

NWR designation has no effect on the rights, privileges, and responsibilities of adjacent private landowners. According to the USFWS, *"The presence of refuge lands does not afford the Service any authority to impose restrictions on any private lands. Control of access, land use practices, water management practices, hunting, fishing, and any other general use is limited to those lands in which the Service has acquired an appropriate real estate interest or right."*

There are excellent models for such cooperative partnerships. The Minnesota Valley National Wildlife Refuge in Bloomington, MN, offers a compelling regional model. The Minnesota Valley NWR includes land owned and managed by USFWS, lands under cooperative management agreement with the USFWS, and many other protected lands that are managed by their respective owners. The lands shown on the public use map as USFWS land are those lands owned by USFWS or under agreement, in which case the USFWS operates and manages the land (signage, law enforcement, staff, etc.). Adjacent to USFWS lands are state DNR lands, conservancy lands, and local parks still managed by their owners, with their own identity (see Figure 6). A later section of this report offers an in-depth look at the Minnesota Valley NWR model.

A Tradition of Conservation Innovation

The proposed Hackmatack National Wildlife Refuge builds upon a long tradition of conservation innovation in the bi-state region. As early as 1869, such prominent Chicagoans as Dr. John Rauch called for the creation of a park system. Rauch reminded city leaders that *"we want, not alone, a place for business, but also one in which we can live."*

In 1909, planner Daniel Burnham extolled a new type of city in Chicago, one that used wooded boulevards to connect the countryside to large natural parks and stream corridors. He entreated the people of the region to *"Make no little plans; they have no magic to stir men's blood."* In 2009, the 100th anniversary celebration of the Burnham Plan reaffirmed the value of the Burnham's original plan, which embraced a proactive approach to shape the landscape and the regional quality of life. During the 2009 centennial, the Burnham Plan Centennial Committee identified 21 Green Legacy projects that will help safeguard and nurture the green infrastructure of the region. During that process, the committee formally

recognized the proposed Hackmatack NWR as an opportunity to preserve some of the region's most dramatic landscapes.

In 1914, Cook County created the nation's first Forest Preserve District for the purpose of *"preserving the flora, fauna, and scenic beauties... and to restore, restock, protect, and preserve the natural forests ... in their natural state and condition, for the purpose of the education, pleasure, and recreation of the public."*

Today the preserves, conservation districts, and municipal parks in the six-county region surrounding Chicago protect over 300,000 acres of public open space in a system of natural lands unparalleled by any other metropolitan area in the country.

Wisconsin has produced some of the nation's most visionary conservation leaders. John Muir began his life-long love of nature on his father's farm near Portage. When he moved west, he asked his brother-in-law to spare the oak groves and sedge meadows he loved:

"I want to keep it untrammeled for the sake of its ferns and flowers, and even if I should never see it again, the beauty of its lilies and orchids is so pressed into my mind, I shall always enjoy looking back at them in imagination, even across seas and continents, and perhaps after I am dead."

Aldo Leopold, visionary ecologist who helped launch the modern conservation movement, wrote his seminal work, *A Sand County Almanac*, on a worn-out Wisconsin farm being restored to ecological health by his family. His essay "The Land Ethic" set the standard for a new way of understanding and interacting with the land:

"All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in that community, but his ethics prompt him also to co-operate. The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land."

The Wisconsin Department of Natural Resources (WDNR) is recognized as a national leader in wildlife conservation. Founded in the nineteenth century as the Wisconsin Conservation Commission, the agency traces its roots to among the earliest attempts at conservation in the Midwest. In addition to managing an important staging area for sandhill crane migration at Peterkin Pond, the WDNR has also preserved important natural lands at the Bloomfield Wildlife Area and Big Foot Beach State Park, all in Walworth County.

Coyotes are common across the Chicago Metro Area and help in the control of Canada goose and rodent populations. Photo by Doug Herr/Painet Inc.

Since 1858, the Illinois Natural History Survey (INHS) has investigated and documented the biological resources of Illinois—one of the largest and oldest state institutions of its type in the country. From 1975 to 1978, the Illinois Department of Conservation (now the Illinois

Department of Natural Resources) conducted the state's initial Natural Areas Inventory, documenting nearly 1,100 ecologically intact sites encompassing 25,000 acres across Illinois –the first inventory of its kind in the nation. The inventory has been an important tool in the conservation of Illinois' vanishing, natural habitats and their unique plants and animals. Over the years, the INHS has contributed significantly to the national and international conservation movement, including establishing the world's first inland aquatic biological field station in 1894.

Long-standing Connections with the Land

Hackmatack study area residents have long depended on and had their lives and livelihoods shaped by the region's natural resources. Rich prairie soils, abundant water, and timber enabled a generation of pioneers to create a network of productive farms and small villages.

The Hackmatack National Wildlife Refuge proposal builds upon this long-standing tradition of nature tourism in communities within the Hackmatack study area.

By the late nineteenth century, the growing cities of Chicago, Rockford, and Milwaukee produced a different type of economic boom for the Hackmatack study area, one based on the landscape's beauty, natural abundance, and rural charm. In Illinois, the Chain O'Lakes region became one of Chicago's premier vacation spots for inland boaters, fishermen, picnickers, or those wishing to relax and play at the beach. Lakeside cottages and resorts dotted the region's more than 6,000 acres of shoreline.

Across the border, Lake Geneva became a resort for wealthy Chicago and Wisconsin families. These families constructed the many mansions on the lake, encouraging visitors to dub Lake Geneva the "Newport [RI] of the West." Visitors included Mary Todd Lincoln and Generals Sherman and Sheridan. Construction and maintenance of these mansions developed a separate industry in the region, adding to existing milling, furniture, wagon, and typewriter manufacturing enterprises.

Rail lines through Richmond, Genoa City, and Pell Lake serviced Lake Geneva resorts, while the Fox Lake line brought visitors to the Chain O'Lakes. At the end of World War II, a literal cottage industry sprang up in many of the small towns in the Hackmatack study area, as residents of Chicago and Milwaukee began purchasing small lots for summer homes in towns like Wonder Lake, Pell Lake, Silver Lake, and Spring Grove.

The Hackmatack National Wildlife Refuge proposal continues this long-standing tradition of nature tourism in communities within the Hackmatack study area.

The town of Lake Geneva, Wisconsin, has been attracting tourists for over a century. Photo by Sarah Schuster.

Biological Assessment

Data from both the McHenry County (IL) Conservation District and Southeastern Wisconsin Regional Planning Commission (SEWRPC) suggest that the Hackmatack study area supports richly diverse flora and fauna, including many species listed as state or federally threatened or endangered. In addition, the U.S. Fish and Wildlife Service has identified numerous local bird species as Birds of Conservation Concern, a designation meant to stimulate conservation efforts to prevent these species from becoming threatened and endangered.

Two extensive studies support and expand upon these findings. In 2005, both Illinois and Wisconsin completed State Wildlife Action Plans. These plans inventoried the states' natural habitats and wildlife populations, and identified threats to those habitats and species, as well as conservation opportunities for keeping common species common and reversing the decline of sensitive species. These plans provide a scientifically rigorous ecological framework with which to assess the biological implications of creating the Hackmatack National Wildlife Refuge.

Both the Illinois and Wisconsin State Wildlife Action Plans note that conserving sensitive species requires the protection and restoration of high-quality habitats. Connecting these high-quality habitats helps sustain an interdependent web of species and natural communities. Chicago Wilderness (a consortium of 240 regional businesses, conservation organizations and public agencies in Wisconsin, Illinois, and Indiana) and SEWRPC have identified ecological corridors throughout the Hackmatack study area that will, if protected and restored, help ensure the long-term sustainability of local ecological systems and sensitive species.

Often flying low and slow over grasslands and marshes to locate its prey, the northern harrier is easily identified by its white rump patch. Photo by Steve Byland.

The Illinois Portion of the Hackmatack Study Area

The Illinois Wildlife Action Plan (formally known as the Illinois Comprehensive Wildlife Conservation Plan, or ICWCP), divides the state into 14 distinct natural areas, or divisions.[1] The Hackmatack study area lies within the Northeastern Morainal Natural Division. According to ICWCP, this area hosts the state's greatest biodiversity, as well as its greatest human population.

While urbanization and sprawl in this region make open-space preservation challenging, ecologists acknowledge that simple creation of parks and preserves is only one step in protecting biodiversity. Even after these areas are protected, their ecological integrity and biological diversity can be threatened by fragmentation, lack of natural

Prairie & Wetland Critical Species

- Henslow's sparrow
- Bobolink
- Loggerhead shrike
- American bittern
- Swainson's hawk
- Black tern
- Northern harrier
- Black rail
- Sandhill crane
- Forster's tern
- Yellow-headed blackbird
- Blanding's turtle

Several whooping cranes land among Canada geese and sandhill cranes in a northern Illinois marsh. The world population of whooping cranes hit a low of 21 in 1941 due to habitat loss. Their population has rebounded thanks to conservation efforts. Photo by Mark Blassage

disturbances like wildfire, modification of natural water cycles, and invasive plants and animals that out-compete native species. Effective habitat conservation depends on landscape-scale planning and management to interconnect preserved areas, and on habitat restoration to remove invasive species and reintroduce natural processes, upon which healthy natural communities depend.

In its assessment of the Northeastern Morainal Natural Division, the ICWCP notes, *"Restoration and management of large, contiguous tracts of land will become more difficult as urbanization continues. New landscape-scaled projects are still possible in Boone,* **McHenry, Lake,** *Kane and DeKalb counties (emphasis added). Existing large areas throughout the natural division will benefit from on-going and planned restoration and management."* [2]

The ICWCP reports that more than 90% of the state's wetlands have been lost to agriculture, development, and other land uses. Before settlement, prairie grasslands covered an estimated 21 million acres of the state. Now less than 2,600 acres of native prairie dot the Illinois landscape. Many of these prairie and wetland remnants are too small and isolated to support viable populations of plant and animal species.

The ICWCP identifies the Lake-McHenry County Wetland Complex as a Conservation Opportunity Area.* This COA overlaps the study area and includes many of the natural sites inventoried for this study. The ICWCP further identifies the priority resources to conserve within this COA: *"several rare wetland types including fens and bogs, rare wetland and grassland species–some not found elsewhere in Illinois."* The plan advocates active management to maintain and enhance biodiversity.

The Wisconsin Portion of the Hackmatack Study Area

Wisconsin's Wildlife Action Plan (formally known as Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need, simply referred to as *Strategy*) divided the state into 16 Ecological Landscapes, based on geology, ecology, and climate.[3] The portion of the Hackmatack study area within Wisconsin lies in the Southeast Glacial Plains Ecological Landscape. Historically, this landscape supported a mosaic of prairie, oak forests, oak savanna, maple-basswood forests, marshes, and fens.

This ecological landscape supports the highest aquatic productivity for plants, insects, invertebrates, and fish in Wisconsin. Agricultural and urban land use practices have drastically changed the land cover since Euro-American

* The ICWCP defines Conservation Opportunity Areas as "locations with significant existing or potential wildlife and habitat resources, where partners are willing to plan, implement and evaluate conservation actions, where financial and human resources are available, and where conservation is motivated by an agreed-upon conservation philosophy and set of objectives." (pg 18-19)

settlement. Much of the current vegetation is agricultural cropland, a reflection of the region's rich agricultural heritage. In spite of this, the area still contains important fens, tamarack swamps, wet prairies, and wet-mesic prairies that support rare plants and animals.

Within each ecological landscape, the Strategy identifies the natural communities that have the greatest priority for protection, restoration and management. In the Southeast Glacial Plains Ecological Landscape, grasslands, wetlands, and savanna top the list.

Wisconsin's *Strategy* reports before European settlement, prairie covered six percent of Wisconsin. Now prairies cover less than one percent of the state, and many of these remnants are small, isolated, and vary in quality. Most remnants are too small to support the species that typically inhabit a native prairie ecosystem.

Wisconsin wildlife planners have identified several areas of enormous potential for the re-creation of a native grassland-wetland complex reflective of the rich mosaic that once defined large portions of the region. Such a re-creation can partially fulfill the goals of Wisconsin's Strategy to establish large blocks of prairie habitat capable of supporting the full suite of grassland nesting birds now in decline across much of the Midwest.

Oak savanna now shares equal billing with tallgrass prairie as the most threatened plant community in the Midwest. While oak savanna once covered 5.5 million acres in the state, the Natural Heritage Inventory now lists fewer than 500 acres as having a plant assemblage similar to the original Wisconsin oak savanna.

Since settlement times, Wisconsin has lost 47% of its wetlands, and most remaining wetlands occur in the northern third of the state. Wetland loss is most severe in southern Wisconsin, where well over 75% have disappeared. The *Strategy* identifies several "major opportunities for sustaining natural communities" in the Southeast Glacial Plains Ecological Landscape, including savanna, prairie, fen, bog, and forest communities.[4]

Rollins Savanna Forest Preserve is known for its yellow-headed blackbirds, which nest in the prairie wetlands and marshes. The habitat within the preserve is a testament to what prairie and wetland restoration can look like. Photo by Ted Lee Eubanks.

Regional Development Pressures

According to a 2007 report in the Chicago Tribune, "the population of the seven-county Chicago metro area experienced a growth rate of 63 percent between 1950 and 2006, and that rate jumps to 261 percent by removing the city of Chicago from the equation."

As Chicago spreads into the rural regions that surround it, farm lands, open space, natural lands, and wildlife are being threatened. Critical natural lands that surround Chicago—Indiana Dunes, the Kankakee River, and the Hackmatack area—are directly in the path of this surge. While the economic recession has slowed this rate of growth, it is likely to return in some form with economic recovery. Some land within the Hackmatack NWR study area has already been slated for development. There is an opportunity to shape future growth in a way that protects and integrates this valuable natural landscape.

Many of the park and preserve districts also offer broad-ranging educational programs, from volunteer land stewardship opportunities and habitat restoration projects to youth nature camps and health and wellness programs.

Ecological Assets within the Hackmatack Study Area

- ***88 publicly and privately owned parks, preserves, and conservation areas with natural ecosystems totaling about 50,418 acres.***

Many of the parks and preserves in the study area primarily conserve natural ecosystems (as opposed to multi-use parks, which mainly offer developed recreation, like playgrounds, ballfields, and community centers). Within the Hackmatack study area, the Lake County Forest Preserve District, McHenry County Conservation District, Illinois Department of Natural Resources (IDNR) and Wisconsin DNR own and manage the bulk of these natural parks. Collectively they manage about 60% of the protected lands in the Hackmatack study area. Community and county parks account for a smaller percentage. Local land conservancies own and manage several smaller sites, and hold conservation easements as well.

These parks and preserves conserve diverse ecosystems. Many have extensively restored native natural communities, providing a high-quality natural experience for visitors. Many of the park and preserve districts also offer broad-ranging educational programs, from volunteer land stewardship opportunities and habitat restoration projects to youth nature camps and health and wellness programs.

- ***109 species of concern that include federal and state threatened and endangered species, and Birds of Conservation Concern.***

- 49 birds
- 5 fishes
- 5 mussels
- 1 amphibian
- 2 reptiles
- 47 plants

Two habitat types account for most of the sensitive species in the study area—wetlands and grasslands. The glacial history of the study area has produced a rich variety of wetlands—including fens, bogs, marshes, swamps, ponds, lakes, and streams—that attract abundant and diverse wildlife. One iconic wetland species seen in the Hackmatack study area is the federally endangered whooping crane. As the eastern migratory population of whooping cranes expands (migrating between Wisconsin and Florida), the wetlands of this region may become increasingly important to that critically imperiled species.

Many of the bird species that rely on prairie grasslands, including the Henslow's sparrow, short-eared owl, bobolink, and dickcissel, are threatened, endangered, or in steep population decline across their range. The Hackmatack study area presently conserves a patchwork of wetlands and grasslands which, if connected, could greatly enhance habitat for these species of conservation concern.

- ***24 State-designated natural areas totaling about 3,444 acres.***

Both Wisconsin and Illinois have programs that designate Natural Areas (WI) or Nature Preserves (IL). These programs assist private and public landowners in protecting high quality natural areas and the habitats of endangered and threatened species. The State Natural Areas protect outstanding examples of native communities, significant geological formations and archeological sites. They harbor natural features essentially unaltered by human-caused disturbances or that have substantially recovered from disturbance over time. These unique natural sites preserve genetic and biological diversity, and provide some of the last refuges for rare plants and animals. The natural areas are surviving islands of native ecosystems that once existed all across the entire study area and offer visitors a chance to experience a variety of intact wetland, prairie, and glacial landscapes.

- ***3 Audubon Important Bird Areas.***

The Audubon Society's Important Bird Areas Program is a global effort to identify and conserve areas that are vital to birds and other biodiversity. An Important Bird Area (IBA) provides essential habitat for one or more species of birds, and often comprise a mixture of public and private land. IBA designation is

independent of government programs and congressional designations and is special recognition that these sites provide critical habitat for sensitive birds.

All of the IBAs within the study area are designated at the "State" level of significance.

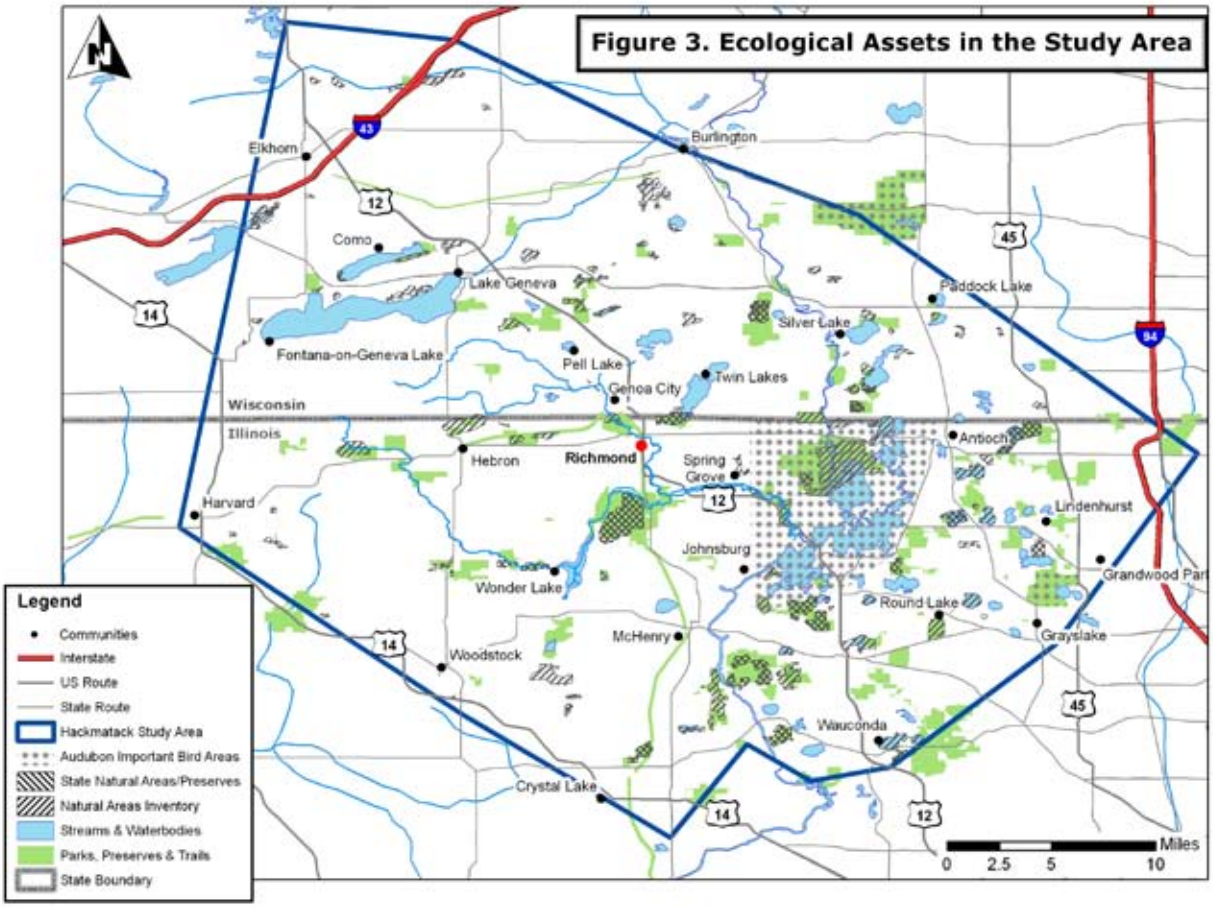
1. Located in northeastern Illinois, the Lake-McHenry Wetlands Complex IBA comprises one of the state's largest concentrations of natural wetlands and glacial lakes. The IBA includes the Grass, Marie, Nippersink, Bluff, Fox, Pistakee, Channel, Petite, Catherine, and Redhead Lakes, along with the Fox River and the surrounding lands that interconnect them.

2. Rollins Savanna, a Lake County Forest Preserve, was designated an IBA in 2005 because of the large number of state endangered wetland birds such as yellow-headed blackbird found here. The preserve is also a good place to observe grassland species.

3. Richard Bong State Recreation Area is one of the largest open, undeveloped areas left in southeast Wisconsin. Bong supports significant populations of grassland birds, such as bobolink, eastern meadowlark, Henslow's sparrow, field sparrow, and savanna sparrow.

- ***230 Natural Area Inventory sites.***

Both Illinois and Wisconsin have assembled an inventory of high-quality natural areas that support rare natural communities and endangered species. The sites identified within Illinois and Wisconsin include a rich diversity of native flora and fauna on both public and private lands. Information from the Natural Area Inventory is used to guide and support land acquisition and protection programs by all levels of government as well as private landowners and conservation organizations. The natural communities inventoried include bogs, fens, marshes, prairies, meadows, oak savannas, and woodlands.



See page 35 for a full-page version of this map.

Connectivity, Restoration, and Biodiversity

"Long-range landscape-level planning is one important component that leads to successful recovery efforts"

--Illinois Comprehensive Wildlife Conservation Plan, pg vi.

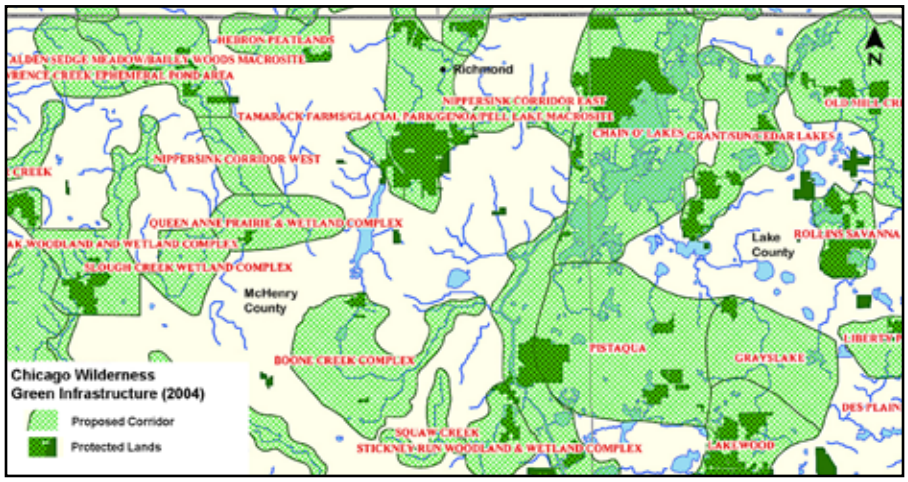


Figure 5: Green Infrastructure Map in for the Study Area in Illinois.
See page 37 for a full-page version of this map.

When landscapes are re-connected and restored, the result is a whole that is far greater than the sum of its parts.

As both the Illinois and Wisconsin Wildlife Action Plans note, landscape-level conservation that connects protected but fragmented landscapes (parks and preserves) is one key to ensuring long-term sustainability of native flora and fauna populations. Ecological corridors connecting sites both small and large open paths for migration and dispersal. Biodiversity also depends on restoration and management of native ecosystems. When landscapes are reconnected and restored, the result is a whole that is far greater than the sum of its parts.

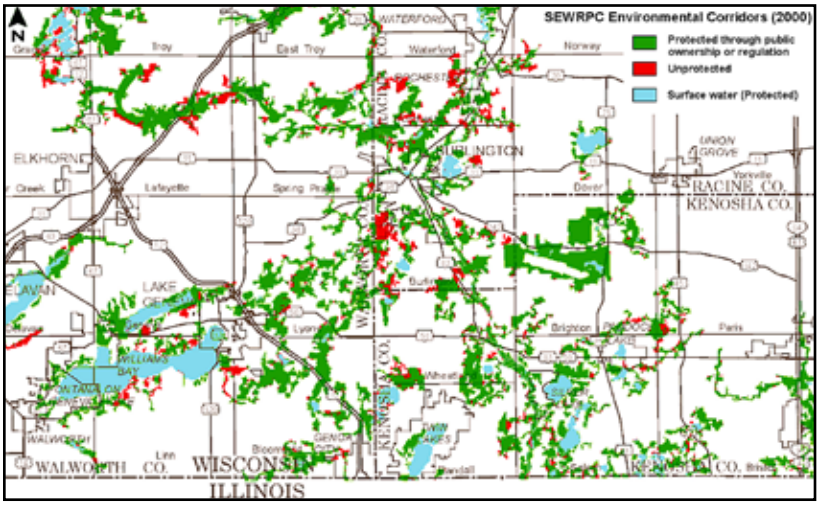


Figure 4: Environmental Corridor Map for the Study Area in Wisconsin.
See page 36 for a full-page version of this map.

Protected lands within the study area exist within the much larger matrix of unprotected public and private lands that support natural systems in the region, a landscape graphically conceptualized in SEWRPC's Environmental Corridor Plan (Figure 4) and Chicago Wilderness' Green Infrastructure Plan (Figure 5). Both plans have widespread support in the region.

Restoration of natural communities has been ongoing on McHenry County Conservation District lands since 1975. At Glacial Park, the restoration of natural communities has been occurring over the past 15 years. Already resource managers at Glacial Park have documented the return of many plants and animals native to these natural communities. Such resiliency within natural systems over such a short period of time holds great promise for restoration of other parks and preserves in the study area. As the Chicago/ Milwaukee/Rockford metropolitan areas continue to expand, the value of these ecological corridors will be even more important to maintain species viability.

Glacial Park is noted for its concentration of important natural heritage elements and has been designated a State Nature Preserve. Photo by Brenda Adams-Weyant.

Glacial Park Region: A Potential Macrosite

The study area contains several potential *macrosites*. Macrosites are large parcels of land capable of sustaining plants and wildlife that require large home ranges or habitat blocks to survive. They are critical building blocks of biologically viable preserves. In northern McHenry County in Illinois, just west and southwest of Richmond, lies one such potential macrosite. This is an area with exceptional native habitats that collectively offer the potential of functioning as a macrosite. This area includes Glacial Park and North Branch Conservation Area (both owned and managed by the McHenry County Conservation District). The Glacial Park region and other potential macrosites in the study area are among just a handful of areas remaining in the Chicago Region where it is possible to protect enough land to create a macrosite.

What makes the Glacial Park area so ecologically significant? Glacial Park protects 3,260 acres of wetlands, oak savanna, woodlands, and prairie. The site's glacial history has sculpted the landscape with moraines, kames, kettle marshes, and bogs. The McHenry County Conservation District and volunteers have been restoring native communities by removing invasive species, conducting prescribed burns, and revitalizing wetlands.

Resource managers have restored much of the site's farmland to prairie, and have returned straightened portions of Nippersink Creek to their former, meandering channels.

Macrosites are large parcels of land capable of sustaining plants and wildlife that require large home ranges or habitat blocks to survive. They are critical building blocks of biologically viable preserves.

Glacial Park is noted for its concentration of important natural heritage elements, including 21 Illinois endangered or threatened species, one federally threatened species, two high-quality streams, a number of high-quality natural communities (including several Illinois Natural Area Inventory sites), and one of the largest blocks of unfragmented grassland habitat in the Chicago Region. Portions of Glacial Park also have the distinction of State Nature Preserve designation. Refer to Appendix A for a list of the species of special concern found here.

The park has been developed with recreation facilities that lie lightly on the land. The natural landscape takes center stage at this park, and recreation facilities provide opportunities for visitors to responsibly explore this landscape. Educational programs and events help visitors learn more about this fascinating place.

North of Glacial Park lies the 520-acre North Branch Conservation Area. This preserve features high-quality oak savanna, prairie,

The American bittern is usually well-hidden in marshes and wet meadows, and is an Illinois endangered species. Photo by Ted Lee Eubanks.

wetland, and streams. The McHenry County Conservation District has been restoring the site's grasslands since the property was purchased in 1999.

Several important natural communities still exist at the North Branch Conservation Area. These include a high-quality Illinois Natural Area Inventory site known as the Genoa City Fen, a graminoid fen, sedge meadow, and marsh community. The North Branch of Nippersink Creek (recognized as a Biologically Significant Stream by the Illinois DNR) bisects the site and supports diverse fish and mussel populations, including the only known county occurrence of the state endangered Rainbow Mussel. The restored grassland areas now support significant populations of declining grassland songbirds. Ten state threatened and endangered species have been documented on the site.

The Glacial Park macrosite is just one example of the potential for landscape scale conservation within the study area. By building on the foundation of the lands already protected within the study area, protecting additional key parcels that provide connectivity and preserve threatened habitats, and facilitating cooperative management, a new Hackmatack Wildlife Refuge can fulfill the National Wildlife Refuge System objectives of conserving, managing and restoring fish, wildlife, plants and their habitat, all within a major metropolitan statistical area.

Conclusion: Ecological Implications of the Hackmatack National Wildlife Refuge Proposal

The creation of Hackmatack NWR would be an important step to help mitigate the impacts of unplanned suburban expansion. The vision of the Hackmatack National Wildlife Refuge includes two key elements that will both enhance biological diversity and ecological processes in the Hackmatack study area. The project would establish a national wildlife refuge, which will be managed according to the NWR system-wide mandate of protecting and enhancing wildlife habitat. Moreover, the project would establish partnerships among public and private landowners within the study area to establish habitat corridors between and among conserved parcels, and facilitate cooperative management. Protecting key corridor parcels in the Hackmatack study area, through purchase or easement, will help maintain species populations and natural communities.

Recreation Assessment

"Opportunities for recreation are outstanding [in the Northeastern Morainal Natural Division, which includes the Hackmatack study area] due to the extensive acreage of publicly owned lands and the numerous programs offered by State, Regional, County and municipal Forest Preserve and Park Districts, including: birdwatching, guided nature hikes, canoe outings, river clean ups, stewardship opportunities, other passive wildlife and plant observations, "citizen scientists" data collection and restoration opportunities, biking, cross country skiing, canoeing, kayaking, and nature photography. Although hunting is limited in many areas, waterfowl hunting, trapping and deer hunting is excellent in some counties. Angling opportunities are outstanding, with … Chain-O-Lakes, other State Lakes, and the numerous Park and Forest Preserve District waters." --Illinois Comprehensive Wildlife Conservation Plan, pg. 173

A study by the Outdoor Foundation found that 50% of Americans (138.4 million people) participated in outdoor recreation activities in 2007, up from 134.4 million in 2006. Because most Americans now live in urban areas–81% in 2005–outdoor recreation provides their primary means of contact with the natural world.[5] With many outdoor recreation experiences in short supply or non-existent in urban areas, people must travel away from home to experience outdoor recreation activities–like hunting, fishing, wildlife viewing, and camping–that require wild or undeveloped lands.

Beyond these overarching premises, the multi-dimensional nature of recreation discourages generalizations. Recreationists differ widely in their preferences, and each group approaches the lands in which they recreate at different times, during different seasons, and with different intentions. Within the Hackmatack study area, the various local and state land management agencies (Illinois DNR, Wisconsin DNR, McHenry County Conservation District and Lake County Forest Preserve District) operate under different mandates, authorities, and funding sources, and have varying approaches to recreation. Because the Hackmatack National

Wildlife Refuge proposal centers on creating a new national wildlife refuge, this recreational assessment begins by taking a look at the recreation opportunities and constraints of NWRs.

Recreation within National Wildlife Refuges

The National Wildlife Refuge System Administration Act (1966) provides guidelines for recreational activities compatible with the primary purpose of NWRs, which is to conserve a diversity of fish, wildlife, and plant populations and their habitats.

As such, national wildlife refuges allow five primary recreational activities:

- Hunting
- Fishing
- Wildlife Viewing
- Wildlife Photography
- Environmental Education and Interpretation

The wide range of managing entities within the study area increases the visitor's recreational choices, as each offers its own suite of potential activities.

Although trails are not listed as one of the primary NWR recreational activities, trails are commonly used on NWRs to provide sustainable access to recreationists pursuing the primary recreational activities.

Although this brief list excludes many recreational activities on the refuge proper, the network of public and private conservation areas surrounding the potential Hackmatack NWR offer an array of recreation opportunities that complement the NWR offerings. Glacial Park provides equestrian and cross-country ski trails. Big Foot Beach and Chain O'Lakes state parks offer quality boating, fishing, and camping opportunities. Paddlers can canoe and kayak on the Nippersink Water Trail, and Wisconsin DNR Wildlife Areas and some McHenry County Conservation District sites offer hunting opportunities. The wide range of managing entities within the study area increases the visitor's recreational choices, as each offers its own suite of outdoor activities.

Demand for Nature-based Recreation

A number of data sources and surveys provide insight into the recreational markets that are appropriate to the Hackmatack study area.

National Survey on Recreation and the Environment

The National Survey on Recreation and the Environment (NSRE) represents the continuation of the ongoing National Recreation Survey series that began in 1960. The NSRE's primary purpose is to explore participation in a wide range of outdoor recreation activities by people 16 years and older in the United States.

Table 1 displays NSRE data on the recreation market for 61 outdoor recreation activities and the trend for each over the past 15 years. The highlighted recreation activities are particularly applicable to the Hackmatack study area.

Fishing is a gateway recreation, one that introduces many young people to the world of nature. Photo by McHenry County Conservation District.

Table 1: Recreational Trends in Illinois (NSRE, 2009)

Activity	Participants 2009	Trend from 1995-2009
Nature-based Activities		
Rock climbing	554,000	63%
Day hiking	3,098,000	52%
Small game hunting	570,000	44%
Mountain climbing	283,000	34%
Developed camping	2,211,000	25%
Migratory bird hunting	226,000	16%
Big game hunting	438,000	14%
Drive off-road	1,091,000	4%
Backpacking	440,000	-16%
Primitive camping	693,000	-34%
Orienteering	105,000	-39%
Viewing/Learning Activities		
View or photograph fish	2,769,000	181%
Caving	286,000	69%
View/photograph wildlife	4,576,000	68%
View/photograph birds	3,128,000	38%
Visit nature centers, etc	5,347,000	3%
Visit historic sites	3,368,000	-16%
Visit archeological sites	1,109,000	-26%
Sightseeing	3,598,000	-30%
Developed Setting Activities		
Yard games, e.g., croquet	5,795,000	66%
Horseback riding	663,000	56%
Attend outdoor concerts, etc.	4,702,000	46%
Family gathering outdoors	8,019,000	44%
Walk for pleasure	8,203,000	36%
Bicycling	4,207,000	35%
Picnicking	5,843,000	24%
Water Activities		
Kayaking	395,000	2094%
Saltwater fishing	585,000	179%
Surfing	52,000	160%
Coldwater fishing	963,000	103%
Sailing	673,000	96%
Jet skiing	625,000	91%
Canoeing	864,000	64%
Anadromous fishing	550,000	42%
Windsurfing	87,000	36%
Warmwater fishing	2,504,000	29%

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Photo by Lenore Beyer-Clow.

Photo by Sarah Schuster.

Photo by McHenry County Conservation District

Photo by McHenry County Conservation District

continued from previous page

Activity	Participants 2009	Trend from 1995-2009
Snorkeling or scuba diving	469,000	17%
Motorboating	2,202,000	7%
Rowing	338,000	5%
Swimming in lakes, streams, etc.	2,999,000	-4%
Rafting	456,000	-6%
Waterskiing	571,000	-16%
Pool swimming	3,296,000	-18%
Snow/Ice Activities		
Sledding	1,810,000	86%
Ice fishing	418,000	71%
Snowboarding	291,000	43%
Snowmobiling	398,000	17%
Downhill skiing	570,000	0.2%
Ice skating outdoors	675,000	-4%
Cross country skiing	155,000	-44%
Sports Activities		
Basketball outdoors	3,789,000	179%
Baseball	1,314,000	129%
Soccer outdoors	728,000	114%
Handball or racquetball outdoors	681,000	99%
Tennis outdoors	1,593,000	81%
Football	1,337,000	76%
Attend outdoor sports events	6,588,000	47%
Running or jogging	3,300,000	37%
Golfing	1,612,000	25%
Volleyball outdoors	1,338,000	-13%
Softball	236,000	-79%

The NSRE report also provides demographic information on the people who are most likely to participate in these outdoor activities. Table 2 shows the demographics of the majority of participants in each of the highlighted activities from Table 1.

Table 2: Demographics for Key Recreational Activities that exist in Hackmatack Study Area (NSRE, 2009)

Activity	Demographics of the majority participant group for each activity					
	Gender	Race/Ethnicity	Age	Education	Income	Residence
Day hiking	Male	White	25-54	All equal	$50,000-99,999	Urban
Developed camping	Female	White, Hispanic	25-54	High school grad, Some college	$25,000-74,999	Equal
View/Photograph wildlife	Male	White, Asian	16-54	College grad, Post grad	$50,000-99,999	Rural
View/photograph birds	Female	White	35-64	College grad, Post Grad	$50,000-150,000+	Equal
Visit nature centers, etc	Female	White, American Indian, Asian, Hispanic	16-64	Some college - Post grad	$25,000-99,999	Urban
Horseback riding	Female	American Indian, Hispanic	16-24	Less than HS, College grad, Post grad	$75,000-150,000+	Rural
Family gathering outdoors	Male	Black,	45-54	Less than HS	$15,000-24,999, $75,000-99,999	Urban
Walk for pleasure	Equal	Black	Equal	Equal	Equal	Equal
Bicycling	Male	Equal	25-44	College grad, Post grad	$25,000-150,000+	Urban
Picnicking	Male	Black, Asian	25-54	Less than HS	$15,000-24,999, $50,000-74,999	Urban
Kayaking	Male	White, Asian	16-44	College grad, Post grad	$50,000-150,000+	Equal
Canoeing	Equal	White, Asian	16-24, 35-54	College grad-Post grad	$50,000-99,999	Equal
Warmwater fishing	Male	White, Hispanic	25-54	Some college	$50,000-150,000+	Rural
Ice fishing	Male	Hispanic	25-34	Less than HS	$25,000-49,999, $75,000-99,999	Urban
Snowmobiling	Equal	White, Hispanic	16-24, 35-44	Some college	$25,000-150,000+	Urban
Cross-country skiing	Female	White, Asian	45-64	College grad, Post grad	$50,000-149,999	Urban
Running/Jogging	Equal	White, American Indian	16-24, 35-44	College grad	<$15,000, $50,000-74,999, $100,000+	Equal

According to the NSRE study, the Boomer generation (born soon after World War II) will likely participate in recreational activities at ages well past those in previous generations because of improved health, fitness, and lifestyle changes. Boomers are also retiring with relatively high disposable incomes, allowing them to travel and participate in diverse recreational activities. As Boomers transition to senior-citizen status, they are expected to change from vigorous sports to more leisurely activities in the outdoors.

As Table 3 shows, seniors tend to remain active after retirement. Important to the Hackmatack NWR proposal, some activities remain popular regardless of age, such as walking, family gatherings, picnicking, and viewing/photographing birds and wildlife.

Table 3: Retiree Participation in Outdoor Activities (NSRE 2005) [6]

Activity	Age 16-64	Age 65-74	Age 75-84	Age 85+
Walk for pleasure	84%	80%	73%	75%
Family gatherings outdoors	76%	67%	60%	54%
Picnicking	56%	49%	41%	36%
Visit nature centers	61%	41%	29%	22%
View/photograph wildlife	48%	38%	29%	22%
View/photograph birds	32%	37%	33%	30%
Day hiking	36%	20%	13%	10%
Bicycling	44%	20%	12%	6%
Warmwater fishing	25%	16%	9%	5%
Developed camping	30%	15	8%	3%
Canoeing	11%	4%	2%	1%
Horseback riding	11%	3%	1%	1%
Cross-country skiing	4%	2%	0.8%	0
Snowmobiling	7%	2%	0.5%	0.1%
Kayaking	5%	1%	0.4%	0.3%
Ice fishing	3%	1%	0.8%	0
Running/Jogging	na	na	na	na

National Survey of Fishing, Hunting, and Wildlife-associated Recreation

One of the oldest and most comprehensive continuing recreation surveys, the National Survey of Fishing, Hunting, and Wildlife-associated Recreation has been conducted every five years since 1955 and provides detailed information regarding hunting, fishing, and wildlife watching. Table 4 draws from the most recent (2006) survey, which assesses participation and related expenditures of people 16 years of age and older in Illinois and Wisconsin.

The National Survey breaks these numbers down further. About 33% of wildlife watchers in Illinois and Wisconsin travelled away from home to participate in the outdoor activities shown in Table 4. This amounts to over 1.5 million participants. While hunting and fishing also have sizable markets, the availability of these activities within the proposed Hackmatack NWR proper is difficult to predict, as the refuge land has not yet been acquired. The availability of hunting and fishing will depend upon the size and configuration of the refuge property, suitable habitat, and conservation management objectives within designated NWR land.

Table 4: Number of Participants in Hunting, Fishing, and Wildlife Watching, and Total Expenditures (2006)

Activity	Illinois		Wisconsin	
	Participants	Expenditures	Participants	Expenditures
Fishing	873,000	$774,319,000	1,394,000	$1,647,035,000
Hunting	316,000	$381,937,000	697,000	$1,312,128,000
Wildlife Watching	2,566,000	$1,133,863,000	2,039,000	$744,689,000
Total	3,755,000	$2,290,119,000	4,130,000	$3,703,852,000

According to the USFWS report titled, *Wildlife Watching Trends: 1991-2006,* the most populated states have participation rates below the national average for wildlife watching.[7] Illinois ranks 42nd in the percent of population that participates in wildlife watching. Wisconsin ranks 21st in the percent of population that participates in wildlife watching. Illinois' high degree of urbanization directly affects opportunities for wildlife watching, pointing to a need to have more quality opportunities close to urban populations.

Another useful statistic the USFWS compiles is the total days of participation per person. In 2006, Illinois and Wisconsin residents spent, on average, 7-8 days wildlife watching. And, on average, those participants spent $36-47 per day on trips away from home to watch wildlife.

Demographically, the majority of wildlife watchers in Illinois and Wisconsin are from rural areas, female, over 35 years old, white, and have high school education or greater. The spread of participants across income levels is proportional to the population as a whole. This implies an important point—that wildlife watching appeals to people of all income levels.

Connecting Children with Nature

Richard Louv's book, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder,* galvanized public concern that American children are less and less connected with the natural world and with outdoor recreation. According to the Outdoor Foundation, *"Participation among boys and girls ages 6 to 12 dropped significantly from 2006 to 2007. Girls had the biggest decline, falling from 77% to 61%. Boys fell from 79% to 72%."* Many factors fuel this trend, including parental fear for safety, increasingly structured lessons and activities, and increased contact with electronics.

The creation of a national wildlife refuge should lead to additional business opportunities in Genoa City, Wisconsin, and other towns in the study area. Photo by Joan Williamson.

Louv writes, *"Some experts link indoor play... to the epidemic of childhood obesity. Ironically, a generation of parents fixated on being buff is raising a generation of physical weaklings. Two-thirds of American children can't pass a basic physical: 40 percent of boys and 70 percent of girls ages six to seventeen can't manage more than one pull-up; and 40 percent show early signs of heart and circulation problems, according to a new report by the President's Council on Physical Fitness and Sports."*

According to studies reviewed in the American Journal of Preventive Medicine, *"creation of or enhanced access to places for physical activity combined with informational outreach"* led to a near-doubling of the frequency of physical activity, as well as a 5.1 percent median increase in aerobic capacity, weight loss, reduced body fat, improvements in flexibility, and an increase in perceived energy.[8]

In their 2009 report, *Conservation: An Investment That Pays, The Trust for Public Land notes, "Clearly, local zoning laws and land-use regulations have important roles to play in shaping communities where people can easily integrate exercise into daily activity. But conservation has a role, too—especially when land is conserved for greenways that support hiking, biking, and other human-powered transportation."* [9]

Restored grasslands host a greater diversity of insect and animal life. Photo by Lenore Beyer-Clow.

The Chicago Wilderness *Leave no Child Inside* initiative is working in the metropolitan area to raise awareness of the issue. They have developed teacher and parent resources, and publicize events, programs and sites where parents can discover nature with their children.

Supply of Nature-based Recreation in the Hackmatack Study Area

Although Illinois has the fifth highest population of all states, the state ranks in the bottom 10% for the per capita amount of lands and facilities for outdoor recreation among all states.

The 2009 Illinois Statewide Comprehensive Outdoor Recreation Plan (SCORP) reports that the total amount of outdoor recreation land in Illinois is low in comparison to other states.[10] Although Illinois has the fifth highest population of all states, the state ranks in the bottom 10% for the per-capita amount of lands and facilities for outdoor recreation among all states. In the Priorities chapter, the SCORP states: *"Conservation of the state's significant natural resources, through acquisition, development, enhancement, management, and stewardship, continues to be the single-most important action to ensure a legacy of quality outdoor recreation opportunities for future generations of Illinoisans."* [11]

The Wisconsin SCORP divides the state into regions. The Hackmatack study area falls within the Lower Lake Michigan Coastal Region. According to Wisconsin's SCORP, nature-based and viewing/learning opportunities in this region are inadequate in proportion to the size of the population.[12]

The 2005 Wisconsin SCORP also identifies the top five Land Legacy Areas in each region—areas thought to be critical in meeting the state's present and future conservation and recreation needs. Two of the five areas lie within the Hackmatack study area—Bong Grassland and Illinois Fox River. The SCORP states, *"These sites should be considered the highest priority recreation areas to preserve and protect in each region."* [13]

Lastly, the Wisconsin SCORP identifies the recreation supply shortages in each region. Within the Lower Lake Michigan Coastal Region, the plan cites shortages in campgrounds, parks, mountain bike trails, water trails, wildlife areas, boat launches, fishing piers, and nature centers.

A 1999 Openlands report, *Under Pressure: Land Consumption in the Chicago Region 1999-2028,* examines likely future development patterns in a 13-county area around Chicago that includes portions of Indiana and Wisconsin. According to the report, residential and commercial

According to the Wisconsin SCORP, nature-based and viewing/learning opportunities in this region are inadequate in proportion to the size of the population.

development is expanding faster than the population growth of the region. Build-out maps within the report indicate that more than 50% of the Hackmatack study area is at medium to high risk of being developed by the year 2028.[14] Actions to protect open space in the study area are needed immediately to conserve its biologically-rich resources.

Build-out maps within the report indicate that more than 50% of the Hackmatack study area is at medium to high risk of being developed by the year 2028.

Conclusion: Recreation Implications of the Hackmatack National Wildlife Refuge proposal

The Hackmatack National Wildlife Refuge vision involves a core NWR parcel, with a limited suite of recreational opportunities permitted under its management directives, working in concert with an interconnected network of publicly accessible lands that offer a broad range of recreation choices.

Beyond improving the study area's biological integrity, the conserved corridors connecting larger conserved areas offer potential recreational corridors, allowing visitors a less

The upland sandpiper nests and forages in native prairie. The conversion of native grasslands to cropland has decreased the population of this once common species. Photo by Ted Lee Eubanks.

fragmented experience of the natural world. Increased access to parks and open space can improve activity levels among both residents and travelers.

A vast audience of recreationists sits on Hackmatack's doorstep – literally millions of people who enjoy nature-based recreation. Both Illinois and Wisconsin SCORPs have documented that opportunities for outdoor recreation are in short supply in the densely populated regions of northeastern Illinois and southeastern Wisconsin.

Designating a national wildlife refuge in the Hackmatack study area would further diversify the region's recreational assets, protect quality natural habitats, and provide additional opportunities for environmental education.

Economic & Social Assessment

As noted in the preceding pages, Illinois and Wisconsin SCORPs identified a significant gap between the supply and demand for nature-based recreation opportunities in northeastern Illinois and southeastern Wisconsin. The Hackmatack NWR proposal offers a potential increase in the recreational supply. But what are the economic benefits or impacts to the local area?

The potential audience base for the NWR is an important consideration in determining economic viability. The standard drive time in many tourism assessments for a regional market is two hours (see Figure 2, page 3, for a map of the 2-hour regional market area for the Hackmatack study area.) As estimated by the U.S. Census for 2008, the population base within a two-hour drive of the Hackmatack study area is over 12 million.

Table 5: Regional Marketing Region Population Estimates

Metropolitan Area	2008 Estimated Population (US Census)
Chicago	9,569,624
Rockford	354,394
Milwaukee	1,549,308
Madison	561,505
Total	**12,034,831**

To understand the potential economic impacts of creating a new NWR in the Hackmatack study area, we examined the Minnesota Valley National Wildlife Refuge (NWR). Like Hackmatack, the Minnesota Valley NWR is located near a large metropolitan area, has a high level of citizen involvement in the protection of open space, and high interest in cooperative conservation agreements with area landowners. The economic impact from Minnesota Valley NWR is comparable with what Hackmatack can expect once the refuge is fully developed for public use.

Case Study: Minnesota Valley National Wildlife Refuge

Minnesota Valley NWR is located in the Minneapolis/St. Paul metropolitan area. The USFWS describes this refuge as an "urban refuge," one of only a handful in the country. The refuge was established in 1976 to provide habitat for a large number of migratory waterfowl, fish, and other wildlife species threatened by commercial and industrial development. Although the refuge is the single largest landowner along this portion of the river, the valley itself contains a patchwork of ownerships, including private landowners, non-profit organizations, corporations, cities, counties, and lands administered by Minnesota Department of Natural Resources. This mosaic of ownerships offers great opportunities for partnerships but also requires a great deal of coordination and cooperation among all land managers.

A state-of-the-art interpretive center in Bloomington, near the Mall of America, serves as the refuge gateway. The Bloomington Visitor Center offers a staffed information desk, four levels of exhibits, a 125-seat auditorium, an art gallery, classrooms, a bookstore, and an observation deck. An estimated 300,000 visitors annually visit the refuge and its associated waterfowl production areas for a variety of reasons, including hiking, hunting, fishing, wildlife observation, and interpretive programs.

Minnesota Valley NWR owes its existence to a group of citizens who were concerned about protecting the important fish, wildlife, and plant resources of the Lower Minnesota River

Valley in the early 1970s. Through hard work and determination, they enlisted the support of more than 40 private groups and many citizens to conserve these important resources through the establishment of a national wildlife refuge. On October 8, 1976, Congress passed the Minnesota Valley National Wildlife Refuge Act.

The non-profit organization Friends of the Minnesota Valley (Friends) incorporated in 1982. Its mission is to support conservation and management of the natural and cultural resources of the Lower Minnesota River Watershed and to promote environmental awareness. The organization has a membership of approximately 500 and is governed by a Board of Directors. Since 1982, Friends has supported refuge acquisition and development. Due to its efforts, the refuge has been able to acquire nearly 11,500 acres and to complete its visitor and wildlife interpretive center in 1990.

In 1991, Friends employed part-time staff to begin implementing the Heritage Registry program. This program is designed to encourage refuge neighbors and other private landowners in the Minnesota River Valley to adopt land management practices that benefit fish, wildlife, and plant communities. Friends has enrolled more than 125 private landowners in this program, including several corporations.

In 2006, the USFWS published the report, *Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Visitation.* The report analyzed visitation records of 80 refuges around the country to estimate the economic role that refuge visitors play in regional economics. Minnesota Valley NWR was one of the refuges included in the study.

The report observes, *"Ecotourism is one method to derive economic benefits from the conservation of wildlife and habitat. Many refuges were established to protect waterfowl-hunting opportunities, but as public interests*

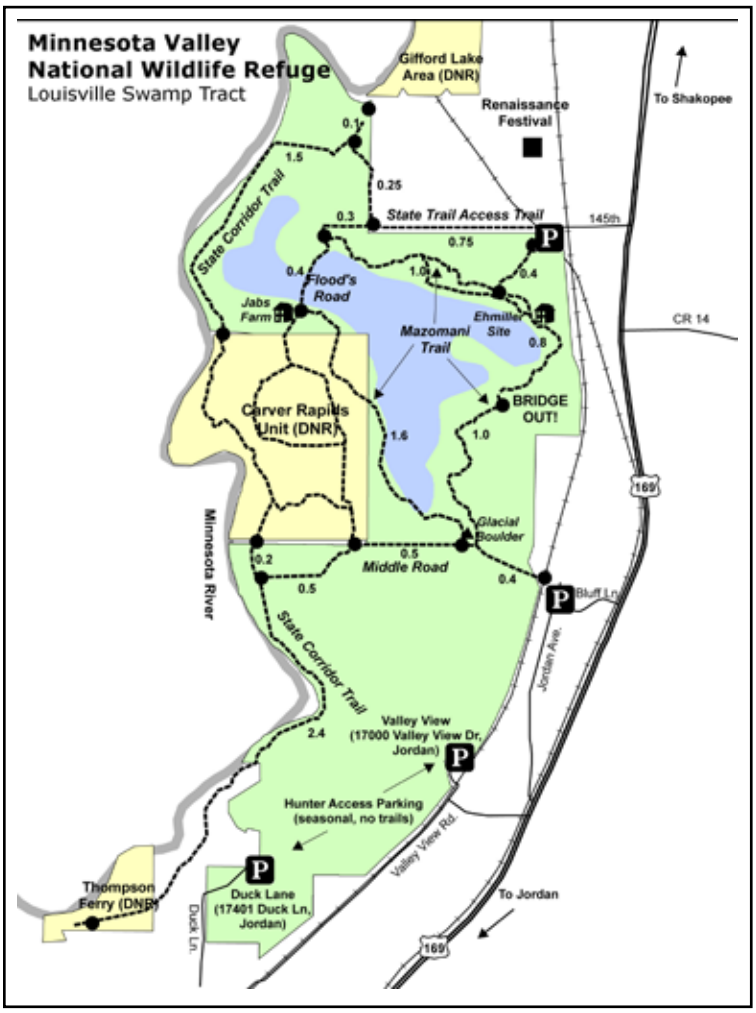

Figure 6: Minnesota Valley NWR Map

have expanded beyond consuming wildlife to emphasize watching and photographing wildlife, the role of refuges has also evolved. The economic effects of ecotourism are determined to assist refuge planning and to facilitate the interaction of refuges and local communities." [15]

The study's findings for Minnesota Valley NWR illuminate the economic potential that Hackmatack could achieve over the long term:

- Almost all of the 257,250 visits in 2006 were for non-consumptive recreation, primarily trail use, birding, and observation platforms.

- Residents (within 30 miles of the MVNWR) accounted for 80% of all refuge visitation.

The village of Richmond, Illinois, offers a charming historic downtown and trail connections to local parks and preserves. Photo by Joan Williamson.

- Total visitor recreation expenditures in 2006 were $1.3 million, with non-residents accounting for 51% of the total expenditures.

- Expenditures on non-consumptive activities accounted for 96% of all expenditures.

- The local economic effects associated with recreation visits are:

  - Total spending by final consumers on all goods: $1,465,700
  - Associated employment: 21 jobs
  - Job income: $629,500
  - Total tax revenue: $214,100

- The total economic effect for Minnesota Valley NWR is $1.48 returned for every $1 in budgeted expenditure.

The willingness of the public and private landowners in the study area to partner and work cooperatively with the new refuge in creating a diverse regional product and identity will be critical.

Other studies offer additional statistics on the economic returns of wildlife watching. The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reports that Illinois and Wisconsin residents spent, on average, 7-8 days wildlife watching in 2006. And, on average, participants spent $36-47 per day on trips away from home to watch wildlife.

The Need for a Regional Approach

What steps should be taken to insure that the Hackmatack study area is able to economically benefit from the establishment of a NWR and an increase in tourism?

The willingness of public and private landowners in the study area to partner and work cooperatively with the new refuge in creating a diverse regional product and identity will be critical. The more the study area as a whole takes part in creating the interconnected web of conserved lands, the more visible the Hackmatack area becomes and the more viable its function as an economic driver.

Dispersed, diverse public use will be a critical component in this strategy, and is one that demands regional cooperation. Lands and facilities throughout the study area—such as Chain O'Lakes State Park, Bong State Recreation Area, Glacial Park, Des Plaines River Trail and Greenway, Lakewood Forest Preserve, Moraine Hills State Park, Rollins Savanna Forest Preserve, Bloomfield Wildlife Area, and even the larger Nippersink Creek watershed—expand the diversity of and capacity for recreation in the study area, and offer a mechanism for spreading the economic returns of nature-tourism.

Other regional conservation initiatives are capitalizing on collaboration among a broad mix of public and private landowners to create a cohesive conservation and market identity. These include Indiana Dunes (which includes a national lakeshore, a state park, and a collection of natural lands in coastal Indiana), Door County (with a broad collection of public and private conservation lands), and the Upper Peninsula of Michigan (similarly amalgamated as Door County). While these areas comprise diverse, widely distributed resources managed by an eclectic variety of resource managers and landowners, they are each working to create a unified regional identity that attracts visitors.

A significant part of the economic benefits to the Hackmatack study area will come from goods and services offered to the recreational public. Therefore physically connecting recreationists to these goods and service providers in the area communities will be critical. Examples abound of communities making these connections. In Pennsylvania, communities along the Great Allegheny Passage hike-and-bike trail are working together through a regional "Trail Towns" initiative. In central Kansas, communities have banded together to create the Kansas Wetlands and Wildlife Scenic Byway, a scenic route that interconnects two counties, several communities, a state wildlife management area, a Nature Conservancy preserve, and a national wildlife refuge (Quivira NWR). In each of these cases, a community or group of communities is strategically interlinking transportation corridors and recreational venues to move recreationists to goods and service providers.

Another model to consider is Jim Thorpe, Pennsylvania. Jim Thorpe is a historic coal mining town situated at the base of the Lehigh Gorge. Jim Thorpe has remade itself as a recreation and travel destination, and has worked to connect itself to the hiking, biking, and water recreation opportunities in the gorge. For others not so recreationally inclined, there are steam train rides through the gorge, and a number of museums and historical places. Although a small community (approximately 5000 residents), the expenditures of visitors support an impressive variety and number of goods and services. Yet the inherent character of the community remains intact, and has not been overwhelmed by tourism.

Local towns and villages can work cooperatively to take advantage of the refuge as a "brand builder." Some may choose to use the brand as a graphical connection (as in a logo), while others could physically connect to the refuge via a trail or greenway. For example, the historic downtown area of Richmond could connect to the refuge with a hiking or bicycling trail. In doing so, downtown businesses would have an opportunity to meet the needs of these recreationists through the goods and services it provides.

Peter Newman, author of *Cities as Sustainable Ecosystems* (2007), has written extensively on resilience in social-ecological systems as a basis for community sustainability. According to Newman, one important model for a resilient community is the "place-based" community. He states that *"most city officials want local economic development as their first priority. The best approach to this is to emphasize local place identity, as shown by Robert Putnam when he found social capital to be the best way to predict wealth in a community. Thus when communities relate strongly to the local environment, the city's heritage and its unique culture, such places develop a strong social capital of networks and trust that forms the basis of a good economy."*

Local towns and villages can work cooperatively to take advantage of the refuge as a "brand builder."

The Regional Land Use Plan for Southeastern Wisconsin recommends a strategy that maximizes the use of existing urban service and facility systems while protecting the best remaining elements of the natural resource base. One of the key recommendations from the Plan is that new urban land would be provided through the infilling and renewal of existing urban areas, and through the orderly outward expansion of existing urban areas. This Smart Growth strategy should be adopted by municipalities across the study area.

Sprawl replaces a native, endemic social structure with one imported (or forced) from the outside. A singular community is transformed into just one small part of a homogenous mass. Creation of the Hackmatack NWR can provide study area communities with a mechanism by which they can maintain their unique environment, heritage, culture, and identity.

Nippersink Creek is known as one of the highest quality streams in Illinois, and is home to at least 21 animals and 30 plants that are listed as Illinois threatened and endangered. Photo by Diane Banta.

National Significance as an Economic Driver

According to a survey by YPartnership, America's leading public relations agency for travel, leisure, hospitality and entertainment clients, 54% of U.S. adults are planning at least one overnight trip during the last half of 2009, up from 50% the same time last year. When asked about dream destinations, 66% of potential travelers said "national parks." [16] While Illinois has two National Park Service sites (Illinois and Michigan Canal National Heritage Corridor, and the Lincoln Home National Historical Site) and Wisconsin has one (Apostle Islands National Lakeshore), none lie within the Hackmatack study area's 2-hour market region. The proposed Hackmatack National Wildlife Refuge would be the first NWR in the Chicago Metropolitan area. The closest NWR to the Hackmatack study area is Horicon NWR, about 2 hours to the north. National wildlife refuge designation connotes national significance to the Hackmatack area wildlands and would increase the visibility and attraction of the region to recreationists.

Local Economic Effects

The creation of a refuge will provide the stimulus to diversify the recreation and travel mix in the region. Lake Geneva has been recognized as one of the nation's distinctive destinations (one of the 2009 Dozen Distinctive Destinations listed by the National Trust for Historical Preservation, with Woodstock listed in 2007). Other communities in the region have not yet received such acclaim, and a more diversified travel and recreation mix should offer these communities a chance to benefit from their nearby natural resources.

Local communities stand to benefit from the Hackmatack National Wildlife Refuge in a number of other ways. Existing businesses will see additional tourist traffic, particularly those along major corridors such as US 12, WI 120, IL 173, and IL 31. Every hunter, angler, birdwatcher, and kayaker (to name a few) requires equipment, access to the resources, travel, food, lodging, and other retail goods and services. Some person or business must supply all of the above, from the manufacturing of the kayak to the shop where it is sold to the visitor. Each recreation, therefore, has a chain of producers, and each link on that chain offers a local economic opportunity.

The degree to which each local community will benefit from the refuge is directly related to the variety of goods and services their businesses offer. What if a community lacks these goods and services? Then the revenue related to the refuge and its associated tourism will "leak" into whatever community can provide those goods and services.

It will be incumbent on the part of the counties and their economic development representatives (for example, the McHenry County Economic Development Corporation) to facilitate and guide the sustainable development of new tourism-related business enterprises, and to aid the expansion of those that exist today. The potential to undermine, through unplanned or unsustainable growth, the very natural and community assets that will draw outdoor recreationists to the Hackmatack area is very real.

Visitation and Expenditure Predictions

Refuge visitation is difficult to predict; however, we can look to similar refuges to give us some idea of what to expect. The Ottawa NWR along Lake Erie in Ohio is within a three-hour drive of 12 million people and attracts 177,529 visitors annually.[17] The Edwin B. Forsythe NWR in New Jersey, near Atlantic City, is visited by over 195,821 people annually.[18] Don Edwards San Francisco Bay NWR, another of the urban refuges, attracts approximately 1,505,410 visitors annually,[19] while Minnesota Valley NWR hosts 257,250 each year.[20]

Given the location of the proposed refuge, when developed (including visitor's center, trails, and educational programming) a conservative annual use estimate would be about 200,000 people.

An estimate of visitor expenditures is more difficult. Given the variables (day versus overnight, resident versus out-of-region, degree of local goods and services provided) the economic expenditures associated with Hackmatack can only be loosely estimated. Most of the urban refuges listed above are day-use facilities, which is comparable with the Hackmatack vision. The USFWS estimates in their state reports that participants in Illinois and Wisconsin spent on average $36-47 per day on wildlife watching trips away from home. If we consider only day trippers, a conservative use estimate of 200,000 visitors annually, and $36/day, then the total annual expenditures would be approximately $7.2 million.

Overnight visitation can rise as high as $125 or more per day for expenditures. If all are overnight guests, then the direct expenditures could total as much as $25 million. Our best estimate is that the expenditures would range somewhere between $7 to 25 million, with both expenditures and their impact increasing as the region develops a broader array of goods and services

Although it is difficult to predict the day-trip versus overnight mix, it is fair to say that the majority of these expenditures will come from inside the region. These expenditures would be widely spread in the economy, benefiting many types of businesses and services. This economic expansion associated with visitation will continue as (1) visitors learn about Hackmatack, and (2) travel to the region is facilitated by additional goods and services.

Other Socio-economic Impacts of NWR Designation

There are potential socio-economic implications of NWR designation that extend far beyond the direct contributions of travel and recreation. According to research by CEOs for Cities, a national network of urban leaders, *"two-thirds of highly mobile 25-to-34-year-olds with college degrees say that they will decide where they live first, then look for a job."* To attract these new professionals and young families they recommend, *"Take care of the basics – Make sure your community is clean, green, safe and inviting."* In his 2002 book *The Rise of the Creative Class,* Richard Florida reports that high-tech workers cited a good environment (what he terms "quality of place") as the most important amenity in attracting them to work in a particular region—more than housing, cost

The native habitats at Moraine Hills State Park host an abundant variety of plants, animals and birds. The restoration of several wetlands has further enhanced the biodiversity. Photo by Ray Mathis.

of living, and good schools.[21] Open space carries with it a quality of life dividend that can accrue to the local communities.

Many studies have shown that residential development in particular may cost communities more money than they stand to gain in taxes, and that conserving land may make more economic sense over the long term.

Establishing an NWR in the Hackmatack study area will also affect local education opportunities. The educational programs made available by the refuge visitor center will serve not only visitors but residents as well. Local school districts, such as Richmond, Spring Grove and Genoa City can benefit from educational programming and opportunities associated with the new refuge. Many refuges offer extensive educational programs, both those that are developed in-house by the staff and those brought to the refuge by local teachers. Curriculum enhancement, field trips, outdoor classrooms, facility sharing, and outdoor and physical recreation and exercise are all examples of ways that local students would benefit from the refuge.

Tax Implications

Many local communities are concerned about the effect of national wildlife refuge designation on their tax base. According the USFWS, *"Lands acquired by the Service are removed from the tax rolls, but the Refuge Revenue Sharing Act, as amended, allows us to offset the tax losses by annually paying the county or other local unit of government an amount that often equals or exceeds that which would have been collected from taxes if in private ownership."*

They continue, *"The Revenue Sharing Act (16 U.S.C. 715s) requires that the revenue sharing payments to counties for our purchased land will be based on the greatest of: (a) 3/4 of 1% of the market value; (b) 25% of the net receipts; or (c) 75 cents per acre. The assessments on Service administered areas will change just like the assessments on private lands change. We reappraise the market value of these areas at least once every 5 years."* In other words, the agency helps offset tax losses through in-lieu payments.

The Trust for Public Land's 2009 report, *Conservation: An Investment That Pays,* notes that, *"Many studies have shown that residential development in particular may cost communities more money than they stand to gain in taxes, and that conserving land may make more economic sense over the long term."*

Another TPL study, *The Economic Benefits of Parks and Open Space,* found that property values for homes adjacent to parks and open space are higher than those that are not. The study also noted that, *"in the long term, Massachusetts towns that had protected the most land enjoyed, on average, the lowest property tax rates—perhaps because they had less development, which requires roads, schools, sewer and water infrastructure, and other services."* The report cautions that

every community is different, and that careful analysis of tax implications must accompany open space conservation.

Transportation and Tourism

"Recreational development is a job not of building roads into the lovely country, but of building receptivity into the still unlovely human mind."

--Aldo Leopold, A Sand County Almanac, 1949

The extent to which the Hackmatack area attracts Chicago and Milwaukee travel markets will be shaped by ease and cost of travel. In these busy times, people yearn for efficiency and simplicity. The region enjoys public transportation opportunities that facilitate travel to the Hackmatack study area—opportunities that the region can build upon. Chicago-O'Hare and Milwaukee Airports offer global air connections, and both are about one hour's drive from the study area. Rail service via Metra connects the study area and Chicago. Metra represents an unexplored opportunity for encouraging additional travel to the region. Additional rail facilities and lines may benefit the Hackmatack study area, assuming that the additional capacity does not provoke uncontrolled residential development and loss of open space.

As fuel prices rise, travelers may increasingly choose local sites versus those far away. One of the emerging travel trends in the nation is the "staycation," in which people choose to enjoy their vacations close to home. According to Michael Redbord, author of "*The Staycation Boom: Destination Tourism at Home,*" 12.9 million Americans researched an in-state vacation in June, 2008, up from 8.7 million in 2007. Illinois ranked among the top states in which residents researched staycation possibilities.[22]

	Destination	June 2008 Staycation Researchers	% Increase over 2007
1	Massachusetts	334,132	104%
2	Pennsylvania	361,440	98%
3	Colorado	358,404	81%
4	New Jersey	1,333,835	79%
5	New York	1,000,617	70%
6	Utah	299,847	69%
7	Minnesota	478,224	65%
8	Illinois	599,536	60%
9	Virginia	364,461	50%
10	Washington	392,244	48%

For a number of years, Hackmatack study area residents have discussed a bypass connecting US 12 to IL 31 and alleviating traffic congestion in the Richmond area. While a full discussion of the merits of this proposal is beyond the scope of this report, it should be pointed out that the degree to which the region is interconnected (physically, economically, environmentally) will shape and influence the economic benefits from the refuge. The proposed Route 12 bypass could be an economic benefit if the region is able to create a destination identity. Otherwise, the bypass may be a detriment in that transient traffic that presently provides some positive impact will be diverted. According to Anderson and Otto 1994, however, bypasses generally do not affect retail sales in the communities they bypass.

In general, outdoor recreationists will be attracted to this study area to the degree that their recreational experience contrasts with their urban lives. Road development that is context sensitive and minimizes traffic congestion can help foster this appealing contrast. If bypass construction physically fragments the network of conserved areas in the Hackmatack study area, however, it could undermine the ecological, recreational, and economic benefits of the Hackmatack plan.

Ecosystem Services

Human communities benefit from a multitude of resources and processes supplied by natural ecosystems, free services that would otherwise require expensive, technology-based solutions. These include:

- Decomposition of organic wastes
- Filtration of pollutants from soil and water
- Buffering of air pollutants
- Moderation of climatic change
- Conservation of soil and water
- Groundwater recharge
- Preservation of genetic diversity
- Pollination of food crops and other plants [23]

As noted in a Trust for Public Land (TPL) study, *"Natural hydrological systems recharge and cleanse the watershed. Roots of wetland plants filter and remove suspended materials. Plants and algae use and remove such nutrients as nitrogen and phosphorus. Bacteria, fungi, and other microorganisms decompose organic material. Forests and wetlands increase the availability of water by absorbing it, storing it, and releasing it slowly during times of scarcity."* [24] TPL concluded that the economic value of a single acre of wetlands is between $150,000 and $200,000 when the benefits of storm buffering, water quality improvement and flood protection are factored in.[25]

By conserving ecological corridors among Hackmatack study area wildlands, the Hackmatack NWR proposal will maintain or enhance the area's ecosystem services.

Conclusion: Economic Implications of the Hackmatack National Wildlife Refuge Proposal

While the creation of a Hackmatack NWR would be an important step safeguarding the integrity of natural communities and sensitive plant and wildlife populations, the benefits of the Hackmatack NWR initiative reach beyond conservation. Several identifiable economic and social benefits would flow from the establishment of a refuge. Whether these benefits come from enhanced educational opportunities at the visitor center, improved health and well-being through expanded trails, or the diversity of new economic opportunities that come with recreation and tourism, the refuge can be a complex economic and social engine, as well as a haven for native plants and wildlife.

Parks and open space help define a region's image and provide an amenity that has continuously ranked among the top priorities in quality of life surveys. A new national wildlife refuge, interlinked with other green spaces in the study area, will go a long way to insuring that the area creates and maintains a "green" identity that attracts the growing number of people for whom "quality of place" is a leading concern when choosing where to live.

Hackmatack can attract the next generation of visitors and residents who value walkable neighborhoods, sustainable communities, healthy ecosystems, and connectivity among open space recreational opportunities. Conservation and responsible, sustainable development can work hand-in-hand to insure that the study area benefits socially, economically, and ecologically. Yet only with responsible, regional planning for sustainable recreation and development will the promise of the refuge be fulfilled.

Overall Assessment

of the Viability of the Hackmatack National Wildlife Refuge Proposal

The proposed Hackmatack National Wildlife Refuge has strong potential to diversify and strengthen the local economy, expand recreational opportunities and tourist attractions, and ensure the continued survival of native species in the Chicago metropolitan area.

The establishment of Hackmatack National Wildlife Refuge would be a strong draw for visitors who enjoy recreating in natural landscapes. The Chicago and Milwaukee metropolitan areas provide the demand for such resources, and the Hackmatack study area can offer one important supply. The willingness of study-area landowners to partner and work cooperatively with the new refuge in creating a diverse regional product and identity will be critical.

However, time is of the essence. Creation of a national wildlife refuge is a lengthy process. One of the most recently established refuges is the Cherry Valley NWR in Pennsylvania. Initiated in 2001, the process of creating the Cherry Valley NWR took nearly eight years. Even discounting the first several years of community efforts (which Hackmatack proponents have already undertaken), the process still took more than three years from the introduction of legislation to the official establishment of the refuge. Assuming there are willing land owners and the funding is available, a lengthy process still lies ahead before Hackmatack NWR can become a reality.

The willingness of area landowners to work together and the richness of the study area's resources will help move the Hackmatack vision forward. Given the challenge of preserving the Hackmatack area's rare and unique core habitats in the face of continuing suburbanization, there is little time to waste.

A rich assortment of wildflowers awaits the visitor to Chain O'Lakes State Park. Photo by Ray Mathis.

The willingness of area landowners to work together and the richness of the study area's resources will help move the Hackmatack vision forward. Given the challenge of preserving the Hackmatack area's rare and unique core habitats in the face of continuing suburbanization, there is little time to waste.

Endnotes

[1] *The Illinois Comprehensive Wildlife Conservation Plan (ICWCP)* is available on-line at **http://dnr.state.il.us/orc/wildliferesources/theplan/final/Illinois_final_report.pdf**

[2] *ICWCP.* Pg. 169.

[3] *Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need (Strategy)* is available on-line at **http://dnr.wi.gov/org/land/er/wwap/plan/**

[4] *Strategy*. Pg. 2-10.

[5] *The Outdoor Recreation Participation report 2008,* The Outdoor Foundation, 2008, Pg. 2.

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[17] *Banking on Nature 2006.* Pg. 143

[18] *Banking on Nature 2006.* Pg. 224

[19] *Banking on Nature 2006.* Pg. 338

[20] *Banking on Nature 2006.* Pg. 131.

[21] *Conservation: An Investment That Pays.* The Trust for Public Land, 2009. Pg. 5.

[22] *The Staycation Boom: Destination Tourism at Home.* 2008. Available on-line at: **http://www.competeinc.com/research/newsletters/staycation-boom-destination-tourism-home/**

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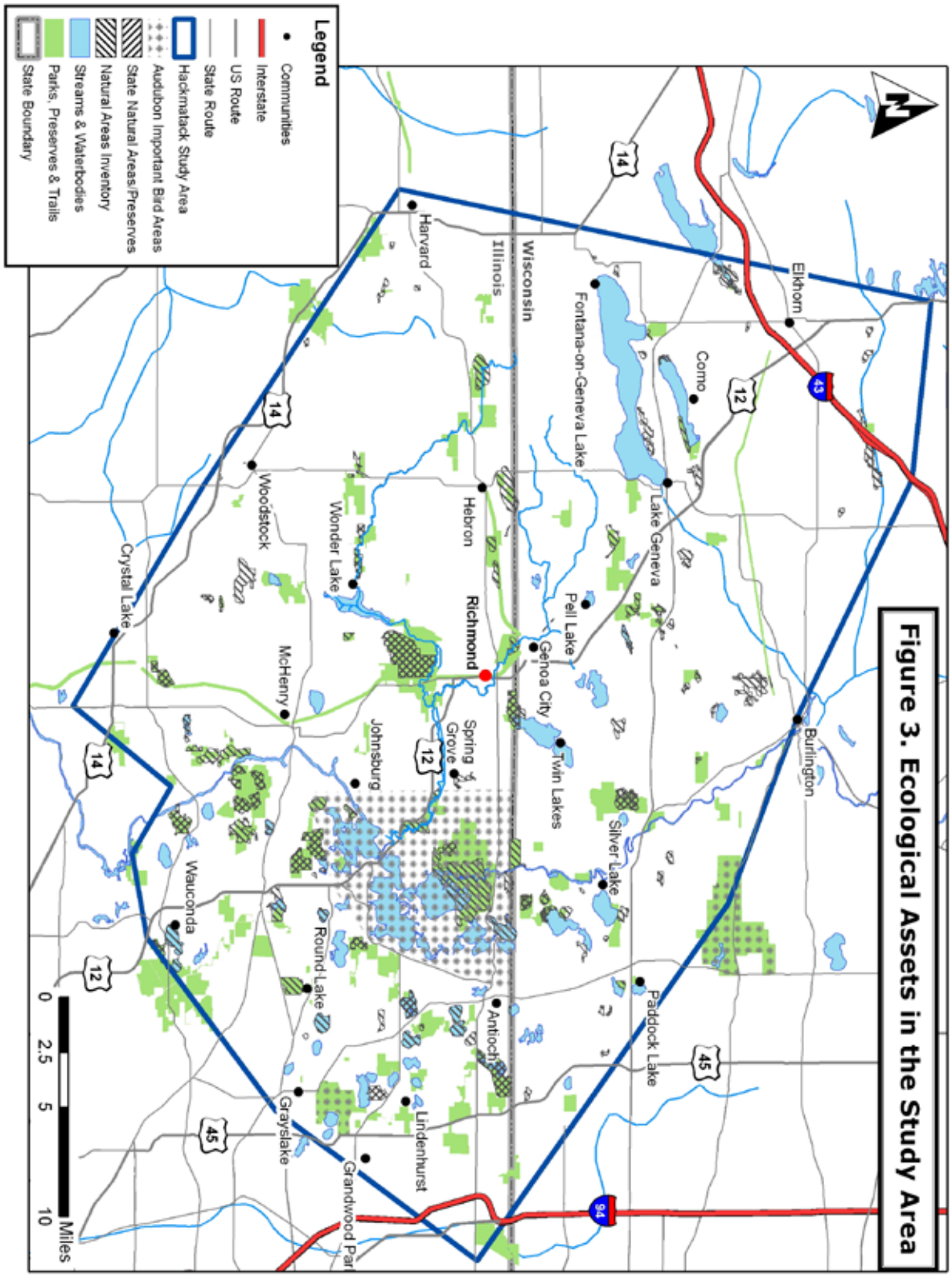
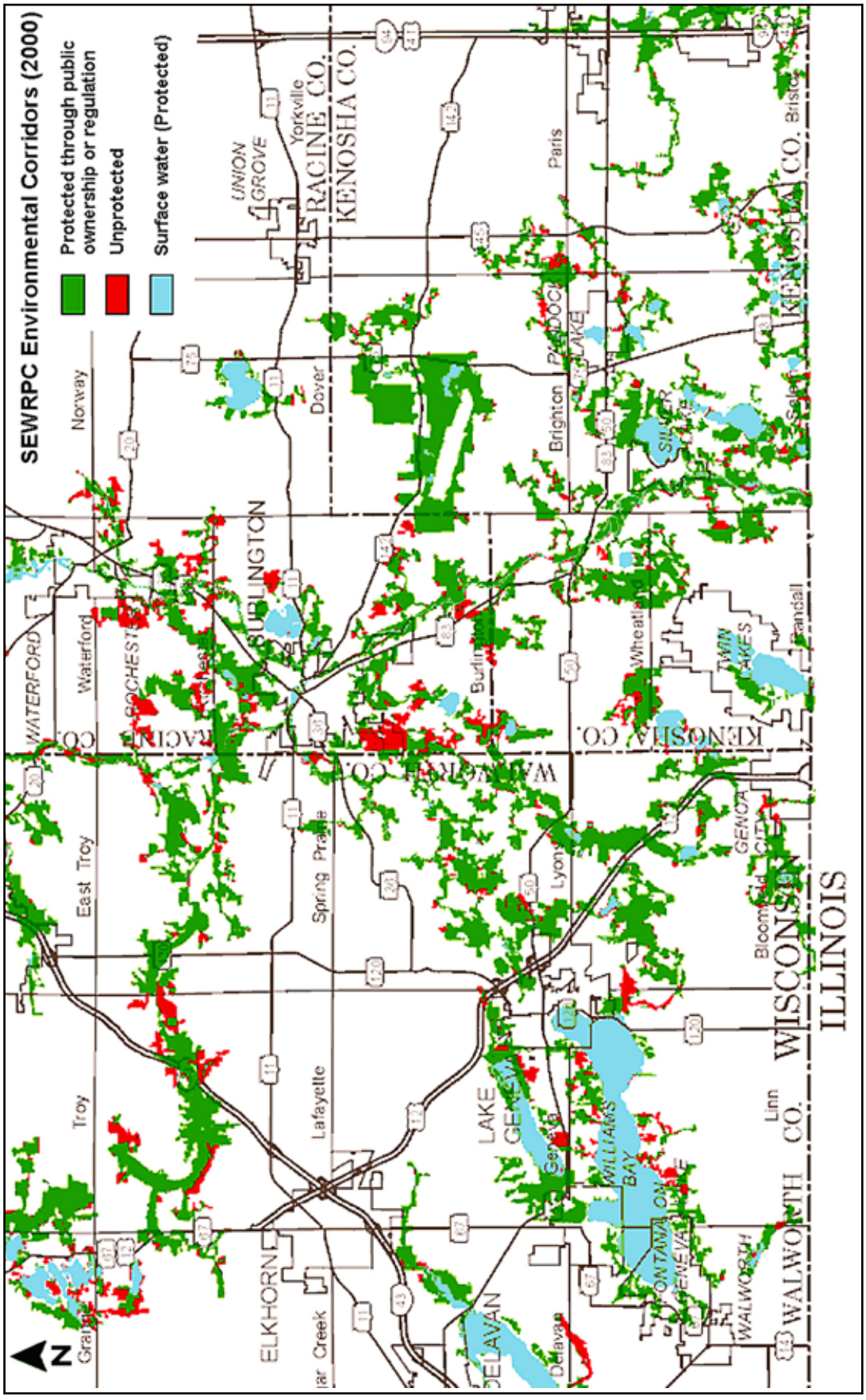
[25] *The Economic Benefits of Parks and Open Space.* The Trust for Public Land, 1999. Pg. 41.

Maps

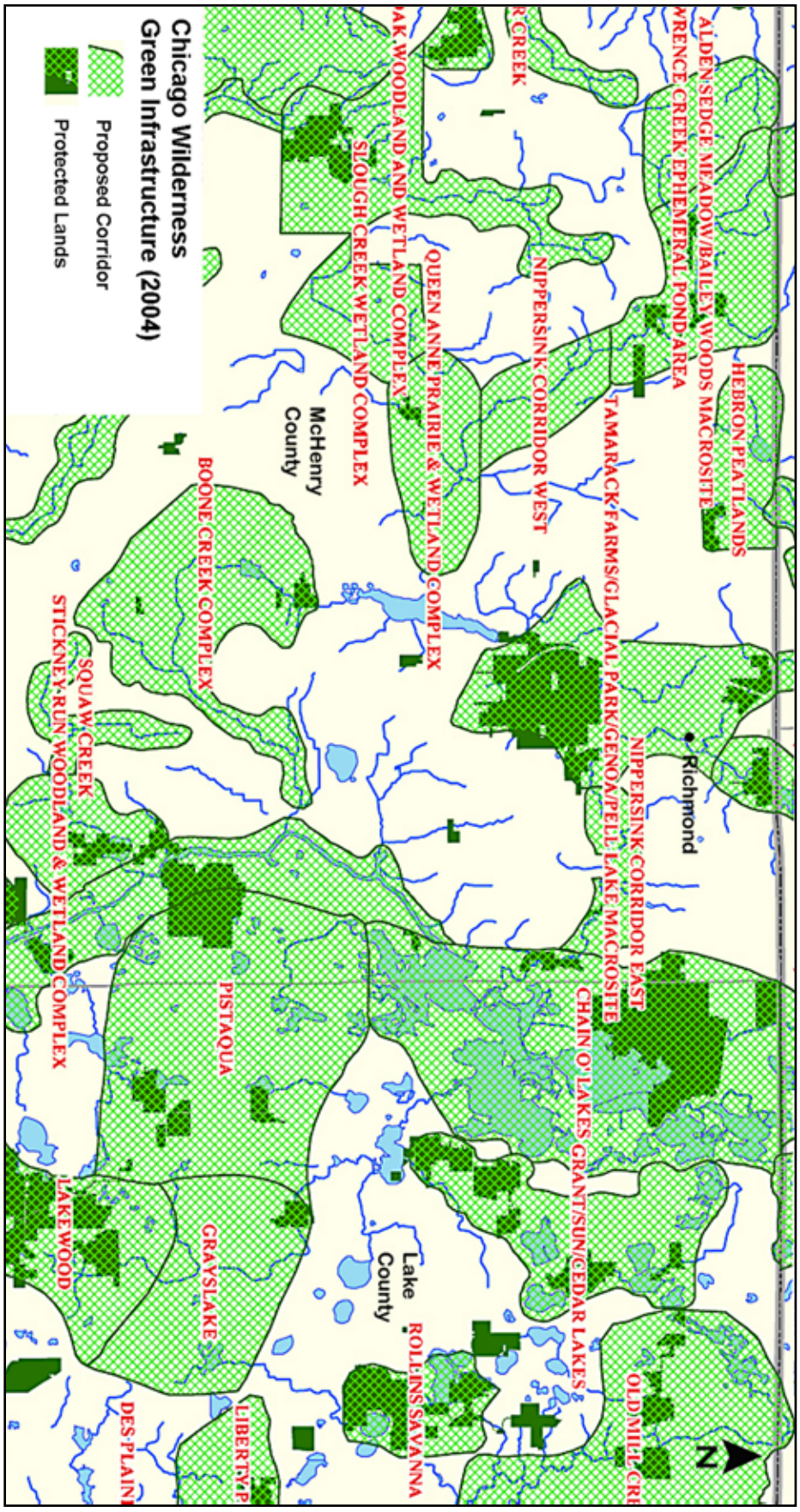
Ecological Assets in the Study Area



Environmental Corridor Map for the Study Area in Wisconsin



Green Infrastructure Map for the Study Area in Illinois



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25 East Washington Street
Suite 1650
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Phone: 312-863-6250
Fax: 312-863-6251
www.openlands.org

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Chicago Region Office
120 South LaSalle
Suite 2000
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